



## Harrier LT/Harrier LT-LBS

FERNO/MAN/1125/209-R8/UK  
Stock Code 2003-0137



*Read this Manual  
and Retain for  
Future Reference*

## Ferno UK Customer Services

Customer Service and product support are important aspects of each Ferno product. Please have the product serial number available when calling, and include it in all written communications.

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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 service.

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 Ferno Customer Service.

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Serial Number \_\_\_\_\_

Location: Actuator guide block brace.



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### USERS' MANUAL

To request additional free users' manuals, contact Ferno Service Department, your Ferno distributor, or visit [www.ferno.co.uk](http://www.ferno.co.uk).

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# 1 - SAFETY INFORMATION

## 1.0 Warning

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

### **WARNING**

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

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

**Improper operation can cause injury. Operate the trolley 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 trolley and be injured. Use restraints to secure the patient on the trolley.**

**Helpers can cause injury or be injured. Maintain control of the trolley, operate the CONTROLS, and direct all helpers.**

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

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

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

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

## 1.1 Danger

Danger notices indicate an immediate hazardous situation which, if not avoided, will result in injury or death.

### **DANGER**

**Electric shock can cause death or serious injury. INSTALL/USE/OPERATE/MAINTAIN the trolley only as described in this manual.**

## 1.2 Important

### Bloodborne Disease Notice

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

## 1.3 Caution

**Bleach, phenols and iodine can cause damage. Do not apply products containing these chemicals to the Trolley.**

**Improper lubricants can cause damage. Use white lithium grease or light oil to lubricate the Trolley.**

**Trapping hazards are unavoidable in this design of Trolley due to its folding action. Operate with care.**

### **WARNING**

**Do NOT exceed the safe working loads of 350 kg when raised, 400 kg lowered.**

## 1.4 Trolley and Fastener Compatibility

Combining different manufacturers' products into a "mixed-component" trolley/fastener system can increase the user's risk of injury and damage.

Ferno (UK) Ltd. strongly recommends that only Ferno (UK) Ltd.-manufactured trollies be used in Ferno-manufactured trolley fasteners, and that only Ferno-manufactured trolley fasteners be used for securing Ferno-manufactured trollies in ambulances.

ANY COMBINATION OF A FERNO TROLLEY OR TROLLEY FASTENER WITH A NON-FERNO TROLLEY OR TROLLEY FASTENER, IS MISUSE OF THE FERNO PRODUCT. Responsibility for the outcome of known, intentional misuse rests squarely on the misuser.

### **WARNING**

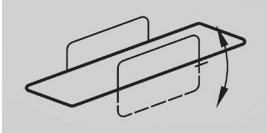
**To comply with EN 1789, the patient harness and leg strap(s) MUST be used at all times to hold the patient on the trolley and the trolley MUST be secured in the vehicle with the 2 part locking device.**



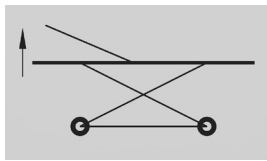
## 1.5 Safety and Instruction Labels

Safety and instruction labels place important information from the user manual on the trolley.

Read and follow label instructions. Replace worn or damaged labels immediately. New labels are available from your distributor.



Instruction for dropping cot side



Instruction for raising Trendelenburg



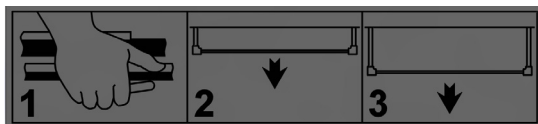
Safety Instruction:  
Max Load in lowest position



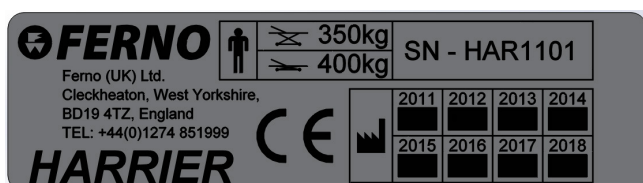
Safety Instruction:  
Pinch Point areas



Safety Instruction:  
Safe Working Load  
label on actuator



Instruction for extending  
the cot side (LBS only)



Serial Number Label  
with weight restrictions

## 1.6 Symbol Glossary

The symbols defined **at right** are used on the trolley and/or in this user manual. Ferno (UK) Ltd. uses symbols recognised by the International Standards Organization (ISO).



Pinch Point:  
Keep Hands Clear



Safe Working Load



Do Not  
Lubricate



Emergency Lower Cover



General Warning of  
Potential Injury



Lubricate



Unlocked



Locked



Product meets UK and EU Standards

## 2 - OPERATOR SKILLS AND TRAINING

### 2.0 Skills

Operators using the trolley need:

- The strength, balance, coordination and common sense to safely operate the trolley.
- The ability to select the proper equipment and procedures for the circumstances.
- Operators should have been trained in the operation of the trolley.
- The ability to understand and follow the procedures described in this manual.
- Operators should have a working knowledge of manual handling procedures.

### 2.1 Training

Operator trainees need to:

- Have followed a training plan.
- Read and understand the instructions in this manual.
- Practice using the fully-equipped trolley with weight and under simulated conditions.
- Trainees should be tested to verify their understanding of trolley operation.
- Keep training records. Annual refresher training for all trolley operators is recommended.



#### **WARNING**

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

## 3 - ABOUT THE TROLLEY

### 3.0 Description

The Harrier LT/LT-LBS is an emergency patient-handling device designed to transport a patient in a ground-based ambulance. It is for professional use by a minimum of two trained operators. It is designed for roll-in loading to help reduce the risk of back injury to medical service personnel.

The trolley is designed for use with the Ferno (UK) Ltd. 2 Part Lock (not included).

