

# Manitowoc Crane Care Training Dealers Course Catalog Mobile 2022

*LATAM*



# Contacts and Trainers

---



**Carlos Eduardo Batista**  
GMK,RT, National e GHC Line  
[carlos.batista@manitowoc.com](mailto:carlos.batista@manitowoc.com)  
Mobile Cel: +5511 97553 8704



**Jorge Campanico**  
Lattice Boom Crawler Cranes Line  
[jorge.campanico@manitowoc.com](mailto:jorge.campanico@manitowoc.com)  
Mobile Cel: +351 9100 50 596



**Jesus Israel Acosta Huerta**  
GMK,Grove Line  
[jesus.acosta@manitowoc.com](mailto:jesus.acosta@manitowoc.com)  
Mobile Cel: +52 81 1555 5279

---

## Manitowoc Training Latin America

Brazil

[treinamento@manitowoc.com](mailto:treinamento@manitowoc.com)  
Fixed Phone: +5511 3103 0272

Mexico

[bruno.camarillo@manitowoc.com](mailto:bruno.camarillo@manitowoc.com)  
Phone: +52 81 1555 5282



Can reach us on Whatsapp too

# Training Center Objectives

---

## *Dear Customers and Dealers,*

At Manitowoc Crane Care we understand the need for technical training. Providing your service technicians with trainings increases your productivity, reduces costs and increases your bottom line.

The 2022 training schedule offers a comprehensive line up of technical courses for Grove, Manitowoc and National Crane machines. These courses will provide your technicians with the skills and knowledge necessary for the execution of preventive maintenance; failure analysis and an overview of security systems and equipment operation.

Our trainers are certified trainers from MTW USA and Germany trainings centers, so you will have available at your region the same level of knowledge

We offer modules all levels, from 3 to 1 week in:

- Crane Operating;
- Crane safety;
- Crane erection and rigging;
- Crane technology
- Or in any specific courses according to your needs.

We strive to provide a personalized training session for each customer, customized to your needs; and we are always available to discuss our training program and any questions you may have.

If you can not find the training courses or program you need, please do not hesitate to contact us, we are always looking to meet any special requirements that you may have.

**If you want the training at your facility, we'll send one of our "flying trainers"!**

# Training Arrangements

---

## ***Registrations:***

**1 – If you have access to Manitowoc Direct / Factory trainings**

**You can apply online for all the trainings that are listed for the several product lines.**

- Go to your Manitowoc Direct page;
- Select **"My Applications"**
- Select **"Technical Learning Center↑"**
- Select **"Course Catalogs"**
- Select **"Technical"**
- Then you choose the Product Line and trainings that you want to attend

**2 – If you don't have yet access to Manitowoc Direct/ Factory Training option, please contact us via e-mail to**

**[treinamento@manitowoc.com](mailto:treinamento@manitowoc.com) (Brazil)**

**[bruno.camarillo@manitowoc.com](mailto:bruno.camarillo@manitowoc.com) (Mexico)**

**For more information about the Manitowoc Direct and training center access.**

Registrations can be made up to one week prior to the scheduled training. Bookings will only be confirmed upon advance payment.

Participants should be those who work directly or indirectly with the equipment or those who have a basic knowledge of equipment operation. All participants must be 18-years-old.

# Training Arrangements

---

## ***Training Schedules:***

All training classes will begin at 8:30 a.m. and end at 5:30 p.m. with a one-hour lunch break. Training duration depends on the training selected.

## ***Training Locations:***

Trainings will be held at the Manitowoc Training Center for Latin America in

São Paulo - Brazil.

Nuevo Leon – Mexico

### **Manitowoc Cranes - Mexico**

Ave. Lazaro Cardenas Suite 1230 435

Piso 12

Zona Loma Larga Poniente, 66266.

San Pedro Garza Garcia, Nuevo León.

Mexico

### **Manitowoc Cranes Brazil**

Av Embaixador Macedo Soares, 10735

05095-035

Sao Paulo, Brazil

The classrooms for theoretical training are organized by Manitowoc as well the teaching materials and meals. Each training class requires a minimum of four participants.

