

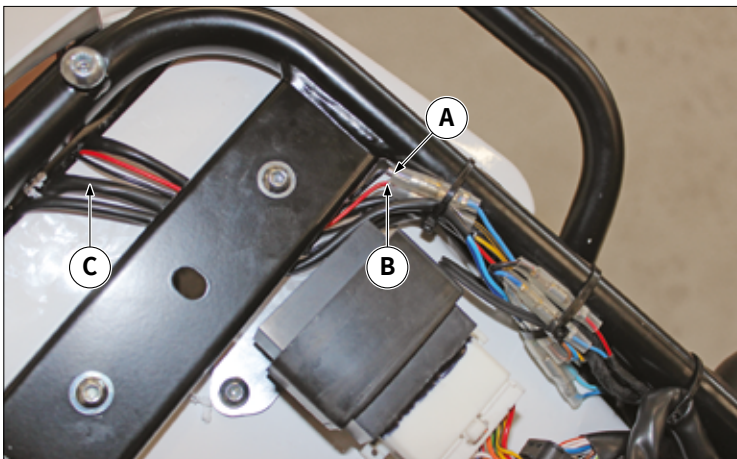
**12.1 SEAT REMOVAL**

To open the seat, unscrew and remove the screw “A”.



Lift up and remove the seat “B”.

**i** Proceed in the reverse order for reassembling.

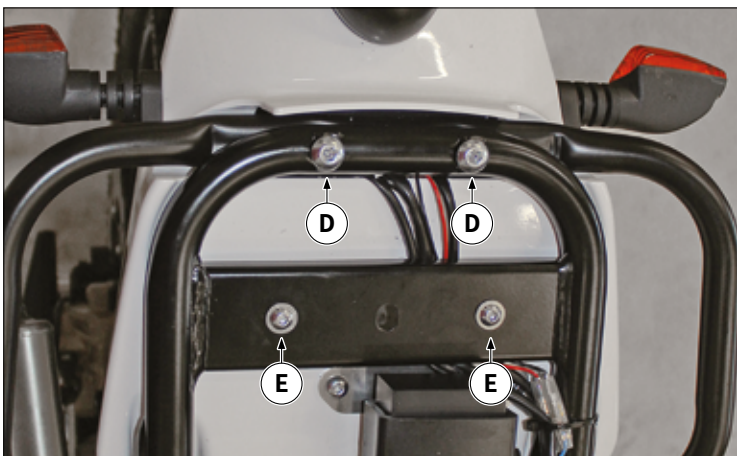


**12.2 LICENSE PLATE HOLDER REMOVAL**

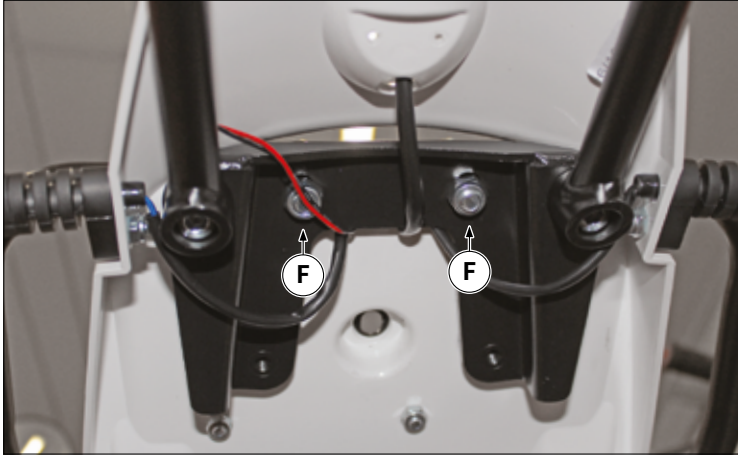
**12.2.1 License plate holder removal (Scrambler version)**

Remove:

- Seat, refer to “12.1 Seat removal” on page 117.
- Disconnect the license plate light wiring black “A” red “B”, and the tail light cable “C” from the vehicle wiring.



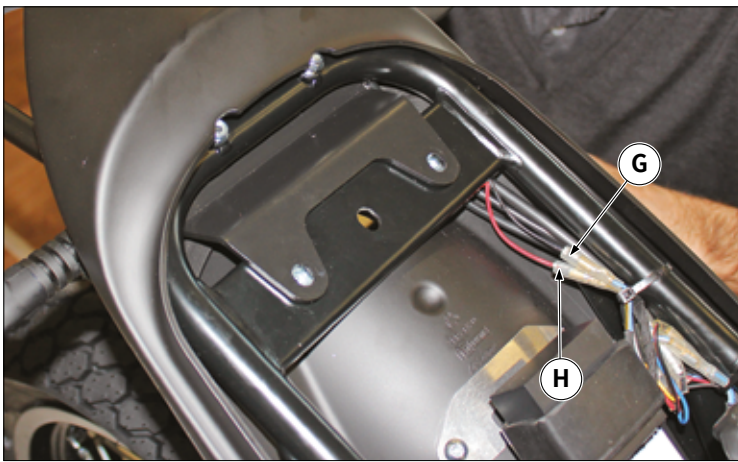
Remove the screws “D”, the screws “E”.



Remove the nuts "F".

Remove the license plate holder, taking care not to damage the wiring of the tail light and of the turn signals.

**(i) Proceed in the reverse order for reassembling.**

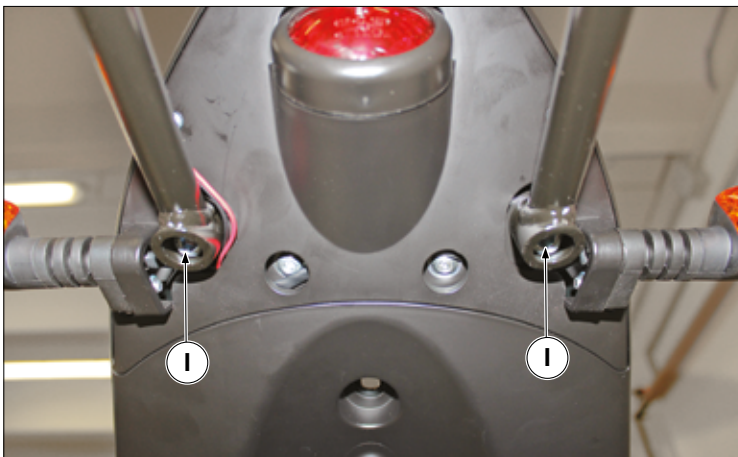


**12.2.2 License plate holder removal (Flat Track version)**

Remove:

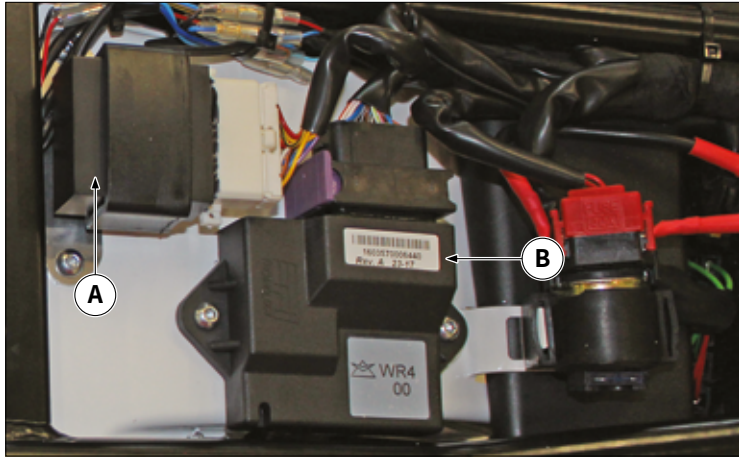
- Seat, refer to "12.1 Seat removal" on page 117.

Disconnect the red "G" black "H" license plate light wiring from the vehicle wiring.



Remove the screws "I", then remove the license plate holder.

**(i) Proceed in the reverse order for reassembling.**



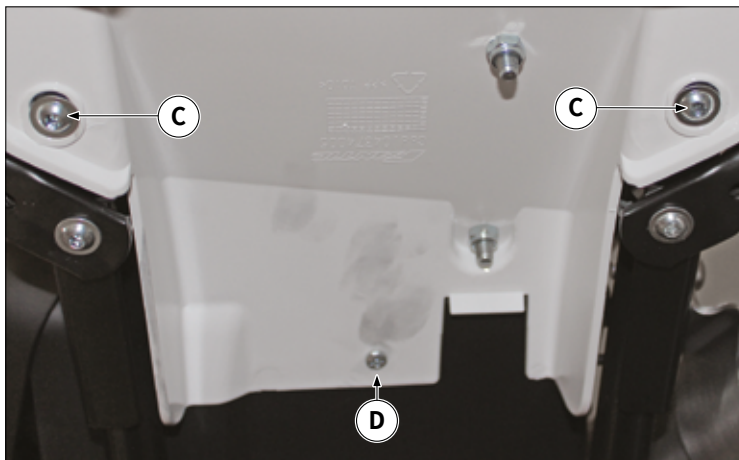
**12.3 REAR TAIL REMOVAL**

**12.3.1 Rear tail removal (Scrambler version)**

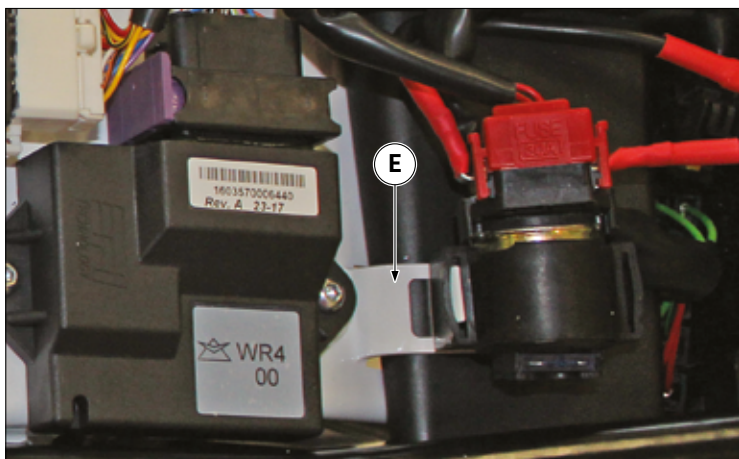
Remove:

- Seat, refer to “12.1 Seat removal” on page 117;
- License plate holder Scrambler version, refer to “12.2 License plate holder removal” on page 117;
- Rear turn signals, refer to “12.23.3 Rear turn signals removal” on page 161;
- Scrambler tail light, refer to “12.23 Rear optical unit removal” on page 159.

Remove the relay box “A” and the module “B” from the tail without disconnecting the wiring.



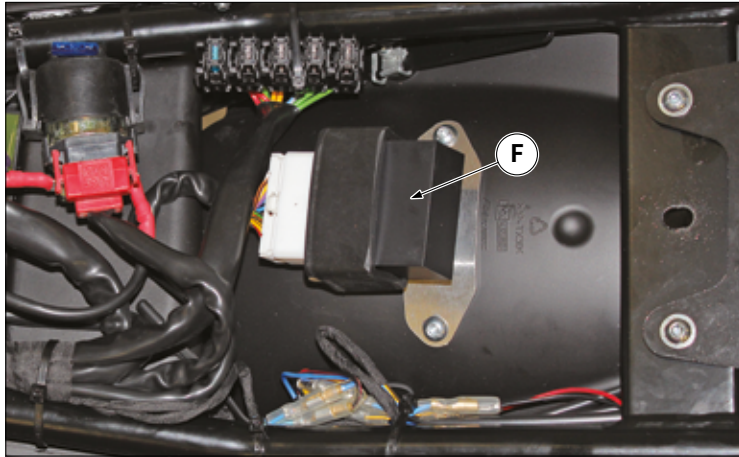
Remove the screws “C” and the screw “D” in the lower part of the tail.



Remove the tail by disassembling it from the hook “E”.

**(i) Proceed in the reverse order for reassembling.**



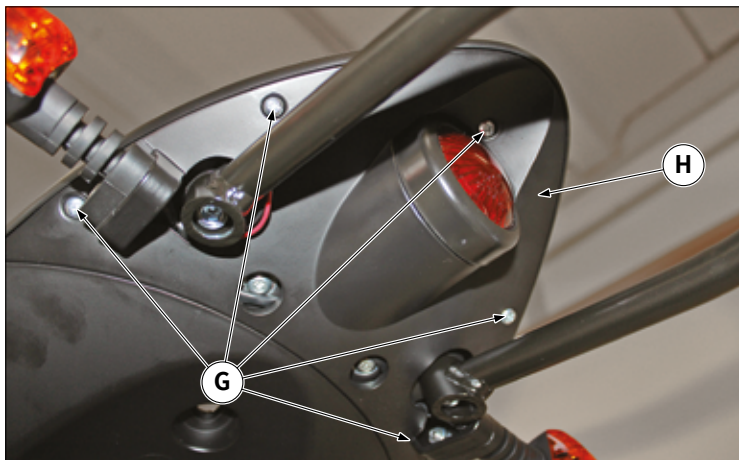


**12.3.2 Rear tail removal (Flat Track version)**

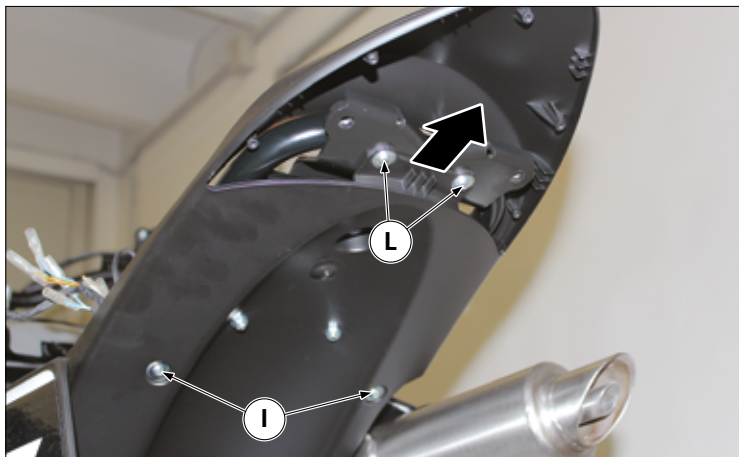
Remove:

- Seat, refer to “12.1 Seat removal” on page 117;
- License plate holder Flat Track version, refer to “12.2 License plate holder removal” on page 117;
- Rear turn signals, refer to “12.23.3 Rear turn signals removal” on page 161;
- Flat Track tail light, refer to “12.23 Rear optical unit removal” on page 159.

Remove the relay box “F” from the tail without disconnecting the wiring.



Remove the screws “G”, then remove the lower cover “H”.



Remove the screws “I” and the screws “L”, then extract the rear tail.

**(i) Proceed in the reverse order for reassembling.**





**12.4 PASSENGER HANDLES REMOVAL**

Remove:

- Seat, refer to “12.1 Seat removal” on page 117;
- License plate holder, refer to “12.2 License plate holder removal” on page 117;
- Rear tail, refer to “12.3 Rear tail removal” on page 119.

Remove the screws “A” and disassemble the passenger handles.

**i** Proceed in the reverse order for reassembling.



**12.5 SIDE PANEL REMOVAL**

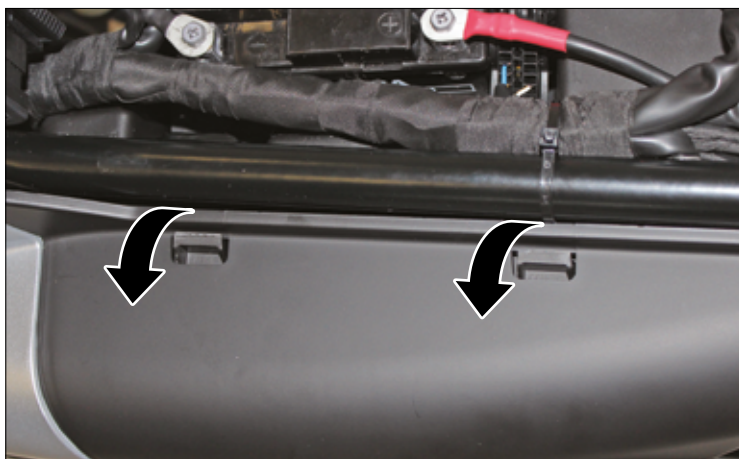
**12.5.1 Left side panel removal**

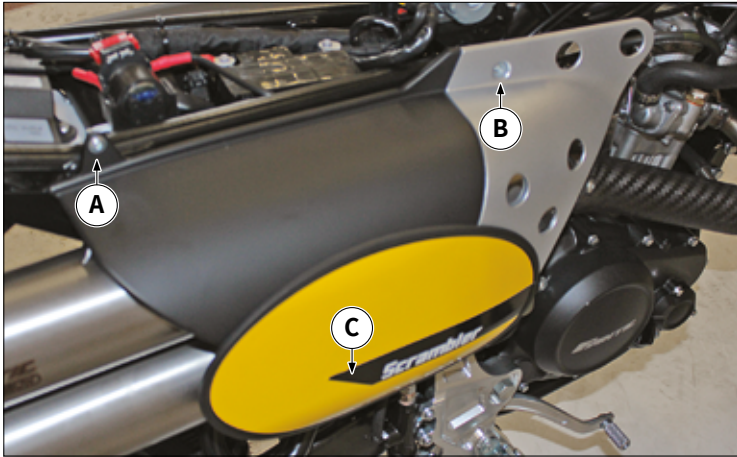
Remove:

- Seat, refer to “12.1 Seat removal” on page 117.

Remove the screw “A”, then release the side panel from the upper and lower couplers, then remove it.

**i** Proceed in the reverse order for reassembling.



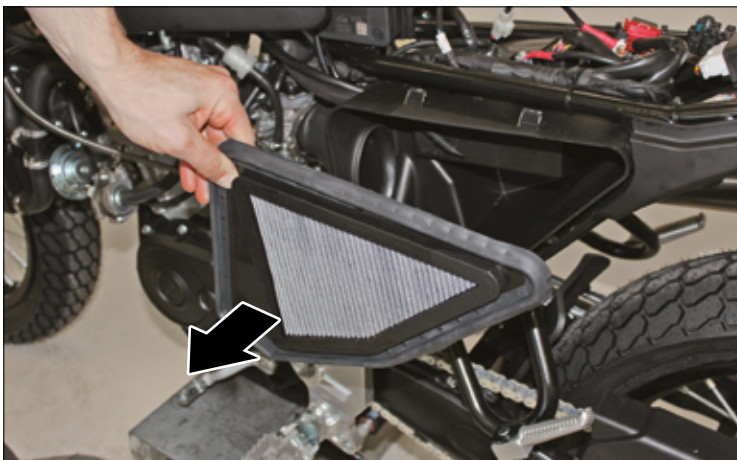


**12.5.2 Right side panel removal**

Remove:

– Seat, refer to “12.1 Seat removal” on page 117.  
Remove the screw “A”, the screw “B” and the screw “C”, then remove the side panel.

**i** Proceed in the reverse order for reassembling.



**12.6 AIR FILTER REMOVAL**

Remove:

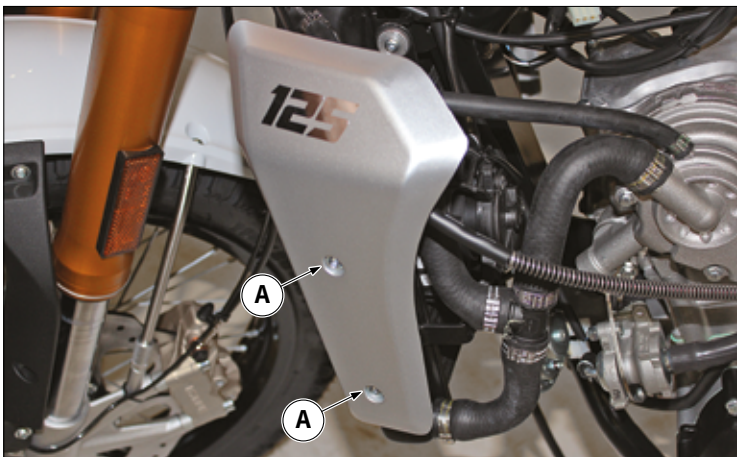
– Left side panel: refer to “12.5.2 Right side panel removal” on page 122.  
Remove the air filter.

**i** Proceed in the reverse order for reassembling.

**12.6.1 Oil filter cleaning**

Clean the air filter with a jet of compressed air directed from the inside towards the outside of the filter.

Externally clean the air filter, the inside of the filter casing and the intake ducts with a clean cloth.



**12.7 UNDERBODY AND CONVEYORS REMOVAL**

**12.7.1 Left conveyor removal**

Remove the screws “A”, then remove the conveyor.

**i** Proceed in the reverse order for reassembling.

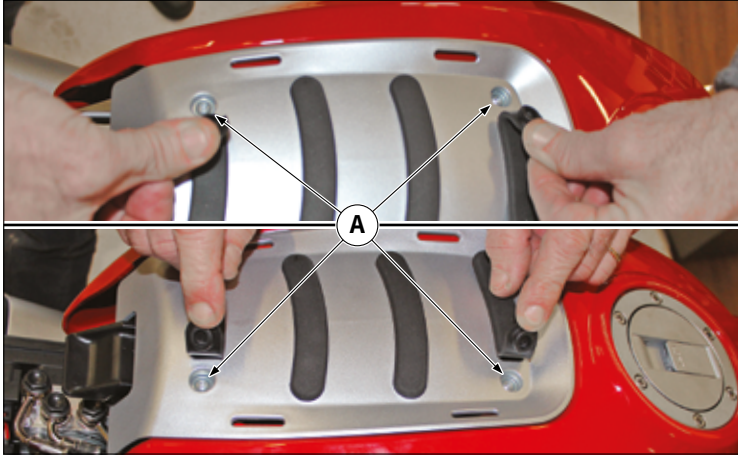


**12.7.2 Right conveyor removal**

Remove the screws “B”, then remove the conveyor.

**i** Proceed in the reverse order for reassembling.



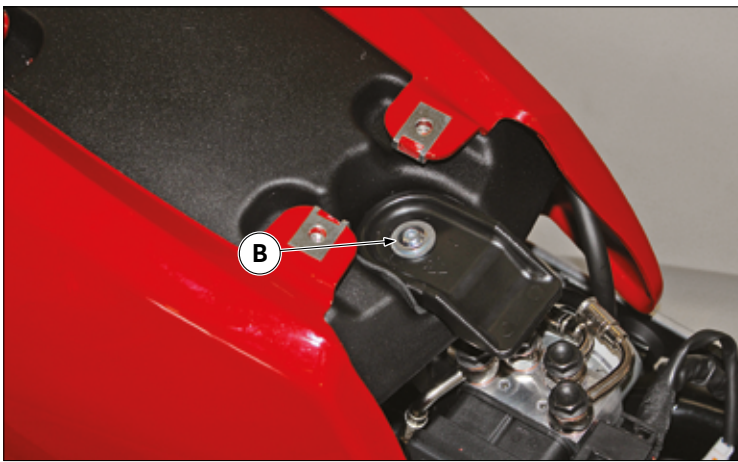


**12.8 FUEL TANK REMOVAL**

**12.8.1 Cover removal**

Lift up the rubber guards and remove the screws "A", then remove the cover.

**i** Proceed in the reverse order for reassembling.

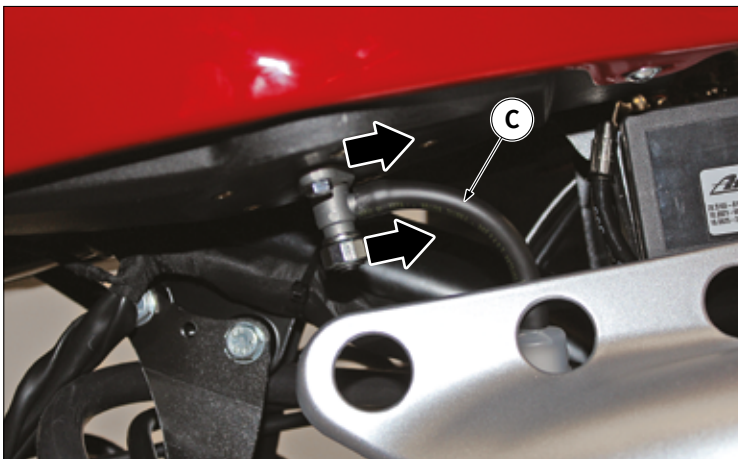


**12.8.2 Complete tank removal**

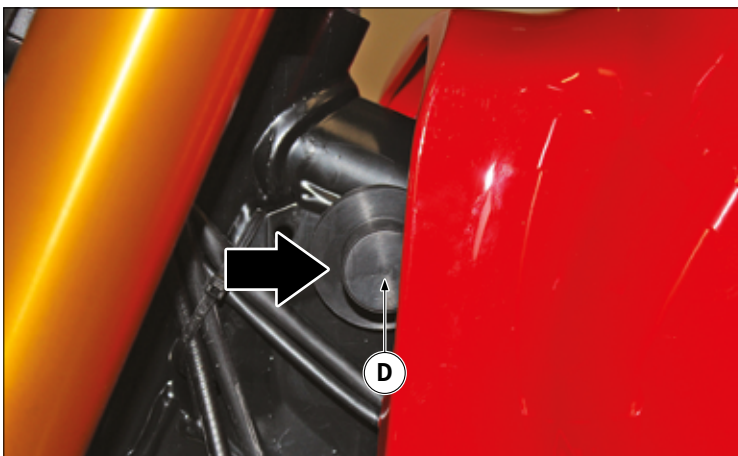
Remove:

- Fuel tank cover; refer to "12.8.1 Cover removal" on page 123.

