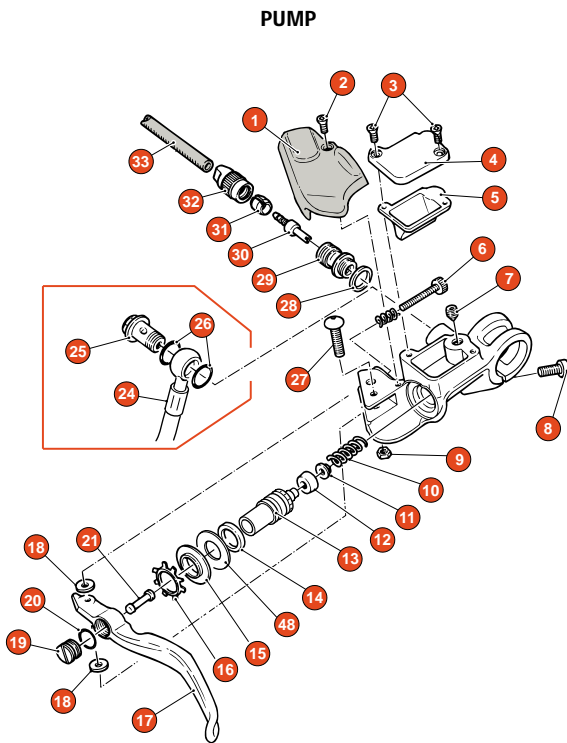


The **Evoluzione** brakes are available in three models: Evoluzione 98, Evoluzione 99 and Evoluzione 9.5.

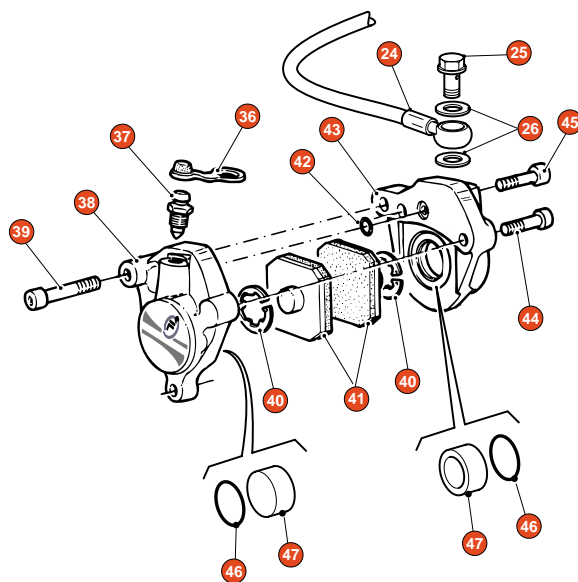
The difference between these brake models is given by the pump piston: the pump piston of model Evoluzione 9.5 has a diameter of 9,5mm, the other two models have a piston with diameter of 11mm. Evoluzione 99 is exactly the same as model 9.5 (apart from the differences above mentioned), whilst the pump '98 is provided with a piston having a different shape, and the tube outlet is parallel with the handlebar rather than being inclined towards the front. By using specific adapters (placed between the caliper and fork/frame), it is possible to assemble larger disks. The various interventions per each model are described in this manual.

LIST OF TOOLS:

- TORX T25 spanner (disk screws);
- 4mm hexagon wrench (pump collar/caliper coupling screws);
- 5mm hexagonal spanner (pincer attachment screw);
- Small star screwdriver (pump tank cover screws);
- Calipers (replacement of hydraulic pipe union);
- Cutter (hydraulic tube cutter);
- 8mm open end wrench (reviewable tube stop nut/caliper breather/bleeder syringe union/caliper tube fixing screw/single-acting valve tightening);
- 10mm open end wrench (tightening of straight sealed tube nut);
- Screwdriver (pads removal/adjusting of lever distance from handlebar);
- Pliers for inner snap rings (pads snap rings);
- 3mm hexagon wrench (pump bleeding assembly);
- 2mm hexagon wrench (I.S. caliper pads adjusting dowels);
- 2.5mm hexagonal spanner (pump lever screw);
- FD40007-20 pump piston pack fixing tool.



