



## Instructions: B&O ICC I-18 Steel Bay Window Caboose

Tangent Part Numbers: 60000-01 & 60001-01

4/23/2020



Thank you for purchasing the Tangent Scale Models B&O ICC I-18 Steel Bay Window Caboose Kit! A few quick notes before starting:

- **Do not download or print these instructions until you actually are ready to build.** Why? We update the instructions frequently, so if you saved this file or printed it for later use, please understand that we may have updated the instructions since then. Please check our website to see if this document has been updated before starting your build. We date the document and only show the most current version on our website.
- **Instructions have many large images:** Because some model builders are visually oriented, while others prefer written instructions, we have included *both* text and diagrams 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.
- **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.
- **This kit is meant for adults:** While we applaud bringing younger modelers into our hobby, this model includes more than 100 small parts, many 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 for our power-pickup caboose trucks in 4 axle packs. Check out our website for details & to order the wheels – [www.tangentscalemodels.com](http://www.tangentscalemodels.com) !
- **We want feedback:** If you find something missing from our text instructions, or you believe there is an error within these kit instructions, please let us know by submitting a comment to us on our website or sending an email to [support@tangentscalemodels.com](mailto:support@tangentscalemodels.com) Thank you!
- **This kit does not include lighting or circuitry:** Please note that this kit does not include lighting circuitry or bulbs. Our approach was that kit builders would want to approach lighting their own way. We have included the external-facing lighting appliances: light bars for the side marker lights (pile or box type, depending on the kit you purchased), as well as the end FRA flasher light (for box marker light kits, SKU 60000-01). Our trucks include power pickup capability and wires, and the kit is ready for whatever lighting circuit or decoder you want to use. (If any!)
- **If you plan to light the caboose:** You may want to plan the drilling of appropriate holes in the metal floor to allow any wires from the truck to pass through the bolster and interior areas. This should be done at Step 9. (Notice there are already holes in the plastic bolsters for wire pass-through. Additional holes need to be considered in the metal floor only.)

## Overview of this kit's contents:

Below you will find photos of the kit's contents with corresponding descriptions for each part in our kit.



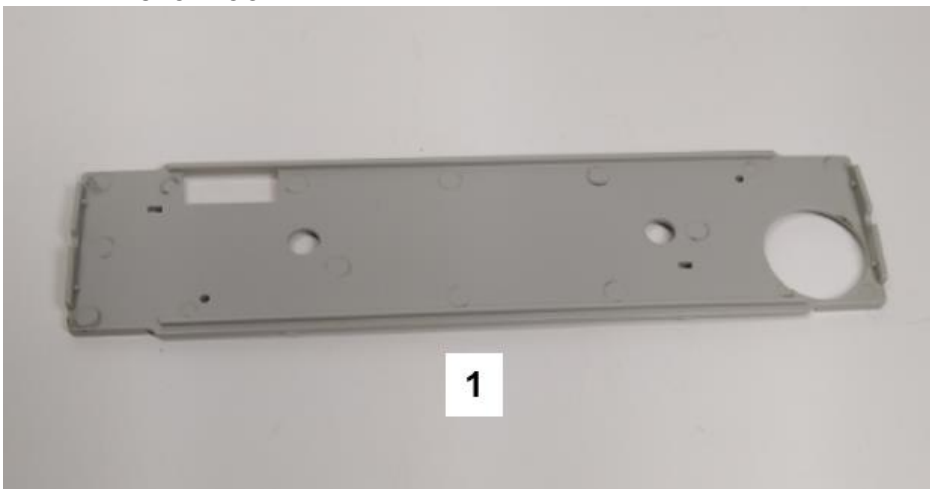
### Standalone parts included:

- Part 1 – Caboose Body (2 possible versions depending on which kit version you purchased)

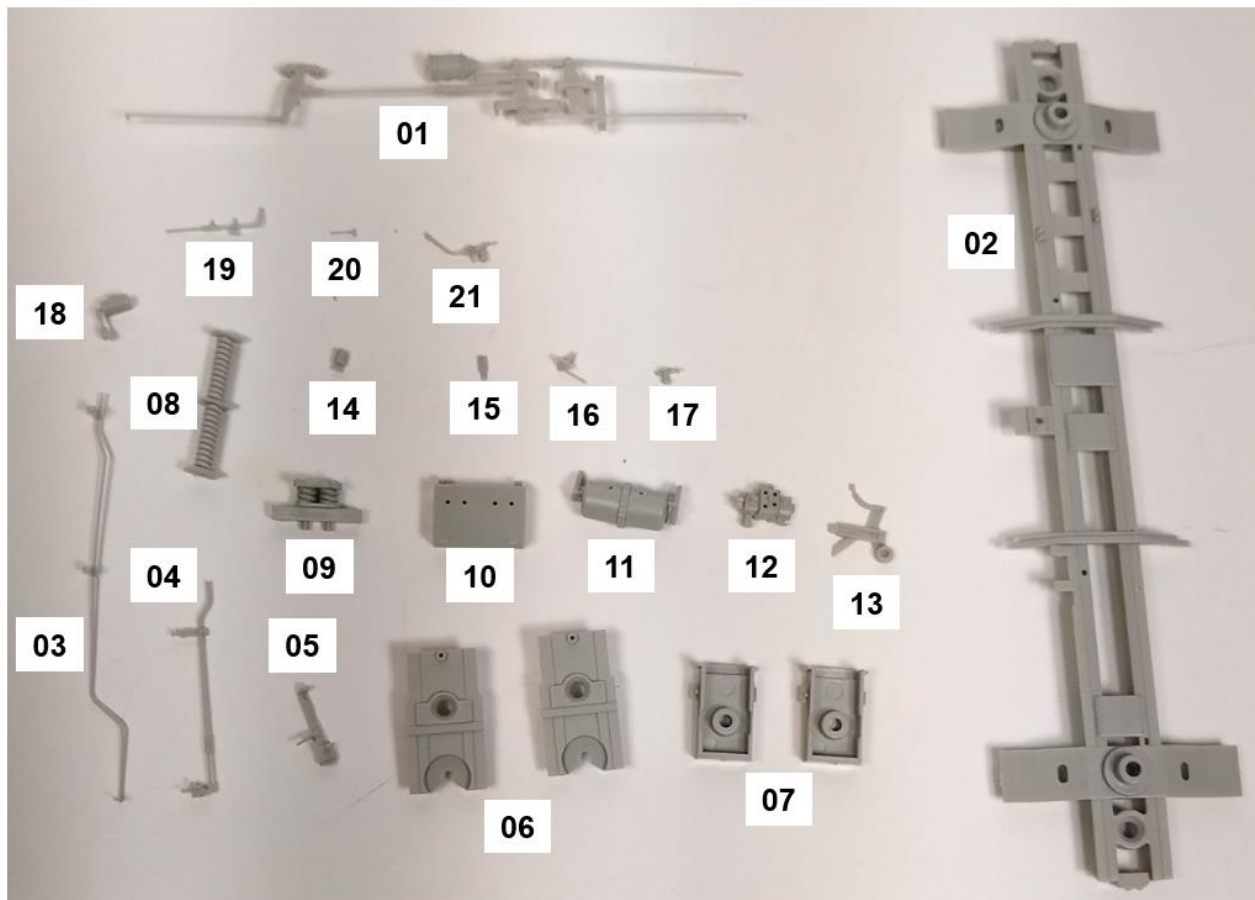
### Part bags included:

#### Parts bag #1

1-1 Interior Roof

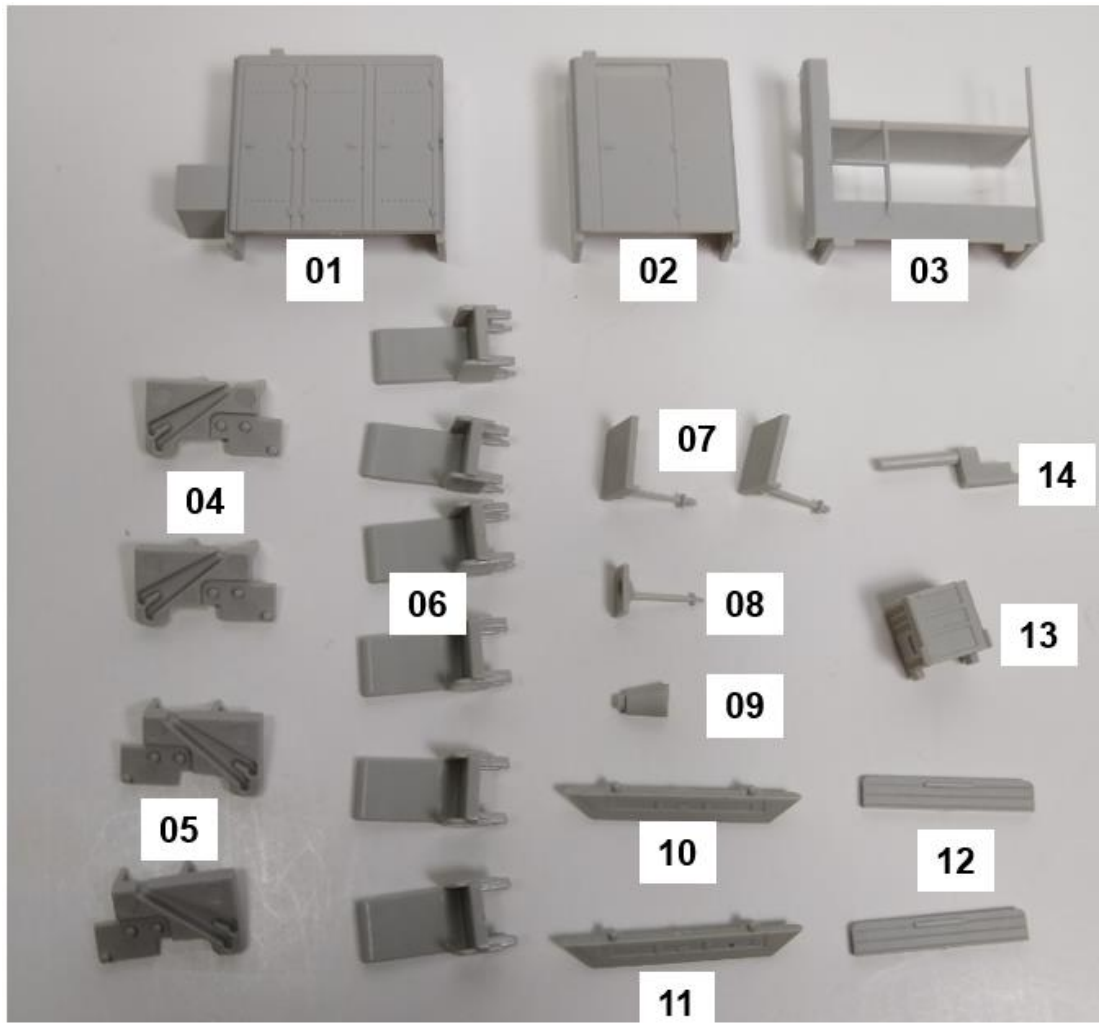


## Parts bag #2



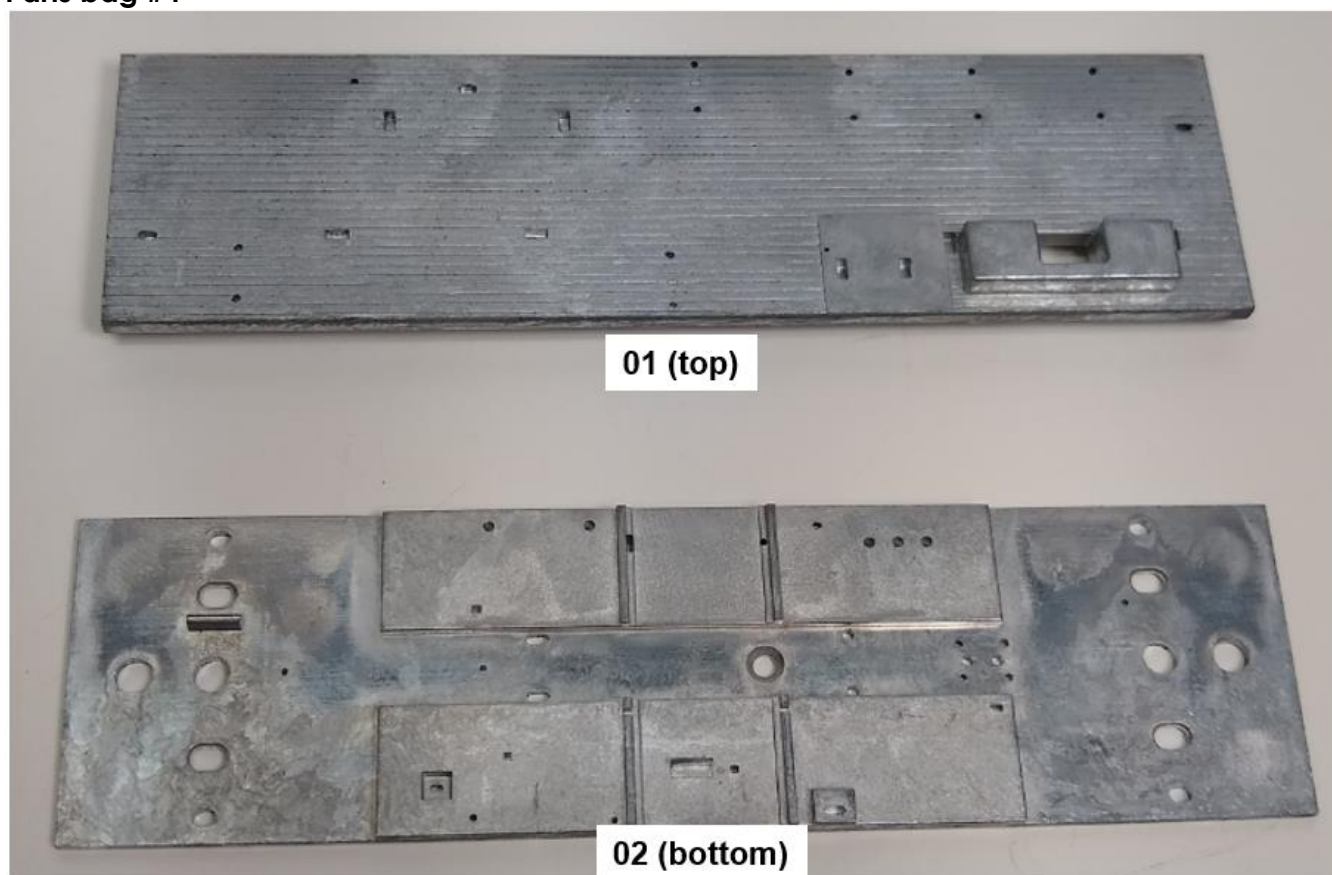
- 2-01 Underframe brake piping
- 2-02 Underframe
- 2-03 Long conduit pipe
- 2-04 Short conduit pipe
- 2-05 Brake piping cap
- 2-06 Draft gear box (2)
- 2-07 Coupler box (2)
- 2-08 Spring
- 2-09 Waugh cushion unit
- 2-10 Battery box
- 2-11 Air reservoir
- 2-12 ABD valve
- 2-13 Axle generator
- 2-14 Oil drain
- 2-15 Release rod bracket
- 2-16 Release rod pivot
- 2-17 Chlorinator
- 2-18 Electrical box
- 2-19 Bay window air line
- 2-20 Bay window air bleed
- 2-21 ABD dirt collector pipe

### Parts bag #3



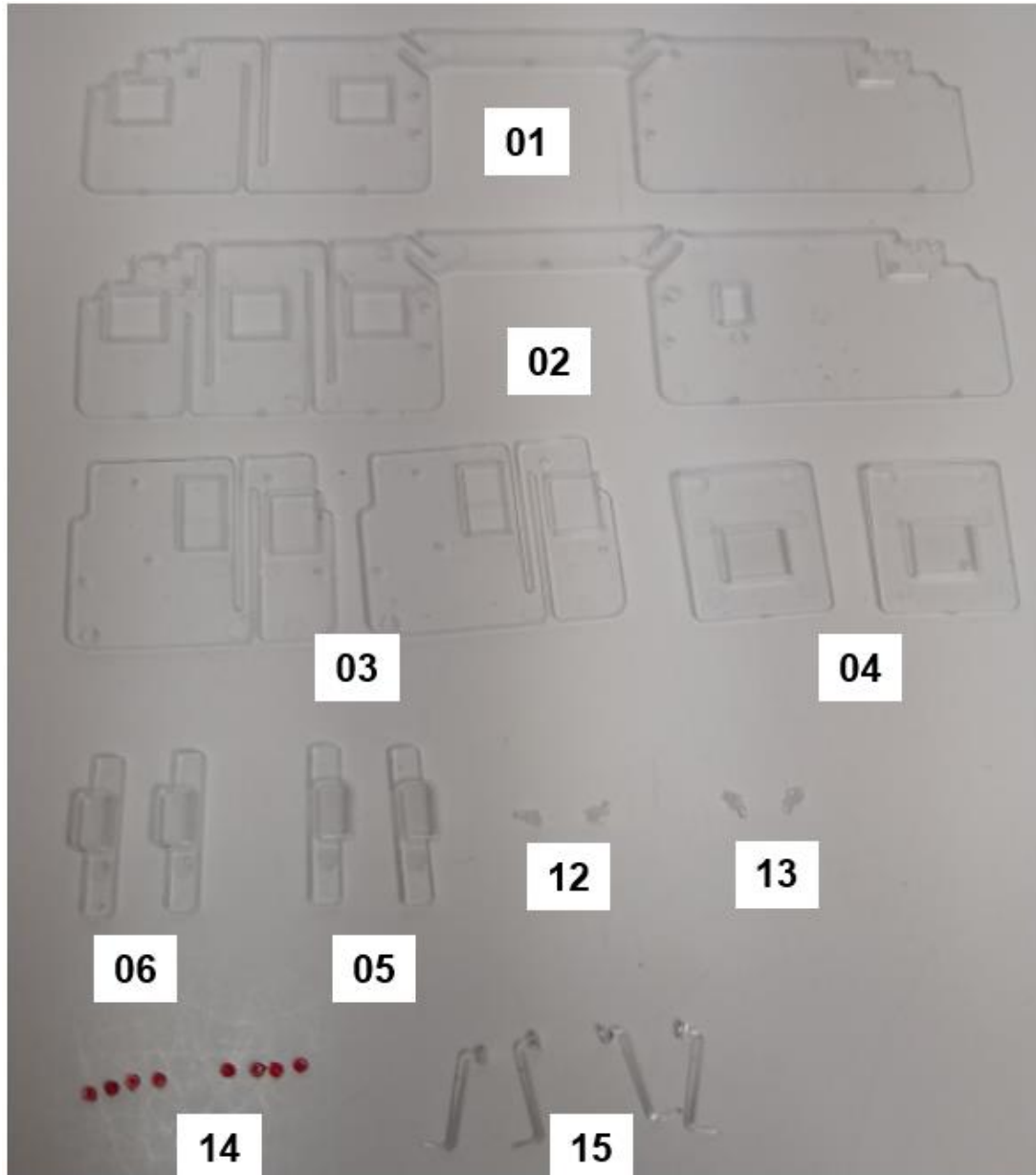
- 3-01 Lockers
- 3-02 Bathroom
- 3-03 Bunks
- 3-04 Left light rod case (2)
- 3-05 Right light rod case (2)
- 3-06 Chair (6)
- 3-07 Table (2)
- 3-08 Sink
- 3-09 Toilet Bowl
- 3-10 Exterior bay window floor
- 3-11 Exterior bay window floor with piping hole
- 3-12 Interior bay window floor (2)
- 3-13 Stove
- 3-14 Stove pipe

