- REEFSTEAMERS DEPOT REPORT – - 02 NOVEMBER 2010

1). INTRODUCTION :

Still kicking we is and now that our financial crisis has been corralled in the rodeo ring, we can get on with the business of playing with ... er, … preserving steam trains. Our finances remain on track for recovery although we'll have to be very careful with shelling out the clams for the foreseeable future. The internecine politics have mercifully calmed down and in fact, it has been downright peaceful. Although there is no more fighting and wrangling concerning issues of wasted or diverted funds and self-serving decisions from certain people, the current board members are presently taking some strain in terms of managing their time. They need our co-operation and support.

Recent news has been all about the SANRASM rescue project. However, we've also had to get two failed locomotives back in action, as well as the long dormant GMAM No.4079. In the background has been the approaching deadline of the annual Cherry Festival train. Let the madness begin!

We are entering the busiest time of our year and within a few action-packed weeks, need to run our Class 15F No.3046 to get the kinks out of her frame, get the GMAM steamed up, road worthy the 25NC which hasn't run for a few months and get the 12AR back into action with a new dynamo. Our recently implemented scheme of always keeping a spare dynamo on hand went a bit soft under the skin when we discovered that the dynamos are not as standardized as we thought they were. At the time of writing, Susan the 12AR is ampless and legally out of action although she is, of course, quite capable of running under her own steam.

In other words, nothing really dramatic and no terribly exciting or photogenic projects. Simply the many smaller jobs and day-to-day challenges of keeping a steam depot going. And to see those small depot-based activities being planned and fulfilled is just as much an act of preservation as seeing a glamorous steam-hauled double-header pounding on the high-irons, being ardently photographed by professional 'rail-heads.'

CP01 – Morning rinse down.

By the time you read this, Class 15F No.3046 'Janine' has had a shake-down run with a day tripper train. Here she has just had the ashy, hard-coaled fire shaken out n' re-laid, and is having the dusty flanks of the firebox sprayed down by the fireman.

This proud recently-named machine will be the head loco for our Cherry Festival double header coming this very month.

2-legged 'Janine's' grandfather, Oom François van Dyk, is going to be driving this 14 'leg' machine outbound on the primary part of the Bethlehem to Ficksburg route on the Cherry Festival run . It will be the first time he's ever had the opportunity. He will be driving with his son Andre firing, and the locomotive named after his granddaughter.

CP02 – At rest.

We not sure if the 12AR arranged to 'painlessly' break down (Dynamo) and be awkward to get a rest and let some of the other locomotives do some work for a change.

She ain't gonna do any more work for at least three weeks anyway as the GMAM takes the 6th November slot and then the Cherry Train is to run.

The 12AR is quite capable of handling the long distance run, but the old fashioned axle keeps and the axle journals are vulnerable to damage due to sustained high speed running with small diameter wheels. On the plus side, the relatively new Vesconite bearings in the motion have bedded in by now. They were relatively new on the last trip and some of the joints ran a bit hot.

2). PROJECT : CLASS 15F 3052 'AVRIL' RE-TUBE :

B01 – Sharp Starter.

The boiler tube project started at this point, restoring the donated Wicksteed reciprocating saw back to operating order. This was done several weeks ago and the job wasn't that difficult. It primarily entailed cleaning out the mechanical lubricator (center right), reconnecting the nylon lubrication lines, tensioning the v-belts and reconnecting the electrics to the newly installed starter box.

The job was delayed as the original blade which came with the saw attached broke and a replacement had to be found.

B02 – For a good cause.

A heavy-duty drift was needed to punch out Avril's boiler tubes from the rear tube plate once their welded beading had been ground off within the firebox, and the expanded front ends slotted with a torch.

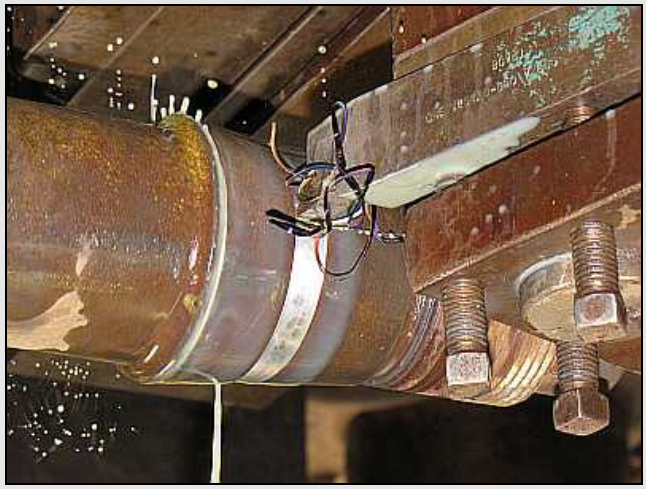
This old, unidentified locomotive piston rod was just the right size. The complicated crosshead casting is actually separate to the rod. If anyone objects a) Identify the loco from which the piston rod came and b) Identify the loco in which the piston rod can be used. The relatively complicated crosshead casting will go into the stores.

B03 – Tentative Shave.

Here is the business end of that old piston rod having been laboriously centered within the chuck of the husky Dean Smith Lathe. The rod itself turned out to be slightly bent.

Peter Labuscagne has just made the first cut at the flared end of the piston's cone. Peter would use that wider diameter to make a stepped ring for the drift and the narrower threaded area would be machined down to fit the inside diameter of the boiler tube.

