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How to get on-board with Tornado



Britain's 100mph main line steam locomotive
Become a monthly Covenantor and help to keep No. 60163 Tornado on the main line.
To find out more about becoming an A1 for the price of a pint of beer* Covenantor - regular donor - for No. 60163 from only £2.50 a week, please visit www.a1steam.com, email enquiries@a1steam.com or call 01325 460163.

Travel on one of Tornado's main line railtours

The A1 Steam Locomotive Trust organises railtours hauled by No. 60163 Tornado that cover the length and breadth of the national railway network. Our railtours have a broad range of starting and pick up points, traverse some of Britain's most iconic and scenic railway lines and go to many of the UK's most historic cities and places of interest.
Our trains are formed of heritage carriages, which provide a nostalgic journey back in time where passengers can enjoy beautiful scenery as plumes of steam drift past the windows and the locomotive's distinctive chime whistle can be heard. Whether you choose to travel in Premier Dining, First Class or Tourist Class, you can be assured of a magical day out on a railtour with Tornado.
For more information about how you can travel with No. 60163 Tornado, please visit enquiries@21stcenturysteam.co.uk, email www.21stcenturysteam.co.uk or 21st Century Steam Ltd on social media.



Darlington Locomotive Works

Part of Hopetown, Darlington's railway heritage quarter, Darlington Locomotive Works welcomes visitors to see progress on the P2 No. 2007 Prince of Wales from its viewing gallery.



Alternatively, visit Darlington Locomotive Works on one of our open days. The works is open on the first and third Saturday of each month between 10:00hrs and 15:00hrs. This is a great opportunity to get up close to the locomotive and discuss the project with our team. Special arrangements can be made for parties from interested clubs and societies.

Our grateful thanks go to Darlington Borough Council for their continued support of The A1 Steam Locomotive Trust and Darlington Locomotive Works.

Volunteering

There are many ways in which you can help us to build No. 2007 Prince of Wales and keep No. 60163 Tornado operating on the main line

- MARKETING AND FUNDRAISING**
We have a successful team of volunteers from all walks of life who support our open days at Darlington Locomotive Works and our national programme of P2 roadshows for No. 2007 Prince of Wales to recruit donors to the project. Our volunteers recruit Covenantors, promote railtours and sell merchandise in support of No. 60163 Tornado, either on-board our railtours or at other events. As long as you enjoy meeting new people and relish a challenge, no experience is necessary and there are opportunities to help across the country.
- ENGINEERING SUPPORT**
We are always on the lookout for volunteers to help with engineering. Experience is useful but many jobs supporting the construction of No. 2007 Prince of Wales at Darlington Locomotive Works require the services of a fitter's mate, so qualifications are not essential.

Please see our websites www.a1steam.com or contact volunteer@a1steam.com for more information.

Help us to build Britain's most powerful steam locomotive

Get on-board with Gresley class P2 No. 2007 Prince of Wales



Follow us on:



Over £4.5m raised to date
All large components now manufactured. Valve gear and electricals in production!



No. 2007 Prince of Wales outside the former Darlington Locomotive Works, with boiler cladding demonstrating what the engine will look like as progress is made.

The Gresley class P2 2-8-2 'Mikados' were the most powerful express passenger locomotives to operate in the UK. They were designed by Sir Nigel Gresley to haul 600 ton trains on the arduous Edinburgh to Aberdeen route. Sadly the design was never fully developed and they were rebuilt by his successor Edward Thompson into ungainly class A2/2 4-6-2 'Pacifics' in 1943/4, and scrapped by 1961. As the builders of No. 60163 Tornado, we have set ourselves a new challenge: to develop, build and operate an improved Gresley class P2 'Mikado' steam locomotive for main line and preserved railway use.
The project to build the seventh Gresley class P2 'Mikado' uses the latest computer design and modelling techniques to enable it to deliver its true potential.

