VIPER2

Powered Ambulance Stretcher

FERNO®

Instructions for Use

Ferno Customer Relations

For ordering assistance or general information:

CANADA AND THE U.S.A.

Telephone (Toll-free)	1.877.733.0911
Telephone	1.937.382.1451
Fax (Toll-free)	1.888.388.1349
Fax	1.937.382.1191
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:

Ferno-Washington, Inc., 70 Weil Way
Wilmington, Ohio 45177-9371, U.S.A.

Telephone	Country Code +1.937.382.1451
Fax	Country Code +1.937.382.6569
Internet	www.ferno.com

USERS' MANUALS

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

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 and local protocol. Training on the proper use of this product must 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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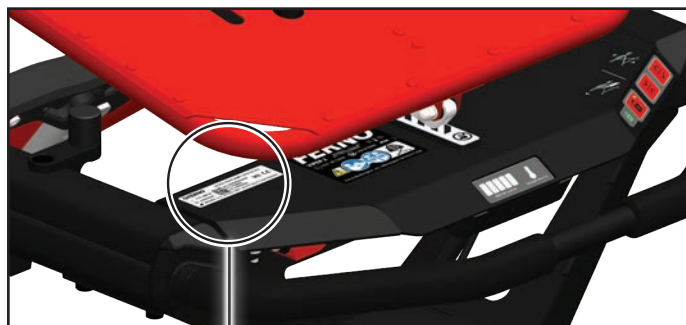
Limited Warranty Statement

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.

Adverse Event Notice

In the event of an adverse event or serious incident related to the use of this device, the end user/operator must report the incident to Ferno-Washington, Inc. at 70 Weil Way, Wilmington, Ohio 45177 USA, 1-877-733-0911, or via email at tscoordinator@ferno.com. If the incident occurred in the European Union, report it to Ferno's Authorised EU Representative and the competent authority of the Member State in which the end user is established.

Unique Device Identification (UDI)

Ferno complies with the United States Food and Drug Administration's (FDA), MDA & CE Unique Device Identification (UDI) regulation to identify medical devices. The UDI label contains information in human- and machine-readable form, which includes the serial number, date of manufacture and product name.

The label is located on the foot-end control panel as per the photo above.

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TABLE OF CONTENTS

1 - SAFETY INFORMATION

1.1 Warning

Warning safety alerts indicate a potentially hazardous situation that, if not avoided, could result in injury or death.

> ⚠️ **WARNING**
>
> Untrained helpers can cause injury or be injured. Trained operators must instruct helpers where to hold the stretcher to avoid injury.
>
> Improper use of the stretcher can cause injury. Use the stretcher only for the purpose described in this manual.
>
> An improper fastener can cause injury. Use only a compatible Ferno fastener designed for use with this stretcher.
>
> Modifying the stretcher can cause injury and damage. Use the stretcher only as designed by Ferno.
>
> Attaching improper items to the VIPER2 can cause injury. Use only Ferno-approved items on the VIPER2.
>
> Turning the power switch off while operating the stretcher can damage the stretcher. Only turn the power switch off when removing or attaching the battery, or when storing the stretcher.
>
> The button lockout feature is active only when charging. Pressing height-control buttons while the stretcher is locked in the loading system can damage both the stretcher and the loading system. Do not press the buttons when the stretcher is locked in the loading system.
>
> Removing/attaching the battery while power switch is ON (I) can damage the stretcher. Remove or attach the battery only when power switch is OFF (O).
>
> Improper charging can cause injury and damage. Charge the battery only with an approved Ferno charger or in the compatible loading system.
>
> Modifying the battery can cause injury and damage. Use the battery only as designed in this manual.
>
> Improper maintenance can cause injury and damage. Maintain the stretcher and battery only as described in this manual.
>
> Improper operation of the SX can cause injury. Use the SX only in a locked position and for the purpose described.
>
> Do not sit or stand on the SX.
>
> Do not use the SX as a patient transfer device or surface.
>
> Do not position the full weight of the patient on the SX.
>
> Do not use the SX as a push/pull device or to steer the VIPER2 stretcher.
>
> An unsecured patient can be injured. Use properly-installed patient straps to secure the patient on the stretcher.
>
> Turning the power switch off while operating the stretcher can damage the stretcher. Only turn the power switch off when removing or attaching the battery, or when storing the stretcher.

> ⚠️ **WARNING**
>
> Uncontrolled movement can cause injury or damage. Support and control the stretcher at all times.
>
> Sheets or other objects can interfere with, or become entangled in, the actuator or legs, which can cause injury and/or malfunction, including unexpected lowering of the stretcher legs. Tuck sheets between the mattress and the patient surface. Keep other items above the mattress.
>
> Moving the stretcher sideways can cause it to tip and injure the patient and/or operators. Move the stretcher only toward the control end or loading end.
>
> Pushing the stretcher by the backrest can cause it to tip and injure the patient or operators. Move the stretcher only by grasping the main frame.
>
> Trained operators must consider the environment and terrain before moving. Moving the stretcher in a lowered position will minimise the potential of a stretcher tip.
>
> Failure to engage the stretcher in the loading arm during loading can cause injury. Operators must ensure lock indicator illuminates green and the stretcher is secure in the loading arm before attempting to raise the legs.
>
> Support the load before using a manual override handle.
>
> Improper maintenance can cause injury. Maintain the stretcher only as described in this manual.
>
> Failure to perform preventative maintenance inspections can cause injury or damage. Have the stretcher inspected regularly by a factory-trained technician.
>
> Spraying directly into the battery cradle, control box, hydraulic unit or wiring can damage the product. Pressure-wash the stretcher only as described in this manual.
>
> Storing the stretcher with battery in the loading system connected to the vehicle's electrical circuit for long period can damage the battery. Always follow the instructions in this manual when storing the stretcher or battery.

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 Bloodborne Disease Notice

To reduce the risk of exposure to blood or other potentially infectious materials when using the product, follow the disinfecting and cleaning instructions in this manual.

1.4 Symbol Glossary

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

Symbol	Definition
	Extend Legs
	Retract Legs
	Release
	Lights

Symbol	Definition
	General warning of potential injury
	Read the users' manual
	Two trained operators required
320 kg 705 lb	Load Capacity/Safe Working Load
	Lock
	Unlock
SN	Serial Number
MD	Medical Device
CE	Compliant with European Union standards
UKCA	Compliant with United Kingdom standards
	Date of Manufacture
	Manufacturer
	Temperature limit
IP 66	IP rating
<18s >102s	Duty cycle
E 8	E8 homologation certificate
O	OFF
I	ON
	WEEE Directive: Dispose of batteries properly

1.5 Safety and Instruction Labels

Safety and instruction labels place important information from the users' manual on the VIPER2. Read and follow label instructions. Replace worn or damaged labels immediately.

Symbol	Definition	Part Number
A	General injury warning, read the users' manual, two trained operators required, load capacity	52114
B	Backrest adjusting	52111
C	Leg platform adjusting	52112
D	Leg platform knee angle adjusting	52113
E	Headrest adjusting	52110
F	Loading height indicator, side	52115
G	Loading height indicator	52116
H	Directional wheel lock	52108
I	Press to fold (fold-down sidearms)	52013
J	Manual release	52106
K	Main switch button	52107
L	Release button; height control buttons	52063

A

B

C

D

E

F

G

H

I

J

K

L

2 - OPERATOR FOCUS

2.1 Operator Training

Operator that using the stretcher:

- must read and understand this manual.
- must have training on proper use of the stretcher.
- must have the physical ability to assist the patient.
- must practice using the stretcher before using it with a patient.
- must keep training records. For a sample training record sheet, see "Training Record" on page 44.

2.2 Using Additional Help

Trained operators may need additional help when working with heavy patients.

- Two trained people stand at either end of the stretcher and instructing the helpers.
- It is recommended that helpers work in pairs to help keep the stretcher balanced.

Look at the chart to see where the operators and helpers should stand.

⚠️ **WARNING**

Untrained helpers can cause injury or be injured. Trained operators must instruct helpers where to hold the stretcher to avoid injury.

Helpers	Changing Levels	Moving	Loading/Unloading
Two Operators + Two Helpers			
Two Operators + Four Helpers			

Key: O = Operator   H = Helper

3 - ABOUT THE VIPER2

3.1 Description

The Ferno® VIPER2 is a medical device designed to transport a patient in a vehicle.

The stretcher is for use by a minimum of two trained operators.

OPTIONS

The stretcher comes equipped with options selected at time of purchase.

- Sidearm Options:
  - Fold-Down Sidearms
  - XS Surface Xtender Cotsides
- Backrest Options:
  - Standard Backrest
  - Head-Tilt Backrest
  - Extending Backrest
- Transport Wheels:
  - 150 mm diameter
  - 200 mm diameter
- Wheel Locks:
  - Two Wheel Locks, Foot-End
  - Four Wheel Locks

COMPATIBLE FASTENERS

- Ferno® Viper Loading System (VLS)

3.2 Compliance

The stretcher meets the following standards:

- **EN 1865-2:** Patient handling equipment used in road ambulances – Part 2: Power assisted stretcher
- **EN 1865-3:** Patient handling equipment used in road ambulances - Part 3: Heavy duty stretcher
- **EN 1789:** Medical vehicles and their equipment – Road ambulances
- **EN 60601-1:2006:** Medical electrical equipment - Part 1: General requirements for basic safety and essential performance
- **EN 60601-1-2:2015:** Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance – Collateral Standard: Electromagnetic disturbances – Requirements and tests
- **EN 60601-1-6:2010:** Medical electrical equipment – Part 1-6: General requirements for basic safety and essential performance – Collateral standard: Usability

> ⚠ **WARNING**
>
> Improper use of the stretcher can cause injury. Use the stretcher only for the purpose described in this manual.
>
> An improper fastener can cause injury. Use only a compatible Ferno fastener designed for use with this stretcher.
>
> Modifying the stretcher can cause injury and damage. Use the stretcher only as designed by Ferno.

3.3 General Specifications
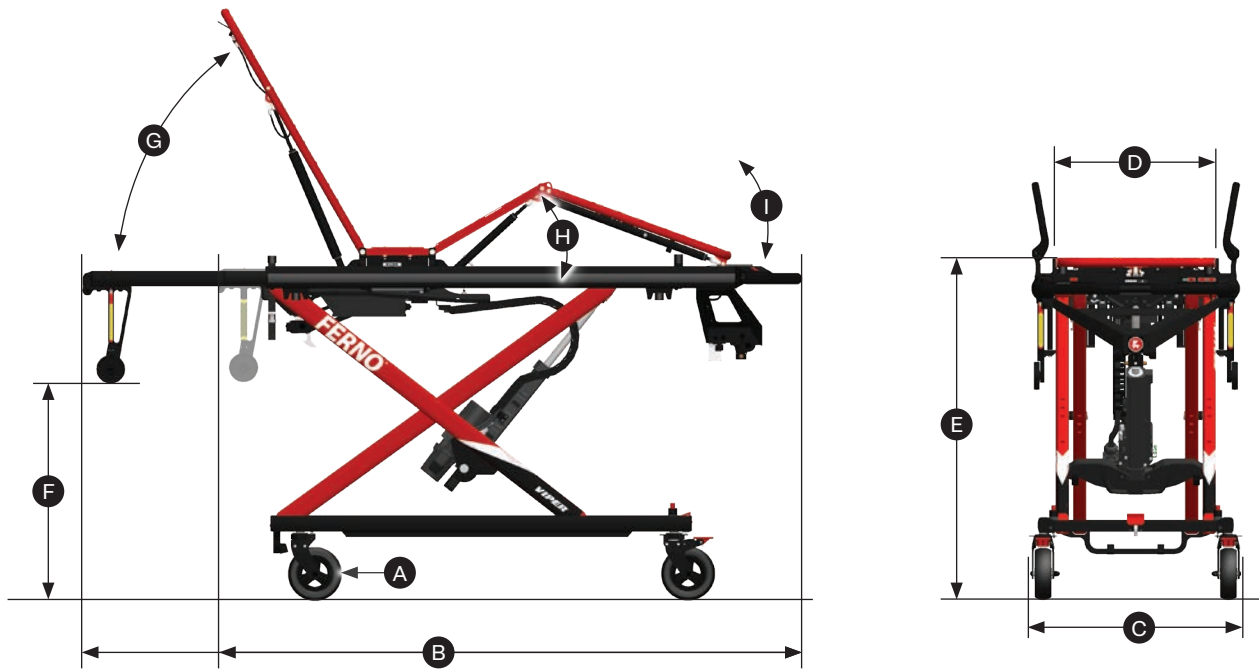
Specifications	Metric	Imperial
A) Wheels	150 x 50 mm or 200 x 50 mm	6" x 2" or 8" x 2"
B) Length (Minimum-Maximum)	1630 mm - 2000 mm	64" - 79"
C) Width of stretcher / with push poles	600 mm / 698 mm	24" / 27.5"
D) Width (Patient Surface) / with SX cotsides extended horizontal	460 mm / 950 mm	18" / 37.4"
E) Height with 150 mm / 200 mm wheels (Minimum-Maximum)	380 mm - 1330 mm / 430 mm - 1380 mm	15" - 52" / 17" - 54"
G) Backrest Adjustment	0° - 90°	
H) Leg Positioning Platform Adjustment	0° - 30°	
I) Footrest Adjustment	50°	
Loading Height (User-Programmable)	Max 950 mm	Max 37.4"
Load Capacity (Unassisted)	320 kg / 50 stone	705 lbs
Stretcher Weight / including SX cotsides, mattress and harness	75 kg / 82 kg	165 lbs / 181 lbs

Specifications are rounded. Imperial conversions are calculated before rounding the metric measurement. Ferno reserves the right to change specifications without notice.

