

Phil's Narrow Gauge

7/8ths Scale Boxcar 147
Sandy River & Rangeley Lakes

Part # PNG-783



Tools Needed:

- Sandpaper
- Wood Glue
- ACC Glue
- #'s 66, 60, 56, 54, 53, 52, 51, 50 and 47 drill bits
- Drill press and handheld "Dremel" type drill
- Xacto knife
- Needle nose pliers
- Diagonal (wire cutting) pliers
- Various plastic and metal small clamps
- 24", 12" and 6" Ruler
- Needle Files

147 Parts List

Wood

W-1	1 ea.	Frame, Fully Assembled
W-2	2 ea.	Outer sides, Lasered Poplar Plywood
W-3	4 ea.	Inner Sides, 2 Left, 2 Right, Lasered Poplar Plywood
W-4	2 ea.	Inner Middle Sides, Lasered Poplar Plywood
W-5	2 ea.	Outer Ends, Lasered Poplar Plywood
W-6	2 ea.	Inner Ends, Lasered Poplar Plywood
W-7	1 ea.	Floor, Lasered Poplar Plywood
W-8	2 ea.	Roof Halves, Lasered Poplar Plywood
W-9	7 ea.	Rafters
W-9	4 ea.	Catwalk End Platform Supports
W-10	11 ea.	Catwalk Center Supports
W-11	6 ea.	Catwalk Boards
W-12	2 ea.	Car End Buffers
W-13	2 ea.	Side Doors, Lasered Poplar Plywood
W-14	2 ea.	Side Door Cut Outs (to assist when painting car)
W-15	4 ea.	2 ea. Fascia Boards 1/16 X 1/4 X 18", 2 ea. Lasered End Fascia
W-16	1 ea.	Bag of Door Trim
W-17	8 ea.	Ladder Rails

White Metal

WM-1	2 ea.	Turnbuckles
WM-2	4 ea.	Queen Post
WM-3	1 ea.	Brake Cylinder
WM-4	1 ea.	Brake Cylinder Saddle
WM-5	1 ea.	Brake Cylinder Base
WM-6	1 ea.	Air Reservoir
WM-7	1 ea.	Air Reservoir Saddle
WM-8	1 ea.	Air Reservoir Base
WM-9	1 ea.	Main Brake Lever
WM-10	1 ea.	Main Brake Lever Support
WM-11	1 ea.	Secondary Brake Lever
WM-12	1 ea.	Secondary Brake Lever Support
WM-13	4 ea.	Bolster Terminating Plate
WM-14	1 ea.	Lower Brake Staff Support
WM-15	1 ea.	Upper brake Staff support
WM-16	1 ea.	Brake Chain Roller
WM-17	1 ea.	Lock Pawl
WM-18	1 ea.	Brake Wheel
WM-19	8 ea.	Grab Iron
WM-20	4 ea.	Truss Rod Square Nut Bolt
WM-21	1 ea.	Retainer Valve
WM-22	4 ea.	Lower Door Glides
WM-23	4 ea.	Upper Door Glides
WM-24	1 ea.	2 Sets of Door Lock Parts
WM-25	2 ea.	Door Handles
WM-26	18 ea.	Ladders Rungs
WM-27	2 ea.	End Beam Grab Irons
WM-28	2 ea.	Door Stops
WM-29	4 ea.	Catwalk End Supports

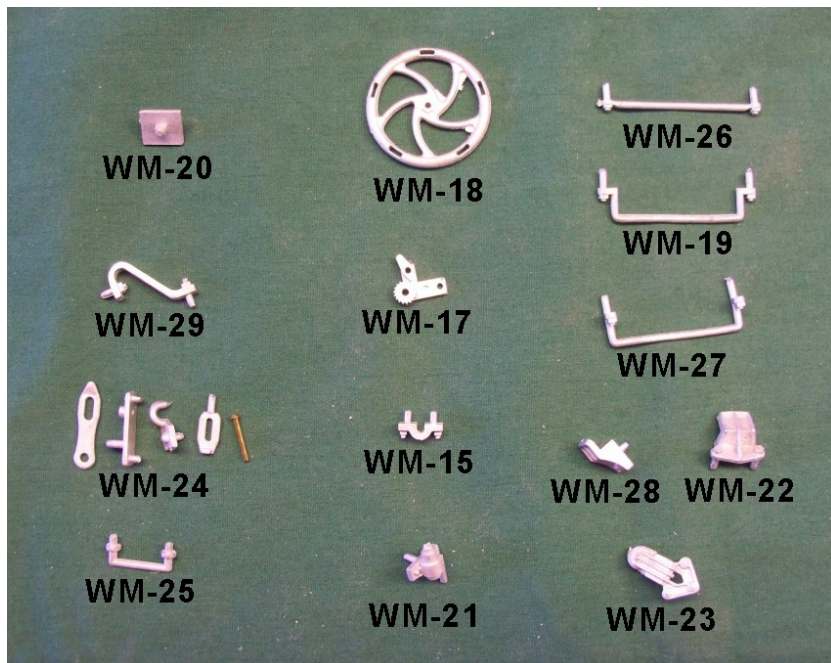
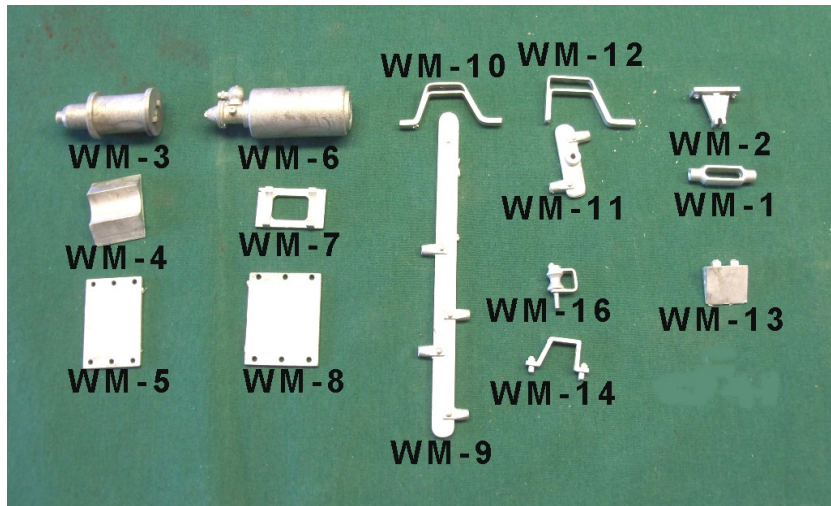
Misc. Parts

MP-1	1 ea.	1 Foot of Chain
MP-2	2 ea.	Brass Wire End Strap Steps
MP-3	1 ea.	Brass Wire Main Brake Lever Limiter
MP-4	4 ea.	Stainless Steel Strap Steps
MP-5	4 ea.	Brass Rod, 1 foot long, 1/16" Diameter

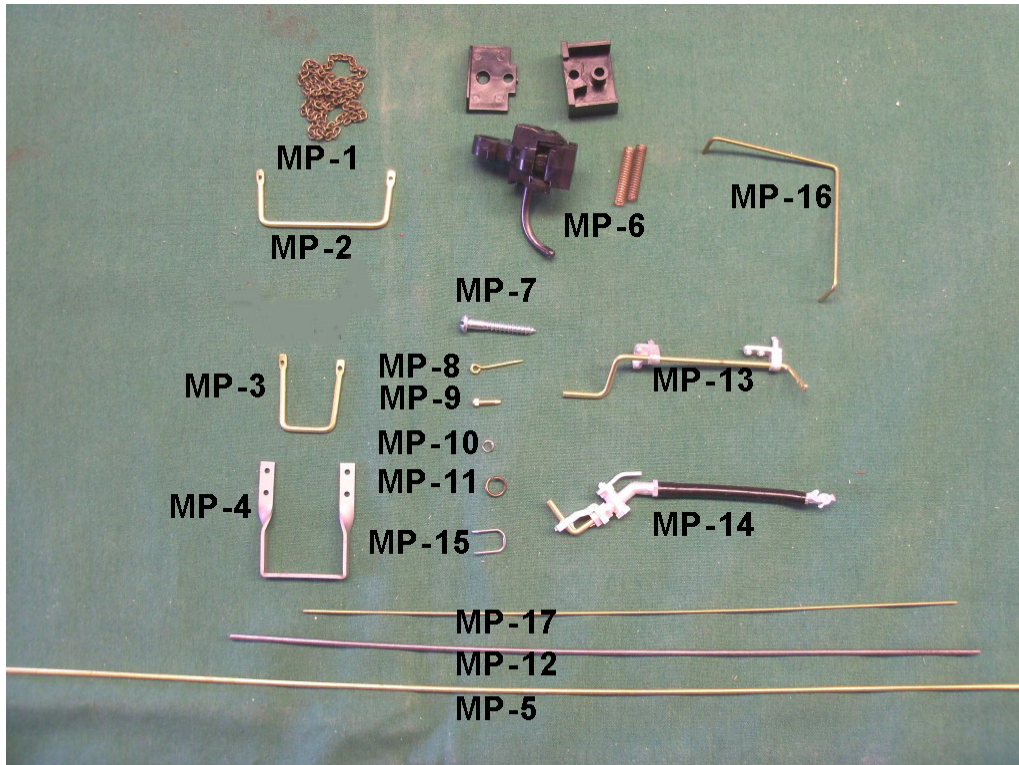
Misc. Parts (continued)

- MP-6 2 ea. Kadee Couplers
- MP-7 2 ea. #4 Wood Screws for Kadee Couplers
- MP-8 6 ea. Eye Pins
- MP-9 100 ea. Brass Nut Bolts
- MP-10 6 ea. 3mm Jump Rings
- MP-11 2 ea. 5mm Jump Rings
- MP-12 1 ea. 8" Music Wire 1/16" Diameter, Brake Staff
- MP-13 2 ea. Coupler Lift Bars
- MP-14 2 ea. Brake Hose Assemble
- MP-15 2 ea. T-18 Size Staple
- MP-16 2 ea. Brass Wire Catwalk Platform Grabs
- MP-17 1 ea. Brass Wire, 1/32" X 6"
- MP-18 40 ea. #20 Brads (not pictured)
- MP-19 84 ea. Roof Tiles, 1.3" X 1.5" (not pictured)
- MP-20 20 ea. Brass Channel for Doors (In Door Bag, not pictured)
- MP-21 4 ea. 3/64" Rivets (for channel, not pictured)

White Metal Parts



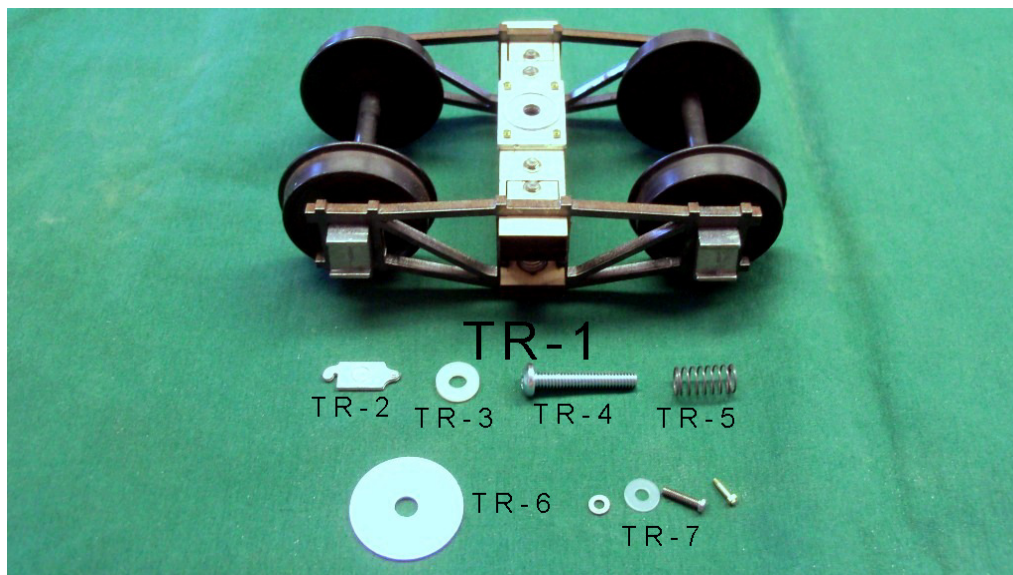
Misc. Parts



7/8ths Trucks with 20" Wheels

TR-1	2 ea.	Trucks, Assembled
TR-2	8 ea.	Journal Box Lids
TR-3	2 ea.	3/16 White Nylon Washers
TR-4	2 ea.	1-1/4" 8/32 Machine Screws
TR-5	2 ea.	Springs
TR-6	2 ea.	1" Fender Washer
TR-7	----	Misc. Spare Parts

Trucks



Step 1.

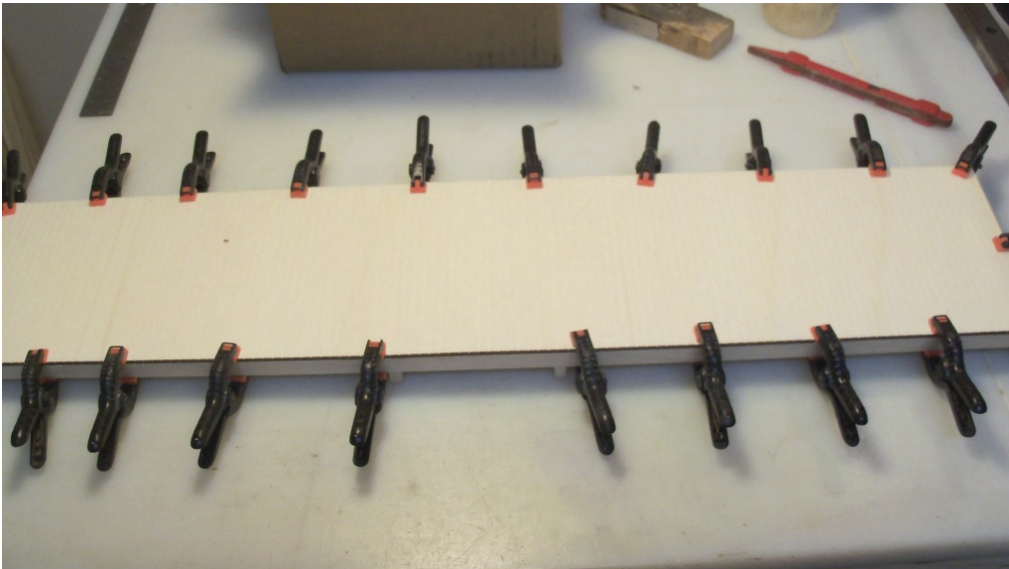
Sand any fuzz and or glue spots from the frame. The frame is fully assembled. It's easier for me and cheaper for you for me to cut the wood, fit into a jig, glue and pin verses cutting extra wood to provide a jig for you to construct the frame upon.

Notice 3 holes in the cross board between the needle beams and body bolsters. I refer to these as the truss rod termination boards. The 3 holes in both boards are for the truss rods (2 at each end) and brake rods (1 hole in the center at each end). The pencil marks on the frame in this picture show where they are.



Step 2.

Glue the floor to the frame. The floor is scribed on both sides. The bottom side has scorch marks from the laser along the edges. Glue this side to the frame.

