

Rear Axle Alignment

The edge of the level is against the spinner. You can tell by how far away the reflection of the level is, from the level itself, at the lowest point of the panel, just how much further the spinner projects on the left compared to the right - 6mm.



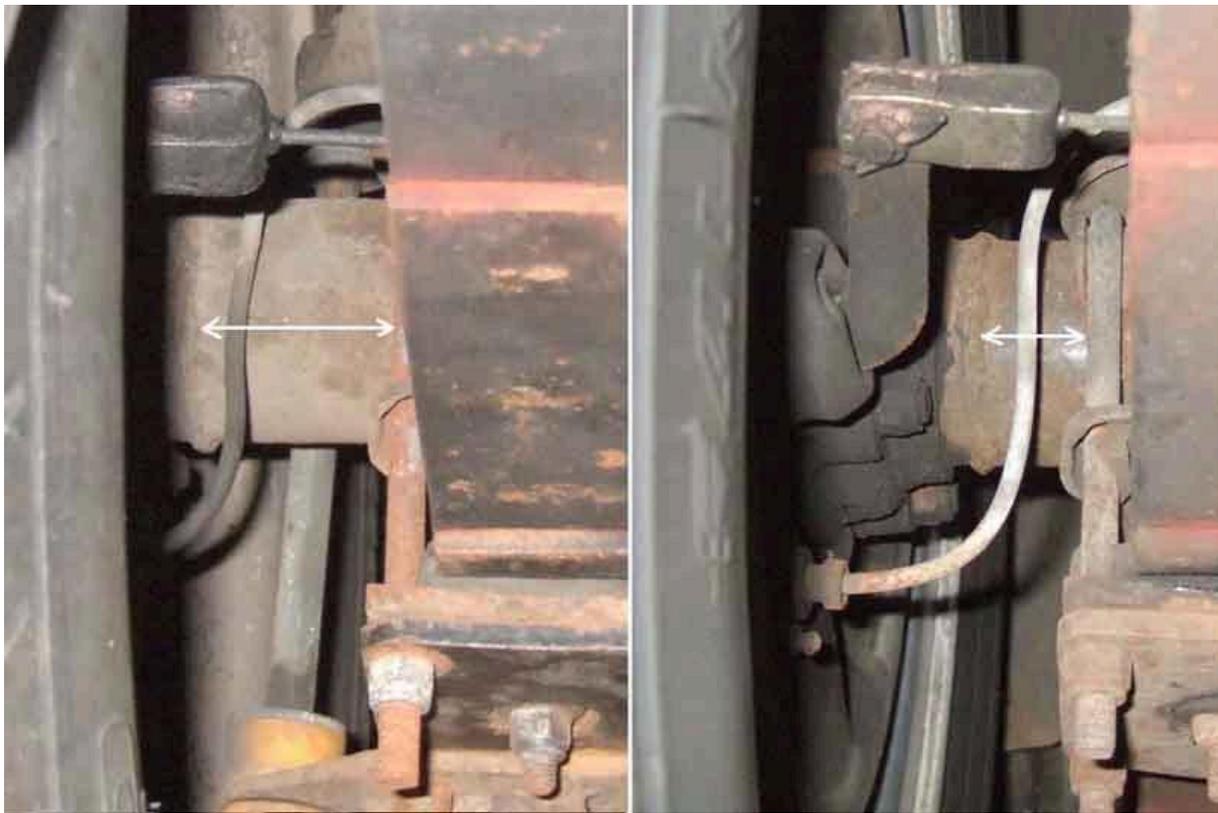
The shape of the reflection also shows how there is more of a curve below the trim strip on the left compared to the right. This puts the trim strip on the left another 6mm further away from the spinner compared to the right, making a 12mm or nearly half an inch difference between sides, if both wings had the same profile.

Axle Length

Stud wheel axle, measured between bearing cap outer faces/backplate inner faces. Just 1/8" short of 48.5" shows this is a Salisbury stud wheel axle.



Steel wheel on the left, about 2" between the U-bolt and the weld for the bearing housing, wire wheel on the right, about 1". This also shows the effect of the different wheel offsets, and why the axles need to be different lengths as a result - most of the brake gear and the back-plate nuts are concealed in the well of the stud-mount wheel, whereas those with a wire wheel are clearly visible. Note this is a feature of the **wheel offset**, not the axle length. To see which axle you have you must measure the tube from U-bolt to weld as described.



April 2020: A measurement between the angled wire-wheel mounting surfaces on what is supposed to be a standard axle and hubs. Pointers of my [tracking gauge](#) in the middle of the surfaces:



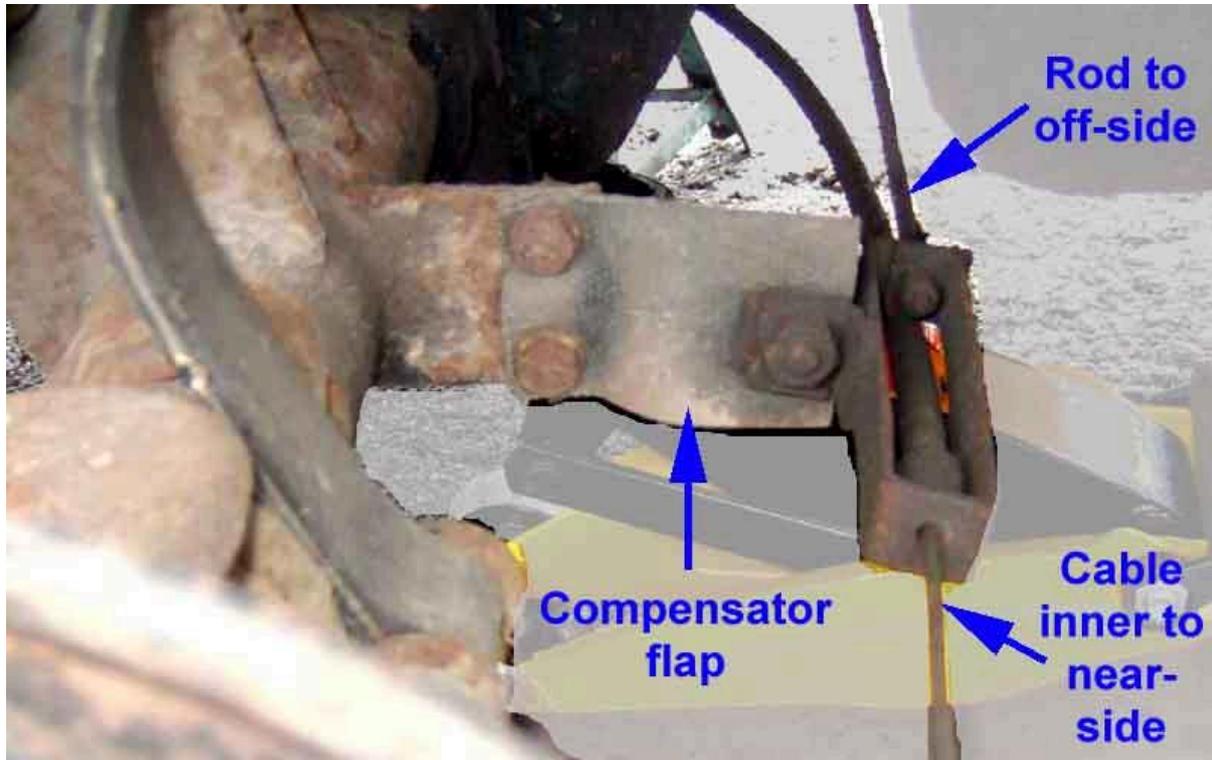
1320 to a milli-metre or so:



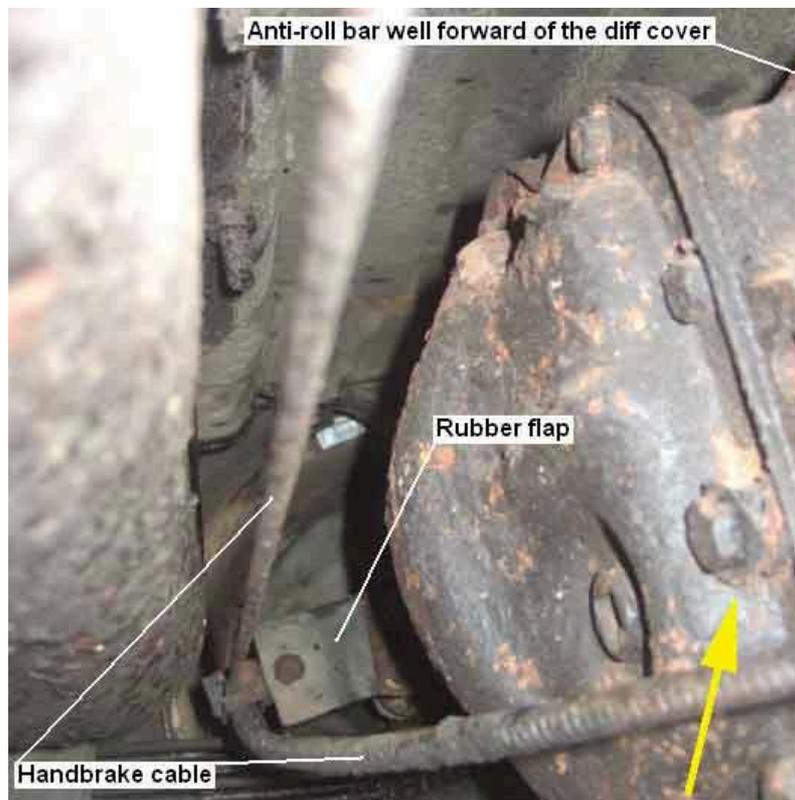
All I need now is someone else to compare it with. Maybe next year. Or 2022 ...

