59T EZ-Glide® POWERTraxx®

Evacuation Chair

FERNO®

Users' Manual

July 2018
Pub. No. 234-3479-03

Read this Manual and Retain for Future Reference

Ferno Customer Relations

For ordering assistance or general information:

CANADA AND THE U.S.A.

Telephone (Toll-free)	1.877.733.0911
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Internet	www.ferno.com

ALL OTHER LOCATIONS

For assistance or information, please contact your Ferno distributor. If you do not have a Ferno distributor, please contact Ferno Customer Relations:

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Wilmington, Ohio 45177-9371, U.S.A.

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Disclaimer

This manual contains general instructions for the use, operation and care of this product. The instructions are not all-inclusive. Safe and proper use of this product is solely at the discretion of the user. Safety information is included as a service to the user. All other safety measures taken by the user should be within and under consideration of applicable regulations. It is recommended that training on the proper use of this product be provided before using this product in an actual situation.

Retain this manual for future reference. Include it with the product in the event of transfer to new users. Additional free copies are available upon request from Customer Relations.

Proprietary Notice

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Limited Warranty Statement

The products sold by Ferno are covered by a limited warranty, which is printed on all Ferno invoices. The complete terms and conditions of the limited warranty, and the limitations of liability and disclaimers, are also available upon request by calling Ferno at 1.800.733.3766 or 1.937.382.1451.

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USERS' MANUALS

To request additional free users' manuals, contact Ferno Customer Relations, your Ferno distributor, or www.ferno.com.

Chair Serial Number _____
Location: Rear of Seat Panel Frame

POWERTraxx® Serial Number _____
Location: Inside Surface of Patient-Left Side Track

UNIQUE DEVICE IDENTIFICATION SYSTEM

Ferno complies with the United States Food and Drug Administration's (FDA) Unique Device Identification (UDI) regulation to identify medical devices. The UDI label contains information in human- and machine-readable form. Device information is online at the FDA's Global Unique Device Identification Database (GUDID). The public can search and download information at AccessGUDID at www.fda.gov.

The label is located either on the product or the product packaging.

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1 - SAFETY INFORMATION

1.1 Warning

Warning notices indicate a potentially hazardous situation which, if not avoided, could result in injury or death.

⚠ WARNING

DO NOT OPEN MOTOR.

No user-serviceable parts inside. Contact Ferno for service.

⚠ WARNING

Untrained operators can cause injury or be injured. Permit only trained personnel to operate the chair.

Improper use of the chair can cause injury. Use the chair only for the purpose described in this manual.

Improperly attaching restraints can allow seat and back panels to dislodge, resulting in injury. Restraints must capture panel AND chair frame.

Improper charging can cause injury or damage. Use only the Ferno-approved battery with the chair, and charge only with the Ferno-approved battery charger.

Using the chair with the track system unlocked can cause injury. Verify that the track system is locked before transporting the patient.

Lubricating the track system can result in injury to the patient and/or operators. Never lubricate the tracks or belts.

Improper operation can cause injury. Operate the chair only as described in this manual.

An unattended patient can be injured. Stay with the patient at all times.

An unrestrained patient can fall off the chair and be injured. Use restraints to secure the patient on the chair.

Helpers can cause injury or be injured. Maintain control of the chair, operate the controls, and direct all helpers.

Improper maintenance can cause injury. Maintain the chair only as described in this manual.

Attaching improper items to the chair can cause injury. Use only Ferno-approved items on the chair.

Improper parts and service can cause injury. Use only Ferno parts and Ferno-approved service on the chair.

Modifying the chair can cause injury and damage. Use the chair only as designed by Ferno.

1.2 Notice

Notices emphasize important, but not hazard-related information. Failure to follow Notices could result in product or property damage.

NOTICE

1.3 Tip

Tips provide recommendations for easier use of the product.

1.4 Bloodborne Disease Notice

To reduce the risk of exposure to bloodborne diseases such as HIV-1 and hepatitis when using the chair, follow the disinfecting and cleaning instructions in this manual.

1.5 Recycling Notice

PROPERLY DISPOSE OF BATTERIES

Recycle batteries at the end of their service life. Do not dispose of batteries with municipal waste. Contact your government for proper recycling.

The chair uses a rechargeable lithium-ion battery to power the motorized POWERTraxx. Two non-rechargeable type "AA" batteries are used in the control panel.

Li-ion

U.S.A.

Recycling in the United States of America is regulated by the Environmental Protection Agency (EPA). Contact your state EPA for recycling information in your area.

WEEE DIRECTIVE (E.U.)

European Union directive 2002/96/EC Waste Electrical and Electronic Equipment (WEEE) limits the disposal of electrical and electronic equipment in landfills. Contact the government in the country in which you reside for recycling information.

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1.6 Symbol Glossary

The symbols defined below are used on the chair and/or in this users' manual. Ferno uses symbols recognized by the International Standards Organization (ISO), American National Standards Institute (ANSI) and the emergency medical services industry.

General Warning of Potential Injury

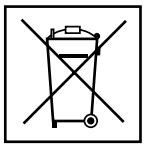
General Warning of Potential Electric Shock

Read the Users' Manual

Chair Operation Requires Two Trained Operators

Load Limit
(Safe Working Load in pounds, kilograms, stone)

OFF ON



WEEE Directive:
Dispose of Batteries Properly

ASCEND

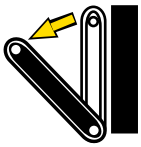
DESCEND

Do Not Pressure Wash

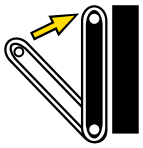
Do Not Step Here

Unlocked Locked

Do Not Lubricate Lubricate



Open POWERTraxx



Close POWERTraxx

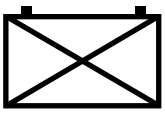
AA Battery Charge Low
(Replace Control-Panel Batteries)

Brake Engaged
(Belts Will Not Turn Freely)

DC (Direct Current) electricity

Main Battery Full to Moderate Charge

Main Battery Charge is Low



Main Battery Insufficient Charge

Manufacturer

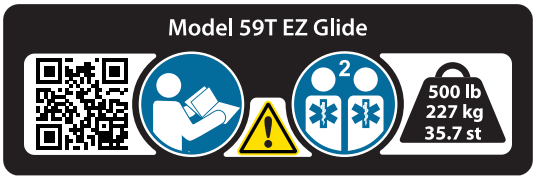
Authorized Representative in the European Community

Product meets European Union Standards

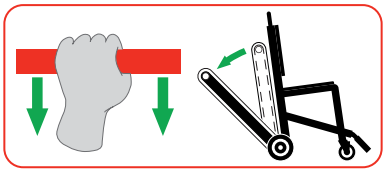
QR Code
(Access Online Material)

1.7 Safety and Instruction Labels

Safety and instruction labels place important information from the users' manual on the chair. Read and follow label instructions. Replace worn or damaged labels immediately. New labels are available from EMSAR, Ferno, or your Ferno distributor (page 44). The labels illustrated below are affixed to the chair.

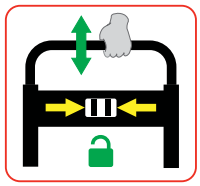


Safe Use Guidelines



Instruction: Opening Tracks

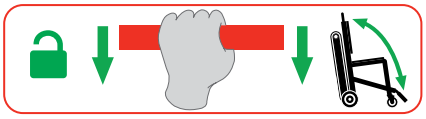
Instruction: Closing Tracks



Instruction: Adjusting Lift Bar

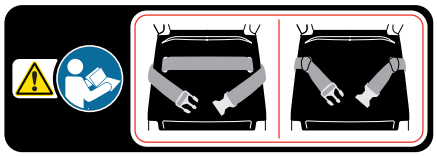
Risk of Injury: Do Not Lubricate Tracks

No Step Label: Do Not Step On Motor

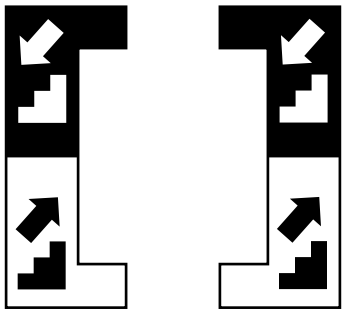


Instruction: Folding/Unfolding the Chair

Ferno Products are Protected by Patents Worldwide



Safety Instruction: Attaching Restraints



Instruction Labels: Descend/Down; Ascend/Up

Safety Instruction: Do Not Open Motor

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2 - OPERATOR SKILLS AND TRAINING

2.1 Skills

Operators using the chair need:

- a working knowledge of emergency patient-handling procedures.
- the ability to assist the patient.

⚠ WARNING

Untrained operators can cause injury or be injured. Permit only trained personnel to operate the chair.

2.2 Training

Operator trainees need to:

- read and understand this manual.
- be trained on the use of the chair.
- practice with the chair before using it with a patient.
- record their training information. A sample training record sheet is provided on page 46.

3 - ABOUT THE CHAIR

3.1 Description

The Ferno® Model 59T EZ-Glide® Evacuation Chair with POWERTraxx® (referred to as the chair in this manual) is an emergency patient-handling device designed to transport a seated patient up or down stairs and over flat surfaces.

The chair is for professional use by a minimum of two trained operators. A third person to "spot" may be required by local protocols. Additional help may be required when working with heavy patients.

The POWERTraxx option is a powered track system that enables the operators to power the chair up or down stairs instead of carrying it. The motor is powered by a rechargeable 28 VDC battery (supplied).

⚠ WARNING

Improper use of the chair can cause injury. Use the chair only for the purpose described in this manual.

3.2 Compliance

CE

MEDICAL DEVICE DIRECTIVE

Ferno products meet the requirements of Medical Device Directive 93/42/EEC as established by the European Union.

The chair meets the following standards:

- IEC 60601-1-2 (electrical and electromagnetic medical equipment standards)
- IP 55 (Ingress Protection Rating; see *Disinfecting/Cleaning the Chair,* page 36)
- EN 1865

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3.3 Chair Features

- POWERTraxx modular, motorized track system powers the chair up and/or down stairs
- Paddle (2), controls track-belt motion
- Track brake (stops POWERTraxx motion when paddles are not being pressed)
- Battery-charge indicators on main battery and display
- Power switch with light
- Kinetic Energy Regeneration System - descending in manual mode will provide a small amount of charge to the main battery
- Molded ABS seat and back panels
- Choice of color
- 5-position extending rear lift bar
- 5-position telescoping front lift handle (2)
- 6" rear locking wheel (2)
- 4" front swivel wheel (2)
- Folding footrest
- Ankle restraint
- Patient restraints (Options shown on page 10)

3.4 General Specifications

Specifications for the chair are shown in the table at right. Ferno reserves the right to change specifications without notice. For more information, contact Ferno Customer Relations or your Ferno distributor (page 2). Ferno reserves the right to change specifications without notice.

Specification	Imperial	Metric
Load Limit	500 lb	227 kg
Load Limit (UK)		35.7 st
Weight*	56.6 lb	25.67 kg
Height		
Maximum	63.5	1613 mm
Minimum	37.5 in	953 mm
Width		
Overall	20.313 in	516 mm
Seat	16.5 in	419 mm
Depth (front to back)		
Tracks closed, Handles retracted	28.5 in	724 mm
Tracks Open, Handles extended	51 in	1295 mm
Folded		
Length x width x depth	37.5 in x 20.313 in x 10 in	953 mm x 516 mm x 254 mm
Wheels, Rear		
Diameter	6 in	152 mm
Width	1.25 in	32 mm
Wheels, Front		
Diameter	4 in	102 mm
Width	1.18 in	30 mm
Power		
Main Battery	28VDC	
Typical Charging Time	About one hour	
Miscellaneous		
Chair Construction	Rectangular aluminum	
Seat/Back Panels	ABS Plastic	
Wheel Bearings	Sealed/greaseless	

*** Weight is without restraints or accessories, but includes the battery**

Load Limit

Inspect the chair if the load limit has been exceeded (See *Inspecting the Chair*, page 37).

