# **INTRODUCTION : WAKE UP – LIL' SUZIE!:**

It was several weeks after 'lil Suzie's debut trip to Magaliesburg that Patrick Ackerman made a comment that is hard to miss, and is worthy of inclusion in this report.

The Acker-comment itself is bit cryptic - in that 'it is nice to see another locomotive number from the kitchen.'

To explain the comment, the workshop canteen's entrance alley, the rat run, the outdoor hand washing area and both of the workshop canteen windows peer in blearily through the cataracted, telephone-number scrawled window panes of the 15M shops where our major repairs are done. Whatever locomotive stored in 15M shop repair bay number one (of eight roads) is clearly visible through the windows. Patrick Ackerman was commenting on the fact that the Class 12AR's cab-side number plate, the unique semi-circular 3D SAR font 'Germiston' text (From her days as a station pilot) and the subtly neat yellow pin-striping on the cab sides, were always visible from the kitchen window as he went to make tea.

Class 12AR No.1535 'Susan' has been waiting in this track, opposite the clubhouse windows for just over two years – her only movement being from when being ignominiously pulled out backwards one day to desperately raid stale coal (with pigeon coprolites) from the tender when an expected, urgent coal delivery didn't arrive and we had to run a train that day. She had to be pulled back to converging tracks, so the hydraulic coal grab wagon could reach onto the tender's coal hopper with its boom and clam-shell scoop. She last ran in early 2007 and was a popular, tough and economic engine for the day-trip work. As the last survivor of her kind with unique proportions, a proper 'goods engine'-sized wheel set and no smoke defectors, she is also a popular subject for the zoom-lens fraternity. The locomotive had failed on her last run. There was a failure amongst the running gear of the Bissel truck. The vertical lead rod between the left hand equalizer beam and the spring for the axle box had snapped. This failure was a tow-home job, the proud little steamer being hauled in by diesels. As the boiler certificate wasn't far off from the 'E' mark, the poor little 96 ton locomotive was staged and would doze in the Number 1 road of the 15M workshop for two years.

After the motion was stripped, James Thomson was put to the task of fabricating a full set of new Vesconite bushes. The job went slowly as he himself was battling with poor health and availability at the time, as well as being pulled sideways onto other jobs. We had just gotten our Class 15CA No.2056 going after a full motion rebuild and a boiler re-tube, so this ALCO engine did much of the day-trip work during 2007. Then, the Sandstone Locomotives arrived – first being the GMAM Garratt No.4079 'Lyndie Lou.' She arrived under her own power and in a double header with a Class 15F – the GMAM being transferred from the 'care' of Rovos Rail to Reefsteamers. Some months later, Dave Shepherd's No.3052 'Avril' hauled a special transfer train from the Sandstone Storage Shed at Ficksburg, with the Class 25NC No.3488 'Enchantress' in tow, along with the ex-Rhodesians Railways Class DE2 No.1207 and four steel bodied mainline coaches. Two of those coaches were originally from 'The Locomotive' restaurant in Weenen – one being the Lilliputian restaurant car and also incorporating 'The Puffing Billy' Bar. (Now partially dismantled as the coach is being refitted for Ekurhuleni Council use.)

These cheeky newcomers muscled and bossed their way into our works schedules – the GMAM needing to have both Bissel trucks removed and overhauled (Their unlubricated transferring plates had seized, locking the Bissel trucks semi-solid and grinding down the wheel flanges on curves.) Amongst many smaller jobs, the mechanical stoker's donkey engine was completely overhauled as well. 'Avril' got the same treatment amongst a full body-off-frames tender strip-down and overhaul. In amongst getting the two operating Sandstone locomotives into shape for main line work, our workhorse 15CA smeared a bearing on the front bogie – so that ended up being a full bogie-out nose-up bogie overhaul with a new home-cast thrust face on the damaged white metal bearing.

In amongst all this work, the 12AR stood forlornly on the one-road although there was a brief burst of activity to get the boiler recertified and nine boiler tubes were replaced. With the 15CA later out of action due to worn flues and the 15F 'Avril' needing 18 boiler tubes to be replaced it has become imperative to get our little Susan going again.

Reassembly came with a few issues – the pistons being warped and the various piston and valve rings delayed in delivery. New garter rings had to be fabricated for the cylinder glands. Time was lost in trying to match the mixed up unmarked bushes and expansion link components matched together with their correct companions. The valve gear came together properly but much careful setting up and alignment was required as both of the radius rods were found to be bent. Then it transpired that someone had stolen the big end bushes – discovered on the day of hoped reassembly and two more weeks were lost in fabricating a set of new bushes from scratch.

In spite of the hold ups and delays, No.1535 'Susan' is now back in operation and strutting her small wheeled stuff out on the main irons. On her last run before de-certification, the locomotive was driven by the late Flip Reimers and fired by his wife, Darlene. It was fitting that Darlene got to fire the engine on its debut post-rebuild trip.

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It would be wonderful to wish our Class 12AR 'Susan' many years of trouble free running. Unfortunately, during the last boiler inspection, the lower sector of the front tube plate was found to be worn down to the minimum safe thickness for operation. We have three years to use and enjoy this locomotive as she will not pass her next boiler certification without some major repair work being performed on the boiler. She is an economical (Relatively) little locomotive to run though and it is hoped that Susan, amongst her bigger sisters, will help bring in fund to get the other preferred day-trip locomotive, the Class 15CA up and running again. (Class 15CA No.2056 requires about R240 000 worth of repairs to the boiler flues – at today's prices.)

On the rare occasions that he makes tea, (he normally handles the braai) Patrick Ackerman now sees the flanks of another steam machine through those afore mentioned workshop windows– Uncle Wilfred's magnificent 60t Crowans Sheldon steam crane!

# PROJECT : Susan gets her name :

One of the last jobs left to prepare our 12AR for her debut run was the fabrication of a name plate. She actually already had one but we are gradually converting all the locomotives to a standard of widely spaced sans-serif brass lettering on a plain black semi-gloss steel background. You will notice in later pictures that this locomotive ran with very little adornment apart from a freshly painted black nose wheel and a pair of brass 'bokkies' borrowed from the Class 25NC No.3472 'Elize.' The 12AR is to remain completely black with the possible exception of polished steel wheel rims and the retention of the historic yellow pin striping on the cab-sides and the classic SAR 3D 'GERMISTON' station pilot names just above the oval cab number plates. The small wheel rims are not to be painted white as is commonly done with the bigger engines. Another cosmetic issue was the lack of polishing on the rods and the valve motion – the residue of the chemical paint stripper remaining. Susan took her first debut run with somewhat scaly, scabby and stained rods.

