

## Virtual Work on the Table 10-Jan-21

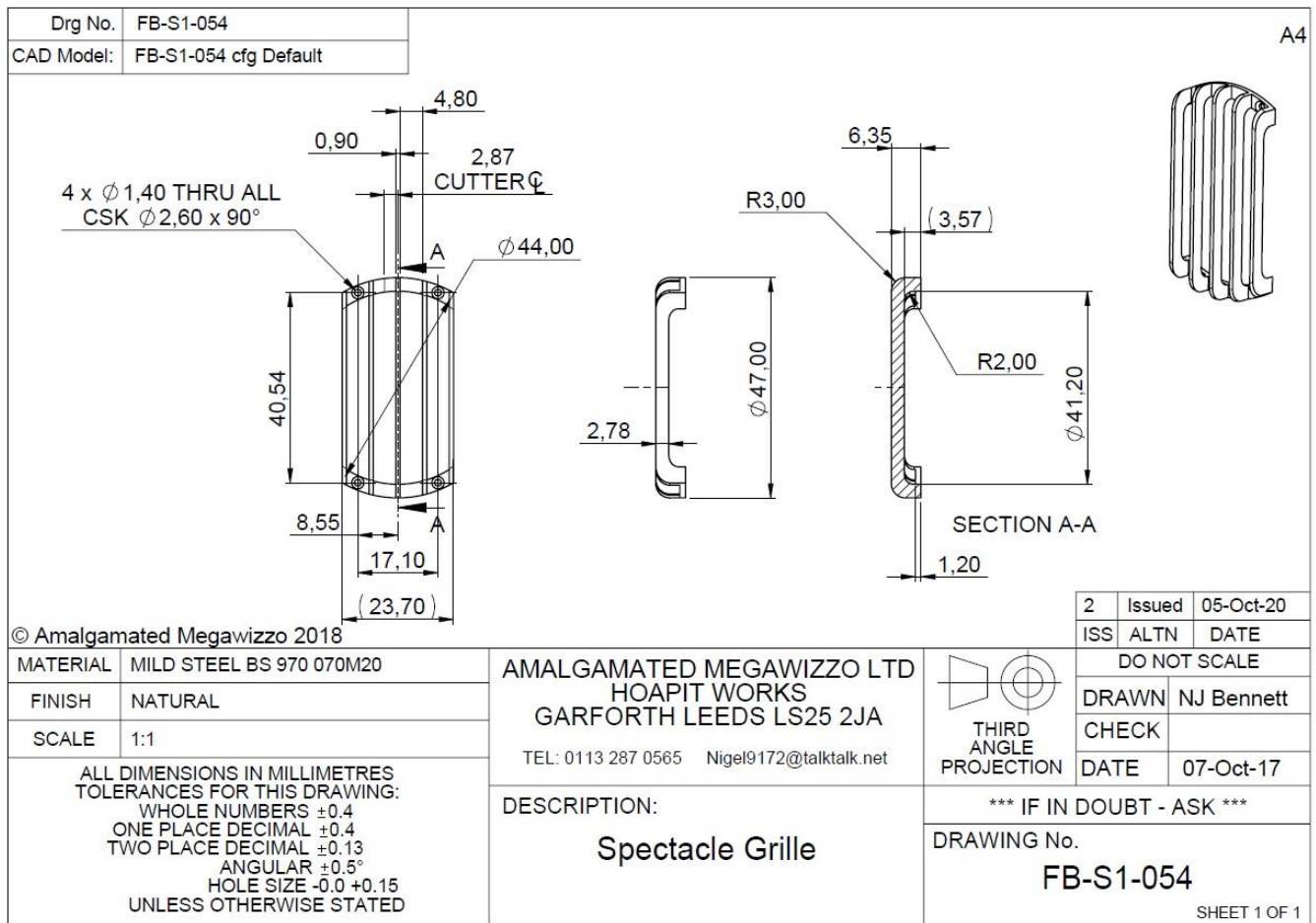
Here was a job I'd been pondering about for a while. The Adams O2s were all (eventually) fitted with an extended coal bunker when transferred to the Isle of Wight, but before that they had had coal rails added to increase coal capacity. When the coal rails were fitted, it became necessary to protect the cab windows from over-enthusiastic coaling. Here's the sole remaining O2 No.24 *Calbourne*, showing the extended bunker; window protectors very much more important now! The line of the original bunker can still be seen.



Ashey is having the standard bunker with coal rails, as originally supplied to the Island. So I needed to make the protectors over the windows. The method of manufacture of these protectors was giving me pause for concern. The originals are ferrous castings, but I didn't fancy that.



I created a drawing for the part; Don Young's drawing wasn't quite right – one too many rails – so I'd redone it more like the photo.