**Parts bag #4**



4-01 Top Floor  
4-02 Bottom Floor

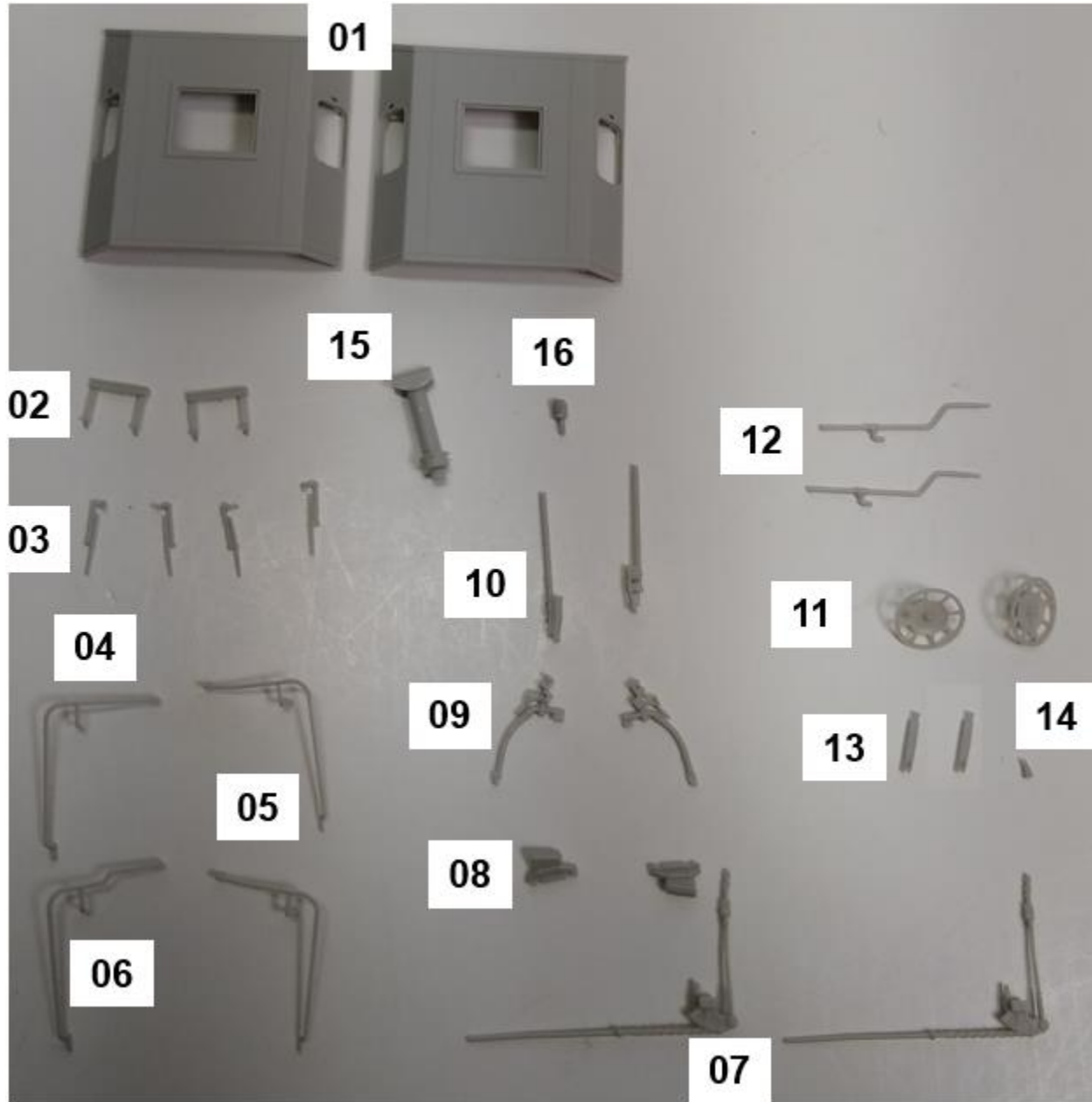
## Parts bag #5



- 5-01 Side windows
- 5-02 Side windows w/bathroom
- 5-03 End windows (2)
- 5-04 Bay windows (2)
- 5-05 Small bay window right (2)
- 5-06 Small bay window left (2)
- 5-12 Marker lantern left (2)
- 5-13 Marker lantern right (2)
- 5-14 End railing lenses (8)
- 5-15 Marker light bars (4)



## Parts bag #6

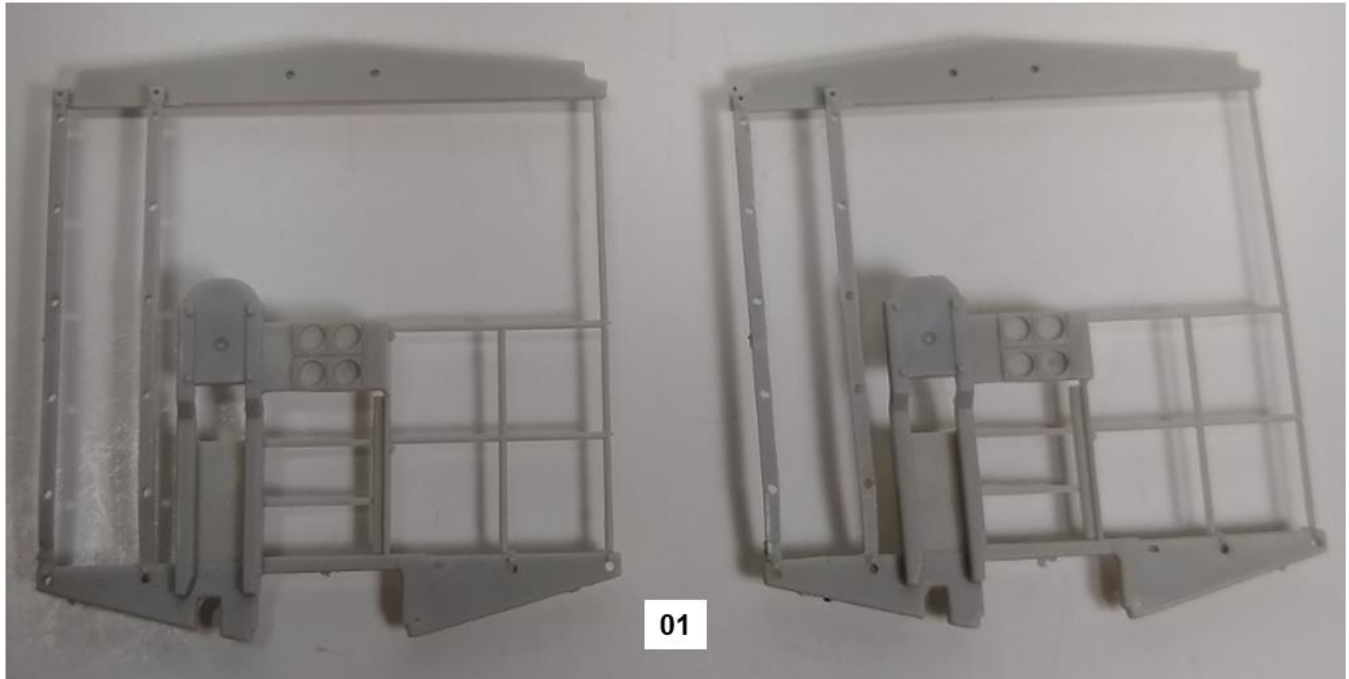


- 6-01 Bay window (2)
- 6-02 Walkway end support (2)
- 6-03 Wiper (4)
- 6-04 End left L grab
- 6-05 End right L grab (2)
- 6-06 End left L grab w/fuel cap bump
- 6-07 Brake chain (2)
- 6-08 Coupler lift bar bracket (2)
- 6-09 Air hose (2)
- 6-10 Air hose pipe (2)



- 6-11 Brakewheel (2)
- 6-12 Whistle pipe (2)
- 6-13 Angle cock rod support (2)
- 6-14 Fuel fill cap

**Parts bag #7**



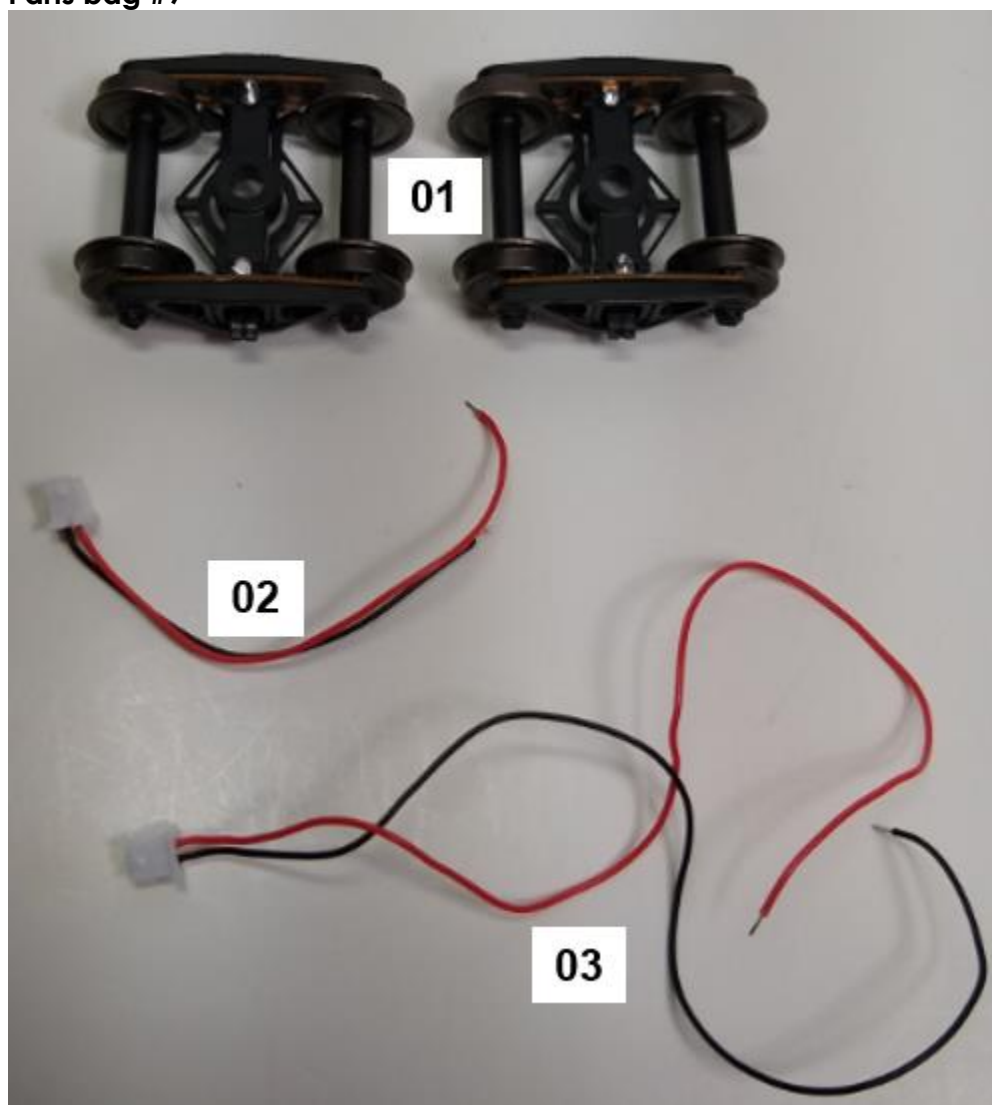
7-01 End frame (2)

**Parts bag #8**



8-01 Running board

**Parts bag #9**

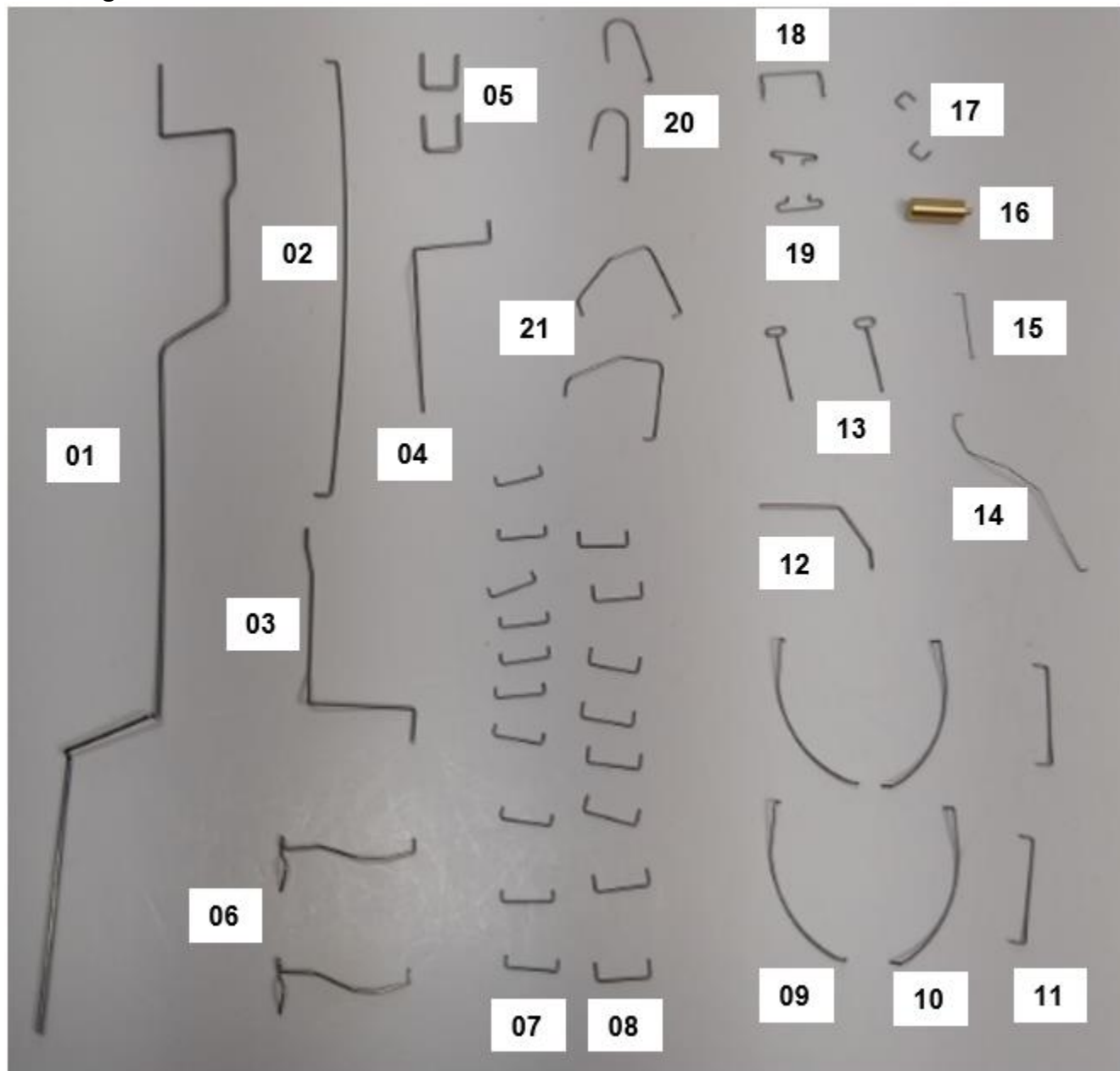


9-01 Truck Assembly with wheels (2)

9-02 Wires-short

9-03 Wires-long

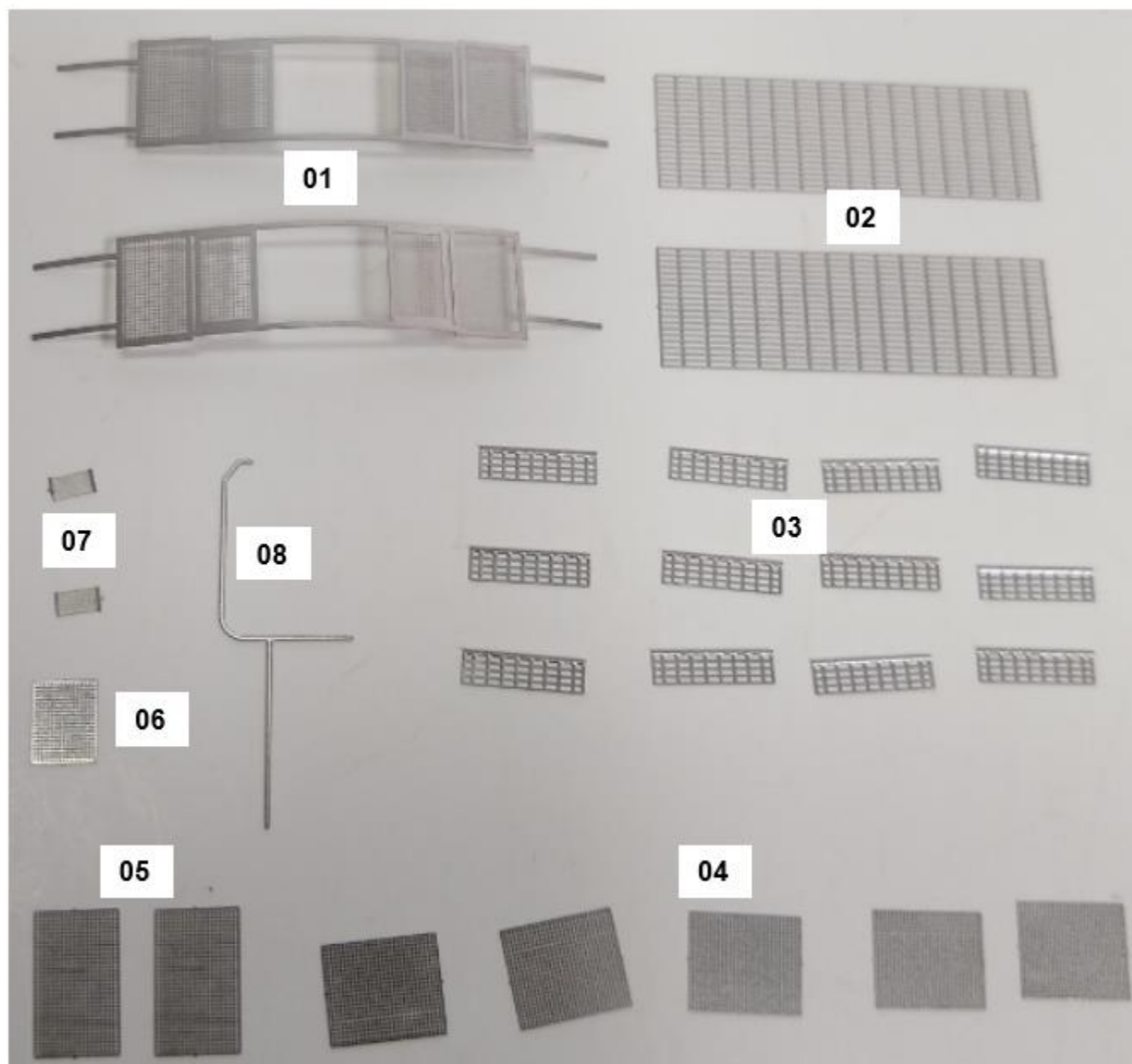
## Parts bag #10



- 10-01 Train Air line
- 10-02 Brake rod
- 10-03 Left reservoir pipe
- 10-04 Right reservoir pipe
- 10-05 Battery box handles (2)
- 10-06 Coupler lift bar (2)
- 10-07 End ladder rung (10)
- 10-08 End grab iron (8)
- 10-09 Left curve grab iron (2)
- 10-10 Right curve grab iron (2)
- 10-11 Left top walkway grab (2)

- 10-12 Cylinder Pipe
- 10-13 Angle cock handle
- 10-14 Release rod-long
- 10-15 Release rod-short
- 10-16 Toilet pipe
- 10-17 Battery box grab iron (2)
- 10-18 Brake rod support
- 10-19 Coupler lift bar support (2)
- 10-20 Bay window air bleed
- 10-21 Ladder railing (2)

### Parts bag #11



11-01 Screen-bay window (2)  
11-02 End walkway (2)  
11-03 Step (12)  
11-04 Screen-side window (5)  
11-05 Screen-end door (2)  
11-06 Screen-bathroom window  
11-07 Tack board (2)  
11-08 Stove top bar

### Parts bag #12



12-01 Screw/washer coarse thread-long (2)  
12-02 Screw-pan head (2)  
12-03 Screw/washer coarse thread-short (2)  
12-04 Screw-flat head short (2)  
12-05 Screw-flat head machine threads long (3)

### Parts needed/recommended:

- Couplers. The coupler boxes for this car are designed for Kadee "whisker" shank couplers - #158.

