Lines West Thrall Caboose Assembly Notes

Pre Release Version with some Production Run Parts Added

August 2019

By George Toman

Watch for new steps and notes for production version in Red Box

Curious about the material and the SLA Printing Lines West uses to 3D print their products and the fact that Todd recommends curing your parts in Sunlight , I Did a bit of research. Follows is a brief summary of SLA Printing and my thoughts on curing

Stereolithography (**SLA**) **printing** was first invented in the 1980's and **works** by curing resin with UV light. The light solidifies a liquid resin via a process called photo-polymerization and builds objects layer by layer. Currently, **SLA** is among the most accurate forms of **3D printing**.

Todd at Lines West comments that the parts are delivered undercured so the supports are easy to remove. Once removed you cure your parts for up to no more that 2 hours in sunlight. The longer you leave in the sun the more it will cure and will become harder even brittle. When you unpack your kit, the parts may have a slight rubbery feel and slight odor. By putting these is the Sunlight for 1 ½ to 2 hours the resin will cure (harden up). The resin used for the trucks and ends is a bit more flexible for inserting the wheel sets and preventing breakage of the End Platforms/Railings and Truck sideframes. I Do Not Cure my Trucks and Ends in the sun unless they really seem to soft
So my process is
Body and Roof in sunlight for 1 1/2 to 2 hours
Trucks and End Platforms 0 to 30 minutes

The Parts Included in Preproduction Run

Note: throughout my assembly notes you may see different color parts as during the construction, Todd did send out some updated parts as we discussed assembly. More improvements are on the way as well. Some parts used were from my own source as they were not available yet for this build as I was taking this to the RPM Meet in Collinsville IL on July 26th and 27th.

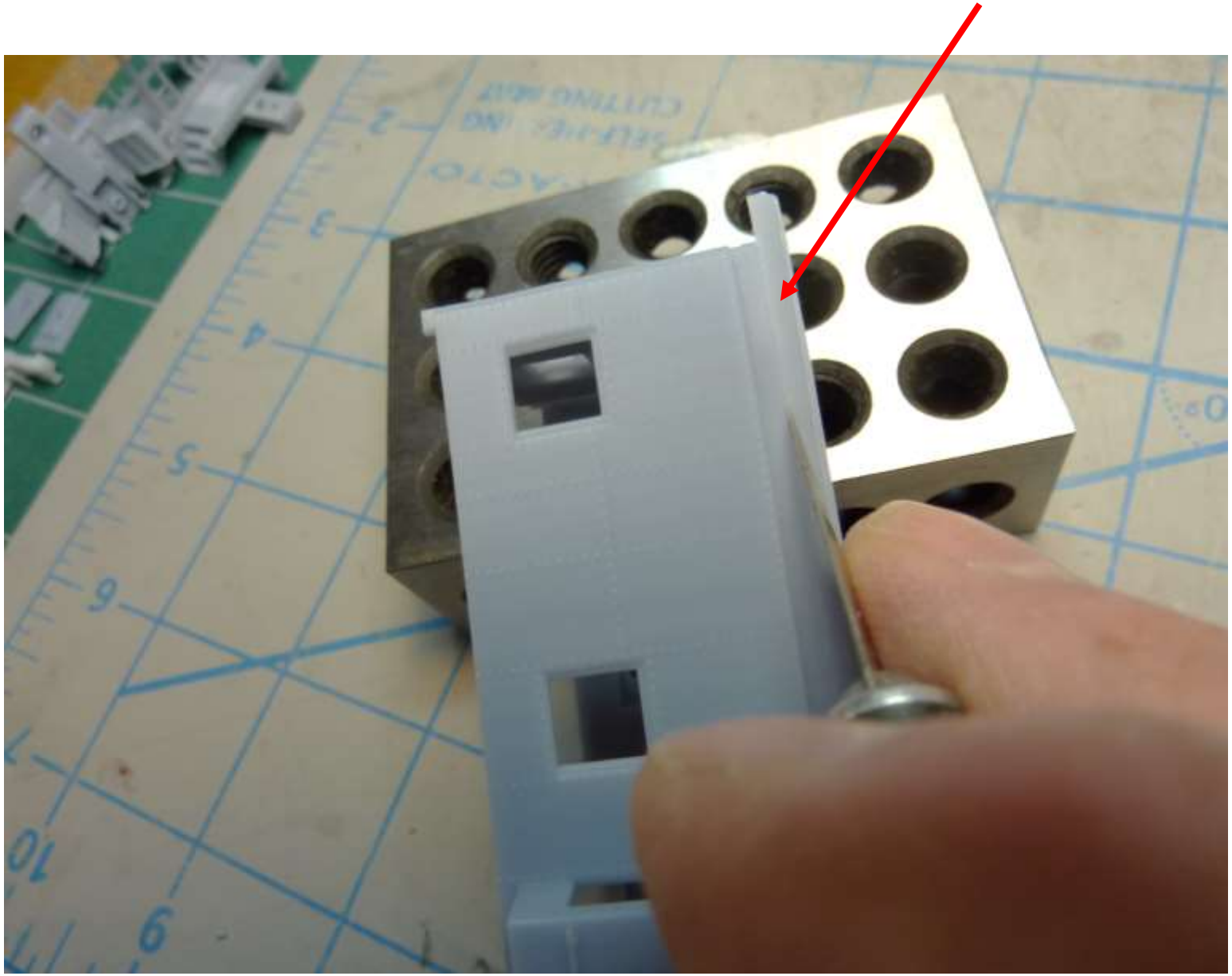
De spurring Parts
Tools Used UUM USA Micro Saw/ and from Micro Mark
Fujiya 25-Degree Sprue Cutter Micro Mark (thin heavy blade gets in tight spots)

Pictures on the next few pages are some of my favorite tools used in the building of resin and plastic kits. I am sure there are many others that are equally as good. The P-B-L nippers are Swiss made and extremely sharp

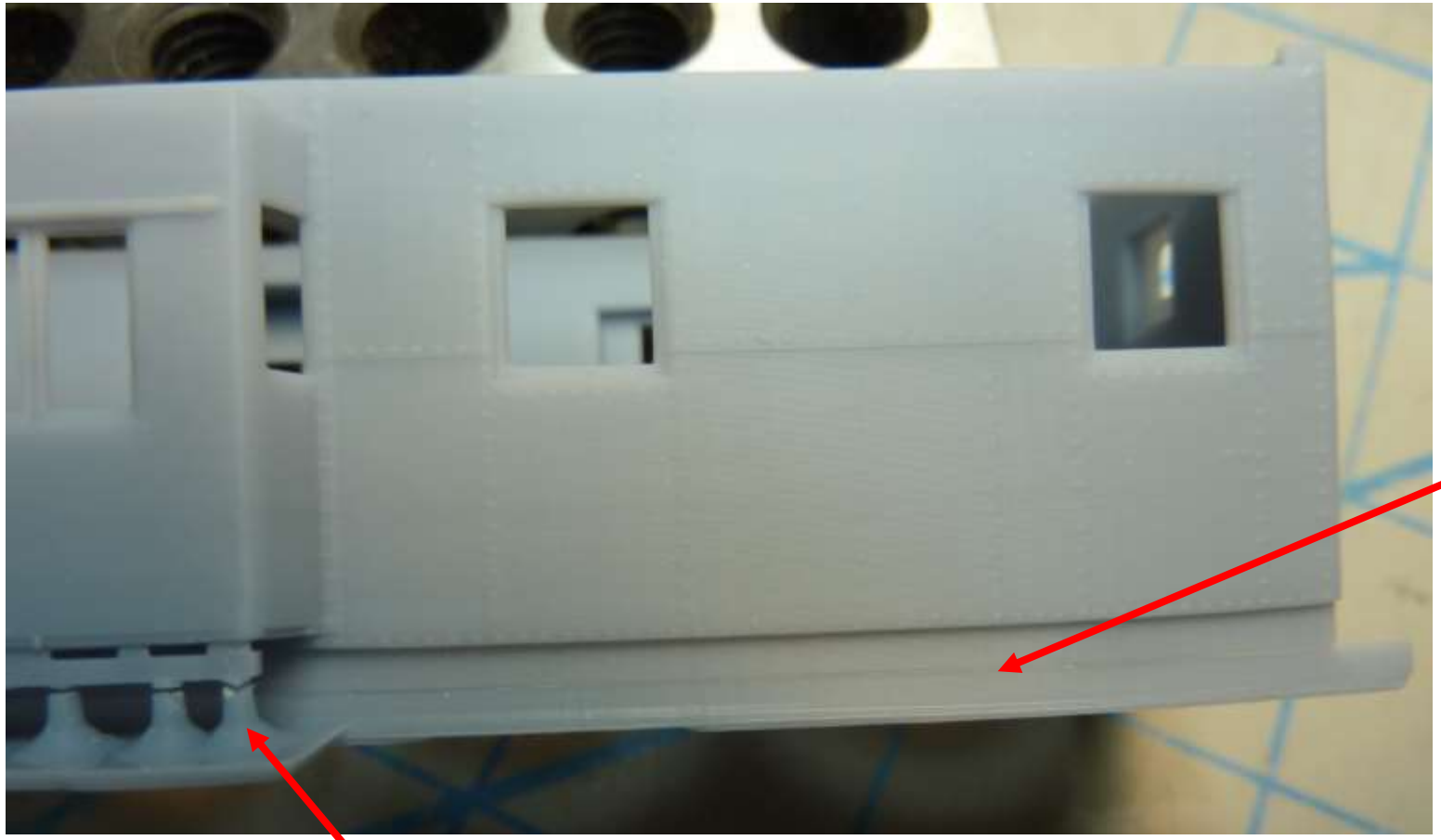
Note: Many parts can be simply de spurred by simply twisting or bending but damage or breakage may occur in an uncontrolled manner so I advise cutting or trimming or scoring to prevent damage

I start by nipping the resin supports that are used in the casting process. I want to clip here to relieve stress on the parts. We will remove the piece below the bay in a later step

Note the faint line between side sill and excess resin casting we need to remove

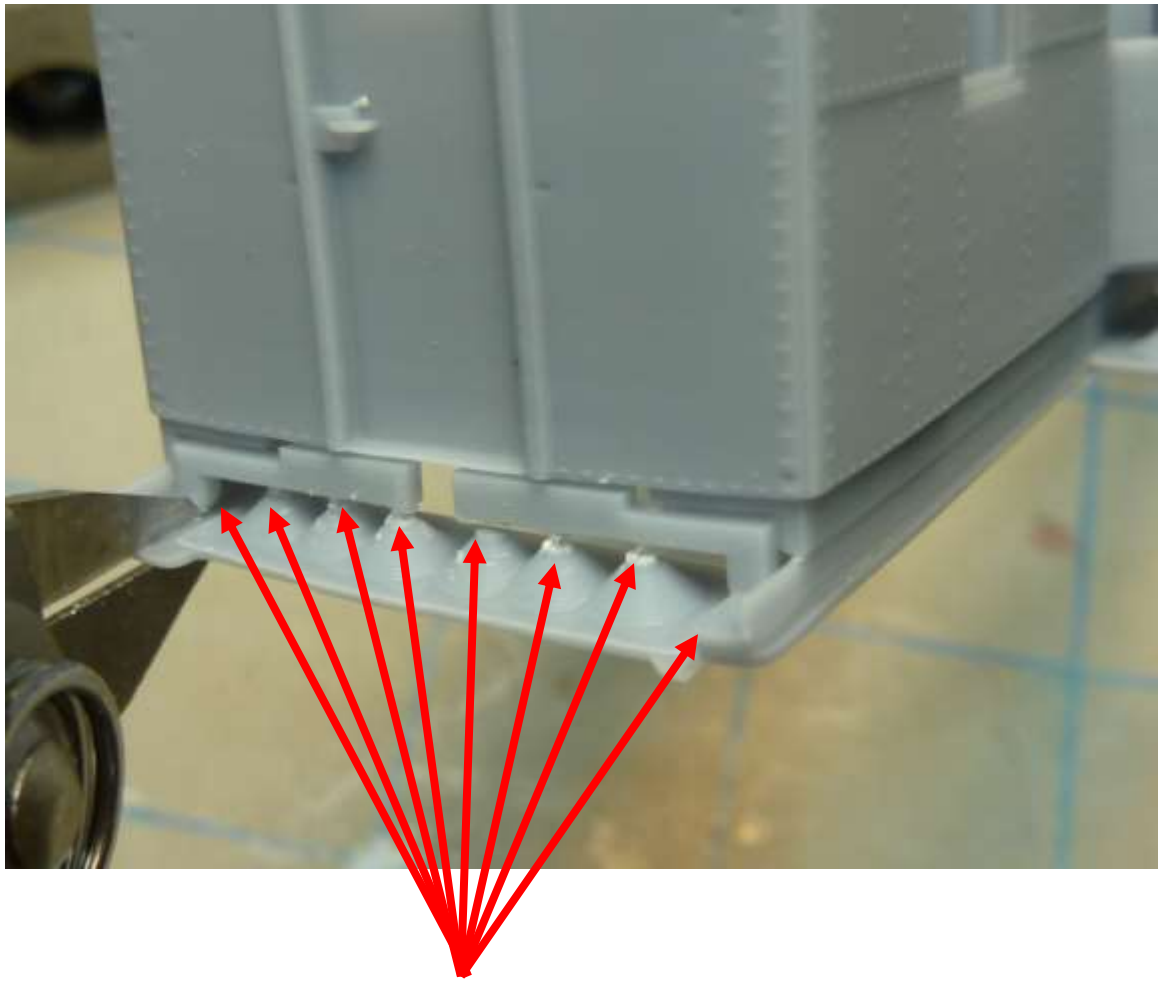


In this step I lightly scribe a line with a sharp xacto blade just below the side sill. Note that there is already a shallow line that I followed freehad and just want to make it a bit deeper or sharper for a clean break in the next step.

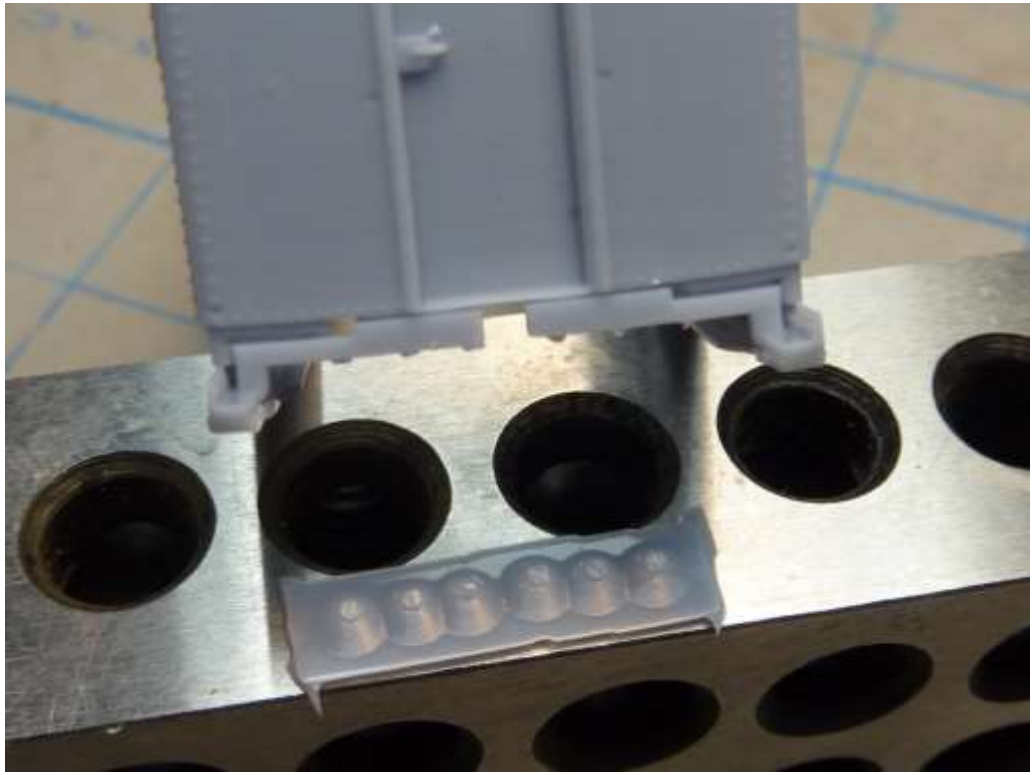


Note the faint scribe line below side sill lightky scribes with a sharp xacto blade

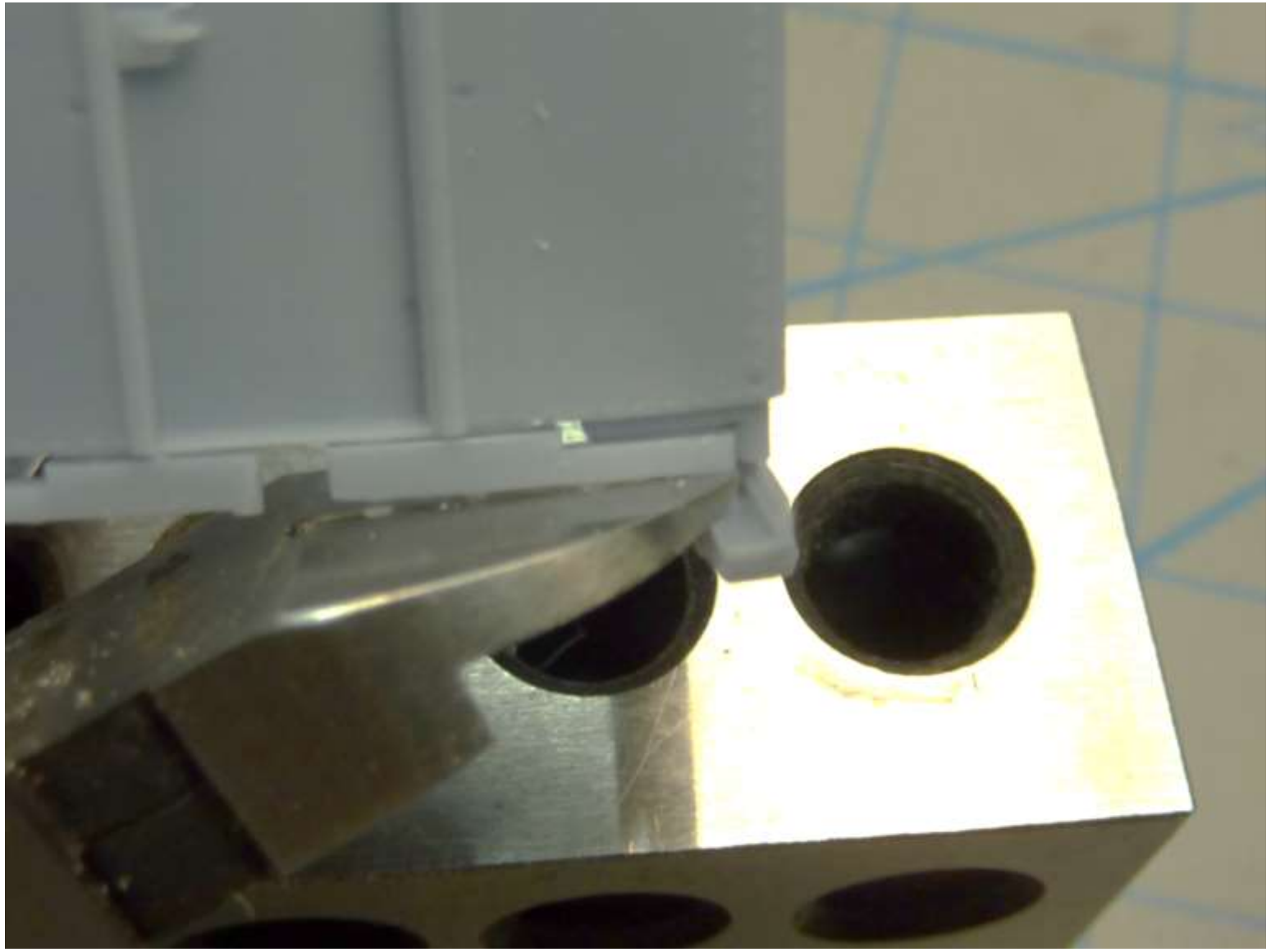
Note Cuts in resin supports below bay



In photo above, I am cutting the unneeded support resin at the places shown this will allow for the clean removes of the excess material below side sill



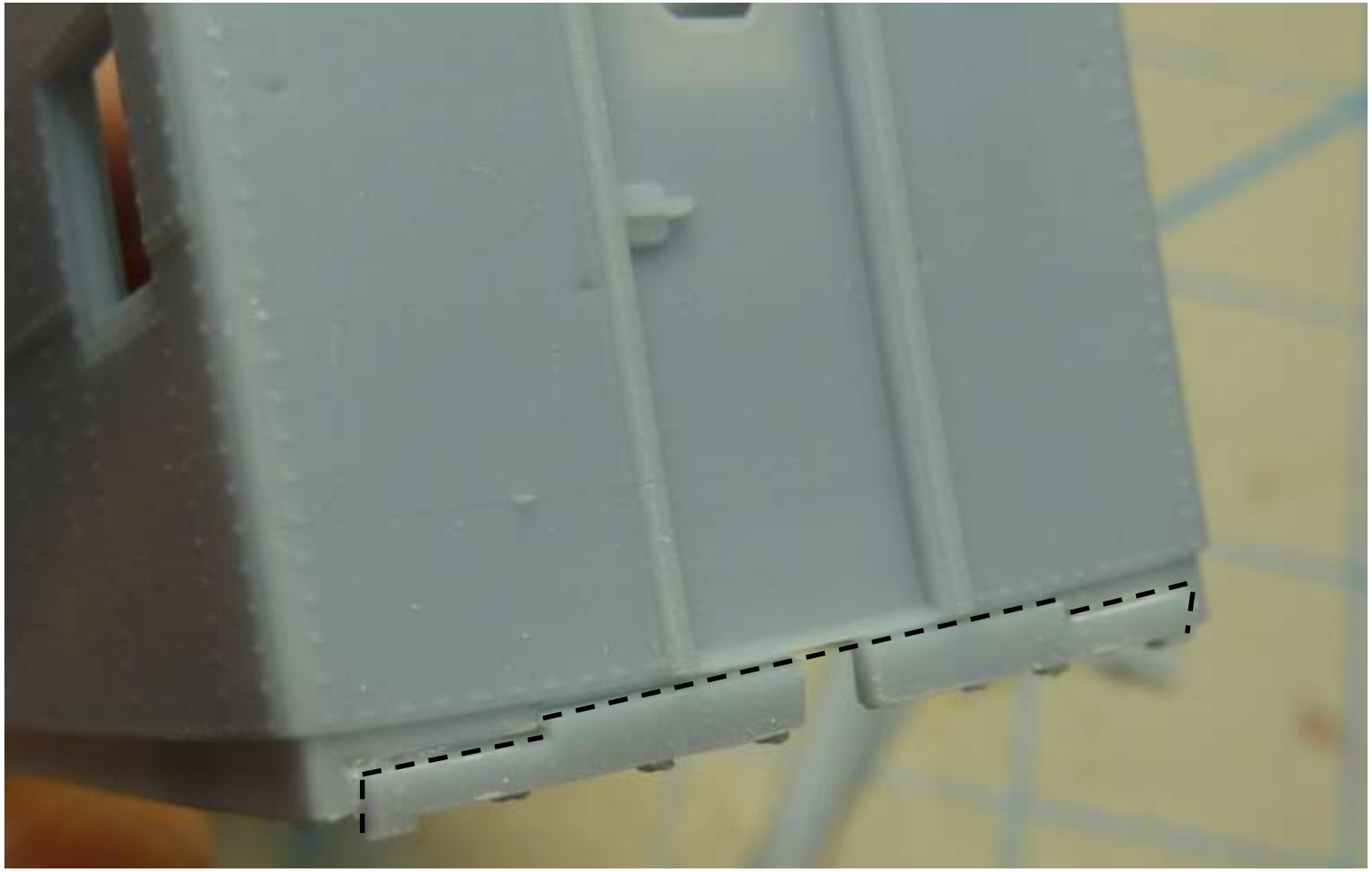
Here is the results or the previous cuts



One more cut was made as shown to release side sill and then we can remove side sill excess.

Now we can gently press the excess resin along side sill down and it will cleanly and easily break away

Now lets finish cleaning the ends of any un needed resin supports



I again lightly scribed with a shape xacto blade beneath the floor and door areas as shown by theblack dashed lines

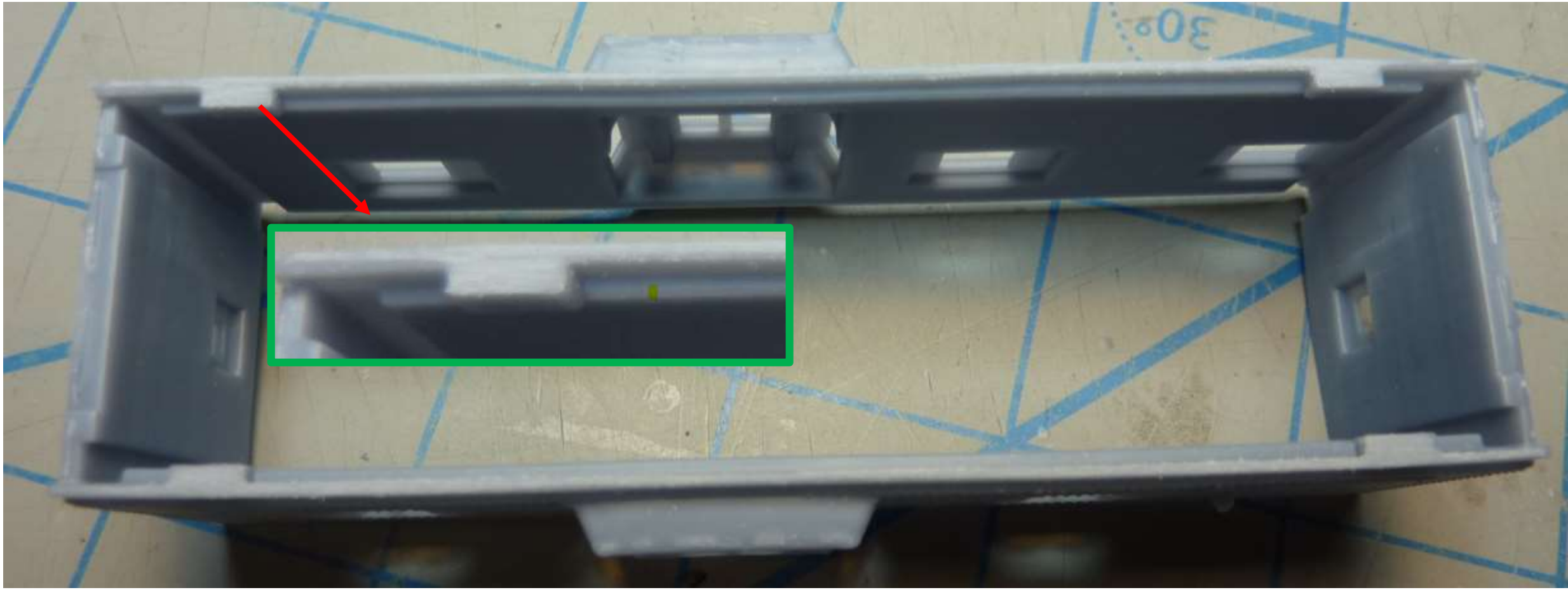
View of end with the excess resin supports broken out after scribing as shown in the previous step. Note the clean break. Very little flash is left to clean

The results of removing all excess resin casting supports. Note the 4 locating rectangular blocks and sanding pads that Todd designed into the body. The blocks are used as an indicator that you have sanded the side sills far enough to have a straight side.

