

1). PROJECT : 12AR BOILER HYDRAULIC PRE-TEST (26 JAN):



P01 – A view of the two new high-pressure ball valves mounted onto the test injection line. The old valves were cheaper plug-type valves and they were leaking under test pressures and causing false boiler-leak readings. These valves need to hold a seal of at least 1640kPa for 3 hours.



P02 – Here is the finished contraption in use a few hours later while draining the boiler. Note the boiler pressure. The lower valve is the filler line. I was sent out to purchase a tee-piece for that gauge and in classic fashion, the depot chumps had found a spare one by the time I got back. Grrr!



P03 – Gabriel Blore puts on his concentratin' face as he matches up the 'shifting spanner' to the pipe fitting. This would be the drain outlet. He had just been taught which way to use an adjustable spanner (Moving jaw leading into the rotation) and is happily applying his new knowledge.



P04 – Club Secretary Stewart Currie has recently retired and will be putting some locomotive time in. Here he is just tightening the small bore steam pipe after snugging down the gauge's base ring. He wasn't sure of the gauge shut-off cock's location and would soon be doing some pipe tracing.



P05 – The serviced gauge in position. It has been recalibrated and certified. However, it won't receive the 'red line' blow-off mark until the boiler is steam tested and the lifting pressures of the two safety valves are set.



P06 – George tops up the boiler (via a hydrant) using a top washout plug hole. The blue WAP pressure cleaner in the foreground was to be used to pressurize the pre-filled boiler – but some spectacularly bad wiring shot that idea down.



P07 – Oh! This would be SO annoying! The RHS blow down valve is leaking at the conical joint behind that bolted flange. The water was just leaking by gravity and the blow down valve hadn't been sealed for full pressure testing yet.



P08 – That she blows! The boiler is full and the water is shooting out of the upward-facing washout hole. This was undesirable as it becomes hard to tell if water seen trickling downwards on the boiler is from a leak or from spill water.



P09 – Our Hott-Nutts shuffles warily cab-wards as not to become Wett-Nutts. It was interesting to see how long the water continued to gush, even after the hose was shut off – showing how the boiler and its plates flex just under the weight of the several tons of water constrained within.



P10 – While he was up there, George was asked to clamp a long hose onto the vent pipe so we could vent air down to ground level and bleed off the initial pressurized water in a gentle fashion. The pressures attained during the official test would cause shock to the boiler if suddenly released.



P11 – With the initial pressure bled off, Gabriel is playing with the drain water stream while his 'Bops' is attempting to tap the blow down valve's spacer tube into a better alignment for seating after loosening the span bolts. The improvement was only minor – the two valves would be removed and the spacer serviced the following week.



P12 – A blow down valve properly sealed for the later high-pressure hydraulic testing, with a rubber sheet and a steel backing plate securely plugging the outlet. At this angle, you can see the troublesome spacer tube behind the flange. You can also see false water leak trails caused by the water running down from the overflow spout far above.



P13 – Even with the piddly blow down spacers leaking on both sides, it was judged worthwhile to pressurize the boiler again. But first, the dodgy venting valve was removed and replaced with this high pressure model. The blanking plates are where the dual safety valves would normally go.



P14 – With the sealed boiler filled up to water mains pressure, there is no sign of a water leak at the recently completed front tube plate. This was between 700-800kPa. The tube plate had been labourously cleaned with a pneumatic wire brush the previous week by Jeremy Wood.



P15 – Here's what Susie's front tubeplate scrub-a-thon looked like a few weeks back with Jeremy Wood really raising the rust after the boiler boys had gotten clear. As per workshop rules, Jeremy had goggles and a facial mask on. The boiler is hydraulically tested with expanded tube ends only (rear end with copper ferrules), the rear end beading and bead-welding done afterwards.



P16 – The wiring for the WAP machine was in bad shape and also had a phase switched with a neutral. It turned out that this board is overfused, and instead of tripping, it allowed the wiring to overheat. Gordon condemned the wiring immediately. Here he is nervously trying to open the fused isolator on the MCC panel in the wheel lathe house. He is deliberately wearing the rubber gloves in this picture.



P17 – The dome gave us much trouble when the 12AR was recommissioned three years ago. This time it didn't have to be disturbed so we are confident of no leaks here. (Leaked like a sieve on 9 Feb, but one round on the nuts fixed it!)



P18 – Copper Slip! Yummie! George tries it out as the slightly saner Dawie re-assembles and seals the RHS blow-down outlets. It may as well have been done even they couldn't pressurize the boiler that day.



