

## New Tender Build

With the delivery on 15 October 2010 of the new tender superstructure base steel and its subsequent transfer into Didcot Railway Centre it was felt appropriate that a new page be started to mark this auspicious development. It marks a turning point in the recreation of 1014, in that construction of her own Hawksworth design tender is now underway. With certain exceptions, reported in the 'Tender' section, most of the work undertaken hitherto has been stripping, restoring/repairing usable, standard components taken from a Collett design tender the Project was given. From now on the emphasis will be on the recreation of a new tender appropriate for a Lot 354, County class locomotive.

### December 2011

The Chairman and Mike Cooper attended the Multi-Tech acceptance of the tender mainframes and buffing plates from Northern Profiles in Wakefield. Richard Smith of Multi-Tech was also briefed on Phases 2 and 3 of the requirement to machine the side plates and assemble the tender underframe.



03/12/2011 - newly cut tender mainframe at Multi-Tech. Although the plate is marginally thicker (0.026 in / 0.65 mm) than original, the cutting tolerance achieved was within 1.5 mm over the full length, which is exceptional.



03/12/2011 - newly cut front and rear buffing plates for new tender frames.

We have also heard that Erlstoke Manor Locomotive Ltd has completed castings for the vacuum brake cylinder cover and piston. Advice of delivery / collection is awaited.

### November 2011

A relatively quiet month. Some milestone events were scheduled for the end of the month, including cutting the plates for the tender main frames and forging of the rear draw gear. The Erlstoke Manor Locomotive Ltd., has completed the castings for the cover and piston for the vacuum brake cylinder.

The test report from our metallurgist David Ward, for the three draw links found in Security which had no paperwork, has been received. It confirms that the mean Brinell No. is 145, equating to a tensile strength of 33 tons per square inch, which is what is required of BS 970:1972:070M20, the specified material



19/11/2011 - Loco/tender draw gear - tried and tested.

## October 2011

Following essential preparations, all riveting of the ladder and 'A' frames was completed on the 15th of the month. Much of the month was spent finalising orders:

1) A works order for production and assembly of the tender main frames was given to Multi-Tech Engineering (MTE), Pontefract, the prime contractor for the underframes. Work will be undertaken as follows:

Phase I - cut main frame plates and buffing plates;-

Phase II - drill main frames;

Phase III - assembling all components into the tender underframe, including the cast drag boxes being manufactured by Boro' Foundary.

Phase I should begin in November, when the subcontractor, Northern Profiles, Wakefield, will cut the four plates. Once accepted by MTE and the County Project, Phase II will be programmed.

2) Erlestoke Manor Ltd., have completed the castings for the cover and piston for the vacuum brake cylinder.

3) An order for a rear coupling hook has been given to Dinmore Manor Ltd. - forging is scheduled for late November.

## September 2011

Much time and effort has been expended in planning for future work etc. to produce the new tender. A number of significant drawings have been completed including those for the rear brake hangers, frame angles in rear step area, tender main frames and rear drag box.

Those for the tender main frames have been sent to Multi-Tech Engineering of Pontefract, the main contractor, who has located the 19.05 mm steel plate necessary for the job. Costings for Phase I, cutting of the frames and buffer plates have been received and an order has been raised. Detailed machining will be undertaken in Phase II. Concerns relating to ability of the Project team to meet the precise assembly requirements of the frames and drag box castings at Didcot have led to arrangements being made for MTE to undertake this work for us.

The preliminary plans for the rear drag boxes have been sent to Eddie Mocroft, the pattern maker.

In mid September, the ladder and 'A' frames having been drilled in readiness for riveting, were united. The dimensions proved to be 'spot on' and the centre points line up and they were bolted together. Work required before riveting, scheduled for October, is proceeding with reaming the rivet holes to 20 mm, drilling where necessary and ensuring the correct rivets are to hand.



*14/09/2011 bolts holding the 'A' and ladder frames in position.*



14/09/2011 - rivet holes in perfect alignment and ready for insertion of temporary bolts.



14/09/2011 - 'A' and ladder frames united and almost ready for riveting.

The drag links retrieved from the stores in August lack paperwork, consequently before they can be considered suitable for use, they have to be strength tested by our metallurgist.

### August 2011

Work Week - Excellent turn out and all objectives achieved.

The tender frame discussions continue, but two of the potential suppliers have been ruled out. Detailed discussions are in-hand with Multi Tech Engineering of Pontefract, who assembled part of Tornado's tender frame.



06/08/2011 - repaired vacuum cylinder as received from CRJ Skinner's.

CRJ Skinner Welding Specialists repaired the cracked tender brake cylinder in two days. The work was 'first class' and has saved the Project a potential £2,000 for the cost of a new item.

With the help of the Operations Manager, Maurice the crane operator and 'Zep' the shunter/slinger the completed ladder frame and 'A' frame were lifted on to the steel slab. Thereafter the dimensions are being carefully checked prior to joining these two elements.



06/08/2011 -lifting the 'A' frame.



