

# Modeling the Great Northern Mid-1950s Freight Car Roster

## 40' Boxcars – Part 2

RICHARD REMIARZ MMR®

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# Acknowledgements

- ▶ Special thanks to
  - ▶ Duane Amdahl
  - ▶ Staffan Ehnborn
  - ▶ John Hill
  - ▶ Stuart Holmquist
  - ▶ Bob Kelly
  - ▶ Norm Priebe
  - ▶ Jim Ruffing
  - ▶ John Westley
- ▶ Great Northern Railway Historical Society Archives
- ▶ Northern Pacific Railway Historical Association Archives
- ▶ Bob's Photos
- ▶ Charles Houser Collection
- ▶ Illinois Railroad Museum
- ▶ Mainline Photos
- ▶ Stan Styles Collection



# Great Northern July 1, 1956 Freight Car Roster

Great Northern Railway Co.

## List of Equipment

No. 36

ISSUED

JULY 1st, 1956

A. W. CAMPBELL

General Superintendent Transportation

W. C. PRESTON

Ass't General Sup't. Transportation

J. L. ROBSON

Chief Mechanical Officer

R.T. MEYERS

914 G.N. BLDG

RAILROADER PRINTING HOUSE

### FREIGHT EQUIPMENT

#### Box Cars—40 Ft.

	Numbers		Inside	Dimensions	Cubic	Lbs.	No.
	From	To	L.	W.	H.	Capa-	of
			ft. in.	ft. in.	ft. in.	city	Cars
.....	2500 <sup>R1</sup>		40 6	9 2	10 0	3727 100000	1
.....	2501	2549				(See Passenger Equipment)	
.....	2600	2649				(See Passenger Equipment)	
(15 ft. Staggered Doors).....	3000	3499	40 6	9 2	10 6	3890 100000	500
(12 ft. Staggered Doors).....	* 3500	3999 <sup>R1</sup>	40 6	9 4	10 6	3851 100000	500
.....	5000	5499	40 6	9 2	10 6	3900 100000	500
.....	9000	9999	40 0	8 7	7 10	2689 80000	62
.....	10000	10899	40 6	9 2	10 0	3727 100000	887
.....	10900	11874	40 6	9 2	10 0	3715 100000	963
.....	18000	18499	40 6	9 2	10 0	3715 100000	498
.....	18500	19499	40 6	9 2	10 2	3775 100000	991
.....	19500	20499	40 6	9 2	10 2	3775 100000	992
.....	20500	21449	40 6	9 2	10 6	3900 100000	949
.....	21450	21939	40 6	9 2	10 6	3900 100000	490
Compartmentizer (Roller Bearing Trks).....	21940	21949	40 6	9 2	10 6	3900 100000	10
Cushion Underframe	21950	21964	40 6	9 2	10 6	3900 100000	15
.....	28494	28993	40 6	8 6	9 0	3098 80000	1188
.....	28000	28499	40 0	8 7	7 10	2689 80000	13
.....	30000	30599	40 6	8 6	9 0	3098 100000	560
.....	31000	31499	40 6	8 6	9 0	3098 100000	474
.....	32000	32999	40 6	9 2	10 0	3769 100000	999
.....	38000	38499	40 6	9 0	10 0	3645 80000	7
.....	44025	44999	40 6	9 2	10 0	3727 100000	959
.....	45000	52999	40 6	9 2	10 0	3712 100000	6791
Total—18,349 Cars							

#### Box Cars—50 Ft.

.....	28975	29999	50 6	9 2	10 0	4629 100000	255
(15 ft. Staggered Doors).....	*35050	35399 <sup>R2</sup>	50 6	9 4	10 6	4947 100000	350
(15 ft. Staggered Doors and End Doors).....	*35400	35499	50 5	9 4	10 6	4941 100000	100
.....	38900	38999	50 6	9 2	10 0	4629 140000	93
(8 ft. Doors).....	39000	39339	50 6	9 2	10 1	4681 100000	316
("DF" Loaders).....	39340	39371	50 6	9 0	10 1	4614 100000	32
(15 ft. Staggered Doors).....	40000	40099	50 6	9 2	10 1	4681 100000	99
(15 ft. Staggered Doors).....	40100	40299	50 6	9 2	10 6	4866 100000	150
(12 ft. Double Doors).....	41525	41999	50 0	9 2	10 0	4583 100000	475
.....	42000	42899	50 0	9 2	10 0	4583 100000	842
(10 ft. Staggered Doors).....	42900	42999	50 0	9 2	10 0	4583 100000	93
(12 ft. Staggered Doors).....	43500	43899	50 6	9 2	10 0	4629 100000	384
(12 ft. Staggered Doors).....	43900	43999	50 6	9 2	10 0	4629 100000	95
Total—3,284 Cars							

Note: <sup>R1</sup>—Cars 3900 to 3999 only have roller bearings.

<sup>R2</sup>—Cars 35300 to 35399 only have roller bearings.

\*—On order 1956 delivery.

# Great Northern July 1, 1956 Freight Car Roster

From	To	# cars	length	height	notes	model	# models
40' boxcars							
2500	2500	1	40' 6"	10' 0"	Roller bearings		0
3000	3499	500	40' 6"	10' 6"	1955 double door		3
3500	3999	500	40' 6"	10' 6"	1956 double door	Accurail (McKean) model modified	3
5000	5499	500	40' 6"	10' 6"	1955	Rapido	3
9000	9999	62	40' 0"	7' 10"	1925 truss rod wood car w/ Murphy ends	Westerfield	0
10000	10499	887	40' 6"	10' 0"	1945 plywood sheathed	Intermountain	5
10500	10899		40' 6"	10' 0"	1947	Sunshine	
10900	11874		40' 6"	10' 0"	1948 12 panel 10' IH	Intermountain	
18000	18499	498	40' 6"	10' 0"	1949		3
18500	19499	991	40' 6"	10' 2"	1949 12 panel 10' 2" IH		6
19500	20499	992	40' 6"	10' 2"	1951		6
20500	21449	949	40' 6"	10' 6"	1952	C&BT	5
21450	21939	490	40' 6"	10' 6"	1953	Rapido	3
21940	21949	10	40' 6"	10' 6"	Compartmentizer		0
21950	21964	15	40' 6"	10' 6"	Cushion underframe	PS-1 Intermountain	0
23494	24993	1188	40' 6"	9' 0"	1919 USRA double sheathed	Accurail, Westerfield	7
24994	25993		40' 6"	9' 0"	1923 USRA double sheathed clone w/ 7/8 murphy ends		
28000	28499		40' 0"	7' 10"	1928 truss rod wood car w/ dreadnaught ends	Westerfield	
30000	30599	560	40' 6"	9' 0"	1924/25 USRA double sheathed clone w/ murphy ends	Sunshine	0
31000	31499	474	40' 6"	9' 0"	1927 single sheathed wood car	Andy Carlson resin kit, Sunshine	3
32000	32574	999	40' 6"	10' 0"	rbldt 1954 plywood sheathed rebuild of wood sheathed cars		6
32575	32999		40' 6"	10' 0"	rbldt 1955		
38000	38499	7	40' 6"	10' 0"	1923 Double sheathed w/murphy ends		0
44025	44399	959	40' 6"	10' 0"	1944 plywood sheathed	Sunshine	5
44400	44999		40' 6"	10' 0"	1944		
45000	46999	6791	40' 6"	10' 0"	1942 wood sheathed	Sunshine	39
47000	48999		40' 6"	10' 0"	1941		
49000	49999		40' 6"	10' 0"	1940		
50000	50999		40' 6"	10' 0"	1937		
51000	51999		40' 6"	10' 0"	1939		
52000	52999		40' 6"	10' 0"	1940		
		18349					105
50' boxcars							
28975	29999	255	50' 6"	10' 0"			1
35050	35399	350	50' 6"	10' 6"	1956 15' staggered doors	Branchline	2
35400	35499	100	50' 6"	10' 6"	1956 15' staggered doors and end doors		1
38900	38999	93	50' 6"	10' 0"			1
39000	39339	316	50' 6"	10' 1"	rbldt 1954 8' doors - steel sides on outside braced wood boxcars		2
39340	39371	32	50' 6"	10' 1"	DF loaders		0
40000	40099	99	50' 6"	10' 1"	15' staggered doors		1
40100	40299	150	50' 6"	10' 6"	15' staggered doors		1
41525	41999	475	50' 0"	10' 0"	12' double doors		3
42000	42899	842	50' 0"	10' 0"	1925 outside braced wood	Westerfield 2852	5
42900	42999	93	50' 0"	10' 0"	10' staggered doors	Westerfield 2804	1
43500	43899	384	50' 6"	10' 0"	12' staggered doors		2
43900	43999	95	50' 6"	10' 0"	12' staggered doors		1
		3284					19
Evans Auto Cars							
38700	38799	100	40' 6"	10' 6"	14' staggered doors - plywood sheathed		1
38800	38849	50	50' 6"	10' 6"	15' staggered doors		0
35000	35049	50	50' 6"	10' 6"	15' staggered doors		0
		200					1

From	To	# cars	length	height	
40' boxcars					
2500	2500	1	40' 6"	10' 0"	
3000	3499	500	40' 6"	10' 6"	1955
3500	3999	500	40' 6"	10' 6"	1956
5000	5499	500	40' 6"	10' 6"	1955
9000	9999	62	40' 0"	7' 10"	1925
10000	10499	887	40' 6"	10' 0"	1945
10500	10899		40' 6"	10' 0"	1947
10900	11874	963	40' 6"	10' 0"	1948
18000	18499	498	40' 6"	10' 0"	1949
18500	19499	991	40' 6"	10' 2"	1949
19500	20499	992	40' 6"	10' 2"	1951
20500	21449	949	40' 6"	10' 6"	1952
21450	21939	490	40' 6"	10' 6"	1953
21940	21949	10	40' 6"	10' 6"	1953
21950	21964	15	40' 6"	10' 6"	1954
23494	24993	1188	40' 6"	9' 0"	1919
24994	25993		40' 6"	9' 0"	1923
28000	28499	13	40' 0"	7' 10"	1928
30000	30599	560	40' 6"	9' 0"	1924/25
31000	31499	474	40' 6"	9' 0"	1927
32000	32574	999	40' 6"	10' 0"	rbldt 1954
32575	32999		40' 6"	10' 0"	rbldt 1955
38000	38499	7	40' 6"	10' 0"	1923
44025	44399	959	40' 6"	10' 0"	1944
44400	44999		40' 6"	10' 0"	1944
45000	46999	6791	40' 6"	10' 0"	1942
47000	48999		40' 6"	10' 0"	1941
49000	49999		40' 6"	10' 0"	1940
50000	50999		40' 6"	10' 0"	1937
51000	51999		40' 6"	10' 0"	1939
52000	52999		40' 6"	10' 0"	1940
		18349			



# GN 20500-21449 40' Boxcars

- ▶ Built by the GN St. Cloud Car Shops in 1952
  - ▶ Underframe by Pressed Steel Car Co.
- ▶ 949 cars on the roster on 7/1/1956
- ▶ 10' 6" IH
- ▶ Diagonal panel roofs
- ▶ 1-3-4 Improved dreadnaught ends
- ▶ Universal hand brake



S Holmquist Collection, GNRHS Archives

6' wide door opening  
5-panel Superior door

Built by G.N.Ry.-1952  
Underframe by Pr.St.Car Co.

40'-6" BOX CAR Nos. 20500 to 21449  
(All Welded Underframe and Riveted Side Frames)  
(Curtain & Carton)

12

100 Cars have Azees  
Lading Anchors  
scattered in Series  
21178 to 21390.

Fiber Glass Insulation.

Draft Gear:-  
Miner 500  
West. 250  
Natl. 250

AFE 81204

Weight	43900 lbs.	Side Bearings	Barber, Du-Well	Length (Inside)	40'-6"	Running Board	A.A.R. Metal
Capacity (Nom.)	100000 "	Truck Bolster	HTS Cast Steel	Width ( " )	9'-2"	Brake Step	" "
Draft Gear	A.A.R. Note	Kind Of Truck	HTS A.S.F.	Height ( " )	10'-6"	Floorplates	Bolster to Bolster, SREM Co
Coupler	Type E	Journal Size	5 1/2 " x 10"	Cubic Capacity	3900	Side Plate	Yoder
" Cent. Dev. & Ht. Adj.	S.R.E.M. Co.	Wheels	1 Wheel	Roof	Riveted Diag. Panel	Side & End Ladders	G.N. Make
" Yokes	A.A.R. Rigid	Snubbers	Ride Control	Ends	Alloy Dreadnaught	Sides	Youngstown
" Release	Rotary	Brake Beams	Unit Cast	Framing	Copper Brg Steel	Lining	13/16 Fir
Air Brake	A.B	Bottom Rod Support	None	Ceiling	Flintkote		
Handbrake	A.A.R. Universal	Slack Adjusters	Univ. Manual, Univ. Auto., LFM Auto., Gustin-Bacon Auto.	Cheathing	Copper Brg. 10" Steel		
				Doors (Side)	Copper Brg 16" Superior		



# GN 20500-21449 40' Boxcars

- ▶ ASF A-3 Ride Control trucks
- ▶ 1 wear wheels
- ▶ Cor-Ten steel
- ▶ Cars used a variety of other equipment
  - ▶ Four types of slack adjusters
  - ▶ Three types of draft gear
  - ▶ Two types of running boards



S Holmquist Collection, GNRHS Archives

S Holmquist Collection, GNRHS Archives



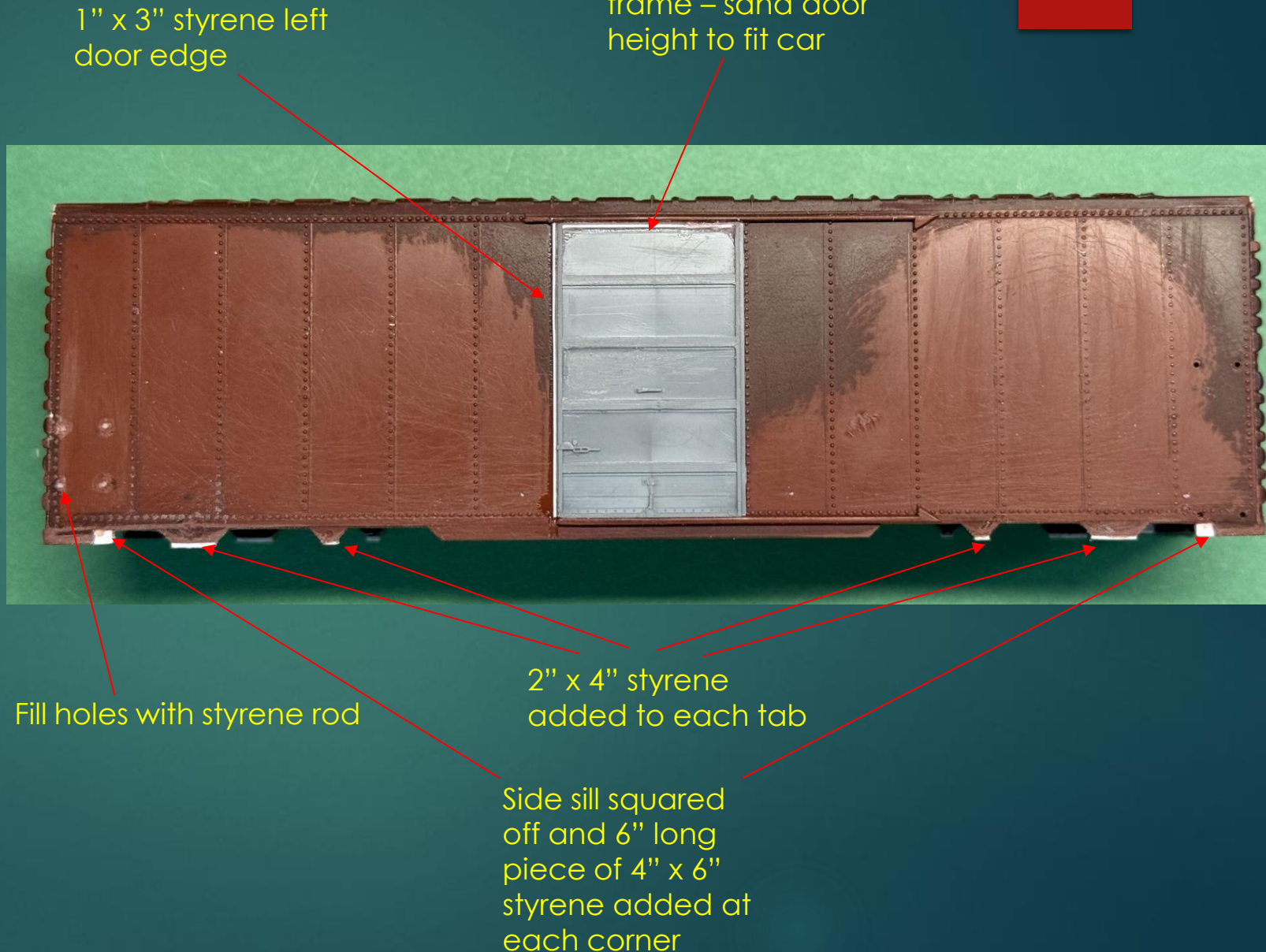
GN 20500-21449 Series Boxcars			
	Hand Brake	Running Board	Slack Adjuster
20500-20999	Universal	Apex	Universal Rotary
21000-21299	Universal	US Gypsum	Universal Rotary
21300-21349	Universal	US Gypsum	Other
21350-21399	Universal	US Gypsum	Other
21400-21449	Universal	US Gypsum	Other

Other slack adjusters	Universal Automatic
	Locomotive Finished Material Co. Automatic
	Gustin-Bacon Automatic



# GN 20500-21449 40' Boxcars

- ▶ C&BT Shops
  - ▶ 1944 AAR 40' Box Car
  - ▶ 4/3/1 End Angle Panel Roof
- ▶ Southwest Scale Models FC 650 5-panel Superior door
- ▶ Prepping the car
  - ▶ Warning – plastic has become brittle
  - ▶ Square-off ends of side sill at each corner and add 6" long extension from 4" x 6" styrene – sand to match height of side sill
  - ▶ Add 2" x 4" styrene to the bottom of each side sill tab – sand down thickness when glue is dry
  - ▶ Glue 1" x 2" styrene strip to inside edge of top door frame
  - ▶ Sand top door until it fits
  - ▶ Add 1" x 3" styrene left door stop





# GN 20500-21449 40' Boxcars

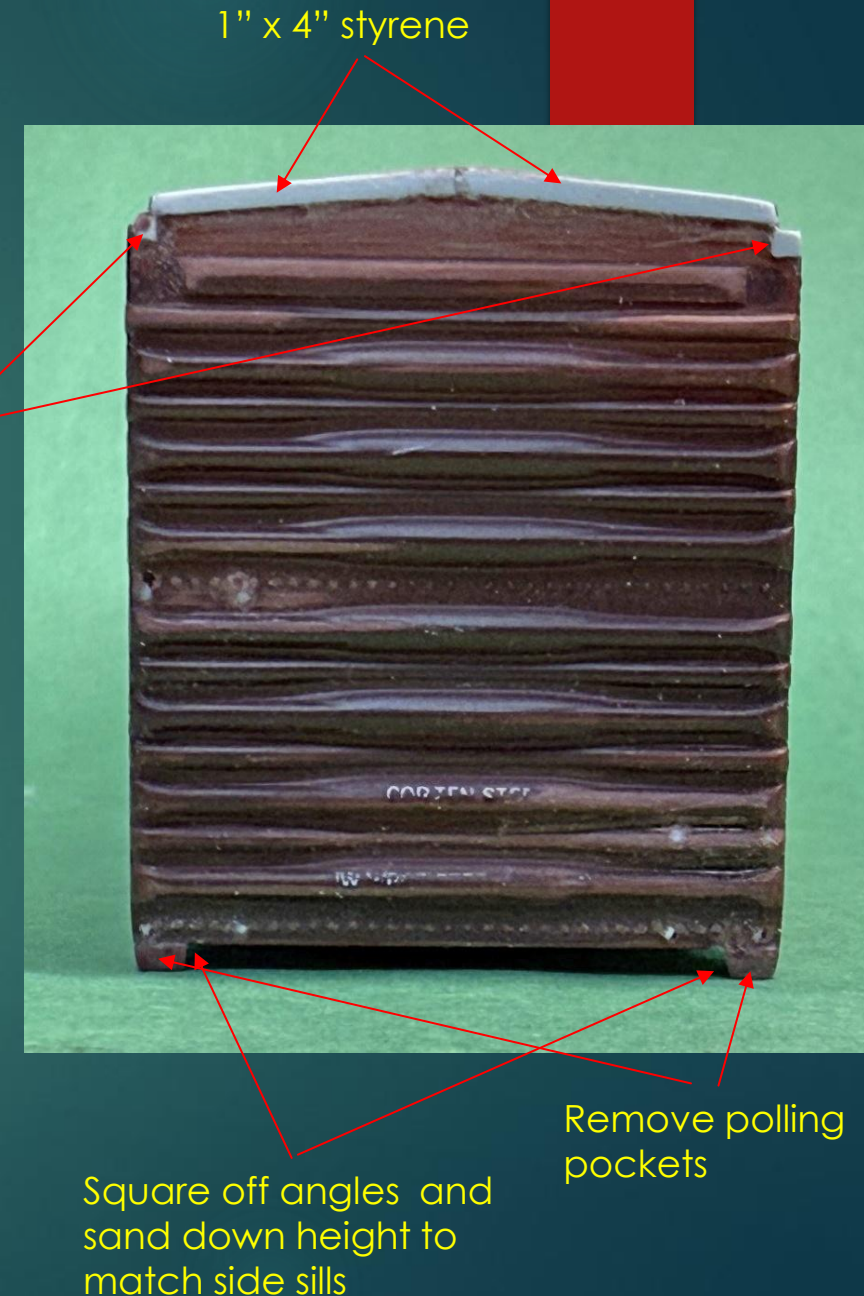
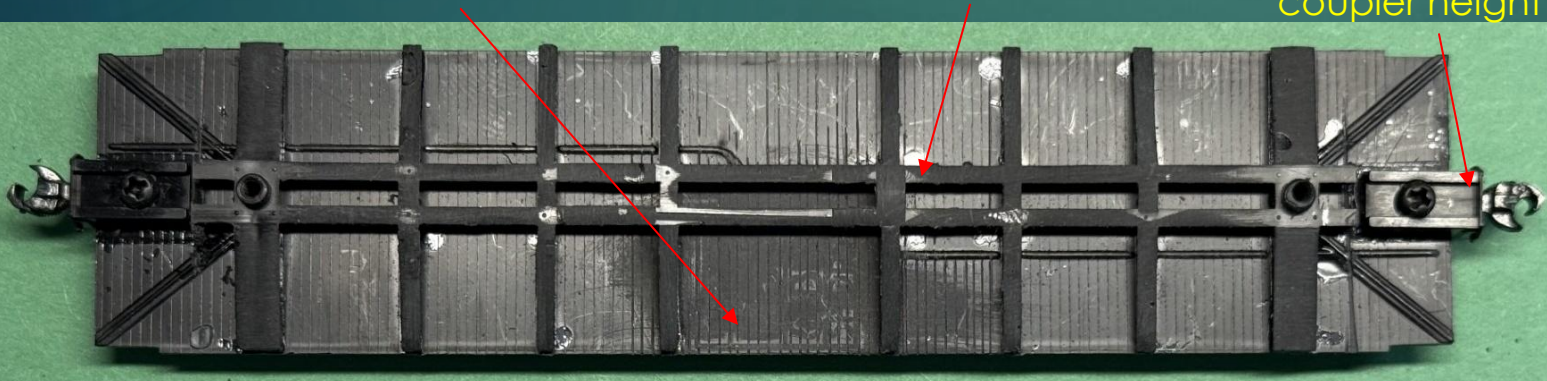
## ► Prepping the car

- Fill holes on ends with styrene rod
- Remove polling pockets and sand corners to height of side sill extensions – square off ends
- Add 1" x 3" styrene to simulate fascia going around corner
- Add 1" x 4" styrene to simulate roof edge overlapping end
- Sand off C&BT logo and re-scribe floor
- Cut off brake system components from underframe
- Sand off remains of brake components and rivets
- Add Kadee #178 couplers in Kadee coupler boxes and two .015" Kadee washers to bring couplers to correct height

