



# **Progress Rail**

*A Caterpillar Company*

# ONE GLOBAL LEADER MEETS ALL RAIL NEEDS



**Progress Rail**  
*A Caterpillar Company*

# COMMITTED TO THE LONG HAUL

**Railroads transport goods and people millions of miles every day. At Progress Rail, we believe in going the distance with them.**

Addressing aging infrastructure needs while continuing to move freight efficiently poses a global challenge. Around the world, railroads continue to serve as a primary solution for effective hauling. Today's industry priorities have become even more attuned to maximizing productivity and availability. Through fleet modernizations, track structure improvements and industry technology advancements, such as asset protection and predictive maintenance tools, railroads are taking efficiency, safety and reliability to the next level.

As a Caterpillar company, we are committed to our customers — having built a legacy on delivering superior value in a cost effective manner. Our team works hard to create lifelong relationships, supplying comprehensive rolling stock and infrastructure solutions for the global rail industry and setting the standard for excellence.

We care about fostering the sustainable movement of goods and people for generations to come, and we know our customers care, too. As one of the largest integrated and diversified suppliers of railroad and transit products and services worldwide, Progress Rail has nearly 200 facilities in 16 countries. Our strategic footprint ensures responsive, quality customer support all day, every day.



For close to a century, EMD locomotives, engines and services have kept the global rail industry rolling. Progress Rail acquired Electro-Motive in 2010. Since then, we have worked together as one team to deliver complete rail solutions. Our team is willing to take today's challenges and address them head on for the next wave of modern rail.



Today, we continue the EMD legacy by providing the same reliable products the industry has come to depend on — not only with the iconic EMD product name, but also innovative features and technologies to meet stringent customer requirements and maintain high performance.

As a worldwide leader, Progress Rail offers diesel-electric EMD locomotives aftermarket parts for all commercial railroads, including freight, intercity passenger, commuter, switching-industrial, and mining applications. More than 65,000 EMD-powered locomotives have been delivered to more than 75 countries to date.

Adding to our coverage as a locomotive and engine manufacturer, Progress Rail is one of the largest global suppliers of new and reconditioned freight cars and components for Class I railroads, shortlines, freight car manufacturers and private car owners.

# ROLLING STOCK

A black and white photograph showing the front of an EMD freight locomotive. The locomotive is pulling a long train of freight cars. The front of the locomotive features two large headlights that are illuminated. The text "EMD" is visible on the side of the locomotive, and "THE NEXT GENERATION OF PROGRESS" is written on a horizontal bar below the headlights. The locomotive is moving on a track, and the background is a clear sky.

Our diversified line of freight and passenger locomotives and new, used and leased freight cars enables us to focus on serving a single industry — the transportation of people, goods and commodities.

- EMD FREIGHT & PASSENGER LOCOMOTIVES
- LOCOMOTIVE REPOWERS AND REBUILDS
- LOCOMOTIVE COMPONENTS AND SERVICES
- NEW AND RECONDITIONED FREIGHT CARS
- FREIGHT CAR COMPONENTS
- FREIGHT CAR LEASING

# ROLLING STOCK

## FREIGHT LOCOMOTIVES



**Our locomotives are designed to suit customer needs around the globe.**

EMD Freight Locomotives			
SD70ACe	SD70ACe-T4	SD70ACe-BB	SD70ACeLW
SD70ACS	SD70ACe/Lci	SD80ACe	
GT38LC3	GT38AC	GT42AC	GT46AC
GT50AC	GT46C-ACe		
JT42CWRM	JT46C	JT56ACe	
GPL38			

We understand that reliability and efficiency drive total cost of ownership. EMD freight locomotives have been specifically developed to deliver the leading fuel efficiency, reliability and maintainability railroads expect. These workhorses offer optimal rail service across North and South America, Europe, the Middle East, Africa and Southeast Asia, with a growing global presence.

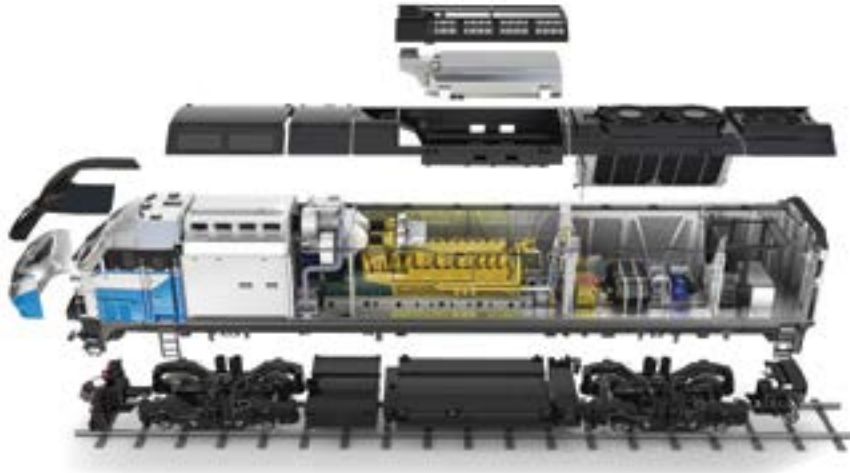
Designed by engineers with more than 100 years of combined, deep expertise, EMD locomotives demonstrate leading performance for operating in the world's most demanding applications. With the support of our parent company, Caterpillar, our team develops solutions that exceed customer expectations and meet today's stringent emissions requirements.

