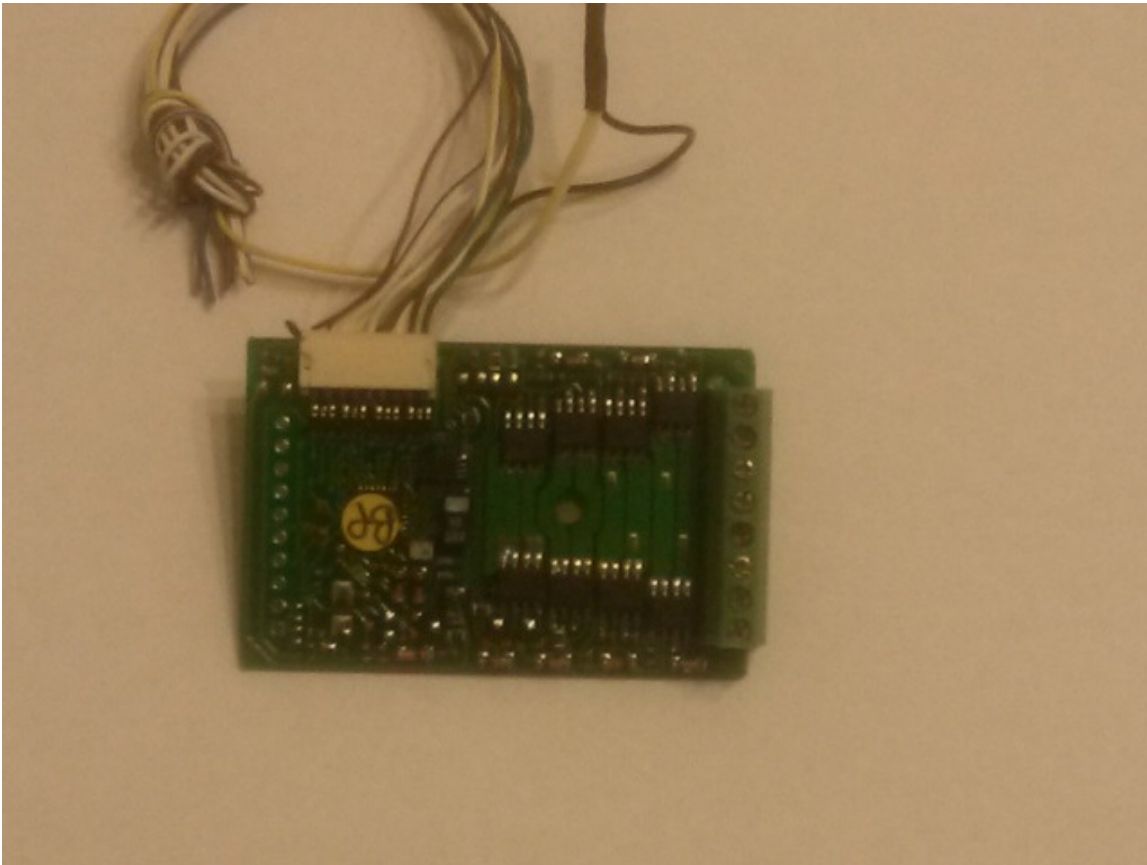


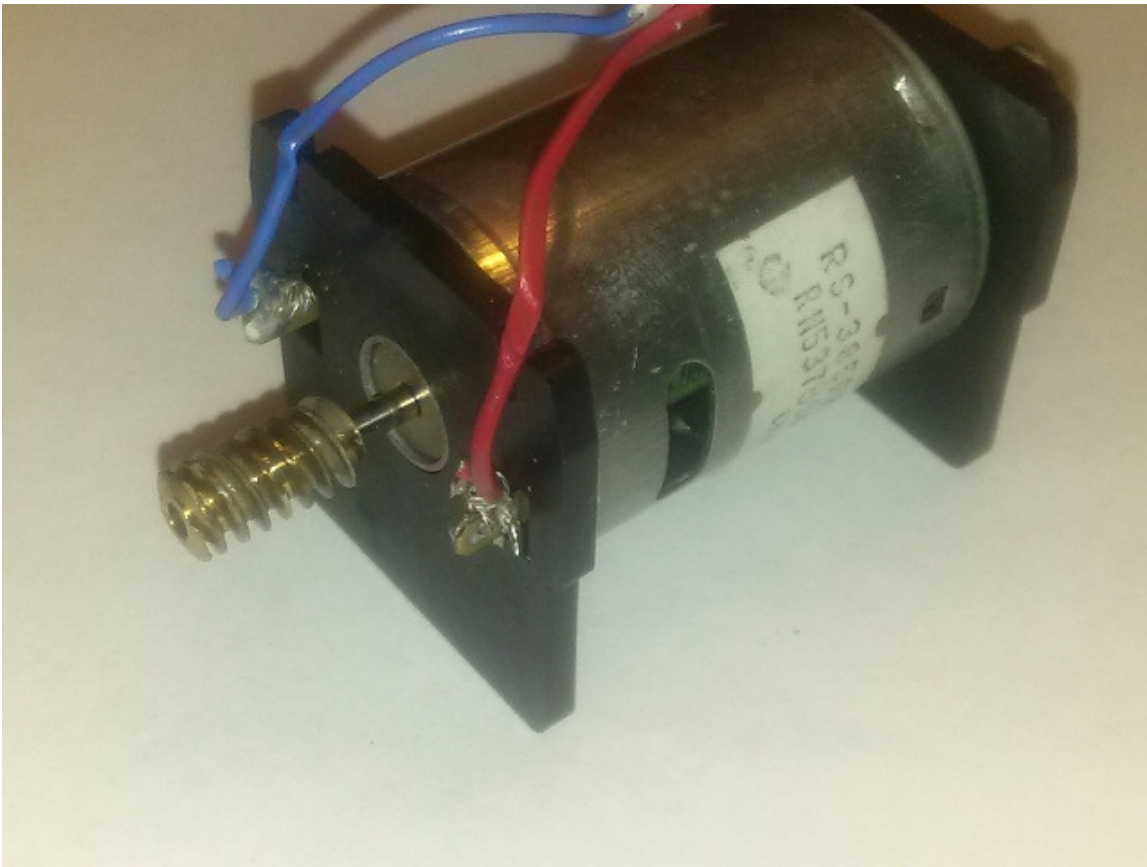
I picked this Hartland Line Car up in a bulk purchase from a friend who was in need of some cash flow. When I took it out of the tub, the front pilot was broken off along with some other smaller detail parts. The power truck was dangling by a couple of wires, and there were parts rattling around inside the cab. When I removed the cab shell, one of the two weights was loose, and there was an unidentified circuit board. There was a brass post stuffed down inside the pivot of the power truck with what looked like a light (smashed by the loose parts) that was supposed to light the headlights.

First order of business was to determine what the unidentified circuit board was.

