

(1259 Words)

Braking System Overhaul (or “Joining up the Dots”) – Part 1

Those who have had the misfortune to mention the subject of Morris Minor brakes to me in the past will usually have had to endure me ‘banging on’ for half an hour about how good they are and how their inherent fallibility is an ‘urban myth’. Most authorities on the subject recommend that brake fluid should be changed at 2 yearly intervals. Hands up all those who rigidly do this in their classics (or indeed, their modern cars)? Not very many, I suspect! The majority of problems with Minor braking systems seem to be related to the deterioration of the cylinders (master and wheel) not to mention the fact that the master cylinder is well hidden and rarely checked. This deterioration is largely due to the brake fluid. As ordinary brake fluid ages, it absorbs moisture from the atmosphere, demonstrating its *hygroscopicity*. This is why the inside of your new brake cylinders will turn from shiny steel to not-so-shiny corrosion after only a few years if you don’t replace the fluid regularly.

Brake fluid now is mostly made to a standard called ‘Dot 4’ which is one of several designations of automotive brake fluid denoting a particular mix of chemicals which have specified ranges of boiling point. Dot 3 has been all but replaced with the superior Dot 4 as there is little cost difference between the two. Ordinary Dot 3 and Dot 4 are polyethylene glycol based fluids which have differing boiling points. The ‘dry’ boiling point of Dot 4 (about 230°C) is about 25°C higher than Dot 3. The performance of both is reduced if moisture is allowed to accumulate over a period of time. This can drastically reduce the boiling point - by an average of about 70°C for both (with only about 4% by volume of water mixed in). The reduced boiling point is probably not of too much interest to you unless you use your car in motor sport where high brake temperatures could lead to boiling and consequent onset of brake ‘fade’ (i.e. no brakes!) However, the other effect – that of promoting internal corrosion - most definitely *is* of interest to us.

The only way to manage this is to change your brake fluid regularly...

Or is it???

There is an alternative brake fluid made to **Dot 5** standard, which has been around for a long time and is quite popular with the classic car movement and racing fraternity. Silicone based (instead of glycol), Dot 5, brake fluid has the great advantage that it is *not hygroscopic* and therefore does **not** soak up water. It also has a much higher boiling point – which makes it popular with the sporting types. It is also widely used by the US Army and Harley Davidson. It does, however, have some other characteristics which affect its suitability for universal use and this (perhaps!) explains why it has not replaced Dot 4.

The first drawback was it’s possible reaction with rubber and I found a report on the internet about a Mk II Jaguar where it had been used and the seals in the brake cylinders had been softened and lost their strength. The silicone

fluid was held to blame, but it turned out that the rubber seals were not new. The same report concluded that if new seals (or cylinders) had been fitted when the silicone fluid was added, the problem would most probably not have occurred. Modern brake cylinders have seals made mostly from Nitrile with only small amounts of rubber. Nitrile is not affected by silicone fluid (and this is the constituent of the blue gloves you can buy for your workshop, being resistant to most oils and acids). However, the small amount of rubber in the brake cylinder seal compound is still vulnerable, but glycol type fluid will also exhibit a similar (but lesser) effect. Air retention can also be a problem with Dot 5 which can prolong the bleeding process.

The second downside is the inability to perform adequately in modern braking systems with ABS where it is prone to 'frothing'. This is not a worry for your standard Morris Minor.

The short conclusion from all this is that I am still convinced that the benefits of using Dot 5 fluid in standard Morris Minors are real and there is no downside that I am aware of. It won't take you very long, if you ask other classic owners, to find some that swear by it for their classic cars! I can only reiterate my experiences of using it in my two Minors, the '57 4 door having successfully used it since 1986, when the braking system was completely renewed and has needed no new cylinders since despite being un-garaged. (Unfortunately, of course, it doesn't stop brake shoe wear!)

There does still appear to be some doubt and confusion in some quarters about the use of Dot 5 fluid and a lot of folks don't like the idea of using it in *any* vehicle. I understand that AP Lockheed Ltd. are not in favour and some Morris Minor parts suppliers do not recommend it. Call me a cynic, but I detect conflicting commercial interests here that make it a similar situation to a Turkey not being convinced that Christmas is a good thing. There is clearly a direct correlation between short lived braking consumables and company profits.

If, having carefully considered the matter and after weighing up all the evidence put before you, you may wish to proceed with a major overhaul of your Minor brakes and *perhaps* switch to Dot 5, silicone fluid. The second part of this article describes the work done on a Morris Minor and will hopefully assist you in that direction. However, if you go ahead, I would reiterate that you are advised not to take any chances with possibly suspect older components and replace EVERYTHING that comes into contact with the brake fluid.

On the subject of costs, the approximate parts prices, at the time of writing (and using a well known supplier of parts based in East Sussex) will be about £270 using pattern parts and about £340 if you stick with genuine Lockheed/AP hardware. It's up to you and you can save about £70 on the pattern cylinders but, again – your choice! I completed the work in a day – so allow 6-8 hours labour if you are paying someone else. I have suggested 1L of brake fluid, but if you are careful, half a litre should be plenty. The system does not actually take much to fill it.

Budget:

(Nov 2010 prices)

		pattern	genuine	pattern total	genuine total
Master cylinder	1	£ 48.00	£ 48.00	£ 48.00	£ 48.00
Brake pipe set	1	£ 25.00	£ 25.00	£ 25.00	£ 25.00
Front wheel cylinders	4	£ 8.00	£ 15.00	£ 32.00	£ 60.00
Rear wheel cylinders	2	£ 19.00	£ 33.00	£ 38.00	£ 66.00
Front brake shoes	1	£ 13.00	£ 13.00	£ 13.00	£ 13.00
Flexible brake pipes	3	£ 5.00	£ 5.00	£ 15.00	£ 15.00
Rear brake shoes	1	£ 13.00	£ 13.00	£ 13.00	£ 13.00
Dot 5 Brake fluid (1000ml)	1	£ 30.00	£ 30.00	£ 30.00	£ 30.00
New bolts/copper washers etc	1	£ 10.00	£ 10.00	£ 10.00	£ 10.00
				£ 224.00	£ 280.00
vat (20%)				£ 44.80	£ 56.00
				£ 268.80	£ 336.00

The second part of this article covers the practical aspects of restoring your brakes (with the brake fluid of your choice!).