

Scratchbuilding PRR Class FL Flat Cars

By David J. Vinci



<Figure 1>

If you have been following the scratchbuilding freight car series I have been doing, you probably have noticed that most of the time I don't have a lot of information to go on. Usually I have just a tracing and maybe a photograph. Well, this time I have an "as-built" photo, two General Arrangement drawings (C-15761 and C-64763) and two Arrangement of Lettering drawings (D-64577 and D-82852)! I think this may be a case of too much information. The drawings are available from the PRRT&HS Microfilm. (Thanks Richard for the prompt service!) Anyway, the drawings provide all the information you'll need to build one of these freight cars.

This car was designed and built in 1901 which is the same year as the class FM but about 6 months earlier. The big difference between the 2 classes is that the FL has 17" wide side and center sills while the FM has 24" wide side and center sills. A substantial difference in strength! As near as I can tell, 1000 of the Class FL flats were built. The distribution was as follows:

1901	Car Numbers	Quantity
Pennsylvania RR. (PRR)	501 – 1000	500
Pittsburgh, Fort Wayne & Chicago (PFW&C)	11001 – 11400	400
Pittsburgh, Cincinnati, Chicago & St. Louis (PCC&StL)	16306 - 16405	100

In 1907 the Pennsylvania Lines was formed and the re-lettering and renumbering got underway.

1907	Car Numbers	Quantity
Pennsylvania RR. (PRR)	435501 - 436000	454
Pittsburgh, Fort Wayne & Chicago (PFW&C)	11001 – 11400	400
Pittsburgh, Cincinnati, Chicago & St. Louis (PCC&StL)	946401 - 946500	100

1908	Car Numbers	Quantity
Pennsylvania RR. (PRR)	435501 - 436000	454
Pittsburgh, Fort Wayne & Chicago (PFW&C)	936794 - 937193	399
Pittsburgh, Cincinnati, Chicago & St. Louis (PCC&StL)	946401 - 946500	-0-

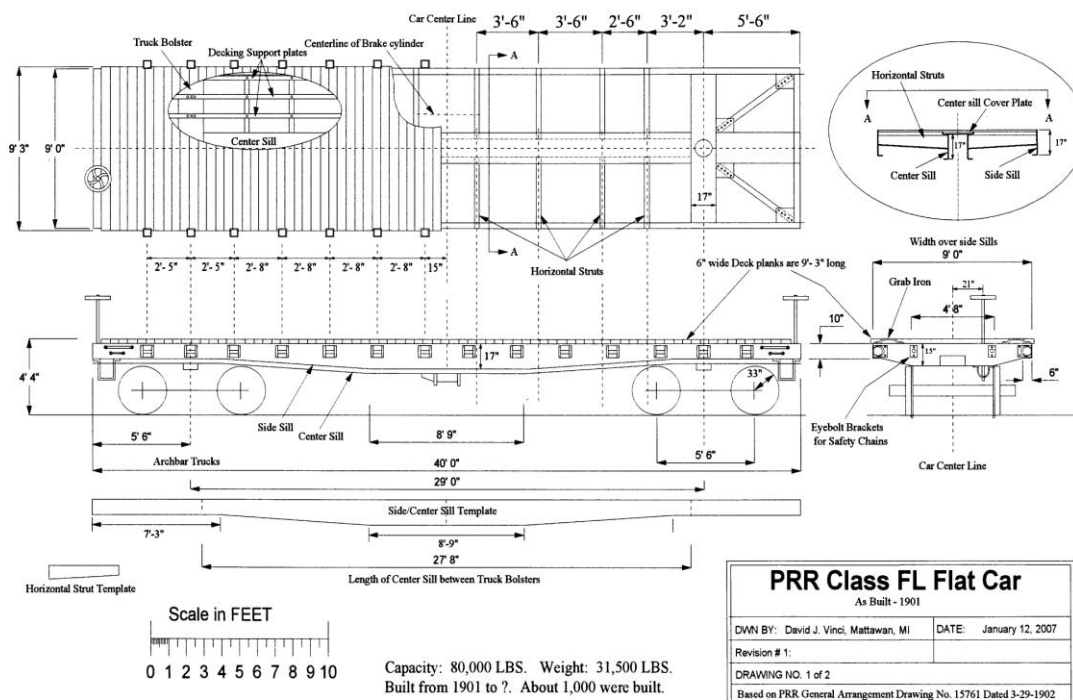
By 1924 the Class FL cars were down to only 525 cars and were numbered as follows:

1924	Car Numbers	Quantity
Pennsylvania RR. (PRR)	435501 - 436000	303
Pennsylvania Lines (PFW&C)	936794 - 937193	222

By 1928, all of the Class FL flat cars were gone from service. I guess 27 years or so isn't all that bad for a general service flat car.

