

DASH 8

A New Generation For
Increased Productivity





From its inception in the early 1980's, our Dash 8 locomotive has been a product not just of the General Electric Company, but of the railroad industry as well. Your needs, your suggestions, and your constructive criticism shaped the design of the Dash 8. Your tests and evaluations of prototypes, demonstrators, and preproduction units refined that design. And, your operating experience with production models continues to be a major influence on every Dash 8 we build.

Today's Dash 8 is a product of that partnership, one that is designed to improve railroads' competitiveness in the transportation marketplace. The Dash 8 can help you reduce operating expense through reduced consist size while improving asset utilization through computer diagnostics, enhanced reliability, and improved maintainability. The fact is that, from the ground up, the Dash 8 is designed and built to help keep railroads as healthy on the balance sheet as they are productive out on the main line.

That's not a challenge to be met once and then forgotten. It's one that we both must work at every day. On the following pages you'll read about the locomotive itself, the manufacturing and test facilities, and the customer support that make the Dash 8 an outstanding locomotive value today. Yet to be described are the innovations that we will work together to implement in the future to keep the Dash 8 an important part of your competitive edge.



W.S. Butler
General Manager—Marketing
GE Transportation Systems

Dash 8 Performance And Availability Deliver Improved Asset Productivity

General Electric's Dash 8 locomotive delivers performance, reliability, and maintainability characteristics that can keep you competitive and strengthen your bottom line.

This new generation locomotive has been designed to reduce operating costs significantly and to provide a healthy Return on Assets.

Productivity Opportunities

REPLACE 6 SD40/C30-7* WITH 5 DASH 8-40C LOCOMOTIVES

REPLACE 4 GP40** WITH 3 DASH 8-40B LOCOMOTIVES

5 DASH 8-40C LOCOMOTIVES REPLACE 6 SD40/C30-7*

REPLACE 4 GP40** WITH 3 DASH 8-40B LOCOMOTIVES

REPLACE 4 GP40** WITH 3 DASH 8-40B LOCOMOTIVES

3 DASH 8-40B LOCOMOTIVES REPLACE 4 GP40**

Unit Reductions → Operating Savings

For example, the Dash 8's pulling power can deliver an immediate benefit to your railroad: the potential to replace a four-unit consist with three Dash 8's, or five units with four, can yield a significant reduction in fuel costs and other operating expenses. (See chart above).

This ability to pull higher tonnage trains, and the resulting increase in gross ton miles per unit, translates directly into improved asset productivity.

Outstanding Performance

Through Continuing Equipment Advances

Microprocessor controls work continuously to optimize Dash 8 locomotive performance while the MICROSENTRY system, which controls wheel slips, helps provide the maximum tractive effort rail conditions permit.

Microprocessor control also increases horsepower available for traction by constantly evaluating and adjusting the auxiliary system to match actual locomotive needs. This saves fuel and the additional traction horsepower results in higher speed on grades, more rapid acceleration of premium trains, and better service to your shippers.

Transitionless GE alternators provide full-time parallel traction motor operation on both four and six-axle locomotives.

Recent refinements to the GE-752™ traction motor have increased the continuous tractive effort rating of the Dash 8 locomotive substantially — up to 11% depending on the locomotive model.

*Based on test in Revenue Service on U.S. Railroad 1.4%, 7 mile grade, 28.2% adhesion.
**Estimate based on comparison of published data for horsepower, tractive effort.

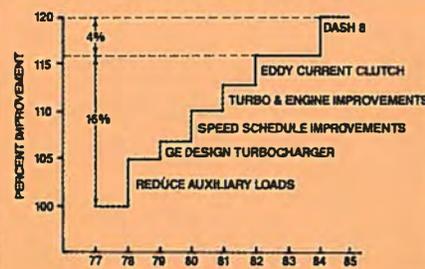
A traction motor thermal protection system eliminates the need to power match and allows full use of motor capacity for faster train acceleration and reduced time on grades.

Lower Fuel Consumption

Today, average fleet fuel savings are 20% over the initial 1977 New Series locomotives — through such means as engine and turbocharger improvements and a self-contained dynamic braking package. Fuel efficiency is also enhanced by using variable speed AC motor drives for the radiator fan, equipment blowers, and the air compressor. The Dash 8 microprocessor automatically selects the minimum speed of each AC auxiliary drive to meet locomotive operating conditions.