Remove C&BT logo  
and re-scribe floor

Remove brake  
components and rivets

Add Kadee #178  
couplers – raises  
coupler height

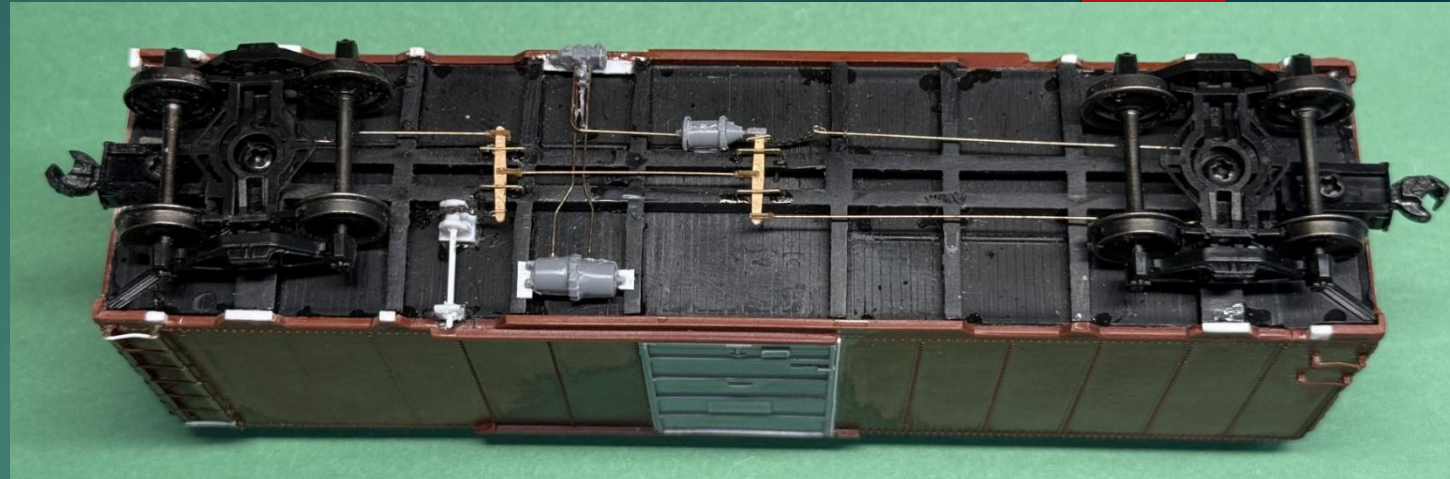




# GN 20500-21449 40' Boxcars

## ► Detail underframe

- 2" x 6" styrene for air reservoir mounts
- 1" x 6" styrene for AB valve mount
- 1/8" angle with one side trimmed for brake cylinder mount
- Tichy AB brake set
- Yarmouth brake levers – use two long levers
- Universal rotary slack adjuster
  - 2" x 2" styrene strip for square rod
  - 1/16" styrene rod for drum and bearing
  - 5/32" styrene C channel for supports cut 8" wide
  - Chain from drum to brake lever
  - Glue thin disk of 1/16" tubing to side sill bracket and drill for 2" x 2 rod
  - Add scrap of styrene for lever
  - Glue drum between two brackets with cut-off corners and glue brackets to base plate

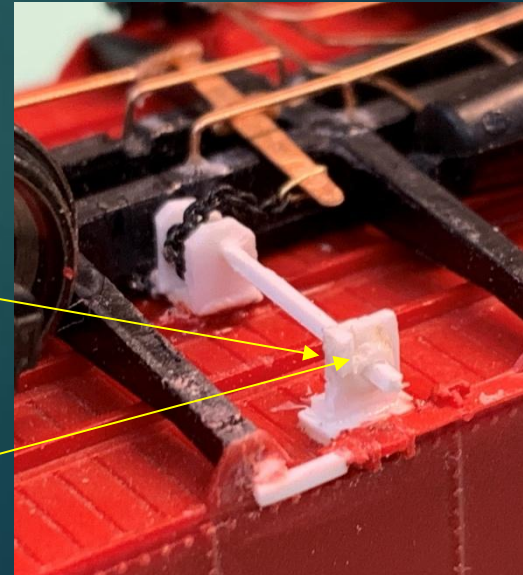


5/32" styrene  
C-channel



Scrap of styrene  
for lever

Thin disk of  
1/16" styrene  
rod





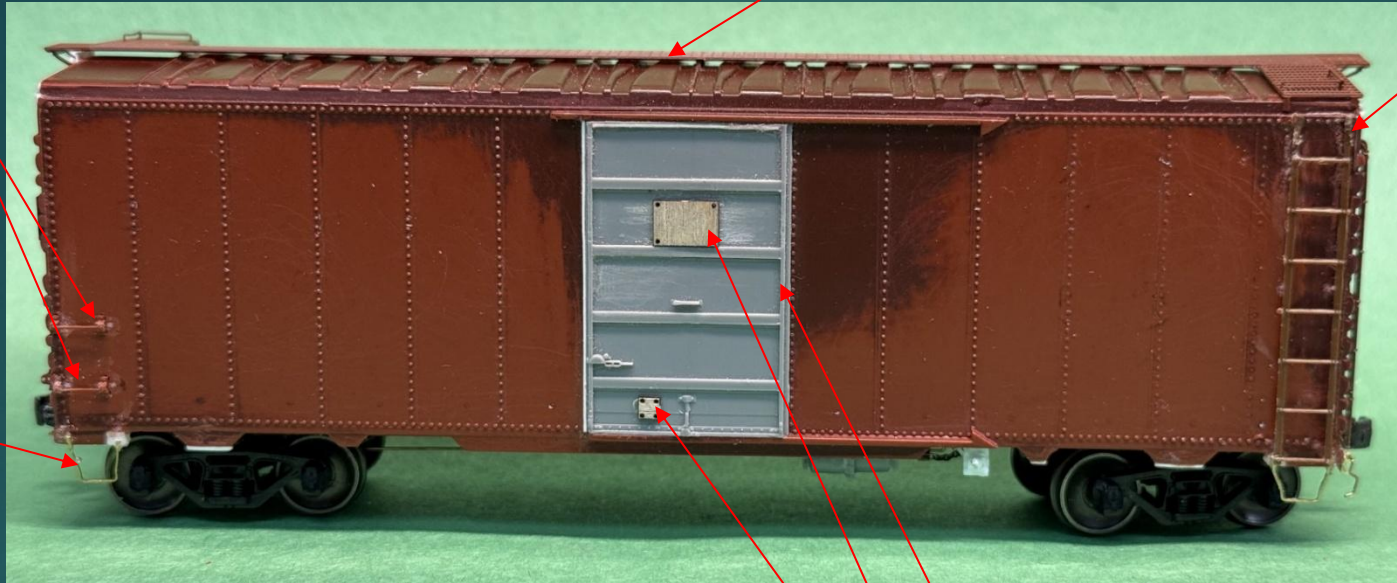
# GN 20500-21449 40' Boxcars

Detail Associates  
ladder with stiles  
extended at top

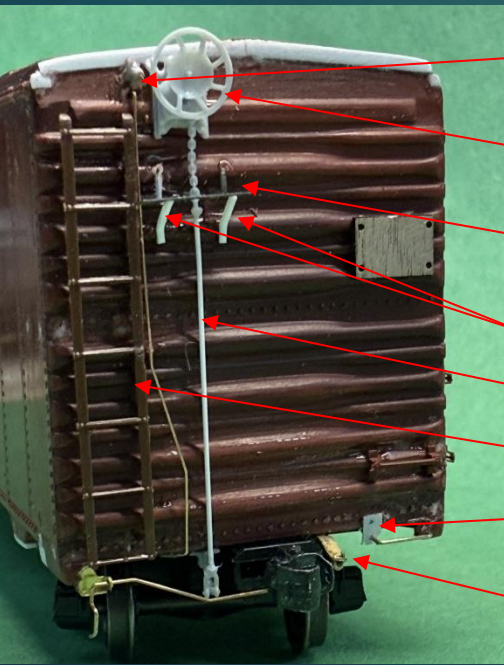
Kadee Apex running board

Kadee side grab  
irons with left  
end mounted to  
car end

Sill steps bent  
from .010" x  
.018" brass bar  
stock



Running board support  
made from 1" x 6" styrene



Tichy retainer valve and  
.008" wire for piping

Tangent Universal hand brake  
and brake wheel

Plano Apex brake step

Supports made from  
1" x 2" styrene

Plastruct .015" styrene rod

Detail Associates ladder

1" x 6" styrene support  
bracket with 18" grab iron

Precision Scale air hose  
bracket

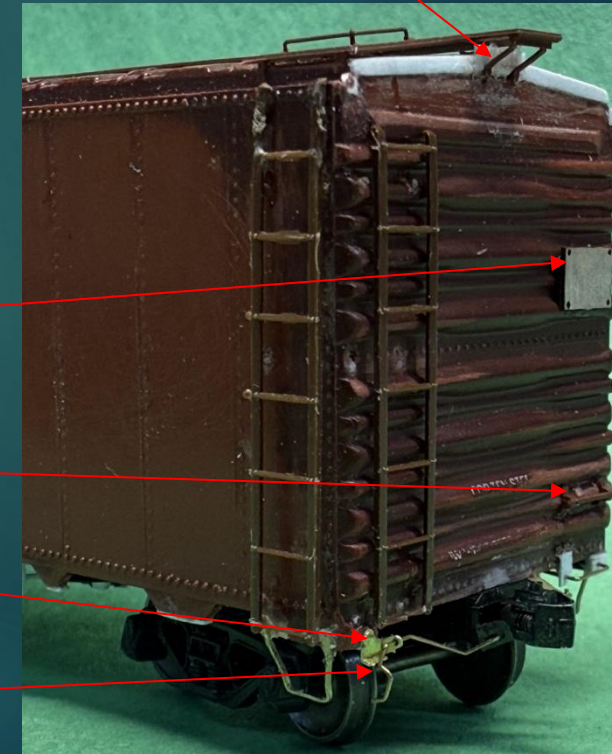
Southwest Scale #650 doors

National Scale Car  
plywood tackboards  
and route card holders

Grab iron from  
scrap box

Yarmouth cut  
lever brackets

Tangent coupler  
lift bars





# GN 20500-21449 40' Boxcars

## ▶ Lettering the cars

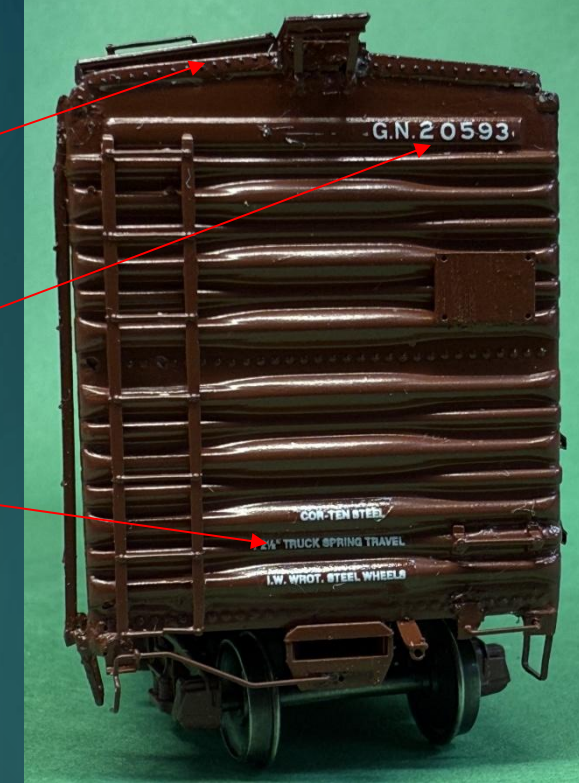
- ▶ Lack of dimensional data for GN 10' 6" cars
- ▶ Door opening instructions
- ▶ Trust lettering
- ▶ End lettering
- ▶ Reflective circles along side sill
- ▶ St. Cloud Shops logo

Rivets along top of ends –  
Archer AR88026 5/8"  
railcar rivets

End car  
numbers –  
NSC 204

End lettering –  
K4 Steel Boxcars

Rivets along edge of roof –  
Archer AR88030 ACR Rivets



Door opening instructions – NSC D204

Trust info – K4 Steel Boxcars

"R" or "L" – NSC D204

Circular delineators – NSC D260

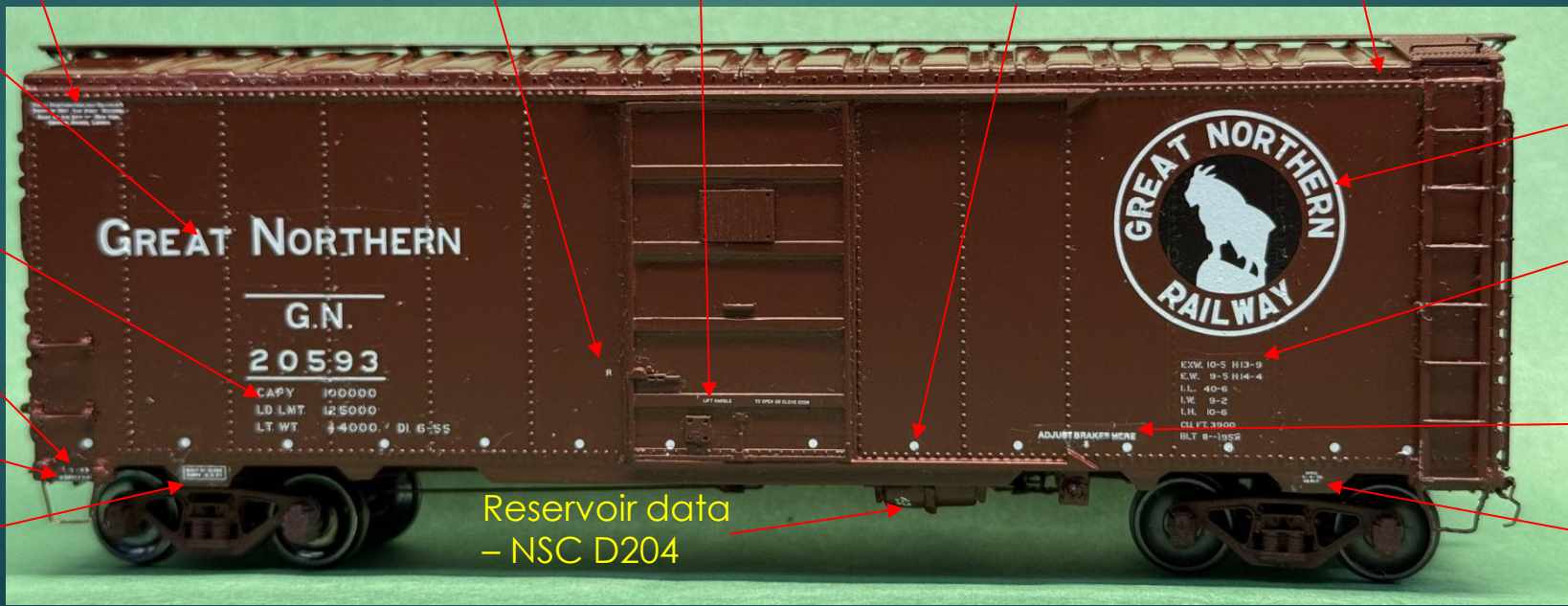
Great Northern and  
Car No. – NSC D204

CAPY data – NSC  
D204 (added 5  
and 4 to match  
prototype)

ENDS stencil –  
NSC D204

Paint stencil – K4  
Steel Boxcar

St. Cloud Car Shops  
logo – K4 Double Door



Reservoir data  
– NSC D204

Goat Herald – NSC  
D204

Dimensional Data –  
NSC D260 – use data  
for GN 21947 – piece  
together BLT date

ADJUST BRAKES HERE  
lettering – NSC D204

Repack data –  
NSC D204



# GN 20500-21449 40' Boxcars

## Parts List

- ▶ Archer AR88026 5/8" railcar rivets
- ▶ Archer AR88030 ACR Rivets
- ▶ C&BT 1944 AAR boxcar 4/3/1 end angled roof
- ▶ Campbell #256 black chain
- ▶ Detail Associates 2522 .010" x .018" brass bar
- ▶ Detail Associates 6242 ladder set
- ▶ Evergreen 8102, 8103, 8104, 8106, 8202, 8204, 8206, 8406, 222 (1/16" rod), 294 (1/8" angle), and 265 (5/32" channel)
- ▶ Hi-Tech Details 6038 air hoses
- ▶ Kadee #178 couplers
- ▶ Kadee 2001 Apex running board
- ▶ Kadee 2250 side grab irons
- ▶ Plastruct 90849 .015" styrene rod
- ▶ Precision Scale 39156 air hose brackets
- ▶ Southwest Scale Models #650 5 panel Superior door
- ▶ Tangent TSM-2011 ASF A-3 Ride Control trucks
- ▶ Tangent TSM-1004 Universal brake housing
- ▶ Tangent TSM-1055 Universal brake wheel
- ▶ Tangent TSM-203 coupler lift bars
- ▶ Tichy 3013 AB brake set
- ▶ Tichy 3021 18" straight grab irons
- ▶ Tichy 8021 turnbuckles
- ▶ Tichy 1106 .0125 and 1108 .008" wire
- ▶ Yarmouth #507 cut lever brackets
- ▶ Yarmouth #403 brake levers



- ▶ Roof, sides, ends, underframe and trucks painted with TruColor TCP-214 GN 1930-45 Freight Car Red
- ▶ Highlight tip of rotary slack adjuster actuator rod with Tamiya XF-2 Flat White
- ▶ Lettered using National Scale GN 40' and 50' Orange and Green Boxcars
  - ▶ K4 Decals set GN 40 Ft Double Door Boxcar
  - ▶ K4 Car D204 Great Northern 1937-1942 Double Sheathed Box Cars and D260 Decals set GN 40 Ft Steel Boxcars
  - ▶ National Scale Car D135 Chalk Marks decals
- ▶ Light weathering using Pan Pastel Paynes Grey Extra Dark, Permanent Red Extra Dark, and Raw Umber, Polly Scale Grimy Black, Modelflex Rust, and AK Weathering Gun Metal pencil



# GN 20500-21449 40' Boxcars



Later  
Paint  
Schemes



Mineral Red with Empire Builder-style lettering, 9-29-1956  
Zanesville, Ohio, Mainline Photos, R Remiarz Collection

November 12-73 reweigh date, Jim Ruffing Collection

Vermillion Red, Post May 1967 C Newby Collection, GNRHS Archives

Reweighed January 1960, Mainline Photos R Remiarz Collection





# GN 20500-21449 40' Boxcars

## ► References

- GNRHS Reference Sheet Reference Sheet #61 – Great Northern 40 Ft. Steel Box Cars: Series 18000, 18500, 19500, 20500 and 21450, by Staffan Ehnбом, March 1981
- GN 1950's Box Cars Prototype, by Staffan Ehnбом, Mainline Modeler, June 1986
- GN 1950's Box Car Models, by Staffan Ehnбом, Mainline Modeler, June 1986
- Great Northern Steel Box Car, by Staffan Ehnбом, Mainline Modeler, November 2001
- Great Northern Postwar Box Cars, by James Kinkaid, Mainline Modeler, December 2001
- Modeling the Great Northern's 20500-21449 Series 40' Box Cars, by Rich Remiarz, future GNRHS Modelers' Pages

- 13



6' wide door opening  
Youngstown 5-6-6 door





# GN 21450-21939 40' Boxcars

- ▶ ASF A-3 Ride Control trucks
- ▶ 1 wear wheels



Post October 1961, G Werkema Collection, GNRHS Archives

S Holmquist Collection, GNRHS Archives





# GN 21450-21939 40' Boxcars

- ▶ Rapido 155001A GN 40' Boxcar w/Early IDNE
- ▶ Fix issues with running board
  - ▶ Lateral running boards mounted incorrectly on some cars
  - ▶ Some running boards are warped
    - ▶ Reinstall with canopy cement
  - ▶ No running board supports at end of car



Slightly bend the laterals at the running board so they are parallel with the roof

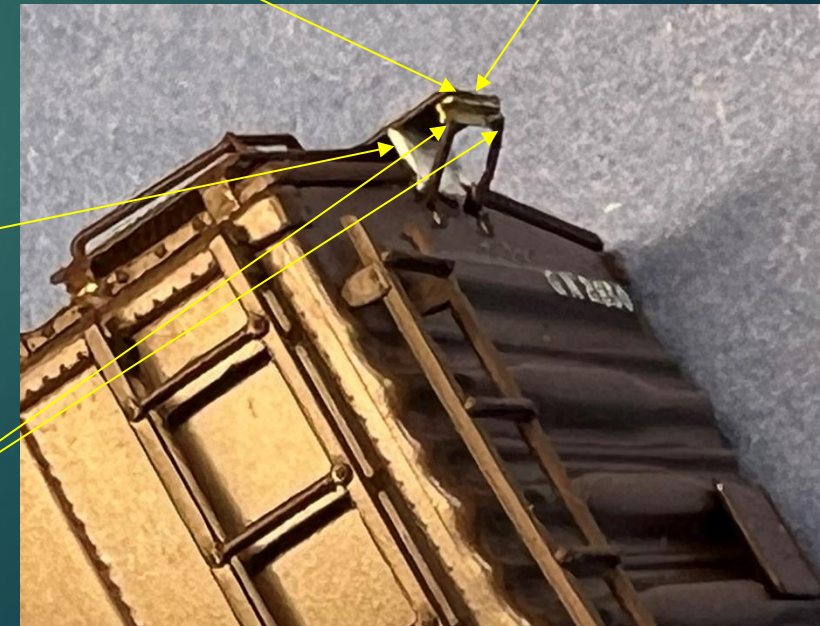
Trim supports at the end of the laterals running boards

Cut running board end supports flush with end of running board

Scrap of Yarmouth ladder stile

1" x 8" styrene glued to end of car/roof under end of running board while car is upside down on flat surface

Trim running board end supports to just reach ladder stile scrap





# GN 21450-21939 40' Boxcars

- ▶ Upgrades
  - ▶ Semi-scale Kadee 158 couplers
  - ▶ .088" semi-scale wheels
  - ▶ Wire coupler lift bars
- ▶ Running board and coupler lift bar paint touch-up
  - ▶ Tamiya XF-9 Hull Red



Tamiya XF-9 Hull Red for paint touch-up

Carve off molded coupler cut bar

Drill hole at the end of the coupler lift bracket

Tangent TSM-203 Coupler Lift Bars



# GN 21450-21939 40' Boxcars

- ▶ Rapido 155001A GN 40' Boxcar w/Early IDNE
- ▶ Detail Parts
  - ▶ Kadee #158 couplers
  - ▶ Tangent TSM 203 Coupler Lift Bars
  - ▶ Tangent .088" blackened wheelsets



- ▶ Touch-up paint – Tamiya XF-9 Hull Red
- ▶ Lightened paint with Pan Pastel Colorless Blender
- ▶ Highlight tip of rotary slack adjuster actuator rod with Tamiya XF-2 Flat White
- ▶ Additional lettering using Speedwitch D135 Chalk Marks decals, Microscale TF-13 Brown Trim Film, and National Scale Car D-204 GN 1937-1942 double sheathed boxcar decals
- ▶ Light weathering using Pan Pastel Paynes Grey Extra Dark, Burnt Sienna Extra Dark, Red Iron Oxide Extra Dark, and Raw Umber, Polly Scale Grimy Black, and Modelflex Rust



# GN 21450-21939 40' Boxcars



J Ruffing Collection

John Hill  
Collection



Later  
Paint  
Schemes

October 1956, Bobs  
Photos, R Remiarz  
Collection



# GN 21450-21939 40' Boxcars

## ► References

- GNRHS Reference Sheet Reference Sheet #61 – Great Northern 40 Ft. Steel Box Cars: Series 18000, 18500, 19500, 20500 and 21450, by Staffan Ehnбом, March 1981
- GN 1950's Box Cars Prototype, by Staffan Ehnбом, Mainline Modeler, June 1986
- GN 1950's Box Car Models, by Staffan Ehnбом, Mainline Modeler, June 1986
- Great Northern Steel Box Car, by Staffan Ehnбом, Mainline Modeler, November 2001
- Great Northern Postwar Box Cars, by James Kinkaid, Mainline Modeler, December 2001
- Upgrading the Rapido 21450-21939 Series Boxcars, by Rich Remiarz, March 2024 GNRHS Modelers' Pages



# GN 21940-21949 40' Boxcars

- ▶ Built by the GN St. Cloud Car Shops in 1953
- ▶ All 10 cars on the roster on 7/1/1956
- ▶ 10' 6" IH
- ▶ Diagonal panel roofs
- ▶ 1-3-4 Improved dreadnaught ends
- ▶ Apex running boards and brake steps
- ▶ Universal hand brake and rotary slack adjuster



Note reweigh date of 2-55 and trust information on upper left hand corner of side

T Wahl Collection, NPRHA Burien Archives

8' wide door opening  
Youngstown 5-6-6 door

Built by G.N.Ry.1953  
Underframes-International Steel Co.