06/08/2011 - 'A' frame and ladder frame positioned on steel slab being readied for joining.

Meanwhile painting the substructure with a suitable protective coat of paint was undertaken, before being lifted onto the repaired accommodation bogies. The latter is now located on No. 2 road and covered, before being moved to No. 4 road, where construction of the superstructure will take place ... in 2012?



06/08/2011 - LaDonna painting the completed, underside of the tender base.



06/08/2011 - lifting the overturned tender base and placing it carefully on the accommodation bogies.

So much was achieved, but the realisation that the frame angles and rear brake hangers recovered from the Collett tender are incompatible with the Hawksworth tender, so cannot be used, was a slight downer. Alternatives will now be sought.

For the remainder of August work was focused on planning, acquiring parts from the stores and a bit of painting.

Planning included the production of drawings for items such as: tender rear brake hangers, rear drag boxes, frame angles in rear step area and the main frame drawings for cutting, including front and rear buffing plates.

With the ladder and 'A' frame parts on the steel slab, dimensioning was being undertaken in readiness for joining the two parts together.

Parts obtained from stores included: intermediate buffing gear and no. 251 springs, brake adjusters and a set of drag links. All will be assessed and if up to the required standard will be reconditioned and repaired.

Painting of the tender substructure is complete and it has been placed on the accommodation bogies. As it is being stored outside until its allotted position in the works is available, it has been covered with a tarpaulin.

## **July 2011**

Once again a period of consolidation, plus preparations for work to be undertaken during Work Week.

Drawings for the dragbox pattern and casting have been completed and an order made. Plans have been sent to Eddie Mcroft (pattern maker who intends starting work in early autumn) and Nick Norton of B'oro Foundry.

Discussions are on-going with three potential suppliers of steel plate appropriate for the tender frames

Finishing work on the ladder frame continues with final welds on the metal stretcher inserts, filling of Collett pattern redundant holes, preparation for riveting during Work Week and painting all metal work with primer.

Welding of the sheets for the tender substructure are complete - the stiffeners have been removed and the filter box and water scoop tower have been fitted into position.

Repair of the accommodation bogies is in hand.

Repair of the cast iron tender brake cylinder is to be attempted by a specialist firm in Wimborne. The crack has been cleaned out in readiness for transport to Dorset later in the month.

An expression of interest has been passed to the Dinmore Manor Group for new draw gear - die forged in modern material and VAB approved.

### June 2011

Good progress was seen with welding of the second side of the tender substructure being completed. In the near future, this will be placed on a pair of accommodation bogies made available to the project (one will need some repairs first), so easing its movement around the works.

The 'A' frame was completed and awaits riveting to the ladder frame - Work Week task.

The ladder frame was cleaned by a combination of needle gunning and wire brush. Some wasted sections have been cut out and replacement sections welded in place. Since then, the frame has been primed.



04/06/2011 - completed 'A' frame



04/06/2011 - cleaned section of ladder frame primed, while work continues on the rest.

Two items were ordered:

- 1) From the Erlestoke Manor team, a top cover for the vacuum brake cylinder. An order for the piston will follow. All parts, including a push rod will be machined in-house.
- 2) Front drag box.

Research is now concentrating on the design and manufacture of the tender frames.

### May 2011

Tender substructure turned over again. Approximately 50% of the welding of underside seams completed.

In two sessions, riveting of the 'A' has been completed, plus renewing the pan head rivets on the front cross stay. A start has been made on marking out the holes in the 'A' frame in readiness for attachment to ladder frame.



28/05/2011 - underside of the tender base plates



07/05/2011 - the riveting squad, resting on the 'A' frame.



07/05/2011 - riveting progress!



07/05/2011 - both sides of the action!



28/05/2011 - riveting completed in 'A' frame. In due course, the 'A' frame will be attached to the other end of the ladder frame (in the distance).and will have components such as the brake cylinder attached.

Other tasks undertaken included: cutting a set of gaskets and receipt of a full set of lubrication pads for the axleboxes.

Meanwhile planning continues for the new vacuum cylinder barrel, location of the main tender build and reconditioning of a pair of accommodation bogies needed to move the completed frame.

### April 2011

Once a couple of badly corroded sections were replaced, the ladder frame was basically complete and ready for riveting the 'A' frame to the front.

On the 'A' frame, top rails and stretch reinforcements have been completed.

Final confirmation of the plans for the new dragbox awaited, though checks indicate the drawings are accurate.



23/04/2011 - replacement of corroded sections of ladder frame.

As promised, the tender substructure was lifted and turned over on 8 April. Welding on the top surface followed and is now complete.

The 7812 Project Group have provided a progress report on the replacement piston and covers for the vacuum cylinder barrel. KWG has identified suitable steel line pipe for the replacement barrel and front vacuum reservoir.

### March 2011

A month of consolidation. Boro Foundry have quoted a price for a pattern for a new dragbox as well as for the casting itself. It has also been confirmed that our proposals for manufacturing the dragbox from a steel cast are satisfactory.