The piston was originally a press fit onto this rod – there is no back-step behind the cone. There is also no keying or indexing provided to stop the piston turning on the shaft. However, the thread and the cotter pin arrangement (slot) are typical.



B04 – The snip.

Cutting begins in earnest and this flash-shot captured the lathe's lubrication system in action. There was a leaking joint on one of the risers, so that cutting oil tank would need to be refilled for the next job.

Peter would have to make several stepped cuts in that conical area to reduce the stress on the tool, before cutting the resulting steps down.

An experienced machinist can tell a lot about the quality and grade of the material from which his workpiece is made, by looking at the behavior, colour and texture of the steel shavings. This steel isn't as hard as you would expect it to be, as the shavings are curling off instead of chipping.

B05 – The raw drift.

Here's the raw tube-drift taking shape with the entire previously conical area cut down to form the drift's barrel and backstop. The raised backstop would actually abut against the end of the tube to drive it out of the boiler tube plate.

The threaded area and the end stub with the cotter pin drilling are waste material and would be cut down to a diameter smaller than that of the drift.

Isn't it remarkable how shiny the freshly cut material is on a piston rod that is several 'centuries' old. However, this is a fairly rough finish in terms of machining – but a drift isn't exactly a precision instrument.

B06 – Pipped.

The drift is almost finished with the thread area cut away to clear the barrel and most of the cotter pin area has been cut away down to the remaining pip.

The drift fitted perfectly in the spare tubes on the rack.

B07 – Pulled Tubes.

Re-tubing of Dave Shepherd's Class 15F No.3052 'Avril' is underway with boiler tubes being pulled out during the week. 52 of these pipe-like objects are to be withdrawn.

We could have gotten the grey-eared clunker running again with less than a dozen new tubes. But it would have violated our 'Technical Excellence' principle. Except for an emergency situation, it is false economy to 'patch up' a generally aged boiler with a new tube or two when the rest of them are looking scabby. There are bound to be further failures which are bad for PR, the image of steam and expensive if the failed steam train has to be towed. It is far more economical to take a buck-shot approach and replace all the marginal boiler tubes 'up-front', even though it takes longer to raise the funds in the first place.

B08 – Front Tube Plate.

Here is the partially empty front tube plate viewed from within the smokebox. The tubeplate itself appears to be in good condition but will need to be checked closely before re-tubing starts. Although it is not as highly stressed as the rear tubeplate in the firebox space, it is still subject to bulging, thinning and cracks.

Note that these tubes are expanded at the front end and are not beaded and welded. This tube plate only has two washout plugs in the lower half (the lowest holes) whereas many locomotives have three or four of them.

The blue object is a tool tray made from a cut down chemical barrel and is being used to cap the vulnerable open steam chest exhaust passages.

B09 – Empty.

Here's a view through the half empty barrel of the Class 15F 'Avril's' boiler. You can even see a bit of day light sneaking in through the rear tube plate, from the firebox doors ½ kilometer away.

Notice the pitted deposits of lime-scale on the extreme left and right tubes. This Is Not A Good Thing. If you look at the withdrawn tubes in Pic B07 – the scale has been peeled off by passing the tube through the tube plate.

B10 – Anointed.

The center row of superheaters had to be removed because the upper inner superheater element was leaking – but the curved pipes from the header (top) were obstructed by the wider-sweeping bends of the lower rows of superheater elements. Awkward…

The clamp bolts have been correctly treated with copper-slip grease. Six superheater elements had to be removed, four from the center column and two from the right side.

B11 – Pulled Superheaters.

Earlier in the re-tube job, there are a variety of pulled and spare superheater tubes waiting on the racks.

Old fashioned saturated steam boilers impart just enough energy into the steam to clear the requirements for enthalpy. That is, the energy absorbed by the working medium to change state ... in this case, from a liquid to a gas. But when saturated steam is expanded (in the working cylinders), the temperature drops with the reducing pressure and the steam temperature enters the zone of enthalpy. The expanding steam starts to condense into lower energy hot water.

Superheaters re-heat and 'dry' the steam, imparting sufficient extra energy to the gas to be well clear of the enthalpic band. When the steam is expanded in the (warm) engine, it remains a dry gas. Superheated steam transmits more energy per volume and makes a boiler more efficient. However, it is harder on the drafting system, as well as requiring special attention to lubrication to withstand the increased temperatures and dryness involved.

B12 – Cast Pipe Ends.

The doubled up length of a superheater element increases the length in which the raw saturated steam travels and is exposed to external heat energy without being exposed to water as within the boiler. The first set of coils normally pass right through from the front to the rear of the boiler.

These elements have a double-decker arrangement so the effective length is more than triple than that of a boiler tube.

The sharply cornered ends are cast pieces rather than joined sections of piping and they rarely leak – but leaks can develop at the welding. The welding gets stressed when the tubes are exposed to constant pressure fluctuations through being downstream of the regulator.

