

## Ron Hopkinson Rear Anti-roll Bar

Front left-hand corner of the spare wheel well showing the three nuts for the mounting bracket. The right-hand is a mirror-image, except a bit more cluttered with the fuel pump (on a rubber bumper), vent tubes and harness.



Left-hand side, taken from under the rear bumper looking forward. Shows the drop-link with black rubber bushes at the top and yellow poly at the bottom.



Right-hand side, showing the bar curving round the bump-rubber.



Corrosion weakening before breakage of the original drop-links

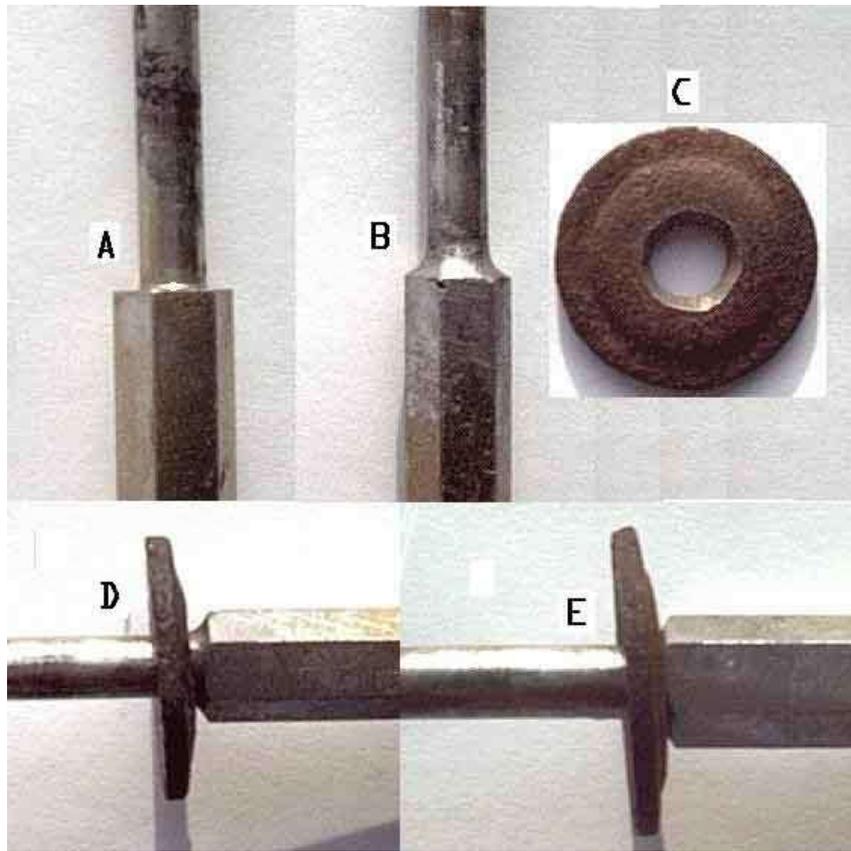


Snapping of the first replacement drop-links



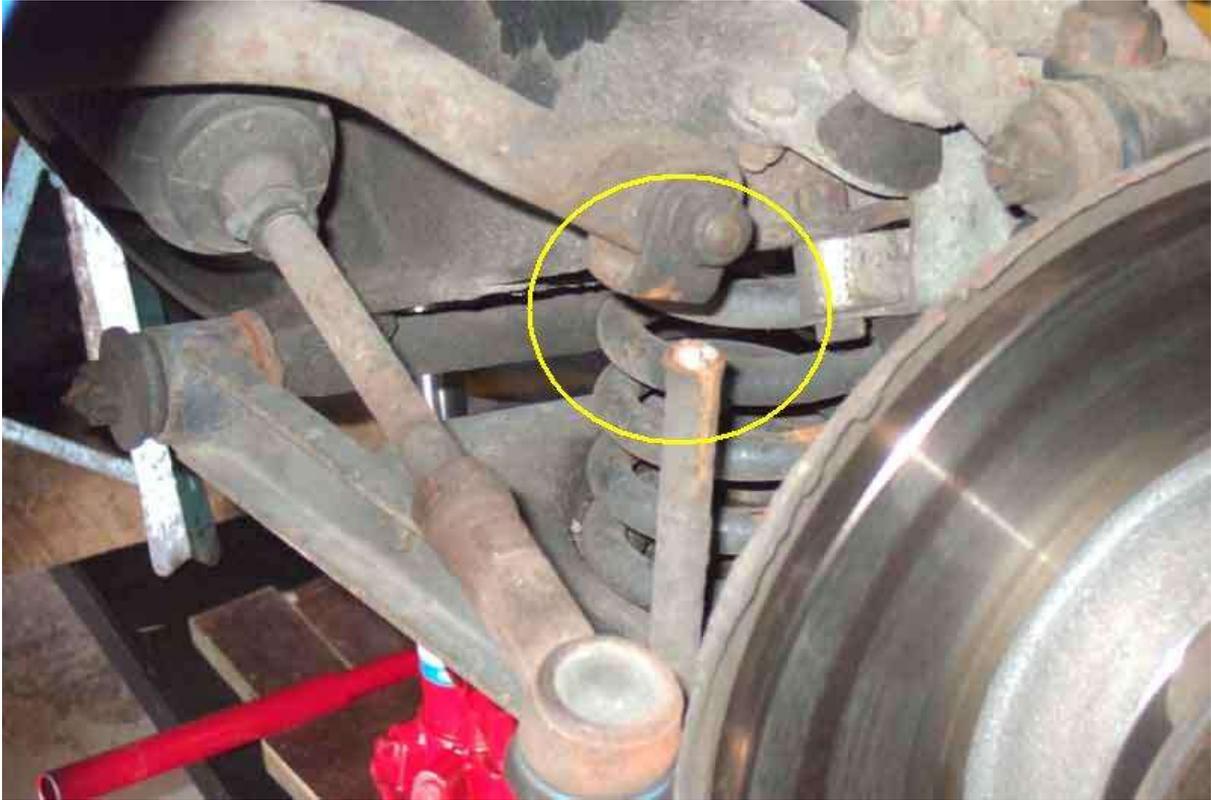
Second replacement drop-links:

- A - as received
- B - strengthened with weld
- C - Support washer chamfered to fit over strengthening
- D - unmodified washer
- E - modified washer



## Front Anti-roll Bar

First break of the original in May 2016. Welded, it broke again in June, so was replaced with a new one.



Replacement broken in the same way, after just four months.



What seems to be a minimal weld, probably just a spot-weld i.e. the two components held together while a high (not high enough) current is passed through the joint



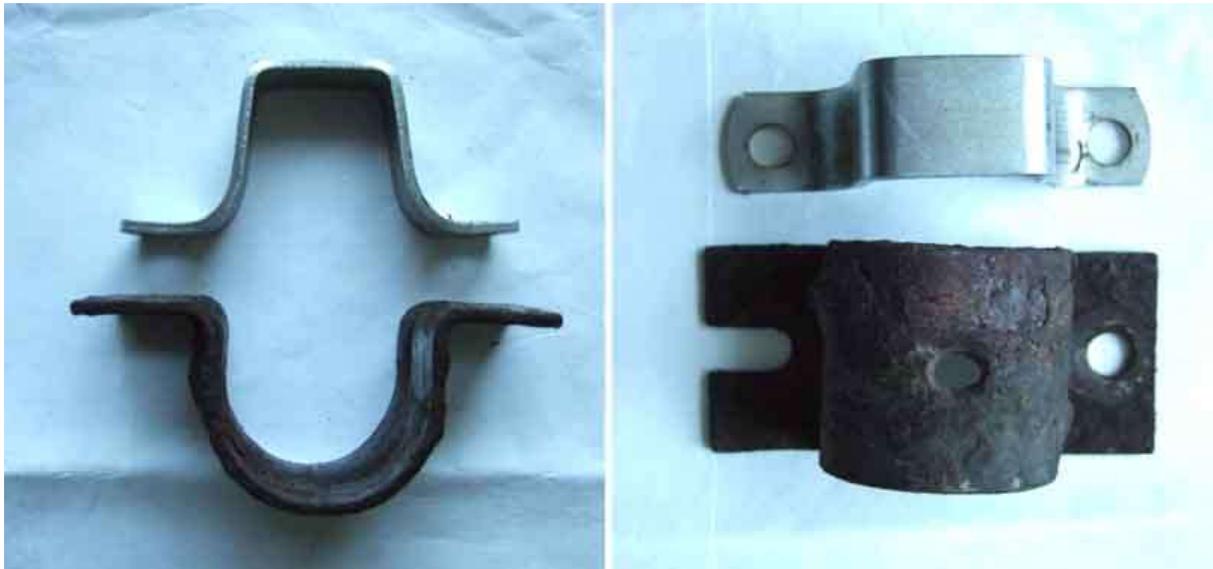
FOC replacement looks just the same, so I'll get it reinforced. OK, the breakages are probably down to the traffic calming 'pillows' we have to suffer round here, but I have no choice but to drive over at least one of them, and a significant detour to avoid another four.



Finding a 5/8" bar on eBay (the original RB V8 bar was 9/16" but the CB was 5/8" so should be fine) I decide to swap that and then see how the drop-links go. It came without pivots or end-stops, but the bushes were good. New pivot rubbers (1B 4526) are cheap enough at under £2, but annoyingly I forget that the Ron Hopkinson pivots and straps are rounded, but the originals ('straps' BHH 2000) are angular. Never mind, the RH ones do for the time being, at less than £2 the P&P on the correct ones is more so they can wait for a supplier visit. Being thinner this time I have some suitable hose so use that with Jubilee clips for end-stops to prevent sideways movement.



Factory pivot straps top, RH lower - one hole on the latter slotted to aid fitting the second bolt. The factory straps have to be checked against the chassis rail holes and 'adjusted' to suit before attempting to fit the bolts.

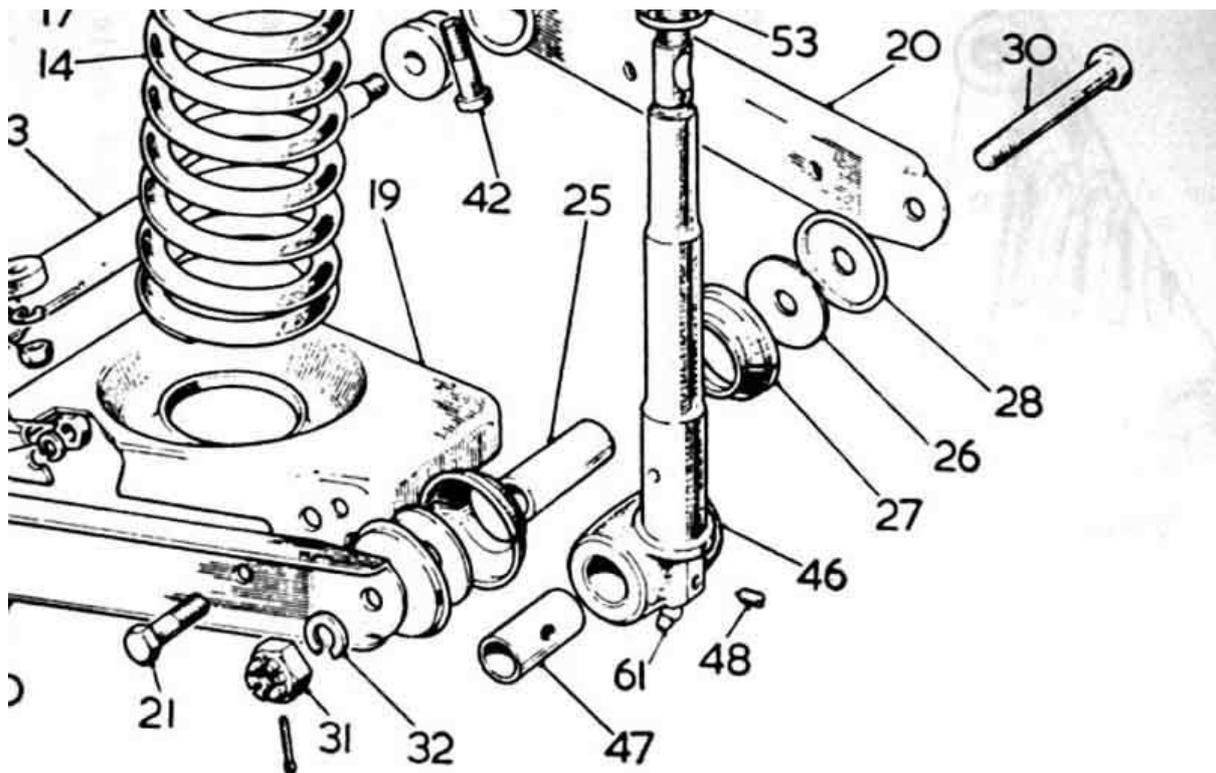


## Clonk when Braking

Eared 'spinner spanner'



Link bolt 30 clamps the seal supports 28 and the thrust washers 26 hard against the ends of the distance tube 25. The distance tube is fractionally longer than the bush 47 to allow free pivoting with minimal fore and aft movement. *Leyland Workshop Manual*



Bee's thrust washers. Clearly grooved on the faces that had been against the bush, but the backs unmarked.



Vee's thrust washers. Definite wear marks, but not so deep, as evidenced from the lesser audible clonk.



## Wire-wheel Rear Hubs

Someone (name withheld to save him from embarrassment) posted pictures of his wire wheel hubs asking why one side had nuts on studs and the other had low-profile bolts. That immediately said to me that he had a standard hub one side but a conversion hub the other, axle type unknown. Conversion hubs are machined to allow the wheel to sit as close as possible to the drum, in an attempt to reduce how much further wire-wheel tyres on a stud wheel axle stick out compared to stud wheel tyres. However only about 10mm is available, whereas the difference in the wheels is about an inch. In this picture you can see the nuts on studs on the left, and low profile bolts on the right. Also the distance between the angled wheel seat and the drum on the left is clearly more than that on the right. It's for this reason that low-profile bolts have to be used on conversions hubs, there simply isn't enough room between drum and hub for the much taller Nylocs and studs:



And this is the effect with the wheel fitted. Richard Tower shows his wire wheel with only 15 thou clearance to the drum when it was on conversion hubs on a stud-wheel axle, whereas mine on standard hubs have 11mm.



Tracking gauge pointers in the middle of the wheel mounting surfaces:



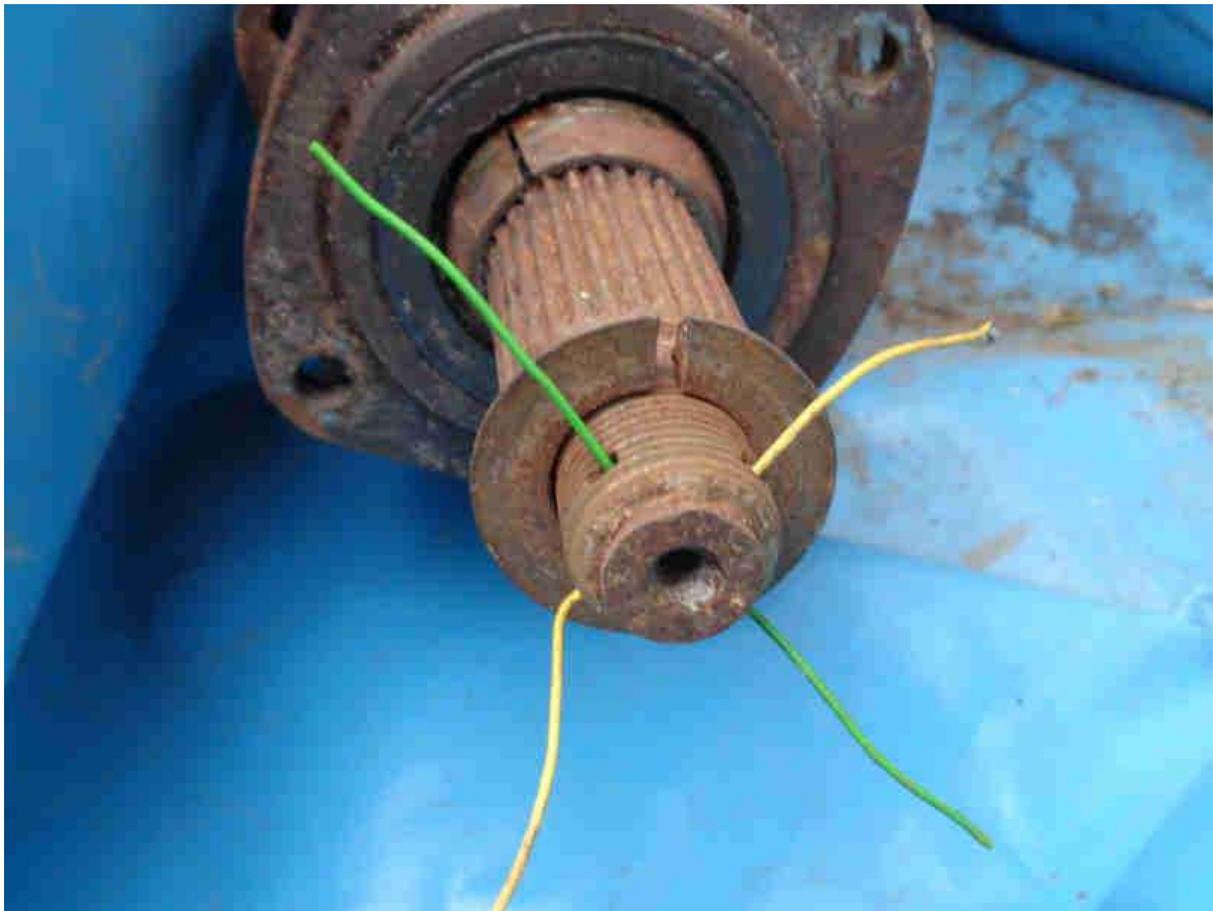
A spacing of 1320mm:



Tube-axle centre-lock hub with two split-pin access holes: ([Orson Equipment](#))



Half shaft also with two split-pin holes:



## Track-rod Ends and [Tracking Alignment](#)

Bee's old and new track-rod ends of different lengths:



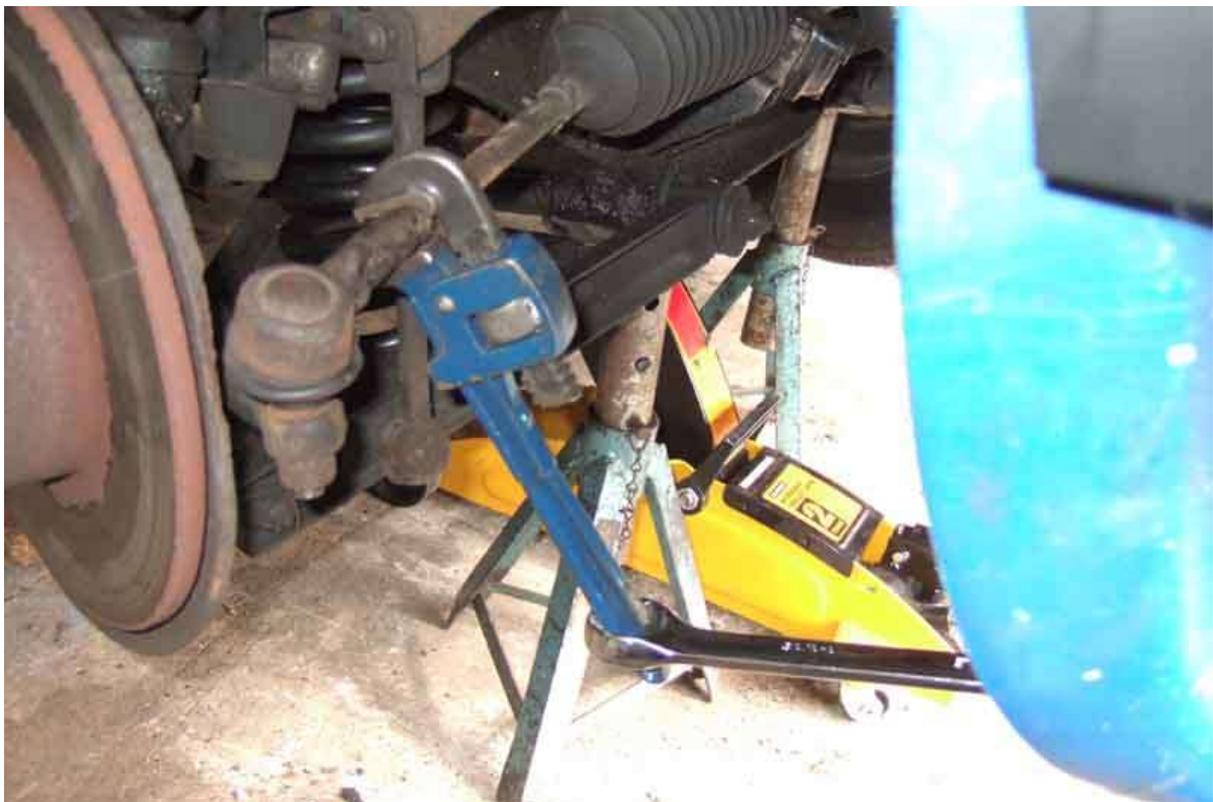
Badly worn unit:



Vee's track-rod ends: Angle-ground along the body of the track-rod to just expose the threads. A bit of a 'do or die' treatment, you wouldn't want to drive it having done this. If this hadn't worked I would have had to remove the rack with track-rod end attached and take it somewhere to get some heat on it:



Ring-spanner on the end of the Stilsons to give more leverage:



Double lock-nuts which I can lock together to make turning the track-rod easier, although judging by the other side I'll not have a problem with it again. If doing this **make sure** you fully tighten the first lock-nut against the end of the track-rod end, then just lightly nip the second nut up to that. If you just lock the two nuts together the track-rod end could be loose on the track-rod (although highly unlikely to come unscrewed from it):



During the annual service I discovered the near-side dust cover damaged, along with its larger retaining spring. On removal it seems to have been punched through from an impact with something as otherwise the rubber is still very supple and shiny i.e. not perished. Fitted in 2010, 18k miles by 2019 so surprising the body is so rusty as the vast majority of those miles have been dry and definitely no salt:



The existing ones are 12-31-17 (small hole - large hole - height) but the closest replacements I could get are 12-31-22. So taller, but correct for the pin and the socket. If they are too tall then when compressed from fitting they could cause the large end to pop off the socket letting dirt in. These are [polyurethane from Bulgaria](#), he sells loads of different types and I was looking for silicone rubber but they were either way too big or not available:



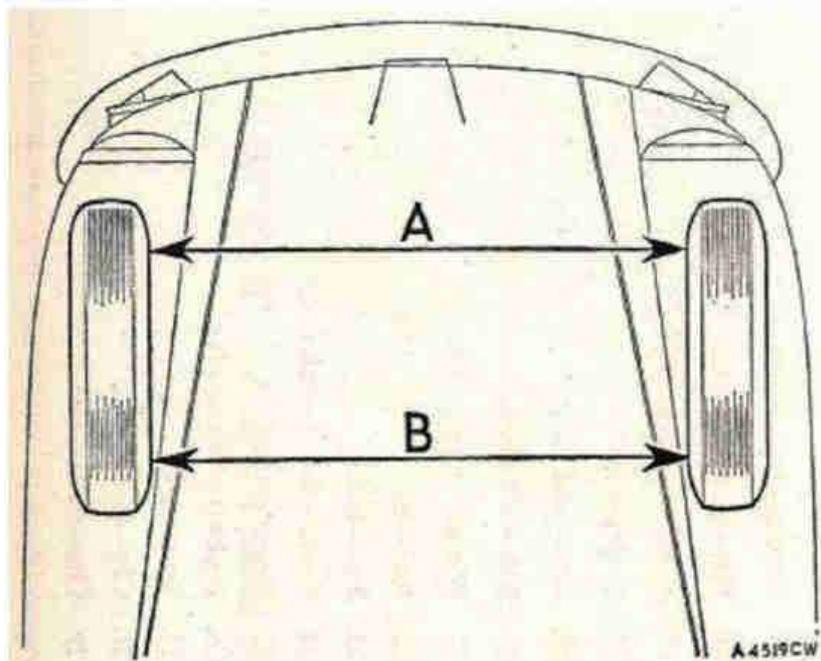
Fitted (yes I know the nut isn't on yet ...), straightened retaining spring looks to be holding OK, I'll have to check after driving a while:



12 months later looks OK:



