

The job took some time, dictated by the measured, stately pace of the drilling. Tapping went with care, with Patrick guiding the tap itself (Pic E03 above) and making sure the extension set-up didn't disengage from the tap's drive head. The flexible joint formed between the tube and the drive socket's bolt proved useful in keeping the alignment straight (Pic E04 below) with Dawie working at the opposite end of all that leverage. Patrick's gloved knuckles took a bit of a beating. He himself was cramped up behind the table plate and his cranium tucked between his patellae for a better view ... but he looked cheerful enough at the progress.



E04 – The tap in action with Patrick using both hands to keep the shaft aligned. The streaky black marks are oil drips and the square shank at the top right is a spare tapered tap lying loosely in a tube.



E05 – The extension bar is just long enough to clear the smoke box and Dawie has free room to swing the tommy bar to rotate the extension. He caught his knuckles a few times on the protruding studs. In this pic, he is just about to turn the tommy anti-clockwise.



E06 – The three newly threaded washout plug holes still weeping oil from the thread cutting operation. The light brown colour visible through the holes is the rust-tinted lime scale that lines the boiler shell.

Dawie had enough room to swing to his (Swak) heart's content with a two foot gwala bar passed through the outer end of the tube. If this was a simple parallel thread cutting exercise, the fellows could have just run the tap in and then out again. But as this is a tapered tap, and scraping the whole slightly larger, the chippings would have to be removed. So the fellows had to rotate in a turn, back out a turn, rotate in a turn and a half, back out a turn, etc. Just like cutting a brand new thread on a newly machined stud or a bolt blank. Dawie, of course, was working totally blind to what was going on at the tube plate and following verbal instructions.

Lunch time rolled around after the first plug had been cut. After topping off their bunkers on Andre van Dyk's stew, the Acker-joen patent washout plug tapper underwent a post patent modification. One of the issues that slowed Dawie down was that he could only put the gwala bat through at 180 degrees through a single hole. As he had to lock the outer end of the bar against the smokebox ring with his foot (As in Pic E05 above) the job was slowed down because of restricted reach. They fired up the radial arm drill and drilled another hole at 90 degrees to the first, which eased the swing in quarter quadrants. The second and third washout plugs went a lot quicker.

The plugs themselves were manually wire brushed clean before being inserted and tightened up for the evening boiler testing. The afternoon was getting on and the boiler boyz had to get back into the firebox and finish off beading the last few tubes. But a bit of washout plug tapping was just the thing to straighten out the pneumatic kinks in their muscles.

Next Page – Class 12AR No.1535 'Susan' – Preliminary Hydraulic test on Boiler

PROJECT – Class 12AR No.1535 ‘Susan’ – Preliminary Hydraulic Boiler Test :



T00 – A chat and a review of the expected time of completion before the boiler could be pressurized. .

The boiler was buttoned up by about 4pm. Shaun ‘Smudge’ Ackerman had been working on installing the hydraulic test coupling and connecting it up to the newly overhauled KEW steam lance. It’s a handy machine as, with the diesel burning heater left unlit, it acts as a high pressure pump and can be used to ‘pump up’ a boiler. Shaun’s patience was tried by incompatibilities and damaged threads in the pipe couplings although, for a change, the test coupling itself was undamaged. Because it sticks out from the side of an engine (Pic T01 below), it is prone to being walked into and the stress can spring joints and fracture valves. It’s also tempting to use the bleeder line as a handle to screw it in.



T01 – The vulnerable protruding test coupling screwed into the left wrapper plate’s wash out plug. The downwards pointing pipe is a bleed pipe to provide intake pressure control during the high-pressure low-flow part of the filling process. (As well as being a drain.)



T02 – Oops. This washout plug on the right, opposite, corner of the wrapper plate had been left out. The draining water has slowed down to trickle. After leaking hoses and missing plugs, maybe we’d get it right on the third time.