Remove the screw "B".

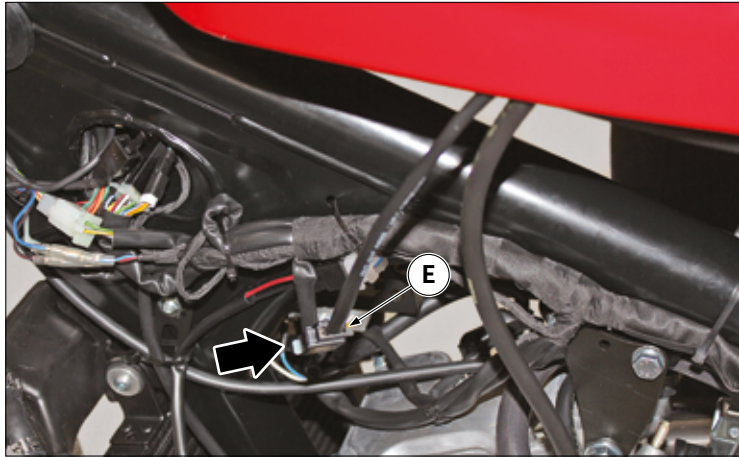


Make sure that the fuel tap is closed and disconnect the rubber tube "C".



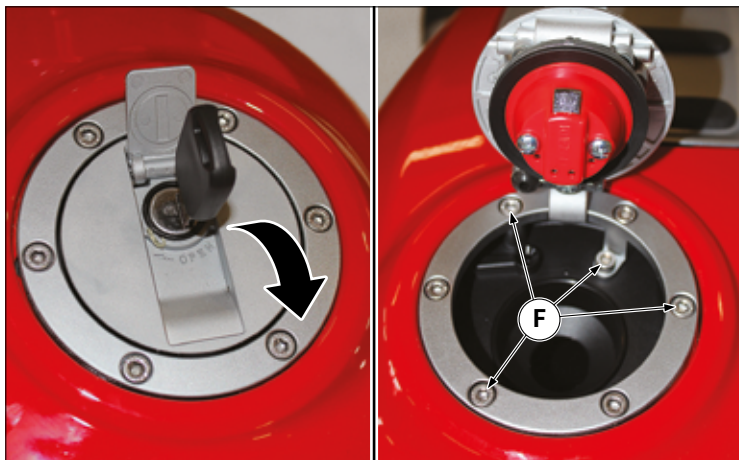
Lift the tank removing it from the front pads "D".





Disconnect the fuel level sensor connector "E" from the main wiring and remove the tank.

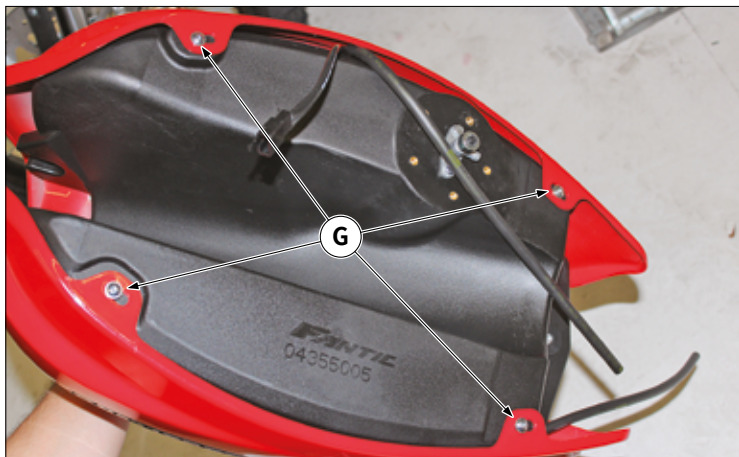
**(i) Proceed in the reverse order for reassembling.**



**12.8.3 Fuel cap removal**

Open the fuel cap with the key and remove the screws "F", then remove the cap.

**(i) Proceed in the reverse order for reassembling.**



**12.8.4 Tank cover removal**

Remove:

- Tank cover, refer to "12.8.1 Cover removal" on page 123;
- Complete fuel tank, refer to "12.8.2 Complete tank removal" on page 123;
- Fuel cap.

Remove the screws "G" and separate the cover from the fuel tank.

**(i) Proceed in the reverse order for reassembling.**



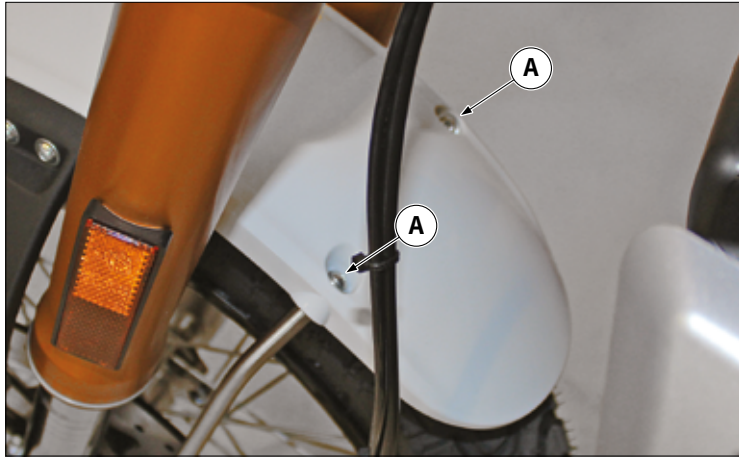
**12.8.5 Fuel tap**

Empty the fuel tank.

Disconnect the rubber tube from the fuel tap.

Remove the screws "H", then remove the fuel tap.

**(i) Proceed in the reverse order for reassembling.**

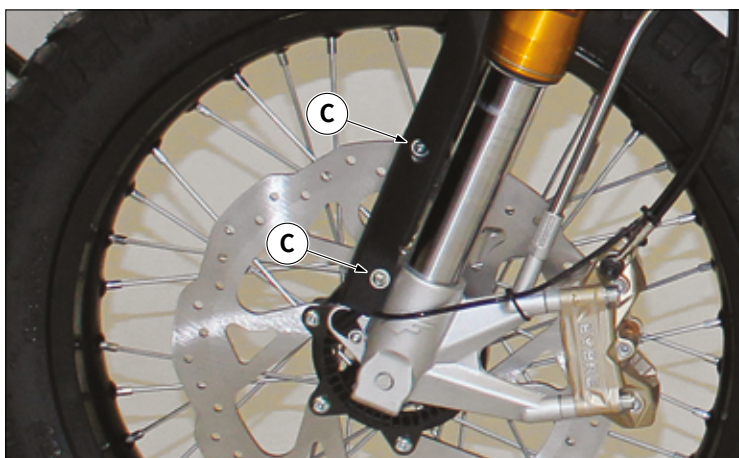
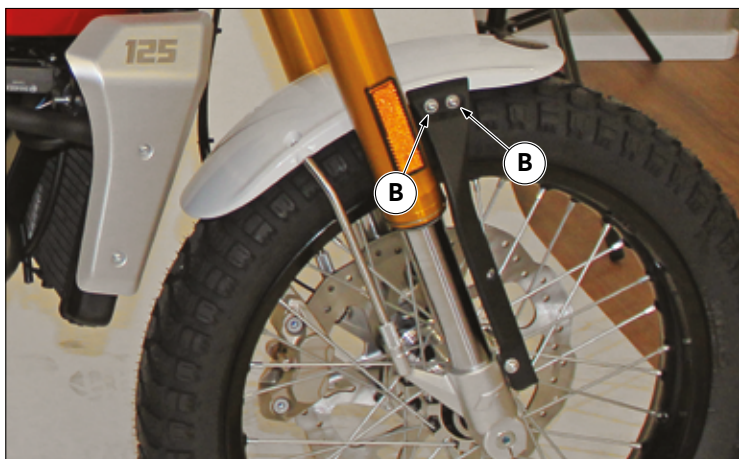
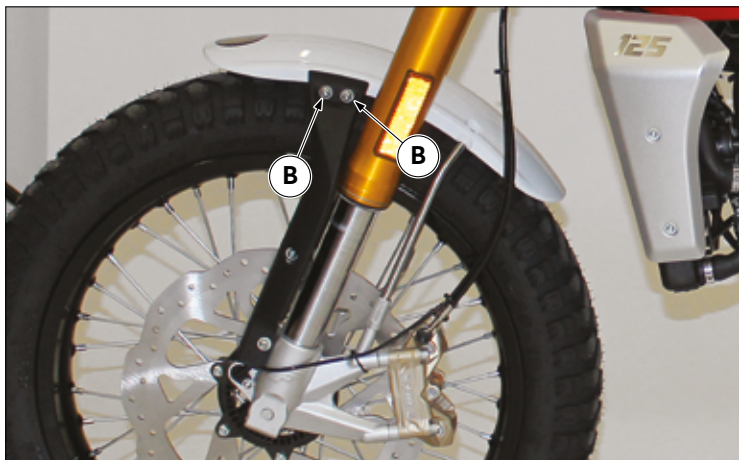


**12.9 FRONT MUDGUARD AND FORK PROTECTORS REMOVAL**

**12.9.1 Front mudguard removal**

Remove screws "A" and screws "B" to release the front mudguard.

**i** Proceed in the reverse order for reassembling.



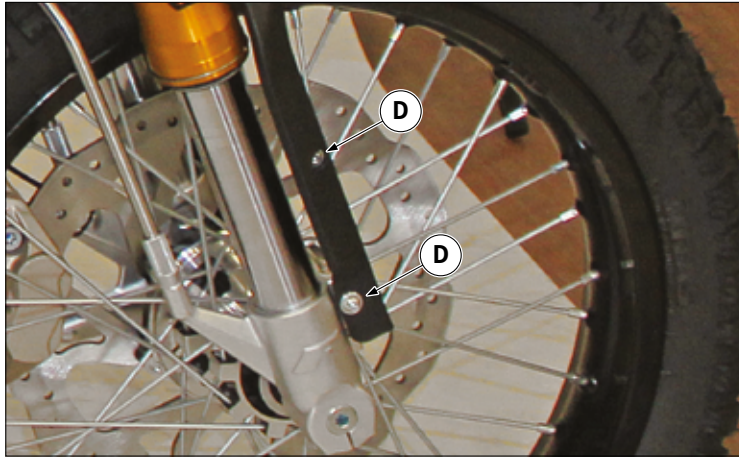
**12.9.2 Fork protectors removal**

Remove:

- Front mudguard, refer to "12.9.1 Front mudguard removal" on page 125.

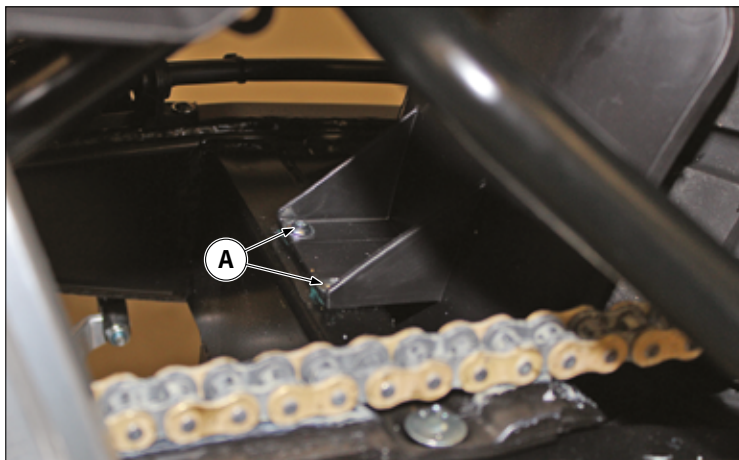
Remove the screws "C" to release the left fork protectors.





Remove the screws “D” to release the right fork protectors.

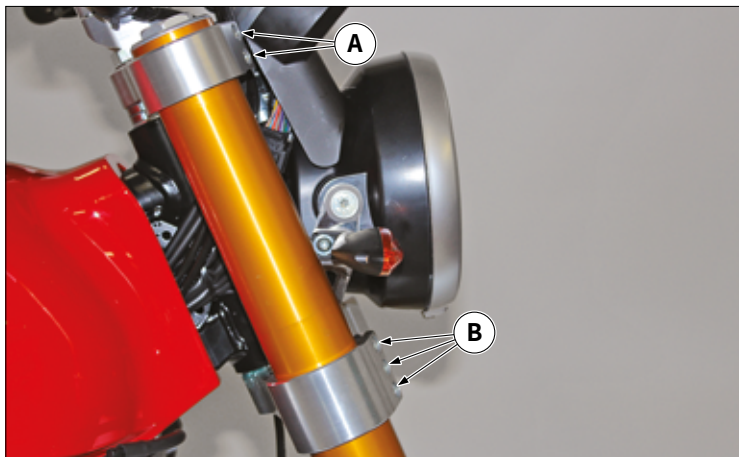
**i** Proceed in the reverse order for reassembling.



### 12.10 REAR MUDGUARD REMOVAL

Remove the screws “A” to release the rear mudguard.

**i** Proceed in the reverse order for reassembling.



### 12.11 SUSPENSIONS REMOVAL

#### 12.11.1 Swingarm removal

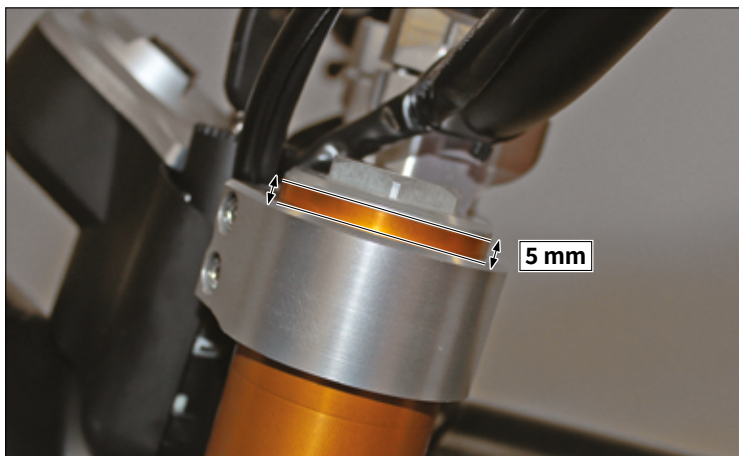
Remove:

- Front wheel, refer to “12.15.1 Front wheel removal” on page 136;
- Front mudguard, refer to “12.9.1 Front mudguard removal” on page 125.

Loosen the screws “A” and the screws “B” on the steering plates to remove the stem.

Repeat the operation on the opposite side.

**i** Proceed in the reverse order for reassembling.



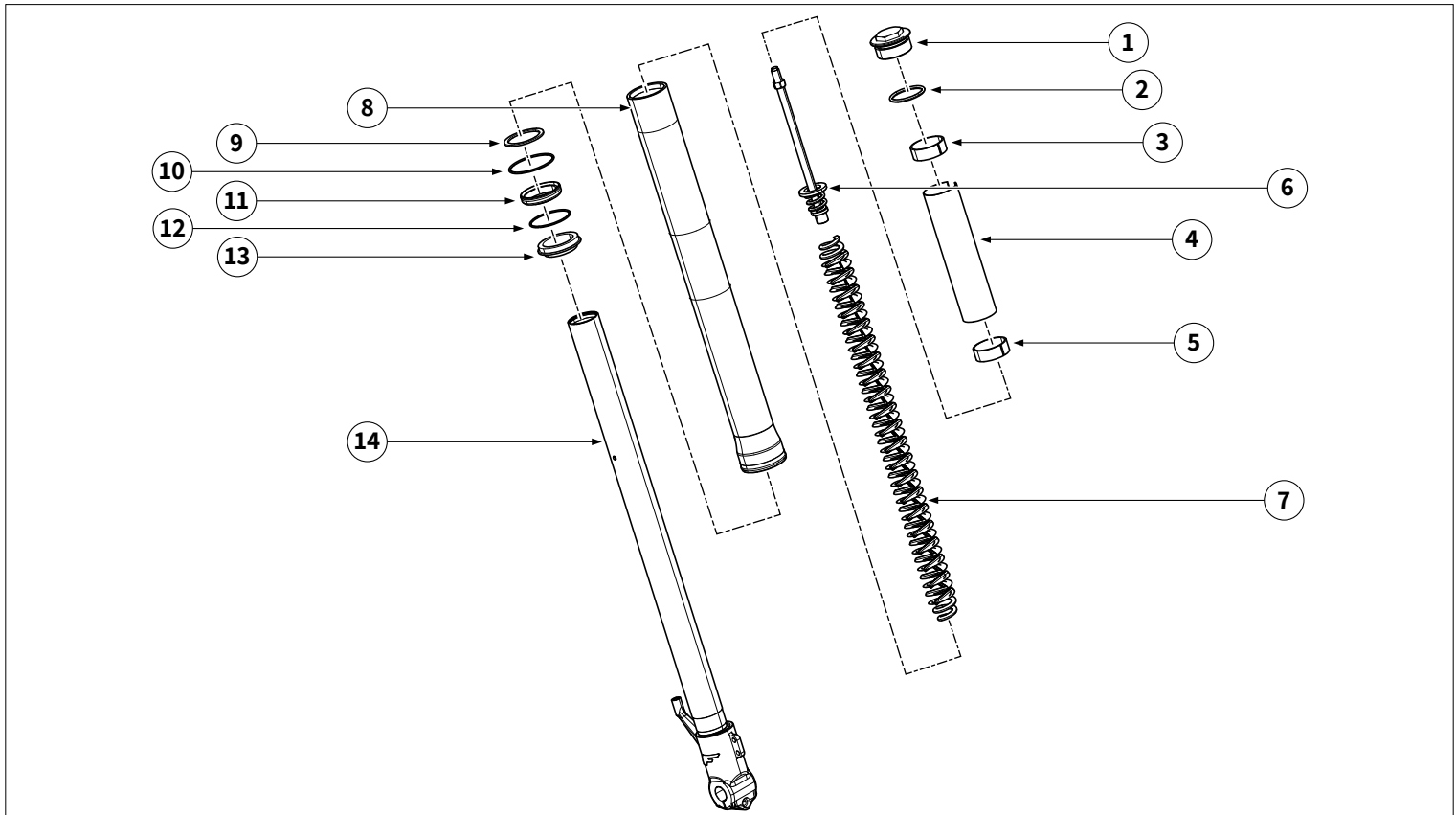
**i** During reassembly, make sure that the golden part of the stems is at least 5 mm out from the upper edge of the steering plate.

- Tightening torques:**
- Screws (A) M6 swingarm plates fastening: 22 Nm (2.2 m·kgf, 16 ft·lbf) to 25 Nm (2.5 m·kgf, 18 ft·lbf)
  - Screws (B) M6 swingarm plates fastening: 12 Nm (1.2 m·kgf, 8.7 ft·lbf)



**12.11.2 Swingarm overhaul**

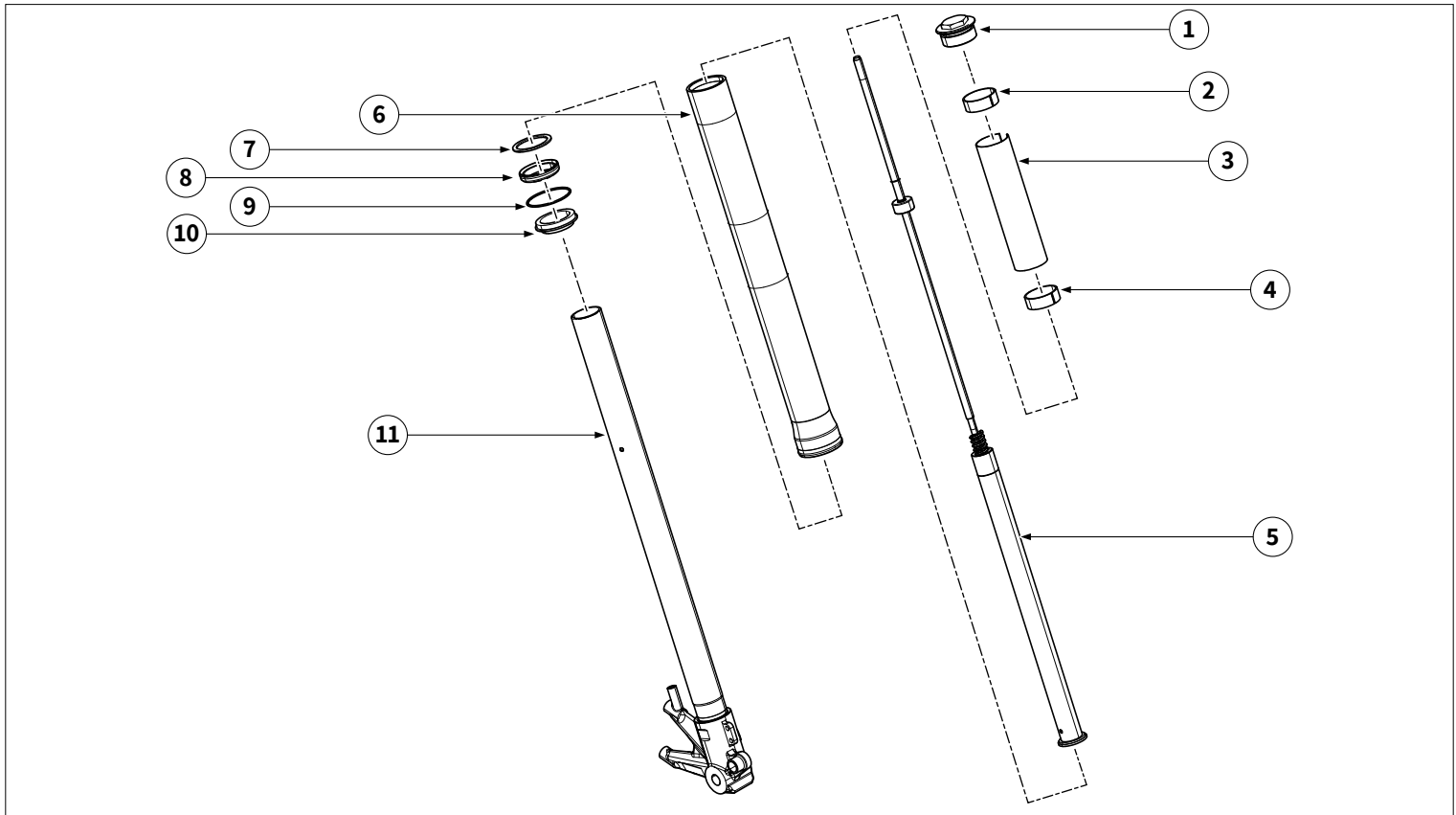
**Right suspension**



Sequence	Operation/Components to remove	Quantity	Remarks
1	Swingarm cap	1	
2	Gasket	1	
3	Bushing	1	
4	Bushings spacer	1	
5	Bushing	1	
6	Rod	1	
7	Compression spring	1	
8	Swingarm lining	1	
9	Washer	1	
10	Oil seal ring	1	
11	Oil seal	1	
12	Oil seal ring	1	
13	Dust cover	1	
14	Stem	1	

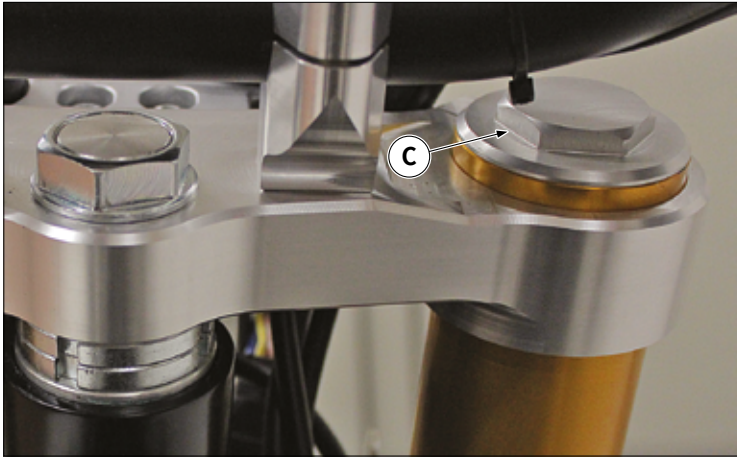
**i** For installation, reverse the removal procedure.