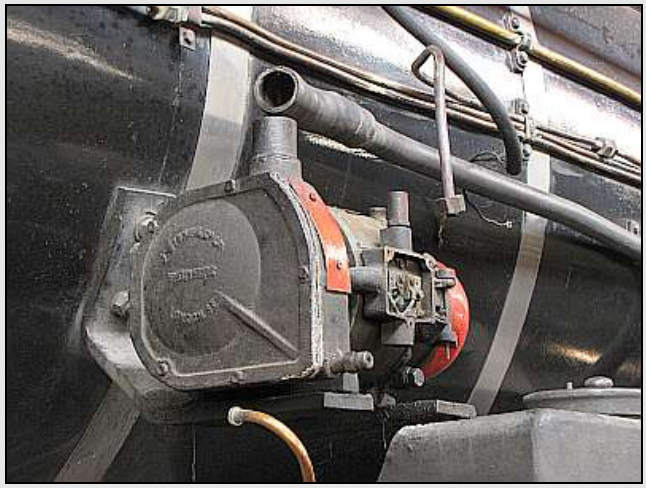
The long length of the multiple, coiled superheater elements means there is always a slight delay in the steam locomotive's response when operating the regulator at very slow speeds, as the length of steam piping between the regulator chest and the cylinders takes a short while to pressurize and depressurize.

3). PROJECT : CLASS 12AR DYNAMO CHANGE:

D01 – Our Girl.

Our old lady, Class 12AR No.1535 'Susan,' is running well since her valve spool repair on the RHS cylinder chest. In fact, she's running better than before with the drivers saying that she pulls like a …well ... train.

The steam turbine dynamo has been running increasingly rough recently. The dynamo proper is a tough device and can run up to 36 000rpm – which means you need very good bearings! A more subtle problem on these Stone Co. built dynamos is that a bad shaft bearing may prevent the dynamo from spooling up on its own at lower boiler pressures. I know I battled to get this dynamo started at just under 1000kPa the last time I worked on this engine. It is possible to open a cover and turn the dynamo shaft with your fingers to get a stiff-ish turbine dynamo started.



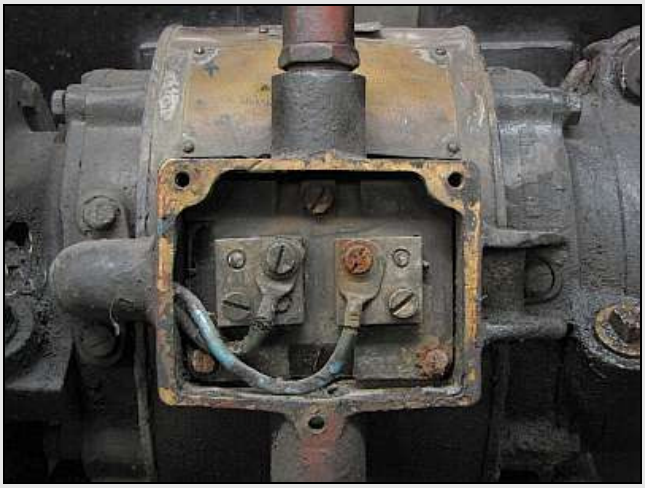
D02 – Disconnected Dynamo.

Here, Aidan McCarthy has already disconnected the services as well as the three mounting bolts – the 'mo is just resting loose on the rugged brackets.

The foreground pipe is the (unvalved) condensate drain, the large pipe being the turbine exhaust and the copper pipe to the right being the narrow bore inlet.

It turns out this dynamo is a bit different from the others as the condensate drain is horizontal instead of vertical and the steam exhaust is displaced as well.

As the spare dynamo, overhauled by James Thomson, was meant to be a universal spare for locomotive runs, it is a good thing that we see these differences now – rather than having to 'modify' a lamp-less locomotive at ballast-side.



D03 –Rusty Reality.

When you only have 32 volts to play with, rusted terminals are a most unwelcome sight.

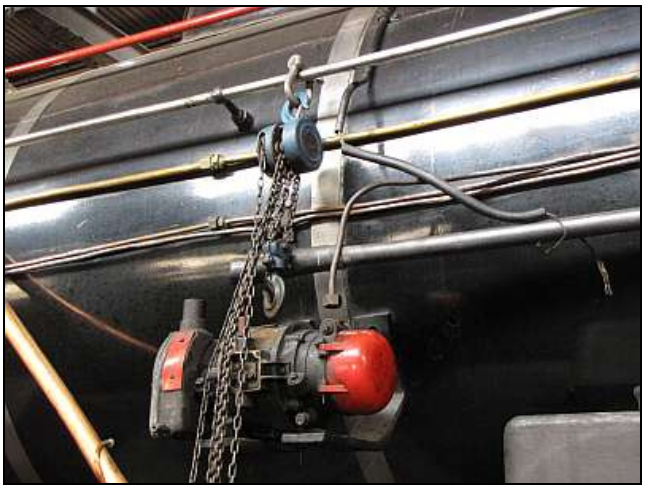
As these 'dynamos' are permanent magnet machines with fixed wound stators, there are no field windings and the stator runs with only one phase output. (2 wires.) There is also no chassis-bound return circuit as in road vehicles – steam locomotives use a wired neutral.

There isn't enough ampacity to actually burn out the wiring in the event of a short circuit – the dynamo simply stalls.

D04 – Magnet Keeper Warning:

The rotor is a laminated permanent magnet. Because it is made from iron instead of the rare-earth or ferrite magnets common today (e.g. : Bicycle dynamos), it is prone to becoming demagnetized – especially as it is laminated to reduce eddy currents. Whenever we have a dynamo rotor withdrawn, it is always placed within a stator of a dismantled spare dynamo to keep the magnetic flux paths intact. We have 2 spares that we use as 'Magnet Keepers.'

This brass plate reminds 'Spoories' of the fact.



