

THRALL CAR MANUFACTURING COMPANY
CHICAGO HEIGHTS, ILLINOIS 60411

SPECIFICATION NO. FMC-100-73-0467(A)
73'-0", 100-TON LIGHT WEIGHT CENTER BEAM
WESTRAN SERVICES LIMITED
NOVEMBER 5, 1987

GENERAL DIMENSIONS

LENGTH BETWEEN BULKHEADS	73' - 0"
CLEAR LOADING HEIGHT	11' - 2-1/2"
LENGTH OVER STRIKERS	75' - 10"
LENGTH BETWEEN PULLING FACE OF COUPLERS	79' - 8"
TRUCK CENTERS	56' - 0"
HEIGHT - RAIL TO TOP OF SIDE SILL	3' - 5-5/16"
HEIGHT - RAIL TO TOP OF FLOOR RISER	3' - 9-1/16"
HEIGHT - RAIL TO TOP OF CAR	15' - 5-5/16"
WIDTH OVER SIDE SILLS	9' - 0"
CLEARANCE	PLATE "C"
ESTIMATED LIGHT WEIGHT	64,500#

CURVE DATA - CAR W/SBE68BE COUPLER

UNCOUPLED	180' RADIUS
COUPLED TO LIKE CAR	180' RADIUS
COUPLED TO AAR BASE CAR	251' RADIUS

DRAWING

GENERAL ARRANGEMENT	3M-001-259
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STEEL

All steel 1/4" or less in thickness shall contain a minimum of .20% copper for improved corrosion resistance. The thinnest sections of rolled shapes shall determine the requirement for copper. Steel shall be identified in this specification by its nominal dimensions and its specified minimum yield strength as provided in the following ASTM or AISI specification:

<u>DESIGNATION</u>	<u>MINIMUM YIELD STRENGTH</u>	<u>SPECIFICATION</u>
Mild Steel	Not Applicable	AISI C or M-1012 thru 1031 ASTM A-575 A-576
Structural Steel	36,000 psi	ASTM A-36 A-53 A-120 A-500 A-501 A-570 A-575 A-576
High Strength Low Alloy (HSLA) Steel	42,000 thru 60,000 psi	ASTM A-441 A-570 A-572 A-576 A-607
Corrosion Resistant (CRES) Steel	50,000 psi	ASTM A-242 A-606
Wear Resistant (WR) Steel	Not Applicable	AISI C-1070 thru 1095

GENERAL DESCRIPTION

This specification describes a 100-ton, all welded, 73' - 0" Center Beam car with 10" end of car cushion units and load anchoring devices. The cars shall be built in a substantial and workmanlike manner, and are designed to meet current AAR and FRA specifications for a car with an underframe designed for equally distributed loading. The car design complies to AAR Plate "C" clearance diagram.

CAR STRUCTURE

CENTER SILLS

Center sills shall be constructed from two (2) AAR CZ13 sections at 41.2#/Ft. of A-441 steel. Welding of the center sill to be per current AAR specifications. Cast steel "Low-Profile" center filler/center plates, SBE68BE couplers, and 10" end-of-car cushioning shall be applied to the center sill. Bellmouth opening to provide 15 degree swing in buff.

BOLSTERS

The bolster shall be of all-welded construction consisting of the following major components:

Top Cover Plate	1/2"	HSLA-50 Steel
Web Plates	3/8"	HSLA-50 Steel
Bottom Cover Plate	1/2"	HSLA-50 Steel
Sole Plates	5/8"	HSLA-50 Steel
Gussets & Stiffeners	3/8"	HSLA-50 Steel or A-36 Modified

The top cover plate shall run the full width of the car. The bottom cover plates and web plates from the center sill to the side

sill. The sole plate shall tie the two (2) bottom cover plates together through the center sill area. The webs shall be reinforced at the side bearings and at each critical bend point in the bottom cover plate. Side bearing reinforcement shall be "A-Frame" design.

