Gauge One 3D Printing Circle

BR Brake Van World Tour 13
Rebuild

Author: John Boyson

The refurbished van ready for packing and posting.

Following our return from a holiday in Japan where sadly the brake van was banned by the highest authority, attention has been focussed on its rejuvenation since its future has now been clarified somewhat. First of all, it has been invited to the British Railway Modellers of Australia (BRMA) annual convention in Launceston, Tasmania from 24th to 27th October 2025.

It will also be attending the Christchurch Convention on 4th to 7th February 2026 following its Tasmanian trip where Andrew Bishop has kindly agreed to take over custodianship for a stint in the South Island.

Hopefully, it will then be able to visit the lower North Island before heading back to Australia once again to continue its world tour.

Given it has become more than a little dilapidated, both in the UK and more latterly on its travels over here, I had to make a decision. On one hand, it was built almost 100% using 3-D printing as the process. It would have been good to maintain the purity of this in recognition of the historic significance of the model. However, practicalities also reared their heads since time and exposure had reveals some weaknesses. Thus, just like the upkeep of any machine, refurbishment was necessary. In addition, given the exposure of the van during its travels, replacement of the damaged areas really needed to be done in more robust materials as well.

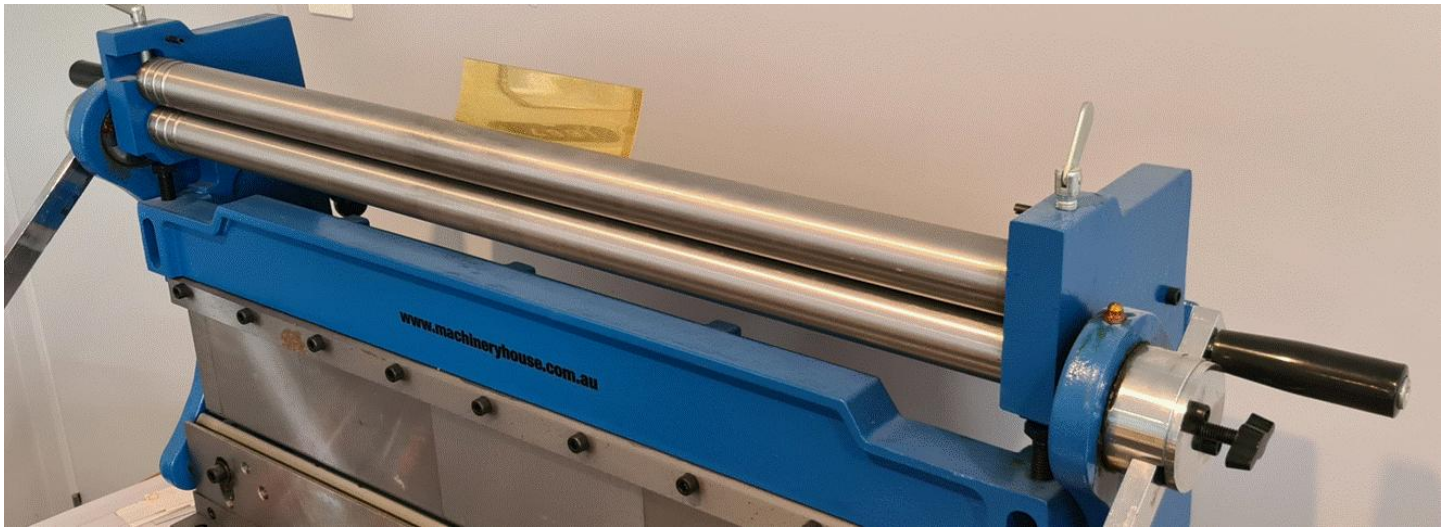
Having previously consulted with its builder, Tref Willingham, he had indicated he was happy for whatever work was needed to be done to happen as each individual caretaker deemed necessary. Thus, with his blessing, I took the actions that I felt best preserved the longevity of the van as opposed to maintaining it in as best as would be possible in “original condition”.

Accordingly, I have resorted to the use of brass for most of the damaged and vulnerable areas to improve its robustness as the story below outlines:

The first area tackled was the roof. This had been formed in two sections like the body. These had gradually been moving further apart (rather like the two islands of NZ!) This was distorting the body and underframe which was beginning to develop a hog. In addition, there were numerous glued cracks etc. and the whole thing looked really untidy. So, I bit the bullet and carefully removed it. The gap in the central joint of the two body sides is evident in the photo above. In removing the roof, I found out just how difficult working with PETG (the material used to form the prints) is compared with the ABS like resin I am more used to. It really is awful stuff (sorry Tref!). Despite my attempts at care, three of the four veranda beams have snapped off during the removal. In the end, the only way to get the roof off was with the Dremel since hand tools barely touched the PETG.

Another area that was particularly vulnerable and which were showing significant wear and tear, were the steps along the underframe. These were cut off as well.

