



SPECIFICATIONS

E-1662-B

**1600 H P DIESEL-ELECTRIC
ROAD SWITCHING LOCOMOTIVE**

*These specifications cover the principal features of
the American Locomotive 1600 hp diesel-electric
road switching locomotive.*



AMERICAN LOCOMOTIVE COMPANY
30 CHURCH STREET • NEW YORK 8, N. Y.



CONTENTS

	PAGE
<i>Section 1</i> — GENERAL CHARACTERISTICS	4
<i>Section 2</i> — CAB	5
<i>Section 3</i> — TRUCKS	6
<i>Section 4</i> — DIESEL ENGINE	7
<i>Section 5</i> — MECHANICAL EQUIPMENT	7
<i>Section 6</i> — ELECTRICAL EQUIPMENT	8
<i>Section 7</i> — AIR BRAKES	9
<i>Section 8</i> — LOCOMOTIVE EQUIPMENT	10
<i>Section 9</i> — OPTIONAL EQUIPMENT	10
<i>Section 10</i> — MODIFICATIONS	10
<i>Section 11</i> — PAINTING AND MISCELLANEOUS	12
<i>Section 12</i> — PERFORMANCE DATA AND OUTLINES	13



Section 1—General Characteristics

1600 HP DIESEL-ELECTRIC ROAD SWITCHING LOCOMOTIVE

MODEL NUMBER	RS-3
CLASS—AAR Designation	B-B
TRACK GAUGE	4'-8 $\frac{1}{2}$ "
GENERAL DESIGN—Shown by Drawing Number	985N94431
PRINCIPAL DIMENSIONS (<i>Drawings</i>):	
Height (<i>Maximum</i>)	14'-5 $\frac{1}{8}$ "
Width (<i>Maximum</i>)	10'-0 $\frac{1}{4}$ "
Length (<i>Inside Knuckles</i>)	56'-5 $\frac{3}{4}$ "
WHEEL BASE	Each Truck (<i>Rigid</i>) 9'-4"
	Total Locomotive 39'-4"
DRIVING MOTORS	Four
WHEELS	Drivers 4 Pairs 40" Diameter
MINIMUM RADIUS CURVATURE—Locomotive Alone	150 ft.
MAXIMUM CURVATURE—With Train	21 Degrees
WEIGHT	On Driving Wheels 240,000 lbs.
	Total Locomotive 240,000 lbs.
SUPPLIES	
Total Capacity	Lubricating Oil 200 gallons
	Fuel Oil 800 gallons
	Engine Cooling Water 250 gallons
	Sand 28 cu. ft.
CLEARANCES—Maximum Outline, Drawing Dimensions	981N94491
SAFETY APPLIANCES—Steps, handrails, safety appliances, etc., applied in accordance with American Locomotive Company's interpretation of Interstate Commerce Commission regulations.	



Section 2—Cab

UNDERFRAME—Fabricated of steel, electrically welded

SUPERSTRUCTURE—Superstructure of welded steel construction, thoroughly braced and secured to underframe.
Operating cab applied between low hood covering power equipment in front of the cab and a low hood in back of the cab.

CENTER PLATES—Cast steel, welded to underframe and equipped with removable liners.

COUPLER HOUSINGS—Cast steel pocket at each end of locomotive.

COUPLERS—AAR Standard Type E top operated swivel coupler applied at each end.

UNCOUPLING DEVICES—Uncoupling levers provided at each end to operate independently from either side.

DRAFT GEAR—AAR friction draft gear applied at each end.

REMOVABLE HOODS—Hood in front of operating cab covers engine and other apparatus and equipment.
Steel door provided in front end of hood
Radiator compartment located in forward section of hood.
Section of hood over engine and generators is removable.
Doors in sides and roof of hood provide access to engine and auxiliaries
Rear side doors in hood provide access to generators and electrical equipment.

CONTACTOR COMPARTMENT—Contactor compartment at rear of front hood contains electrical control equipment. Apparatus is accessible through doors in operating cab and through panels in front partition.

REAR HOOD—Rear hood is removable. Steel doors with louvers are provided in each side, also door in rear end.

CAB—Operating cab of welded steel construction.
Floor of seasoned hardwood, elevated above underframe.
Doors on sides for access to compartment under operating cab floor.
Ends, sides and roof lined with Masonite.
Cab is insulated.

CAB SEATS—One cushioned swivel seat with removable back rest at operating position.
One box type seat, with hinged cushion seat, for left side of cab.
The seat box is suitable for holding small tools
Upholstered arm rests applied to window sills at both sides of cab.

CAB DOORS—Steel doors in right side of rear wall and left side of front wall of operating cab provide access to walkways along hoods.
Doors are provided with windows, weatherstrips and locks.
Door provided in rear wall of cab for access to rear hood compartment.

VENTILATION—Air filters provided for engine room and generator compartment ventilation.



WINDOWS—Two sliding sash in right side window, provided with locks
Three sliding sash in left side window, provided with locks.
Other windows of fixed type, with rubber seals.
All windows are of safety glass.

STEPS—Vestibule type steps with safety treads applied at the four corners.

ACCESSORIES—Inspection card holders and spare lamp holder.

Section 3 – Trucks

TYPE—Two four-wheel, swivel, swing motion, pedestal type motor trucks applied.

CONSTRUCTION—Cast steel construction.

Frame is spring supported on two equalizers on each side, with triple coil springs between the equalizers and the frame. Triple elliptic springs are applied between bolster and spring plank. Center plate safety locks applied.

