

# Shay - Painting The Trucks & Frames

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Painting of the locomotive trucks and frame are described in this page. The tender truck and frame were painted using the same process. The tender frame is much smaller so less effort was required to fit it in the oven for curing. The current plan is to powder coat the entire locomotive. The photos show some of the techniques I used to do the powder coating. A similar process can be used if one is spray painting everything --- except one has to wait for the paint to dry before reassembling.

**Stripping The Locomotive:** The engine had already been removed to make the rear boiler clamps. I decided to start on the

rear truck. The axel pump is on the rear truck so it seemed best to pull the cab, cab floor and the under floor water pipes at this point. The photo shows the locomotive with the rear truck off and the back up on wood blocks ----- sort of reminded me of some cars I've seen.



This is some of the parts on the end of one of the benches. Even though I made all the parts, it's been a long time --- sure hope I can figure out where everything goes.



**Painting A Truck:** The is the middle truck (rear truck on the

locomotive) with the hoses from the axel pump visible in the photo. Everything on the truck except the brass part of the pump and the left side aluminum bearing blocks will be painted.



The truck was only partially disassembled. The side frames, spring planks, axels and brake beams were not taken apart. The parts were sprayed with degreaser, washed in hot soapy water and then cleaned in the pickling solution. The photo shows most the truck parts ( less the axels) in the crock pot. There were left in the solution about a half hour on each end and then washed off.

The pickling solution seem to be loosing strength so I dumped it and made a fresh pot using a can of Sparex No 1. Wow, what a difference; the old pot must have got down to 25% of original strength. (I found [Thompson Enamel](#) carries cans of both Sparex No1 and Sparex No 2 for \$4.99 a can.) After the change, most pieces are cleaned in a hot solution in about 10 minutes.



After the pickling, the parts were washed thoroughly. Parts that had cracks or cavities where oil residue might collect (axels, spring planks, side frames & brake beams) were heated to drive the residue to the surface. All the parts were then bead blasted. The photo shows the parts after blasting. Only one of the universal joints was disassembled at a time to avoid mixing up the parts.



This photo shows some of the parts in the paint closet just before spraying. The parts are hanging from an oven rack. The hangers are made from 17 gauge electric fence wire. All the wires are connected together so that the spray system ground needs to be connected to only one point.

The ends of the axels, the wheel surface and the pump cam were masked using regular masking tape.



This shows the parts after the powder was sprayed.



The rack with parts was then transferred to the oven.



This shows the parts after curing. The masking tape was removed while the parts were still very hot. The tape comes off

easily but leaves a sticky residue. The residue is easily removed with mineral spirits after the parts cool to just warm. If the part is allowed to cool with the tape in place, it becomes baked on and must be scraped off.



This shows the painted parts for one truck. This time the line shaft is included. The line shaft collars and spacers were painted but the stainless shaft was not panted.

