

## Kit K125 - Southern Pacific A-50-11 Auto Cars



Collection of J. Michael Gruber

### History

The Southern Pacific rostered three classes of all-steel "single sheathed" automobile cars. They're not technically single sheathed cars since they had steel sheathing with wood lining, making them double sheathed, but they have visible structural members, lending the traditional look of a single sheathed car.

The first group was class A-50-9, built in 1928 by Tennessee Coal & Iron, 250 cars in series 68980-69229. They were characterized by steel sides with visible structural members in a Howe truss arrangement, long support sections under the Youngstown steel doors, large fishbelly center sill underframes, Murphy Solidsteel roofs, Dreadnaught ends, including end doors in the A end, and Dalman two-level trucks with Barber lateral motion devices.

In 1930, Pressed Steel built 150 cars that were similar to the previous class, down to the end doors, but notably had a different support section under the doors and a different underframe arrangement. This group, nos. 69230-69379, were assigned to class A-50-10.

At the same time, Pressed Steel also built 150 cars without end doors that were otherwise identical to the A-50-10. These cars with tight ends were assigned to class A-50-11, car nos. 69380-69529.

Throughout their service lives, the cars were painted Southern Pacific "metallic" on all surfaces, except the trucks, which were black. The cars carried lettering/stenciling that followed the SP standards of the time periods. The images herein display many of those variations.

### Instructions

General - please, please, please read first, even if you are an experienced resin freight car modeler

This kit includes some extremely detailed etched parts. They can

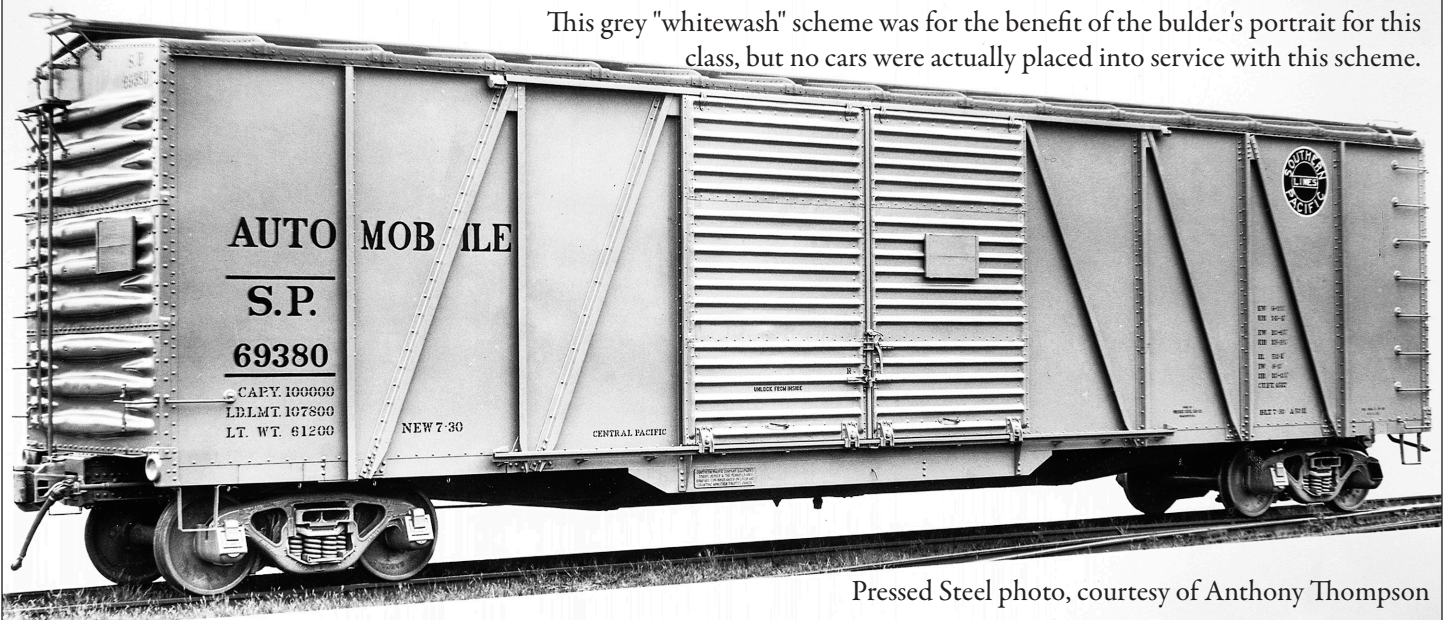
be fussy and may be fragile if not handled as directed or assembled in a different order than laid out herein. It is recommended in the strongest possible terms that you pay attention to the order of operations and also follow the suggestions for tools (as noted at the end of this section.) Not to sugarcoat it, this was a difficult model for me to build and I designed it! I am already streamlining future kits to improve the experience, but maintain the fidelity to detail. Rest assured that the challenge is worth it. Exercise care and patience and you will be rewarded with one of the finest models in your fleet. One other note: when I created the patterns for this model, some of the things that are used in it now, particularly the etchings, were not even in my dreams. That means that in some instances, the castings must be modified to suit these parts. I will mention those things as the build progresses.

The instructions contain high resolution images. You can print the file or zoom in quite a lot to aid in understanding assembly.

The general order of the assembly is in many ways up to the preferences of the modeler. There are also few things that are optional and require items not included in the kit. These are noted throughout the instructions.

*Important* note about working with the etched metal parts... many of the etched metal parts have half-etched "score" lines. These are to be used to aid in folding the parts. *Unless specifically instructed to fold "away" from the score line* (there is at least one instance in this kit where this is called out) always fold *into* the score lines, meaning that the angle formed by the subsequent bend will "contain" the score line, which will "disappear" into the fold in most instances, such as 90° bends. Also, the etched parts in this kit are quite thin and easy to cut or trim. I recommend the following method: lay the parts fret on a cutting mat and

This grey "whitewash" scheme was for the benefit of the bulder's portrait for this class, but no cars were actually placed into service with this scheme.