The Dash 8 Locomotive Delivers More Power To The Rail For Each Gallon Of Fuel It Burns

Dash 8 Fuel Efficiency



20% IMPROVEMENT



Outstanding Availability

From Joint Effort On Reliability

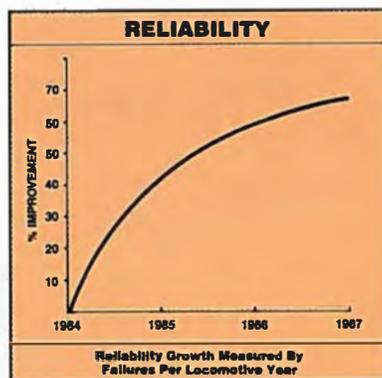
Working with the railroads, we have enhanced the over-the-road reliability of the Dash 8 to increase operator's productivity and return on assets.

As a result of this cooperative approach, refinements have been made to the GE diesel engine and support systems. For example: welded head and liner assemblies, simplified piping and fewer fittings, an improved water flow control system, and microprocessor control of engine functions. These refinements were phased in at the same time our diesel engine was accumulating more than six hundred million miles of revenue service experience at maximum power ratings.

The locomotive electrical system eliminates many mechanical relays, interlocks on power devices, and hundreds of separate wires — replacing them with more reliable microelectronic circuit cards.

VPI insulation in the Dash 8's GE-752 traction motors improves heat transfer and moisture resistance.

To deliver the mission reliability railroads asked for, the Dash 8 constantly monitors the locomotive's systems and recon-



figures operation around faults if they occur. Whenever possible the locomotive continues to operate rather than shutting down, providing an extra measure of "get-home" capability to minimize road failures.

Through Faster Maintenance

On-board diagnostics and a self-test feature combine to provide a powerful troubleshooting tool to simplify and expedite maintenance by pinpointing problem areas. The Dash 8 knows what it is doing, what it is not doing, and what it should be doing; and it can report that data to maintenance personnel to speed up the troubleshooting process and help minimize maintenance or repair time.

Dash 8 equipment is arranged for fast locomotive turnaround

and minimal downtime, with ready access to scheduled maintenance items and easy removal of major components.

GE's Replaceable Unit (RU) microprocessor control concept also improves maintainability as well as availability. All microprocessor control equipment is packaged in Replaceable Units. Main excitation, auxiliary, and battery charging RUs are identical. As a result, a single replacement RU can be put into any of these three locations. The same interchangeability feature applies as well to the equipment blower and radiator fan RUs.

Through Reduced Maintenance Needs

Less time in the shop means more time on the road.

