

4600 CFC. CH
STAX 76000 SERIES**1.1 CONSTRUCTION**

This specification covers an ACF Production Design for a 100 ton 4600 cubic foot steel Center Flow hopper car. The design of the car complies with the Department of Transportation Federal Railway Administration's (FRA) regulations and meets or exceeds Association of American Railroad's car construction requirements. Car structure designed for 500,000# draft force in paragraph 4.1.B with 1.8 load factor per paragraph 4.2.2.4. The car shall be constructed to meet all limiting dimensions in conformance with AAR's Supplement to the Manual of Standard and Recommended Practice, Plate "B", Equipment Diagram - unrestricted for Interchange Service.

1.2 WORKMANSHIP

The car must meet or exceed the requirements of AAR Specification for Design, Fabrication and Construction of Freight Cars adopted as standard September 1, 1964.

1.3 MATERIALS

Construction materials shall be furnished in accordance with the following specification requirements:

- Plate and Structural Shape - Latest AAR, ASTM or ACF Specification.
- Sheets and Strips - Latest ASTM Specification, commercial quality.
- Bars - Grade M1020 Merchant Bar Quality.
- Bolts and Nuts - ASA regular having American Standard coarse threads.

All carbon steel plates, shapes, sheets, strips and bars under 1/4" thick shall have a minimum copper content of 0.20%, except steel obtained from warehouse is non-copper bearing. HSLA steels 1/4" thick and under shall be copper bearing ASTM A-441, unless otherwise specified. HSLA steels greater than 1/4" thick shall be ASTM A-572 Grade 50, Type 2 without copper unless otherwise specified.

1.4 SAFETY APPLIANCES

End ladders, sill steps, grab irons or handholds, end platforms and running boards comply with latest AAR and FRA requirements for material and application. Safety appliances, except running boards and end platforms to be secured with 5/8" diameter rivets or lock bolts.

Ladders - end - two per car, one corner post and one end post each end serve as ladder stiles. Ladder treads are 3/4" diameter. Corner posts and "A" end post are 3" x 3" x 3/16" angles; "B" end post is 3" x 3" x 1/4" angle.

.4 SAFETY APPLIANCES (continued)

Sill Steps - One sill step, 1/2" x 1 3/4" carbon steel, at each corner of the car, with dimensions and application meeting ICC Safety Appliance Requirements.

Grab Irons and Handholds - 3/4" diameter steel bars, four side handholds provided at each corner of car and four end handholds provided at "BR" and "AL" corners.

End Platform - Two per car, one each end plate type 60" long x 8" wide, hot dipped galvanized steel, each fastened to three supports with 1/2" diameter lock bolts. Supports are designed for interchangeability between platform manufacturers. One 1" diameter end platform handhold applied each end.

Running Boards - Two longitudinal elements 24" wide on each side of the car at top and connected across at each end of the car by 24" wide end elements, all of galvanized steel. Running boards are lock bolted to supports. Support System is designed to provide interchangeability between running board manufacturers.

Interior Handholds - None.

The portion of the top of car between running boards is covered with an anti-skid paint.

.5 LIGHT TESTING

Each completed but unprimed car with temporary hatch coverings applied, is to be tested for leaks with high intensity light directed at exterior of roof, sides and floor sheets. Hatches are to be checked for leaks in the same manner after application at another station. Light intensity at the surface is to be a minimum of 80 foot candles.