**Accommodations, transport, travel and meals (outside of class) are the responsibility of the participant.**

## ***Training Costs:***

Refer to service Training Bulletin LATAM

## ***Students Must Provide:***

- Transportation, meals, room and board
- Laptop (per attached requirements)
- Voltmeter
- Proper classroom and shop attire, No SHORTS or SANDALS
- Arrive to class on time each day (Class start time is 8:30am)



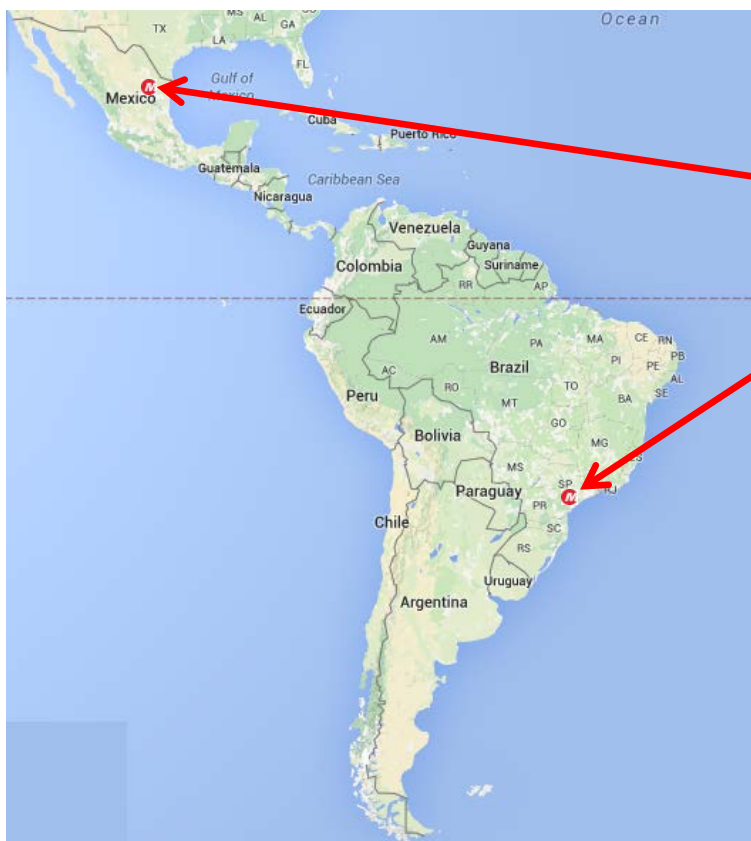
# Training Arrangements

## *TRAINING LOCATIONS:*

Trainings will be held at the Manitowoc Training Center for Latin America in Brazil and Mexico. The classrooms for theoretical only training are organized by Manitowoc as well the teaching materials and meals and can be done on the MTW Training Center.

Each training class requires a minimum of four participants. Our MTW Training Centers are prepared for upon request trainings, or the clients facilities

**Accommodations, transport, travel and meals (outside of class) are the responsibility of the participant.**



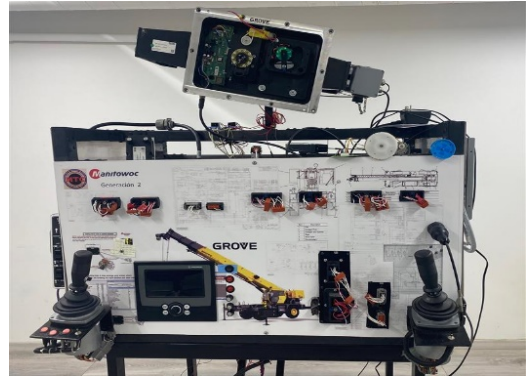
# Training Equipment Revision

## *Equipment, tools of differentiation:*

3 Training rooms.

2 Crane simulators room.

16 Technical Training Simulators



## *Find us on our web site:*

[www.manitowoc.com](http://www.manitowoc.com)

[http://training.manitowoccranes.com/MCG\\_CARE/Services/EN/Training.asp](http://training.manitowoccranes.com/MCG_CARE/Services/EN/Training.asp)