JACKING PADS

Jacking pads shall be provided at the end of each body bolster. Lifting means shall be provided at each bulkhead side member.

CROSSBEARERS

There shall be fourteen (14) sets of built-up welded crossbearers per car consisting of:

Top Cover	1/4"	Structural Steel
Web	1/4"	Structural Steel
Bottom Cover	5/16"	Structural Steel

The top cover plate shall extend the full width of the car (except the middle 1-1/2" over center sill) and the bottom cover plate and webs from the center sill to the sides. Each set of crossbearers shall be tied together thru the center sill by the center sill separators.

SIDE SILL

The side sill shall be a 10" HSLA-50 Steel channel. The side sill shall be suitably reinforced at each end at the bulkhead connection with 1/4" HSLA-50 steel plates and at the body bolster with 1/2" x 2" HSLA-45 steel bars.

FLOOR PLATE

The floor shall be 1/8" structural steel plates thru the center of the car and 1/4" structural steel plates in the bolster area.

FLOOR RISERS

There shall be eighteen (18) sets of tapered floor risers used, made from 1/4" structural steel formed into a channel section. The floor risers shall be located on four (4) foot centers over the crossbearers and adjacent to the body bolsters on 1/4" thick floor sheets.

CENTER BEAM CONSTRUCTION

The center beam shall be all-welded construction and consist of the following major components:

Webs at Ends	3/16"	HSLA-50 Steel
Top Chord	W 6	HSLA-50 Steel
Top Support	3/16"	HSLA-50 Steel
Support Webs	3/16"	HSLA-50 Steel
Web Reinforcement	1/4"	HSLA-50 Steel
Posts @ End	3/16" Formed "U"	HSLA-50 Steel
Posts - Interim	1/4" Tapered Web	HSLA-50 Steel
	5/16" x 5-1/2"	HSLA-50 Steel
	Flanges	

Through the length of the car there are twelve (12) fabricated tapered I-Beam posts in the center and eight (8) sets of "U" shaped tapered posts at the ends which are welded to the end web. All posts are in line with the crossbearers, body bolsters and end floor risers. The center beam web plate shall extend from the bulkheads to the first post inboard of the bolsters. The web plates are reinforced in the bolster area with two (2) sets of horizontal reinforcements made from C3 structural steel channels or equivalent. The top of the Center Beam shall be stiffened full length by the top supports which form a 50" wide trough.

BULKHEAD CONSTRUCTION

The bulkheads shall be of welded construction, and consist of the following major components:

Face Plates	3/16"	HSLA-50 Steel
Top Chord	1/4" Formed "Z"	HSLA-50 Steel
Center Brace	W10	HSLA-50 Steel
Side Brace	W10	HSLA-50 Steel
Horizontal Stiffeners	1/4" Formed Channel	HSLA-50 Steel
Vertical Stiffeners	1/4" x 4" x 4" Angles	HSLA-50 Steel
Floor Tie	3" x 2" x 5/16" Angle	Structural Steel
End Sill	C 8	HSLA-50 Steel

The bulkhead shall be rigidly connected to the Center Beam with structural steel angles and bars. The bulkhead consists of three vertical braces, one at the center in line with the center beam and one at each side which join to the side sill. In the span between the center brace and side brace is a vertical angle stiffener and two formed horizontal channel stiffeners. The bulkhead structure is joined across the top with a form Z shaped chord and at the base by the C8 channel end sill. The bulkhead face plate is welded to the three (3) braces, the horizontal stiffeners, the vertical stiffeners, the chord and end sill.

LADING BAND ANCHORS

Lading band anchors formed from 1/2" diameter structural steel shall be provided for anchoring the lading with bands. There will be thirty-six (36) anchors per car, all of which are attached to the outside vertical surface of the center partition top chord and in line with the tie-down winches.

BODY SPECIALTIES

COUPLERS

AAR SBE68BE, Grade "E" cast steel couplers shall be used.