The EMD SD70ACe-T4 is a prime example. This new freight locomotive meets the United States Environmental Protection Agency's Tier 4 emissions regulations without the use of urea, resulting in substantial savings for the railroads.

And while we are strongly focused on the future, our roots are also embedded in the rail industry's past. We pioneered development of AC traction for heavy haul diesel-electric locomotives. Today's units provide enhanced adhesion performance and lower life cycle costs than ever before. Our proven AC technology, sophisticated microprocessor controls and advanced safety features ensure our locomotives go the distance. Locomotive sensors provide highly-tuned data analytics to keep rail operators informed and functioning in prime operating condition.

# ROLLING STOCK

## **PASSENGER LOCOMOTIVES**



**Since their introduction nearly 100 years ago, our passenger locomotives have provided unparalleled performance and reliability.**

**Over 2,300 EMD passenger locomotives have been delivered domestically and abroad.**





EMD passenger locomotives and parts have diligently helped serve the transit industry since 1924. Fast forward to today. Progress Rail has devoted countless hours and design expertise to bring an innovative passenger locomotive to market.

Our high-speed locomotive – the EMD F125 – is the first new U.S. EPA Tier 4 certified passenger locomotive to be sold worldwide.

Powered by a 4,700 horsepower Cat® C175 engine, the F125 has a broad range of advanced technologies and important safety features for enhanced performance, service-proven components for increased reliability and optimized fuel economy for commuter and intercity operations. A few of those cutting-edge features and technologies include a proven monocoque carbody design with Crash Energy Management (CEM) to meet the latest crashworthiness standards, regenerative braking, inverter-driven Head End Power (HEP) and Positive Train Control (PTC) compatibility. All of these impressive features add up to ensure the F125 delivers fast, clean and efficient operation, while also complying with U.S. Federal Transit Authority's Buy America regulations.

# ROLLING STOCK REPOWER & REBUILD PROGRAMS



**Whether rebuilding existing equipment or upgrading to a modern control system and a new engine, we can extend the useful life of your fleet.**

## **Rebuilt Locomotives Features**

- ▶ Reliable and fuel efficient Cat 3512C HD 2000 HP engine
- ▶ New HVC with Zeit SAL V locomotive control system
- ▶ New Atlas Copco rotary screw air compressor
- ▶ New Progress Rail PowerView event recorder with LDVR
- ▶ Offered with a 2-year warranty for new content.

Progress Rail was built on a foundation of sustainability and a firm belief in extending the life cycle of rail products. Our repowered locomotives continue that tradition in the most innovative manner, by providing the greatest flexibility of any provider in the marketplace — now with a U.S. EPA Tier 4 compliant version to meet stringent emissions standards. By replacing less efficient engines and control systems with new, state-of-the-art technologies, the next generation of single engine locomotives are ready to deliver reliable service for decades to come.

By combining our broad locomotive expertise with Cat® or EMD engines, Progress Rail is able to breathe new life into older locomotives by repowering them. This proven alternative offers a sustainable solution for fleet operators in any corner of the world.

We extend the use of existing locomotives by providing rebuild, overhaul and repower options. These modernization programs upgrade electrical and mechanical systems to extend the life of a locomotive by 10 years or more. Many repower upgrades bring the engine up to U.S. EPA Tier 3 emissions requirements, while improving reliability and maximizing fuel economy.

Repower packages can be tailored for customer installation, or opt to let us deliver complete, turnkey solutions — using the latest generation of EMD or Cat® engines and a choice of control systems. In addition to purchase options, Progress Rail offers locomotive leasing solutions to fit individual needs.

# ROLLING STOCK **LOCOMOTIVE SERVICES**



**Our extensive rolling stock  
maintenance operations  
support unparalleled customer  
performance.**

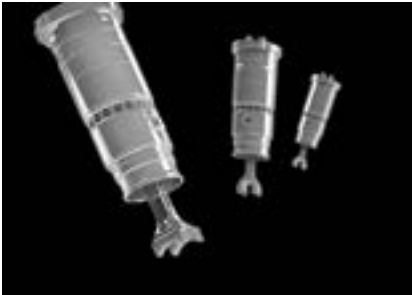
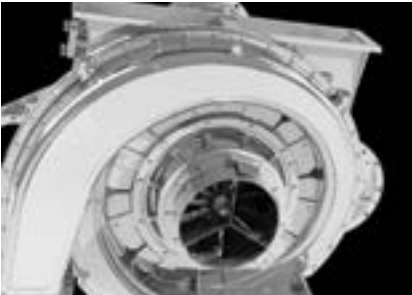
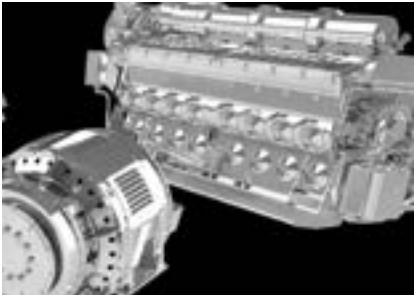
Contract maintenance ensures your locomotive fleet is not only expertly maintained to OEM standards, but also meets proper regulatory requirements. Progress Rail currently performs locomotive maintenance service around the world.

