

THE MIKADO MESSENGER



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



The P2 frames are once again centre stage at Darlington - *Bob Hughes*

Welcome to edition No. 13 of The Mikado Messenger. The Messenger aims to provide a monthly bulletin of news about the construction of No. 2007 *Prince of Wales*.

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Editor of The Mikado Messenger

PRINCE OF WALES ONE-THIRD COMPLETE

Our new Gresley class P2 steam locomotive No. 2007 *Prince of Wales* is already over one-third (34%) complete by weight following the delivery of the engine's 12 tyres less than two years since the launch of the project in September 2013. This rapid construction has been fuelled by the project's

successful fundraising campaigns which have seen pledges of 38% of the £5m required to complete Britain's most powerful steam locomotive by 2021. In only 18 months since the launch of the project's 'P2 for the price of a pint of beer a week' (£10 per month) regular donation - or covenant - scheme, funds either already donated or pledged by Standing Order have already reached £1.9m.

Construction progress to-date includes:

- Frame plates for engine and tender rolled and profiled
- Engine's frames erected at Darlington Locomotive Works
- All 20 wheels for engine and tender cast; eight 6ft2in driving wheels proof machined; engine's tyres delivered
- All major engine frame stays, brackets and horn blocks cast and machined - 26 in total; further 16 axle box and buffer castings underway
- Roller bearings for all engine and tender wheelsets and engine tyres, axles and crank pins ordered
- Over 1,000 fitted and driven bolts ordered Preliminary discussions held with boiler manufacturers and forged foundation ring corners manufactured and machined
- Vampire study into ride and suspension completed and Finite Element Analysis of crank axle underway to ensure locomotive complies with modern standards
- Assessment and notified body appointed to oversee certification
- Nameplates delivered and chime whistle ordered!

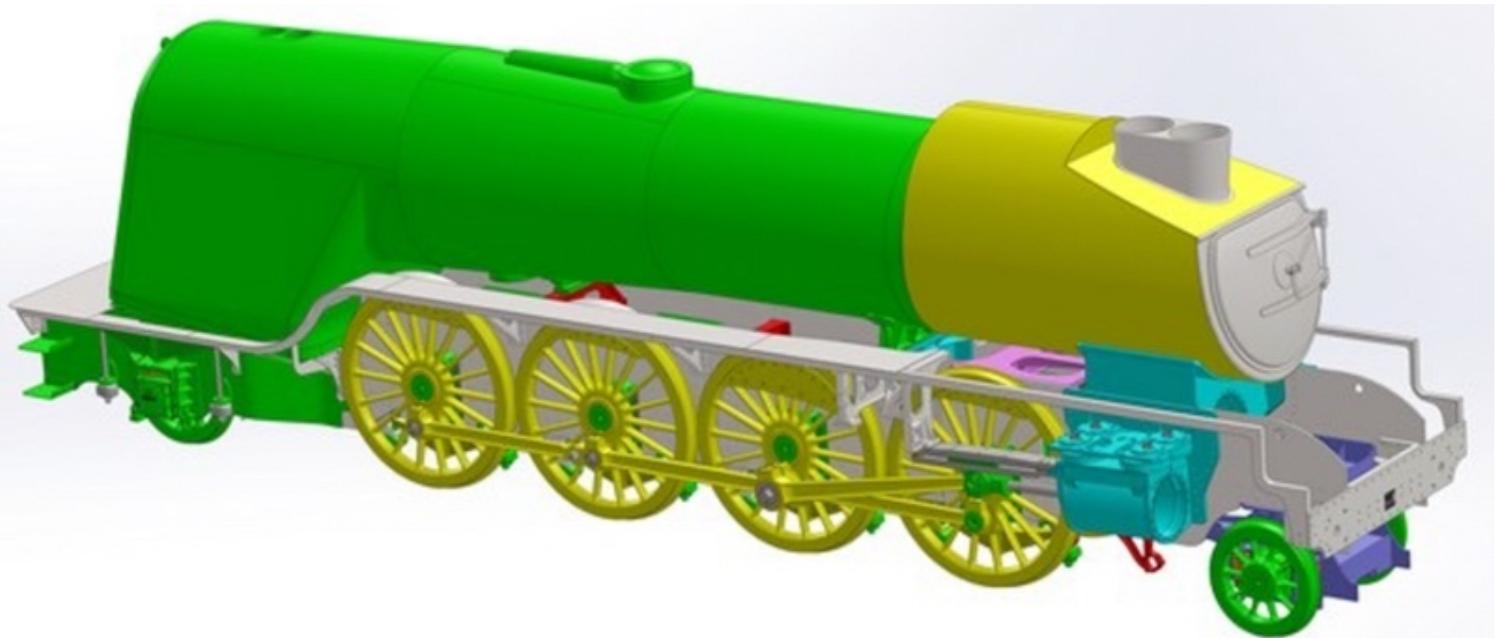
The project's use of the latest Computer Aided Design (CAD) technology means that the weight of all of the components now in existence can easily be calculated. The weight of the engine parts now in existence stands at 37.2 tons (39% of an estimated completed empty weight of 96 tons) and the tender at 4.8 tons (17% of an estimated completed empty weight of 28.4 tons) giving a figure of 34% for the whole locomotive by weight.

