

CYCLE MAINTENANCE

Brakes, gears, punctures and more



WHO WE ARE

The London Cycling Campaign is a volunteer-led, community based organisation working to make London a world-class cycling city. Since 1978, we've been improving facilities, providing information and raising the profile of cycling across London. With over 10,000 members, we are the largest urban cycling organisation in the world.

WHAT WE DO

We bring about real improvements for cyclists in London. Among our key campaigning issues are better conditions for cycling in London, increased provision of cycle parking, and more cycle training in schools and communities. See www.lcc.org.uk/campaigns for more information.

Our **local groups** are made up of LCC members who campaign on a borough level, as well as organising rides and events and providing expert advice to local authorities on routes and facilities.

The **Community Cycling Fund for London (in which LCC is a partner)** allows community groups to apply for up to £5,000 for cycling projects that will

encourage, support and promote cycling in their community: see www.lcc.org.uk/community for more information.

Our **free public enquiry line** staffed by cyclists, comprehensive website and information leaflets on everything from bike maintenance to cycling with children means new and experienced cyclists alike have access to useful advice.

We help people start and keep cycling through our membership package which includes free third party insurance, discounts in over 90 bike shops across London, free delivery of our bi-monthly magazine London Cyclist and more. Join today: www.lcc.org.uk/join

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Company Reg No: 1766411
Charity Reg No: 1115789

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If you take a little bit of time to regularly look after your bike, you'll make your rides faster and more enjoyable and extend the life of your bike. It will be more reliable and you'll need fewer replacement parts, saving you money.

This booklet will guide you through basic bike maintenance, detailing checks you should make, how and why to keep your bike clean and safe, how to fix a puncture and make minor adjustments.

You may decide to take your bike to a bike shop for maintenance, or just for the more technical things.

If you are interested in learning how to do maintenance yourself, you could attend a maintenance course or workshop. You can find details of these in London Cyclist magazine (delivered free to members) and online – www.lcc.org.uk/info.

CHECKING YOUR BIKE

You should get into the habit of checking your bike regularly. A good way of doing this is the 'M' check which ensures you don't miss anything: start with the front hub and wheel, up to the handlebars, down to the bottom bracket, back up to the saddle and end at the back wheel, looking out for potential trouble-spots in between.



What to look out for

Start at the front wheel.

Spin the wheel – it should spin straight. If the wheel wobbles when it spins it may have a buckle and need truing – visit your bike shop.

Check for missing or broken spokes – if any spokes are broken it's important to replace them as soon as possible as one missing spoke will make the others weaker. Wiggle the wheel against its natural axle and check for side to side wheel movement. Listen to make sure you can't hear any damaged bearings. If the wheel moves side to side on the axle the bearings

will need to be tightened. If there is noise coming from the bearings they may need to be cleaned or replaced. If you cannot adjust the wheel yourself, take it to your bike shop.

Check the rim: some rims will have a wear line. If you can't see this, your rim may need replacing. Check that the rim surface is flat and not concave. Check for hairline cracks in the rim. Rims that are cracked or worn away should be replaced.

Check that the tyres are pumped up to the pressure specified on the side (usually expressed in BAR or PSI) and look for wear on the tread or for any cracks in the tyre. Tyres on which most of the tread has worn away are more likely to get punctures so it is worth replacing tyres every couple of years (depending on your mileage) to avoid flats.

Then look at your brakes:

Are your brake blocks worn down? Are the blocks lined up correctly? Squeeze the brake levers: the blocks should hit the rim squarely. Make sure they do not touch the tyres. Squeeze your brake levers and push the bike forwards to make sure the brakes are effective. If you need to replace your brake blocks or adjust your brakes, see p.8.

Check your stem and headset:

Stand over the front wheel pulling on the brake levers and push backwards and forwards (hold the top of the forks as well if you have any front fork suspension). If there is any movement the bearings may be loose – visit your bike shop. Hold the front wheel between your knees and try turning the handlebars – if the bars move without the wheel moving, your stem needs tightening: this can usually be done with an allen key. Check that your bar ends (plugs at the ends of your handlebars) are in place – replace them if not.

Moving onto the second part of the M: check your frame.

