



## FL1 Fastener

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*Read this Manual  
and Retain for  
Future Reference*

## Ferno Technical Support

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. For technical support questions, please contact your Ferno distributor.

## 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	+1.937.382.1451
Fax	+1.937.382.6569
Internet	www.ferno.com

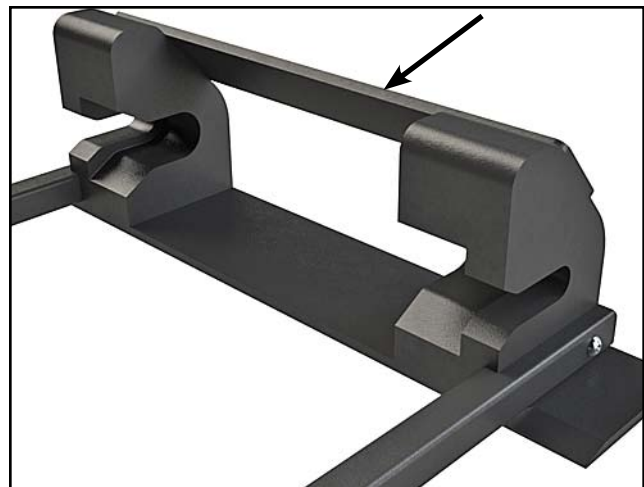
### EUROPEAN REPRESENTATIVE

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

Location: Rear of Tower Crossbar



### USERS' MANUAL

To request additional free users' manuals, contact Ferno Customer Relations, your Ferno distributor, or visit [www.ferno.com](http://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. It is recommended that training on the proper use of this product be provided before using this product in an actual situation.

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

## Proprietary Notice

The information disclosed in this manual is the property of Ferno-Washington, Inc., Wilmington, Ohio, USA. Ferno-Washington, Inc. reserves all patent rights, proprietary design rights, manufacturing rights, reproduction use rights, and sales use rights thereto, and to any article disclosed therein except to the extent those rights are expressly granted to others or where not applicable to vendor proprietary parts.

## 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.


## TABLE OF CONTENTS

Section	Page	Section	Page
Ferno Customer Relations _____	2	<b>5 - Maintenance</b> _____	<b>9</b>
Ferno Technical Support _____	2	5.1 Maintenance Schedule _____	9
<b>1 - Safety Information</b> _____	<b>4</b>	5.2 Disinfecting the Fastener _____	9
1.1 Warning _____	4	5.3 Cleaning the Fastener _____	9
1.2 Important _____	4	5.4 Lubricating the Fastener _____	9
1.3 Bloodborne Disease Notice _____	4	5.5 Inspecting the Fastener _____	10
1.4 Transporter and Fastener Compatibility _____	4	<b>6 - Installing the Fastener</b> _____	<b>11</b>
1.5 Safety and Instruction Labels _____	4	6.1 Before You Begin _____	11
1.6 Symbol Glossary _____	5	6.2 Vehicle Requirements _____	11
<b>2 - Operator Skills and Training</b> _____	<b>5</b>	6.3 Installer Notice: Complying with CEN Standards _____	11
2.1 Skills _____	5	6.4 Items Supplied and Required _____	12
2.2 Training _____	5	6.5 Transporter Placement _____	13
<b>3 - About the Fastener</b> _____	<b>6</b>	6.6 Marking the Ambulance Floor, Table or Tray _____	14
3.1 Description _____	6	6.7 Assembling the Fastener _____	16
3.2 Compatible Transporters _____	6	6.8 Drilling the Holes and Installing the Backing Plates _____	18
3.3 CE Compliance _____	6	6.9 Mounting the Fastener _____	20
3.4 Before Placing the Fastener in Service _____	7	6.10 Testing the Fastener _____	21
3.5 General Specifications _____	7	<b>7 - Parts and Service</b> _____	<b>22</b>
3.6 Fastener Components _____	7	7.1 Service - Worldwide _____	22
<b>4 - Using the Fastener</b> _____	<b>8</b>	<b>Training Record</b> _____	<b>23</b>
4.1 Securing the Transporter In the Fastener _____	8	<b>Maintenance Record</b> _____	<b>23</b>
4.2 Releasing the Transporter From the Fastener _____	8		

