The Keystone Modeler

Pennsylvania Railroad Technical & Historical Society

No. 112 Spring 2020

Inside:

The Keystone Modeler
Pennsylvania Railroad Technical & Historical Society

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FRONT COVER

(Top) Jack Consoli's G31A gondola in HO scale. *(Jack Consoli photo)*

(Middle) Jack Consoli's G1D gondola kitbash in HO. *(Jack Consoli photo)*

(Bottom) Jack's X26C boxcar from a Funaro & Camerlengo kit. *(Jack Consoli photo)*

The Keystone Modeler

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Cancelling the 2020 Annual Meeting was the correct call, I believe, given the pandemic and the fact that we have a lot of members who are in the high-risk categories. It is something I cannot recall happening, however, since I joined the Society in the mid-70s. Of course, we are not alone in cancelling an event. Other organizations have done it as well. As the Bard once wrote, "The time is out of joint," and we are all living with our normal lives and schedules disrupted.

The *TKM* staff hopes that by putting out this edition of our modeling magazine, some semblance of normalcy and some pleasure can be given to our readers. We have two articles, one by Jack Consoli and one by Elden Gatwood and Jack Consoli, plus some further discussion of the BLI GG1.

Jim Hunter, Editor

Pennsylvania Railroad Technical & Historical Society

The purpose of the Pennsylvania Railroad Technical & Historical Society is to bring together persons interested in the history and modeling of the Pennsylvania Railroad, its subsidiaries and its acquired companies. Our goals are to promote the preservation and recording of all information regarding the organization, operation, facilities, and equipment of the PRR.

The Society's quarterly illustrated journal, *The Keystone*, has been published continuously since 1968. Each issue of 64 or more pages contains illustrated original authoritative articles about locomotives, cars, other equipment, facilities, and operating practices of the PRR. The Society also publishes its own thoroughly researched books and other materials concerning PRR history. *The Keystone Modeler* is also a quarterly special 30-plus page online publication of the Society.

The Society meets annually, usually during a weekend in early May, providing an opportunity for its members to get together and learn more about the PRR. Local chapters around the country also provide members and guests with regular meetings that feature PRR related programs.

Information about our Society may be found on our website – www.prrths.com. To join the Society, send $40.00 to:

PRRT&HS
PO Box 54
Bryn Mawr, PA 19010-0054

All memberships are for a calendar year, back issues of The Keystone for the current year are sent upon joining. Overseas membership has added postage fees.

PRRT&HS Interchange

Selected Society Merchandise of Interest to Modelers

PRR Equipment Drawings on Microfilm

Copies of PRR equipment drawings are available from the Society's microfilm collection. To order drawings, you must know the drawing number and title. Ordering information and lists of arrangement drawings are available on the Society's website. Go to www.prrths.com, select National Society, and then The Interchange. If you require a printed copy of this information, please send your address and a check for $2.00 made out to PRRT&HS to:

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The Keystone Modeler
NEWSWIRE
With Steve Hoxie

PRR Product News

ATLAS MODEL RAILROAD CO.
https://shop.atlasrr.com/
PRR G30 War Emergency Gondola—O Scale

Atlas has canceled the G30 gon listed in the last issue.

BROADWAY LIMITED IMPORTS
http://www.broadway-limited.com/
PRR EF-15 and EF-15a A and B (F3 and F7, A and B) Diesel Freight Locomotives—HO Scale

(BLI PRR F3 illustration)

BLI is expecting to be able to deliver their F3 and F7 models in May of this year. Both will include A and B units.

PRR Streamlined K4s Steam Locomotive—HO Scale

(BLI 3768 Illustration)

BLI expects the much-anticipated model of the 1936 version of the streamlined K4s this spring. There will be several paint schemes including bronze and DGLE. Power will be through the company's Paragon3 sound DC/DCC decoder.

EXACTRAIL
https://exactrail.com/
PRR H47A Covered Hopper—HO Scale

(ExactRail photo)

We mentioned this car when it was first introduced. Now for their special during the month of April, **Exactrail** is offering it at a discounted price. See the website for details.

Upcoming Events

April 30-May 2, 2020 Marion, Ohio **POSTPONED**
Central Ohio Railroad Prototype Modelers Meet
Contact dblake7@columbus.rr.com for more details

May 13-16, 2020 State College, Pennsylvania **CANCELED**
PRRT&HS Annual Meeting
http://www.prrths.com/conventions/PRR_Annual.html

May 29-30, 2020 Farmington, Connecticut **CANCELED**
New England/Northeast Railroad Prototype Modelers Meet
http://nerpm.org/index.html

June 20, 2020 Richmond, California
BAPM 2020 – The San Francisco Bay Area Prototype Modelers Meet
http://www.bayareaprototypemodelers.org/

July 12-18, 2020 St. Louis, Missouri **CANCELED**
NMRA National Convention and National Train Show
http://www.gateway2020.org/

July 31-August 1, 2020
St. Louis Railroad Prototype Modelers Meet
http://www.icgdecals.com/stlrpm/

Advance Planning

September 10-13, 2020 Baltimore, Maryland
Mid-Atlantic Railroad Prototype Modelers Meet
https://www.marpm.org/

September 25-26, 2020 Winston Salem, North Carolina
RPM Carolinas School of Railroad Modeling Techniques
https://sissonstony.wixsite.com/rpm-carolina

September 26, 2020 Milwaukee, Wisconsin
Wise Division Railroad Prototype Modelers Meet
https://www.wisedivision.org/events/upcoming-meets-and-events

October 10, 2020 Portland, Oregon
Bridgetown Railroad Prototype Modelers Meet
https://www.brpmm.com/

October 30-31, 2020 Naperville, Illinois
Chicagoland Railroad Prototype Modelers Conference
http://www.rpmconference.com/

What I'm Working On

By Tim Garner

The top level of my HO layout is focused on Pennsylvania Station in Baltimore. With more time at home lately, I've started to work on the Union Tunnels – the twin bores to the east of the station complex. **Figure 1** shows the unpainted eastern portals with a F. A. Wrabel photo of the area. I had to compress the distance between the portals due to track spacing requirements. The layout is 12" deep at the portals. I'll be scratchbuilding the complex structure just outside the portals that feeds the four 132kv transmission lines from the poles into conduits through the 1934 tunnel. **Figure 2** shows the portals in position with the trackage and unfinished wing walls. **Figure 3** shows wood blocks behind the portals. They will support the lighted tunnel walls, the catenary, and the removable tunnel roof. A Baltimore rowhouse neighborhood will be on the tunnel roof.

BLI GG1 Model Review Revisited

By Tim Garner – photos by the author unless noted

BLI's models of GG1 #4856 and 4857 have aluminum-painted window frames as the six GG1's painted in 1952 were given as shown in Lettering Arrangement B-450479. It isn't totally clear whether the four painted in 1953 – 4856, 4857, 4876, and 4929 had that treatment. *(PRR Drawing, Nick Seman collection)*

In the last issue of *TKM*, I said in my review of BLI's fine collection of new GG1 locomotives that I could find no evidence that any Tuscan G's received silver around the cab windows and that the handrails and steps above the chassis should be painted the same color as the carbody instead of black.

Reader Nick Seman took issue with my comments and sent evidence to back it up. He included a clip of PRR lettering arrangement B-450479 indicating the cab side window frames were to be painted aluminum on the Tuscan 5-stripe scheme. He also included photos that showed Tuscan G's with aluminum-painted window frames and black handrails.

I had included with my review a 1953 David Sweetland color photo of GG1 4876, fresh from rebuilding after the *Federal Express* wreck in Washington, D.C. that year (also on next page) on which I primarily based my comments. It had just received the Tuscan scheme, but clearly had Tuscan cab-side steps and did not have aluminum-painted window frames.

Based on Nick's email, I did some further research and found information and images that cleared up some issues and muddled others.

In 1952 between January and March, PRR painted GG1 4908, 4909, 4910, 4911, 4912, and 4913 (all drop-coupler units) in Tuscan red with Dulux stripes and lettering for service on the new Budd *Congressional* and *Senator* trains. As Nick pointed out, these six received silver-painted cab-side window frames along with Tuscan paint as in the specification. Between color photos Nick shared and ones I since discovered, the aluminum color remained on some and was repainted Tuscan on others before all were eventually repainted into the dark green March 1955 broad stripe scheme. Nick had one photo of 4912 where the window frame was repainted Tuscan. Published photos by Charles Ballard in 1955 at South Amboy and John Dziobko in 1957 at Newark, N.J. also show the window frames of 4911 repainted Tuscan. Conversely, a shot in Martin Zak's collection shows a very dirty 4908 in Sunnyside in November 1961 still with the Tuscan 5-stripe scheme and aluminum-painted window frames.

Of the four G's painted Tuscan in 1953, I've found only two color photos and both are of 4876 – one in Altoona in 1953 when just painted and the other in Baltimore in January 1954. Both have Tuscan window frames. I have been unable to locate color photographs of 4856 and 4857 (the only flat-pilot G's painted Tuscan) and 4929. If someone has color images of these three G's, especially from 1953, I would love to see them. Without such images, it is not clear whether 4856 and 4857 – the G's BLI issued – and 4929 had aluminum-painted cab window frames. I recently asked BLI if they have photos that show 4856 and/or 4857 with aluminum-painted frames. They were checking at press time.

Nick also reported that PRR Locomotive Painting Specifications call for all handrails and steps to be painted black. Upon closer inspection of GG1 photos, I agree. Not having the specifications to refer to, I relied on dozens of color images of red and green G's. Road dirt typically hides color contrast between handrails and carbody. When clean, the dark green is far closer to black. The contrast between the carbody and the railings on models is far greater because model manufacturers typically render dark green locomotive enamel too light and too green.

Reader Robert Hess shed light on when MU hoses were added below GG1 nose doors. He shared PRR photos E.20754, -5, and -6 from the Hagley Museum. One image of the nose hoses of #4817 and two of 4828, both on the Enola ready track, are dated February 1, 1955. The have captions that suggest this was shortly after the first installation. The broad stripe scheme became standard the following month.

1. GG1 #4912 in Ivy City Yard in Washington, D.C. with aluminum-painted cab window frames. *(Don Ball collection)*
2. Publicity photo of GG1 on inaugural Afternoon Congressional. G has aluminum-painted window frame. *(Nick Seman collection)*
3. GG1 #4911 had aluminum-painted window frames when painted Tuscan in early 1952, but they are painted Tuscan by June 13, 1957. *(John Dziobko Jr. photo)*
4. GG1 #4876 as it left the shop in Altoona after rebuilding in 1953. It was dark green at the time of the wreck. Note window frames and cab-side steps are Tuscan. *(David Sweetland photo)*
5. GG1 #4876 still looks the same on a train in Baltimore's Pennsylvania Station on January 2, 1954. *(John Dziobko, Jr. photo)*

Modeling the Pennsylvania Railroad's Gondola Fleet
Part 19 – Update: G31A, G31B, G31D and G35 Classes

by Jack Consoli

All photos by the author unless otherwise indicated

Models of as-built class G31A, G35, G31B, and G31D.

With the release of the Tangent Scale Models' HO PRR G31B a few years ago, several other PRR gondola classes and subclasses that were previously somewhat-involved kit conversion projects have become relatively simple kitbashing projects. I had put off doing some of these variations, hoping Tangent would produce some of them, but since that hasn't happened, it's kitbash time. Since this injection molded plastic kit is so well executed, these kitbashes only require changing what is different between the car classes without the added burden of having to fix other parts of the model done badly, incorrectly, or omitted entirely (well, except maybe a couple small ones).

Methods of producing the PRR G35 (1900 cars), G31D (1200 cars) and one of the G31A group of gondolas (800 cars) are presented here. These classes/conversions are grouped together as they all share the configuration of having the hold-down clips mounted along the top chord of the cars' sides as is represented in the G31B (2000 cars) model. The remaining similar welded cars, the G31 (2900 cars), and the first two orders of G31A (4000 cars), all have the clips mounted on the cars sides instead and present their own modeling challenges that are better addressed separately.

The Prototypes

Historical background and modeling of these car classes was previously covered in the following issues of *TKM*:

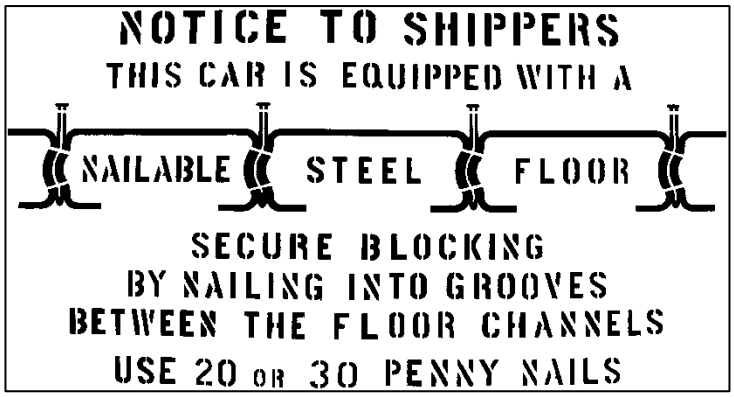
- Issue 16, November 2004 – G31, G31A/B/D, G35 Gondolas; Elden Gatwood's G31 construction article with background, diagram, numbers, quantities, and prototype photos.
- Issue 17, December 2004 – G31C/E construction article with supplemental prototype photos of all G31 and G35 classes.
- Issue 72, Winter 2010 – G31B model review and discussion of the G31 and G35 classes.