## GMK, RT, Boom Trucks and Industrial Cranes Line





# Course Summary

Course Number	Course Name	Location	Page
<b>Prerequisite course</b>			
<b>CTO</b>	Crane Technology & Operation Mobile 1.0	Brazil-Mexico	10
<b>CST</b>	Crane System Theory	Brazil-Mexico	11
<b>GMK</b>			
<b>GMK 1.3</b>	Setup & Operation CCS & ECOS	Brazil-Mexico	13
<b>GMK 2.3</b>	GMK Schematics	Brazil-Mexico	14
<b>GMK 3.3</b>	ECOS (Generation 1 & 2)	Brazil-Mexico	15
<b>GMK 4.2</b>	CCS Intro & Diagnostics	Brazil	16
<b>GMK 5.1</b>	Flashing & Calibration	Brazil	17
<b>GMK 6.2</b>	Engine and Transmission	Brazil	18
<b>GMK 7.2</b>	Steer By Wire	Brazil	19
<b>GMK 8.1</b>	Troubleshooting	Brazil	20
<b>RT</b>			
<b>Grove 1.1</b>	Intro to CANBUS	Brazil-Mexico	22
<b>Grove 2.1</b>	CANLink / Service Tool	Brazil-Mexico	23
<b>Grove 3.1</b>	Orchestra	Brazil-Mexico	24
<b>Grove 4.1</b>	Hybrids ECOS and EKS	Brazil	25
<b>Grove 5.1</b>	CCS Intro & Diagnostics	Brazil	26
<b>Grove 6.1</b>	Flashing & Calibration	Brazil	27
<b>Grove 7.1</b>	Troubleshooting	Brazil	28
<b>National Crane</b>			
<b>National 1.3</b>	Intro National Systems	Brazil	30
<b>National 2.3</b>	Advanced National Systems	Brazil	31

# Grove Crane Technology & Operation

## Contents:

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:

**At the end of the course, technicians will be able to:**

- Have 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.

## Data

### Prerequisites

Work with Manitowoc Cranes  
Line

### Duration

4 ½ days

### Capacity

6 students

## Dates available

**Refer to service Training  
Bulletin LATAM**

# Grove Crane System Theory

## Contents:

This 4 ½ day course requires no service knowledge of Grove, GMK or National 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 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. Manitowoc Crane Care online systems for parts, service and maintenance will be covered to help the students understand basic navigation and content of the different systems.

## Course Benefits:

**At the end of the course, technicians will be able to:**

- 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 crane systems.
- Have a basic understanding of schematic design and layout for the different mobile crane product lines.
- Have a basic understanding of hydraulic, electrical and pneumatic symbols used on mobile crane schematics.
- Have a basic understanding of Manitowoc Crane Care online systems navigation and content.

## Data

**Prerequisites**  
CTO

**Duration**  
4 ½ days

**Capacity**  
6 students

## Dates available

**Refer to service Training  
Bulletin LATAM**

# GMK Courses

---





# GMK 1.3 – Technology & Operation CCS & ECOS

## Contents:

This 4 ½ day 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 focused toward current production GMK cranes equipped with CCS and previous version cranes with ECOS/EKS.

The course features a GMK4100L-1 and will begin with an overview of the carrier controls and continue through the proper use of transmission and driving controls, outriggers, suspension and rear steering systems.

During day two, fundamental safety for crane operators' overview will be covered followed by load chart and outrigger pad load table explanations. Superstructure cab controls will be covered including the proper setup of the Operation & RCL systems.

Day three will began with an overview of the Operation display and the Twin-lock boom control system. This will be reinforced with actual operation of the boom by each student.

Day four will primarily be used for hands-on operation of the boom in semi-automatic and automatic modes. Each student will be expected to demonstrate proficiency in all aspects of crane setup and operation. Each student will also be given tasks to complete during the week to include load charts and outrigger pad loads.

## Course Benefits:

**At the end of the course, technicians will be able to:**

- Have a basic understanding of how to read and interpret load charts and outrigger pad load tables
- Conducted properly set up of GMK 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.