BRAKE PINCER



INTRODUCTION

Our disc brakes with hydraulic controls have been designed to obtain the maximum in braking performance level, reliability, safety and lightness of components. To maintain these characteristics it is necessary that the correct sized brakes are installed on the bicycle bearing in mind the greater pressure that these brakes transmit. Badly installed or badly maintained brakes can diminish the braking efficiency and can cause dangerous situations for the safety of the cyclist. This manual has been produced to instruct the personnel who are specialised in the assembly, reassembly and maintenance procedures of these brakes and also as information for the user about the general notes and the safety norms to follow in case of interventions by the user.

GENERAL NOTES:

- It must be noted that any maintenance or repair intervention carried out during the guarantee period that do not respect the suggested advice of this instruction manual will cancel the guarantee forthwith. The use of non-original spare parts will also cancel the guarantee.
- Utilise only the special tools; do not substitute with any other equipment that could because it could irreparably ruin the component. All tools must be in good condition.
- Utilise cleaning and lubricating products that are preferable biodegradable and do not dispose of the used fluid in the environment.
- At every substitution, the brake fluid must always come from new containers
- Always operate in a clean place and equipped with adequate work clothing as prescribed by the safety norms.
- Always keep a first aid kit available.

⚠ ATTENTION: The fluid used in the braking system, other than damaging painted parts is also dangerous if it comes into contact with the eyes or the skin. In case of accidental contact, wash the affected parts abundantly with running water.

GENERAL NORMS

This technical information sheet is intended as a guide for the correct and safe use and assembly of the braking system and for its reasonable maintenance. Constantly observing the norms indicated in this manual guarantee the best performance, use and long life of the braking system and avoids the more common causes of accidents that could occur during use or maintenance. The following symbols are utilised in every paragraph in this manual:

⚠ WARNING: The inobservance of the advice quoted could cause damage to the equipment.

⚠ ATTENTION: The inobservance of the advice quoted could cause damage to either equipment or the user.

⚠ ATTENTION: Carefully read the safety norms so as to guarantee the correct use of the braking system.

GENERAL SAFETY NORMS

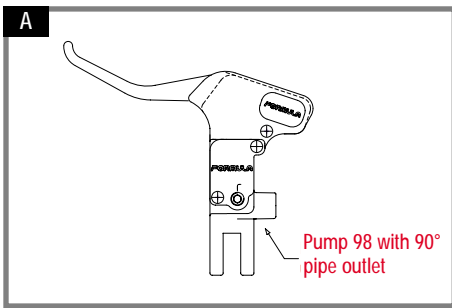
- To carry out correctly all the procedures of removal, reassembly and overhaul it is necessary to have an adequate technical specialisation, a perfect knowledge of the braking system and to have completely read this technical information sheet.
- Do not place the hands near or into moving

parts. Utilise five-finger robust gloves that do not reduce the sensitivity and the strength of grips.

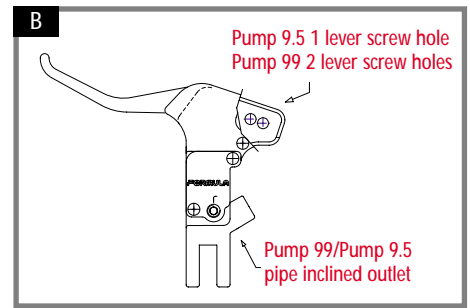
- Instruct the user to not alter the parameters of the braking system to obtain a performance different to the performance foreseen by the design and testing department of Formula.
- Before starting assembly operations examine the work area for possible dangerous conditions. Do not work in the dark – use as much lighting as possible and check that they are efficient.
- Concentrate on making sure that all precautions have been taken before starting any work so that the use of the components will not cause damage.

SAFETY NORMS OF THE BRAKING SYSTEM

- The brake disk must be assembled on wheels suitable for the specific use. A wheel with unsuitable or inadequate spokes may break under the braking force of the braking system, thus causing serious damages and accidents.
- Frequently check the tension and the condition of the spokes. A damaged spoke could break and interfere with the braking system thereby causing serious damage or accidents.
- The frame and the fork of the bicycle must be predisposed to the assembly of the braking system. It is only in this way that the correct dimensions of the supports and the correct positioning of the components can be guaranteed.
- THE BRAKING SYSTEM NEEDS A CERTAIN PERIOD OF SETTLING DOWN TO OBTAIN MAXIMUM EFFICIENCY.



