

# Locomotive - Progress in 2008

## January

The year began with the transfer of the 8F boiler from its resting place in Barry, to Didcot, via Llangollen. The move began early on Monday 7 January. On 8 January work commenced:



January 8 - work on lifting the boiler began at Llangollen - starting with the removal of the cab.



With the cab removed preparations were made to lift the boiler from the frames. Rusted bolts slightly delayed proceedings.



The boiler and firebox removed from the frames, leaving a very rusty smoke box behind. While the boiler was destined for Didcot, the frames were going to be stripped of usable items, including the pony wheels and axle boxes, for use on the Patriot Project, based at Llangollen.



9 January - boiler loaded and setting-off for Didcot - where it arrived that evening.



10 January - boiler unloaded at E.W.S. depot, Didcot.

The boiler barrel was transported into Didcot Railway Centre and placed on a boiler trolley. It was then 'parked' in the centre sidings.

Thereafter, and in consultation with insurers etc. engineering plans drawn-up for the conversion of the boiler from its L.M.S. form to a Swindon Standard 15 OA boiler. This will entail blanking off the holes in the barrel and firebox used for the dome, top feed and safety valves to permit modifications to accommodate the G.W.R. pattern safety valves and top feed.

The fire box will require little further modification apart from that needed to provide clearance for the new, larger driving wheels. Although the diameters of the two boiler types is almost identical, the County boiler is 9 1/8" longer thus a new section of boiler barrel must be manufactured, along with a new smoke box.

In the works, the project team were getting to grips with the task of restoring the frames. Progress in January included:

- Cleaning of bogie; removal of brass rubbing plates; assessment of horn guides and commencement of repairs.
- Main and bogie axle boxes cleaned and await reconditioning.
- Brake gear needs assessed.
- Main springs - contracts let.
- Brake hanger brackets - pattern ordered - 6 will be cast.
- Running plate and splasher steel delivered. Welding work commenced.
- 1,100 County-class drawings downloaded.

## February

Progress made:

- Bogies - work continues - horn guides - at least 3 of 8 will need metal deposit repairs.
- Main brake gear - Brake hanger pattern received - contractor being sought. Brake cross shaft cleaned - bearings need replacing.
- Reversing cross shaft - stripping started.
- Motion bracket repairs assessed.
- Under-cab valances - repair needed with new undrilled material.



23/02/08 Bogie rubbing plates - 10 countersunk screws released. Screws to be renewed, bogie plates to be cleaned.



23/02/08 Steam pipe studs drilled out and retapped.



23/02/08 Sample piston valve chest cover fitted. Fits, but is not to the County specification - no drawing available at this time.



Under-cab valance - needs repairs and longer extension brackets.

## March

Boiler - Following surveys etc. decided to rebuild to full No. 15 OA specification. Engineering work schedule to be negotiated.

Valve-gear - Three items of valve-gear and fourth slide bar located and allocated to Project.

Drilling and welding of splashers and running plates.



29/03/08 - Right-hand splasher welded and placed on running plate.

Release of key on reversing weigh-shaft - novel solution did the trick!



29/03/08 key being extracted in readiness to remove weighshaft.

Spring links and Spring hanger studs cleaned and primed.



29/03/08 ready for storage until required - project running short of storage space!

## April

Steady progress.

05/04/08

- Reported more tools arrived.
- Contracts issued for brake hanger brackets - 6880 project involved in bulk purchase. Various other items ordered for brake system.
- Front buffers mounted and front foot step fitted temporarily.



05/04/08 - drilling the buffer beam in readiness to mount buffers and front step.



05/04/08 - buffers and front step fitted temporarily. Front step manufactured and donated by a volunteer - produced to later B.R. design congruent with 1014 condition when complete.

26/04/08

- Authorisation for procurement/refurbishment of locomotive/bogie/tender springs - cost means wheels delayed for 8 weeks, but Project still on critical path.
- Brake hanger brackets cast and ready for collection.
- Splasher welding 95% complete - fitting to running plate in august work week.
- Bogie repairs continue - slowed by non availability of crane to turn it over.
- Reverser cross shaft - lever *eventually* released!



26/04/08 - The recalcitrant weighshaft lever finally removed after much tugging! Photograph demonstrates size of components being work with.

