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## GENERAL SPECIFICATIONS

### GENERAL DESCRIPTION

The car is a 50'-6" inside length, exterior post boxcar designed for a gross rail load of 286,000 Lb.

### DESIGN

The car is designed and built in accordance with drawings as specified in the AAR Specifications for Design, Fabrication and Construction of Freight Cars, M-1001. The car is designed to comply with AAR Standard S-286-2002. Car builder provides proper fixtures for construction to insure good fit-up and alignment of subassemblies and completed car.

### CLEARANCES

Car geometry complies with AAR Clearance Diagram Plate F. The car structure and all appurtenances are within Plate F.

### INTERCHANGE

The car complies with AAR Interchange Rules and D.O.T. requirements. The light weighing and stenciling comply with AAR Interchange Rule 70.

### MATERIAL AND WORKMANSHIP

All material and workmanship are of the best quality. Parts are made and assembled using gauges and templates to insure interchangeability.

### INSPECTION

Customer may place as many inspectors as deemed necessary at the car builder's works who have free access at all times to all drawings and work, that they may see that the provisions of this specification are complied with in every respect. Material and details not conforming to specifications may be rejected and will be reworked or replaced by the car builder.

### OWNERSHIP INFORMATION

Ownership information is not marked on car body.

### SUMMARY

Car is built in the best, most substantial and workmanlike manner, according to the true intent and meaning of the specification, notwithstanding that everything is not particularly mentioned in this specification.

GENERAL DIMENSIONS  
(NOMINAL)

Gauge .....	4'-8 1/2"
Length, inside .....	50'-6"
Width, inside (between side sheets) .....	9'-6"
Height, inside at eaves .....	13'-1 5/8"
Length over steel ends at top .....	50'-6 7/8"
Length over end sills .....	50'-7 1/8"
Length over strikers .....	53'-6"
Length over coupler pulling faces (nominal) .....	58'-2"
Height, top of rail to center coupler .....	2'-10 1/2"
Height, top of rail to top of threshold .....	3'-7 5/8"
Height, top of rail to top of roof .....	17'-0"
Width over upper eaves .....	9'-6 3/4"
Height, top of rail to upper eaves .....	16'-9 1/2"
Width over lower eaves .....	9'-11 3/4"
Height, top of rail to lower eaves .....	16'-6"
Width, extreme (clevis on door connection pipe) .....	10'-7 15/16"
Height, top of rail to extreme width .....	6'-9"
Width of side door opening (clear) .....	12'-0"
Height of side door opening (clear) .....	12'-4"
Distance center to center of body bolsters .....	40'-10"
Truck wheel base .....	5'-10"
Total wheel base .....	46'-8"

GENERAL DIMENSIONS (Continued)

Light weight of car (estimated) .....	70,000 Lb
Cubic capacity .....	6,301 cu. ft.
Gross rail load .....	286,000 Lb
AAR mechanical designation .....	XM

CURVE NEGOTIABILITY

RADIUS

(a) Uncoupled .....	150'
(b) Coupled to like car (250 minimum) .....	207'
(c) Coupled to 40' (base) car (250 minimum) .....	211'

## TRUCKS

This specification covers 100-ton trucks with narrow pedestal side frames, roller bearings, 36 inch wheels, and 3 11/16 inch spring travel. The trucks are equipped with Barber S-2-HD 9 Coil Split Wedge stabilizers. The trucks are AAR M-976 compliant.

### SIDE FRAMES

Side frames are AAR M-201 Grade B+ cast steel in accordance with AAR Specifications M-203 and M-210. The side frames are narrow pedestal type and have integral unit brake beam guides. Column guides have wear plates secured with SAE J429 Grade 8 fasteners. Holes are provided for side frame keys.

### BOLSTERS

Bolsters are AAR M-201 Grade B+ cast steel in accordance with AAR Specification M-202 and M-210, with 1 3/4 inch X 16 inch finished bowl, with 2 inch welded steel vertical wear ring, designed for loose manganese steel horizontal wear plate. The sloped surfaces of the friction shoe pockets are fitted with weld applied split wedge inserts. The center plate bearing surface is machined.

### ROLLER BEARING ADAPTERS

Roller bearing adapters are ASF/Pennsy Adapter Plus for 6 1/2 inch X 9 inch Class K bearings and narrow pedestal side frames. They are without heat indicators. The thrust shoulders are hardened.

### ROLLER BEARINGS

New roller bearings are NFL type for 6 1/2 inch X 9 inch journals.