Rectangular locating and sanding stop blocks

Here I have the body placed on some 150 grit sand paper that is on a flat glass plate. I will lightly move the body with even pressure on the sandpaper and check frequently that I sand only to the top of the 4 locating/sanding tabs as shown in the previous step

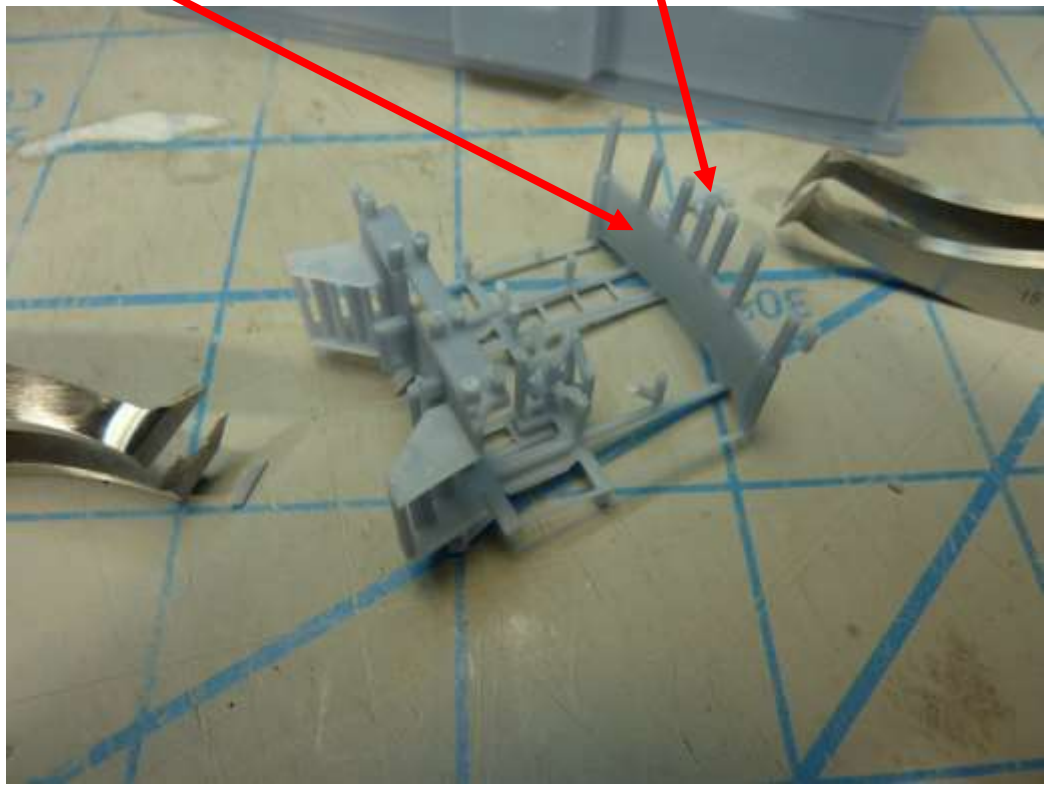
Here is the underside of the car sanded flat. You can see that I just started sanding the tops of the for locating/sanding tabs

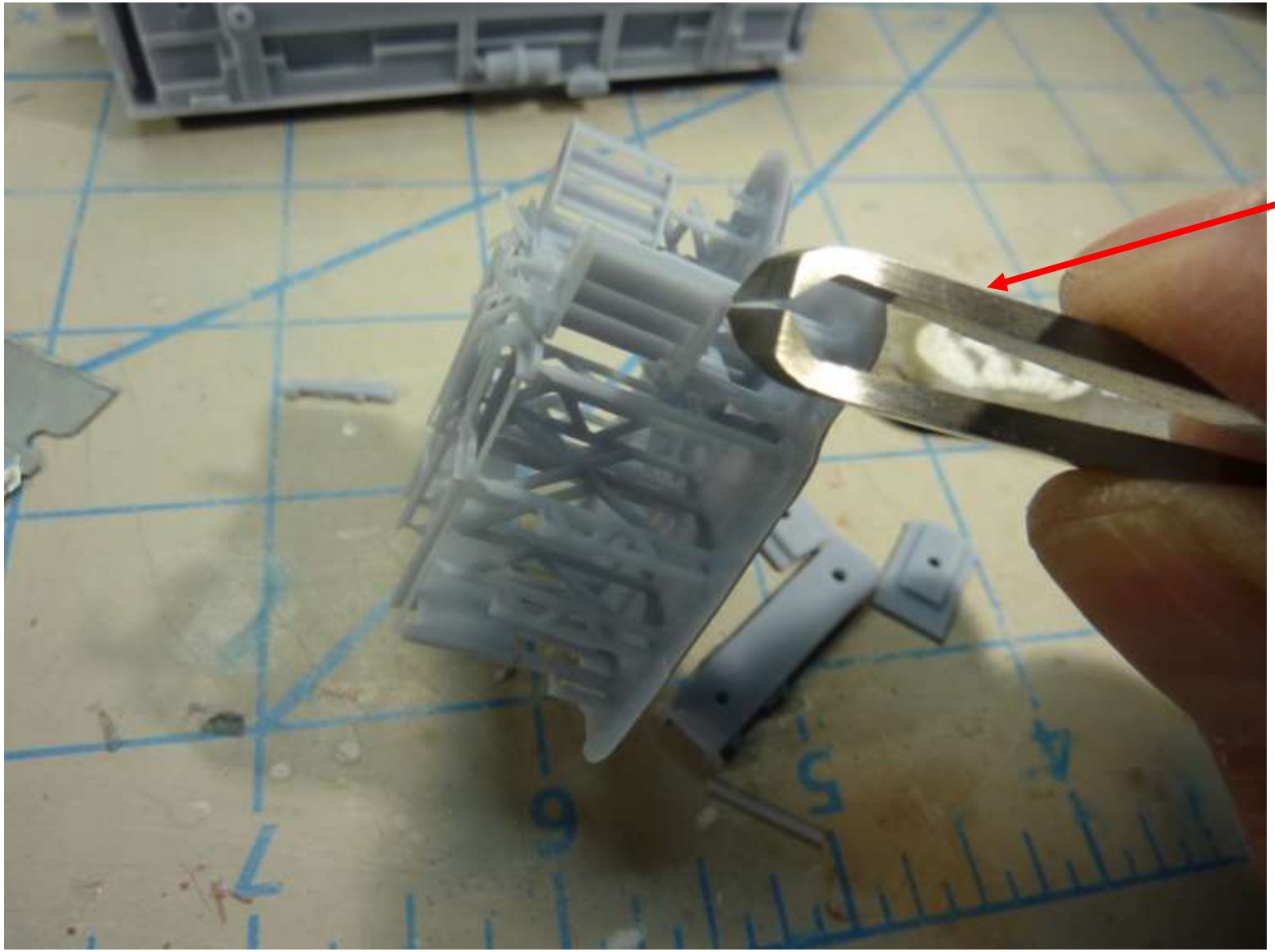


PBL Brand Nippers Shown (Similar ones also available from UUM-USA and Micro Mark)and MicroMark Spur cutters are used to carefully remove end platforms.

Note: Be sure to leave the roof insert that is attached to the top of end rails and ladder.. This will fit in underside of roof.

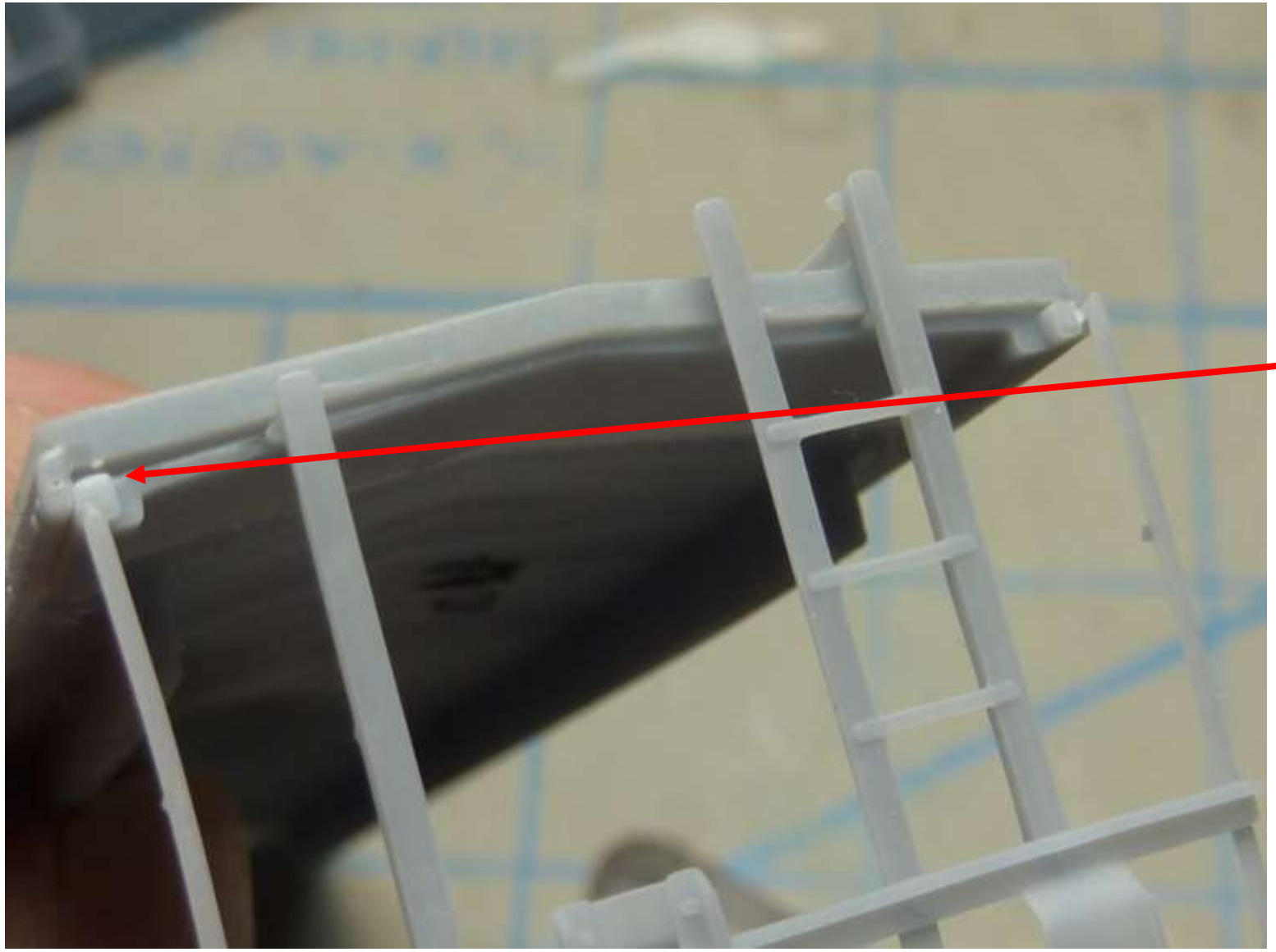
These 7 round supports do get cut





PBL Nippers get into extremely tight areas.

Cleaning up the flash on the end platforms is a delicate job. Model **John Dick** had a good idea to hold the underside of the roof that attaches to the ladder stiles and railings with a larger pair of tweezers. As I did not have a pair that he used, I used my Xuron Micro Nose Plires to hold this piece securely as I finished sanded the excess flash off and to siz it to fit the underside of the roof. (See Photo on next page) Here you see me holding the roof section and sanding the width a bit narrower to fit the roof piece

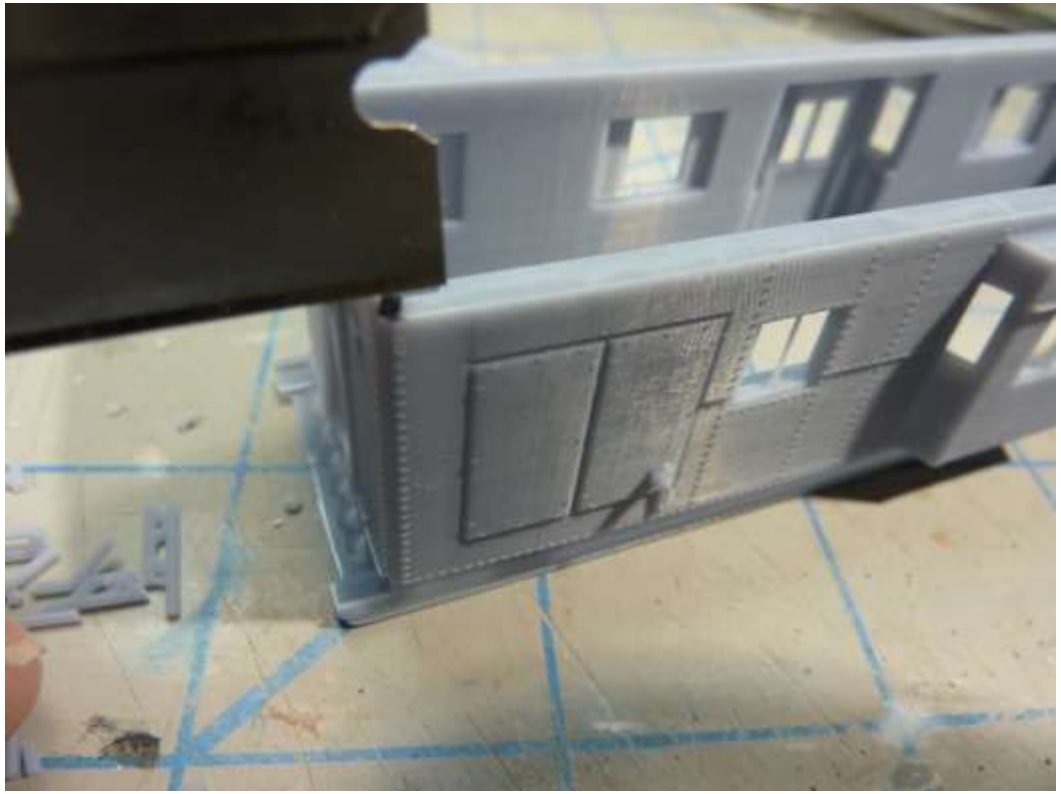


Here is the end platform being test fitted in place. Note that the upper left corner needs a bit more sanding to fit snug

Micro Saw is used to cut excess resin away

For my Roof to fit nicely without any warp, I removed a small area as shown in black in Black from each corner. A single edge razor blade was used to remove a piece no more than about .010 thick. Test fit and mark roof as to which end goes to the same end. Also make sure the larger hoe in the roof goes above the panels for the oil tanks as shown in the photo below.

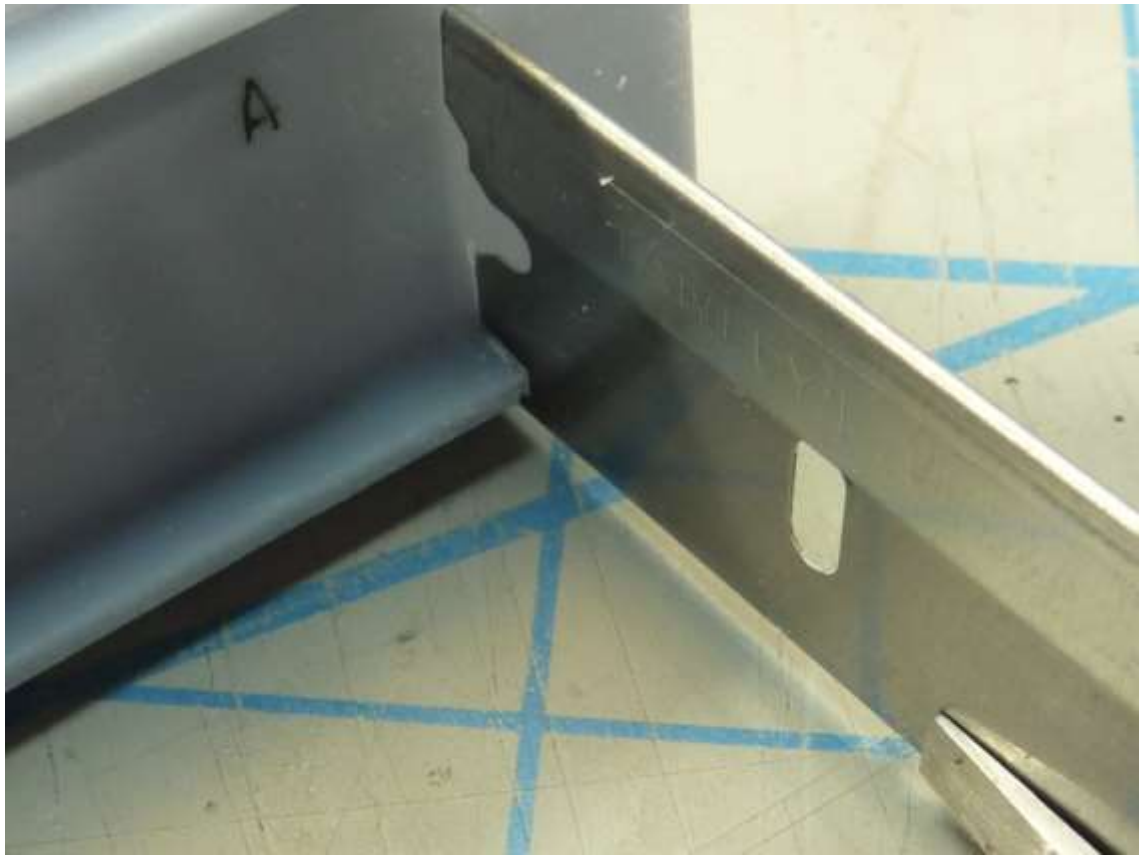
Note: on Production version I did not have to do this step

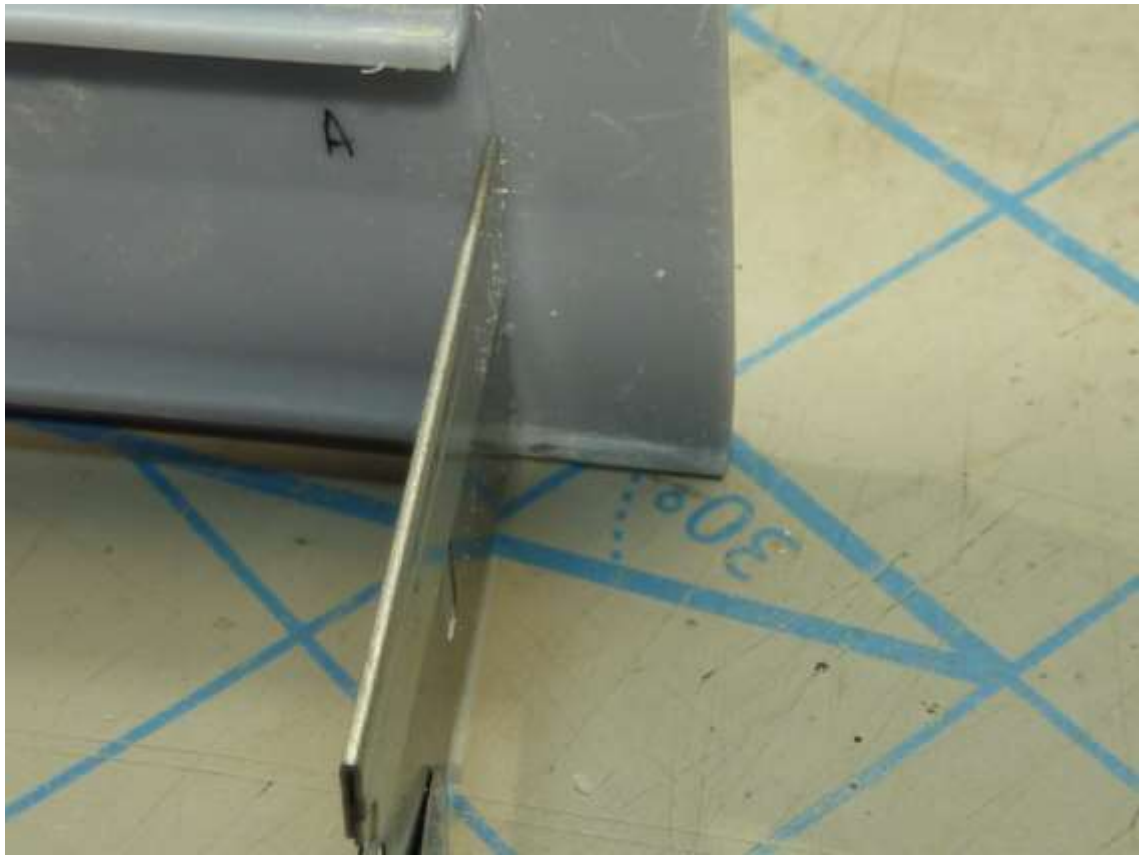


I used a Stevens International Sanding Stick to help clean up the underside of the roof where it meets the sides

For the Roof to fit the body and End Platform Assembly neatly, I cleaned up the inside edge of the roof with a Single Edge Razo Blade. (Used as a scraper)

Note: Only preform this if necessary/ Check your Model and Parts

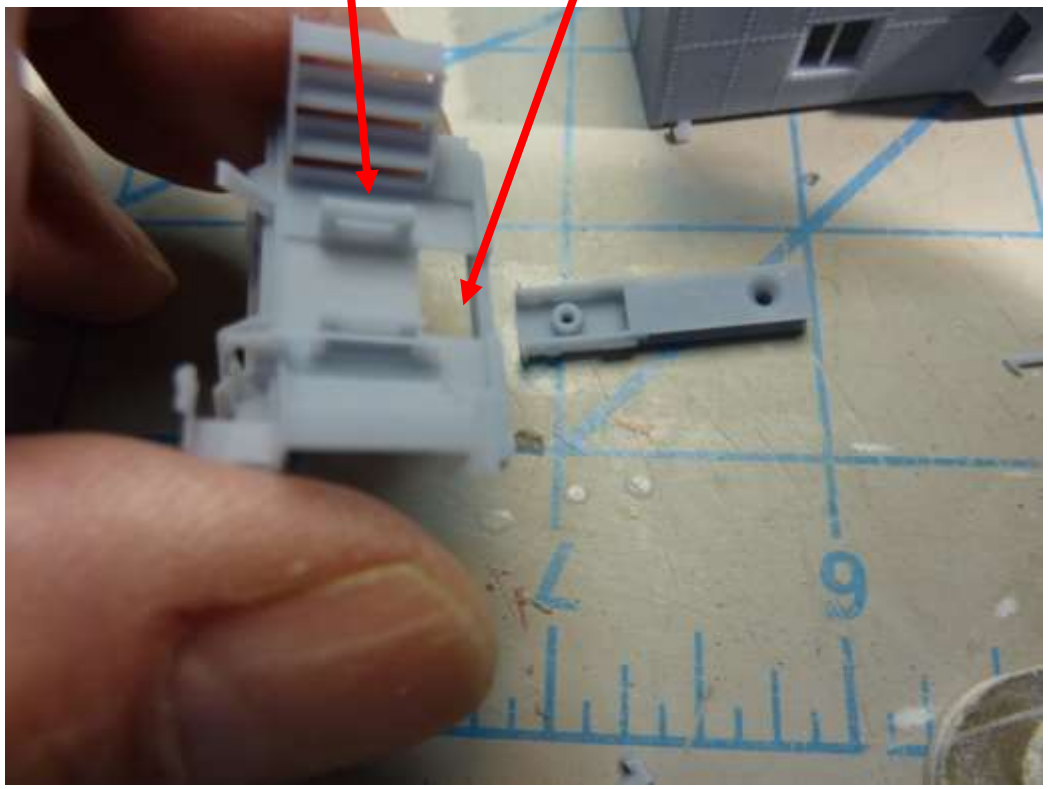




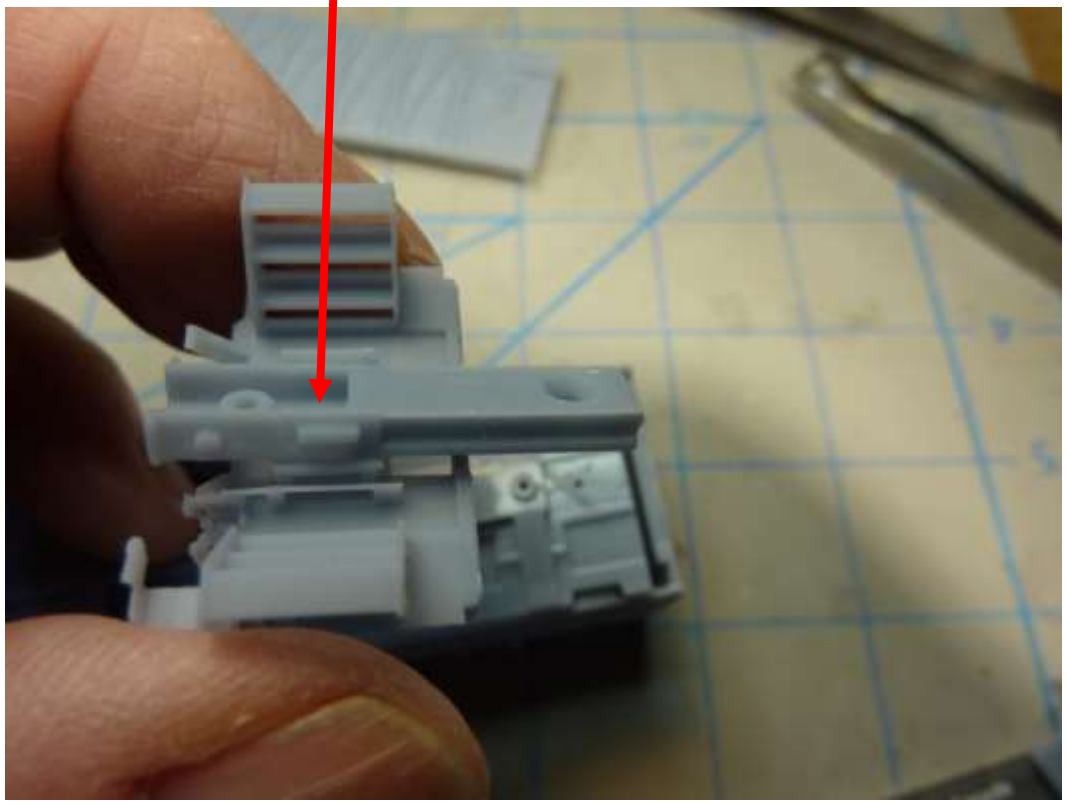
Test fitting roof to body
Roof Overhang is .375 inch from end of body

End Platform/Rail Assembly and Durya Draft Gear showing tabs and how to snap in

Rectangular Openings for tabs on Durya Draft gear (Two)



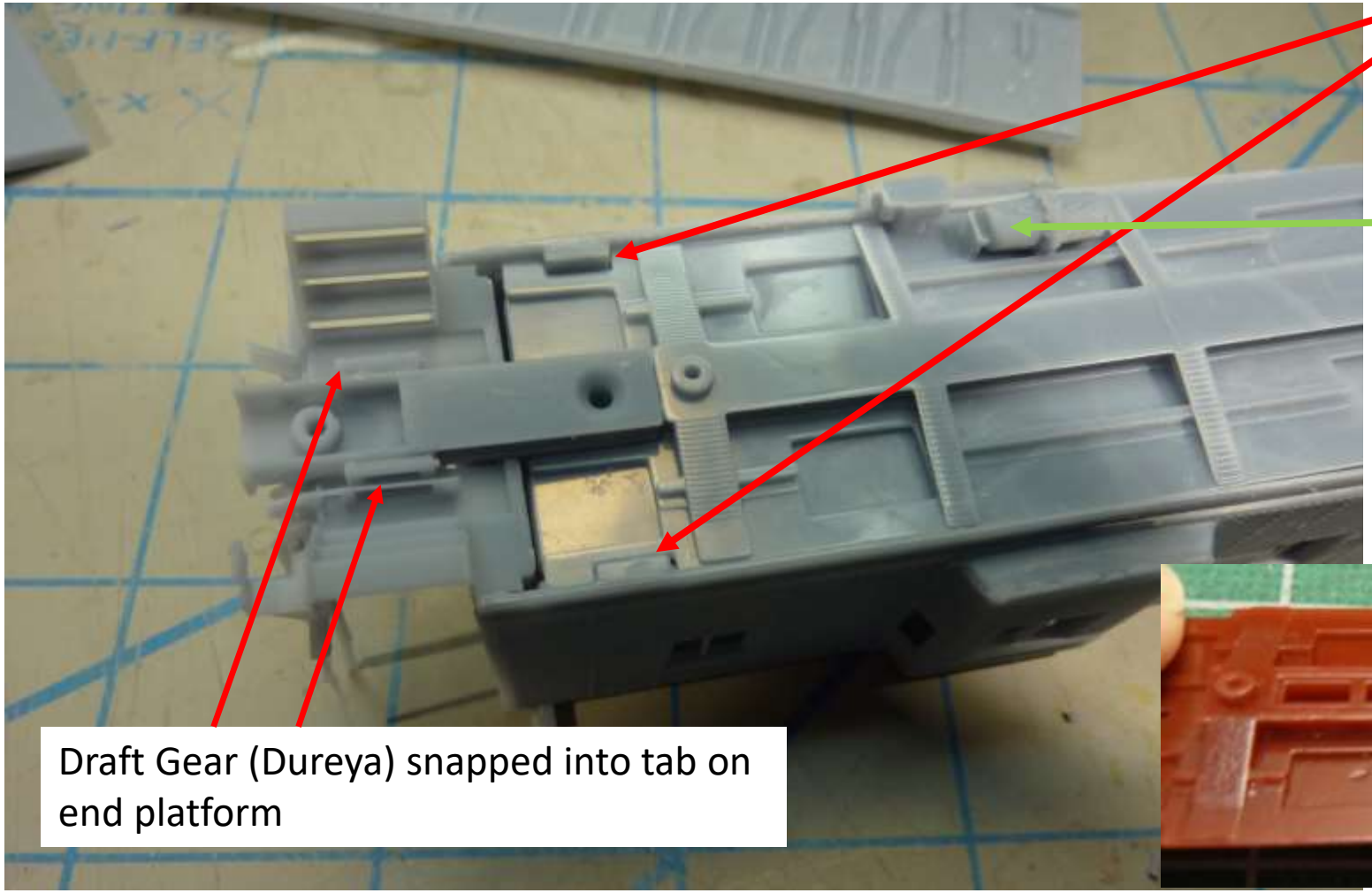
Tab on Durya Draft Gear



Test fitting end rail assembly and floor to body

Note Sliders/Floor Locators in side
Sand to top of sliders when de spurring sides