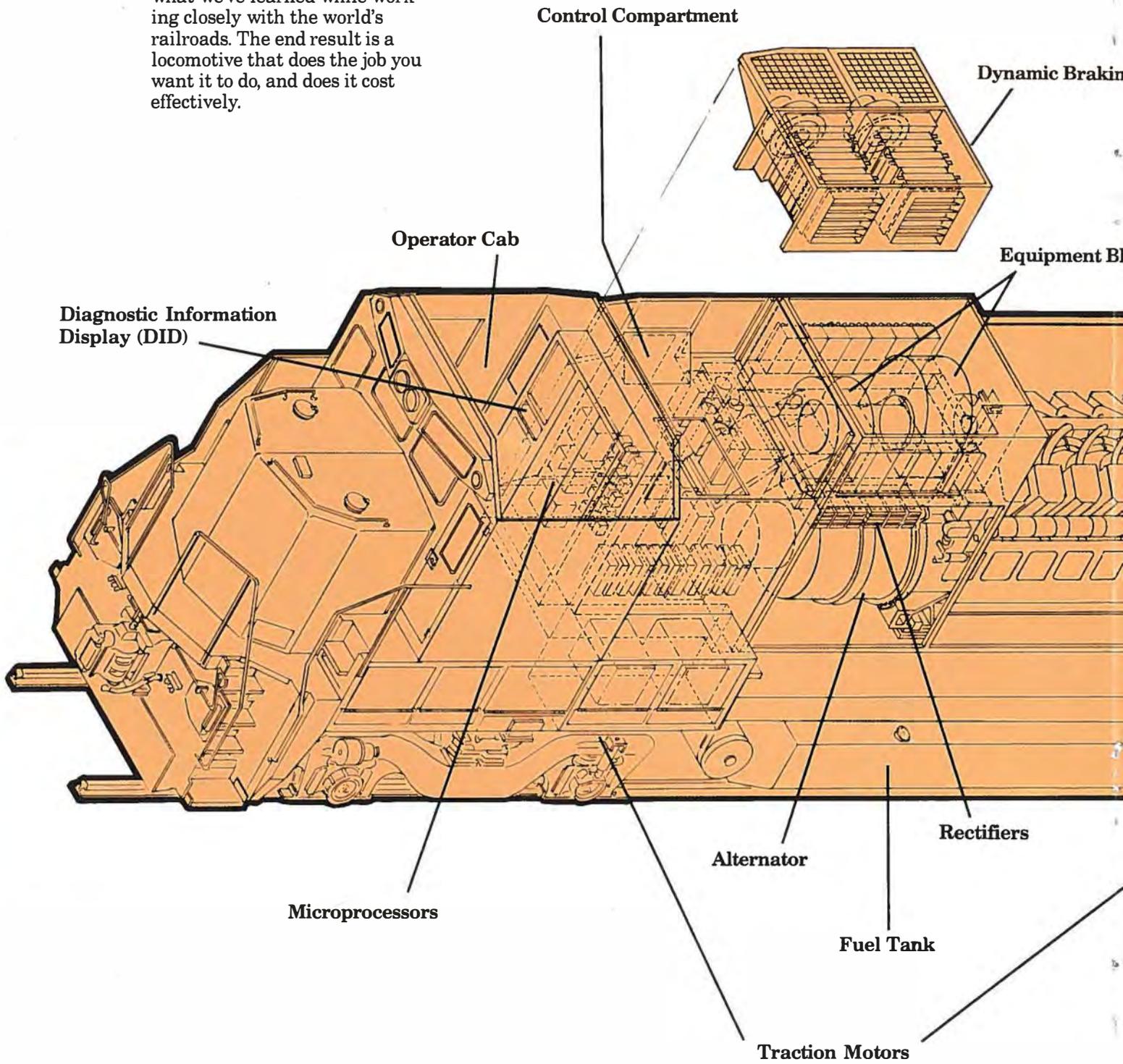
The only running maintenance required prior to 92 days is replenishment of traction motor support bearing oil and gear case lubricants, at approximately 30 day intervals depending on the locomotive's application.

Design improvements in lube oil filters, fuel filters, and other components have made the extended service intervals possible.



