TRINITY RAIL OPERATIONS

RD VI

RAPID DISCHARGE® COAL CAR
4,207 Cubic Foot Capacity

119 Ton, Aluminum Body - Steel Underframe
without Rotary Couplers

SPECIFICATION NO. HTS-C3Q097A
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1.00 GENERAL SPECIFICATIONS

1.01 DESCRIPTION

Car described in this specification is a 119-ton riveted/bolted aluminum body, welded steel underframe, 5 pocket, automatic unloading, RAPID DISCHARGE ® RD VI coal car. The three (3) center pockets consist of two doors on each side of the center sill with the bottom (free) edge of the doors abutting each other. Each end pocket consists of one (1) door on each side of the center sill with the bottom edge abutting the bottom edge of the lower slope sheet. This specification is intended to include everything requisite to the proper building of the car, notwithstanding that everything required might not be mentioned.

Car is constructed in accordance with Association of American Railroads (AAR), Federal Railroad Administration (FRA) and other known governmental regulations known to be in effect as of the date of this specification with drawings, templates, gauges and materials as specified in the AAR manual of Standards and Recommended Practices, Section C, Part II. Car is constructed for 286,000-lb. gross rail load (GRL) in accordance with AAR Standard S-259-94. Car meets AAR Plate "B" Equipment Diagram except as noted under "Door Operating Mechanism", Section 5.00. Car builder provides proper fixtures for construction to insure good fit-up and alignment of subassemblies and completed car Welding is to be performed in accordance with Chapter V of AAR Manual, Section C, Part II and A.W.S. D15.1 Railroad Welding Specification.

1.02 INTERCHANGE

The AAR 263,000 lb. per car 4 wheel truck weight and axle spacing criteria, 2.1 2.2 of Section C, Part II, Volume 1, Manual of Standards and Recommended Practices M-1001 is exceeded with a track load of 286,000 lb. per car on 4 wheel trucks.

The car described herein does not include trucks that meet the requirements of design validation track testing as described in AAR specification M-976.

1.03 MATERIAL

All rolled steel shall meet current AAR specifications, Section 3.1, and material unless otherwise specified, to be minimum requirements as follows:

1. Sheets under 3/16" thick to be ASTM A-1011, Grade 33.
2. Plates 3/16" thick and above to be ASTM A-36.
3. Shapes and bars to be ASTM A-36.
4. Bars for handholds and ladder tread material to be ASTM A-576, Grade 1015-1020.
5. If substitutions are necessary, shapes, plates, and bars, composition of which corresponds to the AISI standard grades of carbon steel may be substituted.
6. Aluminum plates and sheets to be alloy 5083-H321or 5083-H323.
7. Aluminum extrusions to be alloy 6061-T6.
8. Aluminum may have water stains and/or scratches, which are not structurally detrimental

1.00 GENERAL SPECIFICATION (continued)

1.04 RIVETS AND BOLTS

Per current AAR specification, Section 3.1 of AAR Manual of Standards, Section C-II. Aluminum rivets for the side and end assemblies to be 6061-T6 Steel bolts and/or nuts (collars) in contact with aluminum to be plated

All rivets and bolts in the major car body structure to be 5/8" diameter or larger.

1.05 BRAKING POWER

The brake shoe forces as determined by the static dynamometer test (AAR Standard S-401-97) shall be not more than 38% of light weight of car and 8-1/2% to 13% of gross rail load of 286,000 lbs. based on the brake cylinder equalization pressure of 63.5 to 66.5 psi. Handbrake power to be not less than 10% of gross rail load of 286,000 lbs.

1.06 BRAKE PIPE

Extra heavy steel pipe is used for all piping for brake equipment, in accordance with AAR Standard S-401 and S-400, latest revision. All piping is secured to underframe of car with wedge type pipe anchors.