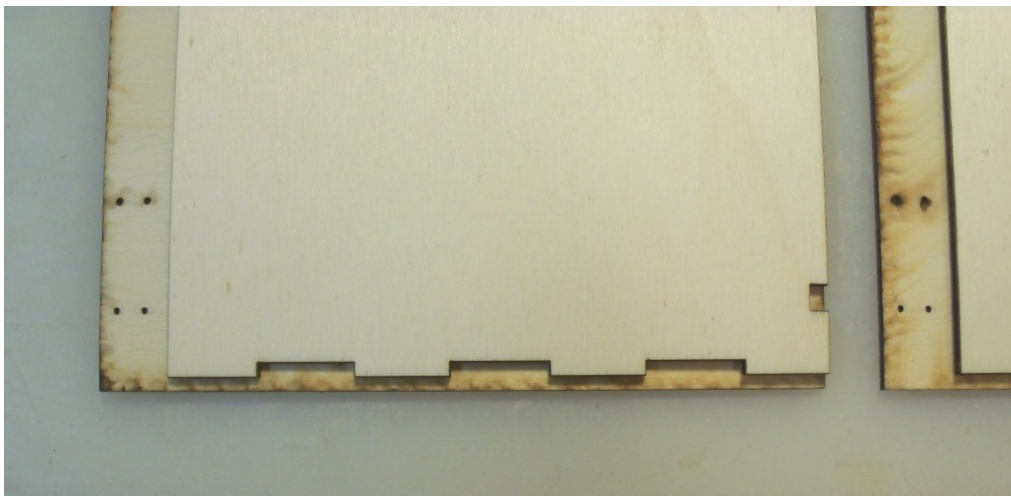


Step 3.

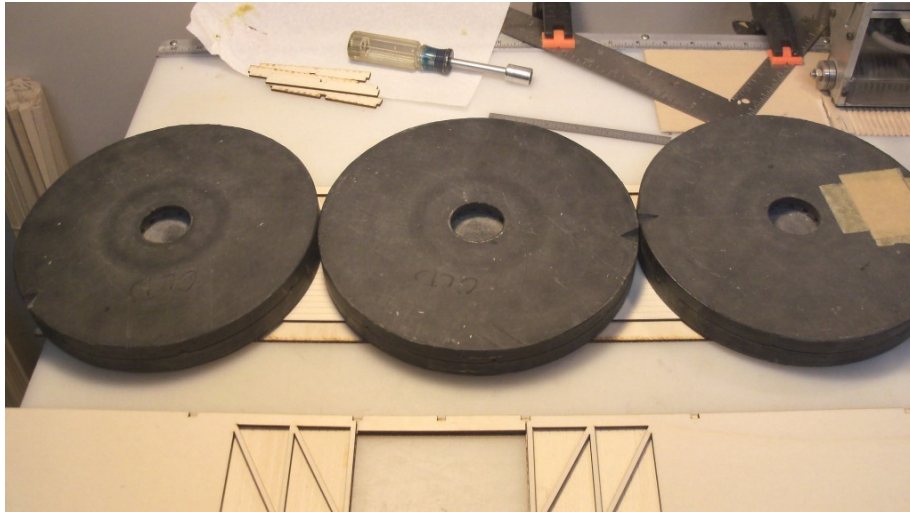
Glue the inner left and right plus center sides to the outer side. The top edge and edges with the door opening should be flush. You need a flat surface plus weights to hold the parts pressed together. Aircraft plywood is typically warped. I cut the outer side with the grain running up and down to match the scribing. The inner sides are cut with the grain running side to side. Once glued together, this will add significant strength.



The space at the bottom will glue to the frame. The ends of the sides Should look like this.

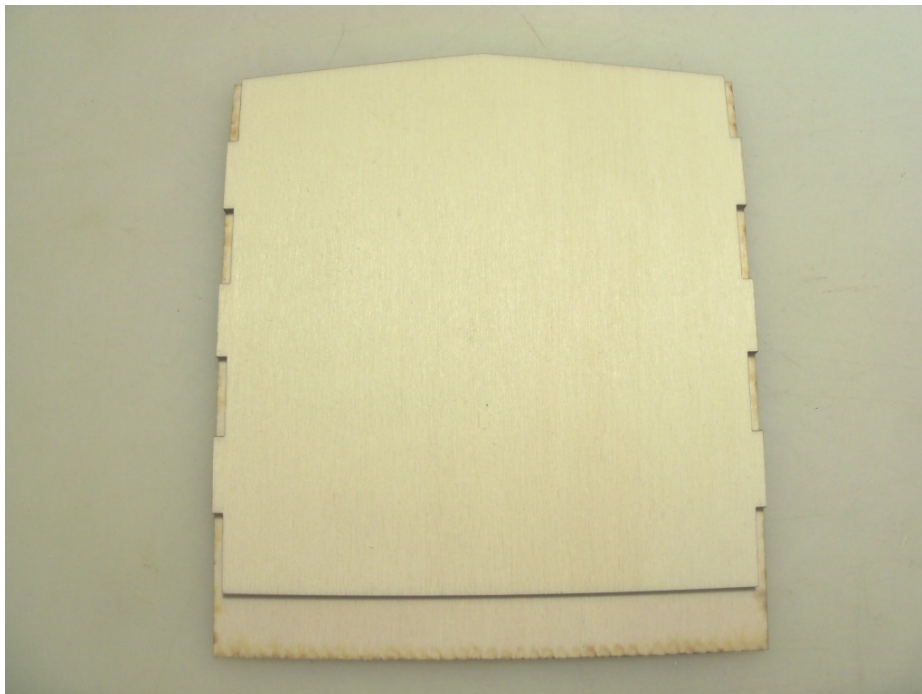


The tabs in the ends are reversed from these tabs and will glue into them creating a strong joint. Do this gluing job on a super flat surface. I have old worn out spin casting molds that I use for weights to firmly press the outer and inner sides together. This is very important so that the end joints will fit together properly.



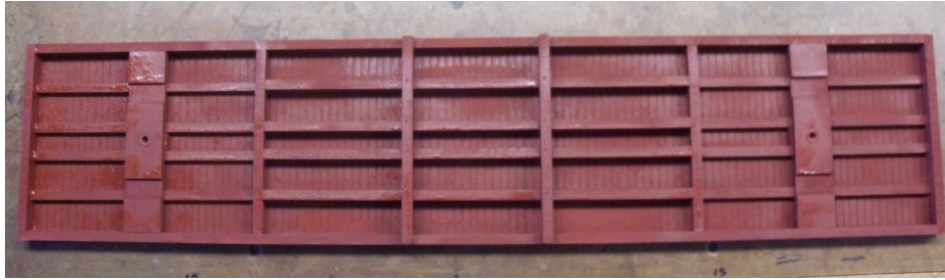
Step 4.

Now glue the outer ends to the inner ends as you did the sides. Add weight until dry.

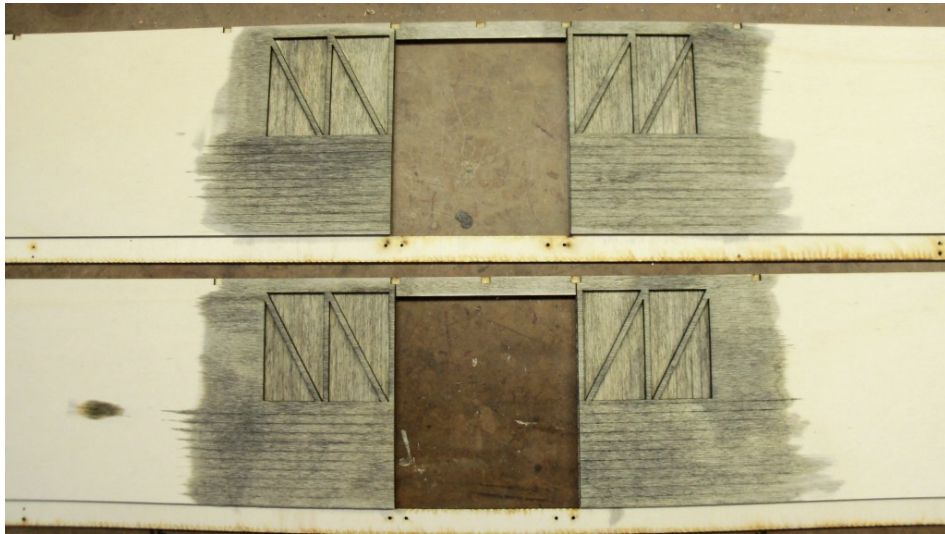


Step 5.

Paint the bottom of the frame. Once assembled the car is large and a bit hard to hold for painting especially all the recessed areas of the underbody.



I also mixed up a solution of India Ink and alcohol and stained the inner walls 4-5" either side of the door opening and the floor. Under normal lighting, this is about as far as you can see into the finished car. You can stain the entire inside if you want. I added cargo to mine which blocks any view deeper into the car.

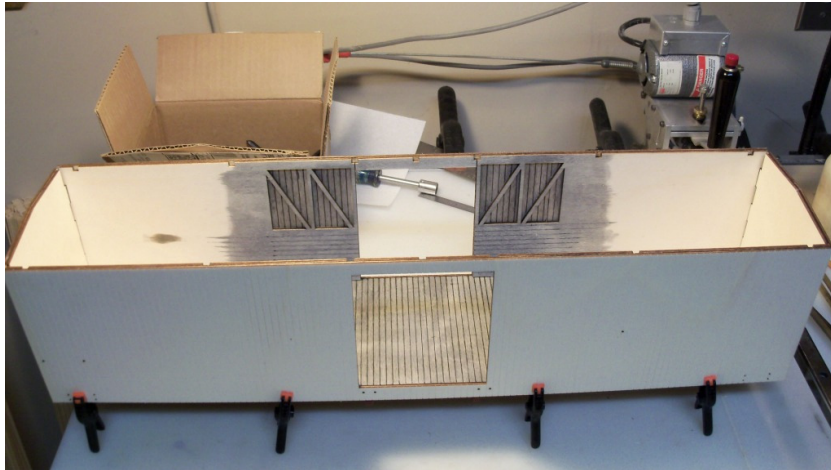


I highlighted the scribes with a super fine tipped marking pin.



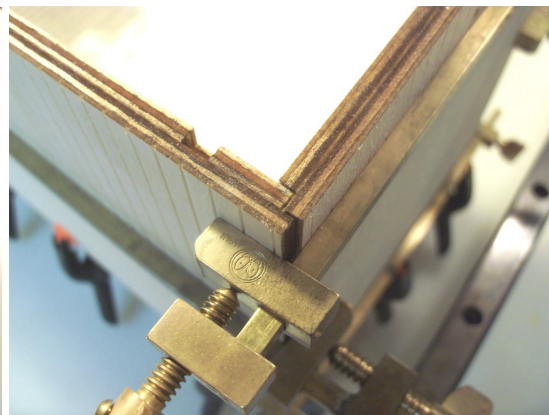
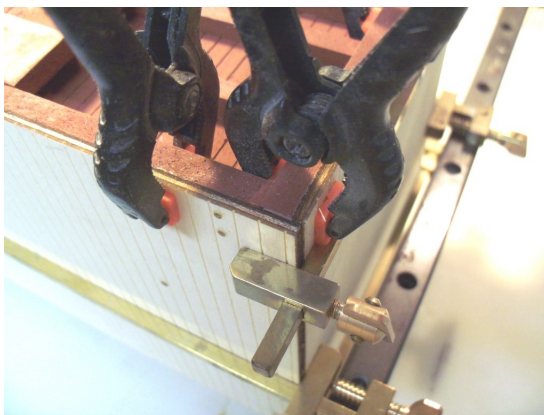
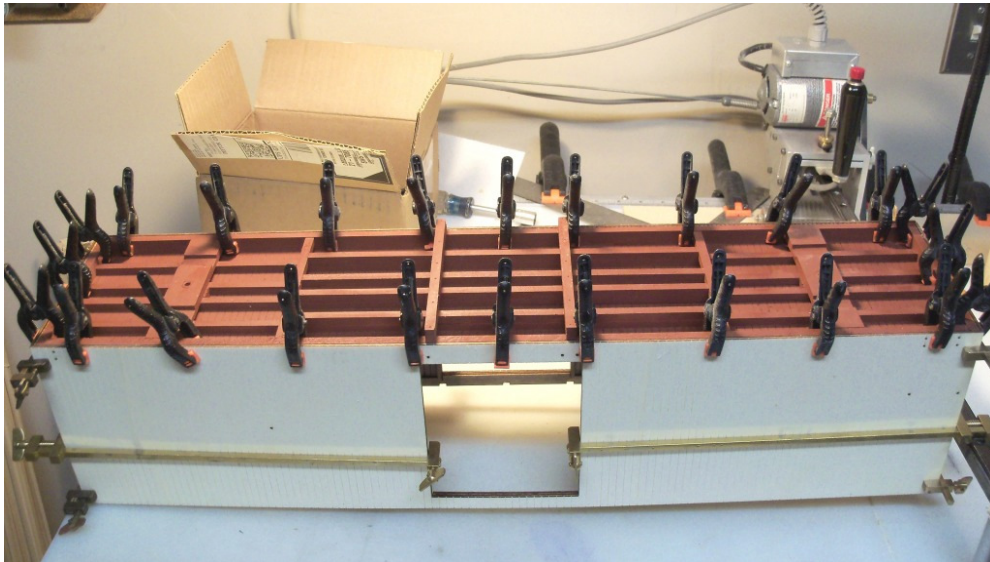
Step 6.

The sides at the door opening are still very fragile if not supported. Carefully test fit the sides and ends to the frame. I used plastic clamps to hold the walls to the frame.



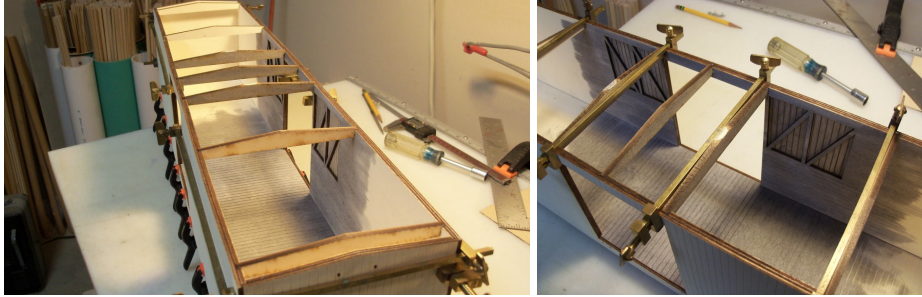
Do this to verify the 4 corners fit together properly. If the floor didn't get positioned 100% over the frame, it might have an edge overhanging the frame on one or more sides. If so, just sand any overhang flush with the sides of the frame. Once you're satisfied with the fit, glue the sides and ends to the frame and to each other.

Clean any excess glue from the joints and clamp all sides together to ensure a tight fit in the corners.



Step 7.

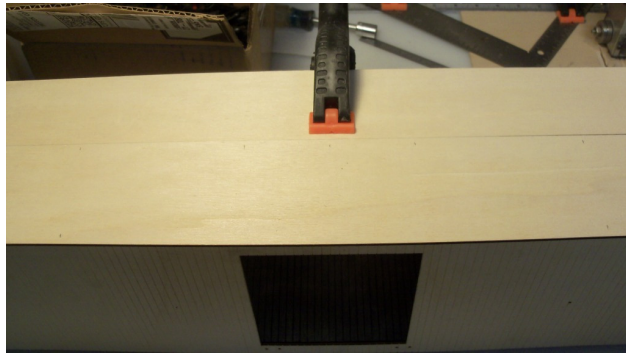
Glue the 7 rafters in place. You'll need to clamp the 5 center rafters to ensure the internal side to side measurement remains the same across length of the car.



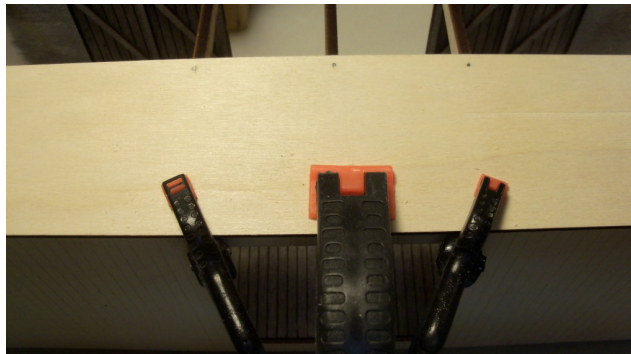
Step 8.

