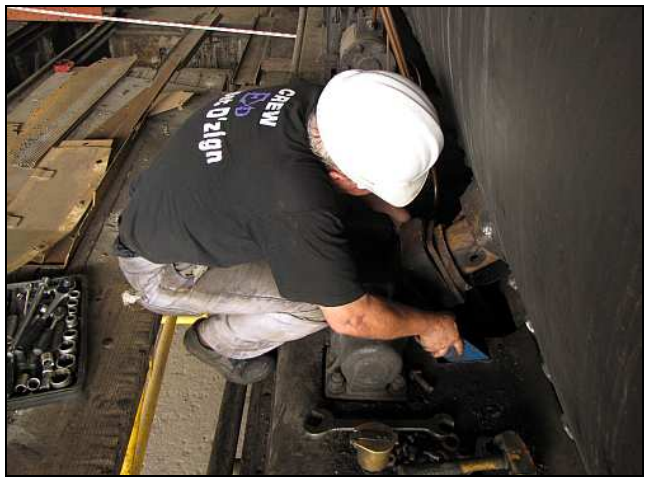
1). PROJECT : 12AR STEAM DOWN PIPE REMOVAL:

R01 – Trying to do the work without removing the vacuum breakers and the cowling was false time saving. Johann Breydenbach exchanges a coal shovel for a spanner and settles into 'slogging' the 'nutz orf.' Johann was fortunate enough to have the household's single car available today so he got to come in for a workday – a rare treat for him.



R02 – Johann B. wisely pulls the bucket over the flanges to keep debris out of the valve chest. To recap, the RHS steam down-pipe was obstructing a boiler tube's removal. Upon rotating the pipe to clear the obstruction, it was found to have been holed. (The pipe is turned 180 degrees in the photo – the visible hole is the steam chest gauge's port.)

R03 – The chokes on the cylinder oil lines also needed to be uncoupled and removed from the cowling. They use differently proportioned counter-porting to ensure the steam in the cylinders doesn't blow back up through the oil lines.

R04 – A view of Class 12AR No.1535 'Susan' under repair. There were also three other fellows hidden away within the firebox. Here, you can see the slanted spark-arrestor chord plate, and the complex bends of the LHS steam down-pipe.

R05 – A bit later with the cowling and breakers removed, one gets to appreciate the gritty-looking craftsmanship of the long-ago pattern makers. Steam loco steam chests are amazingly cast pieces of engineering in their own right.

R06 – Dr. Smudge points to the discovered hole, which normally points rearwards. Notice that the pipe had been patched previously. The plan at this stage was remove the pipe for a thickness test to check for a min. of 4 from 6mm.

R07 – Dr. Smudge and Bullie-bach are discussing the strategy to complete the job. That is 'Swak Hart' Dawie looking in. He was either within the smokebox or firebox during the whacking and heard … every … single … blow!

R08 – On a model steam engine, this is usually just a cute piece of threaded brass tube. The real pipe had been expanded within the flange and would need to be cut away. Note the detail of the 12AR's composite smokebox saddle.

R09 – As I rarely ask the guys to pose, and I take photos under less-than-optimal conditions, I discard about half the photos I take. But occasionally I do get it right, like this moment that the cutting torch is ignited with an arc welder.

R10 – Dr. Smudge gets on with cutting that flange off to free the pipe for removal. Note the gauge port is beautifully lit. You can just see Jeremy Wood inside the smokebox. He was turning the inside end slowly to extend the cut.

R11 – A top view of the pipe cutting in progress. Of interest is the bundle of small bore-pipes at the left. Two of them are condensate drains for the reverser's power cylinder, one is a condensate drain for the vacuum ejector exhaust line and one is the discharge for the reverser's valve chest.

R12 – The cutting job was going well – a bit TOO well. It turns out the whole steam pipe has thin walls and it was sagging under its own weight during the cut. Note that the plastic tray protecting the valve chest inlet had been replaced with something with a MUCH higher melting point!

