

REPAIR MANUAL

FE 450 EU

FE 450 AUS

FE 450 USA

FE 570 EU

FE 570 AUS

FE 570 USA

2009

Article no. 3803004en



HUSABERG

It is important that you read this owner's manual carefully and completely before the start of work.

Only use **ORIGINAL HUSABERG SPARE PARTS**.

This vehicle can only fulfill the demands placed on it in the long run if the specified service work is performed regularly by qualified experts.

The repair manual was written to correspond to the most current state of this model series. We reserve the right to make changes in the interest of technical advancement without, at the same time, updating this repair manual. 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 repair work will be performed by a fully trained mechanic.

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Issued by: TÜV Management Service

HUSABERG eine Division der KTM SMC AG
5230 Mattighofen, Austria

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Symbols used

The symbols used are explained in the following.



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).



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

Formats used

The typographical and other formats used are explained in the following.

Name

Indicates a proprietary name.

Name[®]

Identifies a protected name.

Brand[™]

Identifies a brand in merchandise traffic.

Warranty

The work prescribed in the service schedule must be carried out in an authorized HUSABERG workshop and confirmed in the customer's service record, since otherwise no warranty claims will be recognized. No warranty claims can be considered for damage resulting from manipulations and/or alterations to the vehicle.

Fuel, oils, etc.

You should use the fuels, oils and greases according to specifications as listed in the repair manual.

Spare parts, accessories

Only use spare parts and accessory products that have been approved and/or recommended by HUSABERG. HUSABERG accepts no liability for other products and any resulting damage or loss.

The current **HUSABERG Force Depot** parts for your vehicle can be found on the HUSABERG website.
International HUSABERG website: www.husaberg.com

Work rules

Special tools are required for some work. These are not part of the vehicle standard equipment, but they can be ordered with the item number stated in parentheses. Ex.: Valve spring mounter (59029019000)

When the vehicle is assembled, non-reusable parts (e.g., self-locking screws and nuts, gaskets, seal rings, O-rings, splints, lock washers) must be replaced with new parts.

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

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

After you complete the repair or maintenance work, check the roadworthiness of the vehicle.

Notes/warnings

Pay close attention to the notes/warnings.



Info

Various information and warning labels are affixed to the vehicle. Do not remove information/warning labels. If they are missing, you or others may not recognize sources of danger and may therefore be injured.

Grades of risks



Danger

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



Warning

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

Note

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



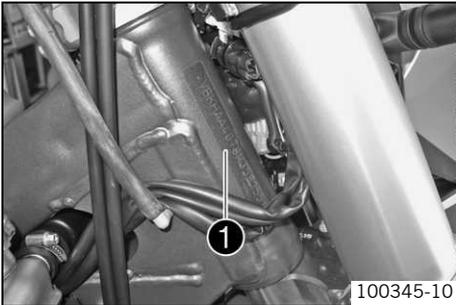
Warning

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

Repair manual

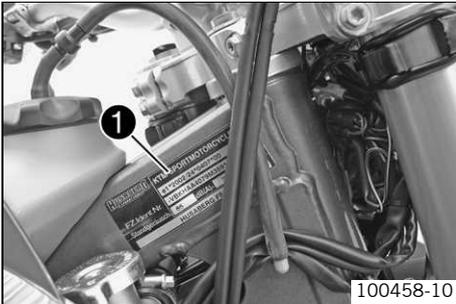
- It is imperative that you read this owner's manual carefully and completely before the start of work. It contains useful information and many tips on how to repair and maintain your vehicle.
- The presence of the appropriate HUSABERG special tools, workbench and workshop equipment are a prerequisite.

Chassis number



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

Type label (FE EU, FE AUS)



The type label ❶ is fixed to the frame at the front right.

Type label (FE USA)



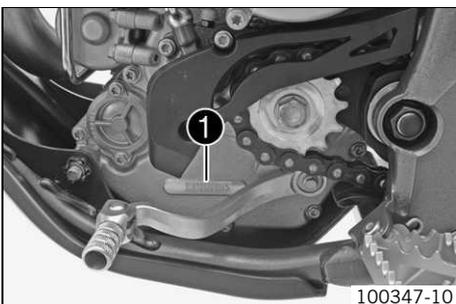
The type label ❶ is fixed to the front of the steering head.

Key number (FE EU, FE AUS)



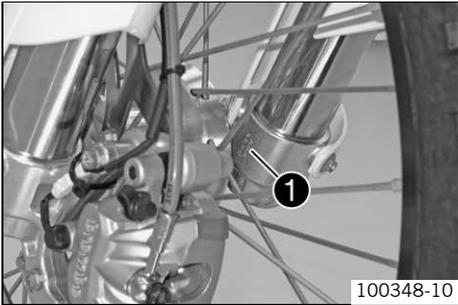
The key number ❶ is stamped on the key strap.

Engine number



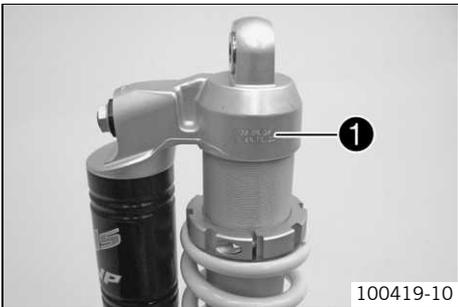
The engine number ❶ is stamped on the left side of the engine under the engine sprocket.

Fork part number



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

Shock absorber part number



The shock absorber part number ❶ is stamped on the upper part of the shock absorber above the adjusting ring. The shock absorber part number is not visible when the shock absorber is installed.

Jacking up the motorcycle



Note

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

- Always place the vehicle on a firm and even surface.

- Jack up the motorcycle underneath the engine. The wheels must no longer touch the ground.

Work stand (81229055000) (☛ p. 273)

- Secure the motorcycle against falling over.

Removing the motorcycle from the work stand

Note

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

- Always place the vehicle on a firm and even surface.

- Remove the motorcycle from the work stand.
- Remove the work stand.

Starting



Danger

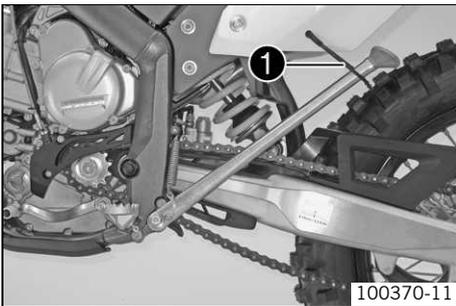
Danger of poisoning Exhaust gases are poisonous and can result in unconsciousness and/or death.

- When running the engine, always make sure there is sufficient ventilation, and do not start or run the engine in a closed space without an effective exhaust extraction system.

Note

Engine failure High engine speeds in cold engines have a negative effect on the service life of the engine.

- Always warm up the engine at low engine speeds.



- Raise the motorcycle off of the stand and secure the stand with rubber band ❶.
- Shift gear to neutral.

(FE AUS)

- Turn the emergency OFF switch to the position ☐.

Condition

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

- Pull the idle speed adjusting screw all the way out.
- Press the electric starter button.



Info

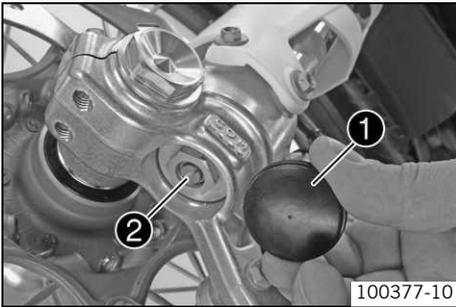
Do not open the throttle to start.

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

Warning lamp **FI** lights up briefly as a functional control when starting.

Adjusting the compression damping of the fork

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



- Remove protection covers ❶.
- Turn adjusting screws ❷ clockwise until they stop.

i Info
Adjusting screws ❷ are located at the bottom end of the fork legs. Make the same adjustment on both fork legs.

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

| Compression damping | |
|---------------------|-----------|
| Comfort | 26 clicks |
| Standard | 22 clicks |
| Sport | 18 clicks |

i Info
Turn clockwise to increase damping, turn counterclockwise to reduce suspension damping.

- Mount protection covers ❶.

Adjusting the rebound damping of the fork

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



- Turn adjusting screws ❶ clockwise until they stop.

i Info
Adjusting screws ❶ are located at the top end of the fork legs. Make the same adjustment on both fork legs.

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

| Rebound damping | |
|-----------------|-----------|
| Comfort | 22 clicks |
| Standard | 20 clicks |
| Sport | 18 clicks |

i Info
Turn clockwise to increase damping, turn counterclockwise to reduce suspension damping.

Adjusting the spring preload of the fork



- Turn the adjusting screws counterclockwise until they stop.

i Info
Make the same adjustment on both fork legs.

- Turn back clockwise the number of turns corresponding to the fork type.
- Guideline

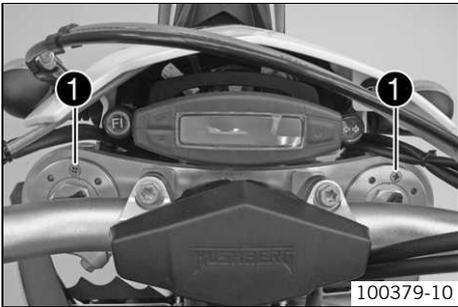
| Spring preload - Preload Adjuster | |
|-----------------------------------|---------|
| Comfort | 0 turn |
| Standard | 2 turns |
| Sport | 4 turns |



Info

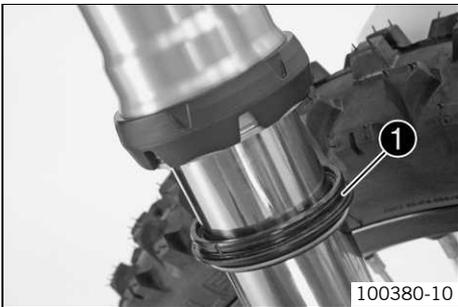
Turn clockwise to increase spring preload, turn counterclockwise to reduce spring preload.
 Adjusting the spring preload has no influence on the absorption setting of the rebound damping.
 Basically, however, you should set the rebound damping higher with a higher spring preload.

Bleeding the fork legs



- Jack up the motorcycle. (☛ p. 9)
- Remove bleeder screws ❶ briefly.
- ✓ Any excess pressure escapes from the interior of the fork.
- Mount and tighten bleeder screws.
- Remove the motorcycle from the work stand. (☛ p. 9)

Cleaning the dust boots of the fork legs



- Jack up the motorcycle. (☛ p. 9)
- Loosen the fork protection. (☛ p. 11)
- Push dust boots ❶ of both fork legs downwards.



Info

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



Warning

Danger of accidents Reduced braking efficiency due to oil or grease on the brake discs.

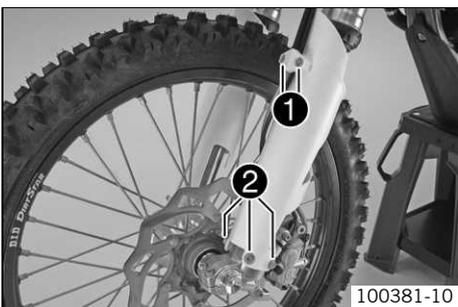
- Always keep the brake discs free of oil and grease, and clean them with brake cleaner when necessary.

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

Universal oil spray (☛ p. 266)

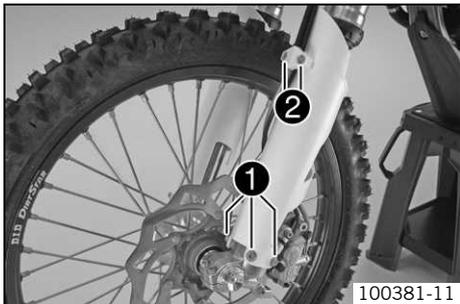
- Press the dust boots back into their normal position.
- Remove excess oil.
- Position the fork protection. (☛ p. 12)
- Remove the motorcycle from the work stand. (☛ p. 9)

Loosening the fork protection



- Remove screws ❶ and take off clamp.
- Remove screws ❷ on the left fork leg. Push the fork protection downwards.
- Remove the screws on the right fork leg. Push the fork protection downwards.

Positioning the fork protection



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

Guideline

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

- Position the brake line and cable harness. Put the clamp on, and mount and tighten screws ❷.
- Position the fork protection on the right fork leg. Mount and tighten the screws.

Guideline

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

Removing the fork legs

- Remove the front wheel. (☛ p. 65)

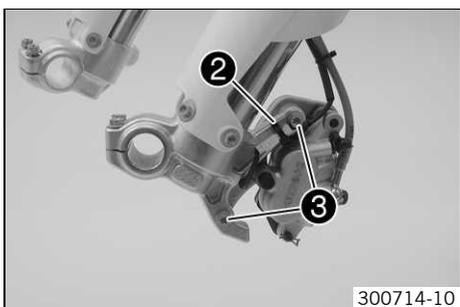
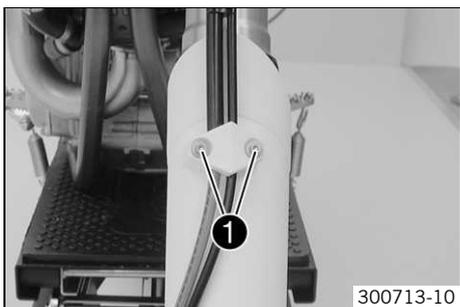
(FE EU, FE AUS)

- Remove the headlight mask with the headlight. (☛ p. 88)

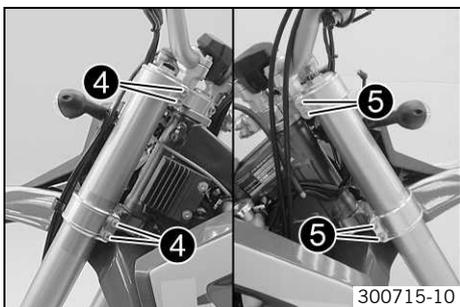
(FE USA)

- Remove the start number plate. (☛ p. 63)

- Remove screws ❶ and take off the clamp.

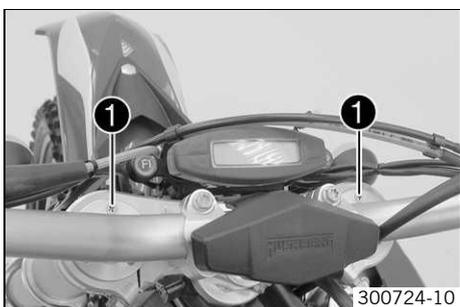


- Remove cable binders ❷.
- Remove screws ❸ and take off the brake caliper.
- Allow the brake caliper and brake line to hang tension-free to the side.



- Unscrew screws ❹. Take out the left fork leg.
- Unscrew screws ❺. Take out the right fork leg.

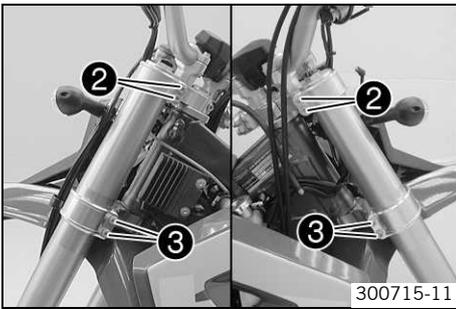
Installing the fork legs



- Position the fork legs.

i Info

The upper milled groove in the fork leg must be flush with the top edge of the upper triple clamp.
Position bleeder screws ❶ toward the front.



- Tighten screws ②.

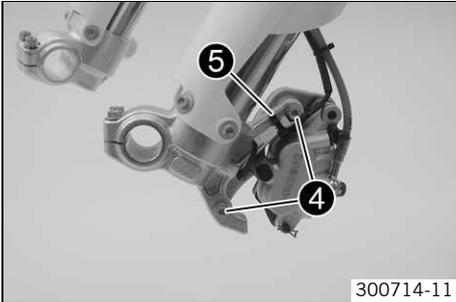
Guideline

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

- Tighten screws ③.

Guideline

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

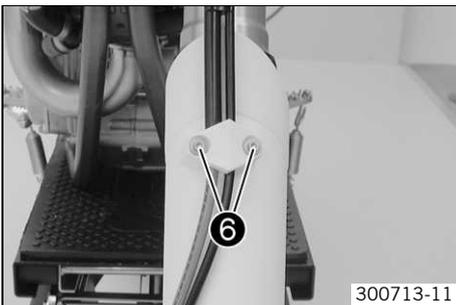


- Position the brake caliper. Mount and tighten screws ④.

Guideline

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

- Secure the cable with cable binders ⑤.



- Position the brake line and wiring harness. Put the clamp on. Mount and tighten screws ⑥.

- Install the front wheel. (☛ p. 65)

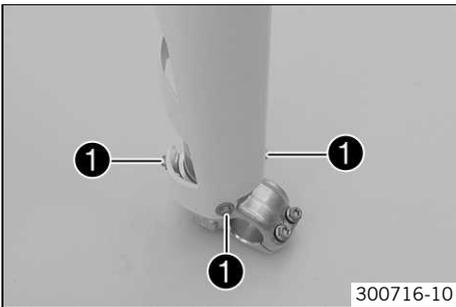
(FE EU, FE AUS)

- Install the headlight mask with the headlight. (☛ p. 88)

(FE USA)

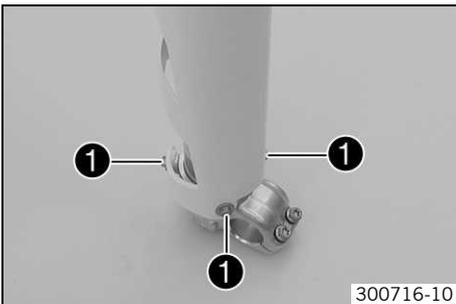
- Install the start number plate. (☛ p. 64)

Removing the fork protector



- Remove the fork legs. (☛ p. 12)
- Remove screws ① on the left fork leg. Lift off the fork protector.
- Remove the screws on the right fork leg. Lift off the fork protector.

Installing the fork protector



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

Guideline

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

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

Guideline

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

- Install the fork legs. (☛ p. 12)

Performing a fork service



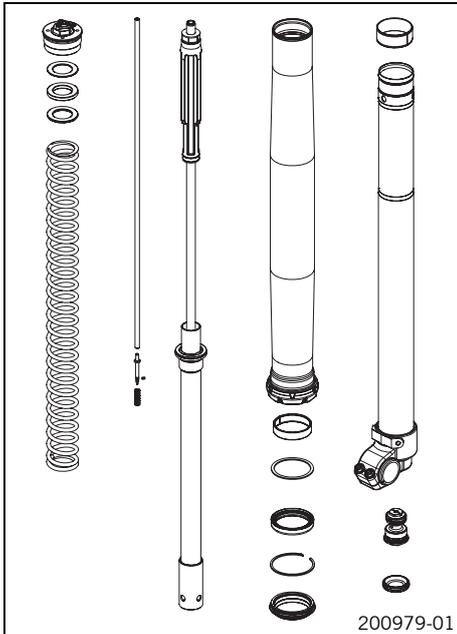
Info

These operations are the same on both fork legs.

Condition

The fork legs have been removed.

- Disassemble the fork legs. (☛ p. 14)
- Disassemble the cartridge. (☛ p. 17)
- Check the fork legs. (☛ p. 19)
- Assemble the cartridge. (☛ p. 21)
- Assemble the fork legs. (☛ p. 23)



Disassembling the fork legs



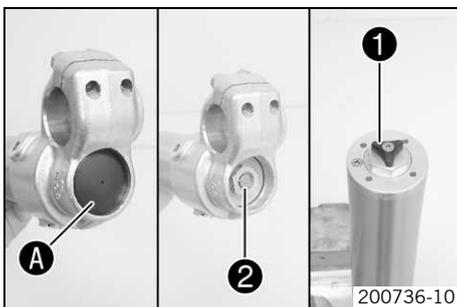
Info

The steps are identical for both fork legs.

Condition

The fork legs are disassembled.

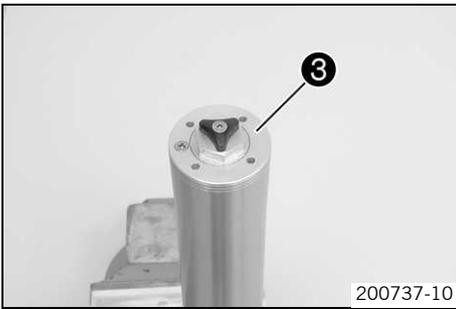
- Remove protective cover **A**.
- Take note of the present state of the rebound damping **1** and compression damping **2**.
- Take note of the present state of the spring preload.
- Completely open the adjustment elements of the rebound damping and compression damping.



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

Clamping stand (T1403S) (☛ p. 277)





200737-10

- Loosen **Preload Adjuster** ③.

Pin wrench (T103) (☞ p. 274)



Info

The **Preload Adjuster** cannot be taken off yet.



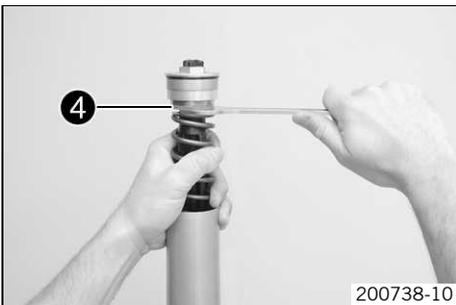
200690-10

- Take out the fork leg and clamp in with the axle clamp.



Info

Use soft jaws.



200738-10

- Push the outer tube downward.
- Pull the spring downward. Place the special tool on the hexagonal part.

Open-end wrench (T14032) (☞ p. 277)



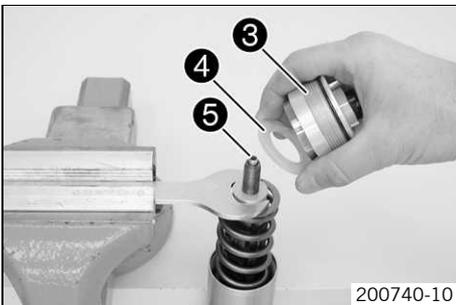
Info

The preload spacers ④ should be above the special tool.



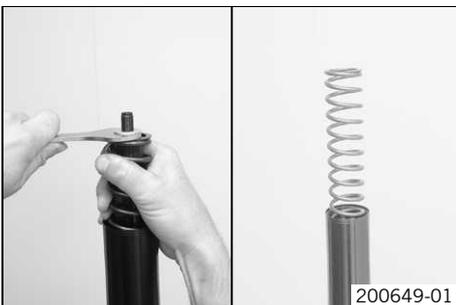
200739-10

- Clamp the special tool in the bench vise. Loosen **Preload Adjuster** ③.



200740-10

- Remove **Preload Adjuster** ③ with the preload spacers ④.
- Remove adjustment tube ⑤.



200649-01

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



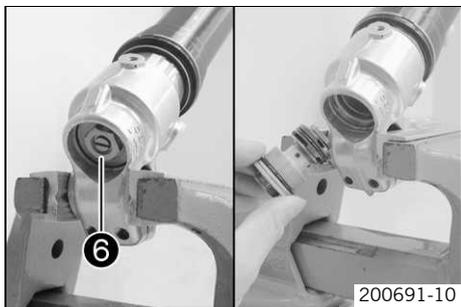
200650-01

- Drain the fork oil.



Info

Pull out and push in the piston rod several times in order to pump out the cartridge until it is empty.



200691-10

- Clamp in the fork leg with the axle clamp.
- Unscrew and remove the compression damping fitting 6.



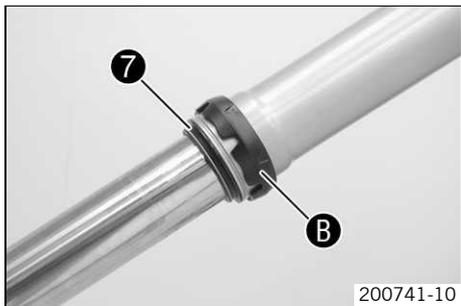
Info

Place a fluid collector beneath it, as usually some oil will drain out.



200653-01

- Remove the cartridge.



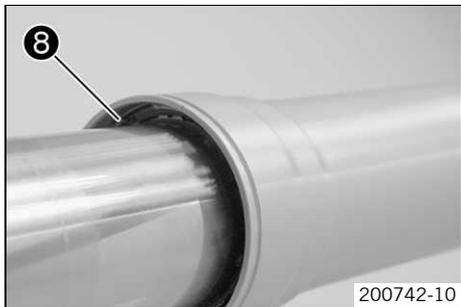
200741-10

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



Info

Disassembly of the fork protector ring is not necessarily required for the further repair.



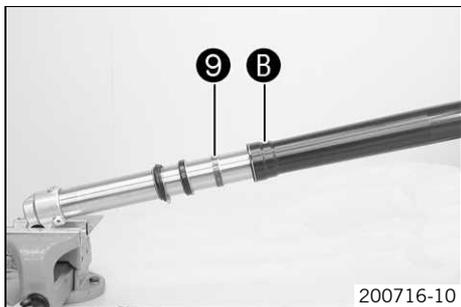
200742-10

- Remove lock ring 8.



Info

The lock ring has a coarsely finished end against which the screwdriver can be placed.



200716-10

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

Guideline

50 °C (122 °F)

- Jerk the outer tube out of the inner tube.



Info

The lower sliding bushing 9 must be pulled out of its bearing seat when doing this.



- Remove upper sliding bushing 10.



Info

Gently pull them apart without using any tool.



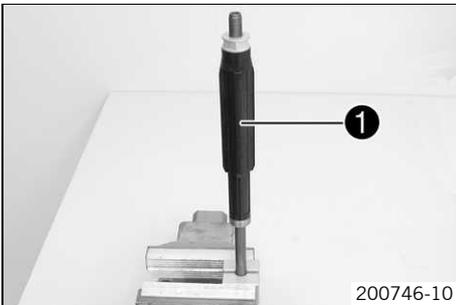
- Take off the lower sliding bushing 9.
- Take off support ring 11.
- Take off seal ring 12.
- Take off lock ring 8.
- Take off dust boot 7.
- Take out the fork leg.

Cartridge disassembly



Info

The steps are identical for both fork legs.

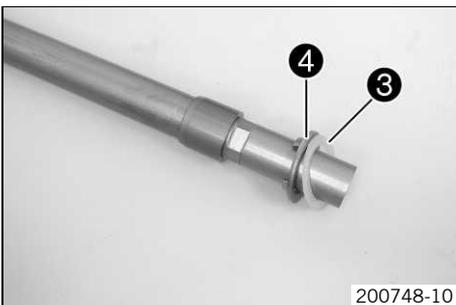


- Disassemble the fork legs. (☞ p. 14)
- Remove fluid barrier 1 from the piston rod.

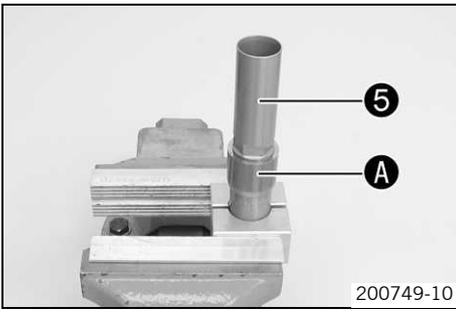
Clamping stand (T14016S) (☞ p. 276)



- Remove piston rod 2 from the cartridge.



- Remove washer 3 and spring seat 4 from the cartridge.



- Degrease the cartridge and clamp using the special tool.

Clamping stand (T14015S) (☛ p. 276)

- Warm up the cartridge in the area of **A**.

Guideline

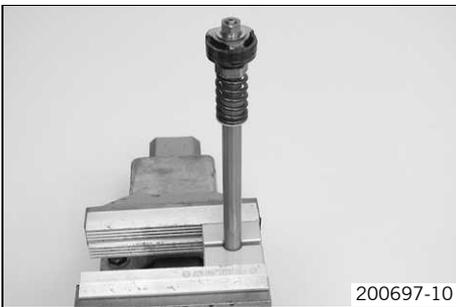
50 °C (122 °F)

- Unscrew and remove screwsleeve **5**.



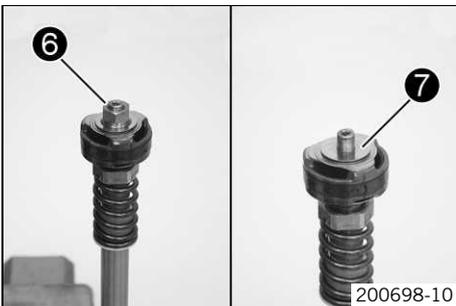
Info

This step is unnecessary for the further disassembly.



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

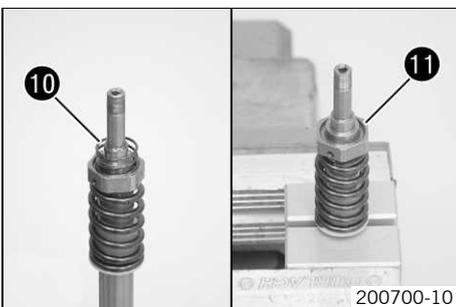
Clamping stand (T14016S) (☛ p. 276)



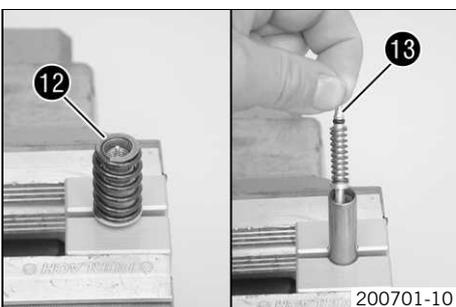
- Remove nut **6**.
- Remove shim stack **7** completely.



- Remove piston **8**.
- Remove shim stack **9** completely.



- Remove spring **10**.
- Remove tap rebound **11**.



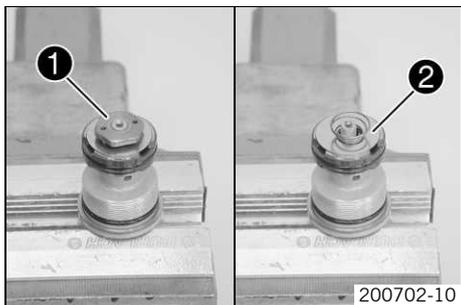
- Remove spring **12**.
- Remove valve **13** of the rebound damping together with the spring.
- Take out the piston rod.

Disassembling the compression damping fitting

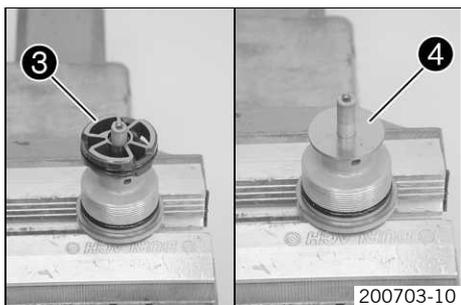


Info

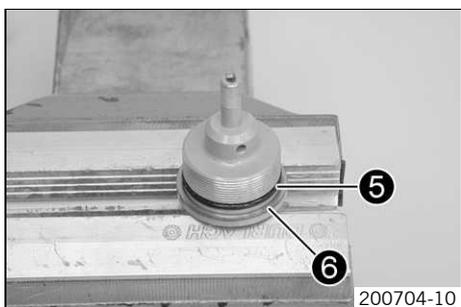
The steps are identical for both fork legs.



200702-10



200703-10



200704-10

- Disassemble the fork legs. (☛ p. 14)
- Clamp the compression damping fitting in a bench vise using soft jaws.
- Remove nut ①.
- Remove the spring.
- Remove washer ②.
- Remove piston ③.
- Remove shim stack ④.
- Remove O-ring ⑤ and seal ring ⑥ from the compression damping fitting.
- Extract the compression damping fitting.

Checking the fork legs

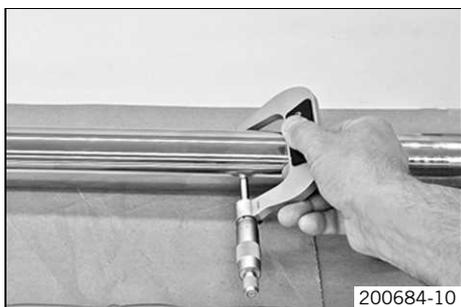
Condition

The fork legs are disassembled.



200728-10

- Check the inner tube and axle clamp for damage.
 - » If there is damage:
 - Replace the inner tube.

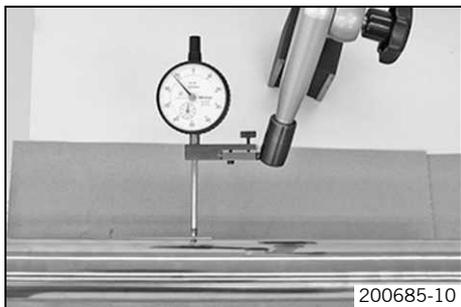


200684-10

- Measure the outside diameter at several points of the inner tube.

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

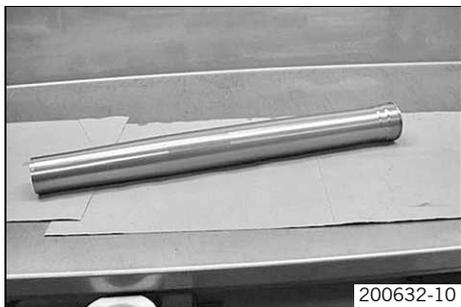
- » If the measured value is smaller than the specified value:
 - Replace the inner tube.



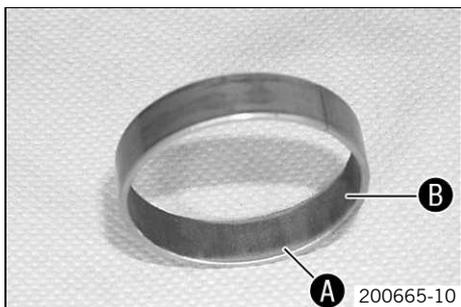
- Measure the run-out of the inner tube.

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

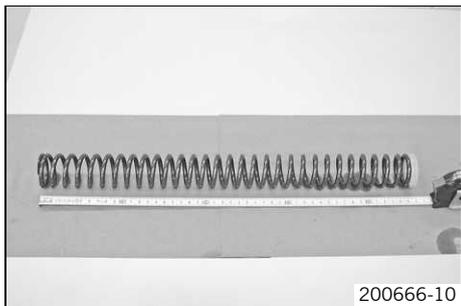
- » If the measured value is larger than the specified value:
 - Replace the inner tube.



- Check the outer tube for damage.
 - » If there is damage:
 - Replace the outer tube.



- Check the surface of the sliding bushing.
 - » If the bronze-colored layer **A** can be seen beneath the sliding layer **B**:
 - Replace the sliding bushing.



- Check the spring length.

Guideline

| | |
|--------------------------------------|-------------------|
| Spring length with preload spacer(s) | 510 mm (20.08 in) |
|--------------------------------------|-------------------|

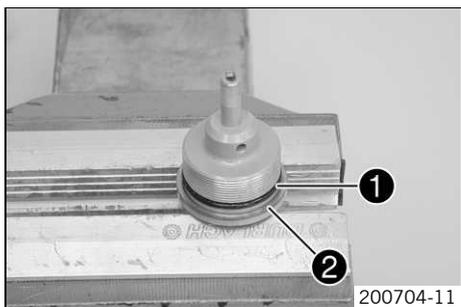
- » If the measured value is greater than the specified value:
 - Reduce the thickness of the preload spacer.
- » If the measured value is smaller than the specified value:
 - Increase the thickness of the preload spacer.

Assembling the compression damping fitting



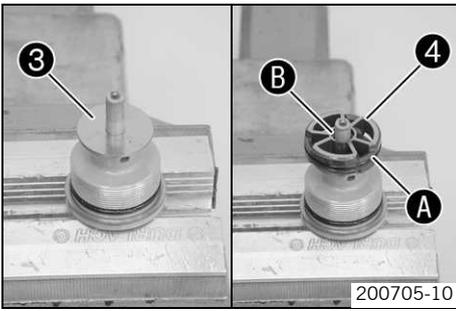
Info

The steps are identical for both fork legs.



- Clamp the compression damping fitting in a bench vise using soft jaws.
- Mount O-ring **1** and seal ring **2**.
- Grease the O-ring.

| |
|-----------------------------|
| Lubricant (T158) (☛ p. 265) |
|-----------------------------|



- Mount shim stack ③.

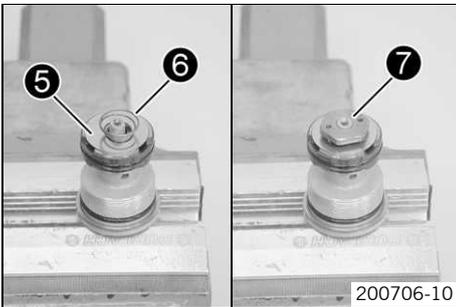
i Info
Mount the smaller shims below.

- Mount pistons ④ with O-ring ①.

i Info
The side with the largest inside diameter ② faces upward.

- Grease the piston O-ring.

| |
|-----------------------------|
| Fork oil (SAE 5) (☛ p. 263) |
|-----------------------------|



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

Guideline

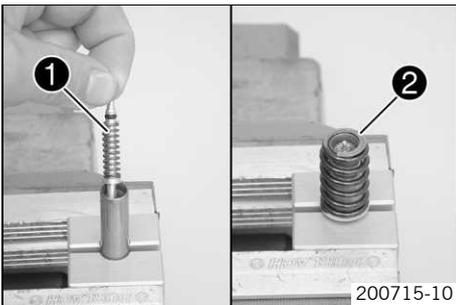
| | | |
|---------------------------------|--------|-------------------|
| Compression damping fitting nut | M6x0.5 | 3 Nm (2.2 lbf ft) |
|---------------------------------|--------|-------------------|

i Info
The washer ⑤ must have freedom of movement relative to the spring force.

- Secure the nut by locking.
- Extract the compression damping fitting.

Assembling the cartridge

i Info
The steps are identical for both fork legs.



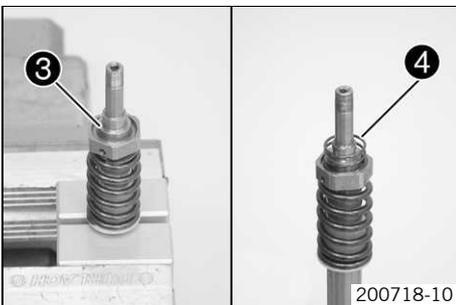
- Clamp in the piston rod.

| |
|-------------------------------------|
| Clamping stand (T14016S) (☛ p. 276) |
|-------------------------------------|

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

| |
|-----------------------------|
| Lubricant (T158) (☛ p. 265) |
|-----------------------------|

- Mount spring ②.



- Grease tap rebound ③ O-ring.

| |
|-----------------------------|
| Lubricant (T158) (☛ p. 265) |
|-----------------------------|

- Mount and tighten the tap rebound.

Guideline

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

- Position spring ④.



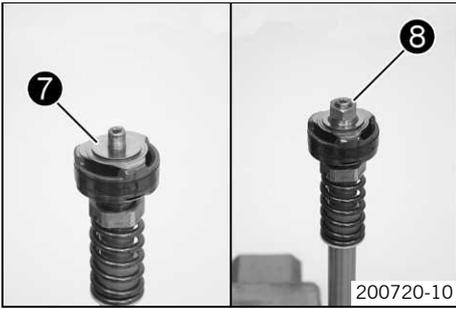
- Mount shim stack ⑤.

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 piston ⑥ with the piston ring.



200720-10

i Info
The side with the largest inside diameter faces downward.

- Mount shim stack 7.

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

- Mount and tighten nut 8.

Guideline

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

i Info
Mount the nut with the collar facing downward.

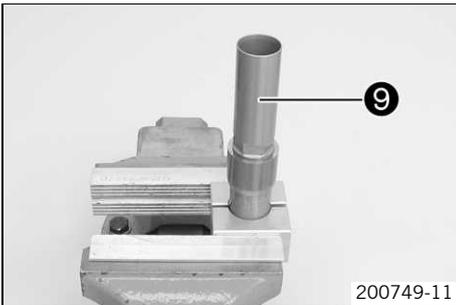
- Secure the nut by locking.
- Degrease the cartridge and clamp using the special tool.

Clamping stand (T14015S) (☛ p. 276)

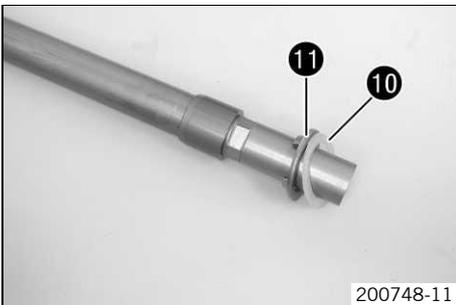
- Mount and tighten screwsleeve 9.

Guideline

| | | | |
|-------------|-------|------------------------|---------------------|
| Screwsleeve | M29x1 | 46 Nm (33.9 lbf ft) | Loctite® 241 |
|-------------|-------|------------------------|---------------------|

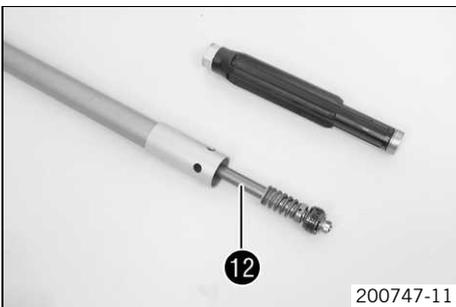


200749-11



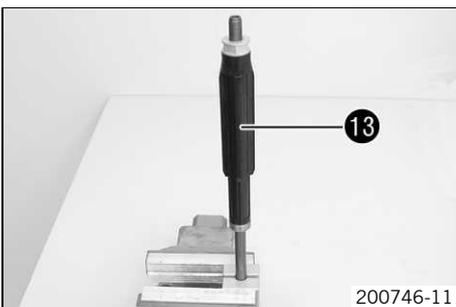
200748-11

- Mount washer 10 and spring seat 11.



200747-11

- Push piston rod 12 into the cartridge.



200746-11

- Screw on fluid barrier 13 to the stop.

i Info
The fluid barrier must be screwed on tightly against the stop. Do not use any tools.

Assembling the fork legs



Info

The steps are identical for both fork legs.



- Check the fork legs. (☞ p. 19)
- Assemble the cartridge. (☞ p. 21)
- Assemble the compression damping fitting. (☞ p. 20)
- Clamp in the inner tube with the axle clamp.
- Mount the special tool.

Protecting sleeve (T1401) (☞ p. 276)

- Grease and slide on dust boot ①.

Lubricant (T511) (☞ p. 266)

Info

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

- Slide on lock ring ②.
- Grease and slide on seal ring ③.

Lubricant (T511) (☞ p. 266)

Info

The sealing lip should face downward and open side upward.

- Slide on support ring ④.
- Remove the special tool.
- Roughen, clean and grease the edges of the sliding bushings using 600 grit sandpaper.

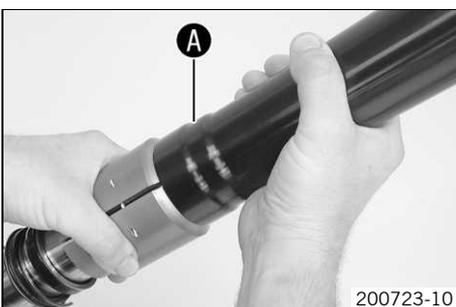
Fork oil (SAE 5) (☞ p. 263)



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

Info

Gently pull them apart without using any tool.



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

Guideline

50 °C (122 °F)

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

Assembly tool (T1402S) (☞ p. 276)

- Press the outer tube all the way in.

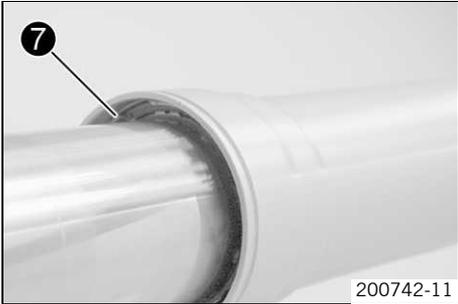


200724-10

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

Assembly tool (T1402S) (☛ p. 276)

- Press the outer tube all the way in.



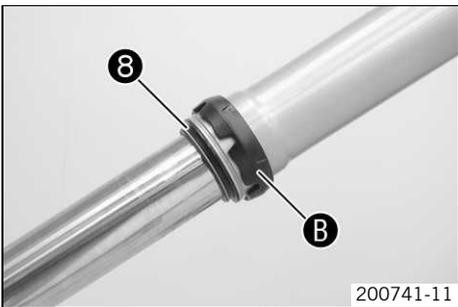
200742-11

- Mount lock ring 7.



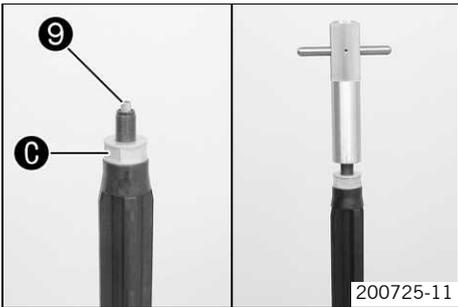
Info

The lock ring must audibly lock into place.



200741-11

- Mount dust boot 8.
- Mount fork protector ring B.



200725-11

- Mount adjustment tube 9 of the rebound damping in the cartridge.
- ✓ The adjustment tube extends 5 mm out from the cartridge and can be pressed inward against the spring force.
- ✗ The adjustment tube extends more than 7 mm out from the cartridge and cannot be pressed inward against the spring force.
- Screw on fluid barrier 10 to the stop.



Info

The fluid barrier must be screwed on tightly against the stop. Do not use any tools.

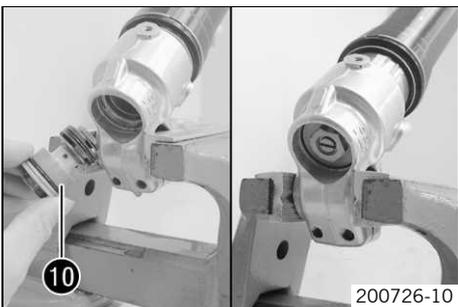
- Mount the special tool on the cartridge.

Gripping tool (T14026S1) (☛ p. 276)



Info

The special tool must be used in order that the adjustment tube is not raised. Otherwise, oil will reach the piston rod.



200726-10

- Push the cartridge into the inner tube.
- Mount and tighten compression damping fitting 10.

Guideline

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



Info

If the cartridge turns as well, press the piston rod slightly to the side.

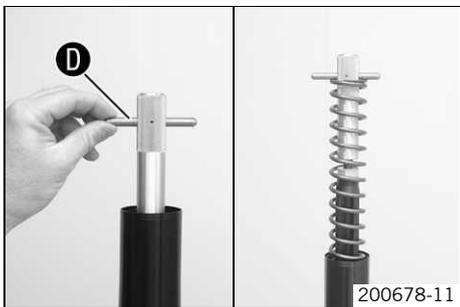


200677-10

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

| | | |
|-----------------------|---------------------------|-----------------------------|
| Fork oil per fork leg | 620 ml (20.96 fl. oz.) | Fork oil (SAE 5) (☛ p. 263) |
|-----------------------|---------------------------|-----------------------------|

i Info
Pull out and push in the piston rod several times in order to bleed air from the cartridge.



200678-11

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

Gripping tool (T14026S1) (☛ p. 276)

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

Guideline

| Spring rate | |
|---|-----------------------|
| Weight of rider: 65... 75 kg (143... 165 lb.) | 4.2 N/mm (24 lb/in) |
| Weight of rider: 75... 85 kg (165... 187 lb.) | 4.4 N/mm (25.1 lb/in) |
| Weight of rider: 85... 95 kg (187... 209 lb.) | 4.6 N/mm (26.3 lb/in) |



200679-10

- Pull the spring downward. Place the special tool on the hexagonal part.

Open-end wrench (T14032) (☛ p. 277)

- Remove the special tool.

Gripping tool (T14026S1) (☛ p. 276)



200743-10

- Clamp the special tool in the bench vise.
- Grease the threads of the piston rod.
- Grease the upper edge **E** of the piston rod.

Lubricant (T159) (☛ p. 266)

Lubricant (T158) (☛ p. 265)

- Screw the **Preload Adjuster** with preload spacer onto the piston rod.

i Info
The **Preload Adjuster** must be screwed in all the way before the piston rod also begins to turn. In case of tight piston rod threads, it must be held to keep it from turning. If the **Preload Adjuster** is not screwed in all the way, then the rebound adjustment will not function.

- Tighten the **Preload Adjuster**.

Guideline

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

- Take pressure off of the special tool. Pull the spring downward and remove the special tool.



200738-11



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

Clamping stand (T1403S) (☛ p. 277)

- Grease the **Preload Adjuster** O-ring.

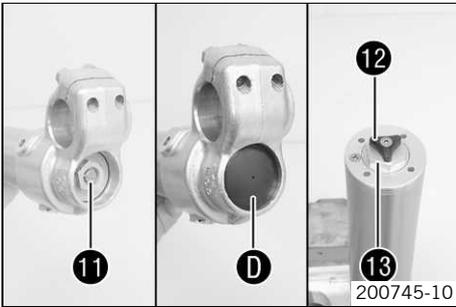
Lubricant (T158) (☛ p. 265)

- Screw on and tighten the **Preload Adjuster**.

Guideline

| | | |
|---|---------|------------------------|
| Preload Adjuster on the outer tube | M51x1.5 | 50 Nm (36.9 lbf ft) |
|---|---------|------------------------|

Pin wrench (T103) (☛ p. 274)



Alternative 1

- Turn the compression damping adjusting screw ⑪ and the adjusting screw of the rebound stage ⑫ clockwise all the way.
- Turn back counterclockwise by the number of clicks corresponding to the fork type.

Guideline

| Rebound damping | |
|---------------------|-----------|
| Comfort | 22 clicks |
| Standard | 20 clicks |
| Sport | 18 clicks |
| Compression damping | |
| Comfort | 26 clicks |
| Standard | 22 clicks |
| Sport | 18 clicks |

- Turn the adjusting screw of the spring preload ⑬ counterclockwise all the way.
- Turn back clockwise the number of turns corresponding to the fork type.

Guideline

| Spring preload - Preload Adjuster | |
|--|---------|
| Comfort | 0 turn |
| Standard | 2 turns |
| Sport | 4 turns |

Alternative 2



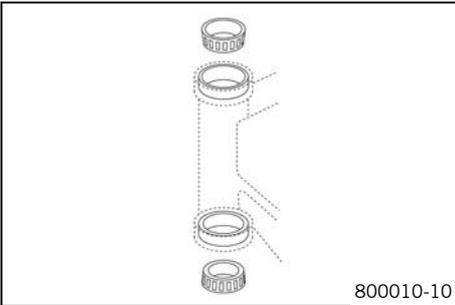
Warning

Danger of accidents Modifications to the chassis can seriously alter the vehicle's handling characteristics.

- Extreme modifications to the adjustment of the spring elements can cause a serious deterioration in the handling characteristics and overload some components.
- Make settings within the recommended range only.
- Following modifications, ride slowly at first to get the feel of the new handling characteristics.

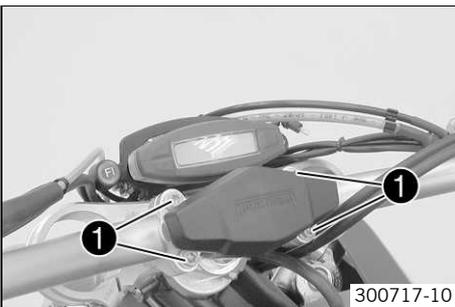
- Set the adjusting screws to the position determined before removal.
- Mount protective cover ⑩.

Greasing the steering head bearing



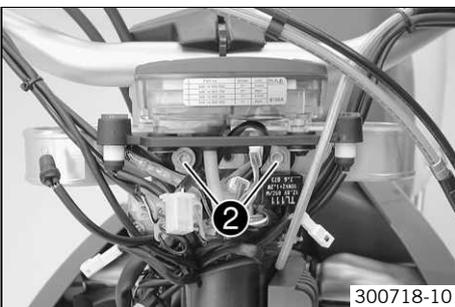
- Remove the lower triple clamp. (☛ p. 27)
- Install the lower triple clamp. (☛ p. 28)

Removing the lower triple clamp



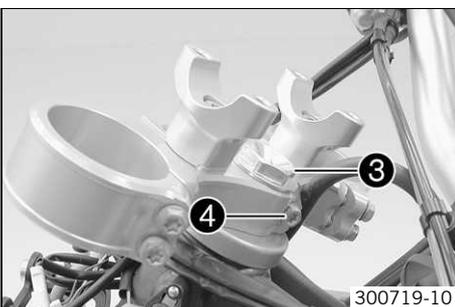
- Remove the fork legs. (☛ p. 12)
- Remove the front fender. (☛ p. 63)
- Remove screws ①.
- Remove the handlebar and lay it to one side.

i Info
Protect the motorcycle and its attachments against damage by covering them.
Do not bend the cables and lines.

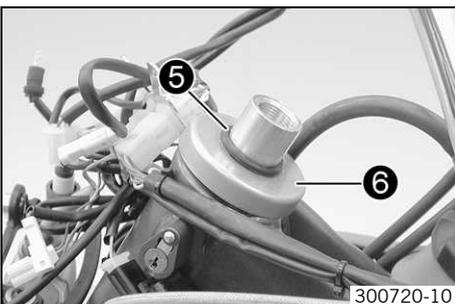


- Remove screws ②.
- Take off the speedometer and connector board and allow them to hang to the side.

i Info
Protect the motorcycle and its attachments against damage by covering them.
Do not bend the cables and lines.

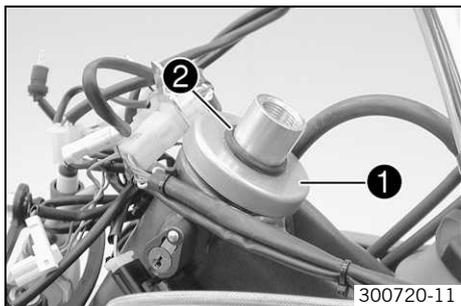


- Remove screw ③.
- Remove screw ④.
- Take off the upper triple clamp.



- Remove O-ring ⑤.
- Remove protective ring ⑥.
- Take out the lower triple clamp with the steering stem.
- Take out the upper steering head bearing.

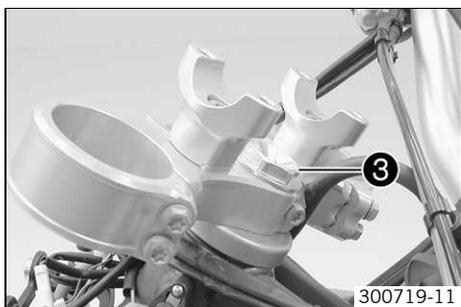
Installing the lower triple clamp



- Clean and grease the earings and sealing elements.

| |
|-----------------------------|
| Long-life grease (☛ p. 265) |
|-----------------------------|

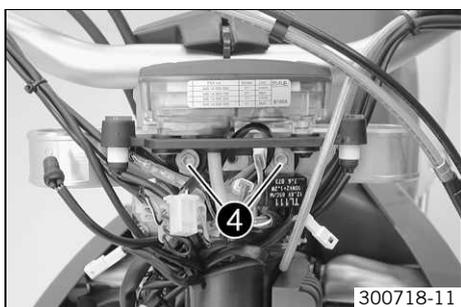
- Insert the lower triple clamp with the steering stem. Mount the upper steering head bearing.
- Slide on protective ring 1 and O-ring 2.



- Position the upper triple clamp.
- Mount and tighten screw 3.

Guideline

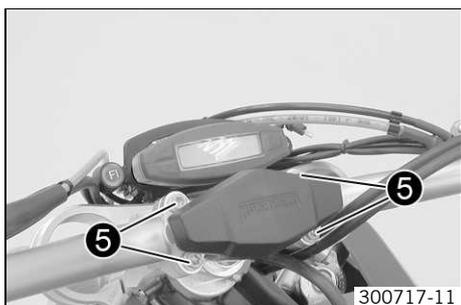
| | | |
|--------------------------|---------|--------------------|
| Screw, top steering head | M20x1.5 | 10 Nm (7.4 lbf ft) |
|--------------------------|---------|--------------------|



- Position the speedometer and connector board. Mount and tighten screws 4.

Guideline

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



- Position the handlebar.
- Mount and tighten screws 5.

Guideline

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

- Install the front fender. (☛ p. 63)
- Install the fork legs. (☛ p. 12)



- Mount and tighten screw 6.

Guideline

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

- Check wiring harness, control cables, brake and clutch lines for freedom of movement and routing.
- Check the play of the steering head bearing. (☛ p. 29)

Checking the play of the steering head bearing



Warning

Danger of accidents Unstable vehicle handling from incorrect steering head bearing play.

- Adjust the steering head bearing play without delay.



Info

If the bike is driven for a longer time with play in the steering head bearing, the bearing and the bearing seats in the frame can be damaged after time.



- Jack up the motorcycle. (☛ p. 9)
- Move the handlebar to the straight-ahead position. Move the fork legs to and fro in the direction of travel.

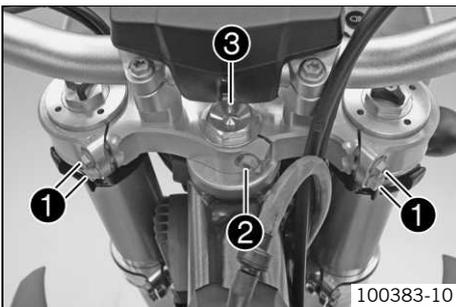
No play should be noticeable in the steering head bearing.

- » If there is noticeable play present:
 - Adjust the play of the steering head bearing. (☛ p. 29)
- Move the handlebar to and fro over the entire steering range.

The handlebar must be able to move easily over the entire steering range. No resting locations should be noticeable.

- » If click positions are noticeable:
 - Adjust the play of the steering head bearing. (☛ p. 29)
 - Check the steering head bearing and change if required.
- Remove the motorcycle from the work stand. (☛ p. 9)

Adjusting the play of the steering head bearing



- Jack up the motorcycle. (☛ p. 9)
- Loosen screw ❶. Remove screw ❷.
- Loosen and retighten screw ❸.

Guideline

| | | |
|--------------------------|---------|--------------------|
| Screw, top steering head | M20x1.5 | 10 Nm (7.4 lbf ft) |
|--------------------------|---------|--------------------|

- Using a plastic hammer, tap lightly on the upper triple clamp to avoid strains.
- Fully tighten screw ❶.

Guideline

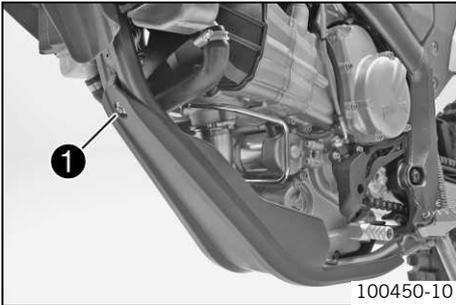
| | | |
|-------------------------|----|---------------------|
| Screw, top triple clamp | M8 | 17 Nm (12.5 lbf ft) |
|-------------------------|----|---------------------|

- Mount and tighten screw ❷.

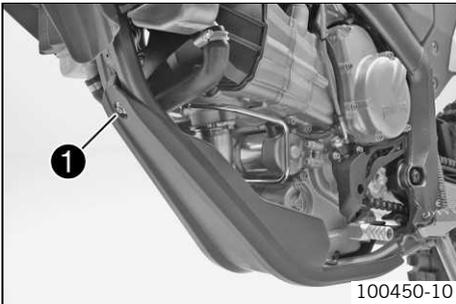
Guideline

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

- Check the play of the steering head bearing. (☛ p. 29)

Removing the engine guard

- Remove screw ❶. Remove the engine guard.

Installing the engine guard

- Attach the engine guard on the frame at the rear and swing it up and forward. Mount and tighten screw ❶.

Guideline

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

Adjusting the high-speed compression damping of the shock absorber



Danger

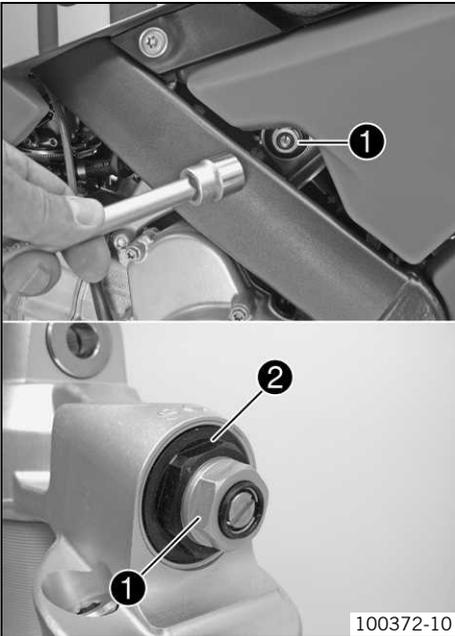
Danger of accidents Disassembly of pressurized parts can lead to injury.

- The shock absorber is filled with high density nitrogen. Adhere to the description provided.



Info

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



100372-10

- Turn adjusting screw ❶ clockwise with a socket wrench until it stops.



Info

Do not loosen nut ❷!

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

Guideline

| Compression damping, high-speed | |
|---------------------------------|-----------|
| Comfort | 2 turns |
| Standard | 1.5 turns |
| Sport | 1 turn |



Info

Turn clockwise to increase damping, turn counterclockwise to reduce suspension damping.

Adjusting the low-speed compression damping of the shock absorber



Danger

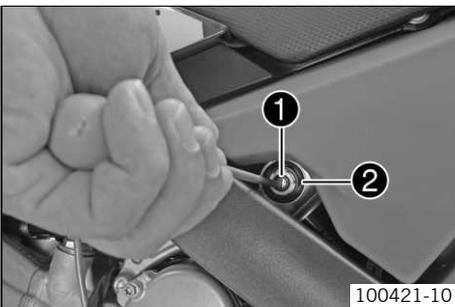
Danger of accidents Disassembly of pressurized parts can lead to injury.

- The shock absorber is filled with high density nitrogen. Adhere to the description provided.



Info

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



100421-10

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



Info

Do not loosen nut ❷!

- Turn back 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 |



Info

Turn clockwise to increase damping, turn counterclockwise to reduce suspension damping.

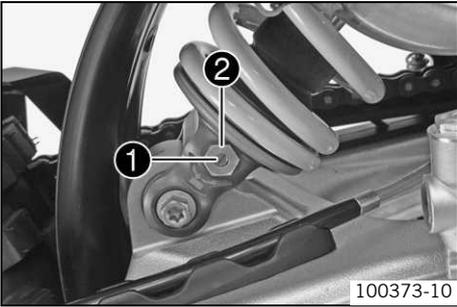
Adjusting the rebound damping of the shock absorber



Danger

Danger of accidents Disassembly of pressurized parts can lead to injury.

- The shock absorber is filled with high density nitrogen. Adhere to the description provided.



100373-10

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



Info

Do not loosen nut ❷!

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

Guideline

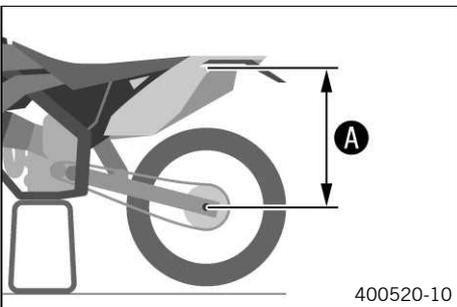
| Rebound damping | |
|-----------------|-----------|
| Comfort | 26 clicks |
| Standard | 24 clicks |
| Sport | 22 clicks |



Info

Turn clockwise to increase damping, turn counterclockwise to reduce suspension damping.

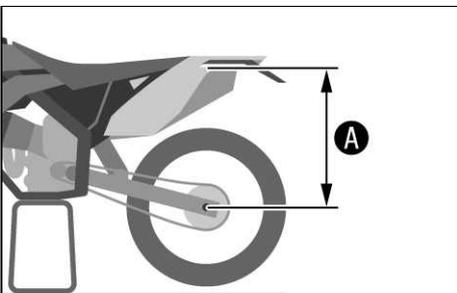
Measuring rear wheel sag unloaded



400520-10

- Jack up the motorcycle. (☞ p. 9)
- Measure the distance – as vertical as possible – between the rear axle and a fixed point, such as the top edge of the side cover.
- Make a note of the value as measurement A.
- Remove the motorcycle from the work stand. (☞ p. 9)

Checking the static sag of the shock absorber



400521-10

- Measure distance A of rear wheel unloaded. (☞ p. 32)
- Ask someone to help you by holding the motorcycle upright.
- Measure the distance between the rear axle and the fixed point again.
- Make a note of the value as measurement B.



Info

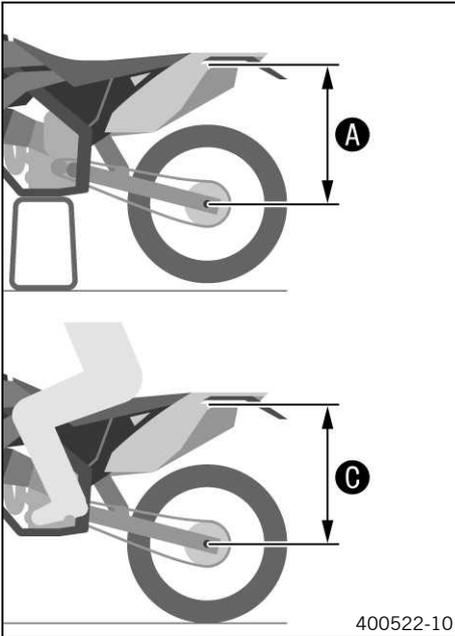
The static sag is the difference between measurements A and B.

- 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. 33)

Checking the riding sag of the shock absorber



400522-10

- Measure distance **A** of rear wheel unloaded. (☛ p. 32)
- With another person holding the motorcycle, the rider, wearing full protective clothing, sits on the saddle in a normal sitting position (feet on footrests) and bounce up and down a few times until the rear suspension levels out.
- The other person now has to measure the distance between the rear axle and a fixed point.
- Make a note of the value as measurement **C**.

i Info

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

- Check the riding sag.

| | |
|------------|------------------|
| Riding sag | 105 mm (4.13 in) |
|------------|------------------|

- » If the riding sag differs from the specified measurement:
 - Adjust the riding sag. (☛ p. 34)

Adjusting the spring preload of the shock absorber



Danger

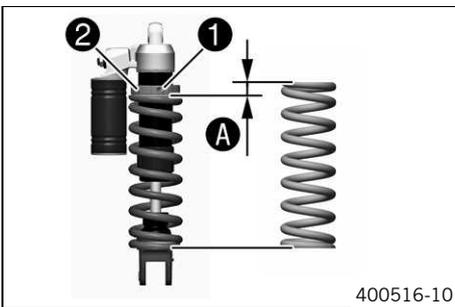
Danger of accidents Disassembly of pressurized parts can lead to injury.

- The shock absorber is filled with high density nitrogen. Adhere to the description provided.



Info

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



400516-10

- Remove the shock absorber. (☛ p. 34)
- After removing the shock absorber, clean it thoroughly.
- Loosen screw **1**.
- Turn adjusting ring **2** until the spring is no longer under tension.

| |
|----------------------------------|
| Combination wrench (50329080000) |
| Hook wrench (T106S) (☛ p. 274) |

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

Guideline

| | |
|----------------|-----------------|
| Spring preload | 10 mm (0.39 in) |
|----------------|-----------------|

i Info

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

- Tighten screw **1**.

Guideline

| | | |
|--------------------------------------|----|-------------------|
| Screw, shock absorber adjusting ring | M6 | 5 Nm (3.7 lbf ft) |
|--------------------------------------|----|-------------------|

- Install the shock absorber. (☛ p. 34)

Adjusting the riding sag

- Remove the shock absorber. (☛ p. 34)
- After removing the shock absorber, clean it thoroughly.
- Choose and mount a suitable spring.

Guideline

| Spring rate | |
|---|---------------------|
| Weight of rider: 65... 75 kg (143... 165 lb.) | 69 N/mm (394 lb/in) |
| Weight of rider: 75... 85 kg (165... 187 lb.) | 72 N/mm (411 lb/in) |
| Weight of rider: 85... 95 kg (187... 209 lb.) | 76 N/mm (434 lb/in) |

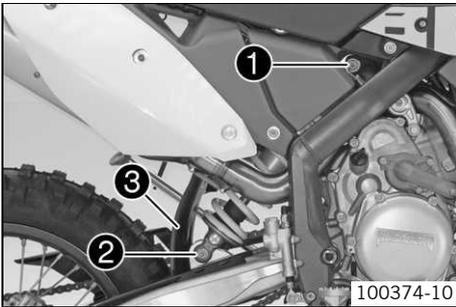


Info

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

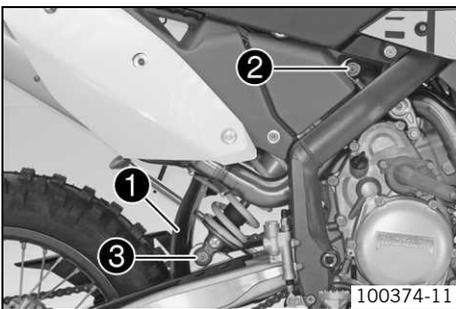
- Install the shock absorber. (☛ p. 34)
- Check the static sag of the shock absorber. (☛ p. 32)
- Check the riding sag of the shock absorber. (☛ p. 33)
- Adjust the rebound damping of the shock absorber. (☛ p. 32)

Removing the shock absorber



- Jack up the motorcycle. (☛ p. 9)
- Remove screw ① and lower the rear wheel with the swing arm as far as possible without blocking the rear wheel. Fix the rear wheel in this position.
- Remove screw ②, push splash protector ③ to the side, and remove the shock absorber.

Installing the shock absorber



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

Guideline

| | | | |
|---------------------------|-----|----------------------|----------------------|
| Screw, top shock absorber | M12 | 80 Nm (59 lbf ft) | Loctite® 243™ |
|---------------------------|-----|----------------------|----------------------|

- Mount and tighten screw ③.

Guideline

| | | | |
|------------------------------|-----|----------------------|----------------------|
| Screw, bottom shock absorber | M12 | 80 Nm (59 lbf ft) | Loctite® 243™ |
|------------------------------|-----|----------------------|----------------------|



Info

The heim joint for the shock absorber at the swing arm 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.

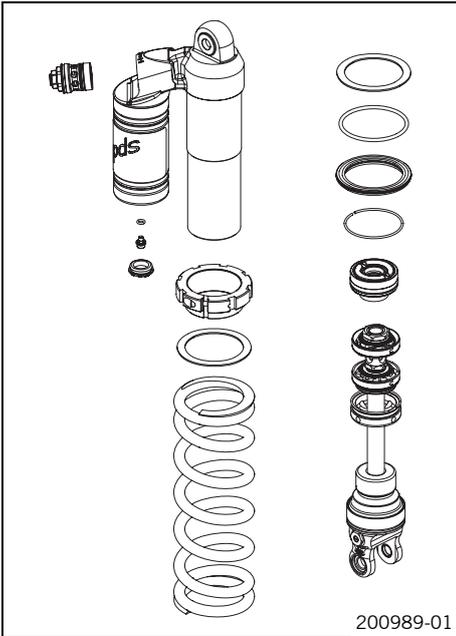
- Remove the motorcycle from the work stand. (☛ p. 9)

Performing a shock absorber service

Condition

The shock absorber has been removed.

- Remove the spring. (☛ p. 35)
- Disassemble the shock absorber. (☛ p. 36)
- Disassemble the piston rod. (☛ p. 37)
- Disassemble the seal ring retainer. (☛ p. 38)
- Check the shock absorber. (☛ p. 39)
- Disassemble the rebound adjuster. (☛ p. 40)
- Remove the heim joint. (☛ p. 41)
- Install the heim joint. (☛ p. 41)
- Assemble the rebound adjuster. (☛ p. 42)
- Assemble the seal ring retainer. (☛ p. 43)
- Assemble the piston rod. (☛ p. 43)
- Assemble the shock absorber. (☛ p. 45)
- Install the spring. (☛ p. 50)



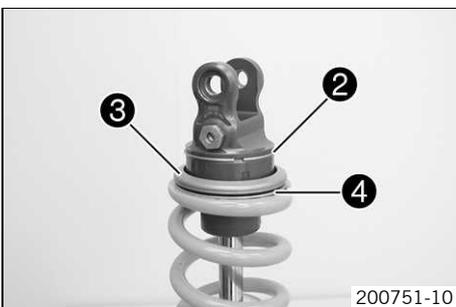
Removing the spring

Condition

The shock absorber has been demounted.

- Clamp the shock absorber in a bench vise using soft jaws.
- Measure and note the spring length in its pre-compressed state.
- Unscrew screw ❶.
- Rotate the adjusting ring until the spring is no longer under tension.

Hook wrench (T106S) (☛ p. 274)



- Remove O-ring ❷.
- Remove spring retainer ❸ and intermediate washer ❹.
- Remove the spring.

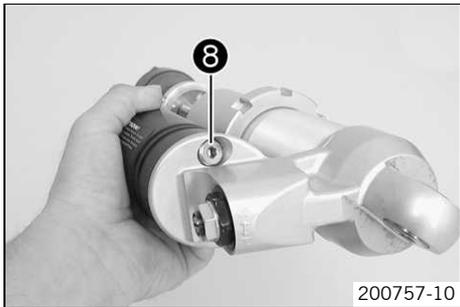
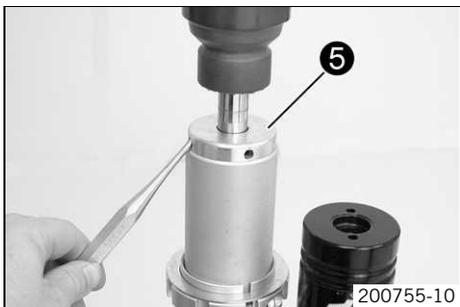


- Rotate adjusting ring ❺ with the intermediate washer toward the top.

i **Info**

Both cannot be taken off yet.

Disassembling the shock absorber



- Remove the spring. (☛ p. 35)
- Take note of the present state of rebound damping ❶ and compression damping ❷.
- Completely open the adjustment elements of the rebound damping and compression damping.
- Remove rubber cap ❸ of the reservoir.

- Slowly unscrew screw ❹.
- ✓ The pressurized nitrogen is bled off.

- Remove locking cap ❺.

- Press seal ring retainer ❻ all the way in with the special tool.

Disassembly tool (T1216) (☛ p. 275)

- Remove lock ring ❼.

i Info
Do not scratch the inner surface.

- Take out the shock absorber.

- Remove screw ❽. Drain the oil.

- Remove the piston rod. Drain the remaining oil.



200759-10

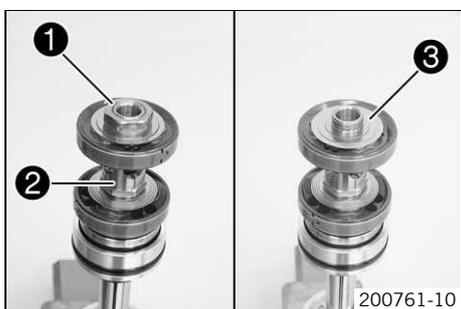
- Remove adjusting ring 9 with the intermediate washer.



200760-10

- Remove compression damping adjuster 10. Remove the spring and piston.

Disassembling the piston rod



200761-10

- Disassemble the shock absorber. (☛ p. 36)
- Clamp the piston rod with the fork in a bench vise.
- Remove nut 1.

i Info
If mount 2 is loosened, apply counteractive force.

- Remove rebound damping shim stack 3.

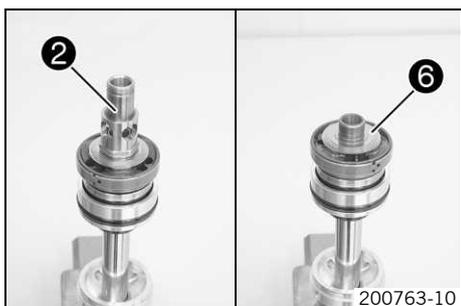
i Info
Guide the rebound damping shim stack onto a screwdriver and put them aside together.



200762-10

- Remove piston 4.
- Remove compression damping shim stack 5.

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



200763-10

- Unscrew and remove mount 2.
- Remove rebound damping shim stack 6.

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

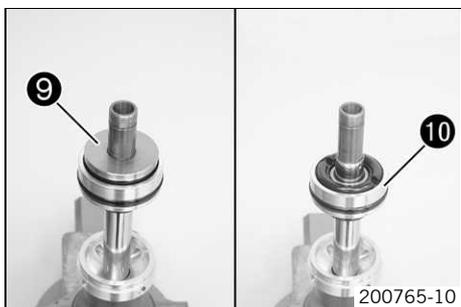


- Remove piston 7.
- Remove compression damping shim stack 8.

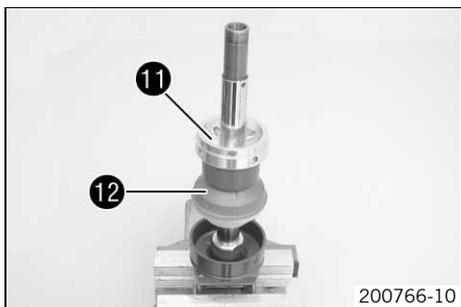


Info

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

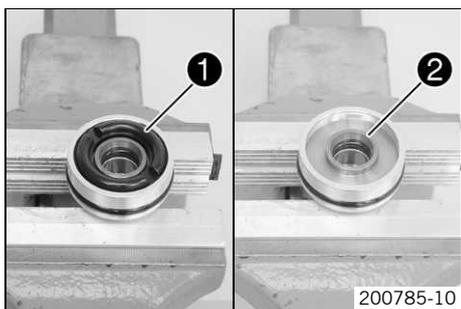


- Remove rebound damping washer 9.
- Remove seal ring retainer 10.

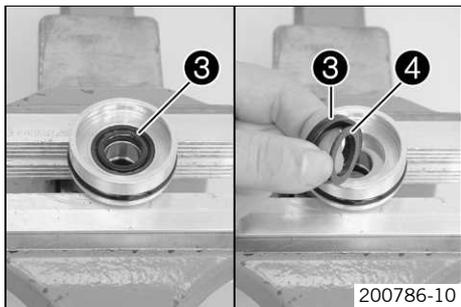


- Remove locking cap 11 and bump rubber 12.

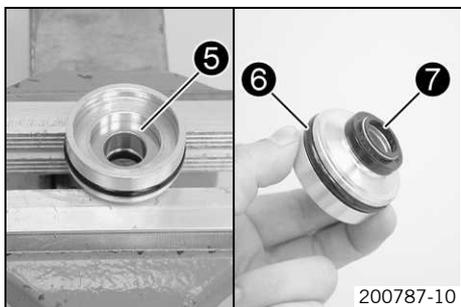
Disassembling the seal ring retainer



- Disassemble the piston rod. (☛ p. 37)
- Remove rebound rubber 1.
- Remove centering disk 2.

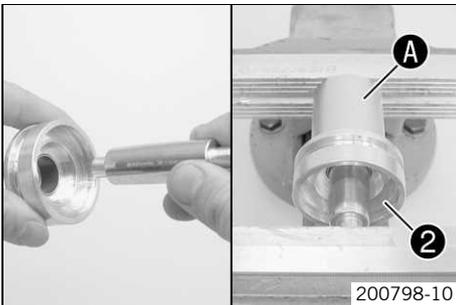
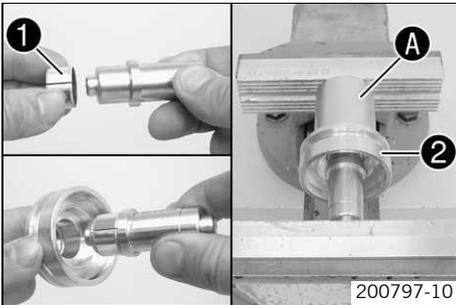
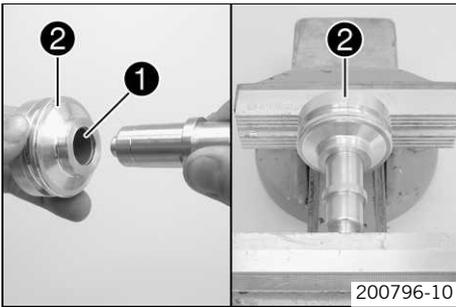


- Remove seal ring 3.
- Remove washer 4 from seal ring 3.



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

Replacing the pilot bushing



- Disassemble the seal ring retainer. (☛ p. 38)
- Press pilot bushing ❶ out of seal ring retainer ❷ using the special tool.

Press drift (T1504) (☛ p. 277)

- Slide the new pilot bushing ❶ onto the special tool.

Press drift (T1504) (☛ p. 277)

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

Press drift (T1504) (☛ p. 277)

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

Assembly tool (T150S) (☛ p. 277)

- Lubricate the special tool.

Fork oil (SAE 5) (☛ p. 263)

Calibration pin (T1205) (☛ p. 274)

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

Assembly tool (T150S) (☛ p. 277)

- Press the special tool through the new pilot bushing.

Calibration pin (T1205) (☛ p. 274)

✓ The pilot bushing is to be calibrated.

- Assemble the seal ring retainer. (☛ p. 43)

Checking the shock absorber



Condition

The shock absorber has been disassembled.

- Measure the inside diameter on both ends and in the middle of the shock absorber tube.

Shock absorber tube

| | |
|------------------|----------------------|
| Minimum diameter | 50.08 mm (1.9716 in) |
|------------------|----------------------|

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

- Replace the shock absorber tube.

- Check the shock absorber tube for damage and wear.

» If there is damage or wear:

- Replace the shock absorber tube.

- 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) |

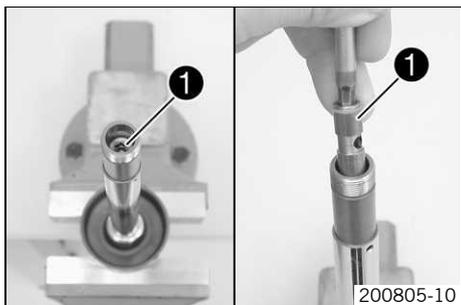
- » If the specified value was not attained:
 - Replace the piston rod.
- Measure the run-out of the piston rod.

| | |
|------------|-------------------------|
| 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.



Disassembling the rebound adjuster

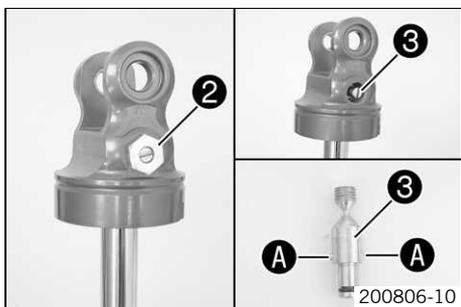


- Disassemble the piston rod. (☛ p. 37)
- Warm up the piston rod in the area of the rebound damping valve seat.