40'-6" BOX CAR Nos. 21940 to 21949

14

Underframe Alloy Steel

Note:-These cars equipped  
with Pullman-Standard  
"Compartmentizers."

The diagram shows a side view and an end view of a boxcar. The side view includes dimensions for the overall length (40'-6"), wheelbase (36'-4"), and various internal clearances and offsets. The end view shows the car's width (9'-2") and height (10'-6").

Side View Dimensions:

- Overall Length: 40'-6"
- Wheelbase: 36'-4"
- Over Steel Ends: 41'-4"
- Over Sill Ends: 41'-10"
- Between Pulling Faces: 44'-4"
- Clearance from Floor to Top of Sill: 8'-0"
- Clearance from Floor to Top of End Wall: 9'-9 1/2"
- Sills: 212 @ 31.3"
- Truck Centers: 30'-10"
- Minimum Tension: 3'-6"

End View Dimensions:

- Overall Width: 9'-2"
- Clearance from Floor to Top of End Wall: 10'-6"
- Clearance from Floor to Top of Door: 13'-8 1/2"
- Clearance from Floor to Top of Roof: 14'-4 1/2"
- Clearance from Floor to Top of End Wall: 14'-10 1/2"
- Clearance from Floor to Top of Door: 10'-7 1/2"
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- Clearance from Floor to Top of Roof: 13'-8 1/2"
- Clearance from Floor to Top

# GN 21940-21949 40' Boxcars

- ▶ Pedestal type cast steel trucks
  - ▶ Side frame casting looks similar to ASF A-3 truck
- ▶ Timken roller bearings
- ▶ Griffin cast EQS wheels
- ▶ Pullman-Standard Compartmentizers
- ▶ Underframe cross members in same locations as 21450-21939 series cars with 6' doors



Scenic, WA July, 1955 – Bob's Photos, R Remiarz Collection



Note missing circular reflective delineators

Vancouver, BC July, 1957 - Stan Styles Photo, Bob Kelly Collection



# GN 21450-21939 40' Boxcars

- ▶ Paint and Lettering Variations
- ▶ Four photos of three cars show multiple variations
- ▶ 21941 and 21943
  - ▶ Herald with green lettering and red background around the goat
  - ▶ Trust information stenciled on upper left hand corner of side
  - ▶ Original lettering scheme
- ▶ 21947
  - ▶ Herald with white lettering and black background around the goat
  - ▶ Lost most delineators between July 1955 and July 1957
  - ▶ Missing lettering for slack adjuster
  - ▶ Repaint data – 4-55
  - ▶ Lettering for bearing grease



Note reweigh date of 3-55 and trust information on upper left hand corner of side

Vancouver, BC May 15, 1957 - Stan Styles Photo, Bob Kelly Collection

# GN 21940-21949 40' Boxcars

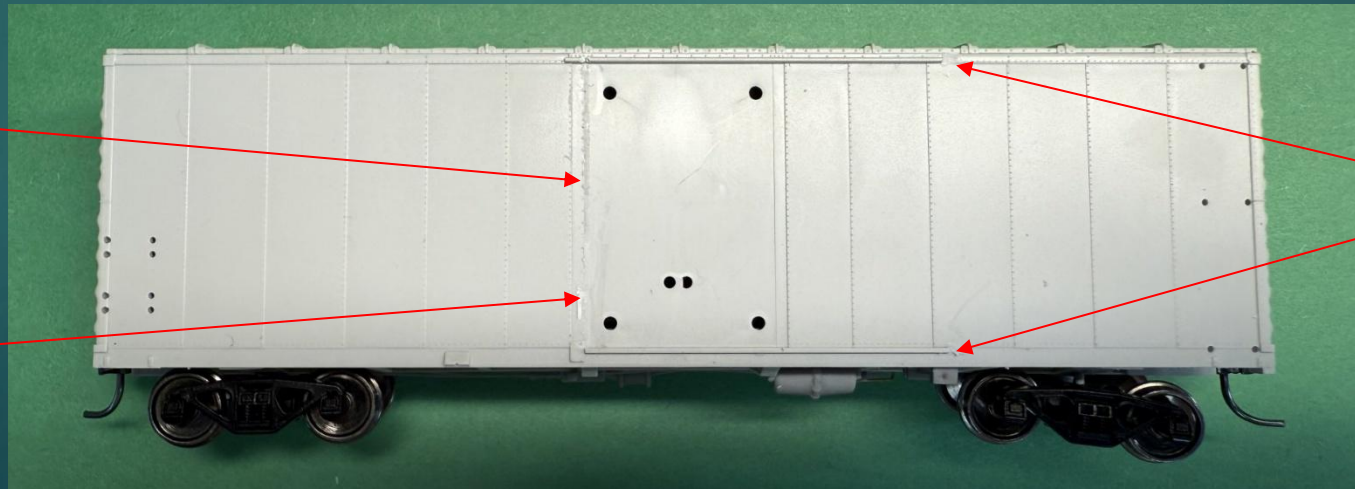
- ▶ Key parts for this model
  - ▶ Rapido 155098 GN 40' Boxcar w/Early IDNE Undecorated
    - ▶ Undecorated kit comes partially assembled
  - ▶ National Scale Car D260 GN 40 and 50 Orange and Green Steel Boxcars
  - ▶ 8' Youngstown 5-6-6 doors
- ▶ Carefully slice off door latch and door stops using chisel blade – save for reuse
- ▶ Remove left door stop



Remove left door stop

Carefully slice off door latch

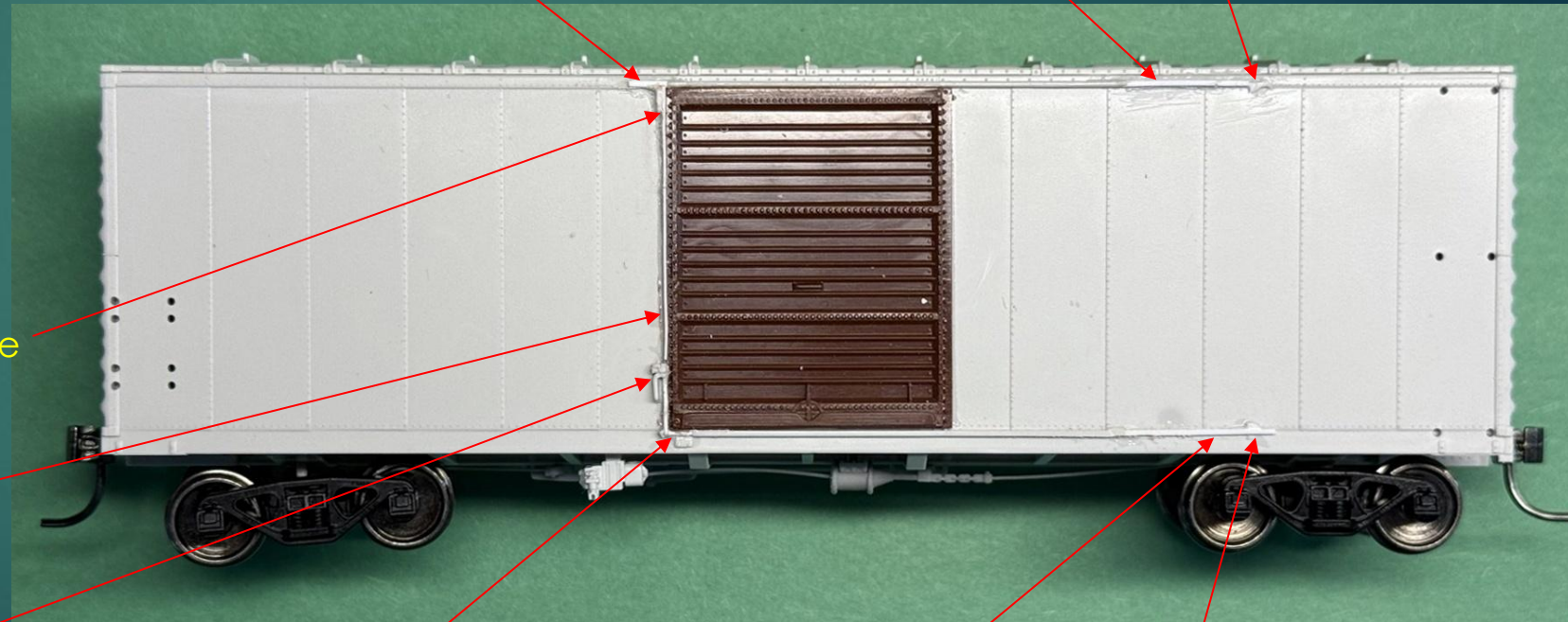
Carefully slice off door stops





# GN 21940-21949 40' Boxcars

- ▶ Youngstown 8' 5-6-6 door
  - ▶ Mine came from the scrap box
  - ▶ Kadee 2215 or 2216 8' Youngstown door, high tack board
    - ▶ Kadee door is slightly too high and will require some sanding
- ▶ Reattach door latch and replace left door stop
- ▶ Lengthen upper and lower door tracks
- ▶ Add new door stops on right



Extend door track with 2" x 2" styrene 3' 6" long

Door stop made from 2" x 4" styrene 6" long cut diagonally

Extend door track with 2" x 2" styrene 12" long

Add to end of door track

2" x 3" styrene 6" long

New left side door stop made from 1" x 3" styrene

Reattach door latch

Lengthen lower door track to end of door with 2" x 2" styrene

Extend door track with 2" x 2" styrene 4' 6" long

Door stop made from 2" x 2" styrene 3" long cut diagonally – line up with upper door stop

# GN 21940-21949 40' Boxcars

## ► Upgrades

- Yarmouth Cut Lever Brackets
- Tangent Coupler Lift Bar
- Tangent Universal Hand Brake Housing and Brake Wheel
  - Requires Tichy brake fulcrum and longer brake rod made from .010" wire and Tichy turnbuckle

## ► Brake step

- Remove plastic piece between brake step support brackets
- Install individual brake step support brackets
- Notch brake step for brake rod
- Use Canopy cement to install brake step

► Add 1" x 8" styrene end running board support

► Add remainder of factory parts

Factory ladder and retainer valve

Fill mounting holes for hand brake housing

Tangent Coupler Lift Bar

Yarmouth Cut Lever Brackets

End running board support – 1" x 8" styrene

Tangent Universal Hand Brake Housing and Brake Wheel

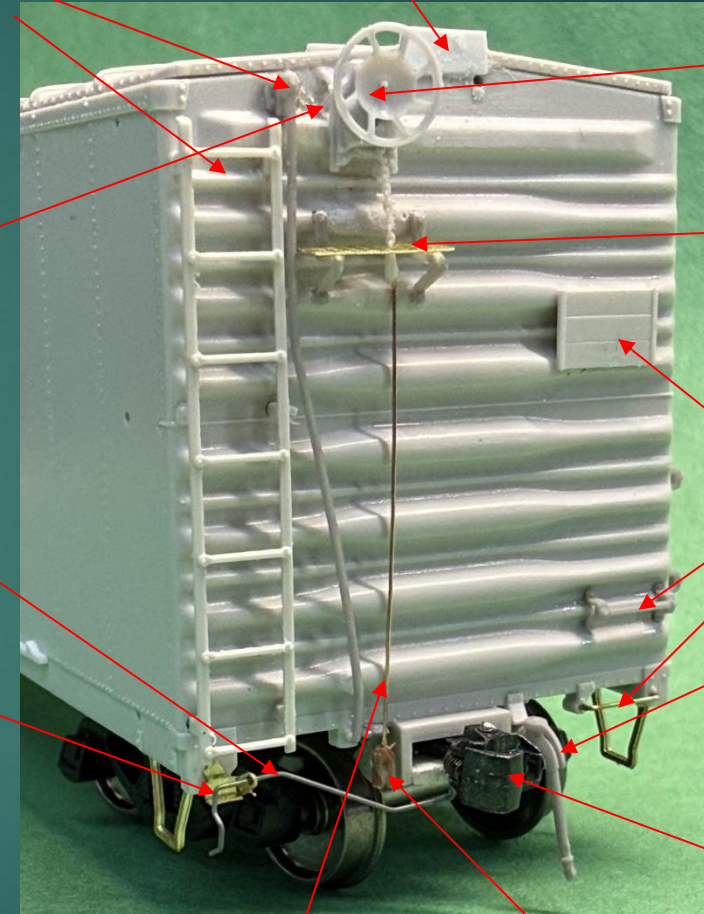
Remove plastic platform between brake step support brackets

Factory tack board, grab irons, and air hose

Kadee 158 semi-scale couplers

Brake rod made from .010" wire and Tichy Turnbuckle

Fulcrum from Tichy AB Brake Set





# GN 21940-21949 40' Boxcars

## ► Upgrades

- Factory route card holder was too short compared to prototype – replaced with shortened Branchline part

## ► Running Board

- Add 1" x 8" styrene end running board support

## ► Add remainder of factory parts

## ► Do Not attach side ladders or tack boards

## ► Cut off end running board supports

## ► Add corner corner grab irons on lateral running boards

## ► Attach running board using Canopy cement

Bend lateral running boards so they are parallel with the roof

Add corner grab irons

Bend lateral running board supports and trim to length

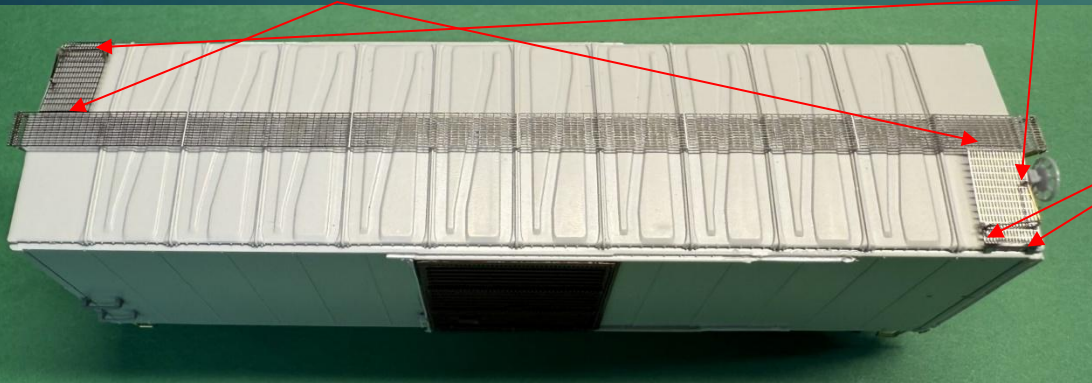
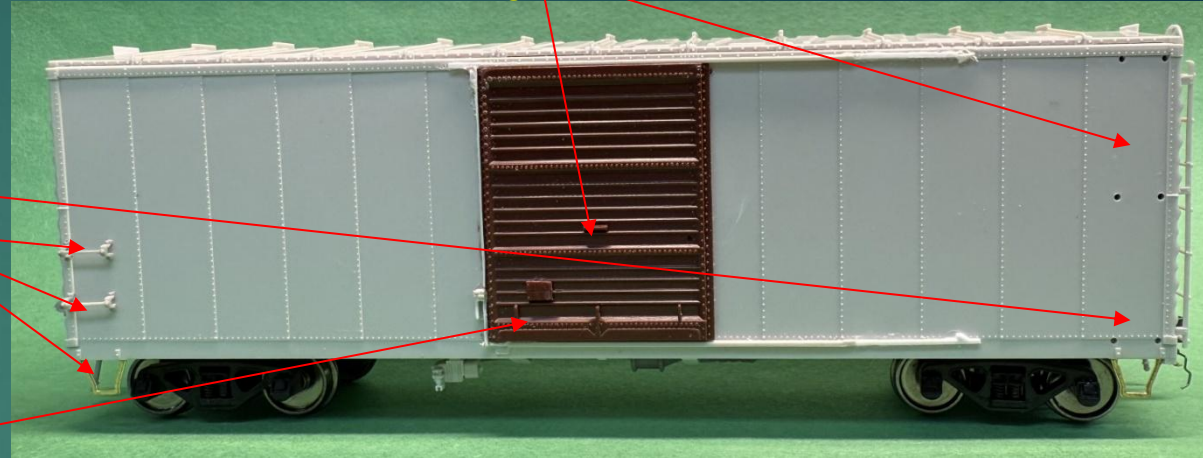
Leave off door tack boards and side ladders until after painting

Factory grab irons and sill steps

Shortened Branchline route card holder

End running board supports installed in holes on ends, bent, and trimmed to just reach ladder style

Add short sections of Yarmouth ladder styles to ends of running boards



# GN 21940-21949 40' Boxcars

- ▶ Rapido 155098 GN 40' Boxcar w/Early IDNE Undecorated

- ▶ Parts Used

- ▶ EB Products T-327B National Timken trucks
- ▶ Evergreen 8102 1" x 2" styrene
- ▶ Evergreen 8103 1" x 3" styrene
- ▶ Evergreen 8108 1" x 8" styrene
- ▶ Evergreen 8202 2" x 2" styrene
- ▶ Evergreen 8204 2" x 4" styrene
- ▶ Kadee 2215 or 2216 8' Youngstown 5-6-6 door or equivalent
- ▶ Kadee #158 couplers
- ▶ Tangent TSM 204 Coupler Lift Bars
- ▶ Tangent TSM 1004 Universal High Brake Housing
- ▶ Tangent TSM 1055 Universal Brake Wheel
- ▶ Tangent .088" wheel sets
- ▶ Tichy 8021 Turnbuckles
- ▶ Tichy .010" phosphor bronze wire
- ▶ Yarmouth YSM-507 Cut Lever Brackets



- ▶ Tamiya Grey Fine Surface Primer - TruColor TCP-050 GN Empire Builder Orange and TCP-049 GN Empire Builder Green
- ▶ National Scale Car D260 GN 40' & 50' Orange and Green Steel Boxcars provides most of the lettering
  - ▶ Two layers of "GREAT NORTHERN" and "PC" decals to get darker green
  - ▶ Fix spelling of "COMPARTMENTIZER"
  - ▶ National Scale Car D204 GN 1937-1942 Double Sheathed Box Cars for "ADJUST SLACK HERE" lettering
  - ▶ Microscale 87-185 GN 40' Boxcars provided the green Trust data in upper left hand corner
  - ▶ K4 Great Northern 40 FT Steel Boxcars provided lettering on the doors – cut lines of text from Trust data
  - ▶ National Scale Car D135 Chalk Marks decals
- ▶ Highlight tip of rotary slack adjuster actuator rod with Tamiya XF-2 Flat White
- ▶ Light weathering using Pan Pastel Paynes Grey Extra Dark, Burnt Sienna Extra Dark, and Colorless Blender, Tamiya XF-63 German Grey, and Modelflex Rust



# GN 21940-21949 40' Boxcars

## ► References

- GNRHS Reference Sheet Reference Sheet #61 – Great Northern 40 Ft. Steel Box Cars: Series 18000, 18500, 19500, 20500 and 21450, by Staffan Ehnбом, March 1981
- GN 1950's Box Cars Prototype, by Staffan Ehnбом, Mainline Modeler, June 1986
- GN 1950's Box Car Models, by Staffan Ehnбом, Mainline Modeler, June 1986
- Great Northern Steel Box Car, by Staffan Ehnбом, Mainline Modeler, November 2001
- Great Northern Postwar Box Cars, by James Kinkaid, Mainline Modeler, December 2001
- Upgrading the Rapido 21450-21939 Series Boxcars, by Rich Remiarz, March 2024 GNRHS Modelers' Pages

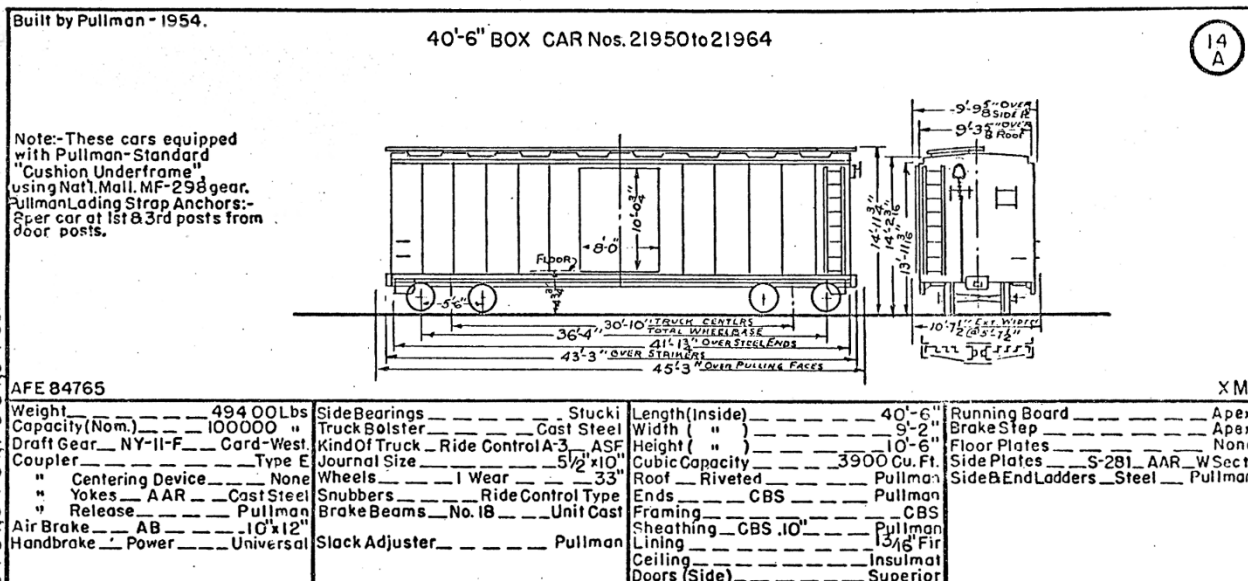
# GN 21950-21964 40' Boxcars (and 39400-39414)

- ▶ Built by Pullman Standard in 1954
- ▶ All 15 cars on the roster on 7/1/1956
- ▶ 10' 6" IH
- ▶ Pullman Standard riveted roofs
- ▶ Pullman Standard ends
- ▶ Apex running boards and brake steps
- ▶ Universal hand brake



S Holmquist Collection, GNRHS Archives

8' wide door opening  
Superior 6-panel door – narrow top panel



3-1-54, 6-1-54, 7-8-54, 3-1-55.