## Data

**Prerequisites**  
CST training

**Duration**  
4 ½ days

**Capacity**  
6 students

## Dates available

**Refer to service Training Bulletin LATAM**

# GMK 2.3 – ECOS Generation 1 **GMK**

## Intro to ELAN

### Contents:

This 4 ½ day course assumes the student has completed all prerequisites and has basic crane knowledge. This course introduces students to an explanation of GMK schematic symbols to include pneumatic, hydraulic and electrical. Also students learn how to read and navigate GMK ELAN and SEE version electrical schematics.

Day #1 begins with an explanation of schematic symbols used on GMK schematics to include pneumatic, hydraulic and electrical. Next is an introduction into the ELAN electrical schematic format and navigation.

Day #2 will continue the study into ELAN electrical schematics used on Generation 1 GMK ECOS cranes with explanations of the different crane function circuits along with schematic task for the students.

Day #3 will be a tour of the typical Generation 1 superstructure and carrier ECOS system focusing on CANBus and module specifics. Detailed explanations of each function circuit are covered using hydraulic and ELAN schematics.

Day #4 begins with an explanation of the TwinLock boom pinning system to include troubleshooting, error code diagnosing. ECOS Service Software for Generation 1 cranes is next with task on simulators of how to navigate and perform different task such as calibration, parameter file reading and writing and troubleshooting.

### Course Benefits:

**At the end of the course, technicians will be able to:**

- 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.

### Data

#### Prerequisites

GMK 1.2, GMK 2.2 or GMK 1.3

#### Duration

4 ½ days

#### Capacity

6 students

### Dates available

**Refer to service Training  
Bulletin LATAM**

# GMK 3.3 – ECOS Generation 2

## Contents:

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 ELAN & SEE electrical schematics used on Generation 2 ECOS models. A GMK5130-1 GEN-2 simulator will be used for hands on portions of the class. Day #1 will include a systems tour of the typical Generation 2 carrier ECOS system to include pneumatic and hydraulic specifics. Next will be a tour of the typical Generation 2 carrier ECOS system focusing on CANBus and module specifics.

Day #2 will include a systems tour of the carrier electrical system to include detailed explanations of each function circuit using ELAN/SEE schematics. Next is a systems tour of the typical Generation 2 superstructure ECOS system to include hydraulic specifics.

Day #3 will include a systems tour of the superstructure electrical system to include detailed explanations of each function circuit using ELAN/SEE schematics. Next will be an explanation of the TwinLock boom pinning system to include troubleshooting and error code diagnosing.

Day #4 will include an overview of the ECOS Service Software for Generation 2 cranes with task on simulators of how to navigate and perform different task such as calibration, parameter file reading and writing and troubleshooting.

## Course Benefits:

**At the end of the course, technicians will be able to:**

- 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.

## Data

## Dates available

### Prerequisites

GMK 2.2 or GMK 2.3 or GMK 3.1

**Refer to service Training Bulletin LATAM**

### Duration

4 ½ days

### Capacity

6 students

# GMK 4.2 – CCS Intro & Diagnostics

## Contents:

This 4 ½ day course covers technology and diagnostics pertaining to the new CCS control system used on the GMK 3060, GMK5180 and 5250L 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.

## Course Benefits:

**At the end of the course, technicians will be able to:**

- 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.



## Data

### Prerequisites

GMK 3.2 or GMK 3.3

### Duration

4 ½ days

### Capacity

6 students

## Dates available

Refer to service Training Bulletin LATAM



# GMK 5.1 – Flashing and Calibration

## Contents:

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 ELAN & SEE electrical schematics used on Generation 1 & 2 ECOS models. GMK5200 GEN-1 and GMK5130-1 GEN-2 simulators are used for hands on portions of the class.

Day #1 will include a systems tour of the typical Generation 1 superstructure ECOS system focusing on CANBus and module specifics. Next will be a tour of the typical Generation 2 superstructure and carrier ECOS system focusing on CANBus and module specifics.

