Scratch building a PRR Class Xi Furniture Car

By David J. Vinci

<Figure 1 Xi>

The Xi class was designed and adopted by the PRR in 1899, and evidently, is the first 50 foot plus box car. This class of boxcar appears to be fairly rare as I have only found listings in the Official Railway Equipment Registers (ORER) for 68 cars. The Vandalia Railroad had 45, and the Pennsylvania Lines (Union Line) had 23. According to the ORERs, the Union Line Xi class cars were originally numbered in the 10201-10536 series along with the Class Xf 40 foot furniture cars. By 1918 the Union Line cars were numbered in 2 series: 575424–575446 and 555067-555101 for a total of 25 cars. I'm not sure where the 15 cars in the 555067 series came from… maybe from the VRR or maybe new construction. The Vandalia Cars were originally operated by the Terre Haute & Logansport Railway and numbered 5100-5119 (see Bob Johnson's Photo in Figure 2 below) and then later renumbered in the 6216-6266 series.

<Figure 2 Xi >

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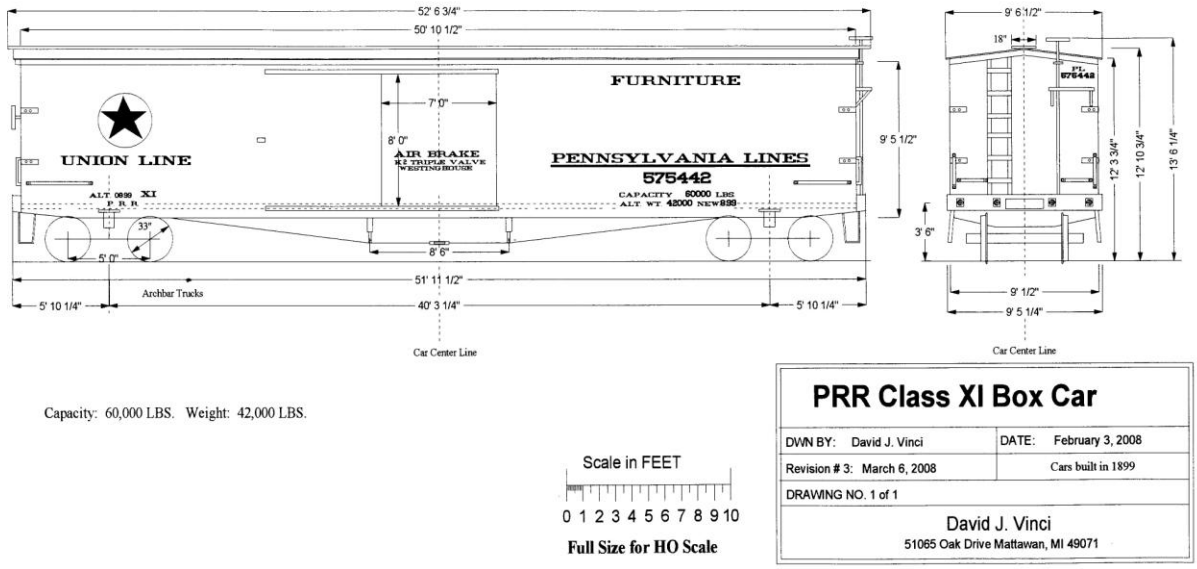
By 1920, there were just 20 VRR cars remaining and 29 Union Line cars. The 1922 ORER lists only 11 cars left, and in 1924 there was just car number 555084 remaining.