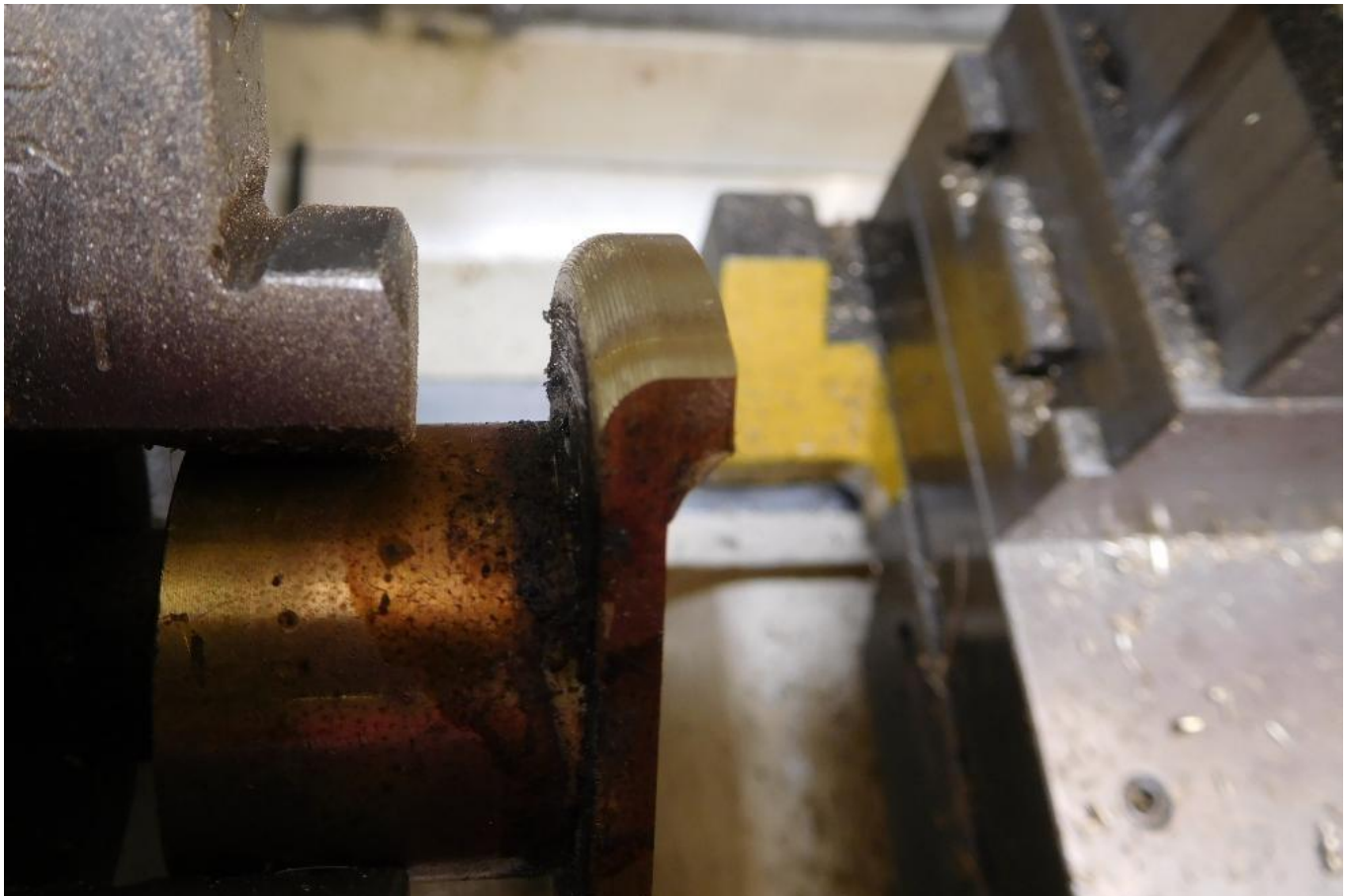
But how to make it? I'd already rejected casting them – making a pattern for whatever method would involve as much work or more as making one – and I only wanted two parts! I suppose I could have got somebody to 3D print a pattern (or even produce laser-sintered metal parts) from my CAD model, but that's going a bit far unless there was no other way. So I could either make them out of solid, or make seven individual pieces per part and solder the job up. So laser-cutting might be an option. However, the make-from-solid idea seemed to make sense if only I could hold it to machine it.

I had a sudden change of mind yesterday when I determined to start to make it – I used brass instead of steel as I'd originally envisaged. This enabled me to soft-solder a 1" diameter boss on to one side of the embryo protector, which was a suitable length of 1/4" x 1" brass bar. Brass seems to soft-solder better than steel, and is so much easier to machine with sharp cutters. I took care to position the boss as centrally as I could, and after turning the outside diameter, I started to turn the inside profile of the job with a boring tool. (Yawn!) I had previously machined a 14mm diameter flat-bottomed hole to depth in order to give the boring tool somewhere to start; 14mm is the largest cutter I have that will fit into a conventional tailstock drill chuck. (Plus it's relatively new and so nice and sharp.) But no photograph of that stage – I forgot, and it's too late now!

