

The 762 Club

***Building No 762 Baldwin locomotive Lyn
for the Lynton & Barnstaple Railway***

Newsletter No 7 - Summer 2014



With an anticipated completion date of Dec 2015, there are just 18 months to go before this iconic locomotive is completed!

Introduction

Welcome to the Summer 2014 edition of the 762 Club Newsletter giving updates of the design and build status of new-build Lyn for the Lynton and Barnstaple Railway.

Much exciting work has been carried out since our last newsletter in recreating a 21st century locomotive for the beautiful Lynton and Barnstaple Railway and this newsletter is an opportunity of providing a road map to complete the building of Lyn within the next eighteen months.

We hope that members have been keeping in regular contact with our progress by reading the monthly LYNformation uploaded to the Club's website (www.762Club.com) in addition to Mike Nelson's design blog (<http://www.machineconcepts.co.uk/baldwin242/baldwin.htmcharting>) and these have become increasingly exciting and regular as the completion date comes into sight!

We are aware that some of our members possibly do not access, or have limited access to, the internet as regularly as others and therefore we are pleased to provide this newsletter for all supporters of the 762 Club. For those without internet access if you have a colleague, relative or friend who does it is worth checking out the websites above for a plethora of images, design updates and charting of progress.

Finance

For members receiving this newsletter via email please find enclosed a copy of the 2013 Calendar Year financial accounts of The 762 Club. These are professionally prepared for us by James Hellyer of Accountancy Edge Ltd. Members not on email can request a hard, or soft, copy by contacting Jon Pain.

Current lifetime membership of The 762 Club stands at 255 members some 73% against our original target of 350. To date we have collectively raised over £280,000 from varied sources including; membership fees, component sponsorship, grant aid, donations and some retail sales. The sponsorship of bespoke components by individuals has raised over £50K in its own right which is a significant contribution towards building the locomotive.

We anticipate requiring an additional £150,000 of capital to complete the project and this is very much achievable given our current run-rate of donations. Our cash reserves have significantly lowered though as purchasing activity has increased to manufacture items and assemblies and it is critical we continue to raise funds to ensure our contractors have a steady flow of work ahead of them.

If you know of anyone who hasn't joined us yet now is a great time for them to join the Club and help us bring this iconic locomotive back to the Lynton & Barnstaple Railway. Additionally if you would like to sponsor a component or donate further please - do not delay!

The Club, as a registered Charity claims back Gift Aid on applicable donations that are backed by a signed Gift Aid declaration. This provides us an opportunity to increase eligible donations by 25%. We also are VAT registered and so claim back the appropriate VAT element on our purchases. Virtually every penny donated to the Club is spent on the locomotive as 99% of all administration is given free or a donation made in lieu of our statutory expenses.



Left: The boiler for Lyn at the Woody Bay Autumn Gala in 2013 with Peter Miles explaining the Project to the local North Devon Journal reporter.

Photo: Tony Nicholson



Left: Inside the boiler showing the superheater header fitted. This was a complex operation.

Photo: Peter Best

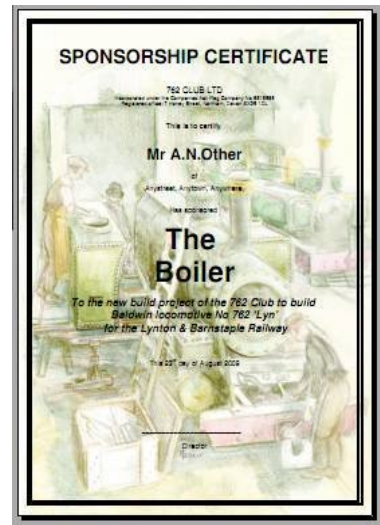
Sponsorship

Sponsorship falls into two areas; Commercial sponsorship and individual donors.

Individual;

Individual donors have helped raise over £56,000 to date having selected individual component items for sponsorship via the 762 Club website. Members receiving this newsletter via hardcopy will receive a copy of the current sponsorship webpage listing in case they wish to sponsor any of the components remaining.

