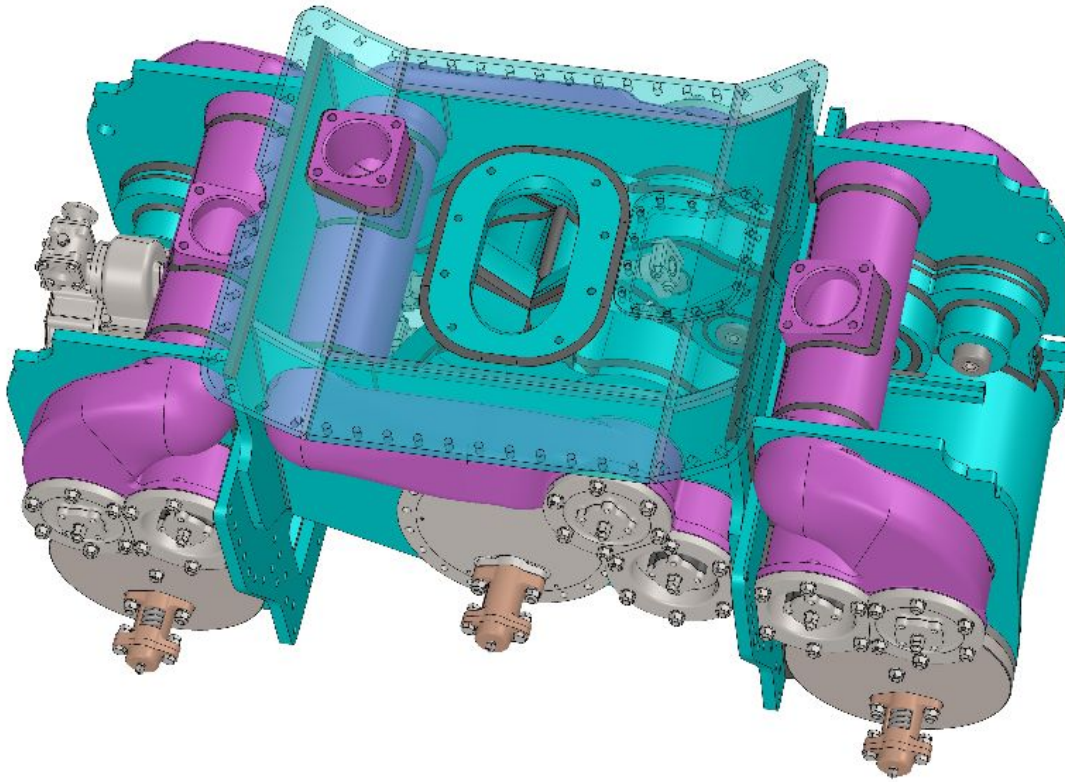


THE MIKADO MESSENGER



2007 PRINCE OF WALES
Building Britain's Most Powerful Steam Locomotive



3D CAD of cylinder block with welds and valve gear - steam chests and ports highlighted - A1SLT

Welcome to edition No. 68 of *The Mikado Messenger*, our monthly eNewsletter which aims to provide a regular progress update on the construction of new Gresley class No. 2007 *Prince of Wales*.

Thanks to our supporters' continued generosity, almost £3.75m has now been donated or pledged - this equates to **almost three quarters of the required £5m**.

Due to the ongoing COVID-19 situation, our staff are still working from home or at Darlington Locomotive Works (DLW) where they are taking all the necessary precautions. The Works remain closed to volunteers, non-essential staff and visitors. We hope you understand that these circumstances are beyond our control and the restrictions are very necessary at this challenging time. We are reviewing all of our activities on a frequent basis to protect everyone involved with the Trust and to secure our long-term future. Please keep an eye on our website and Facebook pages for updates or call 01325 460163 or email enquiries@p2steam.com if you have any questions.

We are delighted to welcome Richard Courteney-Harris, Terry Graham and Ben McDonald as advisors to the Board. Richard will be helping with our long term strategy, planning and organisational structure, Terry will be taking a more central role in the project management of our P2 Project and Ben will be

FUNDRAISING UPDATE

A P2 for the price of a pint of beer a week: around 930 supporters have signed up as Covenantors for No. 2007 *Prince of Wales*, from as little at £2.50 per week, and are now kindly donating over £205,000 annually including Gift Aid. We aim to reach 1,000 regular donors by the 2020 convention in September. If you haven't yet signed up as a Covenantor we would encourage you to get on-board. You can find more information [here](#).

