



FORMULA

4R Racing
XC

EXTREME
FR-DH

FORMULA 4R

MANUALE ISTRUZIONI

OPERATING MANUAL

MANUEL D'INSTRUCTIONS

BETRIEBSANLEITUNG

MANUAL DE INSTRUCCIONES

LIMITED WARRANTY



Congratulations on your purchase of this genuine Formula product. If any component of the this new Formula product (hereinafter referred to as "warranted item") is found to be defective in materials or workmanship within the terms and conditions of this Limited Warranty (the "Agreement"), the defective component will be repaired or replaced, at the option of Formula (hereinafter referred to as "Formula"), free of charge, within thirty (30) days after receipt of the product by Formula.

- 1. NOT COVERED.** This warranty does not cover damage resulting from accidents, alteration, neglect, misuse or abuse, contamination, lack of reasonable or proper maintenance, corrosion, improper assembly, repairs improperly performed or replacement parts improperly installed, use of replacement parts or accessories not conforming to Formula's specifications, use of component parts not manufactured or supplied by Formula, modifications not recommended or approved in writing by Formula, or normal wear and deterioration occasioned by the use of the product. This warranty also does not cover any expenses related to the transportation of the warranted item to or from an authorized Formula Service Center, risk of loss of the item while in transit, labor costs to remove the product, or compensation for inconvenience or loss of use or profits while the product is not in service.
- 2. PURCHASER.** This warranty is made only with the original purchaser of the product and does not extend to any third parties. The rights of the Purchaser under this warranty may not be assigned.
- 3. TERM.** This limited warranty shall apply only in those instances where the defect in material or workmanship appears within twelve (12) months of the date of purchase of the warranted items by the original Purchaser. This term shall not be extended for any items repaired or replaced under warranty.
- 4. ENTIRE AGREEMENT.** This warranty supersedes any and all oral, express, implied or written warranties, statements or undertakings that may previously have been made, and contains the entire agreement of the parties with respect to the warranty of this product. Any and all warranties not contained in this Agreement are specifically excluded.
- 5. DAMAGES.** Except as expressly provided by this warranty, Formula SHALL NOT BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES ASSOCIATED WITH THE USE OF THE WARRANTED ITEM OR A CLAIM UNDER THIS AGREEMENT, WHETHER THE CLAIM IS BASED ON CONTRACT, TORT OR OTHERWISE. The foregoing statements of warranty are exclusive and in lieu of all other remedies. Some states do not allow the exclusion or limitation of incidental or consequential damages, so thus limitation or exclusion may not apply to you.
- 6. DISCLAIMER.** ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ALL IMPLIED WARRANTIES ARISING FROM A COURSE OF DEALING, USAGE OF TRADE, BY STATUTE OR OTHERWISE, IS HEREBY STRICTLY LIM-

TED TO THE TERM OF THIS WRITTEN WARRANTY. This Agreement shall be the sole and exclusive remedy available to the Purchaser with respect to this purchase. In the event of any alleged breach of any warranty or any legal action brought by the purchaser based on alleged negligence or other tortuous conduct by Formula , the Purchaser's sole and exclusive remedy will be repair or replacement of defective materials as stated above. No dealer and no other agent or employee of Formula is authorized to modify, extend or enlarge this warranty. The performance of any warranty service under this Agreement is not an admission or agreement that the design or manufacture of a product is defective.

7. **PROCEDURE.** In the event of a defect covered by this warranty, the purchaser should contact an authorized Formula Service Center or :

To be honored, claims must be submitted within the twelve (12) month warranty period and within thirty (30) days of discovery of the defect or nonconformity. The determination whether the defect is covered by this warranty is within the sole discretion of Formula. Formula reserves the right to discontinue products and to change specifications for existing products at any time without notice and shall not be obligated to incorporate new features into products previously sold, even if those products are returned under a warranty claim. Formula may replace defective parts with similar parts of similar quality in the event that identical parts are unavailable

The purchaser must obtain advance authorization in writing before returning any product to a Formula Service Center for warranty inspection. A return authorization number will be issued and must conspicuously appear on the outside of the product's packaging. The issuance of an authorization number does not constitute acceptance of the claim, which will be evaluated by the Service Center upon its inspection of the product.

The product should be securely packed to prevent damage during shipment and must be accompanied by a letter specifying or including the following items of information:

- a. dated receipt or other proof of date of retail purchase;
 - b. a copy of this warranty;
 - c. Formula part number;
 - d. detailed description of the problem experienced with the product, including a chronology of efforts made to correct the problem;
 - e. identification of the components used in conjunction with the product;
 - f. estimate of product usage: (i.e. accumulated time in service); and
 - g. your name, address, and written authorization to ship the repaired product back to you freight collect ("C.O.D.").
8. **OTHER RIGHTS.** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.
9. **APPLICABLE LAW.** Any disputes arising out of this Agreement or the use of this product will be governed by the laws of the country of Italy and will be decided by the Courts of Prato Italy.
10. **WARNING.** This warranty is subject to the Italian laws.