Individual donors have a choice of A4 certificate one by Eric Leslie (shown below right) of Lyn undergoing overhaul at Pilton works, or a line drawing of Lyn by Peter Willmore (shown below left). All donors have the choice of then having their name (or a loved one) listed on the 762 Club's Roll of Honour listing on the 762 Club website.





The recent Bearings, Bars & Bolts appeal launched in L&B magazine No. 102 has raised over £3,000 to which we have procured a range of bearings from SKF in addition to a number of the bolts & fixings required.

Left: A sample of some of the SKF bearings purchased via the appeal.

Thank-you to everyone who contributed, and continues to contribute, to the appeal (it's still open!)

Payment for sponsoring a component is easy, it can be done via direct bank transfer to the 762 Club bank account, via pay-pal or cheque. Please contact Jon Pain for help.

Corporate;

Corporate sponsorship has been hugely successful with one of our key team members, Peter Best, making contact with various companies who have agreed to manufacture or supply parts for us. Corporate sponsors have included John Guest Ltd, Longshore Systems Engineering, Altecnic, OCS parts, Hydraguard, Porterhouse Models, Accucraft, Steam Powered Services Ltd, North Devon Precision Products and Babcock International. Our sincere gratitude goes to these organisations and we encourage you to look at their websites and support them where you are able.



Left: The completed bunker assembly supplied by our Corporate sponsor Babcock International who kindly manufactured these for us at their Appledore Shipyard facility in North Devon. The bunker was constructed by apprentices at the yard as part of their skills development.

Photo: Babcock Int.

Right: Valves sponsored by Steam Powered Services Ltd. These included a range of non-return and gate valves and have saved the Club over £3,000 if we had to purchase them.

Below: The completed & primed water tanks. Note the dummy rivets, footsteps and filler caps. The tanks and bunker are now at Alan Keef & Sons.





Left: The two lifting links kindly sponsored by Corporate sponsor John Guest Engineering Ltd.

Photo Peter Best

762 Completion programme

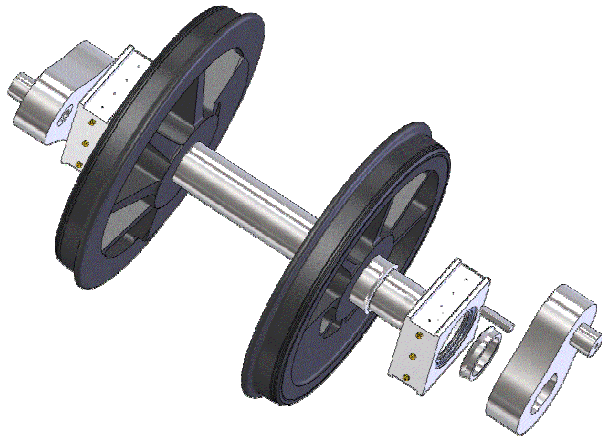
Of most relevance to members and supporters of 762 Club will be when will the engine be ready?

The 762 Club Board decided to adopt an ambitious and challenging plan to have the locomotive finished by December 2015 when they last met in March 2014. The ability to meet this challenging timescale is two-fold. Firstly, can we technically build a locomotive and secondly can we fund the remaining costs needed to buy the necessary components.

Technical challenges – before we detail all those items that are still required, it is very good to report all those things that we have achieved already. The following items have either been completed or are on order and make an impressive and encouraging list:

| | | | |
|--------------------------|---|----------------------------|---|
| Boiler (inc Superheater) | ✓ | Front and Rear couplings | ✓ |
| Saddle assembly | ✓ | Front and Rear Cowcatchers | ✓ |
| Coal bunker | ✓ | Smoke box (including door) | ✓ |
| Cab | ✓ | Side tanks | ✓ |
| Chimney | ✓ | Piston Valves | ✓ |
| Cylinders | ✓ | Pistons | ✓ |
| Driving Wheel sets | ✓ | Feed Water valves | ✓ |
| Pony truck Wheel casting | ✓ | Roller Bearings | ✓ |
| Steam brake | ✓ | Clack valves | ✓ |
| Injectors | ✓ | Name Plates & Numberplate | ✓ |

And many more smaller items inc pressure gauge, valves, whistle, lubricators and the like



Left: A 3D solid works design assembly of the driving wheels mounted on their axles. The assembly also shows the axle boxes and parts of the motion.