AXLES—Two (2) axles, of forged open hearth steel, per truck.

Journals 6½" x 12".

End thrust arrangements provided in boxes.

WHEELS—Four (4) rolled steel wheels, 40" diameter, per truck, to AAR specification M-107. Class "B".

MOTOR MOUNTING—Motors applied to all axles, supported by the axles to which they are geared and by spring nose suspensions on truck transoms.

Wheel and axle assemblies removable with motors.

Forced ventilation is through flexible connections between ducts in the underframe and the motor frames.

LINERS—Steel liners on sides and bottoms of center plates; bottom liners removable for shimming.

Spring steel liners on truck pedestal jaws and journal boxes.

CENTER PLATES—Center plates oil lubricated and protected by dust guards.

SIDE BEARINGS—Plain steel side bearings and swivel limiting devices applied.

SPRINGS—Elliptic and coil springs of open hearth steel tempered in oil.

BRAKES—Clasp brakes on all wheels with two (2) Type G-4630 brake shoes per wheel.

Eight (8) brake cylinders, 10" x 8", single acting; four (4) per truck.

Brake rigging equipped with slack adjusters.

BRAKE PINS—Hardened brake pins and bushings.

HAND BRAKE—Hand brake located outside rear end of rear hood and connected to front wheels of rear truck.



Section 4—Diesel Engine

ENGINE—American Locomotive Company, Series 244, Vee (V) type, twelve (12) cylinder, four (4) cycle, 9" bore, 10½" stroke, turbosupercharged Diesel engine, having two (2) intake and two (2) exhaust valves per cylinder, water cooled cylinder liners and heads, oil cooled pistons, forged steel connecting rods, seven (7) bearing crankshaft and welded base and cylinder block.

REGULATOR—A power plant regulator of variable speed type is applied.
Intermediate engine speeds selected with engineman's throttle lever, which controls setting of regulator.

OVERSPEED SAFETY TRIP—An overspeed safety trip is provided.

ENGINE STARTING—The Diesel engine is started by the main generator acting as a motor, using a special starting field and current from the storage battery.

COOLING—Water is circulated through engine, radiators and lubricating oil cooler by a gear driven centrifugal pump integral with the Diesel engine.
Radiators of panel type mounted vertically at sides of radiator compartment
One (1) mechanically driven fan, revolving in a horizontal plane, draws air through the radiator and exhausts it through a screened opening in the roof.

ENGINE TEMPERATURE CONTROL—Air flow through radiators is controlled by modulated shutter control and by variable speed of radiator fan, which is driven through an electric clutch of the eddy current type.
Shutters and clutch controlled automatically.

LUBRICATION—Full pressure system supplied by gear type pump integral with Diesel engine
Lubricating oil reservoir in engine base.
Filter, heat exchanger, strainer, and pressure regulator applied.
Automatic means provided to stop engine in case of low lubricating oil pressure.

FUEL SYSTEM—Electrically driven transfer pump located in engine compartment for supplying fuel from supply tank to injection pumps.
Supply pipe to transfer pump fitted with large waste packed filter on suction side. Filter also provided on the discharge side
Pressure relief valve and pressure gauge provided in discharge pipe from transfer pump.

Section 5—Mechanical Equipment

ENGINEMAN'S CONTROL STATION—Control stand, conveniently located at left of engineman's position in operating cab, contains: throttle handle, selector handle, reverser handle and air brake valves; switch for generator field; circuit breaker type switches for fuel transfer pump and control circuits; switches with dimming control for front and rear headlights; switches for class, number, hood, dome and engine room lights; duplex air brake gauges; speed and transition indicator; load meter; wheel slip indicating lamp and buzzer; engine stop button; signal lights for low lubricating oil pressure, high engine water temperature, ground relay, steam generator flame out (if used) and train control (if used); switch for gauge lights

Battery disconnecting switch operated from the cab, in front of operator.

Gauge panel, forward of engineman's position, contains: fuel oil pressure gauge, lubricating oil pressure gauge, engine water temperature indicator and cab heater switch and rheostat. Control air pressure gauge mounted at right of operator above reducing valve.



MECHANICAL DRIVES—Flexible couplings installed between engine and air compressor and between compressor and auxiliary drive shaft.

RADIATOR FAN—The radiator fan is of the aphonc type, 60 inches in diameter, of welded construction, designed to operate efficiently with varying speeds

TRACTION MOTOR BLOWERS—The traction motor blowers are of the multivane type.
Front blower—driven through V-belts; Rear blower—gear driven from main generator.
Each is arranged to supply ventilating air to the motors on one truck.

FUEL TANK—One (1) fuel oil tank, of welded steel construction, applied below underframe.
Capacity 800 gallons
Two (2) filling connections and two (2) glass level indicators applied.
One vent applied.
Pull handle for emergency cut-out valve on each side near filling connection and also from within cab of locomotive.
Provision made for draining and cleaning tank.

ENGINE WATER—One (1) expansion tank of welded steel construction located higher than engine and radiators.
Capacity 55 gallons
Filling connection on left side of locomotive.
Emergency filling connection on top of expansion tank, front hood.
Provision made for draining and cleaning system .

Section 6—Electrical Equipment

EQUIPMENT LIST—

	<i>Type</i>
1 — Main Generator	GT-581
1 - Exciter	AM-808
1 -- Auxiliary Generator	GY- 27
4 - Traction Motors	GE-752
1 — Eddy Current Clutch and right angle drive gear box	GDY32
1 - Power Plant Regulator	MG6
1 -- Control Equipment	P

MAIN GENERATOR—The main generator is directly connected to the Diesel engine. The exciter is an amplydne machine designed for use with the power plant regulator. The exciter and auxiliary generator are mounted on the end of the main generator and are gear driven from it.