Note that tripe Valve and Reservoir go on the side with 3 windows

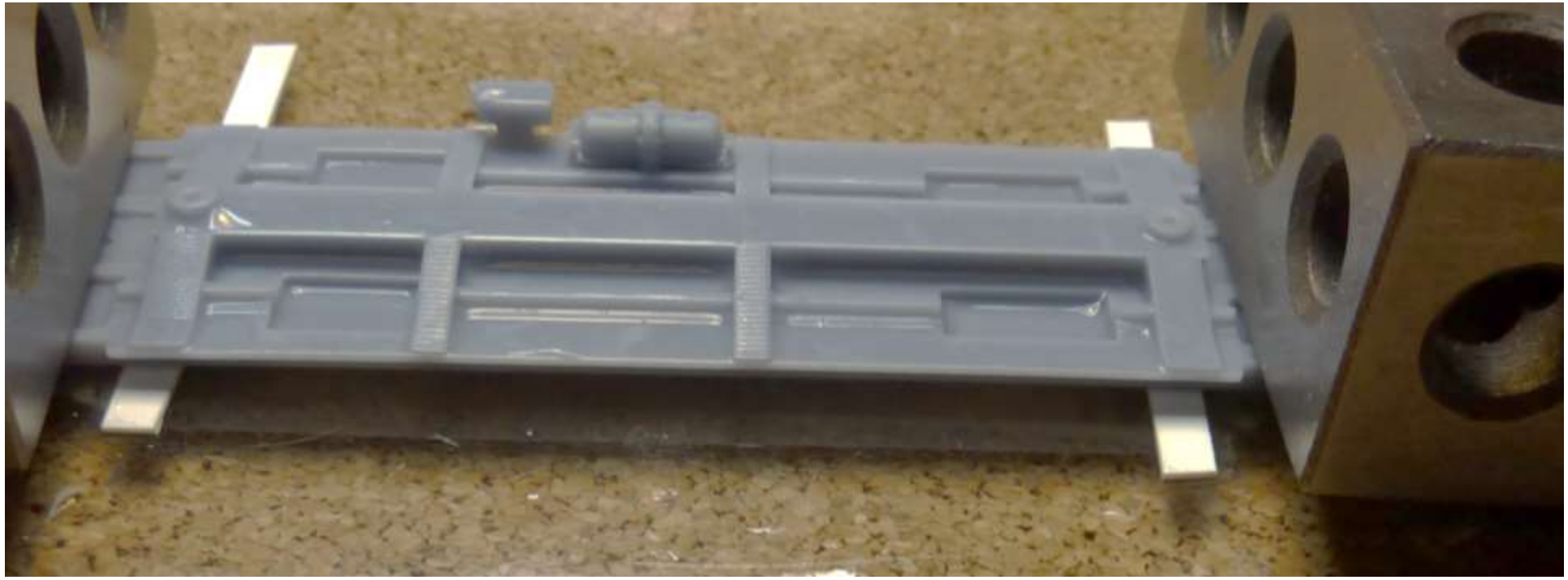


Draft Gear (Dureya) snapped into tab on end platform

Note: Picture of Production Underframe

Floor was put in a bowl of hot water from tap and allowed to heat up for a couple minutes. It was then removed and place on a flat glass plate and weighted down at the end. I used 1-2-3 Blocks for this

There was still a bit of warp at the bolster ends, so after a hot dunk in water, I put a styrene .020 shim under each bolster and weighted each end with a 1-2-3 block. Let cool



Floor is now nice and straight . This method can also work for the roof

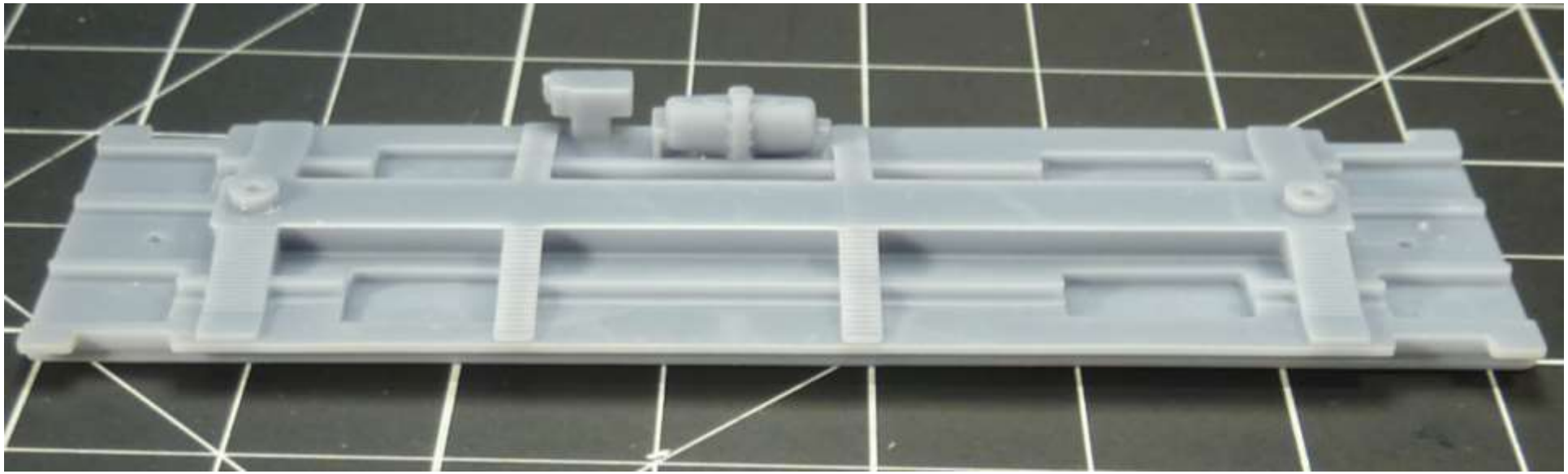
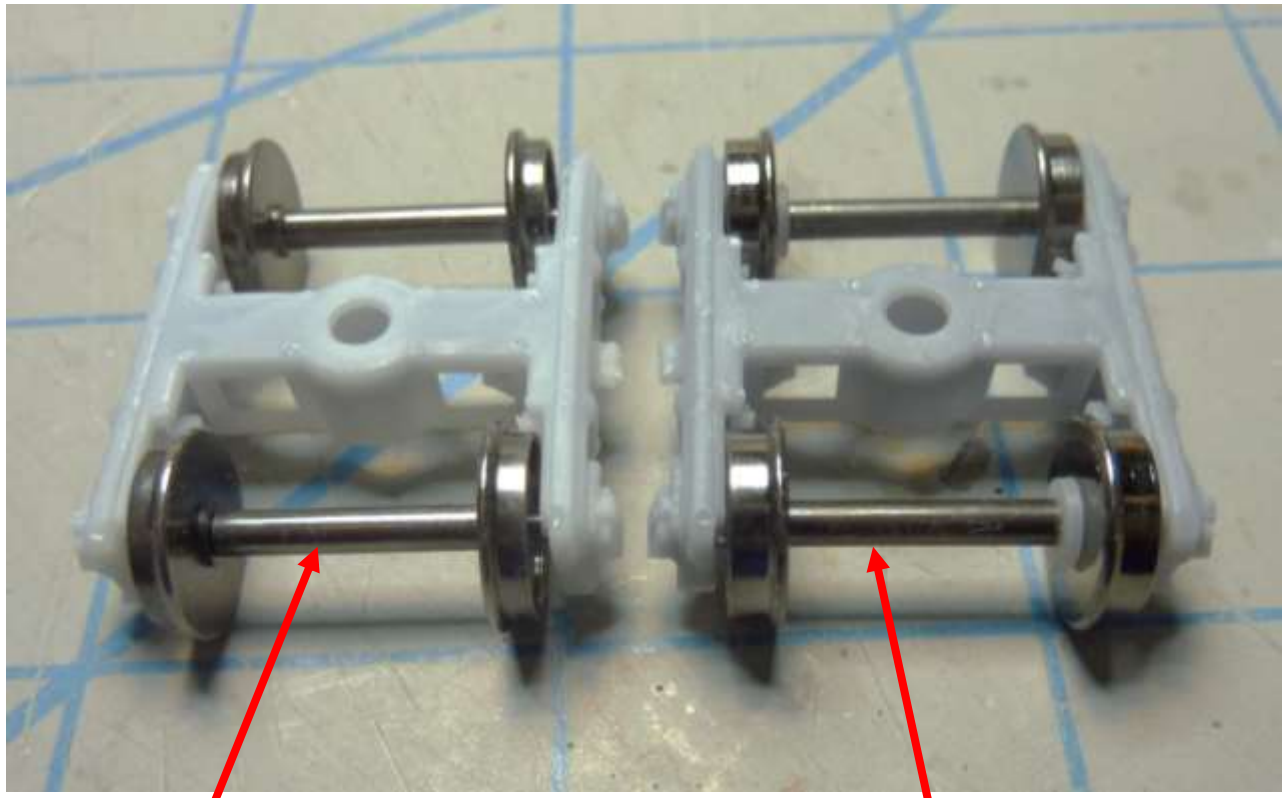


Photo of floor on a straight edge

I could not wait to work on the trucks so here they are!

Picture on the right is before removing from the sprue and of course the left ready for the wheels

Top View

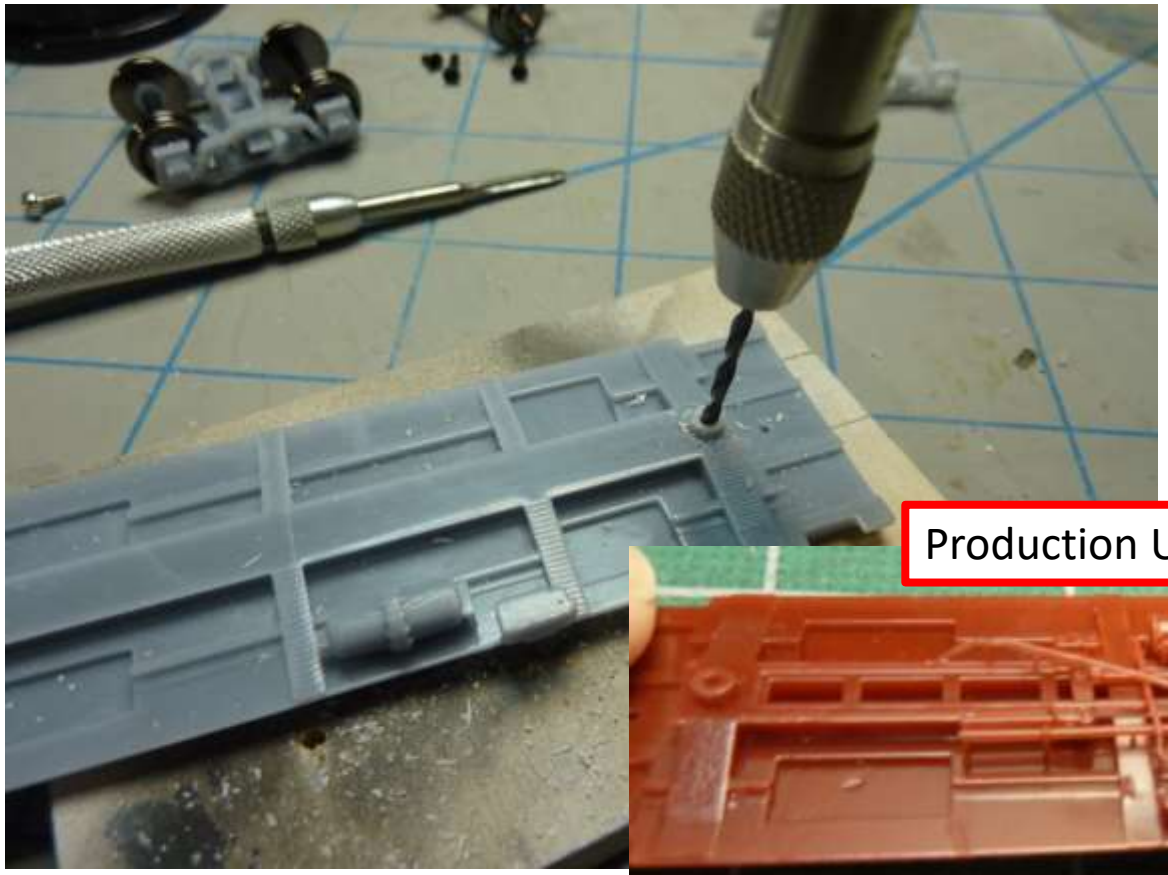


Yes Code 88 Wheels fit as well as see above. These are Inter-Mountain Railway . Axle length about .005 less than supplied but seem to be OK

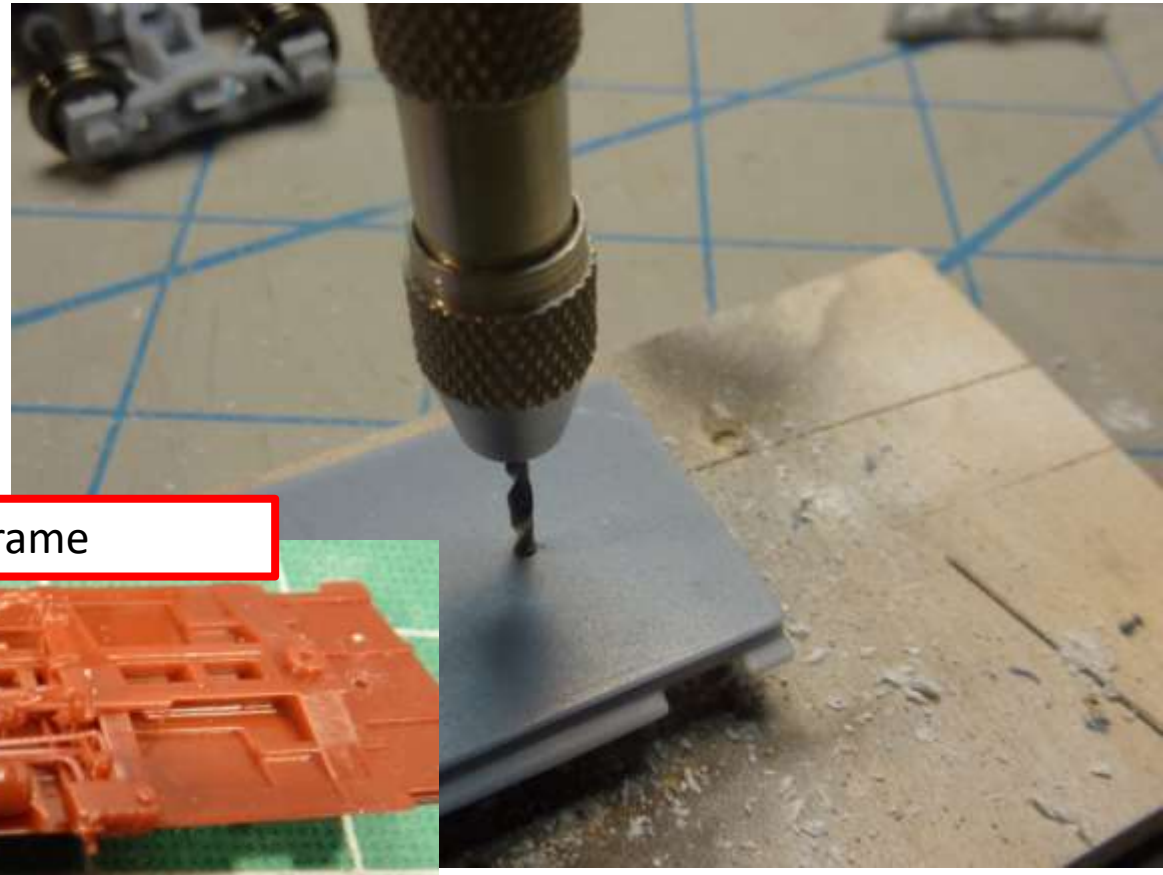
As Supplied Code 110 Wheels

I next drilled and taped a 2-56 hole for the trucks

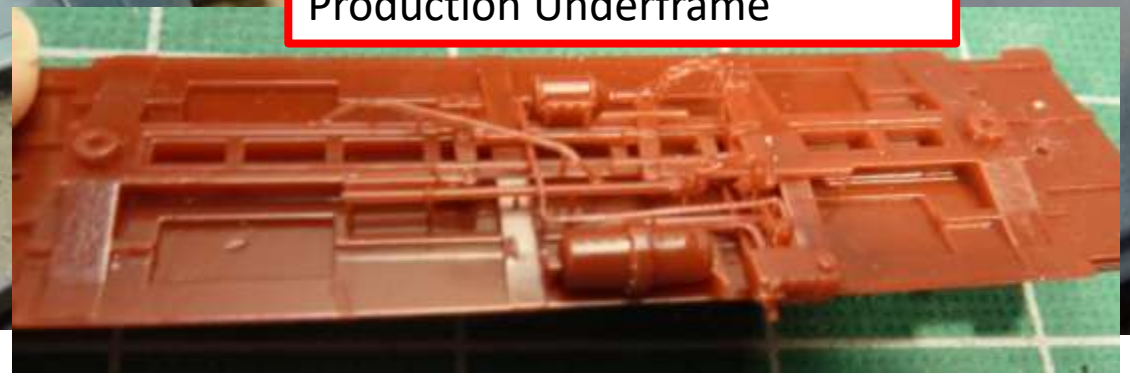
In view below I drilled from the starter hole in bolster a hole smaller than needed to tap that went all the way through. I used a # 60 (.040) for this



I flipped over the floor and drilled a # 50 hole (.070) necessary for the 2-56 tap

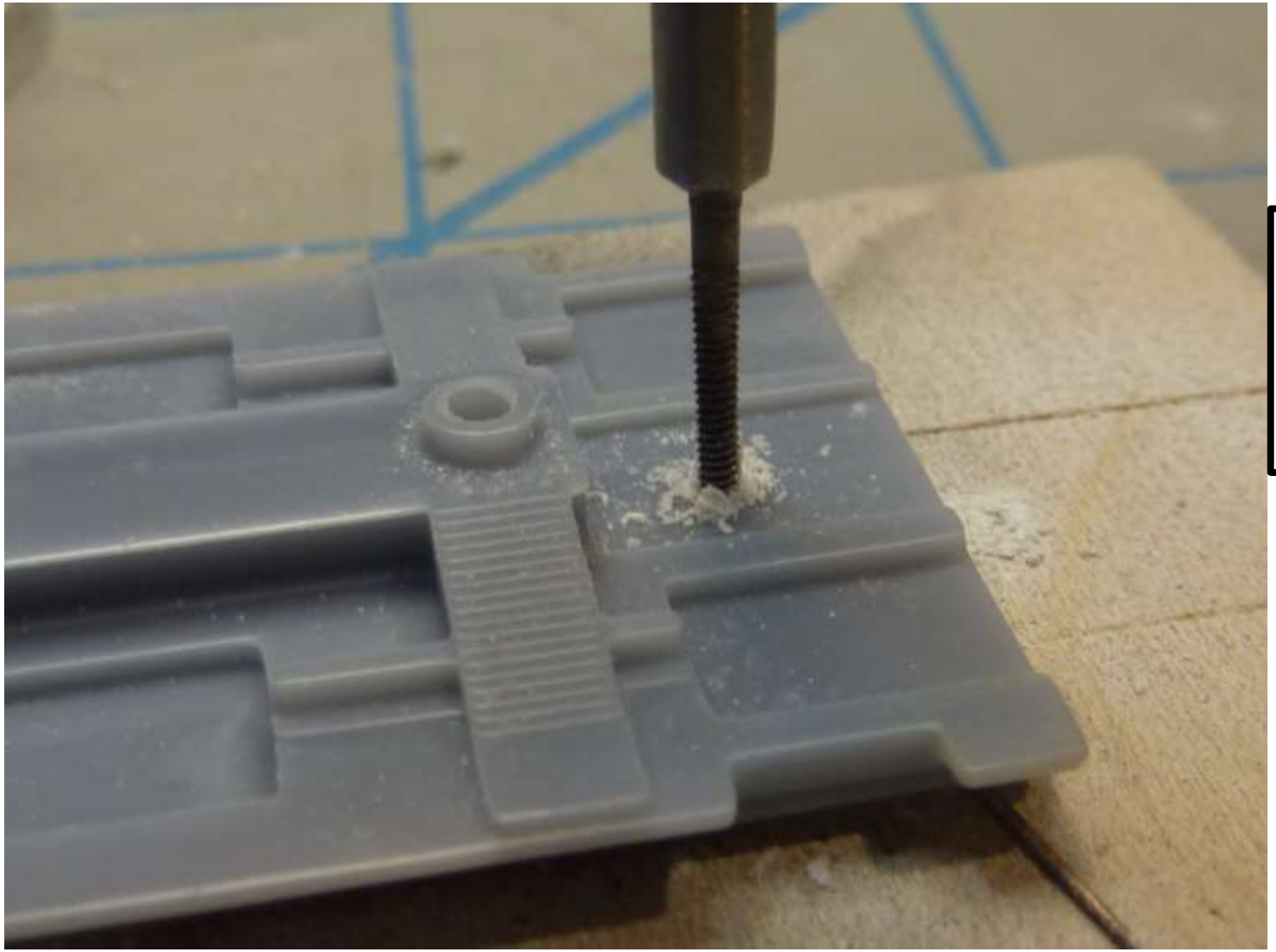


Production Underframe



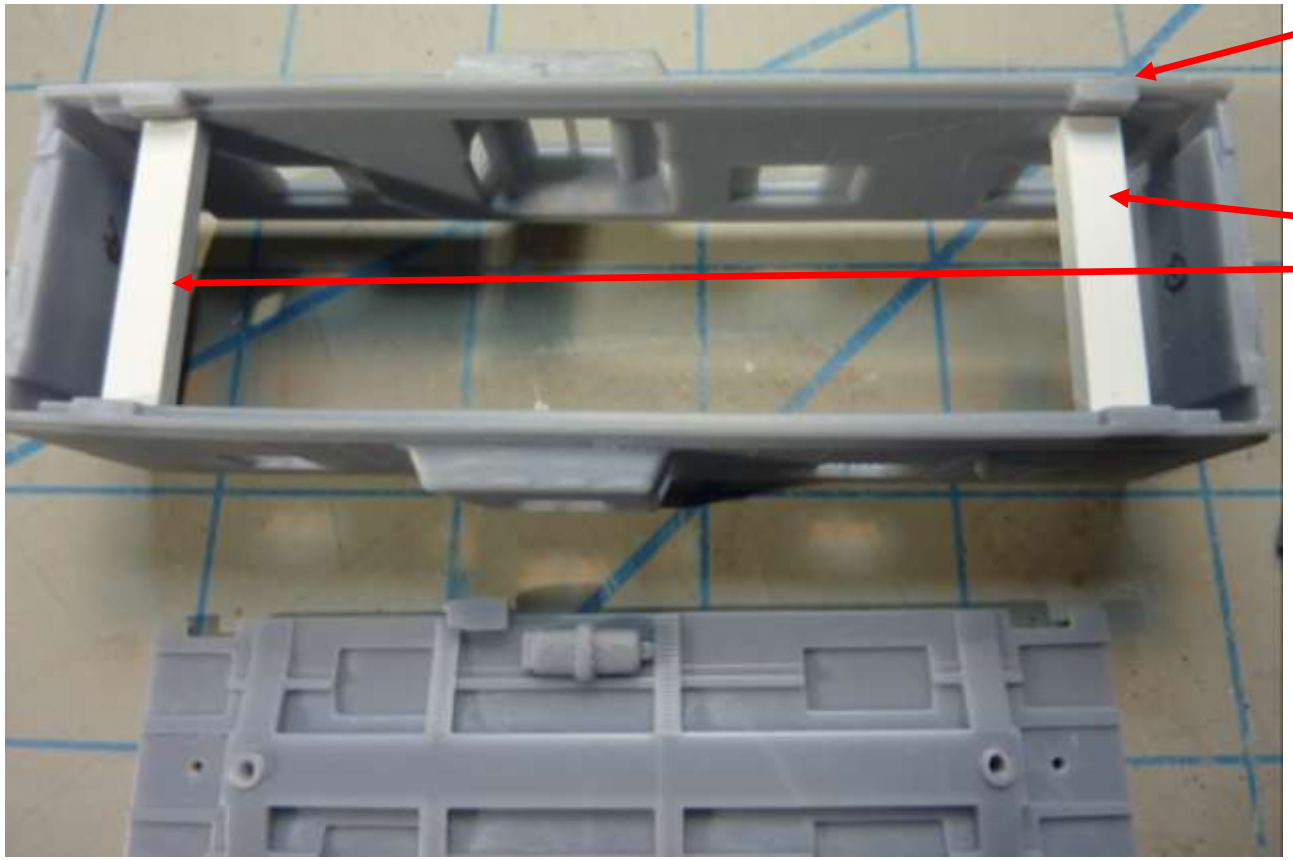
2-56 tap from rear

I tapped a 0-80 hole for the draft gear. I first use a smaller bit .030 to drill all the way through and then use the proper #56 bit (.046) for the tap drill. Next was to use the 0-80 tap. When taping be sure to screw it in slowly and back it out when it feels tight to clean the tap cutting teeth.



Alternate method for removable floor is to use a clearance drill bit # 51 (.067). With this method a 1/8x3/16 styrene strip was epoxied across body. See next step

Two 1/8 x 3/16 styrene strips were cut to the inside width dimension and epoxied in place. The styrene strips were located in line with the 2 tabs in the body side on each end. I had located and marked the position for the styrene by placing the underframe in place and marking the side of the body on the inside to determine the correct position.

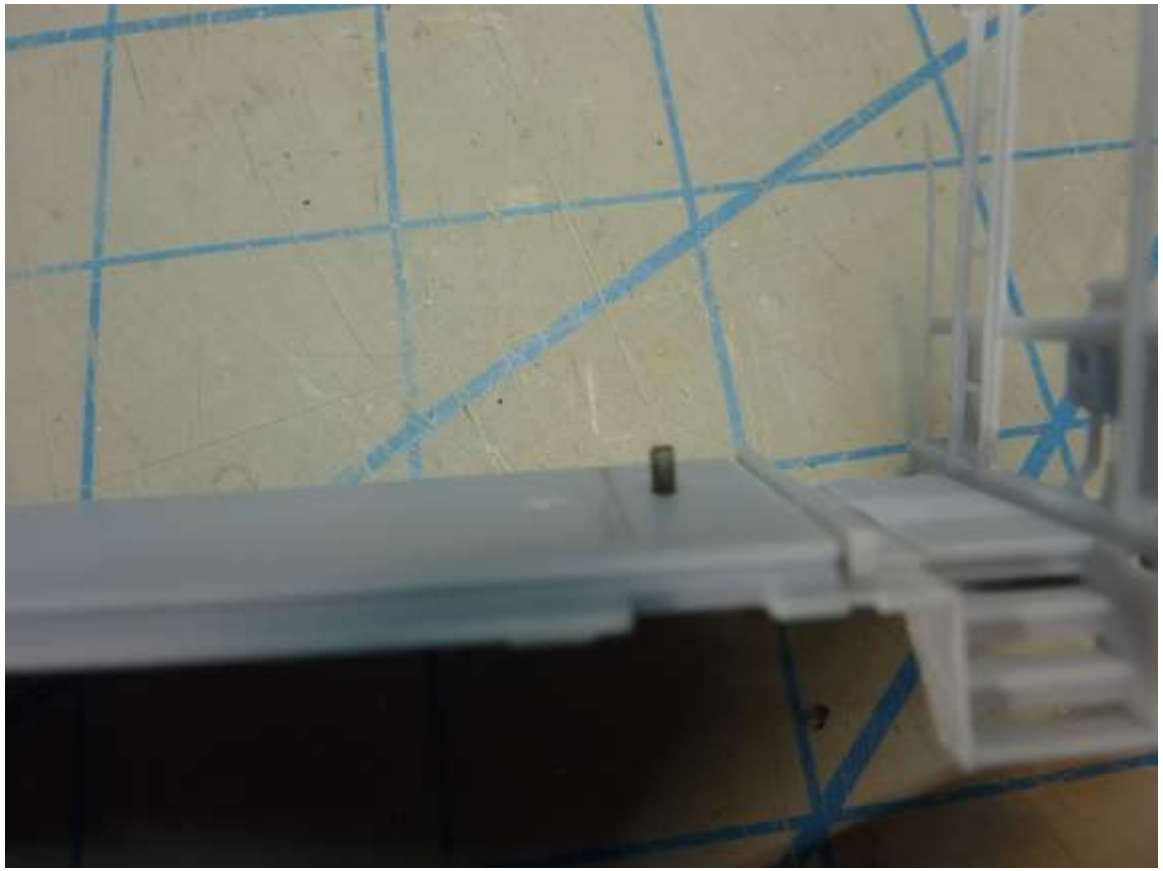


Note Tabs that locate floor and how 1/8x3/16 styrene lines up

Note position of styrene 1/8x3/16 strips are inline with tabs on each side that locate the underframe positioned to rest on the top of the underframe as viewed from inside of model.