Our diversified services include but are not limited to:

- TECHNICAL SUPPORT
- MAINTENANCE MANAGEMENT
- MATERIALS MANAGEMENT
- LABOR MANAGEMENT
- WORKFORCE TRAINING

Achieve maximum uptime while receiving the added benefit of reduced parts and labor costs. Progress Rail locomotive maintenance services can save fleet owners up to 15 percent or more over a locomotive's life cycle.

# ROLLING STOCK **LOCOMOTIVE COMPONENTS**



**EMD OEM parts are  
manufactured under  
sophisticated and exact  
quality control techniques.**

Our genuine EMD OEM components are available for locomotive, marine and power generation applications. All EMD parts are backed by a comprehensive warranty.

We employ a systems approach to product design, development, testing, manufacturing and packaging to ensure our OEM parts provide long-term, dependable service. Our products are designed to meet the toughest applications, from extreme temperatures and altitudes, to high load demands. Advanced techniques, such as automated assembly and torque equipment, electronic profile and contour verification and daily metallurgical testing, are incorporated throughout the manufacturing process.

Our EMD OEM parts are available as new or UTEX® (Unit exchange). The latter is a stringent remanufacturing process to create a like new component, saving on maintenance cost.

Available components include, but are not limited to:

- AIR COMPRESSORS
- MAIN GENERATORS
- ENGINES
- TRACTION MOTORS
- TURBOCHARGERS
- POWER ASSEMBLIES
- WHEELS, AXLES & COMBOS

# ROLLING STOCK **RECONDITIONED & REPURPOSED LOCOMOTIVE COMPONENTS**



**We operate multiple  
reconditioning facilities and  
new product warehouses  
throughout North America.**



As a global supplier of reconditioned and core locomotive components, we have earned our reputation as an industry leader and continue to grow our used and reconditioned locomotive component offerings. Our integrated network of locomotive component reconditioning services, coupled with the new parts we offer, allow companies to reduce their annual fleet maintenance costs.

Available components include, but are not limited to the following:

- ACCESSORY RACKS
- AIR BRAKE
- AIR COMPRESSORS
- AIR DRYERS
- AFTER-COOLER
- ANGLE COCK
- AUX GENS
- BELL
- CONTROL STANDS
- COOLING SYSTEMS
- COUPLERS
- DRAFT GEARS
- EMERGENCY VALVES
- ENGINES
- EQUIPMENT RACK
- EVENT RECORDER
- FUEL MONITORING SYSTEMS
- JOURNAL BOXES
- MAIN GENERATORS
- PNEUMATIC HORNS
- POWER ASSEMBLIES
- RADIATORS
- SANITATION SYSTEMS
- SPEED INDICATORS
- TRACTION MOTORS
- TRUCKS
- VENT VALVES
- WHEELS, AXLES & COMBOS

# ROLLING STOCK **FREIGHT CARS**



**Our proven field coverage means we supply freight cars and parts quickly and efficiently, at competitive rates.**

Our integrated business model has been built on our thorough recycling operations. As a leader in freight car recycling, we provide a steady supply of reconditioned freight car components, including wheel sets, side frames, bolsters, couplers, yokes and more. If you require reliable material that meets or exceeds the Association of American Railroads' (AAR) standards without volatile surcharges on new material, contact us.

If you are in the market for a used freight car, Progress Rail has an extensive inventory, with a network of car repair facilities that will convert a car for the application you need.

Progress Rail is one of the largest global suppliers of new and reconditioned freight car components for Class I railroads, shortlines, freight car manufacturers and private freight car owners. Our available freight car components include, but are not limited to: freight car wheels, axles, bearings, bolsters, side frames, couplers, yokes, brake beams, draft gears and single car test devices.

Our strategically integrated component reconditioning facilities are AAR and ISO certified. We also have the option for new materials, ensuring that regardless of selection, our customers have the ability to reduce annual maintenance costs associated with their operations.

# ROLLING STOCK **FREIGHT CAR LEASING & SERVICES**



**We offer a wide variety  
of freight cars and leasing  
options to meet specific  
transportation needs.**

Progress Rail offers a wide variety of freight cars and leasing options to meet our customers' specific transportation requirements. Understanding your needs and supplying an optimal solution is what we do best.

Lease options include:

- FULL SERVICE LEASE
- NET LEASE
- PER DIEM LEASE
- PURCHASE LEASEBACK

When it comes to freight car services, we have what you need to stay rolling. From routine maintenance and inspection, to complete rebuilding, painting and inspection services, we keep your cars in service and delivering returns.

