THE MIKADO MESSENGER

2007 PRINCE OF WALES

Building Britain's Most Powerful Steam Locomotive

Welcome to edition No.25 of The Mikado Messenger. The Messenger aims to provide a regular bulletin of news about the construction of No. 2007 *Prince of Wales*.

Significant progress continues to be made with the construction of No. 2007 and in this edition of the Mikado Messenger we bring you news about the ground-braking use of technology in balancing the wheels and producing castings for the boiler fittings. In other news, dates for the 2017 Roadshow have been released – make sure you catch one of these and bring some friends!

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Editor of The Mikado Messenger

FRAMES

The leading brake stay has been fabricated and is nearing completion. Following delivery from North View Engineering of the remaining coupled wheel manganese steel faced hornblock liners, detail fitting of them is underway. This involves ensuring that the liners are making full contact with the hornblocks followed by opening out the bolt holes and reaming to take driven bolts. Once all 16 of them are fitted, the gaps between the liners will be accurately measured and mapped. The aim is to have both liners in each hornblock truly square to the frames and parallel with each other. Individual liners will then be surface ground where necessary to achieve this.

The leading frame stay – *David Elliott*

SMOKEBOX

Work has continued on No. 2007 at Darlington Locomotive Works, including riveting of the smoke lifting plate joint strips and permanent riveting and bolting of the front footplating. The chimney has also had all its mounting bolts and studs fitted.

WHEELSETS

When it comes to No. 2007 it is intended to avoid the very time consuming and expensive work required to balance *Tornado's* coupled wheels. This was achieved by the traditional method of making weights to hang on the crank pins which represented the total mass of the rotating motion parts and a proportion of the reciprocating motion parts. *Tornado's* wheels had cast in balance weights which are 'adjusted' by drilling holes in the back of the weights.

For No. 2007 we are intending to achieve balancing entirely by calculation and by using built up balance weights (crescent shaped plates riveted on both sides of the spokes with predetermined quantities of molten lead/antimony alloy poured into the cavities between the spokes and plates). This was standard GWR/LMS/BR practice. However instead of using a dynamic balancing machine to determine the precise amount of lead

required, we intend to do this by calculation. The starting point is the centre of mass of the wheels. The 3D CAD models will predict where this is, however as the wheels are castings which rarely turn out precisely to the shape of the drawing, we need to use other methods to determine the centre of mass. One is to 3D scan the wheels to produce a solid model from which Solidworks 3D CAD can compute the centre of mass. To back this up we will also determine the centre of mass of each wheel in the plane of the wheel by balancing it on a knife edge on the back of the wheel boss and repeating this with the knife edge at 90 degrees.

No. 2007's driving wheel is scanned – *David Elliott*

Crank axle components have been machined at Unilathe – *David Elliott*

Additionally, the plain coupled axles have been delivered from South Africa and are presently at Unilathe at Stoke-on-Trent for finish machining. In the meantime, Unilathe has completed the initial machining of the crank axle stubs and crank pin, which along

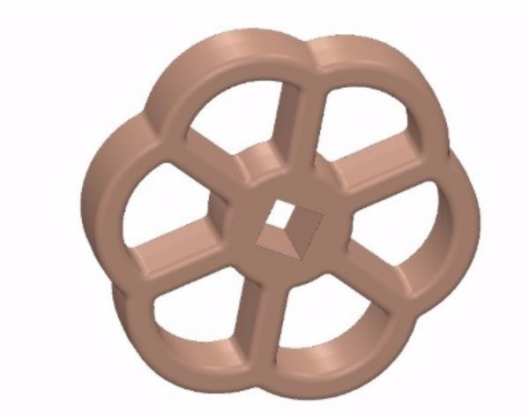
with the crank webs have been sent to South Devon Railway Engineering for assembly. Meanwhile in order to assist in balancing the coupled wheels, they have been laser scanned to confirm that the centre of mass of each wheel is where it should be. Unilathe is also making good progress with machining the crank pins which are made from axle material – specifically from axle stock made for HST power car wheelsets.

