



## The C&S/RGS Type II Box Car Assembly Instructions

### History of the C&S Type II Boxcars

In they years between 1907 and 1909, the Colorado & Southern built a series of box cars for operation on their three foot lines. These box cars had wooden frames, truss rods, and cast steel Bettendorf trucks. These cars were referred to as the Phase, or Type II box cars. The Type II box cars are distinguishable from the Type III box cars in that the Type III cars had steel under frames. The Type II cars were also distinguishable from the Type I box cars in that the Type I cars rode on archbar trucks whereas the Type II rode on cast steel trucks. The Type II box cars were numbered 8103-8192

In 1937 the C&S abandoned its operations into Como and the South Park. Without enough traffic to warrant maintaining a large fleet of box cars, the C&S sold off some of their Type II box cars (amongst other cars) to the Rio Grande Southern in 1938.

### Before you begin assembly

There are several pieces of information that will help during the construction of this kit. Being aware of them will help you to make assembly more enjoyable.

### About the kit

During the design stages of this kit, every effort was made to ensure simple construction on behalf of the modeler. WTH this in mind we have molded pilot holes from simplified drilling of holes. These holes are molded as deep as is possible but still may not be deep enough for every modeler's preference. It is **recommended** that you drill these holes all the way through before beginning construction. Should you decide to pre-drill the holes, you will need a #78 drill for the grab irons, a #57 for the truck mounting screw, and a #76 for the Deloris brake system

Check each part carefully before beginning construction. Clean off any flash and check for missing or damaged parts. If parts are missing or damaged, send us SASE with a description of the part and we will gladly replace it. You should also check with a machinist square (or equivalent) that the larger parts (for example the sides, floor, and ends) are square. If you discover any corners that are not square, use a large file and file away at them lightly until they are square.

During the design stage of this kit every effort was made to ensure an accurate representation to the C&S Type II box car. But as there are differences between prototype standards and S scale NMRA standards, we have had to make some very slight modifications in the layout of the floor beams.. these modifications were necessary to allow optimum operating characteristics for your model railroad.

During construction you are given the option of using brass wires for the truss rods or nylon fishing line. The choice is entirely yours. We have included supplies for both. The views in these instruction show brass wire but the accompanying text also gives instructions for fish line.

There is some question as to whether these cars did not have end doors. We have included them for your convenience and will let you be the judge.

We have also included three complete sets of lettering for your convenience. You may letter your car as either early or late C&S, or letter it for the RGS.

If you prefer to form your grab irons before assembly, you will need the following

- Twelve (12) of the 21" grab irons
- Ten (10) of the 17" grab irons
- Two (2) of the 14" grab irons
- Two (2) 21" grab irons bent into an "L" shape 4" from one to the ends.
- Two (2) 40" grab irons for the roof. The roof grab irons can be formed with your 21" jig by forming the first 21" and then sliding the formed part through the jig and then forming the second 21" segment, thus creating the "L" shape

### **Tools You should have handy**

You should have the following tools handy

- Sharp hobby knife
- Pin vice with #57, #74, #76, and #78 drill bits
- Solvent type cement with #000 spotting brush for application
- ACC type cement
- Wire cutters
- Needle nose pliers

