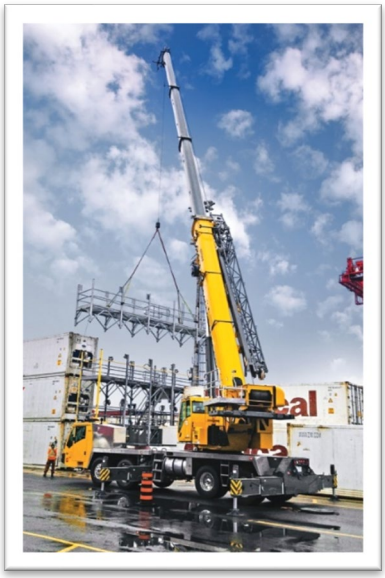
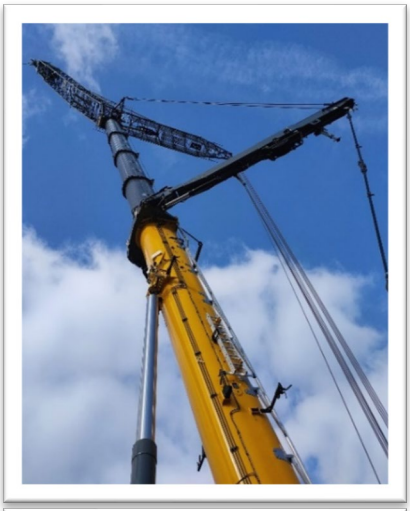
GROVE®

TRAINING 2025

Course catalog

Shady Grove – Pennsylvania, USA





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GROVE®

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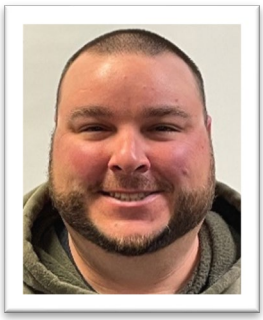

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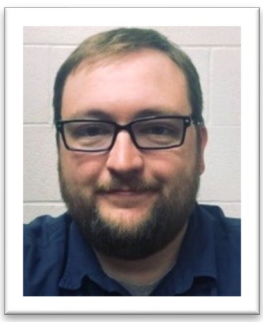

Josh Garrington
Global Training Manager
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Training Center Info

GROVE®

Our Capabilities:

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

The Manitowoc Product Support Training Center 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.

Please contact us if you are interested in Spanish-language instruction.

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 and Brazil:
    - Epic Simulators
    - Canbus Version 1 and version 2 Simulator;
    - Crane in the box Simulator
    - CCS Simulator

Contact us for more information about our global training centers located in Wilhelmshaven, Germany; Monterrey, Mexico; Sao Paulo, Brazil and Dubai, UAE.

Travel Arrangement Info

GROVE®

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. No lunches are served on Fridays. 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.

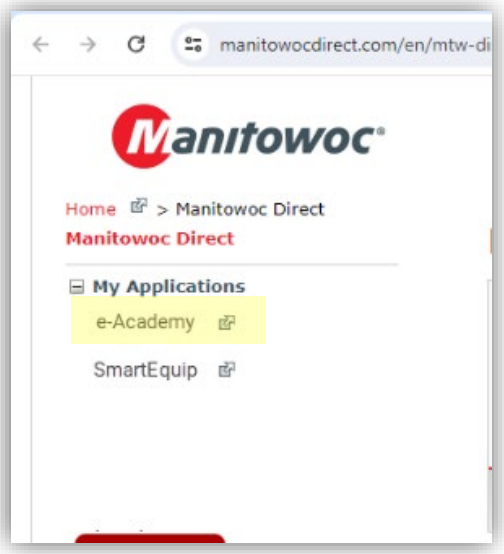
Registration

Request an Account:

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

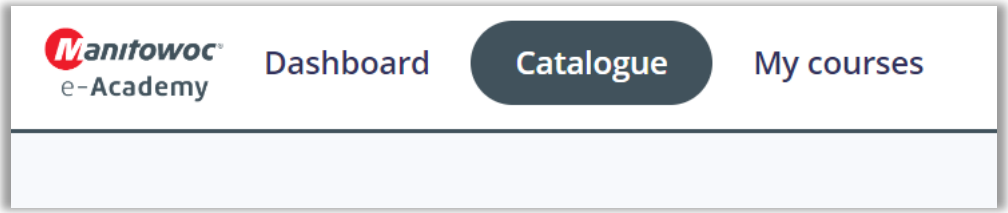
http://www.manitowoccranes.com/en/manitowoc-direct/manitowoc-direct-request-access

Once registered, users should login to Manitowoc Direct, click to expand My Applications, then select e-Academy to enter our website.



Manitowoc e-Academy:

Once logged in, you will see a Catalogue section where you will find our available courses, with upcoming dates listed.



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

Index

GROVE®

Section 1	Grove RT & TMS Course *For customers & dealers*	**Page 07 - 15**
Section 2	Grove RT & TMS Courses *For dealers*	**Page 16 - 19**
Section 3	Grove GMK Courses *For customers & dealers*	**Page 20 – 24**
Section 4	Grove GMK Courses *For dealers*	**Page 25 - 30**
Section 5	Grove Hydraulic Crawler Courses *For dealers*	**Page 31 – 32**
Section 6	Quick Start Yellow *For customers & dealers*	**Page 33 – 34**
Section 7	e-Learning Modules *For customers & dealers*	**Page 35**