Guideline

| |
|----------------|
| 80 °C (176 °F) |
|----------------|

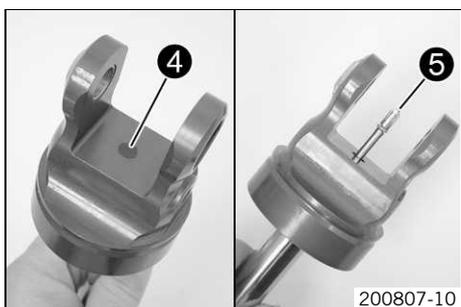
- Remove rebound damping valve seat ❶.



- Remove screwsleeve ❷.
- Remove adjusting screw ❸.

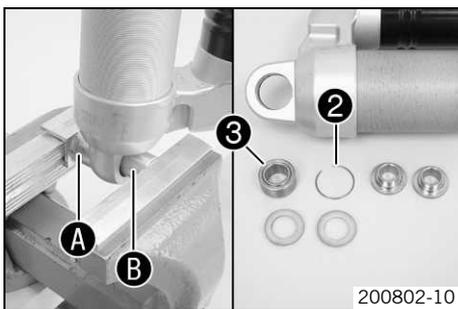
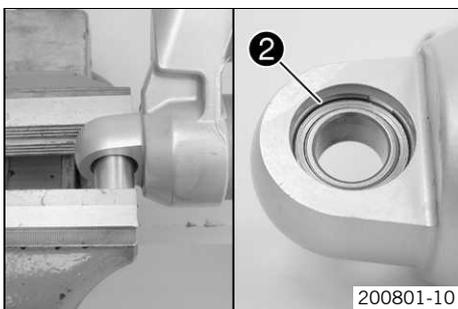
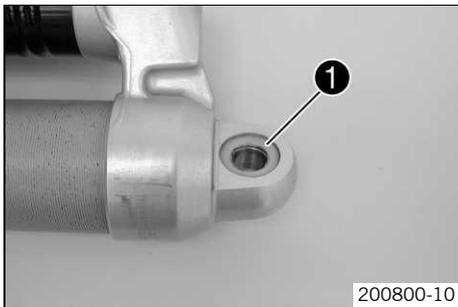
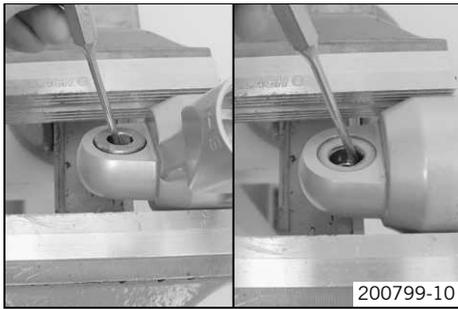
i Info

Do not lose balls ❹ and spring.



- Remove rubber plug ❹.
- From the opposite side, press rebound needle ❺ out of the piston rod.

Removing the heim joint



Condition

The shock absorber has been demounted.

- Clamp shock absorber in a bench vise using soft jaws.
- Remove the collar bushing of the heim joint with a punch.
- Turn the shock absorber around and remove the second heim joint collar bushing with a punch.

- Remove seal ring ❶ on both sides.

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

Pressing tool (T1207S) (☛ p. 275)

- Remove the second lock ring ❷.

- Place special tool ❹ below and press out heim joint ❸ using special tool ❺.

Pressing tool (T1207S) (☛ p. 275)

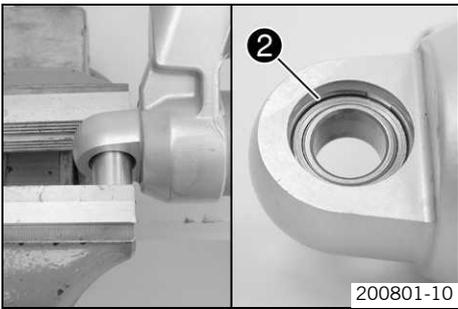
Installing the heim joint



- Position new heim joint ❶ and special tool.

Pressing tool (T1206) (☛ p. 275)

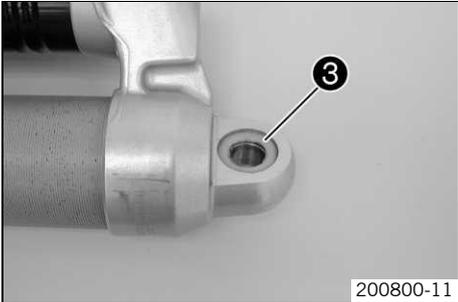
- Press in the heim joint all the way.



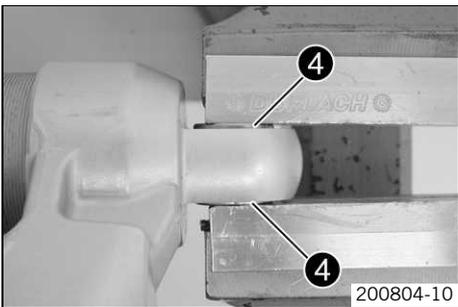
- Press the heim joint against the lock ring using the special tool.

Pressing tool (T1207S) (☞ p. 275)

- Mount the second lock ring 2.

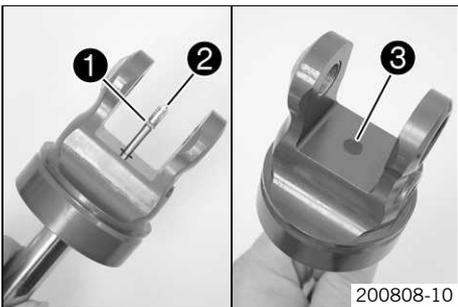


- Mount seal ring 3 on both sides.



- Position both collar bushings 4 and press in.

Assembling the rebound adjuster



- Grease O-ring 1 of the rebound needle.

Lubricant (T158) (☞ p. 265)

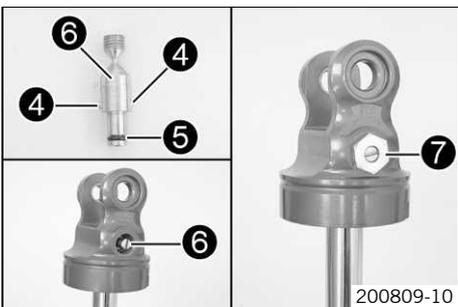
- Mount rebound needle 2 in the piston rod.



Info

Push in the rebound needle to the point where it is possible to mount the rebound damping adjusting screw.

- Mount rubber plug 3.



- Lubricate spring, balls 4 and O-ring 5.

Lubricant (T159) (☞ p. 266)

- Screw in the rebound damping adjusting screw 6 all the way.

- Mount and tighten screwsleeve 7.

Guideline

| | | |
|-------------|-------|------------------------|
| Screwsleeve | M14x1 | 18 Nm (13.3 lbf ft) |
|-------------|-------|------------------------|

- Screw out the rebound damping adjusting screw 6 to the stop.

- Grease the O-ring of the rebound damping seat.

Lubricant (T159) (☞ p. 266)

- Mount and tighten rebound damping valve seat 8.

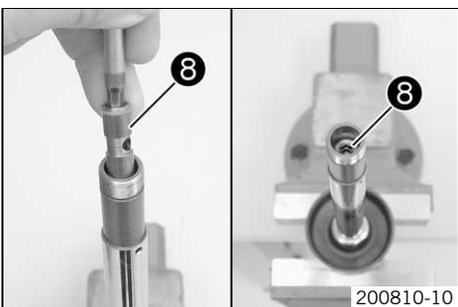
Guideline

| | | | |
|----------------------------|------|----------------------|----------------------|
| Rebound damping valve seat | M8x1 | 6 Nm (4.4 lbf ft) | Loctite® 2701 |
|----------------------------|------|----------------------|----------------------|

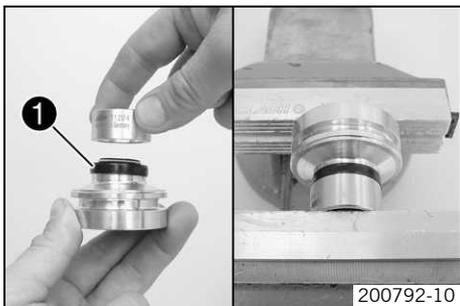


Info

The rebound damping valve seat must be pressed inward before tightening.



Assembling the seal ring retainer

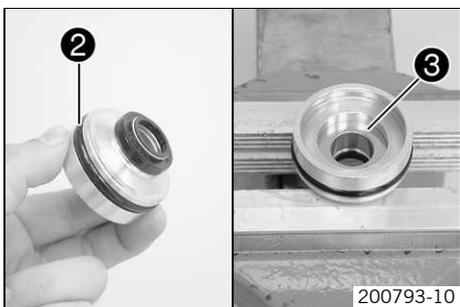


- Mount dust boot ❶ with the special tool.

Mounting sleeve (T1204) (☛ p. 274)

- Grease the sealing lip of the dust boot.

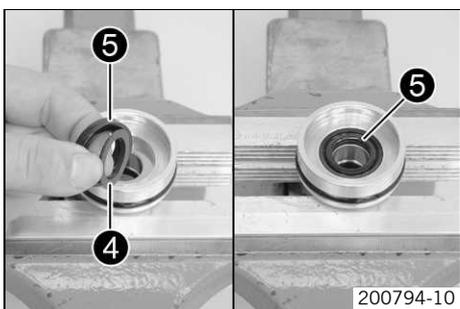
Lubricant (T625) (☛ p. 266)



- Grease the O-ring groove.

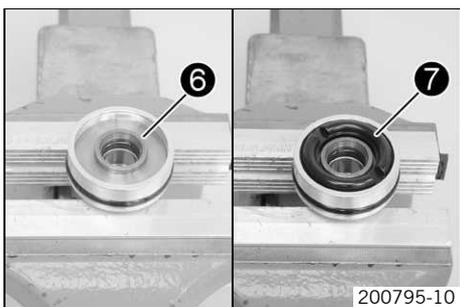
Lubricant (T158) (☛ p. 265)

- Mount O-ring ❷.
- Mount washer ❸.



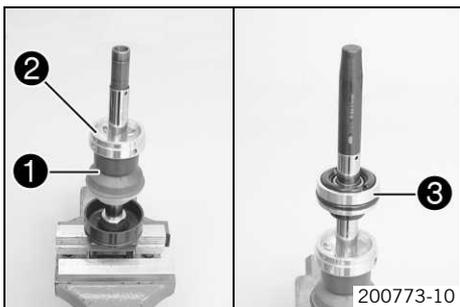
- Position washer ❹ on seal ring ❺.
- Grease the seal ring and mount with the washer facing downward.

Lubricant (T511) (☛ p. 266)



- Mount centering disk ❻.
- Mount rebound rubber ❼.

Assembling the piston rod



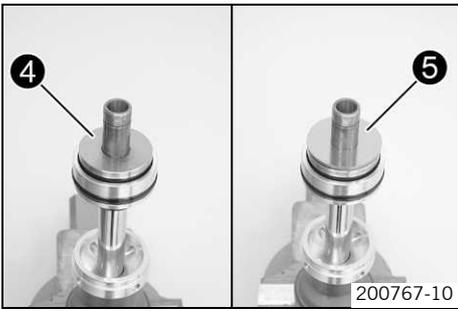
- Assemble the seal ring retainer. (☛ p. 43)
- Assemble the rebound adjuster. (☛ p. 42)
- Clamp the piston rod with the fork in a bench vise.
- Mount bump rubber ❶ and locking cap ❷.
- Position the special tool on the piston rod.

Mounting sleeve (T1215) (☛ p. 275)

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

Lubricant (T625) (☛ p. 266)

- Remove the special tool.



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



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

Guideline

| | |
|--------|-----------------------|
| View A | Top view of piston |
| View B | Bottom view of piston |



- Mount rebound damping shim stack ⑦ with the smaller shims at the top.
- Apply thread locker to the threads of the piston rod.

Loctite® 2701

- Screw on mount ⑧ to the point where the piston can still be turned.



- Mount compression damping shim stack ⑨ with the smaller shims at the bottom.



- Grind piston ⑩ on both sides on a surface plate using 1200 grit sandpaper.
- Clean the piston.
- Mount the piston.

Guideline

| | |
|--------|-----------------------|
| View A | Top view of piston |
| View B | Bottom view of piston |



- Mount rebound damping shim stack ⑪ with the smaller shims facing upwards.
- Grease the threads of the mount.

Lubricant (T152) (☛ p. 266)

- Mount nut ⑫ but do not tighten yet.



- Align both pistons using the special tool.

Centering sleeve (T1214) (☛ p. 275)

- Tighten the nut.

Guideline

| | | |
|----------------|-------|------------------------|
| Piston rod nut | M16x1 | 40 Nm (29.5 lbf ft) |
|----------------|-------|------------------------|

- Remove the special tool.

Assembling the shock absorber



- Assemble the piston rod. (☛ p. 43)
- Slide the spring and piston onto the compression damping adjuster ①.
- Grease the O-ring.

Lubricant (T158) (☛ p. 265)

- Grease the threads.

Lubricant (T159) (☛ p. 266)

- Mount and tighten the compression damping adjuster.

Guideline

| | | |
|------------------------------|-------|------------------------|
| Compression damping adjuster | M31x1 | 50 Nm (36.9 lbf ft) |
|------------------------------|-------|------------------------|

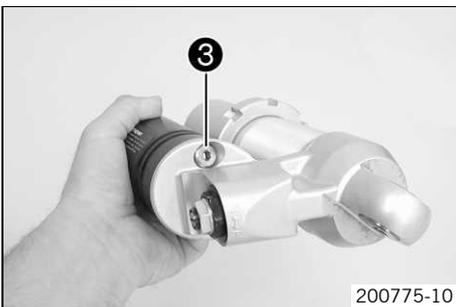
- Install adjusting ring ② with intermediate washer.

i Info

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



- Mount screw ③ but do not tighten yet.



- Grease the O-ring of the seal ring retainer.

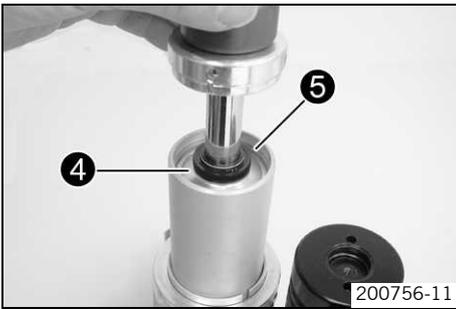
Lubricant (T158) (☛ p. 265)

- Fill the shock absorber tube approximately half way.

Shock absorber oil (SAE 2.5) (50180342S1) (☛ p. 264)

- Carefully mount the piston rod.





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



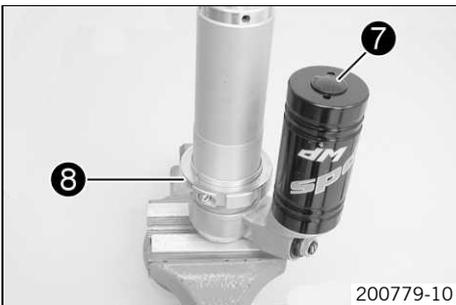
Info

Do not scratch the inner surface.

- Pull out the piston rod in order that the seal ring retainer fits closely against the lock ring.



- Mount locking cap 6 of the shock absorber tube.
- Bleed and fill the shock absorber. (☛ p. 47)
- Fill the shock absorber with nitrogen. (☛ p. 49)



- Mount rubber cap 7 of the reservoir.
- Turn adjusting ring 8 completely down toward the bottom.



Alternative 1

- Turn adjusting screw 9 clockwise with a screwdriver up to the last perceptible click.
- Turn back 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 |

- Turn adjusting screw 10 clockwise with an open end wrench until it stops.
- Turn back counterclockwise by the number of turns corresponding to the shock absorber type.

Guideline

| Compression damping, high-speed | |
|---------------------------------|-----------|
| Comfort | 2 turns |
| Standard | 1.5 turns |
| Sport | 1 turn |

- Turn adjusting screw 11 clockwise up to the last perceptible click.
- Turn back counterclockwise by the number of clicks corresponding to the shock absorber type.

Guideline

| Rebound damping | |
|-----------------|-----------|
| Comfort | 26 clicks |
| Standard | 24 clicks |
| Sport | 22 clicks |

Alternative 2



Warning

Danger of accidents Modifications to the chassis can seriously alter the vehicle's handling characteristics.

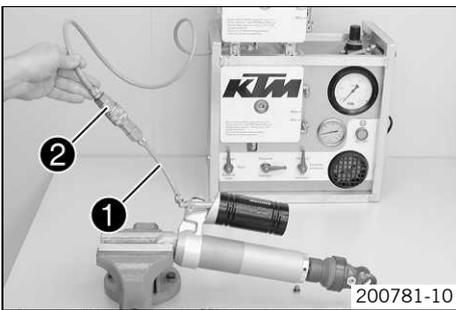
- Extreme modifications to the adjustment of the spring elements can cause a serious deterioration in the handling characteristics and overload some components.
- Make settings within the recommended range only.
- Following modifications, ride slowly at first to get the feel of the new handling characteristics.

- Set adjusting screws 9, 10 and 11 in the positions determined when disassembling.

Bleeding and filling the shock absorber

i Info

Before the vacuum pump can be used, it is imperative to carefully read the enclosed vacuum pump operating instructions. Completely open the adjustment elements of the rebound damping and compression damping.



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



Info

Only tighten hand-tight; do not use any tools.

- Connect adapter 1 to connection 2 of the vacuum pump.
- Clamp in the shock absorber with soft jaws or hold as shown in the photo.

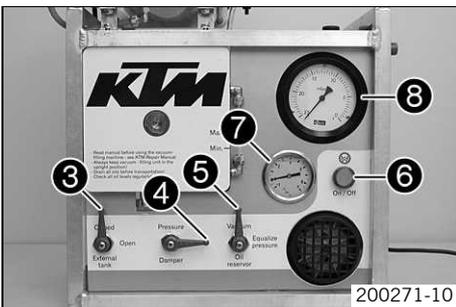


Info

Only slightly tighten the shock absorber.

The filling port must be positioned at the highest point.

The piston rod moves in and out during the filling operation – do not try to grab or hold it!



- Set the control lever as shown in the photo.
 - ✓ The **External tank 3** control lever is positioned to **Closed, Damper 4** to **Vacuum** and **Oil reservoir 5** to **Vacuum**.
- Turn on the **On/Off** switch 6.

✓ The vacuum process begins.

✓ The pressure gauge 7 drops to the specified value.

< 0 bar

✓ Vacuum gauge 8 drops to the specified value.

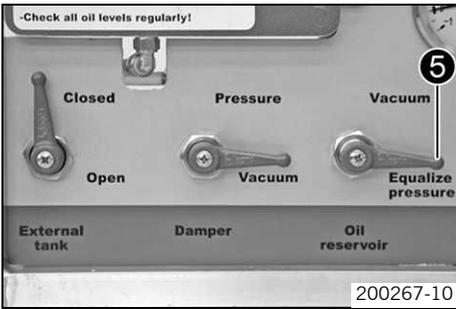
4 mbar

- Distance A between the floating piston and reservoir hole is ascertained using the special tool.

Depth micrometer (T107S) (☛ p. 274)

✓ The floating piston is completely at bottom.





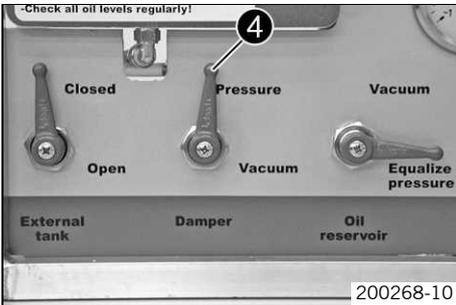
- As soon as the vacuum gauge has attained the specified value, turn the **Oil reservoir 5** control lever to **Equalize pressure**.

Guideline

4 mbar

- ✓ The pressure gauge rises to the specified value.

0 bar



- As soon as the pressure gauge has attained the specified value, turn the **Damper 4** control lever to **Pressure**.

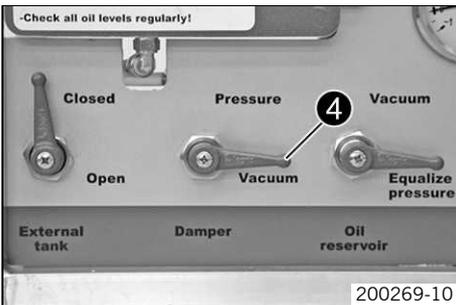
Guideline

0 bar

- ✓ Oil is pumped into the shock absorber.

- ✓ The pressure gauge rises to the specified value.

3 bar



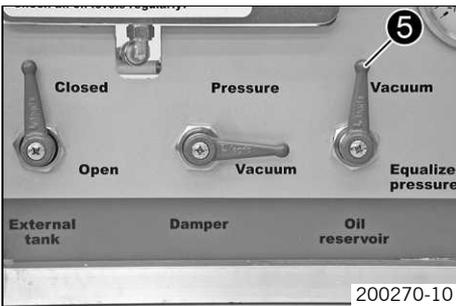
- As soon as the pressure gauge has attained the specified value, turn the **Damper 4** control lever to **Vacuum**.

Guideline

3 bar

- ✓ The pressure gauge drops to the specified value.

0 bar



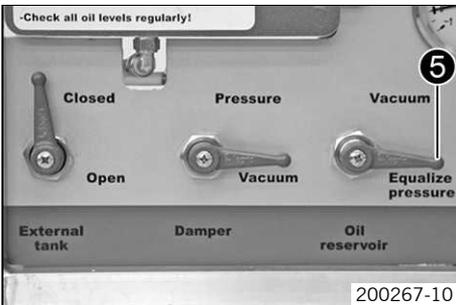
- As soon as the pressure gauge has attained the specified value, turn the **Oil reservoir 5** control lever to **Vacuum**.

Guideline

0 bar

- ✓ The vacuum gauge drops to the specified value.

8 mbar



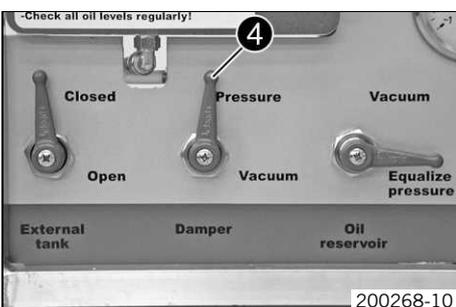
- As soon as the vacuum gauge has attained the specified value, turn the **Oil reservoir 5** control lever to **Equalize Pressure**.

Guideline

8 mbar

- ✓ The pressure gauge drops to the specified value.

0 bar



- As soon as the pressure gauge has attained the specified value, turn the **Damper 4** control lever to **Pressure**.

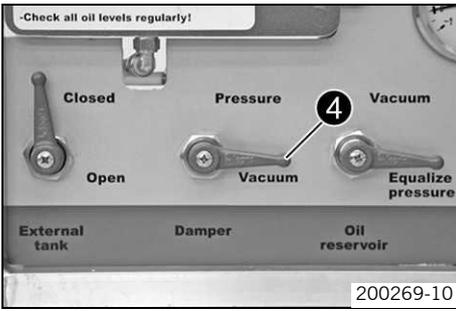
Guideline

0 bar

- ✓ Oil is pumped into the shock absorber.

- ✓ The pressure gauge rises to the specified value.

3 bar



- As soon as the pressure gauge has attained the specified value, turn the **Damper 4** control lever to **Vacuum**.

Guideline

| |
|-------|
| 3 bar |
|-------|

- ✓ The pressure gauge drops to the specified value.

| |
|-------|
| 0 bar |
|-------|

- As soon as the pressure gauge has attained the specified value hat, turn off the **On/Off** switch.

Guideline

| |
|-------|
| 0 bar |
|-------|

- ✓ The vacuum pump has been switched off.

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

Guideline

| |
|-------|
| 10 mm |
|-------|

| |
|-------------------------------------|
| Depth micrometer (T107S) (☛ p. 274) |
|-------------------------------------|

- Push the floating piston into the reservoir using the special tool up to the reduced dimension.

i Info

The floating piston must be set precisely to this position with the piston rod fully extended, as otherwise damage could occur when the shock absorber is compressed.

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

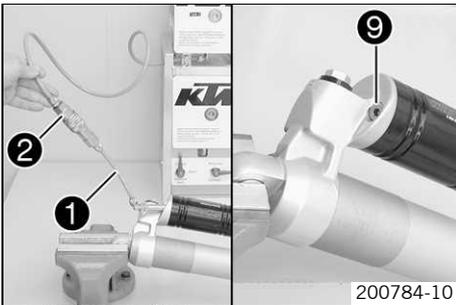
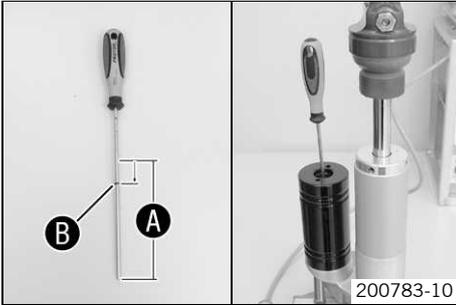
i Info

Hold the shock absorber in such a way that the filling port is positioned at the highest point.

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

Guideline

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



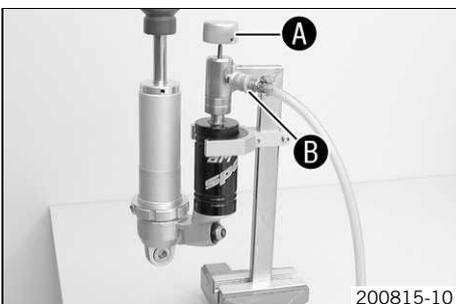
Filling the shock absorber with nitrogen



- Screw in the screw **1** approx. two turns, but do not tighten.

i Info

The piston rod is completely extended.



- Keep the special tool in place in the bench vise.

| |
|---|
| Nitrogen filling tool (T170S1) (☛ p. 277) |
|---|

- 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 shock absorber in the special tool.
- ✓ The hexagonal part of tap handle **A** engages in the hexagon socket of the screw of the filling port.
- Open spigot **B**.
- Fill the shock absorber for at least 15 seconds.

Guideline

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



Info

Monitor the pressure control valve indicator.
Ensure that the shock absorber has been filled to the specified pressure.

- Screw the filling port shut with tap handle **A**.
- Close spigot **B** and remove the shock absorber from the special tool.
- Tighten the screw of the filling port.

Guideline

| | | |
|------------------------------|----|-------------------------|
| Reservoir filling port screw | M5 | 3.5 Nm (2.58 lbf ft) |
|------------------------------|----|-------------------------|

Installing the spring



- Ensure that adjusting ring **1** is screwed on with the intermediate washer.



- Measure the overall spring length when not under tension.
- Position the spring.

Guideline

| Spring rate | |
|---|---------------------|
| Weight of rider: 65... 75 kg (143... 165 lb.) | 69 N/mm (394 lb/in) |
| Weight of rider: 75... 85 kg (165... 187 lb.) | 72 N/mm (411 lb/in) |
| Weight of rider: 85... 95 kg (187... 209 lb.) | 76 N/mm (434 lb/in) |

- Mount intermediate washer **2** and spring retainer **3**.
- Mount ring **4**.

Alternative 1

- Tighten the spring by turning adjusting ring to measurement.

Guideline

| | |
|----------------|-----------------|
| Spring preload | 10 mm (0.39 in) |
|----------------|-----------------|

| |
|--------------------------------|
| Hook wrench (T106S) (☞ p. 274) |
|--------------------------------|

Alternative 2



Warning

Danger of accidents Modifications to the chassis can seriously alter the vehicle's handling characteristics.

- Extreme modifications to the adjustment of the spring elements can cause a serious deterioration in the handling characteristics and overload some components.
- Make settings within the recommended range only.
- Following modifications, ride slowly at first to get the feel of the new handling characteristics.

- Tighten the spring by turning the adjusting ring to the measured value determined when it was removed.

Hook wrench (T106S) (☛ p. 274)

- Tighten screw ⑤.

Guideline

| | | |
|--------------------------------------|----|-------------------|
| Screw, shock absorber adjusting ring | M6 | 5 Nm (3.7 lbf ft) |
|--------------------------------------|----|-------------------|



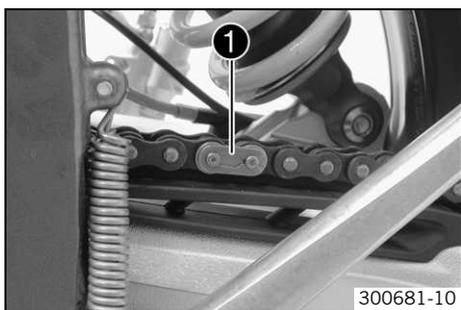
200750-11

Removing the swingarm, with shock absorber and rear wheel

Condition

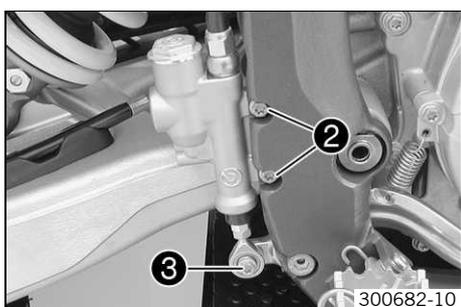
The motorcycle is jacked up.
The fuel tank has been removed.

- Remove chain connecting link ①.
- Thread the chain out.



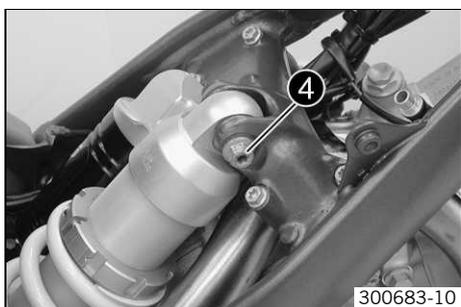
300681-10

- Remove screws ②.
- Remove screw ③.
- Remove the foot brake cylinder and allow it to hang tension-free to the side.



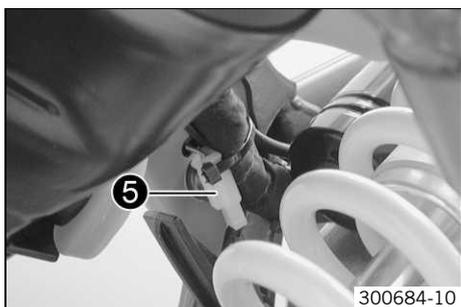
300682-10

- Remove screw ④.

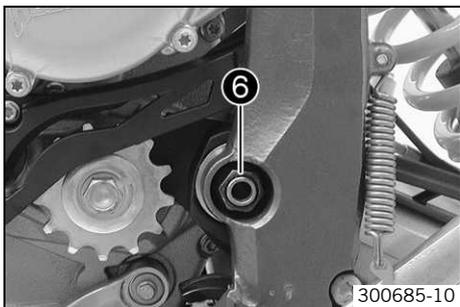


300683-10

- Remove the cable binders.
- Separate plug-in connector ⑤ of the brake light switch.



300684-10



300685-10

- Remove nut ⑥.
- Remove the swingarm pivot.



300686-10

- Remove the swingarm, with the shock absorber and rear wheel.

Installing the swingarm, with shock absorber and rear wheel

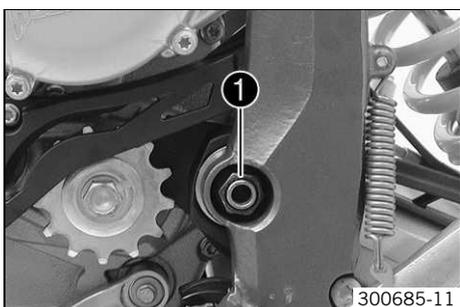
Condition

The motorcycle is jacked up.
The fuel tank has been removed.



300686-10

- Position the swingarm, with the shock absorber and rear wheel.



300685-11

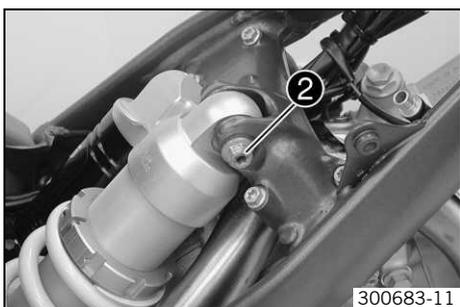
- Mount the swingarm pivot.
- Mount nut ①, but do not tighten it yet.

Guideline

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

i Info

Only tighten the swingarm pivot nut after all engine mounting bolts have been tightened.

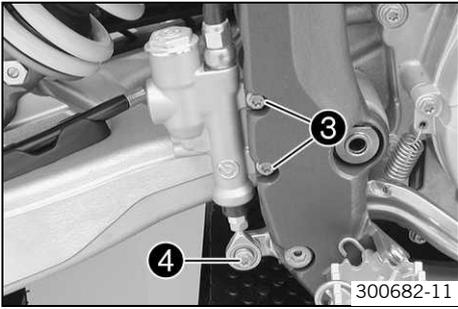


300683-11

- Mount and tighten screw ②.

Guideline

| | | | |
|---------------------------|-----|----------------------|----------------------|
| Screw, top shock absorber | M12 | 80 Nm (59 lbf ft) | Loctite® 243™ |
|---------------------------|-----|----------------------|----------------------|



- Position the master brake cylinder.
- Mount and tighten screws **3**.

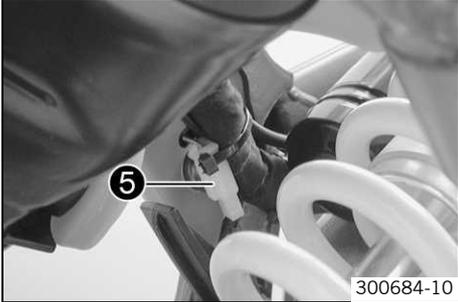
Guideline

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

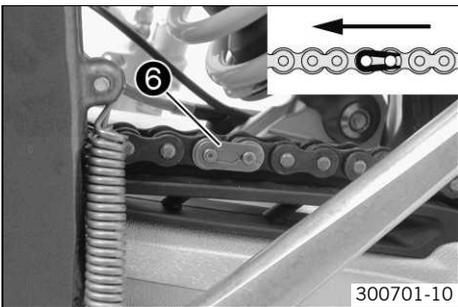
- Mount and tighten screw **4**.

Guideline

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



- Join plug-in connector **5** of the brake light switch.
- Secure the cable with cable binders.



- Mount the chain.
- Connect the chain links with connecting link **6**.

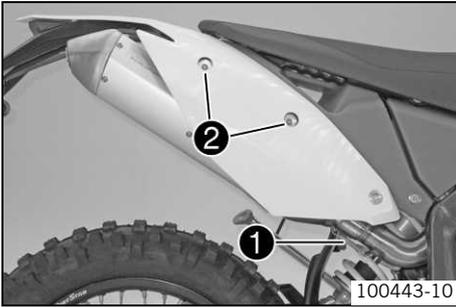
Removing the main silencer



Warning

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

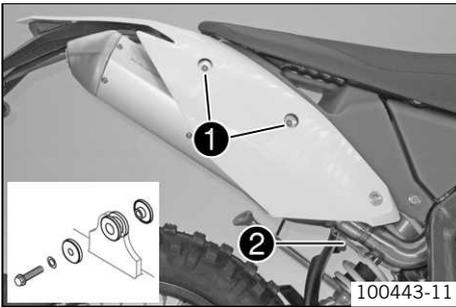
- Allow the exhaust system to cool down. Do not touch hot components.



100443-10

- Disconnect spring ❶.
- Remove screws ❷ and take off the main silencer.

Installing the main silencer



100443-11

- Mount the main silencer. Mount and tighten screws ❶.

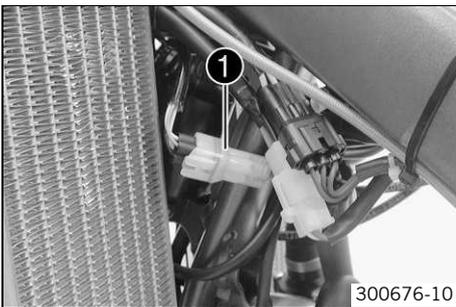
Guideline

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

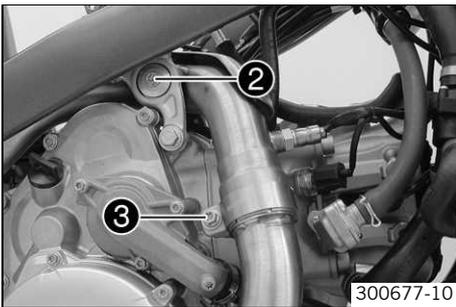
- Reconnect spring ❷.

Removing the exhaust system

- Remove the main silencer. (☛ p. 54)
- Remove the shock absorber. (☛ p. 34)
- Take off the throttle valve body and allow it to hang to the side. (☛ p. 161)
- Disconnect connector ❶ of the lambda sensor. Open the cable binders.

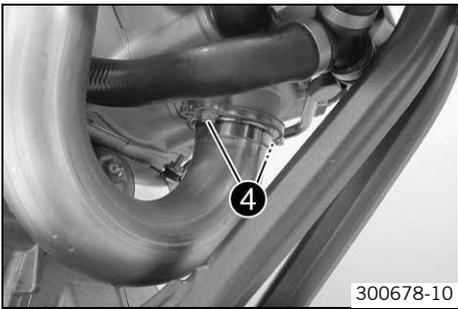


300676-10

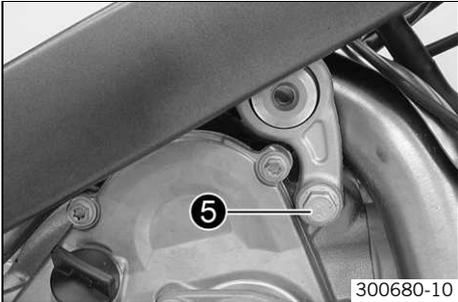


300677-10

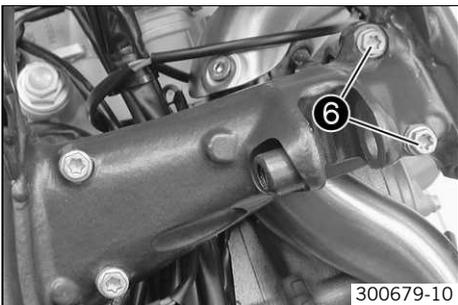
- Remove screw ❷.
- Unscrew screw ❸.



- Remove screws ④.
- Take off the exhaust manifold along with gasket.

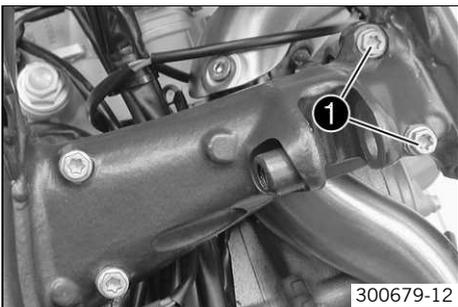


- Remove screw ⑤.



- Remove screws ⑥.
- Take off the right engine mounting bracket.
- Maneuver out the exhaust pipe.

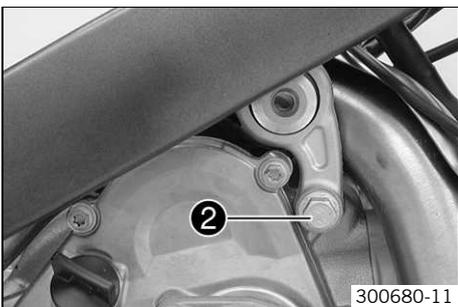
Installing the exhaust system



- Slip in the exhaust pipe.
- Position the engine mounting bracket.
- Mount and tighten screws ①.

Guideline

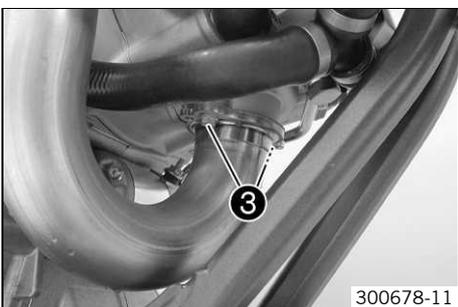
| | | |
|---------------------------|----|------------------------|
| Remaining screws, chassis | M8 | 25 Nm (18.4 lbf ft) |
|---------------------------|----|------------------------|



- Mount and tighten screw ② with the nut.

Guideline

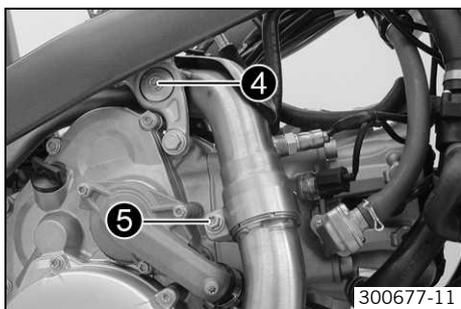
| | | |
|-------------------------|-----|------------------------|
| Remaining nuts, chassis | M10 | 50 Nm (36.9 lbf ft) |
|-------------------------|-----|------------------------|



- Position the exhaust manifold.
- Mount screw ③ but do not tighten it yet.

Guideline

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



- Mount and tighten screw ④.

Guideline

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

- Tighten screw ⑤.

Guideline

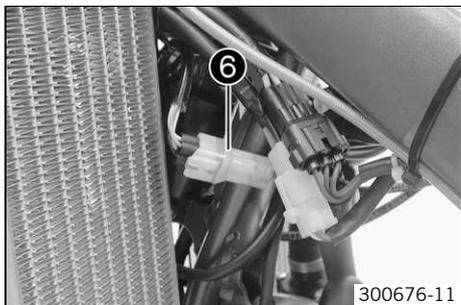
| | | |
|---------------------------|----|--------------------|
| Remaining screws, chassis | M6 | 10 Nm (7.4 lbf ft) |
|---------------------------|----|--------------------|

- Position the exhaust clamp.

- Tighten screw ⑤.

Guideline

| | | |
|----------------------------------|----|-------------------|
| Screw, exhaust clamp on manifold | M8 | 8 Nm (5.9 lbf ft) |
|----------------------------------|----|-------------------|



- Plug in connector ⑥ of the lambda sensor.
- Route the cable so it is tension-free and secure it with cable binders.
- Install the throttle valve body. (☛ p. 162)
- Install the shock absorber. (☛ p. 34)
- Install the main silencer. (☛ p. 54)

Removing the air filter

Note

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

- Never ride the vehicle without an air filter since dust and dirt can get into the engine and result in increased wear.



Warning

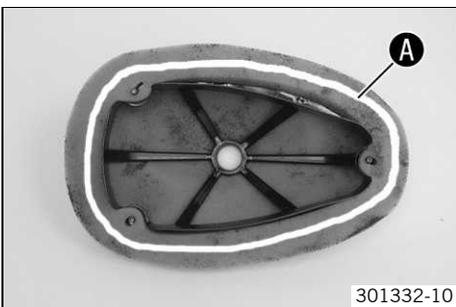
Environmental hazard Hazardous substances cause environmental damage.

- Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.



- Remove the seat. (☛ p. 59)
- Remove coarse dirt.
- Detach air filter holder ① at the bottom and swing it to one side. Remove the air filter with the air filter support.
- Remove the air filter from the air filter support.

Installing the air filter



- Mount the clean air filter onto the air filter support.
- Apply grease to the air filter around area A.

Long-life grease (☛ p. 265)



- Put in both parts together, position them and fix them with air filter holder ①.



Info

If the air filter is not correctly mounted, dust and dirt can penetrate into the engine and can cause damage.

- Mount the seat. (☛ p. 59)

Cleaning air filter



Warning

Environmental hazard Hazardous substances cause environmental damage.

- Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.



Info

Do not clean the air filter with highly flammable substances (e.g., fuel, petroleum, solvents) as these substances will damage the foam rubber.

- Remove the air filter. (☛ p. 57)
- Wash the air filter thoroughly in special cleaning liquid and allow it to dry properly.

Air filter cleaning agent (☛ p. 265)

**Info**

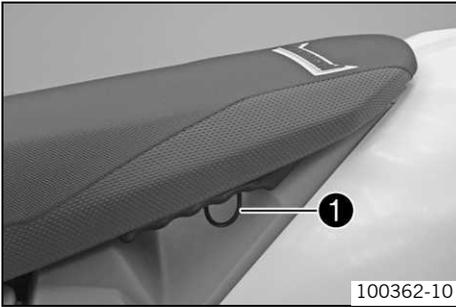
Only press the air filter to dry it, never wring it out.

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

Oil for foam air filter (☛ p. 266)

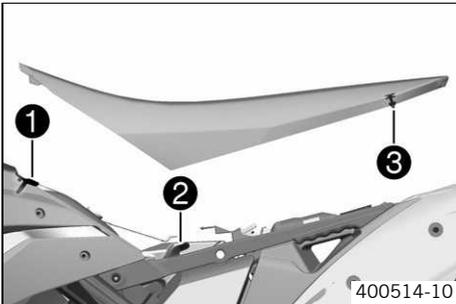
- Clean the intake flange and check it for damage and tightness.
- Install the air filter. (☛ p. 57)

Removing the seat



- Pull on the loop ❶ while raising the rear of the seat.
- Pull the seat back and lift it off.

Mounting the seat



- Attach the seat to the hooks on fuel tank ❶ and on the top part of subframe ❷, and lower it at the rear while pushing forward.
- Guide lock bolt ❸ into the lock housing and push down the rear of the seat until the lock bolt engages audibly.
- Finally, check that the seat is correctly mounted.

Removing the fuel tank



Danger

Fire hazard Fuel is highly flammable.

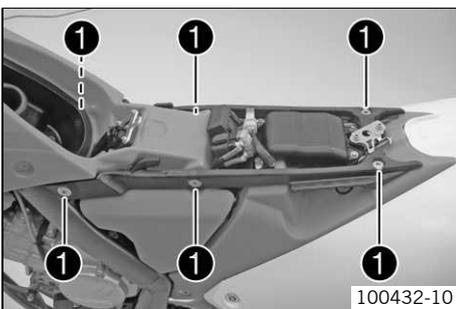
- Never fill up the vehicle near open flames or burning cigarettes, and always switch off the engine first. Be careful that no fuel is spilt, especially on hot vehicle components. Clean up spilt fuel immediately.
- Fuel in the fuel tank expands when warm and can escape if the tank is overfilled. See specifications on filling up with fuel.



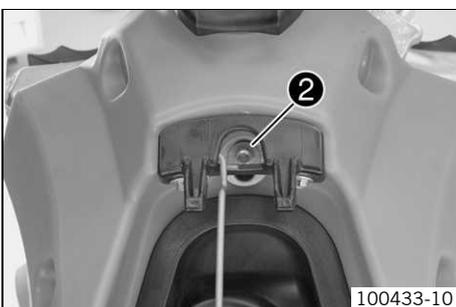
Warning

Danger of poisoning Fuel is poisonous and a health hazard.

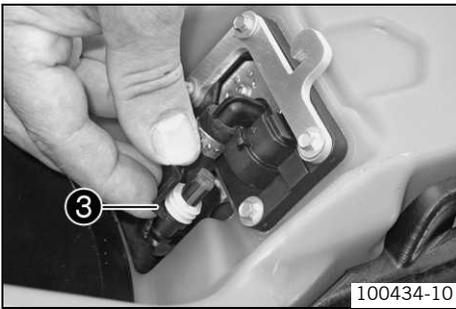
- Avoid contact between fuel and skin, eyes and clothing. Do not inhale fuel vapors. If fuel gets into your eyes, rinse immediately with water and contact a doctor. Wash affected skin areas immediately with soap and water. If fuel is swallowed, contact a doctor immediately. Change clothing that has come into contact with fuel. Store fuel in a suitable canister according to regulations and keep it out of the reach of children.



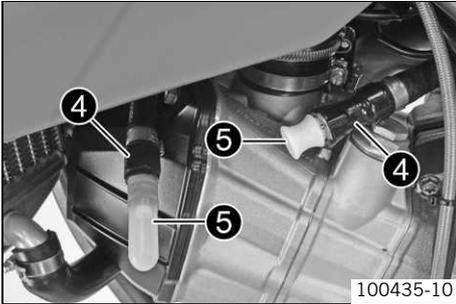
- Remove the spoiler. (☛ p. 61)
- Remove the air filter. (☛ p. 57)
- Remove screws ❶.
- Pull the top of the subframe outward slightly at the front and remove it.



- Remove screw ❷.



- Detach connector ③ of the fuel pump.



- Thoroughly clean the plug-in connection ④ of the fuel line using compressed air.

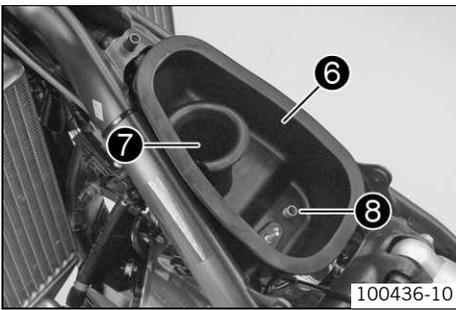


Info

Under no circumstances should dirt enter into the fuel line. Dirt in the fuel line will clog the fuel injection jets.

- Disconnect the plug-in connection of the fuel line.
- Mount wash cap set ⑤.

Wash cap set (81212016000)



- Carefully raise the fuel tank while detaching intake flange ⑥.
- Carefully close intake trumpet ⑦ and connection ⑧ of the engine housing vent to prevent dirt from entering.

Installing the fuel tank



Danger

Fire hazard Fuel is highly flammable.

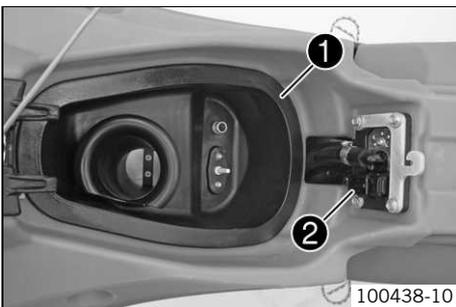
- Never fill up the vehicle near open flames or burning cigarettes, and always switch off the engine first. Be careful that no fuel is spilt, especially on hot vehicle components. Clean up spilt fuel immediately.
- Fuel in the fuel tank expands when warm and can escape if the tank is overfilled. See specifications on filling up with fuel.



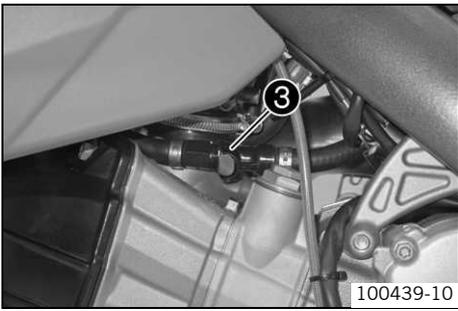
Warning

Danger of poisoning Fuel is poisonous and a health hazard.

- Avoid contact between fuel and skin, eyes and clothing. Do not inhale fuel vapors. If fuel gets into your eyes, rinse immediately with water and contact a doctor. Wash affected skin areas immediately with soap and water. If fuel is swallowed, contact a doctor immediately. Change clothing that has come into contact with fuel. Store fuel in a suitable canister according to regulations and keep it out of the reach of children.



- Clean all parts well.
- Position the fuel tank and route the fuel line to the front.
- Route the fuel pump cable up through the rear opening in the fuel tank and position the fuel tank in its final location.
- Pull intake flange ① through the front opening in the fuel tank and position it.
- Attach connector ② of the fuel pump.



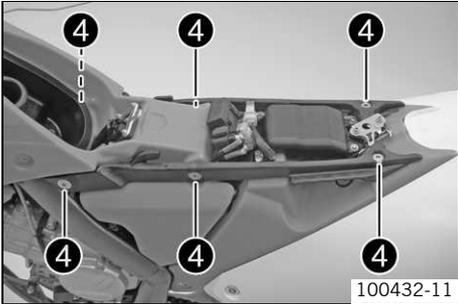
100439-10

- Remove the wash cap set. Oil the O-ring and connect plug-in connector 3 of the fuel line.



Info

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

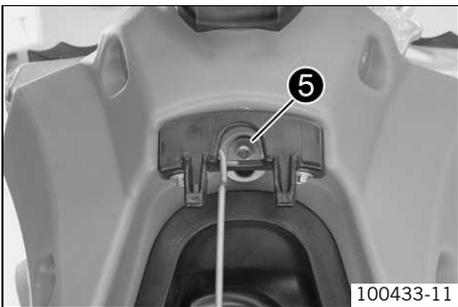


100432-11

- Position the top part of the subframe.
- Mount and tighten screws 4.

Guideline

| | | |
|-----------------|----|------------------------|
| Screw, subframe | M8 | 30 Nm (22.1 lbf ft) |
|-----------------|----|------------------------|



100433-11

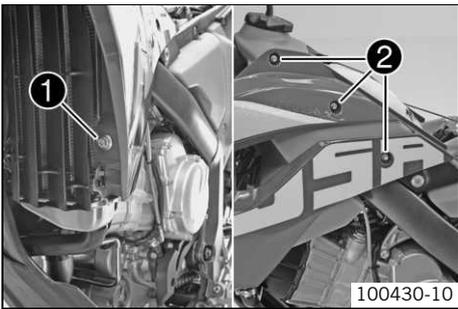
- Mount and tighten screw 5.

Guideline

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

- Check that the intake trumpet and the connection of the engine housing vent are clear.
- Install the air filter. (☛ p. 57)
- Install the spoiler. (☛ p. 61)
- Check the fuel system for leakage.

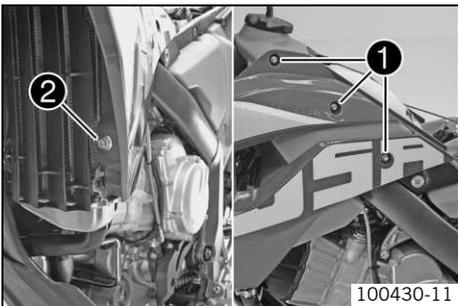
Removing the spoiler



100430-10

- Remove the seat. (☛ p. 59)
- Remove screw 1 on the radiator.
- Remove screws 2 on the fuel tank and take off the spoiler.

Installing the spoiler



100430-11

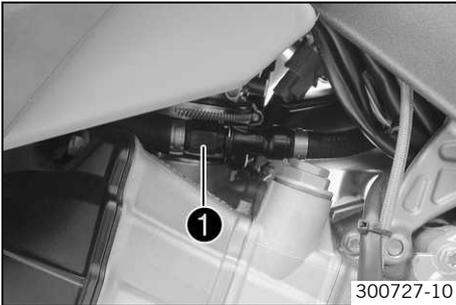
- Position the spoiler. Mount and tighten screws 1.
- Mount and tighten screw 2 on the radiator.

Guideline

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

- Mount the seat. (☛ p. 59)

Checking the fuel pressure



300727-10



300728-10

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

- Mount the special tool.

Pressure testing tool (61029094000) (☞ p. 269)



Danger

Danger of poisoning Exhaust gases are poisonous and can result in unconsciousness and/or death.

- When running the engine, always make sure there is sufficient ventilation, and do not start or run the engine in a closed space without an effective exhaust extraction system.

- Start the engine.
- Check the fuel pressure.

Fuel pressure

| | |
|----------------------------|-------------------------------|
| Under every load condition | 3.3... 3.7 bar (48... 54 psi) |
|----------------------------|-------------------------------|

» If the measured value is less than the specification:

- Change the fuel filter.
- Check the fuel line for free flow.
- Replace the fuel pump.

- 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.

- Detach the special tool.
- Join the fuel hose connection.

Removing the front fender

(FE EU, FE AUS)

- Remove the headlight mask with the headlight. (☛ p. 88)

(FE USA)

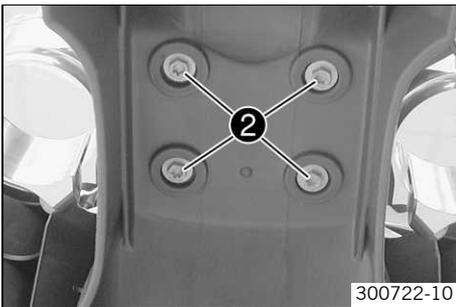
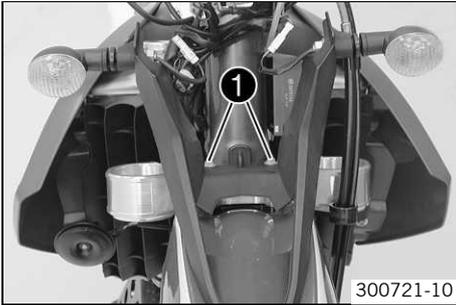
- Remove the start number plate. (☛ p. 63)

- Remove screws ❶.

- Take out the brake line and wiring harness from the brake line guide.

(FE EU, FE AUS)

- Disconnect the front turn signal connector.



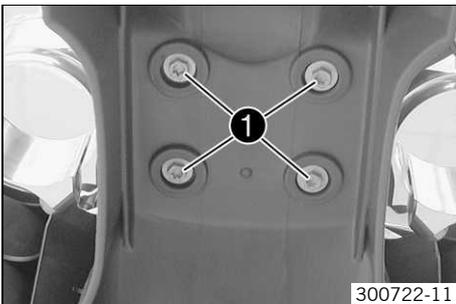
- Remove screws ❷. Take off the fender with the brake line guide.



Info

Pay attention to the location of the distance bushings.

Installing the front fender



- Ensure that the distance bushings are mounted in the brake line guide.
- Position the fender with the brake line guide.
- Mount and tighten screws ❶.

Guideline

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

- Position the brake line and wiring harness in brake line guide.

(FE EU, FE AUS)

- Join the front turn signal connector parts together.

- Mount and tighten screws ❷.

Guideline

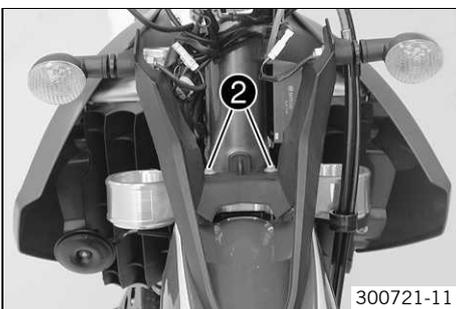
| | | |
|---------------------------|----|--------------------|
| Remaining screws, chassis | M6 | 10 Nm (7.4 lbf ft) |
|---------------------------|----|--------------------|

(FE EU, FE AUS)

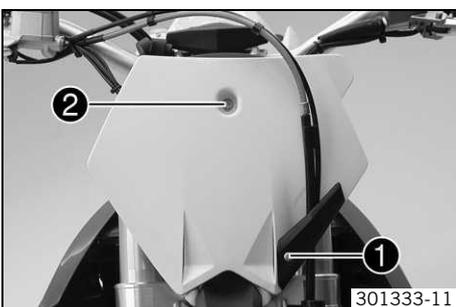
- Install the headlight mask with the headlight. (☛ p. 88)

(FE USA)

- Install the start number plate. (☛ p. 64)

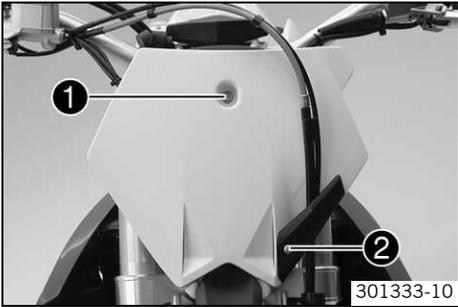


Removing the start number plate (FE USA)



- Remove screw ❶ and take off the clamp.
- Remove screw ❷. Take off the start number plate.

Installing the start number plate (FE USA)



- Position the start number plate. Mount and tighten screw ❶.

Guideline

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



Info

Ensure engagement of the holding lugs on the fender.

- Position the brake line and wiring harness. Put the clamp on and mount and tighten screw ❷.

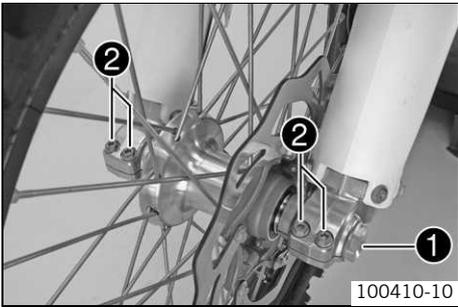
Removing the front wheel



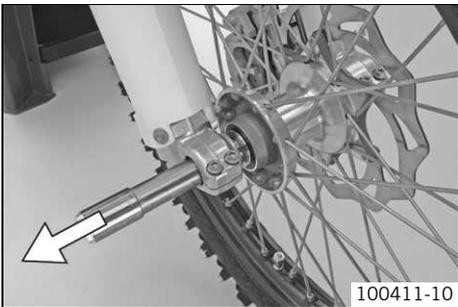
- Jack up the motorcycle. (☛ p. 9)
- Press the brake caliper by hand on to the brake disc in order to press back the brake pistons.

i Info

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



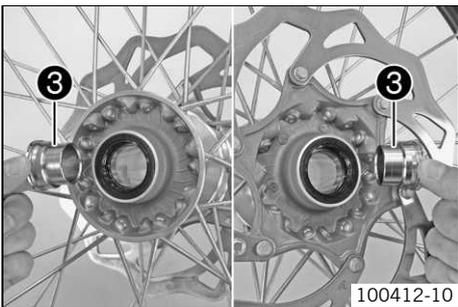
- Remove screw ❶.
- Loosen screw ❷.



- Holding the front wheel, withdraw the wheel spindle. Take the front wheel out of the fork.

i Info

Do not pull the hand brake lever when the front wheel is removed. Always lay the wheel down in such a way that the brake disc is not damaged.



! Warning

Danger of accidents Reduced braking due to damaged brake discs.

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

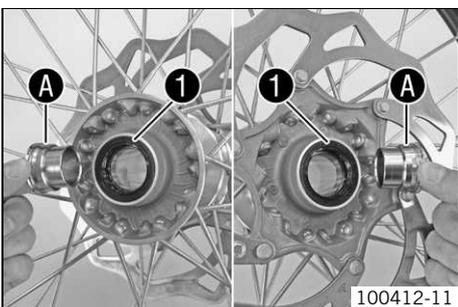
- Remove spacing sleeves ❸.

Installing the front wheel

! Warning

Danger of accidents Reduced braking efficiency due to oil or grease on the brake discs.

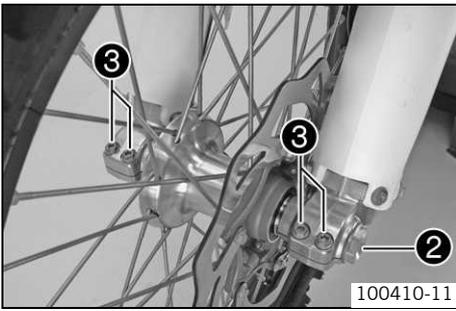
- Always keep the brake discs free of oil and grease, and clean them with brake cleaner when necessary.



- Clean and grease shaft seal rings ❶ and bearing surface A of the spacing sleeves.

Long-life grease (☛ p. 265)

- Insert the spacing sleeves.



- Lift the front wheel into the fork, position it, and insert the wheel spindle.
- Mount and tighten screw ②.

Guideline

| | | |
|----------------------------|---------|------------------------|
| Screw, front wheel spindle | M24x1.5 | 45 Nm (33.2 lbf ft) |
|----------------------------|---------|------------------------|

- Operate the hand brake lever several times until the brake pads are lying correctly on the brake disc.
- Remove the motorcycle from the work stand. (☛ p. 9)
- Pull the front wheel brake and push down hard on the fork several times to align the fork legs.
- Fully tighten screw ③.

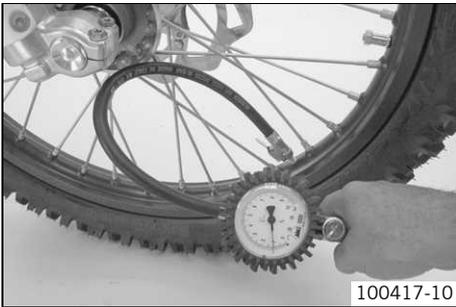
Guideline

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

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 dust cap.
- Check tire air pressure when tires are cold.

| Tire air pressure off road | |
|----------------------------|------------------|
| Front | 1.0 bar (15 psi) |
| Rear | 1.0 bar (15 psi) |

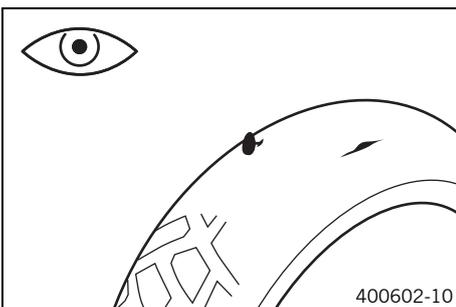
| Road tire pressure | |
|--------------------|------------------|
| Front | 1.5 bar (22 psi) |
| Rear | 2.0 bar (29 psi) |

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

Checking the tire condition

i Info

Only mount tires approved or recommended by HUSABERG. Other tires could have a negative effect on riding behavior. The type, condition and air pressure of the tires all have an important impact on the riding behavior of the motorcycle. The front and rear wheels must be mounted with tires with similar profiles. Worn tires have a negative effect on riding behavior, especially on wet surfaces.



- Examine the front and rear tires for cuts, foreign bodies and other damage.
 - » If you find cuts, foreign bodies or other damage on a tire:
 - Change the tire.
- Check the depth of the tread.

i Info

Note local national regulations concerning the minimum tread depth.

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

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



Info

The tire manufacture date is usually included in the tire identification number and comprises the last four digits of the **DOT** code. The first two digits indicate the week of manufacture and the last two digits the year of manufacture.

HUSABERG recommends replacing the tires after five years at the latest, regardless of the actual wear.

- » If the tires are older than five years:
 - Change the tire.

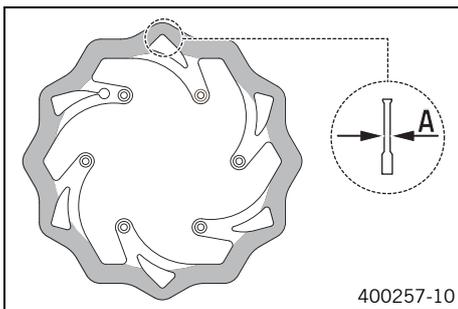
Checking the brake disks



Warning

Danger of accidents Reduced braking efficiency due to worn brake disc(s).

- Change the worn brake disc(s) without delay.



- Check the thickness of the front and rear brake disks at several places on the disk to see if it conforms to measurement **A**.



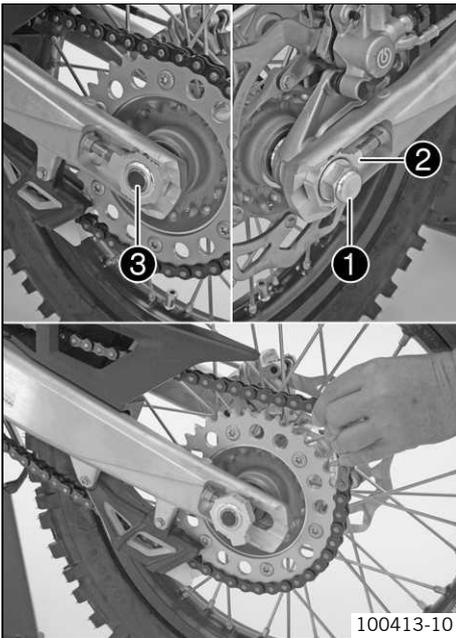
Info

Wear reduces the thickness of the brake disk around the area used by the brake linings.

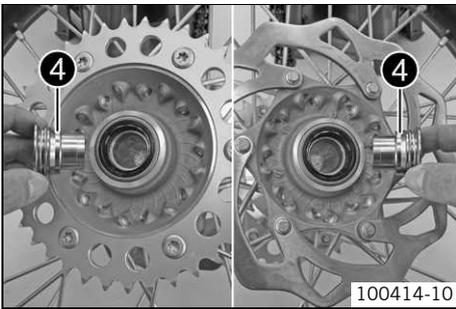
| Brake discs - wear limit | |
|--------------------------|-------------------|
| Front | 2.5 mm (0.098 in) |
| Rear | 3.5 mm (0.138 in) |

- » If the brake disk thickness is less than the specified value:
 - Change the brake disk.
- Check the front and rear brake disks for damage, cracking and deformation.
 - » If the brake disk exhibits damage, cracking or deformation:
 - Change the brake disk.

Removing the rear wheel



100413-10



100414-10

- Jack up the motorcycle. (☛ p. 9)
- Press the brake caliper by hand on to the brake disc in order to press back the brake piston.

i 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.
- Holding the rear wheel, withdraw the wheel spindle. Take the rear wheel out of the swing arm.

i Info

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

! Warning

Danger of accidents Reduced braking due to damaged brake discs.

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

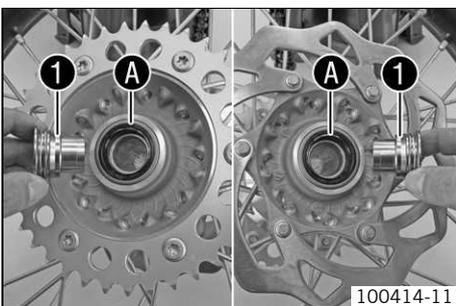
- Remove spacing sleeves ④.

Installing the rear wheel

! Warning

Danger of accidents Reduced braking efficiency due to oil or grease on the brake discs.

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

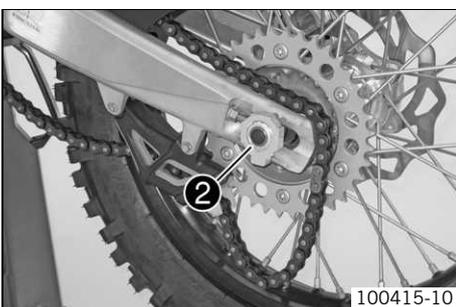


100414-11

- Clean and grease shaft seal rings ① and bearing surface A of the spacing sleeves.

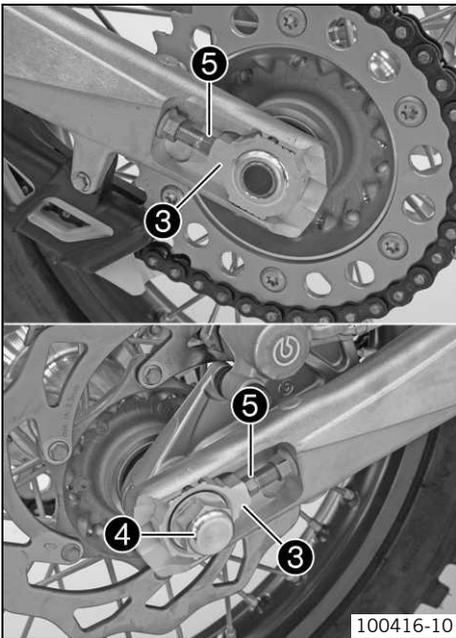
Long-life grease (☛ p. 265)

- Insert the spacing sleeves.



100415-10

- Lift the rear wheel into the swing arm, position it, and insert the wheel spindle ②.
- Put the chain on.



- Position chain adjuster ③. Mount nut ④, but do not tighten it yet.
- Check the chain tension. (☛ p. 69)
- Make sure that chain adjusters ③ are fitted correctly on adjusting screws ⑤.
- Tighten nut ④.

Guideline

| | | |
|-------------------------|---------|-------------------|
| Nut, rear wheel spindle | M20x1.5 | 80 Nm (59 lbf ft) |
|-------------------------|---------|-------------------|

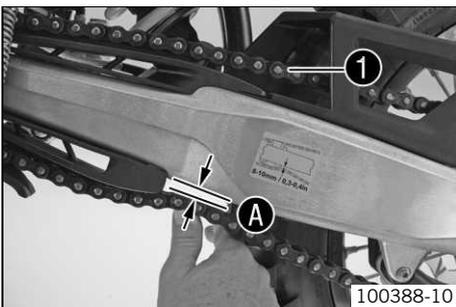
i Info
The wide adjustment range of the chain adjusters (32 mm) enables different secondary transmissions with the same chain length. Chain adjusters ③ can be turned by 180°.

- Operate the foot brake lever repeatedly until the brake linings lie on the brake disc and there is a tight spot.
- Remove the motorcycle from the work stand. (☛ p. 9)

Checking the chain tension

! Warning
Danger of accidents Danger caused by incorrect chain tension.

- If the chain tension is too high, the components of the secondary power train (chain, engine sprocket, rear sprocket, bearings in transmission and rear wheel) are under additional load. Apart from premature wear, in extreme cases the chain can rupture or the countershaft of the transmission can break. On the other hand, if the chain is loose, it can fall off the engine sprocket or the rear sprocket and block the rear wheel or damage the engine. Check for correct chain tension and adjust if necessary.



- Jack up the motorcycle. (☛ p. 9)
- Push the chain at the end of the chain sliding component upwards to measure the chain tension ①.

i Info
The upper chain section ① must be taut. Chain wear is not always even, so you should repeat this measurement at different chain positions.

| | |
|---------------|------------------------------|
| Chain tension | 8... 10 mm (0.31... 0.39 in) |
|---------------|------------------------------|

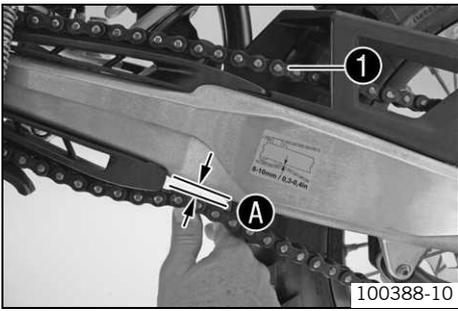
- » If the chain tension does not meet specifications:
 - Adjust the chain tension. (☛ p. 69)
- Remove the motorcycle from the work stand. (☛ p. 9)

Adjusting the chain tension

! Warning
Danger of accidents Danger caused by incorrect chain tension.

- If the chain tension is too high, the components of the secondary power train (chain, engine sprocket, rear sprocket, bearings in transmission and rear wheel) are under additional load. Apart from premature wear, in extreme cases the chain can rupture or the countershaft of the transmission can break. On the other hand, if the chain is loose, it can fall off the engine sprocket or the rear sprocket and block the rear wheel or damage the engine. Check for correct chain tension and adjust if necessary.

- Jack up the motorcycle. (☛ p. 9)



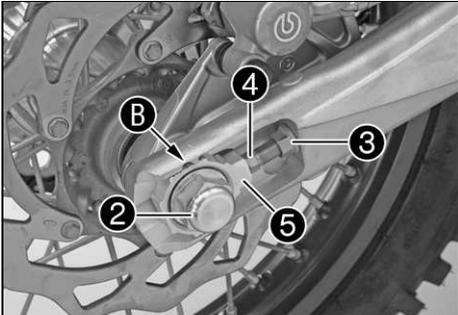
100388-10

- Push the chain at the end of the chain sliding component upwards to measure the chain tension **A**.



Info

The upper chain section **1** must be taut.
Because chain wear is not always even, you should repeat this measurement at different chain positions.



- Loosen nut **2**.
- Loosen nuts **3**.
- Adjust the chain tension by turning the adjusting screws **4** left and right.

Guideline

| | |
|---|------------------------------|
| Chain tension | 8... 10 mm (0.31... 0.39 in) |
| Turn adjusting screws 4 on the left and right so that the markings on the left and right chain adjusters are in the same position relative to the reference marks B . The rear wheel is then correctly aligned. | |

- Tighten nuts **3**.
- Make sure that chain adjusters **5** are fitted correctly on adjusting screws **4**.
- Tighten nut **2**.

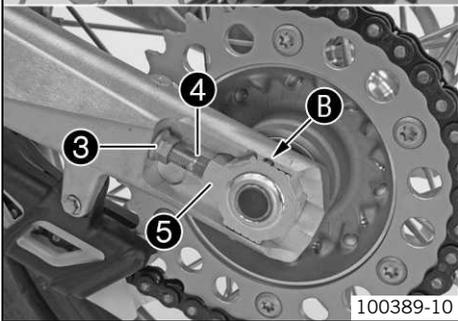
Guideline

| | | |
|-------------------------|---------|-------------------|
| Nut, rear wheel spindle | M20x1.5 | 80 Nm (59 lbf ft) |
|-------------------------|---------|-------------------|



Info

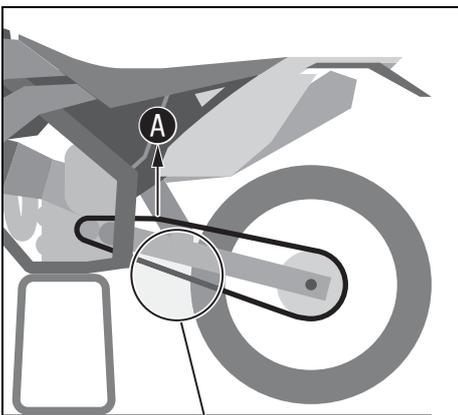
The wide adjustment range of the chain adjusters (32 mm) enables different secondary transmissions with the same chain length.
Chain adjusters **5** can be turned by 180°.



100389-10

- Remove the motorcycle from the work stand. (☛ p. 9)

Checking the chain wear



- Jack up the motorcycle. (☛ p. 9)
- Shift gear to neutral.
- Pull on the upper part of the chain with the specified weight **A**.

Guideline

| | |
|--------------------------------|----------------------------|
| Weight, 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.

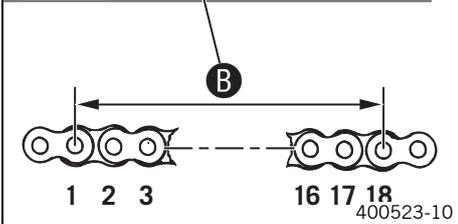
| | |
|--|-------------------|
| Maximum distance B at the longest chain section | 272 mm (10.71 in) |
|--|-------------------|

- » If the distance **B** is greater than the specified measurement:
 - Replace the chain.



Info

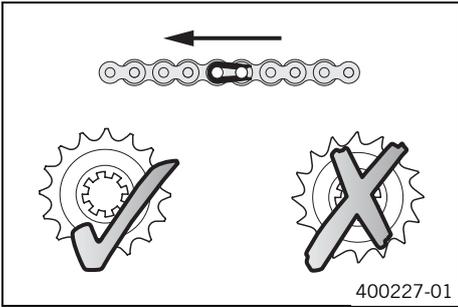
When you replace the chain, you should also replace rear sprocket and engine sprocket.
New chains wear out faster on old, worn sprockets.



400523-10

- Remove the motorcycle from the work stand. (☛ p. 9)

Checking the rear sprocket/engine sprocket for wear

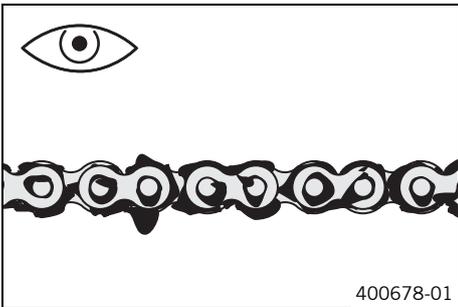


- Check the rear sprocket/engine sprocket for wear.
 - » If the rear sprocket/engine sprocket are worn:
 - Replace the rear sprocket/engine sprocket.

i Info
 When fitting the chain joint, always make sure that the closed side of the joint faces forward (riding direction). The engine sprocket, rear sprocket and chain should always be replaced together.

- Check the chain guide for tightness and wear.

Checking for chain dirt accumulation



- Check the chain for coarse dirt accumulation.
 - » If the chain is very dirty:
 - Clean the chain. (☛ p. 71)

Cleaning the chain

⚠ Warning
Danger of accidents Oil or grease on the tires reduces their grip.
 - Remove oil and grease with a suitable cleaning material.

⚠ Warning
Danger of accidents Reduced braking efficiency due to oil or grease on the brake discs.
 - Always keep the brake discs free of oil and grease, and clean them with brake cleaner when necessary.

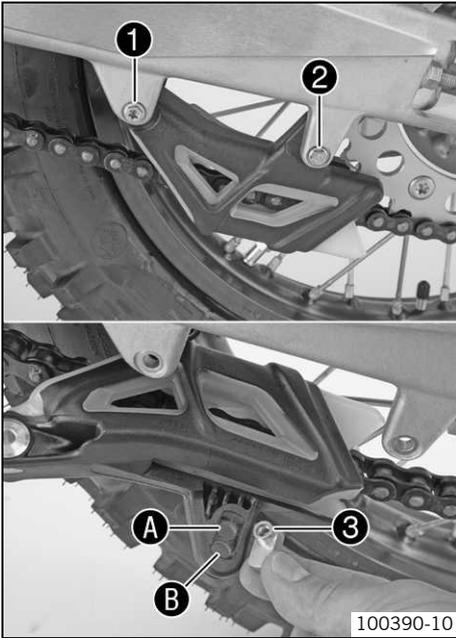
🌿 Warning
Environmental hazard Hazardous substances cause environmental damage.
 - Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.

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

- Clean the chain regularly and then treat with chain spray.

| |
|--------------------------------|
| Chain cleaner (☛ p. 265) |
| Offroad chain spray (☛ p. 266) |

Adjusting the chain guide



- Remove screws ❶ and ❷. Take off the chain guide.

Condition

Number of teeth: ≤ 44 teeth

- Insert nut ❸ in hole ❹. Position the chain guide.
- Mount and tighten screws ❶ and ❷.

Guideline

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

Condition

Number of teeth: ≥ 45 teeth

- Insert nut ❸ in hole ❺. Position the chain guide.
- Mount and tighten screws ❶ and ❷.

Guideline

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

Checking the spoke tension



Warning

Danger of accidents Instable handling due to incorrect spoke tension.

- Ensure that the spoke tension is correct.



Info

A loose spoke can cause wheel imbalance, which leads to more loose spokes in a short time. If the spokes are too tight, they can break due to local overload. Check the spoke tension regularly, especially on a new motorcycle.



- Quickly strike each spoke with the tip of a screwdriver.



Info

The tone frequency depends on the length of the spoke and the 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 varies:
 - Correct the spoke tension.

- Check the spoke torque.

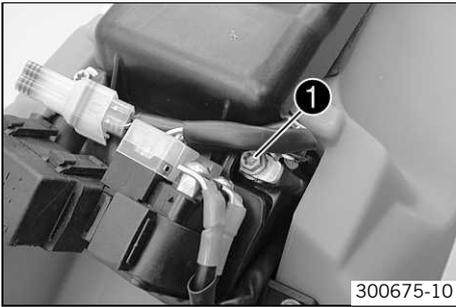
Guideline

| | | |
|---------------------------|------|----------------------------------|
| Spoke nipple, front wheel | M4.5 | 5... 6 Nm (3.7... 4.4 lbf ft) |
| Spoke nipple, rear wheel | M5 | 5... 6 Nm (3.7... 4.4 lbf ft) |

Torque wrench with various accessories in set (58429094000) (☛ p. 268)

Disconnecting the negative cable of the battery

- Switch off all power consumers and the engine.
- Remove the seat. (☛ p. 59)
- Disconnect negative cable ❶ of the battery.



300675-10

i Info

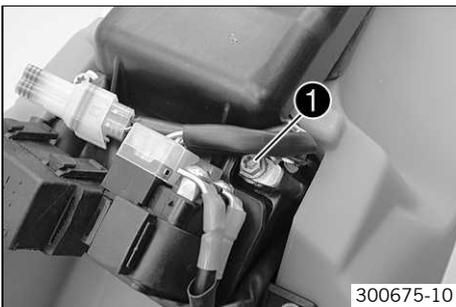
Pay attention to the contact disks between the cable sockets and battery terminals.