P19 – After the outlet elbow had been put on to totally seal the blow-down, and checked for leaks, Dawie takes a few swings at the span bolts in an attempt to tighten the joints. It didn't work, even with Dawie violating his instincts to deliberately try tightening the joints skew against the leaks.



P20 – More wet work. The chaps loosened the bolts to try and free the spacer tube to recentralize it. There was an improvement after a few whacks but no dice. Both blow downs would have to come off and have the spacers and the apertures cleaned and lapped together.

Just to catch up on the 12AR project, before I have a chance to get next week's photos processed.

The leaking blow-down spacers were removed and ground-in again during the week and another attempt was made to pre-test the boiler on Sat, 9 Feb. – to get it pre-tested before the official boiler test on Wednesday, 13 Feb. Initially the blow-downs continued to weep a bit at their flanges but they were tightened up. All this palaver is the reason why Reefsteamers blanks blow-downs at their discharge elbows, rather than at the aperture in the firebox side wrapper sheet.

Then the cam cover leaked on the left side blow down as the water pressure increased above the +/- 800kPa that we originally got from the water mains. The two circular blanking plates over the safety valve apertures also let go and started to cry under pressure. Now THAT was a nuisance as the spill water from up above in the safety valve area would trickle down under the cladding, and if not absorbed by the thermal lagging, show up as false tell-tale leaks and drips below.

At the same time, one of the center front crown stays began to weep and needed caulking. We say 'Caulking' but the process of solving a weep on the inner end of a firebox stay is more akin to peening a rivet. What slows the job down though is that you should not caulk ('peen') a firebox stay with the boiler under pressure. If this is done, the stay is likely to break.

Testing continued. Some of the washout plugs hadn't been properly tightened and so they were nipped up. After the third cycle the dome started to leak badly once the air bubble trapped in there had escaped through its gaps. The dome had been worked on when the boiler was recommissioned 3 years ago. The work was still good as the dome was water-tight after only one quick round with a pneumatic nut driver used by a startled Jeandre 'Gosh' Gordon, who had never handled one before.

Susie's boiler held up well under the final pre-test of the afternoon, with just a few weeps from the blow downs and another stay that leaked within the firebox.

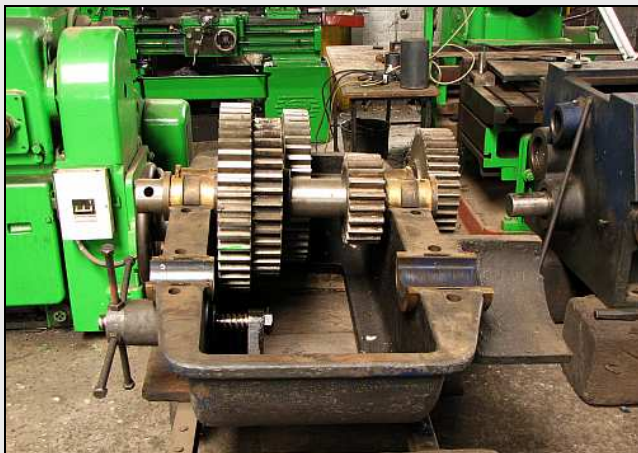
The boiler was 'pumped up' to the test pressure of 1640kPa and it needs to hold that pressure for three hours. We do have a small margin of about 2% that can be used on the blow-downs if we can't get them sealed. However, the tube-plates front and rear look good with not a single dribble amongst them. The boiler test pressure is 125% rated operating pressure. The rated operating pressure is now registered a little lower on the 12AR since the low-water incident a few years back and the crown sheet taking some strain.

After the hydraulic test and visual inspection comes the certified welder, who is required to weld up the rear ends of the tubes after they have been beaded over. At the same time, we'll task him to do 15F 2914's firebox patch which is nearly finished and ready for fitting ... after much patient cutting and grinding by Hott-Nutts George. After the tube bead welding comes a visual inspection, after which the fire arch is built. The safety valves have to be certified during the first live steam test.

