Electric Drive Wheel Loader Technical Training Course Catalog

KOMATSU

Product Training and Publications

Contents

Global Mining Solutions eLearning

Product Training and Publications has identified eLearning as a delivery option for fundamental knowledge and product specific training. eLearning provides several advantages over traditional training methods:

- eLearning content can be accessed through the Internet by any individual who has the appropriate login and password credentials.
- Immediate availability of training content which provides a quicker, more productive workforce.
- Online training reduces the cost of training by eliminating travel, living, and other expenses associated with Instructor-Led Training.
- eLearning provides students with the ability to learn at their own pace and in their own comfortable environment.
- The training content can be delivered to a large contingent of people in varying locations and be technically consistent across the board.
- When used as a prerequisite to Instructor-Led Training, eLearning can level the playing field between novice and senior personnel. 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 Komatsu Generation 2 Electric Drive Wheel Loaders.

Prerequisites:
Students should have a basic working knowledge of computers, and a fundamental understanding of electronics, mechanics, pneumatics, hydraulics, etc., as it applies to the systems of the Komatsu Generation 2 Electric Drive Wheel Loader.

Lesson Location:
eLearning content can be accessed through the Internet 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
- Adobe Reader version 8 or better

Note:
The eLearning content is periodically revised and updated.

Terms and Conditions:

Gen 2 Electric Drive Wheel Loader eLearning - English

Product Introduction

Gen 2 Loader General Safety Practices

Lesson description:
In this lesson the student will learn about the General Safety issues associated with Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will be able to:

- State the purpose of a Lockout/Tagout program
- Identify sources of safety information/references
- Identify the responsibilities of all crew members
- State the purpose of planning a job

Lesson outline:

- Topic 1 – Lockout/Tagout
- Topic 2 – Safety Sources
- Topic 3 – Responsibility of All Crew Members
- Topic 4 – Planning the Job

Gen 2 Loader Electrical Hazards

Lesson description:
It would be impossible to try and detail every electrical hazard that could be associated with Komatsu Electric Drive Wheel Loaders. With that understanding, this lesson will identify some common-sense electrical safety rules can be used to be safe while working on the electrical equipment.

Along with these common-sense electrical safety rules, this lesson includes how to perform a general risk analysis that will help identify those electrical hazards that are associated with your situation.

Objectives:
Upon completion of this lesson the student will be able to:

- Identify and describe safety concerns on Komatsu Electric Drive Wheel Loaders as related to electrical hazards
- Describe how to perform a risk analysis of the electrical system
- State the definition of Electrostatic Discharge (ESD) and explain how to avoid damaging equipment through the transfer of static energy

Lesson outline:

- Topic 1 – General Electrical Safety
- Topic 2 – Risk Analysis
- Topic 3 – Electrostatic Discharge (ESD)

Gen 2 Loader Noise Hazards

Lesson description:
This lesson will provide some common-sense noise hazard prevention advice that can be used to be safe while working on the equipment.

Objectives:
Upon completion of this lesson the student will be able to:

- Identify and describe safety concerns as related to noise hazards

Lesson outline:

- Topic 1 – Noise Sampling
- Topic 2 – Hearing Safety

Gen 2 Loader Mechanical Hazards

Lesson description:
It would be impossible to try and detail every mechanical hazard that could be associated with Komatsu Electric Drive Wheel Loaders. With that understanding, this lesson will identify some common-sense mechanical safety rules that can be used to be safe while working on the equipment.

Along with these common-sense mechanical safety rules, this lesson includes how to perform a general risk analysis that will help identify those mechanical hazards that are associated with your particular situation.

Objectives:
Upon completion of this lesson the student will be able to:

- Identify and describe safety concerns on Komatsu Electric Drive Wheel Loaders as related to mechanical hazards
- Describe how to perform a risk analysis of the mechanical system

Lesson outline:

- Topic 1 – General Mechanical Safety
- Topic 2 – Risk Analysis

Gen 2 Loader Fire Hazards

Lesson description:
This Lesson provides information on the different types and classes of fires and the types of fire extinguishers used on Komatsu Electric Drive Wheel Loaders and how to use them and provides some basic fire safety rules to follow while performing work on Komatsu Electric Drive Wheel Loaders.

The information provided in this lesson is intended as an introduction to fires, fire extinguishers, and fire safety. It is not a comprehensive reference. Be aware that fires are dangerous, and many aspects of fire safety are not discussed here. For more in-depth information, refer to the ordinances of your local, state, country, province, region, etc.

Objectives:
Upon completion of this lesson the student will be able to:

- Identify different types of fires and explain their different characteristics
- Explain how to use the fire extinguisher provided on the equipment
- Explain the Automatic Fire Suppression System (provided on some Komatsu Electric Drive Wheel Loaders)
- Identify basic fire prevention rules as they apply to Komatsu Electric Drive Wheel Loaders

Lesson outline:

- Topic 1 – Types of Fires
- Topic 2 – Fire Extinguishers
- Topic 3 – Fire Prevention and Control

Gen 2 Loader Operational Hazards

Lesson description:
This Lesson will describe some basic safety rules associated with operating a Komatsu Electric Drive Wheel Loader. It will also provide information on performing a risk analysis, which will help identify safety concerns that may be specific to your working environment

Objectives:
Upon completion of this lesson the student will be able to:

- Identify and describe safety concerns on Komatsu Electric Drive Wheel Loaders as related to Operational Hazards.
- Describe how to conduct a risk analysis to operate a Komatsu Electric Drive Wheel Loader.

Lesson outline:

- Topic 1 – Operator Qualifications
- Topic 2 – Operator Conduct and Responsibility
- Topic 3 – Risk Analysis

Gen 2 Loader Introduction

Lesson description:
In this lesson the student will learn about the different motions associated with a Komatsu Electric Drive Wheel Loader, Generation 2, and the controls used by the Operator.

