

## Construction Notes for Brass Car side models.

### Acknowledgements:

I would like to thank Dennis Henry for his assistance in both creating these sides, and also for proofing my document. Without either, we would not have these cars as they are and discuss how to make them.

### NP Dome Sleeper (Brass Car Sides P/N 173-84)

#### Choice for car base:

I chose and bought some Walther's GN Dome Coaches for the base for this car type.

NOTE: There is a WIDE variety of these cars available. The part numbers I have here are, I would guess, are only half of the part numbers that exist for this same car body.

Walthers Part numbers that I know for sure are the same car body:

- 920-9057
- 920-9067
- 932-9091
- 920-9047
- 932-9039
- 932-9094
- 932-9092

I made this choice based on working with many different passenger car models. I did not want to scratch build a car when the GN Dome Coach and the NP Dome Sleeper have the same basic body. This is especially true when some of the detail parts are getting hard to come by.

- The underframes are nearly identical.
  - The Air Conditioning section is different than the Walther's model. The prototype used a Frigidaire AC condenser. The Walther's model used the GN specified Condenser (other manufacturer than Frigidaire).
    - Removal of the Walthers AC units can be done by wiggling and pulling them. Fill the holes, and replace the AC units with American Scale Models 9952-5.
  - Photos of before and after will be inserted here later.
- The roofs are identical except the NP roof is minus the Baker heater stack and the grab irons that the GN car had.
  - I will later cover how to work with this. One nice thing about these Walthers cars, I can come back and take the roof off later to do the roof work I want to do to make it 100% right. I have started one for a BN 555 dome coach, but haven't had time to finish it, and until I do, I won't open up four more roofs for the same process.
- The interior is different only where the heater is on the GN car. The NP car has a luggage closet where the GN had the heater.
- The ends are identical
  - No modification required.
- The sides are easy to overlay as parts, instead of the whole assembly (read easy to modify} to make the car sides work well.
  - Follow this later in this document.
- The car structures are identical. Budd did not change the car from one version to another as a rule.
  - No modification required.

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Author: Jeff Hanson

e-mail: gnwcr@yahoo.com

I measured the fluting in thickness, and found that for the Walthers cars, simply sanding down the sides to remove the relief leaves the Walthers car sides almost a perfect thickness for the 0.010" brass car sides. The photo here shows how thick the relief is on Walthers Budd cars. All of the Budd sides I have measured are within a couple of thousandths of an inch...so far.



The choice of car base became extremely no contest when I became one of the individuals who enabled Dennis to make this car side in the Walthers dimensions.

### NP Budd Diner (Brass Car Sides P/N 173-89)

I made this choice based on working with many different passenger car models. I did not want to scratch build a car. Dennis suggested the NYC Diner Grille car (Many cars Walthers sells are this same car, some of the numbers include: 932-6326, 932-6325, 932-15124, and so on), and it is very similar in nature to the NP Diner. (NOTE, if possible, pick one that is not plated, as extra steps are needed to prepare it for paint later on).

With detail parts getting hard to come by, I wanted something I could modify easily. The Walthers underbody is easy to modify, as it is glued on sub-assemblies, not a cast underbody. With the components being the same or almost the same, as the NP Diner, I decided I can move these components later when I find some time..

- The underframe is similar, but will need components moved later..
  - I will later cover how to work with this. The Walthers underbody makes a good start, but most parts need to be moved.
- The roof is Budd, but needs to be modified later to the correct NP specific roof vents.
  - I will later cover how to work with this. One nice thing about these Walthers cars, I can come back and take the roof off later to do the roof work I want to do to make it 100% right.
- The ends are identical
  - No modification required.

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e-mail: gnwcr@yaho.com

- The sides are easy to overlay as parts, instead of the whole assembly (read easy to modify) to make the car sides work well.
  - Follow this later in this document.
- The car structures are identical. Budd did not change the car from one version to another as a rule.
  - No modification required.

