

# FREIGHT CARS

• HISTORY • MODELING • NEWS

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**FREIGHT CARS JOURNAL**, Volume 7 No. 2 (Issue 34), April 30, 1990  
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— COVER PHOTO —

**WACX 151093** is part of a new series of phosphoric acid tank cars delivered to the Albright & Wilson Co. in October 1989. The cars were built by Trinity. [T. Cobb photo]

**Corrections**

- FCJ 30:8 Caption, bottom of page, HOKX 111130 is one of the many **caustic soda** tank cars . . . (not chlorine)  
 FCJ 32:28 Series is 70001-70025. (E.A. Neubauer)  
 FCJ 32:32 501-625 were built in 1948. 626-750 were built 5=6-50. (E.A. Neubauer)

**Notice**

Michael J. Christian wishes to inform those interested in Canadian railroading and modeling of the recently formed "CN LINES SIG". They cover the CN, GTW, CV, GTR and DW&P. Many of these cars appear in U.S. interchange service. The first newsletter "CN LINES" was issued on September 1, 1989. It has lots of photos, drawings and some very interesting articles on all aspects of the railroad. For more information contact Mr. Christian at 2488 Paige Janette Drive, Harvey, LA 70058.

**Research Requests**

Any Jordan Spreader fans out there? Hal Davidson, 5732 Biscayne Dr., Alexandria, VA 22303, is trying to locate Jordan Spreader 1950-60's stories, photos, especially operating manuals, and experiences. What was the basis for OMI-1305? You can call (703) 557-8868 days, too.

William Stanley, 523 S. Shannon, Van Wert, OH 45891, needs some help with photos of the vans from Micro Scale decal set #341. Especially the SFTT and Western Express vans.

Richard Girsch, 1270 Gerard Ave., Bronx, NY 10452, is interested in obtaining photos and/or painting diagrams of freight cars of the Georgia & Florida RR and the Kansas, Oklahoma and Gulf RR.

Patrick Murphy, 455 Iverson St., Rhinelander, WI 54501, is looking for information on freight cars used by the Duluth, Red Wing, Southern, a pre CGW line of the 1890s.

Hal Davidson, 5732 Biscayne Dr., Alexandria, VA 22303, is trying to locate stories, photos, or blueprints of the Maxon GE 375 ton Schnabel cars (GEX 40017 etc.) and the Union Pacific "Wing Cars" (UP 229580-229587) especially operating manuals, and interchange experiences. You can call 703-557-8868 days, too.

John B. Gwinn, 13230 Pandora, #1615, Dallas, TX 75238, is looking for information concerning the color of car and where to place lettering and numbers on the Lehigh Valley 12 wheel well-hole flat car. My modeling period is late Forties. Car number was 9955. Also need numbering and car color information for the B&LE sixteen wheel flat car, and where to place it.

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# **DOUBLE-DOOR TO SINGLE-DOOR: Gunderson's 1989 Box Car Conversions for the WCTU Railway**

*photos by David G. Casdorph*



*WCTR 66505 was formerly SSW 66505 a double sliding door 50'7" box car. In this photo one can easily see the result of the conversion by the newly painted areas.*



*A close-up of WCTR 66505's door area as viewed from the outside shows the area where the new 10-foot door replaced the former double 8-foot doors.*



*Close-up of the fill-in area to the right of the door. Note the angles at the top and bottom (reminds me of ACF's next-to-door panels).*



*WCTR 66481 viewed from the "A" end. Total number of conversions not presently known. But it looks like at least 80 have been converted so far. These come from a variety of SP and SSW double-door box car series.*



*This photo shows the inside door area of WCTR 67193.*

## RAILROADS

**ASHTABULA, CARSON AND JEFFERSON RR CO.** acquired some 50-foot boxes that were originally Virginia Central's (e.g. ACJR 2208, built 3-56, rebuilt 12-77 by FGE, nee VC 2208). This is the fourth set of reporting marks after the original VC 2208! [T. Hodun]

**ATCHISON, TOPEKA AND SANTA FE** has teamed up with one of America's largest motor common carriers, J.B. Hunt, to form what is now known as "Quantum" service. It's designed to ease billing and pick up and delivery service for intermodal customers. The first of the 48-foot long/102" wide trailers marked HSFZ and numbered in the 610000-series have been delivered by trailer builder Monon. The trailers have the new Quantum logo applied to the sides. [D.G. Casdorff]

**CANADIAN NATIONAL** New box cars are rare these days. So, this makes CN having one of the hottest news items this issue. CN is getting new built box cars from Canadian builder National Steel Car (sighted were CNIS 413577 and 413578). Build date 1-90. The cars have exterior post sides, non-terminating 5/5 ends and Youngstown design 10-foot plug doors. [T. Hodun]

**COPPER BASIN RAILWAY** added fifteen used Thrall Car built 4750-cuft covered hoppers. Numbers are CBRY 803300-803314. These are ex-MILW 803300-803314, exx-MNS 3300-3314, nee-PACY 76600 series. [C.W. Shaver]

**ILLINOIS CENTRAL** acquired fifty (50) former Southern Pacific RBL-refrigerator cars and numbered them IC 532800-532849. These are former SP class B-70-63 cars that originally came from the EFCX 3901-4400 series (remember the big Evergreen cars?). [C.W. Shaver]

**MARINETTE, TOMAHAWK & WESTERN RR CO.** has acquired twenty (20) Pullman-Standard 5344-cuft design box cars from an unconfirmed source. These were built in May, 1979, which would make them ex-CLP or ex-VTR via the ICG or someone like that. Numbers are now MTW 8051-8070. [C.W. Shaver]

**McCLOUD RIVER RR** has recently acquired a number of new built "Center Beam" lumber flat cars from Thrall Car (e.g. MR 30038 built 8-89, Thrall lot 577).

**MINNESOTA, DAKOTA AND WESTERN Rwy.** Irel Rail has converted a number of 60-foot/single 10-foot door box cars into 60-foot/double door (10-foot + 6-foot) box cars at their shops in Council Bluffs and Junction City during August through October 1989. The cars were former Burlington Northern and nee-ALM box cars. [D.G. Casdorff]

**MISSISSIPPI DELTA** has recently began operating some used box cars that are from the GTW 309700-309799 series, nee-NSL 101100-101199 (e.g. MSDR 194598 built 1-78 by USEX). [C.W. Shaver]

**NORFOLK SOUTHERN** A new series of 1,450 coal hoppers were added to the fleet in 1989. Series is NW 144000-145449, class H49. The cars were built by Trinity's Greenville Division and of a 3600 cuft design. Cars sighted so far range from 145312 to 145340 built in 12-89. Additional build dates and sightings needed to confirm if this is a single or multiple group series. [T. Hodun]

**PADUCAH & LOUISVILLE** has acquired at least a dozen used Thrall Car built 4750-cuft covered hoppers (e.g. PAL 803240 is ex-MILW 803240 and nee-PACY 3240). [C.W. Shaver]

**SOO LINE** has added a number of new triple-bay rotary coal hoppers that were built by Trinity's Greenville Division (e.g. SOO 62139 built 11-89). The cars are 100-ton, 4386 cuft, AAR HT hoppers painted black with white rotary ends. [M.B. Foley]

**SOUTHERN PACIFIC TRANSPORTATION** is receiving their third group of 125-ton Gunderson double stack container cars (e.g. SP 513438, 513439 etc. built 1-90 by Gunderson's Portland, OR plant). Southern Pacific class FC-320-3. [D.G. Casdorff]

**WASHINGTON CENTRAL RR.** The trade press reported that Southern Pacific was acquiring a number of gondolas. These have actually gone to WCRC (though they may be leased to the SP). There are two different "designs". One is the 3142 cuft gondolas with bulkheads and an IL of 64-4 (e.g. WCRC 3223, 3286 built 11 = 12-89 by Gunderson). The second is a non-bulkhead 3197 cuft/IL 65-6 version (e.g. WCRC 3024 + 3145 built 9 = 10-89). The cars are painted a similar shade of Southern Pacific brown with white lettering but have no stencilled marks indicating lease to SP. [D.G. Casdorff]

**WCTU RAILWAY.** Gunderson has been converting/rebuilding a number of former SP/SSW double door box cars from the B-70-67, -69, and -71 classes into single 10-foot door cars. Conversions apparently started about July or August 1989 and continued through November. WCTR numbers remain the same as the former SP/SSW numbers. [D.G. Casdorff]

**WISCONSIN CENTRAL** ordered two-hundred fifty 3000 cuft covered hoppers from Bethlehem Steel Car (these are similar to the recent N&W order). The first car, WC 84000, was out for inspection in January 1990. Series will be WC 84000-84249. [J.W. Kreider]

## PRIVATE OWNERS & LESSEES

**ACF INDUSTRIES** is adding some new-built pressure differential 5000 cuft covered hoppers to its fleet. The latest have PCIX reporting marks (e.g. PCIX 87040, built 10-89 at ACF's Milton, PA plant). [D.G. Casdorff]

**ADM TRANSPORTATION** is acquiring 100 more 25,500 gallon general service tank cars for its fleet. ADMX 25301-25400 was built by Trinity's Longview plant. Build date noted so far is January 1990. [C.W. Shaver]

**AIR PRODUCTS MFG.** have acquired a number of new built general-service 20,000 gallon, insulated, coiled tank cars for its fleet (e.g. APMX 4009-4013, built 12-89 by ACF MILT). These are stencilled for Dinitrotoluene (Di/nitro/tol-u-ene). [T. Hodun]

**ALBRIGHT & WILSON CO.** just received a number of phosphoric acid tank cars (e.g. WACX 151018, 151093) built by Trinity, Longview. The cars are class 111A100W1, 14,300 gallon, and have 6" foam insulation. Known build date, so far, 10-89. [T. Cobb]