Objectives:
Upon completion of this lesson the student will be able to:

- Describe the different motions associated with Komatsu Electric Drive Wheel Loaders
- Describe the basic Operator Controls

Lesson outline:

- Topic 1 – Motions
- Topic 2 – Loader Controls

Gen 2 Loader Orientation

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

Objectives:
Upon completion of this lesson the student will be able to:

- Understand the general description of the Komatsu Electric Drive Wheel Loader
- Describe the interior components associated with the Komatsu Electric Drive Wheel Loader

Lesson outline:

- Topic 1 – Loader Overview
- Topic 2 – Major Components

Gen 2 Loader Mechanical Overview

Lesson description:
This lesson provides basic information about Mechanical Components and Systems used on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will be able to:

- Understand and identify the mechanical components and systems that are found on Komatsu Electric Drive Wheel Loaders

Lesson outline:

- Topic 1 – Structural Components
- Topic 2 – Hydraulics
- Topic 3 – Grease (Auto Lube) System
- Topic 4 – Compressed Air System

Gen 2 Loader Electrical Overview

Lesson description:
This lesson provides basic information about Electrical Systems and Components used on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will be able to:

- Understand and identify the electrical components that are found on Komatsu Electric Drive Wheel Loaders

Lesson outline:

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

Product Systems - Mechanical

Gen 2 Loader Structural

Lesson description:
This lesson provides basic information on the structural components used on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will be able to:

- Understand the basic principles of the Theory of Operation of the structural components
- Identify and describe the structural components
- Understand the settings and adjustments

Lesson outline:

- Topic 1 – Theory of Operation
- Topic 2 – Component Description
- Topic 3 – Settings and Adjustments
- Topic 4 – Troubleshooting

Gen 2 Loader Field Welding

Lesson description:
This lesson provides basic information about Field Welding on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will be able to:

- Understand the Warnings, Cautions and Precautions as they relate to welding repairs on Komatsu Electric Drive Wheel Loaders
- Understand the applicable welding standards for Komatsu Electric Drive Wheel Loaders
- Understand generic structural repair welding procedures used on Komatsu Electric Drive Wheel Loaders

Lesson outline:

- Topic 1 – General Welding Practices
- Topic 2 – Generic Structural Repair Welding Procedure

Gen 2 Loader Planetary Drive

Lesson description:
This lesson provides basic information about Planetary Drives used on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will:

- Understand the planetary drive and traction motor removal and replacement procedures for Komatsu Electric Drive Wheel Loaders
- Understand traction motor maintenance and repair
- Understand how to determine the need of 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

Gen 2 Loader Hydraulic Pump Drive (HPD)

Lesson description:
This lesson provides basic information about the Hydraulic Pump drive used on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will:

- Understand the theory of operation of the hydraulic pump drive used on Komatsu Electric Drive 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

Gen 2 Loader Balls Caps and Pins

Lesson description:
This lesson provides basic information about the Balls, Caps and Pins used on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will:

- Understand the theory of operation of the balls, caps and pins used on Komatsu Electric Drive 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

Gen 2 Loader Ladders

Lesson description:
This lesson provides basic information about the Ladders used on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will:

- Understand the operation and types of ladders used on Komatsu Electric Drive Wheel Loaders

Lesson outline:

- Topic 1 – Ladders
- Topic 2 – Powered Access Ladder “Power Step Model RL 1001 & 1002”
- Topic 3 – Powered Access Ladder Hedweld Model “C”
- Topic 4 – Powered Access Ladder “Komatsu Model”

Gen 2 Loader Tires and Rims

Lesson description:
This lesson provides basic information about the Tires and Rims used on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will:

- Understand the operation of the tires and rims used on Komatsu Electric Drive Wheel Loaders

Lesson outline:

- Topic 1 – Theory of Operation
- Topic 2 – Component Description
- Topic 3 – Tires
- Topic 4 – Settings and Adjustments

Gen 2 Loader Engine

Lesson description:
This lesson provides basic information about the Engine used on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will:

- Understand the operation of the Engines used on Komatsu Electric Drive Wheel Loaders

Lesson outline:

- Topic 1 – Theory of Operation
- Topic 2 – Component Description
- Topic 3 – Troubleshooting

Gen 2 Loader Fire Suppression

Lesson description:
This lesson provides basic information about the Fire Suppression System used on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will:

- Understand the basic operation of the Fire Suppression System used on Komatsu Electric Drive Wheel Loaders

Lesson outline:

- Topic 1 – Theory of Operation
- Topic 2 – Component Description
- Topic 3 – Troubleshooting

Product Systems – Air Systems

Gen 2 Loader 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 Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will be able to:

- Identify components of the compressed air system
- Understand the 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

Gen 2 Loader 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 Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will be able to:

- 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

Gen 2 Loader Cooling Air (KLENZ)

Lesson description:
This lesson provides basic information on the Cooling Air – KLENZ ™ System on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will be able to:

- Identify components of the KLENZ ™ System

Lesson outline:

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

Gen 2 Loader Air Conditioning

Lesson description:
This lesson provides basic information on the Air Conditioning System on Komatsu Electric Drive Wheel Loaders.

Objectives:
Upon completion of this lesson the student will be able to:

- 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

Product Systems – Electrical Systems

Gen 2 Loader 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

Gen 2 Loader 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

Gen 2 Loader LINCS II Part 2

Lesson description:
This lesson continues the description of the LINCS II/24 Volt DC System.

Objectives:
Upon completion of this lesson the student will be able to:

- Navigate through the LINCS II/24 Volt DC System

Lesson outline:
- Topic 1 – Navigation

Gen 2 Loader Component Heaters

Lesson description:
This lesson provides a brief description of the Component Heaters available for use on Komatsu Electric Drive 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 Komatsu Electric Drive 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

Gen 2 Electric Drive Wheel Loader eLearning - Spanish

Module 2

Leccion 2.8 recauciones Generales de Seguridad de Cargadores Generacion 2

Descripción de la lección:
En esta lección usted aprenderá acerca de los aspectos generales de seguridad asociados con los Cargadores Komatsu. **LMS ID: LDG2-S-G-SY-02-08-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Indicar el propósito de un programa de bloqueo con candado/tarjeta.
- Identificar las fuentes de información/referencias de seguridad.
- Identificar las responsabilidades de todos los miembros del equipo.
- Indicar el propósito de la planificación de un trabajo

Descripción general de la lección:

- Tema 1 - Bloqueo con Candado/Tarjeta
- Tema 2 - Fuentes de Información de Seguridad
- Tema 3 - Responsabilidad de Todos los Miembros del Equipo
- Tema 4 - Planificación del Trabajo

Leccion 2.9 Riesgos Electricos de Cargadores Generacion 2

Descripción de la lección:
Esta lección identificará algunas normas de seguridad eléctrica de sentido común que usted puede utilizar para mantenerse seguro mientras trabaja en los equipos eléctricos. Junto con estas normas de seguridad eléctrica de sentido común esta lección también le enseña cómo realizar un análisis de riesgo general el cual le ayudará a identificar aquellos riesgos eléctricos que están asociados con su situación en particular.

