

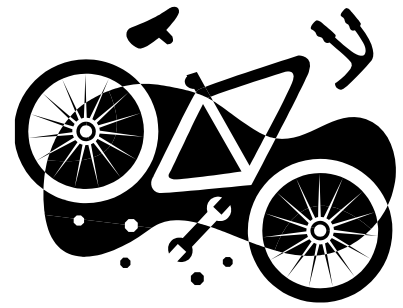


BIKE 101

THE BASICS

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1. An overview of your bike, the Parts & lingo

- Tires / tubes
- Wheels
- Hubs / spokes
- forks
- Drive train
- Shifters
- Brakes, rim & disk
- Handle bar / stem
- Pedals
- Cranks / bottom bracket
- Seat and seat post

2. How to insure your bike is safe to ride

3. How to change a flat tire

4. How to complete basic maintenance

5. How to make minor adjustments

- Shifting
- Brakes

6. How to insure your bike fits you

7. A note about lights and reflectors

THE BIKE PARTS & LINGO



This is a basic bike layout. Bike layout can change in the way of parts & suspension but the basic form and function will always be the same.

BEING SAFE

Frame:

Are all tubes in-line and free of dents, bends, and kinks?

Front Fork:

Is the front fork straight and in good condition?

No play between fork and frame?

Fork turns freely inside of headset?

Suspension moves freely with no play?

Handlebars:

Height of grip below riders shoulder level (seated)?

Handlebar is in line with front wheel?

Handlebar does not move when you hold the front wheel between your legs and try to twist the handlebar?

Grips tight, in good condition, ends of the handlebars covered?

Front Wheel

Tire (inflation): Inflated properly and valve stem straight?

Tires (casing): Good tread and no sidewall damage?

Rims: No dents, twists, or kinks?

Spokes: Good tension, none missing and all tight?

Alignment: When spun, wheel is true and centered in the stays?

Bearings: Wheel spins freely and evenly and does not wiggle?

Rear Wheel

Tire (inflation): Inflated properly and valve stem straight?

Tires (casing): Good tread and no sidewall damage?

Rims: No dents, twists, or kinks?

Spokes: Good tension, none missing?

Alignment: When spun, wheel is true and centered in the stays?

Bearings: Wheel spins freely and evenly and does not wiggle?

When pumping tires inflate only to sidewall rated pressure.

Brakes (front and rear):

Brake lever tight (3/4 inch reserve when brake shoe is engaged)? Cable taut, no breaks, no frayed ends (open the brake lever and check for fraying near the anchor ball at the end of the cable)?

Caliper brakes centered and tight?

Nuts tight on brake shoes?

The open end of the brake pad holder, if any, faces the rear?

At least 3/16-inch rubber on shoes?

Brake shoes meet the rim squarely?

Front and rear brakes operate effectively and smoothly?

Crank and pedals:

Crank turns freely and evenly, no looseness or binding, not bent?

Pedals tight, intact, no binding, free spinning?

Chain:

Chain clean and free of rust, **lubricated**?

Derailleur:

Shifter operates properly?

Derailleur operates properly?

Quick Releases

Hubs – Closing the lever makes an impression on your palm.

Brakes – Closed, brake pads aren't rubbing the rim.

Seat – Closing the lever makes an impression on your palm

REMOVING THE TIRE

- **Instructions**

- **STEP 1:** Remove the wheel from the frame.
- **STEP 2:** Release the air if the tire is not flat.
- **STEP 3:** Insert the thin end of a tire lever between the tire and the rim.
- **STEP 4:** Pull the lever down, and clip the hook end to the nearest spoke.
- **STEP 5:** Move over two spokes, and repeat with a second tire lever.
- **STEP 6:** Move over two spokes more, and repeat with a third lever.
- **STEP 7:** Take the first lever out, move over two spokes from the third lever, and repeat.
- **STEP 8:** Work around one side of the wheel in this way until one side of the tire is free.
- **STEP 9:** When one side of the tire is completely off the rim, pull the other side off with your hands.

