American locomotive company
30 church street
New York

Code Word AVVOCED
May 20, 1942

Locomotive Type 200-3-160

Gauge Wheel Base Driving Wheels
Track Diameter Stroke Diameter

DollIP Fire Box Tubes

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|        |        |        |        |        |        | 13'-5"

Driving Wheel Base Day & Tand-about Engine

- Approximate weight in working order- (Pounds)
- Leading Drivers - Trailing Engine - Tender

15'-6"    25'-3"    25'-0"

- 17,000    143,000    -
- 160,000    130,000

Fuel evaporating surfaces - (square feet)
- Tubes - Flue - Fire Box - Arch Tubes - Total

- Super heat grate - Maximum
- Surface area - Tractive power - Factor
- Sq. Ft. - Sq. Ft. - (Pounds)
- Atmosphere

Coal 1,053 367 136 15 1773 400 41.0 31,500 4.55

Limitations
- Weight per axle

36,000

Tender with 8-wheel capacity water 6,500 gallons

General design given by Preliminary design 905-3-20770

Design in rev.
B-coal
C-
8-121

Fuel 10 tons
FRAMES, CYLINDERS, ETC.

FRAMES
Prame of cast steel thoroughly annealed, with integral single forward section provided with lugs for holding cylinders. Frames thoroughly brazed together and to bolster by suitable crossties and expansion members. Pedestals protected from wear by cast iron shoes and adjustable wedges, and securely fastened together at bottom by caps flanged and bolted to bottom of pedestal.

CYLINDERS
Cylinders, diameter 19", stroke 26", of cast iron.
Cast with half saddle attached, secured together and to frames in a substantial manner.

PISTONS
Pistons of cast iron, made with solid bosses, and fitted with cast iron packing rings.
Piston rods of barreled steel, of ample diameter, securely fastened to pistons and cross heads.

VALVES
Steam chest valves; 10" piston type

VALVE MOTION
Walschaert. Valve motion graduated to cut off equally at all points of the stroke.
Detail parts of body steel with case hardened wearing surfaces.

BED PLATES
Bearings of bronze.

REVERSE GEAR
Reverse gear. Hand lever type, but arranged for future application of power reverse gear. Right hand drive.

ROD PACKING
Metallic packing on piston rods and valve stems.

GUIDES
Guides bored type of steel, securely bolted to cylinder heads and to rigid guide yoke extending across frames.

CROSSHEADS
Crossheads bored type, of cast steel with ample bearings.
Crosshead shoes of cast iron housed.
Crosshead pins arranged for outside applications.

DRIVING WHEELS, ETC., ETC.

DRIVING WHEELS
Driving wheels, number 5, diameter 37", diameter centers 31", carefully proportioned and accurately counterbalanced. Main centers of cast steel.
Hub liners of steel plate. Other centers of cast steel.

TIRES
Tires of open-hearth steel.
3" thick.

FLANGED TIRES
5-3/8" wide.

AXLES
Axles of barreled open-hearth steel finished in best manner.
Main journals, diameter 6", length 21".
Other journals, 6", 6", 21".
Main driving axle hollow bored and heat treated.

BOXES
Main driving boxes of cast steel.
Other driving boxes of cast steel with deep flanges and large force feed oil collars, and carefully fitted with heavy bronze bearings arranged with suitable grooves.

SPRINGS
Driving springs of open-hearth steel, tempered in oil, and secured to a system of equalizing beams to insure the engine riding in the best possible manner.

RODS
Connecting rods of barreled open-hearth steel, fitted with adjustable bronze bearings. I-section.
Parallel rods of barreled open-hearth steel with bronze bushings. Rectangular section.
Boiler type: straight top, largest course 70" outside diameter, material of shell, homogeneous boiler steel. Door well secured to boiler. Shell thoroughly reinforced at opening. Boiler wall designed, thoroughly braced and stayed, of best workmanship, and capable of carrying a working pressure of 225 lbs. per square inch. Boiler tested to A.S.M.E. Boiler Code. Horizontal seam butt jointed, multiple riveted, with velt strips inside and outside. Plates planed at edges and oilfield. Sloping back head and throat. Rivet holes reamed after assembling, to insure uniform holes, and slightly counter sunk under heads of rivets. Boiler design to A.S.M.E. Boiler Code, Section 3, except to have safety factor of 2.


Rud Ring: Rud ring accurately fitted and substantially single riveted.

Staybolts: Staybolts of wrought iron, of ample diameter, secured and riveted in sheets, suitably spaced from center to center, and pneumatically driven. Bell tube holes drilled in outer ends. Crown sheet supported by radial stays of wrought iron, body of ample diameter with enlarged ends, secured through the crown and shell and riveted over. Flexible expansion stays at front of firebox. Approx. 20 in number.

Flexible water space staybolts: Approx. 50 in number.

Flexible radial staybolts: (approx. each side of firebox). Approx. — in number.

Superheater Tube: Fire tube type “A” 150 tubes of steel 2″ outside diameter 1/8 (Min.) B.W.G. thick.

Flues: 30 flues of seamless steel 5-3/8″ “ ” 10 (Min.) B.W.G. thick.