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S.1 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 SAFETY RULES 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.*

S.2 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.*

S.3 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.**



Fig. 1

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.

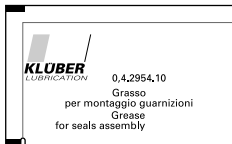


Fig. 2

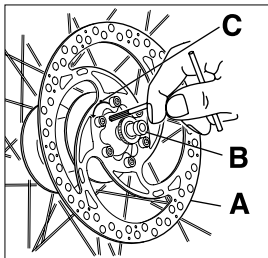


Fig. 3

1.0 INSTALLATION

1.1 Installing the brake rotor

WARNING: read the safety rules

Place the disc brake **A** (fig. 1) 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.

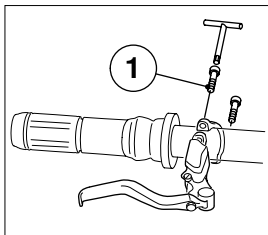


Fig. 4

1.2 Installing the kit

Proceed followingly:

- Place the pump body on the bar in the desired position and lock it in place with the screw (1) using a tightening torque of $2,5 \text{ Nm} \pm 5\%$. The two screws have to be tightened alternately and at the same distance.

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;
- for easy assembly of the hoses on the bicycle, formula has developed a custom made hose holder zip tie that can be ordered as an accessory.

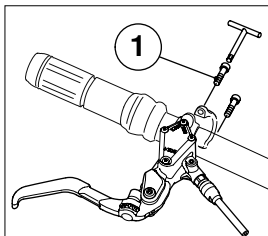


Fig. 4a

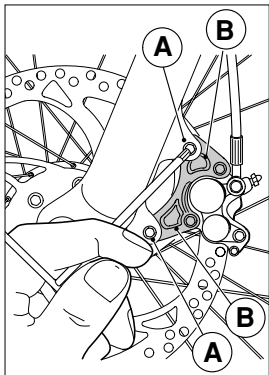


Fig. 5

WARNING

An incorrectly mounted hose or a hose that comes in contact with moving parts of the bicycle, can significantly degrade 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 it's various support elements ensures the safety of the cyclist and the exceptional performance of FORMULA disk brakes.

Join the gripper to the yoke (or the frame) by using the screws (A) supplied.

If the screws are too short because of the parts used or any shims interposed, replace them with sufficiently long ones having the same characteristics so that at least 7 mm of the gripper threads are used.

-First apply a light adhesive on the screws and fix at 9Nm \pm 5% torque.

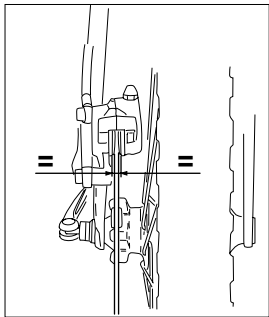


Fig. 7

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.

Mount the wheel and lock it in place with the quick release fix it with the fasteners; turn it slowly to check that the rotor is in the center of the brake-pads and none of the pads rub on the rotor (fig. 7).

Before riding the bike squeeze the brake lever 2 or 3 times in order to bring the pads at the right distance from the rotor.

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.

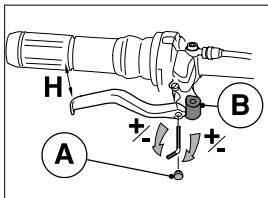


Fig. 8

2.0 OPERATING INSTRUCTIONS

2.1.1 Lever reach adjustment XC

To adjust the lever position it is necessary to remove the locking knob **A** (Fig.8) and with a TORX® -T15 wrench act on the internal screw of the lever by regulating the distance **H** according to your preferences. Lock the knob in place again after completing the adjustments.

WARNING

Lever adjustments should be made one time only when mounted on the handlebar for the first time.

WARNING

If damaged, it is vital to change the dust cover. Failure to observe this, results in grave danger for the user.

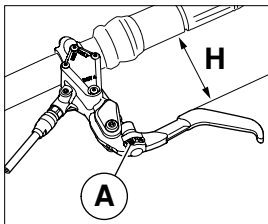
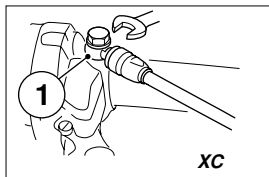


Fig. 8.1

2.1.2 Lever reach adjustment FRDH

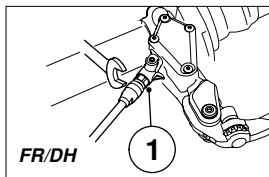
To adjust the lever position, manually turn the knob **A** (Fig. 8.1) and adjust the **H** distance according to the user's requirements.