### Tools needed/recommended:

- Hobby knives - #11 and #17 are ideal
- Small Phillips head screwdrivers
- Tweezers

- Liquid styrene cement for **plastic to plastic** bonds (Tamiya green bottle, Testors Liquid Styrene Cement are two example products)
- CA-type cement or cyanpoxy – for **wire-to-plastic** joins (sold in hobby shops, or in hardware store as “super glue” under various brands in the small squeeze tubes) – best applied with a piece of scrap wire to keep “glue blobs” to a minimum

**Note:** Many of the small parts in this kit are made from slick engineering plastic. (Sometimes referred to as Delrin or POM). For these types of joins, you will need to use CA-type cement or cyanpoxy. This includes the end cage parts (7-01) and the running board (8-01)

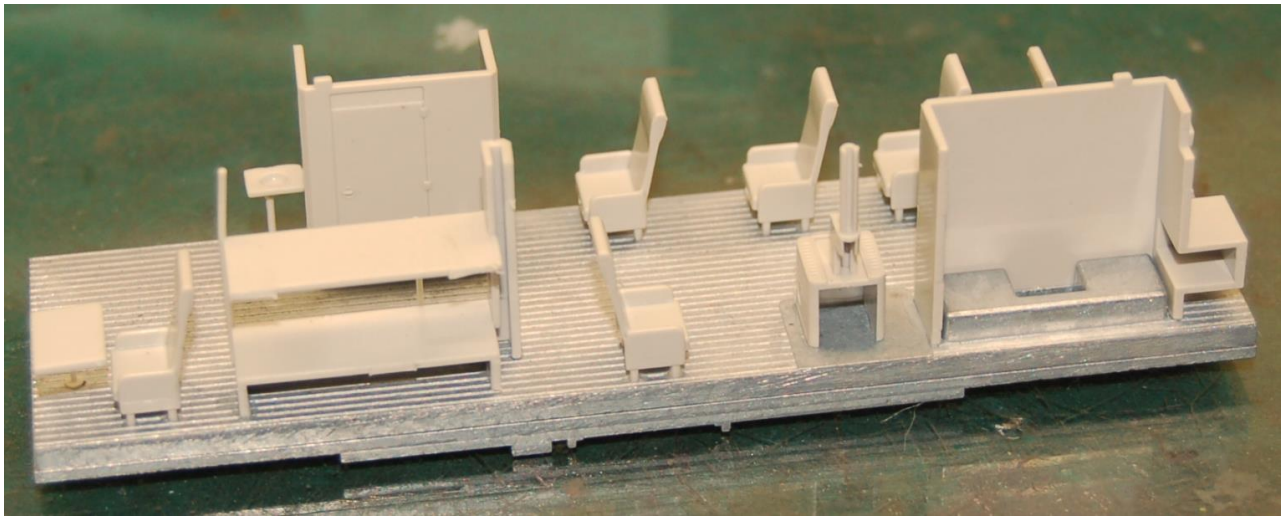
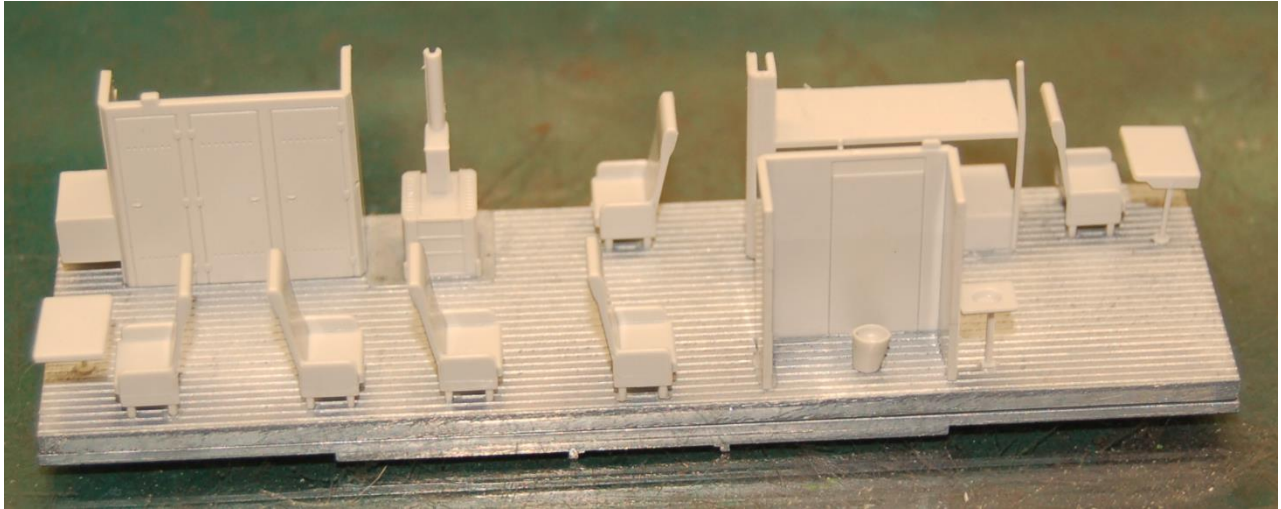
## **PREAMBLE – THINGS YOU SHOULD KNOW**

- **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 access to multiple parts at a time, so we recommend a clean and open work surface so that you can keep all of the parts in the open and accessible. Let's get started!
- **Assembly Sequence** - There are three major subassemblies to this kit:
  - Interior
  - Underframe
  - Body
  - Complete Model
- **Painting:** For the purposes of these instructions we will begin with the interior, then the underframe, then the body. We advise painting the interior assembly prior to working on the body.

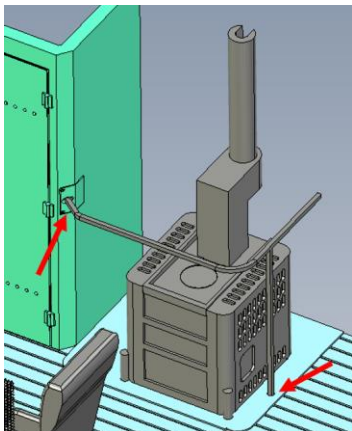
## **Interior Assembly:**

1. **Install the interior parts.** Referencing the photos above, please gather bags 3 and 4. Begin by opening parts bag #3 as this bag contains the interior parts. Also, open parts bag #4 and remove the top floor (part 4-01). Lay the top floor face up on your workbench and referring to the photo install all components (all parts can basically only fit in one location) with CA or canopy glue. Please note – our photos show the bottom floor (part 4-02) attached to part 4-01) – for ease of assembly, we do not recommend you do that.





2. You will also have to locate part 11-08. The long straight leg needs to be bent at a 90 degree angle and inserted into the small hole in the floor next to the stove making sure it does not protrude below the floor, and the leg with the angled end fits in the small notch in the locker casting.

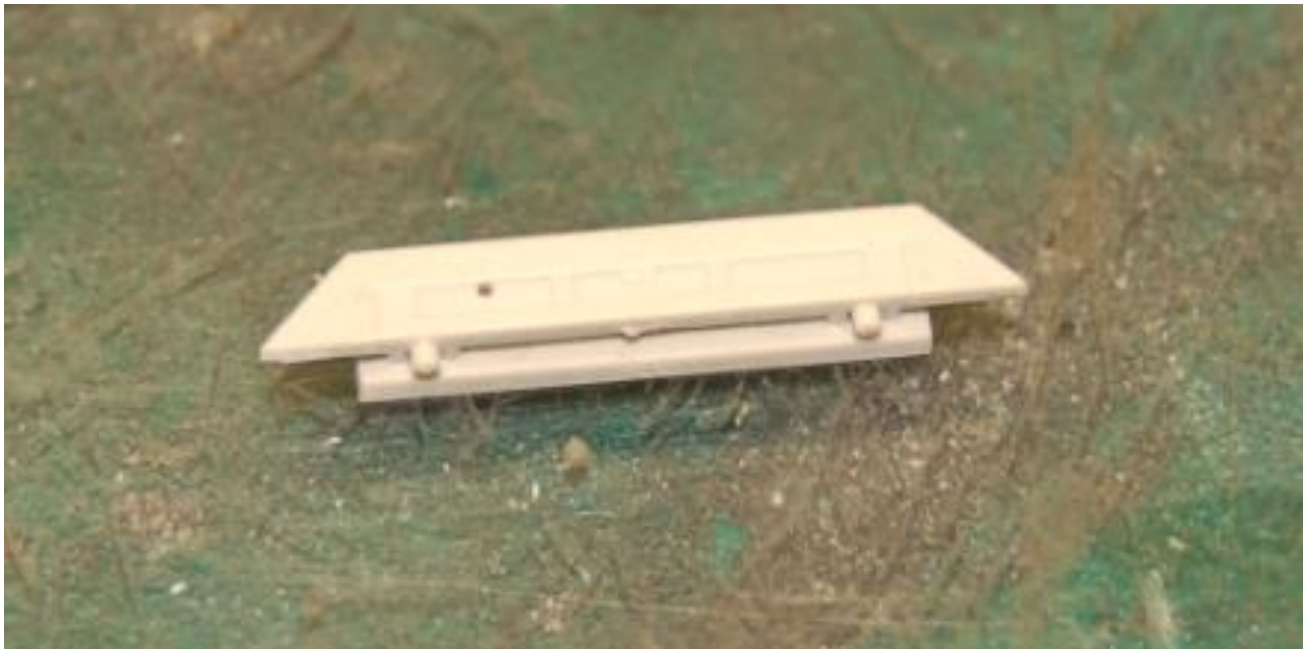


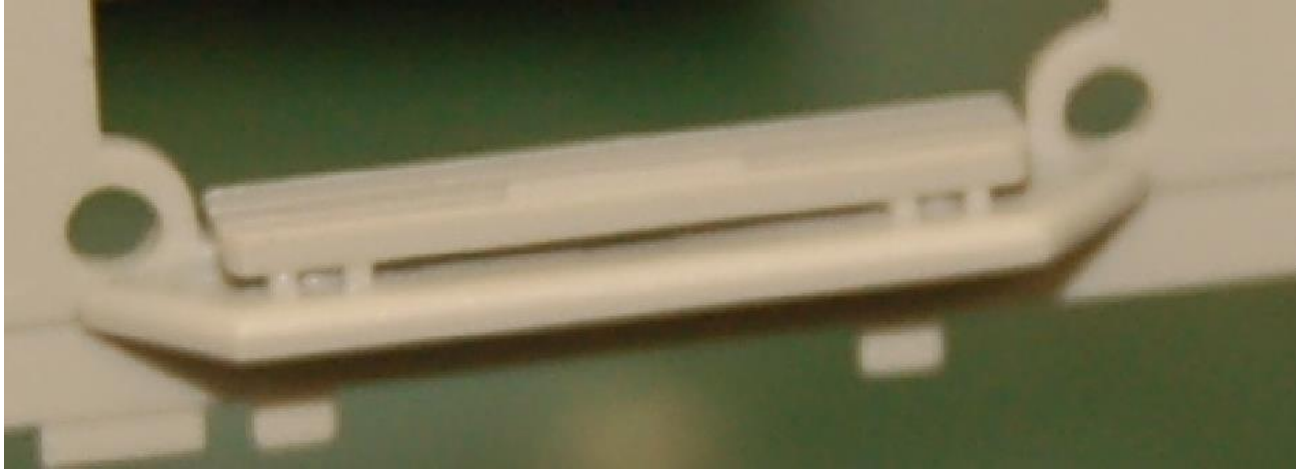


3. **Add the interior roof.** It is keyed and will only fit one way. Locate and glue in place.



4. **Install the bay window floors into the caboose body.** The remaining pieces from bag #3 are the outer and inner bay floors. Glue the inner floor to the outer floor so that the small tab on the inner floor goes toward the short side of the outer floor. One of the outer floors has a small hole. This assembly will go on the side of the body that has the smoke jack. Insert the floor assemblies into the mounting holes at the bottom of the bay openings of the car body and glue in place.

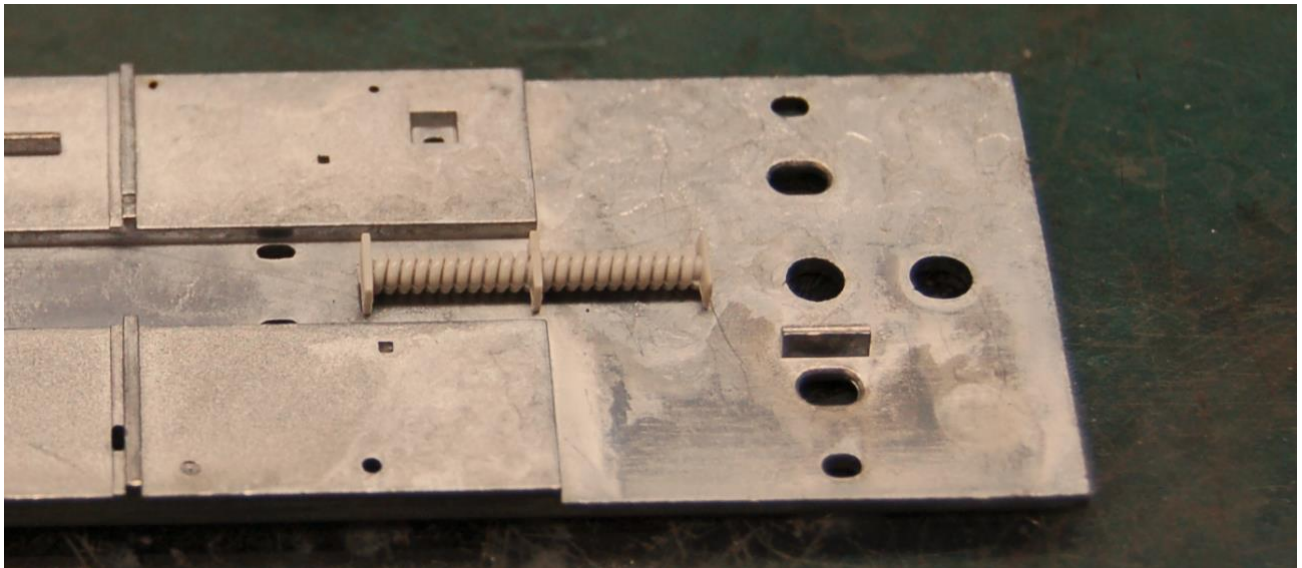




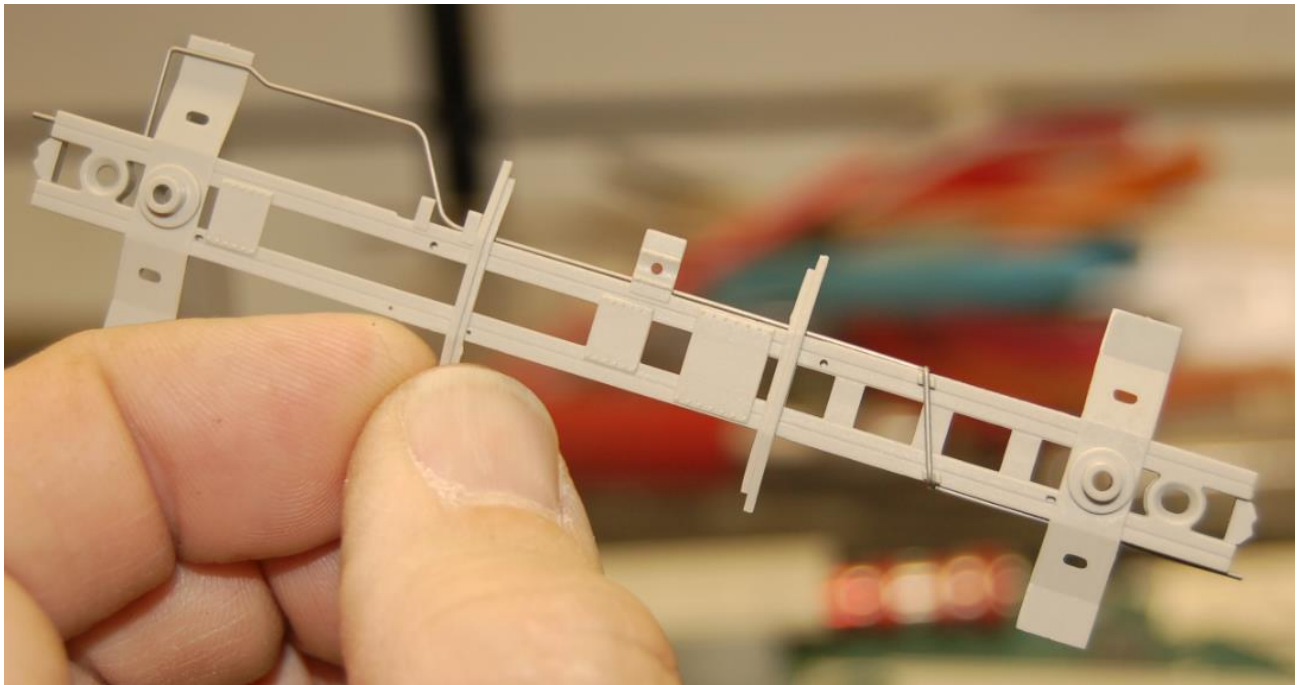
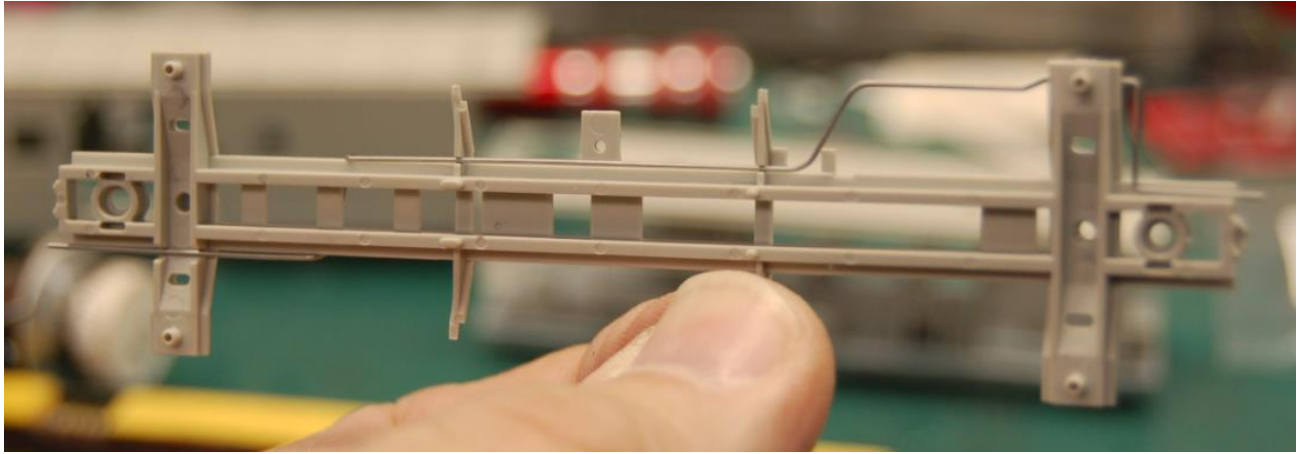
5. **That ends the interior assembly steps.** You may want to paint the interior at this time so that the paint has time to dry while you continue with the assembly.