Handbrake Cable, 1977-on Rear Axle

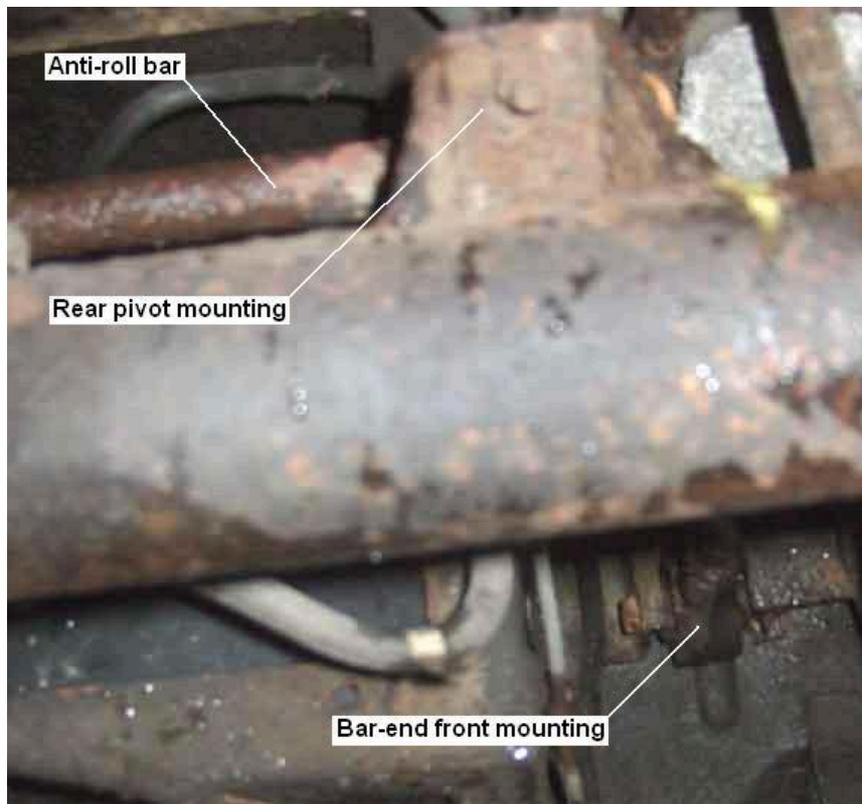
Showing the rubber flap attached to a flange on the axle casing, to which a bracket on the handbrake cable is attached. The rear pivot and mounting for the anti-roll bar can be seen on top of the axle casing (top left), but other than both being attached to the tube in adjacent areas the two are entirely separate.



Showing the rear of the diff, where the handbrake pivot used to be, with the anti-roll bar well out of the way.



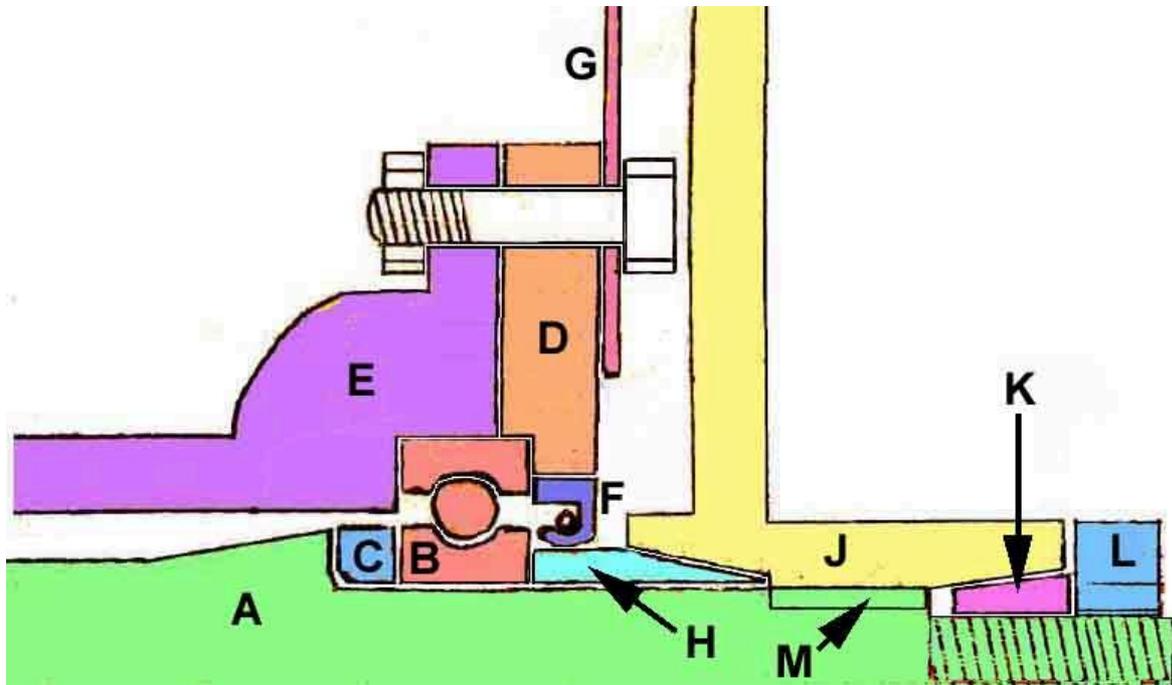
Showing the anti-roll bar, rear pivot on the axle casing, and front pivot mounting point on the body.



Hub Assembly

Salisbury:

Representative sketch only, not to scale



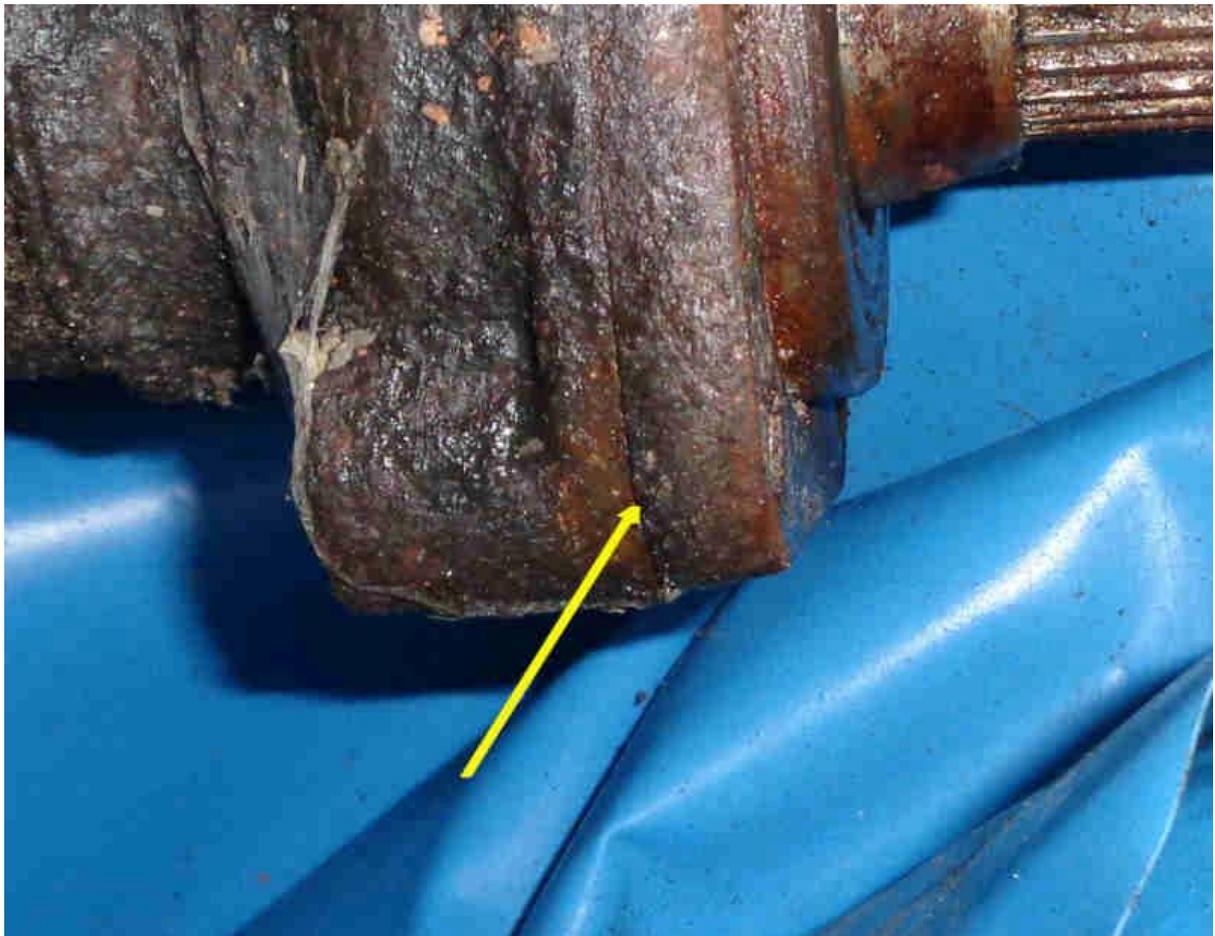
| | | | |
|-----------------|------------------|--------------------|---------------------|
| A - Half-shaft | B - Bearing | C - Bearing spacer | D - Bearing cap |
| E - Axle casing | F - Oil seal | G - Back-plate | H - oil seal collar |
| J - Hub | K - outer collar | L - Hub nut | M - Splines |

Note the orientation of 'C': The chamfered corner must go up against the corner on the half-shaft. If fitted the other way round the half-shaft and hub will be pushed closer to the centre of the car. Probably not enough to cause a problem, but even so.

