

# BLEEDING PROCEDURE

## A. Before you start

### Tool list:

- \*4&5mm allen key
- \*Torx T10
- \*8mm ring spanner
- \*Small flathead screwdriver
- \*Plastic tyre lever or similar
- \*Clear tube for bleed nipple & container to catch fluid
- \*Tissue and meths



Before starting the bleed procedure, it is important that the brake is set up and aligned well so as to achieve a solid feel at the lever. Ensure the mounts are faced using a suitable (such as the Hope Spot Facing Tool) and the caliper is aligned over the rotor perfectly. Rotors should be checked for trueness and pads for condition and wear.

The better the preparation, the better the brake!

**TIP!** Use tissue or rag under the master cylinder (MC) and around the caliper to keep fluid away from parts!

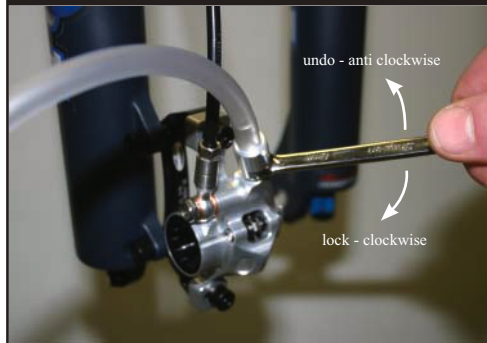
## B. Preparing the bike



Remove wheel. Position the master cylinder (mc) so the reservoir is horizontal to the ground. Remove the lid and diaphragm from the master cylinder and ensure the lever reach adjust is set with the lever in a 'reasonably' outboard position (not too close to the bar as this affects the feel of the brake) Pads or a similar spacing block should be left inbetween the pistons whilst bleeding.

**TIP!** Make sure the spacer block covers the pistons so they don't 'twist' when under pressure!

## C. Prepare the caliper



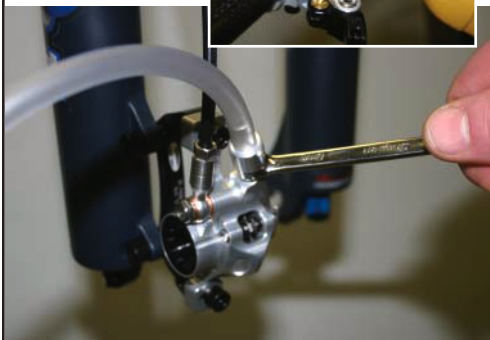
Fit the ring end of an 8mm spanner over the bleed nipple, allowing for a 1/4 turn anti clockwise. Fit a tube to the bleed nipple to carry fluid away whilst bleeding. (this is part of our 'little bleeder' kit) This should be fed into a suitable container (the tube does not need to be submerged in fluid) The hose should be a snug fit to seal on the nipple.

**TIP!** Dot 5.1 brake fluid is corrosive and should be disposed of responsibly!

## D. The bleed process STEP 1-2

- \* Top up the MC using Dot 5.1 fluid.
- \* Open the bleed nipple (anti clockwise) 1/4 turn .

(Ensure a good seal between nipple and tube)



**TIP!** Make sure fluid is always present in the master cylinder - keep topping up throughout the process

## E. The bleed process STEP 3-4

Squeeze the lever to the bars, and whilst holding it there lock off the bleed nipple - Then release the lever.

Repeat the process from Step 1.



**TIP!** Be slow and methodical! This is important! Get the procedure in the right order.

## F. The bleed process STEP 5+

REPEAT! REPEAT! REPEAT! REPEAT! REPEAT! REPEAT! REPEAT! REPEAT! This may take 10 or more cycles to fully expel all air or old fluid from the system.

\*Look at the tube to see when clean fluid is coming out of the caliper and also that the fluid is free from air bubbles.

\*Once happy that this has been achieved, with the bleed nipple locked and the master cylinder topped up (no cap or diaphragm on yet) pump the lever until a solid lever is felt. (this is where the spacing block or old pads are important)

\*At this stage you should have a good, solid feel. If the brake feels spongy or soft, it may be necessary to repeat the bleed process.