The Motion Club has now welcomed 168 members, with only seven places remaining of our 175 members target. As you will see below, we have now started the machining of the four coupling rods. You can find more information about The Motion Club [here](#) - help us to fund the manufacture of No. 2007's motion!

The Boiler Club has reached 197 members, leaving just 103 spaces available - just three to go to hit the two-thirds milestone. As substantial progress is now being made on our boilers, we would urge those who haven't yet contributed towards the purchase of No. 2007 *Prince of Wales*' boiler to join us. This is the single most expensive component on the locomotive and is due to be delivered to Darlington Locomotive Works (DLW) in 2021. More information about The Boiler Club can be found [here](#).

The Tender Club is still filling up rather slowly, with just 68 places taken. In order to keep on schedule to complete No. 2007 within three years, we need to complete the manufacture of the tender frames. Our target for The Tender Club is 250 members, contributing £1,500, so if you would love to contribute towards the tender more information can be found [here](#).

Our first mini-club, **The Pony (Truck) Club**, has already attracted substantial interest and has galloped past its initial target. You can find more information about The Pony (Truck) Club [here](#) - help us to fund the manufacture and certification of No. 2007's pony truck.

You can sponsor components of No. 2007 *Prince of Wales* from as little as £25, ranging up to £15,000! The **Dedicated Donations** scheme has already raised over £400,000. If you would like to sponsor a component, please email dedicated.donations@p2steam.com, detailing the amount you would like to donate and/or if you had a specific part of the engine in mind, we will then send you some component recommendations to suit your donation.

To-date, almost £2.5m has been spent, almost £3.0m raised and almost £3.75m pledged of the required £5m to complete No. 2007 *Prince of Wales* within the next three years.

If there are any surplus funds left when our fundraising clubs have fulfilled their nominated purpose, we will use the money to buy other components for the Gresley class P2 that the charity would not otherwise have.

ENGINE FRAMES UPDATE



Ed Laxton, our Apprentice Machinist, manufacturing cold turned rivets - A1SLT

Summary: engine's frames erected; all major frame stays, brackets, horn blocks, axle boxes & buffers cast and fitted using around 1,000 driven bolts.

Progress update: the policy for assembling the frames has been to use driven bolts where possible rather than hot rivets, as these provide a stronger and more predictable joint, particularly when the fastener is working in shear. It is not possible to use driven bolts with the spring hangers as for several positions on each hanger the nuts on bolts would impede the fitting and removal of the springs. In these areas we are using cold turned rivets with a slight interference to fit in the holes and require driving in. This is done cold, and to ensure that the rivet does not work its way out, the end is warmed up and formed into a head.

Next steps: permanently attach outside motion brackets to the frame; procure two thicker manganese steel liner plates for the leading Cartazzi horn blocks to address the axlebox clearance issue.

Fundraising: The Founders Club was established in September 2013 to give the project a racing start and get it to the point of erecting the engine's frames with a target of raising £100,000 plus Gift Aid from 100 supporters each donating £1,000. The Founders Club closed in July 2014 having attracted 360 members and raised around £450,000.

PONY TRUCK UPDATE



Pony truck progress at NVES - pony truck horn stay; pony truck tack welded - A1SLT

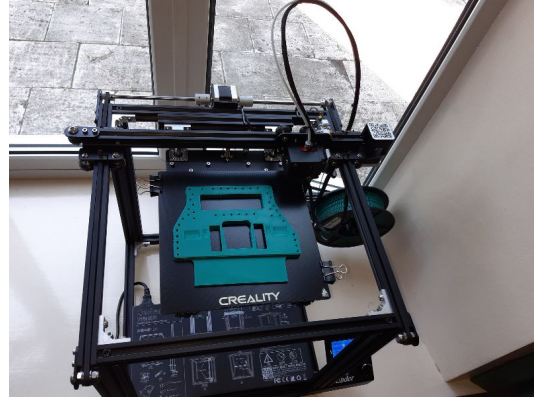
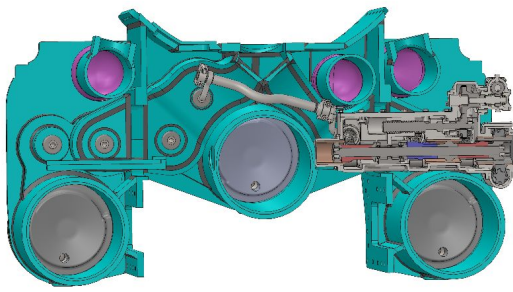
Summary: redesign of the pony truck, using side control springs, has been completed; order for pony truck frame fabrication placed with North View Engineering Solutions (NVES) in Darlington; pony truck wheelset and cannonbox delivered.