# 1 - SAFETY INFORMATION

## 1.1 Warning

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

 <b>WARNING</b>
<b>Untrained operators can cause injury or be injured. Permit only trained personnel to operate the fastener.</b>
<b>Improper use of the fastener can cause injury. Use the fastener only for the purpose described in this manual.</b>
<b>An improper transporter can cause injury. Use only a Ferno transporter designed or properly modified for use with the fastener.</b>
<b>Improper or inadequate installation can cause injury. Install the fastener only as instructed in this manual.</b>
<b>Improper maintenance can cause injury. Maintain the fastener only as described in this manual.</b>
<b>A fastener installed without backing plates can fail in a crash. Use properly installed backing plates to secure the fastener at its mounting points.</b>
<b>Improperly installed backing plates can fail in a crash. Secure the backing plates to primary structural members of the ambulance.</b>
<b>Improper parts and service can cause injury. Use only Ferno parts and Ferno-approved service on the fastener.</b>
<b>Modifying the fastener can cause injury and damage. Use the fastener only as designed by Ferno.</b>

## 1.2 Important

Important notices emphasize important usage or maintenance information.

**Important**

## 1.3 Bloodborne Disease Notice

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

## 1.4 Transporter and Fastener Compatibility

For the purpose of this notice, all Ferno transporters are included under the generic term, “cot”.

Combining different manufacturers’ products into a “mixed-component” cot/cot fastener system can increase the user’s risk of injury and damage.

Ferno-Washington, Inc. strongly recommends that only Ferno-manufactured cots be used in Ferno-manufactured cot fasteners, and that only Ferno-manufactured cot fasteners be used for securing Ferno-manufactured cots in ambulances.

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

## 1.5 Safety and Instruction Labels

Safety and instruction labels place important information from the users’ manual on the fastener.

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

### 1.6 Symbol Glossary

The symbols defined at right are used on the fastener and in this users' manual.

Ferno uses symbols recognized by the International Standards Organization (ISO), American National Standards Institute (ANSI) and the emergency medical services industry.



General Warning of Potential Injury



Read the Users' Manual



Transporter Operation Requires Two Trained Operators



Unlock Button



Do Not Lubricate



Lubricate



Product meets European Union Standards



Centerline Designation (Used During Installation)

## 2 - OPERATOR SKILLS AND TRAINING

### 2.1 Skills

Operators using the fastener need:

- a working knowledge of emergency patient-handling procedures.
- a complete understanding of the procedures described in this manual.

### 2.2 Training

Operator trainees need to:

- read and understand this manual and the manuals for the transporter and stretchers used with the fastener.
- be trained on fastener, transporter, and stretcher operation before the ambulance with the installed fastener is placed in service.
- record their training information. A sample training record sheet is provided on page 23.

 **WARNING**

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

### 3 - ABOUT THE FASTENER

#### 3.1 Description

The Ferno® FL1 Fastener (called the fastener in this manual) is designed to secure a compatible Ferno® transporter in the patient compartment of a ground-based ambulance. The fastener is designed to be installed according to CEN standards. It is for professional use only.

The fastener consists of a lock box, towers, and connecting rails. Features include:

- Locking mechanism secures transporter control end
- Pair of towers secure transporter loading end
- Easy-to-operate transporter release

Hardware to secure the fastener to a tray is supplied. Longer bolts (not supplied) may be needed to install the fastener to an ambulance floor. See *Items Supplied and Required*, page 12.

#### 3.2 Compatible Transporters

The fastener is designed for use with Ferno® Mondial™ or EFX Transporters.

