



E-Moto Brake


Service Manual – 





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Important information

IMPORTANT	
	Products used repeatedly in extreme conditions will require more frequent servicing. The use of high-pressure washing methods, non-original spare parts and non-recommended solvents and lubricants reduces the lifespan of our products.

IMPORTANT	
	<ul style="list-style-type: none">Formula recommends only ORIGINAL spare parts and lubricant products.Formula recommends to contact a specialized mechanic.

SAFETY INFORMATION	
	Always wear nitrile gloves and safety glasses when working on the fork. Ensure correct disposal of waste materials and liquids

TORX® is a registered trademark of CAMCAR / TEXTRON INC. All trademarks are property of their respective owners.

WARNING! BEFORE INSTALLING AND USING THIS NEW FORMULA PRODUCT IT IS CRITICAL TO YOUR SAFETY THAT YOU READ AND STRICTLY ADHERE TO THE INSTRUCTIONS IN THIS MANUAL. FAILURE TO DO SO COULD CAUSE SERIOUS INJURY AND/OR INVALIDATE YOUR LEGAL RIGHTS. KEEP THIS MANUAL IN A SAFE PLACE FOR FUTURE REFERENCE AS IT CONTAINS INFORMATION CRITICAL TO YOUR SAFETY.

ATTENTION! DO NOT INSTALL OR DISASSEMBLE THIS FORMULA PRODUCT ON YOUR OWN!

Always seek the help of a professional mechanic.

If you decide to ignore this important message, keep in mind that you are doing so EXCLUSIVELY at your own risk.

Note: AS WITH ANY MANUAL, THIS ONE IS SUBJECT TO PERIODIC UPDATES. CONTACT YOUR MECHANIC, OR CHECK FOR UPDATES ON OUR WEB SITE, (www.rideformula.com).

This manual provides information for safe and proper mounting and use of the braking system; and for routine maintenance. By following the procedures contained in this manual you will ensure that the braking system has the best performance and operating life, along with avoiding the most common causes of accidents that may result from improper operation and maintenance.

ATTENTION: Carefully follow SAFETY GUIDELINES for proper braking system functioning.

GENERAL SAFETY GUIDELINES

- Never put your hands near or inside rotating parts. Protective five-finger gloves that do not reduce sensitivity or your ability to grip should be used during repair.
- Before starting any mounting operation, carefully check for dangerous conditions at the work site.
- Always wear a properly fitted and fastened helmet while riding. Make sure the helmet is approved in the country of use.

- Wet weather impairs traction and braking, making it much more difficult to control the bike. More attention must be paid while riding in wet conditions in order to avoid accidents.
- Learn and comply with the local rules of the road and cycling regulations. Always ride carefully and responsibly.
- Wear close-fitting clothes that make you easy to see (fluorescent or bright colors).
- If you ride at night, use adequate lights and reflectors that are clean and fitted securely.
- FORMULA braking devices are a high-performance product, offering a stopping power higher than normal brakes. As a result, fewer efforts or lesser effort is required to lock up the wheel when braking. Be careful as a locked wheel can result in loss of control of the bicycle and can cause injuries.
- Brakes are essential for the safe use of a bicycle. The improper setup and use of the brakes can make you lose control and cause an accident, with unpredictable consequences and potentially serious injuries.
- Disc brakes get VERY hot when used. WARNING: NEVER touch the caliper or the rotor immediately after use. Make sure the brakes have cooled down before working on them.
- The brake rotors must be installed on wheels that are suitable for this type of brake system. A wheel with an insufficient spoke section can break under normal use of the braking system and cause serious injury or an accident. Check with your wheel manufacturer BEFORE installation to ensure compatibility.
- Check the spoke tension and condition frequently. A damaged spoke may break suddenly and interfere with the braking system. This may result in serious personal injury or accidents. The bike frame or fork must be suitable for mounting the braking system.
- Only use products recommended in this manual, otherwise you can damage the system and the brakes will be unreliable and potentially dangerous.
- Before every ride, make sure there are no fluid leaks in the system by applying the lever and holding it down as far as it will go. Check the hose connections and the brake fluid reservoir for any leaks. Consult a professional mechanic if there are fluid leaks. A fluid leak can cause a serious accident!
- **TO PROVIDE THE BEST PERFORMANCE, THE BRAKE REQUIRES A BREAK-IN PROCEDURE.**
- Do NOT touch the surface of the disc rotors with your bare hands as the natural oils on your skin can compromise performance. Always wear clean latex gloves when handling the disc rotors.
- Test the brakes and your braking technique on flat and even ground before using the bike in more severe conditions.

BRAKING SYSTEM SAFETY RULES

- All maintenance operations must be carried out solely by authorized FORMULA personnel.
- FORMULA declines any and all responsibility for the safety of this product if used for an application other than which it is intended.
- The user is responsible for learning and using the correct braking technique; consult the Owner's Manual of the bicycle, ask a professional bicycle dealer for advice, or contact FORMULA for additional details and recommendations.
- Do not change or modify the parameters of the braking system to obtain other performances than those established by the manufacturer.
- Before use, check to ensure the front brake lever is on the side of the handlebars you are accustomed to having it on. If the lever is on the other side, sudden braking can cause you serious injury. Have a professional mechanic swap the position of the levers if they are incorrect.
- A high braking load (total weight over 100 Kg and an incline of over 15%) will mean a necessary reduction in your speed and the use of both brakes when braking.
- Before each use, check all fasteners for correct torque. Torque ratings are supplied in this manual and an appropriate torque wrench is required to perform this check.


