

QUICK VISUAL GUIDE TO BASIC BROMPTON MAINTENANCE

A friendly guide by a bunch of LoveCycling SG Brompton Fans.

This guide was put together based on knowledge acquired in technical workshops, personal research and experience for the purpose of sharing on Brompton maintenance with LoveCycling SG Brompton owners. Some of the content in this guide are also available on the internet which may or may not be Brompton specific.

Disclaimer. The producers of this document are not responsible for any death, injury, loss or damage of any kind suffered by any person when using this guide book to maintain their Brompton bicycles. Use of this guide is at owners' risk and discretion. If in doubt, do not proceed and approach a more technically inclined person for assistance or visit your local bike shop/distributor.

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Produced with a lot of fun and laughter by:

Alvin Wong (the one who was too free, conceived the idea and developed the content.)

Allan Ng (the one who lent us his office to work on and whose bike desperately needs to be cleaned...)

Louis Lee (the photographer... and the one who demo-ed the most siong part, changing the tires...)

Darren Siow (the novice cleaner...and the guinea pig. At least we proved that this guide works!)

Section 1: Removing and Installation of the Rear Wheel

The wheel needs to be removed to change the tire, inner tube or simply to facilitate more a thorough cleaning of the bike (e.g. cleaning the inside the of fenders, hub etc). In this section, the process of removing the rear wheel is illustrated. The steps to remove the front wheel is similar. The illustration below uses the 6-Speed Brompton as an example.

Tool(s) Required

(1) Size 15mm Spanner.

Step 1. Find a level ground as far as possible and set the bike on its standing position.



Step 2. Check that both the gear shifters on the handlebar are at the highest setting. The left-hand shifter lever is in the top position and the right-hand shifter lever is on the extreme left position. If not, shift accordingly. This is to ensure (1) that the gear cable tension at the rear hub is at the minimum to allow it to be disconnected later and, (2) the chain is at smaller sprocket at the hub to make it easier to remember when positioning the chain.



Step 3. Release the chain from the chain tensioner.



Step 4. Unscrew the gear cable barrel from the gear chain rod to disconnect the gear cable from the hub.



Step 5. Unscrew the gear chain rod from the rear hub and set aside for cleaning later.



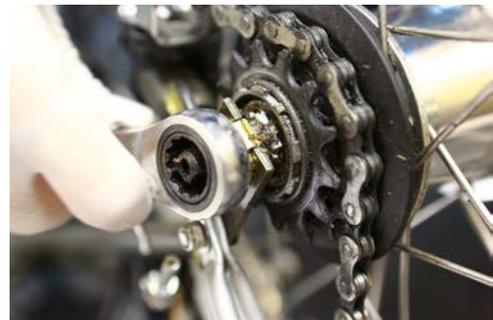
Step 6. Remove the chain tensioner with the size 15mm spanner. Set aside the retaining nut and washer.



Step 7. Deflate the tire with the tip of the gear chain rod. This will allow the easy removal of the wheel from between the brakes.



Step 8. Loosen the 2 bolts securing each side of the rear wheel with the size 15mm spanner.



Step 9. Recline the bike to the position as shown with the saddle and rear rack (if any) resting against the ground.



Step 10. Remove the 2 bolts and the 2 tab washers securing the rear wheel to the frame. Jiggle the rear wheel to loosen the tab washers if it is too tight for removal. Take note that the tab washers need to be re-installed in the correct orientation later. The “TOP” should be in the same orientation as the saddle side when bike is unfolded completely.



Step 11. Remove the rear wheel gently by ensuring the tire clears the rear brake pads without shifting the callipers out of position. The removal of the wheel is now completed.



Step 12. To install the rear wheel, reverse the process from Steps 11 to 7.

Step 13. Set the chain in position as shown before installing the chain tensioner. At the hub sprocket, it should be around the small sprocket.



Step 14. Install the chain tensioner. Note the position of the chain with reference to the jockey wheels.