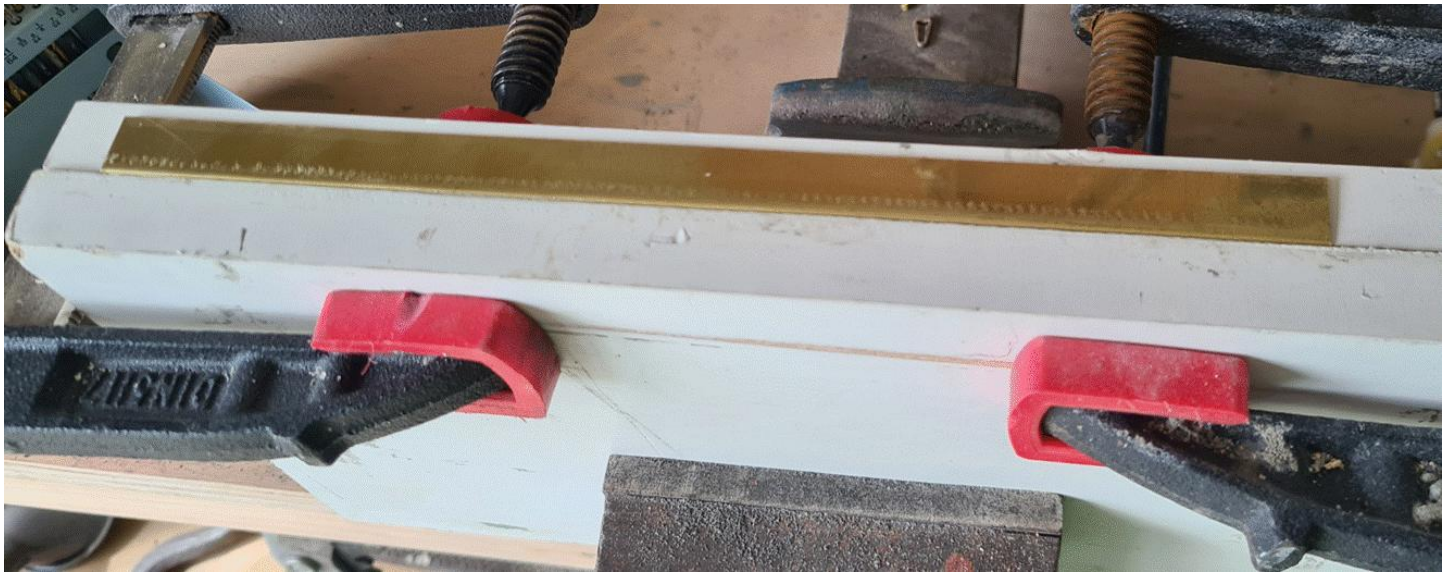
After all this painful surgery, the first task was to straighten the body and glue the two halves together. Here they are being forced together with clamps whilst the glue sets.



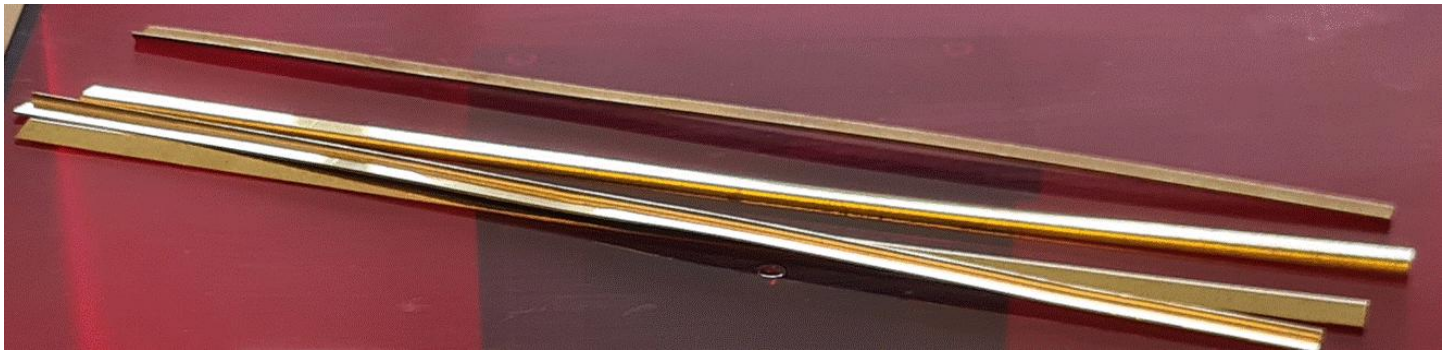
A new roof being formed from a brass sheet through my rollers.

The new roof.

The new roof with holes drilled in for the chimney and ventilators together with the old steps. These are really fragile and bendy. Not ideal for a life on the road.