Progress Rail specializes in large volume program work, complete refurbishment, major rebuilds, warranty repairs and routine repairs. With our vast array of in-stock wheel sets and key reconditioned component parts, we are able to provide the turnaround time needed to fit your schedule. All of our facilities have been AAR certified, and perform quality work that meets or exceeds industry standards, ensuring your car maintenance and repairs are done properly — on time and on budget.

Progress Rail is also a key partner with Class I and regional railroads, providing essential repairs, maintenance and inspection services at various intermodal facilities and repair-in-place (RIP) track operations.

Our comprehensive line of infrastructure solutions includes specialty trackwork, rail and other track material (OTM), fasteners, signals and signal engineering, rail welding and Maintenance-of-Way (MOW) equipment.



**Progress Rail is the largest supplier of infrastructure products and services in the United States, with growing international exposure.**

As a leading manufacturer of specialty trackwork in North America, the United Kingdom and Australia, Progress Rail offers a full line of trackwork, components and fasteners for heavy haul and transit railways. Not only do we provide infrastructure to help the railroads run more efficiently, we have the products and services to maintain them, as well. With more than 25 million welds completed for Class I railroads over a 60-year history, Progress Rail has quality rail welding and top performance covered – and we continue to develop welding programs and equipment today, for customers around the world.

With more than 15,000 systems installed worldwide, Progress Rail also has signal technology designed to keep trains running safely, while protecting vital infrastructure.



# INFRASTRUCTURE

We cover the complete rail infrastructure value chain, with a specialized focus on track structure, signaling and maintenance.

- TRACKWORK & FASTENERS
- MAINTENANCE-OF-WAY & VEGETATION EQUIPMENT
- INFRASTRUCTURE INSPECTION
- SIGNALING
- RAIL WELDING
- RAIL SERVICES
- ASSET PROTECTION

# INFRASTRUCTURE

## **TRACKWORK & FASTENERS**



**Our high performance track and fastener products make it easier for our customers to go the distance for much longer periods of time.**



With state-of-the-art manufacturing facilities located strategically around the globe, we produce the highest quality trackwork and fasteners, with 100-plus years of experience in the design and manufacture of cast manganese crossings.

Our products range from complete turnout panels to replacement parts, flash butt welded frogs, lift frogs, taper heel frogs, partial flange bearing frogs, moveable point frogs, OWLS crossings and clamp-tite adjustable braces. Our specialty products include fixed and sliding buffer stops, overhead line structures, stretcher bars and hollow steel sleepers.

Additionally, we have a variety of rail, guard rails, asymmetric switch points and solid monoblock, tri-metallic welded rail leg crossings available to satisfy all requirements.

Progress Rail acquired Rail Product Solutions, formerly part of Amsted Rail, in 2016 to capture best-in-class, high performance fasteners for freight and transit rail customers. Our fastening solutions serve as fundamental components for rail infrastructure, playing a crucial role in enhancing reliability and minimizing track downtime. We support our customers by delivering innovative options, such as the ME Series or MACRO Armor for concrete ties. At the same time, we offer a broad range of traditional products, such as rail anchors, bonded direct fixation fasteners and e-clips.

# INFRASTRUCTURE RAIL WELDING



**As one of the largest contract service welders in North America, we have consistently designed and manufactured reliable rail welding equipment that exceeds performance expectations, helping maintain your rail for years to come — now with international coverage options.**

Our fixed plant and mobile welding units feature a robust design and modern control systems for unmatched productivity. With the most advanced process controls available — from computerized systems to touch-screen interfaces and detailed self-diagnostics — our welders are designed to be user friendly. The units can also be equipped with modems, allowing our technicians to troubleshoot and complete software updates without the need for a field visit.

Supplementing our welding units is our fleet of continuously welded rail trains, rail unloading and specialized welding support equipment.

We also offer a full range of mobile and stationary plant options, including containerized welding systems for stationary welding, and mobile welders mounted to rough terrain excavators, for extended-reach welding on or off track. In addition, a full range of AC-powered weld heads are available for welding pre-installation rails or performing your track distressing projects.

Working with our international affiliate EO Paton, we have developed a narrow head welder for our mobile units, which can be used with our extended boom trucks when welding turnouts in tight spaces. Our 250-ton AC mobile welders have external pullers for closure welds, expanding our mobile offering of 180-ton fully integrated heads, extended boom units and excavator mounted welders.

# INFRASTRUCTURE **RAIL SERVICES**



**Progress Rail's trackwork  
experience and remanufacturing  
capabilities enable us to provide  
quality trackwork to your  
specifications.**

Whether you need new rail, recycled rail, Other Track Material (OTM), complete turnout packages or a single trackwork component, our facilities can fulfill your requirements.

As an authorized distributor for Arcelor Mittal and Evraz Rocky Mountain Steel, we carry extensive new rail inventory at two steel mill locations — in Steelton, Pennsylvania, and Pueblo, Colorado — and can supply customized rail lengths to meet your specific requirements.

