



Brake health check: stopping safely

Things you'll need

Essential

- Clean Rags
- Degreaser or brake cleaner
- Lubricant
- Allen keys
- A small flat head screwdriver
- Small spanners typically 8/9/10mm

Desirable but not essential

- Gloves (to keep your hands clean and protect them from chemicals)
- A work stand

Brake basics

The key thing you need to know about all brakes is that they rely on friction. The greater the friction, the faster and safer you will stop. In order to make sure your brakes work, we have to make sure that friction is available when you need it, so dirt, grease, wear and poor adjustment are all the enemy of good brake function. In this guide we'll cover the key types of brakes you might find on your bike and the basics of maintaining and adjusting them. There are innumerable designs, styles and brands of brakes, so this guide won't try to cover them all in detail but we will give you the basics.

Types of brakes

Rim Brakes

There are many variations of rim brakes. They are the most common type of brake on a bike and they all work by a pad contacting the rim of the bike wheel. They are typically set up and adjusted using cables. It's important to note that both pads and eventually the rim wear out, so you should check them both.

Calipers or Side Pull brakes

These are often referred to as 'road bike' brakes and this is where you most commonly find them but they are found on BMXs, kids bikes and lots of others. There are many different sorts from very basic to highly complicated Dual Pivot types but they all work in roughly the same way.

The cable enters on one side and squeezes the horseshoe shaped mechanism together applying the pads to the rim.

The important thing to note is that when the pads wear, **they move up the rim toward the tyre.**

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Cantilever Brakes

Most often found on older mountain bikes and touring bikes and still common on cyclocross bikes, these have two independent arms pulled by a central yoke.

The yoke is attached to the brake cable.

The important thing to note is that when the pads wear they **move down the rim toward the spokes.**

Image By [AndrewDressel](#) [CC-BY-SA-2.5](#) from Wikimedia Commons

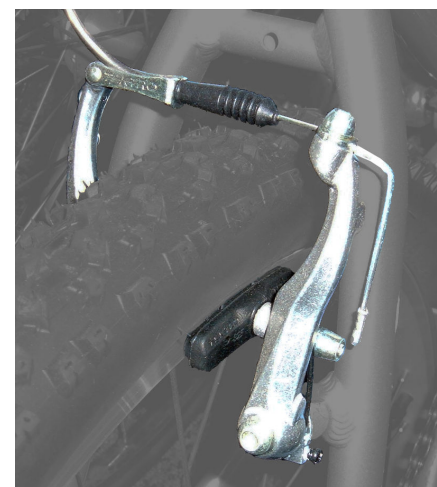


V Brakes

A more modern variation on the Cantilever, sometimes called a linear pull brake, these are very common on all types of bikes. The cable enters on the side of the brake and the two arms are held together by a noodle (yes, really!).

The noodle also acts as a quick release so the wheel can be removed. Like cantilevers, when the pads wear they **move down the rim toward the spokes.**

Image By [Keithonearth](#) [CC BY-SA 3.0](#) from Wikimedia Commons



Disk Brakes

Disk brakes are increasingly common on all types of bikes. They rely on pads braking on a 'rotor' attached to the wheel instead of on the rim. They have some big advantages over rim brakes. They are more powerful, have better modulation (how it feels when you pull the brake lever) and they don't wear out your rims.

There are lots of types but the key differentiator is that some are **cable** operated and are easy to adjust with simple tools but many are now **hydraulic** and require specialist tools to maintain.



Image By [StromBer](#) CC BY-SA 3.0 from Wikimedia Commons

Drum Brakes

Found frequently on utility and dutch bikes and in special applications like tandems, these brakes are built into the hub of your wheels. They rely on brake shoes pushing on the inside of a drum. The key advantage is they need very little maintenance and only occasional servicing. They are heavy though!



Image By [Markus Schweiss](#) CC BY-SA 3.0 from Wikimedia Commons

Inspecting

Brakes become less effective over time. Cables get damaged and pads wear. If you can squeeze the lever all the way to the bar without the brake engaging then they need attention urgently. Ideally the lever should move about 1/3 of the way to the bar before the brake engages. When you pull the lever the wheel should 'lock-up' fairly easily. If you are pulling the lever and the wheel can still move here is what to check for:

1. Is the brake properly set up? V-brakes have a quick release so that the wheel can be removed and refitted easily. The 'noodle' should be hooked into its cradle. Caliper brakes often have a small quick release lever on the caliper, enabling it to open wider. Make sure this lever is closed, otherwise the brake pads will be too far from the rim.

2. Check the condition of cables. If they are damaged or frayed they may no longer be safe or will make it hard to adjust the brakes. Cables are fairly cheap to replace and where

brakes are concerned it's not worth cutting corners. If the cables are damaged, replace them as a matter of urgency.

3. Check the levers: Brake levers should be in good condition, tight on the bar so they don't move. If they are bent or damaged or have parts missing they may need repairing or replacing.

4. Examine the brake pads. There should be a good amount of braking surface remaining. Most pads have a wear line on them to show you when they are close to needing replacement. Make sure you replace pads before they get totally worn out. If your brakes make grinding noises and you can see metal where the pad should be, it's way past time for new pads as your rim or rotor will be getting damaged.



