

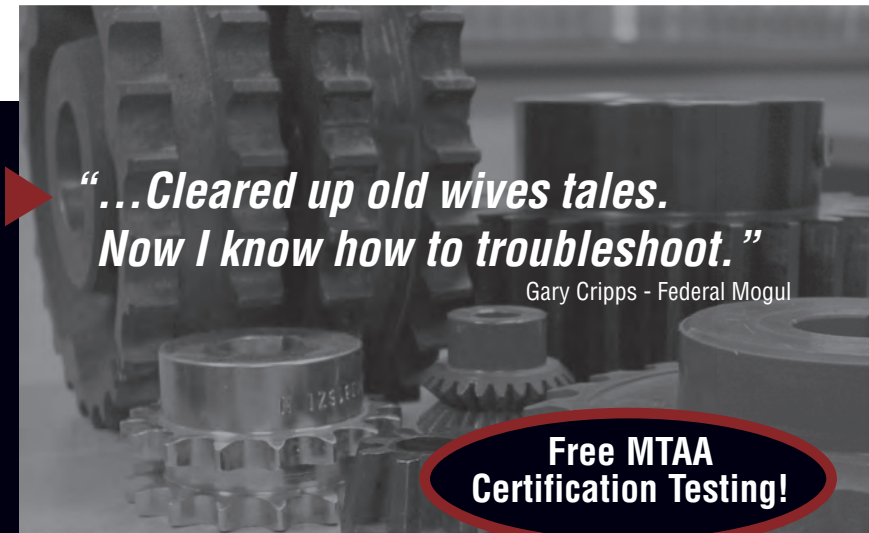
TROUBLESHOOTING MECHANICAL DRIVE SYSTEMS AND ROTATING EQUIPMENT™

For a schedule of open enrollment classes or to bring this training to your plant or facility, contact us @

1-877-97-TRAIN

www.AmericanTrainco.com

A Practical Course Designed for Building Facility and Industrial Plant Maintenance Technicians



"...Cleared up old wives tales. Now I know how to troubleshoot."

Gary Cripps - Federal Mogul

**Free MTA
Certification Testing!**

Minimize downtime & reduce dependence on outside service contractors!



- This seminar can also be presented at your facility for larger groups
- Reserve Your Space Now! **CALL 1-877-97-TRAIN**

Or check us out on the web at www.AmericanTrainco.com

"Easy to understand."

Scott Stewart - Metalpha Bridgestone

TROUBLESHOOTING MECHANICAL DRIVE SYSTEMS AND ROTATING EQUIPMENT™

PURPOSE OF SEMINAR

It is no secret that downtime is expensive. Regardless of the precautions you've taken and preventive maintenance practices you've implemented, sometimes things just go wrong and you need it fixed *now*. But in order to fix it you must know how to isolate and define the problem, and that's what this course is all about – teaching you how to quickly and accurately troubleshoot so that you can avoid costly downtime.

In this course we'll provide the student a new perspective on troubleshooting mechanical and rotating equipment. Rather than teaching about "equipment specific" situations we'll take a more novel approach. We'll teach you to troubleshoot based on the common components that make up a piece of specified equipment so that you can go back to the workplace and troubleshoot just about anything regardless of its function, design or manufacturer. You will learn about basic mechanical applications, failures, life expectancy and maintenance of shafts, bearings, couplings, chains, sprockets, bushings, gears, belts, sheaves and other mechanical components. You'll learn what data to measure, track and trend, so that when equipment fails you can get quick answers to what is wrong. Most importantly you will learn how to find and fix the *real* problems with your equipment, and not just the *symptoms*.

No matter what type of equipment you may confront on the job, after attending this seminar you will have the tools & skills to properly troubleshoot just about any problem you may encounter.

WHO SHOULD ATTEND

This seminar is a must for anyone who works with mechanical and rotating equipment at industrial plants, utilities or commercial and private building facilities. General maintenance personnel, workers in cross-training programs, electricians and engineers will find this course extremely useful. Attendees come from a wide variety of industries, skill-levels, company sizes, and job titles, so if you're not sure you'll fit in or will benefit from the class, don't worry - you will - as long as you work with mechanical or rotating equipment! People who will benefit from attending this seminar include...