If you are in the market for OTM, our inventory is located strategically throughout the United States and Canada so you can receive materials quickly, with minimal freight costs.

We also grade recycled rail — or “relay rail” — and OTM to meticulous industry standards. Additionally, Progress Rail will purchase or trade for your surplus inventory, including rail, plates, frogs, points and switch stands.

# INFRASTRUCTURE **MAINTENANCE-OF-WAY & VEGETATION MANAGEMENT**



**Through our Kershaw brand,  
we have been on the forefront  
of MOW technology since the  
development of the very first  
Ballast Regulator in 1945.**



Since Kershaw became part of our family in 1998, Progress Rail has been a global supplier of a comprehensive line of Maintenance-of-Way (MOW) equipment, providing machines to help maintain rail infrastructure around the world.

With the flexibility to lease or buy, Progress Rail supplies a broad range of MOW and vegetation management equipment.

- KERSHAW BALLAST REGULATORS
- TIE CRANES
- SCARIFIERS
- TIE REPLACERS
- SHOULDER BALLAST CLEANERS
- SAND AND SNOW REMOVAL MACHINES
- UTILITY AND VEGETATION CONTROL MACHINES
- HIGH-RAIL EQUIPMENT

# INFRASTRUCTURE **SIGNALING**



**We serve the signal industry from start to finish – whether you need engineering and project management support, signal design, train inspection, asset protection or installed grade crossing and wayside structures.**





## **SIGNAL ENGINEERING & PROJECT MANAGEMENT**

We are a resource for turnkey project management and work with various railroads on all aspects of their signal design requirements, including Positive Train Control (PTC) upgrades to signal systems and PTC data mapping.

Our experienced signal engineering team designs CTC systems, interlockings and grade crossing warning systems, programs vital processor applications, upgrades rail yards, performs preliminary engineering for commuter rail systems, and provides field service and training.

## **MANUFACTURING, INSTALLATION & MAINTENANCE**

We deliver complete manufactured structures, and take care of installation and maintenance, too. We manufacture cantilevers and gate assemblies for grade crossings, signal bridges and mast ladder platforms for wayside signaling systems, and other structures, such as flood platforms. Our wire shop excels in manufacturing top quality, custom Local Control Panels and Cutover Test Panels. We also offer the latest in crossing recorders and monitoring.

As a leader in the rail crossing, signal installation and maintenance business, Progress Rail provides field management and construction services for large, ongoing projects. We provide a turnkey approach, from survey through design and installation. We also offer contract services to maintain, test and supply material for grade crossings. Progress Rail has continuing contracts with more than 80 railroads and industries.

# INFRASTRUCTURE **ASSET PROTECTION**



**Keep trains moving safely by monitoring wheel and bearing temperatures and inspecting dragging equipment and high, wide or shifted loads.**

## **ASSET PROTECTION**

Our train inspection systems have a wide range of track-mounted equipment to aid in defect detection, diagnostics and monitoring. From protecting the ties and track to high value assets, we can design an asset protection solution to meet customer needs. These systems are delivered as standalone systems or integrated into existing CTC systems.

We also offer a state-of-the art grade crossing obstacle detection system where through the use of radars, the system can detect objects, in the intersection of road and track, and alert the operator or in some cases, stop the train automatically.

In addition to wayside products, PowerView is a next-generation, crash-hardened Locomotive Event and Video Recorder. It provides synchronized recording and playback of multiple data sources and can replace multiple locomotive recorders into a single unit. It is also a complete processing platform that supports edge computing for local analytics, alarming and other applications. PowerView integrates across most OEM locomotive types, as well as various third-party systems.

## **SIGNAL INTEGRATION & WAYSIDE PREDICTIVE ANALYTICS**

Through the acquisition of Inspired Systems, Progress Rail now offers even more specialized signal integration solutions for our global customers, including but not limited to:

- Predictive, Condition-Based Monitoring for Wayside
- Rail Asset Protection and Management
- Project Management
- Software, mechanical and electrical design and implementation
- On-site installation, commissioning services and quality control.

We offer the broadest line of engines in the industry — now with U.S. EPA Tier 4 emissions certified engines for freight, passenger and marine applications.



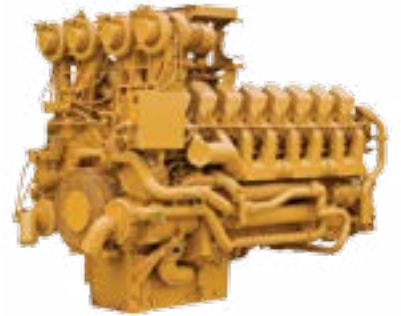
# ENGINE SOLUTIONS



With deliveries to over 75 countries, we have designed and produced more than 75,000 EMD diesel engines — exceeding any other locomotive manufacturer, to create the largest installed fleet worldwide. Our two cycle, medium speed engines are available for marine, drilling, power generation and locomotive applications.

