Maintaining a skilled, knowledgeable workforce is a challenge everyone faces. With changing technologies and fluctuations within the mining industry, it can be especially daunting. Whether you need training for a new hire or a veteran, it can be difficult to find training that is engaging, technologically relevant and easy to fit into busy schedules. The technical communication and training group within P&H Mining Equipment, strives to provide you with the knowledge, skills and competencies needed for your employees to achieve their highest performance potential.

Product Training and Publications has identified eLearning as the primary delivery method for the knowledge components of Fundamental and Product Specific Training. eLearning provides several advantages over traditional training methods:

- eLearning content can be accessed on any computer that has Internet access by any individual who has the appropriate login and password credentials.
- Immediate availability of training content. Students receive the training they require right now, when the training is required most. This provides a quicker, more productive workforce.
- Reduces the cost of training by eliminating travel, living, and other expenses associated with Instructor Led Training.
- Provides students with the ability to learn at their own pace and in their own comfortable environment.
- Improved retention of technical and operational content.
- The training content can be delivered to a large contingent of people in varying locations and be technically consistent across the board.
- Training content can be tailored to an individual's personal strengths and weaknesses. This provides a targeted more effective training solution for today's workforce.
- When used as a prerequisite to Instructor Led Training, eLearning can level the playing field between novice and senior personal. This makes the Instructor Led Training more effective by allowing the Instructor to spend more time developing skills rather than knowledge based components.

This Course Catalog contains descriptions of the eLearning Lessons available to you through Product Training and Publications.

**Lesson Duration:**
Each eLearning Lesson is designed to be 45 minutes in duration. However, because eLearning is self-paced training, actual duration may vary per student.

**Target Audience:**
Loader Operators, Technicians, and Engineers who will operate and/or perform maintenance on Generation 2 P&H Wheel Loader.

**Prerequisites:**
Students should have a basic working knowledge of computers, and fundamental understanding of electronics, mechanics, pneumatics, hydraulics, operation, etc., as it applies to the systems of a Generation 2 P&H Wheel Loader.

**Lesson Location:**
eLearning content can be accessed on any computer that has Internet access by any individual who has the appropriate login and password credentials.
Computer Requirements:
It is recommended that all computers accessing eLearning content have the basic minimum requirements:
- Internet Explorer version 7 or better.
- Flash Player version 8 or better.
- Java version 1.5 or better.
- Latest version of Windows Media Player.
- Adobe Reader version 8 or better.

Gen 2 Loader Maintenance eLearning

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Lesson 6.4 | Component Heaters
Module 4 Mechanical System

Lesson 3.10 Loader Introduction

Lesson Description:
In this Lesson you will learn about the different motions associated with a P&H Wheel Loader Generation 2 and the controls used by the Operator.

Objectives:
- Be able to describe the different motions associated with P&H Wheel Loaders.
- Be able to describe the basic Operator Controls.

Lesson Outline:
- Topic 1 Motions
- Topic 2 Loader Controls

Lesson 3.11 Orientation Basics

Lesson Description:
In this lesson the student will learn where common loader components are located and get a brief description of their purpose.

Objectives:
- Understand the general description of the P&H Wheel Loaders.
- Describe the interior components associated with P&H Wheel Loaders.

Lesson Outline:
- Topic 1 - Loader Overview
- Topic 2 - Major Components

Lesson 3.12 Mechanical Basics

Lesson Description:
This lesson provides basic information about Mechanical Components and Systems used on P&H Wheel Loaders.

Objectives:
Understand and identify the mechanical components and systems that are found on P&H Wheel Loaders.

Lesson Outline:
- Topic 1 – Structural Components
- Topic 2 – Hydraulics
- Topic 3 – Grease (Auto Lube) System
- Topic 4 – Compressed Air System
Lesson 3.13 Electrical Basics

Lesson Description:
This lesson provides basic information about Electrical Systems and Components used on P&H Wheel Loaders.

Objectives:
- Understand and identify the electrical systems and components that are found on P&H Wheel Loaders.

Lesson Outline:
- Topic 1 – Generator
- Topic 2 – SR Motors
- Topic 3 – SR Drive System
- Topic 4 – LINCS II
- Topic 5 – Component Heaters

Module 4 Mechanical System

Lesson 4.1 Structural

Lesson Description:
This Lesson will provide a base knowledge of the 120A Drills Power Unit. Descriptions and locations of the various components will be provided to give a better understanding of the Drills new system.

Objectives:
Upon completion of this Lesson the student will:
- Understand the basic principles of the Theory of Operation of the structural components.
- Learn about the component descriptions and how to identify them.
- Understand the settings and adjustments.