#### **Underframe Assembly:**

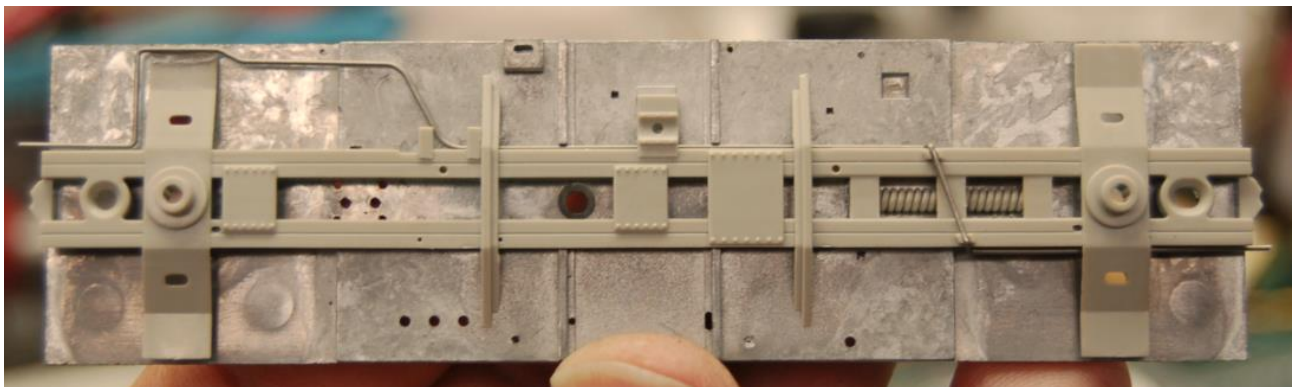
6. **Remove parts from bag #2.** Parts bag #2 contains the parts for the underframe. Remove all parts from the bag and separate them on your work surface. Be very careful as there are many very small parts that can get lost. You will also need a few wire parts so have bag #10 handy as well.
7. **Install the spring.** Lay the lower floor on your work surface with the bottom of the floor facing up. Locate the spring (part 2-08) and place it in the locating holes in the floor and secure.



8. Install the train air line into the underframe. Locate the train air line (part 10-01) and the underframe (part 2-02). You will see a few locating notches on both the top and bottom of the underframe where the train line rests. Maneuver the train line into position in the underframe and glue in place.

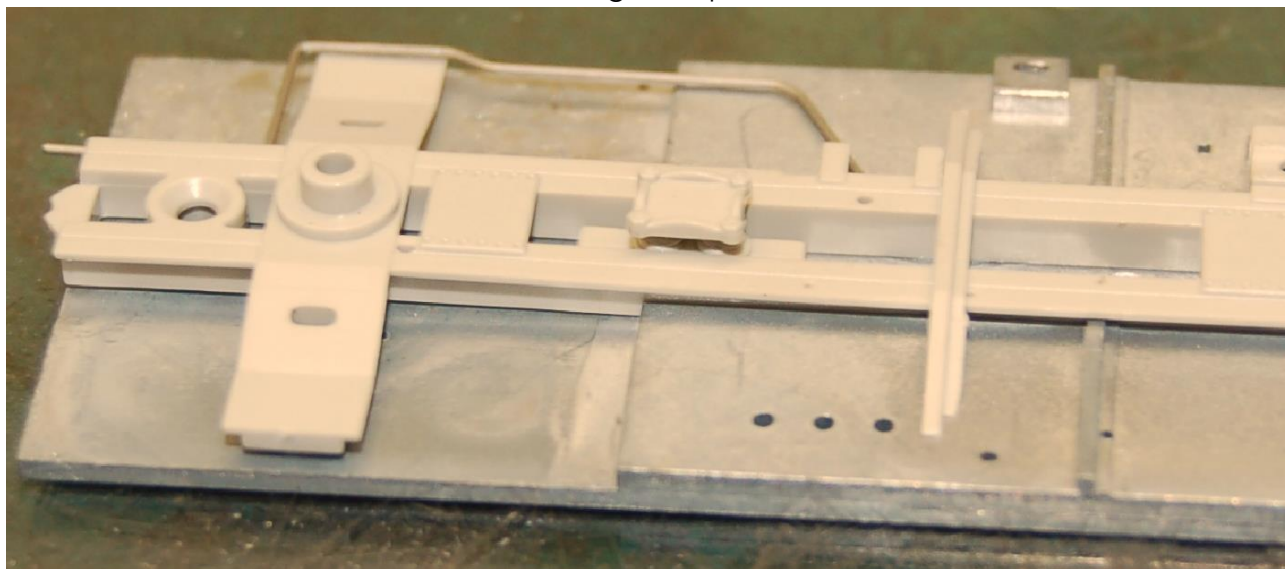


9. **Install the underframe onto the floor.** The underframe is keyed so it can only fit one way.

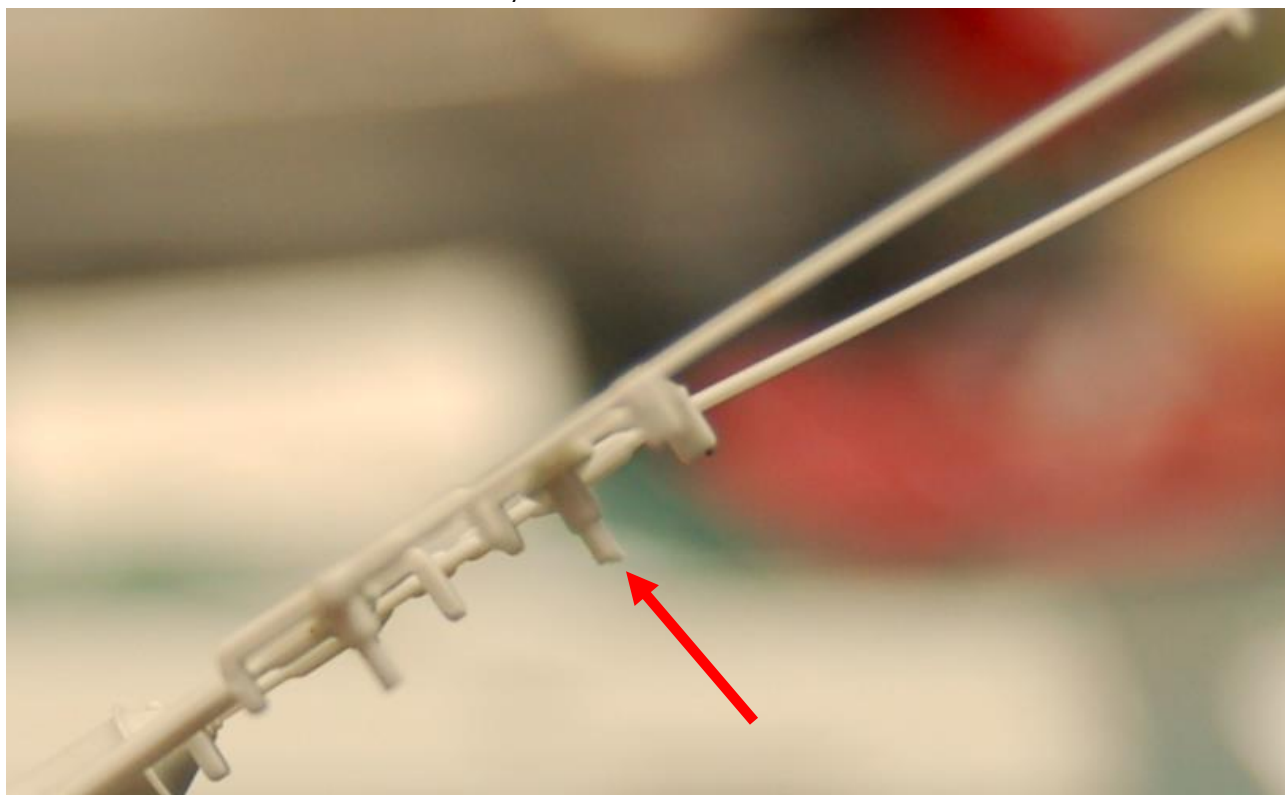




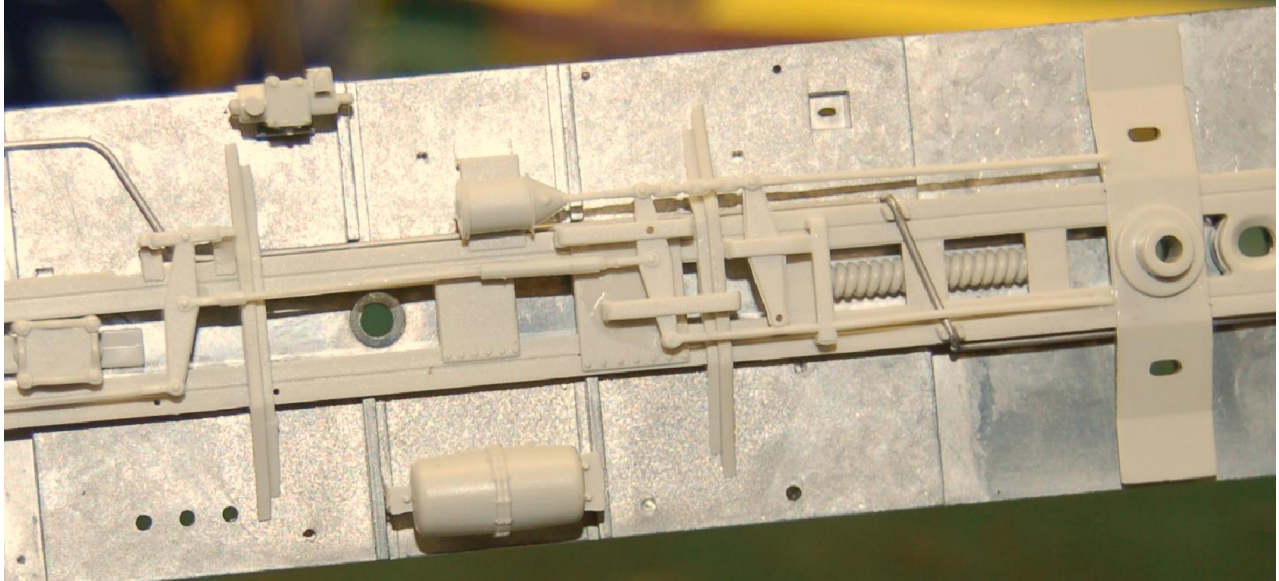
10. **Install the Waugh cushion unit.** Insert the Waugh cushion unit (part 2-09) into the mounting holes located between the center sill and glue in place.



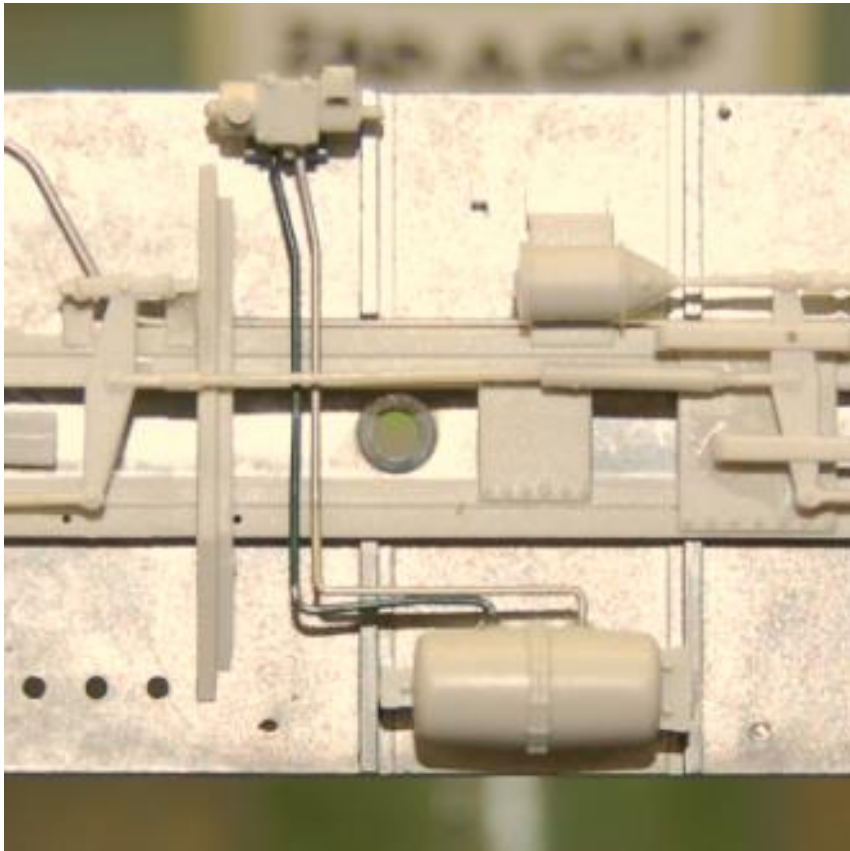
11. **Trim the brake rigging assembly.** The brake rigging assembly (part 2-01) is keyed with locating pins, one of which needs to be trimmed so that the assembly sits properly (the pin that is below the center brake lever).



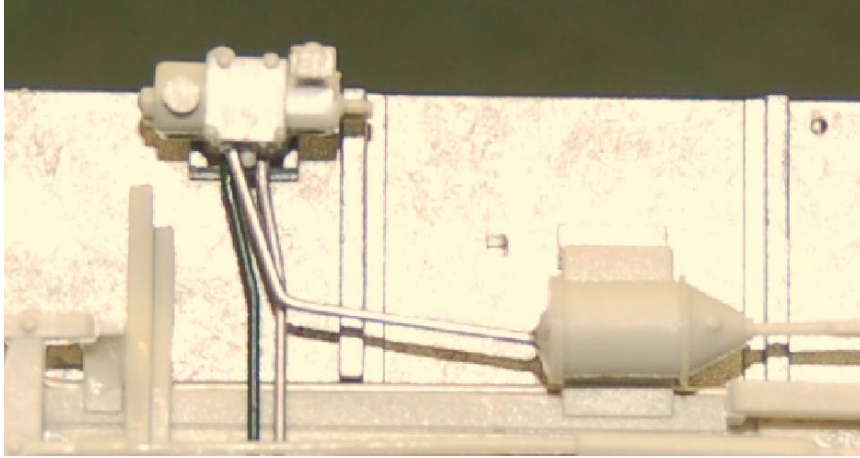
12. **Install the brake rigging assembly, AB valve, and brake reservoir.** Position and glue the brake rigging assembly into place. Glue the AB valve (part 2-12) and reservoir (part 2-11) into their respective locating holes.



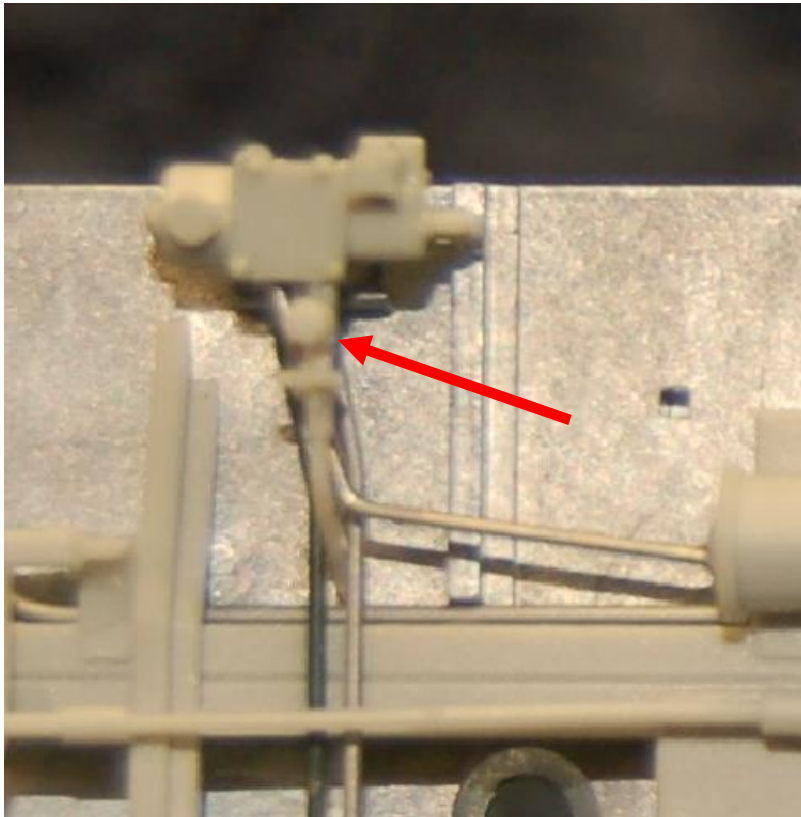
13. **Install air pipes.** Locate the two air pipes (10-03 and 10-04) that go from the reservoir to the AB valve from bag 10. Slide them under the brake rigging and into the two lower holes in the AB valve, as well as the holes in the cylinder. Glue into place.



