MGB Brake System Maintenance checks:

Late last year I heard of two separate incidents where MGBs had sadly been crashed due to faulty brakes, thankfully with relatively minor damage.
In both cases the cause was simply a matter of low brake fluid in the master cylinder.

I know that some MGBs are only taken out for a drive on special / rare occasions. Everyone uses their MGBs in their own way and I'm just happy that MGBs are being enjoyed by their owners.

However, owners of all cars, whether the vehicle is a Veteran, Vintage, Classic or modern, need to be aware that certain consumable items in a car deteriorate over time.
The most critical item is brake fluid.

Brake fluid (Glycol) should be completely flushed from the system and replaced every three years.

This replacement of the brake fluid is not determined by the kilometres driven, the climatic conditions of the car's location, the car's age, whether the car is raced or if it's locked in a garage for 24-months.

The reason why brake fluid must be flushed and replaced every three years is because it's hydroscopic; meaning that it attracts water. Water in the brake fluid reduces its ability to avoid brake fade and will be a cause of rust inside the master cylinders, slave cylinders, brake lines and unions.

Do not think that water can't find its way into the apparently "closed" hydraulic braking system of your car, it does, but not in the way that you might imagine.
Water contamination of brake fluid is not from actual water droplets, it occurs at a molecular level.
Individual H_2O molecules in the atmosphere are readily absorbed by brake fluid, which draws the water molecules through the air vent in the master cylinder cap, and from condensation of the air above the fluid level in the master cylinder, and even through the molecular structure of flexible rubber brake hoses.

Hydraulic master cylinders were changed by the Factory from being metal to a translucent plastic material so the fluid level can be seen without removing the cap. Think about this for a second; Glycol based brake fluid will be absorbing atmospheric moisture in just the short time it takes you to remove the master cylinder cap, have a quick look at the fluid level and then replace the cap.

It's reported that a minimal amount of water molecules will even be absorbed through the "seal" and threaded cap on new brake fluid bottles on the shelf of your favourite car parts shop. You can possibly imagine how much contamination there could be in that part-used bottle of brake fluid that's been sitting on your garage shelf for the past few years.
Unless you're mechanic who works on multiple car's brakes every week, you should always purchase a small bottle of brake fluid. They're usually sold in 500mL bottles for this reason.
Any bottles of brake fluid on your shelf that've been opened longer than three months ago should be disposed of responsibly. Check the date of manufacture of new bottles being sold to ensure that they are less than 24-months old, and even less than 12-months old is better still.

This water contamination is an on-going process and the more time that passes, the greater the amount of water will be absorbed inside the "closed" hydraulic system.
You won't see water droplets sitting on top of the brake fluid in the master cylinder because the molecules are held in suspension within the brake fluid.

You can't visually check the condition of brake fluid, although some brands darken their colour with age.
Water contamination in brake fluid has to be measured by equipment that measures the boiling point of the fluid in the master cylinder. There are battery operated tools that resemble a marker pen which are dipped into the master cylinder, and when a button is pressed, it measures the electrical current passing from one of its probes to the other one, through the water held in suspension in the brake fluid.
These tools, it could be argued, are better than nothing but in reality they can give a false reading and also, they don't take into account the different grades of brake fluid.

The only way to test brake fluid properly is to use a tool that heats a sample of brake fluid from the master cylinder, to test the actual boiling point of the fluid. Despite these tools being quite expensive, I recently considered buying one but thought better of it. These tools are for mechanic's use, so that they can quickly determine the condition of the brake fluid in a car that they haven't worked on before. However, it's far better not to bother checking the boiling point of your car's brake fluid and to simply flush the system every three years, as recommended, or more frequently if the car is being raced.

Silicone Brake Fluid:

While Silicone brake fluid has the benefit of not being hydroscopic, if any water droplets do get into it, the water doesn't get absorbed on a molecular level like it does in normal brake fluid, instead, it stays as "free water" droplets, separate from the brake fluid, which will boil at lower temperatures causing brake fade and will also corrode brake lines and unions from the inside out.