Michael Thiel had volunteered to make a new name plate and came into the depot in the early afternoon as he usually works on Saturday morning. It would be a long day for the dude as he would be working right through to the early hours of the morning, going to bed at 2am and be on the waiting train by 7am. But Michael is 'funn y' that way – it's a disease known as 'steam fever.' The amount of detail that Michael put into the name plate was amazing. The letters were fastened to the backboard with brass countersunk screws with beveled heads. These were carefully and individually filed off flush with the top surface of the individual brass letters to make the mountings virtually invisible. Mike even nipped down the length of the countersinking to get the heights of the heads right to be able to get the screw slots filed off. It was strange seeing a muscle-bound loco man fiddling with little brass screws, thumb sized squares of sandpaper and teeny little jeweler's files, instead of the pachydermically packaged entroument normally utilized.

Anyway, totally off subject.

He had a surprise in store with the name plate business too - read on!

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NP01 – Spread out like a hapless bug messily flattened on a bullet train's windshield (with haemolymph leaking splattily into the slipstream), a somewhat short statured Michael measures the width of the headlamp's glare plate.

It is a convenient place on which to mount a steam locomotive's name plate but the plates get damaged, or sometime impatiently and roughly bent out of the way, when the hinged smokebox door is opened. Mike eventually mounted the plate onto the door's forehead rail itself – visible just above his bone-dome.



NP03 – He grates cheese pretty well too! (And he makes a mean instant noodle snack with mayo, sweet pepperdews and sparkplug juice.) With similar grating movements, Mike scrubs off the loose rust from the wire brushed plate. It was cut square, filed, slightly bevelled and polished up on both sides to accept the inevitably thin coat of paint from an aerosol can without revealing pock marks and roughness.



NP05 – The IQ starts to drop as owl time progresses and pumpkin time approaches, but it's been a long day for this dude. Aidan McCarthy has long since swallowed his pride and gone home, but Andrew King is still around and not too grumpy in spite of the late hour and lack of tea. I'm popping in and keeping Mike company in between tap-the-pressure-gauge sessions and hoping I can keep the 12AR safety valves from howling. The photo is blurred but you can see the mounting pins.



**Reefs** amers

NP02 – This was the starting point, a plate of rusty 3mm thick scrap mild steel which would be an attractive nameplate by sparrow-rise the very next morning.

If you look at the letters, which are commercially made brass letters, you will see that most of the brass worm-holes are off center. This is because these letters were originally made in a serif font but Michael had already trimmed off the pointed serifs and filed the ends down flush to replicate a simple standardized font.



NP04 – Here's a sight that gladdens the heart – a fellow taking great care with the detail of his work, even the tedious jobs like sanding and as you can see by the smile, enjoying his work. The holes have been drilled after careful measuring of the letters and each one has been countersunk. The mounting studs have been welded on the rear face and you can see the heat stressed steel shining on the right side – this would be flatted out by hand.



NP06-I have no idea why they didn't ask me to turn the headlight off, which I had running to load the dynamo, as I usually do.

Here Mike and Andrew prepare the mounting brackets for welding with the loco lamp and a lead lamp substituting for the annoying thermally cycling shunting yard lights – many of which happen to be 'darks' in this picture. (Since repaired in 2010.)

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NP07 - The brackets are in and Mike is busy screwing down the mounting nuts, trying desperately not to drop them onto the footboards and bouncing them out into the waiting ash pits. It's just past midnight and Andrew King has finally dropped off from the locomotive like a sated tick from a buffalo's flanks. There is no rest for Andrew yet as he's grinding like a set of Class 34's on an upgrade mineral train haul, plodding through the train's paperwork in the clubhouse. Andrew loves his paperwork ... not.

Upon close inspection on Mike's alphabrassical work of art, notice that there are no screws visible in the brass lettering. Michael 'hit the bonk' at about 2:15am and slouched off to sleep on the Cru-Boose (pretty convincing act) but he wasn't quite finished with his work for the night – see the next picture...



keels amers

NP08 - Spot the difference?

I took a tripod based photo of the entire loco at about 3:15am and hadn't noticed that the name plate had been, er, updated. Michael had sneaked out past the locomotive during the shank of the morning while I was head-back and trying to elevate some elusive zeds in the fireman's seat. (With the dynamo off for a bit of auditory peace.)

Michael had made the new sign with slip on tin-plate straps and she ran as 'lil-Suzie' all the way to Magaliesburg. This is in reference to the song, 'Wake up Lil' Suzie' and the challenge I once issued for a weekend of focussed Class 12AR work.



NP09 – When Mike was still working on steamers at Millsite, he was making badges and numbers for them and had actually made badges for a number of notable locomotives that were running at the time.

The as yet unpolished and undrilled 'Gerda' letters, for our Class 15F No.3016 were made when she was stationed at Millsite. They are unusual in being 8mm thick and milled from solid (and jolly hard) phosphor bronze instead of the more usual brass. Our Class 15F No.3016 was once one of the regular shunters at Millsite and a well shined presentation locomotive on SAR rails.

The white coloured letters are actually milled from powder-coated aluminium plate. The 15F and the 3052 lettering (with the number '3' being polished as a test) were also made during the short period that Dave Shepherd's 15F 'Avril' was stationed at Millsite before she was handed in to preservation to Mr. David Shepherd at Kimberly. The ovals are to be painted black (eventually) and mounted on the buffer beams.

## **PROJECT : Loco Minding :**

This was my first time looking after this elderly but surprisingly sprightly engine, which I had never seen run before and I was a bit skeptical of the stories I had heard of this one being hot little girl. (Although other female related words were used ... hint = woof!) The clean cab, with the bare wood scrubbed floor, looked bare and primitive too as I, as well as most of the other Reefsteamers, have become used to the well filled, brass-n'-copper-dripping boiler backheads of the mechanically stoked engines and this one is a relatively simple 'hand bomber.' Remember that our equally simple hand-bomber Class 15CA No.2056 hasn't run for a while, awaiting replacement of the worn and thinned superheater flues as well as repairs to the tender water tank and conversion of the tender to roller bearing axles.

