

BUILD SPECIFICATION

FOR A

3250 CUBIC FOOT

286 000 LBS

THROUGH SILL

COVERED HOPPER

For

Midwest Railcar Corporation

R50590

May 8, 2014
Gunderson LLC

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GENERAL SPECIFICATIONS

GENERAL DESCRIPTION

The car is a 41'-11 1/2" through sill covered hopper designed for a gross rail load of 286,000 lbs.

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-286-2012. Car builder provides proper fixtures for construction to insure good fit-up and alignment of subassemblies and completed car.

CLEARANCES

Limiting dimensions are designed to AAR Plate C.

INTERCHANGE

Car complies with AAR interchange Rules and D.O.T. requirements. The light weighting and stenciling meet requirements of AAR Interchange Rule 70 and AAR Standard S-286-2012.

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.

SUMMARY

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

GENERAL DIMENSIONS
(NOMINAL)

| | |
|-----------------------------------------------------|-------------|
| Length over pulling faces..... | 41'-11 1/2" |
| Length between truck centers | 29'-5" |
| Length inside..... | 36'-8 1/8" |
| Distance between gate centers | 12'-0" |
| Extreme height | 15'-3" |
| Extreme width..... | 10'-8" |
| Height at extreme width | 8'-8 1/16" |
| Eves height..... | 13'-0" |
| Eves Width..... | 10'-1" |
| Height, top of rail to centerline of couplers | 2'-10 1/2" |
| Track Gauge..... | 4'-8 1/2" |
| Wheel Base | 5'-10" |
| Gross rail load..... | 286,000 lbs |
| Estimated light weight | 53,500 lbs |
| Estimated load limit | 232,500 lbs |
| Capacity | 3,250 cu ft |

CURVE NEGOTIABILITY

RADIUS

| | |
|---------------------------|------|
| Uncoupled..... | 150' |
| Coupled to Like Car..... | 185' |
| Coupled to Base Car | 185' |

TRUCKS

Trucks are 110-ton, 16" center bowl, and spring grouping suitable for a 286,000 lb gross rail load in accordance with AAR M-976.

SIDE FRAMES

The side frames are Grade B+ cast steel narrow pedestal type, with unit type brake beam guide pockets, provision for frame keys, and column wear plates attached by J428 GR8 bolts and two lock nuts. Side frame buttons shall be matched.

BOLSTERS

The bolsters are Grade B+ cast steel, 16" diameter center bowl with manganese steel horizontal wear liners and stainless steel vertical wear liners. Center pin diameter is 1 3/4".

AXLES

Axles are nominal 110-ton capacity with 6 1/2" x 9" journals, AAR Class K, Grade F.

WHEELS

Wheels are 36", H36 or CH36 one-wear Class C, curve plate design.

ROLLER BEARINGS

Roller bearings are 6 1/2" x 9", Class K

ROLLER BEARING RETAINER KEYS

Roller bearing retainer keys will not be applied.

TRUCK SIDE BEARINGS

Cars will be equipped with extended travel, constant contact side bearings.

MATERIALS

All material, unless noted otherwise, shall be in accordance with the following:

Sheet, Strip - ASTM A-1011
Plate, Bar - ASTM A-36
Structurals - ASTM A-36

Material designated as GR50 shall be in accordance with the following:

ASTM A572 Grade 50
ASTM A1011 Grade 50

Material designated as GR60 shall be in accordance with the following:

ASTM A572 Grade 60

BODY CONSTRUCTION

SIDE SHEETS

The side sheets are 3/16" thick GR50 plate. The side sheets are curved to conform to the shape of the car, and extend from side plate to side sill. The sides are continuously welded to the intermediate and end bulkheads, and slope sheets.

SIDE SILLS

The side sills are formed from 5/32" thick GR50 plate. They are continuously welded to the side sheets.

SIDE PLATES

The side plates are formed from GR50 plate, and are attached to the side sheets and roof.

SIDE SLOPE SHEETS

The side slope sheets are fabricated from 1/4" thick GR50 plate and extend from side sheet at side sill to outlet gate at an angle of 50 degrees.

END BULKHEADS

The end bulkhead is fabricated from the end slope sheets. The end slope sheets are made GR50 plate that extends vertically downward from the roof sheet and is then bent to extend towards the bottom of the car at an angle of 40 degrees. The end slope sheets are profiled to conform to the shape of the car.

INTERMEDIATE BULKHEAD SHEETS

One intermediate bulkhead is provided. The bulkhead sheet is fabricated from 3/16" thick GR50 plate, and contoured to conform to the sides, roof, and the slope sheets

INTERMEDIATE SLOPE SHEETS

The intermediate slope sheets are fabricated from 3/16" thick GR50 plate, and extend from the bottom of the intermediate bulkhead sheet to the discharge gate at an angle of 42 degrees. The apex of the slope sheets is reinforced by a 7" x 3/16" plate.

ROOF ASSEMBLY

The roof is constructed with GR50 sheets. Welded to these sheets are three (3) 30" diameter coamings.

UNDERFRAME CONSTRUCTION

CENTER SILL

The center sill is of weld up fabrication design. It will contain provisions for a 24 5/8" draft gear and a type E coupler. The interior surfaces of the centersill are coated with primer.

BOLSTERS

The body bolsters are double diaphragm type, welded construction, extending from the center sill to the body side bearings. The bolster top cover extends from side sill to side sill. The webs are 7/16" thick GR50 plate. The bolster web extension is made from 3/8" GR50 material and extends from the bolster top cover to the end slope sheet.