#### 3.3 CE Compliance

##### MEDICAL DEVICE DIRECTIVE

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



 <b>WARNING</b>
<b>Improper use of the fastener can cause injury. Use the fastener only for the purpose described in this manual.</b>

 <b>WARNING</b>
<b>An improper transporter can cause injury. Use only a Ferno transporter designed or properly modified for use with the fastener.</b>

 <b>WARNING</b>
<b>Improper or inadequate installation can cause injury. Install the fastener only as instructed in this manual.</b>

### 3.4 Before Placing the Fastener in Service

- Personnel who will work with the fastener need to read this manual and the manuals for the transporter and stretcher(s) used with the fastener.
- The fastener must be properly installed by professional personnel (see *Before You Begin*, page 11).
- Confirm that the fastener operates properly. See *Inspecting the Fastener*, page 10.

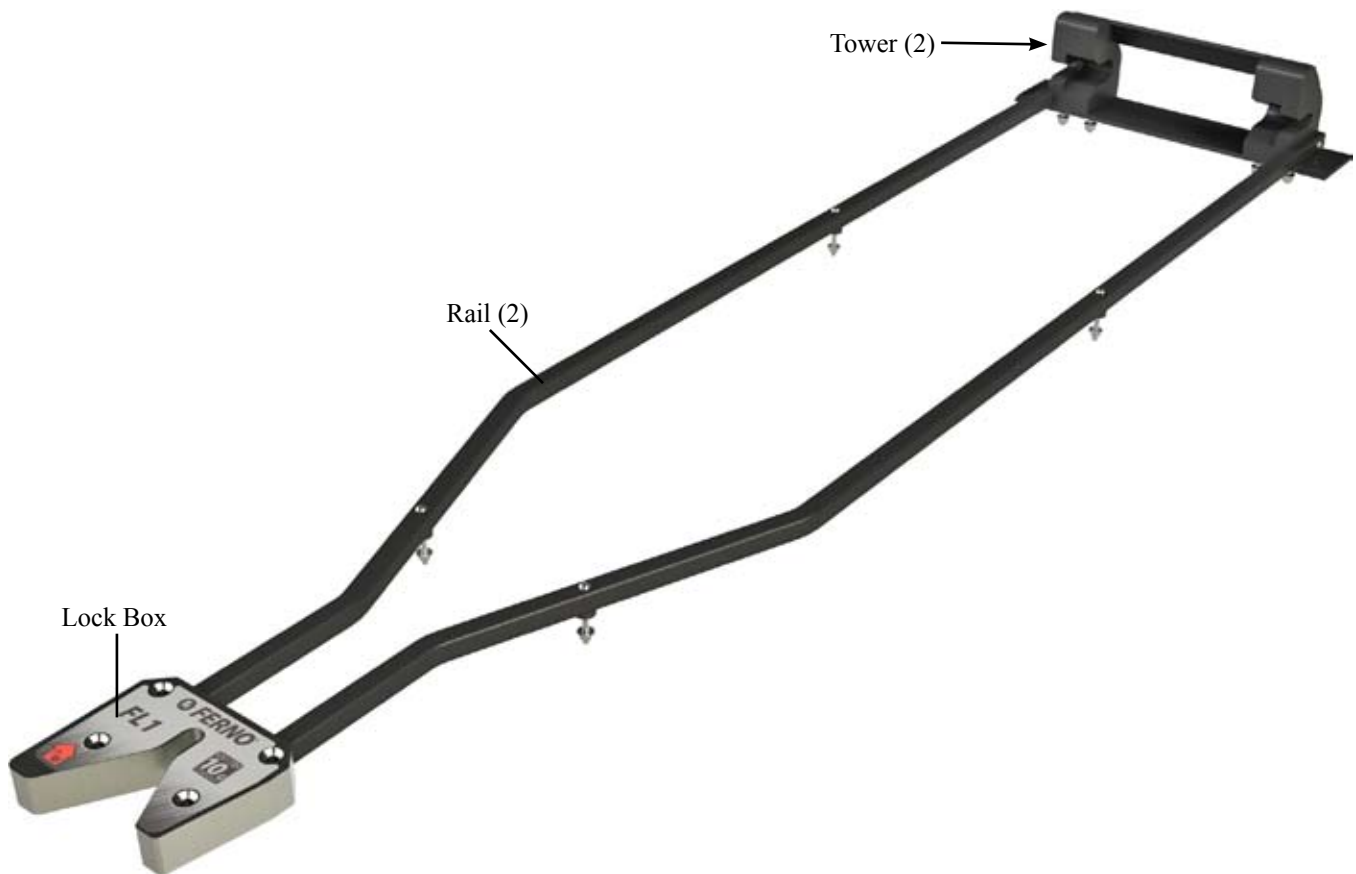
### 3.5 General Specifications

Overall Length	1852 mm	73 in
Overall Width	457 mm	18 in
Height (at lock box)	36 mm	1½ in
Height (at towers)	134 mm	5¼ in

