Productivity through Technology
Who we are

New York Air Brake Corporation, located in Watertown, New York, has served railroad customers for over 110 years, supplying innovative air brake and train control systems to the railroad industry worldwide.

New York Air Brake (NYAB) is part of the Knorr-Bremse Group, headquartered in Munich, Germany. Knorr-Bremse is a global leader in the field of brake systems for rail and commercial highway vehicles, and operates 45 production and sales facilities in 26 countries.

Products and services

This capability brochure provides a brief overview of New York Air Brake’s expanding product line and services, designed for the AAR heavy haul railroad market.
Commitment to quality

NYAB is a leading supplier of heavy haul AAR air brake and advanced train handling technologies to the heavy haul railroad industry.

Safety is the primary driver in our business, driving our focus on Zero Defects in all aspects of our business.

Zero Defects result from:
- Continuous innovation in delivering product excellence in reliability/performance
- Searching for best practices and continuous process improvements in all areas
- Initiatives for improvement of upstream processes such as new product development and Supply Chain Excellence
- Institutionalizing best practice processes

The way to achieve a Zero Defect workplace

We all make mistakes, but:
- Mistakes must not leave the company
- Detect errors and correct them before they become defects
- Find discrepancies as early as possible in the process

Methods
- We will achieve Zero Defect through
  - Systematic and proactive root cause analysis
  - Early correction and ongoing monitoring

Philosophy
- Zero Defect
  - Is important for everyone
  - Allows no compromises

Processes and product quality

NYAB sets very high quality standards for delivery and service to both internal and external customers. The standards for performance and product/service excellence are applied through all processes within NYAB and ultimately to the end customer, to achieve high customer satisfaction.

NYAB excellence is part of a global strategy within the Knorr-Bremse Rail Group and results from several simultaneous and interrelated global quality programs, each focused on efficient planning, exceptional performance and the highest quality outputs. These common Group initiatives are targeted to improve our overall performance by implementing best-in-class processes and structures.
The DB-60 control valve delivers the lowest life-cycle costs in the industry and is the most reliable control valve available.

The heart of a freight car air brake system is the pneumatic control valve. The DB-60 uses high-reliability, long-life poppet valves that are friction-free. The DB-60 is designed and built with superior materials, including long-life rubber compounds. The lightweight DB-60 aluminum control valve weighs 90 lbs, including the ergonomic Single Sided Pipe Bracket (SSPB).

DB-60’s reliability makes it the control valve of choice on a growing installed fleet of more than 380,000 freight cars in service today throughout North America.
CCB II

CCB II (Computer Controlled Brake) provides best-in-class reliability to meet the industry’s demand for increased locomotive availability and serviceability.

CCB II went into production in 1998 with advanced self-diagnostics built into each of the modularized line replaceable units (LRUs). Its 20-minute mean time to repair (MTTR) allows for more rapid and efficient maintenance, reducing costs and locomotive downtime.

CCB II is recognized as the industry’s most reliable air brake system ever — the data proves it. Over 10,000 CCB I / CCB II systems have shipped to satisfied customers worldwide.

CCB II’s high reliability has resulted in best-in-class extended overhaul periods up to 8.5 years, approved by the FRA. It is the most field-proven locomotive computer controlled brake in the world.

The EPCU includes the brake control modules which respond to the engineer’s handle movements on the EBV (above left). Reliability is assured through built-in functional redundancy and pneumatic backup. Seven processors continuously monitor system pressures, signals and each other to ensure a safe and reliable system. CCB II is designed to integrate seamlessly with EP-60 and LOCOTROL® EB.

Released in 2007, CCB-26 (top right in cover photo) can be applied anywhere that 26L is specified, and is especially suited for the new low-horsepower, low-emissions switcher locomotives.

#1 worldwide, best-in-class reliability
EP-60

EP-60 is NYAB’s Electronically Controlled Pneumatic (ECP) air brake system that provides a dramatic improvement in train handling for long, heavy haul trains.