Look out for hairline cracks in the frame, especially at the joins. You should never ride a bike with a cracked frame, no matter how small – take it to your bike shop for advice. If you're using this check to look at a second hand bike, feel the underside of the down tube – if the paintwork is blistered then it may have been in a collision.

Check your bottom bracket: the part of the frame around which the cranks revolve.

Jiggle the cranks from side to side against their natural axle: if there is any movement, the bearings may be loose or your cranks may need tightening (usually either with a 14mm socket spanner or an 8mm allen key). If you are unsure, visit your bike shop.



Spin your pedals and check they are in good condition.

Check that your saddle is at the right height and is bolted tightly: remember, your leg should be almost fully extended at the bottom of a pedal stroke.

Check your back brakes and wheels as you checked the front ones.

Check your gears:

While pedaling, click through the whole range of gears (you may wish to turn your bike upside down, so that it rests on the handlebars and saddle, or ask someone to help you with this). If the gears don't change smoothly, see p 13. Check that the cogs are not worn down.

Check that your chain is clean and lubricated – if you ride regularly, you should aim to clean and oil it once a week.



If you pay attention as you ride you will be able to notice any changes in your bike, for instance if the gears no longer change smoothly or if the handling feels a little odd. Bike maintenance is best done 'little and often'.



TOOLKIT

You don't need much to maintain the basics on your bike; a few tools, some time, good light and patience to carry through your maintenance methodically. You may be slow to start with, but as with anything, once you know how it gets quicker and easier.

You should start by getting the following tools and equipment:

- **Bicycle pump – a track pump is best as you can see the tyre pressure marked on a dial. Track pumps provide high pressures much more easily than ordinary pumps.**
- **Spare inner tube in the correct size for your tyres (check your tyre wall to find out what size you need).**
- **Puncture repair kit**
- **A set of tyre levers (plastic is best)**
- **Light oil and grease, lube**

- **Cleaning rags**
- **A set of Allen keys, including an 8mm one if your crank bolts are this size**
- **A flat head and a Philips head screwdriver**
- **Set of spanners - commonest sizes: 8, 9, 10, 11, 12, 15 mm. Also 13, 14, 17, 19 mm. A small adjustable spanner is useful too.**
- **Plastic gloves (you can get them free from many garages) to keep your hands clean or a good hand cleaner.**

Note: Better quality foldable multi tools will often include a set of allen keys, screwdrivers and a chain tool.

If you decide to do more advanced servicing yourself then you will need specialist tools.



Maintenance tips

Whenever you come to put a bolt or a cable back on your bike, you should lubricate it with a touch of grease. Specialist bike grease is best: ideally in a tube as pots of grease can collect dirt.

Wherever possible, use the correct tool for the job. Make sure that you are in a comfortable position and that the tool is fully engaged before you apply force to it.

BRAKES

a disc or the hub. Brakes are either operated by cables or hydraulic systems. Your brakes should stop the wheel effectively, without you having to squeeze the lever tightly against the handlebar. The following is a general guide to simple adjustments for the commonest types: cantilever, V brakes and side pull brakes. If you have hub, disc or hydraulic brakes, or if you don't feel confident making these adjustments but are at all concerned, you may wish to take your bike for a check up at your bike shop.

There are a number of different brake systems, which either stop your bike by squeezing on the wheel rim or by gripping

You can make small adjustments with the adjusting screw, which will either be where the cable comes out of your brake lever or on the brake itself (by the wheel). On side-pull brakes it may be where the cable meets the brakes. You will need to loosen the locking nut on the inside of the adjuster, and screw the adjuster out to take up slack in the cable. Once you are satisfied with your adjustments make sure you re-tighten the locking nut.

You can also tighten the cable manually. Loosen the cable clamp bolt enough to allow the cable to be pulled through with pliers (or fingers). Pull the cable through a small amount, tighten the bolt, test the brakes and if satisfied fully tighten the bolt.