Since additional prototype G35 information has come to light since the above publications, that information is presented here first. As one of the massive group of gondolas in the post-World War II car building program, the 1952-1953 G35 was essentially an improved design revision of the 1951 G31B. Both were 52'-6" inside length general service mill gondolas, with all-welded construction and drop-type 2-rib Improved Dreadnaught-style end doors. The differences are much fewer in number to describe than the similarities. The PRR built all the G35 cars whereas the G31B construction had been farmed out to the American Car and Foundry Company.

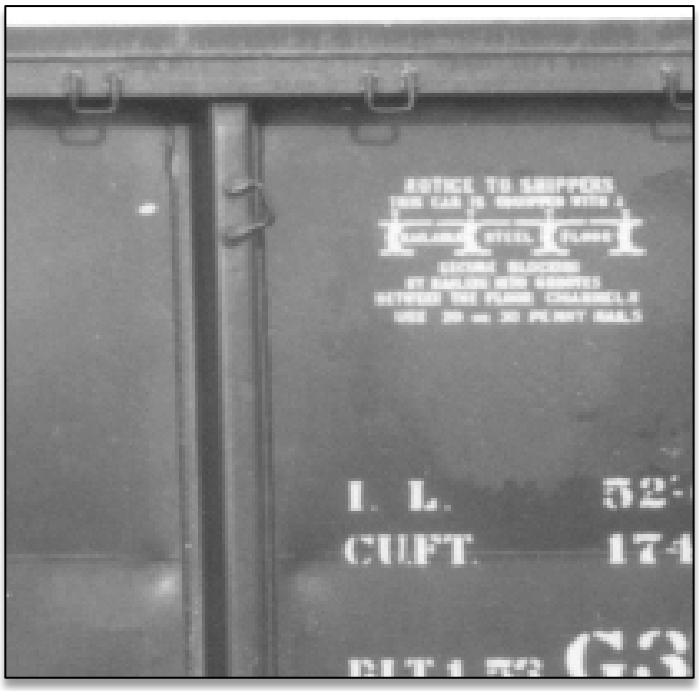
Design improvements in the G35 included having the underframe crossbearers dipped so the longitudinal zee stringers sat on top of them and were thus continuous. On the G31's the stringers were pieced between the crossbearers. Although significant on the prototype, this difference is practically invisible on a model. The most visible difference was that the G35 overall height was slightly taller than the G31's. This was caused by having box section top chord construction instead of the lower profile Zee member that was used on the G31's. For increased strength, the top chord on the G35 was a welded assembly of two horizontal 6" ship channel members to form a stronger 5⅞" tall box beam. Although the 3'-6" inside height of these cars was 3" taller than the G31B, they had the same side construction with just this larger top chord. This difference accounts for the larger cubical capacity of 1745 cu.ft. versus the 1646 cu.ft. of all the wood floor G31-subclasses. This also explains how the (thick) wood floor G35 had the same capacity as the (much thinner) steel floor G31 (no subclass).

New Nailable Steel Floor G35 379057. Note the taller box beam top chord, six gussets on the end sill and open brake platform support brackets. *(PRR photo 1153, collection Harry Warner)*

The G35 cars were built with three different types of flooring. The first 1000 had the standard wood floor, the next 700 had Stran-Steel Nailable Steel Floors, and the last 200 cars had Armco "composite" floors. All three style floors had a fixed 7.25" wide metal plank (an upside down "U") at each end of the car. The NSF was constructed from hollow steel, squared-off "C" shaped members, similar in dimension to the normal wood floor planks. There were 77 full size 8' x 2⅜" "planks" in the center of the car, and one roughly half-width plank at each end to fill the space up to the fixed end planks. Their edges had a proprietary shape that resembled a gently rounded tongue and groove arrangement (see graphic below). The open side of the plank faced downward and only one edge of the "C" was welded to the floor support members. The innovation of the floor design was that nails could be driven into the slots between the floor planks and they would bend around and thus grab in the tongue and groove feature. The side of the "C" that was not welded was free to flex a bit to accommodate the entry of the nails. The nails could then later be pulled out in the normal manner. This gave the railroads a car floor with the strength, heat resistance and endurance of steel, but one which their customers could still conventionally load by nailing blocking to the floor. Special instructions were stenciled on the car sides when new as to how to use these floors. The stenciled figure from the cars shown below illustrates how the floor worked.



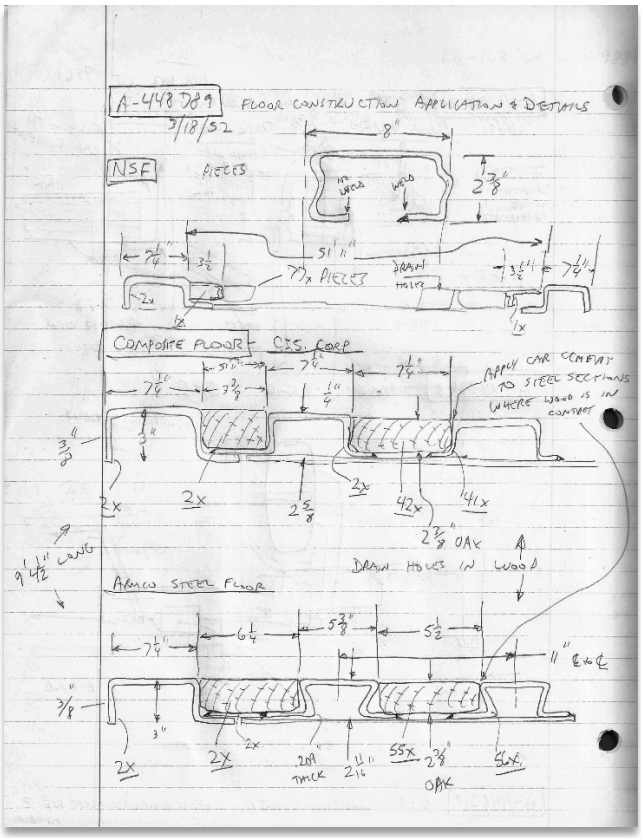
▲ Stencil artwork from PRR tracing D-433745 issued 12/2/49 for cars equipped with Nailable Steel floors. This option specifying 20 and 30 penny nails was called out for the G29, G35 and X45 classes. A second option of 16 and 20 penny nails was specified for X38 and X41B class cars. A note on the tracing references a Great Lakes Steel Corp. drawing. *(Tracing from PA State Archives, PH&MC)*



▶ Detail view of the Nailable Steel Floor stenciling on G35 #379057. *(PRR photo, collection Harry Warner)*

The composite floor was another approach to get a "best of both worlds" floor. These floors were constructed of an alternating pattern of similarly sized steel and wood planks. By interspersing the wood with the steel, nails could still be driven into the wood planks most anywhere in the car and yet the steel members would yield an overall stronger floor. There were two different options shown on the arrangement drawing in the PRR Motive Power Department tracing at the PA State Archives of how the wood and steel were intermixed to try to get the optimal arrangement: one from Carnegie Illinois Steel Corp and the other from ARMCO Steel. Sketches of the three designs from that tracing are shown below. The ARMCO floor employed fifty-five 5½" wood planks alternating between fifty-six 5⅜" steel hat-sections with a 6¼" wood plank at each end filling in the remainder of the 51'-11" between the fixed steel end "planks". (The C.I.S. design had forty-two 7¼" wood planks between forty-three 7¼" steel planks with a 3⅜" wood filler at each end.)

There were three interesting notes on the drawings regarding protection of the materials used in the floors. First, it was called out to apply car cement into the gaps between the ends of the wood planks and the car sides. This can be seen in photos of new cars such as the G31C on page 9 of *TKM* issue 17. Second was that car cement was also to be applied along the sides of the wood planks where they contacted the steel members in the composite floors. Third was that all cars were to have drainage holes drilled into the floors at "appropriate" spacing along the length of the car, out towards each end of the planks. Obviously, on the NSF floor the holes were in the steel members and in the wood floor they were in the wood planks: on the composite floor they were specifically called out to only be put into the wood planks, and not the steel members. From a modeling perspective, at least when new, they all pretty much looked like a wood floor with uniform planks, except that the metal "planks" did not have bolts attaching them since they were welded in place underneath. One could easily model any of these with a multitude of appropriately sized sticks of wood and/or plastic or by scribing plain sheet material. My personal *suspicion* is that the NSF and composite floors would have been painted, at least when new, as normal steel floor cars were. However, the solid wood floor group was outshopped with unpainted floors.

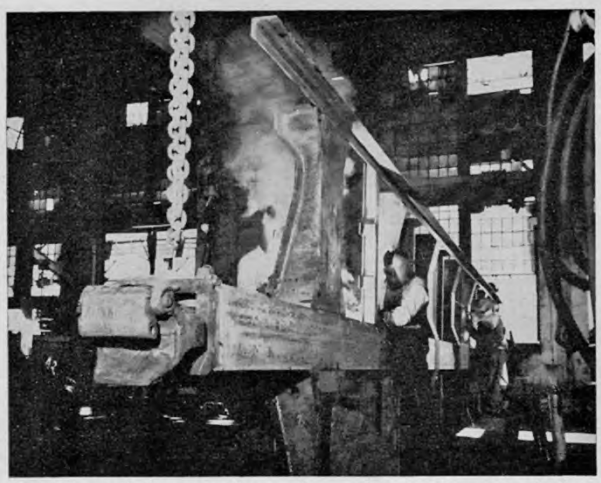


▲ Interior view of new G35 #379057 showing the Nailable Steel Floor: note the drain holes and the retention angles along the edges and that the floor appears to be painted. *(PRR photo 1/53, collection Harry Warner)*

◀ Sketches of NSF plus Carnegie Illinois Steel and ARMCO composite floors from the PRR G35 Floor Construction and Application and Details tracing A-448789.

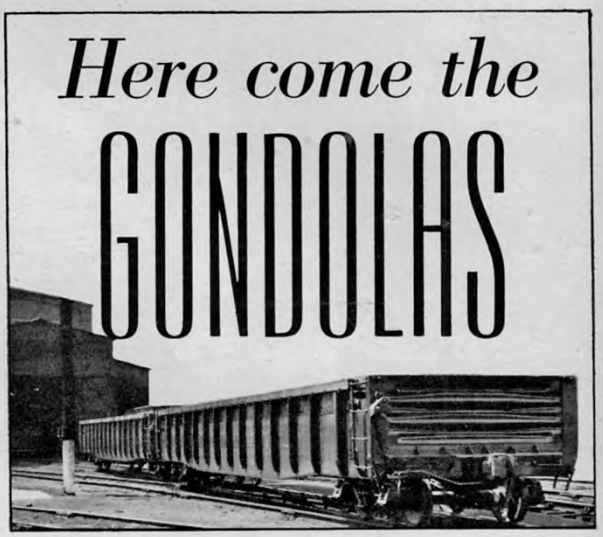
PRR G35-Class Gondolas as Built									
Class	**Number Series**	**Quantity**	**Floor**	**Builder**	**Body**	**Ends**	**Outside Length**	**Insight Height**	**Cubic Feet**
G35	377450-378449	*1000*	Wood	PRR	Welded	Drop, 2-rib improved Dreadnaught	54'-8"	3'-6"	1745'
	378450-379149	700	Nailable Steel						
	379150-379349	200	Composite						
G35 Rebuilds									
G35A	Rebuilt from class G35 in Penn Central era								

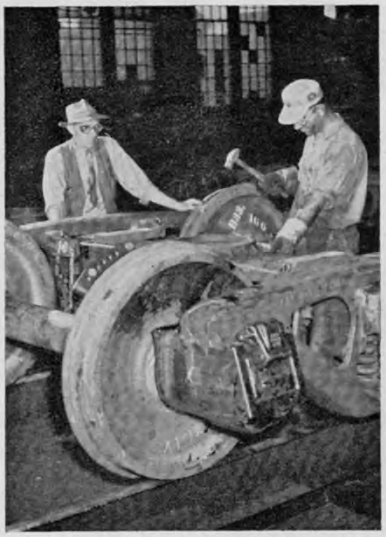
This page and next – G35 construction article from *The Pennsy*, October 1952. The dipped crossbearers can be seen in the upper left photo on the first page and the continuous stringers are in place in the photo at the upper right on the second page.



Gondola underframe, with couplers and cross-pieces attached to center sill, is lowered into pit so welders can work above it.

Here come the GONDOLAS

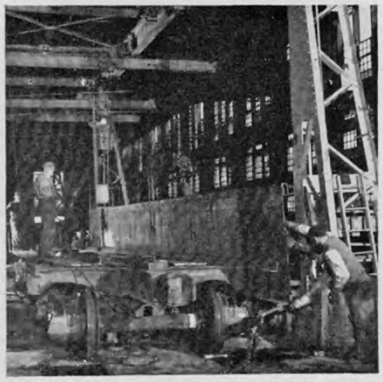




A final tap from A. F. Giosa, car repairman, and Gang Foreman C. C. McGregor okays gondola truck, designed for 70-ton loads.

