

Scratchbuilding a Russell Snow Plow

By David J. Vinci



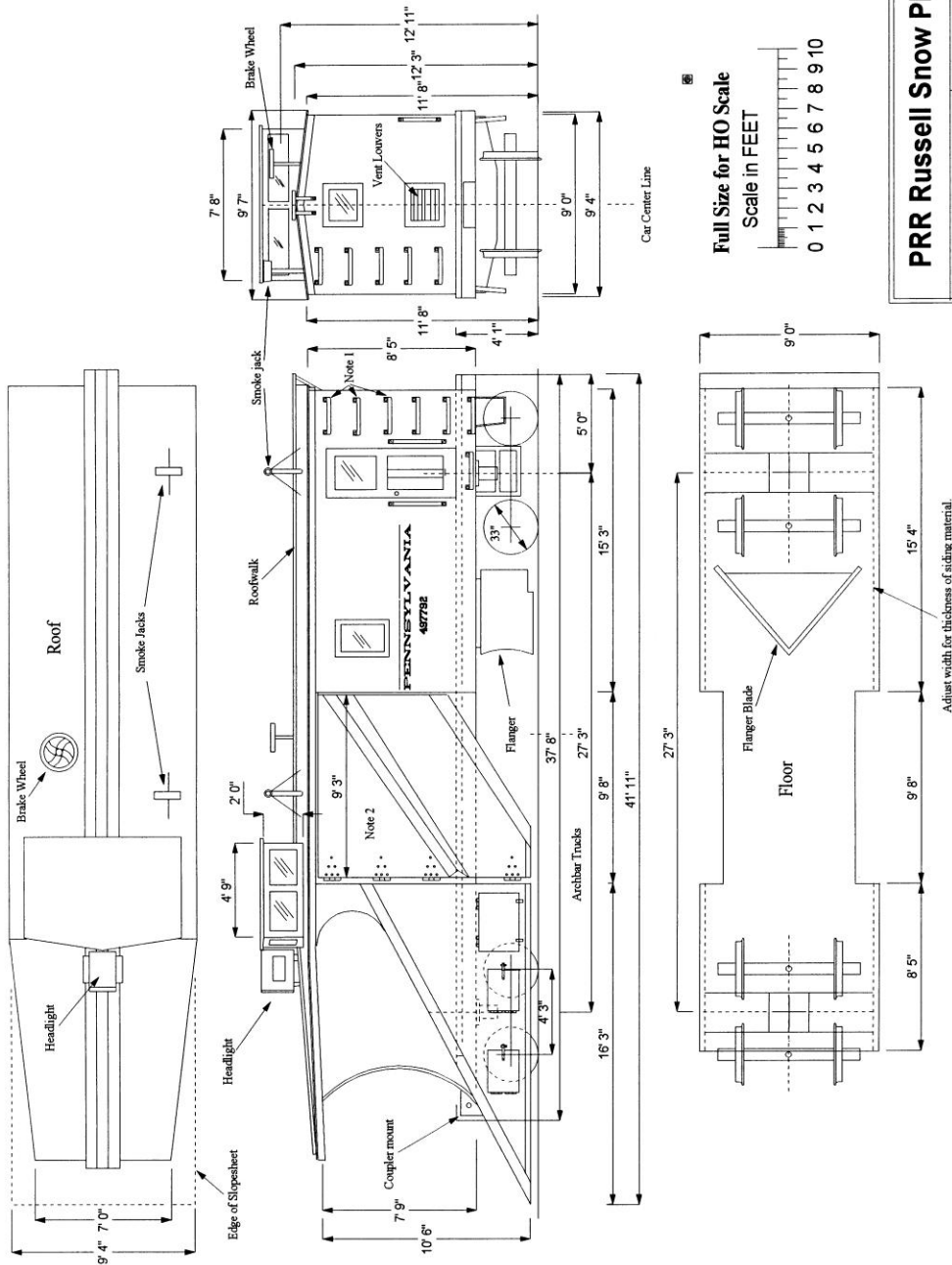
Winter is always a good time to research and build stuff so I decided I needed a new snowplow for my 1920s era PRR model railroad. As it turns out, the plows I grew up seeing on the Pennsy, were all built by the Russell Car and SnowPlow Company (1889 to 1951) located in Ridgway, Pennsylvania. Initially they were all wood and by the late 1930s they had models that were all steel. The wooden plows had frames made of 12" x 12" oak beams to transfer the power of up to 3 locomotives pushing the plows through the snow. Eventually the frames were made of steel, as was the rest of the plow. According to what I read, for these plows to be really effective, they must achieve 35 to 40 miles per hour. They also work best with dry powdery snow.

The two operators sit up in the pilothouse and operate 4 air cylinders, one for each wing and two to drop the flanger blade that sits just in front of the rear truck. The 70 psi of air required is supplied by the pushing locomotive. The flanger blade is held up out of the way with heavy springs and air is used to lower the blade.