Maintenance Personnel in:

Manufacturing Plants *Commercial Buildings*
Hospitals *Waste Water Facilities*
Schools *Government Buildings*
Research Facilities *Shopping Centers*
Apartment Buildings

Including:

Maintenance Technicians *Apprentices*
Mechanics *HVAC Technicians*
Electricians *Machine Operators*
Engineers *Alarm Technicians*
Building Engineers *Stationary Engineers*
Maintenance Supervisors
Electronic and Instrumentation Technicians
Multicraft & Cross Training Personnel

UNAFFILIATED and NON-COMMERCIAL

Unlike some training experiences, you won't get a sales presentation at an American Trainco seminar - all you get is an honest, commercially unbiased education. We do not engage in the practice of selling or promoting any other company's products or services, so you know that by attending one of our seminars, your time and money is well spent.

ABOUT OUR INSTRUCTORS

When we hire our instructors, we want to know three things:

- 1) Do they have a formal education?
- 2) Have they ever spent time in the field doing actual work?
- 3) Are they teaching experts?

If they answer "yes" to all these questions, then we start getting picky. Instructors who want to teach with American Trainco truly need to be a leader in their field. We don't hire field people without teaching experience, and we don't hire teachers without field experience. Our instructors need to have both and are required to keep our classrooms entertaining and lively, ensuring our students a positive and enjoyable learning experience.

HIGH QUALITY PRESENTATIONS

Black and white transparencies never made it in the door at American Trainco. From the start we demanded that all our presentations would be lively, attractive, crisp and clear. Our instructors use state-of-the-art computers, projection equipment and software to bring you a high quality visual experience. And our books are designed with the maintenance person in mind too. We know that they don't always have a lot of time to read volumes of literature so our manuals are quick and to the point, providing students the same charts, descriptions, pictures and bulleted items they'll see during the presentation.

WHAT YOU WILL TAKE HOME

- American Trainco Seminar Manual - detailing all presentation material covered in the class
- Handy reference materials and guides to help you with everyday decisions, calculations and applications in the field.
- Personalized Training Certificate – You will receive a personalized American Trainco Certificate of Completion and 1.4 CEU's (Continuing Education Units) approved by the Maintenance Training Association of the Americas.

▶ **"I definitely recommend
this course to others ."**

Gawdat Wassef - Superior Essex

COURSE OVERVIEW

DAY 1

Understanding Machine Components and Failure Mechanisms

I. Introduction

- a. Overview of Rotating Equipment
- b. What is Common to All Types of Equipment?

II. The Maintenance Educational Component (MEC)

- a. Definition
- b. Application
- c. Understanding How Equipment Works

III. Bearings

- a. Anti Friction
- b. Plain

IV. Measurement of Critical Components

- a. What to Measure
- b. How to Measure
- c. Watching for Trends

V. Shafting

- a. Types of Shafts
- b. Uses and Applications
- c. Repair and Maintenance

VI. Housing

- a. Types of Housing
- b. Re-machining and Repairs

VII. Lubrication

- a. Importance of Lubrication
- b. Types of Lubrication
- c. What Needs to be Lubricated
- d. How & When to Lubricate

VIII. Shaft Couplings

- a. Component Overview
- b. Errors of Omission
- c. Maintenance

IX. V-Belts

- a. Uses for Equipment
- b. Failure Modes

X. Chain Drives

- a. Component Overview
- b. "Pitching" a Solution

XI. Positive Drive Belts

- a. Reducing Tension Headaches

XII. Gears and Gearing

- a. Removing the Mystery
- b. Repair and Maintenance

DAY 2

Troubleshooting Faults and Applying Corrective Action

I. Vibration Analysis

- a. Simple Measurement Practices
- b. Using Data for Troubleshooting

II. Fast Fault Finding

- a. Vibration as Your Tool

III. Acoustical Troubleshooting

- a. Using Sound as a Tool
- b. What to Listen for

IV. Infra-red Inspection

- a. Methods & Devices
- b. When to Use it
- c. What Your Readings Mean

V. Oil Analysis

- a. Hidden Problems Revealed
- b. Analyzing Your Oil
- c. Corrective Action

VI. Motors

- a. Using the Nameplate for Information
- b. Sizing the Motor to the Job

VII. Megger Testing

VIII. Troubleshooting Trees

- a. Types and Uses
- b. How They Work

IX. Basic Troubleshooting

- a. Best Practices
- b. Minimum Changes to get Maximum Results

X. Pumps, Blowers and Fans

- a. The Most Common Problems
- b. Looking for the Obvious
- c. Noise and Capacity Changes