Workmen signal crane operator to ease the 57-foot, 2-inch underframe onto trucks. Car now leaves Boiler Shop for Body Shop.

Outside Body Shop: R. M. Mountain, K. A. McGregor, and G. H. Robinson install air brake system on frame holding job parts.



A 52-foot side of welded ¼-inch plates swings in place under Eli Walker's eye.

Altoona Shops Build 6 Daily, One Every 80 Minutes, With Automatic Welders

In 1936, when Altoona was building riveted gondolas, F. W. Hankins, chief of motive power, made a prediction.

"Someday," he said, "we're going to start welding freight cars, then keep on welding them."

Now Altoona's 12th Street car shop has half-completed its second order for 1,900 all-welded, 70-ton capacity gondolas. Six completed cars roll from the shop every eight-hour shift, one car every 80 minutes.

Welding has not reduced total costs, which are about $6,000 per car, whether riveted or welded, but a welded gondola is built more quickly; it is lighter, easier on the rails, and has a longer life. In 8 to 10 years a riveted gondola's rusted joints need first-class repairs. A welded car resists corrosion several years longer.

The construction of welded cars is, naturally, much less noisy than riveted cars. Now, when the giant center sill—"the backbone of the car," Shop Foreman Ward Wyland calls it—is lowered into the jig, masked welders with their blindings arcs, not riveters with their pounding hammers, step in to join the cross-pieces or "ribs". So it is, too, when the completed underframe moves from the Boiler Shop—a name retained from days

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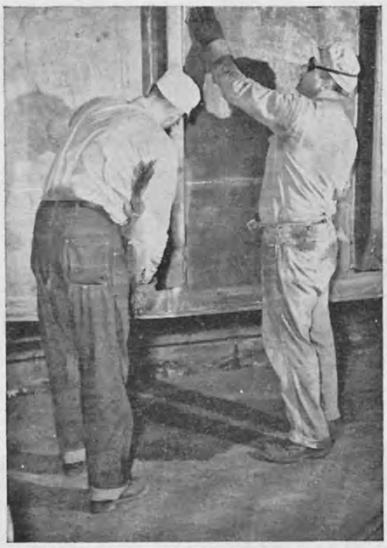
G35

Wire in front of R. C. Dick feeds into automatic machine that welds car sides.

After the sides are attached, the gondola is lifted from its trucks and placed in the "tumble jig", where it's turned on its sides and belly for welders' convenience.

S. M. Fesko and F. A. Nagle guide end gate, corrugated for strength, to position. It drops flat for loads over car's length.

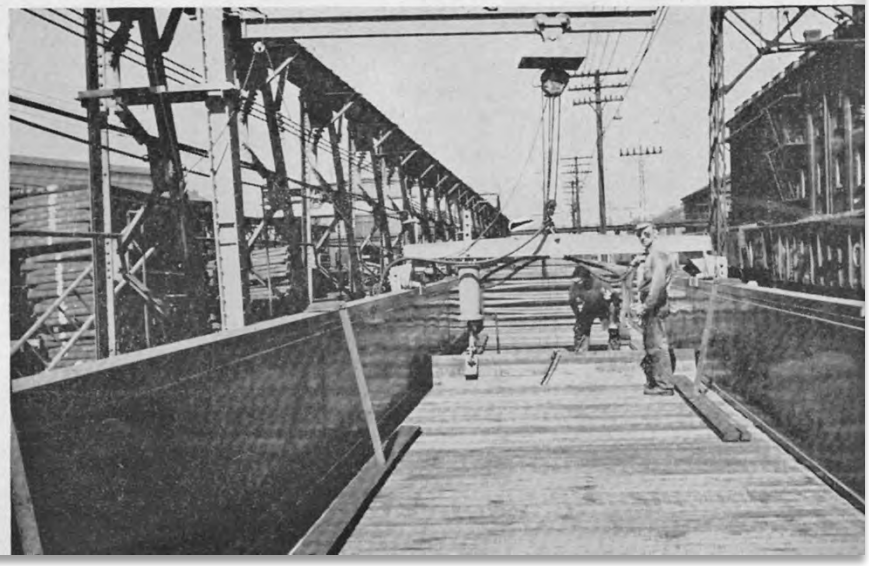
A. O. Dunlap and W. E. Burket satisfy legal requirement that hand holds, sill steps, and ladder treads are riveted in place.



Welding scale and rough edges are chipped off by car cleaners H. J. Kensinger and E. J. Buckler before car goes to paint shop.

when locomotives were built there—to the Body Shop. The sides, the end posts, and other supports—everything on the car body but safety appliances are welded into place.

"The car is so watertight when we're done," says Johnny Limbert, gang foreman, "we have to drill holes in the wood floor to let the water run out after a heavy rain." After the car leaves the Body Shop, it gets a second coat of paint in Hollidaysburg, is weighed, then sent into service.



After floor press snaps last oak planks tight, car gets second coat of paint in Hollidaysburg, then is ready for service.

◀ G35's under construction/completed at Altoona's 12th St. Car Shop, probably with the initial coat of paint (including the interior steel) and awaiting transport to Hollidaysburg for final paint and lettering as described in the article above. *(James Kelly photo, from* The Keystone*, Autumn 1996, page 49)*

▼ Next to the last step in the process, as described in the article: painted and lettered G35's at Hollidaysburg awaiting weighing. *(*The Keystone*, Summer 1996, page 42)*

The wood floor G35 were built starting in April 1952 and were followed by the other two groups extending into 1953. Photographs confirm the following car build data:

- Wood floor #377450 built 4-52, Klasing brake gear ASF A3 trucks;
- Wood floor #377783 built 6-52, Equipco brake gear ASF A3 trucks;
- Wood floor #378235 built 11-52, ASF A3 trucks;
- Wood floor #378441 built 11-52, ASF A3 trucks;
- Nailable Steel Floor #379057 built 1-53, Klasing brake gear, ASF A3 trucks;
- Composite floor #379177 built 2-53, Equipco brake gear, ASF A3 trucks.

There were 1,900 G35 class cars constructed. These made up about 2% of the PRR's total gondola fleet when new and represented roughly 14% of the total G31 + G35 fleet of 14,050 cars.

THE MODELS

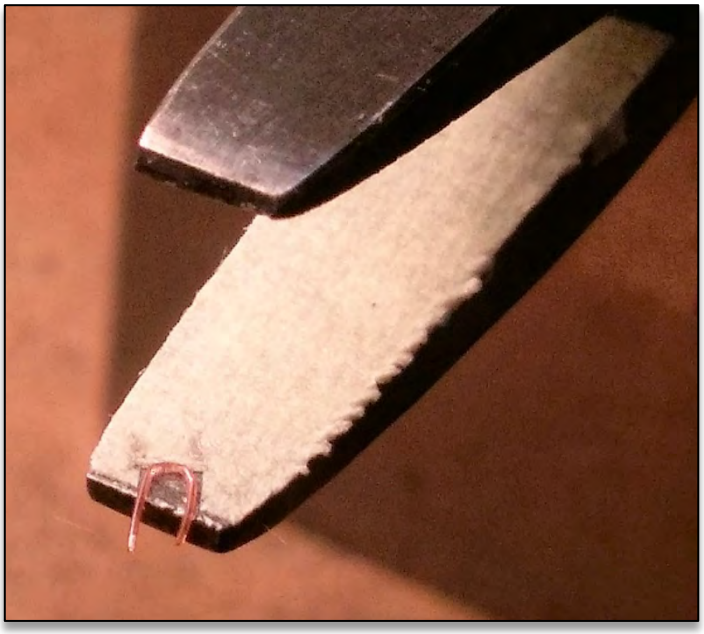
Since there were significant differences between the as-built lettering on the G31B models as produced (correctly) by Tangent, the G35 and the late series G31A, undecorated cars are a better starting point than decorated models. But because the end doors need work on these classes plus the G31D, and the assembled undecorated cars have the end doors glued in place, the undecorated Tangent *kits* are the best starting point for these conversions.

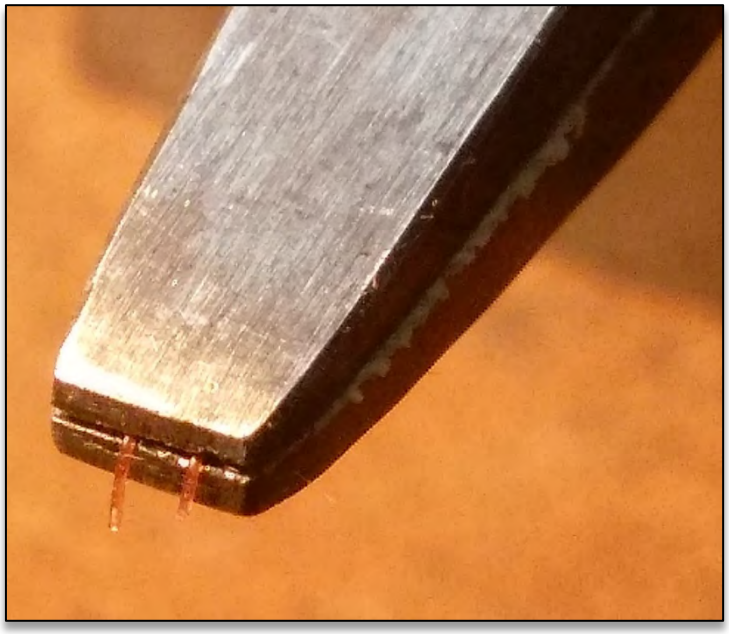
THE G31B

To back up briefly, I had described that there were a few minor improvements that could be made to the base model G31B in *TKM* issue 72 which carryover to these other classes. The short list follows. The prototype cars had only one defect card holder and that appeared on the side facing the viewer when the B-end was to the left, so just slice the one molded on the other side off. The models do not come with Equipment Trust plates applied (which should be present only during the first 15 years of the cars' service). Since I need them in my modeling period, I applied some resin parts that I cloned from a mold I made using those old etched brass Custom Railway Supply Trust Plate parts that used to be produced and which can probably still be found online. A simple rectangle of styrene also works. The trust plates were mounted in the last panel at the right, next to the ladder, on one side of the car, but on the second panel on the side of the car with the retainer in the last panel. I also added strips of .030" square styrene to the sides of the coupler opening to better match the look of the prototype draft gear.

Mercifully, the models come with the 26 hold-down clips applied all along the upper chord on each side of the car. However, there were also four more on each car side, one on each of the second and third side stakes in from each end, mounted at an angle to the vertical. They were staggered vertically, with the taller mounting point on the inner stakes being about 6" down front the top chord, and the outers being about 12" down. Understandably, incorporating these in the kit would have required considerable tooling effort, and the decision was made to forego them. I described a similar process for applying these in the G31C/G31E article in *TKM* issue 17.

The short version of the technique is to take a piece of .010" diameter plastic rod, wind a coil around a strip of .032" thick brass, and tape it in place at the ends. It is almost the shape of the strip, except that it does not have square corners, and it will unwind if released. Click on your kitchen toaster, hold the strip, and slowly wave it above one of the hot slots. Watch the coil carefully as you do, and you will see, when the plastic begins to soften, that the rounded corners suddenly "square up" and conform to the rectangular shape of the strip. Remove the strip from the heat and let it cool. The rod has now taken a "set" and will no longer try to spring back to a straight piece. Lay the strip down, take a single edge razor blade and line it up near one edge of the strip, press down to cut the coil all along the first side. Turn the strip over and repeat the cut on the second side. This yields a supply of overly long clips. For these cars I decided to drill holes to mount these clips as they are in a somewhat precarious position; thus, they need a right-angle bend in the legs before mounting. Since getting the angle consistent on several cars just by eye seemed unlikely, I cut a notch in a piece of masking tape and placed it inside of one jaw of small square-nose pliers as a guide. I could then insert a raw clip into the notch, clamp gently with the pliers and bend the legs up or downward along the front of the jaws to get consistent right- and left-hand bends. Snip any excess length off while still held in the pliers. I marked all the hole locations on the ribs using small pointed drafting dividers and drilled .0135" (#80) holes, setting my drill press short of breaking through the inside of the car. Insert the finished clips and glue in place.





At left, heat-formed clip set into the plier jaw alignment tape guide ready to be formed, a clip with legs formed at right ready for a trim cut.

Angled hold-down clip detail: holes drilled in both side stakes, right clip in place.

The prototype G31B, #371950-373949, rode on two styles of trucks, had three types of end-mounted pump brake gear applied and were built March-July 1951. The decorated cars I purchased all had the very nice version of the 70-ton A-3 Ride-Control trucks which Tangent tooled for this model, Universal brake gear and 3/51 built dates but were numbered in the late series of cars that rode on National C-1 70-ton trucks. Since Tangent sells their Universal and Equipco pump brake gear separately (and *two sets of each* come in each undecorated kit!), I carefully sliced off a Universal brake gear and swapped it for Equipco on one car, and applied National C-1 trucks (available from Atlas Model Railroad Company as their HO National C-1 70T FB Truck Assembly PR, item code 192000) to two of them. (I used those surplus A-3's to upgrade my old riveted G31C and G31E models). I "adjusted" one car number and two built dates to match the prototypes by gently scraping off the offending printed digits with the edge of a #11 blade and applying new decal digits in their place.