## May

Early May:-

- Dialogue beginning with Royal Sun Alliance over boiler conversion proposals.
- New items ready/delivered - brake hanger brackets. bolt/washer/locknuts for exhaust cylinder joint, spring rubbers for main spring suspension.
- Donation - smoke box dart.-

18/05/08

- Weighshaft dismantled.
- Left hand front sanding apparatus repaired.
- Right hand stripped and being worked on.



18/05/08 - Weighshaft removed and dismantled. Reasonable condition - needs cleaning and oiling. Later stripping (31/05/08) revealed new bearing required.

Late May

- Bogie works - Dumb irons straightened.
- Main axle-boxes -Horn guides repaired and machined.



31/05/08 - straightened dumb irons for front of bogie



31/05/08 - Main frame rear horn guide checked and repaired.



18/05/08 - welded and machined post guide.

## June

Steady progress:

- Frames being marked-up for drilling to accept new brake hanger brackets.
- Under-cab valance - Right hand side complete, left hand side 50% complete.
- Substantial work complete on weighshaft.

- Work on main axle boxes etc.

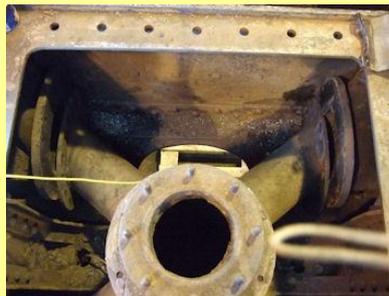
07/06/08 - Right hand motion bracket removed

- one seized bolt prevent removal of left hand bracket:



Both - Right hand motion bracket removed.

- Exhaust pipes free - at last:



21/06/08 - last bolts burned off, blast pipe etc. freed from links with exhaust ports. Not lifted out yet - clearances to be checked. Top section rotted through - new section suitable for double blast-pipe arrangement to be made.

- Work on axle boxes - assessment of damage:



29/06/08 - damaged oil keep.



29/06/08 - Clearly damaged oil keep - several previous owners may be noted (Swindon standardisation): 7927,6820,1026, 8107? and 5012.

## July

Good start, thereafter slower, but steady progress.

05/07/08:

- Exhaust box - removed - stored outside while design and engineering proposal for fabrication of new oval section for connection to double blast pipes is prepared.
- Weld deposited on right hand way-shaft bearing stub completed.
- Marking out of positions for brake hangers completed.
- Two of the six bearings fitted to main frames.
- Eccentric sheaves cleaned and undercoated.



05/07/08 - Exhaust box being lifted out of frames following burning off remaining rusted bolts on 21/06/08.



05/07/08 - One of the main bearings temporarily fitted to main main frames. In total four of the six main bearings were fitted into to the horns on the main frames during July. Three show little appreciable wear.



05/07/08 - eccentric sheaves cleaned and undercoated.



05/07/08 - eccentric stamped 1014 - start of process to give 1014 its identity. During the following working sessions many other parts similarly marked.

19/07/2008:

- Left hand motion bracket removed.
- Four of the six main bearings fitted.
- Machining of weighshaft set-up.



19/07/08 - weighshaft set-up in lathe, showing weld deposited.



19/07/08 - Weighshaft ready for turning. Work undertaken, 26/07/08 - right-hand stub machined to within 5 thousandths of tolerance required. Left-hand stub needed cleaning.

## August

03/08/2008:

- Last two main axle boxes fitted - repairs needed to both - being costed.
- Machining of weighshaft completed satisfactorily.
- Bogie turned - cleaning etc. started.



03/08/08 - Machining of right hand stub of weighshaft completed. Way-shaft turned on plate for work on left hand stub to be undertaken - much less machining required, mainly cleaning and polishing.



02/08/08 - bogie turned - cleaning in preparation in readiness for repainting and assessment of likely repairs needed.

Work week - 04/08/08 - 08/08/08

Much work undertaken by a team that averaged six in number for the whole week - project moved forward noticeably.

- Bogie cleaning proceeds.
- Weighshaft machining complete - bearings and collars being prepared.
- Exhaust box space cleaned and primed.
- Collar stud locations drilled and tapped for the six studs securing brake hanger brackets to frames.
- Splashers fitted to running plates.
- Arrival of the Pooley van.



Following removal of exhaust box cruciform, space cleaned, most threaded holes cleared, cleaned and retapped. Metalwork primed.



The completed splashers were fitted to the running plate, which in turn was fitted to, but not fastened to the frames.

