In The Garage

Feb 2023

Issue 17

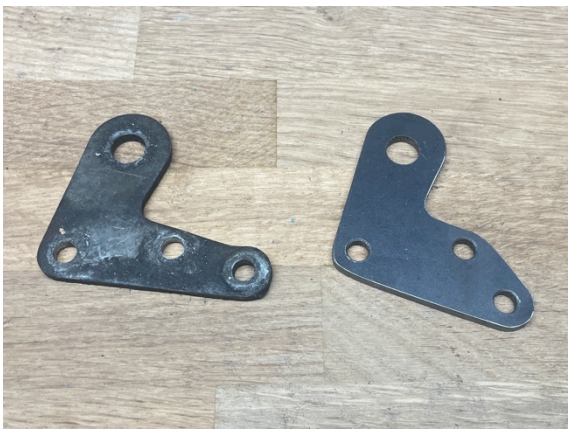
Welcome to Issue 17 of In The Garage. We are always looking for content so please let us know what is going on in your garage especially if you are a new contributor.

Andrew Willmott – TR3

Handbrake Lever Modification

The handbrake lever on TR3s and TR4s is always a bit of a stretch, even for those of a lesser stature like myself. Once properly strapped in with four-point harness the lever becomes unreachable and I've consequently developed various techniques to overcome the problem. These vary from heel and toe on the brake and throttle for hill starts, to releasing the handbrake with the back of the right heel once strapped in and ready to start off!
One solution is to fit a TR4a style lever on the prop-shaft tunnel but I find that positioning awkward and difficult to exert enough leverage from my low seating position. Apart from that the dogs like to lie along the tunnel wedged between the seats.
The "on" position can be brought in reach by simply loosening the cables but the lever remains out of reach when "off" and the locking pawl then becomes close to, or past, the last tooth on the ratchet. I considered bending the lever but that alone wont make enough difference until the bend makes the ratchet operation problematic.
A bit of head scratching and experimentation revealed that the ratchet could be lowered to bring the forward stop position rearward and allow all of the ratchet teeth to remain useable.
The ratchet is attached by a single bolt through its lower end onto a bracket bolted to the chassis. A new bracket was sketched up with the ratchet attachment as low as it would go before the bottom of the lever hit the chassis mounting. This was only about 5/8" lower than standard but a small change close to the lever pivot translates to a much greater change at the handle. A new modified bracket was cut from a piece of mild steel plate and bolted to the chassis. The handbrake assembly was then bolted back onto to the chassis with the ratchet secured in the new position and the cables were adjusted to suit the revised assembly.

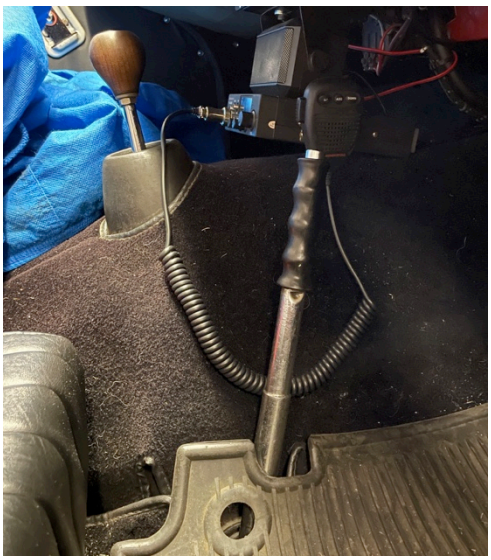
The original bracket on the left and the modified version on the right.



The new bracket in position on the chassis.

I tried fitting a long bolt to the rear bracket attachment with a spacer over the shank to act as a stop. It brought the "off" position closer to the driver but restricted the overall movement to a level where the cable adjustment needed to be too tight and it proved difficult to get the rear drum brakes sufficiently free when "off".

I neglected to take a dedicated "before" photo but this recent picture of the cockpit shows how much further forward the lever was compared with the "after" photo on the right.



A quick trial in the garage confirmed that I am now able reach the lever from my position firmly strapped in to the bucket seat. The coming season will reveal if the new lever position gets in the way while driving.