**AMALGAMAIZE** is leasing some former Corn Sweeteners corn syrup tank cars from Union Tank car (e.g. UTLX 72466). Further, it appears as though there is a slightly new change in Amalgamaize's "Tru Sweet" logo. The former all yellow logo now has a touch of green and white in the center. [C.W. Shaver]

**AMOCO CHEMICAL CO.** added sixty (60) new-built tank cars built in June 1989 by Trinity, Longview. Series is AMCX 123001-123060. [D.G. Casdorff]

**ASHLAND CHEMICAL CO.** is leasing some new-built tank cars from General American Transportation for the transport of Maleic Anhydride (e.g. GATX 34446 built 12-88 by Trinity). These are 100-ton, insulated, coiled, lined, 20,400 gallon, calss 111A100W1 tank cars. [D.G. Casdorff]

**CARGILL** Additional corn syrup tank cars are being delivered from Trinity's Longview plant. The latest are initialed "CRGX" and have numbers above 4943 (and may range up to 5576). Tanks in this new block have build dates of 1 = 2-90 so far. [C.W. Shaver/D.G. Casdorff]

**CHICAGO FREIGHT CAR LEASING** has acquired one-hundred (100) new Thrall Car built 3000-cuft, 100-ton covered hoppers. These are numbered CRDX 9200-9299. This is a new design from Thrall Car which looks much like a shortened version of their 5800-cuft design. It has three large circular inlet hatches and is a two-bay car. Build dates on this series so far are 12-89. [C.W. Shaver]

**DETROIT EDISON** Acquired a total of 300 rotary coal gondolas last year (1989). The series are DEEX 5001-5152 (152 cars) and DEEX 8777-8924 (148 cars). Build dates for the two series range from June to August 1989. Cars are stencilled as having 4325 cuft capacity (see also FCJ 32:21).

**DOW CHEMICAL** More 5800-cuft covered hoppers continue to be added to Dow's leased freight car fleet (see also FCJ 32). Additional dates for the early 1989 built cars being leased from ACF Industries (e.g. ACFX 65759 built 4-89) and a new group being leased from ACF Industries (e.g. ACF 66802-67064 built 8 = 10-89 at ACF's Huntington, WV plant). [Ken Lehman/E.A. Neubauer]

Dow is leasing a number of new-built caustic soda tank cars from Union Tank Car (e.g. 600284 + 600350 built 5-89). These are 100 ton, 16,500 gallon, class 111A100W3 cars. [C.W. Shaver]

**E.I. DUPONT de NEMOURS & CO** recently began leasing 121 new built chlorine tanks from ACF Industries (e.g. ACFX 73578 + 73698, built 12-89 = 1-90 by ACF). [F. Hodun]

**GWILEASING CORP.** just acquired eighty-eight 3560 cuft ACF triple hopper Centerflows sometime in the last year or so. Series is GWIX 2000-2087. Previous reporting marks presently unknown. [T. Hodun]

**GEORGIA GULF CORPORATION (PLAQUEMINE DIV)** has acquired sixty (60) new Trinity (PSM BESS) "Poly Flo" covered hoppers to its fleet. These are 5851-cuft plastics cars built in 10-89. The cars are lined with Amercoat 320 and are (part) of lot 2077. [D.G. Casdorff]

**GEORGIA KAOLIN** Watch for ACFX cars that were formerly leased to Ontario Carbonate that are now being leased to Georgia Kaolin. [C.W. Shaver]

**ITEL RAIL CORPORTATION** added fifty (50) more cut-down (rebuilt) two bay cement hoppers (former Pullman-Standard built grain cars). The series PLCX 926-975 are the same as previous groups of cars in this program (all are 3148 cuft). PLCX 926-975 have a rebuild date of 12-89 sighted so far. [M.B. Foley]

**KERLEY ENTERPRISES** is leasing some new built 20,400 gallon tank cars from General American Transportation (e.g. GATX 37030, built 12-89 by Trinity, Longview). [T. Cobb]

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**B.F. GOODRICH** has received a new batch of ACF built 5800 cuft covered hoppers (e.g. BFGX 1750+1846, built 11-89 = 1-90). Series will probably be BFGX 1550-1929 when completed. Cars are bright medium blue with black lettering. [T. Hodun]

**HUBINGER COMPANY** is adding more corn syrup tank cars to its leased fleet. The newest are built by Trinity, Longview in December 1989 (e.g. GATX 4432 + 4446). These are 17,630 gallon tank cars similar to the Cargill order (see above). [T. Cobb]

**KAMA CORPORATION** has begun leasing a number of Trinity built "PolyFlo's" from General American Transportation (e.g. GACX 74019-74023, built 10-89 at Bessemer, Alabama). They are of the recent 5851 cuft design covered hoppers introduced by Trinity. [T. Hodun]

**MOBIL OIL** recently began leasing about two-hundred (200) new built 5800-cuft covered hoppers from ACF Industries (e.g. ACFX 67151-67350, built 11 = 12-89 by ACF HTG). These are the first known ACF 5800 cuft cars leased to Mobil. [E.A. Neubauer]

**MONSANTO COMPANY** is leasing new built tank cars for phosphorus transport from ACF Industries (e.g. ACFX 73357-73384, built 11 = 12-89 by ACF MILT). These are insulated, coiled, 13,400 gallon, class 111A1100W1 tank cars. [T. Hodun]

Monsanto is also leasing some 20,600 gallon general service, insulated, coiled tank cars from Union Tank Car (e.g. UTLX 641216 built 5-89 and lined with Hersite P403 by Trinity Railcar Repair, Paris, TN in 8-89).

GERSCO is leasing some 100-ton tank cars to Monsanto that were built by Trinity, Oklahoma City recently (e.g. NATX 37028, built 6-89). [D.G. Casdorff]

**OCCIDENTAL CHEMICAL** continues to add new tank cars at an astonishing rate! The latest are more new Chlorine tanks from builder ACF (e.g. HOKX 132584-132913 + , built 11 = 12-89). In addition, Occidental is leasing a number of new built tank cars for phosphorus transport (similar to Monsanto's) from ACF Industries (e.g. ACFX 73403-73438, built 12-89 = 1-90 by ACF). [T. Hodun]

Occidental's Agricultural Products Group is adding some new built molten sulphur tank cars to its fleet (e.g. OCCX 3001-3003 etc., built 12-89 by Gulf Railcar Inc.). These are 13,640 gallon, general service tank cars. [T. Cobb]

**OLIN CORPORATION** began leasing some new-built 100-ton, insulated, coiled, 20,500 gallon, toluene diisocyanate tank cars from Union Tank Car Co. (e.g. UTLX 641785 built 11-89 by Union Tank Car). [M.B. Foley]

**OXY PETROCHEMICALS INC.** has added just over 400 new Thrall Car built covered hoppers that are numbered ALAX 61000-61400. These are a new design from Thrall Car that look much like an enlarged version of their 5800-cuft design. These are the new 6100 cuft size. These are Thrall job 582 (built 8 = 10-89). [D.G. Casdorff/T. Cobb]

**QUANTUM CHEMICAL CO., USI DIVISION** is leasing nearly 500 new-built ACF Center Flow covered hoppers from ACF Industries. These 5400-cuft design cars are numbered ACFX 67581-68077 and have built dates of 11 = 12-89 reported so far. [C.W. Shaver/T. Hodun]

**TENNESSEE EASTMAN** is leasing some new built 100-ton general-service tank cars from Union Tank Car (e.g. UTLX 201174 built 10-89 by Union Tank Car and lined with Plasite 3070 at Rescar, Longview 12-89).

In addition, Eastman has acquired fifteen new 30,100 gallon tank cars in their own reporting marks (series: ETCX 30000-30014 built 10-89 by Union Tank Car). Stencilled "owned by Tennessee Eastman." [T. Cobb]

**TRAILER TRAIN** has begun receiving the new "all purpose spine cars" from builders Bethlehem Steel and Trinity. These are the new design and built dual purpose TOFC/COFC 5-unit articulated skeleton cars. Trailer Train has assigned "TTAX" reporting marks to these (formerly TTAX meant 89-foot all purpose flat, former TTAX cars have been changed to TTWX or similar reporting marks).

The cars are presently being placed into two distinct series according to builder. The TTAX 76000's are Trinity built. Series 76000-76199 have build dates of 11-89 = 1-90 so far. TTAX 78000-78199 are Bethlehem Steel Car built with build dates of 12-89 = 1-90 so far sighted. Though the cars are outwardly similar in design and function, these do represent two different designs.

The new TTAX cars are capable of carrying 20-foot containers on the A & B units but not on the C, D or E units. The Bethlehem built cars have ACF hitches and the Trinity built cars have Pullman-Standard design hitch. Trailer Train has also introduced two new classes with these cars. BAF 55 are the Bethlehem built cars and RAF 55 are the Trinity built cars.