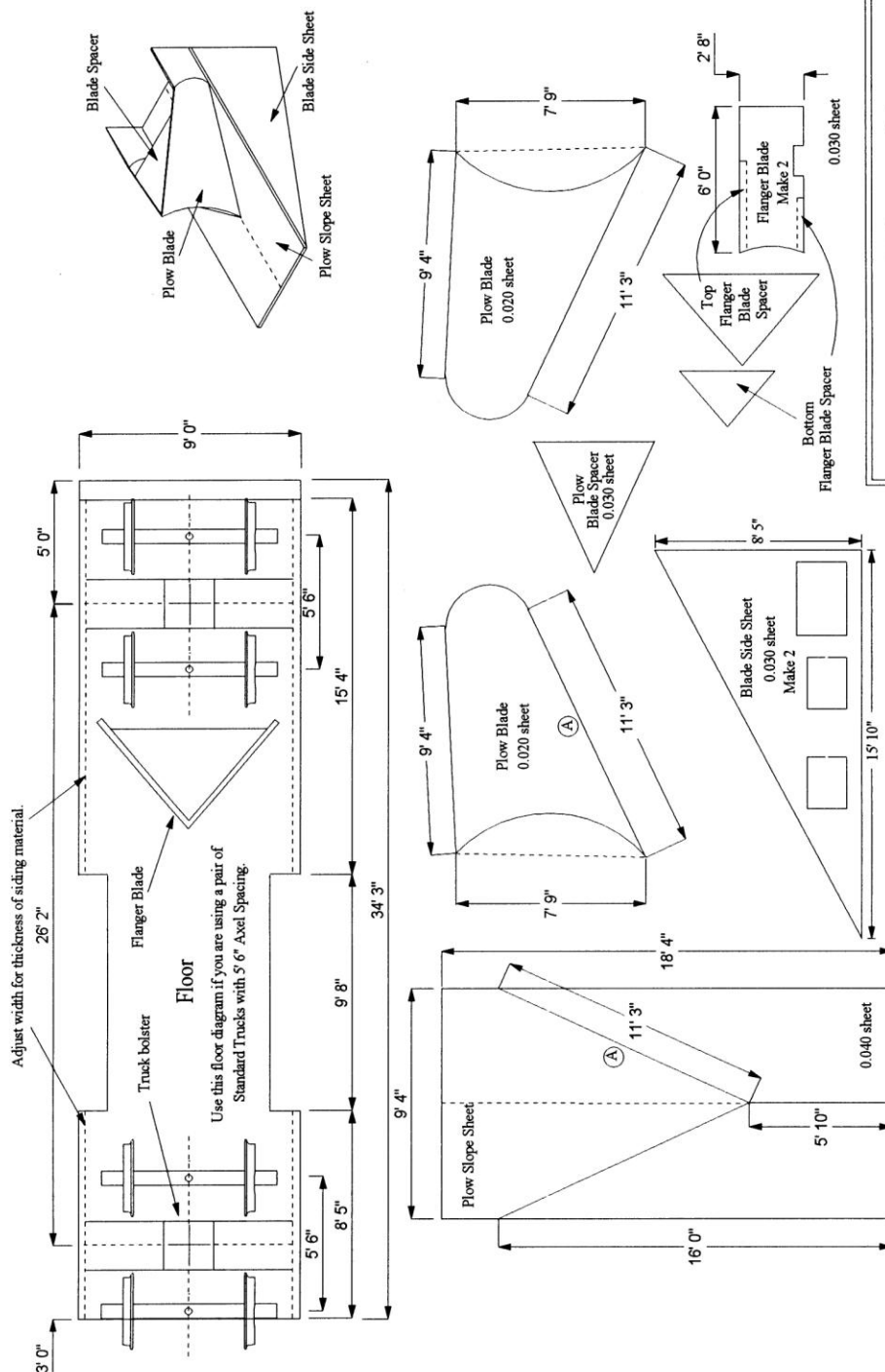
The front truck is placed as far forward as possible to give the plow the best tracking and leverage against the snow. The truck has an unusually short wheelbase of 4' 3" to help locate it farther forward. The two little doors on the side of the plow are to allow maintenance access to the front truck.

I made up drawings mostly scaled from photographs. There are differences in plows built by Russell, most notably in the length of the carbody and the height and shape of the wings. The proportions I think are correct though and the size and shape of the plow and wings are right. The width of the plow is 9' 4" and with the wings extended, the width is about 15' 5". There are double wedge plows like the one I built, but there are also plows that only move the snow off to the right. This type is especially useful on multiple track main lines. Can you imagine what a sight that would have been to watch a pair of these plows, pushed by steam clearing the 4-track

main? Wow! These plows are still around and used when the snow gets bad, even though they're now 60 plus years old!



PRR Russell Snow Plow	
DWN BY: David J. Vinci	DATE: December 19, 2005
Revision # 1: December 31, 2005	
DRAWING NO. 1 of 2	
David J. Vinci	
51085 Oak Drive Mattawan, MI 49071	



PRR Russell Snow Plow

DWN BY: David J. Vinci
 DATE: December 19, 2005
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 DRAWING NO. 2 of 2 - Templates

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Full Size for HO Scale

Scale in FEET



This second drawing has a floor plan for using standard wheelbase trucks, which has the forward truck bolster moved a bit closer to center. This drawing also has a set of templates for the plow itself.