The two figures on the sides show the main differences between the EVOLUZIONE '98, EVOLUZIONE '99 and EVOLUZIONE 9.5 models

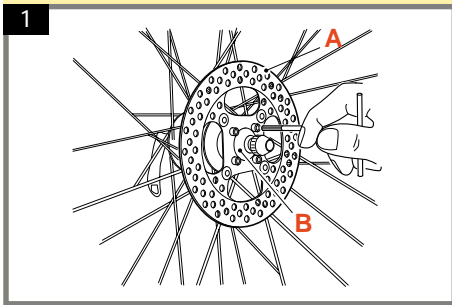


INSTALLATION

1: Brake disc assembly

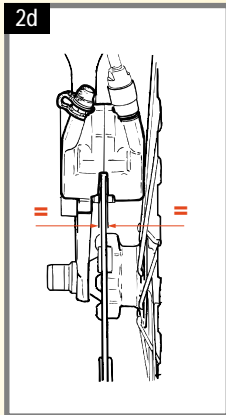
⚠ ATTENTION: Consult the safety norms.

Put the brake disk **A** on the hub **B** of an assembled wheel, with the seat of the screw head facing the external part. Cross tighten the M5 screws with torque **5.75N-m (50.61 in.lbs.) ±5%**. Carefully clean the disk with ethyl alcohol to remove any traces of grease or oil.



2d: Mount the wheel and fix it with the original fixing nuts, rotate it slowly and check that the disc is centralised between the pads and that no parts come into contact.

For the version with adjustment, it is necessary to act on the dowels outside the caliper to adjust the starting position of the pads.



VERSION WITHOUT ADJUSTMENT:

If the lever stroke is too long, remove the wheel and brake 1-2 times without the disk. Refit the wheel and check that the brake stroke is as desired, otherwise repeat the procedure using a screwdriver.

If the pads are too close to each other, space them using a suitable screwdriver.

- screw **F** to bring the small piston in the right position, as it may move during the lever adjustment operations thus clogging the hole between the circuit and the tank, or the play between lever and piston may become excessive.

⚠ WARNING: make sure that the above adjustment does not change the starting position of the small piston; it is recommendable to always leave a small clearance between the parts F-G.I.

⚠ WARNING: the pump is adjusted only the first time according to the user's needs, when it is mounted on the handlebar; for the pump, it is only necessary to check and, if necessary, top up the oil level as the pads get more and more worn.

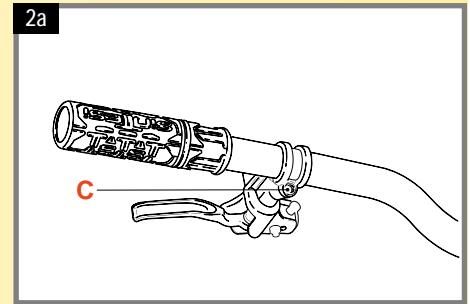
2a: Kit installation

Proceed as follows:

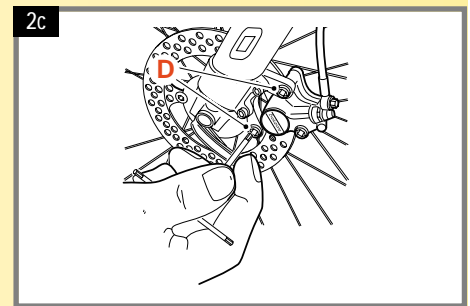
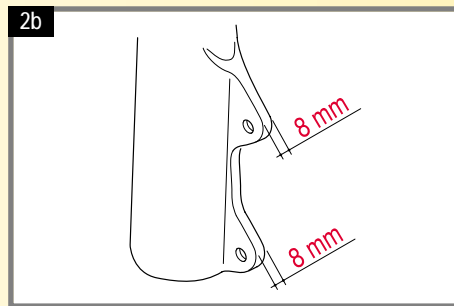
- insert the tube body in the handlebar and turn it to the desired position. Lock with screw **C** with tightening torque **6 N-m (52.81 in.lbs.) ± 5%**.

