

# B1 NEWS

**Newsletter of the Thompson B1 Locomotive Trust**

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*During the Spring Bank holiday 1264 visited the Gloucestershire Warwickshire Steam Railway and took part in their 'Cotswold Festival of Steam' event. On Tuesday 28<sup>th</sup> May 2019, 1264 is seen entering Toddington Station with a service for Broadway.*

*Photo courtesy of Mike Cobley*

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## Chairman's update

*Mike Cobley*

The Summer season has got off to a very good start already this year with the loco performing well on, firstly, our trip on the mainline as part of Railway Touring Company's 'Great Britain XII' tour around the UK running again in Scotland and then over the recent Bank Holiday as a guest loco at the Cotswold Festival of Steam at the Gloucestershire & Warwickshire Railway. The loco has also had a supporting role in the 'Great Yorkshire Railway' TV series with TBLT stars Mark & Emma O'Brien.

Following our delayed 2018 AGM, we now are in the best financial position we have ever been, with a credit balance in the bank and still potential to improve on our funding, looking forward to our next 10- year overhaul in around 4 years' time.

We have another B1 Members' Day planned on 5<sup>th</sup> October – details to follow and already as we near the end of our financial year our 2019 AGM is provisionally booked for 26<sup>th</sup> October subject to home matches for Derby County FC.

As you will see in the following reports, lots of work goes on behind the scenes so our thanks are due to everyone for all their hard work. Without the support of our members and shareholders, past, present and future none of this would have been possible.

## Introducing Alan Hartford our new Trust Secretary



One of the most welcome aspects of our last AGM, held in March this year, was to welcome Alan Hartford as our new Trust Secretary.

For those who don't know him, Alan, like many of us got involved with the loco thanks to being a train spotter in his earlier years. With his spotting days being spent round Wood Green (North London) he developed a strong leaning towards the LNER. Those days, in the mid to late 50's, were for him the golden days of steam. Using some scaffolding poles laid between two supporting walls, he and some other lads created their own grandstand in a builder's yard on the down side of the mainline, just north of Wood Green Station (now Alexandra Palace). With the big pacifics just getting into their stride, all the signals in view and with nobody to bother them they thought it was heaven.

Every Sunday they went shedding to places like Willesden, Old Oak Common, Kentish Town, Neasden, Cricklewood and Nine Elms. Alan reckons he still had change from two bob after all the bus fares involved. As his dad was in the army, Alan finished his schooling at the International School in Fontainebleau, France. In 1958, at the age of 16, Alan joined the RAF which meant moving around quite a bit. In 1966 he got married and after an enjoyable career in the Service left the RAF in 1985. Following this he took up a job in

London, initially managing an office complex at London Bridge, and then various other properties including shopping centres, before retiring in 2013.

When Alan saw shares being sold in the B1, one of his favourite locos, he decided to pledge his loyalty and get involved. Whilst living in London until 1997/8 he joined working parties going up to Loughborough to help restore the loco, collecting Mike Cobley and Dave Fowler on the way.

Alan has an interest not only with railways but with other forms of transport such as ships, buses, trams and cars of the 1950s and 60s. He enjoys travelling and now has a motorhome which enables him to visit preserved railways, especially for steam galas.

On behalf of our members we welcome Alan as our new Trust Secretary.

## **Engineering update- part one**

*Steve Andrews*

I don't know if any of you ever watch 'The Yorkshire Steam Railway: All Aboard' programme on Channel 5 but it gives the impression that the NYMR goes from crisis to crisis. The staff only seem to deal with that crisis and it leads viewers to think that is the way the NYMR is run. I can't watch it anymore! You may have noticed that Paul Middleton was by the B1 explaining the problem they had with the spark arrestors. The only problem 1264 has with the ashpan spark arrestor, is that it's too easy to take out and refit. There are no nuts and bolts, no pins to pull, no locking clamps, no need for spanners or special tools etc. All this just seems to confuse the loco crews who expect it to be difficult. It's just lifted into place between the guide pegs and just sits there. 1264 has even gone out with the arrestor left in the pit. The simplicity of it just overwhelms them but this does not make for exciting viewing.

When 1264 came out of traffic in October 2018 I repaired a number of valves that needed attention, by standing on a ladder outside the running shed in the cold and rain. Later the loco and tender were separated leaving the loco in the running shed. The problem of the reverser leadscrew lock nuts coming loose and the difficulty of access was cured by cutting a door hole in the cab front. There was one already there, but it was too small and slightly in the wrong place. This was extended and a new cover plate made. The fireman's injector was taken off and a new cone made and fitted with the correct length stainless steel locking screw. The injector bracket was removed and a cut out machined on one side to enable access with a C spanner. People get excited about injector cones thinking that the manufacture of them involves the use of witchcraft but over the years I have found it is operator error and badly leaking steam clack valves which overheat the injectors. Crews have even had steam blowing back into the tender and have burst the flexible bags. I have tried so hard to do this but can't. It seems you have to be a driver or fireman to achieve this feat.

I was told that the smokebox blastpipe was carboned up and that it would need taking out. I was a bit shocked as it hadn't been disposed and I had to spend half a day cleaning it out. The next bit of entertainment was removing the spark arrestor which went well (good design) but the blower ring, which sits on the blastpipe cap, has two flange joints which



were installed at the last overhaul at LNWR Crewe so that the pipe could be removed and not bent out of the way. Unfortunately, the  $\frac{5}{8}$  Whitworth bolts used were not graphited and the holes were drilled 16mm which meant there was not enough clearance. After burning off the nut end and heating up, cooling down, use of WD 40 I managed to get them out with no damage. At home in my workshop, I found a straight shank  $\frac{13}{16}$  inch reamer and reamed all 8 holes out. The carboned up blastpipe was removed and mounted onto two bricks, filled up with scrap wood and set fire to. After a few hours the carbon catches fire and flakes off. I then made a set of gaskets and refitted it all.