D05 – The slinger.

The first attempt to hoist was a washout as there wasn't enough travel in the suspended hoist to comfortably fit a sling.

Technically, this isn't really a dynamo. It isn't a true alternator either, even though it does produce AC current. (At roughly 32V depending on the governor.) This machine is actually a turbine-driven MAGNETO.

A magneto is an alternator that produces current using permanent magnets as a field, as opposed to the wired electromagnetic field more commonly used these days. However, the word 'magneto' has been corrupted to refer to self-contained permanent magnet and points ignition systems used on small engines as well as aircraft engines.

But the railways call these 'dynamos' and 'dynamos' they will remain! Some of the technical people prefer to call these machines 'Turbo-Generators' which is more correct.

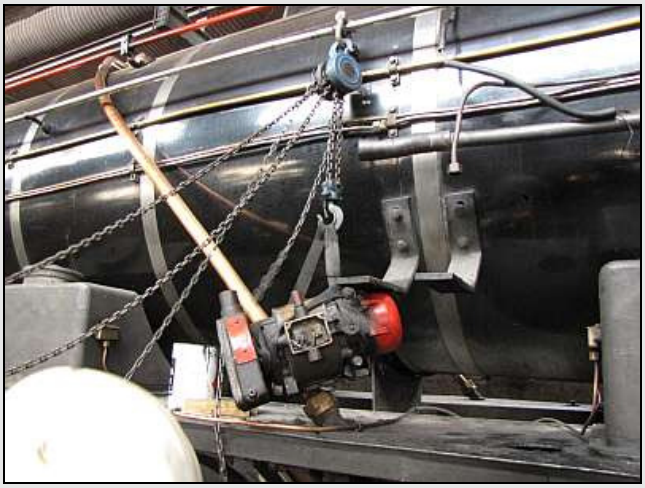
D06 – Sling off.

An extra precious inch or two of chain travel was scrounged by having the hoisting assistants twist the chains. Some of the links had gotten bunched and were jamming within the wings of the hoist's body.

Aidan managed to get enough lift to be able to swing the lump out sideways without busting a hernia and clear those overly long universal brackets.

It took two attempts to get that dynamo safely slinged-up as the turbine end is a lot heavier than the governor end. The job would have been easier with a cable sling rather than the straps these chaps are using – but the cable slings seem to have gone missing lately.

Probably left in various places around the depot and I've seen at least one forgotten sling left looped around a roof rafter.



D07 – Boink!

Ever wonder where the myriad scratches and oxide-coloured dents in steam locomotive piping come from? Well, mostly it's from rough hammering from careless fitters but you do get incidents like these.

The condensate pipe got in the way and ended up twisted underneath the descending dynamo. The steam delivery pipe was impinged on but not damaged. No one wanted to get too close because they didn't trust the slinging.

D08- Almost there.

With new member, Rob, holding the tail chains and Alan Lawton letting the hoist out, Aiden guides the lump safely down to ground level. Notice his awkward posture – he's keeping his toes, albeit steel capped, well out of the way.

The job would be complicated by the fact that the spare dynamo is actually incomplete, missing a central cover, various plugs and adapters, as well as a pin in the governor. As you can't photograph grumbles and grunts, I got out of there onto more productive things.

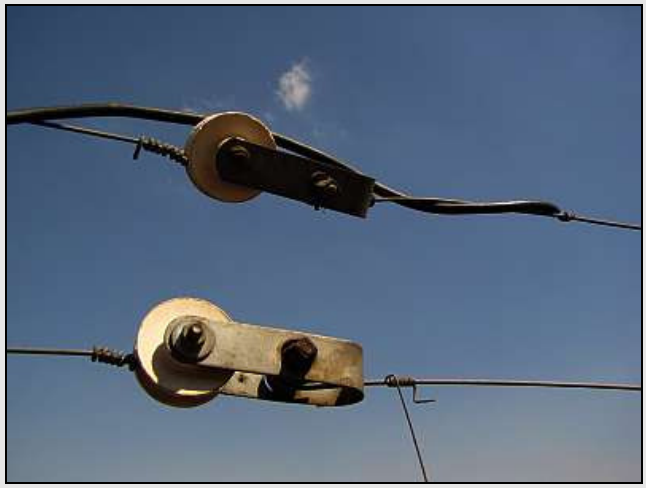
4). PROJECT : PERIMETER FENCING REPAIRS :

F01 – Head Scratcher.

A start to the electric fence project has been made by repairing the existing fence which has been non-functional for some months. The ordinary garden-variety short circuit and arced-open wires were expected to be found, but the many bodge jobs and patched wiring were head scratchers.

Alan Lawton (left) and Aidan McCarthy puzzle over an extra bridge wire they found spanning the corner post. The HT lead-out wiring is all unlabeled and attempts had been made in the past to get the fence working by bridging out certain sections and running the wires parallel instead of the alternate phase and ground wires with which this fence was originally wired.

Alan bravely cut that extra bridge wire on the live fence (With insulated HV-ish pliers) and team leader Robbie was pleased to see the voltage suddenly jump from an apathetic 800V to about 7 200V at the beginning of the section.



F02 – Bobbins at work.

Domestic and commercial electric fences in South Africa use a combination of twisted joints, bolted clamps and crimp connectors – all exposed to the weather and potential trouble spots over time. The military fences are often clamped hydraulically but ironically, run at lower voltages than these 'light duty' fences – but their energizers run on continuous alternating current and not on pulses.