CUSHION UNITS

10" end-of-car gas return cushion units shall be used.

CENTER FILLER/CENTER PLATE

A 15-7/8" diameter "Low-Profile" design cast steel center filler/center plate shall be used. The center bowl shall be flame hardened to 344 BHN.

COUPLER RELEASE

AAR standard rotary operating design for 10" end-of-car cushioning.

SIDE BEARING WEAR PLATES

Wear plates shall be 5/8" x 5" wide flat design. Side bearing wear plates shall be applied with 3/4" diameter Grade 8 bolts, ASTM A-325 heavy hex head nuts and hardened steel washers. Nuts shall be tack welded to bolts after application. Shimming shall be applied to the body bolster as required to adjust side bearing clearance.

SAFETY APPLIANCES

Grab irons and ladder rungs shall be 3/4" dia. material and shall be applied with two-piece fasteners in accordance with current AAR/FRA requirements. The crossover handholds shall be 3/4" dia. material with a center support.

CROSSOVER PLATFORM

An AAR approved perforated type crossover step shall be applied at both ends of the car.

DEFECT CARD HOLDER

One (1) per car.

ROUTING CARD BOARDS

Two (2) per car.

TIE-DOWNS

Thirty-six (36) per car Thrall winch-cable binders with 16 ft. of 3/8" diameter cable including one (1) load protector angle and six (6) links of 3/8" high test chain on the end shall be applied to the side sills. Provisions are made at four (4) locations for attaching each lading cable for binding the load, one at the center partition extension and three (3) on each post except the bolster posts.

TRUCKS

GENERAL

Trucks shall be 100-ton capacity Barber S-2-C type with 6-1/2" x 12" roller bearing journals and 3-11/16" spring travel.

SIDE FRAMES

AAR approved 6-1/2" x 12" Grade "B" cast steel. Column guide wear plates shall be applied with 3/4" dia. #8 hi-tensile bolts and two point welding. Transdyne wear liners shall be applied to the pedestal roofs.

BOLSTERS

AAR approved 6-1/2" x 12" Grade "B" cast steel. Truck bolster center bowl shall be 16" dia. and 1-3/4" deep above horizontal wear liner, machined to 500 micro inch finish. A 1/4" x 2" deep stainless steel vertical liner shall be applied by continuous welding and a 1/4"

thick manganese steel drop-in horizontal liner shall be applied. Bolster slope pocket wear plates shall be applied and provisions for center plate extension pads.

CENTER PIN

1-3/4" diameter.

SNUBBING

Barber S-2-C.

SPRINGS

AAR D-5, 3-11/16" travel alloy steel; twenty-eight (28) outers and twenty-four (24) inners.

SIDE BEARINGS

Double Roller design

WHEELS

AAR CH-36, one-wear, Class "U".

AXLES

Raised wheel seat, Class "F", 6-1/2" x 12"; roller bearing type.

ROLLER BEARINGS

6-1/2" x 12" N.F.L. type.

ROLLER BEARING ADAPTERS

6-1/2" x 12" narrow pedestal adapters with hardened crowns and shoulders.

BRAKE BEAMS

AAR #18

BRAKE SHOES

AAR H-4, 2" Composition type.

BRAKE BEAM WEAR PLATES

Unit type.

TRUCK LEVERS AND BOTTOM RODS

Forged steel levers and bottom rods shall be used.

STABILIZER

Standard Car Truck center plate extension pads.

AIR BRAKES

A body mounted ABDW 8-1/2" x 12" hook and eye brake system with No. 8 vent valve shall be designed and applied in accordance with current AAR Specification No. 2518. Air brakes shall be tested according to current AAR requirements, including actual brake shoe force readings.

SLACK ADJUSTERS

AAR approved automatic double acting design.

HAND BRAKE

AAR Model 1980 hand brake with AAR 8" Dia. Sheave Wheel and 9/16" BBB straight link quality chain.