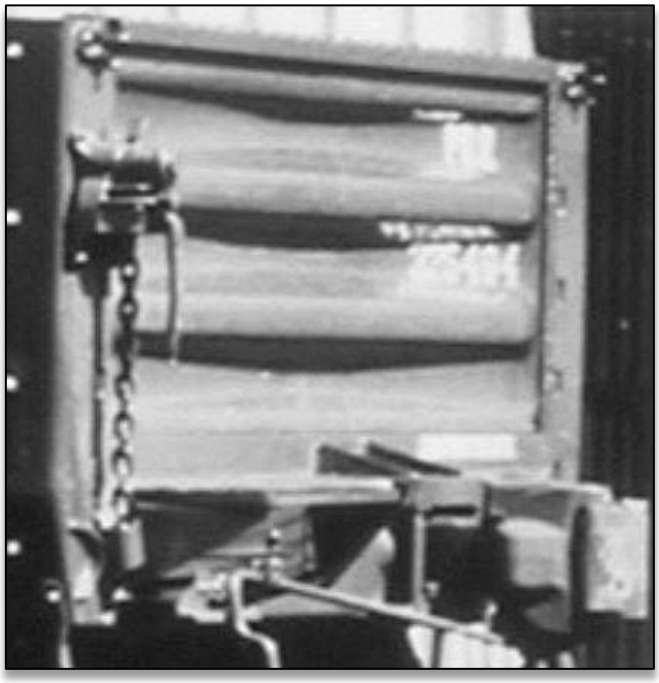
Factory-painted Tangent G31B's showing the baseline minor upgrades to the car before touch-up painting: excess defect card holder removed adjacent to "LD LMT" and road number modified above; Trust plate, National C-1 trucks and Equipco brake gear applied.

THE LATE-SERIES G31A

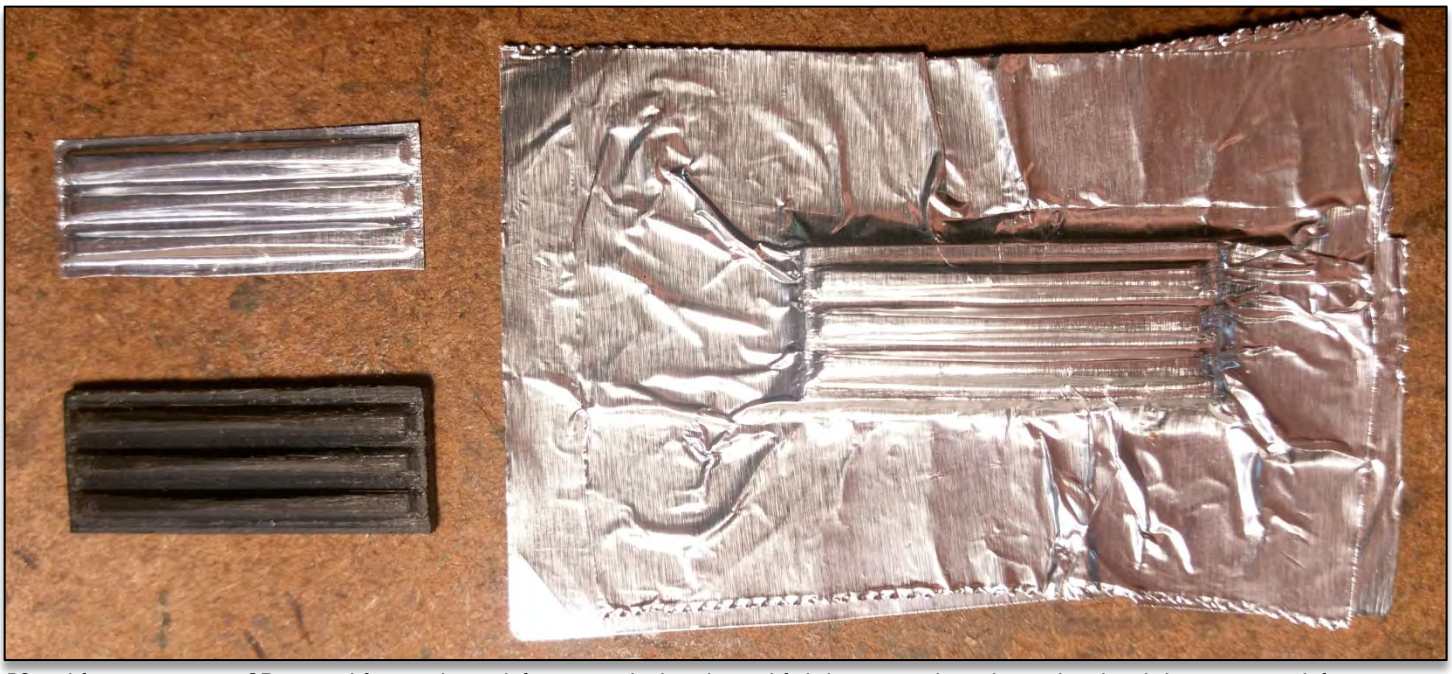
Although all three series of G31A cars were built by Pullman-Standard, only the third order, #374950-375749, had the hold-down clips applied to the upper chord rather than directly on the car's side sheets like the previous two orders. In addition to their somewhat odd lettering, the drop end doors and the placement of the Trust Plates are the only differences from a "corrected" G31B model. On these G31A the plates were mounted in the second panel from the right on both sides. Thus, just build the kit as normal with the small modification to the defect card holder, add Trust Plates and hold-down clips, but don't apply the kit end doors. (Note there is one left-hand and one right-hand part for the separate top chord strips with the hold-down clips molded onto them. The clips need to line up with the holes in the top chords to be correct.) The kits don't include couplers but are configured to accept Kadee #158 Whisker couplers in the molded-in pockets.

All the G31A cars were built with Pullman-Standard stamped drop end doors. These doors have much deeper and more "rolling" corrugations than the Dreadnaught-style ends used on the other classes and the G31B model. They are essentially flat on the outside with three large indentations pressed inward. No one makes a door like this that is commercially available in HO of which I am aware. I did find a pretty crude rendition of this same end door in an old unbuilt Sunshine Models #70.4 B&O O-59A 52' Bethlehem gondola model I have. I tried cloning the resin part using my old VAC-U-FORM toy using thin sheet styrene. Unfortunately, cloning a crude part yields an even cruder part. I looked at the Tangent site since they also market O-59A gons and see that indeed they have a different end for the B&O cars simulating this PS end. However, to my eye, it looks like the ends just have essentially three straight ribs fully across them, not the correct indentations that taper in all three dimensions (see photo below). Too bad, as they are available separately and could be an easy answer here (or "close enough" if you are so inclined). Note that my apparent obsessing about this is because in my 1952 modeling period, G31A's made up 10.8 % of the total PRR gon fleet, so this model is one of a number of these plus the O-59A's I have in queue to build.

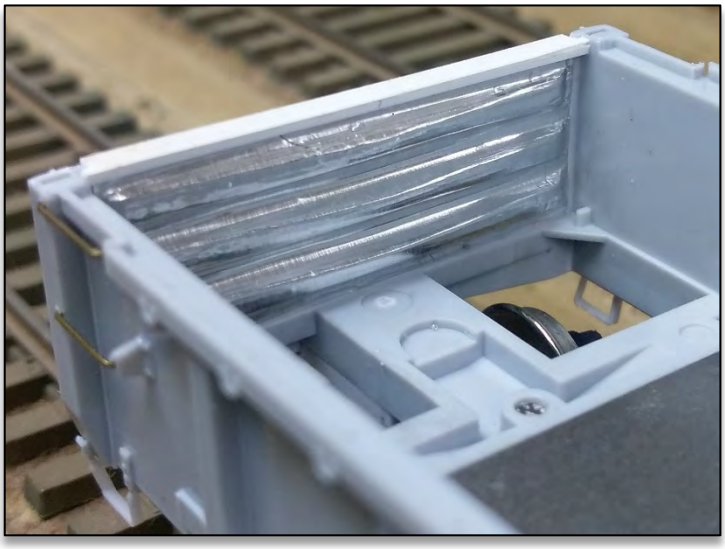
Late G31A #375494 B-end view. Note contours of the Pullman Standard corrugated end, Klasing brake gear and top chord-mounted hold-down clips. *(Builder's photo 3/52, PRRT&HS collection)*



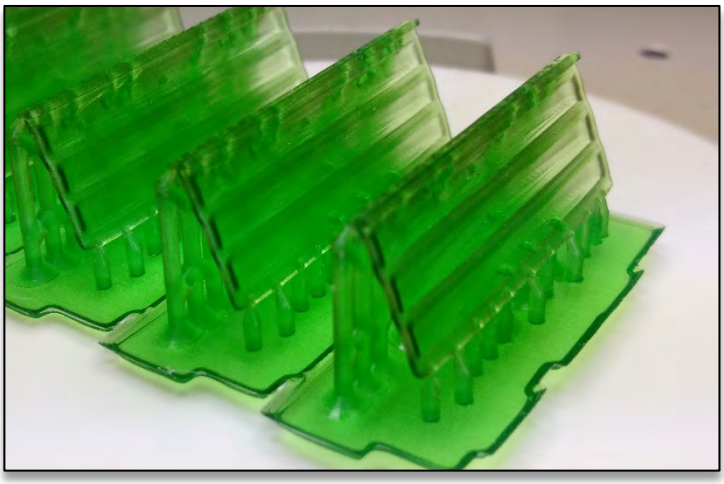
Retreating to plan "C", I drew up some CAD for the door based on the dimensions of the Tangent Dreadnaught door and car end opening and some measurements I scaled from a G31A end photo. I had a part 3D-printed that would simulate the outside half of the forming die that would have been used to make the stamped doors. (Similarly, you could create one of these by carving three rib-forming parts like this out of styrene strips and glue them to a flat plate.) For this one car, I invoked the quick and simple option to just burnish one sheet of aluminum foil down over the pattern with the comparatively soft end of a round toothpick and then a second sheet over top of the first. I then glued them together with thin CA, pressing them together over the form. Once dry, I rough cut the door out with scissors, re-flattened the edges as they get a bit bent and did a final trim on the edges to fit the car with a razor blade. I glued styrene strips along the inside (.020" x .020") and outside (.030" x .020") top edge of the door to represent the top chord. Finally, I applied a .005" styrene strip with rivets embossed along it to the top of the above styrene strips. Apply the finished doors in place of the kit doors with CA and your late G31A is complete. For the remaining projects requiring these doors, I will attempt to get the VAC-U-FORM process to work as the finished parts would be styrene sheet and thus more robust than the foil doors or I could just have them printed directly with 3D printing technology.



PS end forming process: 3D printed form at lower left; two stacked, embossed foil sheets at right and completed end sheet at upper left.



G31A with formed foil PS ends with top chord details added.



First experiment with acrylate PS ends printed on a friend's DLP (Digital Light Projector) home 3D printer with the printing supports not yet removed.

Completed G31A foil PS end.

One interesting thing about these late G31A was the builder's lettering. Across the gamut of the G31- classes, many of which were constructed at outside builders, the PRR painting and lettering diagrams were not followed *precisely*, especially in the smaller details. I described some of these deviations from "standard" in my G31B review in *TKM* issue 72. On these late G31A the oddest transgression was in the class stencil. Although PRR practice seemed to vary somewhat, the class designation was normally the standard font with the letter and numbers in 4" characters and with 3" (or sometimes 4") suffix letter/s and no spaces in between. On these cars, the 4" G31 plus a 3" suffix were used, but the font width was compressed, and dashes were inserted as: G-31-A: very unusual for any PRR freight car. Oddly, on all the earlier PS G31A, the class appeared in normal font, all 4" characters and no dashes. Pullman Standard did use the more typical formatting of the "THIS CAR PROVIDED WITH HOLDDOWN CLIPS…" note in the center of these cars such that the text was only left-justified, whereas ACF did not, although it was placed lower on the center of car side than normal, unlike the earlier two orders where it appeared below the Trust Plate.

Another oddity on these cars was the builder's logo. The previous G31A orders displayed the normal small PS logo as shown below.