#### TROLLEY FEATURES

- 350 kg unassisted lift capacity
- Soft start/stop vertical movement
- Removable, rechargeable Milwaukee 28V battery
- Optimum performance wheels, for ease of manoeuvrability
- 4 wheel-locks
- Anti-static wheel
- Fold down head-end for shortening
- Push/pull handle at head-end of trolley
- Removable AB-PR headrest pad
- Backrest - lift assist for easy operation
- AB-PR mattress
- Biosafe harness and leg restraints
- Anti-bacterial moulded plastic parts & frame coating
- Supplied with 1 battery as standard
- Winch link attachment
- Reflective decals for use at night

#### OPTIONS / ACCESSORIES

- Directional wheel lock (Head End)
- Folding or Removable push-poles at foot-end (folding poles are not available on LT-LBS with longer cotsides)
- Push/pull handle at foot end
- IV Pole (removable)
- Longer cotsides (including inflatable sidepads)
- Black webbing patient restraints (instead of Biosafe)
- CD cylinder tray
- 12-volt In-Vehicle battery charger or 240v charger
- Additional spare battery

### 3.1 General Specifications

**Length: 1930 mm**

**(folded head-end) 1610 mm**

**Width: 570 mm**

**LBS Width: 760/955 mm**

**Height (min): 480 mm**

**Height (max): 925 mm**

**Weight: from 69 kg\***

**Lift Load Limit: 350 kg**

**Lowest Position Load Limit: 400 kg**

**\* Dependent on final specification**



#### WARNING

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



**RAISED  
LOAD LIMIT**



**LOWERED  
LOAD LIMIT**

## 4 - BATTERY INFORMATION

### 4.0 General Information

The Lithium Ion Harrier LT battery pack supplies the electrical power for the Ferno Harrier LT trolleys 28V DC hydroelectric system.

A fully charged battery pack provides power for an average of up to 77 cycles under a 100 kg load before the battery required recharging. Patient weight and extreme temperatures will affect the number of cycles.

Typical charging time is under 1 hour. Actual charging time varies based on the frequency of recharge and the age of the battery. Deeply discharged batteries may require extended charging time.

- The batteries in the pack are Lithium Ion.
- Charge the batteries as frequently as possible to keep the trolley ready for use when you can not access the charger for extended periods of time.
- To confirm the charge level of the battery, press the red button on the battery pack to check the red LED illuminates, indicating sufficient battery power. Remove and recharge the battery pack prior to use if necessary (see Charging the Battery).
- You do not need to fully discharge the battery before recharging.
- The rate of speed for raising & lowering the trolley is faster when the batteries have a good charge.
- The battery pack must be charged with a Ferno (UK) Ltd. approved charger. Chargers are supplied with each Harrier LT trolley and additional chargers are available from Ferno (UK) Ltd.
- Improper maintenance may cause injury. Maintain the battery pack only as described in this manual.
- **ELECTRIC SHOCK HAZARD** - This equipment is to be serviced only by trained personnel.
- Short circuiting a battery can cause injury and damage the battery. Do not allow any wire or tool to connect both positive & negative terminals on a battery. This can damage the battery.
- Modifying the battery pack can cause injury or damage and will void the warranty. Use only as designed.

#### Important

To ensure long battery life, fully charge new batteries before putting into service for the first time.

#### Important

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

### 4.1 Charging the Battery

The removable 28V DC battery can be charged using the supplied mains charger. Whilst the battery is being charged, another fully charged battery may be used to operate the trolley.

To charge the battery, remove the battery pack from the dock on the foot end of the trolley by depressing both red release levers and sliding the battery pack towards yourself.



**Figure 1 - Removing battery pack**

Once the battery pack is fully removed, fit into charging unit and ensure it is locked into place with an audible click. The mains power may now be turned on to begin charging the battery.



**Figure 2 - Battery fitted into charging dock**

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

**RED (Continuous):** Battery is connected and being charged.

**GREEN (Continuous):** Charging is complete.

**RED (Flashing):** The battery temperature is outside the 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.

Remove the battery from the charger and re-install onto the trolley prior to use, ensuring it is securely locked in place on the trolley's battery dock.

#### Important

The battery used on the Harrier LT is a 28V DC Lithium Ion battery and should be disposed at an authorised treatment facility. The battery may be returned for disposal by prior arrangement, to Ferno (UK) Ltd.

The battery charge status can be determined by pressing the indicator button on the battery and LED's will light as per table below.

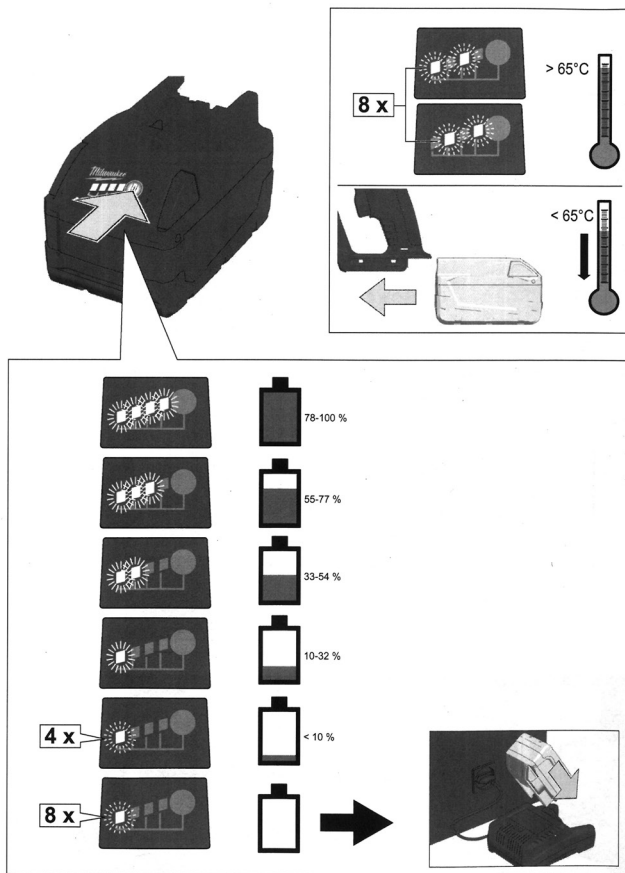


Figure 3 - Battery LED charge status

### In-Vehicle Battery Charger (Option)

Also available is a 12v DC battery charger which can be installed in-vehicle to allow batteries to be charged when away from station. This can be ordered additional to or instead of the 230v AC mains battery charger. It is recommended that this is stored in a cupboard or mounted in a position where it will not be affected by deep-cleaning of the vehicle.

**Note that the Milwaukee 240v and 12V chargers should not be mounted to the wall in-vehicle unless a crash-tested mount is used.** Both wall-mount and INTRAXX-mountable brackets are available from Ferno for both types of charger.