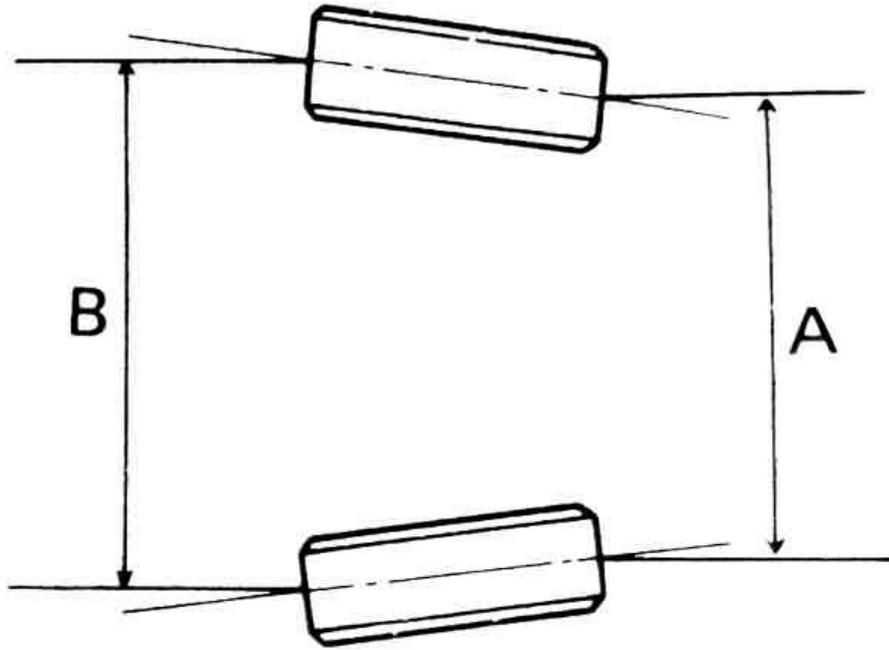
Leyland WSM: 1/16" to 3/32" (1.5 to 2.3mm) toe in, measured at the rims:



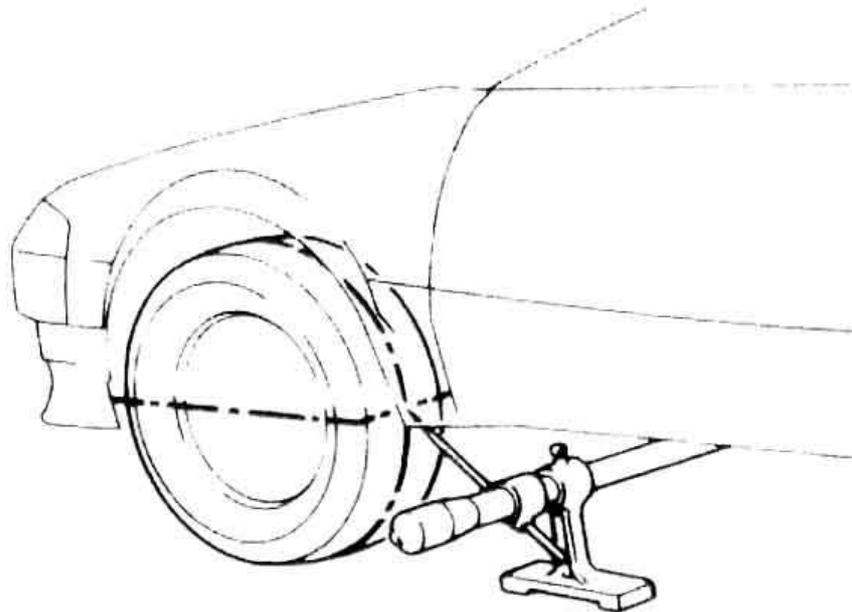
*Fig. J.1*

*The front wheel alignment check must be taken with the front wheels in the straight-ahead position. Dimension (B) is  $\frac{1}{8}$  to  $\frac{3}{32}$  in. (1.6 to 2.4 mm.) greater than (A)*

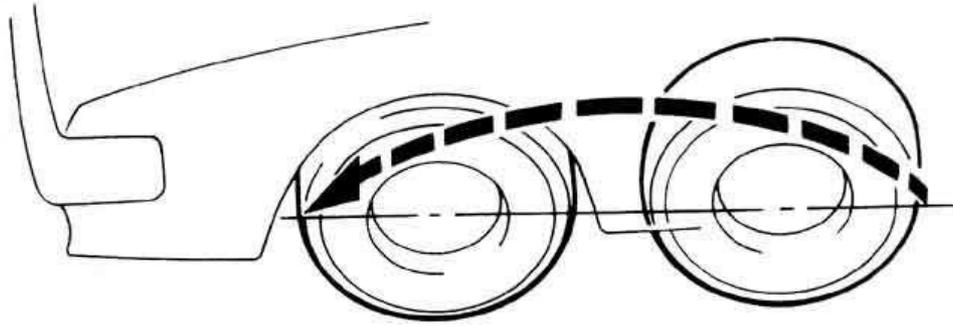
Celica manual: Showing measurements taken at the tread faces:



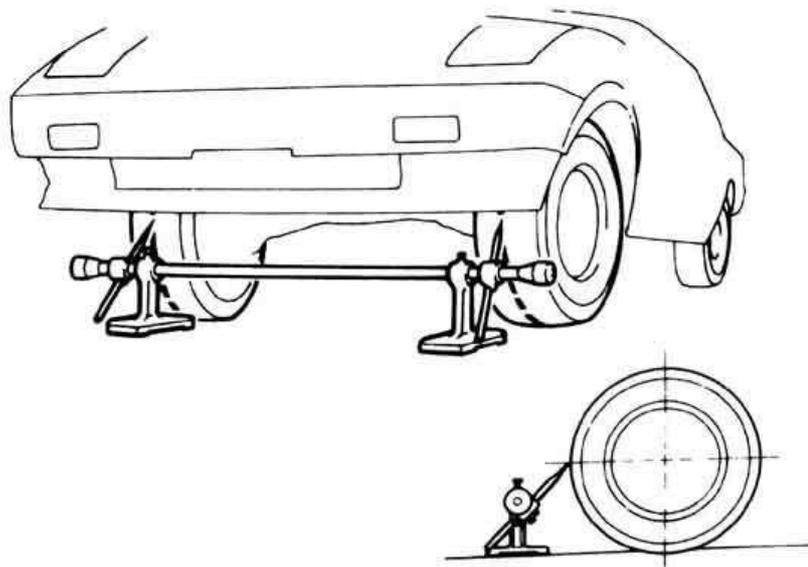
The reference measurement taken from behind the axle:



Rolling the car forward half a wheel turn:



The comparison measurement taken in front of the axle at the same marks as before:

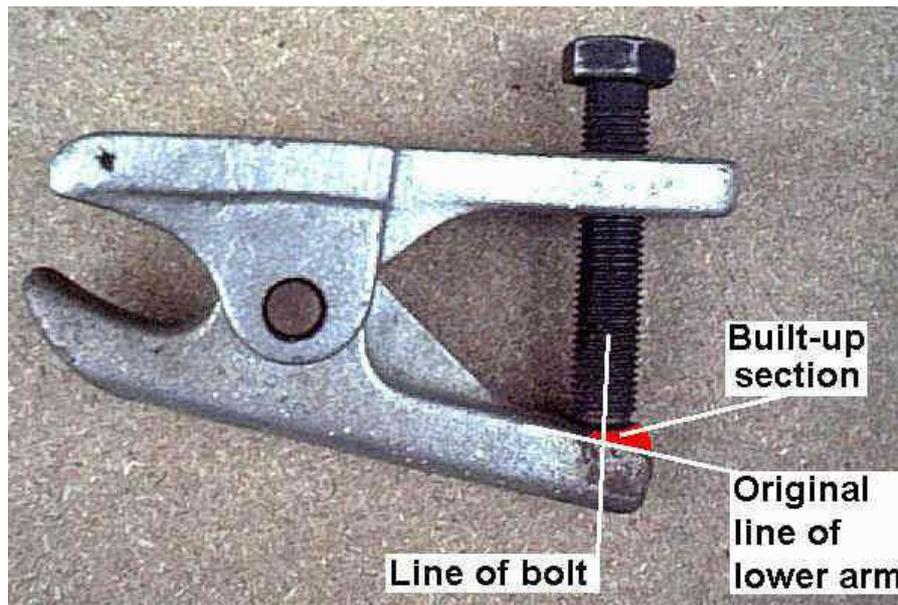


Tracking gauge:





## Ball-joint Splitter



The Sykes-Pickavant ball joint separator as modified. The bolt has to be screwed in so far for the MGB ball joints that it starts making an angle with the lower arm it is bearing on. Despite its heavy construction I could feel the bending forces building up and feared it might shatter, just inches from my face. So I built-up the end of the lower arm so that as the bolt was screwed in, and due to the angles involved moves slightly down the arm from the hinge, its business end is always pretty close to a right-angle with the bit of the arm it is bearing on.

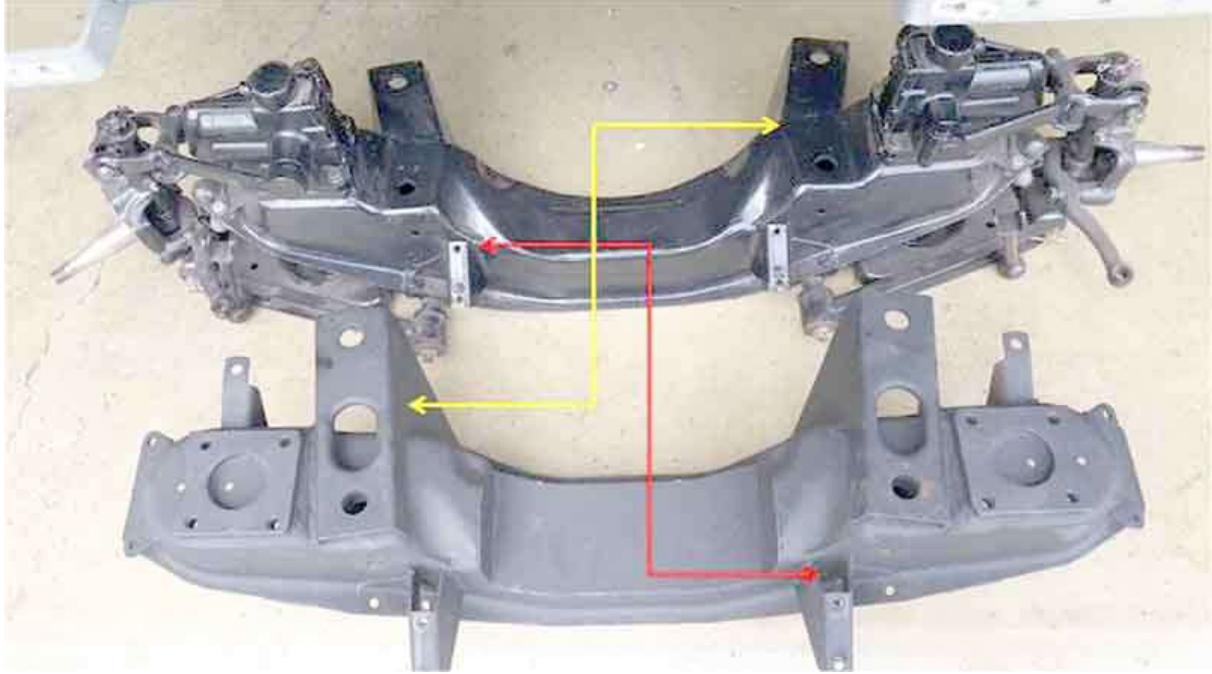
*May 2015:* This type (66055000) is still available (at a price, around £25 from some suppliers but I have found one at £40!) but there are a number of others online at about £10. Some of these have a [curved bottom arm](#), indicating that perhaps the bolt will always be square to the arm. Another has a [recess](#) so perhaps that will also be OK, but others have a [straight arm](#) so depending on the angle the two arms take up on your track-rod ends, they may or may not need modifying.

There are also so-called '[direct acting](#)' types which has the bolt bearing down directly on the pin of the track-rod end rather than a lever action, which wouldn't have the above problem, however I've always felt the flange that fits between the TRE and the steering arm is pretty thin on that type. My scissors type has a 19mm jaw, but is much beefier, so it doesn't matter if it only grips the outer part of the steering arm eye. But the direct-acting type would need to be as snug to the pin as possible to get the greatest area of the flange under the steering arm eye to spread the load. I've measured the pin on a TRE at just under 17mm, so a 17mm one would be the one to go for, not the bigger 19 and 23mm types.

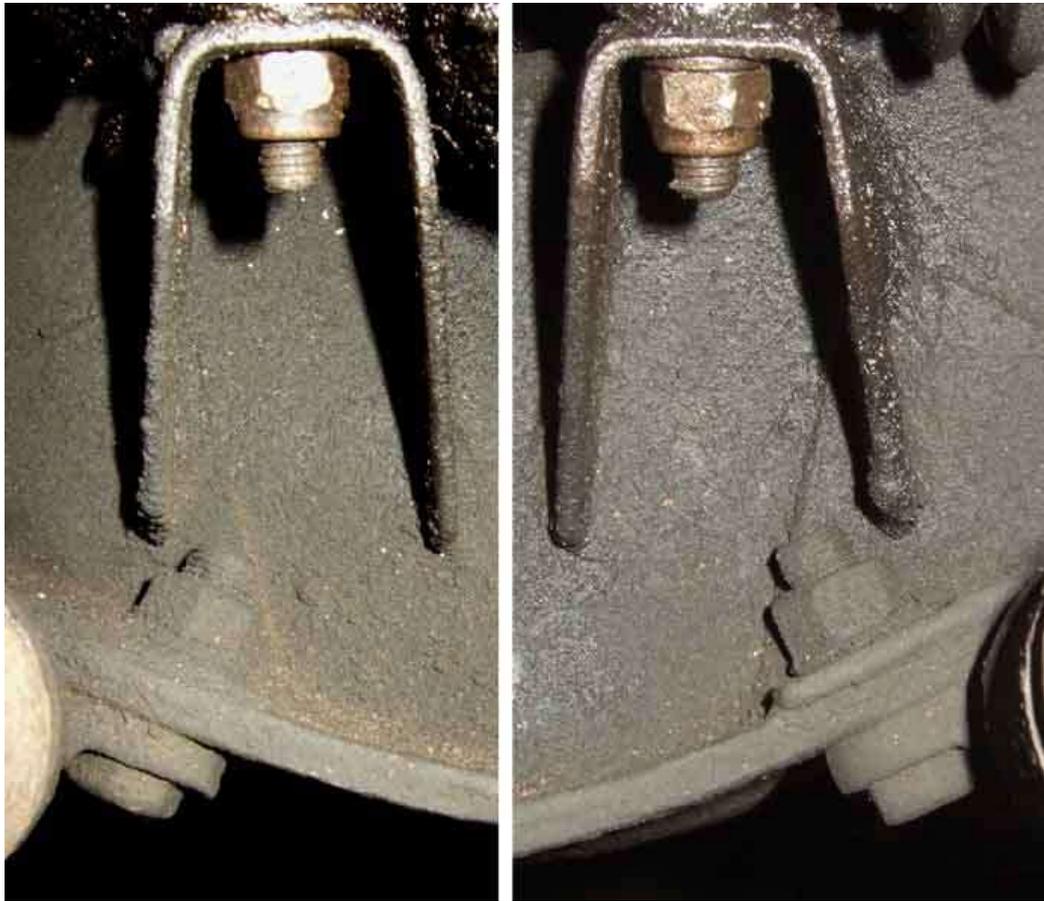
## Front Crossmember

Installation of the rubber pads - [Chrome Bumper](#) [Rubber Bumper and V8](#)

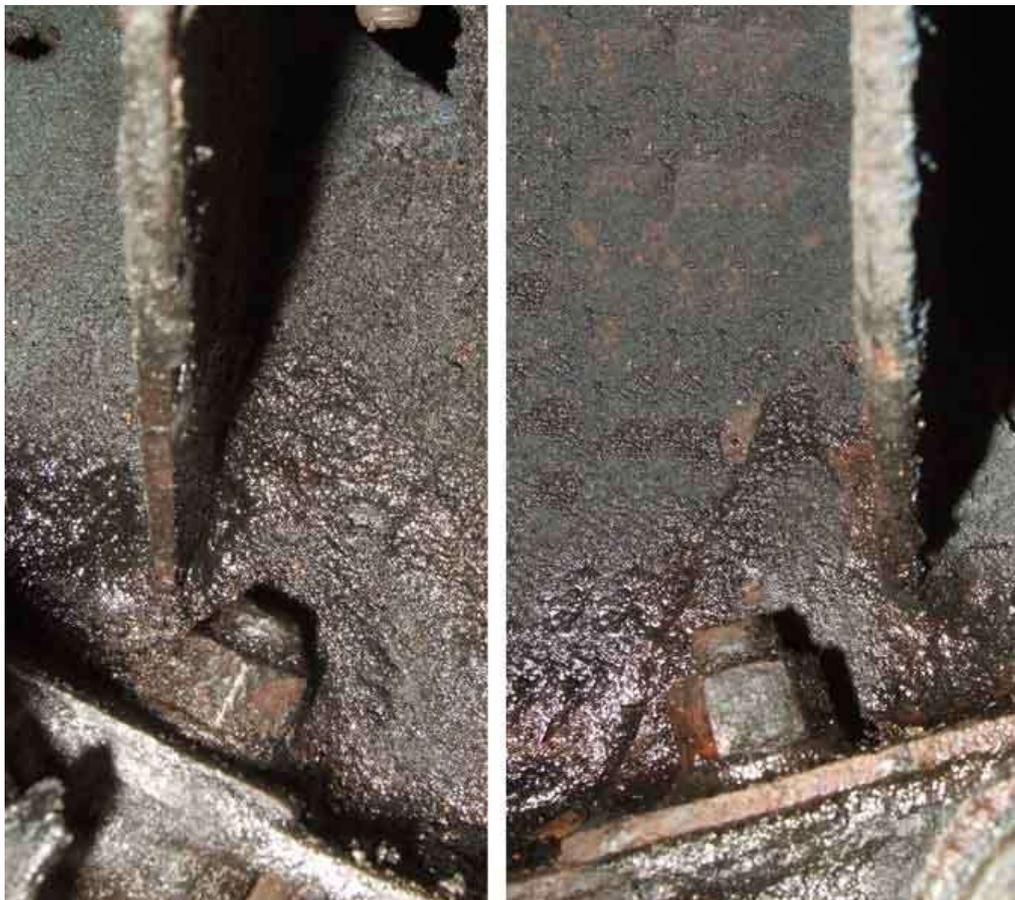
Comparison of chrome and rubber crossmembers. A stout channel (yellow arrows) lifts the chassis rails on the RB (lower) to give the higher ride height. The red arrows show the difference in the rack mounting brackets: ([MG Experience](#)):



According to [Jim Gibson also on MGExp](#) whereas the CB rack mounts were the same for both LHD and RHD, on RB they are apparently moved to one side for RHD and the other side for LHD. This makes sense as the shaft has to pass through holes in the chassis brackets for the engine mounts on RB making lateral position of the rack important, whereas it passes under them on CB so lateral position was unimportant. Mark Vaughan in USA posted the above comparison so presumably is showing a LHD RB crossmember, but any offset in the brackets to one side or the other isn't obvious from the picture. However comparing CB to RHD RB there IS a difference - on the RB the brackets seem to have moved about 1/4" towards the passenger side. CB equidistant from the A-arm bracket bolt:



RB offset to the right, although it would be the rack mounting face that would have been positioned by a jig for welding, the bottom of the 'legs' would be welded where they ended up:



This investigation of rack mounts stems from someone on the MGOC forum saying his driver's side track-rod was angled up towards the wheel whereas his passenger side was level as here:



I suggested he take drop measurements from rack, brackets, crossmember and so on to try and see where the discrepancy lay, and he said one bracket was 10mm higher than the other. His rack shaft passes through the hole in the engine mount chassis bracket correctly, so if the crossmember itself is the same distance from the ground both sides it can only be the passenger side rack bracket being higher than the drivers. And that 'IF' is crucial. Despite saying to take the measurements on flat and level ground, and to take multiple measurements, further investigation revealed that it is his garage floor that is out! In other words rack, brackets, crossmember and chassis rails would all have measured the same both sides.

Two upper pads AHH6205 each side with a collar round the bolt-hole that protrudes down into the crossmember, and two lower pads AHH6206 each side that are flat as there is no space left for a corresponding collar to protrude upwards.

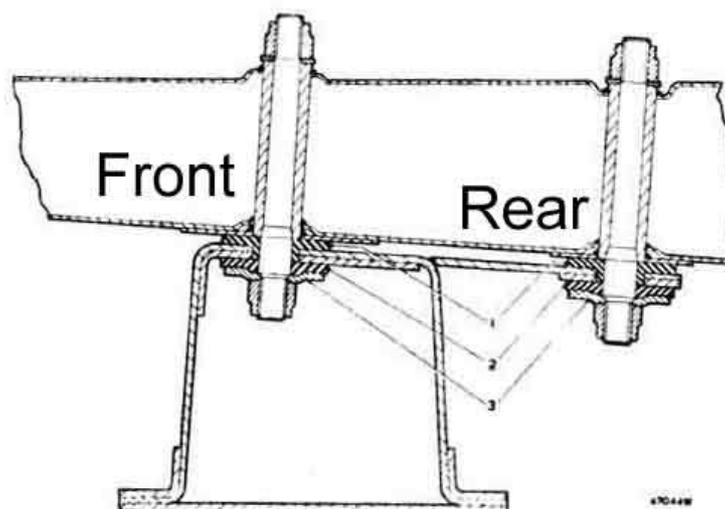


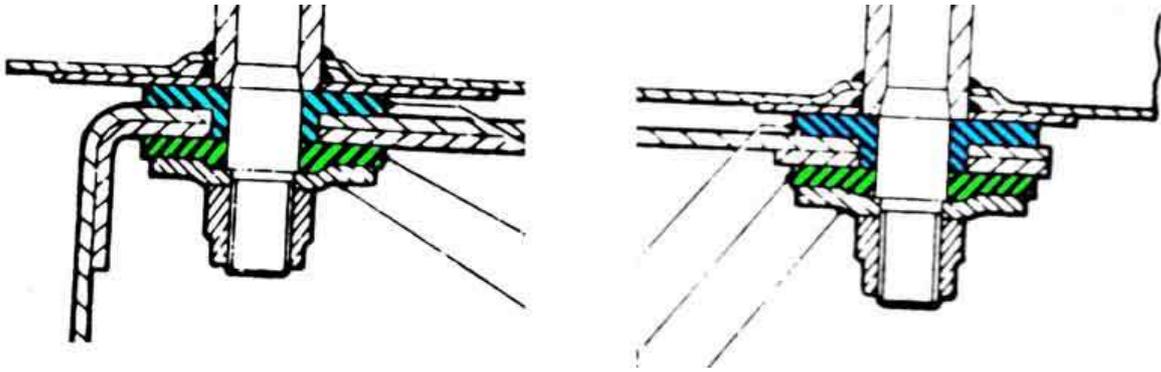
Fig. K.5

Assembly of front suspension cross-member to body side-member showing:

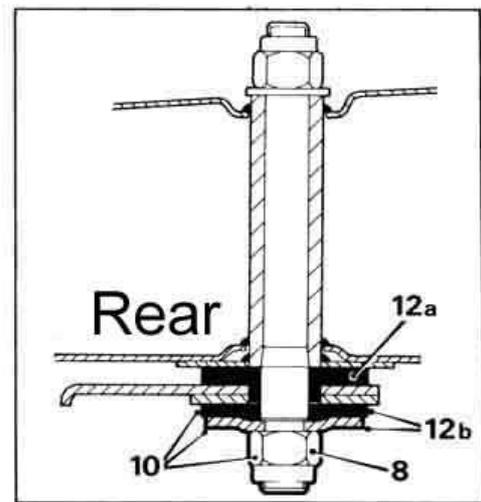
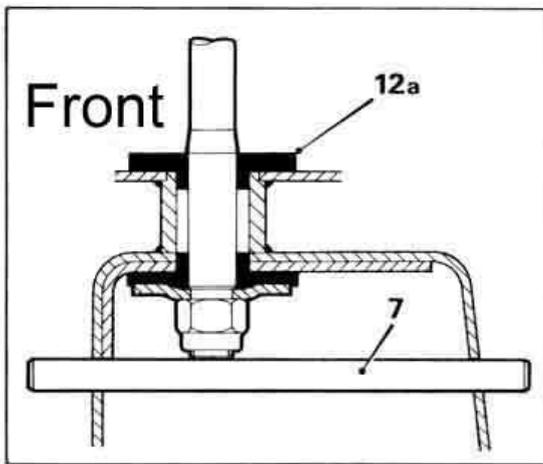
1. Upper mounting pad.
2. Lower mounting pad.
3. Clamp plate.

