



This was the bike when I bought it. At first inspection it looked OK, although it looked as if it had had a hard life, but as I found out later my 16H has literally been salvaged from the grave!



This is how it was found in 2007, 'as found parked in a hedge'! I was amazed when I first saw this picture. I was very impressed with his dedication in restoring what must have seemed like an impossible task. There were a number of things I wanted to sort out soon after I got it but most would have to wait.



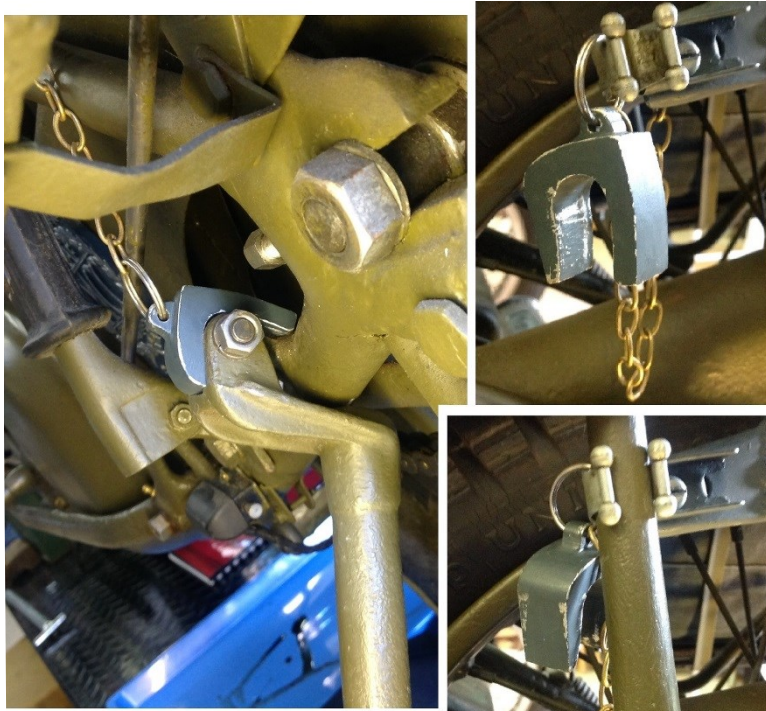
Apart from a few cosmetic changes I left it as I bought it and for the first year this is how I rode and exhibited it at a number of road runs and 1940's events.

After completing a check to make sure all was well mechanically, this included renewing a couple of studs and nuts in the gear selector to rectify the gear change problem. Renewing the leaking felt washer in the tell-tale with two leather ones stamped out of an old belt (it's a bit stiff, it works fine, pops up but needs a finger to push it down again, but I'm assured this will wear in). Changing a leaking fuel tap, then finally fitting a tap to the oil line and we were ready to go.

It wasn't long before a friend said "What you need now is one of those small 'carbon tet' fire extinguishers "

"yeah, but where am I going to get one of those?"
"I think I've still got my Dads one he had on his boat, You can have that, if I can find it!"

Excellent! Making a bracket for it was not to much of a challenge. I copied a full size one and scaled it down. The frame was from scrap 3/4" X 1/8" flat steel, the top clip cut out from 16-gauge steel sheet around a cardboard template. The cup is from a small soup ladle and with the addition of a wrap around quick release strap, salvaged from a broken rubbish bin, I think it looks OK.

