THE MIKADO MESSENGER

No. 9 December 2014

2007 PRINCE OF WALES

Building Britain's Most Powerful Steam Locomotive

Welcome

...to edition No. 9 of *The Mikado Messenger*. *The Messenger* aims to provide a monthly bulletin of news about the construction of No. 2007 *Prince of Wales*. Rapid progress continues to be made, much of it in engineering works other than Darlington.

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Editor of *The Mikado Messenger*

David Elliott

The massive casting for *Prince of Wales's* rear dragbox.

● THE BOILER CLUB

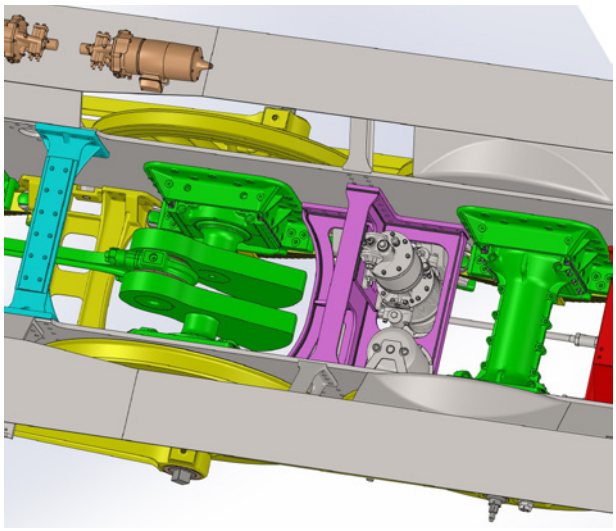
Following the success of The Founders Club, which was designed to get the P2 Project to the point of cutting No. 2007's frames, we have decided to establish The Boiler Club to fund the construction of *Prince of Wales's* boiler. We set an initial target for The Founders Club of at least £100,000 from 100 'Founders' but due to the overwhelming generosity of our supporters we actually raised £450,000 from 360 donors. 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 No. 2007's first main line train
- Reasonable access to No. 2007 at all times
- Opportunity to buy 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*

NEWS BRIEFS

DESIGN - Design work has been concentrated in two areas; drawing and modification of the cab to comply with the reduction in overall height from 13' 1" to 13' as was done with *Tornado* to ensure the widest possible route availability and redesign of frame major frame stays as full penetration welded fabrications with modifications to carry air pumps and air brake cylinders (see 3D model).



David Elliott

FRAMES - The last of the initial batch of 24 frame stay and bracket castings - the drag box - has been completed by William Cook Cast Products including stress relieving and is due to be delivered to MultiTech at Ferrybridge along with other larger frame castings for machining.

WHEELSETS - MultiTech will also be proof machining the small loco carrying wheels and tender wheels ready for wheelset assembly next year. Smaller frame brackets will be machined by companies in the Darlington area. Tyres, axles, crank pins and crank sweep forgings have been ordered and quotations are being sought for assembly of the wheelsets.

RESEARCH - One of the problems experienced with the original P2 locomotives was fracture of crank axles. We are aware of at least four and possibly five occasions when a crank axle broke immediately behind the wheel. Whilst such occurrences were not uncommon in the days before routine non-destructive testing of axles by ultrasonic and more recently magnetic particle inspection, for so many events on a small class of six locomotives over an eight year period is exceptional and will not be tolerated on today's railway.

The design of the P2 crank axle is essentially the same as that for the contemporary A3 Pacifics which were not prone to axle failure. The P2's larger cylinders would have resulted in higher maximum piston forces and hence torque in the axle, and whilst a Pacific at high axle torque will slip dissipating the torque, the additional pair of coupled wheels on the P2s made them one of the most sure footed locomotives ever built. Hence higher sustained torques were possible. The fact that all these failures took place at low speed when the locomotives were accelerating hard had the fortunate consequence that none of the failures resulted in derailment.

The crank axle on *Tornado* has several significant design improvements developed by the Timken company including a better keyway design and a stress relief groove the surface of which was rolled to compress the material. These features improved the fatigue resistance by at least 60%. We intend to further improve the design by incorporating the BR BASS 504 wheel/axle design techniques.

Tim Beere

'Our' lorry called at WCCP to collect recently made castings.

