Crane Care Training – Customer Catalog

Shady Grove, PA & Manitowoc, WI : United States

V3. 06/2018

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Training Center Objectives

Our Capabilities:

Our factory-certified instructors offer operating systems, components, maintenance and repair training on all of our products: Grove, GMK, Manitowoc, National Crane, and Potain.

Manitowoc Crane Care is an innovative leader in advanced crane industry training. Our onsite and online training curriculum is designed with your profits and your safety in mind. With professional and experienced instructors, our training helps you develop the product knowledge you need to be as productive as possible.

Our Facilities:

Shady Grove, PA: This site offers multiple state of the art classrooms. A large hands-on simulator lab to include simulators of multiple generations of Grove domestic, GMK All Terrain and National Boom Truck operating systems. A multiple bay training building is also used to accommodate multiple products for troubleshooting and is currently equipped with a GMK4100L-1 dedicated solely for training purposes. A current CCS Potain tower crane is onsite dedicated solely for training purposes.

Available lab workstations:

- Three generations of GMK simulators to include RCL's
- Four generations of Grove domestic RCL simulators
- Four generations of Grove domestic simulators
- GHC simulator to include the RCL
- Multiple National Boom Truck simulators to include RCL's
- EPIC Hydraulic/Electrical Simulators
- Hydraulic and Electrical workstations
- Tower crane erection / dismantling / troubleshooting
- Mobile crane operation
- CCS equipped immersive operator simulator

Manitowoc, WI: This site offers multiple state of the art classrooms. 2 large hands-on simulators labs to include simulators of multiple generations of Manitowoc EPIC, Canbus and Crane Control Systems.

Available lab workstations:

- 4 generations of Lattice Crane simulators, from conventional cranes to CCS generation;
- 8 hydraulic benches with pumps and motors that can simulate the function of the machines.
- Small Crawler simulator for the small Crawler range.
- A CCS cabin simulator with wireless remote
- Also available in Portugal, Dubai, Singapore and Brazil:
    - Epic Simulators
    - Canbus Version 1 and version 2 Simulator;
    - Crane in the box Simulator
    - CCS Simulator

Registration via Manitowoc Direct

Request an Account:

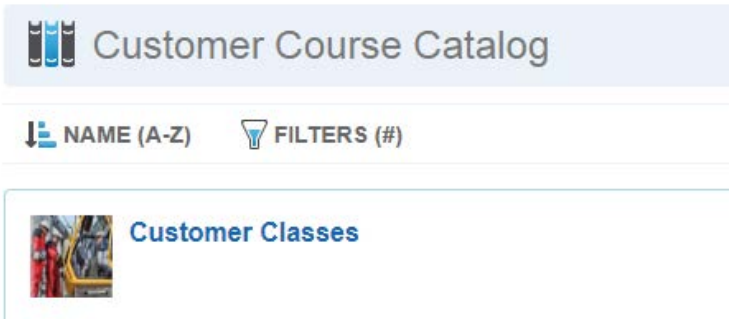
To register to attend a training class, students must have a Manitowoc Direct account with access to the Technical Learning Center application. Please visit this website and complete the required fields:

http://www.manitowoccranes.com/en/manitowoc-direct/manitowoc-direct-request-access

Once registered, users should login to Manitowoc Direct, click to expand My Applications, then select Technical Learning Center to enter our website.

Technical Learning Center:

Once logged in, you will see a Customer Course Catalog, with a link to Customer Classes. Clicking here will bring you to our schedule for instructor-led training.



Beneath the catalog, additional links can be found for E-Training Courses, Test-out Exam for Crane Technology & Operation & other recently released information.

All instructor-led training courses must be paid by credit card.

Any registration/payment questions should be directed to Toni Pagliaro, at 717-593-5918, or by email: toni.pagliaro@manitowoc.com.

Course Summary

Crane System Theory

Content:

This 4 ½ day course requires no service knowledge of Grove, GMK, National or Manitowoc crane systems and will be used as a prerequisite for all introductory level courses.