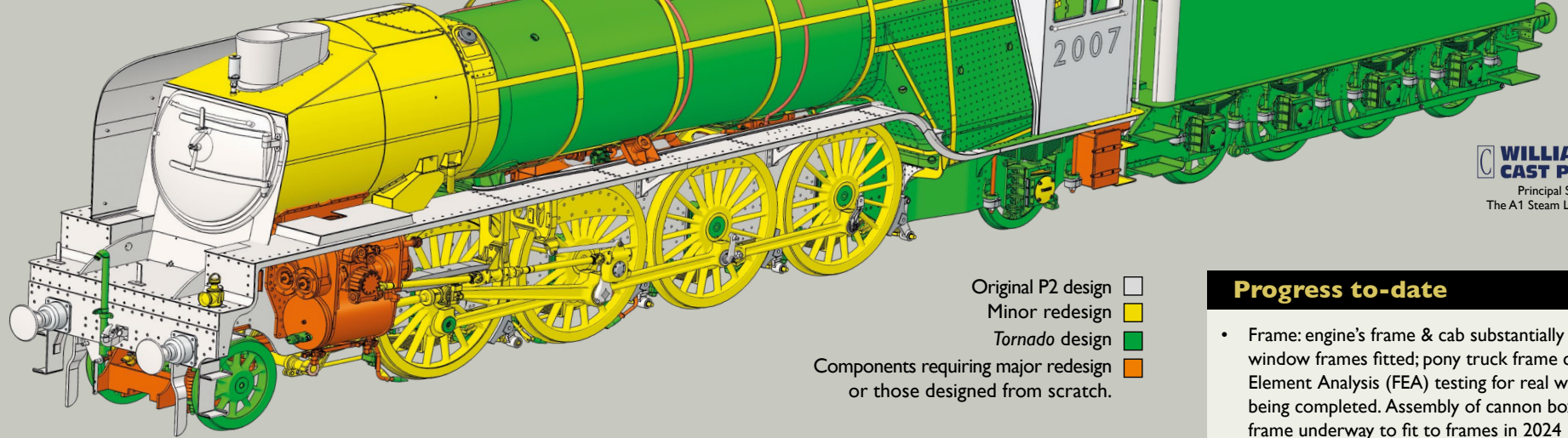
- Make maximum use of systems, fittings and processes in use on No. 60163 Tornado - any changes to the original design will be either for operational, manufacturing or certification reasons
 - Take into account the needs of the operator - all decisions will be judged for their value for money
 - Meet current and foreseeable regulatory standards to allow the locomotive to operate as intended.
- We estimate that No. 2007 Prince of Wales will cost over £6m to build over a 15 year period. As with Tornado, funds will be raised through regular covenanted donations ('a P2 for the price of a pint of beer a week'), donations dedicated to specific components, clubs and commercial sponsorship.

We have the expertise, the track record and a plan... But this can't happen without you.

The new locomotive will:

- Be aesthetically similar to class P2 No. 2001 Cock o' the North - it is a construction and development project not an opportunity for major redesign

CAD model showing sources of design.



- Original P2 design (White)
- Minor redesign (Yellow)
- Tornado design (Green)
- Components requiring major redesign or those designed from scratch (Orange)



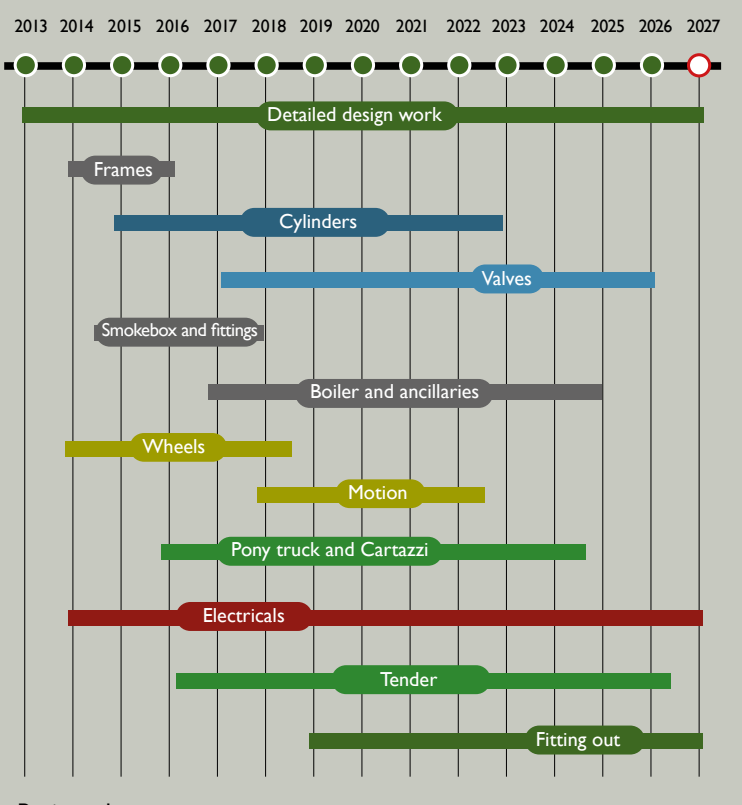
Motion fitted to wheels and being tested.