Wire Wheel Matters

The 5 ½" 72 spoke wires with 165 tyres which I use are too big to fit in the spare wheel storage compartment on the TR3; consequently I've always used the 4" 48 spoke wheel fitted with a 155 tyre which was in the car when I purchased it in the 1980s. Luckily I've never had to use it, as it is obviously well past its sell by date despite looking fine on visual inspection.
A replacement tyre was sourced on line and once the old tyre had been removed and the wheel cleaned and painted I came to fit it together with a new inner tube. Here's where the lesson begins.
First of all there are two valve hole sizes, a larger TR15 hole and the smaller TR13 as used on more modern wheels. The wheel in question had the larger hole and the old inner tube had the corresponding TR15 valve. As the replacement tube had the smaller TR13 valve a plastic TR13 to TR15 ferule was required.

TR15 to TR13 Ferrules

You are unlikely to find one in your local tyre shop but they are readily available on-line…or FOC from me if you need one as I had to splash out on four.

The second point of note is the two coloured dots found on the sidewall of new tyres:

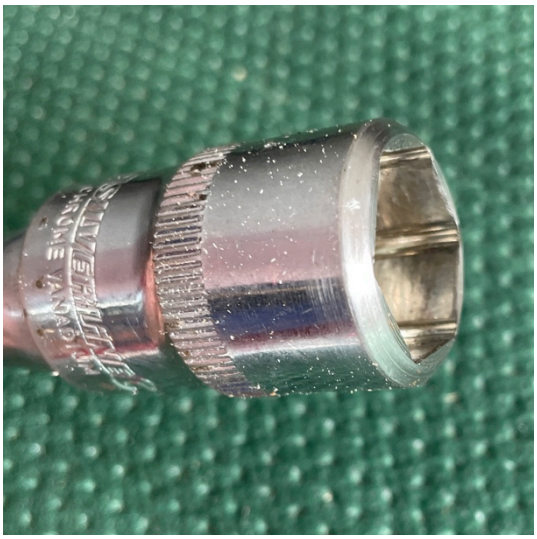
The yellow dots identify where a tyre weighs the least — the lightest point on a tyre. The yellow dot should be lined up next to the valve stem, which should be the wheel's heaviest point.

The red dots identify where the tyre is highest, usually where the belts are joined in the carcass. The red dot should be aligned with the low point of the wheel, which is usually indicated by a coloured dot or a notch on the wheel.

If a tyre has a yellow and red dot, the red dot takes precedence when fitting as the 'light spot' can be balanced out with rim weights. As it happens, the low spot on my spare wheel was adjacent to the valve hole!

There are a few other idiosyncrasies attached to wire wheels on Triumphs, not least the fact that the wire wheel adaptors require shorter studs and low profile double chamfered nuts to clear the back of the wire wheel hub. I get around this by fitting a ¼" spacer between the adaptor and hub. This simple measure ensures that should I wish to revert to bolt on wheels they can still be fitted. A useful facility when travelling in a group as should I be unlucky enough to suffer a double puncture a borrowed bolt on spare can still be used.

As can be seen pictured above the low profile double chamfered nuts leave precious little flat for a socket to locate on when tightening to the correct 65 lb/ft. This can be problematic, especially when the new adaptors from MWS are used as they have a slightly deeper counter-bore than the original Stanpart items. Problems can be minimised by using a six-point socket rather than the more common 12 point bi–hex type and chamfering the edge to fit as far into the counter-bore as possible. I use high strength Loctite on these to ensure that they don't come loose over time.



A read through the pile of receipts, which came with my TR4, revealed a history of loose and lost wire wheels, a scenario that is quickly explained by a look at the back of the wheels once they are removed.

The marks left by the incorrect, longer steel wheel studs are plain to see on the back of the hub. The wheel must have been on and off a number of times to cause that amount of ‘stud rash’ so it’s hard to understand how it wasn’t spotted after multiple problems with loose wheels.

Wire wheel hub showing “stud rash”

Long and short studs compared

To conclude the wire wheel advice the sharp-eyed may have spotted the lettering, which I use on my wheels.
Before fitting tyres I mount the bare wheel on the balancer (using the correct wire wheel cone mounting) and grade it by eye. The wheel is then marked 1 to 5 based on run-out and concentricity. The best ones go on the front, while the worst is consigned to the spare wheel compartment. This one is marked 2F N/S and came from the front nearside.

