

# Troubleshooting And Repairing Locomotive Diesel Engines

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Urban Transportation Abstracts IEEE  
Structural safety of industrial systems and components raises a steadily growing public, scientific and engineering interest, and causes permanent development of methods and techniques used for its assessment. In addition to the well established engineering methods, applied in the field, several new methods and tools have emerged recently. Among them, the most novel ones are probably those related to expert system applications, appearing as an important possible improvement of the current engineering practice. The issue has been addressed by the international course EXPERT SYSTEMS IN STRUCTURAL SAFETY ASSESSMENT organized by MPA Stuttgart and JRC Ispra (Stuttgart, October 2-4, 1989), and the proceedings of the course are contained in this volume of the Lecture Notes in Engineering. The contributions (invited lectures) tackle the issues usually confronting developers and users of expert systems applied in structural engineering, i.e. in structural safety and integrity assessment. Both the book and the course are a combination of a tutorial and of presentation of the current achievements in the field. Starting from the basic elements of expert systems (knowledge based systems), the book should "guide" the reader up to the applications in various particular sub-domains.

Proceedings of the Workshop on the Application of Expert Systems to Transportation Edward Elgar Publishing  
Data Ethics of Power takes a reflective and fresh look at the ethical implications of transforming everyday life and the world through the effortless, costless, and seamless accumulation of extra layers of data. By shedding light on the constant tensions that exist between ethical principles and the interests invested in this

socio-technical transformation, the book bridges the theory and practice divide in the study of the power dynamics that underpin these processes of the digitalization of the world.

Troubleshooting and Repair of Diesel Engines Kalmbach Publishing, Co.  
Artificial Intelligence and expert systems research, development, and demonstration have rapidly expanded over the past several years; as a result, new terminology is appearing at a phenomenal rate. This sourcebook provides an introduction to artificial intelligence and expert systems, it provides brief definitions, it includes brief descriptions of software products, and vendors, and notes leaders in the field. Extensive support material is provided by delineating points of contact for receiving additional information, acronyms, a detailed bibliography, and other reference data. The terminology includes artificial intelligence and expert system elements for:

- Artificial Intelligence
- Expert Systems
- Natural language Processing
- Smart Robots
- Machine Vision
- Speech Synthesis

The Artificial Intelligence and Expert System Sourcebook is compiled from information acquired from numerous books, journals, and authorities in the field of artificial intelligence and expert systems. I hope this compilation of information will help clarify the terminology for artificial intelligence and expert systems' activities. Your comments, revisions, or questions are welcome. V. Daniel Hunt  
Springfield, Virginia May, 1986 ix  
Acknowledgments The information in Artificial Intelligence and Expert Systems Sourcebook has been compiled from a wide variety of authorities who are specialists in their respective fields. The following publications were used as the basic technical resources for this book. Portions of these publications may have been used in the book. Those definitions or artwork used have been reproduced with the permission to reprint of the respective publisher.

Applied Artificial Intelligence McGraw Hill Professional  
Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database.  
The Quest for Artificial Intelligence McGraw Hill

Professional  
To learn more about Rowman & Littlefield titles please visit us at [www.rowmanlittlefield.com](http://www.rowmanlittlefield.com).  
*Proceedings* Tab Books  
The state of the practice--Tools and Techniques--Application Areas: Applications in Manufacturing and Design, Intelligent Computer-Assisted Instructional Systems, Defense Applications of Artificial Intelligence, Financial Applications of Intelligent Systems Technology, Applications in Robotics; Applied Natural Language; Artificial Intelligence and the Airline Industry, Artificial Intelligence and the Legal System, Knowledge-Based Software Engineering--Issues, Challenges, and New Frontiers.

*The 1984 Guide to the Evaluation of Educational Experiences in the Armed Services* Springer Science & Business Media  
In recent years, expert systems have become the most visible and the fastest growing branch of Artificial Intelligence. General Electric Company's Corporate Research and Development has applied expert system technology to the problem of troubleshooting and the repair of diesel electric locomotives in railroad running repair shops. The expert system uses production rules and an inference engine that can diagnose multiple problems with the locomotive and can suggest repair procedures to maintenance personnel. A prototype system

has been implemented in FORTH, running on a Digital Equipment PDP 11/23 under RSX-11M. This system contains approximately 530 rules (roughly 330 rules for the Troubleshooting System, and 200 rules for the Help System), partially representing the knowledge of a Senior Field Service Engineer. The inference engine uses a mixed-mode configuration, capable of running in either the forward or backward mode. The Help System can provide the operator with assistance by displaying textual information, CAD diagrams or repair sequences from a video disk. The rules are written in a representation language consisting of nine predicate functions, eight verbs, and five utility functions. The first field prototype expert system, designated was delivered in July 1983 and is currently under field evaluation.

