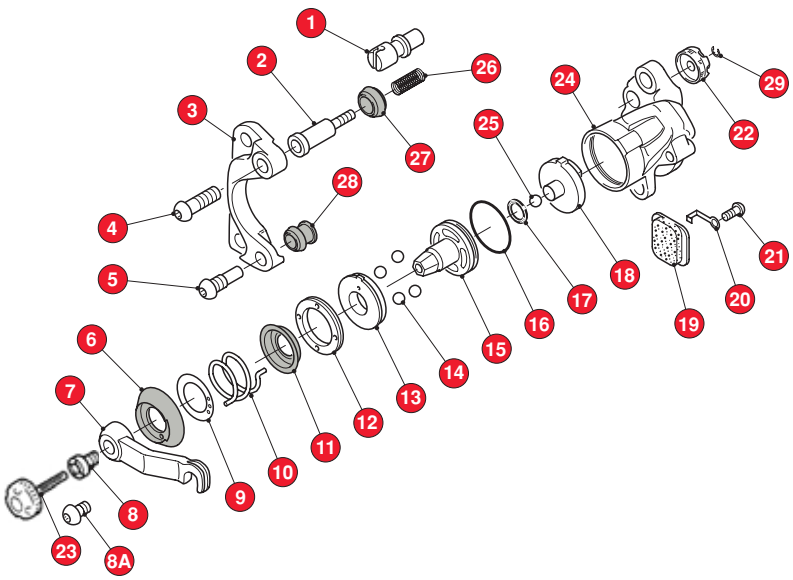
Technical Information Sheet

Activa

MD1

MD-1 and **Activa** braking systems have certain differences between them; the pads, the discs and the system of adjustment of the internal pad. A rapid method of knowing which is which is the colour of the levers: the MD-1 levers are red whilst the Activa levers are black.
It is important to underline that the pads of the Activa braking system are compatible with the MD-1 pincers as long as the Activa disc is utilised. The methods of intervention are pointed out in this manual.

LIST OF TOOLS:
- TORX T25 spanner (disc screws);
- 5mm hexagonal spanner (pincer attachment screw);
- 8mm open spanner (wire-grip screw);
- 3mm hexagonal spanner (wire-grip screw/Md-1 lever screw);
- 4mm hexagonal spanner (Activa lever screw);
- 2.5mm hexagonal spanner (MD-1 external pad adjustment grub screw/Activa internal pad screw)
- Small-bladed screwdriver (Activa external pads);
- Fine-point pincers (pad fixing tongue);
- 17mm open spanner (pincer fixing screw);
- Pincer fixing spanner code FD 40010-60 (MD-1/Activa);



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 because it could irreparably ruin the component. All tools must be in good condition.
- Utilise cleaning and lubricating products that are preferably biodegradable and do not dispose of the used fluid in the environment.
- 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.

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:

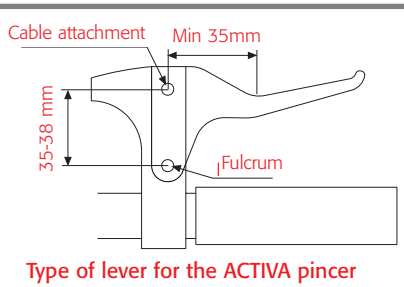
⚠ **WARNING: The inobservance of the advice quoted could cause damage to the equipment.**

⚠ **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 grip.**
- **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 disc brake must be assembled on wheels that are adapted for this type of use. A wheel with insufficient section radius or with radial engagement of the spokes can collapse under the braking action exercised by the braking system and can cause serious damage or 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.**



Type of lever for the ACTIVA pincer

- **THE BRAKING SYSTEM HAS BEEN DESIGNED AND MUST BE UTILISED ONLY WITH HANDLEBAR LEVERS THAT ARE OF THE V-BRAKE TYPE**

FORMULA
Power, Technology, Design.

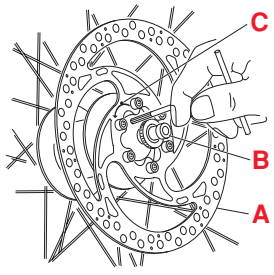
INSTALLATION

1: Brake disc assembly

ATTENTION: Consult the safety norms

Place the disc brake **A** onto the hub **B** of an already assembled wheel taking care to respect the direction of rotation expressed by the arrow **C** on the flange of the disc. Fix the disc with the appropriate **M5** screws and tighten in a cross-wise direction to **5.75N·m (50.61 lbs. per sq. inch) ± 5%**.
Thoroughly clean the disc with ethyl alcohol to remove any traces of grease or oil.
N.B. The disc can have four or six fixing holes.