### **How to use these instructions**

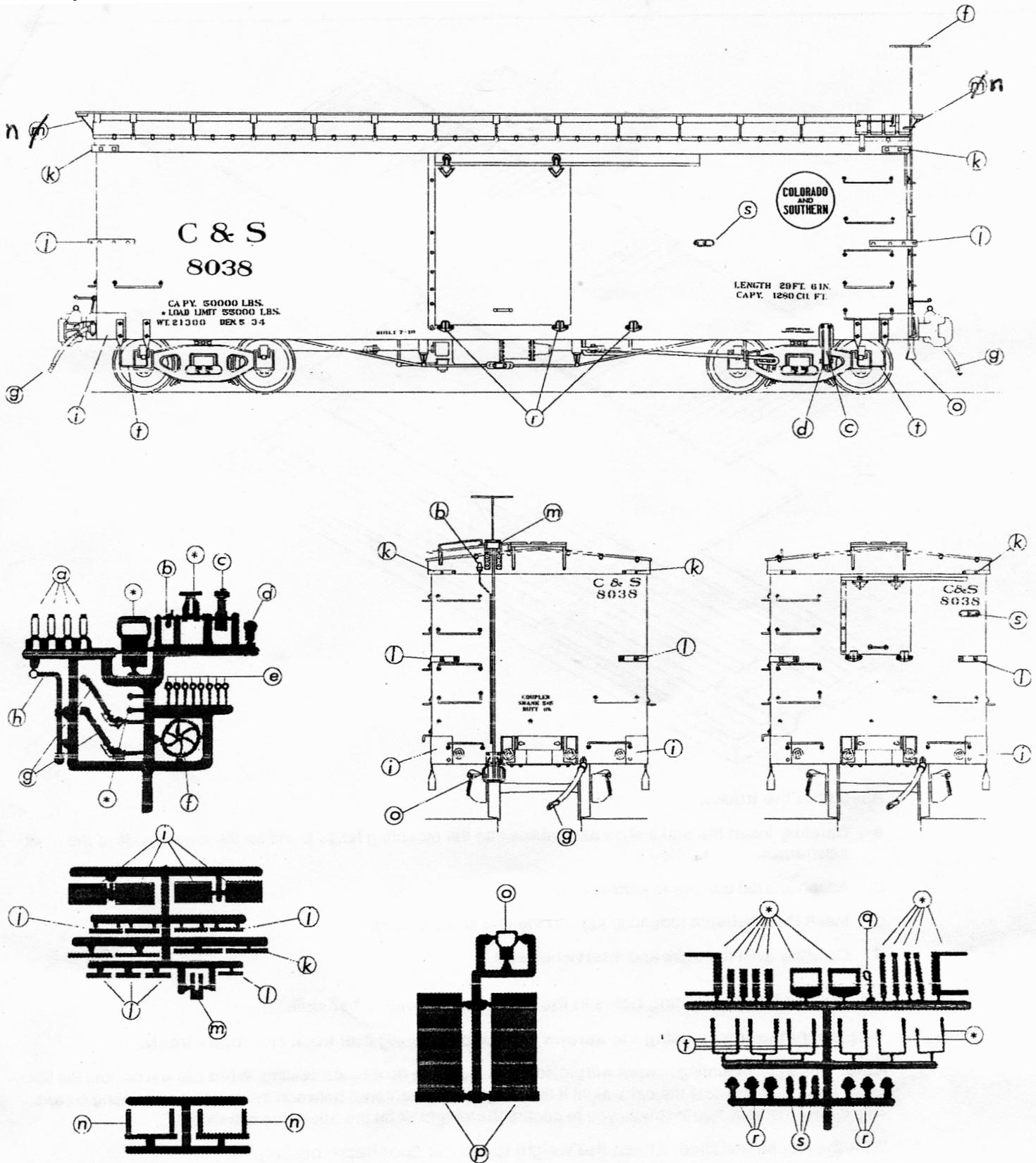
The instructions are broken into the phase of model construction:

- Assemble the floor
- Attach the brake system
- Attach the sides and side details
- Attach the roof and small details

The instructions consist of exploded view isometric drawings and supporting text. While every effort was made to ensure the accuracy of the 3D isometric views, you should always double check the small part placement with the S scale drawings of the car as shown on page 3.