Note: Production Kit will soon include these braces for you to install if you want to use this method to attach floor to body

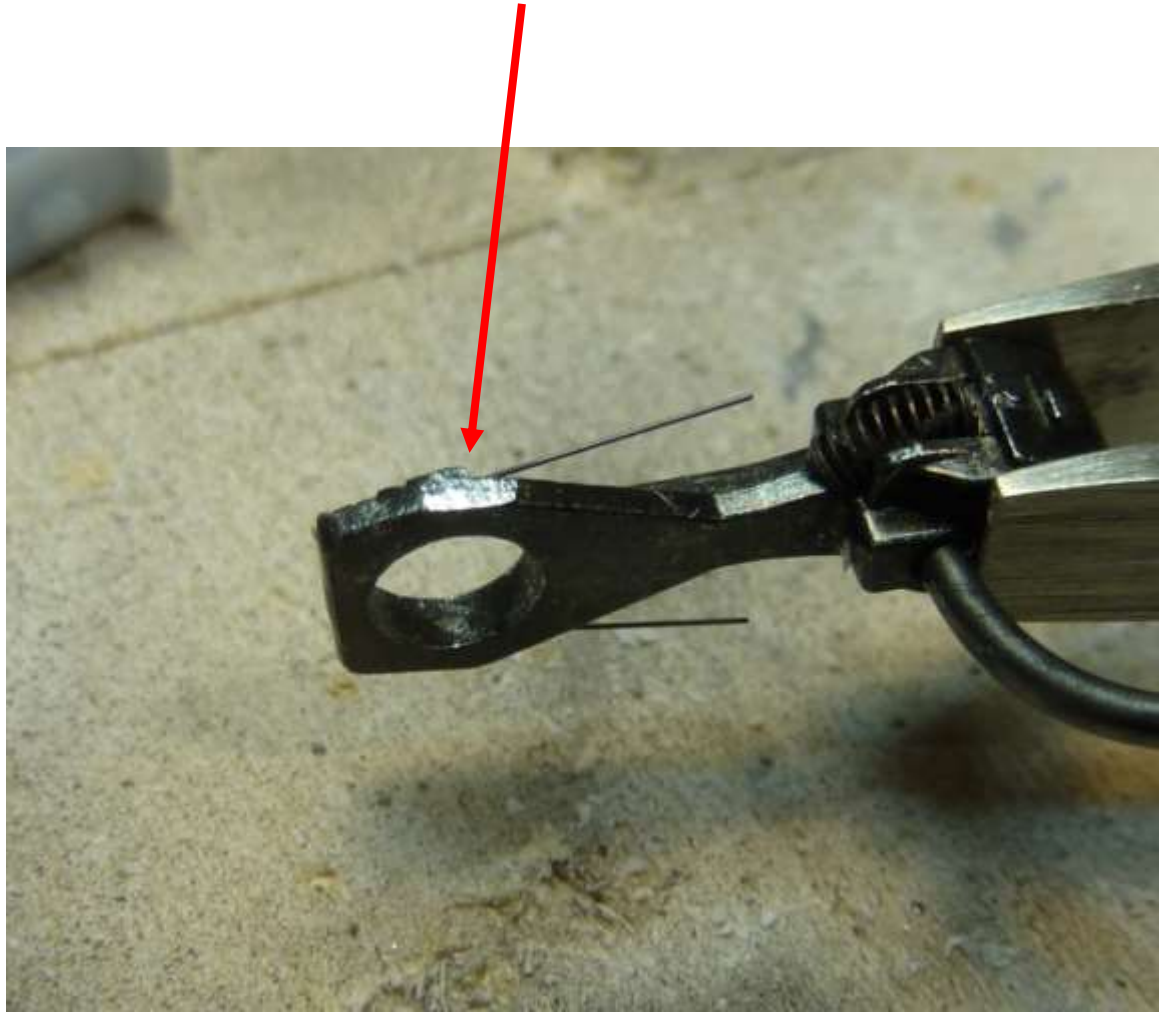
Underframe/floor with optional 1/8 x 3/16 styrene mounting bar



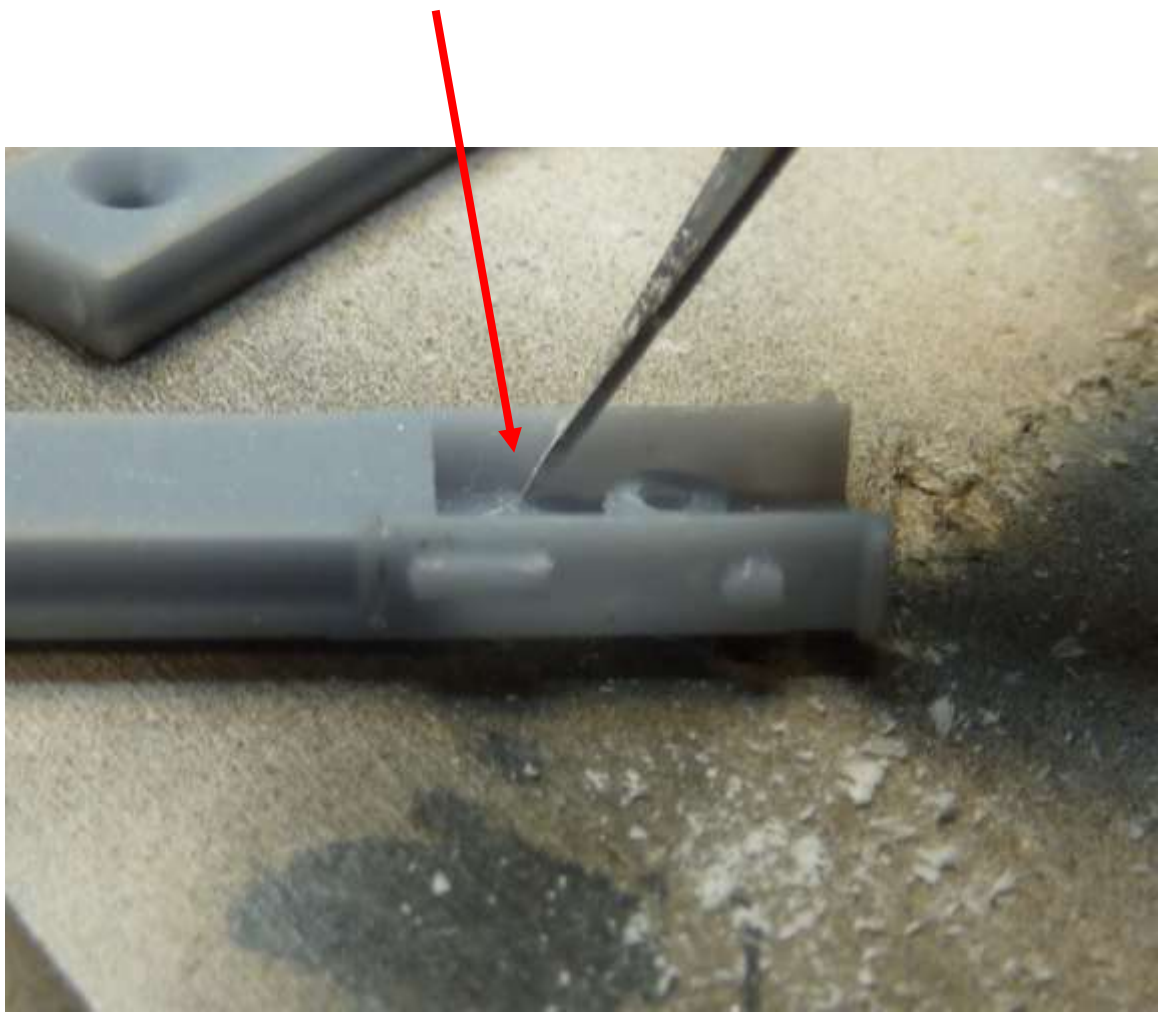
This photo shows the underframe with assembled end platform/draftgear box in place and how the mounting screw looks and will attach the floor to body

Use a Kadee 153 short shank

To make the kadee scale coupler fit better I filed a flat spot as shown on both sides as shown in photo below



I also used a #11 xacto blade may be used to scrape and widen to inside of the coupler box sides

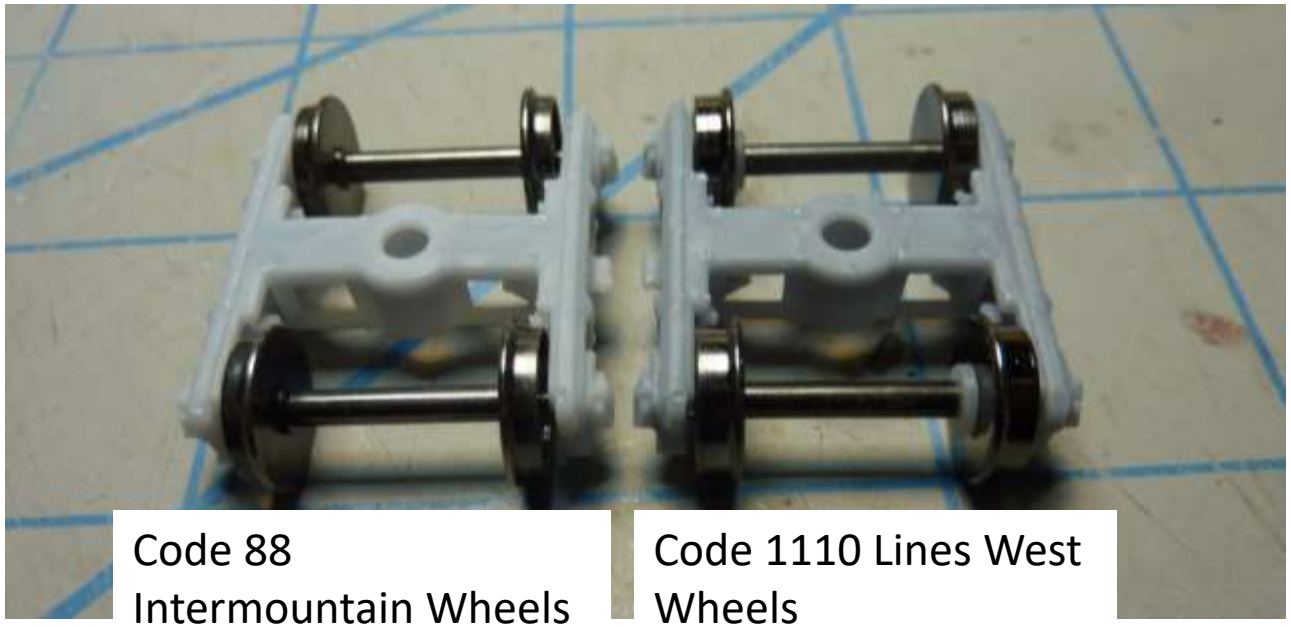


Here are the draft gear boxes being tapped for an 0-80 screw as well.
Again I used a .030 bit for a starter hole followed by a # 56 (.046) tap bit and the a 0-80 tap

Pictured below show the installation of the Kadee Scale Couples and the screwing on of the cover. My supplied 0-80 screws used a hex head. I used a #5 Chapman bit I had to tighten

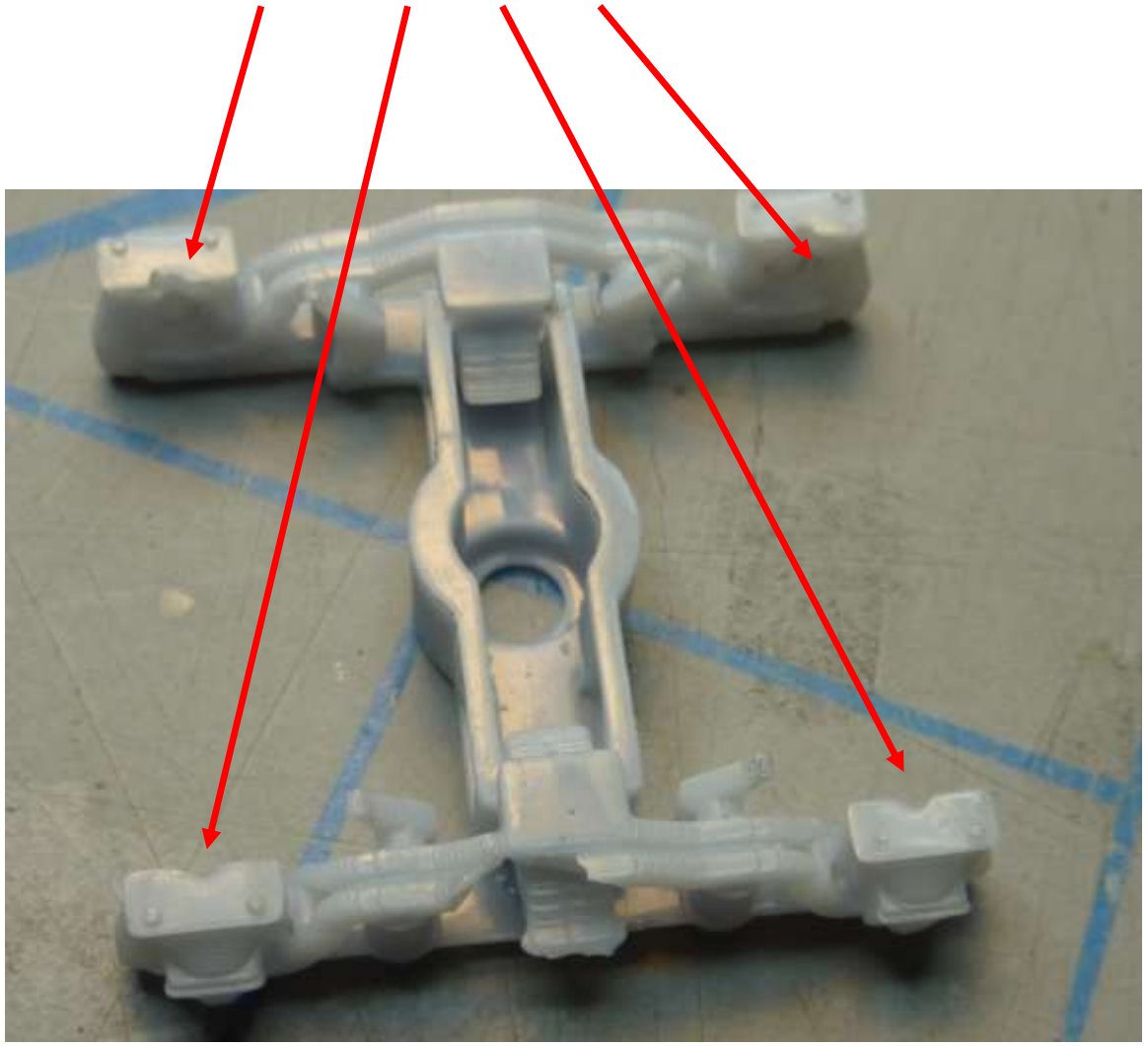
Use a Kadee 153 short shank for less visible shank and closer coupling

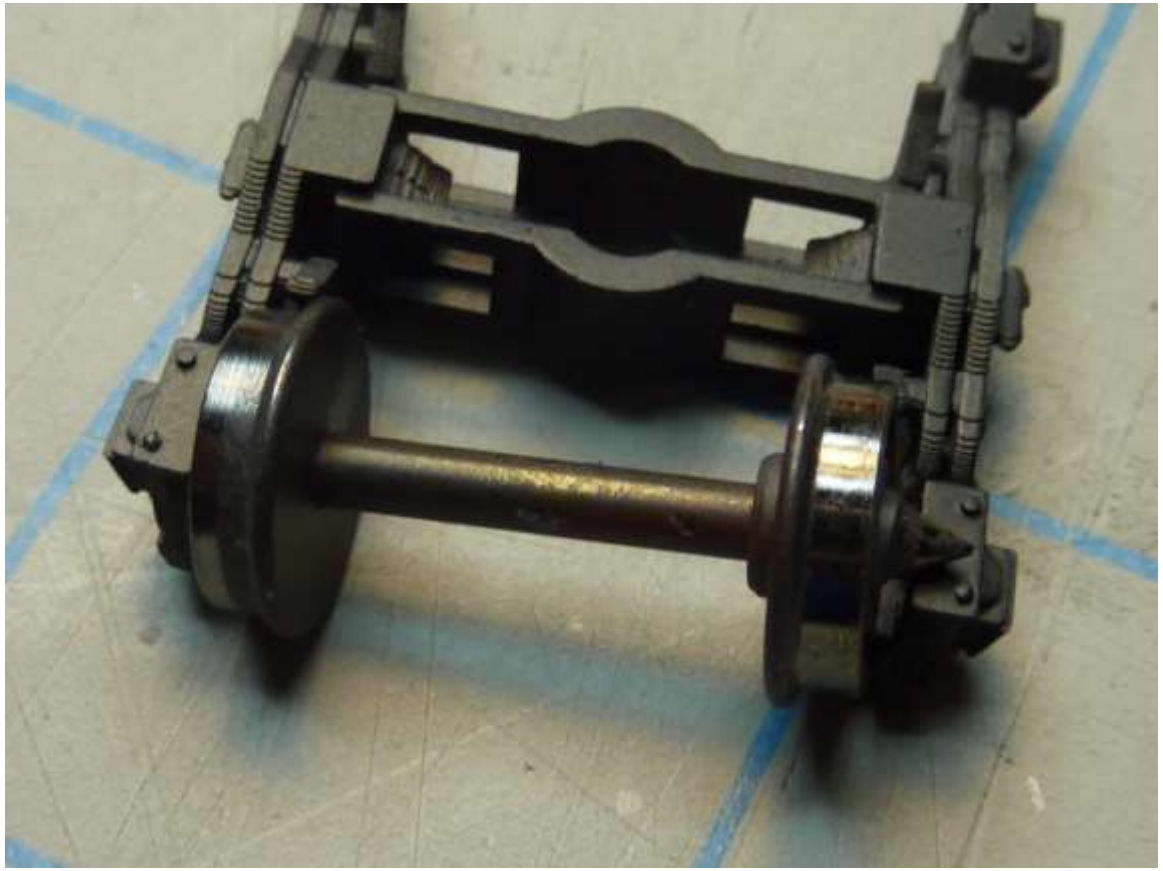
Pictured below are the trucks showing Code 110 wheels (supplied in kit) installed on the left and my choice of Code 88 wheel sets on the left. Installation of the wheel sets has you insert one axle point in the journal and carefully spread the other side into the opposite journal. There is a slight v shape at the bottom center ofr each journal to help install in place.



To minimize breakage of side frames My Advice on the trucks is too not install the wheels set until you have the trucks and wheel sets primed and painted.

Note V groves below each journals

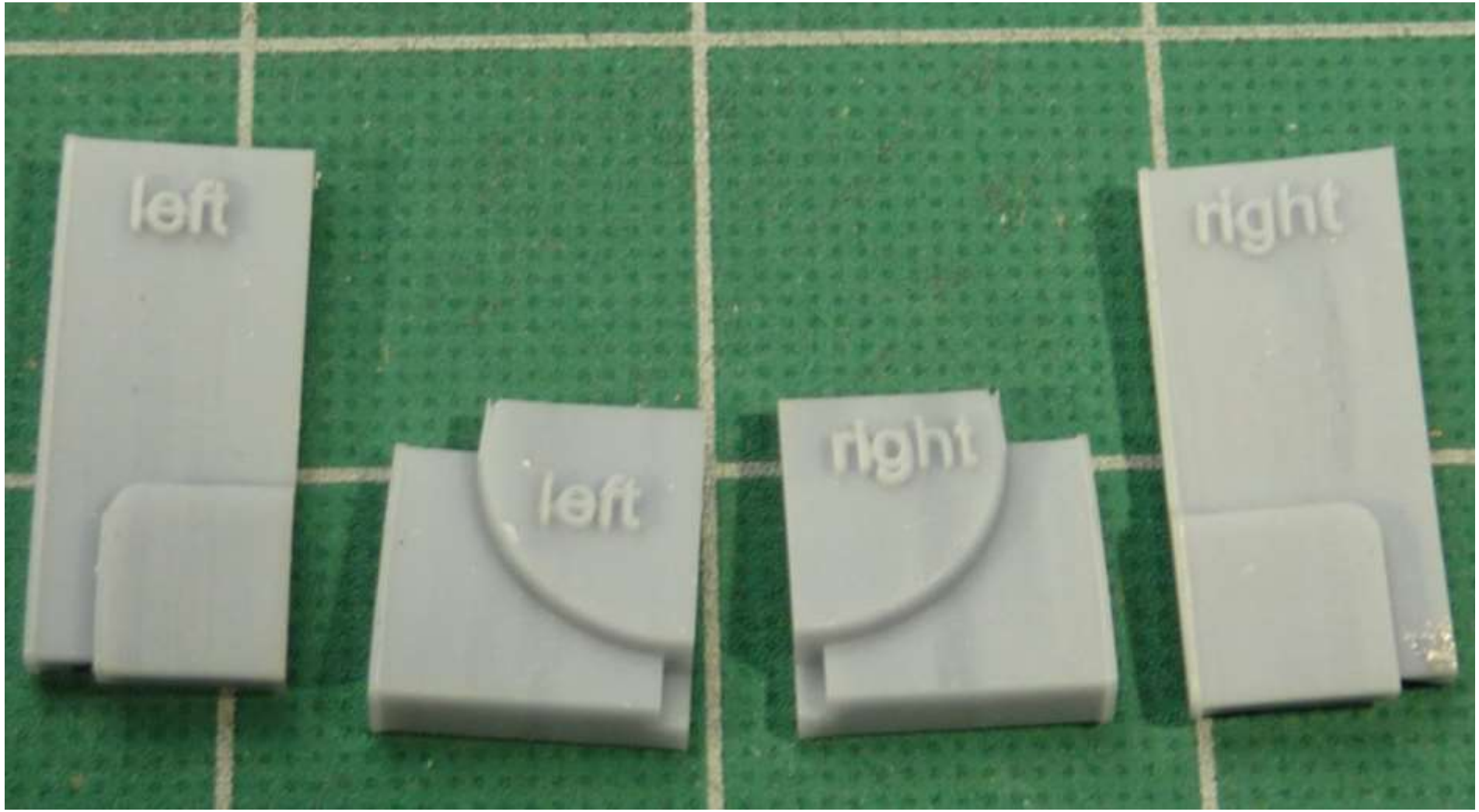




Installing the wheel set by starting one axle point in journal and lining up with oppiste journal/v groove. Carefully/slowly spread side frame to install

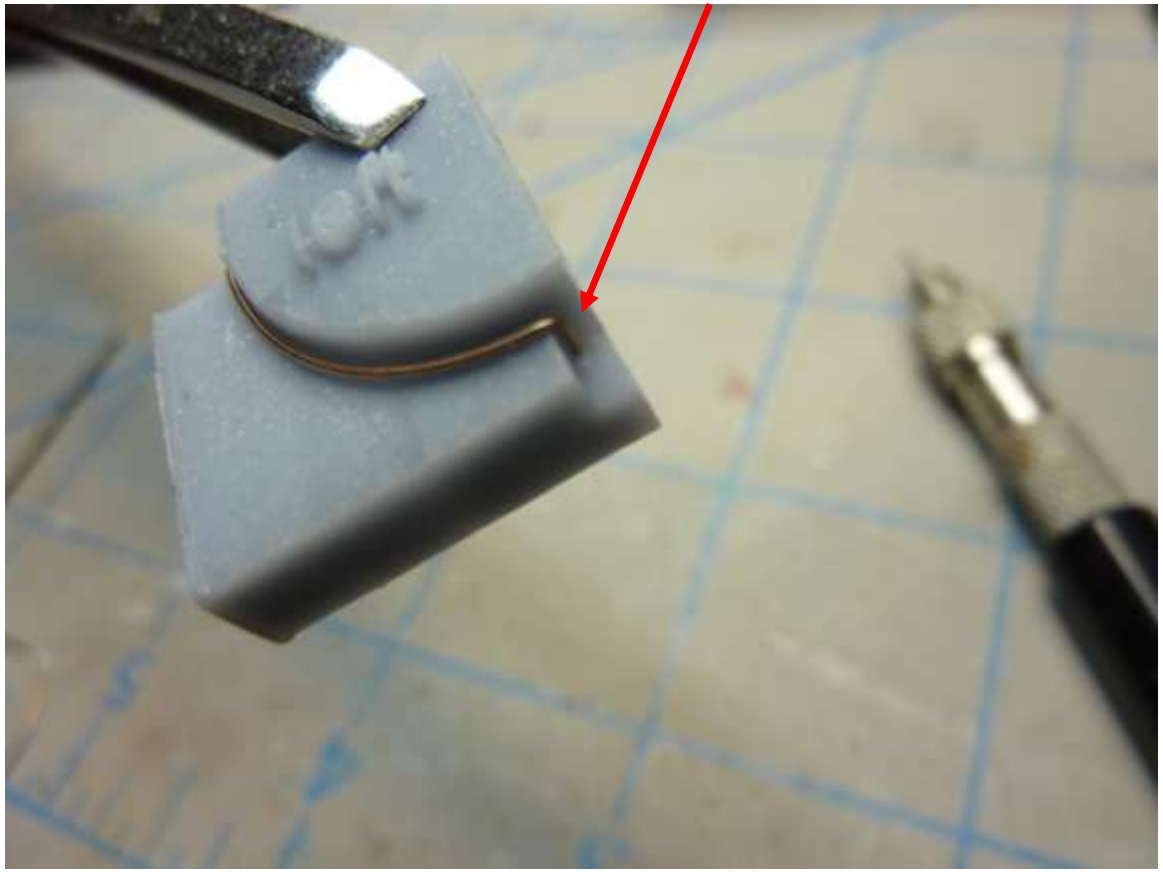
Photo Production Parts from Todd

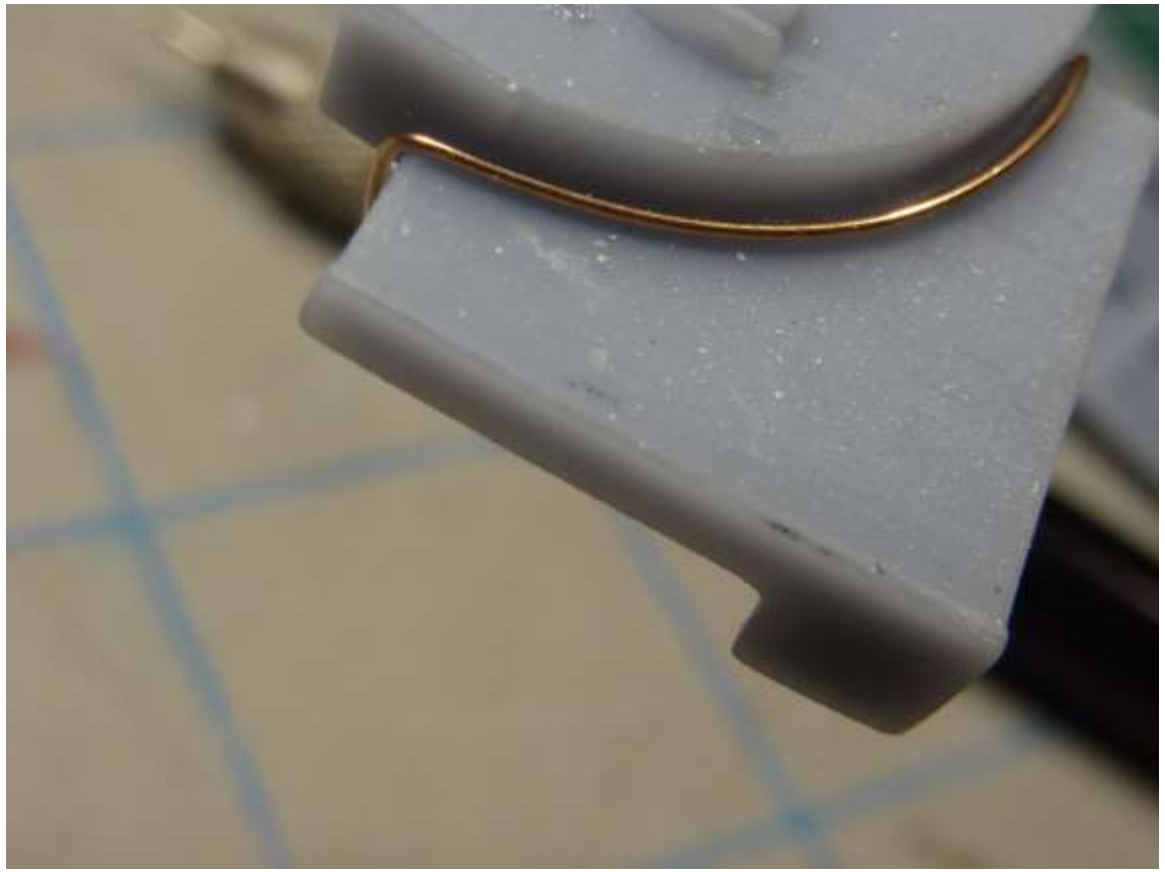
The side grab and end grab bending fixtures arrived and are pictured here