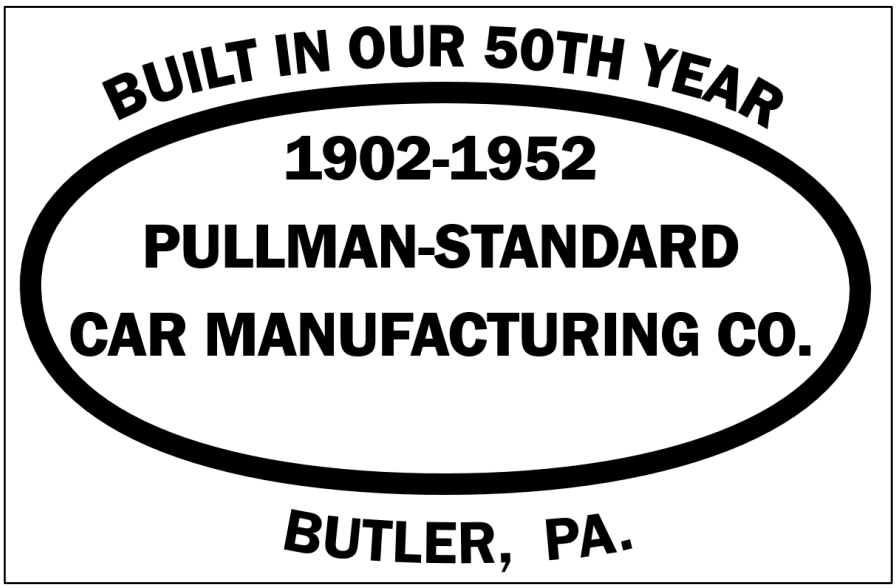
However, since the late order of G31A were built in 1952, they received a special PS 50th anniversary logo from the Butler, PA plant, shown below. The same logo appears on other cars built in 1952 at Butler as well as similar anniversary logos (with different verbiage) from cars built at the Bessemer, Al plant on their anniversary.

I have yet to find a clear enough photo to read the factory lettering on this order of cars and thus I don't know for sure if the historically correct abbreviation the PRR used for the application of one-wear wrought steel wheels of "1W WRT ST WLS" (dashes and periods not withstanding) or the horizontal line in the fraction in the spring travel data on the car ends were applied correctly as they were on the earlier G31A orders, unlike what ACF did on the G31B. We can see in the photo of #375494 that when these cars were built, this lettering was applied to the ends, as the PRR had just started to move this stenciling to the ends in this period.

Detail view of early G31A #374682 built 8/51 showing the side-mounted hold-down clips. Note the normal class designator and small arched PS builder's logo on the left-most panel. The 4-line, left-justified hold-down clips note stencil was placed in an unusual spot on these cars – over underneath the Trust plate, instead of in the center of the car. *(PRRT&HS collection)*

Detail view of late G31A #375584. Note the hold-down clips on the top chord and the two side stakes, the odd class stenciling and the large oval PS 50th anniversary builder's logo at left.

Detail view of the same PS 50th anniversary builder's logo on C&O covered hopper #1300 at left and artwork I created to make decals for these cars.



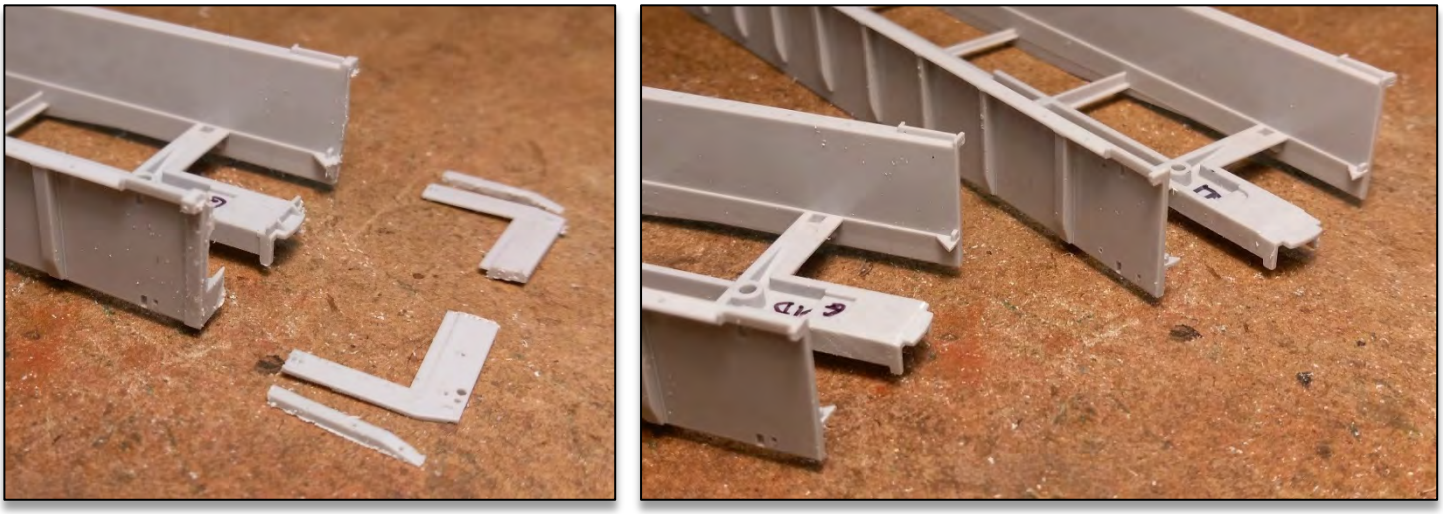
Completed late-series G31A.

THE G31D

The G31D was simply a fixed-end version of the G31B, making for a straight-forward conversion. Basically, you cut off the end sills and yoke, splice back on modified Detail Associates HO #FC 6221 Dreadnaught Ends for GS Gondolas and modify some details much as Elden described for his converted Revell/Con-Cor cars in the original G31-class article in *TKM* issue 16. The Tangent cars are much nicer starting points and I modified them as follows, starting with the unassembled kits.

First cut off the end yoke at a thickness of about .020". This leaves a little extra length of the car sides for a final, more precise cut. Continue the cuts around through the end sills but stop short of the centersill/draft gear. Make cuts along the longitudinal sides of the draft gear box to remove the end slices. Next, slice the remnants of the side stakes/end yoke off the sides at each corner below the top chord. Saw, then file, then sand them flush to leave smooth end panels where the stakes used to be. Measure and mark where to make the final cuts on the sides such that they are 52'-6" long, centered on the car. Cut and file the sides to these marks, making sure the ends are square and vertical. Not surprisingly (since all the classes had the same inside length), these cut ends should basically line up with the outer faces of the small rectangular tabs sticking upward from the bottom corner gussets that the floor fits down in between. File off any remaining material protruding from the draft gear box top and sides: see photo below. Note that the B-end draft box extends out farther than the A-end box: they will be in the correct locations once the new ends are applied. Leaving the kit's draft gear intact conveniently makes the coupler installation painless and robust.

Next modify the DA ends. First file the thin section off along the *bottom* of the ends that carries the lower rivet line, down flush to the step where it becomes full thickness. Measure up from this new bottom 0.452", cut the end off above this line and file the edge smooth. This edge will be the new bottom. I felt inverting the end this way centered the protrusions better with less effort in the finished part. Conveniently, the notches in the rear of the ends along the outer edges fit perfectly in between the Tangent car sides. Turn the car upside down on a flat surface and place .020" spacers on the surface under the ends to allow for adding the top chord later. Glue the ends in place to the sides and the coupler pockets, to which they should fit flush. Once dry, file and sand off any small amount of the ends that protrude out past the car sides and round them to be flush.



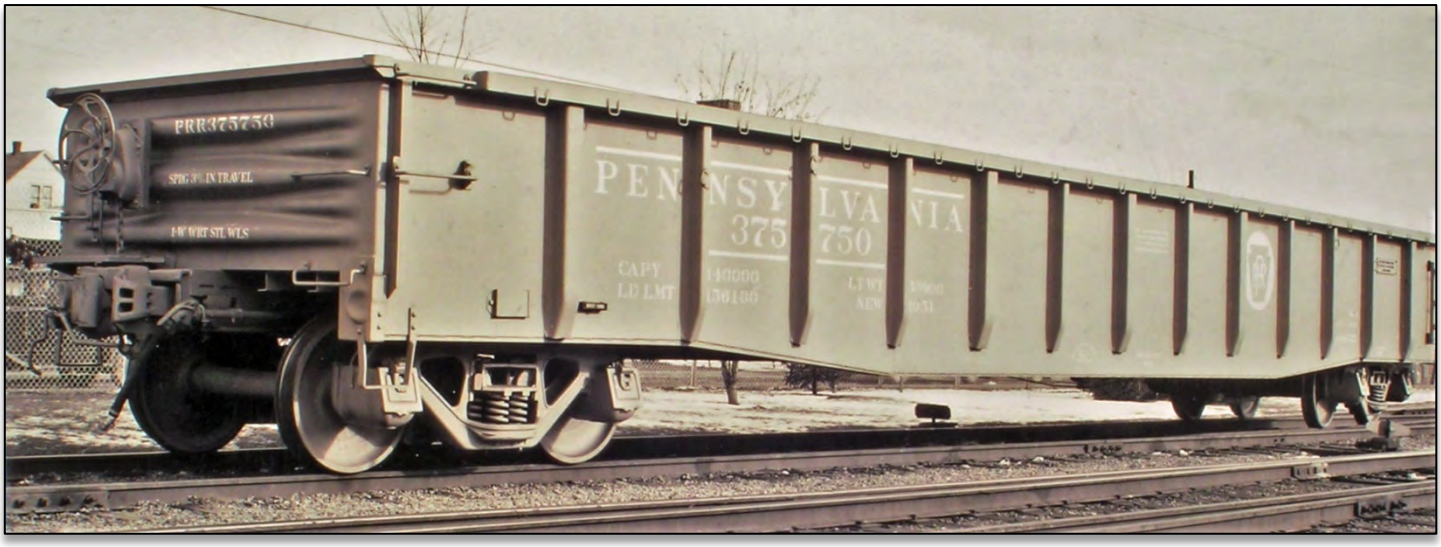
Initial removal of end sills and yokes at left; ends fully cleaned up, ready for application of new fixed ends at right. Note the car at the far right shows the extended draft gear on the B-end.

Stock Detail Associates end at left, bottom lip and rivets trimmed off and the part inverted at center, finished end cut to final height at right.

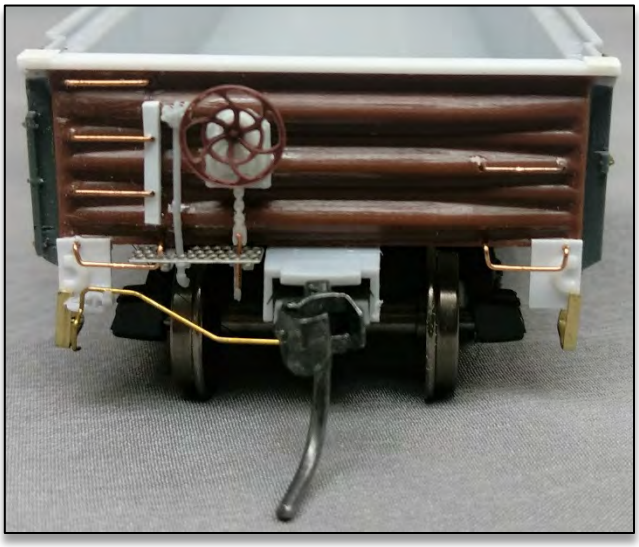
At this point, glue in the car weights, bolster plates, underbody details and the top chord strips carrying the hold-down clips (remember they are left- and right-hand parts). Fill the holes in the side for the kit's retainer valve part, slice off the extra defect card holder and attach Trust Plates in the second panel in from the right end on each side. Add strips of .040" x .040" styrene on the exposed ends of the sides below the DA ends to bring them out flush with the ends. On top of these, and overlapping the ends slightly, glue pieces of .010" x .125" styrene to form the rectangular bottom corner gusset plates. Short lengths of .040" x .080" strip fit nicely behind these plates and reinforce them between the sides and the kit's horizontal gussets remaining after cutting off the original ends. Cut and glue in place oversize lengths of .020" x .080" strip for the top chord on the ends such that they are flush with the inside face of the ends and are notched to fit around the side top chords. Once dry, trim these to length and make and apply corner caps from .005" styrene. Slice off little angled pieces of .093" diameter styrene tube and apply to the gusset plates to represent the poling pockets.

Refer to the excellent end photo of G31D #375810 on page 101 of the PRRT&HS Gondola book to locate and drill holes for the 18" end grab irons. Use two drop-style grabs along the bottom, three straight-style for the "ladder" at left and another in the center on the right side of each end. The two center rungs of the ladder are mounted to a stile that spans the end corrugations only on their right ends, so just drill two holes in a strip of .020" x .030" styrene and feed the grabs through it when inserting them into the holes drilled into the end and glue everything into place. Remove the mounting pins on the backs of the kit's cut lever support brackets and glue one to the face of the gusset plate on the left side of each end: the extended depth one goes on the B-end.

Before continuing, make sure to correctly identify the B-end of the car as the extended draft gear on this end provides clearance for the protruding brake gear and platform. For the brake gear, I added an Equipco housing with chain from a Moloco #HB 0301 brake assortment set and a Kadee Equipco wheel, as that is the only style I have seen in early photos of these cars. Drill an .026" hole in the upper corrugation to mount the kit's retainer valve and pipe alongside the housing. Cut off the angled rear portion of the kit's metal brake platform, notch it for the chain and the retainer line and mount it at the bottom of the end: I used two small brass supports cantilevered out from holes in the bolster and under the end and floor. Add a brake chain fulcrum from a spare Tichy brake set below the brake platform.