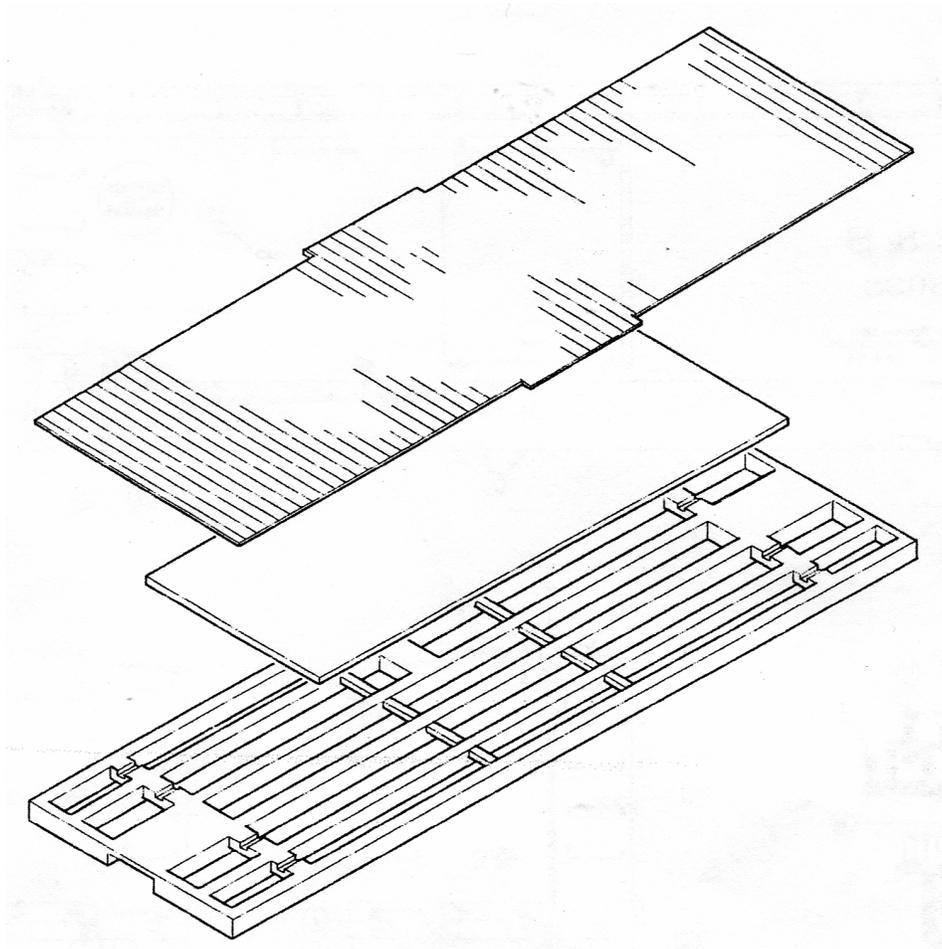
We hope that you enjoy building this fine scale replica of a C&S/RGS Type II box car. **Precision Vintage Classics** welcomes all comments, criticisms, and suggestions with respect to both current and future model railroading products.

Small part identification



\* = Spare parts for your next scratchbuilding project!

## Assemble the Floor Components



### Assemble the trucks:

Carefully insert the brake shoe assemblies into the mounting holes found on the lower inside of the truck side frames.

Attach journal box lids to journal boxes.

Insert the side frame mounting lug into the end of the bolster.

Carefully twist the truck and insert wheel sets.

Drill out the truck mounting holes in the body bolster with a #57 drill.

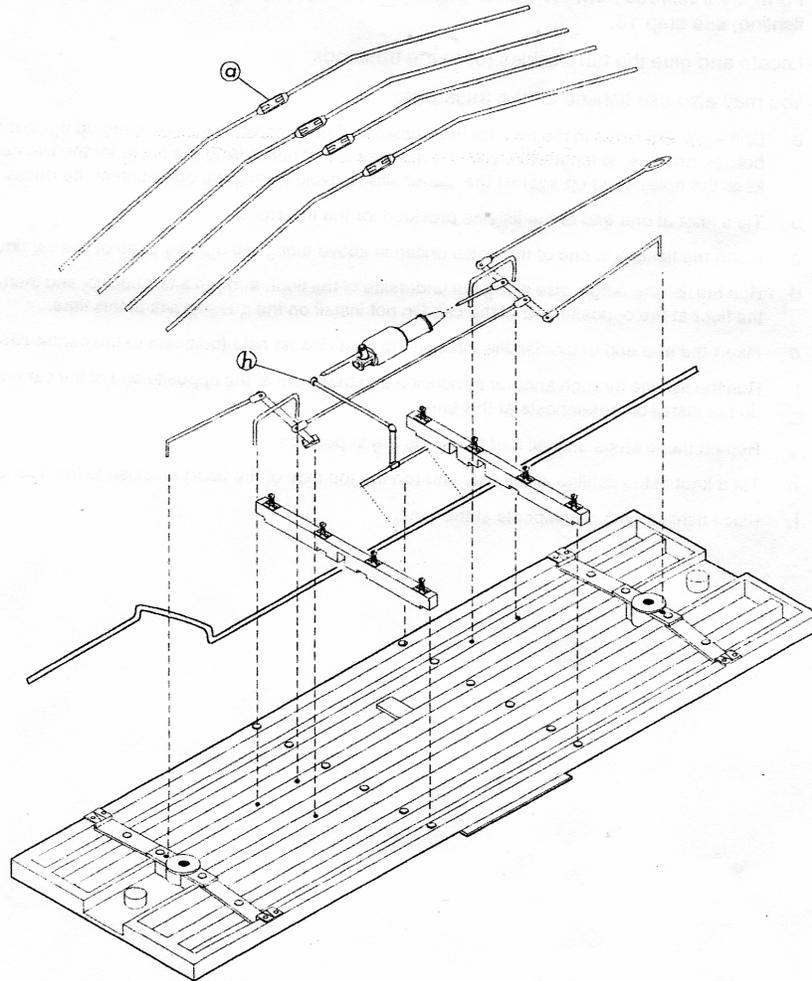
Test mount the trucks using the screws provided ensuring that truck can rotate freely