Boiler being assembled at DB Meiningen.



Tender tank in green undercoat outside the former DLW.



Project plan.



No. 2007's impressive monobloc.

Original class P2s



The first Gresley class P2 No. 2001 Cock o' the North at Doncaster in 1934 with H N (later Sir Nigel) Gresley and his design team.

In February 1933, the LNER authorised the construction of two new 2-8-2 'Mikado' steam locomotives for use on the arduous Edinburgh to Aberdeen road. Subsequently known as the class P2, the order was later revised to just one new locomotive. The frames for No. 2001 Cock o' the North were profiled and laid in February 1934 with construction of the rest of the locomotive following quickly under Gresley's direction. On 22nd May 1934 Cock o' the North rolled out of Doncaster works.

The new locomotive was unlike anything seen before and was the first standard gauge 2-8-2 'Mikado' express passenger steam locomotive to be built to operate in Great Britain. In total, six Gresley class P2s were built:

	Built	Rebuilt to A2/2
No. 2001 Cock o' the North	May 1934	Sept 1944
No. 2002 Earl Marischal	Oct 1934	June 1944
No. 2003 Lord President	June 1936	Dec 1944
No. 2004 Mons Meg	June 1936	Nov 1944
No. 2005 Thane of Fife	Aug 1936	Jan 1943
No. 2006 Wolf of Badenoch	Sept 1936	May 1944

Progress to-date

- Frame: engine's frame & cab substantially complete; cab window frames fitted; pony truck frame complete, Finite Element Analysis (FEA) testing for real world forces study being completed. Assembly of cannon boxes to pony truck frame underway to fit to frames in 2024
- Cylinders: 3D CAD design complete; Computational fluid dynamics (CFD) study of steam flow undertaken; Cylinder block delivered, creating method statement for fitting to frames in 2024
- Valve gear & camboxes: manufacturing drawings for updated poppet valve gear design complete, final checking underway before manufacture of prototype for development testing starting in 2024
- Smokebox & fittings: CFD study successfully carried out to confirm satisfactory smoke lifting performance of front end
- Boiler: boiler design study completed & approved by TÜV Süd notified body; superheater header cast & machined; boiler cladding manufactured; boiler order placed with DB Meiningen for delivery in summer 2024; minor re-design of the banjo dome to suit P2 cladding completed;
- Fittings: many non-ferrous fittings being cast & machined; material for bespoke fittings delivered
- Brakes: manufacture of brake rigging well advanced and spring gear underway; brake cylinders acquired and trial fitted; brake gear partially fitted
- Wheelsets: crank axle re-designed to comply with modern standards & manufactured; all engine wheelsets complete & fitted to engine
- Motion: heavy motion delivered from Stephenson (Engineering) Ltd; six coupling rods, inside connecting rod & strap and outside connecting rods forged; six machined coupling rods and two outside connecting rods assembled to wheelsets. Inside connecting rod and strap delivered.
- Pipework: design well advanced, pipe and fittings procured & installation between frame well advanced
- Electricals: significant progress on electrical system with design scrutiny under way; battery boxes fitted to frame; stainless steel conduit sections cut & bent and mostly fitted; prototype of new axle driven alternator testing ongoing
- Tender: tank constructed at NVES delivered, frame being assembled by ID Howitt to be delivered summer 2024, wheelsets returned from SDR Engineering, axles painted, ready to be balanced
- Finishing: nameplates and chime whistle delivered.
- To-date, over £4.5m has been raised of the estimated £6m required to complete No. 2007 Prince of Wales within the next three years.