- The frame and the fork of the bicycle must be suitable for this type of braking system. The support, size and position of the components will only function properly if the system is intended for use with disc brakes.
- It is important to cross-check your frame and fork manufacturers' manuals on all the parts critical to the braking system and verify that the torque ratings match the ratings found in this manual. In the case of inconsistency of the values, do NOT install the braking system.
- Make sure the bicycle is clean before doing any maintenance on the brakes.
- Never install the brakes using adapters or supports supplied by other manufacturers. Doing so will void the warranty and release FORMULA of liability. Only use original FORMULA products.
- Do NOT let brake fluid or other oils or grease used for lubricating the bicycle come into contact with the disc rotors. If this does happen, clean the discs using isopropyl alcohol ONLY.
- Do NOT let brake fluid or lubricants come into contact with the brake pads. If this does happen, the brake pads will be contaminated and must be replaced before the next use.
- Only use Formula mineral brake fluid from a new bottle (FD-0029-00). NEVER use old fluid, or fluid that has been bled out of the system. Old fluid can contain water and this will compromise the performance and function of the system.
- Every new brake or pads or rotor needs a bedding in procedure with 50 braking operations with 30 km/h, without getting to a full stop, in order to achieve the maximum braking power available. Do this procedure in a safety environment.
- WARNING: All FORMULA brake systems requires a break in (bedding in) period to obtain top performance. We recommend running the bike on a flat surface at a speed of 30 Km/h and braking it at least 50 times allowing it to come to a full stop (taking the required precautions) before considering the system broken in and fully efficient.
- The efficiency of the brakes depends on many factors which FORMULA has no control over. These include the speed of the bike, the wheel-terrain contact, the brake lever application force, the correct installation and maintenance of the brakes, the hydraulic brake fluid, the levers, the brake shoes or pads, the condition of the bike, the weight of the rider, the correct braking technique, the weather conditions, the type and conditions of the terrain, and many other factors.

Needed tools

- Torque wrench with Torx TX 10 tool
- Torque wrench with HEX 8 mm socket tool.
- Torque wrench with HEX 3 mm tool
- Torque wrench with HEX 5 mm tool
- Torque wrench with 8 mm open head tool
- 3 mm allen key
- 8 mm open head key
- Torx TX10 key
- Torque wrench with Torx TX 20 tool
- DOT 4 Formula oil (FD-O029-00) for MSDS visit our [website](#)
- EPDM compatible grease (FD-G065-00) for MSDS visit our [website](#)

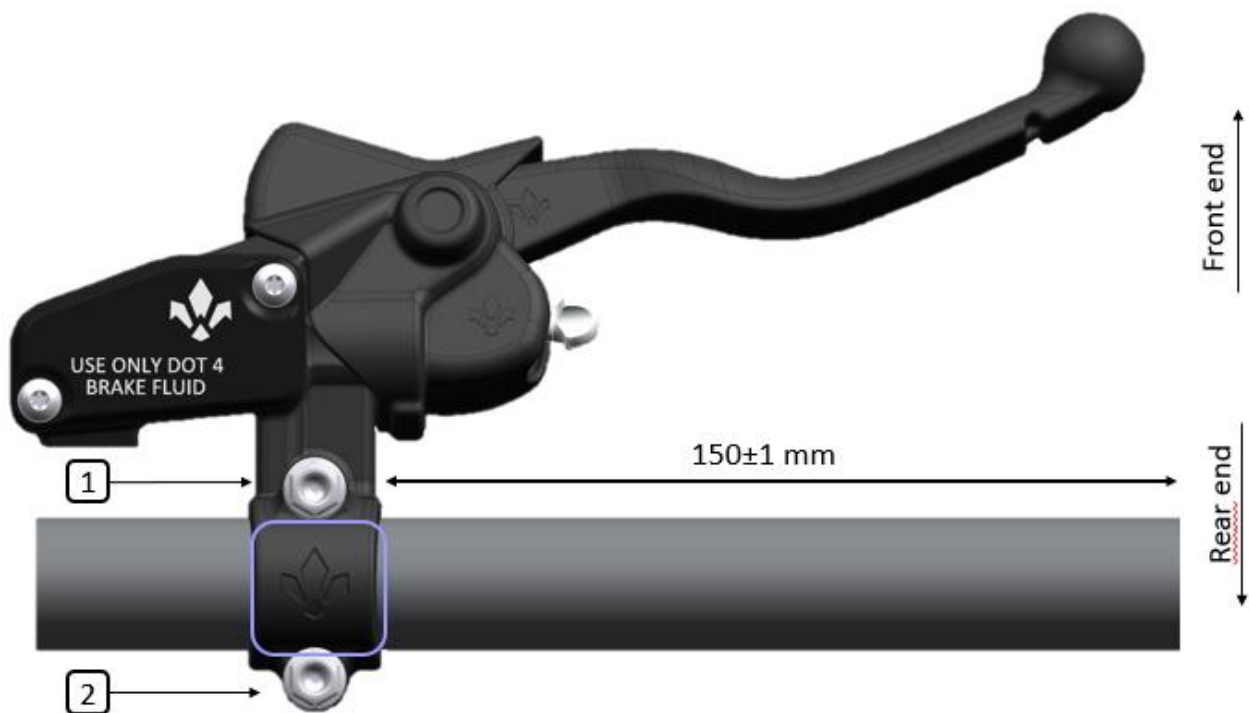
Brake setup

Brake master cylinder

Place the master cylinder on the handlebar at the desired position. The recommended assembly distance from the end of the handlebar is 150 mm. Check the ergonomics of the brake after assembling, the lever should not protrude from the handlebar. The lily  on the clamp needs to be faced towards the cargo bike front end. Tighten the first screw (1) with a torque wrench with HEX 8 mm socket tool at 8 ± 0.5 Nm. Tighten the second screw (2) with a torque wrench with HEX 8 mm socket tool at 8 ± 0.5 Nm.