1



2a, 2b: Front/rear pincer assembly

ATTENTION: Consult the safety norms

Assemble the front and/or rear pincer onto the relative attachments as shown in the figure. Fix them by using the **M6** screws **D-E** to a torque pressure of **9N·m (79.22 lbs. per sq. inch) ± 5%.** Apply a weak thread-locking liquid.

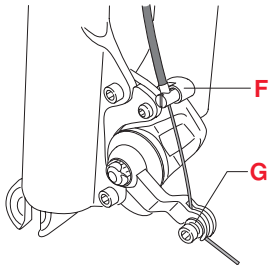
ATTENTION: If the thickness of the relative attachment on the fork or frame is less or more than 8mm it will be necessary to substitute the fixing screws with screws of the correct length.

3a: Cable assembly

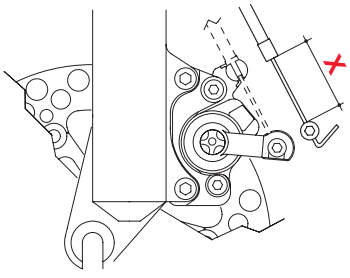
ATTENTION: Consult the safety norms

Insert the complete cable onto the V-BRAKE type brake lever as indicated by the manufacturer of the lever.
The cable and the sheath must be the correct length, bearing in mind the movement of the various elements of the cable that must not interfere with any moving parts of the bicycle.

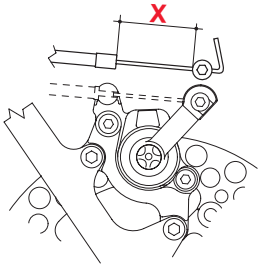
3a



3b



3c

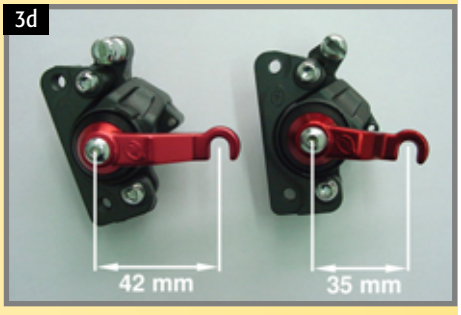


3b, 3c, 3d:

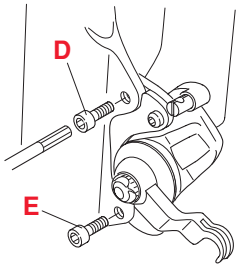
ATTENTION: Cables and sheathes that are too short could limit the ride-ability of the bicycle and could cause serious accidents.

Position the terminal of the sheath on the sheath stop **F**. Insert the cable into the grip **G** at **X** distance as shown in the figure. Tighten the screw of the grip to a torque pressure of **2.91N·m (25.62 lbs. per sq. inch) ± 5%.**
Note: Leave approximately 2 cms of cable after the cable grip F and bend it to 90° immediately after the cable grip F.

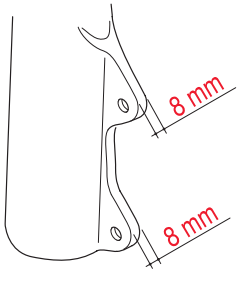
3d



2a



2b



Consult the table below for the "**X**" distances:

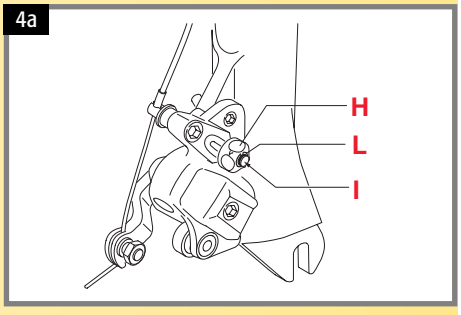
	X
MD1 / Activa with a 42mm lever	50
MD1 with a 35mm lever	42.5

4a: Wheel assembly

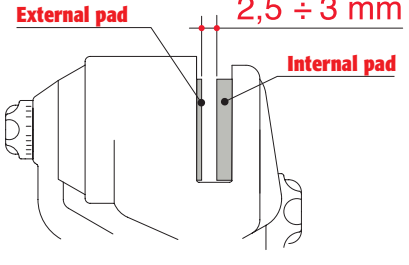
ATTENTION: Consult the safety norms

Before assembling the wheel with the disc mounted, it is necessary to check that on the fixing screws **I** after the pommel **H** there is the security circlip **L**.