K.7

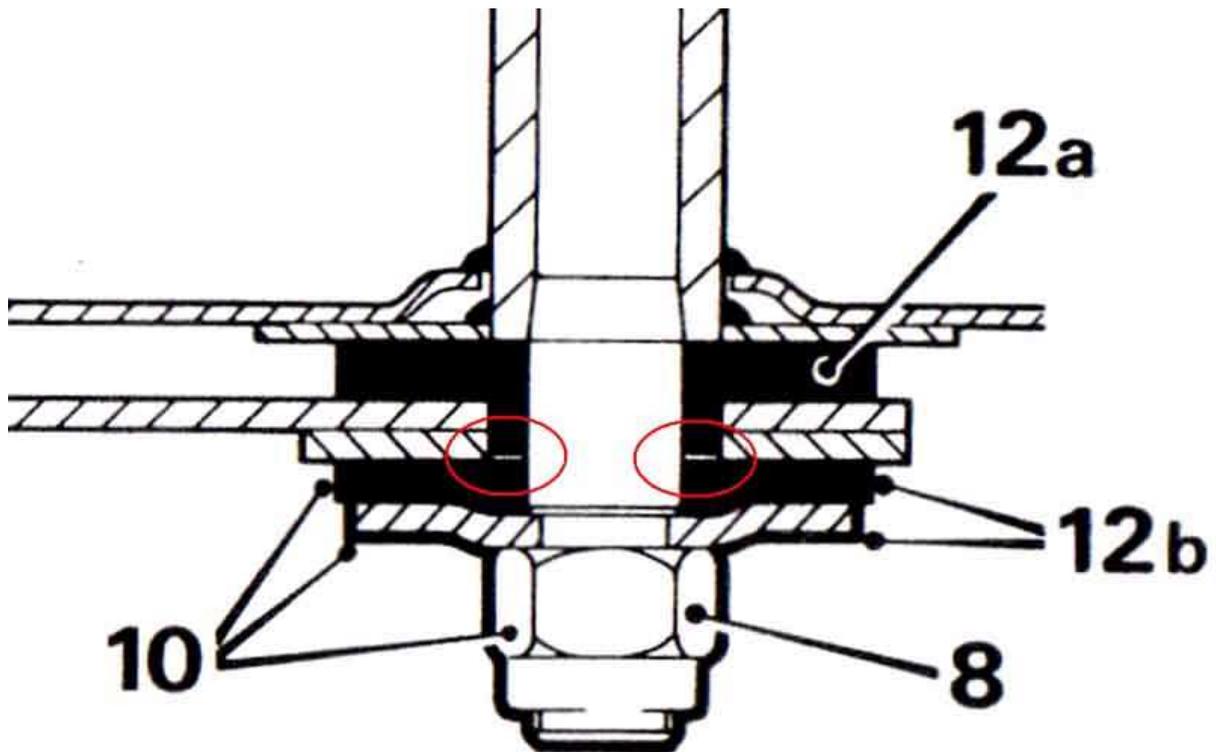
Detail from the above showing collared uppers and flat lowers both front and rear.



**Rubber bumper and V8:** Two upper pads AHH6205 each side with a collar protruding down into the new channel piece, another AHH6205 each side at the front, facing upwards, underneath the original top surface of the crossmember, for the lower pads. Rears staying with flat pads AHH6296 in the lower position each side. Incidentally I'm assuming the V8 should have this arrangement as all V8 had the rubber bumper crossmember. The Parts Catalogue doesn't say so, but then it doesn't say 4-cylinder RBs had the different pad arrangement, until the 77 and later catalogue.



Detail from above confirming that the fronts changed to collared uppers and lowers while the rears stay with collared uppers and flat lowers.



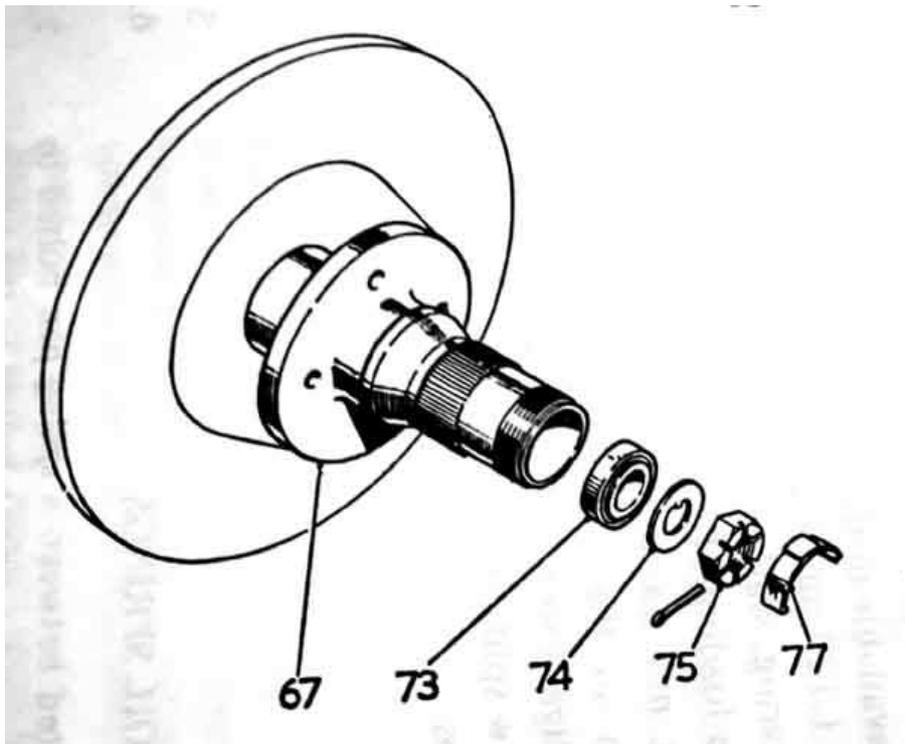


## Front Hub Grease Cap

Stud wheel: The flange allows one to lever the cap out, and limits how far it can be inserted



As depicted in the Workshop Manual (item 77). Looks more like a spring clip that would attach to a tube and cover a grease-point. This is quite likely a generic drawing from a model several generations earlier.



Centre-lock wheel: Fitted with a removal/insertion stud. No flange, and bottoms against a shoulder in the hub



Overall length of a removal/insertion tool isn't critical (and nothing like some found on Google images), enough to grab hold of while you are screwing on and unscrewing, say 4". The end of my studs are about 1" into the hub, and about 1.25" threaded length, So allow say 1/2" to screw the nut onto the end of the stud, then cut the slot so it is level with the end of the hub, say 1.5" from the end of the nut. That leaves plenty of thread to screw the tool further onto the stud, to keep the lever at right-angles to the tool, if you need two or three goes at levering.



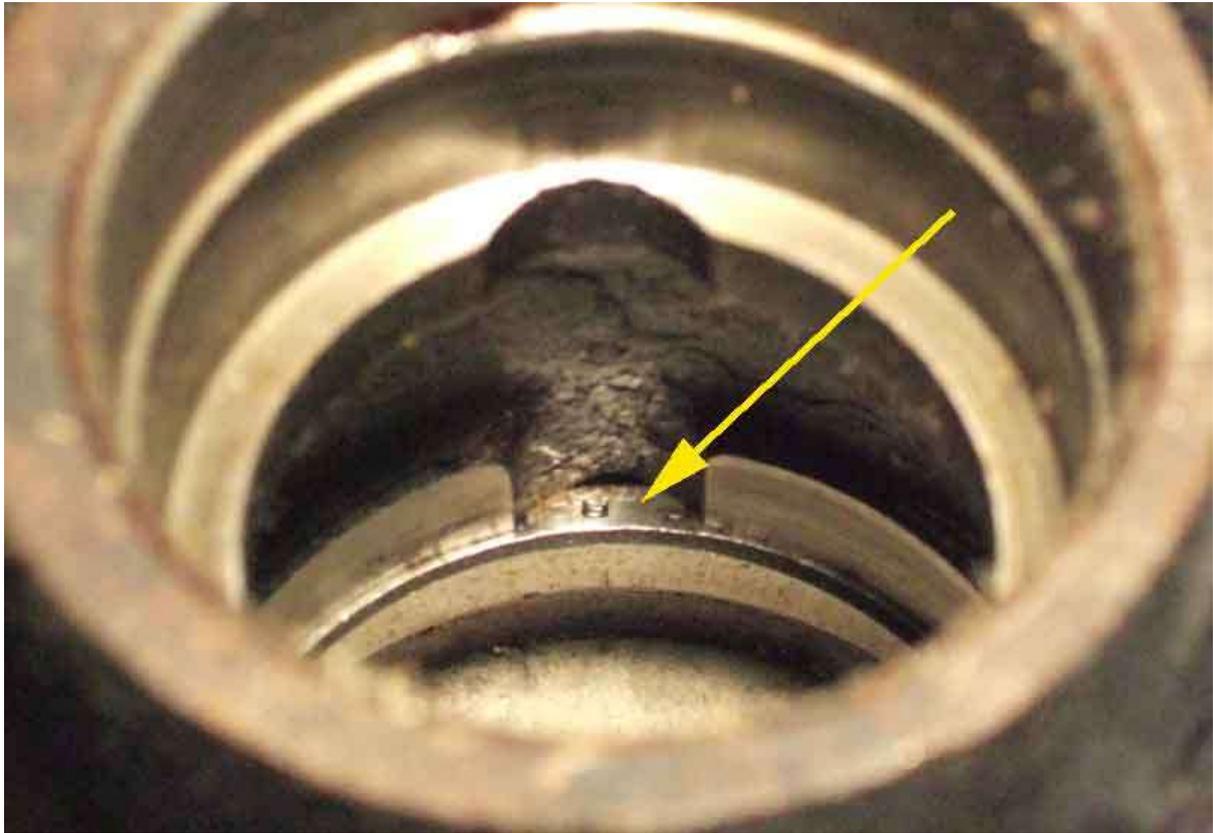
The tool screwed onto the stud such that the lever makes a right-angle to it, to give a straight pull on the cap. If the lever is too far away from the right-angle it will tend to push the cap to one side or the other instead of levering it off with a straight pull.



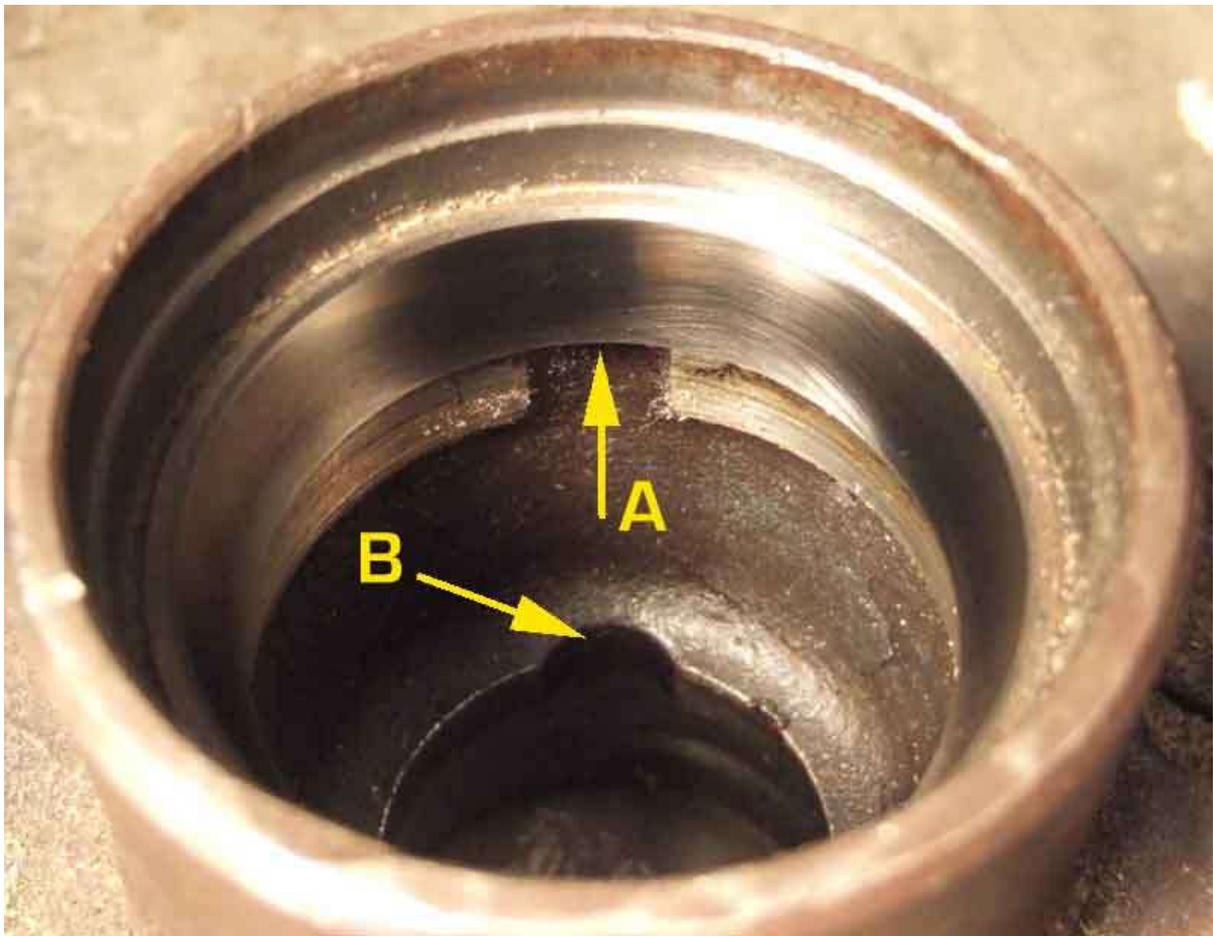
Reinstallation is done by screwing to tool onto the thread of the cap then using the tool to position the cap on the hub and tapping the end of the tool with a hammer.

## Front Wheel Bearing Replacement

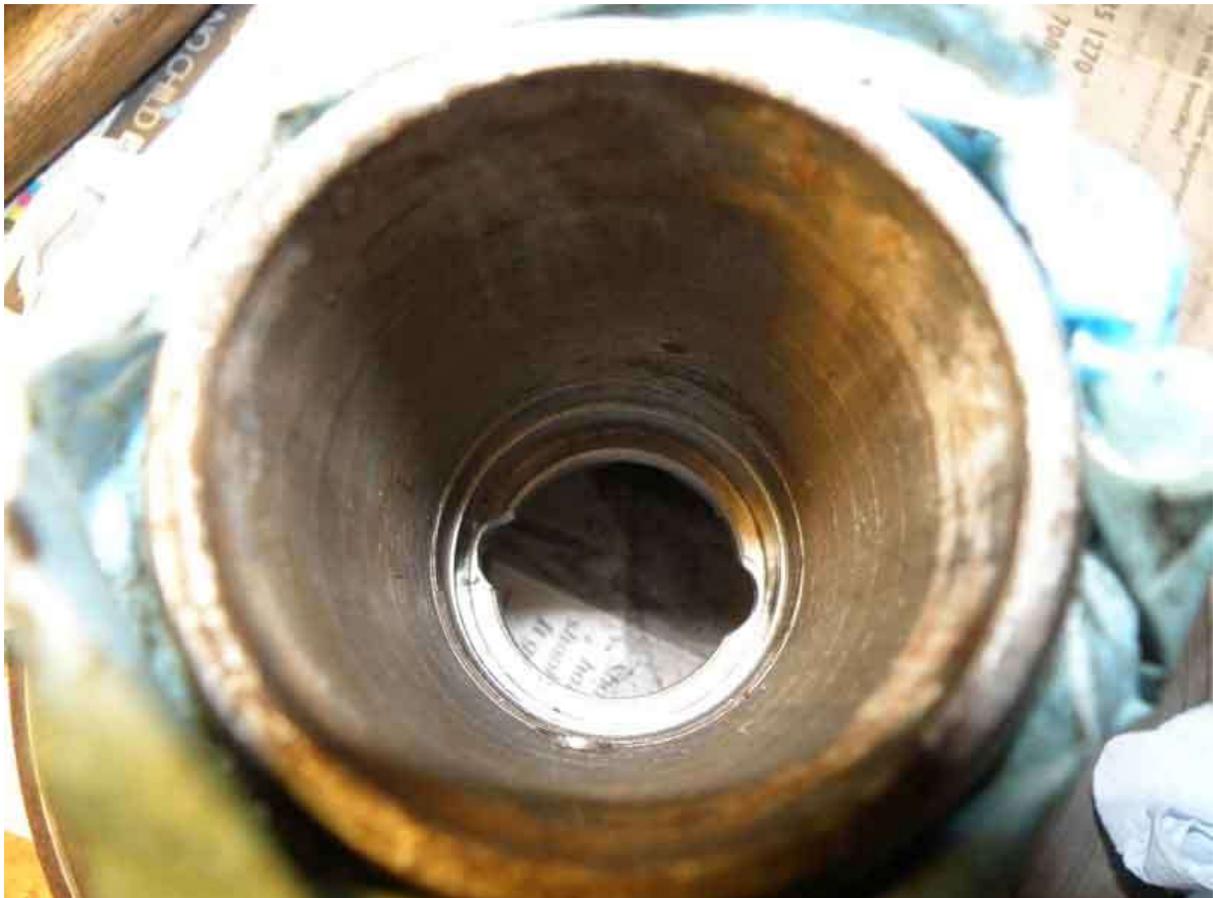
Cut-out revealing the face of the outer race of the outer bearing, for drifting out the old races. Above it is the cut-out for the outer race of the inner bearing which has already been removed.



From the other side - insert a drift through the hub along the line of A to drift this inner bearing race out. B shows the cut-out for the outer bearing race.



Looking down the 4" tube of a wire-wheel hub, down which the outer race of the outer bearing has to be fitted.



1 5/16" socket is a nice fit on the narrow face of the outer race of the outer bearing. OK on a stud-wheel hub, but it's not easy to control down the tube of a wire/wheel hub.



Outer race of the inner bearing. Would need a very large socket, or the old race can be used to spread the load. **Note this thinner face of the two faces outwards, on both outer races.**



It's important to get the races fully seated. When drifting them in there is a definite change in the sound when they 'bottom', but peering in from the opposite end at the cut-outs used for drifting the old races out you can also inspect them. This is not quite seated and shining a light in shows a shadow on the seating face of the race:



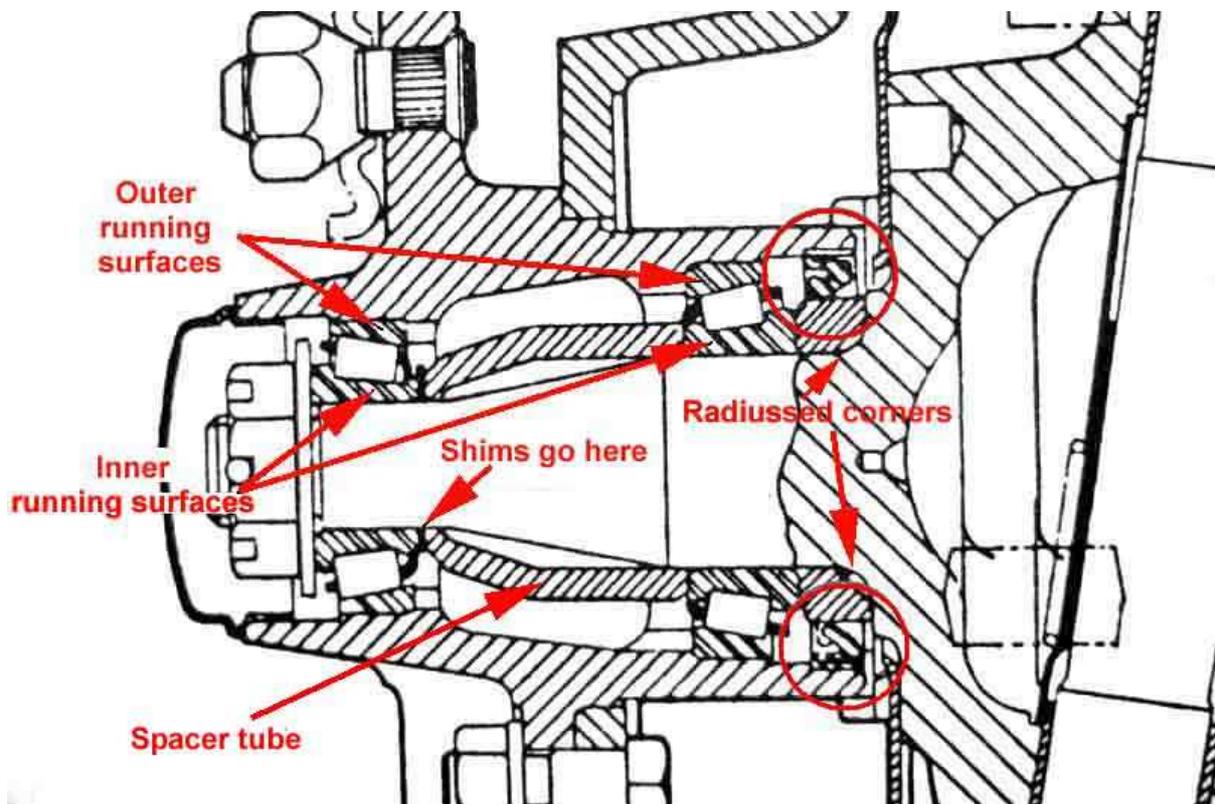
Fully seated and no shadow:



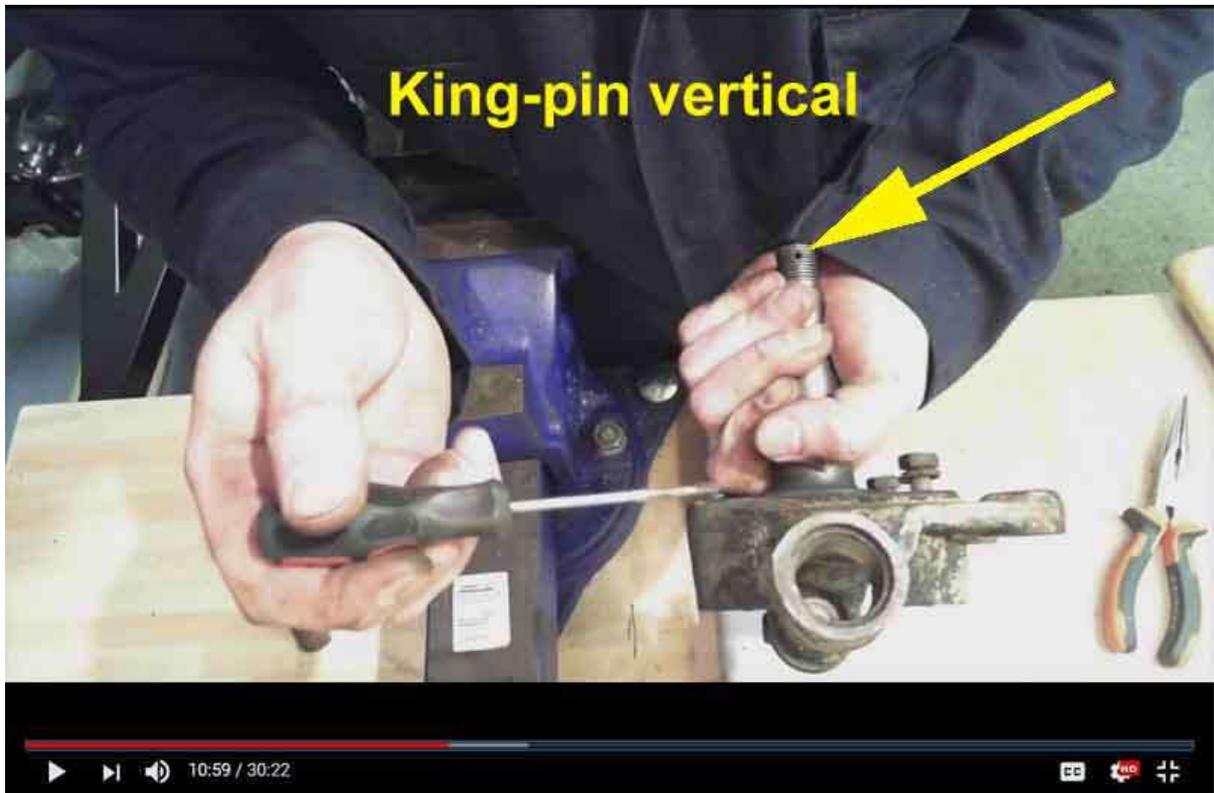
Also fully seated you should be able to see the top of the slightly reduced diameter of the hub as a bright ring (arrowed) at the outer edge of the race:



Oil seal (circled) correctly fitted with the flat side facing outwards (to the right) and the lip and groove facing inwards. Also note that the collar it rides on has the inner radiused corner facing the hub, if it's fitted the other way round you won't be able to set the end-float correctly:

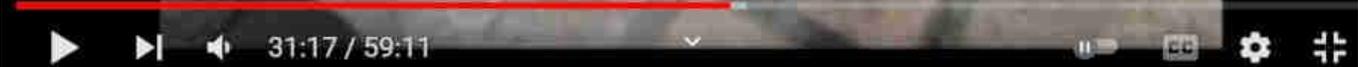
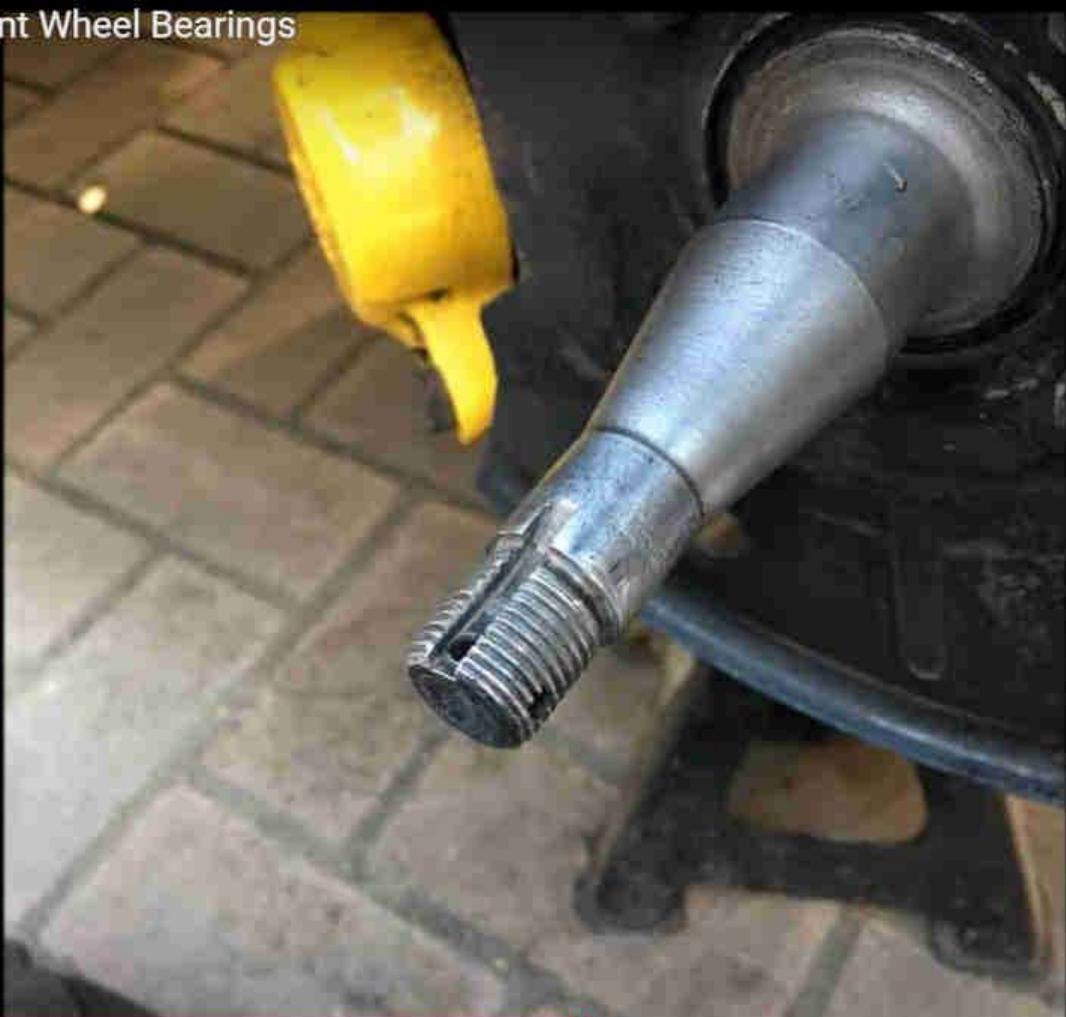


Some have said their stub axle only has one split-pin hole. Mine have two, and these two frames from [this YouTube video](#) also show two - one in-line with the king-pin and the other at right-angles. Check the previously unused hole isn't full of grease and muck:



This still from [another video](#) shows both holes in the same shot:

# MGB Front Wheel Bearings



## Front Bump/rebound Rubbers

Bump rubber missing of the bottom of its bracket, spotted when working on the king-pin



Old and new bump/rebound brackets, notice how the bottom part of the old one is bowed downwards from the swelling of the alloy spacer.