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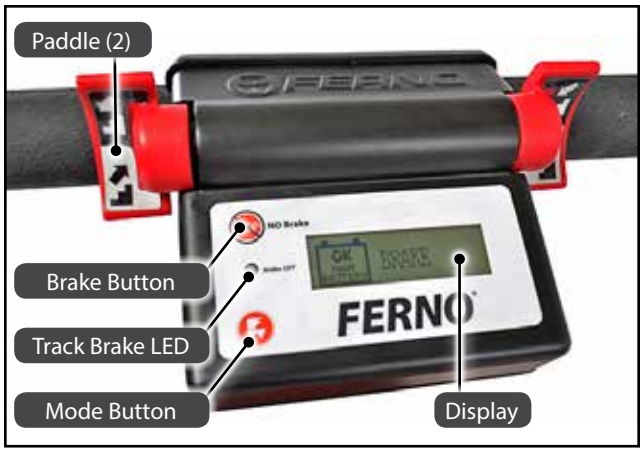
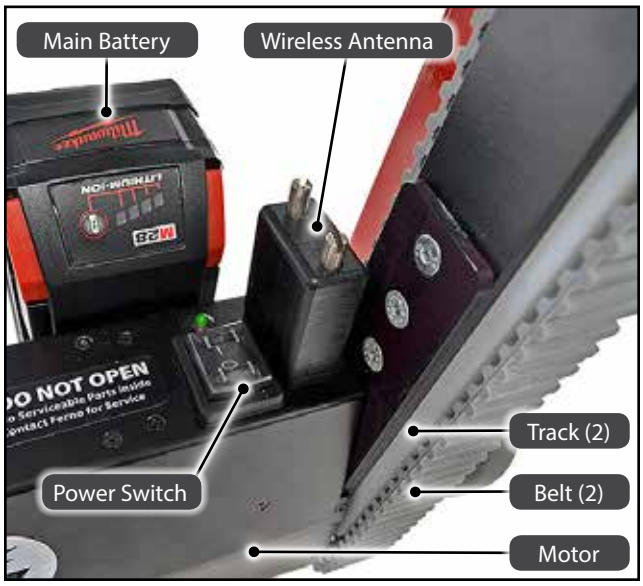
3.5 Components

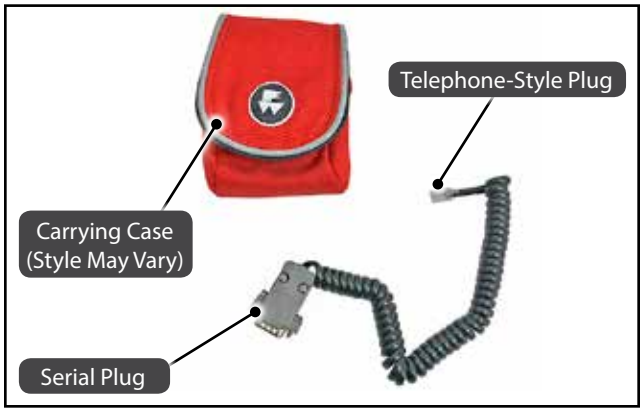
3.5 Components (Continued)





3.6 Items Supplied

- 28 VDC Lithium-ion rechargeable battery (1)
- 28 VDC Battery charger (1) Choice of:
  - 100-120 VAC (60 Hz North America; 50/60 Hz Japan); UL Certified
  - 220-240 VAC, 50/60 Hz (Europe); CE Certified
- Interconnect cord with carrying case
- Users' manual



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4 - SETUP

4.1 First-Time Setup

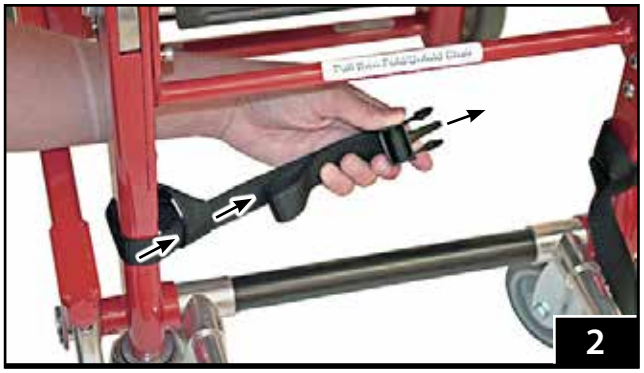
- Attach the restraints as described in this section.
- Inspect the chair (see *Inspecting the Chair,* page 37),
- Use the battery charger (supplied) to charge the main battery (Figure 1). See *Charging the Battery*, page 16.
- Attach the fully-charged main battery to the chair. See *Attaching and Removing the Main Battery,* page 15.
- Install the two AA batteries (supplied) in the control panel (see *Control-Panel Batteries,* page 37). The batteries are shipped in the carrying case with the interconnect cord (see *Components,* page 10).
- Verify the POWERTraxx is functioning properly. If the tension needs to be adjusted, see *Adjusting the Track-Belt Tension,* page 39.
- Verify the paddles allow the user to press softly or more firmly to control the speed of the POWERTraxx. If the POWERTraxx runs constantly when power is applied or if it immediately begins moving at full speed, re-calibrate the paddles. See *Calibrating the Paddles,* page 42.
- If all batteries are properly charged and installed but the paddles do not function, the wireless connection may have been lost. See *Interconnect Cord,* page 41.

1

4.2 Ankle Restraint

Use the ankle restraint to help keep the patient's feet on the footrest. Attach the two-piece ankle restraint to the front legs of the chair. To attach the restraint:

1. Unbuckle the restraint to separate the straps.
2. Wrap a strap around one front leg of the chair and thread the buckle through the loop, then pull the strap tight around the chair leg (Figure 2).
3. Attach the remaining strap to the opposite front leg.
4. Buckle the restraint and adjust the length (Figure 3).


2

3

4.3 Attaching Patient Restraints

Use patient restraints to help hold the patient on the chair. Each restraint must capture **both** the aluminum chair frame and the seat or back panel. Follow local protocols when attaching restraints.

USING TWO-PIECE RESTRAINTS

1. Feed the loop of a restraint strap through a slot in the seat or back panel.
2. Wrap the strap around the aluminum chair frame and feed the male or female buckle through the loop, then pull the strap tight against the frame and panel.
3. Repeat Steps 1-2 for the other half of the restraint.

USING ONE-PIECE RESTRAINTS

Note: *Two-piece restraints are recommended.*

1. To attach the seat-panel restraint, lay the restraint across the top of the seat panel and feed the male and female ends of the restraint down through the slots.
2. Wrap the restraint around the aluminum chair frame on each side of the chair, capturing both the panel **and** the frame (Figure 4).
3. Buckle the restraint and adjust the length.
4. Repeat Steps 1-3 to attach the back-panel restraint.

⚠ WARNING

Improperly attaching restraints can allow seat and back panels to dislodge, resulting in injury. Restraints must capture panels AND chair frame.

NOTICE

Restraint rules (also follow your local protocols):

- Use a minimum of two restraints.
- One restraint must be secured across the chair seat to help hold the patient on the chair.
- Each restraint or strap must capture the aluminum chair frame and the plastic panel.

4.4 Restraint Configurations

Follow local protocols when configuring and using restraints. Two possible configurations are described below.

HORIZONTAL CONFIGURATION

Use one restraint for the chest and one restraint for the lap (Figure 5). Use additional restraints as needed.

1. Attach the chest straps through the vertical slots in the back panel.
2. Attach the lap straps through the seat panel slots.

CRISS-CROSS CONFIGURATION

Use two restraints for the torso and a third restraint for the lap (Figure 6).

1. Attach one strap of a restraint through a horizontal slot on the back panel of the chair.
2. Attach the mating strap of the same restraint through the seat panel slot on the opposite side of the chair.
3. Repeat with the second restraint, attaching its straps to opposite sides of the chair.
4. Attach the lap restraint through the seat-panel slots.

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5 - POWER SYSTEM

5.1 POWERTraxx Components

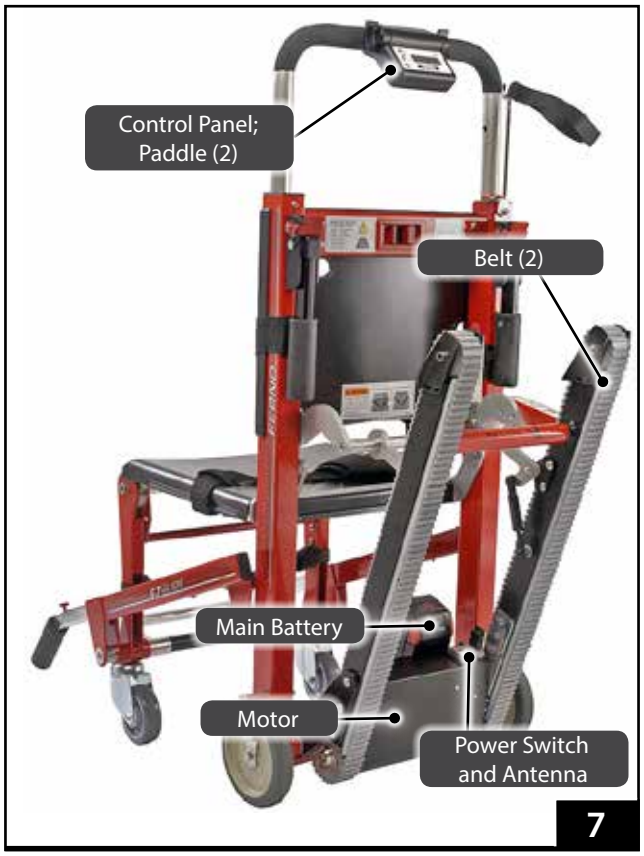
The POWERTraxx (Figure 7) consists of the following components:

- CONTROL PANEL: The control panel is attached to the lift bar. It allows the operator to control the speed and direction of the belts, and monitor the batteries and other aspects of the chair.
- PADDLES (2): The paddles are attached to the control panel. The amount of pressure used by the operator to press the paddle determines the speed of the belts.
- BELT (2): The belts engage the stairs. The motor powers the belts. The user controls the speed and direction using the paddles.
- MAIN BATTERY: The 28V battery attaches to the motor and provides power. It is easily to remove, charge, and reattach. See *Main Battery,* page 14.
- MOTOR: The motor is located between the tracks at the base of the chair (Figure 7 and Figure 8). The motor receives input from the paddles to control the speed and direction of the belts. It also monitors other aspects of the chair.
- ANTENNA: The antenna is mounted to the top of the motor (Figure 8). It allows wireless communications between the motor and control panel.
- POWER SWITCH: The switch is mounted to the top of the motor and allows easy ON/OFF control of the power system (See *Power Switch,* page 17).
- BRAKE (part of the motor): The brake allows the belts to move only when a paddle is used. The brake engages automatically when the system has power. The operator may disengage the brake for non-powered descent.
- SPEED LIMITER (part of the motor): If the system loses power or the brake is disengaged, the belts are free to rotate for non-powered descent. However, the speed limiter retards the speed of the belts to improve operator control for the descent.

⚠ WARNING

DO NOT OPEN MOTOR.

No user-serviceable parts inside. Contact Ferno for service.



7

8

5.2 Main Battery

Note: *The battery and charger instructions from Milwaukee supersede those in this manual. For additional information, see the manuals provided with these components.*

The term "main battery" is used in this manual to describe the Milwaukee® 28-Volt DC, lithium-ion battery (Figure 9). The control panel also uses batteries. See *Control-Panel Batteries,* page 37.

The main battery powers the belts. It is sealed for resistance to precipitation, dirt, body fluids, cleaning solutions, etc. Use only the Ferno-approved battery and battery charger. A battery is provided with purchase of a chair or POWERTraxx retrofit kit. For additional batteries or chargers, see *Accessories,* page 43.

MAIN BATTERY INFORMATION

- Lithium-ion batteries have no "battery memory." You do not need to fully discharge the battery before recharging it.
- A typical fully-charged battery provides power to move an average patient (250 pounds) up more than 200 stairs.
- Typical charging time is about one hour. Actual charging time varies based on frequency of recharge, depth of discharge, and battery age. If a battery becomes deeply discharged, extend the charging time.
- Patient weight, extreme temperatures, and the combination of using the chair to go up and/or down stairs affect the amount of use available from each battery charge.
- The manufacturer's recommended operating temper-ature **for the battery itself** is 14°F to 120°F (-10°C to 49°C). The battery may be used in temperatures outside this range. Battery capacity can be affected if the battery is stored for long periods below 0°F (-17°C) or over 150°F (66°C).
- Recycle batteries at the end of their service life. Do not dispose of batteries with municipal waste. See *Recycling Notice,* page 4.
- Do not open the battery. There are no serviceable parts inside the battery.