The hose needs to be attached to the fork or the frame in a way that doesn't interfere with the free flow of fluid through the hose.

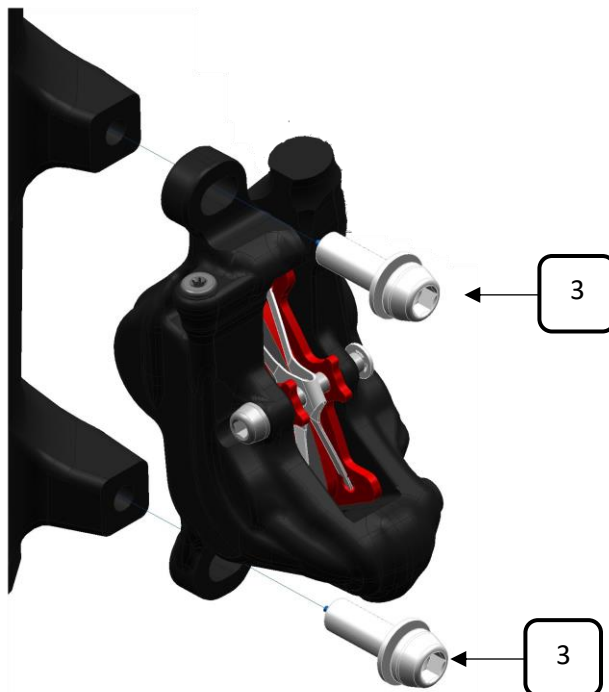
The hose should not make curves smaller than 20 mm radius and should not interfere with any moving parts.



Brake caliper

Brake caliper can be assembled directly on the fork if it's a PM6, otherwise it can be fixed by the use of a adapter (adaptor list available on our website [Formula](#)).

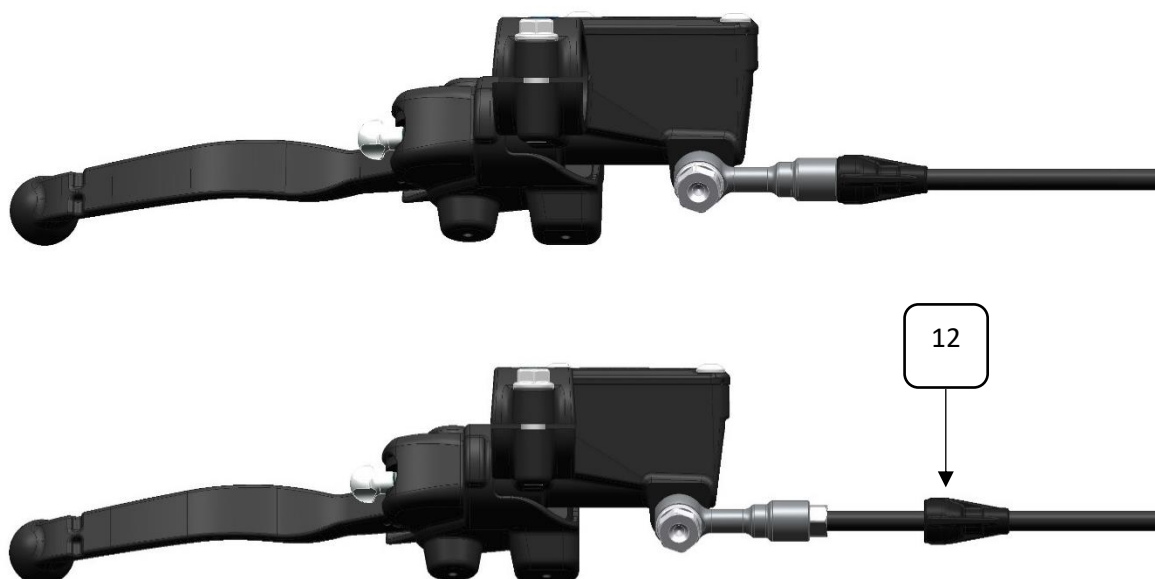
Pull the lever 2/3 times so that the caliper is centered respect to the rotor, keep the lever pulled and tighten the screws (3) with a torque wrench with a HEX 5 mm tool with 9 ± 0.5 Nm torque.



