



Instructions: GATC 4500/4700 & SRS 4600 Covered Hopper System Kit



Thank you for purchasing the Tangent Scale Models GATC 4500/4700 or SRS 4600 Covered Hopper System kit! A few quick notes before starting:

- **Instructions have many large images:** Because some model builders are visually oriented, while others prefer written instructions, we have included *both* text and photos within these instructions. As you can see, many of the images are rather large, to aid in your model building.
- **There are more images at the end:** If you want to see more views of a completed model as a reference for your building, scroll to the end of this document. This is another advantage of a "digital download" over a printed instruction sheet.
- **Modeling from computer screen is ideal:** If possible we recommend modeling from your monitor. You can then enlarge the images as you see fit, and you save ink and paper at the same time.
- **There are several ways to complete your kit:** While there are multiple sequence steps possible to build this car, we believe the sequence included here yields the best results.
- **Prototype photos:** While you likely have your own sources of prototype photos, please recall that for each RTR scheme that Tangent releases, we include a prototype photo on our website. You can use these as references in addition to your own sources.
- **We want feedback:** If you find something missing from our text instructions, or an error within these instructions, please let us know by submitting a comment to us on our website or sending an email to support@tangentscalemodels.com. Thank you!

- **This kit is meant for adults:** While we applaud bringing younger modelers into our hobby, this model includes many small parts, some of which are sharp and/or delicate. Therefore, this kit is recommended for those 14 years of age and older.
- **We offer semi-scale wheels separately:** We offer semi-scale wheels separately in 12 or 100 axle packs – in either 33" or 36" diameters - to fit all our trucks – and those from other brands!



Overview of this kit's contents:



Standalone parts included:

- Part 1 – Covered Hopper Body
- Part 2 – Covered Hopper Top
- Part 3 – Hatch Covers
- Part 4 – Trucks

Parts bags included:

- Bag #5 contains the slope sheets, gusset plates, sill caps, bolster plates, bolsters and coupler covers
- Bag #6 contains the end frames, hopper gates, air tank, brake parts, shaker pockets, etc
- Bag #7 contains the air lines
- Bag # 8 contains the wire parts (will vary by kit)
- Bag #9 contains the screws

Parts needed/recommended:

- Couplers. Our draft sills are designed for Kadee "whisker" shank couplers - #158.

Tools needed/recommended:

- Liquid styrene cement
- CA-type cement or cyanpoxy – for wire to plastic joins
- Canopy cement – for running board to plastic roof joins (made by Pacer and other brands)
- Hobby knives - #11 and #17 are ideal
- #78/#79 drill bit in a pin vise is useful, although a #11 blade can be used gingerly
- Small Phillips head screwdrivers
- Tweezers

PREAMBLE – THINGS YOU SHOULD KNOW

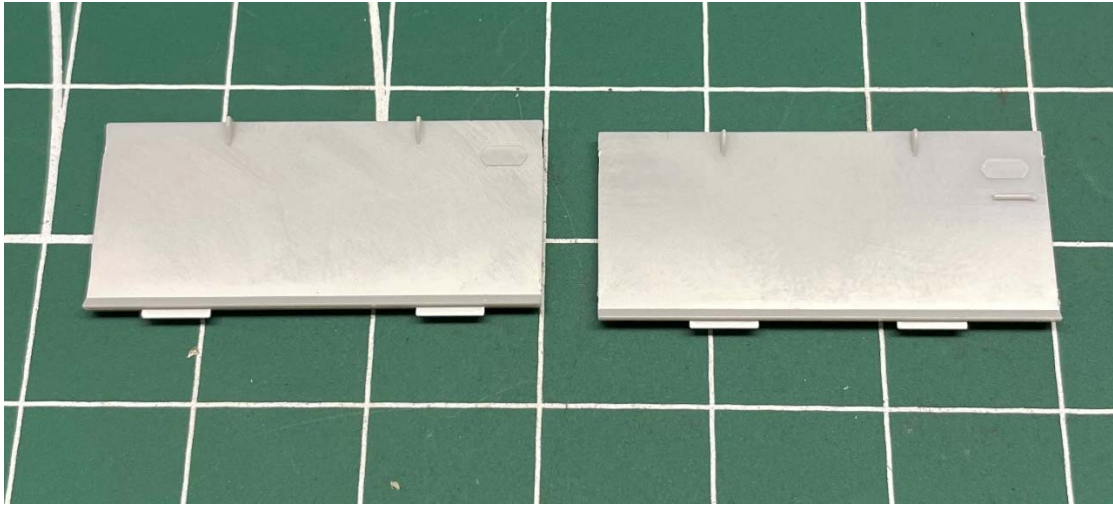
- **This kit is NOT recommended for children aged 14 and under.**
- **Small parts:** there are many very small parts included in this kit. The assembly sequence requires you to have several bags open at a time, so we recommend a clean and open work surface so that you can keep all the parts in the open and accessible. Let's get started!
- **Kit variations:** When you ordered your kit, there were 9 different prototype-based configurations to choose from. If you want to change the configuration of your kit, you can order all of our parts by simply going to www.tangentscalemodels.com and click on "View & Buy Models" and then "Parts".

Construction Overview:

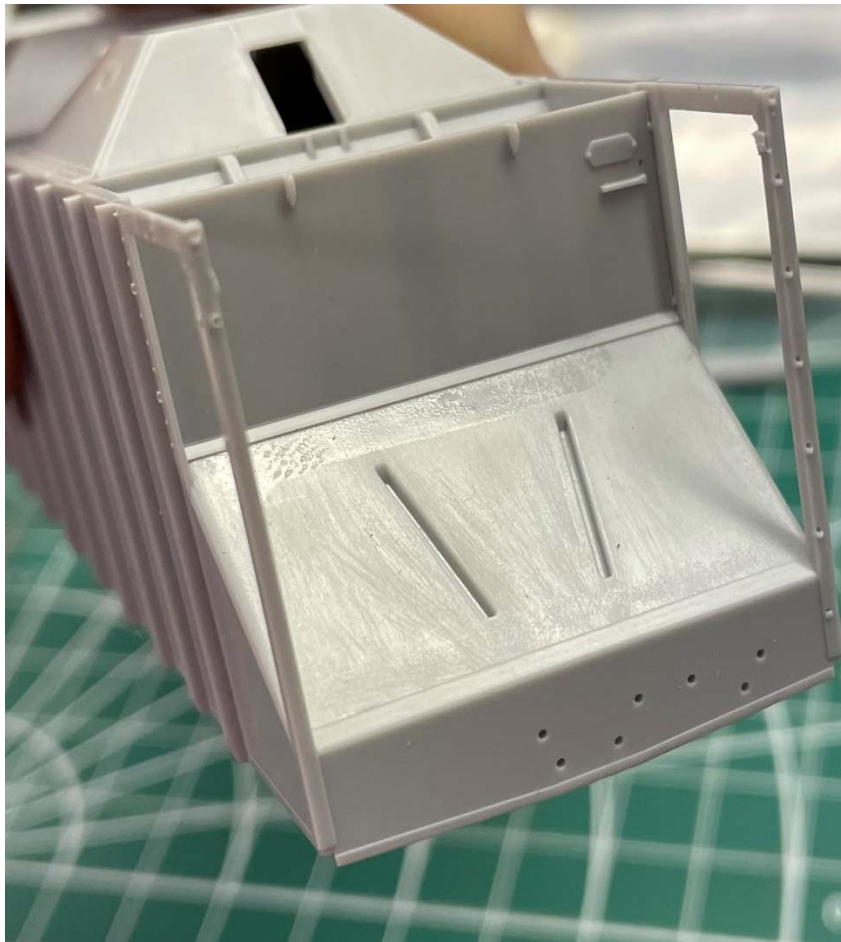
1. Kit Configuration: These instructions will demonstrate the assembly of the 28001-01 CB&Q, C&S, FW&D kit. For other kits, the assembly is basically the same other than the parts you will use.
2. The brake assembly instructions are different at several steps for some kits. Please see alternate assemble instructions, indicated in **red**, at the point the instructions deviate.
3. There is no set assembly sequence when building this kit. There are basically three "sub-assemblies" to construct: the body, the underframe, and the roof. The order in which you assemble each one is entirely up to you, but we recommend building the kit in the order described here. Now, let's get started!

Body Assembly:

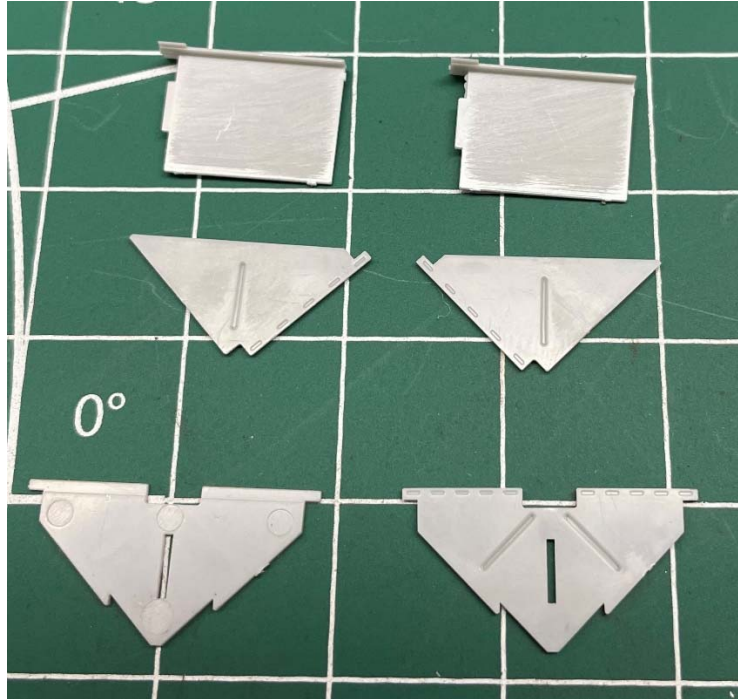
1. **Install the Vertical Slope Sheets:** Begin construction of the underframe by locating the vertical slope sheets. You will notice that the tabs on the bottom are spaced differently-this determines which side of the car they go on.



2. Position the parts so the tabs fit in the slots and the sheets are resting against the ledges cast in the carbody with the side of the casting with the ribs facing the center of the car. When the parts are fully seated, glue in place.



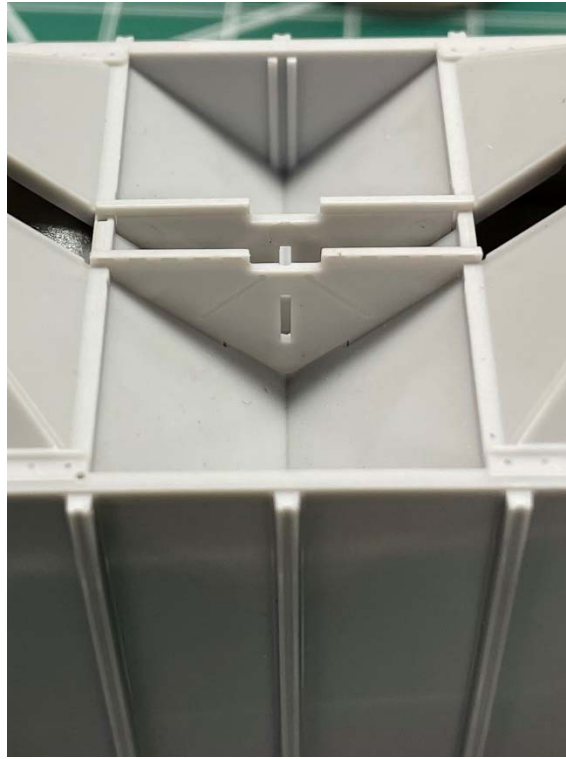
3. **Install Gusset Plates:** There are three different types of gusset plates that form the center sill of the car-two are triangular and one is square (see photo).



