

# MGB Brake Master Cylinder Rebuilding

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Early cars, those from 1963 until late 1967 use a “single circuit” braking system. Master cylinders for these cars are quite simple. It is easy to identify this early MGB braking system. Looking at the master cylinder, you will see the proverbial “Tin Can” fluid reservoir on the body of the cylinder.

This type of cylinder is easier to rebuild than later “tandem” type cylinders, but only if it is in good enough condition!

Though rebuilding the single cylinder is less complicated, a failed overhaul can have catastrophic consequences.

MGB braking systems were updated with a tandem master cylinder in 1967, and for good reason. The tandem braking arrangement of 1967-1980 MGBs is inherently safer than the earlier single circuit arrangement.

With the tandem system, there are two entirely separate braking “circuits” in the car. The forward portion of the master cylinder supplies fluid pressure to the rear brakes while the rear part of the cylinder supplies fluid pressure to the front brakes.

Both systems are totally independent. Should a fluid leak develop in either braking circuit, partial braking will still be available from the other, un-affected brake hydraulic circuit.

Remember, in an early MGB with single circuit braking (most 1963-1966 cars) even a tiny leak anywhere in the braking system will result in a total loss of braking. Though the parking brake will still function, anyone who has suffered a braking emergency can tell you that it is grossly inadequate. Trying to stop from high speed, by means of the parking brake only, will prove to be a perilous experience.

Don't fool with the braking system. Both your life and the large investment in your MG are at stake! Signs of impending brake trouble are usually obvious.

Things like a soft brake pedal, or taking unusually long to stop are good indications of trouble.

At the first sign of trouble, do what ever is necessary to bring your brakes back to good health.

Check the fluid level in the master cylinder reservoir. Keep in mind that slight fluid level dropping in an early car (63-66 with single circuit brakes) or in the front reservoir section only, in a later car with tandem brakes, is normal due to front brake pad wear. As the pads wear down, the caliper pistons extend further out of their bores in the caliper to compensate. Consequently the fluid volume inside the calipers becomes larger.

However, this change will occur slowly, over many months of driving. Any sudden, or substantial loss of brake fluid indicates a leak, which must be attended to at once.

In the case of 1967 and later cars (with tandem master cylinder) no fluid loss in the front segment of the master cylinder reservoir is acceptable. Any loss of fluid here indicates a leak.

Diagnosing brake hydraulic trouble is relatively easy. Examine all four corners of the car, looking for fluid leakage. Look for obvious leaks as well as “damp” spots on or around the brake calipers, wheel cylinders, rubber hoses, and steel pipes.

Also, look up underneath the dashboard, where the pedals protrude from the pedal box above. A badly leaking master cylinder will drip brake fluid down into the cockpit area, around the pedals.

If this rudimentary check locates the trouble, all the better. The leaking component can be overhauled/replaced and the brakes then bled.

One possible brake malfunction that has yet to be mentioned is master cylinder failure caused by "bypassing". When this occurs, brake fluid leaks past either the primary or secondary piston seal in the master cylinder. Often the brake fluid then leaks back into the master cylinder reservoir. In this instance, the fluid level in the master cylinder may not drop at all, while at the same time the brakes will still not operate properly.

Once you have eliminated the other brake hydraulic components, a suspect master cylinder must be removed from the car for internal inspection.

Unfortunately, removing the master cylinder from an MGB is not much fun!

Cars from 1963-1974 have both the brake & clutch master cylinders mounted side by side on the pedal box.

Removing the master cylinder will require that two bolts (difficult to get at!) are removed. These bolts secure the master cylinder mounting flange to the pedal box front face.

1975 and later cars are equipped with a vacuum servo (brake booster). This provides some pedal assist, but more importantly from a service standpoint, allows much easier removal and installation of the master cylinder.

In the case of these later cars, the brake master cylinder is simply bolted onto the end of the brake servo. Removal is simply a matter of undoing two nuts off of the servo studs and then the master cylinder can be slid off.

The brake pipe(s) attached to the master cylinder must also be disconnected.

**NOTE:** Just prior to unscrewing the brake piping, siphon as much brake fluid out of the master cylinder reservoir as possible. This will reduce the amount of brake fluid that spills out during disconnection/removal.