- Load capacity is the amount of weight the stretcher is designed to hold, including patient and accessories attached.
- Height is the distance from the ground to the patient surface.
- Loading height is the distance from the ground to the bottom of the loading wheels.
- Stretcher weight includes the battery but is without optional features.

Power System	
Stretcher Operating Range	-34°C to 60°C/-29°F to 140°F
Battery Operating Range	-40°C to 60°C/-40°F to 140°F
Battery Output	36 VDC, 9 Ah
Recommended Max Operating Duty Cycle	<18 sec ON; >102 sec OFF

3.4 Components

SX Sidearm

Leg Platform

Loading Wheel (2)

Manual Raise/Lower Override Handle

Display

Height Control Buttons

Stretcher Release Button

Directional Wheel Lock

Wheel Lock (2)

Control End

Backrest

Battery

Telescoping Frame

Manual Stretcher Release Handle

Lift Bar

Transport Wheel (4)

Loading End

4 - SETUP

4.1 Ambulance Information

The patient compartment should have a level floor large enough for the stretcher and installed accessories, and the compatible loading system installed.

4.2 Install Accessories

Before placing the stretcher in service, assign appropriate personnel to install any accessories shipped with the stretcher. Keep accessory users' manuals with this manual for future reference.

4.3 Charge the Battery

Charge the battery immediately upon receipt until it has a full charge. To comply with shipping regulations, the battery must be shipped with less than a 30% charge.

Charge the battery by connecting the supplied Viper battery charger (see "Battery Charger" on page 17) or by securing the stretcher into a Viper Loading System (VLS) with integrated charging system correctly connected and powered.

Refer to the battery users' manual for complete information.

4.4 Turn On the Stretcher

The power switch is located under the seat panel on the patient left side (see "Power Switch", page 13). Turn the power switch ON (I) to turn on the stretcher.

4.5 Set the Loading Height

The user can set the stretcher so it stops automatically at a suitable loading height for the assigned vehicle in which it is being used.

To set or change the loading height:

1. On a level surface, raise or lower the stretcher until the yellow arrows on loading system are aligned within the loading height range on the stretcher (Figure 1).

Note: *The yellow arrows should point to the upper half of the loading height range. This will provide a reserve for loading on uneven surfaces.*

2. Press and hold **both** ⬮⬮ height-control buttons until the blue indicator lights ▯▯▯▯▯ reach 5 bars and flash quickly to confirm the new setting.

3. Lower and raise the legs to verify the stretcher stops at the new loading height. Test loading and unloading the stretcher with the vehicle.

Note: *The loading height cannot be set when the stretcher is at the factory-set maximum height.*

⚠ WARNING
Attaching improper items to the VIPER2 can cause injury. Use only Ferno-approved items on the VIPER2.

NOTICE
Loose items and debris on the patient compartment floor can interfere with the operation of the VIPER2 with the fastening system. Keep the patient compartment floor clear.

CHARGE BATTERY IMMEDIATELY UPON RECEIPT

Yellow Arrows

Loading Height Range

1
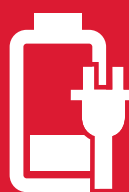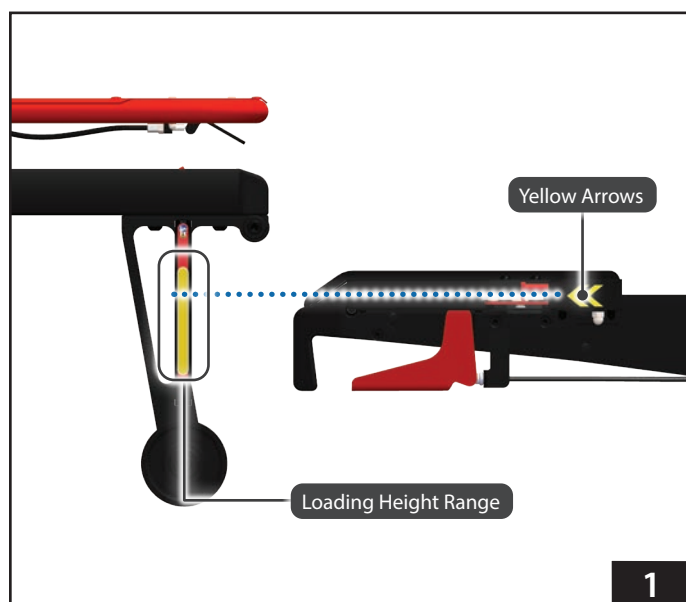
5 - FEATURES

5.1 Power Switch

The power switch (Figure 2) is located under the seat panel on the patient left side. This can be accessed from the side of the stretcher.

Keep the switch in the ON (I) position. Turn the power switch OFF (O) only when removing or installing the battery, or when storing the stretcher.

> ⚠️ **WARNING**
>
> **Turning the power switch off while operating the stretcher can damage the stretcher. Only turn the power switch off when removing or attaching the battery, or when storing the stretcher.**

5.2 Display

When the stretcher is activated the display shows the stretcher status (Figure 3).

INDICATOR LIGHTS

These lights show approximate battery charge:

- 80 - 100%
- 60 - 79%
- 40 - 59%
- 20 - 39%
- < 19 %

When the battery is charging, the lights flash green.

The lights turn red or orange to alert the operator to functional issues (see "Troubleshooting", page 42).

TEMPERATURE ICON

This icon indicates low or high system temperatures.

- **Flashing blue:** Control box temperature is below -20 °C / -4 °F. The stretcher will shut down if the temperature drops below -35 °C / -11 °F. Keep the stretcher in stretcher operational temperatures.
- **Flashing red:** Electronic components temperature is high. Reduce the raising/lowering frequency to allow the system to cool down.
    - Motor driver/controller temperature exceeds 70 °C / 158 °F.
    - Motor temperature exceeds 80 °C / 176 °F.
    - Battery temperature exceeds 55 °C / 131 °F.
    - BMS temperature over exceeds 55 °C / 131 °F.
    - Control box temperature exceeds 55 °C / 131 °F.

Power Switch

2

Indicator Lights

Temperature Icon
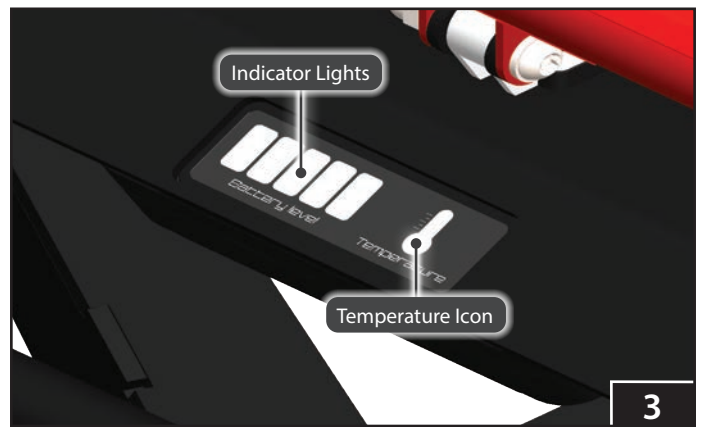
3

5.3 Height-Control Buttons

Height-control buttons are located on the control panel (Figure 4).

EXTEND LEGS: Raises the stretcher when on the ground / lowers the legs when stretcher is on the loading arm.

RETRACT LEGS: Lowers the stretcher when on the ground / raises the legs when the stretcher is on the loading arm.

AUTOMATIC STOPS

The stretcher stops automatically at four set heights:

- Fully-lowered
- Fully-raised
- Factory-set minimum transport height (only stops at this point when lowering the stretcher with a patient on)
- User-set loading height (only stops at this point when raising)

VIPER2 stretcher has a number of pre-set positions where it will automatically stop when pressing (and keeping pressed) the or to raise or lower the stretcher. Additional to this, at any time the button is released, the stretcher will stop at that position.

When raising the stretcher from its lowest position, it will first automatically stop at the user-set loading height (see page 45). Depressing the again, the stretcher will then continue to move up to the maximum height.

When lowering the stretcher from maximum height or below, the stretcher will automatically stop first at a pre-set "minimum transport height", but only when there is a patient on the stretcher. This is the minimum height which the stretcher can be physically wheeled, which is just above the lowest height (thereby ensuring the foot-end direction wheel locks are disengaged, allowing the stretcher to be manoeuvred correctly). Pressing the again the stretcher will then move to the lowest height. When lowering with no patient on the stretcher, it will not stop at minimum transport height, but will move directly to lowest height.

To set the loading height, see page 12.

BUTTON LOCKOUT

Buttons function is locked out to prevent accidental use when the stretcher is being charged.

5.4 Stretcher Release Button

The stretcher release button (Figure 4) unlocks the stretcher from the loading system. This function operates during unloading only when the stretcher legs are on the ground and the „Safe to Release" indicator light has illuminated.

In the event that powered operation is unavailable, refer to the non-powered operation sections of this manual to operate the stretcher manually.

5.5 Sleep Mode

Sleep Mode conserves battery power. If the stretcher is not in use for more than 10 minutes (no buttons pressed), the system enters Sleep Mode. In Sleep Mode, the display and lights (optional) are OFF. Sleep time interval is configurable in Service App (see "Service App", page 41).

Press or to activate the stretcher.

<table>
<tr><td>⚠️ WARNING</td></tr>
<tr><td>The button lockout feature is active only when charging. Pressing height-control buttons while the stretcher is locked in the loading system can damage both the stretcher and the loading system. Do not press the buttons when the stretcher is locked in the loading system.</td></tr>
</table>

Release Indicator Light

Stretcher Release Button

Height-Control Buttons

4
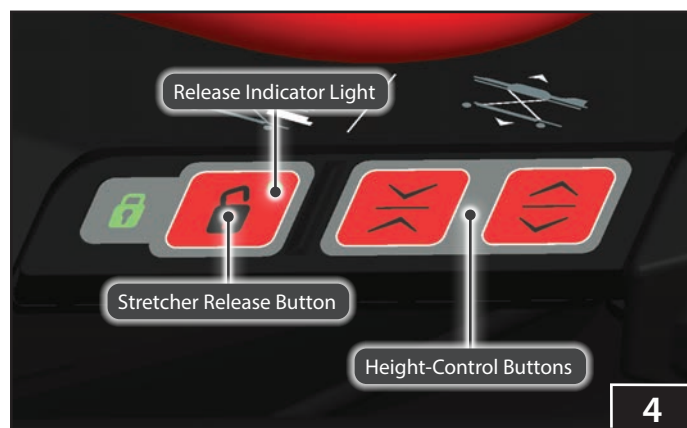
5.6 Lights (Optional)

Lights are located under main frame (Figure 5) and provide steady white light to illuminate the ground around the stretcher.

To turn the lights ON, press 🔆 button.

Press 🔆 button again to turn the lights OFF.

Note: *Lights turn OFF automatically when system enters Sleep Mode (page 14) and turn ON again when the stretcher is activated.*

5.7 Manual Override Raise/Lower Handle

Manual override handle is located under control panel (Figure 6). This handle disengages the stretcher's power system and allows operators to raise or lower the stretcher manually.

Refer to the non-powered operation sections of this manual to operate the stretcher manually.

5.8 Manual Override Stretcher Release

Manual override stretcher release handle is located under the backrest (Figure 7). This handle disengages the stretcher from loading arm and allows operators to release the stretcher manually.

Refer to the non-powered operation sections of this manual to operate the stretcher manually.

5.9 Battery

The stretcher battery (Figure 8) is a rechargeable 36 V Li-Ion battery with a carry handle, installed under the seat panel, accessible from the head-end of the stretcher below the backrest.

For complete use, maintenance, and safety information, refer to battery users' manual.

- Press check button to display the approximate battery charge.
- Charge the battery by securing the stretcher in the loading system or connect it directly to a battery charger.
- Refer to "Storing the Battery" on page 40 for instructions on storing the battery.
- Replace a damaged or cracked battery. Do not open the sealed battery case. Do not dismantle, open or shred the battery.
- Recycle the battery when it no longer holds a charge (see "Recycling Notice", page 40).