Artificial Intelligence & Expert Systems Sourcebook

Cambridge University Press  
A presentation of the central and basic concepts, techniques, and tools of computer science, with the emphasis on presenting a problem-solving approach and on providing a survey of all of the most important topics covered in degree programmes. Scheme is used throughout as the programming language and the author stresses a functional programming approach to create simple functions so as to obtain the desired programming goal. Such simple functions are easily tested individually, which greatly helps in producing programs that work correctly first time. Throughout, the author aids to writing programs, and makes liberal use of boxes with "Mistakes to Avoid."  
Programming examples include: \* abstracting a problem; \* creating pseudo code as an intermediate solution; \* top-down and bottom-up design; \* building procedural and data abstractions; \* writing programs

in modules which are easily testable. Numerous exercises help readers test their understanding of the material and develop ideas in greater depth, making this an ideal first course for all students coming to computer science for the first time.

**A Guide to the Evaluation of Educational Experiences in the Armed Services** S E A I

Technical Publications  
InfoWorld is targeted to Senior IT professionals. Content is segmented into Channels and Topic Centers. InfoWorld also celebrates people, companies, and projects.

Guide to the Evaluation of Educational Experiences in the Armed Services, 1954-1989

William Andrew  
Over 4,100 total pages ... Just a sample of the contents: 256 page Army TRAIN RAILROAD RAILCAR Manual FULL TITLE: MAINTENANCE OF RAILWAY CARS. Published by the Department of the Army on 28 August 1972 (current). 174 page U.S. Technical RAILROAD Design FULL TITLE: Technical Instructions: Railroad Design and Rehabilitation. Published 1 March 2000. 207 page U.S. Navy RAILROAD Handbook FULL TITLE: NAVY RAILWAY OPERATING HANDBOOK, 207 pages. Published by the Department of the Navy, June 1999. U.S. Army RAILROAD LOCOMOTIVE Operations Manual FULL TITLE: RAILWAY OPERATING AND SAFETY RULES. Published by the Department of the Army on 17 July 1989. 139 page Army RAILROAD Rolling Stock Manual Six Lessons; 139 pages on CD-ROM. FULL TITLE: RAILWAY ROLLING STOCK. Published by the Department of the Army on 1 June 1997. 274 page B-B-160 LOCOMOTIVE Operator Manual FULL TITLE: OPERATOR AND UNIT MAINTENANCE MANUAL - LOCOMOTIVE, DIESEL-ELECTRIC, 56-1/2-INCH GAGE, 80-TON, 670 HP, 0-4-4-0 WHEEL, MODEL B-B-160/160-4GE747-A1. Published by the Department of the Army on 22 May 1991. 268 page Army BALDWIN LIMA Locomotive Manual FULL TITLE: OPERATOR AND UNIT MAINTENANCE MANUAL LOCOMOTIVE, DIESEL-ELECTRIC, 56-1/2-INCH GAGE, 60 TON, 500 HP, 0-4-4-0 WHEEL, MODEL RS-4-TC-1A.

Published by the Department of the Army on 8 January 1987. 419 page Army GE B-B-160 Locomotive Manual FULL TITLE: INTERMEDIATE DIRECT SUPPORT AND INTERMEDIATE GENERAL SUPPORT MAINTENANCE MANUAL LOCOMOTIVE, DIESEL-ELECTRIC, 56-1/2-INCH GAGE, 80-TON, 670 HP, 0-4-4-0 WHEEL, MODEL B-B-160/160-4GE747-A1.

Published by the Department of the Army on 21 July 1987. 396 page B-B-160 LOCOMOTIVE Parts Manual FULL TITLE: UNIT, INTERMEDIATE DIRECT SUPPORT AND GENERAL SUPPORT REPAIR PARTS AND SPECIAL TOOLS LIST LOCOMOTIVE, DIESEL-ELECTRIC, 56-1/2-INCH GAGE, 80-TON, 670 HP, 0-4-4-0 WHEEL, MODEL B-B-160/160-4GE747-A1 NSN

2210-01-158-2980. Published by the Department of the Army on 31 March 1993. 90 page 1955 Davenport LOCOMOTIVE Maintenance Manual FULL TITLE: LOCOMOTIVE DIESEL ELECTRIC 56½ GAGE, 44 TON 0-4-4-0, 400 HP DAVENPORT BESLER Published by the Department of the Army on 8 November 1955.