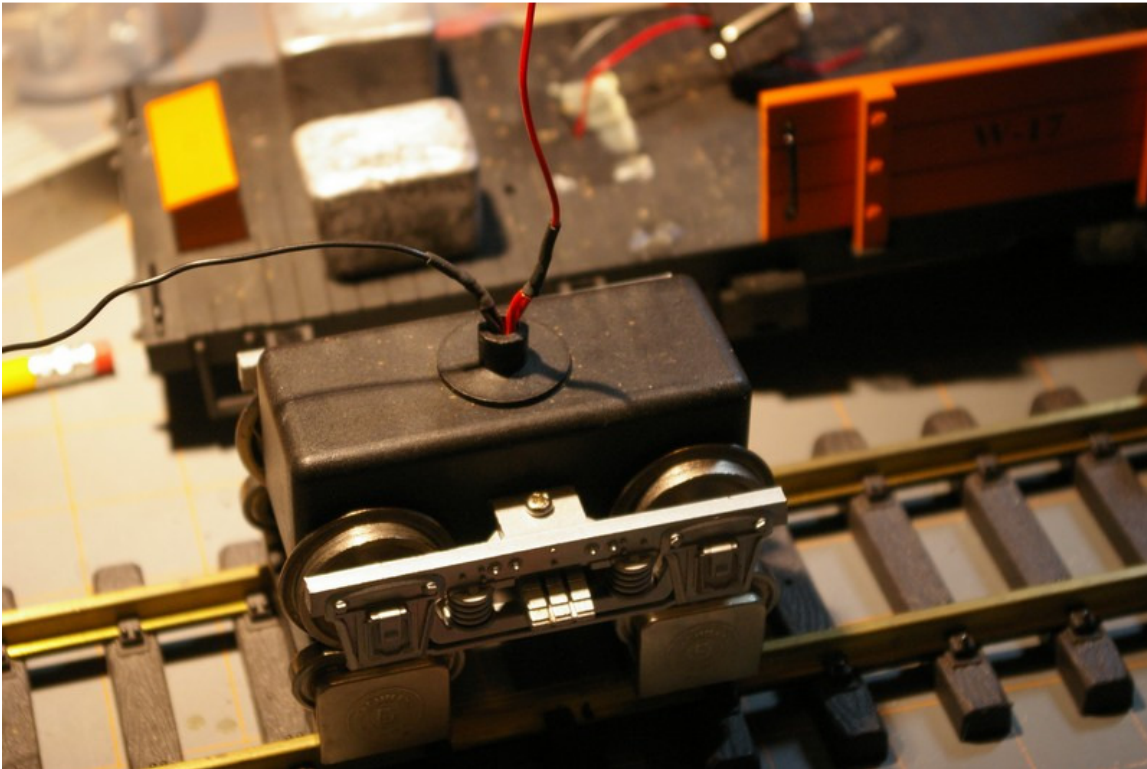


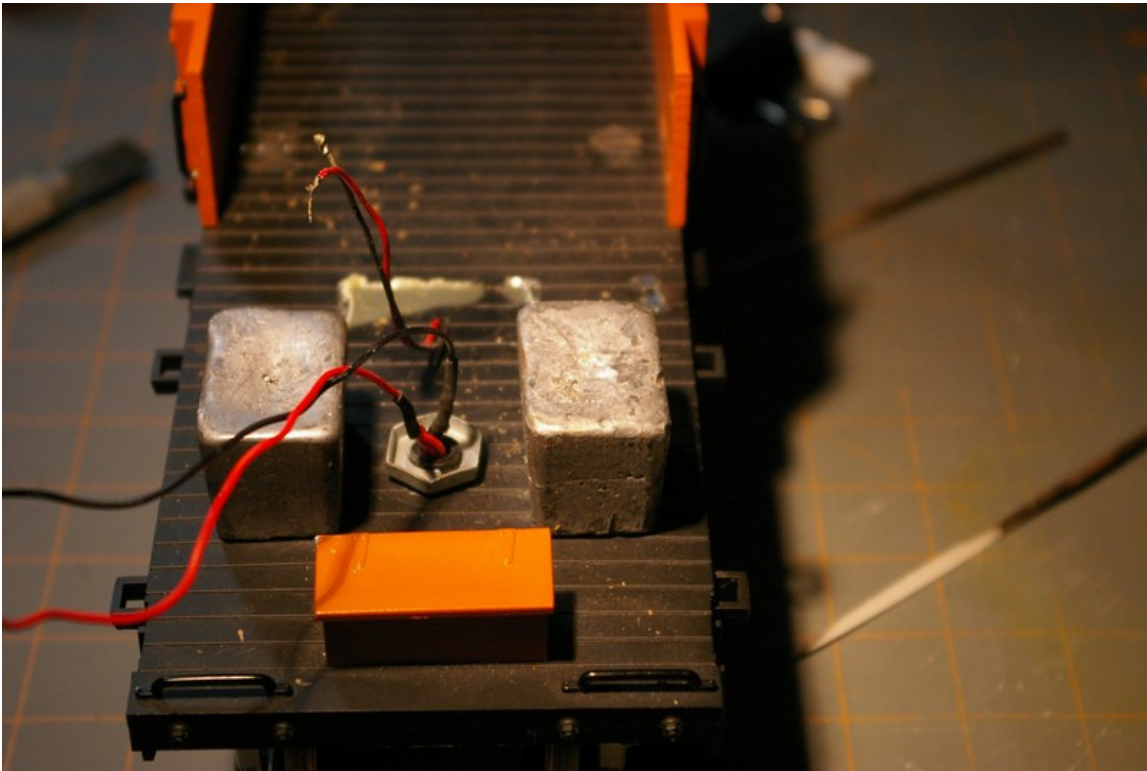
After posting in the chat room one evening, it was determined to be an early DCC board that no longer has any value, so out it went.

Next task was to get the motor block back in to operating condition. I decided to revert back to analog DC track power. Unfortunately I didn't take any pictures of the rebuild of the motor block other than the pinched wires when I remove the motor to do the rebuild.