REMOVING THE BATTERY

1. Turn the power switch OFF (O).
2. Raise the backrest.
3. Slide the release lever to the right and use the carry handle to lift the battery out of the cradle.
4. Lower the backrest.

ATTACHING THE BATTERY

1. Confirm the power switch is OFF (O).
2. Raise the backrest.
3. Angle and slide the battery into the cradle. Press down to lock the battery in place in the cradle until it locks. Ensure the battery release lever is in locked position (pin on the left).
4. Lower the backrest.
5. Turn the power switch ON (I).

⚠️ **WARNING**

Removing/attaching the battery while power switch is ON (I) can damage the stretcher. Remove or attach the battery only when power switch is OFF (O).

Improper charging can cause injury and damage. Charge the battery only with an approved Ferno charger or in the compatible loading system.

Modifying the battery can cause injury and damage. Use the battery only as designed in this manual.

Improper maintenance can cause injury and damage. Maintain the stretcher and battery only as described in this manual.

NOTICE

Charge the battery immediately upon receipt. Shipping regulations require the battery to be shipped with a 30% charge. Failure to charge the battery in a timely manner can damage the battery.

Charge the battery only with a compatible charger.

External Battery Charger Connector

Display

Release Lever

Check Button

8
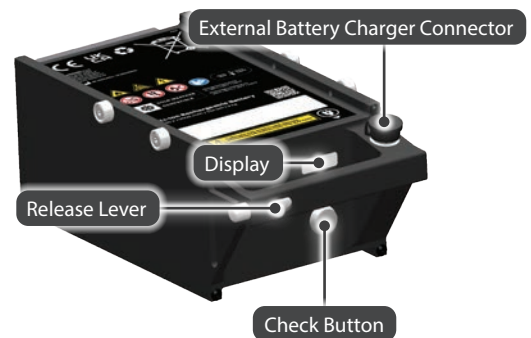
5.10 Integrated Charging System

When the stretcher is locked in the loading system (Figure 9), integrated charging system charges the stretcher battery and disables all powered operations of the stretcher (up/down, stretcher release from platform, etc.). Confirm the loading system is receiving power from the vehicle. The stretcher light indicators will flash green when charging or stay constant 5 bar green when fully charged.

If the battery has a very low charge, the charging system may not be able to charge the battery. In this case, connect the battery directly to the charger separate from the vehicle and loading system.

5.11 Battery Charger

The supplied battery charger for Viper (Figure 10) connects to the external battery charger connector port on top of the battery (Figure 11) for charging the battery outside of the vehicle.

Do not try to connect the external battery charger whilst the stretcher is on the loading system and integrated charging system is charging the stretcher battery.

Use only the provided compatible battery charger to charge the battery, and charge only Viper batteries with the charger.

The charger meets EN 60601-1 standard and is compatible with standard household electricity and is supplied with an input cable for your country.

For complete use, maintenance, and safety information, refer to battery charger users' manual.

External Battery Charger Connector

5.12   Wheel Locks

Wheel locks (Figure 12) stop wheel rotation when engaged, and help keep the stretcher from moving during patient transfer and certain medical procedures. Wheel locks are mounted to control-end transport wheels (or to all transport wheels, optional).

Press the red lever down to engage the lock. Press the opposite end of the lever to unlock.

Remain with the stretcher and keep control of it at all times. Do not leave the patient unattended.

NOTICE
Wheel locks are not a substitute for operator control. The operators must remain with the stretcher and keep control of it at all times. Do not leave the patient unattended.
Wheel locks are not brakes. Do not use wheel locks to slow a moving stretcher.
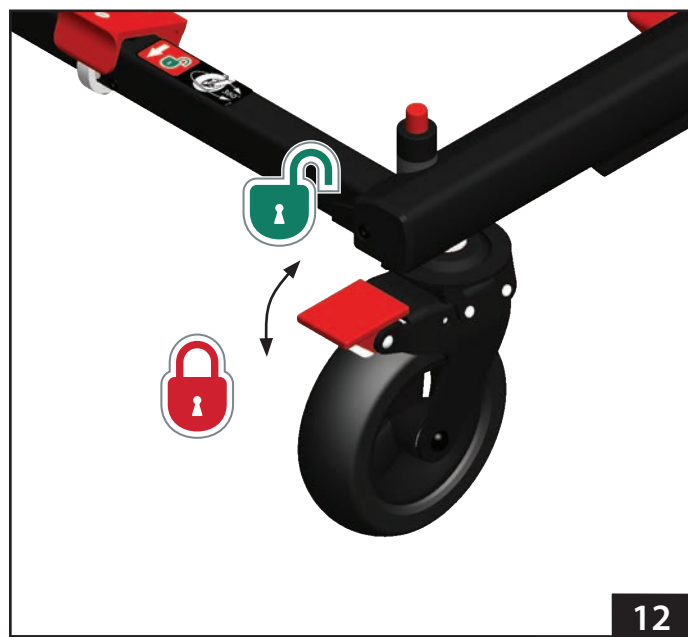
5.13   Directional Wheel Locks

Directional wheel locks (Figure 13) allow the operators to lock the direction of both head-end transport wheels in line with the length of the stretcher.

To lock, press the top of lock lever located at the foot-end of the stretcher. The directional wheels will lock automatically when they align with the length of the stretcher when start to move the stretcher. To unlock, press the opposite end of the lever to disengage and allow 360° swivelling of the head-end wheels.

The directional wheels must be locked before loading the stretcher into a vehicle or unloading the stretcher from a vehicle.

5.14 Telescoping Frame

The telescoping frame (Figure 14) shortens the stretcher to improve maneuverability in confined spaces. The frame locks at the fully-extended and fully-shortened positions.

- Use only a locked position when lifting the stretcher.
- The frame must be locked in the fully-extended position before loading the stretcher into a vehicle or unloding the stretcher from a vehicle. The stretcher will not load/unload if the frame is not fully extended and can cause damage if the operator does not take care in what they are doing.

To use the telescoping frame:

1. Loosen or unbuckle the straps.
2. Raise the backrest.
3. Adjust and fasten the straps.
4. Squeeze the telescoping frame release levers toward the lift bar (Figure 15) and push or pull the frame. Release the levers and continue pushing or pulling the frame until it locks at the new position.

Telescoping Frame

14

Release Lever (2)

Lift Bar

15
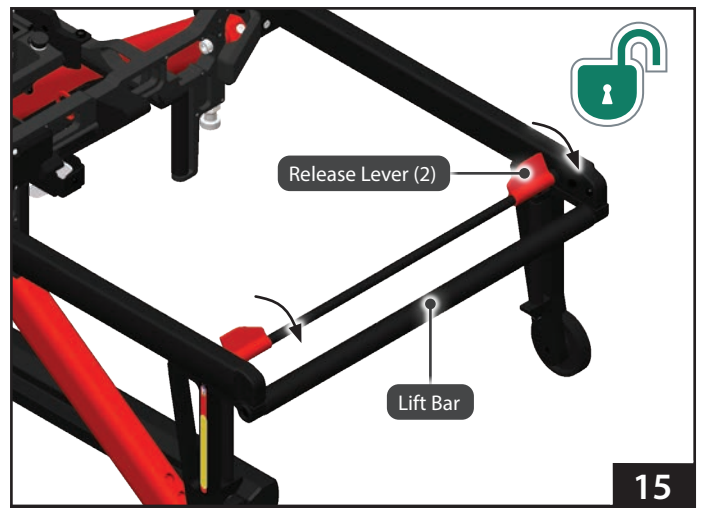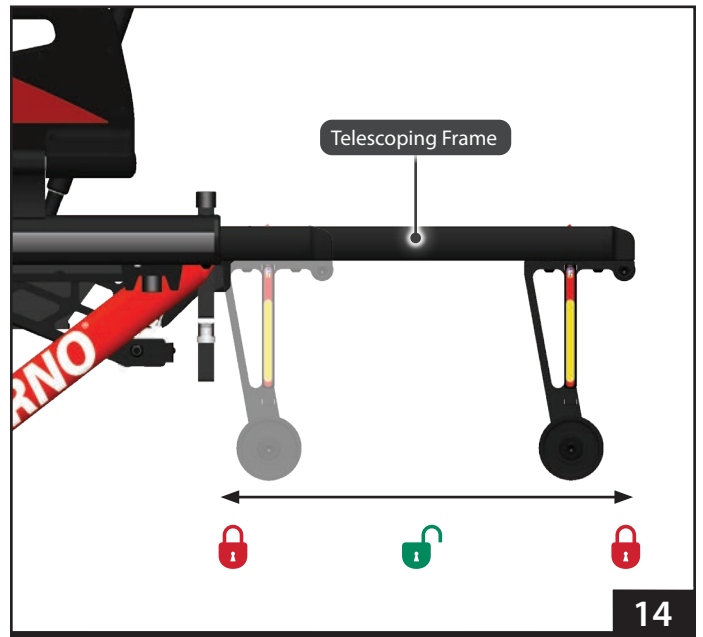
5.15 Oxygen Cylinder Holder (Optional)

The oxygen-cylinder holder (Figure 16) is mounted to the telescoping frame. It can carry a portable oxygen cylinder, up to a maximum 10 kg / 22 lb.

The holder is designed to securely hold a cylinder, even during vehicle transport.

To secure a cylinder on the holder:

1. Center the cylinder on the holder. Wrap the fastening strap around the cylinder and thread the strap through buckle.
2. Thread the fastening strap back through the buckle.
3. With one hand holding the oxygen bottle in place, pull the strap as tight as possible.
4. Secure the fastening strap into the fixing point.
5. Repeat to secure the second strap.

16
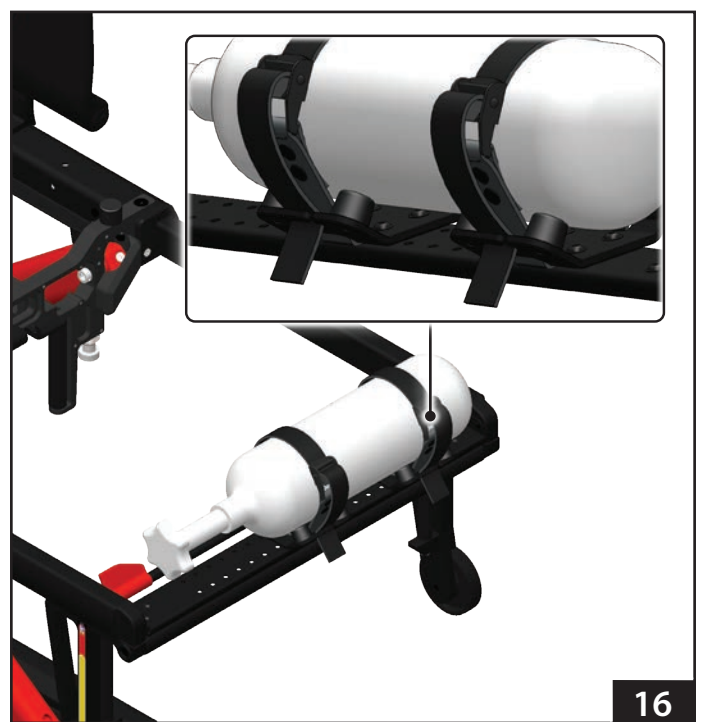
5.16 Standard Backrest

The backrest adjusts to different angles for patient comfort and clinical need. To adjust the backrest:

1. Loosen or unbuckle the straps.

2. Lower the sidearms.

3. Support the weight of the backrest and patient before using the levers.

4. Squeeze the backrest angle adjust lever toward the backrest frame to unlock the backrest (Figure 17).

5. Raise or lower the backrest to the desired position, then release the lever to lock the backrest.

6. Adjust the sidearms.

7. Adjust and fasten the patient straps.

NOTICE
Do not position the full weight of the patient on the backrest.
Do not use backrest to lift the stretcher. Only use the stretcher's main frame or the telescoping frame to lift the stretcher.

5.17 Head-Tilt Backrest Option

The Head-tilt Backrest allows the head section of the backrest to be adjusted and better angled to allow trained medical personnel to access and work with the patient's airway.

1. Grasp the head section frame with both hands. Support the weight of the patient's head.

2. Squeeze the head section angle-adjust lever toward the frame to unlock the head section (Figure 18).

3. Raise or lower the head section frame to the desired position, then release the lever to lock the frame.

5.18 Head Extension Option

Head Extension option includes a moveable head extension plate to make the patient surface longer by 290 mm / 12".

1. Grasp the head section and rotate the release knob (Figure 19) by 180° to unlock the head section.

2. Raise or lower the head section to desired position.

3. Rotate the release knob by 180° to lock the head section.

4. Pull or push the head section until it locks in position.

5.19 Extending Backrest Option

Extending Backrest option (Figure 20) has upper section of backrest that can be extended out to make the patient surface longer by 160 mm / 6.3". Additional pillow available and intended for use with this backrest.