- **Change the Inner Tube**

- **Instructions**

- **STEP 1:** Pull out the old tube with your hand and discard, or save it to patch later.
- **STEP 2:** Run a hand lightly over the inside of the tire to find the cause of the flat and remove it.
- **STEP 3:** With a pump put one or two strokes of air into the new tube.
- **STEP 4:** Put the new tube in the tire.

REMOUNTING THE TIRE

- **Instructions**
- **STEP 1:** Find the hole in the rim for the inflation valve; this is the piece of metal attached to the rubber tube into which air is pumped.
- **STEP 2:** Pull the valve through the hole in the rim, and pull the tire over the wheel.
- **STEP 3:** Working around the wheel with your fingers, push one side of the tire onto the rim. The tire's edge will seat itself along the inside edge of the wheel's rim.
- **STEP 4:** Once one side of the tire is onto the rim, check that the tube is not pinched between the edge of the tire and the rim. If it is, gently pull the tube out from the other side.
- **STEP 5:** Turn the wheel around once one side is complete.
- **STEP 6:** Push the second side of the tire onto the rim with your thumbs. When the tire is nearly all on the rim, it will become taut and will require a last hard push with your thumbs.
- **STEP 7:** Re-inflate the tire to its recommended pressure as printed on the side of the tire.

BASIC MAINTENANCE

It is advisable to take your bike to an experienced mechanic once a year for a thorough service. However, with a little investment in tools and time, the majority of repair and maintenance jobs can be carried out at home.

What you need

There is a range of bicycle tools available, however all you need to start with are screwdrivers, Allen keys, wrenches, a pump, tire levers, cleaning rags an old toothbrush, lubricants and a puncture repair kit.

Daily maintenance

Each day you use your bike, give it a quick once-over. In particular, check the condition of the tires and their pressure.

Weekly maintenance

Lubricate exposed moving parts of the bike, such as the chain and gear mechanisms taking care not to get any on wheel rims or brakes. Clean dirt / grease off wheels with a cloth and some cleaning spray.

Monthly maintenance

Check tire pressure and condition. Make sure your wheels are properly fastened and in line with the frame. Check all nuts and bolt to insure they are tight. Wash down your bike with soap and water (no pressure washers) and re-lubricate all moving parts and cables. Insure correct shifting.

Brakes:

Check the brake pads for wear and ensure they contact squarely with the rim, not the tire. Replace worn or frayed brake cables and adjust brakes so that the brake levers don't come into contact with the handlebars when braking hard.

Gears:

Check gears work correctly and cables move freely (though it's best to leave gear repairs to a bicycle mechanic). Clean the chain with a rag soaked in degreaser then re-oil.

Steering:

Check for looseness in the handlebar and stem and tighten where necessary.

Pedals:

Pedals should spin freely so check the pedal axles for looseness and tighten.

REAR DERAILLEUR

You will need a way to suspend or hold the bike upright (a car rack works or use your repair stand, if you have one) a 5-mm allen wrench, grease, diagonal cutters, pliers, small screwdriver (flat or Phillips) and cable end cap (to prevent fraying)

Place the bike in a repair stand. While pedaling by hand, shift the chain to the smallest freewheel cog and middle or smallest chain ring.

Cut off the end cap, loosen the anchor bolt, and extract the cable. If it's kinked or rusted, replace it. Grease sections that run inside housing and reroute the cable through the housing and to the anchor bolt. Turn the derailleur adjustment barrel clockwise all the way, then unscrew it one turn. Don't tighten the anchor bolt yet.

While pedaling with your right hand, push against the derailleur body with your left thumb causing a shift to the largest cog. Release the pressure with your thumb to shift to the smallest cog. Do this repeatedly, noting any hesitation or over shifting. The chain should move smoothly onto the smallest and largest cogs.

If necessary, adjust the derailleur range of motion by turning the high- and low-gear limit screws (usually the top and bottom, respectively) to allow the derailleur to shift accurately to the largest and smallest cogs. Counter clockwise turns allow it to move farther; clockwise turns limit it. Keep shifting with your thumb and fine-tuning the screws until the chain shifts perfectly onto each cog with no hesitation or over shifting (off the top or bottom cogs).