14. **Install cylinder pipe.** Find the cylinder pipe (part 10-12). This fits into the top left hole in the AB valve and butts up against the back of the cylinder (you may have to trim or bend it to get a proper fit). Secure at the cylinder with CA but not at the AB valve yet.

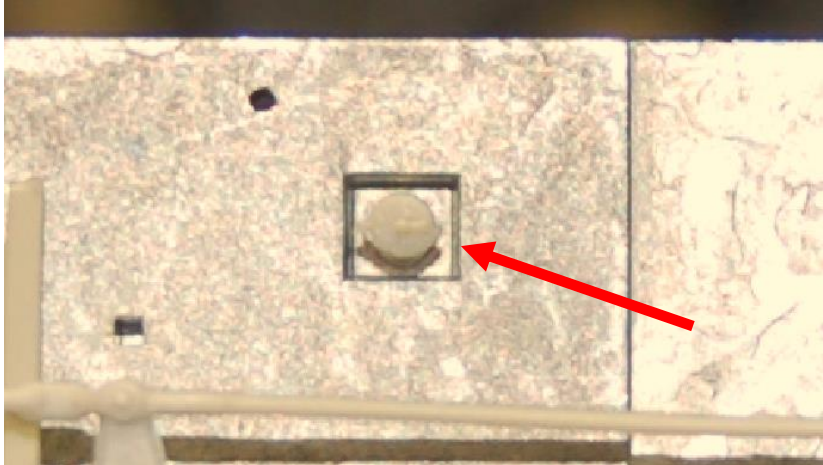


15. **Install the ABD dirt collector pipe.** The ABD dirt collector pipe (part 2-21) goes into the last hole in the AB valve and the other end rests on top of the train line. Secure all parts in the AB valve at this time and glue the dirt collector pipe to the train line.

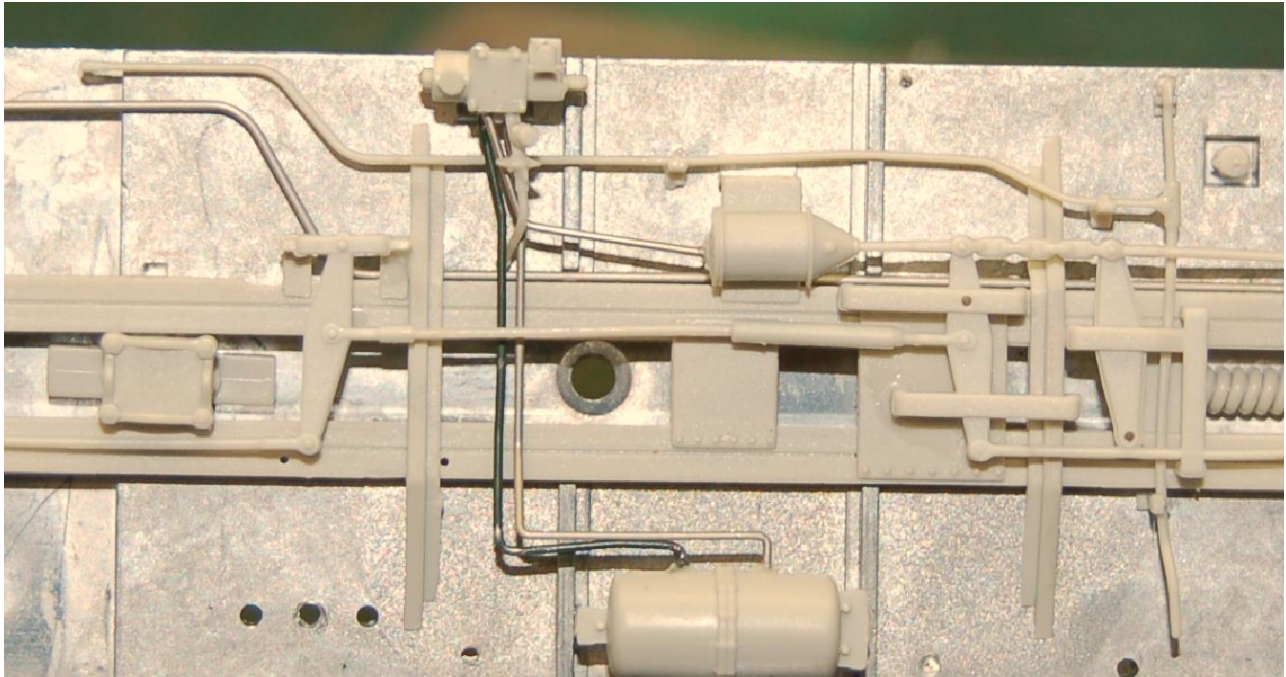


16. **Install the oil drain.** Install the oil drain (part 2-14) into the recess in the floor and secure.



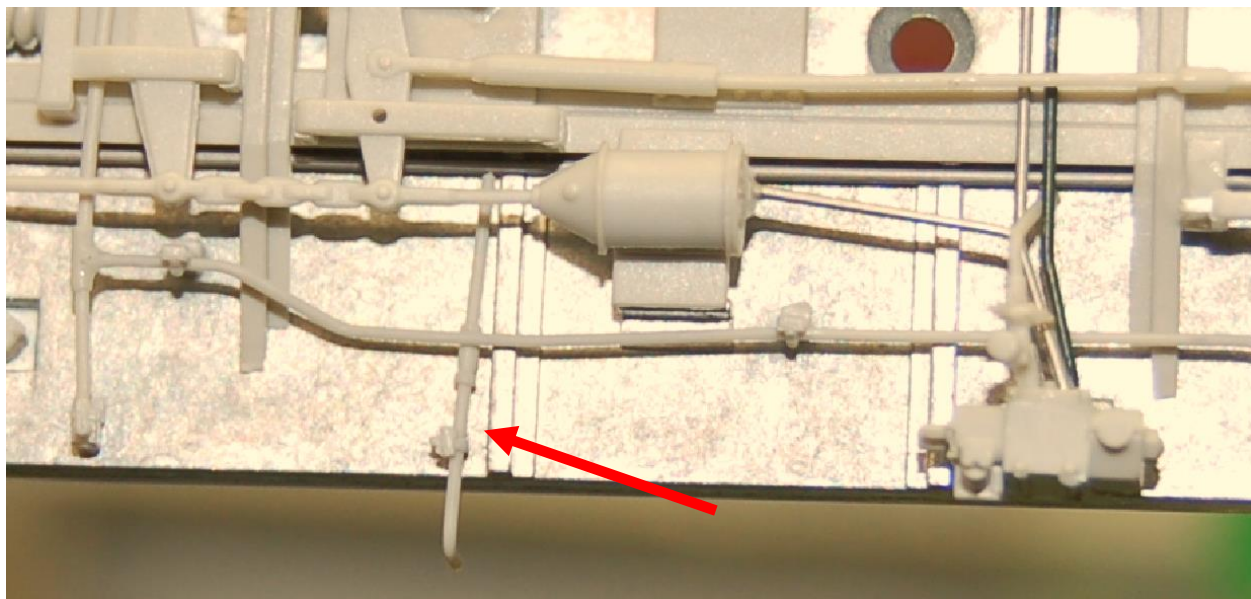


17. **Install the conduit piping.** Fish the small conduit pipe (part 2-04) through the brake rigging and insert pins into locating holes in the floor. Secure with CA. Fish the long conduit pipe (part 2-03) under the piping into the AB valve, again inserting pins into holes in floor and insert the end of the pipe into the junction on the short conduit. Glue in place.

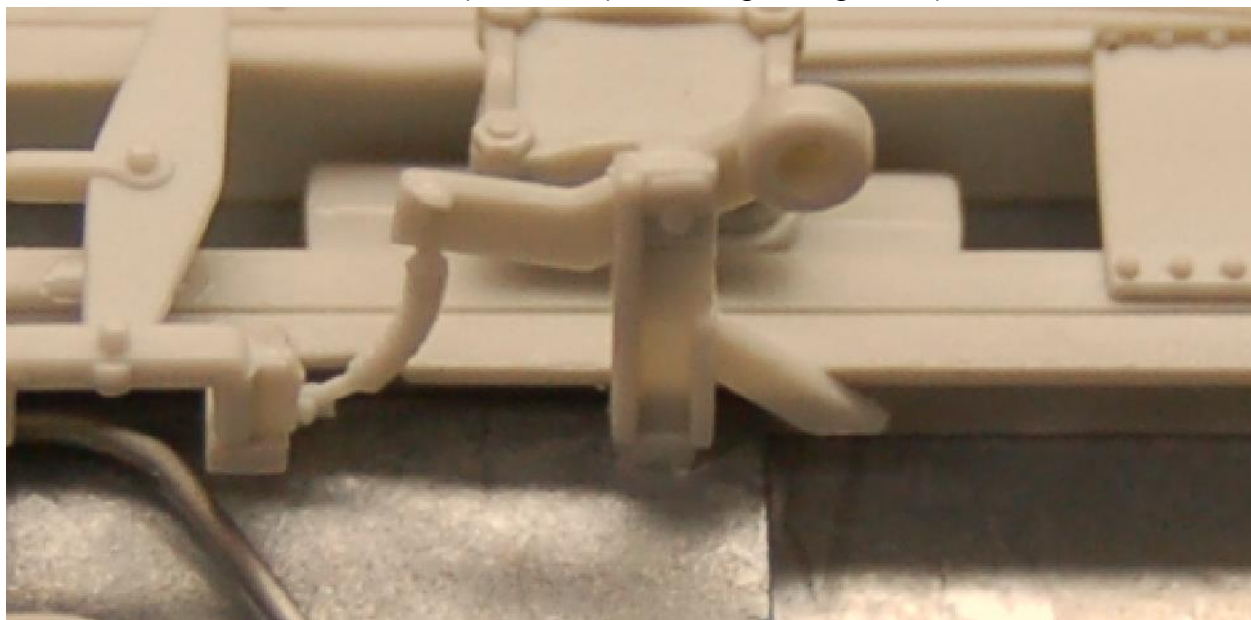


18. **Install the bay window air line.** The bay window air line (part 2-19) has a small pin on the coupling that needs to be cut off so it fits properly. Remove and feed it under the long conduit and insert pin into the mounting hole in the floor. Glue in place.

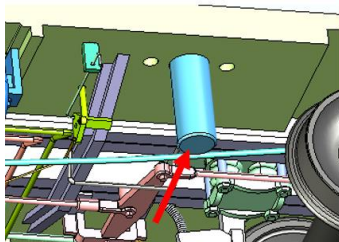




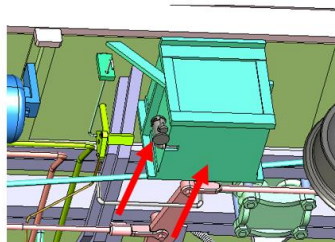
19. **Install the axle generator.** The axle generator (part 2-13) rests in a slot in the center sill toward the bolster. Refer to the photo for positioning and glue in place.

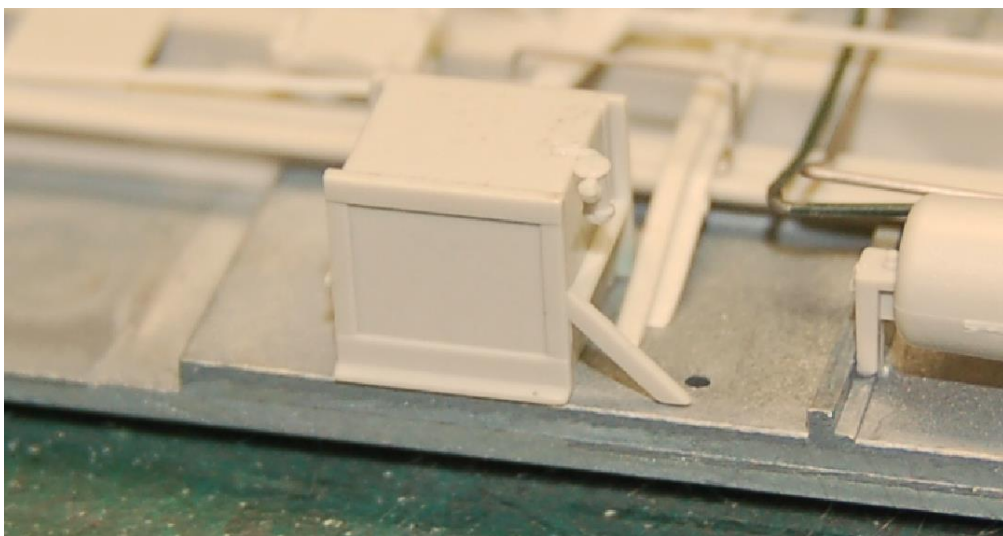


20. **You can choose to install either the toilet flush pipe (part 10-16) or install the chlorinator to the toilet retention tank, and glue the septic tank to the floor.** The small chlorinator should be attached to the box retention tank in the small notch on the casting, then glue the tank to the floor.

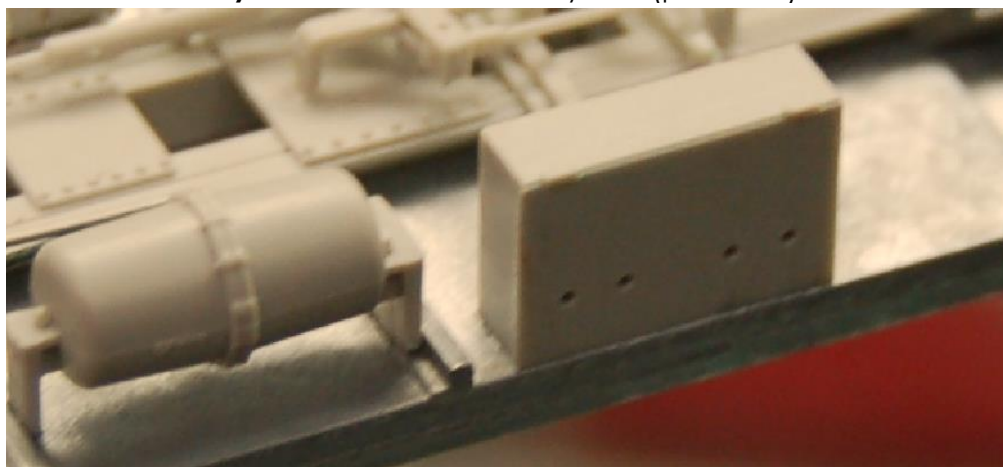


OR

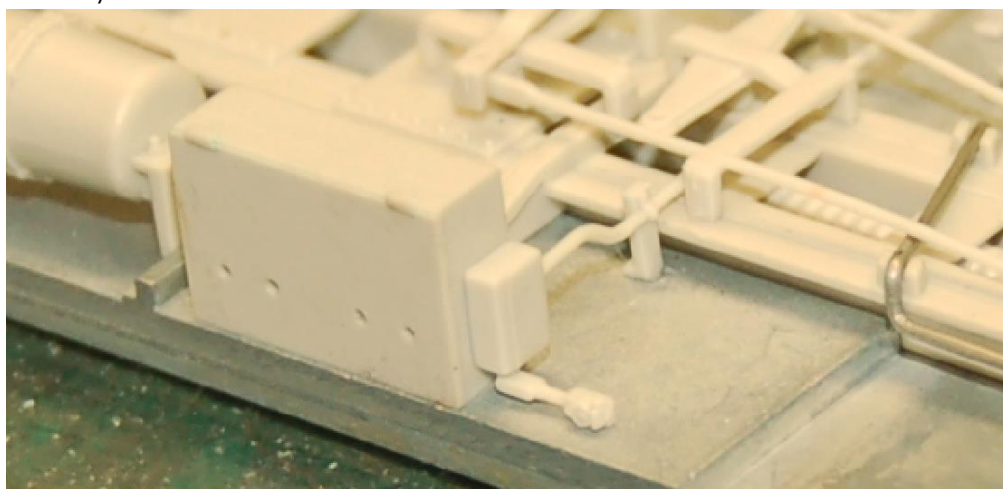




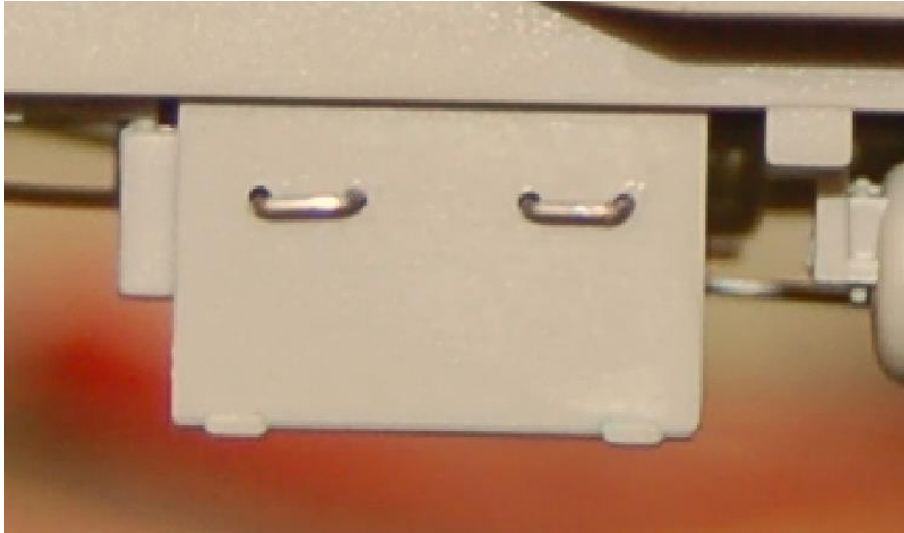
21. **Install the battery box.** Install the battery box (part 2-10) into the floor.



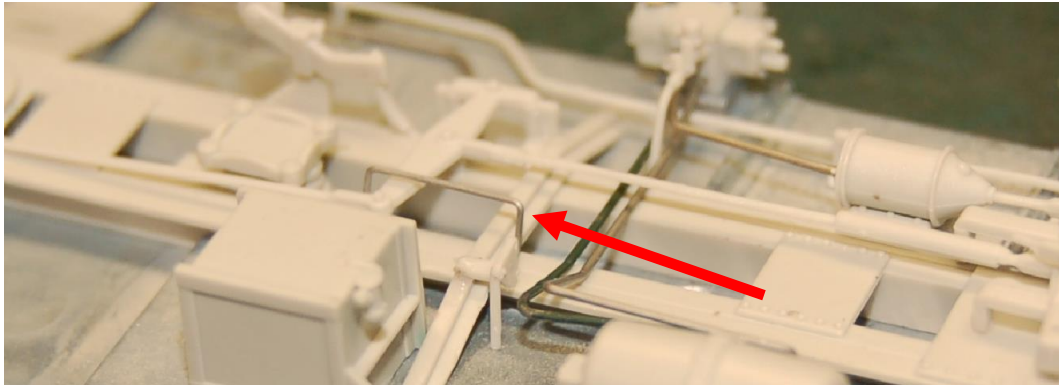
22. **Install the electrical box.** Install the electrical box (part 2-18) into the slot on the side of the battery box.