Most general specifications are rounded to the nearest whole number. For more information, contact Ferno Customer Relations (page 2) or your Ferno distributor.

Ferno reserves the right to change specifications without notice.

### 3.6 Fastener Components



## 4 - USING THE FASTENER

### 4.1 Securing the Transporter In the Fastener

1. Read the transporter users' manual for proper loading instructions.
2. Guide the transporter into the ambulance (Figure 1) and align the fastener post on the control end of the transporter with the fastener lock box.
3. Push the transporter firmly into the fastener until the transporter loading-end crosstube is seated in the tower pockets and the transporter post engages the lock inside the lock box (Figure 2 and Figure 3).

4. Verify that the transporter is locked in the fastener by attempting to pull it out of the ambulance. The transporter should remain firmly locked in the fastener.

### 4.2 Releasing the Transporter From the Fastener

1. To release the transporter from the fastener, press the release button on the lock box (Figure 2) and begin pulling the transporter out of the ambulance.
2. Read the transporter users' manual for complete unloading instructions.

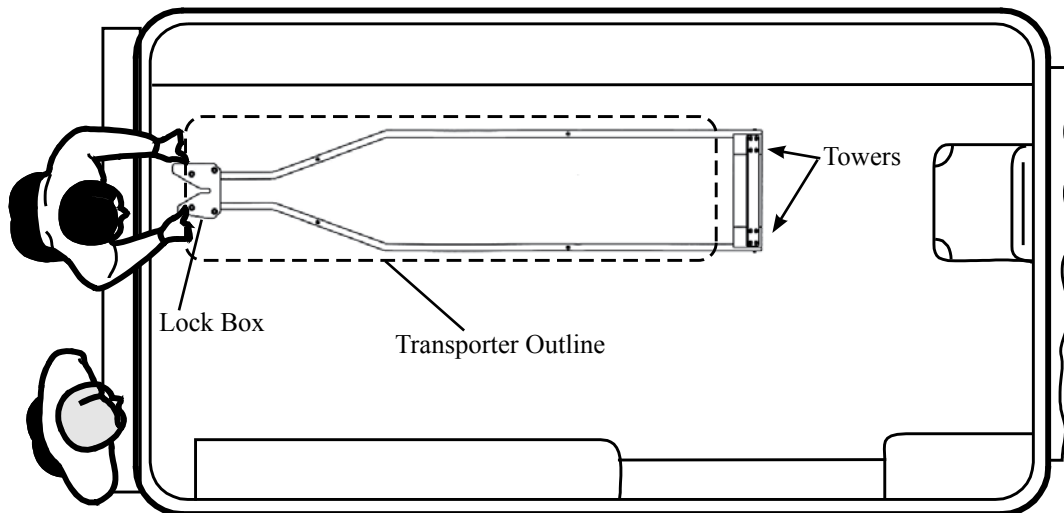


Figure 1 - Loading the Transporter Into the Fastener

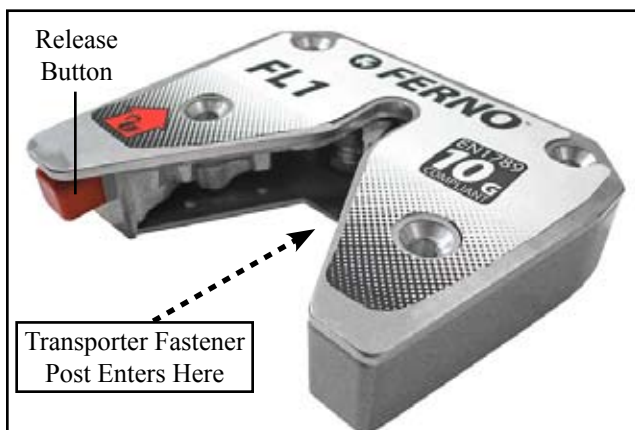


Figure 2 - Lock Box

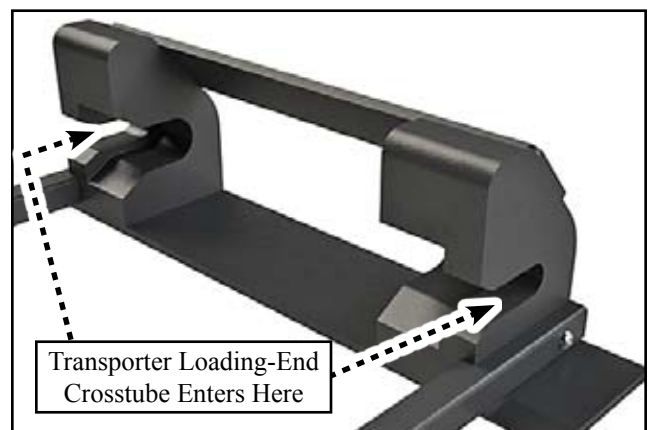


Figure 3 - Towers



## 5 - MAINTENANCE

### 5.1 Maintenance Schedule

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

Keep maintenance records. A sample maintenance record sheet is provided on page 23.

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.

### 5.2 Disinfecting the Fastener

Wipe all surfaces with disinfectant. Follow the disinfectant manufacturer's instructions for application method and contact time. Ferno recommends you inspect the fastener for damage as you disinfect it.

### 5.3 Cleaning the Fastener

Hand wash all parts of the fastener with warm water and a mild detergent. Use a brush with stiff bristles to remove stains. Do not use a metal wire brush. Rinse with warm, clear water. Dry with a towel or allow the fastener to air-dry.

### 5.4 Lubricating the Fastener

The locking mechanism inside the lock box requires occasional lubrication. When needed, apply 1-2 drops of WRL-191S or E-Z-1 to the lock. Wipe off excess lubricant.