To adjust the extending backrest: Grasp the head section and extend or retract the head section to desired position.
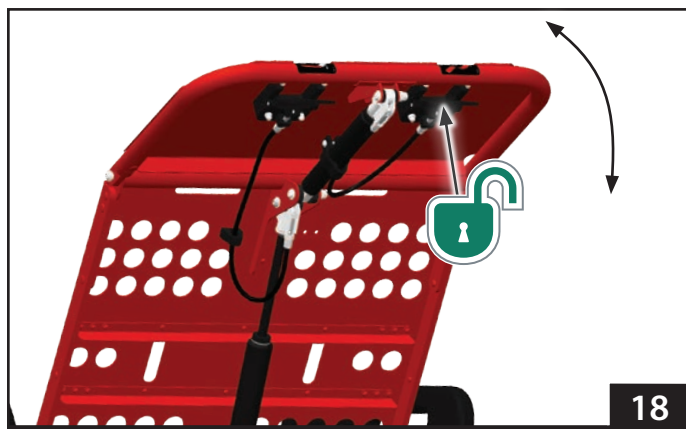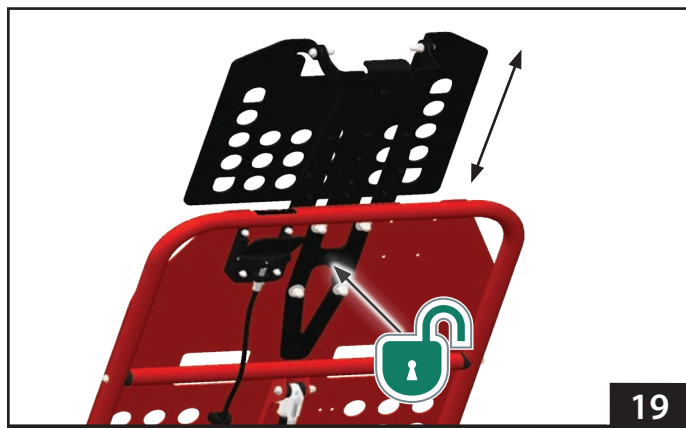
5.19 Leg Platform

The leg platform raises the patient's legs or knees and allows flat, raised and knees elevated position.

RAISED POSITION

1. Hold the leg platform with hand. Support the weight of the patient.

2. Squeeze the leg platform raise/lower lever toward the frame (Figure 21) to unlock the leg platform.

3. Adjust the leg platform to the desired position.

4. Release the lever to lock the leg platform at the new position.

KNEES ELEVATED POSITION

1. Raise the leg platform to the required position.

2. Hold the lower leg platform with hand. Support the weight of the patient.

3. Squeeze the leg platform knee angle lever toward the frame (Figure 22) to unlock the lower leg platform section.

4. Adjust the lower leg platform to the desired position.

5. Release the lever to lock the lower leg platform at the new position.

NOTICE
Do not position the full weight of the patient on the leg platform.
Do not use leg platform to lift the stretcher. Only use the stretcher's main frame or the telescoping frame to lift the stretcher.

Leg Platform Raise/Lower Lever

21

Leg Platform Knee Angle Lever

22
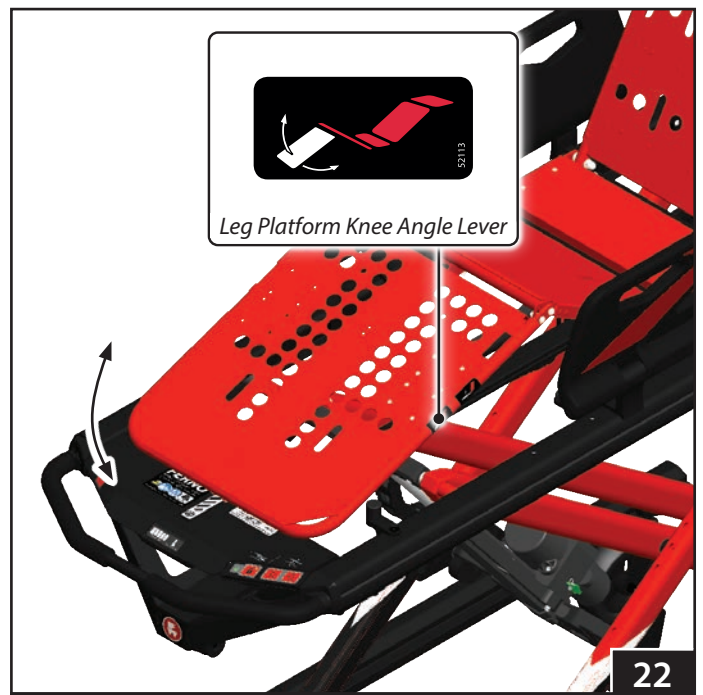
5.20 SX Surface Xtender

The SX surface extenders provide added patient security and comfort, and increases the width of the patient surface allowing flexibility for large patients. The SX also provides a location to place a patient's arm to start an IV etc. Each side locks individually. There are five locking positions and an unlocked, 'down' position..

SX has an integral safety feature which prevents the release mechanism from being overloaded, and to prevent injury to operators. If the release lever is operated while there is pressure on the SX (i.e. the SX is supporting patient weight), the ratchet will not release. Lifting up on the SX to assume the weight will release the ratchet and allow the SX to be lowered.

To Raise the SX: Lift the SX until it locks into the desired position. There is no need to use the release lever when raising. The SX will ratchet upwards, locking in each position.

To Lower the SX: Rotate the SX toward the patient surface slightly to take the weight off the locking mechanism. Squeeze the red lock release lever (Figure 23) and lower the SX to the desired position, or all the way down if performing a patient transfer.

> ⚠️ **WARNING**
>
> **Improper operation of the SX can cause injury. Use the SX only in a locked position and for the purpose described.**
>
> **Do not sit or stand on the SX.**
>
> **Do not use the SX as a patient transfer device or surface.**
>
> **Do not position the full weight of the patient on the SX.**
>
> **Do not use the SX as a push/pull device or to steer the VIPER2 stretcher.**

> **NOTICE**
>
> Do not use the SX sidearms to push or pull the stretcher.

5.21 Fold-Down Sidearms (Optional)

To lower a sidearm, press the release button and lower the sidearm (Figure 24). To raise a sidearm, lift the sidearm up until it locks into position.

> **NOTICE**
>
> Do not use fold-down sidearms to lift the stretcher. Only use the stretcher's main frame or the telescoping frame to lift the stretcher.

5.22 Latching Defibrillator Hook (Optional)

The backrest-mounted defibrillator hook is capable of holding equipment, weighing up to 22 kg / 50 lb with a maximum 31.7 mm / 1.21" diameter carry handle (Figure 25).

The defibrillator hook is not designed to secure equipment during transport in a vehicle. Remove items from the defibrillator hook before transport.

Only use equipment that fits properly into the equipment hook.

1. Raise the backrest to access the defibrillator hook.
2. Open the Defibrillator hook by pulling the red pin on the side.
3. Set the carry handle of the equipment in the hook. Verify the equipment is stable in the hook.
4. Close the latch to hold equipment in place.
5. Remove equipment from the hook prior to transport inside a vehicle. For transport of equipment inside a vehicle, secure only to holder designed for this purpose.
6. It is recommended to remove equipment from the hook before lowering the backrest.

Latching Defibrillator Hook

25
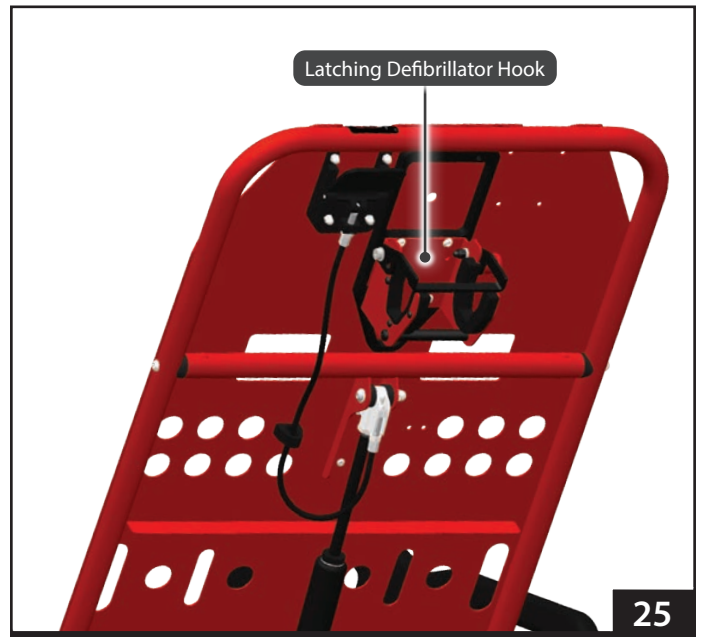
5.23 Medical Rail (Optional)

The Medical Rail option (Figure 26) is fixed to the side(s) of the stretcher and is designed to allow a variety of devices and accessories to be carried on the side of the stretcher when not in vehicle. Medical rail may be installed to either/both sides of the stretcher.

Medical rail is available in standard or short length, according to amount of equipment requiring to be carried.

Medical Rail

26
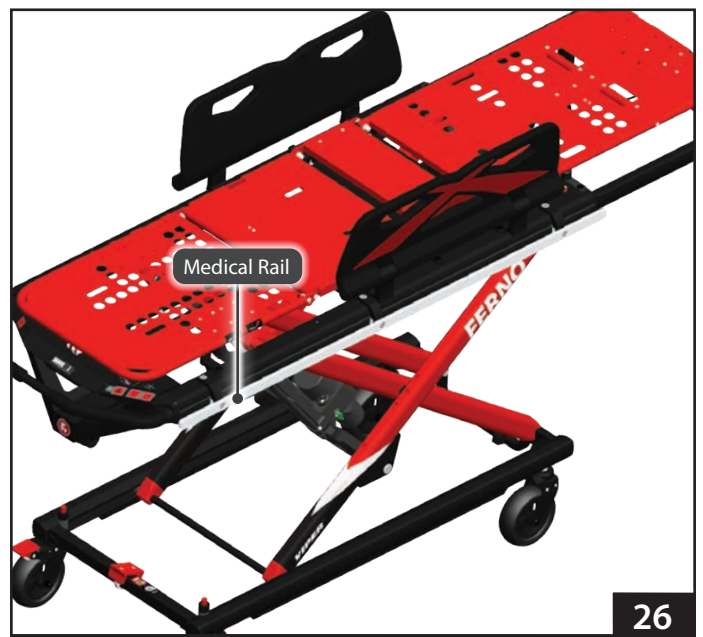
5.24 IV Pole (Optional)

The Ferno® Model LAIV-3SV IV pole (called the IV pole in this manual) is a 3-way locking device designed to carry IV fluid bags and infusion pumps.

The IV pole has three sections with two adjusters to provide a compact IV pole that can be quickly adjusted to a wide range of heights. The top and middle stages of the IV pole can be raised or lowered in any sequence.

For complete use, maintenance, and safety information, refer to IV pole users' manual.

To adjust the pole height:

1. Support the top of the IV pole.
2. Lift either the small or large red clamp lever to adjust the top or middle tube of the IV pole.
3. Raise or lower the telescoping pole to the desired height.
4. Push in the red clamp lever to the locked position.
5. If required raise or lower the other section of the pole.

> ### NOTICE
> Ensure the lever clamps are locked prior to adding items to the IV pole.

To attach IV bags:

IV fluid bags weighing up to 2 kg (4.4 lb) may be attached to the IV pole tip. Use the hook-and-loop strap provided to secure either one or two bags.

1. Clip IV bags to the IV pole tip. Place only one bag on each side of the pole (Figure 28).
2. Secure IV bags with the IV bag strap provided (Figure 29).
3. Wrap the IV bag strap around the pole when storing the pole.

To attach equipment:

Equipment weighing up to 5 kg (11 lb), such as an IV pump, may be fitted with a pole clamp to the bottom tube.

1. Attach equipment securely to the IV pole bottom tube, following the manufacturers' instructions.
2. Remove all equipment before storing the IV pole.

> ### NOTICE
> Attach equipment ONLY to the bottom tube of the IV pole.