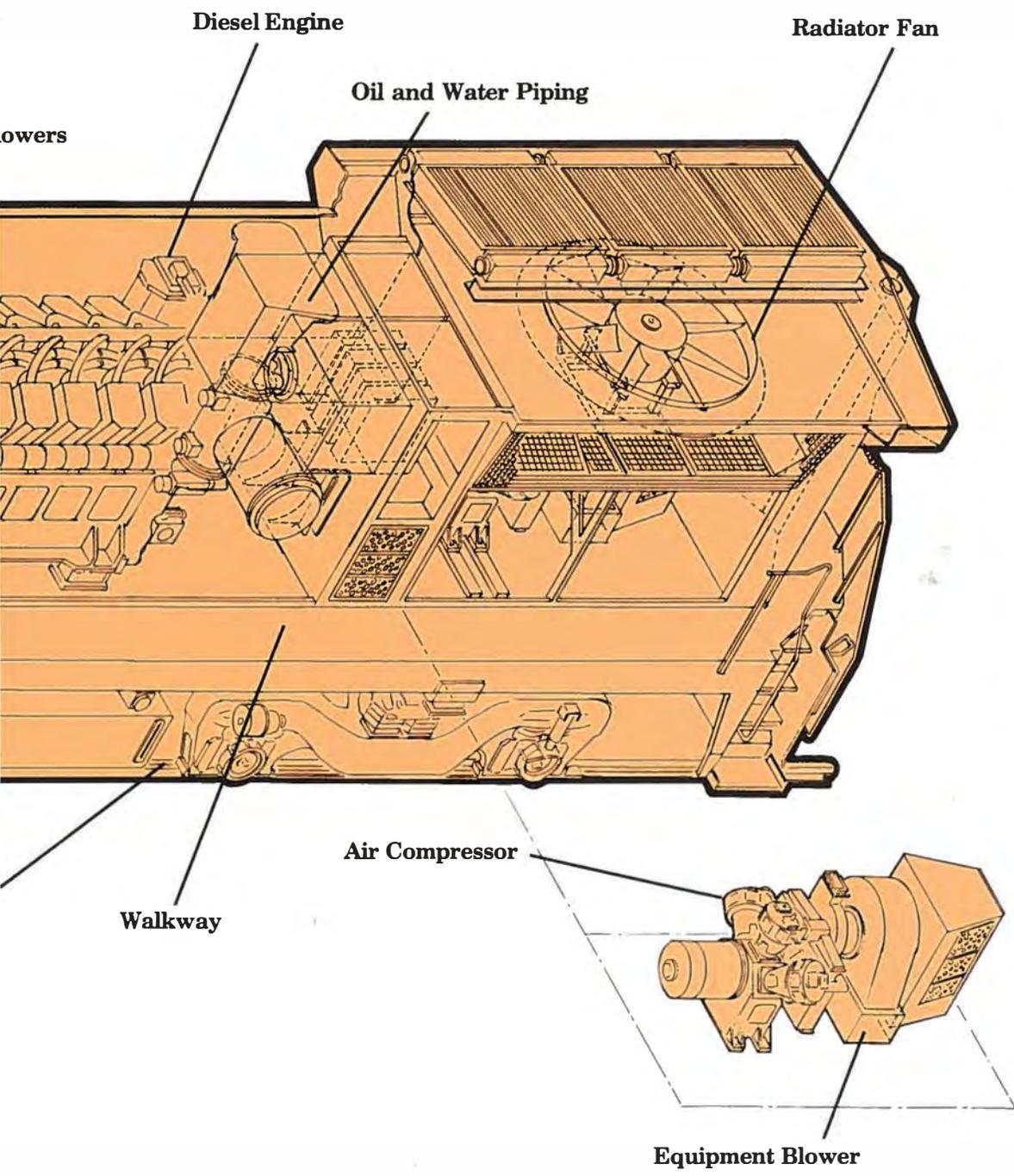
Dash 8 — The Locomotive Railroads Have Been Asking For

The locomotive features highlighted on these pages reflect what we've learned while working closely with the world's railroads. The end result is a locomotive that does the job you want it to do, and does it cost effectively.



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Control Compartment

Microprocessor and power electronics are located in one walk-in compartment for easy inspection and maintenance. Compartment is pressurized with filtered air and sealed against water leaks.



Radiator Fan

Computer-controlled, variable speed, AC motor-driven radiator fan. Fan and motor removable through side-screen opening with out removing radiators, or through top.



Fuel Tank

Fuel tank capacity up to 5000 gallons available for longer range.



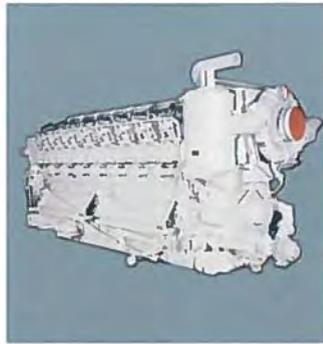
Dynamic Braking

Smaller, lighter two-stack package uses Poly Zi 300™ grids which bolt directly onto the top of the control compartment. Self-ventilated with two DC motor driven blowers. No auxiliary power needed for grid cooling.



Equipment Blowers

Computer-controlled, variable speed, AC motor-driven equipment blowers use only the auxiliary power required. Two blower arrangement provides versatility and energy savings.



Diesel Engine

Four stroke cycle diesel engine. Improved 3-ring piston reduces lube oil consumption. Welded heads and liners, and simplified piping with fewer fittings minimize potential leaks.