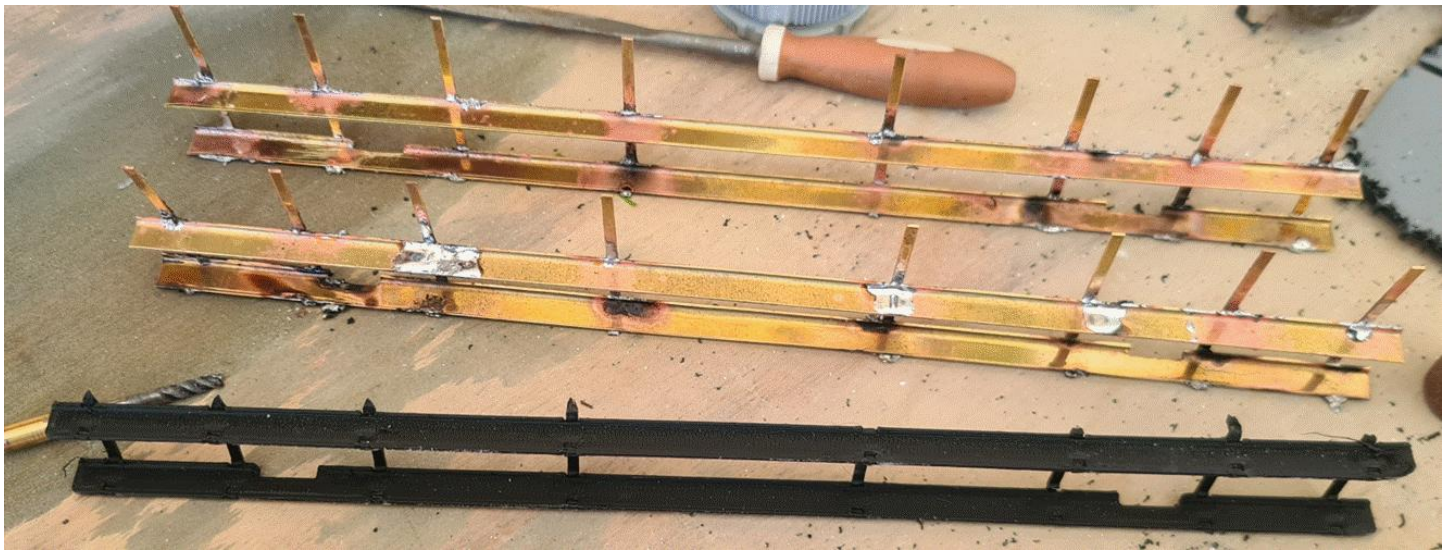
New steps being formed.



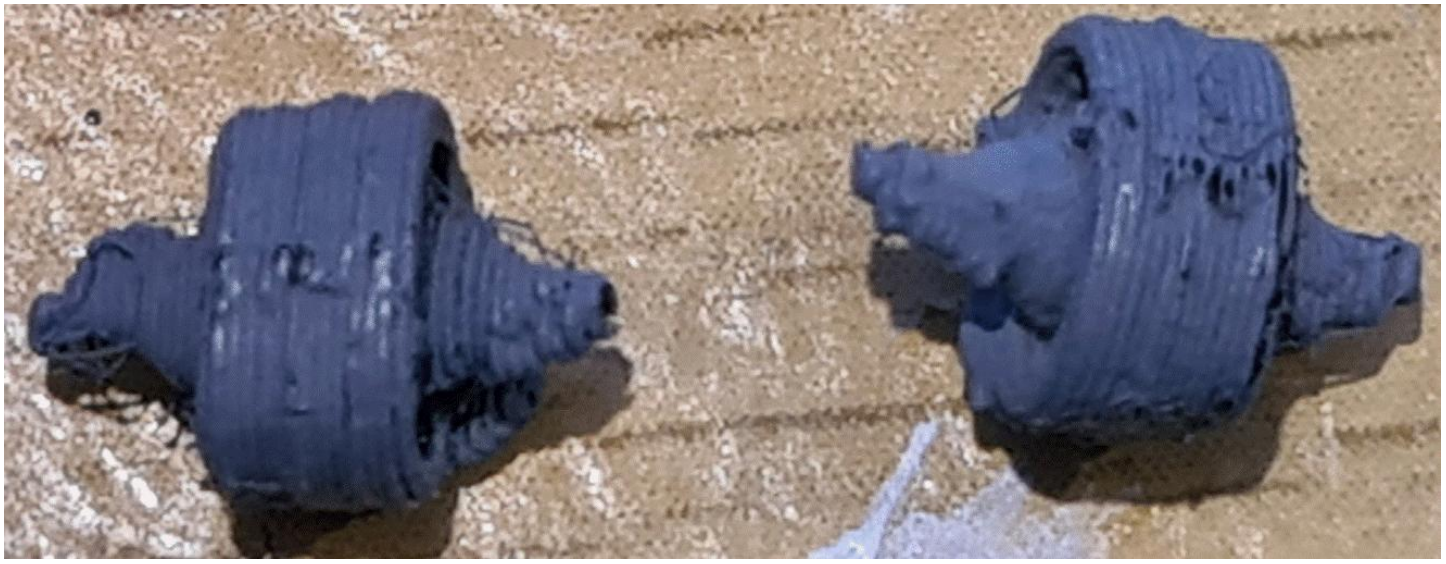
Four steps ready.