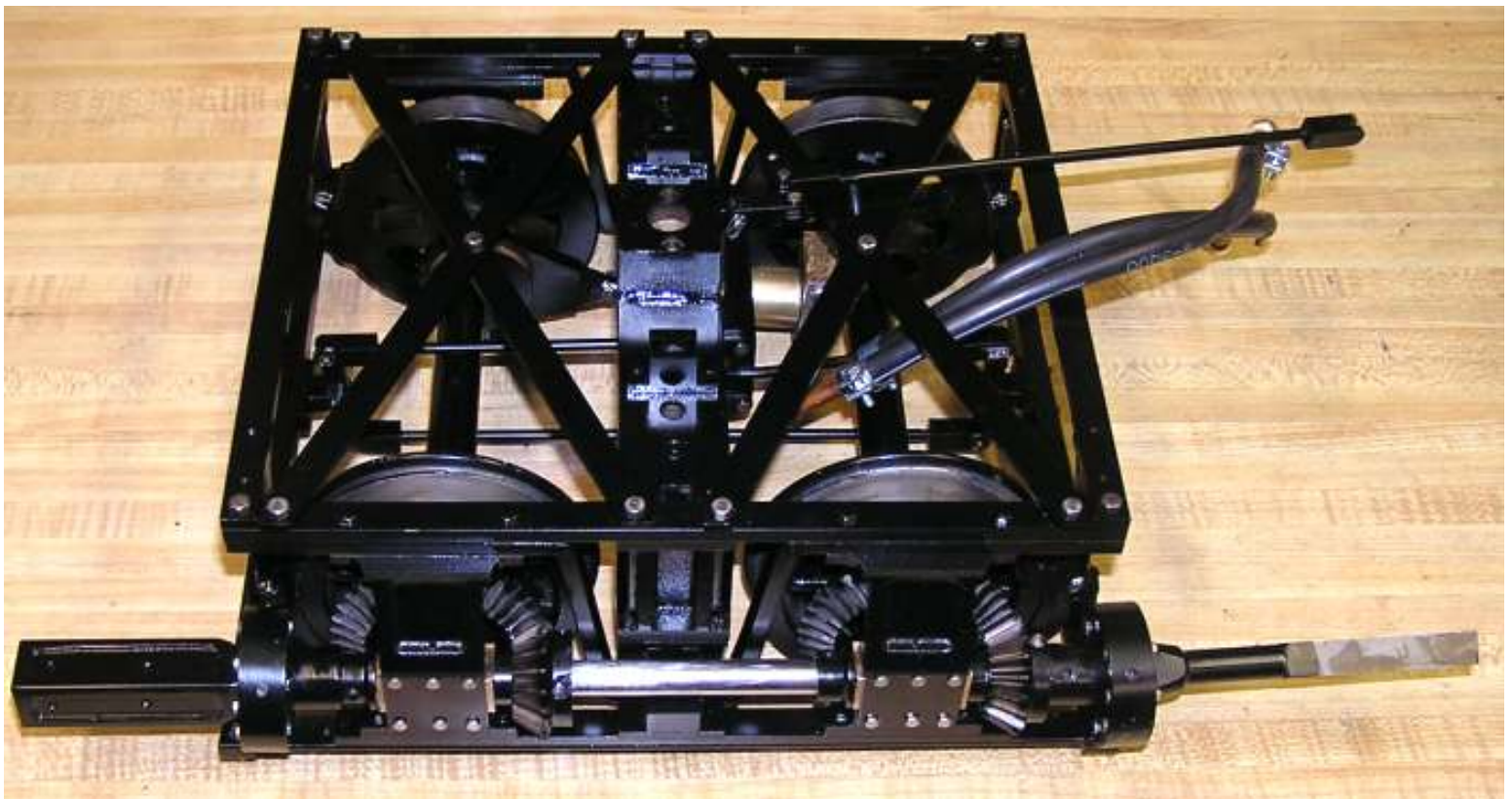
The blind holes in the pedestals and bottom spring plank filled with abrasive during blasting. A tap drill and tap was run into these holes before assembly.



This is the reassembled universal and slip joints. (Both these joints are from the middle truck and don't normally don't fit together; one mounts to each end of the line shaft.)



The right side of the truck



And the left side.



**Axel Pump:** I did a test firing a couple weeks before this painting project. Mark Mihalyi had come from near Pittsburgh to assist. It was about 15 degrees outside which probably says something about our mental capacity. After steam was up the locomotive ran on the test stand for about a half hour. The throttle was then closed to allow steam pressure to build so that the whistle could be adjusted. (The whistle didn't sound very good ---- problem was that it was so cold that the steam condensed

and the whistle merely spit. After it got hot, it sounded better. Hope it works OK in warm weather.) The throttle was opened again after the whistle test (about ten minutes later) but the wheels turned very hard and there was a screeching sound. First thought was that the brakes had hung up. Brakes were checked and found to be OK. It sounded like a bearing someplace. We decided to turn off the fire, drain the boiler, wheel it inside and go to lunch. After we warmed up a bit we played with the line shafts and found that the noise was coming from the axel pump. I was thinking about that pump on the way to lunch and it finally dawned on me that water freezes at 32 degrees ----- and it was 15 degrees. The pump had been idle for about 10 minutes and the pipes and tender had been in the cold for over an hour. Maybe the pump output pipe froze up. That would certainly make the pump stiff. After I returned from lunch (about four hours later ---- there was much to discuss at lunch) the pump turned freely and made no noise.