USING THE MAIN BATTERY

- The mounting slots (Figure 9) are compatible with the motor and with the battery charger. See *Attaching and Removing the Main Battery,* page 15, and *Battery Charger,* page 16.
- Press the two red release buttons (Figure 9) to disconnect the battery from the chair or battery charger.
- To check the charge of the main battery, press the test button on the battery. See *Battery-Charge Indicator,* page 15.
- Store the battery ONLY in a cool, dry place. DO NOT store where temperatures may exceed 120°F (50°C).
- If two batteries are available, keep the spare battery charged and ready for use.

⚠ WARNING

Improper charging can cause injury or damage. Use only the Ferno-approved battery with the chair, and charge only with the Ferno-approved battery charger.

NOTICE

Battery capacity can be affected if the battery is stored for long periods below 0°F (-17°C) or over 150°F (66°C).

Tip

Battery Tips

To extend battery life, always turn the power switch OFF when the chair is not in use.

Lithium-ion batteries have no "battery memory." You do not need to fully discharge the battery before recharging it.

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For additional information, see the Milwaukee® battery and battery-charger manuals. Milwaukee® products are trademarks of the Milwaukee® Electric Tool Corporation, Brookfield, Wisconsin, USA. Milwaukee® is a subsidiary of Techtronic Industries Co. Ltd.

For warranty claims, take the charger or battery to an authorized Milwaukee Service Center.

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MAIN-BATTERY CHARGE INDICATOR

The charge indicator on the main battery (Figure 10) illuminates one to four red lights to indicate the charge remaining in the battery (approximately 25% intervals).

Press the test button (Figure 10) and the light(s) will illuminate briefly. With a full charge, all four lights are displayed. If the charge is lower than 10%, the first light flashes four times when the test button is pressed.

Extreme temperature (cold or hot), extreme patient weight, and the age of the batteries affect how quickly the charge in the batteries is used.

MAIN-BATTERY SHUTOFF

If the internal temperature of the battery becomes too high, the main battery will shut off to protect itself, and all powered chair motion stops.

To verify the battery has overheated, press the test button on the battery. The battery will indicate it is overheated by flashing the lights alternately. Allow the battery to cool before use. When the battery is ready for use, pressing the test button will show the remaining charge.

NOTICE

If the main battery becomes overheated, it will shut off to protect itself. Allow an overheated battery to cool before use.

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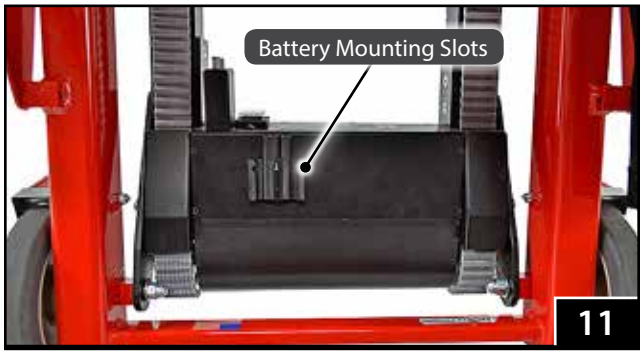
5.3 Attaching and Removing the Main Battery

To attach the main battery to the chair: Align the mounting slots on the main battery (Figure 9, page 14) with the mating ridges on the motor (Figure 11). Slide the main battery onto the slots until it snaps into the locked position (Figure 12). Verify that the main battery is securely mounted on the motor before using the chair.

To remove the main battery from the chair: Press both red release buttons on the main battery (Figure 9, page 14) and slide it off the ridges on the motor.



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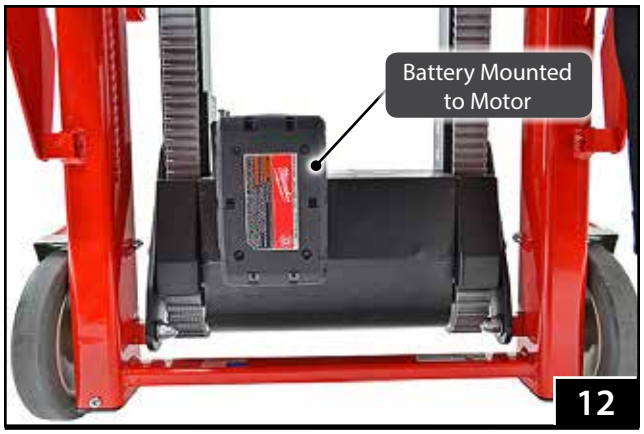

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5.4 Battery Charger

Note: *The battery and charger instructions from Milwaukee supersede those in this manual. For additional information, see the manuals provided with these components.*

A battery charger suitable for use with your local power supply is supplied with the chair (Figure 13):

- 100-120 VAC (60 Hz North America; 50/60 Hz Japan)
- 220-240 VAC, 50/60 Hz (Europe and other areas)

An adapter plug (not supplied) may be needed to adapt the charger plug for the outlet.

Typical charging time is about one hour. If the batteries are deeply discharged, extend the charging time. Actual charging time may vary based on frequency of recharge, depth of discharge, and age of batteries.

Store the charger ONLY in a cool, dry place. DO NOT store where temperatures may exceed 120°F (50°C).

If the charger will be used inside an ambulance, it must be securely mounted (mounting hardware not supplied).

A charger is included with purchase of a chair or POWERTraxx retrofit kit. For additional batteries or chargers, see *Accessories,* page 43.

INDICATOR LIGHTS

The charger has one red and one green indicator light. The lights work together to provide the following information:

- **RED (Continuous):** The battery is connected and is being charged.
- **GREEN (Continuous):** Charging is complete.
- **RED (Flashing):** The temperature of the battery is outside the proper charging range. Charging will begin when the battery reaches the correct charging temperature of 32°F-150°F (0°C-65°C).
- **RED/GREEN (Flashing alternately):** The battery is damaged or faulty. Replace the battery.

CHARGING THE MAIN BATTERY

To attach a main battery for charging, align the slots on the main battery (Figure 9, page 14) with the mating ridges on the charger (Figure 13). Slide the main battery onto the charger until it locks into position. Verify that the main battery is properly connected and the indicator light on the charger is lit.

To disconnect, press the two red release buttons on the main battery (Figure 9, page 14) and slide it off the charger.

NOTICE

Battery capacity can be affected if the battery is stored for long periods below 0°F (-17°C) or over 150°F (66°C).

NOTICE

If the battery charger will be used inside an ambulance, it **must be mounted.** Mount the charger using the mounting bracket built into the battery-charger. (Mounting hardware is not supplied).

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5.5 Power Switch

The rocker-style power switch is located on top of the motor (Figure 14). It allows easy ON/OFF control of the power system.

The switch is protected from liquids and dirt by a rubber cover. You can press the switch through the cover. Do not remove the rubber cover.

To use the chair:

1. Press I (ON).
2. Tap a paddle (Figure 15) up or down to awaken the wireless controller.
3. Allow a few seconds for the wireless connection to be established. When the control panel and motor link, the motor will emit three audible beeps.
4. Use the chair as instructed in this manual.
5. Press O (OFF) to disengage the power.

Tip

Battery Tips

To extend battery life, always turn the power switch OFF when the chair is not in use.

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5.6 Paddles

The paddles are affixed to the control panel on the extending lift bar, where they are accessible to the operator's hands. The paddles are labeled with the symbol of a stairway and an arrow for "descend/down" and "ascend/up" (Figure 15).

The amount of pressure used to press the paddle affects the speed of the belts. This allows the operator to control the speed of the chair on stairs.

To use a paddle:

1. Position your hands to comfortably grasp the extending lift bar, with at least one paddle accessible to your thumb.
2. Press the top or bottom of either paddle to operate the powered track system.

For complete instructions, see *Using the Chair,* pages 28-35.

Tip

Paddles

The amount of pressure used to press the paddle affects the speed of the belts. This allows the operator to control the speed of the chair on stairs.

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6 - CONTROL PANEL

6.1 Control Panel Overview

The control-panel components are (Figure 16):

- **Brake Button** - The symbol on this button is a "Stop Sign" with a slash through it.
- **Indicator Light** - The light is illuminated red, green, or is not illuminated to provide feedback to the user.
- **Mode Button** - The symbol on this button is the Ferno "FW" logo.
- **Display** - The liquid-crystal display provides informa-tion about a variety of chair functions, including battery charge, battery status, brake status, calibration and setting information, and more.

SOFTWARE VERSIONS

The information displayed varies depending on the software installed in the motor and control panel.

The software version is displayed briefly during the calibration procedure (see *Calibrating the Paddles,* page 42). Be aware that you will need to calibrate the paddles to exit this mode.

WIRELESS CONNECTION

Each time the power switch is pressed ON, the motor must make a wireless connection with the control panel.

1. Press the power switch. The motor will beep every five seconds until it locates and connects with the control panel, or until you press.
2. Tap a paddle in either direction. The control panel awakens and attempts to connect with the motor.
3. When the components link, the motor emits three beeps. The display shows the standard screen indicating the status of the Main Battery. If there is sufficient power, the brake is engaged.

   If the link fails, the control panel briefly displays the text, "MASTER not found!" (Figure 17). After this, the control panel will go to sleep.

Tip

Non-Wireless Connection

As an option, the interconnect cord (provided) may be permanently connected to the control panel and motor. In this state, the control panel does not need to connect wirelessly to the controller. See *Interconnect Cord,* page 41.

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If the text, "MASTER not found!" is displayed, the motor cannot locate the control panel. Do the following:

- Connect a charged main battery (page 15).
- Press the power switch (page 17).
- If these solutions don't work, attach the interconnect cord (page 41).

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6.2 Brake Button

The brake prevents the belts from moving unless a paddle is pressed. By default, the brake is engaged when the system has power. To disengage or re-engage the brake, press the brake button STOP on the control panel (Figure 18).

Disengage the brake to allow the belts to rotate without power (for example, to descend stairs without using the power system).

Depending on the version of the software, both the display and indicator light will change to match the current state of the brake. Refer to the images at right.

ORIGINAL SOFTWARE

- **Brake engaged:** The indicator light is off; the display shows the word, "BRAKE" (Figure 18).
- **Brake disengaged:** The indicator light is red and the display shows the word "IDLE" (Figure 20).

SOFTWARE V 1.5P5+

- **Brake engaged:** The indicator light is green; the display shows the word "BRAKE", and the brake symbol ◯ is displayed (Figure 19).
- **Brake disengaged:** The indicator light is red; the display shows the word "IDLE". The brake symbol is not displayed (Figure 20).

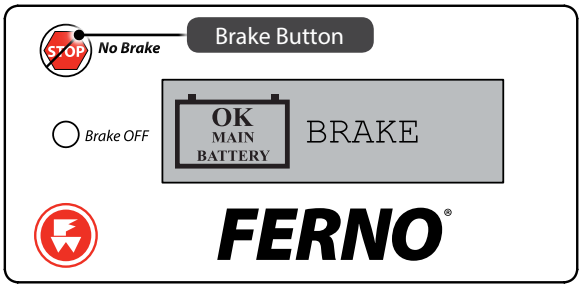
SPEED LIMITER

With or without power, an internal speed-limiting device limits the speed of the belts as the chair descends stairs. Use care and control the descent of a chair that is unpowered or has the brake disengaged.

Tip

About the Brake

The brake is engaged ONLY when the system has power. If the battery charge is depleted, the brake will disengage. Use additional help as needed.



Brake Engaged, Original Software: The indicator light is OFF and the display shows the word "BRAKE"

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Brake Engaged, Software V1.5p5+: The indicator light is green, the display shows the word "BRAKE", and the brake symbol is displayed in the lower-right corner of the display.