Connecting straps being soldered in place.

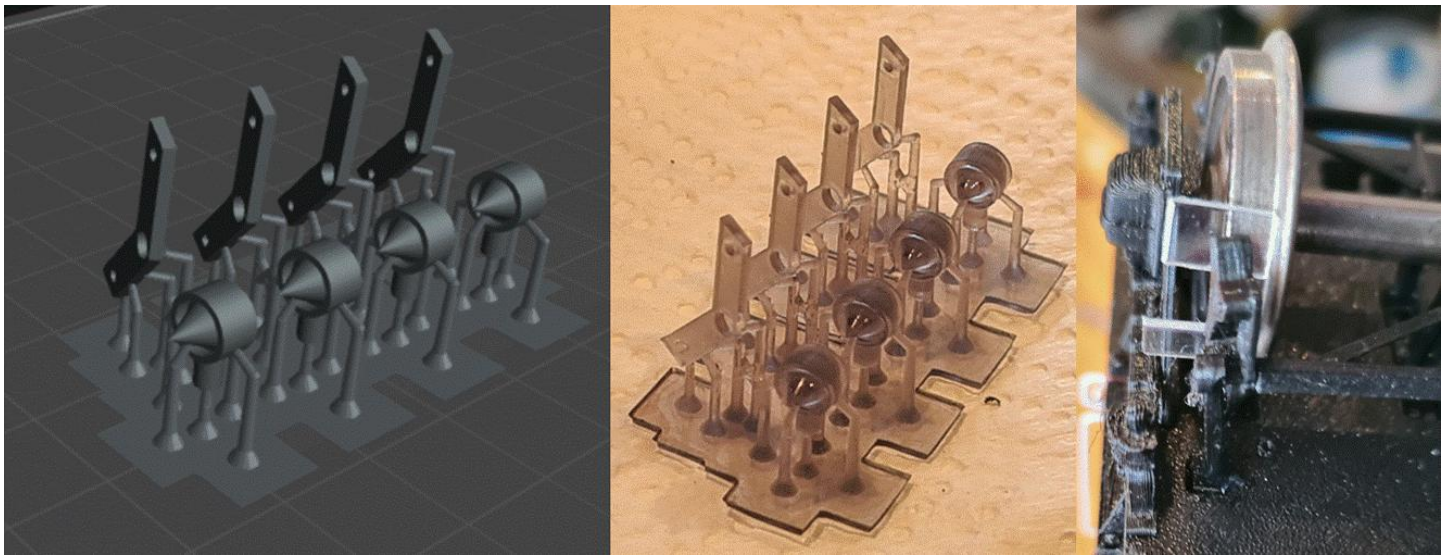
Second step being added.



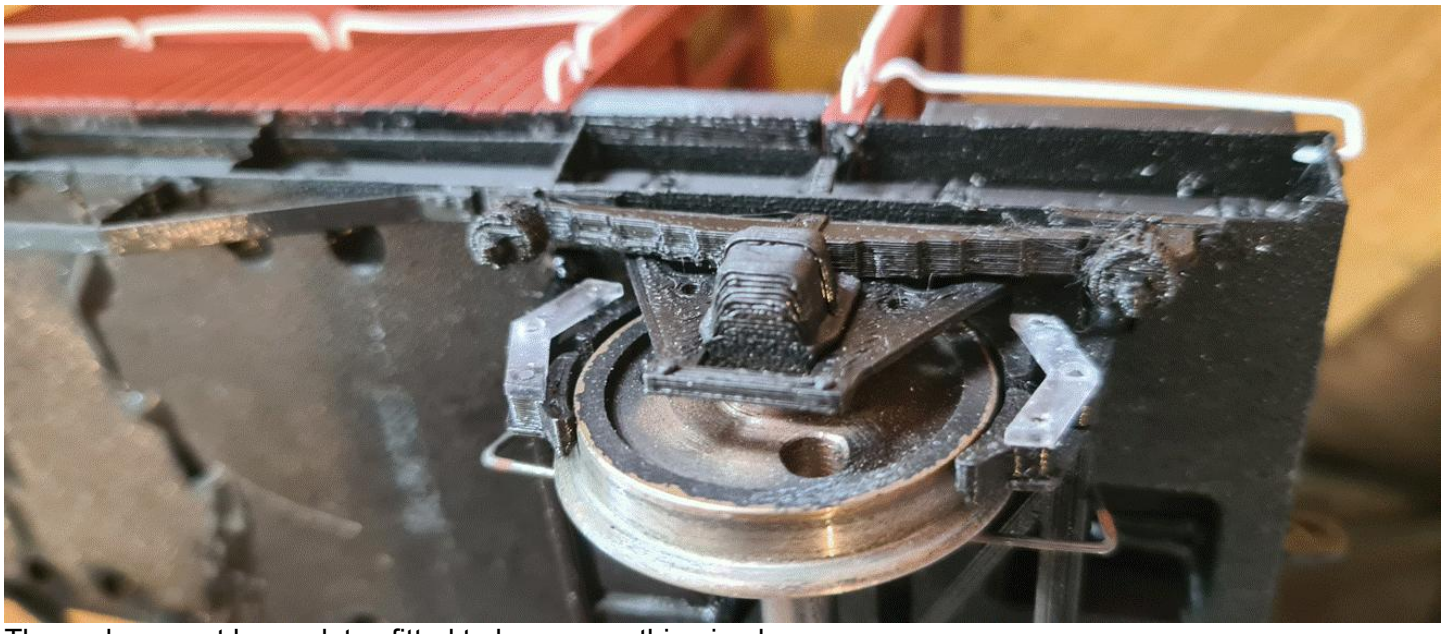
Completed steps ready for finishing with an old set in the foreground.