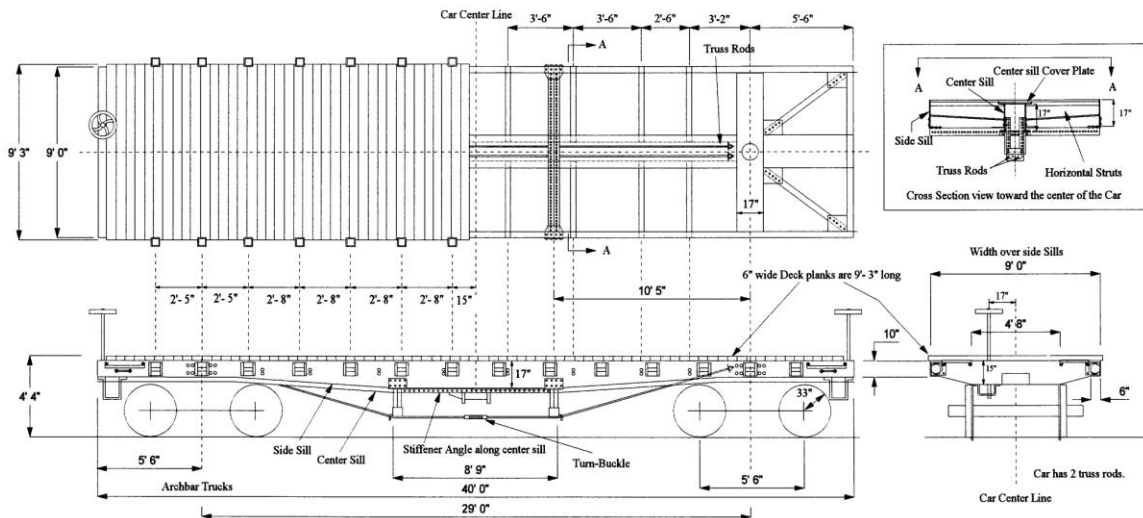
One other item of note is that as originally designed, built and lettered, the FL was given a capacity of 80,000 lbs (40 tons). Evidently during the first few months of service, it was discovered that this car wouldn't carry the design load, so truss rods were added to correct the weakness. You have to wonder how they discovered this... it had to be embarrassing for some engineer to have a new freight car fold in the middle under its rated load. It has to be an interesting story which I hope surfaces some day. It's not surprising that they didn't choose to build additional cars of this class and instead built the much stronger class FM. In any case, the PCC&StL down graded some of their FLs to 60,000 lbs (30 tons). There is a note in the 1904 Equipment Register that states the capacity of some PCC&StL FLs at 100,000 lbs. Makes me wonder if some of the guys in the car shop went to tinkering around with a couple of cars since they had to modify them to hold the 80,000 lb rating anyway. It must not have worked to the satisfaction of management because from 1905 on, the 100 PCC&StL FL flats were rated at 60,000 lbs. and all had disappeared by 1908.

Well, as usual, I made up a set of drawings to build the models from:



<Figure 2>

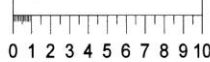
The drawing in Figure 2 is the car “as built” in 1901. Actually, as near as I can tell, all 1,000 cars were built in 1901. There’s enough detail in the drawing so you can build it as accurately as you wish.