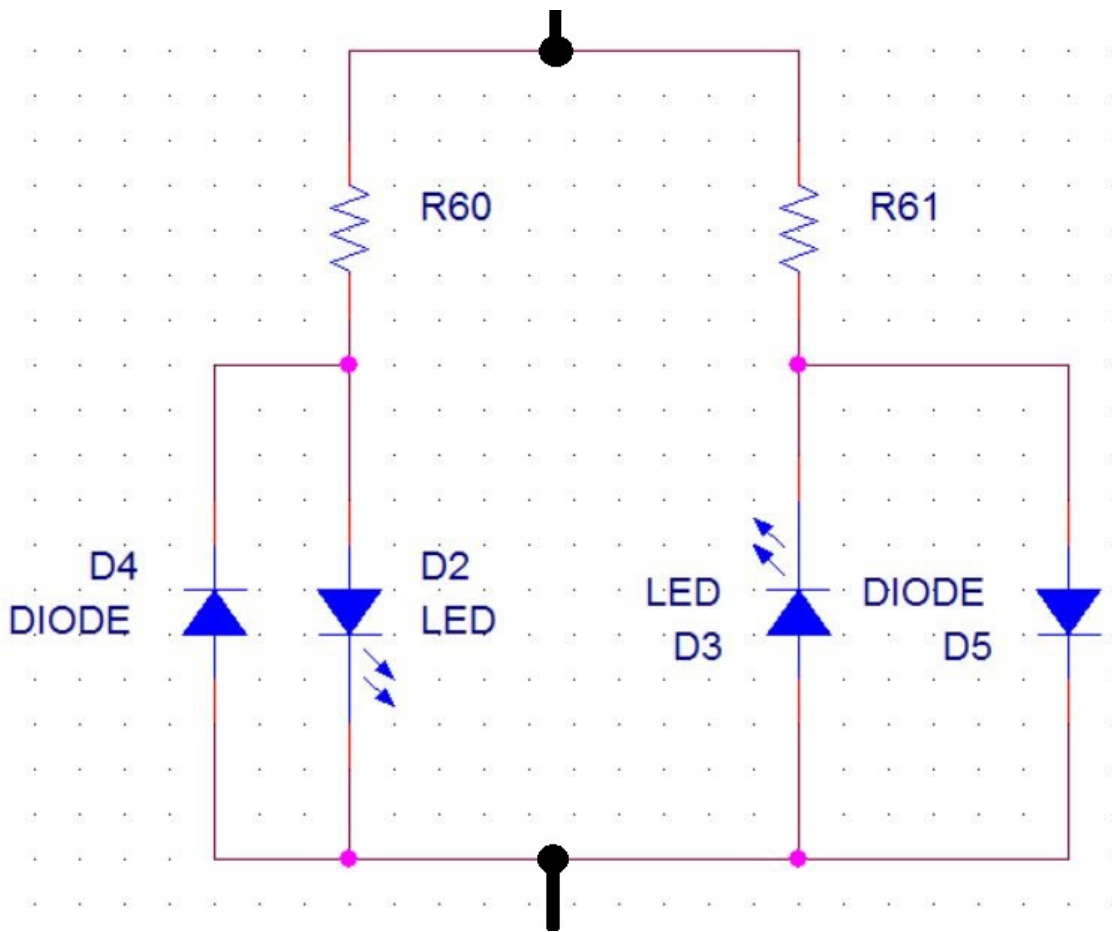


Once the block was repaired and back to near factory specs, I put the front truck in place leaving a slight amount of motion to keep the truck rotating easily.