Connecting the negative cable of the battery

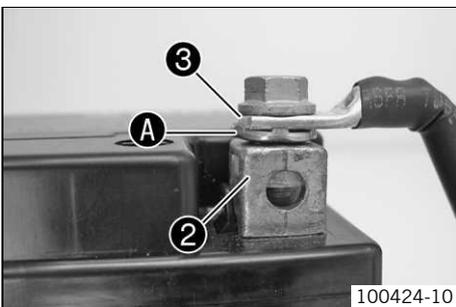
- Connect negative cable ❶.

i Info

Contact disks ❸ must be mounted between battery terminals ❷ and cable sockets ❹ with the claws facing up.



300675-10



100424-10

- Tighten the screw.

Guideline

| | | |
|-------------------------|----|-------------------|
| Screw, battery terminal | M5 | 3 Nm (2.2 lbf ft) |
|-------------------------|----|-------------------|

Changing the main fuse

⚠ Warning

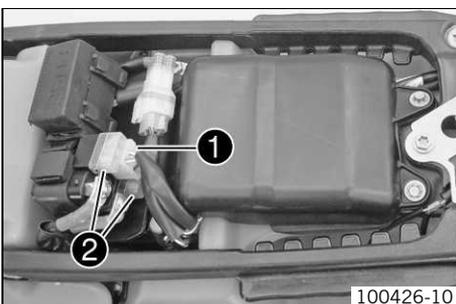
Fire hazard The electrical system can be overloaded by the use of incorrect fuses.

- Use only fuses with the prescribed amperage. Never by-pass or repair fuses.

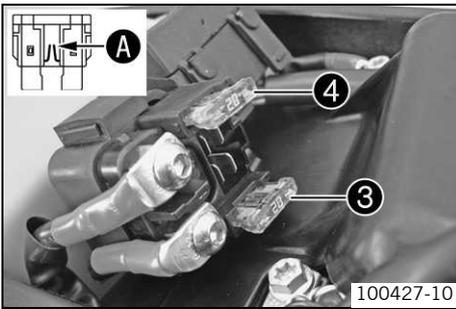
i Info

The main fuse protects all power consumers of the vehicle. It is located in the housing of the starter relay on the battery cover.

- Switch off all power consumers and switch off the engine.
- Remove the seat. (☛ p. 59)
- Detach connector ❶.
- Remove protection covers ❷.



100426-10



- Remove faulty main fuse ③.



Info

You can recognize a faulty fuse by the burned-out fuse wire ④. A reserve fuse ④ is located in the starter relay.

- Insert a new main fuse.

Fuse (58011109120)

- Plug in connector ① on the starter relay.
- Check the functioning of the electrical equipment.



Tip

Replace the spare fuse so that it is available if needed.

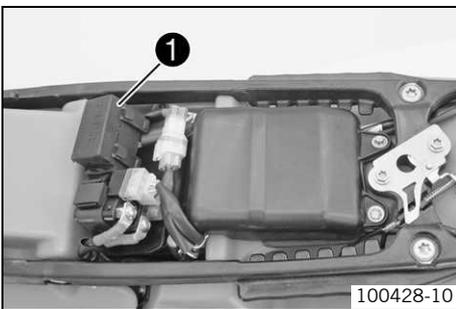
- Attach protection covers ②.
- Mount the seat. (☛ p. 59)

Changing the fuses of individual power consumers

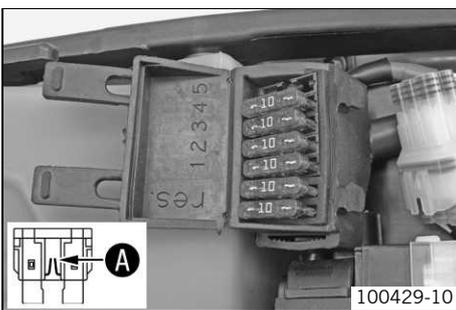


Info

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



- Switch off all power consumers and switch off the engine.
- Remove the seat. (☛ p. 59)
- Open fuse box cover ①.



- Remove the faulty fuse.

Guideline

| |
|---|
| Fuse 1 - 10A - EFI control unit |
| Fuse 2 - 10A - fuel pump |
| Fuse 3 - 10A - high beam, low beam, parking light, tail light, license plate lamp |
| Fuse 4 - 10A - speedometer, horn, brake light, flasher light, radiator fan (optional) |
| Fuse 5 - not used |
| Fuse res - 10A - spare fuses |



Info

You can recognize a faulty fuse by the burned-out fuse wire ④.



Warning

Fire hazard The electrical system can be overloaded by the use of incorrect fuses.

- Use only fuses with the prescribed amperage. Never by-pass or repair fuses.

- Use spare fuses with the correct rating only.

Fuse (58011109110)



Tip

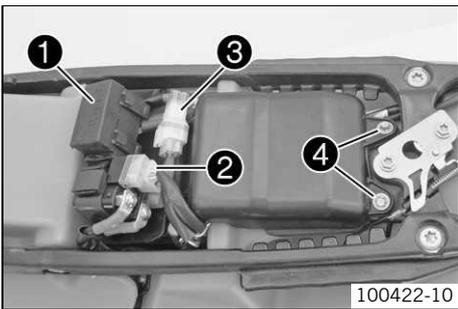
Replace the spare fuse in the fuse box so that it is available if needed.

- Check that the power consumer is functioning properly.
- Close the fuse box cover.
- Mount the seat. (☛ p. 59)

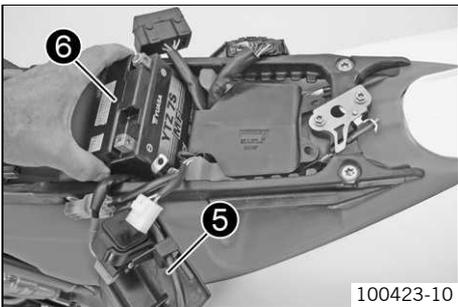
Removing the battery

Warning
Risk of injury Battery acid and battery gases cause serious chemical burns.

- Keep batteries out of the reach of children.
- Wear suitable protective clothing and goggles.
- Avoid contact with battery acid and battery gases.
- Keep the battery away from sparks or open fire. Charge only in well-ventilated rooms.
- In the event of skin contact, rinse with large amounts of water. If battery acid gets in the eyes, rinse with water for at least 15 minutes and contact a physician.



- Switch off all power consumers and switch off the engine.
- Remove the seat. (☛ p. 59)
- Detach fuse box ① and swing it to one side.
- Detach connector ② and swing it to one side with connector ③.
- Remove screws ④ and swing battery cover ⑤ with the starter relay to one side. Swing the EFI control unit to one side.

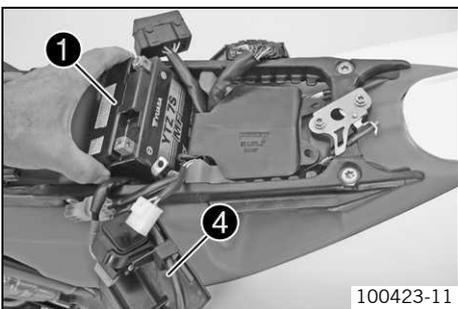


- Disconnect the negative and positive cables of the battery.

i Info
 Pay attention to the contact disks between the cable sockets and battery terminals.

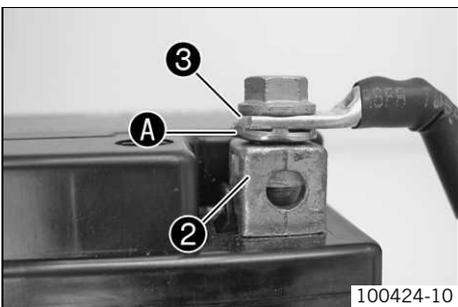
- Lift battery ⑥ up and out.

Installing the battery



- Insert battery ① into the battery tray with the terminals facing to the rear.

Battery (YTZ7S) (☛ p. 224)



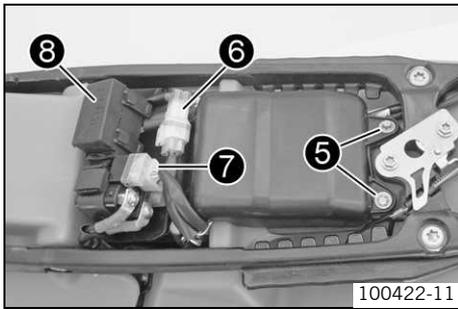
- Connect the positive and negative cables.

i Info
 Contact disks A must be mounted between battery terminals ② and cable sockets ③ with the claws facing up.

- Tighten the screws.

Guideline

| | | |
|-------------------------|----|-------------------|
| Screw, battery terminal | M5 | 3 Nm (2.2 lbf ft) |
|-------------------------|----|-------------------|



- Position the EFI control unit, hook battery cover ④ into the battery tray and mount screws ⑤.
- Attach connector ⑥ to the battery cover and plug in connector ⑦ to the starter relay.
- Attach fuse box ⑧ to the battery cover.
- Mount the seat. (☛ p. 59)

Charging the battery

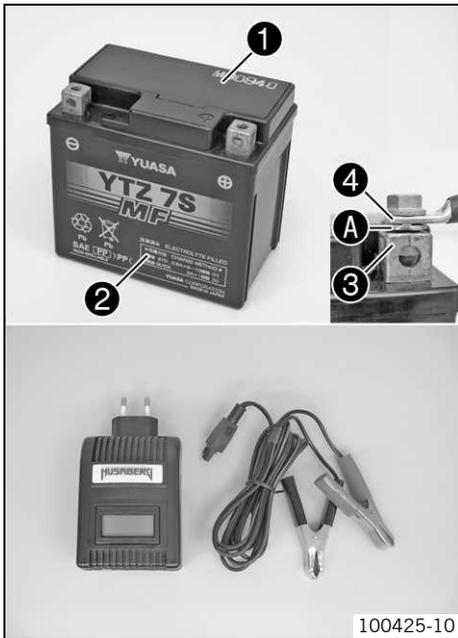
- Warning**
Risk of injury Battery acid and battery gases cause serious chemical burns.
- Keep batteries out of the reach of children.
 - Wear suitable protective clothing and goggles.
 - Avoid contact with battery acid and battery gases.
 - Keep the battery away from sparks or open fire. Charge only in well-ventilated rooms.
 - In the event of skin contact, rinse with large amounts of water. If battery acid gets in the eyes, rinse with water for at least 15 minutes and contact a physician.

- Warning**
Environmental hazard Battery components and acid are harmful to the environment.
- Do not dispose of batteries with the regular garbage. Dispose of defective batteries in an environmentally responsible manner. Take the batteries to your HUSABERG dealer or to a collection point for old batteries.

- Warning**
Environmental hazard Hazardous substances cause environmental damage.
- Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.

i Info
 Even when there is no load on the battery, it is still depleted slightly every day. The charging level and type of charge are very important to the battery service life. Rapid charging with a high charging current has a negative impact on the service life. If the charging current, charging voltage and charging time are exceeded, electrolyte escapes via the safety valves. This reduces the battery capacity. If the vehicle is started repeatedly until the battery is depleted, the battery must be charged immediately. If the battery is left in a discharged state for an extended period, it will drain completely and sulfate, destroying the battery. The battery is maintenance-free, which means that the acid level does not need to be checked.

- Switch off all power consumers and the engine.
- Remove the seat. (☛ p. 59)
- Disconnect the negative cable of the battery to avoid damage to the onboard electronics.



- Connect the battery charger to the battery. Switch on the battery charger.

Battery charger (81229074000)

You can also use the battery charger to check the off load voltage, the starting ability of the battery and the generator. The device also makes it impossible to over-charge the battery.

i Info

Never remove cover ①.
Charge the battery with a maximum of 10% of the capacity specified on battery housing ②.

- Switch off the battery charger after charging.

Guideline

Charging current, charging voltage and charging time may not be exceeded.

| | |
|--|----------|
| Recharge the battery regularly if the motorcycle is not put into operation | 3 months |
|--|----------|

i Tip

If the vehicle is not ridden for more than two weeks, we recommend trickle charging the battery with the HUSABERG battery charger. The battery is first charged completely and then maintained at this level over the subsequent period. Thus, the battery is always fully charged when the vehicle is put into operation.

- Connect the negative cable.

i Info

Contact disk ① must be mounted between battery terminal ③ and cable socket ④ with the claws facing up.

- Tighten the screw.

Guideline

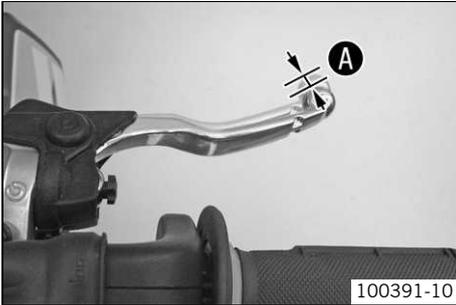
| | | |
|-------------------------|----|-------------------|
| Screw, battery terminal | M5 | 3 Nm (2.2 lbf ft) |
|-------------------------|----|-------------------|

- Mount the seat. (☛ p. 59)

Checking the free travel of the hand brake lever

Warning
Danger of accidents Brake system failure.

- If there is no free travel on the hand brake lever, pressure builds up on the front brake in the brake system. The front brake can fail due to overheating. Adjust free travel on hand brake lever according to specifications.

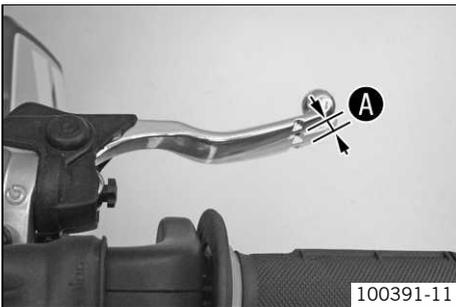


(FE USA)

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

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

- » If the free travel does not meet specifications:
 - Adjust the basic position of the handbrake lever. (☛ p. 78)



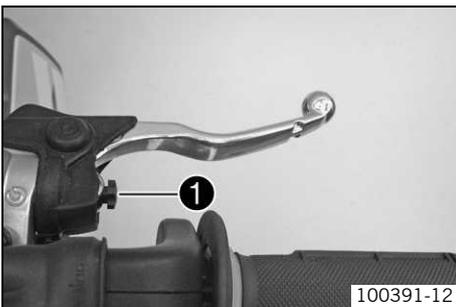
(FE EU, FE AUS)

- Push the hand brake to the handlebar and check free travel **A**.

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

- » If the free travel does not meet specifications:
 - Adjust the free travel of the handbrake lever. (☛ p. 78)

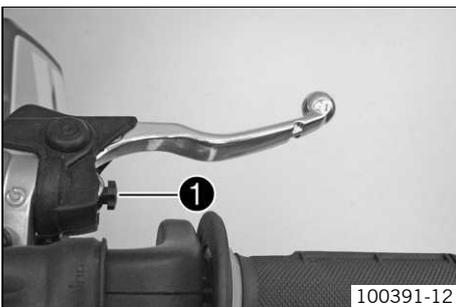
Adjusting the free travel of the handbrake lever (FE EU, FE AUS)



- Check the free travel of the hand brake lever. (☛ p. 78)
- Adjust the free travel of the handbrake 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!

Adjusting the basic position of the handbrake lever (FE USA)



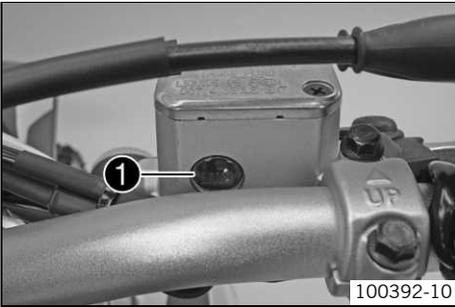
- Check the free travel of the hand brake lever. (☛ p. 78)
- Adjust the basic setting of the handbrake lever to your hand size by turning adjusting screw **1**.

i Info
 Turn the adjusting screw clockwise to increase the distance between the handbrake lever and the handlebar.
 Turn the adjusting screw counterclockwise to decrease the distance between the handbrake 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!

Checking the front brake fluid level

- Warning**
Danger of accidents Failure of the brake system.
- If the brake fluid level falls below the **MIN** mark, this indicates a leakage in the brake system or worn-out brake linings. Check the brake system and do not continue riding.

- Warning**
Danger of accidents Reduced braking efficiency due to old brake fluid.
- Change the brake fluid of the front and rear brakes according to the service schedule.



- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Check the brake fluid level in the viewer ❶.
 - » If the brake fluid is below the **MIN** marking:
 - Add front brake fluid. (☛ p. 79)

Adding front brake fluid

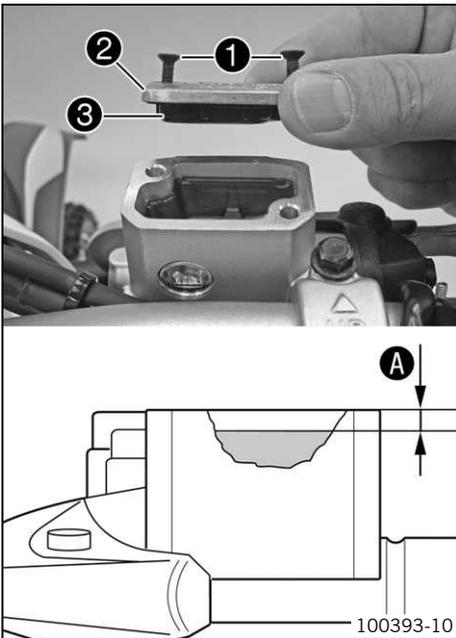
- Warning**
Danger of accidents Failure of the brake system.
- If the brake fluid level falls below the **MIN** mark, this indicates a leakage in the brake system or worn-out brake linings. Check the brake system and do not continue riding.

- Warning**
Skin irritations Brake fluid can cause skin irritation on contact.
- Avoid contact with skin and eyes, and keep out of the reach of children.
 - Wear suitable protective clothing and goggles.
 - If brake fluid gets into your eyes, rinse thoroughly with water and contact a doctor immediately.

- Warning**
Danger of accidents Reduced braking efficiency due to old brake fluid.
- Change the brake fluid of the front and rear brakes according to the service schedule.

- Warning**
Environmental hazard Hazardous substances cause environmental damage.
- Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.

- Info**
- Never use DOT 5 brake fluid! This is based on silicone oil and is colored purple. 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!
 Use only clean brake fluid from a sealed container!



- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ❶.
- Remove cover ❷ with membrane ❸.
- Add brake fluid to level A.

Guideline

| | |
|------------------|---------------|
| Measurement of A | 5 mm (0.2 in) |
|------------------|---------------|

| |
|--|
| Brake fluid DOT 4 / DOT 5.1 (☛ p. 263) |
|--|

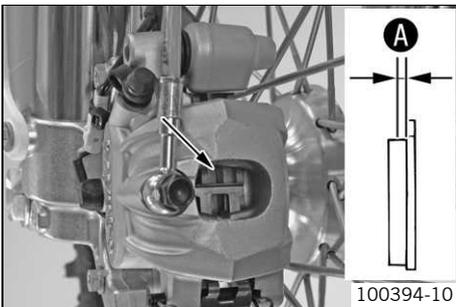
- Position the cover with the membrane. Mount and tighten the screws.

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

Checking the front brake linings

! Warning
Danger of accidents Reduced braking due to worn brake linings.

- Change worn brake linings without delay.



- 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. 80)
- Check the brake linings for damage and cracking.
 - » If damage or cracking is visible:
 - Change the front brake linings. (☛ p. 80)

Changing the front brake linings

! Warning
Danger of accident Brake system failure.

- Maintenance work and repairs must be carried out professionally.

! Warning
Skin irritations Brake fluid can cause skin irritation on contact.

- Avoid contact with skin and eyes, and keep out of the reach of children.
- Wear suitable protective clothing and goggles.
- If brake fluid gets into your eyes, rinse thoroughly with water and contact a doctor immediately.

! Warning
Danger of accidents Reduced braking efficiency due to old brake fluid.

- Change the brake fluid of the front and rear brakes according to the service schedule.

! Warning
Danger of accidents Reduced braking efficiency due to oil or grease on the brake discs.

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



Warning

Danger of accidents Reduced braking due to use of non-approved brake linings.

- Brake linings available from accessory suppliers are often not tested and approved for use on HUSABERG vehicles. The construction and friction factor of the brake linings and therefore the brake power can differ considerably from the original HUSABERG brake linings. If brake linings are used that differ from the originals, there is no guarantee that they comply with the original license. The vehicle no longer corresponds to the condition at delivery, and the warranty is no longer valid.



Warning

Environmental hazard Hazardous substances cause environmental damage.

- Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.

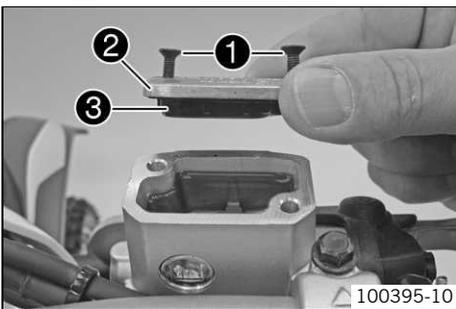


Info

Never use DOT 5 brake fluid! This is based on silicone oil and is colored purple. 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!

Use only clean brake fluid from a sealed container!

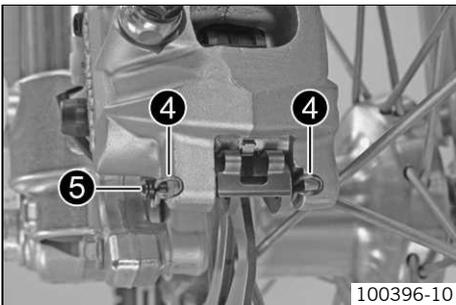


- Move the brake fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws **1**.
- Remove cover **2** with membrane **3**.
- Press the brake caliper by hand on to the brake disc in order to press back the brake pistons. Ensure that brake fluid does not overflow from the brake fluid reservoir, using suction to remove it if it does.

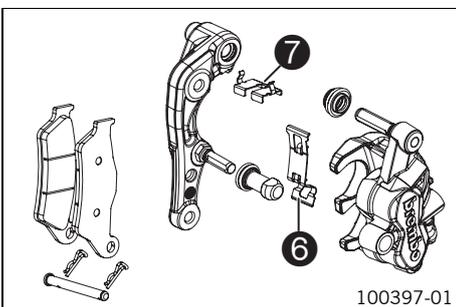


Info

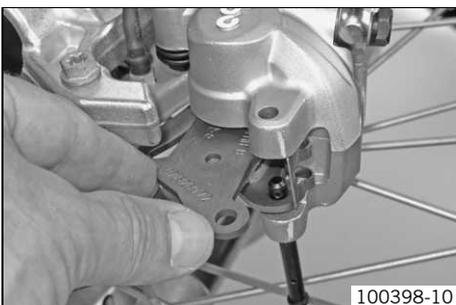
Make sure when pushing back the brake pistons that you do not press the brake caliper against the spokes.



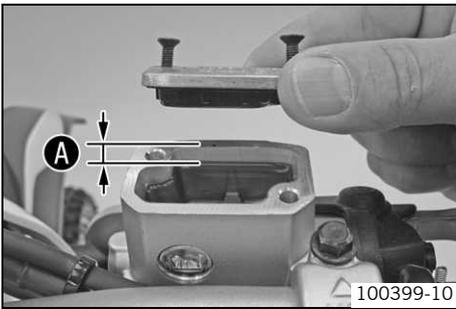
- Remove locking split pins **4**, withdraw bolt **5**, and take out the brake pads.
- Clean the brake caliper and brake caliper support.



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



- Fit the brake pads, insert the bolt, and mount the locking split pins.
- Operate the hand brake lever repeatedly until the brake linings lie on the brake disc and there is a tight spot.



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

Guideline

| | |
|-------------------------|---------------|
| Measurement of A | 5 mm (0.2 in) |
|-------------------------|---------------|

| |
|--|
| Brake fluid DOT 4 / DOT 5.1 (☛ p. 263) |
|--|

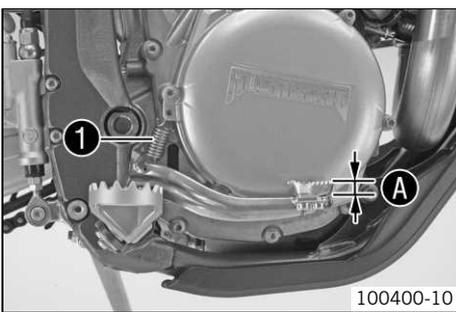
- Position the cover with the membrane. Mount and tighten the screws.

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

Checking the free travel of the foot brake lever

Warning
Danger of accidents Brake system failure.

- If there is no free travel on the foot brake pedal, pressure builds up on the rear brake in the brake system. The rear brake can fail due to overheating. Adjust free travel on foot brake pedal according to specifications.



- Disconnect spring **1**.
- Move the foot brake lever backwards and forwards between the end stop and the foot brake cylinder piston bracket and check free travel **A**.

Guideline

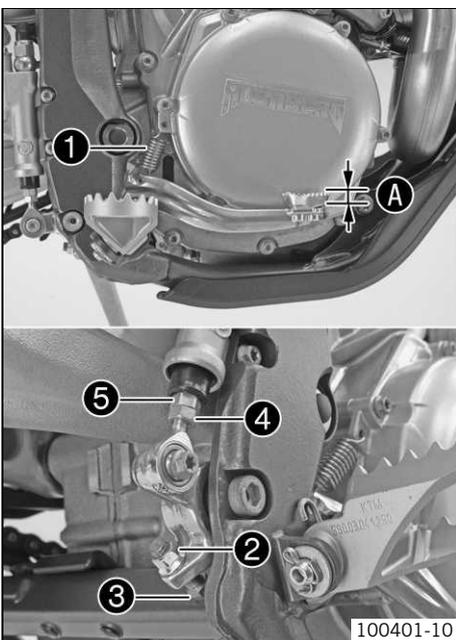
| | |
|---------------------------------|----------------------------|
| Free travel at foot brake lever | 3... 5 mm (0.12... 0.2 in) |
|---------------------------------|----------------------------|

- » If the free travel does not meet specifications:
 - Adjust the basic position of the footbrake lever. (☛ p. 82)
- Reconnect spring **1**.

Adjusting the basic position of the footbrake lever

Warning
Danger of accidents Brake system failure.

- If there is no free travel on the foot brake pedal, pressure builds up on the rear brake in the brake system. The rear brake can fail due to overheating. Adjust free travel on foot brake pedal according to specifications.



- 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 footbrake 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 footbrake lever.

Guideline

| | |
|---------------------------------|----------------------------|
| Free travel at foot brake lever | 3... 5 mm (0.12... 0.2 in) |
|---------------------------------|----------------------------|

- Hold screw **3** and tighten nut **2**.

Guideline

| | | |
|-------------------------|----|------------------------|
| Remaining nuts, chassis | M8 | 30 Nm (22.1 lbf ft) |
|-------------------------|----|------------------------|

- Hold push rod **5** and tighten nut **4**.

Guideline

| | | |
|-------------------------|----|------------------------|
| Remaining nuts, chassis | M6 | 15 Nm (11.1 lbf ft) |
|-------------------------|----|------------------------|

- Reconnect spring **1**.

Checking the rear brake fluid level

Warning
Danger of accidents Failure of the brake system.

- If the brake fluid level falls below the **MIN** mark, this indicates a leakage in the brake system or worn-out brake linings. Check the brake system and do not continue riding.

Warning
Danger of accidents Reduced braking efficiency due to old brake fluid.

- Change the brake fluid of the front and rear brakes according to the service schedule.



- Stand the vehicle upright.
- Check the brake fluid level in the viewer **1**.
 - » When in the viewer **1** an air bubble is visible:
 - Add rear brake fluid. (☛ p. 83)

Adding rear brake fluid

Warning
Danger of accidents Failure of the brake system.

- If the brake fluid level falls below the **MIN** mark, this indicates a leakage in the brake system or worn-out brake linings. Check the brake system and do not continue riding.

Warning
Skin irritations Brake fluid can cause skin irritation on contact.

- Avoid contact with skin and eyes, and keep out of the reach of children.
- Wear suitable protective clothing and goggles.
- If brake fluid gets into your eyes, rinse thoroughly with water and contact a doctor immediately.

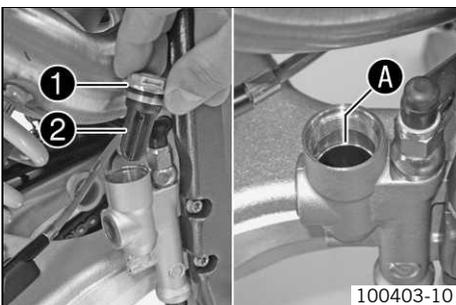
Warning
Danger of accidents Reduced braking efficiency due to old brake fluid.

- Change the brake fluid of the front and rear brakes according to the service schedule.

Warning
Environmental hazard Hazardous substances cause environmental damage.

- Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.

i Info
 Never use DOT 5 brake fluid! This is based on silicone oil and is colored purple. 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!
 Use only clean brake fluid from a sealed container!



- Stand the vehicle upright.
- Remove screw cap **1** with membrane **2** and the O-ring.
- Add brake fluid to level **A**.

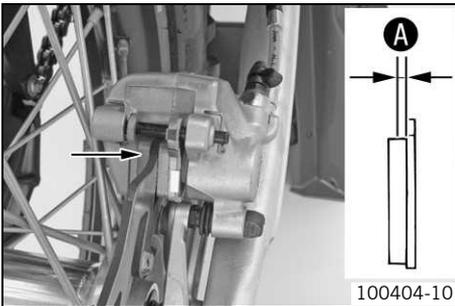
Brake fluid DOT 4 / DOT 5.1 (☛ p. 263)

- Mount the screw cap with the membrane and the O-ring.

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

Checking the rear brake linings

- Warning**
Danger of accidents Reduced braking due to worn brake linings.
- Change worn brake linings without delay.



- Check the brake linings for minimum thickness **A**.

| | |
|----------------------------|---|
| Minimum thickness A | $\geq 1 \text{ mm } (\geq 0.04 \text{ in})$ |
|----------------------------|---|

- » If the minimum thickness is less than specified:
 - Change the rear brake linings. (☛ p. 84)
- Check the brake linings for damage and cracking.
 - » If damage or cracking is visible:
 - Change the rear brake linings. (☛ p. 84)

Changing the rear brake linings

- Warning**
Danger of accident Brake system failure.
- Maintenance work and repairs must be carried out professionally.

- Warning**
Skin irritations Brake fluid can cause skin irritation on contact.
- Avoid contact with skin and eyes, and keep out of the reach of children.
 - Wear suitable protective clothing and goggles.
 - If brake fluid gets into your eyes, rinse thoroughly with water and contact a doctor immediately.

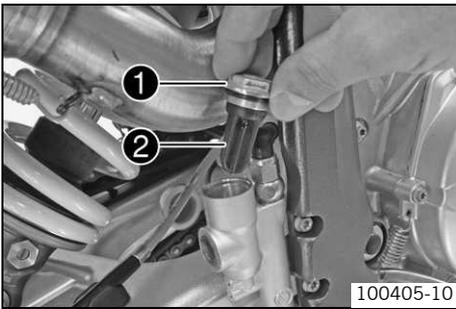
- Warning**
Danger of accidents Reduced braking efficiency due to old brake fluid.
- Change the brake fluid of the front and rear brakes according to the service schedule.

- Warning**
Danger of accidents Reduced braking efficiency due to oil or grease on the brake discs.
- Always keep the brake discs free of oil and grease, and clean them with brake cleaner when necessary.

- Warning**
Danger of accidents Reduced braking due to use of non-approved brake linings.
- Brake linings available from accessory suppliers are often not tested and approved for use on HUSABERG vehicles. The construction and friction factor of the brake linings and therefore the brake power can differ considerably from the original HUSABERG brake linings. If brake linings are used that differ from the originals, there is no guarantee that they comply with the original license. The vehicle no longer corresponds to the condition at delivery, and the warranty is no longer valid.

- Warning**
Environmental hazard Hazardous substances cause environmental damage.
- Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.

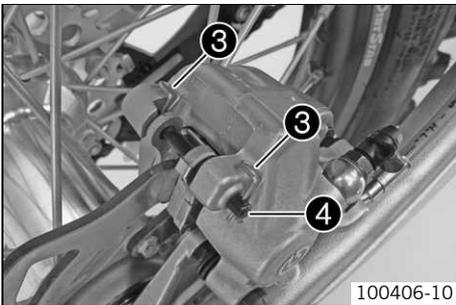
- Info**
- Never use DOT 5 brake fluid! This is based on silicone oil and is colored purple. Oil seals and brake lines are not designed for DOT 5 brake fluid.
 Avoid contact between brake fluid and painted parts. Brake fluid attacks paint!
 Use only clean brake fluid from a sealed container!



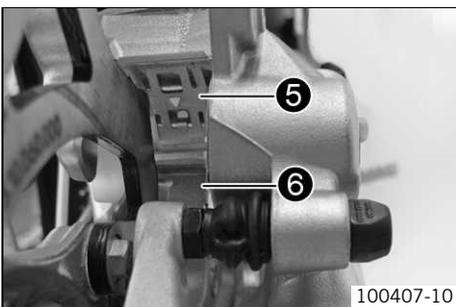
- Stand the vehicle upright.
- Remove screw cap ① with membrane ② and the O-ring.
- Press the brake caliper by hand on to the brake disc in order to press back the brake piston. Ensure that brake fluid does not overflow from the brake fluid reservoir, using suction to remove it if it does.

i Info

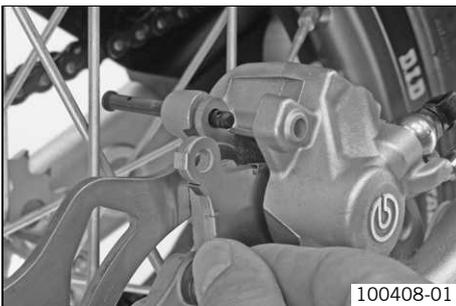
Make sure when pushing back the brake piston that you do not press the brake caliper against the spokes.



- Remove locking split pins ③, withdraw bolt ④, and take out the brake pads.
- Clean the brake caliper and brake caliper support.



- Check that leaf spring ⑤ in the brake caliper and sliding plate ⑥ in the brake caliper support are seated correctly.



- Fit the brake pads, insert the bolt, and mount the locking split pins.
- Operate the foot brake lever repeatedly until the brake linings lie on the brake disc and there is a tight spot.
- Correct the brake fluid quantity to the **MAX** marking.

Brake fluid DOT 4 / DOT 5.1 (☛ p. 263)

- Mount the screw cap with the membrane and the O-ring.

i Info

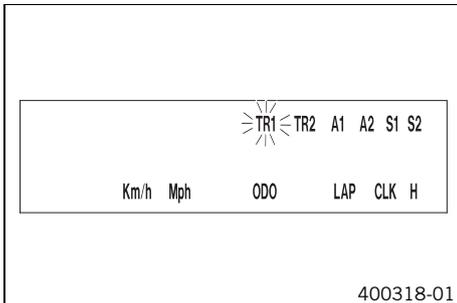
Clean up overflowed or spilt brake fluid immediately with water.

Adjusting the speedometer functions



Info

Upon delivery, only the **SPEED/H** and **SPEED/ODO** display modes are activated.



Condition

The motorcycle is standing.

- Press the button briefly and repeatedly until **H** appears at the bottom right of the display.
- Press the button for 3 - 5 seconds.
 - ✓ The Setup menu opens and the active functions are displayed.
- Switch to the function you require by briefly pressing the button .
 - ✓ The selected function flashes.

Activating a function

- Press the button .
- ✓ The icon remains in the display and the display changes to the next function.

Deactivating a function

- Press the button .
 - ✓ The icon disappears from the display and the display changes to the next function.
- Activate or deactivate all functions accordingly.
- Press the button for 3 - 5 seconds.
 - ✓ The settings are saved and the Setup menu closed.



Info

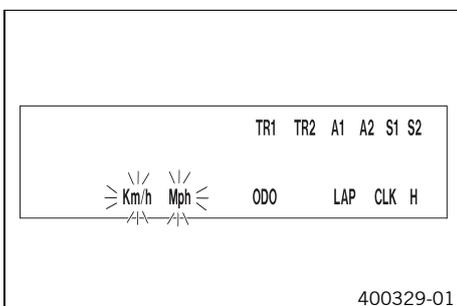
If no button is pressed for 20 seconds, or if no impulse comes from the wheel speed sensor, the settings are automatically saved and the Setup menu is closed.

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 standing.

- Press the button briefly and repeatedly until **H** appears at the bottom right of the display.
- Press the button for 3 - 5 seconds.
 - ✓ The Setup menu opens and the active functions are displayed.
- Press the button repeatedly until the **Km/h/Mph** display flashes.

Km/h adjusting

- Press the button .

Mph adjusting

- Press the button .
- Press the button for 3 - 5 seconds.
 - ✓ The settings are saved and the Setup menu closed.



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 closed.

Activating the 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 homologous version.

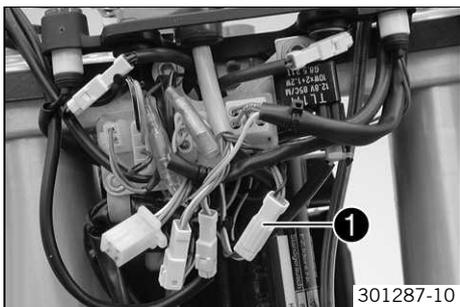
- If the vehicle is modified in any way, then it may only be operated in closed off areas remote from public road traffic. Advise the vehicle owner and rider of this.
- If you undertake any modifications, please insist on receiving a signed workshop order from your customer in which you inform the customer 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.

(FE EU, FE AUS)

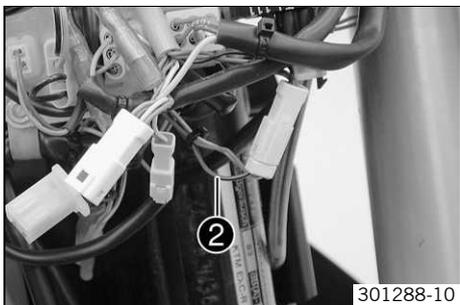
- Remove the headlight mask with the headlight. (☛ p. 88)

(FE USA)

- Remove the start number plate. (☛ p. 63)
- Expose connector **CZ** ①.



301287-10



301288-10

- Sever brown cable ② in front of connector **CZ** PIN 1.
- Insulate both cable ends.

(FE EU, FE AUS)

- Install the headlight mask with the headlight. (☛ p. 88)

(FE USA)

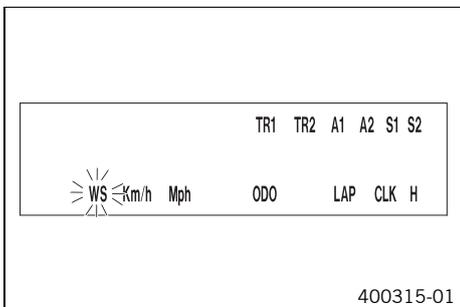
- Install the start number plate. (☛ p. 64)

Setting the wheel circumference

Condition

The motorcycle is standing.

- Activate the additional functions. (☛ p. 87)
- Press the button  briefly and repeatedly until **H** appears at the bottom right of the display.
- Press the button  for 3 - 5 seconds.
 - ✓ The setup menu is displayed and the active functions shown.
- Press the button  until the **WS** indicator blinks.



400315-01



400314-01

- Press the button .
 - ✓ The wheel circumference is displayed in millimeters.

Enlarging the wheel circumference

- Press the button .

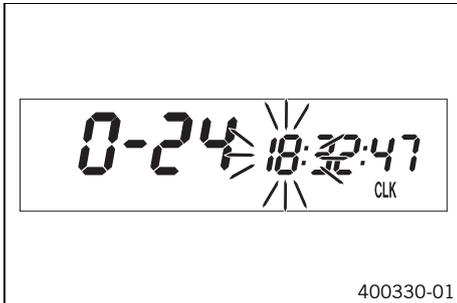
Reducing the wheel circumference

- Press the button .
- Press the button  briefly.
- Press the button  for 3 - 5 seconds.

✓ The settings are stored and the setup menu closed.

**Info**

If no button is actuated for 20 seconds or there is no signal from the wheel speed sensor, then the settings are automatically stored and the setup menu closed.

Setting the clock**Condition**

The motorcycle is standing.

- Press the button  briefly and repeatedly until **CLK** appears at the bottom right of the display.
- Press the button  for 3 - 5 seconds.
 - ✓ The hour display flashes.
- Set the hour display with the button  and/or button .
- Press the button  briefly.
 - ✓ 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 .

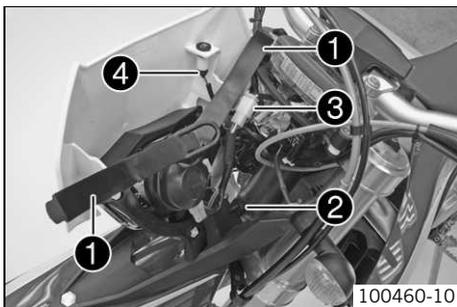
**Info**

The seconds can only be set to zero.

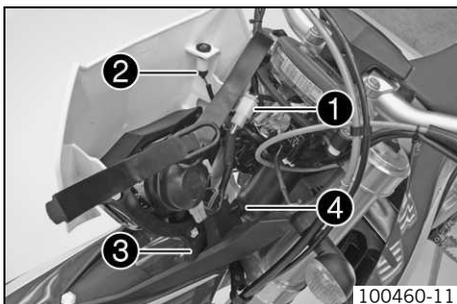
- Press the button  for 3 - 5 seconds.
 - ✓ The settings are saved and the Setup menu closed.

**Info**

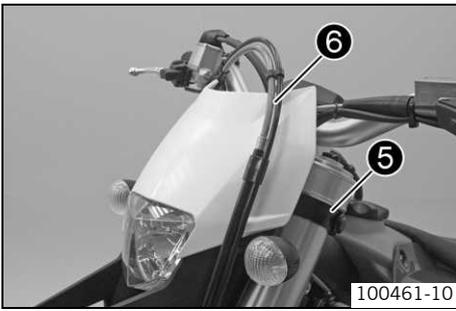
If no button is pressed for 20 seconds, or if no impulse comes from the wheel speed sensor, the settings are automatically saved and the Setup menu closed.

Removing the headlight mask with the headlight (FE EU, FE AUS)

- Switch off all power consumers and the engine.
- Open rubber band **1** on the fork legs.
- Tilt the headlight mask forward and detach it from nose **2**.
- Disconnect connector **3**.
- Pull bulb socket **4** out of the high beam indicator lamp and remove the headlight mask.

Installing the headlight mask with the headlight (FE EU, FE AUS)

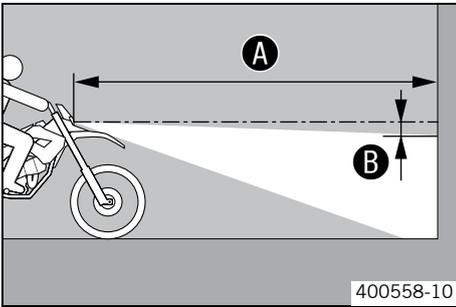
- Connect plug **1**.
- Insert bulb socket **2** into the high beam indicator lamp.
- Check that the lighting is working properly.
- Attach headlight holder **3** at the nose **4** and position the headlight mask.



100461-10

- Wrap rubber band ⑤ around the fork legs and close it.
- ✓ The wiring harness and brake line ⑥ are routed in front of the headlight mask.
- Check the headlight adjustment. (☛ p. 89)

Checking the headlight adjustment (FE EU, FE AUS)



400558-10

- On a light-colored wall behind a horizontal area, make a mark as high as the center of the headlight.
- Make another mark a distance ③ under the first mark.

Guideline

| | |
|------------|-------------|
| Distance ③ | 5 cm (2 in) |
|------------|-------------|

- Stand the motorcycle at distance ④ in front of the wall and switch on the low beam.

Guideline

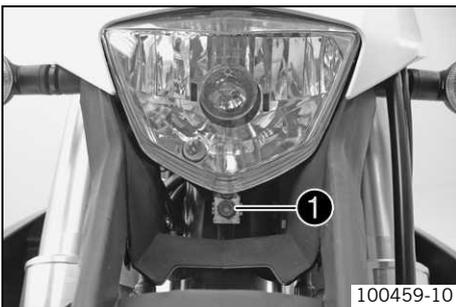
| | |
|------------|-------------|
| Distance ④ | 5 m (16 ft) |
|------------|-------------|

- Check the headlight adjustment.

The border between light and dark must be exactly at the lower mark when the motorcycle is operational and complete with rider.

- » If the boundary between light and dark does not meet specifications:
 - Adjust the beam width of the headlight. (☛ p. 89)

Adjusting the beam width of the headlight (FE EU, FE AUS)



100459-10

- Check the headlight adjustment. (☛ p. 89)
- Adjust the beam width of the headlight by turning adjusting screw ①.

Guideline

The boundary between light and dark must be exactly on the lower mark for a motorcycle with a rider (mark is applied under: Checking the headlight adjustment).

i Info

Turn clockwise to increase the beam width, turn counterclockwise to reduce the beam width.

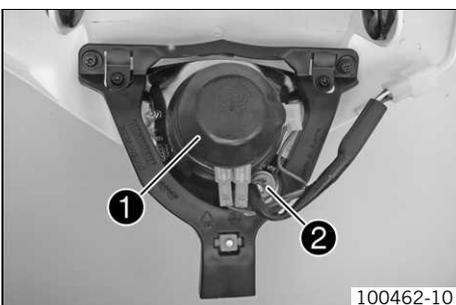
If you have a payload, you may have to correct the headlight beam width.

Changing the headlight bulb (FE EU, FE AUS)

Note

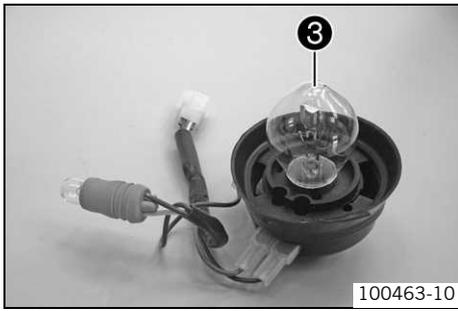
Damage to reflector Reduced luminance.

- Grease on the bulb will evaporate due to the heat and be deposited on the reflector. Clean the bulb and keep it free of grease before mounting.



100462-10

- Remove the headlight mask with the headlight. (☛ p. 88)
- Turn rubber cap ① together with the underlying bulb socket counterclockwise all the way and remove it.
- Pull lamp socket ② of the parking light out of the reflector.



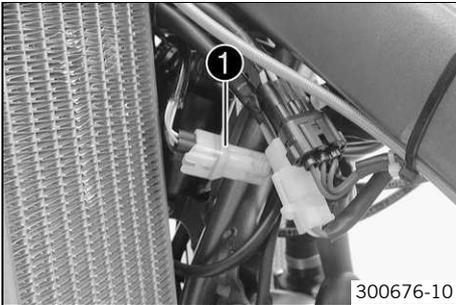
- Press headlight bulb ③ into the bulb socket lightly, turn it counterclockwise all the way and pull it out.
- Insert a new headlight bulb.

Headlight (S2/socket BA20d) (☛ p. 224)

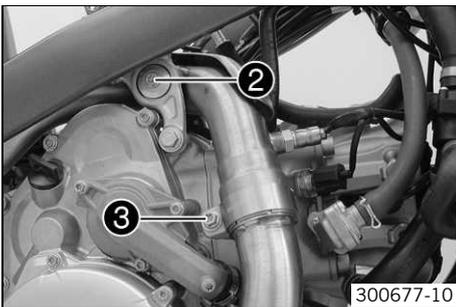
- Insert the rubber cap together with the bulb socket into the reflector, turn it clockwise all the way.
- Insert the bulb socket of the parking light into the reflector.
- Install the headlight mask with the headlight. (☛ p. 88)

Removing the engine

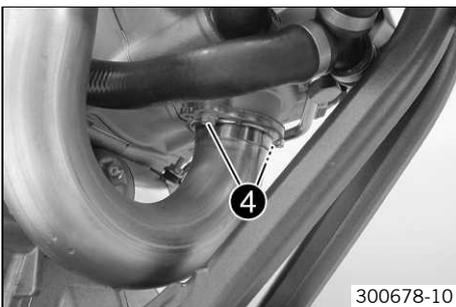
- Remove the engine guard. (☛ p. 30)
- Jack up the motorcycle. (☛ p. 9)
- Disconnect the negative cable of the battery. (☛ p. 73)
- Drain the coolant. (☛ p. 155)
- Remove the main silencer. (☛ p. 54)
- Take off the throttle valve body and allow it to hang to the side. (☛ p. 161)
- Remove the swingarm, with shock absorber and rear wheel. (☛ p. 51)
- Unplug connector ❶ of the lambda sensor. Open the cable binders.



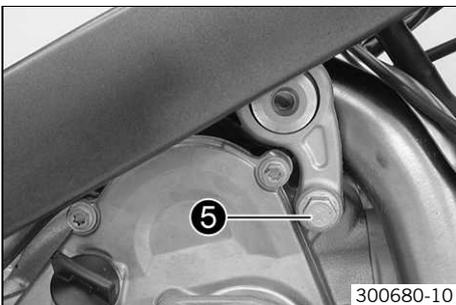
- Remove screw ❷.
- Unscrew screw ❸.



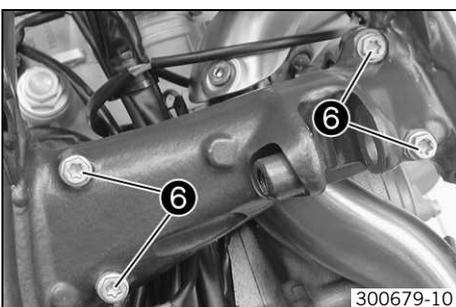
- Remove screws ❹.
- Take off the exhaust manifold along with the gasket.

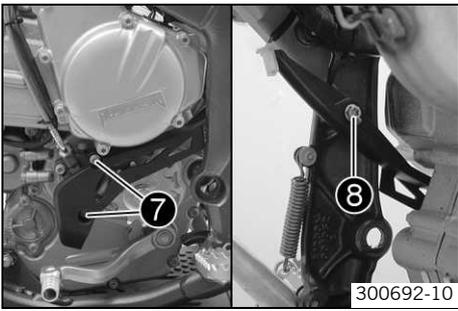


- Remove screw ❺.

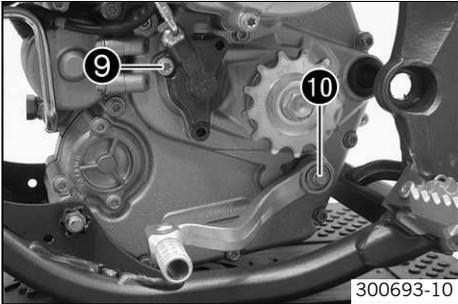


- Remove screws ❻.
- Take off both engine mounting brackets.
- Maneuver out the exhaust pipe.





- Remove screws 7.
- Remove screw 8.
- Take off the engine sprocket cover.



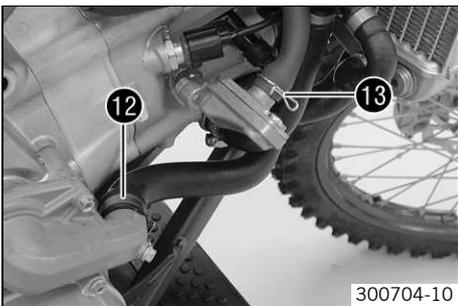
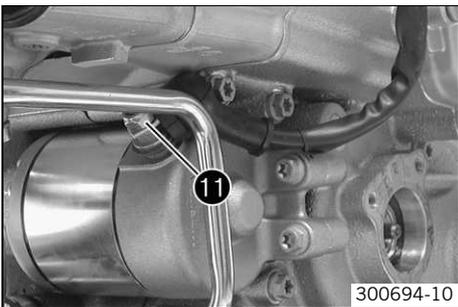
- Remove screw 9.
- Take off the clutch slave cylinder and allow it to hang to the side.



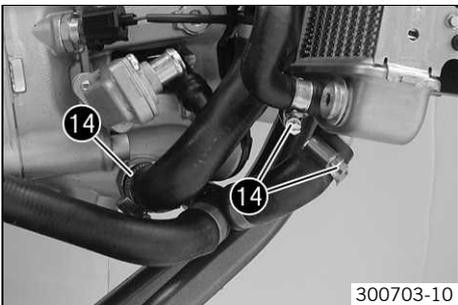
Info

Do not allow the clutch line to become kinked.
Do not actuate the clutch lever while the slave cylinder of the clutch is removed.

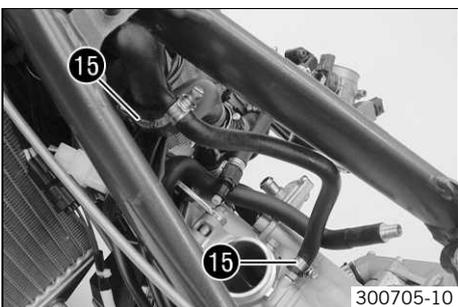
- Remove screw 10.
- Take off the shift lever.
- Push back the rubber cap.
- Remove nut 11.
- Take off the positive battery cable.



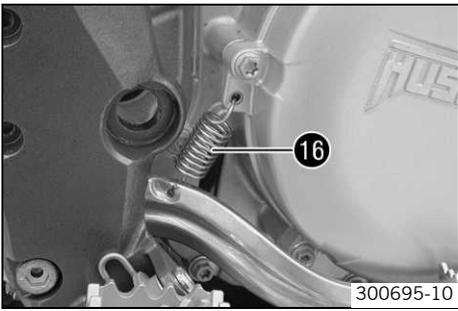
- Undo hose clip 12.
- Take off the radiator hose.
- Take off clamp 13 and engine breather hose.



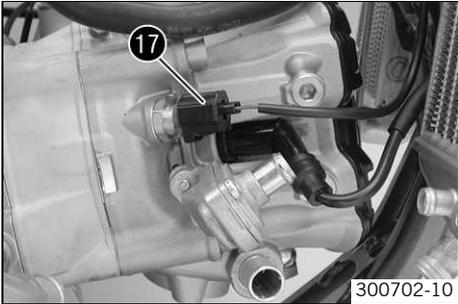
- Undo hose clamps 14.
- Remove the radiator hoses.



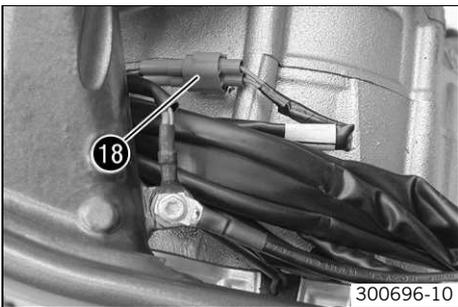
- Undo hose clamps 15.
- Remove the radiator hoses.



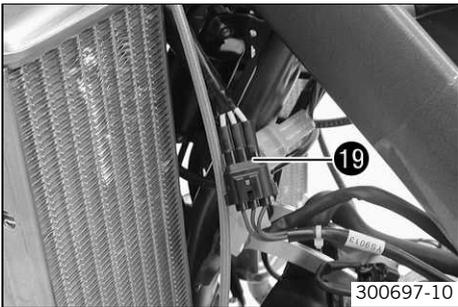
- Remove spring 16.



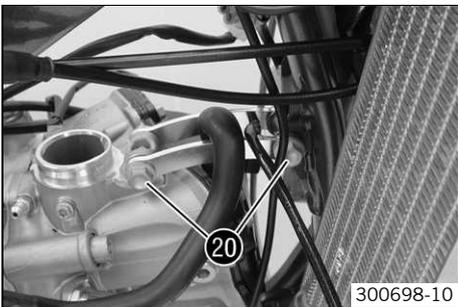
- Take off the spark plug connector.
- Disconnect coolant temperature sensor connector 17.



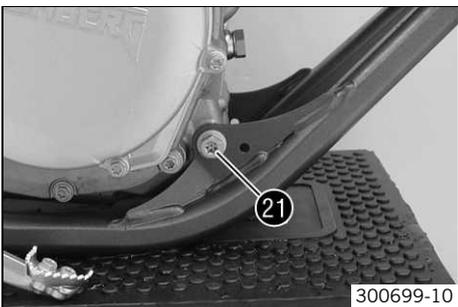
- Expose the cable.
- Separate plug-in connector 18 of the ignition pulse generator.



- Separate plug-in connector 19 of the generator.



- Remove screws 20.
- Take off the engine braces and washers.

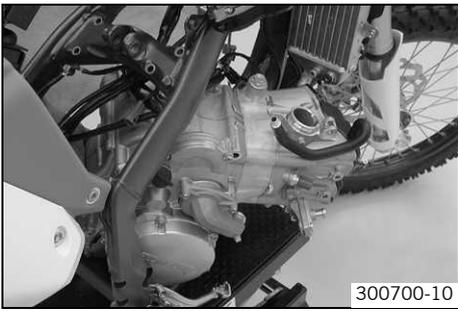


- Remove screw 21.



Info

Do not lose the sleeves.



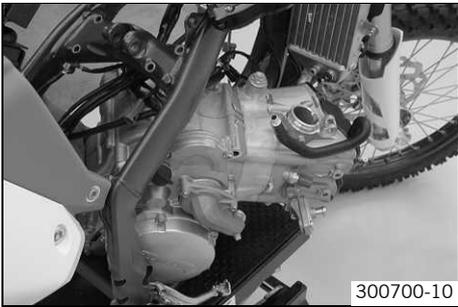
- Lift out the engine from the side.



Info

It is recommended to have assistance for performing this step. Ensure that the motorcycle is sufficiently secured against falling over. Protect the frame and attachments against damage.

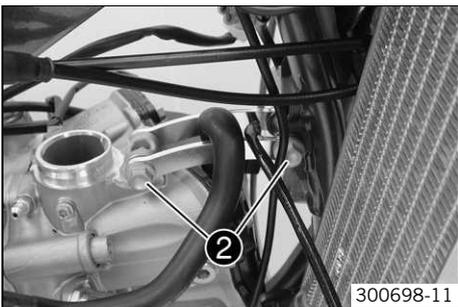
Installing the engine



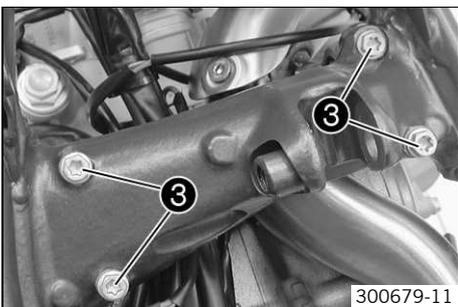
- Position the engine in the frame.



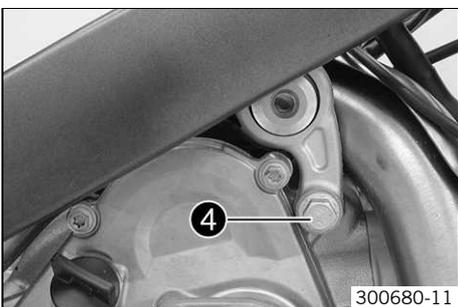
- Mount screw ❶ with the sleeves but do not tighten yet.



- Position the engine braces and washers.
- Mount screws ❷ with the nuts but do not tighten yet.



- Slip in the exhaust pipe.
- Position both engine mounting brackets.
- Mount screws ❸ but do not tighten yet.
- Install the swingarm, with shock absorber and rear wheel. (🔧 p. 52)



- Mount and tighten screw ❹ with the nuts.

Guideline

| | | |
|-------------------------|-----|------------------------|
| Remaining nuts, chassis | M10 | 50 Nm (36.9 lbf ft) |
|-------------------------|-----|------------------------|

- Tighten screws ❸.

Guideline

| | | |
|-----------------------|-----|------------------------|
| Engine carrying screw | M10 | 60 Nm (44.3 lbf ft) |
|-----------------------|-----|------------------------|

- Tighten screw ❶.

Guideline

| | | |
|-----------------------|-----|------------------------|
| Engine carrying screw | M10 | 60 Nm (44.3 lbf ft) |
|-----------------------|-----|------------------------|

- Tighten screws ❷.

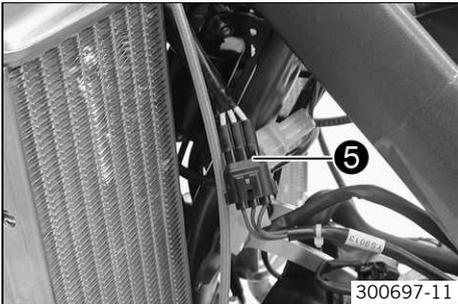
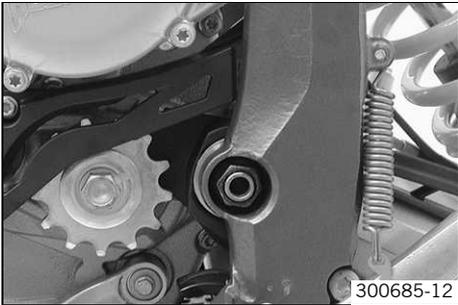
Guideline

| | | |
|---------------------|----|------------------------|
| Screw, engine brace | M8 | 33 Nm (24.3 lbf ft) |
|---------------------|----|------------------------|

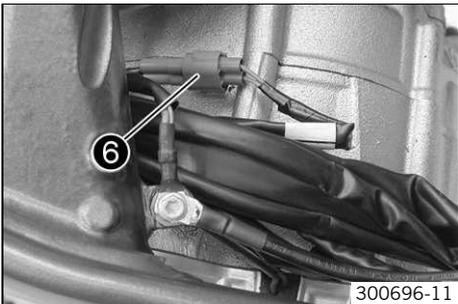
- Tighten the swingarm pivot nut.

Guideline

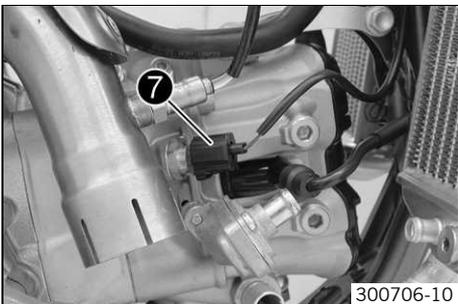
| | | |
|---------------------|---------|-------------------------|
| Nut, swingarm pivot | M16x1.5 | 100 Nm (73.8 lbf ft) |
|---------------------|---------|-------------------------|



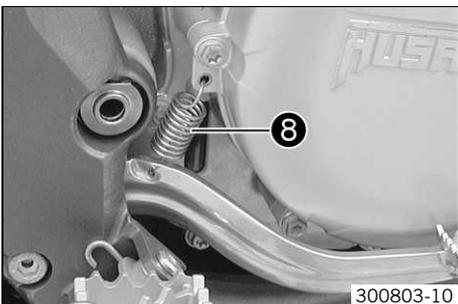
- Join plug-in connector ❹ of the generator.
- Route the cable so it is tension-free and secure it with cable binders.



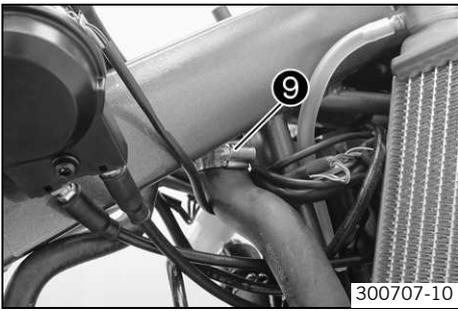
- Join plug-in connector ❺ of the ignition pulse generator.
- Route the cable so it is tension-free and secure it with cable binders.



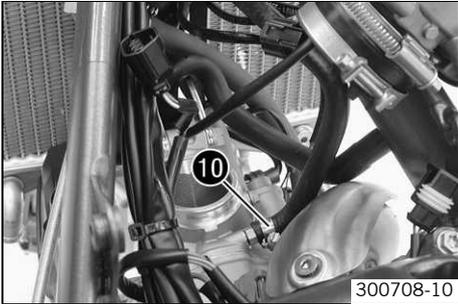
- Connect the spark plug connector.
- Connect coolant temperature sensor connector ❼.



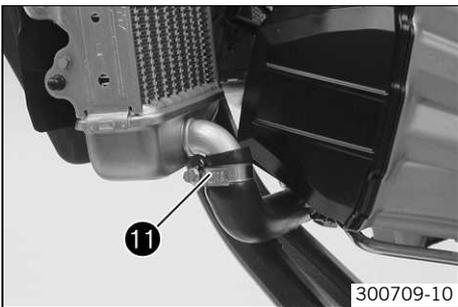
- Mount spring ❽.



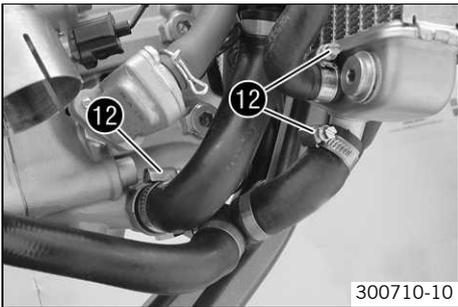
- Mount the radiator hose.
- Mount hose clip 9 and tighten it.



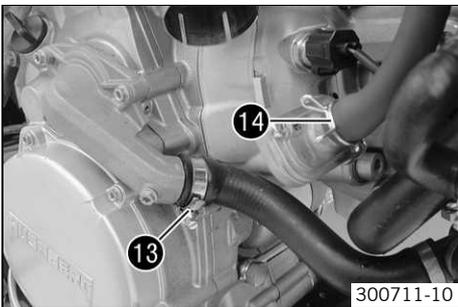
- Mount the radiator hose.
- Mount hose clip 10 and tighten it.



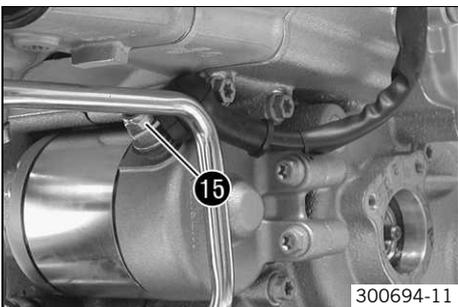
- Mount the radiator hose.
- Mount hose clip 11 and tighten it.



- Mount the radiator hoses.
- Mount and tighten hose clamps 12.



- Mount the radiator hose.
- Mount hose clip 13 and tighten it.
- Mount the engine breather hose and position clamp 14.

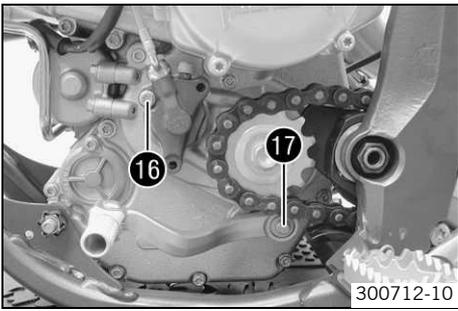


- Position the positive battery cable on the starter motor.
- Mount and tighten nut 15.

Guideline

| | | |
|-------------------------|----|------------------------|
| Remaining nuts, chassis | M6 | 15 Nm (11.1 lbf ft) |
|-------------------------|----|------------------------|

- Mount the rubber cap.



- Position the clutch slave cylinder.
- Mount and tighten screw 16.

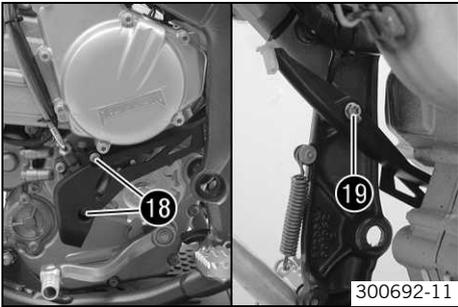
Guideline

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

- Position the shift lever.
- Mount and tighten screw 17.

Guideline

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



- Position the engine sprocket cover.
- Mount and tighten screws 18.

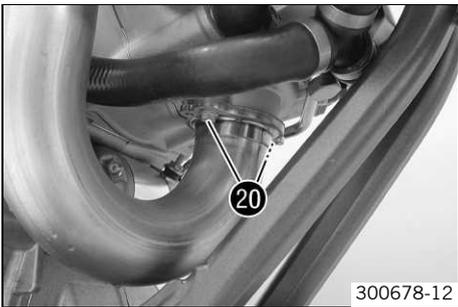
Guideline

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

- Mount and tighten screw 19.

Guideline

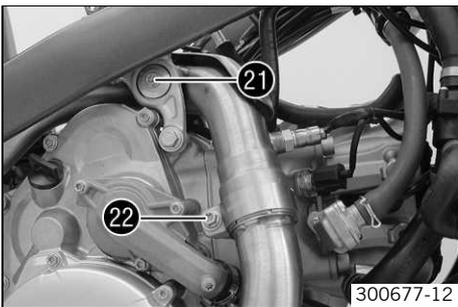
| | | |
|---------------------------|----|---------------------|
| Remaining screws, chassis | M8 | 25 Nm (18.4 lbf ft) |
|---------------------------|----|---------------------|



- Position the exhaust manifold.
- Mount screw 20 but do not tighten it yet.

Guideline

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



- Mount and tighten screw 21.

Guideline

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

- Tighten screw 20.

Guideline

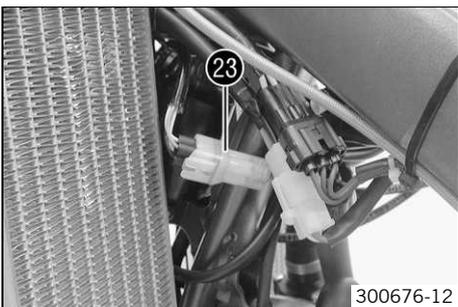
| | | |
|---------------------------|----|--------------------|
| Remaining screws, chassis | M6 | 10 Nm (7.4 lbf ft) |
|---------------------------|----|--------------------|

- Position the exhaust clamp.

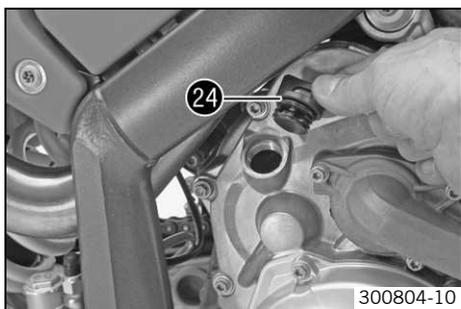
- Tighten screw 22.

Guideline

| | | |
|----------------------------------|----|-------------------|
| Screw, exhaust clamp on manifold | M8 | 8 Nm (5.9 lbf ft) |
|----------------------------------|----|-------------------|



- Plug in connector 23 of the lambda sensor.
- Route the cable so it is tension-free and secure it with cable binders.
- Install the main silencer. (☛ p. 54)
- Install the throttle valve body. (☛ p. 162)
- Connect the negative cable of the battery. (☛ p. 73)

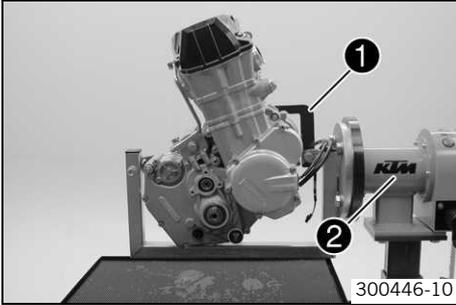


- Remove screw connection 24 and add engine oil.

| | | |
|------------|-------------------|------------------------------------|
| Engine oil | 1.35 l (1.43 qt.) | Engine oil (SAE 10W/50) (☛ p. 263) |
|------------|-------------------|------------------------------------|

- Mount and tighten screw cap 24.
- Remove the motorcycle from the work stand. (☛ p. 9)
- Refill the coolant. (☛ p. 155)
- Make a short test ride.
- Read out the fault memory using the HUSABERG diagnostic tool.
- Check the engine for leakage.
- Check the engine oil level. (☛ p. 158)
- Check the coolant level. (☛ p. 154)

Clamping the engine in the engine work stand



- Mount special tool ① on engine work stand ②.

Engine work stand (61229001000) (☛ p. 270)

Fitting for work stand (81229002000) (☛ p. 273)

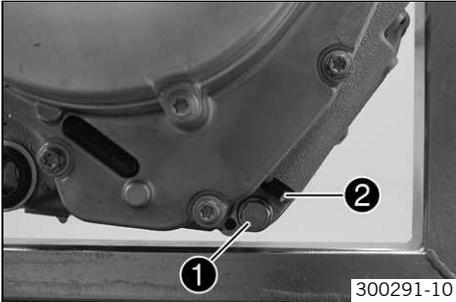
- Mount the engine on special tool ①.



Info

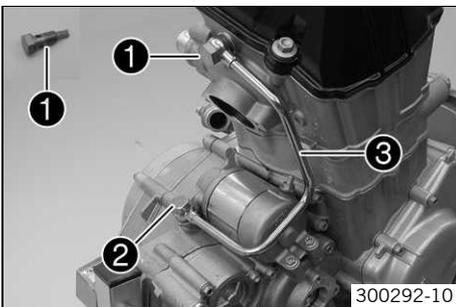
Use a helper or motorized hoist.

Draining the engine oil



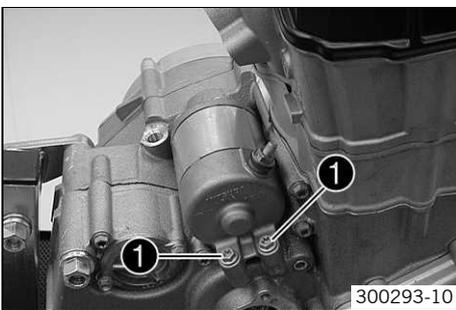
- Remove oil drain plug ① with the magnet and seal ring.
- Remove the engine oil screen plug ②.
- Completely drain the engine oil.

Removing the oil line



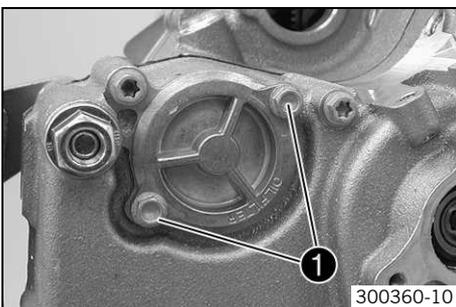
- Remove the banjo bolt ① with the engine oil screen and seal rings.
- Remove banjo bolt ② with seal rings.
- Take off oil line ③.

Removing the starter motor

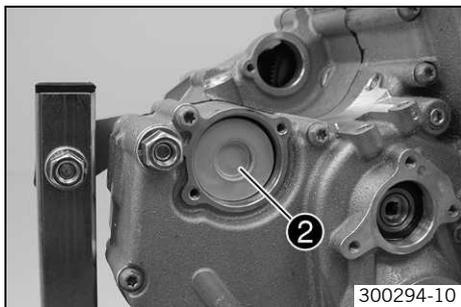


- Remove screws ① and the starter motor.

Removing the oil filter



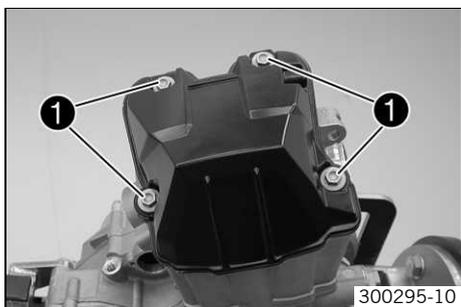
- Remove screws ①. Remove the oil filter cover with the O-ring.



- Pull oil filter element **2** out of the oil filter housing.

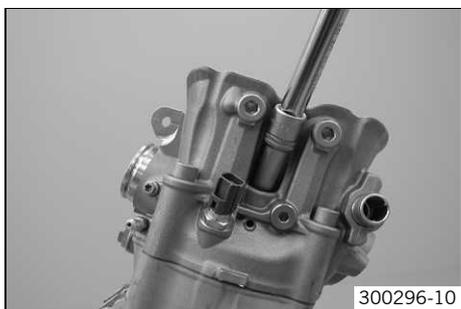
Circlip pliers reverse (51012011000) (☛ p. 268)

Removing the valve cover



- Remove screws **1**. Remove the valve cover with the valve cover seal.

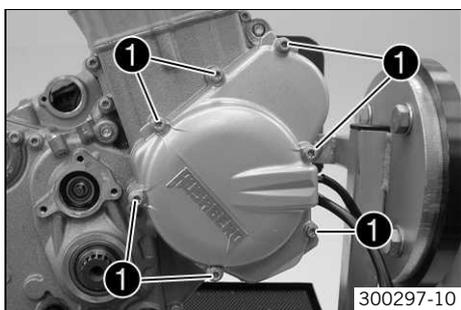
Removing the spark plug



- Remove the spark plug using the special tool.

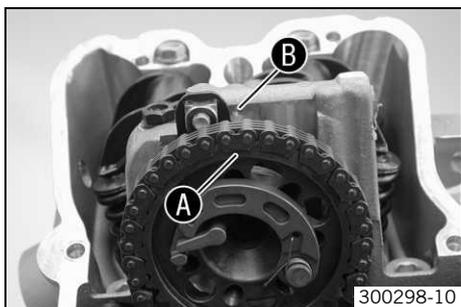
Spark plug wrench (75029172000) (☛ p. 271)

Removing the generator cover

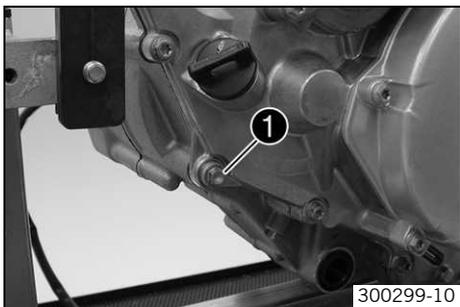


- Remove screws **1**. Take off the generator cover.
- Remove the locating pins. Take off the generator seal cover.

Positioning the engine at ignition top dead center (TDC)



- Align camshaft marking **A** with marking **B** on the cylinder head.

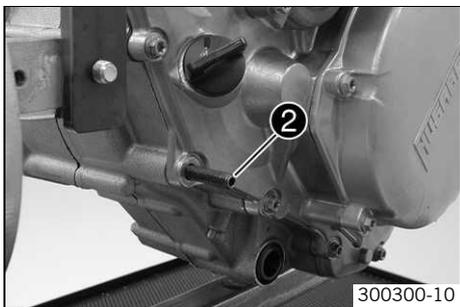


- Remove screw ❶.



Info

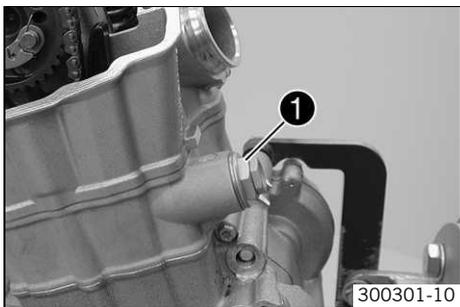
Check through the drill hole whether the position groove of the crankshaft is visible.



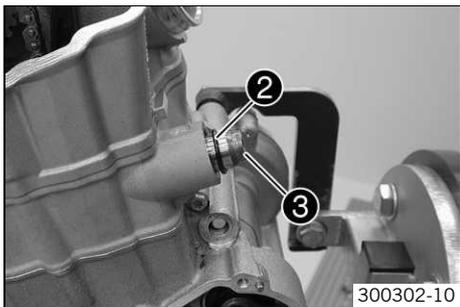
- Screw in special tool ❷.

Crankshaft locking bolt (113080802) (☞ p. 267)

Removing the timing chain tensioner

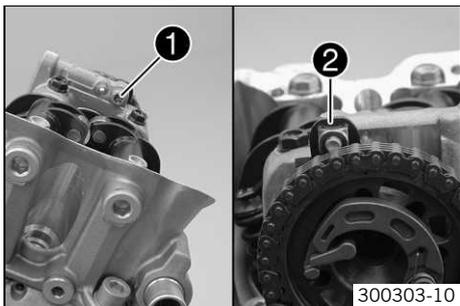


- Remove screw ❶. Take off the seal ring.

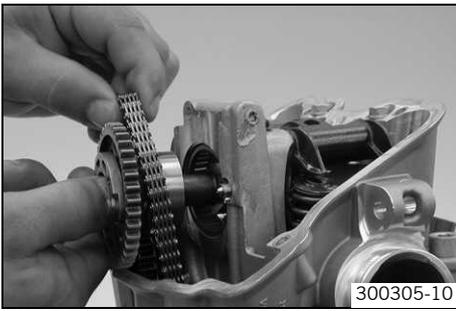


- Pull out timing chain tensioner ❸. Remove O-ring ❷.

Removing the camshaft



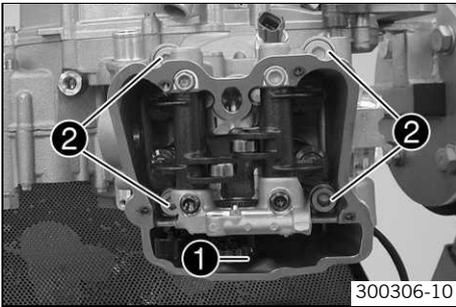
- Remove screw ❶. Remove the camshaft support plate ❷.



300305-10

- Pull the camshaft out of the bearing seats. Take the timing chain off of the camshaft gear. Remove the camshaft.

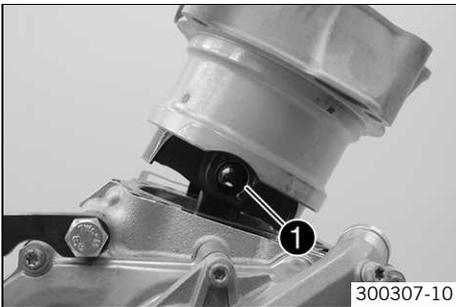
Removing the cylinder head



300306-10

- Remove screw ❶.
- Unscrew screws ❷ in a crisscross pattern and remove.
- Take off the cylinder head.
- Take off the dowels. Remove the cylinder head gasket.

Removing the piston



300307-10

- Push the cylinder upward.



Info

Only push the cylinder far enough upward that the piston pin can be taken out.

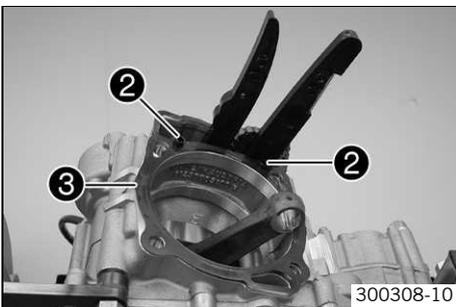
- Remove the piston pin retainer ❶.
- Remove the piston pin.
- Take off the cylinder and piston.
- Push the piston upward out of the cylinder.