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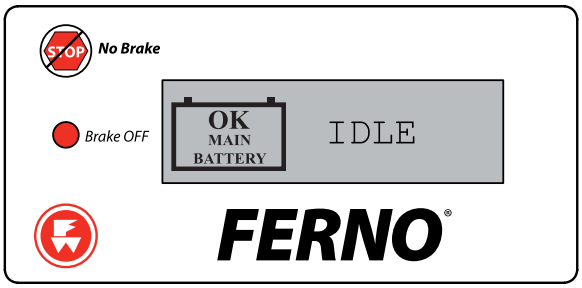

Brake Disengaged, All Software Versions: The indicator light is red and the display shows the word "IDLE". (For v1.5p5+, the brake symbol is not shown).

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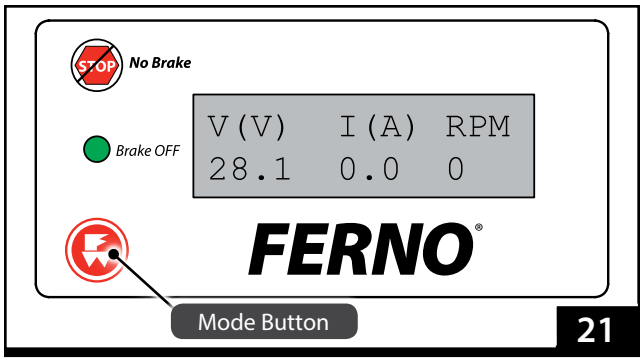
6.3 Mode Button

The mode button is the Ferno logo .

Press and hold for four seconds to show the chair status on the display (Figure 21). The display will show the current voltage and amperage used by the power system, plus the revolutions per minute (RPM) of the motor.

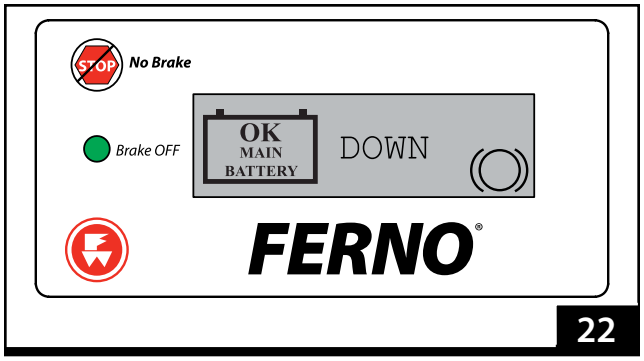
Note: *The RPM indicator tells only the speed of the motor, not the belts.*

The chair can be used normally while the status screen is displayed. To return to the standard screen, press the mode button briefly.



6.4 Display: Ascending (UP) or Descending (Down)

When a paddle is pressed, the display shows your choice of direction by displaying the word "UP" or "DOWN" (Figure 22). The text is shown while the tracks are in motion. When the paddle is released, the display returns to the standard screen.



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6.5 Display: Battery Status

The displays shows battery-status information for the main battery and the AA batteries in the control panel.

MAIN BATTERY

The main battery is shown as an icon on the left side of the display. With a full or moderate charge, the text inside the icon reads, "OK Main Battery." As the charge becomes low, the display will show different icons based on the software version installed in the control panel (Figure 23; also refer to the chart below).

Note: *A charge indicator is also built into the main battery. If in doubt, press the test button on the main battery.*

	Original Software	Updated/ Mixed Components	Current v1.5p5+
Full to Moderate Charge	OK Main Battery	OK Main Battery	OK Main Battery
Low Charge	CHECK Main Battery	CHECK Main Battery LED Blinks Red	CHECK Main Battery LED Blinks Red
Insufficient Charge Remains	CHECK Main Battery	CHECK Main Battery LED Blinks Red	"X" Through Battery LED Blinks Red

AA BATTERIES

Two AA-size batteries power the control panel. If the AA battery warning icon (Figure 24) appears in the upper-right corner of the display, replace the AA batteries.

Also, if there are no lights on the control panel and the paddles stop functioning, the AA batteries may need to be replaced.

See *Control Panel Batteries,* page 37 for details on replacing these batteries.

Tip

Check Main Battery

The "Check Main Battery" symbol is also displayed if the there is a fault with the main battery.

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6.6 Display: Fault Codes

Software version 1.5p5+ and later provides feedback on the display for three different faults, if they occur.

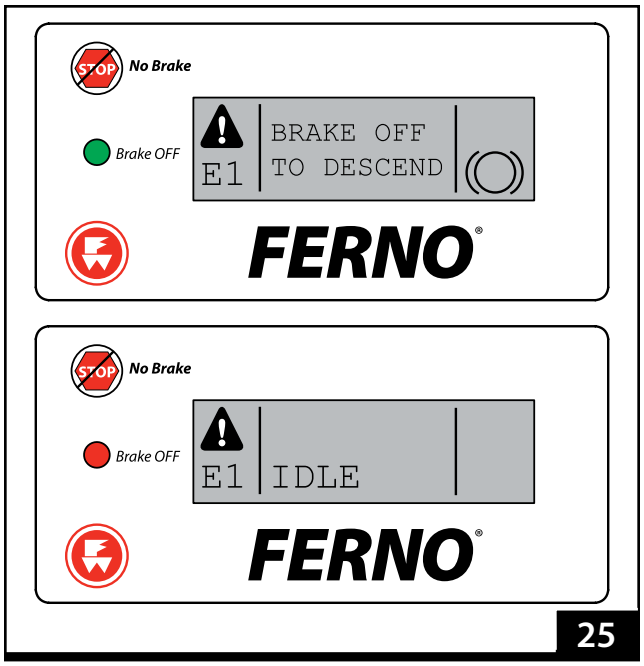
Fault codes are not displayed if the chair has an earlier version of the software. If a fault occurs, the chair will stop functioning and the display will turn off.

In all cases, contact EMSAR or your Ferno distributor for assistance. See *Parts and Service,* page 44.

Control-Panel Fault (E1) – If there is a fault or damage to the control panel (such as a loose or cut wire), a warning triangle symbol and error code "E1" are shown at the left side of the display (Figure 25).

Motor Overheating Fault (E2) – If the motor becomes overheated, a warning triangle symbol and error code "E2" are shown at the left side of the display, and the background is illuminated red (Figure 26).

Failure of Motor Module (E3) – If the motor module (circuit board, electronics, etc.) fails, a warning triangle symbol and error code "E3" are shown at the left side of the display, and the background is illuminated red (Figure 27, page 23).



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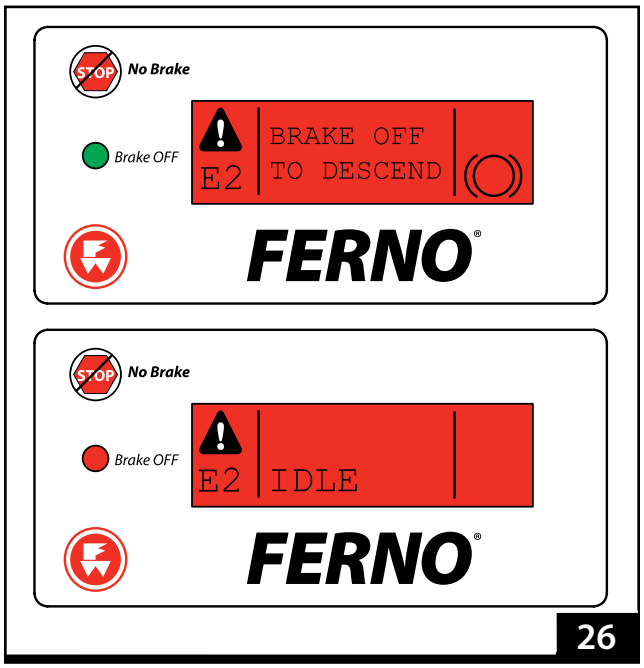

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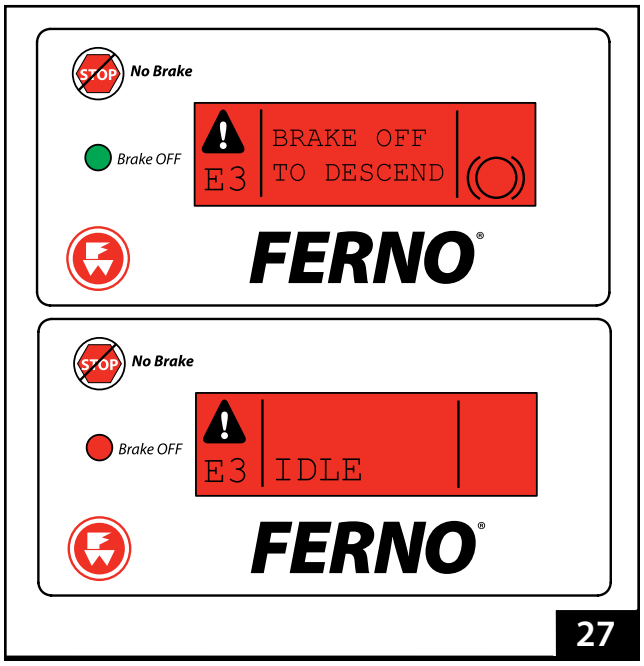
USING A CHAIR WITH A FAULT

If a fault code appears, the operators do the following:

- If the brake is engaged, the center area of the display shows a text reminder: "Brake Off To Descend" (Figures 25, 26, or 27, top). This is a reminder to the operators that the chair may be used in its non-powered mode.
- The operators make preparations to use the chair in non-powered mode, including stopping on the stairs (see *Pausing on the Steps,* page 31), adding additional helpers (see *Using Additional Help,* page 35), or other preparations to help control the chair. Follow local protocols for non-powered chair operation.
- Press the brake button to disengage the brake. The display changes to "IDLE", which verifies the brake is disengaged. Also, the brake symbol is not shown (Figures 25, 26, or 27, bottom).
- The warning triangle and fault code remain visible on the display until repairs are made.



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7 - CHAIR FEATURES

7.1 Folding and Unfolding the Chair

The red lock bar below the front edge of the seat disengages the lock for folding and unfolding the chair. Before seating a patient, verify that the chair is completely unfolded and the lock is engaged.

UNFOLDING THE CHAIR

1. Stand beside the chair and grasp the lift bar with one hand and the lock bar with the other hand.
2. Pull the lock bar forward (toward the front of the chair, Figure 28), then pull the seat away from the lift bar until the chair fully unfolds and the lock engages.
3. To verify the lock has engaged, hold the lift bar while pulling up on the chair frame at the front of the seat (Figure 29). The chair will not fold if the lock is engaged.

FOLDING AN OPEN CHAIR

1. Buckle the restraints and arrange the straps to prevent interference with folding the chair.
2. Roll the chair backward to reverse the swivel wheels (Figure 30).
3. Standing at the side of the chair, grasp the back-panel frame with one hand and the lock bar with the other hand.
4. Pull the lock bar forward (toward the front of the chair), **then** fold the seat toward the back-panel frame.

   AS YOU FOLD THE SEAT: Tilt the chair forward (Figure 28) to keep the swivel wheels rotated outward. This prevents the wheels from holding the frame away from the seat and allows the lock to engage.
5. Press the seat against the back-panel frame until the lock engages (Figure 31).
6. Verify the lock has engaged by pulling the seat away from the back-panel frame without pulling the lock bar. The seat will not move if the lock is engaged.

Note: *If the swivel wheels prevent the chair from locking in the folded position, hold the chair at a greater tilt to allow the swivel wheels to rotate away from the chair frame.*

Folding and Unfolding the Chair

The chair lock must be disengaged before you begin folding or unfold the chair. Pull the lock bar forward, then fold or unfold the chair.

When folding the chair, tilt the seat forward so the swivel wheels rotate outward, away from the seat.

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7.2 Track System

The POWERTraxx is a powered track system that allows the operators to power the chair up and down stairs instead of lifting and carrying it.