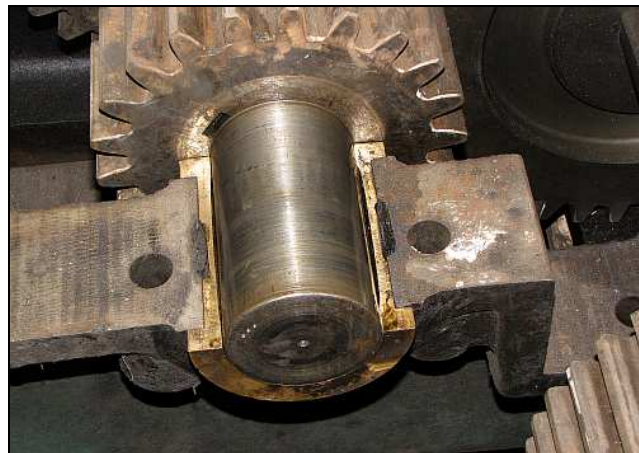
The new down-pipes still need to be fabricated. The sections are already being cut from lengths of 6.6mm wall piping, and the flanges have been turned out to suit the new pipes. The original plan was to replace the frontend platework with 3CR12 chrome-stainless steel. But because of time constraints, we will have to settle for patches in the abraded or corroded areas.

New Depot manager Gordon Bennett received a lot of training for the hydraulic test as he would be on hand to get the boiler ready for the inspector. The new high pressure valves on the test injection lines work a treat. The boiler can be 'pumped up' very slowly with the drain valve used as an accurate bleed to regulate the pressure from the fixed pressure pump. The same goes for drainage. Although there is no heat involved (no fire) it should take about 30 minutes minimum to fill or drain a cold pressurized locomotive boiler to avoid stresses and fractures.

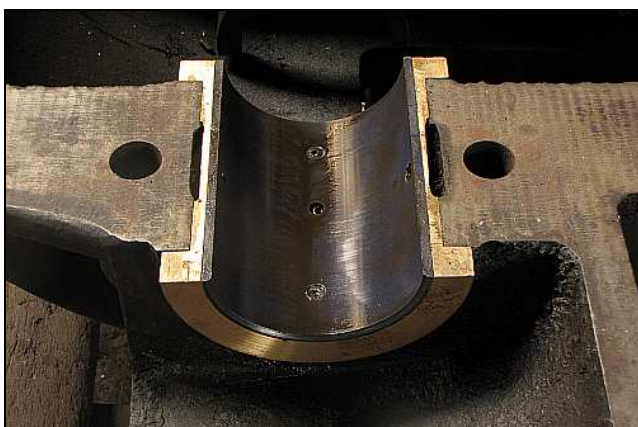
2). PROJECT – WHEEL LATHE REBUILD:



W01 – The completed gear shafts and clusters are being removed and refitted one-by-one as the old shell bearings are being re-lined with Vesconite™. This is to check for the continued correct meshing of the gears as the shaft alignments will change slightly with the new bearings.



W02 – This original shell bearing previously had the center of its surface milled away as an oil reservoir, fed by an oil hole from above. (It is upside down in the photo) The seal-less gearbox bearings weep oil at the outer end, and need frequent top-ups while the lathe is running.



W03 – One of the newly relined bearing shells, with a new Vesconite™ liner. The bronze had been cut back parallel. Vesconite™ is a self-lubricating material. As the shaft now bears on the full length of the bearing the contact pressure is about 3/5 less, meaning less pressure on the oil film.



W04 - The loose bearing shells were locked away from theft and souvenir hunters. As these are gear shafts, the reaction loads are sideways rather than downwards – so the single screws are correctly at the joints where they would cause the minimum disruption to the oil's boundary film.



W05 – With the new roof on, it was time to clean out all the junk that was underfoot in the wheel lathe house. This is the entrance way trench - which was totally bunged up with rubbish under the tread-plates and blocking the drainage.



W06 – Another shot of the new roof shows a new detail. That loose-looking rope is the pull rope for the traversing crane's flap door. The rope was simply routed through a rehabilitated old pulley and extended down to ground level.



W07 – The old floor boards were lifted and decades of debris and lost tools removed. (The spade is not OEM!) The very slow moving quadrants drive lengths of chains, draped around drive ratchet clutches, which in turn slowly extend the cutting tools across the wheel profiles.



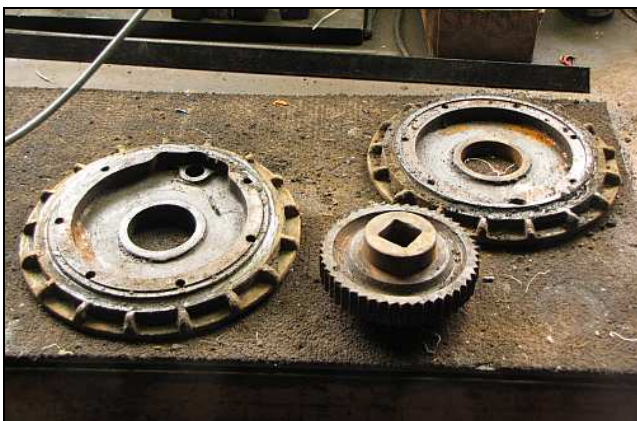
W08 – The same area a week later. The wood and floor boards have been removed. The cranks and linkages for the tool feed quadrants are now exposed. No flooring does expose the mechanical parts, but reduces the fire risk, improves drainage and reduces the risk of losing tools.