Info

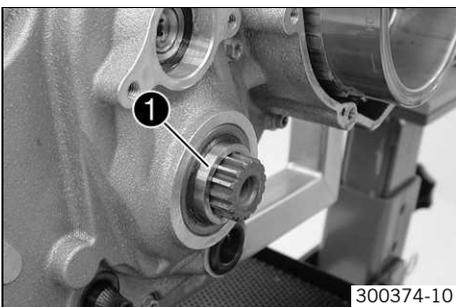
If no further work is to be performed on the cylinder and piston, then the piston can remain in the cylinder.

- Take off dowels ❷ and cylinder base gasket ❸.



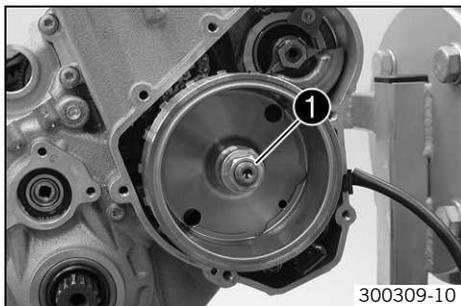
300308-10

Removing the distance bushing

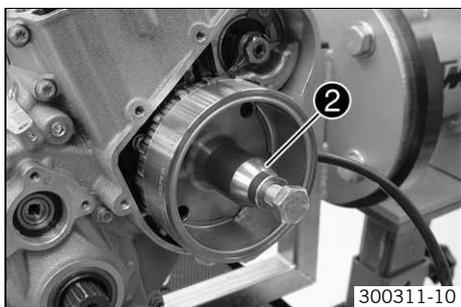


300374-10

- Remove the distance bushing ❶ from the countershaft.

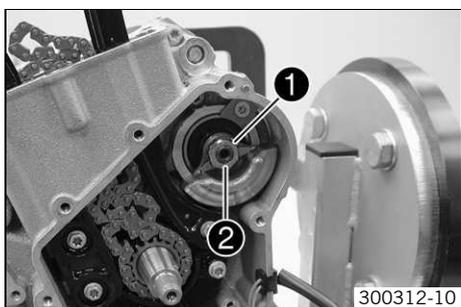
Removing the rotor

- Remove nut ❶ with the spring washer.



- Attach special tool ❷ to the rotor. Counteracting with the special tool, pull off the rotor by screwing in the screw.

Extractor (58012009000) (☞ p. 268)

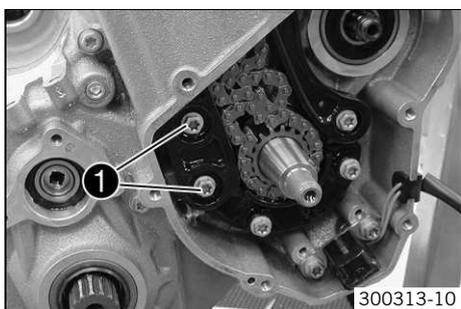
Removing the balance weight

- Bend lock washer ❶.
- Unscrew and remove nut ❷. Remove the lock washer.

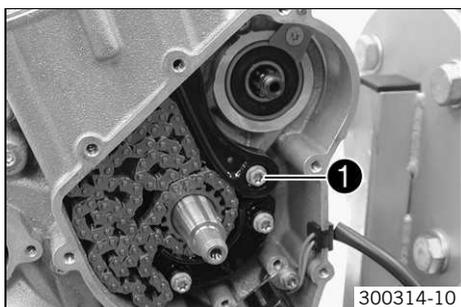
**Info**

Ensure that the crankshaft has been blocked.

- Take off the balance weight.

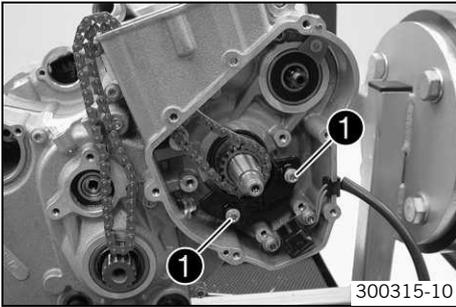
Removing the timing chain guide rail

- Remove screws ❶. Remove the timing chain guide rail from above.

Removing the timing chain tensioning rail

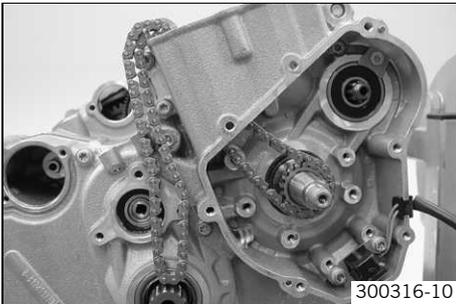
- Remove screw ❶. Remove the timing chain tensioning rail from above.

Removing the timing chain securing guide



- Remove screws ❶. Take off the timing chain securing guide.

Removing the timing chain



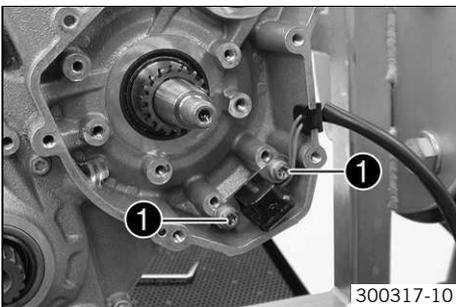
- Take off the timing chain.



Info

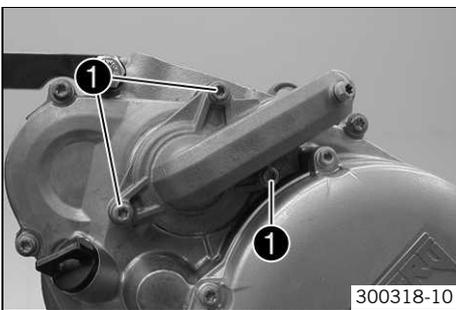
Identify the direction of travel.

Removing the ignition pulse generator



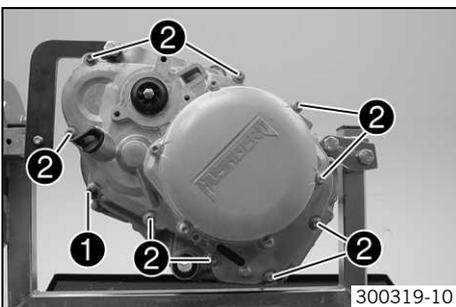
- Remove screws ❶.
- Pull the cable support sleeve from the engine case. Take off the ignition pulse generator.

Removing the water pump cover

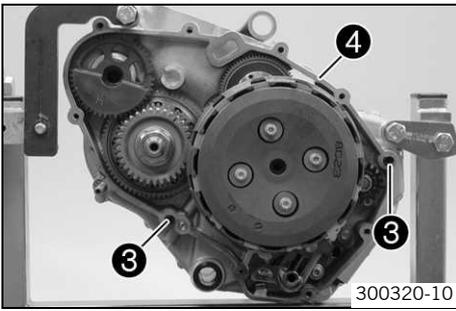


- Remove screws ❶. Take off the water pump cover.
- Take off the water pump cover seal.

Removing the clutch cover

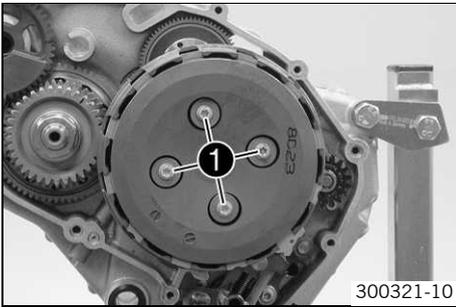


- Remove crankshaft location point ❶.
- Remove screws ❷. Take off the clutch cover.

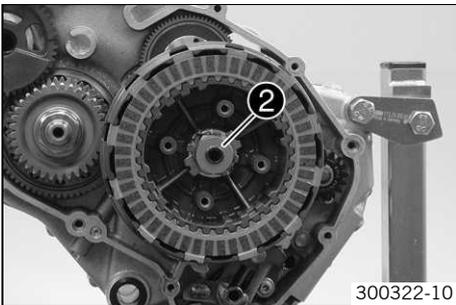


- Take out dowels ③. Take off clutch cover gasket ④.

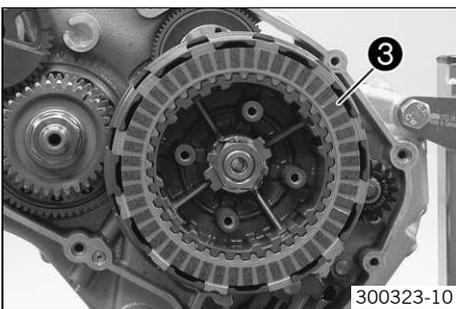
Disassembling the clutch disks



- Unscrew bolts ① and remove them with washers and springs.
- Take off the pressure cap.

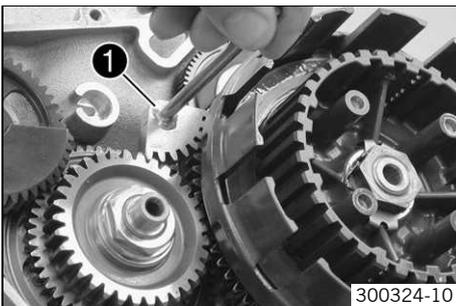


- Remove pressure piece ②.



- Completely remove clutch discs ③.

Removing the primary gear nut



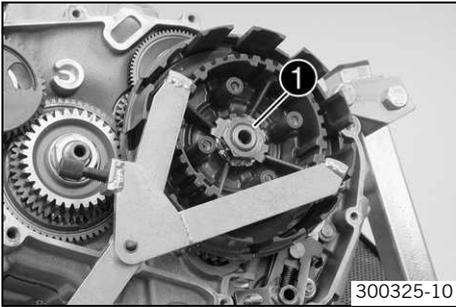
- Block the clutch hub and primary gear using special tool ①.

Gear segment (80029004000) (☛ p. 273)

i Info
LH thread

- Remove the nut.

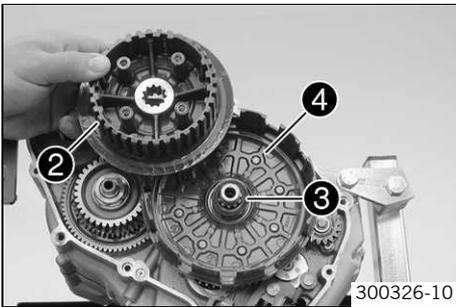
Removing the outer clutch hub



- Bend the lock washer.
- Counterhold the inner clutch hub with the special tool. Loosen nut ❶.

Clutch holder (51129003000) (☛ p. 268)

- Remove the nut with the lock washer. Dispose of the lock washer.

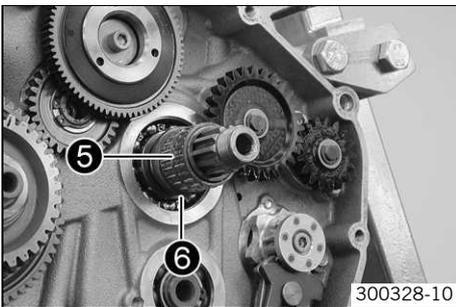


- Take off inner clutch hub ❷ and washer ❸.

i Info

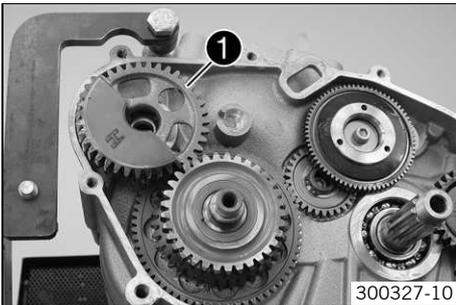
The washer usually adheres to the inner clutch hub.

- Take off outer clutch hub ❹.



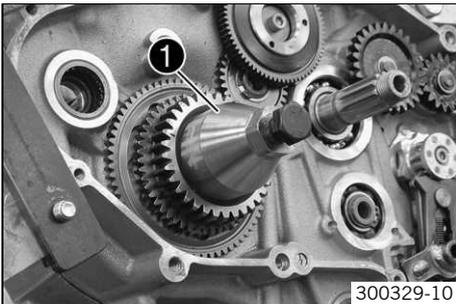
- Remove needle bearing ❺ and collar sleeve ❻.

Removing the balancer shaft



- Pull balancer shaft ❶ out of the bearing seats and remove it.

Removing the primary gear

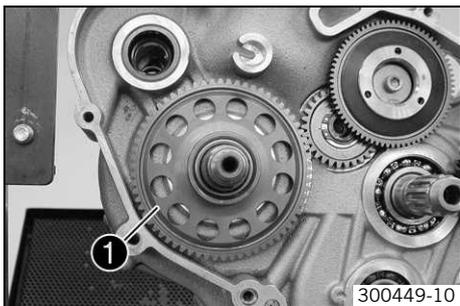


- Mount special tool ❶ on the primary gear.

Extractor (75029021000) (☛ p. 270)

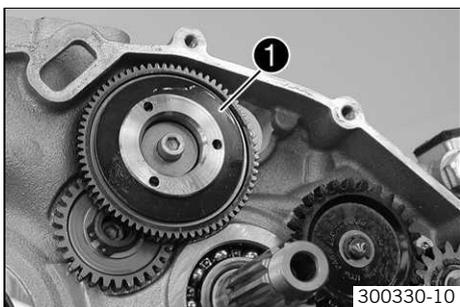
- Counteracting with the special tool, take off the primary gear by taking out the screw.
- Remove the special tools.

Removing the free wheel gear



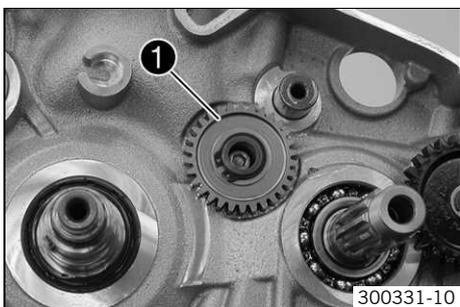
- Remove the spring washer.
- Remove free wheel gear ❶.

Removing the torque limiter



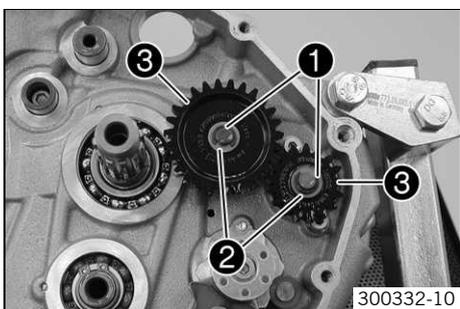
- Remove the screw with the washer. Remove torque limiter ❶.
- Remove washer.

Removing the starter idler gear

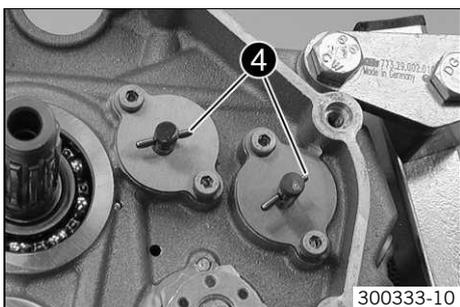


- Remove the lock ring. Take off the washer. Take off starter idler gear ❶.

Removing the oil pump gears

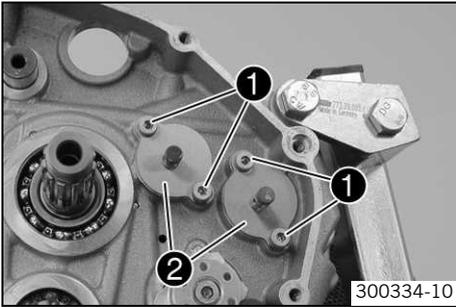


- Remove the shaft locking device ❶.
- Take off washers ❷.
- Take off oil pump gears ❸.

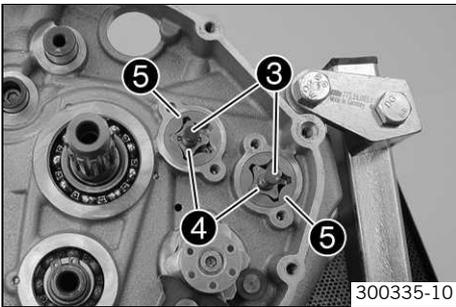


- Remove pins ❹.

Removing the oil pumps

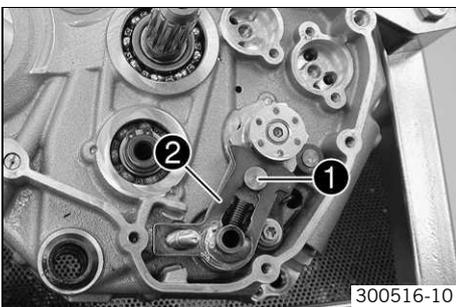


- Remove screws 1.
- Take off oil pump cover 2.



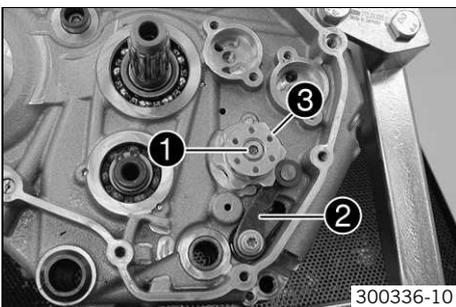
- Take out both oil pump shafts 3 together with pin, internal rotor 4 and external rotor 5.

Removing the shift shaft



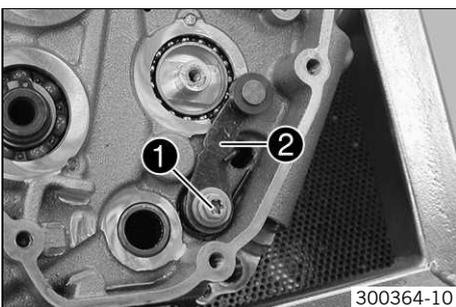
- Push sliding plate 1 away from the shift drum locating unit. Remove shift shaft 2 with the washer.

Removing the shift drum locating unit



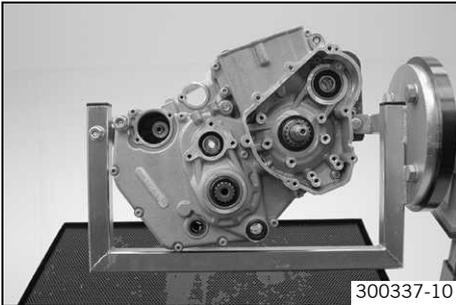
- Remove screw 1.
- Push away locking lever 2 from shift drum locating unit 3 and remove the shift drum locating unit.
- Relieve tension from the locking lever.

Removing the locking lever

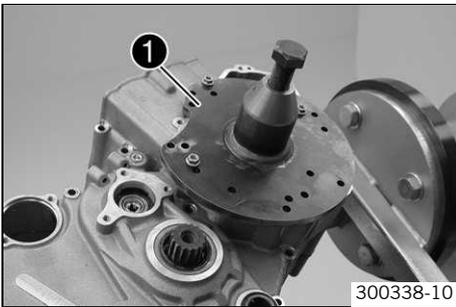


- Unscrew 1 and remove together with locking lever 2, washer, sleeve and spring.

Removing the left section of the engine case



- Remove all engine housing bolts.
- Tilt the left section of the engine case upward and remove the threaded fasteners of the engine holder.



- Mount special tool ① with the appropriate bolts.

Extractor (75029048000) (☛ p. 271)



Info

Use the drill hole marked with 812.

- Take off the section of the engine case.

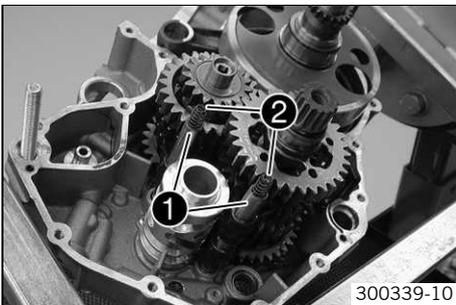


Info

Do not subject the section of the engine case to any stress.

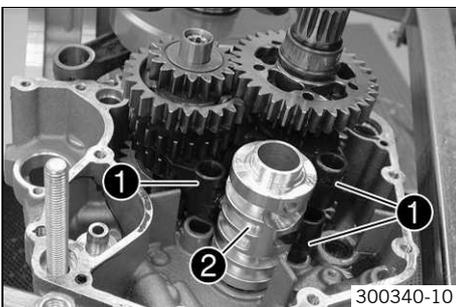
- Remove the special tool.
- Take off the left section of the engine case.

Removing the shift rails



- Remove shift rails ① together with upper springs ② and lower springs.

Removing the shift drum



- Tilt shift forks ① to the side.

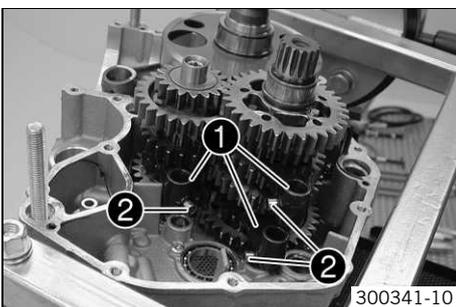


Info

Do not lose the shift rollers.

- Remove shift drum ②.

Removing the shift forks



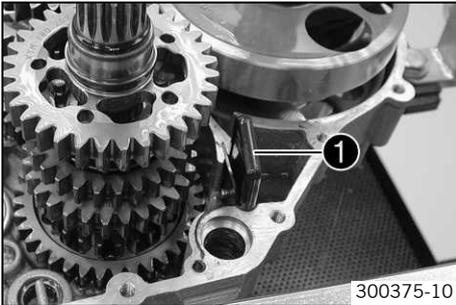
- Take shift forks ① out of the shift grooves.



Info

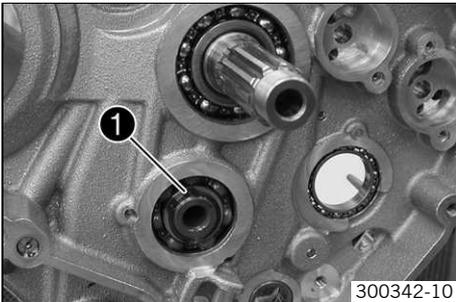
Do not lose shift rollers ②.

Removing the diaphragm

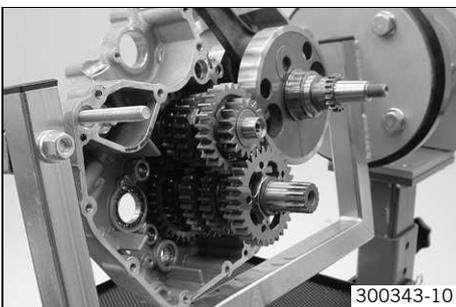


- Remove diaphragm ❶.

Removing the transmission shafts



- Secure the engine in an upright position.
- Remove lock ring ❶.



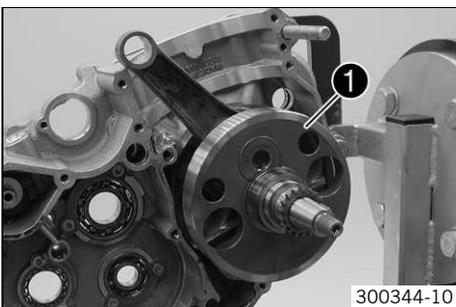
- Pull out both transmission shafts together from the bearing seats.



Info

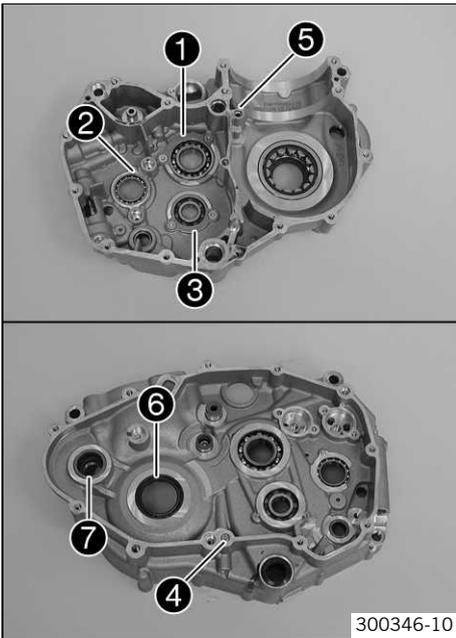
Do not lose the washers.

Removing the crankshaft



- Take out crankshaft ❶.
- Take off the right section of the engine case.

Working on the right section of the engine case



- Remove the oil pressure regulator valve. (☞ p. 113)
- Remove bearing retainers from main shaft bearing ①, shift drum bearing ② and output shaft bearing ③.
- Remove oil jet ④.
- Remove oil jet ⑤.
- Remove the rest of the sealing compound and thoroughly clean the section of the engine case.
- Warm the section of the engine case using an oven.

Guideline

| |
|-----------------|
| 150 °C (302 °F) |
|-----------------|

- Place the section of the engine case on a flat sheet of wood and knock on the case; the bearings will then fall out of the bearing seats.



Info

Any bearings still remaining in the section of the engine case must be removed with a suitable tool.

- Press out the crankshaft shaft seal ring ⑥ from the inside toward the outside.



Info

Do not press the shaft seal ring from the outside toward the inside, as there is a small collar on the inside.

- Remove the shaft seal ring of balancer shaft ⑦.
- Press in the crankshaft from the inside toward the outside, with the open side facing outward.



Info

The shaft seal ring must be flush toward the outside.

- Press in the shaft seal ring of the balancer shaft with the open side facing outward.
- Warm up the section of the engine case again.

Guideline

| |
|-----------------|
| 150 °C (302 °F) |
|-----------------|

- Insert the new cold bearings in the bearing seats of the heated section of the engine case. If necessary, use a suitable press drift from the inside toward the outside. Push all the way to the stop so that they are flush.



Info

When pressing in, ensure that the section of the engine case lies flat in order prevent any damage.
Only press in the bearings by way of the outer ring, as otherwise the bearings will be damaged by the pressing in.

- After the section of the engine case has cooled down, check to ensure that the bearings are firmly seated.



Info

If the bearings are not firmly seated once cooled down, it can be assumed that the bearing races will turn in the engine case at higher temperatures. In this case, the engine case needs to be replaced.

- Position all bearing retainers. Mount and tighten the screws.

Guideline

| | | | |
|---------------------------|----|----------------------|----------------------|
| Locking screw for bearing | M5 | 6 Nm (4.4 lbf ft) | Loctite® 243™ |
|---------------------------|----|----------------------|----------------------|

- Mount and tighten oil jet ④.

Guideline

| | | |
|-----------------------------|---------|-----------------|
| Oil jet, conrod lubrication | M6x0.75 | 4 Nm (3 lbf ft) |
|-----------------------------|---------|-----------------|

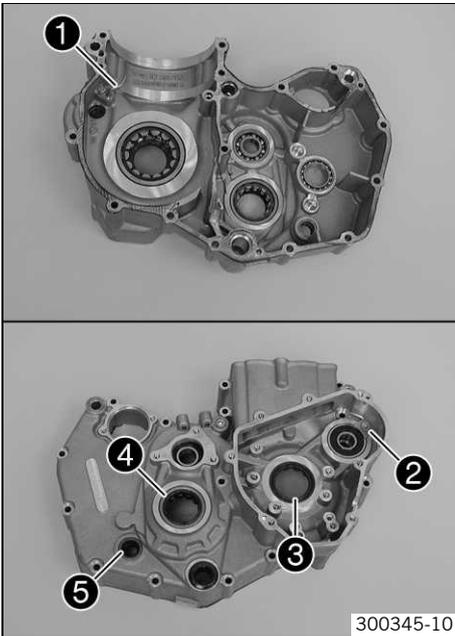
- Mount and tighten oil jet ⑤.

Guideline

| | | | |
|-------------------------|----|----------------------|---------------|
| Oil jet, piston cooling | M5 | 2 Nm (1.5 lbf ft) | Loctite® 243™ |
|-------------------------|----|----------------------|---------------|

- Blow out all oil holes with compressed air and check that they are clear.
- Install the oil pressure regulator valve. (☛ p. 113)

Working on the left section of the engine case



- Remove all dowels.
- Remove oil jet ①.
- Remove the bearing retainer of balancer shaft bearing ②.
- Remove shaft seal ring ③ of the crankshaft.
- Remove countershaft shaft seal ring ④ and shift shaft ⑤.
- Remove the rest of the sealing compound and thoroughly clean the section of the engine case.
- Warm the section of the engine case using an oven.

Guideline

150 °C (302 °F)

- Place the section of the engine case on a flat sheet of wood and knock on the case; the bearings will then fall out of the bearing seats.

i **Info**

Any bearings still remaining in the section of the engine case must be removed with a suitable tool.

- Press out the crankshaft shaft seal ring from the outside toward the inside.

i **Info**

Do not press the shaft seal ring from the inside toward the outside, as there is a small collar on the outside.

- Press in the shaft seal ring from the inside toward the outside, with the open side facing outward.

i **Info**

The shaft seal ring must be flush toward the outside.

- Warm up the section of the engine case again.

Guideline

150 °C (302 °F)

- 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.

i **Info**

When pressing in, ensure that the section of the engine case lies flat in order prevent any damage.
Only press in the bearings by way of the outer ring, as otherwise the bearings will be damaged by the pressing in.

- After the section of the engine case has cooled down, check to ensure that the bearings are firmly seated.

i **Info**

If the bearings are not firmly seated once cooled down, it can be assumed that the bearing races will turn in the engine case at higher temperatures. In this case, the engine case needs to be replaced.

- Position all bearing retainers. Mount and tighten the screws.

Guideline

| | | | |
|---------------------------|----|----------------------|---------------|
| Locking screw for bearing | M5 | 6 Nm (4.4 lbf ft) | Loctite® 243™ |
|---------------------------|----|----------------------|---------------|

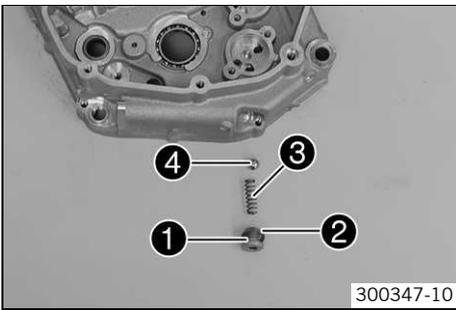
- Press countershaft shaft seal ring ④ and shift shaft ⑤ in flush, with the open side facing inward.
- Mount and tighten oil jet ①.

Guideline

| | | | |
|-------------------------|----|----------------------|---------------|
| Oil jet, piston cooling | M5 | 2 Nm (1.5 lbf ft) | Loctite® 243™ |
|-------------------------|----|----------------------|---------------|

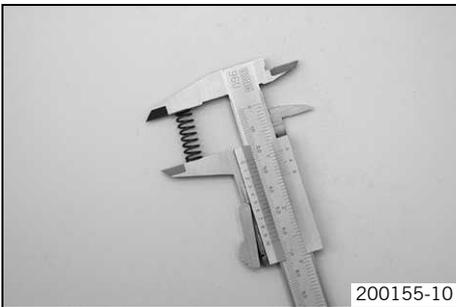
- Mount the dowels.
- Blow out all oil holes with compressed air and check that they are clear.

Removing the oil pressure regulator valve



- Remove plug ① with sealing washer ②.
- Remove pressure spring ③ and ball ④.

Checking the spring length of the oil pressure regulator valve

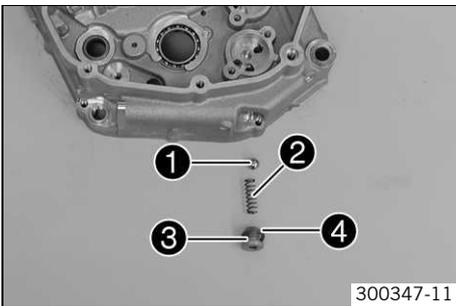


- Remove the oil pressure regulator valve. (☛ p. 113)
- Measure the spring length of the oil pressure regulator valve.

| | |
|-----------------------------------|--------------------|
| Oil pressure regulator valve | |
| Minimum length of pressure spring | 23.5 mm (0.925 in) |

- » If the measured value does not meet specifications:
 - Change the spring.
- Install the oil pressure regulator valve. (☛ p. 113)

Installing the oil pressure regulator valve

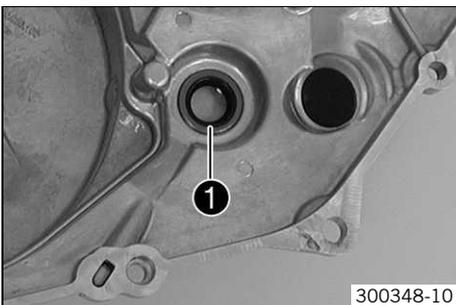


- Install ball ① and pressure spring ②.
- Mount and tighten plug ③ with sealing washer ④.

Guideline

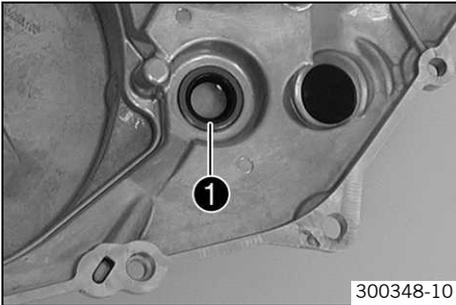
| | | |
|------------------------------------|---------|------------------------|
| Plug, oil pressure regulator valve | M12x1.5 | 20 Nm (14.8 lbf ft) |
|------------------------------------|---------|------------------------|

Removing the crankshaft seal ring in the clutch cover



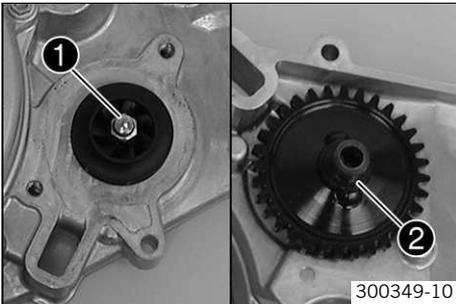
- Remove the crankshaft seal ring in clutch cover ①.

Installing the crankshaft seal ring in the clutch cover

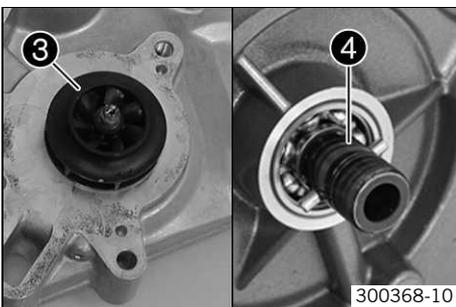


- Press crankshaft seal ring ❶ into the clutch cover with the open side flush toward the inside.
- Grease the sealing lip.

Removing the water pump



- Remove nut ❶.
- Remove lock ring ❷. Take off the drive wheel.

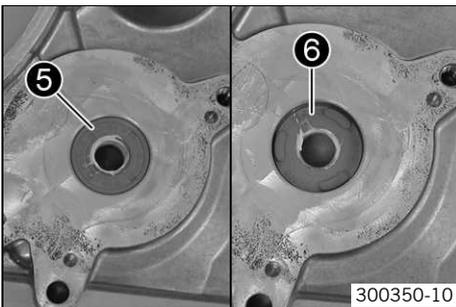


- Take off the water pump impeller ❸.

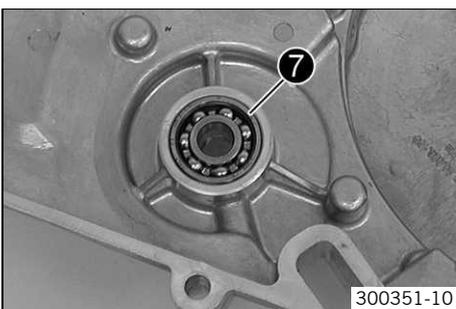
i Info

If the water pump impeller cannot be detached, then the water pump shaft can be pressed out toward the inside.

- Remove water pump shaft ❹.



- Remove shaft seal ring ❺.
- Remove shaft seal ring ❻.

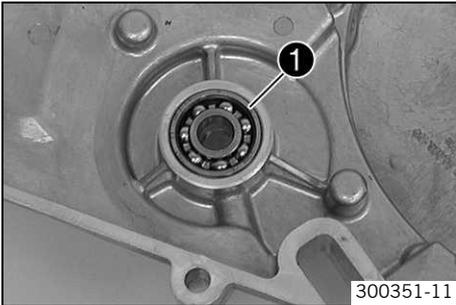


- Press out water pump shaft bearing ❼ with an appropriate tool.

i Info

Provide suitable support for the clutch cover while pressing out.

Installing the water pump

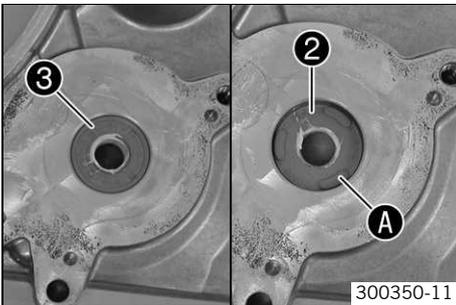


- Press water pump shaft bearing 1 in flush using the appropriate tool.

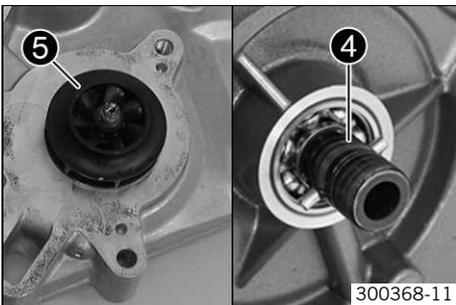


Info

Provide suitable support for the clutch cover while pressing in.



- Press in shaft seal ring 2 all the way, with the open side facing inward.
 - ✓ The spacers A face outward.
- Press shaft seal ring 3, with the open side facing inward, all the way in toward spacer A.



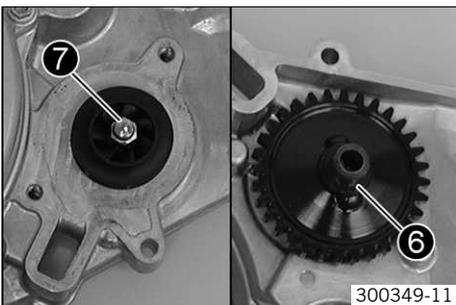
- Mount water pump shaft 4.



Info

Be careful not to damage the shaft seal rings.

- Mount water pump impeller 5.



- Mount the drive wheel. Mount lock ring 6.
- Mount and tighten nut 7.

Guideline

| | | | |
|-----------------------|----|----------------------|---------------|
| Nut, water-pump wheel | M6 | 8 Nm (5.9 lbf ft) | Loctite® 243™ |
|-----------------------|----|----------------------|---------------|

Checking the balancer shaft



- Check the bearing surface of the balancer shaft for pitting corrosion.
 - » If there is pitting corrosion:
 - Change the balancer shaft and bearing.
- Check the remaining areas of the balancer shaft for damage and wear.
 - » If there is damage or wear:
 - Change the balancer shaft and bearing.

Removing the timing chain sprocket



- Warm up the timing chain sprocket ❶ with a blow-dryer.
- Detach the timing chain sprocket.

i **Info**

The timing chain sprocket is usually damaged by the disassembly and must be replaced.

Installing the timing chain sprocket

i **Info**

Never clamp the crankshaft with a crankshaft journal in the bench vise and try to hammer on the timing chain sprocket. In such a case, the crank web would be squeezed together, making the crankshaft unusable.

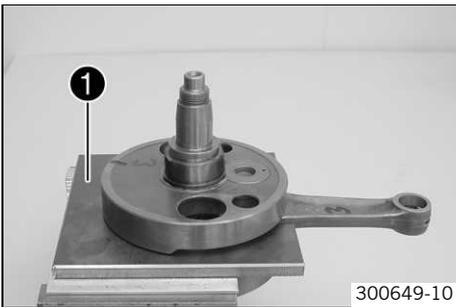


- Warm up the new timing chain sprocket and immediately push it onto the crankshaft.

Guideline

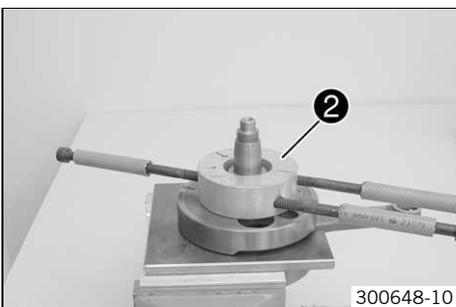
150 °C (302 °F)

Removing the crankshaft bearing inner ring



- Secure the crankshaft in a bench vise using special tool ❶.

Separator plate (78029009000) (☛ p. 273)



- Warm up special tool ❷.

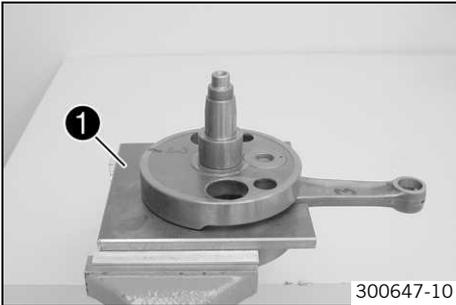
Guideline

150 °C (302 °F)

Tool for inner bearing race (58429037043) (☛ p. 268)

- Push the warmed up special tool ❷ onto the inner bearing race, press firmly together and pull jointly from the crankshaft.
- Take off the compensating disk.
- Repeat this step on the opposite side.

Installing the crankshaft bearing inner ring



- Secure the crankshaft in a bench vise using special tool 1.

Separator plate (78029009000) (☛ p. 273)

- Push on compensating disk.
- Warm up the special tool. Mount the inner bearing race.

Guideline

120 °C (248 °F)

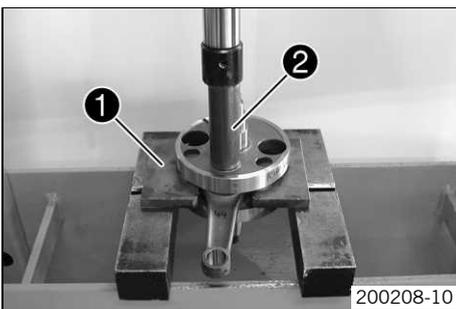
- Repeat this step on the opposite side.
- Ensure that the new inner bearing race is flush.



Info

After replacing the crankshaft bearings, the crankshaft end play must be measured.

Changing the conrod bearing



- Position special tool 1 between the crank webs and place on a press.

Separator plate (78029009000) (☛ p. 273)

- Press the crank pin out of the upper crank web using special tool 2.

Pressing device for crankshaft, complete (75029047000) (☛ p. 270)



Info

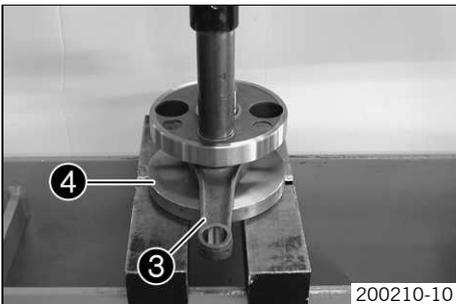
Hold the lower crank web.

- Remove the connecting rod and bearing.
- Place connecting rod 3 onto special tool 4 without the bearing.

Insert for crankshaft pressing device (78029008000) (☛ p. 272)

- Press out the crank pin using the special tool.

Pressing device for crankshaft, complete (75029047000) (☛ p. 270)

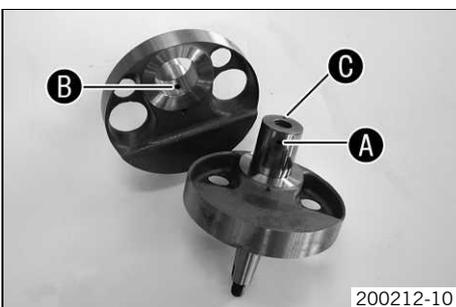


- The crank pin must be pressed in so that oil hole A is aligned with oil hole B. Marking C is across from oil hole A and must be on the outside after mounting.



Info

If the oil holes are not correctly aligned, the conrod bearing will not be supplied with oil.



- Place the crank web onto special tool 4.

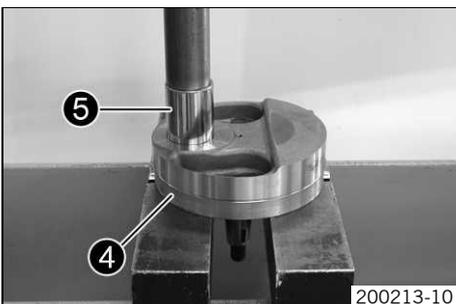
Insert for crankshaft pressing device (78029008000) (☛ p. 272)

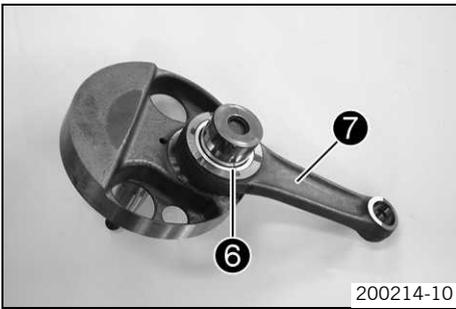


Info

The special tool must be positioned with the flat surface facing downward.

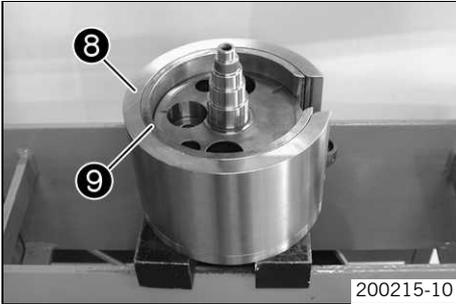
- Press the new crank pin 5 all the way in.
- Use compressed air to check that the oil hole is clear.





- Mount bearing ⑥ and connecting rod ⑦.

i Info
Thoroughly oil the bearing.

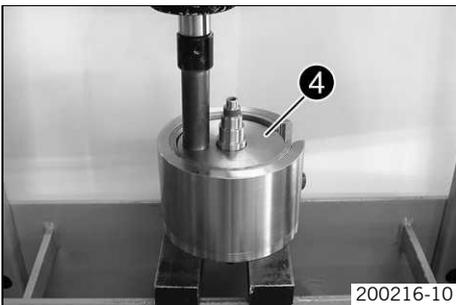


- Position special tools ⑧ and ⑨ on the press.

Pressing device for crankshaft, complete (75029047000) (☛ p. 270)

Insert for crankshaft pressing device (78029008000) (☛ p. 272)

- Insert the crank web with the connecting rod and bearing. Position the second crank web.



- Insert special tool ④.

Insert for crankshaft pressing device (78029008000) (☛ p. 272)

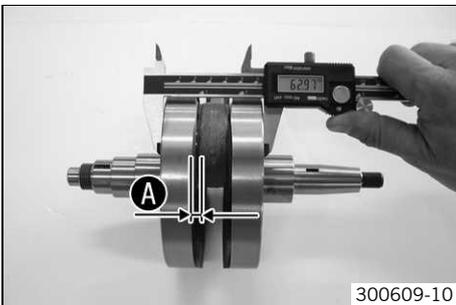
i Info
The flat surface of the special tool must face upward.



- Press the upper crank web all the way in.

i 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.



- Crankshaft - measure the outer dimension of the crank web.

| | |
|---|----------------------------|
| Crankshaft - crank web outer dimensions | 63±0.05 mm (2.48±0.002 in) |
|---|----------------------------|

- » If the measured value is less than the specification:
 - Correct it so the dimension is equal to the specified value.

- Measure end play A between the connecting rod and the crank web.

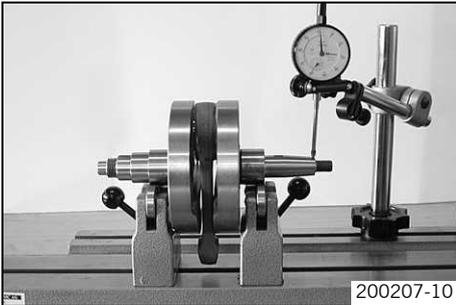
Feeler gauge (59029041100) (☛ p. 269)

| | |
|--|---------------------------------------|
| Connecting rod - end play of lower con-rod bearing | 0.40... 0.60 mm (0.0157... 0.0236 in) |
|--|---------------------------------------|

- » If the measured value is less than the specification:
 - Correct it so the dimension is equal to the specified value.

- Check the crankshaft run-out at the bearing pin. (☛ p. 119)

Checking the crankshaft run-out at the bearing pin

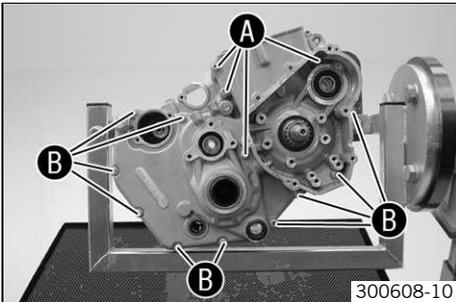


- Position the crankshaft on a roller block.
- Turn the crankshaft slowly.
- Check the crankshaft run-out on both bearing pins.

| | |
|-------------------------------------|-------------------------|
| Crankshaft - run-out at bearing pin | ≤ 0.16 mm (≤ 0.0063 in) |
|-------------------------------------|-------------------------|

- » If the crankshaft run-out at the bearing pin is larger than the specification:
 - Align the crankshaft.

Measuring the crankshaft end play



- Mount the special tool on the clutch end of the crankshaft.

| |
|--|
| Mounting sleeve (78029005100) (☛ p. 272) |
|--|

- Insert the crankshaft in the right section of the engine case.
- Remove the special tool.
- Mount the left section of the engine case.

i Info
Do not forget the fitted bushings.

- Mount screws **A** and, once all screws of the left section of the engine case have been mounted, tighten them.

Guideline

| | | |
|-----------------------|-------|--------------------|
| Screw, engine housing | M6x75 | 10 Nm (7.4 lbf ft) |
|-----------------------|-------|--------------------|

- Mount screw **B** and, once all screws of the left section of the engine case have been mounted, tighten it.

Guideline

| | | |
|-----------------------|-------|--------------------|
| Screw, engine housing | M6x70 | 10 Nm (7.4 lbf ft) |
|-----------------------|-------|--------------------|

- Mount screws **C** and tighten all screws in a crisscross pattern.

Guideline

| | | |
|-----------------------|-------|--------------------|
| Screw, engine housing | M6x60 | 10 Nm (7.4 lbf ft) |
|-----------------------|-------|--------------------|

- Mount the dial gauge support on the engine case, and measure and note the crankshaft end play.

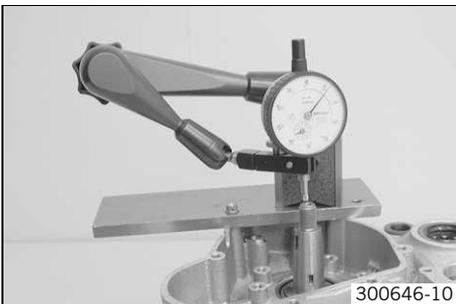
Guideline

| | |
|-----------------------|---------------------------------------|
| Crankshaft - end play | 0.25... 0.35 mm (0.0098... 0.0138 in) |
|-----------------------|---------------------------------------|

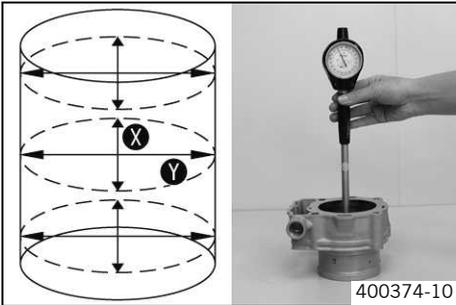
- » If the measured value does not meet specifications:
 - Remove the crankshaft.
 - Remove the crankshaft bearing inner ring. (☛ p. 116)
 - Determine the thickness of the compensating disks by calculating.
 - Add or subtract compensating disks equally on both sides.

i Info
If the end play is too small, compensating disks must be removed.
If the end play is too large, compensating disks must be added.

- Install the crankshaft bearing inner ring. (☛ p. 117)



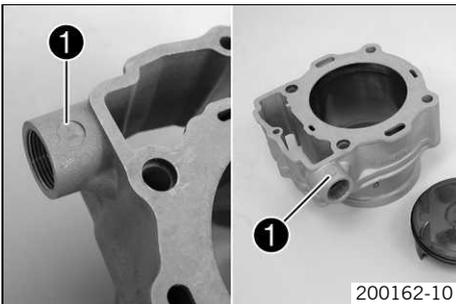
Checking/measuring the cylinder



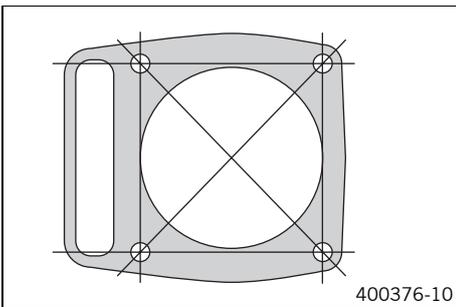
- Check the cylinder bearing surface for damage.
 - » If the cylinder bearing surface is damaged:
 - Change the cylinder and piston.
- Measure the cylinder diameter at several locations on the X- and Y-axes using a micrometer to identify oval wear.

Guideline

| Cylinder - drill hole diameter (All 450 models) | |
|---|---|
| Size I | 95.000... 95.012 mm (3.74015... 3.74062 in) |
| Size II | 95.013... 95.025 mm (3.74066... 3.74113 in) |
| Cylinder - drill hole diameter (All 570 models) | |
| Size I | 100.000... 100.012 mm (3.937... 3.93747 in) |
| Size II | 100.012... 100.025 mm (3.93747... 3.93798 in) |



- Cylinder size 1 is marked on the side of the cylinder.



- Using a straightedge and the special tool, check the sealing area of the cylinder head for distortion.

Feeler gauge (59029041100) (☛ p. 269)

| | |
|--|-------------------------|
| Cylinder/cylinder head - sealing area distortion | ≤ 0.10 mm (≤ 0.0039 in) |
|--|-------------------------|

- » If the measured value does not meet specifications:
 - Change the cylinder.

Checking/measuring the piston



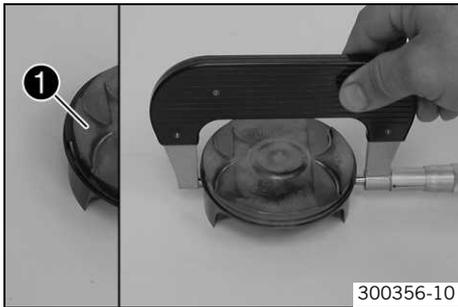
- Check the piston sliding surface for damage.
 - » If the piston sliding surface is damaged:
 - Replace the piston and, if necessary, the cylinder.
- Check that the piston rings move easily in the piston ring grooves.
 - » If a piston ring exhibits excessive resistance:
 - Clean the piston ring groove.

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:
 - Replace 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:
 - Replace 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:
 - Replace the connecting rod and piston pin.
- Measure the pistons at the piston skirt, perpendicular to the piston pin.

Guideline

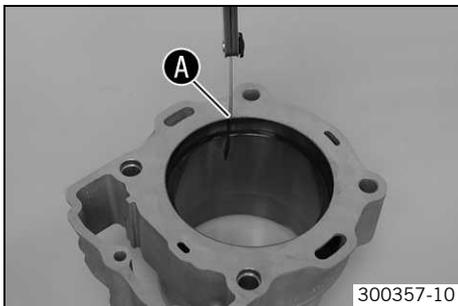
| Piston - diameter (All 450 models) | |
|------------------------------------|---|
| Size I | 94.93... 94.95 mm (3.7374... 3.7382 in) |
| Size II | 94.95... 94.97 mm (3.7382... 3.739 in) |
| Piston - diameter (All 570 models) | |
| Size I | 99.95... 99.96 mm (3.935... 3.9354 in) |
| Size II | 99.96... 99.97 mm (3.9354... 3.9358 in) |



Info

Piston dimensions ❶ are marked on the piston head.

Checking the piston ring end gap



- Remove the piston ring from the piston.
- Place the piston ring in the cylinder and align with the piston.

Guideline

| | |
|--------------------------------------|-----------------|
| Below the upper edge of the cylinder | 10 mm (0.39 in) |
|--------------------------------------|-----------------|

- Measure the end gap with a feeler gauge ❶.

Guideline

| Piston ring - end gap | |
|-----------------------|-------------------------|
| Compression ring | ≤ 1.00 mm (≤ 0.0394 in) |
| Oil scraper ring | ≤ 1.20 mm (≤ 0.0472 in) |

- » If the end gap is greater than the specified measurement:
 - Check/measure the cylinder. (☛ p. 120)
- » If cylinder wear lies within the specified tolerance:
 - Replace the piston ring.
- Mount the piston ring with the marking facing toward the piston head.

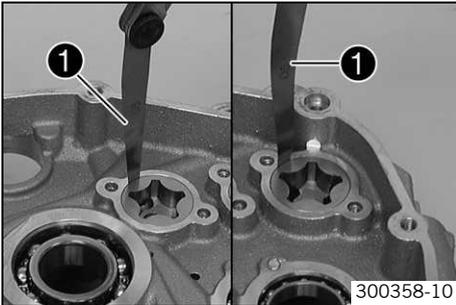
Piston/cylinder - determining the mounting clearance

- Check/measure the cylinder. (☛ p. 120)
- Check/measure the piston. (☛ p. 120)
- The smallest piston/cylinder mounting clearance equals the smallest cylinder bore diameter minus the largest piston diameter. The largest piston/cylinder mounting clearance equals the largest cylinder bore diameter minus the smallest piston diameter.

Guideline

| Piston/cylinder - mounting clearance (All 450 models) | |
|---|---|
| Size I | 0.040... 0.082 mm (0.00157... 0.00323 in) |
| Size II | 0.042... 0.075 mm (0.00165... 0.00295 in) |
| Wear limit | 0.120 mm (0.00472 in) |
| Piston/cylinder - mounting clearance (All 570 models) | |
| Size I | 0.040... 0.062 mm (0.00157... 0.00244 in) |
| Size II | 0.042... 0.065 mm (0.00165... 0.00256 in) |
| Wear limit | 0.120 mm (0.00472 in) |

Checking the oil pumps for wear

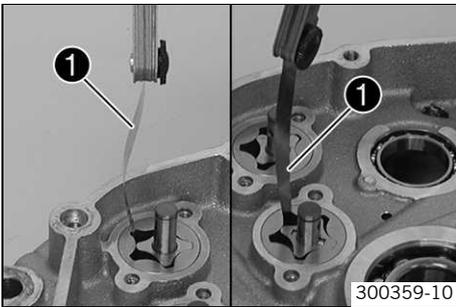


300358-10

- Use feeler gauge ❶ to measure the play between the external rotor and the engine case.

| | |
|--------------------------------------|-------------------------|
| Oil pump | |
| External rotor/engine case clearance | ≤ 0.20 mm (≤ 0.0079 in) |

- » If the measured value does not comply with the specification:
 - Replace the oil pump or, as the case may be, engine case.



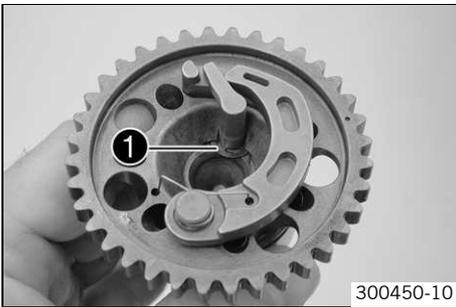
300359-10

- Use feeler gauge ❶ to measure the play between the external rotor and the internal rotor.

| | |
|---|-------------------------|
| Oil pump | |
| External rotor/internal rotor clearance | ≤ 0.20 mm (≤ 0.0079 in) |

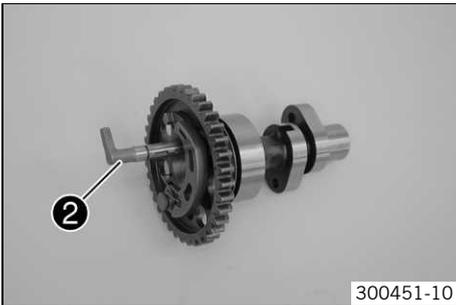
- » If the measured value does not comply with the specification:
 - Replace the oil pump.

Disassembling the autodecompressor



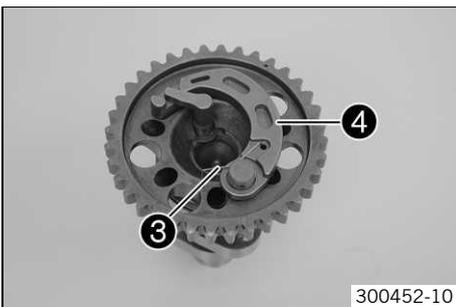
300450-10

- Take lock ring ❶ from the autodecompression shaft and dispose of it.



300451-10

- Pull autodecompression shaft ❷ out of the camshaft.



300452-10

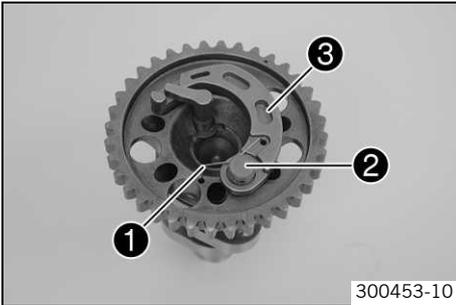
- Release and remove autodecompression spring ❸.



Info

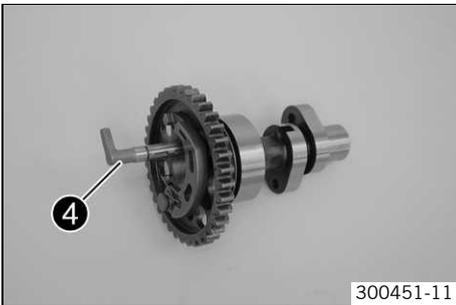
Autodecompression weight ❹ cannot be taken off.

Assembling the autodecompressor



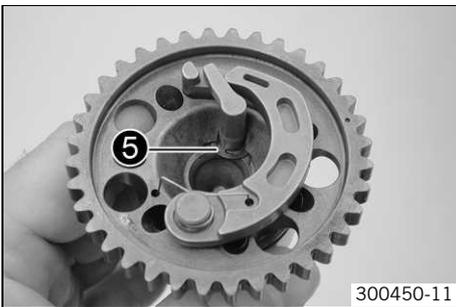
300453-10

- 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.



300451-11

- Mount autodecompression shaft ④ in the camshaft.



300450-11

- 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.

Checking the camshaft



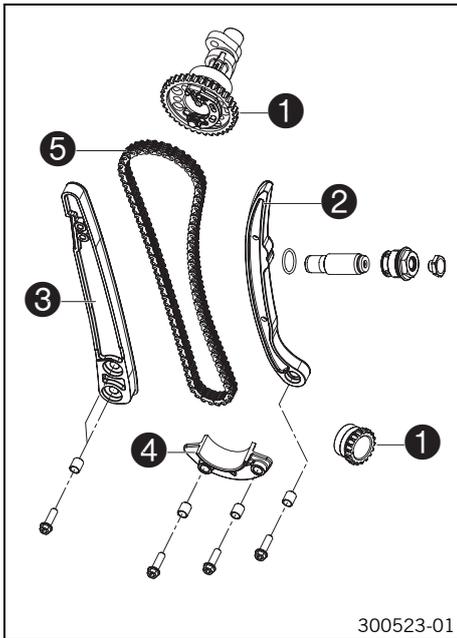
200206-10

- 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 | 33.90... 34.10 mm (1.3346... 1.3425 in) |
| Camshaft - cam height (All 570 models) | |
| Intake | 34.40... 34.60 mm (1.3543... 1.3622 in) |

- » If the measured value does not meet specifications:
 - Change the camshaft.

Checking the timing assembly



- Clean all parts well.
- Check the timing chain wheel/timing chain sprocket ❶ for damage and wear.
 - » If there is damage or wear:
 - Replace the timing chain wheel/timing chain sprocket.
- Check the timing chain tensioning rail ❷ for damage and wear.
 - » If there is damage or wear:
 - Replace the timing chain tensioning rail.
- Check the timing chain guide rail ❸ for damage and wear.
 - » If there is damage or wear:
 - Replace the timing chain guide rail.
- Check the timing chain securing guide ❹ for damage and wear.
 - » If there is damage or wear:
 - Replace the timing chain securing guide.
- Check timing chain ❺ 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.

Preparing the timing chain tensioner for installation



- Press the timing chain tensioner together completely.

i **Info**

This requires some force, as the oil must be pressed out. Without pressure, the timing chain tensioner extends again completely.

- Place two spacing washers or similar aids next to the timing chain tensioner piston. This ensures that, when pressed in, the piston cannot go in all the way.

Guideline

| | |
|----------------------------------|--------------------------------|
| Thickness of the spacing washers | 2... 2.5 mm (0.08... 0.098 in) |
|----------------------------------|--------------------------------|

- Release the timing chain tensioner.

✓ The detent mechanism engages and the piston remains in place.

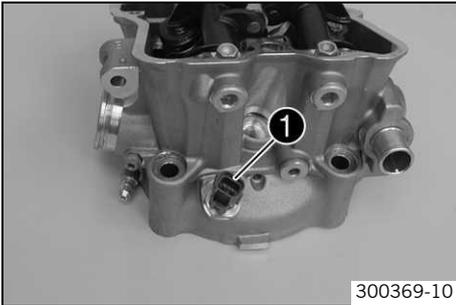
| | |
|---|----------------|
| Final position of the piston after engagement | 3 mm (0.12 in) |
|---|----------------|

i **Info**

This position is necessary for installation.

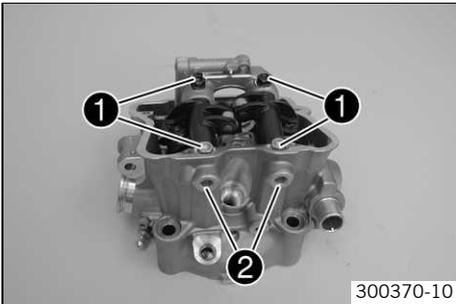
If the timing chain tensioner is now pressed again (in an installed state), and only extended a maximum of half way (therefore preventing it from extending completely), this blocks the detent mechanism and the timing chain tensioner can no longer be squeezed together. This function is necessary in order to ensure sufficient timing chain tension at low oil pressures.

Removing the coolant temperature sensor

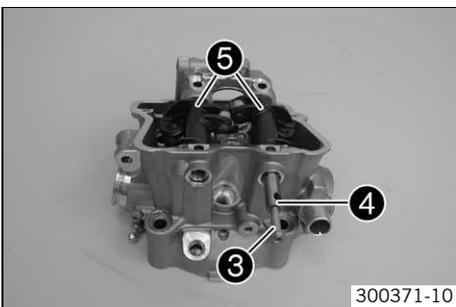


- Remove the coolant temperature sensor ❶.

Removing the rocker arm

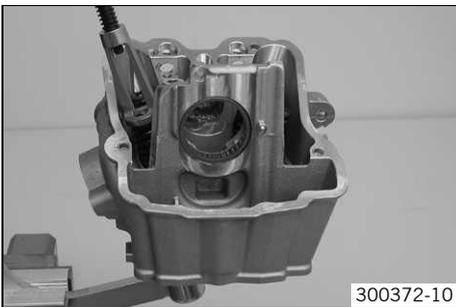


- Remove screws ❶ of the rocker arm shafts. Remove plugs ❷.



- Screw appropriate screw ❸ into the rocker arm shafts. Pull out rocker arm shafts ❹.
- Take off rocker arm ❺.

Removing the valves



- Take the shims from the valve spring retainers and put them aside corresponding to their installation position.
- Pre-tension the valve springs using the special tool.

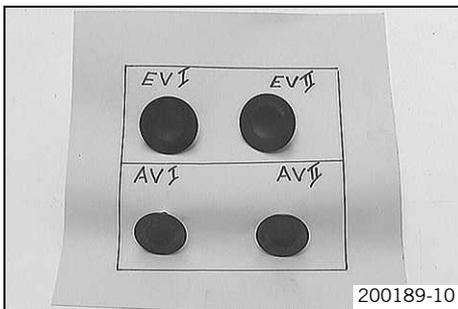
| |
|--|
| Valve spring mouter (59029019000) (☛ p. 269) |
|--|

| |
|---|
| Valve spring mounting device (78029060000) (☛ p. 273) |
|---|

- Remove the valve keys and relieve tension from the valve springs.



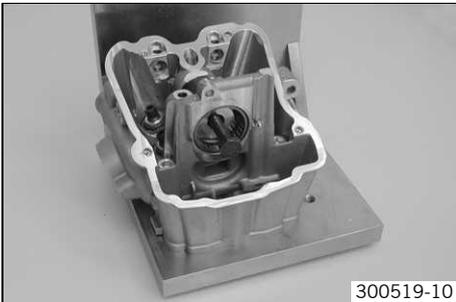
- Remove the spring retainer and spring.
- Pull the valve downward out of the valve guide, remove the valve stem seal and valve spring seat.



- Mark the valves corresponding to their installation position.

**Info**

Place the valves in a carton corresponding to their installation position in and label them.

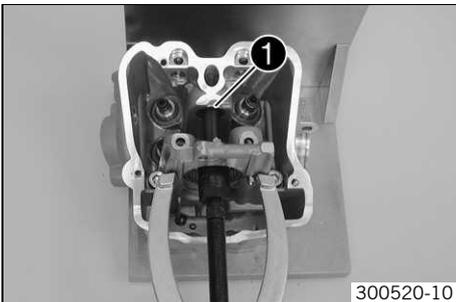
Changing the camshaft bearing

- Mount the cylinder head.

Clamping plate (75029050000) (☛ p. 271)

- Remove the camshaft bearing using the special tool.

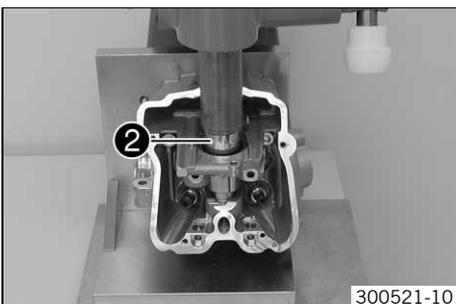
Push-out drift (75029051000) (☛ p. 271)



- Remove the small camshaft bearing ❶ using the special tool.

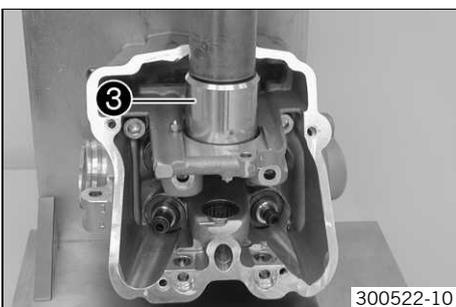
Bearing puller (15112017000) (☛ p. 267)

Insert for bearing puller (15112018100) (☛ p. 267)



- Press the small camshaft bearing all the way in using special tool ❷.

Push-in drift (75029044020) (☛ p. 270)



- Press the large camshaft bearing all the way in using special tool ❸.

Push-in drift (75029044010) (☛ p. 270)

Checking the valves



Info

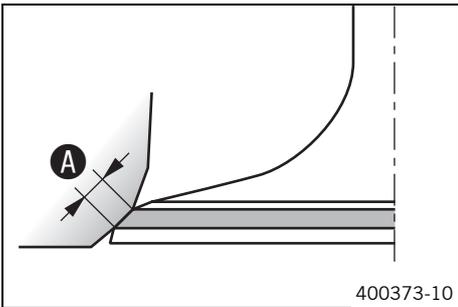
The valve shaft is hard-chrome plated; wear generally appears at the valve guide.



- 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 the valve.

| | |
|---------------------------|---------------------|
| Valve | |
| Intake sealing seat width | 1.50 mm (0.0591 in) |

| | |
|----------------------------|---------------------|
| Valve | |
| Exhaust sealing seat width | 2.00 mm (0.0787 in) |

- » If the sealing seat is not centered on the valve seat or deviates from the specification:
 - Rework the valve seat.

Checking the valve springs



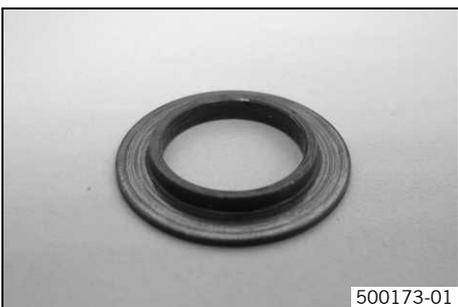
- Check the valve springs for breakage and wear (visual check).
 - » If the valve spring is broken or worn:
 - Change the valve spring.
- Measure the length of the valve springs.

| | |
|---|--------------------|
| Valve spring | |
| Intake minimum length (without valve spring seat) | 46.5 mm (1.831 in) |

| | |
|--|--------------------|
| Valve spring | |
| Exhaust minimum length (without valve spring seat) | 43.0 mm (1.693 in) |

- » If the measured value does not meet specifications:
 - Change the valve spring.

Checking the valve spring seat

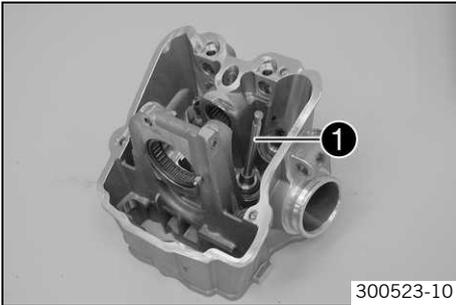


- Check the valve spring seat for breakage and wear (visual check).
 - » If the valve spring seat is broken or worn:
 - Change the valve spring seat.
- Measure the thickness of the valve spring seat.

| | |
|-------------------------------|-----------------------------------|
| Valve spring seat - thickness | 0.9... 1.0 mm (0.035... 0.039 in) |
|-------------------------------|-----------------------------------|

- » If the measured value does not meet specifications:
 - Change the valve spring seat.

Checking the cylinder head



- Check the exhaust valve guides using special tool ❶.

| |
|---|
| Limit plug gauge (59029026006) (☛ p. 269) |
|---|

- » If the special tool is easy to insert in the valve guide:
 - Change the valve guide and valve.

- Check the intake valve guides using the special tool.

| |
|---|
| Limit plug gauge (77029026000) (☛ p. 271) |
|---|

- » 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.

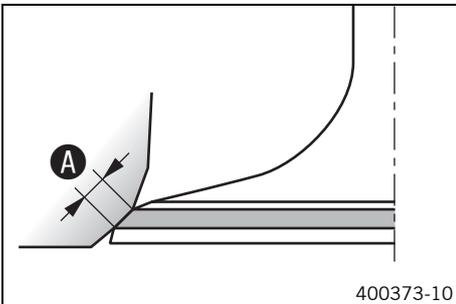
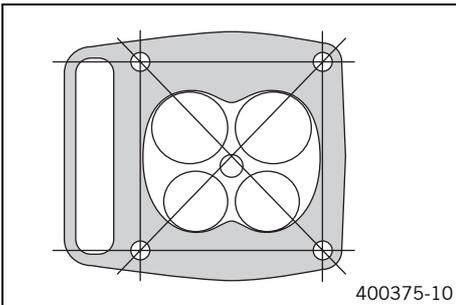
- » If there is damage or cracking:
 - Change the cylinder head.

- Using a straightedge and the special tool, check the sealing area of the cylinder for distortion.

| |
|---------------------------------------|
| Feeler gauge (59029041100) (☛ p. 269) |
|---------------------------------------|

| | |
|--|-------------------------|
| 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 ❶ of the valves.

| | |
|---------------------------|---------------------|
| Valve | |
| Intake sealing seat width | 1.50 mm (0.0591 in) |

| | |
|----------------------------|---------------------|
| Valve | |
| Exhaust sealing seat width | 2.00 mm (0.0787 in) |

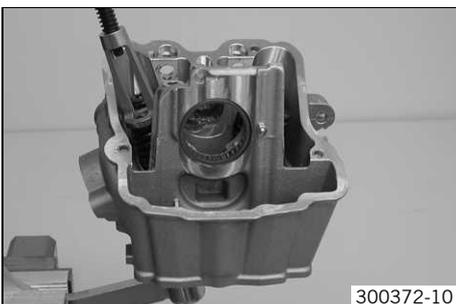
- » If the measured value does not meet specifications:
 - Rework the valve seat.

- Blow out all oil holes with compressed air and check that they are clear.

Installing the valves



- Position the valve spring seat. Mount the new valve stem seals.
- Mount the valves corresponding to their installation position.
- Mount the valve springs and valve spring retainers.



- Pre-tension the valve springs using the special tool.

| |
|--|
| Valve spring mouter (59029019000) (☛ p. 269) |
|--|

| |
|---|
| Valve spring mounting device (78029060000) (☛ p. 273) |
|---|



- Mount the valve keys.

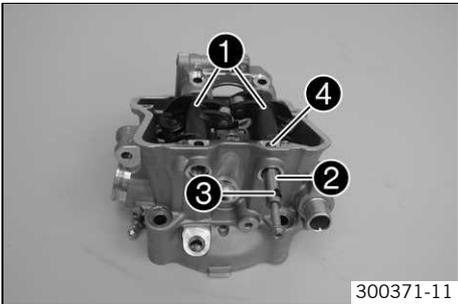


Info

When mounting the valve keys, ensure that they are seated properly; it is recommended to secure the valve keys to the valves with a small amount of grease.

- Place the shims in the valve spring retainer corresponding to their installation position.

Installing the rocker arm



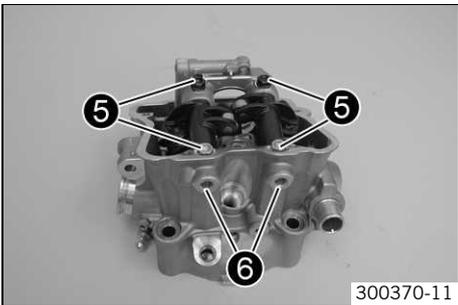
300371-11

- Position rocker arm ❶ and insert rocker arm shafts ❷.



Info

Ensure that the threaded hole of the rocker arm shaft is outwardly positioned. Align the drill holes ❸ of the rocker arm shafts with the drill holes ❹ of the cylinder head.



300370-11

- Mount and tighten the rocker arm shaft screws ❺.

Guideline

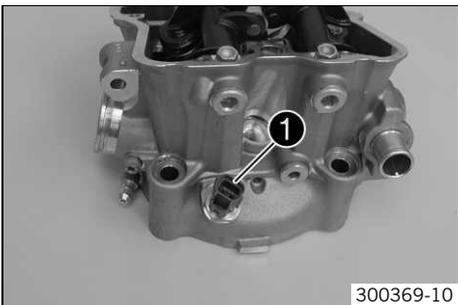
| | | |
|---------------------------|------|------------------------|
| Screw, rocker arm bearing | M7x1 | 15 Nm (11.1 lbf ft) |
|---------------------------|------|------------------------|

- Mount and tighten plugs ❻.

Guideline

| | | |
|------------------|----------|------------------------|
| Plug, rocker arm | M14x1.25 | 20 Nm (14.8 lbf ft) |
|------------------|----------|------------------------|

Installing the coolant temperature sensor



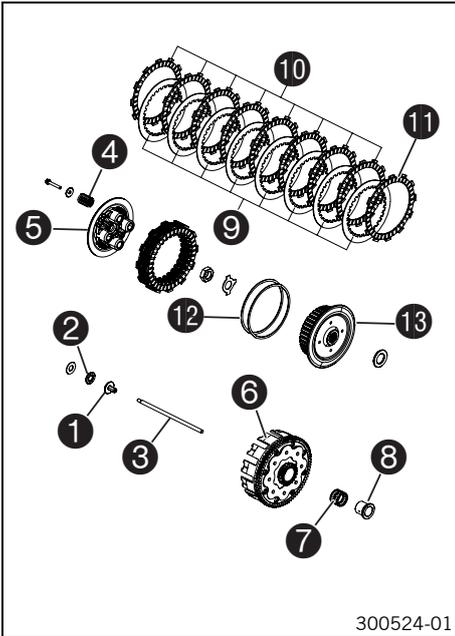
300369-10

- Mount and tighten the coolant temperature sensor ❶ with O-ring.

Guideline

| | | |
|---|---------|--------------------|
| Coolant temperature sensor at cylinder head | M12x1.5 | 12 Nm (8.9 lbf ft) |
|---|---------|--------------------|

Checking the clutch



- Check the pressure piece ❶ for damage and wear.
 - » If there is damage or wear:
 - Change the pressure piece.
- Check axial bearing ❷ for damage and wear.
 - » If there is damage or wear:
 - Change the axial bearing.
- Place push rod ❸ on a level surface and check for run-out.
 - » If there is run-out:
 - Change the push rod.
- Check the length of clutch springs ❹.

| | |
|---|---|
| Clutch spring - length (All 450 models) | 43.00... 44.03 mm (1.6929... 1.7335 in) |
| Clutch spring - length (All 570 models) | 45.10... 46.10 mm (1.7756... 1.815 in) |

- » If the clutch spring length is less than the specified value:
 - Change all clutch springs.
- Check the thrust face of pressure cap ❺ for damage and wear.
 - » If there is damage or wear:
 - Change the pressure cap.
- Check the contact surfaces of the clutch facing disks in outer clutch hub ❻ for wear.

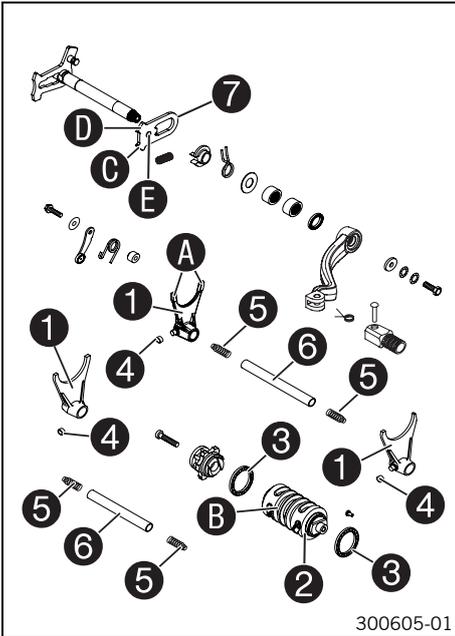
| | |
|--|----------------------|
| Outer clutch hub - clutch facing disks contact surface | ≤ 0.5 mm (≤ 0.02 in) |
|--|----------------------|

- » If the contact surface exhibits significant wear:
 - Change the clutch facing disks and outer clutch hub.
- Check needle bearing ❼ and collar sleeve ❸ for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearing and collar sleeve.
- Check the intermediate clutch disks ❾ for damage and wear.
 - » If the intermediate clutch disks are not even or exhibit pitting:
 - Change all intermediate clutch disks.
- Check clutch facing disks ❿ and ⓫ for discoloration and scoring.
 - » If there is discoloration or scoring:
 - Change all clutch facing disks.
- Check the thickness of clutch facing disks ❿ and ⓫.

| | |
|--------------------------------|-----------------------------------|
| Clutch facing disk - thickness | |
| Outer | 2.6... 2.7 mm (0.102... 0.106 in) |
| Innermost | 2.9... 3.0 mm (0.114... 0.118 in) |

- » If the clutch facing disk does not meet specifications:
 - Change all clutch facing disks.
- Check retention ring and support ring ⓬ for damage and wear.
 - » If there is damage or wear:
 - Change the pretension ring and support ring.
- Check the inner clutch hub ⓭ for damage and wear.
 - » If there is damage or wear:
 - Change the inner clutch hub.

