

THE MIKADO MESSENGER



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



Taper and parallel boiler barrel sections at DB Meiningen- A1SLT

Welcome to edition No. 69 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*.

As you will read elsewhere in this issue of *The Mikado Messenger*, significant progress is being made on all current areas of activity including both of our new boilers where assembly of the first boiler is imminent.

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.

Save the Date: The Trustees have decided that this year's Annual Convention will be held virtually on-

line due to the uncertainties around COVID-19. This virtual event will take place on Saturday 26th September 2020 from 10:30hrs to 12:00hrs. Further details will follow shortly.

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 reached our initial 175 members target. As you will see below, the machining of the four coupling rods is underway. 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 198 members, leaving just 102 spaces available - just two 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 only 71 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 like to contribute towards the tender more information can be found [here](#).

The Pony (Truck) Club, has 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.

We launched **The Turbogen Club** earlier this month and the fundraising campaign has already 'generated' seven members. Our target for The Turbogen Club is 40 members, contributing £1,000, so if you would like to contribute towards the turbo-generator more information can be found [here](#).

You can sponsor components of No. 2007 *Prince of Wales* from as little as £30, 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 and almost £3.0m raised 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: with the tender tank undercoating complete it has been possible to remove the wheelsets from under the engine frames. This has permitted fitting of the remaining driven bolts and cold turned rivets in the outside motion brackets and the spring hangers.

Next steps: the final significant work on the frames is to make and fit the "shelf" that is located between the outer rear frames under the cab. The detailed design of this has been held back pending the final decisions on the type and location of injectors to be fitted which influences details of the shelf. The shelf also supports electrical trunking and terminal boxes for the umbilical cables between the engine and tender.

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 steering arm; pony truck fully 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.

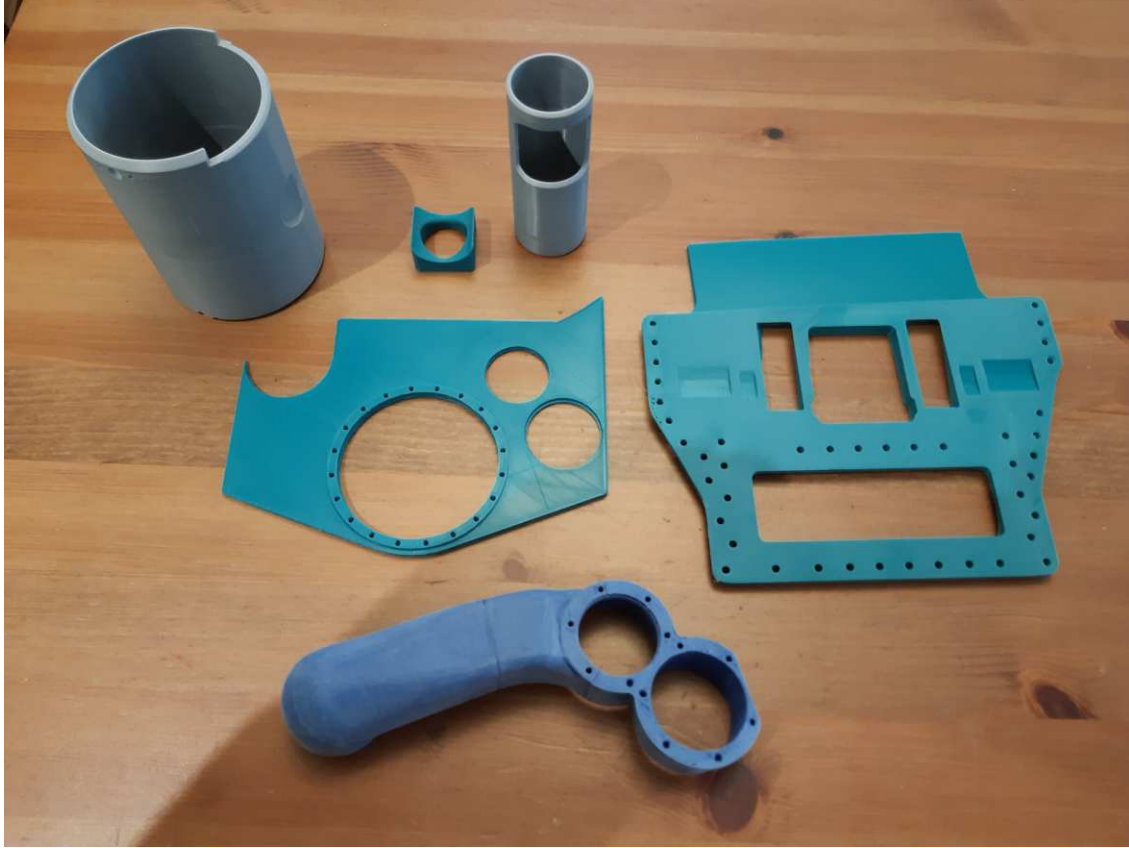
Progress update: although delayed somewhat by the need to modify working practices in light of COVID-19, NVES continues to make progress on the pony truck fabrication with much welding completed and first stage machining work on the pony truck crosshead; Ed Laxton and Ian Matthews have manufactured the spring cups for the secondary rubber springs; four spring bolts have been completed; profiles for the spring planks delivered.