Step 15. Place the chain tensioner arm into position to tension the chain as shown.



Step 16. Next, install the gear chain rod. After screwing in the gear chain rod, turn back a quarter to half turn before connecting the chain with the gear cable barrel assembly. Lock the barrel in position with the lock nut. Installation is now complete.



Quick Visual Guide To Basic Brompton Maintenance



Section 2: Changing of Tire and Inner Tube

Changing of tire and inner tube is an essential skill for all cyclists. Tires and inner tubings can be punctured by debris on the ground and hence needed to be replaced. Tires are also changed due to wear or upgrades. This section illustrates how the tires and tubes are removed and replaced. Do note the Brompton tire and tube are sized 16 x 1 3/8 inch or ERT0 37-349.

Tool(s) Required

- (1) Set of 2 tire levers.
- (2) Flat head screwdriver.

Step 1. Check that the tire is sufficiently deflated for easy removal.

Step 2. Start by using the “scoop” end of the tire lever to scoop and engage the bead wall of the tire.



Step 3. Secure the hook end of the tire lever to one of the wheel spoke.



Step 4. Using another tire lever, scoop the bead wall next to the first lever and run along the rim to scoop out the entire bead wall of the tire.





Step 5. Pull out the tube, starting from the opposite end of the valve stem and then remove the tube from the rim. Do not use excess force to pull out the tube as damage to the valve stem-tube interface is possible. You do not want to damage the tube especially if you need to fit on again later when changing to newer tires.



Step 6. Remove the tire from the rim completely.

Step 7. Do a visual check on the condition of the rim tape. The tape should cover the spoke holes to prevent it from puncturing the inner tube when in use. If need be, replace the rim tape either with the original from the local distributor or use any 3rd party 10mm wide rim tapes.



Step 8. To fit the tire back onto the rim, make sure you get the tire orientation correct because some tires are directional. For e.g., Schwalbe Marathon series. This is to avoid the effort to remove and install the tire again later.



Step 9. Fit one side of the tire bead wall onto the rim as shown.



Step 10. For rims fitted with the original blue plastic rim tape, use a flat head screwdriver to lift up the rim tape at the valve stem hole to facilitate the ease of inserting the stem valve. You can also apply some grease on the stem valve to do this.



Step 11. Insert the valve stem of the inner tube through the rim tape first before going through the rim. You will have difficulty pushing in the valve stem through the rim without doing Step 10. Make sure the valve stem is completely inserted and is protruding straight and not slanted.



Step 12. Insert the rest of the inner tube around the rim and in the tire.



Step 13. Start fitting in the bead wall into the rim, beginning from the stem valve end of the tire.



Step 14. Use both palms to press in the tire bead wall simultaneously on each side of the rim, working around the rim.



Step 15. It is natural that the effort to press

in the tire bead wall into the rim will increase progressively especially when the tire wall is about 75% in. Avoid using a tire lever to force it in as it can cause the rubber to tear and expose the wire bead of the tire wall.

Step 16. To help facilitate easier fitting, pinch the tire round the rim a few times to ensure the bead wall is sitting properly along the inside of the rim.



Step 17. You should be able to press fit the final section of the tire into the rim with a bit more effort after Step 16.



Step 18. Do a final visual check that the tire is properly fitted. Install the wheel back to the frame before inflating to the required tire pressure. This is to ensure that the wheel can fit in-between the brake pads.

Section 3: Inspecting & Patching of Tire and Inner Tube

For long rides, it is essential to bring along additional inner tubes and patch kit in case of tire puncture. This section illustrates on how to inspect for puncture and patch the inner tube as an interim measure. It is recommended that a patched tube and tire be replaced with a new one as soon as possible. Common causes of punctures includes debris on the ground, faulty tube valve/stem and tear at the valve stem-tube interface. For the latter 2, the tubes should be replaced.

Tool(s) Required

(1) Patch kit.

Step 1. Remove the tire and the inner tube as described in Section 2.

