



Switcher Locomotive & Shortline Locomotive Family



SWM9

Switcher, Mid-mount cab 82 ton 900 hp
Mid-Cab Series



SWR18

Switcher, Rear-mount cab 120-180 ton 1850 hp
Rear-Cab Series

Images may be shown with Optional Equipment

Not Shown:

SWF12

Switcher, Front-mount cab 120-180 ton 1200 hp
Front-Cab Series

SWR12

Switcher, Rear-mount cab 120-180 ton 1200 hp
Rear-Cab Series

SWF18

Switcher, Front-mount cab 120-180 ton 1850 hp
Front-Cab Series

Rev 2024.3



www.Integraldx.com



A Letter From the CEO



Interested Locomotive Customer,

Our 28 year old companies are well known in many equipment markets, including the Railroad Maintenance of Way market. We have touched and influenced over 300,000 self-propelled pieces of equipment, including nearly 300 complex railroad car design & builds. Many of these from a clean sheet of paper, through entire design and analysis, and review of all relevant standards.

In 2023 the Navy was seeking someone to design a clean sheet Switcher Locomotive that matched the 1954 GE80 style and performance. We leaped at this opportunity, and inside of 18 months we demonstrated meeting all the AAR-NEC-ISO-ANSI-AWS related Locomotive specifications. We incorporated proven prime movers, generator brand, traction controls, and undercarriage components. Of course, we ultimately built the first units in our AAR certified facility. The following pages will show you the details of each design subsystem.

In 2024 the Air Force followed the Navy and asked that we provide a modern design for something similar to a GP-9. What was interesting here, was the GEEP New Build could utilize many of the same designs we utilized for the GE80 900 Hp Modernized New Build design, but with an upsized Cat Tier 4f diesel prime mover. After all, the EMD D77/78 placed under the 900Hp were capable of 2000 Hp prime movers.

From this GEEP Air Force award, a family was born. Our cab is designed to be mid ship, rear, or front mounted. The generator is sized to match to the 900 Hp, 1200 Hp, or 1850 Hp optional prime mover diesel Tier 4f engines. Propel & Traction controls allow for correct power ratings to the tractive drives, and we place the EMD 77/78 under all of our locomotives. Design the overall weight from 82 tons to 180 tons, 45 feet in Length Overall All (LOA) to 55 feet in LOA, and you have a family of Locomotives.

Yes, we are a new brand to the locomotive industry, but do not let anyone tell you we are a startup. We have co-built and/or turn-key built locomotives & power cars with several industry leaders, including Progress Rail and RJ Corman.

Thank you for considering the first family of New Design & New Build 900 Hp to 1850 Hp Locomotives in over 60 years. This range of offering is perfect for Switcher Locomotives or Short Line Locomotives.

Kevin R. Wald

Kevin R. Wald
CEO



Our Vision: Embrace those who respect, honor, and value relationships



The Family of Switcher Locomotives & Short Line Locomotives Details

Selectable Cab Mount Configuration: Mid, Rear, or Front

- High Voltage Cabinet is inside Mid Mount Cab
- High Voltage Cabinet is outside Rear & Front Cabs, in a NEMA Enclosure
- Cab HVAC maintains 68° F to 72° F in temps 0° F to 100° F ambient

Selectable Prime Movers, Twin Engines

- 900 Hp utilizing two CAT C9.3B Tier 4f, 456 Hp Diesel Engines
- 1200 Hp utilizing two CAT C18 Tier 4f, 600 Hp Diesel Engines
- 1850 Hp utilizing two CAT C27 Tier 4f, 925 Hp Diesel Engines

Cummins & MTU (Rolls-Royce) diesel engine options available upon request

Generator Matched to Engine Selection

- Marathon 574RDL 315 to 480 Vac 3 Phase with 1200 Amp Peak Rating, 900 Hp
- Marathon 744RSL 315 to 480 Vac 3 Phase with 1500 Amp Peak Rating, 1200 & 1850 Hp