4a



4b



4b: Also check that the distance between the pads is always 2.5-3mm as shown in the figure. If the measurement is less, exert a light pressure on the external pad until the pad comes to its resting position. Assemble the front and/or the rear wheel as indicated by the manufacturer.

INSTRUCTIONS FOR USE

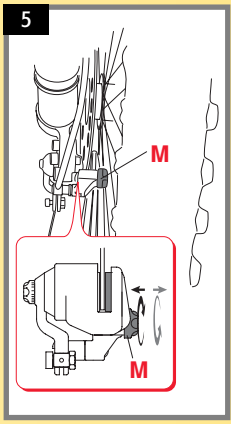
5: Preliminary adjustments and braking adjustments

ATTENTION: Consult the safety norms

Before utilising the braking system it is necessary to effectuate the preliminary adjustments as follows.
Bring the internal pad in contact with the disc. Screwing in the pommel **M**, the pad comes nearer to the disc; unscrewing it makes it move away.

ATTENTION: Also in the case of the inserted pad, check that the pommel M is always screwed in even lightly to avoid losing it.

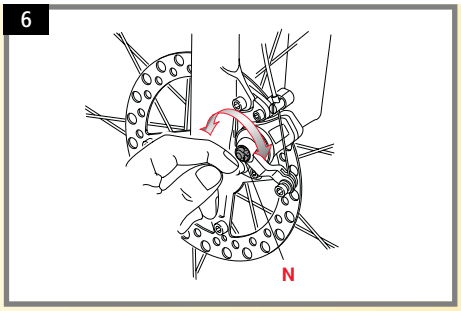
5



6: Activa version

Adjust pommel **N** to bring the external pad to the desired distance from the brake disc to obtain the correct action.
Rotating the pommel **N** in a clockwise direction, the pad comes nearer to the disc.
Rotating in an anti-clockwise direction, the pad can be distanced from the disc by simply applying a light pressure with the finger.

6

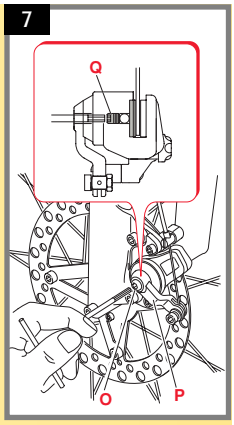


If the action of the lever is too long, repeat the adjustment operations so that the desired situation is obtained.
Repeat the adjustment operations above described until the pads are completely worn out and then proceed with the substitution of the brake pads (See chapter 12).

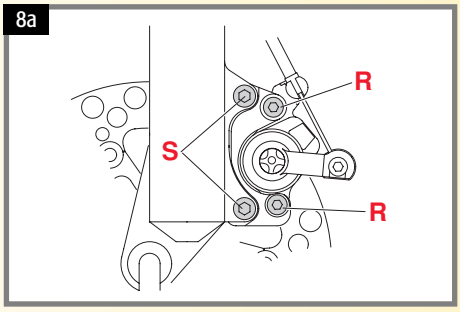
7: MD-1 version

Utilising a 3mm hexagonal spanner, unscrew the fixing screw **O** of the pincer lever **P**. Utilising a 2.5mm hexagonal spanner, screw the fixed internal grub screw **Q** in a clockwise direction until the external pad just makes contact with disc. Replace the fixing screw **O**.
Test the braking system and check if the movement of the lever at the handlebar functions correctly and performs the desired braking action.
If the movement of the lever is too long, act upon the screw adjuster of the handlebar lever.
Repeat the adjustment operation above described from time to time until the pads are completely worn out and then substitute the pads of the braking system (See chapter 16).