Step 2. Do a visual check on the tire to identify the cause of the puncture.

Step 3. Sometimes, the puncture may be hard to detect. Run your fingers on the inside of the tire to feel for any damage to the tire. Remove any debris from the tire.



Step 4. If the hole or cut on the tire is small enough so that the inner tube will not bulge out when inflated, you can ignore it for the moment. Otherwise, you need to repair or change the tire immediately. A temporary repair is to stick over the cut or damage area on the inside of the tire with some non flexible material such as duct tape (aka gaffer tape). The purpose is to prevent the tube from bulging out from the cut when inflated later. A \$2 note is the last resort in case of emergency. A damaged tire should be replaced as soon as possible.



Step 5. Next, locate the damage to the inner tube visually. If it cannot be located, inflate the tube and “scan” along the entire tube against your face/ear while squeezing the tube to detect the leak. Failing which, check the condition of the valve and valve stem-tube interface for damage. Submerging the tube in some water to detect the leak would be best method if access to water is available.



Step 6. Once the leak on the inner tube is located, patch the tube as required by the user instruction in the patch kit. Refit the tube and tire onto the wheel when done.

Section 4: Removing and Installing Hub Sprockets

It is a good practice to clean the chain, chain tensioner and the hub sprockets once in a while. This is to maintain the drive efficiency and to keep the components in a good condition. Long neglect can result in early wear and tear due to the dirt and grit grinding on the sprockets and other drive components. This section illustrates how to remove the chain tensioner and hub sprockets for cleaning. Note that the rear hub for the 6-Speed Brompton is used in the example. Other configurations should be similar in nature.

Tool(s) Required

(1) Flat Head Screwdriver.

Step 1. Remove the rear wheel if it has not been done. Remove the C-shaped spring clip with a flat head screwdriver. To do so, place a finger to hold down a part of the spring clip, insert the flat tip of the screwdriver into one of the slots of the spline on the hub to pry and release the spring clip. Set aside.



Step 2. Remove the small sprocket from the hub. Take note of the sprocket face orientation to facilitate assembling later.



Step 3. Remove the spacer.



Step 4. Remove the large sprocket. Again, take note of the sprocket face orientation to facilitate assembling later.



Step 5. Finally, remove the plastic guard. The removal process is now completed.



Step 6. Clean the hub, sprockets, spacer and spring clip with appropriate degreaser or cleaning agent. Put in your chain too if it needs deep cleaning. Use an old toothbrush dipped in a degreaser to remove stubborn and hard to reach areas is highly recommended.



Step 7. To reinstall the components again, start by installing the plastic chain guard onto the hub. You should notice by now that the chain guard and sprockets are slotted to fit onto the hub only when correctly orientated with the splines. For quick orientation, look out for the smallest slot on the guard/sprockets and the corresponding spline on the hub.



Step 8. Similarly, install the large sprocket with the correct orientation as shown. Notice the curvature of the sprocket teeth.



Step 9. Install the spacer.



Step 10. Install the small sprocket with the correct orientation as shown.



Step 11. To install the C-shaped spring clip to secure the sprocket assembly, hold down one side of the clip and use the flat head screwdriver to aid the installation process as shown.



Step 12. Do a visual check to ensure the clip is installed properly. The re-installation process is now completed.



Section 5: Adjustment of Gear Transmission (Hub)

Gear transmission needs to be adjusted after the rear wheel has been removed or when there are problems with the gear transmission (e.g. some gears are not engaging properly). This section illustrates how to make adjustments to the gear transmission in the rear hub. The 3-speed rear hub is used as the example.

The transmission of the 3 gears in the rear hub is controlled by the tension of the gear cable pulling the gear chain rod in the rear hub. The gear cable tension is in turn controlled by the 3-position shifter on the right handle bar. You can observe the interaction of the shifter positions with respect to the movement of the gear chain rod. Fine adjustment to the gear cable tension or amount of 'pull' is controlled by the barrel on the gear cable barrel assembly and the gear chain rod.