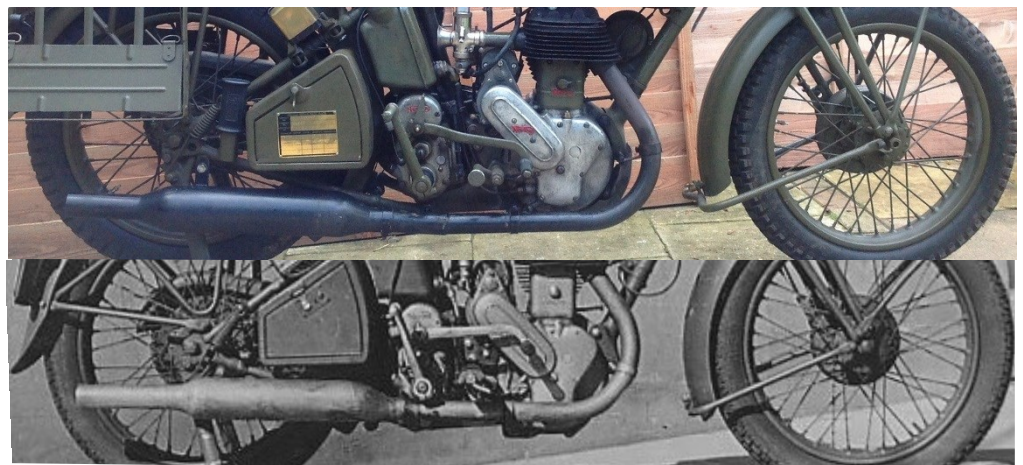


One other thing was, I had to do something to improve the side stand! This design must be the worst ever! Check out the wedge I carved out of a lump of billet aluminium to fit between the stand hinge lug and frame. I got the pattern dimensions from a lump of plasticine I shoved down the gap when the stand was down, works great! Plasticine is great stuff, when its room-temperature it will mould really easily then put it in a fridge (or freezer!) to harden to measure, without accidentally distorting the dimensions!

Rob van den Brink, of the brilliant web site www.wdnorton.nl which is dedicated to the Norton's WD 16H & WD Big4, was great in helping me research the history of my machine and using original photos off the internet I decided that it needed a 'winter project' make over to improve the original appearance of the bike. I was happy with it 'as is' therefore a complete rebuild was out of the question as I only wanted to do sections at

a time so I could put it back on the road as soon as each section was complete. The first thing I noticed after comparing original photos with mine was the exhaust, this I wanted to put right first of all, followed by replacing the oil pipes and basically clean up the appearance of the bike.

Compare the photos. The exhaust needs to be tucked up closer to the engine, the silencer brought in closer to the gearbox, (this will mean relocating the bracket) and about a 2" extension to the tail pipe. The whole thing will need to have the 'cut & shut' treatment.





One of a number of anomalies I found on my 16H was the use of a chaincase footrest tube on the right hand side of the bike. This had been repaired (badly) and resembled a hollow banana! Because of this the 7/16th rod had been replaced by a 3/8th rod and was clearly wobbly, so much so that when I first rode it, I felt, "this is not right" as it seemed to bend with my weight on it!

I then had to make the decision whether to locate a replacement. Where and at what cost? Or fabricate a new one. Chaincase 'tubes' seem to be readily available but right hand ones seem to be few and far between! OK I'll make one then!

Assuming that the dimensions are the same as a chaincase tube but without the sealing ring, it should be quite easy to turn one up on the lathe.



My initial idea of turning a new tube from a solid rod of 1-1/4" (32-mm) steel would be too time consuming as a lot of material needed to be removed, (plus I hadn't a large enough lump in my scrap bin) therefore I decided to make it in three sections. The main shaft from 7/8" (22-mm) rod with a 7/16th hole bored through it. The ends were then made separately using 1" & 1-1/4" rod, turned and filed to the required shape then brazed in place. I thought the filing of the 16 serrations to match the pattern on the footrest hanger would be the most complicated job but it was quite easy using a triangular file.



A few of the rusty engine mounting studs and nuts had to be replaced to tidy up the look, plus the kick-start and gear lever had a makeover.

Rob van den Brink was great in helping me discover some history about the bike. As it turns out it was first contracted to the RAF, initially as a combination, (this is born out as the drive sprocket is still a 17 tooth item) with the contract number S3959, (does the 'S' signify Sidecar?). This was a real delight as my main interest is with RAF memorabilia. With a bit of artistic licence I added 3959 to the tank. Now that I was satisfied with the right side of the machine (for the time being) I decided I still had time to tidy up the left side in time for the next season.

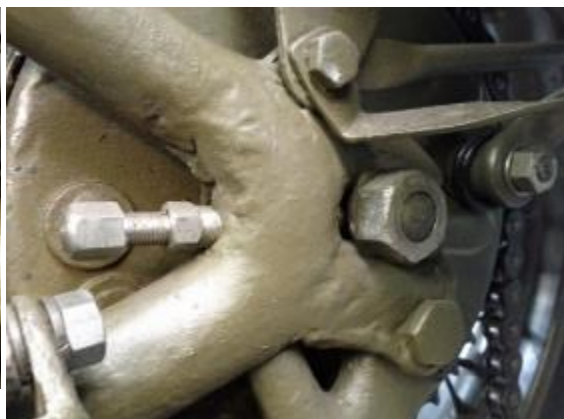


First job was to clean up and repair the chain case inner as it had a few mystery holes! I can't think that it's an original 16H item as nothing seemed to line up, hence the holes!