Axle with bearing cap. The join between the two can be difficult to see as the two halves are rough cast on the outside and the same size and shape:



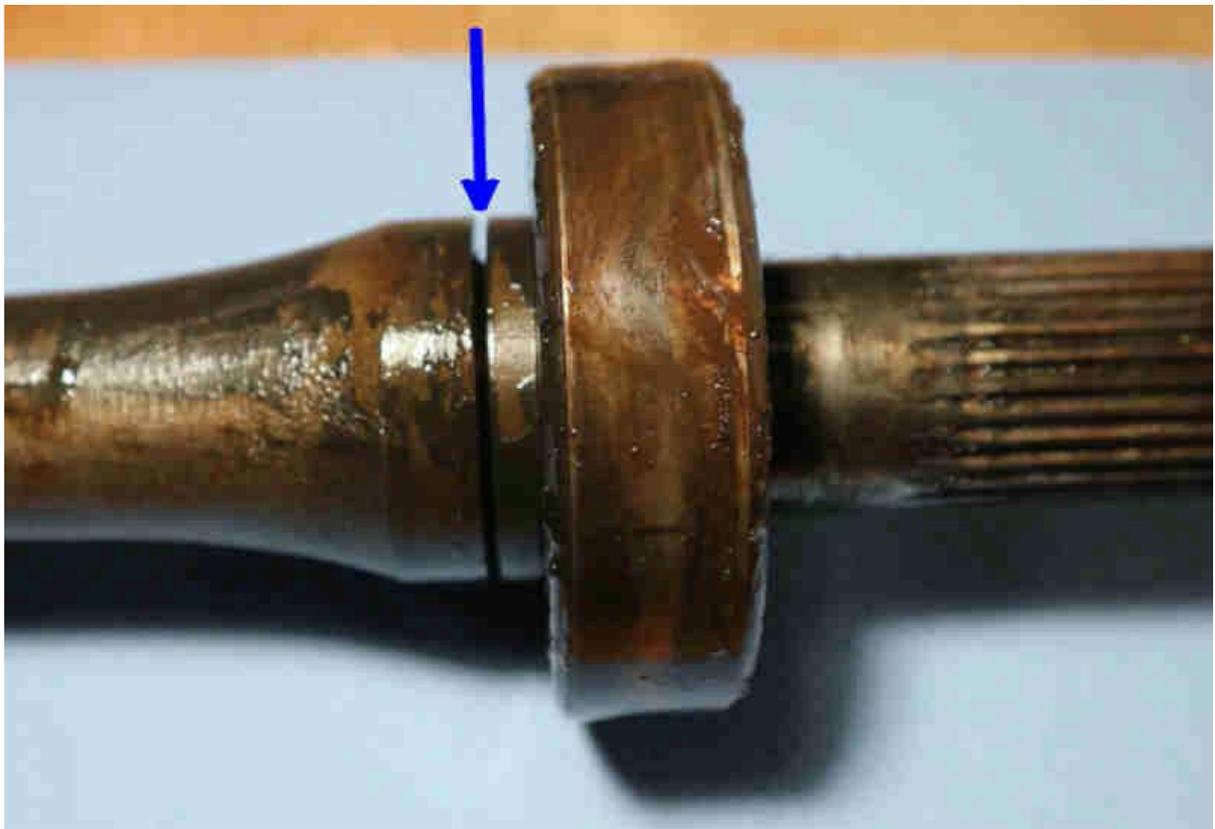
But should be visible somewhere:



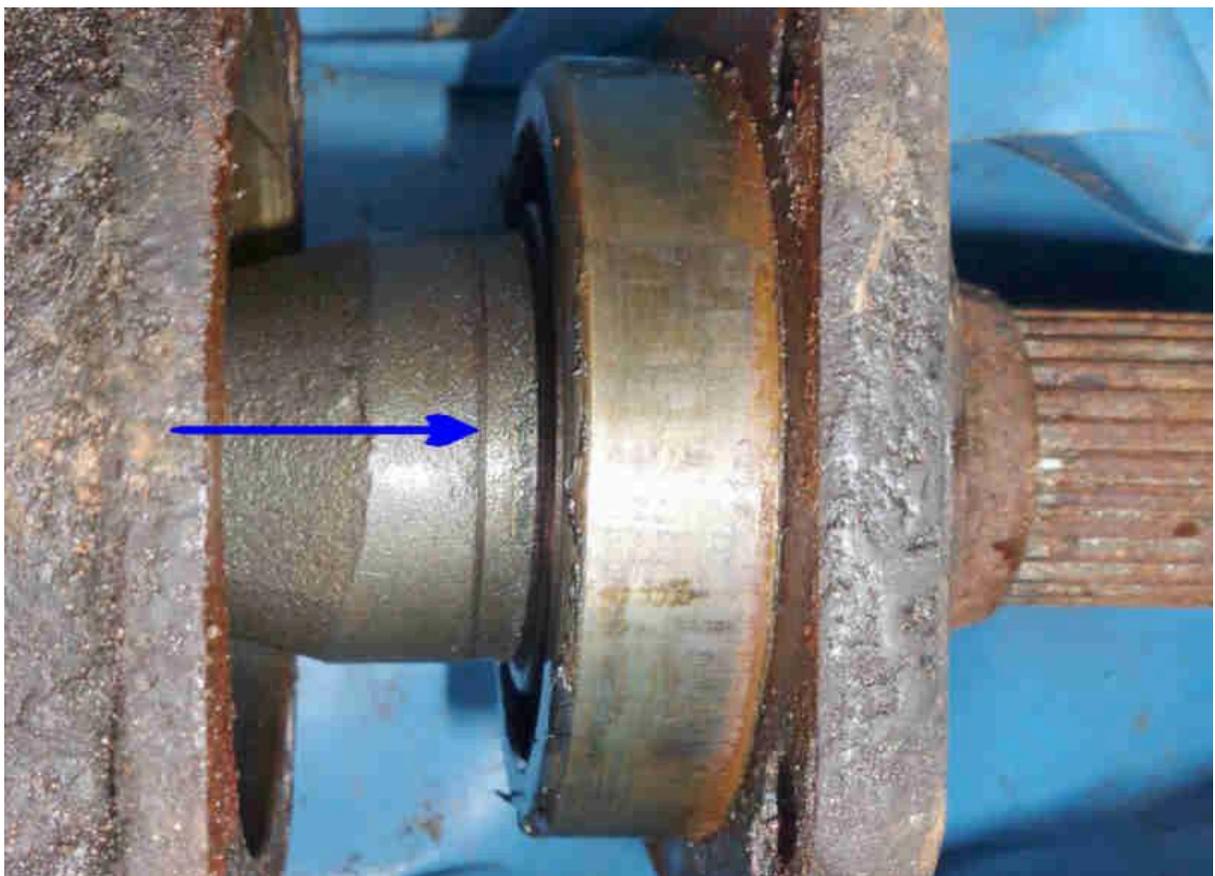
If struggling to part them try tapping the cap round with a hammer and drift above one of the holes, then a soft drift round the back of the cap on the now exposed parts should release it:



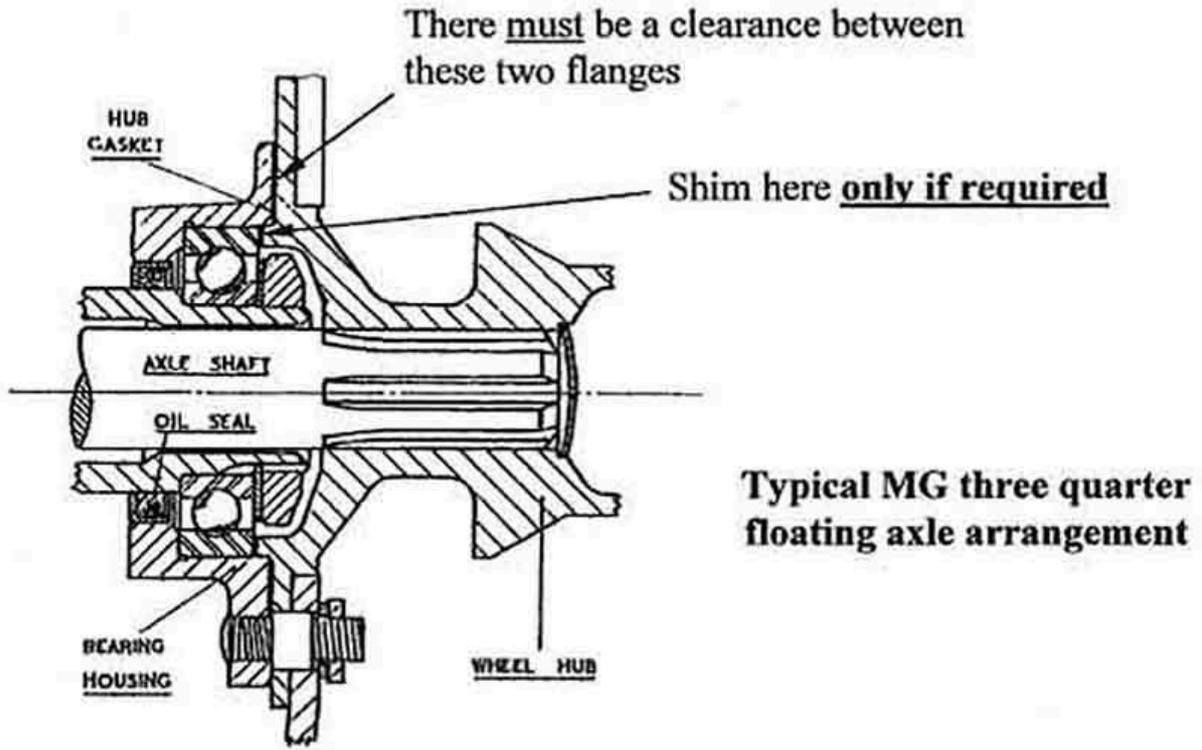
Father Ted's half-shaft with a clear gap between spacer and shaft shoulder:



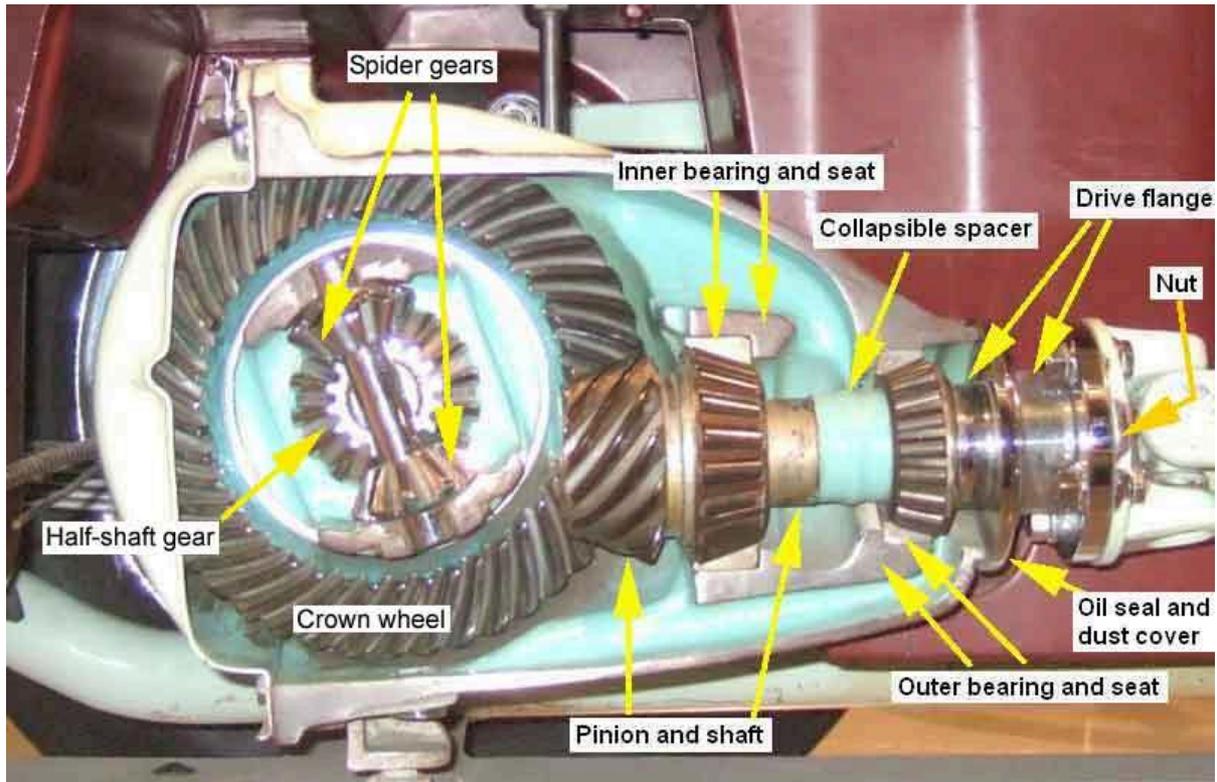
Which should not be there:



Typical MG Banjo:
From [Totally T-Type 2](#)



Pinion Oil Seal



The Parts Catalogue shows the oil seal proper (88G490 4-cylinder, BTB1326 V8) being behind a dust cover (BTC350 NLA), but only the dust cover seems to be here on the Gaydon cut-away. The seal fits inside the casting and the dust cover looks like it fits over a thin flange around the seal. To replace the seal the drive flange must be removed, and as said in the main text it is critical how the flange nut is retightened afterwards or the collapsible spacer can be destroyed.

When tightening the nut you are effectively pulling the pinion against the back of the inner bearing inner race, which via the rollers is pressing the outer race into the axle casing.

Likewise the drive flange is pushing against the inner race of the outer bearing, which via its rollers is pressing its outer race into the axle casing.

So the torque applied to the nut has a direct influence on the force applied to the bearing rollers and the races. Too slack and the pinion shaft will be loose and noisy, too tight and it will result in excessive bearing wear. Unlike the front wheel bearings this assembly does not have an end-float, it has a pre-load, and that pre-load is critical in that the torque required to rotate the pinion shaft must be between 4 and 6 pound INCHES, which needs a special tool to measure. With a solid spacer tube as in the front hub the positioning of the nut would be very difficult indeed to land between 4 and 6 lb in, just a fraction either way will be either too loose or too tight, and the nut has to be secured with a split-pin which doesn't allow for very fine differences in position.

The solution chosen by the designer is to make the spacer tube between the two inner races collapsible, and in that way because the tube collapses progressively as you tighten the nut, absorbing a portion of the force as the force goes up, the increase in rotational torque can be made more gradual. Even so great care is needed, and the Workshop Manual does say that the torque rises rapidly.

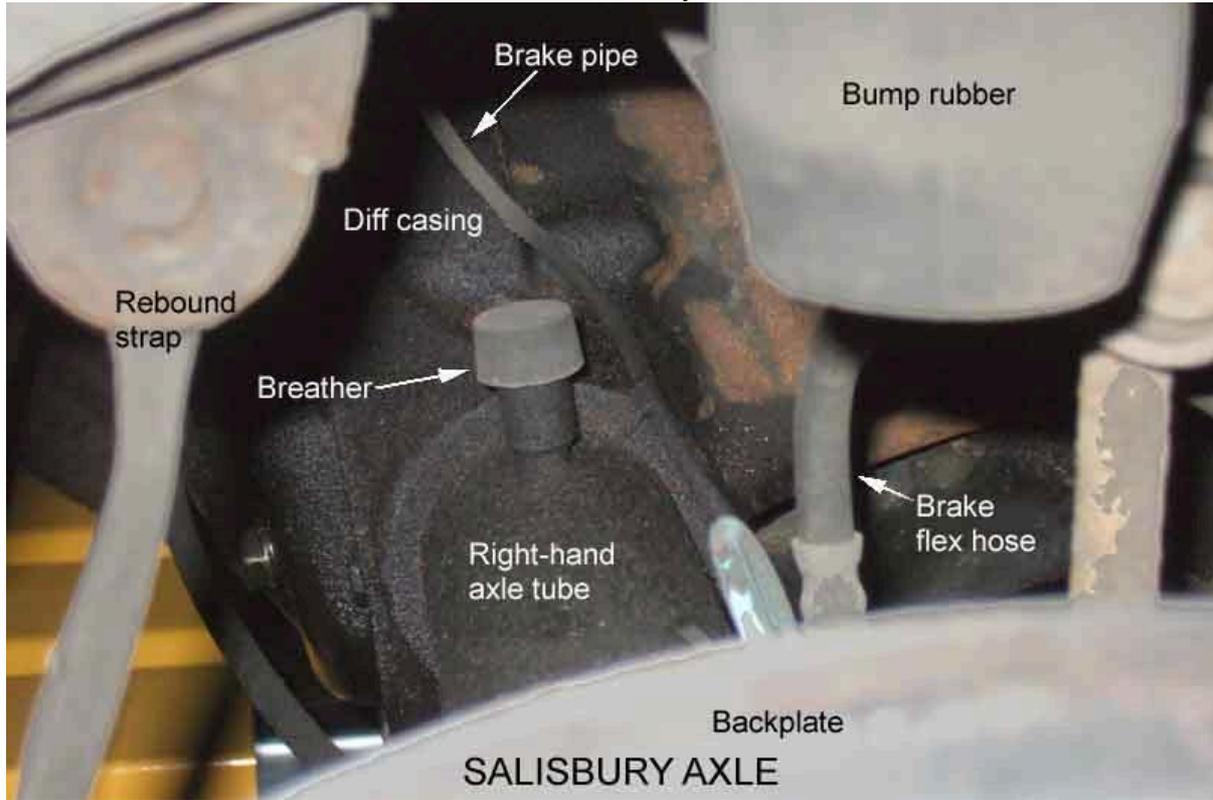
When fitting a new spacer tube I don't see you have any option but to go by the rotational torque, and come up with some way of measuring it. When replacing just the oil seal the Manual says to measure the force needed before slackening the nut, and to refit the nut to the same torque - or if the original torque was zero then to set it to 4 to 6 ft in., which puts us back to needing the special tool again. But it has been found that going by torque can be dangerous when just replacing the seal, destroying the spacer, as well as needing the special tool.

Hence the advice to put the nut back to its original POSITION, regardless of either rotational or tightening torque, and that is much easier to achieve. As said in the main text, carefully mark the position of the nut with respect to the shaft, and I'd also mark the flange with respect to the shaft as well. Once marked, undo the nut, carefully counting full turns, and there will almost certainly be a partial turn just before the nut comes off the threads of the shaft. You must be ready for this so you can note the approximate angle of the partial turn, as well as the exact number of full turns.