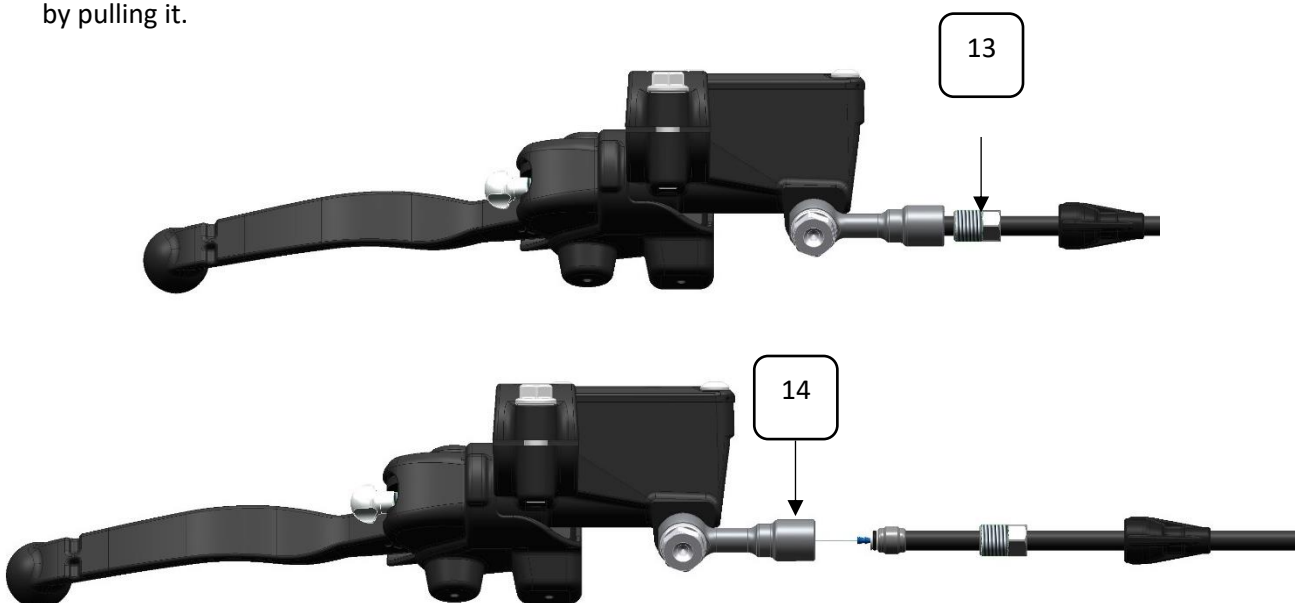
Hose lenght adjustment

Before proceeding with the operation, it's important to check the correct hose lenght required by the e-moto. [Video](#) tutorial available on our Youtube Channel.

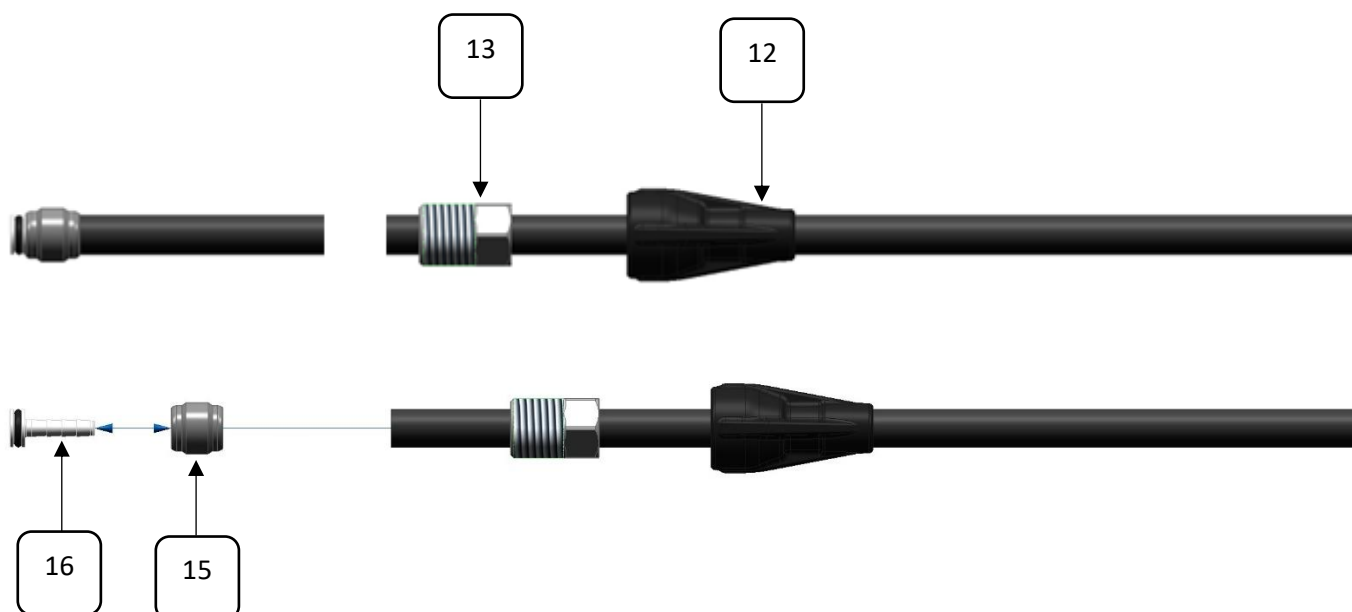
1. After placing the brake master cylinder on the handlebar, remove the hose joint cover (12).



