

Conowingo Models



# 44-Ton Boxbug and Paxbug Doodlebug

HO SCALE



[www.conowingomodels.com](http://www.conowingomodels.com)  
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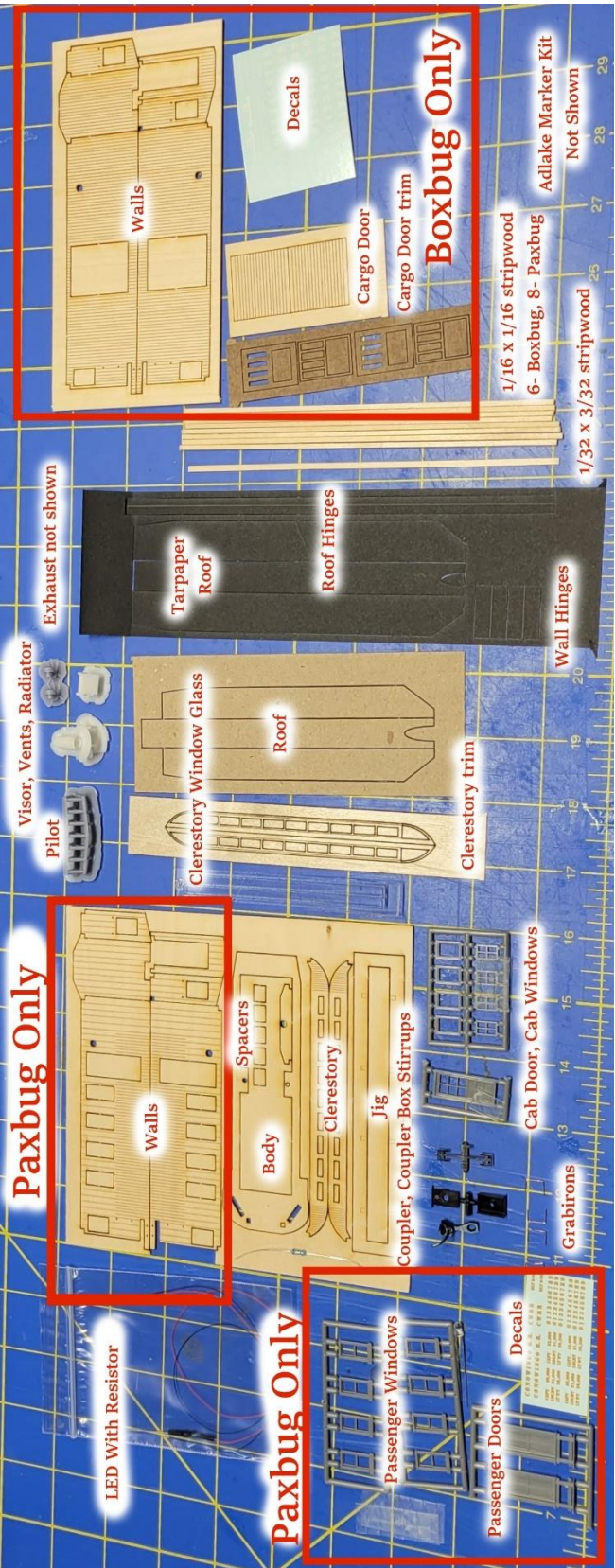
Thank you for purchasing this kit!

You will need to purchase an HO-scale Bachmann 44-Ton Switcher to complete this conversion.