Progress update: certification work on the new design continues; NVES making good progress fabricating the main structures of the pony truck frame; Ed Laxton has completed machining of the spring bolts; Ian Matthews has faced off and tapped the boss for the plug which is used to purge air from the cannonbox when it is filled with grease.

Next steps: completion of fabrication of pony truck components, stress relieving, grit blasting and priming followed by machining; manufacture of spring gear details; final assembly of the cannonbox onto the wheelset.

Fundraising: in April 2020, we launched a £20,000 appeal - The Pony (Truck) Club - to fund the construction of the leading pony truck for No. 2007 *Prince of Wales*. We set a minimum target of 20 generous supporters willing to donate £1,000 plus Gift Aid (in up to four payments of £250) but this mini-club has galloped away and already passed its initial target. We have therefore decided to extend the club by a few members to cover the considerable certification costs associated with the modified pony truck design. Please consider joining The Pony (Truck) Club in advance of the frame's delivery to DLW. For further information click [here](#).

CYLINDERS UPDATE



3D CAD of the rocking shaft solution; David Elliott's 3D printer printing one of the cylinder block frame plates - A1SLT

Summary: design studies into cylinder block manufacture and selection of valve gear complete; 3D CAD design of the cylinder block and valve gear substantially complete; further progress has been made in applying the weld details to the cylinder block inside exhaust passages with particular attention being paid to the order of fabrication to ensure that all welds can be completed properly.

Progress update: the original No. 2001 *Cock o' the North* three cylinder monobloc had some features which ran counter to efficient operation, so we have endeavoured to design them out of the cylinder block for No. 2007. One of these changes has been the arrangement of the valves for the middle cylinder: the original design had inlet valves on one side of the cylinder and exhaust valves on the other. This gave rise to large clearance volumes - the space that is left when the piston is at the end of its stroke. To overcome this, the new design has the inlet and exhaust valves side by side in the same layout as the outside cylinders. This overcomes the excessive clearance volume issue, but then makes driving the inlet valves for the middle cylinder a challenge as they are no longer adjacent to the cam box which drives them. After consideration of several means of transferring the drive across the cylinder block, a simple rocking shaft solution has been designed (see 3D CAD illustration). The cylinder block is a complex fabrication and has been designed so that it is possible to complete all the welds, provided that it is assembled in the correct sequence. Whilst 3D CAD facilitates this sequencing, to check that it is correct, and to assist potential fabricators in understanding the sequence, a 1/8 scale model is being created using David Elliott's newly acquired 3D printer.

Next steps: continuation of detailed 2D manufacturing drawings for the cylinder block; further research into optimising steel grades for the tubes used for the cylinders, valve chests and for cast steam ports.

Fundraising: The Cylinder Club was founded in October 2017 to fund the redesign and manufacture of the cylinder block with a target of raising £100,000 plus Gift Aid from 100 supporters each donating £1,000. The Cylinder Club closed in March 2018 having achieved its target.

BOILER UPDATE



Superheater elements arrive at Darlington Locomotive Works -A1SLT

Summary: boiler design study completed; forged foundation ring corners manufactured and machined; regulator castings delivered; superheater header cast and machined; boiler cladding manufactured, trial fitted to frames and now in storage; boiler order placed with DB Meiningen (DBM) for delivery in 2021; foundation ring forgings and regulator castings despatched to DBM; minor re-design of the banjo dome to suit the P2 cladding completed by DBM; revised design approved by TÜV Sud notified body; major progress on manufacture of the boiler and its components; boiler design sent out to UK authorities for information and comment.

Progress update: DBM is making further progress with the construction of the boiler(s); more photographs of the components manufactured to-date can be seen [here](#).