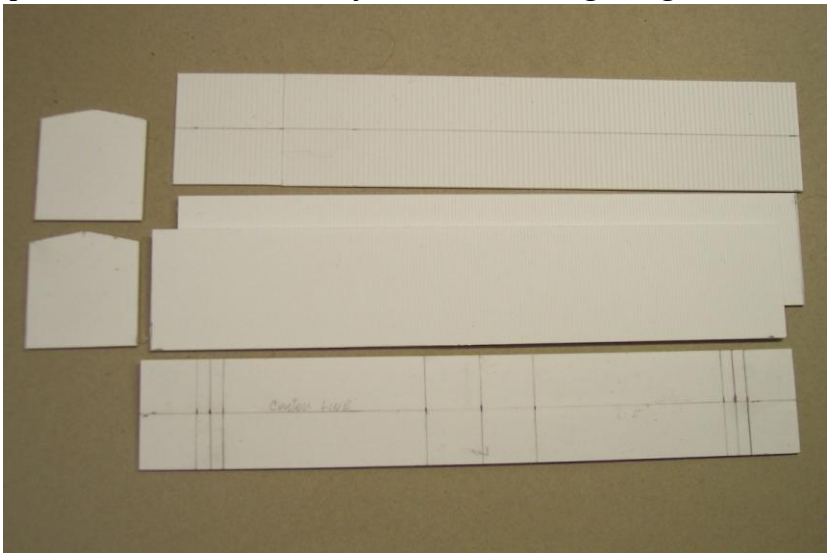
The Class Xi cars have lower floors than the prior box car classes. The prior classes had floors 4 feet above the rails, and these Furniture cars were set at 3 feet 6 inches. The roof height was pretty much the same as it had been, so the net effect was to increase the interior height. This allowed for an 8 foot high door. The Xi class has an interior length of 50 feet. This yields a huge cubic capacity, but the weight capacity was only 30 tons (60,000 lbs.).

I like unique cars, and since this is one of the few in number, oddball designs, I think it is quite unlikely it will be produced commercially. So, scratchbuilding is the way to go. I looked up the equipment diagram and found it to be a great starting point, but I drew up a scale rendering that I could build from.



<Figure 3 Xi>

This drawing you can print full size in the scale of your choice, or just use the scale in the drawing and your scale rule to make the parts. I find it really handy to print the drawing full size in my scale (HO), and then I can take parts measurements directly from the drawing using a divider.



<Figure 4 Xi>

I started this model by cutting out the floor from 0.040 sheet plastic and the sides and ends from Evergreen 0.040 thick car siding. The floor was cut only 8 feet 6inches wide to allow for the thickness of the siding. The ends were cut to the same width as the floor so that they will fit between the sides. (See Figure 4 at right). Notice that I marked the bottom of

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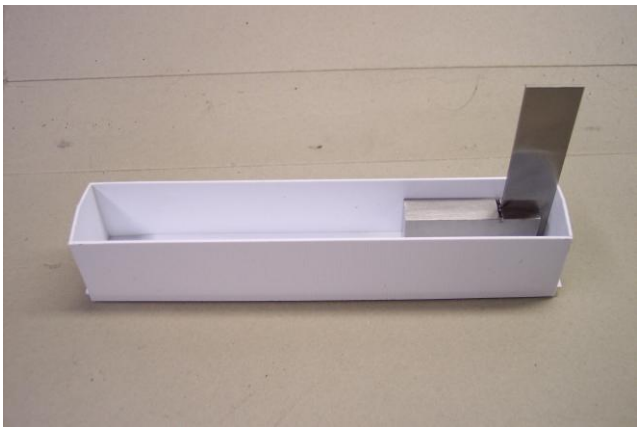
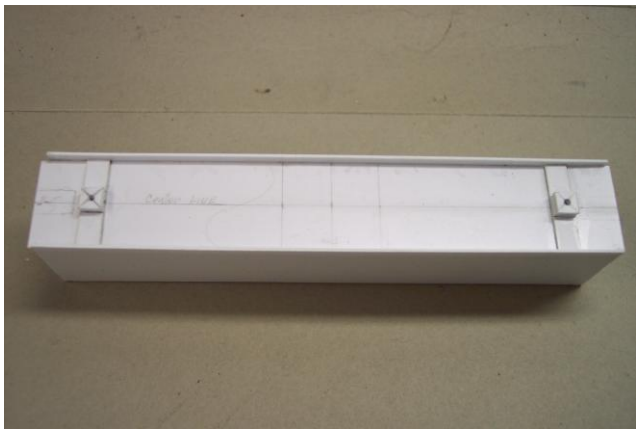
the floor with the position of the car center line, the position of the bolsters and the needle beams. (The queen posts are attached to these beams).

I cut the roof from some Evergreen V-groove siding with a 0.060 spacing and a thickness of 0.020. Because of the way the V-groove siding is laid out, I had to join 2 pieces to make the roof. This butt-joint isn't very strong, but once it is attached to the car body it will be fine.