Tool(s) Required

(1) Nil.

Step 1. Recline the bike to rest on the saddle and the rack/rear ezy wheels. This will allow you to shift the gears with one hand while cranking the pedal with the other to feel the gear transitions. Make sure the right hand shifter is at the highest gear to allow slack on the cable for adjustments.



Step 2. If you cannot remember the amount of tension on the gear cable barrel assembly with the gear chain rod, adjust the tension by tightening the gear cable barrel to about half the length of gear chain rod screw thread. Do not tighten the lock nut at this time.



Step 3. Crank the pedal and note the amount of resistance from the current gear setting.



Step 4. Repeat step 3 with the next gear shift lever position. You should feel the change in resistance or sometimes hear a

distinct change in the gear when cranking the pedal. Do this for all the 3 gear shifter lever positions.

Step 5. When switching between the 2nd and the lowest gear setting, you need to crank faster to feel the change in resistance. If you do not feel any differences between the two, shorten the gear cable length by tightening the gear cable barrel.

Step 6. Repeat Steps 4 and 5 until you can feel the distinct changes in the 3 gear transitions. Do a test ride to confirm the setting and lock the gear cable barrel in position with the locking screw. The adjustment is now complete.

Section 6: Adjustment of Gear Transmission (Rear Derailleur)

The rear derailleur allows you shift between the small and large sprockets on the hub. This is controlled by the 2-position shifter on the left handle bar (some models of Brompton do not have the rear derailleur), which in turn pulls the gear cable to move the rear derailleur to the required position. You can observe the interaction of the shifter positions with respect to the movement of the rear derailleur.

If the transition between the gears is not smooth or the shifting of the chain is noisy, fine adjustments to smoothen the gear transition can be made. Similar to the gears in the rear hub, adjustments are made to the amount of tension in the cable so that the rear derailleur can be rotated to the correct position to make the chain switch to the corresponding sprocket.

Tool(s) Required

- (1) Size 2mm Allen Key.
- (2) Size 2.5mm Allen Key.

Step 1. Before you begin, do a visual trace of the rear derailleur cable from the left-hand shifter to the rear derailleur to ensure that no parts of the cable housing assemblies or components are out of place because this could be the source of the problem in gear transmission.

Step 2. The rear derailleur is sitting on top of a wing nut as shown. The 'wings' on the nut together with the 2 screws (the high and low limits) on the rear derailleur controls or limits the degree of rotation of the derailleur.



Step 3. Recline the bike to rest on the saddle and the rack/rear ezy wheels. This will allow you to shift the gears with one hand while cranking the pedal with the other hand. If you have a work stand, invert the bike for easy visual access to the rear derailleur.



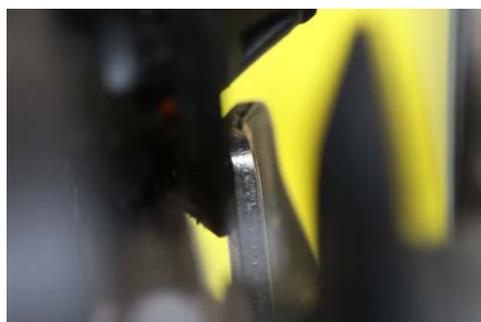
Step 4. Set the left-hand gear shifter to the top position (high gear). At the rear derailleur, you may see there is gap like this between the derailleur guide and the jockey wheel as show in the picture on the right (top).



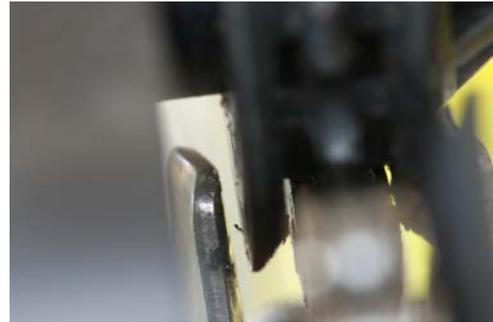
With the size 2mm allen key, unscrew to back out both the high and low limit screws on the rear derailleur sufficiently such that it is not in contact with the wings on the nut. The limit screw are shown in picture on the right (bottom).