Grab the two roof halves and the 20 gauge brads. Even though we did our best to keep the side of the car straight, if you look from end to end down a side, there might be a little warpage. The roof will fix this, but care needs to be used when attaching. I used a large plastic clamp to hold one roof half to the car top. Position the second half in place and mark where the rafters are along the center edge and other edge. Check the overhang along all edges of the roof to ensure its equal all around and clamp the second half. This should bring all sides of the car into square. Then drill #66 holes along the center edge of one roof half. Drill through the roof and into the rafter. Remove the roof half and add glue to half the rafters and the edges of the car and place the roof half back on the car. Verify overhang is still equal around the car. Use a lightweight tack hammer and tap in 7 brads. Drill the outer holes near the edge of the roof into the 4 outer rafter and nail. Just clamp the center 3 rafters.

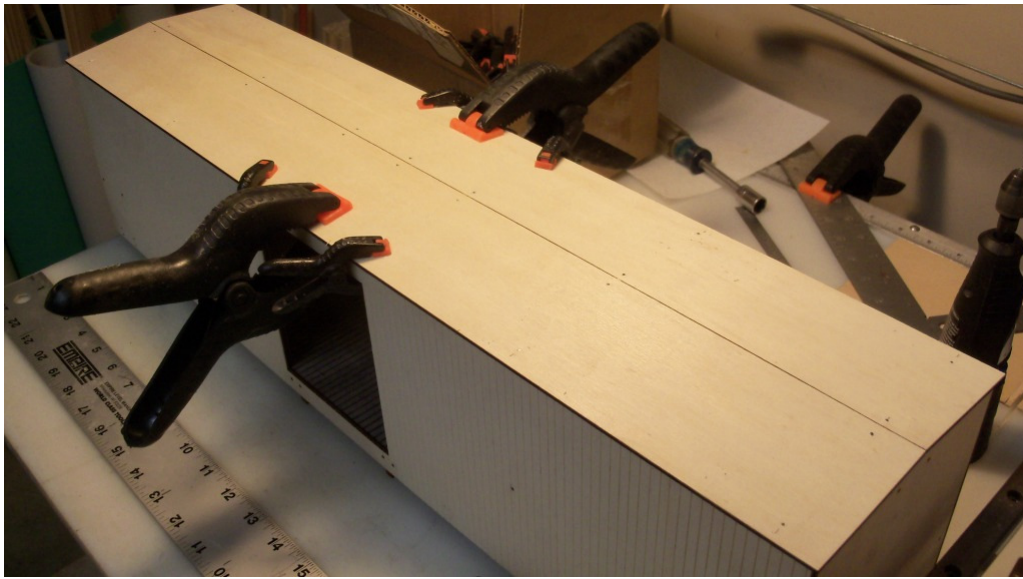
One side clamped (not glued) and adjusting the overhang of both halves.



First half glued and nailed. Don't nail the side edge of the 3 center rafters at the door as the brad will come through and draw blood from someone reaching into the car. Just clamp and let dry.



Now mark for brads, the second roof half, add glue and nail to the car. Again, just clamp at the doors.

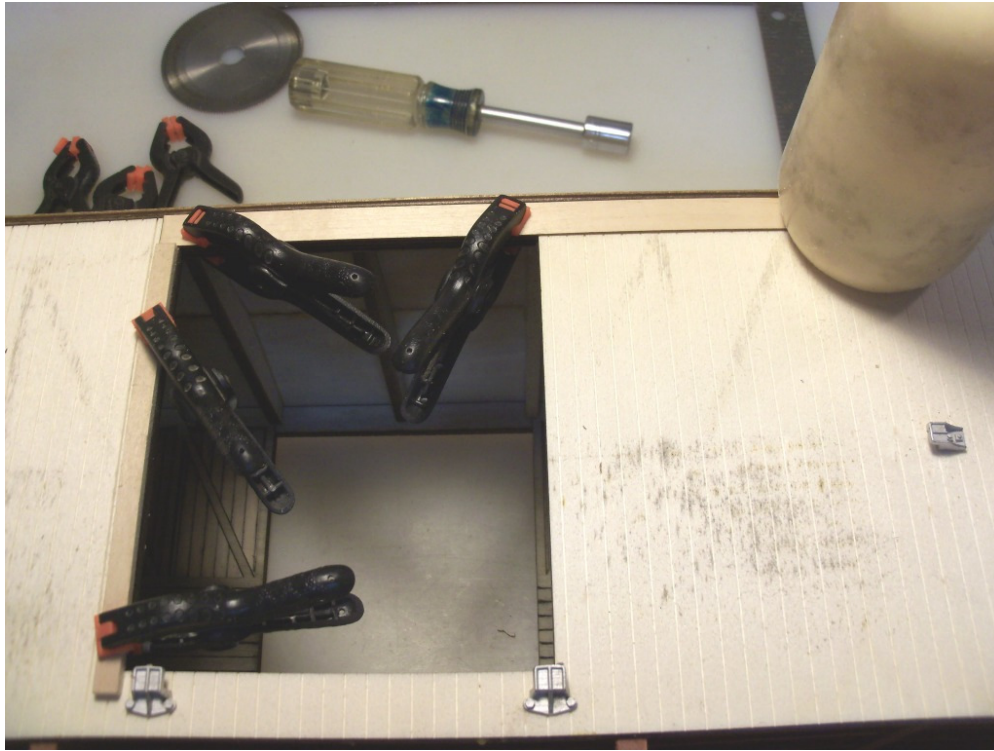


Step 9.

Gather up one of the side doors, 2 of the upper and 2 lower door glides and a door stop. The lasered holes in the sides are only through the outer side. Use a #52 drill bit and drill through the inner sides, the 4 holes for the lower glides and the 1 hole for the door stop. Don't glue any white metal parts in. Just press them in for building out the door framing. Open the door bag. In it are 2 pieces of 1/32" by .450" basswood 8-3/4" long. 2 pieces 1/32" by .240" by 8-3/4". 2 pieces of 1/8" by 1/4" by 5" long. 2 pieces of brass channel filled at both ends and drilled. And 4 pieces of lasered 1/32" basswood. 2 pieces 4" long and 2 pieces of 4-3/8" long. There are 4, 3/64" brass rivets in the small parts bag you will need.



Position the 1/32" by .450" at the top butted up against the roof edge. The 1/8" by 1/4" lays along the left side of the door opening.

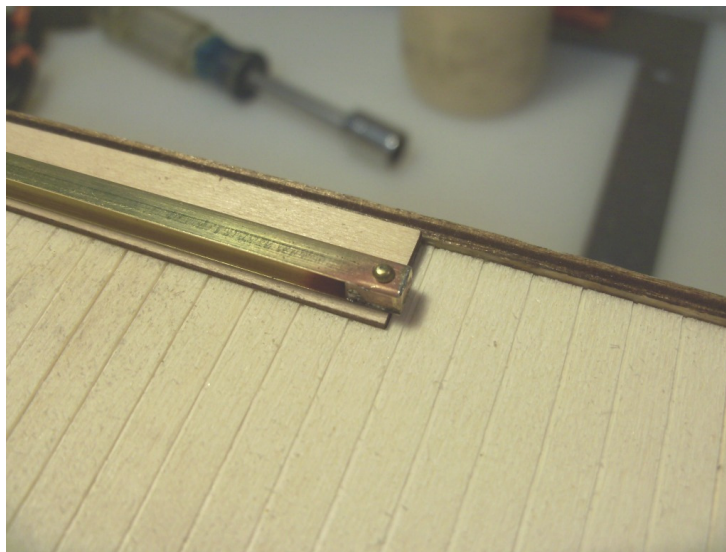


Glue and clamp these parts until dry. You can't clamp the right edge of the 1/32" stick so I put my glue bottle on it to hold it down.



Glue the smaller 1/32" thick piece to the top of the wider stick also butted up to the roof edge.

Now glue the channel onto the wider 1/32" stick and butted up to the smaller 1/32". Drill #56 hole through the predrilled holes in the channel and lightly tap in a rivet at each end. I used a "goo" glue for this.



Glue the door stop in and glue the 1/32" by .140" by 4' strip from the door stop to the door opening. Remove the 2 lower door glides and repeat for the other side. We won't glue the lower glides in until finishing the door.

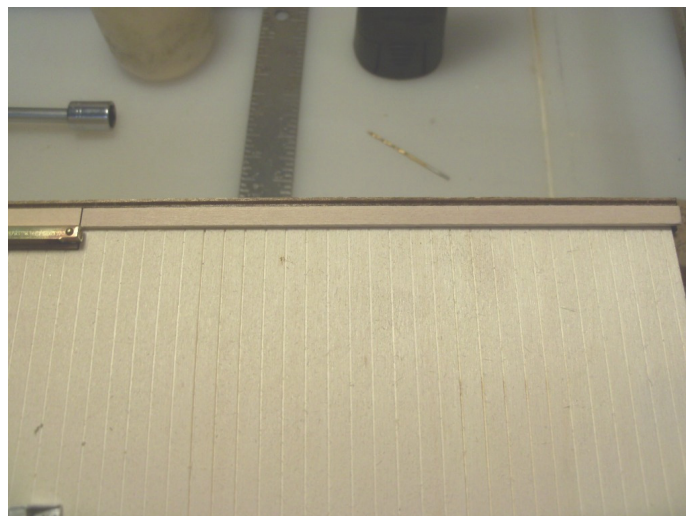


Step 10.

Glue the 2 end fascia pieces under the roof edge with the catwalk end support holes centered.

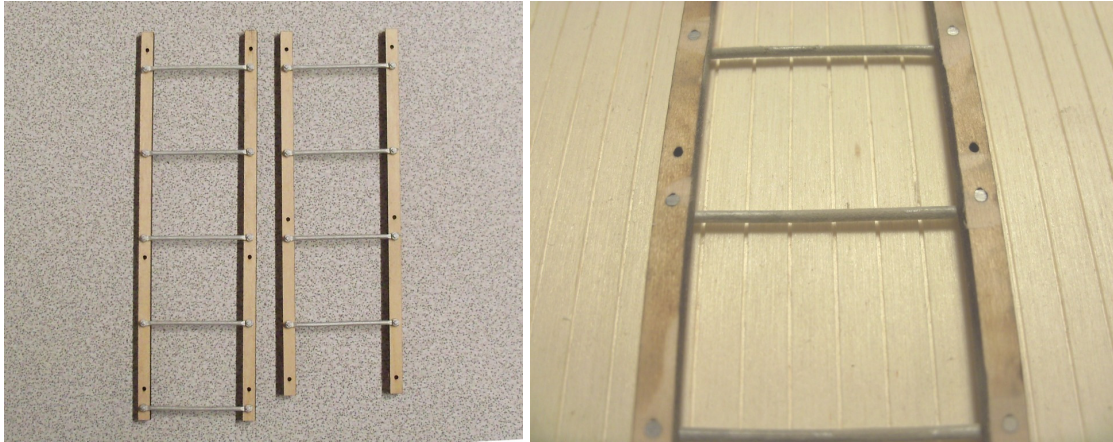


Cut the 1/16" by 1/4" by 18" sticks the fit both sides of the doors up against the roof edges.



Step 11.

Gather the 8 ladder rails and 18 ladder rungs. Notice the 8 rails are not the same length, 4 are 5-rung side ladder rails and 4 are 4-rung end ladder rails. Carefully press all ladder rungs into the rails. The castings will extend through the rails. I use my disk belt sander to sand off the casting that protrudes the back side of the rails. Then hold the side and end ladders next to each other to determine top and bottom. The rungs will only match positions between the two ladders one way. The bottom of the 4-rung end ladder has no bottom rung but the other rungs will match up with the sides. The end rails are a little shorter than the sides rails.

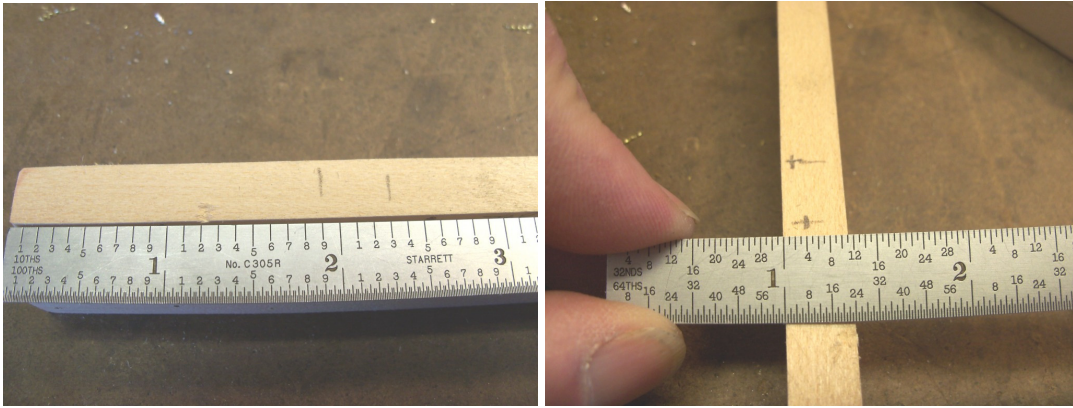


The 4 holes for the strap steps may have filled with glue when you glued the sides to the frame. Drill out the holes using a #56 bit and then paying attention to the twist of the sides of the steps (they should twist inward), pin with brass NB's to the car. Glue the 5-rung side ladder as pictured leaving 1/8" from the right side of the ladder to the right side of the car. Drill the 6 mounting holes with a #56 bit and pin with 6 NB's. Repeat for the other end of the side and the opposite side of the car.



Step 12.

Gather the 2 end buffers. While all the holes in the face of the buffer are pre-drilled, the "B" end buffer needs holes drilled for the brake staff and retainer valve air-line pipe. Both buffers are identical until you drill these holes. Measure from the left side top 1.9" and make a mark. Make another mark at 2.3". Now mark the 1.9" line 1/8" out from the back of the buffer. Mark the 2.3" line 1/16" out from the back.



Now drill from top to bottom the 1.9" by 1/8" mark with a #50 bit. Drill the 2.3" by 1/16" mark with a #60 bit. The "A" end buffer remains as supplied.

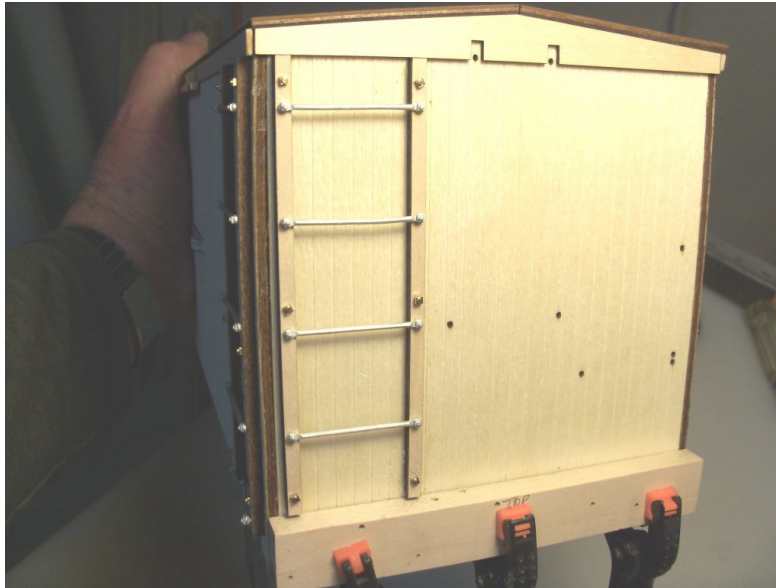


Step 13.

Now glue both buffers to the end of the car. This is the "B" end. The "A" end just doesn't have the brake staff and retainer air-line holes.

