

SAMRA Clinic: Make open loads for hoppers and gondolas.  
Chris Roehl, October 17, 2016

Adding a load enhances the appearance of the car. The load can also hide weight, thus improving the operating qualities of the car.

**Hoppers:** Any loose material, such as coal, ore, rock, gravel, ballast, sand, wood chips, scrap metal.

**Gondolas:** Same as hopper, but also structural steel, rails, ties, poles, pipes, coiled steel, ingots, glass panels, crated or protected machinery, building materials, cable reels, quarried stone slabs, etc. Pretty much anything that does not have to be protected from the weather.

The Association of American Railroads, AAR, has established rules for the safe loading of materials in open cars. Modelers can follow these rules as a guide to create reasonably accurate open loads. Modelers can also research prototype photos on the Internet. A good source is [rrpicturearchives.net](http://rrpicturearchives.net).

**Hoppers:** Method is basically the same for all materials. Install and seal a false floor, build up the load and glue it down. Some modelers make removable loads using magnets. Some fill the car with real, loose material. We will focus on permanent loads used on SAMRA cars.

Can use any suitable material.

Make a buildup box. Example: top and bottom of Athearn “blue box” stapled side by side.

White glue, matte medium.

Water and alcohol.

Eye dropper.

Small cup.

Sheet plastic, balsa.

Plastic cement.

Plastic putty.

Additional weight if necessary.

- a. Install additional weight first, if needed, to get to NMRA standard of 1 oz plus  $\frac{1}{2}$  oz per inch of car body length.
- b. Use sheet plastic to create a false floor at a height appropriate for the depth of the load. Small slots may have to be cut into the edge of the floor to fit around protruding reinforcing supports or ribs in the car side. Cut to fit. Because the floor perimeter will be sealed these cuts do not have to precise.
- c. Use plastic putty to seal the seam.
- d. Glue the first layer to the floor. Let dry overnight. Dump excess into buildup box to re-use material. This first layer gives you “tooth” for the finished load.
- e. Build up and shape the load. Small funnel helps create piles.
- f. Glue the load by wetting with alcohol and then diluted glue. Use an eye dropper. Can use white glue or matte medium, diluted with water and small amount of alcohol. If use too much, tilt car slightly and pull off excess with eye dropper.
- g. Let dry overnight. While holding car over buildup box, turn it over. Should be only a few grains of material fall from load. Can repeat if necessary to get satisfactory coverage and shape. Patch load if necessary—probably in corners—with a bit of glue and load material.

Note that the depth of the load varies. Coal is lighter so is piled high, whereas rock and gravel may not fill the car. Chips may be mounded and may be covered. Scrap is 12" below the car side. Some cars have lines marked on the car side to indicate height of load depending on material. To create a more interesting and eye-catching load, mix a very small amount of a different color into the primary colored material.

Show and tell:

Hoppers with loads: coal, rock, gravel, wood chips.

Do not be in a big hurry. Let dry overnight really means let dry overnight. Don't pick at the load. You can always add more material after it dries.

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**Gondolas:** For loose materials follow method used for hoppers. Otherwise follow AAR rules for open loads.

Depending on the load, you may need:

Adhesive appropriate for material. CA, plastic cement, plastic glue, white glue or matte medium, weight.

- a. Scale lumber for dunnage (blocking, bearing pieces, spacers, guide rails, cap pieces, stub stakes). Northeastern, Evergreen.
- b. Plastic in structural shapes for load.
- c. Coffee stirring straws for pipe.
- d. Sheet plastic for load, thin sheet plastic for securing rods.
- e. Wire to simulate  $\frac{1}{2}$ " and  $\frac{3}{4}$ " rods.
- f. Thread to simulate wire rope. From Jaeger lumber load kits.
- g. 1/64" chart tape to simulate straps. Jaeger kits or drafting supply store.  
Triangle Reproductions, 2203 Ceegee St  
Asel Art Supply, 8127 Callaghan
- h. Paint for scrap loads. Various colors, washes of rust, grimy black.
- i. Balsa for removable base.
- j. Weight.
- k. Pipe cleaners cut in half.
- l. Cements and glues suited to materials.