After a bit of 'cut & pasting' it all now fits together rather well. With the filler and dents knocked out of the outer casing I think it looks as it should and now lines up with the chainguard.



The next job was going to be the chainguard because when I removed it to work on the chaincase It was obvious that it had not faired well with the fight against rust, plus the mudguard (not original) had been patched up and needed to be looked at. But because of the condition of these items I wondered if I should leave them until later.



When my 16H was identified by Rob as the bike in the 2007 'as found parked in a hedge' photo, one of the deciding factors was the unique appearance of the left hand rear fork end and chain adjuster. 'Hats off' to the guy who done a remarkable job in resurrecting her from such an appalling condition but on closer inspection there still needs a fare bit of work to be done. Therefore I'll checkout the rear frame fork ends.

This is what I found under the paint and filler! Astonishingly no rust! But a large amount of welding and grinding has gone on. It was suggested to try and source another frame and cut the end off and weld it on to my original frame, or, just accept it as it is. I probably would have if I thought I could get another frame at a reasonable cost but now I've got this far, and seen what its like, what's to accept?

No, I thought that as it was basically solid weld I'll just renew the worst bits and finish off the rest with more welding, grinding, drilling and filing to achieve a more authentic look.

I didn't want to go ahead and cut out the worst bits first and then replace them because the frame is remarkably straight and true. Therefore I'd fabricate the parts first, pair them up, then cut out the old bits and weld in the new parts.



The remaining lugs were in such poor condition I had to guess the shape and dimensions. Plus any photos I got from the internet were also pretty poor, so they may be slightly different!



First off was to find material for the new brake torque arm lug and pieces of tubing of the correct diameter and thickness as the original frame. This came in the form of a pair of old 'broom handle' handle bars for the frame and a rummage in the scrap bin found a length of 1-1/16" conduit that just needed to be bored out slightly to 7/8" for it to slip over the frame.

The whole thing was made in four parts, its main body was turned down from a 1" rod and bored through with a 3/8" drill.

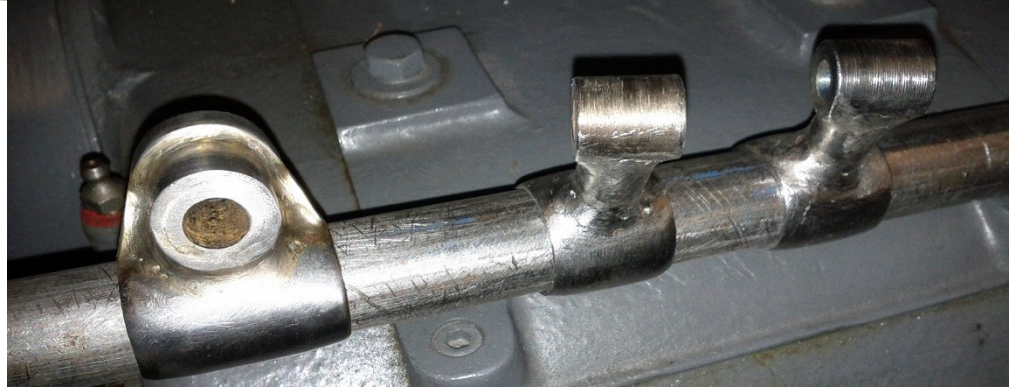
The main parts were first tack welded together, then the side 'support' edges were added. This was then all welded together, filed down then filled with braze. Finally the whole thing was filed to shape.





Next the rear footrest and propstand lugs. As one lug was missing I assumed they were both the same so decided to make a pair, using what was left of the original as a rough guide. Another rummage and again parts were turned on the lathe, then welded together. To get them to hold together for the first 'tack' I placed them in a blob of plasticine! Very useful that stuff!