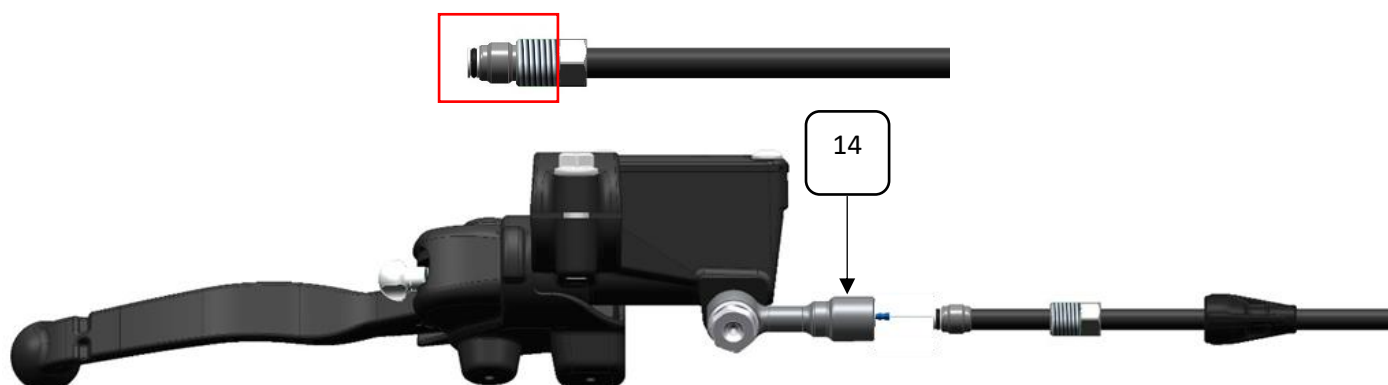
2. Unscrew the bushing (13) from the banjo (14) with a 8 mm open end wrench. Remove the hose from its seat by pulling it.



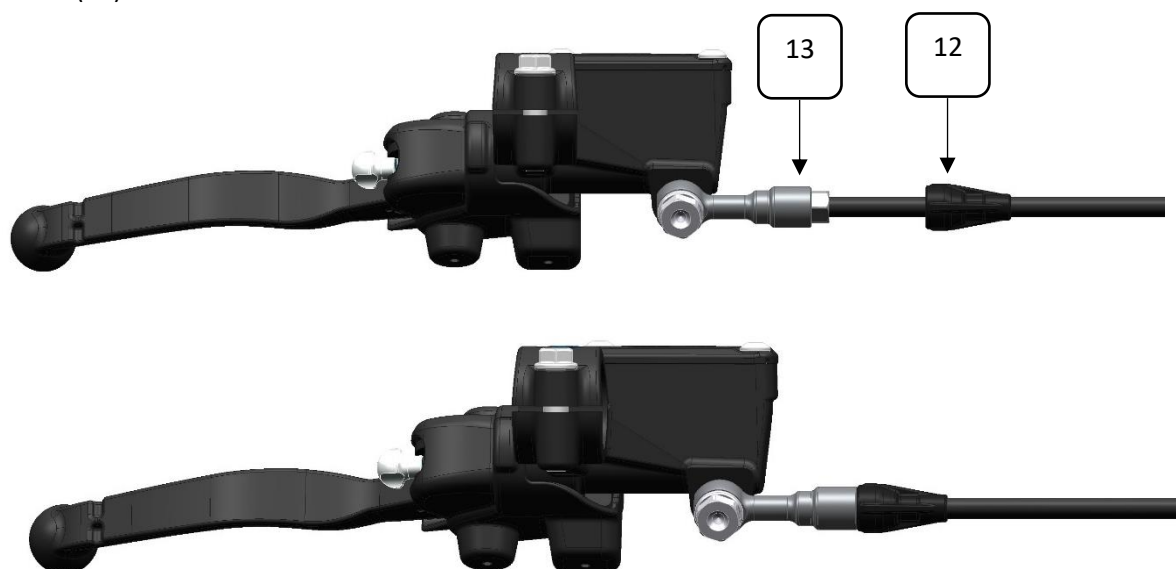
3. Cut off the part of hose no more necessary, saving the bushing (13) and the hose joint cover (12). Place the biconical bushing (15) that you can find in the kit. Place the pin with the preassemble O-Ring (16) in the hose.



4. Place a small amount of grease (**FORMULA GREASE COMPATIBLE WITH EPDM RUBBER**) on the bushing (13), biconical bushing (15) and the O-Ring (16) (red zone marked). Place back the hose in the banjo (14) until you feel a click, which means that the pin is placed correctly.



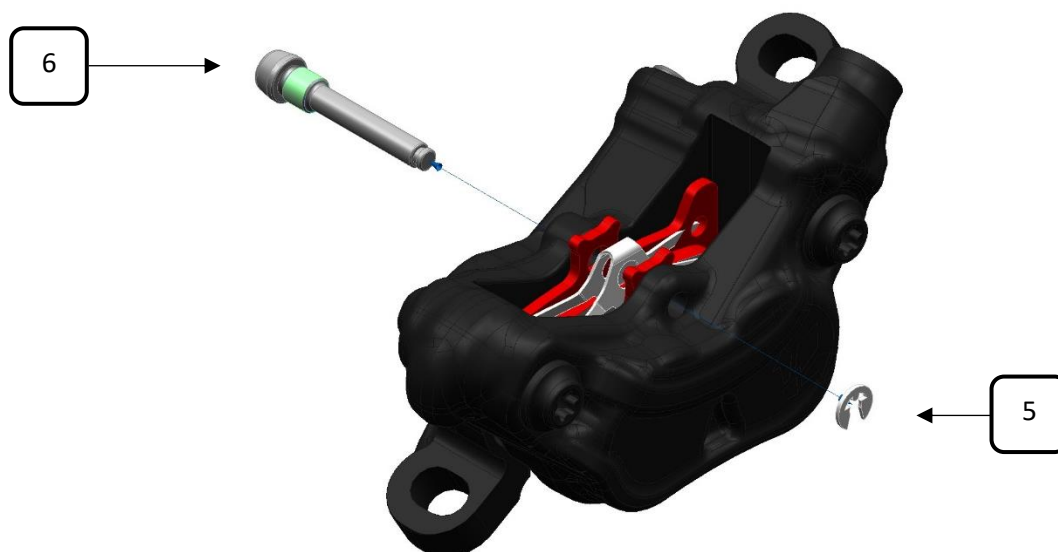
5. Screw the bushing (13) with a torque wrench with a 8 mm open head tool with 8 ± 0.5 Nm. Place the hose joint cover (12) back.