HATCH COVERS

The car is equipped with three (3) circular hatch covers.

DISCHARGE GATES

Two gravity type discharge gates are spaced at 12'-0". They are arranged for 64-bolt application. The gates are in compliance with AAR Specification S-233.

VIBRATOR CASTING PROVISIONS

The side slope sheets are equipped with a 12" wide x 3/8" thick reinforcing plate with vibrator castings applied.

DRAFT GEAR ARRANGEMENT

COUPLERS

Couplers are type E bottom operated bottom shelf, AAR SBE60EE type, without shank wear plate.

DRAFT GEAR

The draft gear is a high capacity type in accordance with AAR Specification M-901E-00 (Group J).

YOKE & FOLLOWER

The yoke is an AAR SY40AE, with a Y44AE follower.

UNCOUPLING RODS

Uncoupling rods are designed to operate the coupler over the complete range of travel.

BRAKE SYSTEM

The air brake is a dual capacity body mounted system, suitable for 286,000 lb GRL. Design and installation of the brake system is in accordance with AAR Standards S-400 and S-401.

CONTROL VALVE

The control valve is an ABDX or DB-60 design.

EMPTY/LOAD VALVE

The empty/load sensor valve is slope sheet mounted.

RESERVOIR

The brake reservoir is the fabricated type.

BRAKE RIGGING

A 10" x 12" brake cylinder delivers brake force to all wheels through a conventional body mounted system of fabricated levers and brake rods, with hardened brake pins. The brake rigging is arranged for rod through application. The net braking ratio is between 11 and 13 ¼% of the gross rail load of 286,000 lbs, and less than 32% of the car light weight.

TRUCK LEVERS

Truck levers and connection rods are forged steel.

SLACK ADJUSTER

A mechanical, double-acting automatic slack adjuster (Group E) is provided, center rod application.

BRAKE SHOES

Brake shoes are 2" high friction composition, secured to the brake beams with forged brake shoe keys.

BRAKE BEAMS

Brake beams are unit number 24 type, with cast iron shoe rejection lugs.

HANDBRAKE

The handbrake is a vertical wheel, non-spin, quick release conventional type, AAR Group N, with long release handle. The handbrake operates through a 66 bell crank to deliver brake force to both trucks. The net handbrake ratio is 11% - 14% of the gross rail load of 286,000 lbs.

BADGE PLATE

A metal badge plate is provided.

ANGLE COCKS

Ball type angle cocks are provided, attached to a threaded pipe nipple and located per S-424. The pipe nipple is attached to the train line piping with a socket-weld/threaded coupling. Low temperature end hoses are provided.

RELEASE ROD

The release rod is 1/2" diameter steel rod with closed loop ends and arranged for in-line operation of the brake cylinder release valve.

PIPE SECUREMENT

All piping is secured to the car using Wright pipe anchors, except the angle cock, where U-bolts are used.

SAFETY APPLIANCES AND APPURTENANCES

All safety appliances are in accordance with the requirements of the U.S. Federal Railroad Administration.

HANDHOLDS

All handholds are 3/4" round bar forgings, except for the end crossover handhold which is a 1" round bar forging.

LADDERS

Each end of the car is equipped with one full height ladder for access to the top platform, and two side ladders and one end ladder of half height for access to the end platform. End ladder stiles are fabricated from 3" x 3" x 5/16" angle.

END PLATFORMS

An 8" x 60" end platform is provided at each end of the car, attached to the car by four brackets using mechanical fasteners.

SILL STEPS

A sill step is located at each corner of the car, fabricated from 1/2" x 2" bar, and secured to the car using mechanical fasteners.

TOP WALKWAY

The top walkway consists of two longitudinal running boards, 24" wide, with a crossover at each end, galvanized, perforated plate.

HANDGRABS

Four end handgrabs are provided at each corner of the car. A handgrab is provided on the top platform at the top of each end ladder.

SECUREMENT

The top walkways are attached to the car body with 3/8" diameter mechanical fasteners. Sill steps, handholds and ladders are attached using 5/8" diameter mechanical fasteners. End crossover platforms are attached to the car body using 1/2" diameter mechanical fasteners.

INFORMATION BOARDS

Two route boards are provided, one on each side of the car.

AEI TAGS

Two automatic equipment identification transponder tags are provided, encoded with information as required by the customer. Tags are secured to the car with rivets.

PAINING AND STENCILLING

EXTERIOR

Prior to painting, the exterior of the car shall be degreased as required and blasted to a commercial quality finish (SSPC SP-6). Trucks, brake components, etc. are suitably protected during blasting. The body of the car, including the underframe, shall be painted with a direct-to-metal paint. The hatch covers, walkway grating and end platforms are not painted.

INTERIOR

The interior is neither blasted nor painted. The interior shall be washed clean using a water based detergent to remove surface oil, loose scale and dirt.

TRUCKS

Truck side frames and bolsters shall be grit blasted and primed black by the foundry, with no further top coating by the car builder.

STENCILLING

Stencilling shall be in accordance with the requirements of the AAR and the customer, and shall be based on 286,000 lb GRL. Stencilling will be decals or paint as appropriate. The ends of the release rod and uncoupling rods are painted white. Delineators are provided on each side of the car per FRA Part 224.

LIGHT TEST / WATER TEST

Each car shall be subject to a light test and a spray water test. During the light test, no direct or indirect light shall be visible, except the indirect light that is visible through the end bulkhead ventilation hole. The completed car will be passed through a spray frame. No water is permitted to enter the car.