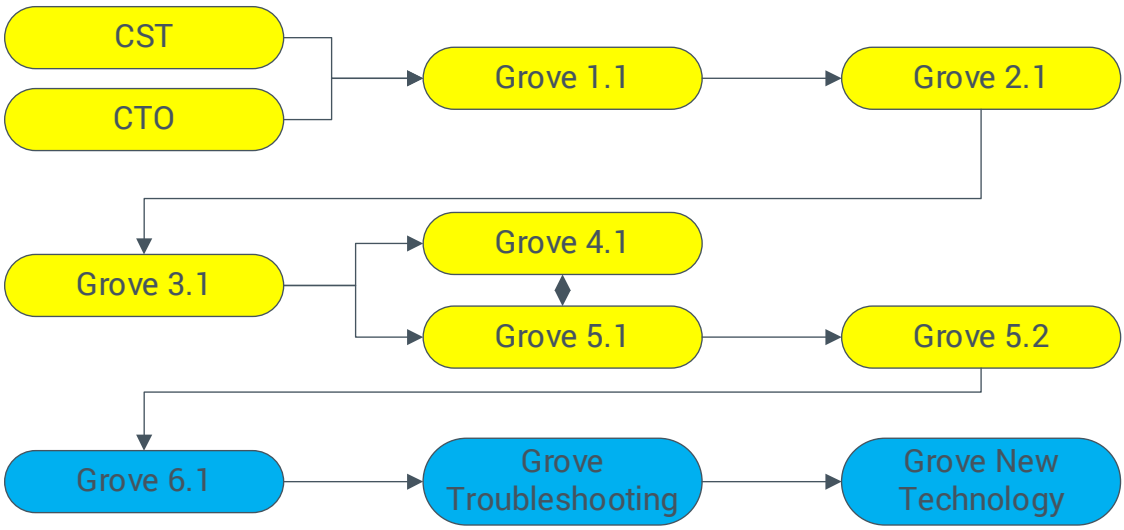
Grove RT & TMS

For customers & dealers

GROVE®

Course	Page	Course name
CST	08	Crane System Theory
CTO mobile 1.0	09	Crane Technology & Operation Mobile 1.0
Grove 1.1	10	Intro to CANBUS
Grove 2.1	11	CANLink / Service Tool
Grove 3.1	12	Orchestra
Grove 4.1	13	Hybrids
Grove 5.1	14	CCS
Grove 5.2	15	GroveLock Pin Boom

These courses are available to Grove customers and dealers. To register for a course please use the Manitowoc e-Academy in Manitowoc Direct. Instructions for requesting an account are found on page 5 of this catalog.



Grove RT & TMS Training Path

Crane System Theory

GROVE®

Aim of training course:

The course is designed to provide a basic understanding of hydraulics, electrical, and pneumatic principles and how they are applied on the Grove and National Crane product.

Program:

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.

Validation of Knowledge:

Daily homework, tasks, and final test at the end of the training course.

Prerequisites

- Must be over 18 years old
- Must bring their PPE

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

- 8 participants

Teaching Methods:

Theory and practice in hydraulic, electrical, and pneumatic schematics and systems. 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

Hardware/Software Provided:

None

Equipment:

- Training room
- Technical Documents
- Simulators
- Hydraulic & Electrical Test Benches

Cost:

- $1,900 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Crane Technology & Operation Mobile 1.0

GROVE®

Aim of training course:

Provide an in-depth overview of Grove RT, TMS, and GHC crane terminology and technologies in relationship to crane systems. 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.

Rated Capacity Limiting systems programming and operation is covered 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 RT crane. This will give students a working knowledge of a Grove crane and the foundation to continue their studies in Grove hydraulic and electrical systems.

Prerequisites

- Must be over 18 years old
- Must bring their PPE

Duration

- 3.5 days
- Monday 7:30am to Friday 12:00pm

Number of participants

- 8 participants

Program:

- Basic understanding of how to read and interpret load charts
- Start-up and programming of RCL systems
- Basic understanding of how to setup and function a Grove crane functions and operates.

Teaching Methods:

Detailed theoretical classroom instruction and hands-on exercises.

Hardware/Software Provided:

None

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane

**dealer pricing may vary*

Cost:

- $1,900 per student course fee*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Grove 1.1
Intro to Canbus

GROVE®

Aim of training course:

Provide an understanding of all previous LMI (Load Moment Indicator) systems used on Grove domestic cranes and introduces them to CANBus RCL (Rated Capacity Limiter) systems used on current domestic cranes.

The course covers how load charts and LMI systems are interrelated. The students then get into the inner workings of the DS150, DS350 to include Boom Control, IFlex5 and IFlex5-2 systems through explanations of the overall system schematics. In-depth sessions covering the individual circuits, digital inputs, measuring channels, and basic adjustments.

CANBus explanation of the current I-Flex5-2 system to include the OMS (Outrigger Monitoring System). CANBus theory along with system schematics will help the students gain an understanding for types of inputs, outputs and troubleshooting.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CST, CTO Mobile

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

- 8 participants

Program:

- Have a basic understanding of CANBus systems and circuits.
- Have a basic understanding of how to diagnosis problems of CANBus circuits.
- Have the basic understanding of LMI systems and circuits.
- Have the basic understanding of how to diagnose problems of LMI systems and perform basic system adjustments and calibrations.
- Receive and understand the use of software programs.

Teaching Methods:

Detailed theoretical classroom instruction and hands-on exercises.

Hardware/Software Provided:

Diagnostic cable, IFlash service tool

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane

Cost:

- $1,900 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Grove 2.1
CANLink / Service Tool

GROVE®

Aim of training course:

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 except for the TMS9000E or RT9150E models.

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

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Grove 1.1

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

- 6 participants

Program:

- Explain function and identify superstructure and carrier hydraulic & electrical components.
- 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 using software programs.

Teaching Methods:

Detailed theoretical classroom instruction and hands-on exercises.

Hardware/Software Provided:

HED comm. cable for Gen 1 & 2, HED Service Tool, & HED CAN Link software

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane

Cost:

- $1,900 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Grove 3.1 Orchestra

GROVE®

Aim of training course:

The course covers recent RT and TM/TMS models using HED Generation 3 control system.

This program covers CANBus technology used on Grove RT & TMS cranes along with hydraulic, electrical systems and components. Students will gain an understanding of components and systems through the intense study of system schematics. This gives the students a working knowledge of these systems and a foundation for proper troubleshooting techniques and test procedures.

Orchestra Software will be loaded onto student's laptops for the purpose to conduct hands-on sessions covering proper software operation and troubleshooting techniques.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Grove 2.1

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

- 6 participants

Program:

- Identify hydraulic and electrical components used on current Grove RT & TMS cranes and explain their basic function.
- Read and understand current Grove RT & TMS hydraulic & electrical schematics.
- Make system checks using recommended test procedures and be able to understand the indicated readings.
- Troubleshoot system problems using the foundation information from this course and utilizing schematics and service software.

Teaching Methods:

Detailed theoretical classroom instruction and hands-on exercises.