I started construction with the plow blade. Cut the slope sheet from 0.030" or 0.040" sheet plastic and cut the blades from 0.020" sheet. Make the locating lines on the top of the slope sheet with a sharp pencil so you know where to cement the blades. Roll the blades around a 1/4"

dowel to give them a bit of curvature before trying any assembly. Oh yes, there is a right and a left plow blade and they are curved opposite to each other so the long points are at the bottom and the “A” side of each blade is down.

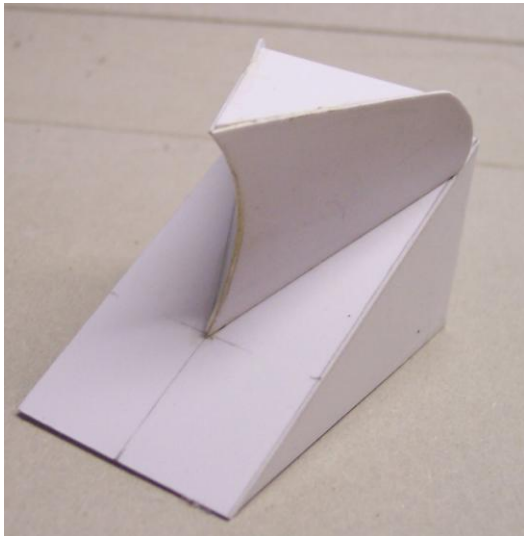


Figure 4

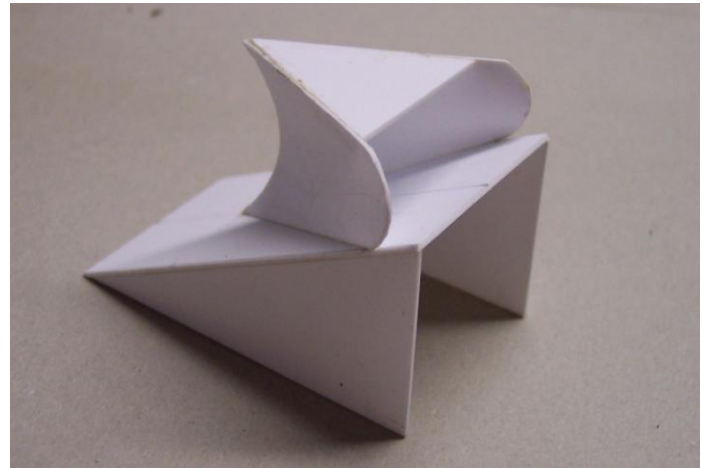


Figure 5

Cut the side sheets and the plow blade spacer from 0.030" sheet. Place one blade in place on the slope sheet and apply liquid cement to the joint. Do the same for the other blade, and then add cement to the curved front joint of the blade. You may have to hold this assembly in place until the glue dries. I use a really fast setting cement for styrene made by Ambroid but use your favorite. Then cement the blade spacer on top of the blades and the side sheets to the bottom of the slope sheet. The assembly should look like figures 4 and 5. I used plain sheet as I wanted to model a steel plow but if you want a wooden plow blade you could either use scribed sheet of scribe it yourself. The wooden plows were covered with a shiny lacquer coating when new.

Next I cut out a floor from 0.040" sheet. Make sure you mark the centerline and the bolster locations on the floor. The floor is narrow in the middle to make room for the wings so make these cutouts now while things are flat.

I made a pair of truck bolsters from 2' wide strips of 0.040" sheet cut to the exact width of the floor and then glued three 2' x 2' squares in the center. I drilled and tapped a hole in the center of each for a 2-56 screw to mount the trucks. Early on these plows had archbar trucks but later ones had Bettendorf types. They probably have roller bearing trucks by now. Once the bolsters were complete, I cemented them in place.

At this point I joined the plow assembly to the floor. To do this, I temporarily attached the trucks to the floor and set it on some track. I had trimmed the front floor width so it fit snugly between the side sheets of the plow assembly. I wanted 0.040" clearance between the railhead and the bottom of the plow, so I set a piece of 0.040 plastic on the track and put the plow assembly on top. Then I rolled the floor into the plow assembly and put some liquid cement on the joints where the side of the floor touched the plow side sheets once I was sure everything looked square. Once the cement had dried, I removed the trucks. It should look like figure 6 at this point.