Steve Robb was rewiring the TPWS battery box and worked out a cunning plan to replace the voltage converter for the AWS. All this has been fitted into a new box and mounted in the same place and there is even a digital battery voltmeter which is always on and cannot be switched off. This tells at a glance that the AWS, TPWS and OTMR are up and running. There was a lot of rewiring to do, not in the best of conditions, in the running shed. Even I'm impressed by the work carried out.

On the tender a new TPWS junction box was fitted in a better weatherproof location. A new bracket was made, the generator lighting plug was replaced by a new one and a resealable flag box was fitted into the tender locker.

Back on the loco just before Christmas, I was cleaning out the dragbox and happened to notice an epic crack across the boiler expansion diaphragm plate which bolts onto the front of the dragbox. After Christmas, Doug and Duncan were to repair the ashpan (more operator error!). I had another shock when I went into the firebox and found that the concrete arch had been broken up and been dropped into the pan but the ashpan had not been emptied over the pit before 1264 was put in the shed. Therefore, there was no option but to empty the contents into the shed pit - more joined up thinking and doing required for 2019. Eventually a couple of volunteers with buckets, shovels and wheelbarrows helped out. An easy job made difficult

The expansion plate was taken home and next day taken to JB Engineering at Hatton. The plate was scanned and laser cut including all holes and then brake pressed to the correct profile. I had three made at £65.00 each - A bargain!! The plate was fitted into place and instead of six  $\frac{7}{8}$  Whitworth bolts, 22mm metric studding was used and before fitting, copper slipped. A shank bolt will corrode into the hole it's in and become a tight fit, but studding, which is threaded on its entire length, will always be a loose fit as the threads corrode, making it easy to undo and knock out.

After the nice job that Doug had made of repairing the ashpan, I had to replace the ashpan spray pipes and when this was done the grate could go back in. An epic amount of work carried out in the freezing, smoke filled conditions of the running shed. On a sunny winter's day, the front shed doors are opened to let the warmth in.

The piston valves were taken out by the shed staff and Nick Proctor decarbonised them and cleaned up the faces and died down the studs. 1264 then had to wait two months for the valve rings to be made. In the meantime, I had made another pair of gauging rings and took all 16 home to my workshop, gapped them all and machined the peg relief on them, in a morning. I didn't want the pistons to come out until the piston valves were refitted and boxed up as that would mean we would have lots of parts laid out on the shed floor going rusty and with the potential of losing parts such as nuts and washers etc. Once the piston valves were back in the pistons came out. Dan Middleton, Paul's brother, (not such the glamour puss as Paul), made the new piston rings. They were then refitted the following week with the help of the shed staff.

I also made, in the comfort and warmth of my workshop, a new pair of valve rod die blocks. These were fitted and a new pair of wick trimmings made. Also, a new stainless cover was made for the top of the loco drag box to stop coal slack and big lumps filling up and damaging the dragbox. When the engine and tender were separated the dragbox and pins were tested and everything passed, but the inspector warned that maybe, next year, we should think of getting a new replacement drawbar. Steve Robb has already organized this with Stevensons, of sunny Manchester. Also, the heroic shed staff remetalled the RHS crosshead and Keith Pardy remachined it using milling cutters which I had saved from the scrap skip. I love recycling for the greater benefit and glory that is railway preservation.

Our intention for maintenance in 2019 is to carry on with the upgrading of the cab wiring, simplifying its layout, another piston and valve exam and the fitting of a two-way bypass valve for the ashpan spray so that control of the spray is removed from the crew. This will give them less to think about and allow them to concentrate on their driving and firing. The extra time saved is not to be used looking at phones but should be spent cleaning the loco.

The tender was also placed onto the wheeldrop so that the wheels could come out and be sent for turning. The wheels came out late Monday afternoon and were delivered to RMTS at Staveley, who have an underfloor wheel lathe which is mounted on the workshop floor. They were loaded back onto the lorry on the Thursday afternoon and were back at Grosmont the following Monday. Note the tyre turning cost of £810 inc VAT. Other tyre turner's prices are unrealistically high and with vague delivery times they need to look at the way they are offering their services.

My thanks to Sean Bowler and his team of OAP desperado volunteers who, not only took the wheels out and replaced them, but cleaned and inspected the axleboxes, bearings and underkeep pads, cleaned up the brake gear, changed the brake blocks and then adjusted the brakes. We know how to get value for money out of pensioners.

When we have a new tender tank, at the next overhaul, it will have a larger manhole by the water sieves so we can get in and clean out the sludge as it takes 15 minutes to get from the water filler down to the front well. It is also dangerous.

The safety valves were taken off and overhauled. The valve faces needed lapping in and the springs were sandblasted and primed. This stops the extensive pitting and extends their life. Steve also took off the regulator handle and stuffing box. I was disappointed that the stuffing box was packed with a length of packing and not cut into rings and packed correctly. After 48 years of railway preservation this should not be happening. The packing that the NYMR use is truly awful and isn't up to the job; it doesn't save work, it creates it.

We went to the Gloucestershire Warwickshire Steam Railway on Wednesday to finish off connecting the engine and tender together. A gang of cleaners was working on 1264 and I was impressed at how clean the loco was and thanked them. I also went on the Saturday and was amazed that 1264 was even cleaner, however you do notice that the entire fleet there is also clean. It would be nice if all the good features at various loco depots on preserved railways could be put together into one depot. The loco preparation and disposal pits outside the shed (two of them) are lit, deep enough and best of all, the water drains out. Some things are not so good such as the crew facilities and the overnight accommodation, but these will improve in the next few years.

On the Friday evening I went down The Chequers pub at Ticknall with my neighbour Ron and my meathead dog, Tessa. I had too much Bass and got home just in time to see 'The Yorkshire Steam Railway' on Channel 5. It was all about Mark and Emma's wedding plans at the NYMR and Mark's battered sausage. Next time you see him, just ask him about it.