Checking the shift mechanism



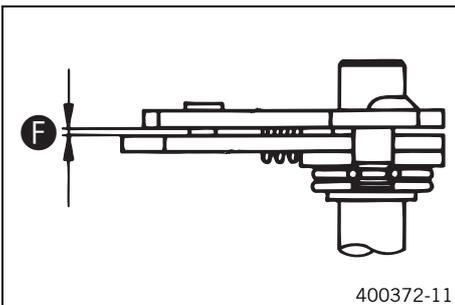
- Check shift forks ① for wear on blade A.

| Shift fork | |
|-----------------|---------------------------------------|
| Sheet thickness | 4.85... 4.95 mm (0.1909... 0.1949 in) |

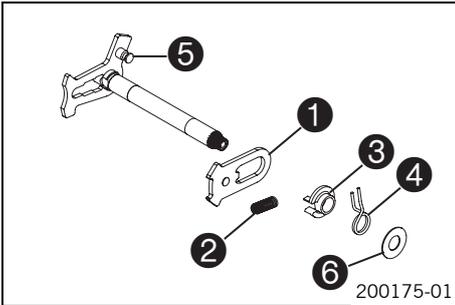
- » If the measured value does not meet specifications:
 - Change the shift fork.
- Check shift grooves ③ of shift drum ② for wear.
 - » If the shift groove is worn:
 - Change the shift drum.
- Check the seat of the shift drum in grooved ball bearing ③.
 - » If the shift drum is not correctly seated:
 - Change the shift drum and/or the grooved ball bearing.
- Check grooved ball bearing ③ for smooth operation and wear.
 - » If the grooved ball bearing does not move easily or is worn:
 - Change the grooved ball bearing.
- 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 damaged or worn:
 - Change the spring of the shift rail.
- Check shift rails ⑥ for run-out on a level surface.
 - » If there is run-out:
 - Change the shift rail.
- Check the shift rails for grooving, scoring and smooth operation in the shift fork.
 - » If the shift rail has grooving, scoring or does not move easily in the shift fork:
 - Change the shift rail.
- Check sliding plate ⑦ for wear on contact areas ⑧.
 - » If the sliding plate is worn:
 - Change the sliding plate.
- Check return surface ⑩ on the sliding plate for wear.
 - » If there is significant indentation:
 - Change the sliding plate.
- Check guide bolts ⑨ for firm seating and wear.
 - » If the guide bolts are loose or worn:
 - Change the sliding plate.
- Preassemble the shift shaft. (☛ p. 132)
- Check clearance ⑪ between the sliding plate and the shift quadrant.

| | |
|--|---------------------------------------|
| Shift shaft - sliding plate/shift quadrant clearance | 0.40... 0.80 mm (0.0157... 0.0315 in) |
|--|---------------------------------------|

- » If the measured value does not meet specifications:
 - Change the sliding plate.



Preassembling the shift shaft



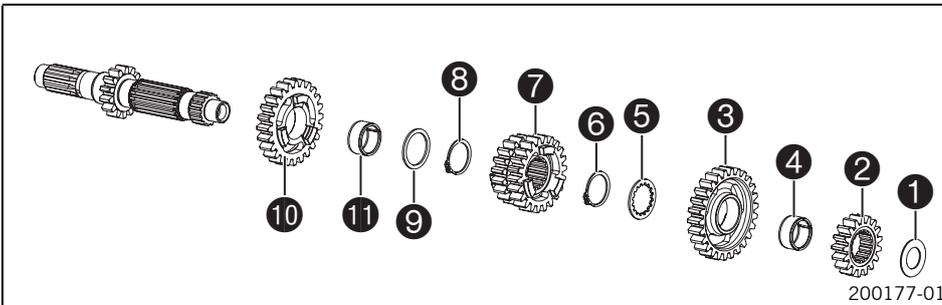
- Secure the short end of the shift shaft in the bench vise.

Guideline

Use soft jaws.

- Mount gliding 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 the abutment bolt **5**.
- Mount stop disk **6**.

Disassembling the main shaft



- Secure the main shaft with the toothed end facing downward in the bench vise.

Guideline

Use soft jaws.

- Remove stop disk **1** and 2nd gear fixed gear **2**.
- Remove 6th gear idler gear **3**.
- Remove split needle bearing **4** and stop disk **5**.
- Remove lock ring **6**.
- Remove 3rd/4th gear sliding gear **7**.
- Remove lock ring **8**.
- Remove stop disk **9** and 5th gear idler gear **10**.
- Remove split needle bearing **11**.

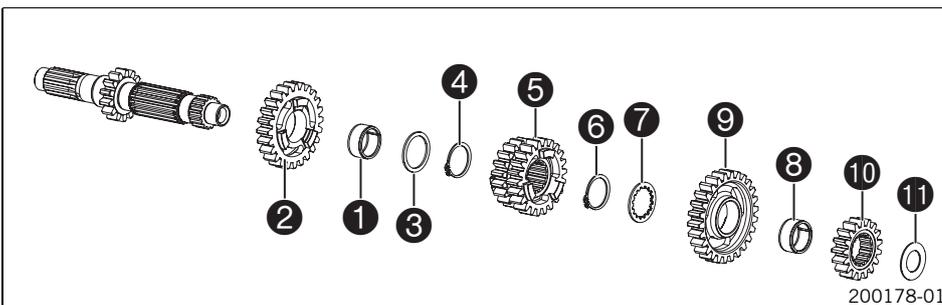
Assembling the main shaft



Info

Use new lock rings with every repair.

- Carefully lubricate all parts before assembling.
- Check the transmission. (↖ p. 134)



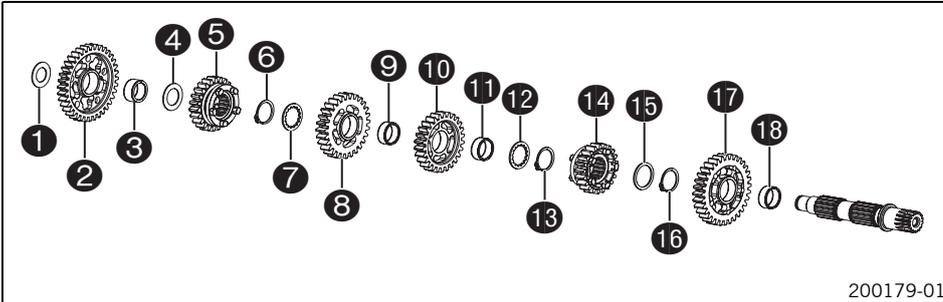
- Secure the main shaft with the toothed end facing downward in the bench vise.

Guideline

Using soft jaws

- Mount split needle bearing ❶, attach 5th gear idler gear ❷ with shift dog facing upward.
- Mount stop disk ❸ and lock ring ❹.
- Attach 3rd/4th gear sliding gear ❺ with the small toothed wheel facing downward and mount lock ring ❻.
- Attach stop disk ❼ and split needle bearing ❸.
- Attach 6th gear idler gear ❾ with the shift dog facing downward.
- Attach 2nd gear fixed gear ❿ with the collar facing downward and stop disk ⓫.
- In conclusion, check all gear wheels for smooth operation.

Disassembling the countershaft



200179-01

- Secure the countershaft with the toothed end facing downward in the bench vise.

Guideline

Using soft jaws

- Remove stop disk ❶ and 1st gear idler gear ❷.
- Remove needle bearing ❸ and stop disk ❹.
- Remove 5th gear sliding gear ❺ and lock ring ❻.
- Remove stop disk ❼ and 3rd gear idler gear ❸.
- Remove needle bearing ❾ and 4th gear idler gear ❿.
- Remove needle bearing ⓫ and stop disk ⓫.
- Remove lock ring ⓫ and 6th gear sliding gear ❹.
- Remove stop disk ⓫ and lock ring ⓫.
- Remove 2nd gear idler gear ❷ and needle bearing ❶.

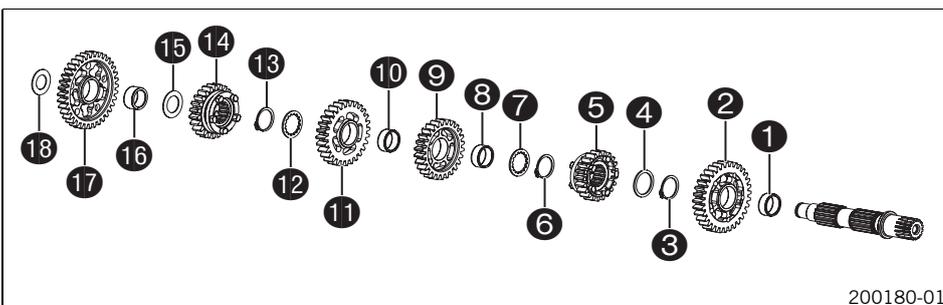
Assembling the countershaft



Info

Use new lock rings with every repair.

- Carefully lubricate all parts before assembling.
- Check the transmission. (↖ p. 134)



200180-01

- Secure the countershaft with the toothed end facing downward in the bench vise.

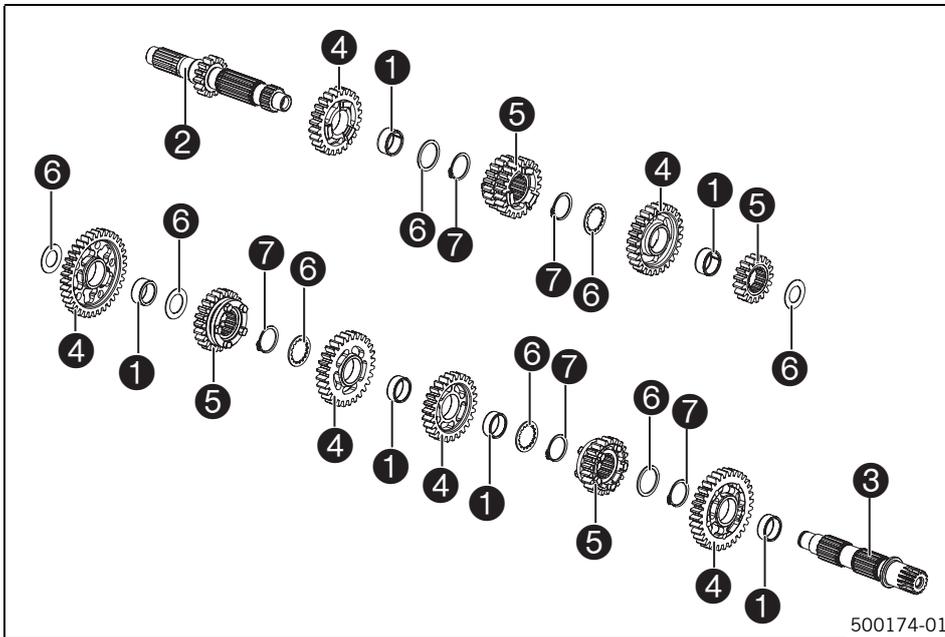
Guideline

Using soft jaws

- Mount needle bearing ❶ and the 2nd gear idler gear ❷ onto the countershaft with the protruding collar facing down.
- Mount lock ring ❹ and stop disk ❸.
- Mount the 6th gear sliding gear ❺ 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 3rd gear idler gear ⑪ with the collar facing down.
- Mount stop disk ⑫ and lock ring ⑬.
- Mount the 5th gear sliding gear ⑭ with the shift groove facing down and stop disk ⑮.
- Mount needle bearing ⑯, 1st gear idler gear ⑰ with the recess facing down and stop disk ⑱.
- In conclusion, check all gear wheels for smooth operation.

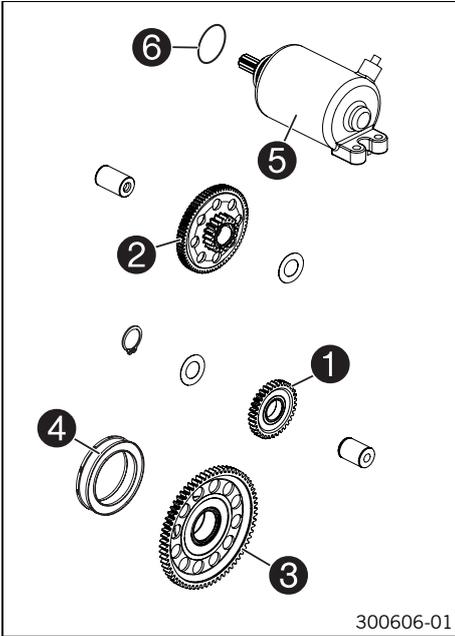
Checking the transmission



- Check needle bearings ① for damage and wear.
 - » If there is damage or wear:
 - Change the needle bearing.
- Check the pivot points of main shaft ② and countershaft ③ for damage and wear.
 - » If there is damage or wear:
 - Change the main shaft and/or countershaft.
- Check the tooth profiles of main shaft ② and countershaft ③ for damage and wear.
 - » If there is damage or wear:
 - Change the main shaft and/or countershaft.
- Check the pivot points of idler gears ④ for damage and wear.
 - » If there is damage or wear:
 - Change the idler/solid gear pair.
- Check the shift dogs of idler gears ④ and solid gears ⑤ for damage and wear.
 - » If there is damage or wear:
 - Change the idler/solid gear pair.
- Check the tooth faces of idler gears ④ and solid gears ⑤ for damage and wear.
 - » If there is damage or wear:
 - Change the idler/solid gear pair.
- Check the tooth profiles of solid gears ⑤ for damage and wear.
 - » If there is damage or wear:
 - Change the idler/solid gear pair.
- Check solid gears ⑤ for smooth operation in the profile of main shaft ②.
 - » If the solid gear does not move freely:
 - Change the solid gear or the main shaft.
- Check solid gears ⑤ for smooth operation in the profile of countershaft ③.
 - » If the solid gear does not move freely:

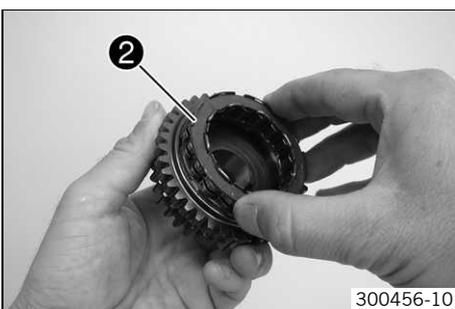
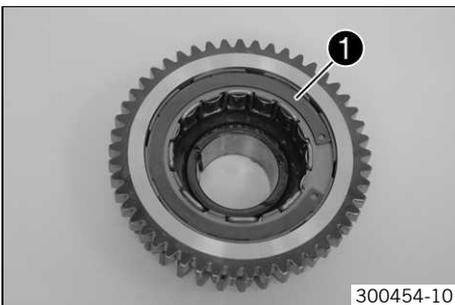
- Change the solid gear or the countershaft.
- Check stop disks **6** for damage and wear.
 - » If there is damage or wear:
 - Change the stop disks.
- Use new lock rings **7** with every repair.

Checking the electric starter mode

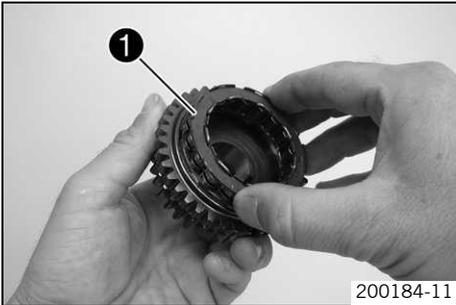


- Check the gear mesh and bearing of starter idler gear **1** for damage and wear.
 - » If there is damage or wear:
 - Change the starter idler gear.
- Check the gear mesh and bearing of torque limiter **2** for damage and wear.
 - » If there is damage or wear:
 - Change the torque limiter.
- Check the gear mesh and bearing of free wheel gear **3** for damage and wear.
 - » If there is damage or wear:
 - Change the free wheel gear or bearing.
- Check free wheel **4** for damage and wear when it is disassembled.
 - » If there is damage or wear:
 - Change the free wheel.
- Checking 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. Briefly connect the positive cable of the power supply with the connector of the starter motor.
 - » If the starter motor does not turn when the circuit is closed:
 - Change the starter motor.

Removing the free wheel



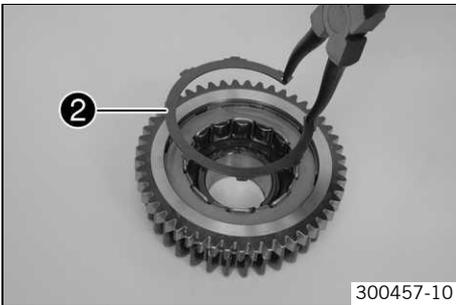
- Press expansion ring **1** together with suitable pliers and take off.
- Take out free wheel **2** from the primary pinion.

Installing the free wheel

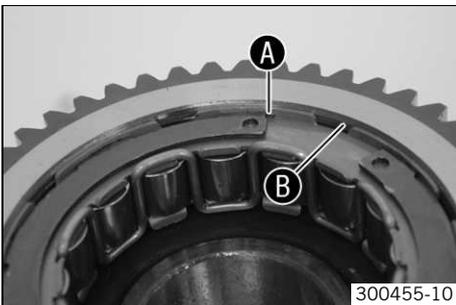
- Thoroughly oil all parts.
- Slide free wheel ① into the primary pinion.

**Info**

Note the direction of rotation.

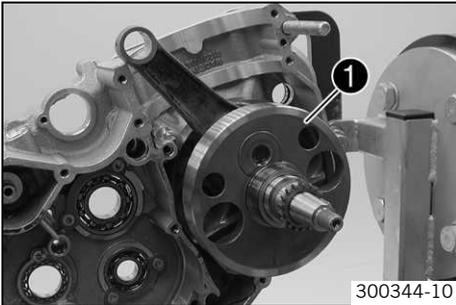


- Mount spreader ring ②.



- Ensure that all lugs of the spreader ring pass through the slots **A** of the free wheel and engage in groove **B** of the primary pinion.

Installing the crankshaft

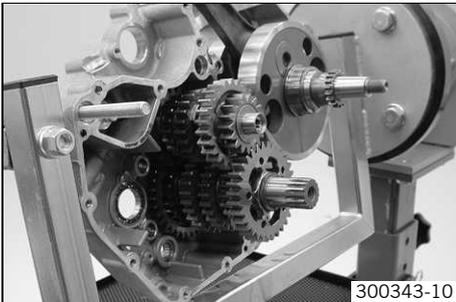


- Tighten the right section of the engine case in the engine work stand.
- Mount the special tool on the clutch end of the crankshaft.

Mounting sleeve (78029005100) (☛ p. 272)

- Push crankshaft ❶ all the way into the bearing seat of the right section of the engine case.
- Remove the special tool.

Installing the transmission shafts

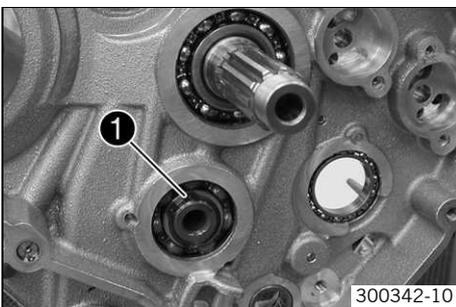


- Slide both transmission shafts into the bearing seats.



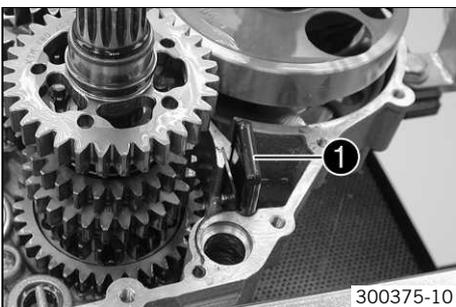
Info

Do not lose the washers.



- Mount lock ring ❶.

Installing the diaphragm

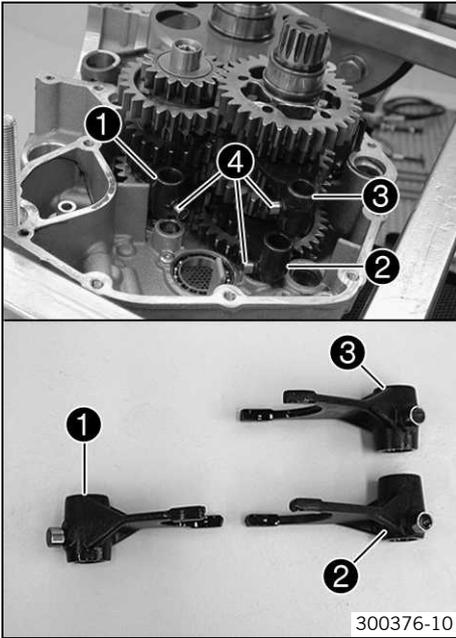


- Grease the rubber seal of the diaphragm.

Long-life grease (☛ p. 265)

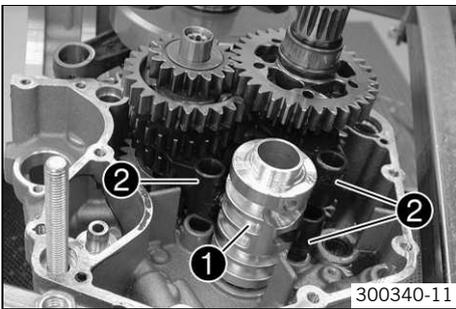
- Position diaphragm ❶.

Installing the shift fork



- Thoroughly oil all parts.
- Shift fork ① has a small inside diameter; mount this in the 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.
- Slide on shift rollers ④.

Installing the shift drum



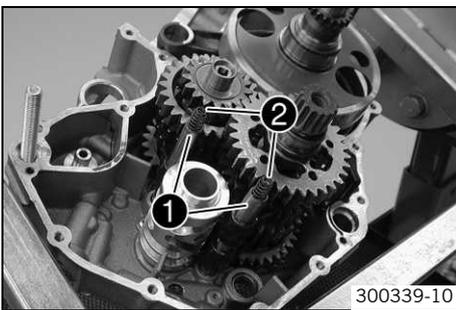
- Push shift drum ① into the bearing seat.
- Put shift forks ② in the shift drum.



Info

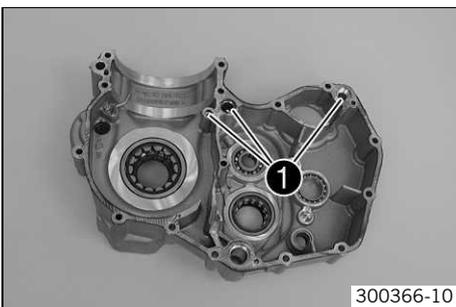
Do not lose the shift rollers.

Installing the shift rails



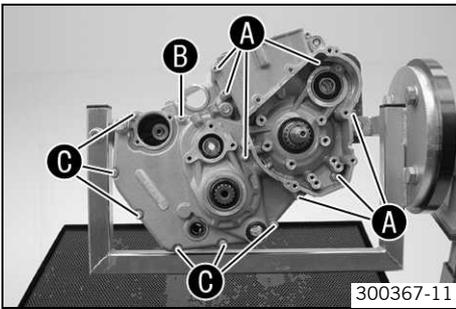
- Install shift rails ① together with upper springs ② and lower springs.

Installing the left engine case



- Mount dowels ① onto the left section of the engine case.
- Grease the sealing surfaces. Apply the sealing compound to the left section of the engine case.

Loctite® 5910



- Mount the left section of the engine case. If necessary, strike it lightly with a rubber mallet.



Info

Do not use the screws to pull the two sections of the engine case together.

- Mount screws **A** and, once all screws of the left section of the engine case have been mounted, tighten them.

Guideline

| | | |
|-----------------------|-------|--------------------|
| Screw, engine housing | M6x75 | 10 Nm (7.4 lbf ft) |
|-----------------------|-------|--------------------|

- Mount screw **B** and, once all screws of the left section of the engine case have been mounted, tighten it.

Guideline

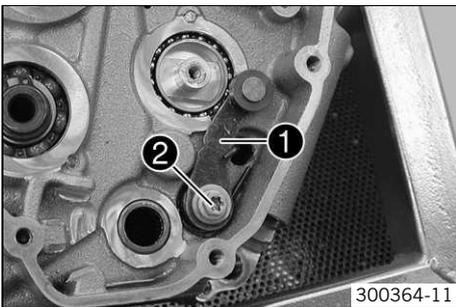
| | | |
|-----------------------|-------|--------------------|
| Screw, engine housing | M6x70 | 10 Nm (7.4 lbf ft) |
|-----------------------|-------|--------------------|

- Mount screws **C** and tighten all screws in a crisscross pattern.

Guideline

| | | |
|-----------------------|-------|--------------------|
| Screw, engine housing | M6x60 | 10 Nm (7.4 lbf ft) |
|-----------------------|-------|--------------------|

Installing the locking lever

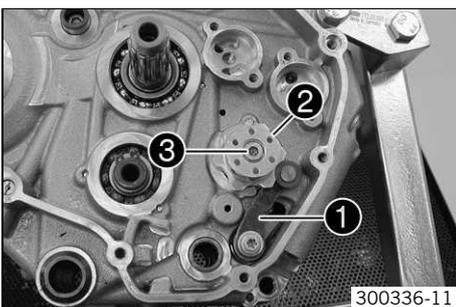


- Mount locking lever **1** with the washer, sleeve and spring.
- Mount and tighten screw **2**.

Guideline

| | | | |
|----------------------|----|-------------------|----------------------|
| Screw, locking lever | M5 | 6 Nm (4.4 lbf ft) | Loctite® 243™ |
|----------------------|----|-------------------|----------------------|

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

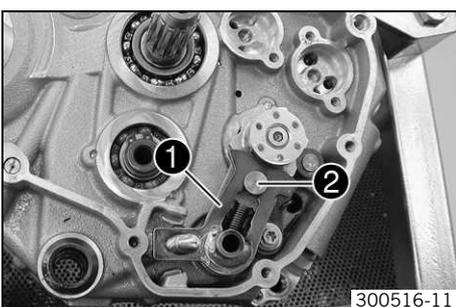
The flat areas of the shift drum locating unit are not symmetric.

- Relieve tension from the locking lever.
- Mount and tighten screw **3**.

Guideline

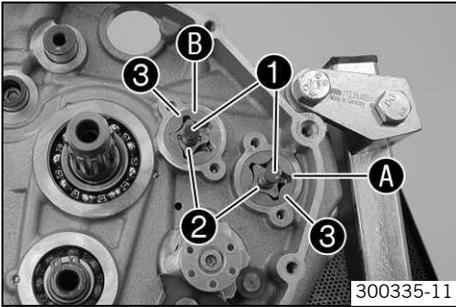
| | | | |
|----------------------------|----|--------------------|----------------------|
| Screw, shift drum locating | M6 | 10 Nm (7.4 lbf ft) | Loctite® 243™ |
|----------------------------|----|--------------------|----------------------|

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. Insert the shift shaft all the way.
- Let sliding plate **2** engage in the shift drum locating unit.

Installing the oil pumps

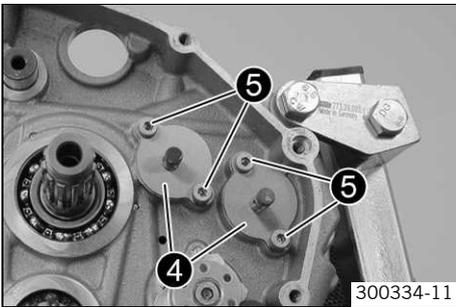


300335-11

- Oil the oil pump shaft, internal rotor and external rotor before assembly.

Engine oil (SAE 10W/50) (☛ p. 263)

- Assemble both oil pump shafts ①, together with the pin and internal rotor ②.
 - ✓ The marking of force pump ④ is visible after assembly, that of suction pump ③ is not.
- Mount both external rotors ③.
 - ✓ The markings are not visible after assembly.



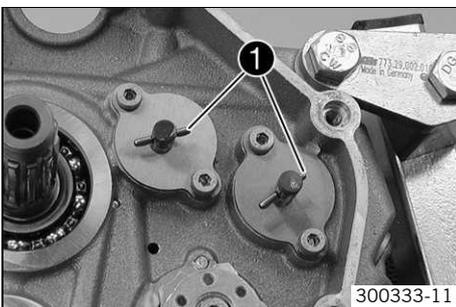
300334-11

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

Guideline

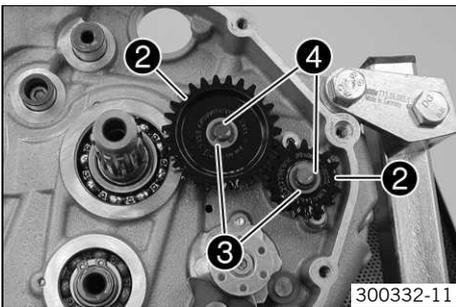
| | | | |
|-----------------------|----|----------------------|---------------------|
| Screw, oil pump cover | M5 | 6 Nm (4.4 lbf ft) | Loctite® 222 |
|-----------------------|----|----------------------|---------------------|

Installing the oil pump gears



300333-11

- Insert pin ①.



300332-11

- Position oil pump gears ②.

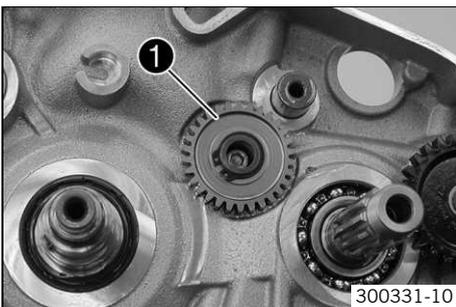


Info

Ensure that the pins are seated properly.

- Position washers ③.
- Mount shaft locking devices ④.
- Crank the oil pump gears and ensure that they move easily.

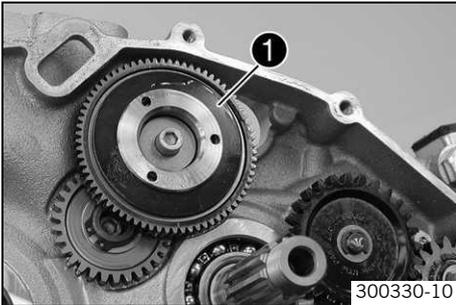
Installing the starter idler gear



300331-10

- Slide on starter idler gear ① with the collar facing the engine case.
- Slide on the disk. Mount the lock ring.

Installing the torque limiter

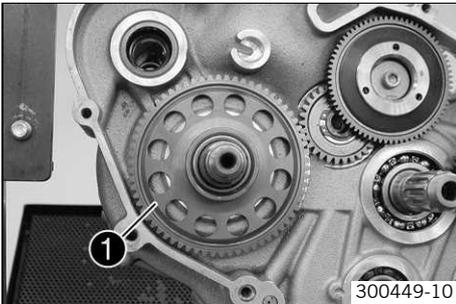


- Mount the washer and torque limiter ❶.
- Mount and tighten the screw with the washer.

Guideline

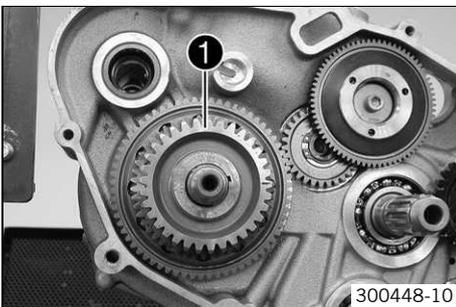
| | | | |
|-----------------------|----|-----------------------|---------------|
| Screw, torque limiter | M6 | 10 Nm (7.4 lbf ft) | Loctite® 243™ |
|-----------------------|----|-----------------------|---------------|

Installing the free wheel gear



- Mount free wheel gear ❶.

Installing the primary gear



- Mount the spring washer.
- Degrease the cone and thinly apply thread locker to it.

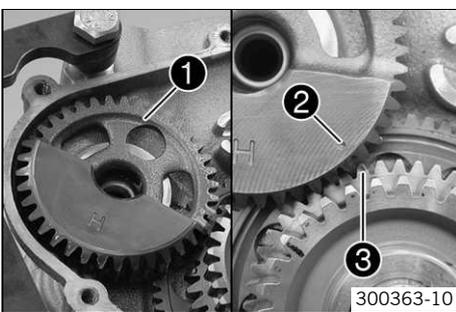
Loctite® 648™

- Mount primary gear ❶.

i Info

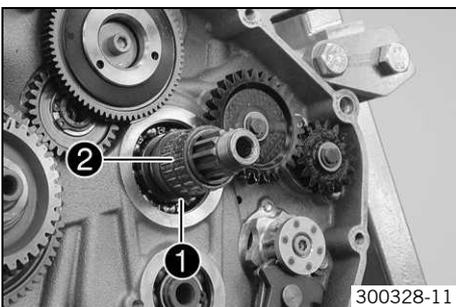
Turn the free wheel gear back and forth to ease engagement.

Installing the balancer shaft

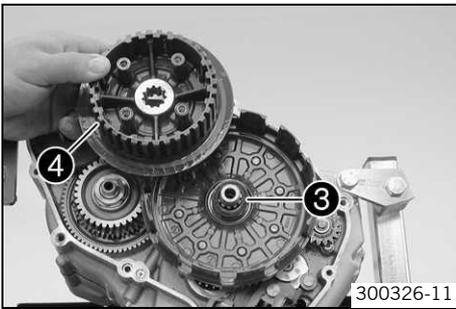


- Push balancer shaft ❶ into the bearing seat. Align marking ❷ on the balance weight with marking ❸ on the primary pinion.

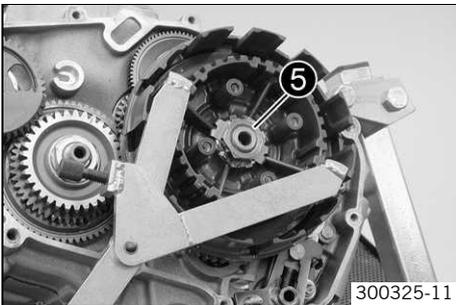
Installing the outer clutch hub



- Mount collar bushing ❶ and needle bearing ❷.



- Slide the outer clutch hub onto the gearbox main shaft. Turn the oil pump gear until the gear of the outer clutch hub meshes.
- Slide on washer ③ and inner clutch hub ④.



- Position the new lock washer and mount nut ⑤. 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. 268) |
|--|

- Secure the nut with the lock washer.

Installing the primary gear nut



- Block the clutch hub and primary gear using the special tool.

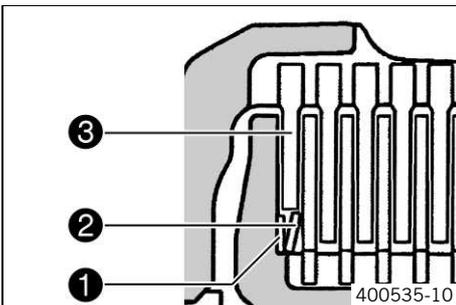
| |
|---------------------------------------|
| Gear segment (80029004000) (☛ p. 273) |
|---------------------------------------|

- Mount and tighten the nut.

Guideline

| | | | |
|-------------------|-----------|----------------------|----------------------|
| Nut, primary gear | M20LHx1.5 | 120 Nm (88.5 lbf ft) | Loctite® 243™ |
|-------------------|-----------|----------------------|----------------------|

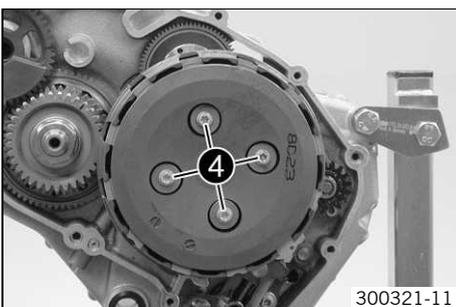
Installing the clutch discs



- Thoroughly grease the clutch facing discs.

| |
|------------------------------------|
| Engine oil (SAE 10W/50) (☛ p. 263) |
|------------------------------------|

- Insert support ring ① into the outer clutch hub.
- Insert pretension ring ② with the open side facing outward.
- Position the machined clutch facing disc ③ with the recess for the pretension ring into the outer clutch hub.
- Beginning with an intermediate disc, alternately insert all other clutch facing discs and intermediate discs into the outer clutch hub.

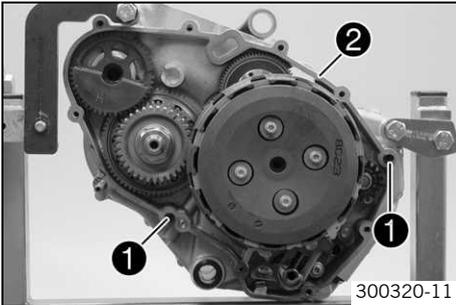


- Insert the pressure piece.
- Position the pressure cap. Mount screws ④ with the washers and springs. Tighten the screws in a crisscross pattern.

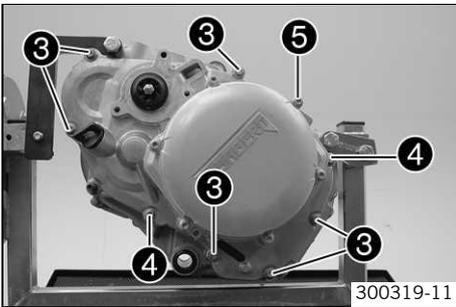
Guideline

| | | |
|----------------------|----|--------------------|
| Screw, clutch spring | M6 | 10 Nm (7.4 lbf ft) |
|----------------------|----|--------------------|

Installing the clutch cover



- Mount dowels ❶. Put clutch cover gasket ❷ in place.



- Mount the clutch cover.



Info

Turn the water pump impeller slightly in order to engage the water pump drive.

- Mount screws ❸ and tighten once all of the clutch cover screws have been mounted.

Guideline

| | | |
|---------------------|-------|--------------------|
| Screw, clutch cover | M6x25 | 10 Nm (7.4 lbf ft) |
|---------------------|-------|--------------------|

- Mount screws ❹ and tighten once all of the clutch cover screws have been mounted.

Guideline

| | | |
|---------------------|-------|--------------------|
| Screw, clutch cover | M6x30 | 10 Nm (7.4 lbf ft) |
|---------------------|-------|--------------------|

- Mount screw ❺ and tighten all screws in a crisscross pattern.

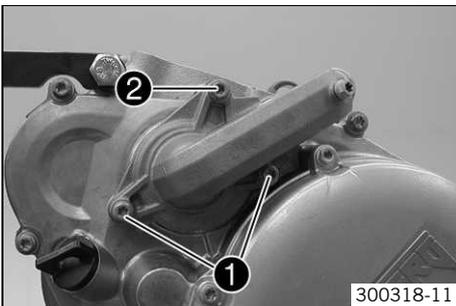
Guideline

| | | |
|---------------------|-------|--------------------|
| Screw, clutch cover | M6x65 | 10 Nm (7.4 lbf ft) |
|---------------------|-------|--------------------|

- Position the crankshaft at top dead center (TDC) and block using the special tool.

| |
|--|
| Crankshaft locking bolt (113080802) (☛ p. 267) |
|--|

Installing the water pump cover



- Put the water pump cover seal in place.
- Put the water pump cover on. Mount screws ❶ and tighten once all of the water pump cover screws have been mounted.

Guideline

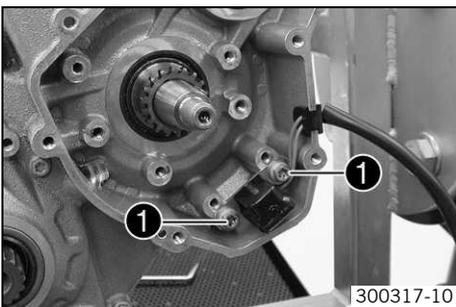
| | | |
|-------------------------|-------|--------------------|
| Screw, water pump cover | M6x25 | 10 Nm (7.4 lbf ft) |
|-------------------------|-------|--------------------|

- Mount screw ❷ and tighten all screws in a crisscross pattern.

Guideline

| | | |
|-------------------------|-------|--------------------|
| Screw, water pump cover | M6x55 | 10 Nm (7.4 lbf ft) |
|-------------------------|-------|--------------------|

Installing the ignition pulse generator



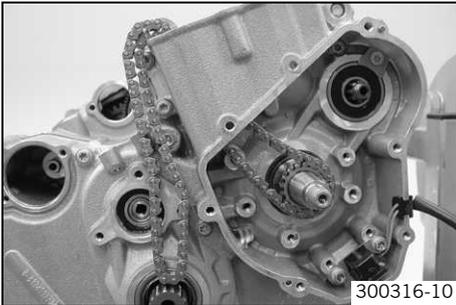
- Position the ignition pulse generator.
- Mount and tighten screws ❶.

Guideline

| | | | |
|---------------------------------|----|-------------------|----------------------|
| Screw, ignition pulse generator | M5 | 6 Nm (4.4 lbf ft) | Loctite® 243™ |
|---------------------------------|----|-------------------|----------------------|

- Position the cable and insert the cable support sleeve into the engine case.

Installing the timing chain

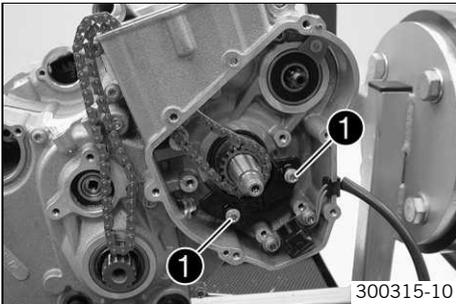


- Thread in the timing chain and place it over the timing chain sprocket.

i Info

If the timing chain is used, ensure it is running in the correct direction.

Installing the timing chain securing guide

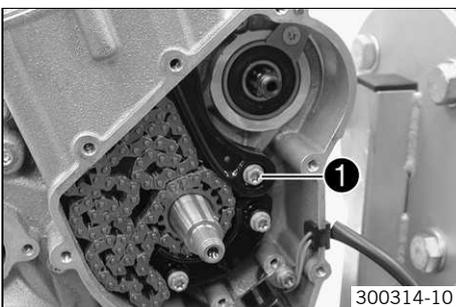


- Position the timing chain securing guide. Mount and tighten screws ❶.

Guideline

| | | | |
|------------------------------------|----|----------------------|----------------------|
| Screw, timing chain securing guide | M6 | 8 Nm (5.9 lbf ft) | Loctite® 243™ |
|------------------------------------|----|----------------------|----------------------|

Installing the timing chain tensioning rail

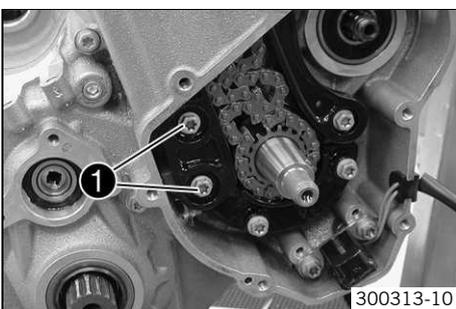


- Thread in the timing chain tensioning rail from the top. Mount and tighten screw ❶.

Guideline

| | | | |
|-------------------------------------|----|----------------------|----------------------|
| Screw, timing chain tensioning rail | M6 | 8 Nm (5.9 lbf ft) | Loctite® 243™ |
|-------------------------------------|----|----------------------|----------------------|

Installing the timing chain guide rail

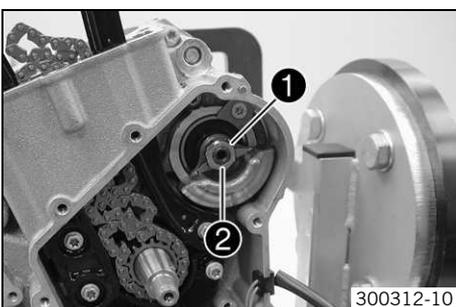


- Thread in the timing chain guide rail from the top. Mount and tighten screws ❶.

Guideline

| | | | |
|--------------------------------|----|----------------------|----------------------|
| Screw, timing chain guide rail | M6 | 8 Nm (5.9 lbf ft) | Loctite® 243™ |
|--------------------------------|----|----------------------|----------------------|

Installing the balance weight



- Mount the balance weight.

i Info

The shape of the gear mesh makes it impossible to mount the balance weight incorrectly.

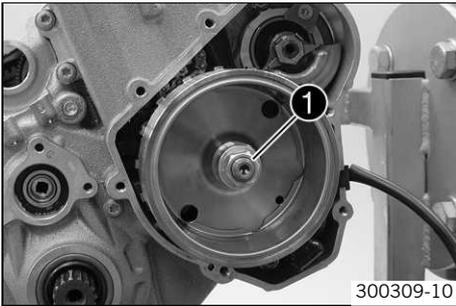
- Mount lock washer ❶ and nut ❷. Tighten the nut.

Guideline

| | | | |
|--------------------|-------|------------------------|--|
| Balancer shaft nut | M10x1 | 40 Nm (29.5 lbf ft) | |
|--------------------|-------|------------------------|--|

- Secure the nut with the lock washer.

Installing the rotor



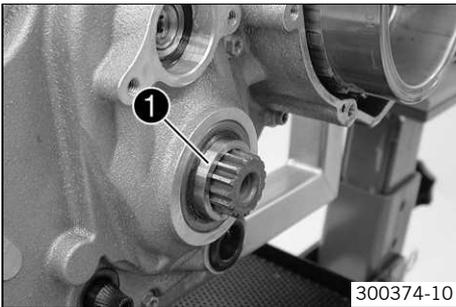
300309-10

- Ensure that the spring washers are seated properly. Mount the rotor.
- Mount and tighten the spring washer and nut ❶. Tighten the nut.

Guideline

| | | |
|------------|-------|------------------------|
| Nut, rotor | M12x1 | 60 Nm (44.3 lbf ft) |
|------------|-------|------------------------|

Installing the distance bushing



300374-10

- Grease the shaft seal ring.

Long-life grease (☛ p. 265)

- Position the O-ring. Mount distance bushing ❶ with the bevel facing inward.

Installing the piston



200086-01

- Move the joints of the compression ring and oil scraper ring so they are offset by 180°.
- Place the oiled piston on the cylinder. Compress the piston rings using the special tool.

Piston ring mounting tool (60029015000) (☛ p. 269)



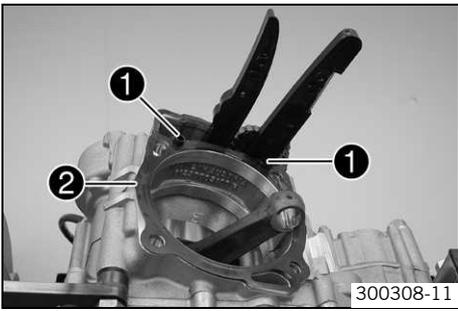
200087-01

- Tap lightly on the piston tension band 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.

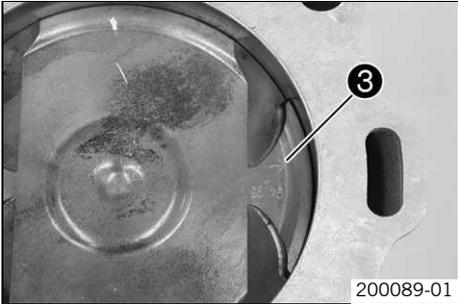


200088-01

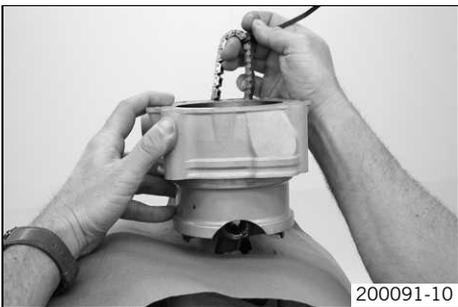
- Carefully tap the piston into the cylinder using the handle of the hammer.
 - ✓ The piston rings should not catch or they will be damaged.



- Mount dowels ❶ and put cylinder base gasket ❷ in place.



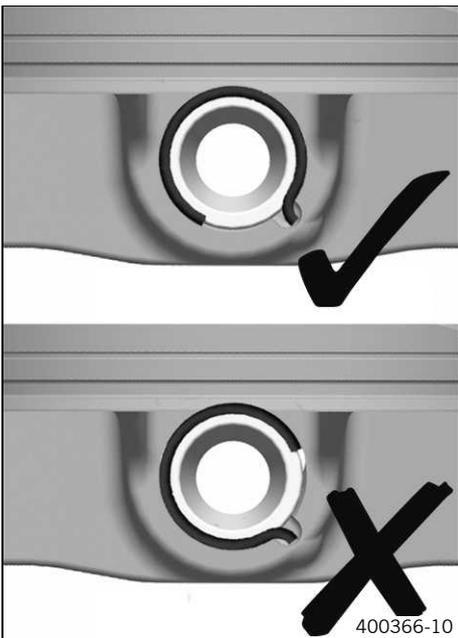
- Ensure that piston mark ❸ faces toward the exhaust side.



- Cover the engine housing opening with a cloth. Thread the timing chain through the chain shaft. Mount the piston pin.

i Info

In order to present them more clearly, the following steps will be shown with a removed piston.



- Position the piston pin retainer.

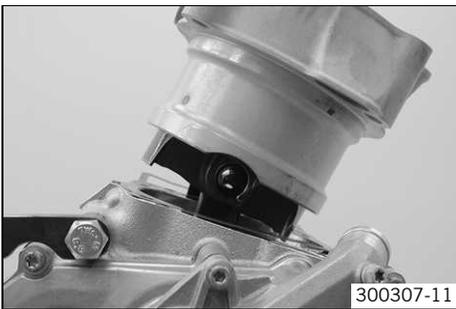


200084-10

- Insert the special tool and press it forcefully to the piston.
- Turn the special tool counterclockwise, thereby pushing the piston pin retainer into the groove.

Insert for piston pin retainer (77329030100) (☛ p. 272)

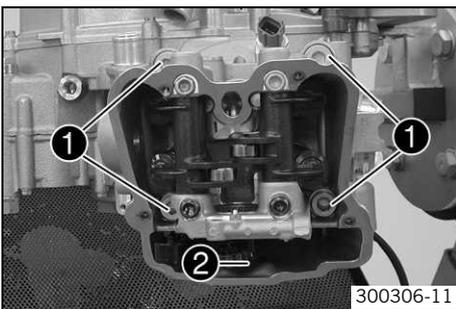
- Ensure that the piston pin retainer is seated properly on both sides.



300307-11

- Remove the cloth. Keep the timing chain held tightly.
- Carefully push the cylinder downward, letting the dowels engage.

Installing the cylinder head



300306-11

- Mount the dowels. Put the new cylinder head gasket in place.
- Put the cylinder head in place.
- Put on the cylinder head bolt washers.
- Mount cylinder head bolts ❶ and tighten in a crisscross pattern.

Guideline

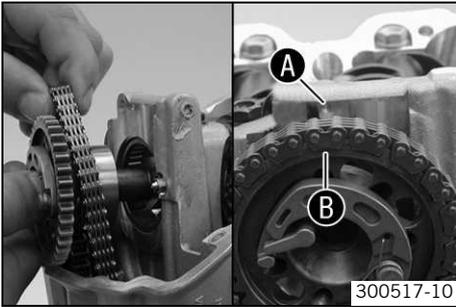
| | | | |
|----------------------|----------|---|----------------------------|
| Screw, cylinder head | M10x1.25 | Tightening sequence: Tighten diagonally, beginning with the rear screw on the chain shaft. Step 1 10 Nm (7.4 lbf ft) Step 2 30 Nm (22.1 lbf ft) Step 3 50 Nm (36.9 lbf ft) | lubricated with engine oil |
|----------------------|----------|---|----------------------------|

- Mount and tighten screw ❷.

Guideline

| | | |
|----------------------|----|--------------------|
| Screw, cylinder head | M6 | 10 Nm (7.4 lbf ft) |
|----------------------|----|--------------------|

Installing the camshaft

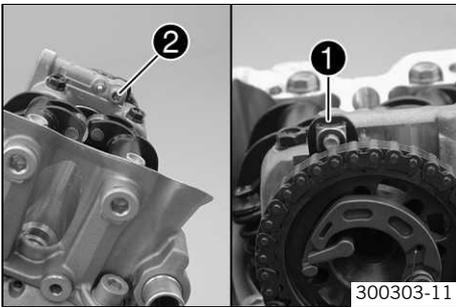


- Wrap the timing chain around the camshaft. Push the camshaft into the bearing seats.
- ✓ The cylinder head **A** and camshaft **B** markings are lined up with each other.



Info

Ensure that the crankshaft is at top dead center (TDC).

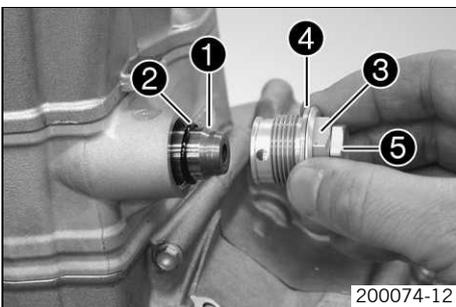


- Position camshaft support plate **1**. Mount and tighten screw **2**.

Guideline

| | | | |
|---------------------------------|----|--------------------|----------------------|
| Screw, camshaft bearing support | M6 | 10 Nm (7.4 lbf ft) | Loctite® 243™ |
|---------------------------------|----|--------------------|----------------------|

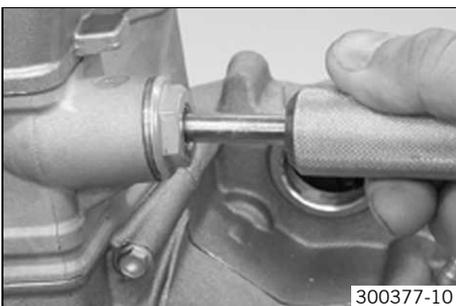
Installing the timing chain tensioner



- Position timing chain tensioner **1** and insert it with new O-ring **2**.
- Mount and tighten plug **3** with new seal ring **4**.

Guideline

| | | |
|------------------------------|---------|---------------------|
| Plug, timing chain tensioner | M24x1.5 | 30 Nm (22.1 lbf ft) |
|------------------------------|---------|---------------------|



- Remove screw **5** and press the timing chain tensioner toward the timing chain using the special tool.

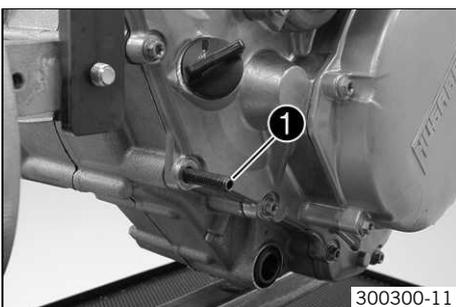
| |
|--|
| Release device for timing chain tensioner (77329051000) (☛ p. 272) |
|--|

- Mount and tighten screw **5**.

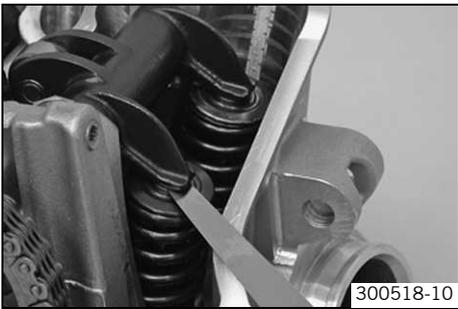
Guideline

| | | |
|--|-------|--------------------|
| Screw, unlocking of timing chain tensioner | M10x1 | 10 Nm (7.4 lbf ft) |
|--|-------|--------------------|

Checking the valve clearance



- Remove special tool **1**.
- Crank over the engine repeatedly.
- Position the engine at ignition top dead center (TDC). (☛ p. 100)



- Check the valve clearance at all valves between the valve and rocker arm.

Guideline

| Valve clearance | |
|---------------------------|---------------------------------------|
| Exhaust at: 20 °C (68 °F) | 0.12... 0.17 mm (0.0047... 0.0067 in) |
| Intake at: 20 °C (68 °F) | 0.10... 0.15 mm (0.0039... 0.0059 in) |

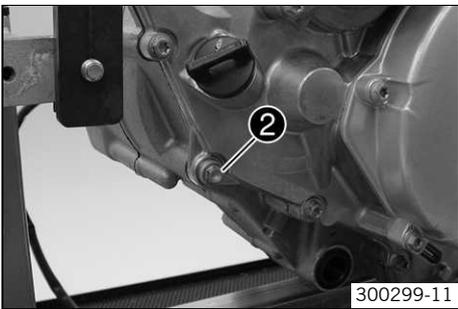
Feeler gauge (59029041100) (☛ p. 269)

- » If the valve clearance does not meet specifications:
 - Adjust the valve clearance. (☛ p. 149)

- Mount and tighten screw ②.

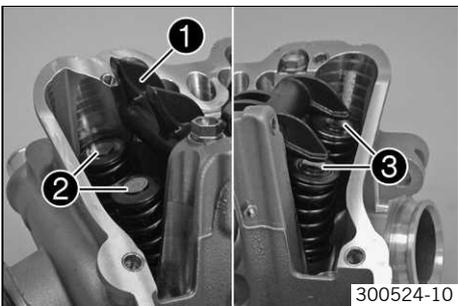
Guideline

| | | |
|---|----|--------------------|
| Plug, crank shaft location with thick copper disk | M8 | 10 Nm (7.4 lbf ft) |
|---|----|--------------------|



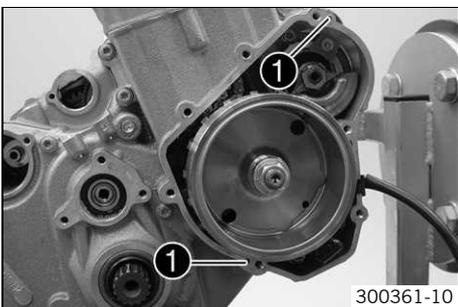
Adjusting the valve clearance

- Remove the timing chain tensioner. (☛ p. 101)
- Remove the camshaft. (☛ p. 101)
- Raise rocker arm ① on the outside.
- Remove shims ② and set down in the position in which they were installed.
- Correct the shims according to the findings from checking the valve play.
- Insert the fitting shims ③.
- Install the camshaft. (☛ p. 148)
- Install the timing chain tensioner. (☛ p. 148)
- Check the valve clearance. (☛ p. 148)



Installing the generator cover

- Mount centering pins ①. Position the generator cover seal.



- Position the generator cover. Mount screws ② and tighten once all of the generator cover screws have been mounted.

Guideline

| | | |
|------------------------|-------|--------------------|
| Screw, generator cover | M6x30 | 10 Nm (7.4 lbf ft) |
|------------------------|-------|--------------------|

- Mount screws ③ and tighten once all of the generator cover screws have been mounted.

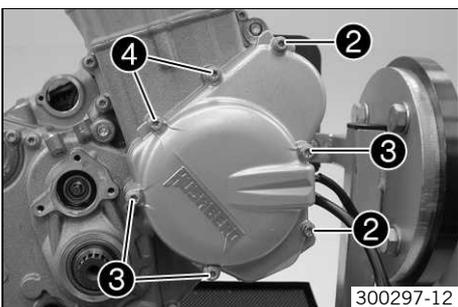
Guideline

| | | |
|------------------------|-------|--------------------|
| Screw, generator cover | M6x50 | 10 Nm (7.4 lbf ft) |
|------------------------|-------|--------------------|

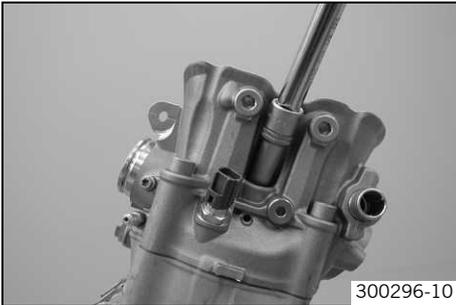
- Mount screw ④ with the seal ring and tighten all screws in a crisscross pattern.

Guideline

| | | | |
|---|-------|--------------------|---------------|
| Screw, generator cover (chain shaft through-hole) | M6x30 | 10 Nm (7.4 lbf ft) | Loctite® 243™ |
|---|-------|--------------------|---------------|



Installing the spark plug



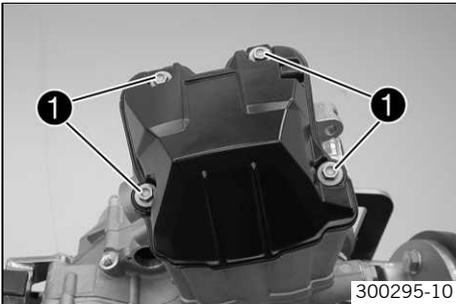
- Mount and tighten the spark plug with the special tool.

Guideline

| | | |
|------------|----------|---|
| Spark plug | M12x1.25 | 15... 20 Nm (11.1... 14.8 lbf ft) |
|------------|----------|---|

Spark plug wrench (75029172000) (☛ p. 271)

Installing the valve cover

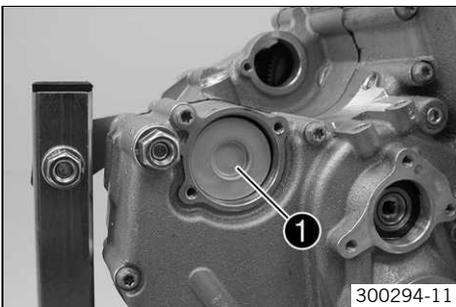


- Position the valve cover seal.
- Position the valve cover. Mount and tighten screws ❶.

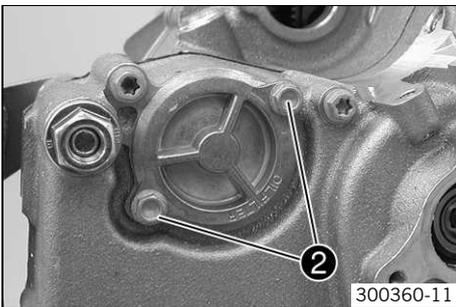
Guideline

| | | |
|--------------------|----|--------------------|
| Screw, valve cover | M6 | 10 Nm (7.4 lbf ft) |
|--------------------|----|--------------------|

Installing the oil filter



- Fill oil filter ❶ with engine oil and place in the oil filter housing.

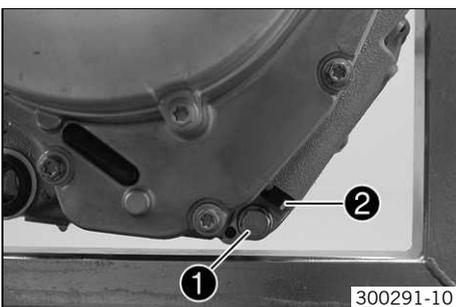


- Oil the O-ring of the oil filter cover.
- Mount the oil filter cover.
- Mount and tighten screws ❷.

Guideline

| | | |
|-------------------------|----|-------------------|
| Screw, oil filter cover | M5 | 6 Nm (4.4 lbf ft) |
|-------------------------|----|-------------------|

Installing the oil screen



- Mount and tighten the oil drain plug with magnet ❶ and the new sealing ring.

Guideline

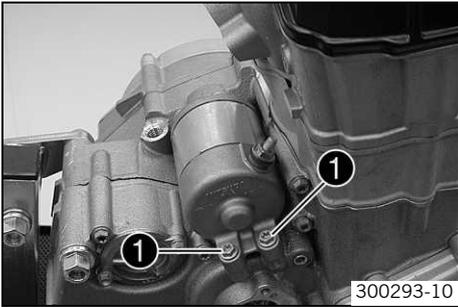
| | | |
|----------------------------|---------|------------------------|
| Oil drain plug with magnet | M12x1.5 | 20 Nm (14.8 lbf ft) |
|----------------------------|---------|------------------------|

- Thoroughly clean the plug and engine oil screen.
- Clean the sealing area on the engine.
- Mount and tighten engine oil screen plug ❷ with the O-rings.

Guideline

| | | |
|-------------------------|---------|------------------------|
| Plug, engine oil screen | M17x1.5 | 20 Nm (14.8 lbf ft) |
|-------------------------|---------|------------------------|

Assembling the starter motor



- Grease the O-ring. Position the starter motor.

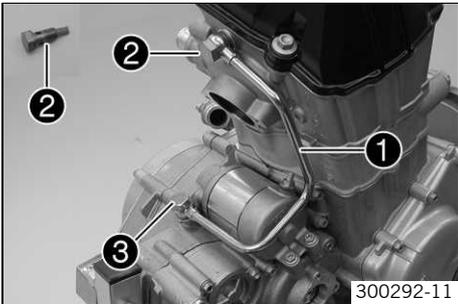
Long-life grease (☛ p. 265)

- Mount and tighten screws ❶.

Guideline

| | | |
|----------------------|----|--------------------|
| Screw, starter motor | M6 | 10 Nm (7.4 lbf ft) |
|----------------------|----|--------------------|

Installing the oil line



- Position oil line ❶.
- Mount and tighten banjo bolt ❷ with the engine oil screen and seal rings.

Guideline

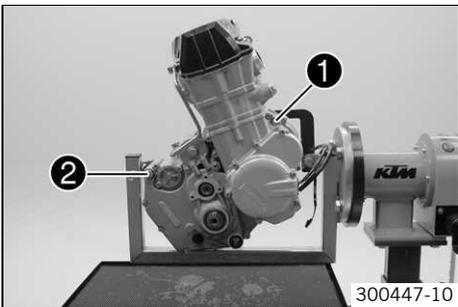
| | | |
|----------------------|-----|------------------------|
| Banjo bolt, oil line | M12 | 15 Nm (11.1 lbf ft) |
|----------------------|-----|------------------------|

- Mount and install banjo bolt ❸ with the seal ring.

Guideline

| | | |
|----------------------|-----|------------------------|
| Banjo bolt, oil line | M12 | 15 Nm (11.1 lbf ft) |
|----------------------|-----|------------------------|

Removing the engine from the work stand



- Remove screw connections ❶ and ❷.
- Remove the engine from the work stand.



Info

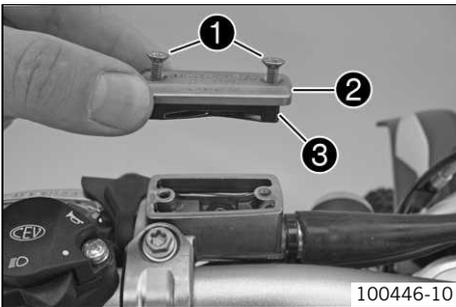
Use a helper or motorized hoist.

Checking the fluid level of the hydraulic clutch



Info

The fluid level rises with increasing wear of the clutch lining disks.
Do not use brake fluid.



100446-10

- Move the clutch fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ❶.
- Remove cover ❷ with membrane ❸.
- Check the fluid level.

| | |
|--|----------------|
| Fluid level under top level of container | 4 mm (0.16 in) |
|--|----------------|

» If the level of the fluid does not meet specifications:

- Correct the fluid level of the hydraulic clutch.

| |
|-------------------------------|
| Hydraulic oil (15) (☛ p. 263) |
|-------------------------------|

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

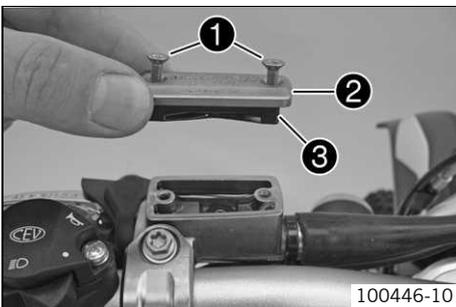
Changing the hydraulic clutch fluid



Warning

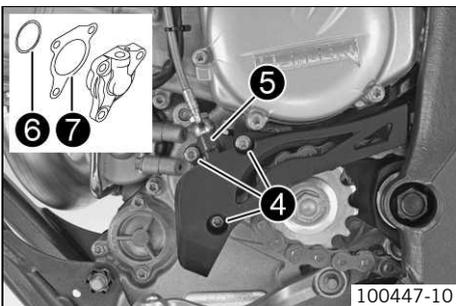
Environmental hazard Hazardous substances cause environmental damage.

- Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.



100446-10

- Move the clutch fluid reservoir mounted on the handlebar to a horizontal position.
- Remove screws ❶.
- Remove cover ❷ with membrane ❸.



100447-10

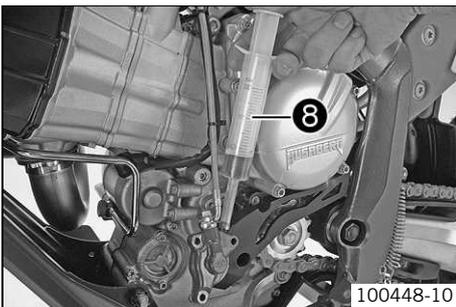
- Remove screws ❹. Lift off the engine sprocket cover at the front and carefully remove clutch slave cylinder ❺.



Info

Do not activate the clutch lever if the clutch slave cylinder has been removed.

- Remove O-ring ❻ and seal ❼.



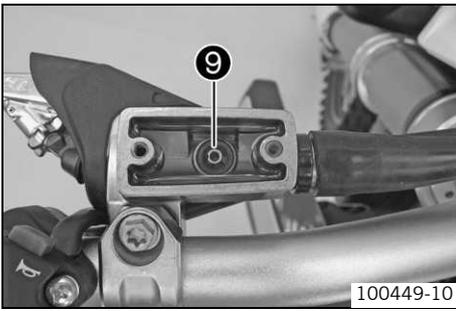
100448-10

- Fill bleeding syringe ❸ with the appropriate hydraulic fluid.

| |
|--|
| Bleed syringe (50329050000) (☛ p. 267) |
|--|

| |
|-------------------------------|
| Hydraulic oil (15) (☛ p. 263) |
|-------------------------------|

- On the clutch slave cylinder, remove the bleeder screw and mount the bleeding syringe.



- Inject the liquid into the system until it escapes from drill hole 9 of the clutch slave cylinder without bubbles.
- To prevent overflow, drain fluid occasionally from the clutch slave cylinder reservoir.
- Remove the bleeding syringe. Mount and tighten screws bleeder screw.
- Clean the sealing surfaces of the clutch slave cylinder and engine housing.
- Position the seal and O-ring on the clutch slave cylinder and install it.
- Mount and tighten the screws.

Guideline

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

- Correct the fluid level of the hydraulic clutch.

Guideline

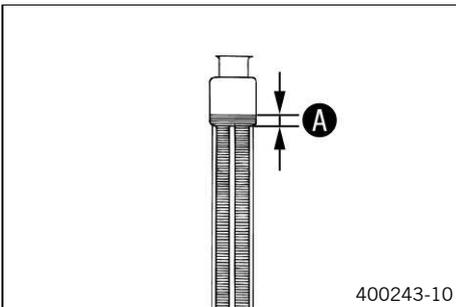
| | |
|---|----------------|
| Fluid level under top level of container. | 4 mm (0.16 in) |
|---|----------------|

- Position the cover with the membrane. Mount and tighten the screws.
- Check that the clutch is functioning properly.

Checking the coolant level

- Warning Scalding hazard** During motorcycle operation, the coolant gets very hot and is under pressure.
- Do not open the radiator, radiator hoses and other components of the cooling system while the engine is warm. Let the engine and cooling system cool down first. If you get scalded, immediately flush the affected areas with lukewarm water.

- Warning Danger of poisoning** Coolants are poisonous and a health hazard.
- Avoid contact between coolants and skin, eyes and clothing. If fuel gets into your eyes, rinse immediately with water and contact a doctor. Wash affected skin areas immediately with soap and water. If coolant is swallowed, contact a doctor immediately. Change clothes that have come into contact with coolants. Keep coolants out of the reach of children.



Condition

The engine is cold.

- Stand the motorcycle upright on a horizontal surface.
- Remove radiator cap.
- Check the coolant level in the radiator.

| | |
|---|-----------------|
| Coolant level A above the radiator fins. | 10 mm (0.39 in) |
|---|-----------------|

» If the level of the coolant does not meet specifications:

- Correct the coolant level.

Alternative 1

| |
|--------------------|
| Coolant (☛ p. 263) |
|--------------------|

Alternative 2

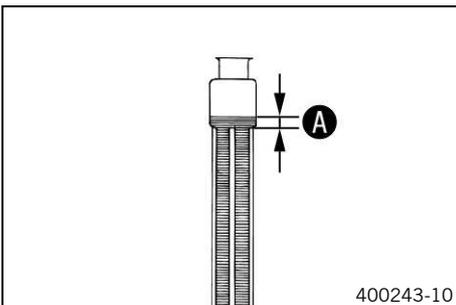
| |
|---|
| Coolant (mixed ready to use) (☛ p. 263) |
|---|

- Refit the radiator cap.

Checking the antifreeze and coolant level

- Warning Scalding hazard** During motorcycle operation, the coolant gets very hot and is under pressure.
- Do not open the radiator, radiator hoses and other components of the cooling system while the engine is warm. Let the engine and cooling system cool down first. If you get scalded, immediately flush the affected areas with lukewarm water.

- Warning Danger of poisoning** Coolants are poisonous and a health hazard.
- Avoid contact between coolants and skin, eyes and clothing. If fuel gets into your eyes, rinse immediately with water and contact a doctor. Wash affected skin areas immediately with soap and water. If coolant is swallowed, contact a doctor immediately. Change clothes that have come into contact with coolants. Keep coolants out of the reach of children.



Condition

The engine is cold.

- Stand the motorcycle upright on a horizontal surface.
- Remove the radiator cap.
- Check the antifreeze of the coolant.

| |
|-------------------------------|
| -25... -45 °C (-13... -49 °F) |
|-------------------------------|

» If the antifreeze of the coolant does not meet specifications:

- Correct the antifreeze of the coolant.

- Check the coolant level in the radiator.

| | |
|---|-----------------|
| Coolant level A above radiator fins. | 10 mm (0.39 in) |
|---|-----------------|

» If the level of the coolant does not meet specifications:

- Correct the coolant level.

Alternative 1

| |
|--------------------|
| Coolant (☛ p. 263) |
|--------------------|

Alternative 2

| |
|---|
| Coolant (mixed ready to use) (☛ p. 263) |
|---|

- Refit the radiator cap.

Draining the coolant

Warning
Scalding hazard During motorcycle operation, the coolant gets very hot and is under pressure.

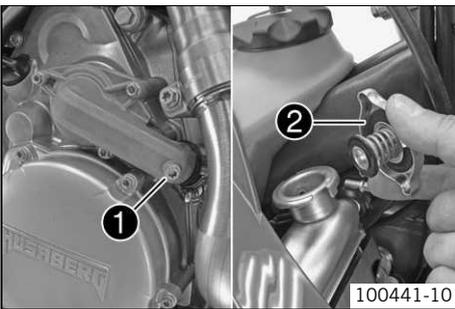
- Do not open the radiator, radiator hoses and other components of the cooling system while the engine is warm. Let the engine and cooling system cool down first. If you get scalded, immediately flush the affected areas with lukewarm water.

Warning
Danger of poisoning Coolants are poisonous and a health hazard.

- Avoid contact between coolants and skin, eyes and clothing. If fuel gets into your eyes, rinse immediately with water and contact a doctor. Wash affected skin areas immediately with soap and water. If coolant is swallowed, contact a doctor immediately. Change clothes that have come into contact with coolants. Keep coolants out of the reach of children.

Condition

The engine is cold.



- Stand the vehicle upright.
- Place a suitable container under the water pump cover.
- Remove screw ❶. Remove radiator cap ❷.
- Completely drain the coolant.
- Mount and tighten screw ❶ with a new seal ring.

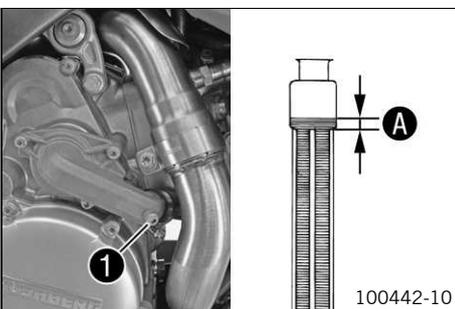
Guideline

| | | |
|-----------------------------|----|--------------------|
| Plug, water pump drain hole | M6 | 10 Nm (7.4 lbf ft) |
|-----------------------------|----|--------------------|

Refilling coolant

Warning
Danger of poisoning Coolants are poisonous and a health hazard.

- Avoid contact between coolants and skin, eyes and clothing. If fuel gets into your eyes, rinse immediately with water and contact a doctor. Wash affected skin areas immediately with soap and water. If coolant is swallowed, contact a doctor immediately. Change clothes that have come into contact with coolants. Keep coolants out of the reach of children.



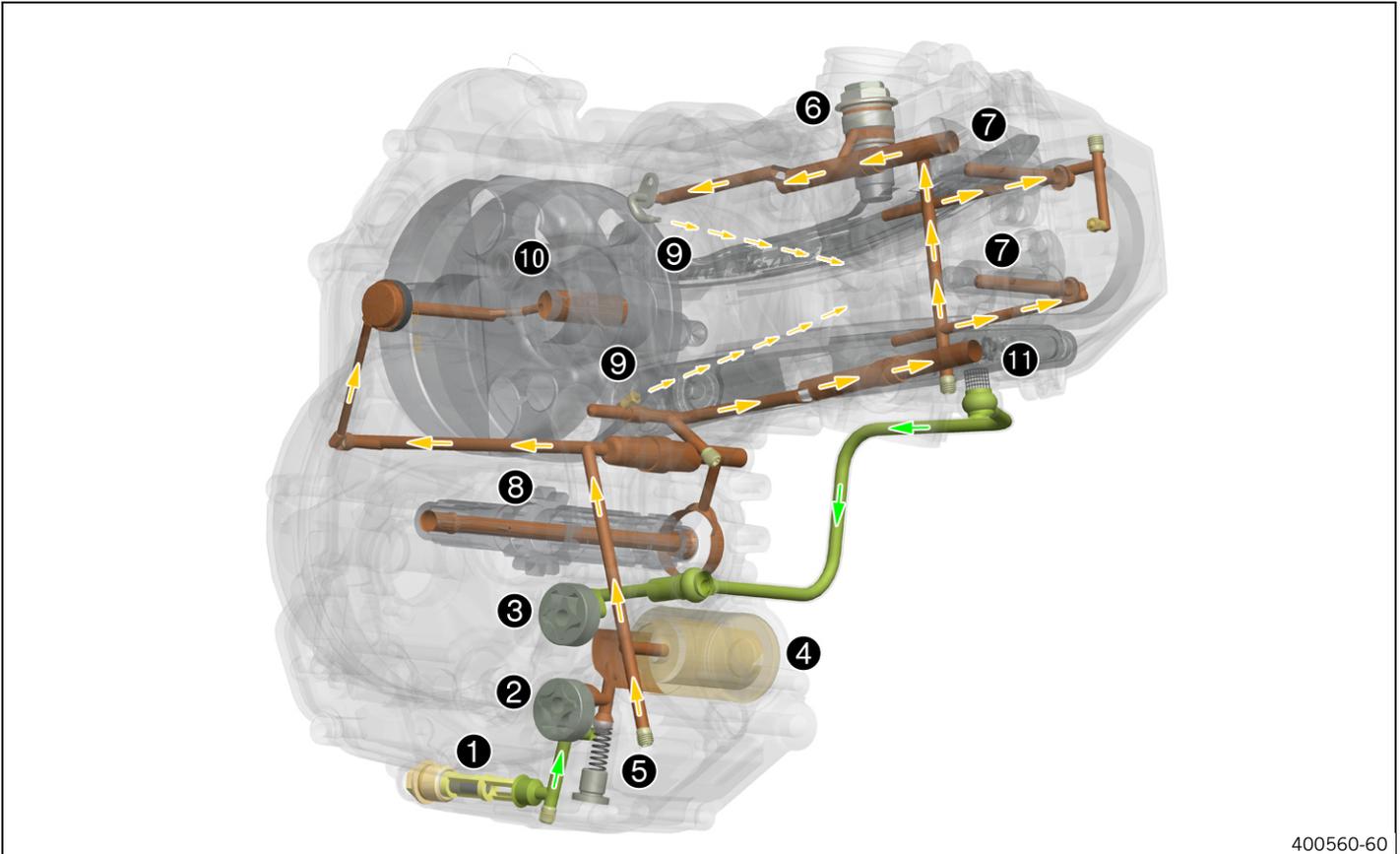
- Make sure that screw ❶ is tightened.
- Stand the vehicle upright.
- Pour coolant in up to measurement A above the radiator fins.

Guideline

| | | |
|-----------------|-------------------|---|
| 10 mm (0.39 in) | | |
| Coolant | 1.00 l (1.06 qt.) | Coolant (☛ p. 263) |
| | | Coolant (mixed ready to use) (☛ p. 263) |

- Refit the radiator cap.
- Make a short test ride.
- Check the coolant level. (☛ p. 154)

Oil circuit



400560-60

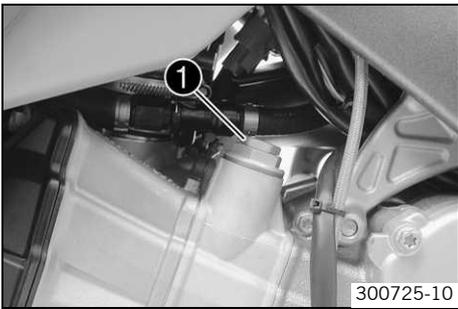
| | |
|----|------------------------------|
| 1 | Oil screen |
| 2 | Force pump |
| 3 | Suction pump |
| 4 | Oil filter |
| 5 | Oil pressure regulator valve |
| 6 | Timing chain tensioner |
| 7 | Rocker arm shaft |
| 8 | Gearbox |
| 9 | Oil jet, piston cooling |
| 10 | Crankshaft |
| 11 | Banjo bolt oil screen |

Checking the engine oil pressure

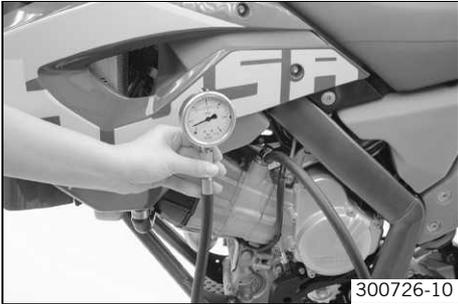
Warning
Danger of scalding Engine oil and gear oil get very hot when the motorcycle is driven.
 – Wear suitable protective clothing and protective gloves. If you get scalded, immediately flush the affected areas with lukewarm water.

Warning
Environmental hazard Hazardous substances cause environmental damage.
 – Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.

– Jack up the motorcycle. (🔧 p. 9)



300725-10



300726-10

- Remove screw ❶.

- Position the banjo bolt with the connection and seal rings. Mount and tighten the banjo bolt.

Guideline

| | | |
|------------|-------|-------------------|
| Banjo bolt | M10x1 | 8 Nm (5.9 lbf ft) |
|------------|-------|-------------------|

Oil pressure adapter (77329006000) (☛ p. 272)

- Connect the pressure measurement tool, without t-plate, to the special tool.

Pressure testing tool (61029094000) (☛ p. 269)

- Check the engine oil level. (☛ p. 158)



Danger

Danger of poisoning Exhaust gases are poisonous and can result in unconsciousness and/or death.