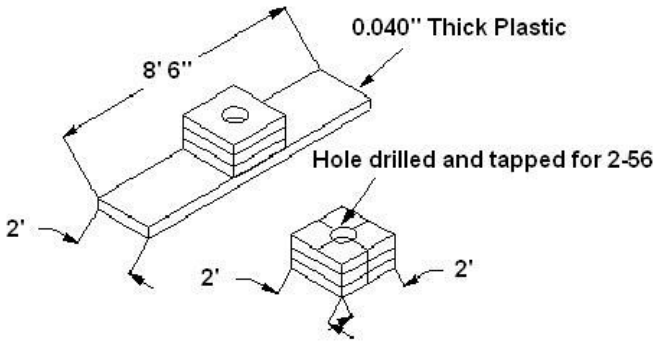
I used a small machinist's square every which way to make sure that the car body was straight, even and, well, square. Take your time with this and check your work frequently. This is the only really difficult part of the car construction.


<Figure 5 Xi>


<Figure 6 Xi>

<Figure 7 Xi>

Next install the truck bolsters. You can use a commercial casting but I use a 2 ft x 8 ft 6 in strip with a pile of three 2 ft x 2 ft squares cemented on top. (See Figure 7 at right) All 4 pieces are made of 0.040 Evergreen sheet plastic. This works out to be the perfect height for the Kaydee #501 Archbar trucks. After the 4 pieces are cemented together, drill a hole in the center and tap it for a 2-56 screw. Next, glue the bolster assemblies to the floor and mark the position of the coupler boxes as shown above in figure 6.



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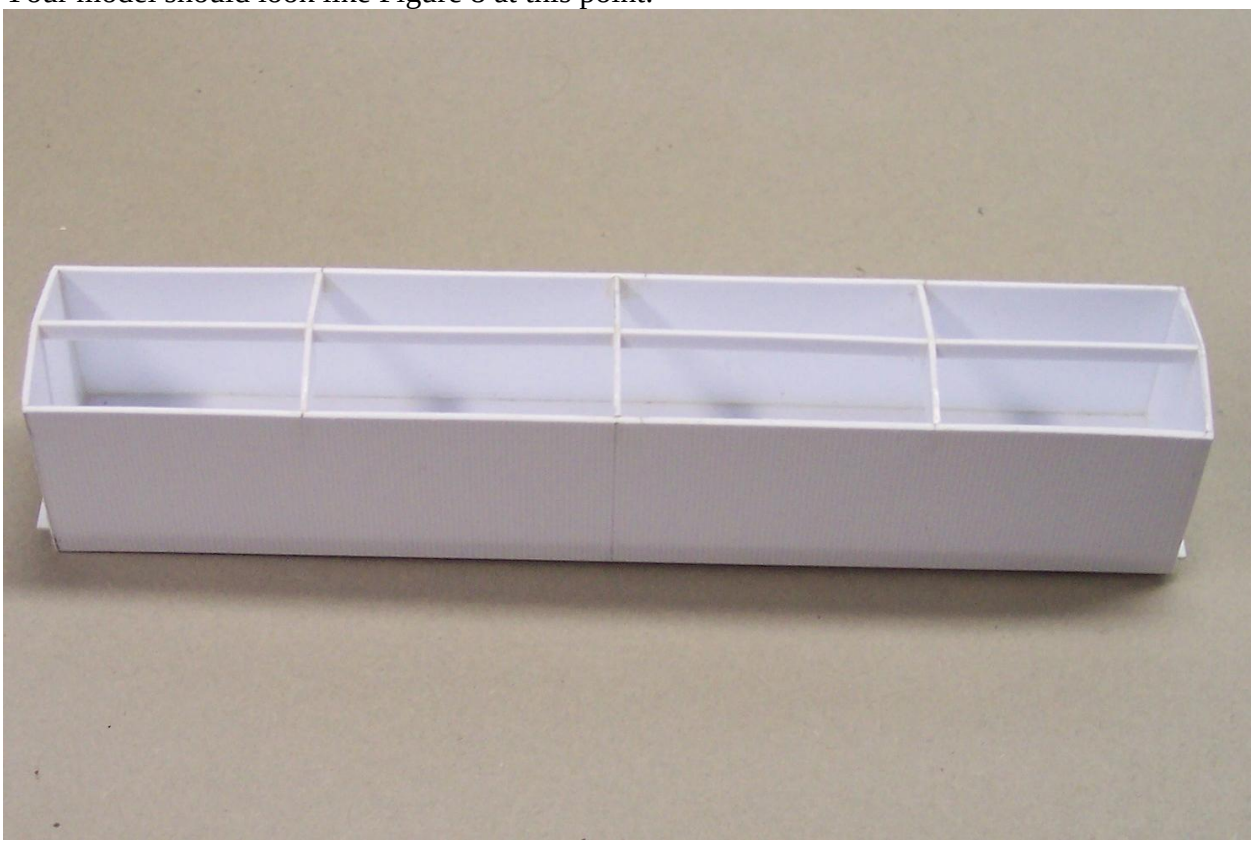
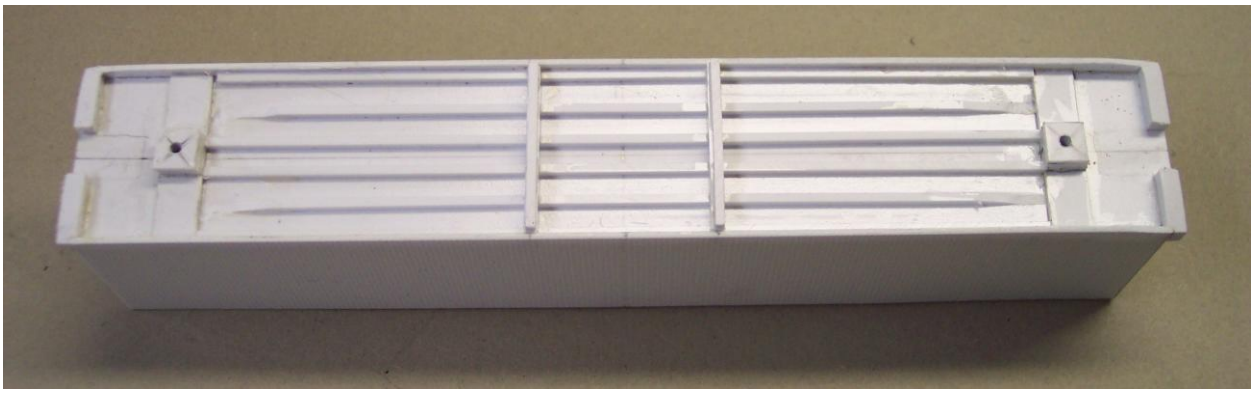
Now cut 3 cross braces from scrap pieces of 0.040 sheet that are the same shape as the end peaks. These pieces will support the roof and help keep the body square. Cut 4 pieces of 0.040 x 0.125 strip to fit between the ends and the cross braces as you cement the cross braces in place. Your model should look like Figure 8 at this point.