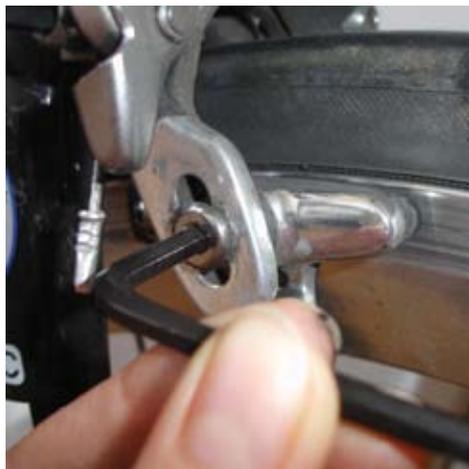
Tightening the brakes



Replacing your brake blocks

If your brake pads have worn down then you will need to adjust or replace them. NEVER let your brake pads wear down so that the metal scrapes the rims! Note: some brake pads also have a feature that lets you know when they need replacing. If replacing the brake pads, pay attention to how they fit and the order of any spacers or washers for fitting the new set.

Whether you are adjusting or changing your brake pads you need to make sure they are aligned correctly, so that when in use they are fully touching the rim and do not touch the tyre. They should be square



so that the entire brake pad touches the rim. Place them so that they are no more than 3mm from the rim when not being applied (if they rub in places you may need to have the wheel trued).

If your brakes squeal, 'toe in' the brake blocks - the front of the block should hit the rim fractionally before the back.

Replacing the cable

Over time cables will stretch and need replacing. If your cables are damaged, frayed or sticking you should replace them. You can remove the cable by undoing the cable bolt (see 'tightening the brakes'), cutting off the cable cap end and sliding the cable through the casing and out of the levers. Pay attention to how the cable

is threaded and fits through the lever for when you put in the new cable; there should be slots in the lever to allow the cable to fit in and out easily. This is a good time to lubricate the cable casing with some light oil.

You fit a new cable from the lever, back through the outer sleeve and down to the brake. There are two types of cable end: pear shaped for drop handlebars and barrel shaped for flat handlebars. Make sure you tighten the cable clamp fully once you have set up the correct tension (see 'tightening the brakes'). If your brake levers have a slot for easy cable installation, make sure the corresponding slot in the adjusting nut is positioned so that the cable won't come out by accident.

WHEELS AND TYRES

Pump your tyres up as hard as you can with a hand pump, or if using a track pump or car foot pump, pump up to the recommended tyre pressure listed on the tyre wall (units: psi = pounds per square inch, Bar/ATM = atmospheres).

Tyres will usually have one of two valves: Presta or Schrader. Presta valves are skinnier and often seen on road bikes. Before you pump up a tyre with a Presta valve you will need to unscrew the end, press it once to release any stiffness, and remember to re-tighten it after inflation. Handle Presta valves with care, as they are fragile. Schrader valves are the same as car tyre valves and commonly seen on mountain bikes and bikes with wider tyres. Older bikes may have other types of valves. Ask your bike shop and consider buying a more modern inner tubes.

Regularly check tyres for glass shards or other sharp things that have stuck in the surface, and remove these before they are able to work through to puncture the inner tube. Clean the rims and spokes, especially if you have ridden on roads that have been gritted for snow, as the salt will damage the rims. Keeping the rims clean will help you to brake efficiently and lengthen the life of your brake pads.



Presta



Schrader

Disengaging the brake to remove the wheel

For V-brakes, pull the brakes together so that the cable can be lifted free of the moveable arm attached to one brake lever. On side-pull brakes there may be a button on the side of the brake lever, or a quick release lever on the brake used to disengage the brakes. If not, you may have to deflate the tyre or remove one brake block in order to get the wheel off. On cantilever brakes pull the cable out of one arm of the brake through the slot. Whatever you do don't forget to re-engage your brakes before you ride your bike again!



Removing the wheel

To take out the wheel, disengage the brake. Your wheel may be held in place with a wheel nut or a quick release nut (see below on how to undo the quick release); you will need a spanner to undo

a traditional wheel nut. The front wheel will drop out easily, while the rear wheel will need to be lifted out of the chain. Fitting the wheel is the reverse of this: make sure you have the wheel firmly back in place and it is properly aligned. Make sure you re-engage the brake.

Older bikes have horizontal rear drop-outs, which allow you to adjust the position of the wheel in the frame. Make sure the wheel is dead centre between the chain stays before you tighten the wheel nuts/quick release lever.