Oil and Water Piping

Simplified oil and water piping, fewer fittings, and greater alignment flexibility help prevent leaks. Easy access to engine oil pump, water pump, oil cooler, water dump valve, and pipe connections.



Air Compressor

Air-cooled, two-stage, AC motor driven air compressor eliminates engine drive shaft and couplings, as well as engine-to-compressor alignment. Easily removed from the side. Does not run when unloaded.



Walkway

Full-width walkway and recessed screens provide more room for walking or working.



Traction Motors

Highest tractive effort rating in the industry. Thermal protection system automatically allows full utilization of motor capacity. VPI of armature and field lowers operating temperature and improves moisture resistance.



Rectifiers

Double-sided cooling of rectifiers improves heat dissipation, providing longer diode life. Each diode stack easily accessible from walkway.



Alternator

Two alternators on a common shaft powers locomotive from zero to maximum speed with motors permanently connected in parallel, with no holes in the tractive effort curve. Auxiliary alternator eliminates DC auxiliary machines.



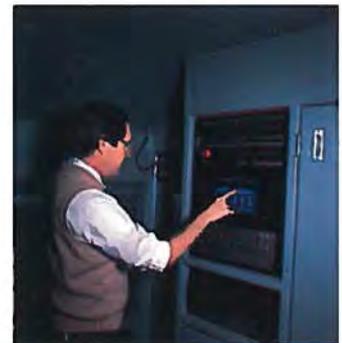
Microprocessors

Microprocessor control manages locomotive systems, monitors operation, and makes adjustments automatically. Works around faults to improve mission reliability. MICROSENTRY adhesion system integrated with microprocessor control.



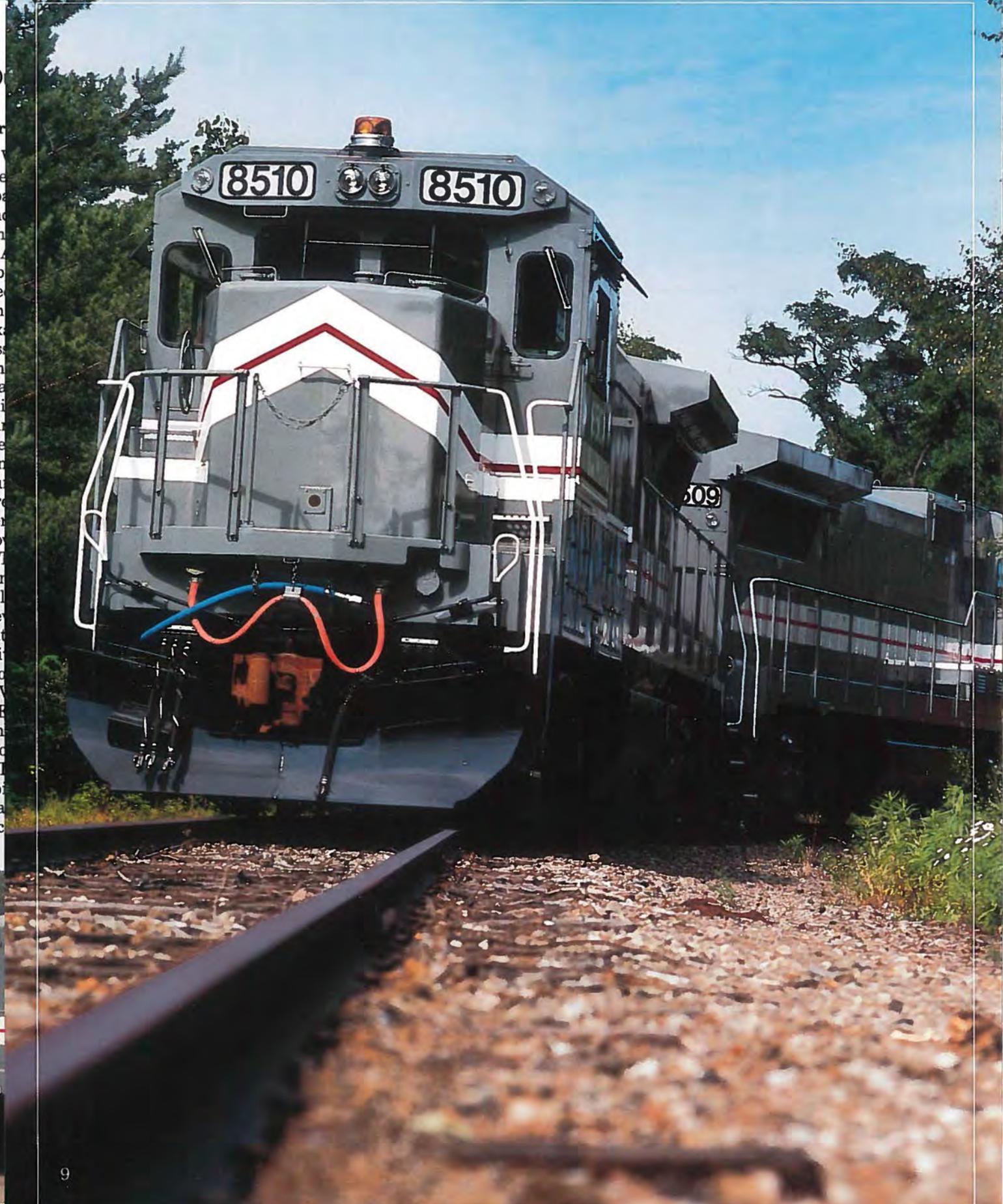
Diagnostic Information Display (DID)

