

# Oro

**MANUALE ISTRUZIONI  
OPERATING MANUAL  
MANUEL D'INSTRUCTIONS  
BETRIESANLEITUNG  
MANUAL DE INSTRUCCIONES**

 **FORMULA**  
Power, Technology, Design.

## GENERAL RULES

This manual provides information for a safe and proper mounting and use of the braking system and for its rational maintenance. Constant compliance of its rules assures the braking system's best performances, duty economy, a longer lifetime and allows to avoid common causes of accidents which may occur during operation and maintenance.

**WARNING:** Follow carefully the SAFETYRULES for a proper use of the braking system.

In this handbook, within each paragraph, you will find the following safety notices:

**CAUTION:** Directs your attention toward unsafe practices which could result in damages to the equipment.

**WARNING:** Directs your attention toward unsafe practices which could result in personal injury or damages to the equipment.

## GENERAL SAFETY RULES

- FORMULA's brakes have been designed to be exclusively used on two-wheel vehicles driven by human propulsion. Any other application may result in personal injury and voids the warranty by raising the manufacturer FORMULA from any and all responsibilities for possible damages.
- The operator charged with the installation shall be skilled, know well the braking system and have read both this operating manual and the relevant enclosed documents from front to back.
- Do not introduce your hands close to or within moving parts; always use strong five-fingered gloves ensuring sensitivity and a powerful grip.
- Do not change the parameters of the braking system to obtain other performances than those established by the manufacturer.
- Before starting any mounting operations, carefully check for dangerous conditions of the working site. If too dark, use all available light sources and make sure they work properly before starting to work.
- Concentrate and take the due precautions before using components which could cause damages.
- When using the bike, it is advisable to wear an helmet and to drive with care and sense of responsibility.
- All extraordinary maintenance operations have to be carried out solely by personnel authorized by FORMULA.

## BRAKING SYSTEM SAFETY RULES

- The brake rotor has to be assembled on wheels conceived to be used with a disk brake. A wheel with spokes of insufficient section or with radially spoked wheels may collapse under the action exerted by the braking system and result in serious personal injury or accidents.
- Check the spoke tension and condition frequently. A damaged spoke may break suddenly, interfere with the braking system and result in serious personal injury or accidents. The bike frame or fork shall be suitable for mounting the braking system. Only in this case, the correct dimensioning of the supports and the suitable positioning of the elements which form it is assured.
- Do not install the braking system by using adapters or supports supplied by other manufacturers. This will void the braking system warranty immediately. Use only parts manufactured or recommended by FORMULA.
- THE BRAKING SYSTEM MAY NOT HAVE THE HIGHEST BRAKING EFFICIENCY WHEN NEW, THEREFORE A BREAK IN PERIOD AND LONGER DISTANCES SHOULD BE ALLOWED FOR UNTIL THE SYSTEM IS BROKEN IN.

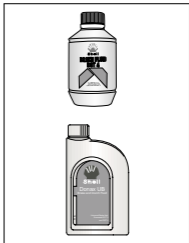
## FOREWORD

### Recommended lubricants and cleaning products

#### Hydraulic brake fluid

Use only DOT 4 or Shell's Donax UB® hydraulic brake fluid from sealed containers. Do not leave the container open over a period of time because this product absorbs the moisture in the air, which alters its physical characteristics.

Formula recommends to replace the fluid in the system every 2 years.

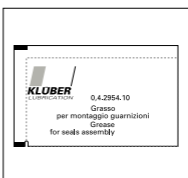


**WARNING:** Besides damaging the paintjob, the brake system's fluid is extremely hazardous if it comes in contact with the eyes or skin. In the event of eye contact flush with fresh water and seek medical assistance immediately.

## Grease

Use silicon grease for EPDM seals. Formula recommends: UNISILKON TKN 1011 by KLUBER.

**⚠ WARNING :** Use of inappropriate type of grease may compromise the integrity of the seals and cause damage to the system and therefore to the user.

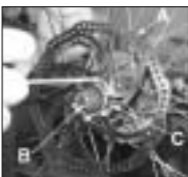


## 1 INSTALLATION

### 1.1 Installing the brake rotor

**⚠ WARNING:** Read the safety rules.

Place the disc brake **A** on the hub **B** of a pre-assembled wheel, paying attention to the rotation sense given by the arrow **C** engraved on the rotor's flange, and lock it in place with the specific **M5** screws supplied which have to be tightened in a crosswise fashion with a  $5,75 \text{ Nm} \pm 5\%$ . Accurately clean the rotor from any trace of grease or oil with isopropyl alcohol. Fit the wheel and fix it into place with the original fastening devices.



### 1.2 Installing the kit

Place the pump body on the bar in the desired position and lock it in place with the screw **(D)** using a tightening torque of  $2,5 \text{ Nm} \pm 5\%$ . The two screws have to be tightened alternately and at the same distance. The pump supplied can be fitted either on the right or the left and is reversible.



If the hose length needs to be adjusted see paragraph 2.3, if not proceed with the positioning of the hose on the bicycle, bearing the following in mind:

- the hose needs to be attached to the fork or frame in a way that does not interfere with the free flow of fluid through the hose;
- the hose should not make curves smaller than a 40 mm diameter and should not interfere with any moving part of the bicycle;

**⚠ WARNING :** An incorrectly mounted tube or a tube that is in contact with moving parts of the bicycle, can eliminate the braking performance and cause serious accidents.

To adapt the frames or forks to the various diameters of brake rotors available, FORMULA supplies different adapters which can be mounted between the fork or frame and the brake caliper.