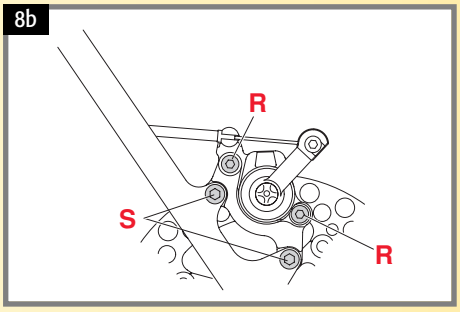
7



8a



8b



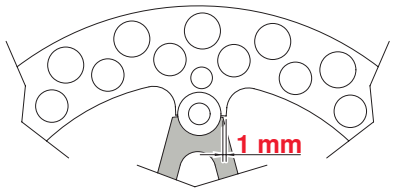
8a, 8b:

ATTENTION: The braking system needs a certain period of settling down to obtain maximum efficiency. Before making the final approval of the set-up it is necessary to effectuate at least one hundred braking actions and then proceed with a further adjustment to the set-up and a check on the tightness of the screws. R (MD-1/Activa) and S (only Activa).

9:

ATTENTION: After a running-in period there is a small amount of play between the external disc and the disc support.
This play must not exceed 1mm.

9

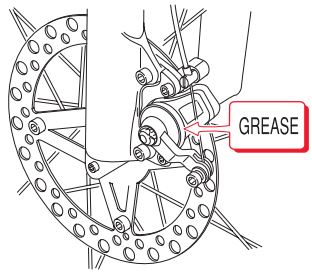


Only for the MD-1 version (riveted disc)

MAINTENANCE

10a:

10a



ATTENTION: Consult the safety norms

According to the type of use and the atmospheric conditions, it is necessary to clean the pincer periodically using an adequate biodegradable degreasing material that will not damage the pincer.
Accurately clean the moving parts of the braking system.

ATTENTION: Protect the disc and the pads with a cloth to avoid contact with lubricating material. This could cause an alteration to the abrasive gripping action between the pads and the disc.

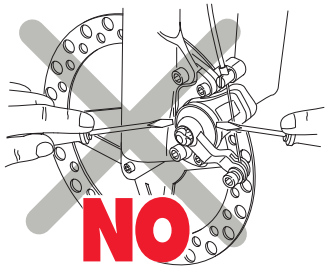
ATTENTION: Utilise only ethyl alcohol to clean the disc. Utilising different products from that described above could represent a serious danger for the user.

10b:

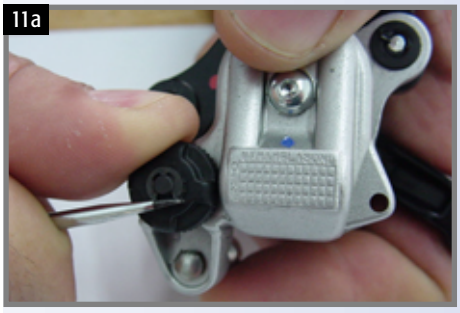
WARNING: Never disassemble the pincer lever utilising tools.

ATTENTION: Never touch the brake disc after utilising the braking system because this could cause injury.

10b



11a



PINCER REMOVAL

N.B.: The numbers in parentheses indicate the reference to the parts shown in the exploded view.

11a: Utilising a screwdriver, remove the circlip (29).

11b: Completely unscrew the pommel (22) underneath the circlip and remove the adaptor (3).

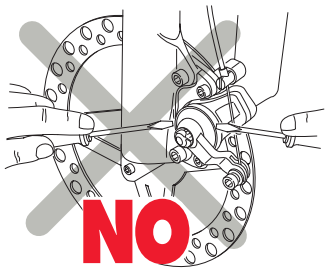
11b

11c

11c: Insert the pincer in a vice and unscrew the pommel (23) until it is completely removed.

11d: Using a 4mm spanner, unscrew the screw (8) as shown in the figure.

11e



11f

11g: Utilising the tool shown in the figure, unscrew the internal ring (12) in an anti-clockwise direction and remove it.

11h

11i: Separate the rotor (15) from the counter-rotor (13) and clean the components using a brush dipped in alcohol.

⚠ ***ATTENTION: Be careful to not drop and lose the internal ball bearings (14) of the rotor unit.***

11l

Reinsert the internal pad (19) and fix it with the metal tongue (20) and the appropriate screw (21).

11m: Insert a 2.5mm spacer between the two pads.
Reinsert the rotor unit and fix it with the internal ring (12) utilising the appropriate tool.

11n

11d

11e:

⚠ ***ATTENTION: Never disassemble the pincer lever using tools.***

11f: Remove the lever unit.

