



# MAINTENANCE TROUBLESHOOTING INTERNATIONAL LLC

AFB-102

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## AFB-102 ANTI-FRICTION BEARINGS: INSTALLATION, TROUBLESHOOTING AND FAILURE ANALYSIS

Investigation into the types of bearings encountered in industry: mounted, un-mounted as well as the use of ball, needle, and roller bearings. Hands-on activities involve bearing identification, choice and installation as well as bearing disassembly for failure inspection. Learn how to use bearing fit tables, how to reduce clearance in a split pillow block bearing, and the feeler gauge technique for bearing alignment. Vibration measurement to determine a failing bearing and proper bearing lubrication procedures are part of the "hands-on" components of the course. The course explains "spalling" and how it happens which emphasis on listening for a bad bearing to spot problems before failure occurs. Each student gets a set of bearing fit tables as well as a bearing dimensional identification chart to allow correct replacement of bearings when the markings are missing. Learning how to use a vernier micrometer and transferring measurements using a telescope gauge are essential elements of the very popular course. Learn how to prolong the life of your bearings by making some simple changes in how you lubricate and install them.



### Types of Bearings and How They Are Made

- Purpose of a bearing
- Plain bearings and where they are used
- Construction
- Metal — bronze, brass, oilite
- Plastic — nylon, polypropylene, TFE, exotic
- Babbitt — poured and bored
- Antifriction bearings and where they are used
- Ball bearings
- Roller bearings
- Spherical bearings
- Special bearings: ceramic bearings, split bearings, pillow block bearings

### Bearing Life Equation

- Palmgren's fatigue equation
- Proper lubrication and installation
- The effect of force on bearing life

### Bearing Numbering Systems

- Series numbers - Basic numbers
- Internal clearance numbers
- How to ID an unknown bearing

### Bearing Classes of Fit

- The correct fit for your application
- Fitting bearing for pumps, blowers, and motors (common machinery)

### Measurement of Bearings, Shafts and Housings Against Specs

- Measurement using vernier micrometers and transferring measurement using telescope gauges
- Use of fitting tables
- Checking bores and shaft journals for bearing fit

### Unmounted Bearings

- Preparing the bearing for inspection
- Mechanical mounting and thermal mounting of bearings (what defines the method)
- Tools for mechanical mounting and tools for thermal mounting
- Removing a bearing when normal methods can be used
- Damaged bearing removal—burning with a torch vs. small cutting wheel

### Mounted Bearings

- Pillow block bearings
- Using the eccentric lock and the set screw
- Split pillow block bearings — simple do's and don't's
- Using the feeler gauge to reduce internal clearance.
- New technology mounted bearings—special cases for special problems

### Bearing Lubrication

- Oil lubrication methods vs. Grease lubrication
- Selecting the right lubricant
- Terminology & Properties
- Test procedures
- Flash and fire points
- Bearing operating environment
- Method to apply fluid lubricants
- Calculating amount of grease
- Calculating re-greasing interval

### Catching a Failing Bearing

- Beaching or breakfast cereal?
- "From the 1st Spall until That's All"
- Acoustical emission
- SEg, Shock Pulse, BDU
- Thermal methods

### CLASS FORMATS AVAILABLE

- MTI Hands-On Center \$995/person
- On-Site (Your Location) Ask for Quote

Quick Quote Available in 48 hrs.

### CLASS DURATION

2-days, 15 hours of instruction  
 40% Hands-On

### FREE TOOLS AND BOOKS

0-1" Micrometers (\$54 value)  
 6" Bearing ID Scale (\$11 value)  
 Audel's Mini-Ref (\$30 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. 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: 12/24/2020