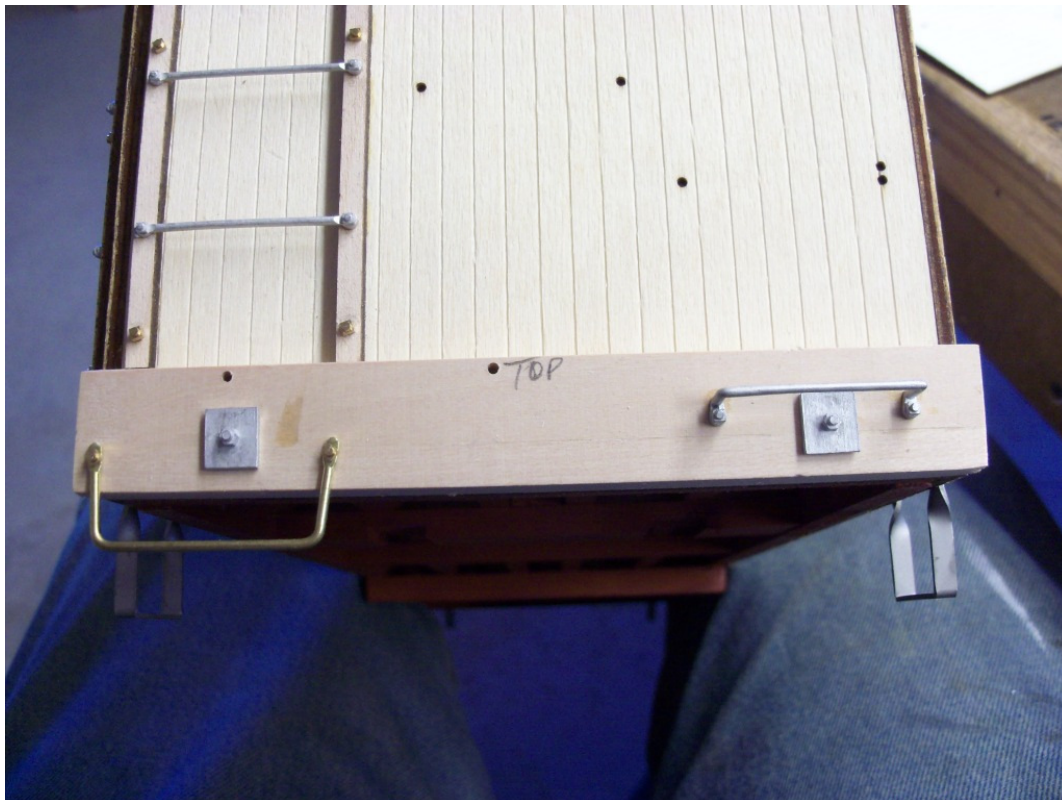


While the buffers are drying, glue and pin both the 4-rung ladders to the ends. The left side of the left rail should be no more than 1/8" from the side of the car. Match the rung height to the side ladder.

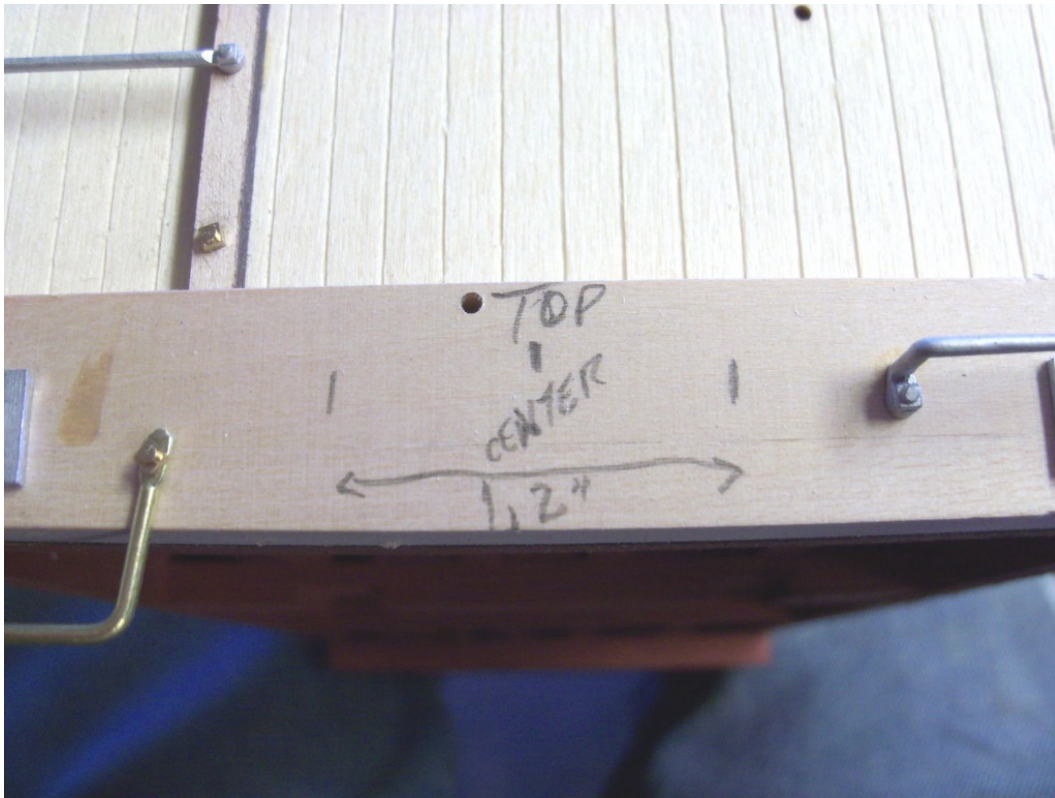


Step 14.

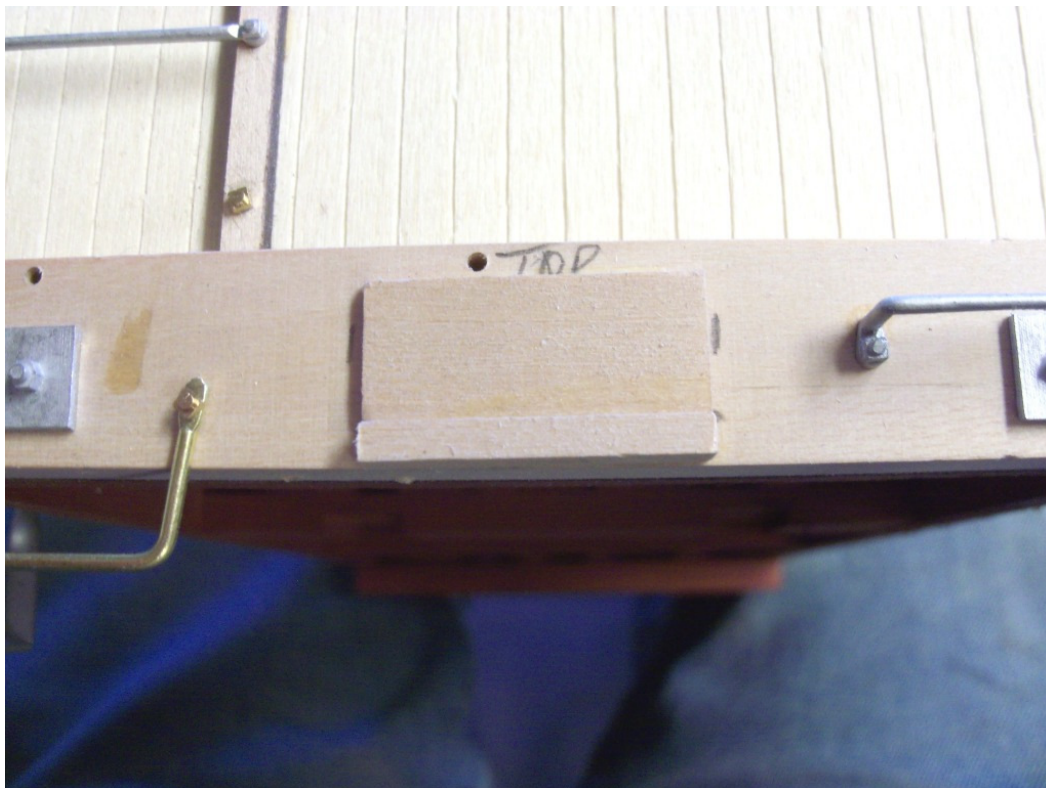
Now gather the 2 brass strap steps, 4 rectangular truss rod end bolts and 2 end beam grab irons. Also 4 pieces of pre-cut basswood. All pieces cut 1.1" long. 2 are 1/16" by 1/2" and 2 are 1/8" square. All the holes for these parts are pre-drilled with a jig to keep positions balanced. Glue the truss rod end NBW's in place with the short side top and bottom and the long side left and right. The white metal grab will glue in on the right side and the brass grab on the left. You may need to close or spread the arms so the holes line up. Pin with 2 brass NB's.



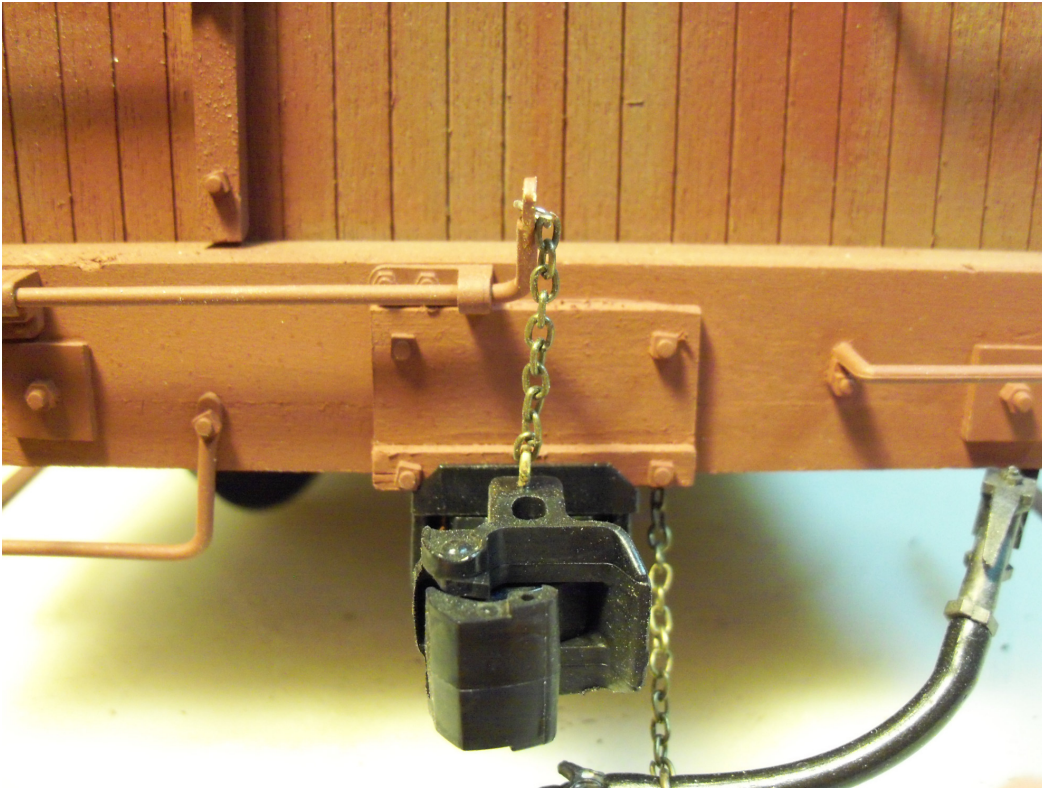
Now locate the center of the buffer and measure and mark .55" either side of center.



Glue the 1/8" square piece at the bottom between the marks and the 1/16" by 1/2" above it.



Now drill 4 #56 holes for NB's in the top 2 corners of the 1/16" piece and the 2 edges of the 1/8" square. Press in 4 NB's. I forgot to take a picture of this, but this is the finished painted parts.



The final part of this step is to glue in the 2 coupler lift bars in the pre-drilled holes. I drilled for the 4 NB's after attaching the coupler lift bars. You can do it before or after.



Step 15.

Grab the 2 side doors and place into the channel. Grab the last 2 pieces of wood from the door bag which are the lasered 1/32" thick by 4.3" long basswood pieces. Glue then on the doors lining up with the pieces previously glued from the door stop to the edge of the door opening.

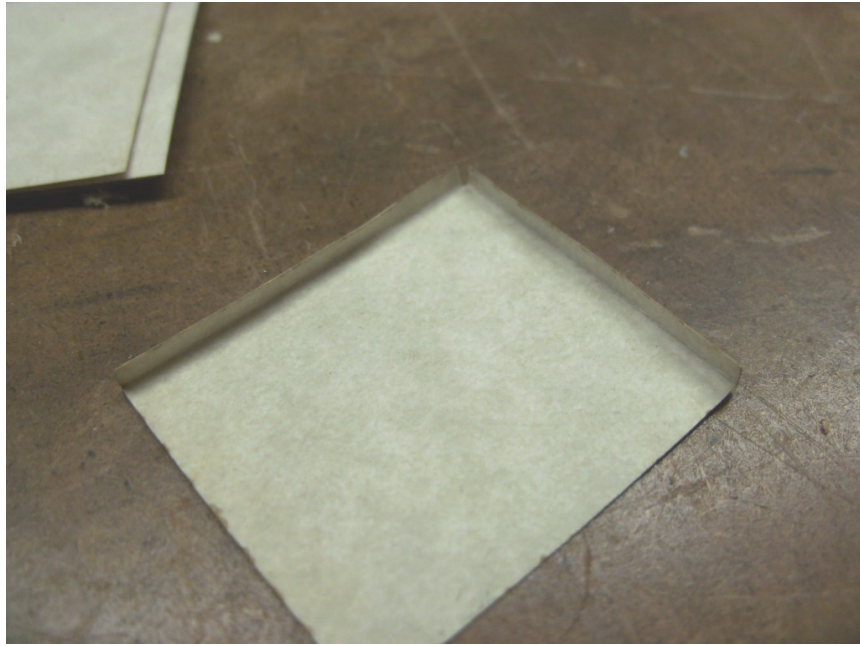


Set both doors aside for painting. The brass channel appears warped up. This is just a side effect of my macro camera lens.

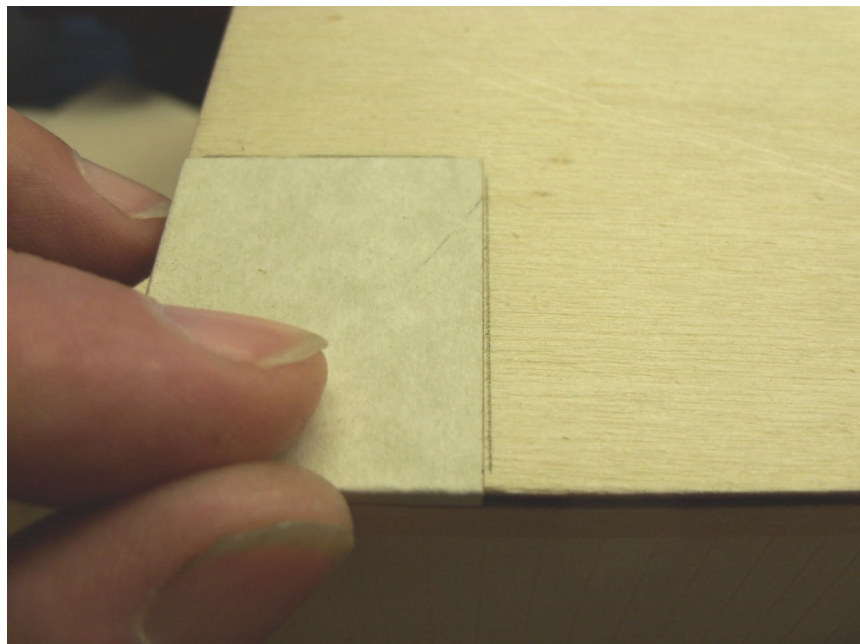
Step 16.