R13 – The heavy flange drops onto the baffle plate and is left to cool while the inner section of the pipe is withdrawn. The rotated square piece is the loose stuffing cover for the upper joint – sealed with graphited rope as packing. The cover is relatively lightweight, as it is 'only' a vacuum joint.

R14 – The RHS steam pipe is definitely thinner than the left side. So either some long-ago fitter took a short cut or the pipe has been replaced before. We aren't even going to bother to check the pipe – just getting sections made up and bent for decent quality replacements. (On both sides.)

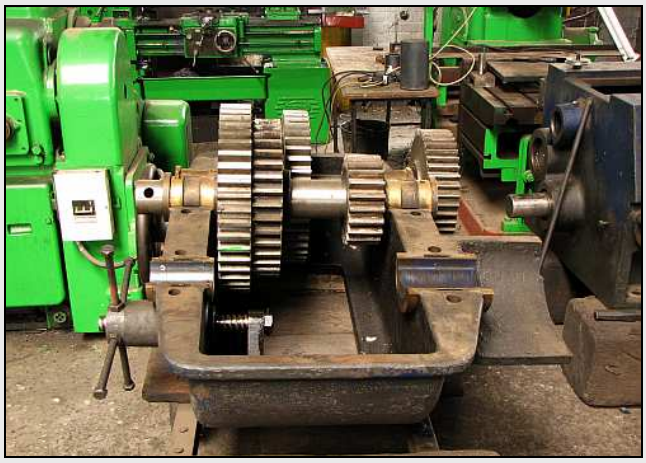
R15 – Dawie (LHS) and Michael, both being taller than Johann Breydenbach, are able to strip the left cylinder area from ground level. It was decided to remove the still-intact LHS steam down-pipe anyway while we had still access and we may as well have two new un-worn pipes made up to the pattern. (Mirror images of each other, of course!)

R16 – More pyrotechnics on the job as Dr. Smudge cuts away the rusted-on nuts from the waist flange. The new nuts will be 'copper-slipped.' (The 'oud Spoories' used graphite in a vain attempt to stop threads from rusting.) The table plate and baffles are to be rebuilt from abrasion resistant-steel sheeting and the bolts treated the same way.

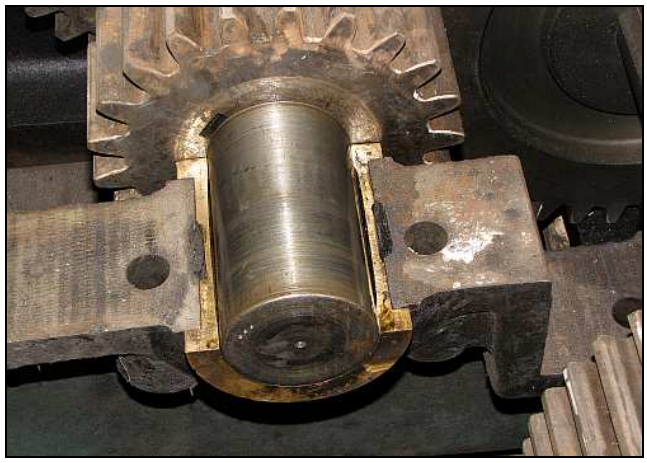
R17 – You need a really delicate touch to work on an SAR steam locomotive. This job required acetylene, a welder, 6ft cheater pipes, big mallets, slogging spanners, a sense of humour and several cups of tea – all in a day's work!

R18 – Here you see the long-compressed flax rope packing being picked out of the stuffing box cavity. It had, naturally, been baked onto the steel and was resisting withdrawal. Failure here would cause a vacuum leak and poor drafting.

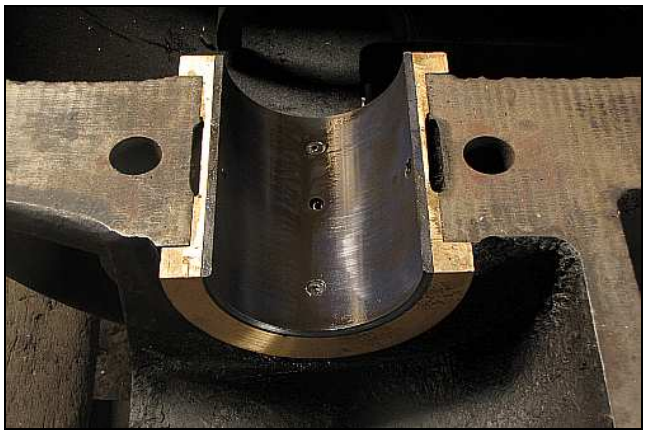
2). PROJECT – WHEEL LATHE REBUILD:



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.