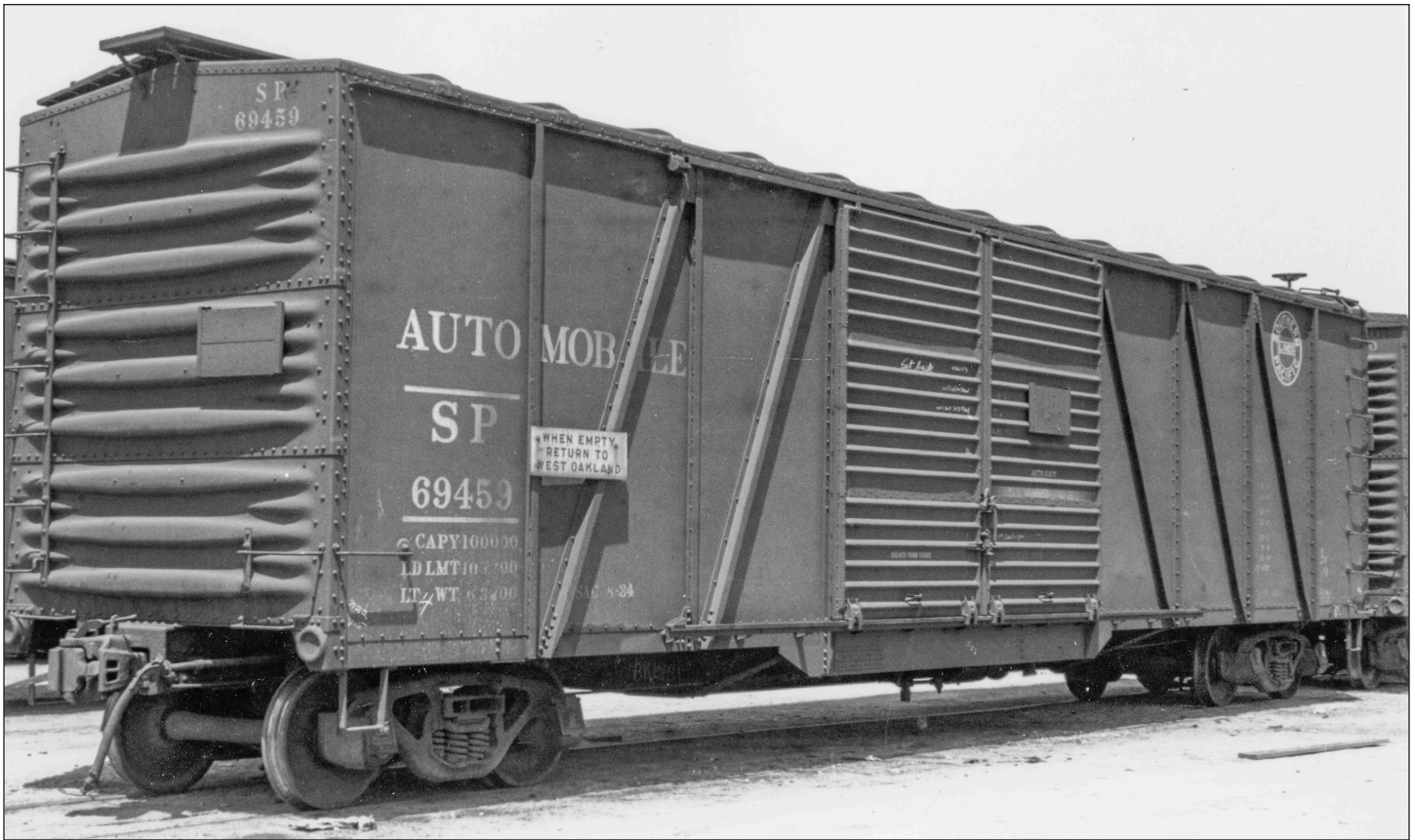
Pressed Steel photo, courtesy of Anthony Thompson



A-50-10 SP 69304 was photographed in Alameda (Oakland area) California in 1947. Note the hinges at the left corner of the car, for the Dreadnaught end doors. Howard Ameling Collection



A-50-10; Al Chione



above - ca. 1937, Collection of J. Michael Urac

overlay that with a steel ruler. Trim straight down using a chisel blade like an X Acto no. 17. When overlaying with the steel ruler, leave the excess "gate" that joins the parts together exposed and the actual part under the ruler. Yes, this leaves you a little "blind" in terms of what you are cutting, but there are extra parts and you will get the hang of it! If a part bends, you can flatten it by "crushing" it between the mat and steel ruler. Also, while I did not encounter any un- or underfilled holes, it does happen and they can be cleaned out with a drill bit (as referenced in the tools section below).

Suggested tools:

- Tweezers such as [these with serrated jaws](#) or [these with diamond tips](#) - etchings can be difficult to handle and plain tip tweezers, no matter how high quality, are not the best tool for the job... avoid flying pieces of metal followed by colorful language!
- Etched part bending tool - these devices make bending etched metal parts, especially long narrow ones like ladder stiles, much easier - I use [the 195mm Piranha](#), but [UMM-USA](#) carries many types.
- Drill bits - all drill bits are not created equal. I purchase mine from [McMaster-Carr](#) for quality and durability. I also recommend [this specific one](#) to have on hand to "ream" holes in etchings in case you find one that is not etched completely. Yes, it is an expensive bit, but I use it only for this purpose.
- Square - I recommend having a [tool grade combination square](#) in your arsenal, but for this model, I use it to "finish" the bends in the ladder stiles. Yes, it's expensive, but I use it all the time!
- Although not called upon for this kit, Yarmouth Model Works

[ladder assembly jig](#) - I have four of these to build multiple ladders at once and I have also made my own jigs by gluing styrene

Parts List:

- Resin castings (body, floor/underframe, detail castings)
- Decals
- Tichy KC and AB brake sets
- Kadee couplers, pair
- Moloco or Jim King draft gear (coupler pockets)
- Tahoe Model Works Dalman two-level trucks, pair
- Moloco angle cock/air hose, pair
- 0.088" tread width wheelsets (4)
- Etchings (two frets)
- 0.008" wire - 1
- 0.010" wire - 3
- 0.012" wire - 2
- 0.015" wire (small piece)
- 0.020" wire - 1
- Retainer valve
- Screws (2-56 and 1-72, one and two pair each, respectively)
- Washers

Extra Parts and other optional items (not included):

- Chain
- Nut-bolt-washer (NBW)
- Branch pipe tee
- [Scale Hardware 0.4mm brass rivets](#)
- [Plastruct 0.010" styrene rod](#)
- Paint

- Weathering media
- Chalk mark decals

#### Assembly Sequence

◇ Begin by examining the castings. The inside of the car body may require some slight cleanup work with a file. The underbody/floor casting will also likely require some filing to fit into the car body, as well. Take care to keep things straight and square, particularly at the corners. At the ends, the floor should be slightly below the level of the ends, with the "pads" for the coupler pockets (draft gear) level with the bottom of the car body at the ends. Once satisfied with the fit, continue, but do not glue the floor into the car body just yet. *Note that there are distinct A and B ends on the car body - 'A' and 'B' have been scratched on to the coupler pocket pads as an aid. I find it useful to write a 'B' on the floor adjacent to the B end to avoid any future confusion as I add details.* Next, drill the holes for the train pipe through the center sills (if adding that detail) at a slight diagonal and appropriate crossbearers, using a no. 65 drill bit; the exact size isn't paramount, although it is better if it is slightly larger than smaller. What is important is that the height of the holes are such that the train pipe can pass through the center sills and crossbearers without a large degree of mismatch in height variation; the train pipe should be relatively straight along its length and when the car is oriented on its trucks, the train pipe passes *through* the crossbearers, but *below* the etched channel crossties (below meaning closer to the rails when the car is mounted upright on its trucks – see photos.) Clean out the slots in the center sills for the brake levers and also drill three holes in the crossbearers for the brake rods (from the levers) and the holes for the wire "piping" between the reservoirs and AB valve. The holes for the rods can be made oval with a round needle file, if desired. A no. 75 bit should be sufficient for all. Please consult photos of the completed underframe for locations.

◇ Drill the underbody for the truck screws. The truck screw holes should be drilled with a no. 50 bit. The screws provided should be self-tapping if gently screwed into the holes. Do not do anything at this time to adjust the bolsters vis-à-vis truck and coupler height. That will be addressed later in the build. Add desired amount of weight to the floor. Glue the floor into the car body. The floor can be tacked in place with regular (medium viscosity) ACC at several points and then thin ACC may be *carefully* flowed along the joints, avoiding adding too much!