An important warning about Silicone brake fluid is that because it doesn't trap water on a molecular level like Glycol fluids do, any water in the Silicone fluid remains as water droplets which collect in the lowest / furthest points of the braking system, that is, the rear wheel cylinders and front calipers, which then causes corrosion in these areas. Corrosion of steel, aluminium or copper can occur when water droplets are present in Silicone fluid. For this reason, owners **MUST** bleed off an amount of Silicone brake fluid from all four slave cylinders every 12-months. This doesn't mean draining the entire system but just removing a small amount where water could be present at all four wheels, before topping up the master cylinder.

Silicone brake fluid isn't a fill and forget product that some people might believe it to be.
MGB owners can make their own decision about Silicone brake fluid but there are reasons why modern car makers don't specify it for use in their cars although it does have the very beneficial feature of not dissolving your car's paintwork if spilled.

Warning:

Due to the safety critical nature of a car's braking system I have to state that the following information is offered to assist MGB owners with the best of intentions, and that I or the MGCC of SA cannot be held liable for any loss, damage or injury. If the vehicle owner is not confident to engage in their own brake maintenance, they should pay to have the work done by someone else. I don't want anyone crashing their car when this is written exactly to prevent that happening.

These points are just checks for MGB owners to pre-empt any possible brake failures and only require the use of a jack, axle stands, wheelbrace/spinner spanner and psossibly a Phillips head screw driver, so most DIYers should be able to manage, but MG owners should use judge their abilities.

Check List:

The workshop manual insists on the follow brake service intervals;

Inspect discs and pads every 6,000 miles / 10,000 kilometres **or** EVERY 6 MONTHS
Inspect drums and shoes every 12,000 miles / 20,000 kilometres **or** EVERY 12 MONTHS
Brakes seals to be replaced every 36,000 miles / 60,000 kilometres **or** EVERY 36 MONTHS

Ask yourself when you last had the brake master and slave cylinder seals replaced on your MGB. That's right, in most cases it won't be since you bought the car, or maybe once that you can just remember. In my opinion, the Factory recommendation for hydraulic seal replacement is more frequent that I think is necessary.

Visually inspect the entire brake system.

- Check the condition of the pedal rubbers; not worn and slippery or torn and falling off.

- In the engine bay, check for fluid leaks from the master cylinder and all brake line unions, also check for any accidental crimping of the Steel (which should not be used because of rust issues), Copper (which should not be used because it's too soft and can break easily), or Cupro-Nickel hydraulic lines.

- If a brake servo is fitted, look and feel for any perishing or chaffing which might cause a leak in the vacuum hose from the inlet manifold

- Remove the master cylinder cap to check the fluid level before quickly fitted the cap back on. Have a small torch handy to see inside the early metal reservoirs. Check clutch fluid while you're at it. It helps to nudge the car with your hip, while it still has all wheels on the ground, to see the fluid level move.

- Using a torch, check the condition of the seal at the back of the master cylinder for leaks or perishing of the rubber. Pull the seal back to check for rust inside the cylinder.

- Every couple of years, it's a good idea to remove the pedal box cover and check for excessive play in the pedal pivot bushes, bolts and clevis pins. If the screws which hold the pedal box cover to the body are corroded in place as they sometimes can be, you can do this check with a torch looking up from inside the footwell of the car.

- Without jacking up the car, turn the front wheels fully to lock, left and then right, to allow you to check the condition of the flexible brake hoses while you're lying alongside the car and ask someone to press hard on the pedal while you check. You'll probably notice how the flexible hose bulges when the brake pedal is applied, even if they're relatively new. This should be enough of a demonstration to convince you to replace the rubber hoses with a set of three, braided flexible hoses. The bulge in the rubber hose is "lost pressure", which is better being applied to the brake pads rather than placing undue strain on the flexible hose. The braided S/S wire sleeve over a PTFE tube not only puts all of your pedal pressure to the brake pads, they provide better protection from stones and other road debris. You'll feel the difference in how much better the brake pedal feels with this modification.