Interactive diagnostics panel in the operator's cab automatically reports faults and, on command, displays performance data requested by the operator.



Operator Cab

Seven foot ceiling, large windows, interior designed to comply with FRA noise regulations.



Dash 8 Performance And Availability Supported By Technology And Talent

Committed to making the Dash 8 locomotive the productivity standard of the industry, General Electric blends advanced technologies with talented people. Our goal is perfection in the way we build our locomotives and the way we support them in service.

Advanced Manufacturing Technology Supports Reliability Goals

On the factory floor, progress toward that goal can be measured by the hundreds of millions of dollars invested in advanced manufacturing technologies. At our "Factory with a Future" quality-oriented processes, featuring computer controls and extensive use of robotics, help assure consistent adherence to high standards of quality.



Master computer manages Flexible Machining System.

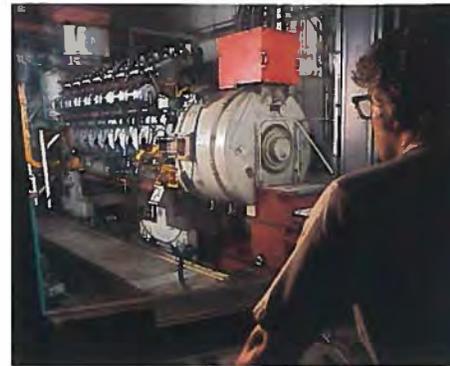
For example, the computer-controlled, completely automated Flexible Machining System for traction motor frames achieves critical dimensions and close tolerances with exceptional consistency, making a significant contribution to the reliability of the GE-752 traction motor.

Robots are linked to computer-controlled machining systems which use lasers for accurate measurements and machine feedback on crucial quality standards.

In diesel engine manufacturing an on-line operator information system on each major machine used in component production instantaneously supplies operators with work piece quality data, allowing them to make timely quality control analyses and decisions. An automated engine test facility cycles each diesel engine through a complete testing sequence, analyzing performance against design criteria and quality requirements.

One of the major features of the Dash 8 is its concept of modular construction, allowing quality testing of components and sub-assemblies at progressive stages of manufacturing.

Testing of electronic assemblies, for example, uses a building-block approach to help assure product integrity. Components such as integrated circuits and power semiconductors, as well as complete microelectronic panels, are subjected to burn-in and rigorous testing. Sophisticated in-circuit testing of the panels verifies their integrity at extremes of temperature and vibration.