Lesson Outline:
- Topic 1 – Theory of Operation
- Topic 2 – Component Description
- Topic 3 – Settings and Adjustments
- Topic 4 – Troubleshooting
Lesson 4.2 Field Welding

Lesson Description:
This lesson provides basic information about Field Welding on P&H Wheel Loaders.

Objectives:
Upon completion of this Lesson the student will:
• Understand the Warnings, Cautions and Precautions as they relate to welding repairs on P&H Wheel Loaders.
• Understand the applicable welding standards for P&H Wheel Loaders.
• Understand generic structural repair welding procedures used on P&H Loaders.

Lesson Outline:
• Topic 1 – General Welding Practices
• Topic 2 – Generic Structural Repair Welding Procedure

Lesson 4.3 Planetary Drive

Lesson Description:
This lesson provides basic information about Planetary Drives used on P&H Wheel Loaders.

Objectives:
Upon completion of this Lesson the student will:
• Understand the planetary drive and traction motor removal and replacement procedures for P&H Wheel Loaders.
• Understand traction motor maintenance and repair.
• Understand how to determine the need for repair/rebuild of a planetary drive.
• Understand the installation for traction motor and planetary drive into the axle.
• Understand the servicing requirements after the planetary drive repair and replacement.

Lesson Outline:
• Topic 1 – Basic Operation and Component Description
• Topic 2 – Traction Motor Maintenance and Repair
• Topic 3 – Determining the Need to Repair/Rebuild a Planetary Drive
• Topic 4 – Removal of Planetary Drive and Traction Motor Assembly
• Topic 5 – Installation of Traction Drive Motor onto Planetary Drive
• Topic 6 – Servicing Requirements After Planetary Drive Repair or Replacement
Lesson 4.4 Hydraulic Pump Drive (HPD)

Lesson Description:
This lesson provides basic information about the Hydraulic Pump Drive used on P&H Wheel Loaders.

Objectives:
Upon completion of this Lesson the student will:
- Understand the theory of operation of the hydraulic pump drive used on P&H Wheel Loaders.
- Understand the component descriptions of the hydraulic pump drive.
- Understand the circuit description for the HPD gearbox oil.

Lesson Outline:
- Topic 1 – Theory of Operation
- Topic 2 – Component Description
- Topic 3 – Circuit Description for HPD Gearbox Oil

Lesson 4.5 Balls, Caps and Pins

Lesson Description:
This lesson provides basic information about the Balls, Caps and Pins used on P&H Wheel Loaders.

Objectives:
Upon completion of this Lesson the student will:
- Understand the theory of operation of the balls, caps and pins used on P&H Wheel Loaders.
- Understand the lubrication methods for the balls, caps and pins.

Lesson Outline:
- Topic 1 – Theory of Operation
- Topic 2 – Ball Lubrication Methods
- Topic 3 – Temperature Limits
- Topic 4 – Bronze Liner Thickness
- Topic 5 – Bronze Liner Edge Chamfer
- Topic 6 – Socket Flatness
- Topic 7 – Ball Cap Socket Alignment
Lesson 4.6 Bucket and Teeth

**Lesson Description:**
This lesson provides basic information about the Bucket and Teeth used on P&H Wheel Loaders.

**Objectives:**
Upon completion of this Lesson the student will:
- Understand the operation of the bucket and teeth used on P&H Wheel Loaders.

**Lesson Outline:**
- Topic 1 – VL-09 ESCO Top Lock Maintenance
- Topic 2 – VL-42a ESCO Loadmaster Lip Loader Installation Instructions
- Topic 3 – VL-43a ESCO Welding Procedures
- Topic 4 – VL-101a ESCO Construction Products Usage and Maintenance

Lesson 4.7 Ladders

**Lesson Description:**
This lesson provides basic information about the ladders used on P&H Wheel Loaders.

**Objectives:**
Upon completion of this Lesson the student will:
- Understand the operation and types of ladders used on P&H Wheel Loaders.

**Lesson Outline:**
- Topic 1 – Ladders
- Topic 2 – Powered Access Ladder “Power Step Model RL1001 & 1002”
- Topic 3 – Powered Access Ladder Hedweld Model “C”
- Topic 4 – Powered Access Ladder “P&H Model”

Lesson 4.8 Tire and Rims

**Lesson Description:**
This lesson provides basic information about the tires and rims used on P&H Wheel Loaders.

**Objectives:**
Upon completion of this Lesson the student will:
- Understand the operation of the tires and rims used on P&H Wheel Loaders.

