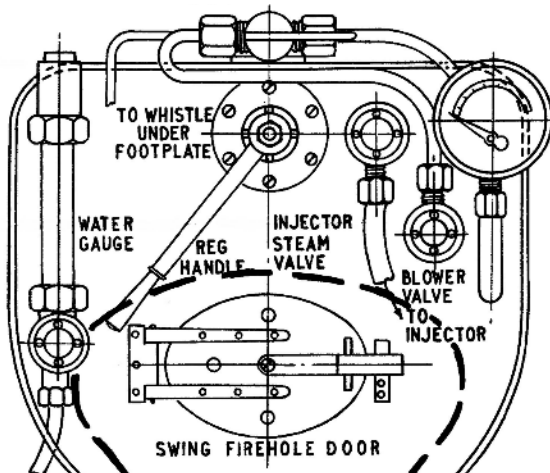


The ups and downs of buying a model steam locomotive. Part 7: The boiler is fixed - Roger Stephen

I was making progress in repairing my Princess Marina boiler but the blind nipples on the longitudinal stays were now leaking. I started unscrewing them, hoping to just put some new sealing compound on the threads and screw them back in. However, more horrors, some of the threads in the copper boiler shell were stripped (more of the red gasket sealer was in evidence) and one of them was obviously just a plain hole. I had another chat with David Saunders and decided to cut new threads of the next size up in the backhead and smokebox tube plate, then refit the longitudinal stays with new bronze blind nipples.

Les Proctor helped me cut the new threads nice and square using a huge milling machine in his workshop. It was a bit tight for space at the smokebox end but with a clamping arrangement you don't find in text books we did it without too much trouble. Having put the stays and nipples back in using high tech "Blue Hylomar" high temperature gasket and thread sealant (as used by Formula 1 teams and on Rolls Royce aero engines) I took the boiler over to David's for a hydraulic test. Bad news: it still leaked in several places, including my new blind nipples! Good news: we took it up to 160psi (twice working pressure like you do for a new boiler) and nothing went pop, bang, ping or click so it would seem the thing is at least structurally sound. We had a chat about what to do next and agreed it was not appropriate to do any more silver soldering and I should just seal the remaining leaks and blind nipples with "Comsol" high temperature soft solder.



The backhead layout as designed by LBSC with the position of the firebox inner wrapper superimposed as a heavy dashed line. Note that the bottom of the gauge glass is below the level of the firebox crown. With water showing at the bottom of the glass the firebox crown may actually be uncovered and overheating.

Back home I carefully removed the blind nipples, cleaned everything up, gave it a day in my citric acid pickling bath and went ahead with the soft soldering at home using my recently acquired propane torch. Not having done this type of soldering before there was a bit of a learning curve but I quickly got the hang of how much heat was required (a lot!) and the soldering went quite well. By this time I had made my own hand pump (see the November 2010 Gazette) and was able to do quick hydraulic tests myself - not official ones obviously. It took me three goes with the torch and Comsol but I then had a boiler which had no leaks that I could find at all.

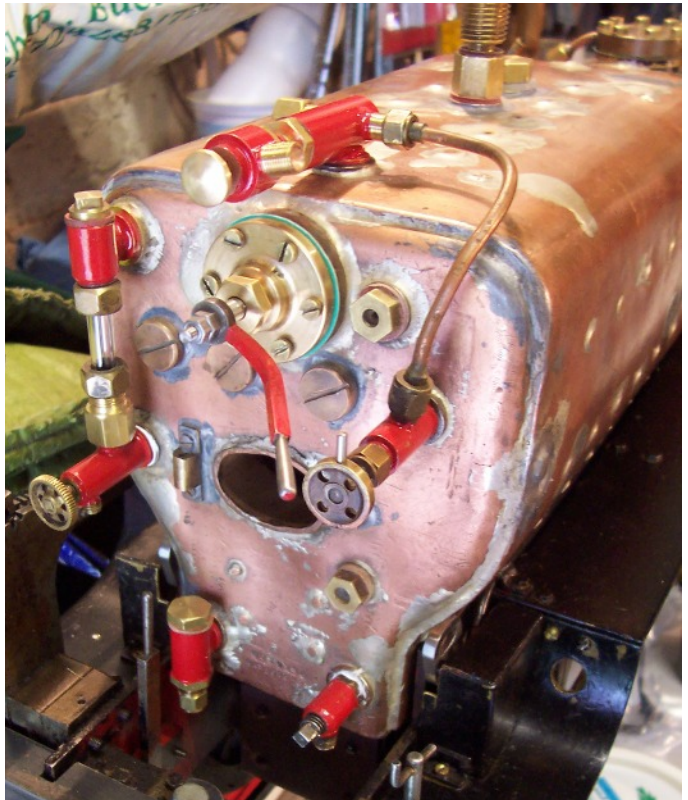
So far the boiler had been tested with plugs in all the boiler bushes so I thought I should put the boiler fittings

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back on for the official hydraulic test. The first of these was the hollow blower stay and blower valve. I did not expect to have to take these out again for some time so I used Loctite 243 'Lock 'n Seal' on the threads. I used the same stuff on the new turret to make sure it was firmly fixed and sealed. My new regulator went in with a normal 1/64" thick gasket under the backhead flange and Loctite 5910 Premium Black Silicone sealant on the threads at the smokebox end, being careful not to block the steam delivery tube and wet header with the sealant. I fitted the other backhead fittings using ordinary plumbers PTFE tape. If you wind enough tape round the right way they screw in nice and firmly and seal first time. Use twice as much as you think is enough!

I reused the old water gauge but made one important modification to it. The water

gauge on Princess Marina and some other LBSC boilers has a serious design fault: the bottom of the glass is below the top of the firebox crown. That means even if you have water showing just above the bottom nut of the water gauge the firebox crown can actually be uncovered and seriously overheating. I was aware of this when running the loco but I suspect it had contributed in no small measure to my boiler failure, perhaps in the past, so I put an extension piece on the bottom half of the water gauge so that the visible part of the glass tube started above the top of the firebox crown. It was just a bit of hexagon brass which I secured and sealed with Loctite 243. On 28th July last year David Saunders and Den Blazdell were doing some boiler tests at Tony Mason's place so, with their agreement, I took my repaired boiler over for an official hydraulic test. To my huge relief it passed with flying colours at twice working pressure. All I had to do now was put the loco back together!



Princess Marina's boiler fully repaired, tested and back on the chassis. The rear end is now properly supported, the water gauge glass starts above the top of the firebox crown, the new regulator is safe and secure, the new turret will fit under the cab roof properly and there are no leaks!

(to be continued)