4. The smaller triangular part without the slot in the center goes between the slope sheet and the first bay. Orient so that the side with the groove is facing out and the small tab is facing the center of the car. Install two on each end of the car and secure.



5. Insert the larger triangular pieces into the slots in the areas between the hopper bays with the side of the part with the groove facing out but do not glue yet-they need to flex a bit for the next step.



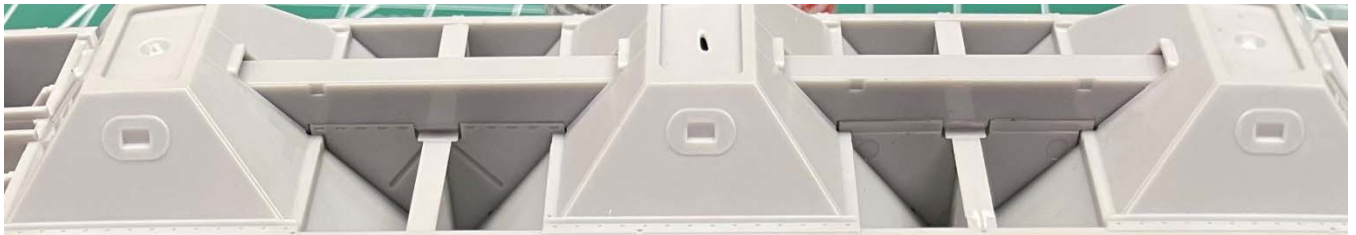
6. Take the square gusset and carefully insert it into the slot in the carbody. The center gusset will flex slightly to allow the tab to snap into the groove. Repeat for both sides. Do not secure anything yet as there is one more step to complete that requires the parts to be flexible.



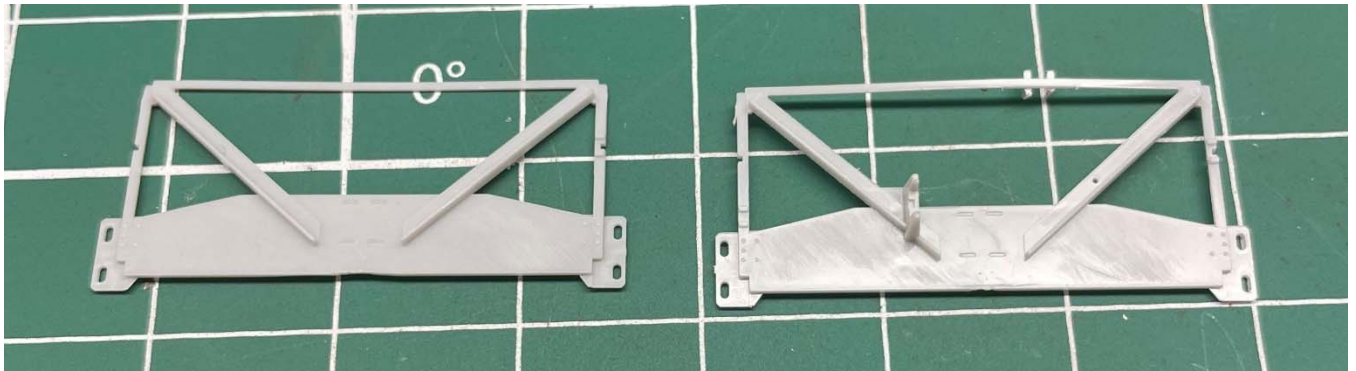
7. **Install Sill Caps:** There are two sill caps that will complete the center sill assembly. They are slightly different, so they have a specific location. Looking at the bottom of the parts you will see that there are two small tabs on each - one has both on the same end and the other has one on each end. Match each part up with the corresponding holes in the center sill.



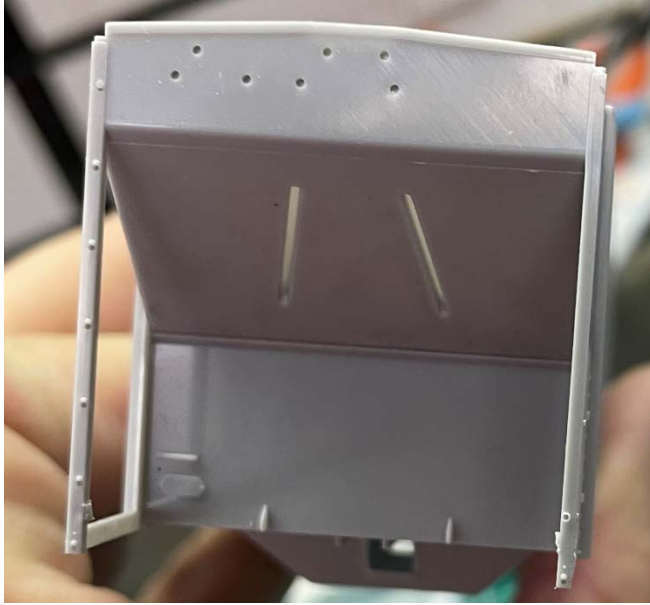
8. Insert one end of the part into the void of the hopper bay until you can fit it between the bays, then maneuver it until the tabs fit into the holes in the center sill and it sits flush with the gussets. When satisfied with the position of the components, secure the whole assembly in both bays.



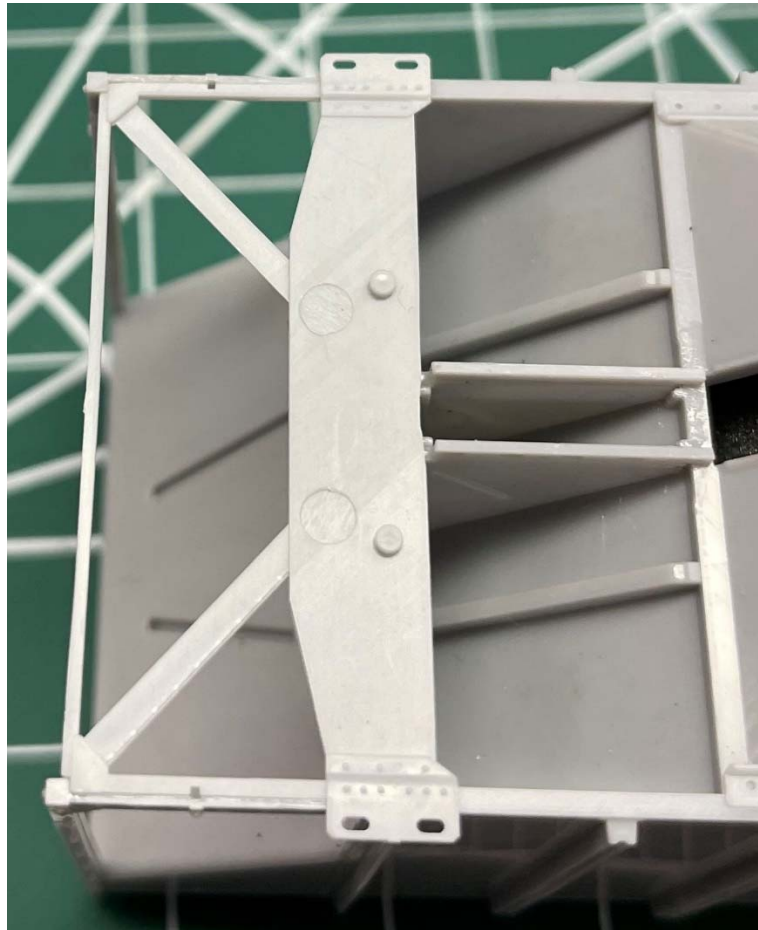
9. **Install Bolster Plates:** There are two bolster plates, one for the A end and one for the B end- the B end has a bracket for mounting the reservoir.



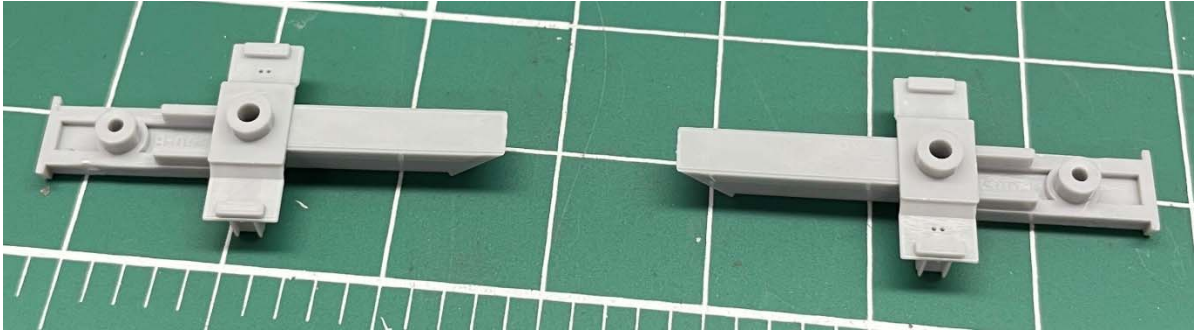
10. The B end of the car is identified by the fact that it has more mounting holes for the brake equipment.



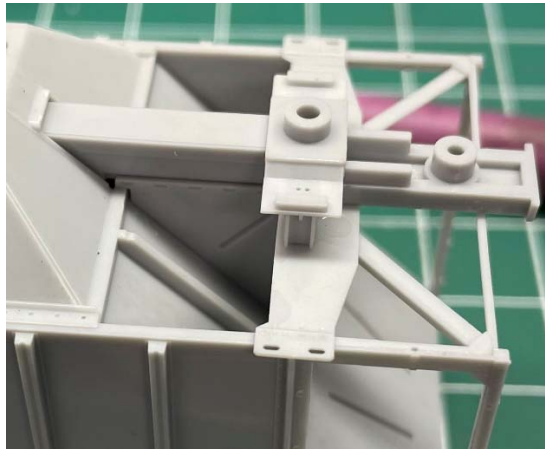
11. Position the bolster plates so that the small pins on the bottom of the part are toward the center of the car, and the corners notches fit flush with the corner posts. When in position, glue in place.



12. **Install Bolsters:** There are two different bolsters, again, one for the A end and one for the B end. The one for the B end has two small slots for the AB valve bracket.



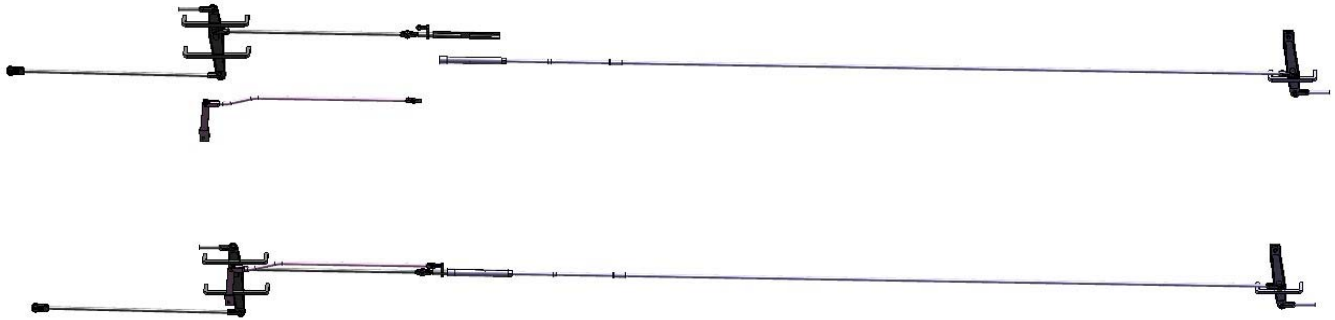
13. Insert the end of the bolster into the opening in the bay and position so the holes line up with the pins in the bolster plates. Glue in place.



