



Newsletter

Keeping Shareholders Informed



Issue 10

Winter 2021

The 4253 Locomotive Company Limited, based in Rolvenden, Kent, is a non-profit, non-political organisation. Reproduction of photos by permission of The 4253 Locomotive Company.

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4253 Hot Rods!

*Special newsletter
report on the
manufacture of
our side rods*

WITH a lot of shareholders whiling away endless gloomy winter days at home, or indeed working from home, we thought another 4253 newsletter might be in order, hopefully to give a brief respite from any boredom.

The manufacturing process of the two missing items that convert steam into motion, 'the rods', has now begun and they are on their way.

You might recall, from previous newsletters, that when 4253 was languishing at Barry scrap yard for many years, and along with virtually all the other locos at Barry, it was the custom to cut away anything that would restrict shunting the rusting locos about the yard. Therefore, the main side rods were often cut off with a torch or removed by 'collectors', along with other motion parts.

So true to form, when 4253 arrived at Rolvenden there wasn't a side rod in sight! Given that there should be six side rods, plus two connecting rods, this became a major challenge to find replacements. All but two replacement rods have been located over the past 9 years, but with all further searches across the UK recently called off, there was nothing left but to have



Picture courtesy of Somers Forge Ltd

One of the 4253 white hot ingots being shaped by the 4000+ tonne Draw Down Press at Somers Forge, West Midlands.

the missing ones made from scratch.

Hopefully the following in-depth look at how our rods have been manufactured will be of interest to shareholders and also give an insight into the world of forging and shaping - which perhaps is not quite as straightforward as first appears . . .

Read on!

4253 Rods. Open Die Forging by Dave Farnham

The manufacture of the two rods has been made possible by specific donations and arrangement with five shareholders. I'm sure all shareholders will join us in thanking them.

Many thanks go to: Martin, Paul, Scott, Terry and one other specific donor, who wishes to remain anonymous.

We thank the above and all other shareholders, for their continued fantastic support.

Due to the lack of fund raising opportunities in 2020 because of Covid-19, we still have a large hole in our finances. The cost of final machining is still outstanding so, if you would like to donate, no matter how small, to help us complete the job as soon as possible, please contact / send cheques to:

Email: gwr4253@gmail.com Website: www.4253.co.uk (follow 'How to Help')

4253 Locomotive Company Ltd, 25 Winsor Road, Rolvenden Layne, Tenterden, Kent TN17 4NL

THE initial forging work was given to Somers Forge Ltd of Halesowen, West Midlands, which also has a parent company in Michigan, USA. The company was established in 1886 in the heart of the Black Country and in the ensuing years they have forged in excess of 1,881,766 tonnes of steel. They can forge weights from 1kg to 80 tonnes and in lengths up to 23 metres . . . easily suited to do our couple of 'little' rods!

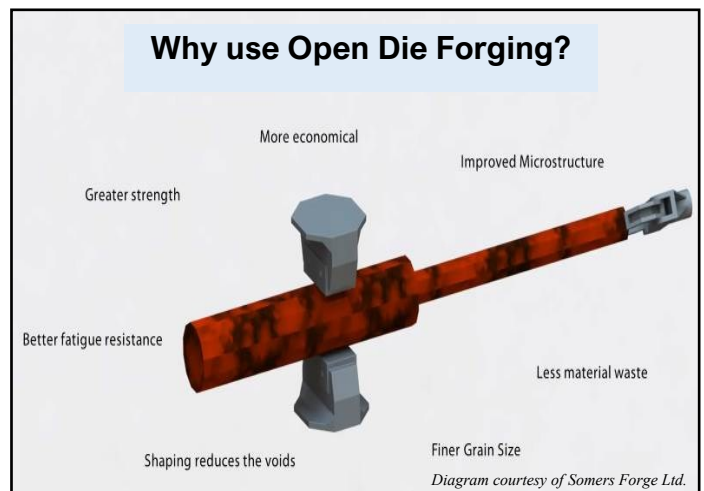
In explaining the Open Die Forging process of the metal that will eventually look like a pair of 4253 locomotive rods, I have been assisted not only by Somers Forge Ltd, but by our resident steel expert Dick Weekes.



All remotely controlled from the comfort of an office!



Pictures courtesy of Somers Forge Ltd.



Reasons why Open Die Forging is the best process for our rods.

The 4000+ tonne Draw Down Press at Somers Forge.