Because of the nature of an electric fence with high voltages, a bodged or 'temporary' connector will often work quite well for a short time – as there are plenty of volts to play with. So the bad workman thinks he has fixed the fence, as happened here. A functioning ungrounded fence with bodged joints will register almost full output voltage – on a resistive HT probe. But as soon as there is a short (or an intruder) the current draw across the myriad bad connections drops the voltage. The capacitive effects of the pulses mitigates the symptoms somewhat.

F03 – Robbie does the switch.

Robbie Davies-Hannibal is in the security hardware biz in the real world so he was a natural choice as a team leader. But his role involved a lot of trundling from the fence posts to the control panel so he got plenty of exercise. He also just about zapped himself sterile as occasionally the energizer was running into an open circuit and then arcing over to unguarded fingers held at a 'safe' distance.

F04 – Gates of Hades.

The two sets of western yard gates are mid-section rather than terminators, so they were trouble spots bristling with arbitrary open-wire bridges and stubbornly unidentifiable feeds. Some of the gates were wired upside-down as well and several had strings of parallel rather than alternating wiring. An important advantage of mid-section gates is the reduced risk of voltage potential across the gate latches.

F05 – Short Circuit.

A typical failure point of a poorly designed fence – slack conductors shorting out against a diagonal fence brace. The inherent length of these conductors isn't long enough to sag appreciably with changes in temperature, but tension springs slacken over time and the barrels unwind in winter.

Putting a plastic bag, insulation tape or as we saw on a few poles, PVC trunking covers, on a pole as Heath Robinson insulators does not work on a pulse-mode fence. The insulating material forms a capacitive dielectric between the wire and the earth – and as capacitive reactance is inversely proportional to frequency, the pulses from the energizer will go right through the repair as if it was made of solid brass. It is the same mechanism whereby a careless car mechanic will get zapped from a spark plug wire even though his shoes have insulated soles and he isn't touching the frame or engine of the vehicle in any way.

F06 – Added Insulators.

The previous fault is solved by strapping on insulators. In the Jo'burg climate, this is only a temporary repair as those straps will go brittle from UV radiation. This is a sheltered spot at the eastern end of the boiler house, and is the feeder pole for the fence that runs between the diesel tanks and the storage track.

Mr. Honeyball brought what he thought was an ample supply of insulators but we were soon stingily handing them out like precious gold nuggets – lots of shorts and almost-shorts on that rickety fence.

As there was a short in the section, Robbie insulated the return wire as well to eliminate extra fault points.

Turns out this whole section is going to be reconnected and re-bridged as it is wired to a different standard to the other fences.

F07 – Beast at the East.

With the workshop empty and the lounge coach's brake adjuster reassembled and re-fitted, Andrew King (center) came out of his corrugated cave and joined the open air fencing team. Robbie (left) is using a really neat FET tester to check voltages. It also has directional sensing to show which direction the current is flowing towards a fault.

Unfortunately that feature only works on a properly wired fence – the bodges and paralleled wiring on our fence sometimes misled both the tool and the operators and led these fellows on a hapless wild-spark chase.

F08 – It's been a long day!

It's been a long, hot day for the inmates of the fencing gang, working in the Vulcan's forge of the Highveld sun, and their brainiums being gently pounded between the hammering heat and the anvil of the sterile, gravelly earth. The last herd of wildebeest have thundered off into the heat-shimmering distance, the burnt-out sun is slipping downwards – and the fence patrol is still working.

The section around the Saki Saloon (Just to the right) was a HT quilt of crude patches and poorly bridged wiring. They weren't able to get that fence running by night fall.

5). PROJECT : COACH WORK :

C01 – Rubber Picasso.

Rob, as a new member, gets a low tech job to start the day – remounting a loose brake hose with Carriage and Wagon specialist Clifford Matthee supervising. We use plain old rubber-based contact adhesive to fit the hoses. That is what Rob is applying after sanding down the old adhesive from the goose neck pipe.

The contact adhesive works well even though it isn't designed to adhere to metal. In practice, a well glued brake pipe that has to be removed for other damage, often has to be slit down with a sharp Stanley knife and then the resulting split 'collar' chiseled open. However, when one of these glued connections fail, they tend to fail completely.

C02 – Digging for the grease.

Cheerfully handling a yucky job, Clifford digs into the drum for deliciously slick handfuls of grease to fill his bucket.

We use graphite or sometimes lithium grease on the exposed sliding components under a coach. It is expensive stuff but resist water quite well. The myriad linkages in the brake system, however, are usually roughly oiled with dirty car engine oil, or perhaps MH oil if we're feeling generous. But MH and steam oil is expensive and dirty engine oil is cheap.

This grease is used primarily for the buffers, draft gear, the gangway plates, handbrake screw and within the adjusters. The bearings use HP or white grease.

C03 – Getting' the twist on.

A cheerful Alan is running the stiff handbrake wheel as Rob manually applies grease to the threads and the follower. Naturally they have to watch out for fingers!

The hand brake wheel went from being barely able to move with a frustrated double-handed grip to being able to spin freely with one hand – and you could hear the healthy squelching noise of the fresh grease in the threads.

The frame in the foreground is for the battery tray. We don't use them any more; so when we get a chance, we cut them away to improve access and to lighten the coach.

C04 – The brush off.