### AXLES

New axles are raised wheel seat design with 6 1/2 inch X 9 inch journals, in accordance with AAR Specification M-101, latest revision, Grade F.

### WHEELS

Wheels are 36 inch, AAR H-36 or AAR CH-36, one wear, Class C.

## TRUCKS (Continued)

### SPRINGS

Springs are alloy steel, 3 11/16 inch travel, seven (7) outer D-5 springs, seven (7) inner D-5 springs, two (2) B-353 outer stabilizer springs, and two (2) B-354 inner stabilizer springs per spring group. Solid capacity is 105,570 lb.

### STABILIZERS

Standard Car Truck stabilizer package consists of two (2) B-353 outer stabilizer springs, two (2) B-354 inner stabilizer springs, two (2) 915-L friction wedges, two (2) 915-R friction wedges, two (2) 5708-316 column wear plates, and two (2) 5821 cast steel bolster pocket split wedge inserts per spring group.

### SIDE BEARINGS

Side bearings, metal cap constant contact type A. Stucki CSB-5000XT, are attached to bolster with SAE J429 Grade 8 bolts and IFI-100 Grade C locknuts.

### CENTER PINS

Center pins are 1 3/4 inch diameter ASTM A36 steel.

### ROLLER BEARING RETAINER KEYS

Roller bearing retainer keys will not be applied.

## UNDERFRAME

### CENTER SILL

The center sill is a fabricated box type of uniform depth. The bottom cover plate at the center is 3/8 inch ASTM A572 GR50 steel. The bottom cover plate at the ends is 3/4 inch ASTM A572 GR50 steel. The top cover is 3/8 inch ASTM A572 GR50 steel from striker to striker. The webs at the ends are 1/2 inch ASTM A572 GR50 steel with Charpy V-notch 15 ft-lb at -20° F. The webs in the center are 5/16 inch ASTM A572 GR50 steel. Center sill separators at crossties are W8 X 10 ASTM A572 GR50 steel and at crossbearers the separators are 3/4 inch X 8 inch ASTM A572 GR50 steel plate.

### BODY BOLSTERS

Body bolsters are built-up welded design consisting of double webs of 1/2 inch ASTM A572 GR50 steel welded to center sill and side sill connection plate.

Top cover plates are 5/8 inch ASTM A572 GR50 steel with a Charpy V-Notch value of 15 ft-lb at -20° F. They extend from side sill flange to side sill flange and are welded to the bolster webs, side sills, and center sill.

Bottom cover plates of 3/4 inch ASTM A572 GR50 steel extend from center sill flange to side sill connection plate. They are welded to the bolster webs (both sides). Each bottom cover plate has a lifting hole meeting the requirements of AAR standard S-234-78.

Bolsters are reinforced over side bearings with an ASTM A572 GR50 pressed steel filler welded to bottom cover plate and bolster webs.

Bolster tie plates are 5/8 inch ASTM A572 GR50 steel, welded to bottom cover plates and center sill flanges.

Web stiffeners are ASTM A572 GR50 steel located at critical changes in section on bolsters.

### BODY CENTER PLATE

Body center plate is 15 7/8 inch diameter low profile design, 3 5/16 inch deep, with 2 1/8 inch hole for 1 3/4 inch center pin. Bearing surface and vertical sides will be hardened to 300 BHN minimum at a depth of 1/8 inch minimum and will be hardened to 375 BHN minimum, 515 BHN maximum at the surface.

### CROSSBEARERS

Crossbearers, four (4) per car, are fabricated wide flange beams consisting of 1/2 inch top and bottom covers and 5/16 inch web. All material is ASTM A572 GR50 steel. The 5/8 inch ASTM A572 GR50 crossbearer top tie plates are welded to crossbearer top covers and top of center sill. Bottom covers of the crossbearers are welded to the bottom cover of the center sill.

## UNDERFRAME (Continued)

### CROSSTIES

Crossties, twelve (12) per car, are W8 X 10 ASTM A572 GR50 rolled steel wide flange beams extending from center sill web to side sill connection plate. Crossties are welded to center sill webs and attach plates, and are fastened to side sill webs with 3/4 inch lockbolts.

### END SILLS

End sills of L7 X 4 X 3/8 ASTM A572 GR50 steel have 7 inch leg horizontal and are welded to center sill, side sill, and end sheet.