To store the IV Pole:

3. Remove all IV bags and equipment from the pole.
4. Lower both sections of the pole fully.
5. Wrap the IV bag strap around the pole.
6. Depress the release button (Figure 30) to unlock the pole Rotate the pole so it is parallel with the Viper side rail. The IV pole auto-locks into position.
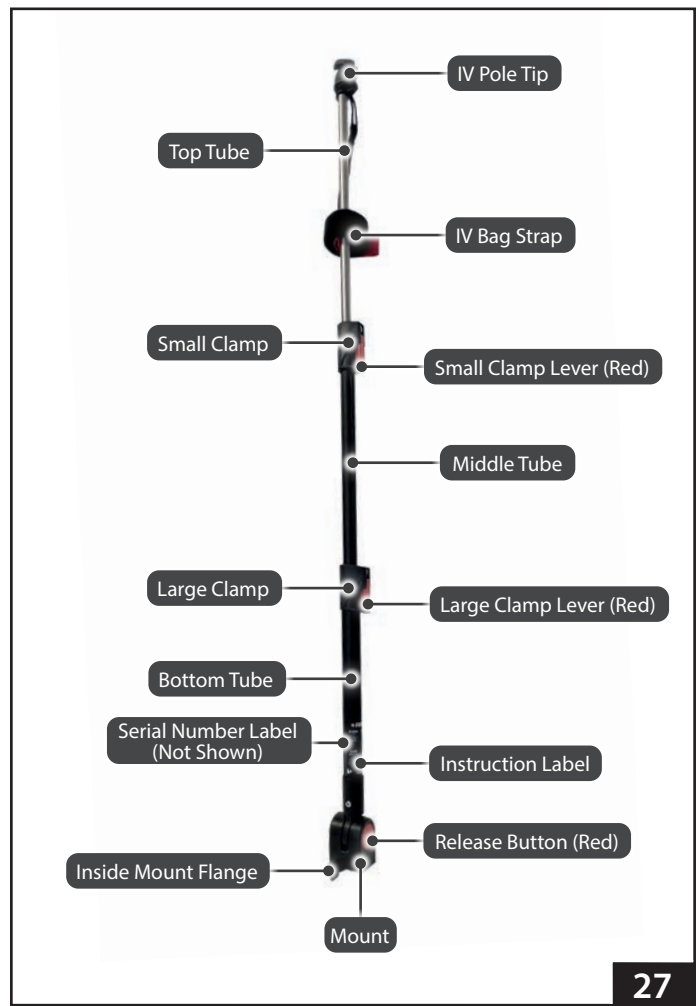
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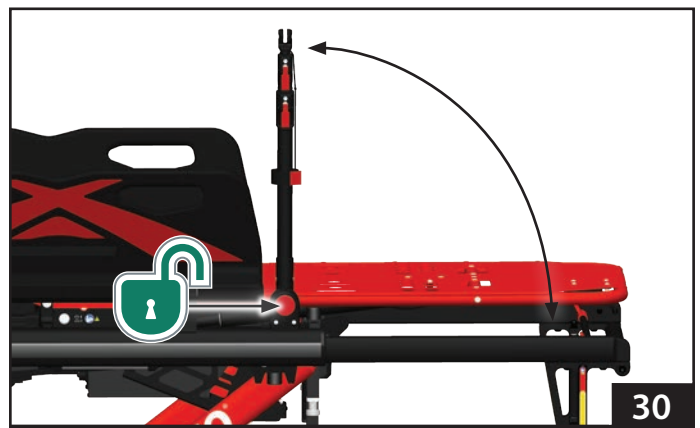
30

5.25 Mattress

The mattress is designed to provide patient security and comfort. The VELCRO® pads on the mattress bottom attach to the patient surface (Figure 32). The head section includes slots to allow the patient shoulder straps to be routed over the patient's shoulders.

To Attach: Lower the backrest and/or leg positioning platform. Place the mattress on VELCRO® pads (Figure 31).

To Remove: Disconnect the VELCRO® pads with both hands and remove the mattress.

<table>
<tr><td>NOTICE</td></tr>
<tr><td>Your stretcher may have been shipped with different mattress per your order (see "Compatible Accessories", page 43). Follow instructions in mattress users' manual and keep it with this manual for future reference.</td></tr>
</table>

31

Mattress Top

Mattress Bottom

32

5.26 Patient Harness System

Patient harness system consist of three parts (Figure 33):

- 4-point harness for use around the patient's shoulders, chest and waist
- 2-piece strap for use on the patient's upper legs
- 2-piece strap for use on the patient's lower legs/ankles

Ensure to use upper body harness and both legs straps at all times to secure the patient on the stretcher.

Adjust the straps to safely secure the patient without causing discomfort or impairing circulation.

ATTACHING THE HARNESS SYSTEM

1. Unbuckle and separate the straps.

2. Wrap the loop end of a strap around the designated attachment point on the stretcher backrest, main frame and leg platform (Figure 33).

3. Thread the male buckle/tang or female buckle/receiver through the loop and pull the strap through the loop until the loop is tight around the attachment point (Figure 34).

4. Repeat Steps 2 and 3 to attach the other part of the strap to the selected attachment point on the opposite side of the stretcher.

Note: *When attaching the shoulder straps, orient the links so they touch when the buckle is assembled (Figure 33). Insert the male buckle (tang) through both shoulder-strap links and into the female buckle (receiver) until it locks into place.*

REMOVING THE STRAPS

1. Unbuckle the strap.

2. Feed the buckle (tang) through the loop, and remove the loop from the stretcher.

SECURING A PATIENT

1. Unbuckle all the straps and position them out of the way.

2. Transfer the patient onto the stretcher following local protocols. Adjust the backrest, leg platform and strap lengths as needed.

3. Lay the shoulder straps over the patient's shoulders and attach them across the patient's chest in an H-formation.

4. Fasten the pelvic/waist straps across the patient's pelvis.

5. Fasten the leg straps over the patient's legs.

6. Adjust the straps so they are snug on the patient, holding the patient safely in place but not too tight.

ADJUSTING A STRAP

To lengthen a strap: Unbuckle the strap. Hold the male buckle/ tang and turn it perpendicular to the strap material and pull outward, away from the strap attachment point until the strap is the desired length.

To shorten a strap: Hold the end of the strap and pull the strap through the male buckle/tang until the strap is the desired length.

⚠ WARNING

An unsecured patient can be injured. Use properly-installed patient straps to secure the patient on the stretcher.

NOTICE

Your stretcher may have been shipped with different straps per your order (see "Compatible Accessories", page 43). Follow instructions in straps users' manual and keep it with this manual for future reference.

Keep straps fastened when not in use to prevent them from interfering with stretcher operation.

Harness

Upper Legs Strap

Lower Legs Strap

Harness Attachment Points

Upper Legs Strap Attachment Points

Lower Legs Strap Attachment Points
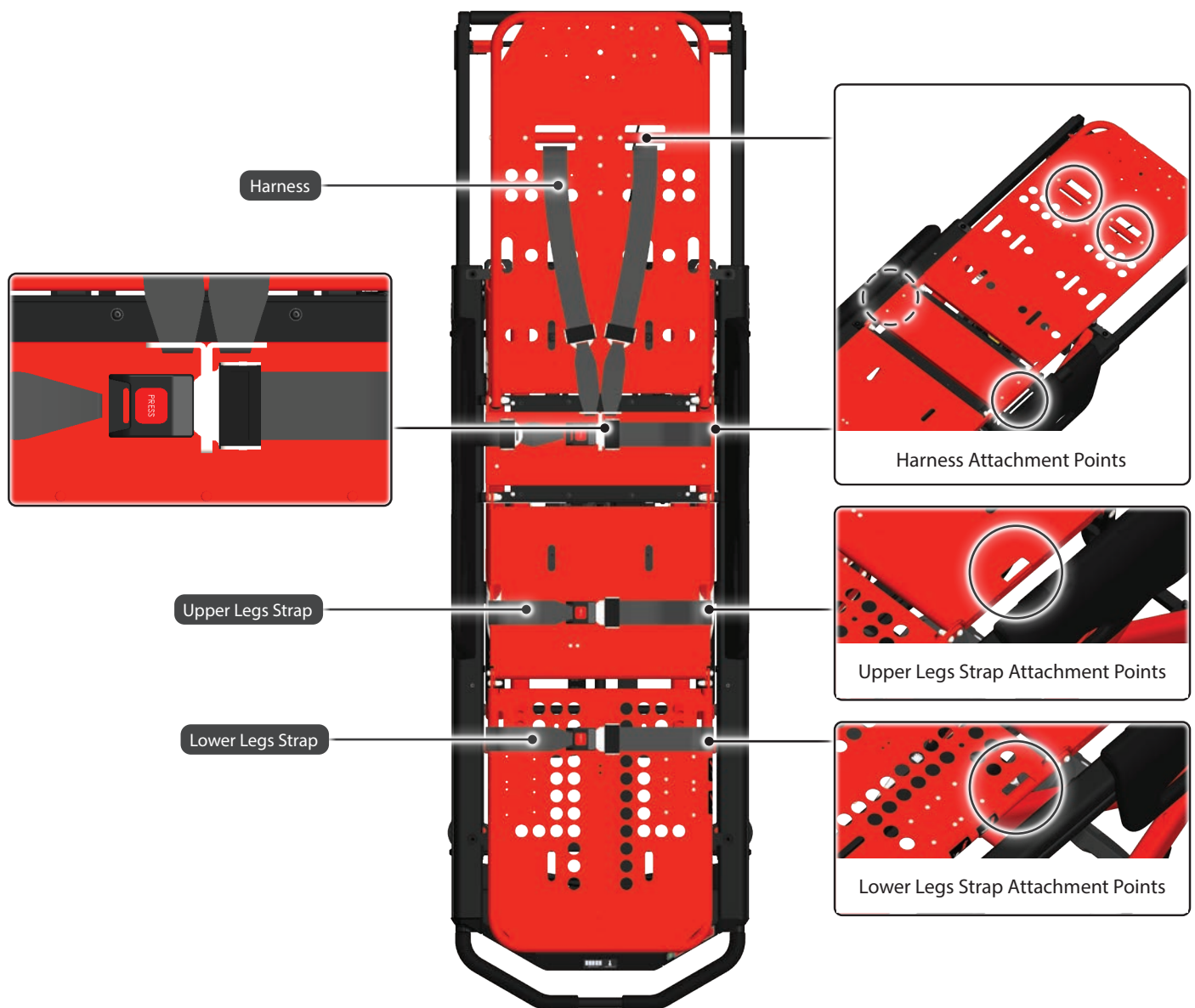
33
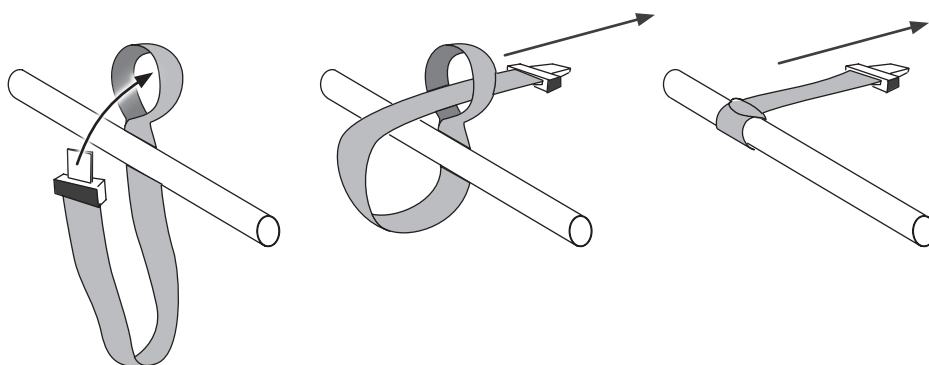
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6 - USING THE STRETCHER

6.1 Before Placing the Stretcher in Service

- Before use, personnel who will work with the stretcher must read and understand this manual. Appropriate training is also required. See "Operator Training", page 7.

- Install any accessories shipped with the stretcher, if not already fitted. Keep accessory users' manuals with this manual for future reference.

- Turn the power switch ON (I) to turn on the stretcher.

- Charge the battery until it has a full charge.

- Set the loading height according to the vehicle it is being used in (page 12).

- Confirm that the stretcher operates properly. See "Inspecting", page 39.

⚠ WARNING
Turning the power switch off while operating the stretcher can damage the stretcher. Only turn the power switch off when removing or attaching the battery, or when storing the stretcher.

NOTICE
Charge the battery immediately upon receipt. Shipping regulations require the battery to be shipped with a 30% charge. Failure to charge the battery in a timely manner can damage the battery.
Charge the battery only with a compatible Ferno charger or loading system.

6.2 General Guidelines for Use

Medical advice is beyond the parameters of this manual. It is the operators' responsibility to ensure safe practices for the patient and themselves. A minimum of two trained operators is required.

- Follow standard patient-handling procedures when operating the stretcher.

- Communicate with one another and use coordinated movements to operate the stretcher.

- Talk to the patient. Communicate with the patient before changing the stretcher position.

- Stay with the patient at all times. Do not leave a patient unattended.

- Use patient harness and leg straps to secure the patient on the stretcher at all times.

- Use additional help as needed (page 7).

- Read the loading system users' manual.

- The stretcher enters Sleep Mode when not in use to preserve the battery. To wake the stretcher from Sleep Mode, press or .

6.3 Powered Raising/Lowering

Raising or lowering the legs with a patient on the stretcher requires a minimum of two trained operators who are communicating, working together, and maintaining control of the stretcher at all times.

Be aware that the stretcher automatically stops at the minimum height, minimum transport height (only with a patient on it), user-set loading height (only when raising), and at the maximum height. To continue, press [icon] or [icon].