2.0 GENERAL DESCRIPTION2.1 OVERALL DIMENSIONS

Length Inside of Body -----	53'-3 3/16"
Length Over Striker -----	55'-5"
Width Overall -----	10'-5 7/16"
Width Inside -----	10'-5 1/16"
Height (To Top of Hatch) -----	15'-1"

2.2 CAR DESCRIPTION

Number Compartments -----	3
Number of Discharge Openings -----	3
Volume -----	4600 cu.ft.
Slope - Transverse Slope Sheets -----	45°
Slope - Side Slope Sheets -----	45°
Slope - End Floor Sheets -----	45°
Truck Centers -----	44'-9"

2.3 NEGOTIABILITY

Horizontal Curve Uncoupled -----	130 feet
Horizontal Curve Coupled to Like Car -----	208 feet
Horizontal Curve Coupled to AAR Base Car -----	208 feet
Vertical Curve Uncoupled -----	520 feet
Vertical Curve Coupled to AAR Base Car -----	520 feet

2.4 HATCHES

Six (6) 30" diameter gasketed hatches with IRE holddowns and located on longitudinal center line of car.

2.5 OUTLETS

Gravity -----	Three per car
Size of Gravity Discharge Opening -----	13" x 42"
Rail Clearance to Bottom of Gravity Outlet -	10-1/16"

Outlets attached to mounting frame with 32 - 1/2" bolts each and with neoprene gasket between mounting frame and outlet flange.

.6 LIGHTWEIGHT

Car Body Weight -----	44,000 pounds
Truck Weight -----	21,000 pounds
Total Car Weight (NOMINAL) -----	65,000 pounds

.7 CENTER OF GRAVITY

Empty Car -----	61"
Loaded Car -----	95 1/2"

BODY MATERIAL AND SIZE

Side Sheets ----- .1799" ASTM A-607, Grade 45, Type 1
Side Slope Sheets ----- 1/4" Carbon Steel ASTM A-283, Grade "D"
Roof Sheets ----- 0.1799" ASTM A-570, Grade "C"
Side Plate ----- 0.1196" ASTM A-607, Grade 50, Type 1
End Floor Sheets ----- 0.1503" Min. ASTM A-607, Grade 50, Type 1
Interior Bulkheads ----- 3/16" ASTM A-441
Interior Floor Sheets --- 3/16" ASTM A-441

UNDERFRAME MATERIAL AND SIZE

Stub Center Sill ----- Z-26, 41.2 lb./ft. ASTM A-572, Grade 50, Ty.2
Shear Plate ----- 5/8" A-572, Grade 50, Type 2
Diagonal Stiffeners ----- 1/4" Carbon Steel ASTM A-283, Grade "D"
Side Sill ----- 11/32" ASTM A-572, Grade 50, Type 2
Lower Bolster Bottom Cover-7/16" Carbon Steel ASTM A283, Grade "D"
Lower Bolster Web-----1/2" Carbon Steel ASTM A-283, Grade "D"
Upper Bolster Web-----5/16" ASTM A-572, Grade 50, Type 2
Center Plate-----AAR contour with bowl bearing surfaces 325 BHN
min; forged steel - AISI C1030. Bowl diameter is
15-7/8" with vertical wall machined cylindrically.
Flange is 1-1/4" thick, bowl depth is 2-1/4" and
overall depth is 3-1/2". Center plates secured with
twelve (12) high strength bolts each.
Body Side Bearing-----Four per car, 2'-1" from the centerline of the car,
4" x 15-1/2" tapered section, carbon steel (0.48 to
AISI Specification C-1050, silicon 0.15 to 0.30%
heat treated to 248-375 Brinell. Side bearing
clearance is adjusted by shims between the roller
side bearing cage and truck bolster, to provide a
clearance at each bearing within the limits of 3/16"
to 5/16". Side bearings are bolted to bolster
bottom cover plate.
Jacking Pad-----At each bolster end.
Roping Staple-----Four per car, one welded at each bolster end, extend-
ing toward end of car.

Center Pin ----- AAR type, 1-3/4" diameter, 15" long with
one end tapered.
Body Bolster ----- Two per car with each consisting of 1/2"
single web plates on each side of the
center sill with one piece 7/16"
bottom cover plate extending from side sill to
side sill. Shear plate acts as top cover.
Two 3/8" "U" pressings provided as web stif-
feners at each side bearing.