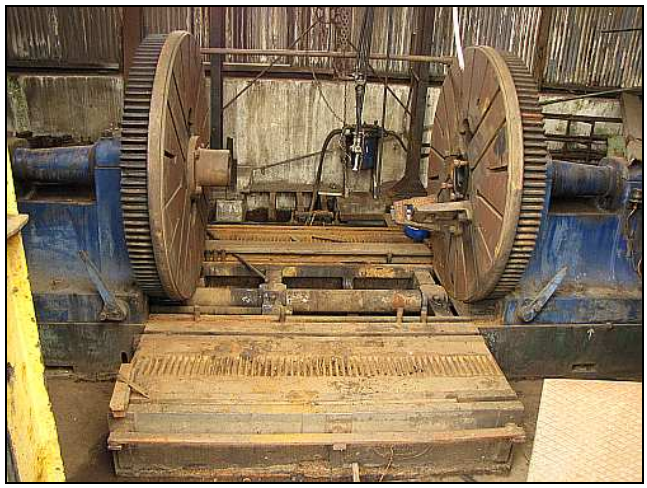
W02 – This original shell bearing previously had the center of its surface milled away as an oil reservoir, fed by an oil hole from above. (It is upside down in the photo) The seal-less gearbox bearings weep oil at the outer end, and need frequent top-ups while the lathe is running.



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 sidewise 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.

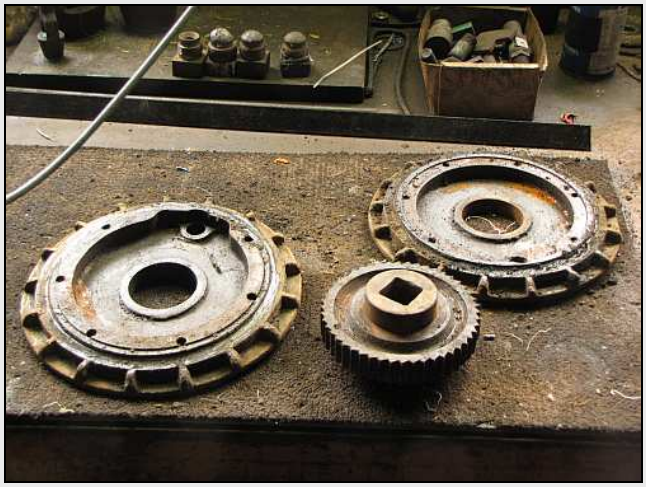
W05 – With the new roof on, it was time to clean out the junk that was underfoot in the wheel lathe house. This is the entrance way trench - which was totally bunged up with rubbish under the tread-plates and blocking the drainage.



W06 – 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. The oil cellars and feed pipes are still intact.

W07 – The old floorboards were lifted and decades of debris and lost tools were shovelled out once the 'sump water' drained away. (The spade is not exactly OEM!) In the center is the ratchet-operated tool feed shaft which connect via chains set into those quadranted sheaths.

W08 – 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?



W09 – On the stripping bench, with all the rust that fell off with the handling, one of the ratchet drives for the tool feed is being examined by Gordon Bennett. It looks as if one of these is missing and will need to be refabricated.

W10 – 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.

W11 – 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!

W12 – 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.

3). PROJECT : 12AR BOILER TUBE INSERTION:

B01 – A view of Susie's cute 'little' smokebox just before the boiler boys climbed in. Both of the steam down pipes would be removed by the end of the day and the blast pipe would remain safely capped. The thin grey-looking pipe to the right is the steam line for the blower. Can you spot the five visible washout plugs in the front tube plate?