GUIDELINES FOR USE

- Using the chair on stairs requires a minimum of two trained operators. Ferno recommends using a third person as a "spotter" (see *Transporting the Patient Down Stairs,* page 30 and *Transporting the Patient Up Stairs,* page 32).
- Verify that the track system is fully open and locked before use.
- Never lubricate the belts. Lubrication can cause the belts to perform unpredictably, resulting in injury to the patient and/or operators.
- Moisture, water, snow, ice, or debris on or between the tracks and belts can cause irregular belt performance that results in sudden changes in the weight operators must support. Make sure the tracks and belts are clean and dry before using the chair on stairs.
- Moisture, water, snow, ice, or debris on the stairs can cause poor footing for operators. To avoid possible injury, clear the stairs or select an alternate route.

OPENING THE TRACK SYSTEM

1. Grasp the red release bar (Figure 32) and firmly pull the track system away from the chair until it locks in the open position.
2. Verify that track system has locked by trying to push the tracks closed. If the lock is fully engaged, the track system will not close.

CLOSING THE TRACK SYSTEM

With your hand, push the red closing handle down (Figure 33) until the track system closes completely.

⚠ WARNING

Using the chair with the track system unlocked can cause injury. Verify that the track system is locked before transporting the patient.

⚠ WARNING

Lubricating the track system can result in injury to patient and/or operators. Never lubricate the tracks or belts.

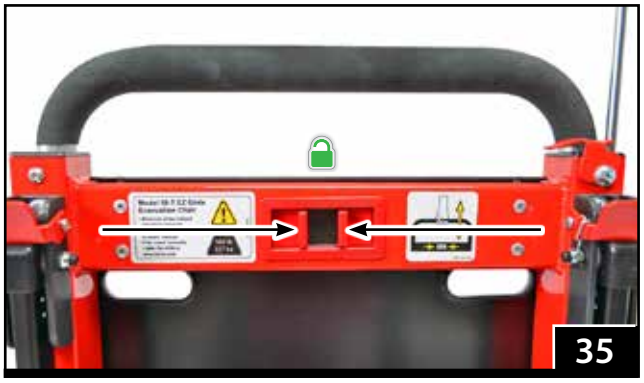
7.3 Extending Lift Bar

The rear operator uses the lift bar to guide and steer the chair when rolling the chair and to control the chair on stairs. The lift bar also contains the control panel with the paddles that control the powered track system (See *Paddles,* page 17).

The lift bar adjusts to five locked positions (Figure 34). Adjust the height according to operator preference and the task or situation at hand.

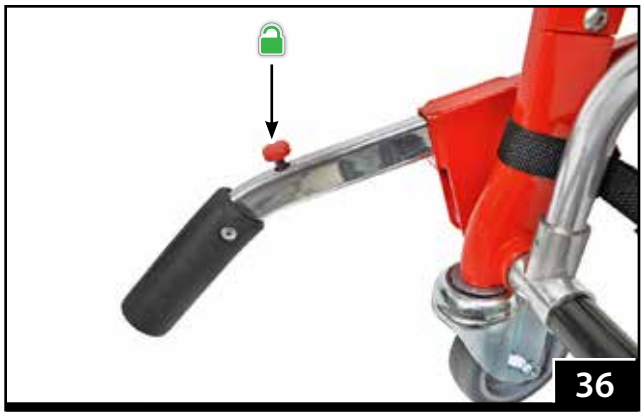
RAISING AND LOWERING THE LIFT BAR

1. With one hand, unlock the lift bar by squeezing and holding the red lift-bar release tabs together (Figure 35), then raise or lower the lift bar with the other hand.
2. When the lift bar is near the desired position, let go of the release tabs and raise or lower the lift bar until it locks into position.
3. Verify that the lift bar is locked by trying to raise or lower it without squeezing the release tabs. When the lock is engaged the lift bar will not move.



7.4 Telescoping Lift Handles

The telescoping lift handles adjust to five locked positions (Figure 36). Adjust the handles according to operator preference and the task at hand.



EXTENDING/RETRACTING THE LIFT HANDLES

1. Press the release button (Figure 36) and push or pull the handle near the desired stopping point.
2. Release the button and slide the handle a little forward or backward until it locks into position.
3. Lock both handles at the same position. Verify that both handles are locked by trying to push or pull them without pressing the release buttons. When the locks are engaged, the handles will not move.

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7.5 Footrest

The footrest has two positions: raised for storage, (Figure 37) and lowered for use (Figure 38).

To lower the footrest, swing it down until it stops.

To raise the footrest, swing it up until it stops.

GUIDELINES FOR USING THE FOOTREST

Use the footrest properly to ensure that is does not interfere with patient's or operators' feet.

- Before transferring the patient onto the chair, make sure the footrest is raised in the storage position. Seat the patient before lowering the footrest.
- When preparing to transfer the patient off the chair, unfasten the ankle restraint and raise the footrest into the storage position **before** unfastening the patient's torso and lap restraints. This will prevent the patient from attempting to stand before the footrest has been stored out of the way of his/her feet.
- Keep the footrest raised when it is not in use.

Tip

Footrest

Raise the footrest to the storage position before transferring the patient onto or off from the chair.

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7.6 Wheel Locks

The rear chair wheels are fitted with wheel locks to help keep the chair from rolling during patient transfer.

Stay with the chair and maintain control of it at all times. Do not use the wheel locks as a substitute for operator control.

To engage a wheel lock, press down the rear end of the lock pedal (Figure 39).

To disengage a wheel lock, press down the forward end of the lock pedal.

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8 - USING THE CHAIR

8.1 Before Placing the Chair in Service

Personnel who will work with the chair need to read this manual.

- Set up the chair, following the instructions in *Setup* (pages 11-12).
- Confirm that the chair operates properly. See *Inspecting the Chair*, page 37.

8.2 General Guidelines for Use

- Medical advice is beyond the parameters of this manual.
- It is the users' responsibility to ensure safe practices for the patient and themselves.
- A minimum of two trained operators is required.
- **Operators work together and maintain control of the chair at all times.**
- Follow standard emergency patient-handling procedures when operating the chair.
- Operators communicate with one another and use coordinated movements to operate the chair.
- Ferno recommends that a third trained person serve as a "spotter" while using the chair on stairs.
- Lift only the weight you can safely handle. Use additional help when working with heavy loads (patient and equipment). For placement of help, see *Using Additional Help,* page 35.
- Stay with the patient at all times.
- Always use patient restraints to secure the patient on the chair.
- The chair is for use on straight (non-spiral) stairways or inclines.
- If the battery is stored separate from the chair, attach the battery before using the chair.
- Remove any water, ice, snow, or debris from the stairs before using the chair on them.
- Remove any water, ice, snow, or debris from the track and tread belts before using the chair on stairs.
- Verify that the track system is locked in the open position before using the chair on stairs.
- The chair can be used for manual descent if the power system becomes disabled. See *Using a Chair Without Power,* page 34.

⚠ WARNING

Improper operation can cause injury. Operate the chair only as described in this manual.

⚠ WARNING

An unattended patient can be injured. Stay with the patient at all times.

⚠ WARNING

An unrestrained patient can fall off the chair and be injured. Use restraints to secure the patient on the chair.

⚠ WARNING

Lubricating the track system can result in injury to patient and/or operators. Never lubricate the track or belts.

NOTICE

Store the battery and battery charger indoors or inside the ambulance. Do not store in places where temperatures will be below 0°F (-17°C) or will exceed 150°F (66°C).

The chair is for use on straight stairways or inclines. Use on spiral stairways may cause the track belts to become dislodged.

Tip

Battery Tips

To extend battery life, always turn the power switch OFF when the chair is not in use.

Tip

Non-Powered Operation

The chair can be used for non-powered descent if the power system becomes disabled due to low battery charge or other factors.

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8.3 Transferring the Patient

Always assist the patient onto and off from the chair.

ASSISTING THE PATIENT ONTO THE CHAIR

1. Unfold the chair and verify that it is locked.
2. Engage the wheel locks.
3. Verify that the footrest is in the storage position.
4. Assist the patient onto the chair using accepted practices and following local protocols.
5. Fasten and adjust the torso and lap restraints.
6. Lower the footrest and place the patient's feet on it.
7. Fasten and adjust the ankle restraint (Figure 40).

ASSISTING THE PATIENT OFF FROM THE CHAIR

1. Engage the wheel locks.
2. Unfasten the ankle restraint and raise the footrest to the storage position.
3. Unfasten the torso and lap restraints.
4. Assist the patient off from the chair using accepted practices and following local protocols.

8.4 Rolling the Chair

- Roll the chair on smooth, flat surfaces whenever possible (Figure 41).
- For patient comfort, pull the chair backward over low obstacles such as door sills.
- The powered track system can be used to raise or lower the chair over obstacles such as curbs (Figure 42) and some ramps, depending on the elevation of the ramp.
- Use the powered track system only to move in a straight line over an obstacle. Do not twist or turn the chair while the track belts are in use.
- Close the track system and use the extending lift bar and telescoping foot-end handles to lift and carry the chair over curbs, high obstacles, and rough terrain.

TO ROLL THE CHAIR

1. **Head-End Operator:** Release the wheel locks.
2. **Head-End Operator:** Adjust the lift bar to a comfortable height and grasp it to push and guide the chair on all four wheels (Figure 41), or tilt the chair back and roll it on its rear wheels.
3. **Foot-End Operator:** Assist the head-end operator as needed and attend the patient.

NOTICE

When the track belts are in use, move the chair only in a straight line. Do not twist or turn the chair while using the track belts: the belts may become dislodged from the track. Set the chair on its wheels between stairways, to turn corners, or to change direction.

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8.5 Transporting the Patient Down Stairs

GENERAL GUIDELINES

- Using the chair to move down stairs requires a minimum of two trained operators working together. Use additional help as needed to control the chair (see *Using Additional Help*, page 35).
- Ferno recommends that the two operators face each other when transporting a patient on stairs and that a third trained person "spot" for the foot-end operator. In some cases, the foot-end operator may be able to descend the stairs facing forward, with his back to the patient. Follow your local protocols for using chairs.
- Remove any water, ice, snow, or debris from the stairs before using the chair on them.
- Remove any water, ice, snow, or debris from the track system and belts before using the chair on stairs.
- Verify that the track system is locked in the open position before using the chair on stairs.
- If the operators tire or need to attend the patient while on stairs, see *Pausing On the Stairs,* page 31.

USING THE POWERTRAXX TO DESCEND STAIRS

1. **Head-end Operator:** Roll the chair near the stairs and engage the wheel locks.
2. **Head-end Operator:** Open the track system (See *Track System,* page 25). Verify that it has locked.
3. **Both Operators:** Raise the lift bar and/or extend the foot-end lift handles to the desired positions and verify that all handles are locked (Figure 43).
4. **Spotter:** Stand below the foot-end operator with a hand on the operator's back to help steady and guide him/her throughout the descent (Figure 43).
5. **Head-end Operator:** Disengage the wheel locks.
6. **Both Operators:** Together, tilt the chair back until the belts engage the floor (Figure 44, page 30).
7. **Head-End Operator:** Press the top of a paddle to start the power system in the proper direction to descend the stairs.

NOTICE

When the track belts are in use, move the chair only in a straight line. Do not twist or turn the chair while using the track belts: the belts may become dislodged from the track. Set the chair on its wheels between stairways, to turn corners, or to change direction.

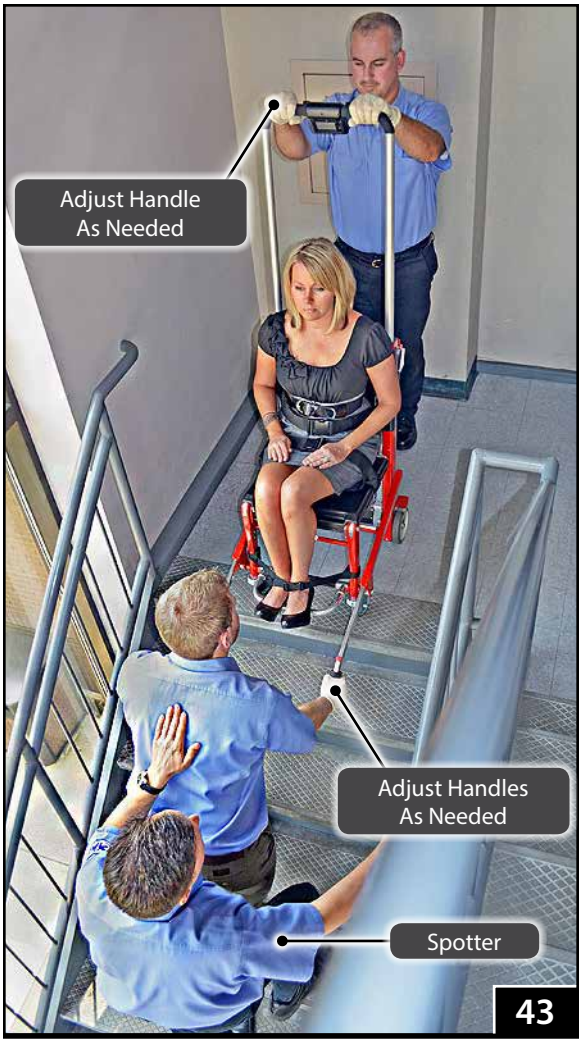
Tip

The Landing Zone

Ferno recommends you visualize a "landing zone" of at the top or bottom of the stairway. The landing zone should provide enough clear, safe space for the chair to be set on all four wheels, away from the edge of the stairway.