W09 – Here is a close-up of the newly cleaned tool feed quadrants. If you look at the lower end, you will see where the chains are held captive. The chains are looped loosely over the ratchets and engaged into their notched rims. Notice that the bearings have old open style lubrication holes. With the shaft clear, we might put grease nipples in.



W10 – The cast-in builder's logo on the lathe's drive-side chuck pedestal. This machine is over 90 years old and is a lot older than most of our locomotives. It probably arrived on a coal fired steam ship too! Craven Brothers started up in 1853, went public in 1885 and finally closed in 1970.



W11 – On the stripping bench, with all the rust that fell off with the handling, one of the ratchet drives for the tool feed has been dismantled and is being examined by Gordon Bennett. At the time, it looked as if one of these was missing and would need to be refabricated.



W12 – The missing tool-feed ratchet clutch (LHS) was later found amongst the junk. You can clearly see the indents where the chain links run. The chains are looped around the ratchets and are pulled at a slow rate by the quadrants. (W09) If the chains are lifted from the rims, the outer casing can be manually wound back to release the cutting tool.



W13 – It is a minor miracle that these three oil cellars had survived intact without disappearing. Two of them even still have their wicks. These oil cellars lubricate the pedestal bearings for the drive shafts for the two chucks. The copper oil lines have since been removed for cleaning.



W14 – This was the state of the transfer shaft pit with the project just started. Although the lathe itself was covered in a tarp, water still got into the building through the decayed roof. Note the oil line running to the center bearing.



W15 – Three containers of cutting tools and accessories were recovered from under the floor boards and around the base of the machinery. Over how many decades have they been dropped through gaps and replacements have just lazily withdrawn from 'never-ending' stocks?



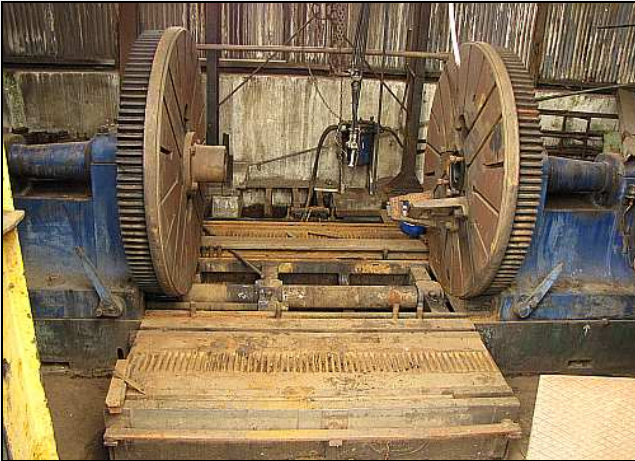
W16 – Unusually, we seem to still have a good collection of tools and hardware for the lathe. Of course, we still need to figure out precisely what everything is for! Andrew 'Noddy' King was the last person to operate this machine and we will POUNCE on him the next time he visits the depot!



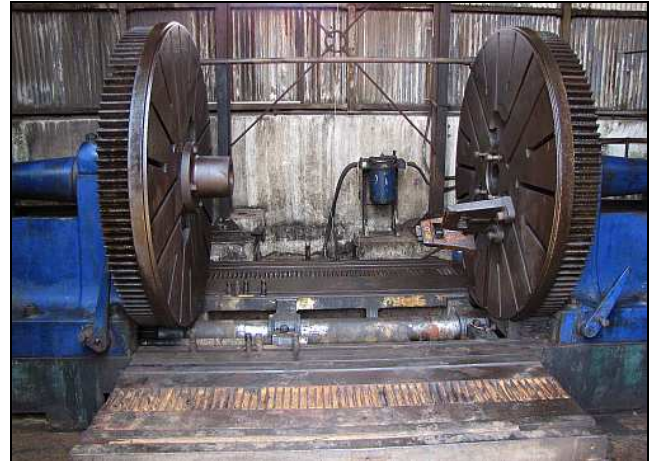
W17 – This is the wheel lathe's drive motor at the start of the project. It has recently been sent to a motor specialist for inspection and overhaul. It is likely to need new slip-ring gear and bearings, but the windings should be OK. We were lent a hydraulic palette loader for the loading job as we can't get the forklift out through the main doors.