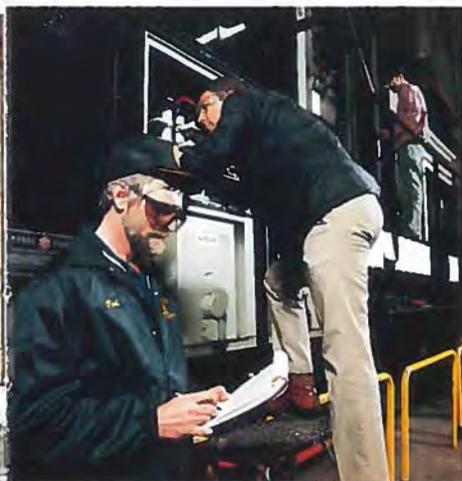
Computer-driven facility automatically cycles engine through complete test sequence.

The reliability and quality process culminates in the \$6 million final test facility where technology, GE test operators and railroad people make a joint effort to see that you get what you are paying for. In final test, locomotives are put through their paces — in computer-monitored integrity and diagnostics testing, and in standstill dynamic testing from notch 1 through 8 to verify reliability. Some units from each order are further tested on a dedicated track to test ride, sway, speed, traction, braking, and performance.

GE test operators personally sign-off on 300 checks of the functional operation of the total locomotive system. These checks include everything from the headlight to motor rotation, from door latches to dynamic braking, from toilets to grid loading. The electrical integrity check alone includes over 1250 test steps. Throughout the testing process railroad visitors are more than welcome as partners in the final check of their locomotives.

Once the GE test operators have given their personal OK to ship, a copy of the test data sheets, including information such as tractive effort and alternator characteristic curves as verified in test, goes with the locomotive to the customer.

Greater reliability on the road is the end result of this intensive quality control at every stage of Dash 8 manufacturing.



Automated Final Test Facility checks functionality and integrity of each locomotive's systems.

Dash 8 Excellence Is A Product Of People As Well As Technology

From the factory floor to the front offices, GE people are the key to applying technology to make the Dash 8 an immediate, and continuous, productive force in any fleet. GE has invested extensively to train production and test workers to make the most of the advanced manufacturing and quality control technologies used in Dash 8 production.

Beyond building for reliability, GE people tap powerful computer networks and data communications links to help keep Dash 8 locomotives productive.

GE replacement parts experts already have a wealth of experience serving railroad customers. Now they're aided by a new information system that helps them provide immediate information on material availability, price, and delivery. Same-day order entry is a reality, and parts can often be shipped within 24 hours. GE replacement parts specialists can also use the system to help railroads plan for their parts requirements to control inventory as well as to design component overhaul kits to meet specific needs.

Application and product service engineers use computer technology with advanced communications capability to keep Dash 8 fleets in service. Whether to perform application studies to determine the Dash 8 configuration that best meets your specific needs, to put it in service, or to keep it on the road, our technical support teams have access to product and performance data bases that supplement their own experience and training. GE field service engineers working with you can draw on that data base to help improve performance and manage maintenance.

Add to that the Dash 8's own on-board computer, with its diagnostic and performance record keeping capabilities, and you have a package of people and technology that works hard to achieve maximum productivity through superior locomotive availability and performance. There are yet more people at GE dedicated to helping you make the most of the Dash 8. There are trainers to teach effective maintenance practices, experts who can help your people learn to use the Dash 8 computer system to maximum effect, and technical writers and catalog specialists who provide additional information to go with your Dash 8's.



Operational data is transferred from locomotive computer memory to serve engineer's records.

The fact is, Dash 8 performance and availability are the product of dedicated, talented people supported by advanced manufacturing and computer technology to build a locomotive that works hard for you.

Dash 8 — A Commitment To Successful Railroading

Your success is the foundation of our success. We cannot build a viable business unless our Dash 8 locomotives are making a strong, positive contribution to successful railroading.

The Dash 8 locomotive, the Factory with a Future, the advanced technology we use, and our personal commitment to serving you are all products of our determination to contribute to your success. Most important of all, though, is what we have learned over the years about listening to and working with railroad people.