Traction Controls & Operators Stand

- Integrated TMV traction controls
- American Traction Systems (ATS) with DLL components
- Custom design and codes IFM control Human Machine Interfaces (HMI)
- All developed to leverage J1939 CAN bus protocols throughout
- Integration of standard locomotive controls per AAR utilizing standard 8-notch propel settings
- Integrated with the standard 27 pin Multi-Unit (MU) locomotive capabilities

Tractive Drives

- EMD D77/D78 Traction Motors, 100% refurbished undercarriage

Braking

- New York Airbrake CCB-26 certified system

Compressor

- Atlas Copco GAR-30 (120 CFM) or Atlas Copco GAR 37 (160 CFM)
- Optional Gardner Denver 170 CFM to 213 CFM
- Optional NYAB 120 CFM

Fuel & DEF

- Selectable 400 gallon, 600 gallon or 800 gallon diesel fuel tanks
 - Other sizes available upon request, and per ability to fit underside frame
- 900 Hp & 1200 Hp require DEF

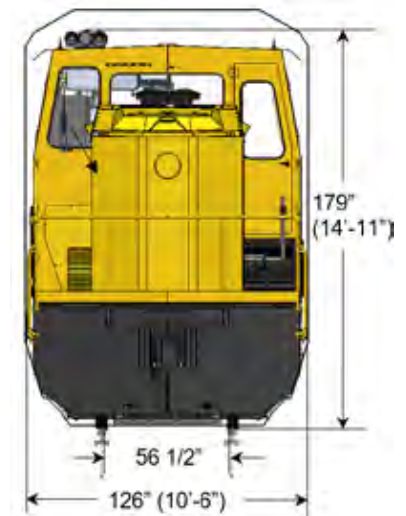
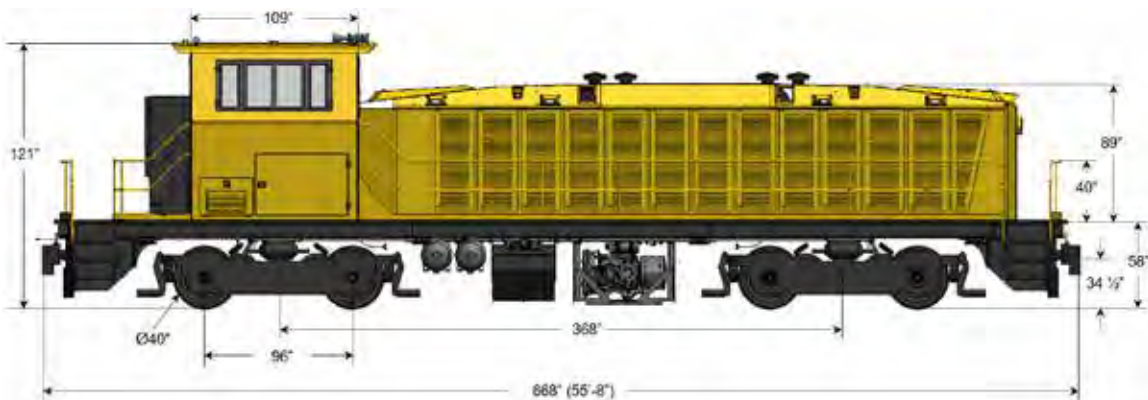
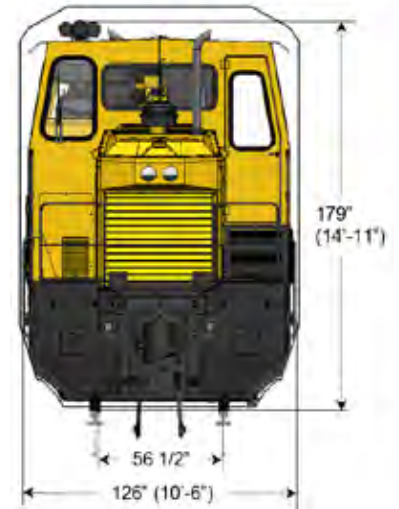
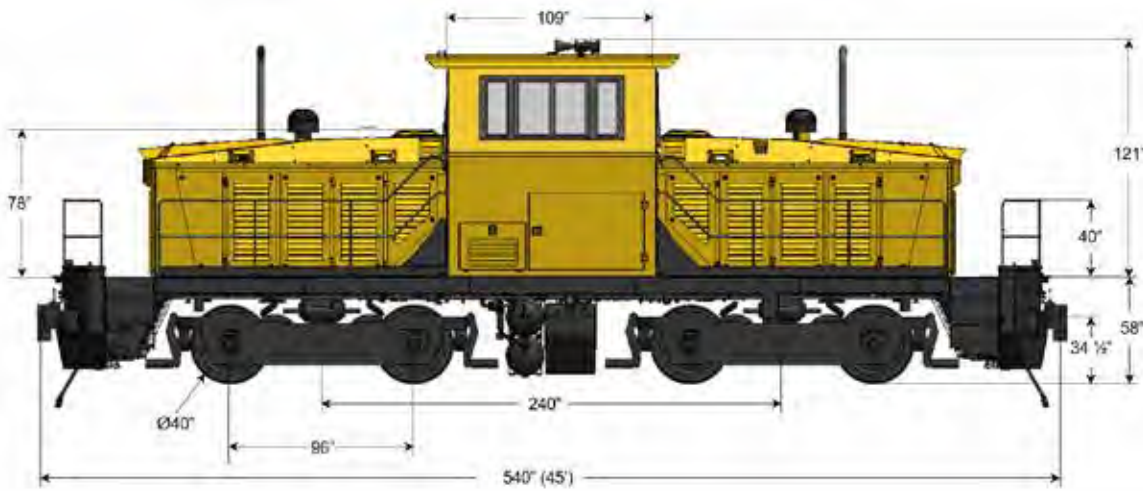
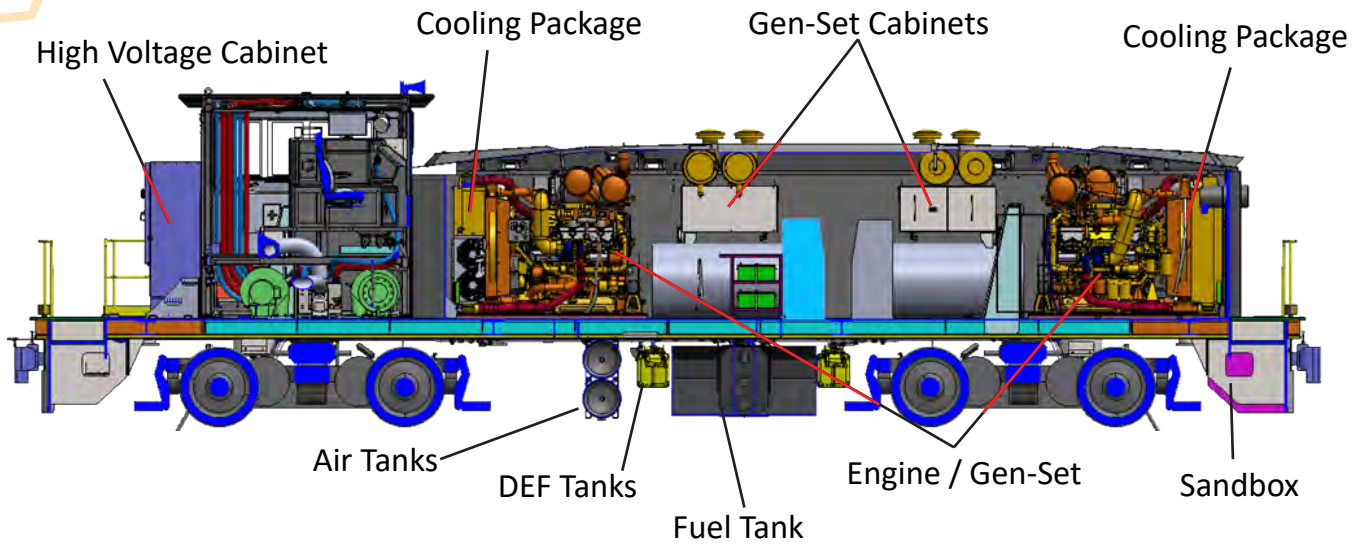
Speed & Draw Bar Pull