# GN 21950-21964 40' Boxcars (and 39400-39414)

- ▶ Pullman Standard slack adjuster
- ▶ ASF A-3 Ride Control trucks
  - ▶ I wear wheels
- ▶ Pullman Standard Cushion Underframe
- ▶ Pullman lading strap anchors

S Holmquist Collection, GNRHS Archives



J Kinkaid Collection, Pullman Library Collection,  
Illinois Railroad Museum

- ▶ Early P-S designed cushion underframe
  - ▶ 8" travel
  - ▶ 10" channel used for center sills
  - ▶ National Malleable Castings model MF-298 cushion package – rubber and metal plate sandwiches



# GN 21950-21964 40' Boxcars (and 39400-39414)

- ▶ Renumbered in 1959-1960
  - ▶ Loader equipment added
  - ▶ Sparton Loaders on 39400-39407 (1959)
  - ▶ Evans DF-2 Loaders on 39408-39414 (1960)
  - ▶ Painted orange and green



S Holmquist Collection, GNRHS Archives

Later  
Paint  
Scheme

D Amdahl Collection



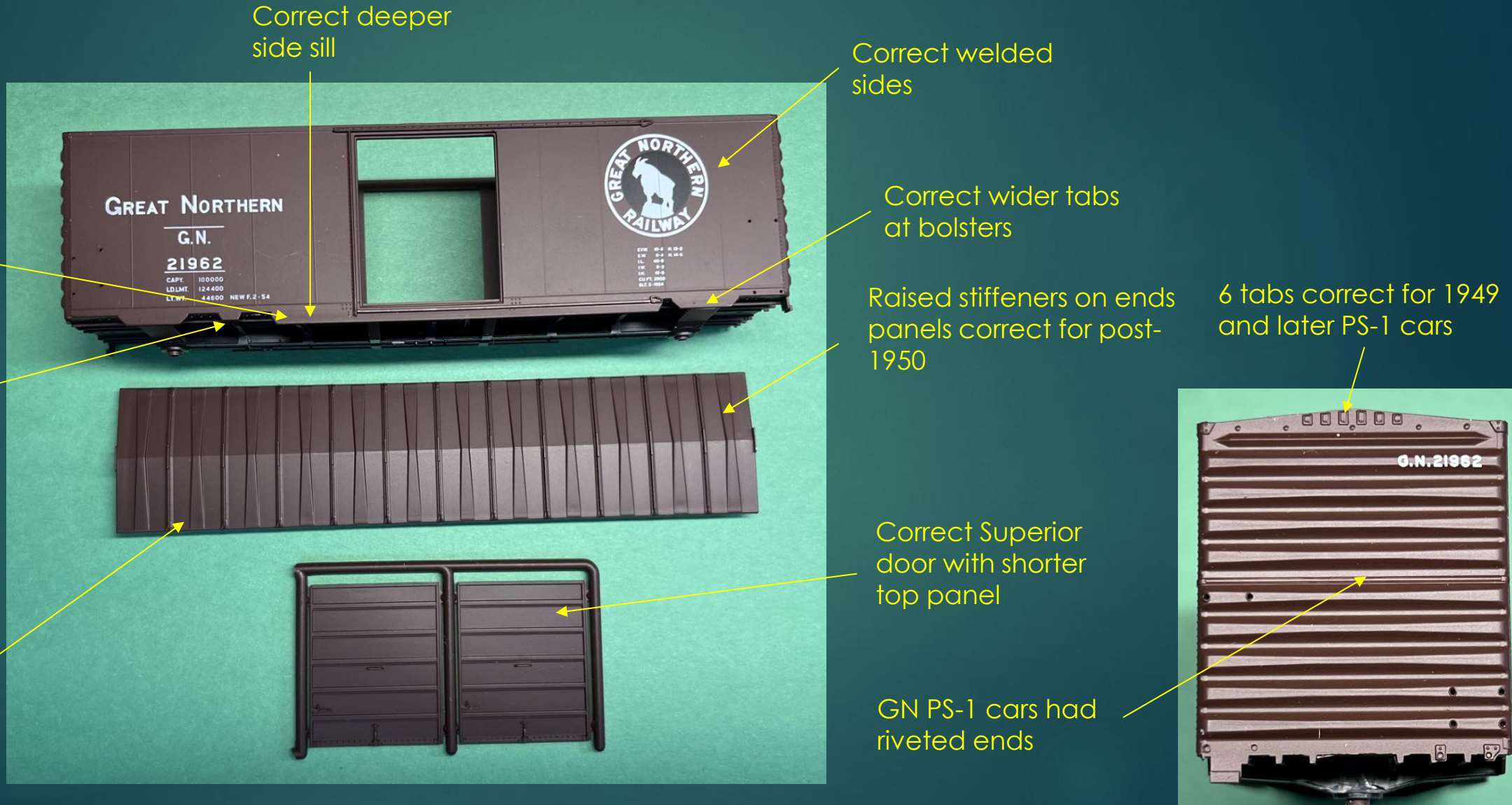
# GN 21950-21964 40' Boxcars (and 39400-39414)

Closest HO scale model:

- ▶ Intermountain
  - ▶ 40453 series PS-1 40' box car
    - ▶ 40453-1 to 40453-15
    - ▶ Found at swap meets and Ebay
  - ▶ Current Intermountain 40453 is listed as orange and green car
    - ▶ 40453-16 to 40453-21
    - ▶ 1979 reweigh date with COTS stencils
    - ▶ Incorrect build date (1948)
- ▶ Express Station Hobbies
  - ▶ Intermountain custom run
    - ▶ PS-1 Boxcar Great Northern Express
  - ▶ Found at swap meets and Ebay
  - ▶ 39400-39407 should have Sparton STB logo



# GN 21950-21964 40' Boxcars (and 39400-39414)





# GN 21950-21964 40' Boxcars (and 39400-39414)

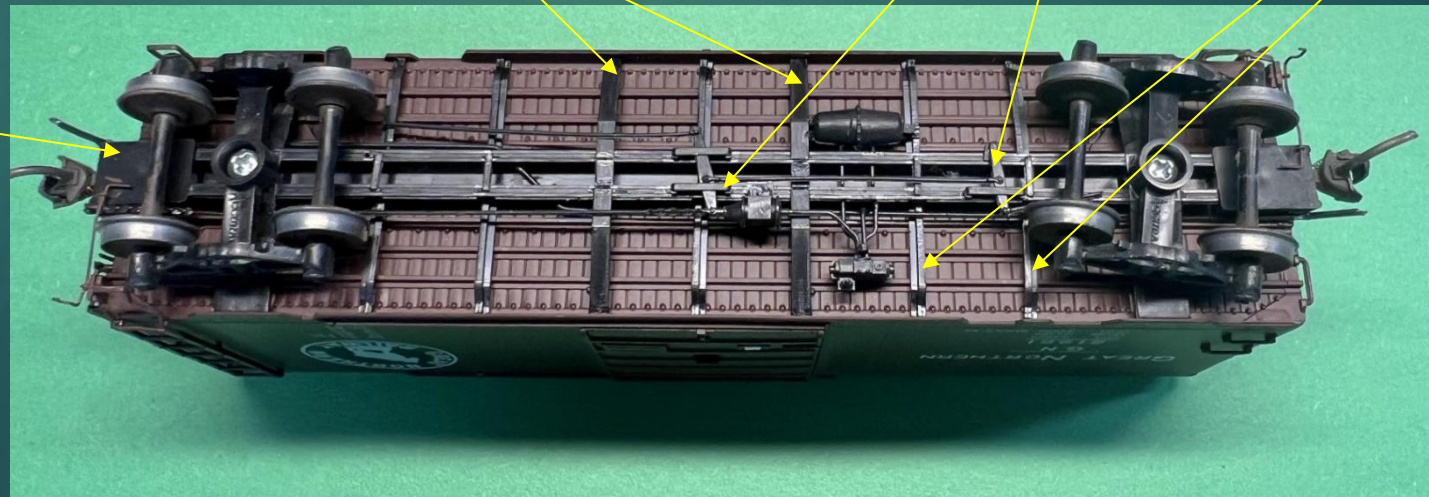
- ▶ Missing cushion underframe
- ▶ Incorrect running board, brake step, and hand brake
  - ▶ Should be Apex and Universal
- ▶ Missing lettering on cars
  - ▶ Door opening instructions
  - ▶ End lettering
  - ▶ Reflective circles along side sill, P-S logo and cushion underframe lettering on boxcar red cars

No cushion  
underframe

Cross bearers in wrong  
location for car with 8' door

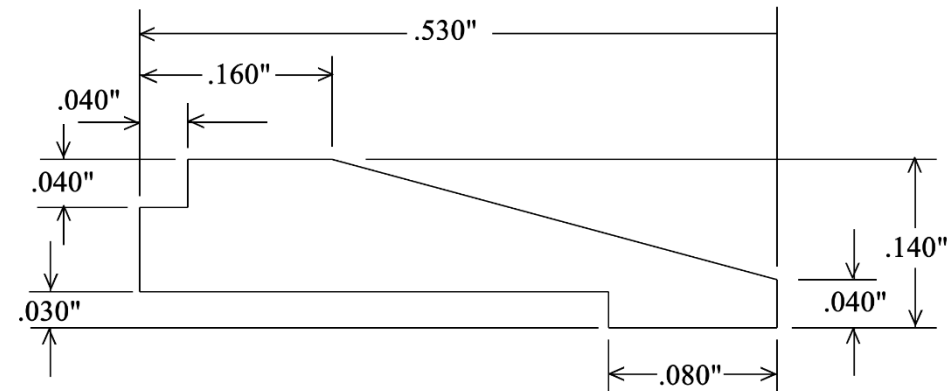
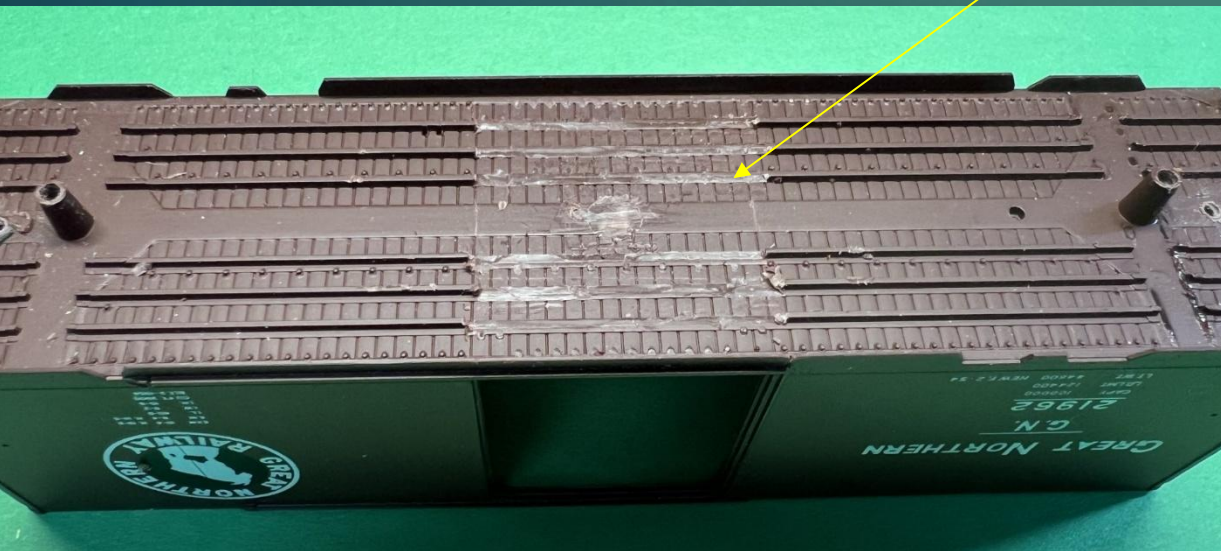
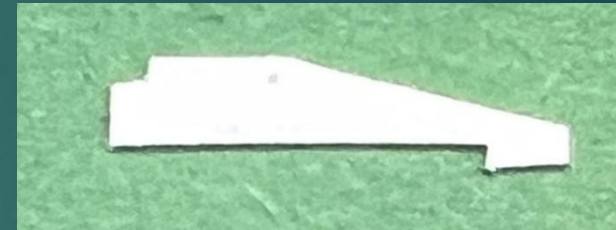
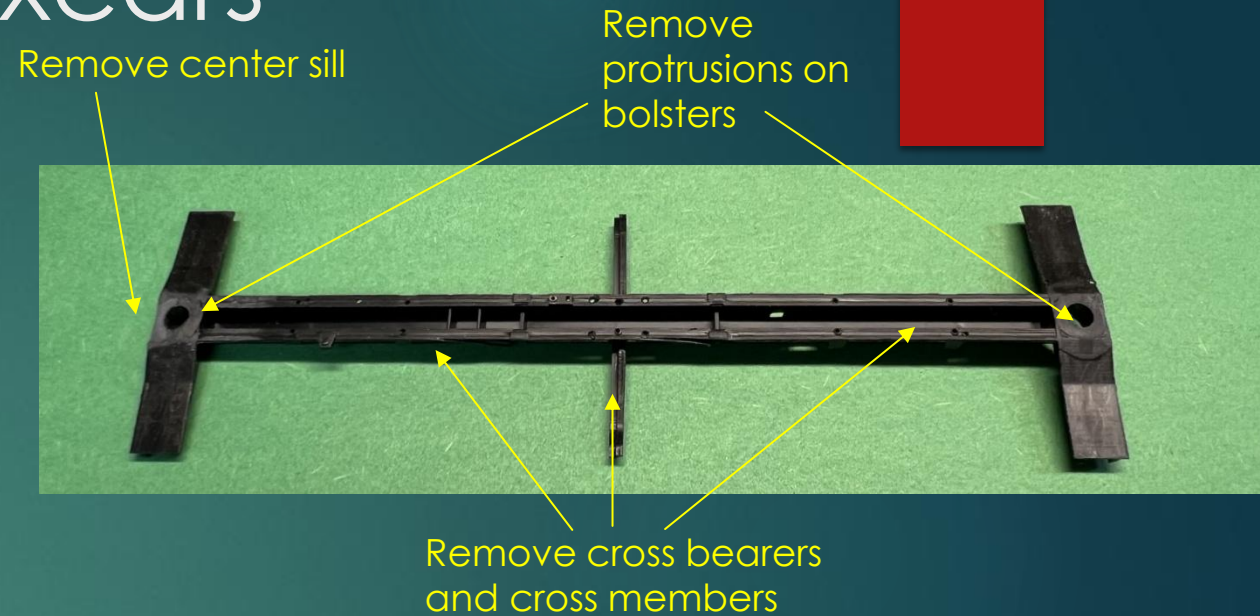
Brake components  
are not attached to  
center sill on cars with  
cushion underframes

Should be  
additional cross  
bearers instead  
of these cross  
members



# GN 21950-21964 40' Boxcars (and 39400-39414)

- ▶ Remove center sill beyond the bolsters
- ▶ Remove cross bearers and all cross members
- ▶ Remove protrusions on bolsters so that car sits lower
- ▶ Sand off details on center sill bottom
- ▶ Remove stringers and other protrusions under the door
- ▶ Cut 4 cross bearers from .020" styrene



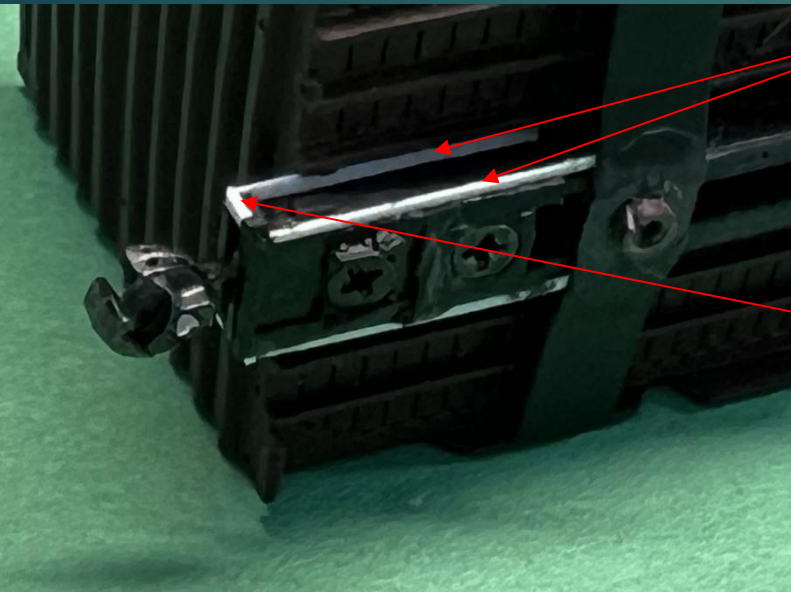
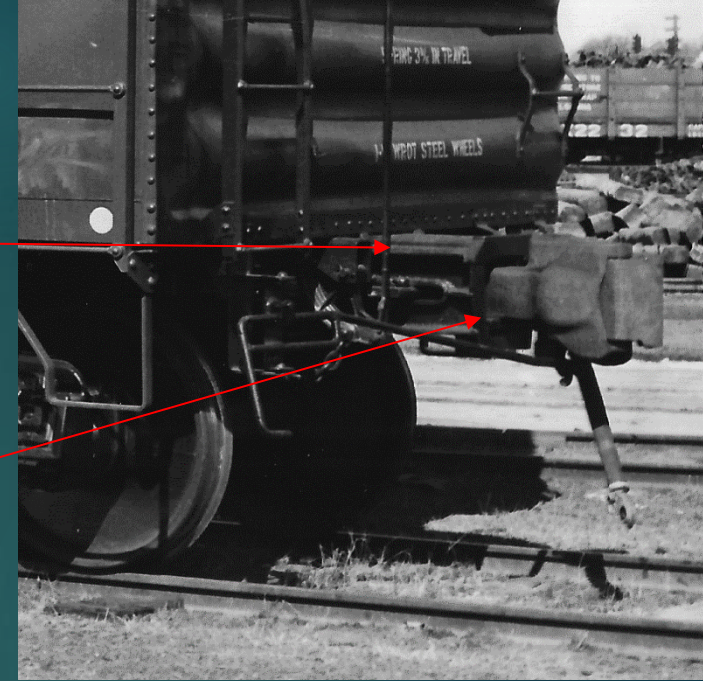


# GN 21950-21964 40' Boxcars (and 39400-39414)

- ▶ Remove 18" from the back of the Moloco P-S cushion underframe draft gear
- ▶ Attach the draft gear to the car floor using the provided screws
- ▶ Add 1" x 2" styrene strips on edge to draft gear to simulate channels
- ▶ Add 1" x 3" styrene strips on edge to simulate striker plate

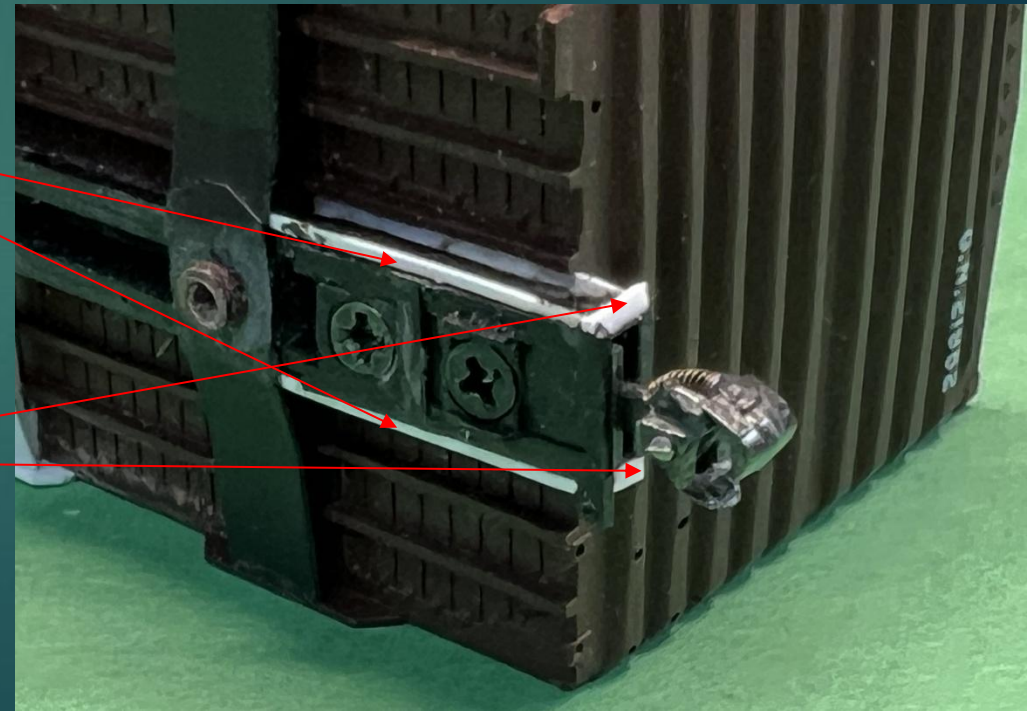
Sliding center sill  
made from channels

Striker plate at  
front of draft  
gear



1" x 2" styrene on  
edge to simulate  
channels

1" x 3" styrene  
to simulate  
striker plate





# GN 21950-21964 40' Boxcars (and 39400-39414)

- ▶ Remove small tab below capacity data
- ▶ Square off end of side sill
- ▶ Make side sill extension from 21" long piece of 2" x 8" styrene strip – angle corner

Remove small  
tab

Square off end  
of side sill

Extend side sill with  
2" x 8" styrene strip

Install 4 new  
cross bearers

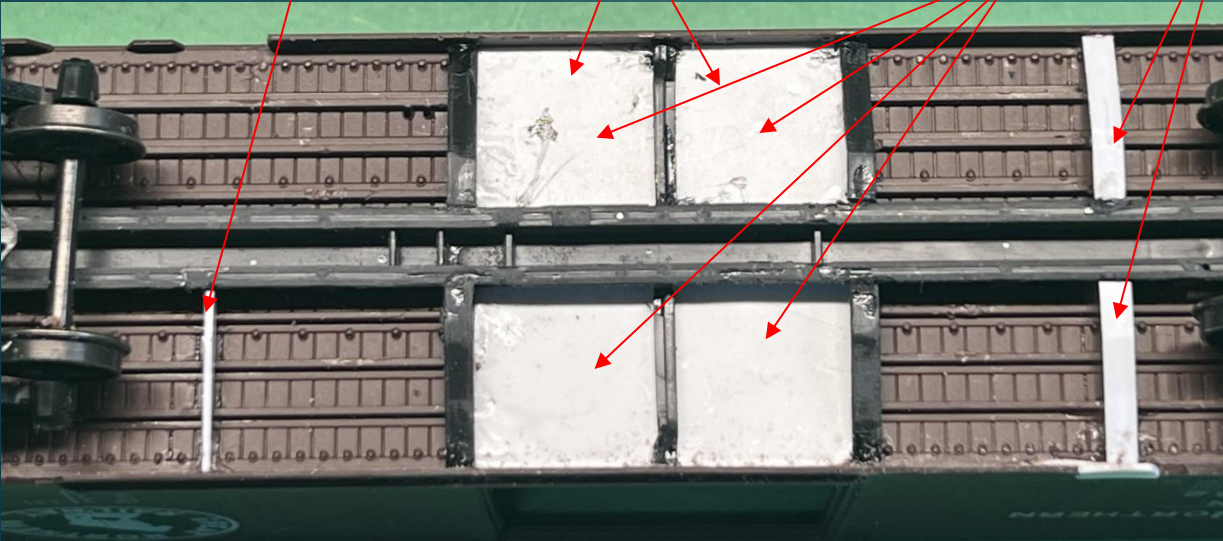
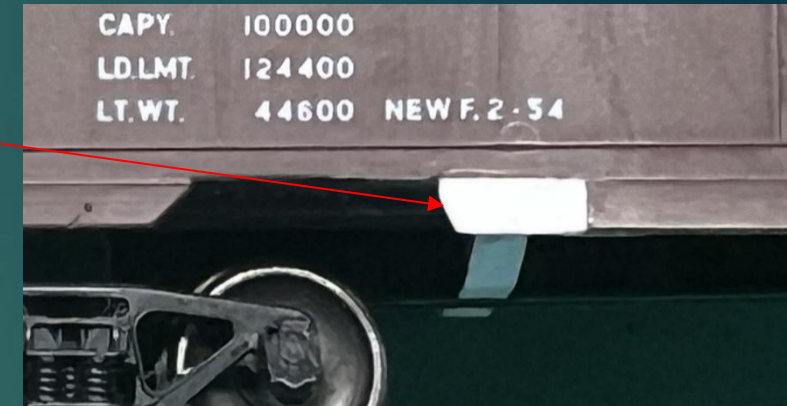
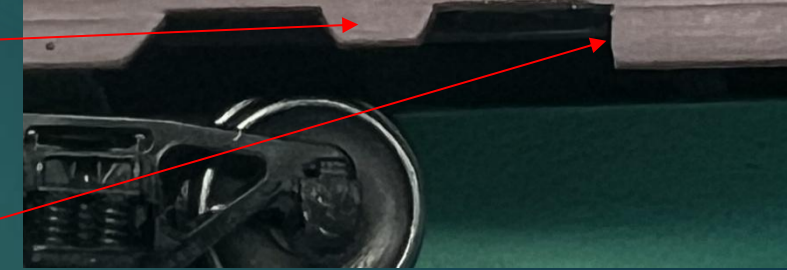
Shear plate made from  
.010" styrene sheet