Note the mechanical 'manipulators' in the right-hand picture that move the red hot ingot about during forging.

Dick is a long-time 4253 volunteer who spent his working life in the steel industry. My grateful thanks to them both for their invaluable help.

So, to the technical stuff . . . !

One lump of steel may look just like any other lump of steel, but that is certainly not the case. Delving into the mysterious world of Open Die Forging and the manufacturing of steel, brings to light a complicated chemistry of different steels, each made for different jobs. The side rods and connecting rods on a steam locomotive will be expected to take huge forces without bending or breaking and to this end a modern steel specification of EN14A is required.

Sawn sample test results of our rods from Somers Forge are: **Rp0.2 = 352MPa, Rm = 546MPa, El = 35%, RA = 77%, CVN = 217, 203, 216 J@RT.**

Or to put it a little simpler, this approximately equates to:

Yield Point: (point before permanent deformation) **23 tons/sq in.**

UTS: (Ultimate Tensile Strength) **35.5 tons/sq in.**

Elongation: (amount the steel stretches before breaking) **35%**

RA: (Reduction of Area, another measure of ductility) **77%**

Izod: (old measure of impact resistance) **75**

(Although modern day units have, unsurprisingly, changed since 4253 was manufactured in 1917, we've given the results in old tons and square inches . . . just to keep Henry happy!)

The bottom line is that these figures mean the steel for our rods is equal, or better, than normalised (slow cooled) EN14A, which is exactly what is required.

4253 Rods. *Open Die Forging* continued

Open Die Forging is the process of deforming a piece of metal between multiple 'dies' which hammer and stamp the metal through a series of movements until the desired shape is achieved. This method of forging is often used when a small quantity with simple shapes is required. The strength of the metal's grain structure is increased during this process as well as the fatigue resistance and overall strength of the final ingot. Any small voids may also be reduced after this process.



Picture courtesy of Somers Forge Ltd

One of our rods begins to take shape between the 'dies' of the 4000+ tonne press.

Before forging takes place the stock ingots of EN14A are 'soaked' in a furnace at around 1,230 degs. C. Forging takes place at about 900-950 degs. C. The temperature of the metal is constantly checked with a pyrometer and if necessary, the bar is returned to the furnace for reheating.

Normalising

After initial heating and the forging process, the metal will have changed its characteristics and be too hard, so a further heating, or 'normalising' process, is required to bring the metal back to an acceptable standard.



Picture courtesy of Somers Forge Ltd

The basic shape of one of the rods starts to appear.



Picture courtesy of Somers Forge Ltd

A finished bar emerges after being forged and normalised.

This is an important process that makes the metal more formable, more machinable and also reduces stresses that might lead to failure. The bars are then left to cool at room temperature. Once cool, test pieces are sawn off and sent to Somers' test house, before further inspection, documentation and delivery.

4253 Rods. *Open Die Forging* continued

As I write, our rods have just been delivered to the second company of the three company process - *forging, water jetting* and *machining*.

The second stage will be at SCISS Waterjet Profile Cutting Services at Staplehurst, here in Kent. As their name suggests, they are able to cut out the shape of our rods with, basically, a water jet! We have already had some work done on one or two other components of the locomotive with SCISS, and I can tell you that the results are quite astonishing, giving an extremely smooth and very precise finish.

Because there are limits as to how far water jet profiling can shape the more complicated areas of a driving rod, they will need to go to a third company for final machining.

The third company has not quite yet been finalised, but hopefully in the next issue of the newsletter we will be able to give a report on the final two processes and hopefully show you the finished articles!



Picture courtesy of Somers Forge Ltd.

Above: Both our rods ready for delivery, after the first stage of the three required to get them to look like locomotive driving rods.



Left: The latest picture of the rods now delivered to SCISS, Staplehurst, ready for water jetting to shape.

4253 Lockdown at Rolvenden *by Kelvin Williams*

So, what is happening at Rolvenden now we are in another Lockdown? *Well, nothing! Sadly!*

AS soon as it was announced that there would be security patrols established, Charlie Masterson, Frim Halliwell and myself volunteered for the bulk of the January security patrols of Rolvenden Station, the Bunko Booth and workshops. We did not do this for praise, but to escape the house occasionally, and also to keep an eye on our work area and equipment.