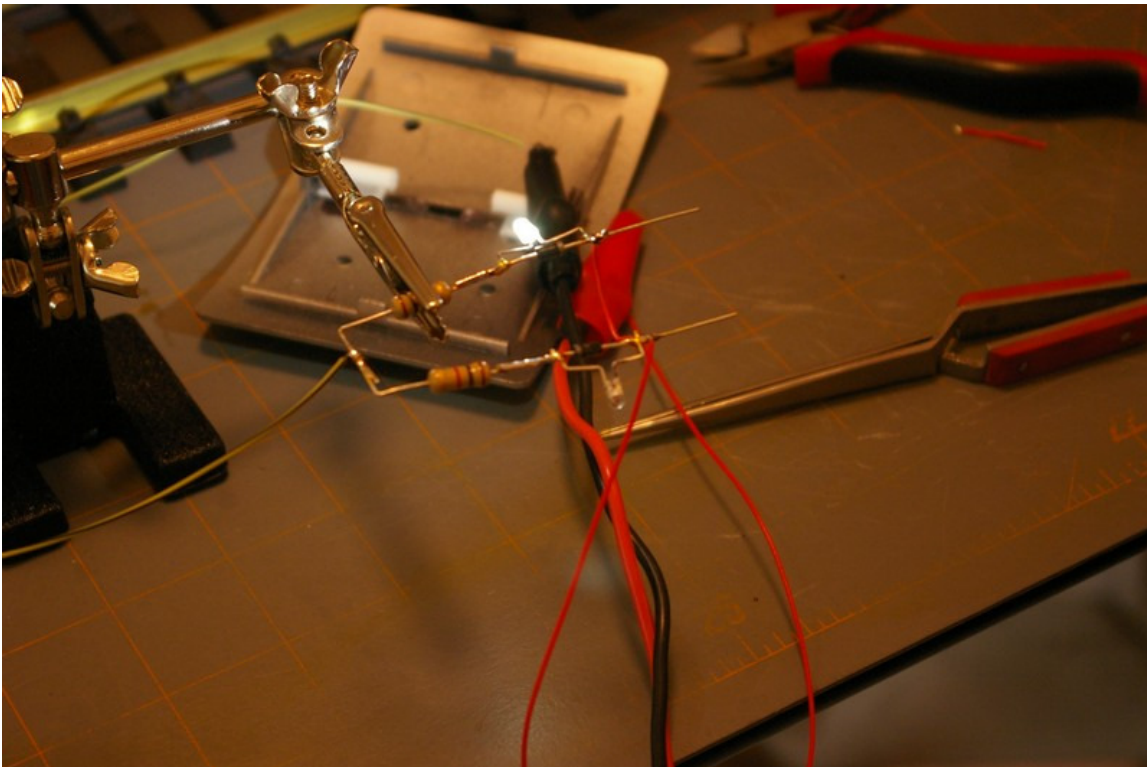


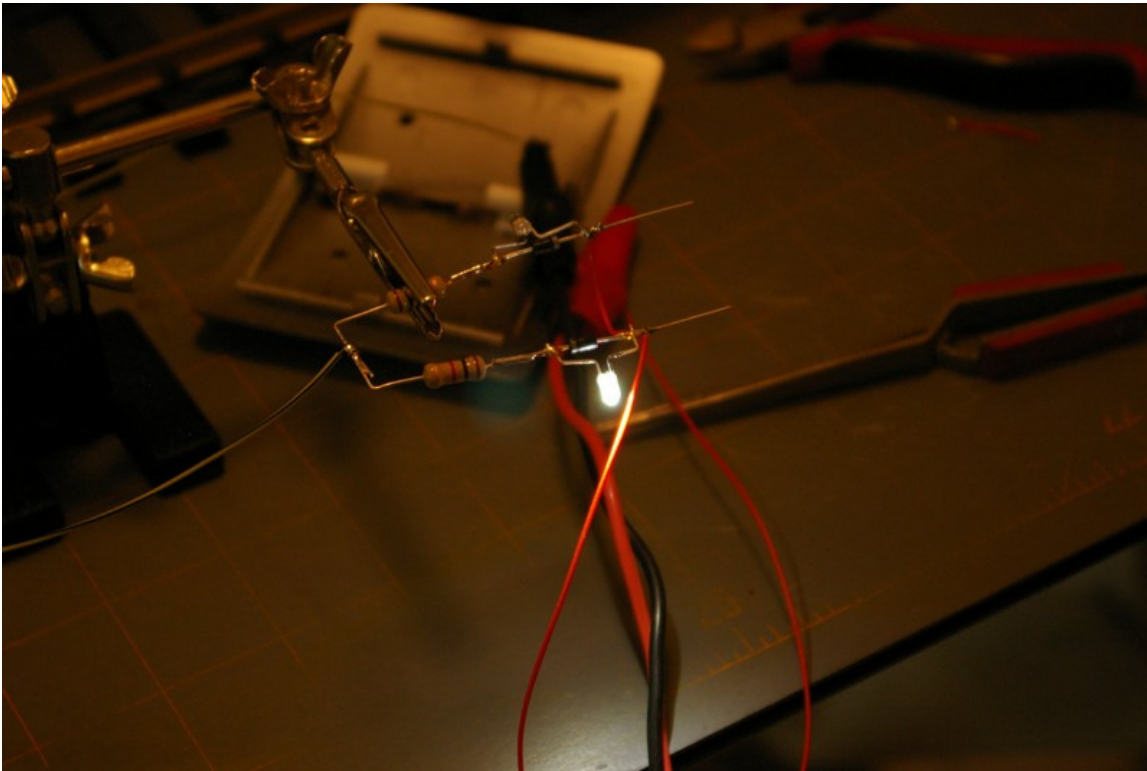


Next was to get the lights working. I decided to experiment with directional lighting using LEDs. I purchased some LEDs, diodes and resistors so if I let some magic smoke out I had spares to work with. I purchased all the components from Mouser Electronics (www.mouser.com). The resistors are 1K ohm, part number 294-1K-RC, the diodes are standard 1N4001 par number 821-1N4001, and the LEDs are part number 78-VLHW4100. All these parts are quite inexpensive, I bought enough to do about 15 or so locos. The schematic below shows how to orient the components for directional lighting. The heavy black connections top and bottom of the graphic are the power connections, the polarity will change dependant on track power,

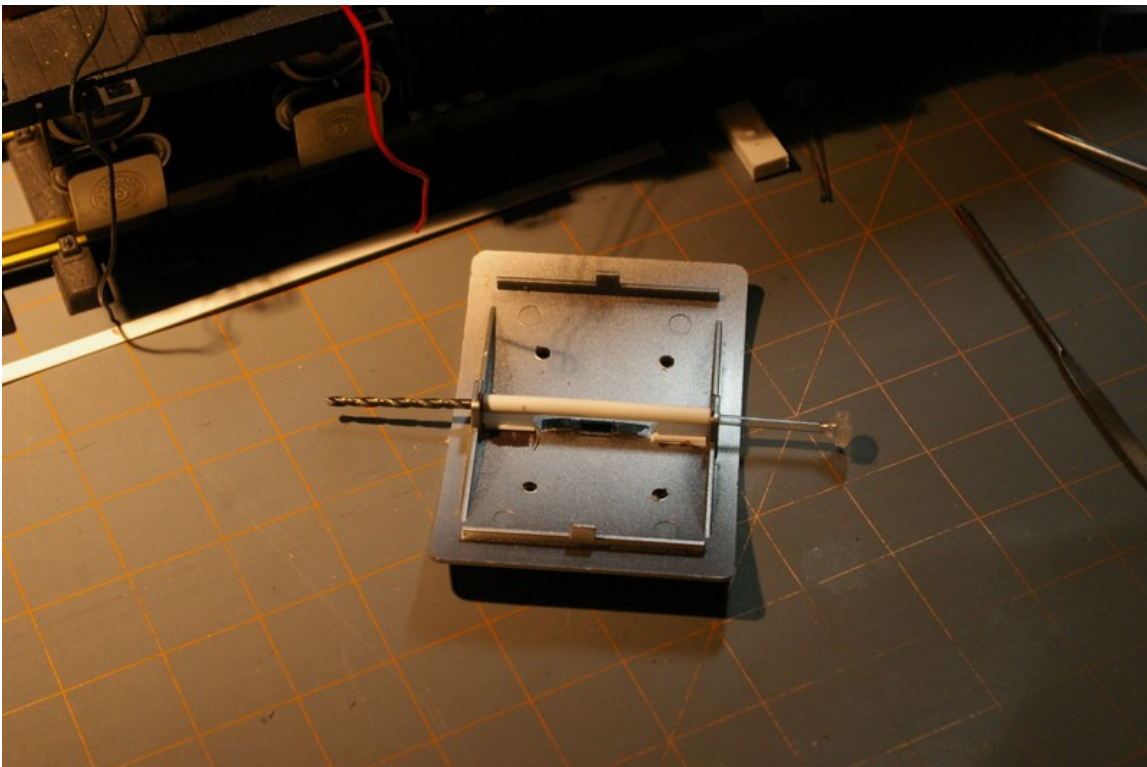


At some point later I will do some experimenting to determine which LED lights with what polarity, I didn't think to do this on this install, I just flipped the assembly when the lighting was opposite the motor direction of travel. The pictures below show the reversing of the polarity and opposing LEDs being lit.