Changes vs As-Built

1. Two Truss rods added under center sill.
2. Conformance to safety standards - 1920
 - a. Changes to end sill grab irons
 - b. Longer grab irons on side sills
 - c. Relocation of the Brake wheel staff.
3. Removal of safety chains

Scale in FEET



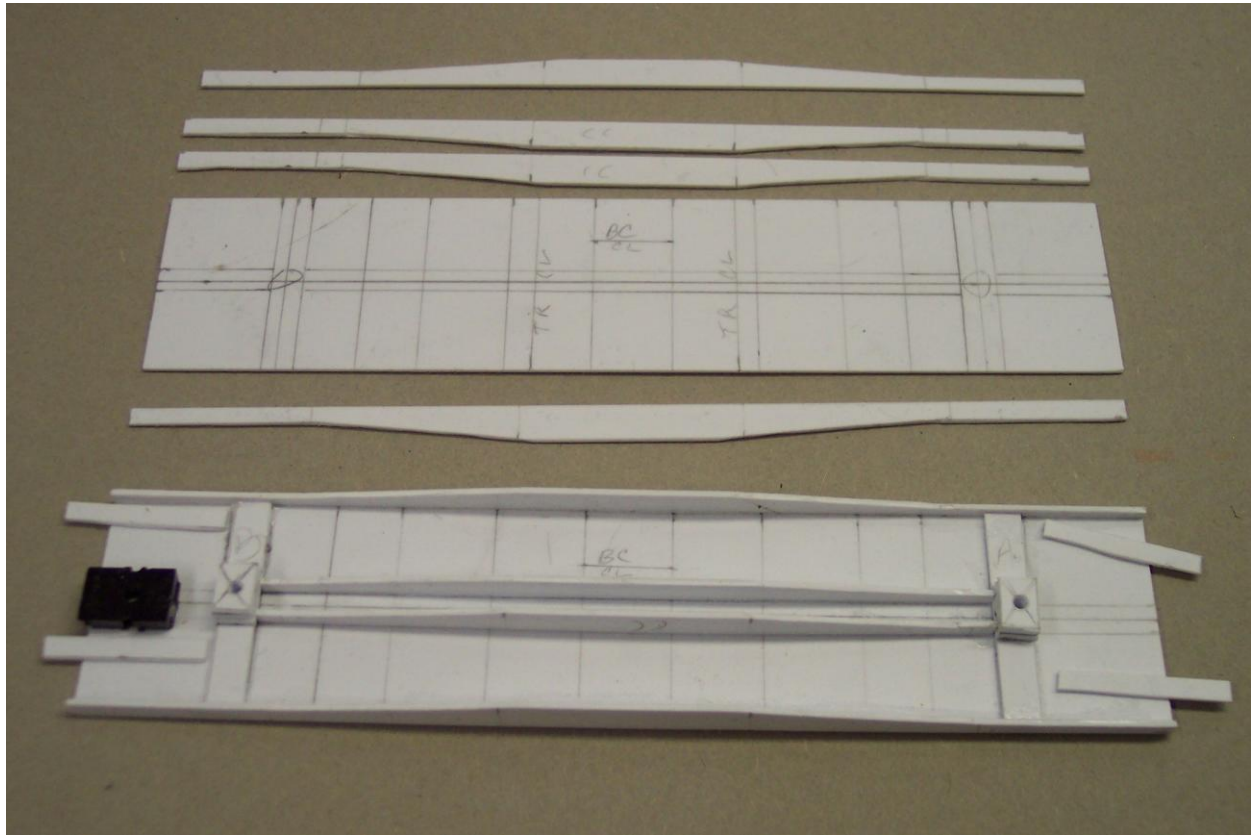
PRR Class FL Flat Car	
<small>As Modified with Truss Rods - 1902 & modified 3-24-1924</small>	
DWN BY: David J. Vinci, Mattawan, MI	DATE: January 12, 2007
Revision # 1:	
DRAWING NO. 2 of 2	
<small>Based on PRR Gen. Arr. Drawing No. 15761 dated 3-29-1902 and PRR Gen. Arr. Drawing No. 64763 dated 3-24-1924</small>	

<Figure 3>

The drawing in Figure 3 shows the changes that were made to the car between 1901 and 1927. The big change is the addition of two truss rods placed between the center sills. The truss rod supports appear to be made from stock angle iron that has 7/8” holes spaced along their length. It must be some material that was routinely carried in inventory in the car repair shops around the system. The drawing also contains the changes to the car to comply with the safety standards in 1920 and 1924.

I built one of each version.

