

# Reinforcing resin house cars

An easy approach to avoiding warped sides on boxcars and reefers/**Jack Burgess**

**A**lthough some resin kits for boxcars and refrigerator cars now include one-piece cast bodies, many of them still require the modeler to assemble the sides, ends, roof and floor into a "box" to which details are then added. A kit with reasonably thick sides and a solid roof which engages the sides results in a fairly rigid body that is unlikely to eventually warp. However, kits without a solid roof to hold the tops of the sides in line, and/or which use thin castings for the sides, typically need a way to reinforce the sides to prevent warping.

In my experience, styrene strips, even large strips, are too flexible to prevent future warping or, when necessary, correct any slight warping of the sides which might have occurred during shipping or storage. One could cut a piece of .040" sheet styrene exactly the correct width and length to fit inside the car but, to be effective, that piece must fit tightly against both sides. Instead, my approach produces the same results with much less exacting measuring and cutting. Instead of cutting a single piece of styrene to fit inside the car, two pieces are cut to overlap each other so they can easily accommodate any width variations in the carbody's interior.

As part of the process, a pair of spacers is added to the inside of the car to allow the floor to be glued in place later at the correct location in relation to the ends. This step is helpful since once the side reinforcing pieces are in place it can be difficult to glue a floor in place with it accurately aligned with both ends at the same time. The floor spacers solve this problem. The side reinforcing pieces will also rest on these spacers, making it easy to position them for gluing.

The process starts with gluing the floor spacers in place. Note that describing the process is much more difficult than doing it, but just bear with me and it will all become clear by the end. Also, note that the styrene spacers and reinforcing pieces should be cut using a machinists square or combination square so the corners are all square.

## Floor spacers

Begin by assembling the sides and ends to form the basic carbody but do not add the floor or roof yet. I use a Coffman Original Right Clamp

([www.coffmaneng.com](http://www.coffmaneng.com)) to hold a side and an end in alignment before gluing them together with cyanoacrylate adhesive. This allows me to make sure that they line up accurately while also automatically holding them at right angles to each other. After both side/end assemblies are done, clamp the two assemblies together with a pair of Original Right Clamps to form the carbody, then complete the box by gluing them together.

Once the cyanoacrylate is dry, test fit the floor and file it as needed to fit the box, but don't glue it in place since you will need both the roof and floor openings available for access while later installing the side reinforcing pieces.

To fashion the floor spacers, cut a piece of .040" plain sheet styrene slightly less than the inside width of the car and approximately equal to its inside height. Next, cut the height of

this piece in half, allowing for the thickness of the roof if needed so both spacers are the same height.

Clamp a floor spacer inside each end with the bottom of the spacer close to the bottom of the end. Turn the body upside down and put the floor in place so it rests on the clamped spacers and push the floor and the spacers down to the correct position. (If each spacer is clamped against a car side, the floor will automatically be square with the ends.) Once the floor and spacers are accurately located (typically with the coupler pads being even with the bottom of the ends), remove the floor and glue the spacers in place using cyanoacrylate.

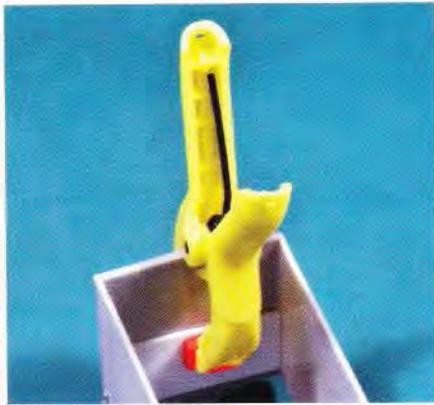
## Side reinforcement pieces

The final step is to cut and install the side reinforcement pieces. Cut a rectangle of .040" sheet styrene barely



The sides and ends of this refrigerator car kit (*above*) have been glued together. Although the sides of resin kits can sometimes be slightly warped, the sides on this refrigerator car are just flexible because they are thin. The basic carbody (*below*) is seen with a pair of floor spacers clamped in place. The body is right side up with the floor below it.