With the chain on the smallest cog, grasp the cable with pliers and pull lightly to remove slack. While holding the cable, tighten the anchor bolt. Install the cable end cap and crimp it in place with diagonal cutters. While pedaling with your left hand, shift repeatedly with your right to test adjustments. The chain should engage the largest and smallest cogs accurately. If necessary, adjust the limit screws.

If the chain won't drop to the smallest cog despite adjusting the limit screw, you may need to loosen the cable by turning the adjustment barrel clockwise half a turn. The other possibility is that you'll need to remove slack that's developed (new cables usually stretch a bit) by loosening the anchor bolt, and pulling on the cable with pliers to remove the slack. The adjustment is right when the cable has no noticeable slack but is not too tight, either.

For the final adjustment, while pedaling with your left hand, move the lever one click with your right. The chain should jump to the second-smallest cog and run quietly. If it **hesitates**, screw the adjustment barrel counter clockwise one-half turn and retry. Repeat this until it shifts immediately onto the cog. If it **over shifts**, screw the barrel clockwise by half turns until it doesn't. Shift through all the gears and test ride the bike. Fine tune again if necessary.

Note: Once the derailleur is adjusted properly, about the only adjustment necessary (assuming you don't crash and damage the derailleur) is taking care of any cable slack that develops from stretching, which occurs over time. To remove slack and restore perfect shifting, simply turn the adjustment barrel counter clockwise in half turns.

FRONT DERAILLEUR

You will need a way to suspend or hold the bike upright (a car rack works or use a repair stand, if you have one) a 4-, 5-, 6-mm allen wrenches, small screwdriver, pliers, 8/9 combination wrench, diagonal cutters, lube, grease, cable end cap, adjustable wrench and a plastic mallet. You may also need bottom-bracket adjustment tools.

Gripping each crank arm with one hand, push and pull laterally to check for play in the bottom bracket. If necessary, use the appropriate bottom bracket (BB) tools to remove play. Depending on what type of BB you have, you may need to remove the crankarm first. Any play in the BB bearings makes it impossible to properly adjust the front derailleur. While you're working on the crank set, check each crank bolt with the 5-mm allen wrench to make sure they're tight.

Lift the chain off the smallest chain ring and place it on the bottom bracket of the frame. Turn the crank by hand while looking at the chain rings from above. Using one side of the front derailleur cage as a reference, observe the trueness of each ring. If they wobble, true them by prying gently with the adjustable wrench (set the jaws just wide enough to slip over the ring). Another way to do this is to tap on the wobble with a plastic mallet. This takes a little practice, but it works nicely when you get the hang of it.

Place the chain back on the ring. Next remove the cable end cap, loosen the anchor bolt with a wrench, and remove the cable from the housing (if applicable). Replace a rusted or frayed cable and cracked or corroded housing. Run the new cable through the lever, housing (or BB guide), and stops to the anchor bolt. Don't tighten it yet. Apply spray lube to the derailleur pivot points and wipe off the excess. Check the tightness of the cage bolt with a screwdriver.

When viewed from above, an imaginary line through the center of the derailleur cage should be parallel to the chain rings. Next, look at the derailleur and rings from the side. Pull the cage outward with your hand. It should clear the large ring by 1/16 inch. If necessary, loosen the frame clamp with an allen wrench and adjust the derailleur position.

Shift to the largest freewheel cog and smallest chain ring. Adjust the low-gear (inboard) limit screw so there is 1/32-inch clearance between the inside of the inner cage plate and the chain. Clockwise turns limit derailleur travel, and counter clockwise turns increase it.

Make sure the front shift lever is in its starting position (shift the chain onto the smallest chain ring by hand). Also, make sure that the cable housing is seated inside the lever and the cable stop(s) because otherwise when it pops into place, it'll create slack ruining your cable adjustment. When the cable and housing is seated correctly, pull lightly on the cable with pliers to remove slack and tighten the anchor bolt with a wrench.

Shift to the largest ring/smallest cog combination. Adjust the high-gear (outboard) limit screw so there is at least 1/32-inch clearance between the inside of the outer cage plate and the chain. Also, the cage shouldn't travel outward so far that it strikes the crank arm.