With No. 60163 *Tornado's* overhaul now complete, our team at Darlington Locomotive Works has now resumed the erection of No. 2007 *Prince of Wales's* frames, fitting the frame stretchers, horn guides and other components manufactured by external contractors over the past few months. The Trust is still hopeful that we will have completed the rolling chassis for No. 2007 *Prince of Wales* next winter and we remain on-track for completion of the new locomotive in 2021. However, to maintain this rate of progress we need to continue to raise in excess of £700,000 per year, which given the

nature of the regular donation scheme becomes more challenging as each year passes.

THE GRESLEY SOCIETY TRUST SPONSORS THE P2 SMOKEBOX

The Gresley Society Trust, which was established in 1963 to sustain the legacy of Sir Nigel Gresley (and owns the oldest surviving Gresley locomotive, Great Northern Railway class N2 No. 1744), is to sponsor the construction of the distinctive smokebox for *Prince of Wales*. The sponsorship by The Gresley Society Trust includes design changes, rolling and assembly of smokebox barrel; smokebox/boiler and smokebox front rings; smokebox door and most fittings (hinges, dart, etc); cross bar, ribs and crinolines; chimney pattern and machining; fairing around chimney and smoke lifting sheets; and whistle bracket, most handrails and knobs.



The extended smokebox in CAD (the Diagram 118a boiler is shorter than the original's)

DESIGN

Design has concentrated on detailing of the footplating and cab to enable components to be ordered. Some of the footplate support brackets have been

ASSEMBLY

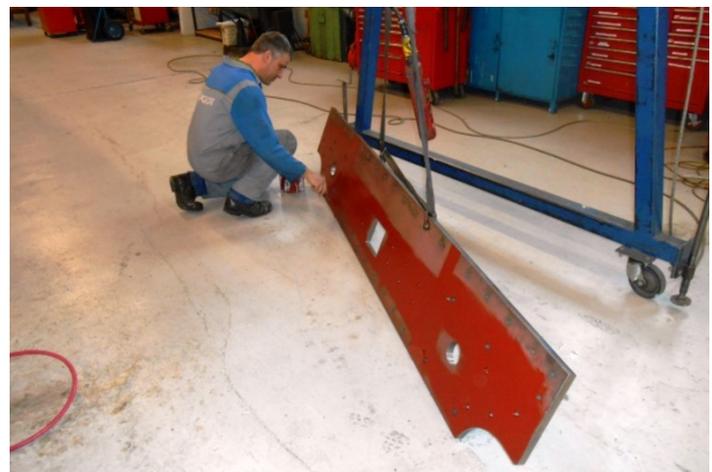
Following experience with Tornado when we dismantled the buffer beam to bore the middle cylinder where some rust was found between the components, the decision has

converted from steel castings to welded fabrications similar to those used on Tornado.

In contrast the decision has been taken to use the original rivet assembly method for the cab. The cab sides are large un-braced flat areas and welding these to the roof and spectacle panels risks significant distortion. As the heat introduced by riveting is much less than for welding, the plates should remain flat. The joining strips between sides, roof and spectacle plates are interesting shapes, with several oblique angles and where the roof meets the spectacle plates, some compound curvature. These components will be press-braked from steel strips, where necessary further shaped by hand blacksmithing.

been made to "wet assemble" all the frame platework and frame stays. This is common practice in the aviation industry where sophisticated interfay compounds are routinely used in riveted aluminium alloy to inhibit corrosion.

After looking at several options, we have settled on using red metal primer as the interfay compound, as where it is squeezed of the joints, it makes an excellent base to ensure adhesion of subsequent layers of paint. The sequence of photos shows Ian Matthews fitting the front bufferbeam. A coat of primer is applied to both mating surfaces and the components assembled and fully bolted together whilst the paint is wet.