**Car preparation (applies to all Walthers cars)**

Once you have your Walthers car(s), you are ready to prepare the car for the Brass Car Sides. The first step is car disassembly.

I did two things in order to do this. One, researched on line how to do it. Two asked a friend who had some significant first-hand experience with it due to his job. What I found worked the best was a combination of the two.

1. Remove all screwed-on detail
  - a. two screws in each of the coupler plates
    - i. Remove the plates and the couplers
  - b. One screw in each drawbar
    - i. Remove the drawbar
  - c. One screw in each truck
    - i. Remove the truck
  - d. There are three screws down the center sill of each car. Each car has three screws, regardless of the car type. The placement is different on each car type as a "key" for re-assembly.
    - i. Remove the screws completely
2. Remove BOTH ends of the car.
  - a. No tools should be required
  - b. Gently pry at the bottom until it starts to pull out of the car
  - c. Gently pry at the top of the end to start the top side moving from the car
  - d. At this point the end should be loose, simply pull it off the car end
3. Remove the bottom of the car.
  - a. Gently pull the two metal conductors out of the end of the car they are on. At this point the bottom of the car is ready to pull out.
  - b. With your fingers, catch one end or the other of the bottom of the car bottom. Pull it up. You are pulling against double stick tape, so it may feel sticky, it is. Pull up in a rotational way (lift one side, and leave the other side down). Pull up one side, not the whole end. Once you get about half way down the car, try the other end on the same side. At this point you should have the bottom loose, and it should pull off.
  - c. Photos will be inserted here later.
4. You now have the car body, sides and roof left on the car.
5. GENTLY twist the car. Grab both ends with your hands and twist. You will hear some popping along the length of the car body, this is loosening the glue joints.

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e-mail: gnwcr@yaho.com

- Do this in a place where any loose parts are caught, as a tab or two may break (you can easily glue them back on later).
6. Repeat the twist in the other direction
  7. At this point, you may or may not have some loosening of any of the parts. I generally twist to get some disassembly of the roof. If it falls off, remove any parts that are loose (the roof). If it is partially loose, gently pull it. Pick one side, leave the other alone, as one loose side will be enough to remove the roof. Slide a soft flat tool between the roof and the interior of the car side to pop any more tabs that are still holding on. The roof needs to snap inside of the car sides, as the car sides fit inside of the roof as a part of a properly fitting assembly. Once one side is loose, rotate the roof to remove the other side.
  8. Generally, I need to disassemble manually at this point. I start at the bottom of one side, GENTLY push with a small screwdriver one of the four tabs that stick through the bottom of the car side, and with my fingers gently pull out of the car side when using the screwdriver. Once each tab pops loose, then move to the next tab. DO NOT pull too hard on this side, or you will break more tabs than needed. Remember, all tabs can be glued back on, but keeping track of which tabs go where is very beneficial.
  9. Once all four bottom tabs are loose, GENTLY pull the bottom so that all four tabs clear the tan car body, and GENTLY push one car side end down while pulling out. Do not push against the roof, push against the tan car body. The tabs on the top are flat bottomed, and the finger is on the top. Repeat this on the other end. The middle two are trickier, as there is a pin with the tab. With the roof out of the way, gently slide a small screw driver between the car side and the tan car body, as close to the pin as you can. Do not damage the pin with the screwdriver. Once the car side is free of the pin, move the tan car body up and pull the car side out. At this point, repeat for the fourth tab.
  10. Repeat 8 and 9 for the other side.
  11. At this time, glue on any tabs that are damaged but still intact, and replace any tabs that are knocked off using plastic cement, not plastic glue or CA. The CA and plastic glue are not flexible enough, and will not hold up to the stresses on these tabs.
  12. Remove all of the windows with a chisel blade knife parallel to the car side. Push the knife into glue joints on the windows, and be careful NOT to damage the glazing. A photo will be inserted here later.
  13. At this point all parts are ready for paint removal. I have found about 30 minutes with 90 percent rubbing alcohol works well. Use a toothbrush to rub the paint off after it has soaked in the rubbing alcohol. Rinse the car side off in water with the toothbrush to remove loose pieces. Repeat if necessary. At this time, the parts should be ready for the modifications necessary.