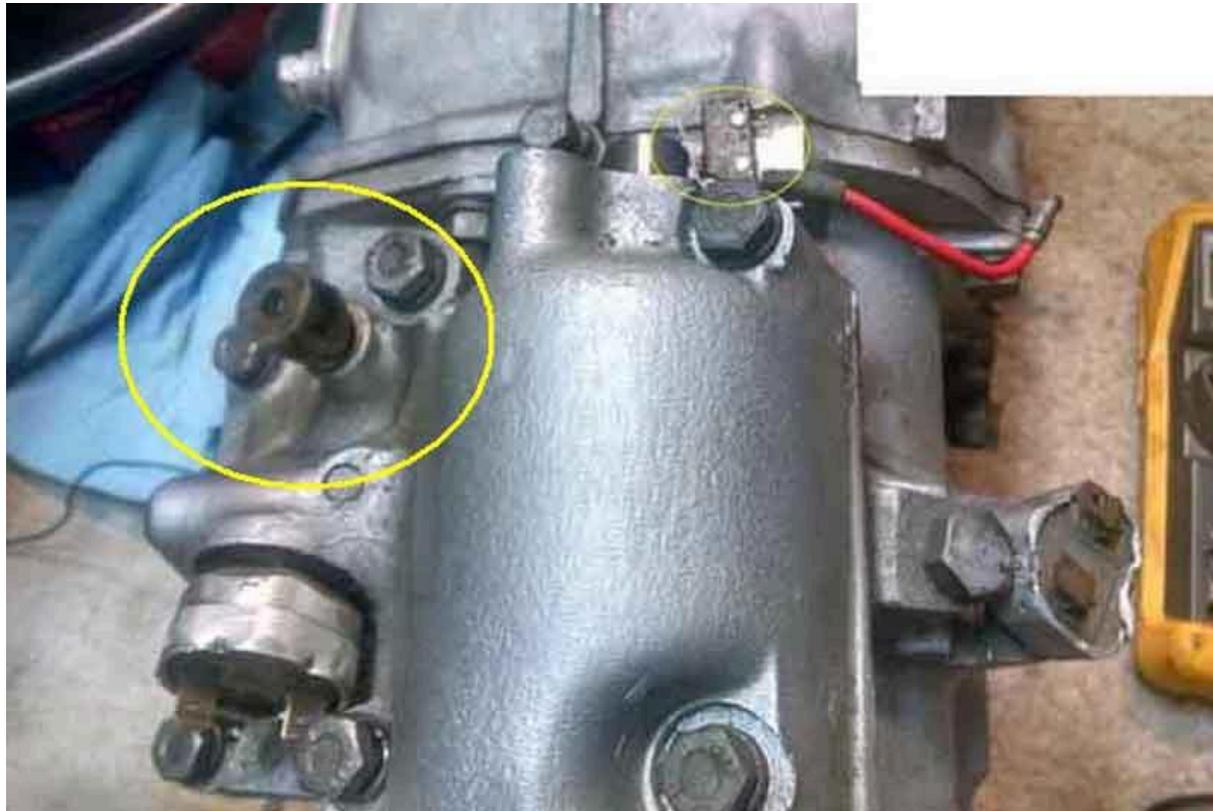
With the oil seal (and any dust seal - which is probably there to keep dirt away from the seal and the part of the shaft it runs on which can cause wear and leaks.) replaced fit the flange back in its original position on the shaft. I would definitely NOT do what one YouTube video advises and that is to seat the flange back on the shaft by tapping it with a hammer or mallet as this will be applying shock loads through the outer bearing inner race onto the collapsible spacer. Because we are going to be tightening the nut to its original position, that is going to seat the flange to the same position as it was before, if there is any stiffness or stickiness on the splines.

Carefully start the nut (having fitted the washer) on the shaft - in fact I would turn the nut **backwards** until I hear and feel the click as the two starts drop past each other, then turn it forwards the previously noted partial turn, and the nut and shaft marks should be aligned - albeit with the nut very loose of course. Then tighten the nut, carefully counting the turns. Probably by hand to start with, but eventually you will need to use a socket, and then a breaker-bar. Be absolutely sure you don't go past the marks as you complete the final turn, and you should be OK to refit the split-pin. If you lose count, remove the nut and start again.

Axle/gearbox breather
Installed to Salisbury axle:



4-synch gearbox - OD and non-OD are the same:



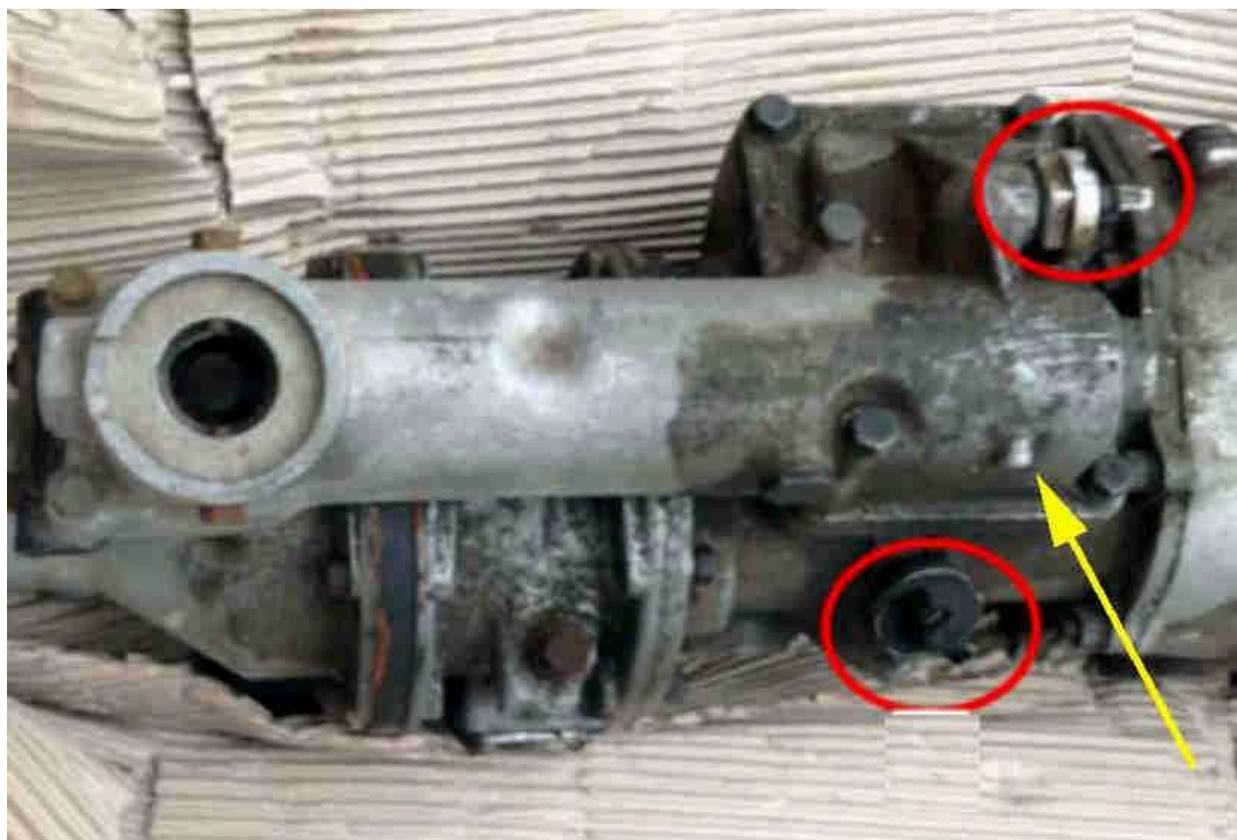
3-synch non-OD: ([Chicagoland MG Club](#))



However despite one being listed in the Parts Catalogue there are several indications in the wild that 3-synch OD don't have one, just a hole in the side of the remote change unit:



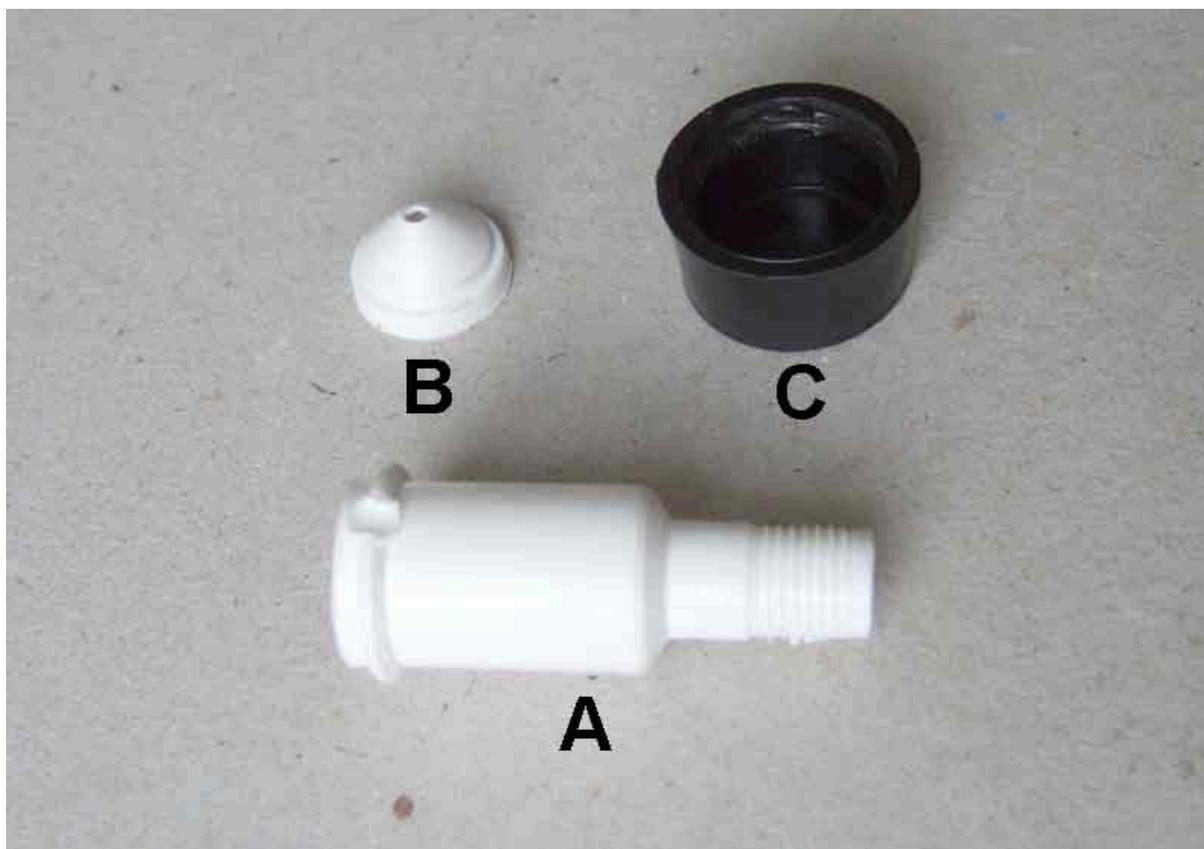
Then again this does seem to have something fitted in that hole (yellow arrow, ignore red circles):