Below: the wheels being connected to the axle in the axle press at Alan Keef and Son's in April this year.

So what have we still got left? Well, already designed and having been released for manufacture, the biggest single item is the valves and motion. We hope to complete the items relating to this big section by the end of 2014. Many companies have volunteered their time to machine parts for us or alternatively are offering very competitive "mates rates" to complete individual parts of valve and motion for us. Generally speaking we prefer to buy our own material so the integrity of the locomotive can be preserved and recorded from a central database controlled by Phil Kent at Keef's who are our major assembly contractor. In order to complete all the parts needed we are approaching machining companies to ask them whether they will take on a batch of parts, either for free, or much reduced costs and we will free issue the material to them. This approach has been very successful and as you will see from our Commercial sponsors web page, the number of companies who are joining this ever increasing list has really taken off.



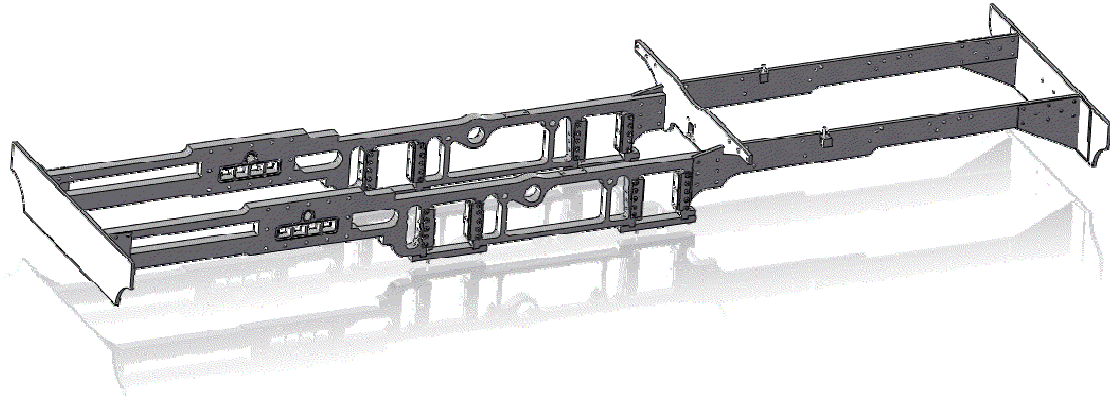


Above: The completed operations showing the driving wheels attached to their axles.

Also during 2014 orders have been placed with Alan Keef & Sons for the blast pipe assembly which will be completed around September time which will finish off all of the items bar the spark arrestor that will be needed in the smoke box area. The Coupling and connecting rods of the motion have been ordered and the firehole door and hinges. The next big order that will be placed relates to the pony truck assembly and the engine suspension and springs which are in the final stages of design and drawing. Our design team of Ian Gaylor and Mike Nelson are well advanced in creating the necessary design and detailed calculations necessary to provide a well balanced, well supported locomotive which will give the necessary extra adhesion needed to cope with the higher power that our high pressure boiler will generate. If the design and drawings are released as anticipated towards the end of June we will place the order with Alan Keef and Son to create the pony truck and suspension so they are completed by the end of 2014.

As soon as Ian and Mike have completed their work on the pony truck, there are really only two further big items which need to be designed. The first one of these is relatively simple which is the brake rigging which also includes the handbrake pedestal and handbrake wheel. This is the final item which needs to be considered with regards holes to be drilled into the main frame. Once the final position of the holes has been modelled then the main frame can be released for quotation. The significant, large and final "big bit" we hope to have completed for November at the latest. Because once it is drawn in solid works the actual construction of the frames is relatively easy. Simplistically you feed in two rectangular lumps of steel into a large CNC milling machine and out the other end comes two finished side frames with all the holes and cut-outs, pre drilled for erection.