Left suspension



Sequence	Operation/Components to remove	Quantity	Remarks
1	Swingarm cap	1	
2	Bushing	1	
3	Bushings spacer	1	
4	Bushing	1	
5	Fantic hydraulic cartridge	1	
6	Swingarm lining	1	
7	Washer	1	
8	Oil seal	1	
9	Oil seal ring	1	
10	Dust cover	1	
11	Stem	1	

**i** For installation, reverse the removal procedure.



**12.11.3 Swingarm oil change**

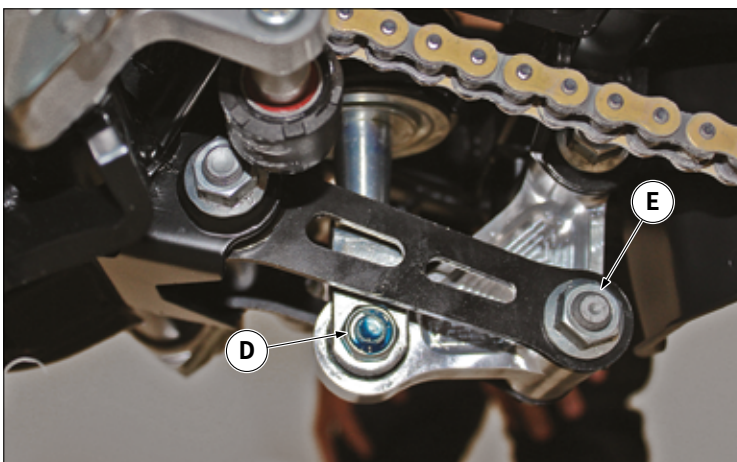
Remove:

- Front wheel;
- Swingarm.

Remove the upper cap “C” of the right stem, turn the stem and wait until the oil is completely empty.

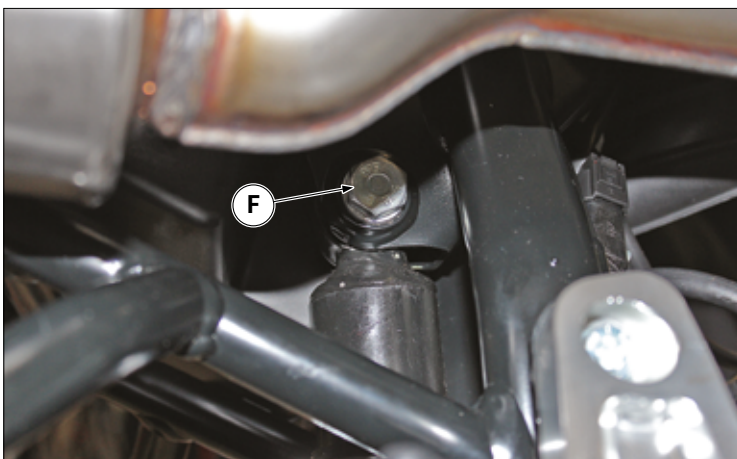
Fill with oil (380 ml).

**(i) Proceed in the reverse order for reassembling.**



**12.11.4 Rear shock absorber removal**

Remove the screw and nut from the lower shock absorber “D” and the screw and nut from the shock absorber linkage “E”.



Holding the shock absorber firmly, remove the screw and nut from the upper connection “F”.



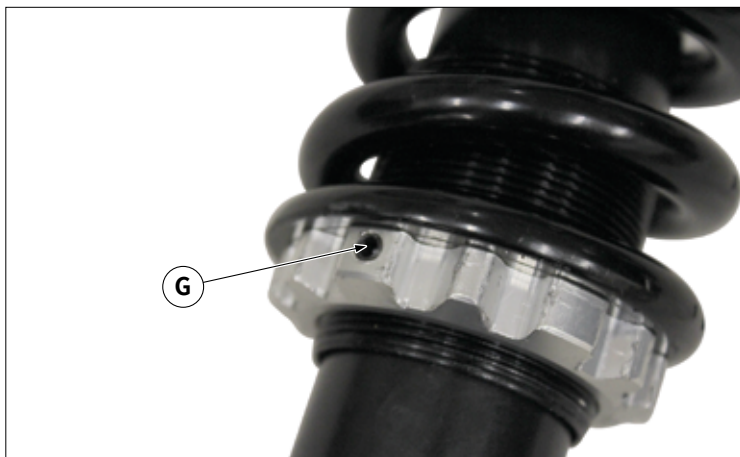
Remove the shock absorber from the bottom of the vehicle.

**(i) Proceed in the reverse order for reassembling.**

**(!)** Apply threadlocker (LOCTITE<sup>®</sup>) to the nuts M10 of the mono-shock absorber lower pin.

- (wrench icon) Tightening torques:**
- Nuts M10 of the mono-shock absorber upper pin: 40 Nm (4.0 m·kgf, 30 ft·lbf).
  - Nuts M10 of the mono-shock absorber lower pin: 40 Nm (4.0 m·kgf, 30 ft·lbf).

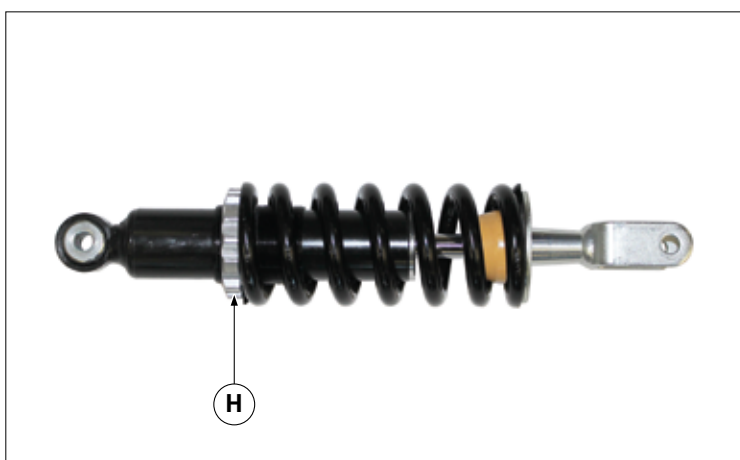




**Shock absorber preload adjustment**

For different use needs, it is possible to customize the setting. To make changes it is recommended to wait until the engine is completely cold. Adjust the spring preload according to the conditions of use of the vehicle.

Loosen the fastening screw “G” of the ring nut.

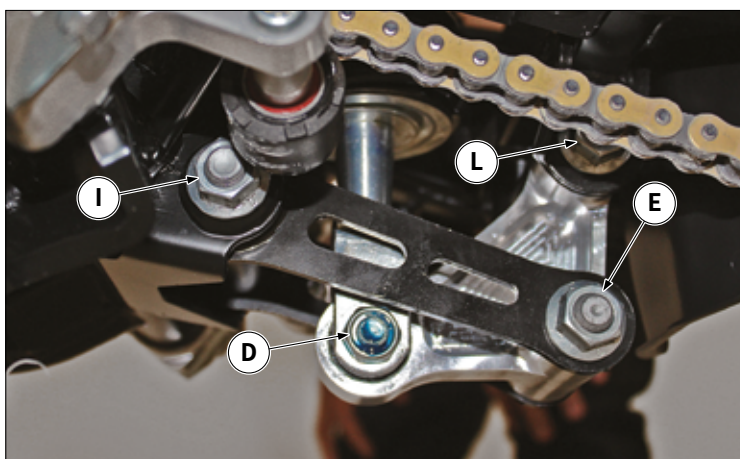


**✘** Using a hook wrench, turn the ring nut “H” to the desired position.

Re-tighten fastening screw “G” of the ring nut.

**⚠** Do not force the rotation of the registers beyond the limit switch (in both directions), to avoid possible damage.

**i** Proceed in the reverse order for reassembling.



**12.11.5 Linkage removal**

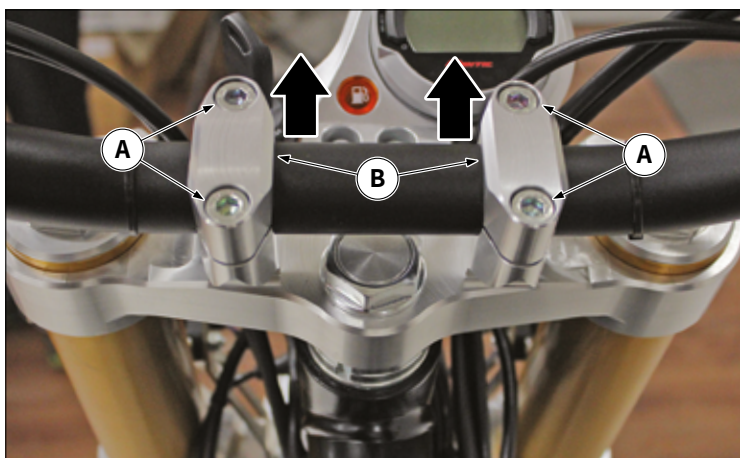
Remove the screw and nut from the lower shock absorber connection “D”.

Remove the screws and nuts from the connections “I” and “L”, then remove the linkages.

Remove the screw and nut from the connection “E” to separate the two components.

**i** Proceed in the reverse order for reassembling.

**🔧** Tightening torque: Rear connecting rods nuts M12: 60 Nm (6.0 m·kgf, 43 ft·lbf)



**12.12 HANDLEBAR REMOVAL**

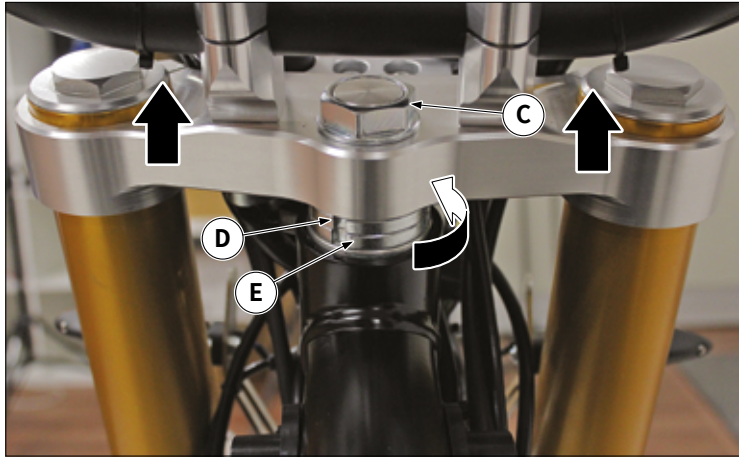
**12.12.1 Handlebar removal**

Remove the screws “A”.

Remove the U-bolts “B” to remove the handlebar.

**i** Proceed in the reverse order for reassembling.

**🔧** Tightening torque: Handlebar U-bolts screws M8: 25 Nm (2.5 m·kgf, 18 ft·lbf)



**12.12.2 Plates removal**

Remove:

- Handlebar;
- Dashboard;
- Front mudguard
- Front wheel;
- Swingarm.

Remove the nut "C" and extract the upper steering plate.

Remove the ring nut "D" and "E" and extract the lower steering plate.

Remove the internal steering tube bearings at the same time.

**i** Proceed in the reverse order for reassembling.



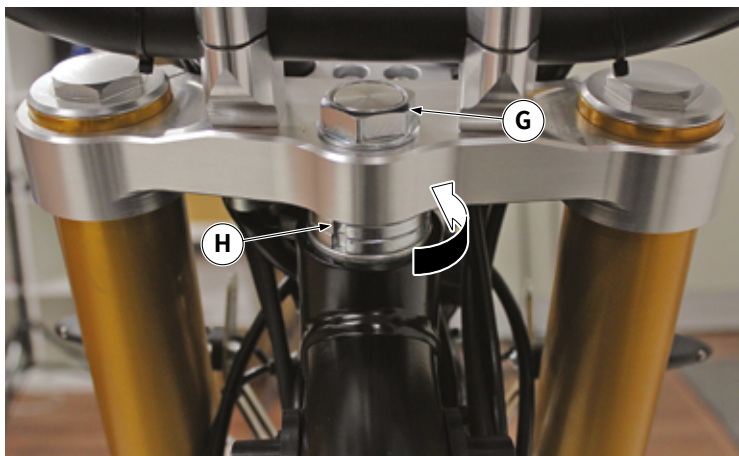
**12.12.3 Steering clearance check and adjustment**

**i** Periodically check the clearance on the steering tube moving the swingarm back and forth as shown in the figure.



If clearance is noticed proceed to the adjustment operating as follows:

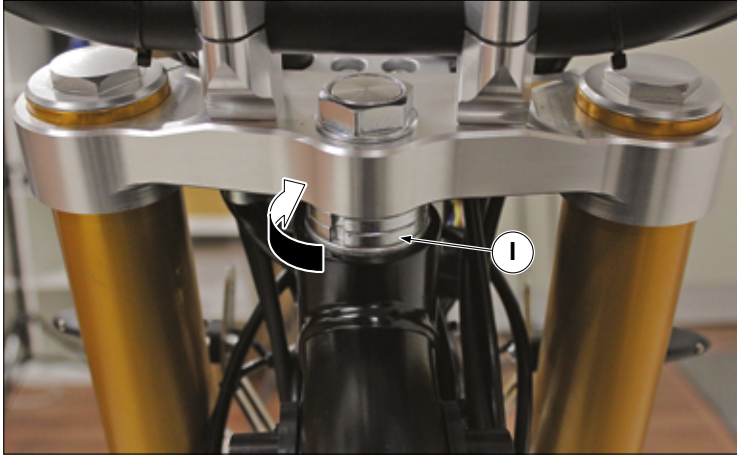
Loosen the screws "F" on both sides of the upper steering plate.



Loosen the nut "G".

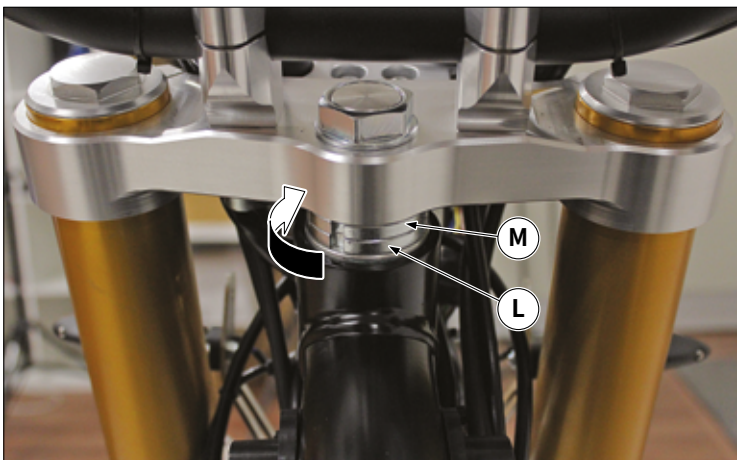
Loosen the upper counter ring nut "H".





Recover the clearance operating on the ring "I".

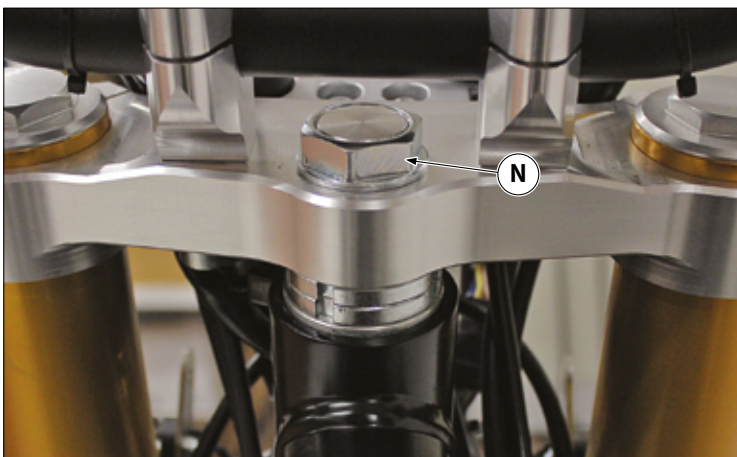
- ⚠ **A proper adjustment does not leave clearance, must not cause hardening or irregularity during the handlebar rotation.**
- ⚠ **Check the U-bolts assembling direction which may vary the handlebar position.**



Re-assemble the lower plate complete with pin and bearings. Temporarily tighten the lower ring nut "L" to 30 Nm to correctly couple the steering tube-bearings assembly. Loosen the lower ring nut "L" and tighten it definitively at 15 Nm.

- 🔧 **Tightening torques: Lower plate lower ring nut**
  - 15 Nm (1.5 m·kgf, 11 ft·lbf)

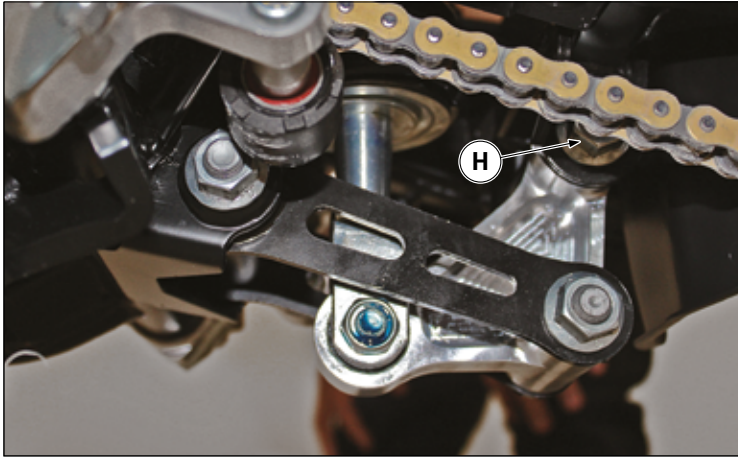
Reassemble the upper ring nut support "M".



Reassemble the upper plate and tighten the locknut "N" to 80 Nm.

- 🔧 **Tightening torque: Upper plate locknut**
  - 80 Nm (8.0 m·kgf, 59 ft·lbf)





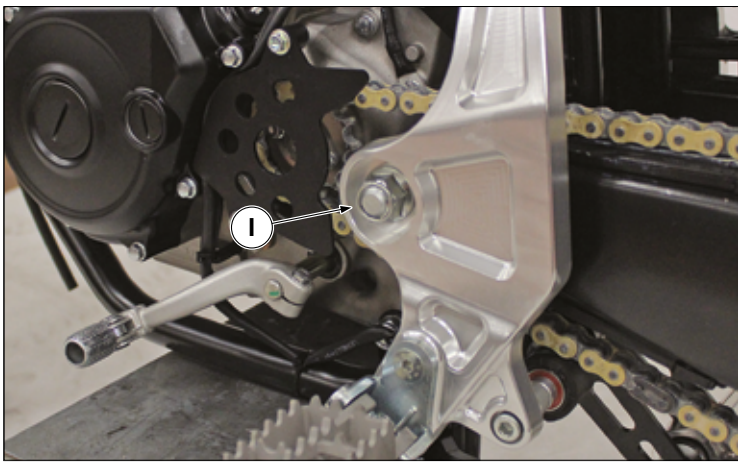
**12.13 SWINGARM REMOVAL**

**i** Position the vehicle on a central support with the rear wheel raised off the ground.

Remove:


- Rear wheel;
- Chain;
- Rear brake calliper.

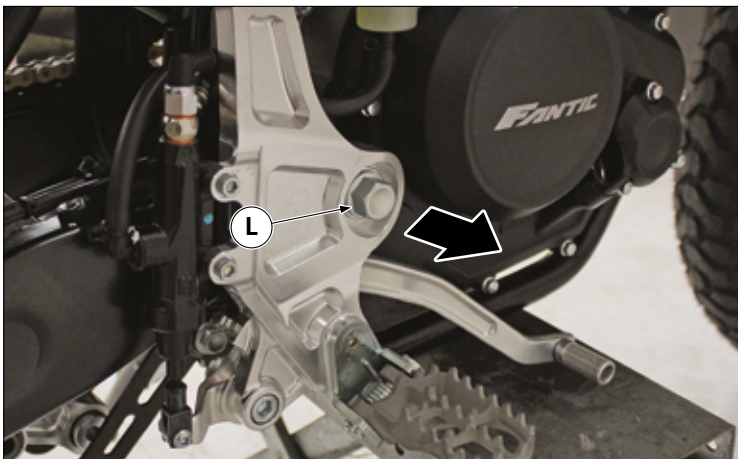
Remove the screw and the nut “H” of the lower coupling.

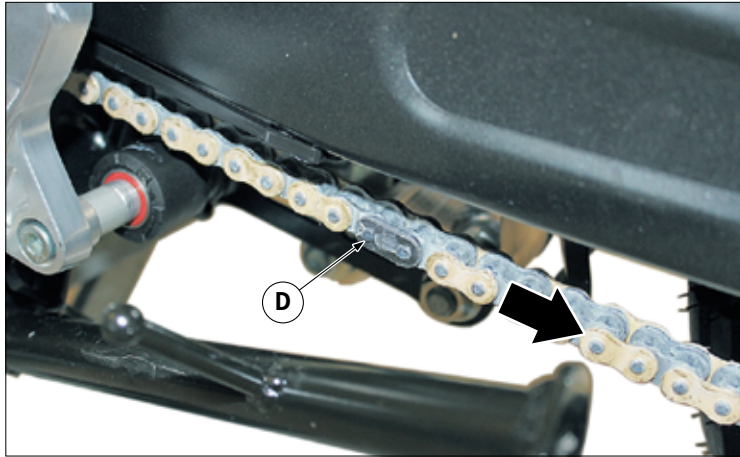


Remove the nut “I” and, holding the swingarm, remove the pin “L” from the opposite side, then remove the swingarm.

**i** Proceed in the reverse order for reassembling.

 **Tightening torque:**  
Swingarm pin M14: 80 Nm (8.0 m·kgf, 59 ft·lbf)



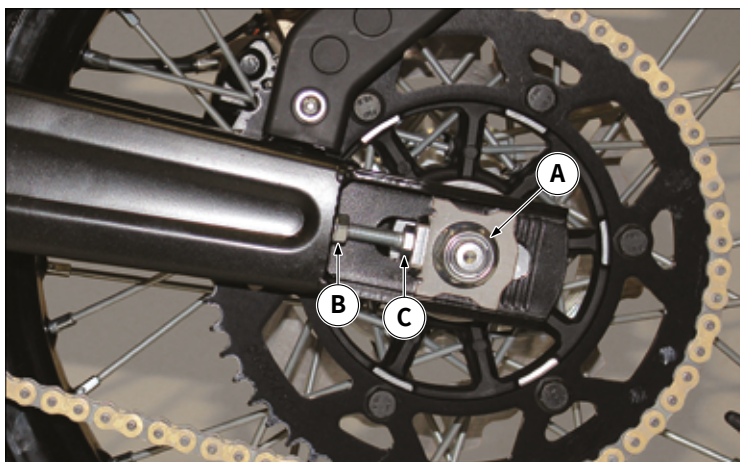


## 12.14 CHAIN REMOVAL

### 12.14.1 Chain removal

Remove the dummy mesh "D" and take out the junction mesh, then remove the chain.

**i** Proceed in the reverse order for reassembling.



### 12.14.2 Chain clearance adjustment

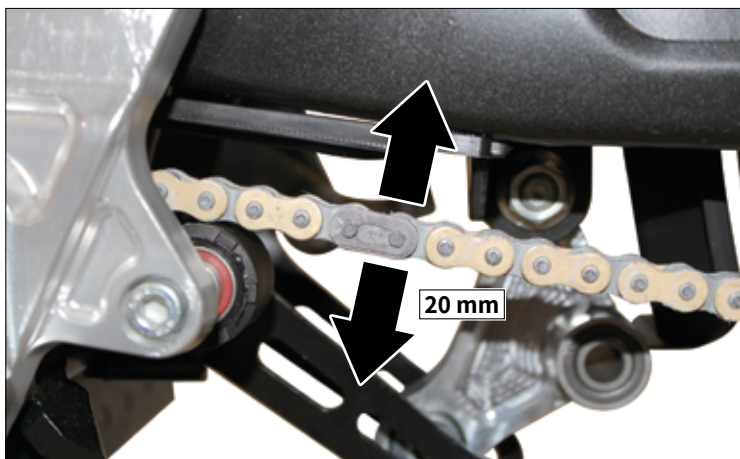
Loosen the rear wheel pin "A".

Loosen the nut "B" and turn the screw "C" until the desired chain tension is reached.