B02 – A view of some of the old tubes that were pulled out. You can see how the tube ends were chiselled to split and collapse them – they are 'only' restrained at the front end by friction via expansion. Once the rolled-over ends at the back-end (the beading) and its welds are ground away on the tube plate, the old tube is free to be withdrawn.

B03 – At the other end, Dawie is adjusting his vernier calliper. On the 12AR, the tube ends must protrude 8mm from the tube plate to get a proper rolled bead without interfering with adjacent tubes, or being too short to weld. As this tubeplate is slightly warped, each tube has to be individually measured and positioned to suit its location.

B04 – Boiler tubes are not only damaged by corrosion, leading to perforation, but are also worn by char cutting. You can clearly see how the old tube ends are worn down compared to the new tubes. The 3 new tubes had already been expanded into place and you can see the inner ridges which mark the inner face of the front tube plate.

B05 – A nice clean rear tubeplate shows the end results, how the tubes and flues are beaded over and then welded. Superheater flues make handy built-in tool storage pockets.

B06 – The tube expander has been inserted for the first pass. The expanders and their mandrels come in different sizes and it is a mix n' match game to get the right combo.

B07 – Once the mandrel and the expander are matched up, the air-motor can be attached. The job usually has to be done in several stages as the expanders are exchanged in stages for bigger ones as the tube-end expands into the aperture. Doing the job too fast will tend to split the tube.

B08 – A box of assorted tube expanders and conical mandrels showing the different sizes. You can clearly see the inclined-axis rollers that tend to drive the expander inwards as well as imposing a tapering force onto the tube. It is the mandrel that sets the expansion plane of the rollers.

B09 – Michael does the final crunch-up using the ratchet driver on the square shank. In the final stages, hand tightening gives you more control. Also, using the air-motor can be dangerous at this stage, as it tends to kick back while running at full power driving the now-tightened tool.

B10 – Hmmm. Hardened steel, homogenous core, 10 inches long and very inflexible. *'The wand chooses the wizard, Mr. Viljoen.'* Although a bit of oil is needed to reduce binding, the debris quickly gunk-up on the oil-wetted mandrel. Jeremy passes the waste across for a quick wipe.

B11 – Sitting room only. Although there is more light and air available at this end, it is also a bit more cramped. Dawie and Michael discuss what to do next. All the boiler tubes need to be installed and expanded-up by the weekend 26/27th Jan. for a preliminary Boiler Hydraulic test.

B12 – This tube would give hassles as the end is protruding a bit too far and is blocking full penetration of the expander. They could have cheated by putting in bigger mandrels but that would have belled the end out. Instead, the expanders were changed more frequently than usual.

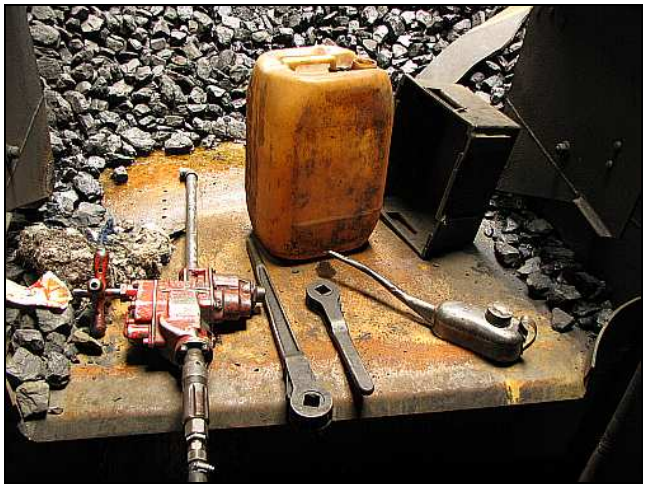
B13 – At the end of a good expansion job is the need to get the expander and mandrel out again – with the rollers squeezed in TIGHT between the tube and the mandrel. Michael gets a bit of rap action going. Note Dawie's cute and still miraculously clean white sokkies in those rugged work boots – this dude is STYLIN' !