I didn't have a suitably-radiused cutter to form the inside radius I wanted, so I used the coordinate method, using the X-Z numbers kindly provided by little the chap in my computer. That nice Mr. Pythagoras has all the answers...



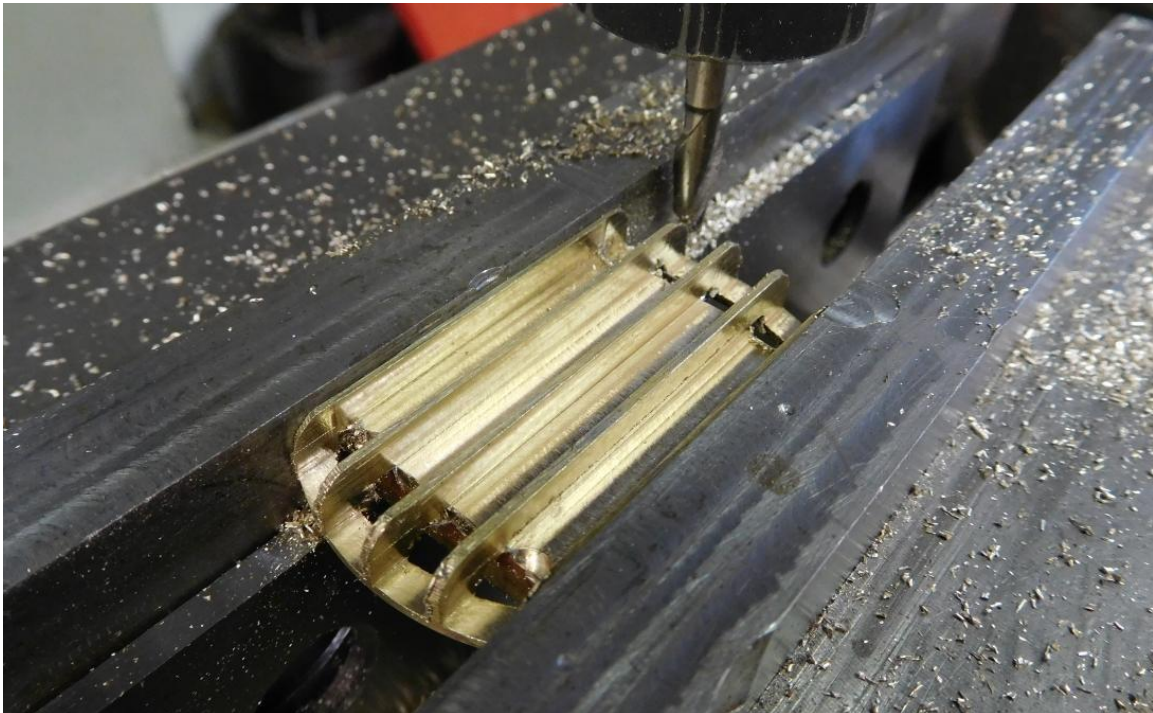
Same process was used for the external radius, but using a parting tool, which could get into the gap between the chuck jaws and job. You can just make out the steps here – they're 0,25mm increments. (About ten thou...)



The boss had only been soldered to the job by “rack of eye”; there was enough material to permit this. Next step was to machine the part to finished width. I used the OD of the boss as a datum for this too – it had been the datum for all the turning. This ensured that the part ended up symmetrical. The boss was un-soldered, and a chunk of brass bar soft-soldered to the previously-turned recessed face. This bar was then carefully machined back to the same width as the job.



The assembly was mounted in the vice on parallels and the slots cut to full width ( $3/16$ ”) in slowly increasing depths (no more than 1mm a time; 0,5mm when nearer full depth) until the  $3/16$ ” cutter just burst through into the brass support bar. It was very necessary to have some kind of support for the increasingly-fragile bars until the last moment, as they could easily have bent or even wrapped themselves round the cutter. There would have been little chance of gripping the job in the vice without crushing it unless the brass support had been there.



A quick application of heat and the support bar fell away. Some attention with a file to a few little burrs is now needed, and I also need to drill some holes to affix it to the loco. The de-burring will have to wait until my wrist gets better as I simply can't hold the part properly in my left hand to attack it with files – and I can't hold files in my left hand either, even if I could work left-handed.



*(I mentioned earlier that I'd soldered the turning boss to the part "by rack of eye". I had allowed enough material to cater for reasonable errors in my positioning. I couldn't locate the boss in a bored hole in the job, because it was already the finished thickness. If I'd done that, I'd have ended up with bits of the bars missing! If positioning had been more important, I dare say I could have drilled and tapped small holes for screws, carefully positioned to end up between the bars.)*

Being effectively one-handed of late has given me even more respect for David Burton and how he manages to build locos and other things in his workshop; I do at least have one-and-a-half working hands at present!

Happy New Year to everybody; look forward to meeting up when it's safe to do so.

1/2021.