LMS ID: LDG2-S-G-SY-02-09-S-00

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Identificar y describir las preocupaciones de seguridad relacionados con los riesgos eléctricos de los cargadores Komatsu.
- Describir cómo se debe realizar un análisis de riesgo del sistema eléctrico.
- Indicar la definición de Descarga electrostática (ESD) y explicar cómo evitar dañar los equipos a través de la transferencia de la energía estática.

Descripción general de la lección:

- Tema 1 - Seguridad Eléctrica General
- Tema 2 - Análisis de Riesgos
- Tema 3 - Descarga Electrostática (ESD)

Leccion 2.10 Riesgos Mecanicos de Cargadores Generacion 2

Descripción de la lección:
Esta lección identificará algunas normas de seguridad mecánica de sentido común que usted puede utilizar para mantenerse seguro mientras trabaja en los equipos. Junto con estas normas de seguridad mecánicas de sentido común esta lección también le enseña cómo realizar un análisis de riesgo general el cual le ayudará a identificar aquellos riesgos mecánicos que están asociados con su situación en particular. **LMS ID: LDG2-S-G-SY-02-10-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Identificar y describir las preocupaciones de seguridad relacionados con los riesgos mecánicos de los cargadores Komatsu
- Describir cómo se debe realizar un análisis de riesgo de los sistemas mecánicos

Descripción general de la lección:

- Tema 1 - Seguridad mecánica general
- Tema 2 - Análisis de riesgos

Leccion 2.11 Riesgos de Ruido de Cargadores Generacion 2

Descripción de la lección:
Esta lección le entregará algunos consejos de sentido común sobre la prevención contra los riesgos del ruido los cuales puede utilizar para mantenerse seguro mientras trabaja en los equipos. **LMS ID: LDG2-S-G-SY-02-11-S-00**

Objectivo:
Una vez terminada esta Lección, el alumno será capaz de:

- Identificar y describir temas de seguridad relacionados con los riesgos del ruido

Descripción general de la lección:

- Tema 1 - Muestreo del ruido
- Tema 2 - Seguridad auditiva

Leccion 2.12 Riesgos de Incendio de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega información sobre los diferentes tipos y clases de incendios y los tipos de extintores usados en los cargadores Komatsu y sobre cómo utilizarlos y proporciona algunas reglas de seguridad básicas a seguir mientras se realizan los trabajos en los cargadores Komatsu. La siguiente información es provista en esta lección como una introducción a los incendios los extintores de incendio y la seguridad ante los incendios. No es una referencia completa. Tenga presente que los incendios son peligrosos y muchos de los aspectos de la seguridad de los incendios no se analizan en este documento. Para obtener una información más detallada consulte los decretos de su localidad estado país provincia región etc. **LMS ID: LDG2-S-G-SY-02-12-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Identificar diferentes tipos de incendios y explicar sus diferentes características
- Explicar cómo se usa el extintor de incendios provisto en el equipo
- Explicar qué es el Sistema de supresión de incendios automático, provisto en algunos cargadores Komatsu
- Identificar las reglas de prevención de incendios básicas, según se aplican a los cargadores Komatsu

Descripción general de la lección:

- Tema 1 - Tipos de incendios
- Tema 2 - Extintores de incendio
- Tema 3 - Prevención y control de incendios

Leccion 2.13 Riesgos Operacionales de Cargadores Generacion 2

Descripción de la lección:
Esta lección describe algunas normas de seguridad básicas asociadas con la operación de un cargador Komatsu. También entregará información para realizar un análisis de riesgo el cual le ayudará a identificar asuntos relacionados con la seguridad que son específicos de su ambiente de trabajo. **LMS ID: LDG2-S-G-SY-02-13-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Identificar y describir asuntos de seguridad relacionados con los riesgos operacionales de los cargadores Komatsu.
- Describir cómo realizar un análisis de riesgo sobre la operación de un cargador Komatsu

Descripción general de la lección:

- Tema 1 - Calificaciones del Operador
- Tema 2 - Conducta y Responsabilidad del Operador
- Tema 3 - Análisis de Riesgos

Module 3

Leccion 3.11 Descripcion General del Cargador Generacion 2

Descripción de la lección:
En esta lección el alumno aprenderá dónde se ubican los componentes comunes del cargador y obtendrá una breve descripción de su propósito. **LMS ID: LDG2-S-G-IN-03-11-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender la descripción general de los cargadores Komatsu
- Describirá los componentes interiores asociados con los cargadores Komatsu

Descripción general de la lección:
- Tema 1 - Visión general del cargador
- Tema 2 - Componentes principales

Leccion 3.12 Vision General Mecanica de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega información básica sobre los sistemas y componentes mecánicos usados en los cargadores Komatsu. **LMS ID: LDG2-S-G-IN-03-12-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender e identificar los componentes y sistemas mecánicos que se encuentran en los cargadores Komatsu

Descripción general de la lección:
- Tema 1 - Componentes estructurales
- Tema 2 - Sistemas Hidráulicos
- Tema 3 - Sistema de engrase (Auto Lubricación)
- Tema 4 - Sistema de aire comprimido

Leccion 3.13 Vision General Electrica de Cargadores Generacion 2

Descripción de la lección:
Esta lección proporciona información básica acerca de los componentes y sistemas eléctricos usados en los cargadores Komatsu. **LMS ID: LDG2-S-G-IN-03-13-S-00**