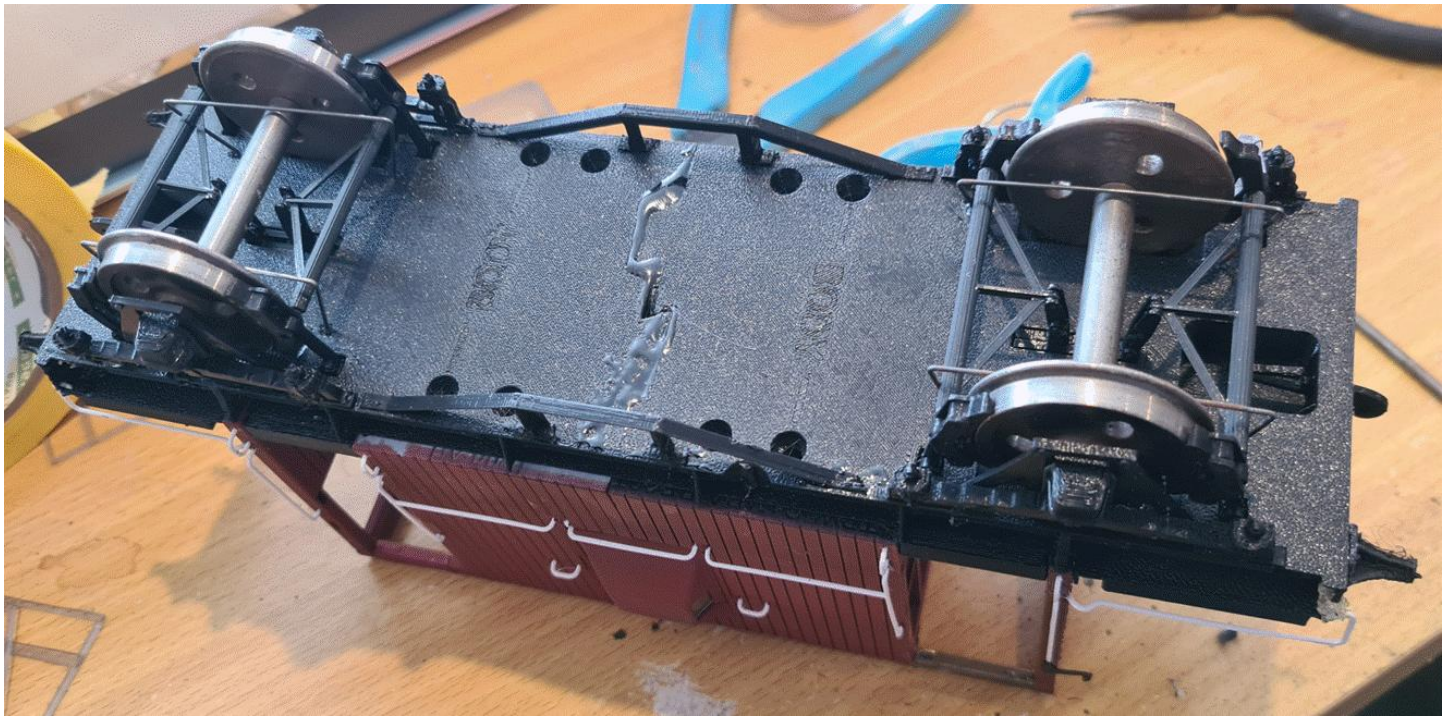
A rather cruel shot of the original roof ventilators.



I could have trawled the 3-D Circles' website to find the replacement artwork for the parts I required. However, I decided it would be quicker to just create my own since all I needed were the ventilators and the keep plates for a couple of brakes which had gone awol over time. The artwork took me about 30 minutes to create, after which, I was ready to go. On the right, some detached brakes are being refitted.