# ENGINE SOLUTIONS

## **TIER 4 LOCOMOTIVE ENGINES**



**We offer the broadest line  
of engines in the industry  
— now with U.S. EPA Tier 4  
emissions certified engines for  
freight, passenger and marine  
applications.**

## **FREIGHT**

Developed using the combined engineering expertise of Progress Rail and Caterpillar, our EMD 4,600 BHP 1010™ engine achieves world-class fuel efficiency and meets U.S. EPA Tier 4 emissions standards, without the use of urea aftertreatment.

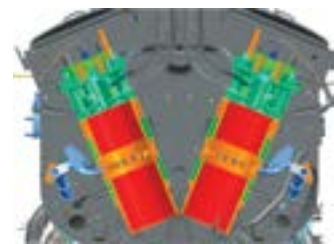
This model has been engineered for fuel savings, performance and reliability. Our double-walled common rail fuel injection system provides increased safety and simplified maintenance. Custom designed EMD turbochargers optimize locomotive performance across operating environments.

## **TRANSIT**

Our EMD F125 Tier 4 locomotive is the fastest diesel electric locomotive in North America, and is powered by a Cat® C175 engine – the first new transit locomotive sold to meet the U.S. EPA's stringent Tier 4 emissions standards. The C175 features 4,700 horsepower and industry-leading fuel economy.

# ENGINE SOLUTIONS

## **NATURAL GAS ENGINES**



**EMD DGB cross sectional view shown. DGB can be built new for replacement or as a conversion kit for any 710 Series engine.**



Lower operating costs and reduce emissions by utilizing natural gas, while maintaining the leading performance and reliability of your EMD engine.

We have developed two natural gas solutions for this purpose:

**Dynamic Gas Blending™**

- Provides up to 70 percent substitution of diesel with natural gas
- DGB™ is a dual-fuel technology allowing for seamless operation using diesel or natural gas.

**Direct Injected Gas**

- Offers exceptional savings with more than 95 percent substitution with the same horsepower and transients as a diesel engine.

**Natural Gas Retrofits**

- Convert your existing EMD engine for natural gas
- Dual-fuel conversion kits are now available.

# ENGINE SOLUTIONS

## **EMD 710 SERIES ENGINES**



**EMD 710 Series engines are available for repower opportunities for emission reduction. EMD also has emission kits that can not only reduce emissions but also save in lube oil and fuel consumption.**

Our EMD 710 Series engine remains an industry powerhouse known for its superior performance and durability.

Available in 8-, 12-, 16- and 20-cylinder configurations, the EMD 710 Series engine has continuous power ratings ranging from 2,000 to 5,000 horsepower.

By leveraging our deep engineering expertise and committing to continuous investments in research and development, we have enhanced the EMD 710 engine with advanced technologies to power new and existing locomotive fleets.

EMD engines are recognized worldwide for setting rail industry standards for performance and reliability, and delivering optimized efficiency for our customers. We apply the same exceptional design process to our engines for marine, drilling or power generation usage.

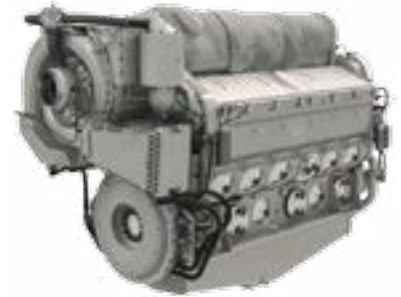
## **EMISSIONS KITS**

Progress Rail provides certified emissions solutions for EMD engines and continues to lead the industry in emissions compliance. Our complete OEM knowledge allows for highly reliable and fuel efficient emission kits. Meeting emissions standards is not a piece-part activity, but a finely-tuned balance between emissions compliance and locomotive fuel efficiency.

Our skilled emissions research team met this challenge using extensive analysis and testing to develop the most advanced emissions solutions for locomotive applications for EMD 710 and EMD 645 engines.

# ENGINE SOLUTIONS

## **MARINE & INDUSTRIAL ENGINES**



**EMD engines have a long history in the marine and industrial marketplace. Progress Rail now produces the only completely integrated U.S. EPA Tier 4 marine solution.**

The simple and robust design of our two-cycle engine has stood the test of time by adapting to new demands and requirements. Progress Rail continues to manufacture EMD 710 Series engines, building upon a legacy that started in 1922 with the U.S. Navy. Customers worldwide continue to choose the EMD 710 for its significant advantages in power, durability and responsiveness that are unmatched in the industry.

Today, the EMD 710 Series Model E 23 marine engine is now certified for U.S. EPA Tier 4 and IMO III standards. The model E23 is available in 8-, 12-, 16- and 20-cylinder options, with power output ranging from 1,490 to 4,100 kw (or 2,000 to 5,000 BHP).

#### Advantages of EMD 710 Series Model E 23:

- Utilizes SCR aftertreatment to meet marine customer requirements
- Next generation accessory rack supports SCR system and is completely integrated
- Fuel injection and electronics are identical to previous model
- Same footprint as previous model
- Convenient system connection locations for easier installations.