Objectivos:
Una vez terminada esta lección el alumno será capaz de:

- Comprender e identificar los componentes y sistemas eléctricos que se encuentran en los cargadores Komatsu

Descripción general de la lección:
- Tema 1 - Generador SR
- Tema 2 - Motores SR
- Tema 3 - Sistema de Propulsión SR
- Tema 4 - LINCS II
- Tema 5 - Calefactores

Module 4

Leccion 4.1 Componentes Estructurales de Cargadores Generacion 2

Descripción de la lección:
Esta lección proporciona información básica acerca de los componentes estructurales usados en los cargadores Komatsu. **LMS ID: LDG2-S-G-SO-04-01-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender los principios básicos de la Teoría de operación de los componentes estructurales.
- Aprender acerca de las descripciones de los componentes y saber cómo identificarlos.
- Comprender las configuraciones y los ajustes

Descripción general de la lección:

- Tema 1 - Teoría de Operación
- Tema 2 - Descripción de Componentes
- Tema 3 - Configuraciones y Ajustes
- Tema 4 - Diagnóstico de Fallas

Leccion 4.2 Soldadura en Terreno de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega información básica sobre la Soldadura en Terreno en los cargadores Komatsu.

LMS ID: LDG2-S-G-GC-04-02-S-00

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender las Advertencias y Precauciones relacionadas con la reparación de soldaduras en cargadores Komatsu
- Comprender las normas de soldadura aplicables a los cargadores Komatsu
- Comprender los procedimientos genéricos de la soldadura de reparación estructural en los cargadores Komatsu

Descripción general de la lección:

- Tema 1 - Prácticas Generales de Soldadura
- Tema 2 - Procedimiento Genérico de Soldadura de Reparación Estructural

Leccion 4.3 Mando Final de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega información básica sobre los mandos finales usados en los cargadores Komatsu.

LMS ID: LDG2-S-G-PD-04-03-S-00

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender los procedimientos de desmontaje y reemplazo del mando final y el motor de tracción de los cargadores Komatsu
- Comprender el mantenimiento y reparación del motor de tracción
- Comprender cómo se determina la necesidad de reparar/reconstruir un mando final
- Comprender la instalación de un motor de tracción y mando final en el eje
- Comprender los requisitos de servicio después de la reparación y reemplazo del mando final

Descripción general de la lección:

- Tema 1 - Operación básica y descripción de componentes
- Tema 2 - Mantenimiento y reparación del motor de tracción
- Tema 3 - Cómo determinar la necesidad de reparar/reconstruir un mando final

Leccion 4.4 Caja Impulsora de Bombas Hidraulicas (HPD) de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega información básica sobre la Caja Impulsora de Bombas Hidráulicas utilizada en los cargadores Komatsu. **LMS ID: LDG2-S-G-HD-04-04-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender la teoría de operación de la Caja HPD utilizada en los cargadores Komatsu
- Comprender la descripción de los componentes de la Caja Impulsora de Bombas Hidráulicas
- Comprender la descripción del circuito de aceite de la Caja HPD

Descripción general de la lección:

- Tema 1 - Teoría de Operación
- Tema 2 - Descripción de los Componentes
- Tema 3 - Descripción del Circuito de Aceite de la Caja HPD

Leccion 4.5 Bolas Tapas y Pasadores de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega información básica sobre las bolas tapas y pasadores usados en los cargadores Komatsu.

LMS ID: LDG2-S-G-BC-04-05-S-00

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender la teoría de operación de las bolas, tapas y pasadores usados en los cargadores Komatsu
- Comprender los métodos de lubricación para las bolas, tapas y pasadores

Descripción general de la lección:

- Tema 1 - Teoría de Operación
- Tema 2 - Métodos de Lubricación de las Bolas
- Tema 3 - Límites de Temperatura
- Tema 4 - Espesor del Casquillo de Bronce
- Tema 5 - Bisel del Borde del Casquillo de Bronce
- Tema 6 - Rectitud de la Cara del Socket
- Tema 7 - Alineación de la Tapa de la Bola con el Socket

Leccion 4.6 Balde y Elementos de Desgaste de Cargadores Generacion 2

Descripción de la lección:
Esta lección proporciona información básica sobre el balde y los elementos de desgaste utilizados en los cargadores Komatsu. **LMS ID: LDG2-S-G-GC-04-06-S-00**

Objectivo:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender la operación del balde y los dientes usados en los cargadores Komatsu

Descripción general de la lección:

- Tema 1 - Mantenimiento del Adaptador ESCO Top Lock VL-09
- Tema 2 - Instrucciones de Instalación del Labio ESCO Loadmaster VL-42a
- Tema 3 - Procedimiento de Soldadura para Elementos de Desgaste ESCO VL-43a
- Tema 4 - Uso y Mantenimiento de los Elementos de Desgaste ESCO VL-101a

Leccion 4.7 Escaleras de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega información básica sobre las escaleras usadas en los cargadores Komatsu.

LMS ID: LDG2-S-G-LA-04-07-S-00

Objectivo:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender la operación de las escaleras usadas en los cargadores Komatsu

Descripción general de la lección:

- Tema 1 - Escaleras
- Tema 2 - Escalera Eléctrica de Acceso "Power Step Modelos RL1001 & 1002"
- Tema 3 - Escalera Eléctrica de Acceso Hedweld Modelo “C”
- Tema 4 - Escalera Eléctrica de Acceso “Modelo Komatsu”

Leccion 4.8 Neumaticos y Llantas de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega información básica sobre los neumáticos y llantas usados en los cargadores Komatsu.

LMS ID: LDG2-S-G-TM-04-08-S-00

Objectivo:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender la operación de los neumáticos y llantas usados en los cargadores Komatsu

Descripción general de la lección:
- Tema 1 - Teoría de Operación
- Tema 2 - Descripción de Componentes
- Tema 3 - Neumáticos
- Tema 4 - Configuraciones y Ajustes

Leccion 4.9 Motor Diesel de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega información básica sobre el motor diésel usado en los cargadores Komatsu.