Gather up the 84 roof tiles. It should only take 84 to cover the roof but I have supplied 94. You will need to bend these on 1 or more edges. I have a small anvil with a straight, square edge that works great. You also need a pair of scissors for trimming some of the tiles. I use white glue to hold them down. We're going to start on the left front corner and work left to right so any piece meal tiles will be hidden by the catwalk ends on the right side of the roof. All tiles are applied with the long side up and down. Narrow width side to side. Some railroads used large sheets of tin to weatherproof the car roofs. The Sandy River used small rectangles soldered at the edges. These tiles will represent the roof as applied.

The first tile has a corner snipped out and two edges folded. The plywood roof is .110" thick so you will need to bend 1/10 of an inch on edges needing to be bent.



Lay this first tile on the lower left corner and mark its edges with a pencil.

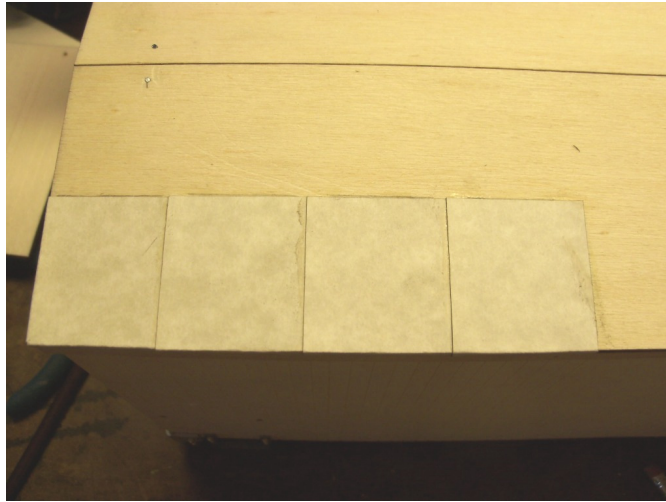


Remove the tile and apply a little glue. I use my index finger to spread the glue evenly and press the tile down. I keep a little bowl of water and paper towels to clean my finger after every 10 or so tiles.

Here's a few pictures of bending the tiles on my anvil.



I bend up several at a time, so I don't have to stop gluing to bend. Overlap each tile a 1/16" or so.



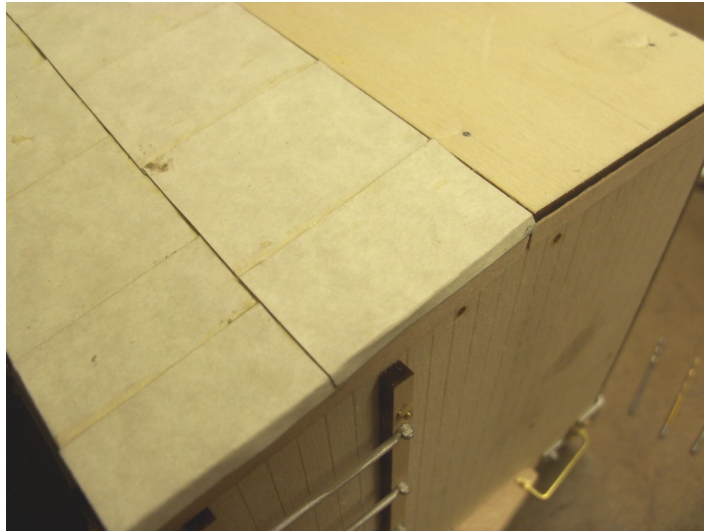
Continue all the way across the roof to the right edge. Mark the tile for cutting with scissors.



The second row of tiles starts with a half tile only bent at the left edge.



Continue across to the right side.



Repeat for the other side. Now glue in the 8 grab irons. I've held this step back to the last step before painting as the grabs are fragile and don't want you to break any. I forgot to get a picture before painting.



Step 17.

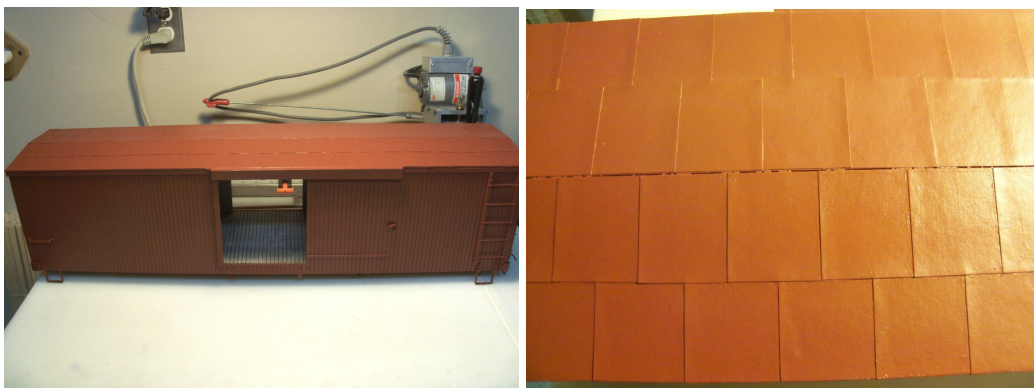
Time to paint the car. I used a rattle can, Rustoleum red primer. Browner than red but a good base coat for weathering. Multiple light coats are always better than one heavy coat. Spray the ends, sides, staying away from the door openings. When dry, get the 2 door blanks I sent with the kit. These are the cut outs when lasering the sides. Tape one in a door opening from the inside. Drop the other in the outside. Pic's are boxcar 85, but principle is the same.



Spray this side of the car. When dry, remove the two cut outs and tape into the other side and paint it.

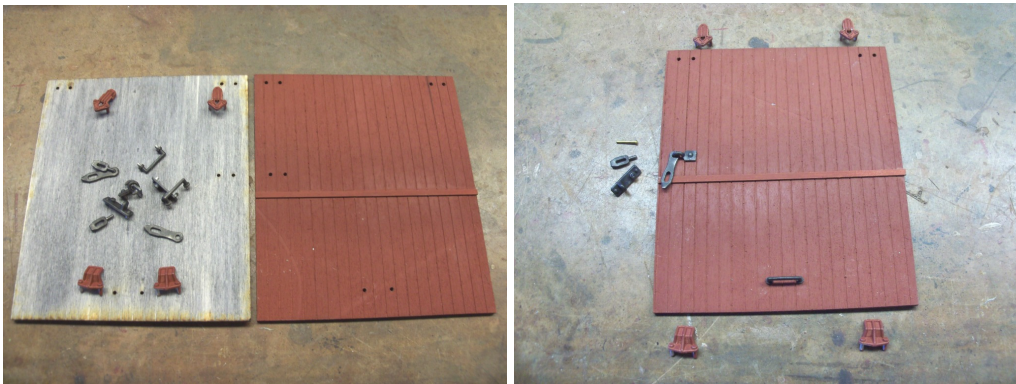


Finished painting.



Step 18.

Gather up the 4 lower door glides, 4 upper glides and the door lock bag. In the bag are the 4 white metal door lock pieces, a rivet and door handle per side. Blacken all parts. Paint the outside of the doors and stain the inside. Glue the handle in and the latch keeper and latch bar. Paint the upper and lower glides.

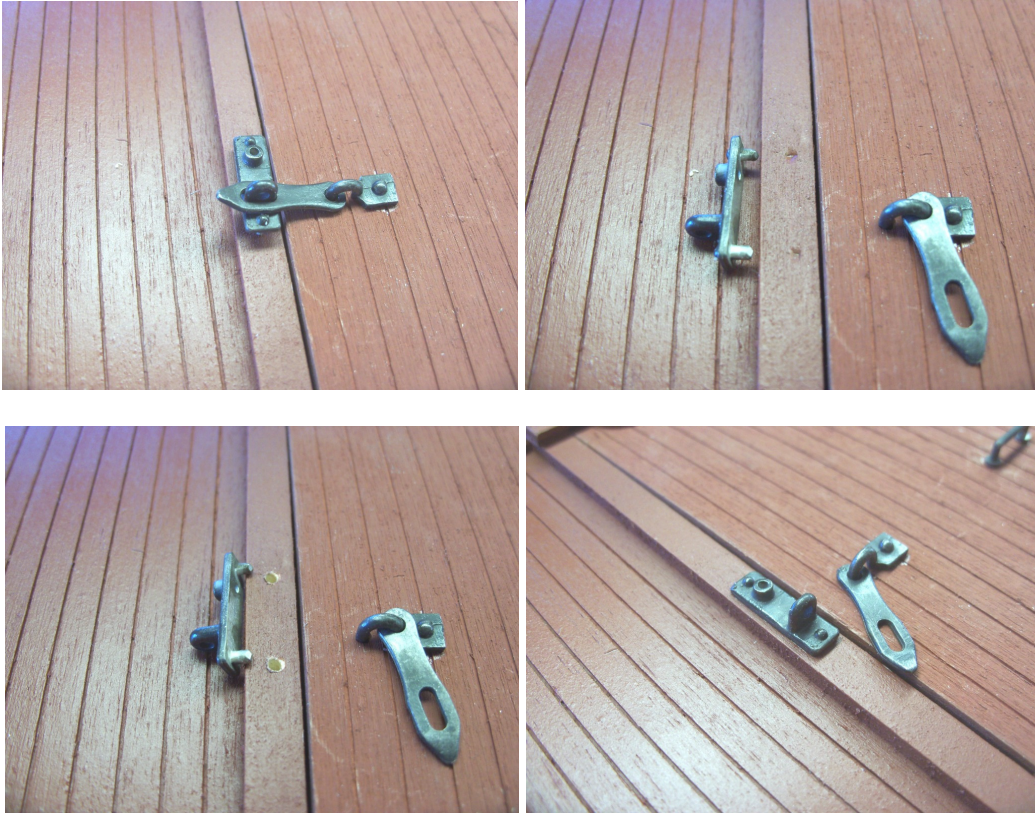


Fit the door in place and glue in the upper and lower door glides. Once you glue in the glides, the door will be permanently locked in place. You can blacken any paint thin spots on the white metal. Repeat for the opposite door.

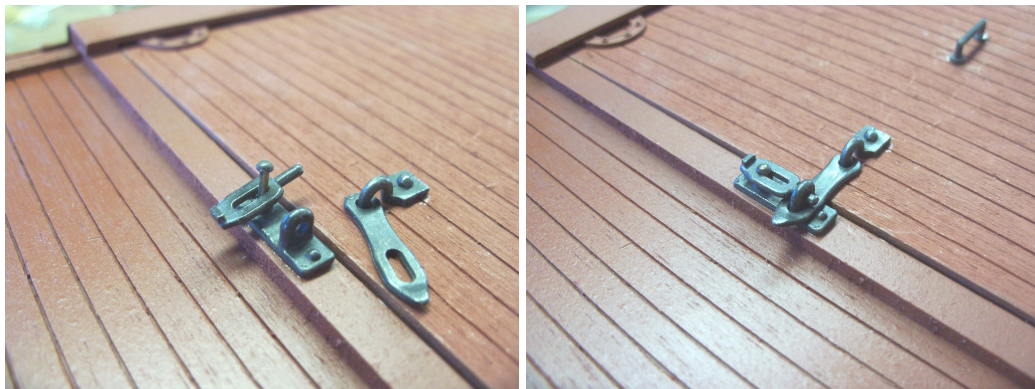


Step 19.

Position the latch plate so the latch bar fits on it. Rock the plate with downward pressure to make dimples in the wood. Drill those dimples with a #52 bit and glue the plate to the wood.



Drill a #56 hole through the hole in the latch plate through the wood door trim and the car side. Press the rivet through the lock pin and into the hole in the plate. Press it down snug but not tight. This will allow the locking pin to move to lock the latching bar to the plate.

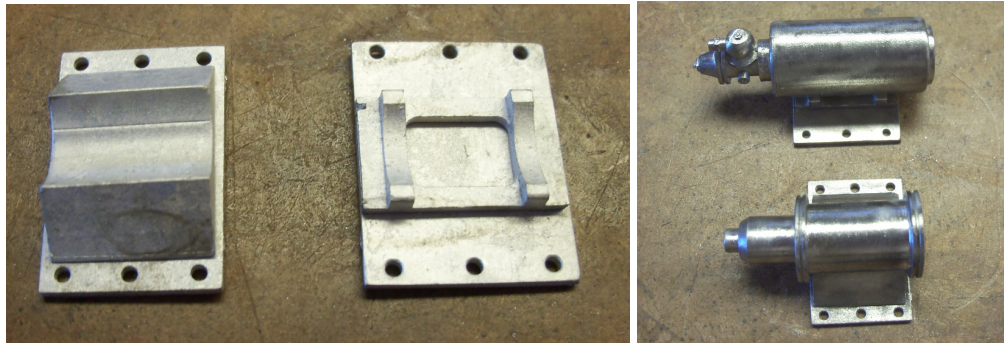


Step 20.

Gather up the remaining white metal. I put a wire brush into my battery powered Dremel and shine up all the metal. It makes them blacken faster and more evenly than not doing it.



Glue the cylinder saddle to the base (left) and the reservoir saddle to the base (right). Then glue the cylinder to the saddle (bottom) and the reservoir to the saddle (top). Do this before blackening.

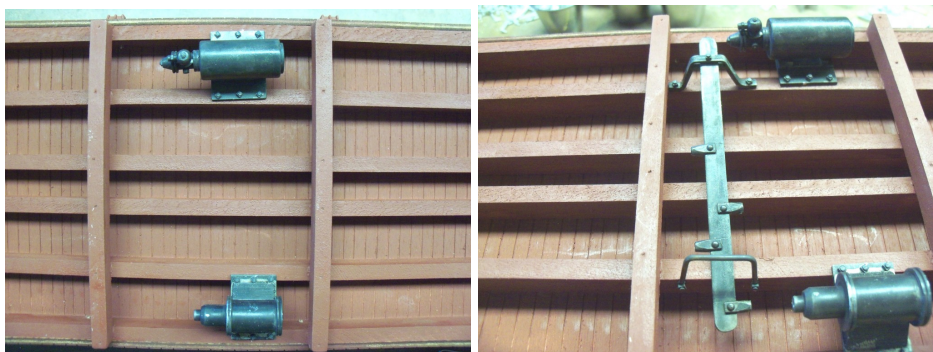


Now blacken all parts. I use a stained glass patina called NOVACAN. A lot cheaper than hobby store blackener. When dry I buff the parts with a wool wheel in my Dremel. Gives a gun metal look.

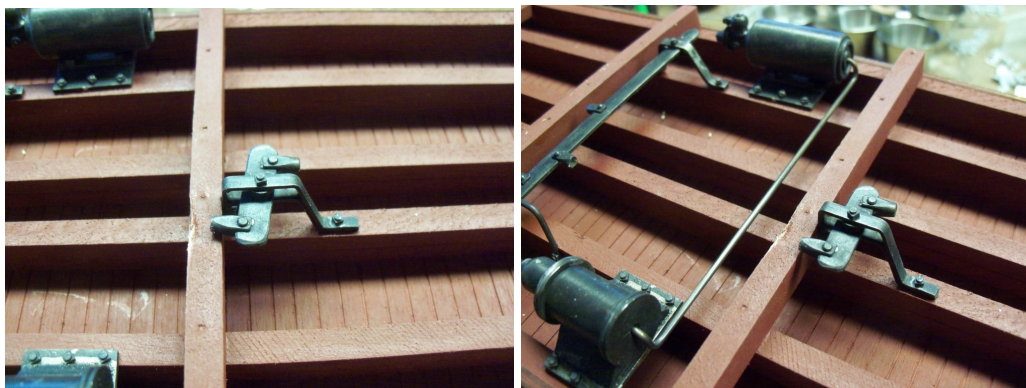


I pre-drilled most of these parts. I will call out those needing drilling with the proper bit size. Place the car upside down with the "B" end (the end with the holes drilled in the buffer) to the left. The following pictures are from the 85 boxcar instructions. The only difference is the space between the needle beams. Use the dimensions I give for placement. Place the cylinder and reservoir in position. Leave 1" between their backsides and the right needle beam. Using a #56 bit, drill the 12 holes through the bases and into the sills. Pin with blackened NB's.