### Preparing the Brass Car Sides for the model

1. Leave the protective coating on the Brass Car Sides at this time. It will be removed later, but it is still needed for protection of the Brass at this time.
2. Shaping the Brass Car Sides. There are many possibilities, but be careful not to bend too much. You want a rolled skirt, not a skirt with square corners.
3. I used a fixture I made as shown here with plywood cut to 45 degrees next to the round bar stock. The large bar is the same diameter as the radius I am trying to

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e-mail: gnwcrr@yahoo.com

achieve. The smaller bar is the next stock size smaller as you need to “over-bend” in order to get the radius needed. Then proofing can be done on the larger bar to flatten any over bent spots. You may need to “fit” some radiuses with an un-surfaced pliers to get the ends to bend right, then proof it on the larger bar with the rubber hammer. Do not use a steel hammer as it will destroy the surface of the brass and damage the surface finish.



4. Fit this brass sides to the original plastic sides to see if the radius is what you want to match the existing skirt curve. Exact is not necessary as some variability existed in the real cars as it was done by craftsman, not machine.
5. My choice for the cutouts on the ends for ladders was to cut off the rung in the brass car side. I will replace this with a plastic two rung ladder (Detail Associates 6608, or the double rung ladder from Detail Associates 6421 (the ladder is the same ladder)) that looks like the real ladder in the final assembly. I used a tin snips, and cleaned the sprue with a file. The end result will be shown here in a picture later.



### Preparing the Plastic Car sides for brass car sides

1. At this point, find the grabs you intend to copy to the brass car sides from the plastic sides. Drill them out as you would a standard Walthers car.
2. The plastic car sides can be sanded down with 220 to 400 grit sandpaper until they are flat. Put the sandpaper on the table, and sand the plastic sides face down on it, making sure to move your fingers every time the relief is gone where your fingers are. You want a smooth surface in the end. Some small lines will still be there on the bottom skirting area, and the vestibule door relief should still be visible, as they are below the 0.010" of the rest of the car sides. All ribs should be sanded down, and all relief. Do NOT forget to do some sanding below the flat sides, and into the curves below the car sides. Do not remove the end hoops on the vestibule end of the dome sides, but sand using about 220 grit sand paper around these ladders. In most other cars, all ladders or stirrups can, and should be, removed. These ladders or stirrups would be replaced later with other ladders.
3. Once the sides are sanded flat, then remove the un-needed skirts. On the Walthers cars, keep the very ends of the skirts. These ends are needed to make the ends look correct on Walthers cars.
4. Next, cut open the window openings enough that a glazing can be put in from the back side later after all painting and decaling is complete.
5. Test the brass sides on the plastic sides to make sure that all parts fit and look correctly.
6. Do preliminary drilling of the brass sides for grabs at this time using the holes left from earlier. Also drill out any additional grabs at this time. It keeps your paint job cleaner later.
7. An image of the pieces for both the diner and sleeper dome are here.



### **Attachment of the plastic sides to the Brass Car Sides**

1. Once all of the work is done on the plastic sides, but after any handling except for attaching the Brass Car Sides to them is complete, I washed the plastic car sides with dish soap and water (with a toothbrush), and then rinsed the sides with warm water. I then made sure these sides had enough time to dry before any further work was done on them. Dry, to me, meant no water visible anywhere.
2. I next took the Brass Car Sides, and stripped them with lacquer thinner. It took only a couple of minutes, and I used a tooth bush to ensure the coating was entirely off of the Brass Car Sides.