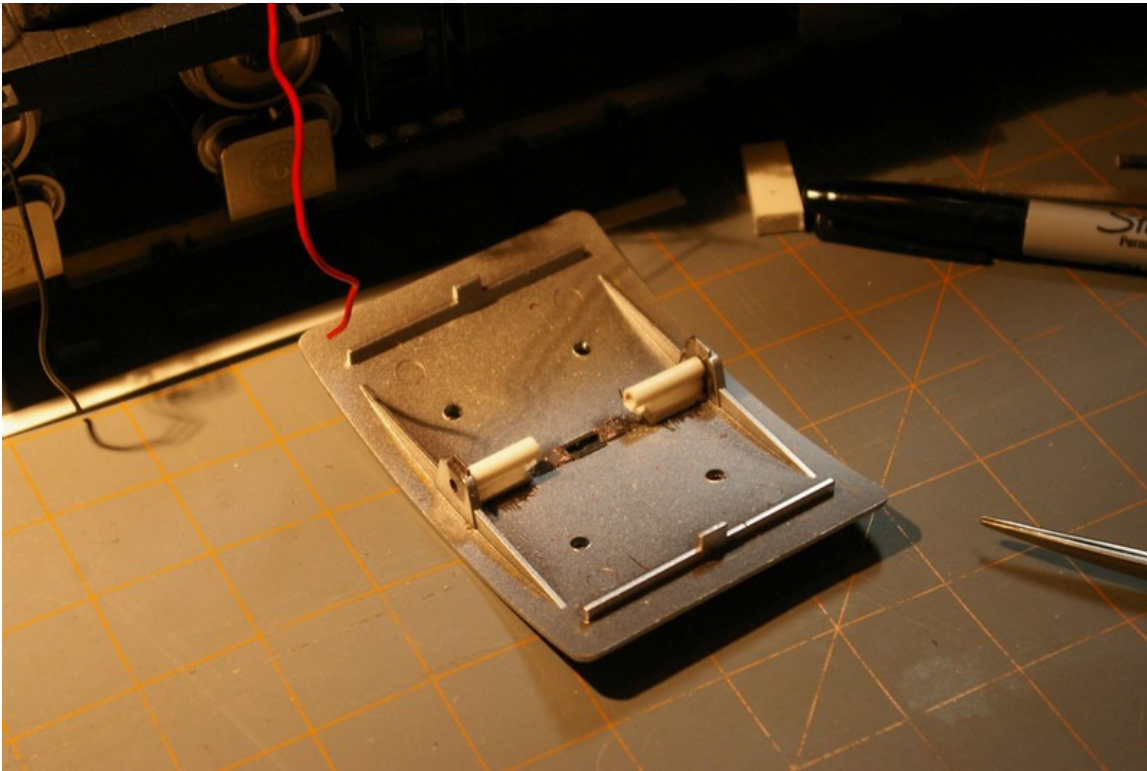




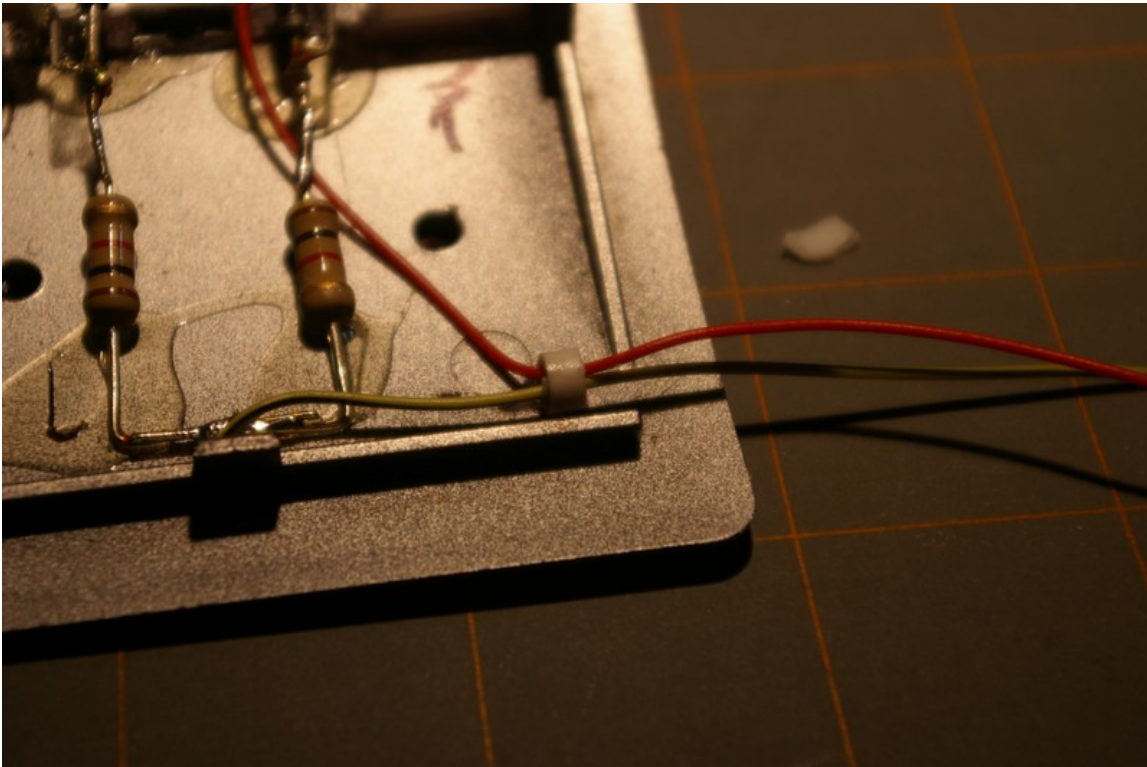
Hartland uses the lenses for the headlights to secure the roof to the cab shell through mating holes. In order to maintain that assembly method I needed to devise a method that would both mount the LEDs and secure the lenses in the roof. Thanks to Rooster here on LSC, he provided a perfect piece of 3mm ID styrene tubing for the project. I cut a length of the tubing to fit snugly between the tabs the lense fit through and used a drill bit the same diameter as the lense to secure the proper alignment. Next I shimmed the tube on the ends and cemented the assembly in place.



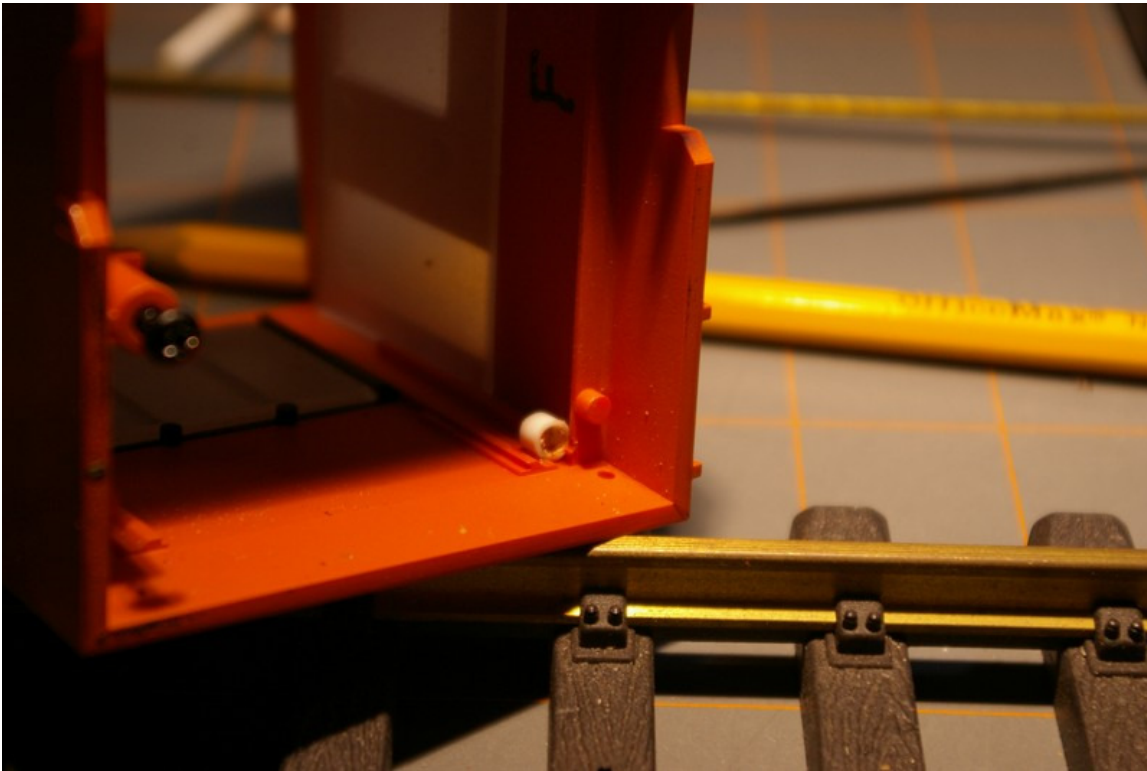
Once the solvent had done it's work, I cut the center section out of the tube.