Here is a bit of sloppy engineering that appears on many items of rolling stock. The trunnion bearings for the primary actuator shaft usually do not have facilities for greasing and are not bored for oiling. To lubricate this joint means a hopeful application of thin oil on the top and around the end of the shaft with the hope that it will be drawn inwards by capillary action. This is one of the joints where we often use Moose Oil. Heated MH oil also works here

Rob has to clean the dirt encrusted shaft down before applying oil in the crevice. The wind is consistently to his back but he should have been wearing safety glasses.

C05 – On watch.

Clifford Matthee did Carriage and Wagon work for over 30 years and can tell stories of long and sometimes tedious days under rolling stock – fixing numerous identical items of stock to deadlines.

He still works full time. However, at the depot he has to be careful of his back and is now leaving the heavier work to the young 'uns. Besides, for those of limited mobility, the work pit here is difficult to get in or out of as it is actually an ash pit, not a workshop pit. (But you can stand straighter as it is deeper than the coach shed pits.) Here he is sitting comfortably on a sleeper, the sun on his back, and is supervising his gang of two, teaching them how to do the job.

C06 – Primitive.

Here is a seriously high-tech, precision bearing for the brake gear's pull rod. It is a cast steel disk suspended loosely on a rod, itself rather loose in the frame and with a built-in annular rattle at the right end.

This is actually good engineering as a cheaply made, robust and loose joint like this is highly unlikely to seize in normal service. The wide clearances means that the rust, instead of expanding and wedging the joint tight, simply gets ground off. It is easy to lubricate too as the entire pull rod can be defected an inch or so to one side and the pulley shaft smeared with a lick of grease. In fact, in dusty environments, it would be better to leave a joint like this UNlubricated as the lubricants are sticky and trap the dust.

C07 – Butt end.

Here's the buffer end of a main line coach. As the guys are just lubricating today they would grease up the scuff plates and its springs, as well as the coupler draft gear box. On a more complete service, the height of the coupler and the scuff plates are matched to a standard gauge.

The white flecks on the coach under frame are bits of fossilized toilet paper that had splashed up from the toilet discharge pipe of the adjoining coach with the train in motion. Some permanent coach sets in regular use used to have their dump pipes extended with a flexible sheath to reduce the splashing onto the coach's bogies and under frames.

I know … yuck. But this stuff is all dried out.

C08 – Suicide View.

Here's the buffer gear of a typical coach. The buffering and slack forces are handled by the central draft gear behind the knuckle coupler. South Africa's railways follow the principles of the American AAR pattern. These are unshelved ¾ 'Janney' couplers.

A traditional beam-end 'mushroom' buffer system could be prone to interlocking on the tighter curvature permitted on the Cape Gauge.

On a coach, the U-shaped scuff plate is spring loaded on either side – the springs clearly visible on either side here. These don't contribute to the stability of the train, but keep the scuff plates together and parallel. This means that the walkways in the gangways remain gap free.

C09 – Lubricated beam..

The scuff plate buffer-rods has been lubricated with MH oil after a bit of wire brushing. Notice the stack of washers on the punch-pin to the right. These are used to adjust and match the heights of the scuff plates and thus the gangway floors.

Normally the mating surfaces of the scuff plates are lubricated with a light smear of lithium or graphite grease. These have been deliberately left dry. It is bad practice to lubricate the scuffers of a free standing coach in a dusty environment as the sticky grease will trap dust and make an effective grinding paste. It is better to lube up just before shunting a freestanding coach into the train.

C10 – Adjuster.

Here is the primary adjuster which is used to manually take up the slack that develops within a brake system as the brake shoes wear down. It is designed to be used with a pole or a crow bar inserted between the arms to provide leverage.

If the brake system is not periodically tightened up, eventually the slack in the system will allow the vacuum cylinder's piston to 'top out.' The result is a loss of braking effort.

C11 – Tight Quarters.

The main reason while this coach was 'pulled over' was because a pin had broken off and released the linkage for the automatic slack adjuster. The cause of failure was poor fitting work. The pivot pin previously passed through a hole bored in the tension lever. It had broken in the past. Instead of a new pin being fitted, the old pin had been welded into place but with the backing boss proud of the rod. The resulting flexure, combined with the brittleness of poor welding, caused a failure.

Andrew is working out what needs to be machined to recreate the original joint before re-welding.

The cylinder to the right is the vacuum reservoir and the one to the left is the water tank.

6). MISC :

M01 – Track Class :

The points in the western yard are covered in chalk and graffiti – but not of the vandalistic persuasion. They have been used as practical training tools for a track maintenance class and the students have been required to either list the names of the various parts, or to put down the order and nature of checks. Reefsteamers have allowed trainees from the R&H Railway Consultants to come and practice on our trackwork so they gain practical experience without having to dodge heavy-weight rolling steel and we get some much needed track maintenance and tuning done!

You don't realize how complicated an ordinary garden variety set of points are until you look at how many individual component parts there are.

Here's a factoid : The frog of the point is actually named after a JUMPING fog – as in jumping a gap. The rails correspond to the amphibian's outstretched fore and hind legs in mid-flight.

M02 – Contrast in technology.

Here is a direct contrast in track mounting technology, the old claw and chair system on the right and a more modern 'Pandrol' E-type track clip on the left. (On a 1983 sleeper.) The sleeper on the right was imported in the Dromadaris.