11g

11h: Utilising pincers, slide out the rotor unit

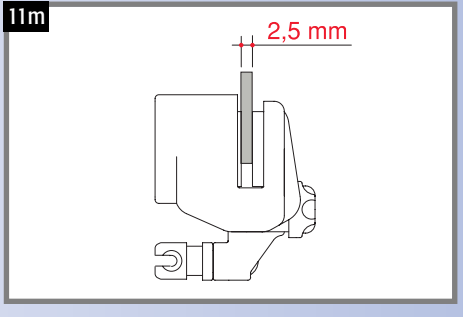
Remove the internal pad (19) from the pincer body and clean it using a brush dipped in alcohol.
To clean the rotor unit it is necessary to remove the external pad (18).

11i

11l: Before reassembling the rotor unit, smear a small quantity of grease in the seats of the ball bearings.

⚠ ***ATTENTION: Be careful to reassemble the rotor unit so that the teeth of the counter-rotor coincide with an angle of the hexagon of the rotor.***

11m



11n: After having substituted the rubber (11), reassemble the lever unit taking care to insert the lever pin into the hole of the counter-rotor.
Rotate the lever and position it as shown in the figure keeping it pushed downwards.
Grease the pins of the adaptor (3) and reassemble the remaining components proceeding in the reverse order of removal.

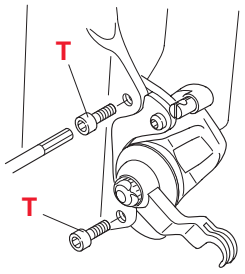
SUBSTITUTION OF THE BRAKE PADS

N.B.: The numbers in parentheses indicate the reference of the parts in the exploded view.

12: Activa version

Remove the cable from the lever of the braking system without unscrewing the cable grip.
Remove the pincer unit by slackening the fixing screws **T**.

12

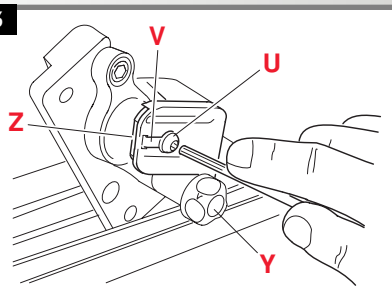


13: Removal of the internal pad

Unscrew the screw **U** (21) utilising a 2.5mm hexagonal spanner.
Straighten the safety tongue **V** (20) and remove the used pads **Z**.

⚠ ***ATTENTION: Be careful when using the screwdriver: the dimensions of the parts are small and therefore this operation could cause injuries to the hand. Wear protective gloves.***

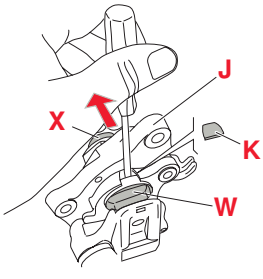
13



14: External pad removal

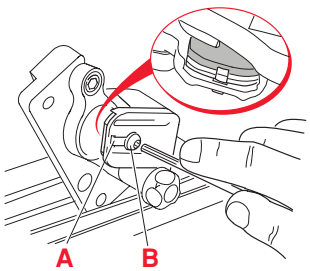
Bring the pommel **Y** (22) into the position where it is touching the circlip.
Extract the plastic protection **K**.
Insert a small-bladed screwdriver (see figure) between the pincer body **J** (24) and the support surface of the pad **W**.
Apply a light pressure in the direction indicated by the arrow and remove the worn out external pad.
Rotate the external pad adjustment pommel **X** (23) in an anti-clockwise direction until it stops.

14

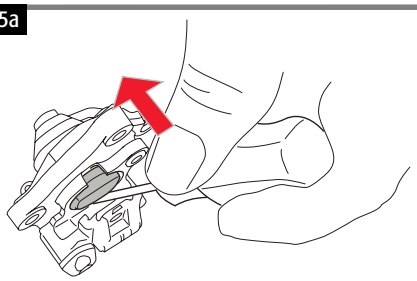


15a, 15b: Assembly
Insert the external pad first, positioning it with the nib part downwards. Utilising a small-bladed screwdriver, press as shown in the figure.
Reassemble the protection **K** into its seat.
Insert the internal pad fixing it with the security tongue **A** (20) that must be bent with a pair of pincers and with the fixing screw **B** (21). Apply a medium Loctite thread-locking liquid to the screw.

