TT Scale GP-38 Mechanical Build Instructions
Written by Elmer McKay

These instructions are written as a guide as to how I built the mechanical portion of my GP-38. You should read through them before starting, and look at each part as you do, so you will get a sense of what is being done and the order that is being followed.

This is not a beginners kit. The procedures and materials that I used for this build, and that are written into these instructions, are not set in stone. You should use techniques and materials that you are familiar with.

Soldering is recommended for the frame and power truck mounting as this provides the strongest assembly. JB Weld epoxy would be the second best method of assembly for the frame folds and power truck mounting.

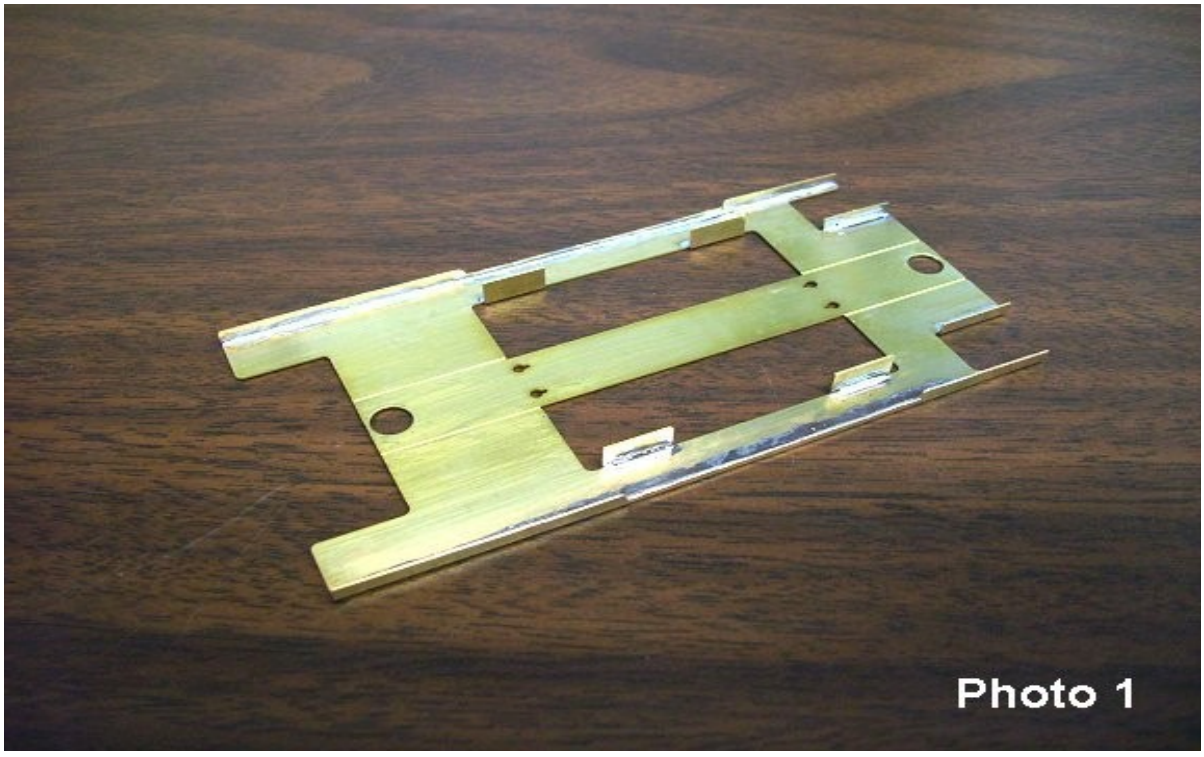
There is ample space for additional weight. In the fuel tank is a good place because it sits low. There is also enough space on top of the frame for an N scale DCC decoder.

Additional parts

- Flywheels if used.
- Universal set - North West Short Line no. 487-6 for 1.5mm shaft. (2 packs recommended)
- 3/64th brass or steel rod material for drive shafts. (A 6 inch length will do.)