## 5 - USING THE TROLLEY

### Important

Always ensure the drop down head end frame is in the raised position before operating the lifting or lowering mechanism on the trolley

**Ensure that the following procedures are complied with:**

1. Advise the patient before making adjustments, lifting or loading the trolley.
2. Stay with the patient and control the trolley at all times.
3. Keep the patient restrained and the cotsides up when using the trolley.
4. Use help when needed to ensure patient and operator safety.

### 5.0 Transferring a Patient Onto a Trolley

1. Lower the cotside rails.
2. Place the trolley beside the patient and open the restraints.
3. Ensure that the brakes are applied.
4. Transfer the patient onto the trolley using recognised manual handling procedures.
5. Close the restraints around the patient.
6. Raise the cotside rails.
7. Make adjustments as necessary.

### 5.1 Using the Biosafe Patient Harness & Restraints

For the product to fully comply with BS EN 1789:2007, the patient must be fully restrained using the 4-point harness and leg restraints.

1. The patient should be secured using the harness and both leg restraints.
2. Dispose of and replace any restraints that are worn, damaged or have been involved in any accident – they may have hidden damage.
3. Unbuckle all restraints and lay the straps out of the way before transferring the patient.
4. Transfer the patient onto the trolley using recognised techniques.
5. To secure the 4 point harness, slide the two buckles on the shoulder straps onto the buckle on the right hand side strap and then clip left hand side to the right hand side buckle. Adjust the shoulder straps so they are snug against the patient's shoulders and adjust left and right hand side straps so they are snug against the patients sides.
6. Fasten the two leg restraints and adjust to ensure patient comfort.
7. To release the harness, press release button.





Figure 4 - Harness lock ready to be applied



Figure 5 - Harness locked



Figure 6 - Harness and leg restraints applied



Figure 7 - Releasing harness lock

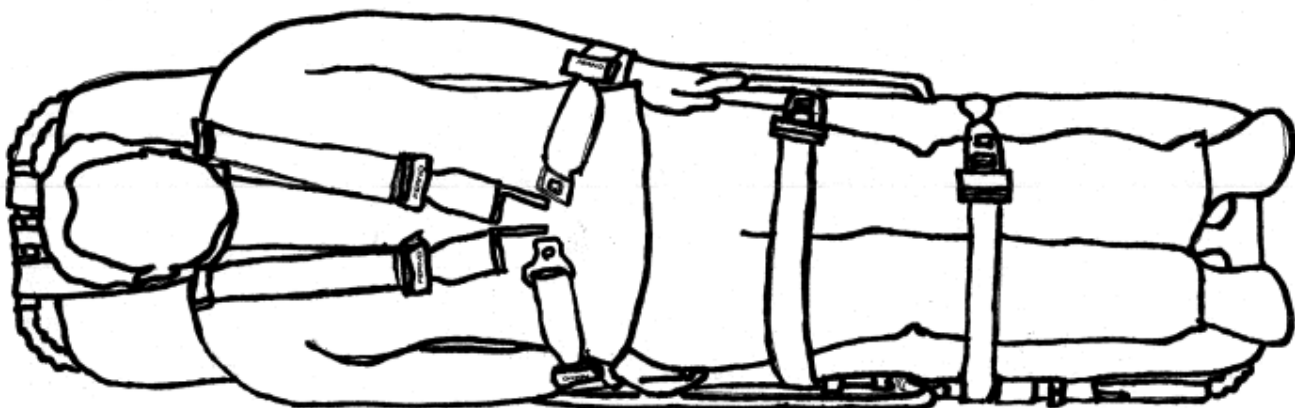


Figure 8 - Location of harness and leg restraints

## 5.2 Turning Power On/Off

1. To turn the power on, press the red switch located on the battery housing unit. Move the switch to the ON position to engage the battery. Always keep the switch in the OFF position when the trolley is not in use to preserve power and prevent accidental activation of the lift process.



**Figure 9 - RED switch turns power on/off**

2. To turn power OFF press the switch into the OFF position.

## 5.3 Sleep Mode

The trolley will go into sleep mode after 1 MINUTE of 'non-activity' on the controls.

To awaken the trolley, press either one of the control buttons.



### WARNING

**If the Trolley is in the Upper most position ONLY the Left Hand DOWN button will WAKE the trolley.**

## 5.4 Adjusting Trolley Height

The lift and lowering operations are controlled via two buttons set into the foot end main frame of the trolley.

### Elevating Trolley

1. To raise the Harrier LT trolley, ensure the trolley is not fitted in a locking device and then press the UP button, located on the right hand side of the main frame until desired height is reached.

2. The top frame and motor will automatically slow down and stop at its highest point.

3. Note that for safety purposes, if the Trolley is fitted into the Ferno two part lock, the power on the trolley will be disabled & operators will be unable to raise the trolley.



**Figure 10- Right Hand UP button**

### Lowering Trolley

1. To lower the trolley, depress and hold the DOWN button, located on the left hand side of the main frame until desired height is achieved.

2. Operators are reminded that they must remain in control of the trolley at all times when moving a patient.



**Figure 11- Left Hand DOWN button**



## 5.5 Manual Override Height Adjustment

### **WARNING**

**THERE ARE TRAPPING AND WEIGHT HAZARDS DURING THIS OPERATION, WHICH MUST BE PERFORMED WITH GREAT CARE. THIS PROCESS MUST BE PERFORMED SAFELY. IT IS NECESSARY A MINIMUM OF TWO OPERATORS MUST BE PRESENT.**

1. In the event that one of the electrical components should fail or the battery has been allowed to flatten then the top frame can be lowered manually.
2. Warning! TWO OPERATORS ARE REQUIRED FOR THIS OPERATION. One Operator must be present at the foot end for support and one operator must be present at the head end of the trolley ready to support the trolley and release the button. The manual override must be operated in a controlled manner to allow the trolley to slowly descend.
3. The Emergency Manual Override Knob is located on the right hand underside of the head end drop down frame.
4. To engage manual operation of the Harrier LT, push the anti-tamper cover back to reveal the knob, twist very slowly in a clockwise direction (see figure 11) until the hydraulics are disengaged and the trolley will start to lower.
5. Once descent of the trolley begins control speed of descent using the knob. Always use two operators for this procedure to prevent injury.
6. Once the trolley is fully lowered, turn the Manual Override knob in an anti-clockwise direction to reset.
7. If the reason for the power failure is not evident then service advice should be sought from Ferno Service Department.