◇ Add the draft gear (coupler pockets). These extend slightly from the end sill of the car, approximately 0.020". They are secured using the 1-72 screws included with the kit. First, if adding a train line and angle cock/air hose parts, add those etchings to the draft gear. This necessitates drilling two holes in the side of the draft gear and then securing the etchings with wire or brass rivets from Scale Hardware. Consult photos for reference. Note that any portion of the wire or brass *inside* the draft gear box could interfere with coupler operation, so take care and clean up any wire on the inside of the box. To attach the draft gear, the following technique works well to

place them to aid in drilling. Using a combination of MEK and Goo (or Barge cement,) tack them in place in the appropriate location. Add ACC to firm up the joint between the draft gear and the floor. Then drill the holes for the screws. Like the truck screws, these are self-tapping in the soft resin. You do want to make sure that the hole in the draft gear is just wider than the threads of the screw or else the draft gear might become unglued as the screw is tightened. This can be accomplished by drilling the hole in the draft gear before attaching it to the car floor and widening it with a round file or else use a slightly larger drill bit for the draft gear than needed for the 1-72 screw.

◇ Assemble the body bolsters from the etchings. Note that some have holes that are used for the trainline (if adding that feature.) Before beginning to assemble these, it is necessary to trim/remove a small portion (our calculations were slightly off in this area!) Use the included graphic as a guide. On our model, the bolsters were preassembled and added to the underframe as assemblies. Again, if adding a trainline, ensure that the correct bolsters (with the holes) are added to the proper locations. The following technique worked to assemble the bolsters, after test-fitting to ensure the bends in the cover plates matched the bolster pieces: tack the parts together using a 50/50 mix of solvent (such as MEK) with Barge cement or Goo or a glue for etchings, such as [Ultra Glue](#), followed by ACC to further firm up the joints. *Once dry*, the bolster assemblies will require a small amount of filing to fit in their locations (we made them too long rather than short.) We used a needle file to remove material at the ends. When satisfied with the fit, glue in place, with the assemblies centered between the rivet rows on the bolster cover plates that are part of the floor casting. Add the bolster cover plate ends to the bottoms of the side sills (two notes: on the pilot model, these were added later in assembly so they do not "appear" until later photos and secondly, they can be "blended" with the rest of the cover plate to appear as a single piece by adding a filler, such as ACC, and sanding smooth.

◇ Add the etched channel crossties to the center of the car (between the crossbearers; the crossties closest to the ends will be added in the following step.) *Carefully note the location of these parts as they align with structural members on the car sides, not simply centered between underframe crossbearers – consult the photos for reference!* The recommended method is as follows: Trim a crosstie from the etched parts fret and complete one of the lengthwise bends, remembering to bend *into* the half-etched score line, meaning that once the 90° bend is complete, the half-etched line "disappears" inside the 90° angle formed by the metal. Bending in the opposite direction from what is described can result in the failure of the metal and the part will break and will not look as good either. Complete the second lengthwise bend, creating a u-shaped channel. Lastly, bend the small bit at the end "into the channel." You will note that where these three bends "meet," there is an angled edge; this faces towards the middle of the car. Repeat to create a total of four (really two pairs) and attach to the underframe. You may need to file the end to effect a good fit – *file the end that is behind the side sill, not the end that*

*is attached to the center sill!* Glue the crosstie in place, knowing that they also rest on the stringers, as well (another good point of attachment with glue!) You can tack these parts in place using a combination of MEK and Goo (or Barge cement,) canopy glue or something like [Ultra Glue](#), applied to the surface of the stringer on which the crosstie rests. I applied sparing amounts of ACC at the center sill and side sill to secure the joints. Repeat for the remaining five crossties. Note: there is a hole etched into the small portion that abuts the center sills. Should you wish to pin or "rivet" the part to the center sills, as the prototype did, you can take that extra step.

◇ Add the etched channel crossties that are located between the outer crossbearers and the bolsters. Note that these have "cutouts" to accommodate the diagonal braces on the underframe. Use the accompanying photos to note the arrangement and orientation of these "cutouts." If attached in the wrong orientation, the diagonal braces will not fit. Also pay attention to the location, as these align with structural members on the side of the car. Use photos as a guide.

◇ For the diagonal braces, you have a choice: you can choose to ignore them, not detracting significantly from the overall appearance of the model, or you can add them, as shown. There are holes to pin the diagonal braces to the mounting brackets, both at the side sill/crossbearer junction, as well as where the center sills meet the bolsters. Using these holes and pinning everything together with wire can become extremely fiddly; we did it on one and for the rest, we omitted that detail. Also, we tried both to assemble the brace and the brackets at each end and add the entire assembly to the underframe and we also added the two brackets and then added the brace to the brackets. Both ways worked. We slightly preferred the method where we added the brackets first, although the difference is not pronounced. What is important is to consult the photos, noting that the relative height of the face of the brackets that the braces are attached to should be close to level so that braces are close to parallel with the imaginary plane of the tops of the railheads. Again, it is important to view the numerous photos as a guide. Also, remember that on the brackets, as well as the braces, the bend of the etched parts should be *into* the score lines. To secure the parts, we used the method of tacking them in place with the Barge cement/MEK mixture followed by ACC applied with a pin to create secure attachments.

◇ Add the train pipe using 0.020" wire. Use the photos as a guide for the bends. Also note that the bolsters should be notched as shown to receive the wire. Secure with ACC

◇ Add the brake cylinder. Begin by trimming the cylinder bracket from the etched parts fret and bending to create a 90 degree angle in the part, using the score line as a guide. Assemble the cylinder from the Tichy parts sprue using parts AB-3, AB-8, and AB-9 using liquid solvent cement. Additionally, add a piece of scrap styrene rod into the hole in the front of the cylinder. If you do not have rod, you can heat a piece of scrap styrene sprue with a candle flame (don't light the sprue on fire... just soften it by holding both ends with the styrene over the flame – also

don't hold so closely that you burn your hands!) and stretch the plastic to create rod. This stretched sprue will have a tapered thickness, Use an appropriate section to glue into the hole in the front of the cylinder. Once dry, drill the nipple in the rear of the cylinder with a no. 78 or 79 drill bit. Trim the rod on the front with just a small amount remaining visible and then drill a hole centered in the front using a no. 76 or 77 drill bit. [*note: the following applies to use of etched levers and clevises; if you choose to use the Tichy styrene levers or create your own, please disregard.*] Remove an etched "clevis" from the etchings fret and bend around a piece of 0.012" or 0.015" wire. Bend the "clevis" so it is effectively closed over the wire. Slide the clevis up near the end of the wire and secure with ACC. Next, take the main brake lever and a piece of 0.010" and pass the wire through the holes in the clevis and the brake lever, effectively "locking" the lever between the clevis. Consult the accompanying photos to ensure that you understand how to accomplish this and that you have the lever oriented properly. For reference, this clevis and will be the one inserted into the front of the brake cylinder. Trim the wire that is extending out from the top and bottom of the clevis, almost flush with the clevis/lever (nut not completely flush.) Slide the wire from the clevis into the front of the cylinder; the aim is to have a little extra for the wire to slide back and forth in the cylinder. *Do not glue the wire into the cylinder yet.* Next, glue the cylinder to the bracket that you bent at the beginning of this step. The orientation is such that when the cylinder and bracket are mounted to the face of the center sill, the small "leg" on the bracket will face towards the rails. For this and most other etched metal to resin or styrene assemblies, it is recommended that the parts be tacked using a combination of MEK and Goo (or Barge cement) or something like [Ultra Glue](#), and then secured in place with ACC. Once secure, slide the wire from the lever/clevis into the front of the cylinder. Carefully slide the lever through the appropriate slots in the center sills. If holding or laying the model on your work surface so that you are looking at the face of center sill, everything should be loosely held in place. Carefully tack the bracket to the face of the center sill using Goo or one of the other contact-style glues mentioned. Prod the bracket until it is in the correct place and the lever is also still passing through the center sill slots. Secure the cylinder bracket with ACC. Finally, again ensure the lever is correctly positioned and secured the wire in the front of the cylinder.