Hardware/Software Provided:

Diagnostic cable, HED Dongle, Orchestra Software

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane

Cost:

- $2,800 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Grove 4.1 Hybrids

GROVE®

Aim of training course:

The course assumes basic knowledge of operation, hydraulic & electrical systems as covered in the previous courses. The course covers the TMS9000E and RT9150E models.

This program covers current CANBus technology used on Grove hybrid cranes along with hydraulic, electrical systems and components. Students will gain an understanding of components and systems through the intense study of system schematics. A session will familiarize the students with the operation of the ECOS and EKS systems used on these models.

Sessions on reading ELAN schematics and Service Software operation will give students the basics for applying trouble shooting techniques. Hands on sessions will be conducted to re-enforce classroom material on system operation and diagnostics.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Grove 3.1

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

- 6 participants

Program:

- Identify hydraulic and electrical components used on current Grove hybrid cranes and explain their basic function.
- Read and understand current Grove hybrid hydraulic & ELAN electrical schematics.
- Make system checks using recommended test procedures and be able to understand the indicated readings.
- Troubleshoot system problems using the foundation information from this course and utilizing schematics and service software.

Teaching Methods:

Detailed theoretical classroom instruction and hands-on exercises.

Hardware/Software Provided:

Diagnostic cables, model specific software tools

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane

Cost:

- $2,800 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Grove 5.1 CCS

GROVE®

Aim of training course:

The course covers the Crane Control System (CCS) used on most current production RT & TMS cranes.

The course will walk the students through overall setup and navigation of components such as the displays and all other cabin related CCS system setup. After the system itself is thoroughly understood, students will walk through the entire crane electrically and hydraulically with the aid of schematics. This course focuses on full power boom machines.

The final portion of the class will cover the CST service software which will be used to diagnose electrical issues and calibrate sensors. The Peak Can Dongle will be supplied for attending and passing the class.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Grove 3.1

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

- 6 participants

Program:

- Have a basic understanding of how to read and interpret the displays and error codes and explain them to operators during machine deliveries.
- Have a full understanding of CCS hydraulic and electrical systems, components and schematics.
- Have the foundation to troubleshoot system problems by utilizing the schematics and service software procedures on current production CCS cranes.

Teaching Methods:

Detailed theoretical classroom instruction and hands-on exercises.

Hardware/Software Provided:

Switchbox, Peak dongle, CST software

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane

Cost:

- $2,800 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Grove 5.2
GroveLock Pin Boom

GROVE®

Aim of training course:

This course will showcase cranes with the operational systems of GroveLock Pin Boom telescoping operation. Service technicians will be guided through pneumatic, electrical, and hydraulic systems by studying the system's schematics and manuals; and by participating in actual hands-on sessions. Extensive in-depth sessions of the machine's operating systems will allow technicians to build the necessary system knowledge and confidence to troubleshoot system problems.

This session will also cover any new extensive differences on how the CST crane diagnostic tool will work on these machines, calibration, adjustments, saving EEPROM files and over all troubleshooting with the software tool. The software and the appropriate license key (TMS) will be provided pending passing and completion of the course.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Grove 5.1

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

- 8 participants

Program:

- The skills required for operating, servicing, and troubleshooting cranes with GroveLock Pin Booms.
- The skills to identify the superstructure/carrier controls and system indicators for the specified machines.
- Understand how the specified machines operates pneumatically, electrically, and hydraulically.
- All documentation for the machine will be distributed in thumb drive/USB format to assist with troubleshooting and machine operation.

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, homework assignments.

Hardware/Software Provided:

None

Equipment:

- Training room
- Technical Documents
- Simulators

Cost:

- $2,500 per student course fee*

**dealer pricing may vary*

Dates:

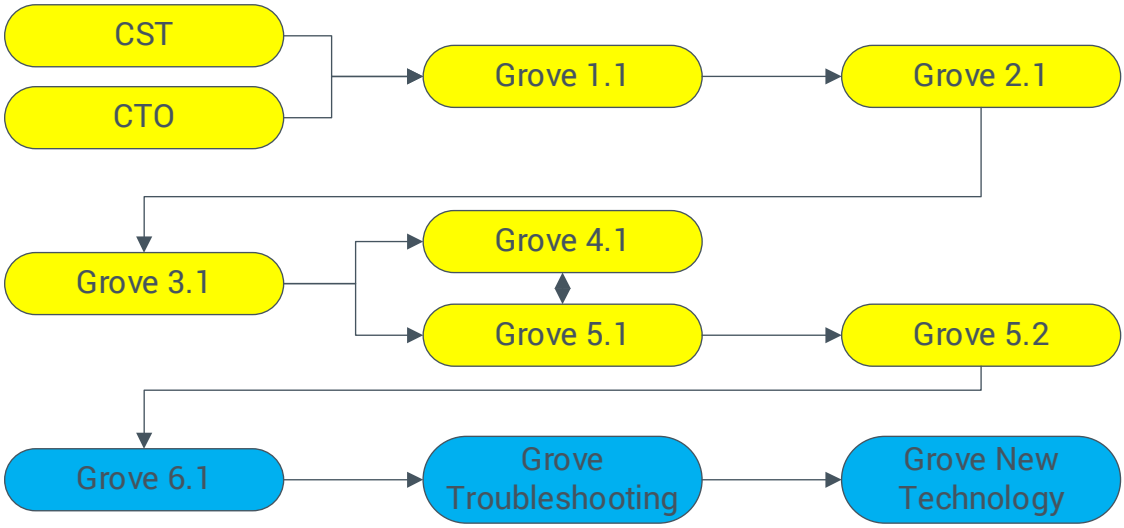
- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Grove RT & TMS

For dealers

Course	Page	Course name
Grove 6.1	17	Flashing
Grove Troubleshooting	18	Troubleshooting
Grove New Technology	19	New Technology

These courses are available to Grove dealers. Grove customers may attend these courses with prior approval from their dealer.



Grove RT & TMS Training Path

Grove 6.1 Flashing

GROVE®

Aim of training course:

The course will cover FLASHING and CALIBRATION of the following:

1. Flashing / loading software for Gen.1, Gen.2, & Gen.3 HED based machines. Including loading of 770 charts, can open transducer calibration and use of Application Configurator program to upload error logs for diagnostics.