### **WARNING**

**IF the manual override knob is not fully RESET after use, the trolley will not raise when using the Up control Button.**



**Figure 12: Turn the Manual Override knob very slowly in a controlled, clockwise direction to start lowering.**

## 5.6 Manoeuvring the Trolley

1. Transporting a patient on the trolley should always be carried out with the side rails raised and the restraining straps applied and fastened.
2. The trolley is best rolled by two attendants, one pulling and the other assisting with guidance and steering as necessary.
3. If low obstacles (such as door sills) are encountered, roll up to them squarely and lift the leading wheels over the obstacle. Repeat for the trailing wheels.
4. High obstacles such as curbs or steps, rough terrain, etc. should be recognised as potentially hazardous to smooth rolling and trolley balance and may require physical assistance or an alternative route.
5. Ensure that the restraints are fastened around the patient. Place the trolley in the lowest position possible. However the trolley may be wheeled in a semi-elevated position along hospital corridors or similar smooth level surfaces, provided that the patient is securely strapped to the trolley and that the two attendants are in control of the patient and trolley at all times.
6. The cotsides are intended to provide patient safety and must not be used for lifting or manoeuvring the trolley.

## 5.7 Loading the Trolley into a Vehicle Fitted with Ramps

1. Make sure that the patient is secure at all times whilst on the trolley.
2. The trolley is loaded with the patients head towards the front of the ambulance.
3. Ensure that the trolley is in its lowest position.
4. Ensure that the push/pull handle is locked in the extended position.
5. Position the trolley at the base of the ramps, head end first.
6. With one operator at the head end pulling and one operator at the foot end pushing simultaneously, the trolley can now be advanced into the vehicle.

### **Important**

Once in the vehicle, fold the head end push/pull handle and ensure it is secured in place as damage to the handle can occur.

## 5.8 Unloading the Trolley From a Vehicle Fitted with Ramps

1. Make sure that the patient is disconnected from any vehicle mounted apparatus or instrumentation.
2. Operation by a minimum of two operators at all times.
3. Disengage the trolley from the two part locking device by depressing the foot pedal (manual lock) and roll the trolley to the rear of the ambulance compartment.
4. Unfold the push/pull handle and ensure it is locked in the extended position.
5. Using two operators guide the trolley down the ramp and out of the vehicle.

## 5.9 Loading the Trolley into a Vehicle Fitted with a Tail Lift

1. Make sure that the patient is secure at all times whilst on the trolley.
2. The trolley is loaded with the patient's head towards the front of the ambulance.
3. Ensure that the trolley is in its lowest position and there are no trailing straps, blankets etc.

### Important

Fold the head end push/pull handle and ensure it is secured in place as damage to the handle may occur if not stowed correctly.

5. Guide the trolley on to the tail lift, head end first.
6. Operate the tail lift as per manufacturers' instructions.

## 5.10 Unloading the Trolley From a Vehicle Fitted with a Tail Lift

1. Make sure that the patient is disconnected from any vehicle mounted apparatus or instrumentation.
2. Operation by a minimum of two operators at all times.
3. Disengage the trolley from the two part locking device by depressing the foot pedal, and roll the trolley to the rear of the ambulance compartment.
4. Guide the trolley onto the tail lift and out of the vehicle.

### Important

Ensure the trolley is secure at all times when on board the tail lift.

## 6 - OPERATING THE TROLLEY FEATURES

### 6.0 Patient Restraints

Each trolley is equipped with a 4-point harness and two restraint straps, all of which should be used at all times. To remove the four-point harness, unclip the two side brackets and un-loop the shoulder straps from the cross bar at the top of the X Frame. See section 5.1 - Using the Biosafe Patient Restraints for instructions on how to secure the patient to the trolley using the restraints provided.

### 6.1 Cotsides

Cotsides should always be in raised position when the patient has been placed on the trolley. They can be lowered by pulling the RED release plunger (see figure 12). All cotsides lock automatically when raised to the vertical position.



Figure 13 - Pull red plunger to lower cotside

### 6.2 Backrest

The backrest may be locked in any inclined position. Support the backrest frame with both hands (to avoid sudden movement). Squeeze the control lever towards the backrest. Raise/Lower the backrest to the desired angle and release the lever to lock in desired position. Support the backrest while making any adjustments.



#### WARNING

**DO NOT use the backrest to manoeuvre the trolley under any circumstances**



Figure 14 - Press either red lever to raise/lower backrest

### 6.3 Leg Rest Trendelenburg Position

The Harrier LT Trolley has the facility to raise the patient's leg in the Trendelenburg position and knee contour. The following features must be executed with the operator positioned at the foot end of the trolley.



Figure 15 - Lift leg rest to deploy Trendelenburg

**Trendelenburg Position** To raise the leg rest to the Trendelenburg position, grip and support the leg rest frame at the foot end. Lift the leg rest until the support bar locks into position. Maintain a grip on the frame and gradually reduce support of the leg rest until you are confident that the support bar has locked.



Figure 16 - Push the leg support bar away to lower

To lower the leg rest from the Trendelenburg position, hold the leg rest frame at both sides at the foot end. Slide hands forward until fingers contact the support bar on the underside of the leg rest frame. At this point, simultaneously lift and move the support bar forward, thus releasing it from its locked position and slowly lower the leg rest frame to its resting position.

#### Important

Do NOT use cotsides for lifting or manoeuvring the trolley,



### 6.4 Leg Rest Knee Contour Position

To raise the knee contour position, hold both lifting straps (yellow) and lift up. Gradually release the lifting straps, ensuring that the support bar has locked in position.



**Figure 17 - Lift straps to create shock position**

To lower the knee contour position, hold both release straps (red), lift up and pull straps in the direction of the foot end and slowly lower the frame to its resting position.



**Figure 18 - Lift straps to return to Trendelenburg**



**Figure 19 - Lift straps to create knee contour**

### 6.5 Fold Down Head-End

To drop the Fold Down Head-End, stand at the head end and pull the knurled sleeves. Ensure hands are clear from springs and grip tightly.



**Figure 20 - Use knurled sleeves to lower head-end**

Once pulled, apply a slight downward force gently pushing the drop down towards the trolley.