<Figure 8 Xi>

This is a good time to cut and install the scale 1 x 4 trim that runs around the top of the carbody.

Now flip the body upside down and we'll work on the underbody.

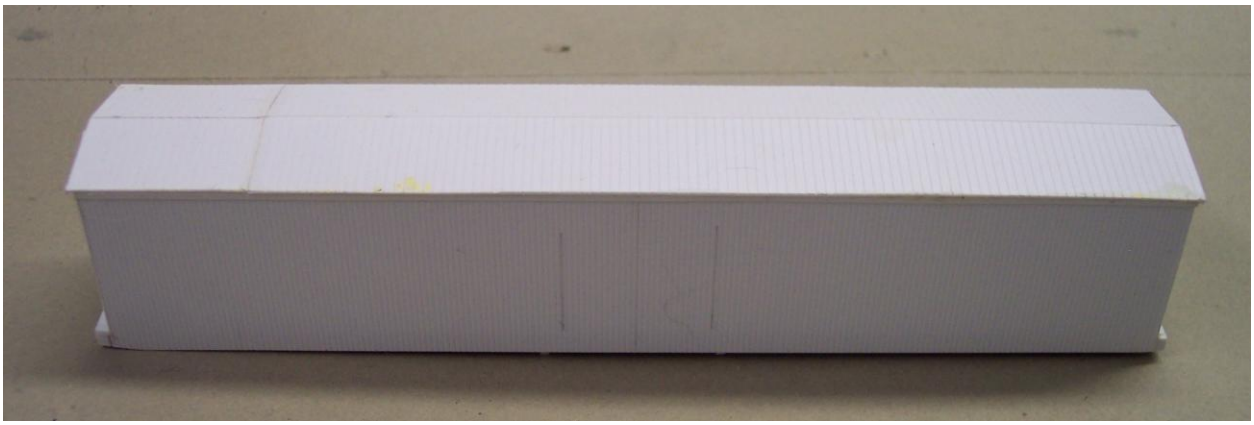


<Figure 9 Xi>

Use Figure 9 above as a reference for the next several steps. First, cut 6 lengths of 0.060 x 0.060 strip to fit between the truck bolsters as shown. Once the glue has set, attach the trucks and mark the areas that must be shaved down to allow clearance for the wheels. Taper the ends of the 2 strips to provide the needed clearance. The end sills are made from pieces of 0.125 x 0.125 strip. Cut them a little long and notch them to fit around and past the car sides. This may sound a little

confusing, but it will be clear when you place the end sill parts on the car floor. After the 4 pieces of the end sills are in place trim the ends of the sills flush with the car sides. The needle beams are made from a strip of 0.060 x0.060 on top of a strip of 0.080 x 0.080. This assembly is then cemented in place on top of the 6 strips as in Figure 9 above.

Since the next major step is to attach the roof, this is the time to add some weight, for once the roof is attached, you won't be able to do that. I use an old cheap plastic postal scale and place the carbody and the trucks on the scale and then add the self adhesive lead squares until I get to the weight I like. In this case I went up to 3.5 ounces, which is a bit light for a 50 foot car, but it should be fine. Once the weights were installed, I cemented the roof in place.



