

13mm MASTER CYLINDER CONVERSION

When criticizing the braking performance of the Norton Commando (which people usually do) It should be remembered that the Commando was one of the very first production bikes to be equipped with a disc front brake way back in 1972, with design work commencing in 69/70.

Going back over 35 years traffic conditions were totally different, as nothing else could stop on the proverbial sixpence it didn't matter that the Commando couldn't.

Today's traffic is a different ball game, a fully laden arctic could easily out brake a standard Commando, so the goal posts so far as braking performance is concerned have been moved.

The three main problems with the standard system are as follows:

1. Brake disc is too small
2. Standard caliper retains too much heat if used repeatedly at high speed
3. Relationship between Master cylinder fulcrum position/piston size and caliper piston size is wrong, leading to low line pressure and a lack of feel

The cheapest and most cost effective improvement is to have your standard master cylinder relined to 13 mm (.520") (standard size is .625").

We sell a kit, which consists of a 13 mm threaded brass sleeve, a 13 mm piston fitted with seals and return spring, an adjustable piston pusher, a 3/8" bleed nipple and the standard dust boot and circlip.

This kit is BCS number 558-13, but I should stress that it is intended for use only by people who are familiar with the workings of hydraulic braking systems and who have good workshop facilities.

The problem with installing this kit on a Norton is basically that there is a variance between Norton master cylinders of about .080" on the optimum piston pusher length, too long a piston pusher takes the piston past the reservoir bleed hole and the fluid cannot get in front of the piston and the brake cannot be bled.

Too short a piston pusher means that the piston seal has to travel some distance before it reaches the bleed hole, resulting in the first part of the lever movement merely pumping fluid back into the reservoir and then there can be too much lever movement and the lever pulls right back towards the handlebar. That is the only advantage of the bigger standard piston, as it moves more fluid for a given lever movement it is not so sensitive to these discrepancies.

It is possible to adjust the piston position via adjustment of the pusher or filling the pad on the brake lever to allow it to move further out.

PLEASE NOTE. RE-WORKING MASTER CYLINDERS SHOULD ONLY BE UNDERTAKEN BY PEOPLE WITH THE APPROPRIATE SKILLS AND EXPERIENCE.

KIT CONTENTS

1. INSTRUCTION SHEET
2. NITRILE SEALLING WASHER
3. BRASS THREADED REDUCING SLEEVE
4. PISTON AND SEALS ASSEMBLED
5. DUST BOOT
6. DUST BOOT LOCATION WASHER
7. 3/8" BLEED NIPPLE
8. STAINLESS ADJUSTABLE PISTON PUSHER



TOOLS REQUIRED

1 X 18 MM X 1.5 MM PITCH TAP

1 X 16.5 MM TWIST DRILL

1 X 5 MM T HANDLE ALLEN KEY, LONG SERIES

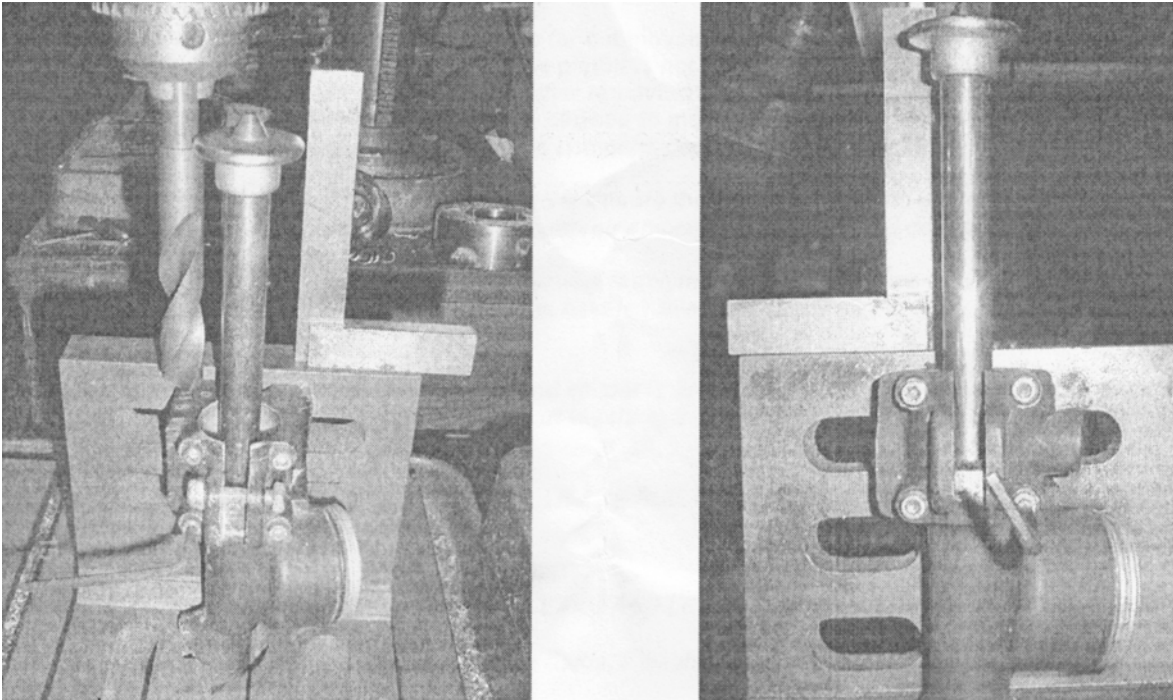
We can provide the above tool pack as BCS 222-09



