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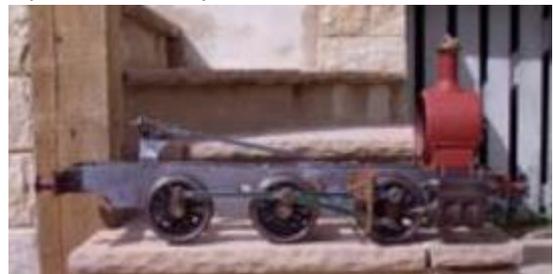
## Buying a second hand 'Simplex'

This document was written by Colin Bainbridge of Ryedale SME and was published in the Southern Federation newsletter in December 2020.

### **Buyer Beware or Simplex - A Comedy of Errors**

*A story from Colin Bainbridge of Ryedale Society of Model Engineers to provoke discussion. Disclaimer: Those of a technically nervous disposition are advised not to read this.*

Just after I moved to a village outside Scarborough over ten years ago, I picked-up a chassis for a 5in. gauge Simplex from a well-known on-line auction site, thinking I might be able to progress it further, maybe even finish it and sell it on. Having rented when I first arrived, this was just at a time when I was about to buy a property and move house. Life got a bit more complicated for a while so I put it under the bench for later; this then progressed to moving house a second time and eventually storing the chassis. Recently I dug it out and started to look it over with a view to selling it in the condition I bought it, as by now I realise I'm a slow builder and have found that when it comes building, 3½ in. gauge as is as big I wish to handle. I'm easily frightened by big lumps of metal! Still a country member of my old club and thinking the Club Newsletter might be a good place to advertise said item, I was prompted to 'look it over'. I would then be in an informed position to advise any potential purchaser of its good points and maybe some of its weaknesses, as no one wants to knowingly sell something 'dodgy' to another member. The photos I have taken show it in pretty much the state I bought it though now without its rather garish paint job on the frames. Unless you're very lucky, when you buy something already started, it's only to be expected, you'll not like everything you find and may have to remake a part or two. If, however, you discover an inaccuracy you also have to ask yourself 'is it an important error or can it be lived with?'



As I progressed with my quest to establish the truth in this particular case, I didn't realise the answers to these questions would be so challenging. At this point take a moment to look at the pictures and I am sure, like me, you'll think it doesn't look too bad. The following is a list of what I have found.

### **Frames - the foundation of everything**

I think one plate is slightly longer than the other causing the buffer beams to be out of square to either plate. The spacing of the slots in the two buffer beams, with angles riveted either side of the frame plates, are different and neither are correct to drawing (both being under dimension) and introduce a taper of 0.030 in. end to end. This is further complicated as all the stretchers are a touch over size causing the plates to bulge out slightly. Only the middle horn slots appear to agree in spacing and size across the frame. The front set has a slight difference from one side to the other and



the rear set a larger difference one to the other. Putting a straight edge along the inside length of plates produced further interesting findings. As far as I could make out, the front half of the frames were roughly straight (bearing in mind the buffer beam issue) but the rear section became progressively more offset peaking at around 1/8 in. offset on arrival at the rear buffer beam. This appears to start around the middle stretcher point.

### **Axleboxes**

Most of the axle boxes (fixed, i.e. non split) are bespoke and fitted to each horn slot with a variation of over 1/16 in. from the largest to the smallest. Not quite sure why, but all are a loose(ish) fit on the axles as if worn, which they can't be as they are all new build.

### **Cylinders**

Surprisingly, the cylinders aren't too bad, that is they are square all round and to length; however the tapped stud holes for attaching the steam chests on both cylinders in the area located over the recessed end of the ports (cylinder ends), have broken through into the port. Similar story with the guide bar fixing points on the rear cylinder covers, that is the tapped drilling has broken into the top of the threaded gland hole. The location of each cylinder on the frames caused some consternation as I found one cylinder was nearly 1/16 in. closer to the driving axle than the other. The fixing holes in the frames are okay but a check of the fixing holes in the cylinders revealed the left cylinder to be offset by about this amount to the other. Interesting!



### **Motion brackets**

With paint removed, the motion brackets seemed quite presentable. Both are castings. However, looking straight on to one (top to bottom) it looked bent. Straight edge again, and yes it was bent but I can't decide if was always like this and has been machined in this state. Same story with the casting's rear fixing, slightly bent along its length. The other motion bracket has another oddity for, when screwed home, the inner pivot support for the expansion link is offset to the front one; meaning the pivot points are out by about 1/32 in. one to the other.

### **Weigh shaft bearings**

These phosphor bronze bearings are a surprisingly good fit on the shaft suggesting they have been reamed to size and may be in line. I say surprising because there's no sign of binding on the shaft indicating they're happily in line with one another and could suggest the frames left / right are as currently affixed, in alignment and possibly proving all the frame errors up to now have been ignored.

### **Coupling rods**

This is where the story becomes interesting. With all I'd found, I thought I'd be able to prove the two sets of rods wouldn't match. But no! With accurately sized rod (to represent the crankpins) put into all the three bushes simultaneously, both sets came together nicely. I was unable to disprove this when I checked the wheel centres as they too appeared okay.

### **Summary**

So where does this lead us? While there is no doubt this chassis is a mess, it still prompts the question: could it still work? When is something really unusable? Let me say straight away I have no intention of

trying to find out but, for the sake of discussion, I've always maintained there is and should be a wide range of ability and accuracy among model engineers, and I think this chassis proves it. For although what I have found puts this firmly at the dodgy end of the scale, what is there is fairly competently made. My investigations have identified a catalogue of errors, but the indications are the builder has (at times) tried to overcome some of these shortcomings. The problems appear to stem from the inaccuracy of the frames and subsequently putting bits together and trying to work round this known deficiency. The obvious place to start rebuilding would be to use a new straight, properly dimensioned and square set of frames. This though would upset the axle boxes as they appear to have been machined to fit what already exists. Therefore, re-machining the axle boxes (assuming enough meat is available) would probably upset the wheel spacing necessitating new coupling rods. If the slight looseness of the axle boxes is to be corrected, then one wheel would have to come off and new axle boxes made. The alternative (controversial – and not for me, guv) solution would be to ask yourself:



- Are all the wheels the same diameter? Yes.
- Is the wheel spacing correct? Yes.
- Do the wheels rotate freely with rods connected? Yes.
- Are the cylinders correctly located, well nearly, or could they be corrected to be so?

Therefore, as long as the boiler locates front to back correctly, the stretchers reduced slightly and with the dubious guide bar brackets remade, the rest could be made to work or ignored. Or could it? What do you think? As to its future, watch out for a box of Simplex bits being advertised on a certain well known on-line auction site!

(I did warn you this article was not for the purist!)