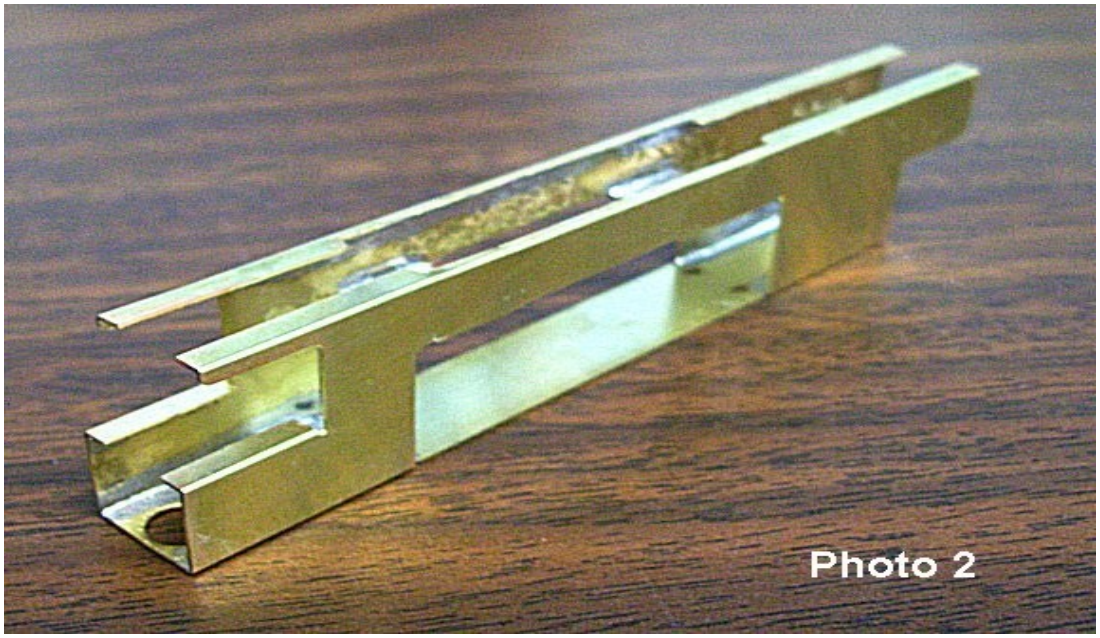
Instructions

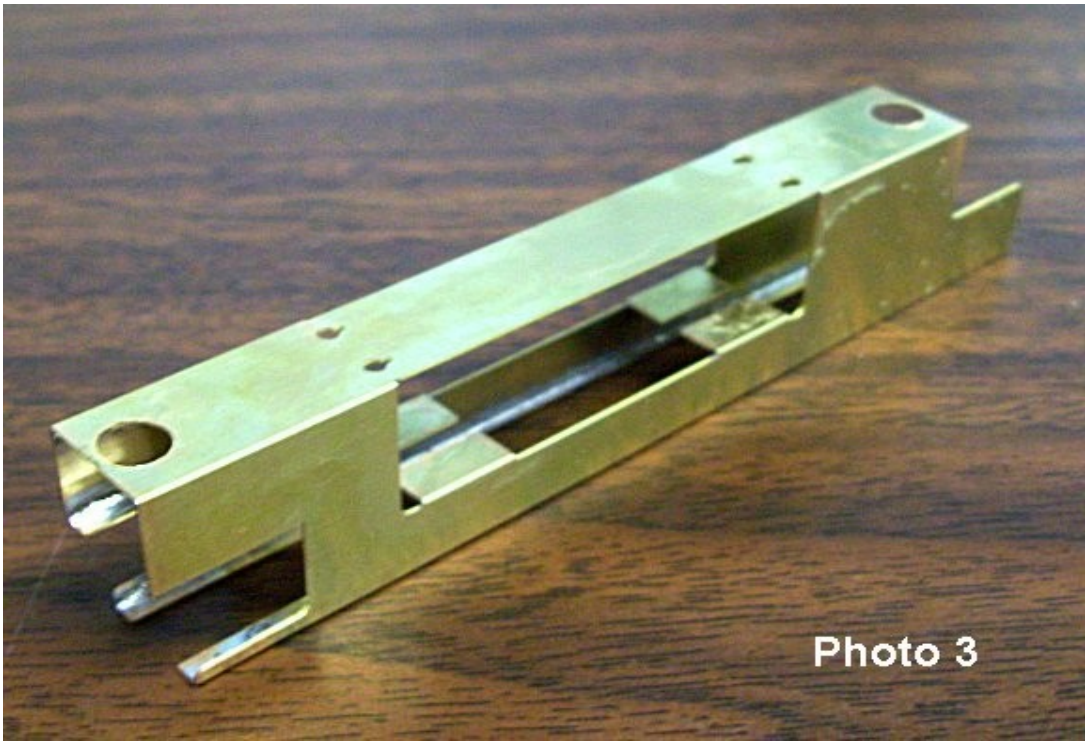
1. Fold up the brass frame except the two center folds which are the bottom / sides, and solder the fold creases. All bends are folded to 90 degrees. Photo 1.



2. Open up the two holes for the truck mounting. I used a 7/32 punch and die. The hole should be slightly larger that the bolster mounting on the Bull Ant power trucks. The trucks will mount to the bottom of the frame.

3. Fold up the remaining two folds on the frame and solder the fold creases. Make sure that these last two folds are exactly 90 degrees as this affects how the model will sit on the track. If the folds are not at 90 degrees, the locomotive could lean to one side or the other. Photos 2 & 3.