◇ Add the AB valve bracket, bending and gluing with the face against the side sill and the other resting on the stringer, as shown. In the AB valve (part AB-5) drill the three holes for the pipes between the valve and the reservoirs and cylinder. The pre-drilled hole is for the dirt collector and requires no drilling. For all of these holes, it is easier to drill if you first create a dimple for drilling, using something like a bulletin board push pin or a needle in a pin vise, by pushing the point where the hole should be located.

◇ Assemble the reservoirs from parts AB-1, AB-2, and AB-10, using liquid solvent cement. Once the parts have dried, drill the nipples with a no. 78 or 79 drill bit and also drill the three

lugs with a no. 78 or 79 drill bit (this is likely something you have never done, but the reservoir brackets include holes to secure them to the reservoirs with wire.) Assemble the reservoirs and etched reservoir brackets, as shown in the photos (*note: in the photos of the reservoirs before they are attached to the model, I erroneously attached the bracket for the two lugs incorrectly! Please be sure to examine the final photos of the reservoirs as attached to the model for the correct placement.*) Use 0.010" and ACC to secure the brackets and the lugs on the reservoirs. Once dry, trim the wire.

◇ Add the AB valve and reservoirs to the underframe. The AB valve should be glued on to the bracket that was already added to the underframe. Again, it is recommended to tack the parts in place using the adhesives previously referenced followed by ACC to secure them. Use the photos as a guide. The reservoirs require a little more finesse, but once located and glued, are quite secure. Consult photos for guidance. Note: if adding a branch pipe tee (not included) to the trainline (opposite the AB valve) this can be added by cutting the wire trainline, sliding the tee over the wire to conceal the cut, and securing with ACC.

◇ Add brake piping. Using 0.012" wire, create the piping between the reservoirs and the AB valve. Beading pliers with round jaws are particularly good for this task. Mimic the piping as shown in the photos. Note that due to the number of bends, we actually created two pairs of wire piping: between the reservoirs and the center sills and between the AB valve and the center sills, with both terminating "inside" the center sills. Next, add the pipe between the cylinder and AB valve, again using 0.012" wire. Trim the dirt collector (part AB-6) from the Tichy parts sprue. You have a few options at this point. Use the "pipe" that is integral to the dirt collector and bend it so it mimics the photos and glue into the AB valve using liquid styrene cement and secure the end of the styrene "pipe" to the train pipe by joining both with a blob of ACC. The other option is to snip off the styrene "pipe," drill a hole (no. 77 or 78) in the front of the dirt collector, glue the dirt collector into the AB valve and then add 0.015" wire between the dirt collector and train pipe, bending as shown, and secure the end of the wire "pipe" to the train pipe by joining both with a blob of ACC. If you have a tee, you can add that as shown in the photos, and secure the 0.015" wire into the tee.

◇ Add the etched crossbearer cover plates. These are another part that requires a little finesse. All three parts are the same as etched, but they require some different handling. The two that are intended to be closest to the ends will be handled in a mirror-like fashion. Both have one that abuts against a deep fishbelly side and another end that extends and covers the bottom of the side sill. This means that the end that abuts the deep fishbelly side sill needs to be shortened by trimming. Sharp scissors, a no. 17 type Xacto chisel blade or even Xuron-style nippers will work. We recommend the following approach (before any cutting to shorten): mark the center and then carefully measure to identify the locations of the various bends. Make these bends as shown in the photos and then trim the end that must be shortened. These can be glued by tacking in place with a Goo/MEK mixture (or

similar contact-type cement) and then secured with ACC. It is better to completely secure one side and the area at the center sills and then complete the other side. The plates should be centered over the line created by the non-flanged edge of the crossbearer, if looking straight down on the crossbearer (to further illustrate this note that the rivets that are applied to the bottom of these cover plates are not centered, but are rather over the flange of the crossbearers; *however, these rivets are not added yet!*) Repeat for the center crossbearer, except this cover plate must be shortened at both ends.

◇ Add the brake levers and rods. The following described the use of etched brake levers and clevises. If using Tichy styrene levers or creating your own, please disregard and proceed in your own fashion. You have a couple choices. Create the clevis/lever assemblies as noted for the cylinder assembly. Use 0.010" for the rods, as shown. The chain at the clevis on the cylinder is an optional item and not included in the kit. Note in the photos how the rods from the levers to the trucks are bent twice to appear, from the side view, that they attach to the levers on the trucks, even though they do not. These are attached to holes drilled into the etched bolster assemblies. Secure all parts with ACC. They should be touching the brake levers. The brake rods must pass *through* the crossbearers in the holes that were drilled before the floor was glued into the body.

◇ Add the draft gear (coupler pockets) included in the kit. Secure with the 1-72 screws, two per pocket.

◇ Add the grab irons to the right end of the car sides. These grab irons are etched parts. The left "legs" of the grab irons will be inserted into holes (drilled by you.) A no. 79 or 80 drill bit will work. If you look closely, you will find small dimples to use a locator guides for your holes. The holes are all below the hardware cast into the car body, *except* for the third grab from the top, which is *above* the hardware. The bottom most grab is a combination drop (left leg) and straight (right leg.) It must be bent from the etching. Once the left holes are drilled, use the grabs to locate the placement of the right hand holes for each grab. We find it easier to make larger holes for these (a no. 78 works well) to allow for a little "play." However, the grabs must first be removed from the etched parts frets. Remove them using the techniques described in the general instructions at the beginning. Once they are cut free, "hold" the grabs down on a mat using something flat and rigid, such as a steel ruler, with only the mounting circle visible. Use a tool such as a no. 17 chisel blade or a single edge razor blade to bend the circle up ninety degrees. Note that the third grab from the top is oriented in the opposite fashion since it is above the mounting hardware. Slide the leg without the mounting circle into the left hole and make a dimple using something such as a bulletin board push pin or a needle. Drill the no. 78 holes and mount the grabs using ACC. Consult the photos as a visual aid.

◇ Create the end grab iron ladders using the etched ladder stiles and grab irons. This is one of the most tedious and time consuming parts of the kit, but will result in close to scale-sized ladders that are more durable than styrene (and if a rung does

get slightly bent, that is entirely prototypical!) We used the following technique, although you are free to use a method that provides you with the most comfort (and modeling joy!) Using the etched grabs, closely estimate where holes need to be drilled to match the width of the grab irons. The best illustration is the photo of the end of the car with the stile and two rungs attached. Make two bends in the top of the stile to create the "leg" that attaches to the car end above the top rib on the end. Drill a hole in the car body end for the "leg" of the top of the ladder stile (the hole to secure the stile itself to the car, not for one of the grabs.) All of this should be done with a consideration that the rungs on the car end should align with the adjacent ones on the side. Once satisfied and the hole has been drilled, secure the stile into the end by "pinning" with wire or a rivet from Scale Hardware ([Scale Hardware brass rivets.](#)) Next, drill holes near the corner of the end (the "left" holes for the grabs) for two grabs that will be used to secure the stile to facilitate easier addition of the remaining grabs. The round portion of the grabs will need to be bent up (or down for one) as on the side grab irons. The holes that you drill may need to be relatively short depth as they could interfere with the metal of the grabs from the sides. Once these are drilled, add the two grabs and secure with ACC. The right legs of the grabs are secured with wire passing through both the hole in the grab and the stile. If they are not 100% level, that can be fixed later. What is important is that the grabs are secured in place with ACC. Add the remaining grabs (except the bottom one as it is different) and secure with ACC. *Again, the third grab from the top is oriented "upside down" from the others.* Lastly, add the bottom grab. It must be bent to create a hybrid straight-drop grab iron. Consult the photos as they are a far better illustration of what must be done than any text!