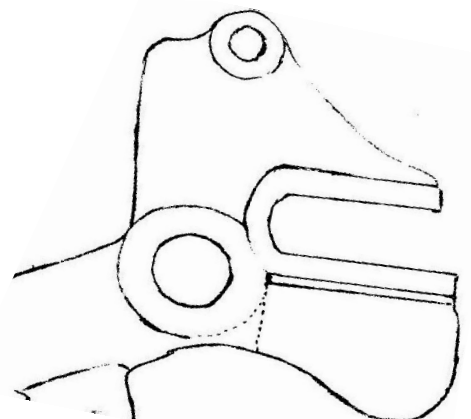
I chose not to use braze on these as if when fitted they needed to be heated up for final adjustments the braze would just melt away.



Now for the fork end and adjuster. I looked and thought for quite awhile, all due respect, but it was a mess and would need allot of tricky and laborious work, I then decided, 'what the hell', it would be just as easy to fabricate a new one rather than mess about trying to make a purse out of a pigs ear! You'd think! This would be my most challenging job yet!



Assuming both sides are the same but mirrored I used a photo to make a 1-1 scale drawing.

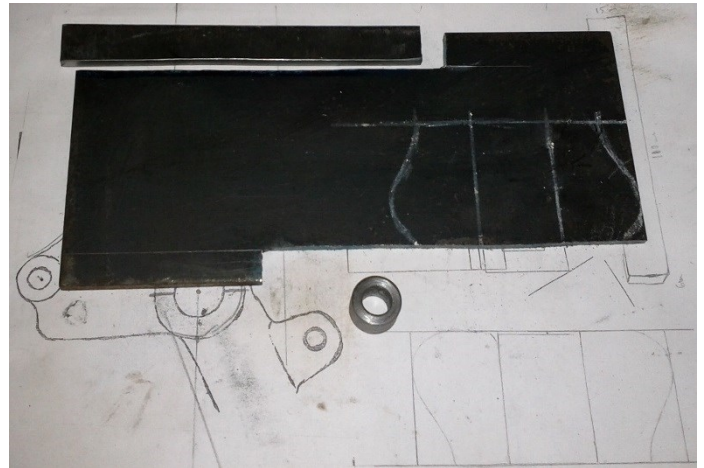


The original part was probable cast as a single piece. I would have to make it in sections welded and brazed together. Therefore I decided to make it with four main parts plus the tube sections for the new frame to slot into.



The first cut.....
Using 1/4" flat steel, now for some filing!

After marking out onto 1/4" sheet (an off-cut from the corner of a welding bench I made some years ago, don't throw anything away!) the next cuts had to be more precise, using a hacksaw.



Using heat these two pieces were bent into shape 'tack' welded into place, filled with braze and filed down. The holes will come later.

The next section was also made in two parts. They were turned from a 30-mm rod bored through with a 5/8" drill and for the 'adjuster' a 3/4" rod drilled through with a 1/4" (pilot hole) drill. After filing a groove for a snug fit another groove needed to be filed for the adjuster bolt to fit. After being tacked in place I made sure the hole and groove still lined up before tacking the other side.



A top and bottom tube for the new frame sections to fit into needed to be made, the bottom one was easy, a length of 1-1/16" tube just needed to be bored out for the 7/8" frame to fit, then cut to an approximate length (slightly over sized). The top tube was basically the same but needed a plug in one end, turned to a round nose. This was measured, cut to length and the end edge feathered to match the original.