AUXILIARY GENERATOR—The auxiliary generator supplies power for battery charging, lighting and control circuits and operates at constant voltage under control of a regulator.

TRACTION MOTORS—The traction motors are four-pole direct current machines designed for operation with full or shunted field. The armatures are equipped with roller bearings.



EDDY CURRENT CLUTCH AND RIGHT ANGLE DRIVE—The eddy current clutch used to control engine water temperature is applied on the engine side of the right angle drive gear box. Slip of the clutch is electrically controlled and is coordinated with radiator shutter control.

POWER PLANT REGULATOR—The power plant regulating system modulates the Diesel engine loading by controlling fuel to the Diesel engine and adjusting generator demand. It holds constant any pre-set engine speed by limiting engine torque and adjusting generator demand to the ability of the engine to deliver power at any moment and for any set speed.

CONTROL—Type P single-end single-unit control is used.

Reverser and line contactors are electro-pneumatically operated; all other contactors are operated magnetically.

There are four traction motor connections: Series parallel full field, series parallel shunt field, parallel full field and parallel shunt field.

Transition is manually controlled, both forward and backward, by a selector handle.

Manual low voltage switches, of the circuit breaker type with reset feature, are used on auxiliary circuits wherever overload protection is required.

CONTACTOR COMPARTMENT—Electric control equipment is contained in the contactor compartment, also engine starting switch.

Switches and meters are contained in a panel mounted on compartment wall at front of operating cab, and accessible to operator in cab.

STORAGE BATTERY—A 32 cell, 426 ampere hour lead acid type storage battery is installed in two battery boxes, one on either side, at rear of operator's cab, above underframe, with sixteen cells in each.

LIGHTING—All lights are connected to the storage battery through circuit breaker switches and light switches.

Lights are provided in operating cab at roof and gauge panels; and in engine hood and contactor compartment.

HEADLIGHTS, NUMBER AND CLASSIFICATION LIGHTS—Headlight with two 200 watt, 32 volt, sealed beam lamps applied at each end; dimming control is provided.

Numeral boxes with electric lighting applied on each side of hood at each end of locomotive.

Receptacle for class light provided at each of four corners of locomotive near numeral boxes.

Section 7 – Air Brakes

BRAKE EQUIPMENT—Brake Schedule 6-SL, pneumatic type, for road switching service, with automatic and independent air brakes on all wheels and hose connections front and rear.

AIR COMPRESSOR—One (1) two-stage, three cylinder, air cooled air compressor applied, direct driven by the Diesel engine.

Displacement at full engine speed (1000 RPM) 225 CFM

Displacement at idling speed (350 RPM) 78.75 CFM

Compressor equipped with unloader .



BRAKE AIR COOLERS—Compressor equipped with unit type intercooler.
Aftercoolers installed between compressor and first main reservoir and between first and second main reservoirs.

RESERVOIRS—Two (2) main reservoirs applied below underframe
Total capacity 60,650 cu. ins

Section 8—Locomotive Equipment

CAB HEATERS—One (1) cab heater, using heat from engine cooling water, applied.

WINDOW WIPERS—Four (4) window wipers applied, located front and back on right and left sides of cab.

WARNING SIGNALS—One (1) horn provided.
Locomotive bell, 12" size, with pneumatic ringer.

FIRE EXTINGUISHER—One (1) 1½-quart in operating cab.

SANDERS—Sanders provided for sanding front and back of each truck.

SAND BOXES—Four (4) sand boxes of welded steel construction provided, all filled from top.
Total capacity 28 cu. ft.

EXTENSION LIGHT—Extension light, with cord and plug, provided.

Section 9—Optional Equipment

GEARING—Traction Motor Gearing

Gear Number of Teeth	74	65	64	62
Pinion—Number of Teeth	18	18	19	21
Ratio	4.111	3.611	3.368	2.952
Continuous Tractive Effort—Lbs.	53,000	46,500	43,400	38,000
Maximum Speed—MPH	65	75	80	92

Section 10—Modifications

WHICH CAN BE ADDED AT INCREASED PRICE, RESULT IN INCREASED WEIGHT
AND MAY CHANGE THE LOCOMOTIVE DIMENSIONS

STEAM GENERATOR—Steam generator installed in rear hood.

Capacity 1600, 2750 or 3500 lbs. steam per hour
Pressure, operating range 65-295 lbs. per square inch
Train line end connections with special pilot and 2" metallic connectors.
Water tank of welded steel construction applied on underside of underframe
Capacity 800 gallons
Filling connections, vents and tank heating connection provided
Tank level gauge at side of tank and remote reading indicator in operating cab.