◇ Add the end sill grab irons. These are quite straightforward, especially after creating the ladders! Follow the previous tips. Use the grab irons to drill holes and it is recommended that you make them slightly larger than necessary (a no. 78 drill bit should do) to allow for a little "play" when aligning and gluing. Use wire of Scale Hardware rivets and secure with ACC.

◇ Add the grab iron to the lower right portion of each end. For these, the assembly is still to the grab irons and stiles along the left edge of the end, but in this case, there is only one grab and a short stile-like mounting apparatus for the left leg. Follow the same technique to "locate" the right leg and the stile section, again using slightly oversized holes (no. 77 or 78) for the stile section, allowing a little "play" to make alignment easier. Use wire or Scale Hardware rivets to "pin" the parts and secure everything with ACC. The photos will aid in location of the grab and stile section.

◇ Add the grab irons to the left edge of the car side. Note that as-built the cars had only a single grab at the left edge of the car side. A second grab was added later, with photos in the '40s displaying two grab irons. The upper grab iron is slightly different in that there was not a circular protrusion around the mounting area on the right portion of the grab, as on the one below it. See photos for clarification. Use the same techniques as noted for the

attachment of other grab irons.

◇ Detail the B end (the B end is the end of the car which the clevis on the cylinder points towards.) Begin with the brake step. The step is a cast resin part. Note that it has rivet/bolt head detail on the front edge of the step. This faces outward from the car end when assembled. First, add the step brackets/supports using the etched metal parts, as shown. Once again, you will drill holes and "pin" the parts in place and secure with ACC. They should be placed as shown in the photos, on the upper two main ribs. The space between the two parts is dictated by the rivets/bolt heads on the step. The plane created by the top of the two brackets should be as close to level (parallel to the rail heads if the car were on the rails) as possible. Once the brackets are secured, add the step. First, drill a no. 77 hole in the step in the center of the ratchet and pawl mechanism. The step can be attached to the brackets first with Goo/MEK (or Barge cement/MEK) or Ammo Ultra Glue or even an adhesive such as canopy cement. Follow with the addition of ACC to secure things.

Next create the upper brake staff bracket from the etched part. Examine the prototype and model photos for guidance. The idea is to start a bend to fold the part in half, then slip a drill bit (no. 77 is good) into the bend and clamp with pliers to create a tight loop. Then flare the "legs" away, creating a "V" with a loop at the angle of the "V," if viewing the part from above. Then gently fold the ends (with the holes.) Take a piece of 0.012" wire and slip it through the etched "V" as well as the ratchet and pawl in the brake step. Carefully, lay the wire against the car end (it is advisable to orient the end so that it is facing up to avoid the wire falling) and mark spots for two holes to be used to secure the "V" into the top of the car end. Consult the photos. Secure the "V" with wire or Scale Hardware rivets. *Do not yet secure the wire brake staff.* Next take the etched brake staff pivot and make the bends to create the shape as shown in the photos of the model. Slip the pivot over the wire and orient it so that it rests on the bottom of the end, allowing you to mark spots to drill holes to secure the etched brake staff pivot. Drill holes and secure the pivot with wire or Scale Hardware rivets, using ACC. If you wish to add chain (not included) and wire to simulate the linkage between the brake staff and cylinder brake rod, do so now. Secure the brake staff in place with ACC, adding glue in the angle of the "V", in the brake step/ratchet and pawl, and in the pivot. It is advisable to leave a small amount of wire below the pivot, as well as sufficient wire at the top of the car end.

Add the pressure retainer valve and pipe. Find the round dimple in the bottom of the pressure retainer valve and drill deeper into the part using a no. 80 drill. Drill a no. 75 or 76 hole in the appropriate location at the top of the car end for the insertion of the post on the retainer valve. Using ACC, attach the retainer valve, taking care to orient properly with the hole pointing directly down to the bottom of the end. Take the 0.008" and insert into the hole in the retainer valve. Carefully bend the wire, using trial and error, replicating the bends in the photos, finishing with a 90° bend at the bottom of the end, with the wire routed directly under the car end, with a little portion continuing

under the end. When satisfied with the bends and routing of the wire, insert into the vale and glue at the valve and at the bottom of the end, using ACC.

◇ Add the Carmer uncoupling devices to both ends. These are comprised of four etched parts: a "handle," a "lever," a "bracket," and a "washer." Remove the bracket from the fret and carefully bend along the score line, with the bend going into the fold line. Using the photos as a guide, identify the location for the bracket. Use the part as a guide to drill two mounting holes to the bottoms of the ends. These can again be slightly oversized to allow for a little "play" in setting things up. Secure the brackets into the holes with ACC, using wire or brass rivets from Scale Hardware, ensuring the "front" of the bracket (with the single hole) angles down from the bottom of the end. Remove the lever from the fret and gently bend the "ears" *noting that we messed up on this part and the bends go away from the score lines* (meaning that when the lever is mounted on the model, the lines will not be visible; they will face toward the trucks.) Also, note that there are two 90° bends that must be made. To understand where they must go, it is easiest to visualize that on the B end, the lever goes around the brake staff (the bends are the same on the A end, but there is not a brake staff on the A end as a visual cue.) Review the photos of the model as a guide. Remove the handle and washer from the fret. Carefully thread these on to a piece of wire or a brass rivet in the following order, back to front: lever, handle, washer. Once you have this set, place the wire or rivet through the hole in the bracket. Carefully add ACC and then, as the ACC sets up, push everything together up against the bracket and orient in the proper arrangement. Add more ACC as needed. Once set, trim the excess wire.

◇ Add the running boards. These are cast resin parts. Carefully rub them on a sheet of medium sandpaper, such as 220 grit, on a flat surface, until the "flash" around and between the boards becomes tissue-thin. Using a hobby knife (such as an X-Acto no. 11) trim away the excess material around the boards, including between them. *Don't cut the pieces holding the boards together though!* Be careful not to mar the edge of the boards either. To clean up any last little bits, you can scrape the edges using the no. 11 blade by holding it perpendicular to the edge of the board and sliding back and forth while scraping the edge. On the long casting with three parallel boards, add 1x6 styrene strips to the underside of the ends, running perpendicular to the boards and abutting the ends of the boards (consult photos in unclear.) It is best to tack in place with a contact-type cement and then firm up with ACC. There should be excess overhanging both sides that can be trimmed and filed clean after the ACC dries. Drill two holes into, but not through, the 1x6 styrene strip and running boards, in the two outermost boards, centered in the middle of those boards side-to-side and centered in the 1x6 strips front-to-back. Remove the running board diagonal braces from the etched parts fret and using wire or Scale Hardware rivets (with the posts trimmed significantly) secure these supports into the running boards (don't worry... the other end of the supports will be secured to the car body once the running boards are attached.)

Carefully turn the car body upside down and gently rub back and forth (lengthwise, not side-to-side) on the same piece of 220-grit sandpaper, to level and slightly roughen the running board "saddles" on the roof. Add a contact-type cement, such as the Goo-MEK or Barge-MEK solution or canopy cement, to the top of the "saddles." Tack the running boards in place, carefully centering between the saddles as well as centering end to end. When satisfied, use a pin to add ACC to these joints to further secure the running boards. You may have to jockey things a little to ensure straightness. Gently prod the other end of the supports in place to identify the locations where holes need to be drilled in the top of the car ends. Drill the holes and secure the supports in place, again using wire or Scale Hardware rivets and ACC.