Thrall Car started deliveries of their new 125-ton all 48-foot well version with 20-foot capability to Trailer Train. This latest version, designated TWG52b by Trailer Train, is capable of carrying 20's, 40's, 45's and 48's in each well. DTTX 72334 and 72360 are examples of this latest group that were built in 10-89 as part of Thrall Car's job 592. [D.G. Casdorff]

**U.S. RAIL SERVICES** In FCJ 32:25 we mentioned the new series of 500 plastics hoppers being acquired by U.S. Rail Services (TQEX 58001-58500). Build dates now range from 7-89 to 11-89 for this series built by Trinity's Fort Worth plant. [T. Hodun]

**VULCAN MATERIALS** has added sixty (60) new 3000 cuft covered hoppers built by Thrall Car. Build dates noted so far are 12-89 = 1-90. Series is UCLX 10201-10260. [C.W. Shaver]

**WESTERN FUELS ASSOCIATION** acquired one-hundred twenty (120) rotary coal gondolas from Bethlehem Steel (e.g. WFAX 89094 Built 7-89, 4000 cuft). Series is WFAX 89000-89119. [J. Hendricks]

**WINDSOR MINERALS** is leasing some NAHX 390000-series covered hoppers tht had been leased to A.E. Shultz Company. [C.W. Shaver]

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## **READING COVERED HOPPER CLASS LOc**

*text and drawing by Eric A. Neubauer*

Reading's first foray into covered hoppers began in 1931. Between then and 1937, 134 USRA twin hoppers were converted to class LOa covered hoppers. The next phase included 350 class LOb,c,d,e covered hoppers rebuilt from HT1 open hoppers. The story of these 350 cars began in 1922 when 2000 HT1 quadruple hoppers were built, followed by 2000 similar class HTn cars in 1924 and 1925. Reading and many other eastern roads seemed to have been quite committed to quadruple hoppers in the 1920's. By the end of the depression they had definitely fallen from favor on the Reading and Lehigh Valley. Rather than rehabilitate and modernize all class HT1 cars as quadruple hoppers, the Reading rebuilt 450 cars as twin covered hoppers, 100 of which were transferred to the Central of New Jersey. An additional 160 cars were changed to flat bottom for ore service. The Lehigh Valley converted many of their quads to covered hoppers or twin open hoppers.

The rebuilding carried out by the Reading in creating class LOb,c,d,e was extensive. The portions retained were the trucks, body bolster, sills and corner posts. Damaged parts were replaced, and other parts were reworked from material recovered from retired cars. Class LOb,c,d had Duryea cushion underframes, however the HT1 center sill, shortened at both ends, was still used. Super Diamond running boards were used on LOb,c. Those on LOb appear to be integrated with the roof sheets. They sit more directly on the roof and probably lack the slots found on LOc.

Class LOd,e differ from LOb,c in running boards and other small details.

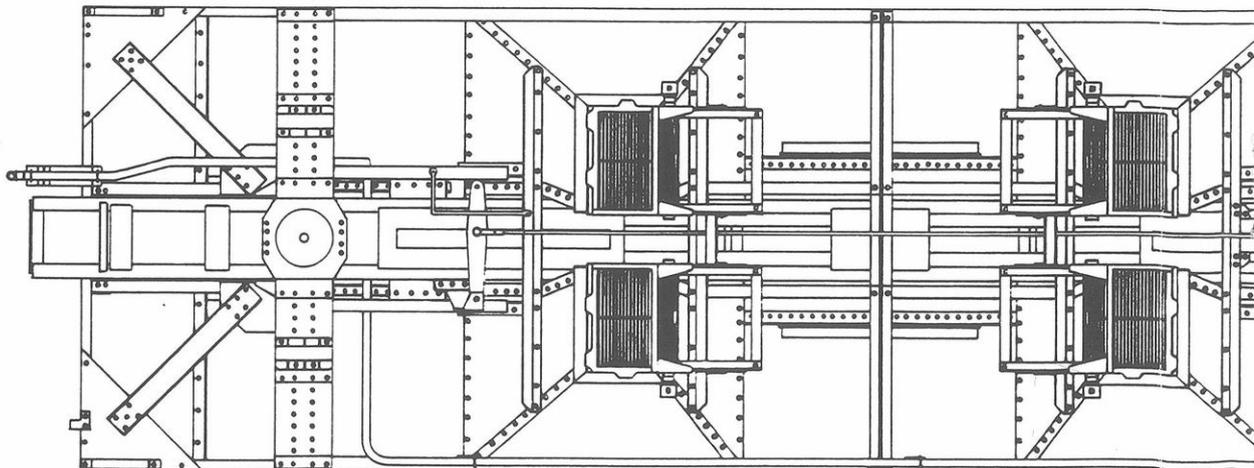
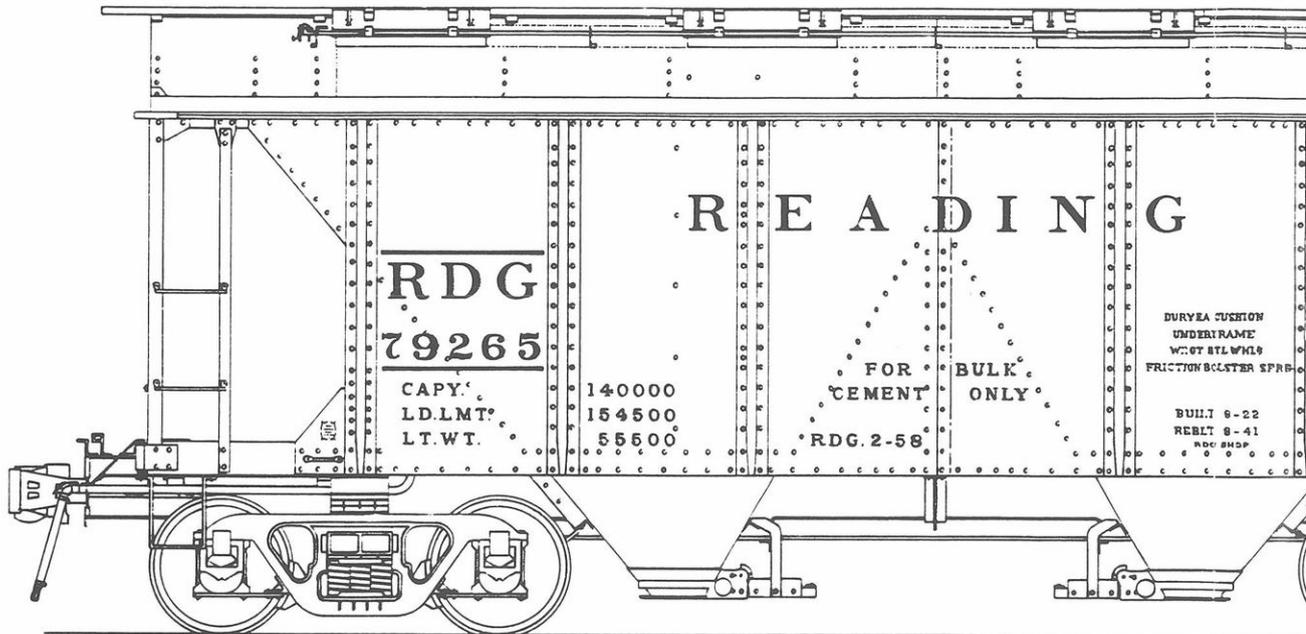
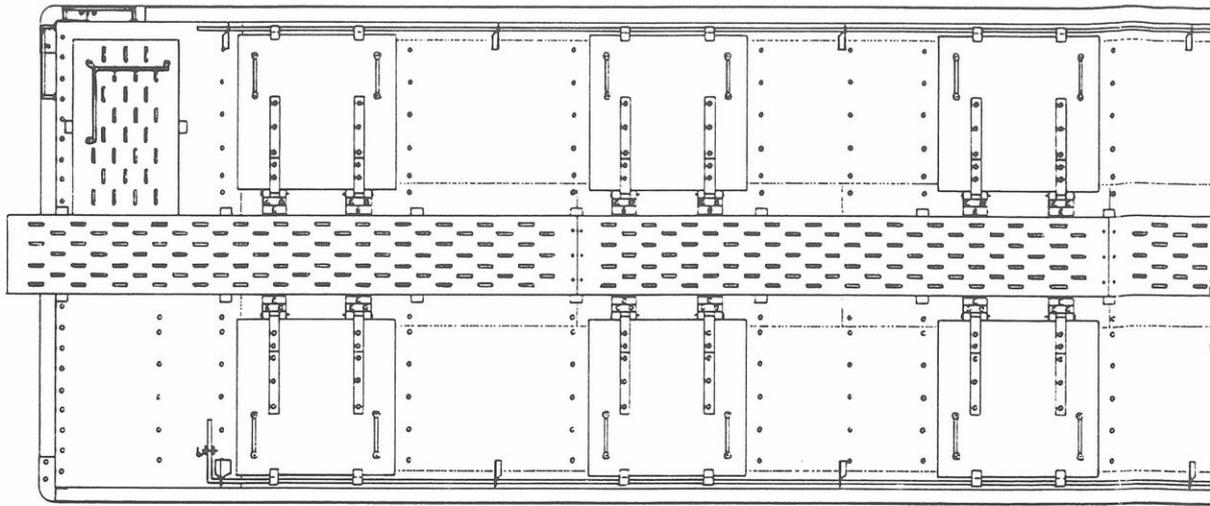
A summary of the classes follows:

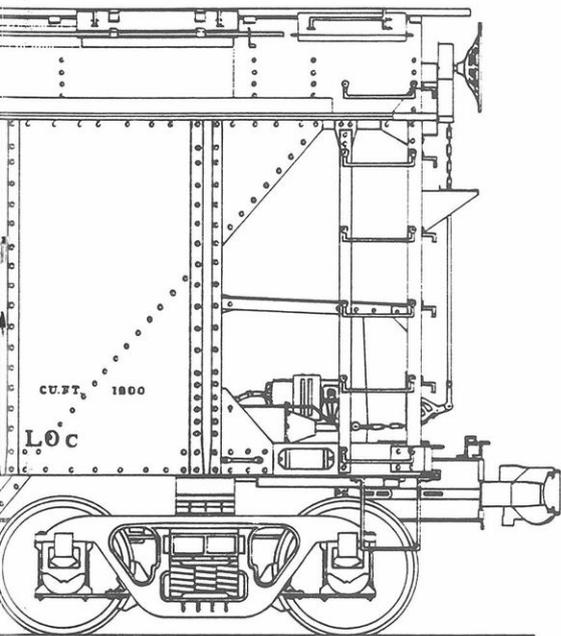
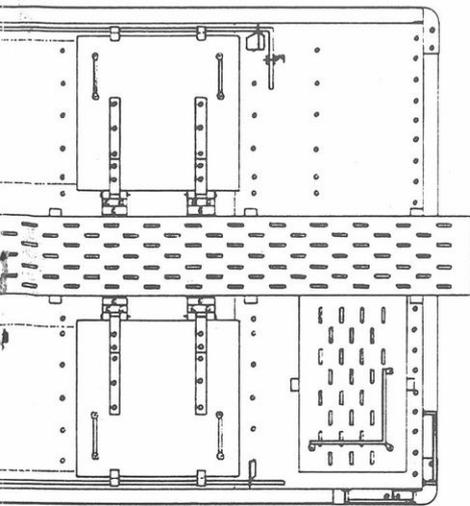
| <b>Year</b> | <b>Numbers</b> | <b>Class</b>                 |
|-------------|----------------|------------------------------|
| 1940        | 79200-79249    | LOb also CNJ 59000-59049     |
| 1941        | 79250-79299    | LOc also CNJ 59050-59099     |
| 1943        | 79300-79349    | LOd wood running boards      |
| 1948        | 79350-79449    | LOd Apex running boards      |
| 1950        | 79450-79549    | LOe conventional center sill |

As of January, 1965, only 7 Reading cars had been retired. After that, the total declined steadily until the last 3 cars were retired in 1975. These included 79262 which became HFC 10, and an LOe which became scale test car 91203, then CR 80023. HFC 10 was used in intraplant service in Hershey for a while, and then stored. It still exists and was recently donated to a historical society.

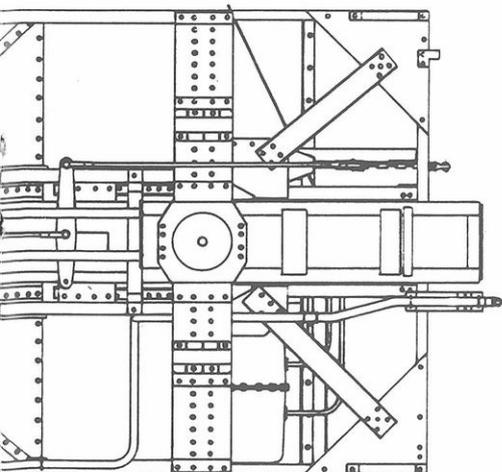
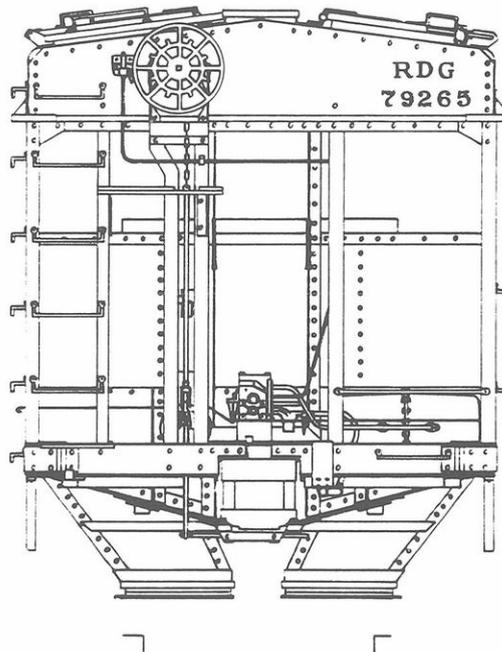
Company records indicate draft gear changes and center sill reinforcement on some cars. These were the only modifications made to these cars, and were not very extensive or efficacious.

Thanks is given to Hershey Foods Corporation for permission to measure HFC 10 on their property, and to John Kreider who helped arrange it.





E.A.NEUBAUER 10-89



# A HISTORY OF PNEUMATIC BRAKE EQUIPMENT FOR RAILROAD CARS 1869-1953

by Richard E. Fisher

*The following is a reprint of a presentation given to the Pneumatic Engineering Class in July, 1953. It was originally titled "A History of Pneumatic Brake Equipment for Railroads" and included locomotives as well. We have included both the freight car and passenger car sections with this article to provide continuity in the discussion.*

## **STRAIGHT AIR BRAKE**

When the speed and length of trains became too great for hand brakes to operate effectively in stopping trains, the straight air brake was invented. This invention by George Westinghouse in 1869 was one of the most important in railroad history. When the brakes were applied, compressed air from the locomotive was put into the brake pipe which ran through the cars of the train. This air acting on a piston in the brake cylinders brought the brake shoe against the wheel and retarded the motion of the train. This was originally used only on passenger trains but was later used in freight service also.

## **PLAIN AUTOMATIC AIR BRAKE**

As the length of trains increased above fifteen cars the effectiveness of the straight air brake was greatly reduced. This was due to the greater volume of air needed for the additional brake pipe and brake cylinders and the greater length of time for the application to travel to the rear cars. Another major fault of this brake was that if the brake pipe broke, all braking power was lost since the air would go to the atmosphere.

The first problem was solved by putting a triple valve and auxiliary reservoir on each car. The triple valve directed the flow of air from brake pipe to auxiliary reservoir, auxiliary reservoir to brake cylinder, or brake cylinder to exhaust. When the train was charged each car had air for its own brakes. The second problem was taken care of by putting air into the brake pipe in normal running and removing it when an application is made. Thus, if the brake pipe should break the pressure in it would reduce and the brakes would apply.

This equipment, which was introduced in 1872, was put on both passenger and freight cars.

## **QUICK ACTION AUTOMATIC AIR BRAKE**

As the trains became longer it was found in the Burlington Trials of 1886 that the plain triple valve was inadequate for the trains of fifty cars or more. The difficulty was that the serial action in emergency was too slow since all the brake pipe air was exhausted through the locomotive brake valve.

The quick action triple valve provided a passage for brake pipe air to flow to the brake cylinders in an emergency application. This gave a local venting of the brake pipe in emergency at each car which resulted in serial quick-action. Another important feature was the higher emergency brake cylinder pressure which was caused by dumping the brake pipe air into the brake cylinders. This equipment which was introduced in 1887 was used in both passenger and freight service. Originally it was called the quick-action triple valve but was later designated as the H-triple valve in freight equipment and P-triple valve in passenger equipment.

## **HIGH SPEED REDUCING VALVE**

As improvements were made in brake and motive power the speed of passenger trains kept increasing. At high speeds the coefficient of

friction between wheel and shoe is much less than at low speeds. Thus to get equal braking forces at all speeds the brake cylinder pressure had to be increased at high speeds.

In 1894 the high speed reducing valve was introduced and used with the P-triple valve. This device limited the service application pressure to a safe amount but let the emergency pressure build up higher and then reduce as the speed of the train reduced. Brake pipe pressure was increased from 70 psi to 110 psi with this equipment which was used only in passenger service.

## **K TRIPLE VALVE**

With the use of quick action brakes the length of trains increased year by year. In 1907 it became apparent that the serial action in service applications was too slow for the length of trains being operated.

The K triple valve incorporated a quick service feature which provided local venting of the brake pipe during service applications. As with quick action, which is used in emergency, the local reduction was passed from car to car to give a serial action. This valve also introduced uniform recharge and retarded release which charged the brake pipe and released the brakes at the same rate on all cars. This equipment was developed for freight service.

## **LN PASSENGER CAR BRAKE EQUIPMENT**

In 1907 an improved passenger car brake was introduced which combined the L triple valve and N brake cylinder. The improvements over previous passenger car equipment were: graduated release in which the brake cylinder pressure could be released in graduations; quick service which was introduced in the K freight brake; high brake cylinder pressure in emergency which was brought about by the use of a supplementary reservoir in addition to the auxiliary reservoir; and quick recharge where the emergency or supplementary reservoir is used to help recharge the auxiliary reservoir after a service application.

## **KL EMPTY AND LOAD**

In 1908 the KL equipment was introduced. It provided a double capacity brake with manual changeover for freight cars.

## **PC PASSENGER CAR BRAKE**

In 1909 the PC (Passenger Control) brake equipment was put into service on heavy passenger cars of 130,000 pounds or more. This valve was a control valve instead of a triple valve and started the passenger car trend in this direction. The new features of this valve were maintenance of brake cylinder pressure, automatic emergency upon depletion of brake pipe pressure, and full emergency braking power at any time.

## **UC PASSENGER CAR BRAKE**

The Universal Control (UC) equipment was made necessary on account of heavier cars, longer trains, higher speeds and faster schedules. This valve was introduced in 1913 to replace the PC brake which

was too complicated and expensive to maintain. It had more certainty and uniformity of service action, maximum service stability and release sensitiveness, improved quick recharge and graduated release, maximum practicable difference between service and emergency pressure, maximum emergency pressure in shortest possible time, separate service and emergency portions, and protection against low brake pipe pressure. It was later adopted for electro-pneumatic operation.

#### ***4-10-16 EMPTY AND LOAD EQUIPMENT***

About 1921 there was a trend for exceptionally heavy freight cars for carrying heavy loads. The 4-10-16 empty and load equipment which was used with the K triple valve was introduced to solve this problem. A four-inch piston was used to take up slack and a ten-inch piston was used to apply the force on an empty car. On a loaded car a sixteen-inch piston was also used to apply braking force.

#### ***AB FREIGHT CAR BRAKE***

As freight trains became longer, it was found that the K triple valve was not very effective with more than 75 cars. The AB valve was originally developed for 100 cars but before it went into service it was extended to 150 car trains. This equipment which was put into service in 1933 is the standard freight brake today. The new features include improved quick service where a minimum of 10 psi brake cylinder pressure is guaranteed, faster and more positive emergency transmission, emergency available at any time, separate service and emergency portions, and controlled emergency pressure build-up.