A County begins to emerge - the splashers are one of the more distinctive features of the County-class, being a single unit rather than the three separate, arcuate splashers fitted to all other G.W.R. 4-6-0s.



Holes drilled for the six studs by which the brake hanger brackets are mounted on the main frames.



The Pooley Van! With an increasing quantity of restored and new parts secure storage space has become a major problem. As a result the Project has been allocated a converted Mink Van (used by Pooley for carrying equipment to check their weighing equipment on the Western Region of B.R.), bequeathed to G.W.S. by a member as a mobile store. Shown soon after arrival in the E.W.S. sidings the van is intended to be relocated to a position near the works within the Centre. Before use the vehicle will need to be weather proofed and painted by Carriage & Wagon Department . (Terry McCarthy)

31/08/2008:

Two main developments:

- Weighshaft mounted in frames.



31/08/08 - Weighshaft mounted in frames. Initially slightly stiff, but better after adjustment.



31/08/08 - Right hand bearing set in frames.



31/08/08 - Left hand weighshaft bearing.

- Brake hanger bracket - trial fitting.



31/08/08 - Newly cast and machined brake hanger bracket trial fitted to main frames.

## September

- Refurbishment of axle boxes commenced - two rear axle boxes need a complete overhaul.
- Bogie and bogie wheels in works - latter being cleaned and primed.
- Range of tasks on smaller items progressing.
- Preparation of frames for re-wheeling in 2009 continues - cosmetic and structural repairs undertaken.



06/09/08 - Holes in frames from Modified Hall fittings filled and smoothed. By 13/09/08, three of the six brake hanger bracket locations drilled.



13/09/08 - vacuum brake trunions completed - previously cleaned and primed, new brass bearing cups fitted.



13/09/08 - Cab side rails derusted and primed.

## October

A month where things seem to be coming together, with visible progress evident.

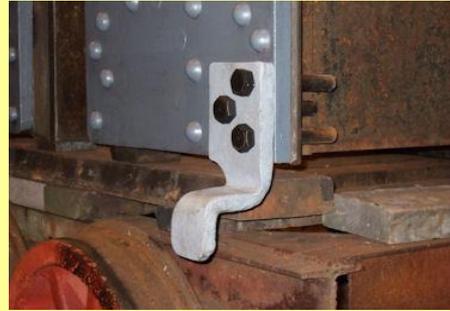


04/10/2008 - 34 sets of spring accessories from Westbury Forgings - some destined for 6880 Project.

Deliveries of parts ordered, included:

- spring accessories (shown opposite);
- spring cups, suspension pads, repair ferrules and brake hanger studs/brackets;
- frame angle to complete under-cab valance - to be trial fitted early November.

Work on bogie continued, with completion of cleaning etc. and commencement of painting of sides and top in works grey. Dumb irons trial fitted. Attention now turning to the yaw plate retainers.



04/10/2008 - bogie dumb irons trial fitted. bolts for permanent fitting ordered.

Work on finishing and assembling brake hanger brackets and hangers continues:



04/10/2008 - following initial machining of stud, brake hanger bracket and hanger partially assembled.



12/10/2008 - brake hanger assembly trial fitted and functional.



25/10/2008 Brake hanger bracket bolted to mainframe and painted in workshop grey - five more to go!  
All frame locations have been drilled and collar studs fitted.

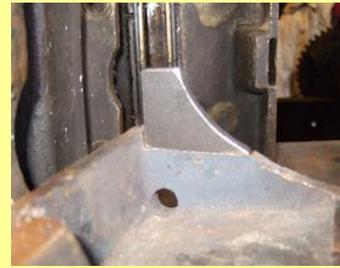
A method for repair of the main bearing oil keeps agreed and phosphor bronze materials ordered. Damaged areas to be cut-out and replaced by Gary Davies.



25/10/2008 - View of the damaged sections of the oil keeps after having been cut-out and prepared for repair.



25/10/2008 - View of oil keep showing damaged area removed and pattern to shape additional phosphor bronze sections required to affect repair.



25/10/2008 - View of repair former to be used as a pattern for new sections of phosphor bronze plate to be welded in place.

Other work undertaken:

- Right trailing axlebox dismantled from frames - wear within limits, but repairs to axlebox bearing dependent on final dimensions of new axles and back to back measurements of assembled wheels.
- Locomotive vacuum cylinder piston rod machined clean.
- All four vacuum cylinder trunions fitted with grease nipples and are thus complete.