1. Extend the telescoping frame if needed before the position change.

2. Keep both hands on the stretcher main frame. Maintain control of the stretcher so it does not shift when raising or lowering the legs. During the position change, move with the stretcher and maintain your grasp on the main frame.

3. Press [icon] or [icon] to awaken the stretcher from Sleep Mode.

4. Press [icon] or [icon] until the stretcher reaches the desired height (Figure 35).

⚠️ **WARNING**

Uncontrolled movement can cause injury or damage. Support and control the stretcher at all times.

NOTICE

Operators must maintain a firm grasp on the main frame and control the stretcher at all times. Be prepared to help raise or lower the stretcher.

Height-Control Buttons

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6.4 Transferring the Patient

To transfer a patient onto the stretcher:

1. Place the stretcher beside the patient. Press ⬦ or ⬦ to adjust the stretcher to the patient's level (Figure 36).

2. Lock the wheel locks.

3. Lower the sidearms.

4. Unfasten the patient harness and leg straps. Arrange the straps so they will not interfere when transferring the patient onto the stretcher.

5. Transfer the patient onto the stretcher using approved emergency-medical procedures and following local protocols.

6. Adjust the backrest, leg platform, sidearms as needed for patient comfortand clinical needs.

7. Fasten and adjust the patient straps.

8. Before moving the stretcher or changing its position, confirm the sheets and other items will not interfere with stretcher operation.

9. Unlock the wheel locks.

10. Press ⬦ or ⬦ until the stretcher reaches the desired height (Figure 36).

To transfer a patient off of the stretcher:

1. Move the stretcher near the destination surface. Press ⬦ or ⬦ to adjust the patient surface to, or slightly above, the destination surface.

2. Lock the wheel locks.

3. Lower the sidearms.

4. Unfasten the patient and leg straps. Arrange the straps so they will not interfere with transferring the patient off the stretcher.

5. Transfer the patient onto the destination surface using approved emergency-medical procedures and following local protocols.

6. Fasten and arrange the patient straps so they will not interfere with using the stretcher.

7. Before moving the stretcher or changing its position, confirm sheets and other articles will not interfere with stretcher operation, unlock the wheel locks, and adjust the stretcher height as needed.

⚠️ **WARNING**

Sheets or other objects can interfere with, or become entangled in, the actuator or legs, which can cause injury and/or malfunction, including unexpected lowering of the stretcher legs. Tuck sheets between the mattress and the patient surface. Keep other items above the mattress.

Height-Control Buttons

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6.5 Moving the Stretcher

Moving the stretcher with a patient on it requires a minimum of two trained operators who are communicating, working together, and maintaining control of the stretcher at all times.

Use additional trained helpers as needed to safely control the weight of the patient and stretcher. See "Using Additional Help", page 7.

Move the stretcher on smooth, unobstructed surfaces whenever possible. Do not move the stretcher sideways or push the stretcher using the backrest. Move the stretcher only with both hands grasping the stretcher main frame.

Move the stretcher at the recommended transport height. Moving above this height can increase the chance for the stretcher to tip.

1. Fasten and adjust the patient straps.

2. Press ⬆ or ⬇ to adjust the stretcher height (Figure 37).

3. Operators position themselves at the ends of the stretcher, grasp the main frame with both hands and maintain control of the stretcher. If needed, direct trained helpers where to stand and how to grasp the stretcher.

The recommended height at which to move the stretcher is dependent on the height/preference of the operators, but may also be dictated by local manual handling protocols and procedures.

The height of the stretcher should be set as low as possible to minimise the risk of tipping, especially on rough ground, but at a height such that the operator is in control and comfortable operating the stretcher.

However if local protocols dictate that the stretcher should be moved in the lowest possible position when moving a patient, then the stretcher should be lowered to the minimum transport height (see "Powered Raising/Lowering) on page 29). The option of Push poles is designed to allow the stretcher to be moved in such position.

> ⚠️ **WARNING**
>
> **Moving the stretcher sideways can cause it to tip and injure the patient and/or operators. Move the stretcher only toward the control end or loading end.**
>
> **Pushing the stretcher by the backrest can cause it to tip and injure the patient or operators. Move the stretcher only by grasping the main frame.**
>
> **Trained operators must consider the environment and terrain before moving. Moving the stretcher in a lowered position will minimise the potential of a stretcher tip.**

Height-Control Buttons

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6.6 Loading the Stretcher

Loading the stretcher into a vehicle with a patient on it requires a minimum of two trained operators who are communicating, working together, and maintaining control of the stretcher at all times.

To set the loading height, see "Set the Loading Height", page 12.

1. Raise the vehicle folding bumper, if present.

2. Extend the telescoping frame and lock directional wheels.

3. Move the stretcher near the vehicle back door.

4. Extend the loading arm **fully** (refer to loading system users' manual).

5. Press 🔼 to raise the stretcher to the user-set loading height. The yellow arrows on loading arm must align within the loading height range shown on the stretcher (Figure 38). If not, press 🔼 or 🔽 to adjust stretcher height.

6. Align the stretcher with the loading system, then move the stretcher into the vehicle until the stretcher locks in the loading arm and lock indicator illuminates green (Figure 39). If not, re-adjust the position of the stretcher and retry.

7. Press and hold 🔽 to lower the stretcher onto the loading arm and fully raise the stretcher legs (Figure 40).

8. Push the stretcher completely into the vehicle and confirm it is locked into the loading system by pulling back on the stretcher. The loading arm red release handle must be in horizontal position (Figure 41).

Button Lockout: Do not press 🔼 or 🔽 while the stretcher is inside the vehicle. Also refer to "Button Lockout", page 14.
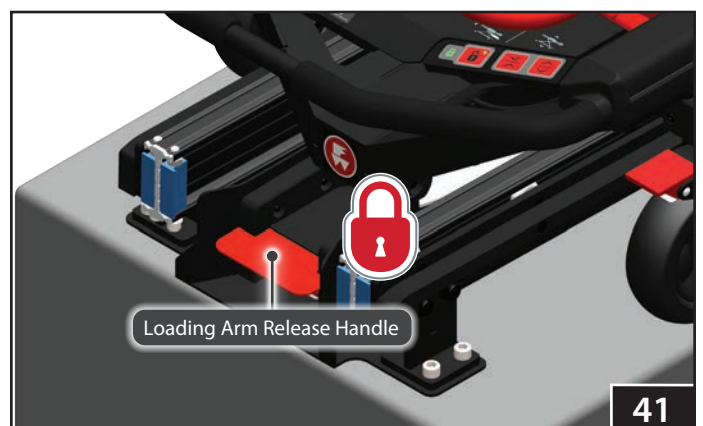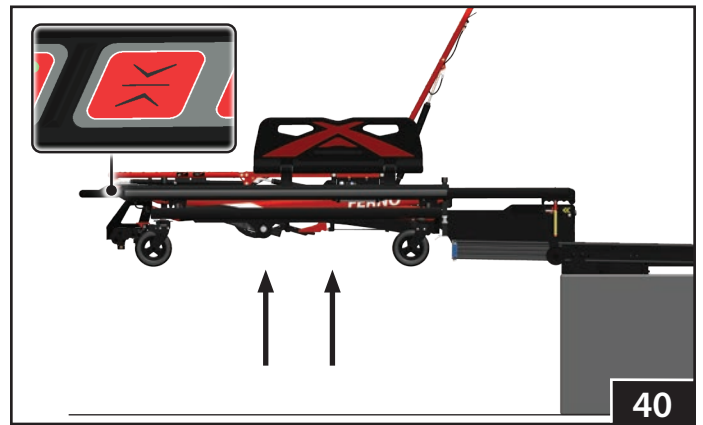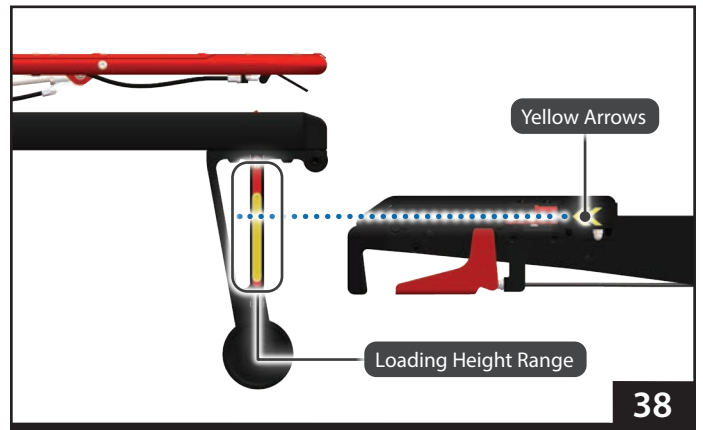
⚠️ WARNING
Failure to engage the stretcher in the loading arm during loading can cause injury. Operators must ensure lock indicator illuminates green and the stretcher is secure in the loading arm before attempting to raise the legs.

NOTICE
If the vehicle is parked on an uneven surface, the operators may need to raise the stretcher higher than the user-set loading height to allow the stretcher to move into the loading arm.

Yellow Arrows

Loading Height Range

38

Lock Indicator

39

40

Loading Arm Release Handle

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6.7 Unloading the Stretcher

Unloading the stretcher from a vehicle with a patient on it requires a minimum of two trained operators who are communicating, working together, and maintaining control of the stretcher at all times.

1. Raise the vehicle folding bumper, if present.

2. Press the loading arm release handle to unlock the loading arm (Figure 42).

3. Grasp the stretcher with both hands and pull the stretcher on the loading arm **completely** out of the vehicle as far as it will go until the loading arm stops and the stretcher is fully out of the vehicle (Figure 43).

4. Press and hold ⬍ until legs stop and touch the ground (Figure 43), and safe release indicator illuminates green (Figure 44).

5. Press 🔓 to disengage the stretcher from loading arm (Figure 44).

6. Move the stretcher completely out of the loading arm. Keep the stretcher parallel with the extended loading arm during moving.

7. Press ⤈ to lower the stretcher before moving. See "Moving the Stretcher" on page 31.

Note: *When unloading on inclined surfaces, the lock might not release the stretcher when 🔓 is pressed. In this case, push the stretcher towards the loading arm and press 🔓 again. If the stretcher is still not released, use the manual override release (see "Manual Override Release", page 15).*

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Loading Arm Release Handle

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NOTICE
If the vehicle is parked on an uneven surface, the operators may need to adjust the stretcher height to allow the stretcher to move out of the vehicle.

6.8 One Operator, Empty Stretcher

If local protocols permit, an empty stretcher (without patient) may be operated by one trained operator. Always use two operators when a patient is on the stretcher.

Raising and Lowering: Press ⬍ or ⤈ to adjust the stretcher height.

Loading and Unloading: Follow the procedures as for two operators. See "Loading the Stretcher" on page 32 or "Unloading the Stretcher" on page 33.

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Safe Release Indicator

Stretcher Release Button
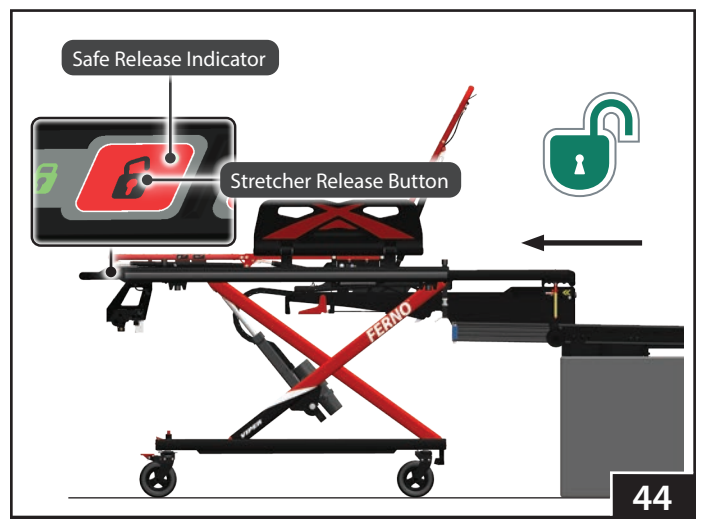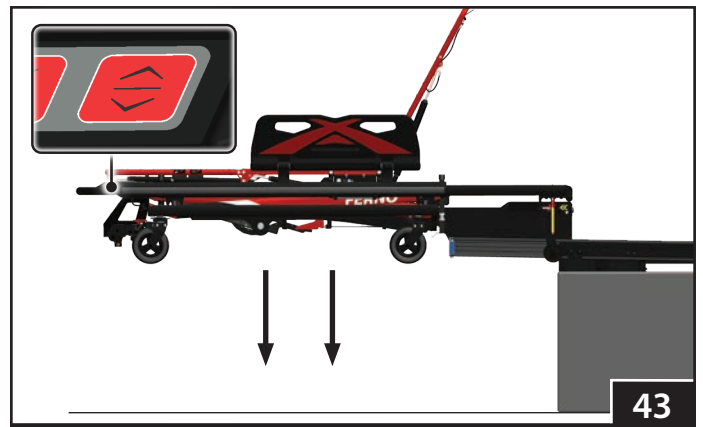
6.9 Non-Powered Operation: Raising and Lowering

When the battery charge is low or depleted, swap for a charged battery. If a charged battery is not available, use the manual override system to operate the stretcher. Use additional trained helpers as needed. See "Using Additional Help" on page 7.