- 60 Mph+ on all units
- 47,500 lb draw bar pull 900 Hp, 82 Ton, Mid Mount Cab
- 65,000 lb draw bar pull 1200 Hp or 1850 Hp, 120-to-130 Ton, Rear or Front Mount Cab
- 85,000 lb draw bar pull 1850 Hp, 180 Ton, Rear or Front Mount Cab

Compliance

- AAR Locomotive, NEC Electrical, FRA/ANSI/SAE/ISO as Applicable
- Safety CFR title 49 part 229 as Applicable
- Manufactured in an AAR Certified Facility
- Extensive detail list of standard compliance available upon request
- All RITALKA Companies are ISO9001 Certified to the latest 2015 standards

Locomotive Layout & Dimensions



All configurations comply with AAR Plate "C" Clearance Diagram

Photo Overview of Features



Operator Station



Lighting



Sand Boxes



**Optional - Slide Hitch (shown)
Standard - Draft Gear Coupling**



Compressor



Batteries

Engine Options

Prime Movers (Diesel Engines)

Integral dx provides you options to best fit your Locomotive power needs.

The old saying, horsepower does not get you up a bigger hill, it climbs the bigger hill faster. A five Hp golf cart will pull a load up a steep hill, but not as fast as an F150 pickup. If you do not operate over 20 mph, then tractive effort might be more important than Hp.

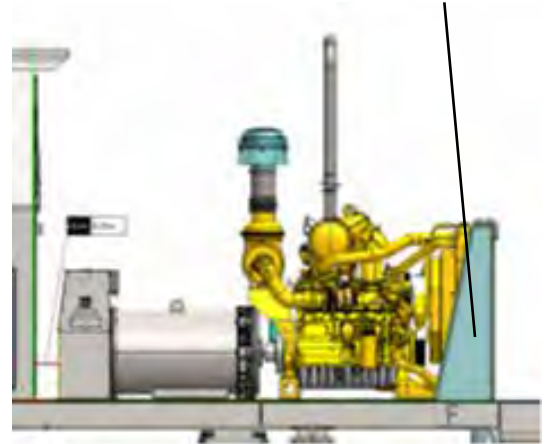
Short Line Railroads tell us that fuel \$'s are on the top 5 expense lines every year. You do not want to burn extra fuel all year long, when it is seldom required.

CAT Brand

We have found the CAT Products to be widely supported, high quality, easy access to service parts, and trained dealerships nearby.

- Selectable Prime Movers, Twin Engine:
 - 900 Hp utilizing two CAT C9.3B Tier 4f, 456 Hp Diesel Engines
 - 1200 Hp utilizing two CAT C18 Tier 4f, 600 Hp Diesel Engines
 - 1850 Hp utilizing two CAT C27 Tier 4f, 925 Hp Diesel Engines

AAR Intergrated Crash Posts



The CAT Tier 4f Engine is direct coupled to the Marathon Generator, with cooling direct driven off the front crank. Exhaust exits high above the shroud. Engine cooling is sized to handle 125 F ambient temperatures, and cold weather start options are available.