**TIP!** Don't skip the bleed process and think that 2 or 3 cycles will be enough. Patience!!

## G. Pushing pistons back



When the brake feels solid, remove the spacing block or pads from the caliper and undo the bleed nipple a 1/4 turn. Use the plastic tyre lever or similar to push the pistons back into the bores (be careful when doing this so as not to damage the pistons, particularly phenolic composite ones) This procedure ensures that any air behind the piston is expelled. Lock bleed nipple off.

**TIP!** Push the pistons back from their centres. Keep them square in the bores otherwise they can twist

## H. Nearly there!

Put the spacing block or old pads back in with everything as it is in the previous step. 'Flick' the lever repeatedly, with short sharp strokes (don't actually pull the lever, just a few mm's of travel is all that is needed) This will help to lift any small trapped bubbles of air up to the MC. (if you look into the MC you should see very small bubbles rising up) Push the pistons back (but this time with the bleed nipple still locked) in the same manner as before.

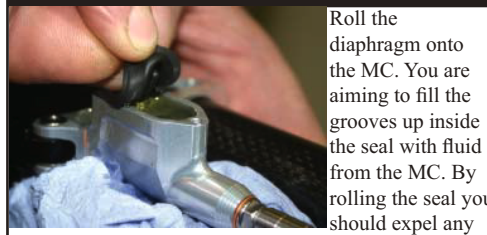
Carefully remove the tube from the bleed nipple and remove the spanner and spacing block or old pads. Clean any fluid from around the caliper using meths and clean tissue.

Refit new pads, not forgetting the retaining clip.

Top the MC up fully (make sure you have some tissue underneath to catch excess, as the next stage will almost always need it)

**TIP!** This 'flicking' procedure is not always necessary, but advisable for the best feeling brakes

## I. Finishing up



Roll the diaphragm onto the MC. You are aiming to fill the grooves up inside the seal with fluid from the MC. By rolling the seal you should expel any

air. If necessary, do this more than once, each time topping the MC up until you are happy no air is under the diaphragm. Replace the top cap and bolts. The bolts are only very gently done up. Slight resistance felt on the Torx key is enough. Clean MC parts with meths, and re set lever to desired position. Re fit pads and fittings.



**TIP!** You may see some fluid coming out of the breather hole at the side - don't worry it's just excess!

**CONGRATULATIONS!!** You've just successfully bled your brake. Before jumping on and riding though, follow the centralising of pistons procedure (overleaf) to ensure perfect braking....

# CENTRALISING, BEDDING IN AND CLEANING

## A. What is centralising?

The process of centralising the pistons is an often overlooked one. If pistons work unevenly (especially on 4 or more piston brakes) a soft, spongy lever will be felt, with excessive travel (meaning that the lever will travel further towards the bars than is necessary and often means that the brake cannot be used to it's full potential)

Most importantly, the caliper needs to be set up square-ly and be true before starting this procedure. This is essential to then having the pistons working evenly. See your set up guide for more information on setting the caliper up correctly, or on line at [www.hopetech.com](http://www.hopetech.com)

You will need a small flat blade screwdriver, plenty of light to see small gaps between pads and rotor and patience!

**TIP!** Be careful with your fingers when spinning the wheel!

## B. The idea

To explain this process lets assume we are working on a 2 piston brake. Same procedure applies to a 4 or 6 piston brake - it's just a little bit more fun!

You are trying to make both pistons work evenly. That is that they both move the same amount before the pads make contact with the rotor and they do not cause the rotor to bend or warp when pressure is applied.

This will only work if pads are both the same thickness (i.e new or not at all worn) and the caliper is set up correctly.

Begin the process by making sure that the pistons are both pushed back fully into the bores (see previous page - Step G)

If pistons are sticking due to being dry or damaged or worn, then they will need making good before starting.

**TIP!** Be patient - a little bit of adjustment goes a long way!

## C. The procedure

Begin by pumping the lever repeatedly until the pads make contact and a 'feel' is achieved at the bars.