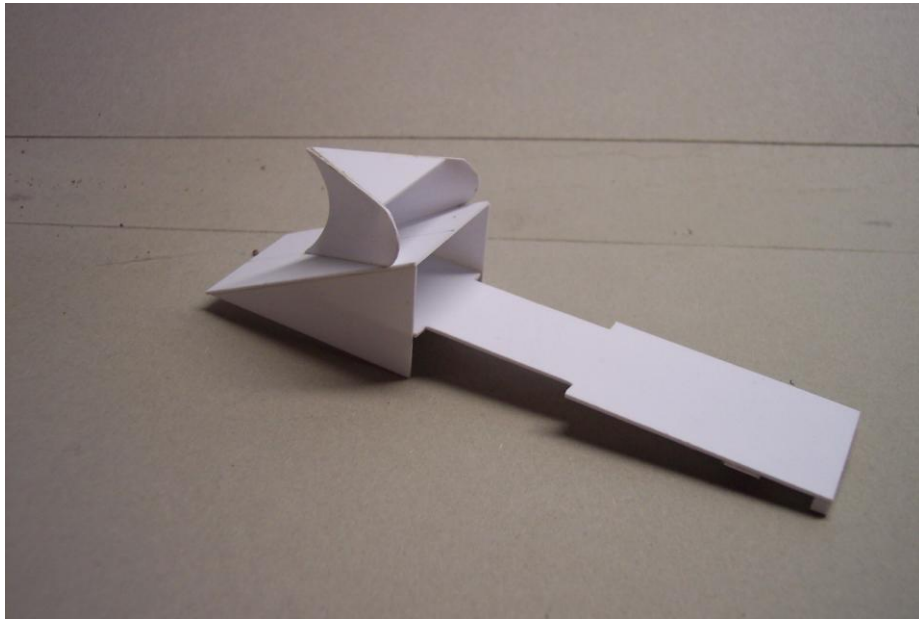


Figure 6

Next, with the bottom side up (see figure 7), I added a center sill, end sill, and 2 strips to simulate the frame (0.125" square stock). The space in the end sill is where the coupler box will be cemented later. You will not be able to see any of this later so I didn't make any real effort to model the underframe or brake rigging. I did want some support for the flanger blade and clearance for the trucks. I also cemented a strip of 0.125 x 0.030 strip along the side of the floor to act as a guide and support for the sidewalls. It would also give me some place to put the steps later.

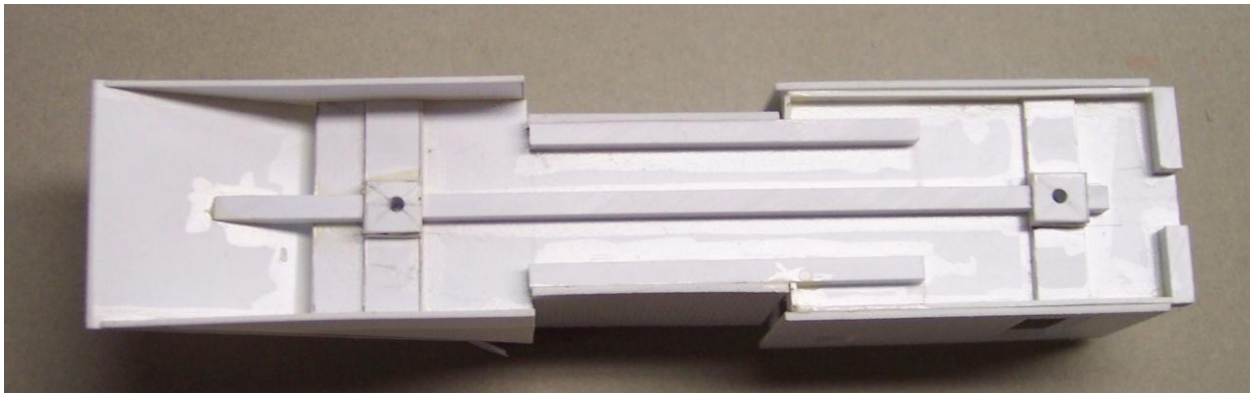


Figure 7

Now for some easier stuff, the carbody. I decided that I wanted to model an earlier plow, but it had to have the wings so I decided to make the carbody of scribed styrene to simulate wood. This is the standard 0.030" thick car siding stuff from Evergreen. I cut out the pieces and while they were flat, cut out the windows and doors. After the end was complete, I made a roof brace the same shape as the top of the end. You can see it cemented between the foreword ends of the rear sidewalls in Figure 8. One all the pieces were ready, they were cemented to the sides of the floor. The sides are placed so they come just to the bottom of the 0.125" square frame braces. The end is cemented between the sidewalls, as is the roof brace.

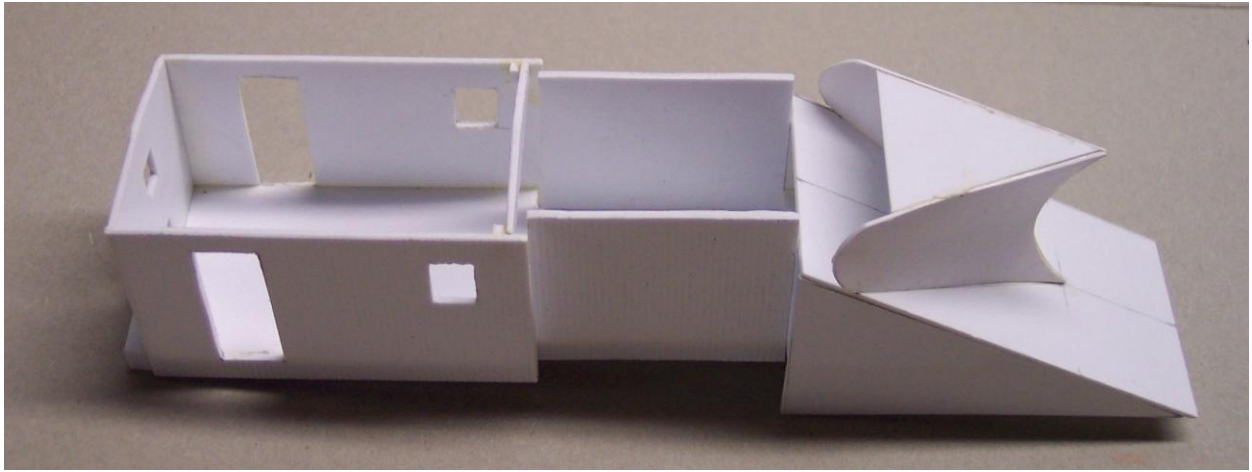


Figure 8

I added a couple of small pieces of scrap to support the ends of the roof brace. Then I cut narrow strips of scribed siding to fill the openings at both ends of the recessed sidewalls. The next little pieces I added were the walls that sit behind the rear edges of the plow. These have a crescent shaped cutout on the foreword end so they will connect with the plow blades. It's a bit tedious to make these fit correctly but go slow, you'll get there. Next I cut the tapered plow roof and cemented it in place as shown in Figure 9 below.