Tender lubrication pads have been ordered from Armstrong Oils using a slightly redesigned G.W.R. pattern.



26/03/2011 - ladder frame almost complete - riveting new 'A' frame is the biggest task to undertake. Considering having frame sandblasted to remove rust, but its size is a problem.



26/03/2011 - welding support angles on to base plate of new tender. The tender substructure is scheduled to be lifted and turned over in early April, so that work can continue.

## February 2011

Design work continues for the tender front dragboxes. Alistair Meanly (Tyseley) has examined the Auto CADs and can see no errors, however, he is looking at the front dragbox of 'his' Hawksworth tender and should report back shortly. We have an initial quote from Eddie Mocroft, who operates from Boro Foundry and who has undertaken work for the Patriot project.

The tender ladder frame has been turned over and modifications have been completed on one side of the rear cross stay. The frame is now in a more favourable position to complete the outstanding riveting.



26/02/2011 - Turning the tender ladder frame over



26/02/2011 - inverted frame showing positions of modifications



26/02/2011 - brake trunion brackets fitted to new 'A' frame.

Tender brake trunion brackets have now been completed and fastened to the A frame.

The sample tender oil lubricator pad from Armstrong Oilers, a redesign of the original GW part, fits the tender oilkeep. Dave Lee at NYMR has resolved a number of queries and purchase of six will be authorised shortly.

Dialogue continues with Terry Jenkins of the Erlestoke Manor project over items for our tender's braking system. An assessment of the brake cylinder parts in our possession suggests both covers are useable, but the barrel is corroded to 50% thickness in places and needs replacement. Also needed - a piston and the two types of rubber seal and strap. The piston rod will be machined 'in house' from stainless steel. 22 inch cylinder drawings have requested, which are being processed.

## January 2011

A month of consolidation. Corroded drain plug in the tender vacuum reservoir has been removed. The thread in the tank body is relatively undamaged, will be cleaned-up and a connection pipe fitting procured. N.B. this reservoir is almost identical to that for the loco, which we intend to build in house. Tender brake trunions completed, apart from the location holes. To be drilled and bolted to A frame next work day.

## December 2010

Work during December, as previously mentioned, was severely curtailed by the weather, nevertheless, work on the tender The set up and drilling of the lead stringers, cross stay and angles on the tender front 'A' frame is now complete and will be riveted to the underframe when the tender substructure is complete.



*01/01/2011 - Tender 'A' frame assembled and ready for riveting.*

Mike Cooper's review of progress on the tender during 2010:

A major inload of steel via West Yard in October saw us starting on the sub-structure of the tender superstructure and manufacturing the totally new front A frame that carries the tender brake vacuum cylinder and connects the ladder frame to the front dragbox. Commencement of work on the tender superstructure and specifying the dragboxes prompted a requirement for a design file format and welding protocols, which have both been completed. The majority of the tender underframe donor components from our Collett tender have been cleaned and overhauled including: water pickup gear, horn guides, axle boxes, brake hangers and cross beams and we have a set of re-tired wheels. Work on the front dragbox drawings proceeds with assistance from Bob Meanley of Vintage Trains. Springs and hangers are in stock, rear steps complete and the filter box and water scoop tower ready for welding to the superstructure base.

Once we are able to move the locomotive chassis about the Works, we can set up the tender superstructure work stream on No 4 Road and start planning for the construction of the tender underframe.

## November 2010

Following the arrival of the steel ordered for cross stays and lead stringers, drilling started to prepare them for riveting to the rest of the modified ladder frame.



*06/11/2010 - Steel work drilled for riveting. Spacer and one lead stringer, temporarily bolted together.*



*06/11/2010 - Lead stringers and spacer drilled and placed in position for riveting to the ladder frame*

## October 2010

The steel plates to form the substructure (base) of the new tender tank were destined to be laid out on the previously prepared plinth. Preparations included accurate leveling of the steel support rails underneath, an essential prerequisite to ensure the tank is square. Levels were rechecked once all the steel had been laid out in readiness for welding.

Lead stringers, cross stays and brackets have also been delivered.

As the images show the tender is a big item. presenting all manner of issues of access and handling in the works - akin to moving a 20 foot ISO container around! A construction action plan has been formulated:

- Tender substructure and fittings;
- Main superstructure with water tank and coal space;
- Conversion of the Collett underframe - well advanced.



23/10/2010 - First pieces of the tender substructure steel laid on plinth.



30/10/2010 - Substructure being prepared for welding. The image gives a clear idea of just how large the tender will be.

Meanwhile work continues on the many 'bits' required to produce a complete tender. The axleboxes are being worked on and painted in works grey prior to storage. By the end of the month four had been completed. The axlebox cover shown is one of two in the possession of the Project - four more to be ordered. The domed nuts shown have been produced in-house, based on the G.W.R. specification, from brass hexagonal stock.



09/10/2010 - Axlebox in workshop grey, fitted with an axlebox cover bolted to the axlebox with some of the domed axlebox cover bolts produced for the task.

Front stretchers and spacers for the tender frame ordered.