Next steps: assembly of boiler barrels and firebox shells.

Fundraising: The Boiler Club was founded in October 2017 to fund the design modification and manufacture of the boiler with a target of raising £600,000, plus Gift Aid, from 300 supporters each donating £2,000 in up to 40 payments of £50. As of today, The Boiler Club has attracted 197 members who have generously donated over £450,000. For further information click [here](#) - we must reach our 300 members target in 2021.

WHEELSETS UPDATE



Summary: study into ride and suspension completed using Vampire[®] software; crank axle re-designed to comply with modern standards, approved and manufactured; all engine wheelsets complete and trial-fitted to engine.

Progress update: Ian Matthews has set up the first cannonbox bottom half on the milling machine - this has required a jury rig to support the cannonbox as it is too large to fit on the milling machine table on its own. Our cast iron marking out table has been set up next to the milling machine and the outer end of the cannonbox set up on rollers so that it is free to move in and out using the power feed on the milling machine.

Next steps: assembly of the intermediate and trailing cannonboxes onto their wheelsets.

Fundraising: The Mikado Club was founded in March 2016 to wheel the engine with an initial target of raising £200,000, plus Gift Aid, from 160 supporters each donating £1,000. This was extended in May 2017 (to also wheel the tender) to 200 supporters raising £250,000 plus Gift Aid. The Mikado Club closed in May 2018 having achieved its target.

MOTION UPDATE



A middle coupling rod on the straddle milling machine at Stephenson (Engineering Ltd) - Robert Stephenson/A1SLT

Summary: all heavy motion ordered from order with Stephenson (Engineering) Ltd of Atherton,

Manchester; work started on machining the four coupling rods with first delivery due in autumn; updated poppet valve gear design almost complete with first components in manufacture.

Progress update: the four coupling rods are currently being machined at Stephenson (Engineering) with each rod requiring an estimated 100 hours of work; a video of the machining of one of the middle coupling rod can be seen [here](#).

Next steps: machining the rear coupling rods and forging the leading coupling rods.

Fundraising: The Motion Club was founded in May 2018 to fund forging and machining of the heavy motion, with a target of raising over £210,000 including Gift Aid, from 175 supporters each donating £1,000 in up to eight payments of £125. As of today, The Motion Club has attracted 168 members who have generously donated over £200,000. For further information on how to become a member and help us to reach our target before the convention click [here](#). Let's get this club over the line!

TENDER UPDATE



The tender tank has modified lamp brackets; the tank awaiting priming - A1SLT

Summary: axlebox and other tender castings produced by William Cook Cast Products; frames being assembled by ID Howitt; tank construction complete; tender wheelsets are now at DLW, having been assembled South Devon Railway Engineering and painted by Ian Matthews.

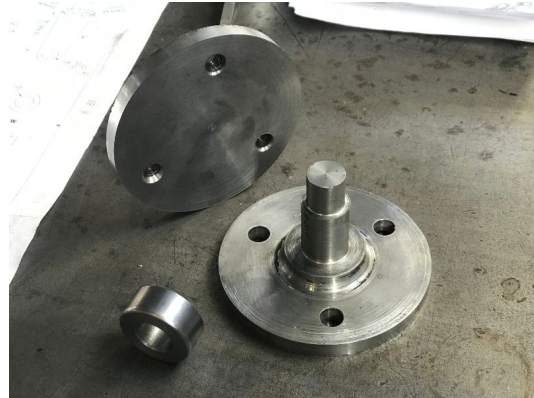
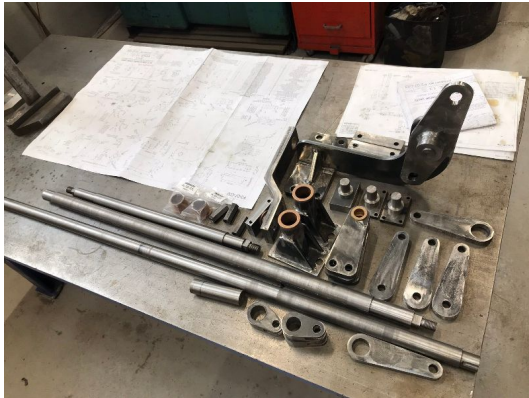
Progress update: the decision has been taken to use two Stones marker/tail lamps, as fitted to *Tornado*, with the same red/white LED arrays as used on *Tornado*. The class P2s had no electrics on board, so to minimise the visual impact the lamps are being fitted flush to the tender tank with wiring concealed in heavy duty conduits in the water space. The marker/tail lamps will carry military specification sockets to enable *Tornado*-style LED hadlamps to be plugged in when No. 2007 is operating tender first on the main line. Ian Howitt continues to make steady progress with the tender frame at Crofton with the brake cross shaft and brake stay being fabricated and the axleboxes being machined. More photographs of progress on the tender tank, from *The Yorkshire Post* visit to DLW, can be viewed [here](#).