If the tube needs to be adjusted, see section 5a "Tube length adjustment", otherwise place it on the bicycle following the instructions below very carefully:

- The route of the tube must adhere to the fork or to the frame and must be fixed without excessive tightening to avoid obstruction of the internal passage of brake fluid;
- FORMULA supplies a zip tube fastener to facilitate the fixing of the tube.
- The tube must not form a curve of less than 20mm and must not come into contact with moving parts of the bicycle;



⚠ ATTENTION: A badly-positioned brake tube or a brake tube that comes into contact with moving parts of the bicycle can impede the braking action and thereby cause serious accidents.



2b, 2c: FORMULA supplies appropriate supports to mount between the frame/fork and the brake pincer to adapt the frame/forks to different available brake discs.

⚠ ATTENTION: If the thickness of the relative attachment on the fork or frame is less or more than 8mm it will be necessary to substitute the fixing screws with screws of the correct length.

⚠ WARNING: Only a correct assembly of the braking system and its relative supports guarantees the safety of the cyclist and the exceptional performance of the FORMULA Brakes.

Assemble the caliper to the fork or frame using the screws **D** supplied with the kit.

- If necessary, apply a light thread locking compound and tighten the screws with torque **9N-m (79.22 in.lbs.) ±5%**.

⚠ WARNING: never mount the FORMULA calipers using adapters or supports supplied by other manufacturers, as this will invalidate the guarantee. To avoid serious accidents, only use FORMULA spare parts assembled to predisposed forks and frames

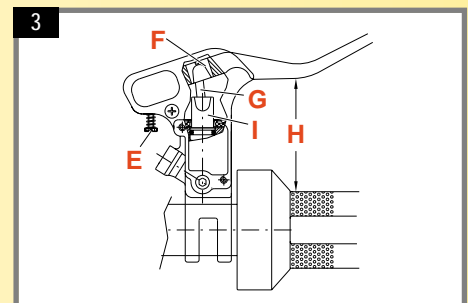
INSTRUCTIONS FOR USE

3: Adjusting lever position of POMPA '99 and POMPA 9.5

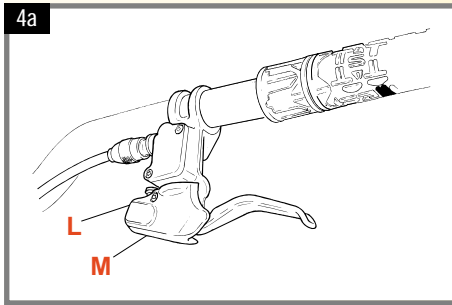
- Remove the lever cover **M** by unloosening the screw **L** (see fig. 4a);

Perform the adjustment via the two screws **E** and **F**:

- Screw **E** to adjust the lever starting position to the handlebar (**H**);



4a: Adjusting lever position of PUMP '98



4a:
The control lever is provided with two adjusting screws to adjust the distance between the lever and the handlebar, and the starting point of the piston stroke. Proceed as follows:

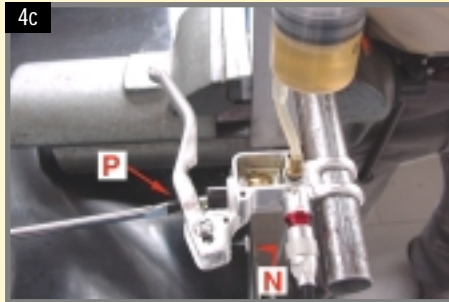
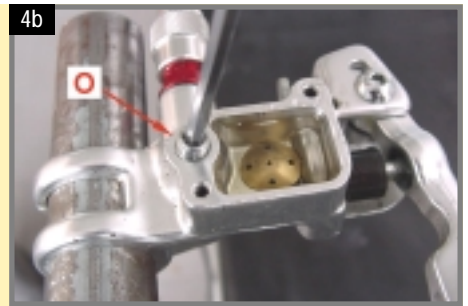
- remove the external guard M by unloosening the screw L;

4b, 4c:

- act on screw N until the right distance between lever and handlebar is found.