The course is designed to provide a basic understanding of hydraulics, electrical and pneumatic principles and how they are applied on the different mobile and lattice crane product lines.

The course will consist of classroom time utilizing programs covering the basics of hydraulics, electrical and pneumatics along with their components and how these components operate and interact with each other. Schematics are used to help the students gain a basic understanding of schematic layouts and component symbols used on the different mobile product lines.

Hydraulic and Electrical test benches are incorporated into the course to help give the student a better understanding of the hydraulic and electrical theories learned in the classroom portion of the training.

Course Benefits:

- Have the basic understanding of hydraulic, electrical and pneumatic principles.
- Have a basic understanding of how hydraulic, electrical and pneumatic principles relate to the different mobile and lattice crane systems.
- Have a basic understanding of schematic design and layout for the different mobile and lattice crane product lines.
- Have a basic understanding of hydraulic, electrical and pneumatic symbols used on mobile and lattice crane schematics.

Prerequisites
None

Capacity
8 students

Crane Technology & Operation

Content:

This 4 ½ day course assumes no basic service and operational knowledge of Grove Rough Terrain, Truck Mounted and All Terrain crane systems.

The course begins with an in-depth overview of domestic RT & TMS crane terminology and technologies in relationship to crane systems. Grove domestic load charts are explained along with exercises to expose the students to how load charts are constructed and how to properly read and interpret them.

The GMK product line is next with an in-depth overview of GMK terminology and technologies. Students will then be taught GMK style load charts to include exercises to assure a full grasp of both the Grove domestic and GMK product types.

Rated Capacity Limiting systems programming and operation is covered to include exercises using RCL simulators. This allows the student to apply load chart theory learned earlier in class to how the RCL works.

Machine hands-on session will allow the students to experience how to properly set up and operate a Grove domestic crane. This will give students a working knowledge of a Grove crane and the foundation to continue their studies in Grove Hydraulics and Electrical systems.

Course Benefits:

- Have the basic understanding of how to read and interpret load charts and explain them to operators during machine deliveries.
- Conduct start-up and programming of RCL systems
- Have basic understanding of how to setup and function a Grove crane functions and operates.

Prerequisites
None

Capacity
8 students

Customer Grove HED & PAT

Content:

This 4 ½ day course assumes basic operational knowledge of Grove domestic cranes and covers domestic Rough Terrain and Truck Mount units to include non CANBus and early version CANBus cranes and does not cover the TMS9000E or RT9150E models. This class also covers the LMI systems for this era of machines.

Classroom programs covering Grove crane hydraulic systems, electrical systems and schematics will give the students a working knowledge of a Grove crane and the foundation to learn proper troubleshooting techniques and hydraulic test procedures.

Customer version HED service software will be covered using HED simulators to allow the student to connect with the service software and understand how it is used for basic troubleshooting and diagnostics.

Hands-on sessions are conducted to reinforce classroom studies.

Course Benefits:

- Identify superstructure and carrier hydraulic & electrical components and also explain their basic functions
- Identification of hydraulic & electrical symbols
- Read and understand hydraulic and electrical schematics
- Troubleshoot possible system problems utilizing hydraulic & electrical schematics
- Conduct basic system hydraulic & electrical test and troubleshooting procedures.
- Receive necessary hardware and basic understanding of using customer version HED software

Prerequisites
Crane System Theory

Capacity
8 students

Hardware / Software Provided
HED communication cable for Generation 1 & 2 HED cranes
HED Service Tool & HED CAN Link software

Customer Grove CCS

Content:

This 4 ½ day course assumes the student has completed all prerequisites and has basic crane knowledge. The course covers setup, operation, terminology, technologies, schematics and service software. Models covered are the RT530,540, GRT 880,8100 GRT655 and TMS 9000-2.

Day #1 will include an overview of the Schematic symbols and terminology hydraulically. An understanding of the hydraulic circuits on the machine will be explained utilizing the specific machines schematics.

Day #2 will include an in-depth look at the actual CCS components and what makes the system unique electrically. From there, we will venture into the electrical symbols and schematics of the specific machines.