**Expert Systems** Springer Science & Business Media

This fully updated, money-saving guide shows, step by step, how to repair and maintain diesel engines  
Thoroughly revised to cover the latest advances, this resource equips you with the state-of-the-art tools and techniques needed to keep diesel engines running smoothly and in top condition. The book offers comprehensive and practical coverage of diesel technology and clearly explains new diesel/hydrogen and diesel/methane engines.  
Troubleshooting and Repairing Diesel Engines, Fifth Edition covers new engine technology, electronic engine management, biodiesel fuels, and emissions controls. This new edition contains cutting-edge information on recent developments, including turbocharging and changes in the composition of conventional fuel. You will find out how to successfully carry out repairs and get professional results while saving money. •Covers a broad range of diesel engine makes and models •Features helpful facts, specifications,

and flow charts •Written by a master mechanic and bestselling author  
The 1984 Inventory of Expert Systems SAE International  
Harness the Latest Tools and Techniques for Troubleshooting and Repairing Virtually Any Diesel Engine Problem The Fourth Edition of Troubleshooting and Repairing Diesel Engines presents the latest advances in diesel technology. Comprehensive and practical, this revised classic equips you with all of the state-of-the-art tools and techniques needed to keep diesel engines running in top condition. Written by master mechanic and bestselling author Paul Dempsey, this hands-on resource covers new engine technology, electronic engine management, biodiesel fuels, and emissions controls. The book also contains cutting-edge information on diagnostics...fuel systems...mechanical and electronic governors...cylinder heads and valves...engine mechanics...turbochargers...electrical basics...starters and generators...cooling systems...exhaust aftertreatment...and more. Packed with over 350 drawings, schematics, and photographs, the updated Troubleshooting and Repairing Diesel Engines features: New material on biodiesel and straight vegetable oil fuels Intensive reviews of troubleshooting procedures New engine repair procedures and tools State-of-the-art turbocharger techniques A comprehensive new chapter on troubleshooting and repairing electronic engine management systems A new chapter on the worldwide drive for greener, more environmentally friendly diesels Get Everything You Need to Solve Diesel Problems Quickly and Easily • Rudolf Diesel • Diesel Basics • Engine Installation • Fuel Systems • Electronic Engine Management Systems • Cylinder Heads and Valves • Engine Mechanics • Turbochargers • Electrical Fundamentals • Starting and Generating Systems • Cooling Systems • Greener Diesels Horizontal Management Kalmbach

Publishing, Co.  
Toy train mechanic Dick Teal demonstrates techniques for keeping toy trains from contemporary manufacturers in excellent condition. Includes steps for proper lubrication, TMCC/DCS troubleshooting, and the right way to replace traction tires, batteries, and light bulbs. It's the essential workbench guide for toy train operators. Edited by Classic Toy Trains editor Neil Besouglouff.  
*Scientific and Technical Aerospace Reports* Lexington Books  
Artificial intelligence (AI) is a field within computer science that is attempting to build enhanced intelligence into computer systems. This book traces the history of the subject, from the early dreams of eighteenth-century (and earlier) pioneers to the more successful work of today's AI engineers. AI is becoming more and more a part of everyone's life. The technology is already embedded in face-recognizing cameras, speech-recognition software, Internet search engines, and health-care robots, among other applications. The book's many diagrams and easy-to-understand descriptions of AI programs will help the casual reader gain an understanding of how these and other AI systems actually work. Its thorough (but unobtrusive) end-of-chapter notes containing citations to important source materials will be of great use to AI scholars and researchers. This book promises to be the definitive history of a field that has captivated the imaginations of scientists, philosophers, and writers for centuries.  
**The 1980 Guide to the Evaluation of Educational Experiences in the Armed Services: Coast Guard, Marine Corps, Navy, Dept. of Defense** Seai Technical Publications  
Save money and avoid repair shops! Learn fundamental repair skills through simple, step-by-step instructions, photos, and

illustrations. You'll be able to maintain and repair DC-powered scale model locomotives, rolling stock, and layouts. Also includes various enhancement projects.  
Proceedings of the National Conference Jeffrey Frank Jones

*Exploring Computer Science with Scheme*

*DELTA: An Expert System for Diesel Electric Locomotive Repair*

## **Artificial Intelligence in Maintenance**

The 1980 Guide to the Evaluation of Educational Experiences in the Armed Services: Army