**Lesson Outline:**
- Topic 1 – Theory of Operation
- Topic 2 – Component Description
- Topic 3 – Tires
- Topic 4 – Settings and Adjustments
Lesson 4.9 Engine

**Lesson Description:**
This lesson provides basic information about the engine used on P&H Wheel Loaders.

**Objectives:**
Upon completion of this Lesson the student will:
- Understand the basic operation of the engines used on P&H Wheel Loaders.

**Lesson Outline:**
- Topic 1 – Theory of Operation
- Topic 2 – Component Description
- Topic 3 – Troubleshooting

Lesson 4.10 Fire Suppression

**Lesson Description:**
This lesson provides basic information about the fire suppression systems used on P&H Wheel Loaders.

**Objectives:**
Upon completion of this Lesson the student will:
- Understand the basic operation of the Fire Suppression systems used on P&H Wheel Loaders.

**Lesson Outline:**
- Topic 1 – Theory of Operation
- Topic 2 – Component Description
- Topic 3 – Troubleshooting

Module 5 Air System

Lesson 5.1 Compressed Air System

**Lesson Description:**
The information provided in this lesson is intended as an introduction to the compressed air system and components used on P&H Wheel Loaders.

**Objectives:**
Upon completion of this Lesson the student will:
- Identify components of the compressed air system.
- Usage of air components powered by the compressed air system.
- Identify auxiliary components of the compressed air system.

**Lesson Outline:**
- Topic 1 – Overview
- Topic 2 – Compressed Air Components
- Topic 3 – Auxiliary Air Components
Lesson 5.2 Brakes

Lesson Description:
This lesson provides basic information on the service brake system and park brake system as it relates to the Air System on P&H Wheel Loaders.

Objectives:
Upon completion of this Lesson the student will:
- Understand the Air Brake system
- Identify the common components of the Air Brake system
- Identify the brake controls

Lesson Outline:
- Topic 1 – Overview
- Topic 2 – Compressed Air Components

Lesson 5.3 Cooling Air (KLENZ)

Lesson Description:
This lesson provides basic information on the Cooling Air - KLENZ™ system on P&H Wheel Loaders.

Objectives:
Upon completion of this Lesson the student will:
- Identify components of the KLENZ™ System.

Lesson Outline:
- Topic 1 – Overview of Cooling Air – KLENZ™
- Topic 2 – System Components
- Topic 3 – Control

Lesson 5.4 Air Conditioning

Lesson Description:
This lesson provides basic information on the air conditioning system on P&H Wheel Loaders.

Objectives:
Upon completion of this Lesson the student will:
- Identify the major components of the Air Conditioning System
- Identify the major components of the Heating System
- Understand the controls for the Air Conditioning and Heating Systems

Lesson Outline:
- Topic 1 – Overview of the Air Conditioning System
- Topic 2 – Common Components of the Air Conditioning System
- Topic 3 – Heating System
- Topic 4 – Control
Module 6 Electrical System

Lesson 6.1 SR Drive System

Lesson Description:
This lesson provides a brief description of the SR Drive System.

Objectives:
Upon completion of this Lesson the student will:
• Understand the basic principles of switched reluctance operation.

Lesson Outline:
• Topic 1 – Theory of Operation
• Topic 2 – Component Descriptions
• Topic 3 – Circuit Descriptions

Lesson 6.2 LINCS II Part 1

Lesson Description:
This lesson provides a brief description of the LINCS II/24 Volt DC System.

Objectives:
Upon completion of this Lesson the student will:
• Understand the basic principles of the LINCS II/24 Volt DC System.
• Understand how the LINCS II/24 Volt DC System operates.
• Understand the circuit descriptions related to the LINCS II/24 Volt DC System.

Lesson Outline:
• Topic 1 – Theory of Operation
• Topic 2 – Component Descriptions
• Topic 3 – Circuit Descriptions
• Topic 4 – Troubleshooting
Lesson 6.3 LINCS II Part 2

Lesson Description:
This lesson provides a brief description of the LINCS II/24 Volt DC System.

Objectives:
Upon completion of this Lesson the student will:
• Navigate through the LINCS II/24 Volt DC System.

Lesson Outline:
• Topic 1 – Navigation

Lesson 6.4 Component Heaters

Lesson Description:
This lesson provides a brief description of the Component Heaters available for use on the P&H Wheel Loaders.

Objectives:
Upon completion of this Lesson the student will:
• Understand the basic principles of the Theory of Operation of the Component Heaters.
• Learn about the different types of heaters on the P&H Wheel Loaders and their specific functions.
• Understand the circuit descriptions related to the individual heaters.
• Understand the settings and adjustments of the individual heaters.

Lesson Outline:
• Topic 1 – Theory of Operation
• Topic 2 – Component Descriptions
• Topic 3 – Circuit Descriptions
• Topic 4 – Settings and Adjustments
• Topic 5 – Troubleshooting