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The right hand water column shields are virtually opaque and the slightly sticky pressure gauge needed some gentle tapping to get accurate readings on the down turn of the needle. However, the recently McCarthy-serviced turret valves were a pleasure to use. There aren't any Seller's valves on the firebox flanks either and the consequent lack of an intermediate steam control between the outermost turret valve wheels and the injectors themselves took some getting used too. I saw that even Darlene Reimers took a minute or two to figure it out the following morning.

Injectors OK though but with little of the deep-throated echoing copper-kettle injector song that you get with the bigger engines. On this particular engine deaf me has to listen for the discharge at the overflow – the steadily-hoarse rasping exhale from the outlets inconveniently hidden out of sight under the cab steps. (Most of the locos have outlets that protrude under and behind the steps and easily visible from the fireman's cab window.)

She doesn't have siphonic arch tubes either and I was wondering how much steam pressure I'd be losing when injecting fresh water without the assisted thermal circulation at the rear end of that extended boiler. As it turned out ... not much.

To my surprise, the 'hot little woofer' stories turned out to be true. You always have to allow for the railway man's built in tendency to exaggerate their experiences to make a better or more dramatic or amusing story. But what I had heard turned out to be fairly well seasoned and not needing much extra sodium of the chloride after all. I was fighting not to allow the safety valve to lift overnight and foul up the newly polished boiler cladding. It was a bit ridiculous actually – with a passive dark red firebed, some massive 'bones' of shunter's clinker shoved up over the drop grates at the tapered front end and 'the full width bank of coal only burning on the leading slope – and the steam pressure still rising over 600kPA while I was chatting sociably with Michael and polishing his new brass 'Susan' letters. I was expecting a 50-100kPA drop and to suddenly see the pressure gauge leaning over the tight side of 12 o'clock was a bit of a shock.

There is just something right about the proportions of that firebox. It isn't particularly wide or deep, but it is quite tall with a short fire arch. The refitted boiler (hence the 'R' in the locomotive classification) is oversized for the cylinders and the extra length is and diameter is obvious when looking at the front end. I gotta admit that I'm impressed with this machine!

The coal wasn't great. It was fast burning but light and clinkery – peppered with ash and sun-powdered dog-putty on top of the tender pile – but that would be Darlene's problem the following day!. There was little in the way of secondary combustion – very little of the cheerful spit-n'-crackle one hears when a half dozen shovel-loads of good quality coal start taking up the heat and it drives the volatile gasses off. Just pale yellow flames going straight to blue. It felt like I was stoking carbon impregnated shredded wheat rather than the usual heft of the dusty diamonds. The crew struggled with that coal on the way home – and clinkered firebed and the coal being hard to place properly within the fierce draft around that fire arch. (The Goodfellow tips had gotten damaged during the run and the unrestricted blast was displacing the coal in the firebox and also making it burn too hot, hence the clinker.)



LM01 – How to waste steam and influence people. (Negatively) This is the second of two blow downs I had to do before the pressure gauge eventually settled down to 1200KPa and stayed reasonably put until easing off to 1000KPa by tickle-time at 4:15am.

The (relatively) small locomotive, with the short tender, was parked so far back that the waste steam was blowing through the workshop windows and some of the machines got a drizzly, warm, midnight bath – but sign-writer Michael came hurtling out like a burly, musclebound missile and had me back off the blow a little bit.



LM02 - You can see the discharge pipe's collar is leaking. I had attempted to tighten those two through bolts earlier in the evening, but they're tight enough – the seating or the pipe end must have gotten damaged during the hydraulic testing prep.

There is a serious misalignment of the pull rods that come out right above the raised cab floor (Not a fault – just some very poor engineering) and it fairly difficult to open the LHS valve from within the cab – but they can closed by hand. I jimmied this open with a short crow bar on the tertiary link and moved back VERY quickly!

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Ree s amers



LM03 – The brand new fire arch ably reflects the heat of the drowsing fire with the individual fire-clay bricks still discernable. The separate bricks of the arch have already fused via heat and mortar and the visible joints will fuse over time. Eventually, after some hot runs, stalactites will start to form on the concave under surface.

That's all the shunter's junk at the front – only the banked coal right at the back was still burning – you can see the tapered glow on the fire arch



LM05 – Feed me! Actually there's enough incandescent carbon in the firebox for now. Everyone appreciates the neat copper-fenced table with its asymmetrical layout facilitating the right-handed fireman. The actual flame plate and combination heat shield is the vertical plate below. It is removable to facilitate firebox access.



kee s amers

LM04 – The same fire arch being built. The fire arch in a simple firebox without siphonic arch tubes has to be laid on a curved former for support. Custom fit wedges are cut for the sides. Just like a roman arch – the keystone at the top locks the reassembly together as the wooden former is gently lowered and then withdrawn.

The angle iron braces (one visible on the left) actually burn away in the fierce heat – but the fire clay bricks fuse to the steel walls making the arch fully self supporting – it is an interesting piece of architecture right within the fiery heart of a steam locomotive.



LM06 – The relatively simple driver's side controls of the 12AR – there isn't even a steam chest pressure gauge - the one visible gauge being the dual vacuum gauge for the brakes.

Unusually, the regulator lever is to the right of the brake ejector (The black-painted quadrant is just visible pointing out above the cone chambers) and this is our only locomotive that is driven primarily with the right hand.

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LM7 – Of interest is that big protruding valve wheel with the extension handle on. This is the turret steam valve for the left injector. As this locomotive does not have Sellers valves, there are no intermediate controls for the injector steam supply – the corresponding turret valve on such locomotives is opened at prep and left open. The Seller's valves operate with pull levers alongside the firebox and from a seated position. (Roughly under where that black funnel is.)

On this Class 12AR locomotive, the turret valve is modulated in use, hence the extension lever – but with healthy injectors, most of us just open it 2 to 2  $\frac{1}{2}$  full turns, leave it and then modulate the injection water in the conventional way. Only then is the valve opened up.

That brass valve next to the black funnel is the local valve for the grate shaker. That massive copper 'pipe' passing behind the water glass and the injector is actually the traverse rod for the regulator. Even though it's not actually a pipe, it still gets skim-blistering hot in use.



ice s amers

LM8 – Injector practice. Most of the older locos have L-shaped kick-levers which protrude about a inch from the floor, for their injection water valves,. They are operated by heel n' toe, but I've always found them difficult to use with big feet, stiff knees and long legs.