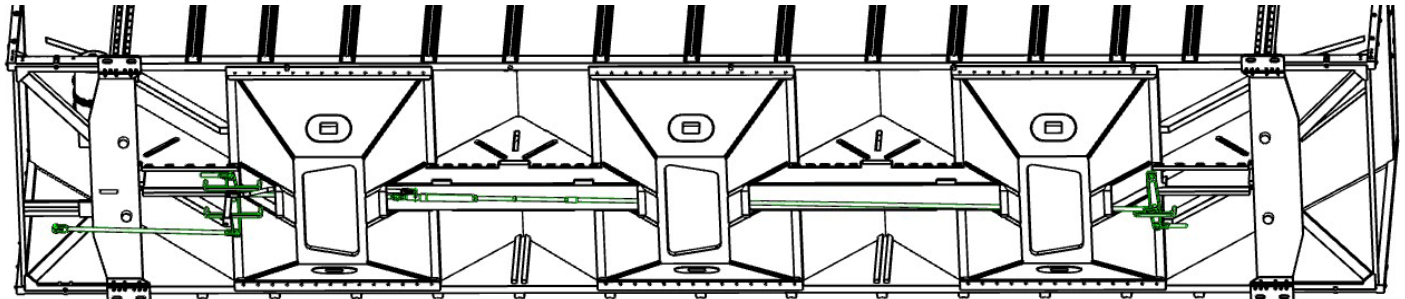
14. **Install the Slack Adjuster Line:** Locate the long wire for the slack adjuster. In order to install this part, you will need to remove the weight from the carbody so you can fish the wire through the hopper bays. This step is a bit tricky, but it is fairly straight forward so take your time. The wire may not be completely straight so we found that the best method for fixing this is after you have fished the wire through the hopper bays, secure one end into the hole closest to the bolster edge (towards the center of the car) then position the wire so it is centered on the center sill and tack it to the top of the opening of the hopper bay as it passes through with CA. Do this for the other two bays making sure the wire is centered and straight as you go. When you get to the other end secure the end of the wire in the hole in the bolster as you did on the other end.



15. **Alternate Build Instructions:** Some kits include body-mounted brakes instead of truck-mounted brakes (these cars have the brake cylinder mounted on the B-end area with the air tank). The slack adjuster line from step 14 is not part of the kit. Instead, the kit includes three plastic brake linkage parts (shown separate and assembled). The B-End of the car is on the left.

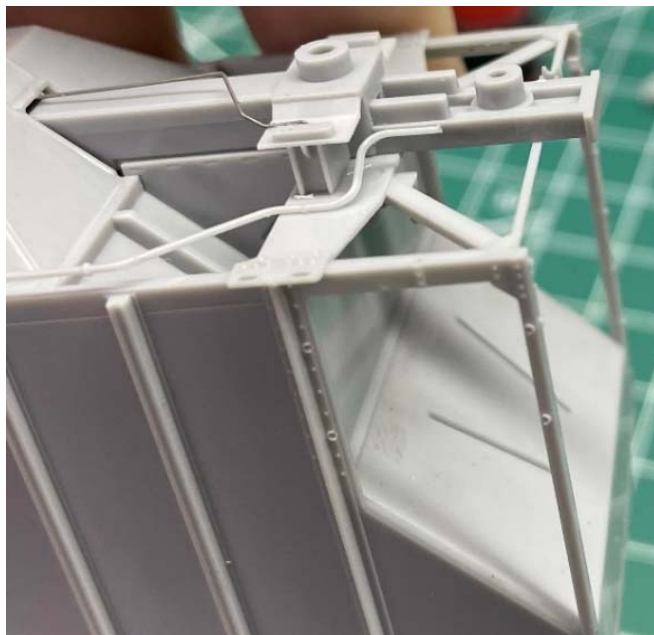
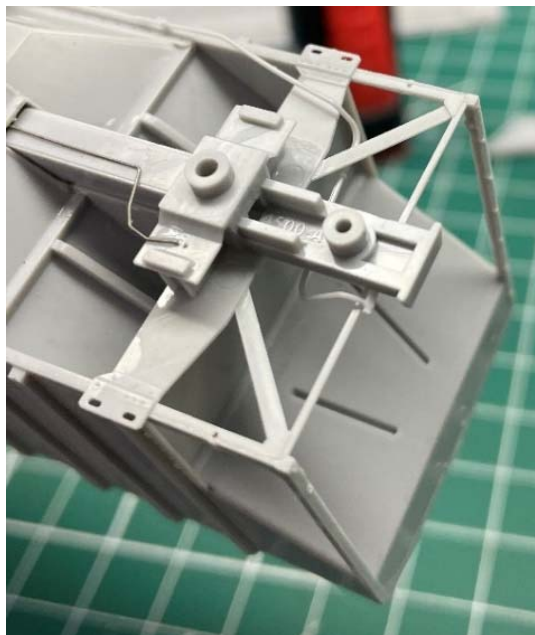


16. The parts are provided as three pieces to ease in threading the parts through the bays from each end without having to take out the weight. Thread through and attach to body as shown.



B End of Car

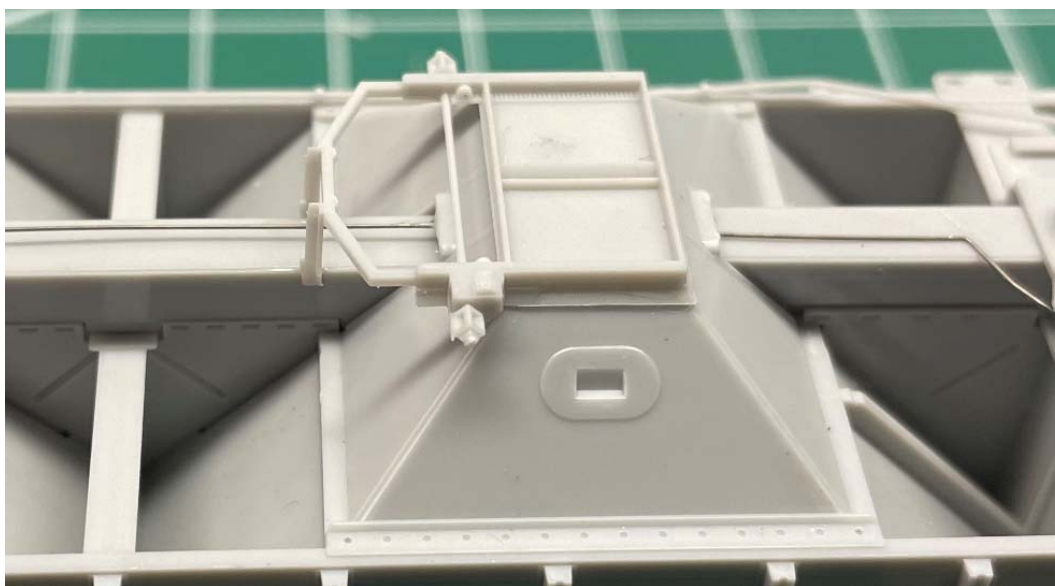
17. **Install Air Line:** Locate the air line. It is secured in holes in the bottom of the car side. The part that goes to the A end of the car needs to be fished through the triangular opening of the end, then over the coupler pocket. The B end just rests next to the bolster. See photos for reference. The ends of the air line will be dealt with in further steps so let them float for now.



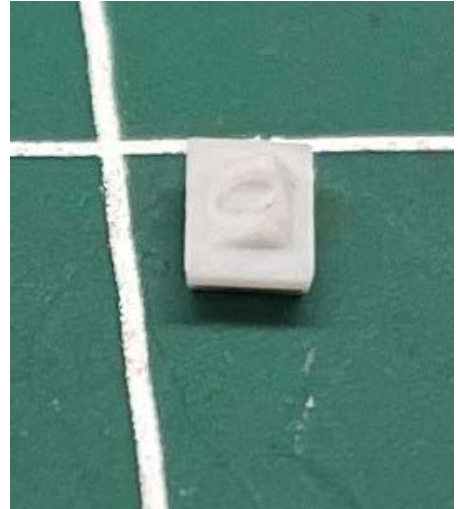
18. **Install Hopper Gates:** The hopper gates are keyed so they can only fit one way.



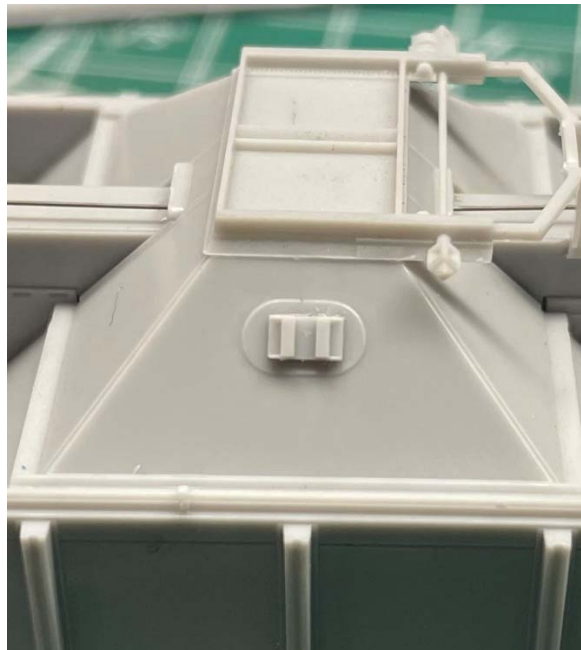
19. Install on bays and make sure the rear supports fit in the small slots in the center sill. Glue in place.



20. The shaker pockets have a small triangular raised tab on the back of the casting-the higher side goes toward the top of the bay (towards the side sill of the carbody).



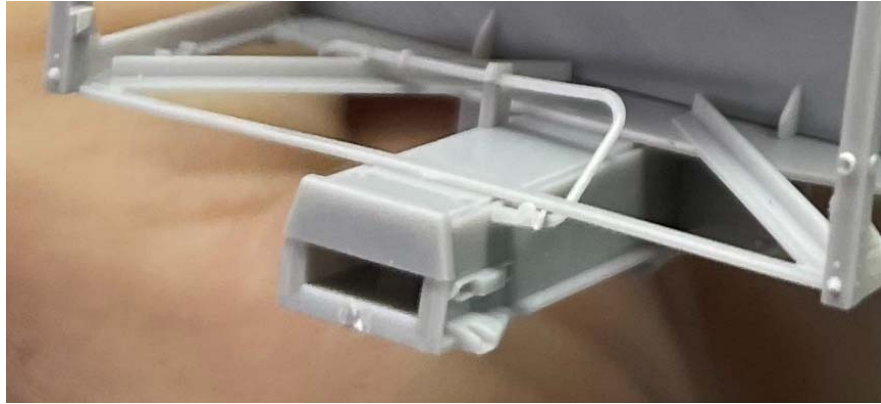
21. Glue all 6 in place.



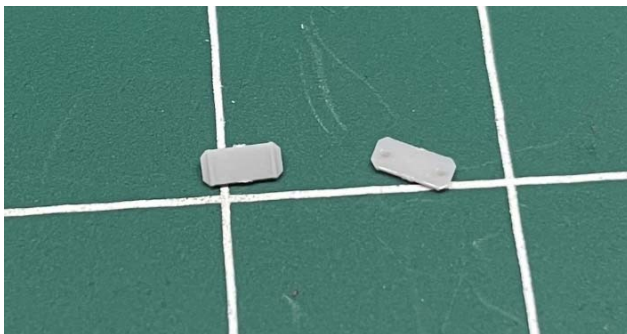
22. **Install Coupler Covers:** There is an A and B coupler pocket cover.