T03 – An important part of boiler hydraulic testing ... the sociable waiting for the boiler to fill up. Left to right – Aiden, Coenie and Shaun, with Patrick and Dawie out of frame, sitting cheerfully on top of the boiler. The pump has just been started in this picture

Coenie Gildenhuys had come in from his post-lunch coach wiring project by the time this boiler was ready for initial hydraulic testing and he was assigned the task of extracting the fire hoses, coupling up two of them and to start getting the 12AR boiler topped up. The ever variable water pressure at the Germiston steam depot wasn’t so great today.

Another issue turned up as the boiler team had forgotten to insert the washout plug on the right wrapper plate. (Pic T02 above) The water was coming out almost as fast as it was going in – although a little scale knocked loose with all the boiler tube work had come out with the water. So the fellows let the boiler drain down completely before finding the missing plug on the walk ways and buttoning up the wrapper plate.

Not the most auspicious moment in a Reefsteamers project!

On the third attempt, the water was staying out within the boiler shell and not splashing out on concrete anywhere! But it still took quite a while to fill through an open washout plug at the top of the boiler. The gearbox work had finished, as well as the diesel axle dropping project – so this became a sociable and very important part of a boiler testing procedure ... waiting for the boiler to fill! (Pic T03 above.)

The test went okay for a preliminary test. Problems were found but none that are major so far. During the fire hose filling of the boiler, the right hand blow down valve was found to be weeping under the natural weight pressure of the water. (Pic T04 below) It just needed to be tightened up to clamp up the rubber blanking disk inserted for hydraulic testing. Fortunately the leak stopped – otherwise we would have wasted much water draining from the boiler while having to split the valve and replace the blanking disk and backing plate.



T04 – The right hand blow down is leaking a bit past the black rubber disk that was inserted to blank off the valve. The two through bolts were nipped up a bit and the leak promptly stopped.



T05 – Patrick and Shaun discuss the regulation of the test pressure. Patrick has just, inevitably, succumbed to the temptation to tap the test pressure gauge.



T06 – A strange sight. The back head pressure gauge is mounting up even though the water glasses have been removed and blanked off.

When the leaking blow down blanking disk was tightened up, and the boiler inspected for other unpressurized water leaks, the fire hose was withdrawn and the open washout plug tightened home. The pressure pump as started up and the wait started to see the boiler pressure climb. Water coming out of a vent hose was a good sign. It takes a while to pressurize such a boiler and we take out time to let the stresses even out. Although the firebox is cold and there is thus no thermal expansion stress, the sheer weight and subsequently the pressure of all that water has to be taken up by the steel work.

No boiler hydraulic test is complete without the obligatory hopeful tapping of the pressure gauge to see if the needle will lift off the zero stop. (Pic T05 above) We had six grown men all focused on a little needle and practically all of them tapped the gauge. The backhead pressure gauge within the cab was still functioning and almost at the end of the pumping, it was showing 1460kPA. (Pic T06 above) The red line maximum safe operating pressure is marked at 1300kPA. (In operation under steam, the safety valves would have already lifted by this point.) The standard procedure for a boiler hydraulic test is to fill the boiler to 125% of the rated operating pressure. The cold pressurized boiler was silent with no popping or creaking.

Some leaks were found. Rats! Damn!

Incontinent rats! Leaking dams.

The single weeping tube at the front end was lubed up. (Pic T07 below) As these are 'merely' expanded into place, the expander cut be re-inserted and the tube expanded even tighter. The firebox end was worse off with a slight water weep at either end of the second row. Just one or two teeny little droplets on each side – but that's enough to require attention. Dawie marked them off with oversized white chalk crosses. A more serious problem was a cracked bead on an existing tube – which was more than just a weep! (Pic T09 below) It may have just failed under the increased pressure, but more likely had been nipped by the pneumatic riveting gun. It could probably be sealed with more expansion of the tube into its old ferrule – but that's only half a job. The bead has to be thoroughly cleaned before assessment of feasibility of re-expansion and/or re-welding, or whether it is to be scrapped and the tube withdrawn. It's an inconvenience – but you don't mess around with a pressurized steam boiler!



T07 – One of the first batch of seven tubes is weeping at the front tube plate next to the driver's side washout plug. Fresh MH Oil is being applied to the inner surfaces to lubricate the expander's rollers.