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## PARTS DIAGRAM



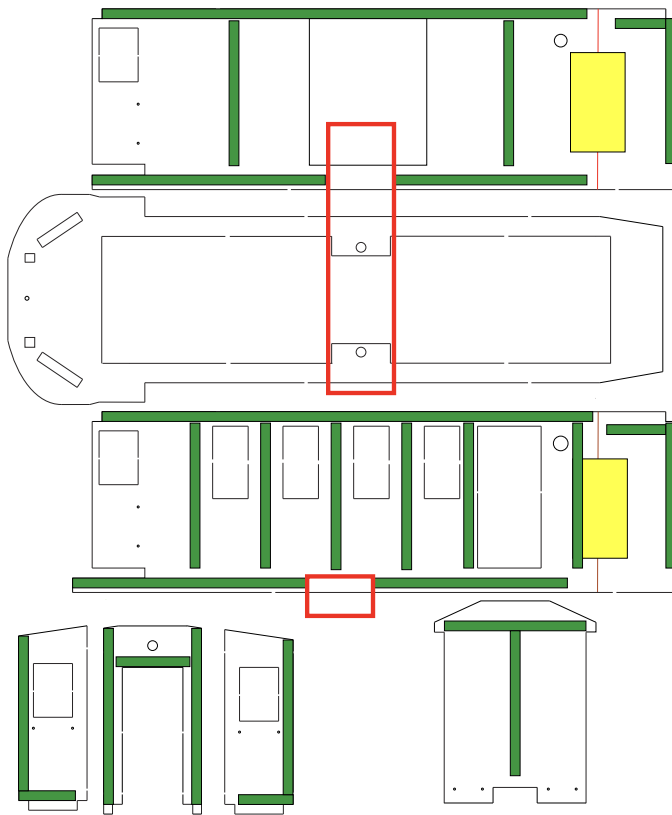
## PREPARE THE MECHANISM

We tried the 70-Ton version, but decided that it doesn't quite fit the bill. You may try to fit it on another body, but we didn't develop any instructions for that. Additionally, we haven't tried the new, DCC Bachmann 44-Ton. However, it appears to be an updated version of the DC version.

Remove the shell by removing the two screws on the center side portion of the underside. **KEEP THE SCREWS!** Some undercarriages may need to be painted to fall in line with your desired paint scheme.

## BRACING

1. Note the scored line towards the rear of the main body halves. Using a pencil, retrace that line on the inside. This will form a bend later on.

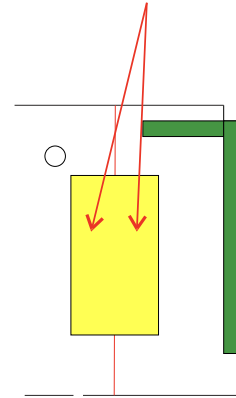


2. Using 1/16 stripwood, brace the top and bottom of the main body using a glue of your choice.

The Boxbug is shown on top, while the Pax bug is shown third down. Only one side of each model is shown for clarity.

The area shown above in a red box is where the body will contact the mechanism. Use the body as a guide to figure out where to and not to add the bracing.

Be sure the ends allow for flexibility at the bends and where the rear piece will connect at the bottom. Apply clamps as necessary to ensure a snug fit.



3. Add two strips of glue to the pre-cut pieces of black construction paper. You want the strips to straddle the bends from step 1, so that the glue does not go over the bend.

The purpose of this is to form a "wall hinge", so when you bend the walls when you attach them to the body, they stay together.

## PAINTING AND PARTS PREPARATION

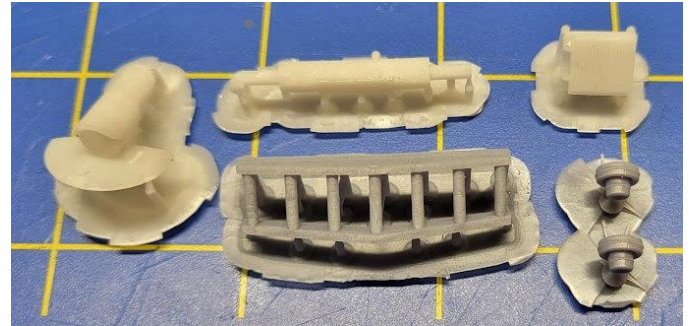
This is to serve as a guide for painting the components of your kit. The colors listed are intended to serve as a guide, based on the pilot models. Please choose your own colors where appropriate. This is your model, not ours.

On the Paxbug, we decided to do an homage to the Boston & Maine. As it turns out, they simply repainted the lettering on used Pennsylvania Railroad coaches. Our pilot model red probably isn't correct, but it looks good just the same. However, it does photograph differently than it looks in real life.