I used .0125 wire for my grabs and drilled a #79 hole in the location shown to help hold during the bend process

#79 hole

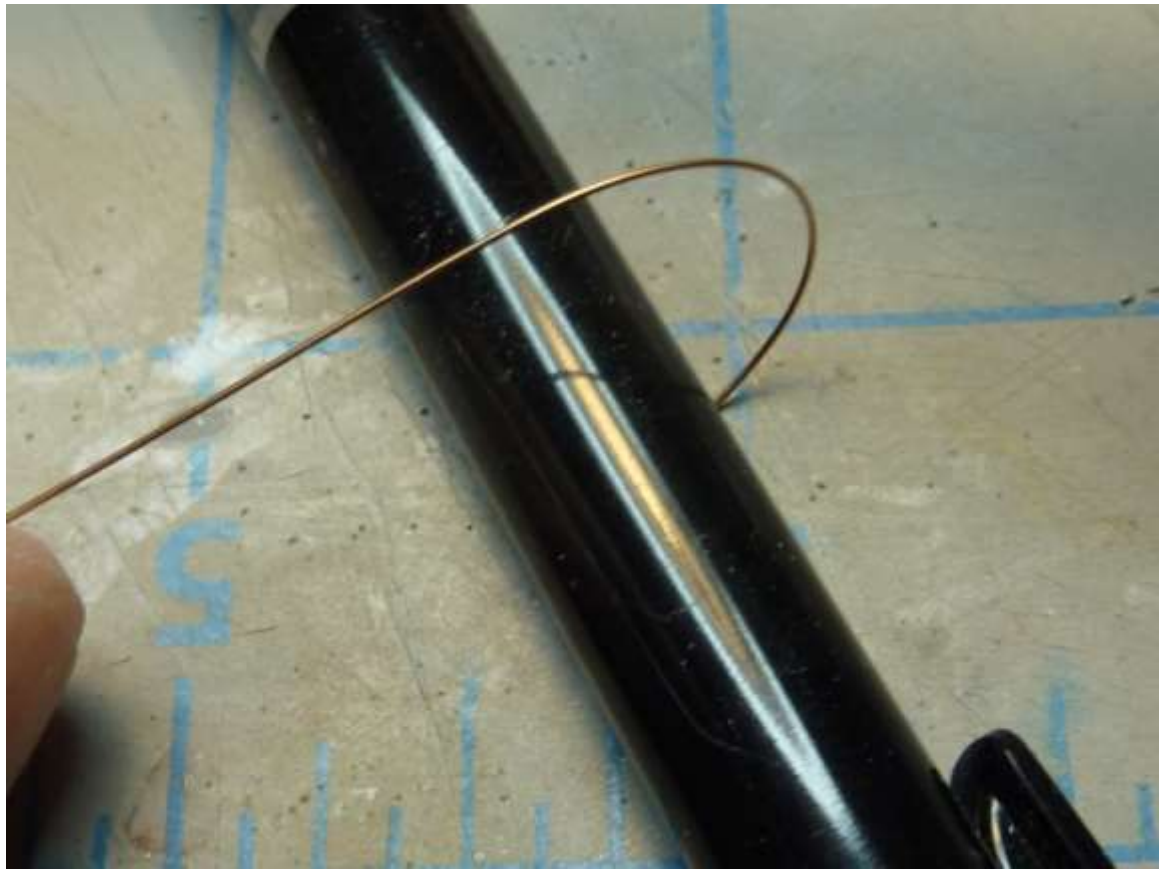




Pictured above is the end that needs to be bent on opposite end

Production version now has hole predrilled

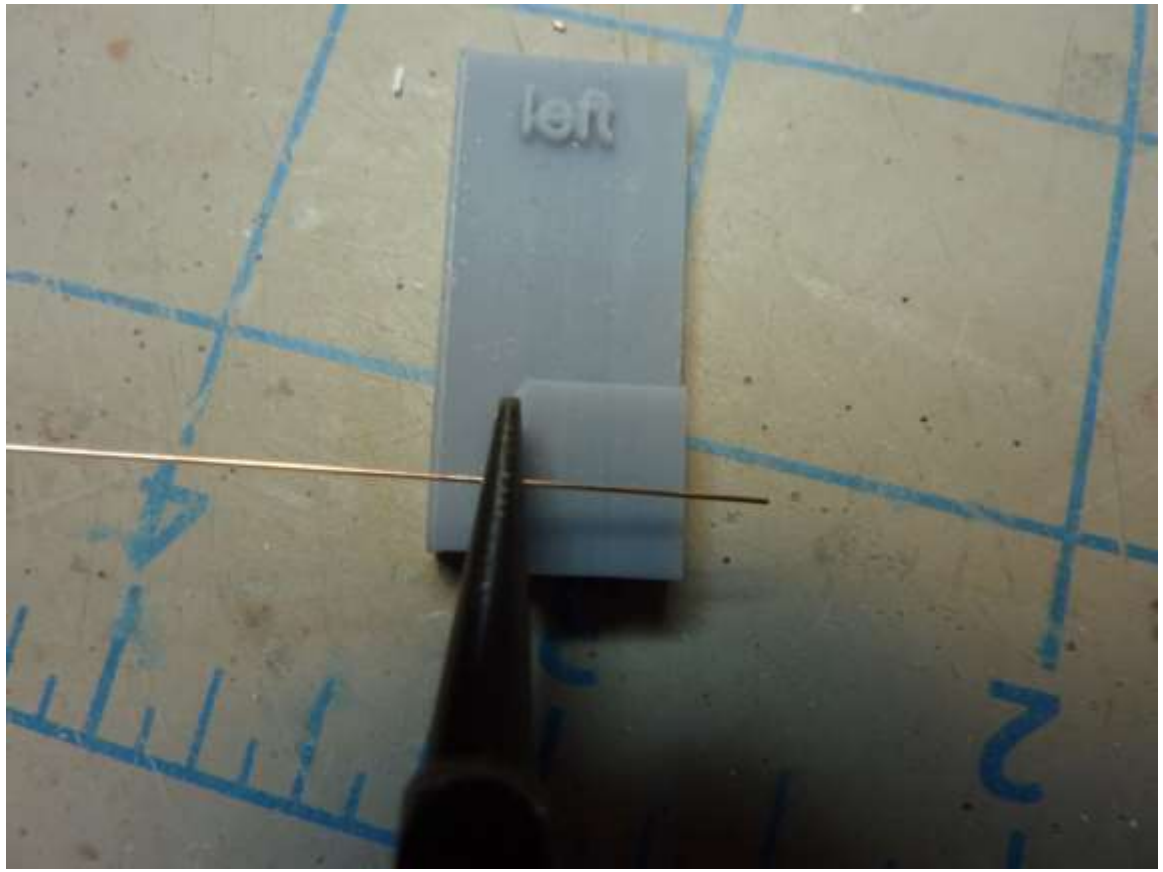
To help form nice side grabs I pre Bend my wire around a ballpoint pen body. As pictured belowit springs back a bit larger about the size I need



A right angle bend was made on one end to go into the #79 hole we drilled in previous step

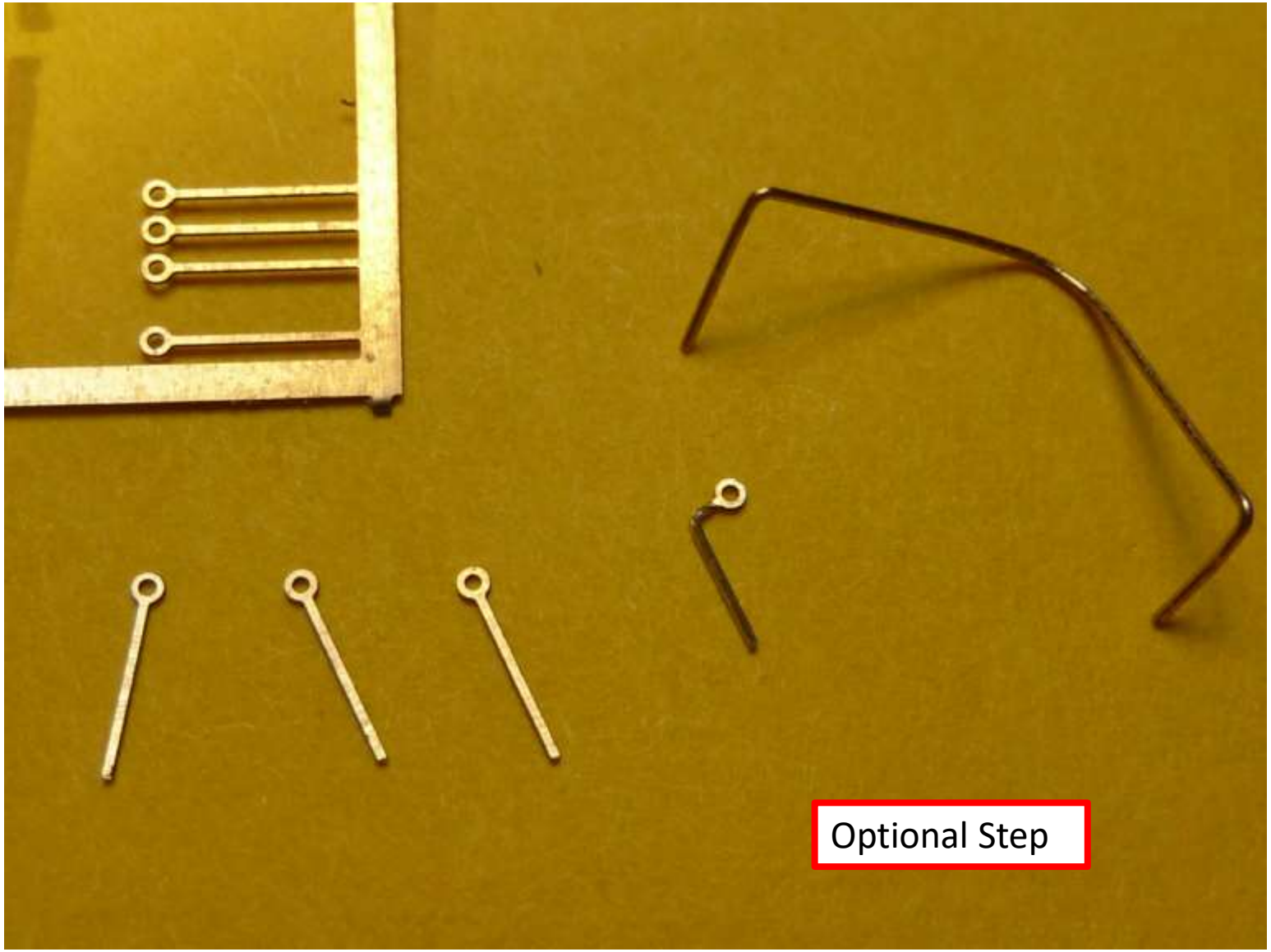
Using a pair of wire cutters I trimmed each end using the guide and leaving about .080 on each end.

Left side End Grab curve being pre bent with a pair of chain nose pliers to radius on bending fixture

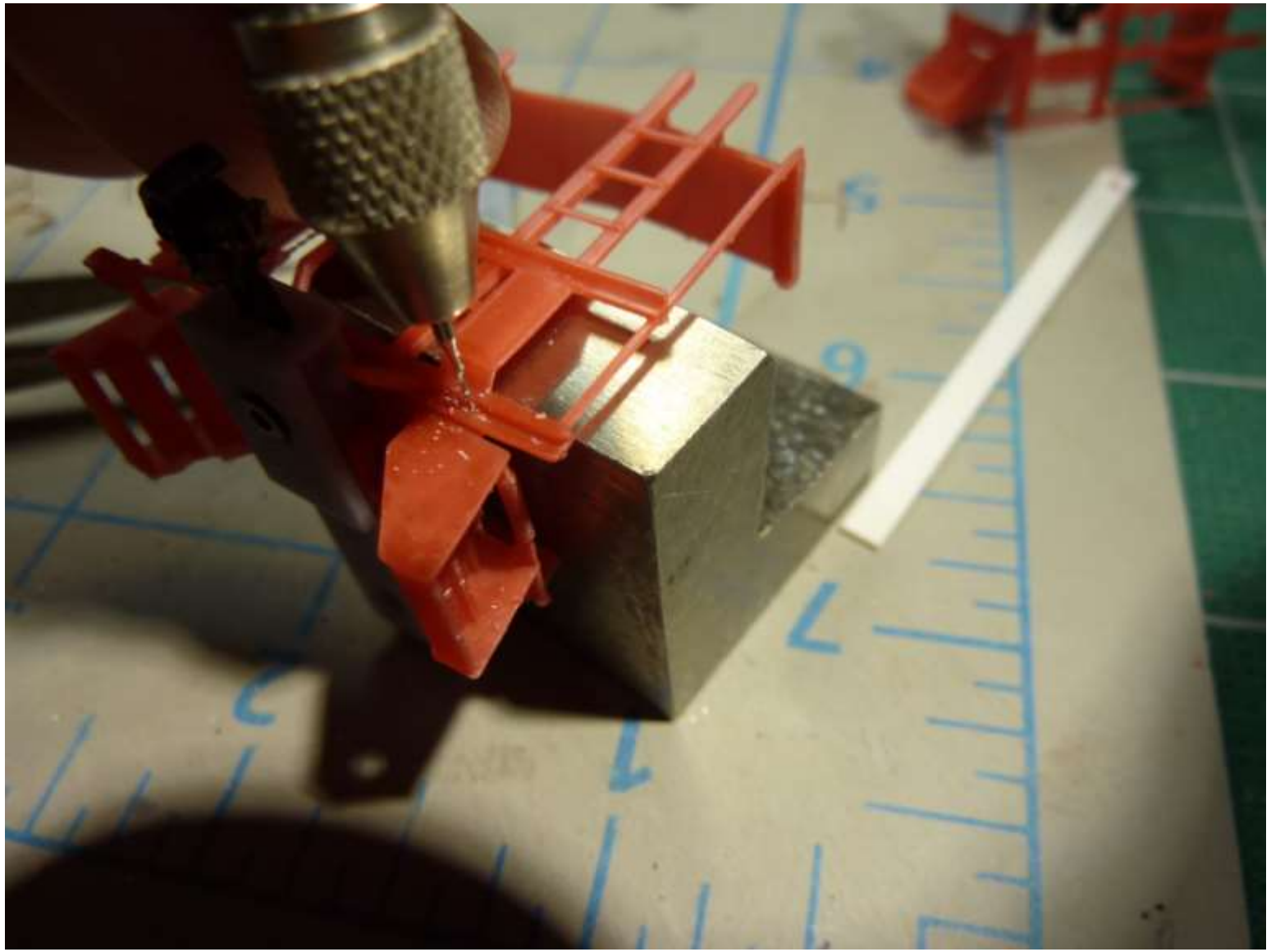


Grab holes are done and grabs bent

Making Corner Grab Stand off brackets using Photo Etched eyelets from scrap box. Mine were Yarmouth Models) Pre-production Kit

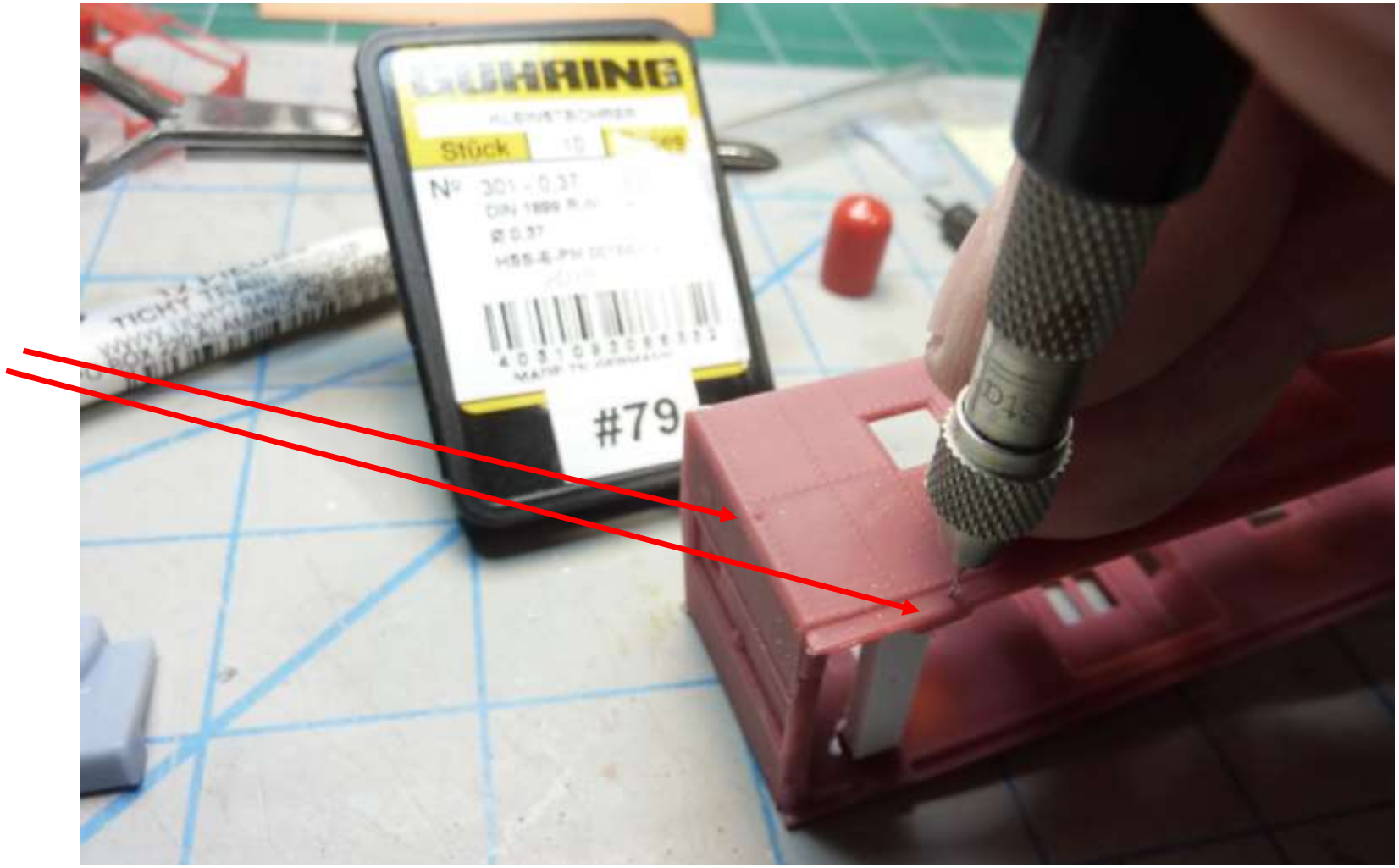


Drilling End Platforms for drop grabs



Here I am using a #79 bit to drill holes for the grabs. A hole is drilled at each dimple locator. Note the car body is a revised version that now has locator dimbles/holes that need to be drilled

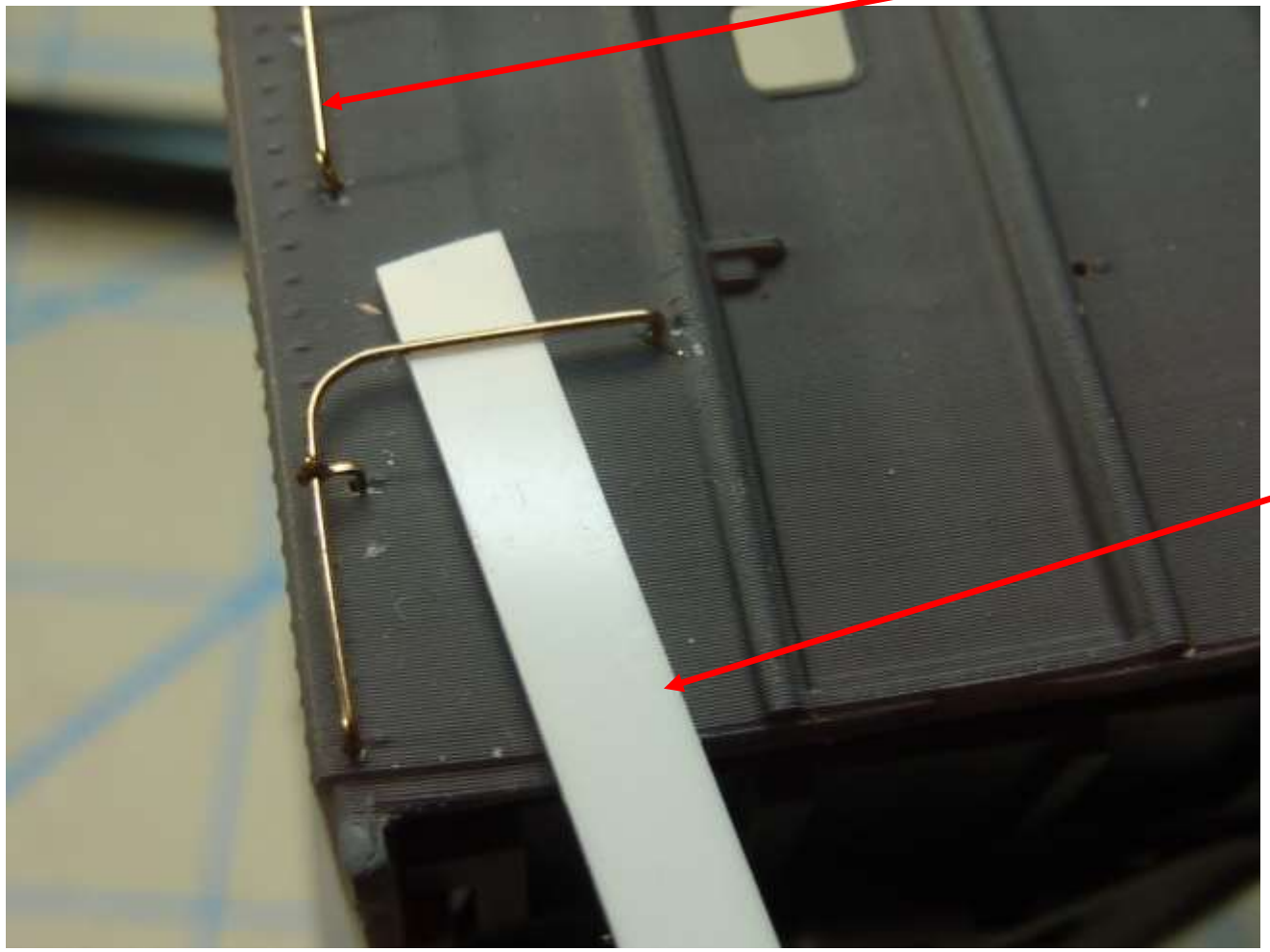
Locator Holes



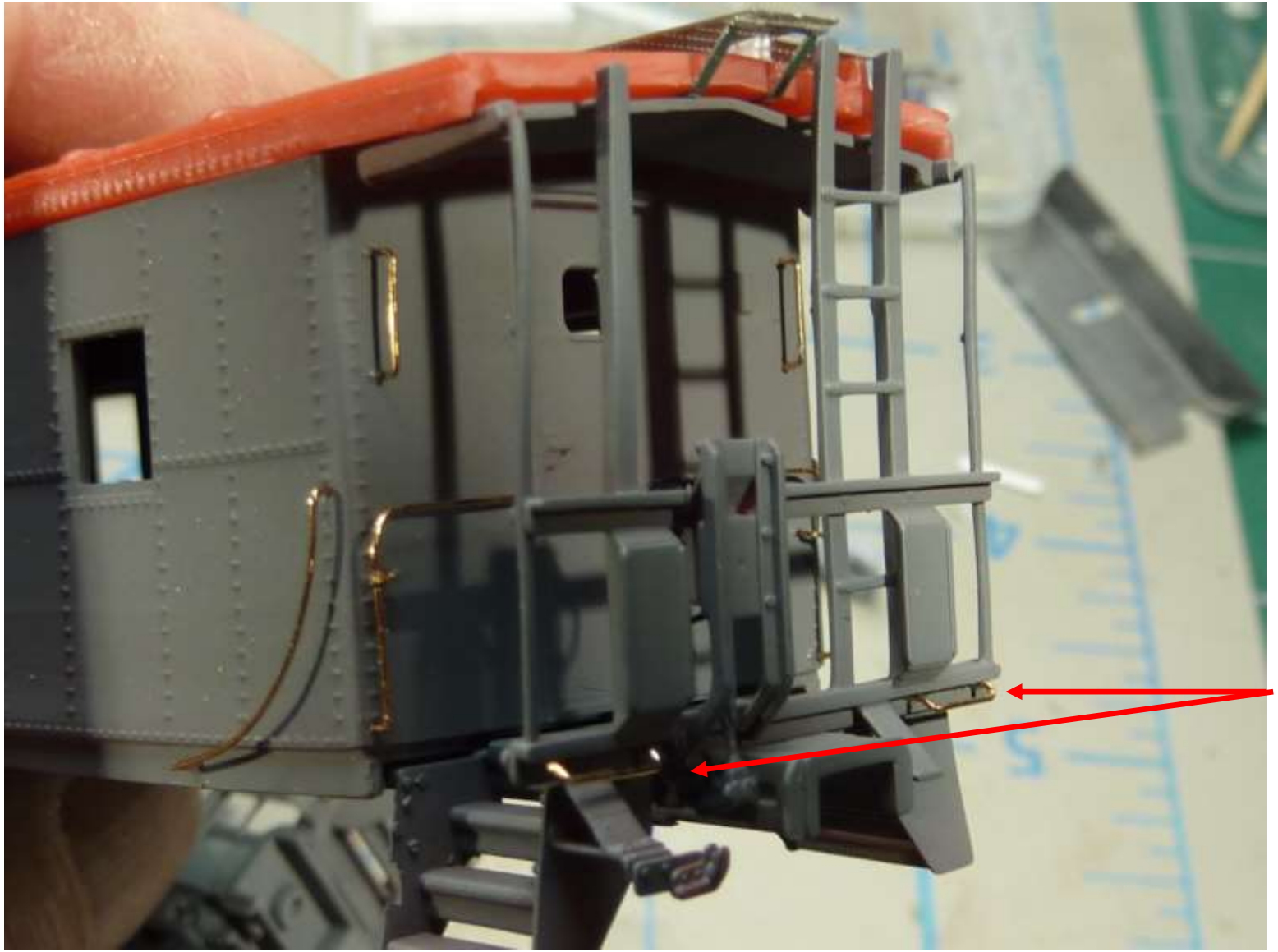
When Drilling Resin/Styrene or brass I use a lubricant. I tought the tip of the bit into some Boelube (available on Amazon and other places) and then drill hole. This keeps your bits sharper longer,

I next installed my grabs into body and spaced .030

The small straight grabs had no bending fixture yet so I bent to .2 inch with .080 legs