T08 – Putting the squeeze on the errant H₂O, Dawie ratchets it up a few more turns. The dark coloured mess in the crevices is actually oil left over from when the washout plugs threads were re-tapped.



T09 – Two of three leaks at the firebox end. The cross marks the slightly weeping bead. That water is running from the tube at top right – a cracked existing bead.

The youngsters were preparing to start setting up the expanders – but the Chief Engineer forbade it. It's dangerous to use an expander on a pressurized boiler. (So nothing was said about the already expanded tube at the front end.) As per our usual practice, the boiler filling vent was opened to discharge the entrapped, pressurized water very slowly through a long, thin rubber hose routed alongside the boiler and footplate, and discharging the water into the inspection trench. Thus we slowly release the stress over a period of about 15 minutes.



T10 – Putting the drip on things, the right front fusible plug is weeping through the threads. That tied on wire was for the inspection lamp.



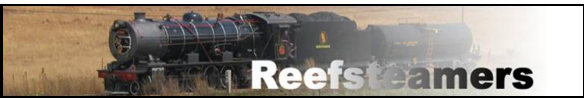
T11 - A sad and tired looking Patrick leans in through the firing hole to hear the news. Actually, we didn't do too badly but that cracked bead throws the score a bit.

Coenie came in with the welcome news that he'd voluntarily made another round of tea so ... no more boiler work today. More faults were found the following week, including dome and regulator covers – so we're in for some fun!

PROJECT : Class 12AR No.1535 'Susan' – Piston Removal :

The pistons on the Class 12AR were uncoupled from the crossheads and withdrawn on Saturday 9th August. (Pic P01 below) I wasn't at the depot in that day so you don't get a running commentary – although Patrick Ackerman would be quite happy to supply the details!

The crosshead wedges were knocked out with a pneumatic hammer after quite a struggle to tap them out by hand. They weren't that tight – but the poor clearance under this compact, small wheeled locomotive, prevented a full arc of mallet swing. With a bit of air assistance, the tight wedges literally just popped out as the tension relaxed. A Class 23 extractor was used to push the rods out from the cross heads – apparently far easier than the use of a Class 19D extractor used when the Class 15CA No.2056 'Dorothy' was rebuilt.



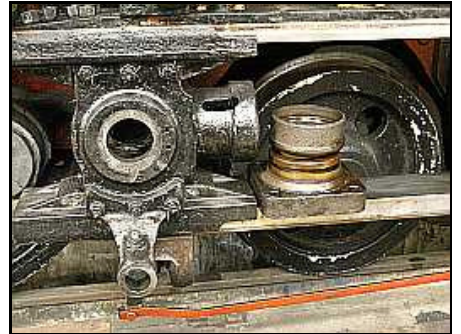
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P01 – A pair of withdrawn pistons wait for stripping, cleaning and groove machining. They are attached to the crosshead by wedges passed through slots, hence the lack of readily visible fastener hardware at the end of the piston rods in this photo.



P02 – A close up of the three piston rings as removed. The rings are a little slack but not in too bad a condition. But they are going to be replaced anyway.



P03 – The dismantled crosshead and piston gland assembly – front of locomotive is to the right. The crosshead wedge slot is clearly visible. Notice that the piston glands are heavily spring loaded. The red lever at the bottom is the pull rod for the cylinder cocks.

The piston rings are to be removed (Pic P02 above) and then the grooves are to be cleaned up and machined square and true, and also with identical dimensions. So the original grooves need to be measured and the largest required dimension after cutting will be the new standard size for the other five grooves. This isn't as arbitrary as it sounds, as when steam locomotive pistons are originally cast, they were usually cast with blank working surfaces and the grooved are subsequently cut by the fitters erecting the locomotives. In fact, we have some rusty, but never used new piston 'blanks' in our stock of Millsite spares. Thus, the piston rings are to be custom machined to fit the pistons. The new dimensions will go into the locomotive's records for future reference. The wedge will be replaced and the glands for the rear cylinder head will be serviced. (Pic P03 above) The piston valves are to have new rings fitted in a similar fashion.

