Western Maryland 138-T Slug

Build Instructions

Thank you for purchasing this one of a kind model from Rule 281 Services. This model took over 300 hours of research, design, and test builds to produce a kit that was both prototypically correct but also buildable for the average modeler.

History of the Prototype

Built in 1962 using the frame and other components from Alco S1 #102. The slug was modified in 1967 by replacing the original Alco Blunt trucks with AAR Type A "GSC" trucks removed from WM #130 a Baldwin VO1000.

138-T spent most if not all of its working life in the Hagerstown yard mated to one of the BL-2s, normally WM #81. Eventually 138-T was donated to the B&O Railroad Museum in Baltimore, MD in 1986.

The appearance of 138-T changed slightly over the years besides the truck change in 1967. Earlier versions do not have the traction motor blower inlet screens they were added sometime in late 1977-early 1978. Footboards were forbidden by the FRA after September 1978, but there is photographic evidence that 138-T still had her footboards as late as July 1979. If you photos to document this please contact me.

WARNINGS and Notices About this Kit

ALWAYS HANDLE THE FRAME DURING ASSEMBLY OR THE COMPLETED MODEL BY THE TOP AND BOTTOM, DO NOT HANDLE THE MODEL/FRAME BY SQUEEZING THE SIDES OF THE FRAME, YOU WILL BREAK THE STANCHIONS!!

A note about the materials used to produce this kit. It is produced solely using 3D Resin Printing technologies. Care has been taken to balance "correctness" with durability. With that comes a caveat!!! The model side rail stanchions are by far the most fragile part of the kit. A custom blended combination of resins was selected for durability, print success rate, and the ability to reproduce the details with acceptable resolution.

If you purchased the kit, the shell is resting on the frame to both protect the frame from warping and to protect the handrail stanchions. Resin model, especially those with long and thin parts are prone to warping, regardless of the resin used. Fortunately, warping can be easily addressed by immersing the part in warm (120 degree) water for a few minutes than gently bending against the warp to counteract it. It may take a few cycles of

warming, bending, and cooling until the resin “remembers” the new shape. There are many YouTube video that can be found regarding this behavior of resin printed models.

All of the printed parts have been washed in Isopropyl Alcohol and cured with UV light. Curing times have been carefully tested and calculated so that the model is not over cured which introduces brittleness into the printed parts.

Tools/Supplies Needed

Tweezers, 400-600 kit sand paper or sanding sticks.

A tacky glue (such as Arleen’s).

ACC Glue

Phillips screw drivers

Couplers of your choice.

Preparing for the build.

The kit is comprised of the following part, care has been taken when packing the kit, but mistake could have been made.

Body Shell
Frame
End railing A end
End railing B end
Small air tank
Air brake equipment (consisting of 3 shapes on one print
Large air tanks – 2 tanks printed together
Headlight faceplate
Footboard Right side
Footboard Left side
Handbrake wheel
Small grabirons – 8 required
Left Hand Corner grab iron – 2 required
Right Hand Corner grab irons – 2 required
AAR Type A truck casting/bolster x2
Truck bottom covers x 2

Other associated parts include:

NWSL 40" .110 tread flush axle wheel sets x 4
Highball Graphics Decals

2K resistor
Black Phillips Pan head M1.7 x 6 mm - qty 6
Black Phillips Pan head M1.7 x 10 mm qty 3
Hex head bolt 2mm x 14 mm qty 2
Washers 2mm x 2
Nuts 2mm x 2
Phosphor Bronze strips with leads- qty 2 - made in house
Shrink tubing
Rule 281 Services designed and built keep alive circuit

If the sound car option was selected:
Soundtraxx Soundcar Decoder
Speaker Enclosure and Speaker driver

The printing support have been removed for you for the shell, frame, and trucks. This was done to lessen the chance for damage and to allow us to inspect the parts for printing defects.

Remove the remaining support from the parts. Do so carefully and with patience. Do not use an Exacto knife, you won't have the control required and will damage parts. Our experience has been using a high quality manicure scissors https://www.amazon.com/dp/B0948TD643 . Work slowly and methodically. Hint: for the A and B end railings, TAKE YOUR TIME.

Another hint, if the resin seems brittle, a short soak in warm water will soften up the part.

After you remove the supports from the frame attach the shell using the 1.7 x 10 mm self tapping screws to assist in protecting the handrails and keeping the frame true and flat. You can remove the shell as needed to complete the assembly.