## Support coach

M14007, the Trust's support coach has had a new set of batteries fitted at a cost of £1603. An automatic top up system is also being fitted at a cost of £90. The coach was cleaned out and the workshop reorganized. We are going to change the 240 Volt fluorescent lights with LED Batten lights which are more in keeping with the look of the coach.

The yearly exam showed up a leaking air brake cylinder and a leak from the vacuum cylinder or direct admission valve. Our coach overhauler, Paul Ramsden of Rampart C&W travelled up from Staveley with a van loaded with replacement parts. The air brake cylinder was an easy one to fix but the vacuum leak was much harder to find. The cause was a split rubber seal on the vacuum release valve on the bottom of the vacuum brake cylinder. It was good of Paul to come all that way as parts are only overhauled to order and not left on the shelf to go out of date. After extensive testing of the air and vacuum brakes everyone went home and the coach is now ready for the Great Britain railtour to Scotland.

## Cotswold Festival of Steam

*Mike Cobley*



The B1 was one of the guest locos at the GWSR steam gala over the bank holiday weekend and during the next week and weekend along with visiting King 6023 from Didcot. I was pleased to have been able to help acting as Owners' rep, joining Mark & Emma on Sunday morning. Riding on the loco and on the trains the weekend after the TV series broadcast their wedding last year, lots of passengers recognized the happy couple and some thought that this was their honeymoon!

The loco was very popular and B1s were rarely seen in BR days in that part of England, sometimes on football specials or deputising for a failed loco. The GWSR made us very welcome and following their opening up the line to Broadway the railway is very optimistic and staff and volunteers were all very positive. The footplate crew were impressed with how easily the loco steams and how it performed. A few old friends were about as well and





*During a quiet spell on Tuesday 28<sup>th</sup> May 1264 stands at Cheltenham Racecourse  
Photo courtesy of Mike Cobley*



*On Tuesday 28<sup>th</sup> May 1264 comes off shed at Toddington ready for a day's work  
Photo courtesy of Mike Cobley*

it was nice to see Jim & Joan Gurnett. Jim managed to get up on the footplate for a nostalgic look round and Rob Robotham, author of several books on the demise of the GCR, was visiting his now local railway. We also had a footplate visit by an Edward Thompson and a £20 donation...





*With Oxenton Hill in the background 1264 approaches Greet Tunnel with the 15.20 service from Cheltenham Race Course on 30<sup>th</sup> May 2019*

*Photo courtesy of Alf Bousie*



*The fireman leans out of the cab to check for any waiting passengers as 1264 approaches Hayles Abbey Halt with the 12.20 service from Cheltenham Race Course on 30<sup>th</sup> May 2019*

*Photo courtesy of Mark Higginson*

## Engineering update - part two

*Steve Robb*

Part of this article may sound like I'm repeating history but bear with me as it will become apparent later why it has been repeated.

At the time of writing the loco is currently stripped for scheduled winter maintenance. In previous years the focus has been devoted to mechanical maintenance with very little, if any time at all, devoted to the electrical systems fitted to the loco. This was until last year when, upon removing the cab floor, it was clear that the effects of the lack of maintenance and the harsh environment had caused severe damage to the electrical conduit. The work to resolve these issues was undertaken by our former company secretary, Dave Fowler, before his untimely death last year, and has improved the situation with regards to the wiring and electrical conduit under the cab floor. It is no longer being trodden on or lying in damp coal dust and is still in good condition and doesn't require any repair work. At the time suggestions were made that further work was undertaken to improve the electrical system, but in short, enough time wasn't available to order the components and do the work. Nevertheless, all appeared to be well, unfortunately this was not to be.

As you are probably aware 1264 suffered an electrical failure (yes that may sound farfetched, but I kid you not, it happened) last year during the first *Whitby Flyer* railtour on Saturday 7<sup>th</sup> April 2018. Upon arrival at Whitby the failure was attributed to a pair of unserviceable TPWS batteries which had rapidly discharged throughout the trip. Frustratingly the replacements obtained from the NYMR and fitted in a 'pit stop' style battery change at Grosmont mainline station were not much better than those that had been fitted by the NYMR some months before. The whole situation on the face of it may seem trivial, however, when you're there on the spot having to deal with the problem indeed any problem with a loco on the mainline, in front of paying passengers and other bystanders, you wish the floor would open up and swallow you whole. The embarrassment is enough to make you feel ill. If you don't believe me try to see it for yourselves. A tense few hours ensued on the way back to York and it was unclear as to whether the loco would make it back. Fortunately, it did, but by the skin of its teeth. Upon arrival at the NRM, York, a quick check with a multimeter showed that the batteries were once again hovering at the point of failure. Further investigations showed that at some point the TPWS engine to tender jumper cable had failed at the tender connection, the cable having disintegrated. Fortuitously, through arrangements made by Clive Goult and myself, a spare jumper cable was obtained on loan from the NRM. Steve Andrews purchased two new 12-volt 110-amp hour batteries and I investigated the wiring for any possible faults. To cut a long, painful and somewhat embarrassing story short the failure in the first instance was attributed to faulty batteries and secondly to the faulty engine to tender connection. As with all these things questions were raised by WCRC, myself and Steve Andrews and these focused on the following points

- 1) How long had the system been fitted to the loco?
- 2) How old were the components within the system?

- 3) When was the last time any of the components were changed for new from Unipart Rail?
- 4) When had the first set of batteries that failed been fitted?