#### ***HSC EQUIPMENT WITH D-22 CONTROL VALVE***

In 1934 High Speed Control (HSC) was put into service with a new control valve, the D-22. This equipment was developed for high speed passenger trains. The D-22 has more refinements over the UC valve rather than radical changes. It has faster service and emergency transmission times, very flexible graduated release, and better dirt protection to insure longer life.

The complete HSC equipment includes electro-pneumatic straight air brake superimposed on automatic brake, speed governor control, and optional decelostat equipment. The electro-pneumatic brake is the most flexible of all brakes. The applications are transmitted by electric wires connecting the cars. The current operates the pneumatic application of brakes. The speed governor control automatically controls the brake cylinder pressure in proportion to the train speed. The decelostat

equipment releases brake cylinder pressure when the wheels start to slip.

#### ***AB-8 AND AB-10 EMPTY AND LOAD***

In 1935 empty and load equipment adaptable to the AB valve was put into service. The change-over from empty to load in this equipment was completely automatic. The AB-8 had 8-inch brake cylinders while the AB-10 had 10-inch brake cylinders and was used for heavier cars. Two brake cylinders were used on this equipment; one for empty cars and both for loaded cars.

#### ***AB-4-12***

This valve which is similar to the KD-4-12 is for very heavy freight cars. It has a 4-inch brake cylinder to take up slack in the brake rigging and a 12-inch cylinder to apply the braking force. This equipment was introduced in 1936 and is used with the AB valve.

#### ***AB-1-B***

As the railroads began running freight cars in high speed passenger service some modifications had to be made to the AB valve since freight and passenger train operation differed. The AB-1-B which was introduced about 1941 solved this problem by eliminating the three stage emergency brake cylinder build-up and connecting the signal pipe to the valve. A quick service valve was also used to give continuous quick service and a safety valve to limit brake cylinder pressure.

#### ***ABLC***

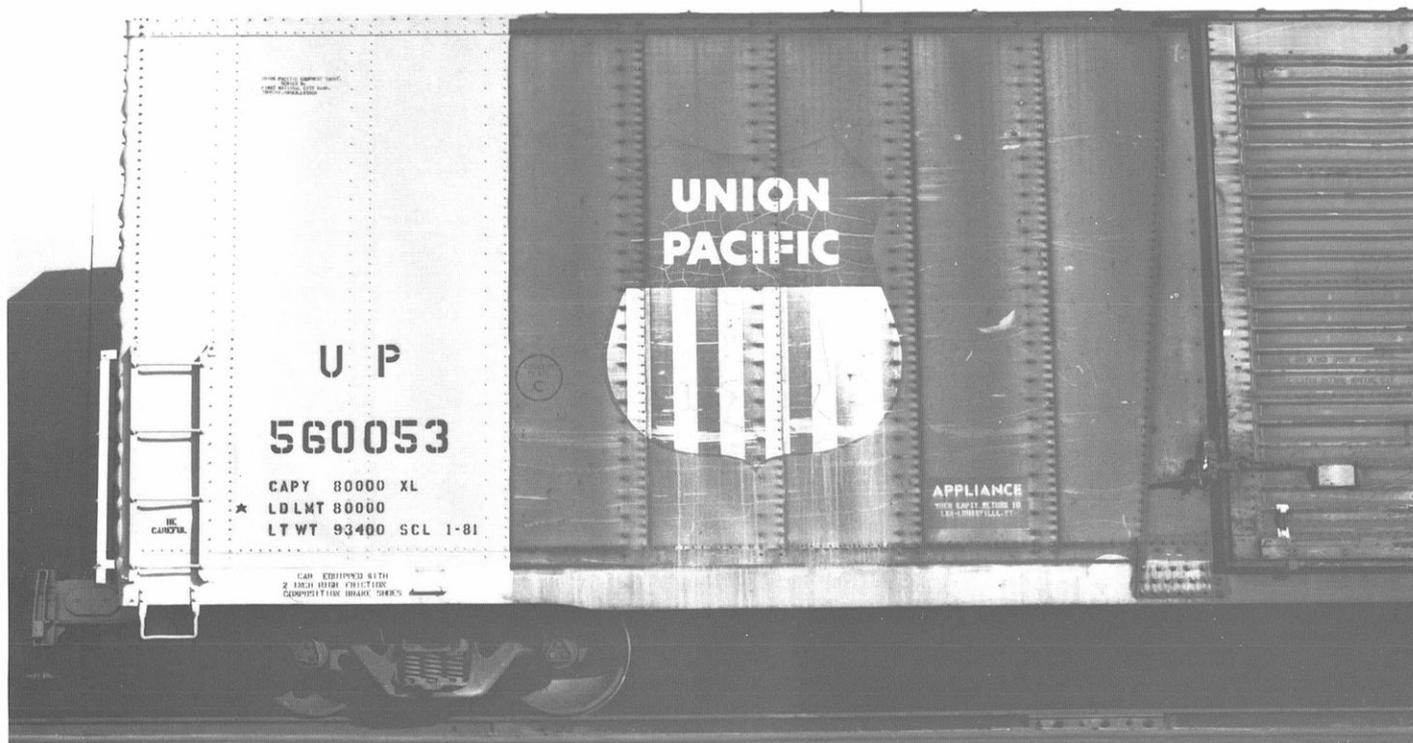
The ultimate in variable load braking was achieved in the ABLC (Load Compensating) brake but it was too complicated and expensive to maintain. It has a variable braking force in direct proportion of the load, whereas the previous empty and load equipment has only two positions — one for empty and one for load conditions. This equipment was put into service in about 1950.

#### ***ABMC***

The latest development in empty and load brake equipment is the ABMC which gives three different braking forces, depending on load, and uses one brake cylinder. This equipment which was introduced in 1953 is relatively simple and limits the braking ratio between 30% and 50% which is satisfactory for all practical purposes.

# FREIGHT CAR REPAIRS: Some Suggestions for Freight Car Individuality in Modeling

by David G. Casdorff



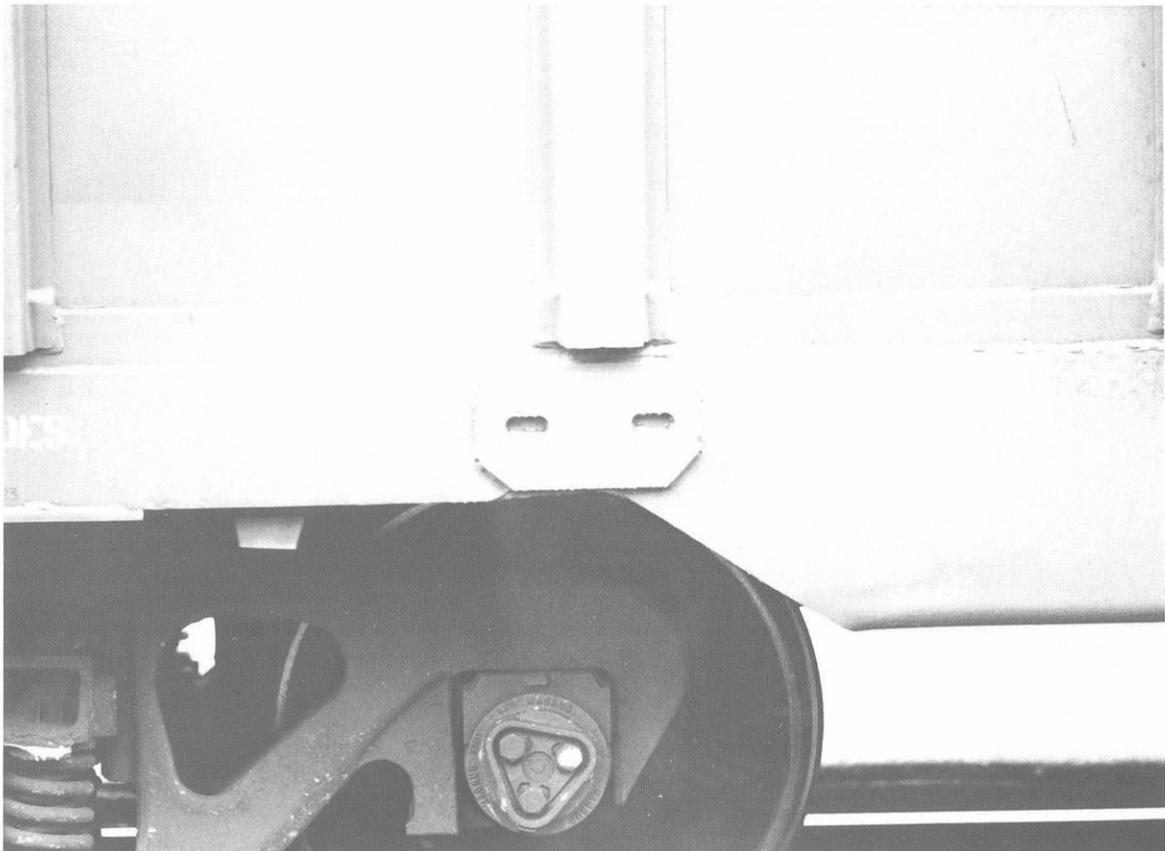
UP 560053 shows probably one of the easiest ways for modelers to “make that car unique.” In this case it’s a matter of just painting the left three panels and restencilling.