B14 – Double-beat ratchet action. Because of the lack of room within the smokebox barrel, it was easier for each fellow to brace-up in his own direction and pull the ratchet his way. That resulted in this very cosy-looking scene.

4). PICS FROM AROUND THE DEPOT:

M01 – Professor Viljoen takes to the whiteboard and is educating the unruly workshop mob. As far as I could tell when I entered to sneak the shot and then headed for the kitchen, he was explaining keying a component to a shaft.

M02 – A quick meeting in between the Coach Controller exams and looking for a victim to send out to buy lunch. The 'always-delightful' Smidge Ackerman gives me 'The Tongue' as I do a zoom-shot around the 15CA's front end.



M03 – Some tube expanding stuff laid out on the 12AR's now-rusted shovel plate (leaky roof panel) and I could hear echoey grumping from Dawie inside the firebox. It turned out that I was standing on his boxed vernier calliper. Oops!

M04 – Second-hand light on the spindle board of the 12AR No.1535 parked under a translucent roof panel. The water columns have been removed and blanked for hydraulic testing, although the pressure gauge has since been fitted.

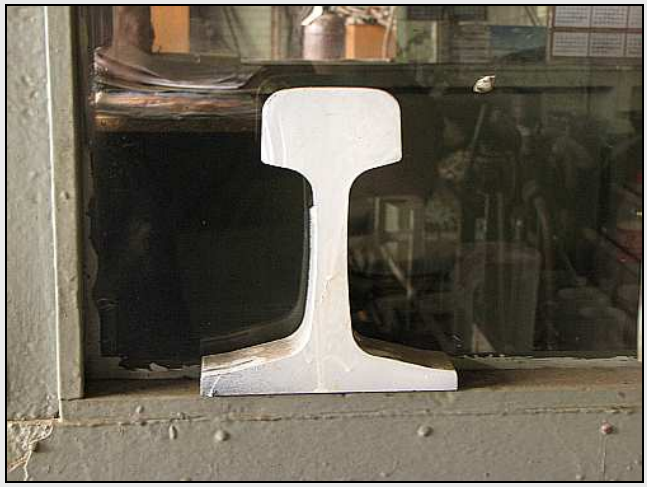
M05 – Fresh from the labs. A set of newly-calibrated boiler pressure gauges and duplex brake vacuum gauges arrived last week. These are for 15F 3046 'Janine' and 12AR 1535 'Susan' – the 15F already so fitted for the new season.

M06 – A stationary train properly protected with 'red flag' boards, indicating that the train is not to be shunted. The rule is that only the person who erected the board may take it away. The train was using mains electricity at the time.

M07 – This pair of boat-shaped frames are the formers upon which the fire clay bricks of the 12AR's fire arch will be erected. As she doesn't have arch tubes, the fire arch will need to be supported while the mortar dries. (Even though it will use a wedging keystone, like a Roman arch.)

M08 – The wooden floor boards of the recently demolished tools store now hold the rotted roof rafters removed from the wheel lathe house's roof. These are in storage for use as locomotive fire kindling. And a Viking's funeral is not an inappropriate way for old SAR&H timber to be laid to rest!

M09 – Monochrone Motion. A study of the RHS return crank on 15F No.3046, with a rusted cast iron brake shoe providing nearly the only colour. Note the cotter pins safely retaining the journal bolts, the bolts themselves routed through semi-circular slots in the square crank pin end.



M10 – A cut-off piece of rail graces the window frame of the old Fitter Shop's Shop Foreman's office. A common piece of rail is a remarkable product with that complex shape being produced from a rolling mill.

M11 – Jeandre the gravel hound waits in HER natural environment for Coenie the human to finish braaing. When the young mutts went in for shots and snips, they weren't yet named. So for the vet's records, they were named after the people who brought then in, being Jeandre and Coenie!

M12 – No, that isn't a Transnet diesel with a major case of turbo-lag! It is a car tyre bonfire. One of the reason why we abandoned our original entrance road was because of the constant incursions and illegal dumping taking place. It was unpleasant for members and dangerous for visitors.