Tim Beere

● **WORKS MANAGER** - we are seeking an experienced steam locomotive engineer to join our team in Darlington in the role of Works Manager. This critical role will lead the team of staff and contractors to actually Gresley class P2 No. 2007 *Prince of Wales*. The successful applicant will be familiar with steam locomotive overhaul and maintenance, have project management experience and be used to leading teams. If interested please send letter of application and CV to enquiries@p2steam.com.

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

The photo shows the failure of the crank axle on No. 2005 *Thane of Fife* at Stonehaven in July 1939, indicating that a crack started from the sharp corner in the end of the keyway for the key that locates the wheel on the axle. The crack had grown slowly until it was about two thirds of the way through the axle when it failed completely.
Photo courtesy of Graham Werrett

● **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 *Prince of Wales* please visit www.p2steam.com, email enquiries@p2steam.com or follow us on Facebook, Twitter and LinkedIn.

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DEDICATED DONATIONS

The Dedicated Donations scheme is now open. In addition to being able to sponsor one or more of the 18 spokes of the 6ft 2in driving wheels for either £600 (or £25pm for 24 months) supporters have the option to sponsor a range of different components from a 'Drag box wing plate LH rolling and profiling' at £50 to a '6ft 2in driving wheel casting and proof machining' at £12,000 (or £200pm for 60 months). Supporters who subscribe to the scheme will have their names inscribed on the official roll of honour at Darlington Locomotive Works listing the components sponsored, receive a certificate recording the sponsorship and copy of the drawing of the component. New components available for sponsorship will become available as construction progresses. The panel illustrates some of the parts available - perfect gifts for Christmas!

Contact **dedicated.donations@p2steam.com** to make your selection.

Sample Dedicated Donations List

Item Number	Component Location	Item	Price £'s	Monthly Cost	Duration in Months
PS0003	Frames	Main frame plate RH - rolling and profiling	£2,400.00	£100.00	24
PS0009	Frames	Rear outer (Cartazzi) frame plate LH rolling and profiling	£600.00	£25.00	24
PS0015	Frames	Doubler for frames over front of firebox RH rolling and profiling	£300.00	£12.50	24
PS0031	Frames	Spring casing for double buffer LH pattern	£1,200.00	£50.00	24
PS0033	Frames	Spring casing for double buffer RH pattern	£300.00	£12.50	24
PS0036	Frames	Leading coupled horn block LH casting	£1,800.00	£75.00	24
PS0042	Frames	Combined frame stay and 4 spring hanger brackets poly pattern	£900.00	£37.50	24
PS0046	Frames	Driving horn block LH machining	£900.00	£37.50	24
PS0058	Frames	Trailing coupled horn block LH machining	£900.00	£37.50	24
PS0071	Frames	Frame stay and firebox support machining	£600.00	£25.00	24
PS0075	Frames	Combined brake hanger bracket and firebox support RH poly pattern	£300.00	£12.50	24
PS0083	Frames	Frame stay between in and outer rear frames RH machining	£600.00	£50.00	24
PS0097	Frames	Cartazzi hornblock leading LH machining	£600.00	£25.00	24
PS0105	Frames	Cartazzi hornblock trailing RH casting	£600.00	£25.00	24
PS106	Frames	Cartazzi hornblock trailing RH machining	£600.00	£25.00	24
PS0111	Coupled wheelsets	Leading RH coupled wheel casting and proof machining	£12,000.00	£200.00	60
PS0112	Coupled wheelsets	Driving LH coupled wheel casting and proof machining - (Per Spoke)	£600.00	£25.00	24
PS0121	Coupled wheelsets	Cartazzi wheel LH casting only	£3,000.00	£100.00	30
PS0125	Tender	Tender frame plate RH machining and drilling	£1,800.00	£75.00	24
PS0126	Tender	Leading intermediate LH tender wheel casting only	£3,600.00	£100.00	36
PS0207	Frames	2 x 1 1/4" Cartazzi horn stay bolts and nuts LH	£150.00	£150.00	1

*NB. Combinations of over 1000 nuts and bolts are available to sponsor

Please note that this is not a comprehensive list and there are many more components available to sponsor upon request.

All enquiries should be emailed to dedicated.donations@p2steam.com or telephone 07984 653235 outside office hours for more information.