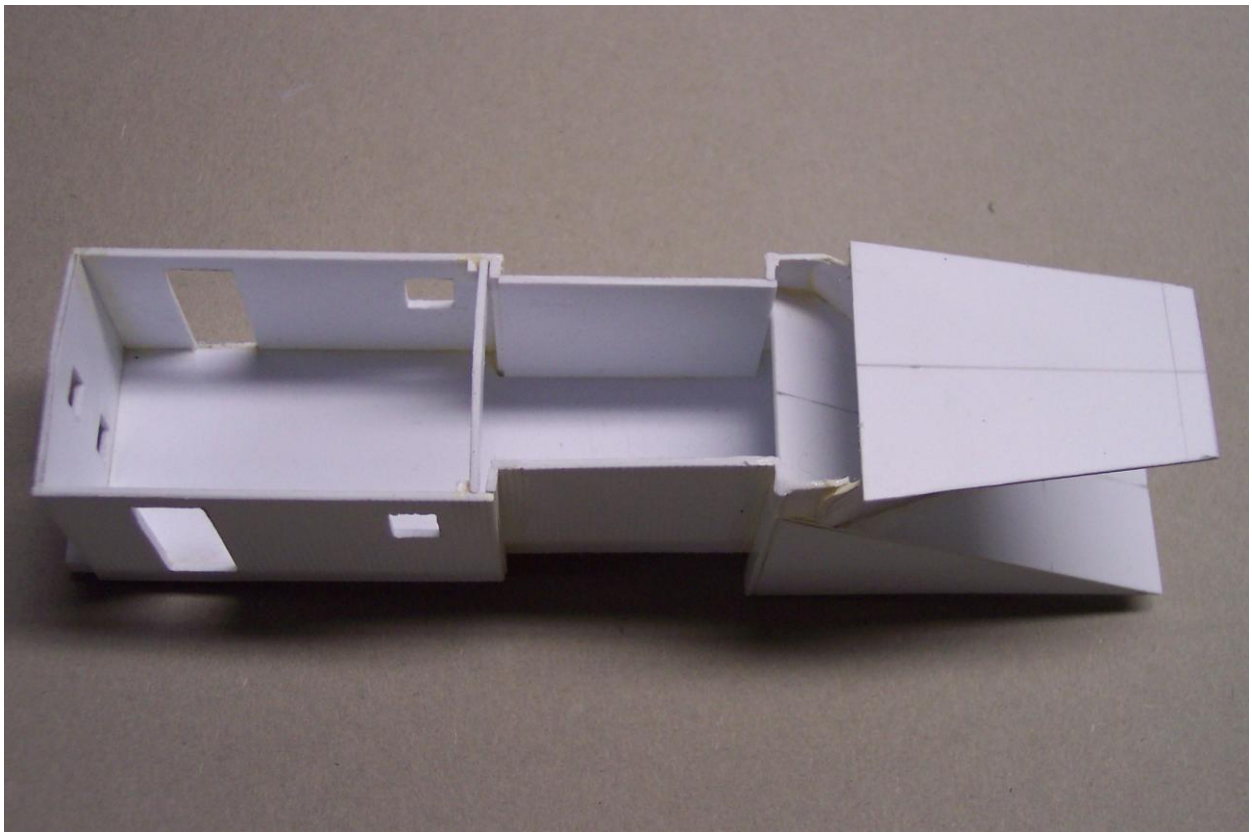


Figure 9

Next came the roof. I cut the roof of 0.030" sheet so it would fit snugly against the plow roof. I made a roof brace like the one you can see in figure 9 and cemented it to the underside of the roof so when the roof was on the car the brace rested against the inside of the end wall. This takes a little fiddling but it's worth the effort. I made and installed another roof brace and cemented it so it is located just to the rear of the body mounted roof brace. You can add any other scraps of plastic to stiffen the roof as you see fit. I built it this way so that the roof would be removable.

I fitted the roof and marked where the pilothouse would go on the roof. I cut a hole and then cut the rear wall of the pilothouse from scribed siding. The side and front walls are really just windows so I used 0.030 x 0.060" strips to make them. Note that the front of the pilothouse has a kind of wedge shape. (See Figure 10.) The pilothouse is cemented one wall at a time to the roof.