⚠ WARNING

Using the chair with the track system unlocked can cause injury. Verify that the track system is locked before transporting the patient.



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8. **Both Operators:** Together, and using the chair power, move the chair slowly forward and downward until the tracks engage two or three steps. This establishes the glide angle (Figure 45).
9. **Both Operators:** Move in a straight line and at a steady pace down the stairs, allowing the motor to do the work. To maintain the glide angle as you descend, work together and:
   - **Head-end Operator:** Apply slight downward pressure on the extended lift bar.
   - **Foot-end Operator:** Apply slight upward pressure on the foot-end lift handles.
10. **Both Operators:** Continue moving the chair in a straight line to the bottom of the stairway, then tilt the chair onto its wheels (Figure 46) as the Head-end Operator stops pressing the paddle.
11. If the chair has reached the destination, or if needed to maneuver the chair to the next stairway:

    Foot-end Operator: Retract the lift handles.

    Head-End Operator: Close the track system. Adjust the lift bar to a comfortable height.

    Both Operators: Roll the chair.
12. To continue the descent, reposition the chair to continue the descent. Use the chair wheels to turn and position the chair for the next stairway.

Note: *In a narrow stairway, you may need to retract the handles between each flight of stairs.*

8.6 Pausing On the Stairs

To pause on the stairs during ascent or descent:

1. **Head-End Operator:** Stop pressing the paddle. The brake engages automatically.

Note: *If the system has power, the brake engages automatically when the paddles are at the neutral position.*

2. **Both Operators:** Tilt the chair forward just enough to allow the rear wheels to rest on the step while both operators hold the chair in place (Figure 47).

To resume:

1. **Both Operators:** Tilt the chair back to the glide angle and engage the belts on the steps.
2. **Head-End Operator:** Press the appropriate end of the paddle to resume the ascent or descent.
3. **Both Operators:** Continue up or down the stairs.

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8.7 Transporting the Patient Up Stairs

GENERAL GUIDELINES

- Using the chair to move up stairs requires a minimum of two trained operators working together. Use additional help as needed to control the chair (see *Using Additional Help*, page 35).
- Ferno recommends that the two operators face each other when transporting a patient on stairs and that a third trained person "spot" for the head-end operator. Follow your local protocols for using chairs.
- Remove any water, ice, snow, or debris from the stairs before using the chair on them.
- Remove any water, ice, snow, or debris from the track system and belts before using the chair on stairs.
- Verify that the track system is locked in the open position before using the chair on stairs.
- If the operators tire or need to attend the patient while on stairs, see *Pausing On the Stairs,* page 31.
- The brake engages by default. When the operator stops pressing a paddle, the tracks stop at the current position. To disengage the brake, press the brake button on the control panel (see *Brake Button,* page 19).

USING THE POWERTRAXX TO ASCEND STAIRS

1. **Both Operators:** Roll the chair backward near the bottom of the stairs and engage the wheel locks.
   - Open the track system and verify that it has locked.
   - Operators raise the lift bar and/or extend the foot-end lift handles to the desired positions and verify that all handles are locked (Figure 48).
2. **Spotter:** Stand above the head-end operator with a hand on the operator's back to help steady and guide him/her throughout the ascent (Figure 48).
3. **Head-end Operator:** Disengage the wheel locks.
4. **Both Operators:** Together, tilt the chair back until the top of the track belts touch the edge of the lowest step of the stairway (Figure 49).
5. **Head-End Operator:** Press the bottom of a paddle to start the belts moving in the proper direction to ascend the stairs.
6. **Both Operators:** Together, and using the chair power, allow the chair to climb the stairway. The tracks should engage two or three steps. This establishes the glide angle.
7. **Both Operators:** Move in a straight line and at a steady pace up the stairs, allowing the chair motor to do the work. To maintain the glide angle as you ascend, work together and (Figure 50):
   - **Head-end Operator:** Apply slight downward pressure on the extended lift bar.
   - **Foot-end Operator:** Apply slight upward pressure on the foot-end lift handles.

⚠ WARNING

Using the chair with the track system unlocked can cause injury. Verify that the track system is locked before transporting the patient.

NOTICE

When the track belts are in use, move the chair only in a straight line. Do not twist or turn the chair while using the track belts: the belts may become dislodged from the track. Set the chair on its wheels between stairways, to turn corners, or to change direction.

Tip

The Landing Zone

Ferno recommends you visualize a "landing zone" of at the top or bottom of the stairway. The landing zone should provide enough clear, safe space for the chair to be set on all four wheels, away from the edge of the stairway.

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8. **Both Operators:** Continue moving the chair in a straight line onto the landing at the top of the stairs, then tilt the chair onto its wheels (Figure 51) as the Head-end Operator stops pressing the paddle.
9. If the chair has reached the destination, prepare the chair for rolling by retracting the lift handles and lowering the lift bar to a comfortable height.
10. To continue the ascent, adjust the lift handles and lift bar as needed to maneuver the chair to the next stairway.

Note: *In a narrow stairway, you may need to retract the handles between each flight of stairs.*

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8.8 Using a Chair Without Power

DESCENDING STAIRS WITHOUT POWER

If the system loses power, the belts are free to rotate, however, the internal speed limiter will limit the speed of the belts as the chair descends the stairs. Use care and control the descent of an unpowered chair.

Follow the instructions in *Transporting the Patient Down Stairs,* pages 30-31, and allow the tracks to carry the weight of the chair and patient.

Note: *If the operators choose to use the chair without power, press the brake button on the control panel to disengage the brake (see* Brake Button, *page 19).*

CARRYING A NON-POWERED CHAIR UP STAIRS

If the power system fails for any reason during an ascent, the operators must pick up the chair with its patient and carry them up the stairs.

- Before lifting, verify the patient is properly restrained. Use additional restraints and additional help as needed.
- Ferno recommends that the two operators face each other when transporting a patient on stairs and that a third person "spot" for the lead operator. Follow your local protocols for carrying chairs.
- Carrying the chair up stairs requires a minimum of two trained operators working together. Use additional help as needed (see *Using Additional Help,* page 35).

1. **Both Operators:** See *Pausing on the Stairs*, page 31, if you need to stop to rest while on the stairs. Engage the wheel locks.
2. **Foot-end Operator:** Extend the foot-end lift handles to the desired position. Verify that both handles are locked and maintain your grasp.
3. **Head-end Operator:** Raise the lift bar to the desired position and verify that it is locked. **CLOSE the track system**.

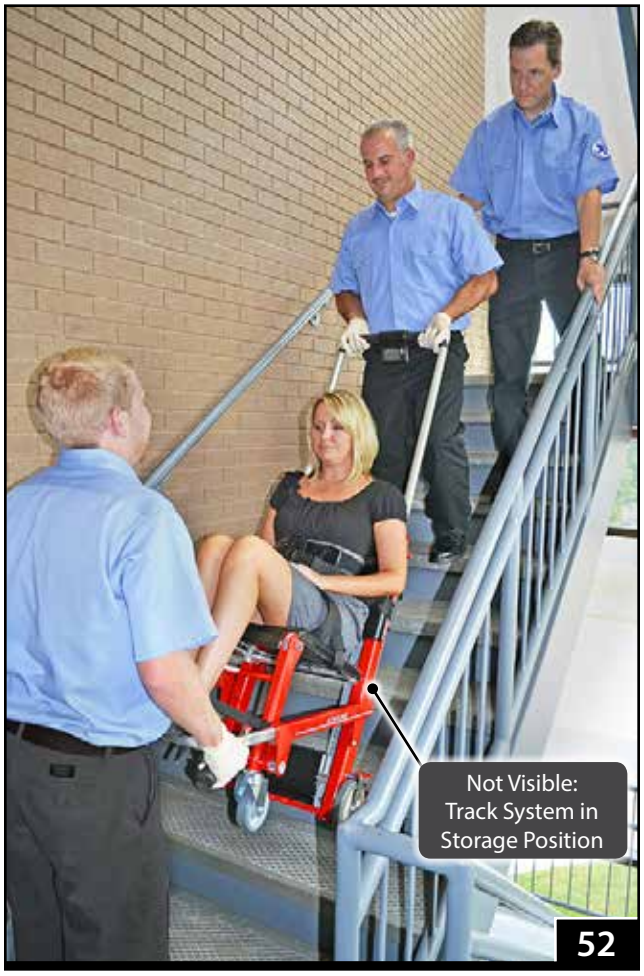
Note: *Close the track system to prevent it from interfering with the steps as you carry the chair.*

4. **Spotter:** Stand behind the lead operator with a hand on the lead operator's back to help steady and guide him/her throughout the move.
5. **Head-end Operator:** Disengage the wheel locks.
6. **Operators, Helpers, and Spotter:** Work together to lift and carry the chair up the stairs. The spotter keeps a hand on the lead operator's back and provides verbal guidance (Figure 52).
7. **Operators and Helpers:** When the destination is reached, set the chair on the floor.
8. **Foot-end Operator:** Retract the lift handles.
9. **Head-end Operator:** Adjust the lift bar to a comfortable height before rolling the chair.

Tip

Non-Powered Operation

The chair can be used for non-powered descent if the power system becomes disabled due to low battery charge or other factors.



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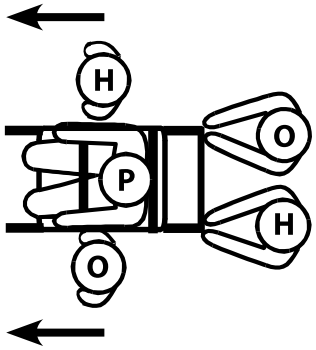
8.9 Using Additional Help

Operating the chair requires a minimum of two trained operators. Ferno recommends positioning a trained operator at each end of the chair, that operators and helpers face each other when transporting a patient up or down stairs, and that a third trained person "spot" for the lead operator. Follow all applicable local protocols for carrying chairs.

The trained operators should maintain control of the chair and operate the controls, and the designated lead operator should direct all helpers. The charts below show suggested placement for operators and helpers.

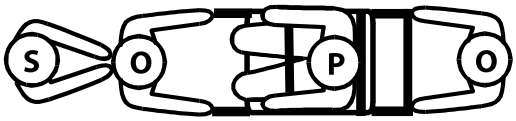
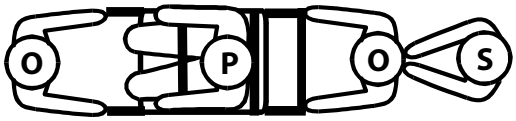
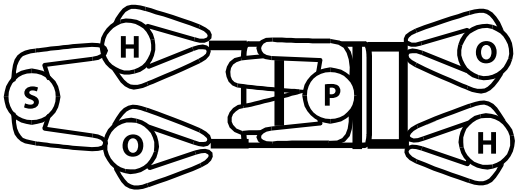
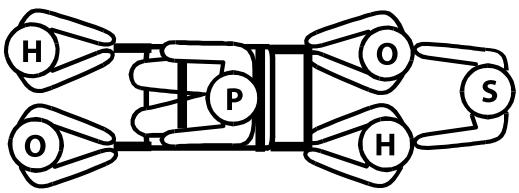
Direction	Rolling on Flat Surface
Two Operators and Two Helpers	

⚠ WARNING

Helpers can cause injury or be injured. Maintain control of the chair, operate the controls, and direct all helpers.