Relocate 4  
factory cross  
bearers

Add 4 cross  
bearer cover  
plates 1" x 8"

- ▶ Install 4 original cross bearers at door posts 8'-6" center to center
- ▶ Glue .010" styrene sheet on either side of center sill between cross bearers
- ▶ Install 4 new cross bearers 5'-4" center to center from door post cross bearers
- ▶ Add 4 cross bearer cover plates from 1" x 8" styrene

CAPY.	100000	
LD.LMT.	124400	
LT.WT.	44600	NEW F. 2 - 54



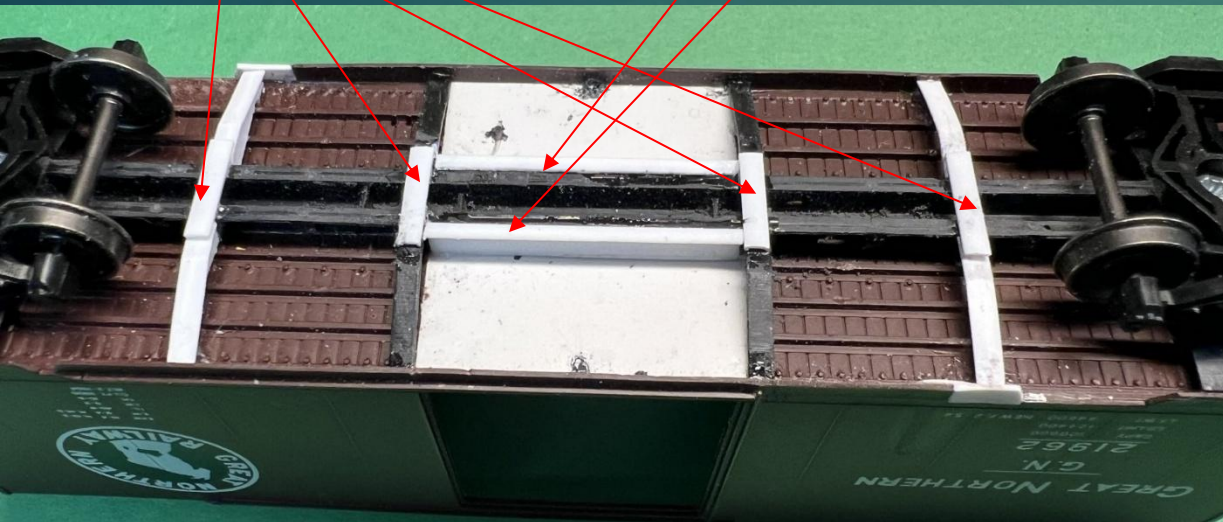


# GN 21950-21964 40' Boxcars (and 39400-39414)

- ▶ Add .080" channel across tops of cross bearers
- ▶ Make cushion gear sills from 5/32" channel with one flange cut off
- ▶ Make cover for cushion gear from .010" styrene sheet
  - ▶ Cut two access slots
- ▶ Add 1" x 3" styrene frame on cushion gear cover plate
- ▶ Add 2 stringers on each side of center sill from 2" x 3" styrene
- ▶ Reinstall factory cross members at center of car

.080" channel 3'  
long – 4 places

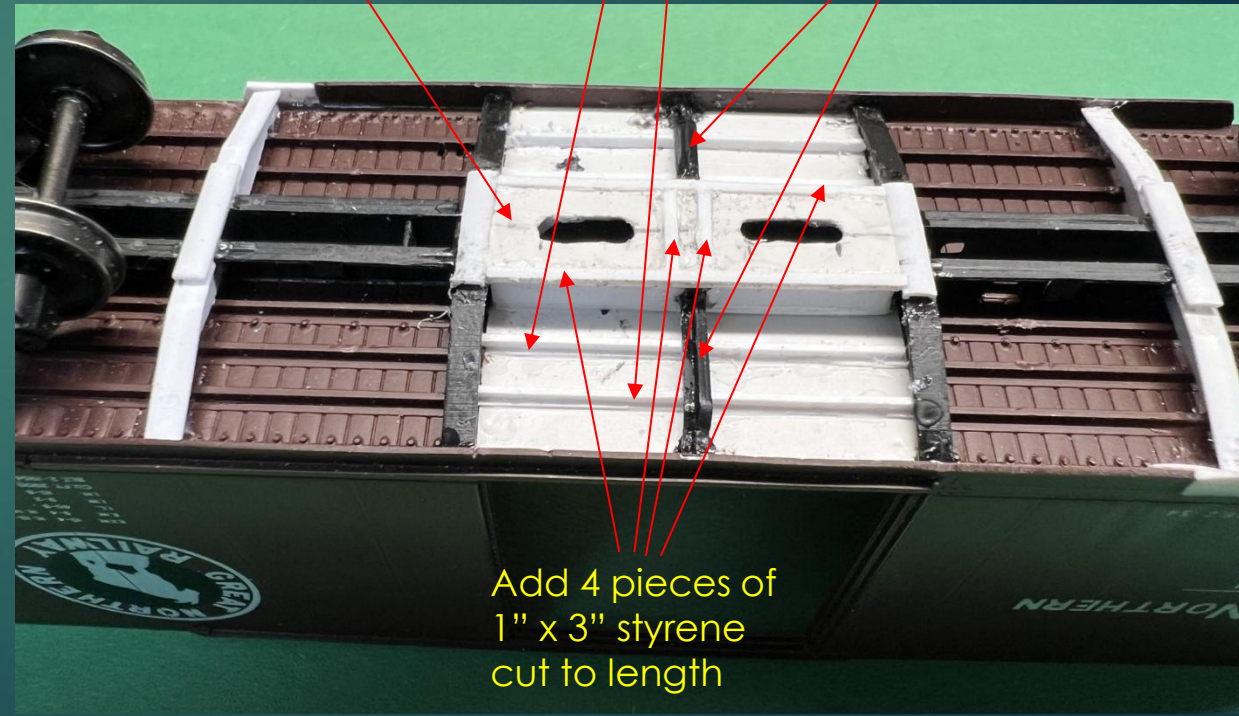
Add cushion gear sills  
made from 5/32"  
channel cut to length



Add 2 stringers  
from 2" x 3"  
styrene on each  
side of center sill

.010" styrene sheet  
cut to fit with two slots  
added

Reinstall  
cross  
members



Add 4 pieces of  
1" x 3" styrene  
cut to length

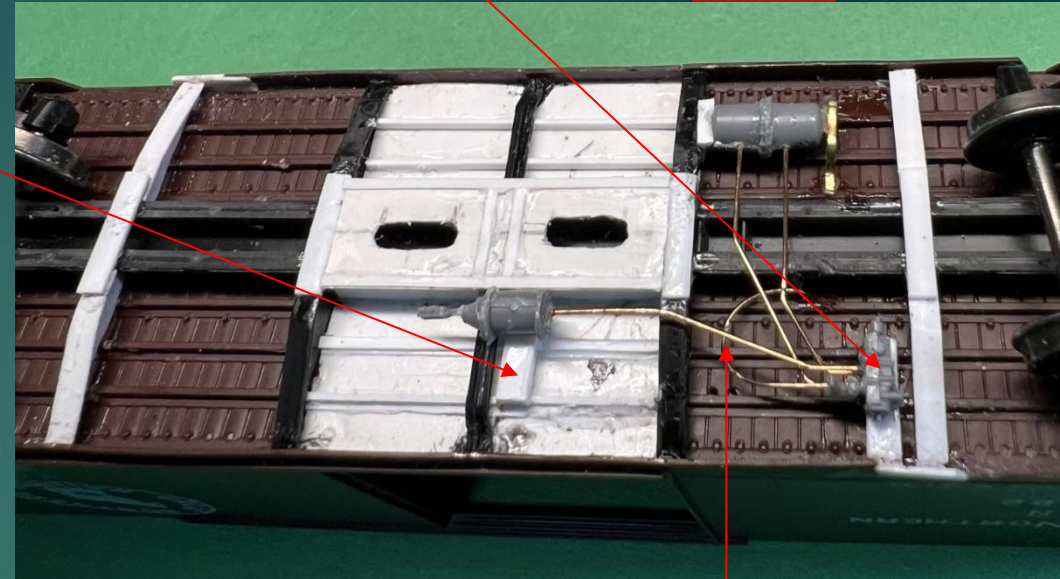


# GN 21950-21964 40' Boxcars (and 39400-39414)

- ▶ Mount brake cylinder on piece of .100" C-channel
- ▶ Mount AB valve transversally on .100" C-channel bracket
- ▶ Mount air reservoir
  - ▶ Attached one end to spacer added to cross bearer
  - ▶ Attach other end to bracket bent from .010" x .030" brass flat bar stock
- ▶ Add piping using .0125" wire
  - ▶ Air line from AB valve to train line has 180° bend
- ▶ Add Yarmouth brake levers and pin plate slack adjuster
- ▶ Brake rods made from .010" wire and Tichy turnbuckles

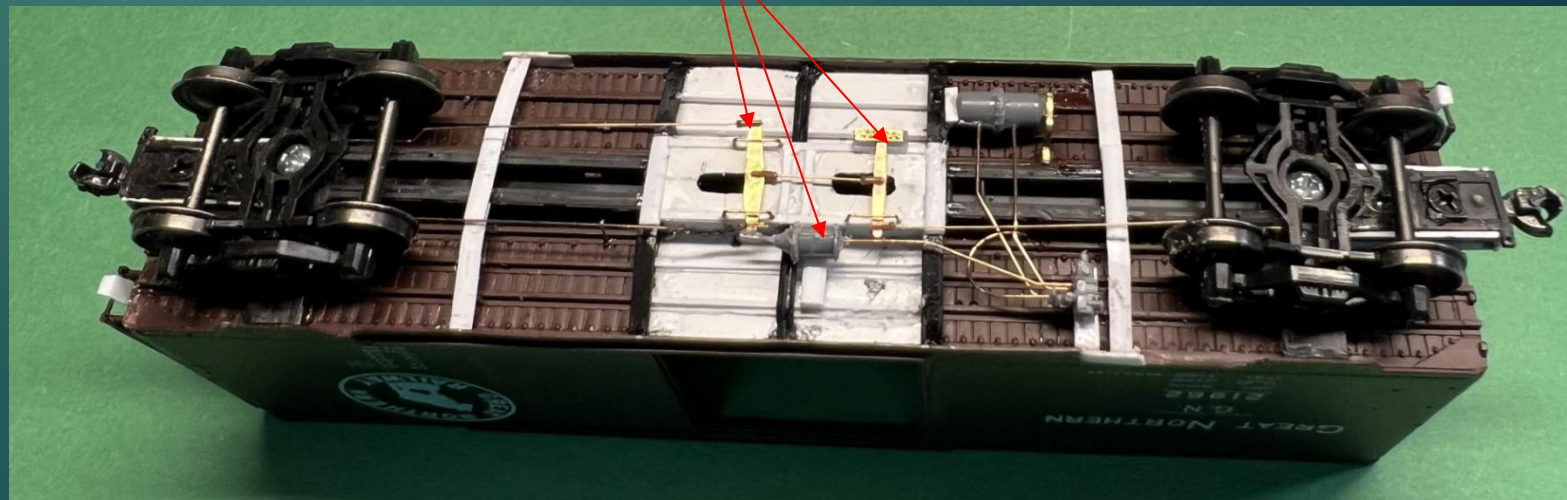
Channel  
mounted to  
stringers

Transversally  
mounted AB valve



180° bend in  
pipe to train line

Brake components are not  
attached to center sill on cars  
with cushion underframes

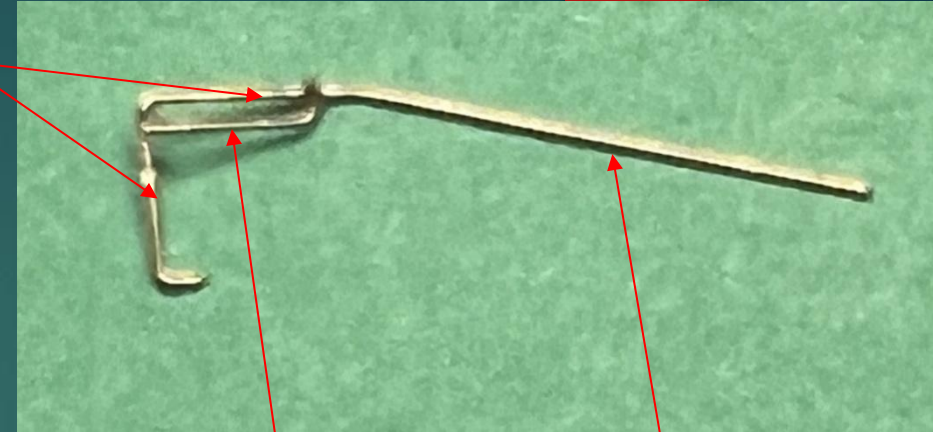




# GN 21950-21964 40' Boxcars (and 39400-39414)

- ▶ Fabricate coupler lift bars from .012" wire
  - ▶ Glue or solder L-shaped rod to main coupler cut bar
- ▶ Make 6" wide coupler lift bar bracket from 1/8" styrene channel with one flange cut off
- ▶ Cut .002" brass shim stock 3" x 9" and crimp over piece of .012" wire
- ▶ Drill hole in lower left corner of coupler box and install Yarmouth eye bolt
- ▶ Install coupler lift bar
  - ▶ Thread coupler lift bar through eye bolt
  - ▶ Glue brass strip to bracket – top wire only

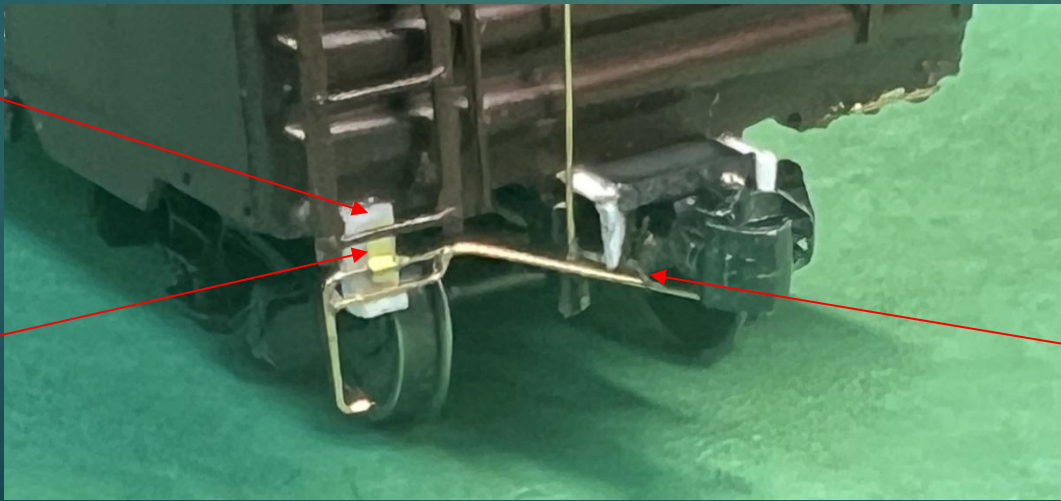
16" between bends



12" long

This portion also bent forward

1/8" channel with one flange cut off – 6" wide



.002" brass shim stock  
3" x 9" crimped over  
top wire

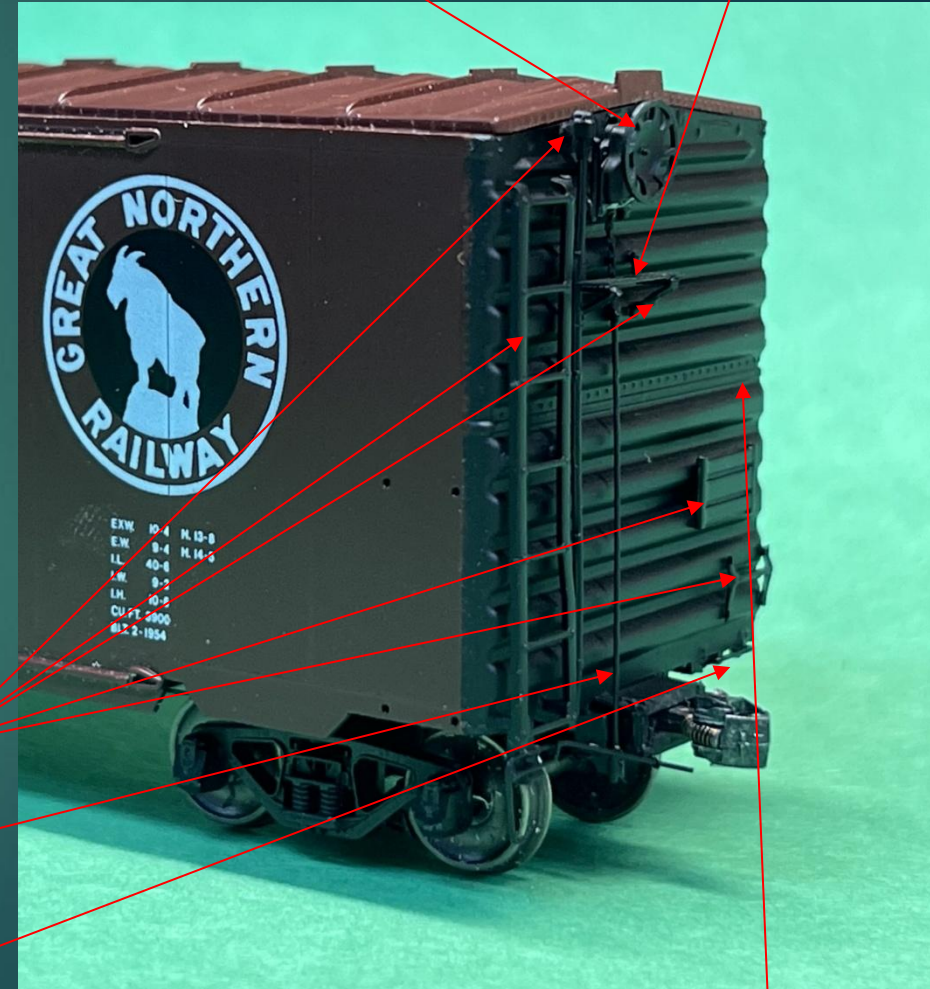
Yarmouth eyebolt  
holds coupler lift  
bar to draft gear

# GN 21950-21964 40' Boxcars (and 39400-39414)

- ▶ Add Archer rivet decals to seam on ends
- ▶ Install factory retainer valve assembly
- ▶ Add Tangent Universal brake housing and brake wheel
- ▶ Replace brake rod from hand brake with wire and Tichy turnbuckle
- ▶ Add Plano Ajax brake step to factory brake step brackets
- ▶ Add Tichy grab iron bottom right side of ends
- ▶ Add factory ladders, tack board, and right grab iron on ends
- ▶ Paint ends and underframe black before adding running board, side ladders, side grab irons, or sill steps

Tangent Universal brake housing and wheel

Plano Apex brake step



Factory parts

.0125" wire and  
Tichy turnbuckle

Tichy 18" straight  
grab iron

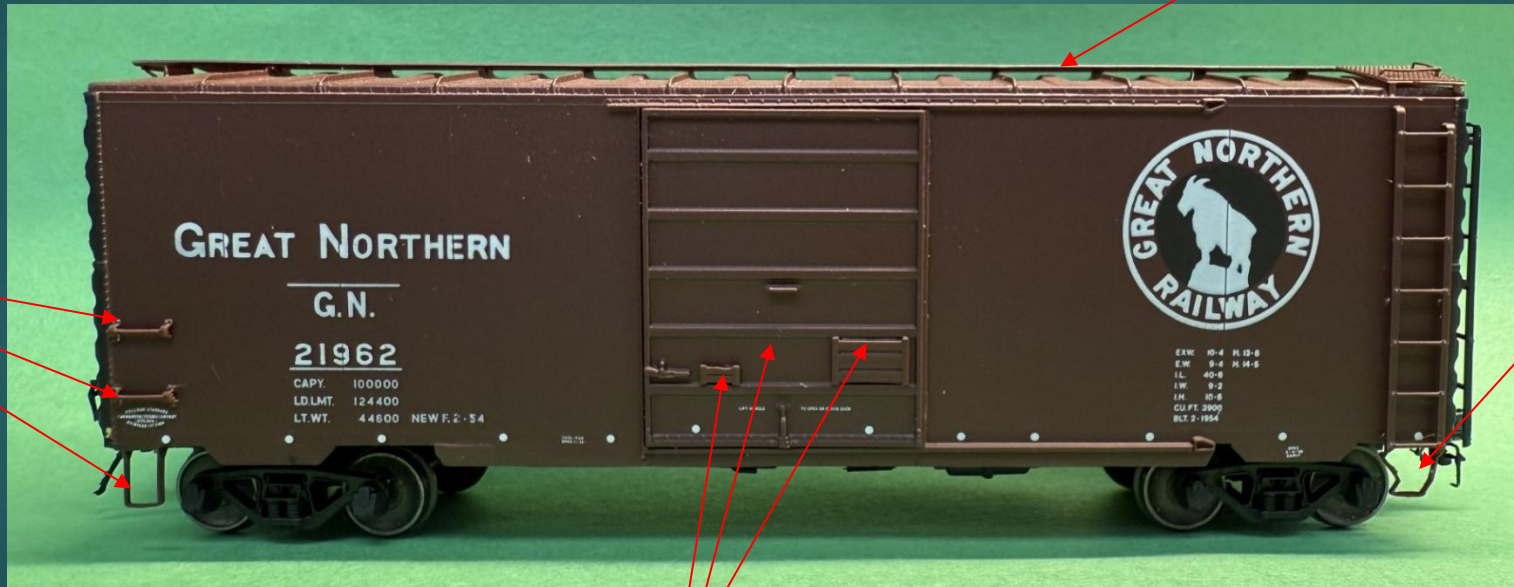
Add Archer rivet decals



# GN 21950-21964 40' Boxcars (and 39400-39414)

- ▶ Install detail parts on sides and roof
  - ▶ Attach Kadee Apex running board with canopy cement
  - ▶ Install factory grab irons and sill steps on left side
  - ▶ Install factory doors, route card holders, and tack boards
  - ▶ Remove extra step from sill step before adding ladders

Kadee Apex  
running board



Factory ladder with  
extra sill step removed

Factory  
parts

Factory  
parts

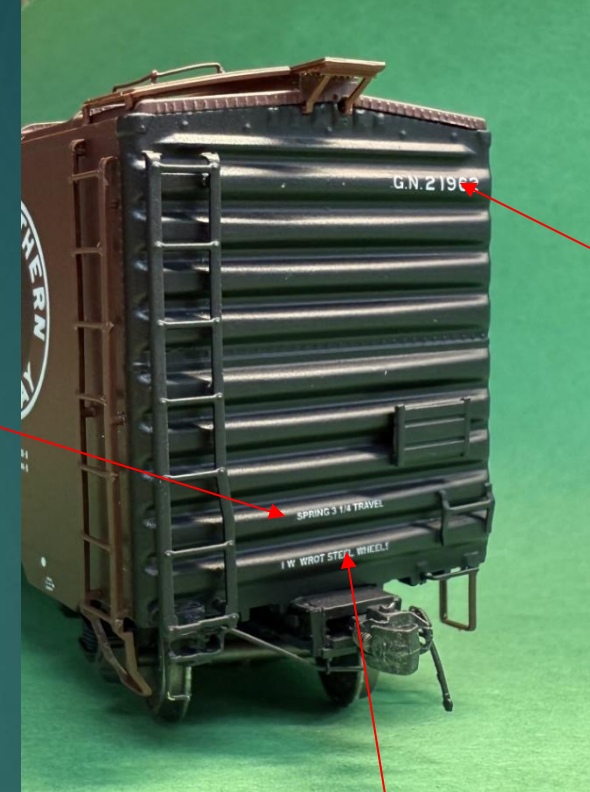
# GN 21950-21964 40' Boxcars (and 39400-39414)