Test your work by shifting repeatedly. Move the lever forcefully to stretch the cable, then shift to the smallest ring and check cable slack. Remove slack if necessary as described in step 5. Go for a neighbourhood test ride. If over shifting occurs (the chain falls off), tighten the appropriate limit screw half a turn at a time and test. If shifts are hesitant, loosen the appropriate limit screw half a turn at a time.

BRAKE ADJUSTMENT

Tightening the Brakes

For off-road, comfort, hybrid and city bikes with upright handlebars; look at the brake levers for a handy device called an adjusting barrel.

It will have a knurled edge for easy gripping and it makes adjusting your brakes easy without tools. It's perfect for making your brakes feel like new after you've logged a good many miles and worn down your pads. And you can even use it on rides if your brakes begin to feel weak as sometimes happens when it's muddy or wet.

To use adjusting barrels, turn them counter clockwise by hand and check the setting by squeezing the levers. When the brakes feel right, lock the barrel adjusters in position by turning the lock ring (the second knurled piece) clockwise until it's tight against the lever.

On road bikes with dropped handlebars, you'll find the adjusters on the brakes. To tighten the brakes, turn the adjusters in the direction that moves the pads closer to the rims.

Keep in mind that when your brake pads wear out, the adjusters won't do any good and you'll need to turn the adjusters all the way back and replace your brake pads.

Wheel Centering

One of the most common brake problems is a dragging brake pad; one that remains against the rim or stays close to it after you've released the brake lever.

The most common cause of this problem is a misaligned wheel. This can occur when you reinstall your wheel after removing it to put your bike on a roof rack or to fix a flat tire, and you don't get it exactly centered in the frame.

This causes the brake to work improperly because it's tight on the frame and has been adjusted to align properly only on a perfectly centered wheel. Now that the wheel is crooked in the frame, the brake can't work correctly.

To correct the dragging shoe, simply center the wheel in the fork or frame. For most wheels, all that's usually required is loosening, making sure they're fully inserted in the fork or frame, and tightening them. (If the bike is standing, just press down on the handlebars for the front wheel and the seat for the rear wheel to push them fully into the frame and center them.)

If you have a frame that lets you place the rear wheel in different positions, check that the wheel is centered between the seat stays and chain stays before tightening it. You can do this by looking at it or use your fingers as "feeler gauges" by sliding the same finger on each hand between the frame and rim or tire feeling if it's centered

Brake Centering

If your wheels are centered and the brake still drags, the brake may have gotten bumped and knocked out of position on the frame. Start by double-checking that the wheel is centered in the frame because you don't want to ruin the brake adjustment if it's actually set correctly.

To center side pull brakes (road bikes), loosen the attaching bolt behind the fork crown or brake bridge until the brake is loose. (It should move sideways when you push it).

Now, squeeze the lever to hold the brake pads against the rim while you tighten the brake bolt on the back of the frame. If the brake needs minor fine-tuning after this, look for a small screw (it might be an Allen type) on top of the brake. Clockwise turns will move the brake shoe on the side of the screw away from the rim and vice versa. (This screw is not intended for major adjustments.)

If adjusting the screw doesn't center the brake, screw it back to where it was and double-check how well centered the wheel is because that's probably the problem.

To center linear-pull brakes (off-road and hybrid bikes), look for a small screw in the side of the brake arm. Clockwise turns of this screw will move the pad in the arm with the screw away from the rim and vice versa.

Brake Binding

Brakes should operate smoothly and easily and the brake pads should snap away from the rims when you release the levers. If not, the brake pivots or cables might be dry, causing binding. To free the pivots, lightly lubricate the brakes where the arms pivot and squeeze the levers repeatedly to work the lube into the brakes. (Be sure NOT to get any lube on the brake pads or rim. If some gets on them; wipe them clean with rubbing alcohol.)

Better? If not, it might be the cable that needs lube. Usually, this is only required on rear cables with split housing (if you have split housing you can see the middle of the inner cable and the housing is in two pieces).

Look closely at where the housing sections enter the stops on the frame. If the stops are split, you'll be able to remove the housing and lubricate most of the cable. If the housing stops aren't split, raise the bike so that gravity will draw the lube into the housing section, apply a few drops of lube on the cable and squeeze the rear brake lever to draw the lube into the housing. Repeat for the front section of housing.