There are a number of companies who can undertake this work and fundamentally we hope to get the six pieces (2 side frames, 2 drag box frames and 2 stretchers) delivered to Ross-on-Wye in January or February 2015. When the side frames are delivered they will have already been machined to accept the axle box thrust faces so the geometry of the engine can be confirmed once the saddle and cylinders are bolted to the frames.



Above: The 3D CAD model of the locomotive frames

If all goes well we should have a rolling chassis by the spring of 2015. If this all goes to plan the boiler will then be mounted on to the rolling chassis and serious assembly will start to take place including the valve gear, motion brakes, and main steam pipe to connect the cylinders with the super heater header.

During the autumn of 2015 we can add some of the ancillary items such as sanders, manifold, chimney, spark arresters and couplings and if anyone is passing Ross-on-Wye with a match we will light it up!! Remember our intention is to hold dedicated members days when the locomotive is being constructed so members can see for themselves the progress being made.

Appeal No. 1

If you are breathless with anticipation and champing at the bit to see Lyn steam for the first time in December 2015 we need more members to join us. To-date we have been extremely successful in raising enough money to keep us going with each phase of the build. Now, we anticipate that within the next 18 months we will require, as mentioned, at least £150,000 in order to complete the job. Currently we are attracting about 4 new members a month but we need to accelerate our recruitment drive so that we can fill the remaining 100 members places to complete Lyn and the 350 members we always anticipated we would need.

So can you help? Can you possibly take on a further membership yourself or know of someone who you think may like to join this exciting, challenging and worthwhile project? In round terms we have 250 members already so if every other member was able to take out one further membership, we would be well on our way to finishing the job in the timescale which is achievable.

Designing the Pony Trucks and Suspension

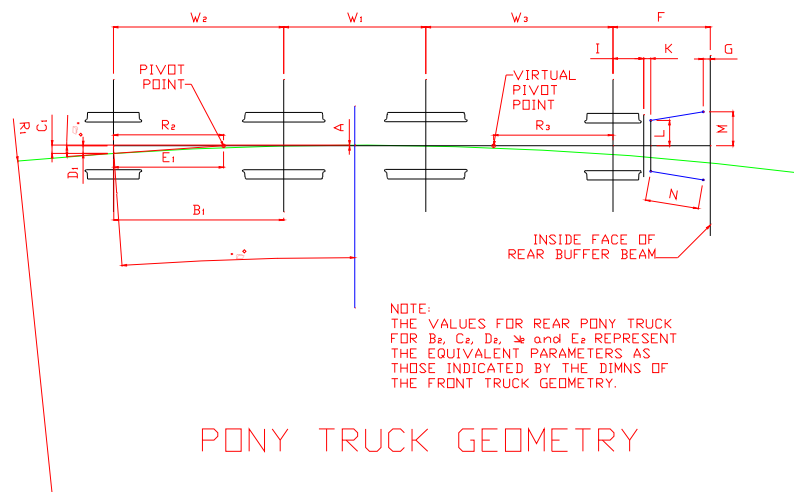
There are moments in the design process when we envy Lyn's original designers, who without CAD or computers to look at complex problems in detail were no doubt free to simply make a few rudimentary calculations and then if it worked adequately in practice everyone was happy. By contrast this approach today would lack the necessary rigour and thus design of the pony trucks and suspension which has been our major design activity for the last few weeks has turned out to be a modelling and three dimensional brain teaser.

As we have no drawings which show the design of the pony trucks or suspension rigging adequately we have had to rely on Steve Phillips excellent illustrations and photographs of the original loco to piece together how the original worked and then modify the scheme to fit the new locomotive.