Naturally, we took the precaution of locking away all the tools etc. But each time we go into the Bunko Booth it looks like the 'Mary Celeste', with work projects lying around part finished, steel plate waiting for marking and drilling and condensation dripping from the tin roof. Sadly, we can anticipate that February will be much the same, whilst we wait for the restrictions to be lifted.

**As with the first Lockdown, what have you been doing during Lockdown 3?
Send us details and any photos of all the interesting or unusual things
you've been up to! Email: gwr4253news.co.uk**

4253 ANNUAL GENERAL MEETING 2021

PLEASE NOTE: That due to the current Covid lockdown restrictions, the meeting that was to be held on 30th January, with only directors present, has now also been postponed.

A meeting, hopefully with all shareholders being able to attend, will now be held at a later date in the year, when Covid restrictions allow. Further information will follow on the situation asap.

Stay With Us!



Boiler Stays Appeal



A COMPELLING OPPORTUNITY TO HELP BRING TO FRUITION THE NATION'S MOST EXCITING LOCOMOTIVE RESTORATION PROJECT - SPECIFICALLY TO COMPLETE OUR BOILER!

WE ARE PLEASED TO INVITE YOU TO SPONSOR

CROWN STAYS RIGID STEEL STAYS COPPER STAYS

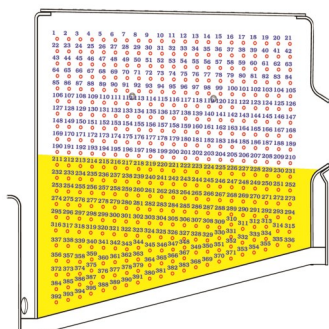
Your chance to help finish the boiler

2019 saw major inroads into our boiler restoration. However, as the year progressed we realised that we had an opportunity to accelerate the refurbishment work on our locomotive to an earlier conclusion than originally envisaged. So, with the blessing of our shareholders present at the January 2020 AGM, we immediately arranged for our boiler to be dispatched to Heritage Boiler Steam Services of Liverpool, where work has been progressing steadily ever since. We had the financial resilience, we had the confidence in our own decision making ability, we had projects in the pipeline and we knew our team could cope with and close the funding gap that existed at that time. Unfortunately, Covid-19 arrived almost immediately thereafter and, as a result, we have been unable to undertake any of our usual fundraising activities. Therefore, we now need as much financial help as possible to keep 4253 on schedule and, accordingly, have launched this sponsorship scheme.

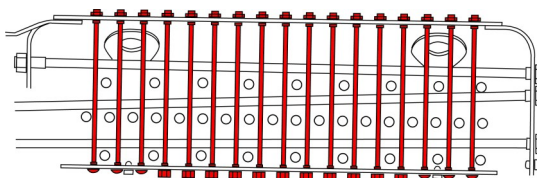
The Layman's Guide to Boiler Stays

Of all the components found in the construct of a locomotive boiler, the humble stay is probably the most important. The thrust of our 'Stay With Us!' campaign is aimed at those encompassing the burning heart of any steam locomotive - the firebox. A seemingly innocuous piece of engineering, boiler stays are generally composed of a steel or copper rod, threaded at each end and depending on location, vary approximately between 6" & 16" in length. In keeping with Swindon practice 4253's firebox area has a copper inner and steel outer wrapper, with a water space between them - in front of, behind, above (the crown) and on the sides. The stays are braced between the two in all these areas, strategically providing rigidity and flexibility to what is essentially a massive pressure vessel. The material used is in accordance with the relevant stress design criteria. They are basically screwed into position and riveted over to finish and seal. Outwardly they have a neat and innocent looking domed appearance - inwardly they present a structural forest. About 70% of the 4253 firebox stays are to be renewed and installed by our contractors at HBSS, Liverpool - all we have to do is supply them!

That's where you come in!



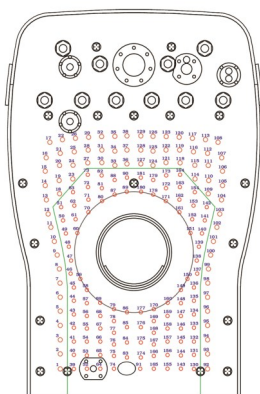
Firebox wrappers
A combination of copper and rigid steel stays. We are renewing all throatplate stays, backhead stays, crown stays and a percentage of the side wrapper plate stays. The stays within the yellow shaded area require replacing.



Cross section of firebox
Side view showing crown stays and nuts (in red). 174 stays are required to complete the task.