Arrangements being finalised for significant Project research meetings and parts harvesting:

- National Railway Museum archive visit - seek out further drawings.
- Visit to Crewe - discussion - boiler shells.
- Visit to Barry to strip usable parts (brake gear and valve-gear bearings) from 5227 - an agreed exchange of spare parts.

## November

Work continues on a number of fronts, including the re-assembly of frame and bogie components.

Bogie:

By 08/11/08 the bogie frame had been cleaned and primed. Work commenced on yaw plates.



22/11/2008 - Yaw plate retainers installed on top of bogie frame.

Bogie wheels also derusted and primed:



08/11/2008 - bogie wheels in process of derusting and priming.



22/11/2008 - bogie wheel and axle derusting completed. Bearings apart, wheels fully primed.

Work on the frame fitments continues:



08/11/2008 - fitting of brake hanger brackets continues - 4 out of 6 fitted. By the end of the month final two fettled and painted.



15/11/2008 - Replacement bearing for main brake cross-shaft completed.

### Cross shaft bearing



22/11/2008 - bearings fitted to main brake cross-shaft.



22/11/2008 - main brake cross-shaft fitted on to frames.



09/11/2008 -trial fitting of extended left hand cab valence - final fitting to be undertaken later, in conjunction with fitting of running plate, splashers and cab sides etc.

Delivery was taken of new brackets to replace brackets 18 and 19, which for the County are of a different size from those utilised on the modified Hall. They be fitted to the frames shortly, after which the running plate can be fitted. While that is being accomplished the cabside valences can be fitted, thus making trial fitting of the cab sides a practical proposition.



29/11/2008 - newly delivered support brackets awaiting priming and fitting.



29/11/2008 - close-up of welding on new support brackets. The will be fitted to the frames between the driving and trailing wheels. The larger driving wheels of the County necessitated larger brackets compared with those fitted to the modified Halls.



Mud plates to be fitted into exhaust box, which has been given a second coat of paint (22/11/2008). Mud plate manufacture being costed.

15/11/2008 - Mud plate patterns produced and trial fitted.



15/11/2008 - sheaves (for valve gear) cleaned and greased in readiness for despatch to Ian Riley's in the New Year for fitting to new axles as part of the assembly of the wheels and axles.



22/11/2008 - repairs to axlebox underkeeps commenced. Note that this keep was fitted to 1006, amongst other notable locomotives.



Meanwhile work continues to manufacture a range of essential items, notably the machining of replacement bolts for a number of fittings.

29/11/2008 - fitting of the beading on the nameplate backplate. Gary Davies is steadily producing the letters which will be mounted on is plate.

At the end of the month Project Leader, Mike Cooper, as part of a group representing range of G.W.R. locomotive schemes, e.g. 2999 and Betton Grange, visited the National Railway Museum, York. Their quarry was the Swindon Archive of engineering drawings. 200 boxes were examined, some revealing 'gems', including many relating to the Counties (some refer to the 99xx class). However, there are at least a further 200 boxes to look through, a task scheduled for a couple of days at the end of January 2009.



Mike Cooper(second from left) with the visiting party at the N.R.M.(Courtesy 6880 Betton Grange Project)

Plans for the boiler modifications making progress.

## December

Work on main brake cross-shaft continues - installed, shimmed and now moving freely (6 December)



13/12/2008 - Brake cross-shaft fitted - stamped with 1014 identity.

Later in the month work began on freeing the two rocker shaft bearings, based on principles established for brake cross-shaft.

To ensure clearances between new larger County (6' 3") driving wheels and the lead brake hanger brackets machining was necessary.

Once complete the bracket was temporarily fitted to the frames. Final tweaking might be needed once wheel sets arrive and are fitted.



20/12/2008 - lead brake hanger bracket after machining.

In early December the County Project received a pair of expansion links and link blocks from D. Howells. They have come from a Modified Hall locomotive and are in fairly good shape. Cleaning will be required, plus putting right a 'bodged repair' (yes even Swindon seems to have done some!), but with refurbishment they will be fit for purpose.



13/12/2008 Stephenson valve gear expansion links obtained for 1014, as received.



13/12/2008 - Expansion link origin - 6988 'Swithland Hall' or could it be 6989 'Wightwick Hall'? The stamp seems ambiguous! At least it will not be ambiguous when 1014 is stamped up on it!