*Note: The truck mounting screws will project up through the floor beam casting. While this will not foul the floor board casting, it may foul the car weight if the weight is not centered between the two truck mounting screws. This is why the next step instructs you to secure the weight while the trucks are installed.*

With the trucks installed, attach the weight to the car floor beam casting.

Carefully line up the floor board casting and glue into place.

Remove trucks and proceed with assembly.

**Attach the Brake System**

Form the air brake line from the 0.025" brass wire provided. Note it runs snug against the center sills except where it crosses them; here the airline drops.

Slide the train line crossover pipe (h) onto the airline but do not glue.

Carefully push the Delrin brake system into place. It should stay in place on its own due to the snug fit, (Delrin rejects most glues).

Glue air brake cylinder in position.

Position and glue the train line crossover(i) in place behind the brake cylinder air reservoir.

Glue the needle beams in place. They go immediately under the reinforcing cross pieces

From the truss rods from the 0.012" brass wire provided. For fishline, see step .

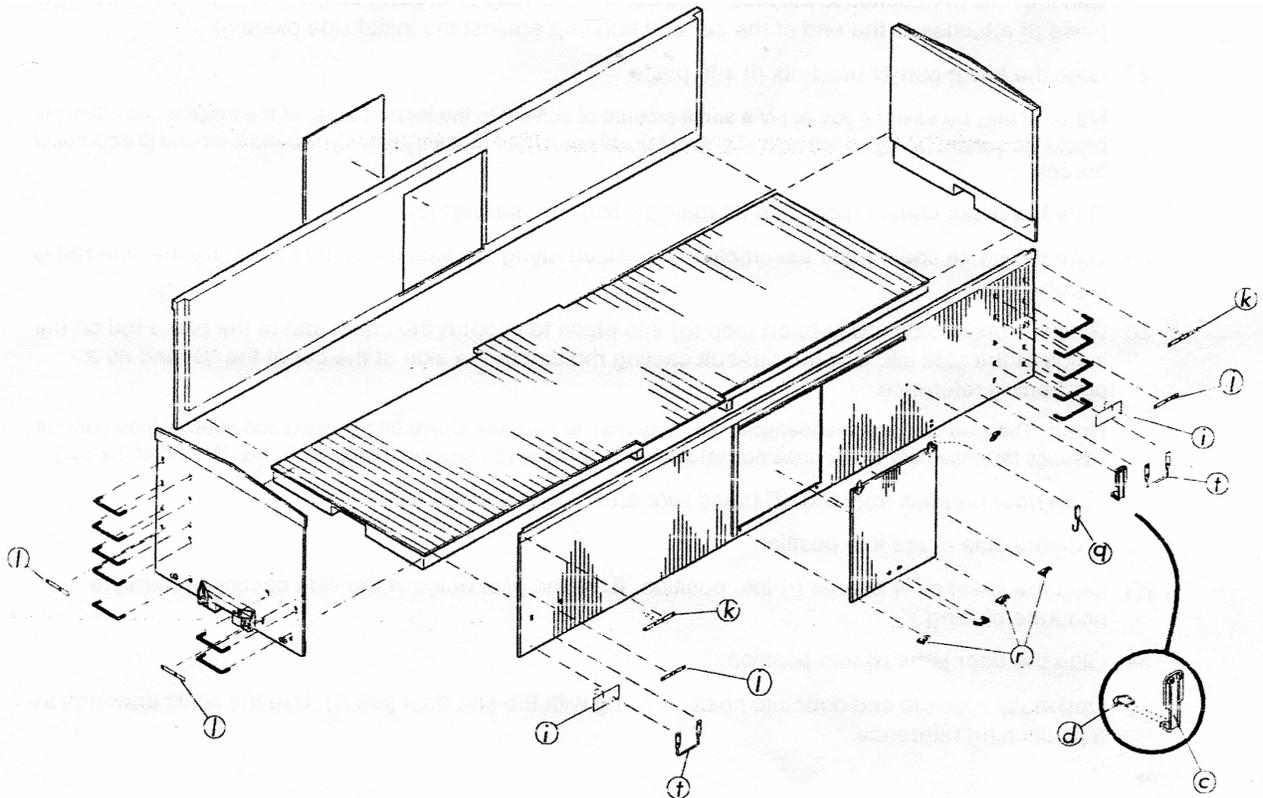
Locate and glue the turnbuckles (a) to the truss rods.

