



Shovel Mechanical Systems Training

Course Duration

Four days

Target Audience

This training is targeted for Mechanical Maintenance and Supervisory personnel responsible for preventive and corrective maintenance and servicing of P&H electric mining shovels.

Description

The course introduces the student to the operation and maintenance of P&H electric mining shovels. It focuses on critical knowledge and skills required in supporting P&H electric mining shovels. All mechanical systems and adjustments are discussed. Recommended preventive and corrective maintenance procedures and practices are reviewed. Actual hands on training and troubleshooting on simulated shovel working components and systems is conducted in our training lab.

Prerequisites

Students should have a basic knowledge of mechanical terminology and practical experience with maintenance equipment.

It is also suggested that students complete the following eLearning training modules: Product Overview, General Assembly Procedures, Disc Brakes, Theory of Operation of the Propel, Swing, Hoist and Crowd Systems and Compressed Air and Lubrication systems.

Course Location

Milwaukee

Course Objectives

Upon completion of this course the student will be able to:

- Locate and identify major mechanical systems, subsystems and components.
- Identify and use available P&H reference material to operate or maintain the shovel.
- Understand the design and function of the various shovel mechanical systems.
- Conduct preventive maintenance inspections.
- Perform maintenance adjustments and repairs.
- Recognize safety hazards associated with inspection, repair and maintenance of shovel mechanical systems.

Main Concepts

- Review of relevant P&H reference material
- Shovel motions and major components
- Lower machine structure and Propel system
- Revolving Frame and Swing system
- Hoist system
- Boom assembly and Crowd system
- Machinery House and Ventilation system
- Compressed Air system
- Brake system
- Automatic Lubrication system
- Inspections, tests and adjustments of major mechanical systems
- Preventive and corrective maintenance procedures

Course Content

Sources of Information

- Mechanical Maintenance Manual
- LinkOne Parts Book
- Service Bulletins and Service Notices

Shovel Orientation and Introduction

- Shovel Orientation
- Mechanical and Structural Overview

Safety Overview

- Electrical and Mechanical Hazards
- Stored Mechanical Energy

General Assembly Procedures

- Bolt Torquing Principles and Practices
- Bolt Tensioning
- “SuperNuts”
- Bearing Types and Adjustment

Shovel Systems: Propel

- Lower Structure and Lower Works
- Propel System Overview
- DELTA Drive System
- Crawler Track Tension Adjustment

Shovel Systems: Machinery House

- House Ventilation and Pressurization
- AirScrubPro

Shovel Systems: Swing

- Swing System Overview
- Center Gudgeon Nut Adjustment

Shovel Systems: Hoist

- Hoist System Overview

Shovel Structures: Attachment

- Boom, Handles and ABSS

Shovel Systems: Dippers

- Dipper Wear Components
- Dipper Trip Mechanism
- “SnubRite” Snubbers
- Pitch Braces

Shovel Systems: Crowd

- Crowd System Overview
- Crowd Belt Replacement and Tensioning
- Shipper Shaft and Saddle Block Adjustments

Shovel Systems: Compressed Air System

- Air System Overview
- Air Compressor
- Air System Control
- Brake Air System
- Lube Air System

Shovel Systems: Disc Brakes

- Operation and Components Overview
- Disc Brake Safety
- Disc Brake Maintenance

Shovel Systems: Lubrication System

- Types of Lubricants
- Motor and Gearcase Lubrication
- Automatic Lubrication System Overview