2. Flashing of all Hirschman I-Flex 2/I-Flex 5 and current Expert systems 2/5. Including all central units and displays.

3. Flashing of ECOS related control units both esx's and gviom's (RT9150 and TMS 9000).

4. Flashing of Wylie I-3500, 4300, 4500 RCL's for Yard Boss/Shuttlelift

5. Flashing and Calibration of new Crane Control System (CCS)

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Grove 4.1, 5.1 & 5.2

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

- 8 participants

Program:

- Understand Flashing and Calibration procedures
- Flash and Calibrate all major components of Grove Domestic cranes

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

Hardware/Software Provided:

As needed

Equipment:

- Training room
- Technical Documents
- Simulators

Cost:

- $2,800 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Grove Troubleshooting

GROVE®

Aim of training course:

This course will cover troubleshooting the Grove control systems learned in previous classes.

Classroom and practical training methods will be used to include a review of Grove Crane systems along with troubleshooting procedures and technics related to the Grove Crane product line. Understanding error codes and how to interpret their meaning will be focused on to help the students apply what they have learned about the systems and how that relates to the different error codes they will be confronted with.

Students will be tested on their troubleshooting skills by means of written task and hands on task. The task will include system errors, software procedures and calibrations. The course will be approximately 30% classroom and 70% practical

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Grove 6.1

Duration

- 3 days
- Tues 7:30 am to Thurs 4:00 pm

Number of participants

- 6 participants

Program:

- Have an understanding of recommended troubleshooting techniques.
- Enhance troubleshooting skills.
- Understand using crane service software for diagnostics.
- Understand how to diagnose error codes properly.
- Understand diagnostic screens.

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

Hardware/Software Provided:

None

Equipment:

- Training room
- Technical Documents
- Simulators

Cost:

- $1,200 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Grove New Technology 2025

GROVE®

Aim of training course:

This course showcases the operational systems of the Grove model GRT780, as well as the TTS option for the TMS9000-2 & assorted updates to other models. Service technicians will be guided through electrical and hydraulic systems by studying the system's schematics and manuals; and by participating in actual hands-on sessions. Extensive in-depth sessions of the machine's operating systems will allow technicians to build the necessary system knowledge and confidence to troubleshoot system problems.

Specifically designed tasks are provided to give technicians the opportunity to experience the computer software on the machine. This session will also cover any new extensive differences on how the CST crane diagnostic tool will work on this Domestic machine, calibration, adjustments, saving EEPROM files and overall troubleshooting with the software tool. The software and the appropriate license key will be provided.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Grove 5.1

Duration

- 2 days
- Mon 7:30 am to Tues 4:00 pm or Weds 7:30 am to Thurs 4:00 pm

Number of participants

- 8 participants

Program:

- The skills required for operating, servicing, and troubleshooting the GRT8120 cranes.
- The skills to identify the superstructure/carrier controls and system indicators for the specified machine.
- Understand how the specified machine operates pneumatically, electrically, and hydraulically.
- All documentation for the machine will be distributed in thumb drive/USB format to assist with troubleshooting and machine operation.

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, homework.

Hardware/Software Provided:

CST update

Equipment:

- Training room
- Technical Documents
- Simulators

Cost:

- $2,500 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Grove GMK

For customers & dealers

Course	Page	Course name
GMK 1.3	21	Basic Operation
GMK 2.3	22	ECOS Generation 1
GMK 3.3	23	ECOS Generation 2
GMK 4.2	24	CCS

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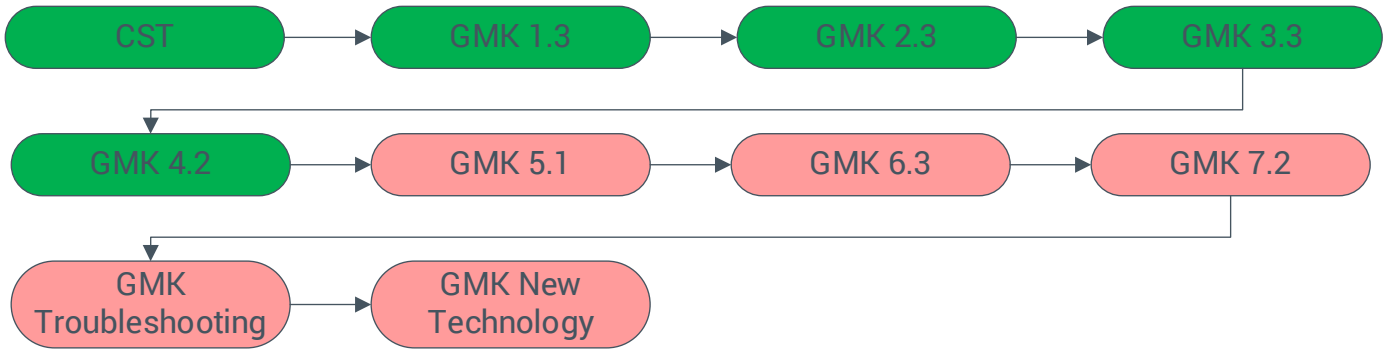


Grove GMK Training Path

GMK 1.3
Basic Operation

GROVE®

Aim of training course:

This course is designed for individuals who are new to GMK cranes but would also be an excellent refresher course for more experienced technicians. The course covers the setup, operation, and technologies of GMK cranes. The focus is on current production GMK cranes equipped with CCS and previous version cranes with ECOS/EKS.

The course features:

- Overview of the carrier controls
- Transmission and driving controls
- Outriggers, suspension and rear steering systems
- Basic crane operators safety
- Load chart and outrigger pad load table explanations
- Superstructure cab controls, including RCL setup
- Twin-lock boom control system.

Topics will be reinforced with hands-on crane time.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CST

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

- 6 participants

Program:

- Have a basic understanding of how to read and interpret load charts and outrigger pad load tables
- Conducted properly set up of GMK CCS for highway travel or lifting operations.
- Be able to operate the boom telescope in semi automatic and automatic modes
- Have knowledge of basic error codes for Operation and RCL systems.

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

Hardware/Software Provided:

None

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane

Cost:

- $2,500 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

GMK 2.3
ECOS Generation 1

GROVE®

Aim of training course:

This course introduces students to Generation 1 ECOS system cranes which will include the explanation of how to read GMK schematics to include hydraulic, pneumatic, and electrical/ELAN. Hands on exercises feature a GMK5180 simulator.