I began by cutting out the side and center sills from 0.030” sheet styrene. Next I cut a sub-floor of the same material scale 40’ long and 8’-6” wide. Then I sanded the long edges so that the width of the floor plus the thickness of the 2 side sills would equal 9 feet. At this point it is wise to mark the car floor to locate the truck bolsters, the car centerline, the horizontal struts and the brake cylinder centerline. I make a copy of the drawing to exactly HO scale and then transfer the lines to the car floor in pencil using dividers, a ruler, and a square.

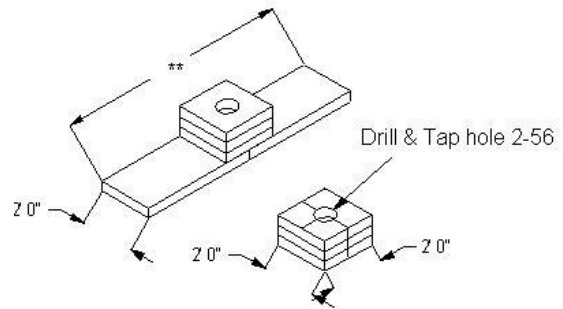


<Figure 4>

<Figure 5 to right of this paragraph>

As you can see in Figure 4, the reference lines are present on the sills as well as the car floors. The upper set of parts is for the car with truss rods and there are reference marks for the truss rod supports. The next step was to attach the side sills to the edges of the floor. Use a square to ensure they wind up perpendicular to the car floor. I made up a set of truck bolsters using my normal pattern (Figure 5 at right) except I made them only 17" wide instead of my normal 2 ft. This was because that was the width on the original car. (see Figure 2). These are made of 0.040" thick styrene and I have found that the 4 thicknesses shown positions the Kaydee trucks just right. Make sure you drill and tap the hole for the 1/4" 2-56 screw that will be used to fasten the trucks before you glue the bolsters in position on the sub-floor. This way the screw will bottom out against the car floor. If you want, you can add additional details to the bolster.