I'm practicing operating the valve with feet only and also monitoring the closure by ear alone – something that I find hard to do being deaf. When a hot injector is finally shut off, it discharges with a croaking, distinctly popping sound before finally falling silent. As these water valves are plug valves, if you kick it too far over-center, the injector water valve opens up again and silently too. As you've already shut the steam off, the tender water just runs quietly away into the night – or until you step into it with leaky safety shoes!

See that black lever just in front of my right foot? That's the blow down lever and I would dearly love to speak to the silly arse of an engineer who placed it there with such badly offset linkage.

# **PROJECT : Morning Preparation :**

This went pretty much without incident, surprises or breakdowns. Recently bereaved Darlene Reimers was back on the footplate and cheerfully swinging her own custom made shovel, while senior loco-driver and elder entertainer Attie de Necker was to be the outbound regulator servo. Shaun Ackerman assisted the fireman's prep as Darlene wasn't familiar with the 12AR class, being more used to the 19D and 24 Class of Friends of the Rail, and the 15F and 25NC locomotives of various groups.

Darlene was the very first steam person I ever spoke to when investigating the possibility of getting involved with steam. I took an initial trip with the Friends of the Rail Easter Bunny Run 2007 and Darlene, totally unsolicited, invited me up into the cab after I was taking detail photos all around their Class 24 Loco – in the rain. (Early signs of steam-driven mental instability.) The late Flip Reimers was driver at the time and as I later came to expect from him, he treated me like a real gentleman. As much as footplate people like visitors, visitors can be a nuisance in the cab when preparing a locomotive or putting them to bed after a run and I'm sure Flip would have preferred for me not to be there...

It was good to see Darlene back where she belongs – in close proximity to a boiler backplate and hot-timing her feet on the freshly sanded floor boards while handling the dusty diamonds. It will, of course, never be the same for her as she was usually rostered with her husband, Flip and they ,were quite a celebrity couple although they where characteristically modest about it. But his abiding love for steam which has been passed on to her, lives on – thus, Flip is still with us in a way. Darlene has since been boarded from firing as she has been found to be suffering from epilepsy – so this was one of her very last runs.

The morning preparation is always a bit of a shock for the loco minder. He or she has been alone all night, working on the loco and taking a nap if they are able, and suddenly the chilly early morning depot is swarming with obnoxiously cheerful coach controllers, service staff and kitchen crews reporting for duty. The coffee pots usually take quite a hit in the club house, paperwork is being checked and the coaching staff are being signed on. There are always a few late comers who get in under the wire, sometimes as the locomotive has already moved off to take charge of her train.

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And then the sad looking leftovers – a steaming pile of warm ash, puddles of water alongside the tracks and scattered pieces of coal that tumbled from the tender side as the fire irons were withdrawn and replaced. And this morning, a forgotten cup of tea ... Attie de Necker was here.



MP01 – It is about 5:30am and I've exchanged the shovel and the pricker for a camera. FireLADY Darlene Reimers has just mounted the cab of this iron horse and is checking the fire to see if I left some nasty surprises for her, while driver Attie de Necker is already brewing hot sweet 'spoorie' tea in the club house's kitchen – tea before the loco. Gotta get your priorities right, I suppose.

I had just discovered at this time that Michael Thiel had swapped the name plates sometime in the early hours of the morning while I was trying to catch a snooze in the cab – head back and eyes closed in the fireman's seat.



ee seamers

MP02 – With his elderly but still flexible and muscular back just touched by the first rays of the rising sun, senior driver Attie de Necker gets going with the morning round of greasing and lubrication, with the cheerful sound of shovel scrapes resounding from within the cab.

Attie is applying the grease-gun to the wheel-center nipple of the intermediate driver – the grease going through to the thrust faces of the axle bearings and acting as a backup until the axles brush up sufficient oil from their keeps to lubricate the journals and then to hydro-dynamically pump it through to the thrust faces as the locomotive starts to move. A disadvantage of the axle keep system is that the axle box thrust faces are only lubricated after several turns of the wheels.



MP03 – The seasons are changing and unlike South Africans, I enjoy highveld winters. Here we see the characteristic deep red dawn that is accompanied by the increasingly chilly nights and mornings.

They are invigorating, great for voluminous steam effects around the engine and they keep the numbers of the depot flying syringes down.



MP04 – Rostered homeward driver Shaun "Smudge' Ackerman keeps himself busy polishing his SAR era plated scoff box. Most of the crews have one in various degrees of reflectivity. Some are brass plated while others are more robustly nickel plated, like this one.

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MP05 – Facing away from the brightening sky, there is some early morning cleaning and preparation work already going on at our tenant's tracks – their train would be leaving the day after our trip, also pulled by our Class 12AR. This is the elliptic roof rake of the Shongololo Express, called 'The Dune Express.' The generator van is silent at the moment – the train is running on 'ground power.'



MP07 – Sunrise over the empty eastern locomotive yard – the dawnbreeze has picked up and I'm about to lean on the electrical box just visible at bottom left and face closed-eyed into the rising sun and enjoy a few more moments of peace and fresh air before getting into the noise and bustle of the morning preparation.



MP09 - Two kinds of lubricant. On the left - a bottle of MH oil for the locomotive and on the right, a cup o' tay for the driver. While Attie's head was buried amongst the valve gear, I was just dying to drop some grease, or perhaps a bit of clinker into that vulnerable, unprotected, oh-so-open cup of tea ... but I let Attie enjoy his tea in peace. I can be a nice guy...sometimes.



Ree seamers

MP06 – Opposite from the waking Shongololo Express, our own train slumbers on for a few more precious minutes although the coaching staff have already started to arrive. The white tarpaulin on the back deck of the water tanker is the protective cover for the fire fighting petrol-engined water pump. I was lucky as the minder – the auxiliary water tank had already been filled before taking the shift.



MP08 – Sunrise on the cab plates – the climbing morning sun breaks through the optical obstacle course of the Reefsteamers buildings and gives the locomotive cab sides a golden first-light kiss. The fiery light belies the chill in the air on this first morning of Class 12AR No.1535 Susan's re-entry into full revenue service.



MP10 – A freshly oiled crosshead awaits action at almost BDC. At start up, the moving parts are oiled with Compounded Steam Oil – which is thick, green and very viscous.