Remember, brake fluid eats paint!

After removal from the car, unscrew the reservoir cap and dump the remaining fluid out of the master cylinder.

Since the most populous MGBs in existence are the 67-74 models with tandem master cylinder, this is the model that we will detail in this tech. article.

The plastic reservoir should be removed from the cylinder body. It is secured with four Phillips head screws, accessible from underneath.

You will note that there are two rubber O-ring seals, which seal the reservoir against the cylinder body. These O-rings are occasionally responsible for fluid leaks.



Reservoir removed showing O-ring seals.

The next job is somewhat unpleasant. After removing the big rubber boot off the push rod end of the cylinder, a "top hat" shaped steel sleeve and large coil spring will be plainly visible. Both these components surround the end of the primary piston. The sleeve will need to be pushed down, compressing the coil spring, while a special type of circlip is being removed.

A "Spirolox" circlip holds this top hat shaped sleeve onto the primary piston. The circlip is made up of thin flat spring steel. It must be prized up out of its groove in the primary piston and carefully "unwound".

Take care not to damage it since it is not separately available and must be re-used.

After the Spirolox clip is removed, the sleeve and coil spring can be slid off the end of the primary piston.



Nothing like a little improvisation!

Here an assistant is using two special "factory" service tools (flat files) to hold down the spring, allowing "Spirolox" circlip removal.

Down inside the exposed end of the cylinder bore will be found a conventional type circlip. This must now be removed.

Pen point shows the first conventional circlip, about 3/8" down the cylinder bore. You can also see the white nylon guide bearing behind it.



Located behind the circlip that you just removed is a white nylon guide bearing. It is a tight fitting nylon bush, which supports and guides the primary piston as it slides in and out of the master cylinder bore.

The guide bearing has a great notoriety for getting seized inside the cylinder bore. It is located way inside the cylinder bore, making it difficult to get at. Its removal is mandatory since there is a second circlip behind it, locking the primary & secondary pistons inside the cylinder bore.

Tap the bottom end of the master cylinder lightly and repeatedly, down onto a wood block. With luck this will jar the nylon bearing and cause it to drop out of the cylinder.

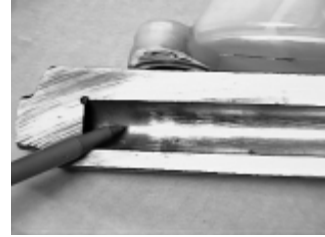
Mechanics have been known to remove the guide bearing by drilling small holes through it and taking it out in a number of small pieces!

After removing the nylon bearing, a rubber seal cup and stop washer should be slid out. This will expose yet another circlip. This next circlip will need to be removed and it will prove to be the biggest pain yet! A long slender pair of snap ring pliers will be needed to accomplish this-usually accompanied by a lot of swearing.

The primary & secondary piston assembly can now be pulled out of the cylinder.



Empty cylinder-ready for inspection.



Special cut away cylinder for demonstration purposes only!

There is a line of serious rusting inside this cylinder at the pen point. This cylinder is not serviceable and should be scrapped.

After removal of the piston assemblies, the cylinder should now be in a bare state.

Wash it in solvent and dry it off. Using a good light, examine the cylinder bore. Any substantial scratches, pits, scoring, or rusting of the cylinder walls means that the cylinder should be scrapped and replaced with a new one.

DO NOT waste your time & effort attempting to salvage a master cylinder with a damaged bore.

Attempting to hone or sand out deep pitting or scratches will not work! Very light scratches may be polished out with a cylinder hone.

On the other hand, if the problem is only worn or damaged rubber seals, installing a repair kit makes sense.

Rubber seals do occasionally tear or leak from long term contact with dirty brake fluid. Overhauling a unit with bad seals will often result in a reliable master cylinder.

Should the cylinder bore be in suitable condition for overhaul, proceed as follows:



"The Guts" Primary & secondary piston assembly



Separating the primary & secondary pistons for seal replacement.

An extra pair of hands will prove to be indispensable!



Everything separated – ready for seal replacement.

Please take careful note of the direction of the lip type seals. Installing one backwards will result in a non-functional master cylinder!