23. **Install the battery box wire handles.** Glue the two small U-shaped grab irons (part 10-17) into the holes in the front of the battery box.

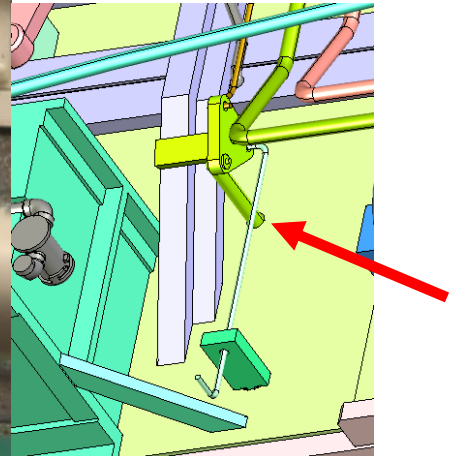
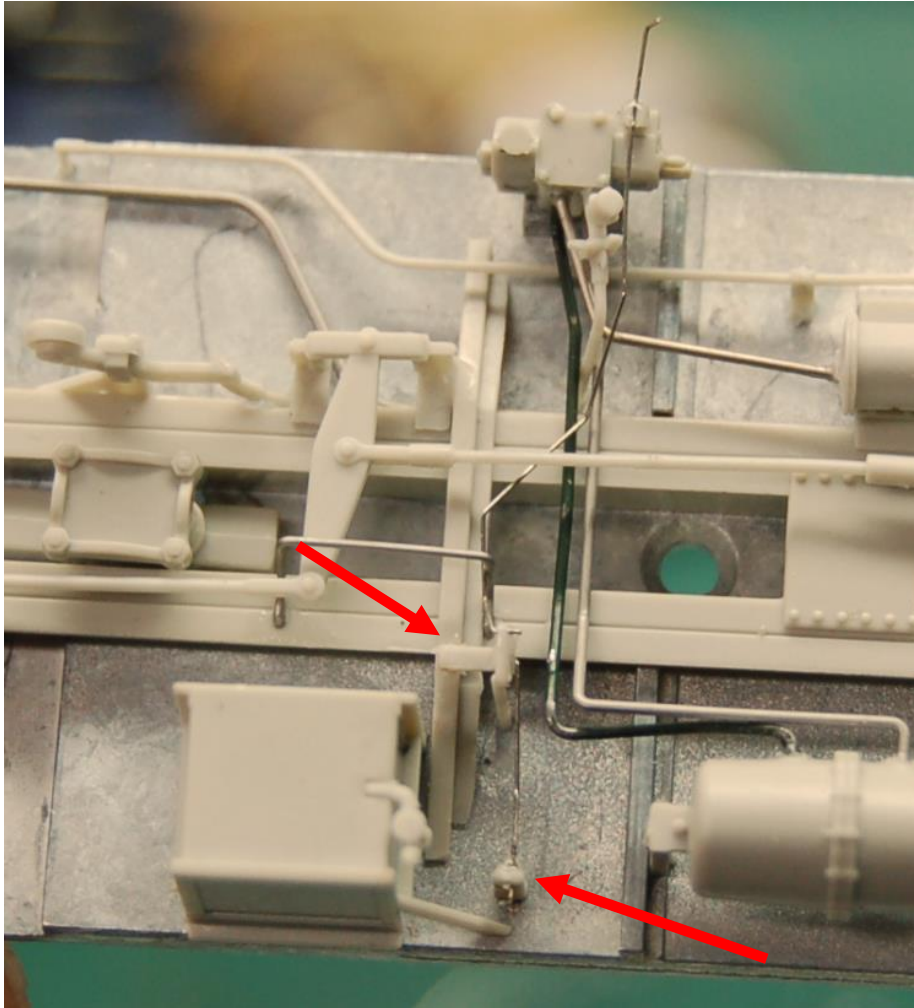


24. **Install the brake rod support.** Locate the brake rod support (part 10-18) from the wire parts and glue in mounting holes.



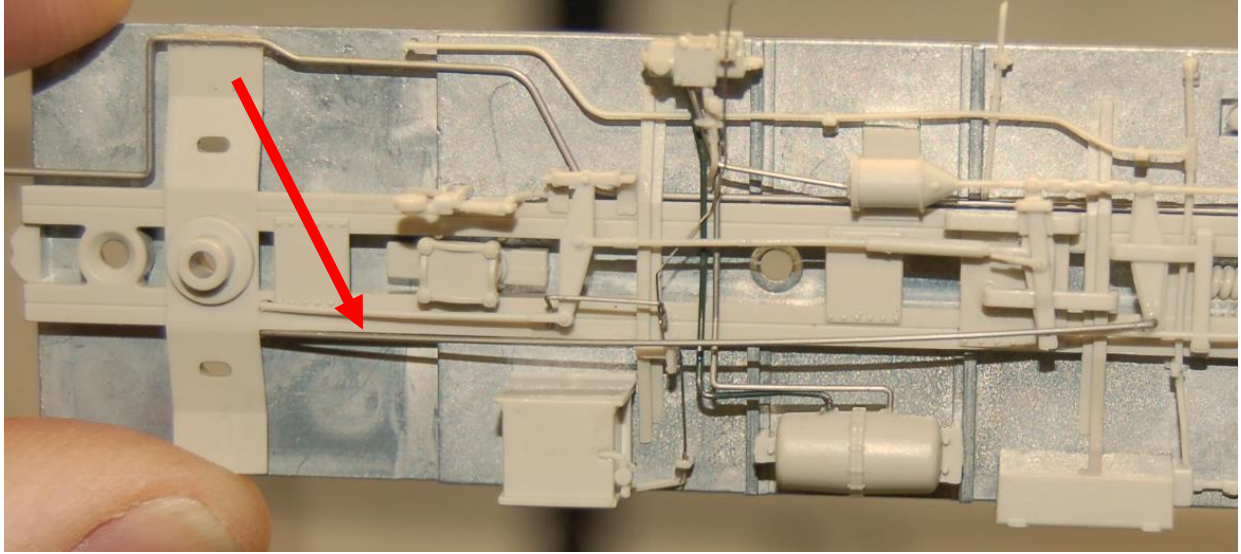


25. **Install the release rod bracket and brake release pivot.** Glue the release rod bracket (part 2-15) into the locating hole next to septic tank. The brake release pivot (part 2-16) rests on top of the stringer next to the septic tank where there is a small notch. Locate and glue in place.

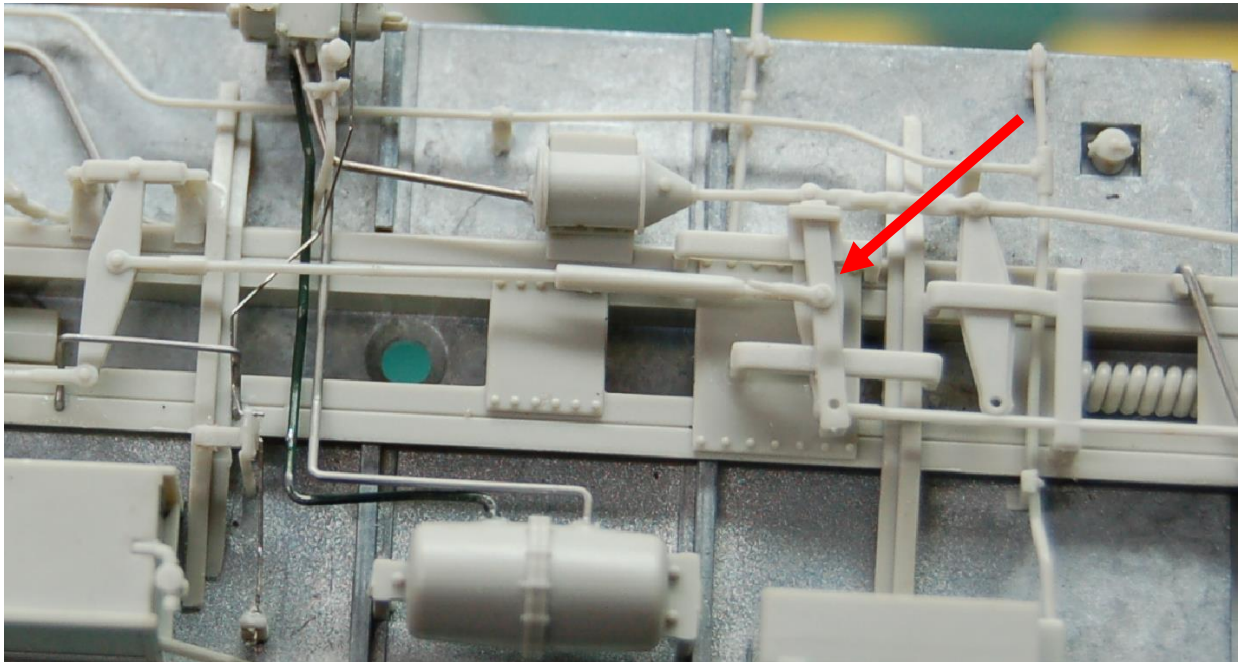


The straight pin just rests on the floor.

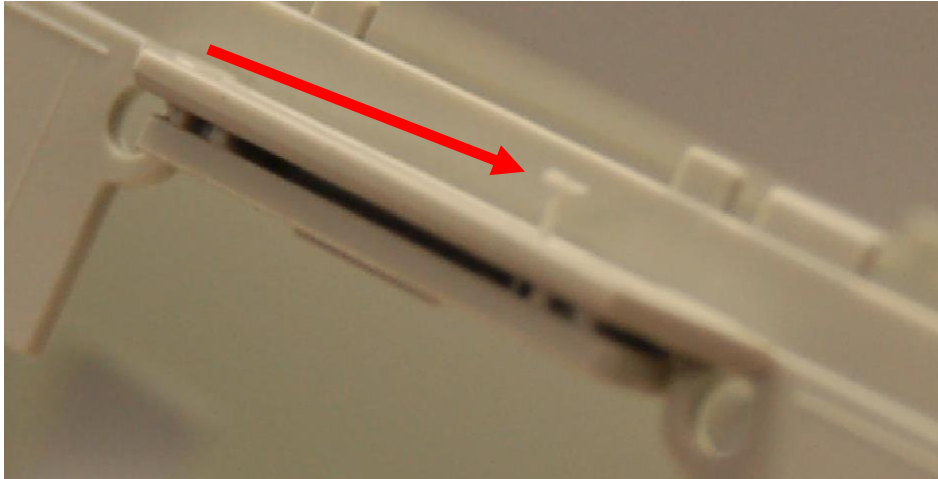
26. **Install the short release rod.** Insert the short release rod (part 10-15) through the brake rod support and into the lower hole in the pivot. Fish the long release rod (part 10-14) under the brake rigging and into the upper hole of the pivot and secure both rods to the pivot. The other end of the long release rod rests on top of the AB valve. Secure with CA. Reference the photo above.
27. **Install the long wire brake rod.** Insert the brake rod (part 10-02) into the hole in the brake lever and the hole in the floor by the bolster.



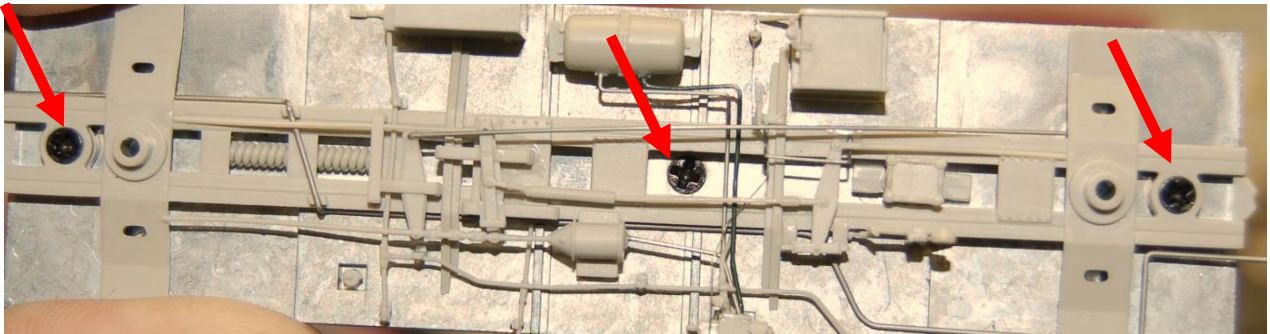
28. **Install the brake piping cap.** Glue the brake piping cap (part 2-05) on top of the center brake lever.



29. **Install the bay window air bleed.** Locate the bay window air bleed (part 2-20) and glue it into the hole in the lower bay floor.



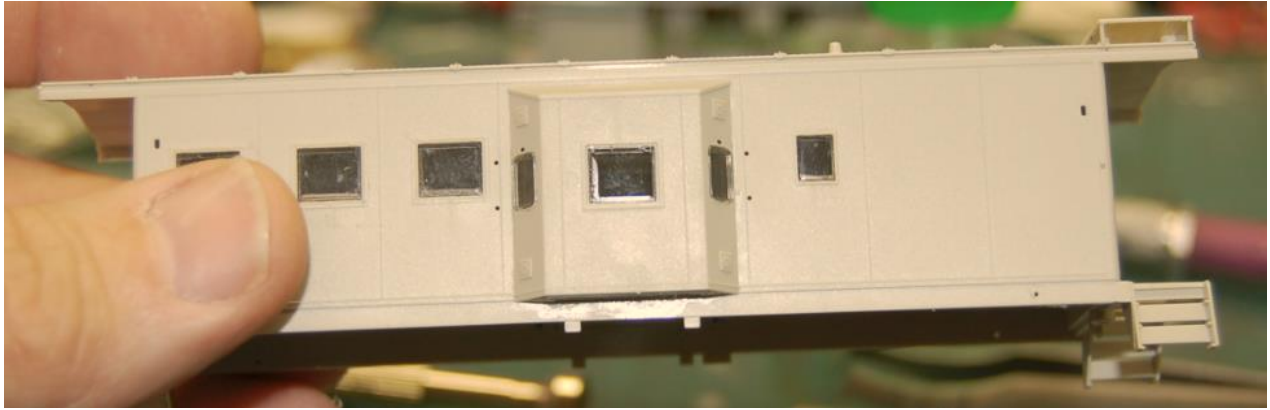
30. **Coupler pockets will be installed later.** Set the coupler pockets aside for a later set of steps.
31. **Join the lower and upper floors using screws.** Join the floors together so that the hole in the upper floor lines up with the one in the lower floor and use the three (Part 12-05) "Flat-head machine thread screws long" to attach.



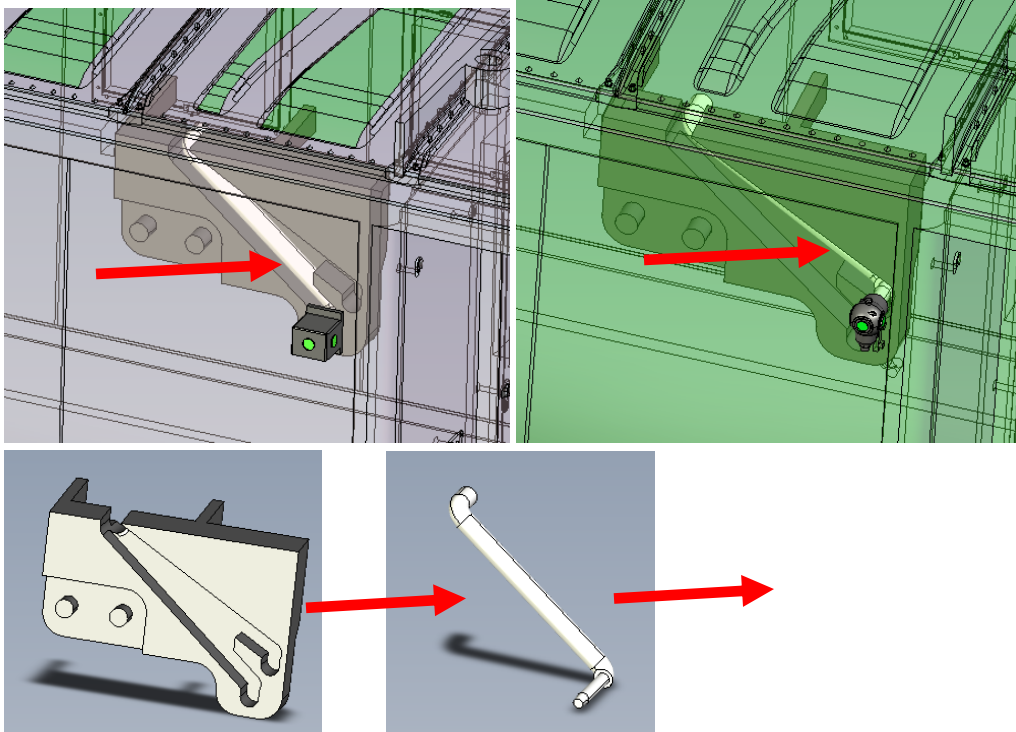
#### **Body (Shell) Assembly:**

32. **Preamble – plan for painting.** We will start by installing the window glass so you may choose to paint the body first or do it later.
33. **Install all window glass.** Remove all window glass from bag 5 and install in the body and bays.





34. **Install the marker lights (either box style or pyle, depending on you kit).** Insert the light rod into the light rod cases (parts 3-04 and 3-05) lower slot (for box style) or upper slot for pyle style) and glue the light rod case inside of the body.