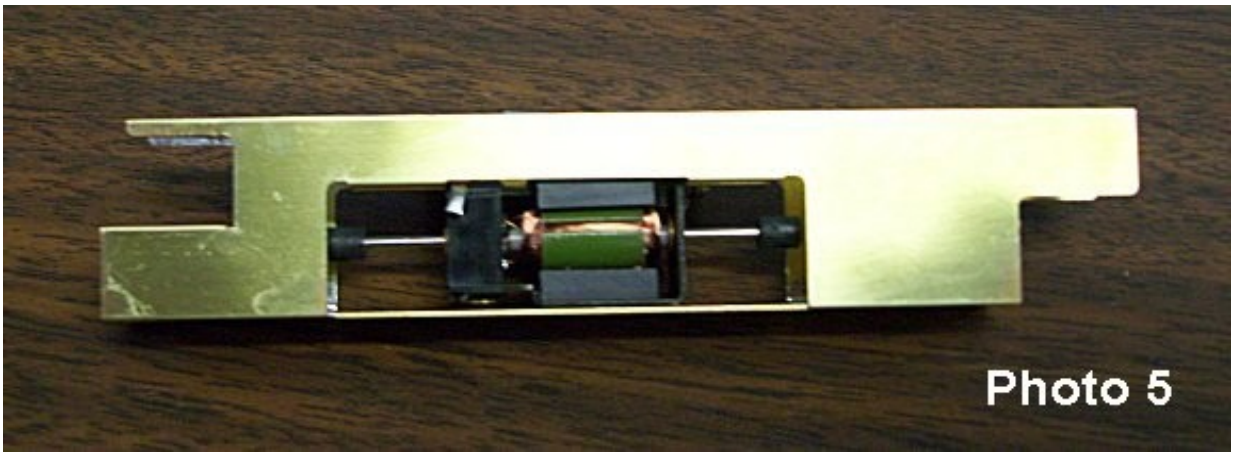


4. Check the power truck mounting on the frame and make any adjustments necessary to the enlarged holes. Use a jewelers file if required.

5. On the Power Trucks, cut off the outer most tab of the side frame mounting piece on each side of each truck. This is the large black plastic part. (Four cuts total.)

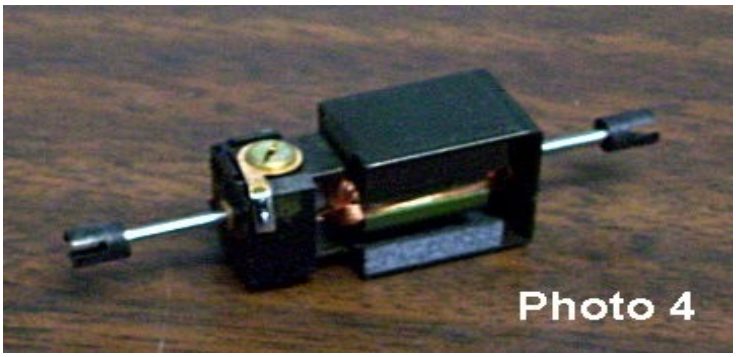
6. Trim and fit the side frames to the trucks. Some trimming of the material inside the square mounting area of the side frames will be necessary. I used a dental bur in a rotary tool at about 5,000 RPM. An X-Acto knife with a #11 blade can also be used. Take your time and don't remove too much material. Do not attach the side frames to the power trucks at this time.

7. Check the fit of the motor in the frame. The motor that I used was an open frame type and fit the frame closely. It also sat even on the bottom so no special motor mounts were needed. If you are using a can motor, you may have to fabricate some spacers or mounting pieces for the motor so it will sit straight in the frame. Pay attention to where the power truck wires will be attached to the motor. You may have to pre-wire the motor so the truck pickup wires can be soldered to the motor easily. Photo 5.