The old system had the advantage that no special tools were required for installation and more progressive railways would even pre-drill the wooden sleepers for the lag bolts.

The Pandrol clips are designed to offer flexibility to the working track. The rails can actually tilt outwards under stress and then ease back into place. The spring action absorbs stress, and although irrelevant today, also helps absorb the pounding from 'boxer' steam locomotives. 'Boxers' tend to pivot around their vertical axis on each piston stroke. It's quite noticeable hanging over the locomotive's hips in the cab on the long-framed un's. 'Bouncers', steam locomotives that tend to oscillate in the vertical plane, are hard on even modern track with the unavoidable hammer-blow that takes place.

M03 – Gauges for Calibration.

Here is a set of expired pressure gauges and duplex vacuum gauges gathered together for recalibration and certification thereof. These are from Class 15F No.3046 'Janine' and Sandstone's Class BGH No.4079 'Lyndie Lou.' (Gricer's Note : BGH = 'Big Green Heffalump')

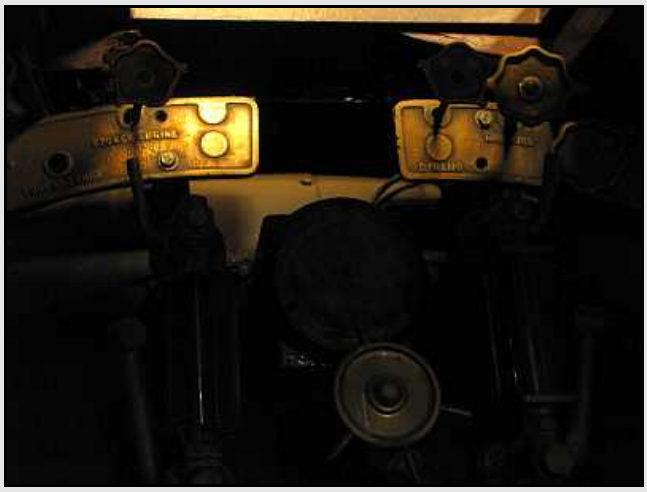
M04 – Profile.

The ex-Federated Timber co. Hunslet Taylor Shunter has been lazily parked on the crossover track after shunting the Lounge Coach No.22901 into place over the ash pits for a refit of the automatic slack adjusters for the brake system.

M05 – Mottled Bottles.

Most serious preservationists also tend to be pack rats or at least have an eye for artifacts. Here is a double handful of bottles that turned up during the recent ground clearing alongside the Member's Car Park, in early preparation for restoring four derelict sidings for rescued SANRASM stock.

You can't see the cast-in logos in the picture – these are antique-ish bottles. That's an interesting cobalt-blue bottle in the center and is ideal for sunny windowsill display. Any guesses as to who this particular pack-ratter is?



M06 – Last Kiss.

The last beams of golden sun raftering through the 15M shed's new(ish) skylight panel illuminate the characteristic two-part spindle boards of the Class 15F No.3046 'Janine.' The pressure gauge is missing as it has been removed for calibration and certification. (Pic M03)

It's always a surprise for me to battle to reach those valves, especially after working on the 12AR for a few months. I'm 6ft2 ½ in safety boots and cannot reach the pictured valves without climbing on the stoker tunnel or using the steps.

M07 – Cow Punchers.

A pair of cow punchers from a Class 25NC (Foreground) and Class 15F (Background.)

The 25NC's cow puncher is a custom job, having been fabricated from copper tubing. It does look impressive all polished up but has since been painted black to hide the theft-prone copper and for a more authentic work-day look.

Notice that the 15F has a correctly profiled and inverted angle iron section bolted under the puncher, which grants more protection for the bogie wheels from track obstacles.

The Arlene-toothed appearance of the big loco cow-scrapers is actually to accommodate hanging links of safety chain. The 15F (No.3046 'J9') still has her chain links hanging down while those of the 25NC are missing.

Both of these locomotives have self-centering couplers at their front ends – you can clearly see the traverse link on the 25NC's draft gear leader box.

M08 – You never know…

Mike Murphy gets on with small scale but precise engineering work as he trues up and re-machines power reverser valve components of Sandstone Estate's GMAM No.4079 'Lyndie Lou.' In the background, Lappies is fabricating a brand new valve spindle for the 15F No.3046 to replace the existing one which was found to have dangerously waisted shoulders behind the fasteners. (Discovered upon withdrawal to replace damaged valve spools.)

This is the very last picture that I have of The Murphy Man. He passed away peacefully in his sleep just over a week after this photo was taken.

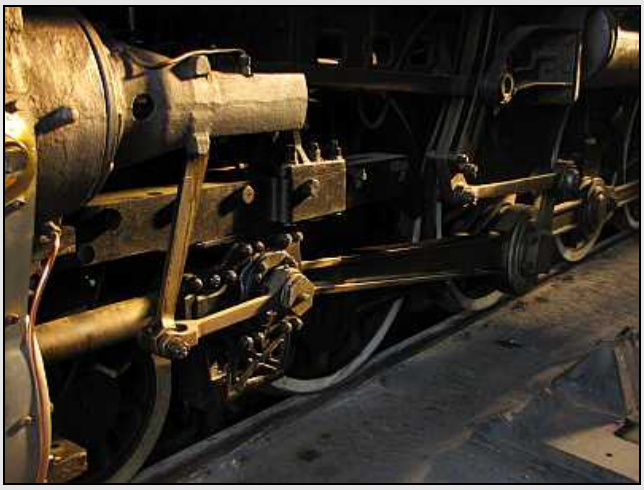
One reason why I take abundant photos is because I don't take the permanence of our structures and machines for granted – and the need to enjoy and record them while they still exists. But it is quite a jolt to realize that the same rules apply to the PEOPLE as well.