You may also use fishline for the truss rods.

a) Drill eight #75 holes in the floor for the truss rods. These holes should be snug up against the inside of the bolster, and line up lengthwise with the queen posts. When drilling the holes for the two center truss rods, keep the holes snug up against the center sills to avoid fouling the operation of the trucks.

- b) Tie a knot at one end of the fishline provided for the truss rods.
- c) Insert the fishline in one of the holes drilled in above along the outside edge of the car floor.
- d) Run the fishline lengthwise along the underside of the floor, through a turnbuckle, and then reinsert through the floor at the opposite end of the car.. Do not install on the queen posts at this time.
- e) insert the free end of the fishline through the next closest hole (adjacent to the center sills).
- f) Run the fishline through another turnbuckle and then hole at the opposite end of the car and reinsert, again do not install on queen posts at this time.
- g) Repeat these steps until all four truss rods are in positions.
- h) Tie a knot in the fishline at the free end (on the top side of the floor) as close to the floor as possible.
- i) Place fishline onto queen posts at this time.

### Attach sides and add details



Glue the walls to the floor assembly (refer to the identifiers found on the underside of the car in the coupler box for reference as to which end wall casting is glued to which end of the floor assembly).

Drill #78 holes for the grab irons using the molded pilot holes as a starting reference.

Form the grab irons using the bending jig provided.

Glue the grab irons into place using ACC. The grab irons should be approximately 0.040" (3/64") from the sides of the car.

Install the Kadee couplers provided referring to the Kadee instructions included in the envelope.

Attach the coupler cover plates (p) to the bottom of the car to hold the Kadees in place.

Glue the air hoses (g) into position.

Glue the stirrup steps (t) into place.

Glue the upper corner brackets (k) into place.

*Note: It may be easier if you apply a small amount of solvent to the inside corner of the bracket and allow the bracket to soften. Doing so will help to prevent the bracket from breaking when you bend it around the corner of the car.*

Glue the middle corner brackets into place. *Note that there are two pieces to this assembly. The piece with the hole (j) attaches to the side of the car with the hole protruding off the end of the car. The other piece (l) attaches to the end of the car and butts up against the initial side piece (j).*

*Glue the lower corner brackets (i) into place*

*Note: it may be easier if you apply a small amount of solvent to the inside corner of the bracket and allow the bracket to soften. Doing so will help to prevent the bracket from breaking when you bend it around the corner of the car.*

Glue the brake chain roller (9d) to its main vertical counterpart (c)

Glue the brake chain roller assembly into position along the side sill of the car where the side rod is exposed.

Glue the brake side rod support loop (q) into place to support the chain end of the brake rod on the inside of the side sill. Use the nut-bolt casting molded to the side of the car at the "B" end as a positioning reference. *Note: The side castings are identical. You may wish to carefully shave off the brake rod support loop nut-bolt castings from the side which does not actually have a brake rod support loop (that is the "A" end of the car).*

Form door handles from 0.012" brass wire and glue into place using ACC.