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e-mail: gnwcr@yahoo.com

3. I rinsed off the Brass Car Sides with water, and blotted them dry with a clean rag, and then let them air dry.
4. As soon as they were dry, in my case it was only 10 minutes later, they were ready for assembly.
5. Adhesive. My choice for adhesive of the brass to the plastic was Walther's Goo. Due to the dissimilar materials and thermal shock associated with the two, I wanted something that was flexible with temperatures changes. CA (Super Glue) is definitely out for this reason, the sides would pop off after the first temperature change. I understand Goo dries out after a number of years, but my experience is that this is minimal, and have some plastic-to-brass bonding on modular layout structures that are holding up after 20 years with this bonding agent.
6. Method:
  - a. I took the Walther's Goo and spread it all around the plastic surfaces with my fingers, leaving enough thickness to do the job. I left a small gap around the outside edge to give the Goo space to compress into so it would decrease the ooze out. I let it set a minute or so, then set the brass car side on a small piece of 1/2" plywood (a little taller than the car side, but about 3/4" shorter), then put the plastic on the brass. I next picked up the assembly, and moved the pieces so they lined up correctly, then set them down again. I put a piece of 1/2 inch plywood narrower than the tabs on the back side of the car side, but large enough to hit most of the plastic exposed on the top. This piece is longer than the car side. I then clamped the middle gently with two "c" clamps about 1/4 of the way from the each end of the car side. I did final placement adjustments for alignment, and then I clamped the ends with small bar clamps from the brass car side to the small plywood across the back of the car side. I then tightened the middle clamps some more.
  - b. I then ran my fingers down the back of the car sides to press the plastic and brass car sides to each other. I did this to make sure the Goo "runs" out to leave the Goo layer an even and thin layer. I also did this to ensure I left no visible gap between the brass and plastic sides. A couple of passes across each surface area and most areas had the amount of movement reduce to near zero. Those spots that it was still moving, I kept pressing across this area for a couple of more minutes, until the movement was minimized.
  - c. After about 10 to 15 minutes, the car sides were roughly bonded together and the clamps were removed from the middle, leaving the large piece of plywood free to remove.
  - d. At this point I took my fingers and removed the "overflow" of goo around all surfaces. If necessary use a flat smooth small screwdriver blade to get into crevices, or for those more skilled people, a chisel blade (#17) without cutting any of the plastic or brass. At this point, the Goo is very flexible and easy to remove this way. If I had left the Goo to dry too long, it would have become difficult to remove from the surfaces because of being too dry and hard.

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e-mail: gnwcr@yahoo.com

- e. Once I finished removing any excess Goo, I removed the end clamps and second piece of plywood.
  - f. I checked the brass side under where the clamp was, and checked the brass side where holes for grab irons were, and cleaned out any Goo that had flowed into these areas..
  - g. I then laid the car side, brass side down, on a flat surface to dry, and repeated step d around the window openings on the inside of the car.
  - h. I then re-drilled the grab iron holes.
  - i. I let this dry (overnight).
7. DON'T FORTGET TO INSTALL THE VENT HOOD on your dome at this time. I used a 0.040" by 0.060" styrene piece rounded to match the prototype, and this was fastened by CA, not Goo, as it is a small enough part that the CA forms a better bond than the Goo. If you are afraid of not getting a good bond, drill two holes behind the vent hood, and these will also give a mechanical bond for your hood.
8. Pre-painted assembly photos are below:





### Painting and Preparation

At this point, the sides, ends, and roof are ready for paint. This should only be a day or two after the assembly of the Brass Car Sides to the plastic sides, or you may find some surface oxidation of the Brass you cleaned off in the previous step.

The underframe can also be prepared for paint when it is ready. As it is black, it can also be done at a different time if it is desired.

Prepare all of the plastic pieces with soap (dish soap, scrub with a toothbrush) and water rinse, let them dry sufficiently.

The brass car sides, and if the care that is being prepared is a plated car, requires more preparation steps as described here. Wash all of the parts with the soap and water wash, but submerge them in a white vinegar etch. I left them for 4 to 5 hours. Don't let them sit too long, or the brass will etch too much. Once this is done (Do not skip the toothbrush step), rinse the car sides off with water. Remove excess standing water, being careful not to leave lint, or touch the surfaces (a low pressure air blowing the sides works well if it is clean (compressed air may have oil, which may cause problems with paint adhesion if it is not removed). Make sure these parts dry completely.