In short, the first three questions were hard to answer as it would appear records for the system were missing and the original components first fitted to the loco were still in use. Nothing had been changed for new components direct from Unipart Rail and instead had been acquired from other sources and so were in effect an unknown quantity. Even 15 years ago, this was deemed unacceptable but to which a blind eye was turned. With the passage of time and the now very restrictive requirements of rail industry standards (yes steam locomotives and heritage vehicles now have their own dedicated suite of standards to which owners must adhere to) the practices of those early days are now even more unacceptable, as is accepting the attendant risk of failure. This isn't an issue common just to 1264; it is a heritage industry wide problem. For whatever reason component service life and purchasing of replacement or spare parts are viewed as a difficult subject for several reasons. This is mainly because of costs and the perception that it is easier to rob Peter to pay Paul and thereby kick the problem and the expense further down the line. The fourth question was relatively easy to answer. Irrespective of what answers could or could not be provided a plan had to be drawn up and actioned to avoid having a repeat performance. Several recommendations were made by WCRC and Steve and I had our own thoughts which were formulated into a plan of action. This resulted in a number of commitments being made to action points in the plan to WCRC, our chosen operator for the locomotive on railtours.

As part of this year's winter maintenance the focus has been split between electrical and mechanical maintenance and the outstanding points of this plan have been completed and the details of the work undertaken are outlined in the rest of this article.

### Ordering New Parts from Unipart Rail

Initially, after a great deal of toing, froing and confusion for a number of reasons, several new electrical components were ordered from Unipart Rail to replace the ones that had failed, along with spares to be kept in stock.

The order from Unipart Rail consisted of the following items:

- One solid state TPWS/AWS voltage converter configured to run on 24 volts.
- Three 4ft long TPWS engine to tender jumper cables.
- Two TPWS aerial junction boxes configured specifically for use on steam locomotives.

The order from Unipart Rail wasn't cheap, these things never are, but the expenditure represents a worthwhile investment in the loco and its future working life. Spare parts sat



on the shelf are not a waste of money, neither are they dead money; they're an investment that pays off when things fail. To those who disagree with that statement I can put it into very sharp perspective.

Had the NRM not had a spare engine to tender connection and had they not agreed to loan it to us the entire 2017 mainline running programme for the loco would have ended there and then with the loss of considerable income and egg on numerous faces. Not only that but the loco would have been stranded in the NRM yard until such a time as it could have moved out of steam to the Network Rail loading point at York Carriage Works. Such a process involves arranging a yard to yard move at a time when the loading point is clear. To do this is not a quick process and can take months to arrange meaning that in all probability we would have lost income from daily running on the NYMR and all for the lack of a spare 4ft long jumper cable. In essence we very nearly got caught out and to be left in such a situation again and have to go cap in hand to other organisations for items we should have in our own spare parts inventory, is in my view totally unacceptable.

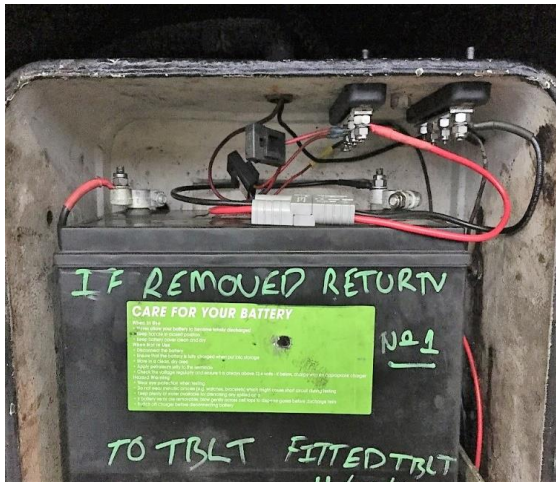
### Battery Box Rewiring

As stated previously the work undertaken by our former company secretary, Dave Fowler, had improved the situation with regards to the wiring and the electrical conduit under the cab floor. It is still in good condition and doesn't require any repair work.

As part of the planned work the decision was taken to improve the battery box wiring which over time had suffered somewhat and needed replacement and improvement of the somewhat confusing layout. This consisted of multiple wires all the same colour and a number of different wires connected directly to the batteries. As with all these things hindsight is a wonderful thing and it is very easy to pick fault and say, "I wouldn't have done it like that". To resolve the problem the existing wiring was separated into positive and negative connections and then shorted, and the terminals crimped to two heavy duty marine type busbars. These were then mounted in the top of the battery box, one for the positive wires and one for the negative wires. This has removed the need for multiple wires being directly attached to the battery terminals. To further improve the situation a set of 50-amp battery connection cables have been installed so that the wiring connecting the two batteries is now much more robust and will reduce the voltage drop between the two batteries. These also connect the batteries to the positive and negative busbars via an Anderson Battery connector which is used to connect the other half of the battery box wiring positive and negative cables attached to the busbars. The use of such a connection also makes removal of the batteries a much easier process, without causing damage to the wiring. The work involved took around half a day to complete and the hardest part about it was actually starting the job. As they say a picture can paint a thousand words and photos below will make the description of the work much clearer.



*The photo opposite shows the two busbars mounted in the top of the loco's battery box. One is for positive connections, the other for negative connections. The metal parts are all stainless steel as are the nuts and cap screws holding everything in place.*



*As can be seen in this image the new layout is much more logical and robust. It includes an Anderson battery connector which is the grey object sat on top of the battery*



*This photo shows the full layout of the battery box with both batteries connected and all cables routed appropriately. Hopefully this provides a much-improved layout with more robust wiring and connections compared with the original design.*