Quick release mechanism

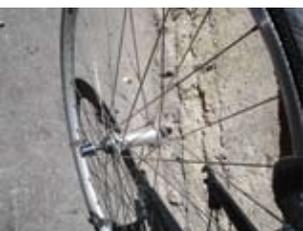
Pull the lever open and undo the opposite nut enough so you can drop the wheel out. To replace the wheel fit it between the brakes and into the drop out, and re-tighten the nut so that you have to push hard with one hand to close the lever. The lever must be closed tightly before riding, and should read 'close' not 'open'.

FIXING A PUNCTURE AND REPLACING AN INNER TUBE

Having a puncture can be annoying, but it should be easy to fix. If you are not used to fixing punctures it can take some time, but does get a lot quicker with practice. It is generally faster to replace the inner tube with a spare rather than try to patch a tube that is on the bike. (You can repair the punctured tube at home or at your workplace.) Puncture glue takes at least five minutes to dry properly.

If you get a puncture, first check the tyre to see if you can find anything that may have caused the puncture. If there is something obvious you may be able to pull out that section of the tube and patch the spot without removing the wheel and then the tube. If you cannot find the object that caused the puncture remove the inner tube, inflate it and listen, or feel, for escaping air. Once you have established where the air is coming from, check that section of tyre for a piece(s) of glass or other sharp object(s) and remove it. There is no point in replacing an inner tube only for it to be punctured again.

Many people choose to use puncture resistant tyres, which have protective strips of materials such as Kevlar inside them.



Removing the inner tube

Remove the wheel, undo the valve cap, remove the threaded metal collar (if there is one), empty any air out of the tube and push the valve back into the rim.

Fit 2 or 3 tyre levers into the rim about 2cm apart and pull them back, levering one side of the tyre out and over the side of the rim. Take care you are not pinching the tube

while you lever the tyre out.

Remove the middle of the 3 levers, and hook it under the tyre about 2 cm past one of the other two. You then have 3 levers in place again, but a longer section of the tyre is hooked over the rim.

Take the middle lever out and repeat the process a few times. Once about a third of the tyre is hooked over the rim, the remainder will come off more easily.

The tyre should remain sitting on one side of the rim. Grab the inner tube at the valve hole, push the valve up through the rim and pull the valve out from the tyre. Pull the rest of the inner tube out.



Mending the puncture



To find the hole you can either pump the tube up and feel/listen for the air coming out or hold the tube under water and see where bubbles appear.



Deflate the tyre, clean the area around the hole and make sure it is dry.

Lightly sand the spot round the hole, and mark the hole with a ball point pen, chalk or a dab of rubber solution.

Apply a little more rubber solution until you have an area slightly larger than the patch, keeping the hole

in the middle all the time. Let the rubber solution dry (5 minutes) but don't let any dirt stick to it.

Peel off the backing paper/foil/plastic on one side of the patch and be careful not to get dirt or fingerprints on the patch itself. Place it on the inner tube so that the middle of the patch covers the hole, and make sure that the patch is in good contact with rubber solution all around the edge. Squeeze the patch hard into the rubber solution for about a minute. To remove the backing paper (not an essential task) fold the inner tube in half so that the backing paper on the patch splits down the middle. Carefully peel the backing off from the middle towards the edge to avoid lifting the edge of the patch. Dust the top of the patch and any exposed areas of rubber solution with chalk/talc to stop it sticking inside the tyre.

[Finally, give the inner tube 2 or 3 strokes of the pump before putting it back on the wheel. This prevents the tube getting pinched when you put the tyre back on.

Replacing the inner tube

Starting at the valve hole, put the inner tube onto the rim under the tyre. Then hook the tyre back onto the rim with your hands, making sure that the inner tube does not get pinched, and that the tyre is seated properly on the rim. You may need to use a tyre lever to get the last section of tyre back on the rim. Replace the threaded collar, pump up the tyre and replace the dust cap.



GEARS

Most gear systems on bikes are derailleurs. Some bikes have hub gears; however as these are comparably uncommon in the UK and need less maintenance than derailleur systems they are not covered in this booklet. Derailleur gears use a combination of different sized front and rear chain rings with a chain that can be moved between them so that different pedalling

force is required to drive the back wheel.

Most modern gear systems will be indexed; this means that you will move the gear lever one click and the chain will shift exactly onto the next chain ring. On some older systems, there is no click: you have to teach yourself how far to move the lever to get an accurate gear change.