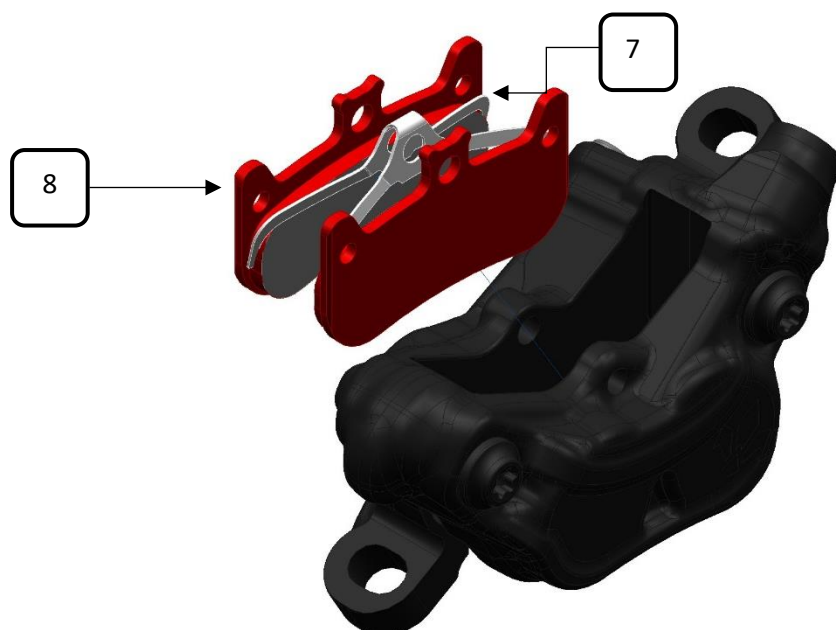
Maintenance

Brake pads replacement

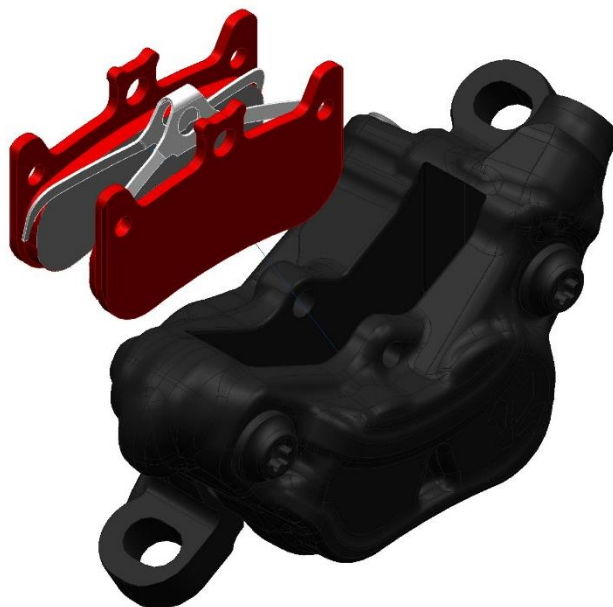
1. If necessary remove the caliper from the fork. Place the piston back in their seats using a screwdriver between the pads.
2. Remove the seeger (5) and unscrew the pint (6) with a 3 mm allen key.



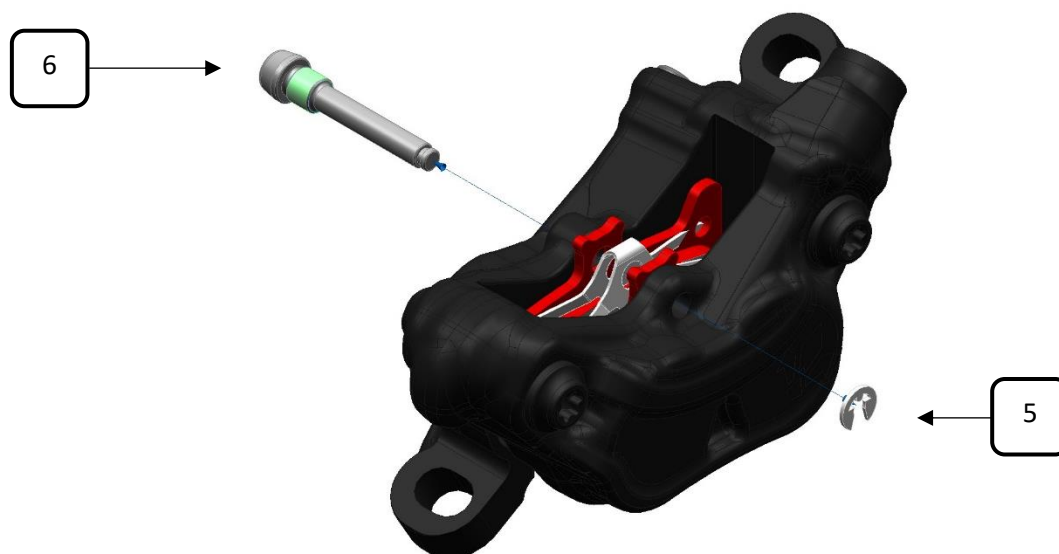
3. Remove the old pads (7) and the spring (8).