 <b>WARNING</b>
<b>Improper maintenance can cause injury. Maintain the fastener only as described in this manual.</b>

Minimum Maintenance Intervals	Each Use	As Needed	Each Month
<b>Disinfecting</b> (this page)		•	
<b>Cleaning</b> (this page)		•	
<b>Inspecting</b> (page 10)		•	•

<b>Important</b>
Disinfectants and cleaners containing bleach, phenolics, or iodines can cause damage. Do not use products containing these chemicals.

<b>Important</b>
Water under high pressure, or steam, can penetrate the locking mechanism, flush away lubricant, and cause corrosion. Use caution when cleaning, and reapply lubricant if needed.

<b>Important</b>
Using abrasive cleaning compounds or applicators on the fastener cause damage. Do not use abrasive materials to clean the fastener.

<b>Important</b>
Lubricating parts that should not be lubricated will allow dirt and foreign particles to collect on the fastener, resulting in damage.

## 5.5 Inspecting the Fastener

Have your service's equipment maintenance personnel inspect the fastener regularly. Follow the checklist below and use a transporter to check the operation of the fastener.

If inspection shows damage or excessive wear, replace the

fastener or remove the fastener from service until repairs can be made. See *Parts and Service*, page 22.

If the ambulance is involved in a crash or traffic accident, the fastener could sustain damage that is not visible to the eye. Replace the fastener if the ambulance is involved in a crash.

### INSPECTION CHECKLIST

- Are all components present?
- Are the required backing plates present, and are they securely welded to a primary structural member of the ambulance?
- Is the fastener free of excessive wear?
- Is all mounting hardware tight?
- Are all parts in good condition, with no bends, cracks, corrosion, or damage?
- Do all moving parts operate smoothly and properly?
- Does the locking mechanism operate and release properly, and properly secure the transporter?
- Does the loading-wheel crosstube on the transporter seat properly in the towers?
- Monitor the ambulance floor, table, or tray, and check the fastener's integrity. Is the fastener setup worn? Has exposure to the environment caused noticeable damage?