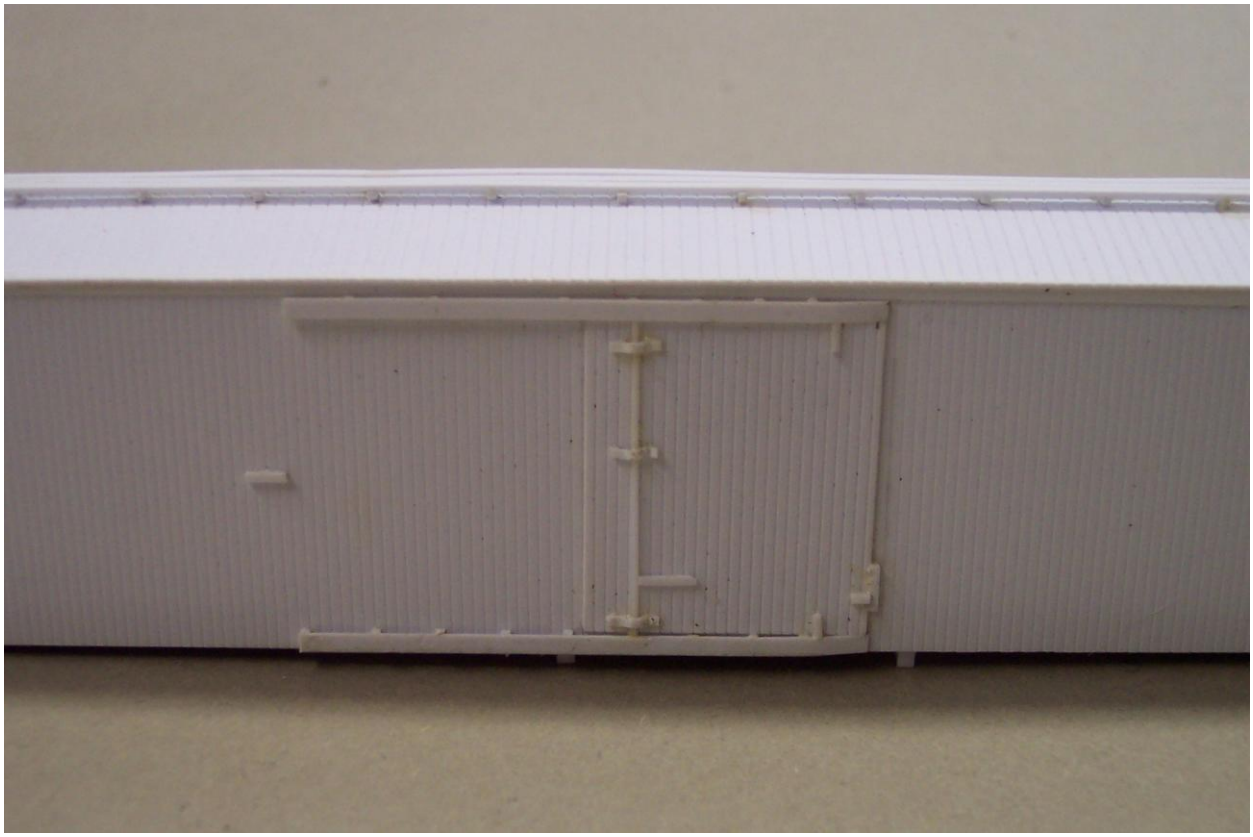
<Figure 10 Xi>

The roof walk is made from 3 lengths of scale 2 x 6 supported by saddles made of 0.030 x 0.030 strip on 3 foot spacing. I marked the ridgeline of the roof with pencil marks to locate the saddles. Then at each location, I filed a flat spot with a square needle file and glued each saddle in place. Next, glue the center board of the roofwalk in place followed by the two outer boards. Leave just a little space between the boards to enhance the appearance. Next, I cemented a piece of 0.030 x 0.030 strip under the very ends of the roofwalk. Later, the roofwalk end braces will be added. (See Figure 12).