Day #3 will begin with a study of the CCS operating system to include basic theory of operation of the CCS CAN Bus system. Additionally, the carrier and superstructures electrical systems will be covered with emphasis CCS module supplies, inputs and outputs. Customer version Crane Service Tool is covered next using a CCS simulator to allow the student to connect with the service software and understand how it is used for basic troubleshooting and diagnostics.

Day #4 the students will practice hands on a crane what they learned during the week about basic theory of operation of the carrier and superstructure. Hands on will include component locations, display operations and basic crane functions and operation.

Course Benefits:

- Interpret and navigate hydraulic and electrical schematics
- Basic understanding of carrier systems used on CCS cranes
- Basic understanding of superstructure systems used on CCS cranes
- Basic understanding of CAN Bus and the operating system used on CCS cranes
- Navigate and understand setup and operation of a CCS machine
- Receive necessary hardware and basic understanding of using Customer version Crane Service Tool

Prerequisites
Crane System Theory

Capacity
8 students

Hardware / Software Provided
CCS CAN Switchbox, Peak CAN Dongle & 9 Pin Serial Port cable
Customer Level Crane Service Tool for RT & TMS CCS cranes

Customer GMK ECOS

Content:

This 4 ½ day course assumes the student has completed all prerequisites and has basic crane knowledge. The program begins with a review of GMK terminology and technology used on Generation # 1 & # 2 ECOS models. The program will contain explanations of the ECOS control systems to include reading electrical, air and hydraulic schematics. Customer version service software with be covered including troubleshooting & diagnostics.

Day #1 will include a systems tour of the typical GEN-1 and GEN-2 carrier systems using pneumatic, hydraulic, and ELAN electrical schematics.

Day #2 will include a systems tour of the typical GEN-1 and GEN-2 superstructure using hydraulic and ELAN electrical schematics.

Day #3 will begin with an overview of the CANBus structures used on GEN-1 and GEN-2 systems to include module specifics. Next emphasis will be placed on the boom telescope Twin Lock system and ECOS error codes.

Day #4 will continue with and overview of EKS4 and EKS5 and finishing off the day will be Customer version service software for both GEN-1 and GEN-2 ECOS systems.

Course Benefits:

- Interpret and navigate GMK hydraulic and pneumatic schematics.
- Have a basic understanding of carrier systems on standard GMK GEN-1 and GEN-2 machines.
- Have basic knowledge of superstructure systems on standard GMK GEN-1 and GEN-2 machines.
- Navigate and interpret “E-lan” and “SEE” electrical schematic.
- Have a basic understanding of GEN-1 and GEN-2 error codes.
- Have a basic understanding of Customer version software and hardware.

Prerequisites
Crane System Theory

Capacity
8 students

Hardware / Software Provided
Gen-2 ECOS Customer cables for Carrier & Superstructure
Customer ECOS Service Software for all Gen-2 ECOS cranes

Customer GMK CCS

Content:

This 4 ½ day course assumes the student has completed all prerequisites and has basic crane knowledge. The program covers GMK terminology, technologies, crane setup, operations, schematics and service software. Models covered will be the GMK3060, GMK4100L, GMK5150 and GMK5250's.

Day #1 will include a tour of the different GMK CCS carrier systems using basic theory of operation along with pneumatic and hydraulic schematics covering steering, suspension and outriggers.

Day #2 will include a tour of the different GMK CCS superstructure systems using basic theory of operation along with hydraulic schematics covering basic crane functions, telescoping systems, swing systems and auxiliary functions.

Day #3 will begin with a study of the GMK CCS operating system to include basic theory of operation of the CCS CANBus system. The carrier and superstructure electrical systems will be covered to include an explanation of CCS module supplies, inputs and outputs. Customer version Crane Service Tool is covered next using a CCS simulator to allow the student to connect with the service software and understand how it is used for basic troubleshooting and diagnostics.

Day #4 the students will practice hands on a crane what they learned during the week about basic theory of operation of the carrier and superstructure. Hands on will include component locations, display operations and basic crane functions and operation.

