

Atlantic Shore line Railway Locomotive 100
Curatorial Report No. 4
6-20 February 2007

Donald G. Curry, Interim Shop Manager
Seashore Trolley Museum

Winter definitely came to Town House Shop. Temperatures were in the single-digits at times with the wind howling but inside, the draughts were at a minimum and temperatures maintained themselves such that you could still work. Yes, the oil tank did go through quite a bit—something like 20 gal. per day for a spell. But anyway, the work we did in the fall, especially the new doors at the end of the 100 box, have paid off. The next winterizing project should be to finish up around the back personnel and garage doors.

At this point we're still putting together the 'kit' of all the parts for 100. We aren't taking much apart. Instead we're sand blasting, priming, painting, welding, grinding, threading, tapping, organizing and purchasing materials.

Having a blast – Again another load of truck parts made the trip to and from A.C. Electric in Auburn, ME, where they spent 22 hours sand blasting and priming them. Including the cost of the primer this load cost about \$1,300. While it seems like a lot, having the pieces returned ready to go really pushed the project ahead. (Phil Morse asked me the other day how it felt to have the necessary funds right at hand so there are no delays. The answer was a resounding, “great”.) This is the way all our projects should run. Productivity is up, which increases morale and interest in what we're doing. Not including the traction motors, this load puts us about half-way through the blasting. Of course we still have major parts of the second truck (left together as a pattern) and the eight journal boxes for both trucks as well as numerous small truck parts. It seems that there was scarcely a single part that didn't show extensive signs of pitting.

People have asked if 100 spent time on the Cape Porpoise Trestle as its predecessor locomotive no. 99 and some of the Sanford and Cape Porpoise cars did before Town House Barn was constructed. Also we wonder about the track that literally ran on the very edge of the beach at Long Sands, York Beach. We have no photographs to confirm or deny either. Of course, salt could have been used in Sanford, where 100 did most of its running. We have several photos of 102 but not many of 100 except in the mills in Sanford. Does anybody have anything in other locations?

We still put in many hours at our own blast cabinet. **Bill Pollman**, **Norman Down** and myself have taken our turns recently. Because of the corrosion we found on many of the bolts, to the point that they were virtually 'necked down' to nothing, we are blasting all new bolts and applying good coats of primer and black enamel.

Truck parts – Over Presidents' Day weekend, **Bill Pollman** divided his time between welding the pitted equalizer bars and blasting the smaller parts such as the brackets which support the brake beams and motors. There is some question about how much to save and re-use vs. piecing in new steel.

The ends of the brake beams look as if they had been chewed upon by carpenter ants. Pits as deep as ¼ in. cover the ends of the bars. **Randy** is working on welding on new ends through which we will have to bore the holes that mount the brake heads. This bar is 1 in. thick in the central section, forged by hammering and bending into its current shape. At the ends it is only ⅝ in. thick. Using the Dayton horizontal band saw donated by **Charlie Publicover**, **Randy** has cut new bars to replace the original.



Randy Bogucki building up pits in truck arch bar,
(No Dean isn't actually looking, despite what it may look like!)

It is interesting to note the shape of the cast brake (shoe) heads. They are obviously from spares or salvaged from Laconia trucks which have a unique 'bulb-T' shape¹ unlike the Alco flat bar. This is the type used on our car 38, whose heads are badly worn whereas those on 100 are in excellent condition, all the more evident now that they have been blasted and painted.

Spring cups are all complete (5 rebuilt and 3 original), blasted, primed, painted.



Original cracked spring cup and rebuilt and repainted² one.

Chuck Griffith spent many hours with filling the pits in the equalizer frames. He used the stick-welder, grinding them quite smooth. We are down to the last two of the eight and these are the best so will require less attention. **Randy** did a similar operation on the arch bars. **Bill** has found several of the small castings involved in the brake mechanisms have cracks and one had been brazed at some point. We will repair all of these.

¹ Unfortunately I don't have a photo of this, which would make it easier to comprehend.

² We don't know where the gray paint originated—probably at Seashore. Of what little remains in the hidden areas, all is black.

Keeping things together – We are replacing virtually every fastener on 100, especially the trucks. We are using three sources for them: First we've very carefully been through the hardware container outside the Shop and brought in those needed for 100 and 1160. Among other things we've cleaned out all the $\frac{3}{4}$ in. coarse-thread heavy hex nuts and are still short of them. So the next step is to purchase the missing hardware, except where the cost is prohibitive or they can't be supplied on special order³, we will make the bolts.