13′-6″ long, set with copper furnace at fire box and 11/16″ tube spaces. Tubes and flues welded in firebox tube sheet.

Fire Brick: Fire brick arch supported on 3′-3″ 0-0, arch tubes 7 B.W.G. (Min.)

Cleaning Holes: Washout plugs provided at corners of fire box, above fire door and crown sheet, and for washing boiler shell.

Fire Door: Of cast iron, hand operated, with removable cast iron liner.

Blow-off Cock: Blow-off Cock, one builder’s standard.

Safety Valves: Safety Valves of ample capacity, 2 — one open and one multitclosed.

Water Supply: Furnished by two injectors of ample capacity. Capable of operating at a feedwater temperature of 150°.

Throttle: Balanced throttle valve done type, with steel dry pipe and cast iron steam pipes to cylinders. Outside steam pipes.

Grates: Decking bars suitable for fuel, removable flapper type to operate in two sections (13, weight type).

Ash Pan: Ash pan of 3/16″ steel plate. Two hopper type.

Smoke Box: Smoke box extended and fitted with netting and deflecting plates. Front and door of pressed steel, carefully fitted.

Smoke Stack: Smoke stack of steel plate designed to give maximum draft.

A-13327-A
Crank Pin
Crank pin of hammerd open-hearth steel with ample bearing surface.

Lubrication
All bearings on engine provided with suitable means for the proper lubrication, adjustable oil cups on guides, and suitable oil cups on rods. Cylinders and valves oiled by 2-3 feed mechanical lubricator. Separate mechanical lubricator for air pump.

Trucks
Type radial inside bearing. Frame of cast steel. Axles of cast steel with bronze bearings oil force feed. Axles of hammerd open-hearth steel. Journals, diameter and length 6\" x 10\".

Wheels, number 2 diameter 30\" rolled steel AAR contour.

CAB, PILOT AND MACHINERY

CAB
Cab substantially built of steel, roof wood lined; thoroughly braced and secured to boiler and running boards, furnished with suitable sliding windows and with convenient tool boxes, seats, cushions and arm rests for engineer and fireman.

Running boards Running boards of steel.

Bumper Front bumper of steel plate.

Steps Steps front of engine and rear of tender.

Coupler Coupler Central spring draft hook and side buffers set 42\" above rail.

Sand Box One sand box of ample capacity arranged with suitable valves and pipes.

Sander Steam type, to apply sand front of No.1 and back of No.3 drivers.

Headlight Apply necessary brackets to suit requirements.

Fixtures Engine provided with cast iron whistle, steam engine, gauge cocks, glass water gauge, blower, cab lamps.

Tools Engine provided with all necessary tools. See list.

Templates Principal parts of engine fitted to gauges and templates, and interchangeable.

Bolts and Nuts All bolts heads US standard, except when finer threads are necessary. All finished removable nuts cast hardened. Fittings manufactured outside to have makers' standard threads.

Handrails Illegible
TENDER

Frame  
Frame substantially built of steel channels.

Coupler  
Coupler suitable spring draft hook and side buffers set 42" above rail.

Trucks  
Two four-wheel center bearing trucks, with heavy bolsters.

Axles  
Axles of homored steel. Journals, diameter and length 5" x 9".

Wheels  
Wheels, number 33" diameter cast iron chilled tread.

Springs  
Springs of open-hearth steel tempered in oil.

Brake  
Brake on both trucks with suitable brake beams.

Tank  
Tank type rectangular, U-shaped made of 1/4" steel plates. 
Strongly riveted together, with angle iron corners, thoroughly 
beveled and stayed, and well secured to tender frame. 
Coal gates of wood. 
Water capacity 6,500 U.S. Gallons (231 cubic inches) 
Coal capacity 10 tons (2000 lbs)

Tool Boxes  
Tool boxes of steel.

GENERAL FINISH

General Finish  
Cylinder casings of sheet steel, with pressed steel painted head 
covers. Steam chest body casings of sheet steel with pressed steel 
covers.

Lagging  
Boiler lagged with sectional magnesia light weight type. 
Cylinders lagged with sectional magnesia light weight type.

Jacket  
Boiler jacket of 1/4 22 B.W.G. sheet steel neatly secured by bands 
and painted. 
Back head lagged and jacketed.

Painting  
Engines and tender well painted and varnished, with markings and 
numbers, as specified by Purchaser.

Patents  
All patent fees not covered by this specification excepted.

BRAKES AND SPECIALITIES

Brakes  
Steam brake on engine and tender, 
Operating valve to suit. 
Foundation brakes, drivers, American Brake Co. 
Train brakes - Automatic air brake equipment for train with connections 
front and rear. 
1 - 9" Air pump with main reservoir of ample capacity. 
Automatic vacuum brake equipment for train with connections front and rear. 
1 - Ejector of suitable capacity.