BRAKE PIPE/FITTINGS

Schedule 80 with single gasket flange type socket welded fittings. Trainline fittings to be socket welded.

PIPE CLAMPS

Split type wedge/base design pipe clamps.

BRAKE PINS

Case hardened steel.

BODY LEVERS/JAWS/CLEVIS

Forged steel.

PAINING AND STENCILING

CLEANING

The underframe and car body shall be cleaned by blasting prior to painting. Any component which might be damaged by this operation shall be suitably protected.

PAINING

Inaccessible or hidden surfaces shall be given one (1) coat of primer.

The complete exterior of the car shall be painted with a coat of approved direct-to-metal finish paint to a total dry film thickness of 3 mils minimum.

Truck bolsters and side frames shall be given one (1) coat of light bodied black paint.

STENCILING

All stenciling required by current AAR/FRA Rules shall be applied.

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-1-

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<u>ITEM</u>	<u>DESCRIPTION</u>	<u>SUPPLIER</u>
COUPLER	AAR SBE68BE, Grade "E" Steel EF512E, Grade "E" Steel	M&T (1st 45 c/s) M&T
CUSHION UNIT	10" End-of-Car, F-10G	Keystone
COUPLER RELEASE	AAR Standard Rotary Operating for 10" E.O.C.	Triax
CENTER PLATE	Cast Steel 15-7/8" Diameter, Low Profile Design, Patt. #BS-347-FH with 344 BHN	A.S.F.
CROSSOVER PLATFORM	AAR Approved Perforated Type	U.S. Gypsum
TIE-DOWNS	Winch-Cable Binder with 16 Ft. of 3/8" Dia. Cable Including One (1) Load Protector Angle and Six (6) Links of 3/8" High Test Chain	T.C.M.C.
BODY SIDE BEARING	5" Wide Flat Design, No. 800, Line 15	A. Stucki
SIDE FRAME	AAR 6-1/2" x 12" Grade "B" Cast Steel w/Column Guide Wear Plates Applied by Welding and Bolting and Arranged for Transdyne Pedestal Roof Liners and Roller Bearing Retainer Keys	Buckeye
PEDESTAL ROOF LINERS	Transdyne Snap-On Type	Transdyne
SNUBBING	Barber S-2-C	Std. Car Truck

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-2-

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<u>ITEM</u>	<u>DESCRIPTION</u>	<u>SUPPLIER</u>
BOLSTER	AAR 6-1/2" x 12" Grade "B" Cast Steel, 16" Diameter Machined Center Bowl, Rod thru Brakes, provisions for "C'-PEP" and Slope Pocket Wear Plates to be Applied.	Buckeye
WHEELS, AXLES, ROLLER BEARINGS	Mounted Sets Consisting of: Wheels - CH-36, Class "U" 1-Wear, Axles - 6-1/2" x 12" Grade "F", Roller Bearings - 6-1/2" x 12" NFL	Griffin Std. Steel Timken
ADAPTERS	AAR 6-1/2" x 12" Narrow Pedestal w/Hardened Crowns and Shoulders	Hayes-Albion
SPRINGS	AAR, D-5 Alloy Steel 3-11/16" Travel 28 Outer Coils, 24 Inner Coils.	Alco
SIDE BEARING	Double Roller Deskin 688-B	Stucki
STABILIZER	Center Plate Extension Pads	Std. Car Truck
BRAKE SHOE	AAR, H-4, 2" Composition	Griffin
BRAKE BEAMS	AAR, No. 18	Buffalo
AIR BRAKES	ABDW 8-1/2" X 12" System Comp. w/#8 Vent Valve	NYABCO
HAND BRAKE	AAR Approved 1980 Vertical Wheel Type w/8" Dia. Sheave Wheel and 9/16" BBB Straight Link Chain	Ellcon-Nat'l.
SLACK ADJUSTER	AAR Approved Double Acting	Ellcon-Nat'l.
PAINT - EXTERIOR	Approved Colors	Williams-Hayward