When the loco is in service, the crossheads, the slides and the piston rod are lubricated via oil drip-fed by three oil pots. Two of them are visible and the pipe of the third can be seen to the right.

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MP11 – More lubrication work, Madame Darlene has just blown out and refilled the four-port Hydrostatic lubricator with flame plate warmed and thinned Compounded Steam Oil. We usually just call it 'Valve Oil' or 'Cylinder Oil.' It's a messy and somewhat sticky job so it is time for a quick wipe up with some waste before chucking in more gravel with her customized short handled shovel.



MP13 – Like first bird that deigns to tweet-up in the morning, we also get the first coach person to venture across the yard. Here is our wild life, trainee Safety Officer Willie Wehmeyer, mounting the Power Van to unlock the compartments and start up Mr. Perkins – our characterful but somewhat temperamental generator.



MP15 – Turning to the left from the previous picture, what could be more appropriate treatment for our somewhat weathered Reefsteamers sign than to be enhanced with a trail of fresh steam from a very perky boiler? The engine blew off several times during the morning prep time. The boiler cladding was wiped down once more before departure though, and care was taken to ensure the tender's water tank was to the brim before departure.

Notice the conveniently built-in tap-off and vent valve between the pair of safeties and the dome.



**Reefs** amers

MP12 – The overnight fire is being dumped with the grate shaker going and the ash pan coolers running, making a photogenically backlit cloud of steam. That is good old 'Stitch' Versteeg standing in the foreground – an experienced workshop man himself, he would be assisting on the coaches today.



MP14 – The generator is running and the coaching staff are starting to board the coaches and stow their luggage. There is activity in the center of the train where the kitchen car is being prepared. Unfortunately I'm standing too far away to smell the bacon that is already being fried up for the day's bacon and egg sandwiches.



MP16 – Here's what is going on at the other end of those threatening safety valves. Shaun Ackerman assisted Darlene (unfamiliar with 12AR) in cleaning out and how to lay out the new fire. This locomotive is a chipmunk – she likes her coal heaped in the back corners like the rodent's cheek pouches. A skim-bank of fresh coal has been laid and the volatiles are burning off, but the rest of the firebed is flat, radiant, rather than flaming. and evenly spread right through to the tube plate – as evidenced by the even glow on that sharp edged new fire arch.

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MP17 – Michael wipes little Suzie's nose before her first run. In accordance with our simple aesthetics policy, Suzie's adornment was a simply a black nose wheel with a bare metal rim (wiped with oil to prevent rust) and a pair of little brass bokkies – no other brass trimming or propeller wheels. Notice the greasy hand prints on the red painted forehead hand rails – mementoes of the midnight work.



Ree seamers

MP18 – The first few piston strokes are always dramatic as the steam condenses in the cool of the morning. It was worth hanging around for this shot although the pulsing steam really foxes a camera with an automatic focus at medium range. You also need to cover your lens or move smartly if you don't want rapidly cooling cylinder oil beading and smearing your optics.

## **PROJECT : All Aboard! :**

The outbound trip met with little incident although the coal was already proving to be troublesome. Delays were minor today in the urban areas but we got 'put in the hole; twice in the outlying radio territory. It was a bit unusual to be held for two Eastbound Goods trains on a Sunday.



AB01 – Madame Dianderson sneaks in a few last minute pics before the engine moves off to the Coach Yard and she has to report for Coach Controller duty. Diana has become one of several official Reefsteamers photographers and she show-cases her steam pictures on her photography business' website.



AB02 – Here's a relatively new water-damped vacuum gauge to test the train brake vacuum from the rear of the train. It has an anticlockwise range from 0-100kPA and is self sealed via the flange being sucked up against the brake pipe's sealing washer.



AB03 – Shaun Ackerman resolves a problem missed by the other coach staff – the water transfer pipe on the auxiliary tanker hadn't been tied up properly. Shaun is rigging up a wire sling before tying up the ends – he let the pipe flop down to test the length of the sling if it would keep the pipe clear from the track work. Notice an easily missed detail – the eye bolt for the shackle links for the safety chain is spring loaded. Shaun was not officially on duty at this moment but was supervising the trainee Safety Officer and the Train Manager.



AB04 – Susan the Class 12AR has backed up to her train and is waiting for the brake tests and the visual inspection work to be done along the train. The Class 12AR's were originally re-built for service on the Witbank Coal fields and are meant to be heavy freight draggers, rather than passenger engines. Nonetheless, Susan does well with a surprising turn of speed for a locomotive with such small wheels and costs just over half as much as the big locos to run.

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AB05 – It's gonna be a great day! The sun is upping, the sky is blueing and the loco is s-s-s-steaming! The 12AR's boiler is over rated for the cylinders, even though it is an old fashioned boiler without siphonic arch tubes. The steam pressure hardly took a dent when moving the locomotive to the west end of the coach yard and here the lower rated front safety valve is raising a plume against the winter-clear sky of the morning. Come on! Let's get going!



AB07 – The Chief Engineer was a little grumpy at having to spend Sunday on the train where he could have been in the workshop and reinstalling the gearbox on the 7 ton Dean Smith lathe. (One of the full time staff dropped a spanner and a few allen head machine screws in amongst the gears – literally a spanner in the works.) Andrew is cheered up with an affectionate hug from The Boss Lady.



AB09 – A sight to gladden the operator's heart – a good natured crowd of people boarding the train. South Africans, being herd creatures by instinct, always tend to all try to board together at one or two coaches without spreading out – it is always funny to watch. Laurence 'Sputnik' Posniak of SANRASM certainly knows how to find bookings and fill up a train.



Ree seamers

AB06 – Wiring up the brake hose coupling between the loco tender and the first coach. This isn't such a dodge as it first appears as the vacuum within the hose (train brakes off) sucks the two coupling halves together and makes an air-tight seal. It is when the brakes are released and the train brake pipe vacuum drops, the couplers have to rely on their own clips. A stiff (especially in cold weather) or misaligned hose, or one with a worn rubber washer, may not seal under vacuum again – which means the brakes won't release



AB08 – Facing into the rising sun and puckering up for Safety Officer Willie Wehmeyer – Douwlina Swanepoel takes the mandatory breathalyser test required for all footplate crew and coaching staff. Even the off duty Reefsteamers, including certain photographers, have to take the test.