Andrew W

John Blake – TR4

Star Contributor

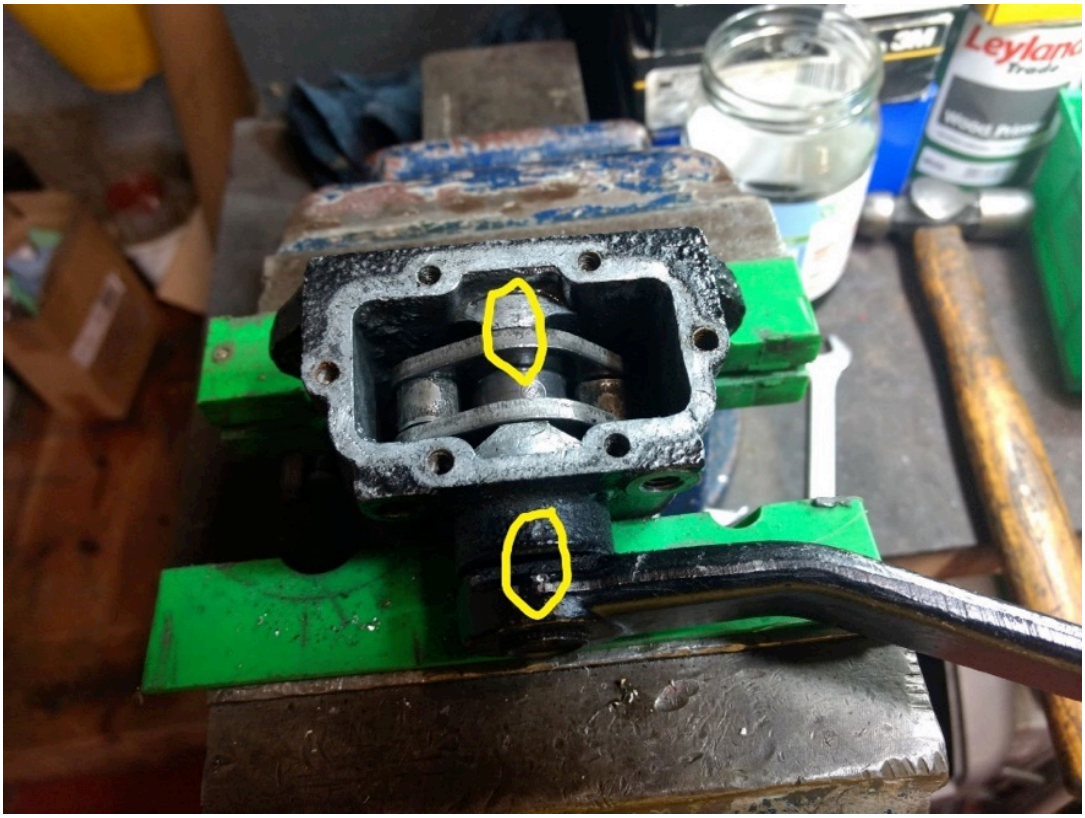
John writes:

Refurbishing Armstrong Lever Arm Shock Absorbers

This is one area into which I’ve never ventured before and I quickly found that there is quite a lot of good relevant information already available on line detailing how to adjust and service lever arm units. This primarily features flushing and refilling with different weight oils. Unfortunately it seems that all of those sources have failed to address the most common problem encountered; that of a leaking seal behind the main arm.
Everything I have read seems to suggest that you simply have to live with a leak at this point or send it to a specialist who has the ‘special’ tools needed, repair being beyond the capabilities of the average TR owner.
There is nothing like a challenge so here’s how it’s done, what’s involved and what it costs… actually very little.
The Armstrong shock absorbers repaired in this article are a fairly rare set of DAS 9 twin pots but the principle is the same for standard fitment lever arm dampers.
I believe the replaced components referred to in this article are the same across the TR range of Armstrong shocks and consider the repair well within the range of abilities of a competent home restorer.
The offending seal sits inside a recess in the damper body and is a square profile rubber ring, which although appropriate at time of manufacture in the ‘50s and ‘60s, can be improved upon today by replacement with a modern twin lip seal.
Please note that this is not intended as a service or adjustment guide for Armstrong lever arm shocks but just a guide to replacing the seals to cure the leak. Andrew has already written a great article detailing the rebuild, uprating and adjustment aspect. (Click here: In The Garage - Issue 13)

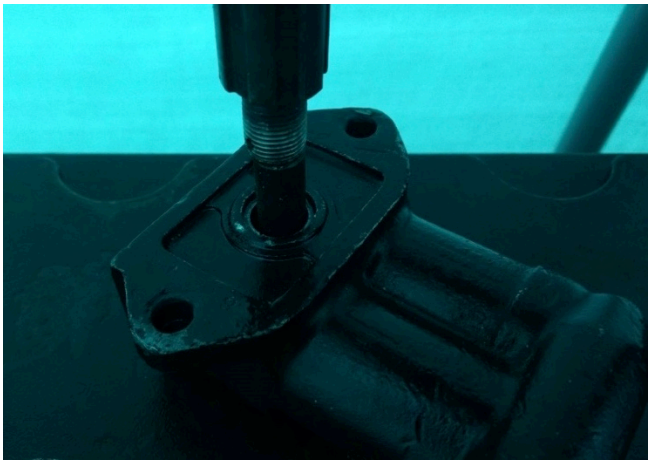
1) Remove the top and drain the oil. I found that some of the old screws were damaged and replaced them all with new cap heads while I was about it. Recover the gasket from under the lid, or if this is not possible make new ones as I did.

