

Laser Alignment

Description

This course is designed as a very thorough and complete alignment class for Industrial Equipment. Several types and methods of alignment will be covered so that the participant will be able to go back to their plant and apply the method available to them. In this course basic machinery alignment will be taught and several methods of alignment conditions will be covered. Some of the methods taught in this class are as follows: Straight Edge Alignment, Precision Straight Edge Alignment, Dial Indicator Align-

ment, Reverse Dial Indicator Alignment, Rim and Face Alignment, Face to Face Alignment, Jack Shaft Alignment, Coupling Alignment, with a major emphasis placed on Laser Alignment. We will teach the participants how to calculate the misalignment error by the following methods: Graphical Alignment, Mathematical Formulas Alignment, Computer Assisted Alignment and using the Laser with its on board computer to calculate the error.

Outline

- The Importance of Proper Shaft Alignment
- Symptoms of Misalignment
- History of Machinery Alignment
- Foundations, Baseplate and Piping
- Flexible and Rigid Couplings
- Various Types of Couplings
- Defining Misalignment
- Alignment and coupling Tolerances
- Shaft-vs.-Coupling Alignment
- Preliminary Alignment Checks
- Shaft Alignment Techniques and Measuring Tools
- Slide Calipers, Micrometers and Dial Indicators
- Lasers and Detectors
- Rim and Face Alignment
- Reverse Indicator Method
- Shaft to Coupling Method
- Face to Face Method
- Dial Indicator, Shaft Alignment Measurement Systems
- Advantages of Laser Alignment
- Laser Alignment Procedures
- Applications of Laser Alignment
- Mathematical Relationships in Machinery Align.
- Graphical Alignment Techniques
- Computer Assisted Calculations
- "On Board" Laser Alignment Calculations
- Calculating Thermal Growth
- Adjustments for Thermal Growth
- "Hot" Alignment-vs.-"Cold" Alignment
- Aligning V-Belt Drives
- Moving Machinery in the Field
- Alignment of Multiple Element Drive Trains
- Alignment Considerations for Specific Equipment Such as; Electric Motors, Pumps, Gear Boxes, Compressors, Cooling Towers, Blowers and Fans, Internal Combustion Engines
- Misalignment Severity
- Vibrations Caused by Misalignment
- The use of Infrared Thermography to Detect Misalignment

Prerequisites

There are no prerequisites required for this course other than an interest in laser leveling and a willingness to participate in an instructor led hands-on classroom environment.

Course Length

24 hours/ Up to 12 participants.

Performance Objectives

At the completion of this course the participant will be able to:

- Calculate and allow for thermal growth as it applies to precision alignment.
- Take a new installation and align it correctly.
- Determine the correct moves needed to precision align rotating equipment.
- Efficiently align motor installations.