G31D 375750 B-end view. *(ACF photo 10/51, PRRT&HS collection)*



View of new end application and B-end details.

Left-side grab iron mounting modifications and new corner step. Note new end has been sanded flush with the car sides and the corner rounds smoothed.

Complete detailing the car. Add the four extra hold-down clips on each side as described above. The side ladders and grabs were somewhat different on the G31D. Add the grabs in the recesses in the top chord at the left end of the sides as normal for the kit, and then drill for and add the unused straight grabs from the drop end sills to the recesses in the top chord at the right ends of the sides since they are separate from the rest of the ladder. The stiles on both outer ends of the sides are inward facing "L" shapes in place of the end stake/yoke members which are not present on this class. Add strips of Plastruct .062" "T" styrene for these outer stiles at each end. (It is easier to work on the end of a long piece of stock to hold the part until the last step.) First, file a bit off the edge of the center leg (bottom of the "T") to make the "T" match the height of the kit's grab supports and to make it squarer to mount against the car. For the left end, mark on the outer flange where the grab hole should be located and drill. File away the portions of that outer flange beyond the small area where the grab mounts as per the photos. This simulates the angles that were attached to the outer sides of the prototype "L" to mount the grabs, without having to use separate parts on the model. Finally cut the part off the strip and file a taper at the bottom end. At the left end mount the kit grab across the new stile and the kit bracket.

Glue and place the kit's inner stile for the right end ladder to fill the holes molded in the car side. The ladder rung spacing on these cars is different than the drop end cars: the rungs should be 0.129", .286", and .443" up from the bottom of the side. Make a new end stile from the "T" as above with holes for the three grabs. Only a small section of the outer flange above the top grab is removed on this stile. Temporarily slip a scrap of .040" styrene under the kit's fragile left stile and transfer the locations of the top two holes from the right stile. Note that the lowest grab is a drop grab on the left end and straight on the right end so its hole in the left stile is offset up from the right stile. Carefully drill new holes for the grabs in the left stile. Use the kit grabs for the upper two and straighten one end of a Tichy drop grab and re-bend it for the lower grab. Glue the right stile and the grabs in place, Remove the temporary support block and glue a small block of styrene under the left stile just below where the bottom grab is attached to be the new lower support bracket. Let dry thoroughly and then trim off the top of the left stile just above the upper support bracket and remove the section below the new lower support bracket. File and sand the side smooth where the original lower support bracket was glued into the car side.

The stirrup steps are different on these cars since the end yokes are not there as on the other classes. The inner legs of the steps attach normally to the car sides, but the outer legs mount to the *end* face of the gusset plates below the ends. Since I couldn't find any commercial parts to fit properly here, I bent my own out of .012" x .030" brass strip. I was concerned that steps glued only to the outside face of the car would be easily popped off, so before bending, I drilled a hole near the top of what will become the side leg of the step and soldered in a piece of .015" brass wire as an attachment "bolt". After cleaning up the solder joint, cut the wire off to length. Bend the step to fit. Only the leg that fits against the car side needs a 90-degree twist. Drill the existing hole in the car side for the step fully through, insert the wire "bolt" and glue the step in place with CA. Check the fit of the wood floor piece and remove material from the lips on the ends if necessary to fit behind the new ends. Glue in the floor now unless you choose to paint it separately from the rest of the car. Install whisker couplers, the coupler pocket lids, and the kit's cut levers which need to be re-bent slightly. I used the kit's A-3 trucks for this class as well.

◀ Right-side ladder and grab iron mounting modifications and new corner step.

▼ Completed G31D.

THE G35

Starting again with an undecorated kit, this kitbash is pretty simple. Since the car's top chord will be extended in height; likewise, the cars' end and end door need to be raised as compared to the G31B. With a sharp chisel blade, carefully slice off flush the end door latch castings near the top of each corner post. They will be relocated later, so do not destroy them in the process (you will also have spares if you do the G31D conversion.) The undecorated kits come with a tree of two pairs of separate doors. These doors will be glued into the ends at a slightly higher position than on the G31B, but they don't need to be modified as there is still enough height to the parts that you won't see the space under the doors this creates.

A couple of minor differences in the G35 versus the G31 should be corrected now. There is a small oval access slot in the side you face when the brake gear is to the right. It is 9" up from the bottom of the side and centered 8.5" from the centerline of the first rib to the right of center. I drilled three .020" holes in a line and carefully connected them using a jeweler's saw blade. The horizontal end grabs on only the A-end are mounted higher than on the G31-classes, so to make it simple, just drill new holes for the grabs above the bolt heads and fill the molded-in kit holes below the bolt heads with putty.

The main aspect of this project is to make the changes to create the new side top chord: a welded assembly of two horizontal 6" ship channel members, open-side to open-side, to form a stronger box beam than the Zee used on the G31's. The horizontal welded seams were visible on the prototype cars, so this can be used to our advantage making the model construction simpler. Glue the molded strips that carry the hold-down clips to the outside edge of the top of the sides as per the normal kit assembly (remember there are left- and right-hand parts). Once attached, this piece is roughly .015" too tall to represent the lower channel and is only along the outer edge of the top chord, since it is supposed to represent a Zee. To simulate the missing inside part of the lower channel, cut a strip of .020" x .060" styrene to fit on the ledge on the top chord behind the outer vertical of the Zee member. Notch the ends to go around the recesses at each end for the top of the ladders/grabs. The .060" strip is somewhat narrower than the space available and thereby provides a gluing channel and saves some tricky cutting, so align it to be flush with the inside of the car side when you glue it in place.

Let these parts dry for a day so they are good and solid. Sand down the excess off the top edge of the side hold-down clip parts to the point they are just flush with the .020" strips you added inboard of them. This creates the proper height lower "channel" while leaving the clips in the proper relative loca-

tion. To do this, turn the car upside down and rub it in an orbital motion on a sheet of fine emery paper on a piece of glass. Work slowly and check often to make sure to get the top edges flat, and don't go too far. Cut a strip of .030" x .100" styrene slightly longer than the car and glue this upper "channel" to the full length of the top chord, overhanging the end yokes. Align its width such that it is flush with both the outside and inside edges of the lower "channel". Any slight mismatch in alignment or solvent cement "ooze" in the upper-to-lower channel joint conveniently looks like the prototype weld seams. The G35 did not have the oval slots in the end yoke corner posts used in the welding process on the G31B. Fill these with modeling putty and let all this dry thoroughly. Trim off the excess length of the upper "channels" overhanging the ends and sand them and any remnants of the end door latches and the putty in the weld openings smooth and flush with the faces of the corner posts. Also, file notches in the sides of the top "channel" where it overhangs the ladder/grab recess at each end to be flush with the notch below. Like the G31-, the G35 had a line of holes along the top chord that line up with the hold-down clips for use in tying down loads. Interestingly, to enable a rope or cable to be easily fished through both the holes in the top and bottom of the new box beam chord on the prototype G35, a piece of 1" pipe was welded inside the box at each hole to provide a tube rather than two unconnected holes. These holes *were* in the top Zee chord on the model before we glued on the "channel" pieces. Fortunately, I found that my .018" (#77) drill bit (which matched the molded-in hole diameter) was just long enough that I could lay the car upside down on a piece of hardboard and drill through the molded-in holes accessible on the underside of the Zee chord and thence through the added-on "channels" to re-open the holes.

Now with all the heavy work completed, add the details to complete the kit construction. Deviations from the normal construction include adding Trust Plates to the second panel in from the right end on each side and gluing the end door latch parts salvaged earlier, back onto the end posts near the top. The G35 had strap-type brake platform supports instead of solid gussets like the G31- so file away the undersides of the molded-on gussets and add .010" x .020" styrene strips at an angle across the two end points of the original gusset. Add the extra diagonally-mounted hold-down clips to the second and third side stakes in from each end like the other classes, except that both clips on the G35 were mounted at the taller height point, about 6" down front the top chord, instead of being staggered vertically. The side grabs were slightly different on the G35 than on the G31-classes. The left side grabs are both mounted on a short stile instead of just a small bracket and the upper chord. Glue in the kit's bracket provided, snip it off shorter and glue another similar .015" styrene bracket onto the car side above it. Drill two holes in an oversize length of 2" x 2" strip of styrene for the stile, insert the grabs and glue it atop the brackets. Once dry, trim the stile to length. The G31B model has two triangular gussets between the top of the end sills and the vertical cross piece along the bottom of the end door. On the G35 there were six gussets spread across the end, so add these from bits of .010" styrene strip. I also added the strips of .030" styrene to surround the coupler opening to better match the prototype draft gear. All the G35 I have seen in photos were equipped with Klasing brake gear, but not having that available, I applied one of the Tangent Equipco sets as its appearance is more like a Klasing than is a Universal set. If gluing the end doors in their closed position, make sure to push them upwards to align their top edges with the new top chord.

G35 end detail showing new box-beam top chord and left side ladder stile, added end beam gussets and repositioned end beam grab irons, doors, and door latches. Note oval weld access holes in end yokes have been filled.

G35 B-end detail changes include open brake platform support brackets and added end sill gussets. Note the two added hold-down clips are at the same height.

G35 overhead view shows new top chords with hold-down holes, NSF floor with drain holes and retention angles along sides and slot added in car side.

Use the kit's wood floor for the initial group of 1000 cars. For the sake of a little variety and since I had gone to the trouble of making the cool decal, I chose to model one of the 700 Nailable Steel Floor G35. Since all the floor members were steel, simply scribe lines in an oversize sheet of plain .030" thick styrene to match the description of the floor "plank" sizes noted above. Cut the scribed floor to final size to match the kit floor. The prototype photo above shows the drain holes drilled into the floor as well as the angle members along the side to help retain the floor members. Mark and drill small holes through the floor in every 5th "plank" per the photo, before gluing it in place. Add a piece of Plastruct AFS-0 1/32" #90500 angle along each side.

With fishbelly-side cars like these, exerting much effort to get the underframe correct is the modeler's decision, as it is basically invisible under there. However, these cars come with nicely molded brake gear, piping, and rodding so no extra work is required there, and other than a little bit of the cylinder, none of it shows anyway. The important structural differences in the crossbearer and stringer arrangements on the prototype G35 versus the G31's are unimportant as they are lost here; buried in the normally invisible area Tangent compromised from prototypical accuracy to place the car's flat steel weights. It appears all the 1,900 G35 were equipped with the 70-ton A.S.F. A-3 Ride-Control trucks, so I used those from the kit with .088" narrow tread wheelsets.

FINISHING

I sprayed the cars with a 5:4 mixture of Scalecoat I Oxide and Santa Fe Reds. The wood floors were sprayed grey separately to represent bare wood, prior to gluing them into the cars. In interior views of prototype cars of this period you can see the car cement applied to the gap between the ends of the floor boards and the steel side plates. Assuming it was body color, as it appears to be in the photos, to achieve the effect brush paint FCC (PRR freight car color) along the joint at the base of the sides once the floors are assembled, trying to duplicate the irregular edge of the overlapping car color. See photos of G31C and G31E on pages 9 and 22 of *TKM* issue 17 as illustrations. I touched up the modifications on the G31B's to match Tangent's factory paint with a mixture of Scalecoat I PRR Freight Car Red plus some Oxide Red.

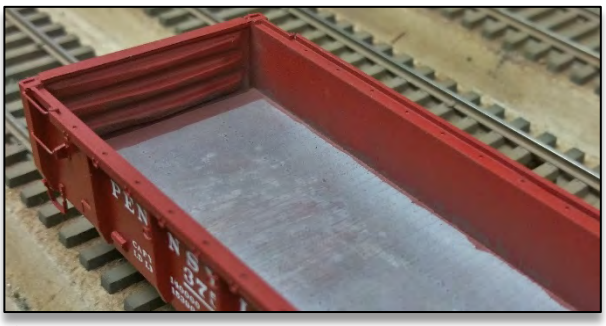
Since the G35 and G31-classes make up a sizable percentage (29%) of the total PRR gondola fleet in my modeling period and would all still be wearing their builder-applied paint and lettering, I created custom decals specifically for all of them to match their as-delivered Circle Keystone schemes. This was partly to avoid having to search for, and piece together, the correct road numbers, data, and date decals for a sizable number of models, but also to include those odd builder lettering variants I was not likely to find elsewhere. This included the non-standard versions of the one-wear wrought steel wheels notes, spring travel data,

"…HOLDDOWN CLIPS…" notes, segregated maintenance triangles, class designator variants, the 50th anniversary Pullman Standard logo, and the Nailable Steel Floor stencils. Maybe Mount Vernon Shops will add a similar set to their line of fine PRR decals to help modelers with G31 and G35 conversions. https://www.mountvernonshops.com,

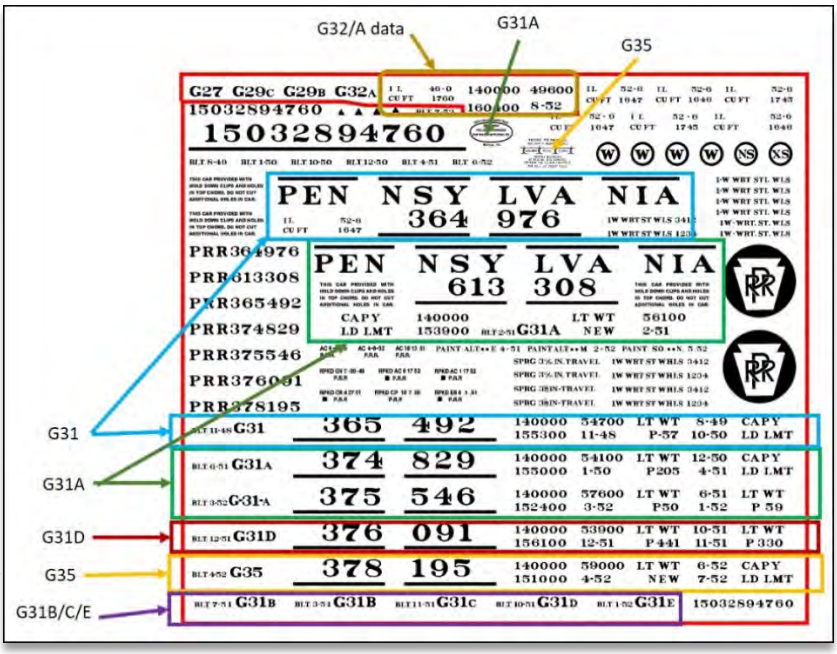
Refer to the prototype photos when lettering the cars and note that in addition to the variations in the lettering itself, there were variations amongst the classes of where the lettering was placed and even the length of the lines under the road numbers. Since the PRR only built the G35 of the classes modeled here, they were the only cars to have the paint note stencil applied to the cars as built. I weathered the cars lightly as they were all no more than a year old in my modeling period, with a combination of techniques including colored pencils to vary the floor board colors, paint washes and weathering chalks, as have been described numerous times in the past gondola car series articles.