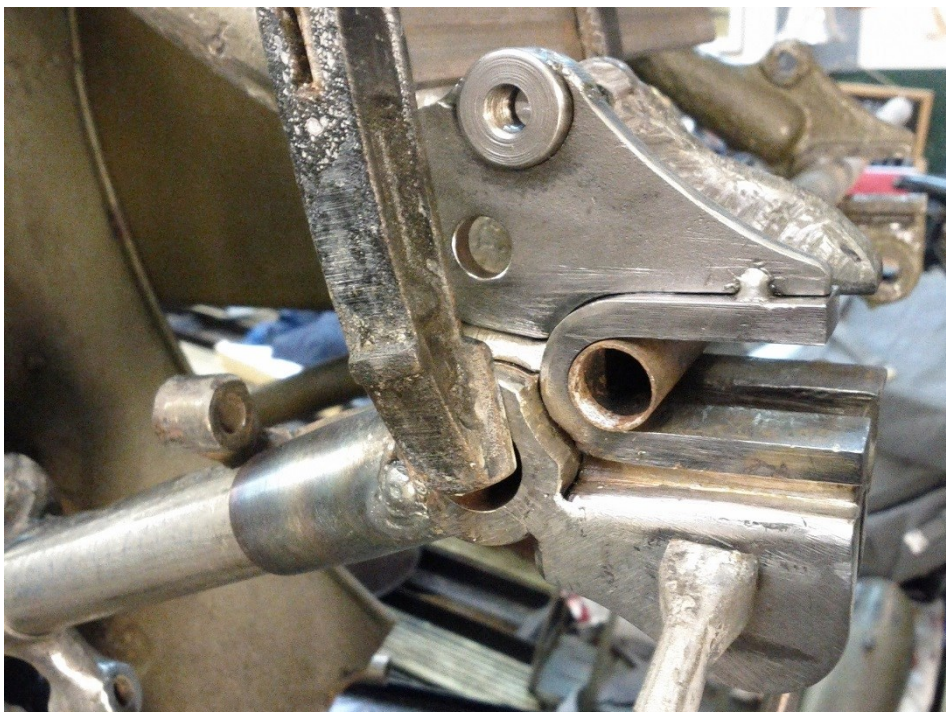


Two small lengths' of rod now needed to be turned and bored for the rack stay bracket (straight forward) and another for the left hand exhaust lug (is for the 'Colonial' model?). I thought it would be easier to turn this from a rod then weld it to the frame by building it up with weld and filing it down. With hindsight it may have been easier to just make one out of a solid lump and just weld it on! But it still looks OK so I'm pleased with it.



Here are all the parts nearly ready to be clamped and tacked together, (I don't think I'll use plasticine!) the bottom tube needs to be 'C' cut and the front end feathered.

Its taking shape, although it needs some tinkering to the angle of the bottom tube.



Just checking it all lines up when clamped in position, bottom tube angle is corrected, top tube still needs to be slotted to fit the top section.



Top tube is now slotted in, recheck the angles and alignment ready to tack the top tube in position.

The top tube is also slotted for it to insert further, for extra strength when brazed.



Everything is now all tacked together, and clamped to the 'good' side to check alignment (again).



The rear stand holes are now drilled and tapped. With the bottom tube at the correct angle this can now be welded together. Then the rear stand bracket can be finished off with two small side fillets.



The small fillets are cut from some off-cuts to fill in each side of the rear stand bracket and will be welded in.



The bottom tube is now welded on, as too are the fillets. The exhaust bracket was welded on and the whole thing is then filed down to its finished shape all ready for all the joints to be flooded with braze.



I wanted to do it all in one go, to keep it hot. After one side, flip it over for the other side.

Once all the flux was removed a bit of final filing was required to finish it off.



The 1/4" pilot hole was drilled out to 6.9-mm for it to be threaded with a 5/16 UNF 24 t.p.i. tap. I had to extend the tap with a 1/4" socket for it to reach all the way through.