**With our powerful data analytics platform, energy management solutions, infrastructure improvement offerings and other innovations, we are able to reduce the railroads' total cost of ownership.**

# INNOVATION

A black and white photograph of a person's hand pointing at a tablet. The tablet screen displays a technical interface. At the top, there is a table with columns for 'Fuel', 'Oil', 'Water', and 'Air', with values 'N/A', 'Full', 'N/A', and 'N/A' respectively. To the right, there is a section for 'Engine State' showing 'Running' and '100.0'. Below this is a detailed diagram of an engine. At the bottom of the screen, there is a section titled 'Action Recommended: Hot Engine Failure' with a 'Support' button. The background is a solid black color with a yellow horizontal bar at the top and a yellow square at the bottom right.

Throughout our history, our iconic product portfolio has been at the forefront of railroad innovation. With organic growth and more than 35 strategic acquisitions, we have expanded our support to ensure we're with rail customers in every corner of the world, delivering reliable, high performance products and quality services.

# INNOVATION DATA ANALYTICS



**PR Uptime can help minimize downtime, improve safety and optimize rail operations through data that delivers results.**



## **COMPLETE CONDITION-BASED MAINTENANCE**

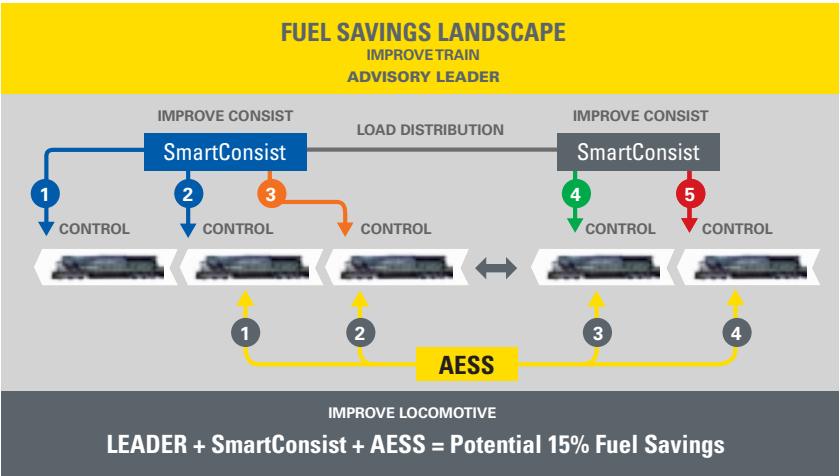
Progress Rail has partnered with Uptake to develop the most valuable predictive analytics software for the rail industry. Through its manufacture of EMD locomotives and engines, Progress Rail delivers rich data and industry expertise, while Uptake brings world-class predictive data science and software development. Through this collaboration, the companies have created tools for anyone who interacts with a locomotive — from maintenance, to transportation, to customer service. Our PR Uptime analytics platform for condition-based maintenance identifies problems before they occur, providing workflow-centric insights to drive improvements in efficiency and productivity. The result is a platform that delivers real, measurable value to our customers in the areas of reliability, availability, fleet optimization and total cost of ownership.

PR Uptime serves as a next generation analytics platform to monitor locomotives and fleets, empowering operators to minimize road failures and optimize performance, while saving time and money.

By harnessing the power of data streaming from our locomotives, and exploring opportunities for other rail sectors, including wayside communications, MOW equipment and more, we effectively address our customers' needs to increase asset utilization.

# INNOVATION

# ENERGY MANAGEMENT



Achieve improved functionality and fuel efficiency savings of up to 15 percent with Progress Rail's energy management suite.

## **ENERGY MANAGEMENT – MORE THAN SAVING FUEL**

When it comes to energy management solutions that work seamlessly, look no further than Progress Rail. We deliver a comprehensive suite of locomotive fuel savings solutions with the highest rate of return on investment. Through our efforts with New York Air Brake (NYAB), Progress Rail has taken customer fuel savings one step further by integrating LEADER AutoControl®, a software solution that puts LEADER® in control of throttle and dynamic braking. This results in an additional 1 to 3 percent fuel efficiency, improved time management and train force control.

LEADER adjusts to train behavior, and offers:

- Higher overall fuel savings of up to 10 percent
- Emissions reduction up to 10 percent
- Improved train handling to reduce risk of derailment
- Optional Positive Train Control (PTC) solution.

SmartConsist™ provides an additional 1 to 3 percent fuel savings, by setting each locomotive to its individual, prime throttle position within the consist, to improve overall fuel economy and reduce emissions, while achieving required power and tractive effort.

EMD AESS™ monitors critical operating parameters during locomotive idling, and safely and effectively shuts down the engine once all factors have been satisfied. EMD AESS™ provides superior fuel and lube oil savings, less emissions and wayside noise, while ensuring the locomotive remains ready for use. This technology also cuts unnecessary idle time by more than 50 percent, improving locomotive fuel efficiency.