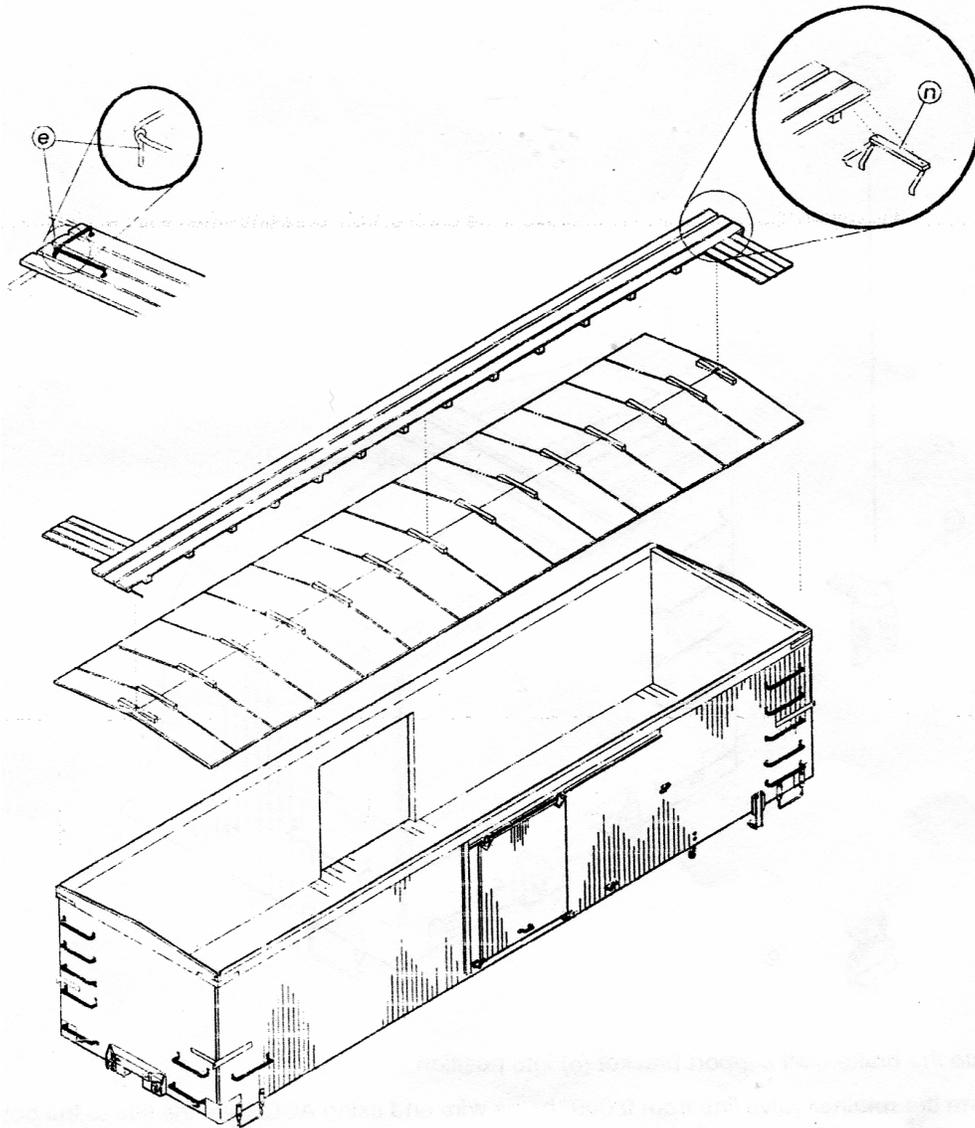
Glue the side doors into position.

Glue the lower door braces (r) into position. (Use the pilot holes in the side castings to ensure accurate placing).

Glue the door jams (s) into position.

Optionally, glue the end door into position along with the end door jam (s). Use the scale drawings as a positioning reference.

**Attach the roof and roofwalk**



Glue the roof into place.