- BRAKING**—Dynamic braking equipment installed in rear compartment.
- STEAM GENERATOR CONTROLS**—Equipment for remote control of steam generator.
- TRAIN LINE END CONNECTIONS**—Metallic connectors 2½"
- REMOTE READING TANK LEVEL INDICATOR**—For fuel tank.
- TRAIN AIR SIGNAL**—Equipment necessary for addition of train air signal.
- FUEL TANK**—If steam generator is not required 1400 gallons of fuel can be made available in one tank.
- AIR BRAKES**—Schedule 24-RL.
- COMPRESSOR**—Displacement at full engine speed 306 CFM
Displacement at idling speed 107 CFM
- MULTIPLE-UNIT CONTROL**—Electric and air brake equipment necessary for conversion to multiple unit control, with or without lighted walkway between units.
- TRANSITION CONTROL**—Automatic control of traction motor connection transitions.
- JOURNAL BEARINGS**—Roller bearing journals, 6½" diameter.
- CAB SEAT**—Additional box or swivel type seat for left side of cab.
- SUN VISORS**—Sun visors for cab windows.
- ELECTRIC WATER COOLERS**—For drinking water.
- STEP LIGHTS**—Four (4) step lights, one (1) at each corner of locomotive, controlled by switch in operating cab.
- GROUND LIGHTS**—Two (2) ground lights, one (1) under each side of operating cab, controlled by switch in cab.
- CHARGING RECEPTACLE**—Receptacle for connection to outside source of battery charging current.
- TRACTION MOTOR CUT-OUT SWITCH**—Mounted inside contactor compartment.
- BALLAST**—For total weight of 248,000 lbs.



Section 11—Painting and Miscellaneous

PAINTING—Outside finish applied as follows:

Primer surfacer

Glazing

Wet sanding

Lacquer primer surfacer, intermediate

Surfacer, final

Lacquer finish

Lettering, numbering and color scheme as requested.

Interior of battery compartment painted with special acid resisting paint.

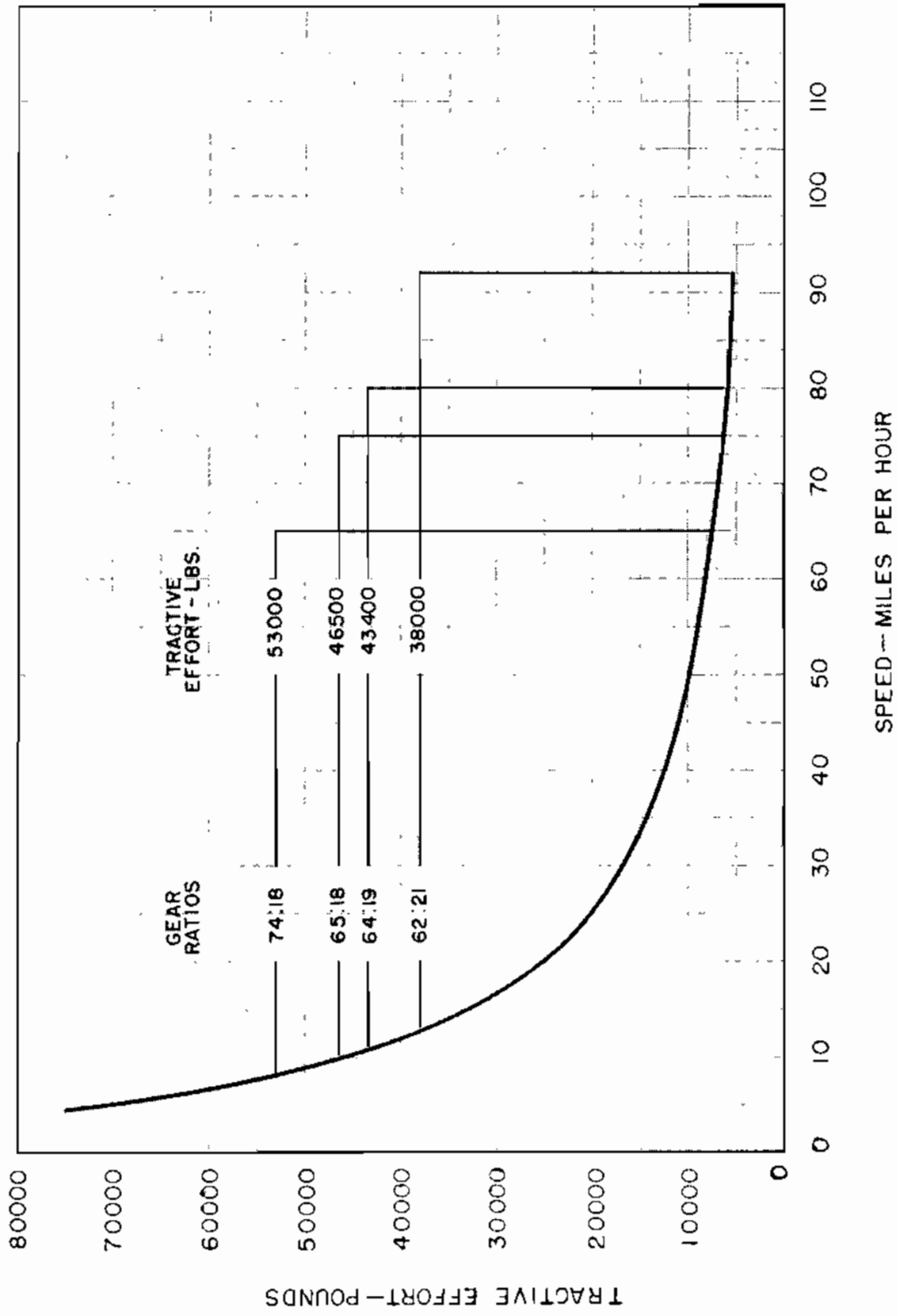
Interior of operating cab and hoods painted suede gray.