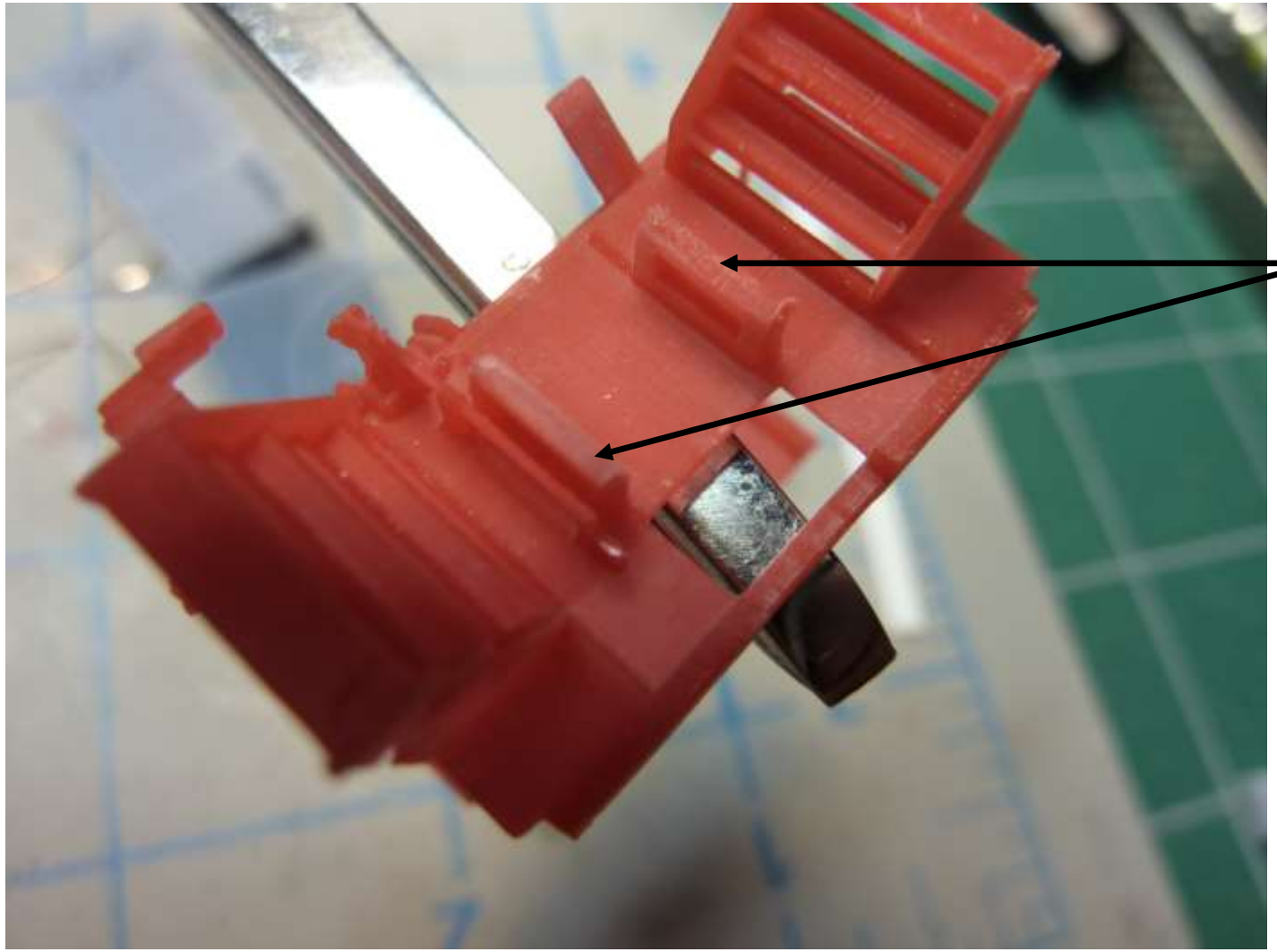
.030 styrene strip used as a spacer for all grabs



Picture showing the grabs installed. Also the platform is being held in place for this photo to show end grab by steps

Note Drop End Grabs on End Platform. Bent .2 inch with a slight downward bend

Prepping End Platform



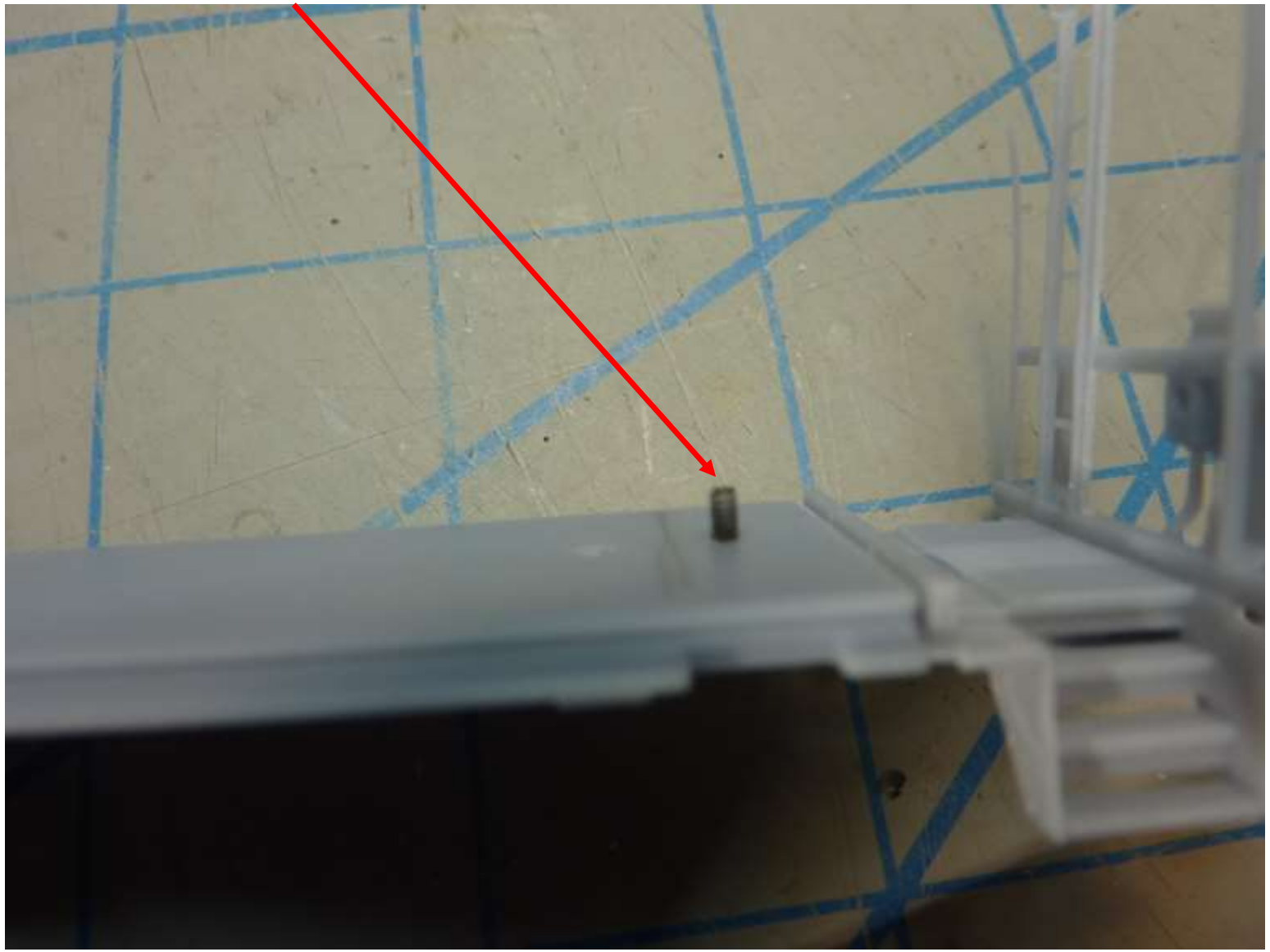
I filed a slight bevel to the locating/mounting tabs for the (Dureya) draftgear boxes at location shown. This helps guide the draftgear in place

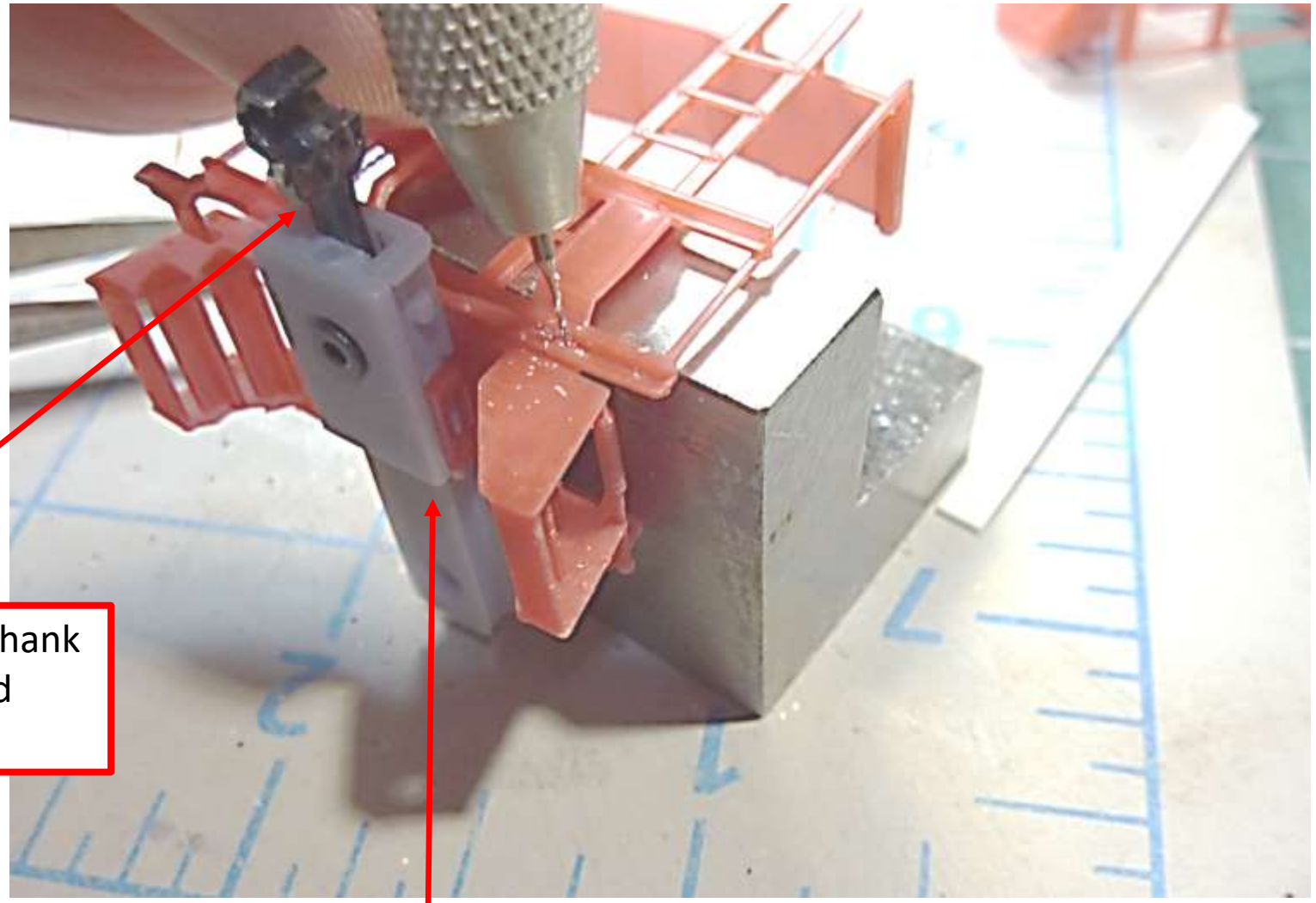
Testing fit of underframe to body. Making sure coupler pad is even with end sill

Body with 1/8 x 3/16 styrene strip epoxied in for floor attachment using screws in draftgear

A bit blurry but show the end platform and how it looks in place

This 0-80 screw is punt in from underframe draft gear and will screw into the 1/8 x 3/16 styrene strip

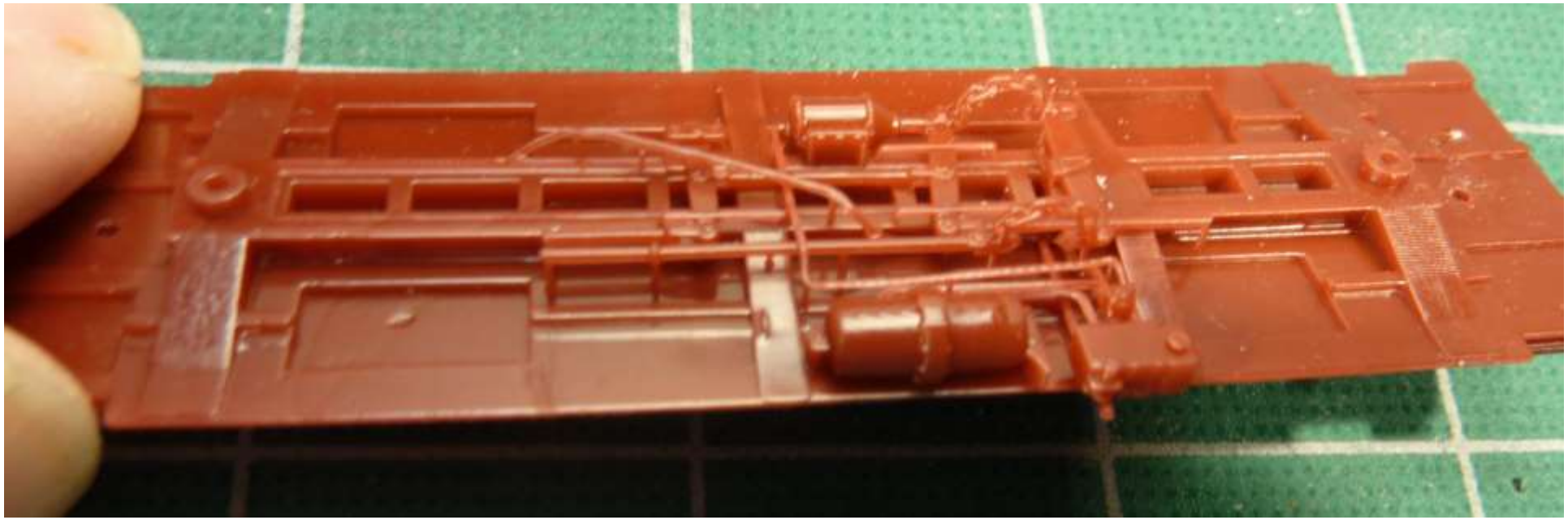




Use a Kadee 153 short shank for less visible shank and closer coupling

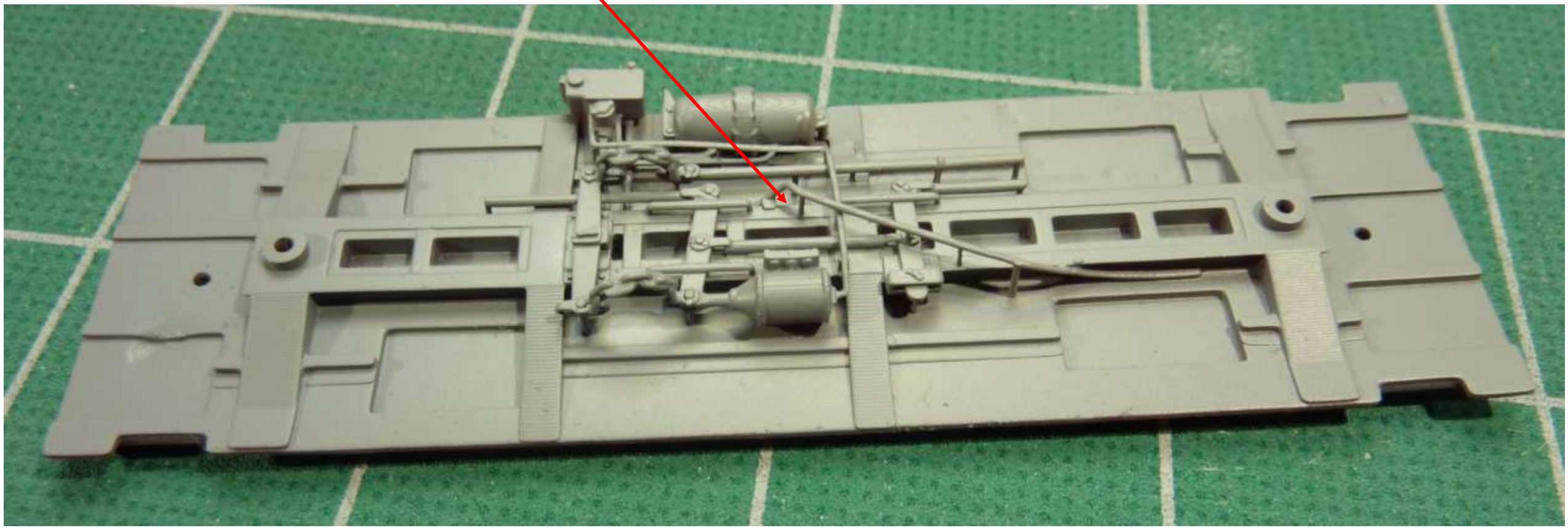
In this phot you can see the draft gear attached to the end platform. This was simply attached by snapping it in place using the tabs we filed in a previous step.

Brake Gear Installation

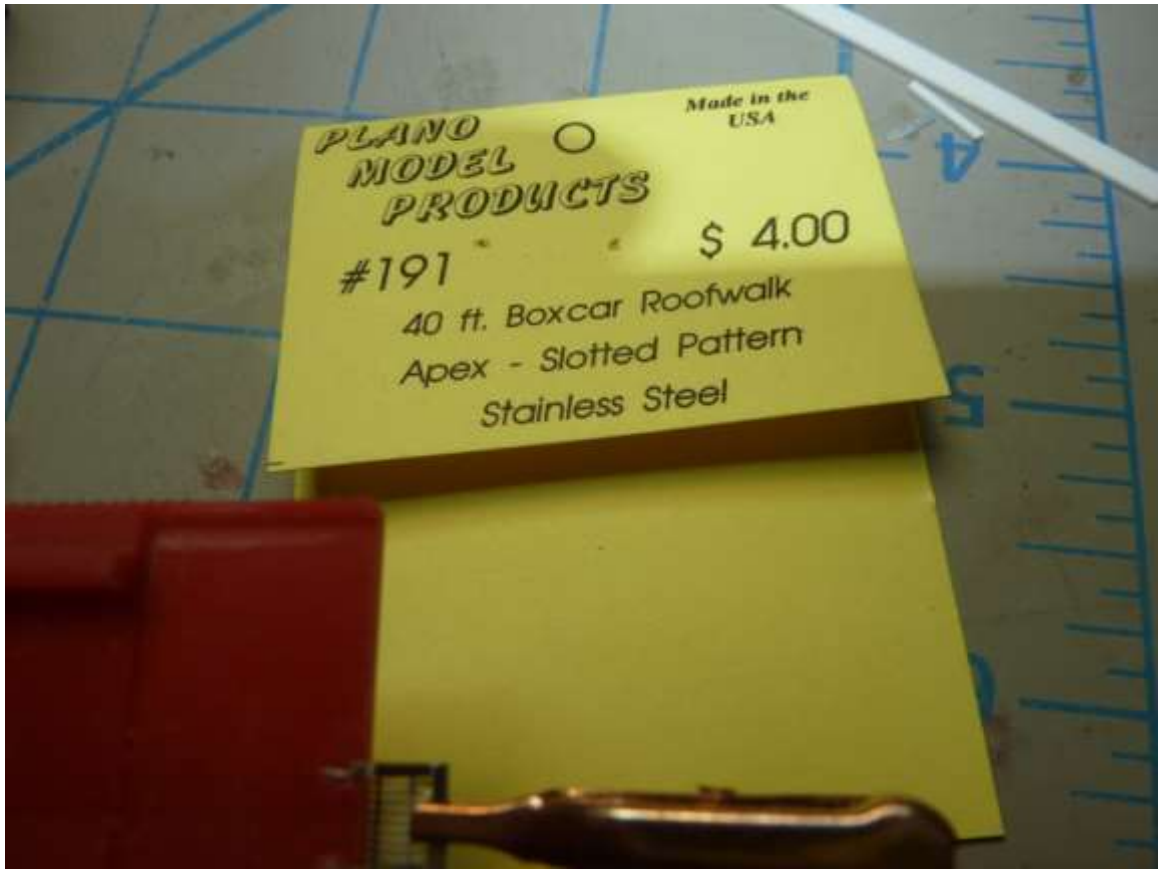


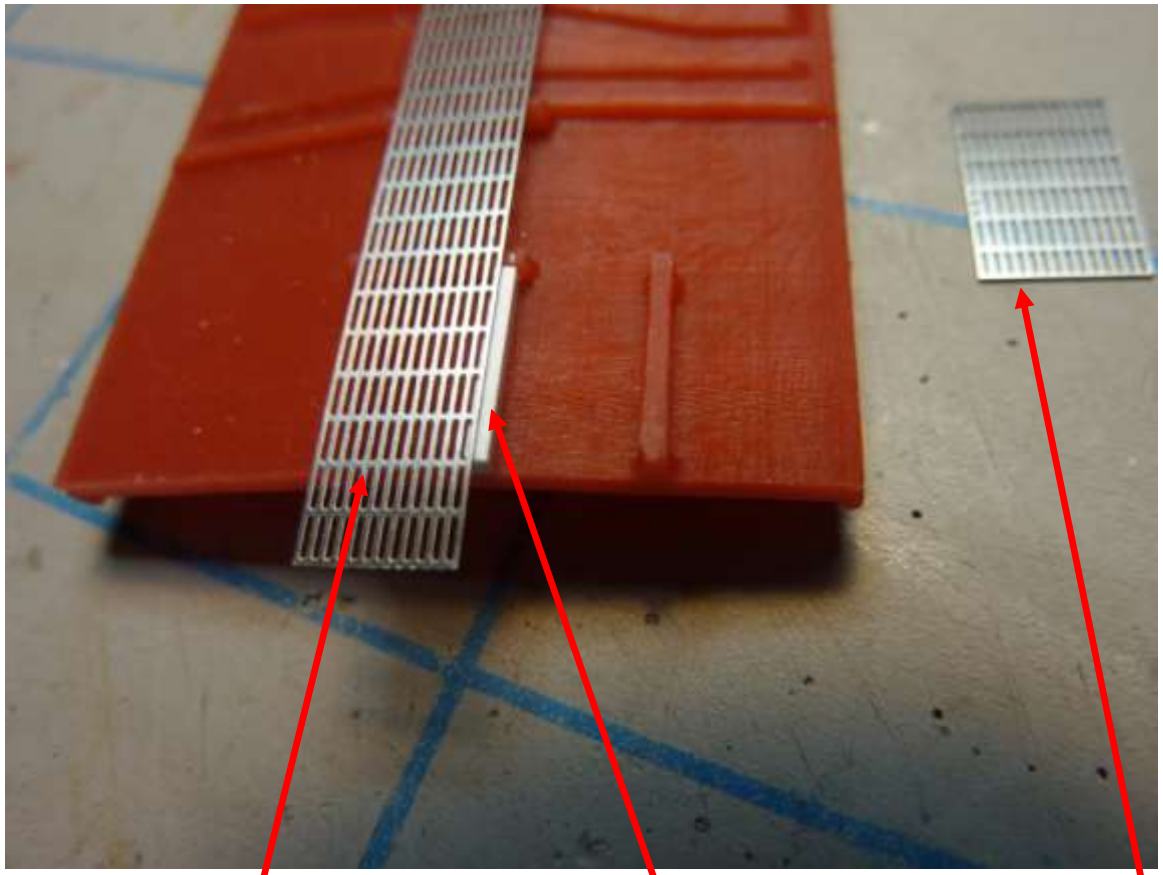
One Piece All Done for you

Brake Line Supports Can be cut out



I used Plano Apex Boxcar Roofwalks cut down to fit roof. Pacer Canopy Glue was used to glue the running board to the supports.

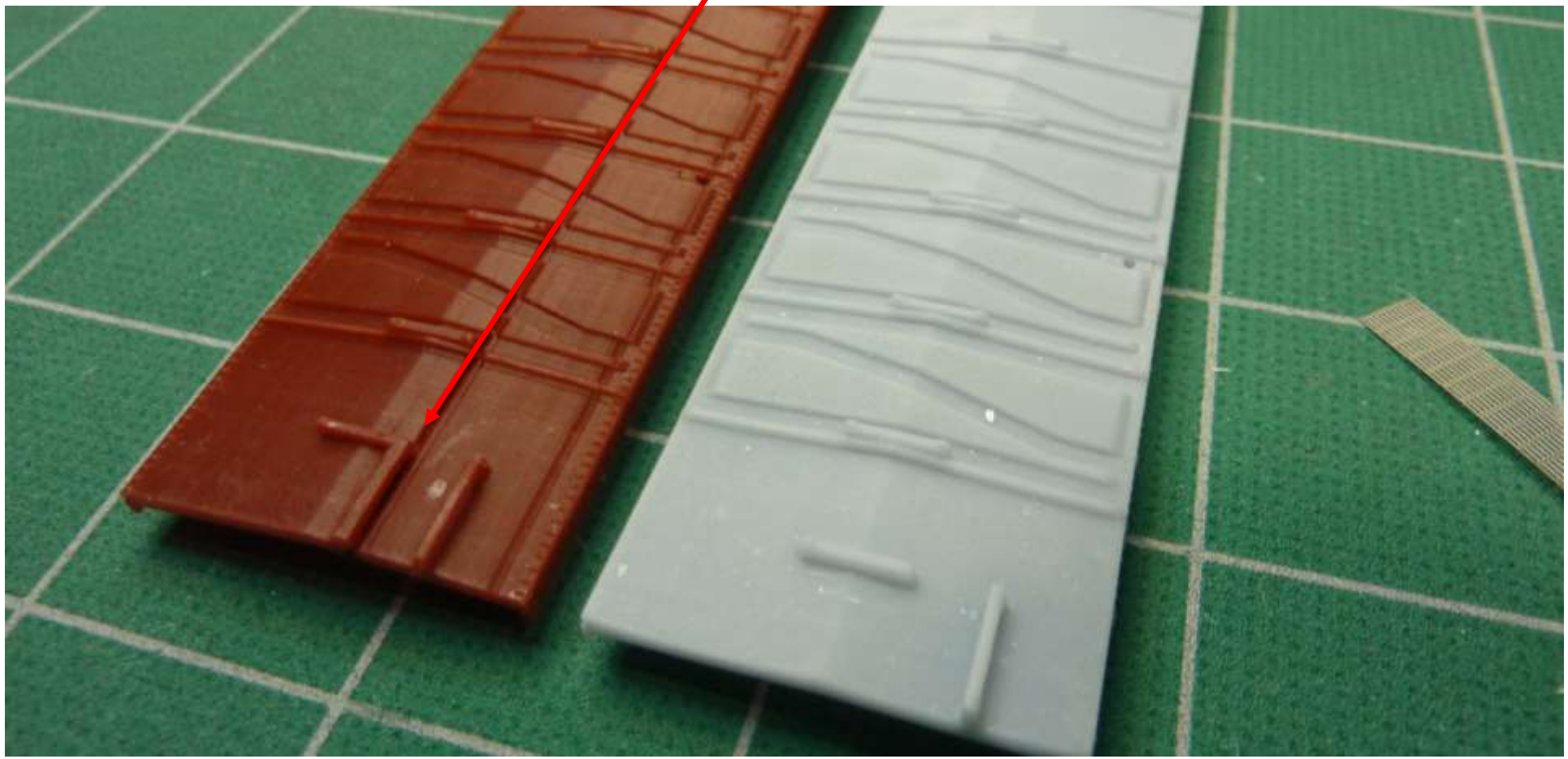




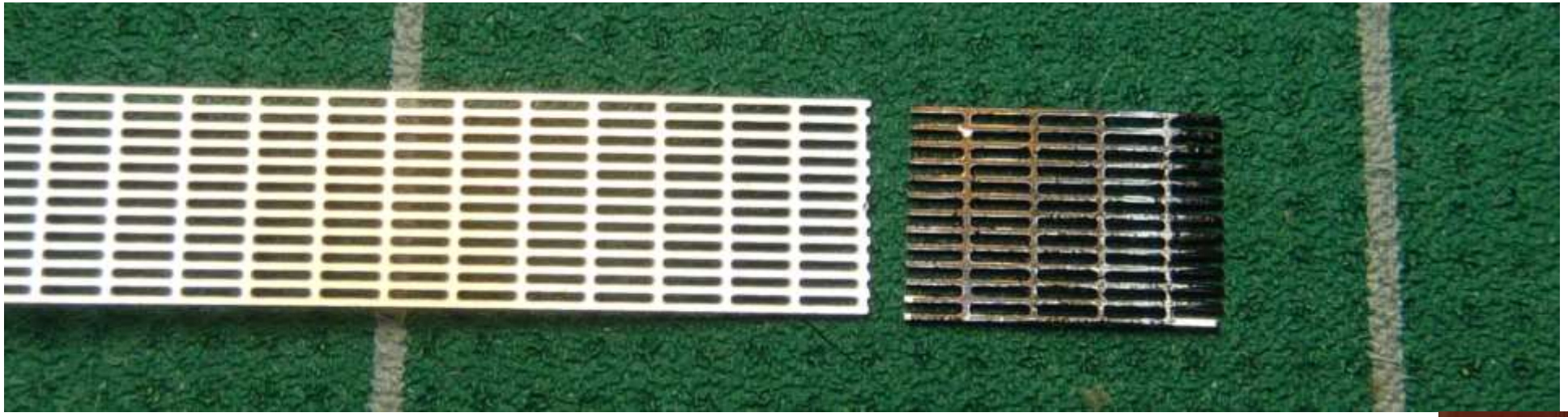
I cut the Plano Running Board to length, leaving two full sections too overhand the end of the roof.

