

## Replacing rotoreflex couplings without pulling the hubs (GT6 Mk2)

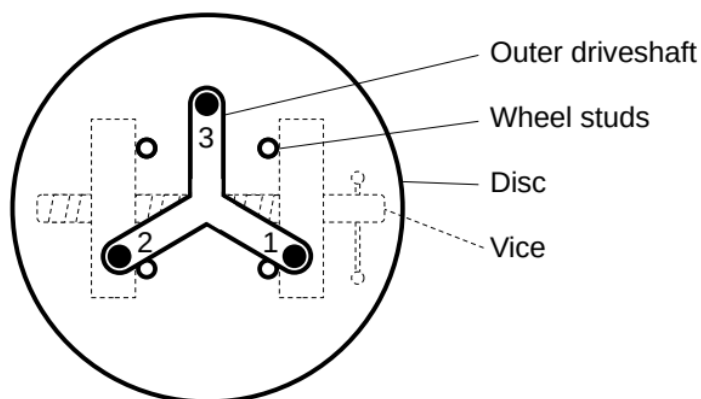
The proper Churchill puller is fairly expensive for an infrequently used tool, and old hubs can be very difficult to budge. This alternative method is to cut the metal retaining band off the rotoreflex donut and stretch the rubber over the prongs of the outer driveshaft. Then the donut has to be re-compressed so that the bolts can be fitted.

If you've seen the online video you'll be aware that this can be done; but the crucial moments are missing. <https://www.youtube.com/watch?v=vZCkhrGIpNM> I've found is that it's quite controllable provided you do a few important things: securely clamp the hub rather than the vertical link; use a much bigger lever than the video; put the lever through the central hole in the rubber donut rather than the bolt holes. Also, I suspect that a couple of "failed attempts" on the first pull might be helping to stretch and work the donut so that you eventually succeed.

- Remove the hub/driveshaft assembly as a unit, complete with the lower wishbone. You don't need to undo the very long bolt holding the vertical link to the wishbone.
- Remove the old rotoreflex coupling. Mine just fell apart, but if yours is intact you might need jubilee clips to compress it prior to unbolting (see below).

### Stretching the coupling over the driveshaft

- I put the brake drum flat across the top of a vice and clamped the wheel studs. Here's a drawing as seen from above (Figure 1.). One wheel stud became loosened, so I suggest connecting the hub to a stout piece of wood using the wheel nuts; then clamping the wood. I prioritised the prongs so that I was always pulling in line with the vice's screw.



*Figure 1: plan view of clamping*

- Cut the mild steel tensioning strap off the rotoreflex donut (an angle grinder is quick). Then soak the coupling in near-boiling water for about five minutes.
- Meanwhile lubricate the tips of prongs 2 & 3 with liquid soap. When the rotoreflex coupling is warm and pliable, put it over prong number 1. Insert a decent sized crowbar through the central hole in the donut (not a bolt hole). Rest the crowbar's tip against the axle, low down

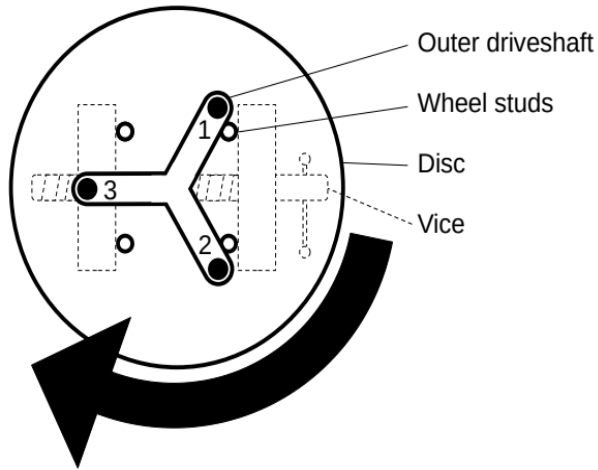
on top of the stone guard, a flat tip with a notch is best (Figure 2.). Lever steadily to stretch the rotoflex towards prong 2, and give an extra tug at the end to pull it over (Figure 3.).



*Figure 2: position of crowbar*



- Reposition the hub in the vice so that prong number 3 is in line with the vice's screw (Figure 4.). Once again insert the crowbar through the donut's central hole, and rest it tip against the axle. This takes just a little more effort than the first pull (Figure 5.) and then you're through the worst of it.



*re-positioned hub*

*Figure 4:*



Bolting up, the coupling needs to be compressed again so that it lines up properly with the bolt holes on both sets of prongs. The video's compression band made from jubilee clips works fine, but there's a tendency for the donut to roll in on itself and slip out of the jubilee band. The trick is to fit the rotoreflex bolts as you go for stability.

- Take a few large-ish jubilee clips (I got some nice strong 40-64mm ones from Mitre 10; slightly bigger might be better). Join them nose to tail to make a single extra-large clip.
- Insert one short bolt to hold the rotoreflex to an outer driveshaft prong; only do it up a few turns.
- Place your jubilee band around the circumference of the donut. Take care to centre it inboard to outboard (as if on the car); and try to align each tensioner on a corner of the hexagon (i.e. the metal divisions where the bolt holes are Figure 6.).



*Figure 6: donut with jubilee band tensioners at corners*

- Gradually tighten each tensioner in turn until you can just insert the unthreaded tips of the other two short bolts into their respective prongs (Figure 7.). A pair of vise-grips can help to gently lever them against the resistance of the rubber. If at any point the jubilee band slips off: slack it off, reposition and re-tighten.



*Figure 7: one bolt started (left) and a second's untreaded tip inserted into outer driveshaft*

- Further compress the rotoreflex coupling until you can start the threads of the two short bolts. I used the knuckle of the crowbar to apply firm pressure while I spannered them into the first few threads (Figure 8.).



*Figure 8: upward pressure to start bolt in threads*

- As soon as all three short bolts are entered into their threads, offer up the inner driveshaft and try to fit the three long bolts: unthreaded tips first, then a few threads. Some gentle levering against the rubber's resistance may be needed (Figures 9. & 10.), a repeat of the crowbar pressure and maybe some more compression of the donut.



*Figure 9: straightening donut to accept a bolt*    *Figure 10: levering a bolt with vise grips*

- Finally, progressively tighten all the bolts and apply a drop of thread locker to each. Torque to 65-70 lbf-ft 9.0-9.7 N-m.