Next steps: painting the tender tank so it will be weatherproof and can be stored outside when the space indoors is required to remove the wheelsets from the frames.

Fundraising: The Tender Club was launched in April 2019 to fund the construction the tender, with a target of raising £450,000, including Gift Aid, from 250 supporters each donating £1,500 in up to eight

payments of £125. As of today, The Tender Club has only attracted 68 members who have generously donated over £120,000 - we still have a long way to go to fund the tender's construction. For further information on how to become a member click [here](#).

MISCELLANEOUS FITTINGS



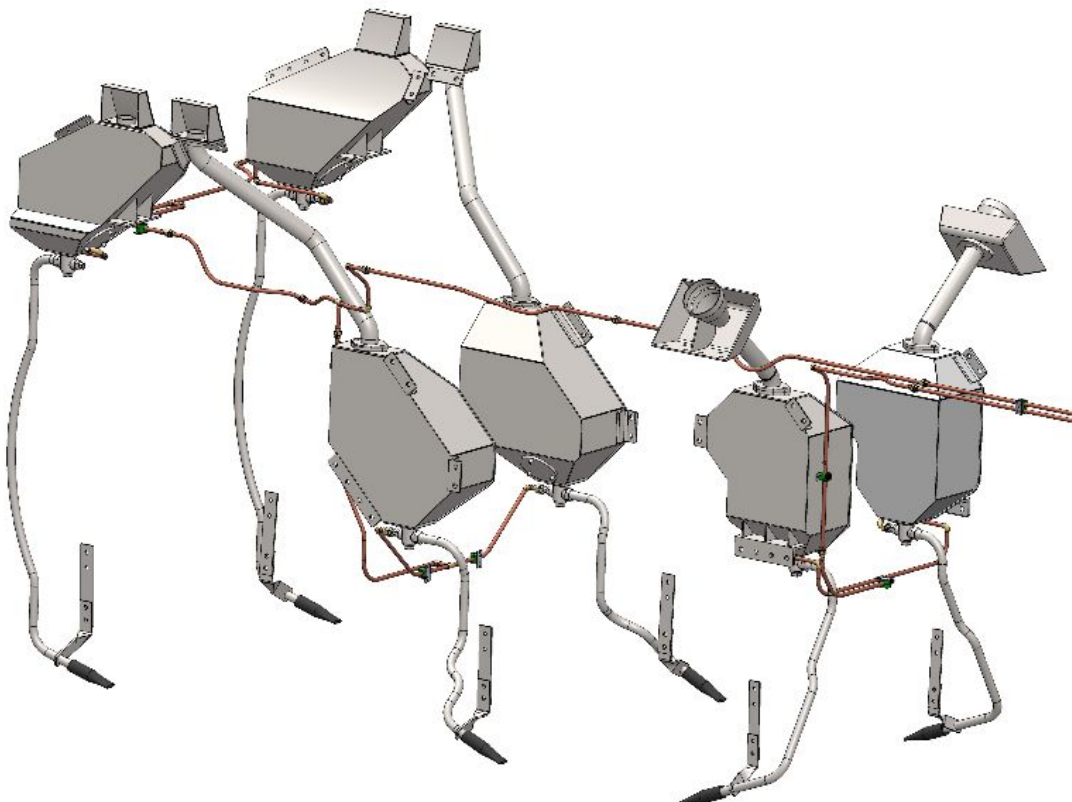
Cylinder drain cock linkage and rod ends - *Bob Hughes/A1SLT*

Running Gear

Summary: following detailed designs by Alan Parkin, DLW continues to make details for the cylinder drain cock gear.