15b



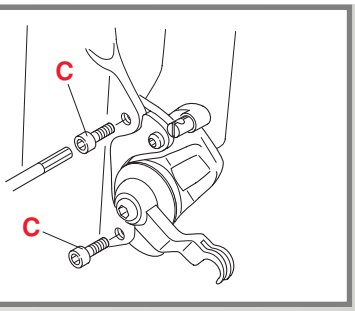
15a



Reassemble the pincer unit onto the fork or the frame respecting the instructions in the braking system manual. Furthermore, effectuate the adjustments mentioned in chapter 5.

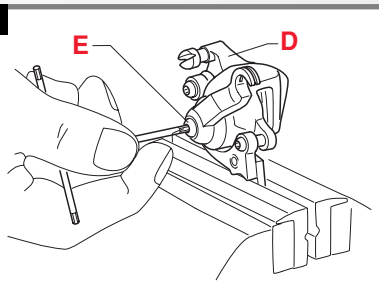
ATTENTION: The braking system needs a certain period of settling down to obtain maximum efficiency. Before making the final approval of the set-up it is necessary to effectuate at least one hundred braking actions and then proceed with a further adjustment to the set-up and a check on the tightness of the screws.

16



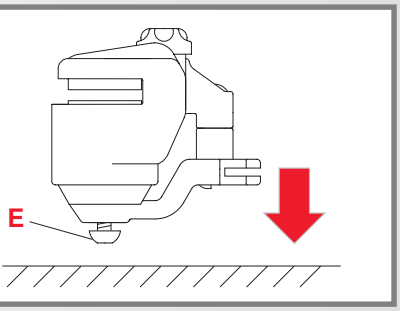
16: MD-1 version
Remove the cable from the brake lever without unscrewing the cable grip.
Remove the pincer unit by slackening the fixing screws **C**.

17a



17a: External pad removal
Place the pincer **D** in a vice utilising protective pieces to not damage the pincer.
Slacken the screw **E** (8A) of the lever turning it three times in an anti-clockwise direction.

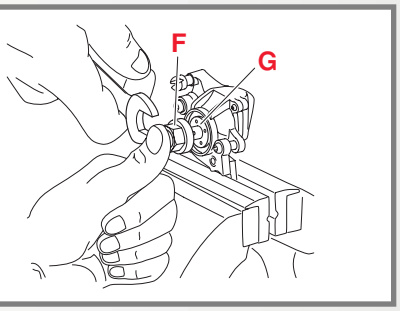
17b



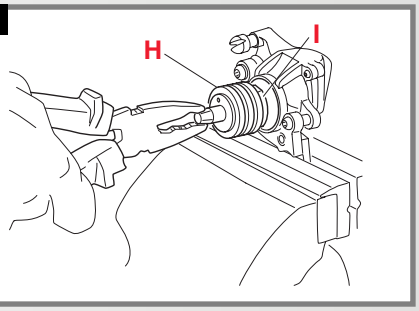
17b: Take the pincer unit in hand and holding it firmly by the extremity of the lever, hit the part of the fixing screw **E** (8A) sharply onto a rigid surface.
Then completely unscrew the screw and remove the lever.

WARNING: During removal, hold the lever tightly so that the spring does not bounce out of its seat.

17c



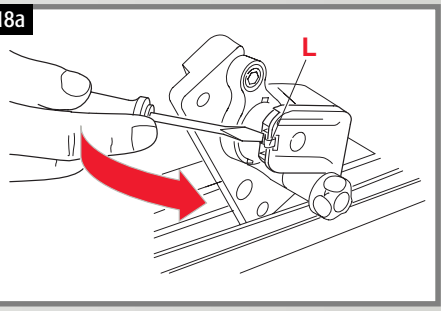
17d



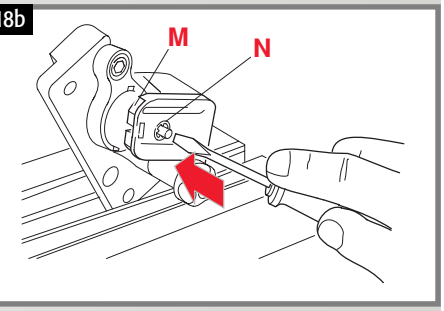
17c: Unscrew the ring **G** (18) utilising the appropriate tool (available from the manufacturer).
17d: Utilising pincers, slide out the pad-carrying piston unit **H**. It is necessary to effectuate this operation with particular care so that the ball bearings (14) do not fall out of their seat.
Slowly slide out the pad carrier **I** from the piston unit **H** being careful to not drop the ball bearings.
Substitute the worn pad carrier with a new one.