**Figure 21 - Pull sleeves back, unlocking head-end**



**Figure 22 - Gently lower the head-end**



Figure 23 - Ensure push/pull overlaps the U-bolt



### WARNING

When head end is lowered ensure the push/pull handle overlaps the U-bolt

## 6.6 Head-End Push/Pull Handle

The push/pull handles have a unique feature, which enables them to be locked securely into the extended position. This enables them to be used as push/pull handles.

To operate this feature, un-clip the push/pull handle extension from the securing clip and fully extend the handle. Slide the knurled sleeves over the hinges to prevent the handle folding up, enabling the push/pull action.



Figure 24 - Release push/pull from clips



Figure 25 - Rotate push/pull away from clips on trolley



Figure 26 - Unfold push/pull handle



Figure 27 - Push knurled sleeves down over hinge

When folding the handles to stow, pull and HOLD the knurled sleeves against the stops to ensure the sleeves are clear of the hinges then fold the handle and push into the securing clip.

The head end push/pull handle should be locked in place when not in use.



## 6.7 Wheel Locks

The trolley is fitted with wheel locks to prevent the trolley from rolling during patient transfer.

To lock the trolley in place, apply force onto the rear end of the brake pad above wheel until an audible click is heard. To unlock, press down on the forward end of the lock pedal.



Figure 28 - Push down on grip tab to engage wheel locks

## 6.8 Anti Static Wheel

To prevent static build up within the trolley while manoeuvring, it is fitted with an Anti-Static wheel.



Figure 29 - Anti Static wheel

## 6.9 Headrest Extension Pad

The Harrier LT is provided with a detachable headrest that provides support particularly in the patient seated position. The red push button, located at the top of the backrest, allows the fitting and removal of the headrest. A vehicle CEN tested stowage bracket, for the headrest, is also available.



Figure 30 - PRESS red plunger before inserting headrest into slot



Figure 31 - Keep plunger pressed while inserting the headrest stalk into the slot



Figure 32 - Push plunger to release headrest

## 6.10 Optional Removable Push Poles

Push Pole handles can only be fitted to the side blocks that are mounted at the foot end of the trolley.

To apply push poles, fit the 'bullet' end into the block aperture. The pole will slot in easily and lock in place via the plunger, situated on the rear face of the block.

To release, pull on the plunger and pull up on the handle until clear of the mount.



Figure 33 - Insert push pole into block



Figure 34 - Release by pulling plunger on rear of block



Figure 35 - Folding Push Poles available

## 6.11 Optional Removable IV Pole

The IV pole will only fit to the trolley if there is an IV pole mount attached. Simply insert the end of the pole into the allocated hole. The red plunger must be pulled out of the way first.

Once the pole is in, check that it is locked in via the plunger. To release, pull the red plunger and pull up on the IV pole to remove clearly from the pole mount.



Figure 36 - Use red plunger to insert/release IV pole from block



Figure 37 - IV pole installed on trolley



## 6.12 Optional Directional Wheel Lock

To deploy the optional wheel lock, pull and twist the location pin to lower it into position, locking the wheels direction.



Figure 38 - Position location pin to apply wheel lock

## 6.13 Optional foot end push/pull handle



Figure 39 - Optional foot end push/pull handle

## 6.14 Extending cotside for Harrier LT-LBS

The Harrier LT-LBS Trolley is fitted with the ability to deploy extendable cot sides. This addition allows patients with a larger body surface to be transported on the trolley.



Figure 40 - Extended cotside at full extend with cushion

To extend the cot side, rotate the red lever upwards (so that it is parallel with the trolley top). This unlocks the mechanism which allows the cot side to slide out.

Pull the cot side away from the trolley to extend. There are two locked positions on the pull out, the first one is between closed and fully extended and the second is fully extended. When locked, the red lever will spring into its locked position (diagonally down).



Figure 41 - Extended cotside in intermediate position



Figure 42 - Extension straps

Ensure the extension straps are fed over the side pad and under the cot side. The strapping must fit round the side pad ONLY and not the frame of the cot side.



## 6.15 Optional Long cotsides

To extend the cotside, rotate the red lever upwards (so that it is parallel with the trolley top). This unlocks the mechanism which allows the cotside to be moved out.

Pull the cotside away from the trolley to extend. There are two locked positions on the pull out, the first one is between closed and fully extended and the second is fully extended. When locked, the red lever will spring into its locked position (diagonally down).



Figure 43 - Extended cotside at full extend with inflatable side pad

## 6.16 Optional CD Oxygen Holder

The Oxygen Holder is located at the foot end of the trolley and can hold a CD or D type Bottle. The boot strap fixing method is simple and convenient to attach / detach the bottle.

To operate, unlock the clip and release the strap. Place the bottle in the centre of the bracket and retighten the strap making sure the bottle does not move from side to side.



Figure 44 - CD Oxygen Cylinder Holder

## 6.17 Winch Link Attachment

The winch link aids the loading of a patient with a large body mass into an ambulance. However, the ambulance must be fitted with a winch mechanism.

To operate, bring the winch round to face the front of the trolley, this will then attach to the winch from the ambulance. The winch is on a spring so be careful for any spring back.



Figure 45 - Winch Link



### WARNING

Ensure that grease never comes in contact with O2 cylinder or cylinder holder due to the potential explosive risk that oil with oxygen under pressure can pose, in the (unlikely) event of an incident and the O2 cylinder getting ruptured.

## 7.1 - Manoeuvring the Trolley

It is recommended to move a patient with the trolley in the lowest position wherever possible, as this minimises risk of tipping.

It is also important to ensure there are sufficient operators holding the trolley when manoeuvring to maintain a stable movement throughout the transfer, wherever possible with heavier patient weights using more than the minimum recommended 2 operators.

It is recommended to always move the trolley in the lowest position when transferring on and off a vehicle via a tail-lift or ramp.

1. Transporting a patient on the trolley should always be carried out with the cotsides raised and the upper-body harness and leg straps fastened and suitably tightened.
2. The trolley is recommended to be operated by at least two people at all times.
3. If low obstacles (such as door sills) are encountered, move the trolley as close as possible and lift the leading wheels over the obstacle. Repeat for the trailing wheels.
4. High obstacles such as curbs or steps, rough terrain, etc. should be recognised as potentially hazardous to smooth rolling and trolley balance and may require physical assistance or an alternative route.
5. Ensure that the harness and straps are fastened around the patient. Place the trolley in the lowest position possible. However the trolley may be wheeled in a semi-elevated position along hospital corridors or similar smooth level surfaces, provided that the patient is securely strapped to the trolley and that the two attendants are in control of the patient and trolley at all times.
6. Where available, attach winch to the trolley winch-link to aid transfer into vehicle

## 7.2 - Ferno locking mechanism

All Ferno Pegasus, Megasus, Harrier and POWERX trolleys are designed to use the same locking mechanism to fit and lock into a 2-part lock that is mounted in the floor of the vehicle.



