

## Morgan 4/4 1600 Speedo Cable Replacement

Recently the speedo in Arabella (Paula's pet name for her blue 1972 4/4 4 seater) stopped working. Initial observations suggested a broken cable, so I removed the cable but found it serviceable – except for a small kink near the middle which I thought was possibly the cause of the speedo needle previously fluctuating about 5 mph up and down about what was roughly the correct speed.

So, as the obvious cause was found to be incorrect, I did the only possible thing I could do under the circumstances - I fired up the web and checked the various Morgan Forums for clues and possible solutions. Well, it seemed that I had opened up a can of worms. There were many postings of tales of woe regarding speedo cable problems with some weird and not so wonderful "solutions", most of which failed within a few miles of use. They mostly focussed on the failure of the 90deg right angle drive (A Smiths part I think, see photo below) located where the cable enters the gearbox, fitted as space is tight since there is not enough room for a direct cable connection.



MGB/Triumph TR series version of the 90deg cross drive currently listed on eBay for \$298!

But is it a genuine Smiths part?

Loosely collecting the relevant postings from the main early 4/4 and +4 Forums, I found –

+4: Here, it appears that replacement genuine Smiths 90deg drives are no longer available but there are some aftermarket units available to suit TR series Triumphs (but not the GT6 apparently) and MGBs that can be used with the +4. However, those that elected to replace their 90deg drive with an aftermarket unit had them fail typically within 50 – 100 miles. Maybe some worked for much longer but I found no postings to support this. There were a few postings where the owner tried to rebuild or have rebuilt the original Smiths 90deg drive with no luck. Maybe those that worked did not post their success?

4/4: I found similar problems as above with the +4 but the aftermarket 90deg Smiths drives do not fit the Ford engined early 4/4s as the short cross piece (about 35mm long) in the 90deg drive is too large in section and will not go into the female square socket in the Ford gearbox. Most postings were for the 1600 Kent engined 4/4s with some earlier Series cars. Best I can work out is that post 1963 these cars were originally fitted with Cortina gearboxes; Pre 1968 with the Mk 1s 3 rail 2000E or "Bullet" gearbox, and post 1968 to 1981 with the Mk2 Cortina and early Capri (but not Escorts) single rail Type 3 gearboxes. (Reference: Burton "Power to Perform" 2022 Catalogue). The ratios given in the 4/4 Manuals I have support this. Some postings talked of filing down the gearbox end of the cross piece square section to fit into the Ford gearbox socket but most seem to have failed in service. I could not find anywhere in GoMog or Morganatica any details of this – maybe I missed it?

Checking the supplier's catalogues (eg Morgan Spares) I found an aftermarket 90deg drive listed but it was unclear (at least it was to me) what the differences are between the +4 and the 4/4 drives and whether the part was a genuine Smiths part or an aftermarket copy. And, as the Forums suggested, the aftermarket drives were best avoided.

SO..... What to do?

Firstly; I removed the 90deg drive by –

- putting the car up on stands,
- setting a jack under the gearbox,
- removing the gearbox mount and support bracket,
- lowering the gearbox jack a little and,
- levering the gearbox across to the LHS to give enough room on the RHS to,
- undo the 7/16" short locking bolt holding the forked clamp plate, and,
- finally, remove the 90deg drive.

I did consider supporting the engine under the sump and removing the engine mounts to allow the engine to sit a little lower (until the exhaust contacted the hole through the valence panel) to give a little bit more room up beside the gearbox but managed without going this far. Certainly, following the dot points listed above, before removing the main speedo cable in the first place, would have been much easier!

Secondly; Inspecting the 90deg cross drive I found a 2.7mm short cross drive cable broken in two pieces identifying the cause of the problem. The main speedo inner cable was also 2.7mm and measuring up the gearbox end input drive square section socket gave a little over 2.7mm. BUT..... The square section sockets in the Smiths 90deg drive for the short cross cable and the long main cable were both very close to 3.2mm. And the input socket into the actual Smiths speedo was also very close to 3.2mm. Upon inspection, the 2.7mm main cable was a sloppy fit in the respective 90deg drive and speedo sockets - explaining the wobbly speedo needle when driving!