LMS ID: LDG2-S-G-EN-04-09-S-00

Objectivo:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender la operación básica de los motores diésel usados en los cargadores Komatsu

Descripción general de la lección:
- Tema 1 - Teoría de Operación
- Tema 2 - Descripción de Componentes
- Tema 3 - Diagnóstico de Fallas

Leccion 4.10 Supresion de Incendios de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega información básica sobre los sistemas de supresión de incendios usados en los cargadores Komatsu. **LMS ID: LDG2-S-G-FR-04-10-S-00**

Objectivo:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender la operación básica de los sistemas de supresión de incendios usados en los cargadores Komatsu

Descripción general de la lección:
- Tema 1 - Teoría de Operación
- Tema 2 - Descripción de Componentes
- Tema 3 - Diagnóstico de Fallas

Module 5

Leccion 5.1 Sistema de Aire Comprimido de Cargadores Generacion 2

Descripción de la lección:
La información entregada en esta lección es una introducción al sistema de aire comprimido y los componentes usados en los cargadores Komatsu. **LMS ID: LDG2-S-G-AS-05-01-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Identificar los componentes del sistema de aire comprimido
- Usar los componentes de aire accionados por el sistema de aire comprimido
- Identificar los componentes auxiliares del sistema de aire comprimido

Descripción general de la lección:

- Tema 1 - Descripción General del Sistema de Aire Comprimido
- Tema 2 - Componentes del Sistema de Aire Comprimido
- Tema 3 - Componentes de los Sistemas de Aire Auxiliares

Leccion 5.2 Frenos de Cargadores Generacion 2

Descripción de la lección:
Esta lección proporciona información básica sobre el sistema de frenos de servicio y el sistema de frenos de estacionamiento relacionada con el sistema de aire de los cargadores Komatsu. **LMS ID: LDG2-S-G-BR-05-02-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender el sistema de frenos de aire
- Identificar los componentes comunes del sistema de frenos de aire
- Identificar los controles de los frenos

Descripción general de la lección:

- Tema 1 - Diseño y Función
- Tema 2 - Componentes del Sistema de Frenos

Leccion 5.3 Sistema de Aire de Enfriamiento KLENZ de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega a los técnicos de servicio una visión general de la operación del sistema de sopladores de aire central y del sistema de admisión de aire del motor con el sistema de filtración KLENZ™ para los cargadores.

LMS ID: LDG2-S-G-KL-05-03-S-00

Objectivo:
Una vez terminada esta Lección, el alumno será capaz de:

- Identificar los componentes del sistema KLENZ™

Descripción general de la lección:

- Tema 1 - Visión general del sistema de aire de enfriamiento - KLENZ™
- Tema 2 - Componentes del sistema
- Tema 3 - Control

Leccion 5.4 Sistema de Aire Acondicionado de Cargadores Generacion 2

Descripción de la lección:
Esta lección proporciona información básica acerca del sistema de aire acondicionado usado en los cargadores Komatsu. **LMS ID: LDG2-S-G-AC-05-04-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Identificar los componentes principales del Sistema de Aire Acondicionado
- Identificar los componentes principales del Sistema de Calefacción
- Comprender los controles para los Sistemas de Aire Acondicionado y Calefacción

Descripción general de la lección:

- Tema 1 - Visión General del Sistema de Aire Acondicionado
- Tema 2 - Componentes Comunes del Sistema de Aire Acondicionado
- Tema 3 - Sistema de Calefacción
- Tema 4 - Control

Module 6

Leccion 6.1 Sistema de Propulsion SR de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega una breve descripción del Sistema de Propulsión SR. **LMS ID: LDG2-S-G-SG-06-01-S-00**

Objectivo:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender los principios básicos de la operación de la reluctancia variable

Descripción general de la lección:
- Tema 1 - Teoría de Operación
- Tema 2 - Descripción de Componentes
- Tema 3 - Descripción de Circuitos

Leccion 6.2 LINCS II de Cargadores Generacion 2 - Parte 1

Descripción de la lección:
Esta lección entrega una breve descripción del Sistema LINCS II/24VDC. **LMS ID: LDG2-S-G-LI-06-02-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender los principios básicos del Sistema LINCS II/24 Volts DC.
- Comprender cómo opera el Sistema LINCS II/24 Volts DC.
- Comprender las descripciones de los circuitos relacionados con el Sistema LINCS II/24 Volts DC

Descripción general de la lección:
- Tema 1 - Teoría de Operación
- Tema 2 - Descripción de Componentes
- Revisión 1 - Temas 1 - 2
- Tema 3 - Descripción de Circuitos
- Tema 4 - Diagnóstico de Fallas

Leccion 6.3 Leccion 6.3 LINCS II de Cargadores Generacion 2 - Parte 2

Descripción de la lección:
Esta lección entrega una breve descripción del Sistema LINCS II/24V DC. **LMS ID: LDG2-S-G-LI-06-03-S-00**

Objectivo:
Una vez terminada esta Lección, el alumno será capaz de:

- Navegar a través del Sistema LINCS II/24V DC

Descripción general de la lección:
- Tema 1 - Navegación

Leccion 6.4 Calefactores de Componentes de Cargadores Generacion 2

Descripción de la lección:
Esta lección entrega una breve descripción de los calefactores de componentes disponibles para ser usados en los cargadores Komatsu. **LMS ID: LDG2-S-G-CH-06-04-S-00**

Objectivos:
Una vez terminada esta Lección, el alumno será capaz de:

- Comprender los principios básicos de la Teoría de operación de los calefactores de componentes.
- Aprender acerca de los diferentes tipos de calefactores de los cargadores Komatsu y sus funciones específicas.
- Comprender las descripciones de los circuitos relacionados con los calefactores individuales.
- Comprender las configuraciones y ajustes de los calefactores individuales

Descripción general de la lección:

- Tema 1 - Teoría de Operación
- Tema 2 - Descripción de Componentes
- Tema 3 - Descripción de Circuitos
- Tema 4 - Configuraciones y Ajustes
- Tema 5 - Diagnóstico de Fallas

Electric Drive Wheel Loader Instructor-Led Training Outlines

Electric Drive Wheel Loader Operator Training

Machine Familiarization Training – Non-Production/Operation

Course Description:
Operators will gain insight into the general safety practices required for machine operation. Initial classroom presentation is conducted which is followed by hands-on training with the Electric Wheel Loader in a non-production environment. Students will be required to demonstrate and practice the operational techniques covered in this training.