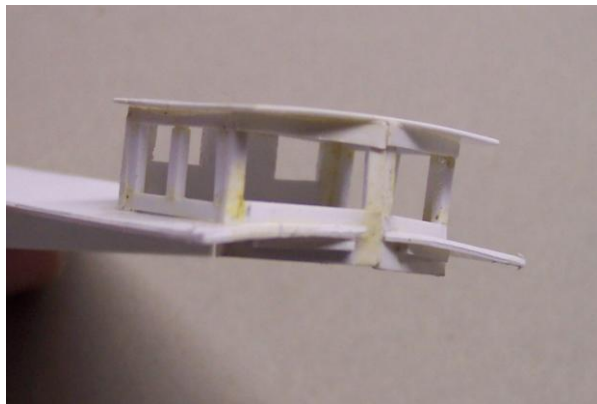


Figure 10

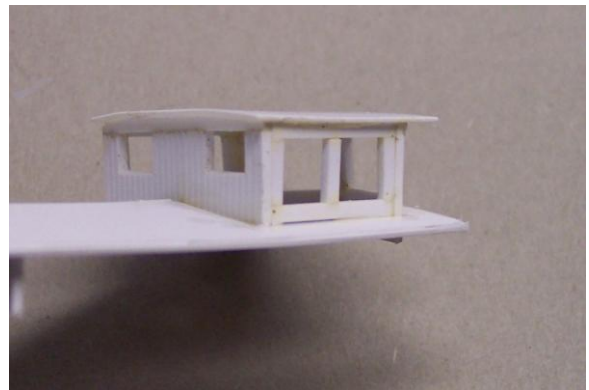


Figure 11

The roof of the pilothouse is 0.020" sheet. Next I made some roofwalk supports from 0.040 x 0.040" square strip and cemented them to the underside of some roofwalk stock and then cemented those assemblies to the roof, as shown below.



Figure 12

If you look carefully at the blade side sheets in figure 12, you can see some of my rivets that I made in some strips of 0.010" plastic. I still don't do these very well so use the method that works for you to make them. I used some HO scale 1 x 6 strips for the trim at the top of the carbody walls. Hey, it's really starting to look like something at this point.

The wings and doors are next. The wings as shown in Figure 13 are cut from 0.030" sheet with the raised ribs, each of which is made from 2 strips of 0.020" sheet. Then I cur a tiny scrap of 0.010" plastic to cover the end of the ribs. You can see how that looks on the left hand wing in Figure 13. Then using a hobby knife and some sandpaper, trim the ends of the ribs flush. When you're done, the thickness of the wing at the highest point on the rib should be just under a scale 12" high.

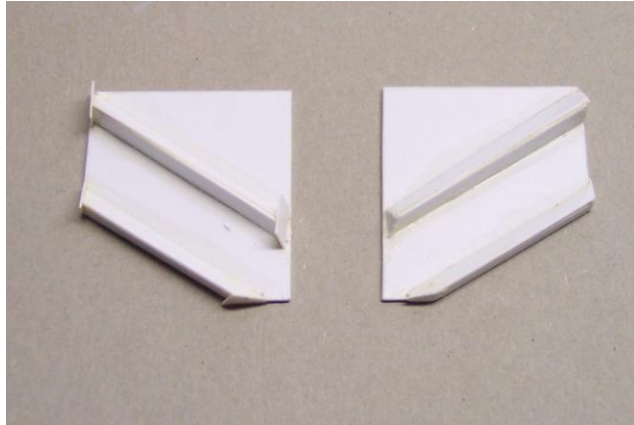


Figure 13

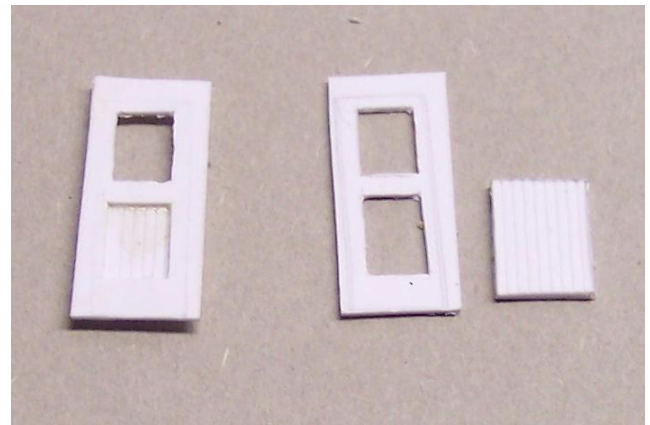


Figure 14

Figure 14 shows how I made the doors. Using some 0.020" sheet I cut out the door just a bit larger than the door opening. Then using my hobby knife I cut out the two openings. The top opening will be a window and the bottom will be a panel. I took a small piece of scribed siding and cemented it to the backside of the lower part of the door. Then all you have to do is glue the door to the inside of the carbody.