Step 5. At the rear derailleur, screw in the high limit screw sufficiently such that the derailleur guide just touches the jockey wheel as shown. The high limit screw is the left screw in the picture shown on the right (bottom).



Step 6. Repeat Step 5 for the low gear lever position by adjusting the low limit screw. For the low limit screw, use the derailleur guide shown on the right as reference for adjustment.



Step 7. Crank the pedal and try shifting between the 2 gear positions to verify that the shifting is now smooth. If not repeat Steps 5 and 6.

Step 8. If the shifting problem persist especially at the low gear lever position with the low limit screw fully backed in, the cable tension might need adjustment at the left-hand shifter.

Step 9. Open the left hand shifter housing with a size 2.5mm allen key.



Step 10. To increase the cable tension (for more rotation of the rear derailleur), move the position of the cable tension limiter down 1 slot. There are a total of 4 slots available. You will also notice that the leverage on the cable length/tension within the housing can also be adjusted but it is not recommended to change this from the factory setting. If you are technically inclined and comfortable to change it, it offers another degree of freedom for adjustment if problem persists after this step.



Section 7: Brakes Adjustment

The position of the brake assembly or callipers can be affected after a fall or during the wheel removal or installation processes. If not corrected, it can affect the functioning and braking effectiveness of the bike and cause uneven wear of the brake pads. This section illustrates on how to make adjustments to the brake assembly or fine adjustments to the callipers.

Tool(s) Required

- (1) Size 2.5mm Allen Key.
- (2) Size 10mm Spanner.

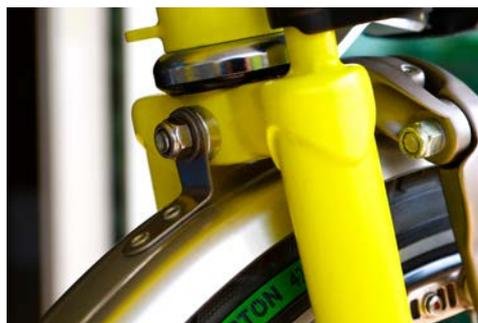
Step 1. Recline the bike to rest on the saddle and the rack/rear ezy wheels.



Step 2. Do a visual check on the gaps between the brake pads and the wheel rim. This should be done especially after a fall. The gaps should be roughly equal on both sides.



Step 3. In the unlikely event that it is out by a lot, centre the whole brake assembly. This can be done by loosening the bolt and re-tighten with a size 10mm spanner when done.



Step 4. Engage the appropriate brake lever and observe if the brake pads comes into contact with the rim simultaneously. The picture on the right shows otherwise. The left brake pad contacted the rim first before the right brake pad.



Step 5. If the contact is not even, small adjustments to the 'swing' of the brake shoes can be made with a size 2.5mm allen key with this screw.



Step 6. Repeat Steps 4 and 5 for both sets of brakes if necessary.

Section 8: Removing and Installing Seat Post

Dirt and grit can accumulate on the seat post through the opening at the bottom of the seat tube during rides. This section illustrates how to remove the seat post for general maintenance.

Tool(s) Required

(1) Size 5mm Allen Key.

Step 1. Loosen the bolt on the saddle pentaclip slightly with a size 5mm allen key and remove (pulling it off upwards) the entire pentaclip and saddle assembly from the seat post. If it is too tight, rotate a little or loosen the bolt more to do so.



Step 2. Unfold the bike and lay the bike on one of its side to remove the seat post through the bottom of the seat tube.



Step 3. Clean the seat post with damp cloth. Do not use any lubricant as it will attract dirt and grit.

Step 4. Clean the interior of the seat tube if necessary.