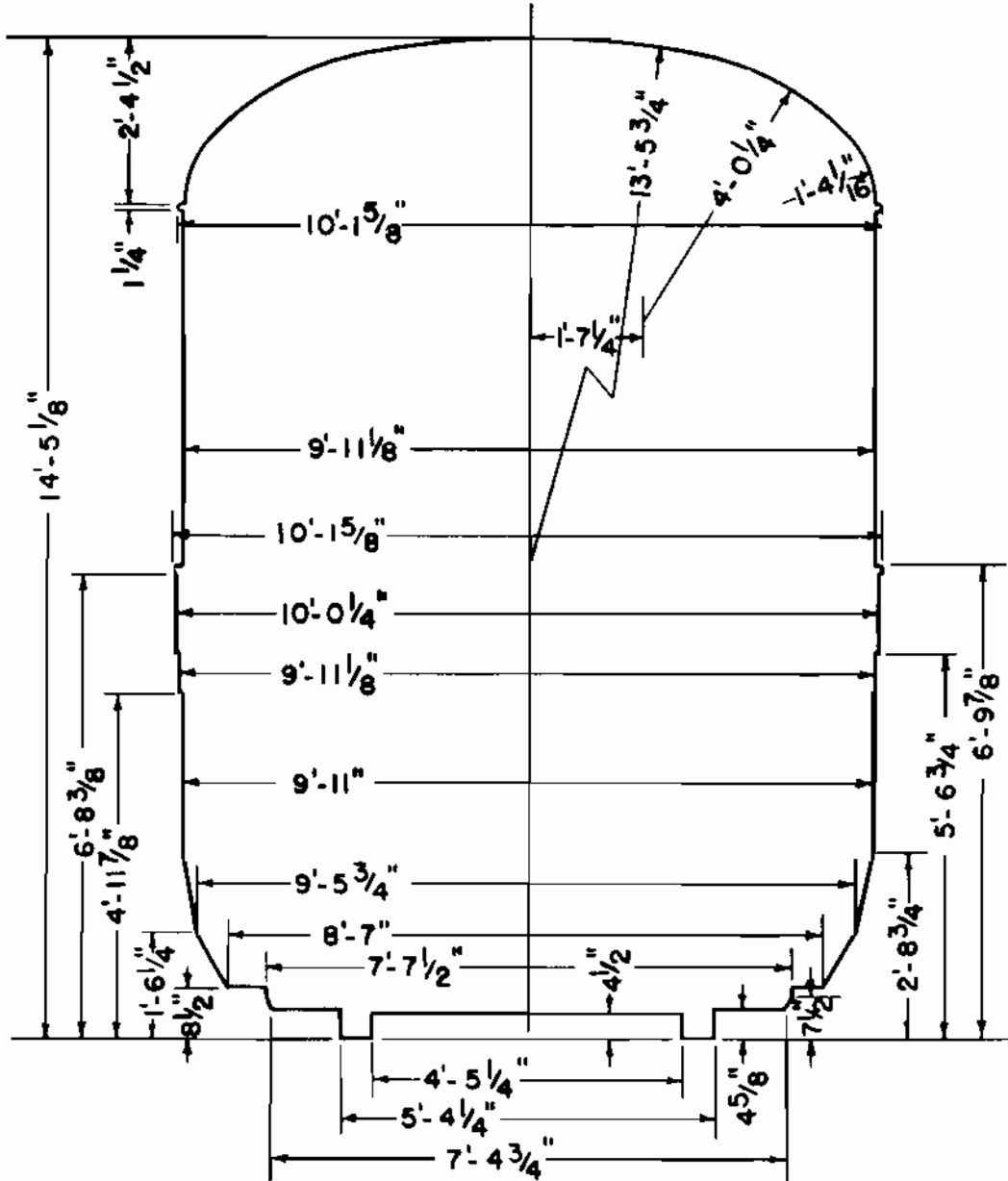
Underframe and trucks painted black.

MATERIALS—All materials are in accordance with standard material specifications of the American Locomotive Company.



