Pumpkin Time - Diffs for MGs & M8s

Well not the Halloween kind but the TC kind....or how to repair your TA/TC differential for 75 bucks, not deer but dollars. How does anyone ever learn to speak English with all or our slang??

Here is an article I wrote some long time ago for the Abingdon Rough Rider Review. I know this will generate howls of originality gruff from up North but I offer it only for your consideration. There are some of us who don't relish spending $1000 to repair a busted rear end and others who want the gear change this affords...and then again there are some of us (me) who never had any luck setting up an original ring and pinion gear (perhaps someone will write an article on how to do this because what is in Blowers never worked for me).

I've done two of these on my TA and put about 30,000 miles on the two. I changed one pumpkin out after it got noisy. It had maybe 10,000 miles on it and no telling how many before I picked it up out of the scrap yard.

A few definitions: Pumpkin = third member = differential carrier, the part that the prop shaft connects to. I'll call it DC in this article for short.

A disclaimer: I've never seen another description of this conversion, I heard that it could be done and I worked it out myself, several others have done it and I haven't heard of any problems outside one where the diff bearing carrier broke on one side but that happens in Spridgets too. You are on your own if you make this conversion as obviously I cannot take a responsibility for it or your workmanship.

What we are going to do is to fit a Morris DC into the rear axle housing of a TA/TC and we are going to select a ratio that will give very nice freeway cruising with 19" wheels. Fortunately nothing much ever changed at Morris/BMC/BL etc. so it will fit up with a few changes and you can still use your original axles.

We are very lucky in the ratio department as no fewer than seven diffs available but the one that is ideal for us is the 4.555 to one.

Ratio	Standard Equipment	Remarks
3.727	Riley 1.5; Morris Major & Austin Lancer (Series 1 only)	
3.000	MG Midget Most 1275cc cars	
4.222	Mk 1, 2 & 3 Sprites	
4.555	Morris Minor 1000	
4.875	Austin A30/Morris Minor Ute & Van	
5.125	Austin A30	Alternative to the 4.875
5.375	Austin A30/Morris Minor Ute	Usually found in 803cc models

RATIOS:	3.727	3.900	4.222	4.555	4.875	5.125	5.375
No. Teeth:	11/41	10/39	9/38	9/41	8/39	8/41	8/43

So we are looking in scrap yards or swap meets for a DC that has 9/41 stamped on the edge of the case or you can count the number of teeth on both the crown wheel and the pinion. Divide the pinion into the crown wheel and that's the ratio e.g. 41 divided by 9 = 4.555

These units are well made and I just cleaned them up and used them but you might want to go a bit further in checking those out for wear and replacing bearings but if you do this, then you have to set them up again and that is where I get into trouble. They (the DC) have modern tapered roller bearings to take the thrust loads of the pinion and a modern set of hypoid gears which run quieter than the original gears.

An aside: Even if you don't do this conversion, if you have not checked the double row ball thrust bearing in your pinion assembly, please do so at the very next opportunity. The brass carrier in these bearings is guaranteed to fail and most have already. When it fails, so does your ring and pinion gears. In two recent cases, when the pinion carrier was removed the balls and the brass ball carrier fell out in pieces. A few more miles and these Rough Riders would have been making the conversion!!

Anyway, let’s get to it. Disconnect your prop shaft at the DC end and tie it up out of the way. Assuming you have found your 4.555/1 Morris DC, buy a new TC type gasket and then remove the TA/TC DC (having drained the oil and pulled out the axles. Remove the spider (cluster) gears from the TC DC and lay them aside for later usage. Removing them will be obvious and doesn't involve any other disassembly. Now do the same on Morris DC. Note that the cluster gears in this unit have bronze thrust washers behind the gears.

Now put the TA/TC spider gears into the Morris DC utilizing two of the bronze thrust washers to make it all fit up nicely, which it will. Now you have provided for your old axle splines in the Morris unit. If you convert to Marino hubs/axles at the same time, you can have Phil cut the Morris splines into his axles and you don't have to exchange the spider gears.

Take the TC gasket and use it as a template to layout a new set of holes in the Morris flange. Don't worry about the old Morris hole pattern as the old holes will fall behind the gasket. Use the bottom and top holes as the guides for the new holes. I hand drilled mine and I broke out through the edge of the alloy flange but it doesn't matter that much. A drill press or a machinist can do a much better job than I did. Use the TC gasket and some good silicone sealer and centre the DC as best you can then bolt it up. One note, the TC studs are really only bolts that are put in threaded holes from inside the axle casing. Run a die over the studs/bolts or replace them (5/16" BSF if I remember correctly) so that when you run the nuts up, you are not unscrewing the studs/bolts.

Because the Morris hypoid gears pump up a lot of pressure inside the axle housing, you have to make new and better vent holes. I did this by getting two MGA vent plugs and drilling the appropriate size holes in the flat spot over each spring hanger. Make arrangements to catch the swarf on a greased piece of cardboard stuck inside the axle housings. Magnetizing the drill helps keep the swarf out too.

You might have to work down the spline area of the axles with some emery paper to get the splines to enter the Spridget unit easily. I use a quart of synthetic 90 wt. oil in mine. BTW the Morris flange will mate with the TA/TC flange.

Good Luck,

TA Terry

Addition from Clem Vernon (Dec. 2000)

Having carried out the conversion to a Morris 1000 differential as TA Terry's article he suggests I let you know how it went.

I did most things as per his article except I had the openings for the axles enlarged rather than reduce the axles themselves as I felt they needed the strength. Once assembled I found the axles did not want to enter the splines so dismantled the lot as I thought the problem was non alignment and the axles entering at an angle which if the issue was forced would put a load on the assembly. Upon dismantling I put the axles into the TC diff, with spider gears and measured the gap between them and the inside of the casing flange. I then did the same with the Morris unit and found the difference to be+-2mm so I had this skimmed off the Morris housing. A machinist did the work which entailed removing the crown wheel assembly and studs and mounting it in a large 4 jaw chuck. The cut was done in small increments between the housing and jaw face. I then used a thin gasket and Loctite grey gasket maker for the joint. This was because I felt 6mm was the minimum for the flange. Everything then went together well with the axles sliding home without any force and all turning easily.

I have driven the car for short journeys but have yet to a long drive and check the speed/revs against another car, such as my BMW which has a fairly accurate speedo although in KPH but the conversions are easy enough even for me.

Regards, Clem

Addition from Paul Rundell (May 2005)

I have just completed the installation of a Minor 1000 differential in my TC, as outlined in "Pumpkin Time", and am absolutely delighted with the result.

I found the instructions admirable, but might I add a couple of suggestions?

First, installing the 2 MGA axle breathers in the suggested position by the spring hangers is awkward, and it is difficult to get all the swarf from the drilling out. While the diff. is out, the holes can be drilled in the top of the diff. casing about 2 inches/5 cm above where the axle tube joins, and the swarf is easily removed, and the same purpose is served.

Second, when the diff. is installed in the housing, only tighten the securing nuts sufficiently to locate the diff., then offer up the half shafts and bolt up the hubs, before

finally tightening the diff. nuts fully -- the diff. floats slightly on the studs, and any possible mis-alignment is avoided, and the half shafts enter more easily.

The results are very pleasing, and a much more comfortable cruising speed is achieved without the feeling that the engine is working too hard. It is obviously not as effective as a 5-speed gearbox conversion, but is very cost-effective -- my MM diff. cost £20 GBP (29 euros) on eBay, with a Morris Minor fuel tank included!!

Thank you, TA Terry!

Paul Rundell