



This article is provided by FMES for your interest thanks to the kindness of the original publishers. FMES makes no representations or warranties of any kind, express or implied about the completeness, accuracy or reliability with respect to this document and any sentiments expressed are not necessarily supported by FMES. Any reliance you place on this document is therefore strictly at your own risk

“Old Rube restoration part 24”

This document was written by Paul Naylor in summer 2026 and is the twenty forth article in a restoration project. The articles were published more or less simultaneously in the Frimley and Ascot Locomotive Society newsletter.

I thought I had better source the bits to go into the rear tray so I could arrange their securing fixings. The first item is a 12volt air compressor for loco and tender air brakes. The standard for this sort of thing appears to be 12volt auto compressors, and I spent some time looking at what was available. The best would be those sold for use in car air springs as they have a high duty cycle and are generally robust. They are also larger and significantly more expensive however than tyre pumps. Avoiding very cheap pumps, I eventual decided to buy a Viair 88P tyre pump that is the right size, pressure and has a reasonably high duty cycle. This is not enclosed in a fancy plastic package with unnecessary features and I think I can use it straight out of the box which helps for longer term maintenance. I saw one on Ebay that was shop soiled (broken glass on pressure gauge and carrying bag zip broken) for half price so nabbed it quick. I had emailed a large UK agent for these asking the simple question ‘can it be used on its side’ using their webform. What is the point of having this if they never reply to messages there? That is a frequent whinge with me as I find complex phone calls difficult owing to deafness and applies to very many suppliers. I have taken the chance though since it isn’t full of oil to leak out and go where it shouldn’t, and I may not need to lie it on its side anyway.

I have also decided to fasten the boxes in with bolts as this is easiest and reliable *provided* they do not rust in. To help avoid this, I have made up 10 threaded bosses to weld inside the tender edge around the holes for an M6, 7mm depth thread that I will fill with stainless steel bolts that should be OK, six for the rear hatch and four for the front. The photo shows the boxes (with welded in bosses under the holes) and the siting of the air compressor that has arrived. I have also added a drain plug to the box front centre. The compressor feels well made (I did replace the broken glass on the gauge with a bit of Perspex), works fine and my calculations about its current draw, litres per minute etc from the specification suggest a ‘deep draw AGM’ 14 AH battery alongside it would last a days-worth of running. Note that the current requirements etc mean that this might shorten the battery life in terms of charge/recharge cycles, but still doable I think. I did look at ‘LIPOFE3’ batteries, but none would fit as the smaller ones have battery current limiting circuits that are too low to handle the initial ‘on’ surge (75 amps apparently for a second or so). I also need to buy a one litre receiver (there is an old one with the engine, but safety first I think) that will mount under the tender in due course. I can mount the compressor upright under a seat OK so I will not lay it on its side. The other bits to go in this space are an electronic pressure switch of suitable on/off pressure and a high current relay. The air feed will then exit this tray onwards to the receiver via a brake valve to connect to and apply/free the brakes – just one airline.



I have ordered a few bits and pieces to build the air control in this box so that I can test the compressor with the pressure controls. Thinking ahead to later bits of the air system, I knew I needed a brake valve. I found a valve in the miscellaneous dismantled bits and pieces that came with the loco that looked like the original, but it was seized up and stuck somehow to a metal bracket. While it was soaking in penetrating oil, I looked around for something to buy that would do. The valve has to have three positions: 'Off' so that air in the system was allowed to exhaust thus releasing the brakes, 'On' so that pressurised air was routed to the cylinders to apply them, and 'Central' where the system was sealed so that any air in the system was retained to hold the brakes at whatever pressure was allowed in when 'On'. Translating this to commercial valves, meant a 'three-way, closed centre' valve was required functionally, and with a suitable hand lever and stops for ease of use. There are a few around at high cost (>£120) from traditional UK sources and very many from China at all sorts of prices. When you eliminate the shuttle valves that allow full pressure quickly to the system (so the brakes might snatch), those that do not specify 'closed centre', hydraulic valves that really need oil in the system to work reliably, and dubious quality ones, I thought I would try to salvage the old one first (and this would be 'renovation' to match the general task). After a bit of brute force to disassemble it, it eventually came apart without harming the sealing bits. It is a taper valve that fortunately was not scored and still seemed to seal (at low pressure!), and other bits some of which will need repair/amendment. The photo shows the disassembled and cleaned up parts, and this shows the slot through the taper which is somewhat crude but apparently will work as required. I rebuilt



this with some newly made parts so I can test it along with the rest of the bits I am making up now.

The result of this little project was quite satisfying, right up to the time I tested it (see later). The fitting in the photo was added to test it...

I also found a '70psi on – 100 psi off' Chinese made pressure switch for the usual low price, a high current (90amp) car relay to protect it and some fittings, and built a little control unit (photo

right).



The electric power wires are connected using high current 'AMASS' connectors that are well made, quite cheap and seem robust. The



compressor has an inline fuse that I will retain (you can see it in the photo). The last item in the tender brake system was amending the compressor a little to fit and plumb in. That involved shortening the wires and adding a

connector, shortening the air line and adding a 'hose to push in fitting' connector – that was home made from stainless steel as I could not find a commercial one the right size. The mountings of this lot are designed to be able to be removed without removing the cover from the tender to ease maintenance and do not require any modification of the compressor rubber 'feet' (or anything else except shortening the cable and airline) in case of replacement.

The result of this (apart from determining where mounting holes need to go in the tender covers prior to paint) is that I can now test the system to see what happens...

Connecting it all up and adding a battery showed that everything worked as hoped, but the brake valve leaked too much meaning the compressor was cycling every 10 seconds to maintain pressure (only stored in a few inches of pipe though rather than a receiver): that is too much and no amount of fiddling with the seals etc on the valve made much difference. The brake valve is now consigned to the 'might have been' bin and I had to hit the internet again. This time, I taught myself pneumatic diagrams of switches and realised that a 3 position four-way closed centre valve would do. I found a rotary one from an English supplier (made in Taiwan apparently) who included on his advert a pneumatic diagram of the item allowing me to confirm the claims and the operation, unlike most other suppliers at the budget end. The photo shows this with a couple of fittings added but without a cover I made to present it better. I also found and ordered an EU made 1 litre air receiver of cylindrical shape that comes with appropriate information for a reasonable price, so when this lot arrives and can be lashed up, I can test the whole system, at least to provide a controlled 100 psi air source. Since this receiver is well below the 50 bar litre limit (10 bar litre at its maximum working pressure), it does not have to be regularly certificated under the Simple Pressure Vessels (Safety) Regulations as long as it is made and maintained using 'recognised engineering standards'. It came with such assurances and the compressor is incapable of beating its maximum working pressure (I will still fit a safety valve though). The receiver came and is as described, so I made up a couple of brackets/straps to mount it under the chassis and painted it black except where the manufacturers information is labelled on it.



I took the trouble to make up a piping/wiring diagram and this can be seen below. I think it is representative...

Old Rube air brake system