Progress update: the remaining detailed parts of the cylinder drain cock gear have been ordered.

Next steps: fitting the operating lever in the cab and brackets to the running plate and frames.



Sand boxes and pipework - *Alan Parkin/A1SLT*

Pipework

Summary: the design is well advanced and installation under way.

Progress update: Alan Parkin is currently drawing the pipework for the tender.

Next steps: continuation of design of pipework details; ordering of long lead items.



The battery fuse fault detection circuit under bench - Rob Morland/A1SLT

Electricals

Summary: significant progress on design and manufacture of electrical system; belt driven tender alternator nearing completion; turbine wheel for steam turbo alternator manufactured; physical mapping of the essential services wiring looms onto the engine conduit system is completed; electronics design largely complete.

Progress update: work on the detailed design of the essential services system is nearing completion.

Next steps: work will soon start on the detailed design of the auxillary services system, including specification and physical location of wiring looms and circuit routing table.

Fundraising

The Dedicated Donations scheme was founded to fund numerous components including the non-ferrous fittings and has raised over £400,000 to-date with new parts being frequently made available for sponsorship. For further information, click [here](#).



Progress on No. 2007 *Prince of Wales* - Mandy Grant/A1SLT

TRAVEL WITH *TORNADO*



No. 60163 hauling 'The Aberdonian' - Peter Backhouse/A1ST

Keeping No. 60163 *Tornado* in tip-top working order is an expensive business as we are constantly being reminded! The profit from operating our programme of main line tours, *Tornado's* hire fees from heritage railways and working for other rail tour promoters normally covers her day-to-day and year-to-year maintenance costs. However, *Tornado's* operations do not at present generate a sufficient surplus to fund her five and ten year overhauls - conservatively estimated at around £500,000 each. With *Tornado* currently in hibernation at the National Railway Museum, she isn't able to generate these fees or be the greatest advert for becoming 'a price of a pint of beer a week' Covenantor. It is therefore

vital that we continue to maintain (and hopefully grow) *Tornado's* on-going Covenant income. If you aren't already an A1 Covenantor - from as little as £2.50 a week - please consider coming on-board. If you are an existing A1 Covenantor, please help us by recruiting a friend. Information about becoming becoming an A1 Covenantor can be found [here](#).

With the easing of lockdown continuing we are currently planning our first railtours with *Tornado* in September 2020. In July, our team will be undertaking the necessary maintenance procedures and other work to ensure *Tornado* continues to be in tip-top condition for our return to traffic.

Our first planned tour is 'The Aberdonian' on Thursday 3rd September. The tourism and hospitality industry in Scotland is planning to re-open from 17th July and so we feel that this is a robust plan. Passenger and staff safety are our priority. We will implement appropriate elements of social distancing, such as reduced seating capacity, and other measures including the use of PPE by our staff, provision of hand sanitiser and additional regular cleaning in common with others in the hospitality and tourism sector. As guidance from Government changes, we will update our policies and procedures as necessary in close consultation with the relevant suppliers.

If you have had a tour with *Tornado* postponed during the lockdown period, please rest assured that we are planning to reschedule these trains as the picture becomes clearer. If we are unable to fit them into the 2020 calendar (taking account reduced daylight hours from October), they will be moved into next year, and we hope that you will be able to join us on the new date.

Bookings for our tours can be made through our [website](#) or by calling 01325 488215.

SUMMER DRAW 2020

On Friday 5th June we drew The A1 Steam Locomotive Trust Summer Draw 2020 at DLW and are pleased to announce the following winners:

1st Prize - Table for two in Premier Dining on a *Tornado* railtour - Mrs Smith

2nd Prize - Two First Class tickets on a *Tornado* railtour - Mr Moore

3rd Prize - Two Standard Class tickets on a *Tornado* railtour - Mr Moyce

5 x Prizes - 'Tornado 10 Years in Steam' poster - Mr & Mrs Clarkson; Mr Bird; Mr Lines; Mr Steele; Mr Jolly

5 x Prizes - 'A Giant Resurrected' poster - Mr Fowkes; Mr Leary; Mr Tick; Mr Goulding; Mr Jolly (again!)

Thank you to all who bought tickets. We raised £2,962 which will be used for maintaining *Tornado*.



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