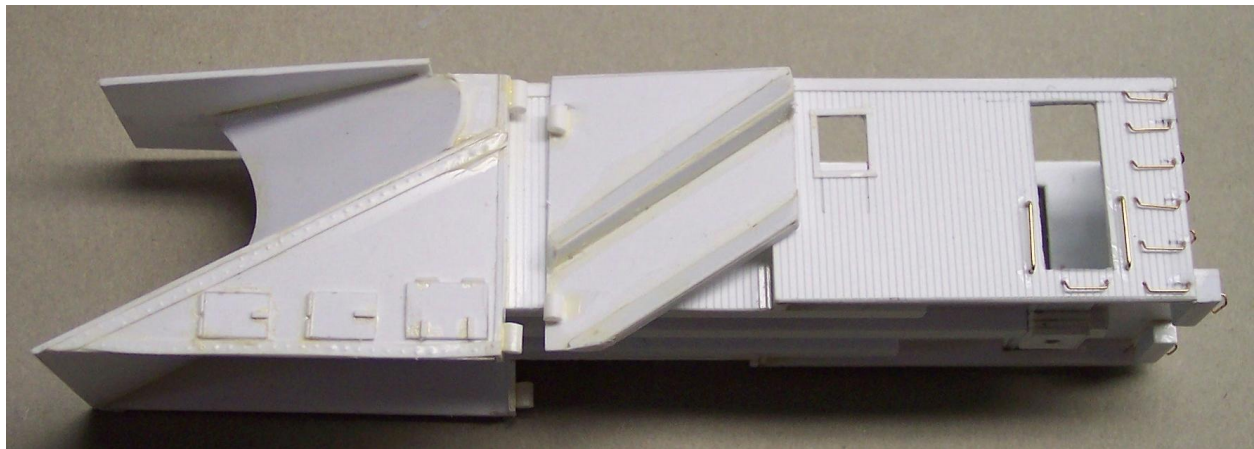


Figure 15

Figure 15 shows the wing in close proximity to its final position to better illustrate the hinges I made so the wings would function. I used 2 short lengths of 3/32" tubing cemented to the wing and 2 to the body as shown. By having the ones on the body as the top and bottom these helped accurately locate the wing. To assemble the hinges, line up the tubes and slide a pin made of either brass wire or plastic rod into the tubes. Then put a drop of glue to hold the pin in position. I slid the pin in from the top on the upper hinge and from the bottom on the lower hinge. From experience I can tell you to assemble the hinges AFTER you paint the model. I had some paint

creep into my hinges and weld them in place. You'd think I would know that after all these years modeling but consider this a word to the wise, for others that experience occasional brain failure like I do.

There are 3 little doors on the blade side sheets that I cut from 0.020" sheet and used short lengths of plastic rod to simulate hinges and short lengths of scale 1 x 3 for the latches. The front two doors are to allow access to the front truck journals. I'm not sure what is behind door No. 3. Maybe the brake rigging.

At this point I added the grab irons and handrails as you can see in Figure 15.

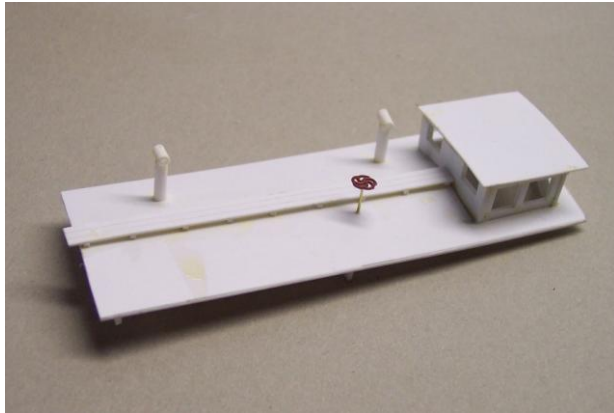


Figure 16

I made the smokejacks on the roof from 3/32" tubing. Cut the crosspiece first, then wrap a piece of sandpaper around a length of the same size tubing and sand the end of a length of tube to make a kind of saddle for the cross piece to sit in. Cement the 2 pieces together and trim the upright to length.

Yes, there were apparently 2 stoves in these cars, presumably to keep the air cylinders from freezing as well as to keep the crew warm. The brakewheel is also roof mounted to keep the shaft from freezing up.

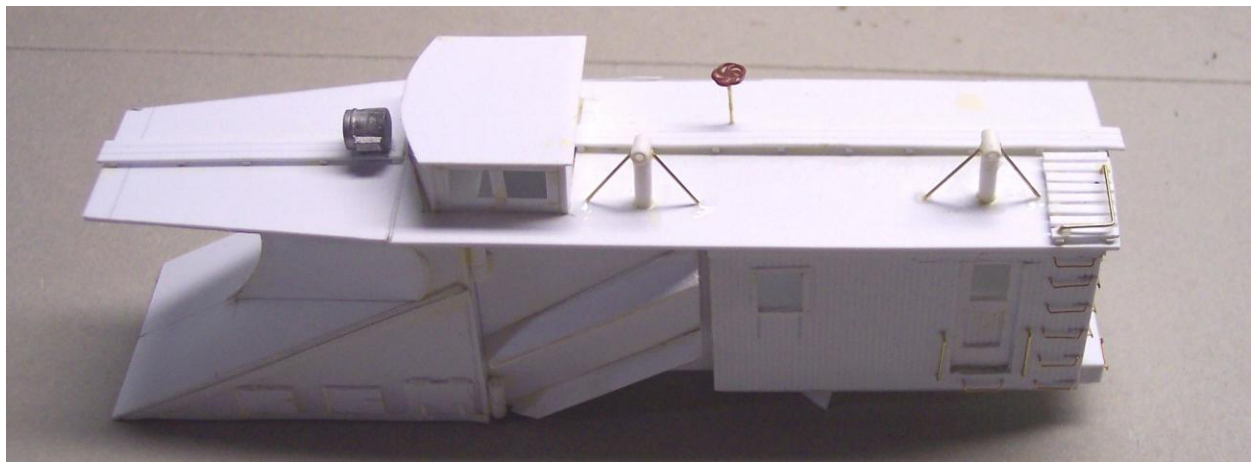


Figure 17

The braces for the smokejacks, which are short lengths of brass wire, were ACC'd in place, as was the headlight. The front of the pilothouse roof was trimmed and the final details were added to roof walk.