Together, this full energy management suite can offer customer potential fuel savings of up to 15 percent.

# INNOVATION ENHANCING OPERATOR SAFETY



Innovating for safer rail lines.

## **FATIGUE MONITORING**

Progress Rail and Seeing Machines Limited, a technology company pioneering computer-vision based operator monitoring and intervention technology services, have been collaborating on in-cab operator fatigue and distraction monitoring systems for use in EMD locomotives.

The underlying Seeing Machines Driver Safety System (DSS) technology is based on patented eye-tracking and analytics that detect driver distraction and fatigue while on the job. The integration of Seeing Machines technology in our locomotive cabs significantly reduces distraction events and helps monitor fatigue, increasing safety and accident avoidance.

## **REAL-TIME DATA FROM CAB TO CABOOSE**

Our End-Of-Train (EOT) devices transmit real-time, vital information from the end of the train to the locomotive cab by way of a locomotive head of train device or locomotive control unit. This technology contributes to improved operational safety, accident investigation, security and vandalism prevention. Compared to other products available today, Progress Rail EOT devices offer a more modern design with improved reliability, ergonomics, lighter weight and advanced power management. The end of train coupler mount makes an EOT faster and safer to apply — a characteristic train operators can appreciate.

# INNOVATION INFRASTRUCTURE INSPECTION



**We are fully compliant with FAA regulations and requirements and have professional licensed pilots on staff to help with the pre-flight, mission execution and post-flight data analytics.**



Unmanned Aerial Systems (UAS) have proven their worth as an essential tool to inspect and maintain critical infrastructure and key resources. Progress Rail has a team of highly skilled UAS operators, experienced in military and commercial aviation, coupled with a fleet of cutting edge aircraft and data sensors.

Our mission is to capture decision quality data by utilizing UAS technology to help customers reduce costs, improve maintenance cycles and maintain operations, while lessening labor intensive, traditional inspection methods.

# INNOVATION

## INFRASTRUCTURE IMPROVEMENTS



**Our Ultrasonic Impact Technology (UIT) services extend asset life of existing metal structures and components, while reducing total cost of ownership. Our equipment is designed and built in the United States of America.**



## **SOLID STRUCTURAL STRENGTH**

Progress Rail provides immediate, onsite service to treat your metal and welded component needs. Through state-of-the-art, patented Ultrasonic Impact Technology (UIT), we are revolutionizing the metal improvement industry. UIT helps multiple industries around the world strengthen their investments in heavy equipment and infrastructure.

UIT is a portable tool that uses ultrasonic waves coupled with mechanical impact to make metal structures and components last longer. By beneficially modifying the grain structure of the metal, UIT extends asset life and increases reliability. Some applications include use for marine and oil and gas platforms, railroad and railcar applications, steel bridges, aerospace and defense, industrial process equipment and many more.

# INNOVATION SUSTAINABILITY



**We are committed to building  
a better world by applying  
environmental principles to our  
daily work.**

## COMMITTED TO BUILDING A BETTER WORLD

Sustainability is not only a highlight of Our Values in Action as a part of Caterpillar, it is an action we take into account every day in the communities where we live and work — whether recycling end-of-life components, railroad materials or repowering or refurbishing a locomotive. We continuously examine ways to create innovative and sustainable products and improve upon our processes to maintain our standing as a rail industry leader.

Progress Rail has strong roots in recycling — in fact, our business was founded on it. While we have broadened our industry expertise to cover the entire rail value chain, recycling is still the heartbeat of our company. Our ability to safely recycle material while extending the life of viable components allows us to provide incremental value for your scrap metal. Our global reach provides direct access to steel mills and foundries — enabling our clients to manage their scrap as an asset.

Integration distinguishes our service, setting us apart from others in the industry. When locomotives and railcars are retired, we refurbish the reusable parts, incorporating them into our extensive inventory, and recycling what remains. The proceeds on the sale of the scrap can then be used to offset new equipment purchases or other services, to help positively affect our customers' cash flow.

Areas of focus include:

- ENTERPRISE SCRAP MANAGEMENT
- STEEL MILL RELATIONSHIPS
- FOUNDRY RELATIONSHIPS
- RAILROAD SCRAP DEMOLITION
- LOCOMOTIVE DISMANTLING
- LOGISTICS
- WORLDWIDE IMPORT/EXPORT
- DERAILMENT MOBILE CREW SERVICES

## **REGIONAL OPERATIONS & SUPPORT**

Internationally, our performance has no borders. We are bringing our extensive range of products and services to all parts of the world and servicing our product portfolio through our network of international associates, partners and licensees. Whether at home or abroad, we listen closely to our customers and deploy the latest technologies to lead the rail industry.

Our highly specialized team of nearly 7,000 employees is based in the following regions:

Algeria  
Australia  
China  
Croatia  
Brazil  
Germany  
India  
Indonesia  
Italy  
Mexico  
Saudi Arabia  
South Africa  
Tanzania  
United Arab Emirates  
United Kingdom  
United States of America

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