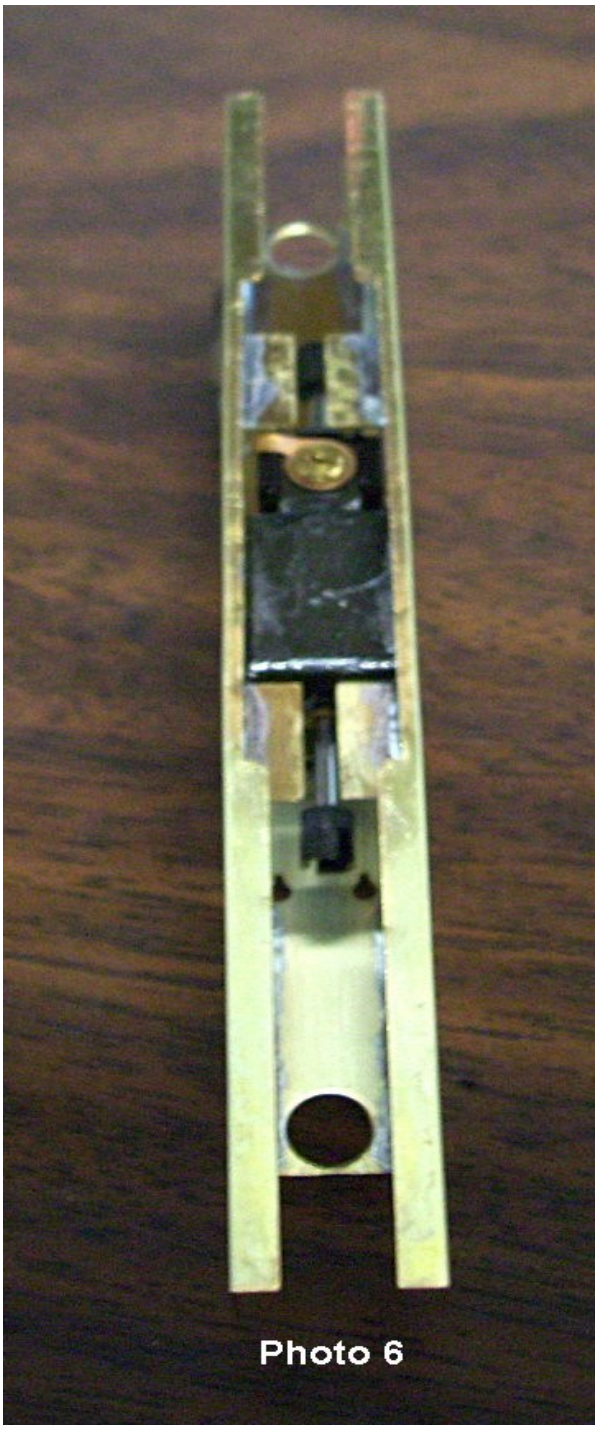


8. Mount the flywheels if used and then mount the universal cups. See the step below for tips for mounting the universal cups. If flywheels are not used, go to the step below.

9. Mount the universal cups on the motor shaft. I used a round toothpick cut in half to push the cup onto the shaft so it wouldn't go too far on. The shaft should not protrude into the cup. Once the cups are in place, apply a small amount of thin super glue on the back of the universal cup and shaft. Photo 4.



10. Mount the motor in the frame. Because the motor I used had a flat bottom, I used Walthers Goo to cement the motor to the frame at the bottom and the top. Photo 6.



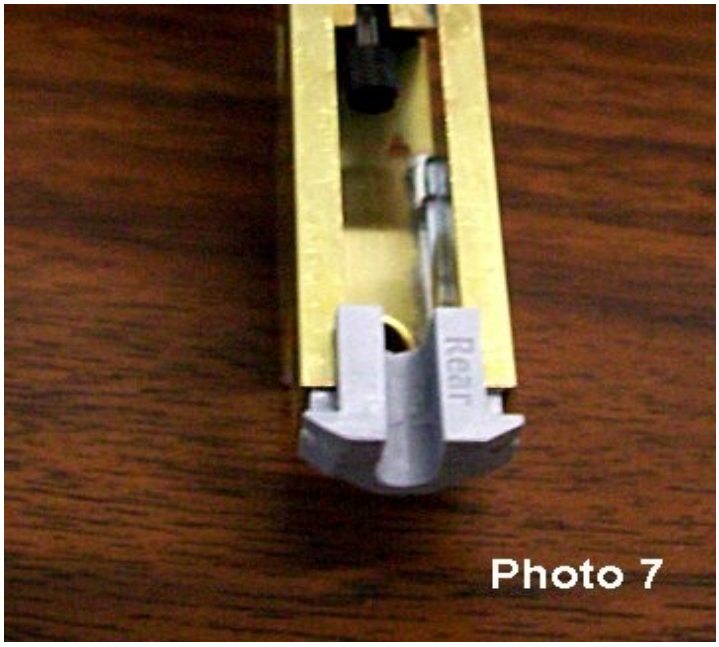
11. Cut the universal shafts to length. Temporarily mount one truck at a time to the frame. (I used a small hemostat to hold them one at a time. I pinched the bolster to the bottom of the frame.) Measure for the universal shaft. Measure from the truck shaft to the motor shaft, inside the universal cups. Cut a shaft to length and fit it in place. It should be long enough so it doesn't fall out and short enough that

it doesn't bind up when the truck is pivoted up and down. Measure and cut each shaft to length. Note: The shafts may not be the same length. The optimum length would be from one shaft end to the center of the universal cup at the other end.