AB10 – As Metro Rail Stations go – the Maraisburg Station isn't bad at all – clean, functional and still active. On the right, an Eastbound Sunday-lengthed (shorter) 12 vehicle rake of Class 5M2 is just pulling in.

One somewhat confused lady, complete with luggage, earnestly enquired if our train is the train that goes to Cape Town.

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AB11 – Douwlina Swanepoel looks a bit nervous as she (wo)mans her post as a coach controller. Reefsteamers has recently adopted the policy of assigned only one or two coaches to each 'CC', as per the guide manual. Originally they all patrolled the entire train and because of human nature, tended to congregate in their own social huddles. The coach vestibules are the only place where the coach controllers can stand – they don't have seats assigned to them on the train.



AB13 – While the passengers are boarding, it is time for a grease up and a wipe down for our pretty 'little' lady. Off-Duty home-bound fireman Michael Thiel is wiping down the cladding of the Reverser's lock cylinder. Driver Attie has already done oiling of the crossheads and the slides, hence the green 'Cylinder Oil' can on the buffer plates.

This is one of the only two conventional locomotives that we run without smoke deflectors – the classic outline being a treat to see.



AB15 – The racial balance in this picture is opposite to what you'd normally see in South Africa. Normally you'd see a whole coach full of those of African origin, or sometimes Indian depending where the marketing efforts went.



eefs amers

AB12 – It's always fun watching the kids on board the train. While the African children are often more familiar with trains in general, often used to the commuters trains – the Caucasian kids usually never experience trains in their day-to-day lives, much less one hauled by a real working steam engine!



AB14 – Off-duty homebound driver Shaun Ackerman is greasing the connecting rod's big end at platform side. This is a newly fabricated brass bushing and lubrication here is critical during the run-in period.

Elderly Attie de Necker is still quite capable of doing this, and being shorter, fits in better under the walkways too. However Shaun was also using the greasing time to check and monitor the newly machined and fitted bearings in the just-rebuilt motion.



AB16 – The two corridor type coaches used for day trips, being 'Kango' the kitchen car, and the Sandstone Estates owned Ex-Locomotion Restaurant Sleeper Coach No.28332, become human obstacle courses as their corridors fill up. Here, Morris Posniak, not exactly a heavy weight, still has to scramble as he starts making his way through the train to make announcements via megaphone.

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AB17 – Most outbound Reefsteamers trains stop at Krugersdorp to pick up a Transnet Pilot who guides the crew through the radio controlled rural section of the Mafeking Line. We sometimes pick up passengers there too and today we had an unusual amount of 'second boarders' at the distinctive curved station platform.



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AB18 – One of two long hold ups we had on our outbound trip, an eastbound Class 34 Diesel still in the old SATS (South African Transport Services) colours. As Transnet continues rationalization and stock reduction, the Class 34 is fast becoming the predominant main line type – and they are very gradually making way for the ugly but impressively powerful Class 39's. One day, Reefsteamers will probably be preserving 'boring diesels like these as they become rare over time.



AB19 – A brake transponder in service on the trailing end of a passing AIR-braked container train – a rather bland replacement for those characterful V8-designated guard's vans. It measures the true brake pressure at the end of the train and sends the signal via radio to an instrument up front in the cab.

Notice this wagon has the old fashioned dual vacuum pipes as well – being a dual air or vacuum braked vehicle.

The brakes on a train, whether air or vacuum, operate in a wave that travels from the front towards the back – as the change in the train pipe pressure activates the brake cylinders one by one. Thus the wagons or coaches at the front of the train begin to brake before those at the rear do, and they release their brakes quicker too. This causes differential movement between the couplers and they may run in (buff) or pull out harshly (slack) on a poorly driven train, uncomfortable jolting for passengers, damaging to the cargo, and possibly even damaging the couplers or draft gear.

Apart from the obvious function of monitoring his brakes for failure, the train driver uses the transponder signal to judge when his brake application really has reached the end of his train. More advanced transponders used in America and other countries with very long trains can remotely release air from the rear of the train and thus start the rear end of the train braking at the same time as at the front.



AB18 – Under the clear skies of a mild early autumn day, we are offloading hungry passengers at the Magalies County Hotel Stop. Even before the train stops, a smart Coach Controller starts 'whipping up' and herding their 'sheeple' through to the center coaches which line up to the short platform. The inconvenience of the short platform is made up by the fact that the hotel and picnic grounds are right opposite the rail side halt – just out of the picture frame.

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## **PROJECT : Servicing :**



SM01 – The crew didn't waste any time and had the locomotive uncoupled, advanced to the points past the level crossing (out of frame to the right) and already backing up on the passing loop track by the time curious onlookers were watching.

We had a small contigiment of keen photographers dogging the loco today – somewhat inexperienced people who kept getting in each other's way. (And my way too but one has to be polite to your cattle, er, passengers, is that not so?).)



SM02 – Curve in the Cosmos. This is the north leg of the turning triangle which no one else uses but us – but the Krugersdorp pilot has to be present to unlock the entry points to the lead track. A coming Reefsteamers project is to send a team out to service the triangle, clear the ash n' clinker (it hinders drainage of the ballast), check the fishplates, clear the flange-ways and to service the points, their tumblers and rodding (including a much needed lube job) – as this obsolete trackage is no longer maintained by Transnet.

This tight curvature almost made us stop running our mighty Class 25NC to Magalies altogether, due to extra wheel flange wear on the long wheelbase, but now when that locomotive is here, we just won't turn it around. Having a dual axle Bissel truck at the rear – the Class 25NC locomotive runs well enough in reverse whereas the more usual single axle Bissel truck restricts a locomotive's safe operating speed in reverse. – so awkward appearance aside, we can safely run the Class 25NC loco backwards for one leg of a typical Magaliesburg Day Trip.



SM03 – Two old technologies meet – the iron steam locomotive and the iron-age ritual of gathering grass stems for drying to make material for roof thatching and for matting. With the poverty, defeat and backwardness of some of the folk in this country, all the natural curiosity seems to have been squeezed out of them.

This lady hardly gave the locomotive a single glance but carried on with the same mundane tasks her mother, grandmother and great grandmother once performed.

The Class 12AR is backing up very gently on the North Leg of the triangle and is making the last move before fire cleaning starts.



SM04 – Fireman Darlene Reimers gets going with the fire cleaning. She's doing this lot dry without the ash pan coolers running, but the fire grate hasn't been properly shaken yet. This locomotive has small oval access holes to the ash pan, so one does what one can to get as much ash and kibble out before dropping the hot chunky stuff.