Next, I went to work on the doors. The Xi cars ended their life with the flush fitting Wagner doors like you've probably seen on the XL class boxcars. Well, on the model, I find that door difficult to see. At right is a photo of a Class XL boxcar I built with the flush fitting door. The door disappeared until I stained the edges with some black paint. It's accurate but I just wasn't pleased with it.

<Figure 11 Xi>

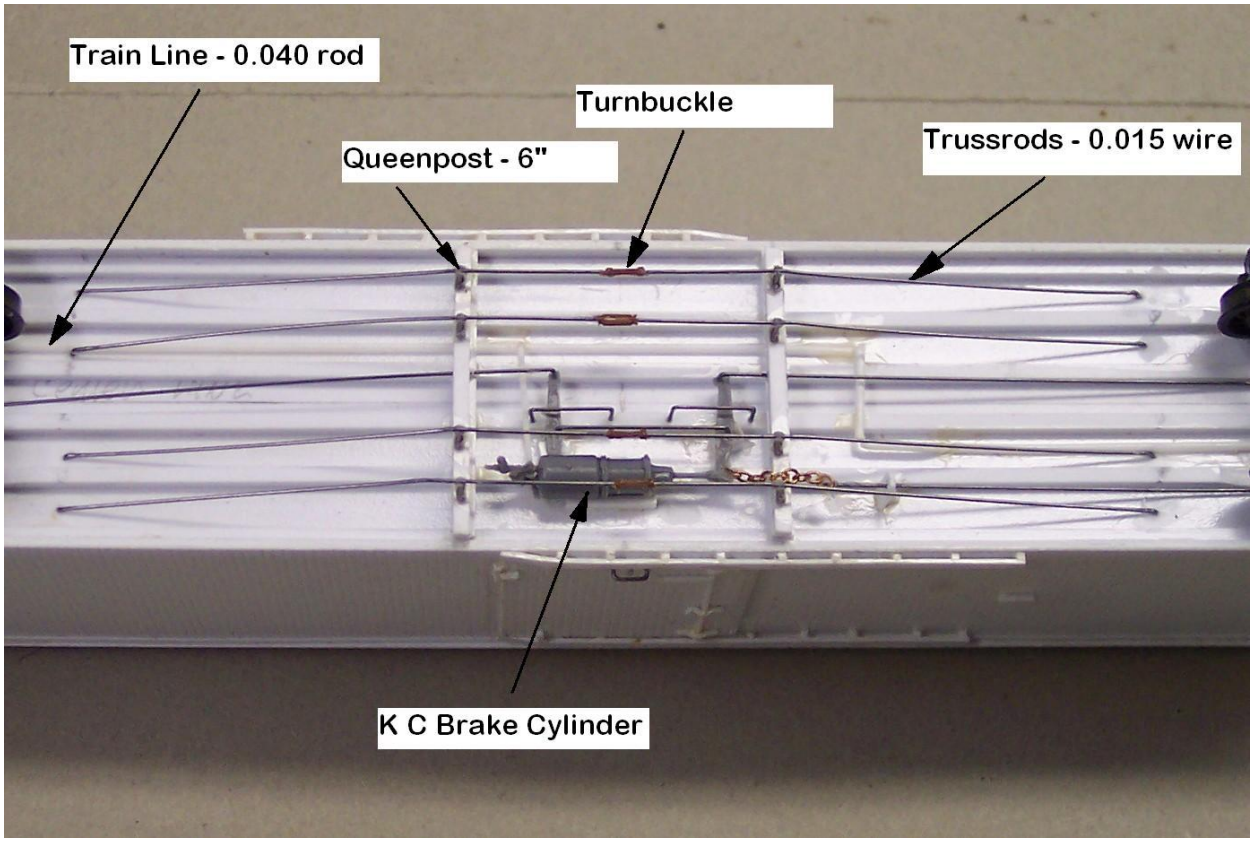
I wanted to really be able to see the doors, so, I made applied doors of Evergreen car siding that is 0.020 thick. Even though it's not completely accurate, I think it makes for a better looking model (compare Figure 1 and Figure 11). You can do it either way, so do what makes you happy.