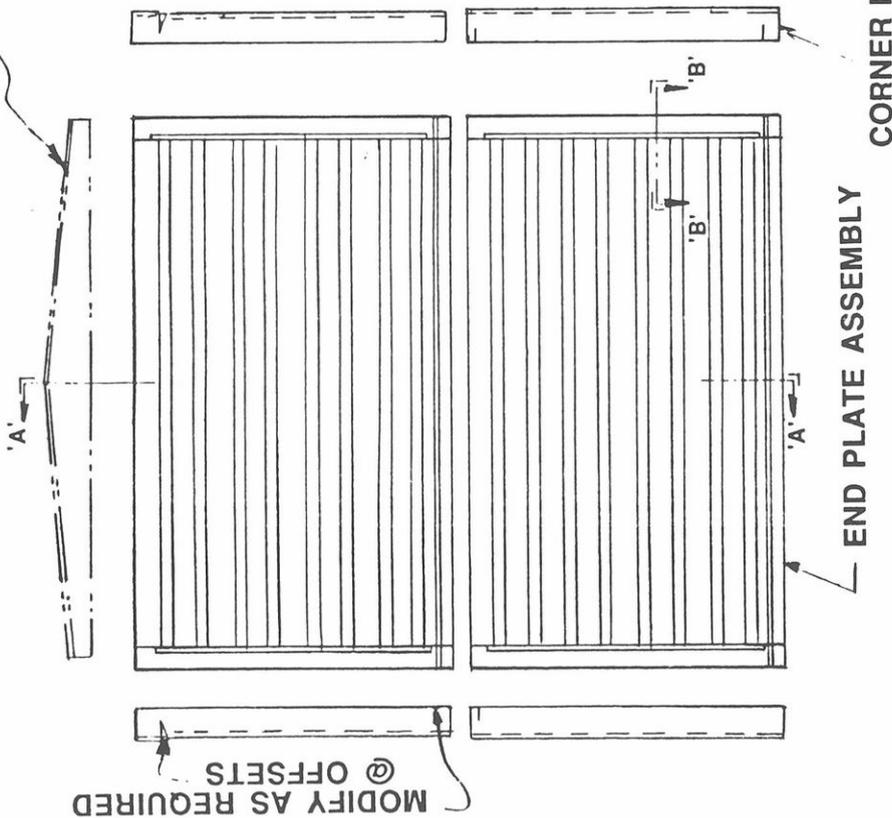
Interior post, double sheath, and insulated box cars often rust out or get punctured sheathing. Here is an example of repairs done to an RBL’s side sheathing. Note they are just rectangular patches welded on over the rusted or punctured area. The one on the left is about 4” wide by 12” tall, but they can be made for any size.



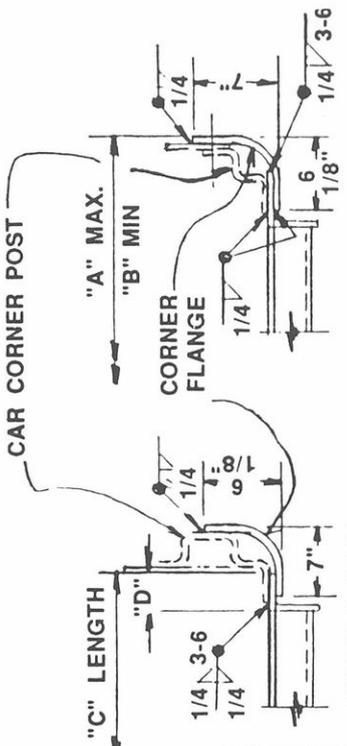
*One of the more common repairs occur along the side and center sills. The center sills aren't as noticeable to the average modeler, but the side sills are. Here are two photos showing a very common repair method on the side sill of an exterior rib box car. This can be simulated by using a thin sheet styrene cut to these patterns. Note the one above is six-sided and the one below is eight-sided. Use a small drill bit to make the initial hole and elongate slightly. Sizes vary according to side sill. Note how in both cases that the height is the same as the sill at that location.*



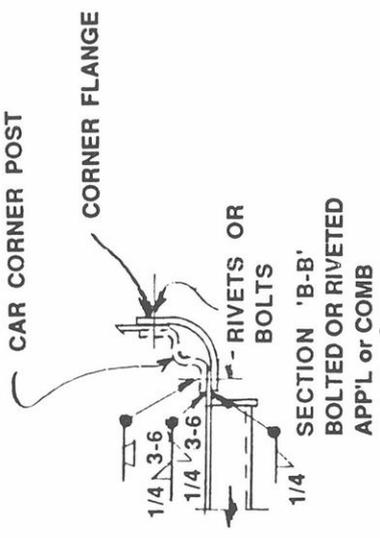
CUSTOMER TO FURNISH EXT'N (BURN EXT'N FROM EXISTING END OR FAB. NEW)



MODIFY AS REQUIRED @ OFFSETS



SECTION 'B-B' WELDED APPLICATION



SECTION 'B-B' BOLTED OR RIVETED APPL' or COMB

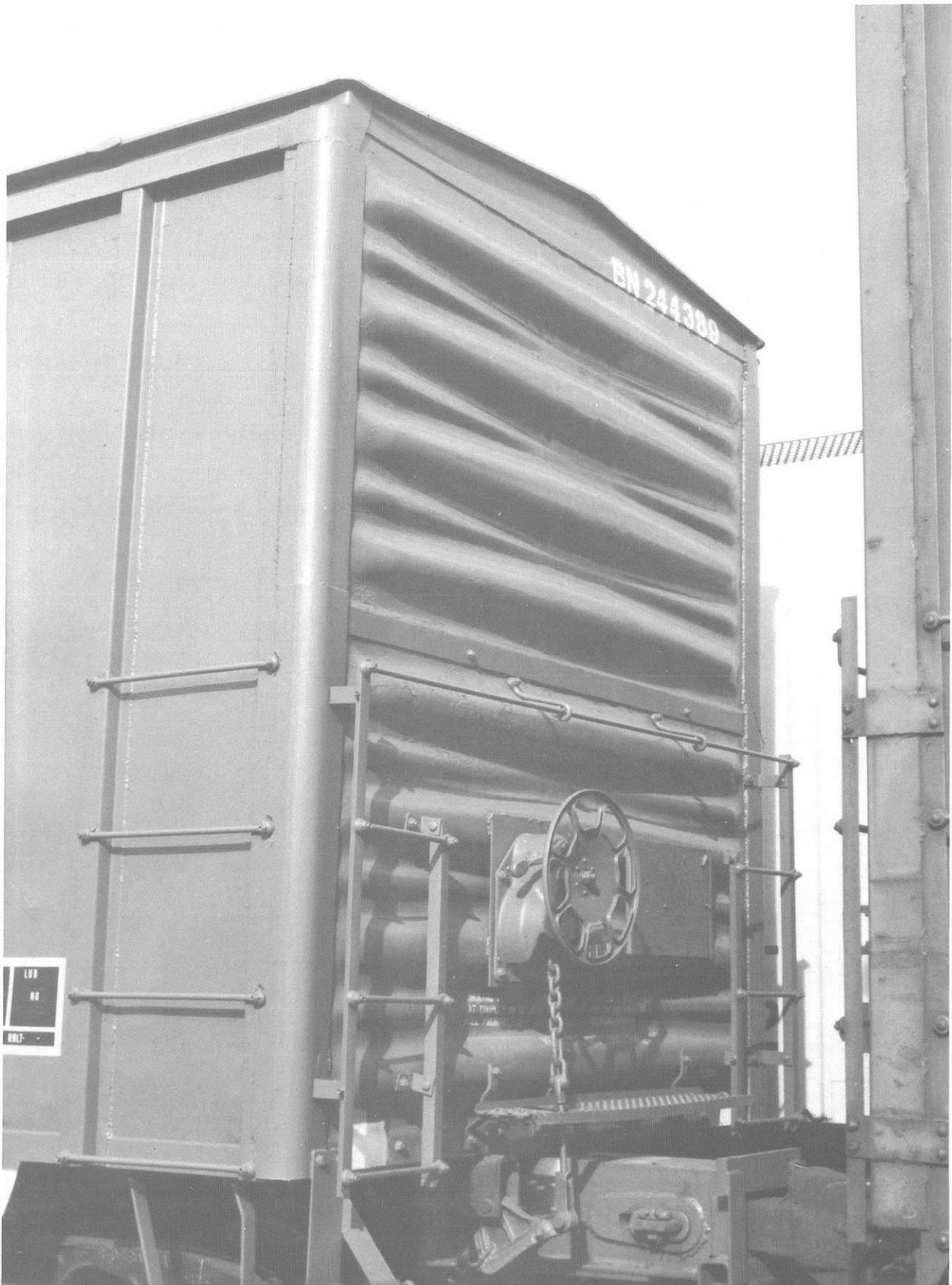


| KIT PART # | "A"        | "B"       | "C"   | "D" | "E"       | "F"     | "G"     | "H"    |
|------------|------------|-----------|-------|-----|-----------|---------|---------|--------|
| 1552-6     | 10'-2 1/4" | 9'-9 1/4" | 9'-3" | 3"  | 5'-9 1/4" | 11 3/8" | 12 7/8" | 1 1/4" |
| 1552-8     | 10'-2 1/4" | 9'-9 1/4" | 9'-3" | 3"  | 5'-4 1/4" | 11 3/8" | 7 7/8"  | 1 1/4" |