The newly installed expansion links had to be removed. The brand new vesconite bearings fitted well. A little too well. For safe operation in the dirty, rough world of a working steam locomotive, they need to have 1mm clearance between the trunnion bearing and the pivots on either side. Vesconite is tolerant of dirt, water contamination and lack of lubrication. It is, however, not tolerant of hot operation caused by tight clearances. The expansion link trunnions need a bit of free sideways play to allow the locomotive drive and valve motion to move laterally should components wear or the locomotive run on consistent tight curvatures.



P04 – A worm's eye view of the front steam ports at the front of the double acting steam cylinders of this 12AR locomotive. There is an identical set at the rear. These act as both intake and exhaust ports, the function being switched by the piston valves.



P05 – James Thomson and Juan 'Nippies' Buys installed the expansion links three weeks ago, with new white vesconite bearings in the trunnion bearings.



P06 – A removed expansion link waits to have the bearings modified. The valve gear of this locomotive is to be completely refitted with Vesconite, just like our successful Vesconite conversion of the Class 15F No.3016 'Gerda'

PROJECT : SIA Storage and Perimeter Fencing – Hanging some gates :

The fencing project continues with the hanging of two sets of newly fabricated gates. The gate gang were working on a new gate right next to the west end yard entrance. It was a pleasantly cool day to work outside. Mark Berry acted as a gate prop while Andre van Dyk did the welding. Miles Buckton acted as a vice.

They mounted all five new gates today. The area shown in Pic F01 below is in line with the existing gates across the western yard approach tracks. The two new gate sets span the back approach track and the road vehicle approach road. Eventually, the guard house next to the existing road vehicle gate (No 6) will be moved out here so the guards can check the rails as well as the road.



F01 – The gate gang working on the first set of gates to be installed today. This is the back entrance track alongside the western shunting yard. The vehicle road, also gated today, runs parallel to the right.



F02 – A fabricated half-hinge has been welded to a spacer block.



F03 – An assembled upper hinge correctly right at the upper cross rail. The split hinges were mounted in opposite directions so the gate cannot just be lifted off it's hinges

The job was complicated by the fact that the prefabricated hinges had to be welded to spacers (Pic F02 above) before welding up everything to the posts. Power to the welding machine was supplied by pick-up bound generator as there is no electrical power at this end of our compound. 8 hinges had to be welded up with half directly to the gate frames and half to spacers. The hinges were mounted in opposite directions to prevent the gates from being lifted vertically off the hinge pins. This team mounted 2 sets of two gates and a single 5th gate in one day. Coenie was sent out to call them in for lunch ... so their existence out side the workshop wasn't totally forgotten.

PROJECT - Sandstone Coach Wiring and Repairs :

The Sandstone Bar Coach No.25282 received attention today. It is, however, inconveniently parked out under the future station awning, sharing the track with the Sandstone Heritage Trust Class DE2 No.1207 ex-Rhodesian Railways diesel and the hand-bomber Class 15F No.2914 'Spikkels' – a long way away from the main workshops.



C01 – The first of the two full length white PVC conduits has been 'stuffed' with a pair of wires and the process of threading it under the coach has begun.

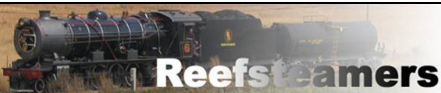


C02 – Miles (Left) feeds the new PVC conduit through the hangers for the coach's water tank as Coenie (Right) looks for the end.



C03 – Coenie catches the end past the vacuum tank and threads it over the handbrake wheel shaft.

Miles BUCKTON (Not 'Burton' as I had mistakenly understood), resplendent in brand new blue overalls and safety boots, worked with Coenraad Gildenhuys to start the coach wiring project. Coenie normally works with our club electrician, Fred Sewell, and has helped with the re-wiring most of the existing coach sets. Today, with his experience, he took on the role of a team leader, working with new member Miles, to start the coach rewiring project on his own.