2.00 GENERAL DIMENSIONS

2.01

Length, Inside	48' - 2"
Length Over Coupler Pulling Faces	53' - 1"
Length Over Strikers	50' - 5-1/2 "
Length Between Truck Centers	40' - 6"
Truck Wheelbase	5' - 10"
Width Over Top Chords	10' - 7-7/8"
Width, Inside	9' - 10-3/8"
Height, Extreme	13' - 6"
Estimated Average LightWeight	48,600 Lbs.
Estimated Average Load Limit (Based on 286,000# GRL)	237,400 Lbs.
Nominal Capacity (Based on 286,000# GRL)	119 Tons
Cubic Capacity Level Full (approximate)	4,207 Cu. Ft.
Cubic Capacity with 10" Average Heap (approximate)	4,603 Cu. Ft.
Slope of Floor Sheets	45° & 60°

2.02 CENTER OF GRAVITY - ESTIMATED

Empty Car	41.1"
Loaded to 286,000# GRL Level Full	89.8"
Loaded to 286,000 GRL with 10" Heap	94.3"

2.00 GENERAL DIMENSIONS cont....

2.03 CURVE NEGOTIABILITY (CALCULATE PER AAR)

Horizontal Curve Uncoupled	150 Ft.
Horizontal Curve Coupled to Base or Like Car	180 Ft.
Vertical Curve Uncoupled	500 Ft.

3.00 UNDERFRAME

3.01 CENTER SILLS

Two (2) AAR CSC sections extending between draft sills. Top flanges to be continuously welded together (100% penetration) per latest AAR requirements. Spreaders to be 3/8" steel plate.

3.02 DRAFT SILLS

Grade "B+" cast steel with integral striker, draft lugs, center filler and 15 -7/8" diameter machined and hardened center plate. Front draft lugs to withstand force of 900,000 lbs. including 1.8 load factor. Draft sill to be fitted with two steel draft gear carriers.

3.03 BODY BOLSTER

Each body bolster (2 per car) to consist of the following major components:

Shear Plate	1/2" x 24"	A-572 Gr.50
Upper Bolster Web Plate	1/4"	A-572 Gr.50
Lower Bolster Double Web Plates	5/16"	A-572 Gr.50
Bolster Bottom Cover Plate	1/2" x 20"	A-572 Gr.50

3.04 TRANSVERSE RIDGES

Transverse ridge slope sheet is 1/4" aluminum plate applied at 55 degrees. Transverse ridges number four (4) per car.

3.05 SLOPE SHEETS

Upper, intermediate, and lower (end hopper) slope sheets are 7/32" and ¼" aluminum plate. Upper slope sheet is applied at 45 degrees, intermediate slope at 45 degrees, and lower slope at 60 degrees from horizontal.

3.00 UNDERFRAME cont....

3.06 HOPPER

Hoppers number five (5) pockets per car, with the doors hinged at the transverse ridge The three (3) center pockets consist of two doors on each side of the center sill with the bottom (free) edge of the doors abutting each other Each end pocket consists of one (1) door on each side of the center sill with the bottom edge abutting the bottom edge of the lower slope sheet. Doors are locked with the RAPID DISCHARGE ® air operated door mechanism and a secondary latch at the air cylinder. (See Section 5.00).

Inside hopper sheets are 1/4" aluminum plate reinforced at the door opening with a pressed (integral) 1" offset. Outside hopper sheets are 1/4" aluminum plate reinforced at the door opening with a pressed (integral) 2-7/16" offset

3.07 LONGITUDINAL HOODS

Longitudinal hood sheets sloped at 55 degrees are 1/4" aluminum plate.

3.08 DOORS

Door sheets are 1/4" aluminum plate with upturned flanges at the top (hinge), inboard and outboard edges and downturned flange at the bottom (free) edge Each door sheet is stiffened with two longitudinal 3" x 3" x 3/16" steel angles extending from door spreader to the hinge which pivots on hardened steel pin. Door spreader is 3/16" A-572 Grade 50 steel pressed hat shape section extending from side to side.

4.00 SIDE AND END

4.01 SIDE SHEETS

Lower, upper and corner side sheets to be 0.18" aluminum arranged with a riveted/bolted longitudinal lap seam.

4.02 TOP SIDE CHORDS

Heavy-duty "P" shape aluminum extrusion with integral shaker/clamp wear bar extending from end to end.