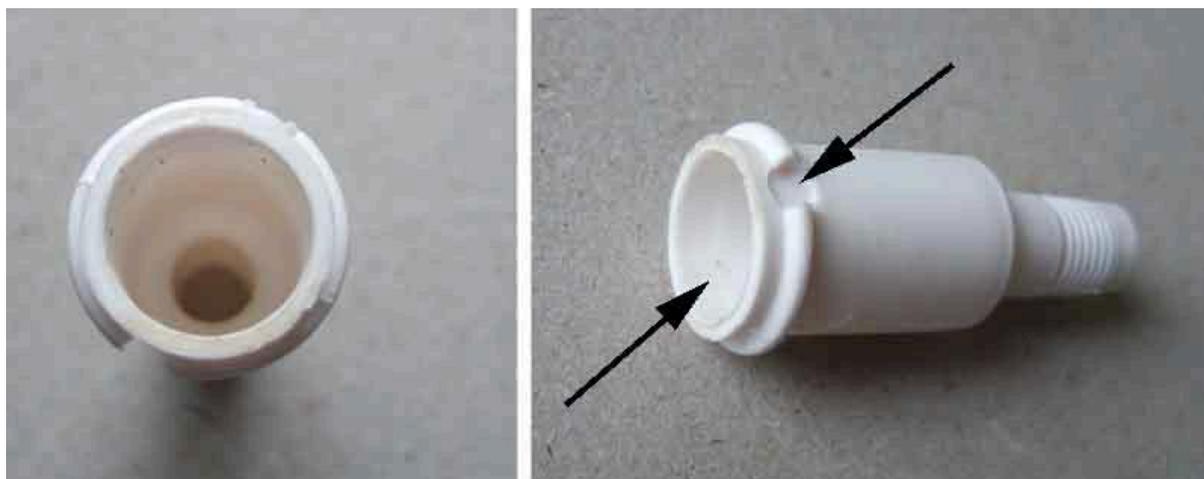
Cap removed. The cap seals the end of the tube, and the holes in the sides (one each side) allow for the breathing. Martin Roberts pointed out that they can be used with a small screwdriver or thin bar through the holes to fit it - or to remove one that hasn't already broken off. The cap should shroud the holes to hopefully prevent flood water going in, but it's a bit hit and miss. ([Dave O'Neil on MG-Cars.net](#)). I suspect this is the earlier breather as a new 21H6060 in 2017 is quite different:



A new 12H6060/V8 breather, comprising a body (A), insert (B), and cap (C). It can be seen that the main part of the body and hence the cap are significantly bigger than the original items above:



Whilst the body has indentations (arrowed), they are not pierced as in the earlier breather. Together with the cut-outs in the ring around the body (which the cap snaps onto), they allow air to pass between the cap and the body:



The insert. The small hole visible in the first image is actually too small to allow water that might be sitting in the insert to run through to the axle. Of course, if the axle is hot, and has run through water, any sitting there will be sucked in as the axle cools.

The slots across the top allow air to pass between the insert and the cap:



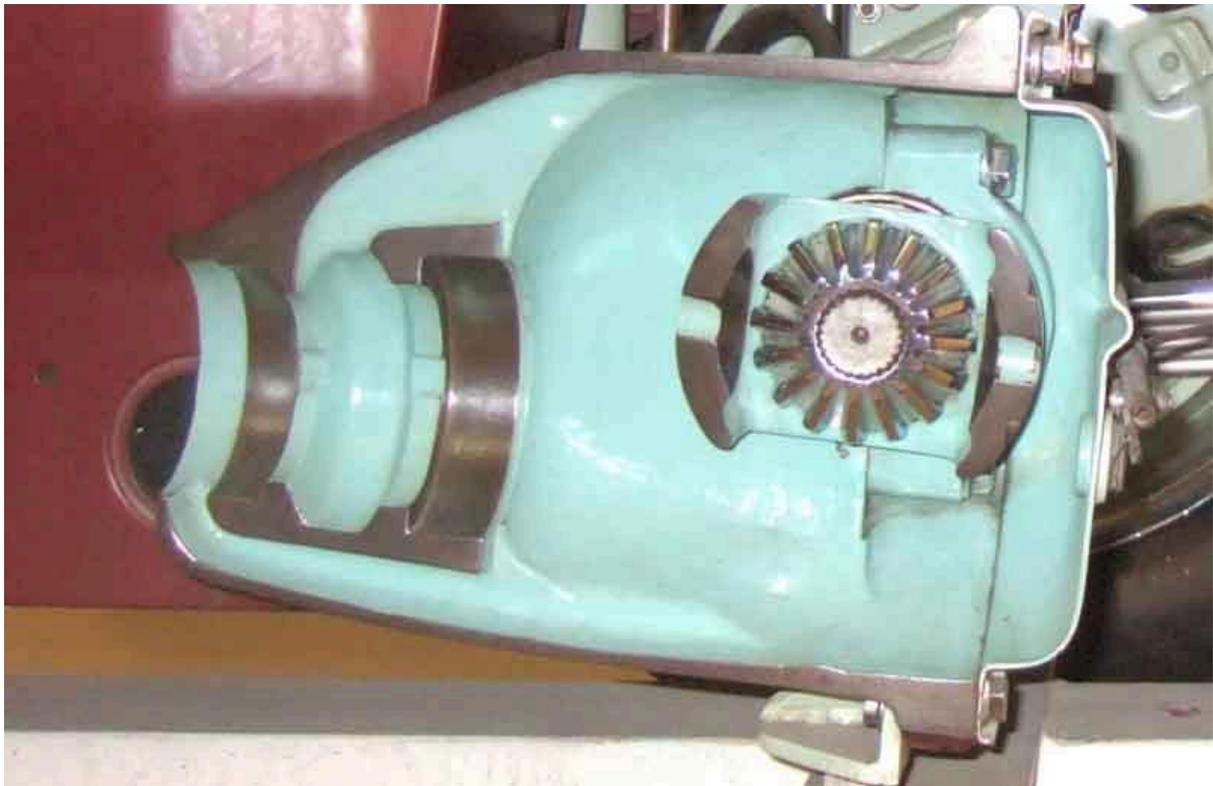
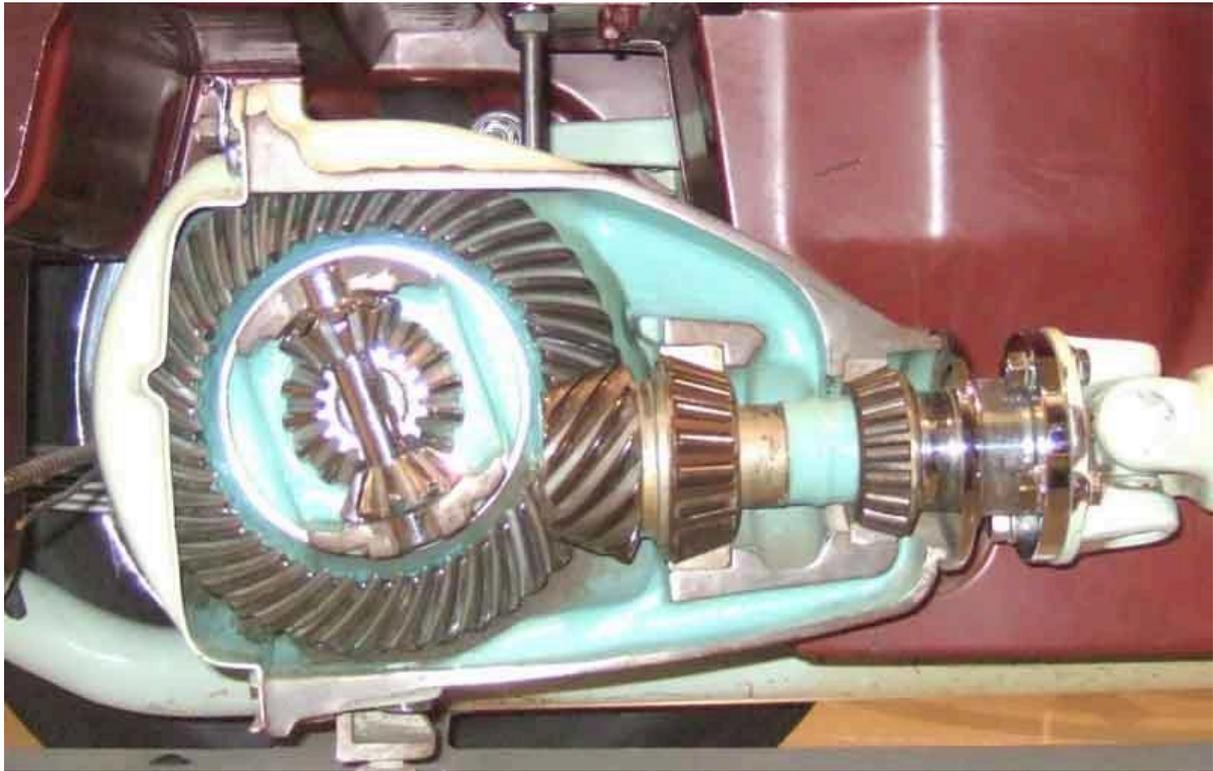
The insert fitted to the body ...