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The two young men started with the cutting of the individual phase and neutral cables and routing them through conduit loosely laid on the ground. (Pic C01 above)

Because this Bar Coach hasn't had the redundant undercarriage equipment removed yet, Coenie and Miles were faced with a real obstacle course through which to pass their conduit. (Pic C02 and C03)

When the conduit was threaded and after a morning tea break, Miles got peeled off to go and assist Andre van Dyk at the new gates. It didn't affect Coenie much as his work from then on was single main work anyway. He got into Fred's stores and got the new 220V series ballasts out and started cutting and fitting 'pig tail' wires for quick installation. (Pic C04 below) The table was cluttered with 11:15am tea break cups and new spares for the Hunslet Taylor shunter, but Coenie found a comfy spot and in an ideal location for the first response for lunch! Coenie also pre wired the starters for the hot-cathode tubes. He had a set of 10 to do for each component t. (Pic C05 below.)



C04 – A cheerful Coenie Gildenhuys busy at the 220V ballast pre-wiring station, very conveniently in the workshop clubhouse itself.



C05 – One down and ten left to go. The wired ballast is a sample, and ten had to be done for the center lighting strip in the coach cabin.



C06 – Spare gangway doors being cleaned for installation – here the oxidised and paint spattered aluminium window trim is being polished.

The already Fred-phase wired Day-Sitter Coach No.25163 is to be treated to a set of cleaned and rebuilt interior doors. This coach originally had the gangway blocked off with a plywood panel. These gangway doors have come out of our stores and are being cleaned and prepared for installation. (Pic C06 above) We could get away without installing these doors as this coach will not run at the end of a train – but it is more original to be able to close off a gangway. And it helps when a coach is reserved by a group on a run.



C07 – Removed and stripped toilet doors waiting for new white paint. All the hardware has been serviced and cleaned. These long-disused doors need to be rubbed down for spray painting but they are out of the way of the plumbing work.



C08 – A recovered corner sink and stand from the Sitemela sleeper coach conversion project, have found a new home in one of the four Sandstone ex-Stilfontien Mine coaches. (The toilet bowl is original)



C09 – This typical 19mm marine ply coach floor has been stripped and cleaned. It needs to be power sanded before the new vinyl sheeting is laid. It is to be laid with Marley Tile Sheeting.

All of the original toilet doors have been removed for cleaning and retrimming, and all the hinges and latches are to be replaced. New adhesive signs are to be mounted as well. (Pic C07 above) Granted, this could have been done with the doors left hanging in their frames. But the spring-loaded doors would get in the way of the toilet compartment refitting project. These 3rd class coach toilets are cramped places in which to work! But the clincher for door removal is the fact that entire coach is to be spray painted on the interior surfaces, including the roof panels.

The toilet compartments are to be completely spray painted in 'sheen' white. 'Sheen White' is actually a mat finish – but not rough to the touch as a PVA coat would be. The 'Sheen' was chosen to hide imperfections, and it is easier to touch up a spray job when then patches are found – whereas re-spraying a gloss coat results in rougher dull patches in the overspray area.

The toilet refitting project is underway. Both rather dusty toilet compartments, disused for many years with the doors blocked off with steel sheeting, have been cleaned out. The only hardware remaining were the toilet bowls themselves, and even these were loosely mounted on the floor, and the compartments open to the exterior through the empty pipe holes. A pair of functioning flap-type SAR toilets has been selected from our spares, and 'new' sinks have been fitted. (Pic C08 above) These parts are from our sleeper coaches that were converted by Sitemela – of which the original bathroom compartments were converted into on-suite bathrooms and all the fittings replaced with domestic type bathroom fittings.

PROJECTS : Depot Signage and Storage

Even more signs have been springing up around the depot. These have been made by Fred Sewell and Shaun Ackerman has been putting them up during the week. They identify the gates and who the gates are actually for. (Pic D01 below) (We have started imposing the separation of the members and the visitors parking.) There is also a network of interlinked red fonted 'assembly point signs that direct people to the gates should the workshops or top shed have to be evacuated for some, presumably ghastly, reason. To help keep visitors safe, a number of 'Watch out for moving trains' signs have been erected in the yard and along the newly relocated yard walkway. (Pic D02 below) These are actually quite necessary, as it is surprising how sneakily quiet a moving train can be, especially if it' the tail coaches encroaching on the walkways.