A word about the frame: Leave the shell attached until you are ready for final assembly. It serves multiple purposes: 1) Protects the side rail stanchions for damage, 2) helps keep the frame from warping, and 3) provides a handy touch point for handling the frame during assembly.

The side handrails have been partially installed to provide support for the stanchions and to protect against breakage.

ALWAYS HANDLE THE FRAME BY THE TOP AND BOTTOM, DO NOT HANDLE THE FRAME BY SQUEEZING THE SIDES OF THE FRAME, YOU WILL BREAK THE STANCHIONS!!

A End versus B End

A note about the A end versus B end. On the frame there are printed letters A and B. On the shell the end with the headlight is the B end. For the end railings, the printed part with the drop steps is located at the A end. The B end end-railings does not have drop steps.

Assembling the Model

Assemble the shell first.

1) Thread the LED through the top of the headlight casting. Center the LED ensuing the yellow side is facing outward and apply adhesive (recommend Arleen's tacky glue) to the inside bottom of the casting where the wire leads pass through the shell to fix the LED in place.

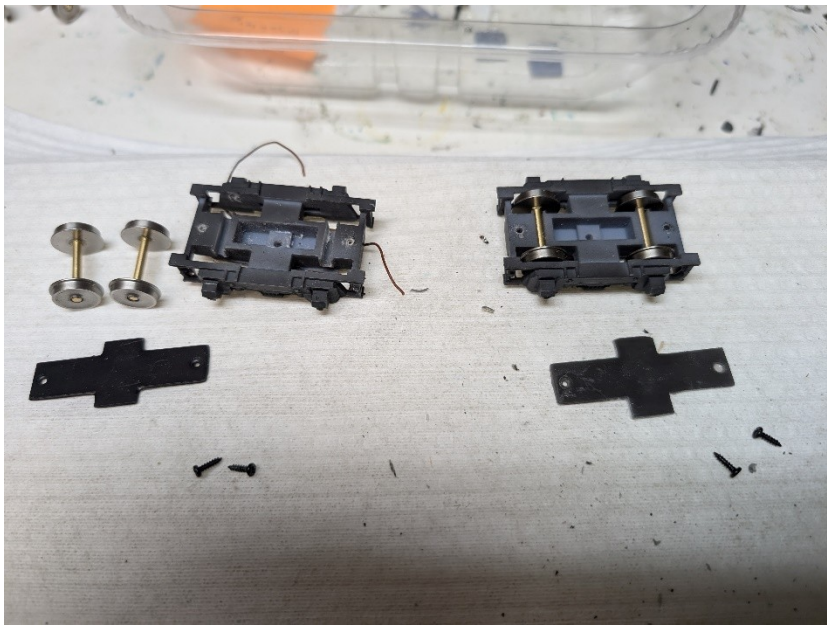
   Add a drop of glue or tape to the inside of the shell where the LED leads pass through into the shell. This will help secure the LED in the headlight casing in case you inadvertently pull too hard on the LED wire leads.

2) Secure the wiring harness inside the shell, suggest you use a tape to secure the wiring and keepalive and sound decoder (if option was purchased). Leave the two loose wires unsecured as they will be eventually be soldered to one of the trucks for electrical pickup.
3) Attach the grab irons to the shell.
   a. Every location for the grab irons has pre-printed holes. Clear the holes with a #77 or #76 drill bit using a pin vise.
   b. Attach the grab irons using ACC or glue of your choice. I suggest Arleen's tacky glue as it gives you time to adjust the positioning, yet sets up in a relatively short period of time.
   c. The curved end grabs have distinct left and right hand rails. Refer to photos of the finished model at rule281services.com/wmslug for reference.
   d. There 4 grab irons that attach to the frame. There are pre-printed holes on each side of the coupler box opening. Install the grabs.
4) Attach the end of the side handrails to the frame. At each corner of the step wells next to the poling pocket there is an indent for a hole. Open these holes up with a #77 drill bit. Test fit the siderail end into the hole and clip the end to adjust the size so the end rail fits neatly against the frame. See photo:

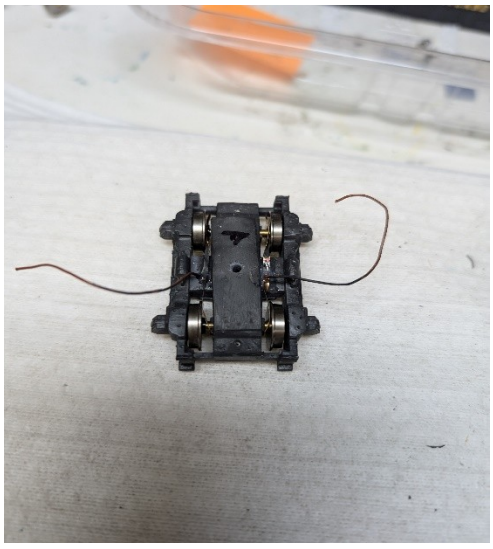
5) Attach the brake wheel to the B end. B end is the end with the headlight.
6) Attached the headlight face plate to the head light casting. Not that there are printed details on one side of the casting (use a magnifying glass) and the reverse has a small lip around the outer circumference. The detail side of the part faces outward, with the incredibly small words “PYLE” oriented to the top of the casting.

   After the LED is centered and glued into the casting, glue the face plate to the headlight casting.

7) Prepare the trucks
   a. Note: One of the trucks will be used for power pickup using the attached phosphor bronze pickup wipers included in the kit.
   b. Clean the bolster mounting screw hole in the top center of the bolster. Use the provided 2mm x 14 mm bolts to test that the truck will turn freely with the bolster bolt installed. Trim the frame behind the end steps or ends of the trucks as necessary to provide adequate swivel motion.
   c. The wheels are insulated on one side. Make sure that the wheels are installed with the insulated side oriented to one side or the other for the power truck only.
   d. For the power pick truck, bend and size the supplied phosphor bronze pickup so that ends touch the wheel treads and that the middle of the strip is located as in the photo:
      <<need photo>>
   e. Install the wheel sets in each frame/bolster. Ensure each wheel turns freely in the slot. See photo:



f. Temporarily attached the truck plate cover with the 1.7mm x 6mm screws. Clear the truck cover mounting holes with a 1.4 mm drill before attempting to install the screws. The trucks should roll freely about 6 inches or more if properly installed. Adjust and lubricate as necessary.
g. Select one truck to be the power pickup truck. Remove the truck bolster cover and wheel sets. Install the phosphor bronze wipers as shown in the photo below.

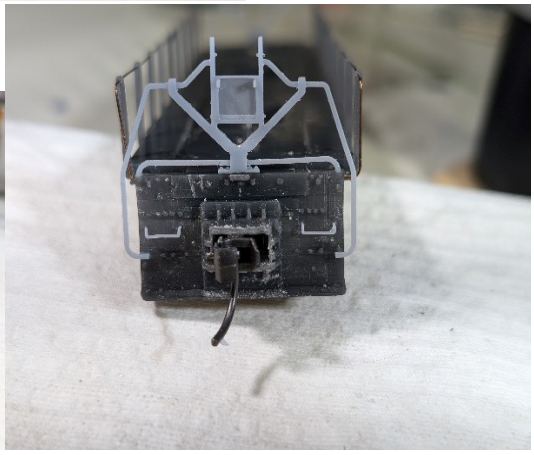


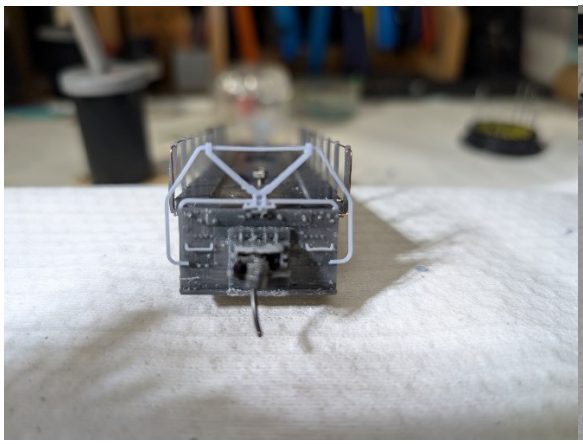
h. Reassemble the truck making sure the insulated wheels are on the same side. We will test and adjust the wipers in a subsequent step later.