The replacement keep plates fitted to keep everything in place.

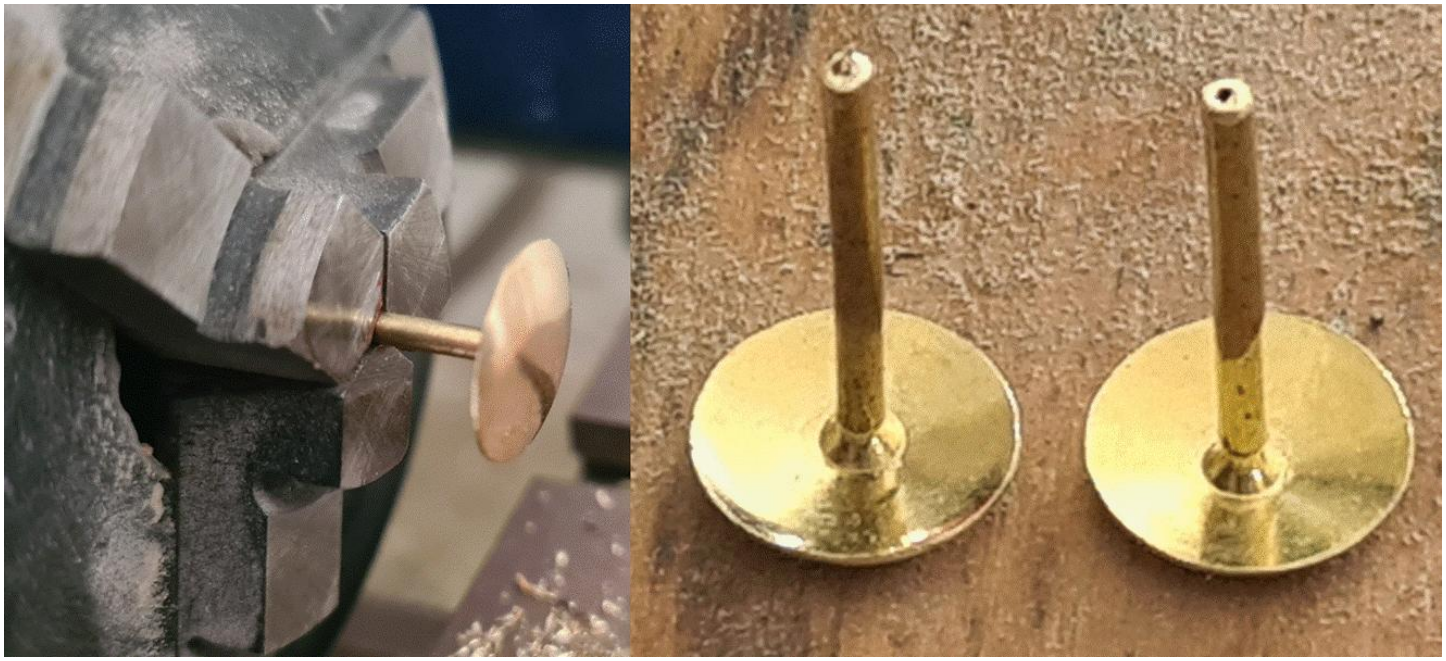


The brake works now complete with new metal safety hoops also fitted to replace three of the four originally there that had vanished. The one left is now a master for any future need.

Every buffer head and shank had also disappeared. Fortunately, there were sufficient headstocks in the spares box to allow me to remove the originals and use these.