### FLOOR STRINGERS

Floor stringers consist of three (3) S4 X 7.7 ASTM A572 GR50 steel I-beams on each side of the center sill between the bolsters. For clearance over the wheels the center stringer on each side of the center sill is terminated at the first crosstie inboard of the bolster at each end. The floor over the wheels is reinforced with 3/16 inch ASTM A572 GR50 steel plate.

### BODY SIDE BEARINGS

Body side bearings, approximately 5 inch X 20 inch, are forged steel with Brinell Hardness 277-341 and are secured to ASTM A36 steel fillers and bolster bottom cover plates with two (2) 3/4 inch SAE J429 Grade 8 square neck plow bolts, F-436 hardened washers, and ASTM A563 Grade C hex nuts, torqued to 300 ft-lb. Nut is tack welded to bolt after torquing.



## DRAFT GEAR ARRANGEMENT

### COUPLERS

Couplers are SBE67DE reduced slack with rigid shank for use with 15 inch end-of-car cushion, with bottom shelf, without shank wear plates and are bottom operating. Cotter is removed from bottom of knuckle pin prior to shipment of car.

### COUPLER RELEASE RIGGINGS

Coupler release riggings are of the type specified for 15 inch end-of-car cushion, and bottom operating coupler.

### CUSHION UNIT

Cushion unit is an end-of-car cushion floating yoke type 15KN1E with 15 inch active buff travel meeting AAR Specification M-921B-93 with 100,000 lb preload and is equipped with unit condition indicator. Unit is applied in accordance with manufacturer's published recommendations.

### STRIKER

Striker consists of a 1 1/2 inch X 4 inch ASTM A572 GR60 steel bar welded to the top of the center sill.

### FRONT DRAFT STOPS

Front draft stops are 1 1/2 inch X 4 inch and 1 1/2 inch X 4 1/2 inch ASTM A572 GR50 steel bars.

### REAR DRAFT STOPS

Rear draft stops are 1 1/2 inch X 6 inch ASTM A572 GR50 steel bars.

## SIDES

### TOP CHORDS

Top chords are 1/4 inch ASTM A572 GR50 steel. They are reinforced with a 3/8 inch ASTM A572 GR50 steel plate welded to door posts, adjacent side posts, and top chord section.

### SIDE SILLS

Side sills are L6 X 3 1/2 X 5/16 and L7 X 4 X 3/8 ASTM A572 GR50 steel angles reinforced with 5/16 inch ASTM A572 GR50 steel formed "J" angles extending full length of car. They are reinforced at door opening with a 3/4 inch X 2 1/2 inch ASTM A572 GR50 steel flat bar on the bottom flange and a 1 inch X 1 1/2 inch ASTM A572 GR50 steel beveled bar on top of the side sill angle.

### SIDE POSTS

There are twenty four (24) side posts per car. All side posts are 8 gauge (0.1644) ASTM A1011/A HSLAS-F GR60 with 0.2% copper steel hat section 2 1/2 inches deep and 8 1/4 inches wide. All side posts are welded to top chord, side sill and side sheets. Side posts adjacent to door posts are also welded to top chord reinforcement. Vent holes, twenty four (24) per car, are in side sheets at all side post locations.

### CORNER SUPPORTS

Corner supports are 1/2 inch X 5 1/2 inch ASTM A572 GR50 steel flat bar. Corner supports are welded to end side sheets, to chords, end sheets, end sills and side sill reinforcements. Corner supports also function as end closures for the end reinforcement channels.

### DOOR POSTS

Door posts consist of 1/4 inch ASTM A572 GR50 steel outer section and an inner section of 5/16 inch ASTM A572 GR50 steel and are designed to accommodate plug doors.

### SIDE SHEETS

Side sheets are 11 gauge (0.1196) ASTM A1011/A GR40 steel with 0.2% copper steel and are welded to side posts, side sill reinforcement and top chord.

SIDES (Continued)

THRESHOLD PLATES

Threshold plates are 3/16 inch ASTM A572 GR50 steel, welded to top of flat bar in doorway.

LADING ANCHORS

Car is equipped with one hundred twelve (112) individual lading anchors at designated side post locations. Each door post is fitted with 120 inches of continuous lading anchor strip.

## DOORS, ENDS, ROOF and FLOOR

### DOORS

Side doors are single 12'-0" plug type with door opening centered on center line of car. Each door is equipped with an anti-spin mechanism. Clear door opening is 12'-0" wide X 12'-4" high.