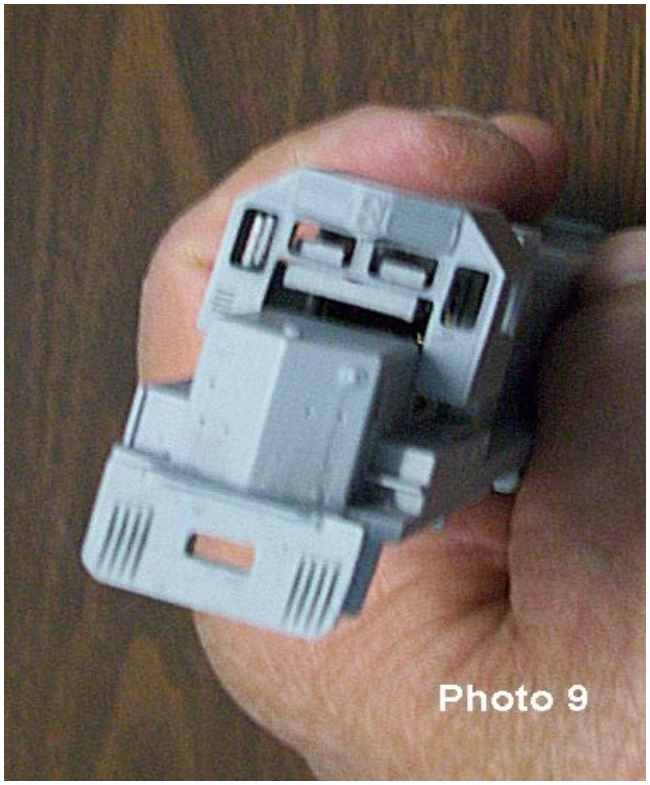
A NOTE about shaft diameter. Although the NWSL universal pack is for 1.5mm shafts, when I used a 1.5mm universal shaft and put the ends on, the ball diameter expanded some and was binding when it was slid into the cup. This is why I used a 3/64th inch shaft.

12. Attach the universal ends to the universal shafts. The 3/64th diameter rods may fit a little loose in the ends. Once the ends are in place, apply a small amount of super glue to them and let cure. When cured, put them in place to double check their fit. Photo 12.

13. Prepare the light bulb holders for the frame. I beveled the corners of the rear holder to fit the end of the shell more closely. Temporarily fit the bulb holders on the top of the frame, then put the frame into the shell and check the fit of all parts together, including the cab. The front to back spacing of the frame in the shell will be set in the next step using the bulb holders. Photo 7.
NOTE: The bulb holders do two important things, so do not leave them off. First, they center the frame in the shell, and second, they set the height of the shell on the frame.



14. Notice the four bolster nubs on the bottom of the shell. These should be aligned with the center of the truck mounting holes as close as possible. Put both bulb holders on the frame and put the frame in the shell, and hold the cab on the shell. Center the frame in the shell by aligning the center of the truck mounting holes with the bolster nubs on the shell. Slide the rear bulb holder tight against the rear of the shell. Carefully remove the frame from the shell without disturbing the rear bulb holder. Glue the rear bulb holder in place using thin super glue and let set. (Do not remove the bulb holder to apply the glue. It must be glued in place to maintain the correct location on the frame.) Next, put the frame with the bulb holders back in the shell and slide the frame to the rear. Using the cab as a guide, line up the front bulb holder with the inside front of the cab. Carefully remove the cab without disturbing the front bulb holder and the frame in the shell. Apply some thin super glue to the front bulb holder and let cure. When this step is complete, put the cab on the shell and hold it in place. You should not be able to move the frame in the shell. To remove the frame with the cab in place, lift out the rear of the frame, then slide the frame back to remove it from the chassis. Photo 8 & 9.



15. If you are going to put lights in your model, now is the time to do it unless you are going to add a DCC decoder, then see the next step. I suggest that you use LED's because they do not generate any heat. Fit the lights into the bulb holders. You may have to enlarge the inside area of the holders for the lights to fit. Be careful not to twist the frame when opening up the inside area of the bulb holders. It is important that the lights do not stick up higher than the top of the bulb holders. If they do, the shell will not sit at the correct height on the frame. The lights must not stick out in front of the bulb holders as well.

16. If you are going to instal a DCC decoder, plan it out now. I suggest that you use a TCS, N scale decoder such as the AMD4. Go to the following link to see the installation photos for an N scale GP-38. Note the location of the pads for the motor wires. The truck wires will go on the outside edges of the decoder where it would normally sit in the frame slots or tabs.
http://www.tcsdcc.com/public_html/Customer_Content/Installation_Pictures/N_Scale/Atlas/GP38-2/Atlas_n_scale_gp_38-2.htm
This decoder also has LED's mounted on it, so you may be able to use a light pipe from them to the bulb holders and headlights. You will have to wire up this decoder for your TT scale loco, and don't forget to insulate it from the frame.

17. Attach the power trucks to the frame. Insert the universal drive shaft between the truck shaft and motor shaft in the universal cups, fit the truck to the frame, and clamp. I clamped one side of the truck bolster at a time to the frame and soldered it. I did one side first, then clamped the other side and soldered it. If you are going to use JB Weld, you may have to clamp both sides at the same time to keep things even while the epoxy cures. Mount and attach one truck first, then do the other one. Photo 10 & 11.