- When running the engine, always make sure there is sufficient ventilation, and do not start or run the engine in a closed space without an effective exhaust extraction system.

- Start the engine and let it warm up.
- Check the engine oil pressure.

| Engine oil pressure | |
|--|-------------------------------|
| Coolant temperature: ≥ 70 °C (≥ 158 °F) Engine speed: 1,500 rpm | 1.3... 2.3 bar (19... 33 psi) |
| Coolant temperature: ≥ 70 °C (≥ 158 °F) Engine speed: 5,000 rpm | 3.0... 4.0 bar (44... 58 psi) |

» If the measured value is less than the specification:

- Replace the oil filter. Check the oil pump for wear. Check all oil holes 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.
- Mount and tighten screw ❶.

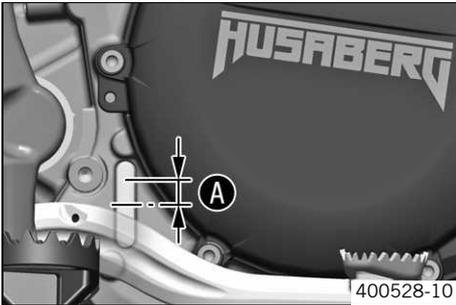
Guideline

| | | |
|--|-------|--------------------|
| Screw, unlocking of timing chain tensioner | M10x1 | 10 Nm (7.4 lbf ft) |
|--|-------|--------------------|

- Remove the motorcycle from the work stand. (☛ p. 9)
- Check the engine oil level. (☛ p. 158)

Checking the engine oil level

i Info
The engine oil level must be checked when the engine is cold.



- Stand the motorcycle upright on a horizontal surface.

Condition

The engine is cold.

- Check the engine oil level.

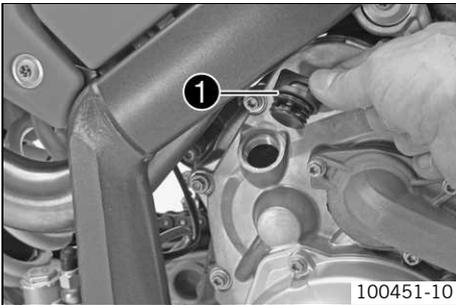
| |
|--|
| The engine oil level must be within range A . |
|--|

| | |
|---|-----------------|
| Range A above the middle of the viewer | 10 mm (0.39 in) |
|---|-----------------|

- » If the engine oil level is below the specified level:
 - Add engine oil. (☛ p. 158)

Adding engine oil

i Info
Too little engine oil or poor-quality engine oil results in premature wear to the engine.



- Remove screw connection **1** and add engine oil.

| |
|------------------------------------|
| Engine oil (SAE 10W/50) (☛ p. 263) |
|------------------------------------|

- Mount and tighten screw cap **1**.



Danger

Danger of poisoning Exhaust gases are poisonous and can result in unconsciousness and/or death.

- When running the engine, always make sure there is sufficient ventilation, and do not start or run the engine in a closed space without an effective exhaust extraction system.

- Start the engine and let it run briefly. Stop the engine and check that it is oil-tight.
- Check the engine oil level. (☛ p. 158)

Changing the engine oil and oil filter, cleaning the engine oil screen

- Remove the engine guard. (☛ p. 30)
- Drain engine oil, clean engine oil screen. (☛ p. 158)
- Remove the oil filter. (☛ p. 159)
- Install the oil filter. (☛ p. 160)
- Fill up with engine oil. (☛ p. 160)
- Install the engine guard. (☛ p. 30)

Draining engine oil, cleaning engine oil screen

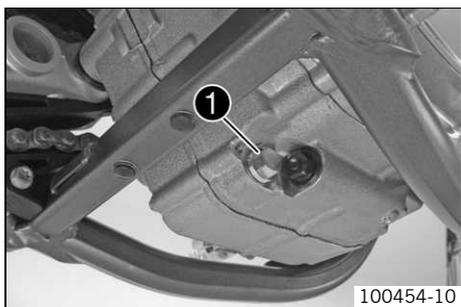
Warning
Danger of scalding Engine oil and gear oil get very hot when the motorcycle is driven.

- Wear suitable protective clothing and protective gloves. If you get scalded, immediately flush the affected areas with lukewarm water.

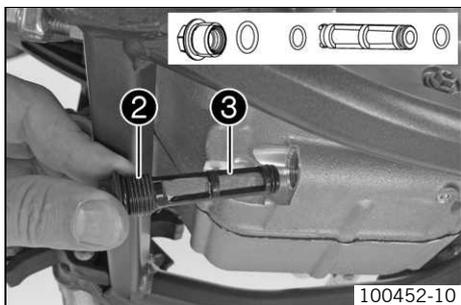
Warning
Environmental hazard Hazardous substances cause environmental damage.

- Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.

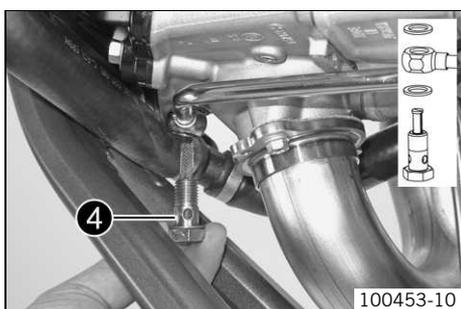
i Info
Drain the engine oil only when the engine is warm.



- Place the motorcycle upright on a horizontal surface (not on the side stand).
- Place a suitable container under the engine.
- Remove oil drain plug ❶ with the magnet and seal ring.



- Remove engine oil screen plug ❷ with engine oil screen ❸.
- Completely drain the engine oil.



- Remove banjo bolt ❹ with the oil screen.
- Thoroughly clean the parts and sealing surfaces.
- Mount and tighten banjo bolt ❹ with the oil screen and seals.

Guideline

| | | |
|----------------------|-----|------------------------|
| Banjo bolt, oil line | M12 | 15 Nm (11.1 lbf ft) |
|----------------------|-----|------------------------|

- Oil the O-rings on the engine oil screen and insert them in the engine oil screen plug. Mount and tighten the engine oil screen plug.

Guideline

| | | |
|-------------------------|---------|------------------------|
| Plug, engine oil screen | M17x1.5 | 20 Nm (14.8 lbf ft) |
|-------------------------|---------|------------------------|

- Mount and tighten the oil drain plug with the magnet and seal ring.

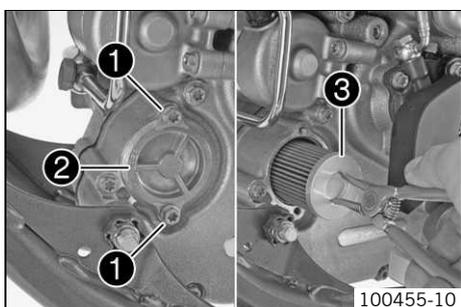
Guideline

| | | |
|----------------------------|---------|------------------------|
| Oil drain plug with magnet | M12x1.5 | 20 Nm (14.8 lbf ft) |
|----------------------------|---------|------------------------|

Removing the oil filter

- Warning**
Danger of scalding Engine oil and gear oil get very hot when the motorcycle is driven.
- Wear suitable protective clothing and protective gloves. If you get scalded, immediately flush the affected areas with luke-warm water.

- Warning**
Environmental hazard Hazardous substances cause environmental damage.
- Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.

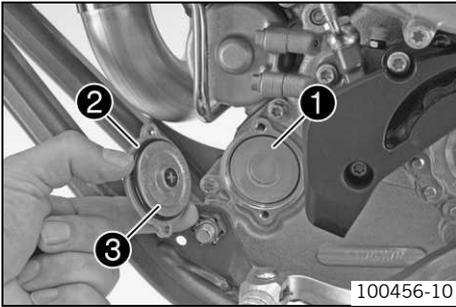


- Place a suitable container under the engine.
- Remove screws ❶. Remove oil filter cover ❷ with the O-ring.
- Pull oil filter ❸ out of the oil filter housing.

Circlip pliers reverse (51012011000) (☛ p. 268)

- Completely drain the engine oil.

Installing the oil filter



- Insert oil filter ❶ into the oil filter housing.
- Oil O-ring ❷ of the oil filter cover.
- Mount oil filter cover ❸.
- Mount and tighten the screws.

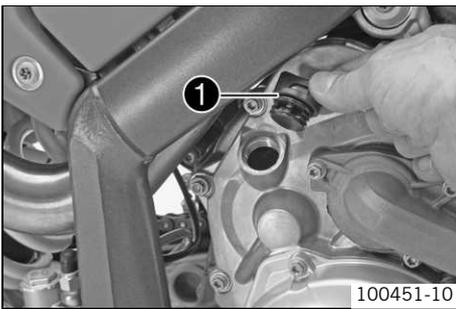
Guideline

| | | |
|-------------------------|----|-------------------|
| Screw, oil filter cover | M5 | 6 Nm (4.4 lbf ft) |
|-------------------------|----|-------------------|

Filling up with engine oil

i Info

Too little engine oil or poor-quality engine oil results in premature wear to the engine.



- Remove screw connection ❶ and add engine oil.

| | | |
|------------|-------------------|------------------------------------|
| Engine oil | 1.35 l (1.43 qt.) | Engine oil (SAE 10W/50) (☛ p. 263) |
|------------|-------------------|------------------------------------|

- Mount and tighten screw cap ❶.

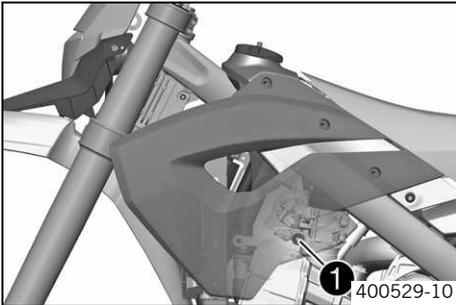


Danger

Danger of poisoning Exhaust gases are poisonous and can result in unconsciousness and/or death.

- When running the engine, always make sure there is sufficient ventilation, and do not start or run the engine in a closed space without an effective exhaust extraction system.

- Start the engine and check that it is oil-tight.
- Check the engine oil level. (☛ p. 158)

Idle speed adjusting screw

Idle speed adjusting screw **1** is attached to the throttle valve body on the left side. The idle speed adjusting screw has two functions. Turning it controls the idle speed. Pulling it out all the way raises the idle speed during a cold start.

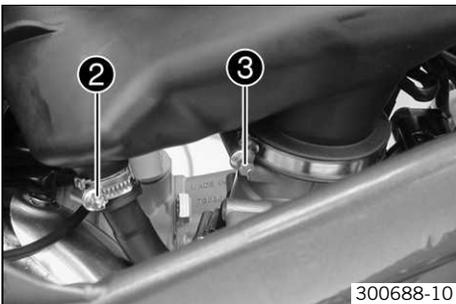
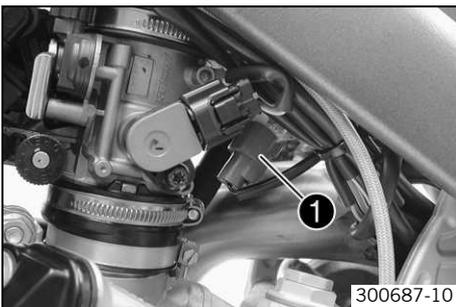
Possible states

- RPM increase activated – Idle speed adjusting screw is pulled out all the way.
- RPM increase deactivated – Idle speed adjusting screw is pushed in all the way.

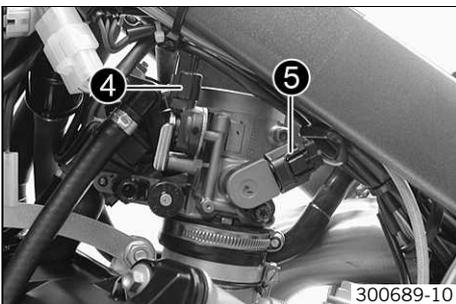
Taking off the throttle valve body and allowing it to hang to the side**Condition**

The battery has been disconnected.

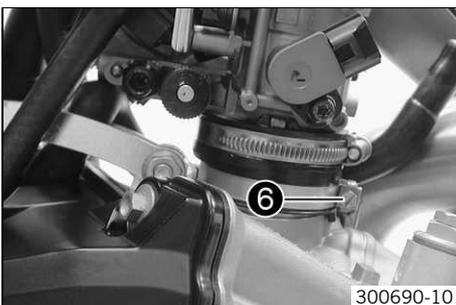
- Remove the fuel tank. (☛ p. 59)
- Disconnect connector **1** of the intake air temperature sensor.



- Undo hose clip **2**.
- Pull off the hose.
- Undo hose clip **3**.
- Pull off the intake trumpet.



- Disconnect connector **4** of the manifold absolute pressure sensor.
- Disconnect connector **5** of the throttle position sensor.



- Undo hose clip **6**.
- Disconnect the throttle valve body.



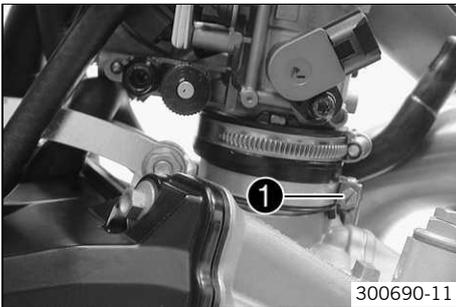
300691-10

- Take off the throttle valve body and allow it to hang tension-free to the side.

Installing the throttle valve body

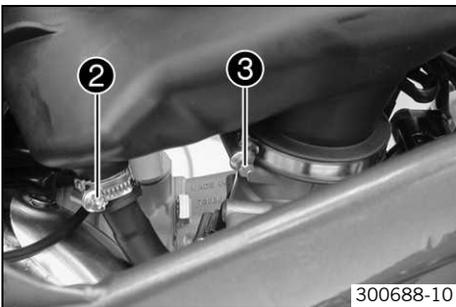
Condition

The battery has been disconnected.



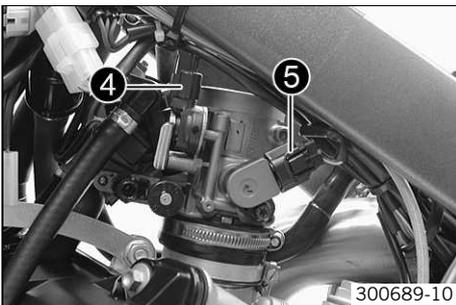
300690-11

- Position the throttle valve body.
- Mount hose clip ❶ and tighten it.



300688-10

- Mount the hose.
- Mount hose clip ❷ and tighten it.
- Mount the intake trumpet.
- Mount hose clip ❸ and tighten it.



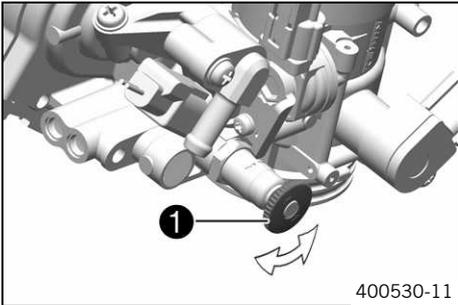
300689-10

- Connect connector ❹ of the manifold absolute pressure sensor.
- Connect connector ❺ of the throttle position sensor.



300687-11

- Connect connector ❻ of the intake air temperature sensor.
- Install the fuel tank. (☛ p. 60)

Adjusting the idle speed

- Idle speed adjusting screw ❶ is attached to the throttle valve body on the left side.
- Run the engine warm and push the idle speed adjusting screw all the way in.
- Set the desired idle speed by turning the idle speed adjusting screw.

Guideline

| | |
|------------|--------------------|
| Idle speed | 1,700... 1,800 rpm |
|------------|--------------------|

**Info**

- Turn counterclockwise to increase the idle speed.
- Turn clockwise to decrease the idle speed.

| | |
|---|---|
| Flash code FI warning lamp (MIL) |  45 FI warning lamp (MIL) flashes 4x long, 5x short |
| Display on diagnostic tool | P0031 "Heater lambda sensor cylinder 1, sensor 1" "Open/short circuit to ground" |
| Error level condition | Malfunction in the circuit: ≥ 3 s |
| Function check | Checking the heating lambda sensor (☛ p. 164) |
| Possible cause | Heating lambda sensor - power supply is faulty (☛ p. 164) |
| | Heating lambda sensor - value is not plausible (☛ p. 165) |
| | Heating lambda sensor - control line is open (☛ p. 165) |
| | Heating lambda sensor - control line has a short circuit to sensor ground (☛ p. 166) |
| | Heating lambda sensor - control line has a short circuit to ground (terminal 31) (☛ p. 166) |

Checking the heating lambda sensor

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"actuator test"**.
- **"Please enter password:"**
- Press **"Continue"**.
- Select **"Heating lambda sensor cylinder 1"**.
- Press **"Continue"**.
- Read the information page in the HUSABERG diagnostic tool and, with **"Continue"**, begin the actuator test.

| | |
|--|-----|
| Lambda sensor | |
| "Function Hego Sensor Bank 1" at test start Voltage "Hego1AD" | 5 V |

| | |
|--|-----|
| Lambda sensor | |
| "Function Hego Sensor Bank 1" at test end Voltage "Hego1AD" | 0 V |

- » If the displayed value is equal to the setpoint value:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is not equal to the setpoint value:
 - Check the next possible cause:
Heating lambda sensor - power supply is faulty (☛ p. 164)

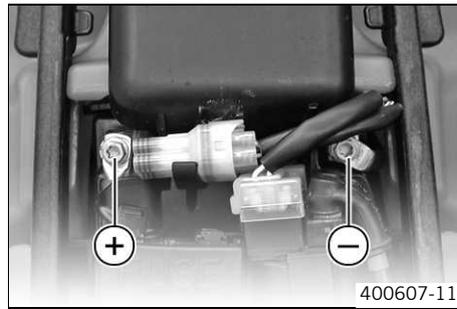
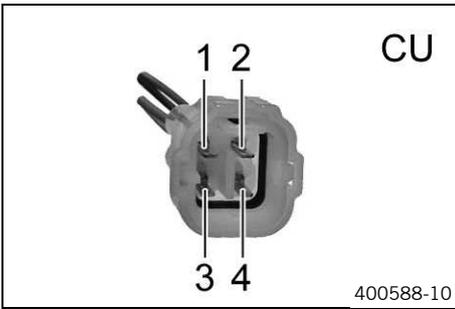
Heating lambda sensor - power supply is faulty

Condition

The diagnostic tool is connected and active.

The EFI control unit is connected.

Lambda sensor is disconnected.



Heating lambda sensor - check the power supply

- **V** Measure the voltage between the specified points.
Connector **CU** Pin **3** – measuring point **Ground(-)**



Info

For the measurement, the measurement points must be loaded with a 12V/21W bulb.

The value should not vary more than 1V from the battery voltage **"VBAT"**.

- » If the measured value does not correspond to the specified value:
 - Check connector **CU** pin **3**.
 - Check the cable from connector **CU** pin **3** to the next node in the cable harness for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Heating lambda sensor - value is not plausible (☛ p. 165)

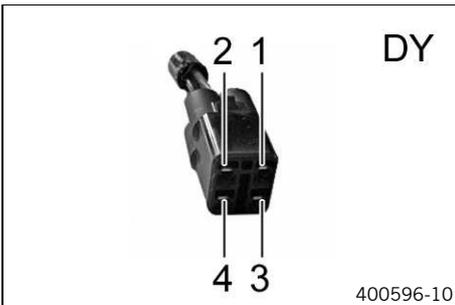
Heating lambda sensor - value is not plausible

Condition

The diagnostic tool is disconnected.
Lambda sensor is disconnected.

Heating lambda sensor - check the resistance

- **Ω** Measure the resistance between the specified points.
Connector **DY** Pin **3** – Connector **DY** Pin **4**



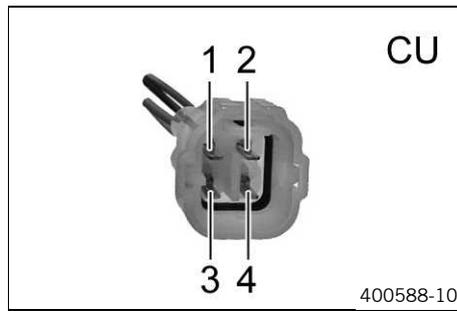
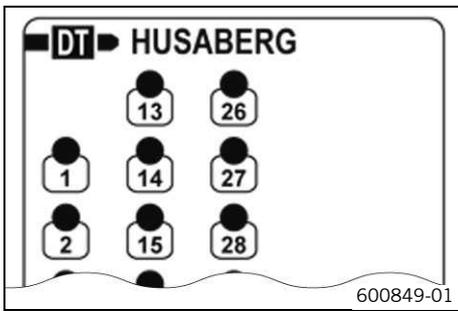
| | |
|------------------------------|--------------|
| Heating lambda sensor | |
| Resistance at: 20 °C (68 °F) | 6.9... 8.5 Ω |

- » If the measured value does not correspond to the specified value:
 - Check connector **DY** pin **3** and connector **DY** pin **4**.
 - Check the cable of the lambda sensor to connector **DY** pin **3** and connector **DY** pin **4**.
 - Change the lambda sensor.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Heating lambda sensor - control line is open (☛ p. 165)

Heating lambda sensor - control line is open

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Lambda sensor is disconnected.



Heating lambda sensor - check the control line for an open circuit

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **11** – Connector **CU** Pin **4**

| | |
|------------|---------|
| Resistance | ≤ 0.6 Ω |
|------------|---------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **11** and connector **CU** pin **4**.
 - Check the cable from connector **DT** pin **11** to connector **CU** pin **4** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Heating lambda sensor - control line has a short circuit to sensor ground (☛ p. 166)

Heating lambda sensor - control line has a short circuit to sensor ground

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Lambda sensor is disconnected.

Heating lambda sensor - check the control line for a short circuit to sensor ground

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **11** – Break Out Box **DT** Pin **24**

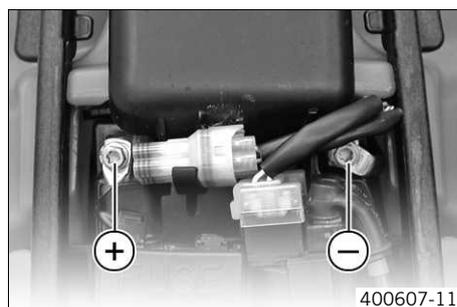
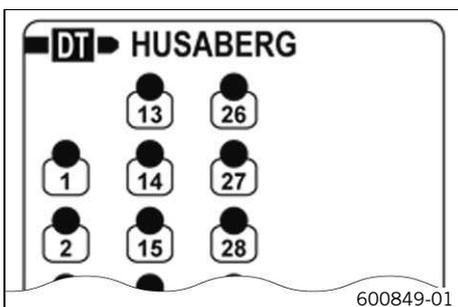
| | |
|------------|-----|
| Resistance | ∞ Ω |
|------------|-----|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **11** to connector **CU** pin **4** for a short circuit to sensor ground.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Heating lambda sensor - control line has a short circuit to ground (terminal 31) (☛ p. 166)

Heating lambda sensor - control line has a short circuit to ground (terminal 31)

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Lambda sensor is disconnected.



Heating lambda sensor - check the control line for a short circuit to ground (terminal 31)

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **11** – measuring point **Ground(-)**

| | |
|------------|-----|
| Resistance | ∞ Ω |
|------------|-----|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **11** to connector **CU** pin **4** for a short circuit to ground (terminal 31).
- » If the measured value corresponds to the specified value:
 - Contact customer service.

| | |
|---|--|
| Flash code FI warning lamp (MIL) |  09 FI warning lamp (MIL) flashes 9x short |
| Display on diagnostic tool | P0107 "Manifold absolute pressure sensor cylinder 1" "Input signal too low" |
| Error level condition | Manifold absolute pressure sensor voltage "PM1AD" : ≤ 0.215 V Time: ≥ 3 s |
| Function check | Manifold absolute pressure sensor - checking the voltage (☛ p. 168) |
| Possible cause | Manifold absolute pressure sensor - signal line has a short circuit to sensor ground (☛ p. 168) |
| | Manifold absolute pressure sensor - signal line has a short circuit to ground (terminal 31) (☛ p. 169) |
| | Manifold absolute pressure sensor - power supply is open (☛ p. 169) |

Manifold absolute pressure sensor - checking the voltage

Condition

The diagnostic tool is connected and active.
 The engine is not running.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"Measurement values"**.
- Highlight **"Mixture preparation, general"**.
- Press **"Continue"**.
- Highlight the measured value **"Manifold absolute pressure sensor cylinder 1 voltage (PM1AD)"** and deselect the other parameters with **"Select measured value"**.

| Manifold absolute pressure sensor voltage "PM1AD" | |
|--|--------|
| at: 800 mbar (11.6 psi) | 2.31 V |
| at: 850 mbar (12.33 psi) | 2.45 V |
| at: 900 mbar (13.05 psi) | 2.58 V |
| at: 1,000 mbar (14.5 psi) | 2.86 V |
| at: 1,050 mbar (15.23 psi) | 2.99 V |

- » If the displayed value is equal to the setpoint value:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is below the setpoint value:
 - Check the next possible cause:
 Manifold absolute pressure sensor - signal line has a short circuit to sensor ground (☛ p. 168)

Manifold absolute pressure sensor - signal line has a short circuit to sensor ground

Condition

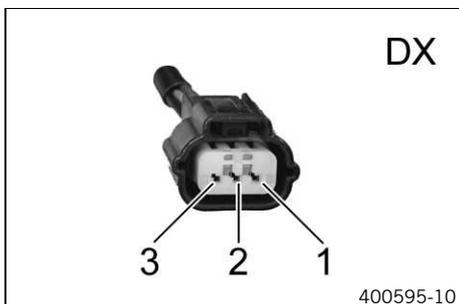
The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The manifold absolute pressure sensor is disconnected.

Manifold absolute pressure sensor - check the signal line for a short circuit to sensor ground

-  Measure the resistance between the specified points.
 Connector **DX** Pin **2** – Connector **DX** Pin **3**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DX** pin **2** to connector **DT** pin **6** for a short circuit to sensor ground.

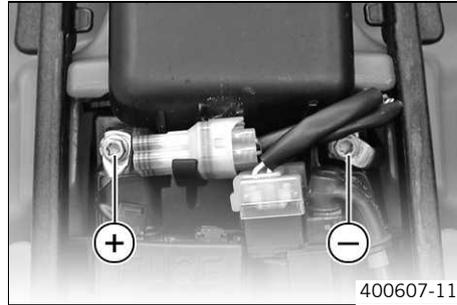
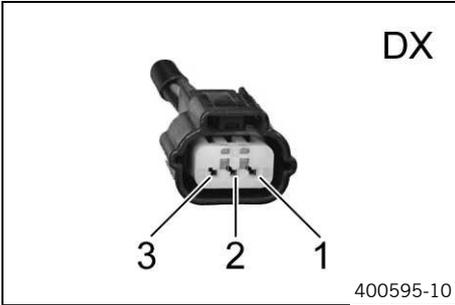


- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Manifold absolute pressure sensor - signal line has a short circuit to ground (terminal 31) (☛ p. 169)

Manifold absolute pressure sensor - signal line has a short circuit to ground (terminal 31)

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The manifold absolute pressure sensor is disconnected.



Manifold absolute pressure sensor - check the signal line for a short circuit to ground (terminal 31)

- Measure the resistance between the specified points.
Connector **DX** Pin **2** – measuring point **Ground(-)**

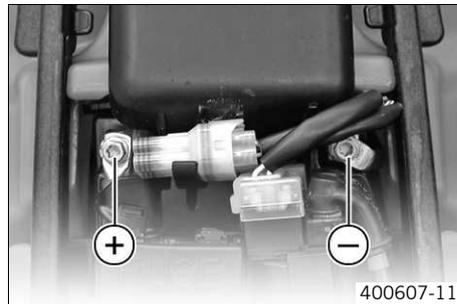
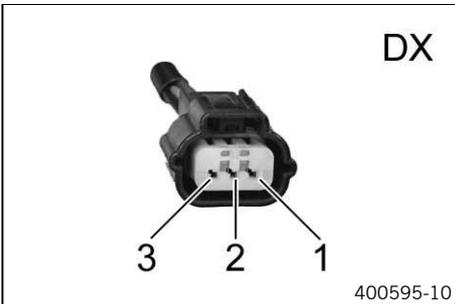
| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DX** pin **2** to connector **DT** pin **6** for a short circuit to ground (terminal 31).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Manifold absolute pressure sensor - power supply is open (☛ p. 169)

Manifold absolute pressure sensor - power supply is open

Condition

The diagnostic tool is connected and active.
The EFI control unit is connected.
The manifold absolute pressure sensor is disconnected.



Manifold absolute pressure sensor - checking the power supply

- Measure the voltage between the specified points.
Connector **DX** Pin **1** – measuring point **Ground(-)**

| | |
|---------|--------------|
| Voltage | 4.9... 5.1 V |
|---------|--------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DX** pin **1**.
 - Check the cable from connector **DX** pin **1** to the next node in the cable harness for an open circuit.
- » If the measured value corresponds to the specified value:
 - Change the manifold absolute pressure sensor.

| | |
|---|--|
| Flash code FI warning lamp (MIL) |  09 FI warning lamp (MIL) flashes 9x short |
| Display on diagnostic tool | P0108 "Manifold absolute pressure sensor cylinder 1" "Input signal too high" |
| Error level condition | Manifold absolute pressure sensor voltage "PM1AD" : ≥ 4.121 V Time: ≥ 3 s |
| Function check | Manifold absolute pressure sensor - checking the voltage (☛ p. 170) |
| Possible cause | Manifold absolute pressure sensor - signal line is open (☛ p. 170) |
| | Manifold absolute pressure sensor - ground line is open (☛ p. 171) |
| | Manifold absolute pressure sensor - signal line has a short circuit to plus (terminal 30) (☛ p. 171) |
| | Manifold absolute pressure sensor - signal line has a short circuit to ignition plus (terminal 15) (☛ p. 172) |
| | Manifold absolute pressure sensor - signal line has a short circuit to the sensor power supply (☛ p. 172) |

Manifold absolute pressure sensor - checking the voltage

Condition

The diagnostic tool is connected and active.
 The engine is not running.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"Measurement values"**.
- Highlight **"Mixture preparation, general"**.
- Press **"Continue"**.
- Highlight the measured value **"Manifold absolute pressure sensor cylinder 1 voltage (PM1AD)"** and deselect the other parameters with **"Select measured value"**.

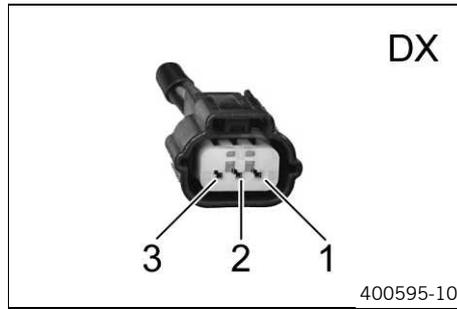
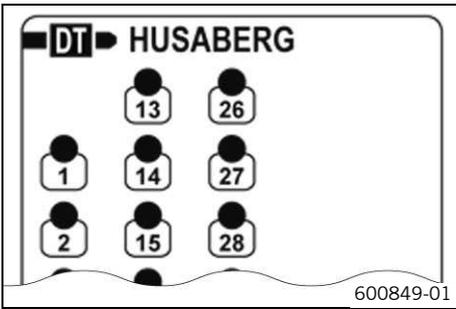
| Manifold absolute pressure sensor voltage "PM1AD" | |
|--|--------|
| at: 800 mbar (11.6 psi) | 2.31 V |
| at: 850 mbar (12.33 psi) | 2.45 V |
| at: 900 mbar (13.05 psi) | 2.58 V |
| at: 1,000 mbar (14.5 psi) | 2.86 V |
| at: 1,050 mbar (15.23 psi) | 2.99 V |

- » If the displayed value is equal to the setpoint value:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is above the setpoint value:
 - Check the next possible cause:
 Manifold absolute pressure sensor - signal line is open (☛ p. 170)

Manifold absolute pressure sensor - signal line is open

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The manifold absolute pressure sensor is disconnected.



Manifold absolute pressure sensor - check the signal line for an open circuit

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **6** – Connector **DX** Pin **2**

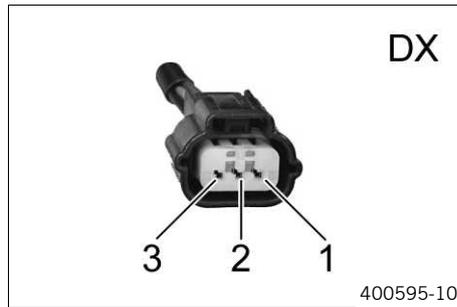
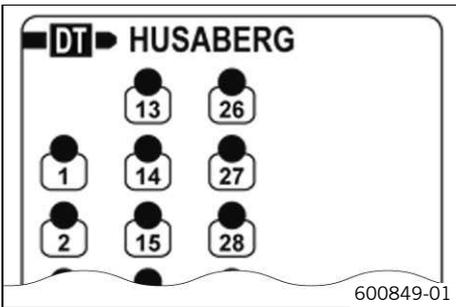
| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **6** and connector **DX** pin **2**.
 - Check the cable from connector **DT** pin **6** to connector **DX** pin **2** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Manifold absolute pressure sensor - ground line is open (☛ p. 171)

Manifold absolute pressure sensor - ground line is open

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
The manifold absolute pressure sensor is disconnected.



Manifold absolute pressure sensor - check the ground line for an open circuit

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **24** – Connector **DX** Pin **3**

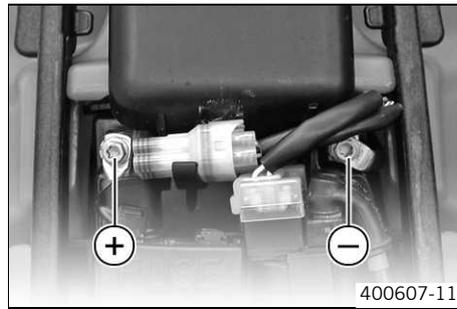
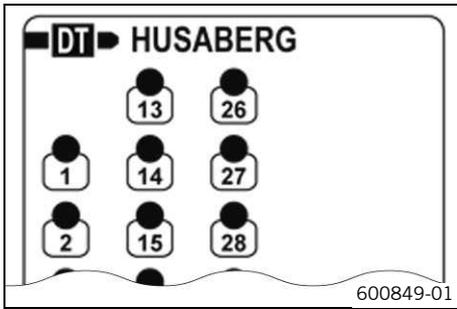
| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **24** and connector **DX** pin **3**.
 - Check the cable from connector **DT** pin **24** to connector **DX** pin **3** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Manifold absolute pressure sensor - signal line has a short circuit to plus (terminal 30) (☛ p. 171)

Manifold absolute pressure sensor - signal line has a short circuit to plus (terminal 30)

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
The manifold absolute pressure sensor is disconnected.



Manifold absolute pressure sensor - check the signal line for a short circuit to plus (terminal 30)

- **V** Measure the voltage between the specified points.
Break Out Box **DT** Pin **6** – measuring point **Ground(-)**

| | |
|---------|---------|
| Voltage | < 0.1 V |
|---------|---------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **6** to connector **DX** pin **2** for a short circuit to plus (terminal 30).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Manifold absolute pressure sensor - signal line has a short circuit to ignition plus (terminal 15) (☛ p. 172)

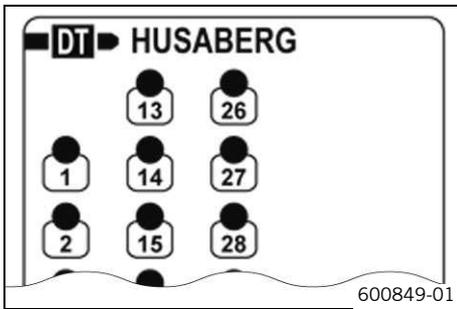
Manifold absolute pressure sensor - signal line has a short circuit to ignition plus (terminal 15)

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
The manifold absolute pressure sensor is disconnected.

Manifold absolute pressure sensor - check the signal line for a short circuit to ignition plus (terminal 15)

- **Ω** Measure the resistance between the specified points.
Break Out Box **DT** Pin **6** – Break Out Box **DT** Pin **1**



| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **6** to connector **DX** pin **2** for a short circuit to ignition plus (terminal 15).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Manifold absolute pressure sensor - signal line has a short circuit to the sensor power supply (☛ p. 172)

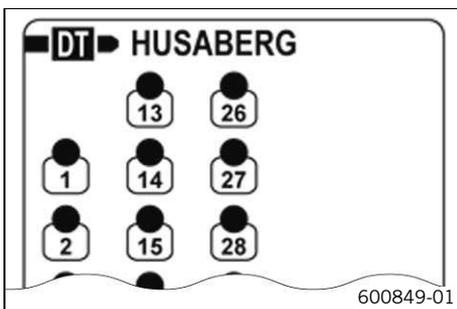
Manifold absolute pressure sensor - signal line has a short circuit to the sensor power supply

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
The manifold absolute pressure sensor is disconnected.

Manifold absolute pressure sensor - check the signal line for a short circuit to the sensor power supply

- **Ω** Measure the resistance between the specified points.
Break Out Box **DT** Pin **6** – Break Out Box **DT** Pin **13**



| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **6** to connector **DX** pin **2** for a short circuit to the sensor power supply.
- » If the measured value corresponds to the specified value:
 - Change the manifold absolute pressure sensor.

| | |
|---|---|
| Flash code FI warning lamp (MIL) |  13 FI warning lamp (MIL) flashes 1x long, 3x short |
| Display on diagnostic tool | P0112 "Intake air temperature sensor" "Input signal too low" |
| Error level condition | Intake air temperature sensor voltage "TAAD" : $\leq 0.195\text{ V}$ Time: $\geq 3\text{ s}$ |
| Function check | Intake air temperature sensor - checking the voltage (☛ p. 173) |
| Possible cause | Intake air temperature sensor - value not plausible (☛ p. 173) |
| | Intake air temperature sensor - signal line has a short circuit to ground (terminal 31) (☛ p. 174) |

Intake air temperature sensor - checking the voltage

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"Measurement values"**.
- Highlight **"Mixture preparation, general"**.
- Press **"Continue"**.
- Highlight the measured value **"Intake air temperature sensor voltage (TAAD)"** and deselect the other parameters with **"Select measured value"**.

| | |
|---|------------------|
| Intake air temperature sensor voltage "TAAD" | 0.196... 4.823 V |
|---|------------------|

- » If the displayed value is equal to the setpoint value:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is below the setpoint value:
 - Check the next possible cause:
Intake air temperature sensor - value not plausible (☛ p. 173)

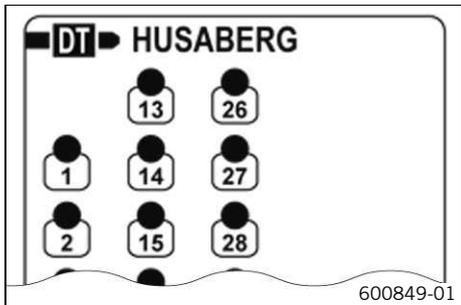
Intake air temperature sensor - value not plausible

Condition

The diagnostic tool is disconnected.
The breakout box is connected to the wiring harness.

Intake air temperature sensor - check the resistance

-  Measure the resistance between the specified points.
Break Out Box **DT** Pin **24** – Break Out Box **DT** Pin **25**



| | |
|--|-------------------|
| Intake air temperature sensor | |
| Resistance at: -20 °C (-4 °F) | 18.80 k Ω |
| Resistance at: 20 °C (68 °F) | 2.942 k Ω |
| Resistance at: 40 °C (104 °F) | 1.136 k Ω |
| Resistance at: 100 °C (212 °F) | 0.1553 k Ω |

- » If the measured value does not correspond to the specified value:
 - Check the next possible cause:
Intake air temperature sensor - signal line has a short circuit to sensor ground (☛ p. 174)
 - Change the intake air temperature sensor.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Intake air temperature sensor - signal line has a short circuit to ground (terminal 31) (☛ p. 174)

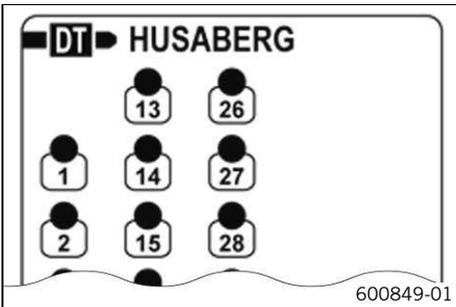
Intake air temperature sensor - signal line has a short circuit to sensor ground

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The intake air temperature sensor is disconnected.

Intake air temperature sensor - check the signal line for a short circuit to sensor ground

-  Measure the resistance between the specified points.
 Break Out Box **DT** Pin **24** – Break Out Box **DT** Pin **25**



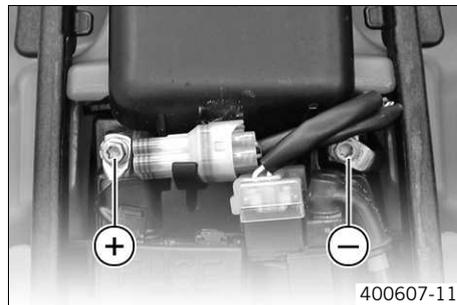
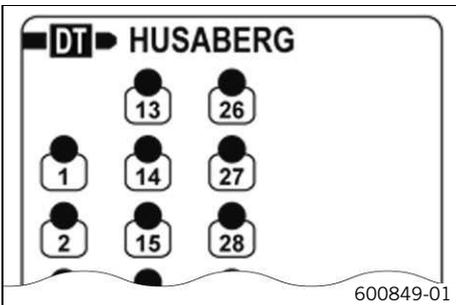
| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **25** to connector **CM** pin **2** for a short circuit to sensor ground.

Intake air temperature sensor - signal line has a short circuit to ground (terminal 31)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.



Intake air temperature sensor - check the signal line for a short circuit to ground (terminal 31)

-  Measure the resistance between the specified points.
 Break Out Box **DT** Pin **25** – measuring point **Ground(-)**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **25** to connector **CM** pin **2** for a short circuit to ground (terminal 31).
- » If the measured value corresponds to the specified value:
 - Contact customer service.

| | |
|---|---|
| Flash code FI warning lamp (MIL) |  13 FI warning lamp (MIL) flashes 1x long, 3x short |
| Display on diagnostic tool | P0113 "Intake air temperature sensor" "Input signal too high" |
| Error level condition | Intake air temperature sensor voltage "TAAD" : ≥ 4.824 V Time: ≥ 3 s |
| Function check | Intake air temperature sensor - checking the voltage (☛ p. 175) |
| Possible cause | Intake air temperature sensor - signal line has a short circuit to plus (terminal 30) (☛ p. 175) |
| | Intake air temperature sensor - signal line has a short circuit to ignition plus (terminal 15) (☛ p. 176) |
| | Intake air temperature sensor - signal line has a short circuit to the sensor power supply (☛ p. 176) |
| | Intake air temperature sensor - signal line is open (☛ p. 177) |
| | Intake air temperature sensor - ground line is open (☛ p. 177) |
| | Intake air temperature sensor - value not plausible (☛ p. 178) |

Intake air temperature sensor - checking the voltage

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"Measurement values"**.
- Highlight **"Mixture preparation, general"**.
- Press **"Continue"**.
- Highlight the measured value **"Intake air temperature sensor voltage (TAAD)"** and deselect the other parameters with **"Select measured value"**.

| | |
|---|------------------|
| Intake air temperature sensor voltage "TAAD" | 0.196... 4.823 V |
|---|------------------|

- » If the displayed value is equal to the setpoint value:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is above the setpoint value:
 - Check the next possible cause:
 Intake air temperature sensor - signal line has a short circuit to plus (terminal 30) (☛ p. 175)

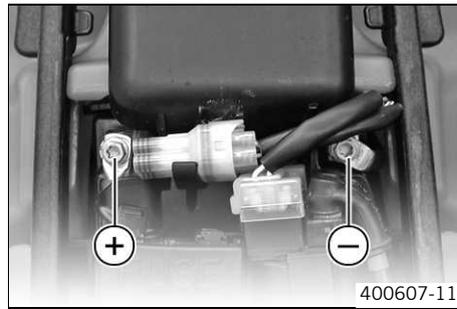
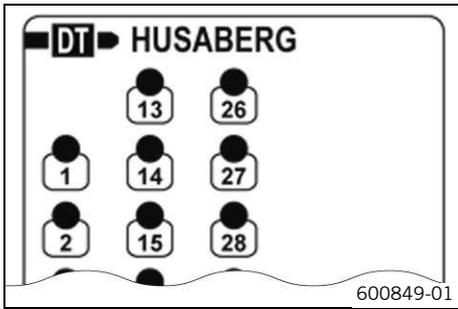
Intake air temperature sensor - signal line has a short circuit to plus (terminal 30)

Condition

The diagnostic tool is disconnected.

The EFI control unit is disconnected.

The breakout box is connected to the wiring harness.



Intake air temperature sensor - check the signal line for a short circuit to plus (terminal 30)

- **V** Measure the voltage between the specified points.
Break Out Box **DT** Pin **25** – measuring point **Ground(-)**

| | |
|---------|---------|
| Voltage | ≤ 0.1 V |
|---------|---------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **25** to connector **CM** pin **2** for a short circuit to plus (terminal 30).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Intake air temperature sensor - signal line has a short circuit to ignition plus (terminal 15) (☛ p. 176)

Intake air temperature sensor - signal line has a short circuit to ignition plus (terminal 15)

Condition

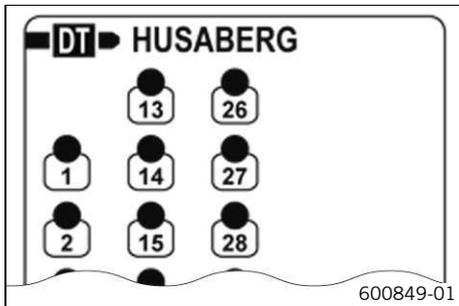
The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.

Intake air temperature sensor - check the signal line for a short circuit to ignition plus (terminal 15)

- **Ω** Measure the resistance between the specified points.
Break Out Box **DT** Pin **1** – Break Out Box **DT** Pin **25**

| | |
|------------|-----|
| Resistance | ∞ Ω |
|------------|-----|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **25** to connector **CM** pin **2** for a short circuit to ignition plus (terminal 15).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Intake air temperature sensor - signal line has a short circuit to the sensor power supply (☛ p. 176)



Intake air temperature sensor - signal line has a short circuit to the sensor power supply

Condition

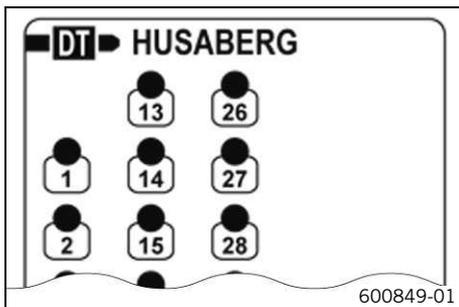
The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.

Intake air temperature sensor - check the signal line for a short circuit to the sensor power supply

- **Ω** Measure the resistance between the specified points.
Break Out Box **DT** Pin **13** – Break Out Box **DT** Pin **25**

| | |
|------------|-----|
| Resistance | ∞ Ω |
|------------|-----|

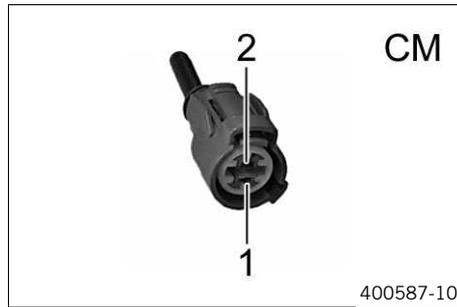
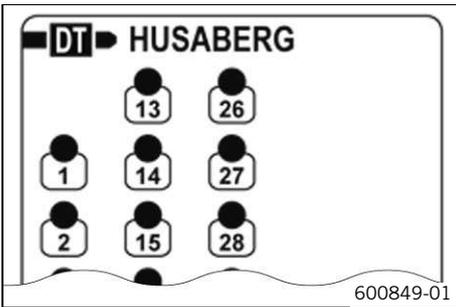
- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **25** to connector **CM** pin **2** for a short circuit to the sensor power supply.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Intake air temperature sensor - signal line is open (☛ p. 177)



Intake air temperature sensor - signal line is open

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.



Intake air temperature sensor - check the signal line for an open circuit

-  Measure the resistance between the specified points.
 Break Out Box **DT** Pin **25** – Connector **CM** Pin **2**

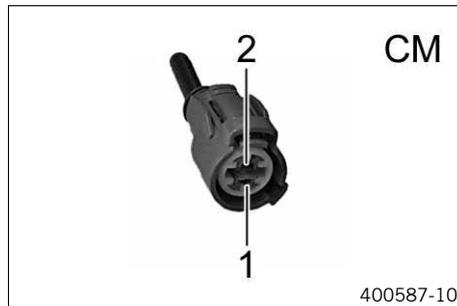
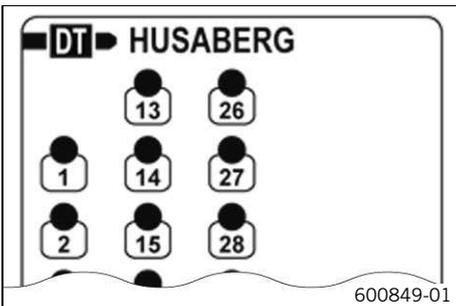
| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **25** and connector **CM** pin **2**.
 - Check the cable from connector **DT** pin **25** to connector **CM** pin **2** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Intake air temperature sensor - ground line is open (☛ p. 177)

Intake air temperature sensor - ground line is open

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.



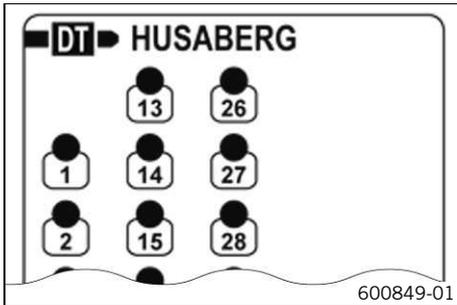
Intake air temperature sensor - check the ground line for an open circuit

-  Measure the resistance between the specified points.
 Break Out Box **DT** Pin **24** – Connector **CM** Pin **1**

| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **24** and connector **CM** pin **1**.
 - Check the cable from connector **DT** pin **24** to connector **CM** pin **1** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Intake air temperature sensor - value not plausible (☛ p. 178)

Intake air temperature sensor - value not plausible



Condition

The diagnostic tool is disconnected.
The breakout box is connected to the wiring harness.

Intake air temperature sensor - check the resistance

-  Measure the resistance between the specified points.
Break Out Box **DT** Pin **24** – Break Out Box **DT** Pin **25**

| Intake air temperature sensor | |
|--------------------------------|-----------|
| Resistance at: -20 °C (-4 °F) | 18.80 kΩ |
| Resistance at: 20 °C (68 °F) | 2.942 kΩ |
| Resistance at: 40 °C (104 °F) | 1.136 kΩ |
| Resistance at: 100 °C (212 °F) | 0.1553 kΩ |

- » If the measured value does not correspond to the specified value:
 - Change the intake air temperature sensor.
- » If the measured value corresponds to the specified value:
 - Contact customer service.

| | |
|---|---|
| Flash code FI warning lamp (MIL) |  12 FI warning lamp (MIL) flashes 1x long, 2x short |
| Display on diagnostic tool | P0117 "Coolant temperature sensor" "Input signal too low" |
| Error level condition | Coolant temperature sensor cylinder 1 voltage "TWAD" : ≤ 0.137 V Time: ≥ 3 s |
| Function check | Coolant temperature sensor cylinder 1 - checking the voltage (☛ p. 179) |
| Possible cause | Coolant temperature sensor - value not plausible (☛ p. 179) |
| | Coolant temperature sensor - signal line has a short circuit to ground (terminal 31) (☛ p. 180) |
| | Coolant temperature sensor - signal line has a short circuit to sensor ground (☛ p. 180) |

Coolant temperature sensor cylinder 1 - checking the voltage

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"Measurement values"**.
- Highlight **"Mixture preparation, general"**.
- Press **"Continue"**.
- Highlight the measured value **"Coolant temperature sensor cylinder 1 voltage (TWAD)"** and deselect the other parameters with **"Select measured value"**.

| | |
|---|------------------|
| Coolant temperature sensor cylinder 1 voltage "TWAD" | 0.138... 4.784 V |
|---|------------------|

- » If the displayed value is equal to the setpoint value:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is below the setpoint value:
 - Check the next possible cause:
Coolant temperature sensor - value not plausible (☛ p. 179)

Coolant temperature sensor - value not plausible

Condition

The diagnostic tool is disconnected.
Coolant temperature sensor is disconnected.

Coolant temperature sensor - check the resistance

-  Measure the resistance between the specified points.
Coolant temperature sensor Pin **1** – Coolant temperature sensor Pin **2**



400599-10

| Coolant temperature sensor | |
|--------------------------------|-------------------|
| Resistance at: -30 °C (-22 °F) | 22.86... 27.94 kΩ |
| Resistance at: -20 °C (-4 °F) | 13.50... 16.50 kΩ |
| Resistance at: -10 °C (14 °F) | 8.24... 10.08 kΩ |
| Resistance at: 0 °C (32 °F) | 5.17... 6.31 kΩ |
| Resistance at: 10 °C (50 °F) | 3.33... 4.07 kΩ |
| Resistance at: 20 °C (68 °F) | 2.21... 2.70 kΩ |
| Resistance at: 30 °C (86 °F) | 1.49... 1.83 kΩ |
| Resistance at: 40 °C (104 °F) | 1.04... 1.27 kΩ |
| Resistance at: 50 °C (122 °F) | 730... 892 Ω |
| Resistance at: 60 °C (140 °F) | 526... 642 Ω |
| Resistance at: 70 °C (158 °F) | 385... 471 Ω |
| Resistance at: 80 °C (176 °F) | 286... 350 Ω |

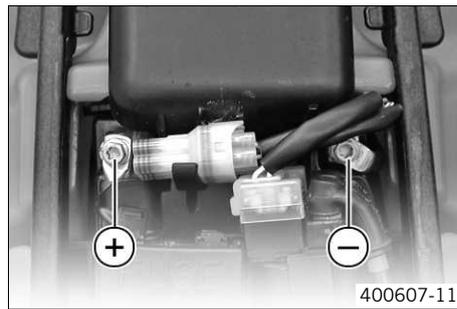
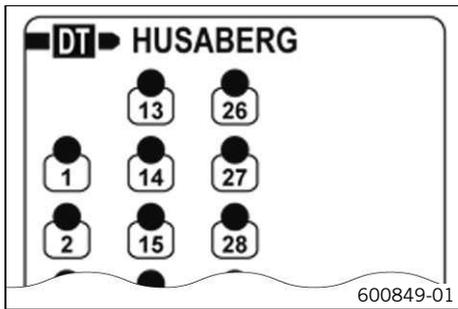
| | |
|--------------------------------|--------------|
| Resistance at: 90 °C (194 °F) | 216... 264 Ω |
| Resistance at: 100 °C (212 °F) | 165... 202 Ω |
| Resistance at: 110 °C (230 °F) | 128... 156 Ω |
| Resistance at: 120 °C (248 °F) | 100... 122 Ω |

- » If the measured value does not correspond to the specified value:
 - Change the coolant temperature sensor.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Coolant temperature sensor - signal line has a short circuit to ground (terminal 31) (☛ p. 180)

Coolant temperature sensor - signal line has a short circuit to ground (terminal 31)

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Coolant temperature sensor is disconnected.



Coolant temperature sensor - check the signal line for a short circuit to ground (terminal 31)

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **22** – measuring point **Ground(-)**

| | |
|------------|-----|
| Resistance | ∞ Ω |
|------------|-----|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **22** to connector **AX** pin **1** for a short circuit to ground (terminal 31).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Coolant temperature sensor - signal line has a short circuit to sensor ground (☛ p. 180)

Coolant temperature sensor - signal line has a short circuit to sensor ground

Condition

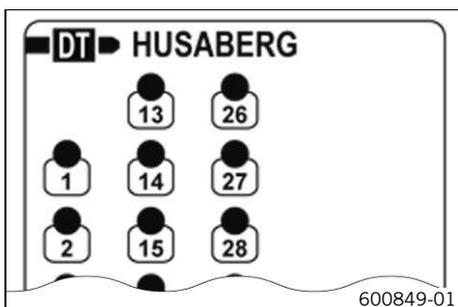
The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Coolant temperature sensor is disconnected.

Coolant temperature sensor - check the signal line for a short circuit to sensor ground

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **22** – Break Out Box **DT** Pin **24**

| | |
|------------|-----|
| Resistance | ∞ Ω |
|------------|-----|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **22** to connector **AX** pin **1** for a short circuit to sensor ground.
- » If the measured value corresponds to the specified value:
 - Contact customer service.



| | |
|---|---|
| Flash code FI warning lamp (MIL) |  12 FI warning lamp (MIL) flashes 1x long, 2x short |
| Display on diagnostic tool | P0118 "Coolant temperature sensor" "Input signal too high" |
| Error level condition | Coolant temperature sensor cylinder 1 voltage "TWAD" : ≥ 4.785 V Time: ≥ 3 s |
| Function check | Coolant temperature sensor cylinder 1 - checking the voltage (☛ p. 181) |
| Possible cause | Coolant temperature sensor - value not plausible (☛ p. 181) |
| | Coolant temperature sensor - signal line has a short circuit to plus (terminal 30) (☛ p. 182) |
| | Coolant temperature sensor - signal line has a short circuit to ignition plus (terminal 15) (☛ p. 182) |
| | Coolant temperature sensor - signal line has a short circuit to the sensor power supply (☛ p. 183) |
| | Coolant temperature sensor - signal line is open (☛ p. 183) |
| | Coolant temperature sensor - ground line is open (☛ p. 183) |

Coolant temperature sensor cylinder 1 - checking the voltage

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"Measurement values"**.
- Highlight **"Mixture preparation, general"**.
- Press **"Continue"**.
- Highlight the measured value **"Coolant temperature sensor cylinder 1 voltage (TWAD)"** and deselect the other parameters with **"Select measured value"**.

| | |
|---|------------------|
| Coolant temperature sensor cylinder 1 voltage "TWAD" | 0.138... 4.784 V |
|---|------------------|

- » If the displayed value is equal to the setpoint value:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is above the setpoint value:
 - Check the next possible cause:
Coolant temperature sensor - value not plausible (☛ p. 181)

Coolant temperature sensor - value not plausible

Condition

The diagnostic tool is disconnected.
Coolant temperature sensor is disconnected.

Coolant temperature sensor - check the resistance

-  Measure the resistance between the specified points.
Coolant temperature sensor Pin **1** – Coolant temperature sensor Pin **2**



| Coolant temperature sensor | |
|--------------------------------|-------------------|
| Resistance at: -30 °C (-22 °F) | 22.86... 27.94 kΩ |
| Resistance at: -20 °C (-4 °F) | 13.50... 16.50 kΩ |
| Resistance at: -10 °C (14 °F) | 8.24... 10.08 kΩ |
| Resistance at: 0 °C (32 °F) | 5.17... 6.31 kΩ |
| Resistance at: 10 °C (50 °F) | 3.33... 4.07 kΩ |
| Resistance at: 20 °C (68 °F) | 2.21... 2.70 kΩ |
| Resistance at: 30 °C (86 °F) | 1.49... 1.83 kΩ |
| Resistance at: 40 °C (104 °F) | 1.04... 1.27 kΩ |
| Resistance at: 50 °C (122 °F) | 730... 892 Ω |

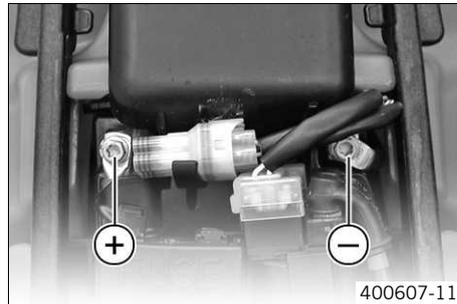
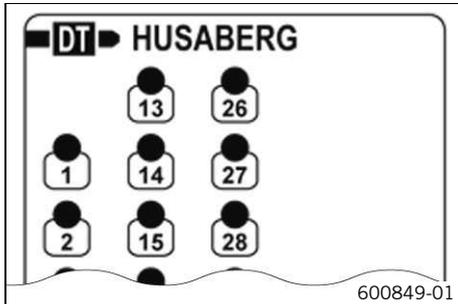
| | |
|--------------------------------|--------------|
| Resistance at: 60 °C (140 °F) | 526... 642 Ω |
| Resistance at: 70 °C (158 °F) | 385... 471 Ω |
| Resistance at: 80 °C (176 °F) | 286... 350 Ω |
| Resistance at: 90 °C (194 °F) | 216... 264 Ω |
| Resistance at: 100 °C (212 °F) | 165... 202 Ω |
| Resistance at: 110 °C (230 °F) | 128... 156 Ω |
| Resistance at: 120 °C (248 °F) | 100... 122 Ω |

- » If the measured value does not correspond to the specified value:
 - Change the coolant temperature sensor.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Coolant temperature sensor - signal line has a short circuit to plus (terminal 30) (☛ p. 182)

Coolant temperature sensor - signal line has a short circuit to plus (terminal 30)

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Coolant temperature sensor is disconnected.



Coolant temperature sensor - check the signal line for a short circuit to plus (terminal 30)

- **V** Measure the voltage between the specified points.
Break Out Box **DT** Pin **22** – measuring point **Ground(-)**

| | |
|---------|---------|
| Voltage | ≤ 0.1 V |
|---------|---------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **22** to connector **AX** pin **1** for a short circuit to plus (terminal 30).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Coolant temperature sensor - signal line has a short circuit to ignition plus (terminal 15) (☛ p. 182)

Coolant temperature sensor - signal line has a short circuit to ignition plus (terminal 15)

Condition

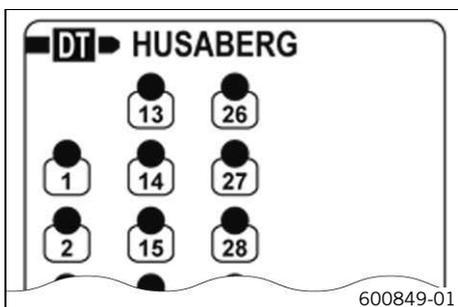
The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Coolant temperature sensor is disconnected.

Coolant temperature sensor - check the signal line for a short circuit to ignition plus (terminal 15)

- **Ω** Measure the resistance between the specified points.
Break Out Box **DT** Pin **22** – Break Out Box **DT** Pin **1**

| | |
|------------|-----|
| Resistance | ∞ Ω |
|------------|-----|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **22** to connector **AX** pin **1** for a short circuit to ignition plus (terminal 15).
- » If the measured value corresponds to the specified value:



- Check the next possible cause:
Coolant temperature sensor - signal line has a short circuit to the sensor power supply (☛ p. 183)

Coolant temperature sensor - signal line has a short circuit to the sensor power supply

Condition

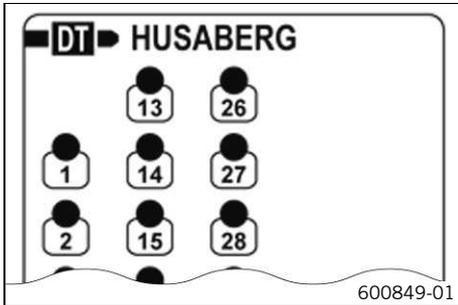
The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Coolant temperature sensor is disconnected.

Coolant temperature sensor - check the signal line for a short circuit to the sensor power supply

-  Measure the resistance between the specified points.
Break Out Box **DT** Pin **13** – Break Out Box **DT** Pin **22**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

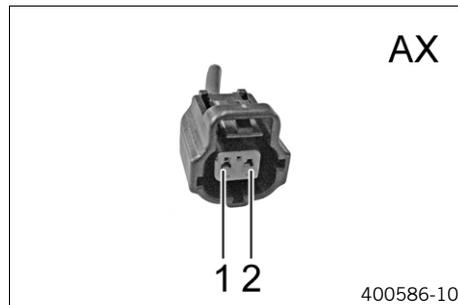
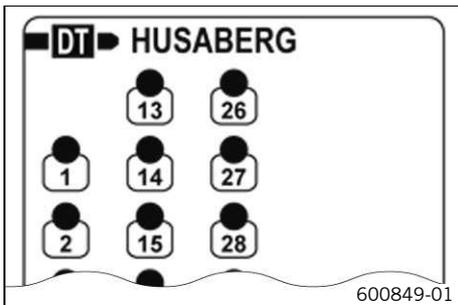
- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **22** to connector **AX** pin **1** for a short circuit to the sensor power supply.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Coolant temperature sensor - signal line is open (☛ p. 183)



Coolant temperature sensor - signal line is open

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Coolant temperature sensor is disconnected.



Coolant temperature sensor - check the signal line for an open circuit

-  Measure the resistance between the specified points.
Break Out Box **DT** Pin **22** – Connector **AX** Pin **1**

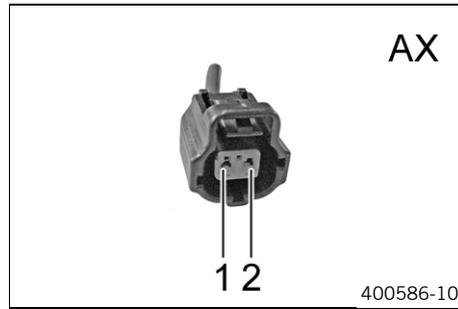
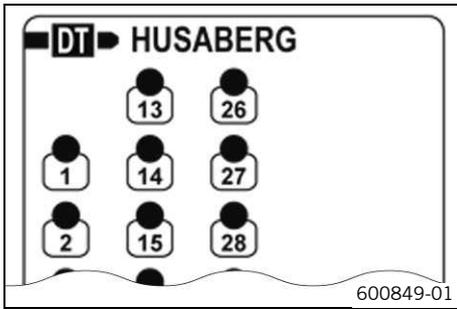
| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **22** and connector **AX** pin **1**.
 - Check the cable from connector **DT** pin **22** to connector **AX** pin **1** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Coolant temperature sensor - ground line is open (☛ p. 183)

Coolant temperature sensor - ground line is open

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Coolant temperature sensor is disconnected.



Coolant temperature sensor - check the ground line for an open circuit

-  Measure the resistance between the specified points.
Break Out Box **DT** Pin **24** – Connector **AX** Pin **2**

| | |
|------------|---------|
| Resistance | ≤ 0.6 Ω |
|------------|---------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **24** and connector **AX** pin **2**.
 - Check the cable from connector **DT** pin **24** to connector **AX** pin **2** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Contact customer service.

| | |
|---|--|
| Flash code FI warning lamp (MIL) |  06 FI warning lamp (MIL) flashes 6x short |
| Display on diagnostic tool | P0122 "Throttle position sensor circuit A" "Input signal too low" |
| Error level condition | Throttle position sensor voltage "THAD" : ≤ 0.352 V Time: ≥ 3 s |
| Function check | Throttle position sensor - checking the voltage (☛ p. 185) |
| Possible cause | Throttle position sensor - power supply is open (☛ p. 185) |
| | Throttle position sensor - signal line has a short circuit to ground (terminal 30) (☛ p. 186) |
| | Throttle position sensor - signal line has a short circuit to sensor ground (☛ p. 186) |
| | Throttle position sensor - signal line is open (☛ p. 186) |

Throttle position sensor - checking the voltage

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"Measurement values"**.
- Highlight **"Mixture preparation, general"**.
- Press **"Continue"**.
- Highlight the measured value **"Throttle position sensor circuit A voltage (THAD)"** and deselect the other parameters with **"Select measured value"**.

| | |
|--|------------------|
| Throttle position sensor voltage "THAD" | 0.351... 4.784 V |
|--|------------------|

- » If the displayed value is equal to the setpoint value:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is below the setpoint value:
 - Check the next possible cause:
Throttle position sensor - power supply is open (☛ p. 185)

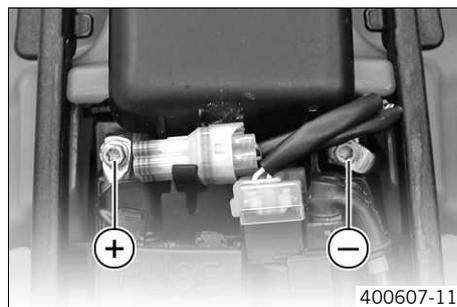
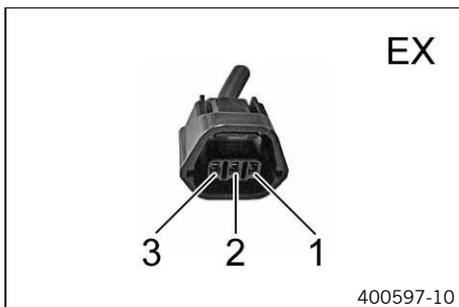
Throttle position sensor - power supply is open

Condition

The diagnostic tool is connected and active.

The EFI control unit is connected.

The throttle position sensor is disconnected.



Throttle position sensor - check the power supply

-  Measure the voltage between the specified points.
Connector **EX** Pin **2** – measuring point **Ground(-)**

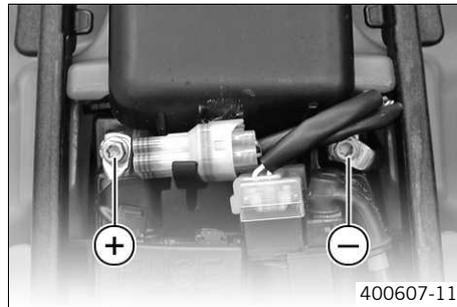
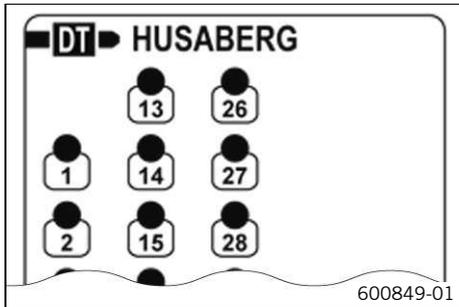
| | |
|---------|--------------|
| Voltage | 4.9... 5.1 V |
|---------|--------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **EX** pin **2**.
 - Check the cable from connector **EX** pin **2** to the next node in the cable harness for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Throttle position sensor - signal line has a short circuit to ground (terminal 30) (☛ p. 186)

Throttle position sensor - signal line has a short circuit to ground (terminal 30)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The throttle position sensor is disconnected.



Throttle position sensor - check the signal line for a short circuit to ground (terminal 30)

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **5** – measuring point **Ground(-)**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **5** to connector **EX** pin **1** for a short circuit to ground (terminal 30).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Throttle position sensor - signal line has a short circuit to sensor ground (☛ p. 186)

Throttle position sensor - signal line has a short circuit to sensor ground

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The throttle position sensor is disconnected.

Throttle position sensor - check the signal line for a short circuit to sensor ground

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **5** – Break Out Box **DT** Pin **24**

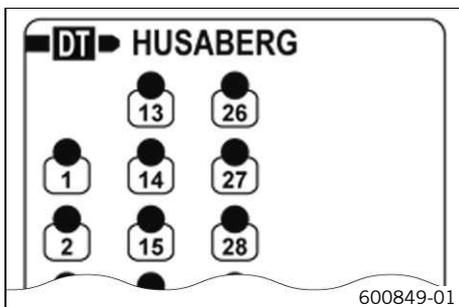
| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

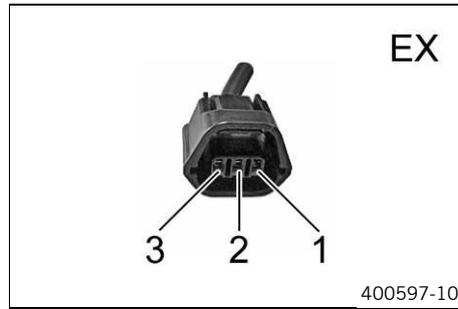
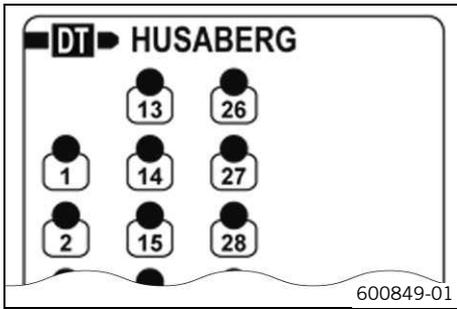
- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **5** to connector **EX** pin **1** for a short circuit to sensor ground.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Throttle position sensor - signal line is open (☛ p. 186)

Throttle position sensor - signal line is open

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The throttle position sensor is disconnected.





Throttle position sensor - check the signal line for an open circuit

-  Measure the resistance between the specified points.
Break Out Box **DT** Pin **5** – Connector **EX** Pin **1**

| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **5** and connector **EX** pin **1**.
 - Check the cable from connector **DT** pin **5** to connector **EX** pin **1** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Contact customer service.

| | |
|---|--|
| Flash code FI warning lamp (MIL) |  06 FI warning lamp (MIL) flashes 6x short |
| Display on diagnostic tool | P0123 "Throttle position sensor circuit A" "Input signal too high" |
| Error level condition | Throttle position sensor voltage "THAD" : ≥ 4.785 V Time: ≥ 3 s |
| Function check | Throttle position sensor - checking the voltage (☛ p. 188) |
| Possible cause | Throttle position sensor - signal line has a short circuit to plus (terminal 30) (☛ p. 188) |
| | Throttle position sensor - signal line has a short circuit to ignition plus (terminal 15) (☛ p. 189) |
| | Throttle position sensor - signal line has a short circuit to the sensor power supply (☛ p. 189) |
| | Throttle position sensor - ground line is open (☛ p. 189) |

Throttle position sensor - checking the voltage

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"Measurement values"**.
- Highlight **"Mixture preparation, general"**.
- Press **"Continue"**.
- Highlight the measured value **"Throttle position sensor circuit A voltage (THAD)"** and deselect the other parameters with **"Select measured value"**.

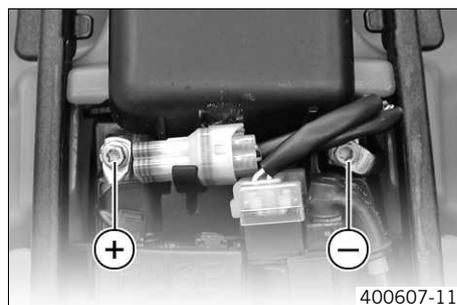
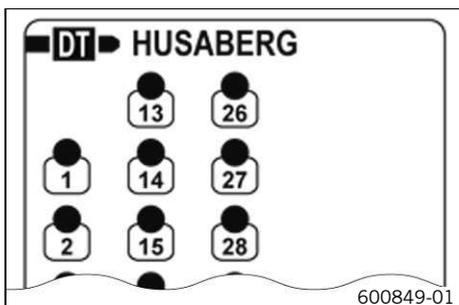
| | |
|--|------------------|
| Throttle position sensor voltage "THAD" | 0.351... 4.784 V |
|--|------------------|

- » If the displayed value is equal to the setpoint value:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is above the setpoint value:
 - Check the next possible cause:
 Throttle position sensor - signal line has a short circuit to plus (terminal 30) (☛ p. 188)

Throttle position sensor - signal line has a short circuit to plus (terminal 30)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The throttle position sensor is disconnected.



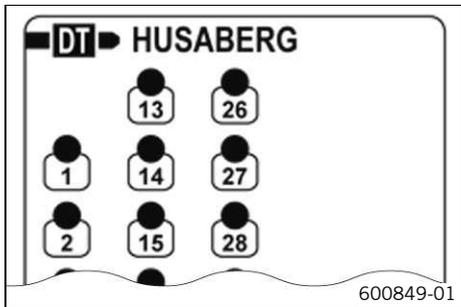
Throttle position sensor - check the signal line for a short circuit to plus (terminal 30)

-  Measure the voltage between the specified points.
 Break Out Box DT Pin 5 – measuring point **Ground(-)**

| | |
|---------|--------------|
| Voltage | ≤ 0.1 V |
|---------|--------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **5** to connector **EX** pin **1** for a short circuit to plus (terminal 30).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Throttle position sensor - signal line has a short circuit to ignition plus (terminal 15) (☛ p. 189)

Throttle position sensor - signal line has a short circuit to ignition plus (terminal 15)



Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The throttle position sensor is disconnected.

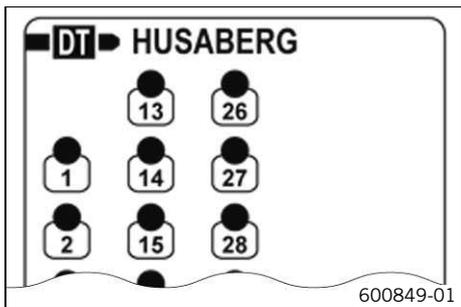
Throttle position sensor - check the signal line for a short circuit to ignition plus (terminal 15)

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **1** – Break Out Box **DT** Pin **5**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **5** to connector **EX** pin **1** for a short circuit to ignition plus (terminal 15).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Throttle position sensor - signal line has a short circuit to the sensor power supply (☛ p. 189)

Throttle position sensor - signal line has a short circuit to the sensor power supply



Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.

Throttle position sensor - check the signal line for a short circuit to the sensor power supply

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **5** – Break Out Box **DT** Pin **13**

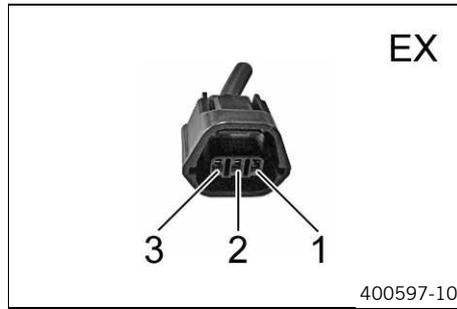
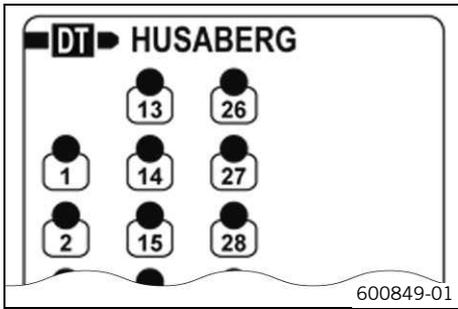
| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **5** to connector **EX** pin **1** for a short circuit to the sensor power supply.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Throttle position sensor - ground line is open (☛ p. 189)

Throttle position sensor - ground line is open

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The throttle position sensor is disconnected.



Throttle position sensor - check the ground line for an open circuit

-  Measure the resistance between the specified points.
Break Out Box **DT** Pin **24** – Connector **EX** Pin **3**

| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **24** and connector **EX** pin **3**.
 - Check the cable from connector **DT** pin **24** to connector **EX** pin **3** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Contact customer service.

| | |
|---|---|
| Flash code FI warning lamp (MIL) |  17 FI warning lamp (MIL) flashes 1x long, 7x short |
| Display on diagnostic tool | P0130 "Lambda sensor cylinder 1, sensor 1" "Malfunction in the circuit" |
| Error level condition | Malfunction in the circuit: ≥ 60 s |
| Function check | Lambda sensor - checking the voltage (☛ p. 191) |
| Possible cause | Lambda sensor - signal line has a short circuit to ground (terminal 31) (☛ p. 191) |
| | Lambda sensor - signal line has a short circuit to sensor ground (☛ p. 192) |
| | Lambda sensor - signal line has a short circuit to plus (terminal 30) (☛ p. 192) |
| | Lambda sensor - signal line has a short circuit to ignition plus (terminal 15) (☛ p. 193) |
| | Lambda sensor - signal line has a short circuit to the sensor power supply (☛ p. 193) |
| | Lambda sensor - signal line is open (☛ p. 193) |
| | Lambda probe - ground line is open (☛ p. 194) |

Lambda sensor - checking the voltage

Condition

The diagnostic tool is connected and active.
 The engine is running at idle speed.
 The engine is at normal operating temperature.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"Measurement values"**.
- Highlight **"Lambda control"**.
- Press **"Continue"**.
- Highlight the measured value **"Lambda sensor cylinder 1 voltage (HEGO1AD)"** and deselect the other parameters with **"Select measured value"**.

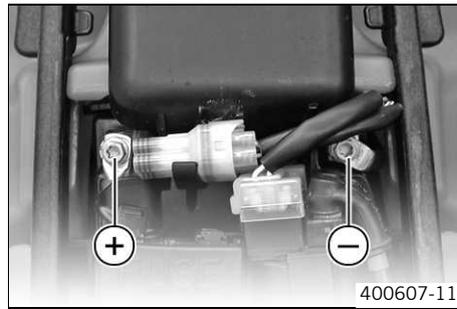
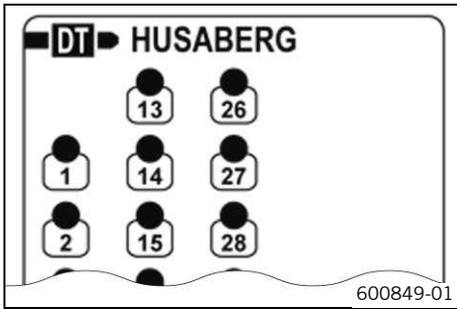
| | |
|--------------------------|--------------|
| Lambda sensor | |
| Voltage "Hego1AD" | 0.2... 0.8 V |

- » If the displayed value is equal to the setpoint value:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is not equal to the setpoint value:
 - Check the next possible cause:
 Lambda sensor - signal line has a short circuit to ground (terminal 31) (☛ p. 191)

Lambda sensor - signal line has a short circuit to ground (terminal 31)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 Lambda sensor is disconnected.



Lambda sensor - check the signal line for a short circuit to ground (terminal 31)

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **7** – measuring point **Ground(-)**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **7** to connector **CU** pin **2** for a short circuit to ground (terminal 31).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Lambda sensor - signal line has a short circuit to sensor ground (☛ p. 192)

Lambda sensor - signal line has a short circuit to sensor ground

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Lambda sensor is disconnected.

Lambda sensor - check the signal line for a short circuit to sensor ground

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **7** – Break Out Box **DT** Pin **24**

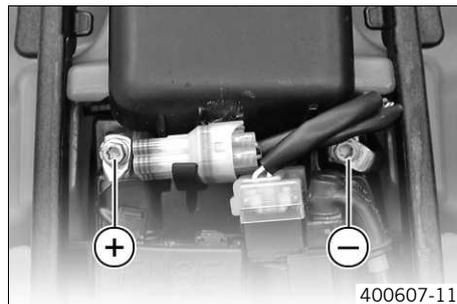
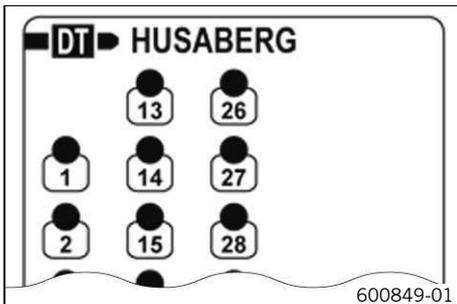
| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **7** to connector **CU** pin **2** for a short circuit to sensor ground.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Lambda sensor - signal line has a short circuit to plus (terminal 30) (☛ p. 192)

Lambda sensor - signal line has a short circuit to plus (terminal 30)

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Lambda sensor is disconnected.