### Important

If the ambulance is involved in a crash or traffic accident, replace the fastener.

### Important

If the required backing plates are not present, immediately remove the fastener from service and have the backing plates installed. Then install a new fastener.

### Important

Make sure all connections are tight, but **do not overtighten the hardware**. Overtightening, especially with powered tools, can cause the nut and bolt beneath the mounting surface to pull through the backing plate.

If inspection indicates the components are pulling through the backing plate, take the fastener out of service immediately and install a new fastener with new backing plates.

## 6 - INSTALLING THE FASTENER

### 6.1 Before You Begin

- Use a skilled professional familiar with ambulance construction to install the fastener.
- Consult the ambulance manufacturer for any special installation techniques or considerations for your type of ambulance, and for ambulance warranty information.
- Inspect under the ambulance floor, table, or tray for anything that might interfere with the installation.

### 6.2 Vehicle Requirements

- The ambulance must comply with the current version of European Standard EN 1789.
- The ambulance and the fastener installation must comply with current government regulations for the country in which the fastener is used.
- Fastener installation requires the use of backing plates beneath the ambulance floor, table, or tray at the mounting points indicated in this manual. If the ambulance does not have the required backing plates or their equivalent, have them installed as instructed in this manual. See *Drilling the Holes and Installing the Backing Plates*, pages 18 and 19.
- If installing the fastener to a tray system, the tray must be at least 1.75 mm thick.

#### **WARNING**

**Improper or inadequate installation can cause injury. Install the fastener only as instructed in this manual.**

#### **Important**

Before installing the fastener, inspect under the ambulance floor, table or tray for anything (wiring, brake lines, fuel tank, oxygen lines or other items) that might interfere with the installation.

#### **European Standards (CEN)**

To obtain an English-language version of EN 1865 or EN 1789 standards, contact the British Standards Institution:

British Standards Institution  
389 Chiswick High Road  
London, England W4 4AL

For other languages, contact the CEN Standards Organization in your country.

### 6.3 Installer Notice: Complying with CEN Standards

To comply with CEN standards, install the fastener according to all applicable EN guidelines and the instructions in this manual. The FL1 Fastener, when installed properly and when used with a Mondial™ transporter and RS2, RS2, or RS4 stretcher, meets or exceeds all European Standards. To obtain a copy of current CEN standards, write to the address provided above.

## 6.4 Items Supplied and Required

### ITEMS REQUIRED (ALL INSTALLATIONS)

For a proper installation, backing plates are required at all mounting points. If the ambulance does not have the required backing plates or their equivalent, have them installed as instructed in this manual. See *Drilling the Holes and Installing the Backing Plates*, pages 18-19.

### ITEMS SUPPLIED

- **TRAY INSTALLATION:** All transporter fastener components and fastening hardware are included. **Backing plates (required) are not included.**
- **FLOOR INSTALLATION:** All transporter fastener components are supplied. However, longer mounting bolts (not supplied) may be required if the fastener will be installed on the ambulance floor.
  - The length of the mounting bolts will be determined by the combined thickness of the fastener tower holes, tower plate, floor and backing plate. The bolts must be long enough to extend beyond the backing plate a minimum of 19 mm (3/4") when installed.
  - The bolts and nuts should be of at least SAE Grade 8, with a corrosion-resistant coating (zinc plating recommended) and a UNC-2 thread.

### COMPONENTS

Part	Quantity
Lock Box	1
Rail	2
Tower (1 ea. right/left)	2
Tower Plate	1
Tower Crossbar	1
Loctite® 271™ (Red) Threadlocker	Capsule

### FASTENERS

Part	Quantity
M8 Stud	8
M8x1.25x70 Flat Head Machine Screw	4
Nylon Spacer	4
Flat Washer .313" SAE (.688"x.344"x.063")	12
Flat Washer 1/4" SAE (.625"x.281"x.063")	4
M6x1x20 Button Head Rail Screw	2
M6x1x60 Button Head Rail Screw	4
M6x1x16 Flat Head Machine Screw	14
M8 Center Lock Nut	12
M6 Center Lock Nut	4