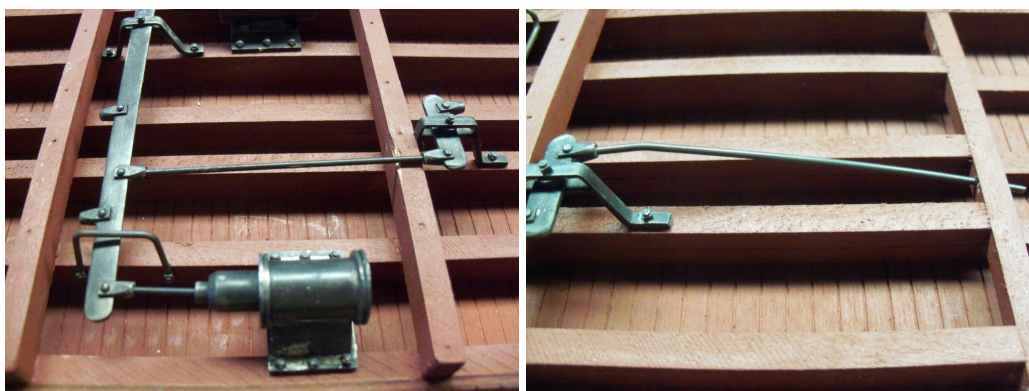
Then place the main brake lever support in position and drill 2 #56 holes through the legs and into the sill. Pin with NB's. Slip the brake lever in and pin with an NB. Hold the brake lever limiting bar in place, drill through the holes in the legs and pin with NB's. Supplied are 4 pieces of 1/16" brass wire 1' long. In a parts bag is a piece, 4-1/2" long that has one end flattened with a hole in it. Set this and 2 each 1' rods aside for the truss rods and chain connecting rod. Brake rods will come from the remaining two 1' rods and 4-1/2" rod.

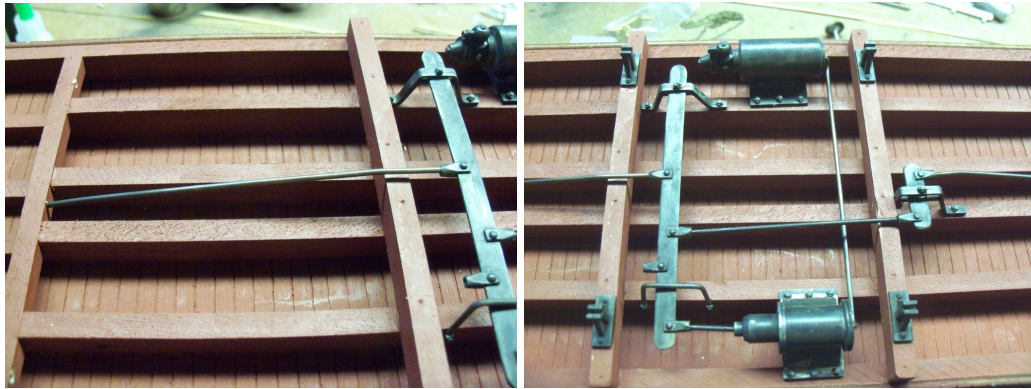


Position the secondary brake lever support as pictured. Drill into the needle beam and sill with a #56 bit and pin with NB's. Slip the brake lever in place and pin with an NB. Measure the distance between holes in the rear of the cylinder and reservoir. Add 1" to this and cut a piece of blackened brass wire. Bend up 1/2" at each end and then bend out 1/4". Adjust the angles of the bends to fit into the rear of the 2 holes and glue in.

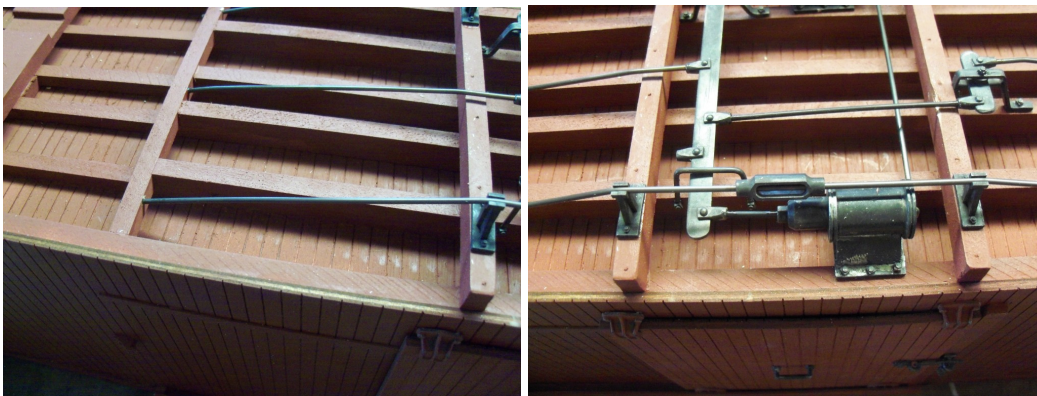


Measure and cut rod to fit from the main lever fourth clevis to the cylinder. Measure and cut another piece from the main lever second clevis to the secondary second clevis. Measure from the secondary lever first clevis to the center hole in the right truss rod termination block. Measure from the main lever first clevis to the center hole in the left truss rod terminating block. When satisfied with the fit, glue in place. Remember to add a drop on the NB's holding both levers in their supports. Glue the 4 queen post in place. Use the holes in the truss rod terminating blocks as guides for placement.

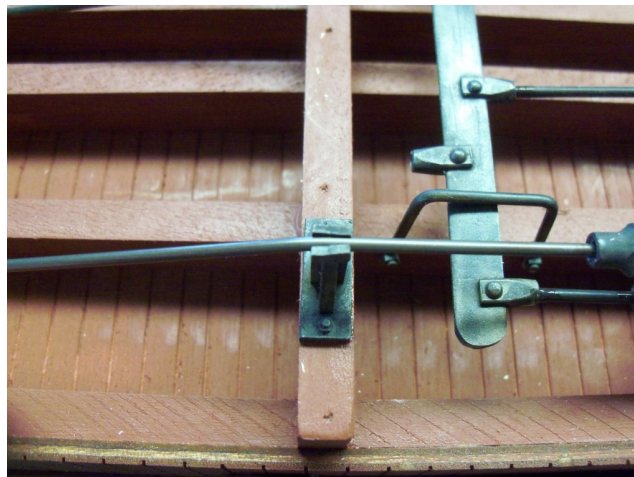




Push one the truss rods into the hole in the truss rod terminating block, bending over a queen post, through a turnbuckle, over the next queen post and down into the hole in the truss rod terminating block. Do the second truss rod the same way.



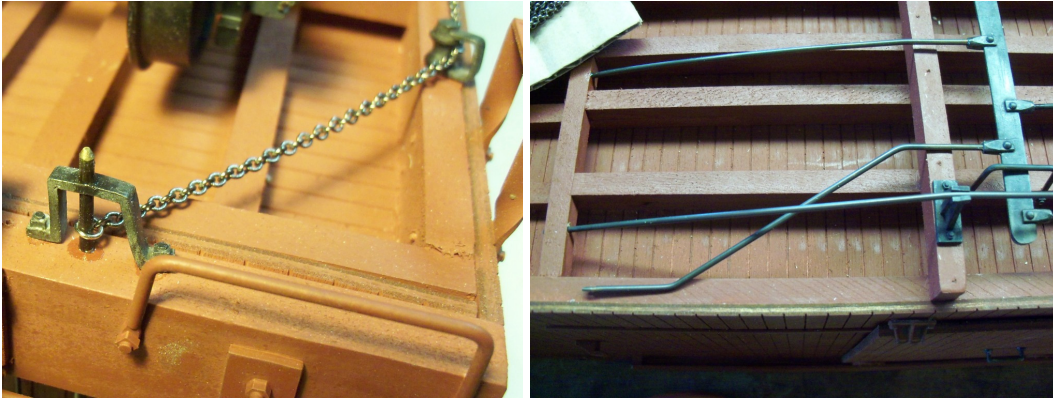
I designed the queen post with deeper than normal slots for the truss rods. This will allow the tops to be slightly bent in with pliers to hold the truss rods from popping out the post. This is white metal and can brake if too much pressure is applied. Just squeeze the tops a little to hold the rods in place.



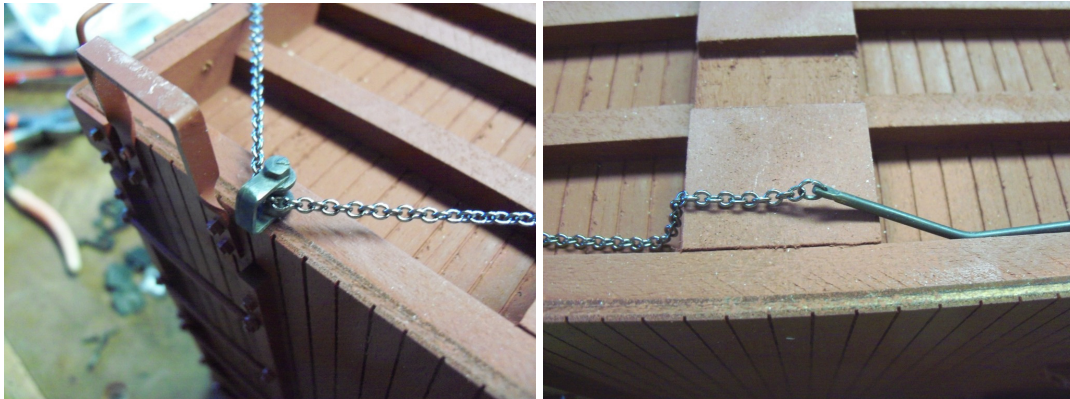
Step 21.

Cut a short piece of rod to push into the brake staff hole in the bottom of the buffer. Only halfway into the buffer. The main brake staff will also fit into this hole. When transporting the car, it might be safer to remove the staff and brake wheel from the top so as not to bend or damage the car. Put a 3 mm jump ring through an

end of the chain and over the rod. Place the lower brake staff support over the rod as shown and rock it a bit to create dimples in the wood. Remove and drill with a #52 bit and then glue the support in place. Grab the 4-1/2" rod with one end flattened and bend as pictured. 1" at each end leaving 2-1/2" in the middle.



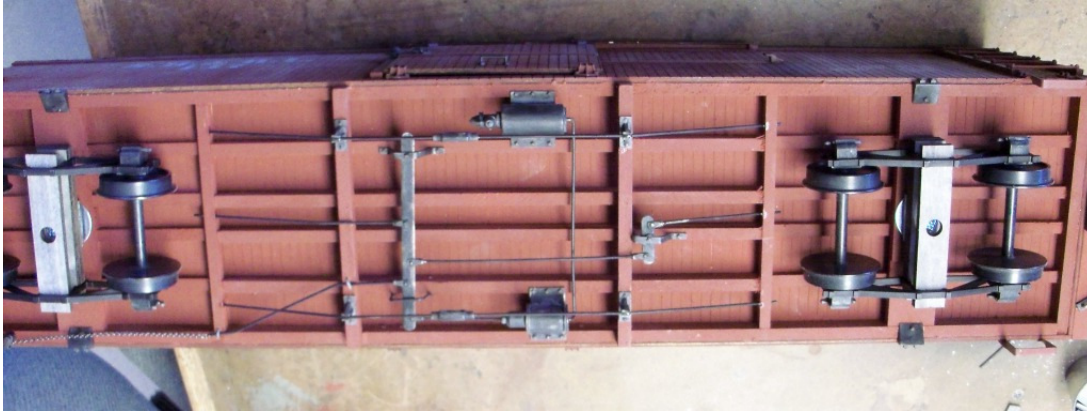
Drill a #52 hole in the side sill next to the strap step. Run the chain through the chain roller and glue into position. With the bent rod in the third clevis of the main lever pull the chain to the end of the rod for length, cut and add a 3 mm jump ring to the chain and rod.



Push the rod back into the third clevis. If too much slack in the chain, remove and trim a tiny bit from the clevis end of the rod and retry. Trim as necessary until the chain is snug with the rod fully inserted in the clevis. Now press the staples into the needle beam and side sill enough to make a mark. Drill with a #56 bit and press the staples in. Add glue to the clevis and staples.

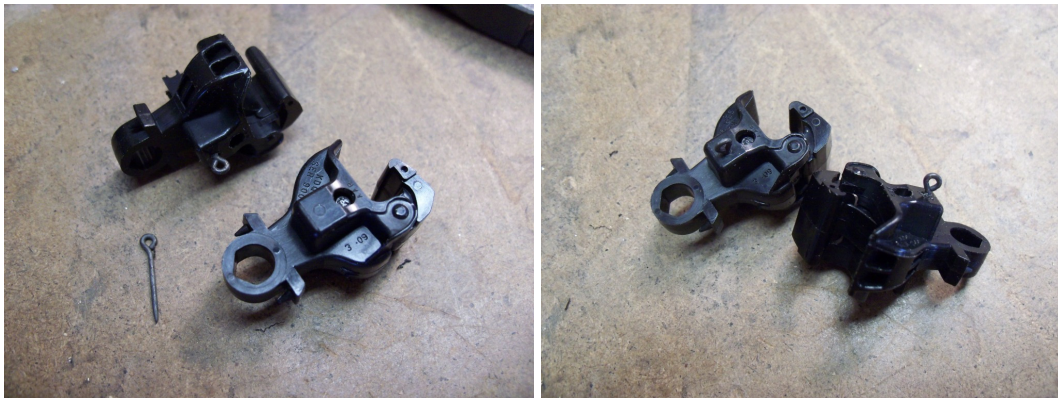


Now glue the 4 bolster reinforcing boxes to the edges of the body bolsters. Drill a #56 hole through the holes and pin with 2 NB's. The NB's will help keep the blocks attached. This is the underside of 147.



Step 22.

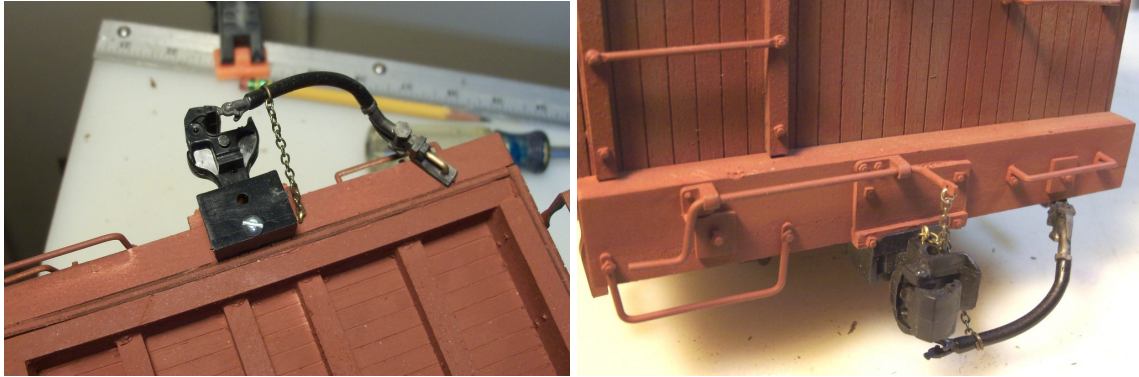
Grab the Kadee coupler knuckles and cut off the uncoupling bar. Then drill a #66 hole in the top through the coupler body. Locate the hole in the flat area behind the knuckle where the small circle is. Press in 2 of the brass eye-pins.