### OTMR Status Indication LEDs

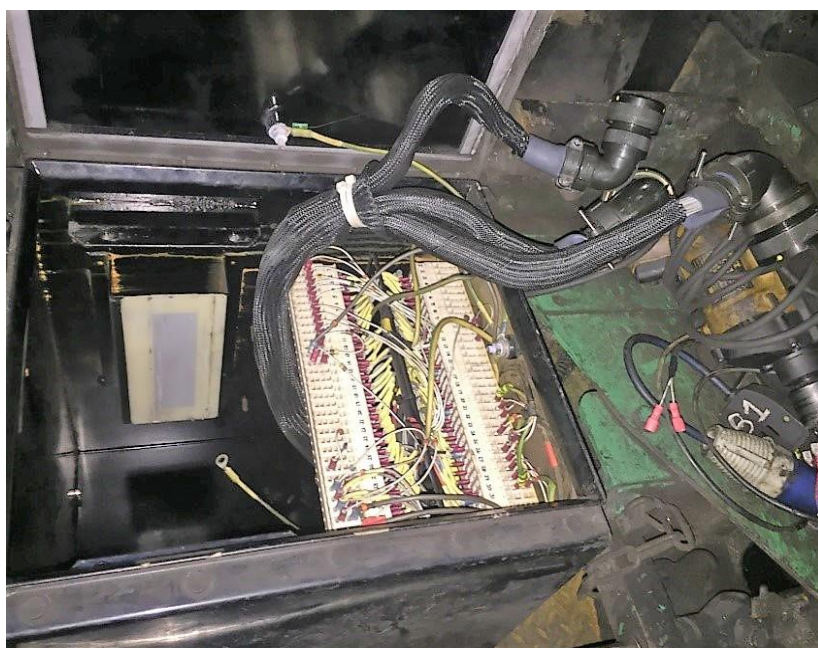
Unbeknown to me the two OMTR status LEDs had also failed. These indicate if the OTMR is functioning correctly as indicated by a blue LED, or if it has developed a fault, as indicated by a red LED. New LEDs were therefore ordered from RS Components and arrived the next day and the work planned in to get them replaced.

What at first seemed a fairly straightforward job of removing the old LEDs, enlarging the two holes and fitting the new ones soon developed into one of those jobs where the available supply of profane language and expletives was soon outstripped by the demand. Suffice to say that to reach the two LEDs the entire OTMR wiring loom had to be disconnected and removed from the OTMR enclosure to allow sufficient room to reach them with both hands. Due to the existing LEDs being an obscure size that RS don't keep

on the shelf the two holes in the OTMR enclosure had to be enlarged to 14mm diameter to accommodate the new size of LED.

Enlarging two holes to 14mm in relatively thin section steel using a DeWalt 240-volt pistol drill is normally a process fraught with hazard. However, this was made less so by inventive use of emery tape, with the abrasive side facing down under the drill against the hole. This is a trick shown to me by Steve Andrews some time ago and one I have never forgotten. With the two holes enlarged the LEDs were fitted and connected up to the wiring. The wiring loom was then reconnected and bolted back into place. The LEDs were then tested. This involved swapping between our own OTMR to test the blue “healthy” LED, and a known faulty OTMR, removed from 76079 at overhaul, to test the red “faulty” LED. What seemed like a simple job took a day and half to complete.

Again, the photos below show the various stages of the work being carried out.



*The photo left shows the OTMR wiring loom part way through removal to allow access to the location of the two status LEDs. Removal of this was the cause of a great deal of annoyance and distress*



*This image shows the location of the two LEDs within the OTMR enclosure. To gain access to this point the OTMR wiring loom had to be removed. When originally fitted the loom and OTMR obviously hadn't been fitted to allow easy access to the front of the enclosure. With everything inside it is impossible to see the front of the box let alone reach it.*

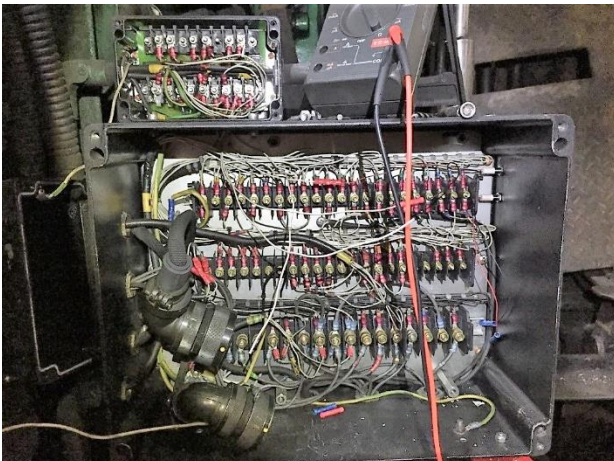




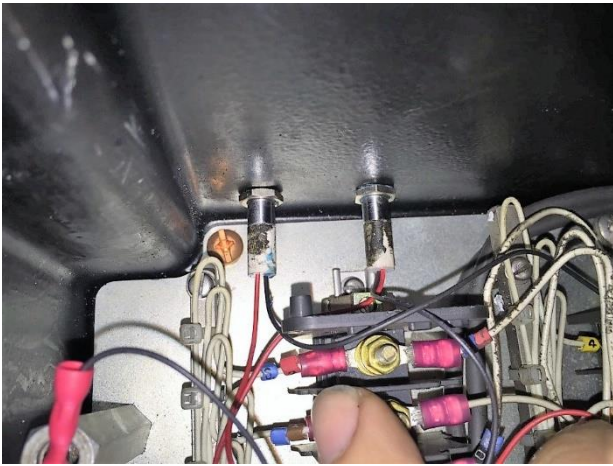
*The picture to the left shows both LEDs, one blue and one red, fitted into position and connected up. The shiny substance around the LEDs is a silicone gasket compound to help prevent the ingress of water via the holes.*

### TPWS Aerial changeover switch proving LEDs

At some point last year there had been considerable confusion regarding the operation of the TPWS aerial changeover switch which is mounted below the reverser weigh shaft between the frame of the locomotive. This forms part of the circuit that selects either the front or back TPWS aerial and several heated phone calls ensued about the issue. There are two TPWS aerials which pick up different radio frequencies from lineside equipment mounted between the rails. One on the loco under the front bogie and one on the tender on the rearmost frame stretcher. Only one of these must be selected, depending on the direction of travel, i.e. front for forward and back for reverse, running tender first. The switch contacts are operated by a cam on the reverser weigh shaft and configured in such a way that they operate the TPWS aerial switching unit mounted above the TPWS control unit in the cab. To avoid such confusion in the future two white LED indicators have been fitted into the side of the control unit enclosure and these will illuminate or extinguish according to the aerial selected. As per the original steam locomotive TPWS/AWS wiring diagram such LEDs are not a requirement and subsequently most steam locomotives were not fitted with them. However, over time problems develop with such a system, as do the solutions to resolve them, and in this case a number of locomotives were retrospectively fitted with LEDs to prove operation of the changeover switch. In the back of my mind I have a recollection of a representative of the then vehicle acceptance body recommending that they be fitted. Again, it took a day to complete the simple task of drilling two holes, tracing wires and making connections in the TPWS aerial switching unit and performing a test to ensure that the LEDs swapped according to the reverser being in forward or backward gear. The pictures below show the LEDs in position.