### END SHEETS

The end sheets are 3/16 inch ASTM A572 GR50 steel plate, extending from corner support to corner support and from end sill to end top chord.

### END SHEET STIFFENERS

Each end sheet is reinforced with seven (7) stiffeners, formed into a channel shape 5 inches deep and extending the full width of the end from corner support to corner support. The four (4) lower stiffeners are 3/16 inch ASTM A572 GR50 steel and the three (3) upper stiffeners are 1/8 inch ASTM A570 GR50 steel. The end stiffeners are attached to the end sheets and corner supports by continuous welds.

### END TOP CHORDS

The end top chords are L3 X 3 X 1/4 ASTM A572 GR50 steel rolled angles and extend from corner support to corner support.

### ROOF

Roof is a flat type made of corrugated galvanized steel with welded perimeter and riveted seam caps. The intermediate sheets are 14 gauge and the end sheets and seam caps are 12 gauge. Capped and riveted seams are caulked. Roof is welded to top chord and end plates.

### FLOOR

Floor is made of 1 3/4 inch X 8 inch nailable steel deck planks secured to underframe by welding. Floor planks are designed to support a 60,000 lb load. The underframe and floor are designed to support a 60,000 lb lift truck front axle load per AAR Specification M-1001, Section C, Part II, Section 4.1.4.

### LIGHT TEST / WATER TEST

Each car, including the doors, shall be subjected to a light test and a spray water test. During the light test, no direct or indirect light shall be visible, except that indirect light is permissible through the side sheet ventilation holes. The completed car will be passed through a spray frame. No water is permitted to enter the car.

## SAFETY APPLIANCES

Safety appliances comply with AAR and FRA requirements.

### HANDHOLDS

All handholds are 3/4 inch round bar forgings of ASTM A576 GR1015 steel.

### LADDERS, END AND SIDE

End ladders consist of handholds fastened with either 5/8 inch diameter cold headed rivets or 5/8 inch diameter locking bolts to L2 X 2 X 3/16 ASTM A36 steel stiles. End ladders are provided with 3/16 inch ASTM A570 GR40 steel brackets bolted or riveted to stiles and connected to end stiffeners with GT washers and 5/8 inch flat neck fasteners. Side ladders consist of handholds fastened with either 5/8 inch diameter cold headed rivets or 5/8 inch diameter locking bolts to L2 X 2 X 3/16 and L2 1/2 X 2 1/2 X 1/4 ASTM A36 steel stiles. Side ladders are provided with 1/4 inch ASTM A572 GR50 steel brackets bolted or riveted to stiles and connected to adjacent side posts with GT washers and 5/8 inch flat neck fasteners.

### END PLATFORMS

End platforms are 8 inch X 60 inch (minimum) and are each mounted on four (4) brackets formed from 1/2 inch X 2 1/2 inch ASTM A36 steel bar.

### SILL STEPS

Sill steps of 1/2 inch X 2 inch ASTM A36 steel are located at each corner of car and fastened to side sill with 5/8 inch diameter locking bolts. Holes in sill steps are drilled.

## BRAKE SYSTEM

### AIR BRAKES - DB-60SR VALVE, 10 inch X 12 inch CYLINDER

Design and installation of the brake system is in accordance with AAR Standards S-400, S-401, S-475 and AAR Field Manual Rule 88 A.2.r. The air brake system is tested in accordance with AAR Standard S-486.

Any hose found porous or leaking around fittings or otherwise defective and any cocks found leaking at top of key are replaced.

### CONTROL VALVE

The control valve is a DB-60SR with aluminum portions on a single sided aluminum bracket. The control valve incorporates an access plate for use of an automated single car test device per AAR S-486.

### CUT-OUT COCK

The car is equipped with a special cut-out cock with extension handle.

### EMPTY LOAD DEVICE

The car is equipped with one 60% empty load system meeting AAR Specification S-4002-02.

### PIPING

Schedule 80 extra strong steel pipe is used for all piping except end nipples which are schedule 40 standard weight. All piping is secured to underframe of car with wedge type pipe anchors. Maximum unsupported span is 8'-0". Individual pipes are formed to accurate shape before application to car. Strain on pipe and flanged unions caused by forcing them in place to obtain connection is avoided.

Pipe connections are made with either adjustable (swivel) socket welded fittings or all welded couplings, except at angle cock, which is screw type.

All pipes are hammered and blown free of dirt with dry air before they are connected to air brake equipment.