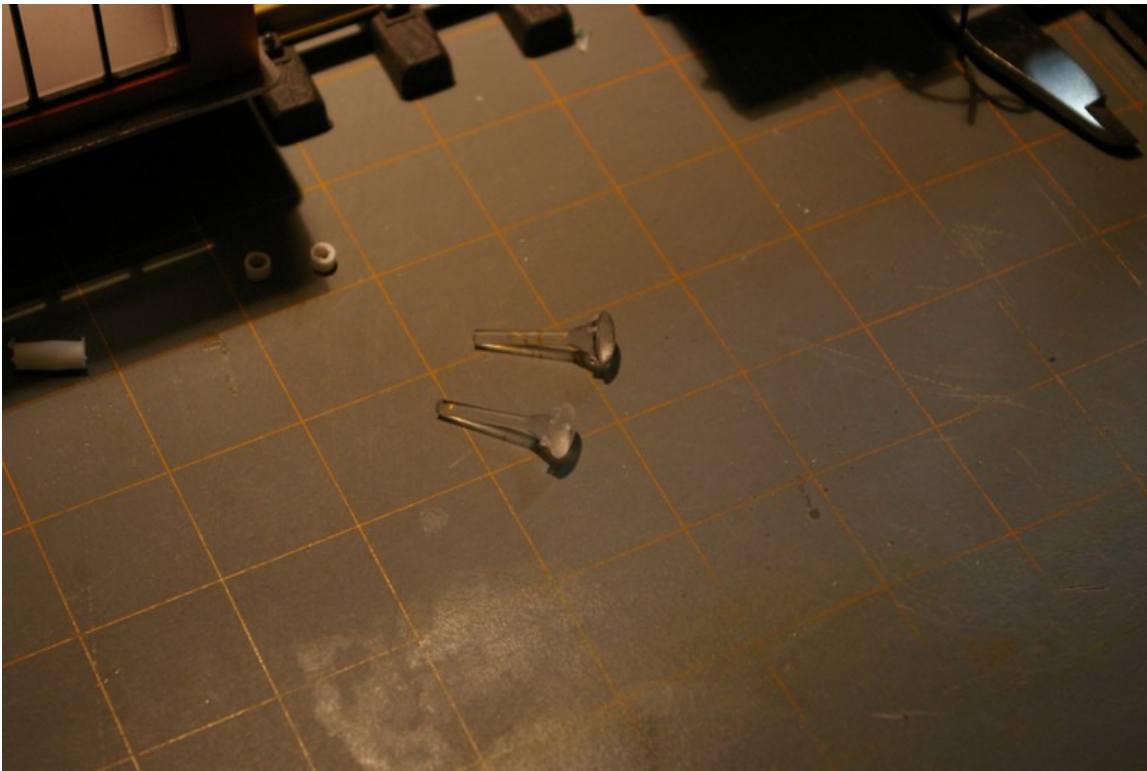
Next I installed the LED assembly, securing the common of the resistors to the roof using rubber cement in a good amount. This allowed me to be able to spring the LEDs out of the tube as necessary for the custom 'trim to fit' of the lenses. I also added a small loop of 3mm tubing for wire control.



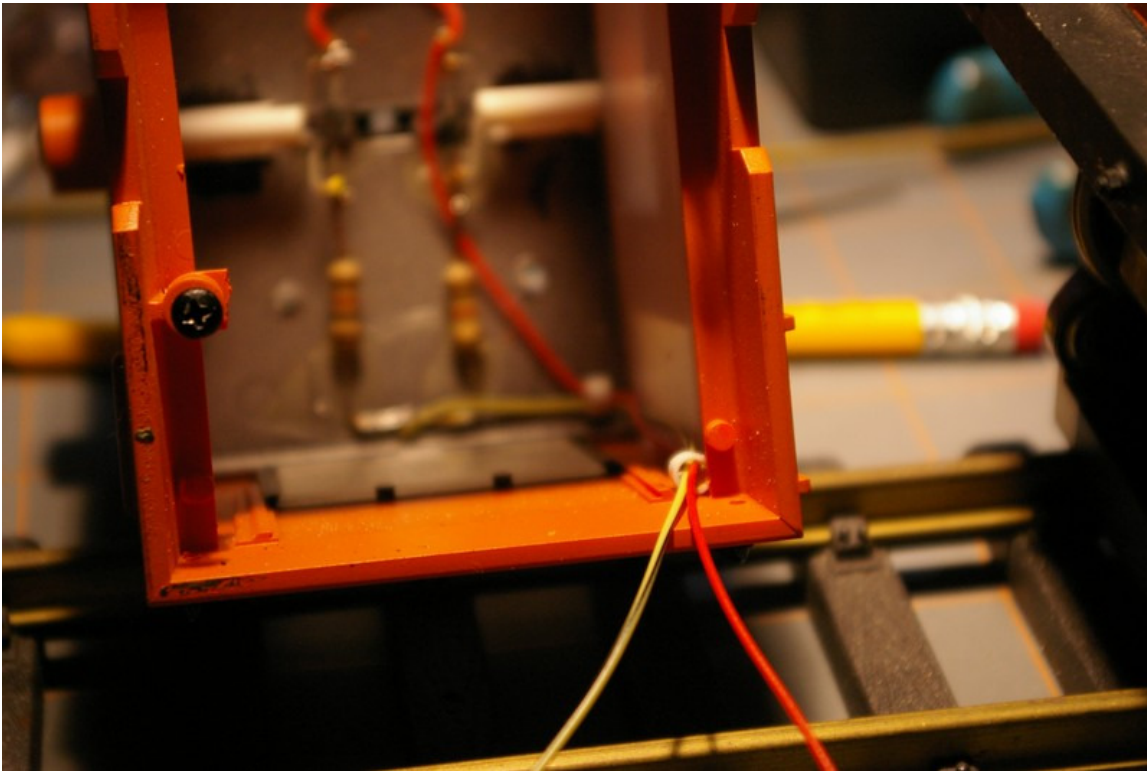
An additional ring of tubing was added at the base of the cab as well.



Next up I trimmed the lenses to fit the installed LEDs. I fit these as close to the LED as possible, making for a bunch of trial and error fitting until they just cleared the installed LEDs.



Once the roof was reinstalled on the cab shell, the connections were made to the motor block and pick up wiring.