During this operation, the pump piston may clog the hole between the hydraulic circuit and the recovery tank. To check, follow the steps below:

- remove the pump cover;
- remove dowel O with a 3mm setscrew wrench;
- insert the syringe containing some oil in the dowel hole, and gently press the syringe. If the oil level in the tank does not go up, unloose the screw P at the same time until the oil starts going up;
- refit the components.



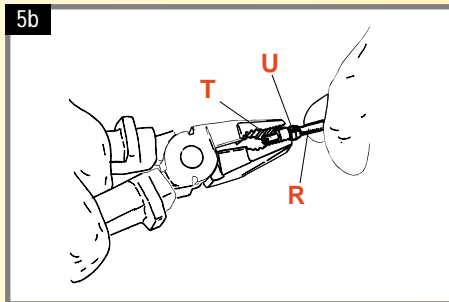
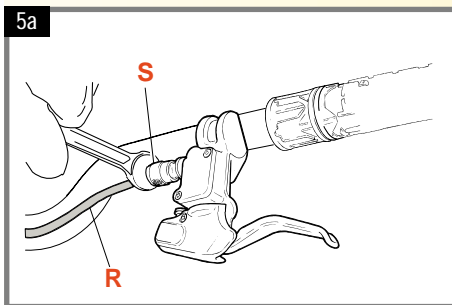
⚠ WARNING: if the screw P is unloosened excessively, the following may occur:
a) ONLY FOR POMPA '98: the small piston comes out of its seat with consequent oil leakage;
b) FOR ALL MODELS: the OR (20) with self-locking function of the screw F (see fig. 3) falls out of the lever, with consequent loss of the lever itself.

5a: Tube length adjustment

(For models with reviewable tube)

If the pump-caliper connection pipe is too long, it is necessary to shorten it as described below:

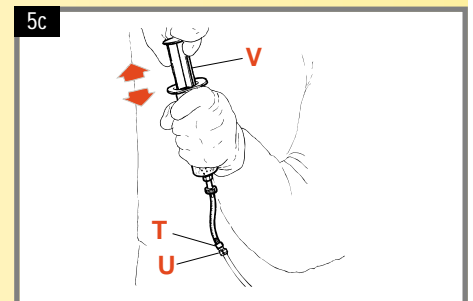
- use an 8mm open end hexagon wrench to unscrew the union S, move it backwards along the tube. Pull the tube out of the pump;



- 5b:
- Cut the tube with a cutter;
 - Hold the part with a larger diameter with pliers, pull out the connection pin T from the cut end of the tube R;
 - Use a screwdriver to enlarge the ends of the biconical bush U and refit it in the tube.

⚠ ATTENTION: Be careful when using the cutter because the blade is extremely sharp and could cause serious injury if not used properly. Do not use blades or saws that could squash or lacerate the tube and therefore could create leakages of brake fluid and therefore an inefficient braking system. A tube that is too short, apart from limiting the ride-ability of the bicycle when making sharp turns could cause tension on the tube that could bring about its separation from the pump or the pincer. IT IS IMPORTANT TO AVOID having pincer/pump tubes that are too short or too long.

- 5c:
- refit the connection pin T on the tube end, and reposition the biconical bush U;
 - fit the provided tube on the string V and insert it in the connection pin T of the tube;
 - slowly suck up the air in the tube, that can be seen by the bubbles coming up in the fluid inside the syringe. Fill the syringe with 10ml of oil and make sure to keep it in vertical position;
 - Release the plunger and repeat the above operation until the air has been completely eliminated;
 - Refit the tube on the pump and fully screw the gasket S manually to the pump single-acting valve;
 - Carry out the safety tightening with an 8mm hexagon wrench, with a 1/2 turn.
 - Try to pull the tube to check if the bush U and the pin T have been correctly installed inside the union S.



⚠ WARNING: if the gasket S is not properly tightened, it may become loose during the driving causing the tube to detach with serious consequences for the user.