Graduated application/release and simultaneous, load compensated braking provide faster brake response and a major improvement in train handling. The result is significant fuel savings and less lading damage, as well as reduced wheel, shoe and draft gear wear. EP-60 has logged millions of car miles of revenue service and meets the latest AAR S-4200 specification in all areas, providing the industry’s most advanced and reliable ECP package.

EP-60 reduces in-train forces, fuel consumption, track wear, brake shoe wear, stop distances, freight car structural fatigue and lading damage, while improving train speed control and safety. In summary, EP-60:

- **Saves fuel**
- **Improves safety**
- **Extends equipment life**
- **Reduces lading damage**
NYAB offers standalone and overlay configurations. EP-60 overlay installation options can be upgraded easily to a standalone configuration.
Features and benefits

**EP-60**

**Car Control Device (CCD)**
NYAB’s CCD is a state-of-the-art mechatronic design, which delivers precise braking control on each freight car. The CCD is designed to mount on the standard AAR pipe bracket for ease during installation. It is available in either standalone or overlay configurations.

**Trainline Communications Controller (TCC)**
Train engineer brake commands are transmitted down the train from the TCC, the brain of the system that manages the ECP train network. The TCC houses the brake control module and a single-board computer, which performs several important functions, including the management of the AAR-approved network protocol, Echelon® LonWorks™, which includes network communication and power-line carrier features. It also manages in-train sequencing, fault monitoring, data logging, the event recorder interface and the Wire Distributed Power (WireDP) feature over the train network.

**Simultaneous control**
EP-60’s wire-based communication and control over the Echelon LonWorks network delivers virtually simultaneous control of every car in the train. EP-60’s low air consumption allows railroads to run longer trains without the need for additional locomotives.

**Diagnostics**
EP-60 technology includes a comprehensive diagnostic capability on each vehicle in the train. System performance is continuously monitored, with individual car status reports transmitted to the TCC. Also, each CCD has a car-sensor interface which provides data flow from car sensors to the locomotive, allowing real-time monitoring of selected car parameters.

**Compatibility and flexibility**
The EP-60 design incorporates both standalone and overlay features, with minor changes to the CCD. EP-60 meets or exceeds the AAR performance specifications, and the communication network has bandwidth available to handle car-sensor data flow. Individual car ID modules provide key data on car characteristics and brake ratios.

**Variable load braking**
The EP-60 design has a unique feature which achieves a uniform brake ratio for all car loadings. This assures that light cars do not over brake. Improved train handling results from a reduction of in-train forces generated while braking a mix of empty, partially loaded and fully loaded cars. The use of analog solenoid valves provides proportional brake cylinder control, for graduated application and release.

**High reliability and low maintenance**
EP-60’s CCD is lightweight, robust and reliable. It has been thoroughly tested in the laboratory and in several real-world revenue service operations under extremely harsh environmental conditions to ensure that high reliability targets are met.

**Safety**
A pneumatic backup brake feature is designed into the CCD. Advanced trainline communications and fault-tolerant control logic provide fail-safe operation. A trainline power safety interlock, which protects the crew from high voltage during train make-up, is an important safety feature.
LEADER

LEADER complements the locomotive engineer’s skills by providing a comprehensive view of the train’s behavior with real-time prompts to optimize the train movement.

LEADER® (Locomotive Engineer Assist / Display & Event Recorder) has become the energy management technology of choice for several railroads in the AAR market, providing a complete solution to optimize train handling. LEADER starts with the best train-handling practices already in place at the railroad, and then improves the effectiveness of those practices through a more complete understanding of train behavior. LEADER drives improvements across the railroad in the form of increased fuel economy, reduced in-train forces and better schedule performance.

Field trials have proven LEADER’s ability to cut fuel use by 8-12 percent in addition to managing the number and severity of slack action events and associated wear on rolling stock. LEADER driver-assist prompts provide real-time coaching to locomotive engineers for throttle and brake changes during actual runs. During the run, LEADER continually monitors the train movement to determine the effectiveness of the prompts, making adjustments accordingly. LEADER also adjusts its dynamic models to account for the changing operating conditions experienced by the train.