Material includes an explanation of schematic symbols used on GMK schematics to include pneumatic, hydraulic and electrical. Using ELAN and SEE electrical schematic formats to explain crane function circuits. A tour of the typical Generation 1 superstructure and carrier ECOS system focusing on CANBus and module specifics. And an explanation of the TwinLock boom pinning system including error code diagnosing and troubleshooting.

Course also covers ECOS Service Software for Generation 1 cranes including calibration, parameter file reading and writing, and troubleshooting.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- GMK 1.3

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

- 8 participants

Program:

- Interpret and navigate GMK hydraulic and pneumatic schematics
- Have a basic understanding of how to navigate ELAN and SEE version electrical schematics.
- Have a basic understanding of Generation 1 carrier and superstructure systems hydraulically pneumatically and electrically.
- Have an understanding of theory of operation of the GMK TwinLock boom and using Service Software for Generation 1 ECOS cranes.

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

Hardware/Software Provided:

ECOS Gen 1 dongle, Gen 1 cable, Gen 1 service software

Equipment:

- Training room
- Technical Documents
- Simulators

Cost:

- $1,900 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

GMK 3.3
ECOS Generation 2

GROVE®

Aim of training course:

This course introduces students to Generation 2 ECOS system cranes which will include the explanation of ELAN and SEE schematics as used on Generation 2 ECOS. Hands on tasks use a GMK5130-1 simulator.

Material includes a systems tour of the typical Generation 2 carrier and superstructure ECOS systems to include pneumatic and hydraulic specifics, the CANBus system, module specifics, and electrical system circuit functions.

The course will also explain the TwinLock boom pinning system, including troubleshooting and error code diagnosing.

Finally, the course also covers . ECOS Service Software for Generation 2 cranes including calibration, parameter file reading and writing, and troubleshooting.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- GMK 2.3

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

- 8 participants

Program:

- Interpret and navigate GMK hydraulic, pneumatic and electrical schematics for Generation 2 ECOS cranes
- Have an understanding of GMK Generation 2 ECOS systems
- Have an understanding of theory of operation of the GMK TwinLock boom telescoping system on Generation 2 ECOS cranes.
- Understand the use of Service Software for Generation 2 ECOS cranes.

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

Hardware/Software Provided:

9-pin cable, switchbox, Gen 2 service software

Equipment:

- Training room
- Technical Documents
- Simulators

Cost:

- $2,800 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

GMK 4.2 CCS

GROVE®

Aim of training course:

This course covers technology and diagnostics pertaining to the new CCS control system used on the GMK 3060, GMK5180, 5200, 5250L and GMK4100L-1 models. Mode of instruction is primarily classroom theory and practical hands on utilizing a GMK CCS simulator.

The course begins with component identification, operational aspects and system overview to include electrical and hydraulic schematics. The class concludes with the students using and understanding the CST service software to include troubleshooting, calibration and flashing of system components.

Program:

- Understand operation of the CCS control system
- Troubleshoot the electrical and hydraulic systems utilized in the CCS control system.
- Perform calibration and flashing procedures necessary for proper operation of the CCS control system.
- Receive, upon successful completion of the final test, the CST service software, switchbox and cabling.

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

Hardware/Software Provided:

PEAK dongle, CST software

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane

Cost:

- $2,800 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- GMK 3.3

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

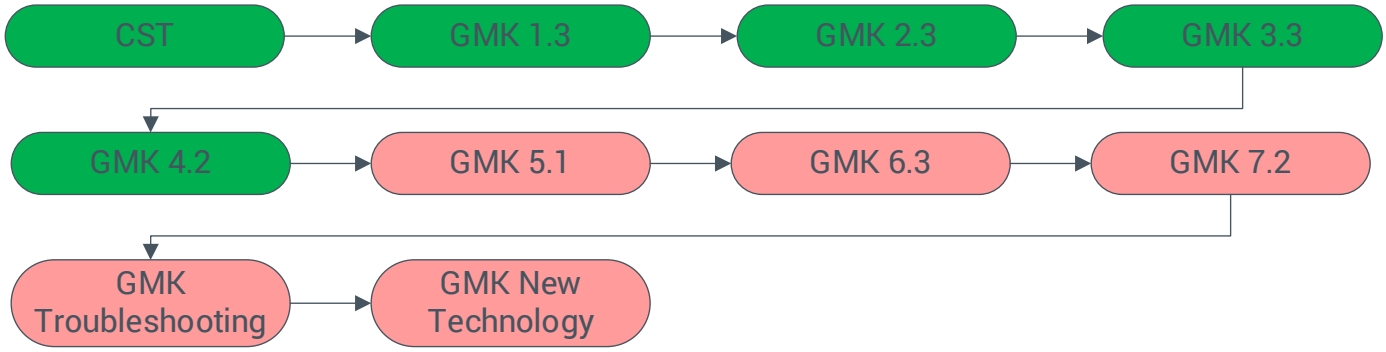
- 6 participants

Grove GMK

For dealers

Course	Page	Course name
GMK 5.1	26	EKS System/Flashing
GMK 6.3	27	MTU Engines & Mercedes Transmissions
GMK 7.2	28	Steer-by-Wire Systems
GMK Troubleshooting	29	Troubleshooting
GMK New Tech 2024	30	New Technology – GMK 6400-1 and 4070L

These courses are available to Grove dealers. Grove customers may attend these courses with prior approval from their dealer.



Grove GMK Training Path

GMK 5.1
EKS System/Flashing

GROVE®

Aim of training course:

This course begins with a review of the EKS 4 LMI system utilized in Generation 1 ECOS equipped cranes.

Primary focus will be centered on the "Flash Programming" of the EKS 5 LMI system and related peripherals and the ECOS ESX system and peripherals.

Mode of instruction is classroom theory/discussion, simulator programming exercises and hands-on. The course conclusion will entail a written final exam.

Program:

- Fully reprogram / re-flash operating software into all EKS and ECOS controls modules and related peripherals as applicable.
- Transfer all eeprom data from one computer module to another.
- Identify and calibrate all peripheral sensors associated with the LMI and ECOS systems.
- Identify and troubleshoot sensor faults on the LMI and/or ECOS control system.
- Receive, upon successful completion, the flashing software, dongle and cable.

