

## Caboose Lighting Kit Installation

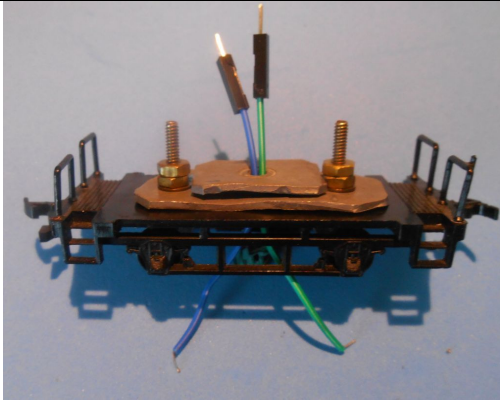
A video and instructions in color describing in detail this assembly can also be found at the website [www.modeltrainsounds.com](http://www.modeltrainsounds.com)



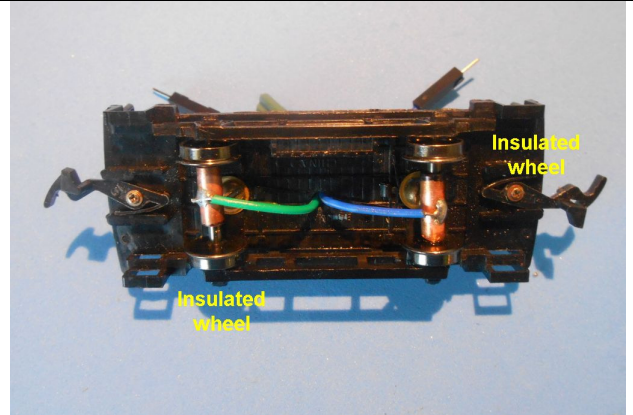
This small HO scale Bobber Caboose is used as example. You can adapt these directions for your model caboose. The shell is first separated from the truck.



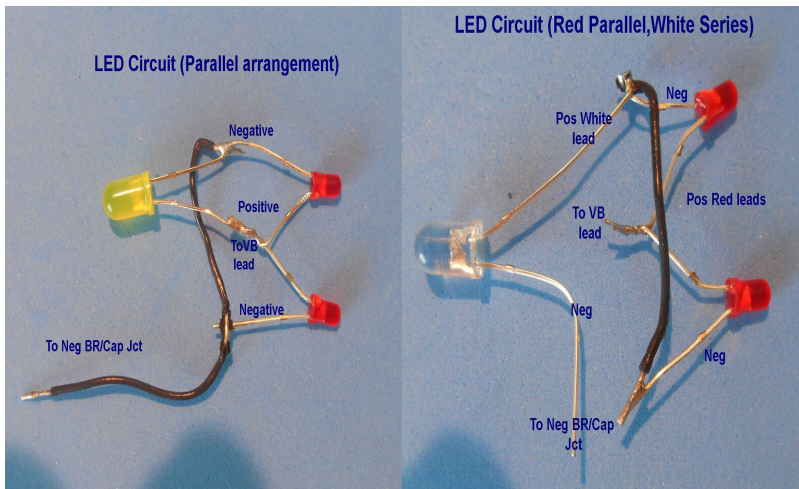
Two holes (5/64") are drilled into the rear wall just under the roof to fit the two red 2mm LEDs. These should fit snugly into the 2 holes.



Weight is added to the truck and secured to ensure good track contact. These weights could have been secured with Blue Tack putty instead of the bolts. Two pick up wires are shown here, stripped and tinned and inserted through a hole drilled through the floor of the caboose.



The wires are soldered to the copper collar pickup wheels which are then attached to the truck as shown. The 2 male pins will connect to the LED light circuit. Make sure the insulated wheels are set opposite one another. A black mark on the collars denotes the insulated wheel.