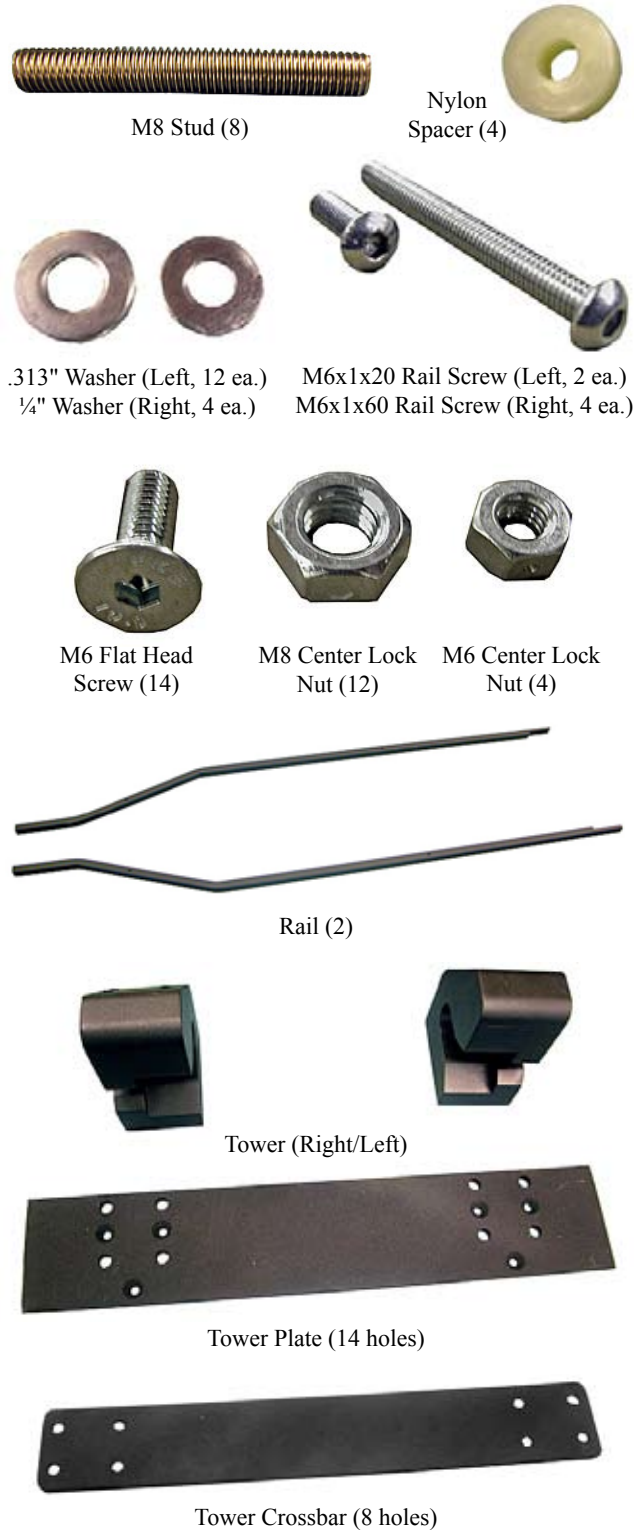


Loctite® 271™ (Red) Capsule



Lock Box

### COMPONENTS (NOT TO SCALE)



## 6.5 Transporter Placement

Before installing the fastener, determine where the transporter should be positioned within the patient compartment.

Use the transporter's overall dimensions to determine where it should be positioned on the ambulance floor, table, or tray. This information will help determine the proper position for the fastener.

