SPECIFICATIONS
E-1662-B
1600 HP 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.
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Section 1—General Characteristics

1600 HP DIESEL-ELECTRIC ROAD SWITCHING LOCOMOTIVE

MODEL NUMBER .................................................. RS-3
CLASS—AAR Designation ...................................... B-B
TRACK GAUGE .................................................. 4'-8 1/2"
GENERAL DESIGN—Shown by Drawing Number ........... 985N944431

PRINCIPAL DIMENSIONS (Drawings):

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (Maximum)</td>
<td>14'-3 3/4&quot;</td>
</tr>
<tr>
<td>Width (Maximum)</td>
<td>10'-0 1/4&quot;</td>
</tr>
<tr>
<td>Length (Inclade Knuckle(s))</td>
<td>56'-5 5/8&quot;</td>
</tr>
</tbody>
</table>

WHEEL BASE

| Each Track (Rigid)         | 9'-2 1/4"     |
| Total Locomotive           | 39'-3 1/4"    |

DRIVING MOTORS

Four

WHEELS

Drivers 4 Pairs 40" Diameter

MINIMUM RADIUS CURVATURE—Locomotive Alone ............. 150 ft.

MAXIMUM CURVATURE—With Train ................................ 23 Degrees

WEIGHT

On Driving Wheels 240,000 lbs.
Total Locomotive 240,000 lbs.

SUPPLIES

<table>
<thead>
<tr>
<th>Supply</th>
<th>Capacity</th>
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</thead>
<tbody>
<tr>
<td>Lubricating Oil</td>
<td>200 gallons</td>
</tr>
<tr>
<td>Fuel Oil</td>
<td>800 gallons</td>
</tr>
<tr>
<td>Engine Cooling Water</td>
<td>250 gallons</td>
</tr>
<tr>
<td>Sand</td>
<td>28 cu. ft.</td>
</tr>
</tbody>
</table>

CLEARANCES—Maximum Outline, Drawing Dimensions ........... 985N944431

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 levers 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 hood.
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, 45” 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-4639 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, 10 1/2" 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 governor plant regulator of variable speed type is applied.
Intermediate engine speeds selected with enginemans'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 injector 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 enginemans's position in operating cab, contains: throttle handle, selector handle, reverse 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 enginemans's position, contains: fuel oil pressure gauge, lubricating oil pressure gauge, engine water temperature indicator and cab heater switch and rheostat. Central 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 aphonic 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—

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<tbody>
<tr>
<td>CT-581</td>
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<tr>
<td>AM-808</td>
</tr>
<tr>
<td>GY-27</td>
</tr>
<tr>
<td>GE-152</td>
</tr>
<tr>
<td>GDY12</td>
</tr>
<tr>
<td>MG6</td>
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<tr>
<td>P</td>
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MAIN GENERATOR—The main generator is directly connected to the Diesel engine. The exciter is an amplidyne 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 preset 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 each 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. Numerical 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.

<table>
<thead>
<tr>
<th>Speed</th>
<th>Displacement</th>
<th>CPM</th>
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<tbody>
<tr>
<td>Full</td>
<td>1000 RPM</td>
<td>225</td>
</tr>
<tr>
<td>Idling</td>
<td>950 RPM</td>
<td>78.75</td>
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</tbody>
</table>
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 ................................................................. 4.114  3.614  3.568  2.952
Continuous Traction 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 CPM
Displacement at idling speed 107 CPM

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