Look in the shown positions whilst squeezing the lever



repeatedly. See which piston is working the most/least. It should be fairly obvious and you may see the rotor being 'pushed' over whilst operating the brake

**TIP!** Make sure you have plenty of light around you. The things you are looking for are only small!

## D. The procedure

If you determine that the left hand piston (outboard behind the bore cap, as looking from the back to the front of the bike on the front brake shown) is working more than the right hand side:

\* use the small flat blade screwdriver and place it behind the pad, in front of the piston and apply a little pressure in order to push the piston back into it's bore.

\* this should be done whilst pumping the lever repeatedly.

You should find that the piston will retract, and the right hand piston has now moved towards the rotor a little.

\* remove the screwdriver and pump the lever again.

Repeat the checking process. Hopefully the pistons are now a little more even in their action.

**TIP!** It can be easier to do this on a workstand or off the ground if possible!

## E. The procedure

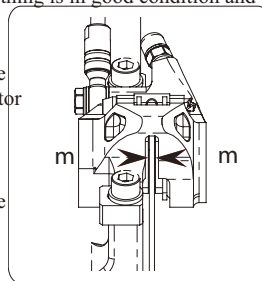
This process can now be repeated as many times as you need, using both pistons to equalize them.

You should feel a noticeable difference in the feel at the lever as you are doing this.

After each process, spin the wheel and listen for any dragging from the pads on the rotor. A well set up brake shouldn't drag if everything is in good condition and well set up.

Look for the gap where shown, between the rotor and pads.

You are looking for an equal gap and drag free running.



**TIP!** If you are finding that the brake rubs in just one or two spots - then you may need to true the rotor!

## F. Patience!

Be patient when doing this!

It can take several attempts to get it right, particularly on 4 or 6 piston brakes - but this is where the benefit is most noticeable.

You may find that you go too far with one piston and then need to make the opposite one work less to compensate.

It is a bit of a 'game'! Once you understand how it is working and what you are trying to achieve though it should be relatively straight forward.

When you are happy the brake is working well - bed the new pads in as shown below

**TIP!** Take it easy on new pads. They need a little time to achieve full potential.

## G. Bedding in

Bedding the pads in is very important. It helps to wear the surfaces of the pad in without getting too high a temperature and 'glazing' the surfaces, which means they will bite on the rotor more effectively.

Make sure everything is clean before starting the bed in, use methylated spirits on the rotor surface and caliper if needed. Pads with even a small amount of contamination or a rotor that has picked some overspray up from lubing a chain WILL NOT WORK as they should, and the brake may be dangerous to use.

Always cover the rotors up with clean tissue when lubing the chain or other parts of the bike.

Pads are best bedded in without the aid of water or other fluids. Sometimes a little 'wet mud' can be used successfully as a 'paste' on the rotor to help - making sure that the mud is not contaminated with oil or fuel if near a roadside.

**TIP!** Allow a little time to bed in before going out on a ride, you may need your brake as soon as you set off!

## H. Bedding in

To bed the pads in - simply ride the bike, very gently scuffing the pads on the rotor with a little pressure on the lever.

**DO NOT ATTEMPT TO STOP IMMEDIATELY!** allow the pad to have a minute or two simply rubbing the rotor gently.

Increase the resistance and also begin to pulse the lever, making the brake work a little harder.

You should start to feel the power of the brake increasing as you are doing this.

Continue this process for as long as you feel it takes until the brake begins to work to its full potential.

The brake WILL get better once it used off road and has some dirt and higher temperatures on it.

**TIP!** If pads are contaminated, **DO NOT REUSE** or attempt to file the surfaces down. Discard and refit new!

## I. Cleaning

All parts of the brake can be safely cleaned using methylated spirits. This will remove spilt hydraulic fluid and safely evaporate after wiping away.

When washing the bike - we strongly discourage the use of car shampoos and other non specific cleaning agents. These often contain oils and waxes which may leave paintwork nice and shiny, but that also means pads and rotors are nice and shiny too! Not good news for a disc brake!

We produce a specific disc brake friendly cleaner (Sh1t Shifter) which has been specifically developed to be effective at dirt removal and safe on disc brakes and anodised surfaces.

Try it and see what a difference it makes to the whole of the bike and be safe in the knowledge that you'll also be able to stop after cleaning it!

**TIP!** Jet washes at garages will have wax residue in the hoses, even if you are only using the rinse function!