Old and new alloy spacers



New bracket partially fitted with long lower bolts, needs manipulating to get the upper holes to line up

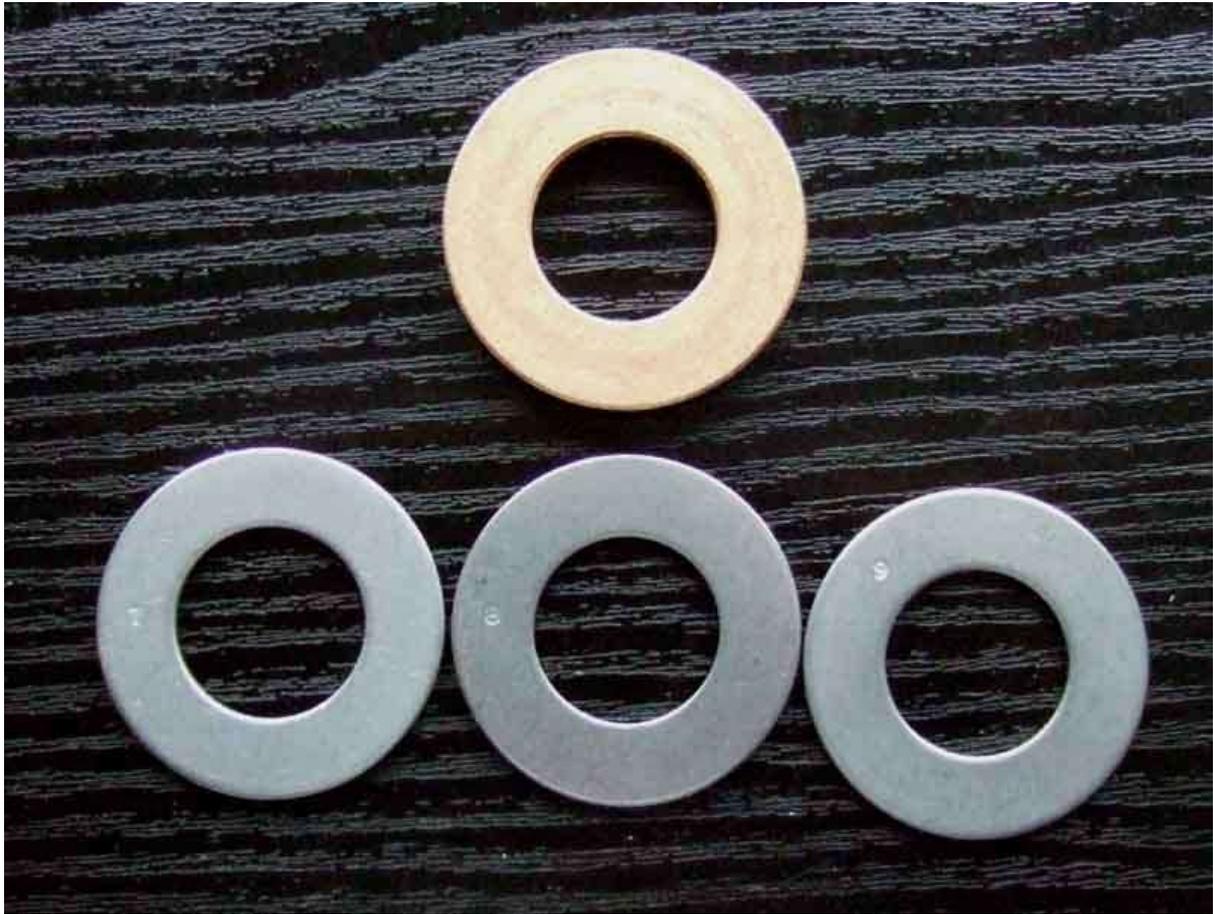


Showing how the cross-member mounting point has been bowed by the swelling of the old spacer



## King-pins

New phosphor bronze thrust washer and three selective sizes of shim. At least that is what the numbers stamped into the shims purport to be, five of the six I got from Moss were all the smallest size!



The recess in the king-pin for the bushes ...



... and the cut-out in the trunnion (shown with the threaded part of the king-pin in the cut-out for clarity):



Ironically I laid in a top-link repair kit for the side I hadn't had apart before, but didn't need it (for that ...). The Motaclan/Leacy repair kit. Ironically the 'original' (i.e. I hadn't had it off before) top trunnion pin came out easily with just a bit of tapping (on the threaded end of the pin with a lump-hammer behind the opposite damper arm):



Just as well as the pin I'd replaced a few years earlier (which also came out just fine) stripped its thread when re-tightening the nut!



Contrary to rumour, these bushes (described as 'barrel' type, and you can see why) have a steel sleeve in them, which acts as a distance tube to leave the correct clearance between damper arms and upper trunnion. This sleeve rusts to the pin meaning you have to hacksaw through the pin either side of the trunnion, then drill/chisel the remains out of the trunnion. There is talk of a poly 'top-hat' type which also have a sleeve, but the rear shackles use a top-hat type and neither rubber nor red (at least) poly have sleeves, which may be where the confusion comes from:



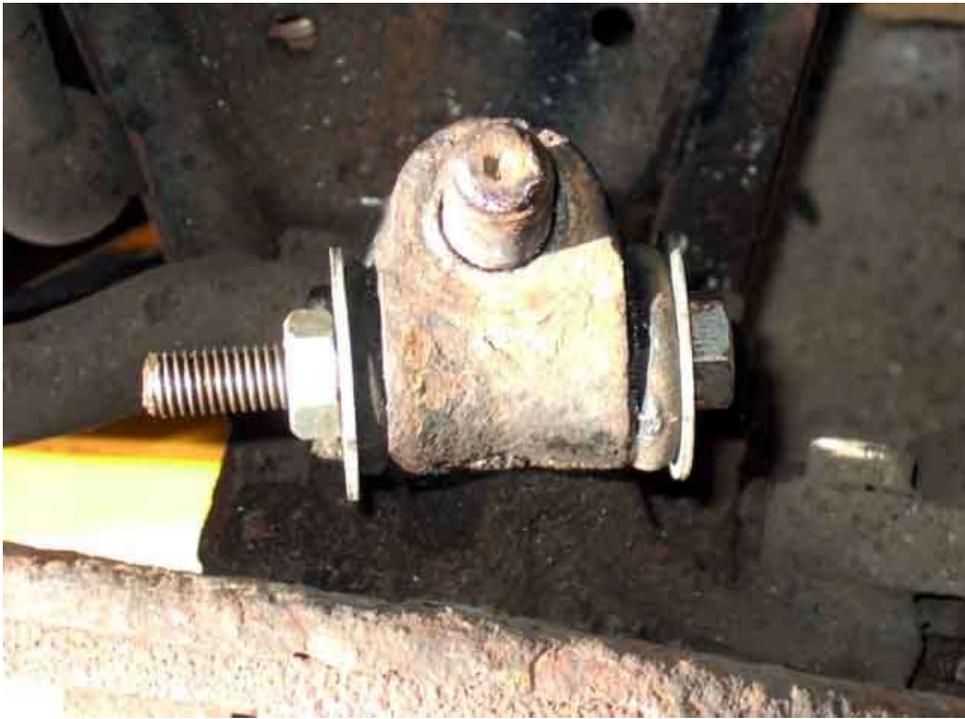
Hub supported. Either behind the bump/rebound bracket, or the anti rollbar drop-link if replacing the bracket at the same time (note the missing bump rubber!):



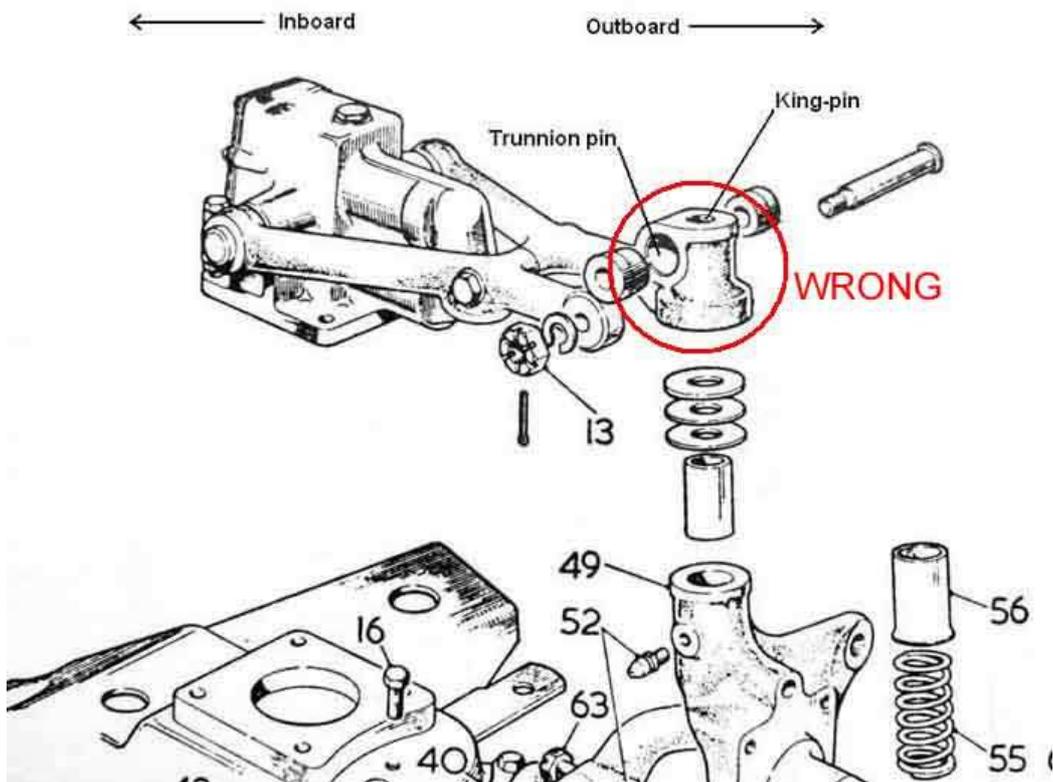
A plain nut and/or a spacer makes life easier when trial-fitting shims (not so much doing up and undoing) and protects the Nyloc (on my king-pins, not castellated) insert from wearing out:



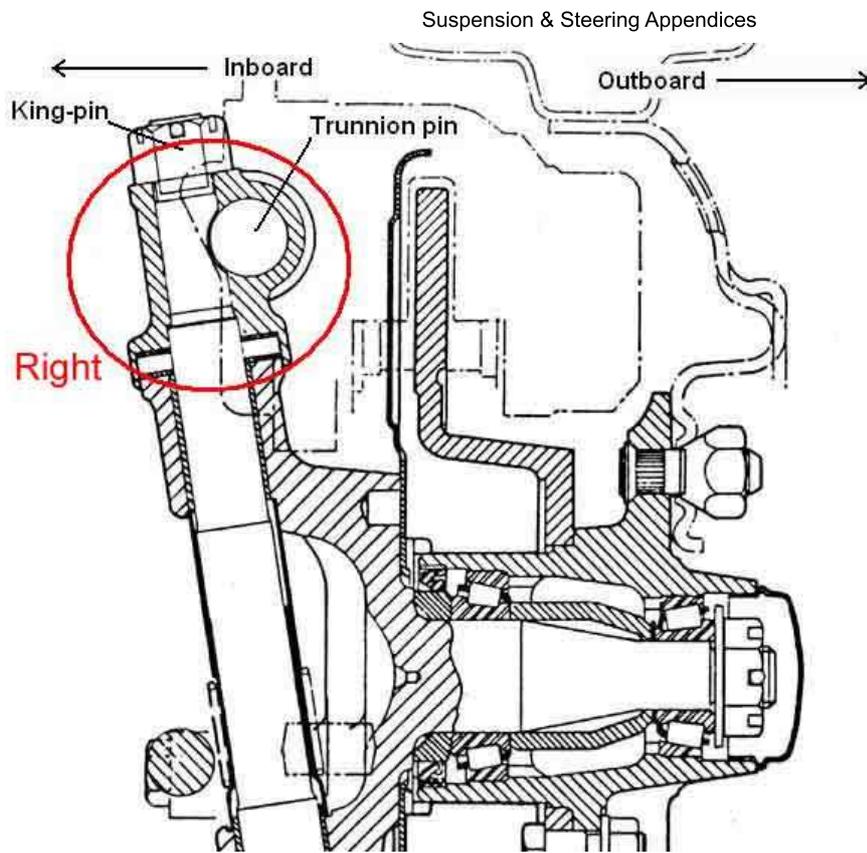
Nut and bolt squeezing the bushes into the trunnion, daub with Waxoyl. Note the king-pin hole is **inboard** of the bushes and pin ...



... the Leyland Parts Catalogue and Workshop Manual exploded drawings are incorrect (note this shows a top-fill damper but MGBs are side-fill) ...



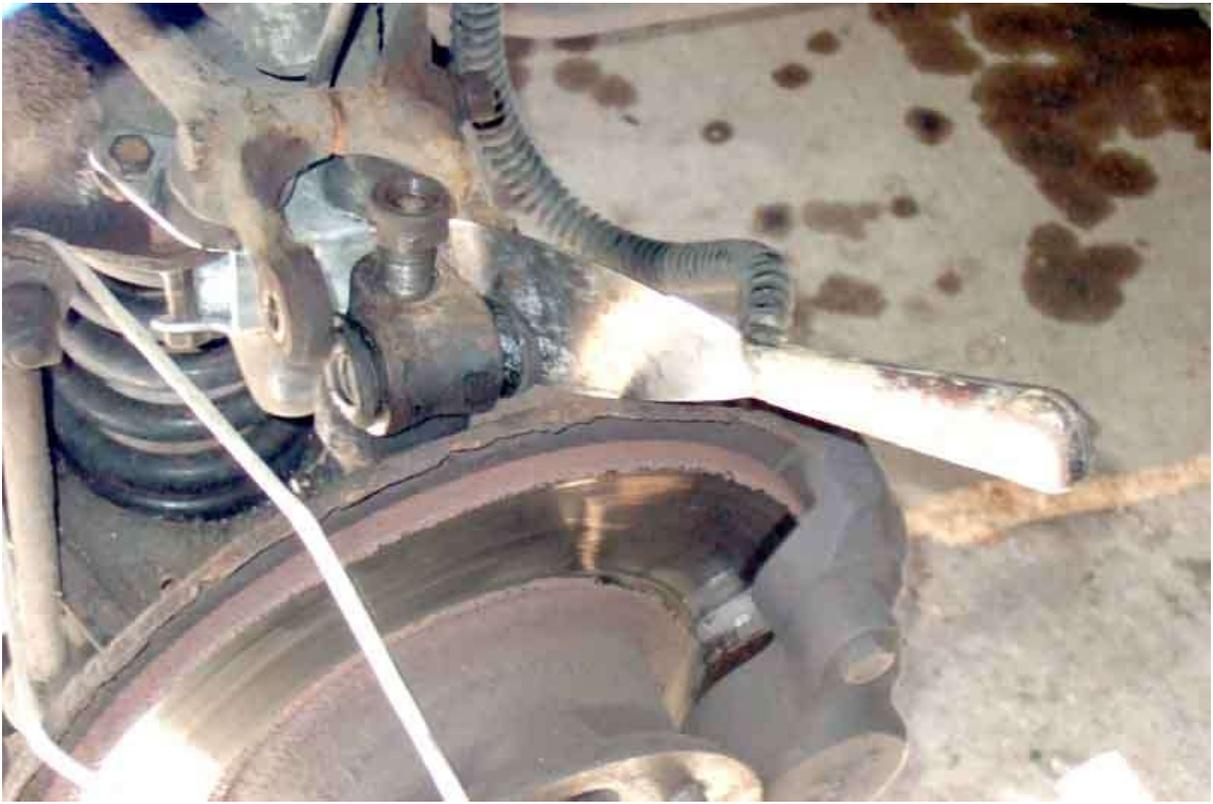
... however the Workshop Manual assembled drawing (mirror-image for comparison with the above drawing) is correct:



Damper cross-bolt slackened, arms wedged apart ...

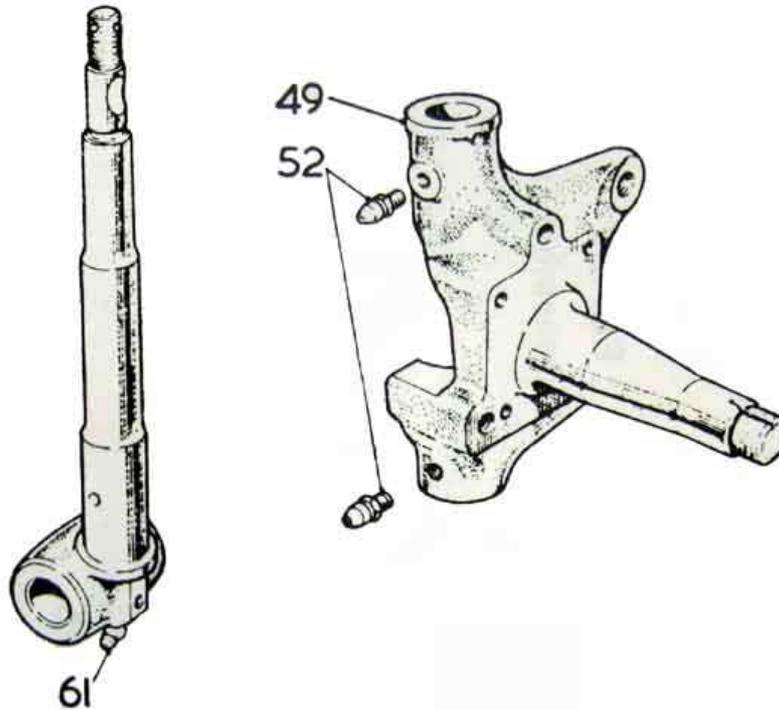


... and a paint scraper used as a guide to wedge the bushes between the arms. Again daub the faces of the bushes with Waxoyl, have the king-pin slack at this point so you can turn the trunnion a bit to get one face in, then push on the trunnion and the other face will slide along the paint scraper in to position:

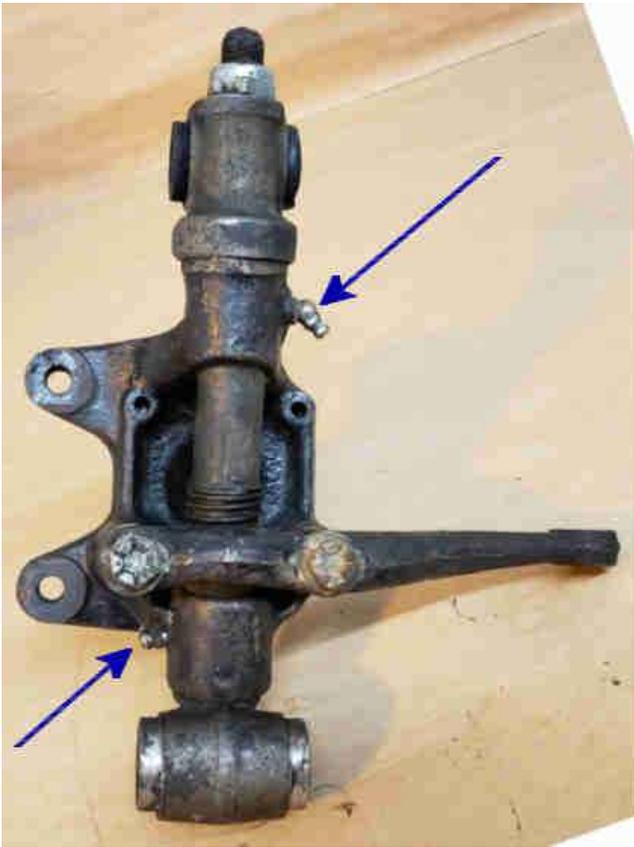


## Swivel Axle Lubrication

Two straight nipples (52) in the swivel axle (49), and an angled one (61) in the king-pin. Note that this depicts a left-hand axle (with the caliper brackets at the rear) but shows both nipples pointing forwards, whereas on the left-hand axle the lower nipple points backwards: (*Leyland Workshop Manual*)



Random images from the web. Left-hand axle on the left with the upper nipple (albeit angled instead of straight) facing forwards and lower facing backwards. Right-hand axle has both facing forwards, with the correct short nipple at the top (where a bulge in the casting brings it forward) and a longer nipple in the lower position:



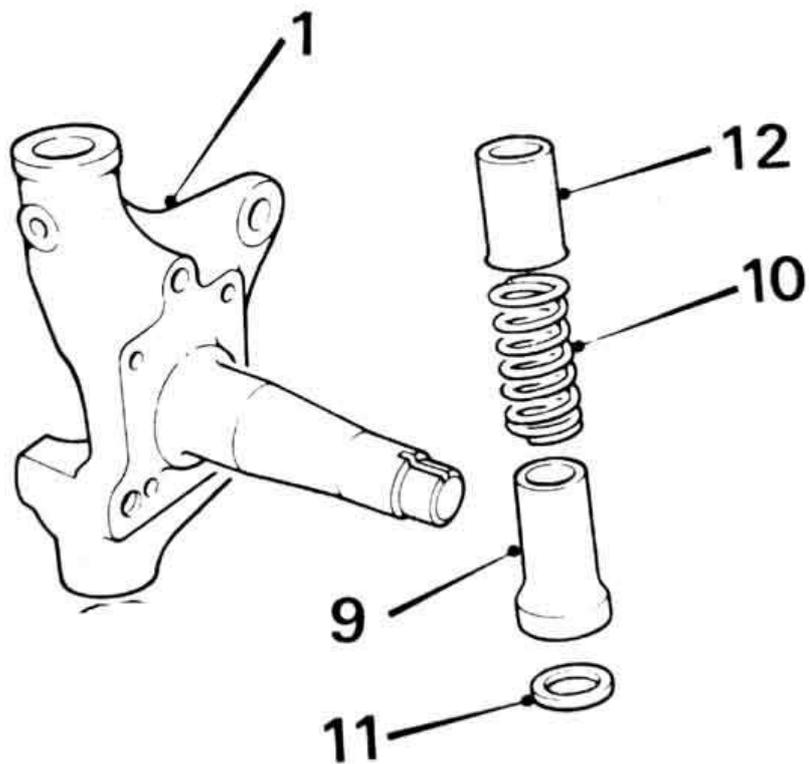
Rather than the two straight nipples being the same length as indicated in the top picture, the upper one is shorter as it screws into a bulge in the casting which gives clearance for the grease gun. The lower has no bulge so needs a longer nipple. Also shown is the two-part assembly of some angled nipples, although it appears that some might have the straight part pressed into the angled part rather than being screwed:



I have compared these and other angled ones and short of a microscope cannot see any difference in the thread shape, not even in the pitch. However most only have three threads exposed which makes that difficult, and indicates that for all practical purposes they are interchangeable, even if they **do** have different threads!