*The photo left shows the wiring located behind the TPWS/AWS control unit and mounted above it the TPWS aerial switching unit. To connect the LEDs the relevant wires and terminals had to be traced and made so that the LEDs would swap over dependent on forward or backward gear.*



*As can be seen the LED indicators just fitted within the space available and were positioned so that they didn't interfere with any other wiring within the control unit enclosure.*



*This image shows the view from outside the enclosure. The top LED is for Forwards, the bottom LED is for Backwards. These will be labelled accordingly and will highlight if the changeover switch has failed.*

### TPWS aerial junction box

As part of the work we committed to WCRC to undertake, two new TPWS aerial junction boxes were ordered. One to replace the one mounted on the tender, on which the bayonet connection appeared to be heavily corroded and therefore suspect, and one to be held as a spare. Again, what seemed a simple thing to do developed into a more complicated process as it was decided that the original location of the junction box was unsuitable due to it being mounted horizontally on the dragbox. This caused two issues, the first being that the 90-degree angle at which the jumper cable connection sat put undue strain on the bayonet connector and the weight of the cable was trying to shear it off. Secondly to carry out any work on the contents of the box entailed lying flat on your back and working overhead with the attendant risk of dropping and losing nuts and washers. A more suitable location for the box was found and a mounting bracket manufactured to allow the box to be mounted vertically and at a 30-degree angle with the connection pointing downwards. This reduces the strain on the bayonet connector because it is now under tension, which that type in particular, will withstand. Mounting the box vertically also removes the need to lay on your back to work on it, making connecting up the wiring much easier. Another benefit is that with the box being at a 30-degree angle any water or coal dust is more inclined to run off, rather than collect on top of it.

What seemed like a simple job that could be completed relatively quickly actually took the best part of 5 days to design and fit everything in position. The work was also undertaken outside at times in the pouring rain, the cold and in the dark working by hand lamp and head torch. For those who are of the belief that running and maintaining a steam locomotive has an element of romance or nostalgia attached to it you are sadly very



mistaken. When undertaking work such as that described above and many other maintenance tasks, both romance and nostalgia, are conspicuous by their absence.



*As can be seen from this photo the aerial box is now mounted in a much better position and although not overly apparent it is mounted at a 30-degree angle. What it does show is the greatly improved access to the electrical connection within the box which can now be worked on without fear of losing anything.*



*The complete assembly with the cover fitted. The 30-degree angle is more apparent. Hopefully this will solve the issue of straining the bayonet connection on the engine to tender jumper cable as both junction boxes now slope at the same angle.*



*This photo shows how the bayonet connector has suffered from the effects of corrosion caused by moisture ingress over the years it has been fitted. Although not particularly heavy it was a cause of concern.*

### OTMR Transducer Box

As has been mentioned previously, 1264 is fitted with an OTMR which uses outputs from transducers to produce the various graphs that form the information produced when a download is viewed in the analyser software. These transducers are mounted under the cab floor in an electrical enclosure. The original electrical enclosure was suffering from the effects of several years of exposure to coal dust and water and was approaching the point



of being life expired. Due to a delay in the availability of another item, which the supplier had to order from Germany, the opportunity was taken to replace the existing enclosure with a stainless-steel enclosure. As the potential for losing time searching for equipment was highly likely if the work was carried out at the NYMR, the fitting of the transducers and drilling various mounting holes and a conduit entry point was carried out in Steve Andrews' workshop. The work was completed in around 3 hours, as opposed to the better part of a day at the NYMR. The work remaining is simple and consists of bolting the box into place and connecting wires which can't be done off the loco. To make removal of the entire box much easier a busbar has been fitted, the components for which came from Termate, Nottingham and are commonplace on rail industry electrical installations. At some point in the near future a number of spare transducers will be ordered and kept in stock to cover for any failures. The photos and captions below show and explain the work involved



*Steve Andrews is seen carefully drilling the holes for mounting the transducers in the box. This was done on his milling machine with the box securely clamped to the table of the machine. This allowed the holes to be drilled with considerable accuracy in comparison to using a pillar drill*



*Externally the finished box with all the relevant mounting holes drilled and sharp edges removed. The work was undertaken in Steve Andrews' workshop because everything was conveniently on hand and an inordinate time was not spent searching for the right tools*



*The inside of the enclosure prior to fitting a set of twin terminals and links to facilitate easy disconnection of the six electrical connections that relate to the transducers. At this point plastic labels were being fitted in order of the transducers and their applications.*

*(L to R) vacuum brake, steam brake, and steam chest pressure. These produce an output which is recorded by the OTMR*



*As delivered the busbar comes as separate segments to allow the number of terminals and links to be configured for a given application. These are then slotted into place and bolted down into position.*



*The finished transducer enclosure complete with internal wiring and stainless steel conduit inspection elbow*



## TPWS/AWS voltage converter upgrade

Although upgrading the TPWS/AWS voltage converter to a modern solid-state version did not form part of the planned electrical work it was deemed prudent to fit one, the justification for which will become clear later. Around three years ago the loco suffered an intermittent fault, firstly with the AWS and later with the TPWS system. These were attributable to other issues within the system but were not being helped by a faulty voltage converter, which was emitting a high-pitched humming noise whenever the systems were turned on. Further investigation showed that the voltage outputs from the converter were unstable and causing issues within the system. It would seem that the fault had been present for some time. Due to the type of voltage converter fitted to 1264, (which is the same as the type fitted to first generation diesel multiple units), a replacement was difficult to obtain, but we were able to borrow one from the NYMR. This was to be fitted to 80135, but instead has been fitted to our loco for the past three years. I mentioned earlier about the justification for the upgrading to a modern converter well here it is.