Course Duration:
3 days (24 hours) Additional time available by request

- 1 day theory
- 2 days evaluation – 2 hours per operator

Student Count:

- 1 day theory- Unlimited
- 2 days evaluation – 8 maximum

Course Location:
Field

Specific items to be covered will include:

- Machine specifications
- Machine safety and emergency shut down procedures
- Machine start up and shut down procedures
- Fire suppression
- LINCS navigation
- Alarm/warning reaction
- Machine capabilities and limited
- Avoiding hazards and tire damage
- Communication
- Machine pre-shift inspection
- Machine controls and functions
- Introduction to digging theories
- Questions and answers

Please Note: Minimum notice prior to requested dates of training – 30 days for U.S. locations; 60 days for international locations. Scheduling based on trainer availability.

Operator Training

Course Description:
Operators will gain insight into the overall machine operation. Initial classroom presentation is conducted which is followed by hands-on training with the Electric Wheel Loader in a production environment. Students will be required to demonstrate and practice the operational techniques covered in this training.

Course Duration:
5 days (40 hours)

- 1 day theory (8 hours)
- 4 days – Demonstration, observation & evaluation – 4 hours per operator

Student Count:

- 1 day theory- Unlimited
- On-site – 8 maximum

Course Location:
Field

Specific items to be covered will include:

- Proper truck placement
- Applying different digging theories when needed
- Digging effectively without tire spin
- Understanding machine's controls
- Understanding machine's limits and capabilities
- Tram procedures
- LINCS navigation
- Control and maintaining work area
- Importance of load placement
- Understand production cycles
- Emergency procedures
- Working with support equipment
- Communication
- Ensuring safe and productive attitude
- Questions and answers

Please Note: Minimum notice prior to requested dates of training – 30 days for U.S. locations; 60 days for international locations. Scheduling based on trainer availability.

Maximining Operator Efficiencies

Course Description:
Operators will gain insight into the overall machine operation. Initial classroom presentation is conducted which is followed by hands-on training with the Electric Wheel Loader in a production environment. Students will be required to demonstrate and practice the operational techniques covered in this training.

Course Duration:
10 days (80 hours) Onsite (No Theory)

- 5 days (40 hours) – Observation & evaluation
- 5 days (40 hours) – Demonstration, observation & evaluation

Student Count:

- 4 students max

Prerequisite:
Standard operator training & 3 years of operating experience

Course Location:
Field

Specific items to be covered will include:

- Operators' skill level
- Truck availability
- Haul truck flow
- Digging conditions
- Proper use of support conditions
- Weather
- Haul distances
- Questions and answers

Demonstration, observation & evaluation process will include:

- Site Evaluation – Cycle Time Analysis
- View Work – Pre & Post Recommendations
- Operator Evaluations
- Full report with recommendations
- Audit report

Please Note: Minimum notice prior to requested dates of training – 30 days for U.S. locations; 60 days for international locations. Scheduling based on trainer availability.

Electric Drive Wheel Loader Instructor-Led Training Outlines

To maximize learning, Maintenance/Technical training courses have been grouped by skilled trade discipline and are packaged into a multi-day experience. The individual courses are shown over the next several pages.

Total Course duration can vary by delivery method.
Field/Virtual* - 3 days, 24 hours; or Factory* – 4 days, 32 hours
*Additional one day (8-hours) for non-English speaking customers allowing time for translation

GEN 1 Maintenance Training – Electrical

Courses Included:

- LINCS I
- SCR Propulsion
- SR Propulsion

GEN 1 Maintenance Training – Mechanical

Courses Included:

- Air Systems
- Hydraulic Systems
- Mechanical Systems

GEN 2 & GEN 3 Maintenance Training – Electrical

Courses Included:

- LINCS II
- SR Propulsion

GEN 2 & GEN 3 Maintenance Training – Mechanical

Courses Included:

- Air Systems
- Hydraulic Systems
- Mechanical Systems

GEN 1 Maintenance Training

Air System Training Course

Objectives:
To advance the knowledge and skills necessary for the technician to be able to troubleshoot, maintain and repair the mechanical, hydraulic and air systems on the P&H brand LeTourneau-series wheel loader machine. Upon completion of this course the student will be able to:

- Locate major components on the machine
- Troubleshoot, maintain, and repair components and associated problems
- Read and understand appropriate schematics
- Test and set pressures and speeds of pumps and fans as per LeTourneau Specifications

Objectives:

Central Air Blower System

LINCS I Overview

Theory of Operation

Component Descriptions

- KLENZ Air Cleaner
- Mist Eliminators
- Filters
- Blower Housing
- Blower Motor
- Blower Ducting

Circuit Descriptions

- Blower Motor Circuit

Settings and Adjustments

Troubleshooting

Compressed Air System

LINCS I Overview

Theory of Operation

Component Descriptions

- Compressors
- Valves
- Solenoids
- Transducers

Circuit Descriptions

- Air System Charging
- Air System Purging
- Air System Park Brake Set
- Air System Park Brake Released
- Air System Service Brake Applied
- Air System Hydraulic Air Supply
- KLENZ Circuit Operation
- Valves

Settings and Adjustments

Installation and Removal

Hydraulics Training Course

Objectives:
To advance the knowledge and skills necessary for the technician to be able to troubleshoot, maintain and repair the mechanical, hydraulic and air systems on the P&H brand LeTourneau-series wheel loader machine. Upon completion of this course the student will be able to:

- Locate major components on the machine
- Troubleshoot, maintain, and repair components and associated problems
- Read and understand appropriate schematics
- Test and set pressures and speeds of pumps and fans as per LeTourneau Specifications