A-13329-A  
5.
Cab shall be of steel, 12 U.S. gauge, open back type. Roof lined with wood.
Back extension of cab roof to be so designed as to be detachable from cab roof.
Front doors.
Cab provided with clear vision front windows, right.
Cab provided with side windows with sliding sash.
Metal sash for cab windows.
Windows shall be glazed with 3/16" laminated glass.
Side windows equipped with blackout curtains.
Cab deck opening shall be provided with canvas curtain, vertical opening.

Steam Turret
Steam turret shall be applied for supply of auxiliary steam with turret valves readily accessible.
Turret dry pipe shall extend into dome.
All valves and fittings shall be A.A.R. type.

Water Gauge
Three gauge cocks and reflex type water gauge shall be located on right side of the back head with quick-closing shut-off valves.

Crown Stays
Crown stays shall be taper head 1-1/2" in 12", the front two rows being provided with spherical nuts.

Firebox
Firebox to be of welded construction.
All firebox sheets welded to multi ring.
All locomotives, either coal or oil, to have arch tubes.

Safety Valves
Valve springs, valves and related parts shall be interchangeable between the two valves.

Lubrication
Grack pins shall be lubricated by oil.
Valve motion pins shall be lubricated by oil.
Engine and tender trucks, oil lubrication.

Fire Door
Suitable provision shall be made to screen fire door.

Couplers
Locomotive and tender to be designed for future application of A.A.R. type couplers with suitable draft gear for tender.

Cylinder Head Casings
Flat disc type of steel plate. (not flanged).

Tool Boxes
Suitable tool boxes shall be applied and secured in cab and on tender to contain all tools except firing tools.

Name Plate
Each locomotive shall be provided with cast iron name plate permanently attached.
The proper designation for the nameplate will be furnished with the contract or purchase order.
Connections Between Engine and Tender

Single drum.
Plain engine and tender chafing irons.
Safety chains to suit design.

Tender trucks must interchange with our truck design to be submitted by the War Department.

Piping

All piping, wherever possible, to be of steel or iron except copper pipe in cab.

Tools

The following tools to be furnished:

1. bar, pinch, 1" x 36"
2. blocks, crank pin
1. broom, corn
1. bucket, G.T.
1. "", sponge
1. can, oil = 1-gal.
1. "", sun., 5-pint.
1. chisel, cape, 3/4" octagon
1. "", cold, 3/4"
1. crew bar
1. filler, lamp, pint
2. flags, railway signal, green
2. "", sun., "", red
2. clamps, crosstie
1. hook, packing
1. iron, "
1. oiler, pump
1. push pole
1. pair retractors
1. screw driver, heavy duty handle
2. torches, engineer
1. pound, cotton, vise
1. set wrenches, for all removable nuts on the loco.
1. wrench, monkey, 12" steel handle
1. "", "", 21" or 24" steel handle
1. "", pipe, adjustable, 1/4"
1. "", "", "", "", 18"
1. bar, shaker, grate
1. "", slice
1. pick, coal
1. poker
1. scoop, shovel
Clearances

U.S. War Department Drawing C-43090, except —
8'-6" wide up to 42" above rail,
9'-0" " 42" and over ".

Roof Contour — 12'-12" max., height

All figures are drawing dimensions.

Locomotive to be so designed that it can be lowered
fully erected through a 35'-0" slip hatch.

General

Locomotive to be designed and built to English
dimensions throughout.

Design to be as simple as possible and should avoid the
use of castings where rolled shapes or plates can be
used.

Builder's standard methods of design and construction to
apply except as herein noted.

Interchange-
ability

Where consistent, design details should interchange with
U.S. War Department (4'-8-1/2" gauge) 2-8-2 type
locomotives, order 2-1972.

Fuel

Engine and tender designed so as to be converted from
coal to oil burning with the minimum number of changes.

Tap all holes in boiler, etc., to take either equipment.

Hollow bolts back of brick for all engines.

Engine and tender connections to take either equipment.

Material

Material to be to the following material specifications
where applicable:

A.R.T.M.,
A.S.M.E.,
A.A.R.,
National Emergency.

Grades and
Curves

Locomotive and tender to be designed for:

Grade ..................25

Curves ..................20°
OIL BURNING LOCOMOTIVES

The following modifications will apply to the foregoing specification for the locomotives which will be designed to burn oil fuel instead of coal:

Boiler

Provision shall be made for the application of fire brick lining for oil burning, with installation of hollow staybolts behind brick work.

Smokebox

The smokebox shall be arranged for oil burning.

Oil Burner

Suitable oil burning equipment to be provided.

Oil Pans

Oil pan shall be 5/16" steel plate.

Fire Door

Fire door of cast iron with renewable fire tile liner and swinging cover.

Oil Tank

Suitable oil tank of 1500-gallon capacity shall be provided to fit into coal space of tender. Tank shall be provided with measuring rod, cock and open heaters, oil tank valve, with strainers and safety cut-out arrangement.

Sand Box

Suitable sand box shall be provided on tender deck in front of oil tank.

Tools

The following tools used on the coal burning locomotives will not be required:

Bar, shaker grate
Bar, alice
Pick, coal
1 = pokers
1 = shovel, scoop

The following additional tools will be required for oil burning engines:

1 = scoop, sand
1 = funnel, sand