3.3 VIBRATOR ATTACHMENTS

Brackets ----- 2 per compartment, castings welded directly to side slope sheets. (Car is designed for a vibrator of the piston type whose force output is 1600 to 1700 pounds per cycle operating at a frequency of 2700 cpm).

3.4 DRAFT RIGGING

Strikers ----- Cast steel, AAR M-201, Grade "B" arranged for Type "E" coupler, welded to center sill.
 Rear Draft Lugs ----- Fabricated
 Coupler ----- E60CHTE with top and bottom support shelves.

Draft Gear ----- AAR M901-E
 Yoke ----- Y40A-HTE

Draft Gear Carrier ----- Two for each draft gear, carbon steel 8" x 5/8" plate, riveted to center sills with four 7/8" rivets.

Draft Gear Follower ----- Y44

Draft Key ----- 6" x 1 1/2" A576 Grade 050, Si 0.15 - 0.30% round edge bar quenched and tempered 241.293 BHN to obtain 80,000 psi minimum yield.

Uncoupling Device ----- Standard Railway Equipment Company Style #1.

3.5 BRAKES

- General** ----- Standard ABD-W 8-1/2 x 12 freight car schedule which includes a cylinder with plain pressure head, latest design 3-position release control retainer, ABD-W valve, reservoir, air brake hose with FP-5 couplings and butt-welded fittings. Brake system designed for operation with 2" high friction composition brake shoes with bottom connection under bolster.
- Brake Power** ----- Theoretical braking forces are designed to provide 10.05% of the rail load limit and 41.13% of the estimated light car weight with 50 psi cylinder pressure. Handbrake force is 16.66% of the rail load limit.
- Lever Ratio** ----- 9.32:1
- Brake Appurtenances** -----
- a. Brake pins are hardened steel.
 - b. All holes for brake pins are drilled
 - c. IRE weld-on pipe clamps are used on trainline pipe and 3/4" cylinder pipe.
 - d. Branch pipe tee anchor, carbon steel bar, carbuilder's design.
 - e. Angle cock bracket, carbon steel plate, welded to bottom flange of center sill. Angle cock is located 12" from the centerline of the car 3" below draft center line and center line of cock is on line with face of striker.
 - f. Elastic stop nuts in trainline at ABD-W valve, reservoir, cylinder retainer, BPT and angle cock "U" bolts to be in accordance with AAR M-922 including marking.
 - g. All bolts are provided with lock nuts.
 - h. Bolts and elastic stop nuts for ABD-W valve and reservoir will be high strength steel. Bolts for reservoir to be applied with heads at top and nuts on bottom.
 - i. Brake pin cotters are Gustin Bacon Lock-Tite type.

3.5 BRAKES (continued)

Brake Appurtenances (continued)

- j. Cylinder and vertical levers, jaws, push rod and bottom connections manufactured by Schaefer Company. "B" end horizontal and "A" end horizontal levers are burned from plate by ACF.
- k. Angle cock to be ball type.

Piston Travel -----	Brake rigging adjusted to obtain 7" to 7 1/2" piston travel.
Brake Pipe -----	Carbon steel extra heavy air brake pipe, including end nipples, butt-welded, plain end to the latest revision of ASTM Spec. A-53. Brake pipes connecting the reservoir and cylinder to the ABD-W valve are applied without sharp bends. All brake pipe to be hammered and dirt blown out.
Pipe Fittings -----	Butt-welded at all locations with butt welded-threaded at 10" nipples.
Slack Adjuster -----	Latest AAR interchangeable automatic double acting, double jaw slack adjuster to compensate for shoe wear.
Brake Diagram Plate -----	Cast iron, bolted to upper bolster web at "B" end of car.
Hand Brake -----	AAR 1966 vertical wheel, non-spin type, with long handle release lever and #66 bellcrank.

3.6 AIR VENT

4" x 9" oval holes in each end floor sheet and each partition near roof. All vents covered with stainless steel screen. Vents in end floor sheets have protective housings and filters.