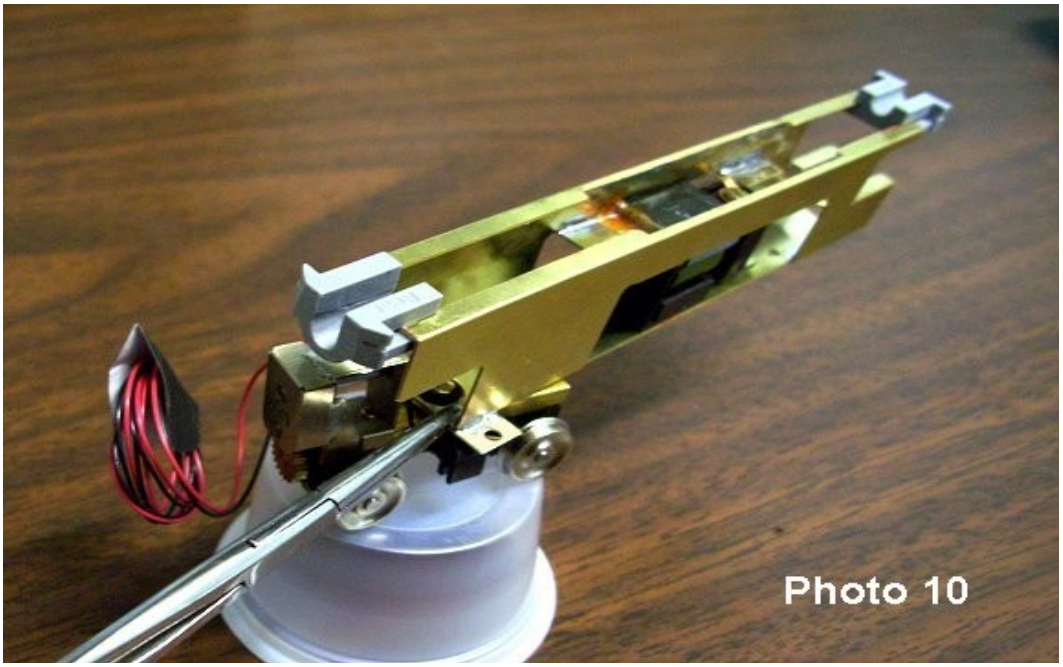
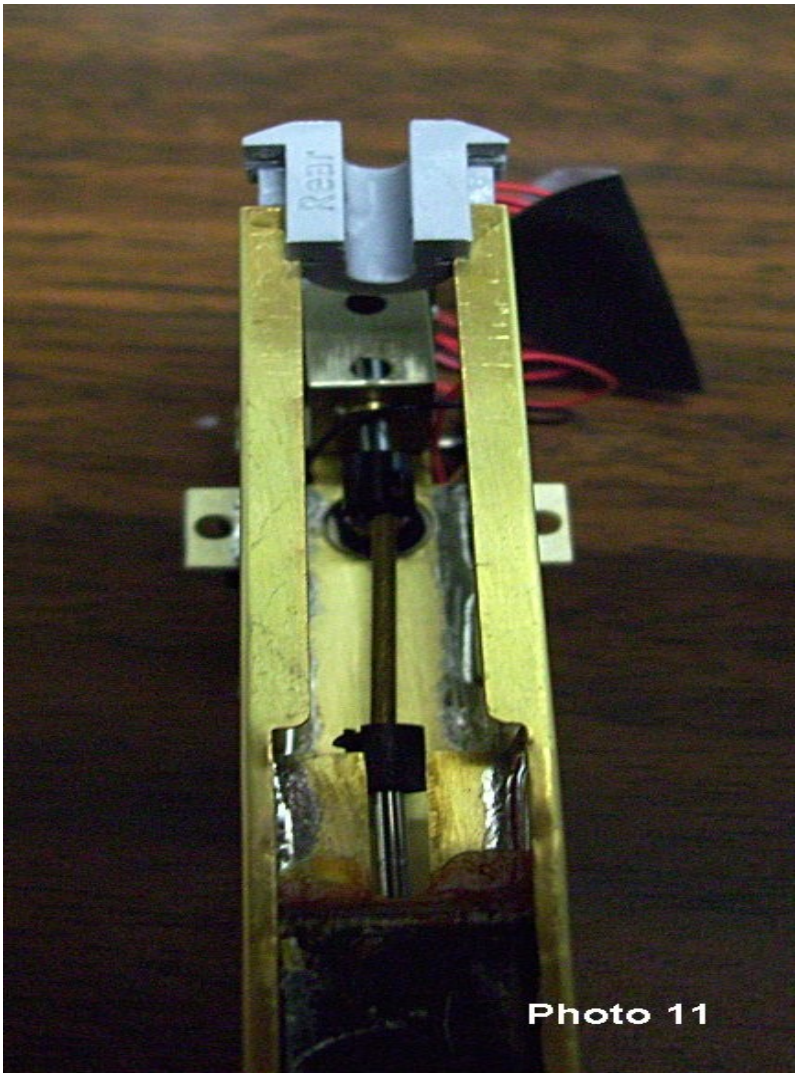


Photo 10


Rear
Photo 11

18. Once the trucks are mounted and any cement has cured, cut off the excess Bull Ant bolster material that extends past the frame sides. I used a cut-off disk in a motor tool running at 5000 RPM. Make several shallow cuts at the joint between the frame and BA bolsters. Do not use force or get them hot as the trucks may come free from the frame.