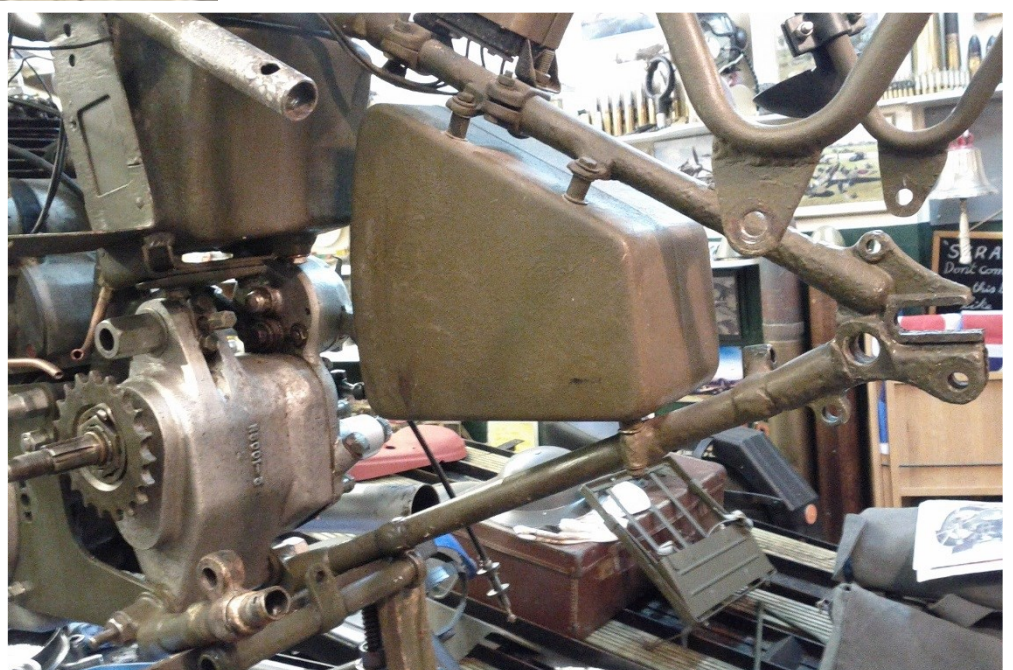


It's looking very good and I'm really pleased with it at this stage!

A final pairing up check, before, getting the hacksaw out and cutting the frame!



OK, now lets see if all this work has paid off!





Next I had to put a matching bend in the new frame section. For this I used my Fathers old pipe bending block that I remember seeing him use for conduit when I was a child! It only needed a small bend and worked just fine.



Its now all put in place, lined up, squared up and level, ready to clamp together for a wheel fitting!



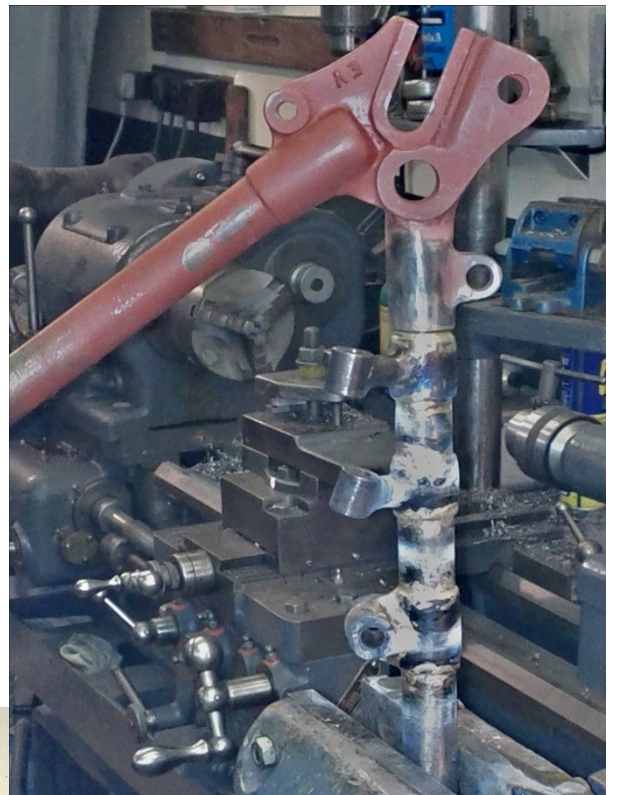


I'm so pleased, it all fits together, lines up and everything is level and square.

The brake torque arm lug is lined up ready to tack, then the prop-stand and foot-rest lugs will be lined up and tacked on.

They are then brazed off the bike.

When cleaned up the whole unit will be ready to attach to the frame, hopefully for the last time



This is it, all ready to attach to the frame, but joining it creates its own problem.

Butt welding or brazing will be too weak, therefore a tube of the inside diameter of the frame knocked through both frame ends will be used. Using the characteristics of the braze capillary action I hope this should be strong enough. Also I thought a peg, similar to the pegs used in lugs



and joints through the original frame will add extra strength. But because of the frames angle I can't just slip it over the inner tubes, so I've decided to braze in the bottom inner first, then for the top, use a sliding tube slotted into the new frame section that can be knocked into place. This and a peg can then be brazed into place, filling the slot with braze. Well that's the theory!

Did you notice the makers letters 'E V', on the original right hand fork leg?