Prime the car sides for sure, and depending on your preferences, the other parts as well. The brass sides may require a different primer from the other parts, I used a sandable automotive primer with small grain (Rust-oleum Light Grey Automotive Primer 2081)...not all primers are created equal. Make SURE that all brass surfaces have been hit by primer to protect the exposed brass.

Let all sides dry completely.

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e-mail: gnwcrr@yahoo.com

Re-drill the grab holes in the sides.

For NP, paint the light green first. I used a special mix of Tru-Color light and dark green to match the NPRHS drift cards. I found stock colors were nowhere near the drift cards. For the Dark Green for the Lowey Scheme, I used one bottle of Tru-Color TCP-057 NP Dark Green, added 1.5 ml of Tru-Color TCP-005 White and 1.5 ml of Tru-Color TCP-010 Black.

For the Light Green for the Lowey Scheme, I used 5 ml of Tru-Color BN Cascade Green TCP-067, 12.5 ml of Tru-Color C&NW Early Yellow TCP-353, 2 ml of Tru-Color Black TCP-010, and 3.5ml of Tru-Color White TCP-005.

I mixed them well, and thinned them about 50 percent to air brush the colors.

Once the light green is dry, usually a day later, paint the dark green. NP is nice as there is only one mask line, and it is right down the Budd-provided stiffener in the middle of the car, where the white stripe is. All of the other parts are complete with a single color of paint.

On all of the parts above, don't forget to paint the sides and ends of the parts, especially the car sides since you can see them when the car is completed.

Interior paint colors. If desired (and necessary in the vestibules), now would be the time to paint the interior the color you want. Either way, paint the inside to help protect the brass. The paint color I used was Tru-Color TCP-227 Passenger Car Interior Light Tan for the walls and vestibules.

Seats are mostly chocolate brown. Sleeper Domes had Medium blue seats in the dome, and Coach Domes had Turquoise colored seats in the dome according to NP documentation. Lounge in the sky had white tables (no table cloths) and black seats according to photos I have found. I have not yet painted the dome section interiors.

Painted car sides are shown here:



### Decaling

I used Microscale 87-208 Northern Pacific Lowey scheme decals for my cars.

A word to the wise, the Diner has a couple of the cars not painted to “stock” lettering methods in painting diagrams, one was the one I chose to do. They appear to be mistakes, as I see no second car for the differences I found. Use your photos to find out what is right for the car you are doing in the timeframe you are doing it.

I also found out that the Observation cars are not done according to the painting diagram. Again, there are multiple variations in paint depending on the car, and lettering differences are also in each car.

The pinstriping can use the Budd horizontal rib for your guide, and a straight edge to finish it. Unfortunately, if you make a mistake with the pin striping, you need to buy a new set, as I have yet to find a 2.5” stripe to match the one that comes with the decal kit. Be sure to wrap the stripe around the ends and windows of the car.

### Finish Coat

I used Tru Color Gloss TCP-018 for the car sides to give the cars the polished look that they had and protect the decals. This gloss has gotten some attention on the cars as I have shown them, as it brings the colors out as well. I was surprised by how much until I did my first car.

### Windows

I used sheet 0.015 styrene with a tint on it. I wanted something thick enough it wouldn't flex by bumping it easily, and wouldn't look wavy. My tint is Tamiya transparent Green equally mixed with transparent Blue, mixed with about 3X that amount of thinner. I airbrushed this on the sheet styrene. Too much gives too dark a tone, too little gives a dry look and not a dark enough tone. The end result is something between Walther's

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e-mail: gnwcr@yahoo.com

factory tint and Broadway Limited's factory tint. It is a little finicky, but the results are worth it. I cut the sheet into the proper sizes for my windows, and glued them in with Microscale Krystal Clear, making sure they were pressed tight to the car body. A method to keep them tight to the car body is to put a spacer on top of the windows being set, and put some weight on them. It doesn't take a lot of weight, but in some cases this is a benefit.