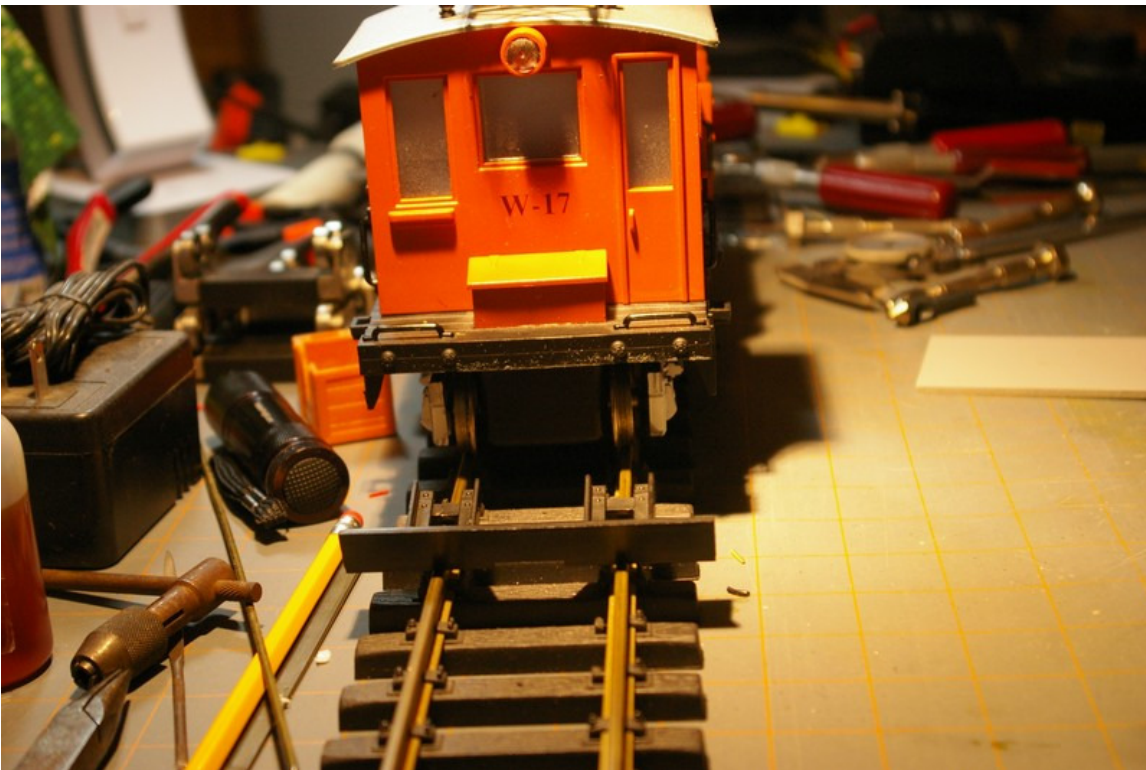


Cab shell re-installed on the frame and the lights working

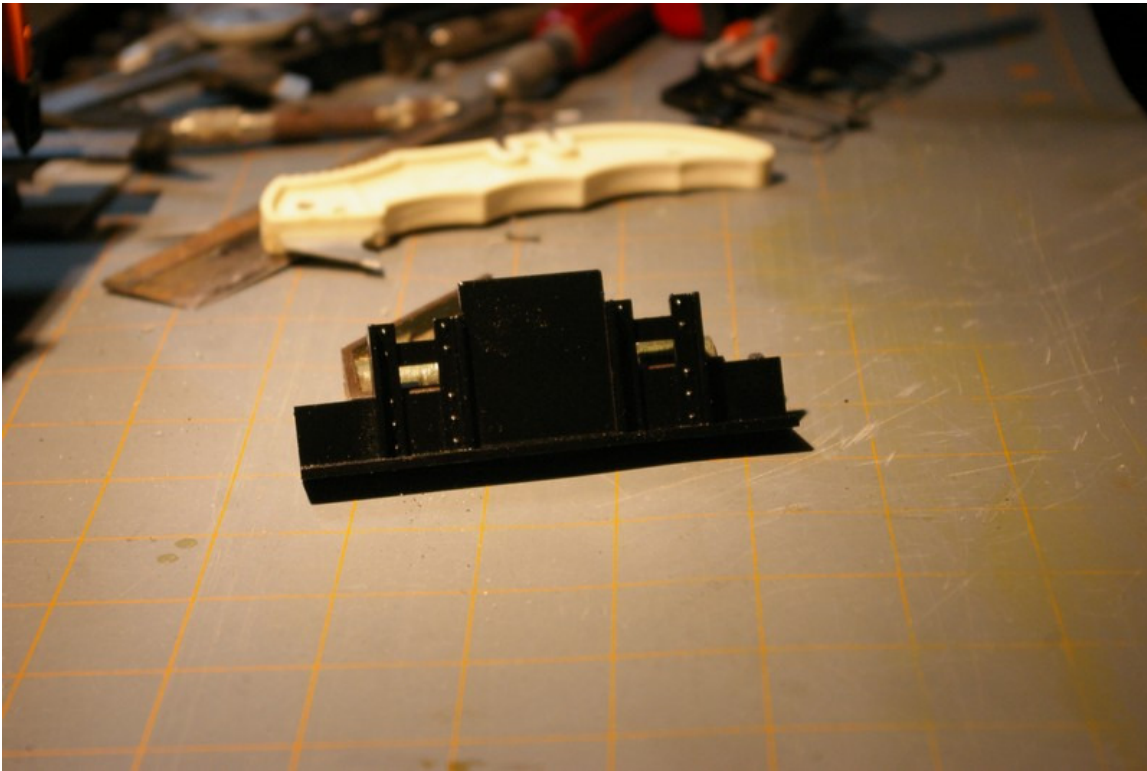


I think what appears to be a light on the end beam is a reflection from the camera lense, but not sure.

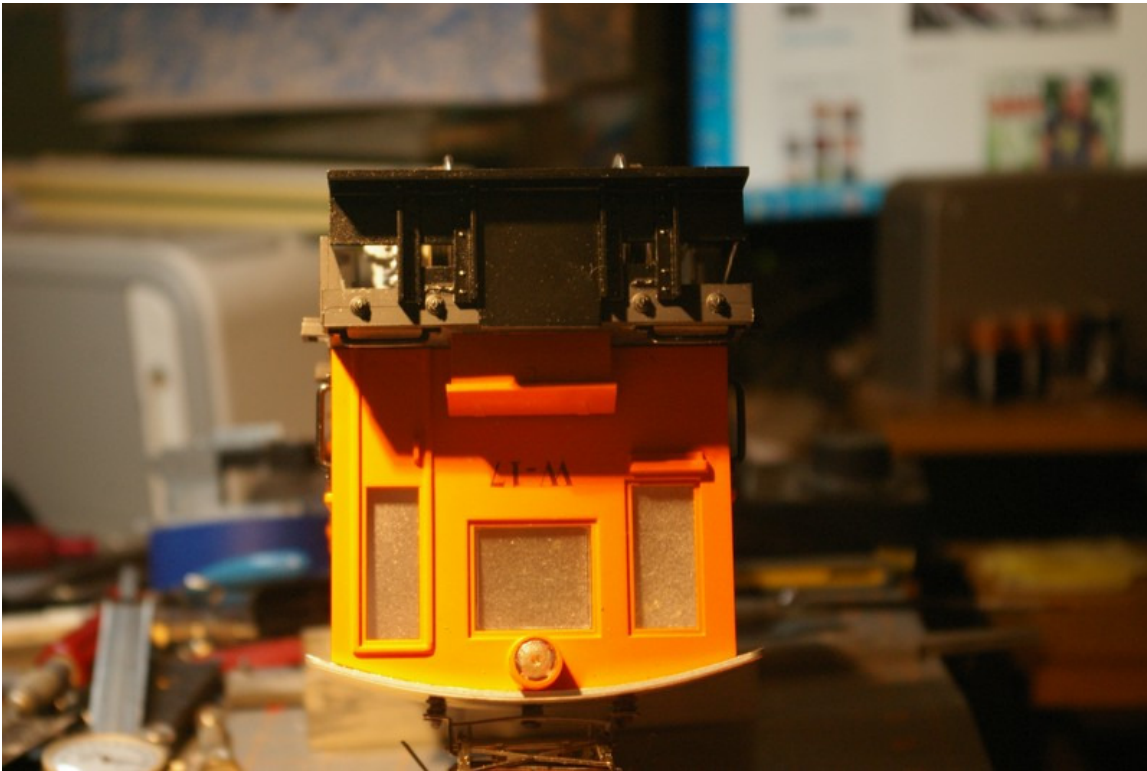
Next up was to repair the broken front foot boards that were broken.