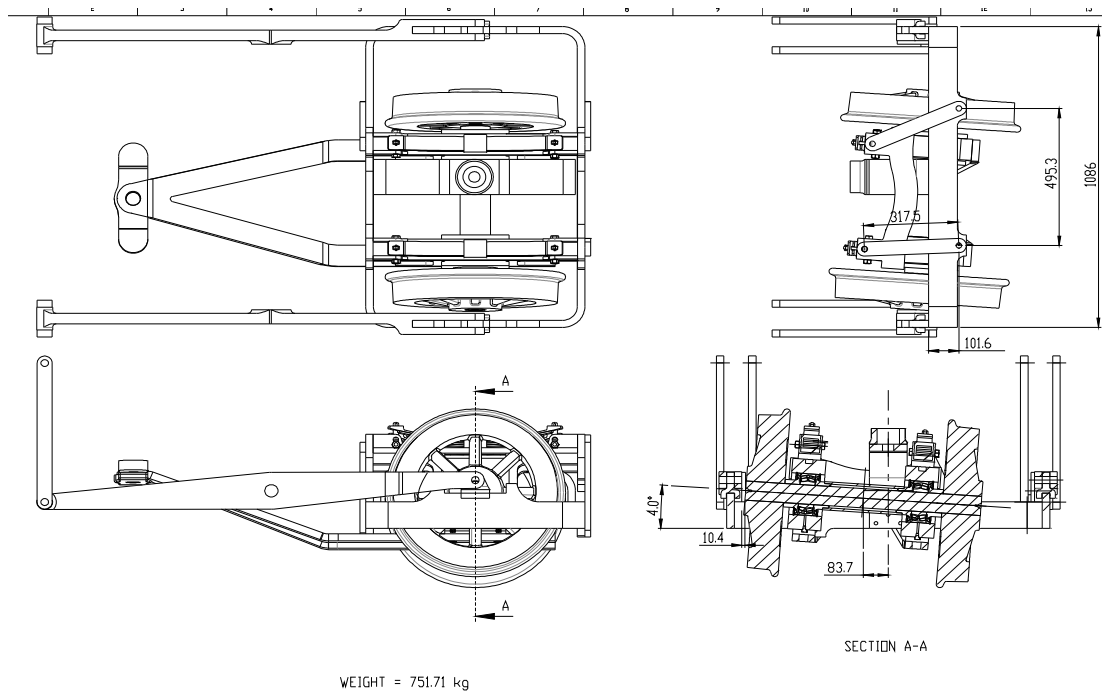
There were a number of key issues to be addressed as follows:

- Firstly Baldwin's compensated suspension systems improved dramatically after 1898 and we have therefore incorporated their 1940's swing link arrangement which gives improved steering of the locomotive when negotiating curves.
- The pivot points for the pony truck 'A' frames were found to be incorrectly positioned to minimise wheel wear and have therefore been relocated as necessary.
- Some alterations were needed to accommodate the slightly larger roller bearing axleboxes of the new locomotive.
- The curves of the Welsh Highland are tighter than the L&B and as we want to be able to visit Wales to fly the flag additional side movement has been incorporated.
- Lastly the rear pony truck 'A' frame is replaced by swing links mounted from the inside face of the rear buffer beam between the frames and this enables the deeper firebox and ashpan to occupy the space which would have been taken up by the 'A' frame. This enables the pony truck to still rotate about the correct virtual pivot point position with no visible external change, unless you lie on the ground next to the loco!

The design process has had to be broken down into a number of discreet steps several of which were iterative before we could solve the problem. In parallel the correct pivot geometry for the front and rear trucks was established while 3D models of the original trucks were created with the best information available (see diagrams and drawings below).