### BRAKING RATIO

Braking ratio is in accordance with D.O.T. requirements and AAR Interchange Rules.

## BRAKE SYSTEM (Continued)

### HAND BRAKE

AAR 1993 Group N hand brake is vertical wheel design, non-spin, quick release type (long handle) with 1966 bell crank.

### PISTON TRAVEL

Ten inch by twelve inch (10 inch X 12 inch) cylinder piston travel must not be less than 7 inches nor more than 8 inches with slack adjuster properly set.

### SLACK ADJUSTER

AAR Group E - mechanical double-acting automatic slack adjuster with double jaws is applied.

### BRAKE SHOES

Brake shoes are 2 inch high-friction composition design meeting AAR H-4 designation.

### BRAKE BEAMS

Brake beams are AAR Standard No. 24, angle corrected, with hardened bushing and with metal shoe rejection lugs.

### BRAKE PINS

Brake pins are C1050 steel turned or drop forged and induction hardened to Rockwell C60-63 to a depth of 0.080 - 0.100 inch. Minimum diameter of pins is 1 3/32 inch. Brake pins are secured with cotter keys. Holes for brake pins are drilled.

### BRAKE SHOE KEYS

Brake shoe keys are forged steel spring type.

### TRUCK LEVERS AND CONNECTIONS

Truck levers and connections are forged steel design.

## BRAKE SYSTEM (Continued)

### BODY LEVERS

Body levers are fabricated by car builder from 1 inch flame cut ASTM A36 steel.

### BRAKE RODS

All brake rods except the vertical hand brake rod are 7/8 inch diameter ASTM A36 steel. The vertical hand brake rod is 3/4 inch diameter ASTM A36 steel.

### BADGE PLATE

Stainless steel badge plate, one (1) per car, showing brake lever dimensions is applied to car in a visible location near air brake cylinder.

### ANGLE COCKS

Ball type angle cocks are used and they are threaded onto a nipple which is secured to brake pipe with a socket weld by screwed coupling.

### RELEASE ROD

Release rod is 1/2 inch diameter ASTM A36 steel with closed loop ends and arranged for in-line operation of brake cylinder release valve.

### BRAKE BEAM WEAR PLATES

Brake beam wear plates are all metal type UW-116.



## PAINTING

### CLEANING

All steel surfaces are cleaned free of rust, scale, dirt, grease, and moisture. The sides, ends, and underframes are blasted to a commercial quality finish (SSPC SP-6) before painting. Air valves, hand brakes, slack adjusters, etc., are not removed during blasting but are adequately protected.

### INACCESSIBLE SURFACES

Metal-to-metal lap joints or surfaces which are inaccessible and open to the atmosphere after assembly are painted with primer before assembling.

### EXTERIOR AND UNDERFRAME

Exterior surfaces of sides (including doors) and ends are painted with solvent base alkyd enamel, four (4) to six (6) mils minimum dry-film thickness. The underside (exterior) of the underframe and the back side of the side sills are also painted with solvent base alkyd enamel, four (4) to six (6) mils minimum dry-film thickness. All paints are lead free in accordance with Gunderson paint specifications for all railcars. The reporting marks and car numbers are steel stamped on the BL side of the center sill inboard of the number 2 axle and on the side sill at the BR corner of the car.

### INTERIOR

Interior, sides (including the doors) and ends only, are painted with two (2) part epoxy paint, three (3) to five (5) mils minimum dry-film thickness. Floor is painted with one (1) coat of primer to two (2) mils minimum dry-film thickness by the floor manufacturer and is not re-painted except for primer application over floor attachment welds.

### STENCILING

Stenciling is in accordance with AAR Manual of Standards and Recommended Practice, Section L. Stenciling is two mils minimum dry-film thickness. The portion of each end more than fifteen (15) feet above top of rail will be painted with reflectorized contrasting paint and will be stenciled in black with 3 inch letters "EXCESS HEIGHT CAR" on the left and with the reporting marks in 4 inch letters on the right. In addition to the reporting marks and numbers on the sides and ends, reporting marks and numbers are stenciled in 2 inch white letters on the truck side frames and on the center sill at four (4) feet inboard of the body bolsters on the BL and AR corners. The empty center of gravity height from rail and the floor height from rail are stenciled on the car exterior. The 98 inch maximum loaded center of gravity for a uniform load is indicated by a maximum load height line on the interior of each side.

### DECALS

Adhesive backed decals are manufactured in accordance with AAR Specification M-947.