M09 – Long drowse.

Class 25NC No.3472 drowses in her cluttered bedroom as the late afternoon sunlight highlights her bulky but well proportioned form within the 15M shed. Her next call of duty will be the Cherry Festival 2010 train.

The controversial missing 'Elize' headboard has since been replaced. It caused some strife amongst some tightly-strung and vocal members of the club. However, it had actually been innocently removed by Michael Thiel for measurements to assist in making the very similar name board for the recently named Class 15F No.3046 'Janine.'

However, 5-year naming rights for this locomotive are still offered for sale. Until she is renamed, this locomotive will continue to run as 'Elize.'



M10 – Static Motion.

When one looks at the myriad links and pivots of a set of Walschaerts valve motion, it is a wonder that it all actually works at all. The horizontal radius rod (shadowed at top center) shows that this engine is in 'center gear', or 'on the notch', equivalent to neutral in a motor car.

Notice one of the characteristics of the 25 type – there is only one slide bar for the piston cross head (Lower left-center) The cross head actually runs on guides within enclosed channels. It was harder to fabricate, but requires less maintenance for running. The partially enclosed channel retains lubricating oil better and there is less risk of misalignment of the two sets of white-metal topped slides as can occur in a more conventional design. Reduced running-shed maintenance was one of the criteria of the 25 design. (Condensing tenders not-withstanding.)

M11 – Tumbler at Sunset.

The tumbler hinge is highlighted by the setting sun. The hinge has a limited range of movement because of the semi-circular saddle above the top pin. The correct way to operate a points tumbler is to lift the weight quickly up to the vertical position and throw it quickly down to the other side. The leading edge of the saddle will contact the rod and the suddenly arrested momentum of the falling weight will help to jerk the points across. On a well maintained set of points, the hammer action is hardly needed, but points quickly go stiff with rust on the switch pads, within vertice pulleys and the throw rods drag on soil and foliage.

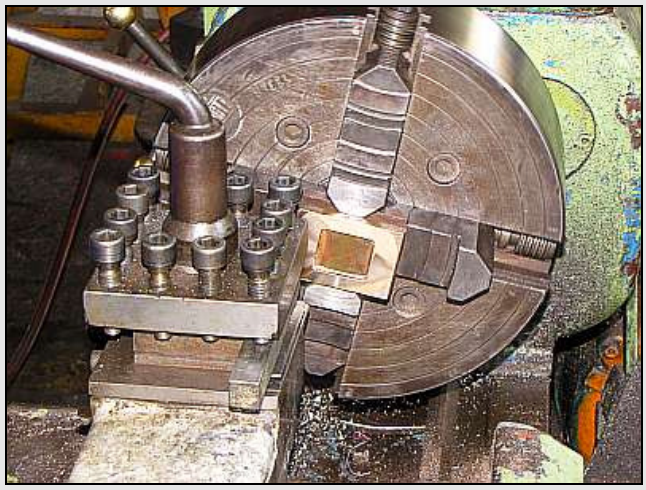
M12 – Anticipation.

These are the two iron ladies that are going to be taking us out on our Cherry Festival 2010 run. They are also going to assist in moving some of Sandstone Estate's equipment form the site of their now-dismantled storage shed at Ficksburg, to safe storage at Kommando Nek. Class 25NC No.3472 and the Class 15F No.3046 'Janine' are both in good operating order and no problems are expected. Obviously they will both be carefully checked beforehand.

No.3072 is an old hand at these Cherry Festival runs but this will be the first long distance trip that we'll be doing using the recently restored Class 15F No.3046 'Janine.'

M13 – Face to face.

Class 12AR No.1535 'Susan' stands face-to-face with the Sandstone GMAM Garratt No.4079 "Lyndie Lou.' There is over 30 years of development between the two machines.



M14 – Conflict in shapes.

As you can see, it IS possible to put a square pin in a round chuck, or something like that. Naturally, objects turned in a lathe are usually radial or cylindrical in nature. Here, a rectangular object is being refaced. This is the D-valve slider for the power reverser's directional valve on the GMAM No.4079 'Lyndie Lou.'

Facing a valve like this normally wouldn't be a viable proposition. However the D-Valve slots in under its spindle and is not rigidly attached. The valve is sealed, just like the old Stephenson type valves, by incoming steam pressure on the top section. So, while it is important that the sealing surface be totally flat, it does not have to be parallel to the top section.

This Depot Report was compiled by Lee D. Gates on behalf of Reefsteamers
For observations, corrections and suggestions – email me at leeg@leaf.co.za

CONTACT DETAILS :

Germiston Steam Locomotive Depot.
Click here to download the location map.

Postal Address :
P.O. Box 1736, Germiston 1400

Depot Mobile = 083 651 5424
(Attie de Necker)

Web Site = www.reefsteamers.co.za
Enquiries Email =Chairman@reefsteamers.co.za

Bookings and Marketing : Les Smith
Bookings : bookings@reefsteamers.co.za
Marketing : marketing@reefsteamers.co.za

Web Master
webmaster@reefsteamers co.za

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