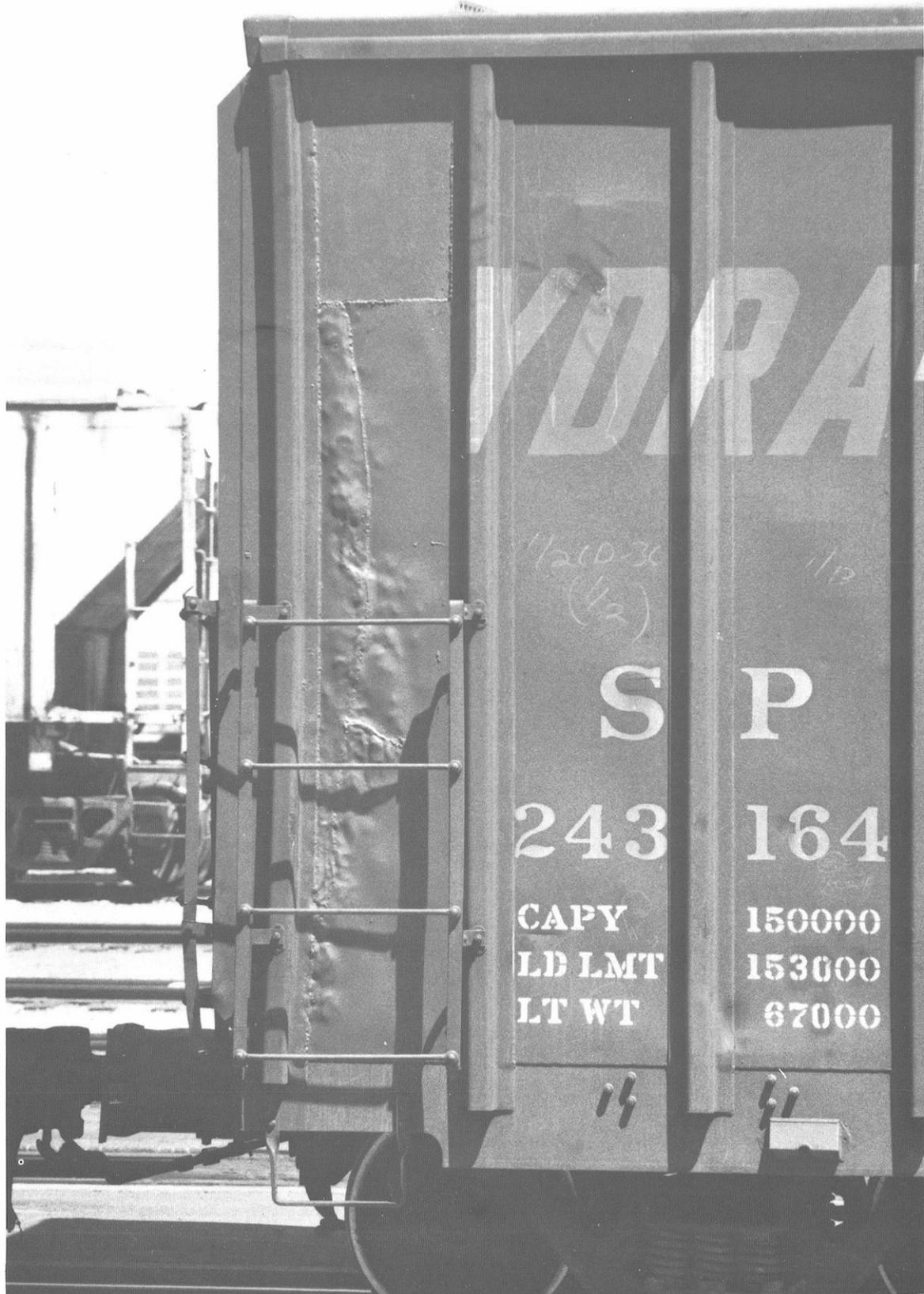
KIT PART NUMBER INCLUDES ONE END ASSEMBLY AND TWO CORNER FLANGES

NOTE: DO NOT SCALE DRAWING! DIMENSIONS GIVEN IN INCHES WITH TOLERANCES AS FOLLOWS UNLESS OTHERWISE INDICATED: FRACTIONS: ± 1/16" ANGLE: ± 1/2° DECIMALS: ± .005 FLATNESS: 1/16"

|   |                |
|---|----------------|
| RAILCAR SPECIALTIES, INC.                       |                |
| END REPLACEMENT INSTRUCTIONS FOR TERMINATED END |                |
| MATERIAL:                                       |                |
| DR: MRT   | SCALE: 11-7-88 |
| CH:   | DATE: 11-7-88  |
| DWG NO:   | GROUP: 121     |
| PIECE NO:                                       | B              |
|   | 1598           |



*The end of BN 244389 doesn't look too different until you notice the area where this former wrap-around end has been replaced with new corner pieces. Normally the end and corner is one piece. This may be actually a Railcar Specialties replacement end or a similar version (see Railcar Specialties instruction sheet).*



*SP 243164 has at one time apparently suffered from load shift, a disease fairly common to box cars. Usually one end gets buckled as a result. Here repairs have pounded some of the buckled area and cut out and replaced the more heavily damaged sections.*

# **EARLY APPLIANCE CAR DEVELOPMENT: Notes on Casdorff, "Sixty-foot Appliance Cars"**

**by Richard W. Dawson**

Having been involved in the design of several groups of 60-foot appliance box cars, I greatly enjoyed reading the article by David G. Casdorff on these cars in the October 1989 Railroad Model Craftsman, pages 82-87. Mr. Casdorff did an excellent job of describing their function and operation and of surveying the fleets of them acquired by various railroads. I would like to offer some additional information about these cars and a few corrections.

First the 480 Penn Central cars described as "secondary" appliance cars were in fact designed from the beginning for appliance service and should therefore be classed as "true" appliance cars. A bit of background information might be useful at this point. In the 1950's and early- to mid-1960's, household appliances were generally shipped in 40-foot box cars converted from general service cars and equipped with DF or SL belt rail and crossbar systems to prevent shifting of the load during movement and during yard impacts. As of the merger with the Pennsylvania in February of 1968, for example, the New York Central had at least 877 such cars in series NYC 83260-87729. These cars had several disadvantages for appliance service, however. As Mr. Casdorff points out, most appliances have a low ratio of weight to volume and these cars, with cubic capacities generally less than 4000 cubic feet, were unable to carry even half their load limits of about 120,000 lbs. The cars were not equipped with hydraulic cushioning and the DF and SL systems were not adequate by themselves to prevent damage during hump yard impacts.

The New York Central's marketing department in 1967 developed the concept of a 60-foot car designed specifically for appliances which would incorporate hydraulic cushioning and the high, almost flat roof contour utilized on 86-foot auto parts cars. The 86' high cube cars, although no higher than the 17'0" permitted by AAR Plate F clearances, exceed Plate F at the upper corners. A prototype appliance car was designed by the railroad and a single car ordered under NYC Lot 151-B (the Central used lot numbers rather than classes to keep track of its cars). The car was equipped with 20" travel sliding sill hydraulic cushioning and both with conventional DF belt rails and crossbars and with the new Evans Air-Pak bulkhead so as to determine whether the pneumatic bulkhead could adequately restrain the lading by itself. It had welded sides of inside post construction and single sliding doors with 10'0" wide clear door openings. The car was completed in March 1968 at Despatch Shops, Inc., a railroad subsidiary in East Rochester, New York, at which it built many of its new cars. Since the Central and Pennsylvania had merged by this time, the car was given the number PC 277058. The car was later renumbered to PC 278949 so as to fit into the number series occupied by the X64's and X64A's. To my knowledge, this was the first 60-foot box car designed specifically for appliance service.

When PC 277058 entered service, it proved to be highly successful. It was soon found that the pneumatic bulkheads and hydraulic cushioning could in fact restrain the lading satisfactorily by themselves and that the DF system was not necessary. A production order for 50 cars was placed for delivery later in 1968. These cars were to be built, however, at Samuel Rea Shop in Hollidaysburg, PA, part of the former Pennsylvania's Altoona Works complex. I was an Assistant Mechanical Engineer at the Penn Central's equipment engineering office at that time and was assigned to develop the design for these cars, which were to be classes X64. The Penn Central continued the Pennsylvania Railroad car class system for cars ordered after the merger.

Although the concept of the car was the same as the Lot 151-B prototype car except for the elimination of the belt rails and crossbars, the detailed design was based more on X62 60-foot auto parts cars for Fisher Body service. Like all cars built new at Sam Rea after the merger, the underframe material was fabricated at Altoona Steel Shop, but the superstructure material such as roof sheets, end sheets, side sheets, side posts, etc. was fabricated at East Rochester. Despatch Shops also fabricated all material for the smaller number of cars completed at East Rochester. The X64 sides were of riveted construction, rather than welded. The underframe had 20" travel sliding sill cushioning and was a common one used for all 60-foot box cars, suitable for use with either 70-ton or 100-ton trucks. Although 50-ton trucks would have been more than adequate from the standpoint of axle capacity, the high price of the infrequently-produced 50-ton roller bearing actually made a 50-ton truck more expensive than a 70-ton truck. In retrospect, it probably would have been preferable to set the stenciled capacity of the car to 80,000 lbs. or so and reduce the spring complement of the trucks, thereby providing a softer ride. Instead, however, the cars were rated at the full axle capacity which, with a gross rail load of 220,000 lbs. for 6"x11" axles and light weights generally around 87,000 lbs., gave load limits of about 133,000 lbs. The floor and end linings were wood and, since there were no belt rails, seven flat bar rub rails were provided on the sides. The cars were numbered PC 278950-278999 and were completed in December, 1968.

An additional 220 X64's were ordered as part of the 1969 new car program and were built immediately after the first 50 with no break in production. The construction of these cars was the same as for the first 50 except that they used Pullman doors instead of Youngstown doors. They were numbered PC 278729-278948 and were completed between December 1968 and March 1969.