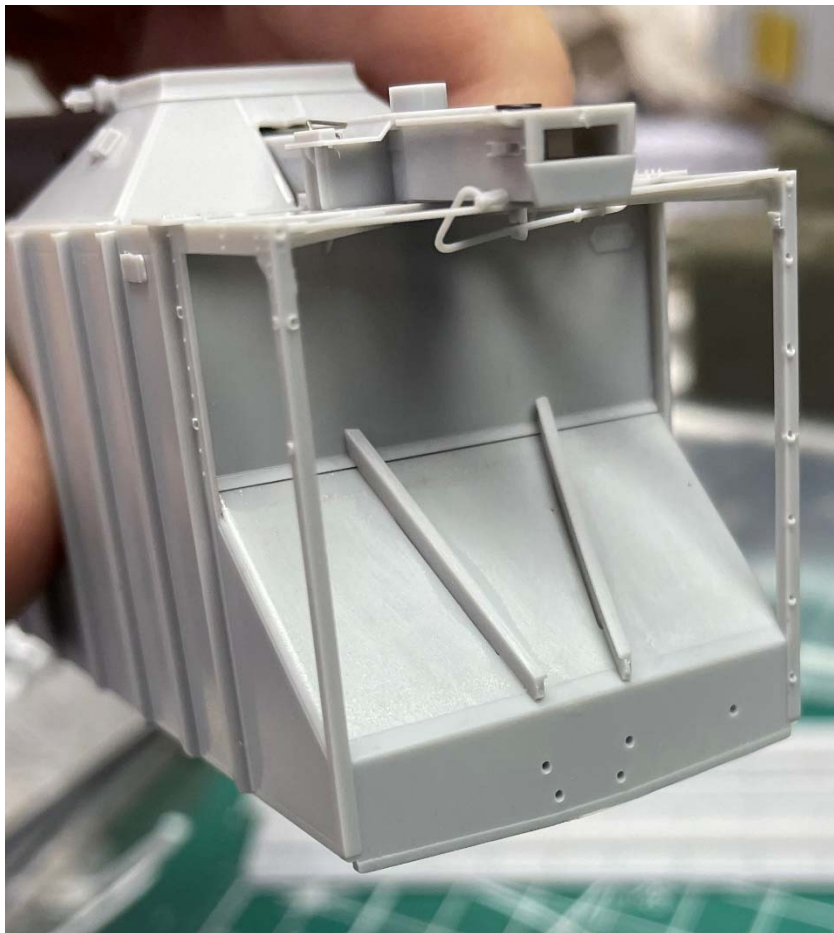
23. The one for the A end has a small bracket in the casting that the air line rests in as it crosses over the coupler pocket. The coupler pocket covers are secured with the small screws.



24. ***A note about the coupler pocket covers.** If you are going to install couplers at this time you can install the covers. If you are going to wait until after the car is completed (paint, weathering, etc., which is what we recommend) it is better to leave them off for now as the following steps make it possible to glue them permanently. Either way you choose, be careful not to get any glue on the covers so they can be removed in the future.
25. **Install Tack Boards:** The small tack boards have two small pins on the back that need to be removed so they sit flat on the car. They are attached in the first panel on the left-hand side of the car (as you're looking at the car) in the lower right hand corner of the panel. See photo.



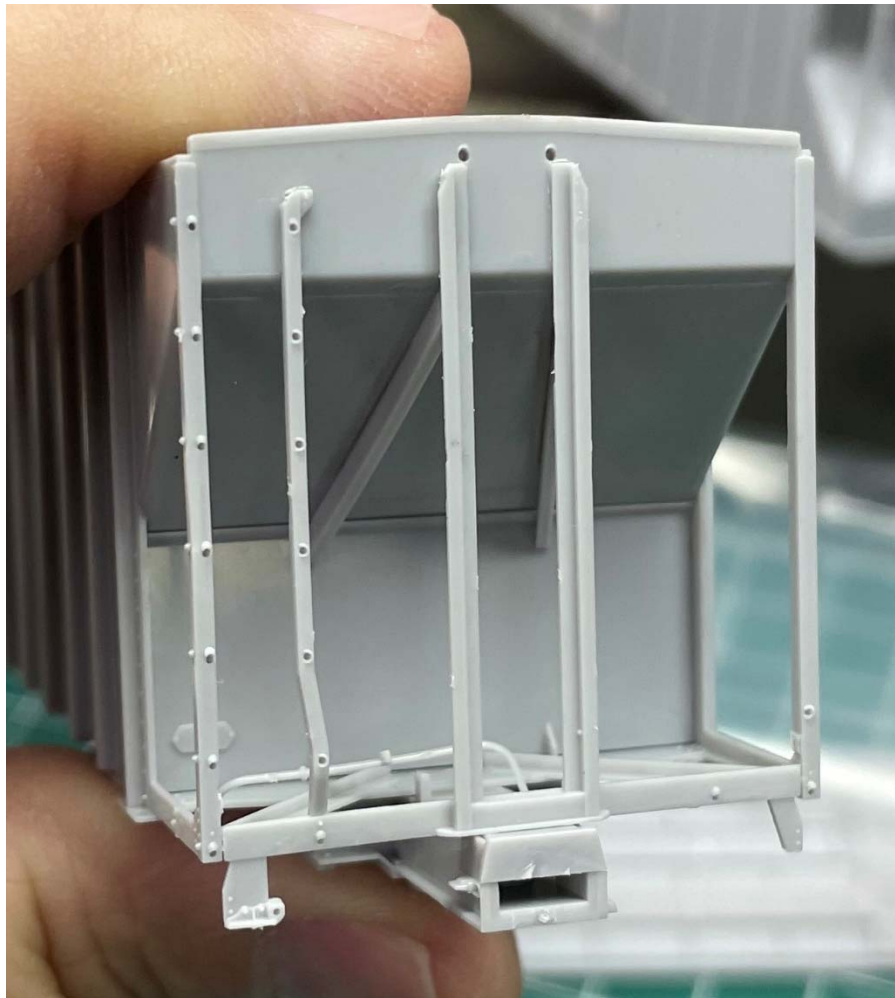
26. **Install Slope Sheet Braces:** There are four slope sheet braces that fit into the slots in the slope sheets, two per end. They are oriented so that the side with the flange faces inward, and the shorter end of the brace is towards the end of the car. Insert and glue in place.



27. **Install the A End End Cage:** Locate the A end end cage. It has locating pins that fit into holes in the car end and the top of the coupler pocket.



28. Position the cage and secure to the car being very careful with the part of the cage that sits on the coupler pocket if you still have the coupler pocket covers installed.



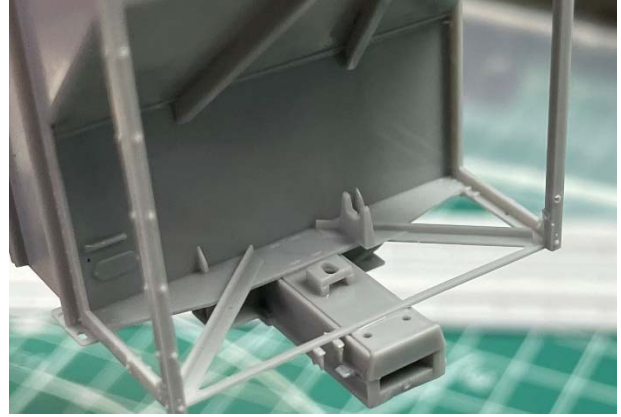
29. **Install A End Side Ladder Stile:** Locate one of the side ladder stiles. The bottom of the stile fits in a pocket on the inside of the side sill and the upper part has a pin that fits into a hole in the side of the car.



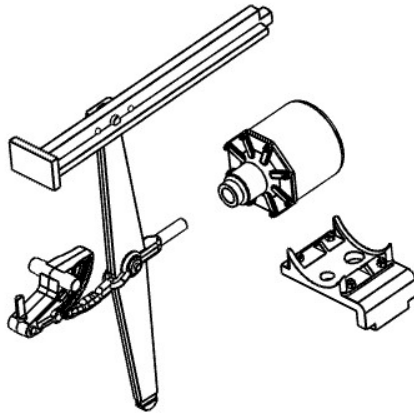
30. Position it so that it is vertical and the bottom of the stile lines up with the locating hole for the bottom grab iron. When satisfied, secure.



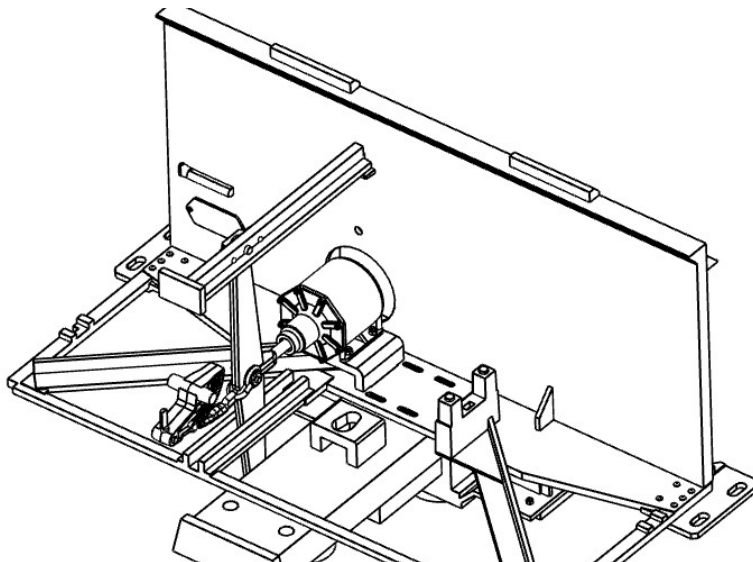
31. **Install AB Bracket:** Start the assembly of the brake gear by installing the AB bracket into the slots on top of the coupler pocket. Glue in place.



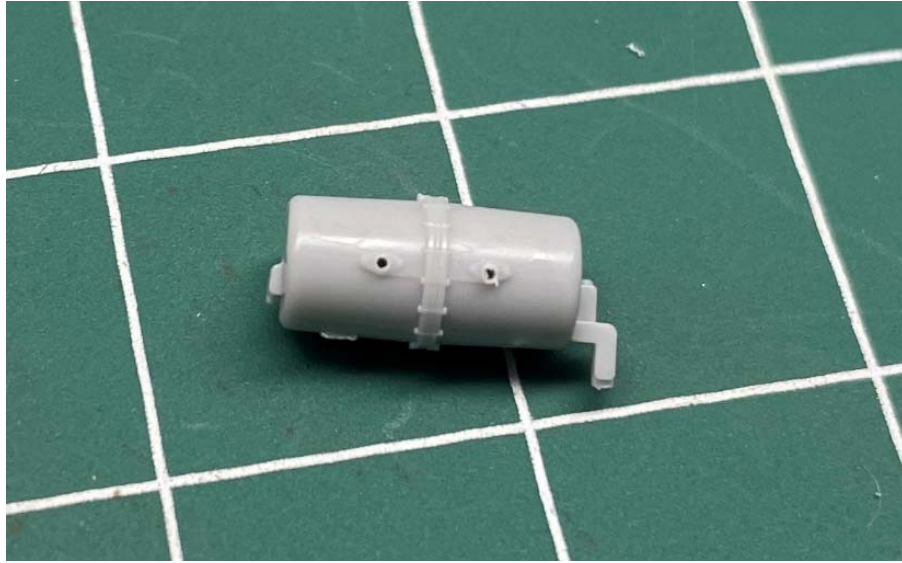
32. **Alternate Build Instructions:** Some cars have a B End brake cylinder. You will find the brake cylinder, its support bracket, and the lever/linkage parts in your parts bag, if needed. (shown below).



33. These are installed to the left of the reservoir as shown:



34. **Install Reservoir:** The reservoir has a tab that rests in a cradle on one end and the other side has a leg that fits in a slot in the side sill. To make installation of the piping easier we suggest that you open the holes in the reservoir with a #80 drill.