XC

2.2 Hose length adjustment

Remove fitting 1 (fig.9) by using a 8 mm open-end wrench. Cut the length of tube to be eliminated and use a utility knife to remove all the parts from fitting 1.



FR/DH

WARNING

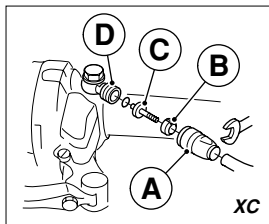
Be careful while using a razorsharp cutter or blade. Do not use blades or saws that could deform or lacerate the hose in such a way to cause loss of fluid or inefficiency of the system.

Fig. 9

VERSION XC

Do not allow oil to come out and attach a new fitting **A**, a new bi-cone **B** and a new pin **C** to the tube.

Apply some grease to bi-cone **B** and to the thread. Screw the part on eyelet fitting **D**. Install the entire part on the pump.

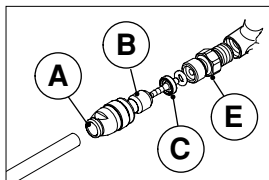


XC

VERSION FR/DH

NOTE: two versions of the FR/DH pump can be provided: one with an eyelet fitting and the other with a straight fitting.

With the FR/DH version with eyelet fitting, adjust the tube and the air vent as recommended for the XC version.



FR/DH

Fig. 9/1

With the RF/DH version with straight fitting, perform the same procedure as above. Attach straight fitting **B** (fig. 9/1) to the pump.

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.

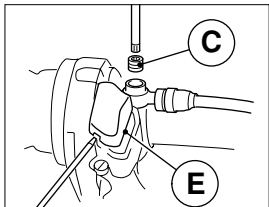


Fig. 10

WARNING

Should biconical bush B (Fig 8) 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.

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

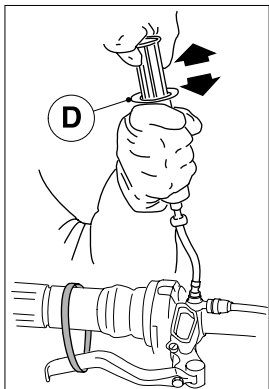


Fig. 11

2.3 Air bubble removal pump lever XC

Foreword

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

- Use a screwdriver introduced in the specific slots to loosen and remove cover E (Fig. 10).
- Loosen the grub screw C (Fig. 10) and remove the O-ring from the coupling screw head having care not to damage the particularly small-sized O-ring.
- Place the syringe D (Fig. 11) filled with 10 ml of oil on the coupling and screw it firmly in place.
- Pull the lever and lock it to the handle bar by means of an elastic, as shown in figure 12.
- With the syringe always steered upward slowly suck out all the air

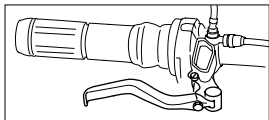


Fig. 12

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 it is necessary to release the pump lever that had previously been locked (Fig. 12).

Check out the quantity of oil contained in the membrane inside the pump and if necessary slightly press on the syringe piston to fill up the membrane.

Attention, an excessive pressure may damage the membrane.

- Remove then the syringe from the connector.
- Reassemble the grub screw and the O-ring paying the latter special attention.

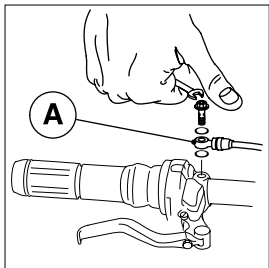


Fig. 13

Remark:

To invert the brake controls procede as follows:

- Detach connector A (fig 13) from its pump and invert both hoses. Reassemble by proceeding as in 2.3.

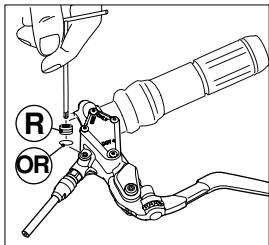


Fig. 14

2.3 Air bubble removal

This operation must be carried out after adjusting the connection tube.

- Unscrew the dowel **R** (Fig. 14) and remove the **OR** with great care.

- Fit the syringe **S** (Fig.15) and screw it to the pump after checking that the oil amount in the syringe is 10ml.

- Squeeze the lever and fix it to the handlebar with an elastic band as shown in the figure.

- Keeping the syringe in an upwards position gently suck the air upwards several times that is present in the tube that is visible by the bubbles that float up in the column of fluid that is in the syringe.

- Release the plunger and repeat the operation several times until the air is completely eliminated.

- Remove the syringe from the pump.