19. Wire up the trucks, motor, lights,and DCC decoder if used. Run all wires on the inside of the frame. Try to keep them clear of the moving parts. Test run the frame when done. It should run smooth and quiet. Fig 1& 2 and Photo 13.

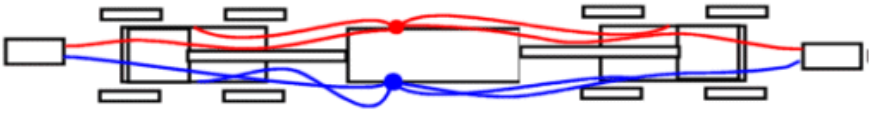


Fig 1

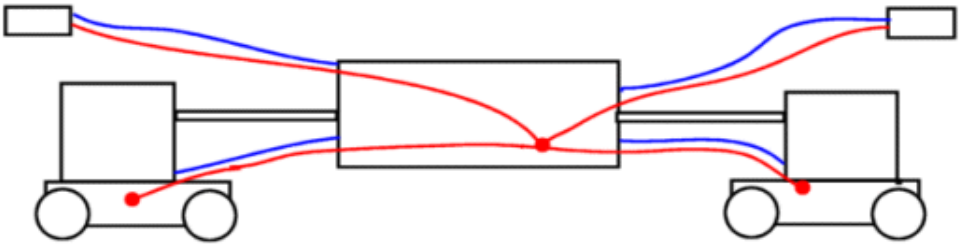
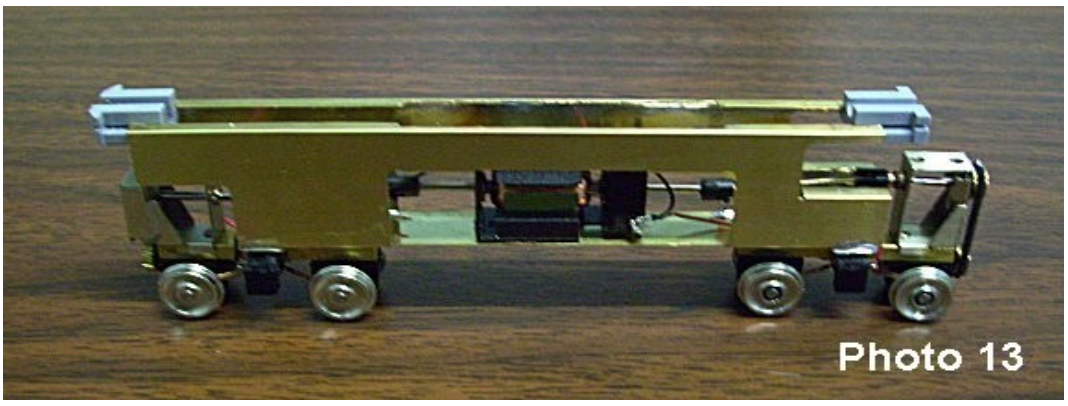
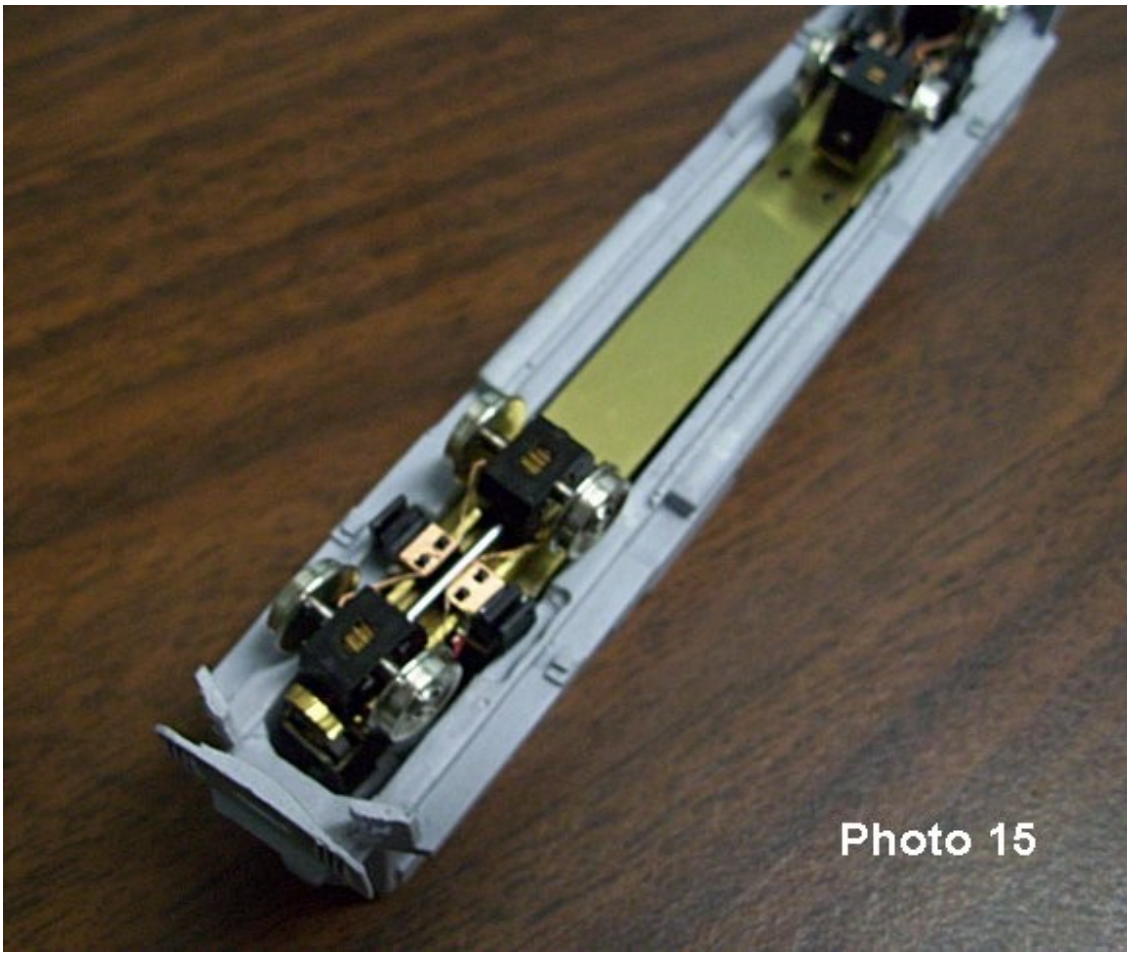