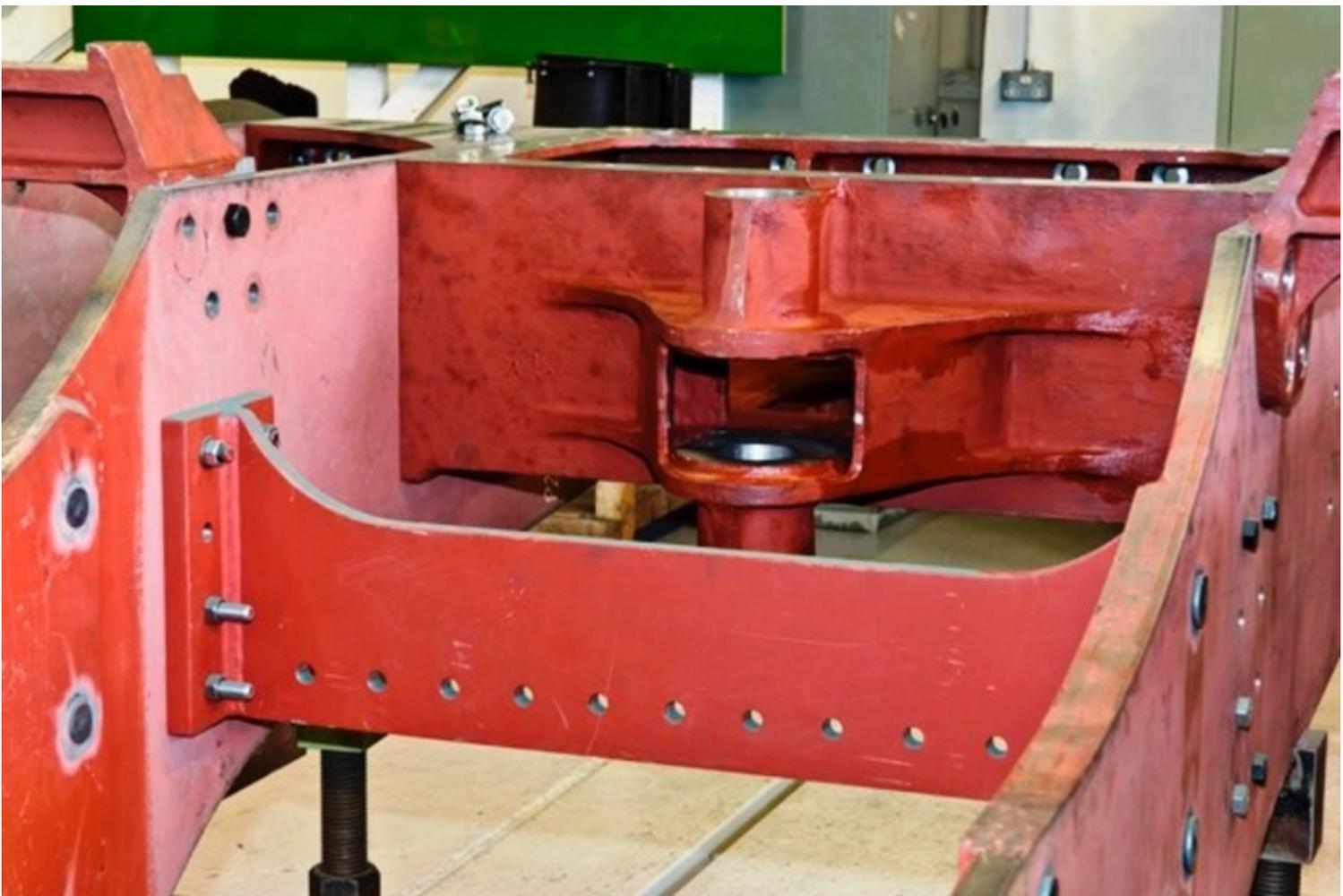


ELECTRICAL SYSTEM

Based on the positive operational experience with the electrical system fitted to No. 60163 *Tornado*, design work is underway on a similar system for No. 2007 making use of 3D CAD models to simplify and improve accessibility of the conduits and trunking for the 1¾ miles (2.6 km) of cable used. Provision is also being incorporated for the new ERTMS cab based signalling system with adequate capacity for future electrical demand. The successful mobile phone charger and tracker will be retained. Another area of development is to produce high intensity headlamps fitting into a traditional LNER oil lamp housing incorporating white marker and red tail lamps in the same unit, as the class P2s were not originally fitted with any electrical system.

SMOKEBOX

Following the announcement of the Gresley Society sponsorship of the smokebox, we have agreed the details for manufacturing the smokebox door with South Devon Railway Engineering (which took over the former R K Pridham Engineering boiler manufacture and repair business) and an order is about to be placed. The 'D' shape of the door inhibits the method used for *Tornado* which involved starting with a spun tank end and then hand forming the sharp radiused flange on the outside edge. The flat on the top of the door prevents this approach. The chosen method uses a former that is the shape of the back of the door and a large 'D' shaped washer acting as form tools in South Devon's boiler flanging press.



The rear drag box has now been installed in the frames - *Bob Hughes*

FUNDRAISING

We have recruited 370 members of The Founders Club since its launch at the A1SLT convention in September 2013 - potentially worth up to £460,000 with Gift Aid added (closed to new members in July 2014). We launched the 'P2 for a price of a pint' covenant scheme at the first of the P2 Roadshows in London on 8th March 2014 and over 670 people have already signed up, worth over £1m over the duration of the project. If we add in the £120,000 pledged to the dedicated donation scheme since its launch last July and over 80 members of The Boiler Club so far our total pledged to-date has already passed £1.9m - but there is still a long way to go to reach the magic £5m.

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.

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 £460,000 from 370 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*

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.

PRESENTATIONS

If any railway society - or indeed other interested group - would like a presentation on the project the [please get in touch](#).

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.

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