



# MAINTENANCE TROUBLESHOOTING INTERNATIONAL LLC

TMR-303

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## TMR-303 TROUBLESHOOTING MECHANICAL ROTATING EQUIPMENT

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 mechanical rotating equipment so that you can avoid costly downtime. Rather than teaching about "equipment specific" situations you are taught to troubleshoot based on the common components that make up a piece of equipment. The attendee will learn about basic mechanical applications, failures, life expectancy and maintenance of shafts, bearings, couplings, chains, sprockets, bushings, gears, belts, sheaves and machine components. Most importantly you will learn how to find and fix the real problems with your equipment, and not just the symptoms. Attendees are taught the logic of troubleshooting based on the common components that make up a piece of equipment. The class covers details of basic mechanical applications, failures, life expectancy and maintenance of shafts, bearings, couplings, chains, sprockets, bushings, gears, belts, sheaves and machine components. **THIS IS OUR MOST ATTENDED AND AND MOST POPULAR COURSE. Come and you will see why!!**



### Types of Equipment

- Electrical Power
- Electrical Control
- Mechanical Stationary
- Mechanical Rotating

### Bearings and Bearing Life

- Plain Bearings
- Anti-friction Bearings

### Bearing Identification

- Series numbers
- Calculating the ID from the number
- Identification of bearings

### Use of Vernier Micrometers

- Reading a micrometer
- Getting a feel for taking a reading
- Shaft measurement
- Use of telescope gages

### Bearing Fit Tables

- Learning to read the tables
- Short cuts for common machines

### Shafting

- Fracture and fretting
- Shaft seat
- Making a shaft print

### Bearing Removal and Installation

- Using a press
- Thermal methods
- Checking the shaft shoulder
- Bearing failure analysis

### Housings

- Housing bores and proper fits
- Expected interference

### Machinery Lubrication

- Oil or Grease?
- Calculation of amount of grease
- Calculation of frequency of re-lube

### Couplings

- Elastomeric and Metal
- How to pick a coupling
- Slow-motion studies
- Use of the strobe light

### V-Belt and Sheaves

- Classification
- Sheave inspection
- Tensioning

### Positive Drives

- Timing belts and HTD belts
- Synchronous drives

### Chain Drives

- Tooth and chain wear measurement

### Gears and Gear Boxes

- Tooth inspection and measurement of backlash

### Vibration Analysis

- Vibration severity and using The Rathbone Chart
- Determining machinery faults
- Velocity limits — 4 to remember

### Acoustical Emission Analysis

- Shock pulse and SEG
- BDU using a TPI-9080

### Infra-red Inspection

- Infra-red thermometers and infra-red thermography
- Test strips

### Oil Analysis

- Spectrographic techniques
- Ferrographic analysis
- Viscosity measurement

### Dynamic Balancing and Shaft Alignment

- The need for technical maintenance

### CLASS FORMATS AVAILABLE

- MTI Hands-On Center \$1295/person
- ZOOM Interactive \$1295/person
- On-Site ) Ask for Quote

Quick Quote Available in 48 hrs.

### CLASS DURATION

3-days, 22.5 hours of instruction  
 65% or more hands-on activities

### FREE TOOLS OR BOOKS

0-1" Vernier Micrometer (\$54 value)  
 6" Bearing ID Scale (\$11 value)  
 Audel Mini-Ref (\$30 value)  
 Sheave Gauge (\$24 value)  
 V-Belt Tension Tester (\$45 value)

**Class Details:** Each student will receive class books, work activity sheets, self-test progress evaluations, as well as questions from the instructor to make sure they understand the material presented. It is expected that an attendee will leave the class with the basic knowledge of the subject and possess new found skills to better equip them when they return to their job. A certificate suitable for framing will be issued to each attendee who successfully completes the course. Students receive \$164 worth of tools and books for FREE. Call, email or check the website for the next time this course is scheduled at the MTI training center or as a ZOOM interactive session. On-site sessions? Request a quick 48-hour turnaround quote. Revised: 12/23/2020