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

Hardware/Software Provided:

EKS4 write protect cable, EKS flashing & calibration software

Equipment:

- Training room
- Technical Documents
- Simulators

Cost:

- $2,800 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- GMK 4.2

Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

Number of participants

- 6 participants

GMK 6.3
MTU & Mercedes

GROVE®

Aim of training course:

This course covers the operational control and troubleshooting of the fully automated Mercedes G-240 and the new G-280 transmission used on various GMK crane models. Also covered in this course is the Mercedes SCR DEF system, Minidiag and Xentry tools.

Mode of instruction is classroom theory/discussion and hands-on practical exercises utilizing a GMK 4100L-1 model crane and simulators as applicable.

Day 1 and 2 will focus on the Mercedes G-240 transmission components and operation along with using the Minidiag II service tool. Mercedes SCR Def systems will also be covered.

Day 3 will focus on the Mercedes G-280 transmission components and operation along with the Xentry service tool. The course is finished on day 4 with a written exam.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- GMK 5.1

Duration

- 3.5 days
- Monday 7:30 am to Thurs 12:00 pm

Number of participants

- 6 participants

Program:

- Understand the Mercedes G-240 & G-280 transmission.
- Troubleshoot and calibrate the Mercedes G-240 & G-280 transmission using the Minidiag II and Xentry service tools.
- Provide driving/operation instruction to customers when delivering machines equipped with the Mercedes transmission.
- Understand operational aspects of the Mercedes SCR def system.
- **Passing students will be eligible to purchase engine diagnostic tool, software, and license from MTU.**

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

Hardware/Software Provided:

Minidiag Assistant program

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane

Cost:

- $2,800 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

GMK 7.2
Steer-by-Wire Systems

GROVE®

Aim of training course:

This course covers the MTW "Manitowoc" designed SBW control system and the new ME "Mobile Electronic" SBW control system used on CCS crane models.

Mode of instruction is classroom theory/discussion and practical exercises utilizing a GMK ECOS model Steer by Wire simulator and a GMK CCS crane equipped with the ME Steer by Wire control system.

Content will include electrical and hydraulic overview of system requirements, mechanical alignment, programming of control modules and calibration of systems controls.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- GMK 6.2 OR GMK 6.3

Duration

- 3.5 days
- Monday 7:30 am to Thurs 12:00 pm

Number of participants

- 6 participants

Program:

- Troubleshoot the electrical and hydraulic systems utilized in the Steer-By-Wire control systems.
- Perform the mechanical alignment of the steering system necessary for proper operation.
- Program and calibrate the Steer-By-Wire controls.

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

Hardware/Software Provided:

MTW SBW cable and software, ME SBW software

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane

Cost:

- $2,800 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

GMK Troubleshooting

GROVE®

Aim of training course:

This course covers troubleshooting the Grove GMK control systems learned in previous classes.

Classroom and practical training methods will be used to include a review of GMK systems along with troubleshooting procedures and technics related to the GMK product line. Understanding error codes and how to interpret their meaning will be focused on to help the students apply what they have learned about the systems and how that relates to the different error codes they will be confronted with.

Students will be tested on their troubleshooting skills by means of written task and hands on task. The task will include system errors, software procedures and calibrations. The course will be approximately 30% classroom and 70% practical.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- GMK 7.2

Duration

- 3 days
- Tues 7:30 am to Thurs 4:00 pm

Number of participants

- 6 participants

Program:

- Have an understanding of recommended troubleshooting technics
- Enhance troubleshooting skills.
- Understand using crane service software for diagnostics
- Understand how to properly diagnose error codes
- Understand diagnostic screens

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

Hardware/Software Provided:

None

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane

Cost:

- $1,200 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

GMK New Technology 2024 GMK6400-1 & GMK4070L

GROVE®

Aim of training course:

This course covers new technology pertaining to the CCS control systems used on the new model GMK6400-1 and GMK4070L cranes.

Mode of instruction is primarily classroom theory/discussion and practical exercises utilizing a GMK CCS simulator.

Content will include new technologies used on the GMK6400-1 and GMK4070L models to include updated ME SBW steering system, new Tier5 engine, CCS on board diagnostics, and new Megawing and Luffing jib design.

Program:

- Understand the new technologies used on the GMK6400-1 and GMK4070L CCS control system.
- Perform calibration procedures via the new on board diagnostics of the CCS system.
- Understand operation of the ME SBW steering system
- Understand the Tier5 technologies to include DEF and ReGen
- Understand the new Megawing and Luffing jib design

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

Hardware/Software Provided:

None

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane

Cost:

- $2,100 per student course fee*

**dealer pricing may vary*

Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- GMK 7.2

Duration

- 3 days
- Tues 7:30 am to Thurs 4:00 pm

Number of participants

- 6 participants

Grove Hydraulic Crawler

For dealers

Course	Page	Course name
GHC 1.1	32	Hydraulic Crawler Overview

These courses are available to Grove dealers. Grove customers may attend these courses with prior approval from their dealer.

GHC 1.1
Hydraulic Crawler Overview

GROVE®

Aim of training course:

This course starts with an in-depth review of GHC terminology and technologies so the students can relate to individual components and systems.

Programs covering the GHC load charts are used to expose the students to how load charts are constructed and how to properly read and interpret them. Sessions on GHC hydraulic and electrical systems will expose the students to schematic layout and symbols with focus on individual circuits as to their purpose and function within the overall system. These sessions will give the students a working knowledge of a fully functioning GHC crane and the foundation to learn proper troubleshooting techniques and test procedures.

The final portion of the course will be focused on the LMI system and the breakdown of the machine electrically.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CST

Duration

- 4 days
- Monday 7:30 am to Thurs 4:00 pm

Number of participants

- 8 participants

Program:

- Have the basic understanding of how to read and interpret load charts and explain them to operators during machine deliveries.
- Have a full understanding of GHC hydraulic and electrical symbols, components and schematics.
- Have the foundation to troubleshoot system problems by utilizing the schematics and service manual procedures on current production GHC cranes.