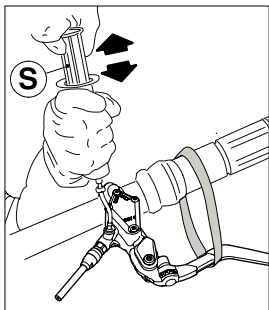


Fig. 15

WARNING: before removing the syringe it is necessary to free the pump lever that has been previously fixed, and then press lightly on the syringe plunger.

Refit the dowel **R** and the **OR** gasket with great care.

N.B.: To invert the brakes control, follow the steps below.

- Disconnect the **S** union from the relative pump and invert the two pipes. Then refit taking care to bleed any air bubbles

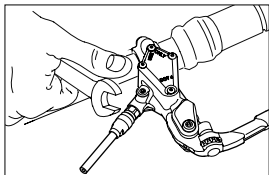


Fig. 16

3.0 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.

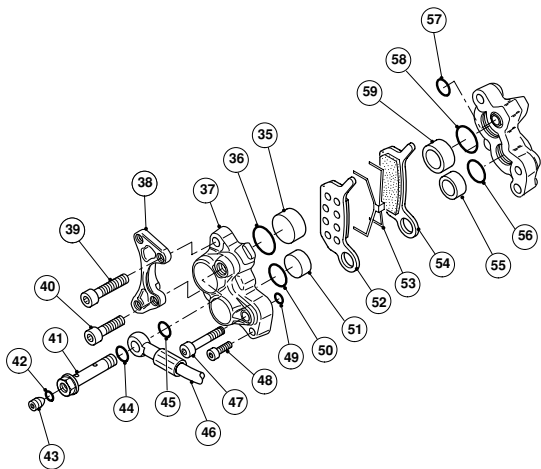
CAUTION:

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

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

3.1 Changing the brake fluid

Periodically, in relation to the bike use it is necessary to entirely change the system's brake fluid. This operation must be carried out only by personnel authorized by Formula.



PINZA FRENO

Calipar

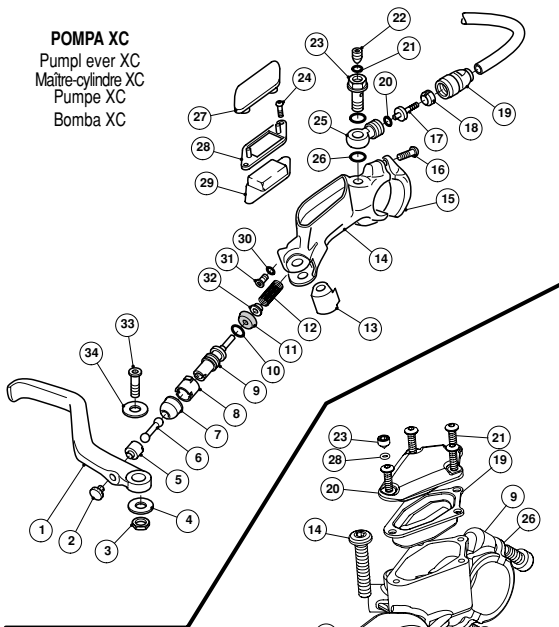
Etrier

Bremssattel

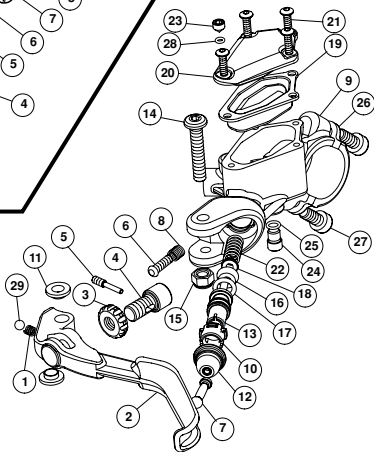
Pinza

POMPA XC

Pumpl ever XC
Maître-cylindre XC
Pumpe XC
Bomba XC



POMPA FR/DH
Pumpl ever FR/DH
Maître-cylindre FR/DH
Pumpe FR/DH
Bomba FR/DH





CERTIFICATO DI GARANZIA
WARRANTY CERTIFICATE

da spedire in busta chiusa a
to be returned with closed envelope to :

FORMULA

Via Erbosa n° 63
59100 Prato (ITALY)

CERTIFICATO DI GARANZIA

WARRANTY CERTIFICATE

Condizioni di Garanzia / Warranty Conditions

Si approvano espressamente le clausole, delle condizioni di garanzia, 9) Foro competente, 10) Scelta della legislazione in deroga degli art. 1341-1342 cod. civ.

The point 7 and 8 are expressly, according to Art. 1341-1342 civil code.

Nome e Cognome/Name

Indirizzo/Address

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Stato/State

Cap/Zip

Tel./Phone

Età/ Age

Data di acquisto/Date Purchased

Mod.

Firma/Signature

Timbro del rivenditore/Retailer's stamp

Numero di serie/Seriel number

Da compilare e spedire/To be filled in and sent



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