Please get on-board and help to complete No. 2007 Prince of Wales in record time

Regular Donations / Covenants

Our concept when we began building No. 60163 Tornado in 1990 was that it should be funded by a large number of affordable, regular donations. Supporters could covenant (donate) just the price of a pint of beer per week. Much of Tornado as you see it today operating on the main line was funded by this means - a lot of people contributing a small amount, on a regular basis. Due to this success, we are using the same approach to raise the funds to build a new Gresley class P2, No. 2007 Prince of Wales.

As a registered charity we are able to claim back from HMRC the tax that you have paid on your donations. For example, for every £10.00 that you donate, we can claim an additional £2.50, making your contribution worth £12.50. Please come on board and help speed the construction of No. 2007 Prince of Wales with a regular donation made by standing order in units of £2.50 per week. In recognition of their support, monthly donors receive:

- Opportunity to a buy ticket (seat already reserved) on one of the first trains hauled by No. 2007 Prince of Wales
- Reasonable access to No. 2007 at all times (by prior appointment)
- Print of the launch painting of Prince of Wales by Jonathan Clay
- Opportunity to join one of the teams building No. 2007
- Monthly e-newsletter Mikado Messenger
- Invitation to the Annual Convention & a free copy of our quarterly magazine, The Communication Cord
- Covenantor card and opportunity to buy exclusive silk tie and Covenantor badge
- Your name inscribed on the Roll of Honour at Darlington Locomotive Works.



Other ways to help No. 2007 Prince of Wales

There have been numerous fundraising clubs since the P2 project launched which have specifically focused on larger components. Many of these have now been manufactured and the next steps involved their fitment within the locomotive.

Clubs & Projects

The Monobloc & Valve Gear
Delivered in late 2023, the fabricated monobloc is a unique design and will work in harmony with the Franklin-Lentz rotary cam poppet valve gear, the manufacture of which commences in 2024.



The monobloc's installation will take place concurrently with the testing of the valve gear prototype. Together they will make Prince of Wales Britain's most powerful steam locomotive.

The Boiler
The boiler is the beating heart of any steam locomotive, and usually its most expensive component! Manufactured at DB Meiningen, the P2 boiler cost over £600,000. The fitment of the boiler involves crane hire and a considerable amount of plumbing! Please consider making a donation to this component today!



Electronics
When you think of a traditional steam locomotive, you'd be forgiven for considering it as something fairly low-tech, using basic thermodynamic principles rather than electronics. Whilst that is true for powering the pistons, with the demands on the modern rail network and the need for diagnostic information, we expect to install around 7 miles of cabling around the locomotive!

Sign up online at p2steam.com/clubs

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.

Legacy Giving

A further way in which you can help build No. 2007 Prince of Wales is by establishing a Legacy in your will, helping to ensure the future of steam on the mainline - our duty, on our website.

Yes! I would like to help build No. 2007 Prince of Wales

The easiest way to sign up is on our website at www.p2steam.com (or scan QR code) Alternatively, please complete the form below and return to:



The A1 Steam Locomotive Trust
Darlington Locomotive Works, 9 Bonomi Way,
Darlington, DL3 0PY.

AMOUNT YOU WOULD LIKE TO DONATE

PLEASE COMPLETE IN BLOCK CAPITAL

£ per month (minimum £10.00)

Name

Address

Postcode

E-mail

Telephone

To set up a Standing Order, please complete the following:

Bank / Address

Postcode

Dear Sir/ Madam

Please pay monthly on the 10th of each month, the sum of

£, commencing with the first payment on the 10th of

(month) 202.., to the

of the Barclays Bank Plc, Sort Code 20 - 61-55, for the credit of

'A1SLT - P2 Construction Fund' (a/c 53835308) and charge my

account no. and sort code

This order is in addition to any existing order that is in favour of 'A1SLT - P2 Construction Fund'

Yours faithfully,

Signature: Date

gifted it

For every £1 you donate, A1SLT can reclaim 25p from HMRC - you just need to tick the box below.

Yes: I want the A1 Steam Locomotive Trust (Charity No 1022834) to reclaim tax on all my donations I make on or after this declaration until I notify them otherwise. I confirm I am a UK taxpayer and understand that if I pay less tax than the amount of gift aid claimed, I am responsible for the difference.