## ► Upgrading the lettering

- Door opening instructions
- End lettering
- Reflective circles along side sill, and P-S logo
- No P-S Cushion Underframe lettering found
- For 39400-39414 use NSC D-260

Door opening instructions – NSC D-260

Circular delineators – NSC D-260



End car numbers –  
NSC D-260

SPRING 3 1/4 IN TRAVEL  
– Microscale 87-185

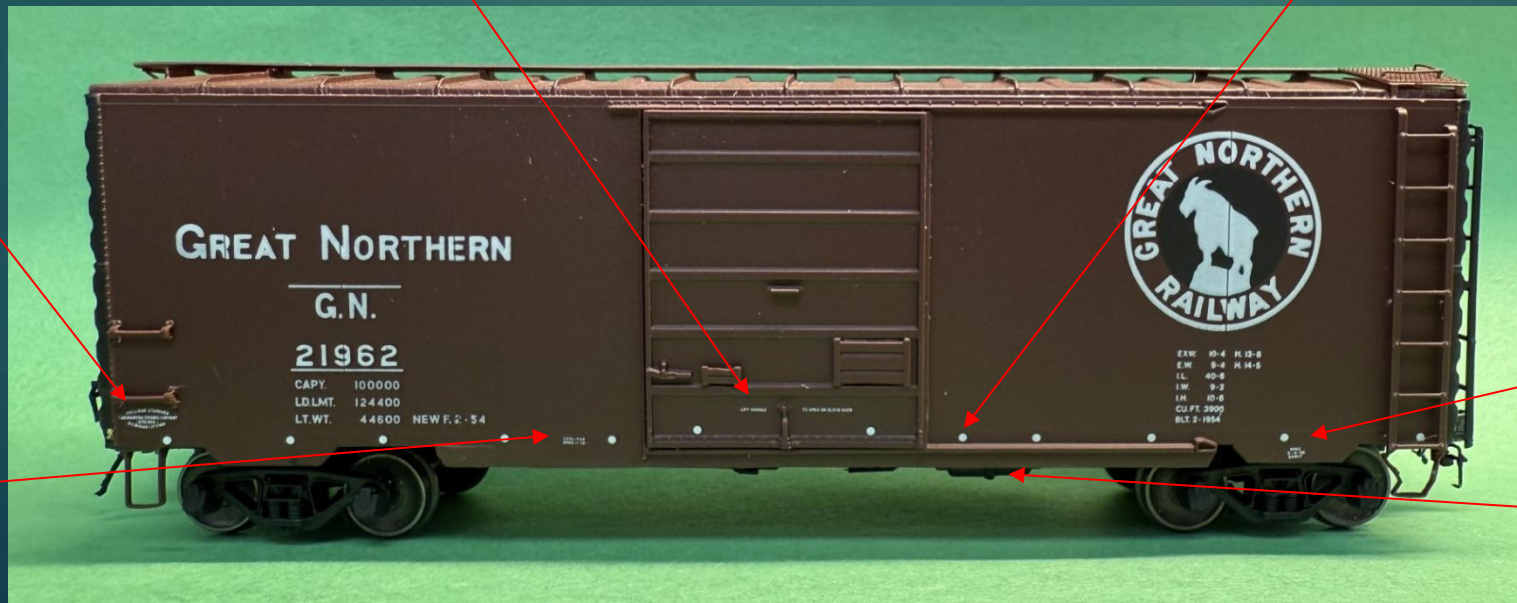
IW WROT STEEL  
WHEELS – NSC D-204

Repack data – NSC  
D-204

Brake reservoir lettering  
– NSC D-204

P-S logo –  
NSC D-204

Wood  
ceiling  
lettering –  
used small  
lettering  
from NSC  
D-260





# GN 21950-21964 40' Boxcars (and 39400-39414)

## ► Detail Parts

- Archer AR88025 Resin Rivets
- Detail Associates 22524 .010" x .030" brass flat bar stock
- Evergreen 8102 1" x 2" styrene strip
- Evergreen 8103 1" x 3" styrene strip
- Evergreen 8108 1" x 8" styrene strip
- Evergreen 8203 2" x 3" styrene strip
- Evergreen 8212 2" x 12" styrene strip
- Evergreen 262 .080" channel
- Evergreen 264 1/8" channel
- Evergreen 265 5/32" channel
- K&S .002" brass shim stock
- Kadee #158 couplers
- Kadee 2001 Apex running board
- Moloco DG-0413 P-S Cushioned draft gear
- Microscale 87-185 decals
- National Scale Car D-135 decals
- National Scale Car D-204 decals
- National Scale Car D-260 decals
- Plano Models Products #11322 Apex Brake Platform
- Tangent TSM-1055 Universal brake wheel
- Tangent TSM-1004 Universal high mount brake housing
- Tangent TSM-2011 50 ton ASF A-3 ride control trucks with .088" wheelsets

- Tichy #1101 .010" phosphor bronze wire
- Tichy #1102 .015" phosphor bronze wire
- Tichy #1106 .0125" phosphor bronze wire
- Tichy 3013 AB brake set
- Tichy 3021 18" straight grab irons

- Tichy 8021 turnbuckles
- Yarmouth YMW-403 brake levers
- Yarmouth YMW-508 Pin Plate Slack Adjuster
- Yarmouth eyebolts w/ no shoulders



- Roof touch-up paint – Tamiya XF-9 Hull Red
- Ends and underframe painted Tamiya TS-6 Flat Black
- Light weathering using Pan Pastel Neutral Grey Extra Dark, Red Iron Oxide Extra Dark, and Raw Umber, Modelflex Rust, Tamiya XF-63 German Grey, and AK Weathering Gun Metal pencil

# GN 21950-21964 40' Boxcars (and 39400-39414)

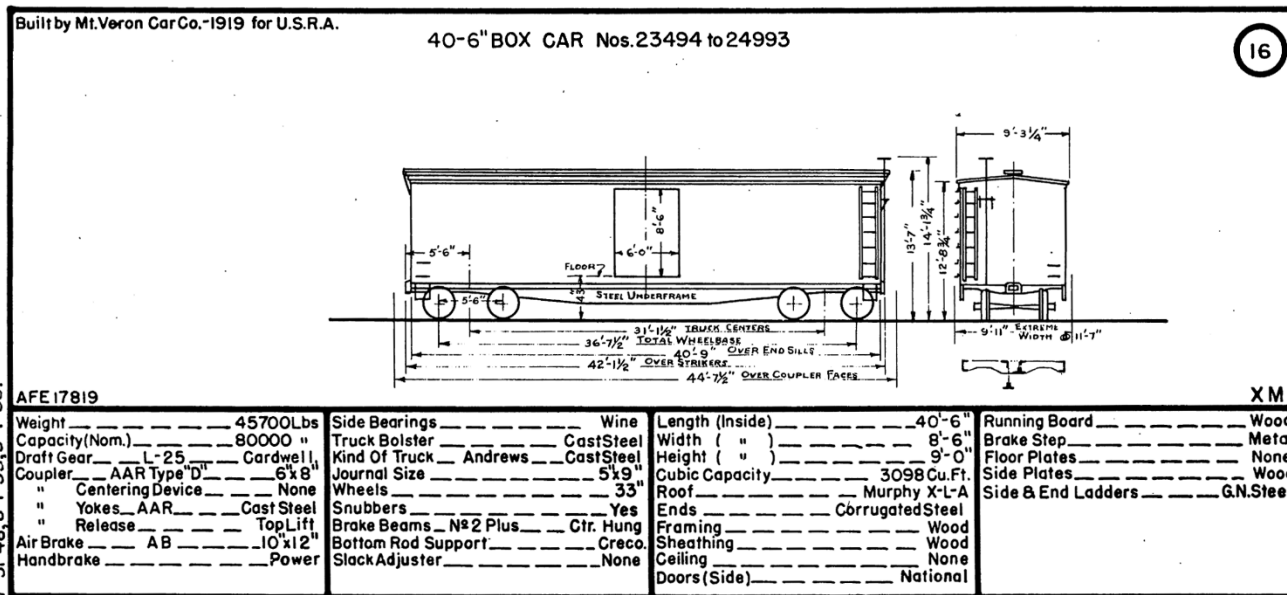
## ► References

- Future GNRHS Reference Sheet – Great Northern 40 Ft. PS-1 Box Cars: Series 21950-21964 and 39400-39414, by Duane Amdahl and Rich Remiarz
- Pullman-Standard's Early Cushion Box Car, by James Kinkaid, Mainline Modeler, January 2002
- Modeling HO Scale Great Northern 40' PS-1 Boxcars, by Rich Remiarz, December 2025 GNRHS Modelers' Pages



# GN 23494-24993 40' USRA Boxcars

- ▶ Built by Mt. Vernon Car Co. in 1919
- ▶ 547 cars on the roster in 1956
- ▶ 9' IH
- ▶ Murphy XLA roofs
- ▶ 5-5-5 Murphy ends
- ▶ Wood running boards and brake steps



S Holmquist Collection, GNRHS Archives

6' wide door opening  
National bottom-supported wood door

# GN 23494-24993 40' USRA Boxcars

- ▶ Andrews trucks
- ▶ 1 wear wheels
- ▶ Upgraded
  - ▶ Ladders on sides
  - ▶ AB brakes
    - ▶ Components on same side of center sill
  - ▶ Powered hand brakes (Universal)
  - ▶ Metal brake step
  - ▶ Fascia board added
  - ▶ CAPY stayed at 80000 lbs

N Priebe  
Collection



T Wahl Collection,  
NPRHA Burien  
Archives





# GN 23494-24993 40' USRA Boxcars

- ▶ Accurail USRA Double Sheathed Boxcar
  - ▶ Upgraded cars
    - ▶ Lateral running board grab irons
    - ▶ Coupler lift bars
    - ▶ Air hoses
- ▶ More knowledge leads to desire for higher accuracy
  - ▶ Horizontal brake wheel
  - ▶ Traditional AB brake component locations
  - ▶ No ladders on sides
  - ▶ Many cars weathered too heavily
    - ▶ Cars upgraded with AB brakes were in good shape and repainted
  - ▶ Cast-on grab irons



# GN 23494-24993 40' USRA Boxcars

- ▶ Ertl USRA Double Sheathed Boxcar
  - ▶ Has individual grab irons – no molded-on ladders and grabs to remove from ends
- ▶ Changes to be made
  - ▶ Upgrade to AB brakes – all components on same side of center sill
  - ▶ Universal hand brake and brake wheel
  - ▶ Fascia board
  - ▶ Ladders on sides
  - ▶ Second grab iron on side
  - ▶ Upgrade grab irons
    - ▶ Deep drop grab iron on left side of ends
  - ▶ Andrews trucks
  - ▶ Coupler lift bars and air hoses

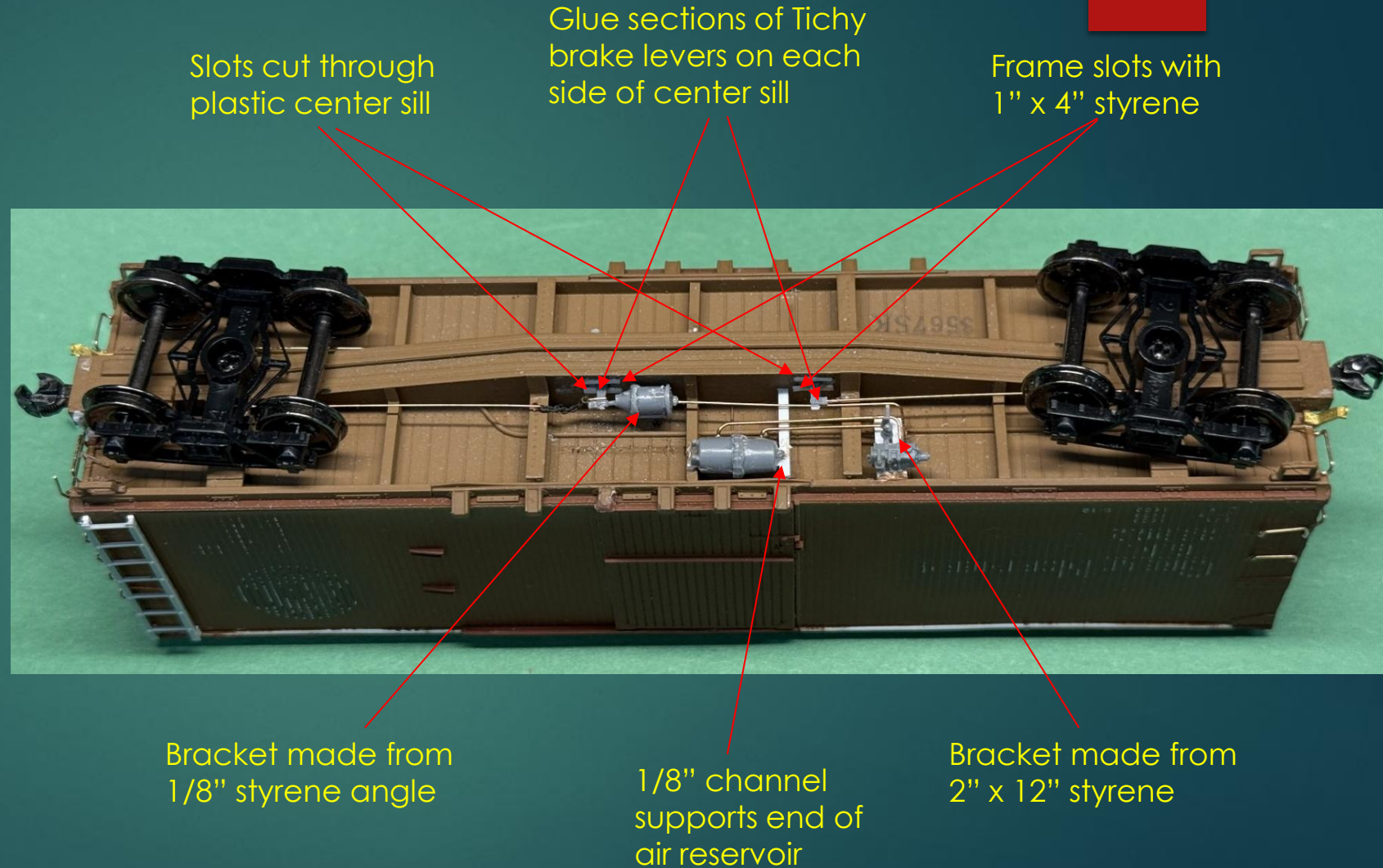




# GN 23494-24993 40' USRA Boxcars

## ► Detailing the underframe

- Difficult to cut slots for brake levers through center sill – center is metal
  - Used router bit to cut slot through plastic center sill
  - Frame slots top and bottom with 1" x 4" styrene
  - Glued sections of Tichy brake lever on each side of center sill
- Tichy AB brake set for main components
  - AB valve mounted on bracket made from 2" x 12" styrene
  - 1/8" channel supports ends of air reservoir
  - Bracket for brake cylinder made from 1/8" styrene angle
  - All components on same side of center sill



# GN 23494-24993 40' USRA Boxcars

## ► Body prep

- Remove all existing grab irons
- Fill grab iron holes where ladders will be installed on sides

## ► Detailing the sides

- Add 1" x 2" styrene fascia boards – end at steel corner braces
- Install Tichy 18" drop grab irons on left - add second grab iron
- Add Tichy 3033 ladders, with stiles trimmed to match prototype
  - Mount with 2" x 2" styrene bits glued to back of ladder stiles

## ► Detailing the ends

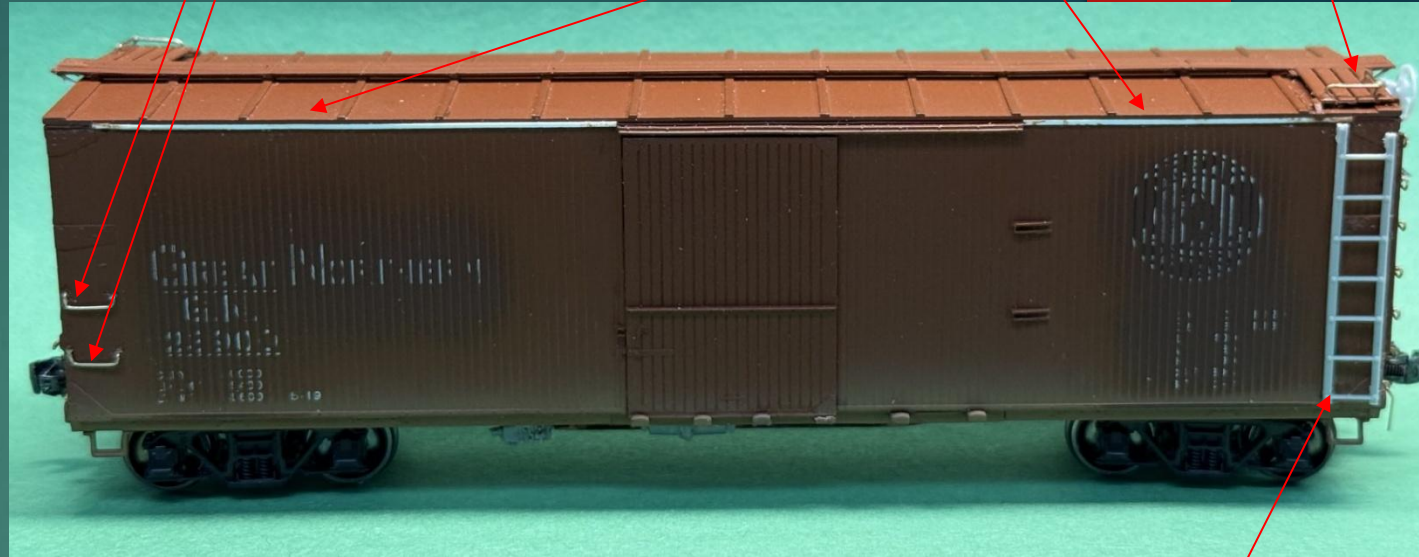
- Replace grab irons with Tichy 18" drop grab irons
- Grab iron below ladder on ends is Tichy 18" straight grab iron bent with a large drop
- Add Tichy retainer valve and .008" wire
- Install Tangent Universal hand brake and brake wheel
- Add Tichy drop step supports and Plano Apex brake step
- Bend coupler lift bars to match prototype photos
- Add Hi-Tech Details air hoses and brackets

## ► Factory running board with corner grabs bent to fit

Tichy 18" drop grab irons

1" x 2" styrene fascia board

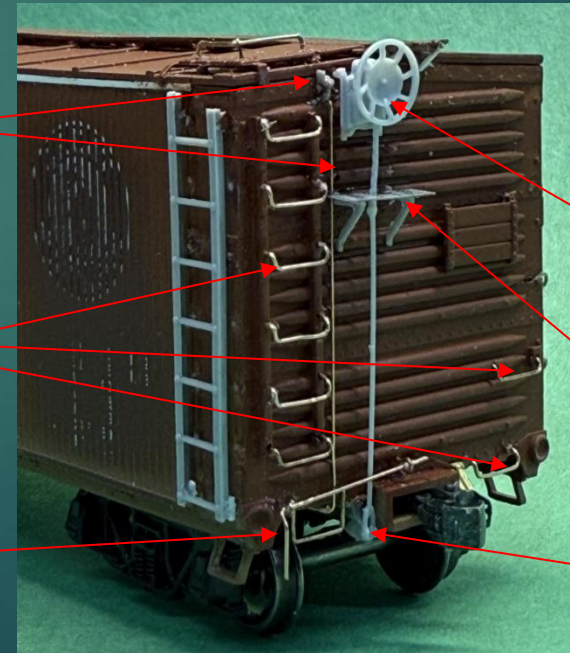
Bend corner grab irons to fit



Tichy retainer valve and .008" wire

Tichy 18" drop grab irons – 8 places

Bend coupler cut bar to match prototype



Tichy ladder w/stiles trimmed to match prototype

Tangent Universal hand brake and brake wheel

Plano Apex brake step with Tichy support brackets

Tichy brake fulcrum



# GN 23494-24993 40' USRA Boxcars

## ▶ Ertl USRA Double Sheathed Boxcar

## ▶ Detail Parts

- ▶ Accurail Andrews trucks
- ▶ Campbell 262 chain
- ▶ Evergreen 8104 1" x 4" styrene
- ▶ Evergreen 8102 1" x 2" styrene
- ▶ Evergreen 8202 2" x 2" styrene
- ▶ Evergreen 8212 2" x 12" styrene
- ▶ Evergreen 264 1/8" channel
- ▶ Evergreen 294 1/8" angle
- ▶ Hi-Tech Details 6040 air hoses & brackets
- ▶ Kadee 158 couplers
- ▶ Plano Model Products #11322 Apex brake platform
- ▶ Tangent TSM-121 0.088" wheel sets
- ▶ Tangent TSM 1055 Universal Brake Wheel
- ▶ Tangent TSM 1004 Universal Hand Brake
- ▶ Tangent TSM-209 wire eye bolts
- ▶ Tichy #1108 .008", #1101 .010", #1106 .0125" phosphor bronze wire
- ▶ Tichy 3013 AB brake set
- ▶ Tichy 3021 18" straight grab irons
- ▶ Tichy 3015 drop grabs
- ▶ Tichy 3033 freight car ladders

- ▶ Roof, sides, ends, underframe, and trucks painted with TruColor TCP-214 GN 1930-45 Freight Car Red

- ▶ Lettered with National Scale Car D138 GN USRA and USRA-Clone Double Sheathed Box Cars

- ▶ Champ BRH-31 for three lines of small lettering on lower left corner of sides next to side grab iron

- ▶ Chalk marks from National Scale Car D135

- ▶ Individual boards colored with Prismacolor Terra Cotta, Tuscan Red, Sienna Brown, & 30% Cool Grey – Roof panels colored with 30% Cool Grey

- ▶ Weathered with Pan Pastel Burnt Sienna, Colorless Blender, Red Iron Oxide Shade, Raw Umber, and Paynes Grey Extra Dark, Modelflex Rust, Tamiya XF-63 German Grey, and AK Weathering Gun Metal pencil





# GN 23494-24993 40' USRA Boxcars

## ▶ Westerfield Models

- ▶ 3815 USRA DS boxcar – original, GN
- ▶ 3855 USRA DS boxcar – modern, GN

▶ Now available with easy assembly with one-piece body

▶ Add bracing inside body to prevent warping

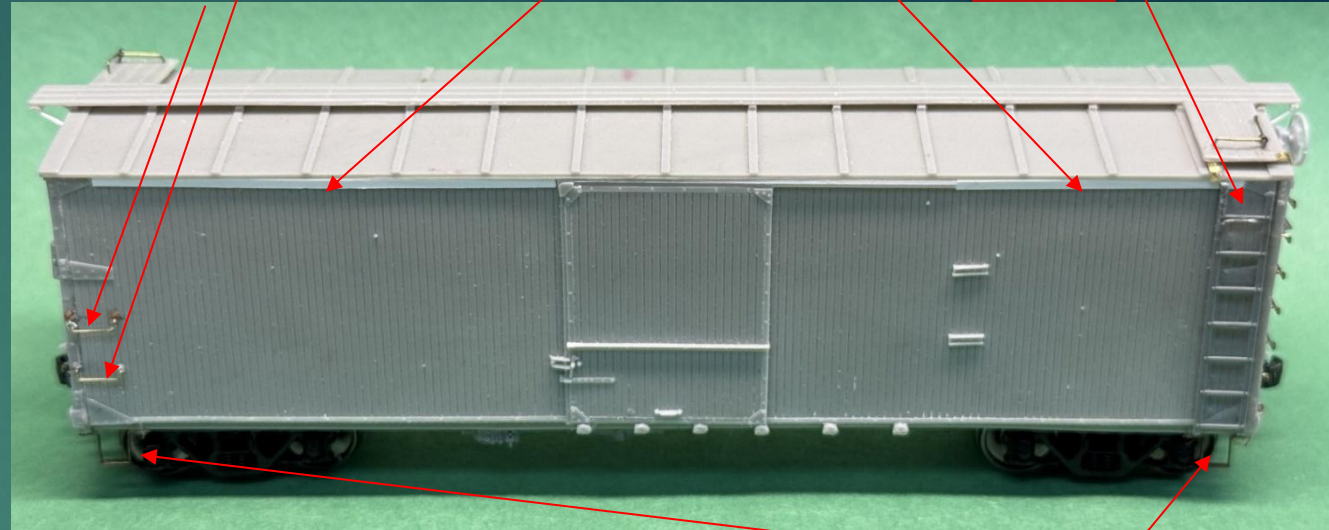
▶ Directions do not cover GN variant accurately