... and the cap fitted:

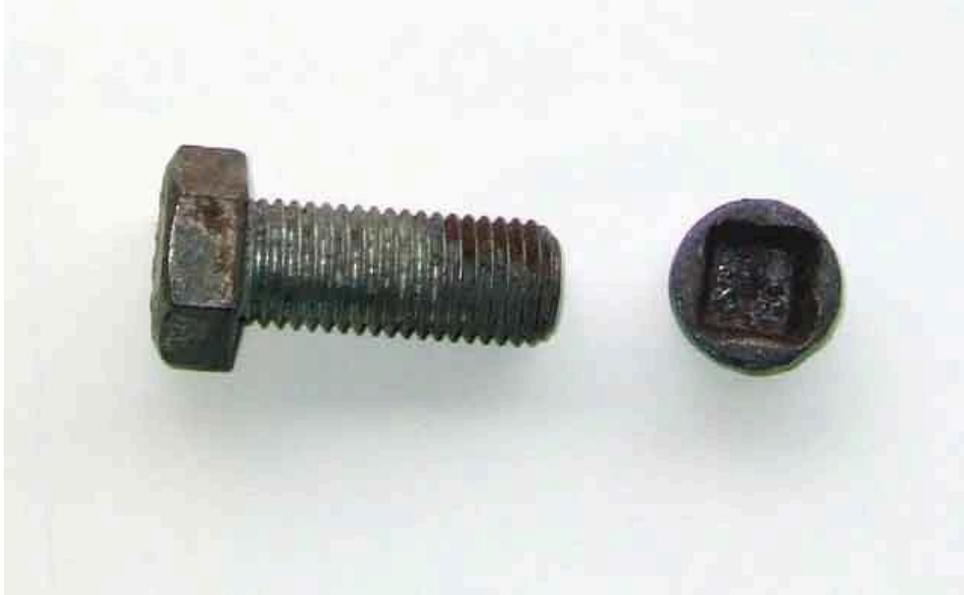


Cut-away Images of the Rear Axle



Axle level/Drain Plugs

Suitable bolt with level-plug:



Bolt cut and tapered, with spacer and location stub welded on the back of the head:



Showing the effect of the spacer, the adapter is how held at the open end of the socket, allowing the user to press the adapter into the axle plug for maximum effect. Product placement for Halfords unintentional!



Adapter in use. This is on a spare axle in the garage. My drive is on a slope, so I usually back the car onto ramps until it is level, which gives me plenty of room to get underneath to check the level. It also means that the weight of the car is on its springs, so the axle is tucked up in front of the fuel tank, which is what limits the space available for socket drive and attachments. If I jacked the **body** up at the rear to be level, and let the axle hand on the check-straps, space might not be a problem, but that is a lot more fiddling about than simply driving it onto ramps:



But I still had problems getting enough purchase from the tapered square drive, so decided to modify a plug by welding a 3/4" bolt hex end with a short stub into the square recess:



Comparing modified axle level plug to gearbox level plug - the latter being significantly larger. Measuring the two shows no overlap in the diameter of the tapers i.e. the large end of the smaller plug is still less than the small end of the larger plug ... if you see what I mean:



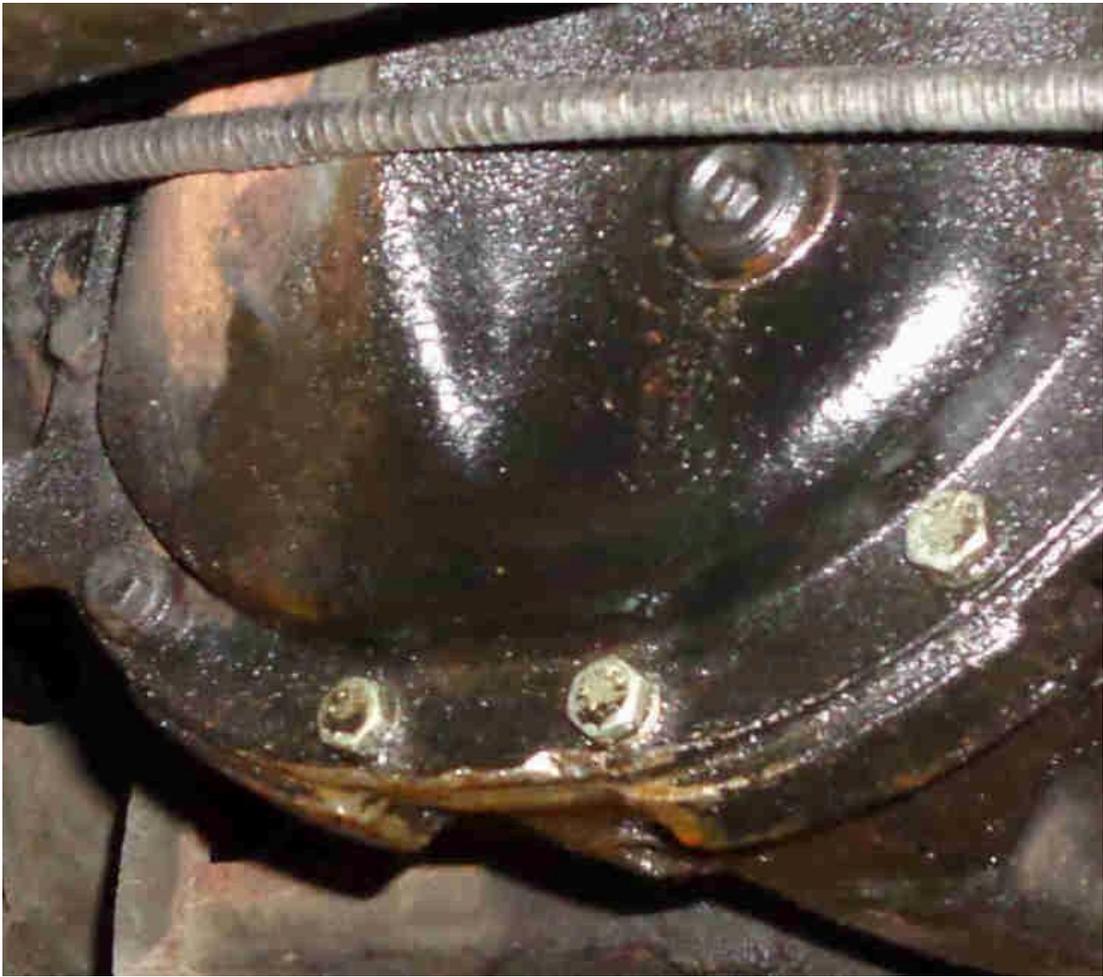
Modified axle plug with 3/4" hex head, and hopefully no more struggles undoing it. However there is a possible safety implication with the head protruding like this in that in a rear-end shunt the tank could be pushed against the back of the axle, and the hex head puncture it, whereas the original 'flat' plug wouldn't:



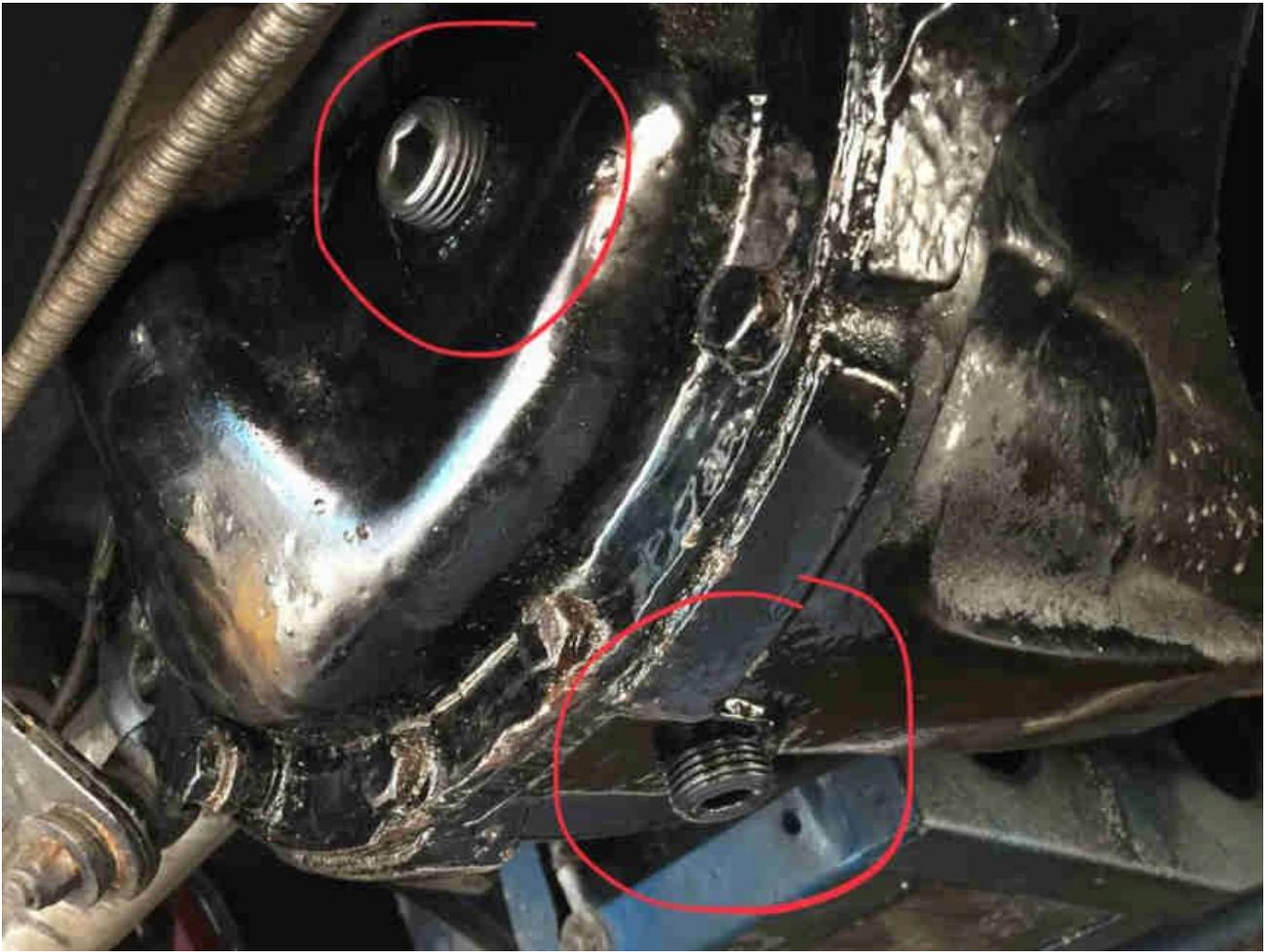
A number of suppliers now show this plug with a hex socket for a 3/8" Allen key. However all suppliers quote the original part number - 6K499 but not all show the socket, so they could be the original tapered square socket, you would have to check:



Fitted, as safe as the original plug, but a jolly-sight easier to remove. Using an extension tube (aka box spanner) on the Allen key makes removal even easier, but tighten using just the key on its own to avoid overtightening:



March 2024: Newly-fitted plugs protruding a lot more than mine above. Immediately after this was posted on the MGOC forum I fitted one to a pal's 78 and it was the same. I wouldn't be happy with the drain plug protruding that much given that it is one of the lowest points of the car, my originals are recessed into the casing slightly and barely visible in the above or below: (*P Lee*)



However Vee's level plug does protrude more:



Gearbox and Rear Axle Oils

Castrol V8 gearbox oil showing 'MANUAL' and a picture of a gear lever on the front ...