Using a lid and a #47 drill bit, position the lid centered on the buffer and drill through the rear hole of the lid into the buffer no more than halfway. Don't drill all the way through. Assemble the coupler and screw to the bottom of the buffer with the supplies #4 wood screws. Cut lengths of chain 10 links long and 15 links long. Open the eye-pin on the knuckle and feed the 10 link chain through it. Close the eye-pin. Open another eye-pin and attach it to the 15 link chain. Assemble the brake hose and fit a 5mm jump ring through the end of the 15 link chain and over the hose of the brake hose. Close the jump ring to hold it attached but not so tight as to crush the hose.

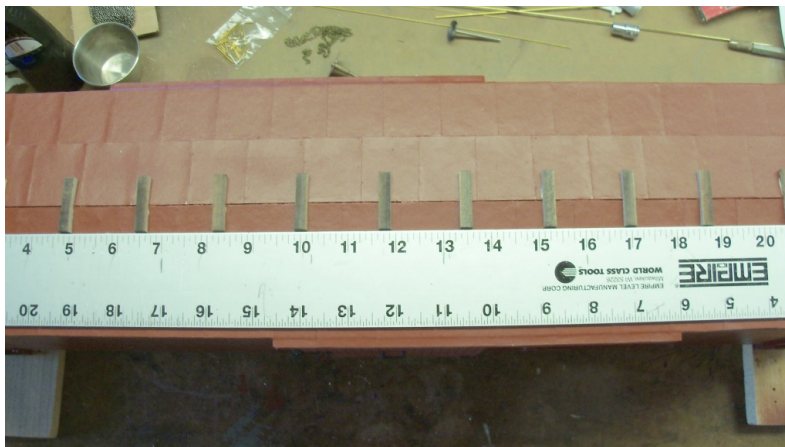


Drill a #52 hole 1-1/4" from the edge of the car into the end beam and a #66 hole in the buffer next to the coupler. Glue the angle cock into the #52 hole and press the eye-pin into the #66 hole. Attach a 3mm jump ring through the coupler chain and through the coupler lift bar hole and close the jump ring. While this won't operate the coupler jaws, it looks good.

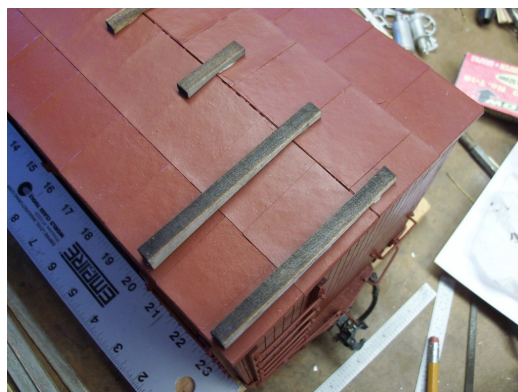


Step 23.

Grab the 11 catwalk supports and the 4 catwalk end platform supports and a 2' ruler.



The roof is 25" long making the center at 12-1/2". Measure from one end and mark the center at the peak of the roof. Now measure 1-3/4" out from one side and mark. Mark every 1-3/4" out 5 marks. Repeat for the other direction. Stain all the supports and then glue the first support centered between the sides of the car at the center mark. Add supports both ways with the ruler in place to keep all the edges even as pictured above. Add the 4 platform supports at both ends. The planks that cover these supports are 2" long so keep the outer edges 1-3/4" apart. Glue the support closest to the edge of the car no more than 1/8" away so the planks will be even with the edge of the car.



When I want grain on any stick wood, I put a cheap Harbor Freight wire wheel in my drill press with a block of wood as a backstop and run the stick wood through it. Then a light stain.



The catwalks overhang the car ends $\frac{1}{2}$ ". I cut my boards so there's 2 or 3 boards per length. Stagger where the joints are for a better look. Space the 3 boards $\frac{1}{16}$ " apart so the total width of the walk is $1\frac{1}{4}$ " wide. Add weights so all contact points with the supports glue down. Remember, $\frac{1}{2}$ " overhang at the ends.



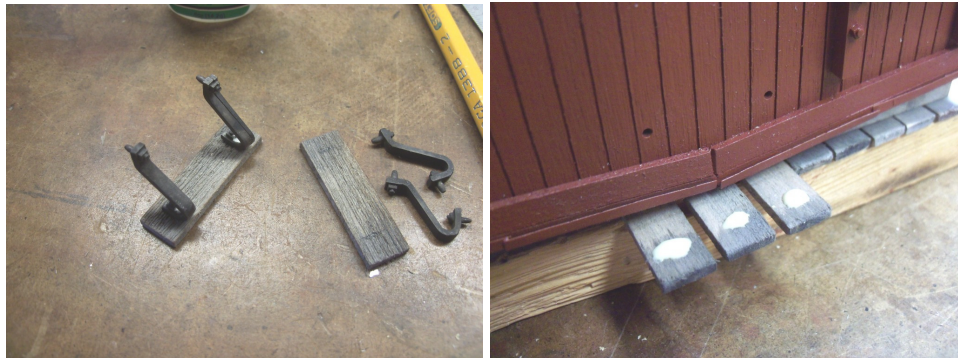
With the remaining lumber, cut 10 pieces 2" long. Glue them to the platforms.



Cut 2 pieces from the same stock 1-1/4" long. Turn the car over and hold a piece next to the 2 lasered holes just below the catwalk. These are for the catwalk end supports. First 3 pics of the 85 boxcar. 4th is the 147 boxcar.



Mark the board to match the holes in the car end. Drill these 2 holes with a #52 drill bit. Glue 2 of the catwalk supports to the board. Add a drop of glue to the bottom side the catwalks



Add a drop of ACC to the support tips and position the supports into the holes and push the board into position as pictured.



Step 24.

On the “B” end of the car find the small hole for the retainer air line in the buffer and based on its position with a scribe in the car end, come up to the top ladder rung and drill a #52 hole. A hole is pre-drilled through the retainer. Glue the 1/32” brass wire into this hole. Wire was blackened first.



Hold the retainer to its hole and cut the wire so it won't protrude below the buffer. Insert the wire into the buffer so the retainer will fit into the drilled hole and glue in.



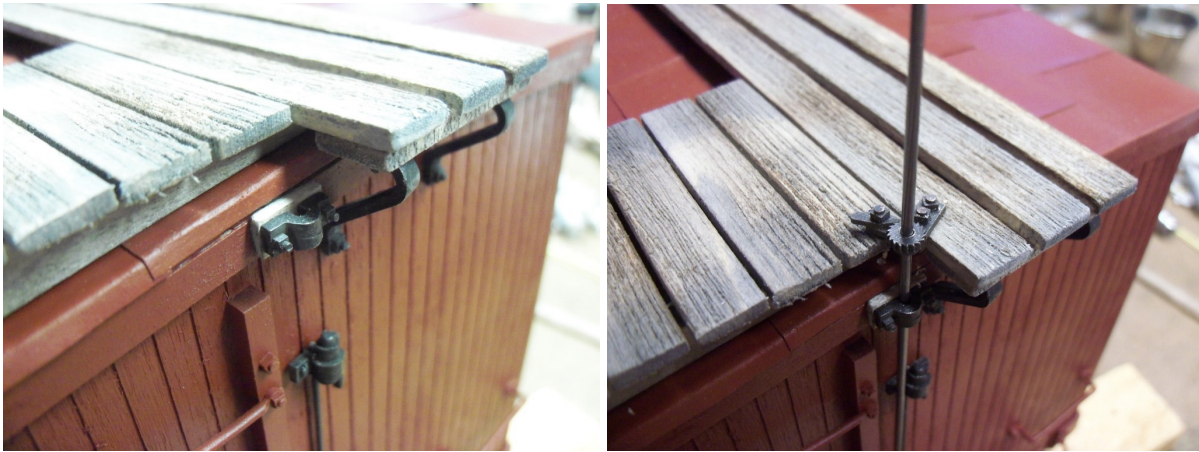
Insert the 1/16” by 8” piece of music wire in the buffer and glue a piece of left over fascia board centered around the wire. Place the upper brake staff support over the wire and rock it enough to mark this piece of wood.



Now drill those 2 holes with a #52 drill bit. Note, first pictures are boxcar 85. Last is boxcar 147.



Glue the upper brake staff support into the holes. Slip the brake staff through the support and into the buffer. Slip the lock pawl over the brake staff and position as pictured. Drill one #56 hole through the brace arm and pin with an NB. Drill the remaining 2 holes through the brace and pawl and pin with NB's

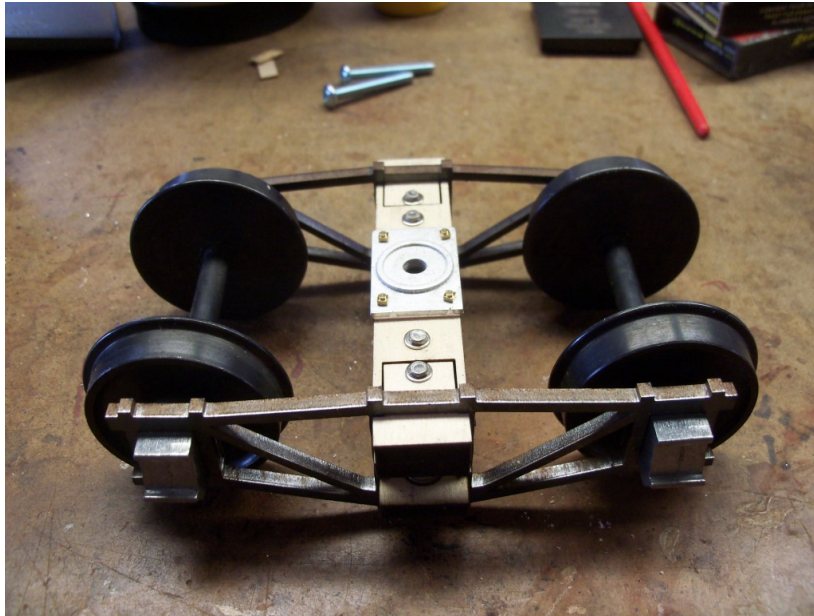


Glue the brake wheel to the top of the staff and slip through the lock pawl, upper support and into the buffer. I don't glue mine in to make transporting less likely to bend or damage any of these parts.

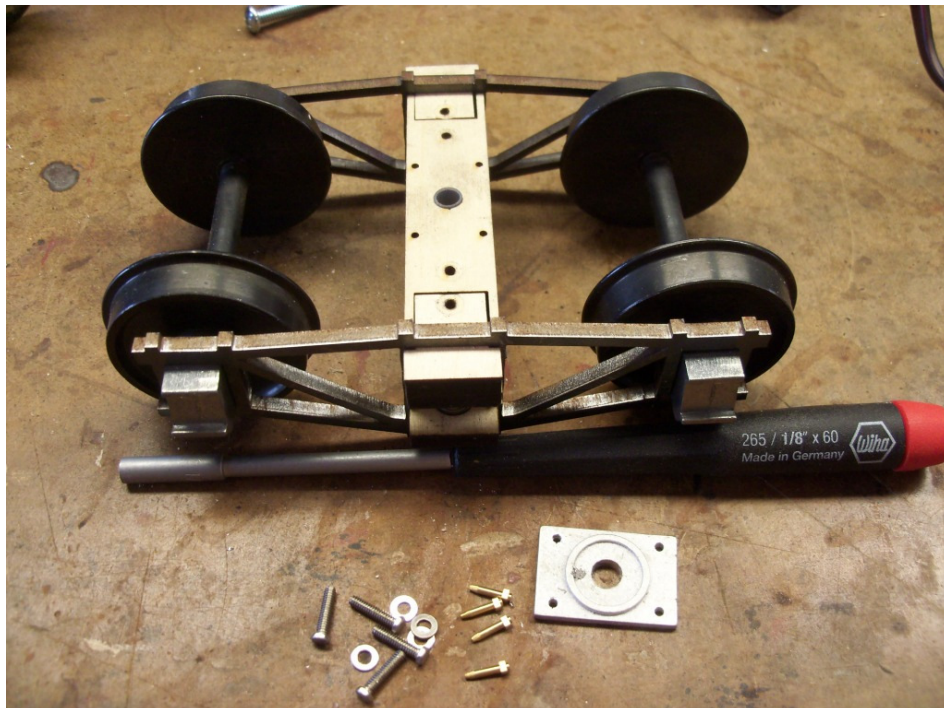


Step 25.

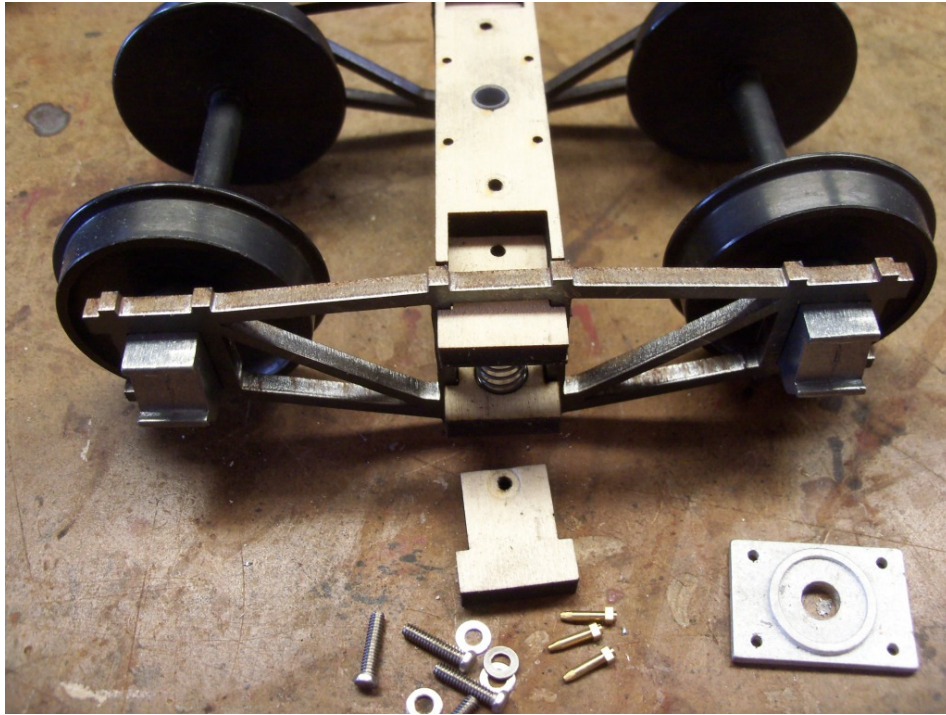
Grab both the trucks, 8 journal box lids, 2 springs, 2 nylon washers, 2 fender washers, two 8/32 by 1-1/4" screws and spare parts. I'll be picturing 1 truck but do this to both.



