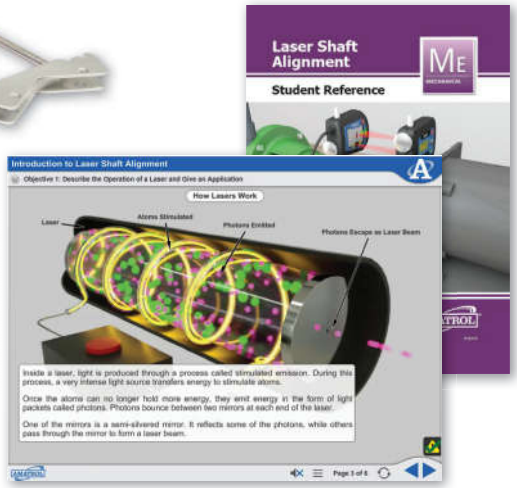
Laser Shaft Alignment Learning System

97-ME2A

MECHANICAL

97-ME2A



Interactive Multimedia Curriculum and Student Reference Guide

Learning Topics:

- Laser Alignment Systems
- Safety Rules
- Rough Alignment
- Jack Bolts
- Laser Shaft Alignment Installation
- Laser Shaft Alignment Operation
- Soft Foot Correction
- Laser Shaft Alignment Analysis
- Shaft Alignment Tolerances

The Laser Shaft Alignment Learning System (97-ME2A) covers the installation, operation, and applications of laser shaft alignment in a variety of industrial scenarios. Laser shaft alignment is the preferred method of shaft alignment among maintenance and plant engineering personnel due to its superior efficiency and accuracy over older methods like the dial indicator method or the straight edge and feeler gauge method. Laser shaft alignment systems also avoid problems such as sagging indicators, reading resolution error, and reading parallax error. These components add to the Mechanical Drives 2 Learning System (97-ME2) and the Mechanical Drives 1 Learning System (970-ME1).

The Laser Shaft Alignment Learning System includes a laser alignment system, two measuring units, two shaft v-brackets, two locking chains, and a motor mount horizontal adjustment assembly. Amatrol learning systems are composed of heavy-duty components that provide learners with real-world equipment they'll recognize on the job and already understand how to use. These components will be used to study topics like rough alignment, laser shaft alignment installation, soft foot correction, and laser shaft alignment operation and analysis.

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Technical Data

Complete technical specifications available upon request.

Laser Alignment System with Mounting Hardware
- Carrying Case
- Display Unit
- Measuring Units (2)
- Shaft V-Brackets (2)
- Measuring Tape
- Locking Chains (2)
- Chain Tightening Rod
- 12V DC 3A Power Supply
- Micro USB to USB Cables (2)

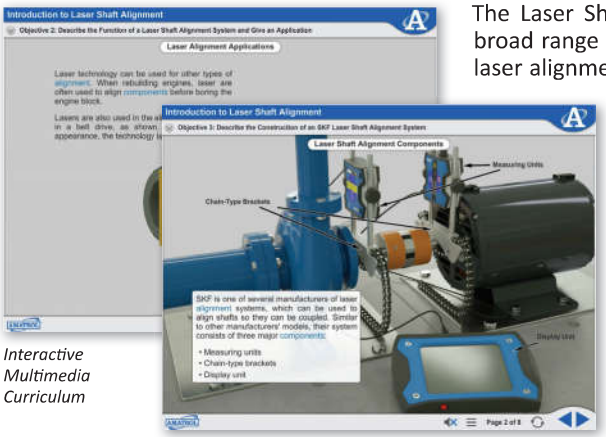
Motor Mount Horizontal Adjustment Assembly
Multimedia Curriculum (M19166)
Instructors Guide (C19166)
Installation Guide (D19166)
Student Reference Guide (H19166)
Additional Requirements:
- Mechanical Drives 2 Learning System (97-ME2)
- Mechanical Drives 1 Learning System (970-ME1)

Install and Align a Power Transmission System using a Jack Bolt Motor Base

Misalignment of power transmission system components is a major cause of excess wear and premature machine failure. When a misaligned machine is allowed to operate uncorrected, the resulting vibration will eventually cause bearing, shaft, seal, and coupling failure. This is why laser alignment systems are so vital. Within the Laser Shaft Alignment Learning System, learners will practice hands-on laser alignment skills, such as: install and align a power transmission system using a jack bolt motor base; using a laser alignment system to correct soft foot; and determine shaft alignment tolerances for a given machine installation.

Requires 970-ME1 and 97-ME2

Use a Laser Alignment System to Align Two Shafts



Interactive Multimedia Curriculum

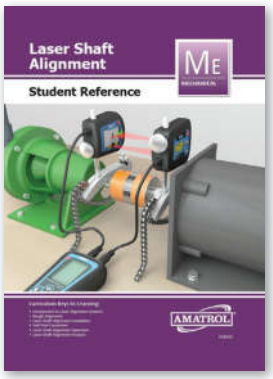
The Laser Shaft Alignment curriculum covers a broad range of topics, including: safety rules for laser alignment system operation; the operation of an SKF laser shaft alignment system; and how to align two shafts using a laser alignment system. The curriculum for the laser shaft alignment learning system is presented in an interactive multimedia format. This multimedia features all of the content from Amatrol's printed curriculum and adds stunning 3D graphics, video, audio voiceovers, and interactive quizzes.

Amatrol's Extensive Line of Mechanical Drives Expansion Systems

Because the Laser Shaft Alignment Learning System requires the Mechanical Drives Learning System, the opportunity to explore a wider range of mechanical drive topics and skills is available through additional expansion learning systems. Other Mechanical Drive 1 expansion options include: bearings and right angle gears used in heavy duty mechanical transmission systems (97-ME3); linear axis drives, clutches, and brakes (97-ME4); machine tool axis drives based on roller-pack type bearings (97-ME4-A) and plain bearings (97-ME4-B); flat belt conveyors (97-ME4-D) and tool chip conveyors (97-ME4-E); and more!

