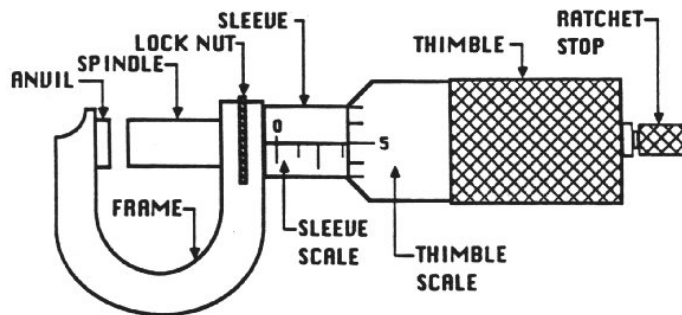


Maximizing Machinery Reliability... the skilled craftsman Seminar Synopsis

Abstract

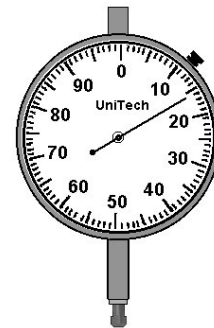
Today's world of rapidly evolving technology poses a wealth of challenges...just to remain abreast of the "latest and greatest;" *but what about the basics?* More and more companies are realizing the need to emphasize a precision mentality and re-focus on the fundamental skills required to achieve "precision."



This course addresses those fundamental skills, including proper use of precision measuring instruments such as dial indicators and micrometers, proper fastening and torquing procedures, precision fits, precision assembly techniques, and proper installation of couplings, gears, belt and chain drive components, bearings, and seals.

Throughout this seminar, instructor demonstrations reveal the impact of course content on machinery reliability, vibration levels, bearing life, etc. Crafts people will leave this seminar with *a refreshed understanding* of maintenance principles and procedures they had forgotten, never used, or never learned.

This seminar provides practical, easy-to-implement techniques for ensuring maintenance tasks are performed *confidently right the first time*. Root Cause Failure determination processes consistently demonstrate that human error in basic mechanical skills is too often the source of the problem.



Preventive procedures, problem-solving techniques and activities include:

- Measurement Tool Selection, Use, & Precautions
- Machinery Component Inspection Procedures
- Handling, Installation & Fit Procedures
- Fastening, Torquing & Tensioning Procedures
- Precision Assembly Techniques
- Good Lubrication Practices
- Precision Shaft Alignment Overview
- Bearing Fundamentals and Failure Prevention Overview

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Seminar Duration

The duration of this seminar ranges from 4 to 5 days depending on client preference, worker availability, and the attendees' backgrounds.

Who should attend?

This seminar is designed primarily for maintenance, engineering, technical support and management personnel whose job functions involve rotating machinery repair. The scope of content is appropriate for technicians who change bearings and seals, repair and restore plant machinery, and those who provide support for such tasks.

Highlights

In this seminar, you will gain knowledge and experience relating to:

- Maximizing Machinery Reliability Overview
- Dimensions, Fits, and Tolerances
- Precision Measurement Techniques
- Vibration Detection and Analysis Overview
- Shaft Alignment Fundamentals
- Fundamentals of Rolling Element Bearings
- Failure Prevention Procedures
- Precision Assembly Techniques

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the skilled craftsman

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Associated Task(s)

SKLT1: When given assigned maintenance tasks, perform the tasks in a manner that demonstrates proficient knowledge and skills with the fundamentals of precision maintenance, including:

- A. A precision mentality
- B. Effects of precision maintenance on vibration
- C. Proper interpretation of dimensions and tolerances
- D. Proper fitting practices
- E. Proper use of precision measurement tools
- F. Proper use of fasteners, torquing, and tensioning
- G. Precision assembly techniques
- H. Fundamental shaft alignment techniques
- I. Precision maintenance of belt drive systems
- J. Attention to fundamental bearing concepts

Seminar Objectives

Upon successful completion of the seminar, the student will be able to:

SKL1: Explain the benefits of precision maintenance and key components of a precision mentality.

SKL2: Explain and demonstrate how to interpret and apply dimensions, tolerances and fit information provided by manufacturers or facility-specific literature.

SKL3: Properly use the following instruments to obtain measurements with an accuracy of +/- the instrument's smallest graduation:

- A. Outside Micrometers
- B. Dial Indicators
- C. Precision Levels

SKL4: When given maintenance tasks that include use of fasteners, properly perform each of the following:

- A. Select the proper fasteners
- B. Determine the fastener torque
- C. Determine and use the proper torquing procedure and sequence.

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the skilled craftsman

Seminar Synopsis

- SKL5: Explain how vibration detection and analysis are used to enhance machinery reliability, including use of amplitude and frequency data.
- SKL6: When given various installation and assembly tasks, explain and demonstrate how to properly perform the given task, including:
- A. Proper use of keys, length, fits, & positioning
 - B. Proper use of set screws, length, & assembly
 - C. Minimizing eccentricity during assembly
 - D. Minimizing axial runout during assembly
- SKL7: When given alignment tasks that include direct-coupled machines, properly perform each of the following:
- A. Determine the purpose/type of alignment task.
 - B. Select an alignment method.
 - C. Perform all pre-alignment checks.
 - D. Perform a rough-in and precision soft foot check and correction procedure.
 - E. Briefly explain methods and procedures used for precision alignment.
 - F. Briefly explain alignment precautions for special or advanced alignment conditions.
- SKL8: When given maintenance tasks that include use of a belt drive system, properly perform each of the following:
- A. Install sheaves and belts
 - B. Properly align belt drive components
 - C. Properly tension belt(s)
 - D. Properly inspect and troubleshoot belt drive systems and components
- SKL9: Explain the following fundamental rolling element bearing concepts:
- A. Bearing life and load criteria
 - B. Major types of rolling element bearings and loads supported
 - C. Fundamental bearing specification terminology
 - D. Categories of bearing failures
 - E. Good bearing lubrication practices