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

Hardware/Software Provided:

None

Equipment:

- Training room
- Technical Documents
- Simulators
- Crane when available

Cost:

- $2,200 per student course fee*

**dealer pricing may vary*

Dates:

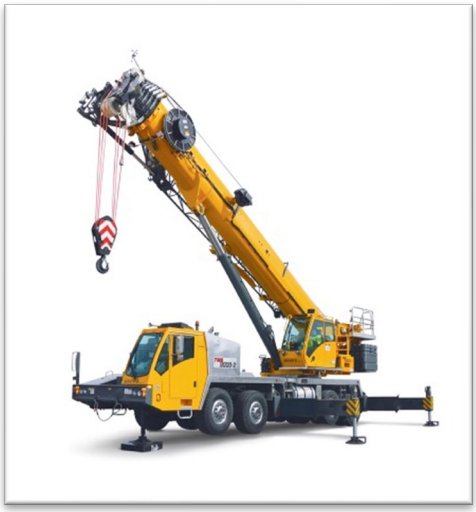
- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Quick Start Yellow

For customers & dealers

GROVE®

Course	Page	Course name
QSP Course 1	34	Crane Systems Theory
QSP Course 2	34	Intro to HED
QSP Course 3	34	Advanced HED
QSP Course 4	34	RT & TMS CCS
QSP Course 5	34	GMK ECOS
QSP Course 6	34	GMK CCS



Quick Start Yellow

GROVE®

Aim of Training Program:

To help newly hired technicians obtain a 'generalist' education in a given curriculum, we have created the 'Quick Start' program. Quick Start is designed for "green" technicians with little to no crane industry experience or prior training.

Students enrolled in the program will be attending an in-person training class with us every 3 months and will be assigned multiple e-learning (online) courses to complete in between the in-person classes. The in-person classes are pre-scheduled and mandatory: you will sign up once for all 6 classes, so the dates are known from the onset of the program.

The in-person classes are fast-paced, and students are required to have hands-on time with the machines in between training classes to ensure the knowledge taught in the classroom is applied on the job.

Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Must be employed by a Grove dealer or direct account

Duration

- 6 one-week of training over 18 months

Number of participants

- 6 students per cohort

Program:

- Provide a basic level of competence in the most common control systems found on Grove RT, TMS, and GMK cranes.
- Instill confidence in a new technician.
- Provide the technician with the tools they need to support customer needs safely.
- Provide and train on use of diagnostic software for HED, ECOS, and CCS controls systems for RT, TMS, and GMK product.

Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, homework assignments, supplemental eLearning materials, and working with a mentor.

Hardware/Software Provided:

Various throughout program

Equipment:

- Training room
- Technical Documents
- Simulators
- Cranes

Cost:

- Contact Global Training Coordinator for more information

Dates:

- Contact Global Training Coordinator for more information

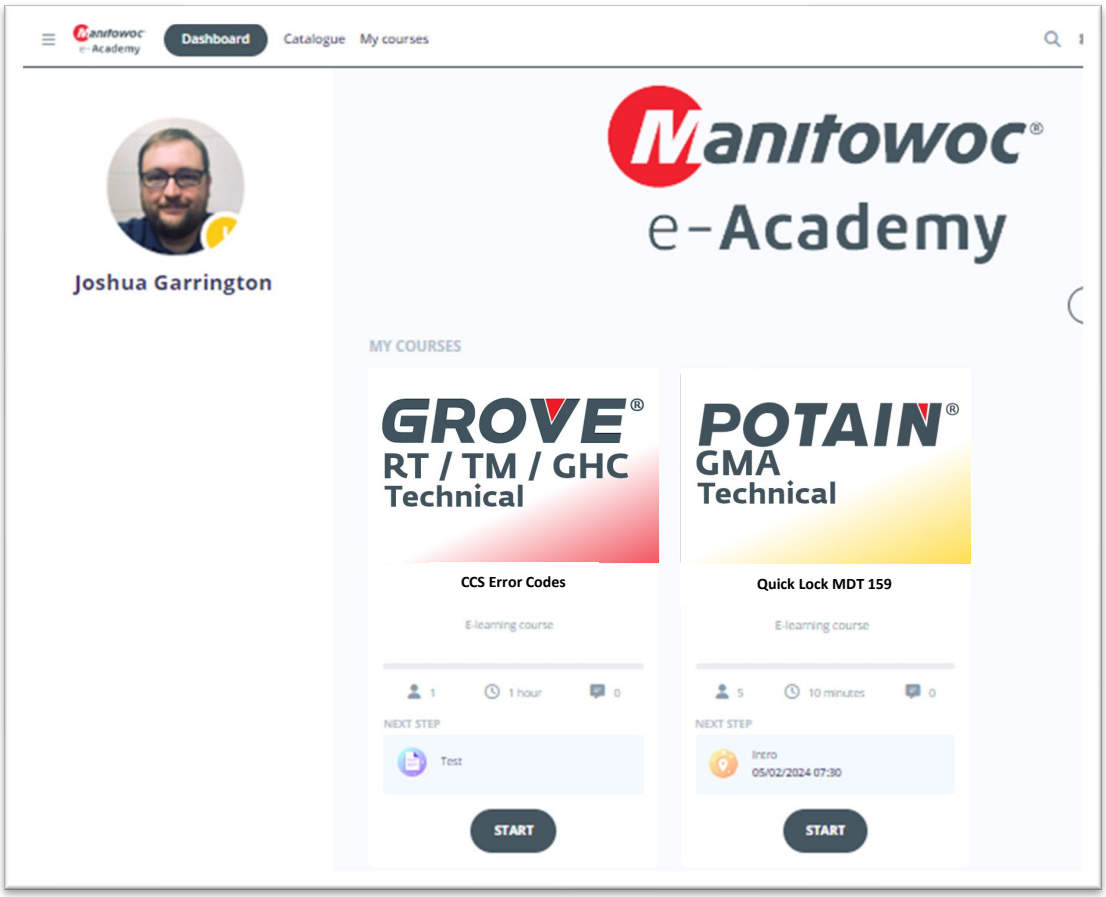
e-Learning Modules

Supplemental Training Materials:

Manitowoc e-Academy includes dozens of approximately 15-30 minute long technical e-Learning modules for all skill levels.