Head-end lock spike fixing U bracket



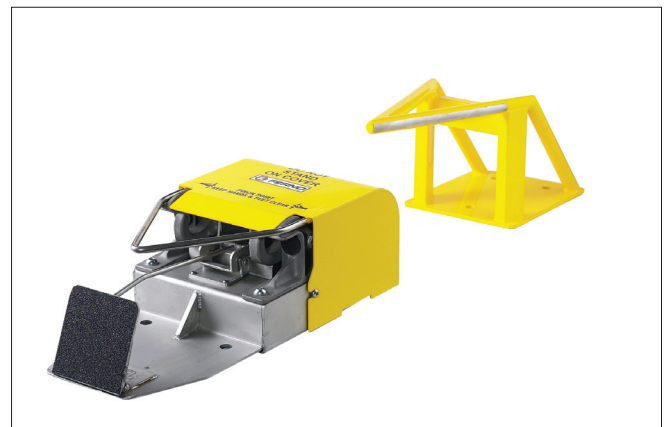
Foot--end cross bar for engagement with grab arm

## 7.3 - Loading into Vehicle with Ramp

1. Make sure that the patient is secure at all times whilst on the trolley.
2. The trolley is loaded with the patient's head first towards the front of the ambulance.
3. Ensure that the trolley is in its lowest position.
4. Ensure that the push/pull handle is locked in the extended position. Where available ensure push poles are deployed
5. Position the trolley at the base of the ramps, head end first.
6. The cotsides are intended to provide patient safety and must not be used for lifting or manoeuvring the trolley.
7. With one operator at the head end pulling and one operator at the foot end pushing simultaneously, the trolley can now be advanced into the vehicle. If a winch is fitted then this should be attached to the head-end of the trolley to aid loading. Follow the manufacturer's guidelines in line with local manual handling protocols.
8. Ensure to align the trolley in line with the lock such that the spike at head end engages with the trolley, then push the trolley fully into the lock until the grab arm fully engages over the cross bar at the base of the foot-end of the trolley, which is indicated by a loud noise when the slam latch engages with the cross-bar. Visually check to ensure it is fully engaged and then recheck it is securely locked in by pulling at the foot end of the trolley to make sure it does not come back out of the lock.

## 7.4 - Unloading From a Vehicle with Ramp

1. Make sure that the patient is disconnected from any vehicle mounted apparatus or instrumentation.
2. Operation by a minimum of two operators at all times.
3. Disengage the trolley from the two part locking device by depressing the foot pedal (manual lock) and roll the trolley to the rear of the ambulance compartment.
4. Unfold the push/pull handle and ensure it is locked in the extended position.
5. Using two operators guide the trolley down the ramp and out of the vehicle.
6. If your Trusts protocol is to use a winch, follow the manufactures guidelines in line with local manual handling protocols.



## 7.5 - Loading into a Vehicle Fitted with a Tail Lift

1. Make sure that the patient is secure at all times whilst on the trolley.
2. The trolley is loaded with the patient's head towards the front of the ambulance.
3. Ensure that the trolley is in its lowest position and there are no trailing straps, blankets etc.
4. Guide the trolley on to the tail lift, head end first.
5. Operate the tail lift as per manufacturers' instructions.
6. Once the tail-lift is in the raised position, push the trolley forward and secure in the Ferno 2 part lock
7. Ensure to align the trolley in line with the lock such that the spike at the head end engages with the trolley, then push the trolley fully into the lock until the grab arm fully engages over the cross bar at the base of the foot-end of the trolley, which is indicated by a loud noise when the slam latch engages with the cross-bar. Visually check to ensure it is fully engaged and then recheck it is securely locked in by pulling at the foot end of the trolley to make sure it does not come back out of the lock.

## 7.6 - Unloading From a Vehicle Fitted with a Tail Lift

1. Make sure that the patient is disconnected from any vehicle mounted apparatus or instrumentation.
2. Operation by a minimum of two operators at all times.
3. Disengage the trolley from the two part locking device by depressing the foot pedal, and roll the trolley to the rear of the ambulance compartment.
4. Guide the trolley onto the tail lift and out of the vehicle.
5. Operate the tail-lift as per the manufactures instructions.
6. Lower the tail-lift to the ground and move trolley forward clear from the tail-lift

## 8.1 - 2-Part Lock LOCKING DEVICES

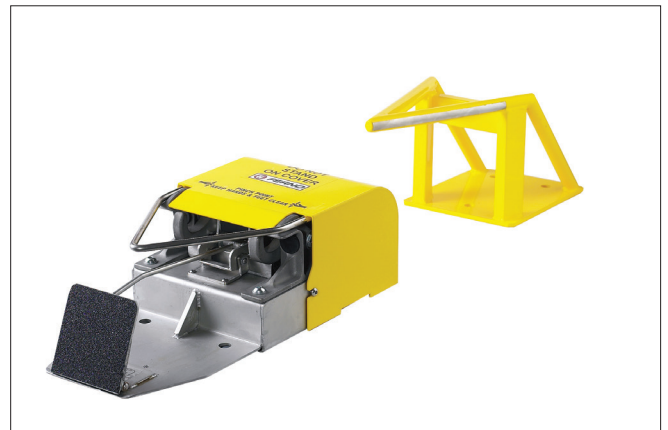
Ferno Locking devices available for use include:

1. Standard floor-mounted Ferno 2-part lock
2. NMI floor-track mounted 2-part lock
3. Unwin floor-track mounted 2-part lock
4. Ferno SlideLock 2-part lock with adjustable floor positioning

All have been dynamically crash-tested to BS EN 1789 and CEN certified when used in conjunction with Ferno UK's range of ambulance trolleys, Pegasus, Megabus, Harrier and POWERX.

Combining different manufacturers' products into a "mixed-component" trolley/fastener system can increase the user's risk of injury and damage if not checked first for compatibility.