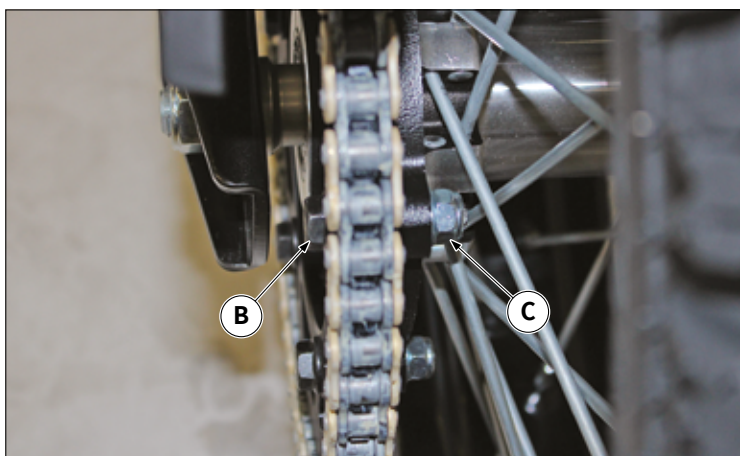
Proceed similarly on the opposite side until the perfect alignment of the wheel is obtained, then tighten the nut "B" on both sides and the rear wheel pin "A".

**!** Perform the chain clearance adjustment procedure with the rear suspension free of loads.

**i** Proceed in the reverse order for reassembling.



**i** For a longer life of the drive chain it is advisable to periodically check its tensioning. Always keep it clean of dirt deposited and lubricate it. If the chain clearance exceeds 20 mm, proceed with its tensioning.



### 12.14.3 Rim removal

Remove:

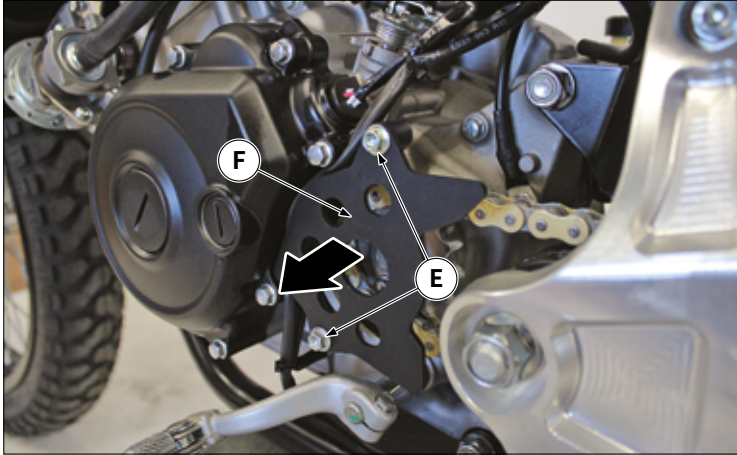
- Rear wheel

Remove the screws "B", the nuts "C" and remove the rim.

**i** Proceed in the reverse order for reassembling.

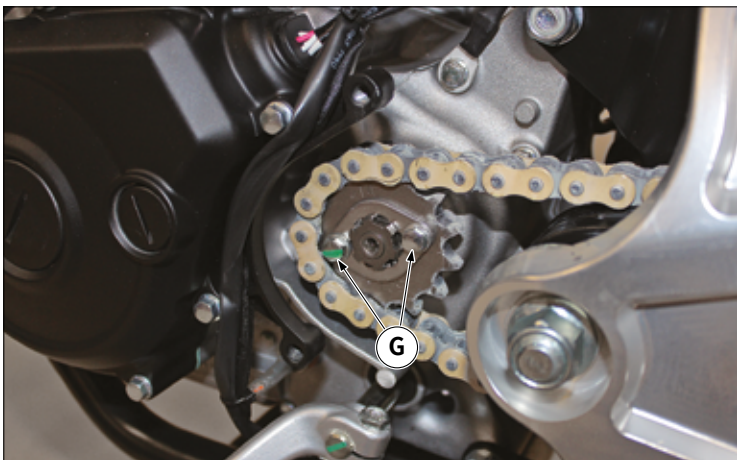
**🔧** Tightening torque: Screws M8 for rim fastening: 25 Nm (2.5 m·kgf, 18 ft·lbf).





**12.14.4 Sprocket removal**

Remove the screws "E" and the sprocket protection "F".

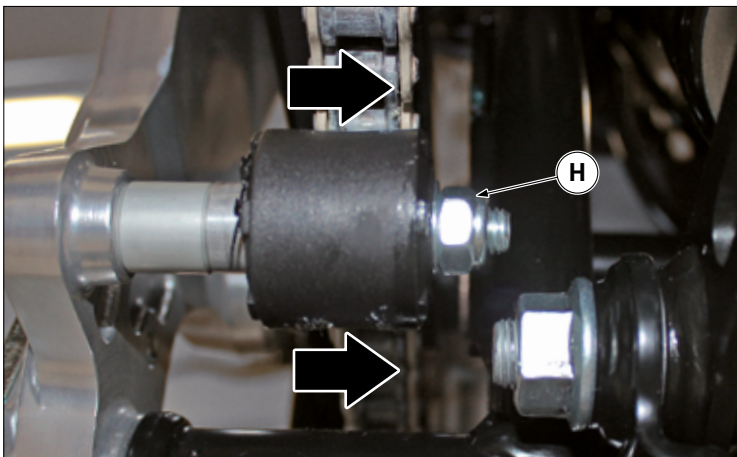


Remove the screws "G", then extract the sprocket

**(i)** Proceed in the reverse order for reassembling.

**(!)** Check the sprocket and rim teeth condition, if excessive wear is found, replace the rim, the sprocket and the drive chain.

**(!)** To avoid early wear of the new components, replace all three together.

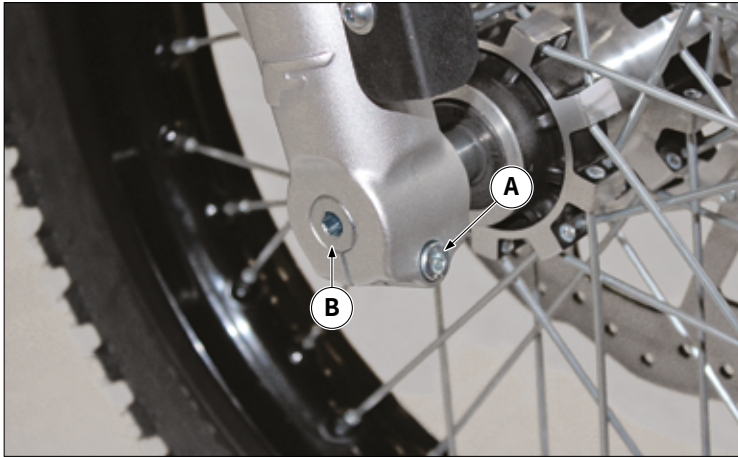


**12.14.5 Chain roller removal**

Remove the screw "H" then remove the chain roller.

**(i)** Proceed in the reverse order for reassembling.





**12.15 WHEELS AND BRAKE DISCS REMOVAL**

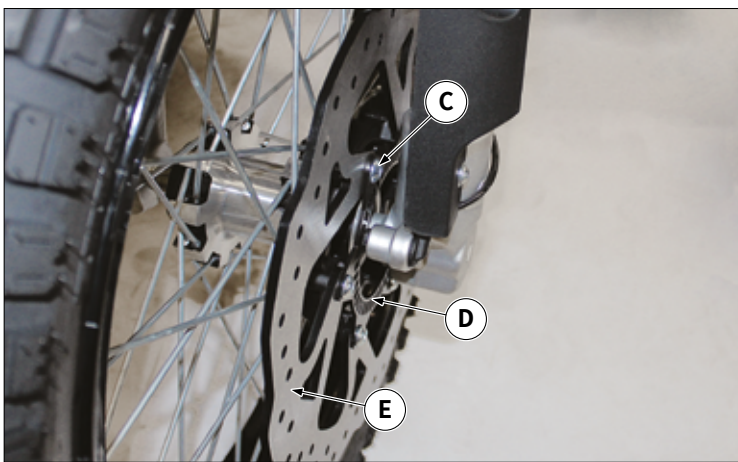
**12.15.1 Front wheel removal**

- i** Position the vehicle on a central support with the front wheel raised off the ground.

Remove the screw "A" and the wheel pin "B".  
Remove the front wheel.

- i** Proceed in the reverse order for reassembling.

- Tightening torques:**
  - Front wheel pin M14: 50 Nm (5.0 m·kgf, 36 ft·lbf).
  - Swingarm foot screw M8: 25 Nm (2.5 m·kgf, 18 ft·lbf).



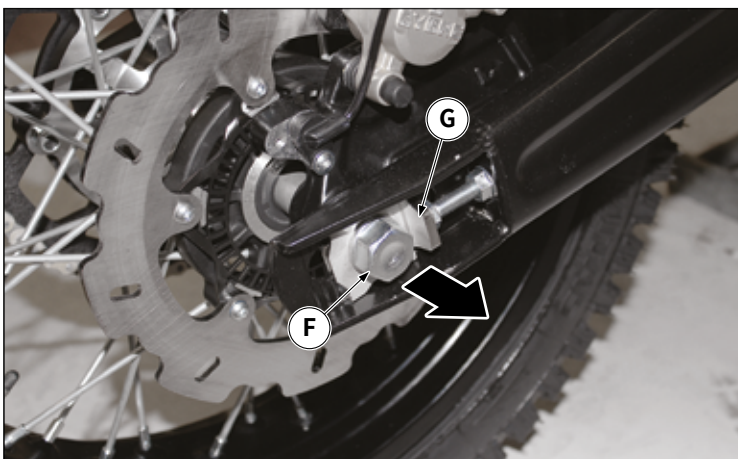
**12.15.2 Front brake disc removal**

Remove:  
- Front wheel.  
Remove the six screws "C".  
Remove the phonic wheel "D" and the brake disc "E".

- i** Proceed in the reverse order for reassembling.

- !** Apply threadlocker (LOCTITE®) to the front brake disc M8 screws.

- Tightening torque:** Front brake disc screws M8: 25 Nm (2.5 m·kgf, 18 ft·lbf)



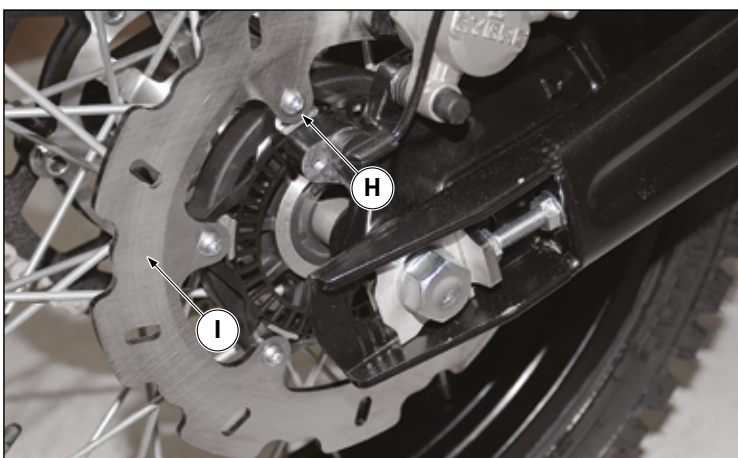
**12.15.3 Rear wheel removal**

- i** Position the vehicle on a central support with the rear wheel raised off the ground.

Remove:  
- Chain.  
Supporting the rear wheel, remove the wheel pin "F" and the adjustment plates "G".  
Remove the rear wheel.

- i** Proceed in the reverse order for reassembling.

- Tightening torque:** Rear wheel pin M17: 80 Nm (8.0 m·kgf, 59 ft·lbf).



**12.15.4 Rear brake disc removal**

Remove:  
- Rear wheel.  
Remove the six screws "H".  
Remove the rear brake disc "I" taking care to keep the phonic wheel in place.

- i** Proceed in the reverse order for reassembling.

- !** Apply threadlocker (LOCTITE®) to the rear brake disc screws M6.

- Tightening torque:** Rear brake disc screws M6: 16 Nm (1.6 m·kgf, 12 ft·lbf)

**12.15.5 Wheels bearings check**

Perform this check with the bearings installed on the front wheel and/or on the rear wheel.

 **Check the integrity of all components and in particular of those indicated below.**

**Rotation check**

Manually rotate the inner ring of each bearing. The rotation must be continuous, free from impediments and/or noise.

If one or both bearings are not within the check parameters, replace both wheel bearings.


**Radial clearance and axial clearance check**

Check the radial clearance and axial clearance. Axial clearance: a minimum axial clearance is allowed. Radial clearance: none.

If one or both bearings are not within the check parameters, replace both wheel bearings.

 **Always replace both wheel bearings.**

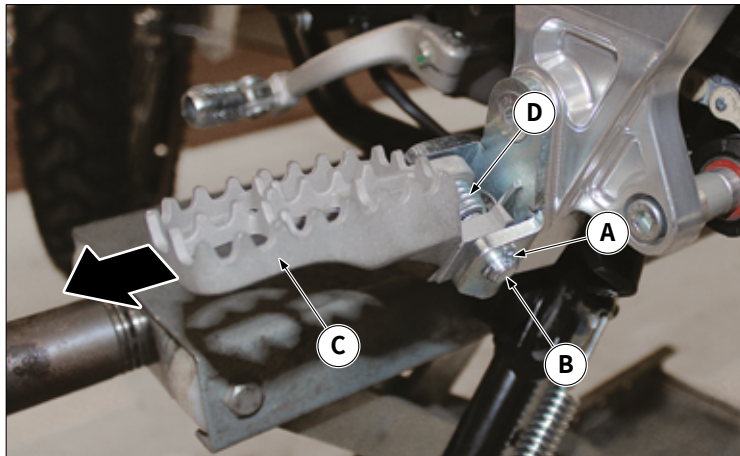
 **Always replace the bearings with bearings of the same type.**

 **Check the integrity of the gaskets; if they show damage or excessive wear, replace them.**

 **Always replace both gaskets.**

 **Always replace the gaskets with new gaskets of the same type.**



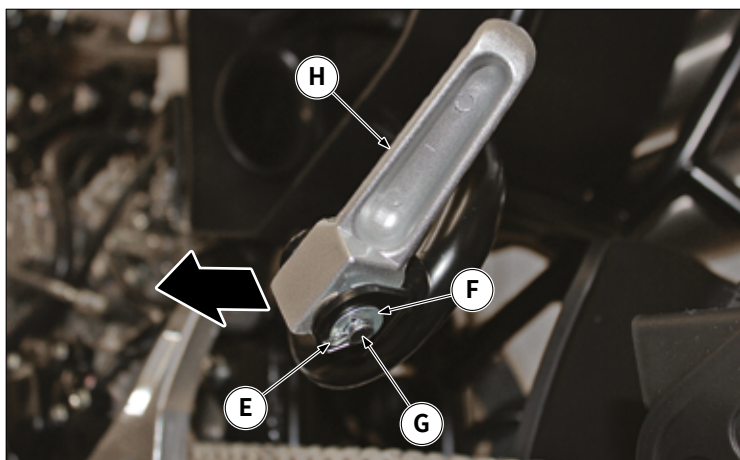


### 12.16 FOOTRESTS REMOVAL

#### 12.16.1 Rider footrest removal

Remove the split pin "A" and the pin "B".  
Remove the footrest "C", taking care to recover the return spring "D".  
Repeat the operation for the footrest on the opposite side.

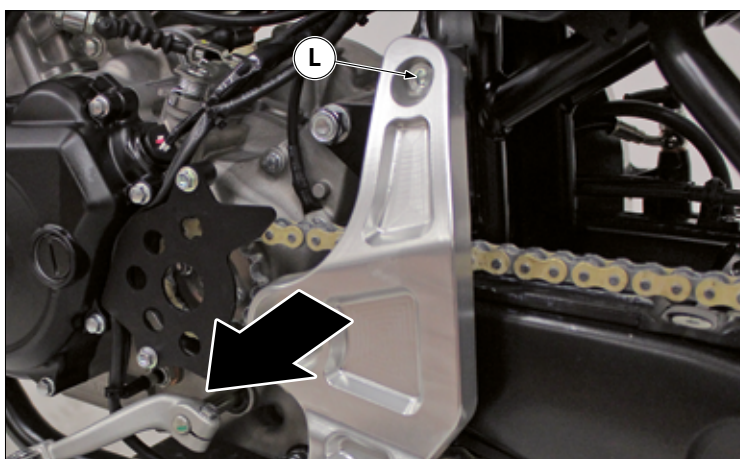
**(i)** Proceed in the reverse order for reassembling.



#### 12.16.2 Passenger footrest removal

Remove the split pin "E", the washer "F" and the pin "G".  
Remove the passenger footrest "H".

**(i)** Proceed in the reverse order for reassembling.



#### 12.16.3 Frame plate for rider left pedal removal

Remove:

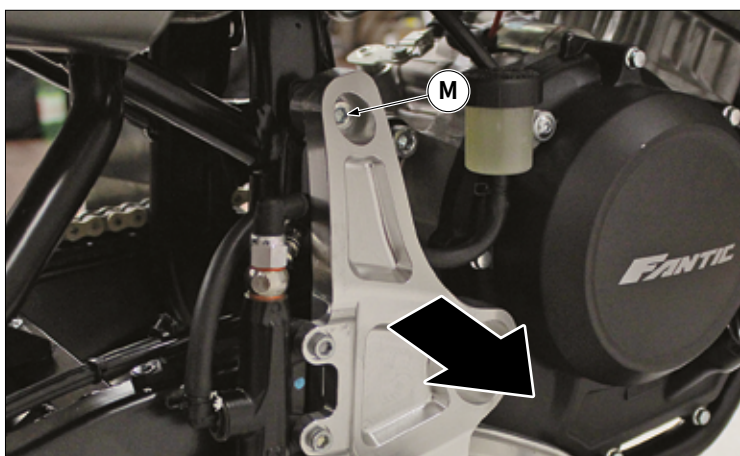
- Left rider footrest;
- Chain roller;
- Swingarm pin nut.

Remove the screw "L" then extract the left frame plate.

**(i)** Proceed in the reverse order for reassembling.

**Tightening torques:**

- Screws M8: 25 Nm (2.5 m·kgf, 18 ft·lbf).
- Screws M6: 16 Nm (1.6 m·kgf, 12 ft·lbf).



#### 12.16.4 Frame plate for rider right pedal removal

Remove:

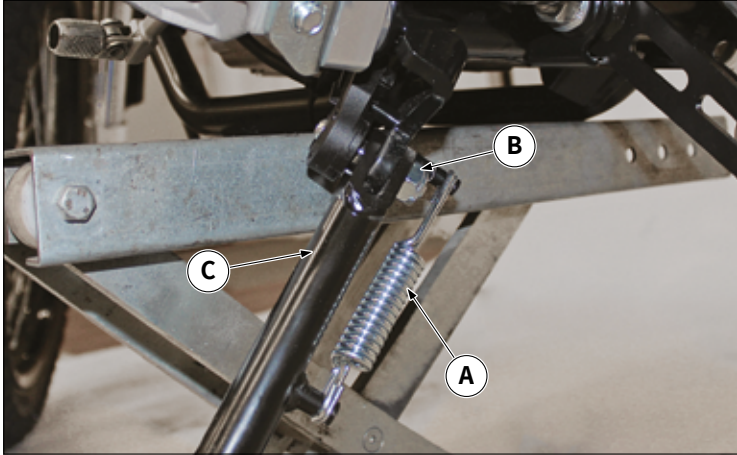
- Right rider footrest;
- Rear brake master cylinder;
- Rear brake lever;
- Swingarm pin.

Remove the screw "M" then pull out the right frame plate.

**(i)** Proceed in the reverse order for reassembling.

**Tightening torques:**

- Screws M8: 25 Nm (2.5 m·kgf, 18 ft·lbf).
- Screws M6: 16 Nm (1.6 m·kgf, 12 ft·lbf).



**12.17 KICKSTAND REMOVAL**

Remove:

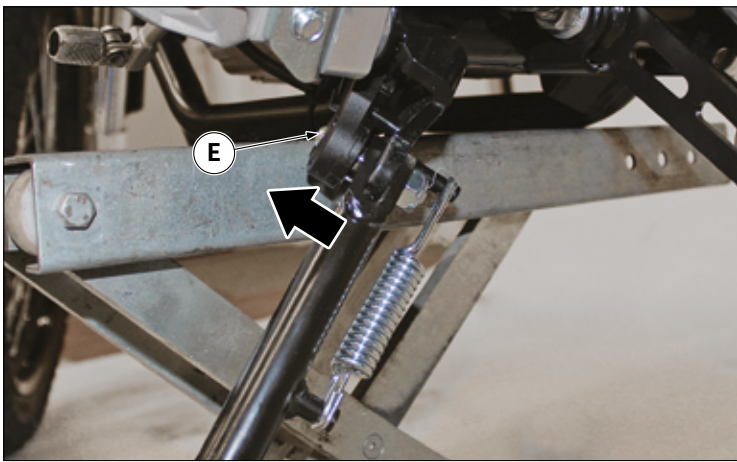
- Speed sensor.

Remove the spring "A" and the screw and fastening nut of the kickstand "B".

Remove the kickstand.

**i** Proceed in the reverse order for reassembling.

 **Tightening torque: Kickstand screw M8: 38 Nm (3.8 m·kgf, 28 ft·lbf).**

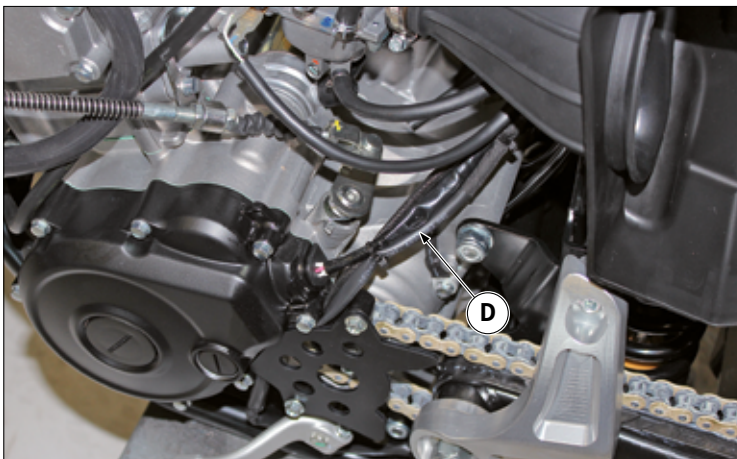


**12.17.1 Kickstand sensor removal**

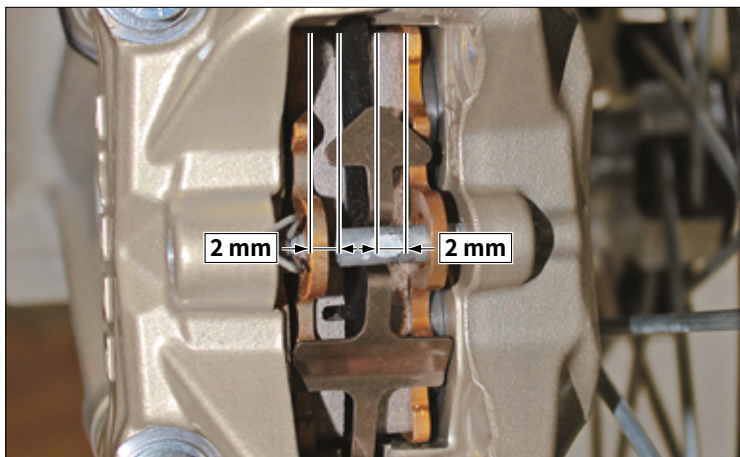
Cut the clamps that hold the kickstand sensor cable "D" locked and disconnect the connector from the main wiring.

Remove the screw "E" and extract the kickstand sensor.

**i** Proceed in the reverse order for reassembling.







**12.18 BRAKE SYSTEM REMOVAL**

**⚠** Considering the danger to the vehicle and to the rider, it is absolutely essential, after the brakes are reassembled and the braking system restored to normal conditions of use, that the hydraulic circuit is purged of air.