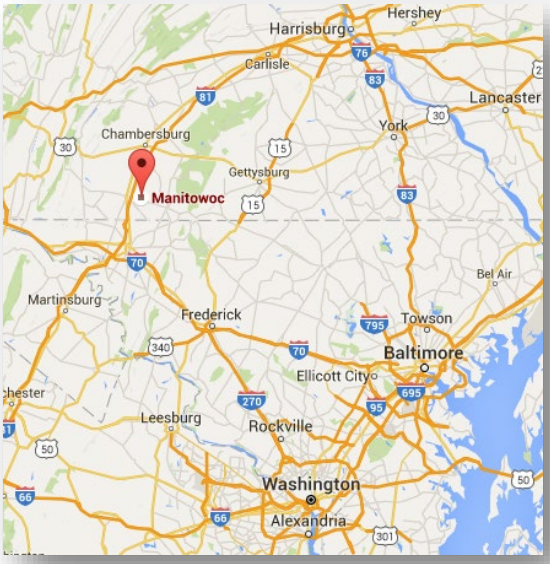
These materials are best used to supplement, reinforce, or review the material covered during instructor-led training courses.

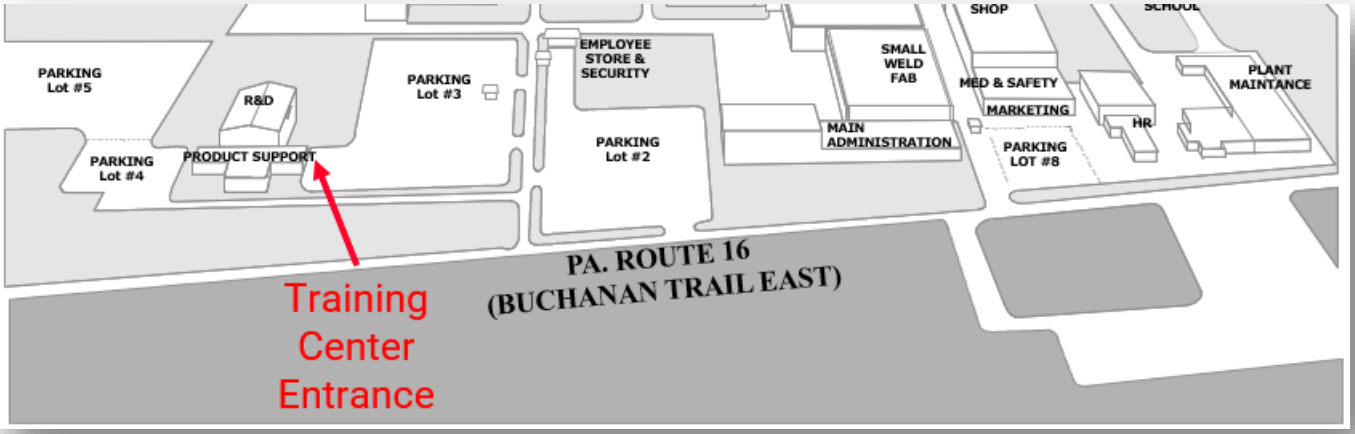
e-Learning modules are free of charge.



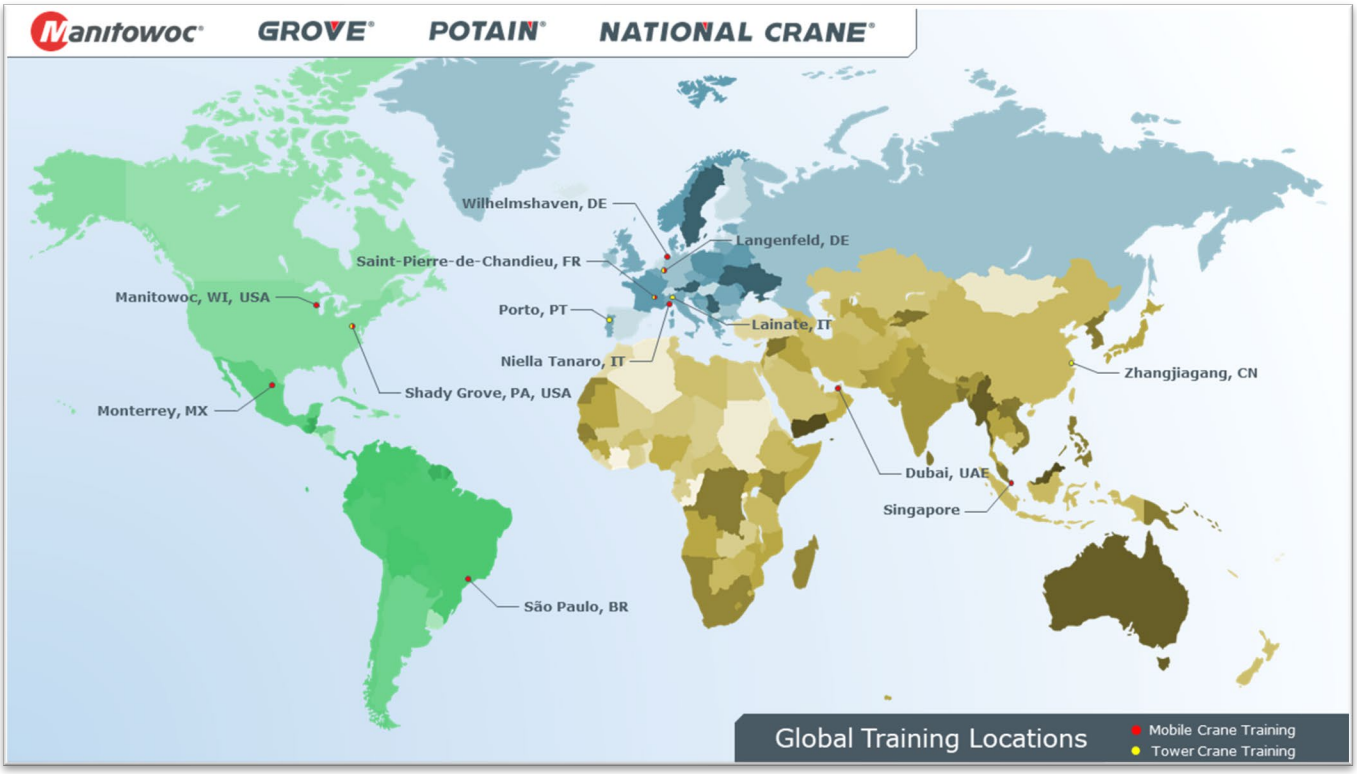
Address/Map

Manitowoc Training Center
1565 Buchanan Trail East
Shady Grove, PA 17256
www.manitowoccranes.com





Manitowoc Training Centers



Manitowoc Product Support 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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