Load Limit

Inspect the chair if the load limit has been exceeded (See *Inspecting the Chair*, page 37).

Direction	DESCEND	ASCEND
Two Operators and One Helper		
Two Operators and Three Helpers		

9 - MAINTENANCE

9.1 Maintenance Schedule

The chair requires regular maintenance. Set up and follow a maintenance schedule. The table at right represents minimum intervals for maintenance.

Keep maintenance records. A sample maintenance record sheet is provided on page 47.

When using maintenance products, follow the manufacturers' directions and read the manufacturers' material safety data sheets. You can purchase a recommended disinfectant from your Ferno distributor or Ferno Customer Relations (page 2).

Minimum Maintenance	Each Use	As Needed	Monthly
Disinfecting (this page)	•		
Clean the Chair (this page)		•	
Clean Tracks and Belts (this page)		•	
Chair Inspection (page 37)		•	•
Track System Inspection (page 37)	•	•	
Lubricating the Chair (page 38)		•	
Adjust Belt Tension (page 39)		•	

9.2 Disinfecting/Cleaning Restraints

Ankle Restraint: Place buckled restraint in a mesh bag and launder in a washing machine using warm water, a disinfectant soap, and gentle agitation. Hang the restraint to dry. Do not put it in a dryer.

Chest and Lap Restraints: Disinfect and clean restraints as directed in the restraint users' manual provided. Additional, free users' manuals can be obtained from Ferno Customer Relations (page 2).

⚠ WARNING

Improper maintenance can cause injury. Maintain the chair only as described in this manual.

9.3 Disinfecting/Cleaning the Chair

To disinfect: Remove restraints and seat and back panels. Wipe all surfaces of the chair and panels with disinfectant. Follow the disinfectant manufacturer's directions for application method and contact time.

To clean: Wash panels and all parts of the chair with warm water and a mild detergent. Rinse with clean water. Dry with a towel or allow to air-dry.

NOTICE

Disinfectants and cleaners containing bleach, phenolics, or iodines can cause damage. Use caution when disinfecting and cleaning with products containing these chemicals.

Using abrasive cleaning compounds or applicators on the chair can cause damage. Do not use abrasive materials to clean the chair or POWERTraxx.

DO NOT PRESSURE WASH

Water under high pressure, or steam, can penetrate joints, flush away lubricant, and cause corrosion. Do not pressure wash the chair or POWERTraxx.

9.4 Cleaning Tracks and Belts

To ensure predictable belt performance, it is important to keep the track and belts free of oil, grease, dirt, and debris.

1. Hold the belts away from the track frame and remove any debris.
2. Clean both sides of the track frame, and both belts, with SD-20™ All-Purpose Cleaner and a clean cloth. Follow instructions on the container.
3. Dry track and belts thoroughly.

Note: *To order SD-20™ Cleaner in North America, contact the Spartan Chemical Company, Maumee, Ohio, USA at 1.800.537.8990 or visit www.spartanchemical.com on the internet.*

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9.5 Inspecting the Chair

Have your service's equipment maintenance personnel inspect the chair at regular intervals. Conduct a visual inspection of the track system before use, and a thorough inspection of the track system after each use.

Follow the checklists on this page and work the chair through all its functions as described in this manual.

If inspection shows damage or excessive wear, remove the chair from service until repairs are made. See *Parts and Service,* pages 44-45.

CHAIR INSPECTION

- Are all components present?
- Is the chair free of excessive wear?
- Are all screws, nuts, bolts, rivets, and roll pins securely in place?
- Do all moving parts operate smoothly and properly?
- Do all locks on the chair operate properly?
- Does the chair roll smoothly?
- Are the restraints properly installed?
- Is restraint webbing in good condition with no cuts or frayed edges?
- Are restraint buckles free of visible damage and do they operate properly?
- Do installed accessories operate properly without interfering with chair operation?
- Does the power switch function properly?
- Do the paddles function properly?
- Is there visible sign of damage to the motor, control panel, batteries, or battery charger?
- Does each battery attach properly to the motor?
- Do the charge indicators on the battery and on the control panel function properly?
- Is the battery-charger power cord free of excessive wear, cuts, and fraying?

TRACK SYSTEM INSPECTION

- Are the tracks and belts free of lubricant, dirt and debris?
- Is there visible damage to the track or belts?
- Do the belts operate properly through the full range of motion, without becoming loose or off-track?
- Does the track system operate smoothly, without binding or excessive noise?
- Are the inner cords of the belts visible (indicating the need for replacement)?
- Are the belt-tensioning bolts and nuts tight?

9.6 Control-Panel Batteries

Two AA batteries power the control panel. If the AA low-battery icon ( ) appears in the upper-right corner of the display, replace the batteries.

Also, if there are no lights on the control panel and the paddles stop functioning, replace the AA batteries.

Access the batteries by removing the access door on the reverse side of the control panel.

The port for the interconnect cord (supplied) is near the AA battery slots (Figure 53). See *Interconnect Cord,* page 41.

Tip

Battery Tip

To extend battery life, always turn the power switch OFF when the chair is not in use.

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9.7 Lubricating the Chair

Disinfect and clean the chair before applying lubricant.

There are two identical lubrication points on the chair. They are located where the brass bushing in the chair lock bar slot meets the stainless steel slide in the chair leg (Figure 54).

Lubricate each lubrication point with **one** drop of SAE 30-weight oil, then move the lock bar back and forth a few times to work the oil into the slide. Remove any excess lubricant with SD-20 Cleaner.

Note: *To order SD-20™ Cleaner in North America, contact the Spartan Chemical Company, Maumee, Ohio, USA at 1.800.537.8990 or visit www.spartanchemical.com on the internet.*

NOTICE

Lubricating parts that should not be lubricated allows dirt and foreign particles to collect on those parts, resulting in damage. Lubricate only the reference points shown.

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9.8 Do Not Lubricate Track System

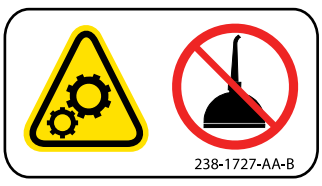
Never lubricate the track, the POWERTraxx, or any other part of the track system. Lubricants on the belts or track can cause the chair to perform unpredictably, resulting in injury to the patient and/or operators.

A label (Figure 55) instructing the user **not** to lubricate the track system is affixed to each side of the track. If these labels become damaged or worn, replace them immediately (see *Parts and Service*, pages 44-45).

If track or belts pick up oil or grease during use or while the chair is being serviced, clean the track and belts with SD-20 All-Purpose Cleaner before using the chair again. See *Cleaning Track and Belts,* page 36, for cleaning instructions.

⚠ WARNING

Lubricating the track system can result in injury to patient and/or operators. Never lubricate the tracks or belts.



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9.9 Adjusting the Belt Tension

TOOLS NEEDED

1 ea.	13 mm Socket Wrench (or 1/2 in Wrench)
1 ea.	6 mm Allen Wrench
1 ea.	2.5 mm Allen Wrench

Over time, the belts may become loose due to wear, or the tension of the two belts may become uneven.

Adjusting the belt tension is a two-person operation.

1. Open the track system and engage both wheel locks.
2. Using a 6 mm Allen wrench and a 13 mm socket wrench (or 1/2" wrench), loosen the large tension-wheel screw (Figure 56).
3. Using a 2.5 mm Allen wrench, loosen each of the two small tensioning-plate screws (Figure 57).
4. While one person pulls the "wings" of the tensioning plates in opposite directions (one toward the chair seat and one away from the chair seat), the other person uses the 2.5 mm Allen wrench to tighten the two tensioning-plate screws (Figure 58).
5. Using a 6 mm Allen wrench and a 13 mm socket wrench (or 1/2" wrench), tighten the large tensioning-wheel screw.
6. Repeat Steps 2-5 for the second track.
7. Verify the belt tension.
   - The tension of the two belts should be even.
   - Check by pulling each belt away from the track by hand. Pull at the center of the track (not on the top or bottom end). Measuring from the black track frame to the closet edge of the belt tooth, the belt should not pull more than 1/4"-3/8" (6.4-9.5 mm) from the frame.

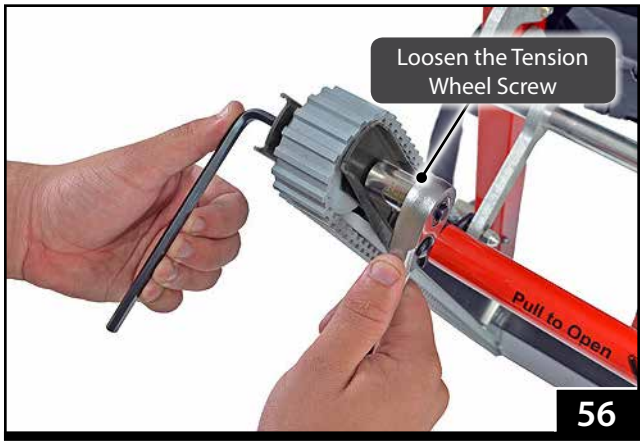
Note: *It may be necessary to repeat the tensioning and measuring one or more times to achieve the correct tension.*

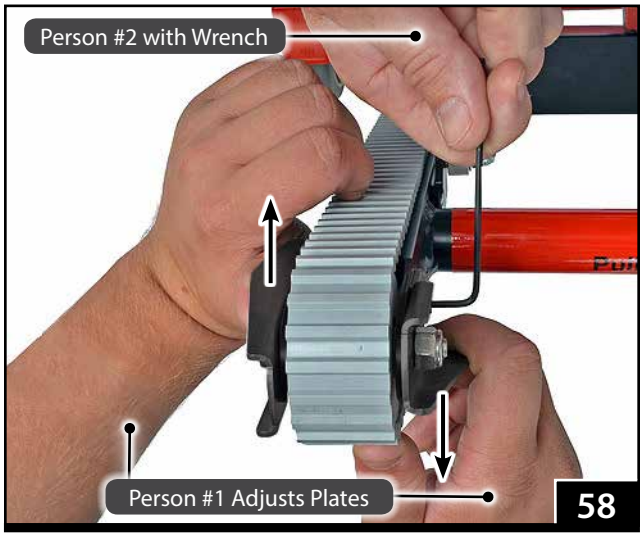
Note: *If the belts cannot be properly tensioned, they may need to be replaced. Contact EMSAR (in the U.S.A. or Canada) or your Ferno distributor for parts and service (see* Parts and Service, *pages 44-45).*

Tip

Adjusting Belt Tension

Adjusting the belt tension is a two-person operation.





9.10 Removing and Attaching the ABS Panels

The molded ABS seat and back panels snap on and off the chair frame.

BACK PANEL

To remove the back panel: Gently pull downward on the flange near one bottom corner and pull the corner of the panel away from the chair (Figure 59). Repeat at the opposite corner. Then slide the panel up off the two keepers at the top of the frame.

To attach the back panel: Orient the panel with the horizontal restraint slots uppermost. Slide the two holes in the panel top flange down over the keepers on the chair frame (Figure 60), then press both lower corners of the panel against the sides of the frame until they snap into place over the keepers.

SEAT PANEL

To remove the seat panel: Pull upward on the panel flange at each front corner to pop the panel free of the seat frame (Figure 61) then lift the panel off the chair.

To attach the seat panel: Align the panel with the chair frame and press down to snap the panel onto the frame.