35. Install reservoir and glue in place.



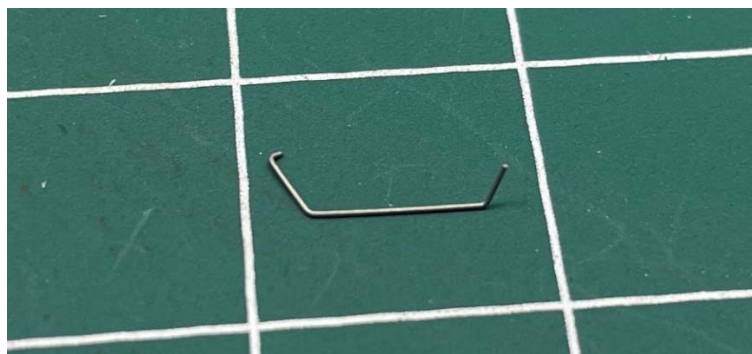
36. **Install the AB Valve:** The AB valve has a small tab on the bottom that fits into the opening in the top of the bracket installed on top of the coupler pocket. Again, to ease the installation of the wire parts open the holes in the AB valve with a #80 drill.



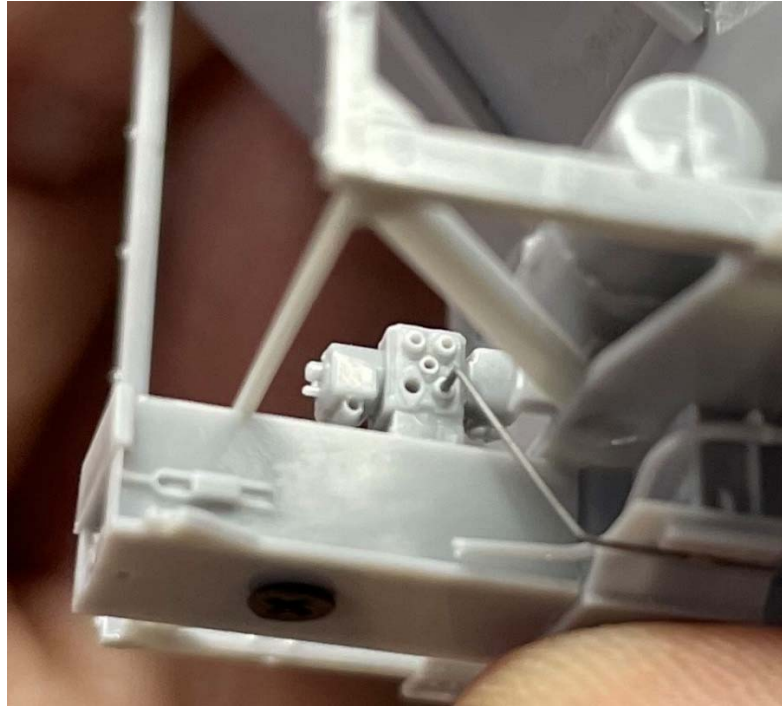
37. When done, install on the bracket with the holes in the AB valve facing the reservoir. Glue in place. To insure everything stays in place you may want to allow these parts to set up before proceeding.



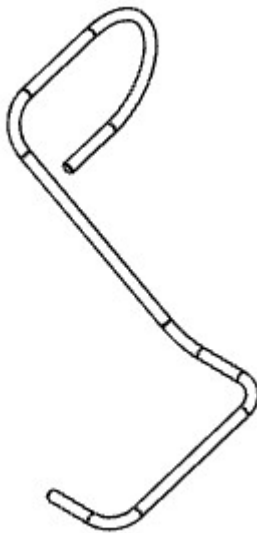
38. **Install Air lines:** From the wire parts bag locate the small irregularly shaped wire (see photo).



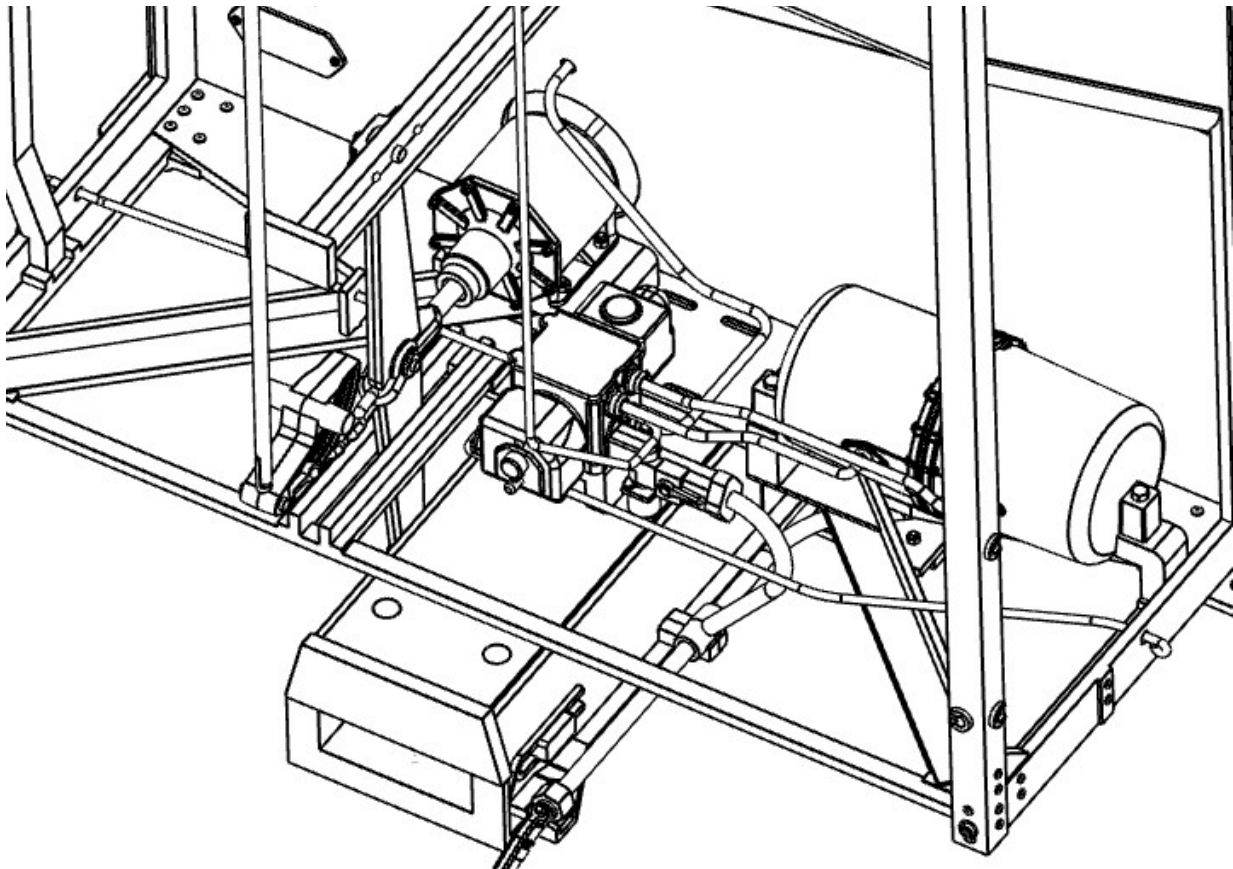
39. The straight end goes into the lower right hand hole in the AB valve and the end with the 90 degree bend goes into the second hole in the bolster plate. Glue the end in the bolster plate but not the end in the AB valve so you don't block any of the other holes.



40. **Alternate Build Instructions:** Instead of the airline used in Step 38 and 39, you will find a looping bent wire part as shown in the wire parts bag



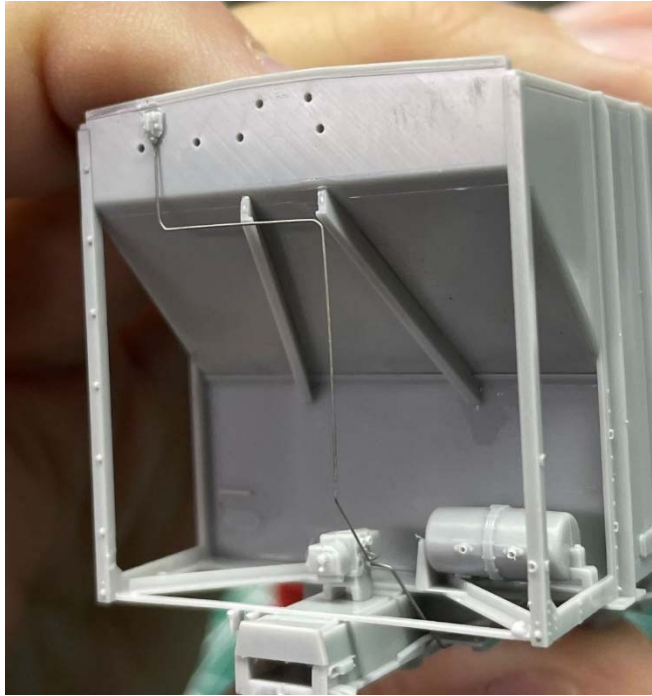
41. This air line connects the brake cylinder to the AB Valve. Thread the looped end through the hole in the vertical end sheet and loop around behind it to attach to the back of the brake cylinder. The short end attaches to the same hole in the AB Valve as the airline in step 39.



42. **Install Retainer Valve and Line:** Locate the retainer valve (it is a very small plastic part) and the retainer pipe (see photo).



43. Install the retainer valve and let it set up so it does not move. When it's set insert the straight end of the retainer pipe into the bottom of the retainer valve and tack it with CA so it doesn't fall out when moved. Maneuver it into position and insert the end with the 90 degree bend into the center hole of the AB valve, again waiting to glue until all other wire parts are installed



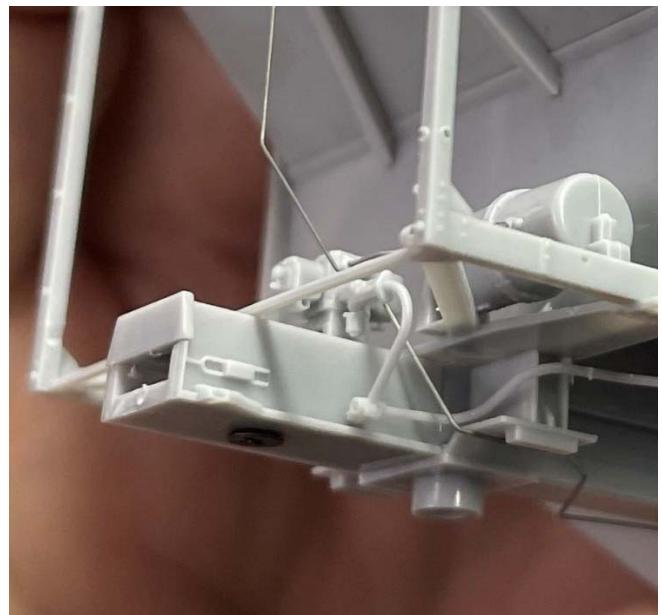
44. **Install Air Lines:** There are two wires that go to the reservoir, one short and one long.



45. The shorter wire goes into the top left hole of the AB valve and into the hole in the reservoir closest to the AB valve. The longer wire goes into the top right hole in the AB valve and into the other hole of the reservoir. Secure the wires in the reservoir but not the AB valve.