**Removable aggregate loads** can be made using a piece of balsa as the floor. Can add weight to a hole cut into the wood and glued in place. Should be just a little bit loose so it falls out of the car without damaging it prying in out.

**Pipe loads** can be made using plastic straws. Simple coffee stirring straws are ideal, cheap, and readily available at HEB. Cut to appropriate length using an HO scale. A "chopper" makes short work of this—you can mass produce pipes. Drilling pipe comes in lengths of 27', 30', 31', 32', and 33', with 31' being the most common. Drilling pipe is often shipped in strapped bundles. The bundles may be "nested" into the car or stacked with spacers between bundles. Bundles are of two layers, say a row of 8 atop a row of 9, or in three layers, say a row of 9 between layers of 8. Paint the bundles flat black and then dry brush with streaks of rust and puddles of rust in the bottom of the open ends. Bind bundles with

three evenly spaced 1/64" chart tape straps, one each about two feet from ends and one centered. The chart tape is gummed but add a drop of CA to be sure. Wipe excess CA off with a half pipe cleaner bent into a "J" form. You will need to add bearing pieces beneath the load, spacers between bundles, and vertical supports between the load and car side sufficient to take up all the space. Unitize the load with another round of straps, this time going completely around the load in three places as above. Paint the pipes flat black and dry brush with streaks of rust. You can use short pieces at the ends to create a hollow within the bundles into which you can glue suitable weight. Used drilling pipe is also shipped by rail. Paint it rusty brown.

**Scrap metal.** Use commercially available scrap loads. Quick and easy. If the scrap is of uniform material you can just give it some washes of grime and rust. If it's different kinds of metal, then have fun and paint the various pieces different colors to simulate painted metal and then give it wash or two. The load should be about 18" below the top chord of the car. You may need to add a spacer to the bottom of the load to get this right. You can use a razor saw to cut commercial scrap loads to fit the car. If you are particularly industrious you can make your own scrap loads from foil by shaping it into bales.

**Poles** can be loaded loose into a pile supported by vertical stakes of the same pole material, or of dimensional lumber, usually paired 6 x 6 about a foot higher than the load. The stakes are held together by wire across the top of the load. The two pole loads in SAMRA gondolas are Jaeger kits.

**Structural steel loads** can be simulated using plastic steel shapes and following the AAR rules by adding bearing pieces, spacers, and strapping. Dimensions of bearing pieces, spacers, and chocks vary with material and weight. The steel is stacked or nested neatly, not loaded loosely. It doesn't take much steel to overload the car's stated capacity. Less is more. See prototype photos.

**Cable reels** can be loaded into gondolas either end-on or sideways. AAR rules provide for both ways. These loads require a lot of wood bracing. Use dimensional lumber and follow the rules. Jaeger offered a cable reels kit that can still be found on ebay. (Same reels as found on the 40' flatcar at SAMRA.)

**Coiled steel loads** are fairly easy to make using readily available loads and gondolas built for the purpose with a supporting channel running the length of the car. Coiled steel is extremely heavy and the weight is concentrated so place the coils over the trucks, not in the middle. The coils can be graphite black or gray. Add some dry-brushed rust.

**Rail loads** are a challenge simply because of the weight. I have not found plastic rails. Rails can be layed side by side or nested with inverted rails between two right side up, and repeat across the load. Use 1 x 3 bearing pieces equal to the width of the car and 1 x 3 spacers equal to the width of the load. 8 x 8 wood beams go across the top of the load, equal to the inside width of the car and secured with 1" rod, washers, and nuts, through the beam and car floor. Alternatively, load can be secured across the top with 6" wide lumber chocks and 2" high tension strapping. Locate one beam or chock 7' from each end of load.

The AAR rules for open loads show many different gondola loads you would not expect, such as glass panels, grinding stones, crated vehicles and aircraft, stone slabs, electrical transformers—pretty much anything. Use your imagination and use the rules as a guide to how it would be loaded.

Show and tell:

Gondolas with loads: rock, gravel, sand, scrap, pipe, poles.