We purchased a number of 20 ft. hot-rolled steel rods. First these were cut to length by **Randy Bogucki**. Then **Dean Look** threaded them. This was done using a combination of the American Lathe and the Rigid pipe threader (power rotating vise) and (for $\frac{3}{4}$ and $\frac{5}{8}$ bolts) the Rigid OO pipe threader. There are still more to do but unfortunately the threading die broke from just plain hard work. We have ordered another and expect it on the 20th.



Dean Look threading a rod before installing bolt-head

Protecting the metal – All of the sand blasted parts were given two coats of 545 Gray primer followed by at least two coats of *Awlgrip* Super Jet Black polyester enamel. This is especially important on the areas which will be hidden such as the shafts of bolts and mating surfaces where the rust had built up so badly. There is sort of an 'exhibit' on the empty deck of 100, which is now covered with a multitude of shiny black parts, awaiting installation.

The motors – Roger Paradie of A. C. Electric says that they now have the four traction motors apart and have begun testing them. They have done a preliminary test of insulation resistance and found that three of the armatures are at 250 or more megohms, which is very good. One is at one meg. He says "it will run but we want it to be better". The next step is to thoroughly clean and dry out the armatures and field coils, then dip and bake them. We are hoping for an estimate but apparently it is too early in the game for them to provide an accurate one. We should be having a delivery of the armature bearings shortly which can then be taken to American Power Service in Georgetown, MA, along with the journal bearings, all of which will then be re-babbitted. They will also sand blast the much rusted cases.

The compressor – A. C. had taken the compressor apart but it had to stop as the technician had a heart attack. (Is that something to do with a GE CP30?—some sort of hazardous substance???)

³ For instance the $\frac{3}{4}$ x 19 in. square-head bolts which are used on the ends to hold the end sills and coupler support blocks in place.

Bolsters and other truck work – Like every other ‘bogie’⁴ car, 100 has two types of bolsters: the body bolster, which is a strong framework fastened to the body frame and pointing downward and the truck bolster, which is suspended on elliptical springs. At present we are working on one of each.

Using the Jancy magnetic-base drill and the *Rotabroach* “*Slugger*” bits, with **Norman Down**’s help we were able to drill through the $\frac{3}{4}$ in. plates many times in a very short time. We were even able to drill the 2 in. diameter hole in the center through which the king pin projects. In this case we used a hole saw and the drill press.⁵ The plates came back from A. C. Electric and have now been painted black.



The Jancy Magnetic-based drill and the *Rotabroach* in action.

Unfortunately there was a bit of a snafu at Novel and the bottom plates were bent slightly incorrectly so that the distance between the top and bottom plate, where the spacer should go was about 1 in. too wide. They are currently modifying them to the correct 5 $\frac{1}{2}$ in. The spacer, an interesting hard-to-describe shape, had broken some time in the distant past so **Dean** welded it back together. The truck bolster parts are all ready to assemble and are in the queue.

Novel Ironworks is still in the process of drilling the transom channels. We have asked them to shot-blast and prime them and they said they will do it at no charge. However, we will have to wait until they have another job that uses their *Wheelabrator*. It takes a large amount of electricity to run it so we’ll have to wait a bit.

Elliptic springs – We have received our quote on the four double elliptic bolster springs from the Beall Manufacturing Co. of E. Alton, IL: \$2,914.40 **ea.** plus freight and pallet charge! This seems like a staggering price but I checked Jeff Sisson and Dave Johnston and both agree that this is not unreasonable. We certainly need one pair as those in the first truck are totally disintegrated. The hard decision is, do we want to replace those in the second truck since they are at least together. It is likely that we will because they are corroded and have had many years of bouncing over less-than-perfect track.

Coil Springs – Despite one end of each of these eight double-sets⁶, being ‘under water’ for much of their life, the coil springs are all re-usable. The in the lower inch or two, especially of the inner coils, is pitted and the end of the coil is a sharp point. We are wondering if these are the original springs since all are the same and some

⁴ Car with swivel trucks

⁵ Dean Look was absolutely incredulous that we were able to do it. It was about all the Delta drill press could do.

⁶ They are nested with a smaller diameter on inside the larger outer one.

are stamped '6 06'. Could this mean June 1906?? A.C. did a great job of cleaning these up and, with their shiny black, look just like new.

