CCB II (Computer Controlled Brake) provides best-in-class reliability to meet the railroads’ demand for increased locomotive availability and serviceability. CCB II was designed in the late 1990s with advanced self-diagnostics built into the control modules (LRUs) that contribute to a 20-minute MTTR. In the field, this 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 developed in the past 50 years—the data proves it.
CCB II is a network-based, electronic air brake system designed for main line freight and passenger locomotives. It is LSI (Locomotive Systems Integration) compliant, and is designed for best-in-class reliability.

CCB II utilizes a line-replaceable unit (LRU) design approach that minimizes spare parts inventory, reduces operating and maintenance costs, and increases locomotive availability. Each LRU module contains self-diagnostic capabilities embedded within its microprocessor.

CCB II incorporates a number of redundant functions, and has the unique ability to identify, reconfigure, and back up key component failures, delivering exceptional mission reliability. The three primary systems are:

- **Electro-Pneumatic Control Unit (EPCU)**
  The EPCU manages the pneumatic interfaces between the locomotive brake system and the consist. It controls the locomotive’s brake cylinders, brake pipe, independent application and release pipe, and the actuating pipe. The heart of an EPCU’s pneumatic circuit is Knorr’s patented analog converter. These converters utilize pulse-width modulation to provide highly accurate and stable control of equalizing reservoirs, brake cylinder pilot, and independent application and release pipe pressure. A redundant pneumatic backup system is integrated into the EPCU, which provides backup for partial loss of computer control in the lead locomotive, or functions in the trail mode when the system is unpowered.

- **Networked Modules**
  One of the keystones of the CCB II design is the application of Echelon® LonWorks™ network technology to interconnect electro-pneumatic modules. These modules, also referred to as Line Replaceable Units (LRUs), are in a constant state of communication with one another, actively controlling a number of functions. Collectively, these networked modules provide faster response time, simplified troubleshooting, and easier train setup. The LRU systems approach minimizes spare parts inventory, and reduces operating and maintenance costs, while increasing train availability.

- **Electronic Brake Valve (EBV)**
  The ergonomically designed EBV is the interface between the brake system and the locomotive engineer, and is designed as either a desktop or AAR-stand installation. An easy-to-read digital display provides instantaneous information on the equalizing reservoir target pressure. This feature avoids the feedback delays inherent in other systems, and allows the locomotive engineer to exercise precise brake control. As a fail-safe design, the EBV permits direct-acting emergency venting of the brake pipe.

- **Integrated Processor Module (IPM)**
  The IPM manages the electronic interfaces between the brake system elements and the engineer’s display. It communicates with the locomotive onboard computer and interfaces with electrical train lines. The IPM also communicates with a portable test unit (PTU) for troubleshooting and system diagnostic tests. With the appropriate hardware and software conversions, the IPM serves as the computer in a Locotrol™ distributed power application.

The EPCU’s modular design simplifies maintenance and minimizes downtime.
CCB II
Features & Benefits

CCB II has the unique ability to identify, reconfigure, and back up key component failures, delivering exceptional mission reliability.

Flexibility, Compatibility, Extendibility
CCB II’s design allows customization for specific customer requirements without the need for extensive modifications. It is compatible with existing 26L brake systems, will multiple-unit with the existing fleet of AAR locomotives, and can accept Locotrol™ distributed power. It is also available as a fully integrated ECP package that reduces cab clutter and provides better train handling. CCB II is LSI (Locomotive System Integration) compliant, but is adaptable to non-LSI applications.

Self Diagnostics
Each LRU module contains self diagnostics embedded within its control node. Diagnostics information can be displayed on locomotive screens for quick and efficient troubleshooting. CCB II’s modular design allows for testing and replacement of LRUs with just one wrench in about 20 minutes. These capabilities simplify maintenance tasks and offer the potential to operate the fleet using a maintenance-on-condition strategy.

Leading the Way
With extensive research and testing facilities, New York Air Brake is committed to developing the next generation of train brake control products. Our facilities in Watertown, New York, and Kingston, Ontario, deliver uncompromised quality, as shown by our ISO 9001 registration.

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