Between the upper and lower king-pin bushes there are two 'dust excluder' tubes - and upper (12) 1G4271 and a lower (9) 21B251, a spring (10) 2K8951, and two seals (11) 1G4217. The tubes and spring are available as a kit from some suppliers: (*Leyland Parts Catalogue*)



## Rear Axle Pedestals and U-bolts

Heavily corroded ...



... and collapsed. If it gets worse than this it could be the damper that limits axle travel:



U-bolts are removed and fitted like this:



I had to lever the flat part of the new pedestal away from the curved part before I could get the U-bolts in:

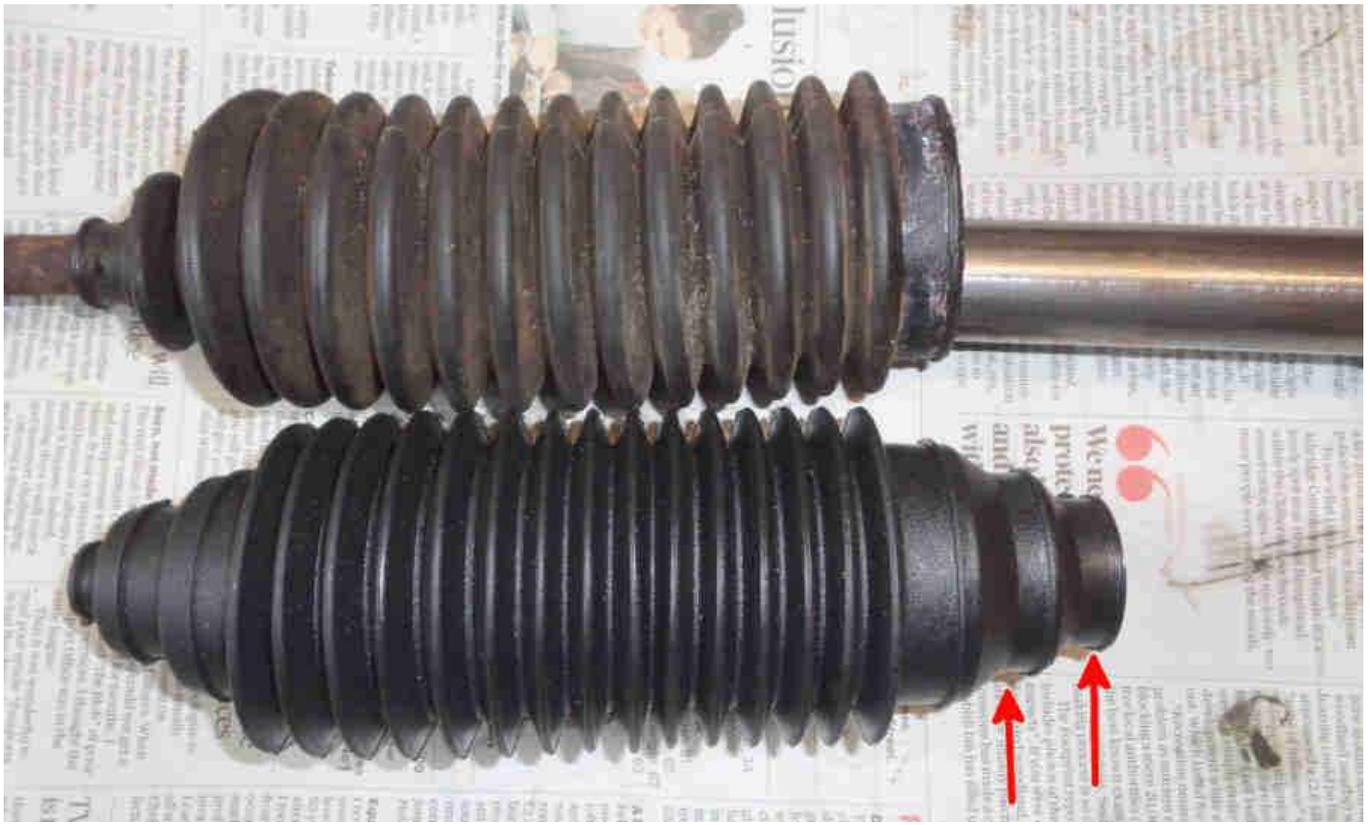


Not the latest in coffee-table chic, but the assembly ready for fitting to the axle:



# Rack Gaiters

Original top, 'universal' below:



The two smaller 'big' ends trimmed off:



## Steering Rack

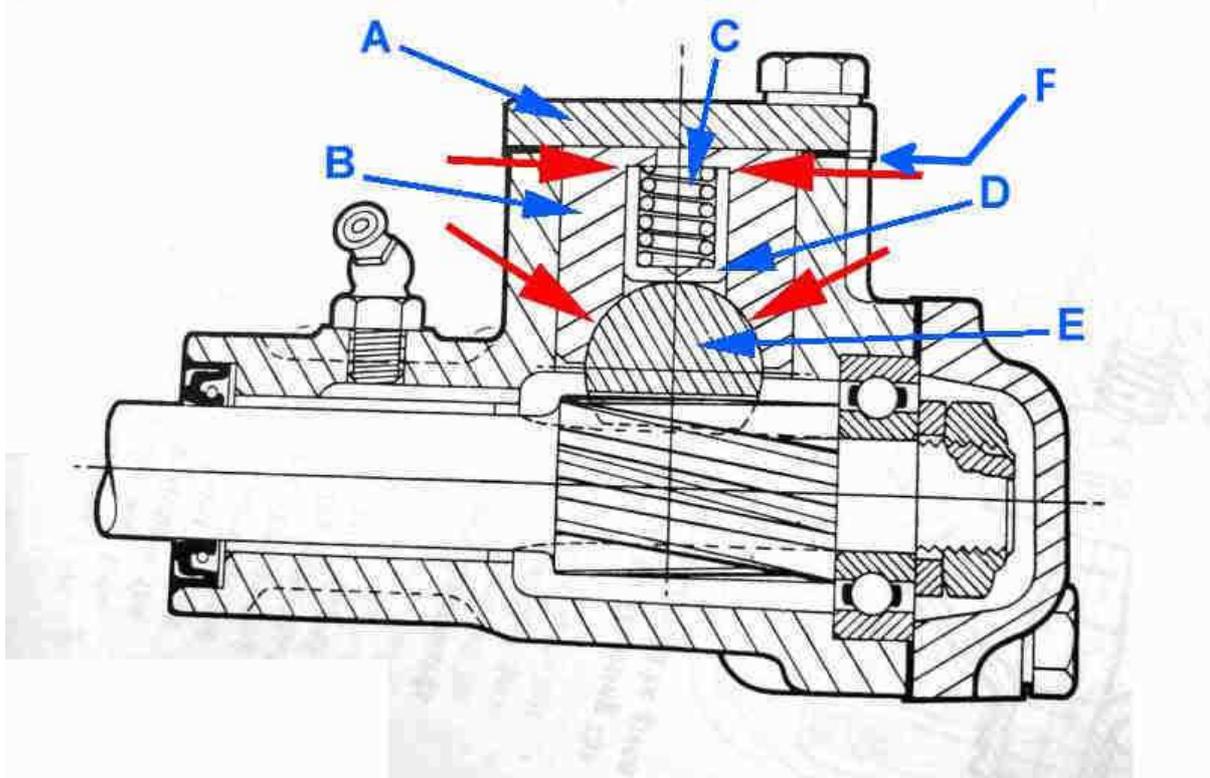
[Rack and pinion](#)

[Tie-rods](#)

[Bee's rack replacement](#)

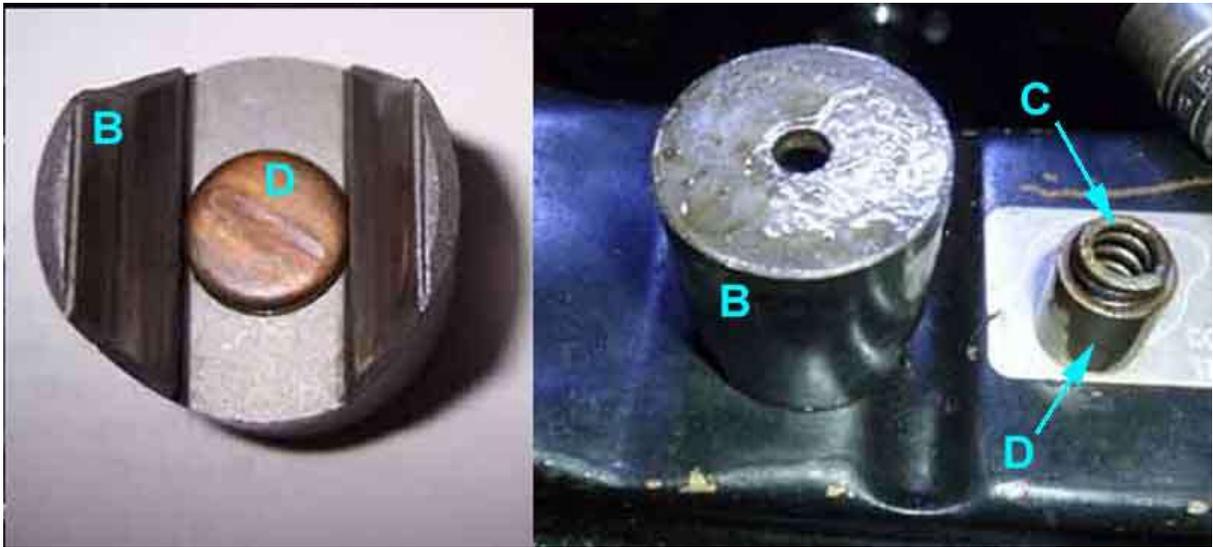
### Rack and pinion:

Drawing from Workshop Manual (the 'grease' nipple - actually for oil, was deleted). However the correct damping function requires small clearances at the red arrows. As shown is what happens when the cover is fitted without shims, and the rack starts to bind in the housing. The gap between cover and body F is then measured and shims of that measurement plus 0.5 to 3 thou fitted. The cover A presses on the yoke B, which is pressing on the spring C, which is pressing the damper D onto the rack E, leaving a total of 0.5 to 3 thou clearances at the indicated points. The shims and cover gasket fit round the yoke so that the greater the thickness the lesser the pressure of the yoke on the spring and damper and hence the rack:

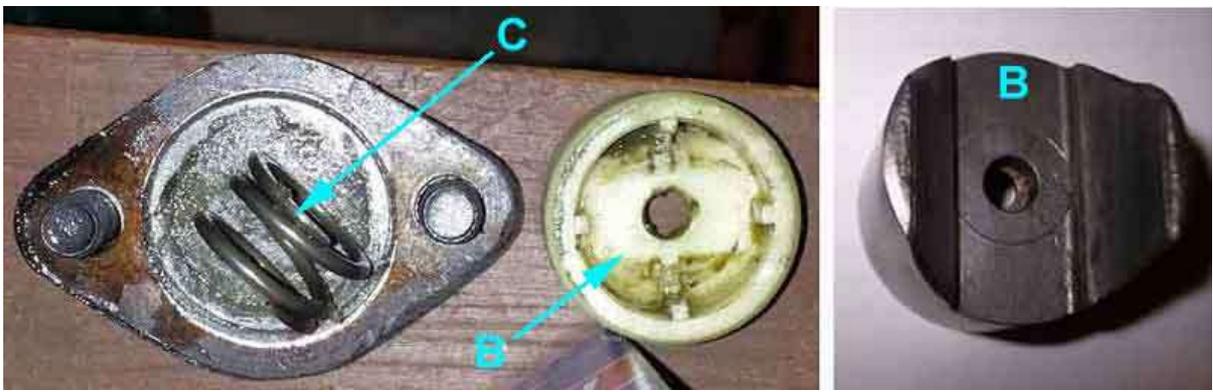


*September 2023:* However only the 5 thou shim seems to be available at the moment, the smaller 2.5 and 10 thou not, although multiples of 5 thou can be made up of course. Another possibility is that the damper pad can be worn, they are available (ACA5244, stocks vary) but the spring (17H6583) is NLA. I have seen a damper pad rotated by 90 degrees in the yoke to remove the wear and increase the pressure - and worn half-way again! It's also possible to shim the socket in the pad to increase the pressure.

The underside of the yoke (B) showing the damper (D) protruding (left), and the top of the yoke with the damper and spring (C) as would be fitted from underneath: (*Anon and John Pinna*)



First cost-reduction - nylon yoke (B) with a recess for the spring (C) in the top this time, and no separate damper (left). The underside of this type - in this case metal (right): (*Anon*)



Adjuster screw and locknut, appearing on new racks from sundry suppliers, in this case for the MGC: (*Moss Europe*)



On the left how they should be assembled i.e. with the spring in the yoke and the washer on top of the spring under the screw. In the centre the washer was under the spring and the screw had nothing to press against, resulting in a huge amount of play between rack pinion. On the right the underside of this yoke: (*Linton Husbands*)



November 2023: Discussing replacement racks with Roger Parker he mentioned that following problems with the first of these racks from South America they are now 're-calibrated' in the UK and are sold with a note to this effect. He went on to say that he hopes that this recalibration is more than just checking the components have been fitted in the correct order! After having advisories of 'inner joint wear' on Bee's original rack I replaced it with a reconditioned hoping to avoid problems such as this, but the reconditioned rack had the same advisories. I replaced that with another reconditioned from the same supplier, and that was exactly the same. I then investigated further and I'm now pretty sure that the problem was caused by pinion clearance, and not inner joints, and because of that in theory the continuous adjustment offered by the screw system would be preferable to the step changes with shimming.

#### Tie-rods:

Ball housing A presses the inner ball on the tie-rod against a sprung seat B. Lock-nut C is staked to both the ball housing and the rack at the indicated points to lock it in position. This drawing from the Workshop Manual should really show clearances at the red arrows, as drawn the joint is fully locked down i.e. the spring is fully compressed and the tie-rod wouldn't articulate: (*Workshop Manual*)

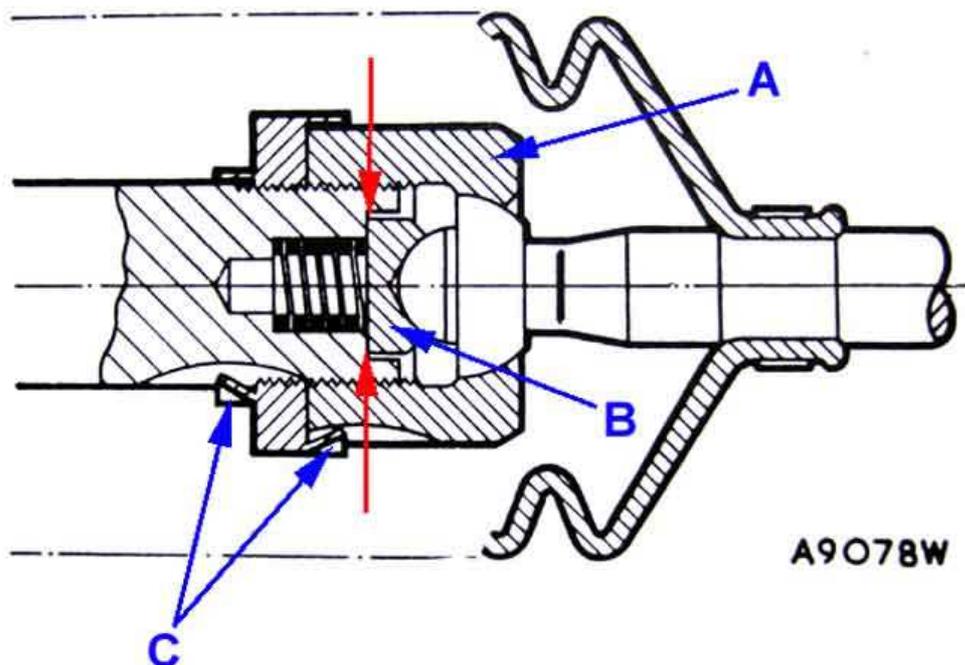


Fig. J.2  
The assembly of a tie-rod ball joint

Another difference with current replacement racks seems to be a 'sealed for life' ball-joint housing: (*JP Hall*)



However with perseverance JP discovered that the joint can be separated if you use big enough Stilson's! There is still the question of locking the joint against coming unscrewed, as well as adjustment to give the correct level or articulation of the track-rod:



The rack does appear to have a flat which the 'nut' could be flattened on to lock it in position, but it didn't seem to be, which is just well as drastic measures would be needed to remove it.

The reason for dismantling the joint was that there was no bush at the passenger side of the rack tube to support the rack shaft, and it flapped about all over the place! Starting inside the rack tube and working outwards there was a washer that wedged against a narrowing taper in the tube, then a gap, then a step in the tube against which a larger washer sat, then a groove against that with a circlip. So it looks like there should have been a bush of some kind between the two washers to support the rack shaft, but there wasn't. This was a replacement rack with the adjuster screw and locknut for the damper, [as above](#): (JPHall)



**Bee's rack replacement:** *January 2023*

About 90 mins saw the rack off and on the bench, track-rod ends removed. It was only when taking this picture I realised I had left the lock-nuts on!:



Can't move the TRE pins by hand so they can go back on.

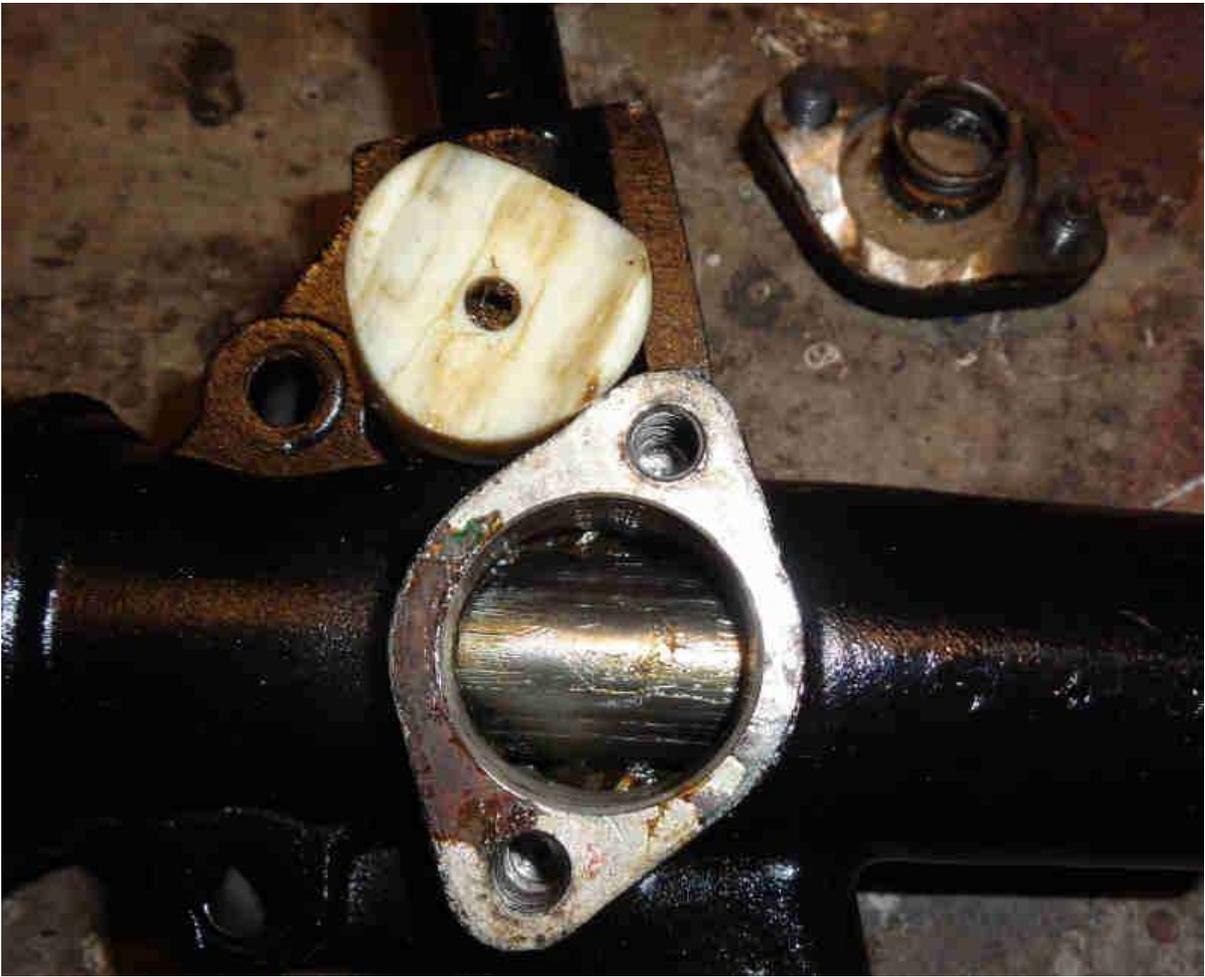
Collected the replacement and dropped off the old two days later, the irony is that it comes complete with TRE lock-nuts, so now I have a couple of spares:



TREs screwed on - added together the 21.5 and 20 turns needed to take them off and divided by two which should give an even number of turns to lock as well as hopefully close to the correct tracking. It'll be interesting to see how the steering wheel lines up when the car is travelling forwards, I might need to add a bit to one and remove a bit from the other if the wheel ends up between two splines although laser-based tracking adjustment should do that as a matter of course:



Nylon yoke instead of steel and copper-coloured damper so probably won't last as long, but clearance set by shims which is better than the adjuster that others have had problems with. Grease-lubricated so no more leaks. Bee's rack shaft was very easy to turn by hand and wheels up could be spun from lock to lock with a little finger-tip, probably a factor of the play in the passenger-side bush. This is stiffer even with the pinion cover slack so that is coming from the bush, I hope it's not stiff enough to prevent self-centring on the road. Speaking of 'lasting' I wonder how long the gaiters will last:



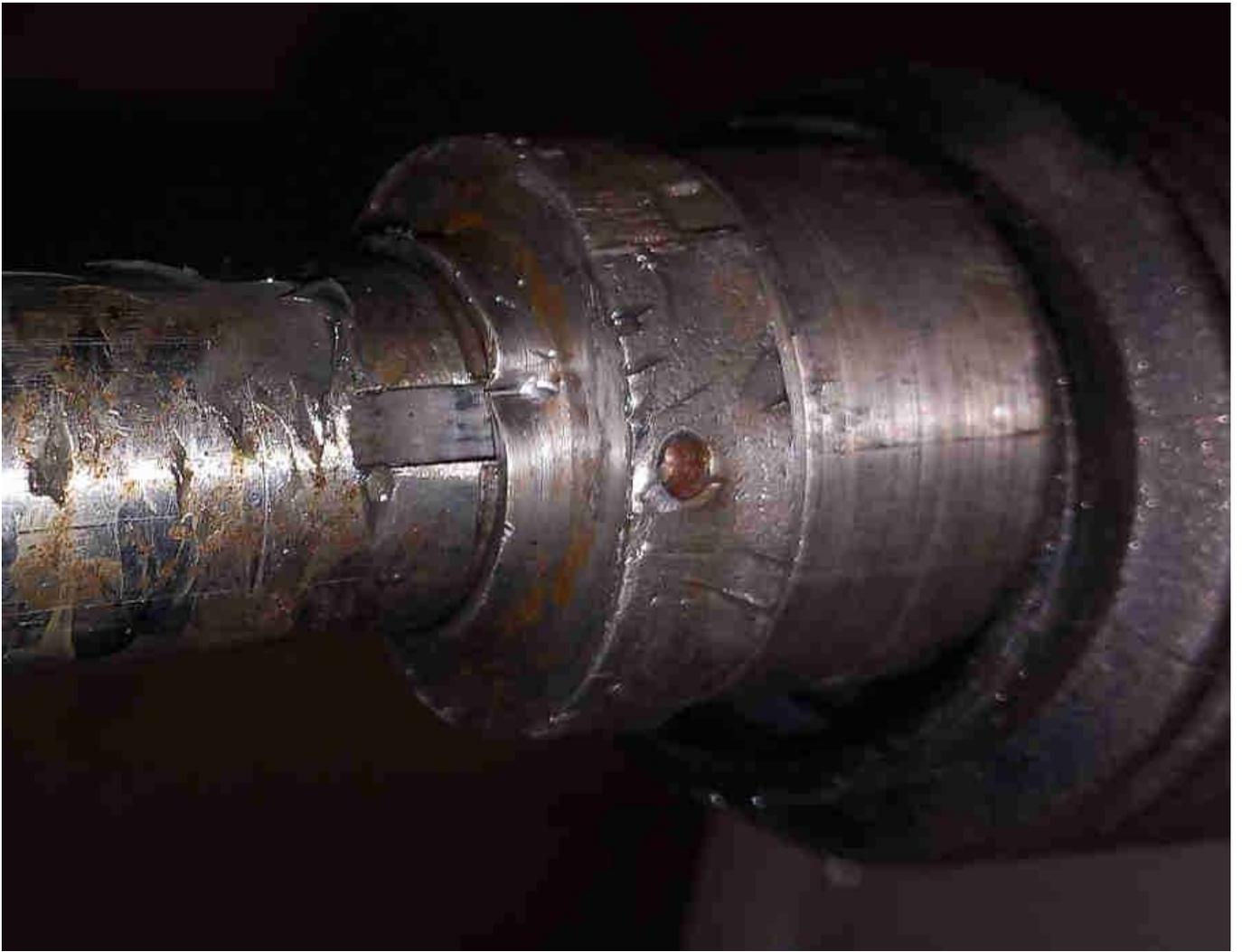
Never mind the gaiters, seven months and 1500 miles later this new rack gets an advisory 'both inner joints worn' i.e. exactly the same as before!