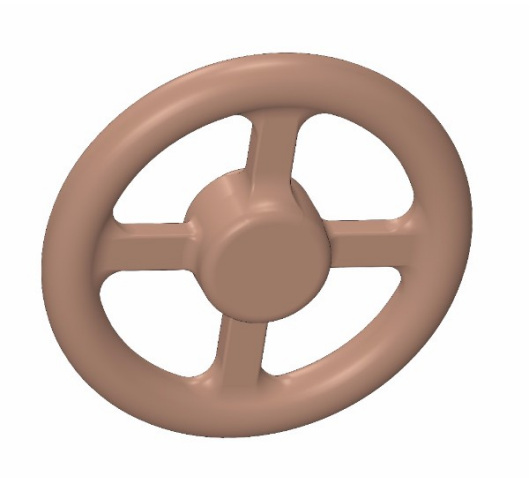
CYLINDERS

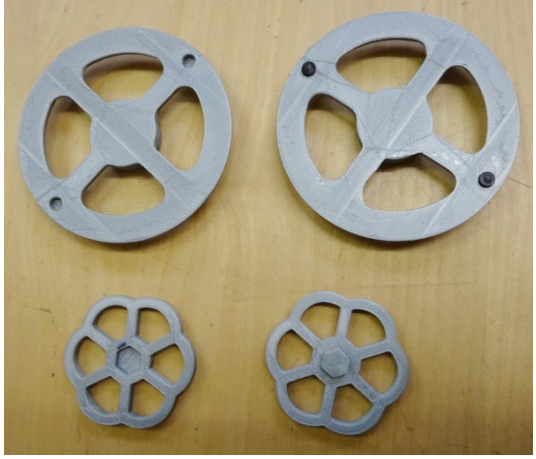
Having reviewed the CAD drawings, William Cook Cast Products have recommended that the monobloc be fabricated rather than cast and have indicated that they are interested in supplying the cast components for this.

BOILER

Whilst several of the bronze boiler fittings are presently being made using patterns originally made for *Tornado*, new patterns are required for steam valve hand wheels. As several hand wheels are needed, wooden patterns would normally be the chosen method, however as all the components for *Prince of Wales* are being drawn in 3D CAD, the opportunity has been taken to use up-to-date manufacturing methods in the form of 3D printing. Ideally the hand wheels would be made by 3D printing bronze, however this technology is still in its early stages, and conventional casting is presently the most cost-effective solution. However, the patterns are strong candidates for 3D printing in plastic and have been made for the Trust by Shildon Manufacturing Company and the castings by South Lincs Foundry at Spalding. Further use of 3D printing technology will be made as the project progresses.







P2 ROADSHOWS DURING 2017

The A1 Steam Locomotive Trust RECENTLY announced that it will be holding a series of presentations on the project to build new Gresley class P2 No. 2007 *Prince of Wales* along the route of the East Coast Main Line from London to Edinburgh and all the way to Aberdeen during 2017. Each presentation will feature key Trust personnel including Mark Allatt (Chairman) and David Elliott (Director of Engineering) and will cover the background to the project, progress to-date, future plans and details of how to get involved. The presentations will run from 11:00hrs to 13:00hrs on each of the days listed below and are open to existing supporters and interested members of the public:

- Saturday 14th January 2017 – The London Transport Museum, London
- Saturday 18th February 2017 – The Great Northern Hotel, Peterborough
- Saturday 18th March 2017 – Doncaster Museum & Art Gallery, Doncaster
- Saturday 22nd April 2017 – York Railway Institute, York
- Saturday 13th May 2017 – Darlington Locomotive Works, Darlington
- Saturday 17th June 2017 – Newcastle Mining Institute, Newcastle
- Saturday 1st July 2017 – Edinburgh Jury's Inn, Edinburgh
- Saturday 14th October 2017 – Dundee Heritage Trust Discovery Point, Dundee
- Saturday 25th November 2017 – Aberdeen Jury's Inn, Aberdeen.

FUNDRAISING

Public interest in seeing a new Gresley class P2 become a reality sooner rather than later is high and 770 people have already signed up to the 'P2 for the price of a pint of beer per week' (£10 per month or more) covenant scheme since its launch. In addition to this core scheme, funds have been raised through The Founders Club (over 360 people have donated £1,000 each – target 100 people, now closed), The Boiler Club (well over 100 people have pledged £2,000 each - target of 300 people), The Mikado Club (over 100 people have pledged £1,000 each – target 160 people/£200,000), Dedicated Donations (over £180,000 from existing supporters sponsoring a variety of components) and the sponsorship of the locomotive's distinctive front-end by The Gresley Society Trust. This means that the project has already received pledges of 45% (including Gift Aid) of the

£5m needed to complete the new locomotive by 2021.

For more information on how you can help to build Britain's most powerful steam locomotive visit www.p2steam.com, email enquiries@p2steam.com or call 01325 460163.