- Jack up the front of the car and use suitable stands to support the vehicle so you can get underneath the MGB to continue checking the system for crimped brake lines, etc.

- Spin those wheels that are off the ground and feel for any "grabbing", or resistance to the wheel spinning smoothly. Resistance to the spinning of the rear wheels could be due to an over adjusted handbrake, while resistance to spinning the front wheels is most likely due to the pistons inside the brake caliper seizing, which should be rectified quickly by the owner.

- With the front wheels removed, inspect the condition of the brake disc. Some things to look for are a "blued" metal colour from over-heating which could cause metal fatigue, cracking anywhere on the disc means that there might imminently be a catastrophic brake failure, a glazed surface like a chrome finish which reduces the grip that can be applied by the brake pad, a "lip" at the edge of the disc which gives a visual indication of how much the disc has worn down over time, concentric ridges around the contact face of the disc which indicates uneven wear. (this last issue can be over-looked in the short term, depending on how bad the ridges are, but new brake pads should never be fitted to these discs because there'll be a greatly reduced contact area between the new brake pads and just the tops of the ridges on the brake discs).

- The disc pad material thickness should not be allowed to get to a minimum level because with more pad material, heat is dissipated more readily.

- Moving to the rear brakes, lower the front of the MGB, chock the front wheels and jack the rear of the car, using axle stands to support the vehicle's weight.

- Remove the rear wheels and, on steel wheel cars, remove the screw that secures the brake drum to the hub. Don't be surprised if yours is missing, many owners/mechanics forget to re-fit it.

- With the handbrake released, pull the brake drums away. This might need some hammer tapping to the inside edge of the drum.

- Clean the drums, backing plates and brake shoes to remove brake dust. Even though Asbestos is no longer used as a brake material, you shouldn't blow out the dust with compressed air, because the subsequent cloud of dust is not something that you want in your lungs. Instead, spray the entire area with an aerosol can of brake cleaner. This is designed for the job, to wash the dust away in the liquid, it evaporates quickly and it won't damage paint or cylinder rubbers.

- Check the condition of the drums, in the same way as the discs. Ridges, glazing and a lip towards the outside of the contact surface. Measuring the amount of wear is best left to a professional unless you own the correct measuring tool.

- As with the front brake pads, it's best not to let the brake lining material wear too thin before replacing it.

- Check the condition of the slave cylinder rubbers.

- Reassemble.

An additional tip for those who aren't aware; the brake fluid level in the master cylinder will drop over time to compensate for wear of the brake friction material.
As the pads wear down, the fluid needs to push the pistons further out of the brake calipers to make contact between the disc and the pads, so more fluid is held in the slave cylinder and less in the master cylinder.
Keep the master cylinder topped up to its full level.

When replacing brake pads you'll need to push the pistons right back into the calipers, so that the thicker friction material on the new pads can pass over the brake discs.
There are many different proprietary tools that correctly and evenly retract the pistons into the calipers, rather than risk any damage by using a large screwdriver or other incorrect type of lever. When pressing the pistons back, it's imperative that the bleed nipple at the slave cylinder is loosened and a short hose connected so that the small amount of brake fluid is drained off into a container. Failure to do this could cause brake fluid to overflow through the vent hole in the master cylinder cap or pushing the fluid in the reverse direction could invert a seal in the master cylinder, making the brake system inoperative.

Some owners might not bother with such regular and thorough checks on their MGBs, but after the two recent brake failure incidents that I was told about, I hope that anyone who doesn't regularly check, or have a professional check, their entire brake system, that those people are never driving behind me on the road.

Think of how important it is to have good brakes on your MGB, at any speed, because one of the previously mentioned brake failure incidents sadly occurred when the poor MGB owner hit the back wall of their garage when the brakes unexpectedly failed to operate after returning home from a drive. Imagine the consequences of this happening at the speed limit in a built-up area with plenty of pedestrians and vehicle traffic.

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