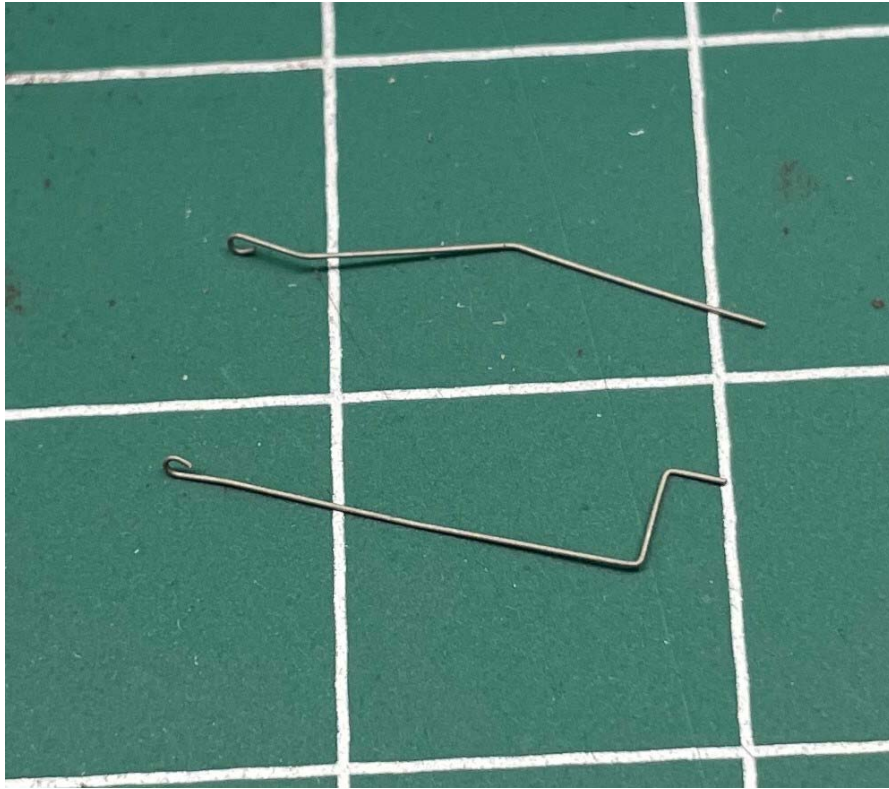


46. **Install Dirt Collector Pipe:** The dirt collector pipe fits into the last hole of the AB valve. Once it is installed you can secure all wire parts. Secure the dirt collector into the AB valve but let the other side float. When it sets up insert the train line into the coupling on the end of the pipe.

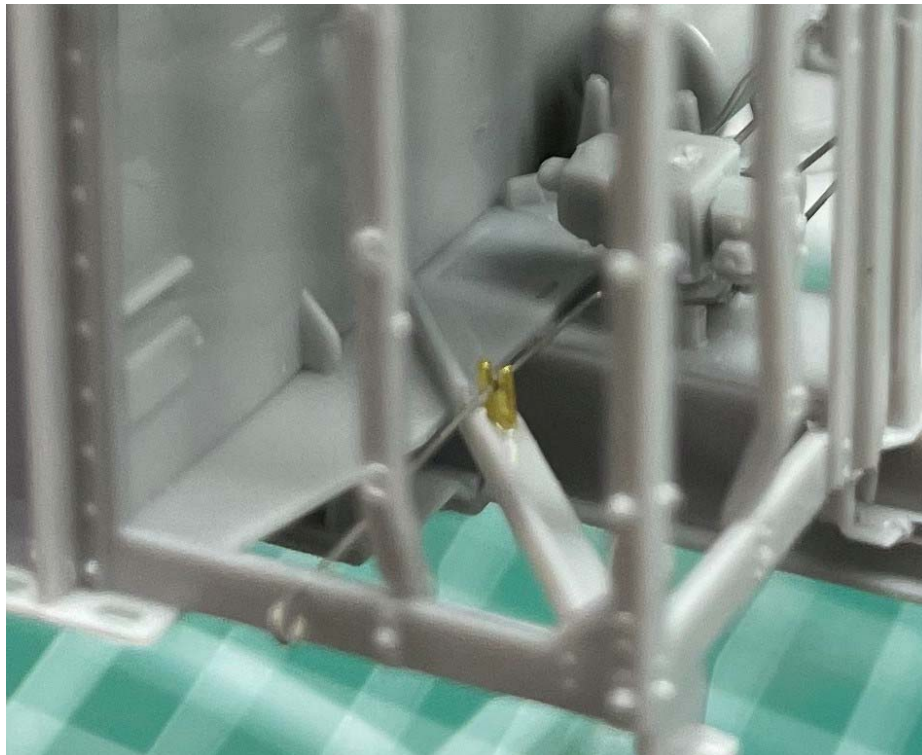


*Regarding the train line and air hoses. Since both ends of the train line will attach to the coupler pocket cover, we will wait until the car is complete until they are installed. There are photos showing their final placement for reference.

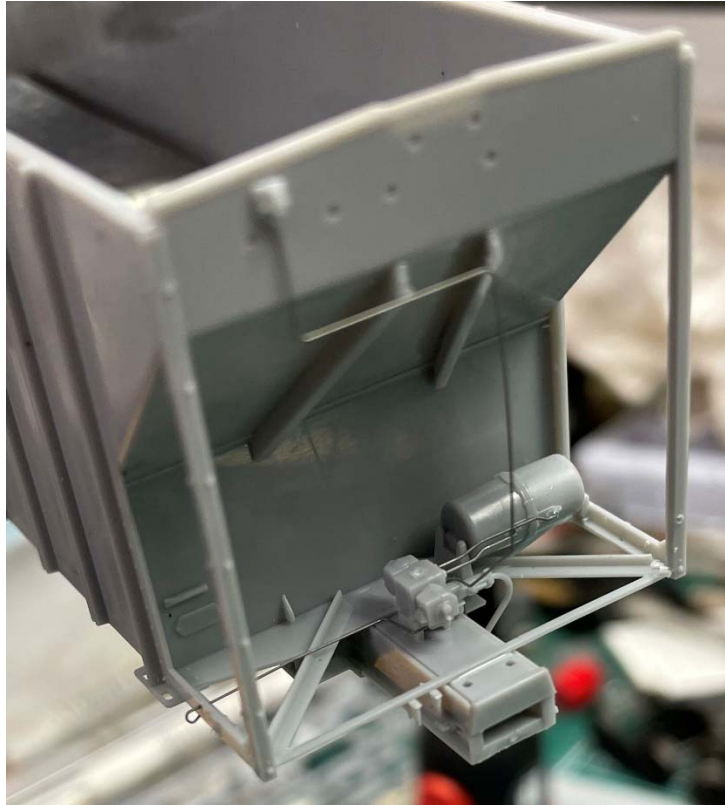
47. **Install Bleed Rod Assembly:** The bleed rod assembly is two wire parts and a small brass piece that acts as a stand off.



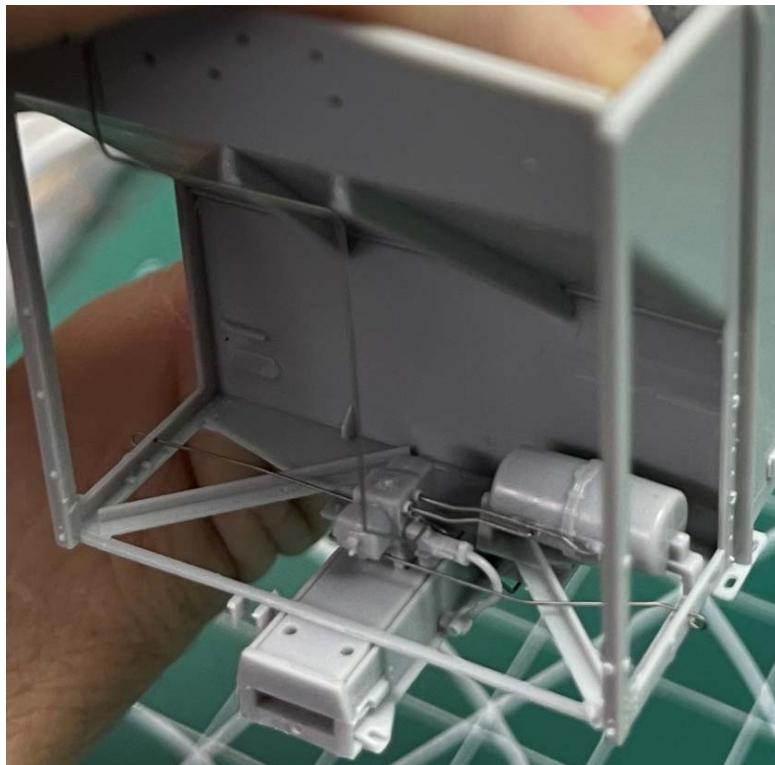
48. Begin by installing the standoff in the hole in the cross brace of the end support.



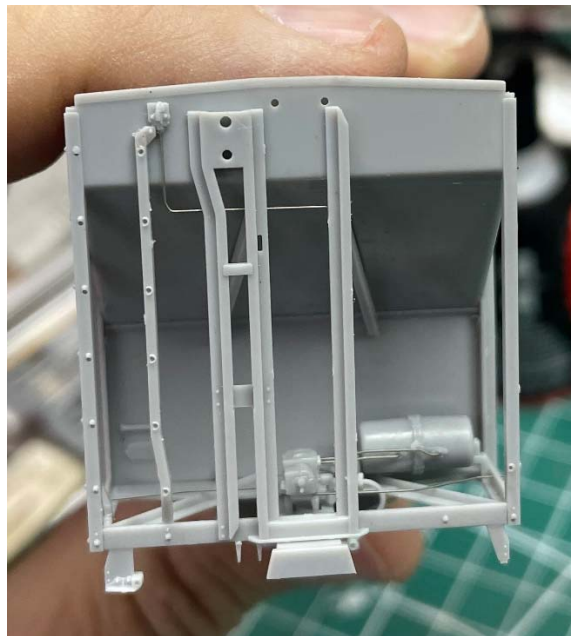
49. The wire that has the 90 degree bend in it goes on the left side of the car. Feed it through the hole in the side sill and insert the end of the wire into the sleeve on the bottom of the AB valve but do not glue yet.



50. Feed the other wire through the hole in the side sill on the right side of the car and into the sleeve in the AB valve. When both wires are seated secure with CA.



51. **Install B End End Cage:** Install the B end end cage and side ladder stile in the same manner as you did for the A end.



52. **Install Grab Irons:** There are a variety of lengths and styles of grab irons for the carbody:

- Short with staggered legs – go in the end uprights except the bottom two rungs
- Longer with staggered legs – go into the second rung from the bottom on the ends and all side ladder rungs except the bottom
- Drop style – go on the bottom rungs on the sides and left end corners
- Straight with equal length legs – right side of the end sills

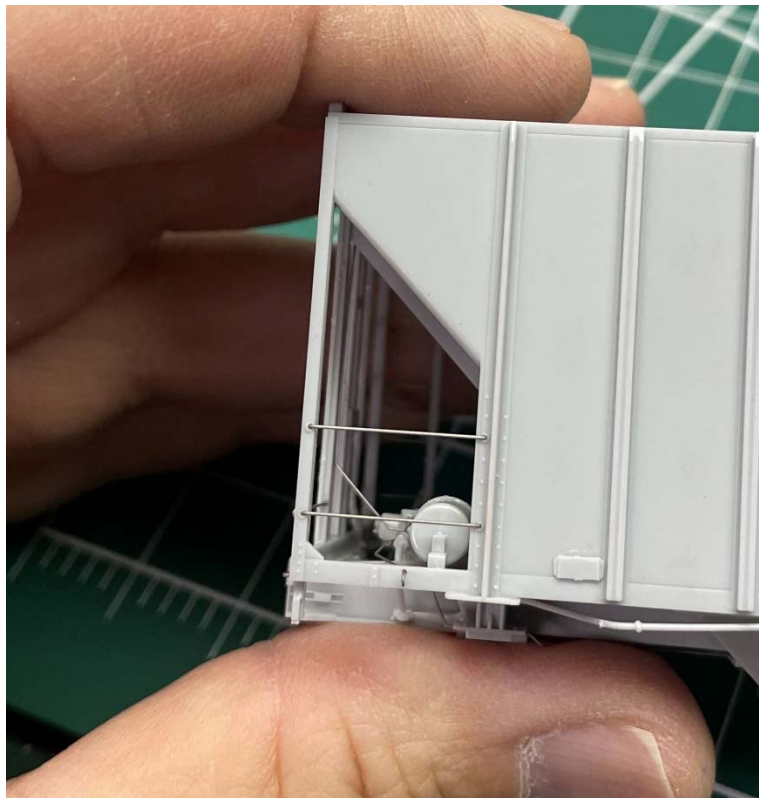
53. Insert and secure all wire grab irons with CA. There is a bit of play in the holes so make sure that they are all straight before securing permanently.