Above: Diagram used as part of the calculation to establish the pony truck pivot point geometry

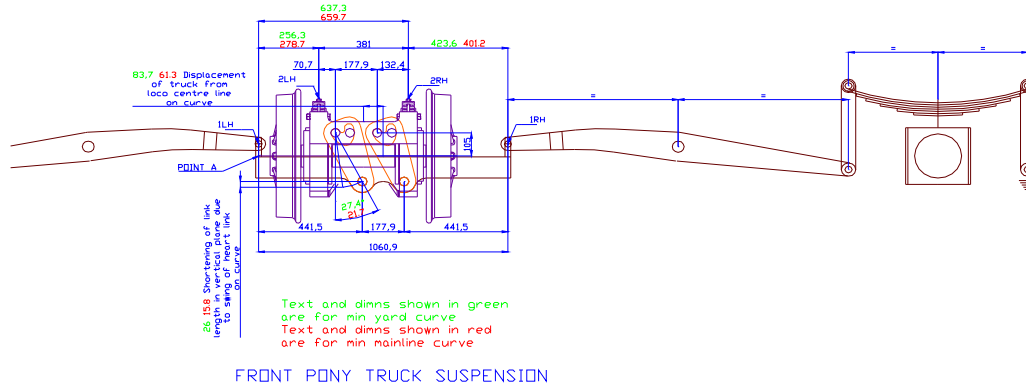


Above: Original Baldwin front pony truck

These models were then updated to allow for the tighter mainline curves of the Welsh Highland, and the more modern swing link design which governs the side control of the locomotive.

The leaf springs for the main driving wheels and pony truck wheels were then designed after consultation with a preferred supplier to ensure we selected material sections available from stock. The designs have subsequently been validated by mathematically modelling the action of the

suspension in a number of scenarios to ensure that wheel and axle loadings are appropriate and that the locomotive is guided adequately without risk of derailment (see diagram below).



Above: Flattened drawing of the front pony truck suspension geometry used for mathematical modelling purposes

To date we have finalised the front pony truck geometry in detail, finalised the spring designs and the key steering geometry for the rear truck. We anticipate releasing the spring drawings for quotation this month and the manufacturing drawings for the front truck will follow shortly with the rear truck being completed later in the summer.

Appeal No. 2

During 2013 and increasingly in 2014 the 762 Club has been delighted to welcome a raft of corporate sponsors and individuals who have elected to finance a part or parts of Lyn. Most of the sponsoring opportunities have come via the 762 website and the very popular successful Component of the Month feature which we launched last year.

If we take into account the value of the materials and components made for us via these most generous individuals and organisations we are already talking almost £100,000. So can we appeal to all our members and supporters to come forward if they can either sponsor an item themselves or know of companies who may wish to get involved with the 762 project by donating time or materials to make a machine part for us? The benefit to the club is huge and we can offer long term publicity via our website as well as offering free tickets when Lyn steams on certain occasions.

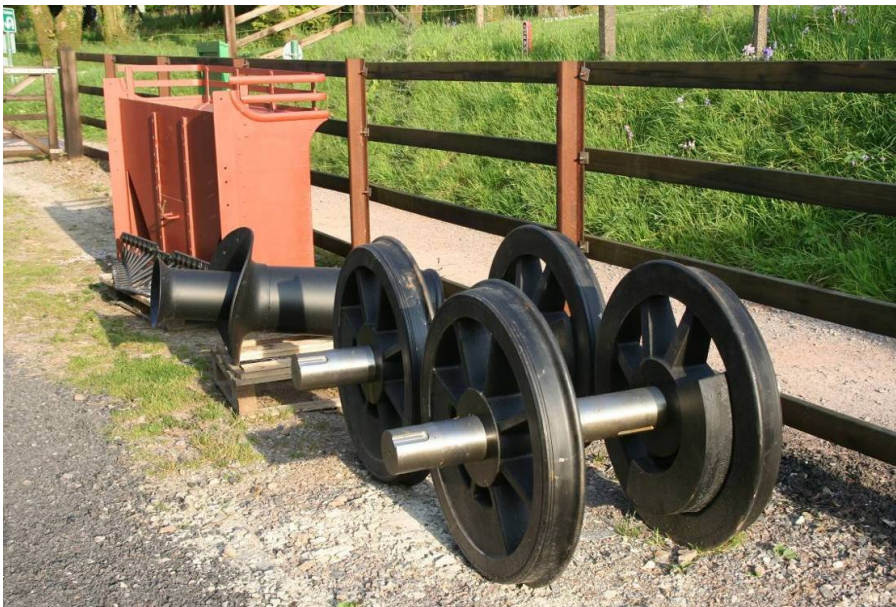
We will need quite large quantities of copper and steel pipe work shortly so if anyone has access to general engineering supplies we can give you specifications of the pipe work and valves we need. Please contact Peter Best to discuss how you may be able to help.