**Bee's 2nd replacement:** *October 2023*

After something of a saga I get that rack exchanged in October and start all over again. It's only with this rack that I notice the gaiter clamps are unusual - being a bit like CV boot clamps. However whereas CV clamps have the free end pushed through a sleeve then bent back and clamped under two pressed-down tabs, these just have a flimsy tab pressed down onto the free end as it exists the sleeve. The tab breaks of very easily when levered back - a 'security' device so the rebuilder can see if returns have been fiddled with?



Nevertheless as both inner joints have only about 1/3rd the articulation force I dive in to find them as per the WSM so can be adjusted. The original staking of the locking-ring to the rack ...



... and to the bearing cup. Well chewed so re-used which is not surprising as they are NLA:



Staking released and bearing tightened to closer to the specified force using grips and Stilson's ... using a bucket of water weighing 6lb positioned 7" from the joint, which equates to 42 pound inches i.e. mid-way between the WSM 32 to 52 pound inches:



Bearing cap with locking ring tightened just a few degrees and restaked:



The other side was the same, only took about 90 mins from start to finish, just gaiter ties to replace, leaving the small one slack pending tracking adjustment.

## Bee's Rack Replacement - a right saga ...

### [Replacement No.2!](#)

January 2023 Bee has had a clonk when rocking the steering back and fore gently at a standstill for a while, and a couple of MOT advisories of inner steering rack joints worn. Last year I had a good pull at the track-rods, and disconnected the track-rod ends from the steering arms to check they were OK and test the resistance to articulation of the rods (should be 32 to 52 pound **inches**). There was little or no effort for articulation on the driver's side and not much more on the passengers, and with the steering turned fully to the passenger side and grasping the rack through the gaiter and pulling up and down there was some play and knocking, so the passenger-side bush was worn at least. Given the complaints about 'new' racks I didn't fancy one, and a look round the suppliers a while ago showed not all had rebuilt, and those that did needed the old one back of course with double the P&P and hassle. Motaclan (Leacy as was) near me means just one trip and no P&P if I take the old one off first, but they only had new at the time. But checking again now showed (and confirmed by email) that they had the rebuilt exchange (but not the new as it happened) so one Saturday morning the old one came off.



Just seven bolts/nuts and nothing else removed to get at them saw it off in about 90 mins, and one scar on my left wrist :o). Lashing down with rain which was less than ideal as I would have rolled Vee out a bit to give me more room, but pushed forward a foot with the door ajar, and with Bee on the full-length ramps in the lowered position I had just enough space between the cars and underneath without jacking the front any higher. I'd slackened the track-rod end lock-nuts first as that is easier with the weight of the car holding the rack steady, and on the bench the driver's TRE came off after 21.5 turns, and the passenger after 20 turns, and removed the lock-nuts. I did that and labelled the TRE's (although they are identical) as that should allow me to get the tracking with the new rack close enough for fine adjustment with [my gauge](#), prior to taking it to an alignment place. Can't move the TRE pins by hand so these can go back on.



Two days later a pre-arranged trip to Motaclan to avoid double P&P. I had to make a special arrangement with them to collect Vee's screen during Covid and didn't notice a collection counter in their new place, which the old one had. Good job I phoned as they only do collection if you order and pay for it in advance, which can only be done over the phone as online is just for mail order. Must be unusual as the chap I spoke to didn't know what to do, saying I would have to pay the surcharge even though I said I'd be bringing the old with me, I said that's fine as long as you can process the refund there and then, at which point he had to put me on hold to find out what to do. In the end he only needed payment for the rack not the surcharge, but I then had to wait for a call-back when they had it ready. More messing about when the Mercedes sat-nav took me to Castle Vale, and I had to use my phone to get me from there to Erdington Industrial Estate which was a bit of a roundabout route. Any road up (as they say rather aptly) it was waiting for me. Did a quick check at the premises, no slip anywhere, track-rods resist articulation well enough. Stiffer to move but I can still do it with my hand round the shaft as well as push-pull a bit so it should be OK.



Fitted the old TREs 20.75 turns each i.e. the half the sum of what was needed to take them both off to get equal turns lock to lock. May have to tweak them from that to set the wheel straight when the car is going straight if it's not an exact number of splines out, but that should be part of commercial tracking adjustment.



Took the pinion cover off to see what lies inside - nylon yoke which I'm not surprised at, and evidence of grease so no more leaks.

Had to wait for a dry day to roll Vee out and give me more room to raise the front of Bee higher to get under the valance easier than before. Back on in a few minutes, didn't even take the wheels off. Wheels up hardly surprising that the steering is a little stiffer, but I can still move it from lock to lock with a finger-tip inside the rim. Squinting down the sides of the car it seemed to be toeing-in a bit so perhaps these track-rods are a bit shorter for some reason. With the front still up in the air and the wheels hanging down I used [my tracking gauge](#) and unscrewed each side about two turns before the front to back measurements were about the same with just a little toe-in. Then jacked it down and rolled it back and for comparing the same point on the tyres back and front and still just a little toe-in, so that will be good enough to drive to the local tracking place. This rack shaft has the UJ groove all the way round (unlike the [V8 which curiously is notched the same as the column shaft](#) so the two shafts can only go back together in one position) and the wheel ended up at about 1/4 turn out, should have set the steering lock as that is close to dead-ahead. Slackened the nut and [rocking the wheel](#) was enough to break it free of the taper, and refitted in about the right position. Went down the road to check the straight-ahead position and made a one spline adjustment, that should be centralised during the tracking as they clamp the wheel in the straight-ahead position then adjust each track-rod to get both wheels toe-in the right amount. Not completely self-centering hands-off but I'm only driving slowly down a short length of road, I'll know more on the drive to the tracking place, which needs another dry day. No more clonks when wagging the wheel slightly, which is good.

Because Bee has the intermediate collapsible column the inner is free to move up and down in the outer, which means when pulling the rack shaft out of the UJ it pulls the wheel towards the cowl, and the slip-ring on the back of the wheel pushes the horn brush back and can bend it out of position. With the rack back in I checked the horn and wasn't surprised it didn't work, but a few minutes to [remove the cowl and unscrew the brush](#) so that I could bend it back was all it took. Removing the wheel before you

start would probably avoid that, but wheel-off you would only have the indicator cancelling peg or cam (or steering lock) to align the column before fitting the UJ to the rack shaft. Easy enough to slide the later cam (1970 models on) round to the correct position but for the peg the correct position can only be achieved by moving the UJ round on the rack shaft.

Because of winter weather I couldn't get Bee to the tracking place until almost the end of February. Not as much rain as I'd have liked after salt two weeks ago so some traces between the wheel tracks in some areas. I'd been to Concourse Motor Co. a few times before for tyres, Vee's valuation and Bee's tracking once before after new track-rod ends (or so I thought) so expected them to hang the gubbins on the wheels and get straight on with it, but it took a bit of fiddling, apparently this was new kit. I did say 'MGB wire wheels with spinners' when booking but the equipment is flatter and won't go over the spinners, so the wheels have to be turned to the right angles to get them on, but once on it only took a few minutes. They said it had been 'near as dammit' Checking back previous notes I discovered that the first two places - this probably being one of them, couldn't get the gauges on and it was only a third even further away that had screwed adjusters on the gauges that held them away from the spinners.

That all done and an opportunity on a lovely afternoon to go for a drive as part of the trip. I've always said that driving Bee it was like I only had to think about small departures from a straight line and she would make them. Now the steering - perhaps not surprisingly - is stiffer and although it self-centres it's not right back to the middle like it was before, that last bit needs to be a deliberate action, as is any departure from a straight line. So not as much as a delight to drive as previously, hopefully it will loosen up over time.

Took another couple of weeks before the roads were good enough for a second run with the new rack. I'm getting used to the lack of the last little bit of self-centering about the straight-ahead position, what was more noticeable this time is the effect when straightening up from a sharper turn as at a T-junction. Driving both cars back-to-back Vee needs quite a bit of restraint to a strong self-centering action, Bee used to be the same but when I apply the same restraint as I always have done to the weaker self-centering it carries on turning for longer than needed and I've had to turn back a bit. Hopefully I'll adapt to that, also hopefully the rack will get freer.

But then suddenly woke up one morning realising [I'd not checked the alignment of the new rack to the column](#), for the UJ! Caused by having removed both racks more than once - Vee's several times, and of course simply replacing them didn't need realigning as I hadn't changed anything. Fortunately hardly any miles driven, but the alignment took longer than either removing the old or fitting the new! A decent drive on a subsequent sunny day and for whatever reason (alignment correct, bedding-in, getting used to it) less conscious effort needed to fully straighten up. As the months go by I find I'm not aware of any stiffness at all.

## Replacement No.2: August 2023

### [Installation](#)

After just seven months and 1500 miles I get exactly the same advisory at the MOT - both inner joints worn! Surely the tester can't just have copied the previous one? So this week under the car, disconnect the TREs from the steering arms and they flop down - admittedly with the TREs still attached. Only if I push them up and release them carefully will they stay up, and at the slightest touch they flop down again. The force needed to articulate the arms is supposed to be 32 to 52 pound INCHES, and with track rods about 8" long and a typical TRE at just over half a pound the inner joints are obviously 'loose'. When I collected the rack I checked them and they did need some force but I didn't measure it. Shaking the off-side one as hard as I can I can hear some movement, but at least the passenger-side bush isn't worn like the old rack was.

Contact Motaclan who ask for a copy of the invoice (!), duly sent, and I get the following response:

"The steering rack has a full 12 months warranty on it from the date of sale so its still fully covered. If you can return it to us we can send it off to the reconditioners' who will check it over.

"If it's out of spec we will replace it for you. If it's still within specification we will return the unit to you."

So that's going to take a while with the car out of action. If they replace it I'll have to go through the tortuous alignment process again, and before taking it away I'll be testing the articulation force with my spring-balance! If the rebuilder claims it is in spec it will be for nothing, although I should be able to tighten the inner joints up, at least with this one I don't have to replace the passenger-side bush which I did many years ago on a Mini and that was a right pain with the very fine threads. I think I'll leave it through September, then take it off while I still have three months warranty. I may even buy a used one, collecting it so I can check it first, and use that while mine is away.

One about an hour away at £40 so a bit of a trek, one closer but they wanted £120 which was a lot more than the rebuilt exchange. Back to the first one but it had gone. Found another at Andy Jennings for £45 so order that, price includes postage which is a surprise for something that big, what state it will be in is anyone's guess but I will have the opportunity to work on it if needs be. Delivery expected Friday to Monday but no show. Wednesday asked for tracking info and they said they had forgotten to despatch it so would next day. But we were going to be away Friday and Saturday so emailed asking them to hold it until the Friday so it would be delivered the following week. Then get an email on the Monday saying yes they would do that i.e. delay it until the following Friday because they hadn't read the email I sent on Wednesday until the following Monday! Hopefully on it's way now ...

Arrived a couple of days later amusingly in a long thin package and not a triangular one - they had removed the pinion shaft but only a few minutes to put back. Inner joints tighter than the 'newly rebuilt' rack! Gaiters ripped but no big deal. A bit of a struggle to get the TREs off (to fit new gaiters), one side not too bad but the other needed a short length of scaffold pole on the Stilson's to break the TRE free, then angle-grinder through most of one flat of the lock-nut, then hacksaw to the tops of the tie-rod threads, then chiselled round which split the nut and off that came. I packed the pinion bearing, rack and pinion teeth and passenger-side bush with grease to save messing with oil.

It's now September, [new gaiters purchased and are of a 'universal' type](#) for multiple rack casing diameters and two narrower sections at the 'big' end have to be trimmed off.

'Old' rack comes off in not much more than half an hour, after having checked the distance between the two tyres with my tracking gauge - helpfully with a white line (relatively new tyres) down the middle of the centre groove which makes it very precise - at 1272mm. On my lowered full-length ramp I can crack the tapers on the TREs and remove the rack with the car still sitting on its wheels. I also measure the distance between the lock-nut end of each TRE and the rack fixing hole centres (297mm R 293L) so I can get these TREs onto the temp rack at about the right tracking, and to give equal steering between the two sides. I also counted the turns to remove at 19 both sides. With one new and one original lock-nut on the temp rack track rods I screw the TREs on to give the same number of turn and nip up the lock-nuts - ready to fit.

Fitting this rack I decide to attempt to get the steering lock to engage with the steering in the straight-ahead position. Neither have ever done that, and I don't even know if they did from the factory! Not really possible on the V8 as for some reason both steering column and rack shaft only have notches for the UJ bolts so the two shafts can only go together in one relative orientation. But the roadster rack shaft has a groove all round so it should be possible - emphasis on 'should'! The mistake I made was doing that first before anything else, and trying to get the rack central i.e. the same number of turns left as right at the same time as turning the column shaft to the locking position before attaching the TREs to the steering arm proved impossible. Running short of time I abandoned that (although in the end I found it was only one spline out) and concentrated on the tracking getting the white lines in the central groove of the tyres (which hadn't been turned on the stub-axles) to the same dimension as before. Then looked at UJ alignment without using the gauges, slotted the rack shaft into the UJ and there seemed to be the about the same gap between the rear bolt position on the rack and the bracket on the passenger side which seemed a good start so used the same spacer there. It's impossible to see or measure the rear bolt gap on the driver's side as everything is in the way, all I could do was insert a feeler gauge from the front alongside the front bolt and hopefully under the rear bolt hole, then nip up the other three bolts. A 4 thou gauge was pinched but a 3 thou wasn't whereas the previous spacer was 62 thou so I thought I'd get away without one that side, but I'm not so sure. I don't expect to be doing many miles on this rack and when fitting the proper rack will pay more attention then. Now waiting on a response from Motaclan after emailing them to say I was ready to bring it back, with a scan of the WSM describing the articulation force there should be.

No response after three days so phoned and spoke to the person who replied to my email to be told "no one here or at the rebuilders could understand the information regarding articulation"! If the rebuilder can't then it's hardly surprising they are not to spec and it's likely to come back just the same. He said I could send or take it back and they would give me a refund. But hang on a minute, this was an exchange rack as I explained in the email and it's on the invoice, so that would leave me without either the old or the new rack! I pointed out that his email said they would send it back to the rebuilder and either be replaced if out of spec or returned if not, and he said "Oh yes we can do that then". So drive over and eventually get to speak to someone who seems to know what he is talking about, and says the comment about not understanding the spec info was probably just wires crossed, had the rack off me, noted it as received on the original invoice which I have kept of course, said he would email the rebuilders straight away and I would probably hear something at the end of next week (this being Friday). We shall see.

Three days beyond the 'end of next week' heard nothing so phoned. "The repairer was away for the first few days and I didn't follow it up after that". Latest is they will chase them then call me back.

Two days later - nothing and it's now October. Phone again to be told he is "with someone ..." and will call me back. Eventually he did and said as they have not had any response from the rebuilder they will give me another one from stock - "and make sure it has tight joints"! Fair enough, but this was immediately before we were away for a week so I would have to wait until the following week to pick it up. But then he's on holiday himself that week from the Tuesday, and we don't get back until early evening on the Monday after travelling all day! But he says he will leave it with someone else so I can collect it in his absence. Busy all day Tuesday, plan to go Weds afternoon so ring in the morning ... to be told "no one here knows anything about it"! Says he will investigate further and call me back in about half an hour ...

No call so next day I write a polite but firm email outlining the saga and asking when it will be sorted out. Almost by return I get a response from one of the more senior members saying he couldn't find out who I had spoken to (which as happened before) but saying They will give me another from stock if I let them know a date and approximate time. Wasn't going to leave it any longer so arranged to go straight away, it was waiting for me, the email chap came down and apologised for the confusion and said they would start another 12 month warranty again from that day. Back home I emailed thanking him for sorting out, and extending the warranty. I can't see much point in taking it back again if the same problem occurs, but if anything else should happen that will take me past the next MOT. Unless they email back denying the extended warranty as far as I'm concerned they are deemed to have accepted it.

### **Installation:** *October 2023*

## Aftermath

First thing I noticed on collection is that the tube seems to have been squashed slightly between the two mounting brackets. But it moves as well as the others have done (none of them are 'silent' when the shaft is spun by pushing and pulling a steering arm) so I'll accept it and hope it fits the cross-member brackets - otherwise it will go straight back!



The second thing is that the gaiter clamps, both large and small, are of a type I've not seen before - neither the original screwed clamp nor the ubiquitous zip-tie, but something a bit like some types of CV boot clamp. It is a plain band but instead of the end being pulled through a sleeve then bent back and held down under two flaps, the sleeve contains a small ball-bearing in an angled slot which allows the free end to be inserted but will jam if trying to pull it back. When in position a special tool apparently pulls on the free end to tighten it, compresses the sleeve to press the ball bearing into the 'free' end, and chops off the excess, all in one go. Leaves very sharp edges sticking out of the sleeve. Maybe a 'security' feature so the rebuilder can check if it has been interfered with on a return? But I can't find anything online that looks like it. Nevertheless I will have to remove at least one of the small ones as it's impossible to turn the steering arm (for tracking adjustment) without winding up the gaiter.

Annoyingly I can't find my spring-balance so filled a bottle with water and hung that at various points along the steering arms. One arm moved at 5" and the other at 7", but with the bottle weight at 2.34 lb that represents 11 and 16 pound inches, which is way below the WSM spec of 32-52 pound inches! As I have to remove at least one of the small gaiter clamps I might as well remove a large ones and see if the joints are as shown in the WSM with a view to tightening them up.



Gaiters removed both locking rings have obviously been reused - not surprising as MGB ones 17H6574 are NLA, 17H8715 that several suppliers list for the MGB are actually for the MGC and are apparently a smaller diameter. The gaiters are also different but in that case MGB ones GSV1155 are available.



Aiming for the WSM spec of 32 to 52 pound inches (median 42) for articulation I calculate that 6lb at 7" along the arm (they are about 7.25" long) equates to the median and using a bucket of water tighten them to that, which is only a few degrees tighter than they were.

However that was measured with the steering arms pointing straight out from the rack, they don't move far from that when on the car, but when I move them sideways and vertically through their full range of movement they are only that tight around the in-line position, getting looser elsewhere. That seems odd, with wear one might expect them to tighten up when moved out of the normal arc when installed not slacken.

It then struck me that Vee - tested at the same garage - doesn't get the same advisory. So disconnect one of the track-rod ends from the steering arm ... and find it is about as floppy as the returned rebuilt unit, only just staying up with the weight of the TRE! That gets me thinking that what the MOTer has been finding on Bee is nothing to do with articulation force but from some other factor.



In which case maybe as tight as I have put them may cause variable self-centering on the road which would be unpleasant, so I back the bearing cups off the merest fraction until the resistance is about the same over the full angular range, and stake them down there. As mentioned above the WSM quotes 32 to 52 pound inches, but in [this old John Twist video](#) they are barely tighter than floppy, and can be rotated by hand seemingly easily (although both depend on John's arms and fingers ...), no mention of a particular force. I've not found any other comments on the WSM force, either for or against. [These people](#) are offering a sealed inner joint replacement, pre-set that just screws on to the end of the rack shaft and is staked down, I'm trying to get from them what force they use.

Saturday afternoon turned out to be dry after Storm Babet so time to roll Vee forwards far enough to get at the rack as I did before, and go through the saga of aligning all over again. Temporary rack off, and the UJ from the column shaft, and the new rack fitted minus TREs at this point (in case there is a major problem mounting the rack). First thing was to check the rack mounts were square to the cross-member-brackets, bolting down the rear driver's side first as that is the hardest to get shims on, then its front bolt just nipped up which didn't leave any clearance, then the two on the passenger side also just nipped up and all four were clearance free. Tightened up for alignment I fitted the alignment gauges - on the CB the column shaft can be slid up far enough to fit both with column and rack in position whereas on RB either the column or the rack has to be upbolted. Just a little up and down and side to side misalignment, no more than a couple of mm in each case. Vertical done first by slackening both toe-board and dashboard ends - former pulled down and latter pushed up and nipped up and rechecked - needed a couple of iterations to get it right when fully tightened. Then the heater shelf bolts slackened to the toe-board bracket can be slid horizontally - I say slid but it needed a bit of "encouragement" with a mallet and drift, and spot on in both vertical and horizontal directions. Probably about an hour and a half.

Gauges removed and rack unbolted to fit the UJ - the rack splines had been painted so that had to be cleaned off with a wire brush in a drill and greased before the UJ would go on. TREs swapped over from the temp rack at this point - about 20 turns on one and 18 on the other so I put them both on 19 on the new rack. With the rack centred by eye I refitted it loosely with just the front bolts dropped in, and the TREs nipped up to the steering arms. The car had been on its wheels until now so

jacked it up, axle stands under the inner end of the A-arms, so I could check the number of turns of the wheel lock to lock and get both sides the same which should be just under one and a half turns each side for the CB rack, slightly more for the later RB rack. I also wanted the steering lock to engage in the straight-ahead position so with the column locked fitted the wheel with the steering wheel 'straight' then unlocked could turn side to side. Close, but more than one and a half turns to one side, so then it was an iterative process of taking the pins out of the rack brackets, sliding the rack shaft out of the UJ and turning it one or more splines in the appropriate direction and reinserting, and trying again until they are just about equal. All bolts tightened and checked, leaving the tracking until another day but it's not far out as on both the original and the temp racks the TREs were screwed on about 20 turns. This section took longer than the basic removal, fitting and UJ alignment, the whole thing being about 3 1/2 hours.

Next morning dry enough for a drive round the block (but a Sunday so a work-free zone ...) to check the feel before going any further, and I'm immediately struck by how much smoother this rack feels. Can't remember that between the original and the first replacement but the most noticeable thing with that was the initial lack of final self-centering, which is barely noticeable with this one and only when I'm specifically looking for it. Maybe I've just got used to it. As far as the smoothness goes maybe the MOTer was picking up some other issue in the first replacement (and the original) which isn't present on this one. Steering wheel nicely centered but the indicator cancelling cam needs sliding round a bit.

Monday afternoon dry so do the tracking with my gauge - both screwed in by about two turns. Next steps are to get it double-checked at a local place who have done it before, and see if I can get it into my MOTer for them to check just the rack which hopefully will only take five minutes and they can do it at short notice.

But before that I made some enquiries about just how they detect worn inner joints, and received some worrying information. Apparently my MOT station uses 'single person' testing where instead of a second person levering wheels, operating brakes, steering etc, the MOT ramp has shaker plates that pull, push and turn the wheels to put all the joints under stress with the single operator under the car looking for movement where there shouldn't be. Beloved of stations who don't like paying a second tester to sit in the car listening to the radio, David Birkby who is an MOT station inspector says he won't let his station use them on his Midget as it 'puts 50 years of wear' on the car, and [after seeing this video I can understand why!](#) If ever there was a reason to stop having MOTs this is it. I'll be talking to mine to see if they will do the test without using the shakers, and if not will have to look for another one that doesn't use them.

**Aftermath:** *November 2023* Back to the MOT station and it's still doing it - without using shaker-plates. I asked about not using shaker-plates in future and the boss was very hesitant saying that's how the Government want it done and if anything should happen as a result of not picking up a defect it would be his head on the chopping-block. A bit OTT because as far as I'm aware it's not compulsory for an MOT station to have shaker-plates installed. Anyway. They show me that with the wheels off the ramp shaking the wheel back and fore grasping it at 3 o'clock and 9 o'clock there is a very definite clonk and movement, and if you pull the steering arm towards you it stops, which tells them it is the inner joint, driver's side worse than the passenger's. Back home I can't hear it with the wheels on the ground, but up on axle stands I can, so at least I have something to aim at. I've ordered and received a column UJ so will fit that next (it needs replacing anyway) and see how that compares.

Replaced the UJ - what a pain to get the circlips out which seemed too big for the holes in the yokes, and to get the cups out. Barely moved hammering on the shoulders, had to press them out as far as I could using two sockets in a vice, which exposed about 3mm, then grip that in the vice and twist and pull to get them out the rest of the way. Got the new ones in using two sockets and the vice again, the new circlips went in a bit too easily and have rather a lot of lateral play. Next time (I'm sure there will be a next time ...) I'll be replacing the whole thing with a one-piece like the RB items which are now the standard item for the CB. And after all that the play was still the same.