54. **Install Wire Guards:** There are two wire parts that have a single 90 degree bend that go on the right hand side of the ends of the car. The end with the bend goes into a hole in the corner post and the straight end fits into a slot on the back side of the center upright. The easiest way to position the part is to tack it in the hole in the corner post and maneuver it into the slot behind the center upright, then secure permanently on both ends.

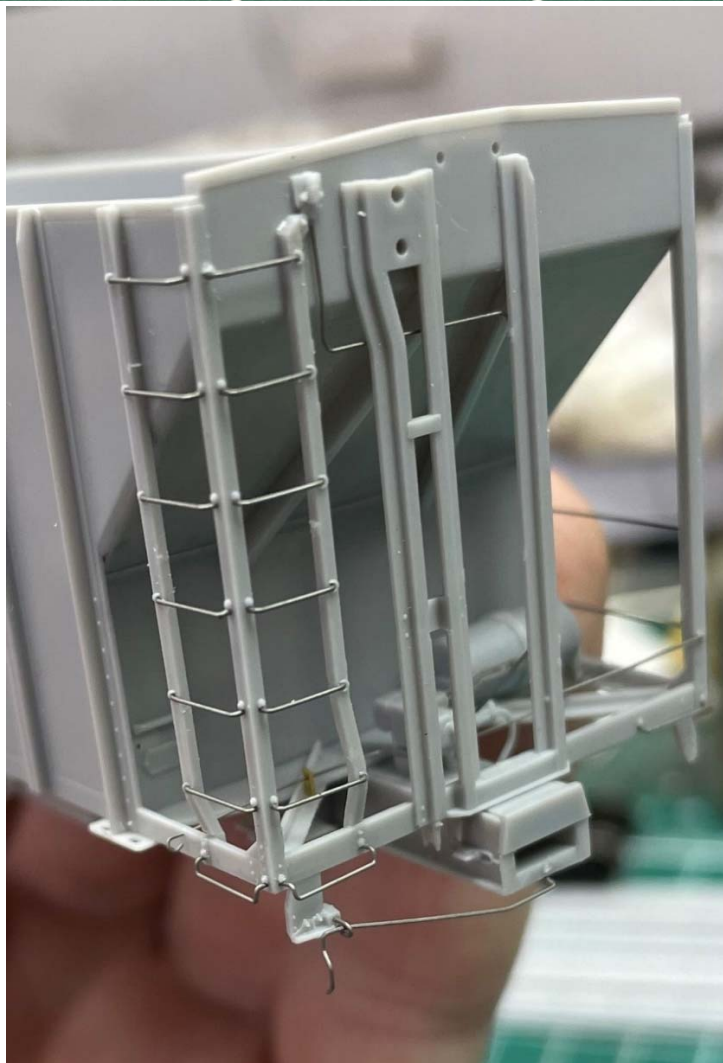


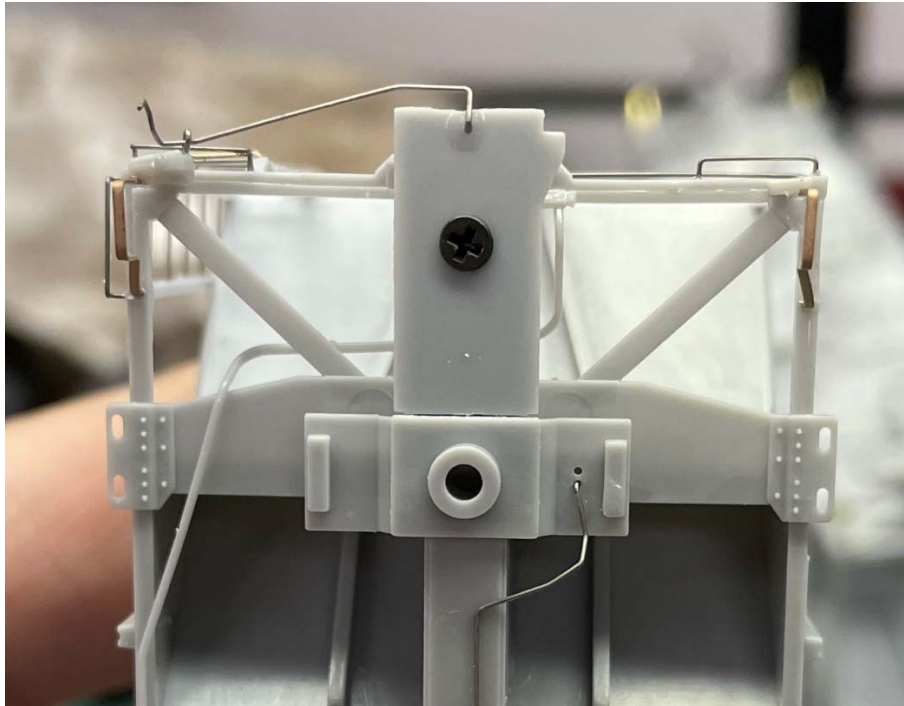
55. There are four long wires with 90 degree bends on both ends. These go on the left hand side of the car. Insert into the holes and secure with CA.



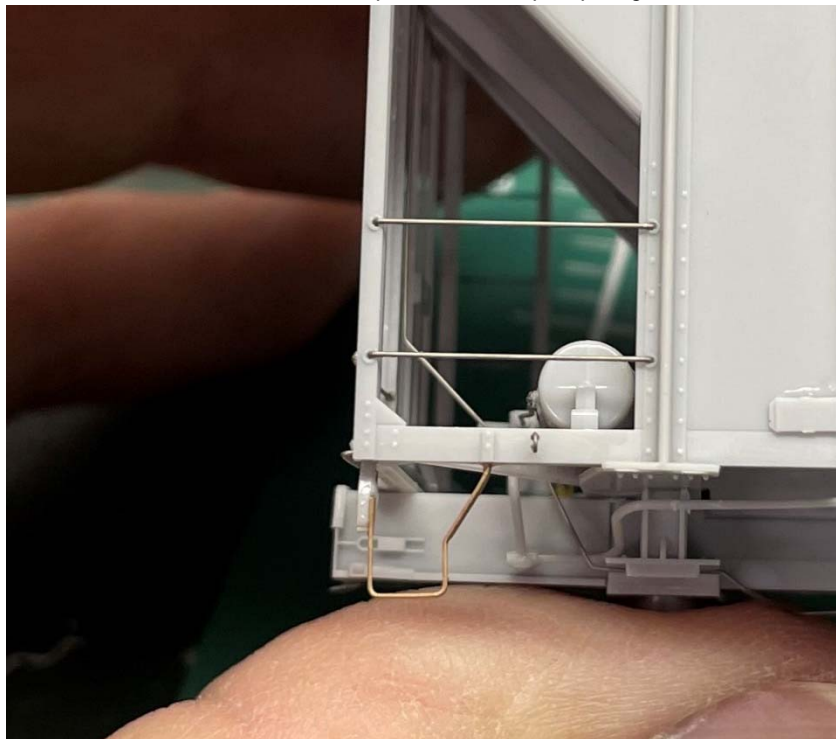
56. At this time you can install the coupler pocket covers.
57. Locate the small eyelets and insert them into the holes in the cut lever brackets on the lower left corners of the car ends. Fish the cut levers through the eyelets and insert the ends

into the holes in the bottom of the coupler box covers. Tack with CA at the cover only to allow the couplers to be installed after painting.





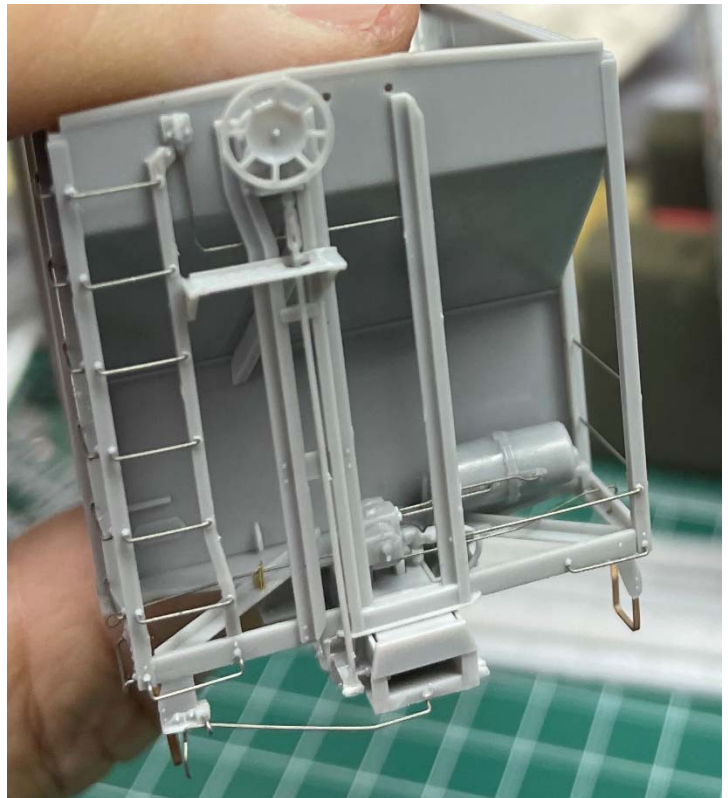
58. **Install Sill Steps:** The sill steps have a slight offset to allow them to sit even with the side when installed. When installing the steps make sure the offset is facing out so the steps sit properly. To allow the installation to be a bit smoother you can open the hole in the side sill with a #76 drill. Insert the angled part of the sill step into the hole and rest the straight leg in the groove of the corner brackets. When positioned properly, secure with CA.



59. **Install Brake Fulcrum:** The fulcrum sits in a cradle next to the coupler pocket. Position it so that the end that the brake staff attaches to is sitting vertically and secure being careful not to get any glue on the coupler box cover.