XI. Other Rotating Equipment

XII. Review

- a. What Applies to Your Job
- b. What Will You Do when You Return to Your Job?

SEMINAR AGENDA

7:30 am	Registration
8:00 am	Class Begins
12:00 -1:00 pm	Lunch (on your own)
4:30 pm	Class Ends

SEMINAR FEES

\$985 Both Days

NO RISK REGISTRATION and MONEY-BACK GUARANTEE

If you're not yet sure you'll be able to attend this seminar, you can still make a reservation to hold your space in class. While payment is due prior to the start of the seminar, you may choose a full refund or credit for cancellations made at least 24 hours in advance. Student substitutions can also be freely made at any time prior to the start of the seminar. Refunds will not be issued for registered attendees who fail to show up and have not given a notice of cancellation. In the rare event that should you not receive the expected value after attending our seminar, simply notify us in writing of your reasons and your money will be promptly refunded.

IN-HOUSE TRAINING

You can bring this or any other maintenance training program directly to your plant or facility. Simply call us and tell us what you're looking for. In addition to our own American Trainco seminars and instructors, we have established relationships with literally hundreds of other expert instructors and consultants who conduct training in virtually all areas of maintenance; and our custom training staff is among the most experienced in the industry. Chances are good we will be able to meet your needs.

Call **1-877-97-TRAIN** and ask for Dan or Adam, or email AdamC@AmericanTrainco.com. You may also visit us on the web at: www.AmericanTrainco.com to view a listing of courses and to request a quote.

Some of the other training topics we can bring to your site include:

- Arc Flash Electrical Safety
- Basic Electricity for Non-Electricians
- Electrical Troubleshooting
- Air Conditioning & Refrigeration
- Variable Frequency Drives
- Hydraulics
- Standby Generators & Emergency Power
- 2008 National Electrical Code®
- Electrical Diagrams, Schematics & Drawings
- Boiler Operation, Maintenance & Safety
- PLCs for Non-Programmers
- Pumps & Pump Systems
- Electrical PM & Best Practices
- Inventory Control for Maintenance
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- Saving Energy at Your Facility
- and more!

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FIVE EASY WAYS TO REGISTER:

- 1) **Internet** www.AmericanTrainco.com
- 2) **Fax** (303) 531-4565
- 3) **Phone** Toll Free 1-877-97-TRAIN 1-877-978-7246 or (303) 531-4560
- 4) **Mail** this form to: American Trainco, Inc. P.O. Box 3397 Englewood, CO 80155
- 5) **E-mail** the information requested on this form to: Sales@AmericanTrainco.com

Primary Contact/Authorizing Supervisor: Name _____
 Title _____ Company Name _____
 Address _____
 City _____ State _____ Zip _____
 Phone _____ Fax _____ Email _____

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Gary Cripps - Federal Mogul

Seminar Attendees:	Name	Title	E-Mail	Seminar City

Billing Information: (Please fill out this section only if the "Bill To" name and address is different than the Authorizing Person's name and address above.)

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Other Seminars Coming To Your Area!

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- Electrical Troubleshooting
- Air Conditioning & Refrigeration
- Boiler Operation, Maintenance & Safety
- Variable Frequency Drives
- PLCs for Non-Programmers
- Electrical Diagrams, Schematics & Drawings
- Standby Generators & Emergency Power
- Pumps & Pump Systems
- 2008 National Electrical Code®
- Electrical PM & Best Practices
- Hydraulics
- Saving Energy at Your Facility
- Inventory Control for Maintenance
- Predictive Maintenance & Condition Monitoring
- and more!

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