How You Can Help

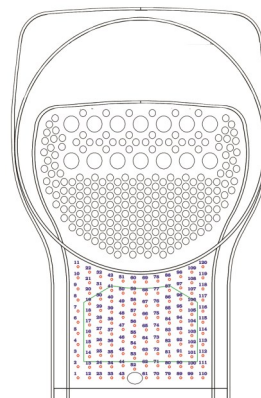
You can sponsor a set of 3 stays for £99. Each set comprises 1 crown stay and 2 nuts, 1 copper stay and 1 rigid steel stay. Two or more sets can be sponsored by Standing Order, spread over 6 months. Alternatively, you can sponsor individual stays.



Rigid Steel Stay
Copper Stay
Crown Stay & Nuts

Per Stay	£17.50	} £99.00
Copper Stay	£35.00	
Crown Stay & Nuts	£50.00	

Total No. of Stays	412
	288
	174



By sponsoring any of the above you will receive a personalised certificate and be entered into a draw for a footplate ride on GWR 4253 on the earliest available date after launch into service.

Please visit www.4253.co.uk for further information and online payment details.

If you wish to set up a bankers Standing Order, please print the form and post to the address shown.

Please help get YOUR boiler back into steam!

Application to set up a Bankers Standing Order for 'Stay With Us' appeal (minimum 2 sets).
Please print, complete the form and post to the address shown below.



GWR 2-8-0T Locomotive No. 4253 'Stay With Us' Application Form

Please complete the form below in BLOCK CAPITALS and return to:

The 4253 Locomotive Company Limited, Old Chilmington Oast, Chilmington Green, Ashford, Kent TN23 3DP

Full Name: _____

Address: _____

Telephone Number: _____

Email Address: _____

I hereby make an application for ____ Rigid Steel Stay(s) ____ Copper Stay(s) ____ Crown & Nuts Stay(s)
and / or ____ Complete set(s) of Stays.

I enclose a cheque made payable to The 4253 Locomotive Company Limited / a completed Bankers Standing Order
(please delete as appropriate).

STANDING ORDER OPTION ONLY AVAILABLE IF SPONSORING COMPLETE SETS OF STAYS - MINIMUM 2 SETS.

I am a member of The Kent and East Sussex Railway: Yes / No (please delete as appropriate).

☐

I consent to being contacted by 4253 Locomotive Co. via email/post
for information updates about 4253 progress and activities.

Signed: _____ Date: _____

Bankers Standing Order Form ('Stay With Us')

(if you wish to pay by monthly Standing Order over 6 months)

To the Manager: _____ (Your) Bank

Your Bank Address: _____

Please make 6 payments of £ ____ on the ____ day of every month commencing on ____ / ____ / ____ to:
The 4253 Locomotive Company Limited, Account Number 47817011 National Westminster Bank Plc.
20 High Street, Ashford, Kent TN24 8SH. Sort Code 60-01-21.

Account Name: _____

Your Address: _____

Sort Code: _____ Account Number: _____

Signed: _____ Date: _____

*Please quote Reference Number in all payments ____ * to be entered by 4253 Project Staff.

The 4253 Locomotive Company Limited, 25 Winsor Road, Rolvenden Layne, Tenterden, Kent TN17 4NL - Stays

A 4253 mask is for life - not just for lockdown!

4253 specially commissioned Face Masks



These can be used as general face coverings for dust/allergies and also to aid in complying with current Government Covid-19 measures.

Made to last from triple layered cotton for easy care and hand-made in Kent.

Available in: **4253 Red**, **4253 Black**, **4253 Blue** and **4253 Green**

All individually packed. Availability subject to stock.

Priced at £5.25 + 75p postage each.

Order yours today from our online shop at www.4253.co.uk

Colours may appear slightly different from images above, due to photographic limitations.

4253 Pen and Torch Set



This superb gift set comes in a presentation box and includes a 4253 pen and LED torch with key ring.

***Priced at just £6.00
including FREE p&p***

**Order yours today from our online shop at
www.4253.co.uk**

Covid-19 arrangements at Rolvenden and future post-lockdown 4253 visits at Rolvenden

Rolvenden Station and Rolvenden Works are currently closed under current lockdown Covid-19 government rules.

Unfortunately there is no public access at the moment.

If you wish to visit us in the future, it is essential you please make prior arrangements by emailing: gwr4253@gmail.com