D01 – New gates signs. This is the current member's gate next to the old forge house. The guard house is to be moved to the outer gates once the perimeter fencing is finished. Notice that Reefsteamers reserves the right to search the vehicles of both visitors and members alike.



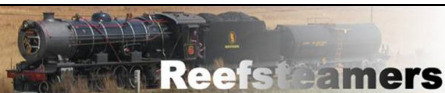
D02 – Please beware of moving trains and whistle. Whistling frightens the dangerous engines away! Shaun Ackerman made this is the new locomotive whistle board that guards the back entrance road. The track with the trolley is the crossover to the yard, and the building ahead-center is the 'Top Shed' with the ash pits and blow down station just in front.



D03 – A safety regulations compliant first aid box and a brand new fire extinguisher, mounted right next to the workshop lounge kitchen door. This area used to be occupied by a rarely used wall mounted TV \ DVD player, which is now in the formal Club House.

The first aid kit has been mounted very logically between the kitchen and the workshop club house, and only 2 m from the main doors. (Pic D03 above) The box used to rest on a filing cabinet next to the inwards opening entrance door. The first aid box was gradually getting buried by files, spares and tools. The first aid kit itself has recently been fully replenished.

The Millsite Spares store is now in use (Pic D04 and D05 above) and is also used for night time storage of tool boxes and small locomotive spares. The wall on the right side of Pic D04 is actually a windowed wall – but the shelves provide their own burglar proofing by backing up to and blocking those windows.



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D04 – Just a small selection of the antique steam locomotive tools recovered from the Millsite Workshops. The top shelves have valve seat grinders – in their original stands. The lower two shelves are host to a selection of locomotive sized thread taps, reamers and thread chasers.



D05 – Check out these callipers and that locomotive-sized outside micrometer.



D06 – A scruffy bogie-less caboose, marked with X's to not be cut up scrap, is undergoing a cleanout, courtesy of Victor, hence all the junk spread about. It is to be cleaned up, moved next to the 'Sakkie Saloon' and used for basic worker's accommodation. Both the cabooses are to be upgraded.

Pictures from around our Steam Depot :



M01 – This is the characteristic double tunnel under the Goods Line on the Reefsteamers approach road. Piet 'Buffels' Steenkamp, who still has many friends and contacts on the railways, chats to the 'unit dryer' as this double headed train of Portland cement bags waits for a green signal.



M02 * – Vindication of another typically tasty and nutritious Andre van Dyk mutton stew, Miles Buckton is happily licking out the still warm stew pot.



M03 * – Curious about the day's boiler tube beading work, a somewhat portly Mark Berry gets a little assistance to squeeze through the oval firebox portal on the Class 12AR. Said assistance was gleefully provided by Shaun 'Smudge' Ackerman.



M04 – A brace of 5M2's snooze the Saturday afternoon away. Note that the center unit still has the pantographs up and is still energized. The still-electrified but weed grown tracks in the foreground lead to a three stub-storage tracks that buffer up against a hardly used access road.



M05 – Isn't he just ADORABLE?
During a typical Saturday night meal at 'The Keg', Coenraad 'Coenie' Gildenhuys strikes a wistfully romantic pose with a long stemmed rose. Notice that Coenie is wearing his trademark 'Metro Rail' branded anorak.



M06 – The Cute Chairman, Elize Lubbe, may present a case-hardened chrome vanadium steel exterior when countering obstacles and quite often, sheer stupidity, in furthering the aims of Reefsteamers, or when defending her extended family. Here, a rarely photographed Lee 'Flash' Gates shows that she is still a softy at heart when presenting her with a long stemmed rose.



M07 – Patrick Ackerman's dead light bulb collection. These are 32V locomotive-standard globes and are the casualties of two Saturday's worth of smokebox work in the isolated-secondary 32V inspection lamp.



M08 – An evil looking Shaun Ackerman caught in the act of closing the 12AR firebox doors, with me n' Dawie trapped inside on the grates. He opened up just 5 seconds later in case of claustrophobia but Dawie was too tired to care.

" Pictures M02 and M03 were posed.
- Lee Gates -