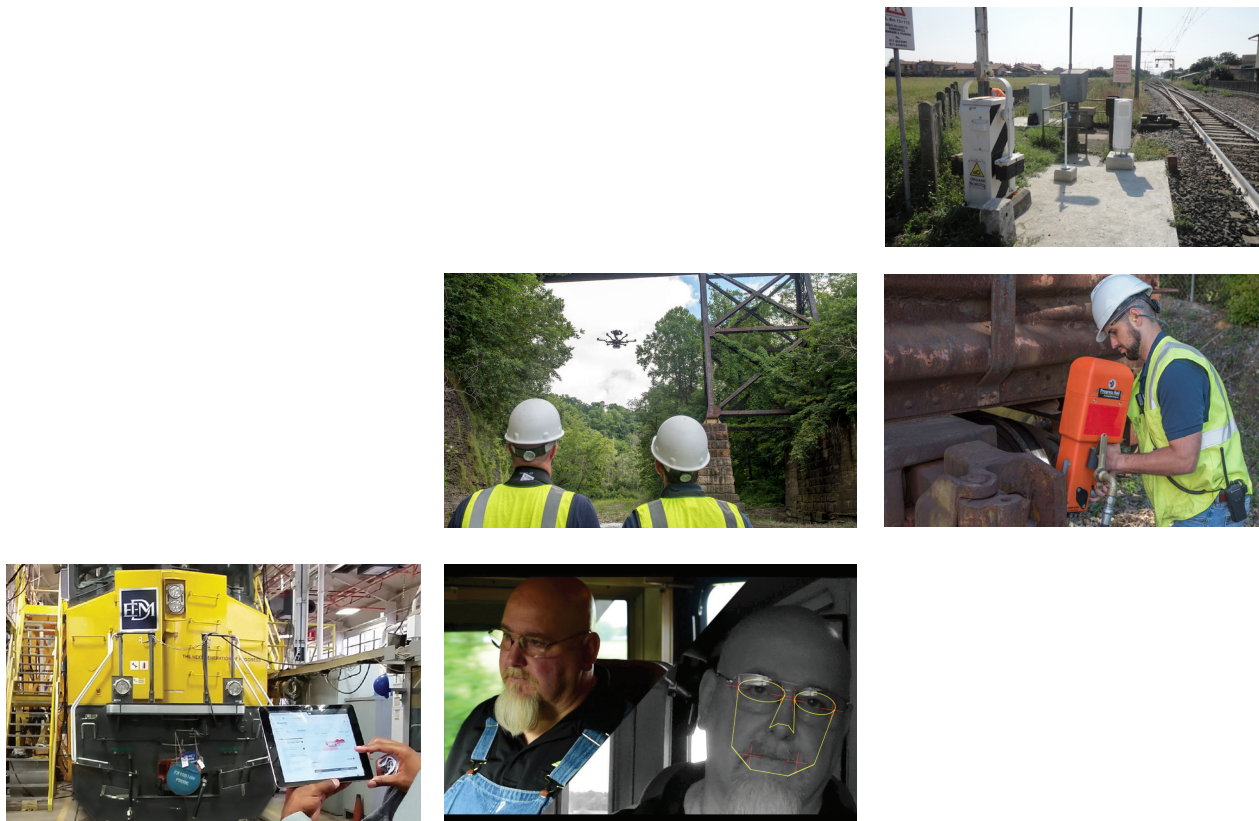


INNOVATION



Throughout our history, our iconic product portfolio has been at the forefront of railroad innovation. Through fleet modernizations, track structure improvements and technology advancements, such as asset protection and predictive maintenance tools, we are helping railroads take efficiency to the next level.

Our powerful data analytics platform, energy management suite, infrastructure inspection solutions and other technologies contribute not only to reducing the railroads' total cost of ownership, but also making great strides toward improving overall safety and efficiency.

- ASSET PROTECTION
- CONDITION-BASED MAINTENANCE
- FATIGUE MONITORING
- END-OF-TRAIN DEVICE
- ALTERNATIVE FUEL TECHNOLOGY
- INFRASTRUCTURE INSPECTION

Progress Rail
A Caterpillar Company

INNOVATION

ASSET PROTECTION & SAFETY

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, Progress Rail can design an asset protection solution to meet customer needs. The company also offers a state-of-the-art grade crossing obstacle detection system, where radar detects objects in the intersection of road and track, and alerts the operator, or in some cases, stops 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 as 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.

FATIGUE MONITORING

Progress Rail and Seeing Machines Limited, a technology company pioneering computer-vision based operator monitoring and intervention technology services, have collaborated on in-cab operator fatigue and distraction monitoring systems for use in 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 locomotive cabs significantly reduces distraction events and helps monitor fatigue, increasing safety and accident avoidance.

REAL-TIME DATA FROM CAB TO CABOOSE

Progress Rail's End-Of-Train (EOT) device transmits 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.

ALTERNATIVE FUEL TECHNOLOGY

Progress Rail introduced Liquefied Natural Gas (LNG) retrofit kits featuring Dynamic Gas Blending (DGB) dual-fuel technology. These kits allow customers to utilize natural gas while maintaining leading performance and reliability. This technology enables engines to work on LNG or diesel fuels.

COMPLETE CONDITION-BASED MAINTENANCE

Progress Rail partnered with Uptake to develop the most valuable predictive analytics software for the rail industry. Through this collaboration, the companies 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 insights to drive improvements in efficiency and productivity. The result is a platform that delivers real, measurable value to customers for reliability, availability, safety, fleet optimization and total cost of ownership. PR Uptime monitors 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 locomotives, and exploring opportunities for other rail sectors, including wayside communications, MOW equipment and more, Progress Rail effectively addresses customers' needs to increase asset utilization.

INFRASTRUCTURE INSPECTION

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.

Progress Rail and Rail Visions' Trackvue system serves as another innovation to help maintain and monitor infrastructure issues before they occur. Machine Vision systems inspect and survey railroad tracks using imaging and laser sensors with minimal or no human intervention for the purposes of track maintenance and renewals. Rail Vision track imaging hardware uses multiple laser and camera options to automatically find a range of track defects and report these for maintenance.



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