**12.18.1 Brake pads removal**

Front brake pads

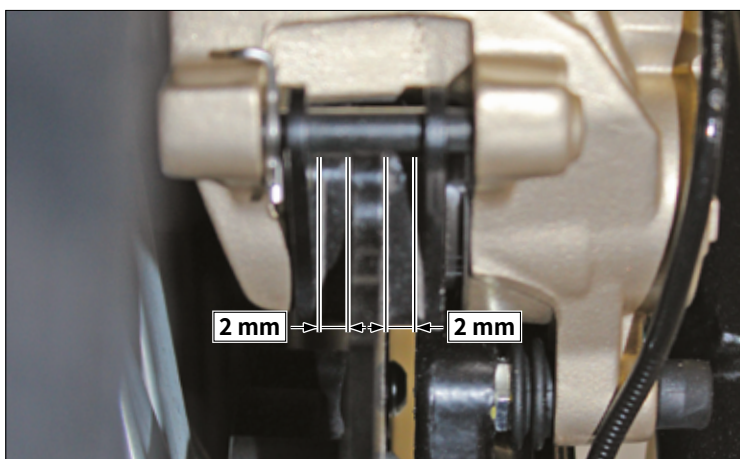
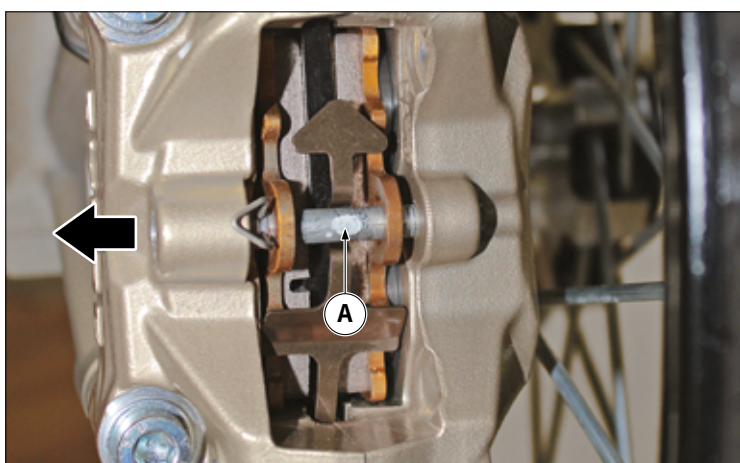
**⚠** Check the wear condition of the front brake pads from the back of the calliper, where it is possible to see the ends of the pads which must have at least a 2 mm layer of lining. If the layer is lower, proceed immediately to replace them.

**i** Perform the check following the times indicated in the scheduled maintenance table.

Remove the front brake calliper without disconnecting the brake system tube connection.

Remove the screw pin "A" and remove the pads from the front part of the calliper for replacement.

**i** Proceed in the reverse order for reassembling.



Rear brake pads

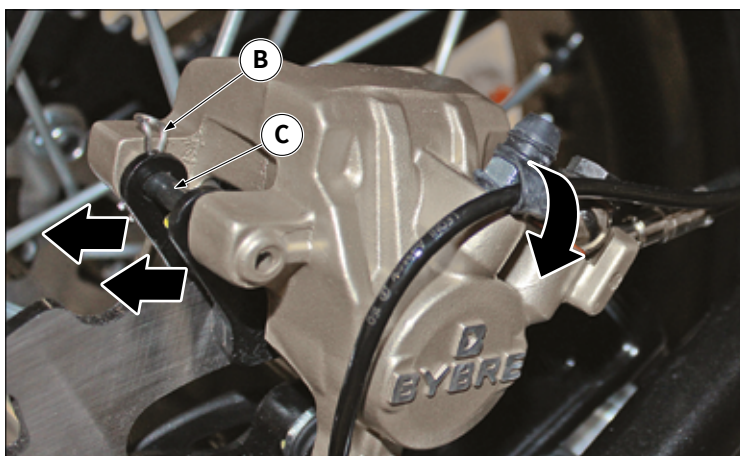
**⚠** Check the wear condition of the rear brake pads from the upper part of the calliper, where it is possible to see the ends of the pads which must have at least a 2 mm layer of lining. If the layer is lower, proceed immediately to replace them.

**i** Perform the check following the times indicated in the scheduled maintenance table.

Remove the rear brake calliper without disconnecting the brake system tube fitting.

Remove the split pin "B" and remove the pin "C", then remove the pads for replacement.

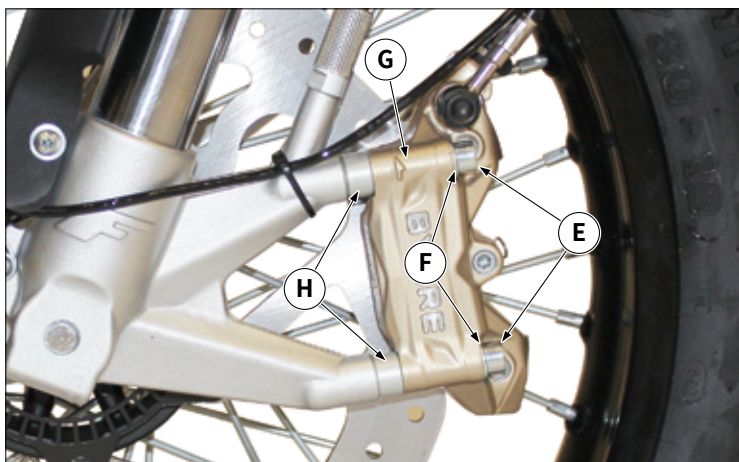
**i** Proceed in the reverse order for reassembling.





**12.18.2 Front brake calliper removal**

Remove the front brake tube fitting “D”, be sure to place a container for collecting the brake oil.



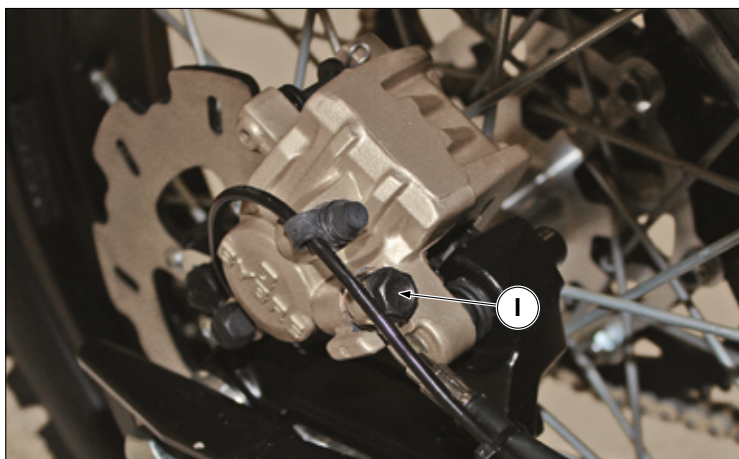
Remove the screws “E” and washers “F”.

Remove the brake calliper “G” recovering the spacers “H”.

**i** Proceed in the reverse order for reassembling.

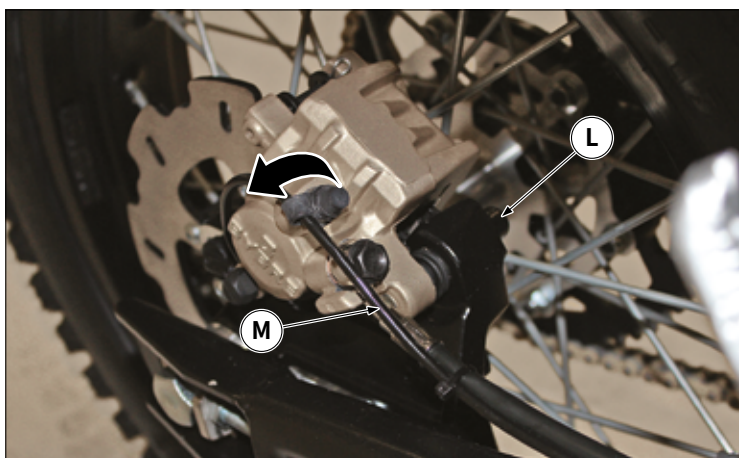
**!** Apply threadlocker (LOCTITE®) to the front calliper screws M8.

**🔧** Tightening torque: Front brake calliper screws M8: 25 Nm (2.5 m·kgf, 18 ft·lbf)



**12.18.3 Rear brake calliper removal**

Remove the rear brake tube fitting “I”, make sure to place a container for collecting the brake oil.

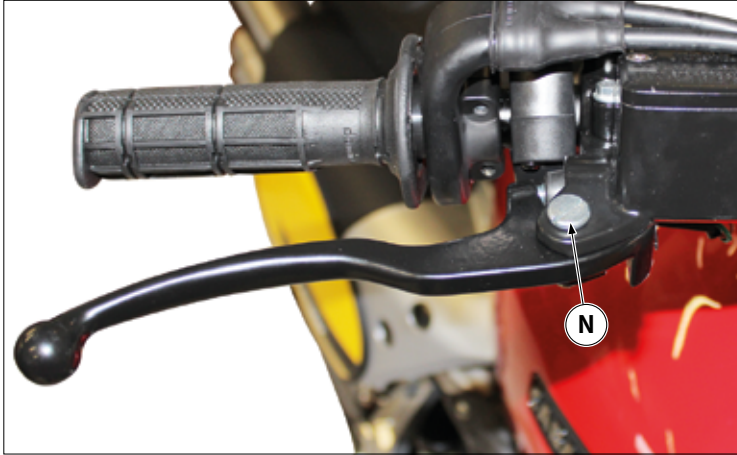


Remove the screw “L” and lift the rubber plug of the rear brake purge valve to release the ABS sensor cable “M”.

Remove the rear brake calliper.

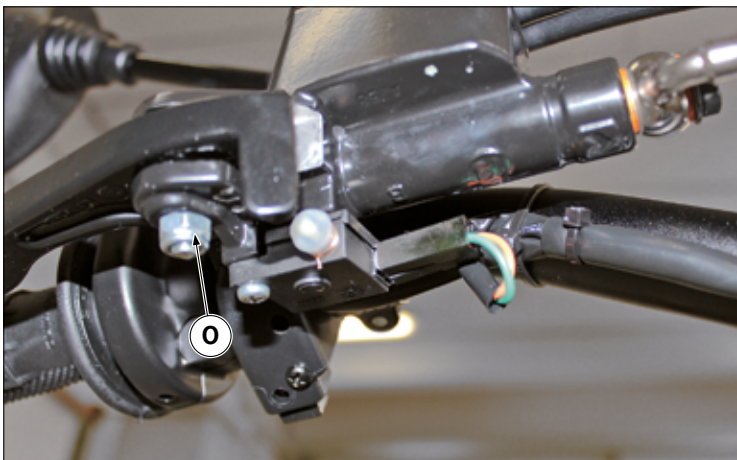
**i** Proceed in the reverse order for reassembling.





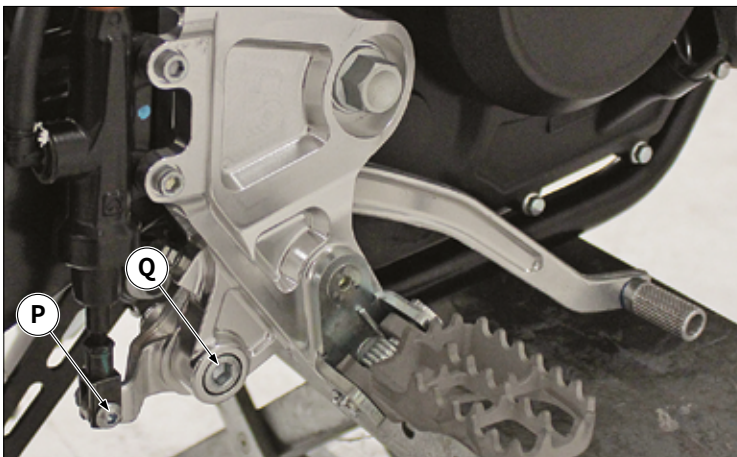
**12.18.4 Front brake lever removal**

Remove the screw "N".



Remove the screw "O", then extract the front brake lever.

**i** Proceed in the reverse order for reassembling.

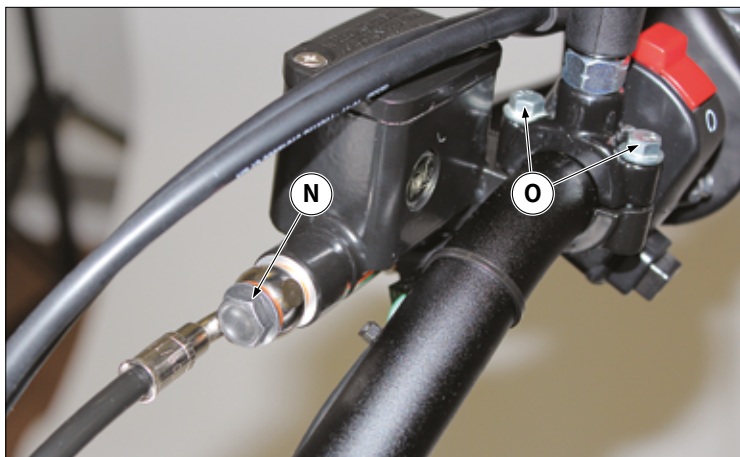


**12.18.5 Rear brake lever removal**

Remove the screw "P" and the screw "Q", then remove the rear brake lever.

**i** Proceed in the reverse order for reassembling.

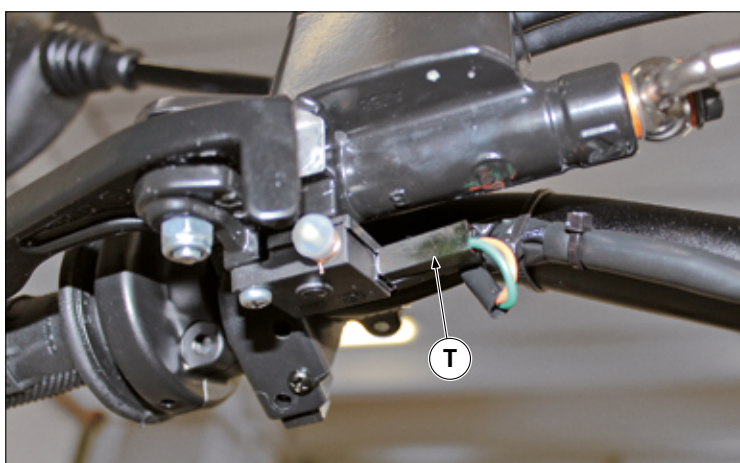
**Tightening torque: Rear brake calliper screw M10: 50 Nm (5.0 m·kgf, 36 ft·lbf)**



**12.18.6 Front brake master cylinder removal**

Remove the rear brake tube fitting “R”, make sure to place a container for collecting the brake oil.

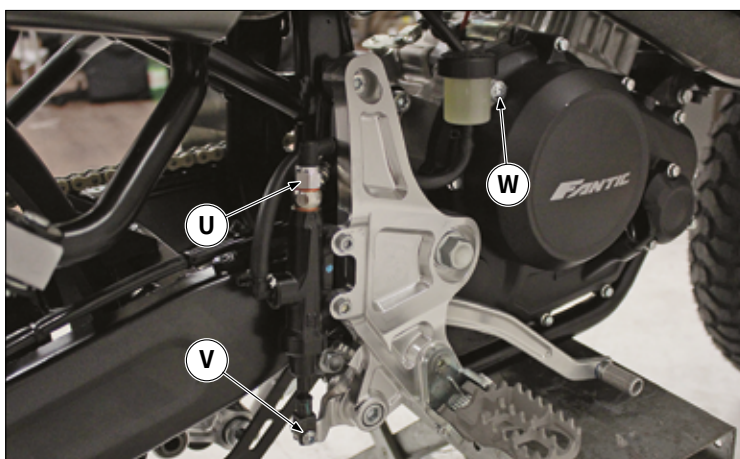
Remove the screws “S” securing the upper collar.



Disconnect the connector “T” of the brake light switch then remove the brake master cylinder.

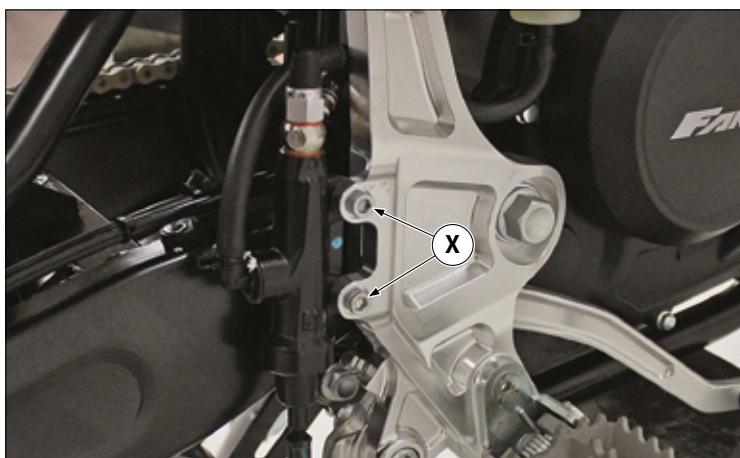
**i** Proceed in the reverse order for reassembling.

**Tightening torque: Brake master cylinder collar screws M6: 10 Nm (1.0 m·kgf, 7.2 ft·lbf)**



**12.18.7 Rear brake master cylinder removal**

Remove the brake system fitting “U”, the rear brake lever connection “V” to the pump and the screw of the brake fluid reservoir “W”.



Remove the two “X” screws, then remove the rear brake master cylinder.

**i** Proceed in the reverse order for reassembling.



### 12.18.8 Brake system draining

- (i)** If during the draining operation air continues to go out, examine all the fittings, if they do not show any anomaly, search for air entering from the various seals of the pump and from the calliper pistons.
- (⚠)** During the operations the vehicle must be in a vertical position.
- (i)** During the bleeding operation, frequently check the level to prevent the introduction of air into the system through the pump.
- (i)** The brake fluid is hygroscopic, i.e. It absorbs moisture from the surrounding air. If the moisture contained in the brake fluid exceeds a certain value, an inefficient braking results. It is therefore appropriate to take the liquid from sealed containers. Under normal riding and climatic conditions it is advisable to replace this liquid every two years. If the brakes are subjected to heavy stress, replace the liquid more frequently.
- (⚠)** When carrying out the operation, oil can seep between the purge screw and the seat on the calliper. Carefully dry the callipers and degrease the disc, in case there is oil on it. When the operation is complete, tighten the oil drain screw to the prescribed torque.
- (⚠)** Avoid contact of brake fluid with eyes, skin and clothing. In case of accidental contact, wash with water.
- (⚠)** The brake fluid has a high corrosive power, avoid it from coming into contact with the painted parts.
- (⚠)** If the ABS module is replaced, proceed with the braking system draining as described in section “12.19.2 ABS module removal” on page 146.

#### Front braking system

Remove the rubber protection cap from the bleed valve.

Insert a transparent plastic tube on the bleed valve of the front brake calliper and insert the other end of the tube into a collection container.

Remove the front brake oil reservoir cap.

Operate and release the front brake lever quickly and repeatedly, keeping it fully actuated.

Loosen the bleed valve 1/4 turn so that the brake fluid flows into the container, this will remove tension on the brake lever and this will make it reach the end of stroke.

Close the bleed valve before reaching the end of the stroke with the lever.

Repeat the operation until the liquid reaching the container is completely free of air bubbles.

Tighten the bleed valve and remove the tube.

Top up restoring the correct level of brake fluid in the tank.

Reposition and lock the front brake oil reservoir cap.

Reset the rubber protection cap.

- (i)** When draining the hydraulic system, fill the reservoir with brake fluid when necessary. Check that brake fluid is always present in the reservoir during operation.

#### Rear braking system

Remove the rubber protection cap from the bleed valve.

Insert a transparent plastic tube on the bleed valve of the rear brake calliper and insert the other end of the tube into a collection container.

Remove the rear brake oil reservoir cap.

Operate and release the rear brake lever quickly and repeatedly, keeping it fully actuated.

Loosen the bleed valve 1/4 turn so that the brake fluid flows into the container, this will remove tension on the brake lever and this will make it reach the end of stroke.

Close the bleed valve before reaching the end of the stroke with the lever.

Repeat the operation until the liquid reaching the container is completely free of air bubbles.

Tighten the bleed valve and remove the tube.

Top up restoring the correct level of brake fluid in the tank.

Reposition and lock the rear brake oil reservoir cap.

Reset the rubber protection cap.

- (i)** When draining the hydraulic system, fill the reservoir with brake fluid when necessary. Check that brake fluid is always present in the reservoir during operation.

#### Brake fluid replacement

- (i)** To change the brake fluid, operate in the same way for the front and rear parts.

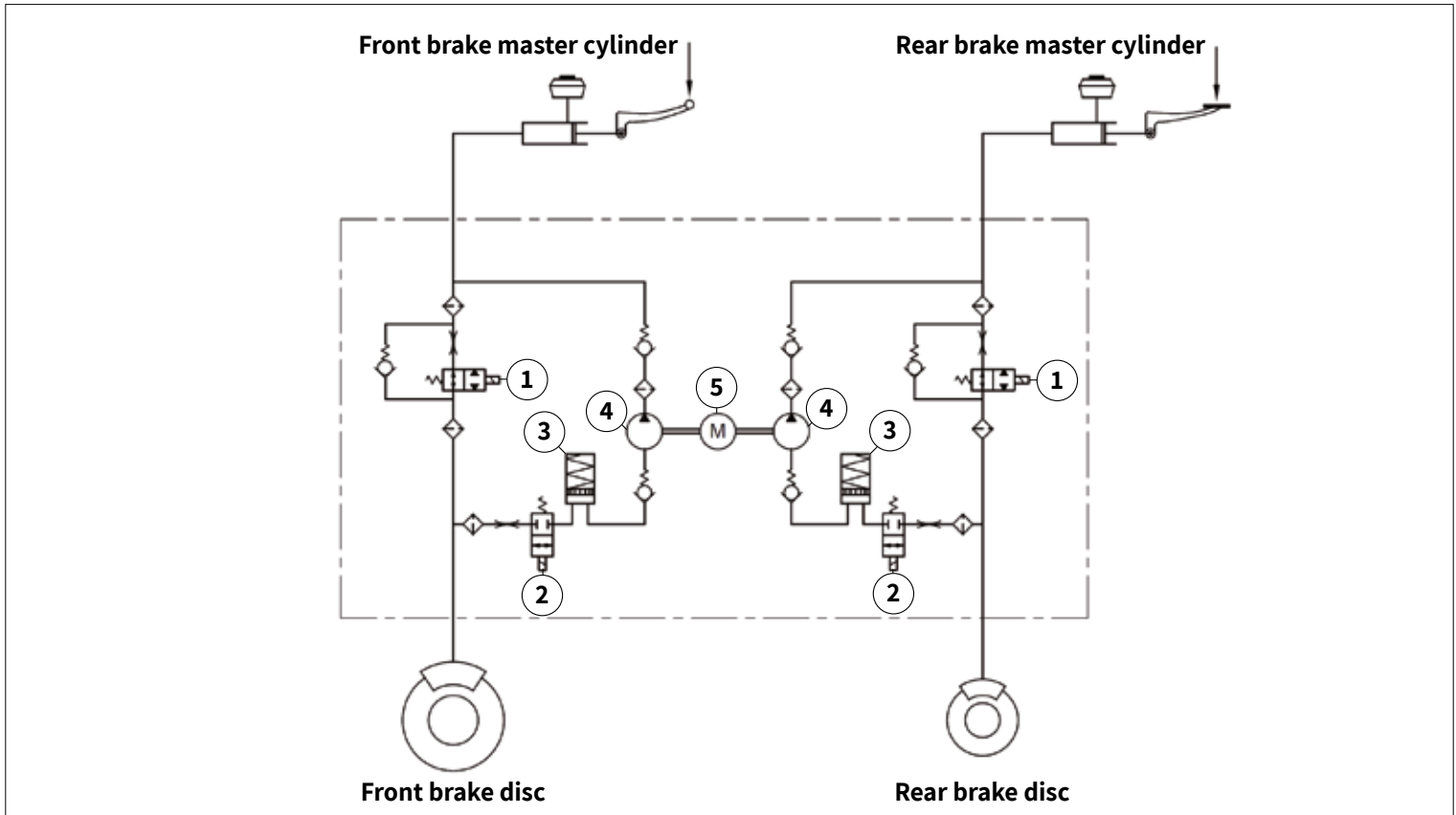
Open the brake fluid reservoir removing the cover and gasket.

Drain the system according to the drain procedure, proceeding until it reaches the level indicated in the inspection window.

Close the brake fluid reservoir.

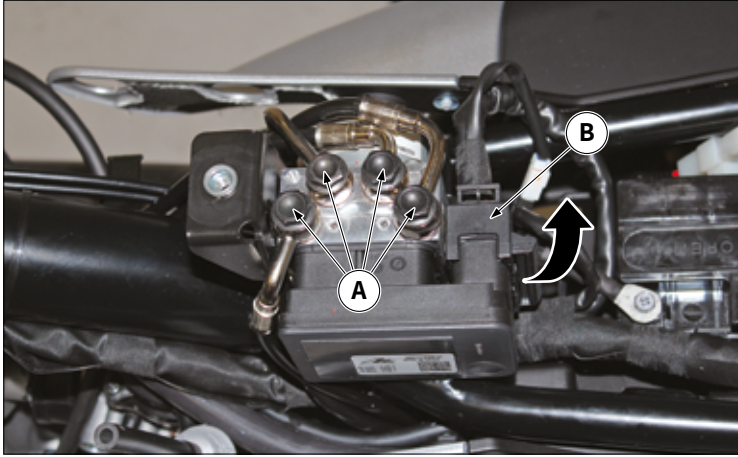
**12.19 ABS SYSTEM REMOVAL**

**12.19.1 ABS system hydraulic diagram**



- 1. Inlet valve
- 2. Outlet valve
- 3. Low pressure accumulator
- 4. Hydraulic pump
- 5. Electric motor





**12.19.2 ABS module removal**

Remove the brake system tube fittings “A”, make sure to place a container for collecting the brake oil.