... and 'MANUAL' and 'GL4' on the back.



Castrol rear axle (and steering rack) oil for all MGBs showing 'DIFFERENTIAL' and a picture of an axle on the front ...



... and 'DIFFERENTIAL' and 'GL5' on the back.



Axle Rebound Straps

[Webbing style from two sources in the UK](#)

With the car on its wheels there should be a gentle curve in the strap, i.e. they are not under tension until raising the body is lifting the wheels clear of the ground:



Spacer tube, showing corrosion before cleaning off



Barely a centimetre of stretch in the original reinforced straps ...



but over 3cm of stretch in the modern 'all rubber'



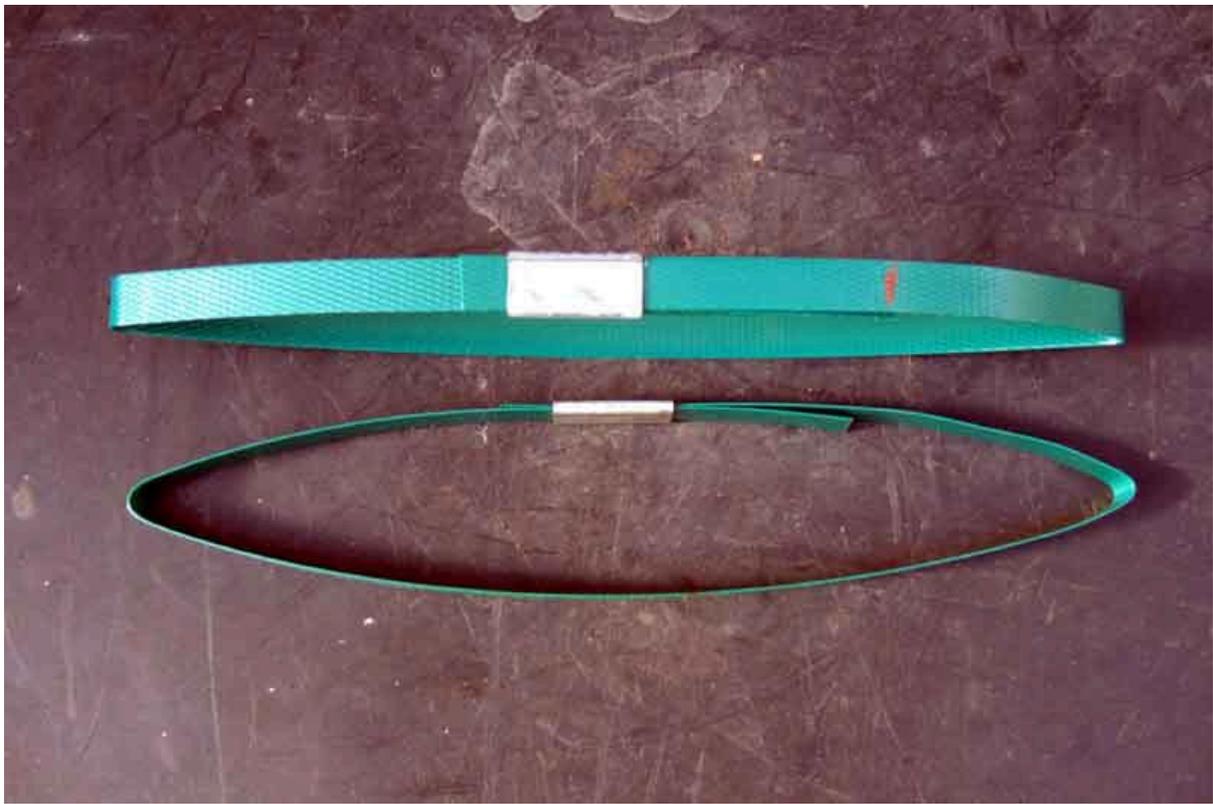
Clear signs of reinforcing in the original (top), none in the current stock



The different markings on old (top) and new



Reinforcing straps ...



... reducing the extra travel with the rubber straps to about 3mm from over 30mm before



Fully fitted, with cable tie



August 2018: Ben Colomb and new straps from the MGOC. Seem to be two layers of rubber with some woven material glued between them, but split the first time they were asked to take the load of the axle. So 'reinforced', but if these are the same as the Moss reinforced then they are clearly still rubbish. Better off with the Moss webbing-style.





Webbing style:

October 2020: MGOC have the rubber type but for less than £3 one wonders what you are getting. Moss rubber are currently £4 and a while back they told me they had cut one open and it contains reinforcing, and they haven't had any complaints for a while now, so it's up to you whether you give them a go.

[Moss webbing-style](#), currently (October 2020) £19 per pair plus P&P. They are black, the image has been enhanced to show the webbing and stitching.



They have been available for a while but in June 2020 Justalad who contributes to the MGOC forum advertised the following:

I can now produce MGB rear axle check straps in a quality super strong 32mm (1-1/4") polyester webbing, sewn on an industrial sewing machine.

They may be considered as a useful upgrade from the usual replacements.

The nominal (mounting points centre to centre) lengths for standard cars are:- 8" (203mm) for chrome bumper cars.
9" (229mm) for rubber bumper cars.

The steel upper mounting sleeve is re-used.

However, there are now so many variations of springs, dampers, lowering blocks, etc, if your MGB requires a different length just let me know with your order.

Please bear in mind that the straps will stretch 3 or 4 mm when fitted and under tension.

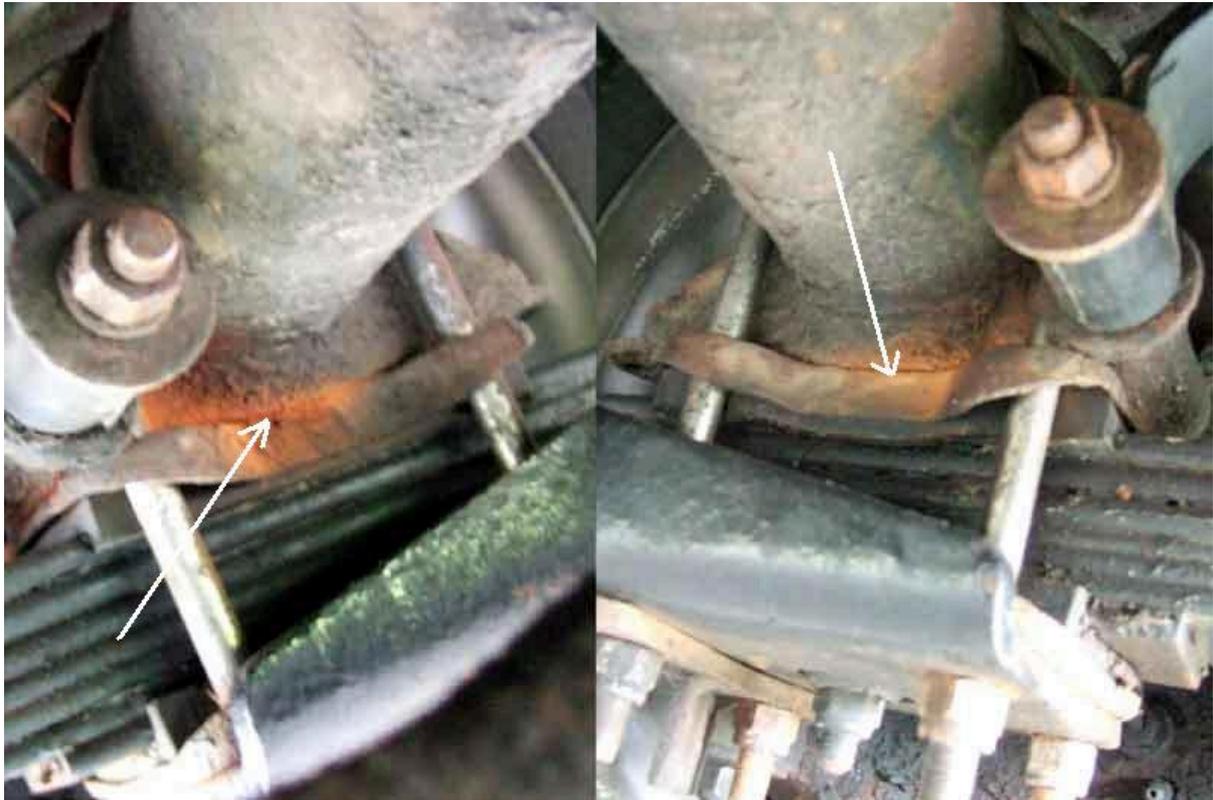
The photographs show the straps off the car and when fitted to my MGB and supporting the axle.

The price is £14.50 per pair, post free, UK only. For the rest of the world please enquire. PayPal payment with length required, address and all enquiries please to the e-mail address on my avatar (p.brook2@btinternet.com).



U-bolts

The orange staining where the axle butts up against the top spring plate, probably showing where the two have been fidgeting. The U-bolts were certainly not tight enough.



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