### Final Assembly

Paint the furniture the colors the car had in real life. You can see it from the outside.... Final assembly is reverse of initial assembly, minus two things. Put the sides on first, and once you have the bottom on the car body, snap the top outside ends in. Then push the two middle body assembly points out and down to engage the pins with the hooks.

A photo will be inserted here later showing this

### Couplers

The coupler used on these cars was an AAR Type H coupler.

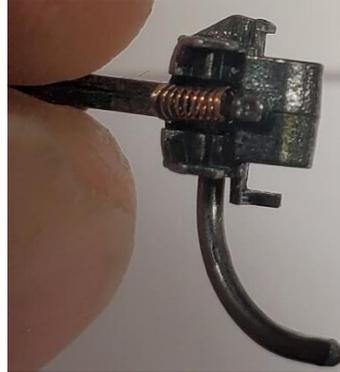
The photo below is blown up from NP 309 in St. Paul, MN in 1966. The photo is a Jerry LaBoda Photo. It shows the prototype of the coupler we are trying to match.



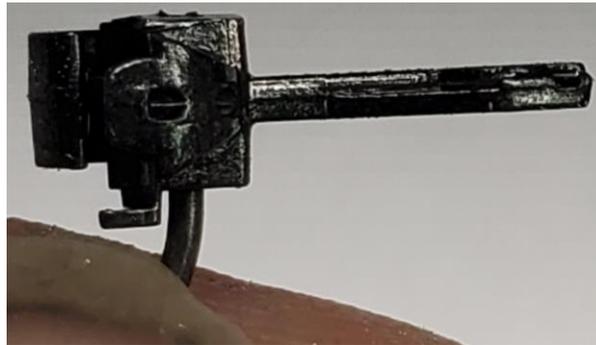
Now, for the sake of operation, I am going to show a type F coupler due to the fact that it locks making better operation in real live operation. Many of the locos had type F couplers (which have the bottom shelf in addition to the look of the type H coupler), most of the passenger cars had type H couplers (which have neither the top or bottom shelf, but use the geometry of the coupler to lock the train together).

The Kadee #118 coupler can be used to make this coupler.

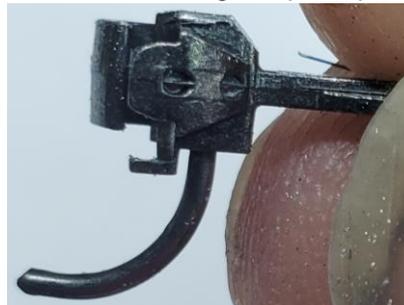
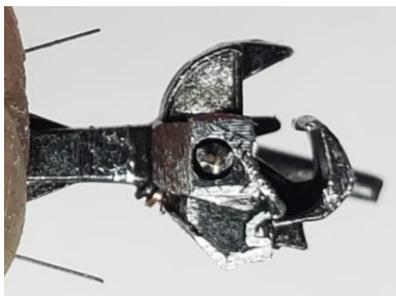
1. Find 2 Kadee 118 Scale SF Shelf type couplers for each car. The images here show the coupler before modification.



2. File the top down flat until you start filing the relief on the top of the coupler, then stop. At this point, we have an AAR Type F coupler for Intermodal cars and locomotives.



3. The next step is not due to prototype reality, rather for keeping the passenger car coupler swing moving smoothly. On all passenger cars and some locos the top back of the coupler in this current form would interfere with car or locomotive details. To address this on all passenger cars, and those locomotives where the coupler movement is hindered at this step, file the back of the coupler at a 45 degree angle with the top, up to, but not including the pivot pin.



4. Paint the spring and the top of the coupler black, and use this instead of the stock Walthers couplers. Not only are they good looking couplers for your good looking car, but also correct prototype for the model you have, and I have also found they significantly enhance their operation.

### Short-Term Finished product:

#### NP Budd Dome Sleeper #309



#### NP Budd Slab Side Diner #458 (CB&Q sub lettered)





**In the train:**