N.B.: to invert the brakes control, unscrew the unions S and detach them from the relevant pump. Refit them on the other pump taking care not to let any oil leak out of the tubes.



RECOMMENDED LUBRICANTS AND CLEANING PRODUCTS

6: Brake fluid

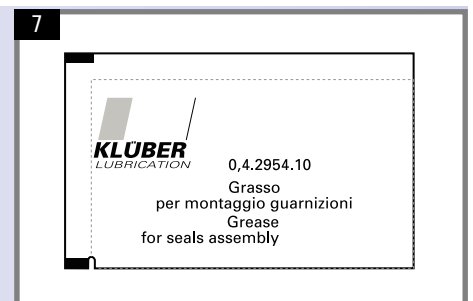
Only use DOT 4 oil for hydraulic brakes. Make sure the containers are undamaged. Avoid leaving the container open for a long time because this product absorbs humidity that is present in the air and therefore modifying its physical characteristics. Substitute the brake fluid every two years.

⚠ ATTENTION: The fluid used in this braking system, apart from damaging painted parts is also dangerous if it comes into contact with the eyes or skin. Abundantly wash the injured parts with running water in the case of accidental contact with the fluid and contact a doctor if the fluid has come into contact with the eyes. Do not dispose of used fluid in the environment.

7: Lubricants

Utilize grease (silicone paste) for the O-rings in EPDM. We recommend UNISILKON TKN 1011 KLUBER.TKN 1011 KLUBER.

⚠ ATTENTION: The use of non-specified greases can compromise the condition of the O-rings and cause damage to the system. This condition could cause a serious danger for the user.



MAINTENANCE

⚠ ATTENTION: Consult the safety norms.

⚠ ATTENTION: Utilise only ethyl alcohol to clean the brake discs. Utilising products other than those described above could represent a serious danger to the user.

It is necessary to periodically clean the pincers according to the amount of use and the atmospheric conditions. Utilise an adequate biodegradable degreasing material that does not damage the pincers as described in the introduction to this technical information sheet.

Carefully clean the moving parts of the braking system.

⚠ ATTENTION: Never touch the brake disc after the braking system has been used. This could cause injuries.

BRAKE LEVER AND PUMP DISASSEMBLY

N.B. The numbers in parentheses indicate the references of the parts shown in the exploded view.

8a:

- Remove the tube by unscrewing the union (32) as shown in the figure. Use an 8mm wrench.



8d:

- Use a screwdriver to remove the inner snap ring (16).



8g:

- Clean with a cloth soaked in alcohol, and oil the piston.
- Refit the piston assembly with the spring (10). Refit the snap ring (16) and press down the whole assembly with the specific tool until the snap ring has been properly fitted into place.



8b:



8b:

- Use a star screwdriver to remove the tank cover (4), the membrane (5), and the lever cover (1). Suck up the oil from the tank using an empty syringe.

8e:



8e:

- Remove the piston assembly and the spring (10) below.

8g:



8c:

- Put the pump in the vertical position. Remove the lever (17) fixing screw (27) with an 8mm wrench and a 3mm socket head screw.

N.B.: Pay attention to the two shims (18)



8f:

N.B.: The parts of pump '98 (15-48-14-13) are not the same as those of the other versions.

⚠ WARNING: clean all the components with a cloth soaked in alcohol. Replace any damaged or worn parts.



- Disassemble following the same procedure in the reverse order, after having oiled the brake lever pin.

CALIPER DISASSEMBLY



9a:

- Put the caliper in a vice using suitable aluminium plates, unloose the tube fixing screw (25) with an 8mm wrench.

⚠ WARNING: pay attention to the 2 copper washers (26) found on the tube union

9b:

- Use a 4mm wrench to unloose the 2 caliper fixing screws (44-45).



CONTINUED ON PAGE 5



9c:
- Open the caliper body and remove the pads (41).