The existing voltage converter really needs to be returned to the NYMR before it fails. This might not seem too big an issue as these things fail and its part and parcel of what they are and how we use them; they were never really designed for steam locomotives. But in the event of it becoming unserviceable TBLT would have to stand the cost of buying two voltage converters, one for ourselves, and one to replace the one belonging to the NYMR. This is where the policy of robbing Peter to pay Paul or running on borrowed parts fails. It becomes more and more expensive as you end up paying for things twice.

Several ideas were bounced around regarding where best to fit the new voltage converter as it is much smaller, meaning that the footprint compared to the old one has been greatly reduced. However, to protect the investment made in the new unit it has been mounted inside a rail industry spec electrical enclosure manufactured by the same company that supply Unipart Rail. Although this hasn't greatly reduced the footprint of the system, it has, by judicious use of panel mounted switches, consolidated the two isolation switches into one location within the enclosure. The enclosure itself is mounted on the fireman's side with all the switches and the voltage converter mounted inside it. In the pictures below the voltage converter is shown prior to fitting within the enclosure.



*These photos show the new style of voltage converter which is considerably smaller in size than the previous DMU type that was initially fitted to 1264 when the AWS system was installed, shortly after it entered traffic in the late 1990s. As with many things the use of electronics has reduced its size.*



As part of this upgrade a separate isolation switch has been installed to independently isolate the TPWS and AWS without isolating the OTMR, meaning that the isolation is recorded and that the other outputs can be monitored. This has been done on the recommendation of WCRC and follows a similar set up fitted to their locos. The switch has to be protected in some way, in this case by a latch and break seal arrangement, which was supplied by the manufacturer of the switch, rather than by adapting a standard isolation switch. The design and completed assembly are compliant with rail industry standards and readily available. According to the requirements drawn up by the Office of Road and Rail in response to the *Tangmere* incident at Wootton Bassett, the primary isolation switch needs to be lockable in the 'on' position, to avoid it being deliberately or inadvertently isolated. To avoid modifying an 'off the shelf' switch, discussions with the same switch manufacturer resulted in a solution being found. Again, this is an 'off the shelf' unit they supply, in a configuration that can be secured by a padlock in the 'on' position, something that seemed to cause confusion with other switch gear manufacturers. As mentioned previously, whilst not the cheapest option, use of these switches has allowed them to be consolidated into one location and has made the system compliant once again. The addition of a DC voltmeter will also allow the battery supply voltage to be monitored, which will go some way to avoiding a repeat of a battery failure in future and will remain live when the safety systems are isolated.



*These images show the TPWS / AWS independent isolation switch and its protective latch to prevent deliberate or inadvertent operation. This whole assembly meets with the rail industry's standard for low voltage switch gear and is manufactured in the West Midlands*



The photo on the left shows the rough layout of the various items that make up the enclosure. Whilst the design had been drawn up half scale, only by trying out different arrangements could the best use of space in the enclosure be worked out. The chosen layout also had to allow for wiring to be routed to avoid pinch points and unnecessary strain on the electrical connections.

The photo on the right shows the enclosure mounted in position with all switches and indicators labelled up. As can be seen the new layout is much neater and allows the isolation of the TPWS & AWS in the event of a failure. The voltmeter has been included so that the battery voltage can be monitored throughout a mainline trip.



As a further improvement to the electrical system, proper electrical protection has been installed in place of the previous automobile style blade fuses, which were unsuitable. The new system is now protected by three 5 Amp miniature circuit breakers. These are shown above mounted in position within the battery box.

## TPWS Mk 4 The future

To sum up, it is hoped that the work undertaken on the electrical system so far will ensure its reliability for some time to come and should also reduce the work required during the next overhaul, by which time 1264 will have to be put through a mandatory system upgrade to TPWS Mk 4. This should have happened at the last overhaul however by a stroke of luck 1264 entered traffic before the cut-off point of 1<sup>st</sup> December 2013 and therefore didn't need to be upgraded. For the loco to remain compliant with GE/RT807 AWS and TPWS interface requirements and therefore compliant with the requirements to operate on Network Rail maintained infrastructure it will have to receive such an upgrade.

At present three steam locomotives have successfully been fitted with this TPWS MK4 and entered service with the system performing faultlessly. All however were new entrants onto the mainline and were fitted from a blank canvas. 1264 is not a blank canvas and already has an existing system which means that to carry out the upgrade is a simple process of adding the new components and removing the old ones from the system. Whilst simple to fit the equipment, to carry out the upgrade comes at a cost. When I enquired about what was involved in upgrading an existing system the total cost came to around £11,000 inclusive of VAT. This included all the equipment required and the 'first of class' test to validate and certify the upgrade.

Unlike the proposed roll out of ERTMS, TPWS Mk4 is not a network change it is an upgrade to an existing system which has hitherto remained unchanged in its Mk2 and Mk3 enhanced incarnations and as such the costs involved would be carried by TBLT. However, the two systems, TPWS and ERTMS are linked to each other and as 1264 is one of the locomotives listed as having any ERTMS equipment fitted for free, the £11,000 is a small price to pay to ensure the future operation of the loco on the mainline and as part of a fleet of locos used by the NYMR to operate to Whitby or Battersby. This being is one of the sections of railway earmarked to be fitted with ERTMS.