Course Benefits:

- Interpret and navigate GMK CCS hydraulic and pneumatic schematics
- Basic understanding of carrier systems used on GMK CCS cranes
- Basic understanding of superstructure systems used on GMK CCS cranes
- Basic understanding of CANBus and the operating system used on GMK CCS cranes
- Navigate and interpret GMK CCS "SEE" electrical schematics
- Receive necessary hardware and basic understanding of how to use Customer version Crane Service Tool

Prerequisites
Crane System Theory

Capacity
8 students

Hardware / Software Provided
CCS CAN Switchbox, Peak CAN Dongle & 9 Pin Serial Port cable
Customer Level Crane Service Tool for GMK CCS cranes

999 Customer Level 1

Content:

This 4-day course will feature the 999 model crane. The following subjects will be covered during daily classroom lecture time:

- EPIC structure of the 999
- Customer Level software and applicable cables
- Crane Diagnostics
- Crane Swing system
- Crane Travel system
- Drum operation system
- Rated Capacity System
- Boom Remote input node system

Hands-on lab exercises will include:

- Building the crane canbus electrical system
- Use diagnostics for canbus communication errors
- Construct crane systems Swing, Travel, Drums and boom system.

In addition, there will be daily quizzes and homework followed by a final written test on the last day.

Course Benefits:

- Have an understanding of the operating system as used on the 999 crane.
- Identify the cab controls.
- Use the proper crane assembly procedures.
- Use the on-board diagnostics to diagnose problems and adjust drum speeds.
- Navigate the crane maintenance manual.
- Set up the Rated Capacity Indicator for operation and calibration.
- Understand the boom up limit adjustment.
- Understand the block up limits adjustments.
- Understand the electrical schematic from the battery to the boom top.
- Understand the hydraulic schematic from the tank to the crane functions.
- Check Computer system communication by information covered in this class.
- Perform pressure calibrations, controls calibrations, charge pressure tests and pump pressure tests.

Prerequisites
Crane System Theory

Capacity
8 students

Hardware / Software Provided
EPIC Breakout Cable and Peak CAN Canbus Adaptor
Customer Level Crane Service Tool for Manitowoc Lattice Cranes

MLC165 Customer Level 1

Content:

This 4-day course will feature the MLC165 model crane. The following subjects will be covered during daily classroom lecture time:

- Canbus structure of the MLC165
- Customer Level software and applicable cables
- Crane Diagnostics
- Crane Swing system
- Crane Travel system
- Drum operation system
- Rated Capacity System
- Boom Remote input node system

Hands-on lab exercises will include:

- Building the crane canbus electrical system
- Use diagnostics for canbus communication errors
- Construct crane systems Swing, Travel, Drums and boom system

In addition, there will be daily quizzes and homework followed by a final written test on the last day.

Course Benefits:

- Have an understanding of the operating system as used on the MLC 165 crane.
- Identify the cab controls.
- Use the proper crane assembly procedures.
- Use the on-board diagnostics to diagnose problems and adjust drum speeds.
- Navigate the crane maintenance manual.
- Set up the Rated Capacity Indicator for operation and calibration.
- Understand the boom up limit adjustment.
- Understand the block up limits adjustments.
- Understand the electrical schematic from the battery to the boom top.
- Understand the hydraulic schematic from the tank to the crane functions.
- Check Canbus communication by information covered in this class.
- Perform pressure calibrations, controls calibrations, charge pressure tests and pump pressure tests.

Prerequisites
Crane System Theory

Capacity
8 students

Hardware / Software Provided
Canbus Breakout Cable and Peak CAN Canbus Adaptor
Customer Level Crane Service Tool for Manitowoc Lattice Cranes

MLC300 Customer Level 1

Content:

This 4-day course will feature the MLC300 model crane. The following subjects will be covered during daily classroom lecture time:

- Canbus structure of the MLC300
- Customer Level software and applicable cables
- Crane Swing system
- Crane Travel system
- Drum operation system
- Rated Capacity System
- Variable Position Control Counterweight

Hands-on lab exercises will include:

- Building the crane canbus electrical systems
- Use diagnostics for canbus communication errors
- Construct crane systems Swing, Drums and VPC System.