You may notice that over time your gears go out of alignment, so that as you cycle you are unable to change gears smoothly, the gears jump or the chain falls off. These problems can occur as your gear cables stretch with time, the chain, cogs and sprockets wear or if the gear mechanism gets bumped.



Adjusting your gears

If the gears are not changing smoothly you may only need to make a small adjustment. If you have indexed gears you will be able to do this by turning the barrel adjuster by the gear levers or at the derailleur. You can adjust the movement of the derailleur

mechanism, to prevent the chain going beyond the cogs, by two small stop screws on the mechanism (usually marked H and L). They should allow the chain to move up and down the cogs without coming off the top or bottom.

CLEANING AND OILING YOUR CHAIN

You should clean your chain before you lubricate it; you can use degreaser or special cleaning product from your bike shop. There are special chain cleaners on the market, which fit over your chain, or you can run your chain through a rag coated in cleaning material, until no more dirt comes off. To get your chain

really clean you should clean every link individually. You should then clean the chain rings at the front, the sprockets at the back, jockey wheels and all other related parts.

Once these are all clean you will need to oil the chain and exposed metal parts. Oil the inside of the chain, running it around the chain wheel and sprockets a couple of times as you go; leave it to penetrate for several minutes, then wipe off the excess. Excess oil or grease on the outside will attract dirt; this will wear out the chain. It is best to use a light oil like 3-in-OneR or you can also get specialist lubes from bike shops designed for the different conditions you may ride in.



CONTACTS

London Cycling Campaign

Find this information and more on the website, or call us for advice about your bike.

t: 020 7234 9310

w: www.lcc.org.uk

Cycle Training UK

Cycle Training UK is a not-for-profit workers' co-operative promoting cycling for all. They run a selection of maintenance courses on which LCC members can get a discount.

t: 020 7231 6005

w: www.cycletraining.co.uk

London School of Cycling

Cycle training and day-long maintenance courses in central London on which LCC members can get a discount.

t: 020 7249 3779

w: www.londonschoolofcycling.co.uk/

Park Tools

Makers of bike maintenance tools. Website includes comprehensive maintenance advice and instruction.

w: www.parktool.com/

MEMBERSHIP BENEFITS

Free London Cyclist magazines

For all the news affecting cyclists in the city plus features, reviews, maintenance tips, great rides and offers.

Free third party insurance

Covers you for up to £2million worth of damages if you injure someone or damage their property.

Up to 10% off bike gear

You'll get great discounts at bike shops throughout London where you can save money on everything from a new bike to a puncture repair kit.

Free legal advice

If you ever find yourself involved in an accident you can call any one of our cyclist-friendly solicitors for free advice.

A world class cycling city

LCC is the only organisation campaigning and lobbying exclusively to ensure the best possible routes, facilities and services for people who cycle in London.

PLUS special deals on theft insurance, discounts on cycle maintenance training, free leisure rides, events and campaigns in and around your borough.

ABOUT THESE LEAFLETS

There are 13 information booklets in this series.

Getting started

Buying a bike

Getting started on a bicycle

Cycling for people with disabilities

Cycle Sense

Workplace

Cycling to work

A guide for employers

Parking and storage

Leisure

Leisure rides

Cycling with children

Travelling with your bicycle

Practical

Cycle maintenance

Bike security

Protection: insurance and incidents

These leaflets can be downloaded from www.lcc.org.uk/info or ordered from the LCC office by calling 020 7234 9310.

This edition published May 2007.
Many thanks to Che Sutherland, Tom Bogdanowicz and Rosie Downes for their contributions to these leaflets.

Get more out of cycling in London

Join the London Cycling Campaign to save money and get all the support you need to cycle in London - from free and specialised insurance, updates on the latest cycle routes and social rides, to London Cyclist magazine, the essential read for everyone who cycles in London.

Add to this the discounts you'll get in bike shops and on cycle training and you'll see why LCC membership is as necessary to you as your pedals.

In turn your membership will help us to make your cycling safer, quicker and more pleasant around London: we are constantly lobbying and campaigning on your behalf to win real improvements that affect us all.



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Cover image:
Rosie Collins

cycling... good for London, good for you!

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