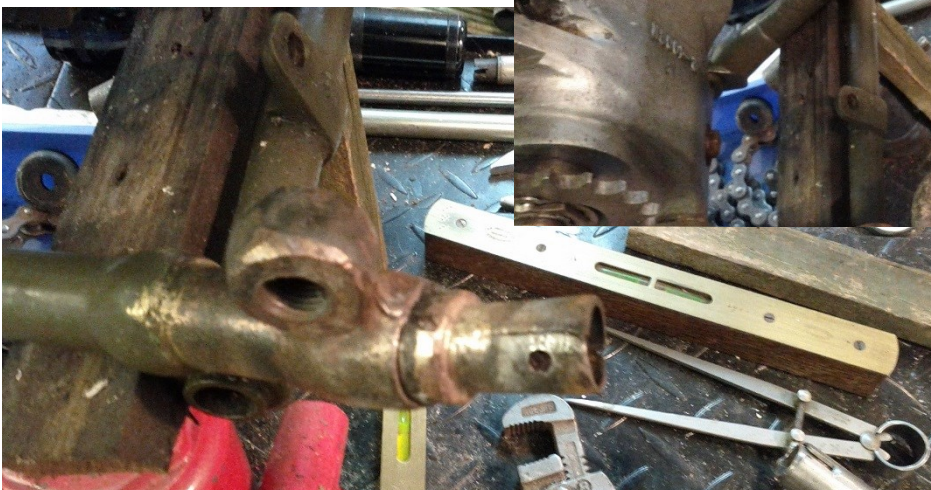


Well I couldn't resist, and had to put them on the 'new' side, just for that finishing touch!



And this is the top tube, (offset to show the inner tube) ready to be knocked into place.

As can be seen its now been tapped into the top tube ready to be brazed in. The peg will be ground off later. The hole in the top frame end is to help the braze capillary action. Moulton braze flows better downhill!

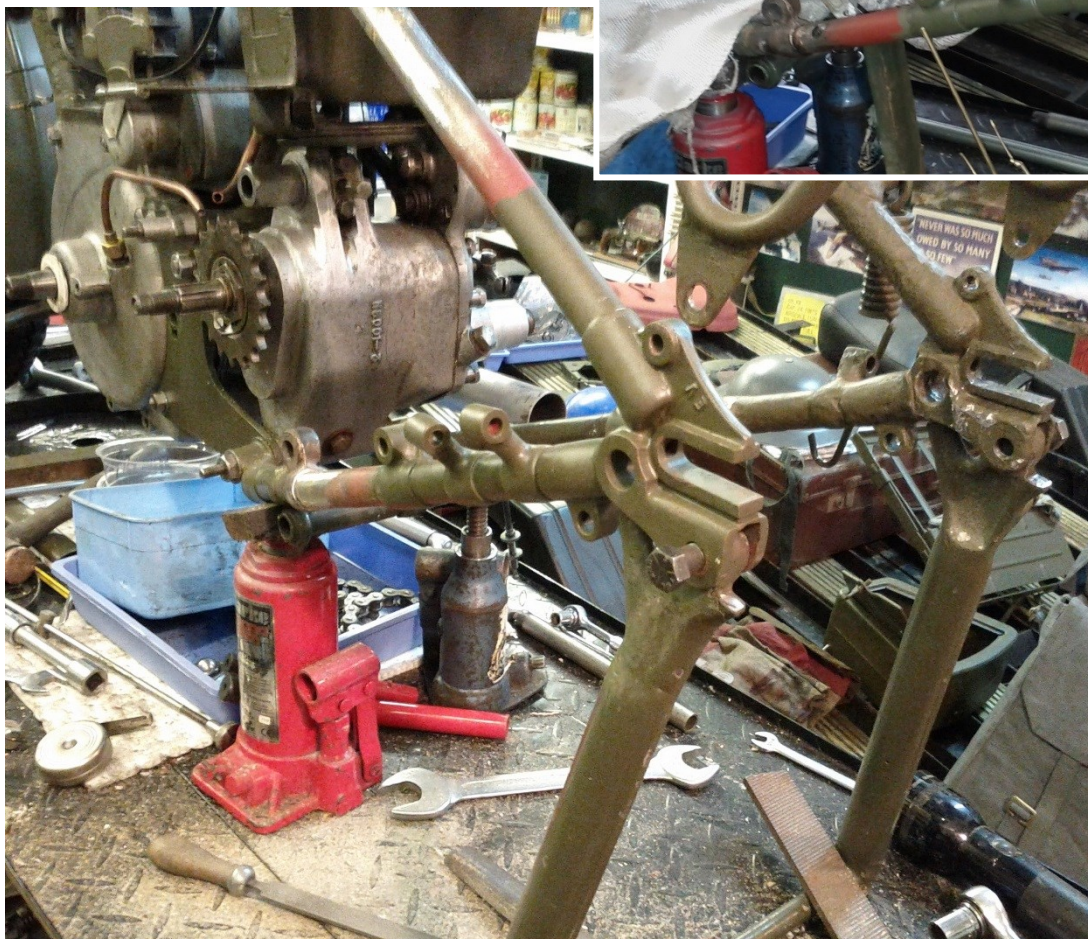


This is the bottom tube ready with its inner tube brazed in and pegged.