There is a metal link securing the secondary piston to the end of the primary piston. This link needs to be removed in order to replace the rubber seals on both pistons. A coil spring is wrapped around the outside of the link.

Pull back the coil spring and its metal sleeve from the end of the primary piston. Using a small pin punch and hammer, drive out the roll pin. This will allow you to separate the primary & secondary piston assemblies.

Remove the rubber seals and thin piston washers from the primary & secondary pistons. Check the condition of the pistons. The outside surfaces should be smooth and free from any damage. If the pistons are not in excellent condition, the cylinder assembly should be scrapped!

Provided that the pistons are serviceable, carefully clean them in solvent and dry thoroughly.

Coat them with brake lube or clean fluid. Install the new seals, with washers where appropriate, using only the fingers!

Using pliers or screwdrivers may tear or damage the seal surfaces. Ensure that the seal lips are correctly oriented.

Put the primary & secondary pistons back into position and reconnect the link. This involves holding things together with the spring retracted, while the roll pin is reinstalled.

After reassembly, the piston assembly can be slid back into its bore in the master cylinder. First ensure that the cylinder body is scrupulously clean. After washing out the cylinder with solvent, scrub it out with hot water & soap, followed by carefully drying things out with rags. This is necessary since any residual solvent will damage the new rubber seals that you are about to install! A light smear of rubberlube or clean brake fluid should precede the piston assembly. It will make installation easier and help ensure that no seal damage occurs. Install the first circlip.

Install the new nylon guide bearing (included in the seal kit) and then the outer retaining circlip.

The coil spring and top hat sleeve should now be pushed in place and held down while the Spirolox circlip is installed on the end of the primary piston.

Test the cylinder for movement. The piston should slide in and out with relative ease.

The reservoir should now be reinstalled. Be sure that it is clean and don't forget to install new O-ring seals where it attaches to the top of the cylinder body.

The cylinder can now be reinstalled on the car.

After ensuring that the fluid pipes and banjo fittings are properly connected, refill the master cylinder reservoir with clean, fresh, brake fluid. We recommend Lockheed DOT 4 fluid for this.

The brakes should be properly bled at all four wheels starting at the rear.

At least a full litre of brake fluid should be bled from the system. This is important. Doing so will ensure that all old fluid with any absorbed moisture, as well as any dirt, will be eliminated from the hydraulic system.

Long, trouble free, service from the braking system depends on keeping the hydraulic system clean.

Initially test the brakes by holding the pedal down hard while an assistant checks for any leaks. Careful inspection around the master cylinder and all pipe connections is critical.

The pedal should remain rock hard while it is held down. Any "creep" in the pedal indicates a leak, which must be found and rectified.

Provided that the static test proves to be OK, road test the car on a deserted stretch of road, at low speed.

This is also a good time to check and adjust the hand brake and the rear brakes as well. Incorrect adjustment of the rear brakes will result in a "spongy" feel to the pedal.

### **Brake & Clutch Fluid**

Master Cylinders, wheel cylinders, slave cylinders, and calipers are all prone to rust and water damage.

All of these components have precision machined, internal operating surfaces. Some are cast iron, some are an Aluminum alloy, and in the case of caliper pistons they are chrome plated. All will become rust damaged if left exposed to water.

Water/moisture collects in the hydraulic systems of your car as time passes.

Brake fluid is hygroscopic (it attracts water). Water in the air passes through the vented caps in both your clutch and brake master cylinders. After some months of driving, enough water will accumulate in your brake fluid for corrosion to take place.

Therefore, regular fluid changes are mandatory! We recommend completely emptying and refilling/bleeding your brake & clutch hydraulic systems at least once per year.

Doing this will greatly extend the life of these expensive parts.

You will save lots of money during the life of your car and suffer far less aggravation caused by failed brakes or clutch.

Obsolete Automotive sells original Lockheed DOT 4 brake fluid. This is a premium brake fluid correct for all MGs and Triumphs, Austin & Austin Healey, Sunbeam, and most Jaguars. We are selling original Delphi-Lockheed fluid at prices equal to or lower, than generic fluids sold at your local garage or auto parts store.

Most cars will need approximately one litre to properly bleed out the brake & clutch systems. We recommend ordering two litres, which will give you some extra fluid for future topping up as the brake pads wear down.

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