762 Club Stand report from the L & B Vintage Weekend Spring Gala

The Vintage weekend at Woody Bay on the 10th and 11th May saw the 762 Club stand in action again with attendance alongside long-standing L&B colleagues in the marquee by the entrance to Woody Bay station from the Heritage coach project, Exmoor Associates and the L&B Trust. Jon Pain was accompanied this year by the recently completed bunker, 4 driving wheels set on their axles, the Chimney and a cowcatcher. Despite the rather wet and blustery weather on the Saturday and marginally improved weather on the Sunday resulting in reduced footfall to previous Gala's for the 762 Club it was a success, meeting members of the Club and signing-up some new ones!



Left: The completed bunker and a cowcatcher sits at Woody Bay ready for the Vintage Weekend.



Left: The four driving wheels on their axles adjacent to the Chimney and Bunker ready for the Vintage Weekend.



Left: The Chimney assembly prior to the visit to Woody Bay for the Vintage weekend Gala in May. Here it is seen standing proud at Alan Keefs & Sons facility. The double radius smokebox plate was recently cast at Israel Newton & Sons Ltd.

Derek Goodwin kindly offered the 762 Club the anticipated proceeds of his regular Jigsaw sales stand at the end of the 2014 summer season. Do you have any unwanted Jigsaws that you can donate? The regular 'bucket' collection at the AGM raised over £450 towards the locomotive funds and our sincere thanks to Fred Scholes for kindly donating this to us.

Right: The Cylinder cover top pattern.

This pattern that Brian Lloyd has kindly manufactured is now completed.

It is ready to be cast but we may wait until we have another part and then do them together.



Retail

Members of the Lynton & Barnstaple Railway Trust will have noted the superb painting of Lyn at Parracombe adorning the cover of the latest Spring 2014 edition of the L&B Trust magazine (No 103). The artist is Mr Sean Bolan and the painting is owned by Mr Michael Rumsey who has kindly allowed the 762 Club exclusive use of the image for our fund raising activities and the 762 Club is indebted to them for their generosity in allowing this.



As a result the 762 Club commissioned a range of merchandise for sale. Items include a limited edition, individually numbered, A3 size signed print by the artist. A4 size unframed prints (unsigned) and a greetings card.

The greeting card is blank inside allowing you to write your own message and are therefore useful for virtually any occasion so why not stock-up with half a dozen or so?

Prices are as follows;

A3 Limited edition signed print £49.95 each + £3.10 P&P (shipped in a stiff cardboard tube)

A4 unsigned print £18.00 + £2.00 P&P (shipped in a stiff card-backed A4 envelope)

Greetings cards £1.99 each 5.25" square + 75p P&P (any quantity)

We also have a couple of Eric Leslie prints that are available. One is an A4 image of Lyn (as used on the cover of our membership application leaflet) priced at £5.00 + £1.00 P&P and the other is an A3 sized image of Lyn hauling a train over Bridge 67 towards Lynton priced at £7.00 + £3.00 P&P.

The Club also has for sale a high quality lapel badge of Lyn priced at £3.95 + 75p P&P (see below).



Please contact Jon Pain for details of postage for multiple items as this will generally be less expensive.



Above: A4 print (£5)



Above A3 print (£7)

Appeal No.3

Friends of Lyn

OK we promise you this is the final appeal!