Fig 2

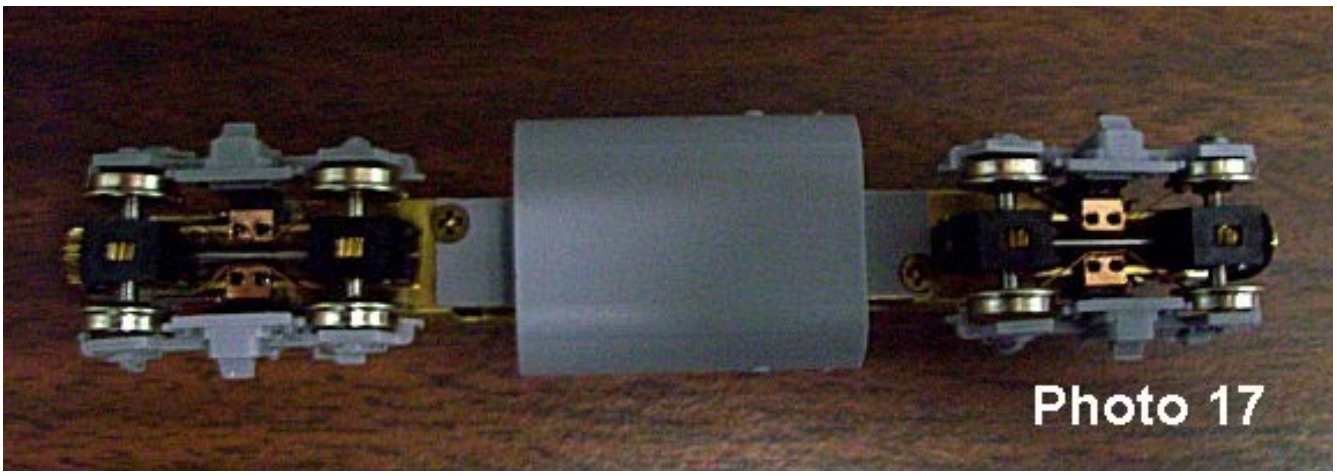


20. Put the frame into the shell. Notice that the frame does not go all the way into the shell as it should, and that the power truck's black bolsters are rubbing on the bottom of the shell's frame rail. This part of the shell around the truck bolsters will have to be removed. I used a motor tool with a

dental bur running at about 5000 RPM's. I was careful enough that I was able to leave the outside of the resin frame rail intact, and only removed the inside area. Take off a small amount of material at a time and check the fit of the frame, power trucks, and shell often as you work. Photo 14 & 15.



21. Using two small flat-head sheet metal screws, attach the fuel tank to the frame. Make sure the screws do not hit or contact any of the moving parts of the drive. You may have to counter sink the mounting tab of the fuel tank so the screw heads are not seen when looking at the loco from the side. Photo 17.



22. Side Frame mounting. Mount and glue the side frames on the power truck bolster mountings. Again, I used Walthers Goo. Photo 16.

23. Couplers. Obtain and mount the couplers of your choice to the height used on your other TT scale models. You will have to make a mount for your couplers, depending on the coupler type used. The couplers are mounted to the shell.

The mechanical part of your TT scale GP-38 build is now complete. Remove the shell and cab from the frame. Clean up the shell and cab as necessary. Detail and paint as desired.