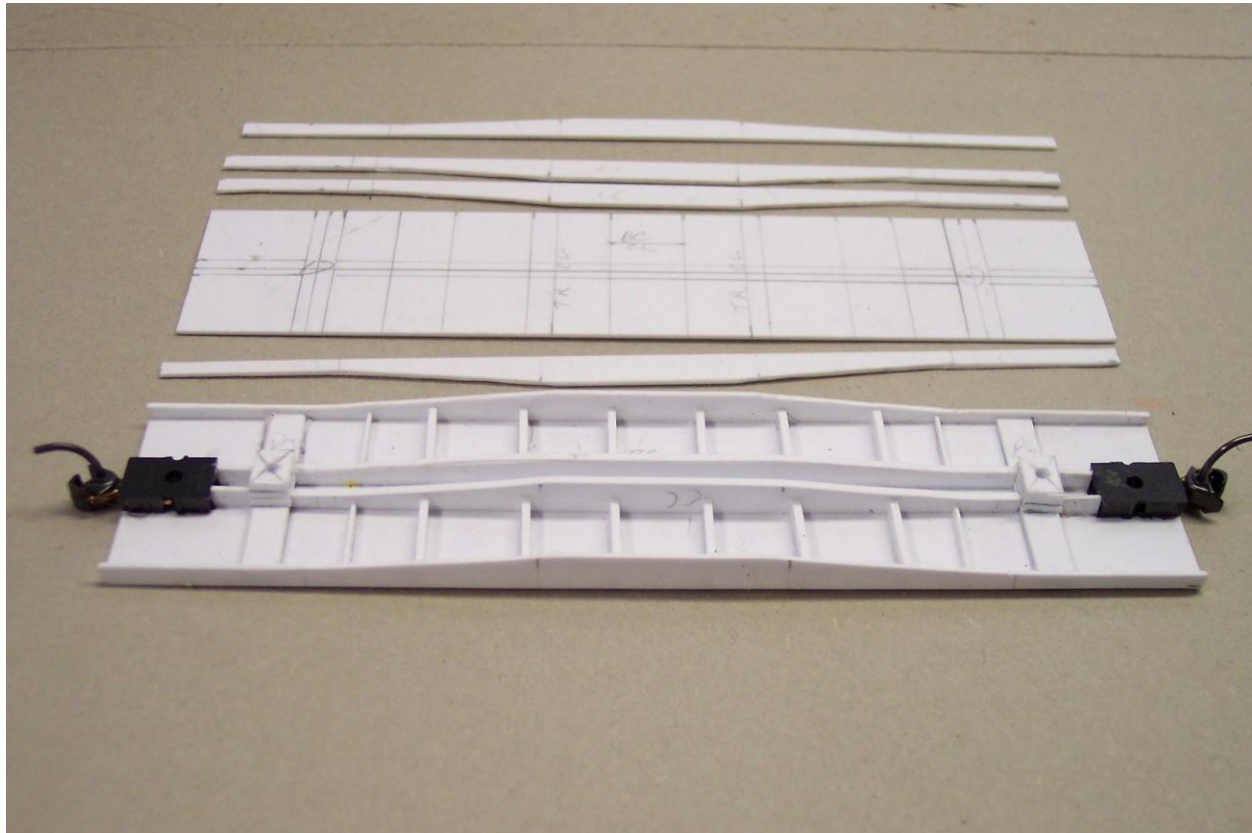
Freight Car Truck Bolster



** Length is equal to the width of the car floor

Next position the two center sills between the truck bolsters. Glue them right on top of the reference lines. Once these were set, I cemented a strip of scale 1 x 6 styrene on top of each center sill so that the overhang was toward the sides of the car. You can see this flange inside the oval located in the upper right corner of figure 2. You could add a small flange to the inside of the side sills but it won't show, so I didn't bother.

The Horizontal struts come next. The Figure 2 has a template for these so you can cut them from 0.015" strip and add the taper then add a lip on one side or you can take the easy way like I did and use 0.100" C-channel strip which is real close.