4. Place the new pads in the caliper




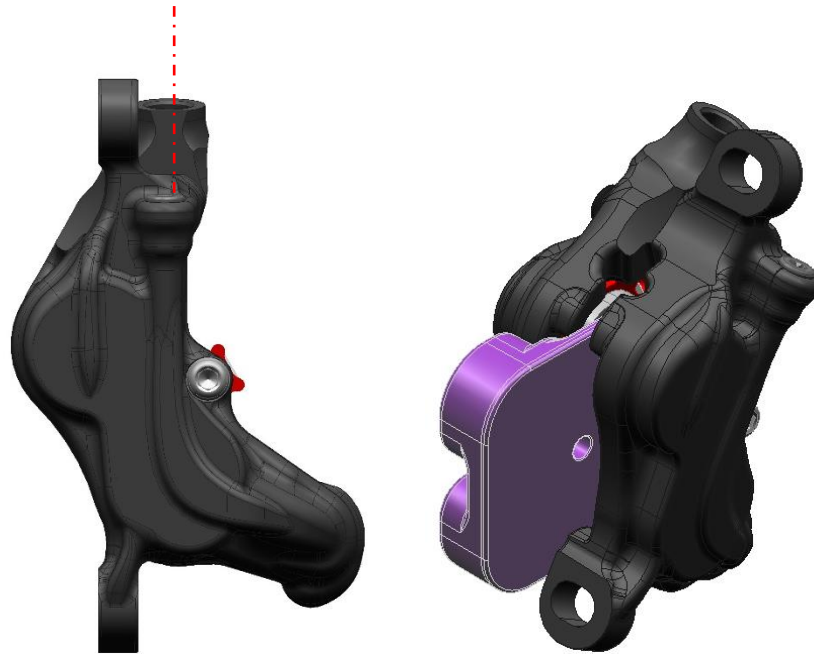
5. Tight the pin (6) with a torque wrench with HEX 33 mm tool with 2 ± 0.25 Nm torque. Place the seeger (5) in its seat.



6. In case the brake performance are not satisfactory, proceed with the bleeding process as shown in the paragraph "[Bleeding procedure](#)".

Bleeding procedure

1. For the bleeding process it's very important that the bleeding hole on the caliper is faced upwards. If it's necessary, remove the caliper from the bike, by removing the screw (3). Place the piston back in their seats using a screwdriver between the pads and place the pad spacer in between (you can use the brake rotor as well).
 During the process it's important to protect the pads with a cloth from any possible oil contamination.



2. Remove the bleeding screw (9) with a Torx T10 key.



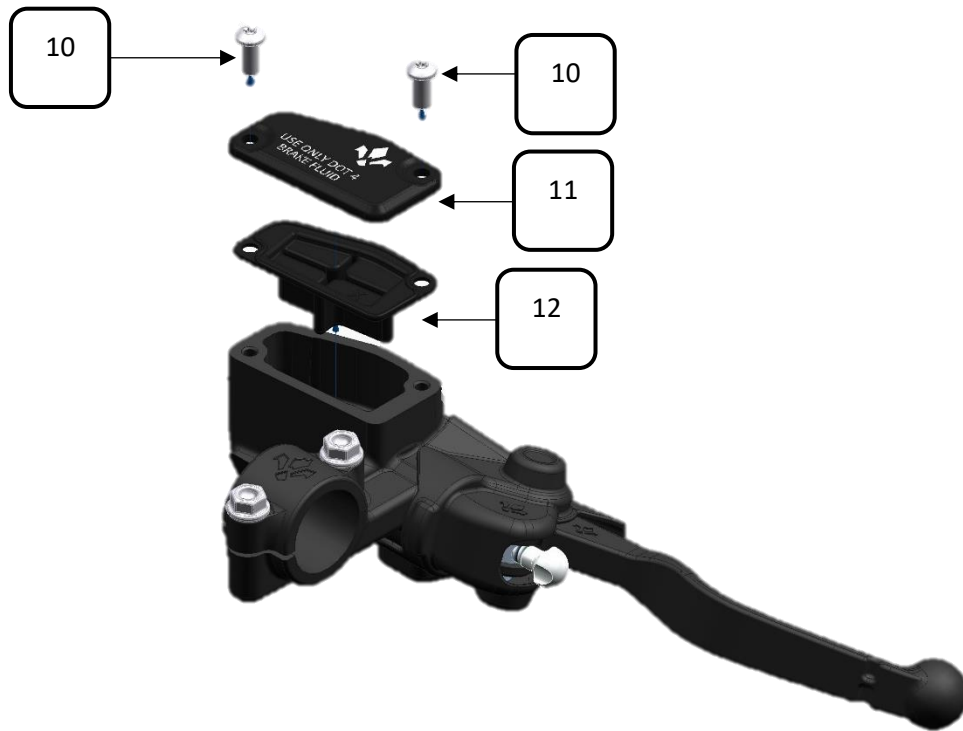
3. Rotate the master cylinder on the handlebar so that the reservoir is horizontal.



4. Fill the syringe with DOT4 oil, removing any bubbles that may be formed during the process. Place the syringe with the ;5 grub inn the hole where the bleeding screw (9) was placed on the caliper.



5. Remove the screws (10) with a Torx TX20 key. Open the cap (11) and remove the bladder (12) that is placed inside the reservoir.