Step 5. To install the seat post, reverse the process from Step 2.

Section 9: Breaking and Joining of Chain

Breaking of the chain is necessary when it needs to be replaced or to allow for more thorough cleaning of the chain. This section illustrates how the chain can be broken and joined using a chain tool.

Tool(s) Required

(1) Chain Tool.

Step 1. To break a chain, place the chain in the lower chamber (there are 2 chambers on the chain tool) as shown.



Step 2. Turn in the handle on the chain tool to position the push pin to just contact the pin on the chain. Make sure the push pin and the pin on the chain is aligned.



Step 3. Holding the chain and chain tool firmly, turn in the handle on the chain tool to push the chain pin out of the chain gradually. **DO NOT PUSH THE PIN OUT OF THE CHAIN COMPLETELY.** Else, the link will be unusable. The aim is to push out the chain pin just enough for the links on the chain to be separated.



Step 4. Remove the chain from the chain tool to check if it can be separated after several turns of the handle. Re-insert the chain into the chain tool and continue pushing the chain pin if necessary. With enough practice and experience, you will be able to do this within a few tries.

Step 5. The picture on the right shows the chain pin position when the chain can be separated.



Step 6. To join the chain, place the chain in the lower chamber of the chain tool as shown.



Step 7. Turn in the handle on the chain tool to position the push pin to just contact the chain pin on the chain. Make sure the push pin and the chain pin on the chain is aligned.



Step 8. Holding the chain and chain tool firmly, turn in the handle on the chain tool to push the chain pin into the chain gradually. Stop when the chain pin is almost fully in.



Step 9. Remove the chain from the lower chamber. You will notice that the chain link is very stiff and cannot be articulated. That is normal. Move the chain and the affected pin into the upper chamber as shown.



Step 10. Making sure that the push pin and chain pin are aligned, turn the chain tool

handle in to complete the pushing of the chain pin into the chain. Remove the chain and the chain section is now able to articulate. Joining of the chain is now complete.

An alternative way to join the chain is with a SRAM Powerlink. Once the Powerlink is installed on the chain, you can separate or join the chain without any tools. Some newer Bromptons might be factory fitted with the SRAM Powerlink on the chain. The SRAM Powerlink can be purchased through online store such as the Chain Reaction Cycles. Get the Powerlink for the 7 Speed Chain configuration if you are using it on the chain of a 6 speed Brompton. The illustrations below show how the Powerlink are installed and used for separating and joining the chain.

Step 1. Break the chain with a chain tool as described above.

Step 2. Repeat Step 1 on the adjacent pin on the same link of the chain.

Step 3. The Powerlink comes in a set of 2 links.



Step 4. To join the chain, install the links as shown.



Step 5. To complete the joint, gently tension the chain so that the links are closed and locked into position.



Step 6. To separate the chain, hold firmly on the Powerlink surface to slide and unlock the links.

Section 10: “Zhng” Your Brompton

As with all bicycles, Bromptons can be “Zhng-ed” or modified to bring about better performance or just simply eye candy. This section illustrates some common modifications which you can do to your beloved Brompton. Most of the items are available in your local bicycle store or can be acquired via online stores such as Chain Reaction Cycles and TaoBao.

Hand Grip. There are many comfortable and ergonomic hand grips available that offers better feel and reduced hand fatigue during long rides. Visit your local bicycle shop to find one suitable. If there are options for size, opt for those meant for twist gripshifts as they are shorter. Otherwise, you may need to trim the length of the grip (see brake levers below). An Ergon GR-2 is shown on the right.



Brake Levers. The brake levers can be changed to one of your liking. Look for those meant for straight handlebars. A comparison with the stock Brompton levers and the Shimano BL-R770 levers are shown in the picture on the right. On the Brompton lever, notice the plastic housing extended beyond the mounting ring. This will shorten the hand grip length if used with the stock lever. Hence, one may want to change the brake levers together with the hand grips. New brake cables will be required when changing from the stock Brompton levers to others as the cable end (head) at the brake lever is different.