W18 – The sliding tool-stand bolts were found to be stuck. Someone had put a thick layer of bitumen into the traverse groove, probably in hope of stopping the square-shaped heads from rusting up under the old decayed roof. Coenie was tasked with cleaning up the slots – with a fun mixture of solvents, old chisels and scrapers.



W19 – These are the two mighty wheel lathe chucks themselves, set in between two of the racked bars upon which the tool posts are mounted. We still have all the wheel clamps. Tread plates need to be re-fabricated to cover the transfer shaft pit.



W20 – The lathe bed area has since been cleaned up and the rear tool bed has been de-rusted. The chucks have been cleaned and lightly greased. The rear bed was wire brushed, the sliding bolts loosened up (W18) and then the whole assembly sprayed with paraffin as a water repellent.



W21 – This is the main gear between the gearbox and the lathe. It has been wiped and then lightly oiled. Notice the key fixing the gear to the shaft. This lathe actually has two gearboxes working in tandem and visible is the lower 1/3 of the 4-speed transfer box. The drive gear was originally caged, (since scrapped) and a new safety cage will be built.



W22 – The ring gears that drive the chucks themselves were also cleaned and then greased. These ring gear teeth are a little worn but still usable. It appears that the main gear damage was confined to the stacked gearboxes, where operators were changing gear ratios before allowing the heavy lathe to coast to a stand-still.

3). SHUNTING WITH THE 15F 3046:

S01 – After a working morning of being a software crash-test dummy, I walked into the yard at mid-day, not expecting much apart from a few steam-heads working on the 12AR or maybe 2914. Imagine my surprise to see a whiff of smoke and then see this old lady standing in steam while shunting. Did this cheer me up? You bet it did! ☺



S02 – Just look at that face! Don't you just wanna take her home? This, to me, is what a steam locomotive should look like – clean(ish) and tidy, but business-like, with a slight patina of being a hard working machine. That's what they were built for. We do have a few decorative items but they are removed when the locomotive is staged for servicing.



S03 – There are worse places for a grand old lady to spend her retirement, amongst a garden where once only cinders grew. As stated earlier, those aggressive cacti are on the hack list to make this area less prickly for visitors.



S04 – Today's shunt would mainly be the coaches of the Shongololo Express and then go and sort out some of our own toys. Unlike our day-sitter and sleeper sets, this train usually needs to be turned around in between trips too.



S05 – Rear view of clearstory stock on the now-stationary shunt. Note that the front of the loco is already just past where the original east-end gates were – showing the value of our extended head shunt for the three leftmost tracks.



S06 – This fellow is waving the train back over the points. It was noted that these guys need training as there were some very sloppy signals. However, both Attie and Cliffie were further back and doing the trickier close quarter stuff.



S07 – The rear coach approaches the Saki Salon. Of interest is how quickly the rails were getting polished on this rusty set of tracks, as the coaches were coming in from curved rails and the bogies were displacing sideways.



S08 – Coming to a halt at the end of the move, 15F 3046's 'scratch' fireman has just finished 'feedin' de gol'fish'. That is: a light sprinkle to keep the fire alive but not to raise steam, as 'Janine' was already thinking about blowing off.



S09 – Andreas 'Bobtail' Matthee was driving. He recently qualified as a shedman and is getting time-in with shunting and moving the loco in the mornings. He is a slow, careful driver and it was a treat to see him do hill starts with nary a slip or fuss. He does say that it is unnerving waiting for the steam chests to charge up before opening up though.



S10 – Andreas's brother, Michael, was the 'scratch' fireman and he had an absolute blast! Both Andreas and Michael are currently employed by Transnet. Michael hustles toasters and Andreas plays with tall pretty-coloured lights and interlocking. Cliffie, their dad, who was conducting the shunt, is ex-SAR Carriage and Wagon.



S11 – A long string of coaches tentatively back up into the carriage shed. You can see by the rusty railheads that there hadn't been much action over the year-end. The first 2013 train would only be running the following week.



S12 – This beat-up old gasket still manages to look good, somehow. She will be withdrawn from service end of March for the mandatory three-year boiler certification. The pressure is on to get the 12AR No.1535 ready in time.