I was anxious to examine the pump to see if the screeching was due to metal on metal rubbing and determine any damage. There were some minor scrapes on the piston and pump bore but suspect those were made during fabrication and not a result of the freeze up. Maybe the screeching was due to water being forced past the O-Ring. The O-Ring looked OK, but was replaced anyway.

**Heat Wave - A Good Time To Do Frame:** The weather forecast was for sunny and 50 degrees so I decided to do the main frame since it must be blasted outside. The pile of parts in the corner grew even bigger. Sure hope I can put it back together.



Little supports were made for the frame to position it in the oven. The rods take the place of the truck pivots and are retained by the 5/16" screws. Note that the frame really sticks out of the oven.



I tried the oven extension and found a slight gap ---- but close enough. (The tender frame fit in the oven plus extension easily with no gap.)



The frame was taken outside and blasted. The pressurized blaster works really well. She wanted some fill dirt on that bank so did her a favor. The white stuff in the background is snow.

It was perfectly still so the powder was also applied outside ---- saved a big mess in the basement since the frame won't fit in my little painting closet..



## Kids- don't try this at home!

My son helped carry the frame inside and position it in the oven. The gap between the oven and extension was covered with heavy duty aluminum foil secured with the universal fastener.

I baked it for about 90 minutes. The temperature made it to about 350 degrees





The finished frame ---- looks great.



**Finishing Up:** The front truck was powder coated using the process described above. Boy am I glad that's done; don't think I can face another brake shoe. Before attaching the trucks to the frame all the parts that fit under the frame such as the brake levers and brackets and the brake cylinder were powder coated and installed. Photo shows some of the brake and sill parts just after powder was sprayed on them.



This shows the parts after curing. I'd opened the oven to remove the masking tape while the parts were still hot. That's the brake cylinder on the right.



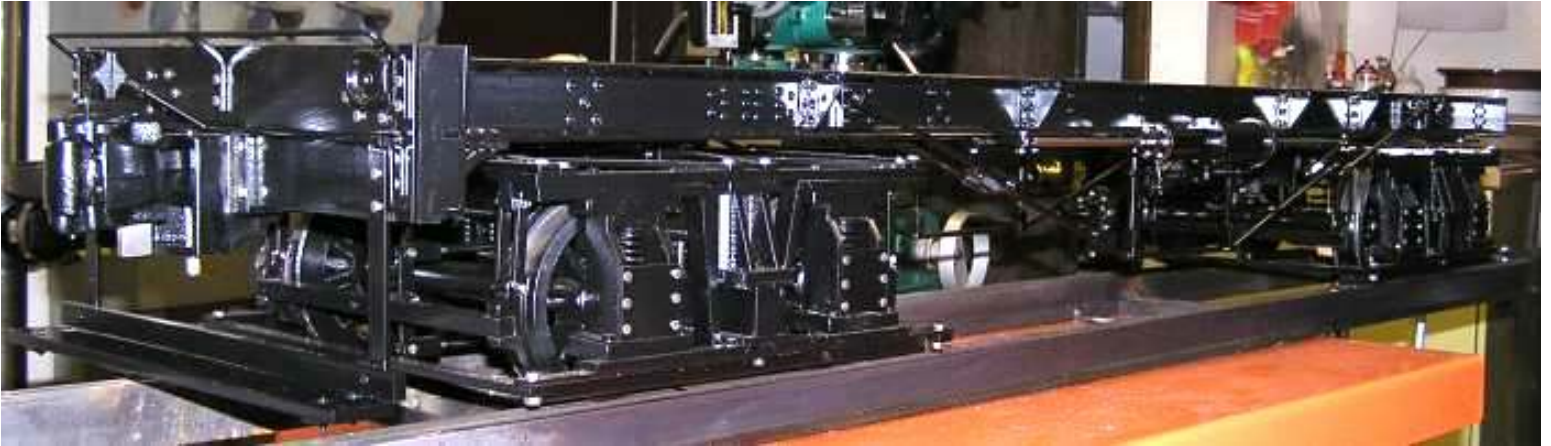
The brake cylinder looks great but doesn't show up very well with the black I beam in the background.



The front sill was finished using the same techniques as the rear sill on the tender.



Next photos show the finished trucks and frame. Hope I don't have to take them apart for at least a decade.



The boiler is next --- after that it'll be all down hill.

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