4.1 DESCRIPTION (cont.)

Center Plate Lubricant -----	50-50 mixture by volume of molybdenum disulfide powder and stoddard solvent.
Live and Dead Levers -----	8" x 14"
Bottom Connection -----	37" between inside holes, offset.
Brake Shoes -----	2" high friction composition with rejection lugs.
Roller Bearing Retainer -----	None. No holes provided in side frame.

5.1 SURFACE PREPARATION AND CLEANING

Exterior - Grit blasted to a commercial grade. Brake equipment must be suitably protected and trucks removed prior to blasting. Before replacing trucks, abrasive particles must be blown off car.

A" 5.2 INTERIOR

Grit blast welds to commercial grade. Remove anti-spatter compound and chalk marks. Oil and grease deposits removed by solvent wiping. Sweep all debris from interior prior to application of outlets. Interior edges and welds to receive ACF Standard preparation. Complete interior to receive commercial blast. Vacuum interior prior to application of lining.

5.3 RIVETED LAP JOINTS

Apply one coat of lap and joint primer.

5.4 EXTERIOR SIDES, ENDS AND UNDERFRAME INCLUDING OUTLETS

One coat of Mobil zinc chromate primer 13-R-50 at 1-1/2 mils dry film thickness. One or more coats of Mobil vinyl alkyd gray 75-F-110 finish at 3 mils total dry film thickness. Total dry film thickness for system to be 4.0 mils minimum.

5.5 ROOF

Apply one coat primer and one coat gray finish to all surfaces, including hatches and hatch rings. Area of roof between running boards to be coated with anti-skid compound at 1/16" wet film thickness.

5.6 TRUCKS

Preprimed black by manufacturer. To receive fog coat of black. Wheels and axles not painted.

5.7 BRAKE AND SAFETY EQUIPMENT

Same paint products as applied to adjacent areas.

5.8 RUNNING BOARDS AND END PLATFORM

Galvanized - not painted.

"A" 5.9 STENCILING

AAR markings, owner stencil and Stauffer identification sprayed in (black and white consolidated stencil) and principal markings applied by decal 1' high and 5' long located to right of car center line. Drawing 4-H-3410.

"A" 5.10 INTERIOR

Kontol KP 94 (clear) at approximately 1.0 to 2.0 mils dry film thickness. Weld seams to be brush coated prior to spraying. Cars that have interiors blasted Friday and will not be lined until Monday must have 5# of silica gel suspended in each compartment, have all openings sealed with plastic, and are to remain inside building.

TRUCKS

- 1. Axles----- Standard Steel
- 'B" 2. Bolster ----- ASF 76195
- 3" 3. Side Frames ----- ASF 75981-A
- 4. Wheels----- Standard Steel J-36, Class "C"
- 3" 5. Brake Beams - 76001-76095-----ASF 13200-G
76096-76110 Buffalo 299-H
- 6. Roller Bearings----- Timken E-31383-C
- 7. Truck Springs----- ASF D-5 (Alloy)
- 8. Truck Parts----- ASF
Friction Shoe 75500-H
Outer Springs 54223-F
Inner Springs 54222-G
Wear Plate 43132-C, Line 4
- 9. Brake Shoes----- ABEX BC-6668 (H4)
- 10. Brake Shoe Keys----- ABEX BC-6550-A
- 11. Adapters----- Dayton Malleable D-1293-C
- 12. Side Bearings----- ACF 2-A-0283
- 13. Wear Plates----- Unit Truck UW-133-D
- "B" 14. Bottom Rod Guard-- 76001-76095 - Creco SD 1470
76096-76110 - Creco SD 1316
- 15. Truck Levers----- Schaefer 3340 (8" x 14")
- 16. Bottom Connection ----- Schaefer 3334 (37")
- 17. Horizontal Wear Liner-----Manganese Steel Forge F-1858-D