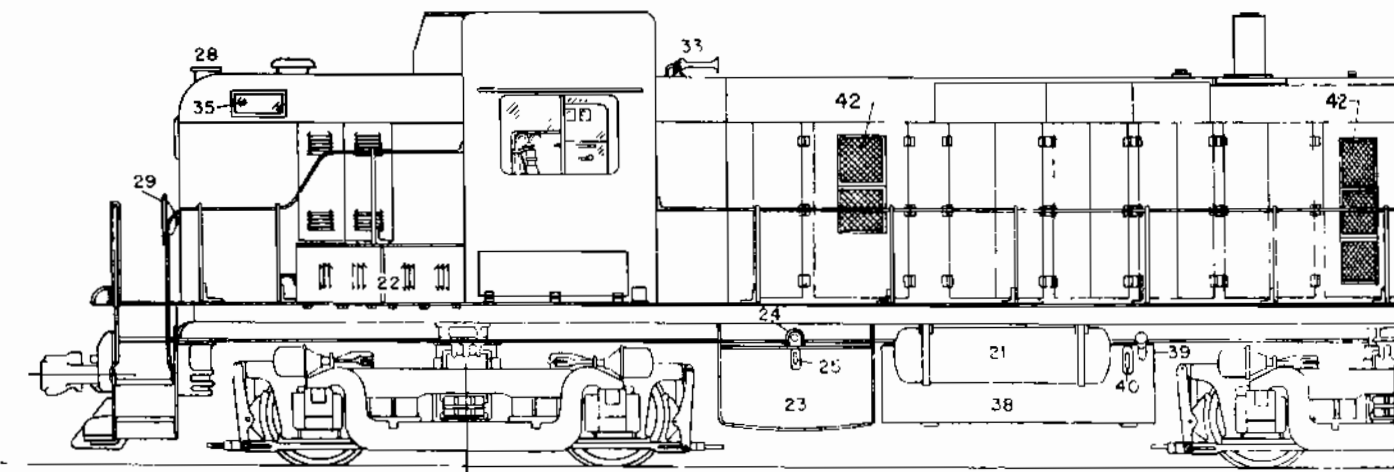
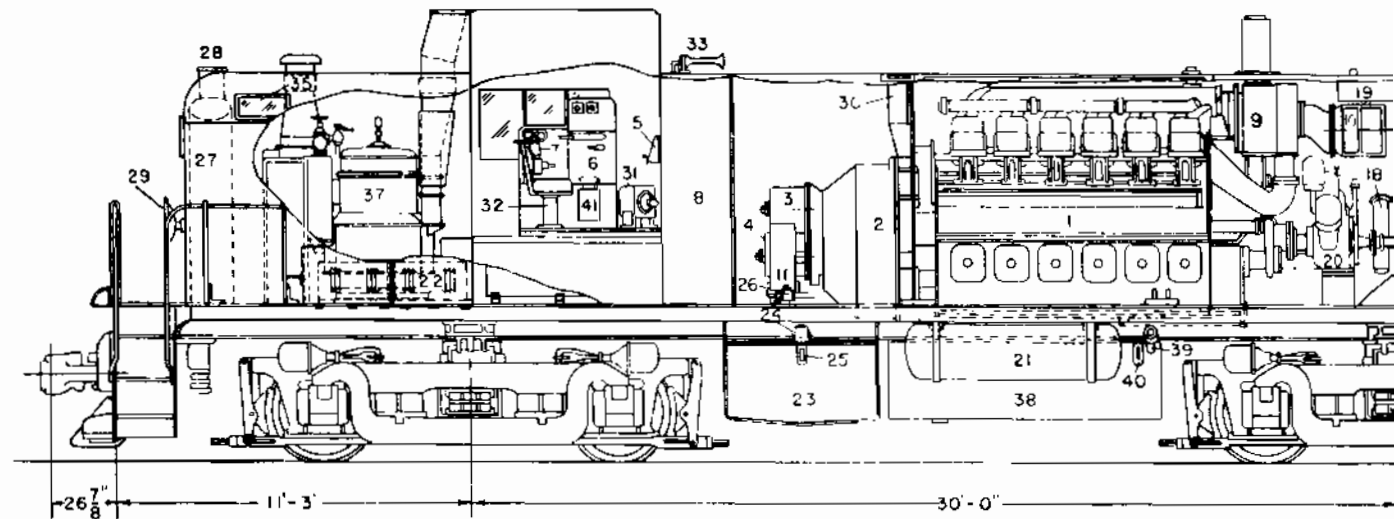
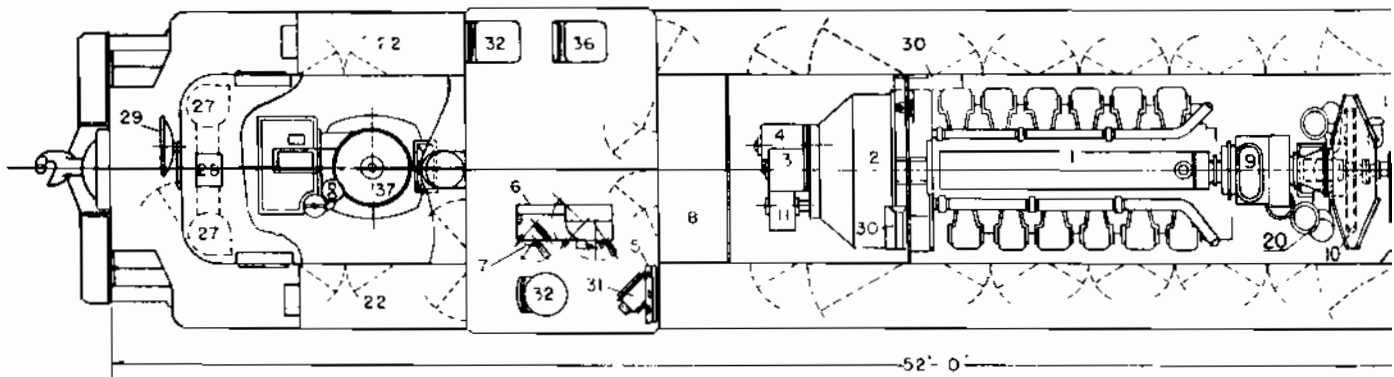
ALCO 1600 H. P. LOCOMOTIVE

