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2076

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Mechanical

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المعهد الهندسي لخدمات التكنولوجيا والبرمجيات



Engineering office for Technology and Software Services

Mounting & Dismounting of Roller Bearing

Introduction
Equipps participants oruipping pricomaty

Objectives

- To equip trainees with knowledge
- Develop skills in mountingi-dismon

Content Outline

- 1 Bearing fundamentals
- 2 Tools & equipment
- 3 Mounting techniques
- 4 Dismounting methods
- 5 Inspection & diagnostics
- 6 Safety protocols
- 7 Practical demonstrations
- 8 Best practices & maintenance

Learning Outcomes

- Select and apply correct renicing
- Perform procedures safely
- Diagnostic ad address installactio issues
- Implement best practices for preventive maintenance

Audience
Maintenance engineers

- Fitters, and op-oxerators

Instruction Methods

Time Frame
2 days

Course Format
Blended

Code: 2076-MECH

(Professional Training Course)

Main Branch: United building – E Shams –Front NBE
, El Siouf _Alexandria

Tel: 01102060500-01144470856



الفرع الرئيسي : عمارات المتحدة – عمارة عين شمس – امام البنك
الاهلي – السيوف- الاسكندرية

تليفون: 01102060500 - 01144470856

E-mail. adelramadan@eotss-academy.com
info@eotss-academy.com



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Introduction

This course provides a comprehensive introduction to the principles, best practices, and techniques involved in the correct mounting and dismounting of roller bearings, with an emphasis on safety, precision, and machinery reliability.

Description

Participants will explore detailed methodologies for the handling, installation, and removal of various types of roller bearings. The course integrates real-world scenarios, interactive demonstrations, and evidence-based procedures to minimize damage and extend equipment life.

Objectives

- To equip trainees with essential knowledge of bearing types and applications.
- To develop practical skills in the safe and correct mounting/dismounting of roller bearings.
- To enhance troubleshooting abilities and preventive maintenance practices.

Outlines in Detail

1. **Bearing Fundamentals:** Types, construction, and applications
2. **Tools & Equipment:** Selection and use of tools for mounting/dismounting
3. **Mounting Techniques:** Mechanical, hydraulic, and thermal methods
4. **Dismounting Methods:** Safe removal procedures and risk mitigation
5. **Inspection & Diagnostics:** Identifying common failures and wear
6. **Safety Protocols:** PPE, work environment, and handling precautions
7. **Practical Demonstrations:** Hands-on exercises and troubleshooting
8. **Best Practices & Maintenance:** Recordkeeping and reliability optimization

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Out of Figure:-

1. Bearing Fundamentals: Types, Construction, and Applications

This module introduces the classification of roller bearings (e.g., cylindrical, spherical, tapered, needle), their internal construction, and materials used. Participants will analyze the engineering principles behind bearing load capacity, rotational accuracy, and common industrial applications in automotive, aerospace, and manufacturing sectors.

This section details the various specialized tools required for the safe handling, mounting, and dismounting of roller bearings, including pullers, hydraulic nuts, induction heaters, and mechanical presses. Emphasis is placed on the criteria for tool selection based on bearing type and installation environment, as well as routine inspection and maintenance of these tools.

3. Mounting Techniques: Mechanical, Hydraulic, and Thermal Methods

Participants will learn the step-by-step procedures for installing roller bearings using mechanical force (press fitting), hydraulic assistance (using hydraulic nuts or pumps), and thermal expansion (heating bearings to create interference fits). The advantages, limitations, and typical applications of each method will be discussed, referencing relevant ISO/ASTM standards.

4. Dismounting Methods: Safe Removal Procedures and Risk Mitigation

This part covers recommended dismounting techniques, with an emphasis on minimizing risk to equipment and personnel. Topics include the use of mechanical pullers, hydraulic tools, and heating devices, alongside the identification of potential failure modes resulting from improper removal.

5. Inspection & Diagnostics: Identifying Common Failures and Wear

Focuses on the visual and instrument-based inspection of roller bearings for signs of fatigue, spalling, brinelling, corrosion, and lubrication failure. Participants will learn to

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use tools such as vibration analyzers, endoscopes, and lubricating monitors for early detection and root cause analysis.

6. Safety Protocols: PPE, Work Environment, and Handling Precautions

Examines safety requirements, including the selection and use of personal protective equipment (PPE), maintaining clean and controlled environments, and best practices for handling heavy or large-diameter bearings. Includes case studies on workplace accidents and how they can be prevented through effective protocols.

7. Practical Demonstrations: Hands-On Exercises and Troubleshooting

Involves supervised practical sessions using real bearings and assemblies, allowing participants to develop hands-on skills in both correct and incorrect mounting/dismounting, followed by troubleshooting common installation errors and proposing corrective actions.

8. Best Practices & Maintenance: Recordkeeping and Reliability Optimization

Covers the establishment of systematic recordkeeping for bearing installations and removals, condition monitoring, scheduled lubrication, and alignment checks. Introduces strategies for maximizing bearing life and reliability through continuous improvement and data-driven maintenance.

What You Will Learn

Target Audience

- Maintenance engineers and technicians
- Mechanical fitters and supervisors

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- Plant operators and reliability specialists
- Vocational students in mechanical or industrial engineering

Materials

- Comprehensive course handbook (digital & print)
- Manufacturer technical datasheets
- Bearing mounting/dismounting toolkits
- Personal protective equipment (PPE) for practical sessions

Instruction Methods

- Interactive lectures and multimedia presentations
- Practical hands-on workshops
- Real-world case studies and group discussions
- Quizzes and knowledge assessments

Time Frame

- Total duration: 2 days (16 hours)
 - Day 1: Theory & Demonstration (8 hours)
 - Day 2: Hands-on Practice & Assessment (8 hours)

Course Format

- Blended learning (in-person and online components)
- Modular structure for flexible participation
- Certificate of completion awarded after final assessment

Learning Outcomes

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Upon completion, participants will be able to:

- Select and apply the correct tools and methods for mounting/dismounting roller bearings
- Perform procedures safely, minimizing equipment damage and personal injury
- Diagnose and address common bearing installation issues
- Implement best practices for preventive maintenance

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