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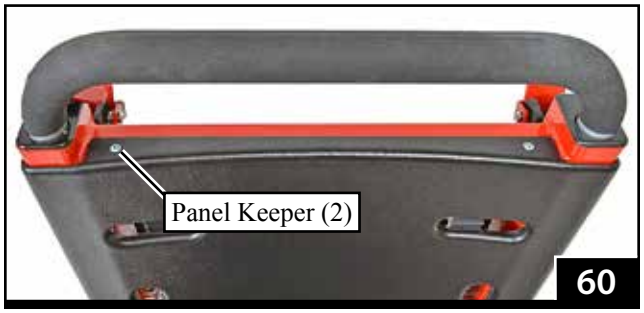

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9.11 Interconnect Cord

The interconnect cord (Figure 62) physically connects the control panel with the motor. It serves two purposes:

- (Optional) The interconnect cord can be connected permanently to bypass the wireless system. If you decide to use the interconnect cord permanently, arrange the cord so it will not be pinched by opening, closing, or using the chair.
- The interconnect cord can re-establish the wireless link between the control panel and motor. The control panel and motor are linked during assembly and should not lose contact during normal use. If the connection is lost, do the following to re-link the components:

1. Open the access door to the control panel batteries and connect the telephone-style plug on the interconnect cord to the port on the control panel (Figure 63).
2. Use a flat-blade screwdriver to remove the two screws and wireless antenna (Figure 64).
3. Plug the serial plug on the interconnect cord into the port on the motor (Figure 65).
4. Turn the power switch I and allow the unit to synchronize the wireless controller to the motor.
5. Disconnect the interconnect cord and reattach the wireless antenna and control-panel access door.

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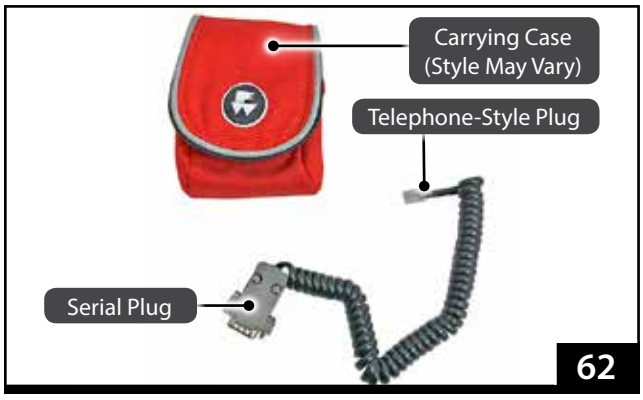

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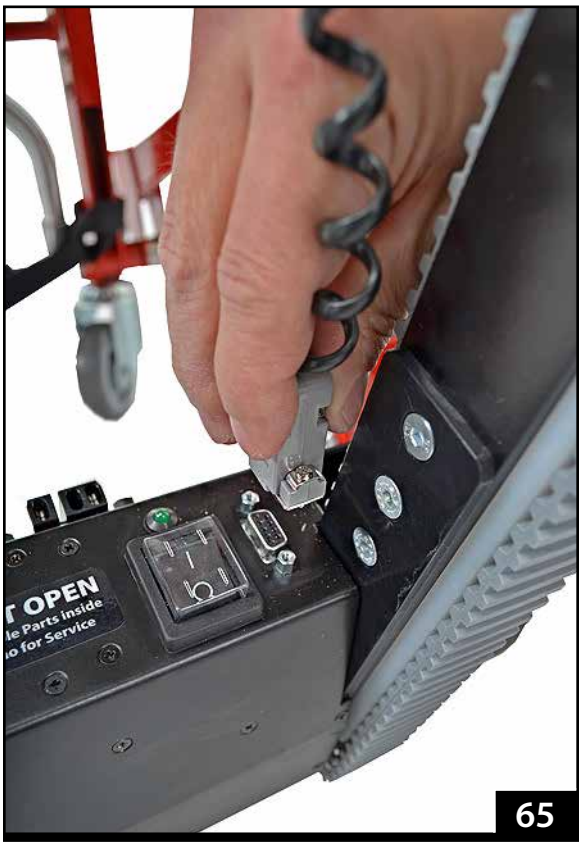

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9.12 Calibrating the Paddles

KNOWING WHEN CALIBRATION IS NEEDED

The paddles are pressure-sensitive. When properly calibrated, the paddles allow the operator to control the speed of the belts. Applying less pressure should make the belts move slowly, while depressing the paddle fully should make the belts move as quickly as possible.

Recalibration of the paddles is needed when you observe any of the following:

- there is no difference between a light touch of the paddle and fully-depressing the switch (the belts should not immediately begin moving at full speed with only light pressure)
- if the belts continues to move when the switch has been released (no pressure)

CALIBRATING THE PADDLES

1. If needed, disconnect the interconnect cord. Press the power switch O. Wait until the lights on the control panel turn off and the control panel is inactive (about five seconds).

Note: *The calibration procedure cannot begin unless the interconnect cord is disconnected, the power is OFF, and the control panel is inactive.*

2. **Do not** touch the up/down paddles.
3. Simultaneously press the brake STOP and mode buttons on the control panel (Figure 66).

Note: *If Step 3 is completed properly, the control panel will illuminate with a red background. The software version is briefly shown, then the calibration sequence begins. If the background is not red and the standard screen is displayed, repeat Steps 1-3.*

4. Instruction: "Throttle UP 100% Then Press a Key": Press and hold the ASCEND part of the paddle fully, then press the mode or brake button.
5. Instruction: "Throttle DW 100% Then Press a Key": Press and hold the DESCEND part of the paddle fully, then press the mode or brake button.
6. Instruction: "Throttle IDLE 0% Then Press a Key": Leave the paddle in the neutral position and press the mode or brake button.
7. If you completed all steps properly, the display will show "Calibration OK!" Begin using the chair normally.

IF THE CALIBRATION FAILS

Repeat Steps 1-7. Do not press the paddles until directed to, and press in the proper direction. If the paddles cannot be recalibrated, contact Ferno Technical Support for assistance (page 2).

Tip

Paddle Calibration

The paddles cannot be re-calibrated when the interconnect cord is connected. Disconnect the interconnect cord and install fresh "AA" batteries in the control panel if needed.

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10 - ACCESSORIES

Ferno offers a full line of emergency medical service accessories. Selected items approved for use with the chair are listed here.

Always follow the instructions packed with accessories. Keep the instructions with this manual. Be aware of any special considerations (loading heights, door widths, etc.) when using accessories.

For product information, contact Ferno Customer Relations (page 2).

⚠ WARNING

Attaching improper items to the chair can cause injury. Use only Ferno-approved items on the chair.

If the EZ-Glide with POWERTraxx will be mounted inside an ambulance, order kit 057-3085. The EZ-Glide Secure Mount is the only mount designed and tested for use in an ambulance.

The EZ-Glide Secure Mount was independently tested to the current CEN (European Norms) standards and is compliant with EN 1789:2007.

EZ-GLIDE CHAIR ACCESSORIES

Description	Part #
Kwik Klip™ Restraint System	031-4002
IV Bag Holder Complete	082-1976
IV Bag Holder Replacement Strap	082-1972
Headrest, Soft	031-4000
Headrest, Folding	083-2182
Head Strap Replacement	082-1970
EZ-Glide® Oxygen Cylinder Holder	082-1977
Oxygen Cylinder Replacement Straps	031-3661
Locking Rear Lift Handles (Pair)	082-1975

WALL MOUNTS

Description	Part #
EZ-Glide with POWERTraxx Secure Mount (Suitable for use in an Ambulance)	057-3085
EZ-Glide Wall Bracket (Hook Secures Top of Chair Only)	082-2073

RESTRAINTS

Description	Part #
Ankle Restraint	082-1973
430 Restraint, 2-piece, 5' (1.5 m), black, metal buckle	031-3892
430 Restraint 2-piece, 7' (2.1 m), black, metal buckle	031-3911
430-P Restraint 2-piece, 5' (1.5 m), black, plastic buckle	031-3797
430-P Restraint, 2-piece, 7' (2.1 m), black, plastic buckle	031-3801
Coated Restraint, 2-piece, 5' (1.5 m), green, nonabsorbent straps, metal buckle	E32032

Note: *See* Components, *page 8 for a photo of restraint options.*

Note: *Models 430 and 430-P restraints also available in 5-foot (1.5 m) and 7-foot (2.1 m) lengths in burgundy or orange.*

POWERTRAXX® ACCESSORIES

POWERTraxx conversion kit (120 VAC; see Note)	083-2195
POWERTraxx conversion kit (240 VAC; see Note)	083-2196
28 VDC Milwaukee Battery	083-2198
Milwaukee Charger, 120 VAC	083-2199
Milwaukee Charger, 240 VAC	083-2200

Note: *Each conversion kit contains one battery, one charger, and the POWERTraxx® unit.*

MILWAUKEE® ACCESSORIES

The Milwaukee® 28 VDC battery and battery charger may be purchased from Ferno, from a Milwaukee® distributor, or directly from the manufacturer by visiting http://www.milwaukeetool.com/ on the Internet.

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11 - PARTS AND SERVICE

11.1 U.S.A. and Canada

In the United States and Canada, to order parts or for professional chair repair, contact EMSAR® - the only agent authorized by Ferno to manage, service, and repair Ferno products.

Telephone (Toll-Free)	1.800.73.EMSAR
Telephone	1.937.383.1052
Fax	+1.937.383.1051
Internet	www.EMSAR.com

⚠ WARNING

Improper parts and service can cause injury. Use only Ferno parts and Ferno-approved service on the chair.

⚠ WARNING

Modifying the chair can cause injury and damage. Use the chair only as designed by Ferno.

11.2 Worldwide

To order Ferno parts, and for professional repair, contact your Ferno distributor. Your distributor is the only agent authorized by Ferno to manage, service, and repair Ferno products.

11.3 Parts List

Ref. #	Description	Part #
1	ABS back panel	190-1489
2	Track-close push handle	190-1500
3	ABS seat panel	190-1490
4	Seat bumper, pair w/hardware	190-1501
5	Inner telescoping handle assy. (right-side or left-side)	090-5837
6	Telescoping handle, grip only	190-1495
7	4" Front caster, complete	190-1494
8	Rear brake assy, right	090-5841
9	6" Rear wheel w/hardware	190-1493
10	Telescoping handle assembly	See chart at right
11	Ankle restraint	082-1973
12	Track release linkage	090-5844
13	Rear brake assembly, left	090-5843
14	Lift bar lock assembly	190-1492
15	Lift bar handle, complete	190-1491
16	Gas spring assembly	190-1499
17	Seat frame assembly*	090-5840
18	Chair labels and logos*	190-1502
19	Paddle w/labels (set L/R)	283-1641
20	Wireless controller (Complete)	283-1639
21	Battery door	283-1640
22	Interconnect cord	283-1648
23	Cord pouch	283-1649
24	Antenna w/housing	283-1647
25	Motor cover (bottom)	283-1650

* not shown

Telescoping Handle Assemblies (complete)		
Color	**Patient Side**	**Part #**
Red	Left	190-1619
Red	Right	190-1688
Platinum/Silver	Left	190-1689
Platinum/Silver	Right	190-1622
Blue	Left	190-1618
Blue	Right	190-1686
White	Left	190-1691
White	Right	190-1690

Note: *Please specify the RIGHT-side or LEFT-side assembly and color when ordering a telescoping handle assembly. "Right" or "Left" is as viewed by a patient sitting in the chair.*

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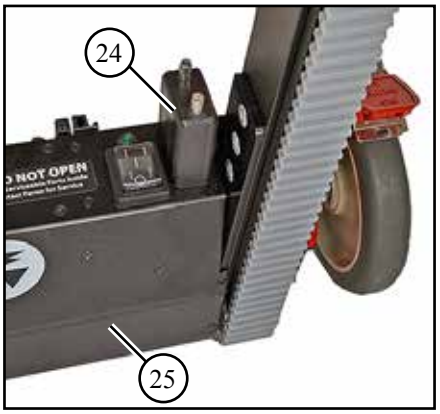
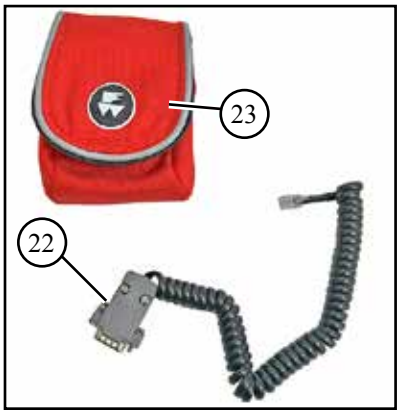
11.4 Parts Diagrams

Refer to Chart On Page 44





TRAINING RECORD		
Date	**Name**	**Training Method**

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MAINTENANCE RECORD

Date	Maintenance Performed	By

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