4.03 SIDE SILL

Special aluminum "Z" extrusion extending between bolsters and 5" x 3-1/2 " x 3/8" aluminum angle from bolster to end sill.

4.04 SIDE STAKES

Hat shaped 6061-T51 aluminum. Side stakes will number eleven (11) per side.

4.05 SIDE BRACES

Sides are braced diagonally at each transverse ridge with an oval aluminum extrusion, four (4) per side, eight (8) per car. Sides are tied together at each end and in the center with an oval horizontal aluminum extrusion, three (3) per car.

4.06 END SHEETS

1/4" aluminum plate with a pressed integral 6" channel on the top edge to form the end top chord and flange on the bottom edge to support the slope sheet.

4.07 END SILLS

6" x 3-1/2" x1/2" 6061-T6 aluminum angles.

4.08 CORNER POSTS

Four (4) per car, 3-1/2" x 3-1/2' x 1/4" 6061-T6 aluminum angles. Side and end sheets are connected by corner post.

4.09 END POSTS

3" x 2-1/2" x ¼" 6061-T6 aluminum angles.

4.00 SIDE AND END cont....

4.10 TOP CORNER CONNECTIONS

1/2" steel plate bolted to top side and end chords A 1/4" web is welded to the corner cap.

4.11 HANDHOLDS

3/4" diameter forging of A-576, Grade 1015-1020 steel. Handholds over 36" long to be 1" diameter

4.12 LADDERS, END AND SIDE

2" x 3" x 1/4" 6061-T6 aluminum angles fastened with 5/8" diameter fasteners.

4.13 SILL STEPS

1/2" x 2" ASTM A-576, Grade 1015-1020 steel bar and are located at each corner of car and secured with 5/8" diameter fasteners.

5.00 DOOR OPERATING MECHANISM

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RAPID DISCHARGE ® door operating system which is designed for automatic operation while the car is in motion, is accomplished with power supplied by a double acting 14" diameter pneumatic cylinder with fiberglass tube mounted above the center sill near the "A" end of the car. A pneumatic solenoid operated spool valve is mounted in a lockable control box at the "A" end of the car and has solenoids designed for 24 volt DC operation. These operate in conjunction with purchaser's trackside source of 24-32 (30 preferred) volt DC electric power.

On diagonally opposite corners of car, spring-loaded "third rail" pick-up shoes are provided to engage purchaser's trackside unit. Pick-up shoes, when extended to operating "ungagged" position, will extend car width to 11'- 0" at a point approximately 32" above the top of the rail. Pick-up shoes are arranged so that they can be "gagged" to be within the AAR clearance line. Pick-up shoes are mounted approximately 18" inboard of the bolster center at the "BL" and "AR" corners of the car.

Cars are equipped with a separate air trainline for supply from the locomotive main reservoir equalizing line to a car mounted 30-gallon vertical reservoir. Dump air end cocks and hoses are mounted in the low position. Complete car dump air system is operable at 90 psi and is designed for 150 psi maximum with reservoir ASME Code stamped accordingly. Air system is independent of the car braking system.

Cars are also equipped with a "way-side" air connection located at the "AR" corner. A ½" quick connect fitting allows the air system to be charged independently from the train-line system.

6.00 PAINTING

6.01 GENERAL

All paint material will meet current environmental laws for volatile organic compound. All paint material is lead and chrome free

6.02 CLEANING

All steel surfaces to be painted or primed are cleaned free of rust, scale, grease, dirt, and moisture by means of washing, wire brushing or SSPC-SP6 commercial blast prior to painting.

6.03 STEEL TO ALUMINUM JOINTS

Steel contact surfaces to be primed before application of aluminum components. One coat of non-curing mastic, PVC tape or other Trinity Rail Group approved barrier material to be applied to steel prior to application of aluminum components.

6.04 INACCESSIBLE OR HIDDEN SURFACES

Where practical steel surfaces of underframe and car body, which are inaccessible after assembly, including draft gear pockets, are given one coat of primer.

6.05 UNDERFRAME

The underframe and other steel components of car body are given one coat of water based direct-to-metal black paint to obtain a dry film thickness of 4 mils minimum.