If the housing stops are split, open the quick release on side pull brakes or unhook the noodle on linear-pulls. This should provide enough slack so that you can pull gently on the housing sections and free them from the frame stops. If you need more slack, squeeze the brake shut with your hand.

When the housing is released from the stop, slide the rear housing section (with flat-handlebar-equipped bikes you'll be able to slide the front housing section, too) along the cable so that you can lubricate the cable where it runs inside the housing, which should eliminate the binding. Then reconnect the cables and your brakes should feel as good as new.

For optimum braking, the rims and brake pads must be clean. As you use your brakes, however, the pads strike the rims picking up anything on them and sometimes transferring rubber deposits to the rims. The pads even pick up bits of sand and gravel that then grind the sides of the rims as you brake wearing them prematurely. This is another reason it's important to keep the pads and rims clean (rim replacement is expensive).

To clean them, dampen a corner of a rag with rubbing alcohol and scrub the rims to remove any rubber deposits or grimy build up. Then wipe the surfaces of the brake pads to clean them.

DOES YOUR BIKE FIT

- **Size - Fit of bike to rider:**
- Can rider straddle the frame with both feet flat on the ground?
- **Height of Seat – Beginner** – Seated cyclist can place feet on ground? (more for kids)
- **Experienced** – Seated cyclist can put ball of foot on the pedal at its lowest point? (Leg fully extended, but without rocking hips) Seat in good condition and does not move when you grab hold and try to twist it side to side or up and down?
- To achieve a basic fit for ride height, sit on your bike with someone holding you up and place your right heel on the pedal with the pedal in the lowest position. Your leg should be almost straight with just a slight bend in you knee. If not, lower the seat just enough to achieve the slight bend.
- To achieve a basic fit for riding position, sit on your bike with both feet in the normal position. Level the pedals so they are parallel to the ground. You should have an approximate 90 degree bend in your forward knee. If not move your seat forwards or backwards just enough to create an approximate 90 degree bend.
- The other factors that affect your riding position is stem length and height. If your stem is too long you will feel stretched out and if it is to short you will feel cramped or to upright. The basic rule of thumb is that while you are in your normal riding position you should not be able to see the front axle of your front wheel when you look down, the head of the stem should cover it. This will require the purchase of a new stem to adjust this or if it is a new bike most good bike shops will exchange it for one more suited to you.
- Stem height is more to do with rider preference, riding style and comfort. If you are commuting or riding downhill trails you would want to be more upright. If you are doing cross country riding or more performance oriented you will want to be lower and slightly forward but in general whatever is comfortable for the rider.

LIGHTS & REFLECTORS

- By law all bikes sold in North America are required to come with a front and back reflector and two wheel reflectors. If you are commuting it is a good idea to leave those reflectors on your bike. If you are trail riding these will become broken and damaged and could cause injury to the rider so removing them would be suggested but that is your call. A good idea for all cyclists is to purchase a front light and a rear flashing light to make yourself more visible to vehicle traffic in both day and night.
- There are many types of bicycle lights available, each with its own advantages and disadvantages. There is no one "best" solution for any rider, and many riders mix and match different technologies to provide the balance that works for them. There are basically three types of bike lights in today's market that range in price from a few dollars to upwards of \$600.
 - Halogen
 - L.E.D.
 - H.I.D.
- Halogen is the cheapest and emits a "spot" like beam but has the shortest burn time.
- L.E.D. (light emitting diode) is now comparable in price to halogen and has the longest burn time but emits a "flood" like beam and more of a glow type light.
- H.I.D (high intensity discharge) is the most expensive, the brightest, has the most adjustable beam and has a comparable burn time to an L.E.D. systems. H.I.D. lighting systems start at around \$200 for a single light.
- A common setup for a commuter might include:
 - a removable halogen or LED light powered by a rechargeable battery pack,
 - a removable LED tail light, either steady, flashing or pulsating. Red or orange in color,
 - and possibly a flashing/pulsating LED front light for conspicuousness