References

- *The Keystone,* December 1980, page 35, article and photographs.
- *Rails Northeast,* November 1976, Circle Keystone painting & lettering diagram.
- *Railway Prototype Cyclopedia: RP CYC 19,* Ed Hawkins, page 113, G31 article, photos, and data (also similar cars on other roads).
- *Pennsylvania Railroad Gondolas, Revenue & Work Equipment, 1869-1968,* Al Buchan and Elden Gatwood, PRRT&HS, 2011.



▲ Interior view of G31A showing simulated over-run of car cement onto ends of floor boards.



▶G31 and G35 class gondola decals I created for these projects. Note the alternate floor designation symbols in the circles: W for wood, NS for Nailable Steel, and XS for the composite wood/steel floors (no symbol indicated a steel floor). Although I couldn't find tracing D-456266 for these symbols, the tracing number register indicates it wasn't issued until October/November 1955. They were applied later to Circle Keystone scheme cars that lasted past this date. For an example see photo of G31B at the bottom of page 25 in *TKM* issue 17.

▲ Completed Nailable Steel Floor G35. ▼ Minimally modified Tangent G31B, basis for all the other class conversions illustrated here.

Modeling the Pennsylvania Railroad's Box Car Fleet
Part 8A – The Pennsy's X26C Class
The Funaro & Camerlengo Resin Kit

by Elden Gatwood and Jack Consoli – Photos by Jack Consoli unless noted

Completed F&C X26C models.

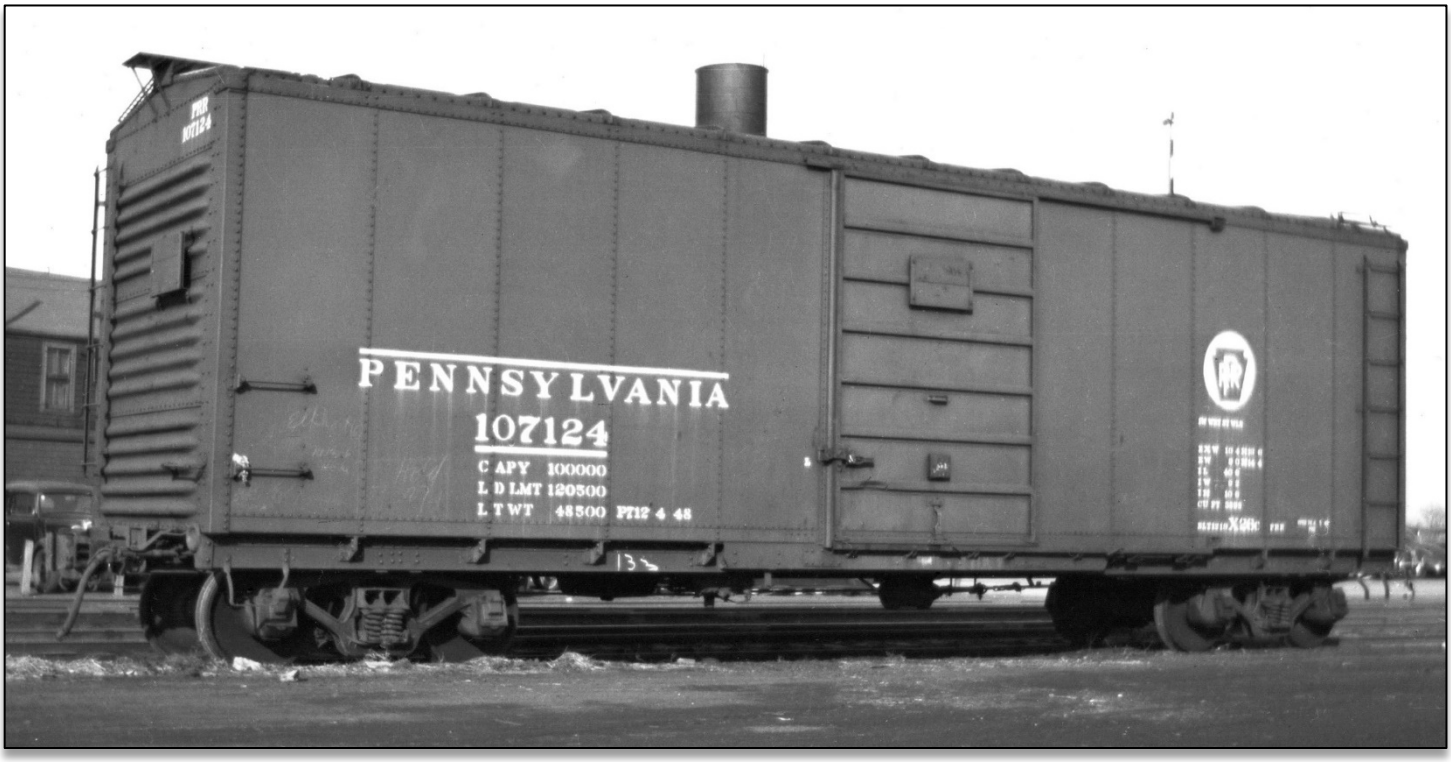
INTRODUCTION

This article will focus on prototype information and construction of this important prototype using the Funaro & Camerlengo resin kit. Like with the X29B, we are covering several options for constructing this box car in HO. The initial installment (part 8) of the boxcar series on the X26C article was in *TKM* issue 61 back in August 2008. This article contained more detailed prototype information for the cars and covered building the Sunshine resin kit for a Youngstown door car in *Shadow Keystone* lettering.

As previously discussed, the X26C was the result of a major effort by the Pennsy to utilize the sturdy underframe and steel ends, from their worn-out USRA X26 box cars, while disposing of the deteriorated wooden roof and sides from the original single-sheathed body structure. The class was very significant on the PRR with 3,500 cars reconstructed during the 1945-1949 timeframe. This made it the sixth most numerous box car on the PRR shortly before completion of the project, and the fifth most numerous box car in the PRR fleet from the early fifties until the early 60's when they began retiring many X26C cars. As such, this is a car that the vast majority of Pennsy modelers, and any post-war modeler of any road, will want to have represented.

THE PROTOTYPE SUMMARY

By the end of World War II, the Pennsy's USRA box car fleet, originally some 10,000 cars, was worn out and obsolete. They had been surpassed by more durable steel cars of greater width and height, although they still possessed some usable parts. The AB brake systems were recently applied, and the heavy steel underframe and ends were still useful. Like other railroads in search of less costly ways of rebuilding their box car fleets, the Pennsy chose to utilize their own shops forces and the availability of new pre-assembled roof and side components to rebuild the usable parts into a "modern" 9'-2" wide, 10'-6" inside height, box car, with the Pennsy's now-preferred 7-foot door. The cars featured state-of-the-art rectangular panel "Murphy" roofs, 5/5 riveted panel sides, and initially, the pre-war incarnation of the Youngstown corrugated 7-foot door. The old car body was removed, T-shaped brackets riveted to the old side sills, filler panels added at the top and side of the old 5/5/5 Murphy ends, and a new car body assembled on top. The first 2,000 cars, running from road number 104260 to 106259, appear to have had only minor differences, primarily in power handbrakes. The next 1,000 cars, in road number 106260 to 107259, seem to have been furnished with Superior 7-panel doors and a mix of power handbrakes. The final 500 cars, running from 107260 to 107749, and constructed in 1949, were furnished with Youngstown "post-war" 7-foot doors (the primary spotting difference being the raised seam panels approximately one-third and two-thirds of the way up the door), and also featured the brand-new diagonal panel roof being produced by Standard Railway Equipment Manufacturing (a.k.a., "Stanray"). All cars appear to have some variation of the rectangular grid running board. The cars were very successful and led the way to a whole series of X29 rebuilds, like the X29B which we have already covered in the pages of *TKM*.



▲ X26C 107124 from the second lot with Superior doors with an April 1948 reweigh date. ▼ X26C 106983 from the second lot with Superior doors, circa September 1953. *(Both photos, Jack Consoli collection)*

By the early 60's, the underframes of the X26C began to run afoul of the 40-year rule, and the cars were supposed to be retired. The Pennsy chose to rebuild hundreds of X26C with "new" underframes (probably restricted to bolsters), and re-classed them as X26F, many in number series 107761 to 109759. The rebuilds placed in that series appear to have had modifications that resulted in a change in the interior height since all X26F are stated as having a revised capacity of 3904 cubic feet versus the 3878 of the X26C. By January 1964, 497 X26C had been rebuilt as X26F and renumbered while 219 X26C appear to have been rebuilt and re-classed, but retained their original numbers, and noted as having a roof higher in center than at the sides of 10'-5" inside height at the sides and 10'-11" at the centerline of car. It is not currently known what changes were made that would have resulted in these apparent capacity differences. We will cover the X26F in a later article.

TRUCKS

PRR documents indicate the use of the original Andrews-type truck as found on the USRA cars as-built as well as the Pennsy's 2D-F8 and 2D-F12 trucks equipped with standard bearings, a 5'-6" wheelbase, and weight of 7,500 pounds each. The 2D-F12 can be distinguished from the 2D-F8 by its use of a leaf spring in place of one of the outer springs.

CAR NUMBERS IN SERVICE

Table 1 contains a timeline, car numbers and totals, for the X26C class box car.

Table 1– Pennsylvania Railroad X26C Class Box Car Timeline

Class	Car Numbers	No. Built	1949	1955	1959	1964	1968
X26C	104260-107749	3500	3057	3446	3402	2579	<100
	See below					12 (1)	
	"					7 (2)	
	"					23 (3)	
	"					1(4)	
	"					2 (5)	
X26F	random					219 (6)	695*
X26E						1	
X26F	107761-109759					497	695*

(1) Car numbers 104361, 104374, 104430, 104493, 104518, 104550, 104563, 104594, 104602, 104623, 104654, 104669, equipped with Pullman-Standard "Compartmentizers". No photos of these cars have surfaced that would indicate whether they had the special "PC" logo on the car sides.

(2) Car numbers 104287, 104495, 104786, 104820, 104976, 105198, 105230 equipped with racks for hauling farm machinery.

(3) Car numbers 104301, 104305, 104314, 104335, 104341, 104360, 104434, 104467, 104585, 104600, 104648, 104650, 104672, 104695, 104755, 104756, 104765, 104925, 105090, 105206, 106149, 106525, 107061 equipped with racks for hauling miscellaneous auto parts.

(4) Car 105330 equipped with racks for hauling auto side panels.

(5) Cars 105136 and 107324 equipped with "device" for hauling L.C.L freight.

(6) 219 cars of this series differ slightly in interior dimensions, possibly due to use of different flooring or side and end lining.

* Entire X26F class was 695 cars at that time. The number of cars in each series was not determined.

X26C BOXCARS LEASED TO THE DETROIT, TOLEDO & IRONTON RAILROAD

Between 1953 and 1955, the Detroit Toledo & Ironton Railroad leased a total of 73 Class X26C boxcars, DT&I 104326-107113. These cars were equipped to handle automobile parts (AAR Class XAP) and retained their PRR car numbers.

Table 2 – Roster History

Series	Jan 1953	Jan 1954	Jan 1955	Jan 1956
DT&I 104326-107113	39	73	73	0

DT&I 104452, leased X26C with pre-war Youngstown doors, equipped for auto parts loading, circa April 1953. *(Richard Burg collection)*

Table 3 – Class X26C Boxcars Leased by the DT&I, January 1955 ORER

Cars in *italics* equipped with racks for handling auto side panels.