Part	Quantity	Color	Boxbug	Paxbug	Notes
Body Frame	1	Black	X	X	Don't forget underside
Clerestory Trim	2	Black		X	
Cab Door	1	Black		X	
Grabirons	4	Black	X	X	Paint during Final Touchups
Headlight	1	Black	X		Older kits only. Silver in lamp area
Passenger Door	2	Black		X	
Passenger Windows	8	Black		X	
Pilot	1	Black	X	X	
Roof vents	2	Black	X	X	Metal
Small Widows	4	Black		X	
Stirrups	2	Black	X	X	
Visor	1	Black	X	X	Silver in lamp area
Bell	1	Brass	X	X	Newer kits - bell on visor
Whistle	1	Brass	X	X	
1/32 x 3/32 stripwood	1	Driftwood	X		Cargo Door Step
Roofing	3	Grey	X	X	See Roof Prep Section
Exhaust	1	Metal	X	X	Newer kits only
Radiator	1	Metal	X	X	Newer kits only
Smoke Jack	1	Metal	X		Older kits only
1/16 x 1/16 stripwood	1	Red	X		Cargo Door Frame
Bell Mount	1	Red	X		Older kits only
Cargo Door	2	Red	X		
Cargo Door Smaller Trim	2	Red	X		
Clerestory	2	Red	X		
Cab Door	1	Red	X		
Small Widows	4	Red	X		
1/32 x 1/16 stripwood	1	Tuscan Red		X	Cab trim
1/32 x 1/32 stripwood	1	Tuscan Red		X	Passenger trim rail
Aft wall	1	Tuscan Red		X	
Clerestory	2	Tuscan Red		X	
Front walls	3	Tuscan Red		X	
Side walls	2	Tuscan Red		X	
1/32 x 1/16 stripwood	1	Yellow	X		Cab trim. 1/32 x 1/32 in older kits
Aft wall	1	Yellow	X		
Cargo Door Larger Trim	2	Yellow	X		
Clerestory Trim	2	Yellow	X		
Front walls	3	Yellow	X		
Side walls	2	Yellow	X		

## 3D PARTS

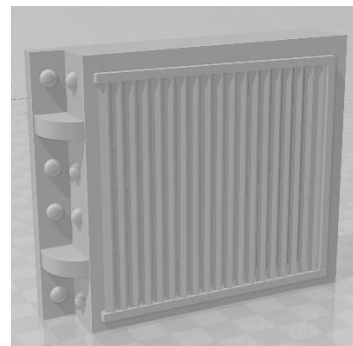
We left the 3d printed parts on their carriers, figuring that they'd transport better that way. Carefully cut away from the part with your hobby knife. (Some parts not shown)



On the left is the visor. It contains the visor itself, the headlight and the bell. We recommend painting the whole assembly black. Then, paint the inside of the headlight silver and the entire bell brass. We found Valejo Brass to be an excellent product for this.

The exhaust (top center) can be painted a metallic or steel color.

The pilot (bottom center) can be painted black



The radiator is based on the radiator of the M-1 at the East Broad Top Railroad. It has been heavily modified to suit our needs. On the left is the side that faces forward. It can be painted a metallic or steel color. On the M-1, it would be on the left side. However, it could go on the right side.

The mushroom vents are painted black, however a metallic or steel color would also be appropriate.

## DOOR AND WINDOW PREPARATION



1. The cab door comes with muntins installed. Remove them if desired.
2. The four windows that go on either side of the cab have a muntins piece. We didn't install it, but the choice is yours.
3. Using a clear-drying adhesive, glue the windows onto the backside of the door and all windows.

The clerestory will be built up separately.

## BUILD THE CLERESTORY

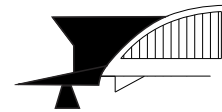
1. Locate four of the five blocks, the two basswood clerestory pieces, two 1/32 plywood trim pieces and two acetate pieces.
2. Ensure all the windows and clerestory trim piece knock outs are removed.

We included a jig, which we figured would help keep the clerestory square as you are constructing it. Use it as you see fit.

3. Glue the basswood clerestory frame and trim pieces together as shown below. You may want to clamp the pieces together to keep them flat. Do this part for each half.
4. Glue the four spacers into place on the inside of one half as shown below. The tall side goes vertically.