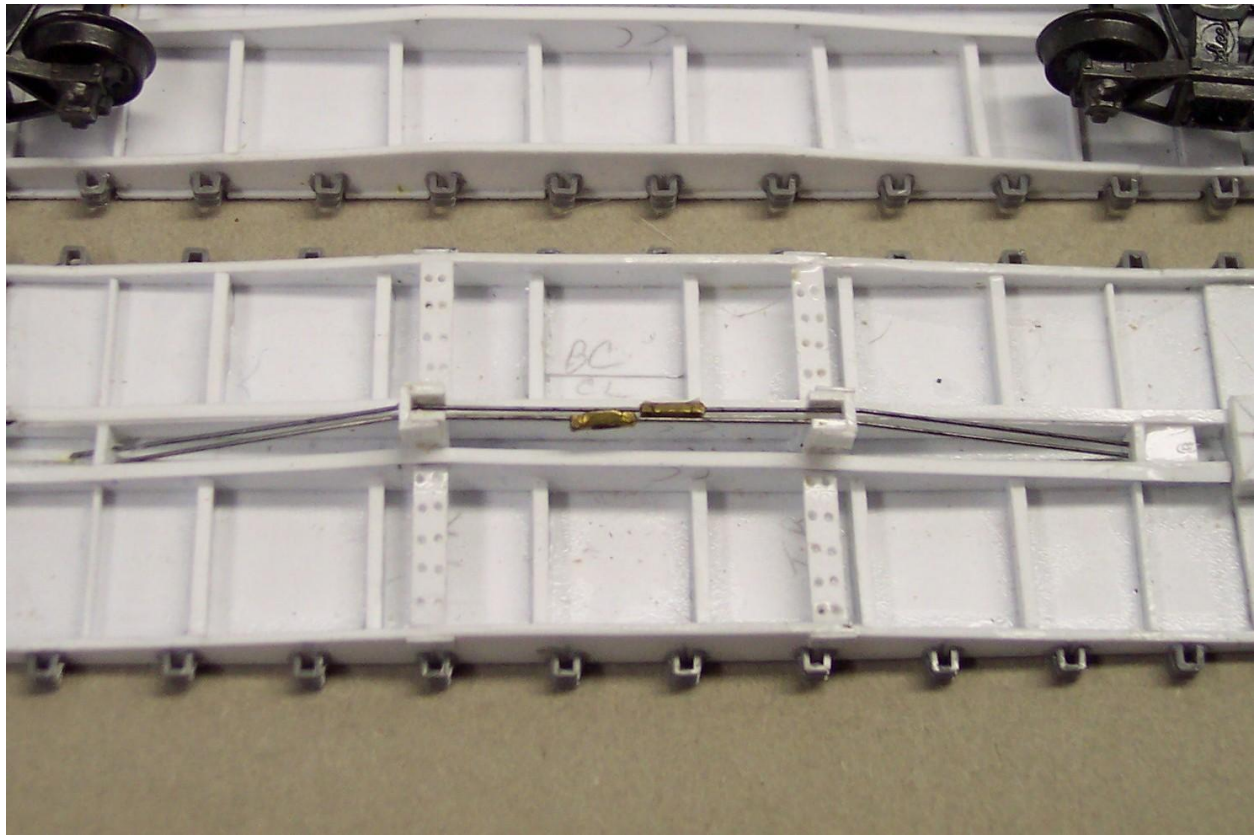
<Figure 6>

I fitted the coupler pockets and added the strips of left over center sill to fill the space between the bolsters and the pockets. The Kaydee coupler box has a lip on top that points up and acts as a locating flange. For this car, I trimmed it off and positioned the coupler box so it was flush with the car sub-floor. Since I paint my freight cars with a brush, I attached the couplers at this point. As you can see in Figure 6 above, the horizontal strut next to the bolster needs to be lower so it won't interfere with the out of scale wheel flanges. I used 0.020 x 0.060 strip for these struts instead of the C-channel.

Next I cut and fit the pieces that make up the end sill on each side of the coupler box. These pieces are made from 0.030" styrene like the floor and sills and fit between the coupler box and the side sill. I made my poling pockets from a rectangle of 0.010" strip and a thin slice of 1/16" tubing cut on the bias on one side.

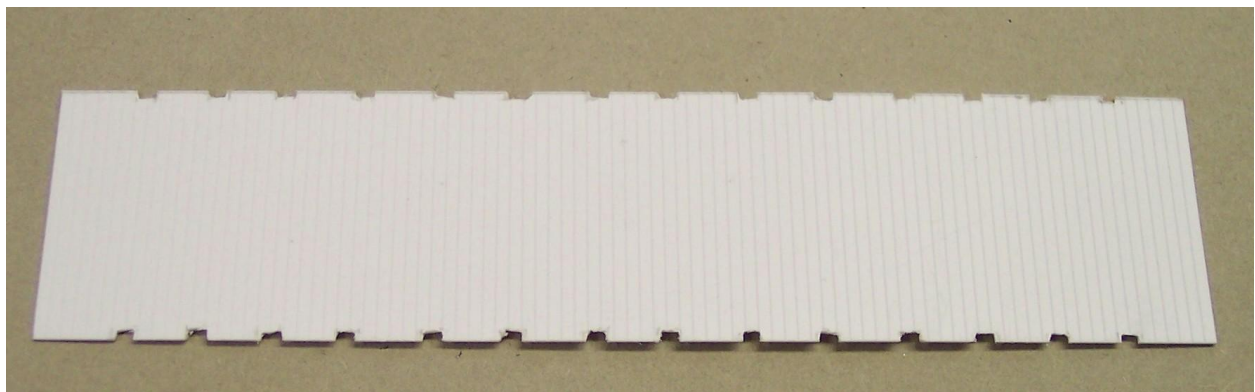
I placed the car on the scale drawing and marked the side sill for the placement of the stake pockets. I used Tichy Train Group part #3006 Stake pockets. These are very nice plastic castings. One package will be required for each car as there are 14 pockets per side. Position the pockets so that they are flush with the top of the sub-floor. When you add the decking, it must be positioned above the stake pockets.

At this point, I stopped working on the "as-built" car and built the other car to the same point.