Lambda sensor - check the signal line for a short circuit to plus (terminal 30)

- Measure the voltage between the specified points.
Break Out Box **DT** Pin **7** – measuring point **Ground(-)**

| | |
|---------|---------|
| Voltage | < 0.1 V |
|---------|---------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **7** to connector **CU** pin **2** for a short circuit to plus (terminal 30).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 - Lambda sensor - signal line has a short circuit to ignition plus (terminal 15) (☛ p. 193)

Lambda sensor - signal line has a short circuit to ignition plus (terminal 15)

Condition

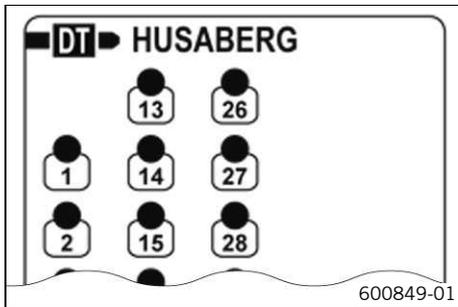
The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 Lambda sensor is disconnected.

Lambda sensor - check the signal line for a short circuit to ignition plus (terminal 15)

- Measure the resistance between the specified points.
 Break Out Box **DT** Pin **1** – Break Out Box **DT** Pin **7**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **7** to connector **CU** pin **2** for a short circuit to ignition plus (terminal 15).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 - Lambda sensor - signal line has a short circuit to the sensor power supply (☛ p. 193)



Lambda sensor - signal line has a short circuit to the sensor power supply

Condition

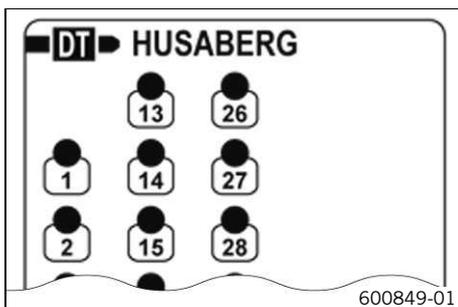
The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 Lambda sensor is disconnected.

Lambda sensor - check the signal line for a short circuit to the sensor power supply

- Measure the resistance between the specified points.
 Break Out Box **DT** Pin **7** – Break Out Box **DT** Pin **13**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

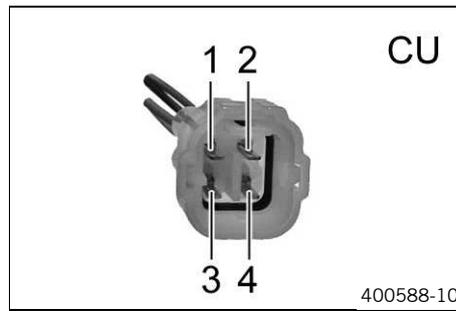
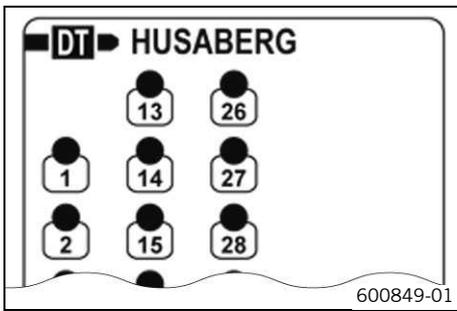
- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **7** to connector **CU** pin **2** for a short circuit to the sensor power supply.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 - Lambda sensor - signal line is open (☛ p. 193)



Lambda sensor - signal line is open

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 Lambda sensor is disconnected.



Intake air temperature sensor - check the signal line for an open circuit

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **7** – Connector **CU** Pin **2**

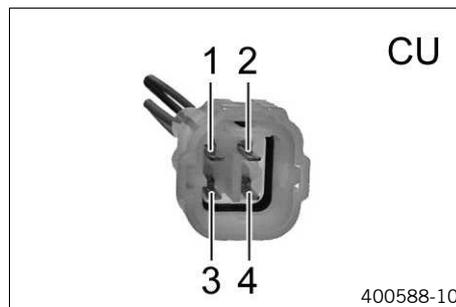
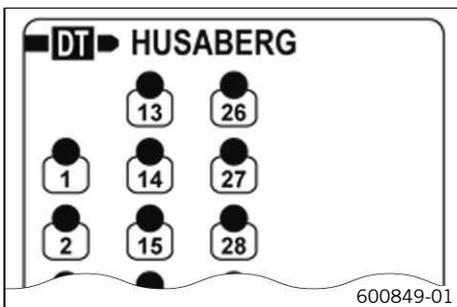
| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **7** and connector **CU** pin **2**.
 - Check the cable from connector **DT** pin **7** to connector **CU** pin **2** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Lambda probe - ground line is open (☛ p. 194)

Lambda probe - ground line is open

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Lambda sensor is disconnected.



Lambda probe - check the ground line for an open circuit

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **24** – Connector **CU** Pin **1**

| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **24** and connector **CU** pin **1**.
 - Check the cable from connector **DT** pin **24** to connector **CU** pin **1** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Contact customer service.

| | |
|---|---|
| Flash code FI warning lamp (MIL) |  33 FI warning lamp (MIL) flashes 3x long, 3x short |
| Display on diagnostic tool | P0201 "Injection valve cylinder 1" "Malfunction in the circuit" |
| Error level condition | Malfunction in the circuit: ≥ 0.2 s |
| Function check | Injection valve - checking the actuation (☛ p. 195) |
| Possible cause | Injection valve - value not plausible (☛ p. 195) |
| | Injection valve - power supply is faulty (☛ p. 196) |
| | Injection valve - control line has a short circuit to plus (terminal 30) (☛ p. 196) |
| | Injection valve - control line has a short circuit to ignition plus (terminal 15) (☛ p. 197) |
| | Injection valve - control line has a short circuit to the sensor power supply (☛ p. 197) |
| | Injection valve - control line is open (☛ p. 197) |
| | Injection valve - control line has a short circuit to ground (terminal 31) (☛ p. 198) |
| | Injection valve - control line has a short circuit to sensor ground (☛ p. 198) |

Injection valve - checking the actuation

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"actuator test"**.
- **"Please enter password:"**
- Press **"Continue"**.
- Select **"Injection valve cylinder 1"**.
- Press **"Continue"**.
- Read the information page in the HUSABERG diagnostic tool and, with **"Continue"**, begin the actuator test.

| | |
|-----------------|----------------|
| Injection valve | Function noise |
|-----------------|----------------|

- » If the specification is attained:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is not equal to the setpoint value:
 - Check the next possible cause:
 - Injection valve - value not plausible (☛ p. 195)

Injection valve - value not plausible

Condition

The diagnostic tool is disconnected.
The injection valve is disconnected.

Injection valve - check the resistance

-  Measure the resistance between the specified points.
Injection valve Pin **1** – Injection valve Pin **2**



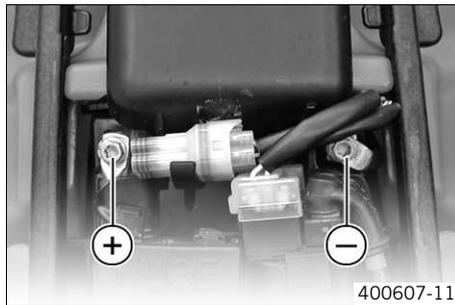
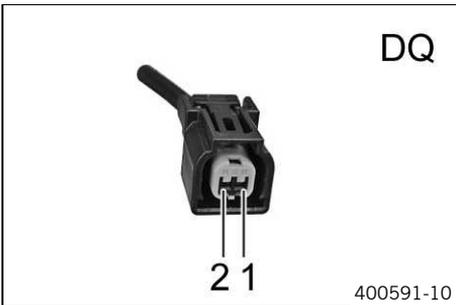
| | |
|------------------------------|----------------|
| Injection valve | |
| Resistance at: 20 °C (68 °F) | 10.5... 13.0 Ω |

- » If the measured value does not correspond to the specified value:
 - Change the injection valve.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 - Injection valve - power supply is faulty (☛ p. 196)

Injection valve - power supply is faulty

Condition

The diagnostic tool is connected and active.
 The EFI control unit is connected.
 The injection valve is disconnected.



Injection valve - check the power supply

- **V** Measure the voltage between the specified points.
 Connector **DQ** Pin **1** – measuring point **Ground(-)**



Info

For the measurement, the measurement points must be loaded with a 12V/21W bulb.

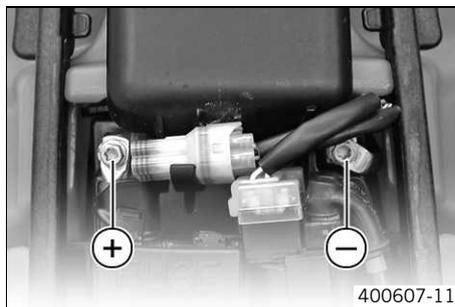
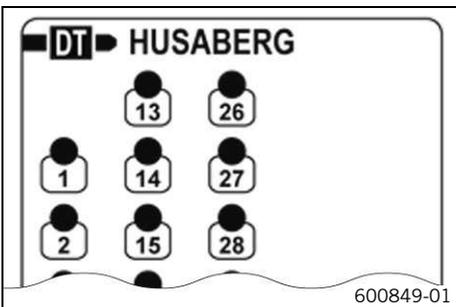
The value should not vary more than 1V from the battery voltage "VBAT".

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DQ** pin **1** to the next node in the cable harness for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Injection valve - control line has a short circuit to plus (terminal 30) (☛ p. 196)

Injection valve - control line has a short circuit to plus (terminal 30)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The injection valve is disconnected.



Injection valve - check the control line for a short circuit to plus (terminal 30)

- **V** Measure the voltage between the specified points.
 Break Out Box **DT** Pin **16** – measuring point **Ground(-)**

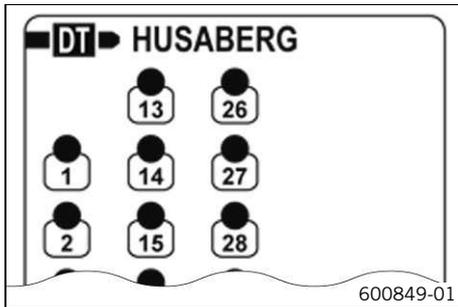
| | |
|---------|---------|
| Voltage | < 0.1 V |
|---------|---------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **16** to connector **DQ** pin **2** for a short circuit to plus (terminal 30).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Injection valve - control line has a short circuit to ignition plus (terminal 15) (☛ p. 197)

Injection valve - control line has a short circuit to ignition plus (terminal 15)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The injection valve is disconnected.



Injection valve - check the control line for a short circuit to ignition plus (terminal 15)

- Ω Measure the resistance between the specified points.
 Break Out Box DT Pin 1 – Break Out Box DT Pin 16

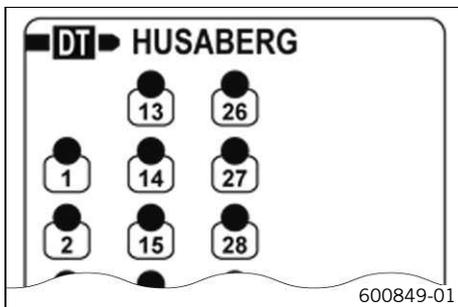
| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector DT pin 16 to connector DQ pin 2 for a short circuit to ignition plus (terminal 15).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Injection valve - control line has a short circuit to the sensor power supply (☛ p. 197)

Injection valve - control line has a short circuit to the sensor power supply

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The injection valve is disconnected.



Injection valve - check the control line for a short circuit to the sensor power supply

- Ω Measure the resistance between the specified points.
 Break Out Box DT Pin 13 – Break Out Box DT Pin 16

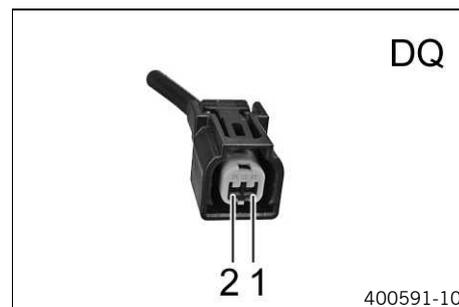
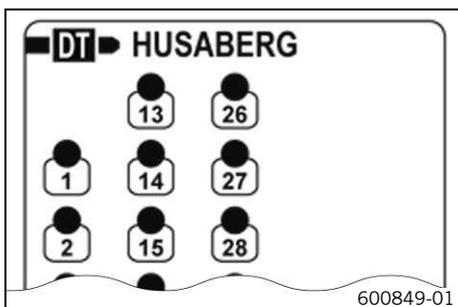
| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector DT pin 16 to connector DQ pin 2 for a short circuit to the sensor power supply.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Injection valve - control line is open (☛ p. 197)

Injection valve - control line is open

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The injection valve is disconnected.



Injection valve - check the control line for an open circuit

- Ω Measure the resistance between the specified points.
 Break Out Box DT Pin 16 – Connector DQ Pin 2

| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

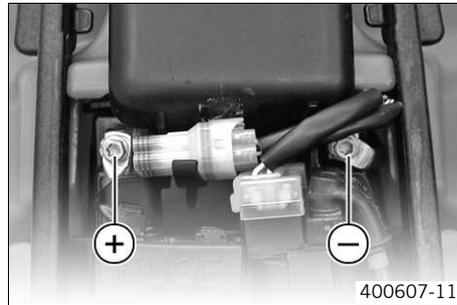
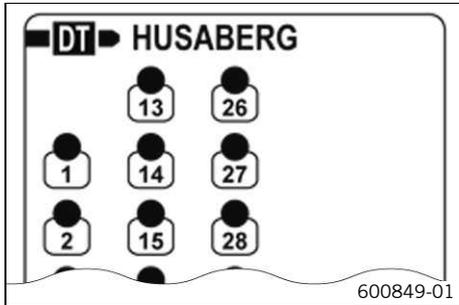
- » If the measured value does not correspond to the specified value:

- Check connector **DT** pin **16** and connector **DQ** pin **2**.
- Check the cable from connector **DT** pin **16** to connector **DQ** pin **2** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 - Injection valve - control line has a short circuit to ground (terminal 31) (☛ p. 198)

Injection valve - control line has a short circuit to ground (terminal 31)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The injection valve is disconnected.



Injection valve - check the control line for a short circuit to ground (terminal 31)

- Measure the resistance between the specified points.
 Break Out Box **DT** Pin **16** – measuring point **Ground(-)**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **16** to connector **DQ** pin **2** for a short circuit to ground (terminal 31).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 - Injection valve - control line has a short circuit to sensor ground (☛ p. 198)

Injection valve - control line has a short circuit to sensor ground

Condition

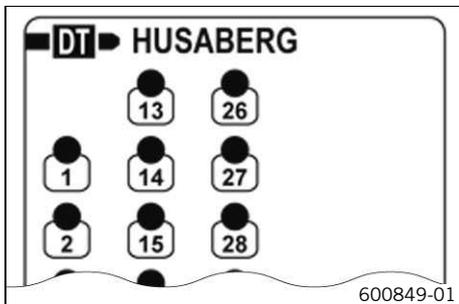
The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The injection valve is disconnected.

Injection valve - check the control line for a short circuit to sensor ground

- Measure the resistance between the specified points.
 Break Out Box **DT** Pin **16** – Break Out Box **DT** Pin **24**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **16** to connector **DQ** pin **2** for a short circuit to sensor ground.
- » If the measured value corresponds to the specified value:
 - Contact customer service.



| | |
|---|---|
| Flash code FI warning lamp (MIL) |  02 FI warning lamp (MIL) flashes 2x short |
| Display on diagnostic tool | P0335 "Circuit ignition pulse generator" "Malfunction in the circuit" |
| Error level condition | The manifold absolute pressure sensor is generating a standard signal (the engine is running), whereas the ignition pulse generator is not generating any signal. The engine will be switched off: ≥ 1 s |
| Function check | Ignition pulse generator - checking the signal (☛ p. 199) |
| Possible cause | Ignition pulse generator - value not plausible (☛ p. 199) |
| | Ignition pulse generator - signal lines are open (☛ p. 200) |
| | Ignition pulse generator - signal lines have a short circuit to each other (☛ p. 200) |
| | Ignition pulse generator - signal lines have a short circuit to ground (terminal 31) (☛ p. 200) |
| | Ignition pulse generator - signal lines have a short circuit to sensor ground (☛ p. 201) |
| | Ignition pulse generator - signal lines have a short circuit to plus (terminal 30) (☛ p. 201) |
| | Ignition pulse generator - signal lines have a short circuit to ignition plus (terminal 15) (☛ p. 202) |
| | Ignition pulse generator - signal line has a short circuit to the sensor power supply (☛ p. 202) |

Ignition pulse generator - checking the signal

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"Measurement values"**.
- Highlight **"Starter"**.
- Press **"Continue"**.
- Highlight the measured value **"Engine speed (NE)"** and deselect the other parameters with **"Select measured value"**.
- Perform the starting procedure.

| | |
|----------------------------|---------------|
| "Engine speed (NE)" | Starter speed |
|----------------------------|---------------|

- » If the specification is attained:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the specification is not attained:
 - Check the next possible cause: Ignition pulse generator - value not plausible (☛ p. 199)

Ignition pulse generator - value not plausible

Condition

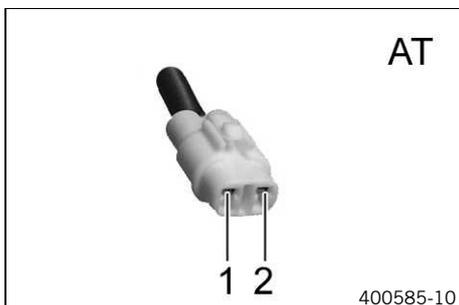
Ignition pulse generator is disconnected.

Ignition pulse generator - check the resistance

-  Measure the resistance between the specified points.
 Connector **AT** Pin 1 – Connector **AT** Pin 2

| | |
|------------------------------|-------------|
| Pulse generator | |
| Resistance at: 20 °C (68 °F) | 80... 120 Ω |

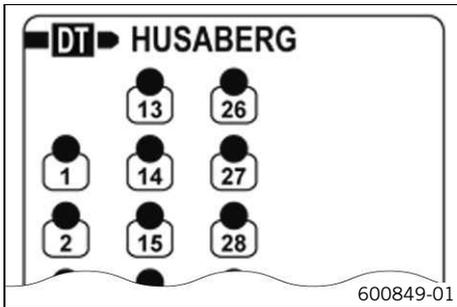
- » If the measured value does not correspond to the specified value:
 - Change the ignition pulse generator.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause: Ignition pulse generator - signal lines are open (☛ p. 200)



Ignition pulse generator - signal lines are open

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 Ignition pulse generator is connected.



Ignition pulse generator - check the signal lines for an open circuit

- Measure the resistance between the specified points.
 Break Out Box **DT** Pin **3** – Break Out Box **DT** Pin **9**

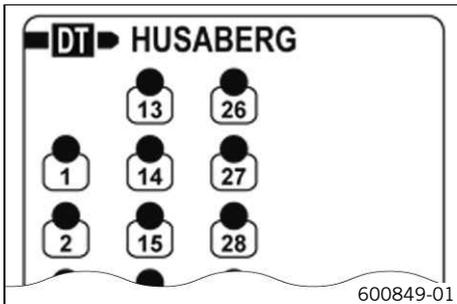
| | |
|------------------------------|-------------|
| Pulse generator | |
| Resistance at: 20 °C (68 °F) | 80... 120 Ω |

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **3** and connector pin **9**.
 - Check connector **AL** pin **1** and connector pin **2**.
 - Check the cable from connector **DT** pin **3** to connector **AL** pin **2** for an open circuit.
 - Check the cable from connector **DT** pin **9** to connector **AL** pin **1** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Ignition pulse generator - signal lines have a short circuit to each other (☛ p. 200)

Ignition pulse generator - signal lines have a short circuit to each other

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 Ignition pulse generator is connected.



Ignition pulse generator - check the signal lines for a short circuit to each other

- Measure the resistance between the specified points.
 Break Out Box **DT** Pin **3** – Break Out Box **DT** Pin **9**

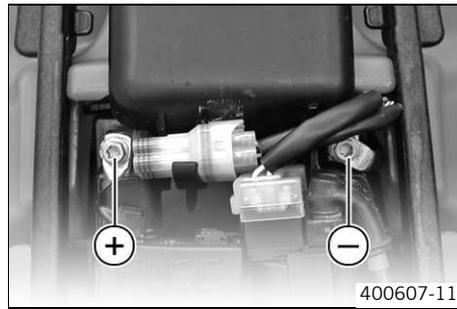
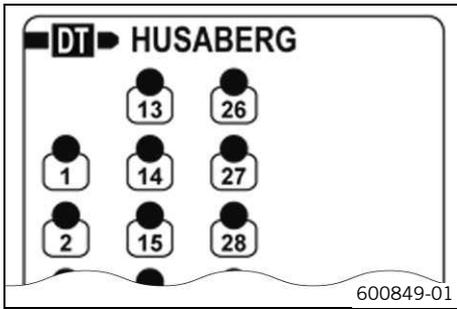
| | |
|------------|-----|
| Resistance | ∞ Ω |
|------------|-----|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **3** to connector **AL** pin **2** for a short circuit to the cable from connector **DT** pin **9** to connector **AL** pin **1**.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Ignition pulse generator - signal lines have a short circuit to ground (terminal 31) (☛ p. 200)

Ignition pulse generator - signal lines have a short circuit to ground (terminal 31)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 Ignition pulse generator is connected.



Ignition pulse generator - check the signal lines for a short circuit to ground (terminal 31)

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **3** – measuring point **Ground(-)**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **3** to connector **AL** pin **2** for a short circuit to ground (terminal 31).
 - Check the cable from connector **DT** pin **9** to connector **AL** pin **1** for a short circuit to ground (terminal 31).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Ignition pulse generator - signal lines have a short circuit to sensor ground (☛ p. 201)

Ignition pulse generator - signal lines have a short circuit to sensor ground

Condition

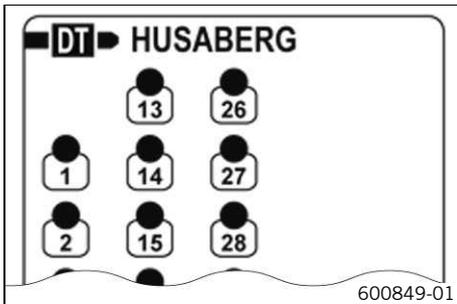
The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Ignition pulse generator is connected.

Ignition pulse generator - check the signal lines for a short circuit to sensor ground

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **3** – Break Out Box **DT** Pin **24**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

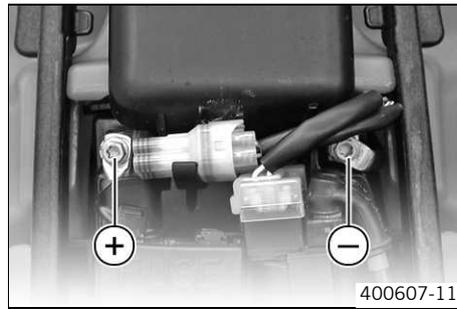
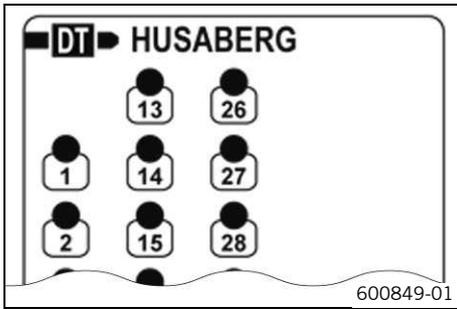
- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **3** to connector **AL** pin **2** for a short circuit to sensor ground.
 - Check the cable from connector **DT** pin **9** to connector **AL** pin **1** for a short circuit to sensor ground.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Ignition pulse generator - signal lines have a short circuit to plus (terminal 30) (☛ p. 201)



Ignition pulse generator - signal lines have a short circuit to plus (terminal 30)

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Ignition pulse generator is connected.



Ignition pulse generator - check the signal lines for a short circuit to plus (terminal 30)

- **V** Measure the voltage between the specified points.
Break Out Box **DT** Pin **3** – measuring point **Ground(-)**

| | |
|---------|---------|
| Voltage | < 0.1 V |
|---------|---------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **3** to connector **AL** pin **2** for a short circuit to plus (terminal 30).
 - Check the cable from connector **DT** pin **9** to connector **AL** pin **1** for a short circuit to plus (terminal 30).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Ignition pulse generator - signal lines have a short circuit to ignition plus (terminal 15) (☛ p. 202)

Ignition pulse generator - signal lines have a short circuit to ignition plus (terminal 15)

Condition

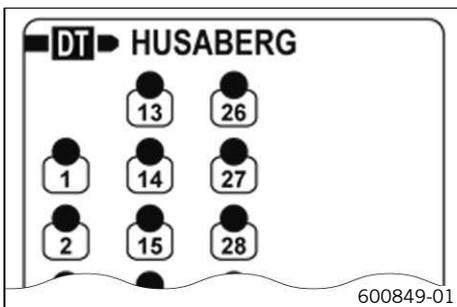
The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Ignition pulse generator is connected.

Ignition pulse generator - check the signal line for a short circuit to ignition plus (terminal 15)

- **Ω** Measure the resistance between the specified points.
Break Out Box **DT** Pin **1** – Break Out Box **DT** Pin **3**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **3** to connector **AL** pin **2** for a short circuit to ignition plus (terminal 15).
 - Check the cable from connector **DT** pin **9** to connector **AL** pin **1** for a short circuit to ignition plus (terminal 15).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Ignition pulse generator - signal line has a short circuit to the sensor power supply (☛ p. 202)



Ignition pulse generator - signal line has a short circuit to the sensor power supply

Condition

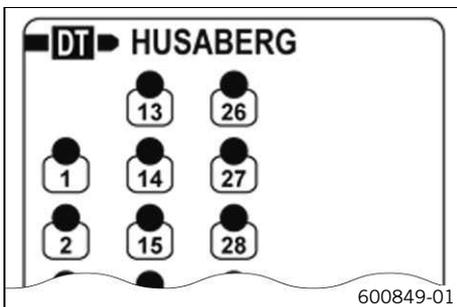
The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
Ignition pulse generator is connected.

Ignition pulse generator - check the signal line for a short circuit to the sensor power supply

- **Ω** Measure the resistance between the specified points.
Break Out Box **DT** Pin **3** – Break Out Box **DT** Pin **13**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **3** to connector **AL** pin **2** for a short circuit to the sensor power supply.
 - Check the cable from connector **DT** pin **9** to connector **AL** pin **1** for a short circuit to the sensor power supply.



- » If the measured value corresponds to the specified value:
 - Contact customer service.

| | |
|---|---|
| Flash code FI warning lamp (MIL) |  37 FI warning lamp (MIL) flashes 3x long, 7x short |
| Display on diagnostic tool | P0351 "Cylinder 1 ignition coil" "Malfunction in the circuit" |
| Error level condition | Malfunction in the circuit. The engine will be switched off: ≥ 0.2 s |
| Function check | Checking the ignition coil (☛ p. 204) |
| Possible cause | Ignition coil - value not plausible (☛ p. 204) |
| | Injection coil - control line has a short circuit to ground (terminal 31) (☛ p. 205) |
| | Ignition coil - control line has a short circuit to sensor ground (☛ p. 205) |
| | Ignition coil - control line has a short circuit to plus (terminal 30) (☛ p. 205) |
| | Ignition coil - control line has a short circuit to ignition plus (terminal 15) (☛ p. 206) |
| | Ignition coil - control line is open (☛ p. 206) |

Checking the ignition coil

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"actuator test"**.
- **"Please enter password:"**
- Press **"Continue"**.
- Select **"Ignition cylinder 1"**.
- Press **"Continue"**.
- Read the information page in the HUSABERG diagnostic tool and, with **"Continue"**, begin the actuator test.

| | |
|------------|----------------|
| Spark plug | Function noise |
|------------|----------------|

- » If the specification is attained:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the specification is not attained:
 - Check the next possible cause:
 - Ignition coil - value not plausible (☛ p. 204)

Ignition coil - value not plausible

Condition

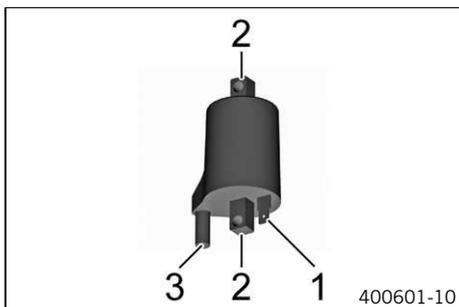
The control line of the ignition coil is disconnected.

Ignition coil - check the resistance

-  Measure the resistance between the specified points.
 - Ignition coil Pin 1 – Ignition coil Pin 2

| | |
|---|------------------|
| Ignition coil | |
| Primary winding resistance at: 20 °C (68 °F) | 0.425... 0.575 Ω |

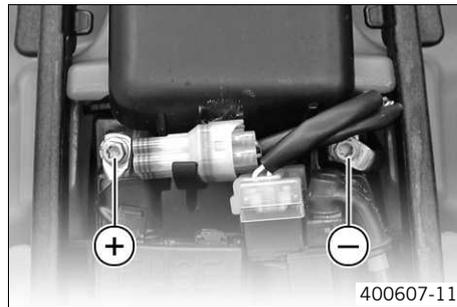
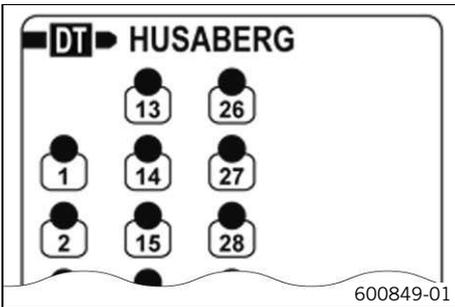
- » If the measured value does not correspond to the specified value:
 - Change the ignition coil.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 - Injection coil - control line has a short circuit to ground (terminal 31) (☛ p. 205)



Injection coil - control line has a short circuit to ground (terminal 31)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The control line of the ignition coil is disconnected.



Ignition coil - check the control line for a short circuit to ground (terminal 31)

- Measure the resistance between the specified points.
 Break Out Box **DT** Pin **18** – measuring point **Ground(-)**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **18** to pin **1** of the ignition coil for a short circuit to ground (terminal 31).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Ignition coil - control line has a short circuit to sensor ground (☛ p. 205)

Ignition coil - control line has a short circuit to sensor ground

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The control line of the ignition coil is disconnected.

Ignition coil - checking the control line for a short circuit to sensor ground

- Measure the resistance between the specified points.
 Break Out Box **DT** Pin **18** – Break Out Box **DT** Pin **24**

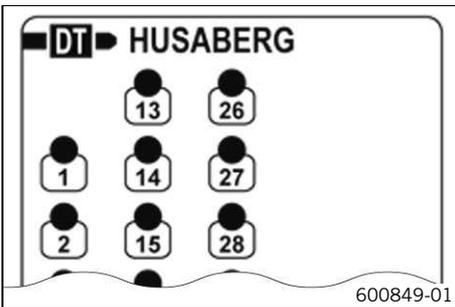
| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

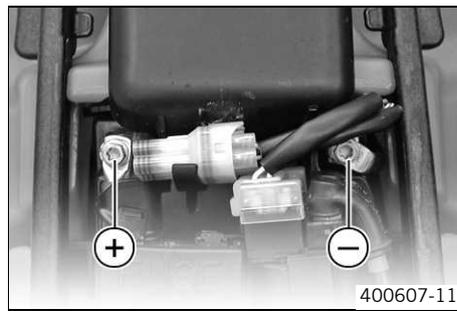
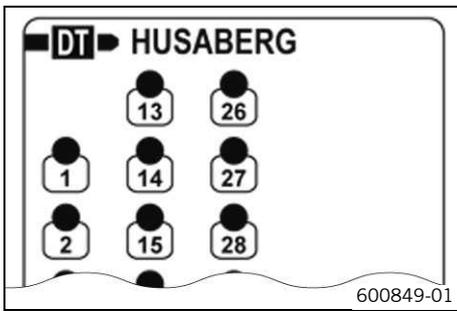
- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **18** to pin **1** of the ignition coil for a short circuit to sensor ground.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Ignition coil - control line has a short circuit to plus (terminal 30) (☛ p. 205)

Ignition coil - control line has a short circuit to plus (terminal 30)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The control line of the ignition coil is disconnected.





Ignition coil - check the control line for a short circuit to plus (terminal 30)

- **V** Measure the voltage between the specified points.
Break Out Box **DT** Pin **18** – measuring point **Ground(-)**

| | |
|---------|---------|
| Voltage | < 0.1 V |
|---------|---------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **18** to pin **1** of the ignition coil for a short circuit to plus (terminal 30).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Ignition coil - control line has a short circuit to ignition plus (terminal 15) (☛ p. 206)

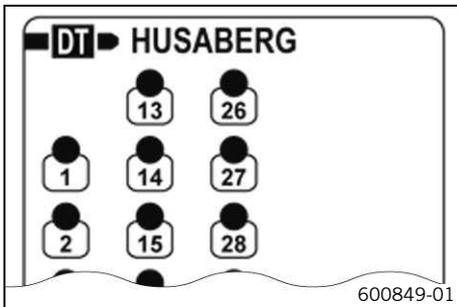
Ignition coil - control line has a short circuit to ignition plus (terminal 15)

Condition

The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
The control line of the ignition coil is disconnected.

Ignition coil - check the control line for a short circuit to ignition plus (terminal 15)

- **Ω** Measure the resistance between the specified points.
Break Out Box **DT** Pin **1** – Break Out Box **DT** Pin **18**



| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **18** to pin **1** of the ignition coil for a short circuit to ignition plus (terminal 15).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Ignition coil - control line is open (☛ p. 206)

Ignition coil - control line is open

Condition

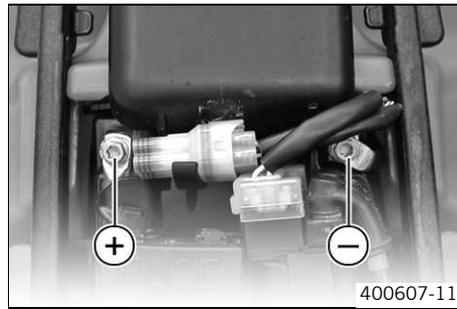
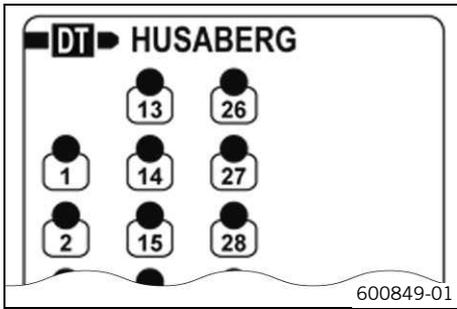
The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
The control line of the ignition coil is disconnected.

- Connect battery plus with Break Out Box PIN **18**.



Info

The connection must be protected with a 5A fuse.



Ignition coil - check the control line for an open circuit

- **V** Measure the voltage between the specified points.
Break Out Box **DT** Pin **18** – measuring point **Ground(-)**



Info

For the measurement, the measurement points must be loaded with a 12V/21W bulb.

The value should not vary more than 1V from the battery voltage **"VBAT"**.

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **18** and connector pin **1** at the ignition coil.
 - Check the cable from connector **DT** pin **18** to connector pin **1** at the ignition coil for an open circuit.
- » If the measured value corresponds to the specified value:
 - Contact customer service.

| | |
|---|---|
| Flash code FI warning lamp (MIL) |  41 FI warning lamp (MIL) flashes 4x long, 1x short |
| Display on diagnostic tool | P1231 "Fuel pump controller" "Open/short circuit to ground" |
| Error level condition | Malfunction in the circuit. The engine will be switched off: ≥ 3 s |
| Function check | Checking the fuel pump relay (☛ p. 208) |
| Possible cause | Fuel pump - value not plausible (☛ p. 208) |
| | Fuel pump - control line is open (☛ p. 209) |
| | Fuel pump - resistance of ground line is too high (☛ p. 209) |
| | Fuel pump - control line has a short circuit to ground (terminal 31) (☛ p. 210) |
| | Fuel pump - control line has a short circuit to sensor ground (☛ p. 210) |

Checking the fuel pump relay

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"actuator test"**.
- **"Please enter password:"**
- Press **"Continue"**.
- Select **"Function fuel pump relay"**.
- Press **"Continue"**.
- Read the information page in the HUSABERG diagnostic tool and, with **"Continue"**, begin the actuator test.

| | |
|-----------|----------------|
| Fuel pump | Function noise |
|-----------|----------------|

- » If the specification is attained:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the specification is not attained:
 - Check the next possible cause:
 Fuel pump - value not plausible (☛ p. 208)

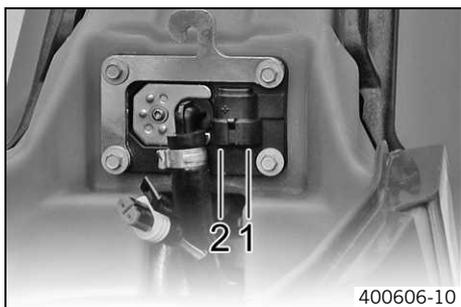
Fuel pump - value not plausible

Condition

The diagnostic tool is disconnected.
 Fuel pump is disconnected.

Fuel pump - check the resistance

-  Measure the resistance between the specified points.
 Fuel pump Pin **1** – Fuel pump Pin **2**



400606-10

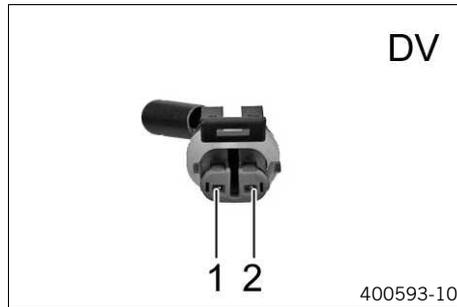
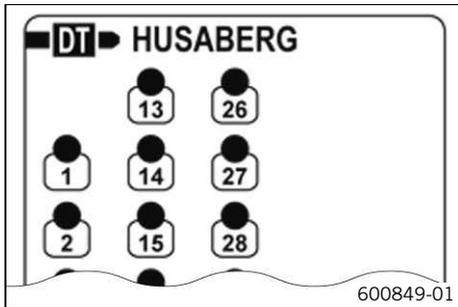
| | | |
|-----------|------------------------------|--------------|
| Fuel pump | Resistance at: 20 °C (68 °F) | 1.0... 1.8 Ω |
|-----------|------------------------------|--------------|

- » If the measured value does not correspond to the specified value:
 - Replace the fuel pump.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Fuel pump - control line is open (☛ p. 209)

Fuel pump - control line is open

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 Fuel pump is disconnected.



Fuel pump - check the control line for an open circuit

-  Measure the resistance between the specified points.
 Break Out Box **DT** Pin **15** – Connector **DV** Pin **2**

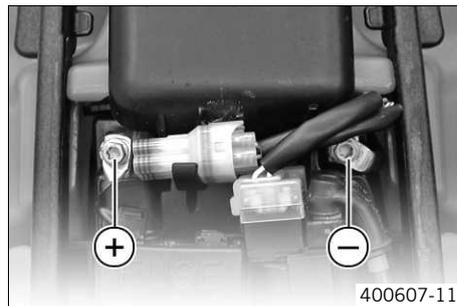
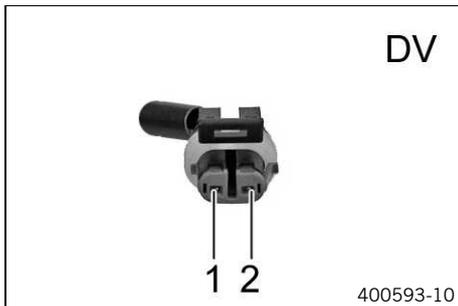
| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **15** and connector **DV** pin **2**.
 - Check the cable from connector **DT** pin **15** to connector **DV** pin **2** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Fuel pump - resistance of ground line is too high (☛ p. 209)

Fuel pump - resistance of ground line is too high

Condition

The diagnostic tool is disconnected.
 Fuel pump is disconnected.



Fuel pump - check the load capacity of the ground line

-  Measure the voltage between the specified points.
 Connector **DV** Pin **1** – measuring point **Plus (+)**



Info

For the measurement, the measurement points must be loaded with a 12V/21W bulb.

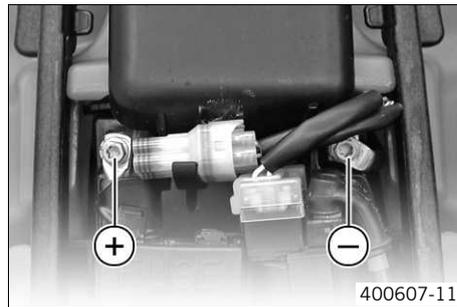
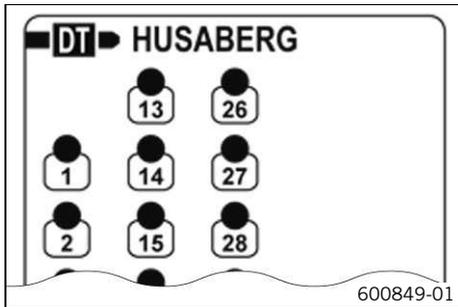
| |
|---|
| The value should not vary more than 1V from the battery voltage "VBAT". |
|---|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DV** pin **1** to the next node in the cable harness for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Fuel pump - control line has a short circuit to ground (terminal 31) (☛ p. 210)

Fuel pump - control line has a short circuit to ground (terminal 31)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 Fuel pump is disconnected.



Fuel pump - check the control line for a short circuit to ground (terminal 31)

- Measure the resistance between the specified points.
 Break Out Box **DT** Pin **15** – measuring point **Ground(-)**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **15** to connector **DV** pin **2** for a short circuit to ground (terminal 31).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 Fuel pump - control line has a short circuit to sensor ground (☛ p. 210)

Fuel pump - control line has a short circuit to sensor ground

Condition

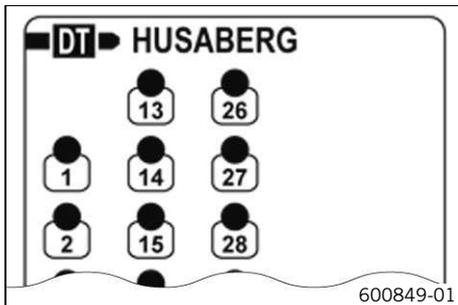
The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 Fuel pump is disconnected.

Fuel pump - checking the control line for a short circuit to sensor ground

- Measure the resistance between the specified points.
 Break Out Box **DT** Pin **15** – Break Out Box **DT** Pin **24**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **15** to connector **DV** pin **2** for a short circuit to sensor ground.
- » If the measured value corresponds to the specified value:
 - Contact customer service.



| | |
|---|---|
| Flash code FI warning lamp (MIL) |  41 FI warning lamp (MIL) flashes 4x long, 1x short |
| Display on diagnostic tool | P1232 "Fuel pump controller" "Short circuit to positive" |
| Error level condition | Malfunction in the circuit. The engine will be switched off: ≥ 3 s |
| Function check | Checking the fuel pump relay (☛ p. 211) |
| Possible cause | Fuel pump - power supply via 2 is faulty (☛ p. 211) |
| | Fuel pump - power supply is faulty (☛ p. 212) |

Checking the fuel pump relay

Condition

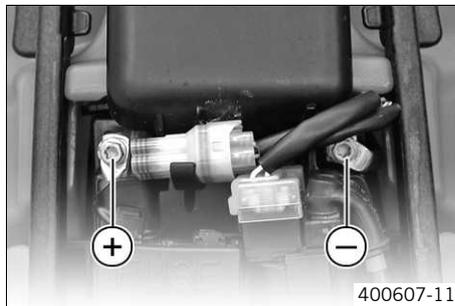
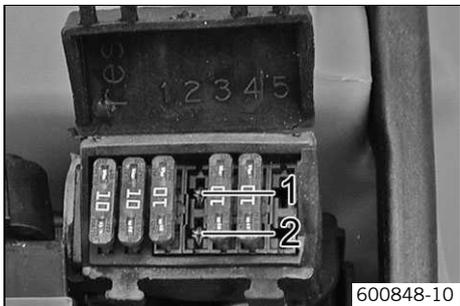
The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"actuator test"**.
- **"Please enter password:"**
- Press **"Continue"**.
- Select **"Function fuel pump relay"**.
- Press **"Continue"**.
- Read the information page in the HUSABERG diagnostic tool and, with **"Continue"**, begin the actuator test.

| | |
|-----------|----------------|
| Fuel pump | Function noise |
|-----------|----------------|

- » If the specification is attained:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the specification is not attained:
 - Check the next possible cause:
 Fuel pump - power supply via **2** is faulty (☛ p. 211)

Fuel pump - power supply via 2 is faulty



Fuel pump - check the power supply at fuse 2.

- **V** Measure the voltage between the specified points.
 Fuse **2** Pin **1** – measuring point **Ground(-)**

i Info

For the measurement, the measurement points must be loaded with a 12V/21W bulb.

The value should not vary more than 1V from the battery voltage **"VBAT"**.

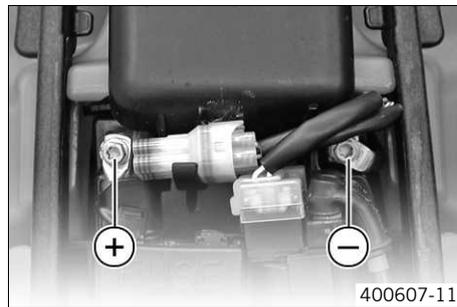
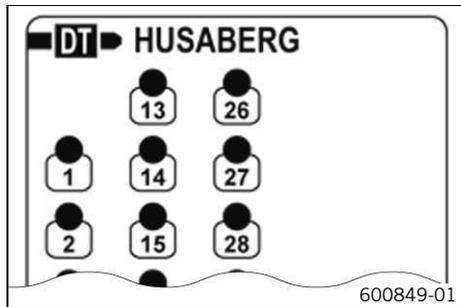
- » If the measured value does not correspond to the specified value:
 - Check the cable from the connector of fuse pin **1** to the next node in the cable harness for an open circuit.

- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
 - Fuel pump - power supply is faulty (☛ p. 212)

Fuel pump - power supply is faulty

Condition

The diagnostic tool is connected and active.
 The breakout box is connected to the EFI control unit and wiring harness.



Fuel pump - check the power supply

- **V** Measure the voltage between the specified points.
 Break Out Box **DT** Pin **14** – measuring point **Ground(-)**



Info

For the measurement, the measurement points must be loaded with a 12V/21W bulb.

The value should not vary more than 1V from the battery voltage **"VBAT"**.

- » If the measured value does not correspond to the specified value:
 - Check the cable from the connector of fuse pin **2** to connector **DT** pin **14** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Contact customer service.

| | |
|---|---|
| Flash code FI warning lamp (MIL) |  15 FI warning lamp (MIL) flashes 1x long, 5x short |
| Display on diagnostic tool | P1631 "Rollover sensor (A/D type)" "Input signal too low" |
| Error level condition | Signal voltage "(A/D type)" : ≤ 0.176 V Time: ≥ 3 s |
| Function check | Checking the rollover sensor (☛ p. 213) |
| Possible cause | Rollover sensor - signal line has a short circuit to ground (terminal 31) (☛ p. 213) |
| | Rollover sensor - signal line has a short circuit to sensor ground (☛ p. 214) |
| | Rollover sensor - power supply is open (☛ p. 214) |

Checking the rollover sensor

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"Measurement values"**.
- Highlight **"Starter"**.
- Press **"Continue"**.
- Highlight the measured value **"Rollover sensor voltage (RolloverAD)"** and deselect the other parameters with **"Select measured value"**.



Info

Deselecting the other parameters improves the quality of the selected parameters (faster data transmission due to smaller data volume).

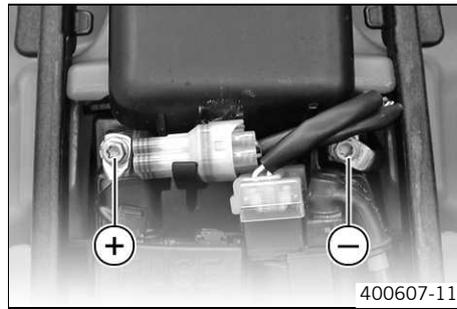
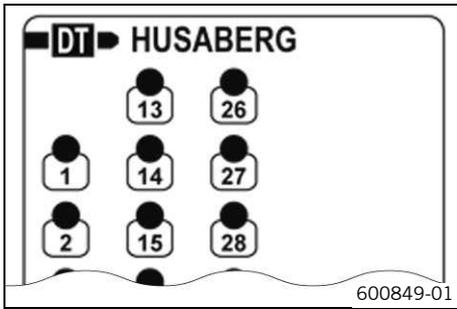
| | |
|--------------------------------|--------------|
| Roll angle sensor | |
| Voltage "Standard" | 0.4... 1.4 V |
| Voltage "Drop detected" | 3.7... 4.1 V |

- » If the displayed value is equal to the setpoint value:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is below the setpoint value:
 - Check the next possible cause:
 Rollover sensor - signal line has a short circuit to ground (terminal 31) (☛ p. 213)

Rollover sensor - signal line has a short circuit to ground (terminal 31)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The rollover sensor is disconnected.



Rollover sensor - check the signal line for a short circuit to ground (terminal 31)

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **2** – measuring point **Ground(-)**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **2** to connector **AP** pin **5** for a short circuit to ground (terminal 31).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Rollover sensor - signal line has a short circuit to sensor ground (☛ p. 214)

Rollover sensor - signal line has a short circuit to sensor ground

Condition

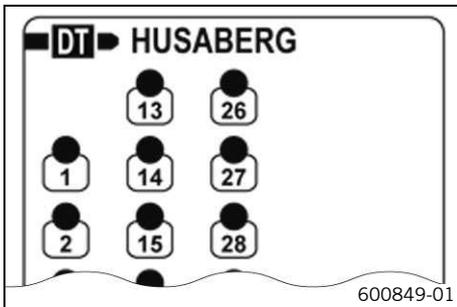
The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
The rollover sensor is disconnected.

Rollover sensor - check the signal line for a short circuit to sensor ground

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **2** – Break Out Box **DT** Pin **24**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

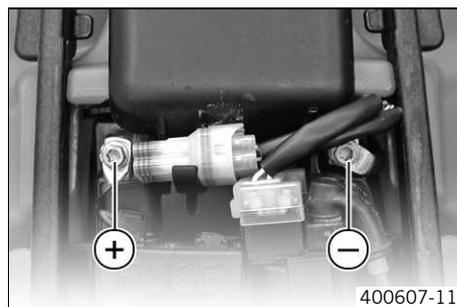
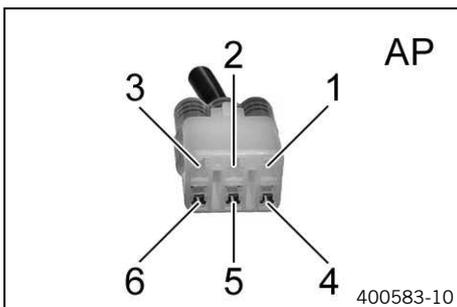
- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **2** to connector **AP** pin **5** for a short circuit to sensor ground.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Rollover sensor - power supply is open (☛ p. 214)



Rollover sensor - power supply is open

Condition

The diagnostic tool is connected and active.
The EFI control unit is connected.
The rollover sensor is disconnected.



Rollover sensor - check the power supply

- Measure the voltage between the specified points.
Connector **AP** Pin **6** – measuring point **Ground(-)**

| | |
|---------|--------------|
| Voltage | 4.9... 5.1 V |
|---------|--------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **AP** pin **6**.
 - Check the cable from connector **AP** pin **6** to the next node in the cable harness for an open circuit.
- » If the measured value corresponds to the specified value:
 - Contact customer service.

| | |
|---|--|
| Flash code FI warning lamp (MIL) |  15 FI warning lamp (MIL) flashes 1x long, 5x short |
| Display on diagnostic tool | P1632 "Rollover sensor (A/D type)" "Input signal too high" |
| Error level condition | Voltage "(A/D type)" : ≥ 4.57 V Time: ≥ 3 s <hr/> Voltage "(A/D type)" : 1.875... 3.125 V Time: ≥ 25.5 s |
| Function check | Checking the rollover sensor (☛ p. 216) |
| Possible cause | Rollover sensor - signal line has a short circuit to plus (terminal 30) (☛ p. 216) Rollover sensor - signal line has a short circuit to ignition plus (terminal 15) (☛ p. 217) Rollover sensor - signal line has a short circuit to the sensor power supply (☛ p. 217) Rollover sensor - signal line is open (☛ p. 218) Rollover sensor - ground line is open (☛ p. 218) |

Checking the rollover sensor

Condition

The diagnostic tool is connected and active.

- Select the model type.
- Select **"ECU Diagnostic"**.
- Highlight the **"Engine electronics EXC"** control unit.
- Press **"Continue"**.
- Select **"Measurement values"**.
- Highlight **"Starter"**.
- Press **"Continue"**.
- Highlight the measured value **"Rollover sensor voltage (RolloverAD)"** and deselect the other parameters with **"Select measured value"**.



Info

Deselecting the other parameters improves the quality of the selected parameters (faster data transmission due to smaller data volume).

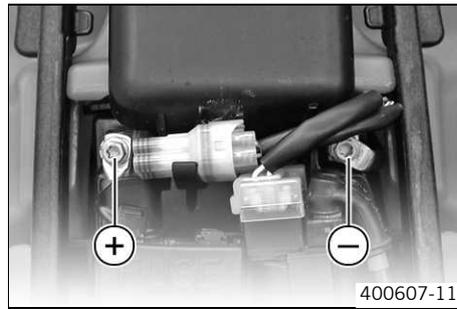
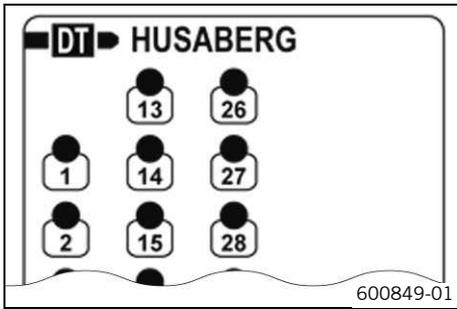
| | |
|--------------------------------|--------------|
| Roll angle sensor | |
| Voltage "Standard" | 0.4... 1.4 V |
| Voltage "Drop detected" | 3.7... 4.1 V |

- » If the displayed value is equal to the setpoint value:
 - Delete the fault code.
 - Make a test ride.
 - Read out the fault code.
- » If the displayed value is above the setpoint value:
 - Check the next possible cause:
 - Rollover sensor - signal line has a short circuit to plus (terminal 30) (☛ p. 216)

Rollover sensor - signal line has a short circuit to plus (terminal 30)

Condition

The diagnostic tool is disconnected.
 The EFI control unit is disconnected.
 The breakout box is connected to the wiring harness.
 The rollover sensor is disconnected.



Rollover sensor - check the signal line for a short circuit to plus (terminal 30)

- **V** Measure the voltage between the specified points.
Break Out Box **DT** Pin **2** – measuring point **Ground(-)**

| | |
|---------|---------|
| Voltage | < 0.1 V |
|---------|---------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **2** to connector **AP** pin **5** for a short circuit to plus (terminal 30).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Rollover sensor - signal line has a short circuit to ignition plus (terminal 15) (☛ p. 217)

Rollover sensor - signal line has a short circuit to ignition plus (terminal 15)

Condition

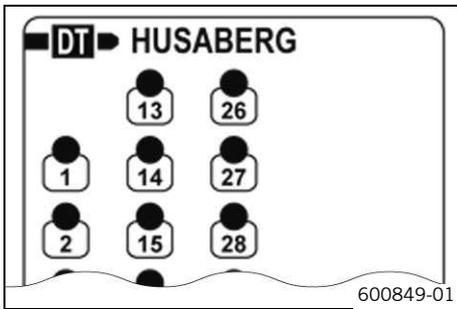
The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
The rollover sensor is disconnected.

Rollover sensor - check the signal line for a short circuit to ignition plus (terminal 15)

- **Ω** Measure the resistance between the specified points.
Break Out Box **DT** Pin **1** – Break Out Box **DT** Pin **2**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **2** to connector **AP** pin **5** for a short circuit to ignition plus (terminal 15).
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Rollover sensor - signal line has a short circuit to the sensor power supply (☛ p. 217)



Rollover sensor - signal line has a short circuit to the sensor power supply

Condition

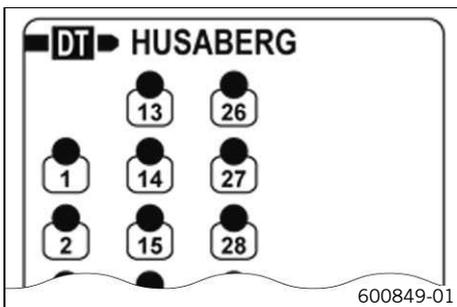
The diagnostic tool is disconnected.
The EFI control unit is disconnected.
The breakout box is connected to the wiring harness.
The rollover sensor is disconnected.

Rollover sensor - check the signal line for a short circuit to the sensor power supply

- **Ω** Measure the resistance between the specified points.
Break Out Box **DT** Pin **2** – Break Out Box **DT** Pin **13**

| | |
|------------|-----------------|
| Resistance | $\infty \Omega$ |
|------------|-----------------|

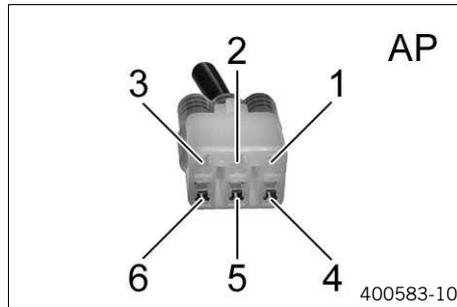
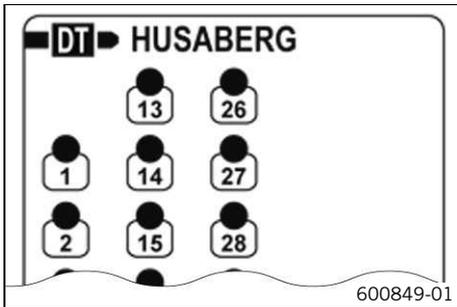
- » If the measured value does not correspond to the specified value:
 - Check the cable from connector **DT** pin **2** to connector **AP** pin **5** for a short circuit to the sensor power supply.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Rollover sensor - signal line is open (☛ p. 218)



Rollover sensor - signal line is open

Condition

- The diagnostic tool is disconnected.
- The EFI control unit is disconnected.
- The breakout box is connected to the wiring harness.
- The rollover sensor is disconnected.



Rollover sensor - check the signal line for an open circuit

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **2** – Connector **AP** Pin **5**

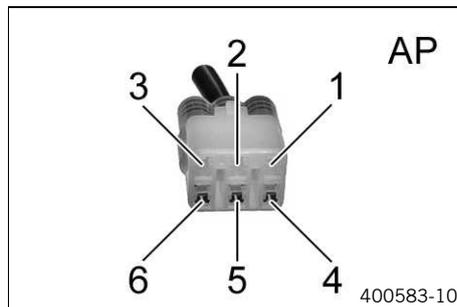
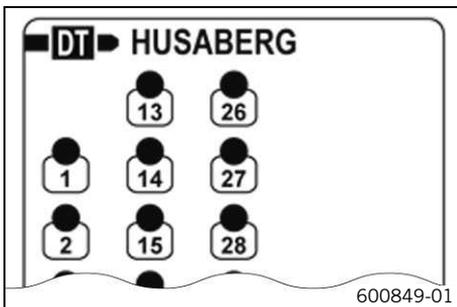
| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **2** and connector **AP** pin **5**.
 - Check the cable from connector **DT** pin **25** to connector **AP** pin **5** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Check the next possible cause:
Rollover sensor - ground line is open (☛ p. 218)

Rollover sensor - ground line is open

Condition

- The diagnostic tool is disconnected.
- The EFI control unit is disconnected.
- The breakout box is connected to the wiring harness.
- The rollover sensor is disconnected.



Rollover sensor - check the ground line for an open circuit

- Measure the resistance between the specified points.
Break Out Box **DT** Pin **24** – Connector **AP** Pin **4**

| | |
|------------|-------------------|
| Resistance | $\leq 0.6 \Omega$ |
|------------|-------------------|

- » If the measured value does not correspond to the specified value:
 - Check connector **DT** pin **24** and connector **AP** pin **4**.
 - Check the cable from connector **DT** pin **24** to connector **AP** pin **4** for an open circuit.
- » If the measured value corresponds to the specified value:
 - Contact customer service.

| | |
|-------------------------------|---|
| Design | 1-cylinder 4-stroke engine, water-cooled |
| Displacement (All 450 models) | 449.3 cm ³ (27.418 cu in) |
| Displacement (All 570 models) | 565.5 cm ³ (34.509 cu in) |
| Stroke (All 450 models) | 63.4 mm (2.496 in) |
| Stroke (All 570 models) | 72 mm (2.83 in) |
| Bore (All 450 models) | 95 mm (3.74 in) |
| Bore (All 570 models) | 100 mm (3.94 in) |
| Compression ratio | 11.8:1 |
| Idle speed | 1,700... 1,800 rpm |
| Control | OHC, 4 valves controlled via rocker arm, drive via tooth/wheel chain |
| Valve diameter, intake | 38 mm (1.5 in) |
| Valve diameter, exhaust | 32 mm (1.26 in) |
| Valve clearance | |
| Exhaust at: 20 °C (68 °F) | 0.12... 0.17 mm (0.0047... 0.0067 in) |
| Intake at: 20 °C (68 °F) | 0.10... 0.15 mm (0.0039... 0.0059 in) |
| Crankshaft bearing | 2 cylinder bearings |
| Conrod bearing | Needle 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 rotary pumps |
| Primary transmission | 33:76 |
| Clutch | Multidisc clutch in oil bath/hydraulically activated |
| Transmission ratio | |
| 1st gear | 14:36 |
| 2nd gear | 17:32 |
| 3rd gear | 19:28 |
| 4th gear | 22:26 |
| 5th gear | 24:23 |
| 6th gear | 26:21 |
| Generator | 12 V, 210 W |
| Mixture preparation | Electronically controlled fuel injection |
| Ignition | Contactless controlled fully electronic ignition with digital ignition adjustment |
| Spark plug | NGK LKAR 8AI - 9 |
| Spark plug electrode gap | 0.9 mm (0.035 in) |
| Cooling | Water cooling, permanent circulation of coolant by water pump |
| Starting aid | Electric starter |

Capacity - engine oil

| | | |
|------------|-------------------|------------------------------------|
| Engine oil | 1.35 l (1.43 qt.) | Engine oil (SAE 10W/50) (☛ p. 263) |
|------------|-------------------|------------------------------------|

Capacity - coolant

| | | |
|---------|-------------------|---|
| Coolant | 1.00 l (1.06 qt.) | Coolant (☛ p. 263) |
| | | Coolant (mixed ready to use) (☛ p. 263) |

| | |
|--|---|
| Camshaft - cam height | |
| Exhaust | 33.10... 33.30 mm (1.3031... 1.311 in) |
| Camshaft - cam height (All 450 models) | |
| Intake | 33.90... 34.10 mm (1.3346... 1.3425 in) |
| Camshaft - cam height (All 570 models) | |
| Intake | 34.40... 34.60 mm (1.3543... 1.3622 in) |
| Valve | |
| Intake sealing seat width | 1.50 mm (0.0591 in) |
| Exhaust sealing seat width | 2.00 mm (0.0787 in) |
| Run-out at valve plate | ≤ 0.05 mm (≤ 0.002 in) |
| Valve spring | |
| Intake minimum length (without valve spring seat) | 46.5 mm (1.831 in) |
| Exhaust minimum length (without valve spring seat) | 43.0 mm (1.693 in) |
| Valve spring seat - thickness | 0.9... 1.0 mm (0.035... 0.039 in) |
| Cylinder/cylinder head - sealing area distortion | ≤ 0.10 mm (≤ 0.0039 in) |
| Piston - diameter (All 450 models) | |
| Size I | 94.93... 94.95 mm (3.7374... 3.7382 in) |
| Size II | 94.95... 94.97 mm (3.7382... 3.739 in) |
| Piston - diameter (All 570 models) | |
| Size I | 99.95... 99.96 mm (3.935... 3.9354 in) |
| Size II | 99.96... 99.97 mm (3.9354... 3.9358 in) |
| Cylinder - drill hole diameter (All 450 models) | |
| Size I | 95.000... 95.012 mm (3.74015... 3.74062 in) |
| Size II | 95.013... 95.025 mm (3.74066... 3.74113 in) |
| Cylinder - drill hole diameter (All 570 models) | |
| Size I | 100.000... 100.012 mm (3.937... 3.93747 in) |
| Size II | 100.012... 100.025 mm (3.93747... 3.93798 in) |
| Piston/cylinder - mounting clearance (All 450 models) | |
| Size I | 0.040... 0.082 mm (0.00157... 0.00323 in) |
| Size II | 0.042... 0.075 mm (0.00165... 0.00295 in) |
| Wear limit | 0.120 mm (0.00472 in) |
| Piston/cylinder - mounting clearance (All 570 models) | |
| Size I | 0.040... 0.062 mm (0.00157... 0.00244 in) |
| Size II | 0.042... 0.065 mm (0.00165... 0.00256 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) |
| Connecting rod - end play of lower conrod bearing | 0.40... 0.60 mm (0.0157... 0.0236 in) |
| Conrod bearing - radial clearance | ≤ 0.05 mm (≤ 0.002 in) |
| Crankshaft - end play | 0.25... 0.35 mm (0.0098... 0.0138 in) |
| Crankshaft - run-out at bearing pin | ≤ 0.16 mm (≤ 0.0063 in) |
| Crankshaft - crank web outer dimensions | 63±0.05 mm (2.48±0.002 in) |
| Clutch facing disk - thickness | |
| Outer | 2.6... 2.7 mm (0.102... 0.106 in) |
| Innermost | 2.9... 3.0 mm (0.114... 0.118 in) |
| Clutch spring - length (All 450 models) | 43.00... 44.03 mm (1.6929... 1.7335 in) |
| Clutch spring - length (All 570 models) | 45.10... 46.10 mm (1.7756... 1.815 in) |
| Outer clutch hub - clutch facing disks contact surface | ≤ 0.5 mm (≤ 0.02 in) |
| Oil pressure regulator valve | |
| Minimum length of pressure spring | 23.5 mm (0.925 in) |
| Oil pump | |

| | |
|--|---------------------------------------|
| External rotor/engine case clearance | ≤ 0.20 mm (≤ 0.0079 in) |
| External rotor/internal rotor clearance | ≤ 0.20 mm (≤ 0.0079 in) |
| End play | ≤ 0.15 mm (≤ 0.0059 in) |
| Shift fork | |
| Sheet thickness | 4.85... 4.95 mm (0.1909... 0.1949 in) |
| Shift shaft - sliding plate/shift quadrant clearance | 0.40... 0.80 mm (0.0157... 0.0315 in) |
| Transmission shaft - run-out | ≤ 0.06 mm (≤ 0.0024 in) |

| | | | |
|---|---------|---------------------|---------------|
| Screw, cable holder in generator cover | M4 | 4 Nm (3 lbf ft) | Loctite® 243™ |
| Locking screw for bearing | M5 | 6 Nm (4.4 lbf ft) | Loctite® 243™ |
| Oil jet, piston cooling | M5 | 2 Nm (1.5 lbf ft) | Loctite® 243™ |
| Oil jet, rocker arm lubrication | M5 | 2 Nm (1.5 lbf ft) | Loctite® 243™ |
| Screw, ignition pulse generator | M5 | 6 Nm (4.4 lbf ft) | Loctite® 243™ |
| Screw, locking lever | M5 | 6 Nm (4.4 lbf ft) | Loctite® 243™ |
| Screw, oil filter cover | M5 | 6 Nm (4.4 lbf ft) | – |
| Screw, oil pump cover | M5 | 6 Nm (4.4 lbf ft) | Loctite® 222 |
| Nut, water-pump wheel | M6 | 8 Nm (5.9 lbf ft) | Loctite® 243™ |
| Plug, water pump drain hole | M6 | 10 Nm (7.4 lbf ft) | – |
| Screw, camshaft bearing support | M6 | 10 Nm (7.4 lbf ft) | Loctite® 243™ |
| Screw, clutch cover | M6x25 | 10 Nm (7.4 lbf ft) | – |
| Screw, clutch cover | M6x30 | 10 Nm (7.4 lbf ft) | – |
| Screw, clutch cover | M6x65 | 10 Nm (7.4 lbf ft) | – |
| Screw, clutch spring | M6 | 10 Nm (7.4 lbf ft) | – |
| Screw, cylinder head | M6 | 10 Nm (7.4 lbf ft) | – |
| Screw, engine housing | M6x60 | 10 Nm (7.4 lbf ft) | – |
| Screw, engine housing | M6x70 | 10 Nm (7.4 lbf ft) | – |
| Screw, engine housing | M6x75 | 10 Nm (7.4 lbf ft) | – |
| Screw, generator cover | M6x30 | 10 Nm (7.4 lbf ft) | – |
| Screw, generator cover | M6x50 | 10 Nm (7.4 lbf ft) | – |
| Screw, generator cover (chain shaft through-hole) | M6x30 | 10 Nm (7.4 lbf ft) | Loctite® 243™ |
| Screw, idler | 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 | 10 Nm (7.4 lbf ft) | Loctite® 243™ |
| Screw, starter motor | M6 | 10 Nm (7.4 lbf ft) | – |
| Screw, stator bracket | M6 | 10 Nm (7.4 lbf ft) | Loctite® 243™ |
| Screw, timing chain guide rail | M6 | 8 Nm (5.9 lbf ft) | Loctite® 243™ |
| Screw, timing chain securing guide | M6 | 8 Nm (5.9 lbf ft) | Loctite® 243™ |
| Screw, timing chain tensioning rail | M6 | 8 Nm (5.9 lbf ft) | Loctite® 243™ |
| Screw, torque limiter | M6 | 10 Nm (7.4 lbf ft) | Loctite® 243™ |
| Screw, valve cover | M6 | 10 Nm (7.4 lbf ft) | – |
| Screw, water pump cover | M6x25 | 10 Nm (7.4 lbf ft) | – |
| Screw, water pump cover | M6x55 | 10 Nm (7.4 lbf ft) | – |
| Oil jet, conrod lubrication | M6x0.75 | 4 Nm (3 lbf ft) | – |
| Plug, oil channel | M7 | 9 Nm (6.6 lbf ft) | Loctite® 243™ |
| Screw, rocker arm bearing | M7x1 | 15 Nm (11.1 lbf ft) | – |
| Plug, crank shaft location with thick copper disk | 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® 243™ |
| Balancer shaft nut | M10x1 | 40 Nm (29.5 lbf ft) | – |
| Screw, unlocking of timing chain tensioner | M10x1 | 10 Nm (7.4 lbf ft) | – |

| | | | |
|---|-----------|---|----------------------------|
| Screw, cylinder head | M10x1.25 | Tightening sequence: Tighten diagonally, beginning with the rear screw on the chain shaft. 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 |
| Banjo bolt, oil line | M12 | 15 Nm (11.1 lbf ft) | – |
| Nut, rotor | M12x1 | 60 Nm (44.3 lbf ft) | – |
| Spark plug | M12x1.25 | 15... 20 Nm (11.1... 14.8 lbf ft) | – |
| Coolant temperature sensor at cylinder head | M12x1.5 | 12 Nm (8.9 lbf ft) | – |
| 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) | – |
| Plug, SLS | M12x1.5 | 20 Nm (14.8 lbf ft) | – |
| Plug, rocker arm | M14x1.25 | 20 Nm (14.8 lbf ft) | – |
| Plug, engine oil screen | M17x1.5 | 20 Nm (14.8 lbf ft) | – |
| Nut, inner clutch hub | M18x1.5 | 80 Nm (59 lbf ft) | – |
| Nut, primary gear | M20LHx1.5 | 120 Nm (88.5 lbf ft) | Loctite® 243™ |
| Plug, timing chain tensioner | M24x1.5 | 30 Nm (22.1 lbf ft) | – |

| | | |
|--|---|--|
| Frame | Perimeter tube frame made of chrome molybdenum steel tubing | |
| Fork | WP Suspension Up Side Down 4860 MXMA PA | |
| Suspension travel | | |
| Front | 300 mm (11.81 in) | |
| Rear | 335 mm (13.19 in) | |
| Fork offset | 19 mm (0.75 in) | |
| Shock absorber | WP Suspension PDS 5018 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 | | |
| Front | 2.5 mm (0.098 in) | |
| Rear | 3.5 mm (0.138 in) | |
| Tire air pressure off road | | |
| Front | 1.0 bar (15 psi) | |
| Rear | 1.0 bar (15 psi) | |
| Road tire pressure | | |
| Front | 1.5 bar (22 psi) | |
| Rear | 2.0 bar (29 psi) | |
| Final drive | 13:38 (13:52) | |
| Chain | 5/8 x 1/4" | |
| Rear sprockets available | 38, 40, 42, 45, 48, 49, 50, 51, 52 | |
| Steering head angle | 63.5° | |
| Wheelbase | 1,475±10 mm (58.07±0.39 in) | |
| Seat height, unloaded | 985 mm (38.78 in) | |
| Ground clearance, unloaded | 390 mm (15.35 in) | |
| Weight without fuel, approx. (FE 450 EU, FE 450 AUS) | 116.5 kg (256.8 lb.) | |
| Weight without fuel, approx. (FE 570 EU, FE 570 AUS) | 117 kg (258 lb.) | |
| Weight without fuel, approx. (FE 450 USA) | 113 kg (249 lb.) | |
| Weight without fuel, approx. (FE 570 USA) | 113.5 kg (250.2 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.) | |

| | | |
|---------|-------|---|
| Battery | YTZ7S | Battery voltage: 12 V Nominal capacity: 6 Ah Maintenance-free |
|---------|-------|---|

Lighting equipment

| | | |
|------------------------------------|----------------------|-----------------|
| Headlight (FE EU, FE AUS) | S2/socket BA20d | 12 V 35/35 W |
| Parking light (FE EU, FE AUS) | W5W/socket W2.1x9.5d | 12 V 5 W |
| Indicator lights | W1.2W/socket W2x4.6d | 12 V 1.2 W |
| Turn signal (FE EU, FE AUS) | R10W/socket BA15s | 12 V 10 W |
| Brake/tail light (FE EU, FE AUS) | LED | |
| License plate lamp (FE EU, FE AUS) | W5W/socket W2.1x9.5d | 12 V 5 W |

Tires

| Validity | Front tire | Rear tire |
|---|---|--|
| (FE EU, FE AUS) | 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 |
| (FE USA) | 80/100 - 21 51M TT Bridgestone M59 | 110/100 - 18 64M TT Bridgestone M402 |
| Additional information is available in the Service section under: www.husaberg.com | | |

Capacity - fuel

| | | |
|-----------------------------------|---------------------|--|
| Total fuel tank capacity, approx. | 8.2 l (2.17 US gal) | Super unleaded (ROZ 95 / RON 95 / PON 91) (☛ p. 264) |
|-----------------------------------|---------------------|--|

| | | |
|---|--|-----------------------------|
| Fork part number | 14.45.7E.02 | |
| Fork | WP Suspension Up Side Down 4860 MXMA PA | |
| Compression damping | | |
| Comfort | 26 clicks | |
| Standard | 22 clicks | |
| Sport | 18 clicks | |
| Rebound damping | | |
| Comfort | 22 clicks | |
| Standard | 20 clicks | |
| Sport | 18 clicks | |
| Spring length with preload spacer(s) | 510 mm (20.08 in) | |
| Spring rate | | |
| Weight of rider: 65... 75 kg (143... 165 lb.) | 4.2 N/mm (24 lb/in) | |
| Weight of rider: 75... 85 kg (165... 187 lb.) | 4.4 N/mm (25.1 lb/in) | |
| Weight of rider: 85... 95 kg (187... 209 lb.) | 4.6 N/mm (26.3 lb/in) | |
| Air chamber length | 110 ⁺²⁰ ₋₃₀ mm (4.33 ^{+0.79} _{-1.18} in) | |
| Spring preload - Preload Adjuster | | |
| Comfort | 0 turn | |
| Standard | 2 turns | |
| Sport | 4 turns | |
| Fork length | 940 mm (37.01 in) | |
| Fork oil per fork leg | 620 ml (20.96 fl. oz.) | Fork oil (SAE 5) (☛ p. 263) |

| | |
|---|--|
| Shock absorber part number | 12.45.7E.02 |
| Shock absorber | WP Suspension PDS 5018 DCC |
| Compression damping, low-speed | |
| Comfort | 18 clicks |
| Standard | 15 clicks |
| Sport | 12 clicks |
| Compression damping, high-speed | |
| Comfort | 2 turns |
| Standard | 1.5 turns |
| Sport | 1 turn |
| Rebound damping | |
| Comfort | 26 clicks |
| Standard | 24 clicks |
| Sport | 22 clicks |
| Spring preload | 10 mm (0.39 in) |
| Spring rate | |
| Weight of rider: 65... 75 kg (143... 165 lb.) | 69 N/mm (394 lb/in) |
| Weight of rider: 75... 85 kg (165... 187 lb.) | 72 N/mm (411 lb/in) |
| Weight of rider: 85... 95 kg (187... 209 lb.) | 76 N/mm (434 lb/in) |
| Spring length | 250 mm (9.84 in) |
| Gas pressure | 10 bar (145 psi) |
| Static sag | 35 mm (1.38 in) |
| Riding sag | 105 mm (4.13 in) |
| Fitted length | 411 mm (16.18 in) |
| Shock absorber oil | Shock absorber oil (SAE 2.5) (50180342S1) (☛ p. 264) |

| | | | |
|--|---------|-------------------------------|----------------------|
| Spoke nipple, front wheel | M4.5 | 5... 6 Nm (3.7... 4.4 lbf ft) | – |
| Screw, battery terminal | M5 | 3 Nm (2.2 lbf ft) | – |
| Screw, intake air temperature sensor | M5 | 2 Nm (1.5 lbf ft) | – |
| Spoke nipple, rear wheel | M5 | 5... 6 Nm (3.7... 4.4 lbf ft) | – |
| Remaining nuts, chassis | M6 | 15 Nm (11.1 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) | – |
| Screw, front brake disc | M6 | 14 Nm (10.3 lbf ft) | – |
| Screw, rear brake disc | M6 | 14 Nm (10.3 lbf ft) | – |
| Screw, shock absorber adjusting ring | M6 | 5 Nm (3.7 lbf ft) | – |
| Nut, rear sprocket screw | M8 | 35 Nm (25.8 lbf ft) | Loctite® 243™ |
| Nut, rim lock | M8 | 10 Nm (7.4 lbf ft) | – |
| Remaining nuts, chassis | M8 | 30 Nm (22.1 lbf ft) | – |
| Remaining screws, chassis | M8 | 25 Nm (18.4 lbf ft) | – |
| Screw, bottom triple clamp | M8 | 12 Nm (8.9 lbf ft) | – |
| Screw, engine brace | M8 | 33 Nm (24.3 lbf ft) | – |
| Screw, exhaust clamp on manifold | M8 | 8 Nm (5.9 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, side stand fixing | M8 | 40 Nm (29.5 lbf ft) | Loctite® 243™ |
| Screw, subframe | M8 | 30 Nm (22.1 lbf ft) | – |
| Screw, top steering stem | M8 | 17 Nm (12.5 lbf ft) | Loctite® 243™ |
| Screw, top triple clamp | M8 | 17 Nm (12.5 lbf ft) | – |
| Engine carrying screw | M10 | 60 Nm (44.3 lbf ft) | – |
| Remaining nuts, chassis | M10 | 50 Nm (36.9 lbf ft) | – |
| Remaining screws, chassis | M10 | 45 Nm (33.2 lbf ft) | – |
| Screw, handlebar support | M10 | 40 Nm (29.5 lbf ft) | Loctite® 243™ |
| Screw, bottom shock absorber | M12 | 80 Nm (59 lbf ft) | Loctite® 243™ |
| Screw, top shock absorber | M12 | 80 Nm (59 lbf ft) | Loctite® 243™ |
| Nut, swingarm pivot | M16x1.5 | 100 Nm (73.8 lbf ft) | – |
| Nut, rear wheel spindle | M20x1.5 | 80 Nm (59 lbf ft) | – |
| Screw, top steering head | M20x1.5 | 10 Nm (7.4 lbf ft) | – |
| Screw, front wheel spindle | M24x1.5 | 45 Nm (33.2 lbf ft) | – |

Cleaning the motorcycle

Note

Material damage Damage and destruction of components by high-pressure cleaning equipment.

- Never clean the vehicle with high-pressure cleaning equipment or a strong water-jet. The excessive pressure can penetrate electrical components, socket connects, throttle cables, and bearings, etc., and can damage or destroy these parts.



Warning

Environmental hazard Hazardous substances cause environmental damage.

- Oil, grease, filters, fuel, cleaners, brake fluid, etc., should be disposed of as stipulated in applicable regulations.

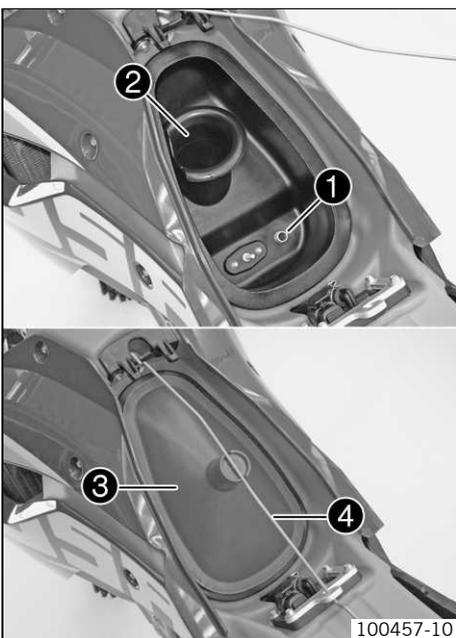


Info

If you clean the motorcycle regularly, its value and appearance are maintained over a long period.

Avoid direct sunshine on the motorcycle during cleaning.

Before cleaning, the intake flange and exhaust system must be protected against contact with water. To protect the intake flange when the fuel tank is mounted, proceed as follows:



- Remove the seat. (☛ p. 59)
- Remove the air filter. (☛ p. 57)
- Close off sleeve ① of the engine vent and intake trumpet ②.
- Mount intake flange cover ③ and fix with filter fixing bracket ④.