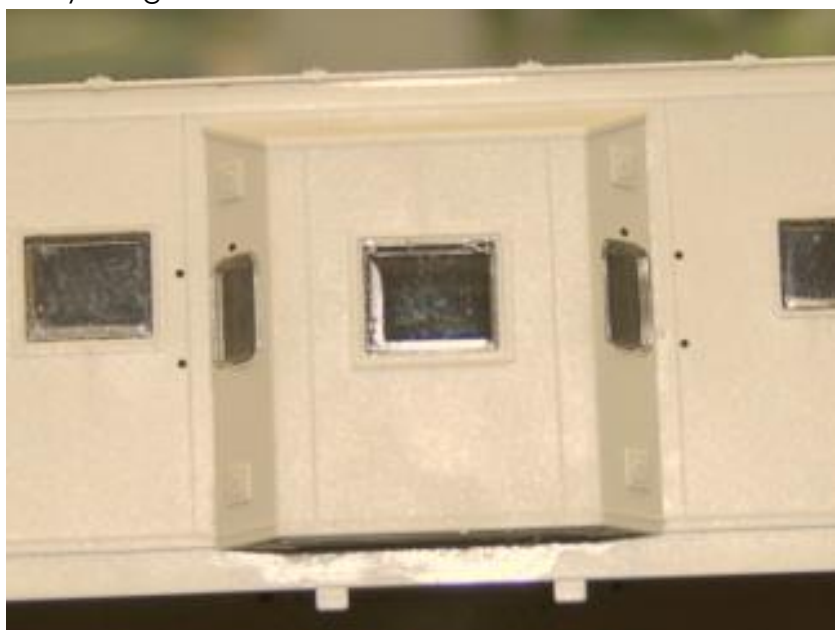




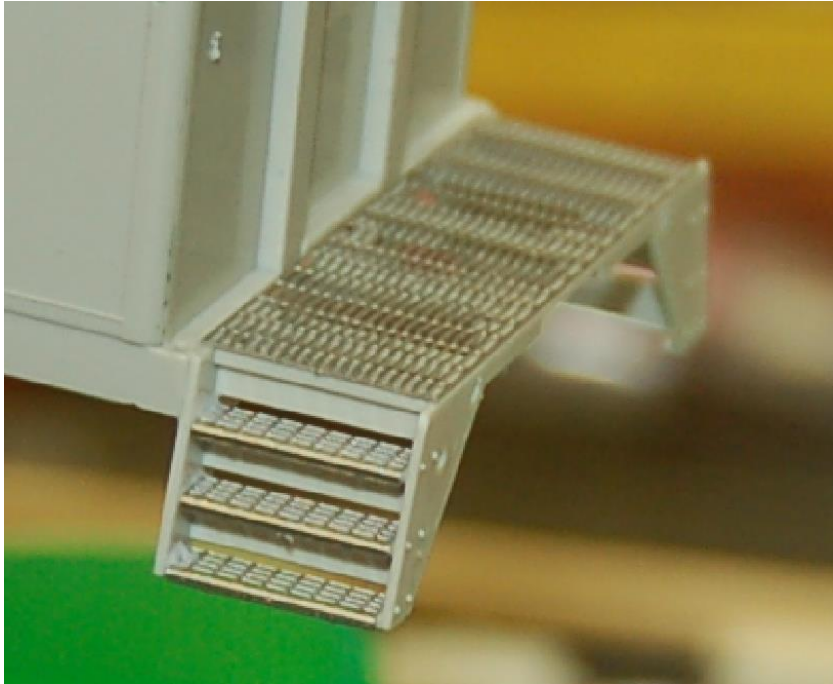
35. **Install the running board.** Note this plastic running board is a press fit.



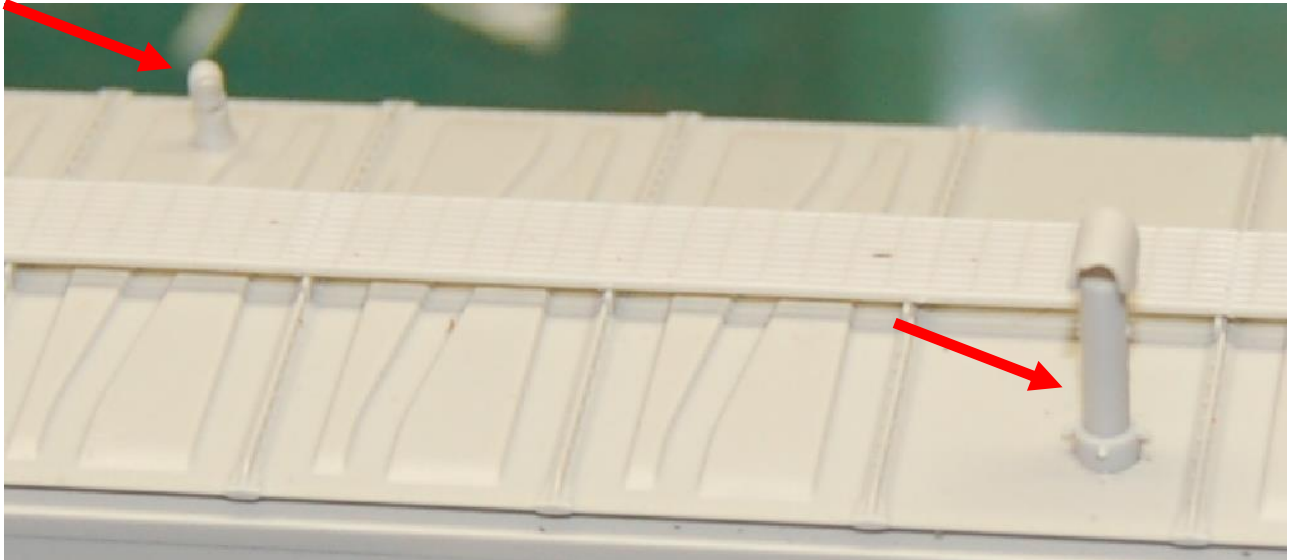
36. **Install the bay window parts.** Install and glue the bay window assemblies (Parts 6-01) onto body using the locator holes.



37. **Install the etched metal walkways.** Remove the end walkways (Parts 11-02) and 12 step treads (Parts 11-03) from bag 11. The end walkways fit into a small recess under the door and you want to position it so that it overhangs the step well equally on both sides. We recommend canopy glue for these parts as it works better when joining dissimilar materials. The step treads have a small lip that goes toward the front of the step. Glue all 12 step treads in place.



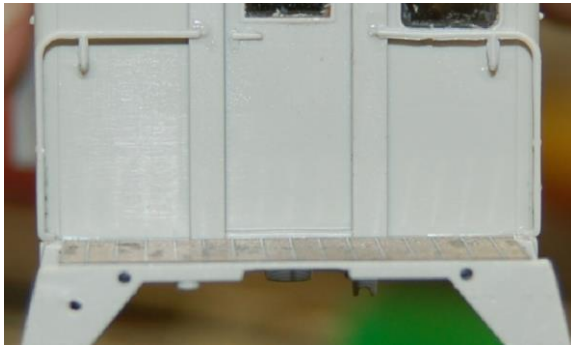
38. **Install the smoke jack and toilet vent onto the roof.** Open parts bag 6 and remove contents. Locate the smoke jack and toilet vent and glue in place.



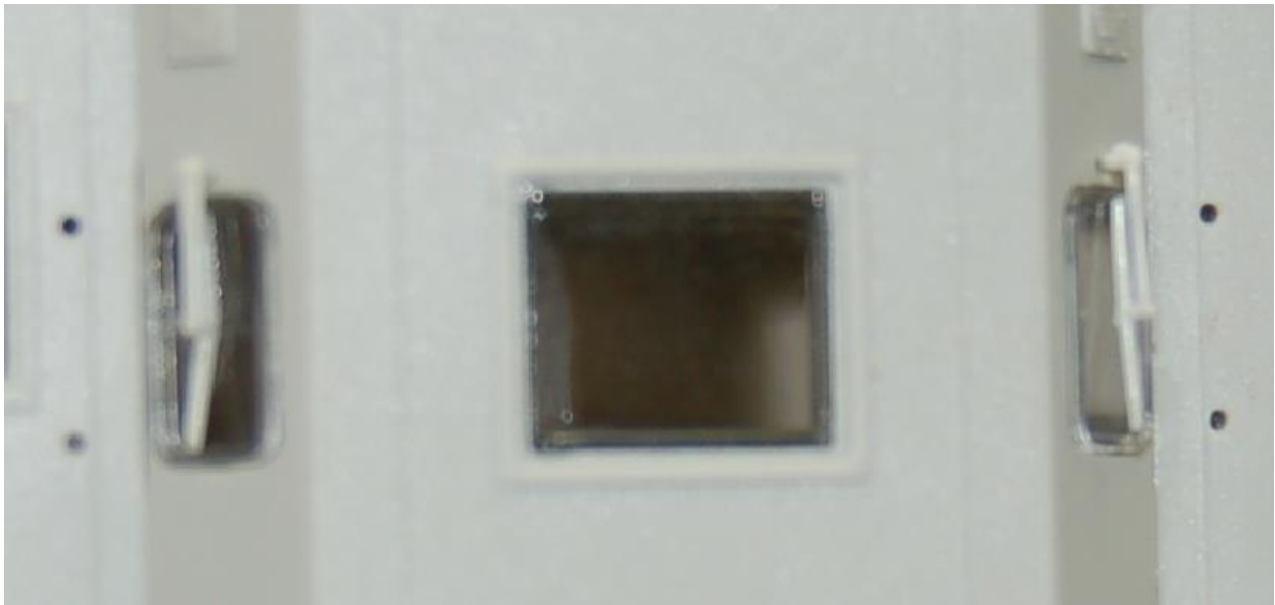
39. **Install the fuel fill cap.** Install the fuel fill cap (part 6-14) into the hole next to the end door making sure it is tilted upward and glue in place.



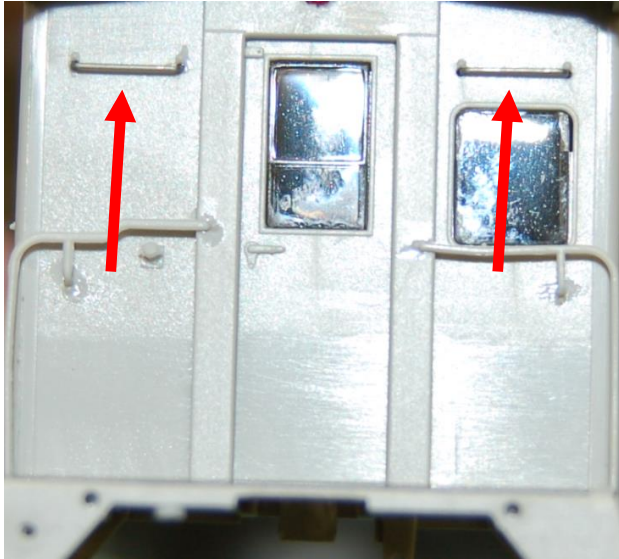
40. **Install end railings onto the end of the caboose.** There are left and right end railings (parts 6-04, 6-05, and 6-06), with one left hand railing having a “bumpout” for the fuel fill. Insert all four railings in their proper positions and glue in place.



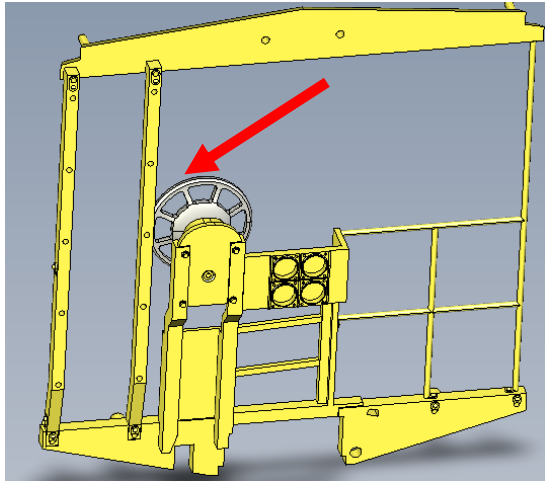
41. **Install the windshield wipers to the bay window windows.** There are four windshield wipers (part 6-03) that should be installed above the four side windows of the bay. The mounting pins and mounting holes are angled so it is best to preposition the parts before gluing in place.



42. **Install the grab irons to the end of the car.** There are 18 straight grab irons, 8 with longer legs (part 10-07) and 10 with shorter legs (part 10-08). The ones with the longer legs go above the end windows and on the end sill. The ones with the short legs are the end ladder rungs. Install the 4 grab irons above the end windows with CA and secure.



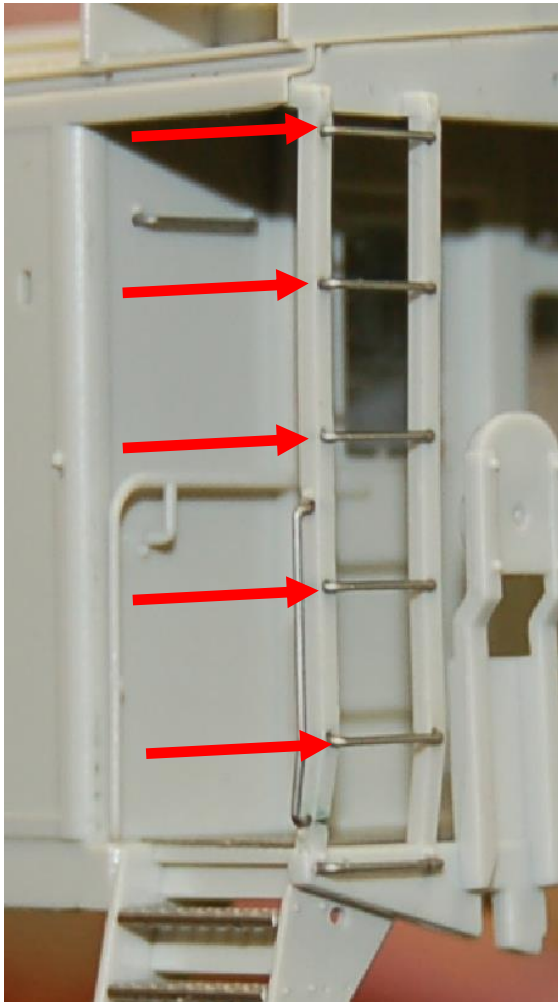
43. **Install the brakewheels to the end cages.** Remove the end cages from bag 7 and install the brakewheels.



44. **Install the end cages.** Glue the end cages to the car body. (Note we did not install the brakewheel for this image)



45. **Install the ladder grab irons.** Glue the short leg grab irons into the ladder styles making sure that they do not stick out the back side.

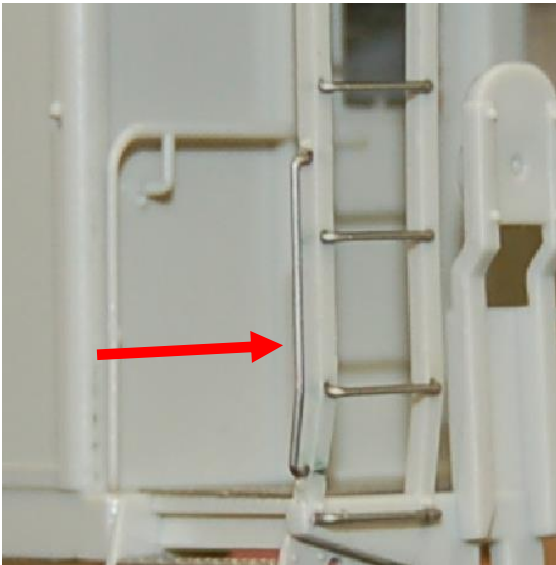




46. **Install grab irons to end sill.** Glue the last four grab irons to the end sill.



47. **Install vertical grab iron to corner of car.** There is a vertical grab iron that goes on the right hand side of the car. It has a slight bend in it which goes toward the bottom to follow the vertical end support. Glue in place on both sides of the car, again making sure it does not stick out the back.

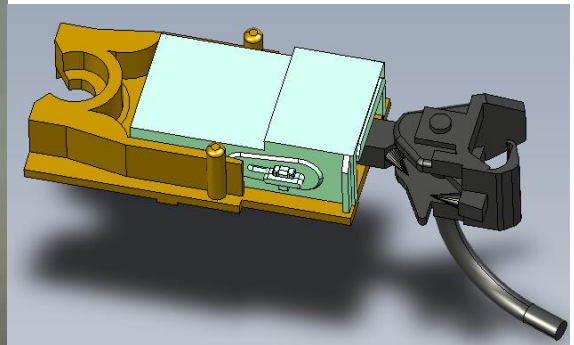


48. **Install the four curved corner grabs to the side of the caboose.** The four curved corner grabs (parts 10-09 and 10-10) have a part of the leg that straightens out. This end goes toward the top. Locate and glue all four in place.



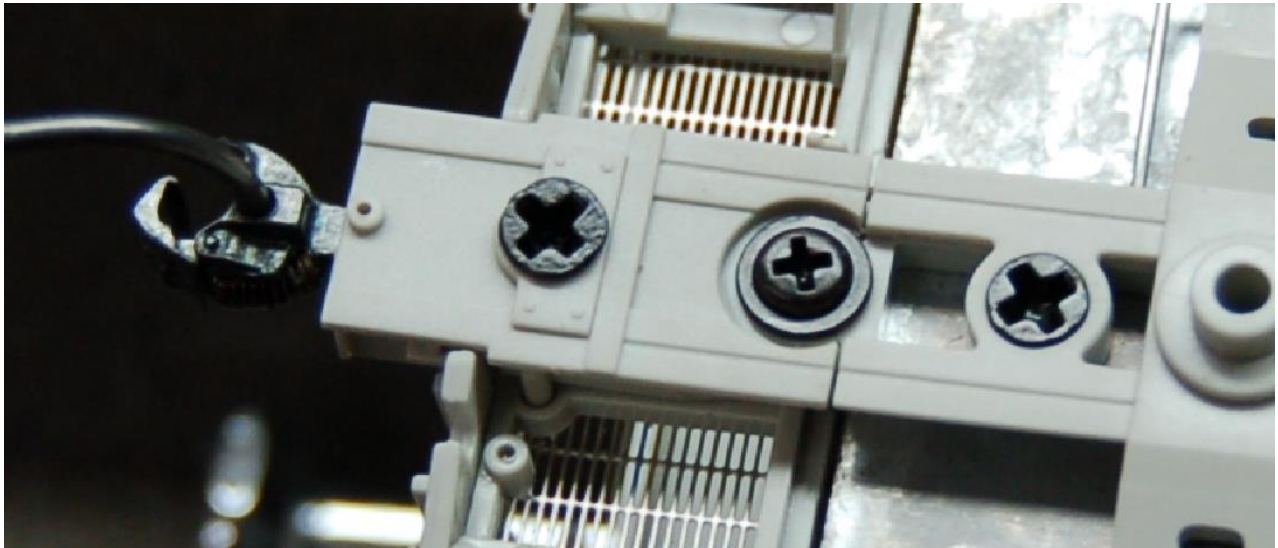
### Complete Model Assembly:

49. **Insert the underframe/interior assembly into the car body.** Make sure to orient the assembly so the stove lines up under the smoke jack and the toilet is under the vent. This will be held in place with screws, so gluing during this step is not necessary.
50. **Assemble the coupler pockets.** Using the small flat head screws, take the coupler pockets that were set aside earlier in the process and assemble. You may want to assemble without a coupler for painting (more steps), or you can tape it off later (fewer steps - easier).





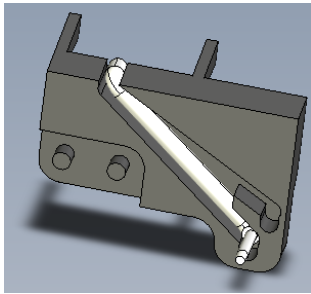
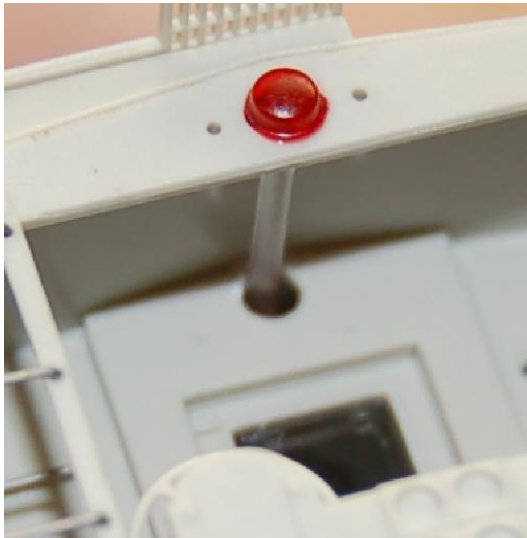
51. **Install the couplers onto the underframe.** Position the coupler box assembly so that the small pins fit into the holes under the end walkway and secure with the smaller pan head screws with washers.