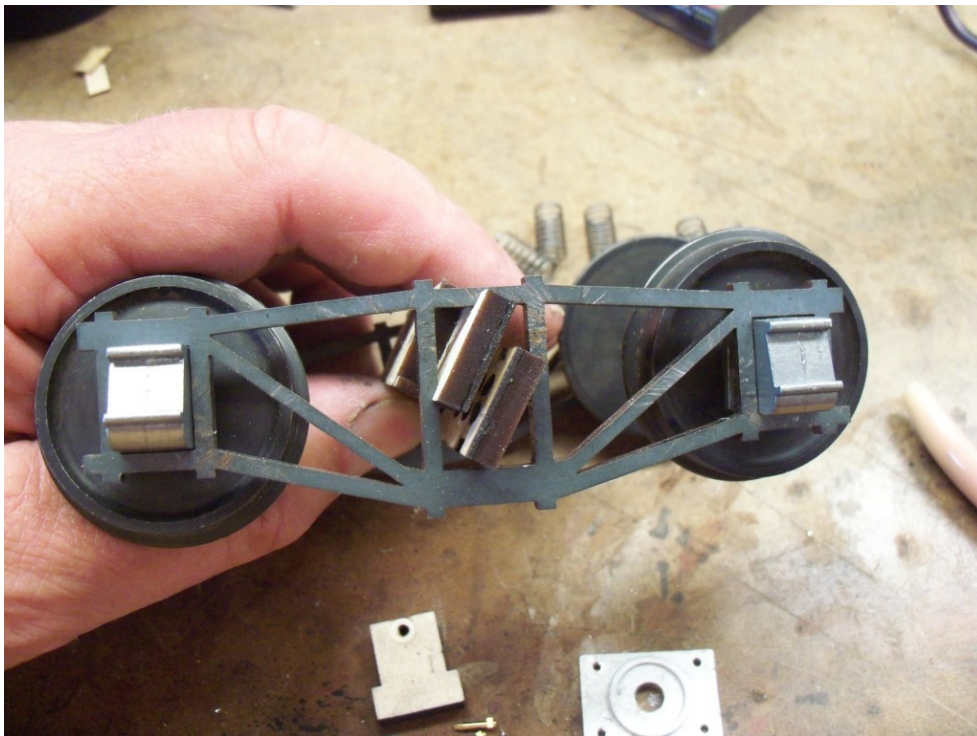
Using a 1/8" socket (3.2mm will work), remove the 4, 2-56 hex head screws and #2 washers. Also remove the 4 NB's and white metal bolster pivot plate. Also pictured is my 1/8" socket wrench.

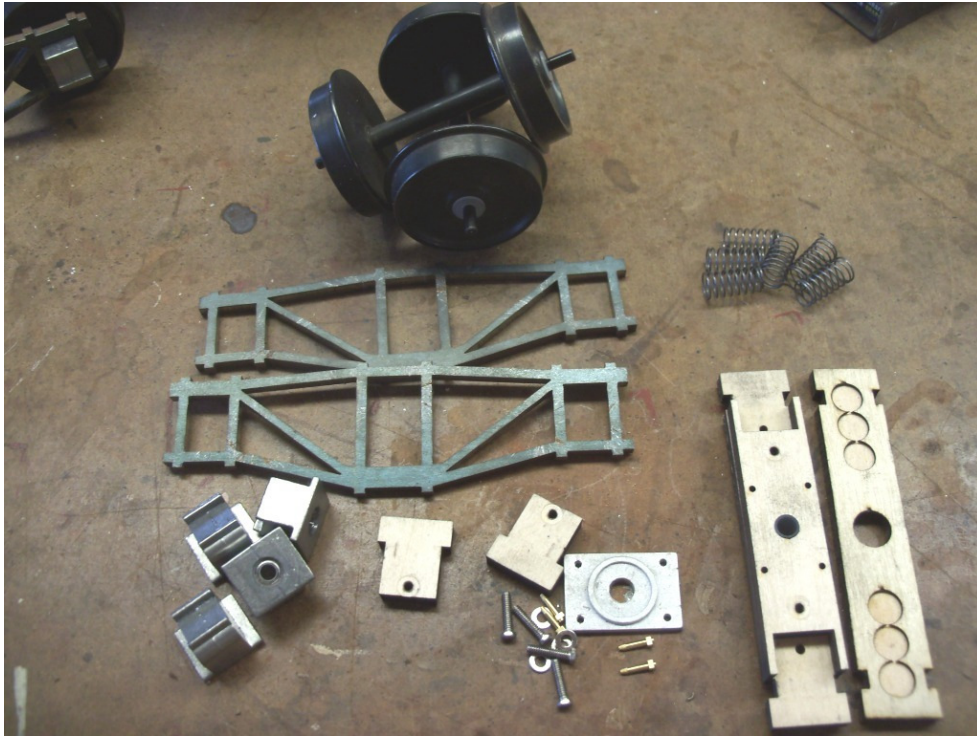


Remove the 2 wood pieces from the side of the bolster.



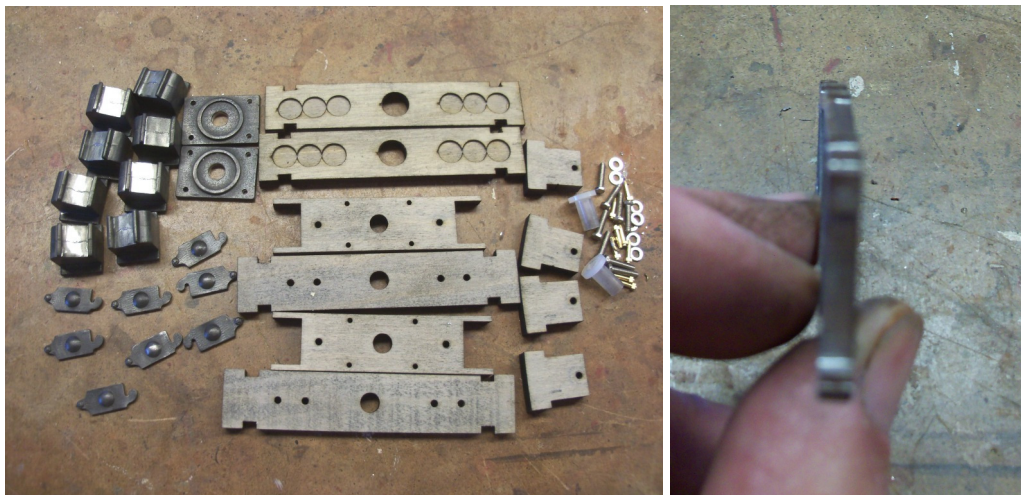
Tilt the bolster leaving the spring plank flat and the springs should pop out. You may need to pull them out. Now tilt both the bolster and spring plank so they are both 90 degrees from the flat position. This will allow you to slide the side frame off allowing the trucks to fully come apart. There are thin, white nylon washers on the axle tips so don't lose them. I added them in case you plan on running the car on electrified track.





Take the sideframes outside and rattle can them with flat black paint. I sprayed them on a piece of cardboard and then worked on staining with India ink and alcohol all the wood parts. I also shined up the white metal and diecast journal boxes and blackened them with patina. When dry, I buffed the blackened parts with a wool wheel in my Dremel. By this time, the first side of the sideframes were dry and I flipped them over and sprayed the other sides.

Once all parts were dry, it was time to re-assemble the trucks.

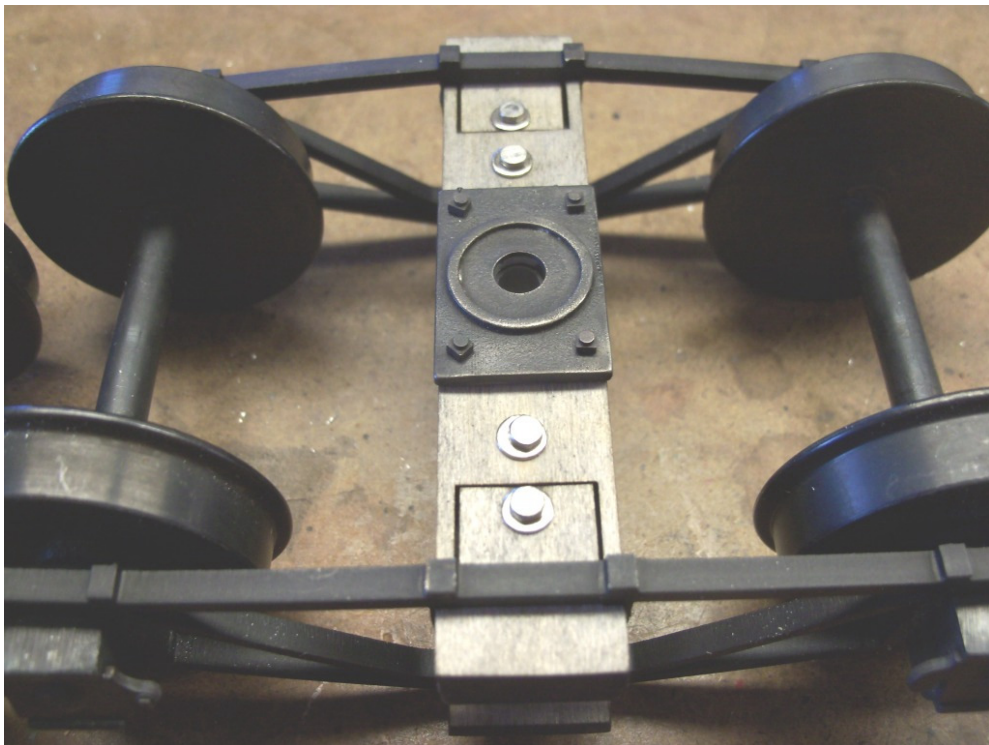
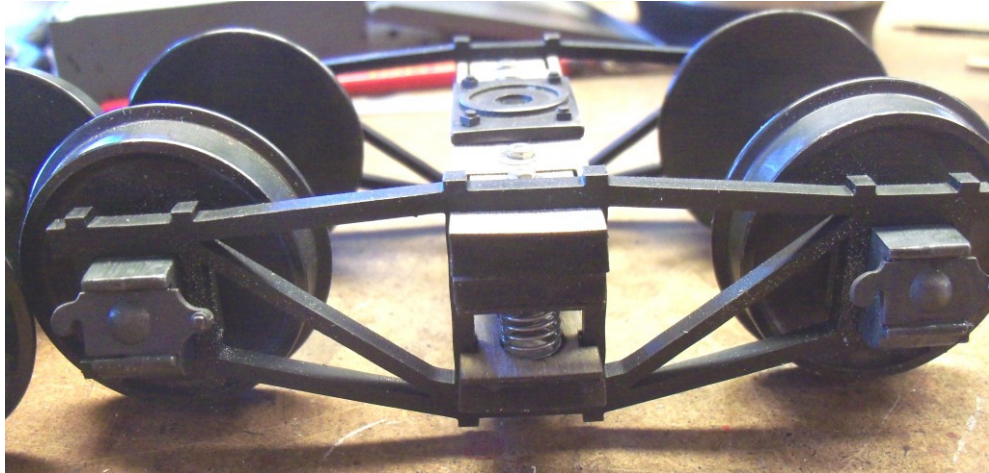


If you hold up a sideframe and look down its length, you'll see it is slightly warped. This is from the heat of the laser cutting them from a large sheet of 11 gauge steel. When you re-assemble the trucks, you want the middle bowed out from the truck. If you reverse them so the journal box ends are bowed out, the wheels and journal boxes will be overly loose and sloppy.

Start by placing the journal boxes into the sideframes. Then place the wheels into one frame and then the second frame with journal boxes onto the axle tips. Don't let any of the axle tip washers get lost. Holding this together, slide the bolster in from between the frames and the spring plank from one side. Hold the bolster up and rotate the spring plank flat. Rotate the bolster flat and put one spring in each side. Slide the end blocks in and screw in place. Add the other screws and washers plus the bolster pivot plate and NB's. If the NB's are loose, add a drop of ACC. Put the other 4 springs into the pockets.

I'm supplying 6 springs per truck. Each spring will support 1/4 lb. So, 2 springs in the truck will support 1/2 lb. 1 lb over the 2 trucks. 4 springs per truck will support 2 lbs and 6 springs per truck will support 3 lbs. The car itself weighs 2 lb 8 ounces so you need 6 springs per truck just to support the weight of the car. If you plan to carry more than a few ounces of weight inside the car, you will need to source stronger springs from a different supplier.

Shine up the pocket in the face of the journal boxes and the back side of the journal box lids. For whatever reason, patina nullifies the ACC so cleaning it off the surfaces to be glued is necessary. Add a drop of ACC to the back of the lids and glue in place. Let dry for several hours.



Step 26.

The remaining parts in the truck bag are 2 ea. 8-32 by 1-1/4" long machine screws, 2, 1" fender washers, 2 nylon washers and 2 springs as well as a baggy of spare parts. Set the car upside-down and place a fender washer over the threaded insert on the body bolsters. Place a nylon washer over the center of the fender washer. Put a spring on the screw and push into the bottom of the spring plank and up through the bolster pivot plate. Position over the nylon washer and screw into the threaded insert. Screw in until the spring is fully compressed and back off 1 to 2 turns. The last thing you want to do is punch a hole in the floor so if you feel the screw hitting something stop. The length of the screw verses the thickness of the truck and spring and washers should not allow the screw to contact the floor.

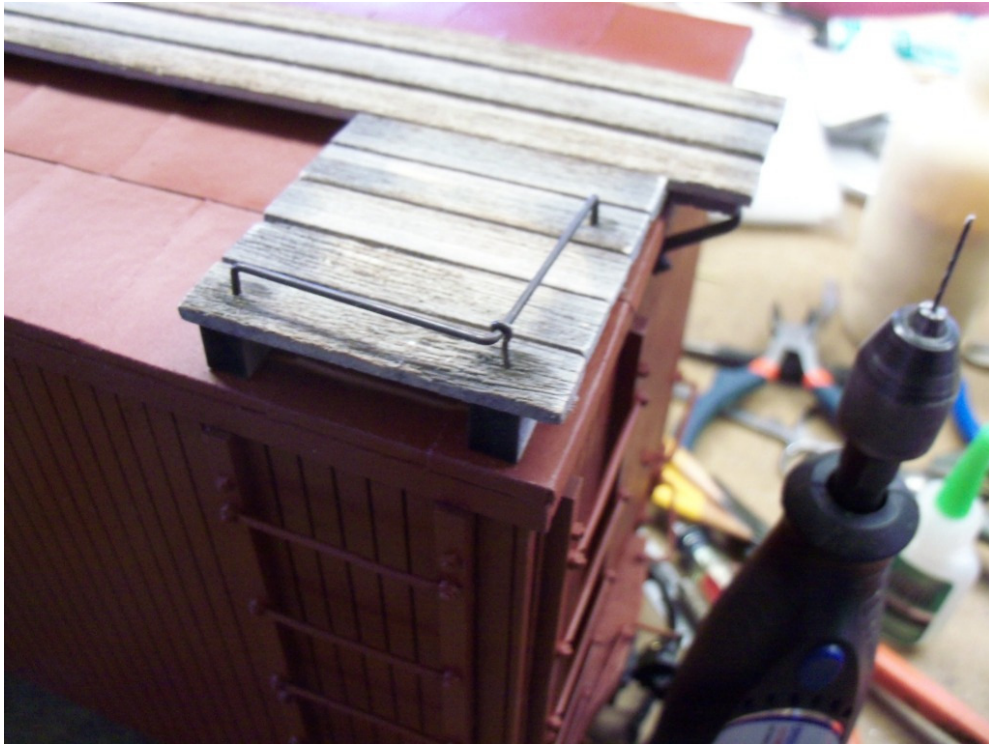


If the screw is working loose during operation, try a little silicon on a tiny portion of the screw threads. When silicon is dry, it's doesn't dry hard but remains flexible so you can remove the screw and trucks at a later point for maintenance.



Step 27.

Grab the 2 catwalk grabs and the last 2 eye-pins. Position on the catwalk platform. Use a #56 bit for the grab legs and a #66 bit for the eye-pin. Press into place and add a tiny drop of ACC to hold.



This completes the build. Years ago, I ground down a center punch to a point to use in making nail holes. You can do this or not. For the time being, Stan Cedarleaf will print the decals for the car. This is Kit # PNG-783. The decals from Stan carry the same number. Stan's email is, SCedarleaf@aol.com





Finished!!

Comments are always welcome. Positive or negative. Please contact me for any issues with the construction. My email is phil@philsnarrowgauge.com. Email is the best way to reach me as I check it several times a day. I'm not always near a telephone.

Please send photos of your completed model. I always enjoy seeing my customers work.

Thank you for the purchase and I hope the build was as fun for you as the design was for me.

Phil Dippel
Phil's Narrow Gauge