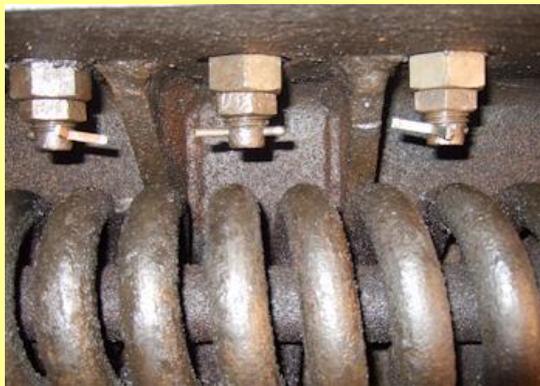
20/12/2008 - just look at what a bit of tender loving care can do to an expansion link! Well done Laura! The other one, did not look anything like as good!

On the frames preparation work was undertaken to fix the under cab valance extension in place - following Mike Cooper's maxim: '*measure once, measure twice and cut once*'. Fishplates are being manufactured to ensure the join is secure.



20/12/2008 Measuring and clamping the under cab valance extension joint.

Work continues on the bogie, with the fitting of the yaw plate.



20/12/2008 - Yaw plate - bolted, nutted, split-pinned and cottered.



And then work stopped for a bit of a Christmas 'do'. Mike provided the eats and refreshments. Our Chairman Richard Croucher said a few kind words about progress and Mike thanked all the team for their support and efforts in 2008. Then the Chairman took the team photo:



20/12/2008 - The 'County Set' - we happy few !

Martin has apologised for not removing his reflective viz suit!

A review of progress in 2008 from Mike Cooper, as well as an indication of the 'County Set's' ambitions for 2009:

## PROJECT REPORT - CHRISTMAS 2008

The County Project has now been running for some 18 months and, as I did last year when we were callow and inexperienced, I thought that I would try and summarise where we are and where I hope we are going.

So where are we going in 2009? Procurement of the wheels will proceed at best speed. It is our assessment that the work on the mainframe, including axleboxes, for re-wheeling will cost about £11k, which will be funded. Any suitable pieces of motion that become available will be purchased, at risk, and we can proceed with costing and procuring the tender superstructure steel, if a second backer can be persuaded to put his hand in his wallet! We have costed the tender underframe at about £40k for construction, plus about £24k for outstanding parts and a method statement for its final strip has been completed. We are also intending to facilitate a meeting with Richard Watkin, from Crewe, regarding boiler strategy in the very near future and are also now committed to an expedition to Barry in January 2009 to recover a set of brake parts from 5227 for both 1014 and 2999. I am also looking to see how we can put more effective time into the project by organising volunteers for works parties every Saturday.

As to 2008, my judgment is that we have had a successful year. Probably the defining event was the arrival of our boiler from Llangollen and Keith Gilbert is working hard behind the scenes to plan, document and cost the work needed to change it from LMS 8F specification to a GW No 15 OA type. 1820 man hours of work in the shop, besides countless hours spent in project administration such as web and engineering design, parts acquisition and liaison, has delivered the following: work on the frames is well advanced; splashers and footplate are welded; exhaust box is de-rusted, painted and rethreaded; weigh- and brake-shafts reconditioned; motion brackets removed and their modification decided; bogie modified, de-rusted and reconditioned; a vast amount of derusting completed; cab drop valance from Maindy Hall modified; parts obtained, designed, produced or reconditioned; front step and cab seats completed; sandboxes are in process; brake hanger brackets are being fitted; springs have either been delivered or ordered and all spring hangers and studs manufactured or reconditioned. In addition, the nameplates are in production; oil keeps are under repair and a host of minor jobs have been completed. Our website has been launched and our reputation as a sound, willing and committed project team who can deliver is confirmed. We have solved many of our safety issues and have taken delivery of a Pooley van for which a repair programme is identified. We have also taken part in an assessment of the Swindon drawing records at the NRM, which has yielded some vital material. We continue to get exposure in the railway press and both Richard Croucher and David Bradshaw are working to identify backers for the project. One thing we lack is a publicity machine, as effective as that of Betton Grange, however, we have some ideas as to how to solve that problem (now solved!).

All of this is all very positive. We continue to be a force to be respected and can be well pleased with what we have achieved to date. I am very optimistic on our potential progress for 2009.