However, Ferno trolleys are designed to be compatible with the Ferno range of Two-Part locking devices or competitors equivalent locking devices, giving full compatibility and interchangeability across your vehicle fleet.



**Ferno Standard 2-part Lock**



**Ferno 2-part NMI Track lock**



8.2 - SlideLock Overview



Ferno SlideLock (150)

Ferno SlideLock is a 2-position ambulance trolley lock system, allowing the position of the trolley lock to be moved from side to centre (C to B) quickly and easily, without the need to remove the lock and with no tools required, making it simple to reconfigure the vehicle to accommodate a bariatric trolley such as Harrier/ Megasus with extended sides or POWERX with ratcheted SX cot sides or with Split Scoop attached.

The lock is mounted on a linear bearing mounted into the floor, allowing the lock to be moved from side to side.



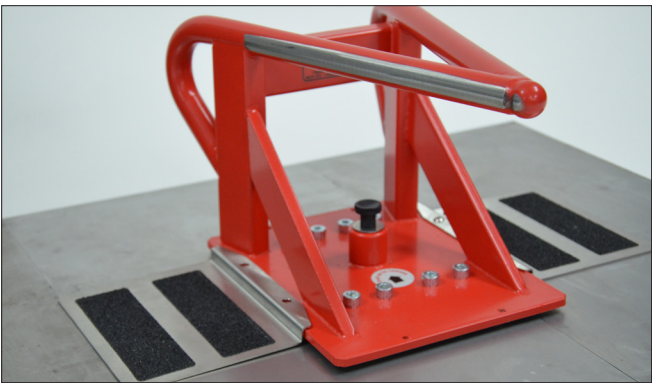
SlideLock Spike - Linear bearing mounted in floor



SlideLock 255 (single linear bearing cover on RHS)

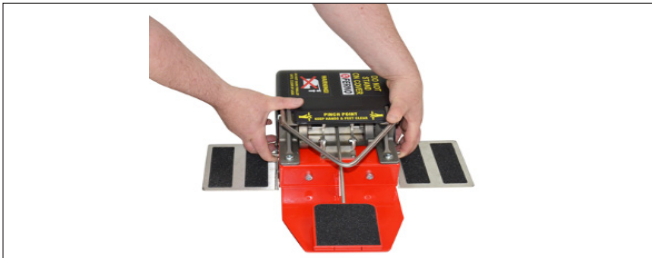
8.3 - SlideLock Operation

To move the Spike section of the lock, lift the black release plunger on the top of the base of the Spike to unlock it from the linear bearing below and then start moving the lock to the other side. Once the lock has started to move over, release the plunger knob whilst continuing to move the lock all the way over to the other side. It will lock in position with a positive ‘click’ sound and the plunger will have moved back own indicating the locking pin has located itself into the locking hole. Rattle the lock from side to side to ensure it has indeed locked in place. If the Spike has not locked into place, slightly move the lock to the left and then to the right until you find the locking pin hole, such that it then locks in place.



Plunger on SlideLock Spike

Do the same for the foot-end section of the lock. Either side of the lock there is a small metal lever. Lift the levers on both sides of the lock and then slide the lock across towards the other position, letting go of the levers once it has started moving. Continue to move all the way over to the other side and again it will lock in position with a positive ‘click’ sound. Rattle the lock from side to side to ensure it is indeed locked in place.



Foot-end SlideLock movement



### 8.3 - SlideLock Operation (cont..)



**POWERX with Split Scoop attachment, SlideLock moved to B position**

Due to the simplicity of SlideLock, it allows the vehicle to be reconfigured in real time by the crew in order to accommodate transporting bariatric patients.

### 8.4 - Maintenance and cleaning of SlideLock

SlideLock is designed such that the lock does not need to be removed from the vehicle floor. The 2 sections of the lock are attached to linear bearings that are fixed to the chassis and embedded in a cut out in the vehicle floor, which is covered by cover plates attached to the Lock itself.

As part of the regular cleaning and maintenance schedule of the vehicle, the cover plates for the Lock (2 plates for Slidelock 150 and 1 plate for SlideLock 255) should be removed and the area below cleared out of any debris that may have collected and the whole area thoroughly cleaned and disinfected accordingly. Pressure washer may be used to clean out the whole area.

The linear bearing slide rail must NOT be greased as it uses a self-lubricating bearing. Greasing of the rail will only attract build-up of dirt and debris.

Further details on cleaning and maintenance are included in the SlideLock Installation and Maintenance guide (0859-0006 & 0859-0003)



**Removal of cover plates for cleaning linear slide rail and enclosure**



## 7 - MAINTENANCE

### 9.0 Maintenance & cleaning

The trolley requires regular maintenance, cleaning and disinfecting. Set up and follow a regular maintenance schedule. Keep maintenance records. A sample maintenance record sheet is provided at the end of this manual.

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 (UK) Ltd. Service Department.

### 9.1 Cleaning the Trolley

Regular cleaning helps reduce the risk of transmitting disease and enables equipment to function at its optimum.

Ensure that all equipment is removed from the trolley.

Trolley should be hand-wiped using a suitable cleaning solution.

For particularly grimy cases, especially if the trolley has been in storage for a long period, it may be necessary to first clean the trolley with a water-soluble solvent-soaked cloth.

Once cleaned, dry the trolley with a soft towel, paying particular attention to swivel and sliding joints. If a compressed air hose is available, you may find that compressed air jets are more effective in drying the hard-to-reach places.

Ensure no liquid enters the control box, battery holder power connectors or any other electrical component.

### 9.2 Disinfecting the Trolley

Wipe all surfaces with disinfectant. Follow the disinfectant manufacturer's instructions for application method and contact time. Ferno recommends you inspect the trolley for damage as you clean and disinfect it. See note regarding disinfectants to use.

1. Remove the mattress, restraints and any accessories.
2. Hand clean all surfaces of the trolley with warm water and a mild detergent.
3. Rinse with warm, clear water. Dry the trolley with a towel and allow it to air-dry thoroughly, replacing the mattress and harness/restraints prior to storage.
4. To disinfect: Apply disinfectant to the trolley, following the disinfectant manufacturer's instructions for application method and contact time. Ensure to wash down thoroughly after disinfecting to remove any chemical residue that might cause long-term damage

#### IMPORTANT

Disinfectants and cleaners containing phenol or iodine can cause damage, it is recommended not to use products containing these chemicals.