**⚠ CAUTION:** Only a correct mounting of the system and its various support elements ensures the safety of the cyclist and the exceptional performance of FORMULA disk brakes.

Fit the calliper to the fork, proceeding as follows:

#### STANDARD INTERNATIONAL COUPLING

- Fit the adapter to the calliper, tightening the fastening screws slightly.
- Fix the adapter and calliper to the fork, tightening the screws to  $9 \text{ Nm} \pm 5\%$  and applying weak Loctite if necessary.



- Pull the brake lever to stabilise the calliper and at the same time, tighten the screws fastening the calliper to the adapter.



#### POST MOUNT COUPLING

- Fit the adapter to the calliper, tightening the fastening screws slightly.
- Pull the brake lever to stabilise the calliper and at the same time, tighten the screws fastening the calliper to the fork.

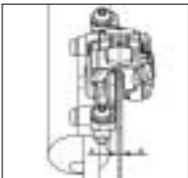


**⚠ WARNING:** Never install the Formula brake system with adapters that are not supplied by Formula. This will void the warranty. To avoid serious accidents use only parts made by Formula and mounted on specially preset forks and frames.

Turn the wheel slowly, making sure that the disk is centred on the pads and that none of the parts comes into contact with the others.

Perform 2 or 3 test braking actions to bring the pads to the correct distance from the disk.

**⚠ WARNING:** The brake system needs a break in period. FORMULA suggests to brake at least a hundred times before considering the system broken in and fully efficient.



## 2 OPERATING INSTRUCTIONS

### 2.1 Lever reach adjustment

To adjust the lever reach position (distance **E**) to meet personal requirements, it is necessary to use a 2-mm Allen wrench on the adjustment screw, as shown in the figure.



## 2.2 Loadless travel adjustment

To adjust the loadless travel of the lever to meet personal requirements, turn the knob shown in the figure.

**WARNING:** while adjustment is taking place, the lever must be in the idle position.



## 2.3 Hose length adjustment

Loosen the fastening screw **F** on the pump, using an 8-mm wrench and being careful of the two O-rings on the banjo coupling.

After identifying the part of the tube to be eliminated, make a precise cut using the relevant Formula tube cutter (code no. FD P034-00) or if you do not have this, use a sharp cutter. Taking care not to allow any oil to leak, fit the new threaded bushing **G** and new biconic **H** to the tube.

Next, insert a new plug **I** into the end of the tube, pressing firmly so that it adheres perfectly to the edges of the tube itself.

Refit the banjo coupling **L** onto the pump body, using the screw **F** and taking care to insert the O-rings correctly into the grooves of the coupling, tighten the screw with a torque of 8 Nm.

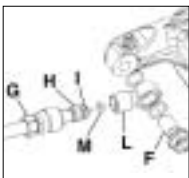
Apply a little grease to the thread on the banjo coupling **L** and insert the O-ring **M** (supplied) on the pipe complete with plug.

Press the tube in the direction of the pump, making sure that the plug comes into contact with the relevant seating on the banjo coupling **L**; at the same time, bring the biconic **H** and bushing **G** close to the banjo coupling **L** and tighten with an open 8-mm wrench and a torque of 5 Nm. Make sure that the tube has been installed correctly, pulling it forcefully outwards and then pull the lever sharply and check that there are no leaks close to the joint.

**WARNING:** Be careful while using a razorsharp cutter or blade. Do not use blades or saws that could deform or lacerate the hose in such a way to cause loss of fluid or inefficiency of the system. AN UNNECESSARILY SHORT HOSE NOT ONLY CAUSES STEERING PROBLEMS but can also cause strain on the hose which may result in its disconnection from the caliper or pump lever. Using the correct length of the hose is vital to achieve maximum efficiency of the system.

**WARNING:** Should biconical bush **H** not be tightened enough, as prescribed, it might come loose while riding. This causes hose detachment and consequently a dangerous situation for the rider and for anyone found nearby.

**CAUTION:** Put a small quantity of grease on the connector's thread.



## 2.4 Air bubble removal

These operations, if necessary, must be performed after completing hose adjustment.

- Place the pump in an upright position and remove the screw, as shown in the figure.

- Insert the syringe, screwing it into the screw hole and making sure to insert 10 ml oil into it.

- With the syringe always steered upward slowly suck out all the air contained in the pipe. The presence of air in the pipe is evidenced by the bubbles coming up through the fluid head contained in the syringe;

- Release the syringe piston and repeat the procedure as many times as necessary until you have removed all the air from the pipe.

**WARNING:** before removing the syringe, press lightly on the plunger to make sure that the barrel fills completely.

- Remove the syringe from the hole and tighten the screw.

**WARNING:** be careful of any oil spillage; clean away oil carefully using the relevant cloth.



## 3 MAINTENANCE

**WARNING:** read the safety rules.

Periodically clean the caliper in relation to the bike use, the route length, and the weather conditions using a biodegradable degreaser suitable for the caliper. Carefully clean all moving parts.

**WARNING:** ISOPROPYL ALCOHOL is recommended to clean the disc brake. The use of any other product may be hazardous to the user.

**WARNING:** Do not touch the rotor right after its use as it might cause you severe injury.

## 4 PAD REPLACEMENT

- Remove the o-ring and unscrew the fastening pin from the pads.

- Remove the pads and the spring.

- Carefully clean the pistons inside the calliper, using a brush soaked in spirit.



- Temporarily put the worn pads back in position and, using a screwdriver to push down between the pads, push the pistons fully back inside the calliper.
- Remove the worn pads.
- Insert the new pads with the spring.  
**NOTE:** the pads are identical and can be placed on the left or right side.
- Refit the o-ring and tighten the pin fastening the pads in place.





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