Rollers or Ezy Wheels. Common reasons to change are because the stock wheels do not roll very well and are relatively “thin”. Hence the bicycle is not very stable when rolling around. Roller blade wheels with better bearings or other suitable roller wheels can be used.



2 important points to note when performing this modification. First is to ensure the diameter of wheel is not excessive (max 72mm is ideal). Otherwise, the bicycle may roll on uneven ground as the rubber stopper at the end of the seat post cannot come into contact with the ground when in fully folded position. Second is the need to have longer

bolts to secure the thicker profiles of the roller wheels properly.

The stock bolts securing the front ezy wheels (on frame) on the Brompton are of size 6mm (M6) and length 25mm. The one for the rack is 5mm (M5) and length 35mm. It is highly recommended to replace these with a longer length of 35mm (frame) and 50mm (rack) respectively. Examples of the replacement bolts are shown on the right (middle) for the M6 and right (bottom) for the M5. Source from hardware shops in Kelantan Lane together with new nyloc (self locking) nuts. Opt for allen key heads.



Some people may experience their heels striking the roller wheels when pedaling. This is because the roller wheels are protruding more outwards due to their thicker profile. It can be overcome by adjusting your feet placement (more outwards) on the pedals.

Pedals. The stock pedals may be too small or narrow to one's liking. Visit a local bicycle shop to change to one of your preference if required. The left stock folding pedal can be difficult to remove without the proper tool. Example of a replacement folding pedal is shown on the right. It is a MKS FD-7 pedal.



Shock Absorber. Stock Bromptons come with a standard shock absorbing block. For better shock damping, you can get a replacement FIRM block from Brompton as shown on right (top). Other options include adjustable dampener shown on right (middle).



To replace the shock absorber:

- (1) use a 8mm spanner to unscrew the nut securing the shock absorbing block to the rear triangle frame.
- (2) Replace with new block.
- (3) Secure the nut with the 8mm spanner.



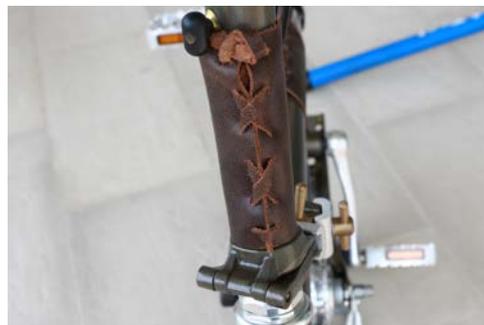
Mud Flaps. Leather replacement for the stock rubber mud flaps are available to enhance the look of the bicycle. A set of leather replacement front and rear mud flaps are shown on the right.



Clamp Levers. Clamp lever replacement for the stock plastic levers are also available to enhance the look of the bicycle. A set of brass replacement lever is shown on the right.



Leather Wraps. Leather wraps on the stem and top tube are used to enhance the look of the bicycle and also to act as a grip when carrying or folding the bicycle. An example of the wraps on the stem and top tube are shown on the right.



Drive Train. There are upgrade kits available for the Brompton to upgrade beyond the maximum 6 Speed configuration. However, one should research and evaluate the gearing ratios the kit offers before deciding to do so. It should also be noted that some kits require the rear triangle frame to be modified or replaced to accommodate the larger hub on the rear wheel.

An example of a 8 Speed upgrade kit with the Sturmey Archer X-RF8(W) hub with twistgrip shifter is shown on the right. It is available through Tiller Cycles and no modifications on the rear triangle is needed.

Jockey Wheels. The plastic jockey wheels on the chain tensioner of the single or 3 Speed Brompton can be replaced with those of better bearings. The jockey wheels are of the 10T variant. Examples are shown on the pictures on the right.



Kick Stand. For those who cycle around with things strapped to the rear rack most of the time, a kick stand is useful to park your bicycle. An example is shown on the right.