<Figure 12 Xi>

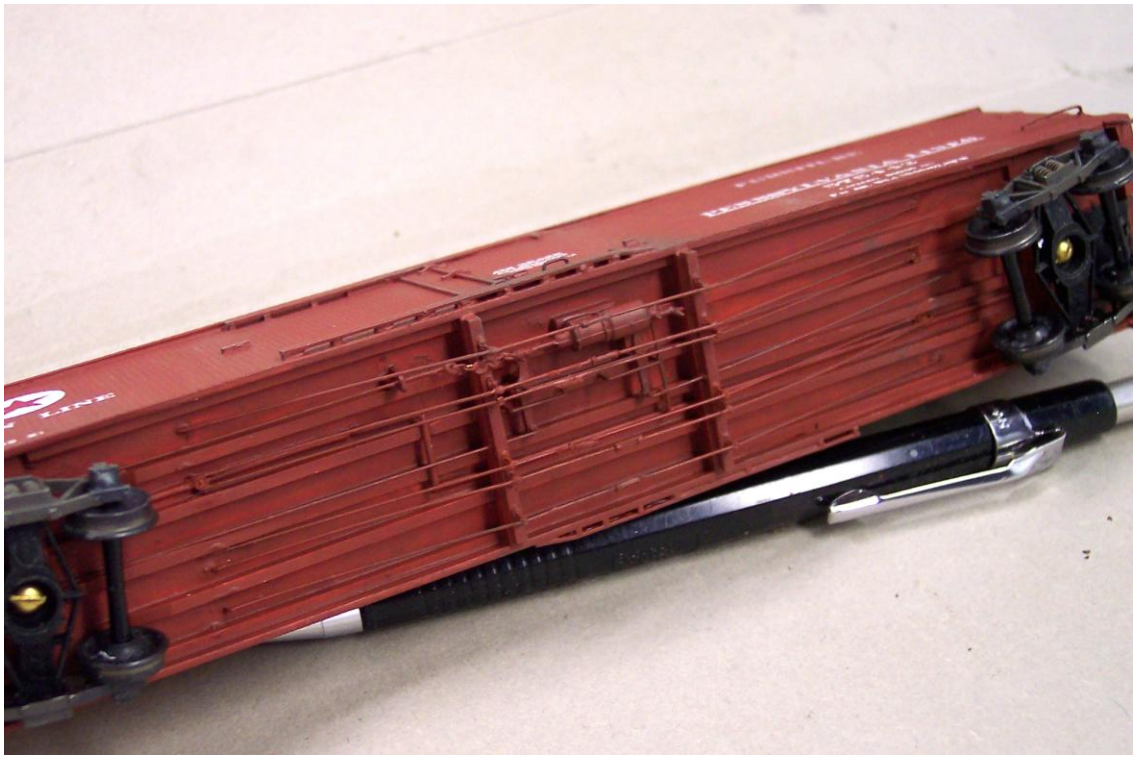
I elected to make a Wagner type door as was applied to these cars later in life, as opposed to the one seen on the prototype car in Figure 2. I made the door tracks from a strip 0.015 x 0.080 with spacers of 0.030 x 0.030 strip. The door latch is a piece of 0.020 rod with the handle made of a length of 0.020 x 0.030. The 3 straps on the latch were made by pressing a piece of 0.020 x 0.030 strip over a piece of 0.020 brass wire. The plastic will hold the molded shape long enough to glue it in place. The door lock and the door stop are also made of bits of scrap plastic strip.