It's now all connected up, all in place, clamped and ready to be tacked in position. I thought I'd paint it first off the bike as the heat will probably not get that far, but if it should a little 'Cold Front' should protect it.

Now it's tacked in place it just needs brazing together.



Now it's all brazed together and filed flat, (spot the brass filings!) it just needs painting.



Now its all painted, its ready to put back together. First though I've got to sort out the mudguard then back to finish the chainguard.



This is what I found when I took off the chainguard, its actually two mudguards (badly) welded together. The indent for the chainguard looks like it was just hammered in after it was welded together.

There were also some random holes that were blanked off with blind nuts & bolts and some just holes! (nine all told). These I wanted to weld up and do away with the bolts, so after a painstaking first hole welded with a small disc, I thought that there must be an easier way. Cutting a small round disc was fiddly enough, therefore I thought about hacksawing off a small disc from a bolt of the same size as the hole.



Then I had the idea of tapping the hole to the size of a bolt, screwing it in until it was just proud of the other side and locking it with a nut.

I did this with all the rest of the holes, turned the mudguard over and welded them all in perfectly.



Turn it back slacken off the nut and hacksaw it flush with the guard. Now a bit of fine welding on the outside, then grind it off to a perfect finish (you could use a smearing of 'metal stopper' if you wished as it is secure from the inside anyway, its up to you)

Once this was all done, strip the paint, a bit of panel beating, more welding, grinding, filing, sanding and it was ready for a paint job.

Next we go back to the chain guard. When stripped of paint and filler it also was pretty rusty. I wanted to keep as many of the original parts on the bike as possible so I decided to give this a makeover as opposed to replacing it with a new one. First get down to bare metal (ex rust) and see what we have. After rustproofing and a quick coat of primer I set about the bracket.



This was very rusty and was badly repaired. I found a diagram on the internet and made a new bracket before grinding the old one off, after I made a note of its exact location. Once this was ground flat I brazed on the new one.

Now the bracket was in place it was time to line the chainguard up with the chaincase. As you can see in the before photo, when bolted to the chaincase, the fixing hole was out of line and the chainguard sat too high.



With the old hole welded up a new one was needed. The position was checked using a cardboard pointer lined up with the bracket behind. At this stage I left it on the back-burner while I concentrated on the rear frame fork end.

Getting back to the chainguard I set about repairing the rim around the bottom edge as the rust had reduced the edge down to a rusty razor blade. I drew around the edge for a template and cut out a new edge from of 1mm thick steel sheet. I made the new piece 3mm wider than the edge to make the braze flow easier and further between the two pieces.



To braze this against the original edge the heat would probably distort the whole thing so I clamped it on with as many mole grips as I had. This way I only had to use the minimum amount of heat to braze in between the clamps. To keep the heat as low as was necessary I used a small welding/brazing kit that has only a fine flame and runs on disposable oxygen and propane mix.



Once it was brazed between the clamps they all came off and then filled in the gaps.



The extra 3mm edge was then filed level, the contour checked then flattened and primer applied. It went well, no distortion and the edge is as thick as new.



Its now the middle of March and this is how it looks so far. Just a few things to sort out before the first outing on April 24. The horn (and bracket), tool box and the number plate need looking at.



So here it is after its first 'Winter Project' makeover. I didn't get as much done as I wanted but I'm happy with it. I think it looks so much better than before.



I didn't get to do the number plate or tool box but that can be a working progress. The pannier rack needs a revamp but that again will have to wait. A number of other things that were tidied up were the battery and carrier, the voltage regulator and bracket (this will need more attention later on), the rear wheel sleeve bolts (I had to make a new one!) the sump guard and the valve cover. Next year I'll be giving the rear brake drum, the oil tank, the right-hand frame fork end a 'make over' and if time a front-end frame, front brake and fork overhaul.