

Addition of a Remote Brake Fluid Reservoir to MG YB TD and TF (TA TB TC YA with mods)

Readers may recall that the subject of fitting a remote brake fluid reservoir to the TD, TF and possibly the Y Type has arisen before but apart from the article in the February 2012 Bulletin no. 496 page 38 which gave some basic details not much else has been written. For the benefit of readers who do not keep their copies of the Bulletin the article is reproduced below.

David Reeves (6472):-

MG TDs and TFs have Lockheed brake master cylinders combined with a fluid reservoir. This reservoir has a limited capacity and access to check the brake fluid level and add fluid is difficult in that the cylinder is located just below the floor near to the foot pedals. To gain access the carpet must be folded back and a metal cover screwed down onto the flooring must be removed. This gives access to the filler plug through a small hole in the flooring.

Even with the steering wheel removed it is difficult to position ones head to see down into the opening and pretty well impossible to add fluid and check the fluid level. The only solution appears to be one which involves a mirror, torch and a purpose made dipstick. The fitting of a remote reservoir addresses both access and potential low fluid levels, eases the bleeding of the brakes, and enables the car user to see any drop in fluid level by simply lifting the bonnet. The sketch shows how I installed a remote reservoir to my TF.

The installation was not that easy as access is from above, and this necessitates removal of the seats, steering wheel, drive and transmission cover and the timber floor panel on the driver's side. The master cylinder sits in a fairly restricted space between the pedal box and a tubular chassis cross member. These restrictions were further compounded by the additional

supports on the cross member for the 5 speed gearbox fitted onto my car, and I found the best solution involved a banjo off the front of the master cylinder with a 1/4 in feed pipe up to the remote reservoir which I located on the outside face of the tool box under the bonnet. (See photo) Please note that no modifications to the existing master cylinder are required other than the replacement of the filler and cleaning plugs. However as the work necessitates removal of the master cylinder the owner may take the opportunity to have the cylinder refurbished by a specialist, say Past Parts of Bury St Edmunds, beforehand.

Materials Used:-

Remote reservoir. Single chamber remote reservoir by Girling.

7/16 inch 20tpi UNF connection

F7/16. 20 tpi to 1/4 inch pipe.

I purchased mine from Europa Spares on the internet.

Feed pipe. 1/4 copper pipe of length sufficient to wind down to a location beneath the master cylinder where it is connected to a 1/4 inch flexible pipe I used standard copper as this is easy to bend using a pipe bending tool.

Flexible pipe and banjo. 13 inch long purpose made flexible pipe with a female union at one end to make connection to the 1/4 copper feed pipe via a 7/16 inch, 20tpi UNF brake nut, and a 1/4 BSP banjo and bolt at the other end.

Ideal Hose and Safety Ltd at Rugby made up the flexible hose connected to the banjo and banjo bolt, but no doubt there are others who can do this.

Connection to master cylinder. Remove the existing drain plug at the front of the master

cylinder reservoir. You can drill and tap this to take the banjo bolt but the interfaces must be perfect as brake fluid leaks readily through weak points. I replaced this plug with one from a Morris Minor restoration company and drilled and tapped this out to take the banjo bolt. Owing to the tight space between the front of the master cylinder and the circular chassis cross member I found it necessary to reduce the thickness of the head of the banjo bolt to enable a fit. I used standard new copper washers and a big spanner to ensure a tight leak proof fit. In my case the location of the 5 speed gear box connection very much dictated the angle of the banjo.