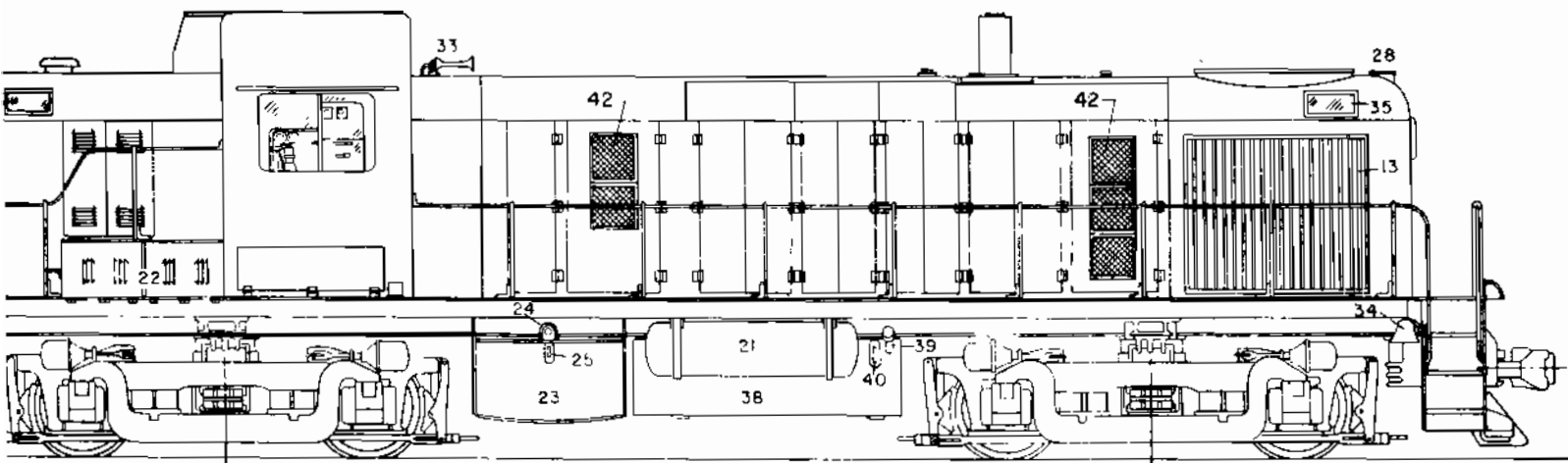
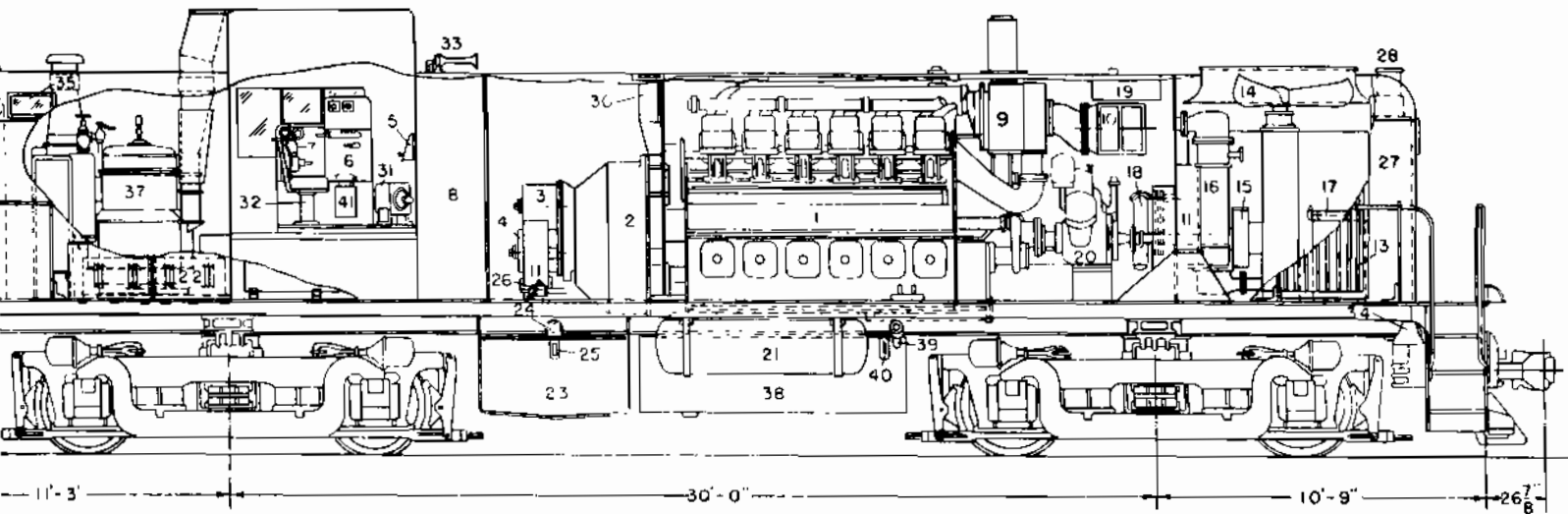
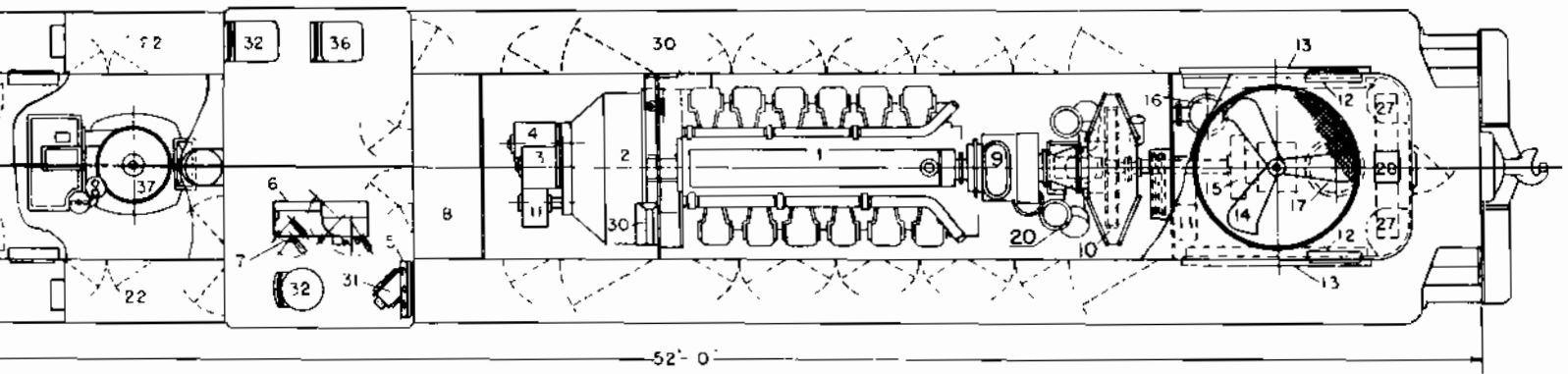