We are already turning our attention to what will happen with Lyn once she is finished. Although nothing is set in stone, in all probability once Lyn has been tested for the most basic operational check list at Alan Keef's and depending on the date when he will release it, Lyn is likely to go to the Welsh Highland Railway at Portmadog for running in and performance trials. Depending on how long this takes, we appreciate there will be a grand christening of Lyn at the Lynton and Barnstaple Railway which we hope will coincide with the Spring Gala in 2016.

Lyn will require a regular flow of funds in order to keep on top of her maintenance; plans for subsequent overhauls, maintenance and consumables will be required.

The proposal is to set up a Friends of Lyn Club which will be an annual membership to provide the resources to keep Lyn in good order. Already much of this framework for this new club has been considered and is in the advance planning stage. However we need an administrator to take on this task and our third appeal is if there is someone out there with a little time and reasonable IT skills would they like to join us in becoming the administrator of the Friends of Lyn? Please contact Jon Pain

Email and Postage

If you have received this through the post it means that we have no record of your email address, or your email address that you supplied doesn't work! In order to reduce postage costs it would be appreciated if you could email Jon Pain with your email address so we can add you to the email mailing list.

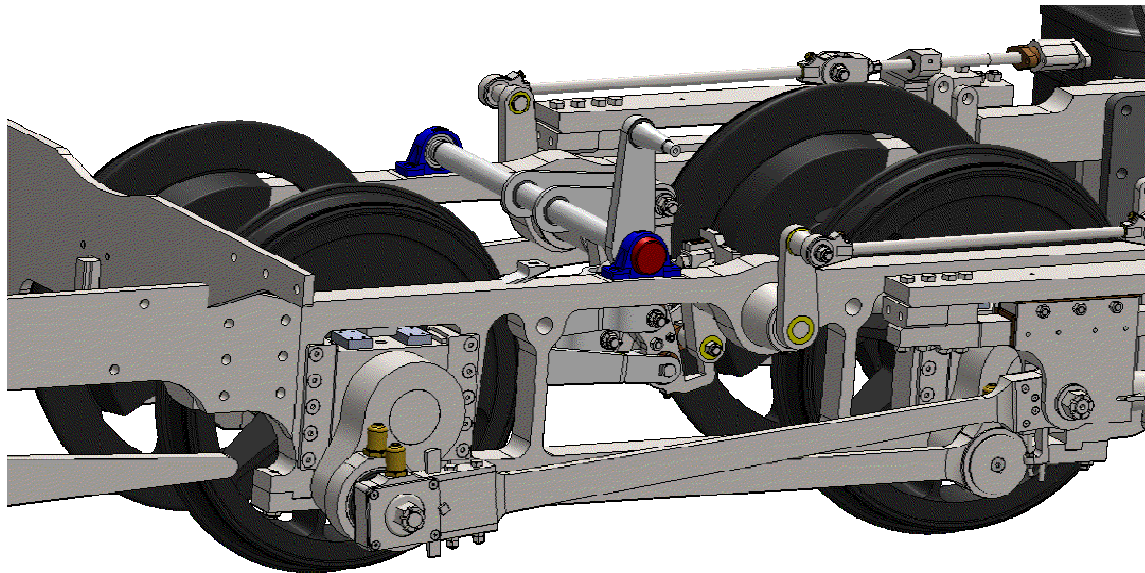
HMRC

The 762 Club is a registered charity. If you have completed a Gift Aid declaration remember you need to advise us if your tax circumstances change. Conversely as a higher rate tax payer you should be able to record your donations/sponsorship and membership subscription on your tax return to qualify for tax relief.

If you need a record of your payments to the 762 Club please contact Jon Pain. Members should be reminded of their own responsibility to check their own tax affairs as the 762 Club cannot be held liable for any incorrect advice.

And Finally

A huge thank-you must go to all of you for supporting the project to date. It is your funding that has enabled the progress to be made some of which you have seen in this newsletter. We have tackled many of the most expensive parts to the locomotive and whilst there is a long way to go we have come a very long way. Let's make the assembly below come to life!



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