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STOP YOUR OLD MG

(This is an edited version of the article by Mike Allison which first appeared in the old-style 'Safety Fast')

This article covers the complete overhaul of the mechanical braking system fitted to MMM cars. Firstly, let us examine the standards to which we must aim. Unfortunately, road tests of the day were not too technical, and seldom, if ever, are actual figures for stopping distances recorded. However, reports always spoke of the MG's powerful brakes needing light pedal pressures. The following figures have been found for some models.

The Autocar (22 January 1932) testing the MG F1 four seater showed 30 feet stopping distance from 30 m.p.h. equivalent to 1g.

Motor Sport testing an L2 in November 1933 showed 1g from 40 m.p.h. while the same magazine testing an NA Magnette in February 1935 says 'as befits a car of high maximum speed, the brakes of the Magnette are extremely powerful ... Although no servo mechanism is fitted they are absurdly light in operation and this may account for the curious apparent lack of braking effect experienced by the driver. The car pulls up quickly and smoothly, even when they are applied vigorously.'

Testing the PA Midget in November, 1934, the Autocar gives a figure of 29 feet from 30 m.p.h. and 27 feet from the same speed if the handbrake was applied simultaneously.

Certainly, it is my experience that if adjusted correctly, the MG mechanical brakes are extremely good, and even by the latest standards need only fairly heavy pedal pressures from high speeds. Now why are your brakes not so good? It is never just one reason, but usually a whole host of things all adding a little to the general malfunctioning, and, in my experience, the following is a list of the more usual faults in mechanical systems:

- (a) Bad adjustment
- (b) Lack of lubrication to the cables

- (c) Wear on linings
- (d) Wear on bushes and/or pins in operating mechanisms
- (e) Cable stretches too far
- (f) Brake drums worn.

There are others, but the above are the more usual points which need to be checked. On the first of the Midgets the original braking system was rod and cable, similar to the Morris Minor, but this system, together with the transmission hand brake, was dropped in favour of the Bowden type, which is probably one of the simplest and best mechanical systems ever devised. This article will deal with the overhaul of the Bowden system in some detail, and with the final adjustment.

#### Preliminary Work

Before starting on the braking system itself, make sure that the suspension is in good condition. The shackle pins and bushes (trunnion blocks on the later cars) should all be in good condition. The springs should be tightly attached to the pins, and the axles to the springs. Lastly, wheel bearings and king pins should be in good order; check the steering-box and connections, and make sure that there is no play here. Faults in any of these departments will lead to bad braking, and need attention before getting down to the final adjustment.

#### Dismantling

Pull the whole system down to the backplates, leaving these attached to the axle. If any difficulty is experienced in removing the drums, a sharp tap with the hide end of your wheel hammer will usually suffice to break the joint. If not, a little judicious levering with a piece of copper behind the drums will - but again if there is no joy (and please do not force it) replace the wheel nut, and remove the whole hub and drum together by tapping behind the ears of the nut - don't forget to remove the hub retaining nut from the stub axle if it is a front drum which is giving trouble! Keep all components of each drum in a separate box. Pull the cables right out, and send these to Thomas Richfields Ltd via your local garage, who will overhaul them for a modest price.

Now you will probably have found that there is a glutinous mass where the rear brake linings should be, so draw the halfshafts and replace the cork oilseals, and fit new paper gaskets around the hub-bearing housing. Be very careful when replacing the corks, as these are fragile. I usually find that a smear of grease on the axle shaft and in the housing helps to make a good job here.

#### Attention to Brakes

After dismantling, all parts should be left in their dirty condition, but before starting the following work they should all be carefully washed with petrol. Firstly, look at the drums. These will certainly be scored but provided these are not deep they can be ignored. Check the internal diameter of the drum with a vernier gauge, and make sure that this is dead round, and also ensure that the actual braking surface is exactly perpendicular to the drum face, using a square. Now if things are not right here, you can either try to obtain another set of drums, or you can get the old ones built up by metal spray, and machined and balanced to the correct size. This will certainly be expensive, but will be money well spent. Certainly drums of MGs should not be skimmed, as this will probably result in subsequent distortion on heavy braking.

Now attention is turned to the backplates. Firstly, the pivot bushes and camshafts; these will almost certainly be worn, but if you are lucky the camshafts will be quite passable after a light dressing with a 'smooth' stone. If they are badly ridged, either fit second-hand ones which are in better condition, or have the old ones built up by welding and ground to the correct size. New bushes can be bought easily, and should be reamed before fitting to the backplate to give an easy fit on the camshaft, but with no side movement. When this is obtained slide the bush over the camshaft and gently press the whole into the backplate.

Refit the operating levers, using new Woodruff keys.