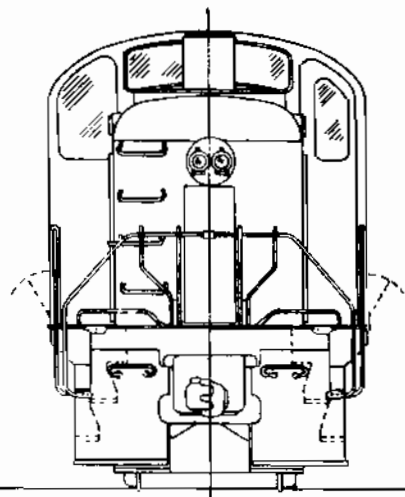
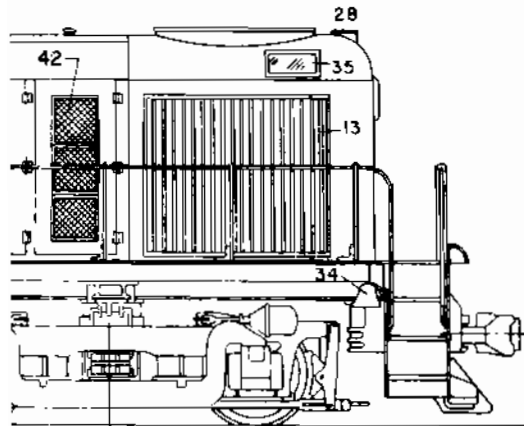
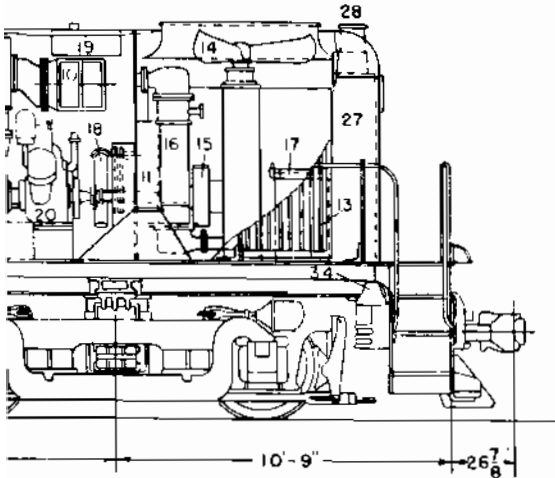
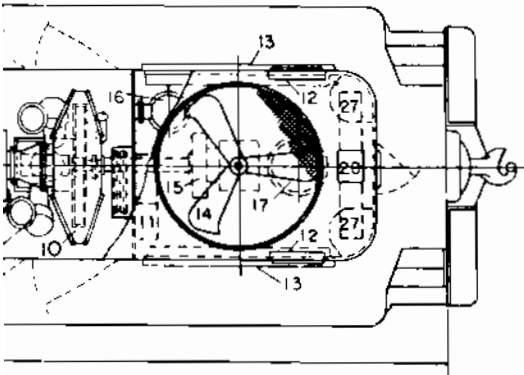
MAXIMUM OUTLINE
DRAWING DIMENSIONS
1600 H.P. ROAD SWITCHER

981 N 94491





AMERICAN LOCOMOTIVE COMPANY
985 N 94481



- | | |
|---|---|
| 1- ENGINE | 22- BATTERIES |
| 2- MAIN GENERATOR | 23- FUEL TANK |
| 3- EXCITER | 24- FUEL TANK FILLING CONNECTION |
| 4- AUXILIARY GENERATOR | 25- FUEL TANK GAUGE |
| 5- GAUGE PANEL | 26- EMERGENCY FUEL CUT OFF |
| 6- CONTROL STAND | 27- SAND BOXES |
| 7- BRAKE VALVES | 28- SAND BOX COVER |
| 8- CONTROL COMPARTMENT | 29- HAND BRAKE |
| 9- TURBO SUPERCHARGER | 30- GENERATOR AIR DUCTS |
| 10- TURBO SUPERCHARGER
FILTERS & SILENCERS | 31- CAB HEATER |
| 11- TRACTION MOTOR BLOWERS | 32- CAB SEATS |
| 12- RADIATORS | 33- HORN |
| 13- RADIATOR SHUTTERS | 34- BELL |
| 14- RADIATOR FAN | 35- NUMBER BOXES |
| 15- RADIATOR FAN CLUTCH | 36- CAB SEAT (MOD.) |
| 16- LUBRICATING OIL COOLER | 37- STEAM GENERATOR (MOD.) |
| 17- LUBRICATING OIL FILTERS | 38- WATER TANK (MOD.) |
| 18- LUBRICATING OIL STRAINER | 39- WATER TANK FILLING
CONNECTION (MOD.) |
| 19- ENGINE WATER TANK | 40- WATER TANK GAUGE (MOD.) |
| 20- AIR COMPRESSOR | 41- HUMP CONTROLLER (MOD.) |
| 21- MAIN AIR RESERVOIR | 42- AIR FILTERS |