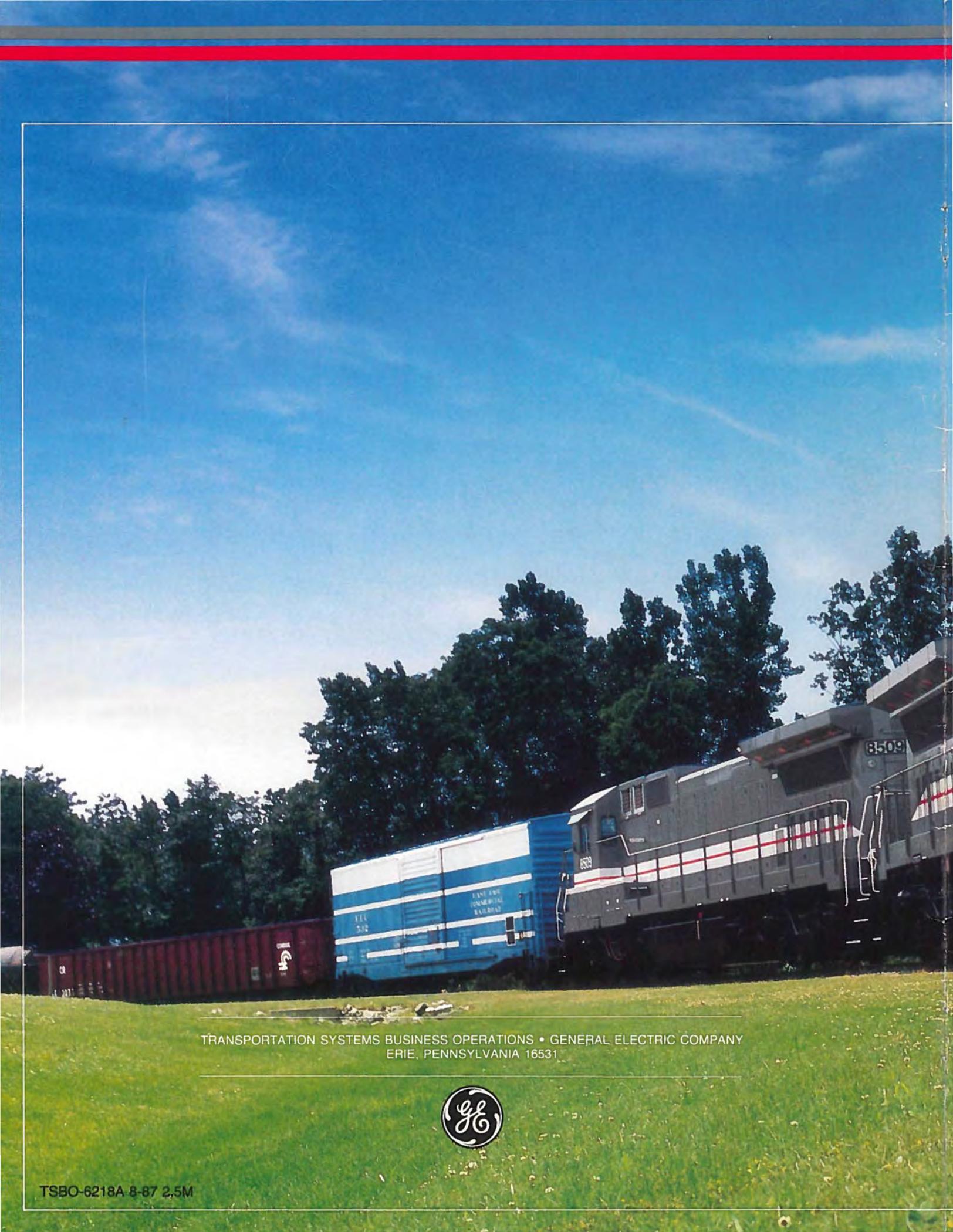
Our investments have been made to provide you the motive power quality and cost efficiency you must have to run a successful railroad. The Dash 8 has been designed, tested, proven, and produced with your goals for performance and availability in mind. The Dash 8 is easier to operate for your crews, easier to troubleshoot and maintain for your mechanical people, more reliable over the road for your transportation or traffic departments, and more productive for your financial officers.

The Dash 8 is the locomotive railroads have been asking for. It is here, today, ready to go to work for you as soon as it enters your fleet.



DASH 8 LOCOMOTIVE LINE

DASH 8 LOCOMOTIVE LINE				
MODELS	32B	40B	32C	40C
CYLINDERS	12	16	12	16
TRACTION HORSEPOWER (APPROXIMATE)	3200	4000	3200	4000



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