Integration with existing onboard electronics has been an area of focus in evolving LEADER’s architecture to provide simplified/integrated solutions for the railroads. Integration with onboard locomotive computers, emerging train control systems, and wireless communication solutions has been achieved to better align LEADER’s deployment with railroad technology strategies. At the same time, NYAB continues to offer a suite of proven, ruggedized hardware including Profiler® (NYAB’s computer platform) and the LCDM (NYAB’s cab display module) to support various applications.

Onboard LEADER installations range from software licenses hosted on existing computer platforms to a full hardware / software package to meet customer requirements. To be fully functional, LEADER requires data acquisition of locomotive status, GPS-based location, radio communication, processing capability and a cab display. Off-board, the back office system runs on a local server and can be connected with NYAB’s TDS-5000 family of simulators for analysis or training.

LEADER provides real-time status information and coaching to assist the locomotive engineer in making optimal train-handling decisions.

Improved railroad operations and efficiency
Productivity through Technology

Better railroad operations

Working with the customer, NYAB’s Train Dynamic Systems group sets LEADER’s operating goals based on business priorities such as capturing energy savings, reducing in-train forces, on-time performance and braking preferences, with safety always the highest priority. These operating goals drive the development of the Golden Run which is ultimately realized in driver-assist prompts that recommend optimal throttle and brake settings.

LEADER continuously captures the onboard data required to recreate the train trip for post-trip analysis. The data files are transmitted wirelessly from the locomotive to a wayside network and eventually delivered to a LEADER back office data server. The data server automatically processes the files to produce a comprehensive evaluation of each run, resulting in a performance and exception report. Performance records are archived in the back office database and are combined into aggregate reports across operator, territory and/or service.

Recent applications have been focused on a tight integration of LEADER with the new generation of train control products. LEADER and train control technologies are synergistic and combine to improve efficiency and safety in ways neither could alone. Train control systems manage train movements on the macro level, preventing train collisions while improving network throughput. LEADER manages the train on the micro level, providing optimal train-movement solutions within the limits of authority provided by train control. Together the two technologies squeeze out operational inefficiencies.

LEADER also functions as an event recorder, and its underlying simulator dynamic models technology allows field-captured data to be downloaded for in-depth study and replay on a TDS-5000 simulator – ideal for engineer training and incident investigation.

Alerts and exception reports identify good and bad train-handling decisions to give railroads the specific information they need to coach drivers to improve their performance. Further, this information can be fed into the TDS-5000 training simulator to allow that captured experience to be shared. Engineers using the TDS-5000 simulator are trained against actual conditions in a highly realistic operating environment that applies the latest in computer generated graphics to approach a real-world experience, after which they emerge ready to use LEADER in field operations.

Profiler® captures engineers’ performance metrics and real-time operation data to identify the optimal or Golden Run best suited to meet the railroad’s goals.
TDS-5000

The TDS-5000 family of simulators delivers maximum flexibility at minimum cost.

The modular design of TDS-5000 simulators provides configurations that range from ultra-portable to expandable networked operating consoles and training stations for local or remote use. Portable systems, including the new TDS-5100 desktop, provide both operations analysis and fully dynamic training simulations.

TDS-5000 systems offer the most advanced computer-generated graphics in the industry, providing state-of-the-art training, and can be configured to meet every railroad’s specific needs.

Train Dynamic Systems, a unit of NYAB, is the leading industry expert in train dynamics and training simulators.
New York Air Brake’s M-601 end-of-car air brake hose assemblies feature Premtec’s cold weather hose with NYAB’s patented HI-FLO® gladhand, delivering the service-proven best quality in the industry. NYAB’s M-601 hoses are designed and built to exceed a service life of eight years. Assemblies are available in 22”, 33” and other custom lengths. All hoses meet or exceed AAR cold temperature flexibility requirements.

Our M-601 line includes a 0” shank HI-FLO gladhand, as well as Locktab II with its innovative anti-disconnect feature.

The Locktab II features a patented anti-disconnect design that reduces undesired hose separations. NYAB crimping technology delivers superior cold weather performance and lowers replacement costs.

