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### 7.25" South African Class 10 Pacific Locomotive

This document was written by Richard Niven and was published by Worthing and District SME in their newsletter in the Spring of 2011.

In 1990 while working as a fireman in Kimberley one of the drivers asked if I would be interested in building a live steam loco. I was in the process of building two 3.5" gauge locos, but this chap wanted a large 7.25" gauge machine. Of course, the answer was yes, and I thought about building one of the large 4-8-4s that we were still working on in Kimberley. He was thinking of the old 1904 Glasgow built class 10 Pacific's which he was a fireman on. We agreed and began designing the machine. At



the far end of the mainline where we worked was the railway town of De Aar. This town had a massive reserve of about 400 stored steam locomotives and somewhere in there was a class 10. We finally found her and made drawings from that.

Next it was off to see the workshop foreman at Kimberley and get him and the apprentice fitters to cut out the frames for us. He explained that they only had rather heavy steel and so the frames would have to be almost an inch thick. We agreed, and less than a week later our heavy frames were delivered fully machined and complete, in exchange for a few bottles of whisky. Next it was castings for wheels and cylinders. Unfortunately, Kimberley being just a running shed had no way of making these, but just down the secondary mainline, which we still worked with the 4-8-4's, was Bloemfontein which had a massive railway works. A few nice words and a few bottles of Whisky, and we had a pair of rather large cylinders and a wonderful set of wheels all machined. Within about a year the frame was complete and was running on air.

Unfortunately, at that point the end of steam in Kimberley had come and I was forced to move on. I resigned and moved back to UK and finally ended up in Worthing where I joined W&DSME and carried on constructing my 3.5" gauge locos.

Years went by and I had lost touch with my old Kimberley friend who's name was Blaar, and often thought whatever happened to that wonderful class 10. Then in 2003 I went to South Africa on holiday and made contact with Blaar. I was amazed at the collection of locos he had in his garage. Class 23 4-8-2s, class 16E 4-6-2s, class 19s class 11, but no sign of the big class 10. All the locos he had were 5" gauge and when asked about the big 7.25" gauge class 10 he informed me it was standing outside behind the workshop. I went out and sure enough was this mighty heavy frame with wheels and cylinders complete. I said to him "let's get it finished" he replied "We have nowhere to run it". After returning home to Edinburgh I nagged and nagged him to get the boiler built and get it running and finally he did in 2006.

As he had nowhere to run it he decided to lend it to a club in Natal near Durban who simply trashed and destroyed it. A few months later he sent me a few shots of the loco and was not a happy chappy. I told him to get it back and that I will buy it. Sure enough, he asked them to return the loco and right away they did, but not before they did a few major repairs and gave it a quick paint job.

Next it was all crated up and on its way to my workshop in Edinburgh. It arrived on a one-man truck and was a mighty problem to unload. Loco, tender and the crates were just under one ton. Finally, after about 6 hours of unloading and getting it out of the crates we were able to inspect the beast. The paint job was fabulous and

really made the loco stand out. Next it was down to the track for a test run which proved a disaster. The loco was extremely rough riding and felt like it had square wheels. On top of that it kept jumping off the tracks for no apparent reason. Something terrible was wrong. One day I was down testing her alone when every wheel and the tender came off the track on a set of points. Getting a half ton loco back onto the track alone was mighty hard work and a great lesson for me not to run alone. On close inspection it was noted that the compensated spring gear system was not working correctly and at times the driving wheels were not sitting on the rails.

Back home it was time to build a wheel-drop and remove the wheel sets. With a jack under the rear axle, I removed the axle box keeps and slowly lowered the jack and expected the wheels and boxes to drop out. A slight tap with a hammer did no good, then more force with poles and levers but that axle box was well and truly seized in the frames. Eventually I made a tool to extract the wheel set from the frames. We found that the frames had been quickly painted and the axle boxes fitted into place letting the paint dry around them. We also realised that the two halves of the axle boxes on this wheel set were not the correct ones for each other and the edges did not line up. We now had to remove all drivers and match up all the axle boxes upper and lower halves. We also found that due to the axle boxes not being square in the frame had made the massive 11" drivers loose on the axles...another job to sort out!!

Anyway after a few weeks of hard work and much help from my friend Tony from The Edinburgh club we finally got the locomotive back together. What a difference in performance this time!

It was like a new locomotive right out the shops. But even though she was now running smoothly and steaming well, there was still something that was worrying me, and that was the way she went into turns. Rather than take a gentle move into the curve she more like jumped into the curve as though there was no leading bogie, and to make matters worse the leading bogie would often derail at points etc. Back again at the workshop we removed the bogie and found that the cross slide was totally seized. I decided to cut out the slides and make up new ones. We also found the wheels were out of gauge and had far too much side play in them. This was all corrected, and we fitted new side control springs and replaced the leaf suspension springs. Another test run; this time the whole locomotive ran perfectly and was extremely smooth running.



With the loco now running perfectly it was time to take her to the rather steeply graded Comrie railway where she really would be made to work. Here the engine is in her element. Like most South African Railway locomotives, the class 10 were built with rather oversize fireboxes designed to burn very poor-quality coal, or anything that was thrown into it. Due to this, most South African models steam like a dream on any good quality British coal. Here at Comrie it is no different. On leaving the station with a load of about 12 passengers the regulator is just cracked for the gentle down grade towards the long river bridge. At this point the

fire is rather dead, with a few shovel loads of unburnt coal laying on top. As the train heads across the bridge, I gently open the regulator for the steep and long bank ahead. Too little reg and you will stall, too much and you will slip. As she barks up the 1 in 25 grade her fire is blinding hot and the needle is moving ever closer towards the red mark. I open the firebox door to slow the steaming but she keeps climbing towards the red. I then start the injector and it holds the needle just under the red and prevents the safety valves from lifting. As we approach the top of the bank the line gets steeper and rather than open the reg wider I have to ease off

power and let momentum help the train over this very short but steep section. Keeping too much reg open here would result in a violent slip and most possibly bring the train to a complete stand. One would then require the two-legged bankers to help restart the train.

On working the loco so hard on this line we discovered steam was escaping from around the cylinders but we could not find out where it was coming from. The leading driving wheels were also covered in oil making the loco rather light on its feet. On close inspection it was found that the steam was escaping from the valve spindle glands.

While running at Edinburgh track which is quite flat, we did not have this problem, but here where the engine is working flat out, we realized that the blast pipe was too small and was holding back the exhaust steam causing it to force its way out past the valve spindle glands. A new blast pipe was then quickly made up and tested. End of problem was the result and even better steaming. Since then, this half ton, class 10 4-6-2 has become a star performer at the Comrie Miniature Railway.