The 79 cars in class X64A, series PC 278650-278728, were completed in December 1970 and were the last cars built new by the Penn Central Railroad in its own shops. Having sought protection in June under Section 77 of the bankruptcy laws, the railroad was unable to obtain financing for any additional cars built in its own shops beyond those already committed for. (It was, however, able to lease cars built by outside companies.) Except for a single gondola order built in Conrail, the X64A's were, so far as I know, the last cars built at the Altoona Works, a shop complex with a long and productive history in the manufacture of steam and electric locomotives and of freight and passenger cars. Before Despatch Shops in East Rochester closed permanently in March, 1970, the superstructure material was fabricated for the remainder of the 1970 new car program at Sam Rea. Among this was 79 carsets of material for X62B auto parts box cars. It was later decided that 79 appliance cars were more needed than auto parts cars and the production orders were changed accordingly. This created the problem of how to utilize side and end material that had been produced for a car 18" lower in height and with a six-foot wider door opening. The side sheets and side posts were lengthened by butt welding extensions onto their bottom edges and the roof material could be used without change. It was decided, however, to use new door posts, corner posts and end sheets rather than compromise the structural integrity of these critical components. The X64A's also differed from the X64's in several respects that were not related to the use of the X62B material. Nailable steel flooring was used in place of wood and the plywood end lining of the X64's was replaced by flat steel. Body

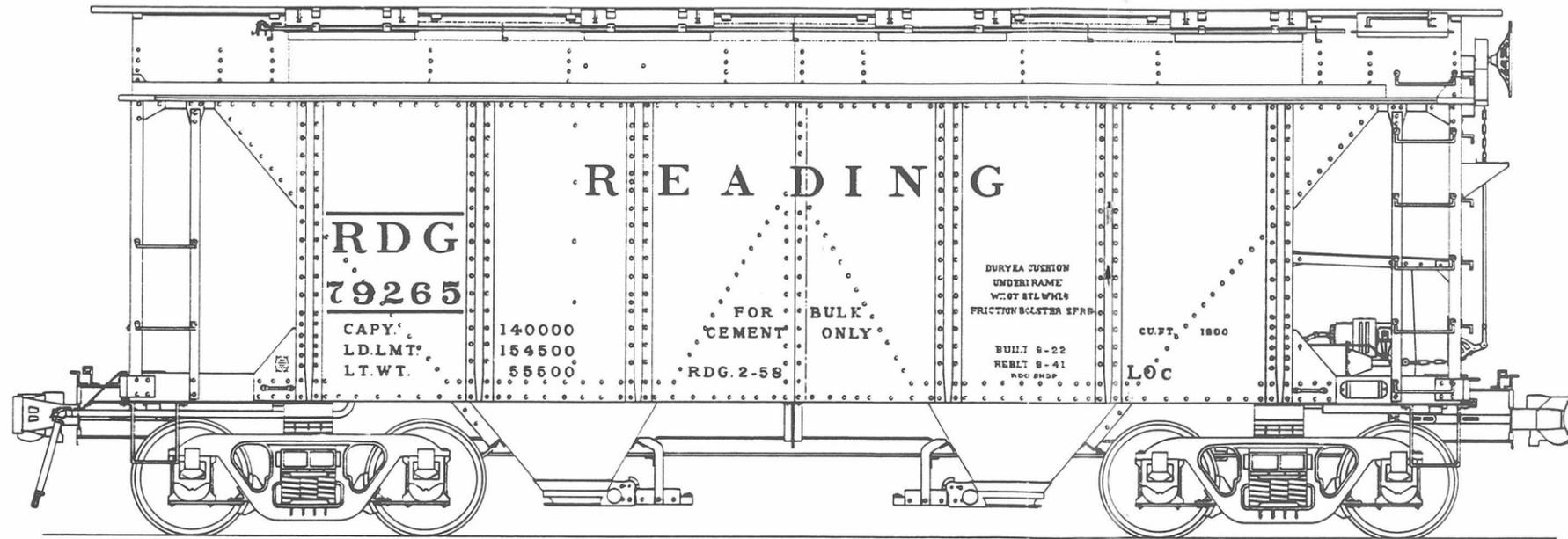
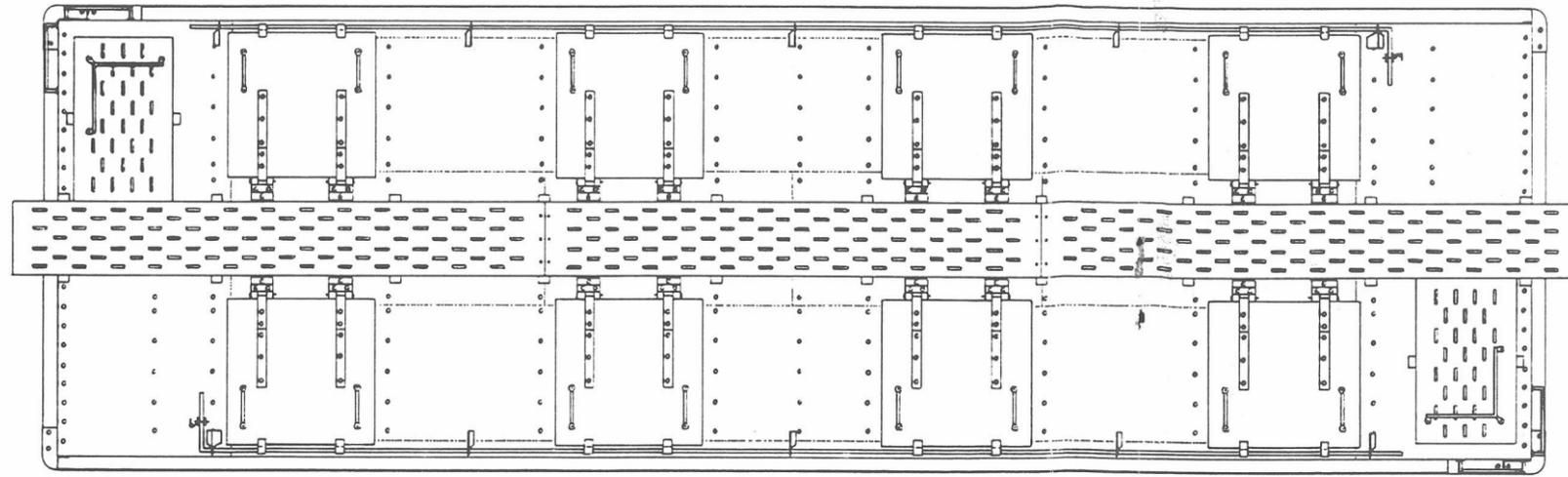
mounted brake rigging, as can be seen in the photo of CR 216722 on page 86 of the article, also replaced Wabcopac truck mounted brakes.

The last appliance cars acquired by Penn Central were 130 class X77 cars in series PC 278045-278174. These cars were built by Berwick Forge & Fabricating in February and March of 1973 under Berwick Lot 17300-1. Like the X64S's, they were inside-post cars with sliding sill hydraulic cushioning, nailable steel flooring, flat steel end lining and pneumatic bulkheads. They differed, however, in having welded sides and non-terminating ends. The ends, although similar in some respects to Pullman's non-terminating end, were designed and produced by Berwick Forge. The attachment to the end side sheets is by Huck bolts and not rivets. As noted in the tabulation, many of the ex-Penn Central appliance cars are being renumbered from the CR 278000 series to the CR 216000 series, which reflects removal of the pneumatic bulkheads and their reclassification from XL to XP. Berwick built 15 similar cars in a tack-on order for the Rock Island under Lot 17800 and 20 for the Illinois Central Gulf under Lot 17900. These cars were presumably built shortly before or after the Penn Central cars. Although I no longer have access to Berwick's records for the road numbers originally applied to these cars, comparison of a builder's photo with the October, 1977 Official Railway Equipment Register leads me to conclude that the ICG cars were in series ICG 660213-660232. The Rock Island cars appear to have been built in series RI 32550-32564 as listed by Mr. Casdorff. All the above cars were designed and built specifically for appliance service.

After a few years at Trailer Train, I joined Berwick Forge in March of 1977 to head up their engineering department and stayed until Berwick ceased freight car production in 1984. In addition to the three lots described above, Berwick also built several groups of cars which may very well have been intended for appliance service. 53 60-foot cars were built for the Southern Railway in the late 1960's with Plate F clearances, 30" travel cushioning, 10'0" sliding doors and movable bulkheads

under Lot 9879. These are probably SOU 43647-43699 as listed by Mr. Casdorff. The next car lot, 9916, consisted of 25 60-foot cars built for the Cotton Belt with Plate F clearances, 20" travel cushioning, 10'0" sliding doors, movable bulkheads and rub rails. These may also have been appliance cars. Lot 11300 consisted of 29 60-foot cars for the Norfolk & Western and were described in the list similarly to the SSW cars. These are probably N&W 602000-602028 in the author's listing. The 1-70 construction date listed would be about right. Berwick later built three groups of cars that definitely were intended for appliance service. The first of these is the 165 cars in Lots 17300-1, 17800 and 17900 described above.

Another group of three lots were built in 1976. 40 cars were built under Lot 33600 for the Louisville & Nashville, 30 cars under Lot 33700 for the Rock Island and 5 cars under Lot 22800 for the Missouri Pacific. These cars differed considerably from previous Berwick appliance cars, however. The sides were of outside post construction rather than inside post, 15" travel end-of-car cushioning was used in place of 20" sliding sill and 1/4" flat steel was used instead of 1 1/4" nailable steel flooring, thereby gaining another 1 1/2" of inside height without increasing the outside dimensions. The L&N cars were in series L&N 410160-410199 and the Rock Island cars appear to have been ROCK 532565-532594. I cannot isolate the five MP cars from the Equipment Register listing. Note that the Equipment Register listing for ROCK 532565-532594 incorrectly describes them as being essentially the same as RI 32550-32564, which they definitely are not. I believe this answers the question raised by Mr. Casdorff in Note 2 to Table 1. The last group of Berwick appliance cars was another 40 cars for the L&N, series L&N 410200-410239, built under Lot 35300 in 1977. These cars were the same as the Lot 33600 cars except for a few minor differences — a new engineer after all has to make his presence known and tinker with existing designs even if those designs are perfectly satisfactory.



E.A.NEUBAUER 10-89