Disconnect the ABS module connector “B”.

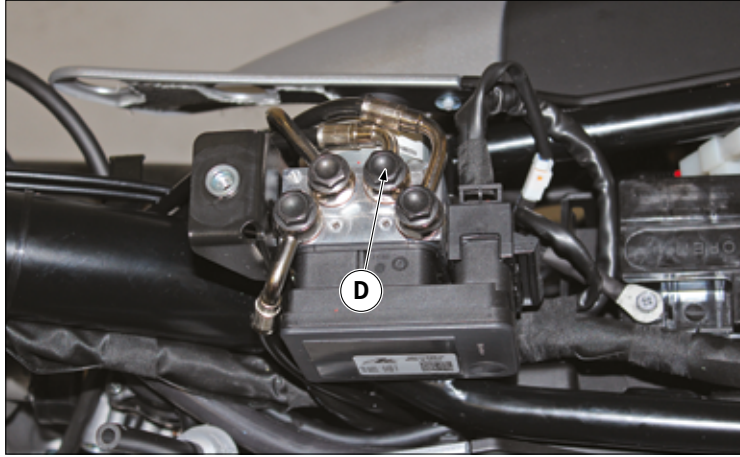


Remove the screws “C” securing the module to the frame, then remove the ABS module.

**i** Proceed in the reverse order for reassembling.

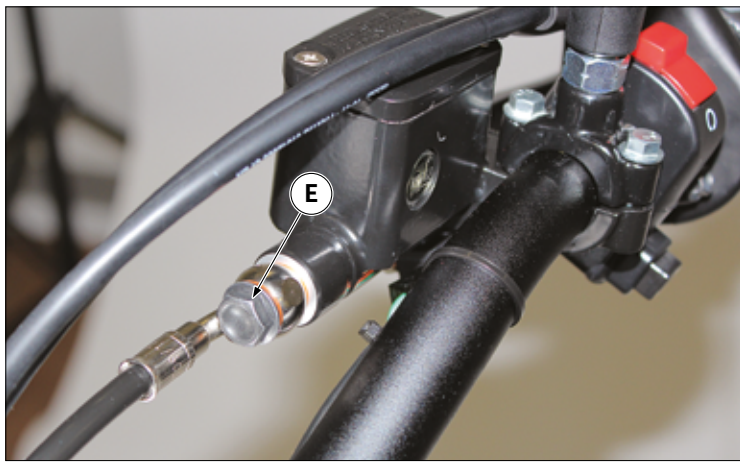
**!** Following the replacement of the ABS module, drain the system using the diagnostic system.



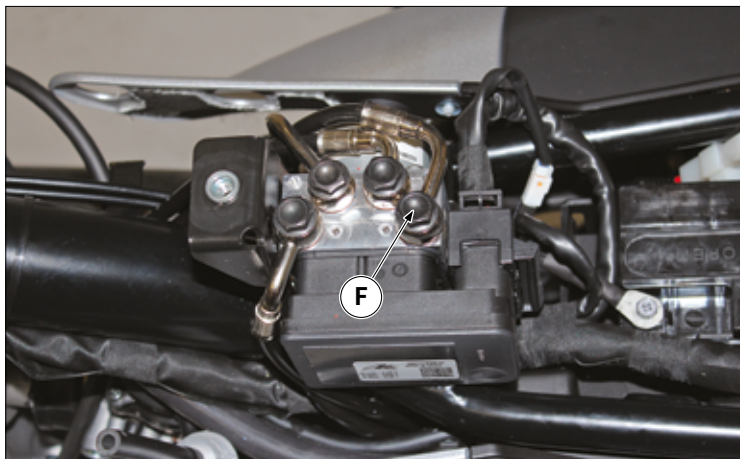


**12.19.3 Front ABS tubes removal**

Remove the brake system tube fitting “D”, making sure to place a container for collecting the brake oil.



Remove the brake system tube fitting “E” on the front brake master cylinder and remove the tube.



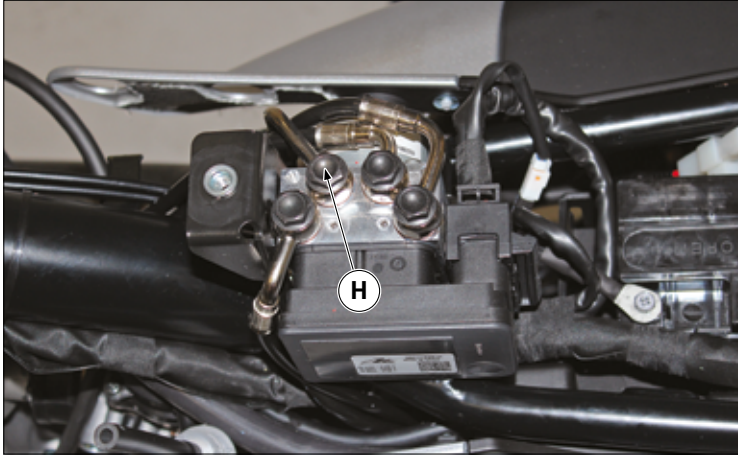
Remove the brake tube fitting “F”, making sure to place a container for collecting the brake oil.



Remove the brake system tube fitting “G” on the front brake calliper and remove the tube.

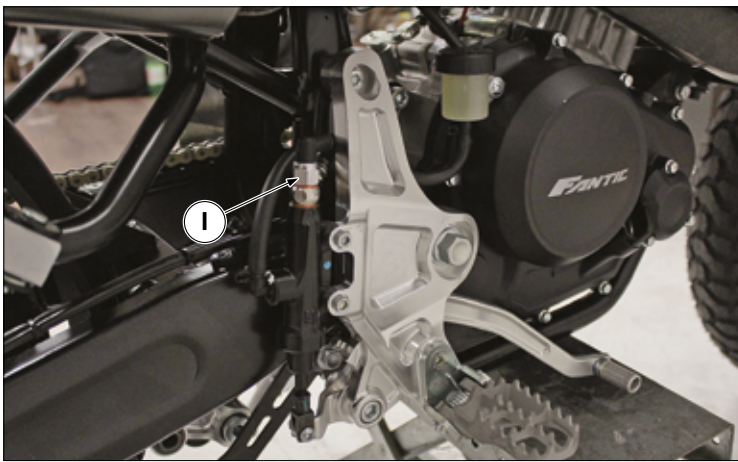
**i** Proceed in the reverse order for reassembling.



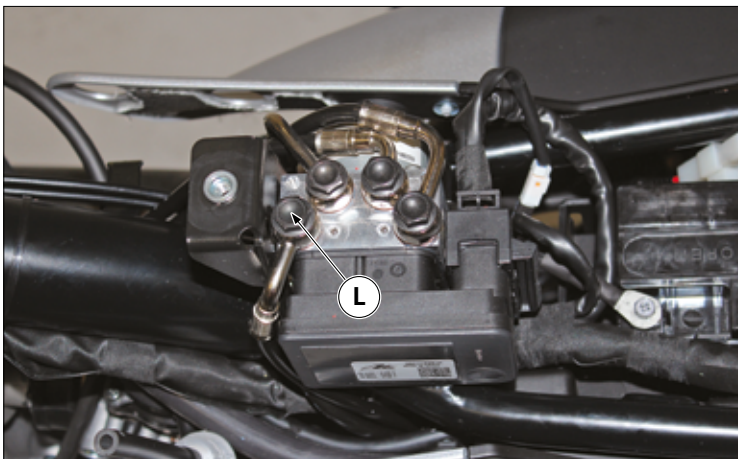


**12.19.4 Rear ABS tubes removal**

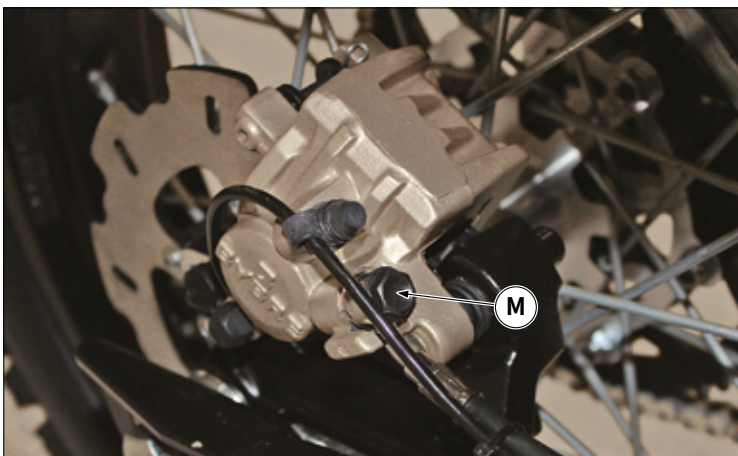
Remove the brake system tube fitting “H”, making sure to place a container for collecting the brake oil.



Remove the brake system tube fitting “I” on the rear brake master cylinder and remove the tube.

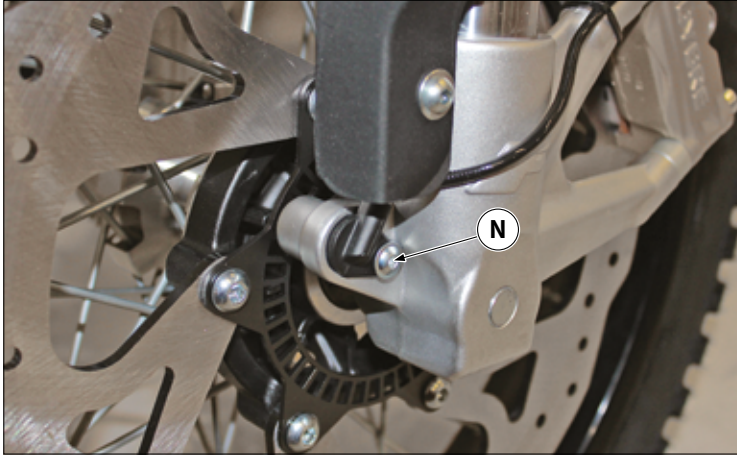


Remove the brake system tube fitting “L”, making sure to place a container for collecting the brake oil.



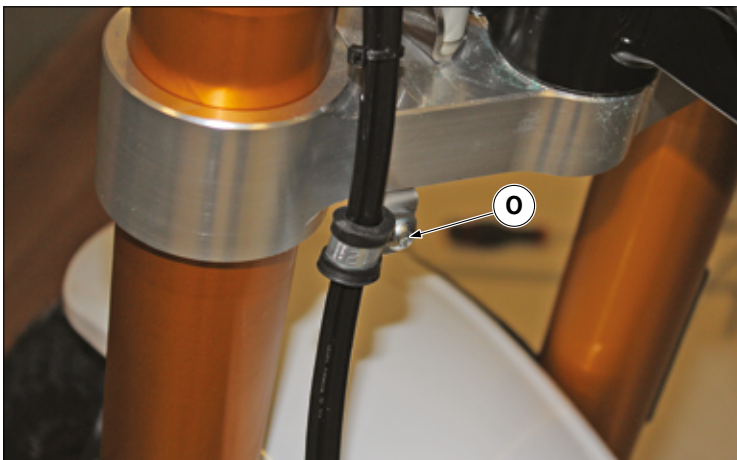
Remove the brake system tube fitting “M” on the rear brake calliper and remove the tube.

**i** Proceed in the reverse order for reassembling.

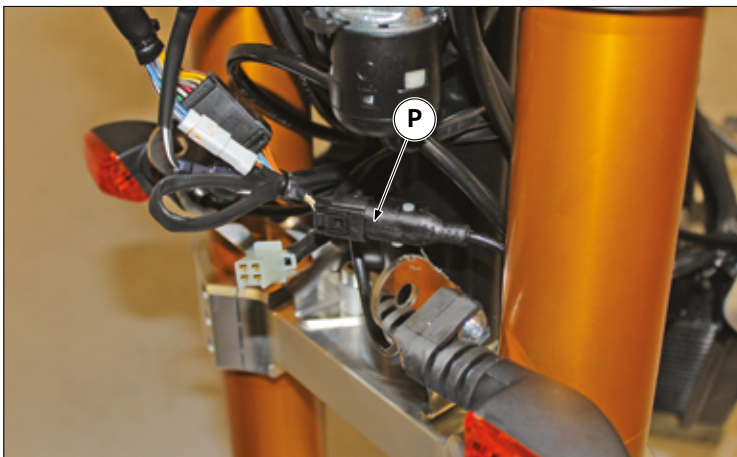


**12.19.5 Front ABS sensor removal**

Remove the screw "N" that secures the front ABS sensor.



Remove the screw "O" of the cable gland and remove the strap clamps on the cable and brake tube to release the sensor cable.

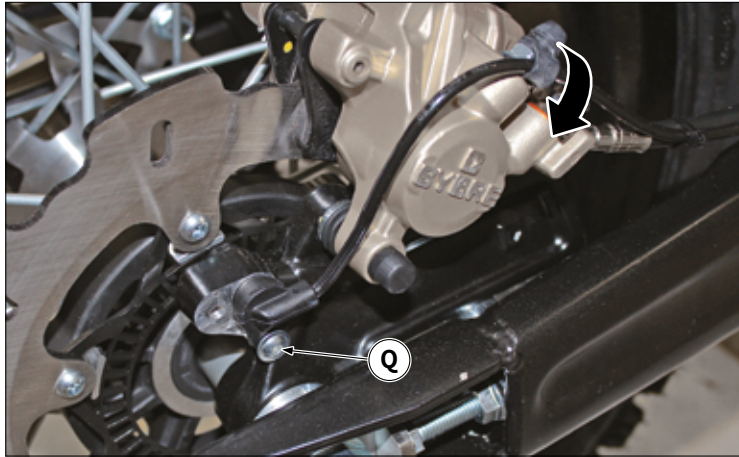


Disconnect the connector "P" and remove the ABS sensor cable.

**⚠** The distance of the ABS sensor from the phonic wheel must be between a minimum of 0.3 mm and a maximum of 1.5 mm.

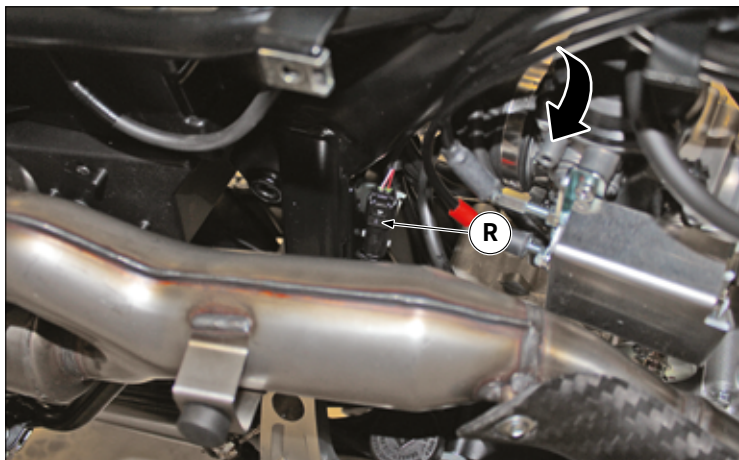
**i** Proceed in the reverse order for reassembling.





**12.19.6 Rear ABS sensor removal**

Remove the screw “Q” that secures the rear ABS sensor. Lift the purge screw cap to release the sensor cable. Remove the strap clamps on the cable and the brake tube.



Disconnect the connector “R” and remove the ABS sensor cable.

**⚠** The distance of the ABS sensor from the phonic wheel must be between a minimum of 0.3 mm and a maximum of 1.5 mm.

**i** Proceed in the reverse order for reassembling.



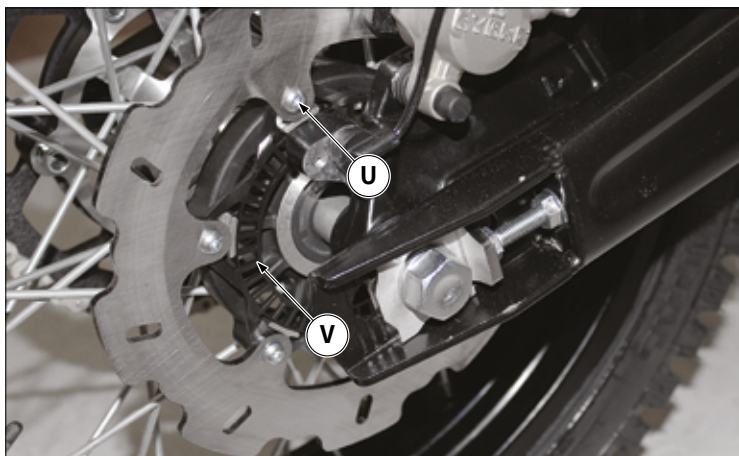
**12.19.7 Front ABS phonic wheel removal**

Remove:

– Front wheel.

Remove the six screws “S”, then remove the brake disc and the phonic wheel “T”.

**i** Proceed in the reverse order for reassembling.



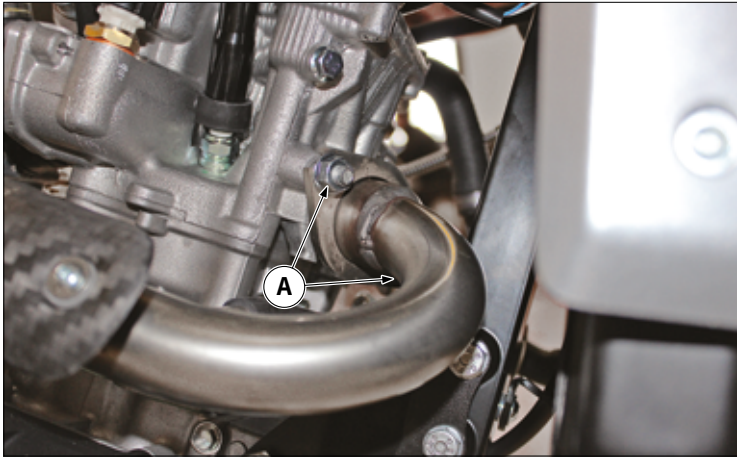
**12.19.8 Rear ABS phonic wheel removal**

Remove:

– Rear wheel.

Remove the six screws “U”, then remove the phonic wheel “V”.

**i** Proceed in the reverse order for reassembling.



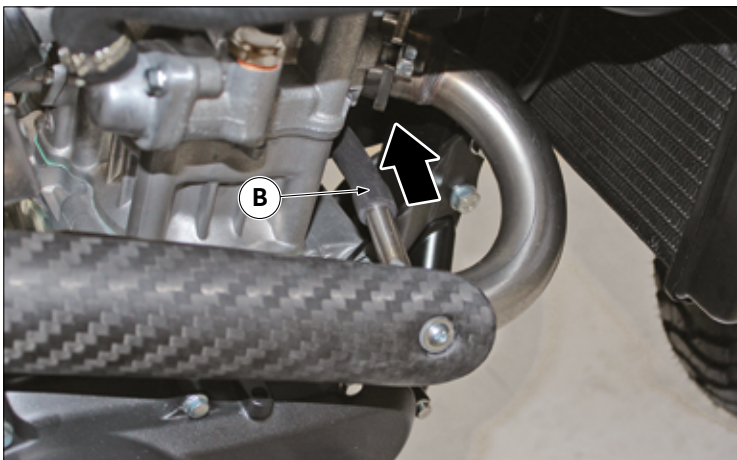
**12.20 EXHAUST SYSTEM REMOVAL**

**12.20.1 Silencer removal**

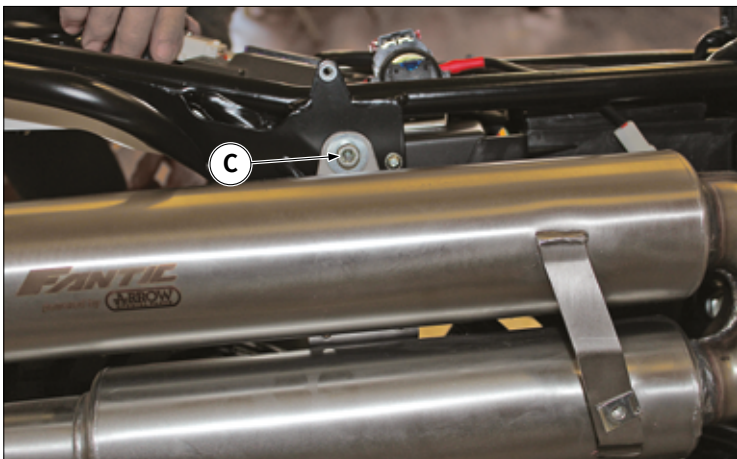
Remove:

- Seat, refer to “12.1 Seat removal” on page 117;
- Right side.

Remove the two nuts “A” that fix the exhaust manifold to the cylinder.

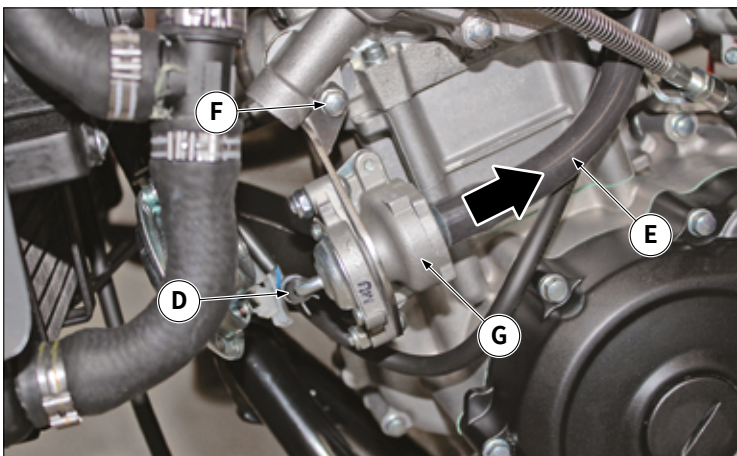


Remove the rubber tube “B” of the SAS valve.



Remove the screw and washer “C”, then remove the drain.

**i** Proceed in the reverse order for reassembling.



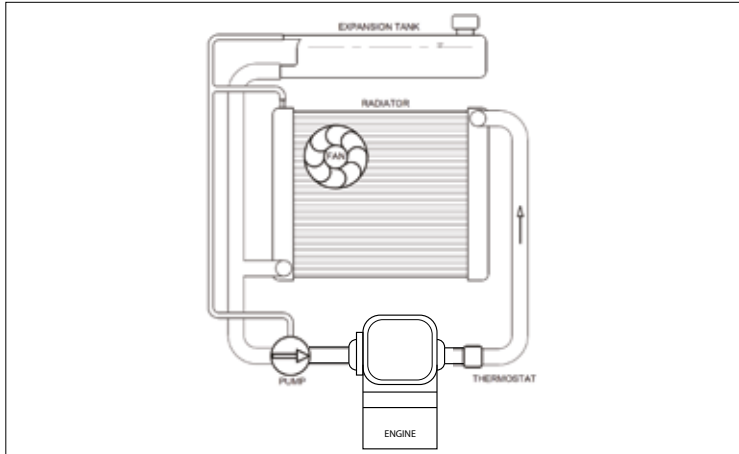
**12.20.2 SAS valve removal**

Remove the rubber tube “D” of the SAS valve.

Remove the rubber tube “E” and the fastening screw “F”, then remove the SAS valve “G”.

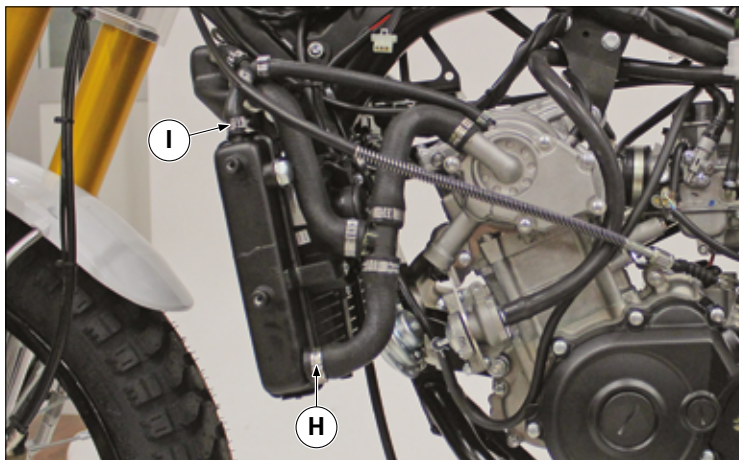
**i** Proceed in the reverse order for reassembling.