Student Reference Guide

A sample copy of the Laser Shaft Alignment Student Reference Guide is also included with the system for your evaluation. Sourced from the system's curriculum, the Student Reference Guide takes the entire series' technical content contained in the learning objectives and combines them into one perfectly-bound book. Student Reference Guides supplement this course by providing a condensed, inexpensive reference tool that learners will find invaluable once they finish their training making it the perfect course takeaway.



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LASER SHAFT ALIGNMENT LEARNING SYSTEM
This unit shall add to a separately specified mechanical drive workstation to teach how to setup, operate and apply laser shaft alignment to a variety of industrial applications. Shall include shaft alignment system, carrying case, student curriculum and teacher's assessment guide.

Shaft Alignment System
Shall meet the following specifications and include the following components:

- 29mm (1.1 in.) CCD with red line laser Class 2
- 0.07 – 4m (0.23 to 13.1 f) system measuring distance
- 120 x 90 x 36 mm (4.7 x 3.5 x 1.4 in.) dimensions
- 180 g (0.4 ib.) weight
- 5.6 in. color resistive touchscreen LCD display
- 7 hours continuous operating time

Carrying Case

- Measurement units (M&S)
- Display unit
- Shaft brackets with chains 400 mm (15.8 in.) and threaded rods 150 mm (5.9 in)
- Chain tightening rod
- Power supply
- Micro USB to USB cables
- Measuring tape

Student Curriculum
The student curriculum supplied shall be designed in a skill-based format that focuses on teaching industry-relevant tasks. The objectives shall be accomplished by organizing the learning material into a series of interactive multimedia modules, which are further subdivided into three or more segments per module. All learning materials needed shall be contained in the course including text material, laboratory equipment activities, and multimedia directions. No external text sources shall be required. The specific cognitive skills taught by each text passage shall be identified next to the passage. Each lab activity shall be identified by the industrial task taught. All activities shall be highly detailed with step-by-step instructions to facilitate a self-directed learning environment. A combination of step-by-step enabling activities and creative, problem-solving activities shall be provided. A self-review of five to ten questions shall be provided after each segment. The curriculum must be capable of both self-directed and instructor directed study. All activities must correlate directly to the hardware supplied, with detailed illustrations and diagrams.

The student curriculum shall consist of one (1) course of two (2) multimedia modules that shall contain at least five (5) industry skills covering the following topics: introduction to laser alignment systems, rough alignment, laser shaft alignment installation, soft foot correction, laser shaft alignment operation, and laser shaft alignment analysis. The curriculum must be capable of completely self-directed and instructor directed study. All subject content as well as hands-on activities shall be included in the student curriculum. All activities must correlate directly to the hardware supplied, with detailed illustrations and diagrams.

Teacher's Assessment Guide
The teacher's assessment guide shall contain student data sheets, data sheet solutions, self review answers, quizzes, quiz answers, student skill record sheets, and assessment directions. The student data sheets shall be designed with data collection blanks to permit students to record data without consuming the learning activity packets. A quiz shall be provided for each packet. A question shall be provided in each quiz for each cognitive objective taught and correlated as such. All tasks listed in the packet shall be listed on personalized student record sheets. The teacher's assessment guide shall include methods for both cognitive objective assessment and authentic skill assessment, with all skill assessment criteria explained in detail.

Amatrol Model No. 97-ME2A or equal

97-ME2A
LASER SHAFT ALIGNMENT LEARNING SYSTEM

MODULE 1 INTRODUCTION TO LASER SHAFT ALIGNMENT

SEGMENT 1	**INTRODUCTION TO LASER ALIGNMENT SYSTEMS**
OBJECTIVE 1	Describe the operation of a laser and give an application
OBJECTIVE 2	Describe the function of a laser shaft alignment system and give an application
OBJECTIVE 3	Describe the construction of an SKF laser shaft alignment system
OBJECTIVE 4	Describe the operation of an SKF laser shaft alignment system
OBJECTIVE 5	List four operation safety rules for a laser alignment system
Activity 1	SKF Shaft alignment system component identification
SEGMENT 2	**ROUGH ALIGNMENT**
OBJECTIVE 6	Describe the function of jack bolts in the installation of a mechanical device
OBJECTIVE 7	Describe the operation of jack bolts used to align a motor shaft
OBJECTIVE 8	Describe how to perform a rough alignment on a power transmission system
SKILL 1	Install and align a power transmission system using a jack bolt motor base
SEGMENT 3	**LASER SHAFT ALIGNMENT INSTALLATION**
OBJECTIVE 9	Describe how to install and adjust a laser shaft alignment system
SKILL 2	Install and adjust an SKF shaft alignment system

MODULE 2 LASER SHAFT ALIGNMENT OPERATION

SEGMENT 1	**SOFT FOOT CORRECTION**
OBJECTIVE 1	Describe how to use a laser shaft alignment system to correct soft foot
SKILL 1	Use a laser alignment system to correct soft foot
SEGMENT 2	**LASER SHAFT ALIGNMENT OPERATION**
OBJECTIVE 2	Describe how to align two shafts using a laser alignment system
SKILL 2	Align two shafts using a laser alignment system
SEGMENT 3	**LASER SHAFT ALIGNMENT ANALYSIS**
OBJECTIVE 3	Describe how to determine shaft alignment tolerances in a power transmission system
SKILL 3	Determine shaft alignment tolerances for a given machine installation