As you have to run the injectors to pressurize and operate the ash pan coolers – you need to have space in the boiler for the water. Thus on the outbound fire cleaning, the crew try to minimize the time the coolers run. An overfull boiler would be messy if the safety valves lift and also carries the risk of priming when the engine is moved back to its train. The boiler water level can be manually lowered by opening one of the two blow down valves, but that is wasteful both of water and the coal used to heat it.

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SM05 – Reefsteamers has had great success in using Vesconite on steam locomotive bearings and currently have four locomotives with Vesconite equipped valve gear – Class 25NC, 15CA, a 15F and now the 12AR. The GMAM Garratt has custom moulded vesconite plates in the Bissel trucks although the valve gear is still brass bourne As brilliant as Vesconite is, one thing it is not tolerant of is tight working clearances – needing to be cut slightly more than traditional brass or bronze.

The left return crank's eccentric bearing (top joint in the picture) had been machined a bit tight and had been damaged by the run. With extra grease it would get us home but at a reduced speed – all the other bearings in the rebuilt valve motion were operating as normal.



 $\mathsf{SM07}-\mathsf{Servicing}$  amongst the Cosmos. This is a rare treat and this area will soon become rank and brittle with winter grass. The fire cleaning has started properly as evidenced by the steam discharge from the ash pan. BOTH outbound and inbound crews are working together.

Homebound driver Shaun Ackerman is shaking the grate and homebound fireman Michael Thiel is receiving instruction on greasing while Outbound Driver Attie is inspecting and guiding Mike's work and Darlene is punting ash. Dianna Sanderson (behind the sign) is taking service pictures and I'm just about to mount the tender and start trimming the coal.

Michael is receiving greasing instructions as that is normally the driver's responsibility, and not officially performed by the firemen. Although the driver must always check – having a trusted fireman do the greasing can save time. Shaun is doing the firebox work being familiar with it and giving Michael the opportunity to get some training.



Ree S amers

SM06 – A view of the same motion joints in the workshop. One of the nasty surprises we encountered in getting Suzie back on the road is that one of the connecting rod bushes 'took a walk.' We think we know who it was but obviously have no proof. We discovered this only one week before Suzie was due to run.

With no hope of recovering the existing bushing, a new one had to be fabricated from scratch by Patrick Ackerman, Kames Thomson – working on the large boring mill by the light of a weak lead lantern – we had no lighting at that end of the workshop at that time (21 March 2009).

This was a trial fit for clearance. The grease holes still need to be drilled and chamfered in their slanted rows around the circumference.



SM08 – After fire cleaning, it isn't infrequent to lose a lot of steam pressure with the fire being much reduced in size and steam still being consumed to run auxiliaries. Cold air also gets in through the necessarily thinned and holed fire and tends to cool what little hot air passes through the boiler tubes at this point. The water level tends to drop too.

After a somewhat brutal fire cleaning to get the bones out, and a single round of firing, Susan's boiler is again on the sunny side of 1000kPA. Shaun Ackerman has left boiler water level still only two-fifths up the glasses. (In the photos, the water is more visible in the right hand glass – the refractive meniscus roughly in line with the base of the valve wheel's finger upper grip.) Shaun has left plenty of head room to inject more water should the boiler pressure continue to climb and the safties valves lift – said injected cool water being used to lower the boiler pressure.

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SM09 – Knuckle chopper in action. Michael Thiel is discovering the delights of using sticky grease sticks (Called 'Skaap Worsies – Trans = 'Little Mutton Sausages') in a grease pump. These pumps couple to the grease nipples with an action similar to a bayonet light bulb – slip on and twist the collar to lock.

The plunging piston chops the end off from the grease stick and pumps it in the cavities when the handle (at 2 o'clock) is pumped down. Inevitably grease oozes back past the pistons of worn tools and out back through the hole – Michael is gathering up the last smeared bits of grease for the final stroke.



**Reefs** amers

SM10 – With the fire cleaned and re-laid, the coal trimmed and all the seemingly hundreds of joints lubed, the locomotive has been backed up to the train. With the extra 'running in checks' the servicing took a while and the train had arrived a bit late – we had little more than an hour to wait before heading back to the Hotel Stop to pick up the passengers.

Notice that Michael Thiel had removed the slip-on lil' Suzie name plate and the locomotive is now displaying her proper, more dignified name. The 'Lil' Suzie' name plate is now permanently displayed in the club canteen.

PTO for more.

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## **PROJECT : Homeward Bound :**



JH01 – Locomotive Hairball. As our Susan started her train and passed over the level crossing at Magaliesburg, line-sider Patrick Ackerman saw something come rocketing out the chimney, and then plummet back to earth and bouncing off the sidewalk plate. The driver heard it too and throttled back – but Patrick waved him on once he realised what the hairball was. He also had the presence of mind not to try and pick it up as it would be too hot to handle. Fortunately it didn't hit anyone or damage somebody's car.

The 'hairball' was a tube expander, one that was known to have gone missing from a set. It was suspected as having dropped down the blast pipe and into the steam chest passages and was fished for with wire and draw tape but to no avail. So we assumed it just 'took a walk' or maybe got accidentally discarded amongst scrap It turns out it was lurking down there after all and came loose with the fierce upgrade draft.

The rocketing tube expander bashed out the Goodfellow tips from the blast gear. These help to modulate the draft from the steam exhausts. A steam loco's draft pipe is always made oversized and then throttled down as a form of tuning. In America, they call this practice 'setting the nozzles.' Even more so than motor car engines, a reciprocating steam engine is greatly affected by it's 'breathing' characteristics.

Without the modulation of the Goodfellow tips, and running on raw unthrottled blast from the cylinder exhausts, the locomotive burnt the coal very fiercely – overheating the fire and forming clinker. The draft was so fierce that the fireman was having some trouble positioning his coal properly in the back corners. It also made the door-open time for the firebox more problematic in terms of deeper, faster drafts of cold air being drawn in above the fire bed.



JH03 – The top bunks in the sleeper compartments are always popular with the kids – obviously adding a little more to experience during their steam train adventure.



JH04 – People who experienced train travel in steam days often reminiscence about the scent of the coal smoke drifting along the platform. Here is what that smoke looks like from a driver's point of view.