THE MIKADO CLUB

WE WANT EIGHT AND WE WON'T WAIT - £200,000 appeal launched to wheel No. 2007 *Prince of Wales* by the autumn.

On 29th March we announced a new £200,000 appeal to wheel No. 2007 *Prince of Wales* by autumn 2016. When achieved, it will be the first time for over 70 years that one of this iconic class of locomotives has stood on its wheels - the last original Gresley class P2 No. 2003 *Lord President* was rebuilt into an ungainly Thompson class A2/2 Pacific in December 1944.

Following the success of The Founders Club (to get the project to the point of cutting the frames) and The Boiler Club (to fund the construction of the boiler), the Trust has decided to establish The Mikado Club to raise an estimated £200,000 required to wheel No. 2007 during 2016.

If the project to complete No. 2007 *Prince of Wales* in 2021 is to remain on schedule the engine needs to be wheeled this year. The Trust has therefore set itself the challenge of raising £200,000 through The Mikado Club from 160 supporters each donating £1,000 (plus Gift Aid) to the project in up to eight payments of £125 by standing order. This estimate excludes the components already ordered or delivered such as wheels, tyres, axles, bearings and cannon boxes some of which are still available to sponsor as Dedicated Donations.

In return for supporting this appeal, special benefits for members of The Mikado Club include:

- Reserved seat on one of No. 2007's first main line train
- Reasonable access to No. 2007
- Opportunity to purchase an exclusive Mikado Club badge
- Opportunity to join one of the teams building No. 2007
- First choice of other components to sponsor
- Special limited edition version (signed/numbered) of Stephen Bainbridge's new painting of No. 2007 *Prince of Wales* at Darlington station
- Special Mikado Club day with *Tornado*.

We are confident that we will have completed the rolling chassis for No. 2007 *Prince of Wales* in early 2017 having reached over 65% of our target for The Mikado Club. We would encourage those of you who haven't yet contributed to this exciting project to help us to meet these deadlines by becoming a member of The Mikado Club. It's time to get on board!

To become a member of The Mikado Club, email enquiries@p2steam.com, call 01325 460163 or visit www.p2steam.com for more information.

THE BOILER CLUB

It is our desire to leave No. 2007 *Prince of Wales* debt free upon completion and therefore our aim is to raise at least £600,000 for The Boiler Club from 300 supporters each donating £2,000 to the project (in up to 40 payments of £50 by standing order).

Special benefits for members of The Boiler Club:

- Opportunity to buy a ticket (seat already reserved) on one of No. 2007's first main line train
- Reasonable access to No. 2007
- Opportunity to purchase an exclusive Boiler Club badge
- Opportunity to join one of the teams building No. 2007
- First choice of other components to sponsor
- Special limited edition version (signed/numbered) of the first official painting of No. 2007 *Prince of Wales* with No. 60163 *Tornado*
- Special Boiler Club day with *Tornado*

For more information on how you can help to build Britain's most powerful steam locomotive visit our website, email us or call 01325 460163.

P2 BOILER CLUB & MIKADO CLUB EXCLUSIVE BADGES

P2 BOILER CLUB & MIKADO CLUB EXCLUSIVE BADGES ARE NOW AVAILABLE TO BUY! These badges are only available to Boiler Club or Mikado Club members.

To purchase your badge please send a cheque for £5 made payable to The P2 Steam Locomotive Company to The A1 Steam Locomotive Trust, Darlington Locomotive Works, Hopetown Lane, Darlington DL3 6RQ

DEDICATED DONATIONS

Since its launch in 2014, 236 individual components have been sponsored as part of the Dedicated Donations Scheme, this is in addition to many of the smokebox components which have been sponsored directly by The Gresley Society Trust.

If you would like to sponsor a component on No. 2007 *Prince of Wales*, please contact dedicated.donations@p2steam.com

PRESENTATIONS

If any railway society – or indeed other interested group - would like a presentation on the project they should contact us by email enquiries@p2steam.com

VOLUNTEER

As ever we are looking for more volunteers. It takes a lot of people to both keep *Tornado* on the main line and also to build *Prince of Wales*. There is always so much more that we can achieve with the right volunteers with the right skills and can-do attitude. Please email enquiries@p2steam.com if you think you can help.

For more information on the project to build Gresley class P2 No. 2007 P*rince of Wales* please visit www.p2steam.com, email enquiries@p2steam.com or follow us on Facebook, Twitter and LinkedIn.

Our mailing address is:
The A1 Steam Locomotive Trust, Darlington Locomotive Works, Hopetown Lane, Darlington. DL3 6RQ