- ▶ Brake system, hand brake, and narrow fascia

18" drop grab irons

1" x 2" styrene fascia board

Tichy ladder w/stiles extended and trimmed to match prototype



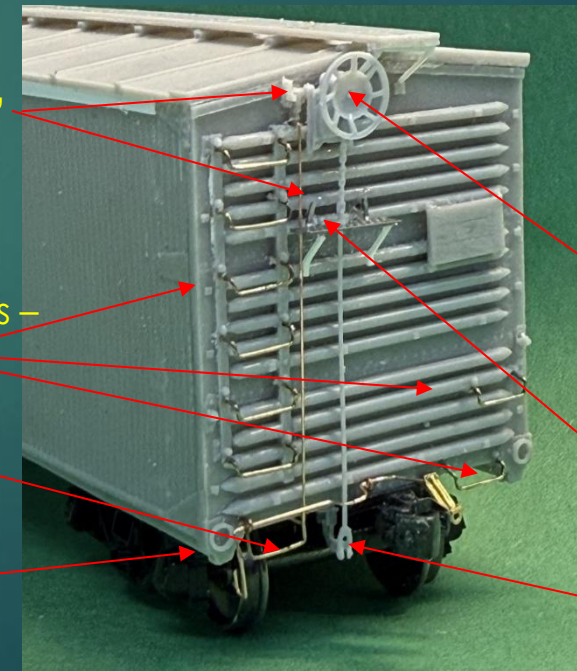
All brake components on same side of center sill

Tichy retainer valve and .008" wire

18" drop grab irons – 8 places

Tichy straight grab iron bent for deep drop

Bend coupler cut bar to match prototype



Yarmouth 221 curved leg underbody mount sill steps

Tangent Universal hand brake and brake wheel

Plano Apex brake step with styrene support brackets

Tichy brake fulcrum



# GN 23494-24993 40' USRA Boxcars

▶ Westerfield 3855 USRA Double Sheathed Boxcar, Modernized GN

## ▶ Detail Parts

- ▶ Campbell 262 chain
- ▶ Evergreen 8102 1" x 2" styrene
- ▶ Evergreen 264 1/8" channel
- ▶ Evergreen 292 .080" angle
- ▶ Hi-Tech Details 6040 air hoses & brackets
- ▶ Kadee 158 couplers
- ▶ Plano Model Products #11310 Apex brake platform
- ▶ Tahoe Model Works 212 USRA 50 ton trucks
- ▶ Tangent TSM 1055 Universal Brake Wheel
- ▶ Tangent TSM 1004 Universal Hand Brake
- ▶ Tangent TSM-209 wire eye bolts
- ▶ Tichy #1108 .008" phosphor bronze wire
- ▶ Tichy 3033 freight car ladders
- ▶ Tichy 8021 turnbuckles
- ▶ Yarmouth 221 curved leg step
- ▶ Yarmouth 403 brake levers

▶ Roof, sides, ends, underframe, and trucks painted with TruColor TCP-214 GN 1930-45 Freight Car Red

▶ Lettered with National Scale Car D138 GN USRA and USRA-Clone Double Sheathed Box Cars

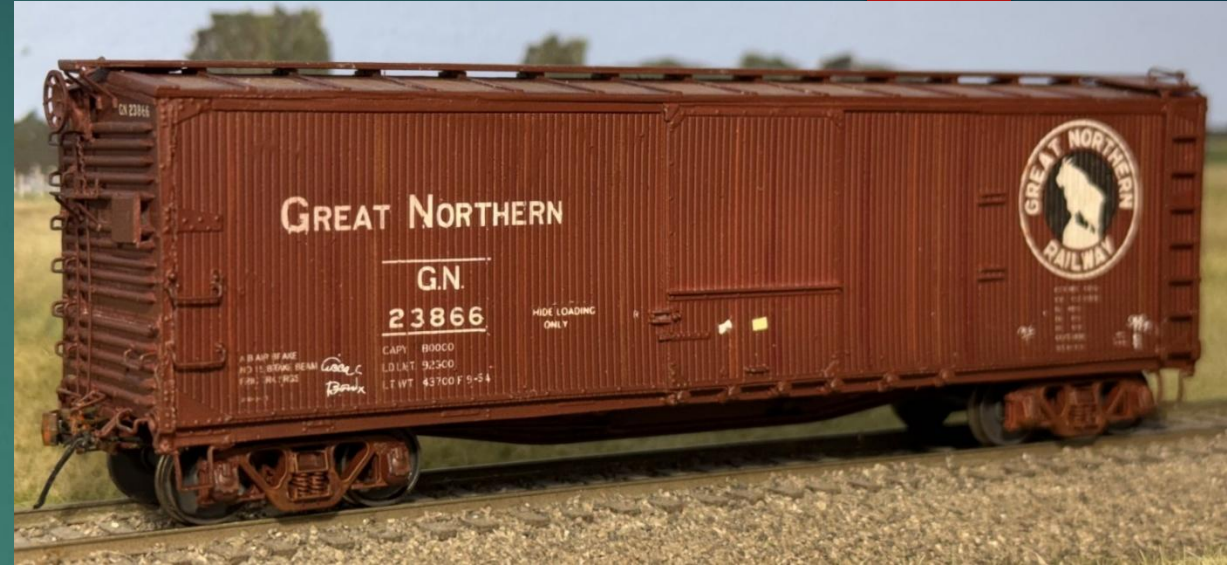
▶ Champ BRH-31 for three lines of small lettering on lower left corner of sides next to side grab iron

▶ Chalk marks from National Scale Car D135

▶ Westerfield decals for HIDE LOADING ONLY

▶ Individual boards colored with Prismacolor Terra Cotta, Tuscan Red, Sienna Brown, & 30% Cool Grey – Roof panels colored with 30% Cool Grey

▶ Weathered with Pan Pastel Burnt Sienna, Colorless Blender, Red Iron Oxide Shade, Raw Umber, and Paynes Grey Extra Dark, Modelflex Rust, Tamiya XF-63 German Grey, and AK Weathering Gun Metal, Medium Rust, Rubber pencils



# GN 23494-24993 40' USRA Boxcars

## ► References

- USRA Freight Cars: An Experiment in Standardization, by James Lane, Mainline Modeler, January/February 1980
- USRA Double-Sheathed 40-Foot Box Cars, by Richard Hendrickson, Model Railroading, May 1988
- U.S.R.A. Double-Sheathed Boxcars, Patrick Wider, Railway Prototype Cyclopedia Volume 16
- Focus on Freight Cars Volume Two: Double Sheathed Box & Automobile Cars, by Richard Hendrickson, pages 34-37
- GN Box Car, by Staffan Ehnbohm, Mainline Modeler. August 1993
- Different Approaches to Modeling Great Northern's USRA Double Sheathed Boxcars, by Rich Remiarz, future issue of GNRHS Modelers' Pages

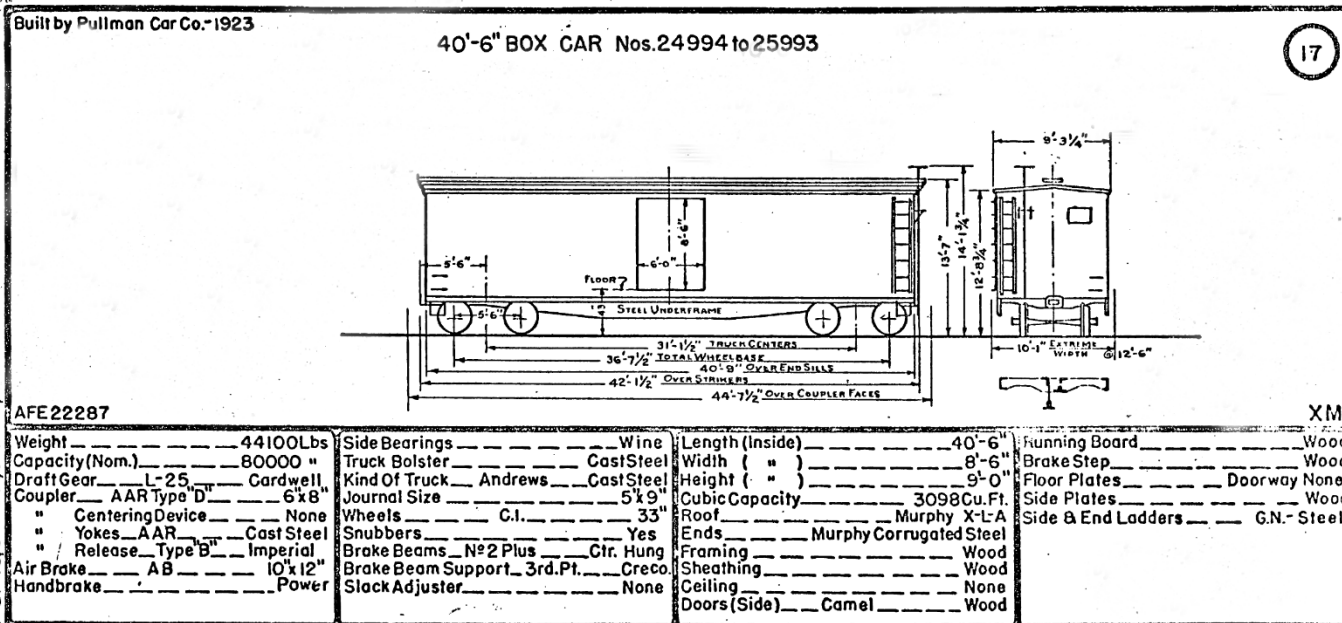


# GN 24494-25993 40' USRA Clone Boxcars

- ▶ Built by the Pullman Car Co. in 1923
- ▶ 641 cars on the roster in July 1956
  - ▶ 314 still left on roster in July 1961
- ▶ 9' IH
- ▶ Murphy XLA roofs
- ▶ 7-8 Murphy ends
- ▶ Wood running boards and brake steps



S Holmquist Collection, GNRHS Archives



6' wide door opening  
Camel top-supported wood door

7-31-48, 8-1-53, 3-1-55, 9-3-57.

# GN 24494-25993 40' USRA Clone Boxcars

- ▶ Andrews trucks
- ▶ 1 wear wheels
- ▶ Upgraded
  - ▶ Ladders on sides
  - ▶ AB brakes
    - ▶ Components on same side of center sill
  - ▶ Powered hand brakes (Universal)
  - ▶ Fascia boards added
  - ▶ CAPY stayed at 80000 lbs



T Wahl Collection, NPRHA Burien Archives



L Thompson  
Collection,  
GNRHS  
Archives



# GN 24494-25993 40' USRA Clone Boxcars

- ▶ John Westley kit-bash project
  - ▶ Accurail 40' USRA double sheathed boxcar
  - ▶ 7/8 ends
    - ▶ Tichy 3058
    - ▶ Westerfied 3615
  - ▶ Wood USRA clone doors – Tichy 3018
  - ▶ Shave off ladders, grab irons, and lower door supports
  - ▶ Remove ends and doors



John Westley photo

# GN 24494-25993 40' USRA Clone Boxcars

- ▶ Add Tichy #3058 7-8 ends
- ▶ Add Tichy #3017 wood door
  - ▶ Use 2" x 3" styrene for lower door track
- ▶ Details sides
  - ▶ Tichy 3033 freight car ladders
  - ▶ Tichy 18" drop grab irons
  - ▶ Yarmouth #201 sill steps
- ▶ Detail ends
  - ▶ Tichy 18" drop grab irons and straight grab irons
  - ▶ Wood brake step
  - ▶ Universal hand brake and brake wheel
- ▶ Detail underframe using Accurail #180 brake set
  - ▶ Brake system components all on same side of center sill
- ▶ Paint car mineral red
- ▶ Lettering from National Scale Car D-138



John Westley photo



# GN 24494-25993 40' USRA Clone Boxcars



Earlier  
Paint  
Schemes

J Ruffing Collection



GN Claims  
Files, GNRHS  
Archives

S Holmquist  
Collection,  
GNRHS  
Archives



# GN 24494-25993 40' USRA Clone Boxcars

## ► References

- U.S.R.A. Double-Sheathed Boxcars, Patrick Wider, Railway Prototype Cyclopedia Volume 16
- U.S.R.A. Double-Sheathed Boxcars, Patrick Wider, Railway Prototype Cyclopedia Volume 16
- Focus on Freight Cars Volume Two: Double Sheathed Box & Automobile Cars, by Richard Hendrickson, pages 34-37
- Kit-Bashing the Great Northern's USRA Clone Boxcars (Series 24994-25993 and 30000-30599), by John Westley, December 2022 GNRHS Modelers' Pages



# GN 28000-28499 40' Truss Rod Boxcars

- ▶ Rebuilt by the GN St. Cloud Car Shops in 1928
  - ▶ New steel underframes
  - ▶ Given new build date
- ▶ Only 13 cars on the roster on 7/1/1956
- ▶ 7' 9<sup>3</sup>/<sub>4</sub>" IH
- ▶ Murphy XLA roofs
- ▶ Inverted Dreadnaught ends
- ▶ Wood running boards
- ▶ No brake steps



Circa 5-1933 Bob's Photos, R Remiarz Collection

Built by G.N.Ry.-1928  
Underframe-Superior  
Body-St. Cloud.

40' BOX CAR Nos. 28000 to 28499

18

AFE 35336

XM

Weight _____ 43100 Lbs	Side Bearings _____ Friction	Length (Inside) _____ 40'-0"	Running Board _____ Wood
Capacity (Nom.) _____ 80000 "	Truck Bolster _____ H.B.B.	Width { " } _____ 8'-7"	Brake Step _____ None
Draft Gear _____ L-25 Cardwell	Kind Of Truck _____ Belt & Andr. Cast Steel	Height { " } _____ 7'-9 3/4"	Floor Plates, Doorway _____ None
Coupler _____ AAR Type "D" 6"x8"	Journal Size _____ 5"x9"	Cubic Capacity _____ 2689 Cu. Ft.	Side Plates _____ Wood
" Centering Device _____ None	Wheels _____ G.I. 35"	Roof _____ Murphy X-L-A	Side & End Ladders _____ G.N.-Steel
" Yokes _____ AAR Cast Steel	Snubbers _____ Yes	Ends _____ Dreadnaught Steel	
" Release _____ Top Lift	Brake Beams _____ No. 2 Plus Hung	Framing _____ Wood	
Air Brake _____ AB 10"x12"	Brake Beam Support (Part) _____ 3rd. Pt. Creco	Sheathing & Lining _____ Wood	
Hand Brake _____ Plain	Slack Adjuster _____ None	Ceiling _____ None	
		Doors (Side) _____ Camel Fixtures	

5' 5" wide door opening  
Camel door fixtures

# GN 28000-28499 40' Truss Rod Boxcars



Tacoma, WA 3-4-1951 Bob's Photos, R Remiarz Collection



# GN 28000-28499 40' Truss Rod Boxcars

- ▶ Westerfield Models
  - ▶ 10454 28000 series DS boxcar – 1925 lettering
  - ▶ 10455 28000 series DS boxcar – 1937/41 lettering
  - ▶ 10456 28000 series DS boxcar – 1948 lettering
- ▶ Easy assembly with one-piece body
- ▶ Bracing added inside body to prevent warping



- ▶ Detail Parts
  - ▶ Accurail trucks with Intermountain wheelsets
    - ▶ Now would use Tahoe Model Works #215 40 ton ARA trucks
  - ▶ Kadee #78 couplers
  - ▶ Kadee air hoses
    - ▶ Now would use Hi-Tech Details 6040 air hoses & brackets
  - ▶ CDS herald
  - ▶ Sunshine chalk mark decals
- ▶ Roof, sides, ends, underframe and trucks painted with Polly Scale PRR Road Maroon
- ▶ Weathered with Floquil Grimy Black and Earth, Polly Scale Rust and Grimy Black



# GN 28000-28499 40' Truss Rod Boxcars

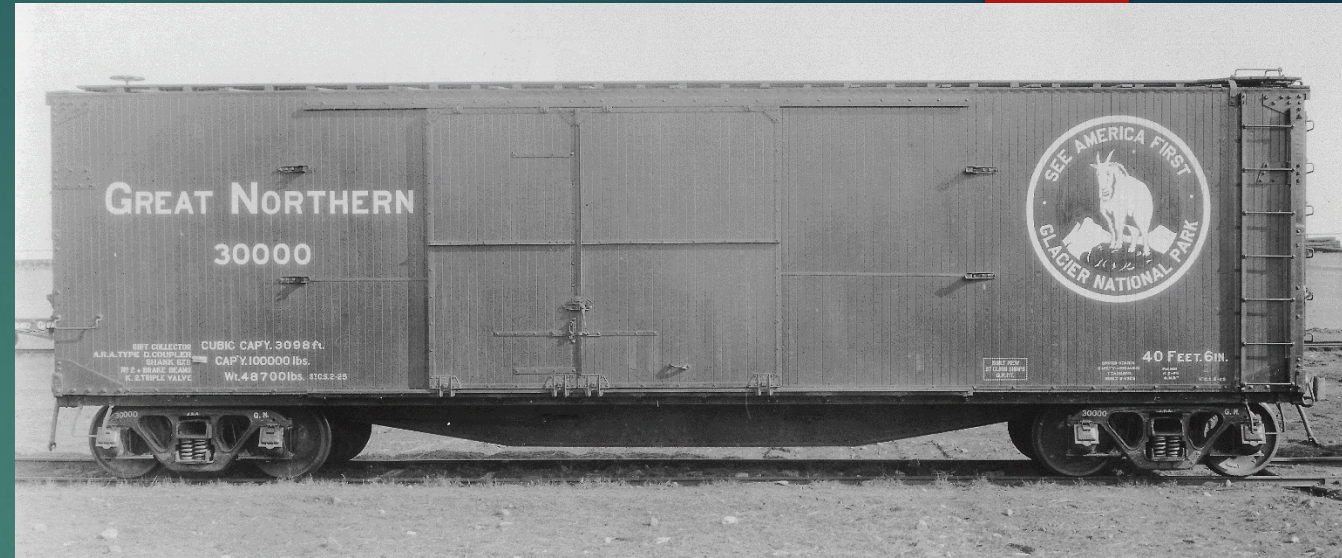
## ► References

- GNRHS Reference Sheet Reference Sheet #408 – Great Northern 40-Foot Truss-Rod Box Cars, by Ken Middleton, March 2018
- Modeling Great Northern 9000-9999 and 28000-28499 Series Truss Rod Boxcars, by Rich Remiarz, June 2025 GNRHS Modelers' Pages

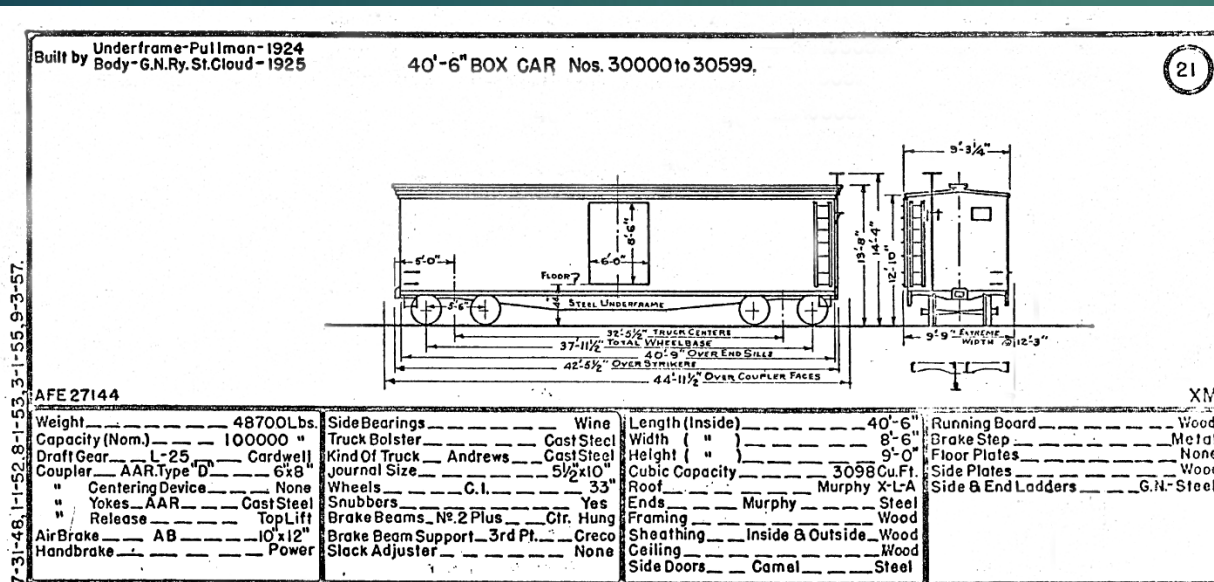


# GN 30000-30599 40' USRA Clone Boxcars

- ▶ Built by the GN St. Cloud Car Shops in 1925
  - ▶ Pullman-Standard built underframes in 1924
- ▶ 9' IH
- ▶ Murphy XLA roofs
- ▶ 7-8 Murphy ends
- ▶ Wood running boards
- ▶ 32' 5 1/2" truck centers
  - ▶ Longer than USRA cars



S Holmquist Collection, GNRHS Archives



10' wide door opening  
Main door - 6'  
Auxiliary door - 4'  
Main door centered on car centerline

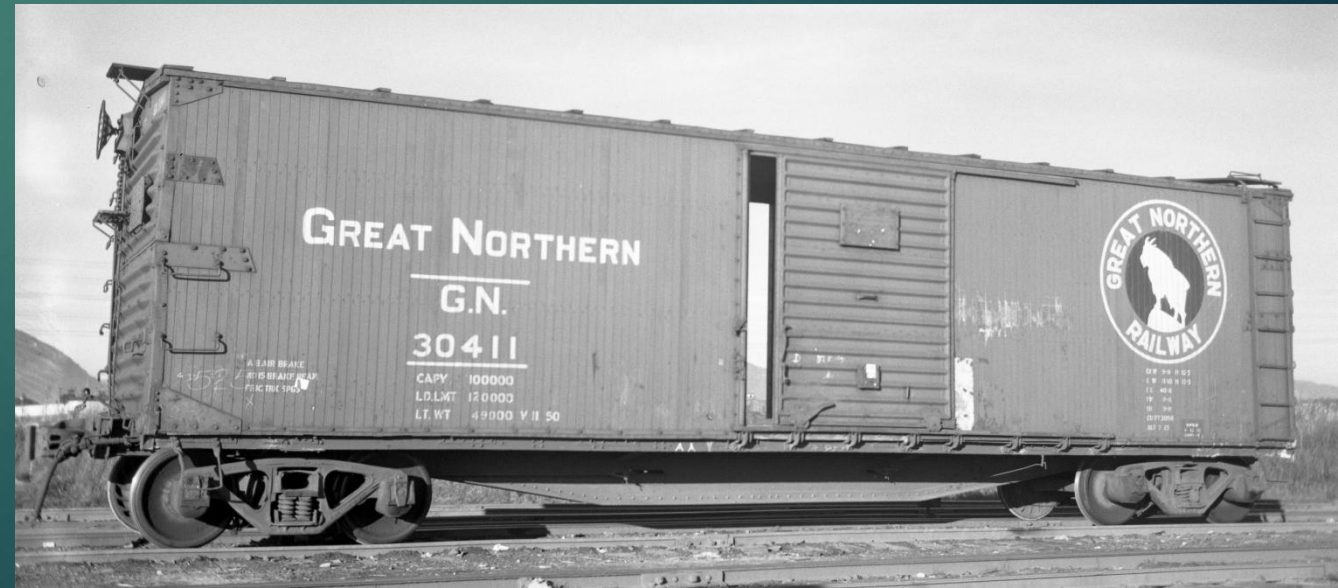


# GN 30000-30599 40' USRA Clone Boxcars

- ▶ Rebuilt in 1930s
  - ▶ Youngstown 6' door
  - ▶ AB brake components mounted on same side of underframe
  - ▶ Andrews trucks
  - ▶ Power hand brakes
    - ▶ Universal or Ajax hand brakes and brake wheels per photos
  - ▶ Ladders on sides
  - ▶ Additional reinforcing plates at corners
  - ▶ Fascia boards
  - ▶ 100,000 lb CAPY
- ▶ Additional changes over time
  - ▶ Some cars had trucks upgraded