<Figure 7>

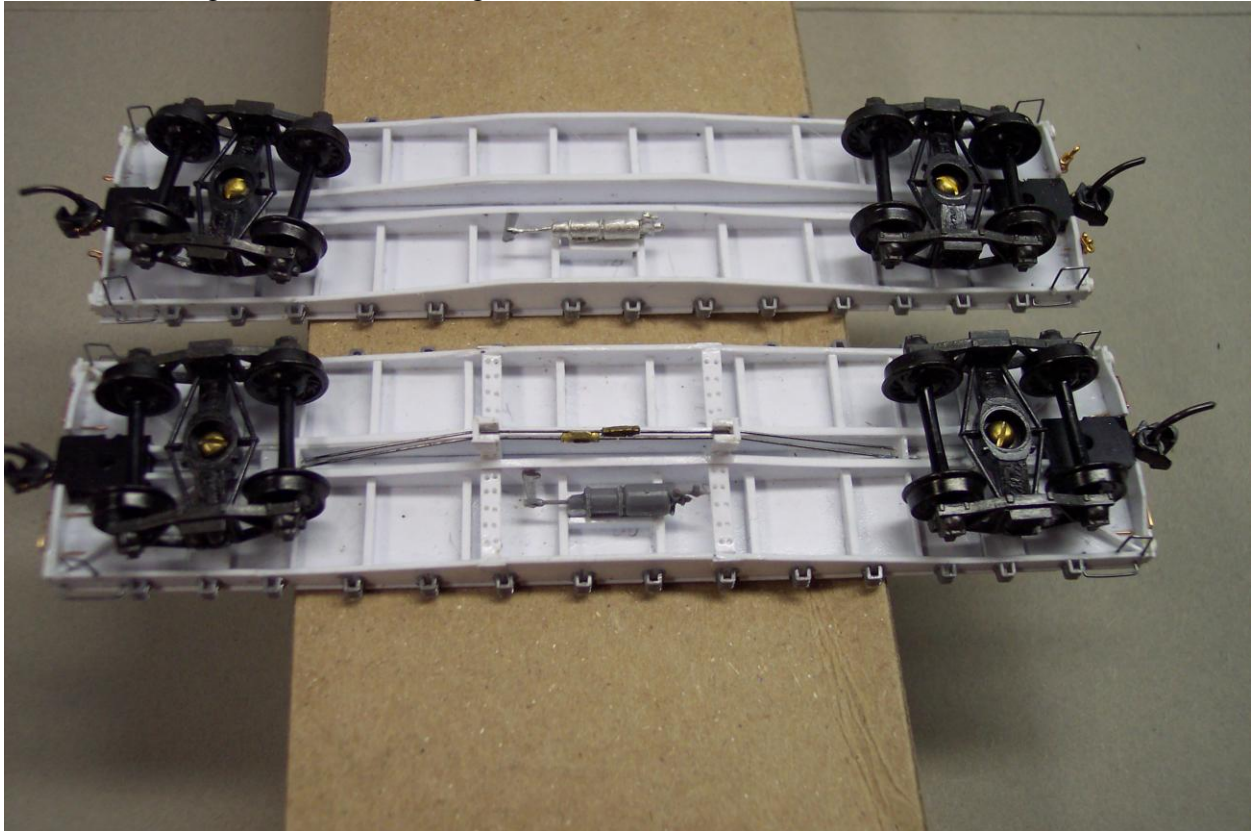
I used 0.030 x 0.100" strip plastic to make the truss rod supports. I drilled a series of holes to make them appear like the angle stock the drawings called for. I usually don't go to this level of detail under the cars because it doesn't show, but I just chalked it up to momentary insanity brought on by having a good time building the model. I even added rivets to the small 0.010 thick squares that appear on the outside of the side sills. They're so small that you can't really see them but they're there. Figure 7 shows the finished truss rod assembly in place on the car. I found some Central Valley turn-buckles in the old parts box so I added them. I wonder how long those have been out of production. There must be some better castings available but I had these so I used them.



<Figure 8>

Cut a piece of 0.020 thick v-groove plastic (0.060" spacing gives a nice 6" wide board in HO) a scale 9'-3" wide by 40' long. This will give you 1.5" overhang on each side of the car. Use a piece of 2 sided tape and temporarily position the decking on the car and mark each stake pocket.

Remove the decking and using a square needle file, make a notch at each location. When you're done the decking should look like Figure 8.