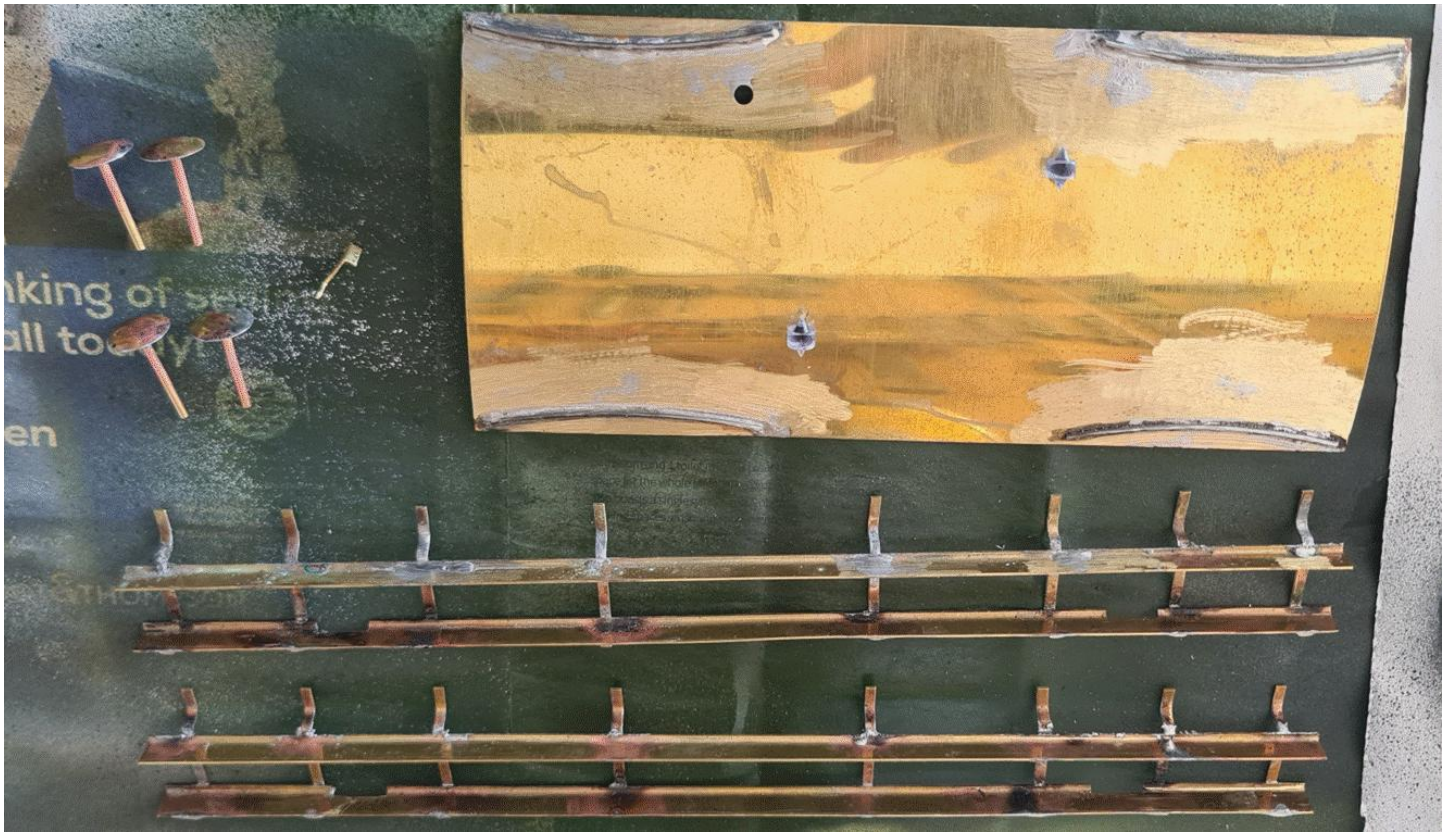
Being particularly vulnerable, I elected to make new shanks and buffer heads from brass. Here a section of tube being opened out to allow the head (a brass drawing pin) to be fitted. N.B. Whilst the lathe was used for the

operation, I did not power it up. Instead, I turned the headstock by hand and gently fed the centre drill in also by hand to ensure that there was no damage.



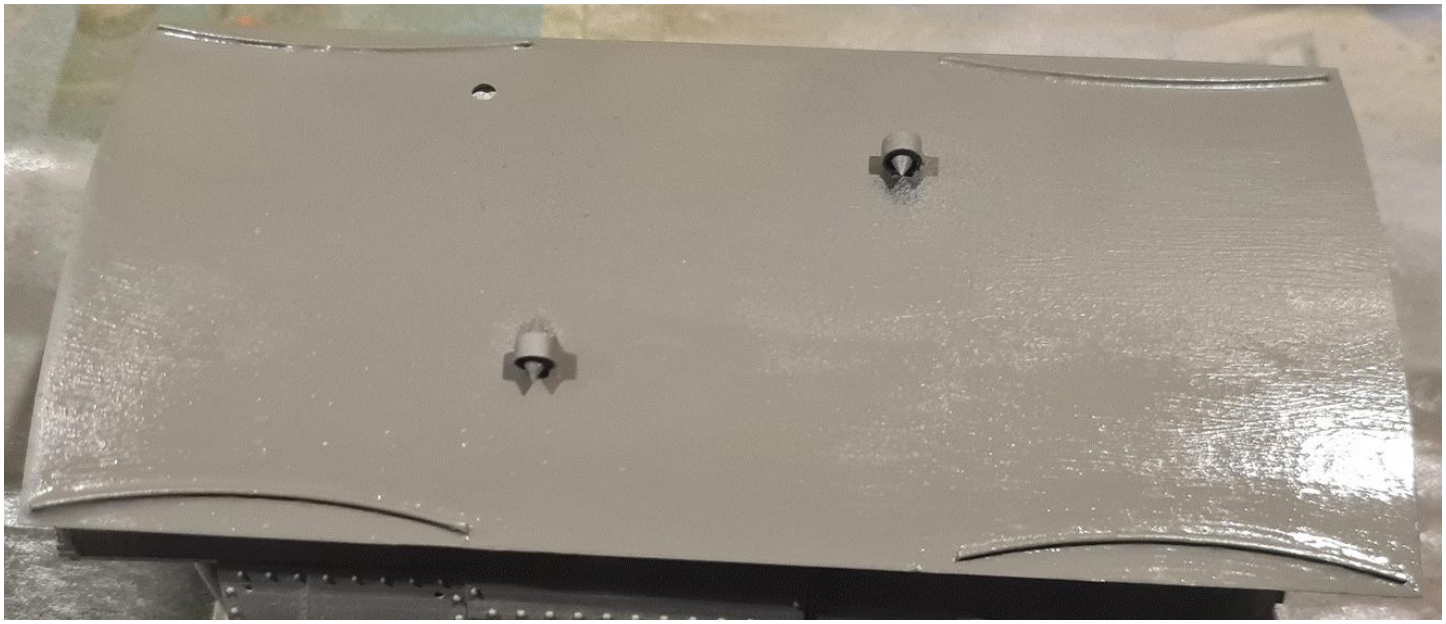
The prepared buffer heads. N.B. Brass drawing pins make great wagon buffer heads.