Topics Covered:

LINCS I Overview

Theory of Operation

Component Descriptions

- Hydraulic Tank
- Pumps
- Gearbox
- Main Hoist and Bucket Control valves (Husco)
- Multi-Port Distribution Manifolds
- Float Valves
- Old-Style Pilot System
- Current Pilot System
- Steering Main Valves
- Motors
- Driver Oil Filtration Systems
- Oil Cooler Control Valves
- Auxiliary Oil Cooler (Optional) Fan Seep Control
- Cylinders
- Warnings and Cautions

Circuit Descriptions

- Bucket Roll Back
- Bucket Roll Forward
- Hoist and Hoist Up with Fast Hoist
- Power Down and Power Down with Float
- Bucket and Lift Arm Movement
- Steering
- Accessory Pump Circuit
- Blower Circuit
- Radiator Fan Circuit
- Gearbox Oil Circulation Pump
- Oil Cooling Circulation Pump
- Aux Oil Cooler

Settings and Adjustments

Troubleshooting

- 50 Series Diagnostic Tool

Installation and Removal

Mechanical Training Course

Objectives:
To advance the knowledge and skills necessary for the technician to be able to troubleshoot, maintain and repair the mechanical, hydraulic and air systems on the P&H brand LeTourneau-series wheel loader machine. Upon completion of this course the student will be able to:

- Locate major components on the machine
- Troubleshoot, maintain, and repair components and associated problems
- Read and understand appropriate schematics
- Test and set pressures and speeds of pumps and fans as per LeTourneau Specifications

Topics Covered:

Ball and Socket Joints

Grease System Overview

Theory of Operation

Component Descriptions

- Ball
- Lip Seal
- Liner
- Socket Cap
- Bolts
- Spacer Plate
- Shims
- Socket

Settings and Adjustments

Installation and Removal

Troubleshooting

Pins and Bushings

Grease System Overview

Theory of Operation

Component Descriptions

- Spherical Bearing
- Taper Pin
- Saw-Cut Bushing
- Retaining Washer
- Bolts
- Straight Pin
- Bushing
- Spacer
- Seal

Settings and Adjustments

Installation and Removal

Troubleshooting

SCR Propulsion Training Course

Objectives:
To build knowledge and skills necessary for the technician to be able to troubleshoot, maintain and repair DC (SCR) Drive components and propulsion problems. Upon completion of this course the student will be able to:

- Locate and identify major components
- Troubleshoot, maintain, and repair major DC (SCR) drive components
- Perform basic AC main generator inspection and maintenance
- Perform basic DC traction motor inspection and maintenance
- Apply proper DC (SCR) propulsion system repair procedure
- Diagnose and locate ground faults
- Conduct load bank testing

Topics Covered:

Theory of Operation

Component Descriptions

- Engine
- Generator
- Ac Fuses
- Traction Motor (J2)
- Traction Motor (M40)
- Motor DC Fuses
- Controller
- Remote Cab Tester
- Input Devices
- Converter Panels / Inductor Coils
- Braking Grid
- Ground Fault Resistors

Circuit Descriptions

- Engine
- Prime
- Voltage Regulator
- Field Converter
- Armature Converter
- Dynamic Brake Fail
- Ground Fault Detection
- Load Bank Mode
- Stand-By Power

Troubleshooting

- 50 Series Diagnostic Tool
- *23 Step Chart*

Installation and Removal

SR Propulsion Training Course

Objectives:
To build knowledge and skills necessary for the technician to be able to troubleshoot, maintain and repair SR Drive components and propulsion problems. Upon completion of this course the student will be able to:

- Confidently describe SR Drive principle of operation
- Read SR Drive machine schematics
- Locate and identify major components
- Perform basic AC generator maintenance
- Isolate traction motors
- Apply basic SR Propulsion system repair procedures as outlined in the SR Drive Signals and Alarms Troubleshooting manual
- Diagnose and locate 'ground fault' connections
- Conduct load bank testing

Objectives:

Theory of Operation

Component Descriptions

- Engine
- 6R Generator
- 9B Generator
- B40 Motor
- Temperature Sensing (RTD)
- Electrical Cabinet
- Drive Module
- Chopper Panel
- Phase Panel
- Balance Resistors
- IGBT Indicator Lights
- Interface Cards
- Transformer Card
- Voltage Regulator Panel
- Component Interconnection Diagram
- Bus Voltage Indicator
- Braking Grids
- Ground Fault Resistors

Circuit Descriptions

- Engine – Cummins
- Engine – Detroit
- Prime / VR Control
- VR Blown Circuit
- Basic Propel Logic Circuit
- Propel Circuit
- AC Blown Fuse Circuit
- Speed Sensing
- Ground Fault Monitoring
- Load Bank Mode

Troubleshooting

- Alarm Chart & Descriptions
- Troubleshooting Flow Charts
- 50 Series Diagnostic Tool

Installation and Removal

LINCS I Training Course

Objectives:
To build knowledge and skills using the LeTourneau LINCS digital control system. Upon completion of this course the student will be able to:

- Effectively describe the LINCS architecture and theory of operation
- Troubleshoot and repair LINCS hardware problems on the machine
- Access and manipulate LINCS screens
- Access maintenance level on the LINCS system
- Calibrate joysticks and sensors
- Bypass limits for preventative maintenance checks
- Use LINCS for troubleshooting and repair of the LINCS system

Topics Covered:

Theory of Operation

Component Descriptions

- Master Control Module
- I-Button
- Remote Control Module
- Translator
- Drive Module
- Service Tool Connectors
- CAN Bus Layout
- Keypad and Indicators
- Interface Cabling
- Rotary Transducers
- Joysticks
- Foot Pot
- Thermistors / RTD's

Circuit Descriptions

- I/O Power On (initializing Net)
- Emergency Stop Activation
- Key Switch Off (Shutdown Timer Timeout)

Navigation

- Operator
- Maintenance
- Service

Troubleshooting

- Indicators
- *Red Alarm*
- *Yellow Warning*
- *Blue Alert*
- *Acknowledge vs. Clear Event*
- *LINCS Storage Size*