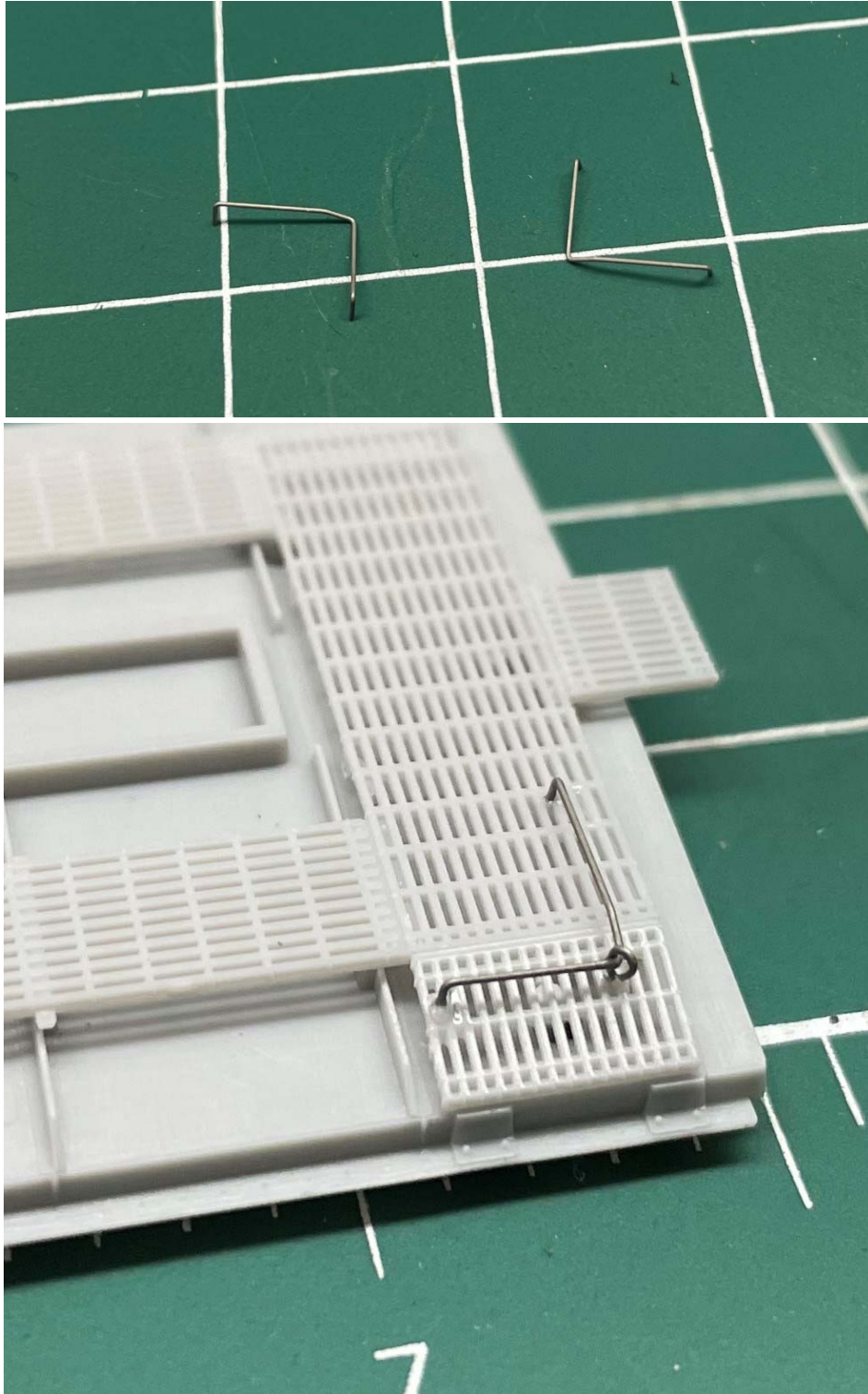


60. **Install Brake Appliances:** Install the brake platform into the slot in the upright and secure the other side to the right upright of the end ladder making sure that it sits level.
61. Insert the brake staff through the hole in the platform and insert the pins on the back of the brake wheel housing into the holes in the end of the car. The end of the brake staff has an offset that fits against the vertical part of the fulcrum. Line up the two parts and secure together. Install the brake wheel into the housing.



62. Secure the running board to the roof since it may be a bit loose.

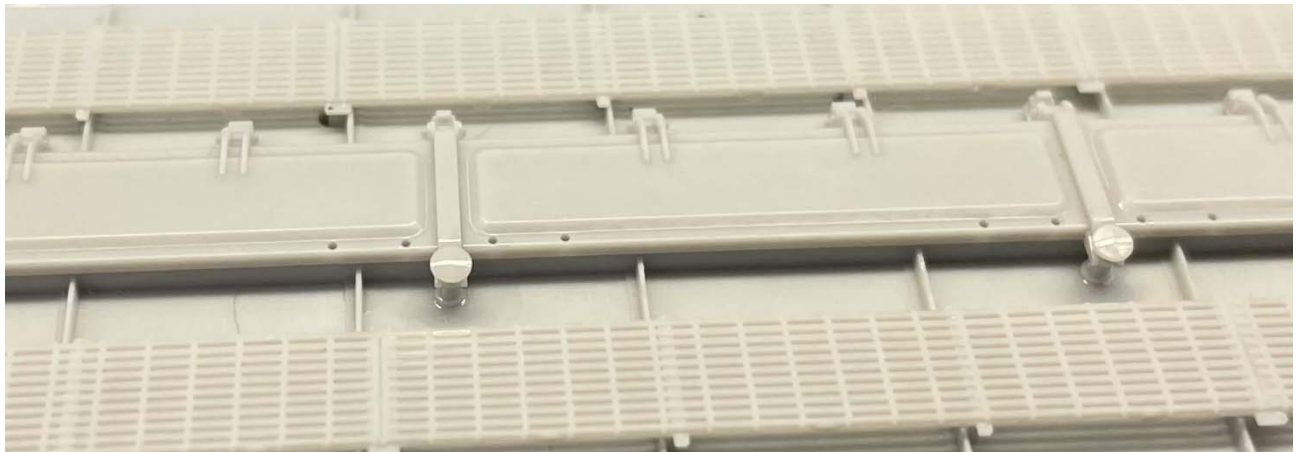
63. Insert an eyelet into the corner holes of the running board laterals and secure with CA.
Feed the corner grabs through the eyelets and insert the ends into the holes of the laterals.
Secure all points with CA.



64. The hatch covers are keyed with a small semi circle in the casting and on the roof. Position and glue in place.



65. The hatch standoffs fit in small notches in the roof hatch casting. They have a large round side and a smaller round side. The large side faces up. There is also one that has a straight end that fits in the location next to a roof rib—it's the fourth one from the left. Fit the standoffs into the notches so that the smaller end sits flat on the roof and when positioned correctly glue in place.



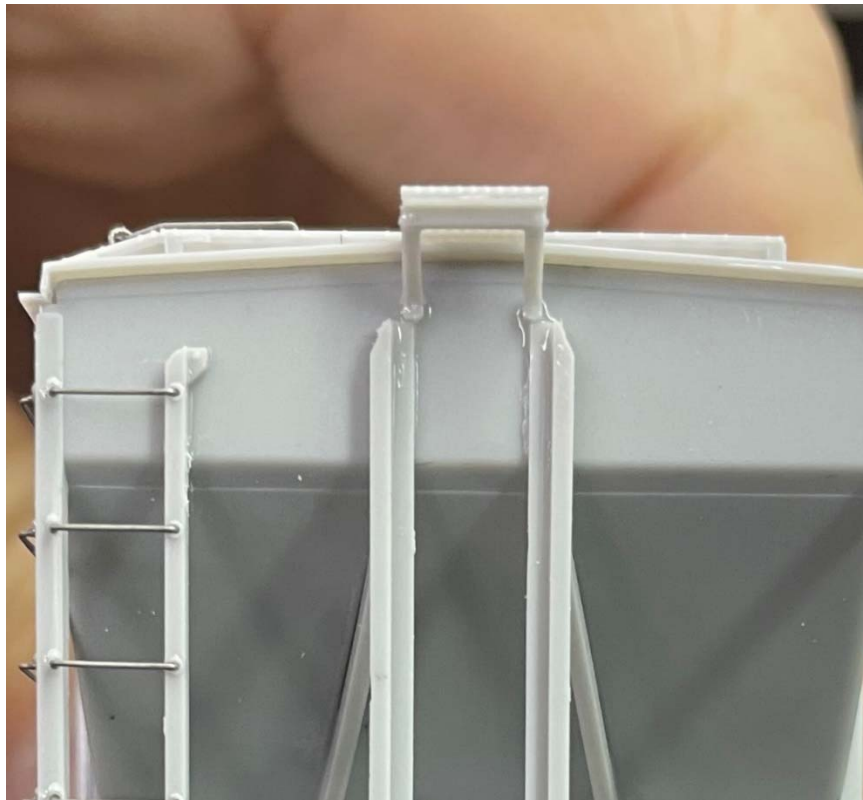
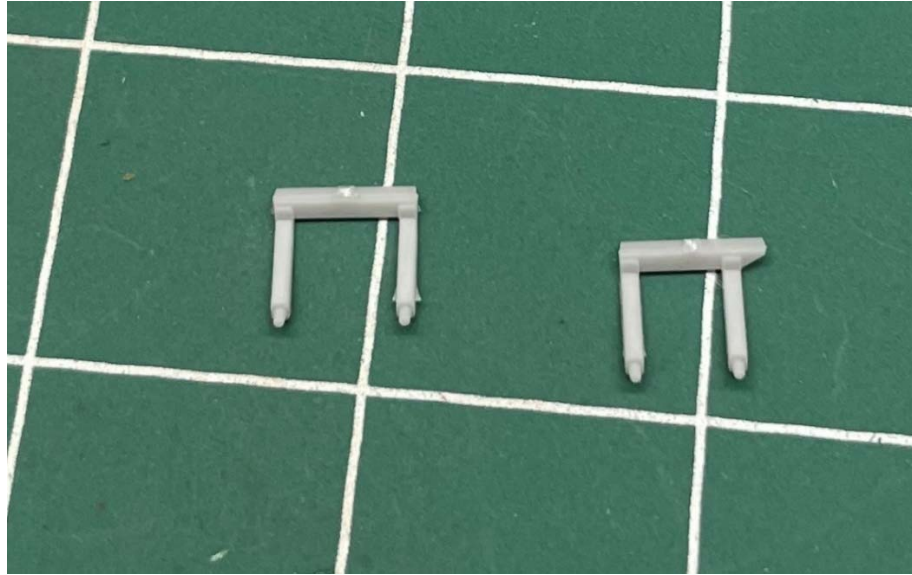
66. Insert all of the hatch handles and secure with CA.

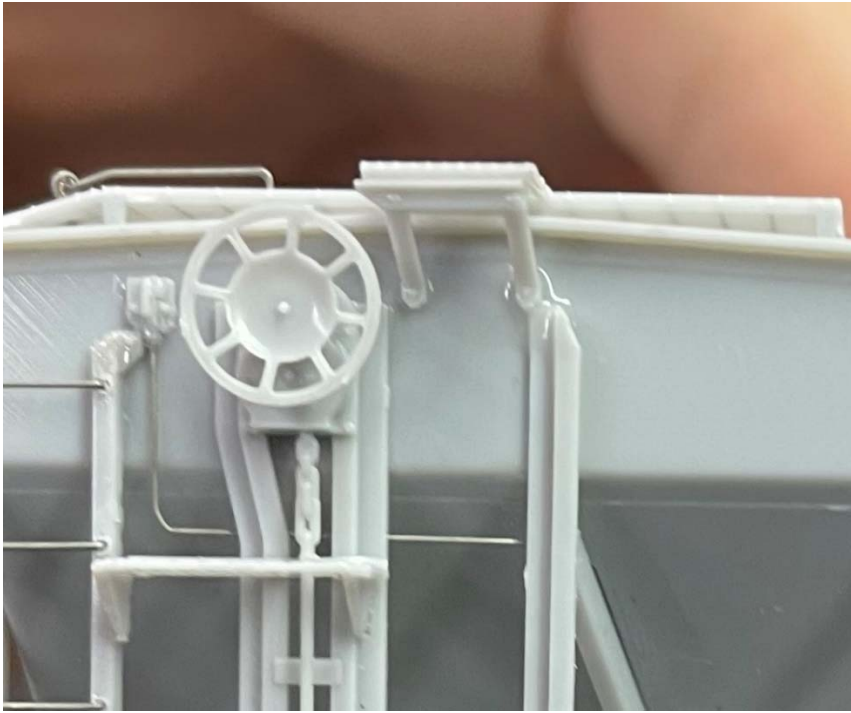


67. The roof has a small tab that fits into a slot in the end of the car. Position the roof so the tab fits in the slot and glue.



68. The end running supports are different for each end of the car. The one for the B end has a slight offset. Insert the pins on the legs of the support into the holes in the car ends and rest the horizontal end of the support on the underside of the running board and glue in place.





69. If you're doing the CB&Q/C&S/FWD version of the car there is a brass part for the placard. It is positioned approximately 9" (scale) from the bottom edge of the roof and centered on the second panel from the right side of the car.
70. This completes the assembly of the car. After all paint and weathering is completed and the couplers are installed you can permanently fix the air line and air hoses on the car ends. You may want to use an adhesive like Canopy Glue in the event that you need to service the couplers as the joints can be broken without damaging the parts.