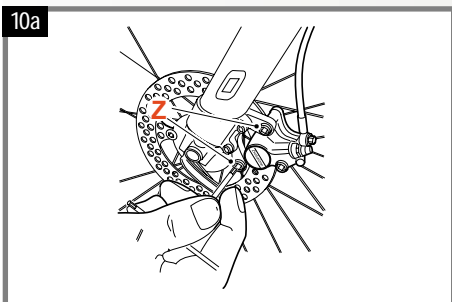


9h:
- Check the status and position of the O Ring (42) connecting the 2 caliper bodies.
- Reassemble the caliper body by means of the 2 screws. Tighten with torque 5.75N-m (50.61 in.lbs.) ±5% and then insert the 2 pads (41).
- Check the position and status of the copper washers (26) on the pipe union, and then fit the pipe on the caliper.



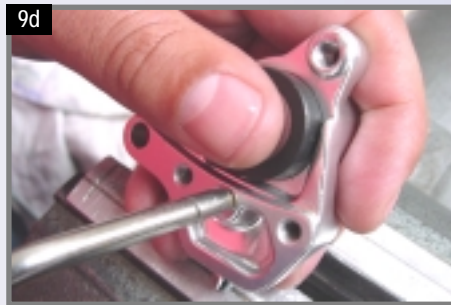
PADS SUBSTITUTION

10a:
To replace the brake pads, disassemble the caliper from its support by unscrewing the fixing screws Z.

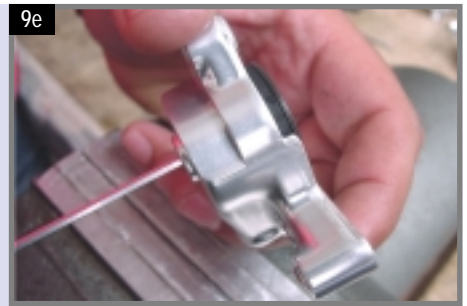


9d:
- For the version without the adjustment: pull out the pistons (47) from the caliper body using a compressed air gun, after plugging the holes.

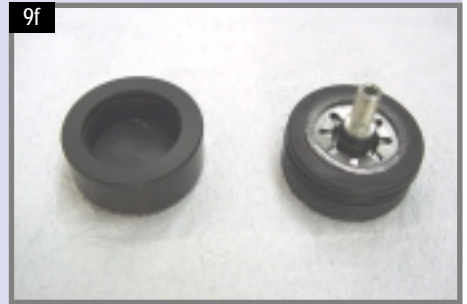
ATTENTION: It is advisable to use a cloth to prevent a violent expulsion of fluid and the piston.



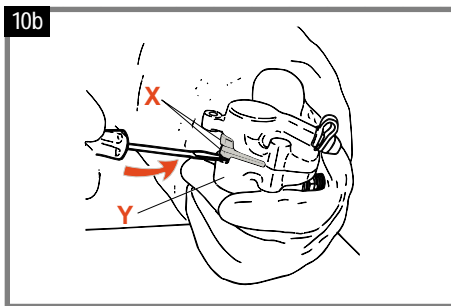
9g:
- Clean all the components with a cloth soaked in alcohol. Replace any damaged parts and oil the gaskets.
- To refit the caliper with adjustment, follow the disassembly procedure in the reverse order. Pay special attention to the O Ring inside the piston.
- For the Evoluzione caliper: refit the gaskets (46), oil them and then refit the pistons (47) by pressing with the fingers only.



9e:
- For the version with the adjustment: use a 2mm setscrew wrench to screw the adjusting dowel until the piston is completely out.

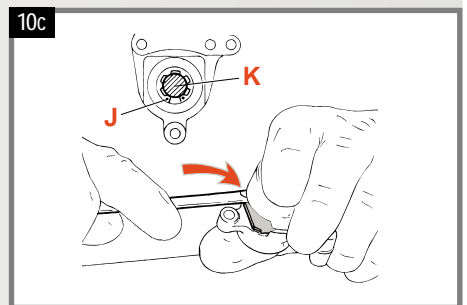


9f:
The figure shows the piston of the caliper with adjustment and of the caliper without adjustment.



10b:
Follow the steps below:
- insert a small screwdriver, see figure, between the caliper body Y (43) and the pad X (41) supporting surface. Remove one pad per time starting from the one on the tube side, and move the pistons to their start position (47) using a small screwdriver.
If the caliper is of the type with manual adjusting of the pads, completely move back the pistons using the adjusting screws found on the caliper front part, taking care not to damage the dowel.