WARNING: Position the new pad as shown in chapter 21a, 21b.

18a



18b

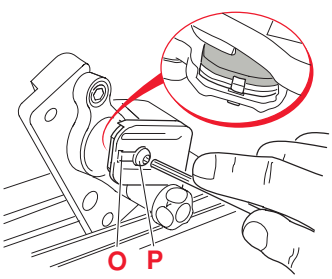


18a, 18b: Internal pad removal
Maintain the pincer unit mounted on a vice with protective pieces as shown in the figure, without tightening too much so that the pincer unit is not damaged.
Lift up the tongue **L** (20) utilising a small-bladed screwdriver and slide out the tongue utilising the appropriate pair of pincers.
17b: Effectuate a pressure on the pad support pin until the circlip **N** comes out.

ATTENTION: Be careful when using the screwdriver: the dimensions of the parts are small and therefore this operation could cause injuries to the hand. Wear protective gloves.

Slide out the worn out pad **M** and substitute it with a new one.

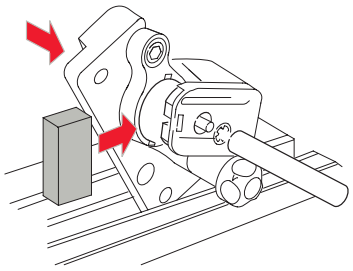
19



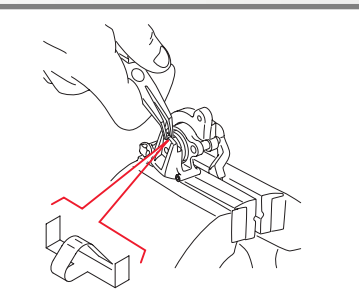
19: Sintered internal pad assembly
Insert the internal pad and fix it with the security tongue **O** (20) and with the fixing screw **P** (21). Apply medium Loctite thread-locking liquid to the screw.
N.B. Use new parts that are included in the kit.

CONTINUED ON PAGE 6

20a



20b



20a, 20b: Organic internal pad assembly

Assemble the new pad by inserting it into the seat of the piston unit (as indicated by the arrow in the figure) in such a way that the pad support pin inserts into the appropriate hole.

Insert an adequate spacer between the pincer and the pad, then insert the new circlip and fix the pad by pressing on the pad with a tool that has an 8mm external diameter and a hole of 3.5mm.

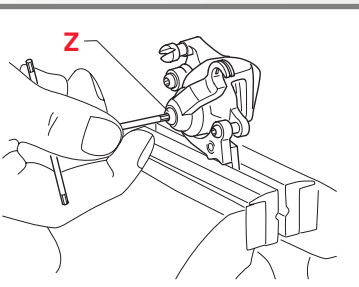
WARNING: Never reuse the old tongue or circlip: there are new ones included in the kit with the new pads.

ATTENTION: If this warning is not respected there could be the risk of accident with danger to life

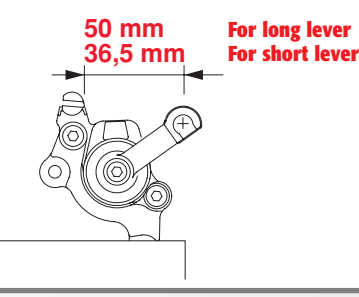
Bend the tongue onto the support and with the appropriate flat, curved pincers tighten the part of the tongue with the pad as indicated in the figure in such a way that there is no play.

ATTENTION: Effectuate the bending of the tongue with great caution so as not damage the tongue. Be careful when effectuating this operation: the dimensions of the parts are small and therefore this operation could cause injuries to the hand. Wear protective gloves.