*Read this section through completely to familiarize yourself with the entire process and which method works best for you.* The latitudinal running boards are another area requiring a little finesse. The supports are etched parts that once bent and ready to be attached, can be pinned to the plate at the top edge of the side. It requires carefully drilling holes, adding wire, and carefully slipping the supports over the wire, and securing the other end of each support under the running boards. The best description I can provide is as follows: using the accompanying photos, identify the locations where the holes for the wire "pins" need to be drilled. Drill the holes using a no. 78 or 79 drill bit and affix wire pins with only a little "nub" exposed above the plate (you can leave excess below the plate and trim with wire nippers later.) The spacing of the supports should be such that they align with the rows of simulated bolt locations on the latitudinal running boards. One note is that the two bends on the supports are not both 90°. The lower one closest to the "pin" is acute (<90°) while the other is obtuse (>90°) when the supports are viewed in profile. The ends of the supports that attach to the underside of the running boards should be very slightly angled to fit snugly against the bottom of the running boards. They can be affixed with contact-type cement followed by ACC. Add the latitudinal running boards on top of the brackets using contact-type cement first, followed by ACC. [*note: the next paragraph details the preparation of the latitudinal boards and their corner grab irons; read that paragraph before beginning on the entire latitudinal running board step.*] The other option is to add the latitudinals to the brackets before attaching that entire assembly to the body. Either method works, but requires a little finesse at different steps in the process.

Assuming you have already cleaned the latitudinal running board castings, add the corner grab irons. These are comprised of L-shaped etched grab irons with etched eye bolts. The ends of the L-shaped parts must be bent to match the holes in the latitudinals. The holes should be drilled in the locations shown in the accompanying photos, using a no. 79 drill. Secure these parts in place with ACC and once dry, trim the exposed metal from the underside of the casting and file smooth. At that point, the latitudinals are ready to be attached.

◇ Add the doors and upper door tracks. The upper tracks are etchings that must be folded. This is an instance where a folding



tool, such as the one referenced in the "Suggested tools" section earlier in these instructions, would be a good tool to use. The door castings should be carefully sanded on the 220-grit sandpaper to roughen the back of the casting and to make the flash at the edge thin for easy removal. The recommended approach is as follows: the door tracks have a very small portion that overlaps/rests on the plate at the top of the side and a portion that overlaps the top of the doors. To make things more solid, we added 0.020"x0.030" on edge. It serves two purposes: as noted it makes things more solid and also provides an aid to locating what can be a fussy edge. The strip styrene is glued against the plate, face-to-face (yes, it is a thin edge) with the top of the strip matching the top plane of the plate. The orientation is such that the 0.030" dimension extends out from the plate towards your face if you are holding the model. The strip should extend the entire length of the upper door track with a small shortage at both ends to avoid the strip being visible at the ends. There is additional gluing surface for the strip at the top of the center door section of the body as well as where it passes the upper portions of the structural members. Next, using a contact-type cement that allows the part to be moved a little before the bond fully sets up, tack the doors into the center section of the door area with the top of the doors butting up against the bottom of the styrene strip. Next, take the etched door track and lay it in place. To refresh, a small portion should overlap the top plate as well as the top of the doors. If the doors do not need to be moved any further, they can be secured with ACC applied with a pin, followed by adding an securing the door tracks.

◇ Add the lower door tracks. These must be bent and it is almost a requirement that you have a tool for bending etchings to perform this task, since there are two bends required in a long thin piece. Here is how I did it. I will also provide a recommendation for a non-etched solution should you decide to throw up your hands and curse at me. Using a tool to bend etchings, begin by bending the "smaller" of the two legs by securing into the bending tool and folding, following the instructions supplied with the tool. It is not important that the bend be exactly 90° at this point, but it should be something greater than 60°. Repeat to make the bend on the larger leg, again, making it greater than 60°. At this point, here is what I did. I carefully placed the "U" created by the two bends over the edge of my trusty General HO scale steel ruler. Using [these Tekton pliers](#) (they're great!) I then crimped the etching to create two fairly tight 90° bends. You cannot do this all at once. It is necessary to start at one end and progressively move "down" the etching until the part is bent to your satisfaction.

The non-etched part solution is to glue a 0.020"x0.030" strip to a 0.010"x0.040" aligned along an edge to create a 0.030"x0.030" strip with a 0.010" "leg." This will certainly be easier to handle although it is a little less durable and lacks the channel feature of the etching.

Attach the lower door tracks. The entire process revolves around securing the center portion first. The channel of the track faces down and the wider "leg" is in back. The track should fit/nest into and behind the rollers of the doors. If it does not (mine

wasn't a perfect fit) you can use a no. 17 chisel blade to remove a little material from behind the rollers and/or from the faces of the door frame structural members.

Add the door track brackets. To confess, the kit includes etchings for both the "base" of the brackets as well as the main portion of the brackets. The pieces of the main portion are both small and require bending into a u-shaped channel-like segment. While these are provided, I did not opt to use them as they are quite fiddly. What I did was to glue 0.020"x0.030" styrene strips, on edge, between the "base" portions of the brackets and the tracks. I find this to be durable, good-looking, and far easier than working with the etched main portion of the brackets. The "base" pieces are etched and are glued against the car sides, behind the tracks, with "point" oriented down towards the bottom of the car side. I added 12 for each door track. The locations need not be perfectly exact and can be seen in the accompanying photos. The styrene strips to simulate the main part of the brackets were glued in place in the center of the brackets "bases." I used Goo-MEK to attach the etched "bases" and ACC to attach the styrene to the "bases." Lastly, I attached the rear portion of the tracks to the styrene pieces first with Goo-MEK followed by ACC to further secure the bonds.

◇ Add the placard boards to the doors and ends. These are created by framing resin boards with etched metal parts. Using the [Tekton pliers](#) referenced previously, I created the 90° bend in the main part of the placard board brackets. Using contact-type cement, I tacked these in place at the edges of the boards. I then completed the arrangement, but bending the two "ears" to complete the framing of the boards. I added some ACC to the back edges of the joints to secure the bonds. I then tacked these boards in place on the doors and ends using contact-type cement followed by ACC applied at the edges with a pin. Consult the photos to confirm placement of these assemblies.

◇ Add the door stops. The upper door stops require folds. Once completed, the upper flat surface is glued to the bottom of the flange of the plate. In this instance, if you are someone who only uses ACC in assembly, it is highly recommended that you instead begin with a contact-type cement, augmented further by ACC, to achieve a very strong bond. As would be expected, these stops are located just past the ends of the upper door tracks.

The lower door stops must also be folded, with the resultant piece akin to a rectangle with two triangles on edge along the adjacent edges. These should be attached to the top surfaces of the lower door tracks, with the triangular shapes pointed away from the doors. For both upper and lower door tracks, consult the photos for reference.

◇ Add the small splice plates to the upper diagonals [note that I forgot to add these until I had otherwise finished the model and the photos reflect this!] I used scrap bits of 0.020" styrene attached into the space where the angles created by the diagonals met (the styrene is hidden once the splice plates are added.) I then attached these etched plates and pushed them up into angles. They nest under the undercut of the structural members. If you need to "narrow" one to allow it to slide far enough up into the

angle, you can trim the edge with something like Xuron nippers (I had to trim a couple of them for this reason.) Add four per side, omitting only the angle just to the right of the right door.

