

## **The ups and downs of buying a model steam locomotive. Part 5: The saga continues! - Roger Stephen**

Cast your mind back to the autumn of 2005 and you may remember several Gazette articles about my Princess Marina 3½" gauge steam locomotive (Gazette Nos 381 to 384, September to December 2005). I had bought it, supposedly as a runner, from a model dealer and the articles recounted the tale of woe between purchase and the point when she was at last performing reasonably well at the track. The existing boiler hydraulic certificate (from another Southern Fed affiliated club) expired in winter 2005/06 so she was tested by David Saunders and Guy Ellerby in March 2006 (see Gazette 388, April 2006). The boiler was pronounced fit for service but there was a tiny drip from the wet header in the smokebox so David & Guy issued me with a hydraulic test certificate for 12 months (instead of the normal 4 years) with a note that the small leak be investigated at a convenient time.

I ran the Princess several times through the summer without any particular problems and in the autumn decided that the time had come to investigate the leak. Having taken the cab off I was playing with the regulator when something let go inside the boiler leaving the regulator handle freely going round and round. Now my boiler really did need to come off and that's when the fun started all over again. Did I say "fun"? - well I suppose it was interesting and challenging which I suppose is a kind of fun. The boiler proved to be much easier to remove than I had expected because I discovered the only things holding it in place were the cab and the superheater. There were no screws securing it to the smokebox and, even more worrying, there was no support whatever at the firebox end (unless you count the ashpan - which is removable) - it was simply jammed between the frames. This meant the axle boxes were being pushed outwards against the wheel backs. Horrible, but things got worse!

To remove the regulator assembly I needed to unscrew the wet header fitting from a bush in the smokebox tube plate. This was where the water was leaking from on the hydraulic test. The wet header should have a thread on the outside that screws into the boiler bush and a thread of the same pitch that screws over the end of the regulator tube. It came out easy enough and I soon found out why: the boiler bush was just a plain hole when it should have been threaded. The wet header was only sealed by some sort of goo like red haematite gasket sealer, so no wonder it leaked. The bush also had four unused threaded holes in it, suggesting someone had previously fitted a regulator and wet header in the boiler a different way, but these holes were worn or stripped and no use any more. However, I decided I could simply put an M12 x 0.75mm pitch thread inside the boiler bush and an M8 x 0.75mm pitch thread on a new regulator tube to refit the regulator in the usual way. Sorted: but when I took the boiler cladding off things got worse!

The handrail stanchions on the boiler sides appeared to be rather firmly attached and I was a little concerned that they had been screwed directly into the copper boiler barrel and firebox outer wrapper in the LBSC style. I need not have worried: they were attached by thin nuts on the back of the boiler cladding sheets, but the firebox cladding sheet was screwed to holes in the boiler outer wrapper! Oh well, I suppose I could put it back the same way - after all it didn't leak there - but I would use phosphor bronze screws when the time came. The good

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*My boiler after a good clean but before repair. The old regulator bush is still there but the positions of the rod stays have been drawn on the outer wrapper ready for drilling.*

news was that I could find no trace of soft solder anywhere on the boiler - only silver solder - so repairs might be possible if required. My attention now turned to the regulator and things got worse again!

I undid the six 6BA screws securing the regulator body in the backhead and withdrew the regulator assembly. This did not look good: there was a lot more of the red gasket sealer around and the regulator bush was a nightmare. Two of the 6BA holes in the bush were actually stripped and one of those was half in the bush and half in fresh air! Why the thing did not leak I shall never know but I am quite impressed with the performance of red gasket sealer! As for the regulator itself the cause of the breakage soon became apparent: it is a simple screw down type valve where the bronze screwed bit is fitted to the stainless steel regulator spindle by a tiny pin. Someone had used an ordinary mild steel split pin for this and it had rusted away. The whole regulator was poorly made and I soon decided it needed to be completely remade. This was disappointing but, again, things got worse: a lot worse!

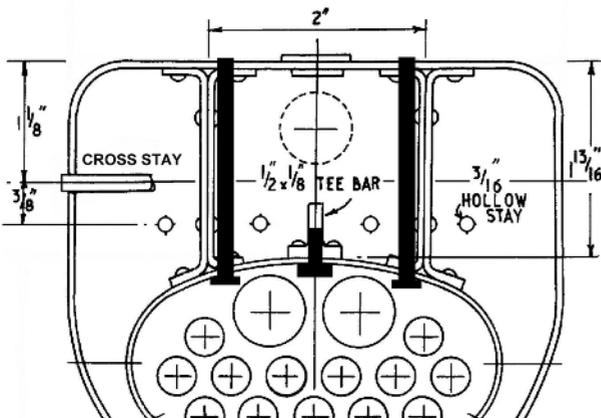
Having got the boiler off and the regulator out my attention turned to the condition of the firebox. I was suspicious of some slight undulations in the firebox crown and on examining the crown girder stays through the regulator bush in the backhead I found to my horror that the crown stays had become detached from the firebox crown for the greater part of their

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length. So the boiler was now scrap metal and I started thinking about how much a new one might cost. It so happened that Tim Hopkins was going to order a boiler from Cheddar Valley Steam the following weekend and offered to get me a quote for a new boiler while he was there. It seems that soldering the firebox crown stays on the Princess Marina boiler makes it one of the more difficult and expensive boilers to make and the price was a bit of a shock: £1,334 including VAT! Ouch!! This was not good news but after a couple of days of soul searching I began to hatch a plan to repair the boiler. I had nothing to lose so why not try tying the firebox crown sheet to the girder stay flanges with phosphor bronze screws and seal them with silver solder? Time to have a word with David Saunders - after all, if he was not happy with the repair I could not expect him to test the boiler afterwards.

Like me, David was initially of the opinion that the boiler was scrap (George Ausden of Watford High Street gives a fair price for scrap copper!) but he agreed there was nothing to lose in trying a repair although he was rightly doubtful about the likelihood of success because the silver solder would have to run down the threads of the bronze screws and fuse with the girder stay metal. Relying on the thread alone in the copper sheet stay flanges would not really be good enough. We also agreed that the regulator bush needed replacing but were not sure how. I went home slightly encouraged and ordered some repair materials from a model engineering supplier.

Before the materials arrived I had a phone call from David. He had been talking my problem over with fellow boiler tester, Guy Ellerby, who had suggested a slightly different approach: why not fit new rod stays right through from the firebox crown to the outer wrapper and silver solder them in? Why is it that these things are so obvious when suggested by people with more knowledge and experience? It made great sense and so I thought about it for a day or two before drawing all over the firebox in felt pen to decide where the rod stays could go. The problem was getting them close enough together for adequate strength and making sure



*The general idea was to insert the rod stays and bolts shown here in solid black, but the rods had to miss all the other metalwork inside the boiler.*

they did not foul the existing six cross stays, four longitudinal stays, the two safety valve bushes and the regulator! Easy! After a lot of messing about I decided I could get two rows of five  $\frac{3}{16}$ " phosphor bronze rod stays up the sides of the existing outer girder stays. I could not do the same through the central tee-bar girder stay because the regulator ran directly above it, but I could get four 4BA phosphor bronze screws into it. That would have to do. I discussed the plan with David and Guy at the next club night and, with a couple of small amendments we agreed to give it a try.

*(To be continued)*