If using disinfectant that is chlorine-based then ensure the concentration used is no higher than 10,000 ppm.

If higher than 10,000 ppm, it is recommended to use for the manufacturer's minimum recommended effective contact time after which any residue should be wiped/washed off.

Accessories such as push poles, IV poles etc. should be cleaned and disinfected whilst detached from the trolley and the fixing points on the trolley also cleaned and disinfected.

### 9.3 - Disinfecting & Cleaning Restraints and mattress

It is recommended to remove the restraints and mattress from the trolley before cleaning and disinfecting to ensure they can be cleaned effectively on all surfaces.

#### Cleaning Webbing restraint straps

1. Immerse webbing straps in a solution of mild soap and water to clean. Do not immerse any metal buckles or metal fixation clips in the solution, these should be wiped clean only.
2. Repeatedly dip the webbing in clean water to rinse. Do not immerse any metal buckles or fixation clips. Hang the restraints to air-dry. Attach only clean, dry restraints back onto the equipment.

#### Disinfecting webbing restraint straps

1. Immerse or spray the restraint webbing straps following the selected disinfectant manufacturer's instructions for application method and contact time. Do not immerse any metal buckles or metal fixation clips into disinfectant liquid
2. Spray the metal buckles and fixation clips with disinfectant cleaner spray, following the disinfectant manufacturer's instructions for application method and contact time
3. Hang the restraints to air-dry if needed. Attach only dried restraints to the equipment

#### Cleaning Biosafe restraint straps


1. Wipe-clean the restraints, buckles and fixing clips with mild soap and water
2. Hang the restraints to air-dry. Attach only clean, dry restraints back onto the equipment

#### Disinfecting Biosafe restraint straps

1. Spray the restraint webbing metal buckles and fixation clips with disinfectant cleaner spray, following the disinfectant manufacturer's instructions for application method and contact time
2. Hang the restraints to air-dry if needed. Attach only dried restraints to the equipment

## 9.4 Maintenance Intervals

The table at right/below represents minimum recommended intervals for maintenance. If local maintenance procedures are more often, then work with those intervals and procedures.

 <b>WARNING</b> <b>Improper maintenance can cause injury. Maintain the trolley only as described in this manual.</b>			
Minimum Maintenance Intervals	Each Use	As Needed	Each Month
Disinfecting	•		
Cleaning		•	
Inspecting		•	•
Lubricating		•	

## 9.5 Lubricating the Trolley

Ensure to disinfect and clean the trolley before applying lubricant. Use the lubricants designated below to lubricate the trolley. Do not lubricate points marked with the “do not lubricate” symbol.



**Do Not Lubricate**



**Lubricate**

Your Ferno Harrier LT/LT-LBS trolley will work efficiently and safely only when it is well lubricated. You **MUST** lubricate all moving and sliding parts after every inspection or preventative maintenance programme, or if there is inadequate lubrication for the moving parts to operate easily and quietly.

In general terms, almost all sliding and moving parts may be lubricated with light duty grease. A penetrating fluid lubrication is used on some sliding parts of the trolley. However, when a penetrating fluid lubricant is used, all excess **MUST** be wiped away, to prevent any build-up of dust or grime which can clog up working parts and impede movement.

### IMPORTANT

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

## 10 - ACCESSORIES & RELATED PRODUCTS

Ferno offers a full line of accessories and products for the Harrier trolley. 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.

Contact Ferno Service Department or your Ferno distributor for product information.

### **WARNING**

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

## 9 - PARTS AND SERVICE

### **WARNING**

**Modifying the Trolley can cause injury and damage. Use the Trolley only as designed by Ferno (UK) Ltd.**

### **WARNING**

**Improper parts and service can cause injury. Use only Ferno (UK) Ltd. parts and Ferno-approved service on the trolley.**

## 11.0 UK Support

In the United Kingdom to order parts or for professional trolley repair, contact Ferno (UK) Ltd. - the only agent authorised by Ferno (UK) Ltd. to manage, service, and repair Ferno (UK) Ltd. products.

Telephone	+44 (0)1274 851999
Service	+44 (0)1274 854511
Service Fax	+44 (0)1274 855511
Internet	<a href="http://www.ferno.co.uk">www.ferno.co.uk</a>

## 11.1 Worldwide

To order Ferno (UK) Ltd. parts, and for professional trolley repair, contact your Ferno distributor. Your distributor is the only agent authorised by Ferno (UK) Ltd. to manage, service, and repair Ferno (UK) Ltd. products.

## 12 - Inspection Checklist

To ensure consistently safe operation of the trolley and to monitor wear and tear, prior to each use, ensure the trolley is thoroughly checked in compliance with the following checklist.

### INSPECTION CHECKLIST

- Are all components present?
- Is the trolley generally free of excessive wear?
- Are all screws, nuts, bolts, rivets, and roll pins securely in place?
- Do all moving parts operate smoothly and properly?
- Does the trolley raise and lower properly into position?
- Does the trolley roll smoothly?
- Do the wheel castors and brake operate properly, rotate fully and have adequate tread?
- Are the patient restraints and harness properly installed?
- Are the restraints, mattress and harness in good condition with no cuts or frayed edges?
- Are restraint buckles free of visible damage and do they operate properly?
- Check that the battery is fitted to the trolley and that it is fully charged at the beginning of each shift (charge at least once every 5 days).
- Press the button located on the battery pack and check the red LED's light up test the battery and ensure it is ready to use.
- Confirm the operation of the trolley by using the up/down control buttons on the foot end main frame.
- Check the trolley mattress and patient restraining system for damage and that they are secured correctly.
- Check that the trolley cotsides raise, lower and lock in position.
- Check that the ambulance has a properly installed, approved locking device.
- Check the operation of the push/pull handles and ensure the head end handle clips in the stowed position.
- Study this manual before use. Practice without a patient until fully competent in using the trolley.





## 13 - SERVICING SCHEDULE

It is recommended in addition to the regular inspection and cleaning interventions that Ferno Harrier LT is serviced at least once every 12 months. Below is a service schedule sheet where servicing dates and activities can be recorded. Ferno UK offers a range of cost-effective servicing programmes, helping to keep your equipment in good condition and keeping whole life time costs to a minimum.

<b>Trolley Model</b>	
<b>Serial Number</b>	
<b>Date placed in operation</b>	

[illegible]