◊ Add the sill steps. These are added at this point in assembly because they are prone to breakage due to the unusual handling during assembly. These are etched parts that must be folded and they are secured with wire used as "pins" or brass rivets from Scale Hardware. Our preferred technique is to drill one hole in each of the four corner locations of the sill steps. Then insert wire in place and thread a step over the wire and orient so that a dimple for the second hole can be marked. Repeat for the other three locations and then drill the holes. Secure the steps in place with wire or rivets and glue with ACC.

◊ Add the brake wheel, secure with ACC, and trim the brake staff if necessary. Add the angle cock/air hoses into the brackets and secure with contact cement followed by ACC.

◊ If you are blasting your model you can return to this step later; if you will not be blasting your model, you can add the rivets as shown in the photos. They should be applied to the bolster and crossbearer cover plates. Note that on the crossbearer cover plates, they are not centered. After you have applied setting solution and everything has dried, it is highly recommended that you brush on a coat of Future, Quick Shine or a similar protective coating besides paint to ensure that rivets are not accidentally flicked off at some point.

◊ Construction is complete! Before painting the model, we recommend lightly [sandblasting](#) all metal and engineering plastic surfaces with [aluminum oxide](#) to ensure that the paint will not chip or flake. This should be followed by a washing using liquid dishwashing detergent and a soft toothbrush, taking great care to avoid delicate parts and assemblies. Rinse thoroughly and allow to dry completely.

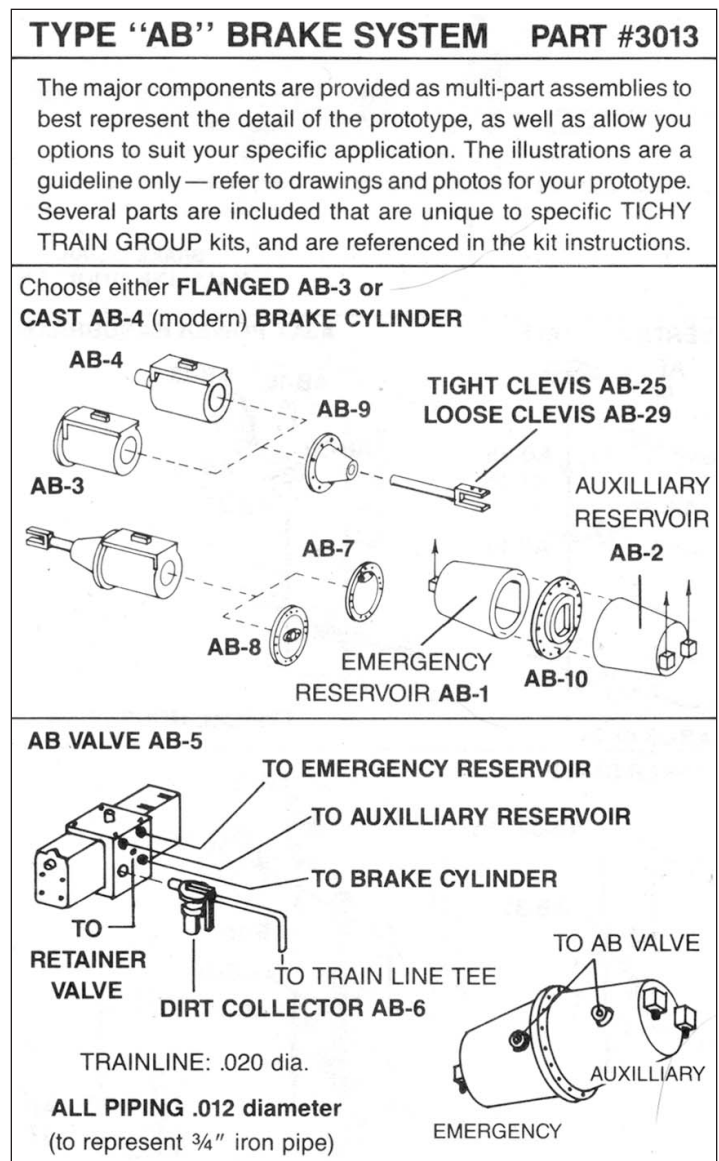
◊ We highly recommend painting using an airbrush. Prime the model with your choice of primer. The pilot model shown was primed with grey primer from the Badger Stynylres line. The sides, roof, ends, and underframe (as well as trucks) were painted with P-B-L Star Brand SP/UP Freight Car Red (1-STR-30; go to <https://www.p-b-l.com>, click Online Catalog from the menu at left and then select "Paint" from the drop down menu) an exact match for the SP's freight car red. The trucks and wheelsets were painted with Tamiya black. Add a [gloss coat](#) to aid in decal adhesion.

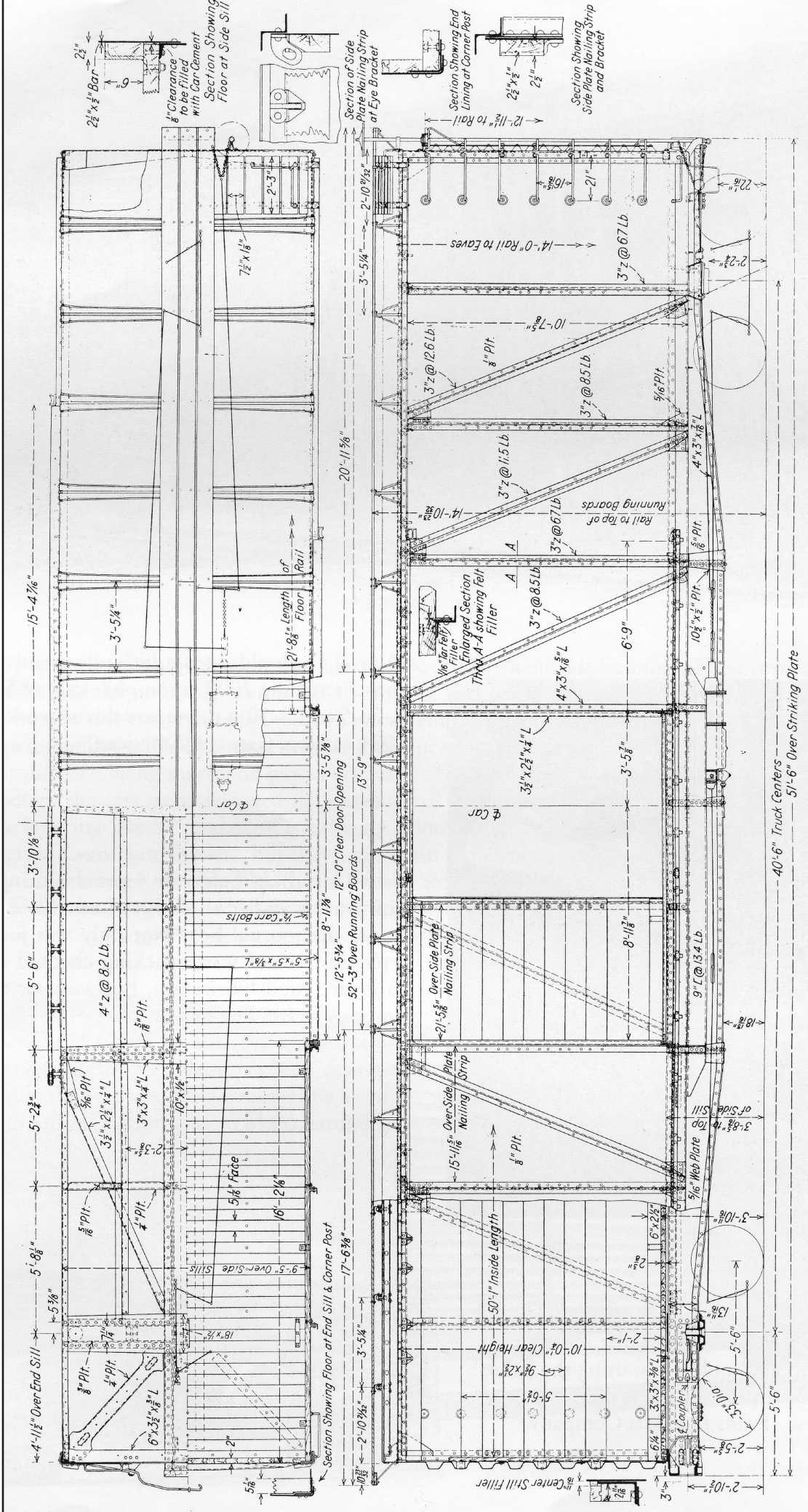
◊ For decaling, our recommended approach is to apply the decals with only water. After sliding them in place (with a dull object) let them dry *mostly*. Apply decal setting solution by touching the edge of the decal with a brush that has the solution on it and letting capillary action pull the solution under the decal. Again, let the decals dry thoroughly. After they have dried again, add setting solution over