Brake linings are the next problem but these can be bought from the usual suppliers, already drilled. Make sure that they are of the correct material, details of which are given in the table below. Use of a harder material is of no advantage at all; it merely increases the pedal pressure required. With exposed brake-drums such as fitted to these early cars, brake fade is not really a problem even under quite severe conditions, since the drums have cooling air passing over them all the time, and the construction of the drums allows good conduction of heat from the linings. The linings should be riveted in place, using the correct rivet snap. Now replace all the brake shoes. A light smear of molybdenum disulfide paste on the pivot pins is a good idea, and on the camshaft and 'flat' ends of the shoe. This helps to reduce friction losses. Next, the drums are replaced, and attention is paid to the cross-shaft, and operating details.

Recommended Ferodo Linings for M.G. Cars fitted with Mechanical Brakes

<u>Date</u>	<u>Model</u>	<u>Length</u>	<u>Width</u>	<u>Thickness</u>	<u>Grade</u>
1929-30	M )	7.13/16"	1"	3/16"	MR
	)	3.7/16"	1"	3/16"	BA.DP(H/Brk)
1931-32	M C )				
1932	D )	7.11/16"	1"	3/16"	MR
1932-33	F1 J1 J3 )				
1932-34	J2 )				
1933	F2 F3 L2 )				
	J4 )				
1933-34	L1 )				
1934-35	PA NA )				
1934	QA NA )	10.13/16"	1 $\frac{1}{8}$ "	3/16"	MR
1935-36	PB NB )				
1935	RA )				
1932-33	K1 K2 )				
1933	K3 )	12 $\frac{3}{8}$ "	1 $\frac{1}{8}$ "	3/16"	MR
1934-35	KN )				
1934	K3 )	13.5/16"	1 $\frac{1}{8}$ "	3/16"	MR

The figures for the 1934 K3 are applicable to cars fitted with the double lever brakes.

### Brake Cross-shaft

The pedal and cross shaft and any intermediate levers should be removed from the frame and given a thorough wash with petrol. Be careful not to loose any of the needle roller bearings; pack them with grease and reassemble, making sure that none of the clevis pins are worn - these are very cheap, and this is not worth skimping. If the yoke ends are worn they should be drilled out to the next larger size of clevis pin.

Slacken off the master adjuster screws for hand and foot brakes, and refit the cables, threading them through the chassis before attaching, first to the cross-shaft end, then to the brake lever.

### Preliminary Adjustment

Leaving the car jacked off the ground, without the wheels fitted, tighten each adjuster in turn until the drum no longer revolves freely, then slacken off one whole turn of the nut. Do up the locknut. Remove the drum and smear the inside of the rubbing surface with engineer's blue. Carefully replace the drum, taking care not to touch the shoes at all, and tighten up on the hub. Now undo the adjuster locknut, and turn the adjuster until you can hear rubbing on the rotating drum, then remove it again taking care not to touch the linings, and examine the surfaces. If there is an even blue film over the linings, you will be lucky! If not, file the blue parts of the lining with a coarse file, and repeat the blueing. When you can achieve a nice even blue all over the linings you have got exactly the right adjustment. It only remains now to check this for the small variations you will get owing to unequal pull in the brake cables. Replace the drums, after cleaning out all traces of blue.

### Final Adjustment

Replace the road wheels and screw down the main adjusters on the cross-shaft to the stops, then turn back a fraction, say one eighth of a turn. The foot pedal should have about  $\frac{1}{2}$  inch of free travel, but if not the length of the coupling rod can be adjusted to give this. Take the car off its jacks, and take it out to a quiet road, preferably on private ground, and with a loose surface.

Drive up to 15-20 m.p.h. and apply the brakes hard. From the direction and length of the skid marks you can deduce which brake is not doing enough work, and adjust this one up a little. When you have dead four-square braking your job is over. Take your car to the testing station if you wish, when 1g or 100% retardation on the handbrake should be recorded.

#### Routine adjustment for wear

Having got the brakes in good order, it is easy to keep them so. Lubricate the camshafts with a high melting point grease once a week (one turn of the greaser is enough, refilling this when it is hard down), and the cables at the same time with S.A.E. 140 gear oil. Grease is not to be used in the brake cables - Please!

When the pedal eventually has a long travel, adjust the main screw on the cross-shaft to restore normal travel for the pedal, and bring the handbrake adjuster up to meet this. This will probably be necessary roughly every 1500 miles, but will also depend upon how you drive. When there is no more adjustment left here, slacken right off again and readjust the brakes at each wheel independently, as above, although there is no need to go through the blueing routine again until the linings require replacing.

Given normal maintainance, carefully carried out, they should last another 30 years or so before requiring a second complete overhaul. They have already survived that long with very casual attention! (As a result of this last paragraph, and assuming that everyone attends to their brakes this year, this article will not need to be repeated until the year 2,000 ED)