INSTRUCTIONS:

1. REMOVE AND DISMANTLE MASTER CYLINDER, CLEAN AND DE-GREASE. BAG AND STORE ALL INTERNALS.

2. ARRANGE A METHOD OF ACCURATELY AND SECURELY LOCATING MASTER CYLINDER BODY AND DRILL 16.5 MM TO THE BASE OF THE BORE OF THE MASTER CYLINDER. IT IS IMPERATIVE THAT THIS HOLE IS DRILLED TRUE TO THE BORE, I HAVE FOUND IT FAIRLY EASY WITH A BENCH DRILL BUT DIFFICULTY WILL BE EXPERIENCED DOING THIS JOB BY HAND. You can use a 5/8 mandrel in conjunction with a set square and an angle plate to obtain appropriate accuracy.



3. TAP M18 X 1.5 .AGAIN THIS WILL NEED TO BE TAPPED TRUE TO THE BORE, I WOULD RECOMMEND USING ONE OF THE PROPRIETARY TAP GUIDES OR STARTING THE THREAD USING THE DRILL PRESS AND THEN CAREFULLY CONTINUE IN THE NORMAL MANNER, WITH OUR TAP 8 ROTATIONS IS PLENTY (MINIMUM SEVEN ROTATIONS) AND THIS SHOULD GIVE THE 9 MM OF FULL THREAD REQUIRED.

4. Thoroughly wash the body, hot soapy water will do fine, be sure to remove all traces of swarf, grease, etc. and be sure to clear the two holes into the reservoir. Clean and dry all components.

5. Place the nitrile washer in the bore of the master Cylinder, carefully press down to the bottom, wipe a little silicon sealer into the master cylinder thread. A very small amount as excess can block the reservoir holes. Carefully slide the sleeve into the master cylinder, engage the thread and tighten fully. Tighten sufficiently to compress the washer slightly. Be sure the allen key is not projecting past the end of the sleeve as you tighten the sleeve this will prevent the sleeve from fully going home.

6. Carefully clean the bore and remove any traces of thread tape or silicon. Particularly from the end of the sleeve where the piston enters, compressed air can be used to good effect, particularly through the two small holes into the reservoir.
7. Fit the hydraulic brake switch. And carefully press piston assembly into the bore, take care when engaging the seal.
8. Fit the bleed nipple where the brake hose would normally go.
9. Offer the piston pusher up to the piston, locate with brake lever, add pivot bolt.
10. Fill reservoir approx. 1/3 full, allow a few minutes for fluid to enter cylinder, agitate the lever, this should produce air bubbles, it should be possible to bleed up the master cylinder fully without using the bleed nipple at all, holding the master cylinder in your hand and positioning it such that the holes in the reservoir are at the top will whilst operating the lever will work. This is where you have to use some judgment and position the piston, if its past the holes it will be very difficult to bleed, if to far out, movement is wasted pumping fluid into the reservoir. If the fluid is not entering the bore and you are sure the piston is not to far in then the holes may be obscured with silicon, a blast of compressed air could be useful here, after removing the piston. The position of the piston can obviously be dictated using the adjuster, it can also be allowed to move further out by filling the location pad on the lever, this can often give a better lever position, and also compensates slightly for the additional lever movement resulting from the bore reduction, but care must be taken to ensure that the O ring seal on the end of the piston does not exit the bore. Once bled up, ie no more air enters the reservoir and lever is firm, a small column of fluid should be seen entering the reservoir as the lever is pulled in.
11. The master cylinder can now be fitted, although applying a steady pressure to check for leaks is a good idea. If the master cylinder is not to be used right away, it is best left filled and ready and in a dry place, brake fluid being hygroscopic. If it is to be fitted to the machine now, try to ensure the line and caliper is full, do not try to push air downhill, it should be possible to agitate air up into the reservoir and without touching the caliper bleed nipple at all persuade all the air out of the system.

While DOT 3 or 4 will work, the FERODO DOT 5.1 imported by British Cycle Supply is the best for the job. (Do NOT use DOT 5 in any Lockheed brake systems!!)

DOT 3 is OK. DOT 4 is "better" in that it has a higher boiling point. DOT 5.1 (note the "point one") is best. DOT 5 is not recommended.