6. Using the syringe remove the oil present in the master cylinder reservoir.



7. Press the syringe caliper side until the oil reaches half the height in the master cylinder reservoir.



8. Remove the old oil present in the master cylinder reservoir using a syringe.



9. Pour some new DOT 4 oil from a sealed bottle in the master cylinder reservoir.

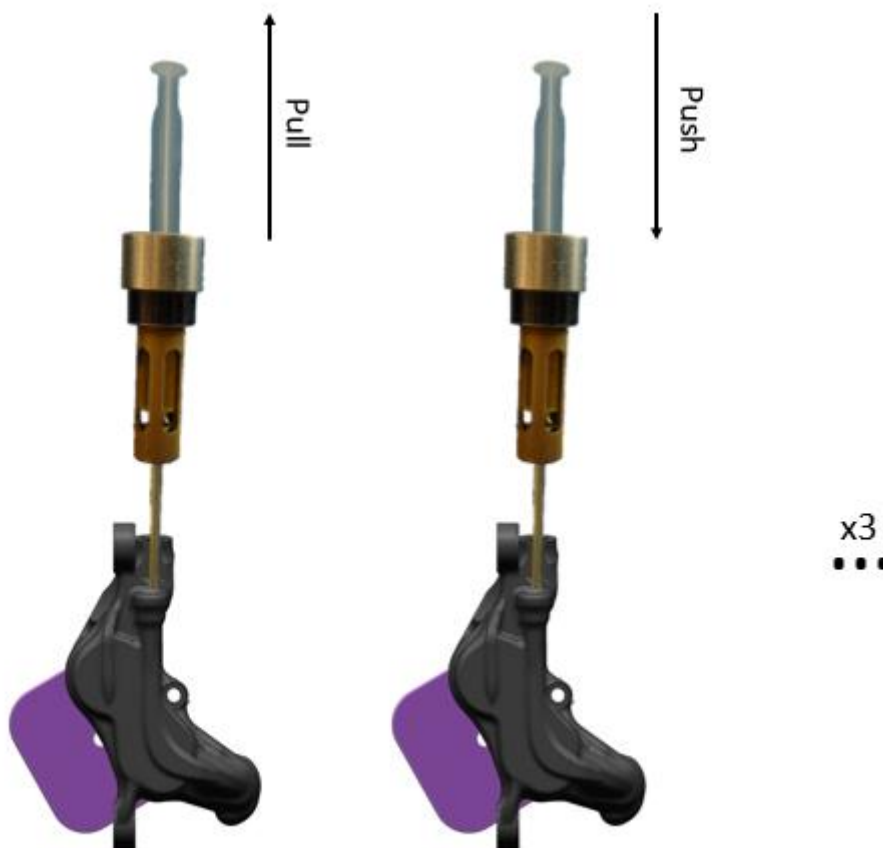


IMPORTANT



In the next steps, please pay attention to not let any air inside the circuit, checking that the oil level is always enough.

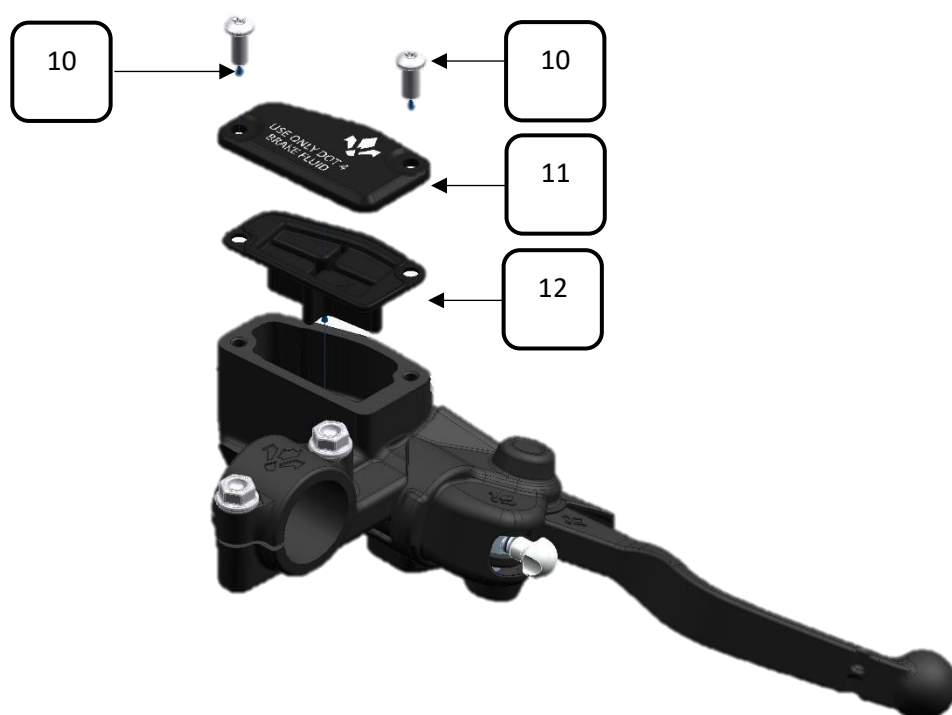
10. Fix the lever at the handlebar with a rubber band, so that the circuit is pressurized. Pull and push the syringe caliper side three times. Once finished, remove the rubber band and release the lever.



11. Pour some new DOT4 oil in the master cylinder reservoir until it reaches 3 mm from the superior edge.



12. Insert the bladder (12) back in the reservoir. Place the cap (11) and tight the screws (10) with a torque wrench with TX20 tool with 1.25 ± 0.25 Nm torque.



13. Remove the syringe on the caliper and tighten the bleeding screw (9) with a torque wrench with torx T10 tool with 1.25 ± 0.25 mm torque.



14. Clean the caliper and the mastercylinder from any oil residual with brake cleaner and wipe with a cloth.

<https://www.rideformula.com/it/>

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