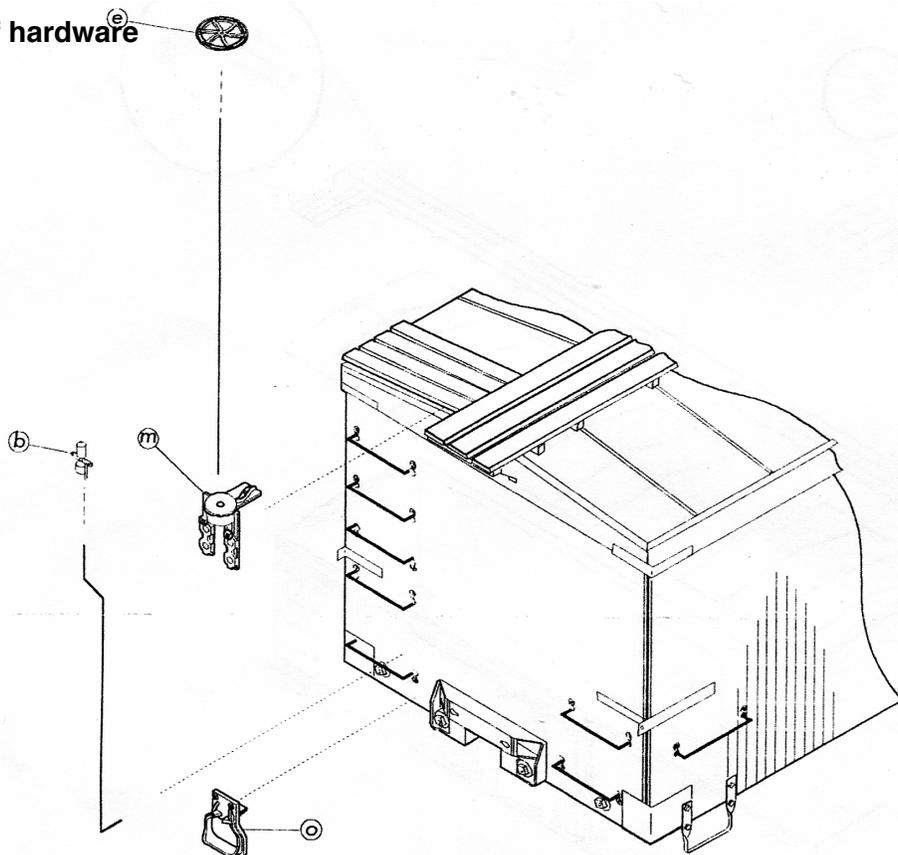
Glue the roof walk into place

Carefully bend the roof walk end platform support straps down and over the end and side of the roof then glue

Drill #78 holes in the roof walk end platform for the roof grab irons

Form the roof grab irons, insert grab irons into a styrene "eye" casting (e) and glue the assembly to the roof with the "eye" casting acting as the corner support.

Carefully bend the roof walk end supports (n) and glue into position.

**Attach brake staff hardware**

Glue the brake staff support bracket (o) into position

Form the retainer valve line from 0.009" brass wire and using ACC, glue the line to the bottom of the retainer valve (b). (Optionally, you may want to drill out the bottom of the retainer valve first.)

Glue the retainer valve and line to the "B" end wall of the car.

Glue the brake ratchet and pawl (m) to the roof of the car ensuring that it is dead center over the brake staff support bracket. Use the scale drawings to ensure accurate placement.

Insert the 0.019" brake staff into the ratchet and pawl. Drill out the styrene casting with a #76 drill if needed.

Glue the brake wheel (f) into position on top of the brake staff.

Form the coupler cut-off bars from 0.009" brass wire. Insert cut-off bars onto two "eyes"(e) and glue the assembly into the holes located on both end walls.

*Note: The cut-off bars are different for each end; one has a dip in it to clear the brake staff.* Attach the chain provided to the brake side rod. This may be done in one of several ways:

- a) Using a straight pin, insert the pin into the last link of the chain and press the pin into a soft wood surface (example : homesite). Press the pin into the link until it is rounding out large enough to fit onto the cast Deloris exposed side brake rod. Using tweezers, grasp the link of chain next to the link which you just expanded and connect the chain to the brake rod
- b) Glue the last link directly to the exposed brake side rod using ACC.
- c) Form a small loop from brass wire (>0.012") to join the link to the exposed brake side rod.

Route the chain through the brake chain roller assembly to the brake staff supporting bracket. Connect the other end of the chain to the bottom of the brake staff using either ACC or raising the brake staff slightly (before gluing) and lowering it down so it "spears" the last link of chain.

### Painting and Lettering

When these cars were built they were painted freight car red. The lettering schemes for these cars varied widely. We have presented some examples here of how the two railroads lettered their cars. You should check your references for other examples as used including "Narrow Gauge Pictorial Volume VIII" by Robert Grandt, "Silver San Juan" by Mallory Hope Ferrel, and the "Up Clear Creek" series in the "Narrow Gauge and Short Line Gazette" by Harry Brunk.