2) Centre pop, or mark the components in some other way, so that they can be reassembled in the same orientation.



3) Remove the rear core plug. I drilled a series of small holes and then fished it out with a screwdriver. Be aware there is a thin gasket around the inside edge of the core plug which you will need to re-use so be careful when popping the plug out.

4) Press the arm out (it's a press fit in the internal rocker) and clean the base of the axle where it has been sitting inside the old seal. Mine was a bit corroded and needed some fine wet and dry to clean it up.



5) Remove the old rubber seal and retaining washer – the old seal is easily removed. Mine was really crusty and slightly perished on the inside.

6) Clean the area and fit the new seal (R23/TC 17-27-5) with the original retaining washer on top. Press the seal back in, ensuring that everything is aligned correctly. I used a vice to slowly push it all together.

7) Replace the small gasket at the back of the recess and fit the new core plug, giving it a sharp blow in the centre to spread it and lock it into place.

That's it – no drama really, I re-sealed this set about 2 ½ years ago and have had no further leaks since. Total cost for core plugs and seals, less than a fiver.

<u>Spax Adjustable Front Shock Absorber Problems – TR4</u>

In preparation for this year's events I am in the process of stripping, checking and changing some of the suspension components. I have been using the Spax G209 adjustable front shock absorbers for the last few years and have had no problems with them up until now.
When stripping the front suspension, I found that the adjuster knob at the base of the shock had been damaged and realised that it had been making contact with the inner top rim of the spring pan during operation.

At the time I didn't consider it much of a problem but resolved to adjust the shock to zero and reset it to match my new springs before removing the adjuster knob. It is only secured by a single 2mm grub-screw. Any subsequent adjustments could be made with a screwdriver in the slotted adjuster screw.

When turning the adjuster anti-clockwise back to zero I hadn't realised that I was also turning the housing fitted to the body of the unit, and the whole assembly shot out at considerable speed driven by the pressurised gas and oil within.

Contact with Spax confirmed my fears, even though I had recovered all the component parts and the unit was only about 3yrs old it was not serviceable – basically scrap.
I removed the shock absorber from the other side and found it to be suffering from the same problem. This time, as I turned the adjuster slowly, I watched the retaining boss carefully, and sure enough it started to rotate out of the body with no effort at all.
I suspect that the adjuster wheel contacting the spring pan had not only damaged the wheel, but the intermittent impact had compromised the security of the adjuster assembly in the body of the shock absorber. The bosses have very little thread and it is quite possible that if undiscovered, they could have blown out in service.
The picture of a shock absorber re-assembled to the spring pan without the spring clearly shows what is happening: when the suspension is under compression the knob contacts the spring pan. Even with the adjuster wheel removed it's far too close to the protruding adjuster screw for comfort leaving only a millimetre or so clearance. I've tried turning the shock absorber 180 degrees but this made matters worse.

I don't know if this is also a problem for the IRS cars as they have a slightly differently pressed spring pan to my live axle cars but I suspect it could be the case and it is certainly worth checking by anyone using these items.
Contact with Spax revealed that no design changes have been implemented since 2004 and despite their continued sales of these units they have had no one else bring this issue to their attention.
This problem is not apparent until the units are removed so please check and be aware that if you have signs of similar damage ignoring the symptoms could lead to failure in service.
Subsequent to further discussions with Spax they have agreed to convert a set of the dampers to the previously supplied standard, which features a shorter screw adjuster with no turn wheel. At the time of writing I am awaiting the return of the modified units.
In fairness to Spax I don't consider this to be their fault but rather the fault of mainstream suppliers who have been selling these for years without confirming that the units are fit for purpose.