Vineland, NJ, 1954, R Remiarz Collection  
Circa 1952-53 - Stan Styles Photo, Bob Kelly Collection





# GN 30000-30599 40' USRA Clone Boxcars

Narrow fascia boards

Circa 1954 - Stan Styles Photo, Bob Kelly Collection

Reinforcing plate located higher than on USRA cars

Additional reinforcing plate with grab iron attached



Ladder on sides

Youngstown steel door

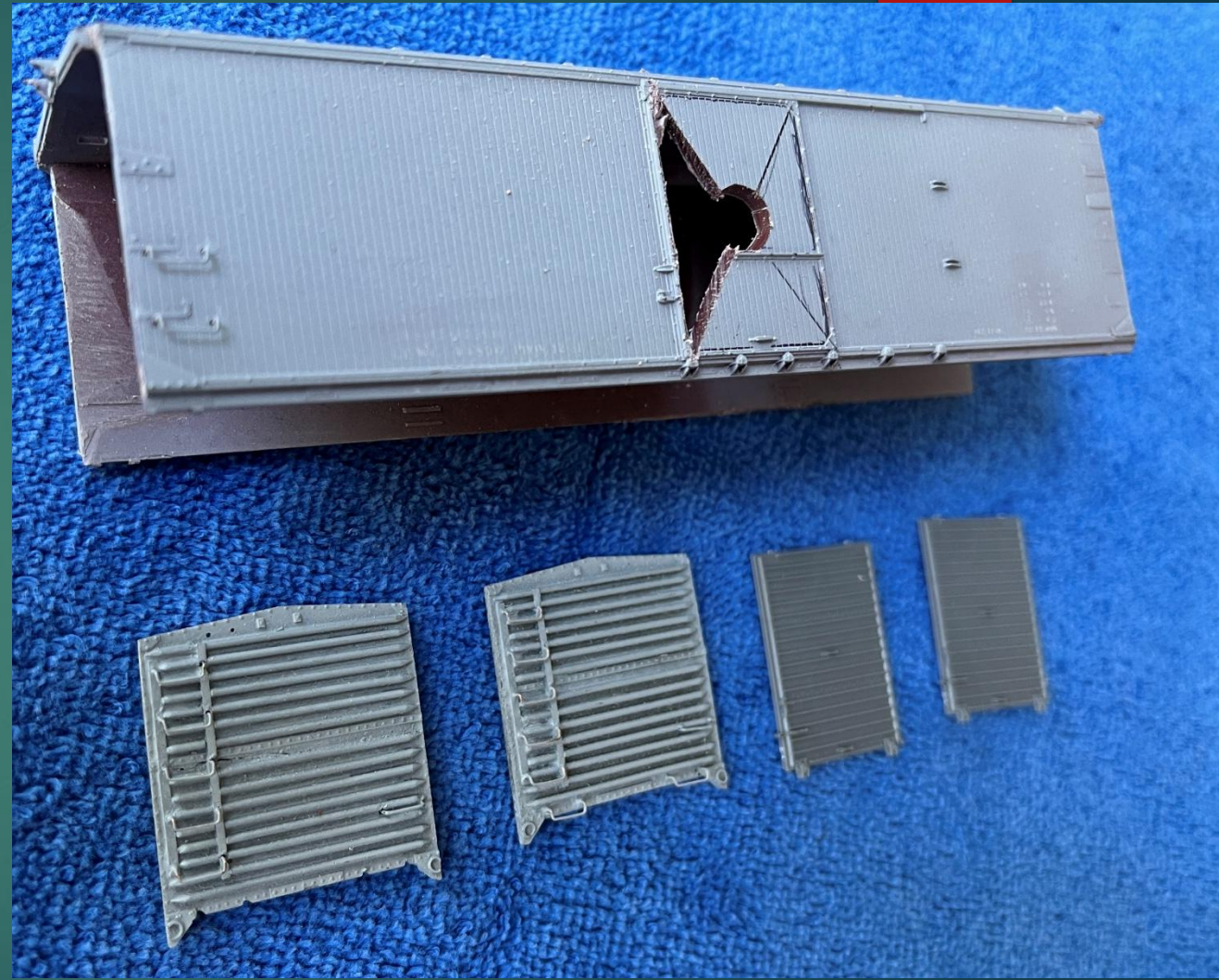
All three AB brake components located on same side of center sill

Lower door track attached to eight door supports



# GN 30000-30599 40' USRA Clone Boxcars

- ▶ John Westley kit-bash project
  - ▶ Accurail 40' USRA double sheathed boxcar
  - ▶ 7/8 ends
    - ▶ Tichy 3058
    - ▶ Westerfied 3615
  - ▶ Dreadnaught doors – Tichy 3018
  - ▶ Shave off ladders, grab irons, lower door supports, and door stops from the sides
  - ▶ Remove ends and doors

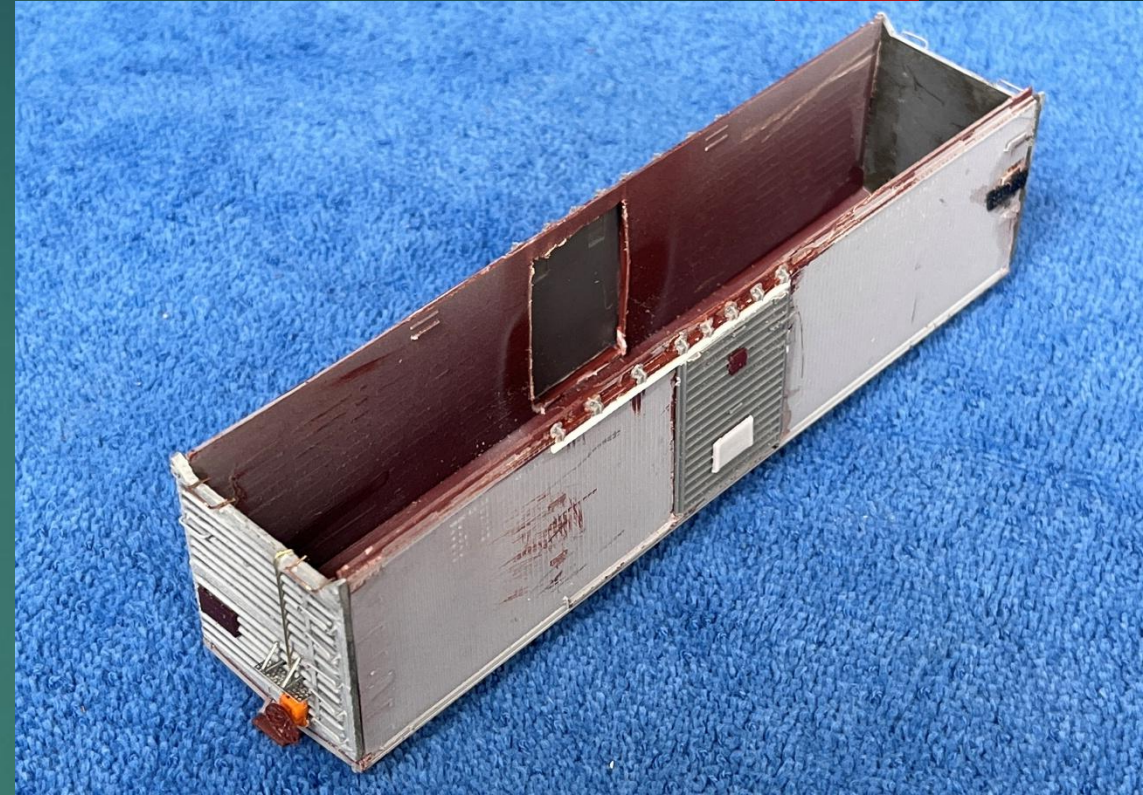


John Westley photo

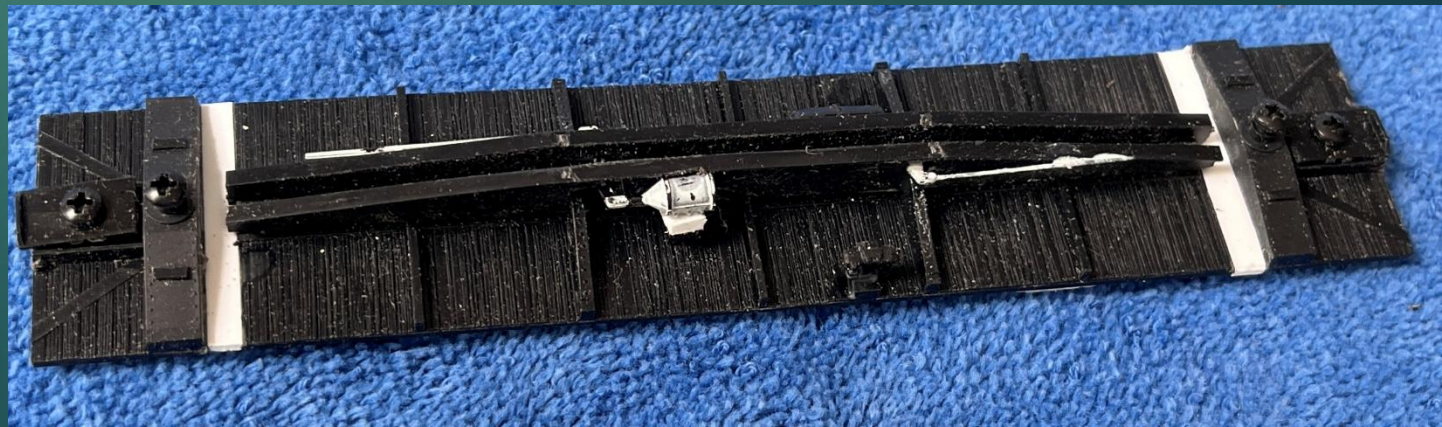


# GN 30000-30599 40' USRA Clone Boxcars

- ▶ Add Tichy #3058 7-8 ends
- ▶ Add Tichy #3018 dreadnaught door
  - ▶ Use 2" x 3" styrene for lower door track
  - ▶ Add 8 door supports from Tichy #3070
- ▶ Details sides
  - ▶ Tichy 3033 freight car ladders
  - ▶ Tichy 18" drop grab irons
  - ▶ Rivet plates above side grab irons made from Tichy #8214 rivet plates
  - ▶ Yarmouth #201 sill steps
- ▶ Detail ends
  - ▶ Tichy 18" drop grab irons and straight grab irons
  - ▶ Plano #11322 Apex brake step
  - ▶ Ajax hand brake and Kadee Ajax brake wheel
- ▶ Modify underframe to match prototype 32' 5½" truck spacing
  - ▶ Cut floor and underframe at bolsters
  - ▶ Add 6" x 12" styrene to lengthen floor
  - ▶ Shorten ends of underframe accordingly
- ▶ Detail underframe using Accurail #180 brake set



John Westley photos





# GN 30000-30599 40' USRA Clone Boxcars

- ▶ Roof, ends, and sides painted Scalecoat Box Car Red #3
- ▶ To give underframe well-aged look, underframe painted equal parts of Scalecoat Flat Roof Brown, Flat Railroad Tie Brown, and Grimy Black
  - ▶ Prototype underframe and trucks were painted mineral red
- ▶ Tichy decal set #10089
  - ▶ Specifically designed for these cars
  - ▶ Substitute road name and herald from National Scale Car #D138 decals



John Westley photo



# GN 30000-30599 40' USRA Clone Boxcars

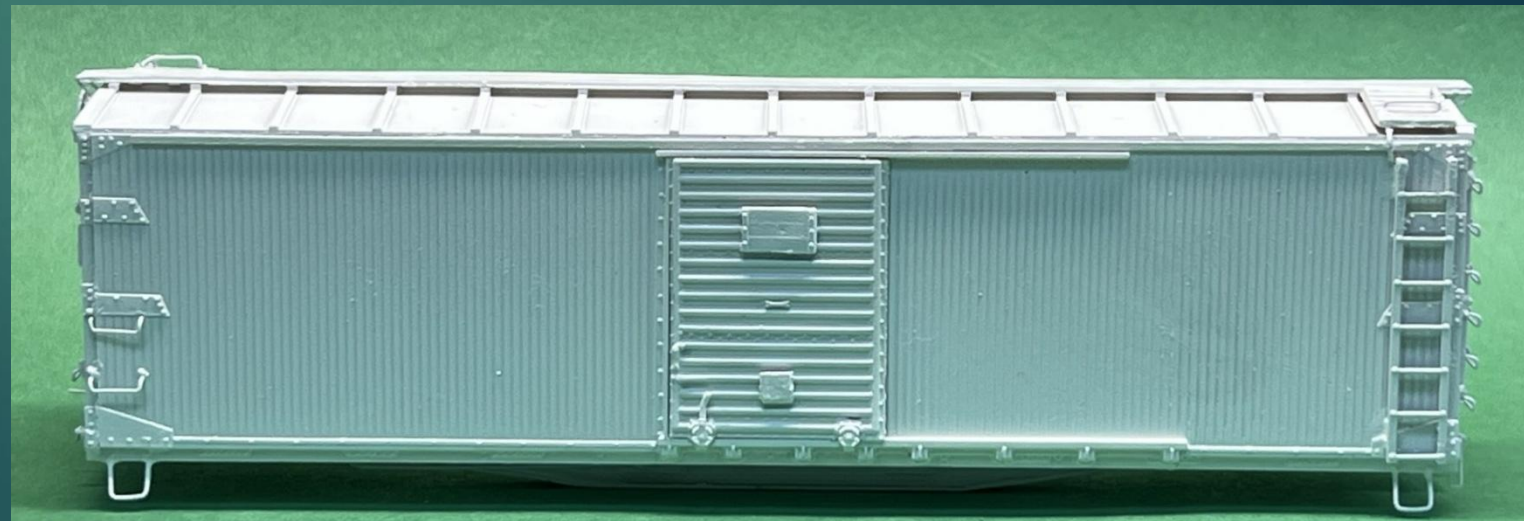
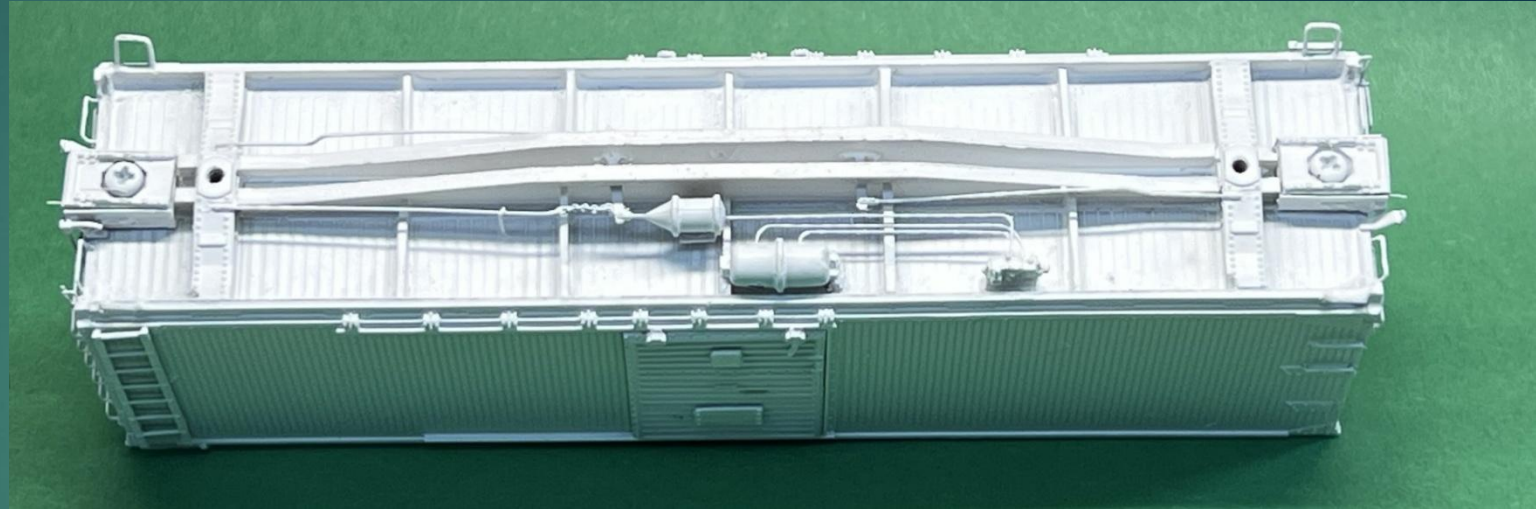
- ▶ Further detailing
  - ▶ .088" wheel sets and Kadee 178 semi-scale couplers
  - ▶ Air reservoir moved to same side of underframe as AB valve and brake cylinder
  - ▶ Hi-Tech Details air hoses and brackets added
  - ▶ Coupler lift bar – with U-shaped handle
  - ▶ National Scale Car chalk marks
  - ▶ Weathering appropriate for September 1956
    - ▶ Car repainted in 1951





# GN 30000-30599 40' USRA Clone Boxcars

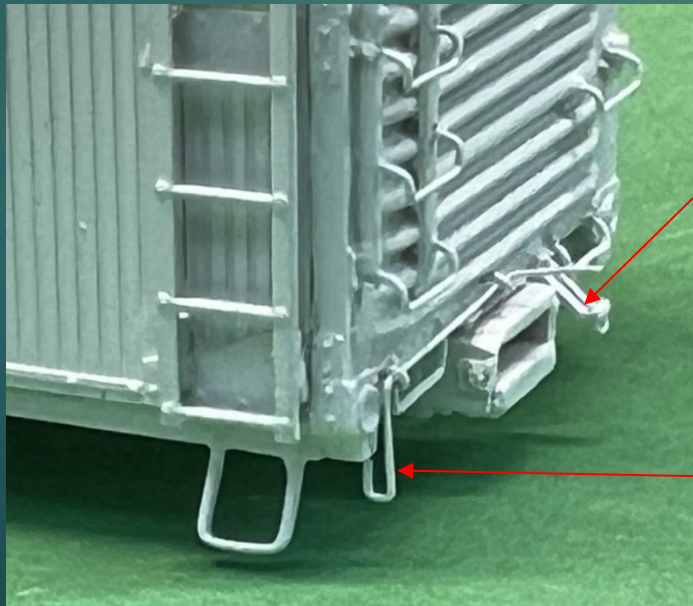
- ▶ Sunshine models
  - ▶ #77.4 GN 30000 Series D.S. Boxcar 68' GNRwy Herald
- ▶ Brace the interior of the car to prevent the sides from warping in the future
- ▶ Mount all of the brake components on the same side of the center sill
  - ▶ Yarmouth etched brass brake levers
- ▶ Used 2" x 2" styrene for lower door guide
- ▶ Ignore instructions about incorrectly spaced bolt heads on the end ladder stiles
  - ▶ Use Tichy 3033 Freight Car ladders on sides – they have the correct rung spacing and match the end ladder spacing





# GN 30000-30599 40' USRA Clone Boxcars

- ▶ Added Tangent Universal hand brake and brake wheel
- ▶ Plano brake step
- ▶ HiTech Details air hoses and brackets
- ▶ Grab iron to left of coupler has deep, straight drop
- ▶ Unique U-shaped handle on end of coupler lift bars



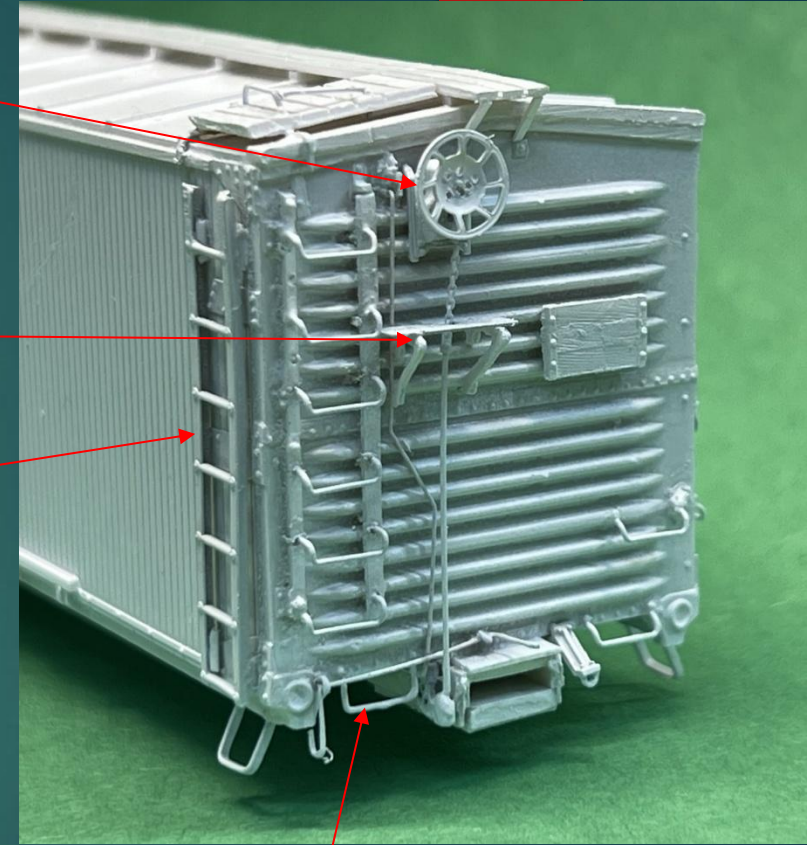
Tangent Universal  
hand brake and  
brake wheel

Plano Apex brake  
step with Tichy  
support brackets

Tichy 3033 ladder

HiTech Details  
air hoses and  
brackets

U-shaped handle  
on coupler lift bars



Left grab iron has  
deep, straight  
drop

# GN 30000-30599 40' USRA Clone Boxcars

## ▶ Detail Parts

- ▶ Campbell 256 chain
- ▶ Evergreen 8202 2" x 2" styrene strips
- ▶ Hi-Tech Details 6040 air hoses & brackets
- ▶ Kadee #158 couplers
- ▶ National Scale Car D-135 chalk mark decals
- ▶ Plano 11322 Apex brake step
- ▶ Tahoe Model Works TMW 212 Andrews trucks
- ▶ Tangent TSM 1004 Universal Hand Brake
- ▶ Tangent TSM 1055 Universal Brake Wheel
- ▶ Tichy .010" and .0125" phosphor bronze wire
- ▶ Tichy 3021 straight grab irons
- ▶ Tichy 8021 turnbuckles
- ▶ Tichy 3033 freight car ladders
- ▶ Yarmouth YMW-403 Brake Levers



- ▶ Roof, sides, ends, underframe and trucks painted with TruColor TCP-214 GN 1930-45 Freight Car Red
- ▶ Individual boards and roof panels colored with Prismacolor Terra Cotta, Tuscan Red, Sienna Brown, & 30% Cool Grey
- ▶ Weathered with Pan Pastel Permanent Red Extra Dark, Raw Umber, Burnt Sienna, Colorless Blender, and Neutral Grey Extra Dark, Modelflex Rust, Tamiya XF-63 German Grey, and AK Weathering Gun Metal pencil



# GN 30000-30599 40' USRA Clone Boxcars

## ► References

- GNRHS Reference Sheet Reference Sheet #42 – Great Northern Box Cars, Series 30000 and 31000, Staffan Ehnborn, May 1978
- Kit-Bashing the Great Northern's USRA Clone Boxcars (Series 24994-25993 and 30000-30599), by John Westley, December 2022 GNRHS Modelers' Pages

# Thank you!

## Any Questions?

- ▶ Next year's clinic will finish the Great Northern 40' boxcars

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