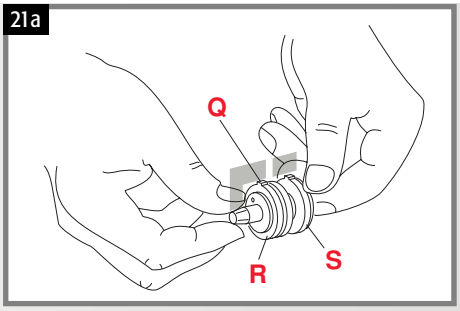
21g



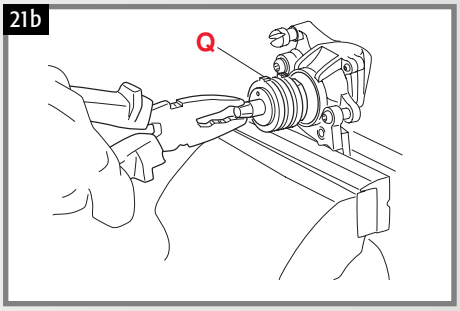
21h



21a



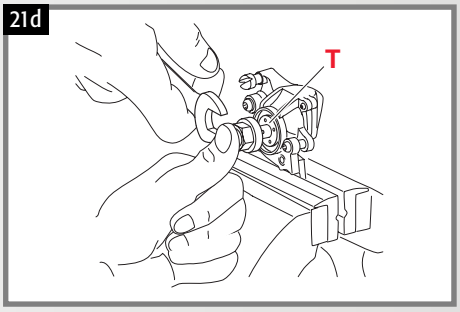
21b



21c:

WARNING: Insert a 2.5mm spacer between the two pads as indicated in the figure.

21d

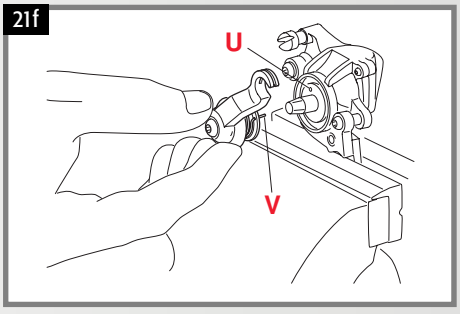


21e: Lever unit assembly procedure

When assembling the lever unit, be careful that the long pin of the spring is inserted into the lever.

Furthermore, place the spring in one of the two holes present on the gasket and on the lever to adjust the tension of the spring.

21f



21g, 21h: Tighten the fixing screw **Z** (8A) of the lever to a torque pressure of **4.5N·m (39.61 lbs. per sq. inch) ± 5%**.

Check that the lever rotates easily and smoothly.

21a, 21b: Organic/sintered external pad assembly

WARNING: If the support R slides out from the ball bearing carrier during the substitution of the pad carrier S it will be necessary to reposition it in such a way that the tooth Q on the ball bearing carrier is aligned with the angle of the hexagon of the piston as shown in the figure.

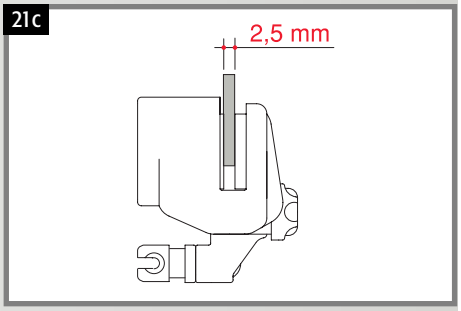
Before inserting the piston complete with the pads onto the brake unit it is necessary to lightly lubricate (use ALVANIA EP (LF) 2) normal grease for the ball race movement) the internal part of the unit and the external circumference of the piston unit.

ATTENTION: Do not put too much grease because the excess quantity could infiltrate to the braking parts.

ATTENTION: Do not dirty the pad with grease. This could be dangerous to life.

Reassemble the piston unit and the pad carrier to the pincer unit, inserting the tooth **Q** in the appropriate seat of the cylinder on the pincer unit.

21c



21d: Reassemble the ring T (18) utilising the appropriate tool and tighten to a torque pressure of **11N·m (96.83 lbs. per sq. inch) ± 5%.**

21e

21f: Reassemble the lever unit with the spring onto the pincer unit.

WARNING: Ensure that the pin V of the spring is inserted into the hole U of the piston unit.

Insert the lever unit into the pin of the piston unit, positioning it onto the hexagonal conical coupling in such a way that the lever is found in the position as indicated in the figure.

Reassemble the pincer unit onto the fork or the frame of the bicycle respecting the instructions previously mentioned.

ATTENTION: The braking system needs a certain period of settling down to obtain maximum efficiency. Before making the final approval of the set-up it is necessary to effectuate at least one hundred braking actions and then proceed with a further adjustment to the set-up and a check on the tightness of the screws.

N.B.: See the disassembly of the pincer for the cleaning/lubrication of the moving parts (see chapter 21a)