Removable louvred doors provide easy access for service & repairs

Left Side

AC Compressor

Fuel Filter

Oil Dipstick



Right Side

Oil Filler Neck

Oil Filter

Oil Dipstick

Oil Drain

Coolant Supply

Coolant Return





CAT 9.3B, Tier 4f

900 Hp Prime Mover (456 Hp x Qty 2)

The C9.3B is an inline six-cylinder, 9.3-liter engine system with 18 percent more power compared to previous engines. It combines a new high pressure common rail fuel system and advanced after treatment technology to produce 340 kW of power. Ratings on this platform run from 335 to 456 horsepower at speeds of 1,800 to 2,200 rpm, with max torque at 1,400 rpms measuring 1,540 foot-pounds. The engines meet the requirements of the EPA Tier 4 Final and EU Stage V emissions regulations. A single ECM controls the engine, fuel and after treatment, rather than multiple control units. The new ECM also has about 13 times more processing power than previous systems and a two-wire Ethernet. The C9.3B is being built in Caterpillar's new engine plant in Seguin, Texas, just outside of San Antonio.



CAT C18, Tier 4f

1200 Hp Prime Mover (600 Hp x Qty 2)

The Cat® C18 (<560 kW) industrial diesel engine is an inline six-cylinder, with single turbocharger-after cooled (TA) arrangement is offered in ratings ranging from 429-470 bkW (575-630 bhp) @ 1800-2000 rpm. These ratings meet U.S. EPA Tier 4 Final emission standards. Caterpillar (Cat) diesel engines, including the C18, are manufactured at the company's 1.7 million square foot plant in Seguin, Texas.

Press Release Caterpillar:

"The Caterpillar C-Series engines from the C9.3 to C32 model are manufactured in the United States. There are versions available for the level of emissions engines dedicated to rail vehicles, which is very important in the context of the use primarily in locomotives."



CAT C27, Tier 4f

1850 Hp Prime Mover (925 Hp x Qty 2)

The Caterpillar C27 is a V12 Industrial Diesel Engine has ratings ranging from 597-783 bkW (800-1050 bhp) @ 1800 rpm. The C27 has a dual-can diesel oxide catalyst (DOC) after treatment that eliminates the need for diesel exhaust fluid (DEF). It also has a fuel consumption that is optimized to match the operating cycles of a wide range of equipment. Caterpillar (Cat) diesel engines, including the C27, are manufactured in Seguin, Texas.

Engines pictured may not exactly represent those installed in your Locomotive. Standard CAT Warranty (See Warranty for Details): 24 Months / 3000 hours, Emissions 60 months / 3000 hours. Extended Warranty may be available depending on model, contact Integral dx for details. Detail specifications for each model available on the CAT web sites, www.cat.com.

Cummins and MTU (Rolls-Royce) diesel engines options available upon request.

Generator

Since 1913, Marathon Electric has been dedicated to providing customers with quality products for targeted applications. Located in Wausau, Wisconsin, the company is composed of two strategic product lines: motors and generators. Marathon headquarters remain in Wausau, Wisconsin, with approximately 550 employees. The company's customer care team is located there, along with engineering, finance, HR, and accounting.

Since its market introduction, Marathon Electric's MAGNAMAXDVR® has been a technology leader and proven performer. The MAGNAMAXDVR® generator line offers as standard a permanent magnet generator excitation system, exceptional transient performance and strong motor starting capability, and utilizes the industry's first digital voltage regulator.

Fully Guarded for operator safety and generator protection, no rotating or electrically energized parts are exposed. All openings are covered by louvers or screens, in addition to the engine enclosure of the Locomotive.