The spacers are rectangular pieces on the 1/16 basswood sheet with the frame on it. There are actually five pieces. The intent is to form the width of the clerestory.

5. Take the two acetate window pieces, cut them to fit between the blocks and glue them into place. You may choose to cut some scrap wood and use it in place of the acetate. This could simulate a conversion of the doodlebug from a passenger configuration to a freight configuration.
6. Dry fit the two halves together, ensuring they are square.

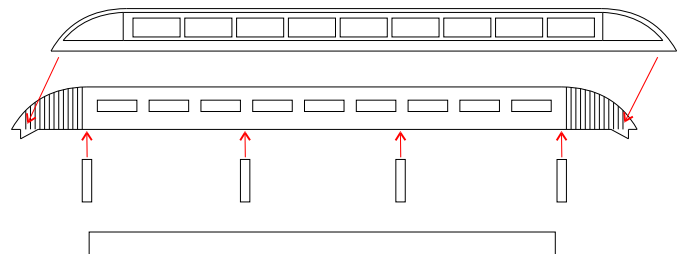


Test fit the visor assembly into its' place on the front end of the clerestory. It should be positioned so that the visor itself hangs in front of, and touching the center cab wall.

It may require some trimming.

Once you're happy with the fit, remove the visor assembly and glue the clerestory together.

We found that clamping these two pieces together helps immensely.



7. Locate the black "roof hinge" strips as shown above. There are two of them. Glue them to the bottoms of each side so that the excess sticks out the outboard side.

Viewed from on top, below is how they should appear



This forms a hinge that you will attach the two side pieces of the roof to, and prevents most light from going through.



## CANVAS ROOFING

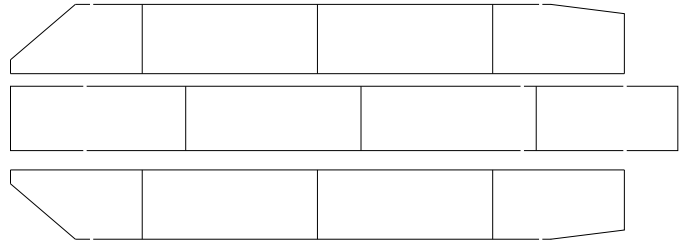


1. Find the black construction paper carrier sheet with the cut strips on it. They look like what you see above

**\*\*\*Do not remove the strips from the carrier sheet yet.\*\*\***

**The front is shown on the left, with the rear on the right. The bottom piece is the left side, top is the right side and the clerestory is in the middle.**

2. You could use it the way it is to represent a brand-new roof by using as single, even coat of dark grey and skipping ahead to step 9. However, we recommend very quickly spray painting it with three different shades of grey. You don't want a uniform cover. Half-sprayed splotches are great.
3. It dries pretty quickly. Once the roofing is dry, cut a strip from the carrier sheet.
4. Take either a 400-grit sanding sponge or sandpaper and gently run it across the construction paper strip. The goal is to blend the paint colors together.
5. If you so desire, you can dig into one of the long the edges and sides of the construction paper enough that the black comes through to show roofing damage. It's your model, your call.



6. OPTIONAL - If you so desire, you can cut the roofing pieces as shown above. Those pieces are about 1.5 inches long.

This would simulate a tarpaper roof. We did this with the Boxbug pilot model, but in retrospect, wish we hadn't as we don't feel that it's realistic. We did not do it with the Paxbug.

7. Glue the prepared construction paper to the corresponding chip board pieces.

On the side pieces, apply the construction paper so that the inside edges match up and the outer edges slightly overhang.

On the clerestory, match up the sides with the ends slightly overhanging.