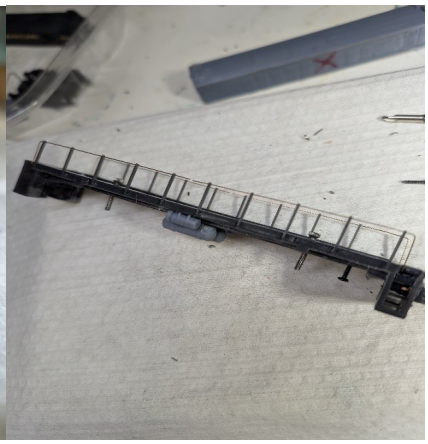
8) Prepare the Frame. (note, the photos show the air brake reservoirs, and air brake equipment attached. **Do not install** them until instructed to do so. They are susceptible to breaking if handled too much during the build process)

a. Install the couplers of your choice in the provided coupler boxes. The model is designed to accept a standard Kadee coupler box with #5 couplers. Remove the mounting ears from the Kadee box as we are only attaching using the center mounting hole. First lightly sand the top and bottom of the frame where the coupler boxes pass through. Lightly sand all sides of the mount them into each end of the frame and fasten them with the provided 1.7mm X 6 mm Philips screws. Clear the holes with a 1.4 mm drill bit before attempting to screw the boxes into place.
b. Clean the underside of any leftover supports and lightly sand the entire under side to reduce the size of the support “divots” where the supports were attached during the printing. Pay particular attention to where the truck bolster contacts the frame bolster. Ensure it is smooth and level.
c. Install the bolster mounting bolts. These are 2mm x 12 mm hex head bolts. Thread them from the top of the frame. Secure the head of the bolts to the frame with epoxy glue (so that the bolt does not turn when attaching the trucks at a later step).
d. Place the frame with the trucks installed on a test track and check coupler heights. You can adjust heights by sanding the tops of the truck or using washers between the frame/bolster interface as necessary.
    i. Remove the coupler and coupler boxes, you will reattach them after painting.

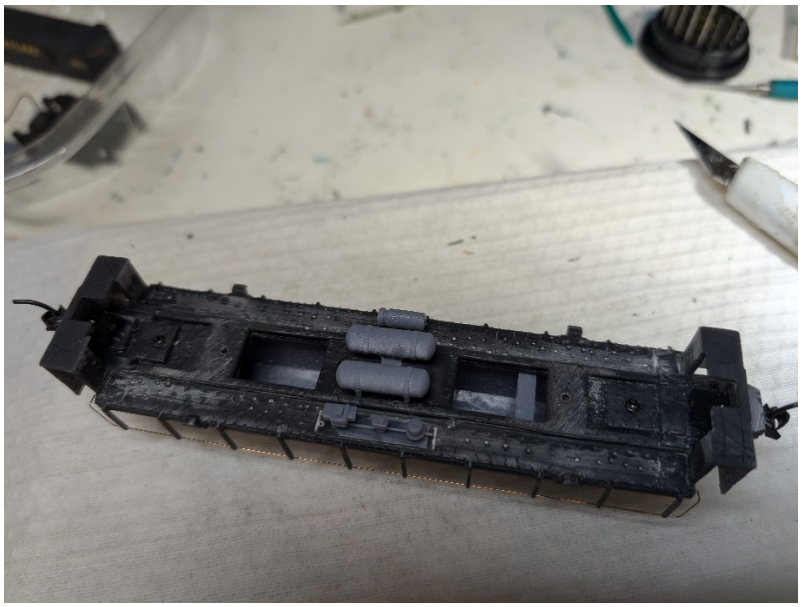
e. Install the grab irons as indicated:



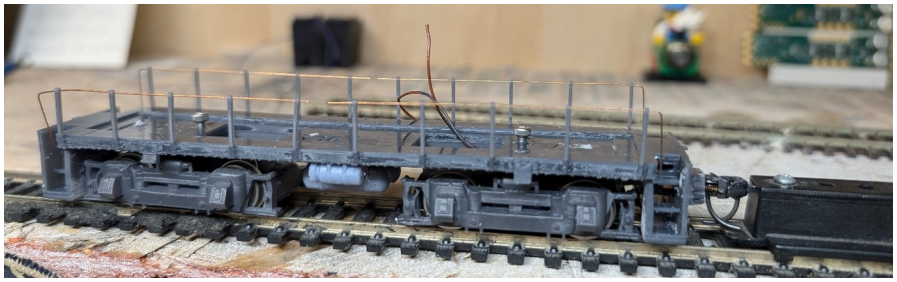




f. Install the underbody detail as shown below:



Note that the small airtank has a flat end, this end faces the “B” end of the frame. The three air brake components on the other side have a detent in the frame to align the parts with. The control valve (with squarish item on one end) goes toward the “B” end.



9) Installing the end rails on the frame