Thirdly; I tracked down an old instrument fitter that I had used years ago, Humphrey Instruments now in Unanderra on 02 42 726014. He took one look at the 90deg drive and said he had rebuilt many of them and did I have a TR series Triumph or an MGB? When I said neither, it from a Morgan, he had a closer look, checked the cables I brought in and said that the problem is the 2.7mm cables - should be 3.1mm to suit standard Smiths sizes. He then made up a new speedo cable outer (as the old one had a small kink in it) and a new 3.1mm inner. We stayed with the original length fitted to the car at 57" (1450mm for those that cannot handle the old imperial measurements) rather than the 54" (1375mm) length suggested as "standard" in the Forums as the longer length seemed to fit well with lazy large radius curves – which cables like for smooth operation and long life. He also stripped, checked and rebuilt the original 90deg cross drive, fitting a new short cross drive inner cable with 2.7mm square section on the gearbox end and 3.1mm on the 90deg drive end. He did say that he was concerned that the reduced 2.7mm section was the weak point in the system and that this part would fail before anywhere else. I guess sometimes we have to take our chances.....

The end result is a speedo that works perfectly. Very smooth with no discernible "bounce" of the needle (at least at the speeds I have seen anyway) and surprisingly accurate according to my GPS. We have since driven the car from home at Marshall Mount (20k southwest of Wollongong) up to Alstonville (between Ballina and Lismore) totalling just on 2000k. To avoid the advanced boredom of doing it all on the M1, this included a section from Nabyac via Wingham to Comboyne then Wauchope and next day via Dorrigo to Grafton via Nymboida then on to Alstonville. Overall slower as 20k of dirt and a lot of damaged potholed sections due to recent rain and flood damage going up but much more interesting and almost no traffic. Returned mostly on the M1 via Tuncurry. A good test of the car as well as the speedo!

SO..... What can we learn from all this?

If you need to replace the speedo cable on a Ford engined pre 1982 4/4 with a Smiths speedo, get a good cable maker or Instrument Fitter to make up a new outer cable using your existing fittings and a new 3.1mm main drive inner cable. If you have problems with the cross drive, get your reputable Instrument Fitter to rebuild it with a new 2.7mm gearbox end and a 3.1mm drive end.

Avoid replacement non genuine 90deg cross drives as they may not last (according to the Forums) and, they probably will not fit. Maybe you can source the correct genuine Smiths part, with the reduced 2.7mm gearbox drive end – if so please let us all know where you found it.

AND..... Some interesting history at least!

The history of the +4 and the post 1955 4/4 with respect to speedo cables suggests that back in 1950 Morgan followed the lead of the TR series Triumph (or was the leader, not sure of comparative initial build dates as not yet born then. Undoubtedly someone smarter than me will put me straight) or followed Smiths' advice and used standard Smiths nominal 1/8" speedo cable sizes including the 90deg drive to suit the (guessing here) 1/8" input square socket used on the original +4's Moss gearbox.

[Note that 1/8" is 3.2mm, so the 3.1 male cable and 3.2mm female socket clearance sizes as described on the previous pages is consistent with this]

Fast Forward to 1955 and the Series II 4/4s were fitted with Ford 100E engines and contemporary Anglia/Prefect 3 speed Ford gearboxes. Series III and later 4/4 cars from 1959/60 had Ford 4 speed gearboxes fitted. By 1963 or 4 the then new 2000E and later again Type 3 Ford gearboxes fitted to the Series IV, V and then 1600 Kent engined 4/4s used a nominal 2.7mm cable size so the earlier Ford gearboxes fitted to earlier Series II and III cars were very likely the same size. I suggest that all these Ford gearboxes used a nominal 7/64" sized speedo cable as that is 2.78mm so a 2.7mm nominal cable size would be a good fit.

So what did Morgan do in 1955 when fitting Smiths speedos with 1/8" speedo cables and 90deg cross drives (that they had in their parts bins from the +4) to Series II 4/4s with 7/64" gearbox speedo input sockets? Obviously, they simply used the same 90deg cross drive with a nominal 7/64" (2.7mm) inner cable square section on the gearbox end to suit the Ford gearboxes and nominal 1/8" (3.1mm) on the 90deg drive end to suit the Smiths' standard sizes.

FINALLY..... While this is a little off track in solving my speedo drive problem, some understanding of the history backs up the choices made in coming up with the solution.

DISCLAIMER: Of course, some of this is not far from pure supposition, but it is supported by the history – at least the history as I have found from my relatively short time doing the research. And also, of course, if you have anything to add, change, correct, or simply suggest that I am well off track, please advise as the development history of these traditional old British sports cars is always interesting, and, I can always learn more.

Cheers

BF

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