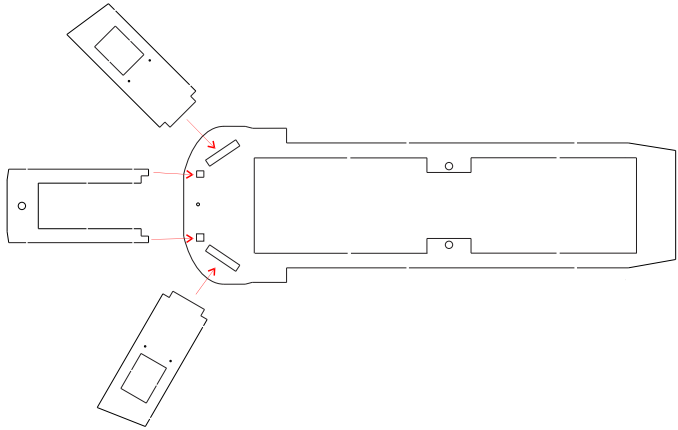
If you had cut down the pieces as shown in step 6, we recommend gluing them down from the front to the rear on the side pieces.

8. Flatten to prevent warping.
9. When dry, curl the overhang to cover what will be the visible edges of the roof. You may need to use a hobby knife to help the process.

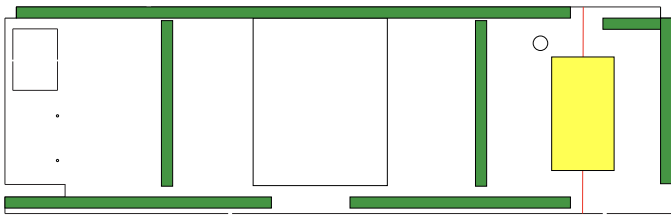
We recommend using some CA on the underside of the roofing material to glue down the edges.

## BODY CONSTRUCTION

1. Add the front cab panels to the body as shown below. We recommend using a slower drying glue for this as it may take some manipulating to get it right.



2. On the side walls, bend the two wall hinges at the bend lines that you had previously braced with cardstock. Try not to break them. If you are worried about breakage, wet them with some water first.

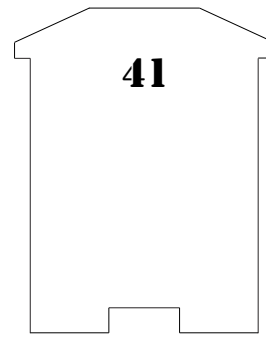


3. Add some glue to the bottom piece of 1/16 stripwood on the side walls.

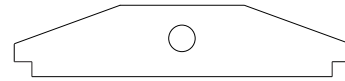
Next, slide the side walls into place, being careful not to break the lips on the forward end of each.

If they do break, you can glue them back into place. It happened with the pilot model. (We subsequently moved the bracing locations.)

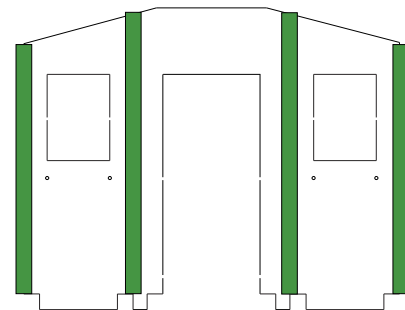
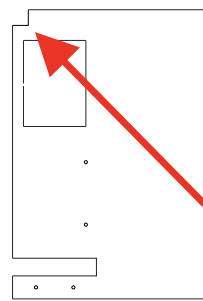
The bend lines should match up with the bend in the aft section of the body frame.



4. To square off the side walls, glue the rear wall into place, using the notches to engage the side walls.



5. You should also glue the small brace (above) to the notches above the front windows.

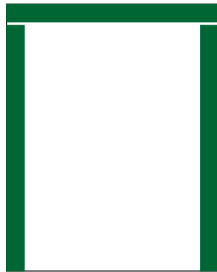


6. Size, cut and install the 3/32 (1/32 on early kits) stripwood to the sides of the pieces shown above so that the seams are hidden. We recommend a fast-drying glue for this step.
7. Trim the tops so that the roof will fit snugly.
8. Glue into place the grabirons. One goes underneath each of the cab windows. They are illustrated on the diagram above and on the diagram in step 2.

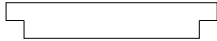
We recommend using a piece of 1/16 stripwood to set the placement for the grabirons.

## BOXBUG- SPECIFIC ITEMS

1. Cut and glue the 1/16 trim for the cargo doors as shown below. The small void between the top and side pieces is only for clarity purposes.