A lot can change in four and half years and it may well be that the ERTMS project is cancelled or shelved, but in the wake of its cancellation and in four years' time it is looking increasingly likely that there will be no way of avoiding an upgrade to TPWS Mk4. Taking the view of only doing it if we have to and being resistant to change is not a forward thinking one and is akin to burying our heads in the sand, as is considering the kneejerk reaction of taking the loco off the mainline register. Along with all the other work entailed in an overhaul the upgrade to TPWS Mk4 is a very real but undaunting prospect and is something that as an owning trust we need to give serious consideration to before we get to that point. After all, 1264 was at one point a mission impossible scrapyard wreck that was never going to run again. A small band of volunteers overcame the insurmountable and to their credit the loco steamed 21 years later and it is not as if TBLT hasn't proven its resolve to overcome both minor and major issues that have occasionally reared their heads ever since those very early days.



## News of members

*Mike Coble*



Murray Pearson celebrated his 90<sup>th</sup> birthday at the Gartell Light Railway on 6<sup>th</sup> April along with his family and many friends. Murray was treasurer for the Trust throughout the hard times of fund raising for the initial restoration and return to steam and was best remembered for organising our sponsored cycle rides in the 1980s. He was succeeded by John Kiefer, who also was a guest, but alas John has been in poor health over the last few years.

The railway put on a special birthday train and Murray managed a footplate ride. The catering team provided an excellent buffet lunch and then cakes and tea later in the afternoon. A visit to this small railway, near Templecombe is recommended, with an opportunity to travel on a short length of the original S & D track bed.

Thanks to Lucy for the organisation ... and the invite,

## TBLT Members' Day Special

The Members' Day Special is always a good time to meet up with fellow Trust members and old friends. Subject to final confirmation this year's Special will be held on Saturday 5<sup>th</sup> October at the NYMR. Please look out for further details in due course.

## Great Britain XII

This year 1264 operated days six and seven of the Railway Touring Company's 'Great Britain XII' steam tour along with Black Five No 44871. On Thursday 2<sup>nd</sup> May the pair hauled the train from Edinburgh to Stranraer followed the next day by taking it from Ayr to Carlisle. The tour continued with Merchant Navy Pacific No 35018 British India Line whilst 1264 returned to Grosmont.



*On 2<sup>nd</sup> May the pair are seen en route to Stranraer*

*Photo courtesy of Steven Craig*



*The support crew are seen at Stranraer Station ready for the next leg of the tour*



## Tender tyre turning

*Steve Robb*

As part of the planned winter maintenance work the tender axlebox bearing crowns have had the white metal built up to remove excessive side play. As part of this process the tender wheelsets were removed and sent to Richardson Machine Tools Services (RMTS) at Staveley, near Chesterfield for reprofiling due to all wheelsets having thin flanges or being very close to being outside the acceptable limits of wear.

A further very noticeable issue was that over the years the tyre treads had worn hollow resulting in a substantial discrepancy in diameter between wheels. When new the difference allowed between wheels on one axle is 0.25mm, but in one case this was close to 3mm, due to the hollow wear. The tyres have now been turned to recover the profile and flanges to within the acceptable limits. However, this has left them roughly 1.5mm above last turning tyre thickness of 41mm, meaning that at the next overhaul new tyres will have to be fitted.



*This photo shows one of the tender wheelsets during reprofiling on the wheel lathe at RMTS, who are the UK agents for the German wheel lathe manufacturer Hegenscheidt MFD. This is now very much the machine of choice for train operating companies and this one was removed as scrap from Northern Rail's Longsight Depot in Manchester.*

The whole process took roughly a day and half to complete and had to be overseen by a representative of TBLT in case of any unforeseen issues. It's much easier to make a decision regarding a course of action needed to resolve a problem when it's there in front of you rather than trying to visualise it and then give advice via the telephone. This worked rather well as at one point there was some confusion regarding which wheelset had the thinnest flanges. This resulted in one of the wheelsets having to go back on the lathe to bring it down to the same size as the other wheelsets; only a minor issue but when the finished size is going to be close to the last turning limit any errors can result in the tyres being scrapped.





*The photo above shows a lathe mounted below floor level as is the normal convention enabling locos and wagons to be shunted over the top of it without having to have their wheels removed  
Both photos courtesy of Steve Robb*

To give you some idea of how much material has been removed, the tyres when new, (which granted was some time ago), start off life 75mm thick and to recover 1mm of lost flange thickness requires the removal of 4mm of tyre thickness. This confirms the old rule of thumb that you only get three goes on a wheel lathe before an engine needs new tyres.



*1264 crosses Water Ark bridge running tender first with the 10.30 ex Grosmont service on 31<sup>st</sup> March 2019  
Photo courtesy of Ken Snowdon*

## TBLT 150 Club

Stephen Harris

### Prizewinners 2018/2019

2018	Special	£50	£30	£20	£10
December	£200 71 A Naylor £100 32 A Naylor	116 G Brothers*	130 D Wellington*	112 Mrs J Whitfield	68 Mrs J Whitfield
<b>2019</b>					
January		81 R Goldthorpe*	42 A Hartford*	154 R Morris*	33 A Angus
February		65 N Suggs	109 B Rich	134 A Camp	66 R Goldthorpe*
March	£100 5 R Castling £100 167 D Westbury £80 168 A Lightowler		48 S Barrington	91 J Moore	47 S Barrington
April		145 M Rogers	8 R Barnes	39 R Morris*	49 S Barrington
May		68 Mrs J Whitfield	4 K Parkes	140 C Baines	164 A Naylor
June	£100 132 P Bates		94 J Whitfield	120 P Morrell	17 P Bates

\* Denotes prize donated to TBLT

There are always a few numbers available, so if you would like to subscribe or increase your subscription please contact Stephen Harris at 7 Church Lea, Tavistock, Devon. PL19 9PS

Or

Tel: 01822 618395 or by e mail – [stephenharris@hotmail.com](mailto:stephenharris@hotmail.com)