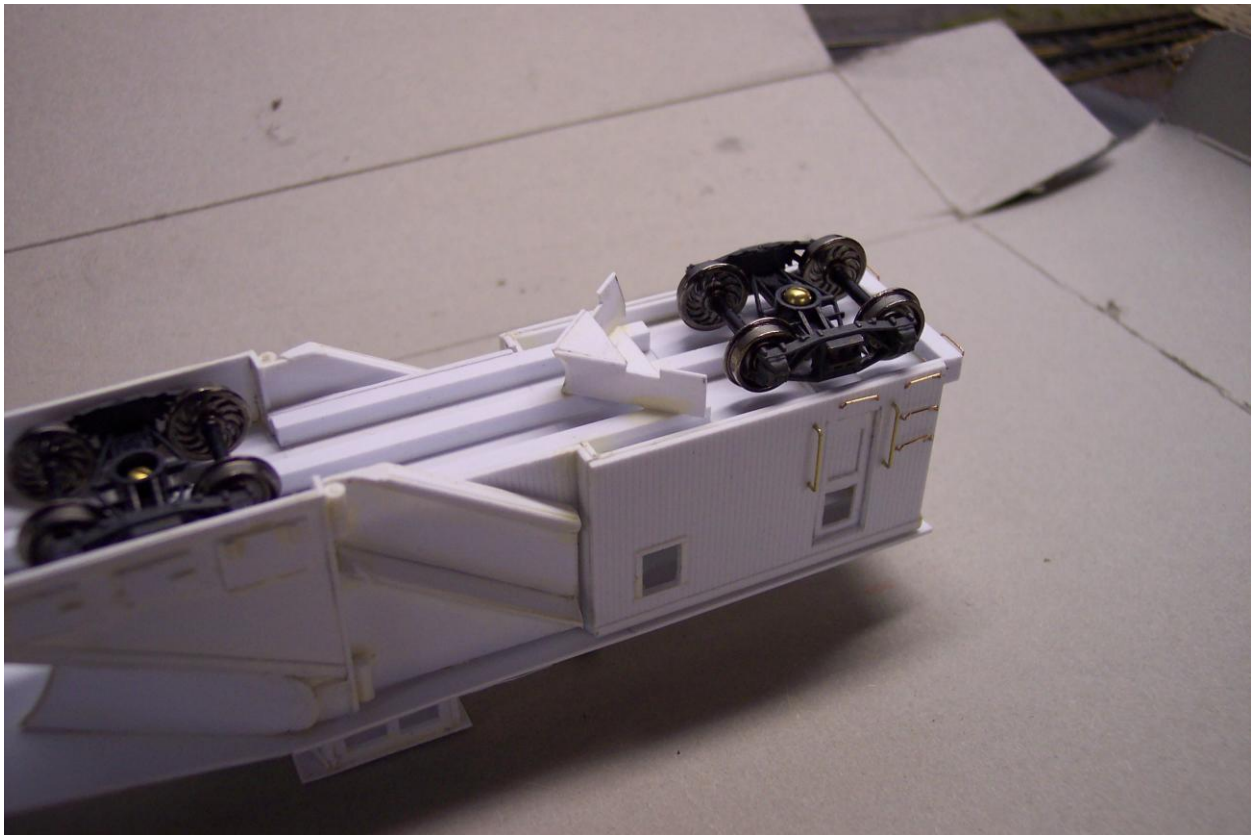


Figure 18

We're almost ready for paint, but first we have to build the flanger blade. Cut the blade sides from 0.020" sheet and the 2 braces from 0.030" sheet. Put some curve into the blades like you did for the main plow blade by bending the parts around a dowel. The notches in the bottom edge of the blade should line up with the rails when the blade is properly located. I cemented the blade assembly to the floor to simulate its normally retracted position as shown in Figure 18 above.

Good photos of these plows when first delivered to the PRR seem to be scarce as hen's teeth so there's a bit of guesswork on my part but I think I'm pretty close. I wanted to show the plow in "as delivered" condition in the 1920s. To do that, I painted the plow freight car red with a black roof. I used a Poly S Special Oxide Red with a bit of Reefer Orange added. The underframe and flanger blade were painted with Rail Brown. I used some Westerfield decals for the lettering. The car was then dry brushed with some Reefer Grey and Rail Brown to pop the highlights.

The final results can be seen in Figures 19 and 20 below.

These plows didn't appear to change much over the years except in paint color, so to model a later period (after 1938) the car should be painted Grey (or yellow after 1949?) with black lettering. You may wish to make the carbody of plain plastic to simulate steel sheathing as the cars were built in the mid-1930s and later.

On the whole, I like how the plow came out, even if the rivets were a bit anemic.



Figure 19



Figure 20