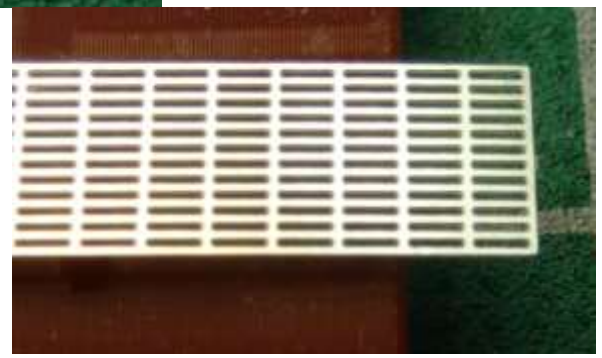
A .030x.040 styrene strip was glued to the roof with ½ under running board and ½ with be under lateral

The new production roof already has the .030x.04 brace I used on the pre production model.



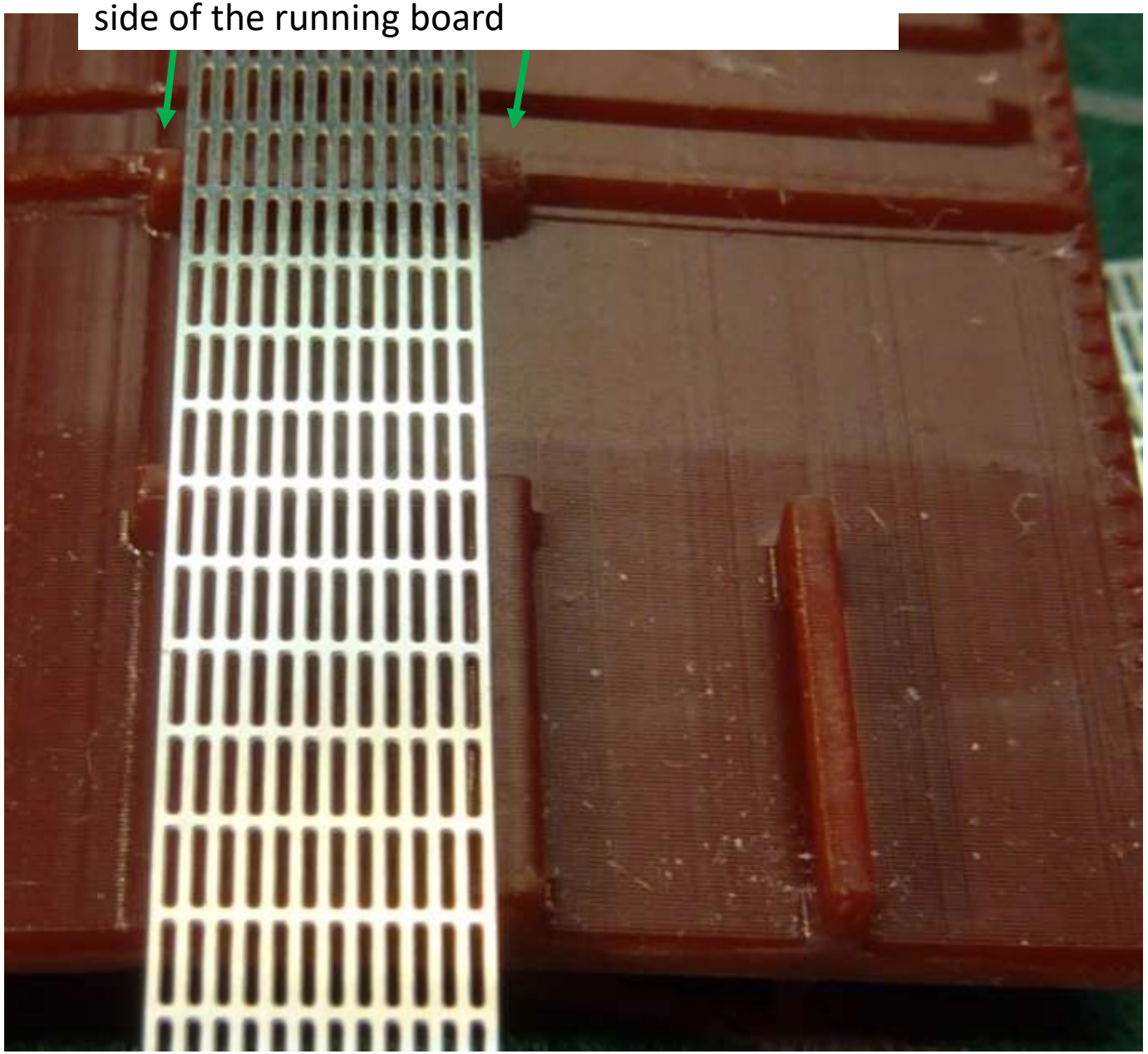
Plano Apex Boxcar Running boards are supplied with the production kits. They will need to be cut down to fit roof. Pacer Canopy Glue was used to glue the running board to the supports.





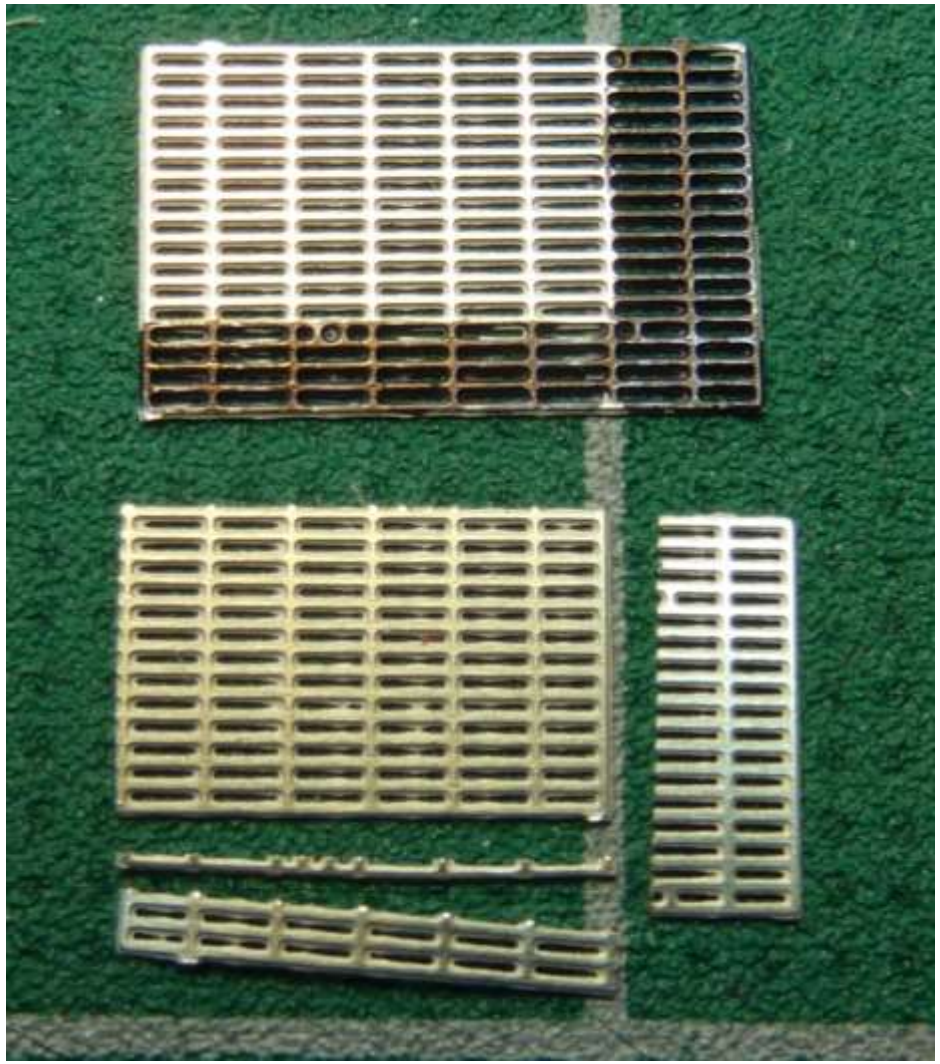
My first step was to trim the running board to length. In the photo above you see I cut 5 sections from the Plano Part. The end result is for two full sections to overhang the roof end as seen to the right.

Support brackets have a raised support on each side of the running board

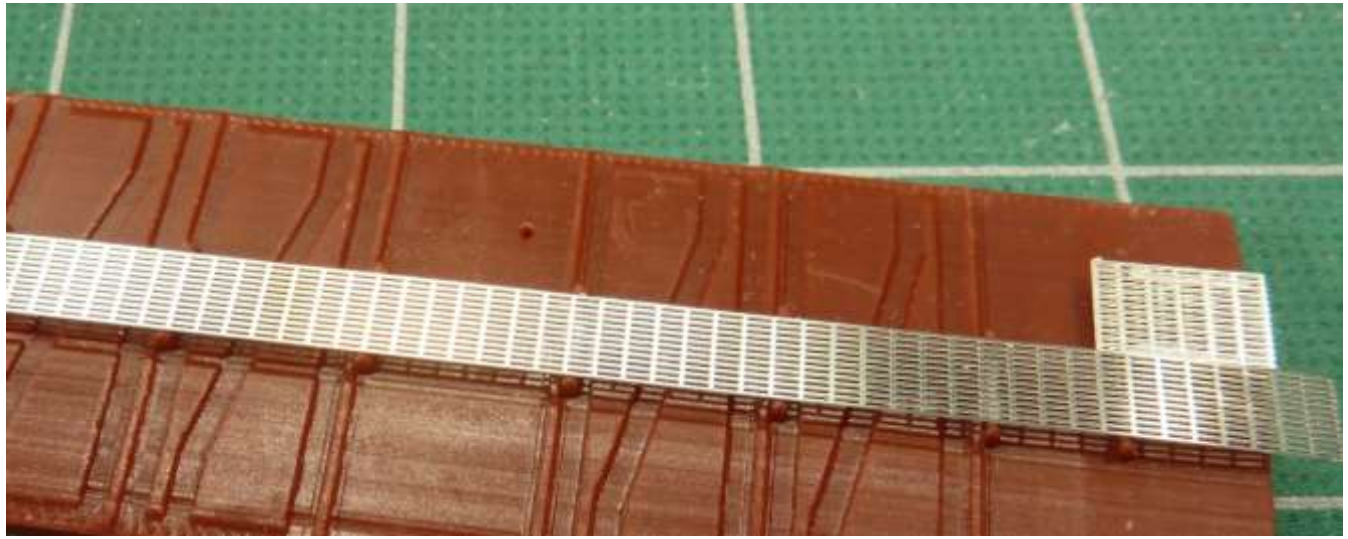


Test fitting the running board to make sure it sits between the support brackets. Make sure it sits flat. Some minor sanding /filing of width may be necessary.

Laterals also need to be trimmed as shown below
Finished size is .255x.406. Please measure before cutting to make sure you don't cut too much



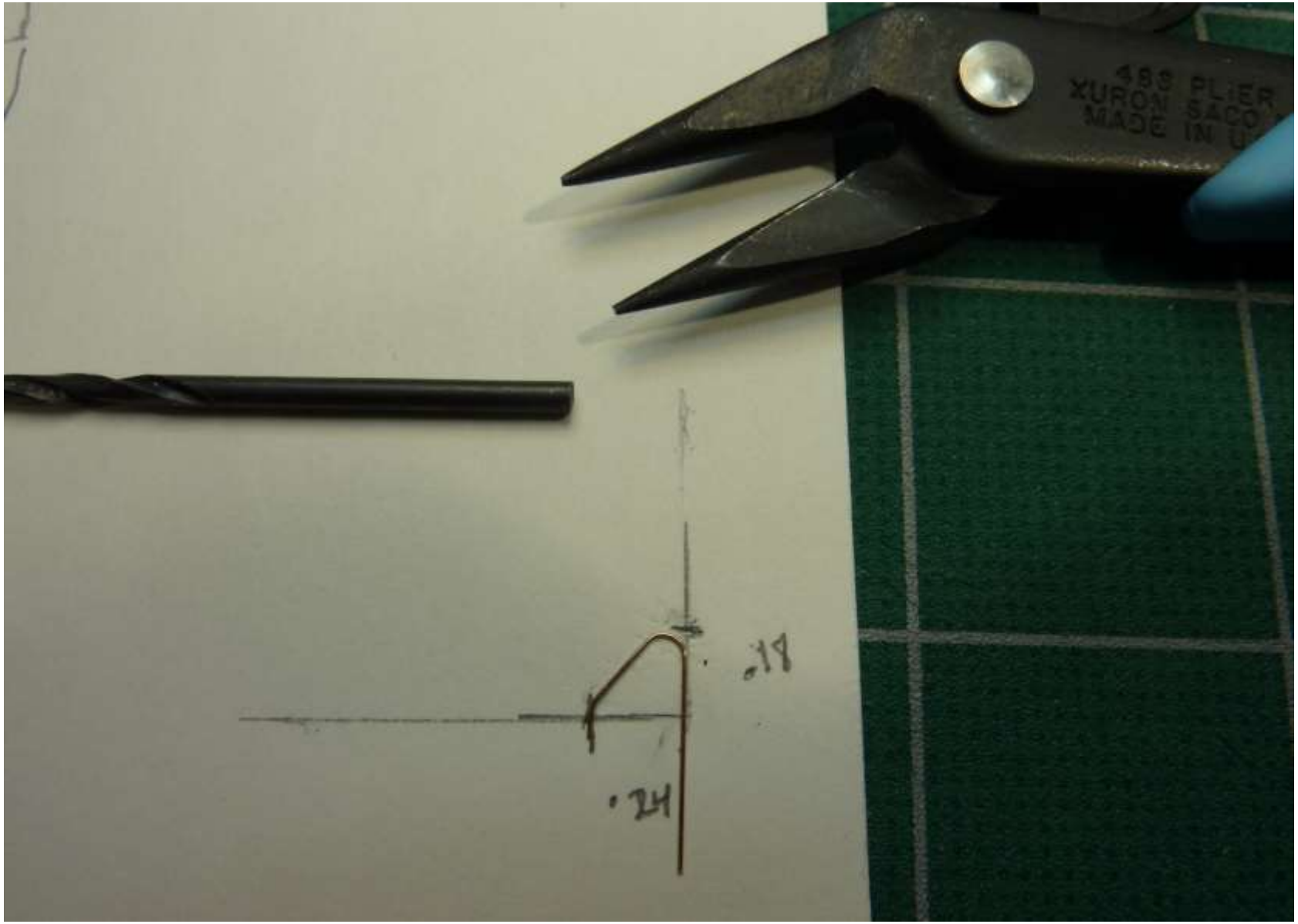
Pacer Canopy glue was applied to running board supports with a tooth pick.



Laterals and Running Board are in place

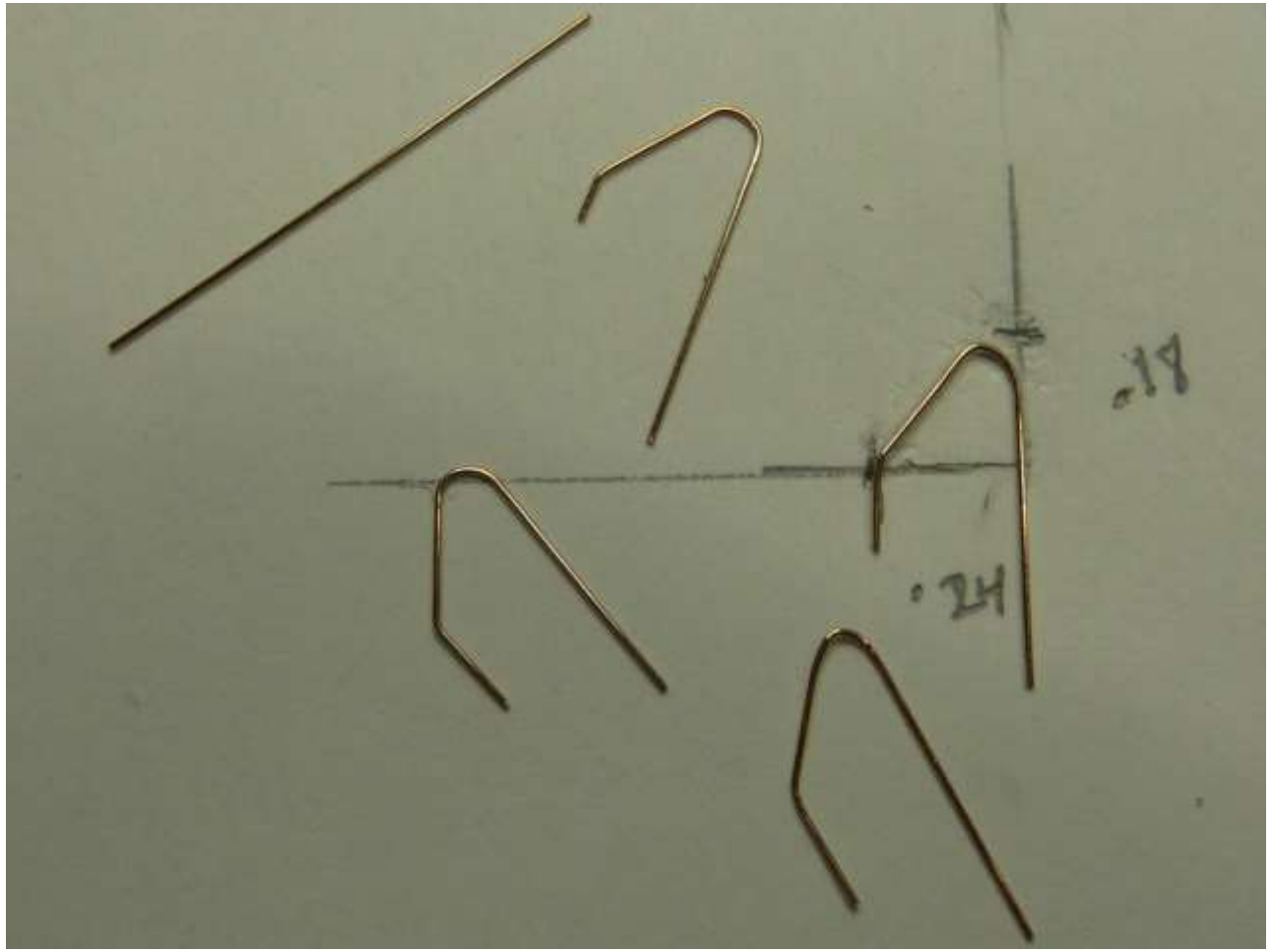
I flipped it over on a level surface and weighted down and let toughly dry

I made a sketch as shown with marks for a height of .18 inch on the vertical axis and a width or .24 on the horizontal axis



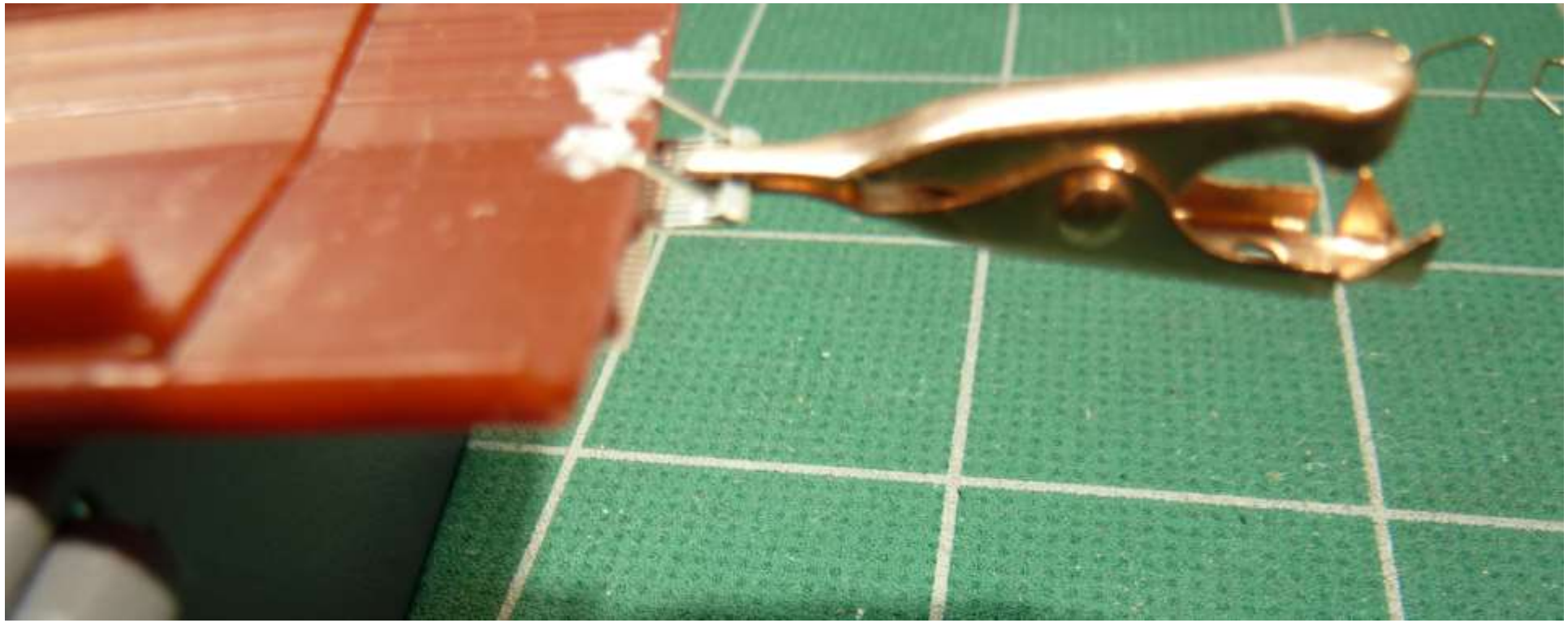
I used some Xuron Round Nose Plyers and a # 44 drill bit shank (.036) to help form my grabs at the ends.

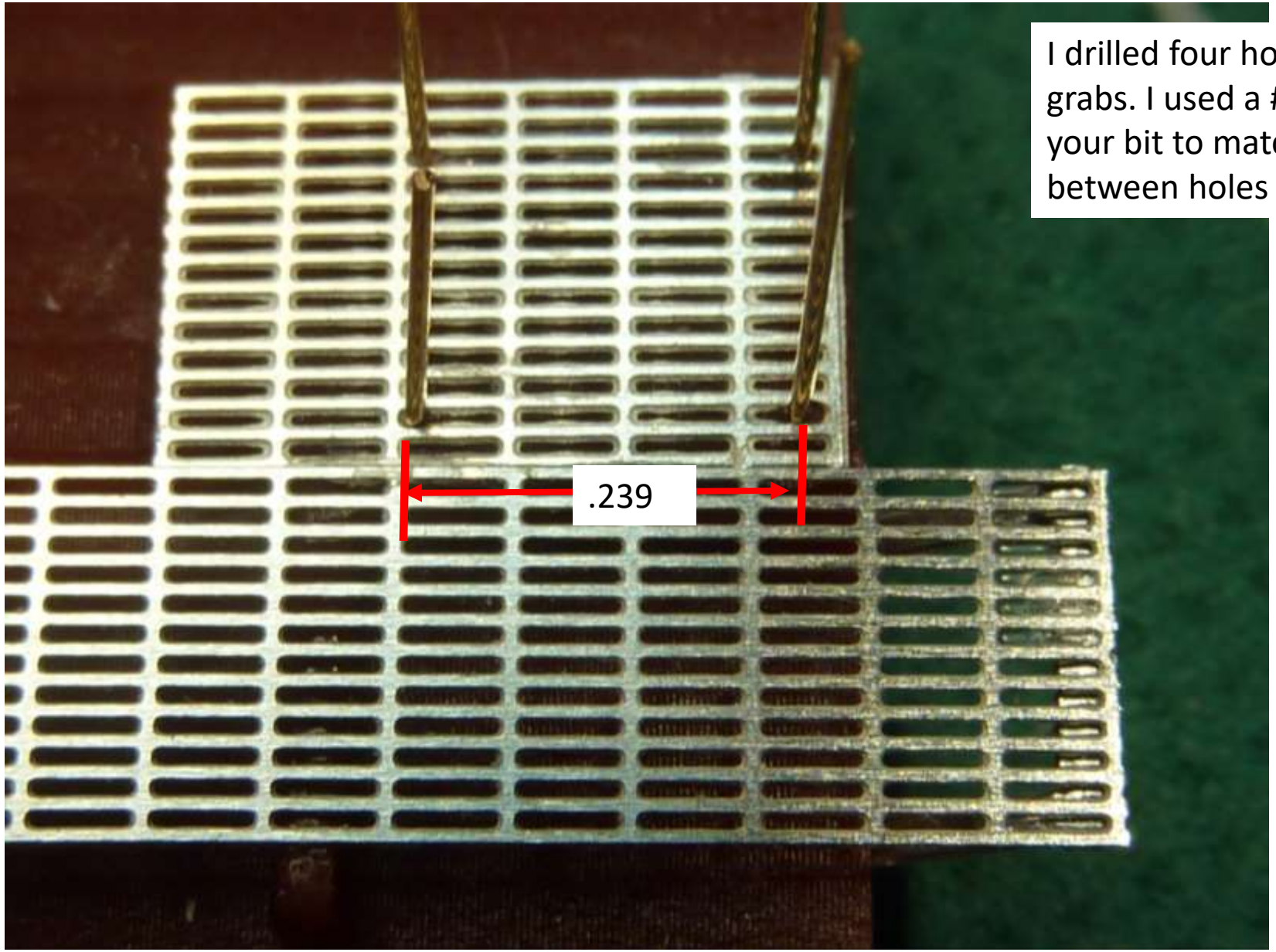
I cut my wire to 1 inch lengths for bending. Pictured below are my 4 wire grabs. Leave the ends longer for now.



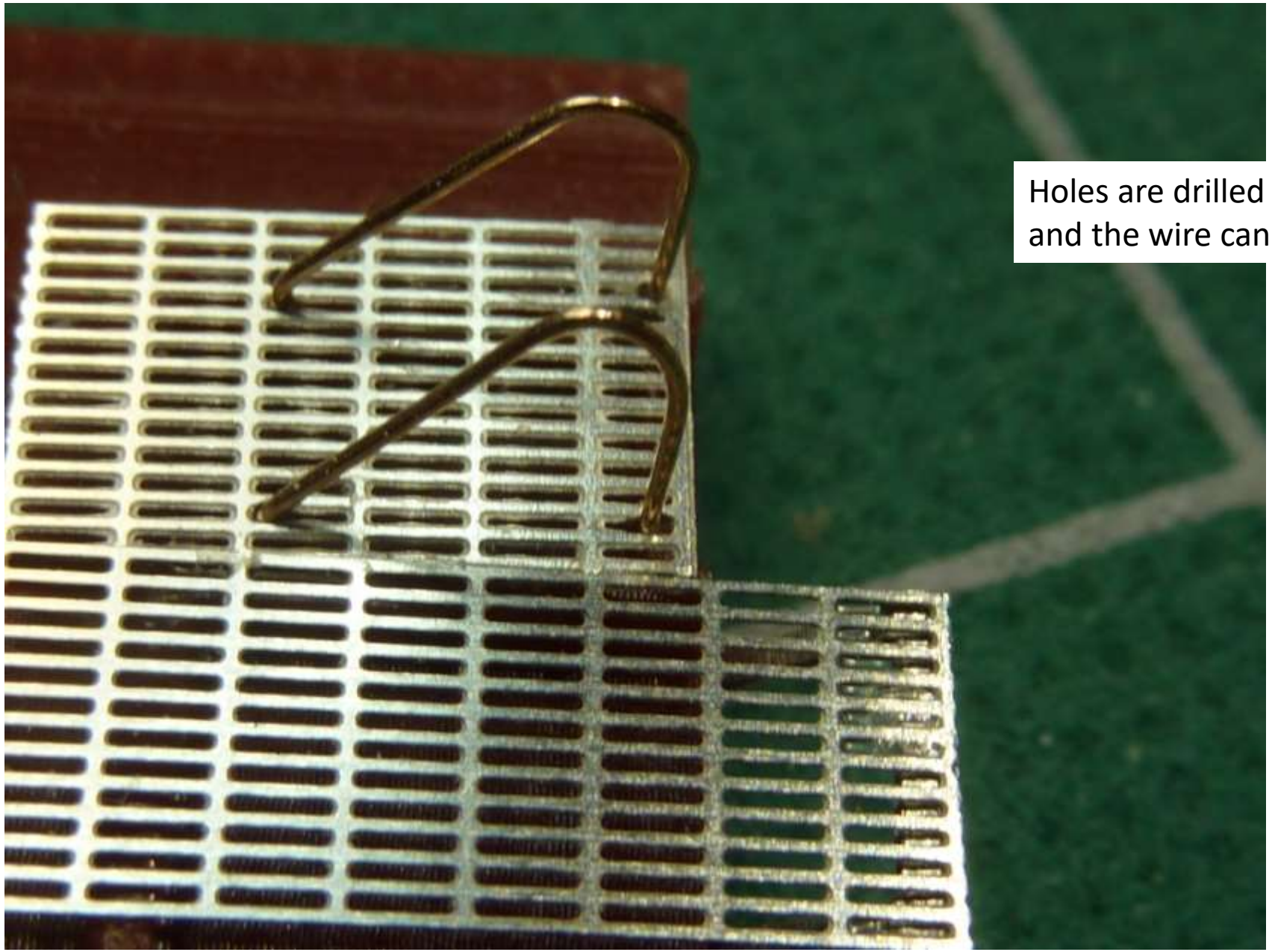
The running board supports were cut from the Photo Etch sheet and bent as shown at a shallow angle. I also used Pace Canopy Glue to secure this to the underside of the running board and roof underside

Using a smooth jaw micro clip as a clamp worked great for securing this. Let thoughly dry.