In addition, there will be daily quizzes and homework followed by a final written test on the last day.

Course Benefits:

- Have an understanding of the operating system as used on the MLC300 crane.
- Identify the cab controls.
- Use the proper crane assembly procedures.
- Use the on-board diagnostics to diagnose problems and adjust drum speeds.
- Navigate the crane maintenance manual.
- Set up the Rated Capacity Indicator for operation and calibration.
- Understand the electrical schematic from the battery to the boom top.
- Understand the hydraulic schematic from the tank to the crane functions.
- Check Canbus communication by information covered in this class.
- Perform pressure calibrations, controls calibrations, charge pressure tests and pump pressure tests.

Prerequisites
Crane System Theory

Capacity
8 students

Hardware / Software Provided
CCS CAN Breakout Cable and Peak CAN Canbus Adaptor
Customer Level Crane Service Tool for CCS Lattice Cranes

MLC650 Customer Level 1

Content:

This 4-day course will feature the MLC650 model crane. The following subjects will be covered during daily classroom lecture time:

- Canbus structure of the MLC650
- Customer Level software and applicable cables
- Crane Swing system
- Crane Travel system
- Drum operation system
- Rated Capacity System
- Variable Position Control Counterweight

Hands-on lab exercises will include:

- Building the crane canbus electrical systems
- Use diagnostics for canbus communication errors
- Construct crane systems Swing, Drums and VPC System

In addition, there will be daily quizzes and homework followed by a final written test on the last day.

Course Benefits:

- Have an understanding of the operating system as used on the MLC650 crane.
- Identify the cab controls.
- Use the proper crane assembly procedures.
- Use the on-board diagnostics to diagnose problems and adjust drum speeds.
- Navigate the crane maintenance manual.
- Set up the Rated Capacity Indicator for operation and calibration.
- Understand the electrical schematic from the battery to the boom top.
- Understand the hydraulic schematic from the tank to the crane functions.
- Check Canbus communication by information covered in this class.
- Perform pressure calibrations, controls calibrations, charge pressure tests and pump pressure tests.

Prerequisites
Crane System Theory

Capacity
8 students

Hardware / Software Provided
CCS CAN Breakout Cable and Peak CAN Canbus Adaptor
Customer Level Crane Service Tool for CCS Lattice Cranes

Training Arrangements for PA:

Our Address:

1565 Buchanan Trail East
Shady Grove, PA 17256

Local Airports:

Baltimore/Washington (BWI) International Airport
Washington Dulles (IAD) International Airport
Harrisburg, PA (MDT) International Airport
Hagerstown Regional Airport (HGR)

Rental Car: A rental car will be required for transportation to and from the airport. A rental car will also be required for daily transportation to and from the Manitowoc Training Facility.

If transportation service is required; arrangements must be made prior to the start of class by contacting Toni Pagliaro at Toni.Pagliaro@manitowoc.com. **Please note** all transportation fees incurred will be billed in addition to the cost of the training course you are attending.

Recommended Hotels:

1. Homewood Suites, 1650 Pullman Lane, Hagerstown, MD 21740
   Phone: (301) 665-3816
2. Springhill Suites by Marriott, 17280 Valley Mall, Hagerstown, MD 21740
   Phone: (301) 582-0011
4. Holiday Inn Express, 241 Railway Lane, Hagerstown, MD 21740
   Phone: (301) 745-5644
4. Courtyard by Marriott, 17270 Valley Mall Road, Hagerstown, MD 21740
   Phone: (301) 582-0043

Hotel arrangements, hotel expenses, transportation, breakfast and evening meals are the student's responsibilities.

Manitowoc does provide a catered lunch Monday-Thursday at 12:00 PM and ends at 12:30 PM. No lunches are served on Friday's. Coffee, sodas, and bottled water are available daily in the training cafeteria at no cost to the students. Snacks are available anytime in the Training Cafeteria vending machine.