M13 – Or maybe it WAS those Dirty-Diesels after all! That orange clunker pulling the Spoornet-blue 1974-built GE 34-400 has just moved into perfect alignment with the smoke. Our rebuilt northern electric fence is already under attack (Slackened top wire is a tell tale) and a steel manhole cover was recently stolen right outside the property boundary.

M14 – Cooooenie a' scoootin' … in de rainnnn! Why walk to find the security guard who has the keys, when you can just scoot around the yard? (Said security guard hiding from the rain) This little 'Big Boy' machine has carried more than its own weight in hardware, bread rolls and boerewors in its time. Only crazy photographers walk around in the rain…

M15 – The aisle lights have been switched on early for a cloudy evening – this aisle yet to be converted to the cold flat glare of CFLs. That is 15F No.2914's tender to the left and 12R No.1947's tender to the right – tailed by a generous pile of bagged blasting sand.

M16 – Hard hats are generally not worn for firebox work as it is generally quite hot enough in there, and they tend to come off in transit through the firing portal. However, more than one Reefsteamer has bopped their loaf on the crown sheet and the protruding fusible plugs in the 12AR.

M17 – The new energizer for the balloon fence extension is genuinely an cattle-grade energizer at about 3 times the joule (energy) capacity of a domestic fence. It will run on 'only' about 0.8 to 1.2KV, making it less likely to arc to ground. However, the fence will be more vulnerable to volt drops within the joints. It is still gonna hurt like hell though!

M18 – Here's the beast which was mounted and energized on 20th Jan, although the HT wasn't wired yet. An interesting feature is a photo sensor that allows the setting of a different voltage for night time use – usually higher as that's when the buggers roam. Being mounted above a workbench, it will be easy to increase the battery capacity.

5). COACHIE TRAINING SESSION:

C01 – Train Manager Attie makes a clarification comment deep within the coachie training session. Despite appearances, Jeandre (center) WAS awake – he was just looking down and taking notes on the awkwardly English Coach Controller guide.

C02 – Not all of our coachies were present. Most of the people in this room have other regular roles at RS as well. As certification/refreshers are mandatory according to signed access agreements, we will need to host another training session to cater for the coachies that we missed.

C03 – A rare pic of Chairman Dennis Edgar NOT wearing The Clanking Tam o' Shanter while on the Depot premises. As can be seen, his dome is fairly normal in shape! He is a qualified, active Train Manager and was thus able to talk the coachies through the notes from practical experience.

C04 – With the Clanking Tam o' Shanter back on to disperse the earth's magnetic field around his cranium (For enhanced concentration) Dennis settles down to marking one of 10 exam papers. Although the questions are relatively simple, there is a high passing grade requirement.

C05 – They don't look too nervous as they wait around the Headmaster's office, just like in the ol' school days. Warren (RHS) seems to be enjoying a seriously good joke. They had no need to be worried – of the ten people that wrote the exam, all ten of them are passed and certified for Coach Controller service for this year.

C06 – The coachies dispersed like cats on hot crack after the marking session, but were soon instinctively herded together by the inviting smell of lunch. Those steel chairs, fabricated from oil transformer cooling-fin tubes, have become a permanent fixture on the Tea Green, snuggled in right next to the T & P Tree.

C07 – Coenie Gildenhuys wasn't quite fast enough and he got hooked into doing the lunch-time braai. He didn't mind. (Usually doesn't) Here he carries the spicely finished and delicately smoked result, with an ever-optimistic pair of furry remoras dogging his footsteps.

C08 – At 74yrs young, the oldest operational steam driver in South Africa still has his own teeth and is quite capable of tearing into a classic Reefsteamers boerie roll. The good Lord is keeping Attie around to entertain the rest of us! He has recently been retired from the stressfull Depot Management Duties as the somewhat younger Gordon Bennett has taken over full time. But Oom Attie is still put onto lighter duties – when he isn't on the footplate, Train Managing or conducting a shunting turn. Otherwise he is happily drinking endless cups of tea, pottering around the old steam machines and enjoying the company of a new generation of steam people.

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