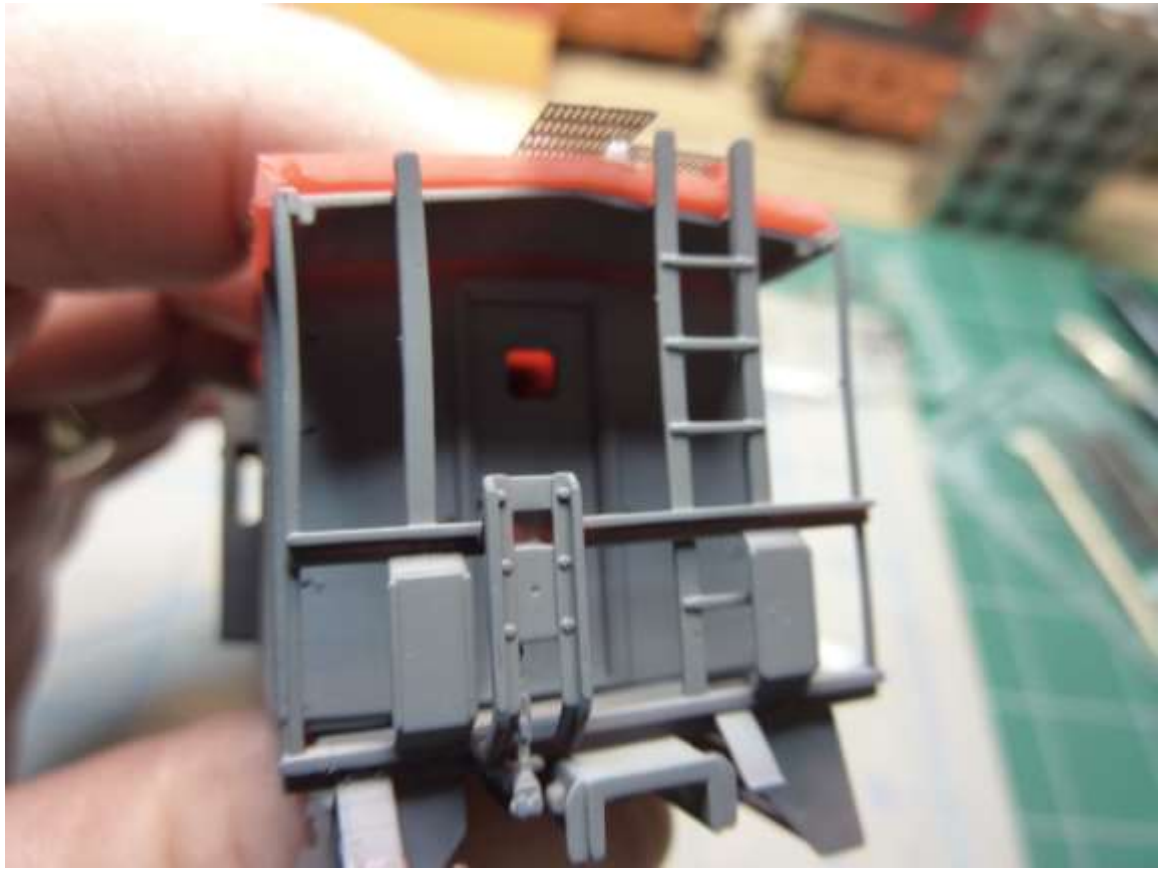
I drilled four holes at the shown locations for the grabs. I used a #79 drill bit for my .125 wire. Adjust your bit to match your wire size. The distance between holes from left to right is .239 inch

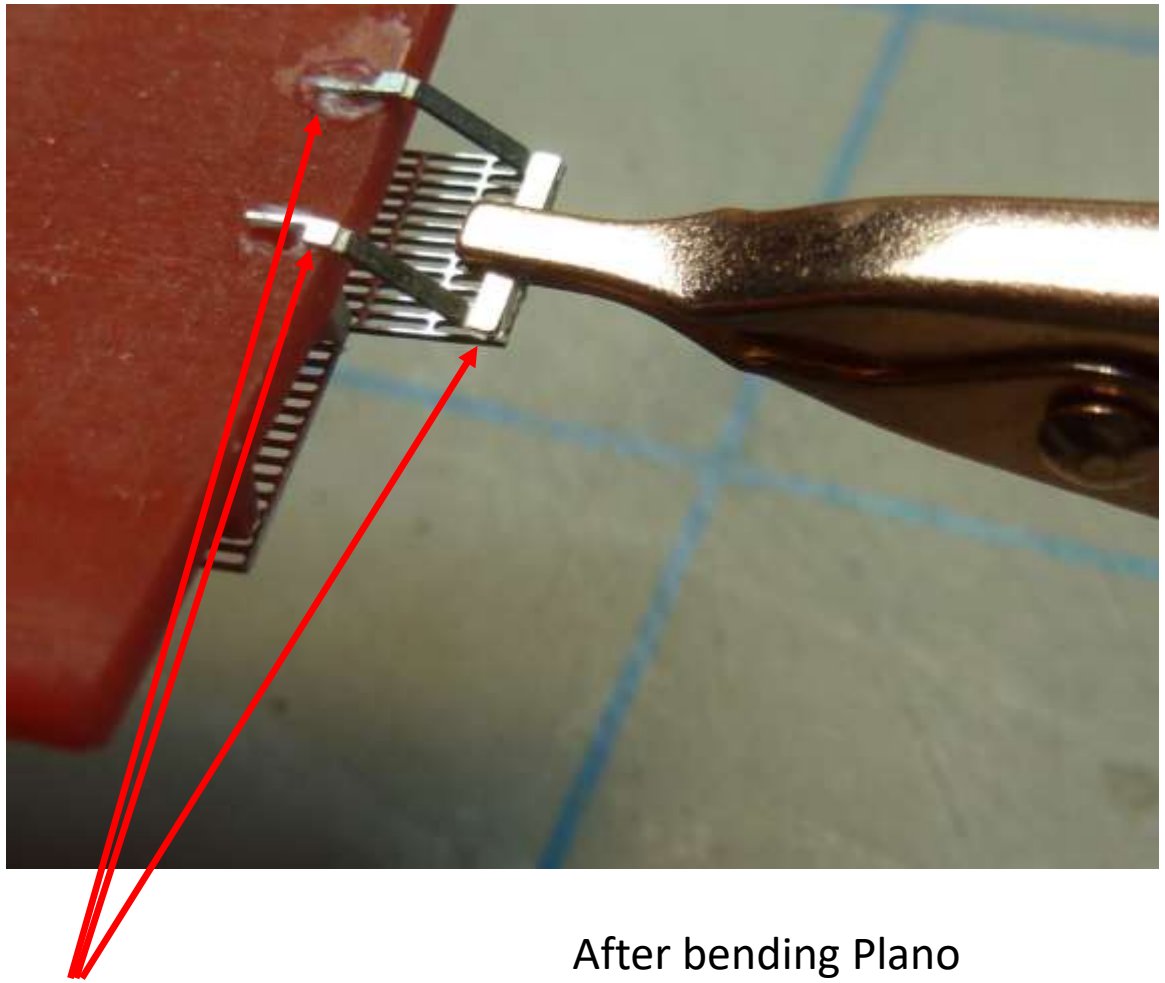


Holes are drilled all the way through the roof and the wire can be trimmed from the bottom

View of preproduction kit

End view showing overhang of running board and the lateral up to edge of roof resting against ladder





Canopy glue applied here

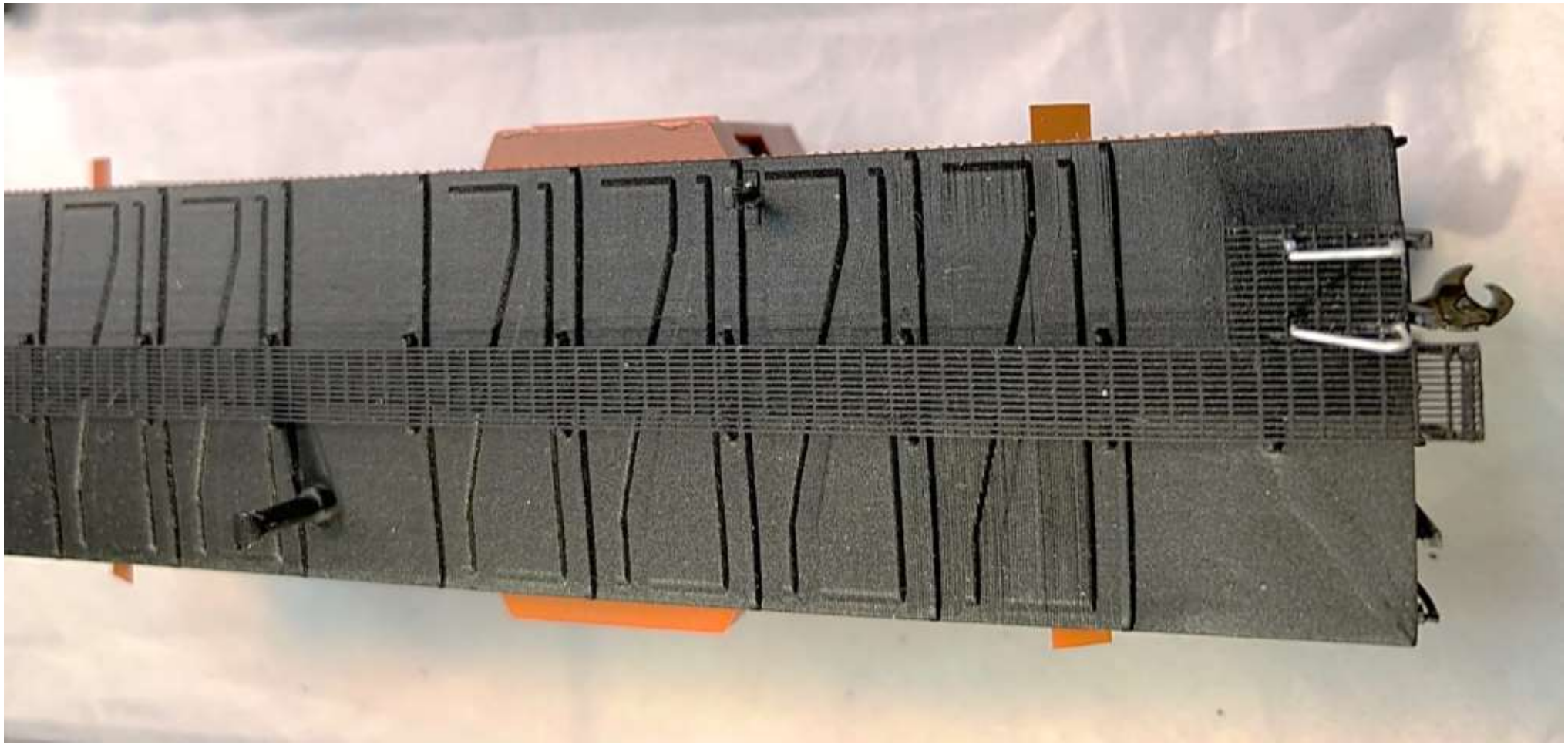
After bending Plano Running board support, I glued in place with Pacer Canopy Glue and clamped in place with a mini alligator clip that has no teeth or serrations. (old Radio Shack Part)

View of Pre Production Kit. The new roof has rivets added and locator tabs for correct orientation of roof. Note that the smooth panel with stack is on side with generator panel covers.

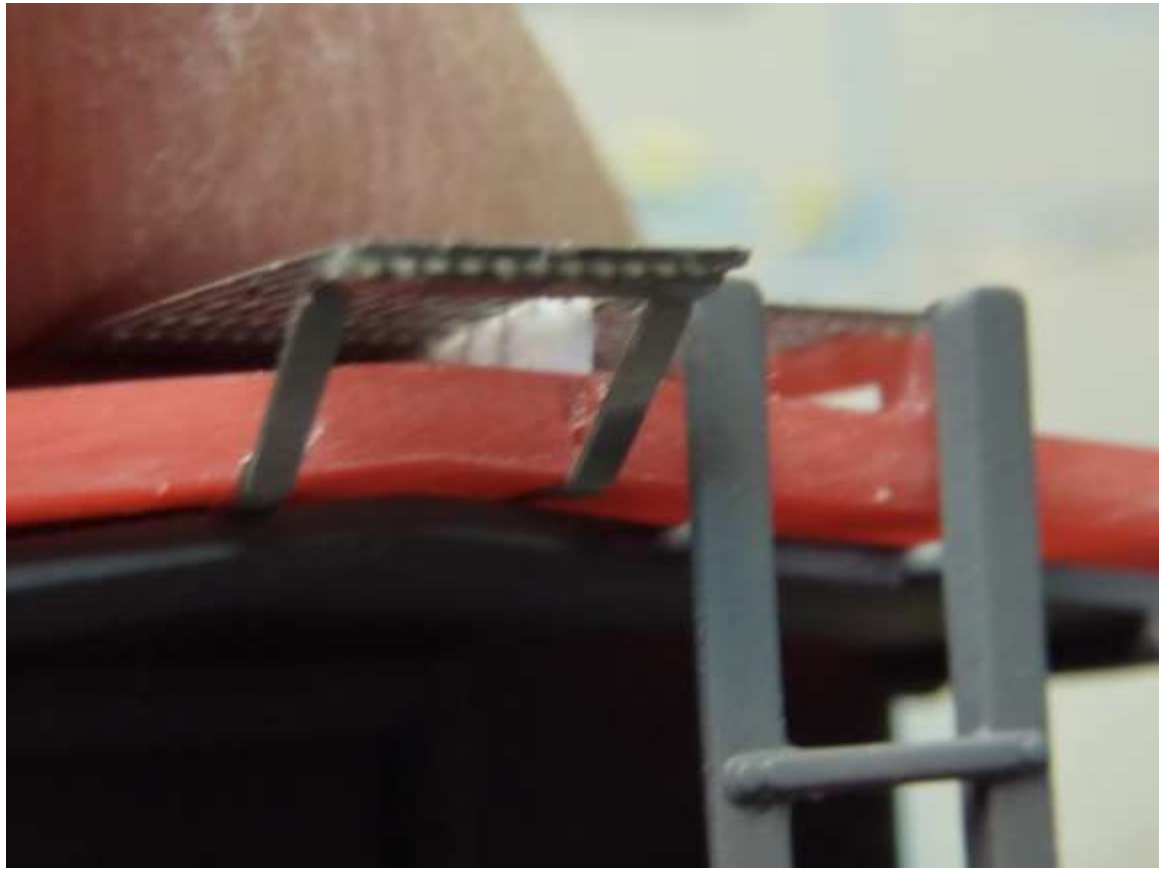
Roof Assembly

I added some .008 wire for the stack braces on the generator side. A hole was drilled near the top and one hole on either side in the roof

Forgot to take photo of roof and running boards unpainted, but this shows the Laterals and the formed grab irons and how I mounted the, A #79 holed was drilled through laterals and into roof. This allows for a very robust installation of hand rails painted white here in this photo

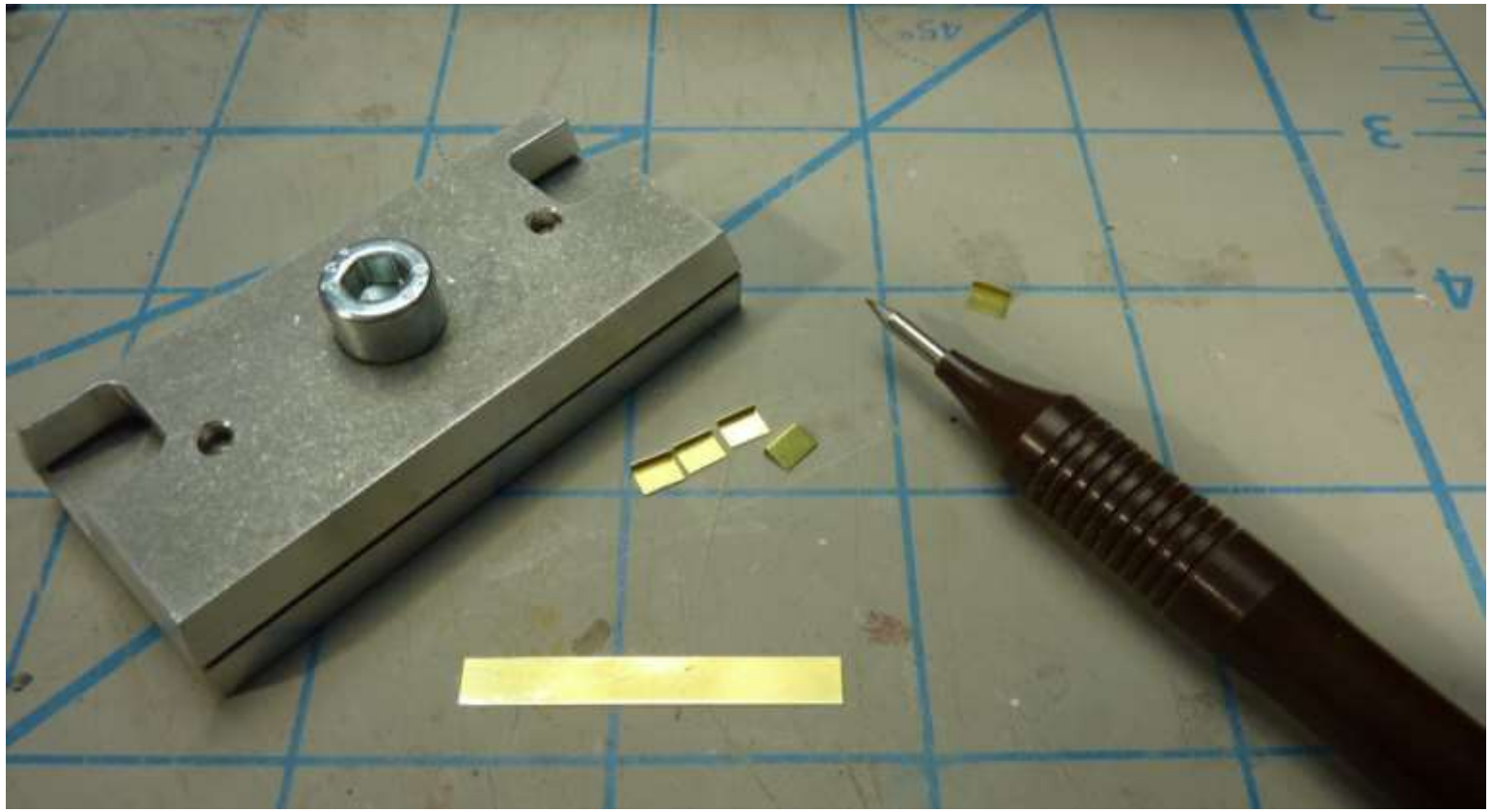


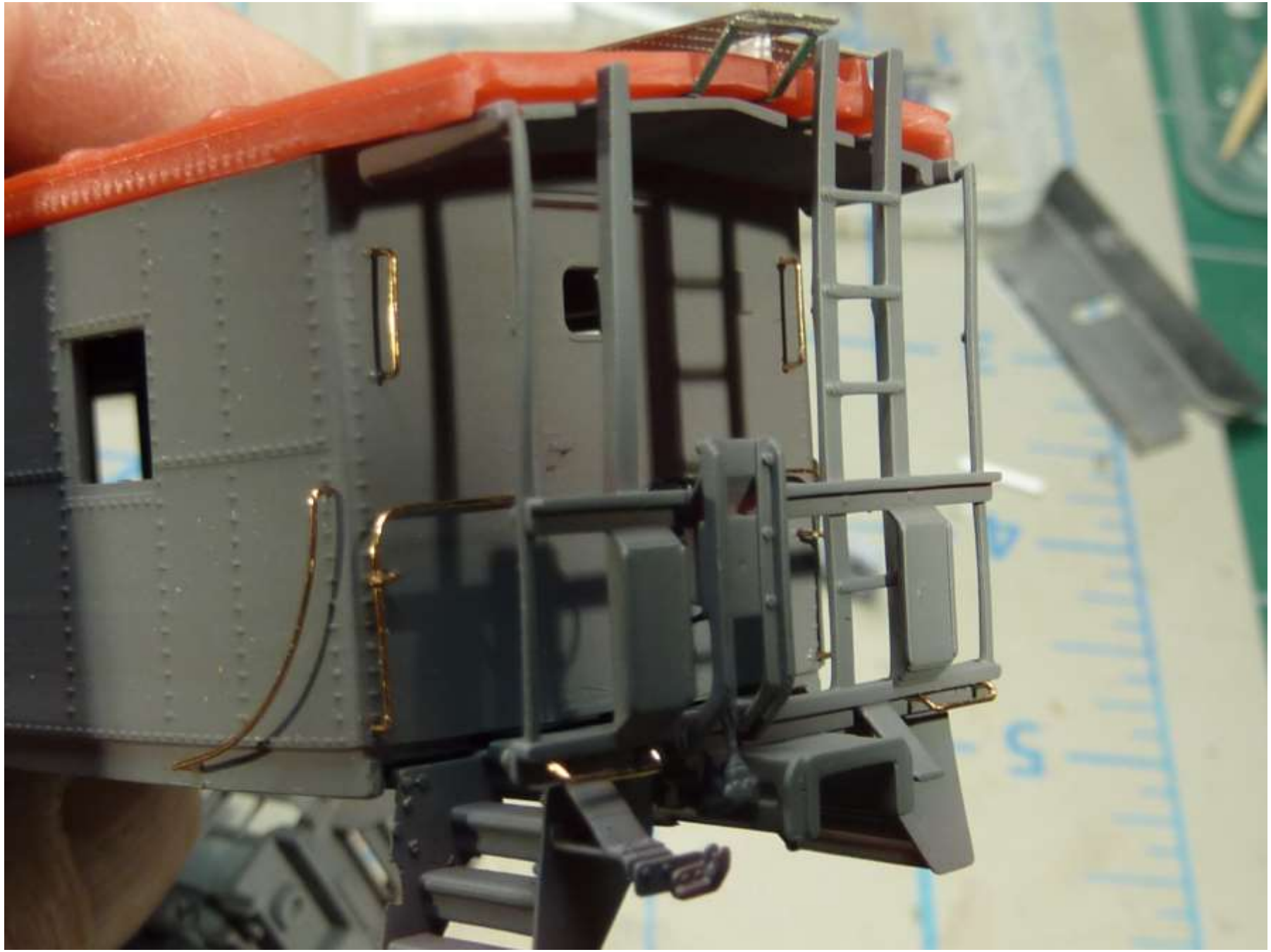
End view showing support bracket bent and glued in place



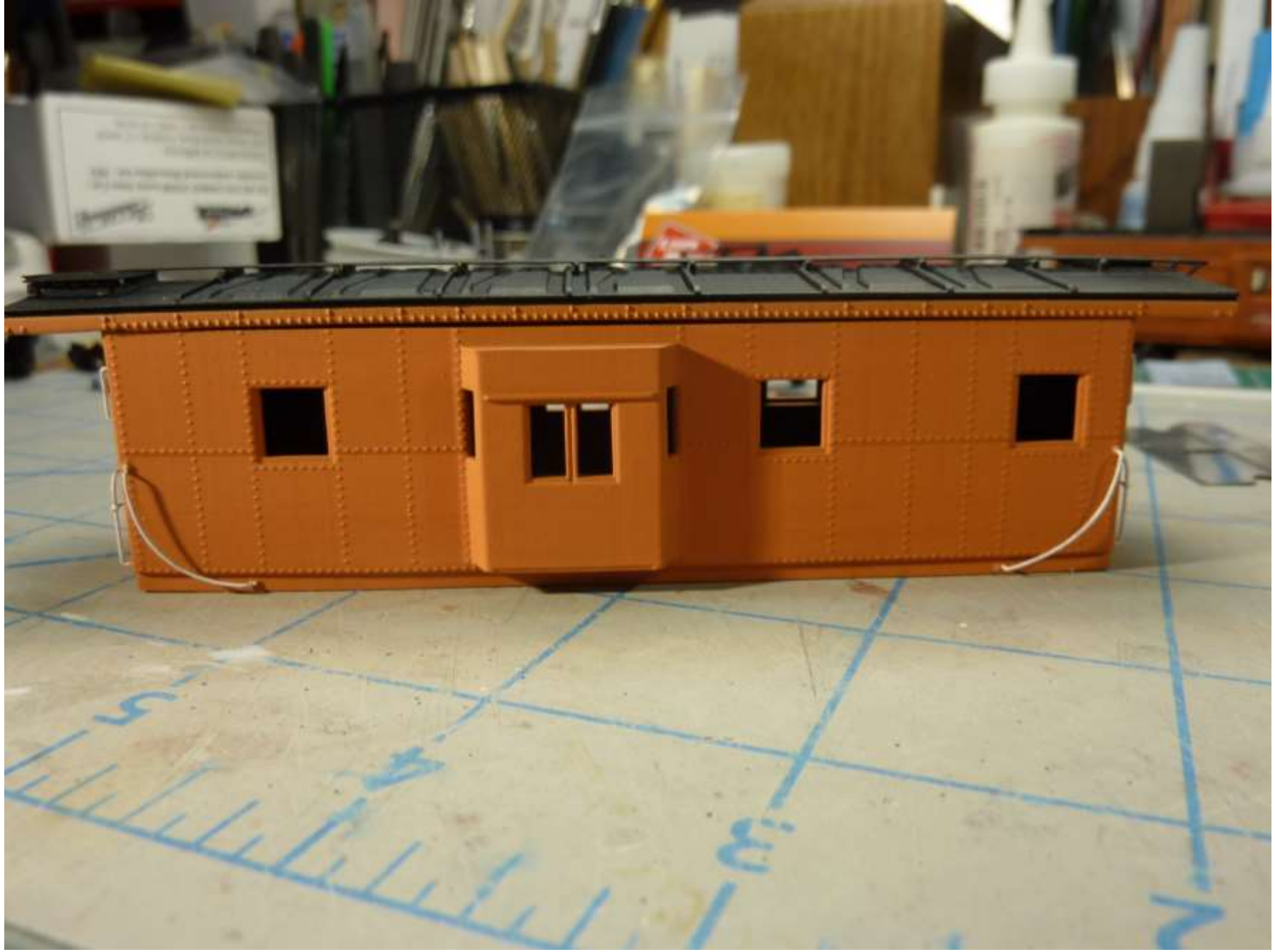
On my Preproduction model I used .125 Tichy wire to bend my handrails for the Ladder/Running Boards. I used a Walthers Ribside to take measurements from to bend my ladder tops

Making the light shields.deflectors. These are to be added to production kit. I used .005 brass and cut to .180 wide stripes and bent with a Photo Etch bender with about a .030 lip and the body about .100 After painting I attached with Canopy Glue





Following pages show the model after cleaning with soap and water and painter. Acrylic paints were user as follows
The model was primed with STYNYLREZ gray primer
Floquil Milwaukee Road Orange
Floquil Reefer White for handrails
Vallejo Model Air Black for roof and underframe and platform ends
Model Master Flat
Future Pledge Acrylic Floor Wax for gloss coat before the Decals were applied




WATCH YOUR


992195
THE MILWAUKEE ROAD

Final Thoughts

This has been an enjoyable kit to build using new SLA 3D Printed Parts.
It really did not take long at all to build as you see the small number of parts needed to construct it. I spent longer documenting and taking photos than I did to build and complete my Thrall.
Don’t let the # of steps in my construction notes stop you from building