5. Examine the rim or rotor: if you have rim brakes, the rim should be in good condition. Over time they get thinner as you continuously brake on them. When they are concave rather than flat then a new rim or wheel will be in order. Don't let them get like this picture! You can also clean and degrease your rims or rotors to make sure the pads can get a good grip. Use clean rags and degreaser/brake cleaner or just hot soapy water.



Adjusting

Cable tension

All cable-operated brakes should have a barrel adjuster somewhere, often where the cable exits the lever or where it enters the brake. Some bikes use 'inline' adjusters part way along the cable outer instead.

To increase cable tension, turn the barrel adjuster anti-clockwise. Try one full turn initially, then half turns, until the brake is nicely adjusted. If the barrel adjuster has a threaded lockring or locknut, unscrew this to enable the barrel to turn, then screw it flush to the lever or caliper to keep the barrel firmly in its new position.



If a few turns of the barrel adjuster don't solve the cable tension problem, try re-clamping the cable. First wind the barrel adjuster back in. Then undo the bolt that anchors the cable to the brake.

Use one hand to squeeze the brake mechanism together. This is easy with side pull brakes and V-brakes: simply hold the brake blocks against the rim. With cable disc brakes, push the caliper's brake arm up to engage the brake. The brake doesn't need to be jammed on; just touching the rim or rotor is okay. Don't let go of the brake until you've re-clamped the cable.

Then with your other hand, unclamp the cable and pull more cable through the cable clamp, until the cable is just taut. Let go of the cable and tighten the clamp bolt. Finally, let go of the brake mechanism.

Since you weren't pulling on the cable when you re-clamped it, there should be enough slack that the brake pads don't rub the rim or rotor. If there's too much slack, use the barrel adjuster. If the cable is too tight and the brake rubs constantly, repeat the above process allowing a little more slack in the cable.

Centring the brake

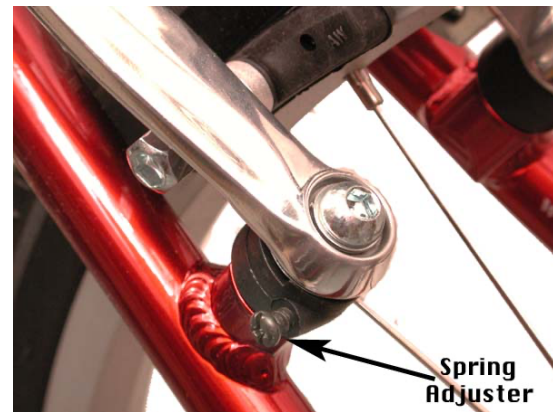
Sometimes just one of the brake pads will rub. In this situation, you need to centre the brake.

Side pull brakes often have a small adjuster screw on top of the caliper, at one side. Screw this in or out – slowly, so you can watch the brake arms move. If your bike's side pull brakes lack this feature you can often just grab the whole brake and realign it with your hand or loosen the fixing bolt that holds the brake to the frame or fork, move the brake, then retighten the fixing bolt.

V-brakes have a small screw at the bottom of each brake arm. These adjust the spring tension. To move the brake pad away from the rim, increase the spring tension by screwing

inwards. To move it towards the rim, decrease the spring tension by unscrewing. As the brake pads' positions are determined by the spring tension on both sides, you'll often tighten one side and unscrew the other to get it right. Work in small increments – e.g. a half turn at a time, pulling the brake lever between each adjustment.

Image: Sheldon Brown



Disc brakes, whether cable or hydraulic, are held to the frame or fork by two long (normally 5mm Allen) bolts. Undo these two bolts enough that you can move the disc caliper side to side by hand. Then squeeze the brake lever so the brake is fully on. Without letting go of the brake lever, use the 5mm Allen key in your other hand to tighten the caliper's frame/fork bolts.

If the pistons on both sides of the caliper move – all hydraulics and some cable discs – the caliper should now be centred. If, as with most cable discs, only one piston moves you may need to adjust the position of the fixed one (see below).

Pad adjustment

The pads on rim brakes need to be in line with the braking surface on the rim. Pads set too high will touch the tyre and damage the sidewall; pads set too low will develop a lip that can hold the brake pad against the rim and in the worst cases slip into the spokes. To adjust pad position, undo the bolt on the pad, then carefully tighten as you hold the brake manually against the rim. Pads should hit the rim squarely or be slightly 'toe in' which will help stop them squealing.

With cable disc brakes, the piston (and pad) nearest the wheel is usually fixed; it doesn't move when you squeeze the brake lever. But you can move it in or out to get it the right distance from the rotor. Use the adjuster on the brake to do this. Hydraulic brakes self adjust as they wear.

Finally, when you've adjusted your brakes, squeeze them on hard a handful of times to test.

Some useful resources:

<https://www.parktool.com/blog/repair-help/brake-pad-replacement-rim-brakes>

<https://www.parktool.com/blog/repair-help/sidepull-brake-service>

<https://www.parktool.com/blog/repair-help/linear-pull-brake-service>

<https://www.parktool.com/blog/repair-help/dual-pivot-brake-service>