Day #2 will include a systems tour of the different Generation 1 and 2 superstructure hydraulic systems. Detailed explanations of each function circuit are covered using hydraulic and ELAN schematics.

Day #3 begins with an explanation of the TwinLock boom pinning system to include troubleshooting, error code diagnosing for both generations of ECOS and finally an overview of ECOS service software.

Day #4 will include Service Software for both GEN-1 and GEN-2 cranes with task on simulators of how to navigate and perform different task such as calibration, parameter file reading and writing and troubleshooting.

## Course Benefits:

**At the end of the course, technicians will be able to:**

- Interpret and navigate GMK hydraulic, pneumatic and electrical schematics
- Have intermediate understanding of GMK GEN-1 and GEN-2 ECOS systems
- Have an understanding of theory of operation of the GMK TwinLock boom telescoping systems.
- Have an understanding of using Service Software for both GEN-1 and GEN-2 ECOS cranes.

## Data

**Prerequisites**  
GMK 4.2

**Duration**  
4 ½ days

**Capacity**  
6 students

## Dates available

**Refer to service Training Bulletin LATAM**

# GMK 6.2 – Mercedes Transmission & SCR Systems

## Contents:

This 3 ½ day 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.

## Course Benefits:

**At the end of the course, technicians will be able to:**

- Understand operational aspects of 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.

## Data

### Prerequisites

GMK 5.1 or GMK 5

### Duration

3 ½ days

### Capacity

6 students

## Dates available

**Refer to service Training  
Bulletin LATAM**

# GMK 7.2 – Steer By Wire

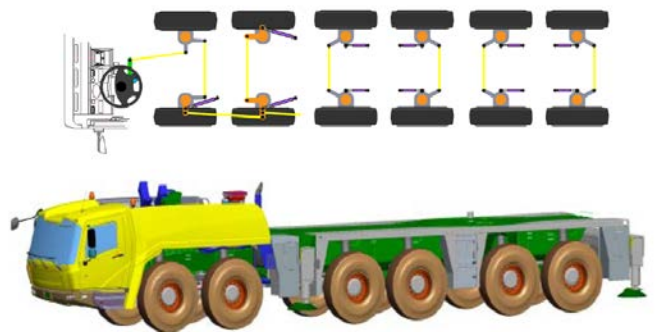
## Contents:

This 3 ½ day course covers the ECOS “Steer by Wire” control system and the new CCS “Steer by Wire” control system used GMK 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 CCS 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.

## Course Benefits:

**At the end of the course, technicians will be able to:**

- 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.



## Data

### Prerequisites

GMK 6.2 or GMK 6.1

### Duration

3 ½ days

### Capacity

6 students

## Dates available

Refer to service Training  
Bulletin LATAM

# GMK Troubleshooting

## Contents:

This 3 day course will cover 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 techniques 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. Class size will be limited to eight (8) students. The course will be approximately 30% classroom and 70% practical.

## Course Benefits:

**At the end of the course, technicians will be able to:**

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

## Data

### Prerequisites

GMK 7.2 or GMK 7.1

### Duration

3 days

### Capacity

4 students

## Dates available

**Refer to service Training  
Bulletin LATAM**



# Grove RT Courses

---



# Grove 1.1

## Contents

The 4 ½ day course provides the student with 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 begins with 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.

## Course Benefits

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

## Data

### Prerequisites

CST & CTO training

### Duration

4 ½ days

### Capacity

6 students

## Dates available

Refer to service Training  
Bulletin LATAM

# Grove 2.1

**Contents**

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.

**Course Benefits:**

This course is for crane service technicians to gain basic operational knowledge of Grove cranes and hydraulic, electric structure and software diagnostics programs for RT gen#2.



**Data**

**Prerequisites**  
Grove 1.1

**Duration**  
4 ½ days

**Capacity**  
6 students

**Dates available**

**Refer to service Training  
Bulletin LATAM**

# Grove 3.1

## Contents:

This 4 ½ day course assumes basic knowledge of operation, hydraulic & electrical systems as covered in the previous courses. The course covers current RT and TM/TMS models with the exception of the TMS9000E & RT9150E.