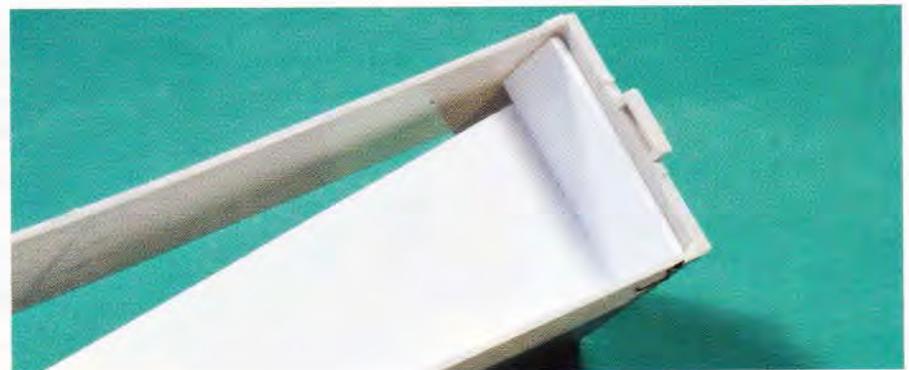
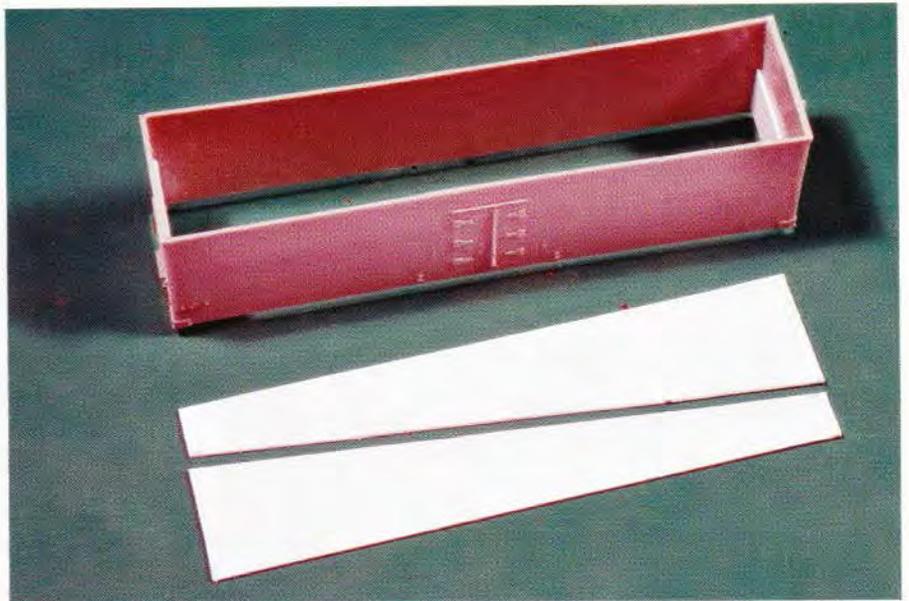


One of the two floor spacers is shown clamped inside the end, *above*. Note how it has been placed adjacent to one side of the car so its bottom edge is parallel to the bottom of the car. It is set above the bottom of the car side to allow for the thickness of the car floor. When correctly positioned the floor spacers are glued in place. A styrene rectangle has been cut diagonally (*right top*) to create a pair of side reinforcement pieces. Its length is a little shorter than the inside length of the body, while its width before cutting is  $\frac{1}{4}$ " wider than the inside width of the car. Looking from the bottom (*right, middle*) the first side reinforcement piece has been attached to tops of both floor spacers at the ends and to the side itself. After the other reinforcement piece is in place (*below*) the two pieces are glued together where they overlap. The pieces are approximately midway up the inside the car.

less than the inside length of the car (just so that it easily drops in place) and approximately  $\frac{1}{4}$ " wider than its inside width. Make a pencil mark on one end of this piece about  $\frac{3}{16}$ " narrower than the width of the car, measuring up from the bottom right corner. Now mark the opposite end in a similar manner but measure down from the upper left corner. Cut the piece of styrene from one mark to the other to create a pair of equally-sized, wedged-shaped pieces as shown. These will be the pieces that reinforce the sides.

With the car oriented roof side up, position one reinforcing piece inside the body with its longer end resting on top of one of the floor spacers. Push it tightly against the inside corner of the car and tack it in place with a drop of cyanoacrylate in the corner only. When that has cured, add a drop of adhesive to the opposite (shorter) end, again only at the corner, to bond it in place. Be sure the reinforcing piece sits tight inside the corner. If any dried cyanoacrylate cement inside the carbody interferes with that, clip off the corner of the reinforcing piece for clearance.

Next, lightly push the car side against the length of the reinforcing piece and run cyanoacrylate cement



along the rest of the joint. This will ensure that the side stays straight and does not warp.

When the joint is dry, place the other reinforcing piece inside the body with its long end against the opposite end of the car and follow the same procedure as with the first piece. Again, if the side of the car is slightly warped, glue the corners first, then eliminate the warping by

pushing the side tight against the reinforcing piece. Finally, glue the two pieces of styrene together at their overlapping joint. Use styrene cement for this.

At this point you are ready to continue with the rest of the construction of the kit. When you are ready to glue the floor in place, it will drop in place against the floor spacers, exactly up where it should be.