I have asked Spax to consider the alterations I have requested as the new standard for the live axle Triumph TRs. My request has been passed to their engineering department for consideration. In an attempt to ensure that no one else suffers the same problems I will pursue this and hopefully will be able to report back positively in the future.
There is a certain irony to my request given that the original Spax adjustables were built exactly that way before they were 'improved' with a long adjuster and turn wheel.
Onwards & upwards…
John B

Ed: Subsequent to John's experience I've checked my Spax equipped TR4 and was pleased to confirm that it is fitted with the earlier design adjuster as pictured below. These shock absorbers were fitted around 20 years ago prior to the manufacturer's design revisions.

STOP PRESS

John has just received the modified shock absorbers back from Spax and was delighted to find that they had been fitted with a flush fitting adjuster with a hexagon socket. This will allow a ball ended hexagon wrench to be inserted between the spring coils and located in the adjuster at an angle without slipping.

Even quite dark clouds can have a silver lining.

Zoom!

John had ordered some exceedingly heavy new springs and an anti roll bar from Revington TR and elected to collect them rather than pay for the recent vagaries of the postal system. Having ordered some parts for myself I joined him for a “jolly boy’s outing”.
Having collected the parts from the stores it’s always worth a wander across the road to the workshops to see “what’s occurin?”
We were treated to a TR4 Rally Replica nearing completion and a very rare Triumph 2500 Estate, which had been converted to four-wheel drive when new by Ferguson Formula using the same system as they had designed for the Jensen FF. The estate was on a four-post lift at the time so we were able to examine the neatly installed system in detail. With the car stood on the ground there were no visible clues to the exotic underpinnings other than “Town and Country” tyres.
We paid for the tour by being seconded into lifting the bodywork of the unique Zoom Prototype back onto its chassis with Neil and his brother.

Neil already owned the Zoom when I first met him in the mid ‘70s and having recently completed his TR3 Beta restoration the rebuild has at last come to the top of the jobs list. I’m looking forward to seeing it completed and on the road.

Andrew W

Bob Dove

Silicon Brake Fluid – A Different Perspective

A few words about the silicon brake fluid that Andrew favours, as my experience has been the unfavourable and there are some important points to highlight.
An industry expert told me years ago that silicon brake fluid was designed for military vehicles, hangar queens and very low usage historic vehicles. Because it is not hygroscopic like conventional fluid as you mention, any water which does creep into the system will fall to the lowest point and sit there corroding its way through pipes or cylinders. It follows that it should still be changed on a regular basis thus removing the first alleged advantage.
The most important point, and one which I have personally experienced, is that when hot it becomes compressible. Suddenly finding that your brake pedal is spongy half way down an Italian Alp is certainly no fun and the thought of this with any kind of high performance vehicle fills me with fear. I may be coming the other way!
The third point, and another I have had to deal with, is that of contamination. It is very important to clearly mark reservoirs when silicon fluid is installed. On several occasions I have had to completely strip and overhaul the braking system on a car because some idiot has put normal fluid on top of silicon. It doesn’t like it at all!
So that leaves us with only one supposed advantage that it doesn't pickle paint. Then don't spill brake fluid.
Sorry but balance is important in any article.

Cheers
Bob

Andrew Writes:
Further to my findings when stripping down the TR4 braking system I stripped out the braking system on my TR3 which, in contrast to the relatively newly acquired TR4, has been subject to regular if not frequent fluid changes over the years. I was pleased to find that there was no evidence of corrosion or water ingress so it all went back together with just a thorough clean and blow out with an airline prior to refilling and bleeding.
A brief note on bleeding with silicon fluid: I always make sure that the bleed nipple is fully open and ensure that the brake pedal is depressed briskly. I believe that the subsequent turbulence through the large voids behind the calliper pistons and in the slave cylinders is needed to displace any trapped water and eject it through the bleed nipple. If the bleed nipple is only just cracked and the pedal depressed slowly the low flow rate achieved is likely to leave any trapped moisture static at the low points of the system.

Mark Radford - TR6

Mark's rebuild continues apace over the winter. With the chassis now straight, the focus has moved to the bodywork.

From this side it looks like a TR6!

This picture of the nearside shows that there is still a way to go.

Martin Lovell –TR6

Martin has been multi tasking this winter, working on his TR6 and lawn mower at the same time. Perhaps we'll be seeing a very quick mower and an economical TR6 this summer ☺

You – Your Car

Thanks to all our contributors to this issue.
Contributions and feedback (positive or negative) are always welcome.

What's happening in your garage?
Please make a few notes about *your* garage exploits and email them to me for the next issue.
Contributions are best managed by sending in plain text with attached photos or in Word format.

Mail your notes and pictures to: andrewawillmott@gmail.com

Andrew W