Intake flange cover (81206005000)



Info

If the intake flange is not closed properly, dirt and water can enter into the engine. In the worst case, this can lead to engine damage.

- When you remove the fuel tank, carefully close off the sleeve, intake trumpet and the entire intake flange.
- Remove the fuel tank. (☛ p. 59)
- First remove coarse dirt particles with a gentle water spray.
- Spray very dirty areas with a normal motorcycle cleaner and then clean with a paintbrush.

Motorcycle cleaner (☛ p. 266)



Info

Use warm water containing normal motorcycle cleaner and a soft sponge.

- After rinsing the motorcycle with a gentle water spray, allow it to dry thoroughly. Blow off the vehicle with compressed air.
- To prevent electrical problems, treat electric contacts and switches with contact spray. Disconnect the electrical plug-in connections, blow off with compressed air and treat with contact spray.

Contact spray (☛ p. 265)

- Check that all closed openings are clear.
- Install the fuel tank. (☛ p. 60)
- Clean the air filter. (☛ p. 57)
- Install the air filter. (☛ p. 57)



Warning

Danger of accidents Reduced braking efficiency due to wet or dirty brakes.

- Clean or dry dirty or wet brakes by riding and braking gently.

- After cleaning, ride the vehicle a short distance until the engine warms up, and then apply the brakes.



Info

The heat produced causes water at inaccessible positions in the engine and the brakes to evaporate.

- Push back the protection covers on the handlebar instruments to allow water to evaporate.
- After the motorcycle has cooled off, oil or grease all moving parts and bearings.
- Clean the chain. (🔧 p. 71)
- Treat bare metal parts (except for brake discs and exhaust system) with anti-corrosion materials.

Cleaning and polishing materials for metal, rubber and plastic (🔧 p. 265)

- Treat all painted parts with a mild paint polish.

High-luster polish for paint (🔧 p. 265)

(FE EU, FE AUS)

- Lubricate the steering lock.

Universal oil spray (🔧 p. 266)

Protection for winter operation

i Info

If you use the motorcycle in the winter, you can expect to encounter salt on the roads. Precautions need to be taken against road salt corrosion.

If the vehicle has been used on salted roads, clean it with cold water. Warm water intensifies the effects of salt.

- Clean the motorcycle. (🔧 p. 229)
- Treat the engine, swingarm and all other bare or galvanized parts (except the brake discs) with a wax-based anticorrosive.

i Info

Avoid getting anticorrosive on the brake discs: this would badly affect the braking.

After riding on salted roads, thoroughly wash the motorcycle with cold water and dry it well.

- Clean the chain. (🔧 p. 71)

Storage

- Warning**
Danger of poisoning Fuel is poisonous and a health hazard.
- Avoid contact between fuel and skin, eyes and clothing. Do not inhale fuel vapors. If fuel gets into your eyes, rinse immediately with water and contact a doctor. Wash affected skin areas immediately with soap and water. If fuel is swallowed, contact a doctor immediately. Change clothing that has come into contact with fuel. Store fuel in a suitable canister according to regulations and keep it 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.

- Clean the motorcycle. (☛ p. 229)
- Change the engine oil and oil filter, clean the engine oil screen. (☛ p. 158)
- Check the antifreeze and coolant level. (☛ p. 154)
- Check the tire air pressure. (☛ p. 66)
- Remove the battery. (☛ p. 75)
- Charge the battery. (☛ p. 76)

Guideline

| | |
|---|--------------------------|
| Storage temperature of battery without direct sunlight. | 0... 35 °C (32... 95 °F) |
|---|--------------------------|

- The storage place should be dry and not subject to large temperature fluctuations.

- Info**
 HUSABERG recommends jacking up the motorcycle.

- Jack up the motorcycle. (☛ p. 9)
- Cover the motorcycle with a porous sheet or blanket. 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.

Putting into operation after storage

- Remove the motorcycle from the work stand. (☛ p. 9)
- Install the battery. (☛ p. 75)
- Refuel.
- Make checks before putting into operation.
- Make a test ride.

Important maintenance work to be carried out by an authorized HUSABERG workshop

| | | S1N | S3N | S15A | S30A |
|--|---|-----|-----|------|------|
| Engine | Change the engine oil and oil filter, clean the engine oil screen. (☛ p. 158) | • | • | • | • |
| | Replace the spark plug. | | | | • |
| | Check the valve clearance. | | • | • | • |
| | Check the engine mounting screws for tightness. | | • | • | • |
| | Clean the spark plug connectors and check for tightness. | | • | • | • |
| | Check the shift lever screw for tightness. | | • | • | • |
| Fuel injection | Check the bellows for cracks and leakage. | | • | • | • |
| | Read out the fault memory using the HUSABERG diagnostic tool. | | • | • | • |
| | Check the fuel hoses, SLS hoses and vent hoses for damage, correct routing and leaks. | | • | • | • |
| | Clean, check and lubricate the O-ring of the fuel hose connection. | | | • | • |
| | Check the cable harness of the throttle valve body for damage and correct routing. | | • | • | • |
| | Check the fuel pressure. (☛ p. 62) | | | • | • |
| Attachments | Check the cooling system for leakage. | | • | • | • |
| | Check the antifreeze and coolant level. (☛ p. 154) | | • | • | • |
| | Check the exhaust system for leakage and looseness. | | | • | • |
| | Check the Bowden cables for damage, smooth operation and routing without sharp bends. | | • | • | • |
| | Check the fluid level of the hydraulic clutch. (☛ p. 152) | | • | • | • |
| | Clean the air filter. (☛ p. 57) | | • | • | • |
| | Check the cables for damage and routing without sharp bends. | | | • | • |
| | Check the functioning of the electrical equipment. | | • | • | • |
| | Adjust the beam width of the headlight. (FE EU, FE AUS) (☛ p. 89) | | | • | • |
| Brakes | Check the front brake linings. (☛ p. 80) | | • | • | • |
| | Check the rear brake linings. (☛ p. 84) | | • | • | • |
| | Check the brake disks. (☛ p. 67) | | • | • | • |
| | Check the front brake fluid level. (☛ p. 79) | | • | • | • |
| | Check the rear brake fluid level. (☛ p. 83) | | • | • | • |
| | Check the brake lines for damage and leakage. | | • | • | • |
| | Check the free travel of the hand brake lever. (☛ p. 78) | | • | • | • |
| | Check the free travel of the foot brake lever. (☛ p. 82) | | • | • | • |
| | Check the brake system function. | | • | • | • |
| | Check the screws and guide bolts of the brake system for tightness. | | • | • | • |
| Chassis | Check the shock absorber and fork for leakage and functioning. | | • | • | • |
| | Clean the dust boots of the fork legs. (☛ p. 11) | | | • | • |
| | Bleed the fork legs. (☛ p. 11) | | | • | • |
| | Check the swingarm bearing. | | | • | • |
| | Check the play of the steering head bearing. (☛ p. 29) | | • | • | • |
| | Check all screws to see if they are tight. | | • | • | • |
| Wheels | Check the spoke tension. (☛ p. 72) | | • | • | • |
| | Check the rim run-out. | | • | • | • |
| | Check the tire condition. (☛ p. 66) | | • | • | • |
| | Check the tire air pressure. (☛ p. 66) | | • | • | • |
| | Check the chain wear. (☛ p. 70) | | • | • | • |
| | Check the chain tension. (☛ p. 69) | | • | • | • |
| | Clean the chain. (☛ p. 71) | | • | • | • |
| | Check the wheel bearing for play. | | • | • | • |
| Clean and grease the adjusting screws of the chain adjuster. | | • | • | • | |

S1N: once after one operating hour

S3N: once after three operating hours

S15A: every 15 service hours / after every race

S30A: every 30 service hours

Important maintenance work to be carried out by an authorized HUSABERG workshop. (as additional order)

| | Competition use | | | Hobby use | | | S15N | S45A | J1A |
|---|-----------------|------|------|-----------|------|------|------|------|-----|
| | S15A | S30A | S45A | S30A | S60A | S90A | | | |
| Perform a fork service. (☛ p. 14) | | | | | | | • | • | |
| Perform a shock absorber service. (☛ p. 35) | | | • | | • | | | | |
| Grease the steering head bearing. (☛ p. 27) | | | | | | | | | • |
| Treat the electric contacts with contact spray. | | | | | | | | | • |
| Change the hydraulic clutch fluid. (☛ p. 152) | | | | | | | | | • |
| Change the front brake fluid. | | | | | | | | | • |
| Change the rear brake fluid. | | | | | | | | | • |
| Check wear of the clutch discs. | • | • | • | • | • | • | | | |
| Check the clutch. (☛ p. 130) | | • | | | • | | | | |
| Check/measure the cylinder. (☛ p. 120) | | | • | | | • | | | |
| Change the piston. | | | • | | | • | | | |
| Check the camshaft. (☛ p. 123) | | | • | | | • | | | |
| Change the camshaft bearing. (☛ p. 126) | | | • | | | • | | | |
| Check the valve spring seat. (☛ p. 127) | | | • | | | • | | | |
| Check the cylinder head. (☛ p. 128) | | | • | | | • | | | |
| Check the valves. (☛ p. 127) | | | • | | | • | | | |
| Check the valve springs. (☛ p. 127) | | | • | | | • | | | |
| Check the radial clearance of the rocker arm rollers. | | | • | | | • | | | |
| Check the timing-chain tensioner function. | | | • | | | • | | | |
| Check the balancer shaft. (☛ p. 115) | | | • | | | • | | | |
| Check the crankshaft run-out at the bearing pin. (☛ p. 119) | | | • | | | • | | | |
| Change the conrod bearing. (☛ p. 117) | | | • | | | • | | | |
| Change the crankshaft main bearing. | | | • | | | • | | | |
| Check the transmission. (☛ p. 134) | | | • | | | • | | | |
| Check the shift mechanism. (☛ p. 131) | | | • | | | • | | | |
| Check the spring length of the oil pressure regulator valve. (☛ p. 113) | | | • | | | • | | | |
| Change the glass fiber yarn filling of the main silencer. | | • | | | • | | | | |
| Change the foot brake cylinder seals. | | • | | | • | | | | |

S15A: every 15 service hours / after every race

S30A: every 30 service hours

S45A: every 45 service hours

S30A: every 30 service hours

S60A: every 60 service hours

S90A: every 90 service hours

S15N: once after 15 operating hours

S45A: every 45 service hours

J1A: annually

Important checks and maintenance work to be carried out by the rider

| | NB1A |
|---|------|
| Check the engine oil level. (☛ p. 158) | • |
| Check the front brake fluid level. (☛ p. 79) | • |
| Check the rear brake fluid level. (☛ p. 83) | • |
| Check the front brake linings. (☛ p. 80) | • |
| Check the rear brake linings. (☛ p. 84) | • |
| Check and adjust the Bowden cables. | • |
| Bleed the fork legs. (☛ p. 11) | • |
| Clean the dust boots of the fork legs. (☛ p. 11) | • |
| Clean the chain. (☛ p. 71) | • |
| Check the chain tension. (☛ p. 69) | • |
| Check the chain wear. (☛ p. 70) | • |
| Check the rear sprocket/engine sprocket for wear. (☛ p. 71) | • |
| Clean the air filter. (☛ p. 57) | • |
| Check the tire air pressure. (☛ p. 66) | • |
| Check the tire condition. (☛ p. 66) | • |
| Check the coolant level. (☛ p. 154) | • |
| Check that all operating elements for smooth operation. | • |
| Check braking. | • |
| Check all screws, nuts and hose clamps regularly for tightness. | • |

NB1A: Depending on conditions of use according to requirements.

Component:

| | |
|----|---|
| G1 | Battery A5-6 |
| G2 | Generator C6-7 |
| K1 | Starter relay with main fuse A5 |
| K2 | Power relay E-F5 |
| M1 | Starter motor A5 |
| M3 | Radiator fan E-F4 |
| N1 | Voltage regulator/rectifier C6-7 |
| S3 | Temperature switch for radiator fan E-F3 |
| S8 | Electric starter button A3 |
| V1 | Diode E-F4 |

Cable colors:

| | |
|-----|--------------|
| 38 | Brown |
| 39 | Brown |
| 40 | Black |
| 41 | Black |
| 54 | Black-blue |
| 62 | White-black |
| 68 | White-red |
| 69 | White-red |
| 70 | White-red |
| 71 | Blue-red |
| 72 | Orange |
| 73 | Yellow |
| 74 | Yellow-blue |
| 75 | Yellow-red |
| 76 | Yellow-red |
| 77 | Yellow-red |
| 78 | White-red |
| 83 | Yellow-blue |
| 84 | Yellow-blue |
| 90 | White-black |
| 93 | Brown |
| 94 | White-red |
| 95 | White-black |
| 105 | Brown |
| 106 | Yellow-blue |
| 108 | White-black |
| 109 | Yellow-red |
| 110 | White-red |
| 111 | White-red |
| 113 | Brown |
| 119 | White-red |
| 120 | Black |
| 121 | Black-yellow |
| 122 | Black-blue |

Component:

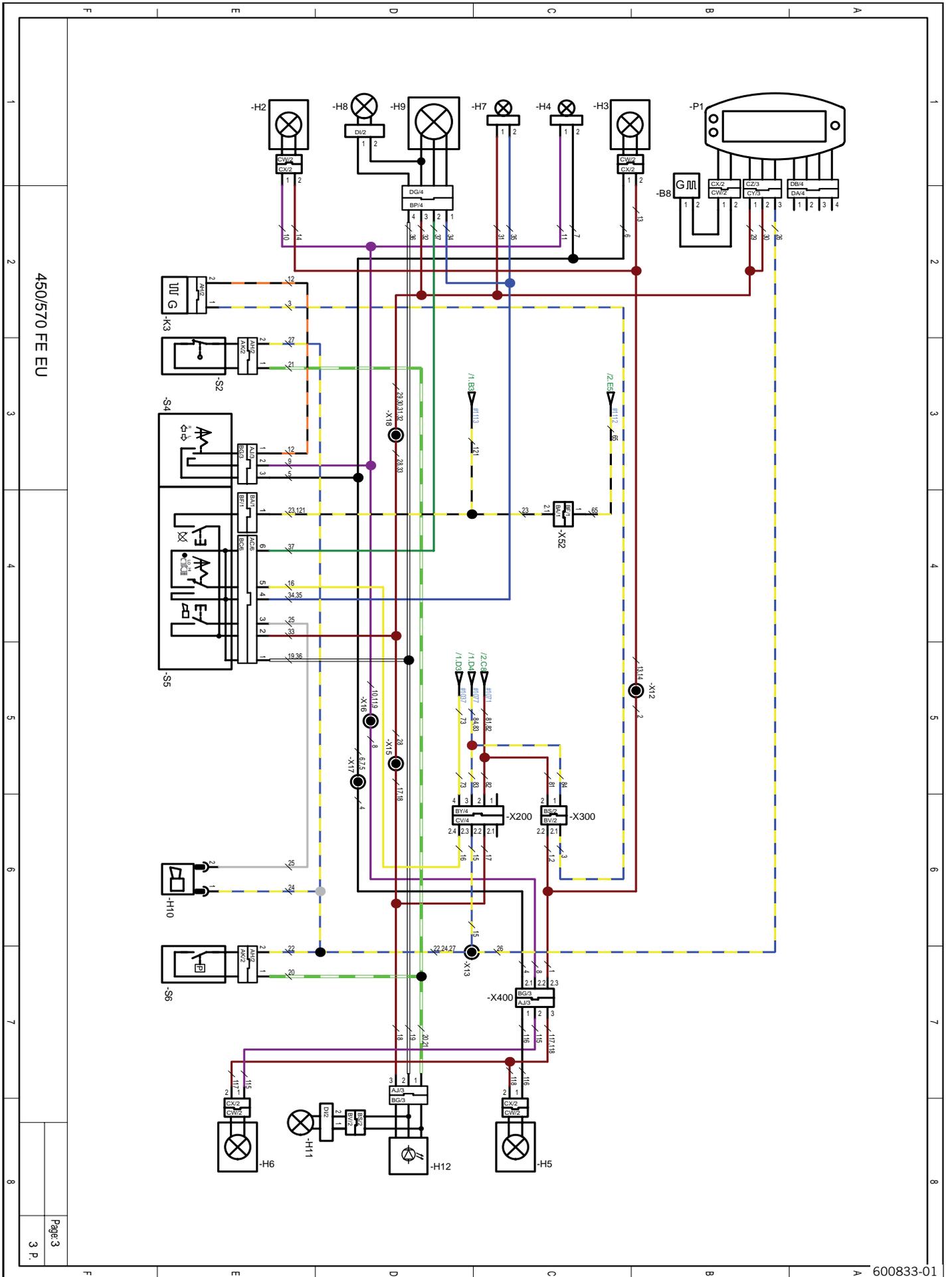
| | |
|-----|---|
| A1 | EFI control unit F4-5 |
| B1 | Roll angle sensor F4 |
| B2 | Map-Select switch F3 (optional) |
| B3 | throttle position sensor F2 |
| B4 | Manifold absolute pressure sensor F2 |
| B5 | Lambda sensor F1 |
| B6 | Coolant temperature sensor F6 |
| B7 | Intake air temperature sensor F6 |
| H1 | FI Warning lamp (MIL) A4 |
| L1 | Pulse generator F3 |
| L2 | Ignition coil F7 |
| M2 | Fuel pump F8 |
| X50 | Diagnosis connector A4 |
| X51 | Resistance A5 |
| Y1 | Injection valve F7-8 |

Cable colors:

| | |
|----|--------------|
| 42 | Orange |
| 43 | Yellow-red |
| 44 | White-yellow |
| 45 | Black-brown |
| 46 | Yellow |
| 47 | Purple |
| 48 | Green-red |
| 49 | Brown-purple |
| 50 | Yellow-blue |
| 51 | Light blue |
| 52 | Pink |
| 53 | Blue |
| 54 | Black-blue |
| 55 | Blue-green |
| 56 | Black-gray |
| 57 | White-purple |
| 58 | White |
| 59 | Red-purple |
| 60 | Black |
| 61 | Red |
| 62 | White-black |
| 63 | Black-blue |
| 64 | White-blue |
| 65 | Black-yellow |
| 66 | Brown |
| 67 | Brown |
| 72 | Orange |
| 79 | Blue |
| 80 | Black |
| 81 | Brown |
| 82 | Brown |
| 83 | Yellow-blue |
| 84 | Yellow-blue |
| 85 | White-blue |
| 86 | White-blue |

| | |
|-----|-------------|
| 87 | Black-blue |
| 88 | Black-blue |
| 89 | Orange |
| 90 | White-black |
| 91 | Brown |
| 92 | Brown |
| 93 | Brown |
| 96 | Black |
| 97 | Blue |
| 98 | Blue |
| 99 | Black |
| 100 | Orange |
| 101 | Black |
| 102 | Brown |
| 103 | Black |
| 104 | Orange |
| 105 | Brown |
| 107 | Black |
| 112 | Orange |
| 113 | Brown |
| 114 | Black |

3 of 3 (FE EU)



450/570 FE EU

Component:

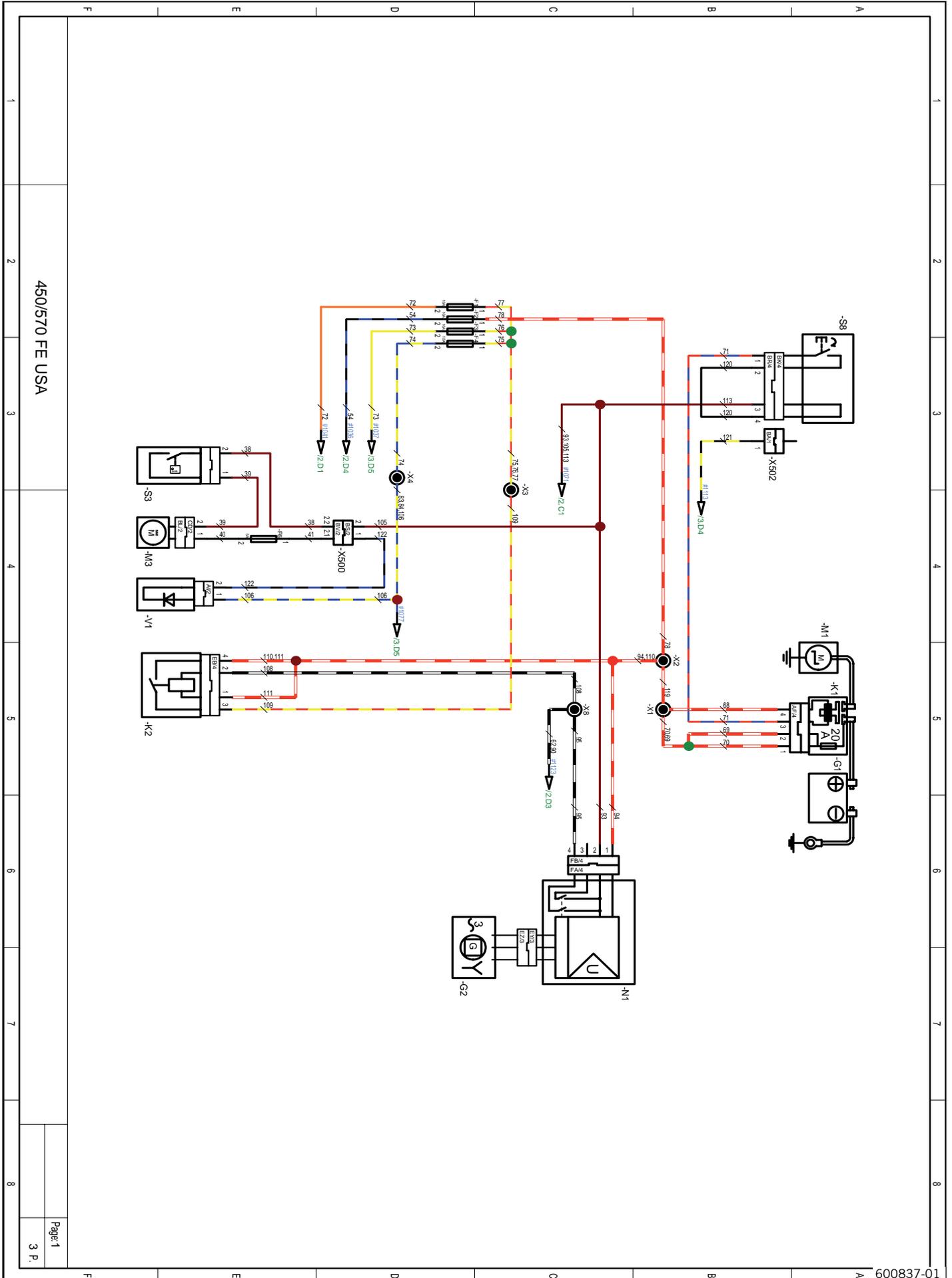
| | |
|-----|---|
| B8 | Wheel speed sensor B1-2 |
| H2 | Turn signal, front left E1 |
| H3 | Turn signal, front right B-C1 |
| H4 | Turn signal indicator lamp C1 |
| H5 | Turn signal, rear right C8 |
| H6 | Turn signal, rear left E8 |
| H7 | High beam indicator light C1 |
| H8 | Parking light D1 |
| H9 | Low beam/high beam D1 |
| H10 | Horn E6 |
| H11 | License plate lamp D-E8 |
| H12 | Brake/tail light D8 |
| K3 | Turn signal relay E2 |
| P1 | Speedometer A-B1 |
| S2 | Brake light switch, front E3 |
| S4 | Turn signal switch E3 |
| S5 | Horn button, light switch, short circuit button E4-5 |
| S6 | Brake light switch, rear E7 |

Cable colors:

| | |
|----|--------------|
| 1 | Brown |
| 2 | Brown |
| 3 | Yellow-blue |
| 4 | Black |
| 5 | Black |
| 6 | Black |
| 7 | Black |
| 8 | Purple |
| 9 | Purple |
| 10 | Purple |
| 11 | Purple |
| 12 | Black-orange |
| 13 | Brown |
| 14 | Brown |
| 15 | Yellow-blue |
| 16 | Yellow |
| 17 | Brown |
| 18 | Brown |
| 19 | White |
| 20 | White-green |
| 21 | White-green |
| 22 | Yellow-blue |
| 23 | Black-yellow |
| 24 | Yellow-blue |
| 25 | Gray |
| 26 | Yellow-blue |
| 27 | Yellow-blue |
| 28 | Brown |
| 29 | Brown |
| 30 | Brown |
| 31 | Brown |
| 32 | Brown |

| | |
|-----|--------------|
| 33 | Brown |
| 34 | Blue |
| 35 | Blue |
| 36 | White |
| 37 | Green |
| 65 | Black-yellow |
| 73 | Yellow |
| 81 | Brown |
| 82 | Brown |
| 83 | Yellow-blue |
| 84 | Yellow-blue |
| 86 | White-blue |
| 115 | Purple |
| 116 | Black |
| 117 | Brown |
| 118 | Brown |
| 121 | Black-yellow |

1 of 3 (FE USA)



450/570 FE USA

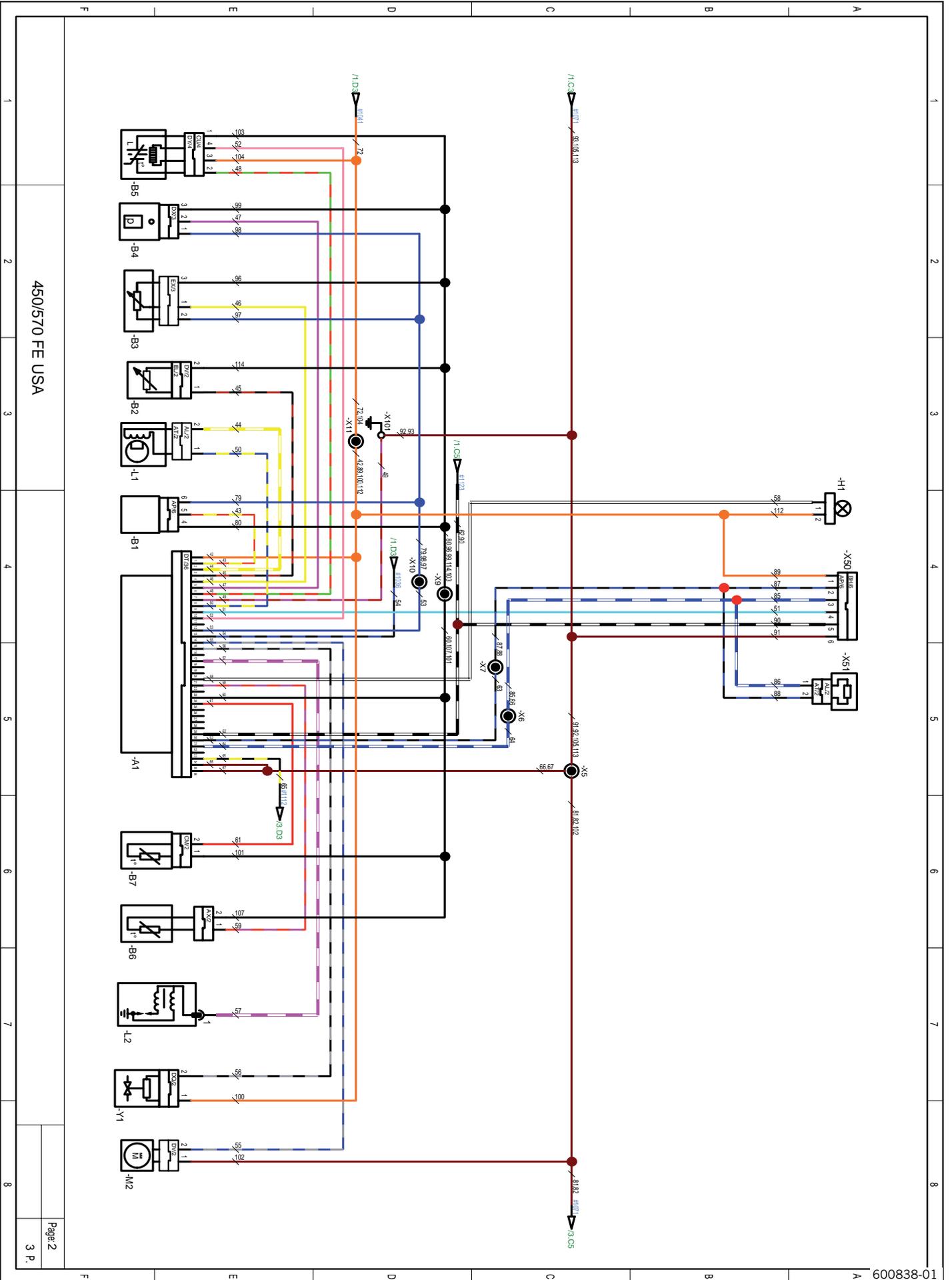
Component:

| | |
|----|---|
| G1 | Battery A5-6 |
| G2 | Generator C6-7 |
| K1 | Starter relay with main fuse A5 |
| K2 | Power relay E-F5 |
| M1 | Starter motor A5 |
| M3 | Radiator fan E-F4 |
| N1 | Voltage regulator/rectifier C6-7 |
| S3 | Temperature switch for radiator fan E-F3 |
| S8 | Electric starter button A3 |
| V1 | Diode E-F4 |

Cable colors:

| | |
|-----|--------------|
| 38 | Brown |
| 39 | Brown |
| 40 | Black |
| 41 | Black |
| 54 | Black-blue |
| 62 | White-black |
| 68 | White-red |
| 69 | White-red |
| 70 | White-red |
| 71 | Blue-red |
| 72 | Orange |
| 73 | Yellow |
| 74 | Yellow-blue |
| 75 | Yellow-red |
| 76 | Yellow-red |
| 77 | Yellow-red |
| 78 | White-red |
| 83 | Yellow-blue |
| 84 | Yellow-blue |
| 90 | White-black |
| 93 | Brown |
| 94 | White-red |
| 95 | White-black |
| 105 | Brown |
| 106 | Yellow-blue |
| 108 | White-black |
| 109 | Yellow-red |
| 110 | White-red |
| 111 | White-red |
| 113 | Brown |
| 119 | White-red |
| 120 | Black |
| 121 | Black-yellow |
| 122 | Black-blue |

2 of 3 (FE USA)



450/570 FE USA

Component:

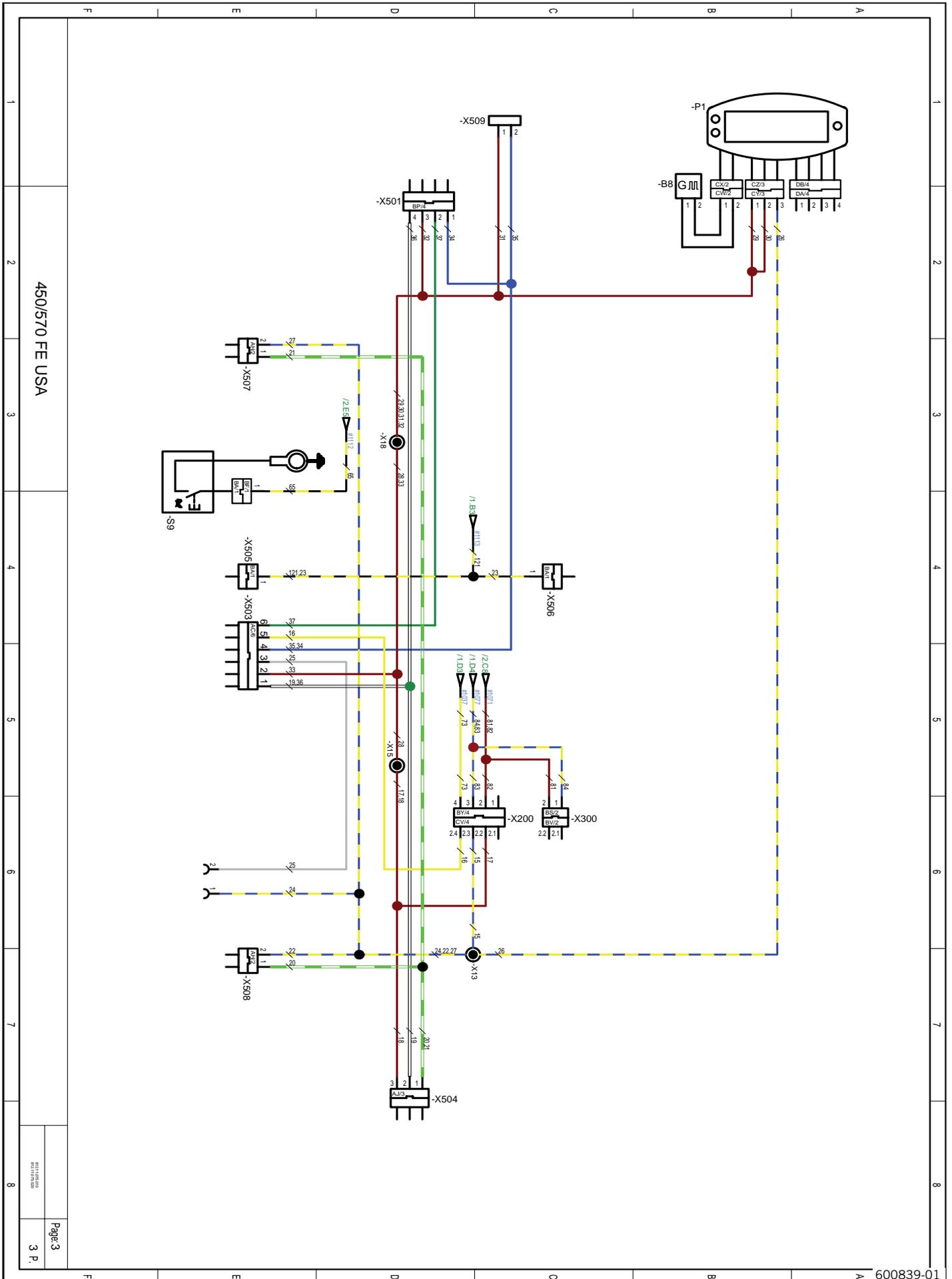
| | |
|-----|---|
| A1 | EFI control unit F4-5 |
| B1 | Rollover sensor F4 |
| B2 | Map-Select switch F7 (optional) |
| B3 | Throttle position sensor F2 |
| B4 | Manifold absolute pressure sensor F2 |
| B5 | Lambda sensor F1 |
| B6 | Coolant temperature sensor F6 |
| B7 | Intake air temperature sensor F6 |
| H1 | Warning lamp F1 (MIL) A4 |
| L1 | Pulse generator F3 |
| L2 | Ignition coil F7 |
| M2 | Fuel pump F8 |
| X50 | Diagnosis connector A4 |
| X51 | Resistance A5 |
| Y1 | Injection valve F7-8 |

Cable colors:

| | |
|----|--------------|
| 42 | Orange |
| 43 | Yellow-red |
| 44 | White-yellow |
| 45 | Black-brown |
| 46 | Yellow |
| 47 | Purple |
| 48 | Green-red |
| 49 | Brown-purple |
| 50 | Yellow-blue |
| 51 | Light blue |
| 52 | Pink |
| 53 | Blue |
| 54 | Black-blue |
| 55 | Blue-green |
| 56 | Black-gray |
| 57 | White-purple |
| 58 | White |
| 59 | Red-purple |
| 60 | Black |
| 61 | Red |
| 62 | White-black |
| 63 | Black-blue |
| 64 | White-blue |
| 65 | Black-yellow |
| 66 | Brown |
| 67 | Brown |
| 72 | Orange |
| 79 | Blue |
| 80 | Black |
| 81 | Brown |
| 82 | Brown |
| 83 | Yellow-blue |
| 84 | Yellow-blue |
| 85 | White-blue |
| 86 | White-blue |

| | |
|-----|-------------|
| 87 | Black-blue |
| 88 | Black-blue |
| 89 | Orange |
| 90 | White-black |
| 91 | Brown |
| 92 | Brown |
| 93 | Brown |
| 96 | Black |
| 97 | Blue |
| 98 | Blue |
| 99 | Black |
| 100 | Orange |
| 101 | Black |
| 102 | Brown |
| 103 | Black |
| 104 | Orange |
| 105 | Brown |
| 107 | Black |
| 112 | Orange |
| 113 | Brown |
| 114 | Black |

3 of 3 (FE USA)



450/570 FE USA

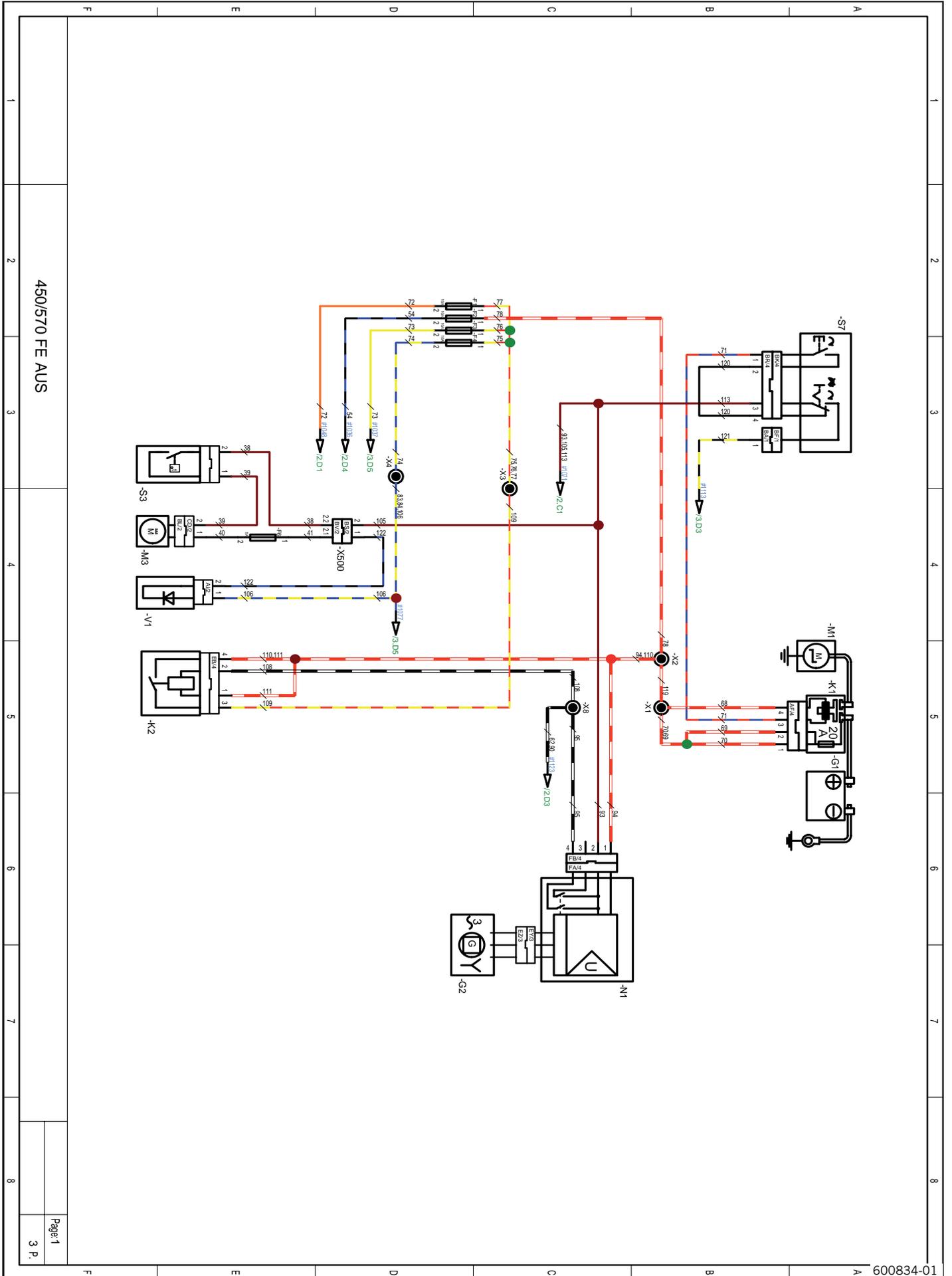
Component:

| | |
|------|---|
| B8 | Wheel speed sensor B1-2 |
| P1 | Speedometer A-B1 |
| S9 | Short circuit button E3-4 |
| X501 | Plug-in connector for low beam/high beam D1 (optional) |
| X503 | Plug-in connector for light switch E4-5 (optional) |
| X504 | Plug-in connector for low beam/high beam D8 (optional) |
| X507 | Plug-in connector for brake light switch, front E3 (optional) |
| X508 | Plug-in connector for brake light switch, rear E7 (optional) |
| X509 | Plug-in connector for high beam indicator switch C1 (optional) |

Cable colors:

| | |
|-----|--------------|
| 15 | Yellow-blue |
| 16 | Yellow |
| 17 | Brown |
| 18 | Brown |
| 19 | White |
| 20 | White-green |
| 21 | White-green |
| 22 | Yellow-blue |
| 23 | Black-yellow |
| 24 | Yellow-blue |
| 25 | Gray |
| 26 | Yellow-blue |
| 27 | Yellow-blue |
| 28 | Brown |
| 29 | Brown |
| 30 | Brown |
| 31 | Brown |
| 32 | Brown |
| 33 | Brown |
| 34 | Blue |
| 35 | Blue |
| 36 | White |
| 37 | Green |
| 65 | Black-yellow |
| 73 | Yellow |
| 81 | Brown |
| 82 | Brown |
| 83 | Yellow-blue |
| 84 | Yellow-blue |
| 121 | Black-yellow |

1 of 3 (FE AUS)



450/570 FE AUS

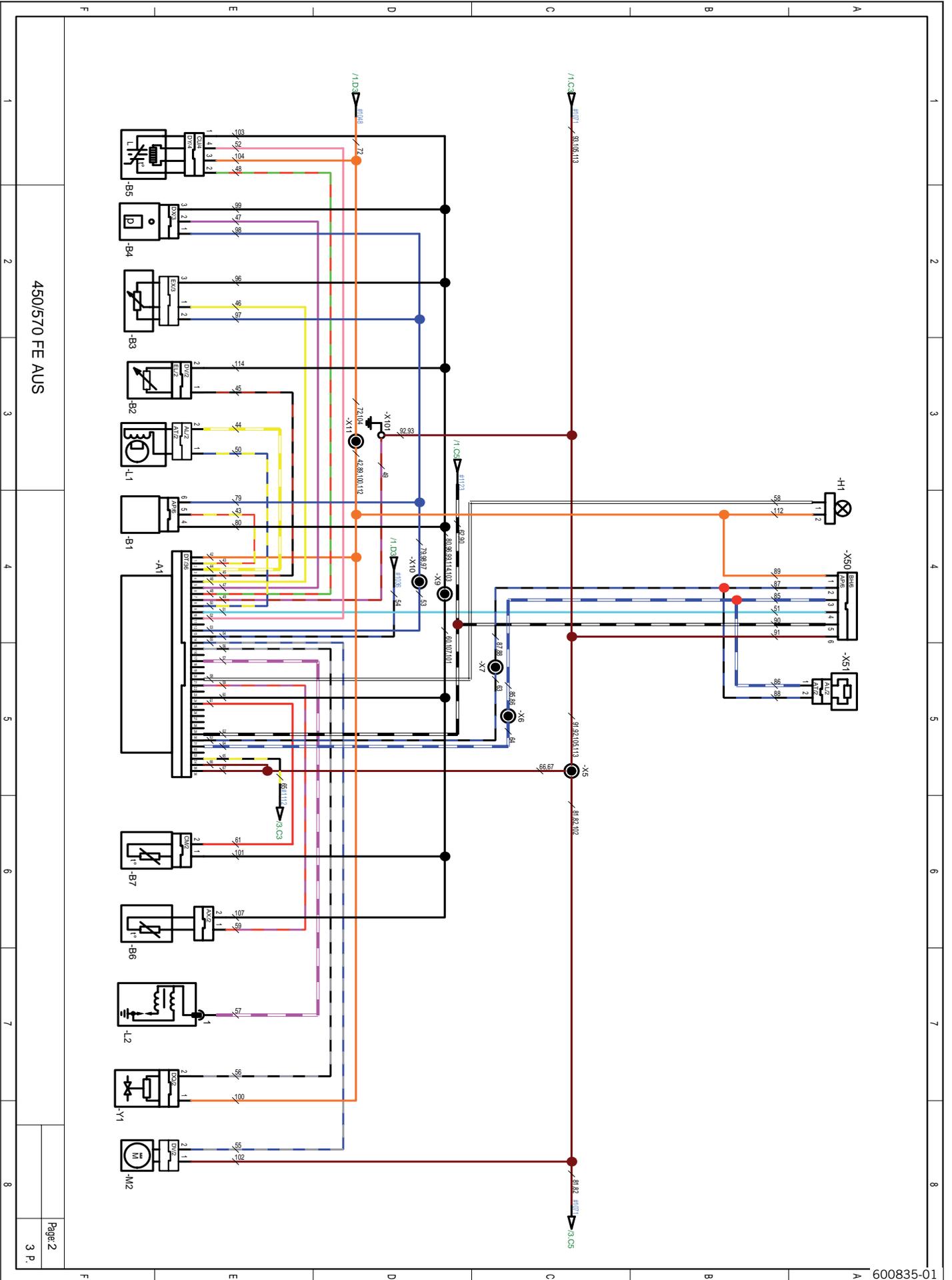
Component:

| | |
|----|---|
| G1 | Battery A5-6 |
| G2 | Generator C6-7 |
| K1 | Starter relay with main fuse A5 |
| K2 | Power relay E-F5 |
| M1 | Starter motor A5 |
| M3 | Radiator fan E-F4 |
| N1 | Voltage regulator/rectifier C6-7 |
| S3 | Temperature switch for radiator fan E-F3 |
| S7 | Electric starter button, emergency OFF switch A3 |
| V1 | Diode E-F4 |

Cable colors:

| | |
|-----|--------------|
| 38 | Brown |
| 39 | Brown |
| 40 | Black |
| 41 | Black |
| 54 | Black-blue |
| 62 | White-black |
| 68 | White-red |
| 69 | White-red |
| 70 | White-red |
| 71 | Blue-red |
| 72 | Orange |
| 73 | Yellow |
| 74 | Yellow-blue |
| 75 | Yellow-red |
| 76 | Yellow-red |
| 77 | Yellow-red |
| 78 | White-red |
| 83 | Yellow-blue |
| 84 | Yellow-blue |
| 90 | White-black |
| 93 | Brown |
| 94 | White-red |
| 95 | White-black |
| 105 | Brown |
| 106 | Yellow-blue |
| 108 | White-black |
| 109 | Yellow-red |
| 110 | White-red |
| 111 | White-red |
| 113 | Brown |
| 119 | White-red |
| 120 | Black |
| 121 | Black-yellow |
| 122 | Black-blue |

2 of 3 (FE AUS)



450/570 FE AUS

Component:

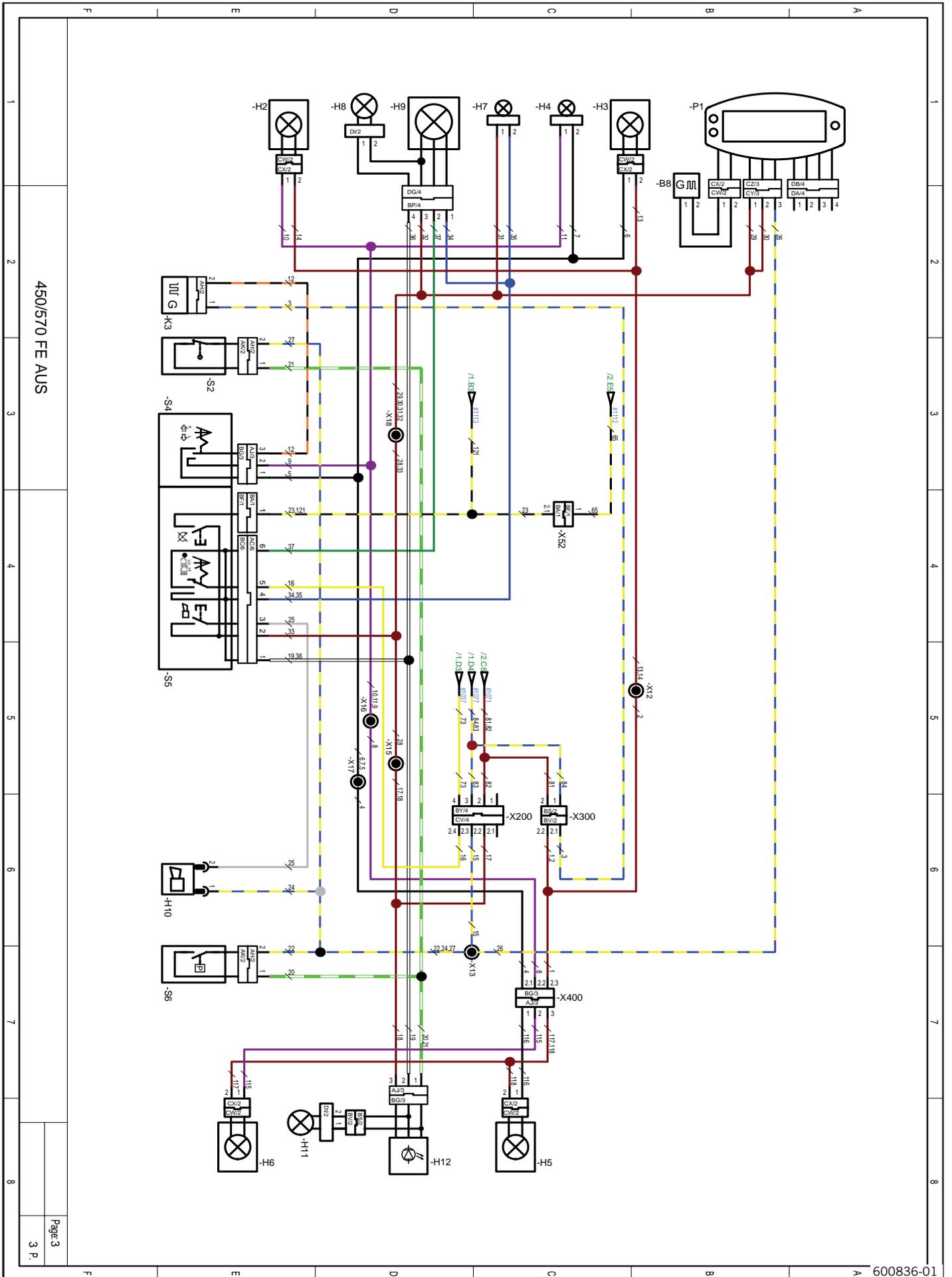
| | |
|-----|---|
| A1 | EFI control unit F4-5 |
| B1 | Roll angle sensor F4 |
| B2 | Map-Select switch F2 (optional) |
| B3 | throttle position sensor F2 |
| B4 | Manifold absolute pressure sensor F2 |
| B5 | Lambda sensor F1 |
| B6 | Coolant temperature sensor F6 |
| B7 | Intake air temperature sensor F6 |
| H1 | FI Warning lamp (MIL) A4 |
| L1 | Pulse generator F3 |
| L2 | Ignition coil F7 |
| M2 | Fuel pump F8 |
| X50 | Diagnosis connector A4 |
| X51 | Resistance A5 |
| Y1 | Injection valve F7-8 |

Cable colors:

| | |
|----|--------------|
| 42 | Orange |
| 43 | Yellow-red |
| 44 | White-yellow |
| 45 | Black-brown |
| 46 | Yellow |
| 47 | Purple |
| 48 | Green-red |
| 49 | Brown-purple |
| 50 | Yellow-blue |
| 51 | Light blue |
| 52 | Pink |
| 53 | Blue |
| 54 | Black-blue |
| 55 | Blue-green |
| 56 | Black-gray |
| 57 | White-purple |
| 58 | White |
| 59 | Red-purple |
| 60 | Black |
| 61 | Red |
| 62 | White-black |
| 63 | Black-blue |
| 64 | White-blue |
| 65 | Black-yellow |
| 66 | Brown |
| 67 | Brown |
| 72 | Orange |
| 79 | Blue |
| 80 | Black |
| 81 | Brown |
| 82 | Brown |
| 83 | Yellow-blue |
| 84 | Yellow-blue |
| 85 | White-blue |
| 86 | White-blue |

| | |
|-----|-------------|
| 87 | Black-blue |
| 88 | Black-blue |
| 89 | Orange |
| 90 | White-black |
| 91 | Brown |
| 92 | Brown |
| 93 | Brown |
| 96 | Black |
| 97 | Blue |
| 98 | Blue |
| 99 | Black |
| 100 | Orange |
| 101 | Black |
| 102 | Brown |
| 103 | Black |
| 104 | Orange |
| 105 | Brown |
| 107 | Black |
| 112 | Orange |
| 113 | Brown |
| 114 | Black |

3 of 3 (FE AUS)



450/570 FE AUS

Component:

| | |
|-----|---|
| B8 | Wheel speed sensor B1-2 |
| H2 | Turn signal, front left E1 |
| H3 | Turn signal, front right B-C1 |
| H4 | Turn signal indicator lamp C1 |
| H5 | Turn signal, rear right C8 |
| H6 | Turn signal, rear left E8 |
| H7 | High beam indicator light C1 |
| H8 | Parking light D1 |
| H9 | Low beam/high beam D1 |
| H10 | Horn E6 |
| H11 | License plate lamp D-E8 |
| H12 | Brake/tail light D8 |
| K3 | Turn signal relay E2 |
| P1 | Speedometer A-B1 |
| S2 | Brake light switch, front E3 |
| S4 | Turn signal switch E3 |
| S5 | Horn button, light switch, short circuit button E4-5 |
| S6 | Brake light switch, rear E7 |

Cable colors:

| | |
|----|--------------|
| 1 | Brown |
| 2 | Brown |
| 3 | Yellow-blue |
| 4 | Black |
| 5 | Black |
| 6 | Black |
| 7 | Black |
| 8 | Purple |
| 9 | Purple |
| 10 | Purple |
| 11 | Purple |
| 12 | Black-orange |
| 13 | Brown |
| 14 | Brown |
| 15 | Yellow-blue |
| 16 | Yellow |
| 17 | Brown |
| 18 | Brown |
| 19 | White |
| 20 | White-green |
| 21 | White-green |
| 22 | Yellow-blue |
| 23 | Black-yellow |
| 24 | Yellow-blue |
| 25 | Gray |
| 26 | Yellow-blue |
| 27 | Yellow-blue |
| 28 | Brown |
| 29 | Brown |
| 30 | Brown |
| 31 | Brown |
| 32 | Brown |

| | |
|-----|--------------|
| 33 | Brown |
| 34 | Blue |
| 35 | Blue |
| 36 | White |
| 37 | Green |
| 65 | Black-yellow |
| 73 | Yellow |
| 81 | Brown |
| 82 | Brown |
| 83 | Yellow-blue |
| 84 | Yellow-blue |
| 86 | White-blue |
| 115 | Purple |
| 116 | Black |
| 117 | Brown |
| 118 | Brown |
| 121 | Black-yellow |

Brake fluid DOT 4 / DOT 5.1

According to

- DOT

Guideline

- Use only brake fluid that complies with the specified standards (see specifications on the container) and that possesses the corresponding properties. HUSABERG recommends **Castrol** and **Motorex®** products.

Supplier

Castrol

- **RESPONSE BRAKE FLUID SUPER DOT 4**

Motorex®

- **Brake Fluid DOT 5.1**

Coolant

Guideline

- Use only suitable coolant (even in countries with high temperatures). Using inferior antifreeze can result in corrosion and foaming. HUSABERG recommends **Motorex®** products.

Mixture ratio

| | |
|---|--|
| Antifreeze: -25... -45 °C (-13... -49 °F) | 50 % Anti-corrosion/antifreeze 50 % Distilled water |
|---|--|

Coolant (mixed ready to use)

| | |
|------------|-----------------|
| Antifreeze | -40 °C (-40 °F) |
|------------|-----------------|

Supplier

Motorex®

- **Anti Freeze**

Engine oil (SAE 10W/50)

According to

- JASO T903 MA (☞ p. 278)
- SAE (☞ p. 278) (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. HUSABERG recommends **Motorex®** products.

| |
|----------------------|
| Synthetic engine oil |
|----------------------|

Supplier

Motorex®

- **Cross Power 4T**

Fork oil (SAE 5)

According to

- SAE (☞ p. 278) (SAE 5)

Guideline

- Use only oils that comply with the specified standards (see specifications on the container) and that possesses the corresponding properties. HUSABERG recommends **Motorex®** products.

Supplier

Motorex®

- **Racing Fork Oil**

Hydraulic oil (15)

According to

- ISO VG (15)

Guideline

- Use only hydraulic oil that complies with the specified standards (see specifications on the container) and that possesses the corresponding properties. HUSABERG recommends **Motorex®** products.

Supplier**Motorex®**

- Hydraulic Fluid 75

Shock absorber oil (SAE 2.5) (50180342S1)**According to**

- SAE (p. 278) (SAE 2.5)

Guideline

- Use only oils that comply with the specified standards (see specifications on the container) and that possess the corresponding properties.

Super unleaded (ROZ 95 / RON 95 / PON 91)**According to**

- DIN EN 228 (ROZ 95 / RON 95 / PON 91)

Air filter cleaning agent

Specification

- HUSABERG recommends **Motorex®** products.

Supplier

Motorex®

- **Twin Air Dirt Bio Remover**

Chain cleaner

Specification

- HUSABERG recommends **Motorex®** products.

Supplier

Motorex®

- **Chain Clean 611**

Cleaning and polishing materials for metal, rubber and plastic

Specification

- HUSABERG recommends **Motorex®** products.

Supplier

Motorex®

- **Protect & Shine 645**

Contact spray

Specification

- HUSABERG recommends **Motorex®** products.

Supplier

Motorex®

- **Accu Contact**

High-luster polish for paint

Specification

- HUSABERG recommends **Motorex®** products.

Supplier

Motorex®

- **Moto Polish**

Long-life grease

Specification

- HUSABERG recommends **Motorex®** products.

Supplier

Motorex®

- **Fett 2000**

Long-life grease

Specification

- KTM recommends **Motorex®** products.

Supplier

Motorex®

- **Fett 2000**

Lubricant (T158)

Specification

- HUSABERG recommends **Lubcon®** products.

Supplier

Lubcon®

- **Turmogrease® PP 300**

Lubricant (T511)**Specification**

- HUSABERG recommends **Lubcon®** products.

Supplier**Lubcon®**

- **Turmsilon® GTI 300 P**

Lubricant (T159)**Specification**

- HUSABERG recommends **Bel-Ray®** products.

Supplier**Bel-Ray®**

- **MC-11®**

Lubricant (T625)**Specification**

- HUSABERG recommends **Molykote®** products.

Supplier**Molykote®**

- **33 Medium**

Lubricant (T152)**Specification**

- HUSABERG recommends **Bel-Ray®** products.

Supplier**Bel-Ray®**

- **Molyube® Anti-Seize**

Motorcycle cleaner**Specification**

- HUSABERG recommends **Motorex®** products.

Supplier**Motorex®**

- **Moto Clean 900**

Offroad chain spray**Specification**

- HUSABERG recommends **Motorex®** products.

Supplier**Motorex®**

- **Chain Lube 622**

Oil for foam air filter**Specification**

- HUSABERG recommends **Motorex®** products.

Supplier**Motorex®**

- **Twin Air Liquid Bio Power**

Universal oil spray**Specification**

- HUSABERG recommends **Motorex®** products.

Supplier**Motorex®**

- **Joker 440 Universal**

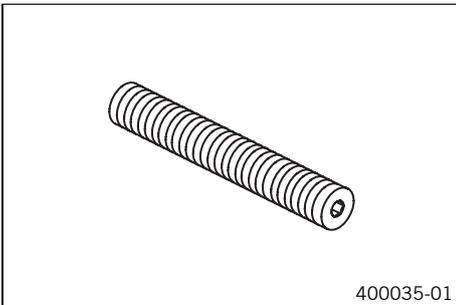
Breakout box



200930-10

Art. no.: 00029095000

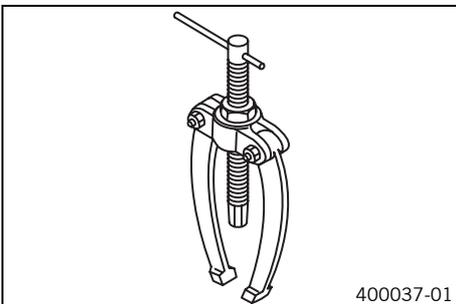
Crankshaft locking bolt



400035-01

Art. no.: 113080802

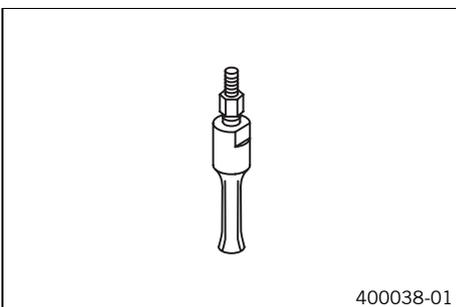
Bearing puller



400037-01

Art. no.: 15112017000

Insert for bearing puller



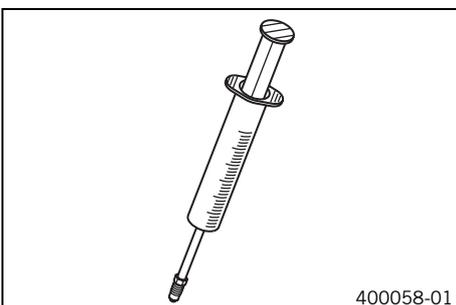
400038-01

Art. no.: 15112018100

Feature

18... 23 mm (0.71... 0.91 in)

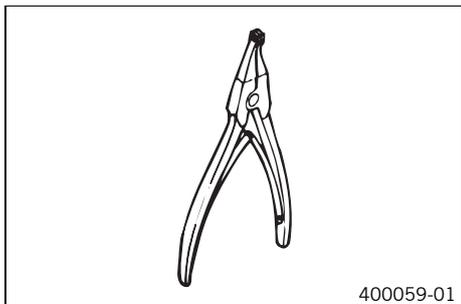
Bleed syringe



400058-01

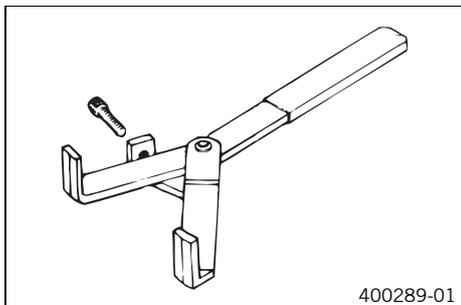
Art. no.: 50329050000

Circlip pliers reverse



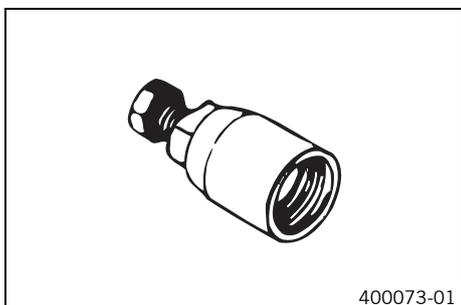
Art. no.: 51012011000

Clutch holder



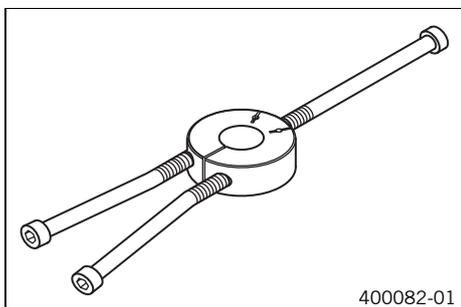
Art. no.: 51129003000

Extractor



Art. no.: 58012009000

Tool for inner bearing race



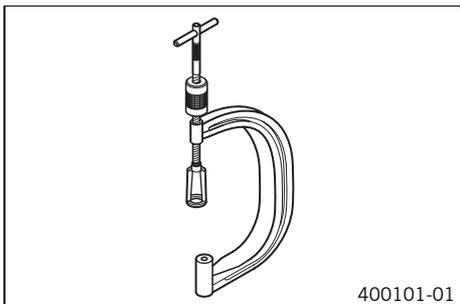
Art. no.: 58429037043

Torque wrench with various accessories in set



Art. no.: 58429094000

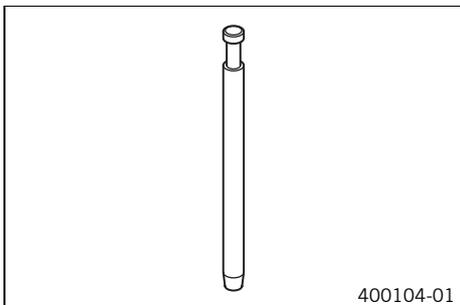
Valve spring mounter



400101-01

Art. no.: 59029019000

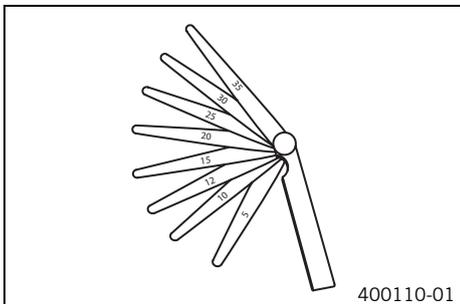
Limit plug gauge



400104-01

Art. no.: 59029026006

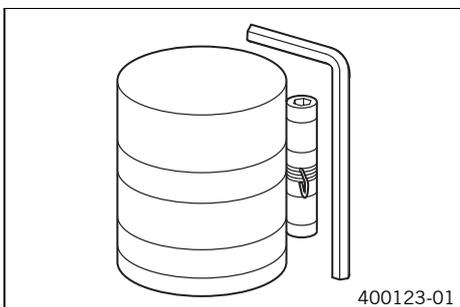
Feeler gauge



400110-01

Art. no.: 59029041100

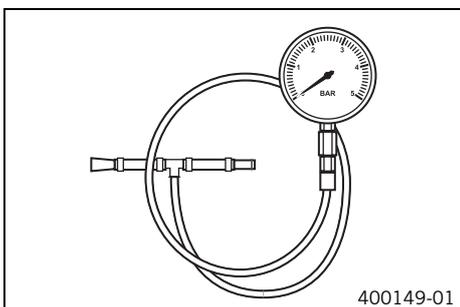
Piston ring mounting tool



400123-01

Art. no.: 60029015000

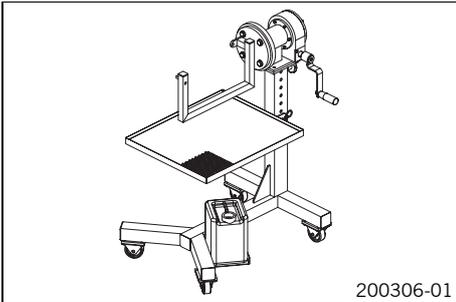
Pressure testing tool



400149-01

Art. no.: 61029094000

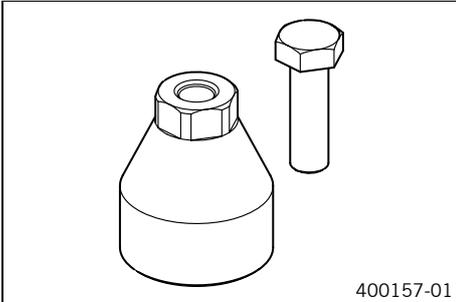
Engine work stand



200306-01

Art. no.: 61229001000

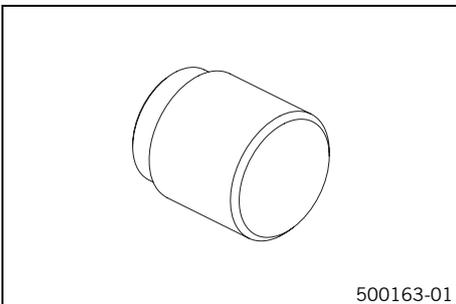
Extractor



400157-01

Art. no.: 75029021000

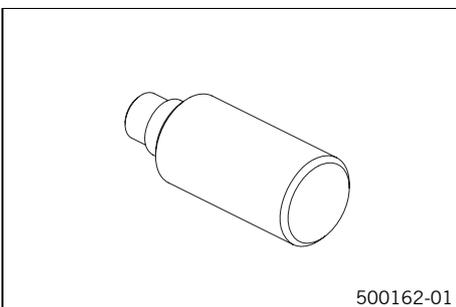
Push-in drift



500163-01

Art. no.: 75029044010

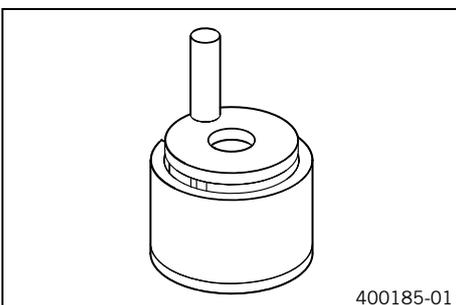
Push-in drift



500162-01

Art. no.: 75029044020

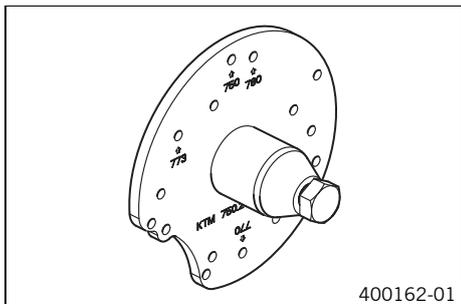
Pressing device for crankshaft, complete



400185-01

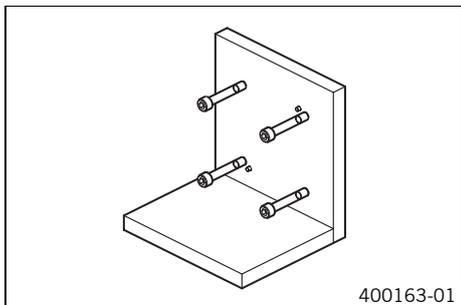
Art. no.: 75029047000

Extractor



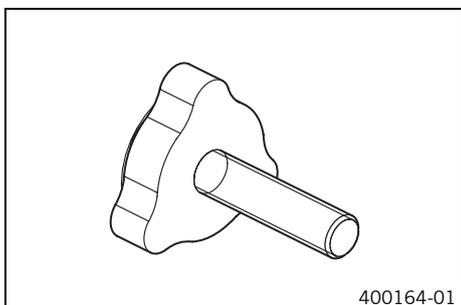
Art. no.: 75029048000

Clamping plate



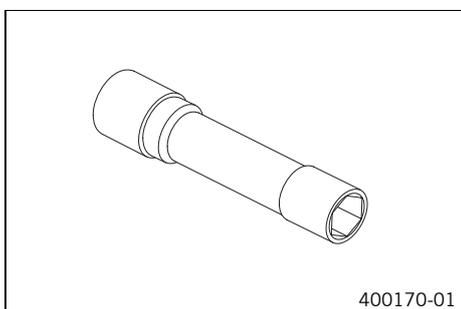
Art. no.: 75029050000

Push-out drift



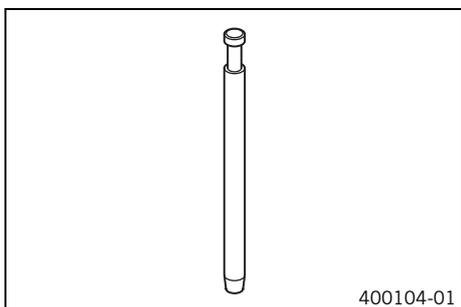
Art. no.: 75029051000

Spark plug wrench



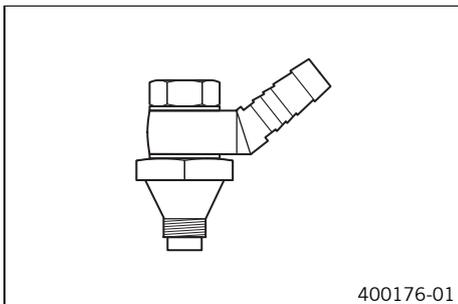
Art. no.: 75029172000

Limit plug gauge



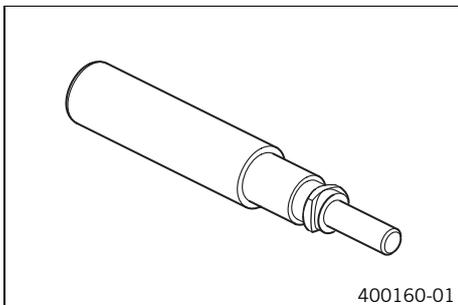
Art. no.: 77029026000

Oil pressure adapter



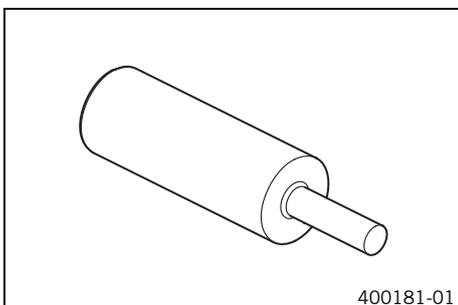
Art. no.: 77329006000

Insert for piston pin retainer



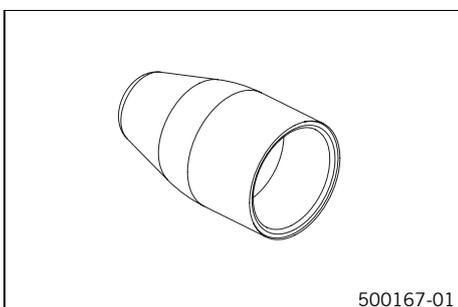
Art. no.: 77329030100

Release device for timing chain tensioner



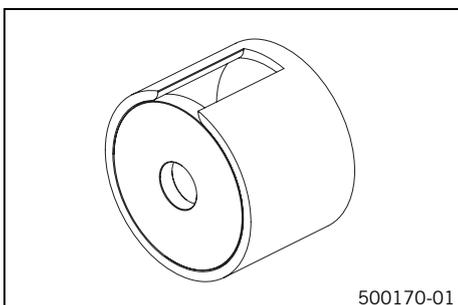
Art. no.: 77329051000

Mounting sleeve



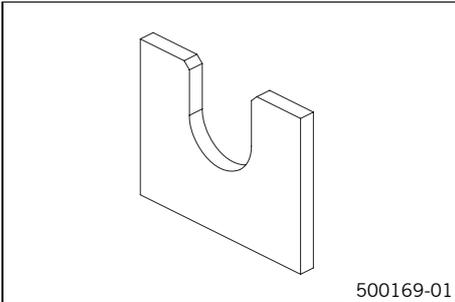
Art. no.: 78029005100

Insert for crankshaft pressing device



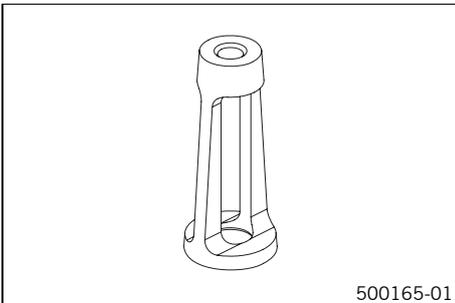
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Separator plate



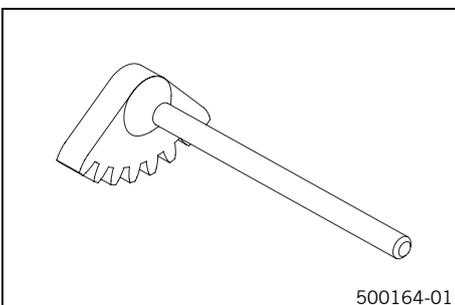
Art. no.: 78029009000

Valve spring mounting device



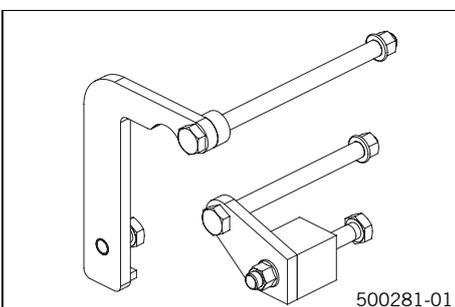
Art. no.: 78029060000

Gear segment



Art. no.: 80029004000

Fitting for work stand



Art. no.: 81229002000

Work stand



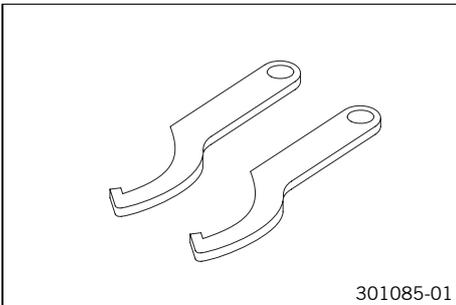
Art. no.: 81229055000

Pin wrench



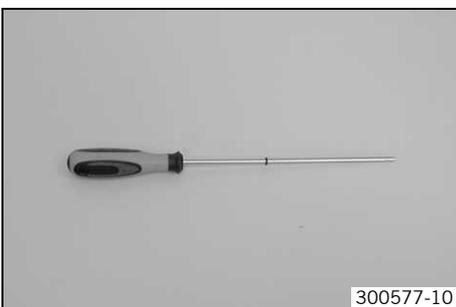
Art. no.: T103

Hook wrench



Art. no.: T106S

Depth micrometer



Art. no.: T107S

Mounting sleeve



Art. no.: T1204

Calibration pin



Art. no.: T1205

Pressing tool



200583-10

Art. no.: T1206

Pressing tool



200585-01

Art. no.: T1207S

Centering sleeve



200777-10

Art. no.: T1214

Mounting sleeve



300568-10

Art. no.: T1215

Disassembly tool



200816-10

Art. no.: T1216

Protecting sleeve



200635-10

Art. no.: T1401

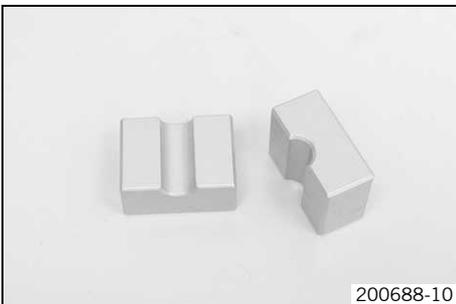
Clamping stand



200733-10

Art. no.: T14015S

Clamping stand



200688-10

Art. no.: T14016S

Gripping tool



200639-10

Art. no.: T14026S1

Assembly tool



200634-10

Art. no.: T1402S

Open-end wrench



Art. no.: T14032

Clamping stand



Art. no.: T1403S

Press drift



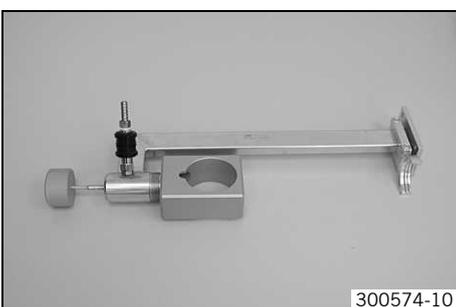
Art. no.: T1504

Assembly tool



Art. no.: T150S

Nitrogen filling tool



Art. no.: T170S1

JASO T903 MA

Different technical development directions required a new 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, high performance at high engine speeds are in the foreground for motorcycle engines. With most motorcycles, the gearbox and the clutch are lubricated with the same oil as the engine. 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.

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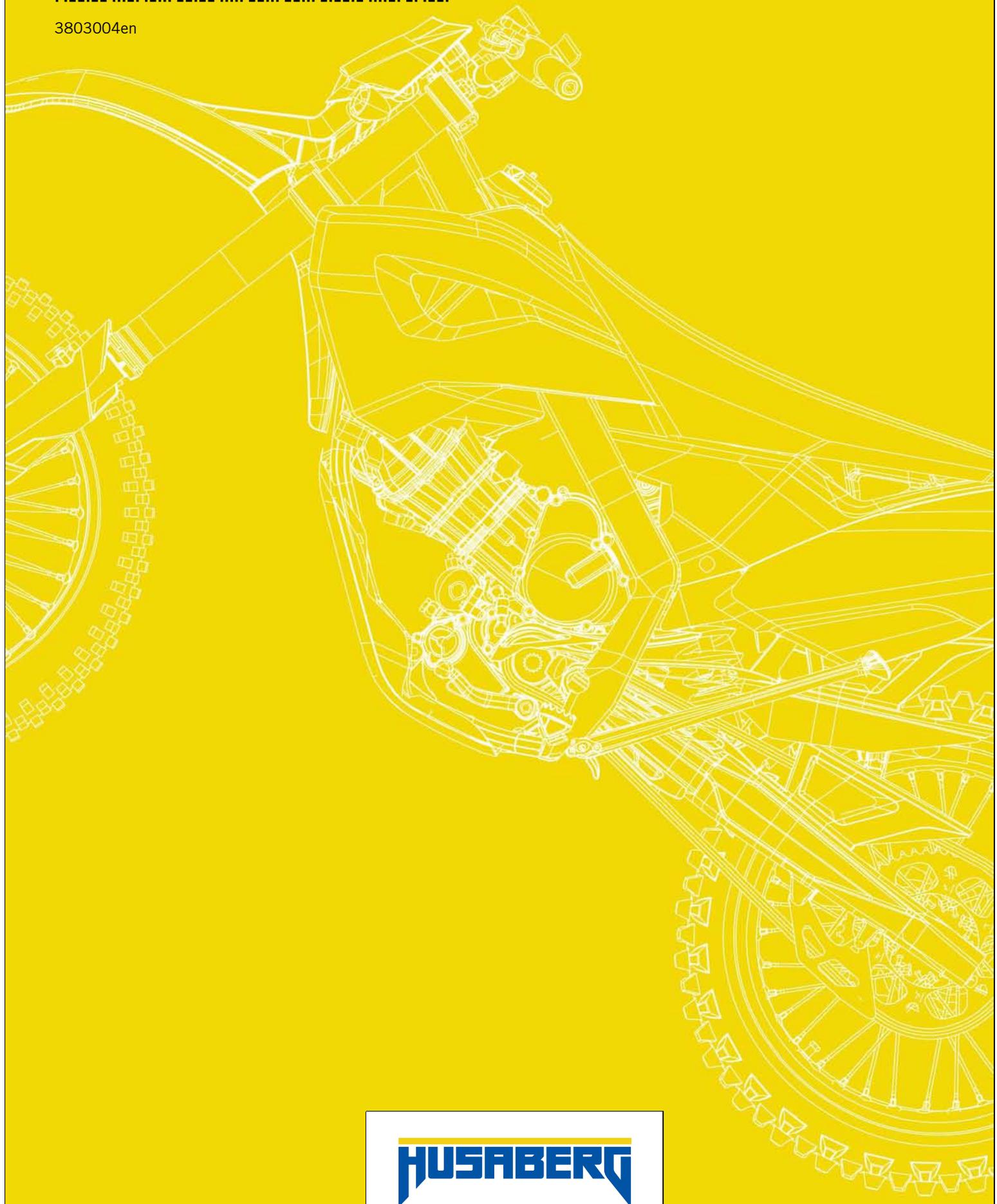
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