**12.21 COOLING SYSTEM REMOVAL**

**12.21.1 Cooling system diagram**



**⚠ Perform the following operations only when the engine is cold.**

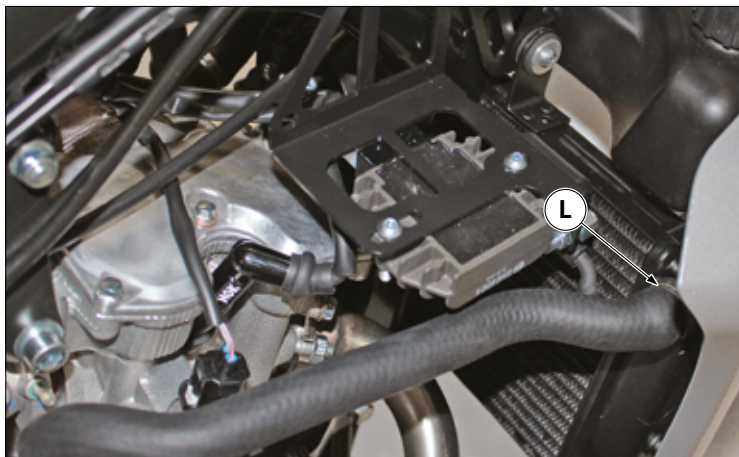
**12.21.2 Radiator removal**

Remove:

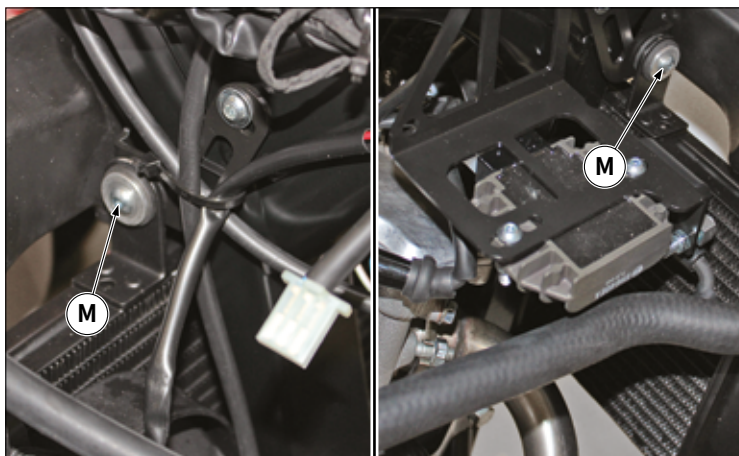
- Conveyors;
- Radiator electric fan;
- Expansion tank.

Release the tube "H" and empty the radiator from the coolant.

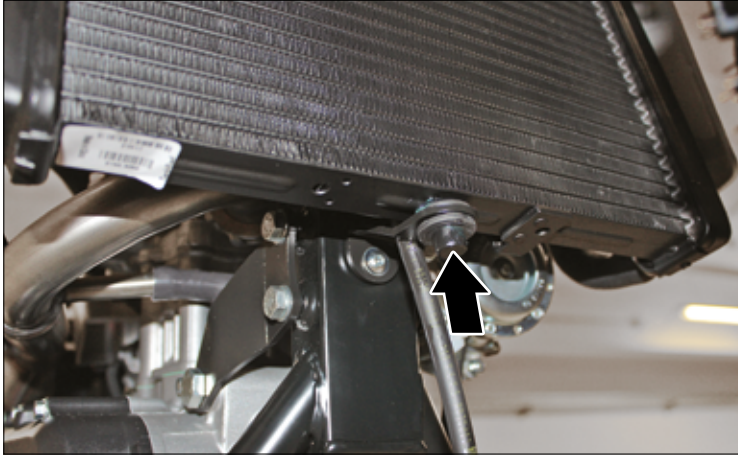
Release the tube "I" from the radiator.



On the opposite side, release the tube "L".

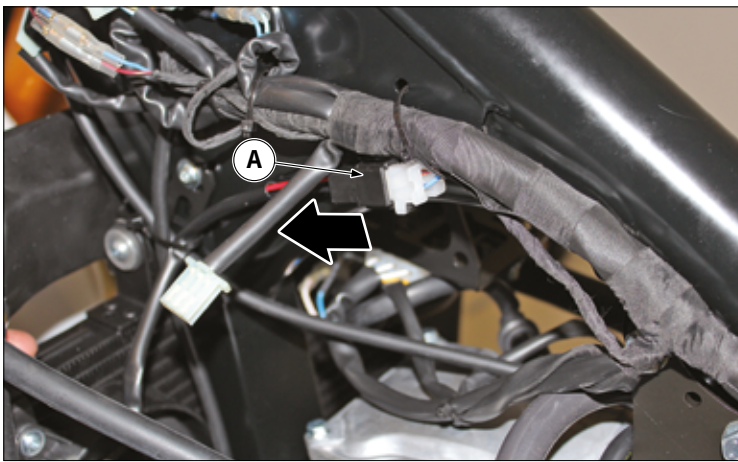


Remove the two screws "M" that fix the radiator to the frame.



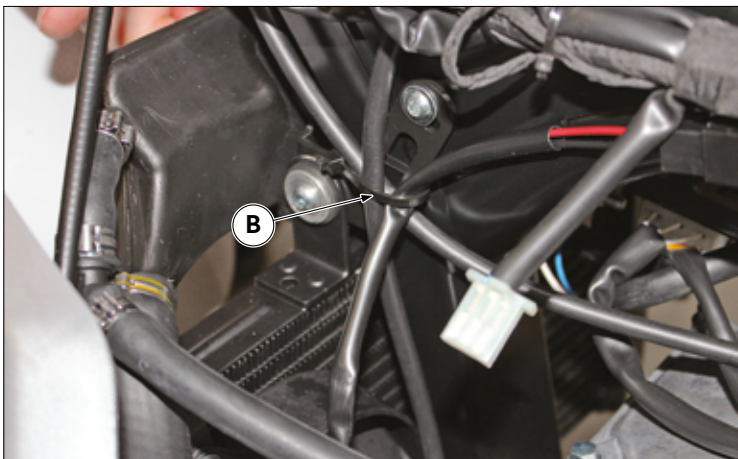
Remove the radiator pulling the lower pin out of the anti-vibration grommet.

**i** Proceed in the reverse order for reassembling.

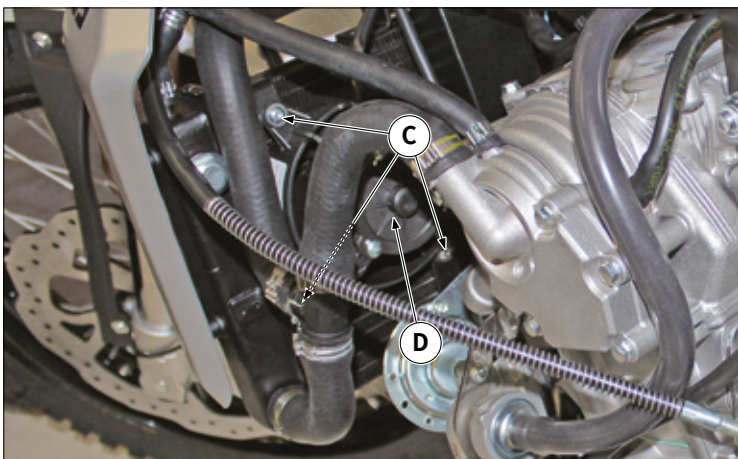


**12.21.3 Fan removal**

Disconnect the electric fan connector "A" from the main wiring.



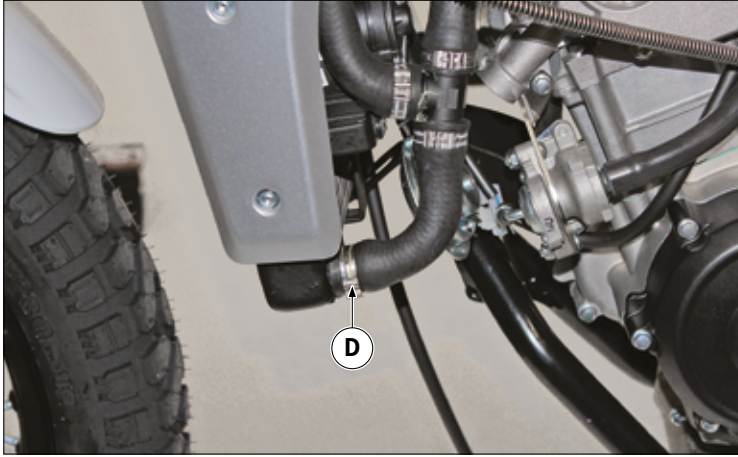
Remove the strap clamp "B" to release the electric fan cable.



Remove the three screws "C", then remove the electric fan "D".

**i** Proceed in the reverse order for reassembling.

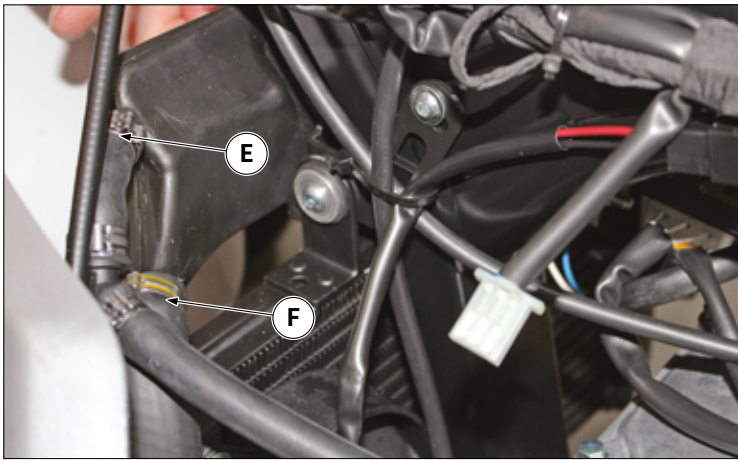




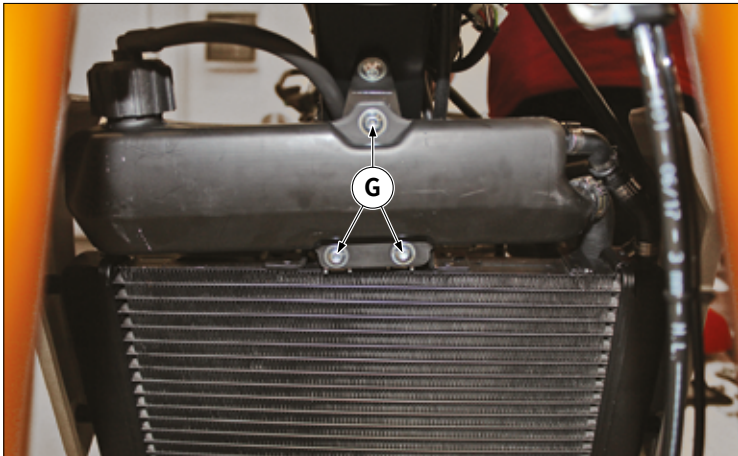
**12.21.4 Expansion tank removal**

**(i)** Place a container for collecting the coolant.

Release the tube “D” and empty the coolant from the radiator.



Release the tube “E” and the tube “F” from the expansion tank.

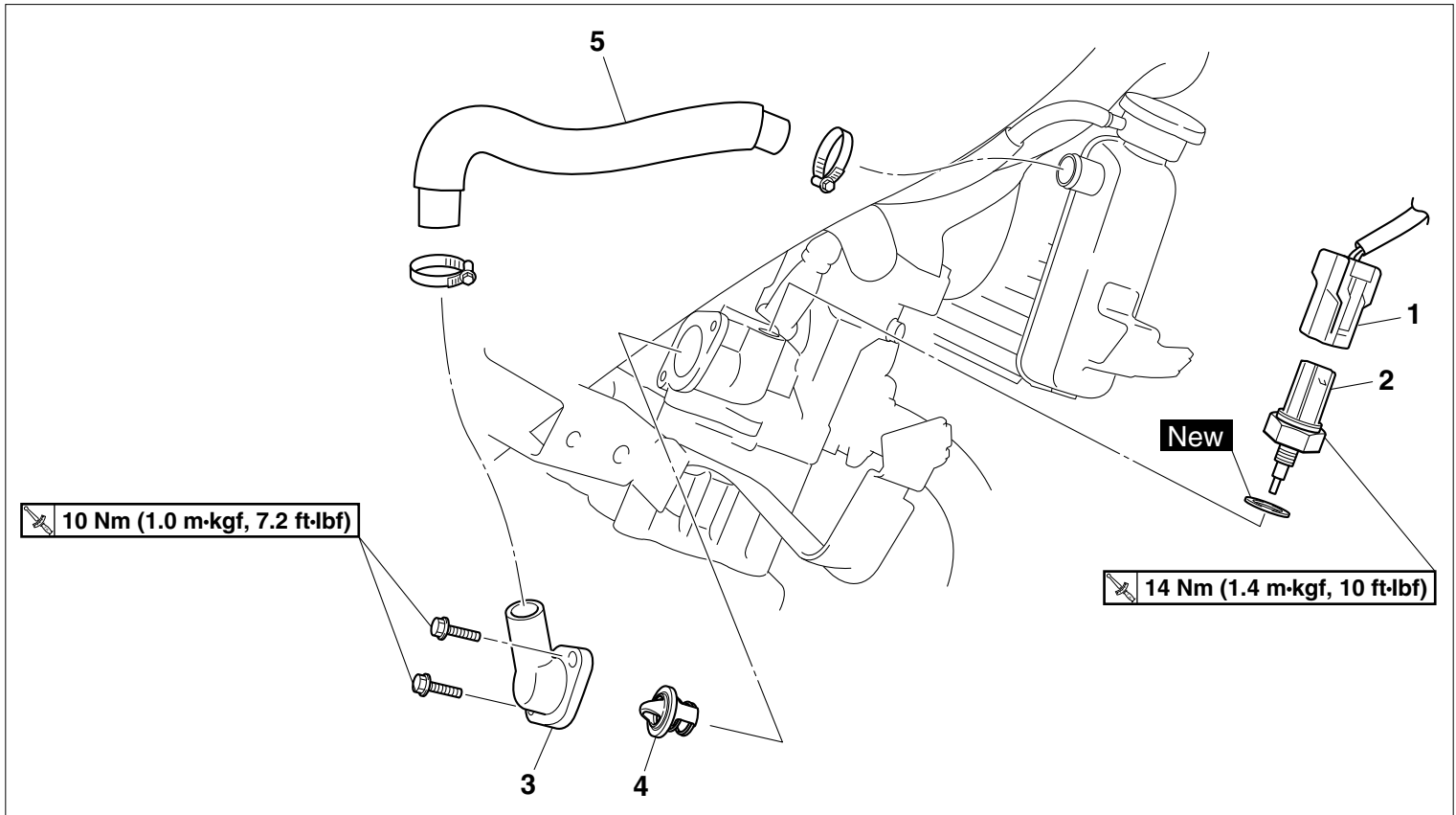


Remove the three screws “G”, then remove the tank.

**(i)** Proceed in the reverse order for reassembling.

**12.21.5 Thermostat**

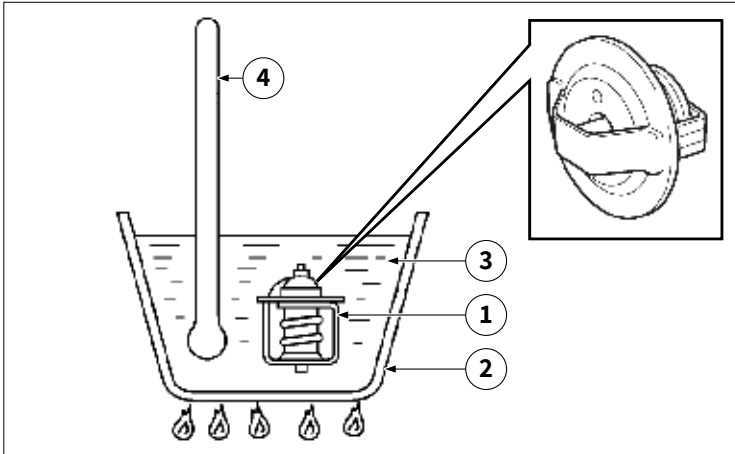
Thermostat removal sequence.



Sequence	Operation/Components to remove	Quantity	Remarks
1	Coolant temperature sensor connector	1	Disconnect.
2	Coolant temperature sensor	1	
3	Thermostat cover	1	
4	Thermostat	1	
5	Radiator inlet coupling	1	

**i** For installation, reverse the removal procedure.





**12.21.6 Thermostat check**

Check the operation of the thermostat: if it does not open at the temperature of 80.5-83.5 °C (176.9-182.3 °F), replace.

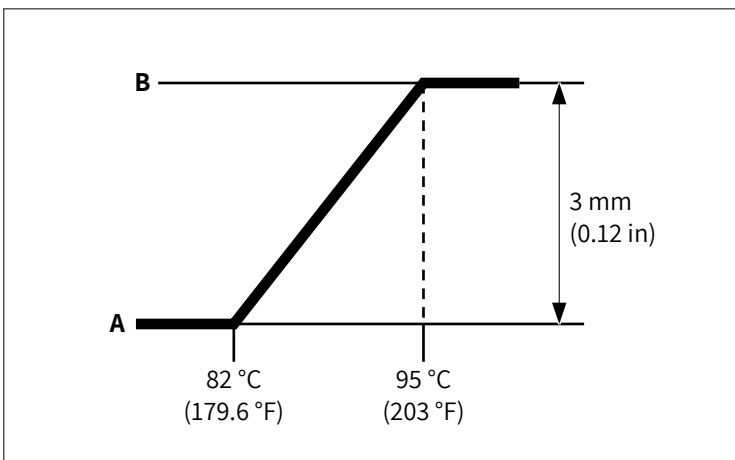
Proceed with the check as follows:

- Suspend the thermostat "1" in a container "2" filled with water;
- Heat the water "3" slowly;
- Dip a thermometer "4" into the water.
- Shake the water, observe the thermostat and the temperature indicated by the thermometer.

Level "A" = Fully closed

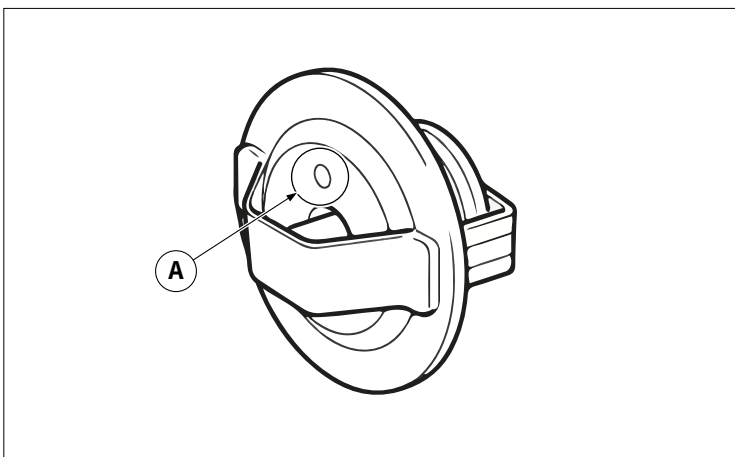
Level "B" = Fully open

**i** If you doubt the accuracy of the thermostat, replace it. The faulty thermostat can cause dangerous overheating or cooling.



Check the thermostat cover: if there are any cracks and/or damage, replace it.

Check the radiator inlet coupling: if there are any cracks and/or damage, replace it.



**12.21.7 Thermostat installation**

Install the thermostat with the vent hole "A" facing up.

Install a new copper washer and coolant temperature sensor.

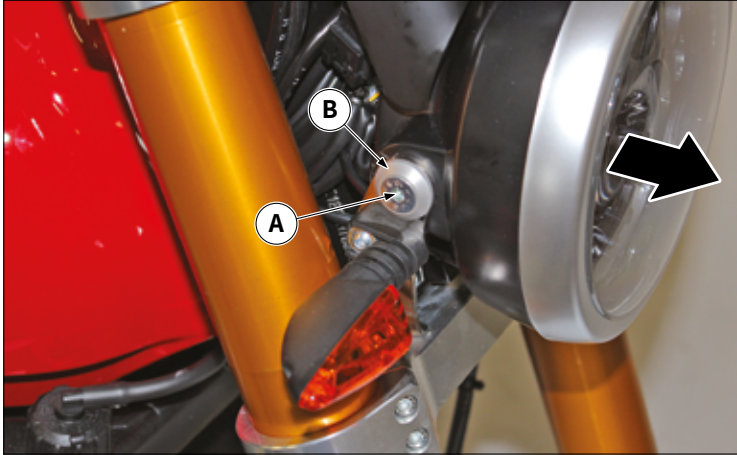
**Tightening torque:**  
Coolant temperature sensor  
**14 Nm (1.4 m·kgf, 10 ft·lbf)**

Pay particular attention when handling the coolant temperature sensor. Replace any piece that has fallen to the ground or has had a strong impact.

Fill the cooling system with the prescribed amount of recommended coolant.

Check the cooling system: if there are leaks, repair or replace the defective components, if any.

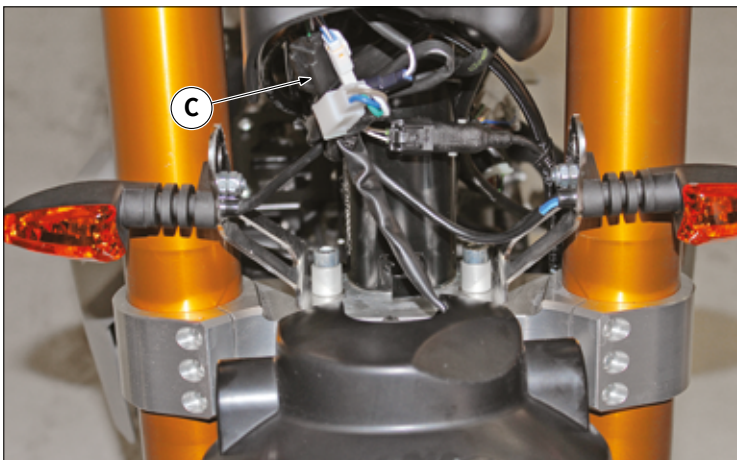
Measure the radiator cap opening pressure: if it is below the prescribed pressure, replace the radiator cap.



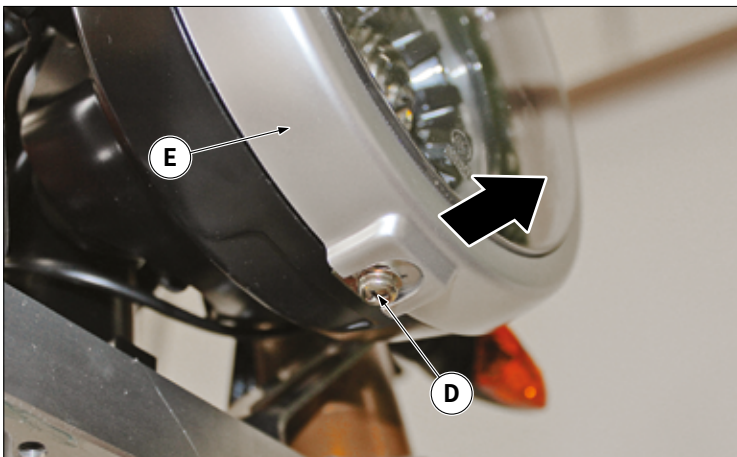
**12.22 FRONT OPTICAL UNIT REMOVAL**

**12.22.1 Front headlight removal**

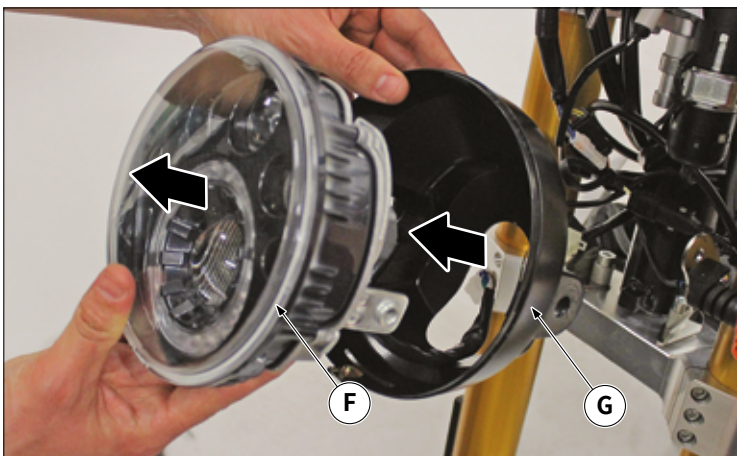
Remove the screw "A" and the spacer "B" on both sides of the headlight and remove the headlight from the brackets.