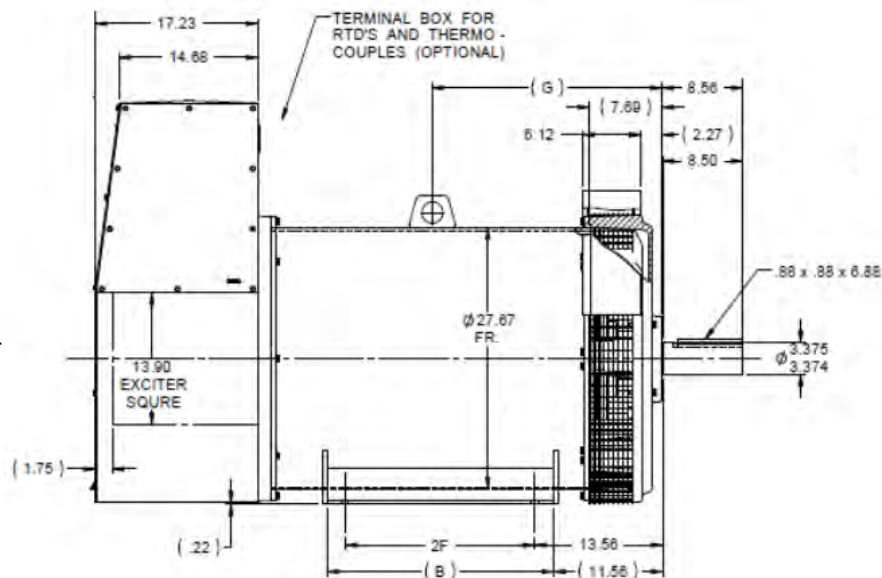


Model 574RDL Coupled to 900Hp CAT Diesel

Output	315 480 VAC 3 phase
Current Rating	1200A (peak)
Power Generation	31 kW (900 RPM idle) 368 kW (1800 RPM)

Model 744RSL Coupled to 1200Hp/1850Hp CAT Diesel

Output	315 480 VAC 3 phase
Current Rating	1500A (peak)
Power Generation	31 kW (900 RPM idle) 408 kW (1800 RPM)



Generators pictured may not exactly represent those installed in your Locomotive.

Standard Marathon Warranty (See Warranty for Details): 12 Months. Extended Warranty may be available depending on model, contact Integral dx for details.

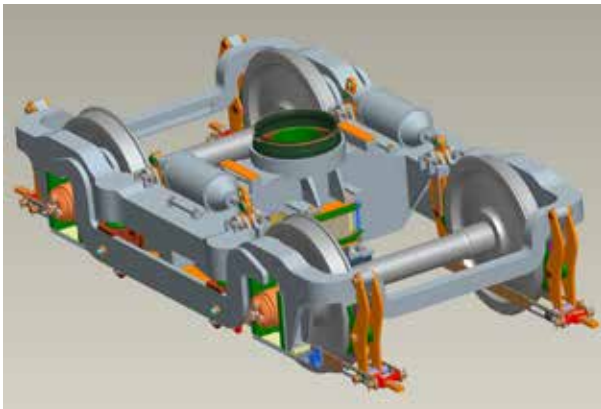
Detail specifications for each Marathon model available on the Marathon web sites, www.marathongenerators.com.

Kato and other brand options available upon request.

Traction Drives & Undercarriage / Brakes

All sizes of our Locomotive family utilize the EMD D77. This is the only part of our family where we integrate refurbished parts. The

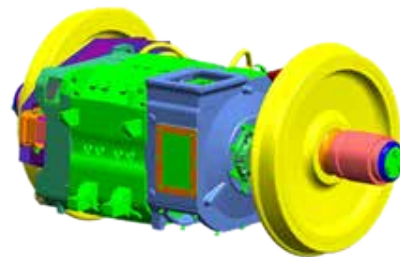
EMD D77 is so proven and so widely understood, it simply makes \$ sense to integrate this proven work horse.



NEW: Brakes & Rigging, Suspension, Rotating Bearings-Journals, Hardware-Pins-Bushings, Bolster Ring, Wheels.