One of the enhancements made, was to fit glazing to the windows which had previously been open. Note also the damaged handrails which are likewise plastic. If I had more time I would have made up metal rails but since I was on a deadline, I simply glued the rails back in place. Maybe a job for the future. Note also the brass lamp iron on the top right where one of the plastic originals had gone AWOL.

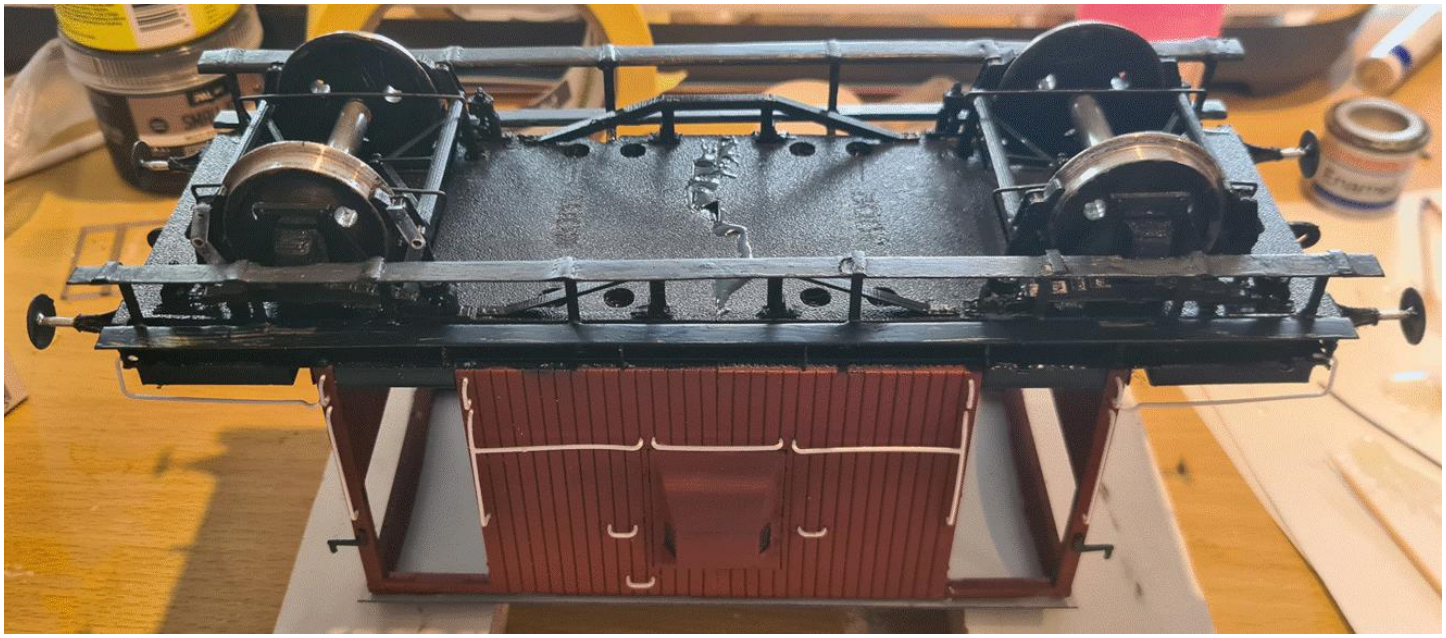


The prepared brass sections ready for painting, firstly with an etch primer. Note the roof now has the ventilators glued in and rain strips soldered in place as well.

One of the footsteps glued in place and likewise, the buffers. The buffers are being supported by the wooden blocks on either side of the van whilst the glue sets.



The roof painted.



The finished underframe area being painted. Another refinement was to paint the backs of the wheels as well as touching up the outside edges as well.

And stowed in its box. Frustratingly, the box needed to have areas ground out to both accommodate the buffers and the wheels. These had always been tight before but now it simply wouldn't fit any longer.

And packed ready for shipping to Tasmania.