Whilst being based on the design of the later type side control spring type fitted to the Gresley class V2, the pony truck is very much 'safety critical' and, as far as No. 2007 is concerned, is a new design. Therefore, we need independent verification of the design (building on the results of the Vampire® ride and track force study) and our calculations in order to achieve final certification of the locomotive. Our analysis indicates that the design is well up to handling the forces experienced by the pony truck. Ricardo Rail have been retained to carry out this work and the start up meeting is taking place week commencing 20th July.

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; machining of the spring planks; support and progress on the design verification study.

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 printed parts of the 1/8 scale cylinder block model - A1SL7

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 monobloc fabrication design for the cylinder block is inevitably a complex structure with 129 separate components! Whilst the 3D CAD is a useful tool to assist in sequencing the assembly, to ensure that all the welds can be completed successfully, David Elliott's 3D printer is creating a 1/8 scale model of the complete block. This will be particularly useful when discussing the fabrication with prospective manufacturers.

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



Boiler components at DBM - clockwise from top left: dome & steam collector holes for banjo dome; foundation rings; a close up of the front tube plate; machined manhole ring & main steam pipe joints - A15LT

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: a progress visit to DBM was made on Tuesday 14th July. Notwithstanding COVID-19 issues, progress with the boiler is good and the work done to date of a high standard. Most of the detail components have been made and assembly of the first boiler is imminent. The blanks plugging connections to the boiler, which are required for hydraulic testing, have been extracted from the stores at DLW and sent to DBM.

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 198 members who have generously donated over £450,000. For further information click [here](#) - we must reach our 300 members target in 2021.

WHEELSETS UPDATE



Ian Matthews machining a cannonbox bottom half lug - A1SLT

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 completed the additional machining of the lower coupled cannonbox halves to enable the spring links to be fitted - the castings being slightly oversize in this area have required additional machining.

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



Progress with machining a middle coupling rod at Stephenson (Engineering) Ltd - A1SLT

Summary: all heavy motion ordered from order with Stephenson (Engineering) Ltd of Atherton; 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: Stephenson continue to make progress with machining the first pair of coupling rods; a video of the machining of one of the coupling rod can be seen [here](#).

Next steps: machining the rear coupling rods and forging the leading coupling rods; production of drawings for the coupling and connecting rod bushes.

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 reached the initial target of 175 members, who have generously donated over £200,000. For further information on how to become a member click [here](#).

TENDER UPDATE



The tender tank in grey undercoat, at DLW - A1SLT

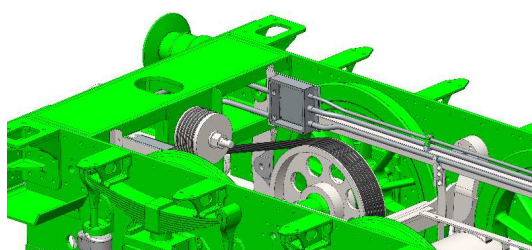
Summary: axlebox and other tender castings produced by William Cook Cast Products; frames being assembled by ID Howitt; tank construction complete; tender wheelsets now at DLW, having been have been assembled South Devon Railway Engineering and painted by Ian Matthews.

Progress update: Ian Matthews has completed undercoating the sides and back of the tender tank and applying black gloss to the top surfaces and underneath; the tank has been wheeled outside on the accommodation bogies to create much needed space in the workshop with tarpaulins covering the tank to protect the undercoat from sun and rain.

Next steps: completion of the frames.

Fundraising: The Tender Club was launched in April 2019 to fund the construction of 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 so far only attracted 71 members who have generously donated over £130,000 - 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](#).

ELECTRICALS UPDATE



Press equipment to form the special profile for bends in the conduits; CAD image of the electrical trunking at the rear of the tender - *A1SLT*

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 complete; electronics design largely complete.

Progress update: work on the detailed design of the auxiliary services system has commenced; a first draft of the auxiliary I/O panel (distribution board) design has been produced and allocation of circuit identifications is underway; stainless steel electrical conduit and junction/break out boxes supplied by Electrix of Bishop Auckland has been delivered to DLW; Ian Matthews has made up a set of press equipment to form the special profile for bends in the conduits to clear footplate brackets where the conduit runs under the footplate; work has started on physical design and layout of the tender electrical conduit system. The CAD image photo shows progress with laying out conduits and electrical enclosures under the rear of the tender - the drive pulley for the axle driven alternator can also be seen.

Next steps: work continues on the tender conduit system and the detailed design of the auxiliary services system, including specification and physical location of wiring looms and circuit routing table.