2. Locate the two cargo door sills. They should be glued into place with the wider part on the outside of the doodlebug and the narrower part inside the doorway, between the trim pieces installed above.

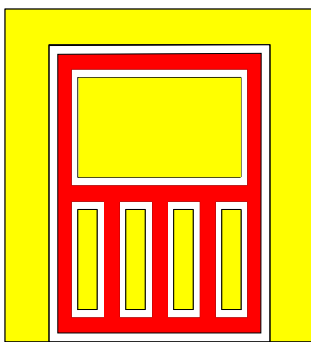


3. This step is optional. Some people may want the cargo doors to be plain jane. Refer to the step below for a visual representation of this step.

Take the 1/32 scribe piece (x2) (Shown in yellow) and orient them so that the scribe runs vertically.

Take the larger piece of laserboard (shown in white) and glue it so that it is centered on the bottom of the scribe.

Take the smaller piece of laserboard (shown in red) and glue it so that it is centered on the larger piece of laserboard.



4. The cargo doors can now be glued into place. The trim on the cargo doors should be centered on the door opening with the bottom of the trim at the bottom, touching the door sill.

It is not advisable to modify the door and leave the door open unless you have something (like built crates) to block the visibility of the mechanism.

## PAXBUG- SPECIFIC ITEMS



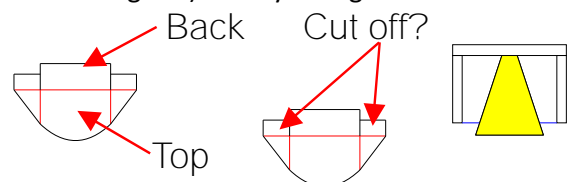
You want to complete this step before adding the roof.

1. Glue into place the passenger doors as shown above.
2. Glue into place the eight passenger windows.
3. Cut and glue into place the 1/32 x 1/32 stripwood trim rail as shown above.
4. Cut the yellow cardstock to cover three sides of the passenger windows; top, right and left.

Varying lengths show “signs of life”.

## BELL ASSEMBLY (EARLY BOXBUG KITS)

1. Locate the bell hanger on the laserboard sheet. It looks like the piece below on the left. The areas shown in red are bends. Laserboard tends to be stiff, so manipulate it with your fingers. You want it to form a shelf with a backer. You might consider cutting off the shorter wing pieces (as shown on the middle diagram). It may fit together better that way.



- 23b. Glue the bell into place using a fast-drying adhesive.
- 23c. Glue the bell assembly into a place of your choosing. We chose to install it above the right, forward window, out of the engineer’s line of site.

## WIRING

1. Install the Adlake markers into their respective holes as shown below.



2. Install the small LED in the headlight on the visor.

Note this LED has a prewired resistor. You may choose to shorten the wire and move the resistor in the process.

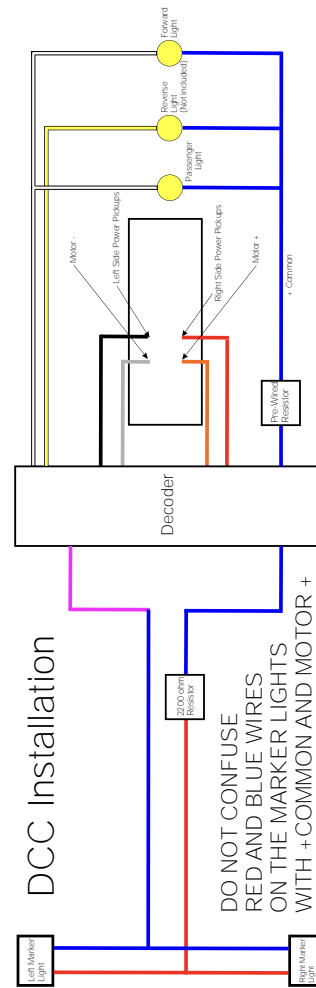
We used CA to glue the wire into place and a small piece of masking tape to hold it there. This helps protect the wires from separating from the LED. If this happens, most likely the LED will be destroyed.

