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## Stirling Single Modifications

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With my London Transport Hunslet completed and running well, one of the Club members offered me a Stirling Single Wheel 2-2-2 locomotive. I did not want another locomotive at the time and this one was not of a very high standard. However, after much haggling and the price coming down, I eventually purchased the part built locomotive. My son Robert had done some work on the locomotive. The cylinder block bores had been machined from both the front and back of the cylinder casting, and yes, you may have guessed it, did not line up. There was a step half way down the cylinder bore. Robert had taken the cylinders into work, borrowed a set of adjustable reamers, and reamed the cylinder bores until true. To this day one of the cylinders is larger than the other by a 1/16th" or so.

I started work on the Stirling several years after purchasing the parts, working on the tender running gear. The recesses for the wheels to clear the tender sole plate were the first to be done. A sump tank was then fitted into the sole plate with fine gauze mesh filter over the sump as on my other locomotives. The tender water tank was then taken apart back to bare flat plates ready to start again. A large number of unnecessary holes were then plugged up by copper rivets hammered into countersunk holes. After six months the tender tank had been rebuilt and soft soldered together except for the sole plate. With the sole plate screwed down onto the tender chassis, the hand pump was fitted after it had been rebuilt to my design. The pipe work was then all done and when complete the sole plate was soldered onto the body.

Next was the assembly of the wheels, brakes and running gear under the tender until the tender was nearly ready to paint. A coat of primer was put on before the tender was put to one side. Work now started on the engine. The cylinder block was dismantled out of the frames for a rebuild. All the tapped holes were drilled deeper and re-tapped, some being made larger in diameter. Larger sighting holes were drilled and tapped into the steam chest so that I could see the valve timings easily. After this, the eccentrics were all reworked and the lifting links on the valve gear were modified to clear a foul up in the expansion links.

The cylinders were drilled and tapped for the drain cocks. When all looked OK, this was followed by an air test. Result - Super! Steam operated cylinder drain cocks were done. Work continued on the locomotive, boiler valves, pipework, and the clack valves were scrapped and remade. Eventually the hydraulic test was done and passed at 200psi and the hydraulic test cert issued by Gordon Ross. Then an air test through the boiler was carried out to check the regulator and the engine would not run. On a Stirling 2-2-2 there is no dome, the steam is taken from the boiler by a large tube passing high along the boiler, with a row of small holes drilled in the top of the tube. The regulator was stripped from the boiler and these holes were opened up. The regulator was then replaced with PTFE sealing discs and stainless steel pins in the linkages.

The first steam test presented yet more problems. The piston rods were replaced with stainless steel, the original ones being mild steel. The pistons were taken out and new piston rings fitted in PTFE to my published design. Next was a track test. Oh dear, there were steam leaks from under the smoke box, and so the boiler was lifted yet again. Joints on the steam chests and cylinder covers had all blown out. The screws on the steam chests were then tapped out to a larger size and increased in number. The main steam pipe was fitted with a screwed union to replace the flange joint held together with just two screws. Eventually a successful steam run was had at the track. The loco was now run regularly but there was trouble ahead.

The super heater was replaced to a better design, having failed on the original silver soldering in the smoke box. After 200 miles had been run, the crank shaft failed when the Society had a day at Chelmsford track. I then had to machine up a new crankshaft from the solid and made this in EN8 steel, so there should not be any more trouble here. I then had to machine up new eccentrics to fit into the new crankshaft centre. I have now heard of four other modellers who have had built up crank shafts fail. My Claud Hamilton has a solid crank but this was already in when I bought the frames. I have also made a new fire grate from high temperature stainless steel, with the fire bars running up and 4 down the firebox, instead of across as they were when I bought the loco.

The loco has now run 370 miles, with several of the club members having had a drive. All have had a smile on their faces when driving the loco. When Alec Walford had a drive he summed it up by saying, as he handed the loco back to me, "This engine needs one of my governors fitted", and I have had a few moments myself about going too fast.