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JH02 - The contradictory phenomenon that is Attie de Necker. He is our senior driver and elder statesman who is almost obnoxiously cheerful and good natured, and yet when at repose, and unaware of being observed, he has probably the saddest face of all the Reefsteamers.

There are many memories inside that greying head, and the loss of a much loved wife still preys on his mind. It is literally the activities and the social life at the depot that keep this man going.

Attie is a regular on the trains even when he's not driving – acting as Train Manager or in a supervisory role.



JH05 – A part of the charm of the old choo choos is that one can see all the moving parts and experience the energy being transformed. Andrew King squats down at the Krugersdorp platform and casts a cynical glance at the RHS valve crosshead. This needed much set up n' adjustment during re-assembly. Clearances at the loco's front end are quite critical to avoid extra wear on the valves and pistons. Unlike those of a car engine, the annular surfaces of the valves and pistons of a steam engine make no contract with the engine's parts and only the piston or valve rings should experience friction.



JH07 – Disembarking at Maraisburg – the cheerful but tired crowd of passengers step out in some confusion as they look for the subway to get off the platform. The fact that the locomotive is on the opposite end of the train and the platform is on the opposite side disorientates many people until they 'click'; and just follow the people ahead of them. 'Oom' Attie in the center foreground is sneaking a glance at that young lady in the white tee-shirt.



JH09 – The signals are green on this mellow Sunday evening, plenty of time to check out the green aspects as the commuter trains are not running at peak. 'Our' signal is the short one to the right. The white lights on the left signal refer to the points visible at the lower left, just to the left of the yellow speed limit sign. The points are set 'straight.'



Reefstamers

JH06 – Under the Krugersdorp Station sign we see an overhauled Class 5M2 motor coach coupled to a first generation metro coach. The overhauled units have plain yellow doors regardless of the grey backgrounds whereas the older units, which were done with slightly more costly masking, have the grey chevrons painted onto the doors.

These decades old commuter sets are just starting to be phased out with the prefabricated Class 8M's with semi streamlined cab-ends.



JH08 – Some of the passengers take the chance for a quick tour around the locomotives cab before going home. It's always a tossup between being friendly to the visitors and the inconvenience of a crowded cab, especially a relatively small one that Susan has. Driver 'Smudge' Ackerman, in the greasy cap, is asking for the grease gun.

You can't help but notice the shine on the tender's paintwork in the foreground.



JH10 – This was an unusually long stop as we took time with the greasing and motion inspection, as well as entertaining curious passengers. The early autumn sun is now setting with the speed that surprises those of northern climes, as the last few passengers depart.

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HB01 – As soon as the passengers depart, the litter cleaning begins. Even with the most well behaved of passengers the coaches often get pretty dirty with the inevitable spills caused by the unpredictable movements of the train.

But some trains loads of passengers are just disgusting pigs, to put it mildly, and leave the coaches in a real mess. What you see here is actually very mild compared to what we put up with at times.



HB03 - I'm looking west into the very last light of the day as our tired train rounds the wide radius curves of the running tracks of the goods yard at Germiston Station. It's been a long day for me as I'd been on duty since 6pm the previous evening. But even for the day crews it's been a long haul as most members had reported for duty between 5 and 7am that morning.



HB05 – In the shadowed gap between the tender and the auxiliary tank, Andrew King unwinds the baling wire that was used to help keep the water transfer line clear of the track. Many SAR locomotives have a doubled brake line assembly and the center, unused brake pipe is visible above Andrew's hands



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HB02 – The Coach Controllers get on with the glamourous (not) task of a full-train 'chicken parade.' Traditionally, the security guards close the windows from the rear towards the front and the Coachies clean up the loose litter. The coach seats and floors are washed down before every trip – a tedious task with all those seat supports in the way.

These are the old 3<sup>rd</sup> class fibreglass seats. One of our wish-list jobs, pending availability of money, is to make slip on padded covers for a more comfortable ride. But the bare Alcatraz style seats are, admittedly, easier to keep clean.



HB04 – How many times as a teenager and a young adult have I sat on the platforms behind that bare face-brick wall and watched the Germiston hunters, or hoping to see some action from my carefully selected window seat in a waiting commuter train. And here I am now on the OTHER side of that wall on a steam hauled train – hauled by loco upon which I've helped to prepare and service. Quite a different perspective and a privilege too.



HB06 – This is a bit unusual, filling up the tender before a fire dropping – and the first time a 12AR has been at the water tower for quite a few years! The locomotive would be working again during the week to haul the Shongololo Express train set – so the tender is being pre-filled to save time.

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HB07 – The business end, tinted deep gold by the yard lights, these are the stainless steel sheathed cylinders that have worked so hard today, still warm but quiescent with no steam leaks from the glands, nor any issue from the cylinder cocks, due to the newly served regulator still sealing nice and tight.





**Reefs** amers

HB08 – Last few puffs – the tired 'little' lady trundles thankfully into her bedroom, with her fires dropped but the boiler still under residual pressure. She is moving with the strange grace that only a creeping steam locomotive can achieve, with barely more than a sibilant hiss from the front end and a slight gritty rumble from the wheels. It is now past 8:20pm and we're all pretty tired – but still had enough energy for a 'whirl of tea' and a good long chat about the exploits of our wonderful 'little' fire chariot on her first run.

HB09 – Reflections. This report had almost been lost bit was retrieved from archives, completed and sent almost a year after this particular event. Year 2009 had been a tough year for Reefsteamers. The economic recession made the market sluggish and unable to bear price increases, but our costs are increasing all the time. We are reaching the stage when most of our boilers are reaching the end of their service life before needing expensive repairs.

In 2010, Reefsteamers faces the challenge of survival with our operating costs finally beginning to outstrip our income – and creative solutions and strategies are being sought.

To continue to experience scenes like depicted in this report, we are going to need to pull together and fight for the survival of steam at the Germiston shed. It's going to take sacrifice, discipline, and effectual, imaginative leadership ... and some, perhaps uncomfortable, changes need to be made.

If we don't, those gracefully spoked wheels will rust to the rails, and the beating heart of steam at the Germiston Locomotive Sheds, after over 130 years, will finally fall silent.

This Photo Essay was compiled by Lee D. Gates on behalf of Reefsteamers. For observations, corrections and suggestions – email me at <a href="mailto:leeg@leaf.co.za">leeg@leaf.co.za</a>

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