

BEV WR5 Baby Jane restoration / recommissioning - Andy Kemplen – Latest Report

Following on from the previous article that saw the control box cover completed I moved onto laying out and fitting the emergency stop/battery isolator switch and the battery cables from the control box to the inside of the battery box via a high amperage Anderson disconnecter.

The first thing I did was decide on a location for the disconnecter that gave a smooth path for the thick cables but allowed for an accessible location that was able to facilitate the folding footplate – the disconnecter was originally where you plugged the batteries in to charge, but as we are going to use the onboard charger from the Cushman E-Z-GO Titan electric truck that we scrapped, it will only be used to disconnect the control box cables for maintenance or removal.

I decided upon the disconnecter location and after a trial fitting, I drilled the battery box side to take the bolts to hold the fixed part of the Anderson connector as seen below.



With it fitted like this it can be disconnected and the entire battery box removed – this is how charging would have been done down the mine, there would have been multiple battery boxes and when you needed to recharge you went to the charging station and just switched over to a charged battery box by sliding the whole box off and a fresh one on, connecting the run down one up to charge before you went back to work; the box can be seen to be sitting in runners that facilitated this, in the above picture.

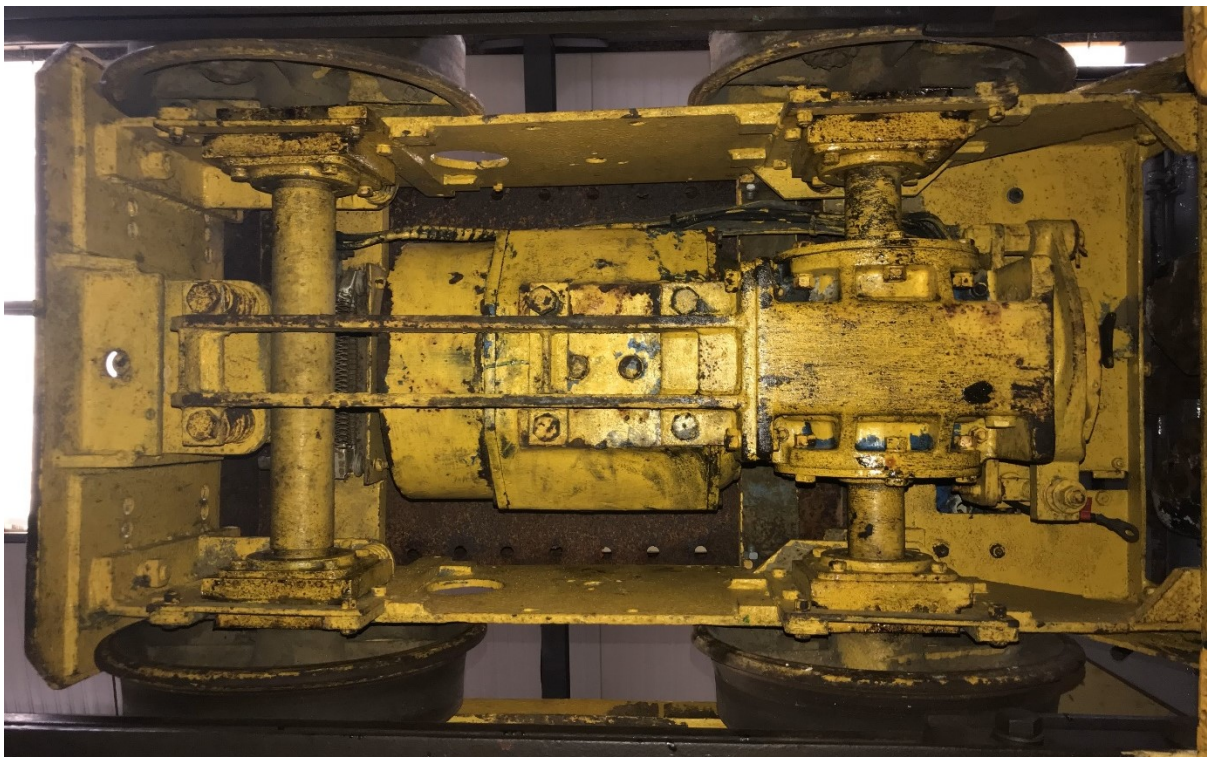
I have found out that the battery box Baby Jane has, is probably not the original one it had from the factory when new, although it looks similar and performs the same it is dimensionally different to what is shown in the BEV brochure – it is longer and not as high, as there is little or no gap between the battery box and the control box and it overhangs the front buffer plate. This became evident when I was planning the location of the connector as originally it was on the rear face of the battery box but we could not put it there as it would not fit, you can see its size in the above picture also.