MANUAL RAISING OR LOWERING

1. Extend the telescoping frame.

2. Stand at opposite ends of the stretcher and grasp the main frame with an underhand grip (palms facing up).

3. Lift the stretcher slightly to lift the weight off the leg locking mechanism.

4. Pull the manual override handle fully (Figure 45) and keep in pulled whilst making the position change.

5. Manually lift or lower the strethcer to the desired height, keeping the stretcher held at that position until the legs touch the ground.

6. Release the manual override handle to lock the stretcher at the desired height.

7. Slowly lower your hands and loosen grip to ensure the stretcher has stabilised at the new position.

⚠ **WARNING**

Uncontrolled movement can cause injury or damage. Support the load before using a manual override handle.

NOTICE

The manual override handle will not function unless the weight has been lifted off the leg locking mechanism. This is a safety feature to help prevent accidental lowering of the legs.

After power-raising the stretcher legs, wait at least 10 seconds before using the manual override handle. This delay allows the hydraulic pressure to equalize.

Manual Override Raise/Lower Handle

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6.10 Non-Powered Operation: Loading

To load the stretcher into a vehicle if no power on the stretcher and no way of charging and no spare battery, follow the normal loading procedures, but with the following dofferences:

1. Raise the vehicle folding bumper, if present.

2. Extend the telescoping frame and lock directional wheels.

3. Move the stretcher near the vehicle back door.

4. Extend the loading arm **<u>fully</u>** (refer to loading system users' manual).

5. **If helpers are available:**

    ○ Use additional help to adjust the stretcher to the loading height (see "Manual Raising and Lowering" on page 34).

    ○ Align the stretcher with the loading system, then move the stretcher into the vehicle until the stretcher locks in the loading arm.

    If helpers are not available:

    ○ Manually raise the stretcher as high as possible.

    ○ Align the stretcher with the loading system, then lift the loading-end of the stretcher and place the telescoping frame on the slider of the loading arm (Figure 46).

    ○ Lift the control-end and push the stretcher towards the vehicle until the stretcher locks in the loading arm (Figure 47).

6. Confirm the stretcher is locked in loading arm by pulling it slightly outwards from the vehicle. If not, adjust and retry. Reminder: Lock indicator does not function when there is no power.

7. Pull the raise/lower manual override lever and keep it engaged.

8. Hold the lower frame of the undercarriage by the longitudinal beams, ensuring your fingers rest on the outer surfaces (Figure 48).

9. Raise the undercarriage to raise the stretcher legs (Figure 49).

Note: *The stretcher legs must be fully raised to be able to unlock the loading arm, allowing the stretcher to be loaded into a vehicle.*

10. Push the stretcher completely into the vehicle and confirm it is locked into the loading system. The loading arm red release handle must be in horizontal position.

11. Release the manual override handle.
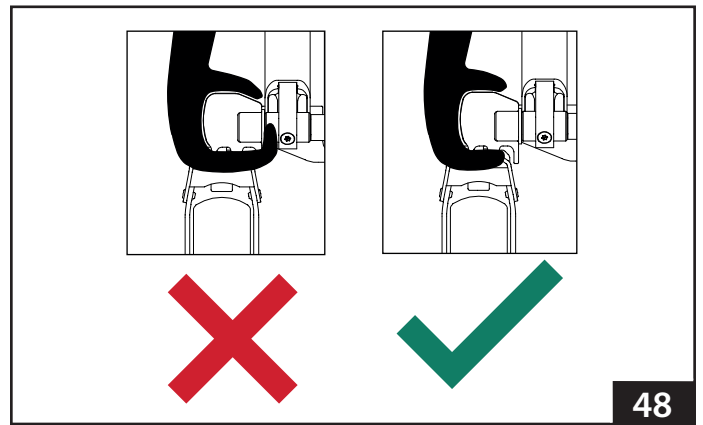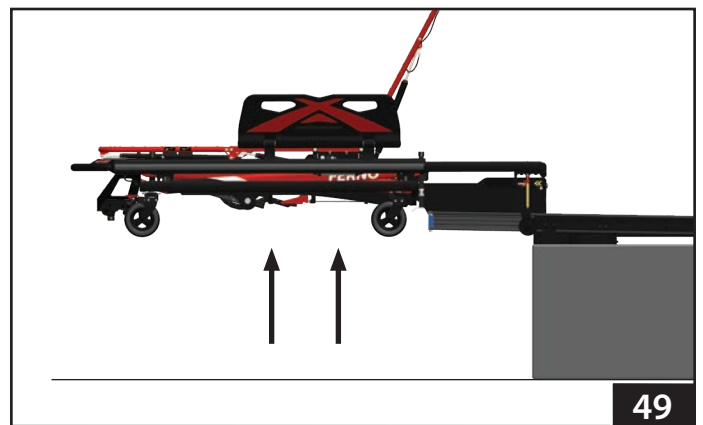
6.11 Non-Powered Operation: Unloading

To unload the stretcher from a vehicle if no power on the stretcher and no way of charging and no spare battery, follow the normal unload procedures, but with the following differences:

1. Raise the vehicle folding bumper, if present.

2. Press the loading system release handle to unlock the loading arm.

3. Grasp the stretcher with both hands and move the loading arm and stretcher completely out of the vehicle until the loading arm stops.

4. Pull and hold the manual override handle until legs stop and touch the ground (Figure 50). Release the override handle.

5. Raise the backrest (see "Backrest" on page 20) and pull the manual override stretcher release lever to release the stretcher from loading arm (Figure 51). Reminder: Release button does not function when there is no power.

6. Move the stretcher completely out of the loading arm (Figure 52). Keep the stretcher parallel with the extended loading arm during moving.

Note: *Support the loading-end of the stretcher when telescoping frame leaving the slider of loading arm. The stretcher may drop slightly since it is not at its regular height for unloading.*

7. Lower the stretcher (see "Manual Raising and Lowering" on page 34) before moving.

Manual Override Raise/Lower Handle

50

Manual Override Stretcher Release

51

52
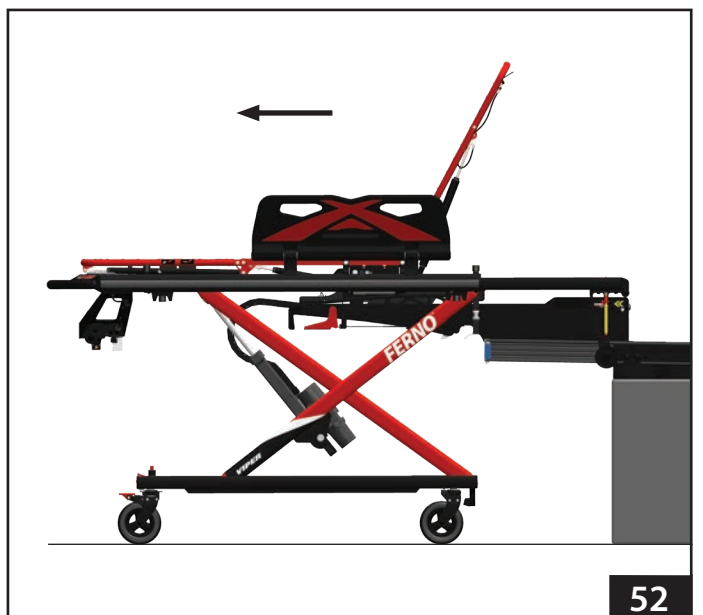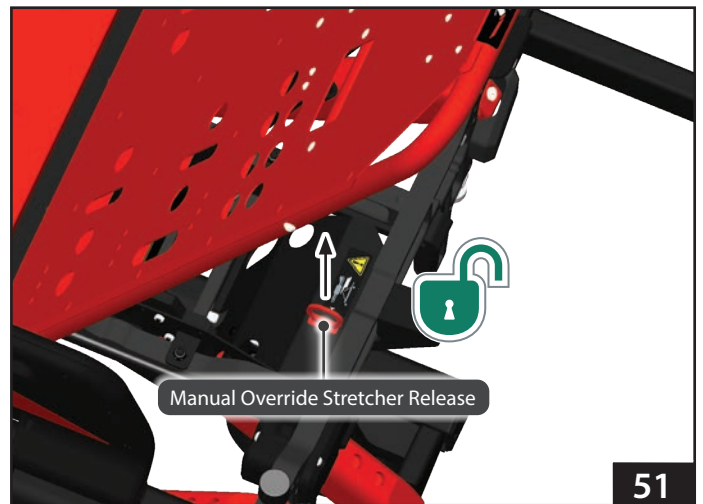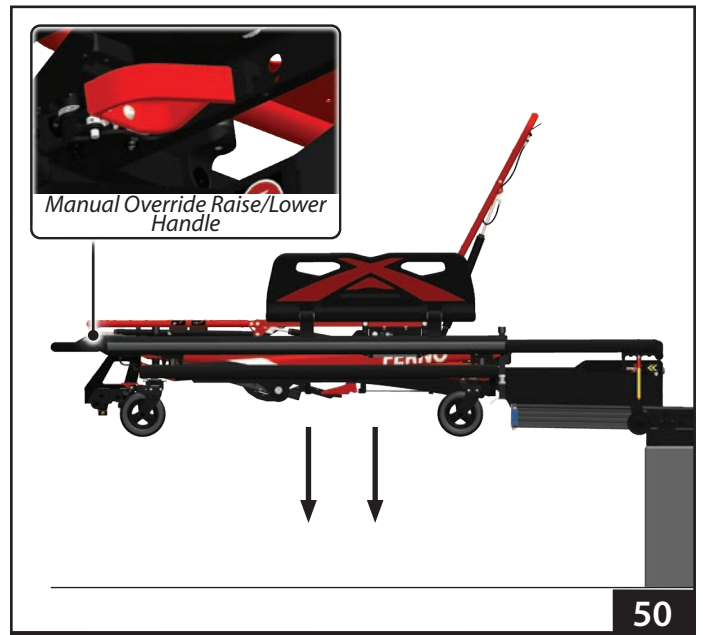
7 - MAINTENANCE

7.1 Maintenance Schedule

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

Keep maintenance records. For a sample record sheet, see "Maintenance Record" on page 46.

When using maintenance products, always follow the instructions given by the manufacturers, and read any material safety data sheets.

7.2 Service Life

Many factors affect a product's service life, including frequency of use, local environment, maintenance and other factors.

Follow the disinfecting, cleaning, and inspection procedures in this manual to ensure long life for the stretcher.

7.3 Disinfecting

Wipe all surfaces with disinfectant. Follow the disinfectant manufacturer's instructions for application method and contact time. It is recommended to inspect the stretcher for damage as you disinfect it.

7.4 Cleaning

1. Remove the patient straps, mattress and any accessories.

2. Hand clean all surfaces of the stretcher with warm water and a mild detergent, or pressure-wash the stretcher as described in "Pressure-Washing" on page 38.

3. Rinse with warm, clear water. Dry the stretcher with a towel or allow it to dry.

Note: *Do not lubricate the stretcher. Lubricating allows dirt and foreign particles to collect on stretcher, resulting in damage.*

4. When fully dry, reattach the straps, mattress and accessories.

7.5 Preventative Maintenance Inspections

Preventative maintenance inspections must be performed by a factory-trained service technician regularly. The product is first checked 24 months after purchase and then every 12 months. Always make sure the product is properly cleaned and disinfected before inspection.

⚠ **WARNING**

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

Failure to perform preventative maintenance inspections can cause injury or damage. Have the stretcher inspected regularly by a factory-trained technician.

Minimum Maintenance	Each Use or Daily	As Needed	Monthly
Disinfecting (this page)	●		
Cleaning (this page)		●	●
Pressure-Washing (page 38)		●	
Inspecting (page 39)		●	●

NOTICE

Disinfectants and cleaners containing phenolics or iodines can cause damage. Do not use products containing these chemicals. If bleach is used, rinse with plenty of clear water to remove bleach residue.

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

Do not lubricate the stretcher. Applying lubricant can cause damage to the stretcher.

Water under high pressure, or steam, can penetrate joints and cause corrosion. Use caution when cleaning moving parts.

Clean and disinfect the product properly before preventative maintenance inspection.

Battery Care

- The battery is water-resistant and is suitable for outdoor use. Do not submerge the battery in water.

- Remove the battery from the stretcher before pressure washing the stretcher.

- Refer to the battery users' manual for disinfecting and cleaning instructions.

- Recycle the battery when it can no longer maintain a charge. Do not dispose of batteries with municipal waste. See "Recycling Notice" on page 40.

- Replace a damaged or cracked battery.