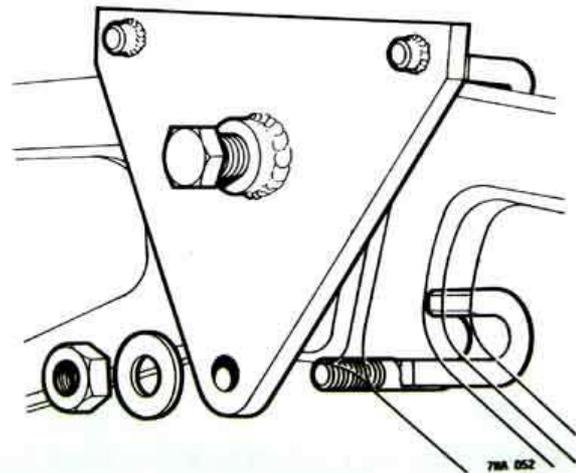
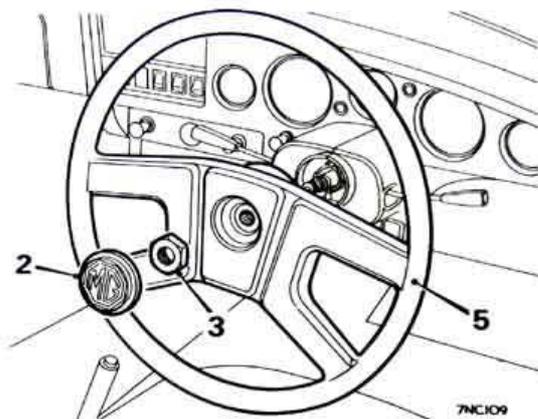
So next was the pinion shimming, took one out and tightened the cover bolts to make it bind - and no play! I had a spare shim thinner than the thinnest so substituted it, but tightened down that made the steering a bit stiff (but no play) so the original had to go back, But I noticed it had traces of old gasket on it - not needed now it is grease-filled and not oil, scraped that off, then bolted down that just removed the play without making it stiff. The MOT place said the passenger side wasn't as bad as the driver's, but I'm wondering if it was the same cause but by being at the other end of the rack sounded different. We shall see at the next MOT, but that's a long way away.

## Steering Wheel Removal

You can use a two-leg puller on the slotted wheel (1973 models up to July 73), maybe on the previous wheel with the 'finger-trapping' holes if the inner hole is big enough, less likely if at all on earlier and later wheels. But even though this wheel has been off several times I was surprised how many turns of the bolt were needed to crack the taper.



For the 77 and later wheel the Leyland Workshop Manual shows a puller comprising a triangular plate with three broad hooks that curl round behind the central part of the wheel about an inch or more. The 'hooks' on generic pullers are usually much shallower and would only pull on the edges of the wheel, maybe ripping the plastic covering off.



Swapping the mid-era wheel like-for-like you can simply undo the six bolts under the horn-push (*Ray Longsheds*)



Some buckling, possibly due to the push-pull method of removal in the past ([Ray Longsheds](#))



What lies under the foam/faux-leather covering ([DIY Wood Steering Wheel](#))



## Refurbishing a steering wheel for Vee

As received. Scruffy, but an undamaged rim ...



... although wire-brushing marks on the spokes ...





... and rust on the back



Hub needs repainting. Rubbing with wire wool dipped in cellulose thinners got all the old paint off and left a smooth surface. Hammerite special metals primer as the first coat, then two coats of Hammerite smoothrite satin black.



Horn push pretty-well perfect



Dismantled ready for refurb



One spoke polished up



Horn button dismantled ...



... and the brass and copper contacts cleaned up



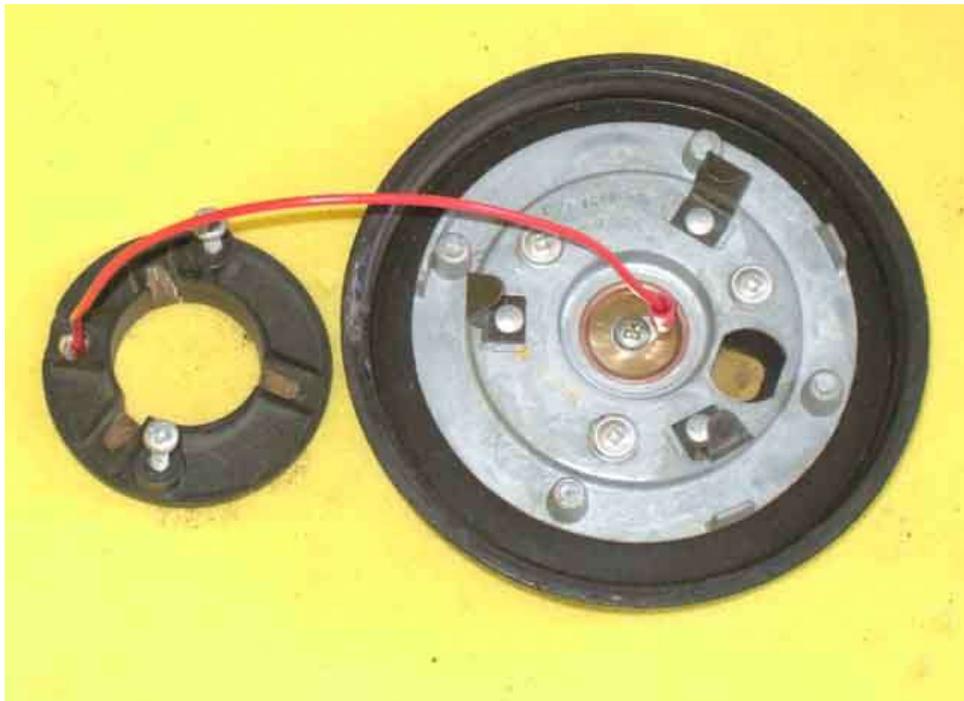
Slip-ring dismantled ...



... the wire replacing the pencil soldered on ...



... and attached to the horn push. This will need removing from the horn push to be fitted through the hole in the hub. Make sure the tag or whatever you use fits through the hole. You could use a bullet connector in the wire, or a spade connector screwed to the back of the horn button, but how often are you going to be removing it? Make sure that whatever you use on the back of the horn push clears the copper ring on the alloy base of the push, or the horn will sound continuously ...



Fitted, and at long last I can see the supplementary gauges with a glance instead of having to peer round the rim, as well as having lighter steering. Gold-highlighted logo as befits a 1975 build.



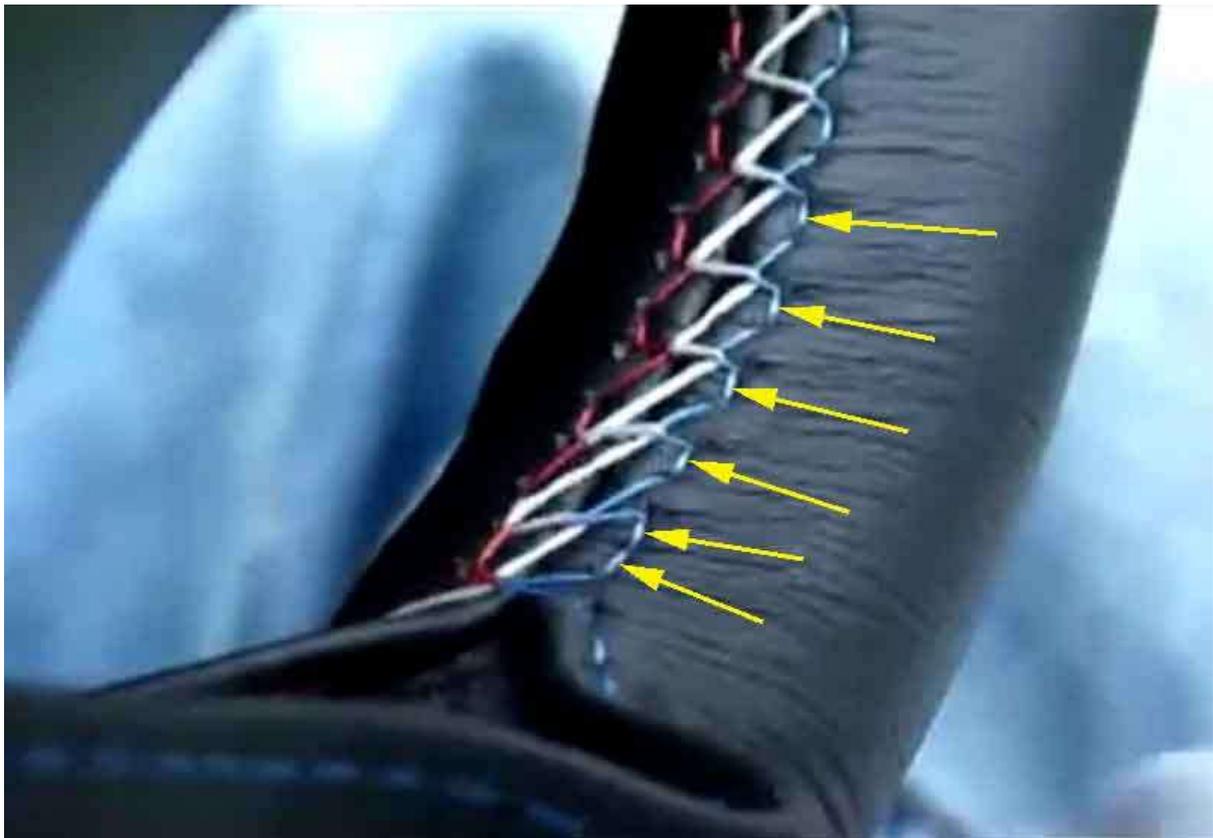
Bee's wheel - 'simulated' leather according to Clausager, difficult to say whether it's really stitched as leather would be, or if that is simulated as well:



Someone has repeatedly claimed that the V8 had a stitched leather cover as well and is 'well worth searching for', but both Clausager and the Leyland Parts Catalogue show that both the V8 (in Jan 73) and 4-cylinder cars (Jun 73) got the same wheel with the solid spokes part number BHH1307. No other wheel is given for the V8, so any V8s built before Jan 73 probably had the slotted spokes. Claimed V8 special wheel on the left, Bee's on the right, the only evidence offered that the V8 is different is the 'ruffling' just to the left of the spoke on the left. Original brochures covering both V8 and 4-cylinder list the 'V8 only' items but no mention of a steering wheel, so probably duff gen.



A still from the [Mr Steering instructional video](#) showing how the stitching was getting more and more out of line, until he skipped two stitches on the right-hand edge instead of one:



A pleasing 'cross-hatched' stitch pattern, with the edges of the cover pulled together and no gap. Possibly the outer circumference could have been a little smaller, but all I can do is measure the wheel, after that it's up to the supplier. Textured surface whereas the video shows smooth, which I would have preferred:



The top of Bee's wheel that gets all the sun is quite ratty, although given the manufacturer would never have intended it to have been used for 50 years it's pretty remarkable:



The underside - just light scuffing:

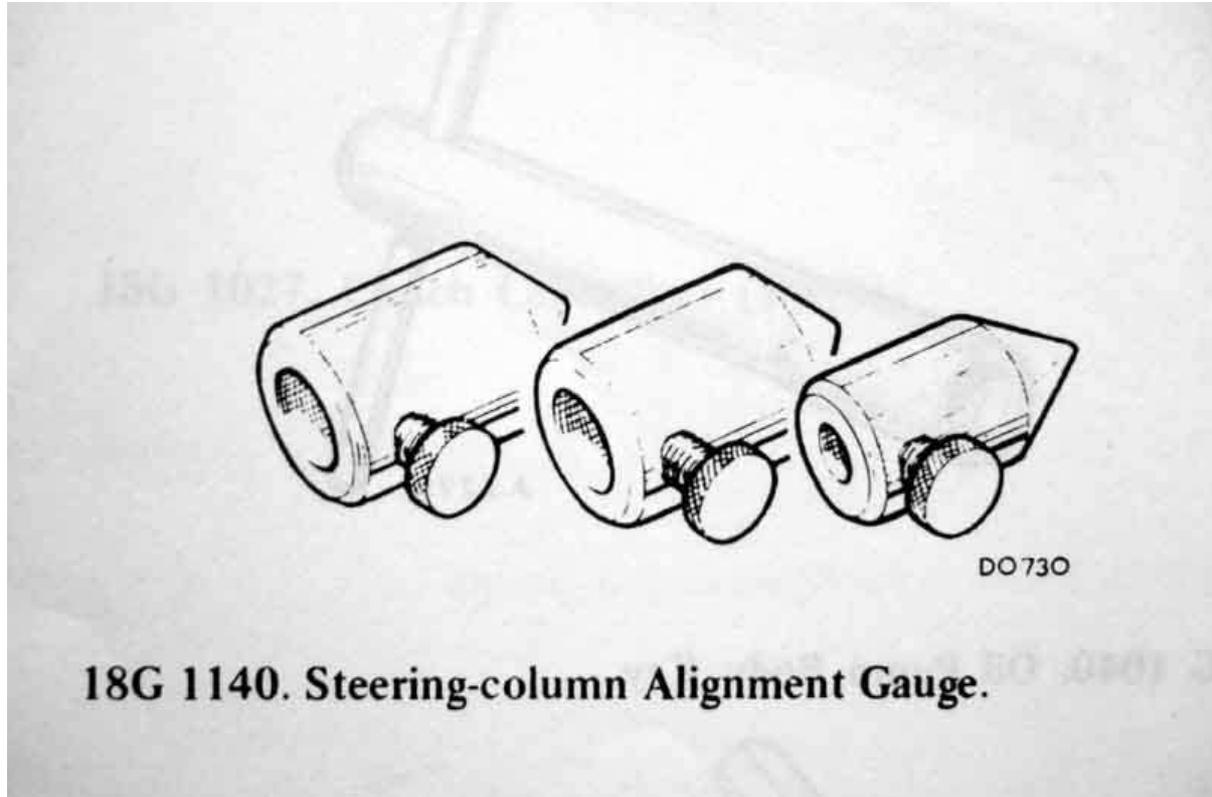




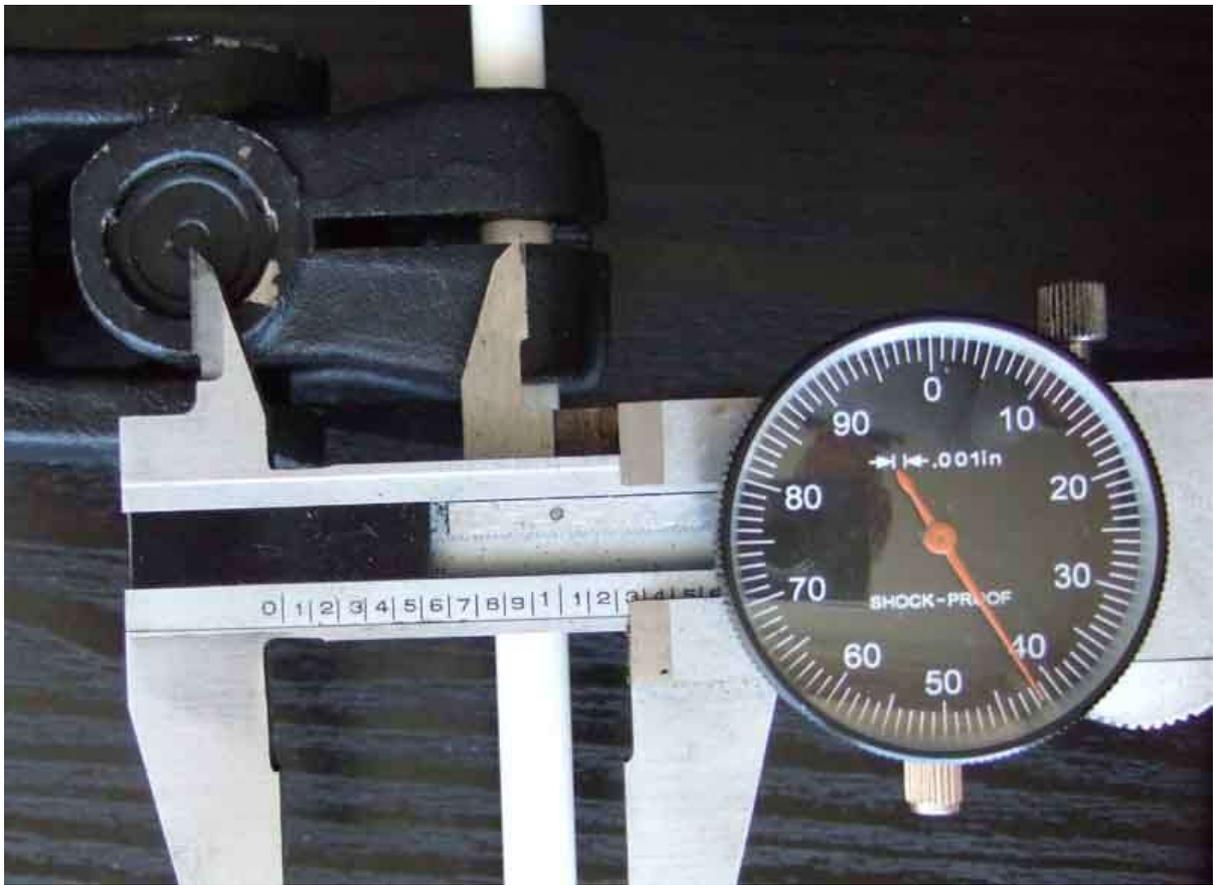
## Steering Column/Rack Alignment

[Early and mid-era columns](#) [Later column](#)

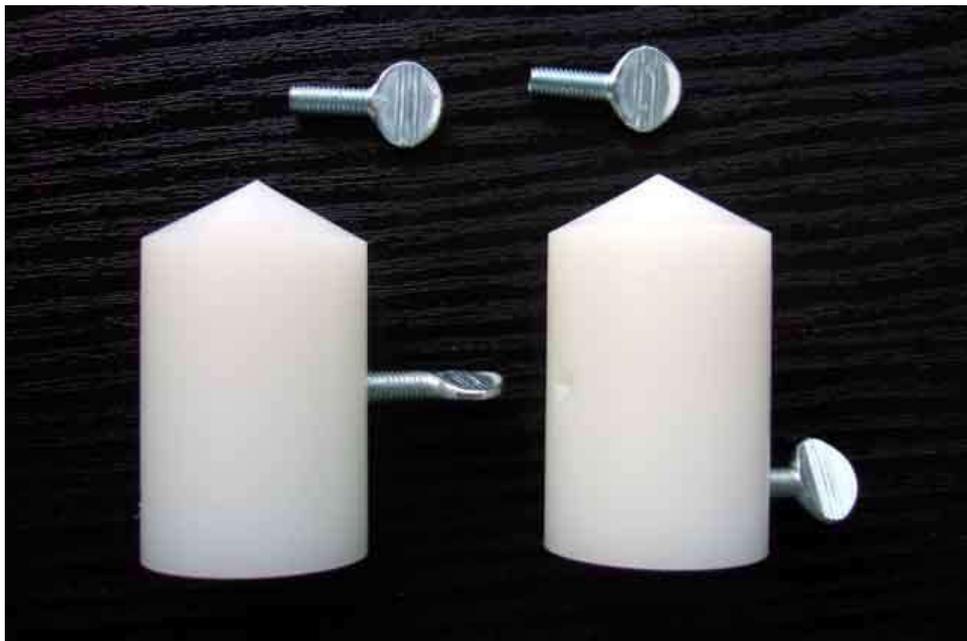
The tool shown in the Leyland Workshop Manual



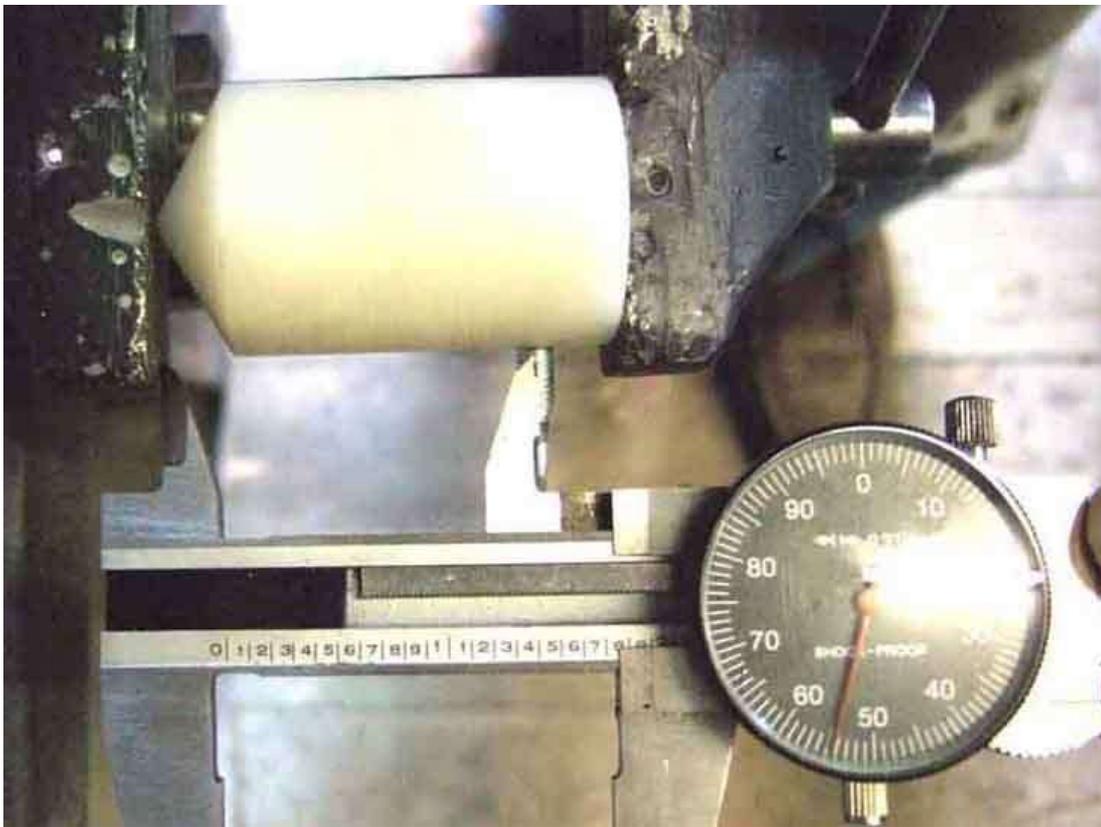
Re-measuring my new RB V8 UJ - 1.2415" or 31.5mm. Done more carefully than before, I have laid a white pencil in the bolt holes so it will be lying at the bottom of the hole i.e. the middle of the pencil should equate to the middle of the hole. One caliper finger is over the middle of the pencil, and the other is resting in the middle of the spider, as judged from the concentric rings on the end-face of the cup:



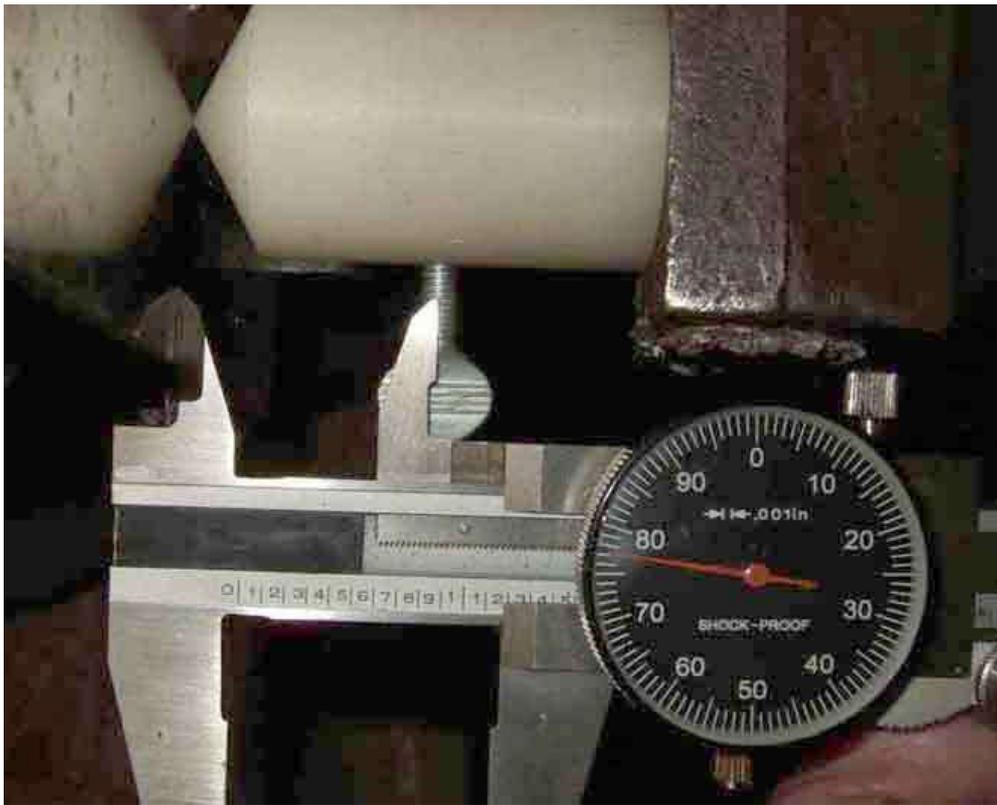
The Moss tool as received, showing the relative positions of the two holes:



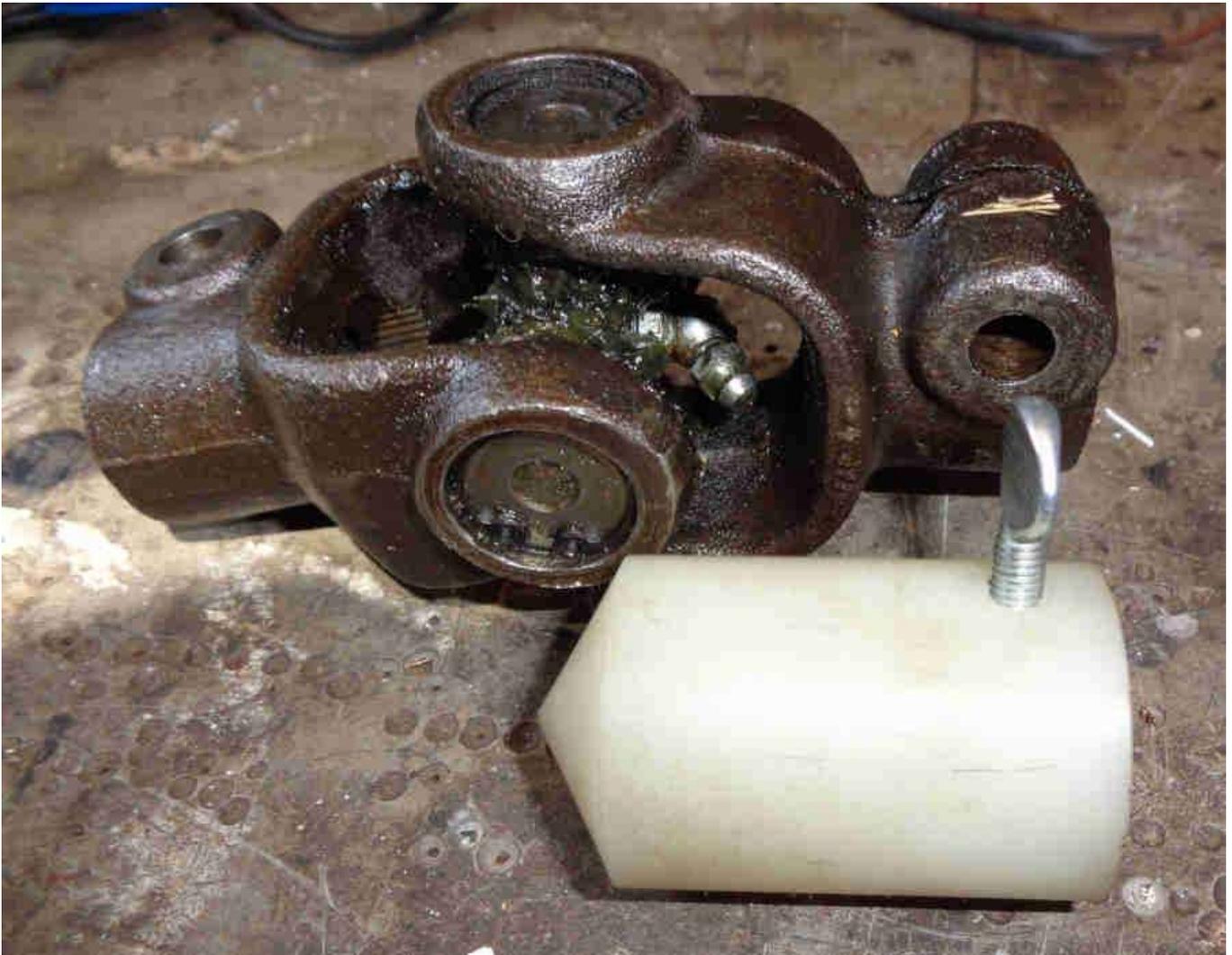
Measuring from the tip to the centre of each hole 1.755" or 44.58mm ...