NYAB supplies a wide selection of M-618 specialty hoses, fittings, hose hangers and other components that deliver improved airflow, more reliable connections and longer life. NYAB introduced crimped fittings to the M-618 line several years ago as a product improvement resulting in better value for customers.

M-618 specialty hoses, backed by an eight-year workmanship warranty, are assembled with Aeroquip’s AAR approved M-618 hose, meet the M-619 specification and feature AAR approved M-927 fittings. NYAB specialty hoses are manufactured in a large variety of styles and configurations, and are available for all car and locomotive applications.
NYAB offers a complete range of AAR-certified rubber replacement parts.

**Freight car components**

NYAB offers a proven line of freight car and locomotive components and has a 95% on-time delivery record.

With extensive product development and testing facilities, NYAB is committed to developing and supplying superior quality components. We provide technical support to assure that the right component is selected for every application, and maintain a network of field service personnel as part of our customer service commitment.

- **Dirt collector & cut-out cock**
- **Flanged and standard ball-type angle cock**
- **KM-2 vent valve** utilizes a poppet valve design to provide superior and reliable venting.
- **Three-position retaining valve**, the most competitive in the industry, is made from high-strength composite materials.
- **Two-compartment emergency & auxiliary reservoirs** are available in standard and large sizes.
- **NYAB** is a leading supplier of OEM and replacement combined reservoirs, available in standard and large sizes.
- **Brake cylinder pressure measurement taps** meet AAR Standard S-4020.

First-rate quality – service second to none
Trouble-free performance

Empty/Load Valves

Slope Sheet Empty/Load
The EL-60SS valve provides empty/load control for bulk commodity hopper car applications, using the proven EL-60 upstream proportioning technology in a slope sheet package. In addition to a lightweight all-aluminum design, the EL-60SS includes an innovative test feature, which makes single car testing easy.

Additional EL-60SS features:
- Available in 40% and 50% proportioning models
- Available for conventional and food service FDA approved applications
- Sensing and proportioning in one assembly
- No set up or adjustment required
- Visual brake system indicator shows empty/loaded rail car brake condition
- Designed for use with working system pressure up to 110 psig

EL-60/ELRP
The EL-60 empty & load valve protects wheels by reducing braking forces on empty cars. The EL-60 is a fully proportioned, body-mounted design that senses loaded or empty conditions, and features a visual indicator showing full or proportional brake condition.

NYAB’s ELRP (Empty & Load Remote Proportioning) valve employs the industry-leading EL-60 upstream proportioning technology with the sensing and proportioning packaged in separate modules, offering flexibility for those applications where the control valve is mounted in the center of the car. ELRP sensing and proportioning modules are both lightweight, with a minimum of parts. EL-60 is offered with proportioning levels of 40, 50 or 60%, and the ELRP is offered in 50 and 60% proportioning levels. Both include a brake cylinder pressure measurement tap and both are AAR approved.
The TMB-60 is a robust, innovative truck mounted brake with demonstrated installation ease, superior operational performance and low life cycle costs as a result of uniform shoe and wheel wear. The system eliminates through-bolster rods – this feature reduces the risk of equipment damage due to rail car jacking procedures and ice build up. The TMB-60 self-adjusting integral compression slack adjuster ensures proper piston travel with each application and eliminates costly piston travel adjustments.

TMB-60 installation set-up is the fastest in the industry and the brake heads can be removed and replaced without truck disassembly, facilitating running maintenance. The lightweight TMB-60 is field proven, highly reliable and features premium #28 (28,000 lb.) cast beams, the strongest beam available.

<table>
<thead>
<tr>
<th>Cylinder Size (inches)</th>
<th>Approx Piston Travel at 50 PSI (inches)</th>
<th>Brake Cylinder Volume (cubic inches)</th>
<th>Actual Shoe Force per Truck (pounds at 65 PSI)</th>
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<tbody>
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<td>LR 1:4.3</td>
<td>LR 1:4.75</td>
<td>LR 1:5.26</td>
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<tr>
<td>10</td>
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NYAB’s LCDM design is manufactured in Germany to our design and specification, and is known as the MFT 3 display or LCDM. With approximately 2,000 units in service and more than 600,000 hours logged, the LCDM has demonstrated an excellent track record for reliability and availability. The LCDM significantly reduces life-cycle costs for locomotive operators.