## Course Benefits:

This program covers current CANBus technology used on Grove domestic 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.

## Data

**Prerequisites**  
Grove 2.1

**Duration**  
4 ½ days

**Capacity**  
6 students

## Dates available

**Refer to service Training  
Bulletin LATAM**



# Grove 4.1 – ECOS and EKS

## Contents:

This 4 ½ day 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



## Course Benefits:

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.

## Data

**Prerequisites**  
Grove 3.1

**Duration**  
4 ½ days

**Capacity**  
6 students

## Dates available

Refer to service Training  
Bulletin LATAM

# Grove 5.1 – CCS System

## Contents:

This 4 ½ day course will cover the new operating system that will be across all Manitowoc products in the future. Only Grove domestic products will be covered.

Identification of CCS components; CANBUS system of the CCS; understanding and troubleshooting electrical and hydraulic schematics; service software CCS; error codes identification.



## Course Benefits:

The course will walk the students through overall setup and navigation of new components such as the displays and all other cabin related CCS system setup. After the system itself is thoroughly understood, students will be walked through the entire crane electrically and hydraulically with the aid of schematics.

## Data

### Prerequisites

Grove 3.1 or Gove 4.1

### Duration

4 ½ days

### Capacity

6 students

## Dates available

Refer to service Training Bulletin LATAM

# Grove 6.1 – Software RT

## Content:

This 4 ½ day 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 along with use of Application Configurator program to upload error logs for diagnostics.
2. Flashing of all Hirschman Components I-Flex 2/I-Flex 5 and current expert systems 2/5. All central units and Displays will be covered.
3. Flashing of all ECOS related control units both esx's and gviom's. RT9150 and TMS 9000 related.
4. Flashing of Wylie I-3500, 4300, 4500 RCL's for Yard Boss/Shuttlelift
5. Flashing and Calibration of new Crane Control System (CCS)

## Course Benefits:

This course is for crane service technicians works with different types of software RT.



## Data

### Prerequisites

Grove 5.1

### Duration

4 ½ days

### Capacity

6 students

## Dates available

Refer to service Training  
Bulletin LATAM

# Grove Troubleshooting

## Contents:

This 3 day 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 techniques 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. Class size will be limited to eight (8) students. The course will be approximately 30% classroom and 70% practical.

## Course Benefits:

At the end of the course, technicians will be able to:

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

## Data

**Prerequisites**  
Grove 6.1

**Duration**  
3 days

**Capacity**  
4 students

## Dates available

Refer to service Training  
Bulletin LATAM

# National Crane Courses

---





## National 1.3

### Contents

This 4 ½ day course focuses on National models not equipped with HED operational systems. The course starts with an in-depth review of boom truck terminology and technologies, so the students can relate to individual components and systems.

### Course Benefits:

Programs covering the National load charts are used to expose the students to how load charts are constructed and how to properly read and interpret them. Sessions on National 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 National Crane and the foundation to learn proper troubleshooting techniques and test procedures. The final portion of the course will be focused on the OMS (Outrigger Monitoring System) used on the National product.



### Data

**Prerequisites**  
CST Training

**Duration**  
4 ½ days

**Capacity**  
8 students

### Dates available

Refer to service Training  
Bulletin LATAM

## National 2.3

### Content:

This 4 ½ day course assumes basic knowledge of operation, hydraulic and electrical systems as covered in the previous courses. The course begins with programs covering current National Crane CANBus systems to include hydraulic and electrical systems and components.



### Course Benefits:

Students gain an understanding of components and systems through the intense study of the system schematics. Programs covering software, service and troubleshooting procedures will give the students a working knowledge of the systems and the foundation for proper troubleshooting techniques and test procedures. The simulator (hands on) session of the training reinforces classroom studies. Students will have the opportunity to review the hydraulic, electrical systems and components utilized on a specific crane model. Machines covered: NC 900H-1, NBT 30H-2, NBT 50 and NBT 60.