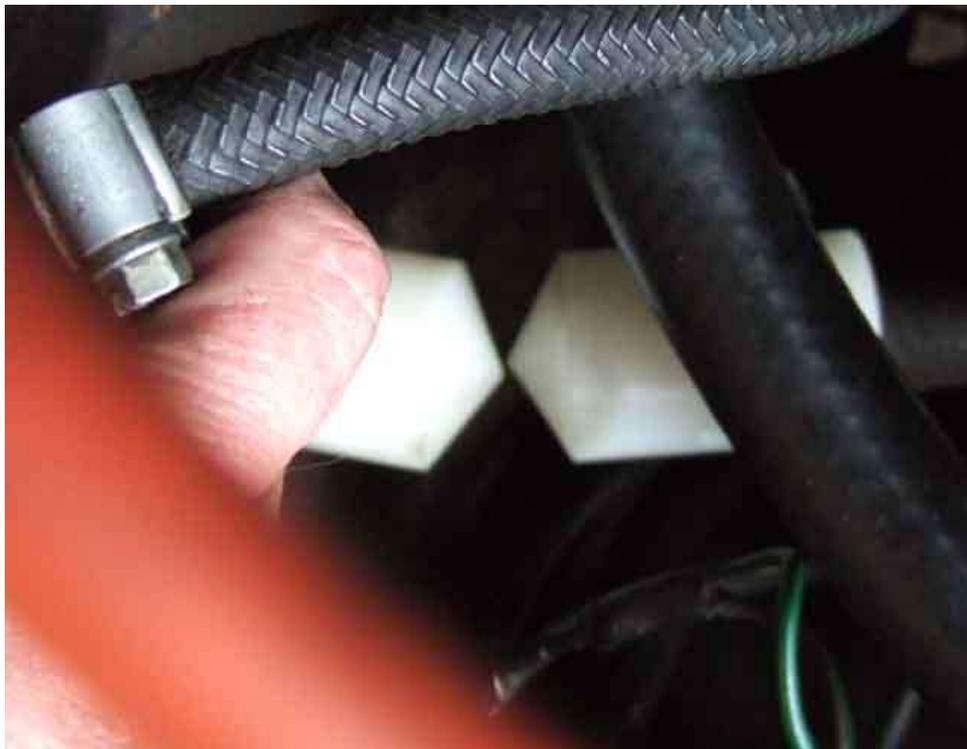
... and 1.177" or 30mm, so 1.5mm out for the RB UJ:



Hole nearest the open end for the roadster:



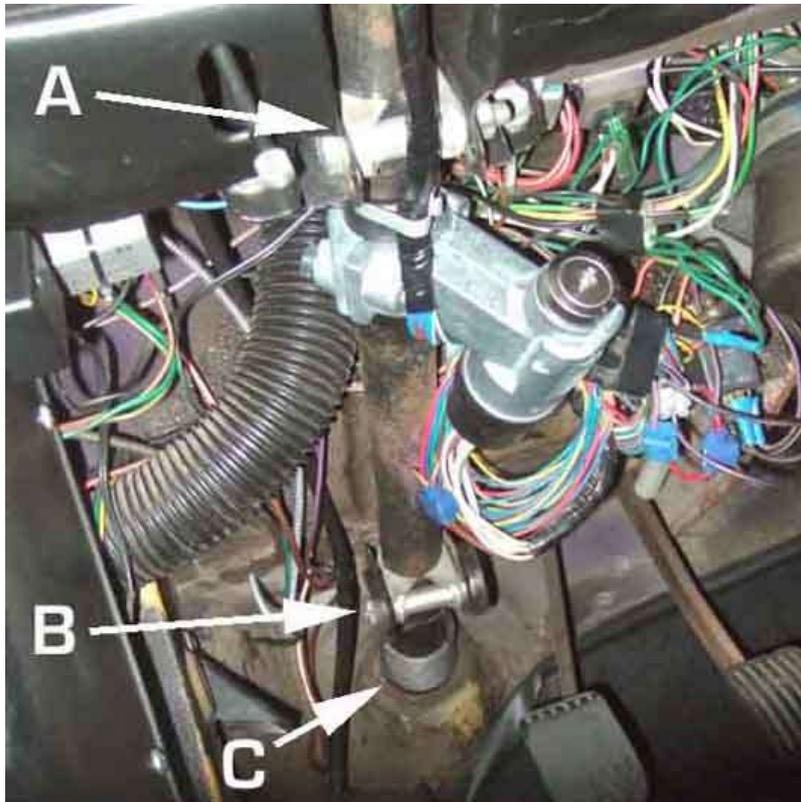
About 1/8" misalignment on the roadster:



And after correction:



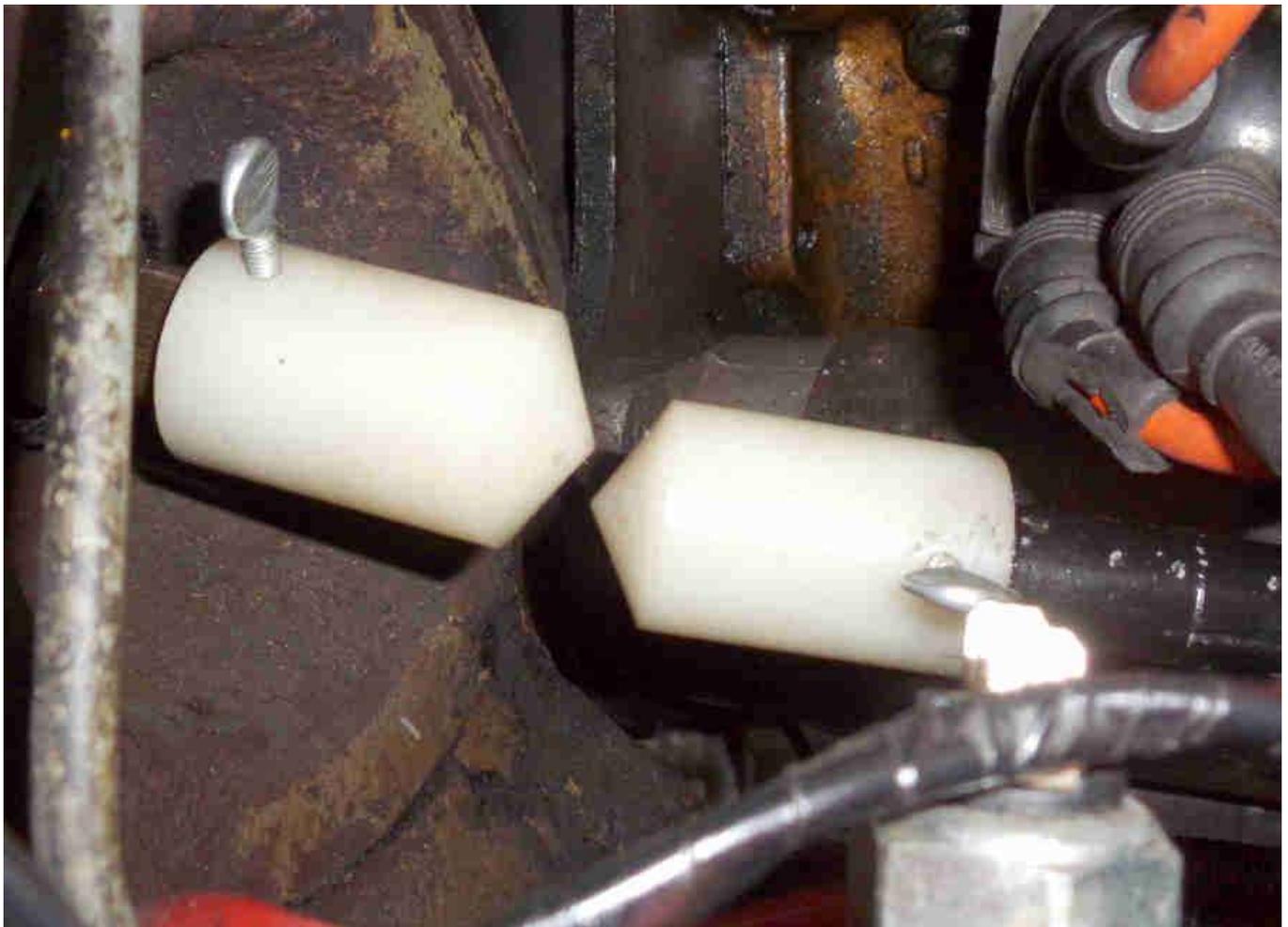
**Early and Mid-era columns:** The column outer clamps 'A' and 'B', and the concertina bulkhead seal 'C'. 'A' only allows up and down movement, 'B' allows up and down when the nut here is slackened ...



... and when these two nuts on top of the heater shelf are slackened the whole lower bracket and clamp assembly will slide from side to side for horizontal alignment: ([MGE](#))



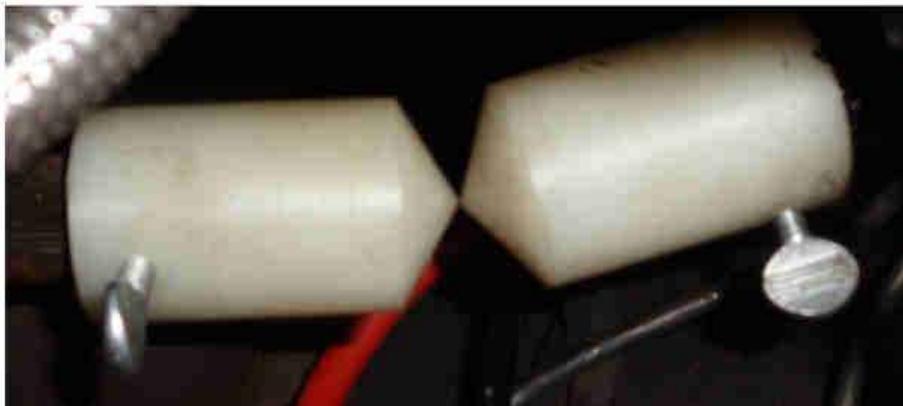
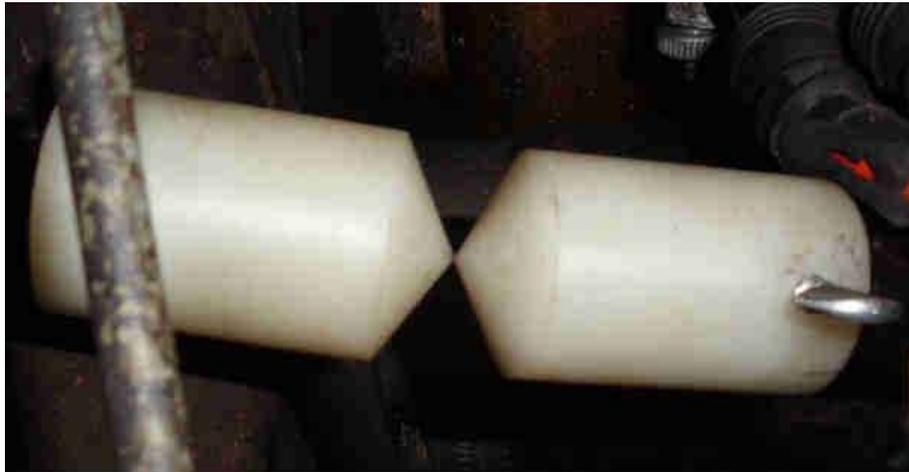
With the Bee's new rack the initial misalignment is a lot more in both vertical and horizontal directions:



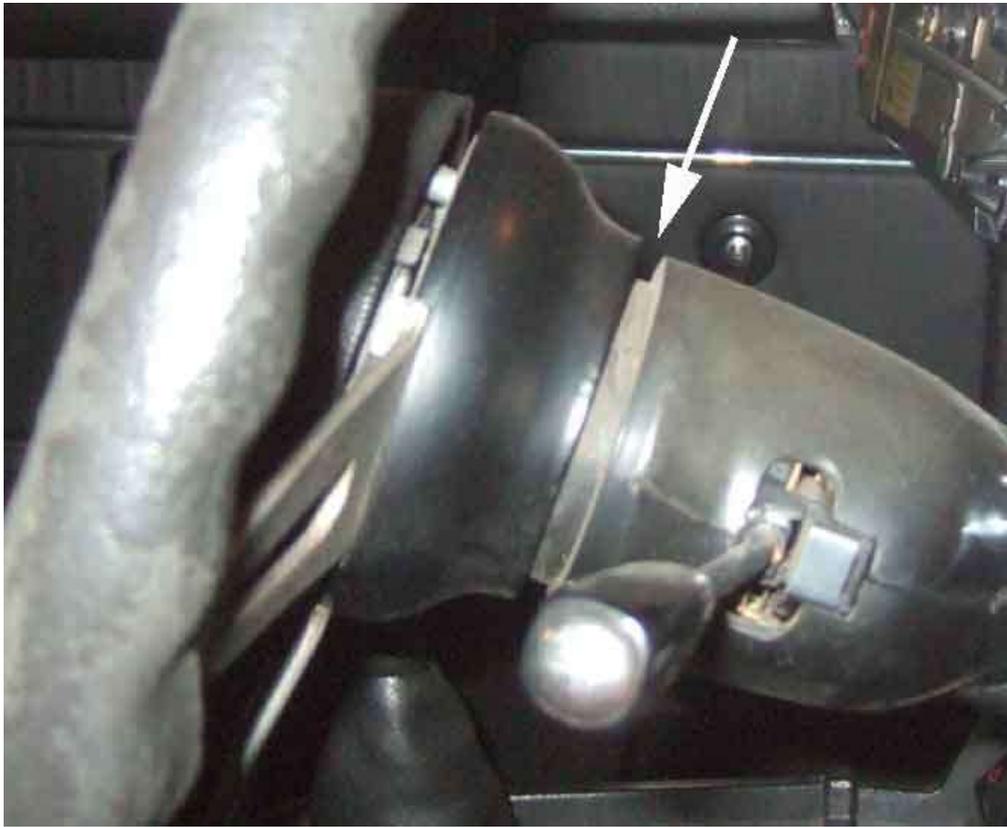
There is enough movement in the lower column bracket to correct the horizontal but not enough in either of the column brackets to correct the vertical so the upper mounting points on the new rack will have to be shimmed. As well as all that the four rack mounting points need to sit square to the cross-member brackets and with the new rack (at least, I didn't have cause to check the old rack) the upper end of the near-side has a 12 thou gap to the bracket with the other three bolts nipped up:



Several hours later, aligned from two angles about 90 degrees apart:



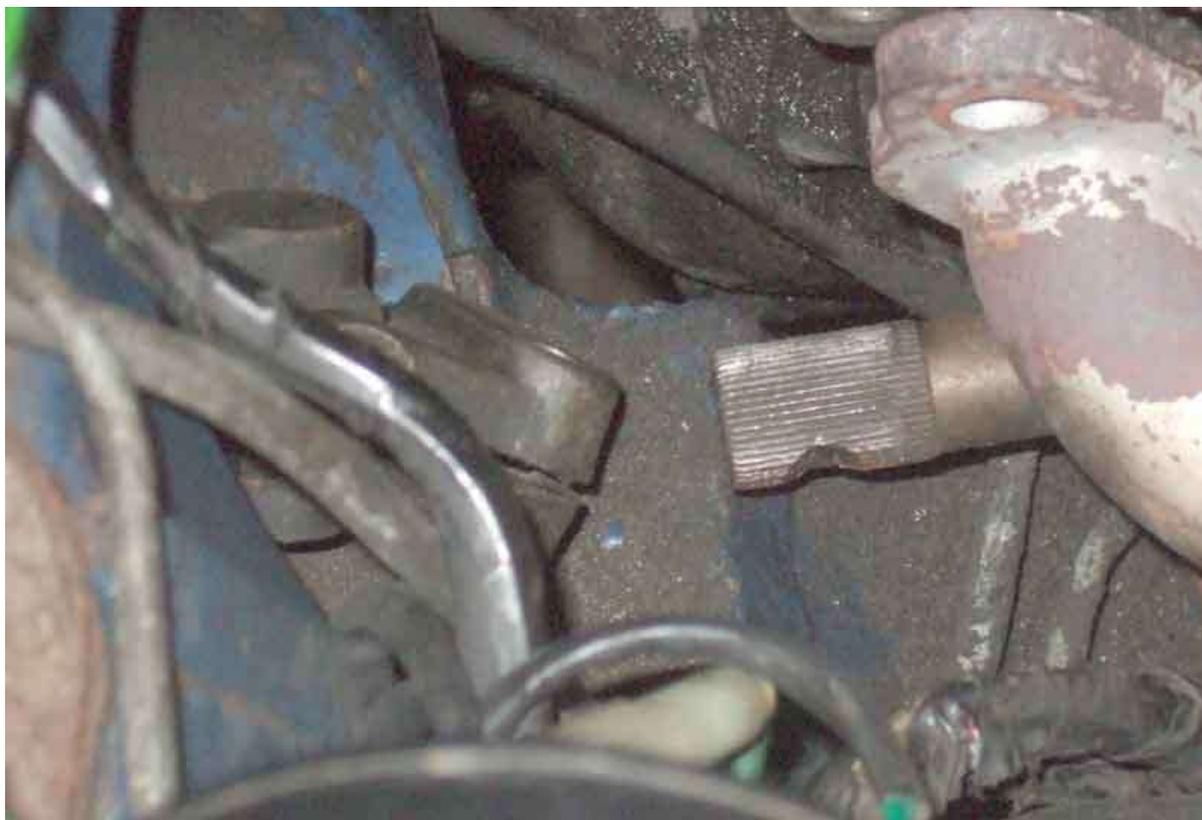
The inners slide up and down in the outers so the rack and UJ set the position of the wheel relative to the dash. Because the outer can be moved independently of the inner and the cowl and indicator switch positions are determined by the position of the outer the outer needs to be slid up and down in the under-dash brackets to get the correct overlap between cowl and wheel:



73 roadster and 75 V8 column shafts only have a notch for the UJ clamp bolt meaning the UJ can be attached to it in only one rotational position:



But whereas the roadster rack shaft has a groove all the way round meaning it can be fitted to the UJ in any rotational position the V8 rack shaft also has a notch! This means that you can only correct steering wheel alignment by a combination of the position of the wheel on the shaft and the relative positions of the track-rod ends on the track-rods. By comparison the roadster rack shaft is grooved all the way round, meaning that the nearest rack/UJ spline can be used to correct steering wheel alignment in addition to the other methods:



**Later full energy-absorbing column:** The UJ controls the position of the inner, and as the relative position of inner and outer is fixed by the upper bearing the UJ also controls the position of the column brackets 'B' to the mounting points. The slots in those brackets allow a significant amount of fore and aft adjustment, as well as 'pivot' to move the UJ end of the column from side to side. Spacers between the column brackets and the mounting points control the vertical position of the UJ end of the column:

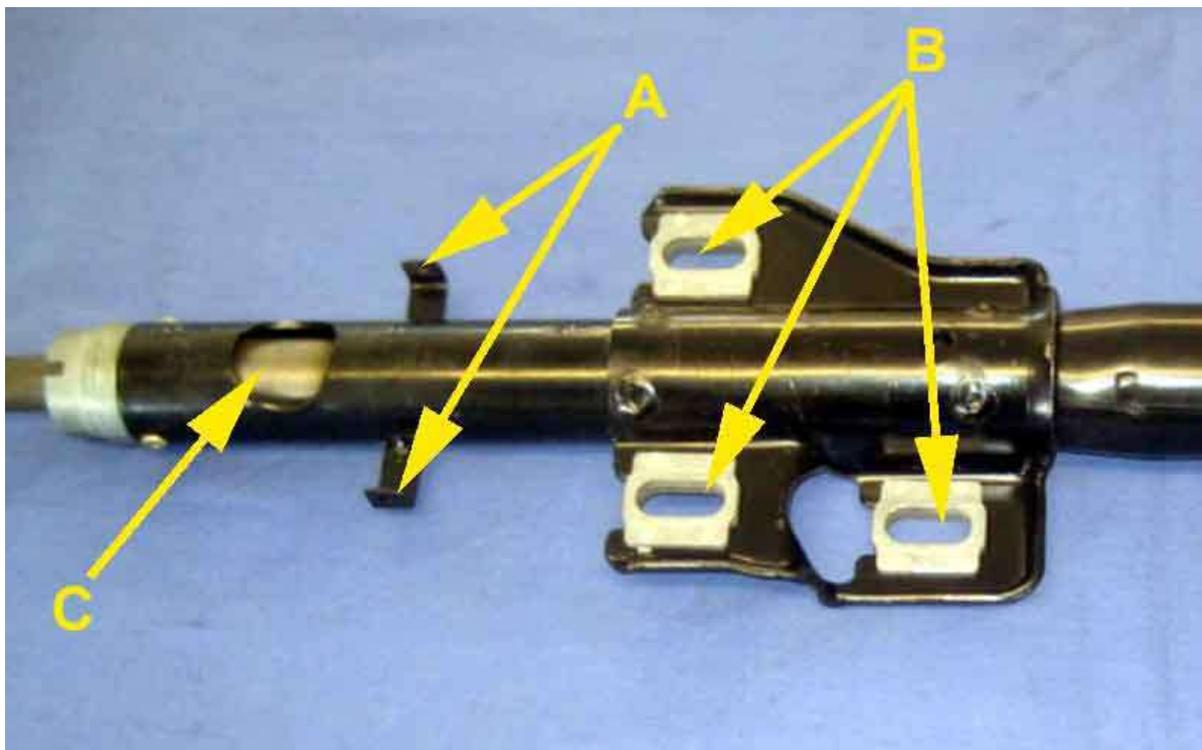


Plate (A), seal (B) and alignment gauge attached to column before refitting. Subsequently I chose to attach the plate and seal to the toe-board first, then push the alignment gauge (screw removed) on the end of the shaft through them. The plate at the bottom of the column is only tightened to the toe-board once the column has been aligned, it should not be used to force that end of the column into the correct position:



Column aligned, although with this later column you may need to leave a small gap between the tips or you may not get the clamp bolts through:



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