Next we'll tackle the bottom details. Ok, I usually don't do a lot of underbody detail because it will mostly be unseen; but I had a moment of insanity, so I added the detail. I have to admit that it was fun, but I don't think I'll go back and rebuild the whole fleet. Figure 13, below, shows the gory details for your reference. I built this model before we found a prototype photo of a Class Xi, so there were a few surprises in the photo (see Figure 2). The most notable item was how the queenposts are made… they look like the center pair are double truss rods. Also, the car doesn't appear to have the typical truss rod bolts on the end sills which makes me wonder how and where they were anchored. It really does pay to work from photos and not to get impatient like I do sometimes. Feel free to correct these errors on your model.



<Figure 13 Xi>

The train line was made from 0.040 plastic rod, and the other plumbing was made from 0.020 plastic rod. The KC brake cylinder is from Tichy as are the turnbuckles on the truss rods. The truss rods and the brake linkages are made from 0.015 steel wire, and the 6 inch queenposts are Grandt Line parts.



<Figure 14 Xi>

Oh, and I did go back and add the additional truss rods as you can see in Figure 14 above.

The B end details include Tichy ladders, Grandt Line Trussrod end bolts, and grab irons made from 0.015 wire. Note the supports on the end of the roofwalk made from 0.020 x 0.030 strip. The stirrups are from A Line. (See Figure 15 at right).

The couplers were attached with pan head 2-56 screws. I used Kaydee #5 couplers but maybe the #58 couplers would look better. Both the trucks and couplers will be removed before painting.

The only parts left to be added are the corner straps (I'm getting better at rivets), air hoses, and the Tunnel Brake on the A end as shown in Figure 16 at right.

The car was painted with my version of freight car red which is Poly S Special Oxide Red with some Reefer Orange added. I wanted to model a Union Line car in a later paint scheme, so I selected the billboard style which would date to the teens. Since I model the 1920s, I figured this would be a typical look for the car. Naturally, about the time this appears in print, a photo will show up to indicate that I have selected the scheme in error. This is a corollary of Murphy's Law I suspect. In any case, I used a set of #1302 Westerfield XL boxcar decals which has all I needed except for the "Furniture" lettering. I rooted around in my decal collection and found an old Champ set that had the lettering needed. I like to add a bit of light weathering to my cars, and this one is no exception. After the paint was dry and the lettering sealed with Dullcoat, I added some rust to the truck springs and the couplers. The Air hoses were painted with Grimy Black and then the ends and valves highlighted with silver. Then I dry brushed the car with Rail brown to indicate where dirt would build up: next to the doors, the roof walk, ladders and grabs. I also lightly dry brushed the whole car with a bit of Reefer Grey to highlight the details. You have to go gently with this because it's easy to over do it.

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<Figure 17 Xi>

The finished car is nearly 52 feet long, which is a real behemoth for 1899 and even for 1920. Just to put the thing in perspective, in the photo above, the big car is between a 40foot reefer and a PRR Class XLc boxcar. The car on the siding behind the Xi is a 34 foot PRR Class Gi Long gondola. It was fun to build!

Parts List:

Evergreen Styrene
- 0.040 thick sheet
- 0.040 thick Car Siding
- 0.020 thick Car Siding
- 0.020 thick V-groove siding 0.060 spacing
- 0.020 x 0.030 strip
- 0.030 x 0.030 strip
- 0.040 x 0.125 strip
- 0.060 x 0.060 strip
- 0.080 x 0.080 strip
- 0.125 x 0.125 strip
- 0.020 rod
- 0.035 rod
- HO scale 2 x 6
- HO scale 1 x 4

Tichy
- 3005 KC Brake Gear
- 3033 Freight Car Ladders
- 8021 Turnbuckles
- 8034 Truss Rod Ends

A Line
- 29000 Stirrups – Style A

Grandt Line
- 5050 6” Queenposts

Kaydee
- No. 5 couplers
- 501 Archbar Trucks

Westerfield
- 1302 Decals

Misc.
- 0.015 steel wire
- Brass chain
- 2-56 screws

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