6.06 STENCILING

Stenciling is in accordance with AAR Manual of Standards and Recommended Practices, Page L36, latest revision. Ownership information (if required) to be stenciled on car body. Decals will be standard, not precluding the use of stencil paint; both will be compatible with exterior paint.

6.07 TRUCKS

Truck side frames and bolsters, as received from manufacturer, have a fog coat of light-bodied black paint. Trucks are stenciled with customer's reporting marks and car number on side of each bolster facing outboard end of car.

6.08 DELINEATORS

2" x 16" Scotchlite, Diamond Grade, White. 20 per car.

7.00 SPECIALTY LIST

7.01 BODY

a Air Brake	Body mounted, ABDX with aluminum pipe bracket (Wabtec)
b. Empty and Load	Slope sheet mounted ELX-S-40 (Wabtec)
c Brake Reservoir	(Wabtec)
d. Hand Brake	AAR Vertical Wheel Group "N" with long release handle (Wabtec/Universal)
e. Body Brake Levers	Steel ,1" thick A572-50
f Slack Adjuster	Double Acting, Automatic (Wabtec/Universal)
g Brake Jaws, Eyes & Clevises	(Schaefer)
h Brake Pins	Induction Hardened
i. Brake Badge Plate	Stainless Steel
j. Draft Gears	AAR M901E (Miner Crown SE)
k. Coupler	SBE60EE (McConway & Torley)
l. Yoke	Y40AE (McConway & Torley)
m Follower Block	Y44AE (McConway & Torley)
n. Knuckle Pin	Non Metallic (ZefTek ZT-2075)
o. Uncoupling Device	Bottom Operated (Stanrail)
p. Draft Sills	Cast Steel, (ASF) (see 3.02)
q. Coupler Carrier Wear Plate	Non Metallic (Holland)
r. Door Operating Mechanism	Trinity (see 5.00)
s Brake Step	8-3/8" x 30", Galvanized (Morton)
t. Roping Staples	None
u Defect Card Receptacle	(1) one, AAR Standard
u. Route Card Boards	(2) two, AAR Standard, aluminum
v. A.E.I. Tags	(2) two (High Temperature)

7.02 TRUCKS

a. Wheels	36" dia., One Wear Class "C", Mounting Pressure 90 - 160 Tons (Standard Steel)
b. Axles	AAR M-101, 6-1/2" x 9" (Standard Forge)
c. Roller Bearings	AAR, 6-1/2" x 9" (Brenco)
d. Roller Bearing Adapters	AAR M-924, 6-1/2" x 9" with hardened crown and shoulders (Annapurna)
e. Roller Bearing Retainer Keys	Forged (Schaefer)
f. Side Frames	Grade "B+" cast steel, Super Service Ride Master. Column Wear Plates applied with H.S. Bolts. No welds. (ASF)
g. Pedestal Roof Liners	Transdyne
h Bolsters	Grade "B+" cast steel, Super Service Ride Master. 16" diameter by 2-1/4" deep center bowl. 2" king pin (ASF)

7.02 TRUCKS (continued)

i. Center Plate Liners	Manganese (Astralloy)
j Snubbing	ASF Ride Master
k. Springs	3 11/16" Travel, minimum solid capacity 105,000# per group (Barber)
l. Side Bearings	Stucki CCB4500XT Constant Contact/Long Travel
m. Brake Beams	#24 (Miner)
n Brake Beam Wear Plates	Non-Metallic (ZefTek ZT-1696B)
o. Brake Shoes	AAR H-4, 2" H.F. Composition (RFP)
p. Brake Shoe Keys	Forged (SCT)
q. Center Pins	AAR 2" Diameter
r. Brake Hoses	NYAB

7.03 DOORS

a. Spool Valve	Rexroth
b. Air Cylinder	14" with fiberglass barrel (Rexroth)
c. Air Tank	30-gallon, vertical mount (Montex)
d. Air Filter	Monnier model #92-090
e. Isolation Valve	¾", brass
f. Check Valve	¾", brass
g. Quick Exhaust Valve	¾", brass
h. Drain Valve	1/2", brass
i. Doors, Linkages and Operating Beam	Trinity
j. Air System Hoses	NYAB