

Bearing Maintenance Technology

Technical Proposal Scope

Bearings are critical components in a wide variety of machinery, enabling rotational or linear movement while reducing friction and handling stress. Understanding the different types of bearings, their designations, lubrication needs, fits and tolerances, appropriate tools, and common failure modes is essential for effective machinery maintenance and operation. This training program aims to provide comprehensive knowledge and practical skills to enhance participants' expertise in bearings.

Objectives

The primary objectives of this training program are to:

- Provide an in-depth understanding of different types of bearings.
- Educate participants on bearing designation systems.
- Equip participants with knowledge on selecting appropriate lubrication for bearings.
- Teach the principles of fits and tolerances as they apply to bearings.
- Introduce the tools used for bearing installation and maintenance.
- Identify and analyze common bearing failures and their causes.

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Terms To Understand

1. Types of Bearings

Topics Covered

- Overview of Bearings
- Rolling Element Bearings
 - Ball Bearings
 - Roller Bearings
 - Cylindrical Roller Bearings
 - Spherical Roller Bearings
 - Tapered Roller Bearings
 - Needle Roller Bearings
- Plain Bearings
 - Sleeve Bearings
 - Thrust Bearings
 - Flange Bearings
- Specialty Bearings
 - Magnetic Bearings
 - Fluid Bearings

Learning Outcomes

- Understand the basic principles and functions of various types of bearings.
- Identify different types of rolling element and plain bearings.
- Recognize applications for specialty bearings.

2. Bearing Designation

Topics Covered

- Bearing Numbering Systems
 - ISO Bearing Numbering
 - Manufacturer-Specific Numbering Systems
- Interpreting Bearing Codes
- Size and Dimension Series
- Load and Speed Ratings

Learning Outcomes

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- Interpret bearing designations and codes.
- Understand the significance of size and dimension series.
- Determine load and speed ratings from bearing codes.

3. Lubrication Selection

Topics Covered

- Importance of Lubrication
- Types of Lubricants
 - Grease
 - Oil
 - Solid Lubricants
- Factors Influencing Lubricant Selection
 - Temperature
 - Load
 - Speed
 - Environment
- Lubrication Methods
 - Manual Lubrication
 - Automatic Lubrication Systems

Learning Outcomes

- Recognize the importance of proper lubrication in bearing performance.
- Select appropriate lubricants based on operating conditions.
- Understand different lubrication methods and their applications.

4. Fits and Tolerances

Topics Covered

- Introduction to Fits and Tolerances
- ISO System of Limits and Fits
- Bearing Fits
 - Shaft Fits
 - Housing Fits
- Tolerance Classes
- Measuring and Achieving Proper Fits

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Learning Outcomes

- Understand the concepts of fits and tolerances in bearing applications.
- Identify appropriate fits for different bearing installations.
- Apply tolerance classes in practical scenarios.

5. Tools

Topics Covered

- Installation Tools
 - Bearing Pullers
 - Hydraulic Presses
 - Induction Heaters
- Measurement Tools
 - Micrometers
 - Calipers
 - Dial Indicators
- Maintenance Tools
 - Grease Guns
 - Oilers
 - Condition Monitoring Tools

Learning Outcomes

- Identify tools used for bearing installation, measurement, and maintenance.
- Demonstrate the proper use of installation and measurement tools.
- Utilize maintenance tools to ensure bearing longevity.

6. Bearing Failures

Topics Covered

- Common Types of Bearing Failures
 - Wear and Tear
 - Corrosion
 - Fatigue
 - Contamination
 - Improper Installation

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- Root Cause Analysis
- Preventive Measures
- Case Studies of Bearing Failures

Learning Outcomes

- Identify common bearing failure modes and their causes.
- Conduct root cause analysis for bearing failures.
- Implement preventive measures to avoid bearing failures.

Financial Proposal

- Total number of course days are 5 days --5 Hours / Day
- Total course hours are 25 hours
- The course includes 30 minutes break each session

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