7.6 Pressure-Washing

Use caution when cleaning the stretcher with pressurised water. Wear all safety equipment recommended by the manufacturer of the pressure washer. Do not pressure wash the battery.

1. Remove the straps, mattress and any accessories.

2. Turn the power switch OFF (**O**), engage the wheel locks, and remove the battery.

3. Set the nozzle pressure at or below 20,000 kPa/2,900 psi or less and 15 liters/4 gallons per minute or less. Keep the nozzle at least 50 cm/20" away from the stretcher at all times. **Do not spray directly into the battery cradle, control box, hydraulic unit or wiring** (Figure 53).

4. Use only cold water without disinfectants.

5. Spray the patient surface, legs, and wheels of the stretcher.

6. Allow the stretcher to dry for 10 minutes.

7. Attach the battery and turn the power switch ON (**I**).

8. When fully dry, reattach the patient straps, mattress and accessories.

⚠ **WARNING**

Spraying directly into the battery cradle, control box, hydraulic unit or wiring can damage the product. Pressure-wash the stretcher only as described in this manual.

NOTICE

The stretcher is water-resistant. When pressure-washing:

- Remove the battery.

- Keep nozzle pressure at 20,000 kPa/2,900 psi or less, or 15 liters/4 gallons per minute or less.

- Keep the nozzle at least 50 cm/20" from the stretcher at all times during cleaning.

- To clean the display and buttons, reduce water pressure and/or increase the distance (greater than 50 cm/20").

- Do not spray water upward into the wiring or forcibly at or around the control panel and control box.

Wiring Under Control Panel

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7.7 Inspecting

Inspect the stretcher regularly. Follow the checklist on the right and try all the stretcher functions described in this manual.

A daily inspection is recommended at the start of each operator shift, including the manual override release handle and the electrical inspection on this page.

If the inspection reveals damage or excessive wear, remove the stretcher from service until it has been repaired.

Electrical Inspection

- Do both sets of height-adjustment buttons function properly?
- Does the powered system operate properly through the full range of motion?
- Does the powered system operate smoothly, without binding or excessive noise?
- Does the actuator stop running at the user-set loading height, fully-raised and fully-lowered positions?
- Do all indicator lights on the control panel function?
- Is there visible sign of damage to the electrical box?
- Are all cords/cables free of excessive wear, cuts, and fraying?
- Does the integrated charging system charge the stretcher battery and prevent stretcher operation when the stretcher is secured in the loading system?

Mechnical inspection

- Are all components present?
- Is the stretcher free of excessive wear?
- Does the hydraulic power system operate smoothly, without excessive noise?
- Is all hardware securely in place?
- Do all moving parts operate smoothly and properly?
- Does the stretcher load and unload properly?
- Do the legs show signs of wear or damage?
- Does the manual override release handle function properly and is the cable free of excessive play?
- Does the stretcher move smoothly?
- Do the wheels show excessive wear or damage?
- Do the wheel locks and directional wheel locks engage properly and function properly?
- Are the harness and straps properly installed?
- Are the straps in good condition with no cuts or frayed edges?
- Are the strap buckles free of visible damage and do they operate properly?
- Can the patient strap length be adjusted properly?
- Is the ambulance properly prepared for the stretcher with the loading system installed?
- Do installed accessories operate properly without interfering with stretcher operation?
- Are contacts of integrated charging system clean and make a good connection?

7.8 Storing the Stretcher

If the stretcher will not be in service for long period of time, prepare it for storage as follows:

1. Lower the stretcher to the fully-lowered position (Figure 54). Turn the power switch OFF (O).

2. Remove the battery and prepare it for storage. See "Storing the Battery" below.

Before returning the stretcher to service:

1. Fully charge the battery. Attach only a fully-charged battery.

2. Turn the power switch ON (I).

3. Have your service's equipment maintenance personnel inspect the stretcher. See "Inspecting" on page 39.

7.9 Storing the Battery

- Charge/discharge the battery to 30-50% before storing it. Do not store the battery with full charge.

- Maximum storage duration is **3 months**.

- After a period of storage, charge the battery fully before use.

- Store the battery only indoors in a cool, dry place.

  ○ Do not store batteries outdoors, or where temperatures will exceed 23°C / 73°F.

  ○ Battery capacity can be affected if the battery is stored for long periods outside of the recommended temperature range.
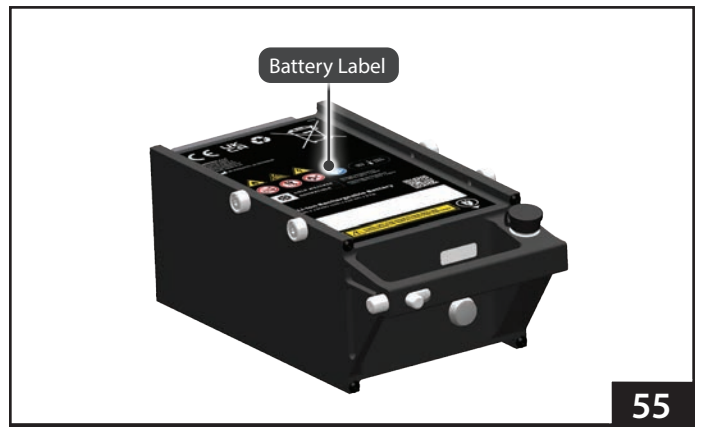
Battery Label

7.10 Recycling Notice

The stretcher uses a rechargeable, 36 V Li-Ion battery (specifically "LiFePO4" as noted on the battery label, Figure 55).

Contact the government in your state, territory or country for proper recycling of the battery and charger. Do not dispose of the battery or charger with municipal waste.

Battery: Recycle the main battery when it can no longer hold a charge.

Charger: Recycle the charger if it becomes damaged or fails to properly charge the battery.

WEEE DIRECTIVE (EUROPEAN UNION)

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.

⚠ WARNING

Storing the stretcher with battery in the loading system connected to the vehicle's electrical circuit for long period can damage the battery. Always follow the instructions in this manual when storing the stretcher or battery.

NOTICE

Before placing the battery in storage, charge/discharge the battery to 30-50%. Never store fully-charged battery.

A battery with a very low charge may not be able to be charged by the integrated charging system in the loading system. Connect the battery directly to the charger separate from the vehicle and loading system.

If the battery sustains noticeable or suspected damage or is hot to the touch, immediately remove it from service and store outside of a building.

7.11 Viper Service App

The Viper service app is available for iOS and Android mobile devices to provide service and usage information of the stretcher. Advanced settings features are only for Ferno service technicians upon login.

To install: Search for "Vipe Service" in the App Store or Google Play Store and install the application (Figure 56).

To connect:

1. Launch the "Viper" service app on your mobile device.
2. If asked, allow the app to use bluetooth connection.
3. Press ⬙ or ⬙ to activate the stretcher.
4. Select the stretcher you want to connect. The stretcher is identified by the serial number of control box on patient right (Figure 57).
5. When successfully connected, the indicator lights on control panel illuminate yellow ▯▯▯▯▯ .

To disconnect: Click the "Disconnect" button in the service app.

FEATURES

System status screen:

- Warning and error messages
- Firmware information
  - Main Unit firmware
  - BMS firmware
- Battery information
  - Capacity
  - Voltage
  - Battery current
  - Highest cell voltage
  - Lowest cell voltage
  - Charging voltage
  - Battery temperature
  - Invertor temperature
  - Battery cycles
  - Overall inner temperature
- Usage information
  - Number of relative cycles
- Motor information
  - RPM
  - Current
  - Temperature
- Battery management system information
  - BMS temperature
- Download CSV data file feature
- Download PDF service report feature

Height positions screen:

- Current height
- Loading height
- Highest position possible
- Lowest position possible

App Icon

56

Control Box Serial Number

MU1234
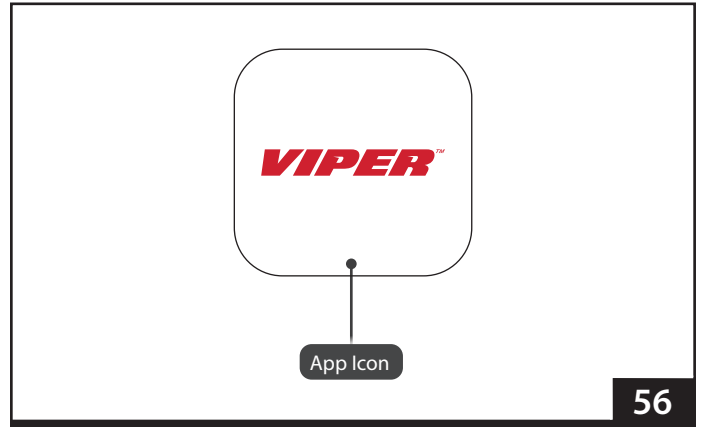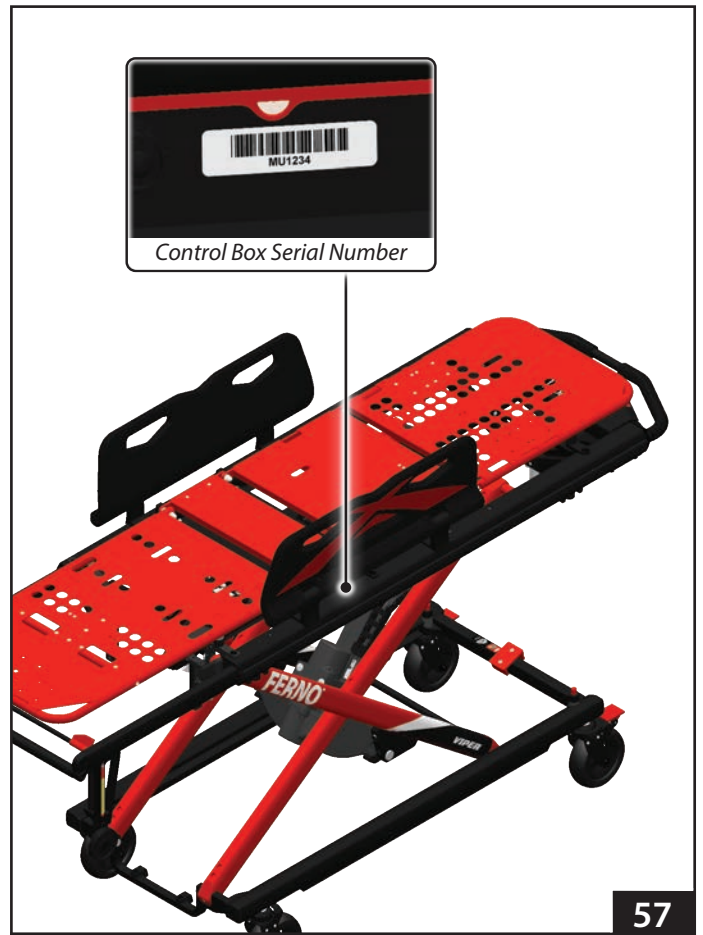
57

8 - TROUBLESHOOTING

Indicator lights alert the operator to functional issues. Red lights are high priority, orange lights are medium priority. For service, contact your distributor.

Indicator Lights	Meaning	Solution
Five indicator lights flash orange	The motor current is high, because stretcher is overloaded, or maximum motor running time has been exceeded. The system stops the motor for 5 seconds.	Press ⬒ or ⬓ to continue. Provide manual lift assistance if the situation repeats.
Five indicator lights illuminate red	Exceeding the range of high or low operation temperatures, low battery voltage or interrupted CANBUS communication. The system switch off within 5 seconds to protect electronic components.	1. Connect the external battery charger. 2. Press ⬒ or ⬓ to activate the stretcher. 3. Contact an authorised service center.
No lights out	Sleep mode activated or system shut down.	1. Press ⬒ or ⬓ to activate the stretcher. 2. Connect the external battery charger. 3. Contact an authorised service center.

9 - ACCESSORIES

Ferno offers a full line of accessories approved for use with the VIPER2. Follow all instructions in accessory users' manuals. Keep the instructions with this manual.

When using accessories, be aware of any special considerations such as doorway heights and widths, or other factors which may be affected by the addition of the accessory/accessories to the VIPER2.

Contact Ferno Customer Relations (page 2) or your Ferno distributor for VIPER2 information.

⚠ WARNING
Attaching improper items to the VIPER2 can cause injury. Use only Ferno-approved items on the VIPER2.

TRAINING RECORD

Date	Printed Name	Signature	Training Method			Trainer Initials
			Read Manual	Video/ Online	Hands-On	

TRAINING RECORD

Date	Printed Name	Signature	Training Method			Trainer Initials
			Read Manual	Video/Online	Hands-On	

MAINTENANCE RECORD

Date	Maintenance Performed	By

MAINTENANCE RECORD

Date	Maintenance Performed	By

FERNO®

70 Weil Way
Wilmington, OH 45177

Aviation

Military

Mortuary

EMS

Rescue

FERNO

70 Weil Way
Wilmington, OH 45177

Aviation

Military

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