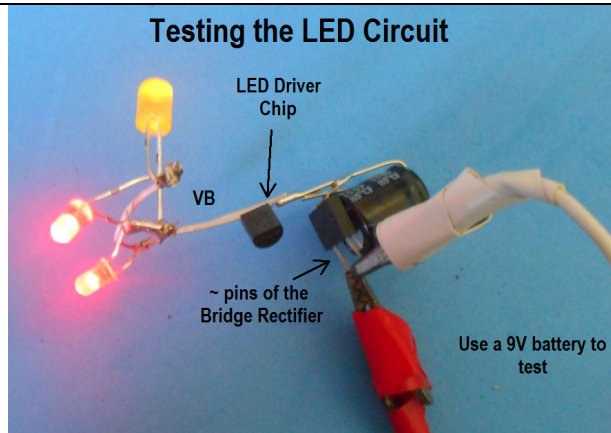
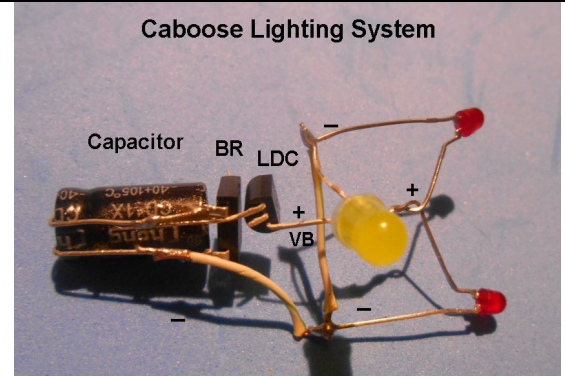


**Note: The Positive lead of an LED is the longer lead.**

The LED setup used to light the cabin in this case was made with two red 2 mm LEDs along with one 5 mm **yellow** LED set up in Parallel arrangement. Since the red LEDs had to fit into the holes the setup is shown on the left. The three Positive anode leads were soldered together. The free Negative cathode leads are linked by a connecting wire. This setup is now soldered to the LED Driver Unit.

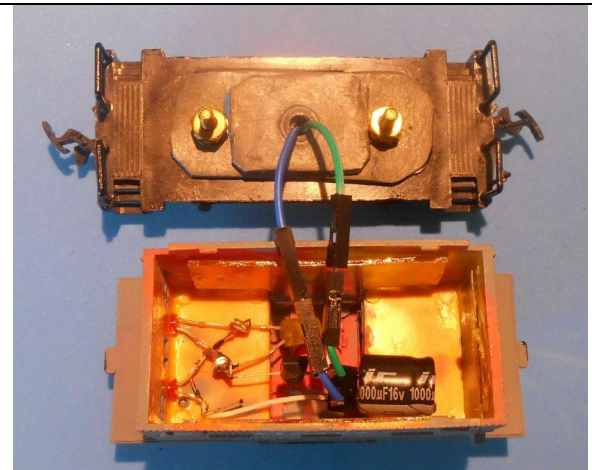
A **soft white** LED is also supplied for cabin illumination. This white LED is set up in series to the red as shown on the right. It has a higher forward voltage and will not light if set up in parallel. (see website for more discussion and details of the circuit, **Project #6** )

The yellow LED for the cabin was chosen here to give a softer light than the white LED. The negative lead wire from the LED circuit is soldered to the negative side of the Bridge Rectifier/Capacitor junction. The positive leads are soldered to the VB lead extending from the LED Driver chip. The LED driver circuit consists of the Capacitor, Bridge rectifier and LED Driver Chip. See **Project #3** at the website for more details on how to assemble this unit. The top of the Bridge rectifier may have a notch or angled edge at the top. Use The symbols (+, - or ~) to orient.



The circuit should be tested using a 9 Volt battery to ensure the system works. Connect the battery leads to the (~) tilde symbol pins on the Bridge Rectifier (BR). Two short wires (about 1" long), with the female connectors are soldered to these BR (~) pins. The Heat Shrink Tube included can be used on this connection to protect the joint.

The cabin can be painted and interior blackened. The LED circuit and driver unit are now inserted into the cabin with the two red lights exiting the holes in the wall and the yellow LED centrally located. The red LEDs can be glued in place with CA glue if desired.



The connecting leads with the dupont connectors are used to assist in disassembly. These wires connect the pickup wires that were soldered to the Bridge rectifier. The rectifier ensures that the lighting stays on in both forward and reverse motion.

The capacitor will reduce and prevent light flickering by maintaining voltage over dead zones in the track. Adding weights and keeping track clean helps maintain constant lighting.

The cabin is reattached to the wheel chassis and the caboose is ready for the track.

Check the website for more details including some upgrade tips. (see **Project # 6**)

**The Caboose Lighting Kit** includes:

A Bridge Rectifier, Capacitor, LED driver chip that limits current to 20 mamps, Dupont connecting leads, Two metal wheels 33" with copper collars, heat shrink tube. The LED lights included are two 2mm red, one 5mm soft white and one yellow. Plus these instructions

**Note:** The 2mm LEDs are included instead of the 3mm shown above. These are more prototypical in size to HO scale.

(Rev June 2023)