There was however enough room on the rear face of the battery box to add the emergency stop/battery isolator switch, that I fitted next, it can be seen in the following pictures.



I have since these photos were taken ordered grommets for the holes in the battery box to stop the cables chaffing, we don't want a big flash bang when she is in use !

As an aside, one morning when I was shed master I found Baby Jane over the pit and took the opportunity to snap the following picture, interesting to see it from this view I think ?



When looking at battery box sizes and noticing that Baby Jane's box was unlike others, I found a set of photos on the internet that I had not previously seen, they were from 2016 and they showed the BEV WR5 at the Lea Bailey Light Railway (LBLR) being moved and prepared for its first run with replacement, original contactors, sourced second hand from Alan Keef – those contactors reportably being the last known stock in the country (I previously knew about this as Nicholas Harper from the LBLR originally helped me to source the replacement alternate contactors that I have used in Baby Janes control box) – interestingly the photos showed the contactors and some of their wiring which I found intriguing as it was not quite like how I had worked out and put Baby Janes together (even though how I had done it theoretically worked) - the position of the links between the contactors that I could see in the pictures were different to how I had worked them out. I made contact with Nicholas again and was put in contact with the LBLR chairman Ben Coulson who had taken the photos, and after conversation via email and messenger I planned/arranged a visit to see for myself, how a known working BEV WR5 example like Baby Jane was wired up.

A convenient date was set and a weekend away planned in the Forest of Dean for my wife and I, we stopped in the village of Clearwell near the Clearwell Caverns tourist attraction.

When we arrived and everything was unlocked, I had a short tour of their facilities and chatted with Ben about their BEV WR5 – it turns out that the iron mine on which the Clearwell Caverns attraction is situated was its original home. In a shed their BEV WR5 was up on blocks having had final drive problems in 2020, this meant that the battery box was off and access to the motor wiring was good and I was able to probe the cables with my meter, take notes and photos to see how it was wired – here is a picture of the loco as I was testing and mapping out its cables in the shed



I have also included these shots of the original Sevcon Contactors, that are rarer than hens teeth, the second with the arc chutes removed.



It was interesting to see that the interior of the box was painted cream like Baby Janes and that the links between the contactors were made of a braided flat wire like a battery earth strap, not copper plate like I had used for ours. The contactors worked in an identical order to ours for the three speeds so the cam was the same, All the motor wire positions where they exited the motor were the same as I had worked out, although the '3' tag had dropped off one of the field winding cables, so they were labeled Y1, Y2, Y and Y4 - the link positions and the Y cable contactor positions were noted on a sheet I had prepared. The R1 and R2 cables were positioned exactly as ours, as was the shunt (battery negative) - the position of the cable from the reverser (battery supply) was also noted.

I thanked Ben for allowing me to visit and after a bit more chat headed home – that very evening using my notes I created an alternate wiring diagram and then put how theirs was wired up into the Circuit Wizard program that I used to test the function of how the cables are joined to the contactors and effect the field windings as the speeds are selected - it functioned exactly the same as how I had done it. I have since re-looked at the parts book that we have a copy of, the links shown there are as they were on the LBLR controller, I had previously noted this and knew it was not how I had worked it out, this had always bugged me, so I think I will make the changes and move the links so it is as originally designed.

Altogether a successful trip I think. I also noted where the loco data plate was attached to the frame on their BEV WR5 – other BEV WR5s that I have collected pictures of from the internet, have a plate in a similar location – unfortunately I can also see in pictures that I have of Baby Jane there is no plate at that location – so I think her works number will remain a mystery.

This progress has improved my confidence of success, so with a little more work, we will I hope soon be testing out the controller. - Andy