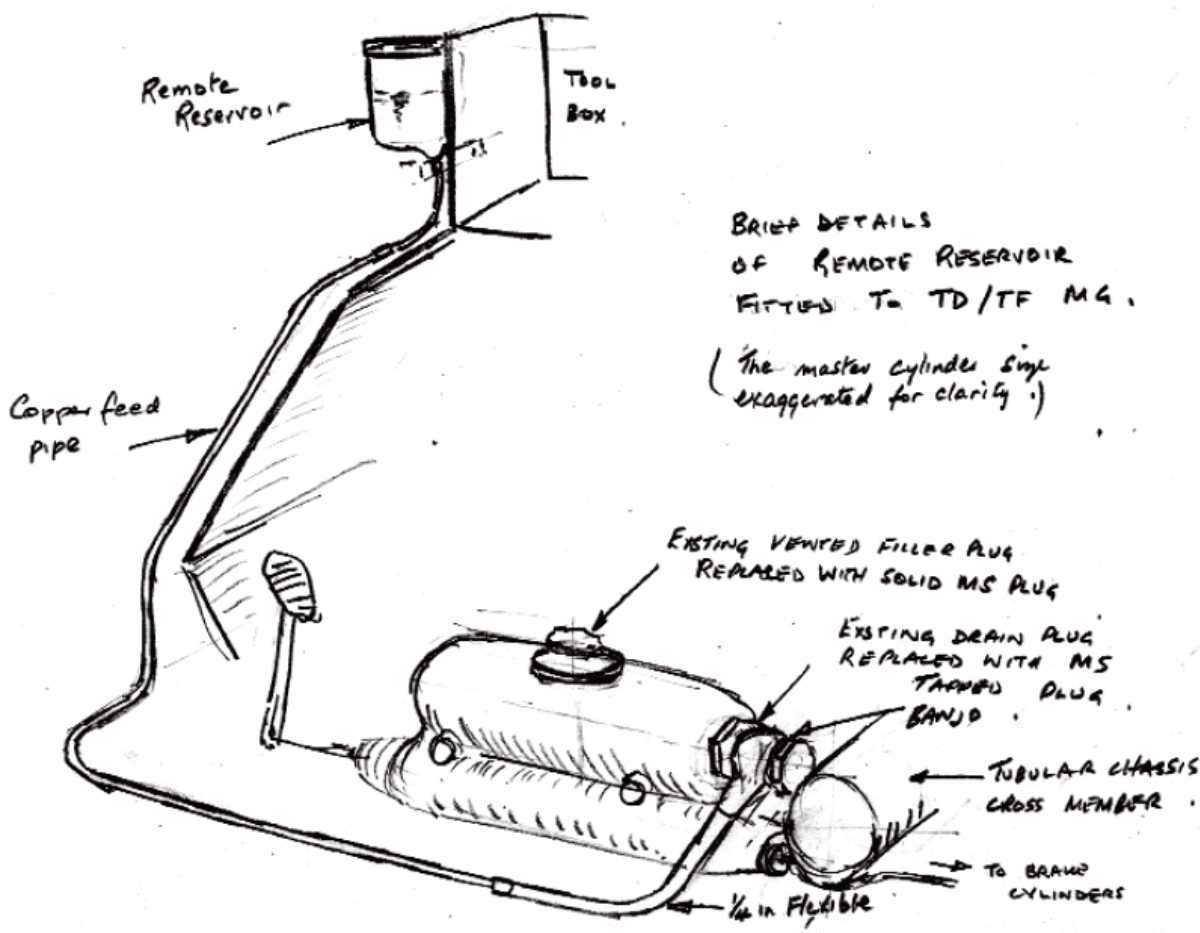
Existing filler plug. This is an 11/8 inch 20 tpi UNF aluminium plug 3/4 inch deep with a vent hole. I tried sealing this but was not assured that

it would not leak in time so I replaced this with a solid steel plug from the same Morris Minor restoration company who supplied the other plug. I fitted fibre washers which gave an adequate seal with the new plug well tightened down.

Filling I left off the new plug from the original filler hole and only put this in at the last moment during filling before the brake fluid spilt over to ensure that there was little or no air trapped in the master cylinder reservoir.

Note

I then made a suitably large opening in the floor above the master cylinder so that I could see the end connections and tighten the bolts if necessary. I covered this with an aluminium plate screwed down to the floor. This being





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beneath the carpet cannot be seen.

Since fitting this system in January 2011 I have found it so useful in not only having the comfort of being able to see the brake fluid level at any time but in bleeding the brakes. It is so simple to top up the remote reservoir during this process.

Additional Note

During the course of this work I discovered that the same Lockheed master cylinder was used on a number of cars in the 50s most notably the Morris Minor. MM specialists often replace the drum brakes at the front with discs and as the reservoir is insufficient have been fitting a remote reservoir for some time. They use standard 3/16 copper pipe and connect this direct into the predrilled plug they screw into the front of the master cylinder. They have room to do this not having a tubular cross member in the way. I used ¼ inch to ensure I could overcome the air lock during initial filling.

Credit for the contents of this new article and the photographs go to members Hugh Stirling and Candy Jacklin TF owner and not least Dave Wilson who until recent retirement was chief engineer at Fisher Restoration, Droitwich and who carried out the modification work. Hugh informs me that the information contained in the February 2012 article was used as the starting point for the modification, but certain changes were found to be necessary as work progressed. The modification was done as part of a full overhaul of the TF brake system which included a refurbishment of the master cylinder by Past Parts, Bury St. Edmunds. The following spare parts were obtained from the Octagon Club: 4 front and 2 rear brake cylinders, 3 brake hoses, 3 banjo bolts, 4 bleed nipples and dust covers, copper washer set and 4 plugs for the brake adjusting hole in the drums. The existing brake drums, shoes and linings were checked and found to be in

satisfactory condition for reuse after cleaning. The new Lockheed brake fluid reservoir was purchased from Carbuilder.com at a cost of £13.20. A photo of the new reservoir mounted under the bonnet on the front corner of the toolbox is shown below:



Dave Wilson relates the changes he made to his installation 'I used a copper sealing washer to seal the new fitting where it is threaded into the master cylinder. The cylinder is not designed to have a fitting at this position and therefore was not manufactured with this in mind. It was necessary to create a flat sealing surface on the face of the refurbished master cylinder so that brake fluid would not weep out of the joint. I used a finishing machine to take the majority of the rough casting down and the hand finished the surface on plate glass with 1200 grade paper lubricated with paraffin.