### Data

**Prerequisites**  
National 1.3

**Duration**  
4 ½ days

**Capacity**  
8 students

### Dates available

Refer to service Training  
Bulletin LATAM

# Manitowoc Regional Offices Latin America

## MTW LATAM Offices

### Manitowoc Cranes - Mexico

Ave. Lazaro Cardenas Suite 1230 435  
Piso 12  
Zona Loma Larga Poniente, 66266.  
San Pedro Garza Garcia, Nuevo León,  
Mexico

### Manitowoc Cranes - Colombia

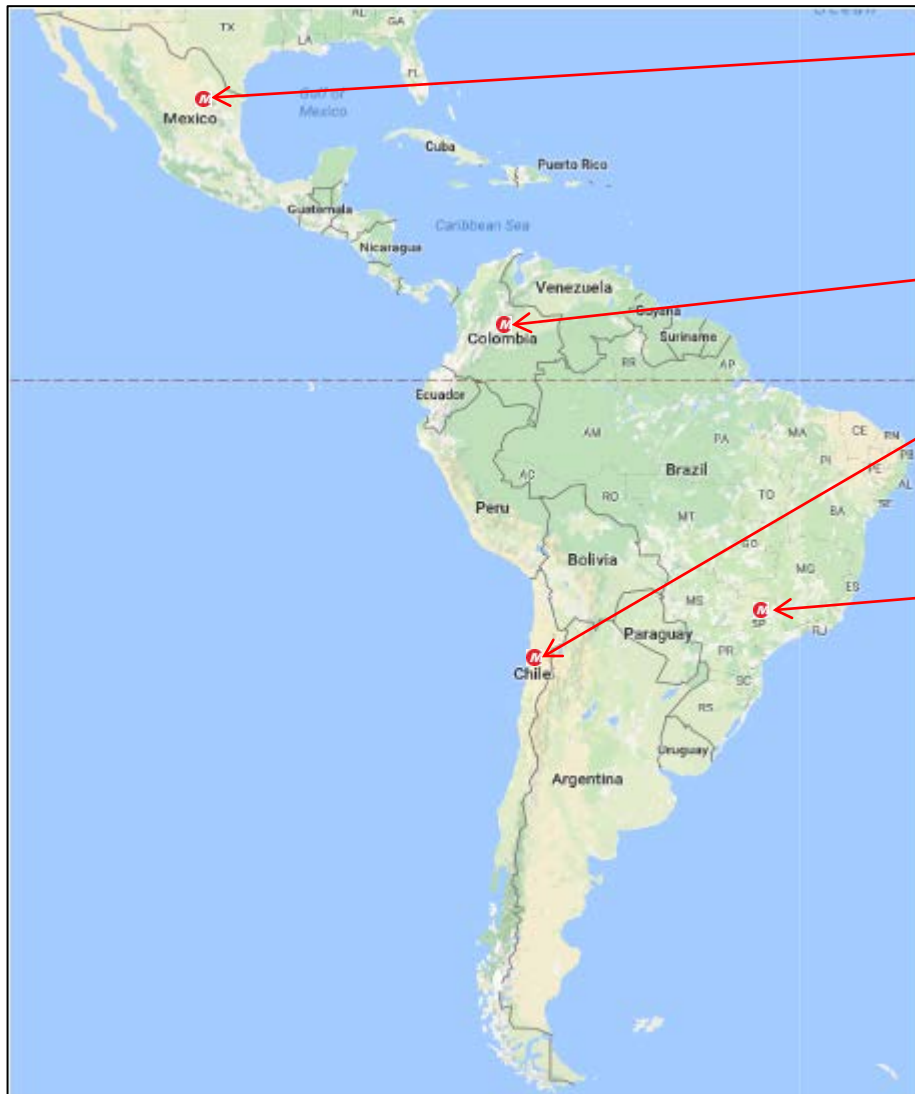
Carrera 18 No. 86ª - 14 Oficina 216  
Bogotá, Colombia

### Manitowoc Cranes Group Chile

Cerro El Plomo 5855 Las Condes  
Santiago, 7561160  
Chile

### Manitowoc Cranes Brazil

Av Embaixador Macedo Soares, 10735  
05095-035  
Sao Paulo, Brazil



**Thank You For Your Business !**