the entire decal and let that dry (and don't panic if the decals wrinkle or pucker a little when wet). After they have dried yet again, using a sharp knife, slit any areas where there are bubbles or silvering. Add a setting solution. Keep repeating until all traces of air are gone. Add a gloss coat to seal the decals and hide the edges of the film. Add a flat coat. Weather to your preference, add reweigh and repack stencils, and [chalk marks](#), and your model is ready. Congratulations!

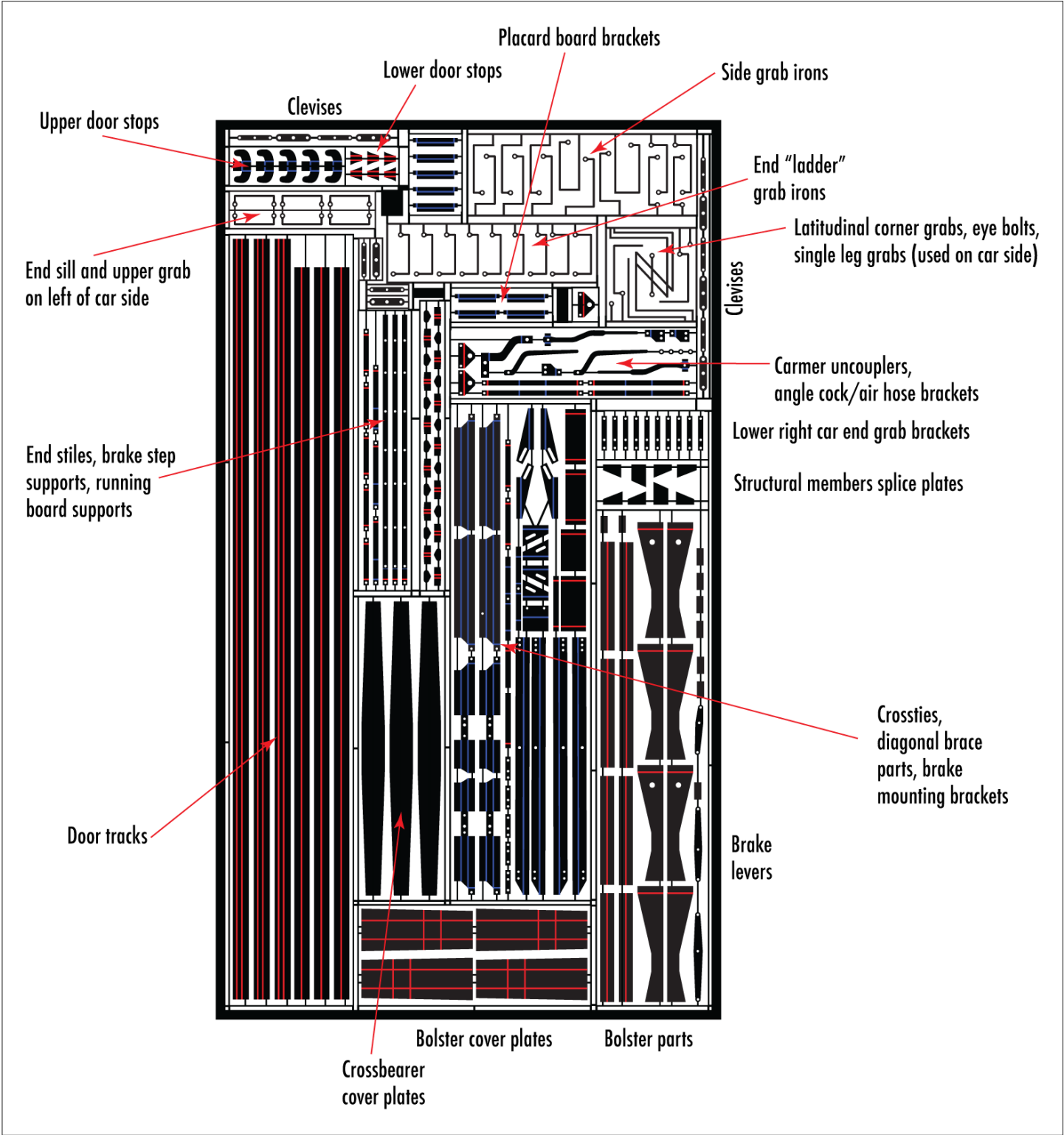
Thank you to:

- ▶ [Cartograf](#)
- ▶ Ron de Pierre
- ▶ [Tahoe Model Works](#)
- ▶ [Moloco Trains](#)
- ▶ [National Scale Car](#)/Ryan Mendell
- ▶ [PPD](#)
- ▶ [Tichy Train Group](#)





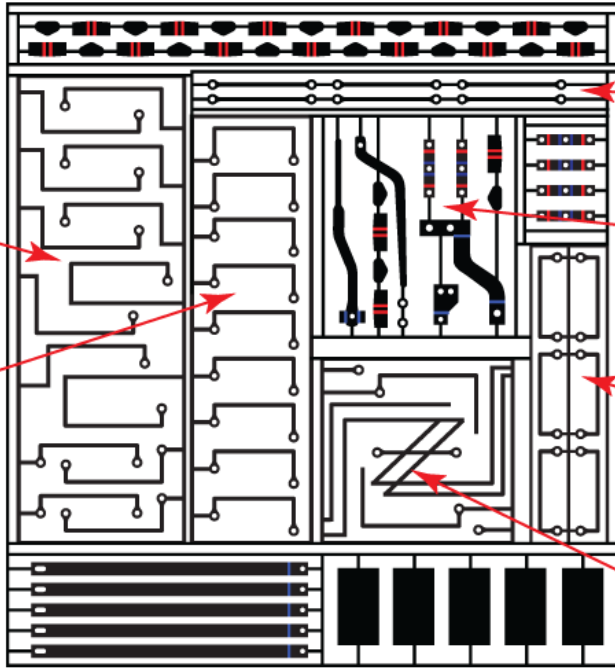
40'-6" Truck Centers  
51'-6" Over-Striking Plate



# Lower door track supports

Side grab irons

End "ladder" grab irons



Lower right car end grabs

Carmer uncouplers, extra lower door track supports

End sill and upper grab on left of car side

Latitudinal corner grabs, eye bolts, single leg grabs (used on car side)

Latitudinal running board supports

Bolster cover plate ends