Disconnect the connector "C" of the front headlight from the vehicle wiring.



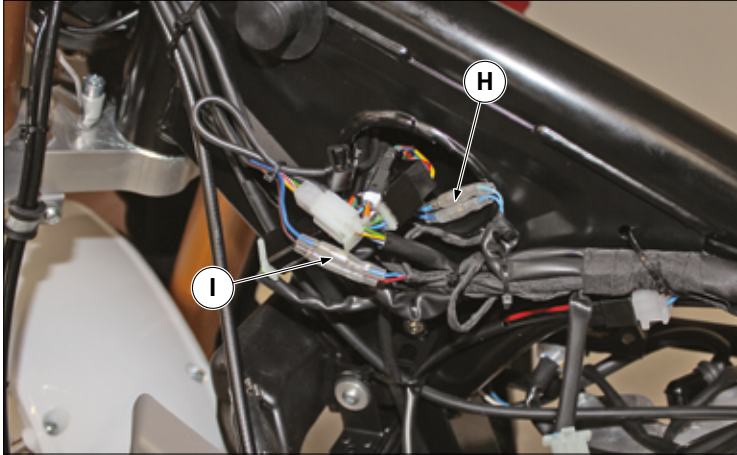
Remove screw "D" and take out the frame of the headlight "E".



Remove the optical unit "F" from the headlight cover "G".

**i** Proceed in the reverse order for reassembling.



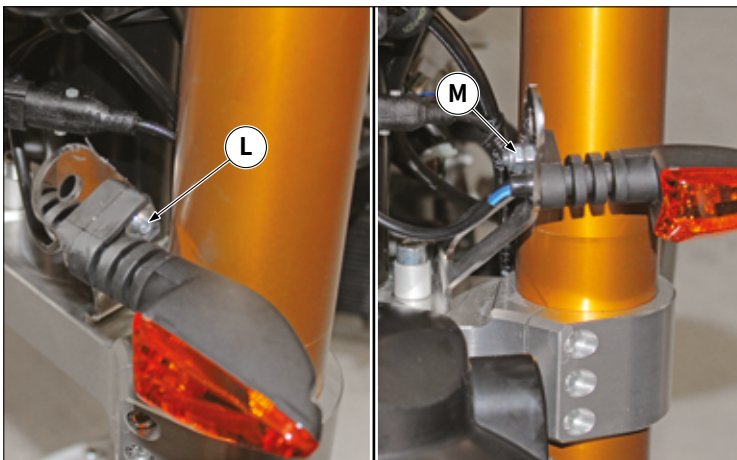


**12.22.2 Front turn signals removal**

Remove:

- Headlight;
- Tank.

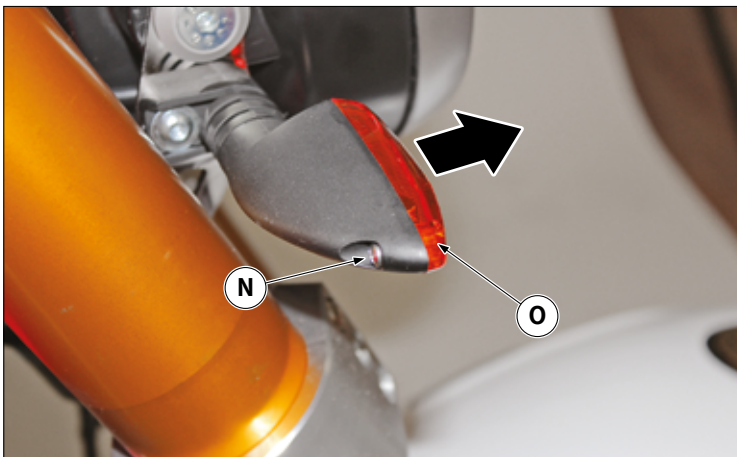
Disconnect the front left "H" and right "I" turn signal wiring.



Remove the screw and washer "L" and the self-locking nut "M", repeat the operation on the turn signal on the opposite side.

Remove the front turn signals.

**i** Proceed in the reverse order for reassembling.

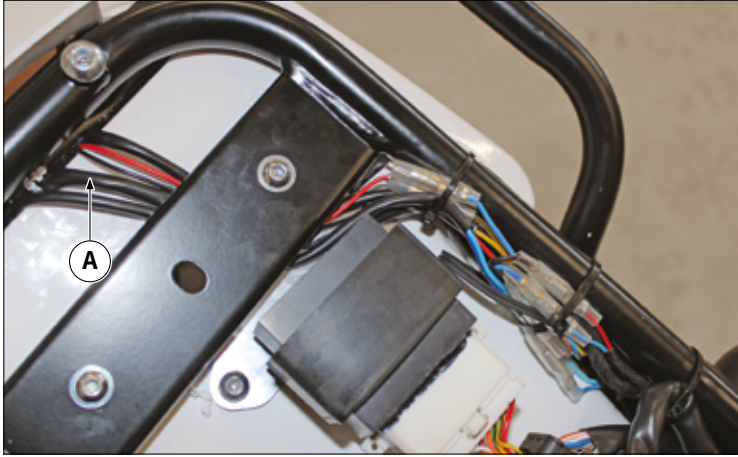


**12.22.3 Turn signal bulbs replacement**

Remove the screw "N".

Remove the transparent cover "O" and replace the bulb with one of the same type.

**i** Proceed in the reverse order for reassembling.

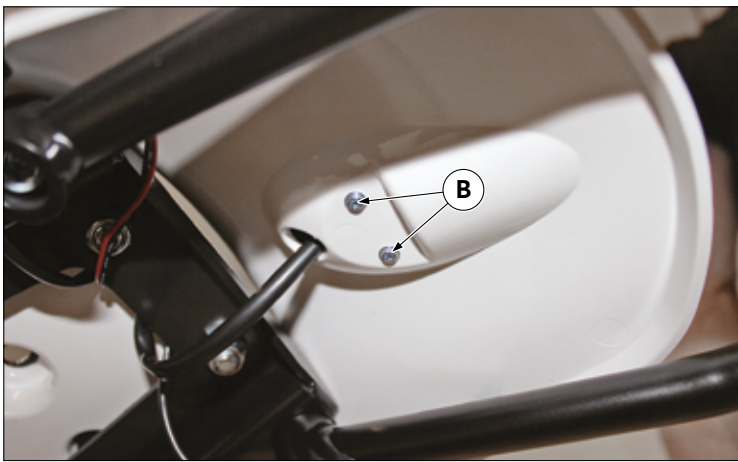


**12.23 REAR OPTICAL UNIT REMOVAL**

**12.23.1 Rear headlight removal (Scrambler version)**

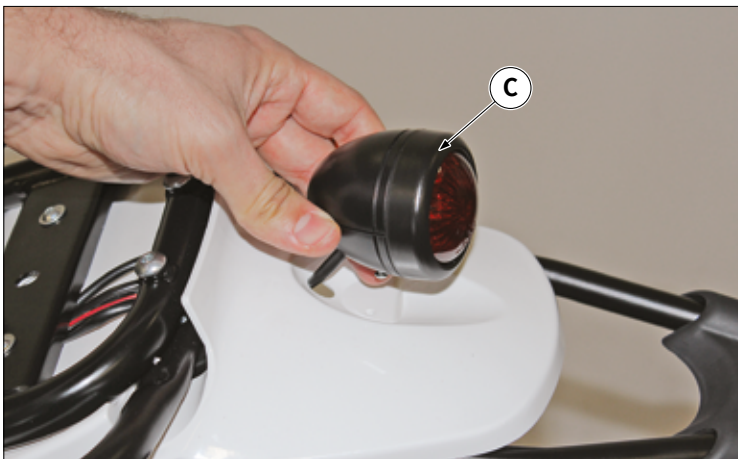
Remove:

- Seat, refer to "12.1 Seat removal" on page 117.
- Disconnect the rear headlight wiring "A" (black, yellow and red wires) from the vehicle wiring.

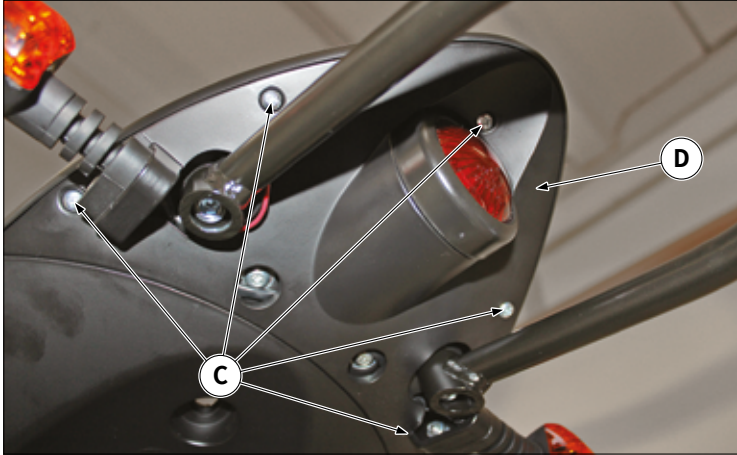


Remove the fastening screws "B", then remove the tail light "C".

**i** Proceed in the reverse order for reassembling.





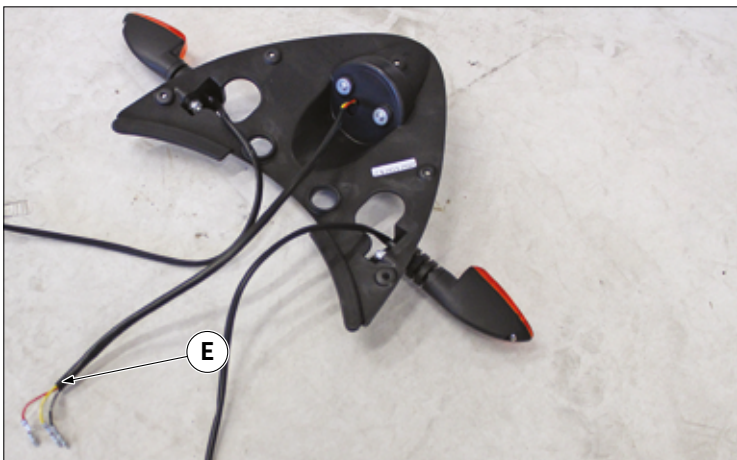


**12.23.2 Rear headlight removal (Flat Track version)**

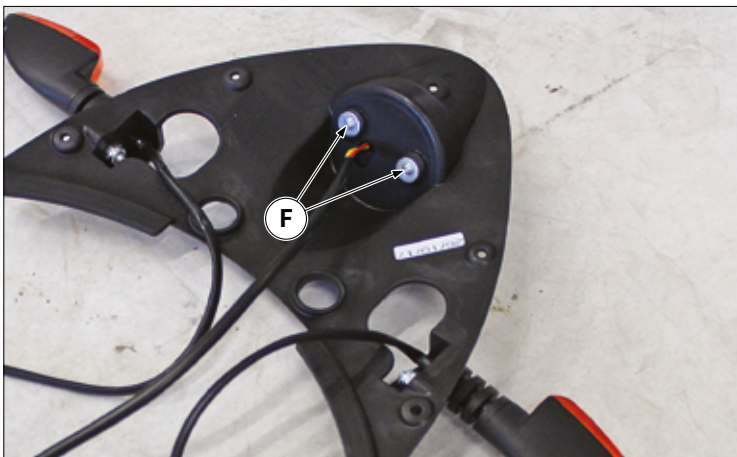
Remove:

- Seat, refer to "12.1 Seat removal" on page 117;
- Flat Track license plate holder.

Remove the screws "C", then remove the lower cover "D".

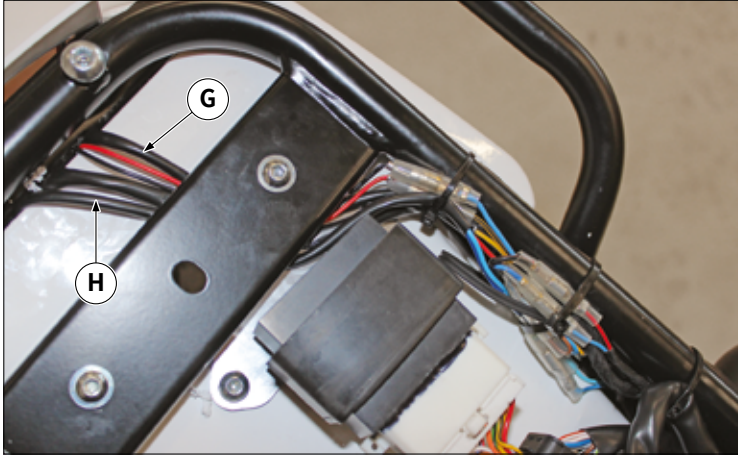


Disconnect the tail light wiring "E" (black, yellow and red wires) from the vehicle wiring.



Remove the screws "F", then extract the tail light.

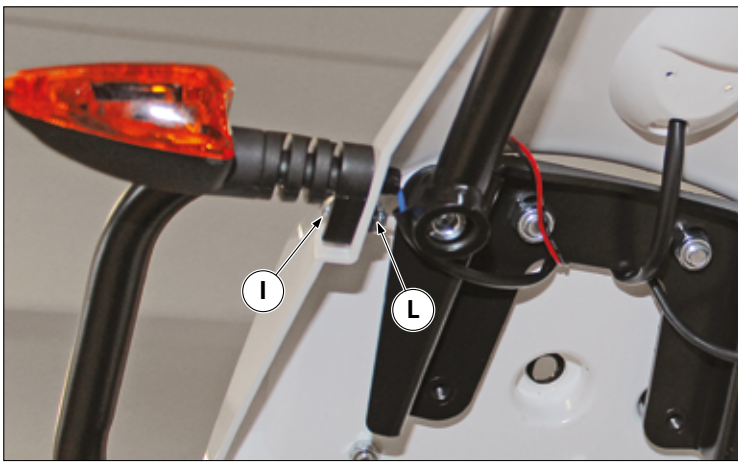
**i** Proceed in the reverse order for reassembling.



**12.23.3 Rear turn signals removal**

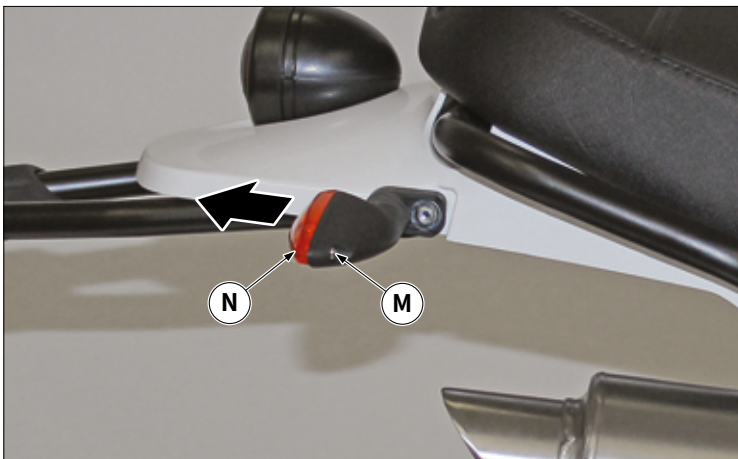
Remove:

- Seat, refer to "12.1 Seat removal" on page 117.
- Disconnect the left turn signal wiring "G" (blue and black cables) and the right indicator wiring "H" (blue and sky blue wires).



Remove the screw and washer "I" and the self-locking nut "L, repeat the operation on the turn signal on the opposite side.  
Remove the rear turn signals.

**i** Proceed in the reverse order for reassembling.



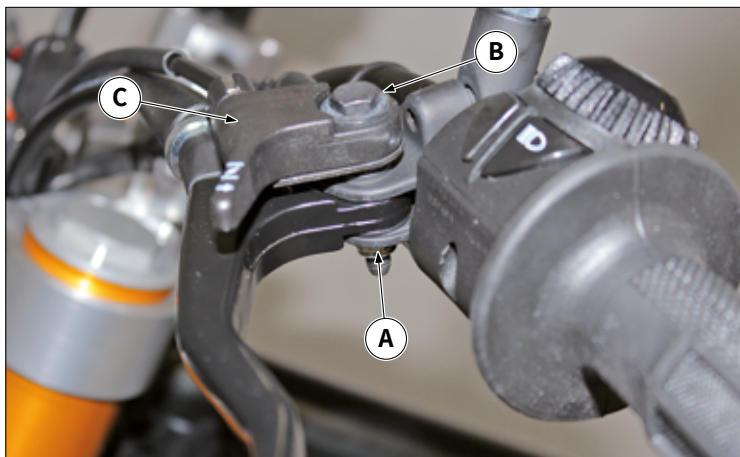
**12.23.4 Rear turn signal bulbs replacement**

Remove the screw "M".

Remove the transparent cover "N" and replace the bulb with one of the same type.

**i** Proceed in the reverse order for reassembling.

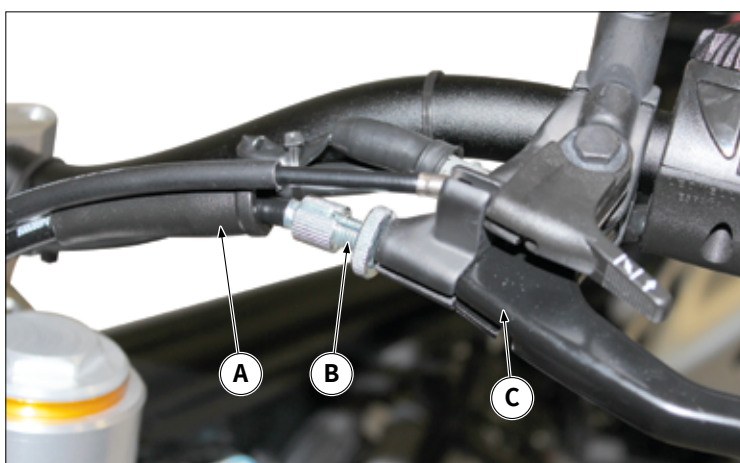




**12.24 STARTER LEVER REMOVAL**

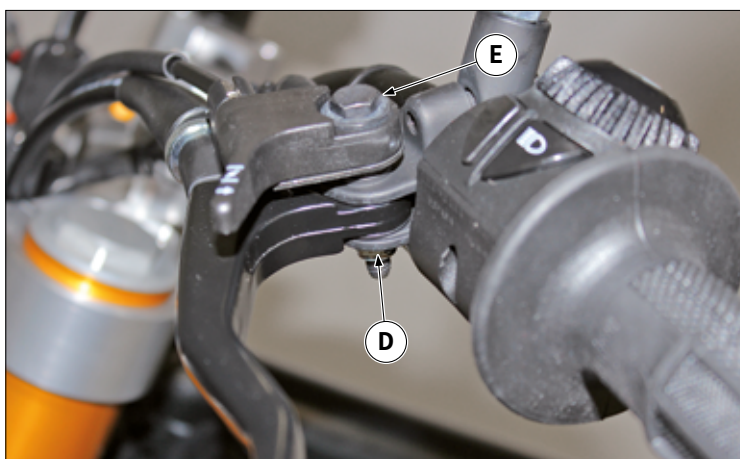
Remove the nut "A" and the screw "B".  
Remove the starter lever disconnecting it from its cable.

**i** Proceed in the reverse order for reassembling.



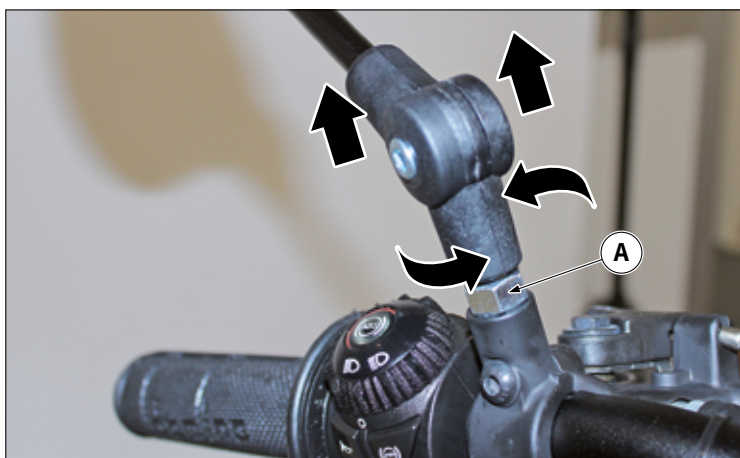
**12.25 CLUTCH LEVER REMOVAL**

Lift the cap "A" and unscrew the clutch adjuster "B" and remove the clutch cable from the clutch lever "C".



Remove the nut "D" and the screw "E", then remove the clutch lever.

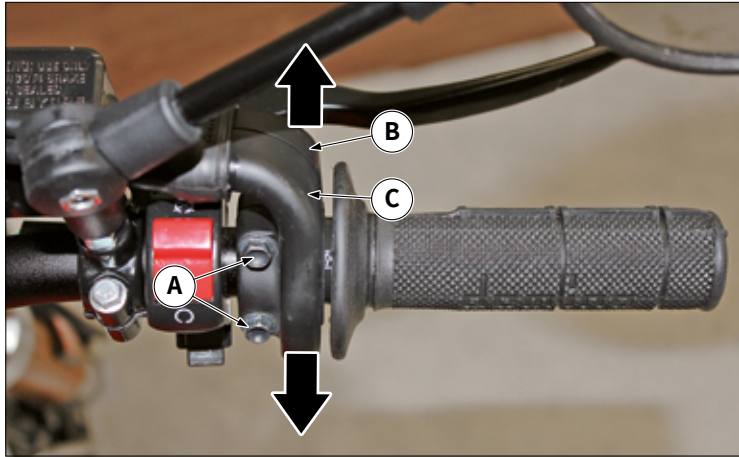
**i** Proceed in the reverse order for reassembling.



**12.26 REAR-VIEW MIRRORS REMOVAL**

Loosen the locknut "A" and unscrew the mirror rod to remove them.

**i** Proceed in the reverse order for reassembling.



**12.27 THROTTLE CONTROL REMOVAL**

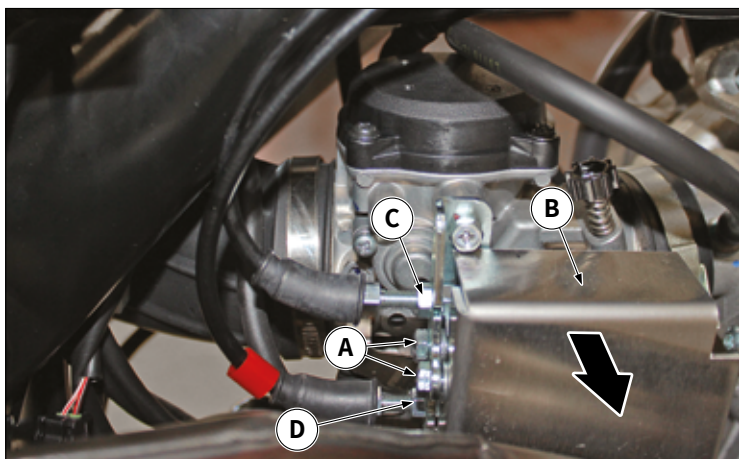
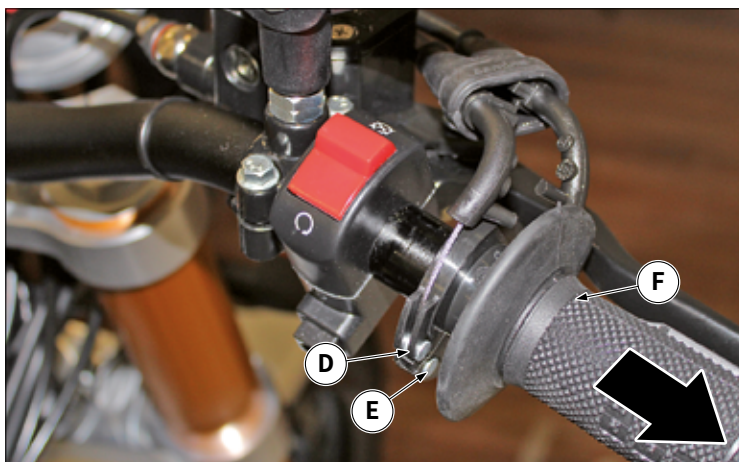
**12.27.1 Throttle control knob removal**

Remove the screws "A".

Remove the U-bolts "B" and "C".

Disconnect the cables "D" and "E" from the knob "F" and remove it.

**(i) Proceed in the reverse order for reassembling.**



**12.27.2 Throttle cables removal**

Remove:

- Throttle control knob.

Remove screw "A" and take out the cover "B".

Loosen the nuts "C", "D" and disconnect the cables from the carburettor to remove them.

**(i) Proceed in the reverse order for reassembling.**