Spring Planks – This afternoon we assembled the first spring plank. Apparently it was not uncommon to have wood fillers in this area and 100 is a good example. There is an oak block on top of and below the 'plank' (actually an 8-in. channel). The upper is angled to fit snugly inside the tapered edges of the channel's flange.

We have made a slight change in design, hopefully back closer to the original design. The spring plank we have just assembled will replace the currently rusted-too-thin channel. At some point ASL or YUCo welded 1 x 7 in. steel plate on the inside of the channel but, because it didn't go all the way across, it really didn't appear to do much and the channel bent anyway. (For whatever reason it is straight on the other truck despite being likewise reinforced.)

We are not going to put in the plates, so to keep the bottom casting through which the rod for the swing link is passed, the same length, we are changing the thickness of the upper oak block—adding about $\frac{3}{4}$ in. We have only made the blocks for one truck just to be sure this will work.



Interim Shop Manager installing lag screws in spring plank assembly



Original and new spring plank assembly
(The wood on either side of the top casting had broken away on removal.)

The top casting is the seat in which the elliptic spring rests.

The bottom casting is for the swing link pin which is suspended from the transom by the swing links.

The wonder of Alco – As we look at the shapes that were formed to make these trucks we marvel at the machines and the men who built them. For instance, the swing links are double-thickness at the loop ends. What holds the second thickness in place is simply ‘forge’ welding where the two plates are heated to the proper temperature; then one placed over the other and literally pounded together by a forging hammer. Then there is also the huge rectangle forming the actual main truck frame. The thick steel was literally pulled around the 90 degree corners, being pounded as it went to keep it flat. Does anybody have photos that show such processes? They would make an interesting addition to our exhibition of the car.

How much is this all going to cost? Below is a chart estimating material and contracted expenses for the project. It’s a ‘moving target’ as we discover more things we need but it does give an indication.

19 February 2007

ASL 100 Chart of estimated material and contracted expenses

As we get more into the work on 100 we’re getting a much better feeling for the scope and cost of the project. Below are the known, estimated and unknown material and contracted expenses for the project.

Item	Vendor	Cost ⁷	Status	Comments
Elliptic springs	Beall Mfg.	2,914.40 ea. \$5834.80/pair for one truck	Price quote	\$5,834 second truck
Bolts, nuts, washers	Ind. Hdw., McM-Carr	522.52	Purchased	
Awlgrip-primer, catalyst, bk. Enamel	Hamilton Marine	\$369.02	Purchased	
Felt Strips – comm. covers	McMaster-Carr	\$34.60	Purchased	
Steel – trucks, body bolts	Mill Metal	\$1,416.25	Purchased	
Truck transoms-steel & fabrication	Novel Ironworks	\$790.00	Committed	
Truck parts sandblast-1 st group	A.C.Electric	\$1,407	Purchased	
Additional parts blasted	A. C. Electric	\$3,000 est.	Estimate	(This includes \$1,381 for 15 Feb. work.)
Bearings babbitted	Am. Power Service	\$2,415	Price quote	
Motors – preventative mtc.	A. C. Electric	\$8,000	DGC Est.	
Remanufactured wood	Barnstormers!	\$9,500	Committed	Still not delivered
Chassis Black	Magnetic Paint	\$87.95	Purchased	
Awlgrip 545 primer	Hamilton Marine	\$150	Price quote	
Color Analysis	Building Cons. Assoc.	\$1,490 (2 colors)	Price quote	
Cutting gas	Maine Oxy	\$44.07	Paid	

⁷ This does not include freight or the STM administrative fee (9%)

Copper Wire	Arthur Hurley, A & J. Cable	\$1,378	Paid	
Roof Canvas	C. R. Daniels	\$150	DGC est	
Misc. supplies	Various	\$1,000	DGC est	Includes about \$300 hardware & specific tools a/o 20 Feb.
Pipes for air	Pillsbury	\$800	DGC est	
Heat/Energy share	Down East	\$1,200	DGC est	
Journal/Motor waste	Miller Waste	\$500	DGC est	
Rotabroaches	McMaster-Carr	\$195	Committed	
Cutting gas-additional	Maine Oxy	\$150	DGC est	
Bolster bending	Novel Ironworks	\$350	DGC est	
Finish paint	Fine Paints or U. S. Paint	\$400	DGC est	
		\$21,579.21		

Total committed/estimated \$41,284.21
Second set of springs 5,834.80
\$47,019.01

Other factors

Wages

Administrative Fee

D. F. 13.7892%⁸

⁸ Jeffrey can explain the history of this.