Training Arrangements for WI:

Our Address:

1424 Dewey Street
Manitowoc, WI 54220

Local Airports:

Green Bay Austin Straubel Airport - If you are flying into this airport, directions are as follows. As you leave the airport, make a right turn onto Airport Drive. Follow this to the 41/172 interchange where you will get on 172 going east. Watch for the signs for I-43 south. Continue on I-43 south for about 40 miles to Exit 149 at Manitowoc. After exiting I-43, turn left (east) onto Hwy. 151. The Holiday Inn will be just a short distance ahead and to your right.

Milwaukee's Mitchell Field Airport - If you are flying into this airport, directions are as follows. As you leave the airport, make a right turn onto I-94 north. As you near the downtown Milwaukee interchange, follow the signs for I-43 north. Continue on I-43 north for about 80 miles to Exit 149 at Manitowoc. After exiting I-43, turn right (east) onto Hwy. 151. The Holiday Inn will be just a short distance ahead and to your right.

Recommended Hotels:

1. Holiday Inn
Address: 4601 Calumet Avenue, Manitowoc, Wisconsin 54220
Phone: (920) 682-6000

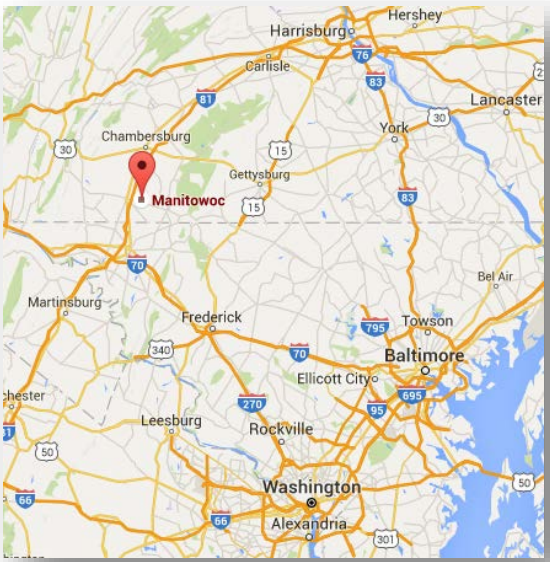
2. Baymont Inn & Suites
Address: 101 Maritime Drive, Manitowoc, Wisconsin, 54220-6804
Phone: (920-682-7000)

Hotel arrangements, hotel expenses, transportation, breakfast and evening meals are the student's responsibilities.

Manitowoc does provide a catered lunch Monday-Thursday at 12:00 PM and ends at 12:30 PM. No lunches are served on Friday's. Coffee, sodas, and bottled water are available daily in the training cafeteria at no cost to the students. Snacks are available anytime in the Training Cafeteria vending machine.

Address / Map

Manitowoc Crane Care
1565 Buchanan Trail East
Shady Grove, PA 17256
www.manitowoccranes.com



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Manitowoc, WI 54220
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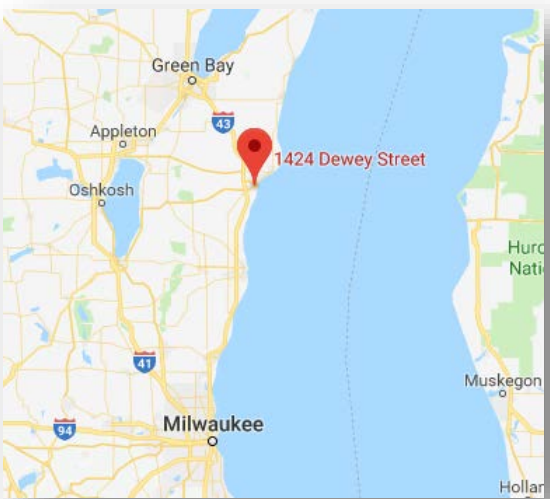

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Manitowoc Crane Care when you need it.

The assurance of the world's most advanced crane service and support to get you back to work fast.

Manitowoc Finance helps you get right to work generating profits for your business.

Financial tools that help you capitalize on opportunity with solutions that fit your needs.

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