REFURBISHED: Motor-Axle, Frames, Brake Air Cylinders. Details upon request

Gearing	62/15, 4.133:1 Standard 65/12, 5.416:1 Optional
Motor Peak Torque	6,000 Ft-lbs
Motor Continuous Torque	4,400 Ft-lbs
Wheel Diameter	40 Inch
Braking	Clasp Brakes, Twin Shoe
Hand Brake	Standard
Leaf Springs	Heavy (Standard 220,000-300,000 lbs), Light (Optional <220,000 lbs)
Flange Lubrication	Optional
Sanding Nozzles	Optional



Traction Controls

Connecting the Generator to the Traction Motors is accomplished via TMV Control Systems and American Traction Systems (ATS). The TMV Traction Engine Control Unit (TECU), an intuitive system that is easy to navigate and operate so that you can get the most out of your Locomotive. Installed inside your high voltage Electrical Cabinet, the TECU I/O modules receive input from contactors, relays, current sensors, fuel level, pressure sensors, and oil sensors. TMV is integrated with the ATS DC propulsion design that features include: Motor Thermal Overload Protection, Adjustable Overcurrent Protection, Single-Dual-or-Triple Genset Systems, Compact Modular Construction, and Automatic Wheel Slop Control.



Our custom control screen shots shown below perform in bright light, and provide complete feedback & control for TMV, ATS, Diesel Engine J1939 CAN bus system, and HVAC at your fingertips.



Main Display Screen



Lighting



HVAC



Aux Display

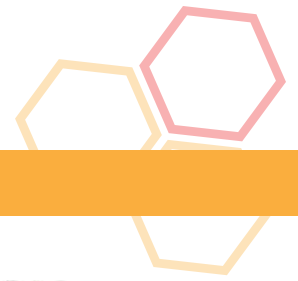


Generator Status



Engine 1 Info

Key Components



Multi Unit MU

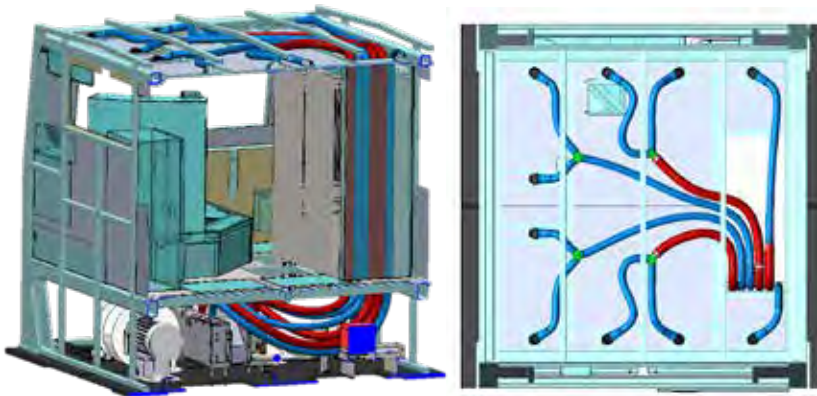
AAR S-512 27 pin industry standard MU system

MU receptacle and dummy receptacle provided on both ends for connection cable storage

Rail Duty Pyle National Receptacles

Standard Isolate / Run cab controls configuration

AAR S-5529 compliant MU brake equipment



HVAC

DTAC 811 Evaporator - Qty 2

Cooling Capacity: 36,000 Btu/hr ea.
(72,00 Btu / hr total)

Heating Capacity: 38,700 Btu / hr ea.
(77,400 Btu / hr total)

New York Air Brake

The CCB-26 electro-pneumatic control unit (EPCU) is mounted in the locomotive brake bay.

It consists of modularized line replaceable units (LRUs) that control the development of all pneumatic control pressures.

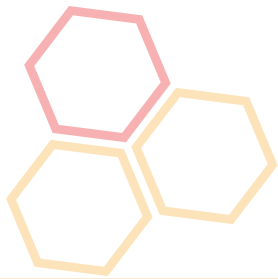


Atlas Copco

CFM: 119.5 @ 138 PSI, before the Dryer
29.3kw (480VAC 60HZ)

1183 lbs

1375 L x 770 W x 1065 H



Past Rail Projects



The above provides you a sample of our Past 28 Years of Rail Projects

Use of Logos does not infer partnership