104326	104452	104603	*104726*	*104863*	105115	105259	*105834*	106199	106806
104337	*104465*	*104606*	*104768*	*104865*	105162	105295	*105845*	*106291*	*106912*
104369	104471	*104607*	104773	*104871*	*105166*	105330	105871	*106311*	106927
104406	*104551*	*104651*	104780	104978	*105189*	105690	*105900*	*106563*	*106930*
104413	104567	104701	104800	*104981*	*105200*	*105721*	106000	*106618*	*107092*
104418	104571	104707	*104829*	104986	*105226*	*105761*	106096	*106683*	*107102*
104424	*104596*	*104708*	104838	*105038*	*105248*	*105775*	106142	106783	*107113*
104438	*104601*	*104711*							

The paint and lettering on these cars were the PRR *Circle Keystone* scheme, except the DT&I reporting marks and herald replaced those of the PRR.

Appearance Over Time

In PRR service, the X26C cars were initially painted the PRR's standard Freight Car Color and lettered in the *Circle Keystone* scheme found on boxcars built or rebuilt in that timeframe with the full spelled-out "PENNSYLVANIA". This scheme featured a line over the name, and a corresponding line under the number, applied to the left of the door. Dimensional data was arrayed under the car number. The *Circle Keystone* monogram appeared in the third panel to the right of the door. The paint apparently wore pretty well, as cars in this scheme appear well into the late 50's, albeit in very poor condition. Many of them developed a patina of rust in various places as time wore on. Paint wore off the galvanized roof in many cases, resulting in a grey-steel roof color on some cars.

It is unknown as to whether the small number of X26C used in LCL shipments were painted in any of the Merchandise Service schemes, although documents indicate they may have. No photos of them have surfaced at the time of publication.

The X26C was issued a new painting diagram covering the *Shadow Keystone* lettering scheme on April 14, 1954. Due to the early date at which these rebuilds were created, most if not all the class was eventually repainted in this scheme. No photos have surfaced which show an X26C in *Circle Keystone* lettering, after the late 50's, unlike numerous X29B.

The change to the *Plain Keystone* scheme was introduced with issuance of a new lettering diagram on December 20, 1961. This was the final lettering scheme these cars saw in PRR ownership. Most remaining X26C cars remained in the *Shadow Keystone* scheme at the time of the merger. The X26F were repainted into the *Plain Keystone* scheme at the time of their rebuilding.

Modeling the X26C Class

The X26C may be modeled in numerous ways in any scale. There are 10-panel, riveted side box cars with a 7-foot door opening in most scales. The task of cutting off the lower bolster and cross-bearer tabs and replacing them with an inset underframe and side sills is a task common to any scale. Modelers in N-scale could simply shave off the tabs on any AAR-style Box car and build up an inset side sill and brackets from styrene shapes since the rivet detail would be largely invisible at that scale.

The Funaro & Camerlengo X26C Model

I chose to utilize a new Funaro & Camerlengo resin kit for my models of both an X26C from the second run of 1000 cars as well as one of the first run cars that were leased to the DT&I. Construction was essentially the same except for the doors and brake wheels. This is one of F&C's modern one-piece body kits with a drop-in floor/underframe. Doors and some details are separate parts. They offer four variations of this kit:

- 8010 PRR pre-war Youngstown door car
- 8011 PRR Superior door car
- 8012 DT&I pre-war Youngstown door car
- 8020 PRR post-war Youngstown door and diagonal panel roof car

I basically followed the kit instructions:

1) First, file/sand the flash off the bottom and insides of the one-piece body casting. Make sure the areas around where the couplers will be mounted are nice and flat.

2) Do the same with the floor/underframe and sand a little on sides and ends until it just drops into place with the bottom at the coupler flush with the bottom of the ends. When this is done you can apply weights to the top of the underframe casting and let the cement set up solid. Use two ounces if using metal trucks, or three ounces, if not.

When the weights are all set up solid, mate the floor and body, and place small dabs of CA adhesive at the four corners. If satisfied with the orientation of both, drizzle thin CA down the inside seams at floor level and let dry.

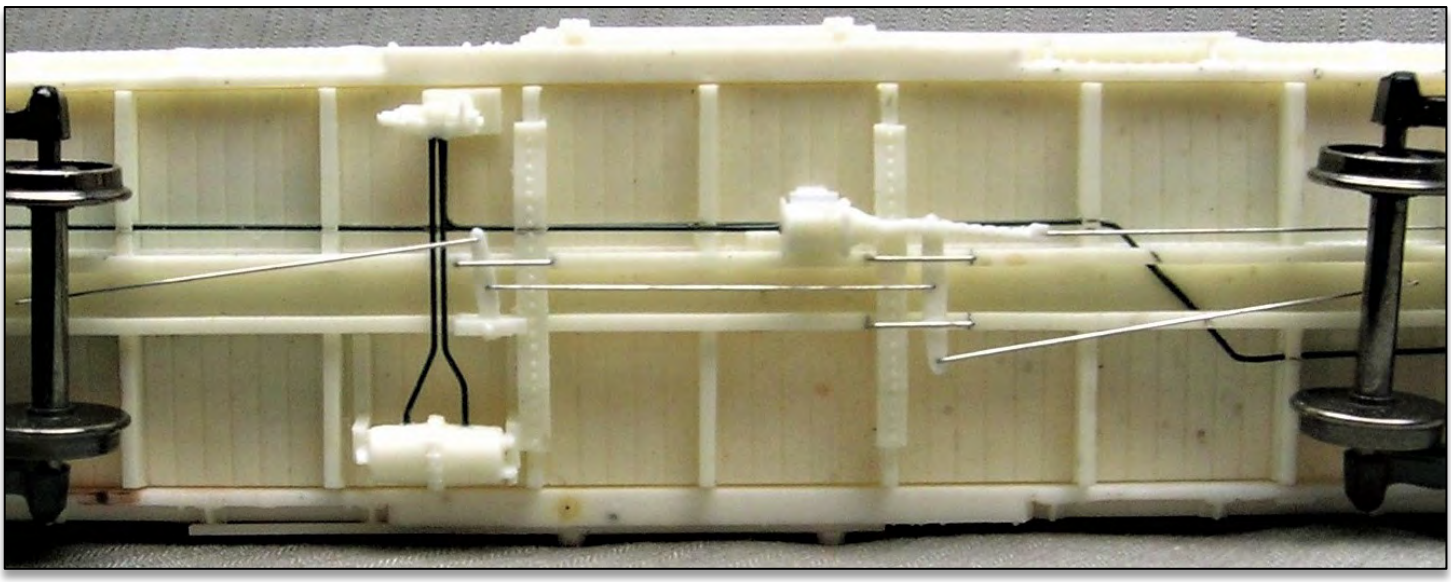
3) Drill and tap the bolsters to mount the trucks with 2-56 screws. Test fit and remove.

4) Detail the underbody. I like to create sub-assemblies, including the Triple valve and reservoir set-up (with two pipes in between), and brake lever set-up (with the end rodding), by first drilling #78 in each part, bending the .012" wire to fit the spacing required, building the sub-assembly, then mounting: a) the triple valve and reservoir, then, b) the brake cylinder with clevis, then, c) mounting the levers and rodding. Finally, I go back and, d) add the lever hangers, and finally, e) the chain and rod attached to the cylinder end of the brake lever. I find this way of doing it much easier for me than trying to add piping and all after the components are in place. See the photo below for the details of where each component is located.

5) Mount couplers of your choice. The boxes should be close to flush with the outside of each end.

6) I choose to use the kits resin corner steps, cleaning them up and gluing in place. If your equipment gets handled a lot, you should consider drilling the sills and adding metal stirrups at each corner. Remount the trucks temporarily to protect the details.

7) Now mount the ladders. I used some aftermarket parts, rather than what was supplied, since they appeared to fit better. Six-rung ladders go on the ends, seven-rung on the sides. The kit has ladder mounting bases, which makes this easier.



X26C underframes showing brake gear, B-end is to the right above, at left below.

8) Drill and mount the two bottom grabs on each end. I drilled at an angle up into the body, and mounted grabs on which I had bent each leg, rather than trying to drill straight in, and risk having the grabs rip out of the thin remaining resin under each grab. It appeared to be a sturdier solution.

9) Now drill for, and mount the right end grabs, on the brackets supplied.

10) Now add the doors, and door guide. The door guide was fashioned from .020" x .030" styrene strip, mounted on bases created from styrene blocks.

11) Now add door and end tack boards, the small grab iron on the Superior door and handles on all the doors, bent from wire. Use the photos for reference.

12) Now do the bracket grabs on the left side of the car side. The F&C kit has the bracket part of the grabs cast on, so just add pieces of .012" wire, cut to length across their tops.

13) Add "B" end details. The retainer can be mounted first, followed by its line, created from .010" wire. I cleaned up the brake housing chain and rod, which is mounted to the base of the brake wheel housing, and then mounted on the end. Create the brake step. I used a plastic brake step and the triangular brackets from the Tichy set, cemented to the end, centered on the brake housing. Finally, mount a fulcrum directly below the chain, and clip the end of the rod off so it can be cemented onto the tip of the fulcrum. Add the brake wheel.

14) I bent the cut levers from .012" wire, drilled for and added a ring bolt on the lower poling pocket tab. I prefer to add these after the car is painted and weathered to avoid gumming up the couplers as much as possible. I feed them through the eye and glue them to the bottom of the coupler box near its front edge with CA later.

15) Add the running board and corner grabs. I used a Kadee 40-foot walk, which has the laterals and grabs already mounted. I had to clip the mounting pins off the underside, and off the end diagonals, and then cemented it on with a dab of GOO on each mounting bracket.

Completed PRR X26c. Added-on detail parts clearly visible here compared to creamy resin color parts.

▲ Completed DT&I X26c. This car has the pre-war Youngstown door and Ajax brakewheel. ▼ Completed X26c leased to the DT&I with Bowser 2D-F12 leaf/coil spring trucks.

X26C in 8/50 and X29B in 10/55. (The variation in color rendition in printed photographs is clear here.) *(Jack Consoli collection)*

PAINTING, LETTERING, AND FINAL ASSEMBLY

I used photos of the cars above as my guide to painting and lettering. The basic car bodies were painted initially with a 2:1 mix of Floquil Oxide Red to (one of their many variants of) Caboose Red. The sides and ends were oversprayed with Testors Glosscote shortly after the color coats to provide a good surface for applying the decals.

For the benefit of those that have not read our back issues; From the "Instructions for Painting Freight Equipment Cars", dated January 13, 1953, reproduced from the Pennsylvania State Archives, we see that: *"Paint all metal parts with two coats of "Wet-on-Wet" Freight Car Paint, Acct. 47, Ref. 2383."* Except when the car was new and featured re-conditioned trucks, the trucks were *not* painted. Thus, I painted the trucks and wheelsets a brownish black.

For these cars, I used the decals provided in the kits. Microscale Micro-Sol was applied to get the decals to nestle down into the recesses. This was followed by a coat Testors Dullcote on the PRR car and a coat of Floquil Flat Finish (which is equivalent to a mixture of Dullcote and Glosscote) on the DT&I car to protect and blend the decals and provide a base for weathering. The difference here being that the PRR car was to represent a well weathered car whereas the DT&I car was freshly repainted.

WEATHERING

Since the DT&I car was to represent a month-old reshopped car, it received only a light dusting of brown/black weathering powders, overcoated again with the Floquil Flat finish. For the PRR Superior door car, I was torn as to which heavier weathering pattern to emulate, exhibited by the two rebuilt boxcars above.

I decided to try to replicate the rust and corrosion patterns on the right-hand photograph. First, panel lines and battens were highlighted with thinned burnt umber tube paint. The recessed parts of the roof panels were also given a heavy wash of this mix. This was followed by brushing of select parts of the car, especially the side panels, with a mixture of brick red, and medium rust weathering powders enough to create variations in the hue of the paint, and to blend the overall effects. I then gave the car a coat of Dullcote to fix these layers. To replicate the creeping rust patches on the car, I sprayed on a mixture of the new Scalecoat I flat roof brown with some flat engine black added. This required a delicate touch using a double-action airbrush. You must aim at the desired area, press down to start the airflow, then very, very carefully pull back to let some paint flow to get the noticeably light to darker faded patches. Even a slight over movement of the paint release valve will result in an immediate splotch of paint, which, if you are quick, can be mostly wiped away immediately and then blended over to disguise. You can guess how I know that. Once the rust patches were dry, I streaked more browns and black weathering powders vertically down the car sides to blend and replicate streaking from the patches. I add chalk marks using white colored pencils sharpened to a very fine point with a hobby knife. Another coat of Dullcote sealed the finish.

REFERENCES

- *Official Railway Equipment Register*; The Railway Equipment and Publication Co., NY, NY; various dates
- Photographs of PRR freight cars; Pennsylvania Railroad Technical and Historical Society collection.

Completed Superior door X26c with Kadee trucks representing the original USRA Andrews-type trucks.