S13 – Safety hazard in the making. The residual steam oil is still running through the cylinders and is going to make that cross ramp very slippery. The steam oil actually forms a soapy emulsion in the cylinders, hence the milky colour.



S14 – You don't often get to snap this angle in daylight, up from the entrance ramp to the 15M workshops. That water is cross-spray from the fellow hosing the ash pan down from the other side while the grate shakers are being used.



S15 – Nothing like wrapping up your shift after a long day and anticipating some tea and perhaps even some surviving biscuits. Attie had been on his feet all day! The still-driving Attie has just turned 75yrs old – he started out firing on Noah's Ark, then graduating to the 10th Classes.



S16 – With the late afternoon sun forming a halo in his hair, Senior Driver Attie de-Necker humbly gets on with swilling down the ashpan. (The boiler water was too high to use the coolers.) They could have used the blow-downs but we discourage it here as it literally cooks and kills the grass.



S17 – Class 15F No.3046 gets to look at the sunset as she is put to bed, and her proud young(ish) crew pose in front. Andreas is about 34 and Michael about 41 – not youngsters exactly, but a new generation of steam preservationists with millions of steel-topped miles still ahead of them.

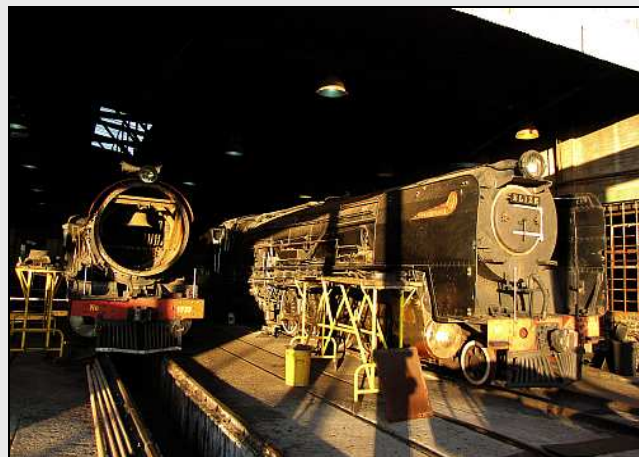


S18 – Andreas and Michael Matthee at the end of a long day's work. Both of them are keen steamers but because of their erratic working hours, they tend to be a bit scarce. Michael (RHS), is training as a Train Safety Officer while Andreas is currently a qualified fireman AND a shedman.

4). PICS AROUND THE DEPOT ... AND SOME SUNRISE PICS:



M01 – Getting his bi-weekly steam fix. Machinist James Thomson had come in for an early morning visit to the depot before heading out for a Saturday morning at his work. Steam locos are a mainly a visual experience for James, as he is totally deaf and hears nothing but tinnitus.



M02 – There is nothing like lying in bed and having the sun creep up and kiss you right on the face. Long-static 25NC No.3472 (RHS) is still fully functional but she awaits wheel profiling. We'll do the GMAM first, as that loco doesn't have issues with turning triangles as the long-framed 25NC does.



M03 – Sunrise on the Fitter Shop, north of the fenced 15M compound. This shop is being cleared out and refurbished to serve as a General Workshop, although the axle pad presses will remain. The contents of the various tool stores will also be moved here, to be in one centralized location.



M04 – It is early morning and Ol' Sol is peeking through the clearstory of our adopted Running Shed. Even the Loco-Minders rarely get this angle as they are normally occupied with finishing opening their fire and getting going on the engine prep at this time.



M05 – Me George. Me pretty. Me buff. Me fireman. Me King of Coal. Shovel Coal. In. In. In. Blower on. Fire hot. Make steam. Driver happy. Driver happy, me happy.



M06 – The Reefsteamers sign stands out against the rising anvil head of a newly formed storm cell. Classic summer weather – the short, sharp arvey or evening thunderstorm.



M07 – Gordon had made a temporary wiring joint for the 'small' air compressor. Is he waving the smoke away before I catch it on the cam? The 50 ton hydraulic press has recently been moved from this location to stand amongst the main 15M machine shop, as a part of the current workshop rationalization project. The compressor itself is likely to be moved later.



M08 – After a busy day at the Depot, George and Gordon walk off companionably. As we couldn't get the WAP going, the 12AR's boiler couldn't be fully pressurized (26 Jan.). The fellows were tired and soaked, and not up to draining the 12AR's boiler to try and sort out those leaky blow-down spacers. So they called it an early day....



This Depot Report was compiled by Mr. Lee D. Gates on behalf of Reefsteamers Association NPC.
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