3. When dry, glue the headlight lens into place using a clear-drying glue.
4. (PAXBUG ONLY) Install the yellow 3mm LED at a place of your choosing. The resistor is for this LED.

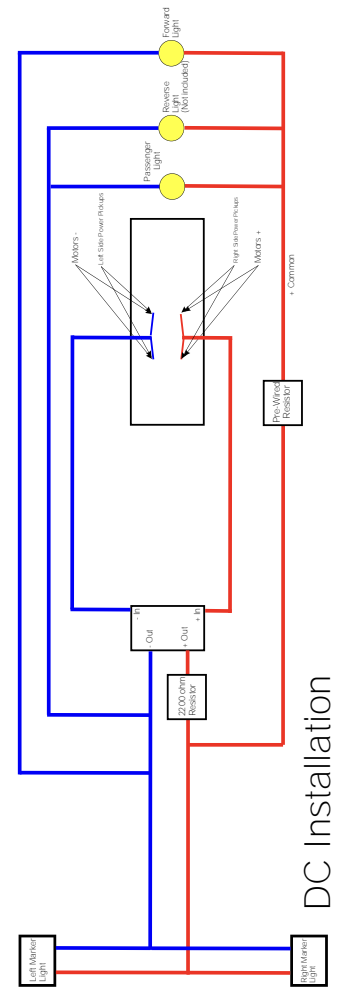
We recommend installing it on the underside, center of the clerestory.

4. Follow the diagram for further wiring instructions.

Due to the differences in the generations of the Bachmann, we did not include instructions on converting each to DCC. We have included an approximate guide on the last page. WE ARE NOT WIRING EXPERTS. USE AT YOUR OWN RISK!



WE ARE NOT EXPERTS AT WIRING. USE THESE DIAGRAMS AT YOUR OWN RISK





## FINAL ASSEMBLY

1. Fit the new body into place on the mechanism. Be sure to align the screw holes. Using the screws from when you removed the original body shell, attach the mechanism and body together.
2. With the visor and wiring over the cab door, fit and glue the clerestory into place with the visor cut out facing forward.

It should fit evenly side to side and front to rear on the flat parts of the front door and rear wall.

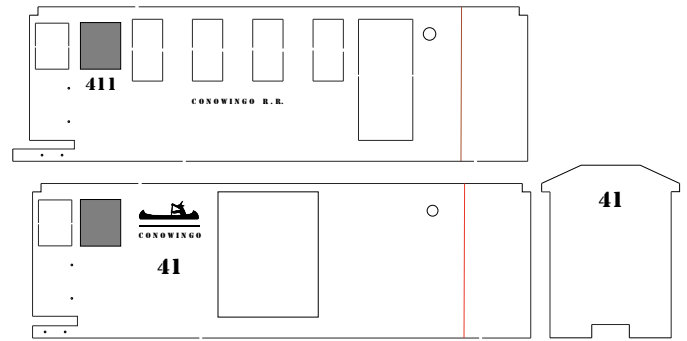
3. Glue the headlight and visor into place above the door, ensuring the visor sits even with the forward cab wall.
4. Fit and glue side roofing pieces in place, ensuring the stubbier end is towards the rear.
5. Fit and glue into place the pilot. Be careful to place it so that it doesn't interfere with the front truck.



6. Install the radiator and exhaust stack.

We chose to put the radiator on the left side, so it matches the positioning on the EBT M-1. We figured that exhaust would flow out the right side.

7. Apply decals as you see fit. Below is how we recommend adding the fictional Conowingo Railroad decals. The sides mirror one another.



8. Please share your photos on our Facebook page!

<https://www.facebook.com/ConowingoModels>

Once again, thank you for your purchase!

If there are any parts missing, please e-mail me what you need to complete the kit and I'll send it your way. I'm a one-man shop and I do occasionally miss things. Also suggestions for improvement are welcome.

Please send photos!

See the Conowingo Models website

[www.conowingomodels.com](http://www.conowingomodels.com)

Or our Facebook page

<https://www.facebook.com/ConowingoModels/>

for more exciting, funky buildings and rolling stock for your model railroad!

Many thanks to my family, Geoff Bunza, Jeff Grove, Steve Milley and Mark Schreier for their support!