Fundraising: We launched **The Turbogen Club** earlier this month and the fundraising campaign has already 'generated' seven members. Our target for The Turbogen Club is 40 members, contributing £1,000, so if you would like to contribute towards the turbo-generator more information can be found [here](#).

MISCELLANEOUS FITTINGS



The 3D printed regulator stuffing box cover pattern - *A1SLT*

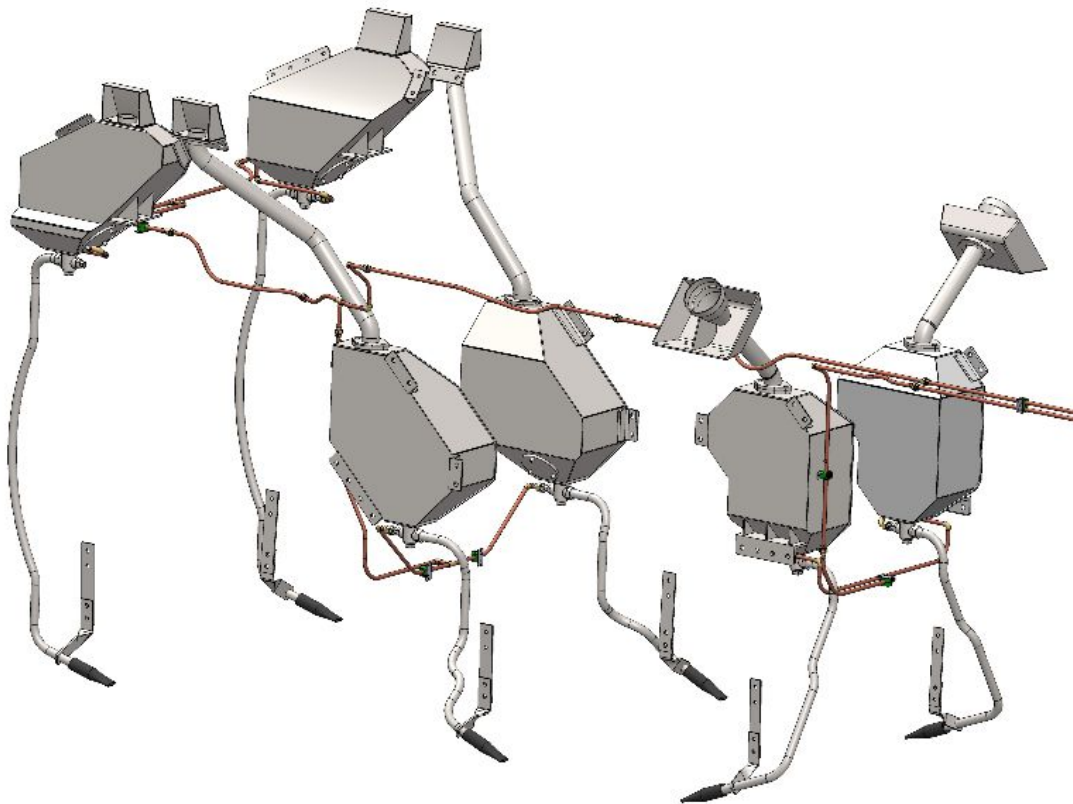
Part of the contract with DBM for the boiler included fitting the regulator and its control rods and levers. This includes the regulator stuffing box and cross shaft. The cross shaft will be made at DLW, however the stuffing box requires two leaded gunmetal castings for the body and the cover. Unfortunately, we do not have a cover pattern but, as it is not too big, David Elliott has been able to 3D print a replacement.

Running Gear

Summary: brake gear fully designed and mostly manufactured, drain cock linkage (based on A1 design) drawn, linkage components made.

Progress update: the two brake cross shafts have been delivered from I D Howitt.

Next steps: now the wheelsets have been removed from the frames, the brake cross shaft bearing bushes can be completed and the brake shafts installed; cylinder drain cock linkage to be installed between the frames.



Sand boxes and pipework - *Alan Parkin/A1SLT*

Pipework

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

Progress update: Alan Parkin has continued drawing the pipework through the tender.

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

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](#).

Plans are well advanced for the return of steam tours and heritage railways in the UK. It's been a long enforced break!

Our own railtours get underway in September with two trips to Aberdeen on '[The Aberdonian](#)'. We then have a true East Coast experience with '[The Queen of Scots](#)' with *Tornado* hauling the return leg from Stirling to York. [The Ticket to Ride](#), our first ever trip to Liverpool is scheduled for Saturday 19th September when we also return to Copy Pit. For those who enjoyed 'The Mad Hatter' tour last year this is a trip to be a part of.

Tornado will be hard at work into the festive season and we are pleased to announce that we will be running from Bristol to Chester, for The Railway Touring Company, on Saturday 14th November. Currently, this will be our only trip in the west due to the lockdown.

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.



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