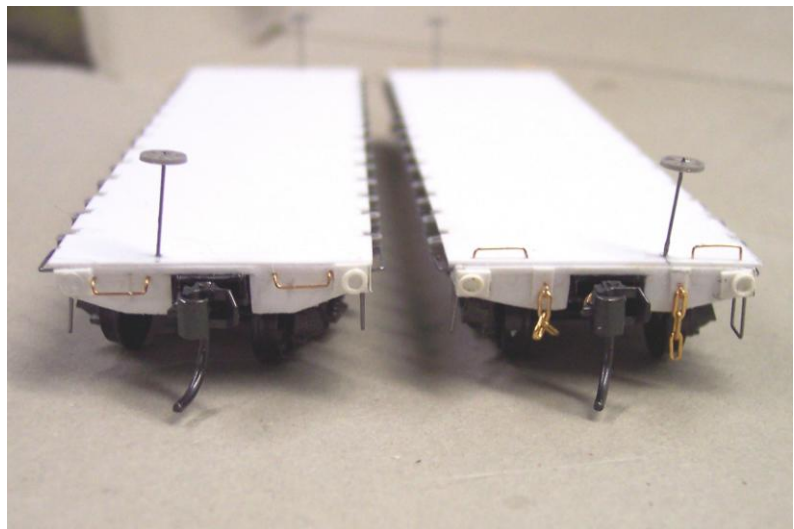


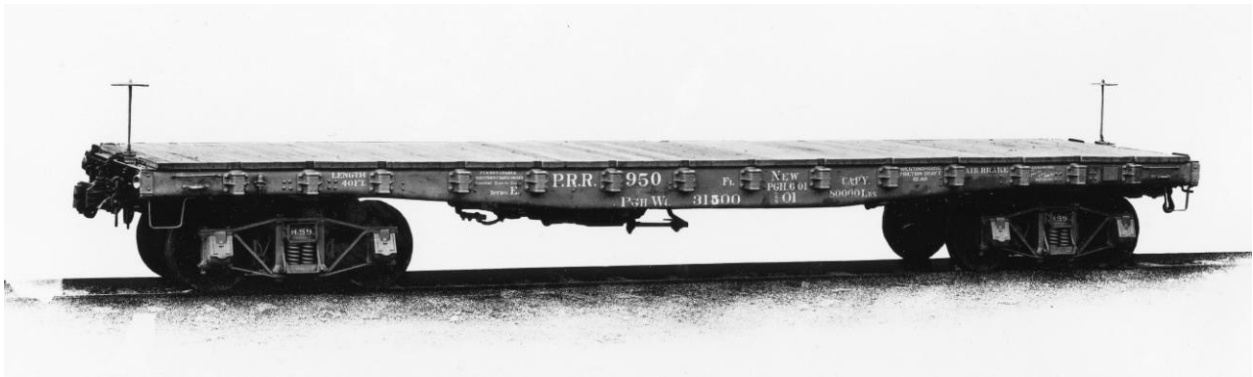
<Figure 9>

Next I added the brake cylinders, the corner steps, the grab irons and in the case of the “as-built” car, the safety chains. Figure 9 shows the extent of the brake equipment, or lack thereof, that I installed as well as the Kaydee #501 Arch Bar trucks.

<Figure 10>

Figure 10, at right, shows the car end differences between the “as-built” car on the right and the truss rod car on the left. Small details to be sure, but interesting none-the-less.





<Figure 11>

Figure 11 is a builder's photograph of a Class FL flat car as delivered to the PRR. Notice the P.R.R. road name, the 3 digit car number, and no truss-rods.

I painted my models with my standard Poly S mixture of Special Oxide Red and a little Reefer Orange. The Decking was given a coat of Reefer Grey and then streaked with Rail Brown, Tarnished Black and Rust.

The lettering is problematic for these cars. The roadname and number are supposed to be 5" high and as far as I can find, these are not available in HO, so I used bits from Westerfield decals, some Old-time and regular Walthers data sheet decals to make up the lettering. And here's how they came out:



<Figure 12 – The "As-built" Car>



<Figure 13 – The modified Car>

Weighting these cars turned out to be a bit of a problem as there isn't very much room to add weight. I used lead shot glued to the underside with white glue but they still only weigh just a bit over 2 ½ ounces. I think I could use something with "the density of a neutron star" as a friend of mine says, to get these where they really should be. Well, they seem to track well and they were fun to build.