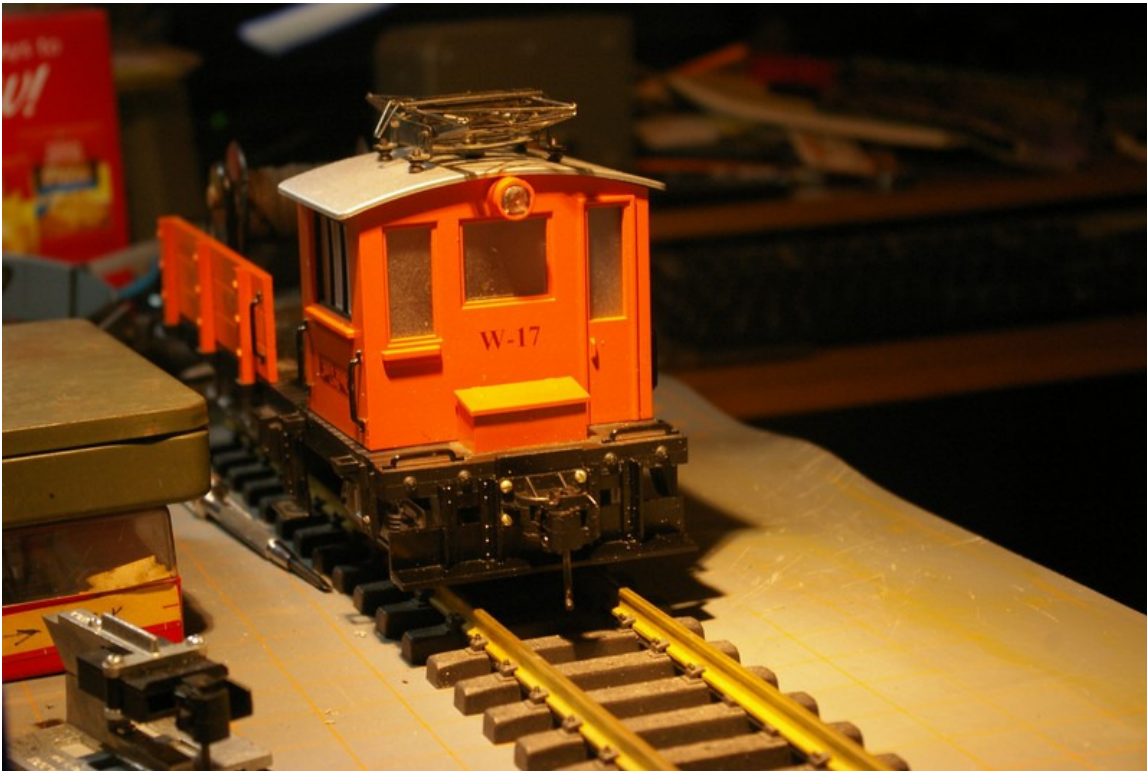
I decided I wanted to install Kadee couplers on this unit, and felt the 779 End Beam mount would be best for this end of the motor. I added a piece of 1/8 inch ABS plastic I had in the shop between the center uprights on the foot step.



This was then re-installed on the end of the car body using thick ACC.



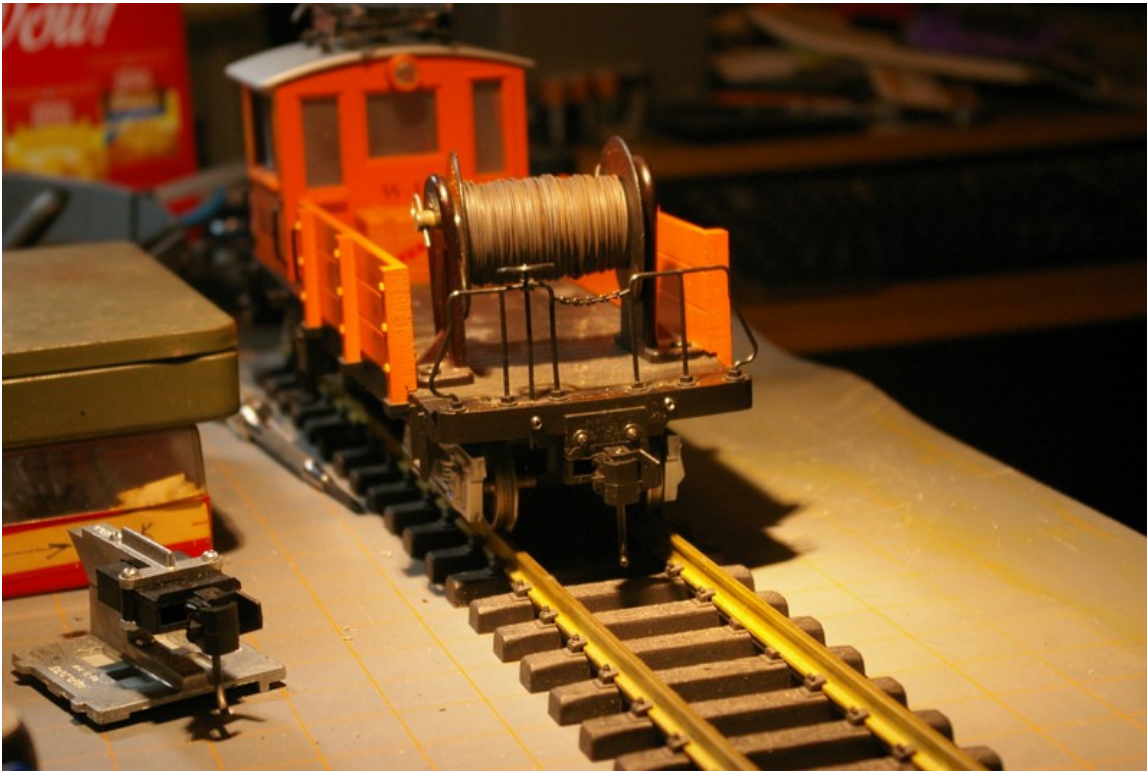
And the final result with the Kadee 779 coupler installed.



The other end of the car got a Kadee 830 in a more conventional method. I removed the end beam piece after marking the height for the coupler with the Kadee gauge. I trimmed the end beam, and shimmed as necessary to add the height and strength necessary. This was done with multiple layers of 1/8 inc ABS and one layer of .030 sign plastic (mystery material).



The end beam was then re-installed on the motor, drilled and tapped for #2-56 machine screws and Kadee 830s installed.



The original intent was to get it running and sell it to recoup some of what I spent, however my sweet significant other decided she liked it and informed me it was staying. I guess next I will add some detail 'junk' on the deck to make it look more like a work motor.