I used a rigid copper pipe with short flexible hose end sections. The new remote reservoir came equipped with a barbed hose tail fitting

for use with a flexible hose. I then soldered an 'olive' on the copper pipe ends to create a raised ridge to give a good seal on the hose to copper pipe joint so that the hose clamp could not slip off. The same was done on the master cylinder where a barbed hose tail fitting was used on the flexible hose to make the connection. Again, an olive was soldered onto the copper pipe to ensure a good secure fitting of the hose to pipe joint.

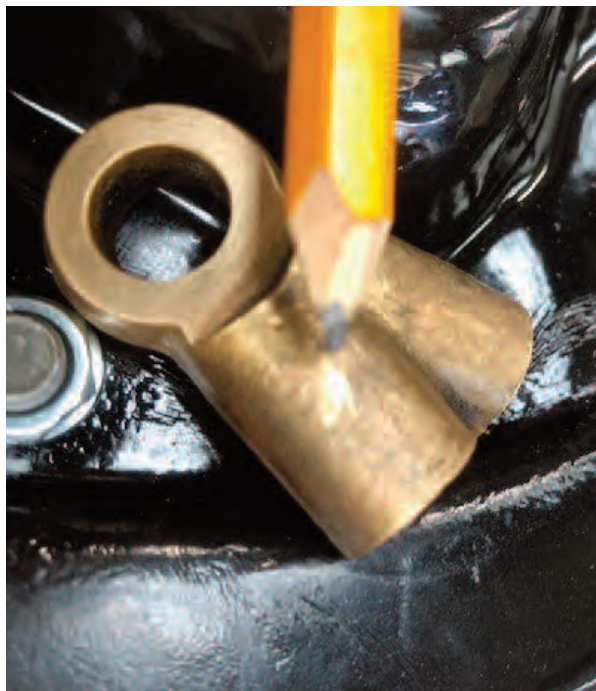
The majority of the pipe run is copper. It is wise to check there is a good rate of flow of fluid through the pipe from the reservoir to the master cylinder, if not then a problem can arise when bleeding the brakes'. Below is a photo of the refurbished master cylinder showing the new fluid feed pipe:



The TF had initially been left with Dave Wilson because of brake failure. Investigation by him showed that the master cylinder was

empty of brake fluid but at first the only evidence of a leak he could find was traces of fluid stains on the nearside front tyre. He refilled the master cylinder and bled the front brakes and found the brakes to work perfectly during a short test drive. However, when the car was back on the hoist, fluid dampness was noted around the NSF pipe union on the rear of the backplate, so the brake system was pressurised, and this revealed a weep of fluid was evident from the front banjo connection to wheel cylinder joint although the banjo bolt appeared to be tight.

Dave's conclusion was the brake fluid was dripping onto the inner face of the tyre and spun off when the car was in motion which was why there was no evidence of a leak on the garage floor when the car was stationary. The total loss of fluid had allowed air to enter the system and led to total brake failure. But what was causing the loss from a seemingly tight joint? On dismantling the suspect banjo connection to the front cylinder, a telltale witness mark on the banjo was noted, photo below:



The culprit was found to be the wheel cylinder stud which was a shade too long so that when the banjo bolt was tightened and the copper washers compressed, the stud interfered with the banjo causing a strain on the joint and hence the leak. The simple remedy was to shorten the stud slightly so that the interference of stud against banjo no longer took place. See photo below:



Dave commented that on other cars the banjo may be offset slightly to one side and this may not occur. The position of the banjo is determined by the length of the connecting pipe between the two banjo connections, but it is worthwhile to check that there is no strain on the fittings caused by an overlong stud. You cannot be too careful when making new brake connections. He also commented that because the original MG design was not easy to inspect for brake fluid level checks the only indication of fluid loss would be the loss of brake force at the brake pedal. The fitting of a remote reservoir should make fluid checks much easier to achieve.

Contact Details.

Could I clarify some contact details to help ensure that members can direct communications to the correct person to obtain the best possible response.

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