NYAB has used the LCDM displays as a key component of advanced train control technology since mid-2005. Recent data from fielded units demonstrates an average observed MTBF value of 30,000 hours. This is a critical input factor for LCC considerations in systems that must perform well in extreme environmental conditions.

Our LCDM’s record for the MTBF value is an impressive benchmark which was previously considered impossible for displays in rail vehicles.

Continuous improvements have led to today’s high-performance and highly reliable displays, featuring:

- Minimum MTBF value of 120,000 hours operating 16 hours/day
- Robust housing with a high IP54/IP65 (housing/front) protection class
- High component integration
- Flat mounting dimensions (approx: 11” w x 8” h x 2” d)
- Double the product life-cycle
- Platform for operating systems Linux, QNX, MS Dos and Windows
- Interfaces with RS422 HDLC, USB, RS232, Ethernet
- Internal display heater for low temperature operation
- Ability to operate in extreme temperature ranges from -35°C to 70°C

World leader in operating reliability
NYAB acquired the assets of Klasing Hand Brake in early 2008. The product line includes vertical wheel, geared hand brake designs (Groups N and O) which are AAR approved and qualified. The robust Klasing design provides improved hand brake longevity, reducing rail car life-cycle costs.

Quick release levers are available in a short or long handle version, which provides versatility for unobstructed access. The long handle requires less pulling force to activate complete release.

Pinion gear and quick release mechanisms are hardened to provide improved wear resistance. A shelf-type winding drum protects the chain from bending, twisting or overlap. The unique winding drum design provides quick chain take-up and also provides smooth gradual release.

The NYAB / Klasing hand brake incorporates permanently lubricated sealed ball bearings to support the hand wheel shaft for improved vibration and wear characteristics. The sealed bearing design eliminates premature wear.

Forged steel gearing and clutch mechanism provide increased strength and durability. A combination of zinc plating, dichromate coating and internal / external painted surfaces ensure the finest corrosion protection in the industry.

Vertical wheel hand brake

Reduced rail car life-cycle costs
Highly durable, easy to maintain

**Body mount slack adjuster**

The NYAB KRD-482-E is an automatic, double-acting slack adjuster designed for body-mounted freight car applications.

The type E tension slack adjuster, designed for use in Group E applications, is AAR approved. Additional body mount features include:

- Corrosion protection on all parts
- Wear-resistant seals between sliding parts prevents dirt and moisture from entering the unit
- Automatically adjusts for brake shoe and wheel wear with each brake application
- Two brake applications are needed to adjust for correct clearance after brake shoe replacement
- Control link clearance allows for 6° of axial alignment in all directions between the slack adjuster and the control rod
- Take up capacity - 19” (482 mm)
**Repair services**

**ISO 9000/AAR M-1003 approved service centers**

In addition to our Canadian service center in Kingston, Ontario, New York Air Brake offers full car and locomotive rebuild and repair services at our facilities located in Little Rock, Arkansas and Riverside, Missouri.

For sales office contact numbers, call New York Air Brake at (315) 786-5431.

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**Knorr Brake Limited, Kingston, Ontario**

KBL is the world’s largest manufacturer of locomotive electronics and air brakes, with over 10,000 CCB systems installed globally.

**NYAB Service Center, Little Rock, Arkansas**

Our Little Rock Service Center specializes in COT&S for all types of freight car control valves, 26L systems, components, single car test devices and other products.

**NYAB Service Center, Riverside, Missouri**

Our Riverside Service Center specializes in COT&S for 26L and CCB locomotive controls.
Contact us

New York Air Brake delivers reliable replacement parts fast. We promise that your order for in-stock parts will be shipped on the next business day (overnight delivery is also available.) We provide technical assistance to help you specify all types of parts for your application — call us.

For more information, visit our website at www.nyab.com, or contact us at the address or phone numbers listed above.