Support Software and Tools

- 50 Series Diagnostic Tool
- Service Tool
- eLeTrochart
- Log Viewer
- Remote I/O Breakout Box
- Remote I/O Interface Tester
- Remote Cab Tester
- RF Modems

GEN 2 & GEN 3 Maintenance Training

Air System Training Course

Objectives:
To advance the knowledge and skills necessary for the technician to be able to troubleshoot, maintain and repair the mechanical, hydraulic and air systems on the P&H brand LeTourneau-series wheel loader machine. Upon completion of this course the student will be able to:

- Locate major components on the machine
- Troubleshoot, maintain, and repair components and associated problems
- Read and understand appropriate schematics
- Test and set pressures and speeds of pumps and fans as per LeTourneau Specifications

Objectives:

Central Air Blower System

LINCS II Overview

Theory of Operation

Component Descriptions

- KLENZ Air Cleaner
- Mist Eliminators
- Filters
- Blower Housing
- Blower Motor
- Blower Ducting

Circuit Descriptions

- Blower Motor Circuit

Settings and Adjustments

Troubleshooting

Compressed Air System

LINCS II Overview

Theory of Operation

Circuit Descriptions

- Compressors
- DLU Valves
- Tanks
- Air System Complete

Settings and Adjustments

Installation and Removal

Troubleshooting

Hydraulics Training Course

Objectives:
To advance the knowledge and skills necessary for the technician to be able to troubleshoot, maintain and repair the mechanical, hydraulic and air systems on the P&H brand LeTourneau-series wheel loader machine. Upon completion of this course the student will be able to:

- Locate major components on the machine
- Troubleshoot, maintain, and repair components and associated problems
- Read and understand appropriate schematics
- Test and set pressures and speeds of pumps and fans as per LeTourneau Specifications

Topics Covered:

LINCS II Overview

Theory of Operation

Component Descriptions

- Hydraulic Tank
- Pumps
- Gearbox
- HUSCO Valves
- Multi-Port Distribution Manifolds
- Current Pilot System
- Steering Main Valves
- Blower Motors
- Auto Lube
- Auxiliary Oil Cooler
- Cylinders

Circuit Descriptions

- Bucket Roll Back
- Bucket Roll Forward
- Hoist and Hoist Up with Fast Hoist
- Power Down and Power Down with Float
- Bucket and Lift Arm Movement
- Steering
- Accessory Pump Circuit
- Blower Circuit
- Radiator Fan Circuit
- Gearbox Oil Circulation Pump
- Oil Cooling Circulation Pump
- Aux Oil Cooler

Settings and Adjustments

Troubleshooting

Installation and Removal

Mechanical Training Course

Objectives:
To advance the knowledge and skills necessary for the technician to be able to troubleshoot, maintain and repair the mechanical, hydraulic and air systems on the P&H brand LeTourneau-series wheel loader machine. Upon completion of this course the student will be able to:

- Locate major components on the machine
- Troubleshoot, maintain, and repair components and associated problems
- Read and understand appropriate schematics
- Test and set pressures and speeds of pumps and fans as per LeTourneau Specifications

Topics Covered:

Ball and Socket Joints

Grease System Overview

Theory of Operation

Component Descriptions

- Ball
- Lip Seal
- Liner
- Socket Cap
- Bolts
- Spacer Plate
- Shims
- Socket

Settings and Adjustments

Installation and Removal

Troubleshooting

Pins and Bushings

Grease System Overview

Theory of Operation

Component Descriptions

- Spherical Bearing
- Taper Pin
- Saw-Cut Bushing
- Retaining Washer
- Bolts
- Straight Pin
- Bushing
- Spacer
- Seal

Settings and Adjustments

Installation and Removal

Troubleshooting

SR-SR Propulsion Training Course

Objectives:
To build knowledge and skills necessary for the technician to be able to troubleshoot, maintain and repair SR Drive components and propulsion problems. Upon completion of this course the student will be able to:

- Confidently describe LINCS II Drive principle of operation
- Read Drive machine schematics
- Locate and identify major components
- Perform basic AC generator maintenance
- Isolate traction motors
- Apply basic Drive System repair procedures as outlined in the Drive Systems and Alarms Troubleshooting manual
- Diagnose and locate ‘ground fault’ connections
- Conduct load bank testing

Topics Covered:

Theory of Operation

Component Descriptions

- Power Units
- SR Motors, Generators & KESS
- Rotor Position Sensor
- Temperature Sensing
- Converter Panel & Cabinet
- Cooling Pumps
- Breakout Boxes
- Parallel Converter Wiring
- SR Families
- Operator Inputs

Circuit Descriptions

- LINCS II Booted
- Generator Enables
- Propel
- Braking
- SR Energy Recovery

Installation, Removal, & Isolation

LINCS II Training Course

Objectives:
To build knowledge and skills using the LeTourneau LINCS digital control system. Upon completion of this course the student will be able to:

- Effectively describe the LINCS architecture and theory of operation
- Troubleshoot and repair LINCS hardware problems on the machine
- Access and manipulate LINCS screens
- Access maintenance level on the LINCS system
- Calibrate joysticks and sensors
- Bypass limits for preventative maintenance checks
- Use LINCS for troubleshooting and repair of the LINCS system

Topics Covered:

Theory of Operation

Component Descriptions

- Low Voltage Control Cabinet
- VCU (Vehicle Control Unit)
- Digital Interface Cards
- Cab
- Display Console
- HMI Functionality
- Breakout Boxes
- I/O Devices and Cables
- Other Cabling
- Pressure Transducers
- Position Sensors
- Steering Interface Card
- Enclosures

Circuit Descriptions

- Data Recording
- Idle Timer
- User Access
- Load Weight

Navigation

- Operator
- Maintenance
- Service

Troubleshooting

- *Troubleshooting Notices*
- *Red Alarm*
- *Yellow Warning*
- *Blue Events*

Support Software and Tools

- Download Log
- Upload New Configuration
- Use of Off-Line Tool
- FTP Site