10c:
- clean the inner part of the pistons K (47) and snap ring J (40) using a brush and/or compressed air. Take care to remove any carbon deposits and traces of dirt;
- fit the new pads starting from the one on the breather pipe side (38)
Center the rear projection of pad X in the snap ring J (40). With a large screwdriver, push on the entire braking surface until it comes to a stop.



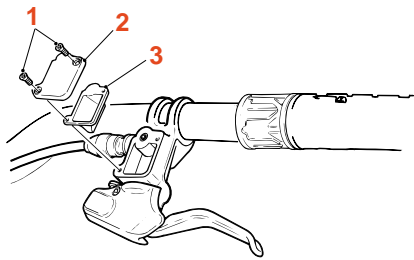
ATTENTION: Considering the reduced dimensions of the components, be careful in the use of the screwdriver because it could cause injury in case of accidental contact with the hands. Use protective gloves.

WARNING: if the pad does not enter its seat, check that the piston-snap ring area is clean. If the trouble persists, the pads snap ring J (40) may be damaged and therefore must be replaced.

- refit the other pad following the same procedure. Refit the caliper on the support as described in the instructions manual.

ATTENTION: The braking system needs a period of settling down to obtain the maximum efficiency. Before completing the set-up of the braking system it is necessary to action the brakes at least one hundred times and then proceed with a further adjustment and also a check on the tightness of the screws.

11



11: Topping up the oil level in the recovery tank

Each pad can perform maximum one 2.5mm approach stroke to the disk, therefore the oil level must be checked after about half its consumption. Follow the steps below:

- place the pump horizontally on the handlebar;
- unloose the screws 1 fixing the tank cover 2. Remove the cover and the rubber diaphragm 3;
- check the fluid level, as it may have lowered due to the pad wear. If the level is low, fill the tank up to the edge with DOT 4 oil only. Make sure the oil container is undamaged;

⚠ WARNING: using any other oil may cause irreparable damages to the system

⚠ WARNING: protect the bicycle parts with a cloth. Wear goggles to protect the eyes from the oil that may come out of the tank during this operation.

- refit the diaphragm and the tank cover on the pump. The oil must overflow to avoid air forming in the tank;
- clean the pump with a cloth and fix it in the desired driving position.

12a: Kit bleeding with open pump

- Remove the breather (37) situated on the caliper using an 8mm wrench, after having removed the rubber cap.

12a



12d:

- Utilising the empty syringe, suck out all the old fluid.
- Remove the syringe, empty it and fill it with 20ml of DOT 4 brake fluid or superior.
- Refit the syringe in the hole, position it vertically and introduce new oil until the tank is full.

⚠ ATTENTION: The fluid used in this braking system, apart from damaging painted parts is also dangerous if it comes into contact with the eyes or skin. Abundantly wash injured parts with running water in the case of accidental contact with the fluid and contact a doctor if the fluid has come into contact with the eyes. Do not dispose of in the environment.

12d



12b:

- Insert the empty syringe with the union in the breather hole.

12b



12e:

- Move the lever to the handlebar with an elastic.

12f:

- Keep the syringe upwards and suck out the air that may be present in the caliper.

12f



⚠ WARNING: check that during the vacuum phase the oil level in the tank does not lower too much. This is due to the structure of the piston gasket.

- Remove the syringe and refit the breather (37).
- Remove the elastic holding the lever against the handlebar.
- Fill the tank with DOT4 oil.
- Pull the pump lever a few times.
- Refit the membrane (5) and the cover (4) on the pump.

⚠ WARNING: before removing the syringe it is necessary to free the pump lever that has been previously fixed. Check that the tank is full of oil; if necessary, push the syringe plunger to send up the oil level.

12c:

- Place the pump horizontally and remove the cover (4), as shown in the figure.

12c



12e



12g:

- Put a shim between the pads (2.5mm).
- Pull the brake lever with force for 3-4 times to check the system strength and the presence of air in the tank.

12g