52. **Install the light bar for the end FRA flasher light (For Undec Model 60000-01 Only).** Insert the long straight light bar into the back of the end marker lens and secure.

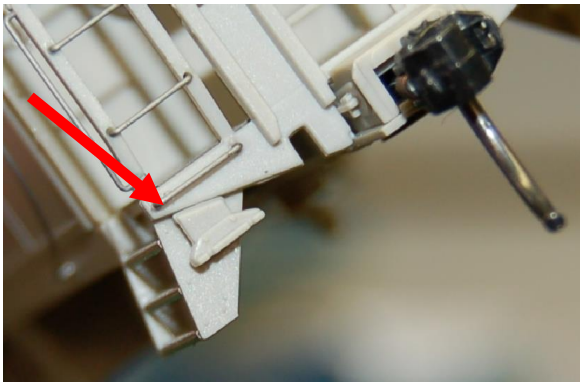


53. **Install the light bar and FRA flasher assembly to the body.** Insert the assembly through the opening on the end of the car and line up the pegs on the lens with the slots on the side of the opening and glue in place.

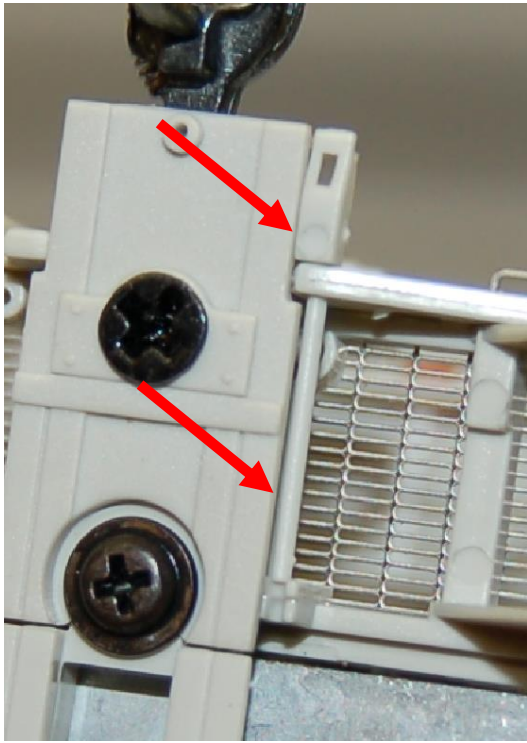


The box or pyle marker part will then be attached with glue from the outside of the caboose body. Repeat for the other end of the caboose.

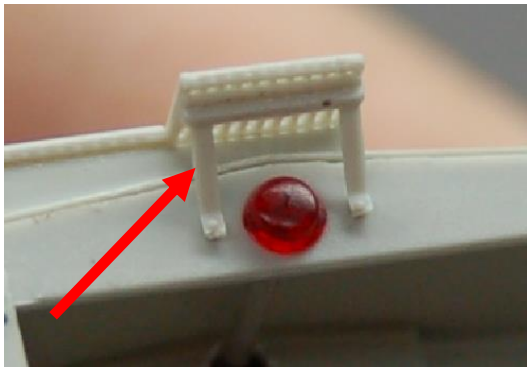
54. **Install the plastic coupler lift bar brackets.** Glue the coupler lift bar bracket (part 6-08) into the locating hole on the left-hand side of the end sill. Repeat for the other end of the caboose.



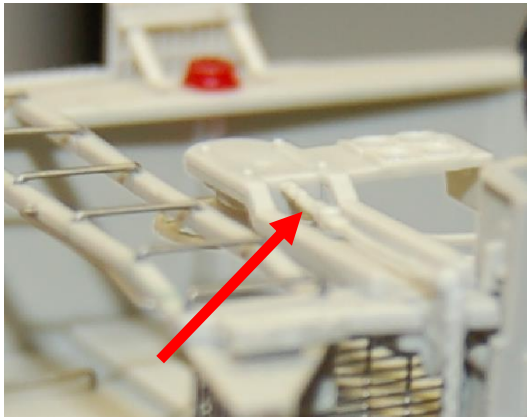
55. **Install the air hose pipes.** Insert the air hose pipes (part 6-10) and insert them into the holes next to the coupler pockets with the flat side facing down (toward the tracks) and the back end of the pipe resting in the slot under the walkway.



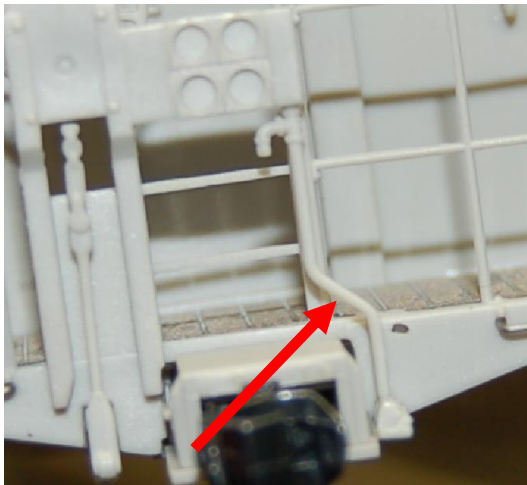
56. **Install the running board supports.** Glue the running board support (part 6-02) in place. Repeat for the other end of the caboose.



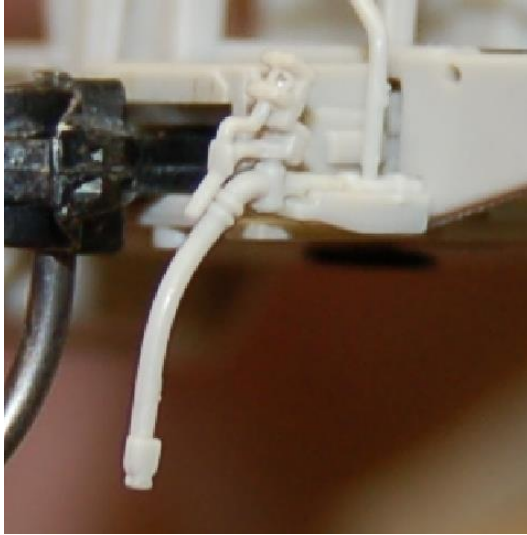
57. **Install the brake chain.** Glue the brake chain (part 6-07) into the slot to the left of the coupler pocket. Repeat for the other end of the caboose.



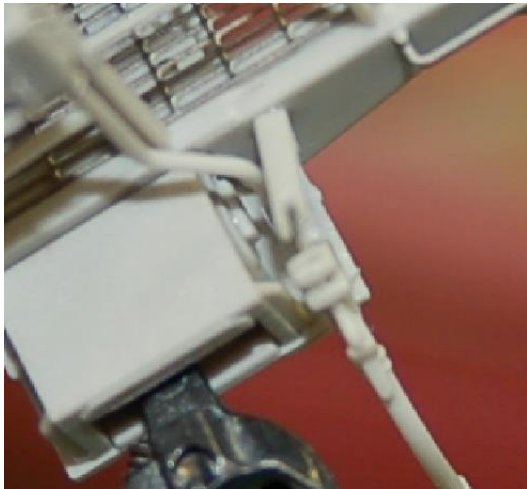
58. **Install the whistle pipe.** There is a small hole in the coupling of the air hose pipe. The whistle pipe (part 6-12) fits into this hole and the other end of the pipe fits behind the plate for the end markers. Position whistle pipe and glue. Repeat for the other end of the caboose.



59. **Install the air hoses.** Install the air hoses (part 6-09) into the slots of the air hose pipes and secure. Repeat for the other end of the caboose.



60. **Install the angle cock rod support.** The angle cock rod support (part 6-13) installs into the small slot to the right of the whistle pipe in the end sill. It will angle upward and position it so that the slot in the end lines up with the hole in the top of the angle cock. Repeat for the other end of the caboose.

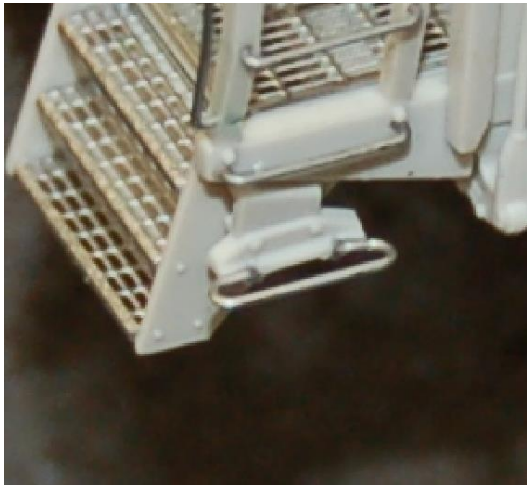


61. **Insert the angle cock handle.** Insert the wire angle cock handle (part 10-13) into the hole in the angle cock and rest it into the slot of the rod support. Secure with CA. Repeat for the other end of the caboose.

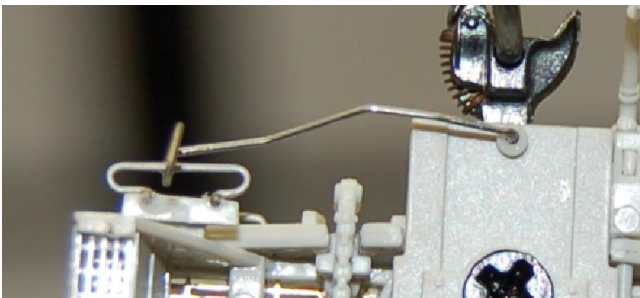




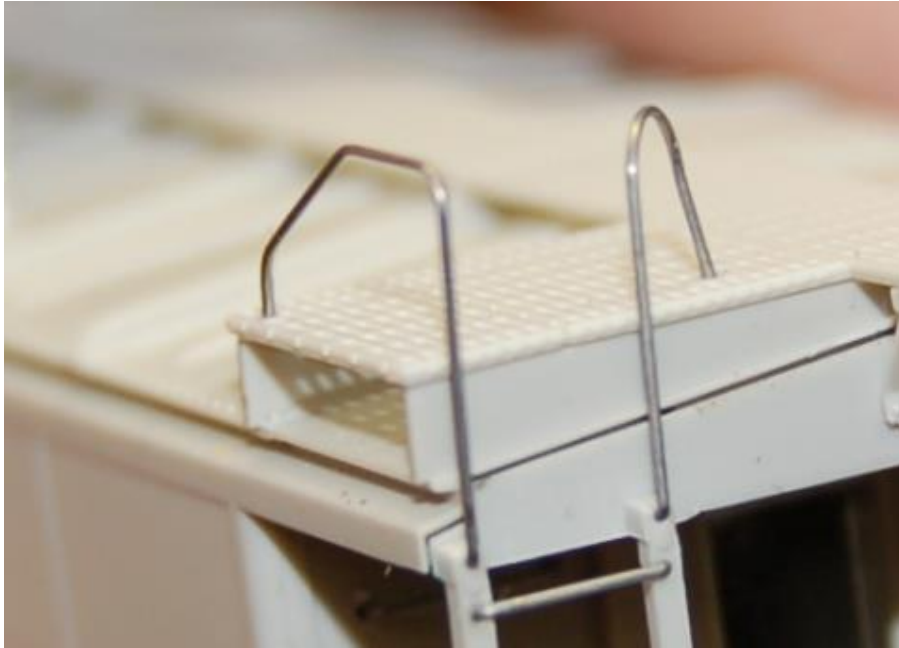
62. **Install the wire coupler lift bar support.** Install the wire coupler lift bar support (part 10-19) into the slots of the coupler lift bar bracket with the pins facing down. Glue in place. Repeat for the other end of the caboose.



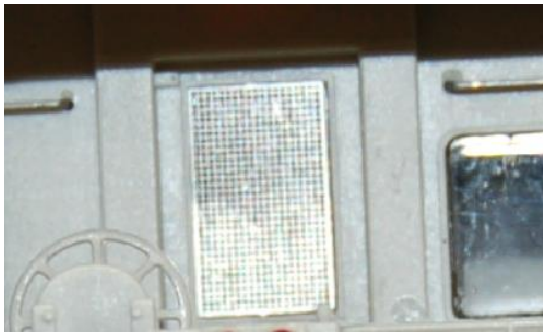
63. **Install the coupler lift bars.** Fish the wire coupler lift bar (part 10-06) through the bracket and insert the other end into the small opening under the coupler pocket. Secure. Repeat for the other end of the caboose.



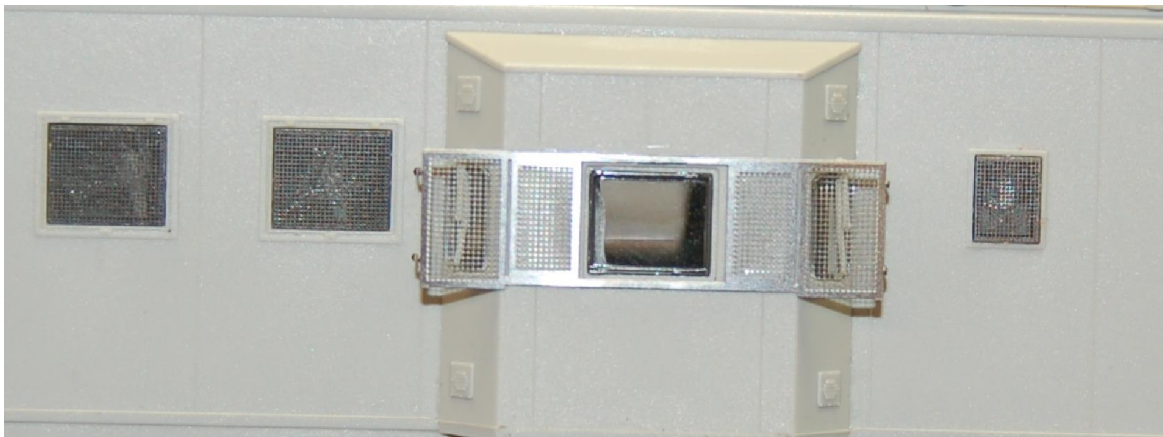
64. **Install the ladder railings to the top of the caboose.** Open the top two holes of the ladder styles with a #79 drill. Install the ladder railings (part 10-21) making sure that the ends are not visible through the lateral walkways. Secure. Repeat for the other end of the caboose.



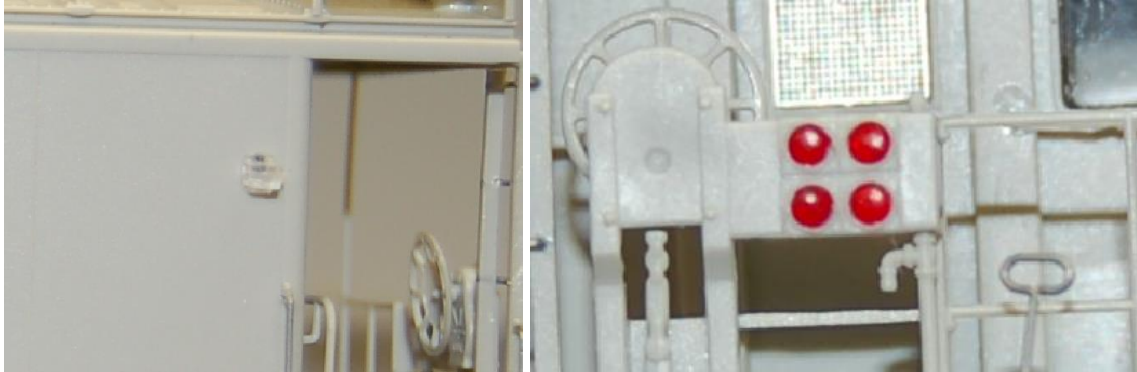
65. **Install the end window screens.** Install the end window screens to the door windows using a small amount of canopy glue, applied sparingly.



66. **Install the side window screens.** Install the side window screens using a small amount of canopy glue. (They rest on "top" of the glass.) The large metal bay window screen needs the end supports bent at a 90-degree angle. Insert into the holes in the car body and secure with CA in those 4 holes. Repeat for the other side of the caboose.



67. **Install the end railing lenses and side marker lights.** Test fit and secure the end railing lenses and side marker lights. Repeat for the other end/side of the caboose.



68. **Install the trucks.** Using the remaining truck screws provided, install the trucks.

This concludes the construction phase.

#### **FINISHING UP:**

69. **Paint the car.** Refer to photos, and if the caboose is fully assembled, don't forget to mask the windows, screens, and couplers so they will not be painted or "sticky" from the paint.

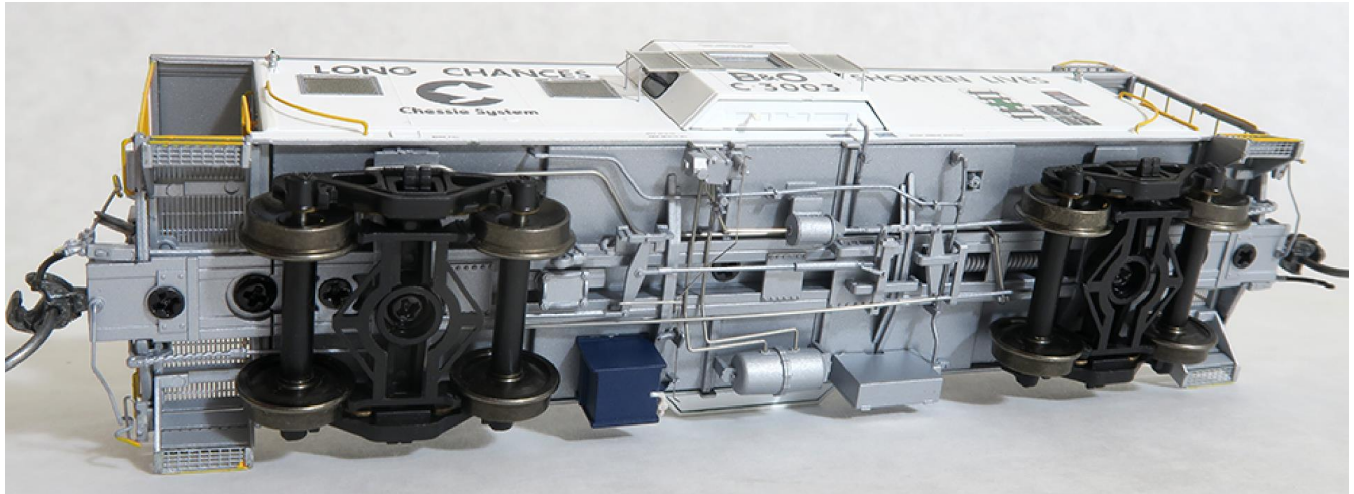
This concludes the assembly of your kit. We hope you have enjoyed building our B&O ICC I-18 Steel Bay Window Caboose kit, and we thank you for your support of Tangent Scale Models! Your hard-earned dollars allow us to continue to bring you more models in the future.

Want to share your creation with the world? Please feel free to upload an image of your customized Tangent model to: <http://tangentscalemodels.com/share/>

More images of finished cars are on the following pages.







**TANGENT**  
SCALE MODELS





**TANGENT**  
SCALE MODELS