Refer to the current CEN standards to properly position the transporter within the "treatment area" specified in EN 1789. The overall dimensions of transporters compatible with the fastener are shown at right

<b>Model</b>	<b>Overall Width</b>	<b>Overall Length</b>
Mondial™ ST70	550 mm	1970 mm
Mondial™ ST64	550 mm	1970 mm
EFX	565 mm	1970 mm

## 6.6 Marking the Ambulance Floor, Table or Tray

### MARKING THE TRANSPORTER CENTERLINE

#### Installing to a floating table or tray:

1. Measure across the table or tray and divide the total by two. This is the distance to the center of the table or tray.
2. Measure and mark a point at the center of the tray near the door end of the ambulance. Measure and mark a second point at the center of the tray near the forward end of the ambulance.
3. Use a chalk line to mark a straight line between the two points from Step 2. This is the transporter Centerline (Figure 4).

#### Installing to an ambulance floor:

Follow the procedure at left to center the fastener on the floor, **OR** follow the steps below to place the fastener as close to the side wall as possible:

1. Starting at the side wall near the doors, measure and mark a point 300 mm (minimum) from the side wall. At the forward end of the compartment, measure and mark a second point at the same distance.
2. Use a chalk line to mark a straight line between the two points from Step 1. This is the transporter Centerline (Figure 4).

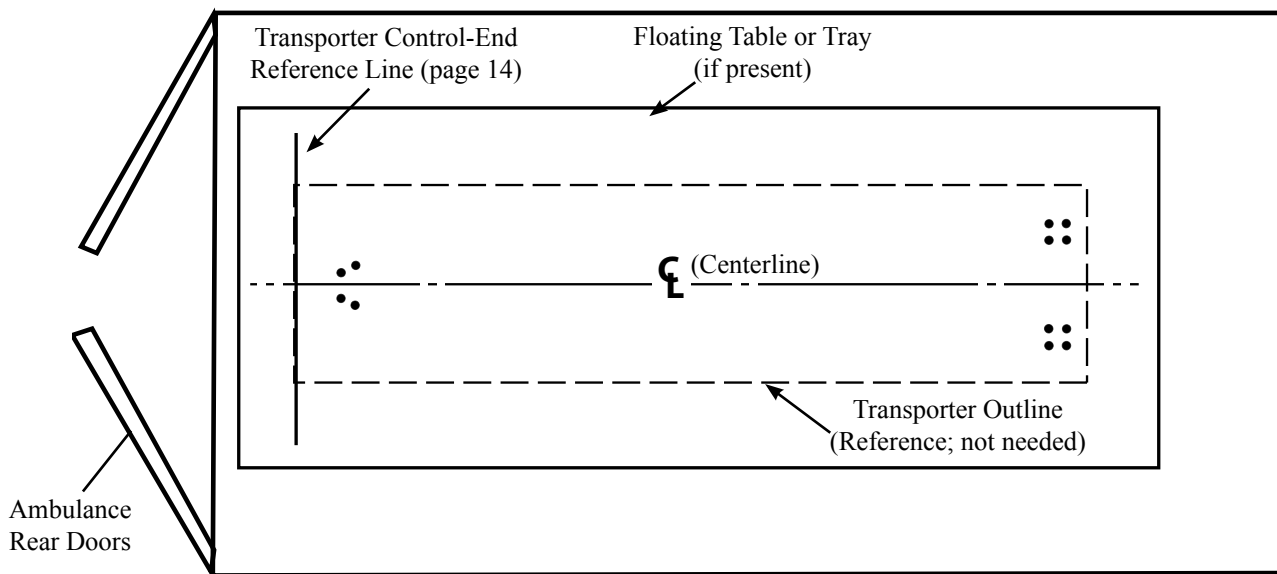


Figure 4 - Ambulance Compartment Layout (Top-Down View)

### MEASURING AND MARKING

#### THE LOCK BOX MOUNTING HOLES

1. Use the transporter overall length (see *Transporter Placement*, page 13) to determine where the transporter should sit on the floor, table, or tray. Draw a line perpendicular to the Centerline to represent the exact location of the **control end** (rear) of the transporter (Figure 4 and Figure 5).
2. Beginning where the Centerline intersects the control-end reference line, measure 250 mm (approximately 9.8") toward the front of the ambulance and draw a line perpendicular to the Centerline. Center the lock box on the Centerline with its flat, long end on this new line (Figure 5).
3. Use a marker, pen, or other tool to mark the four drilling points for the lock box on the floor, table, or tray.

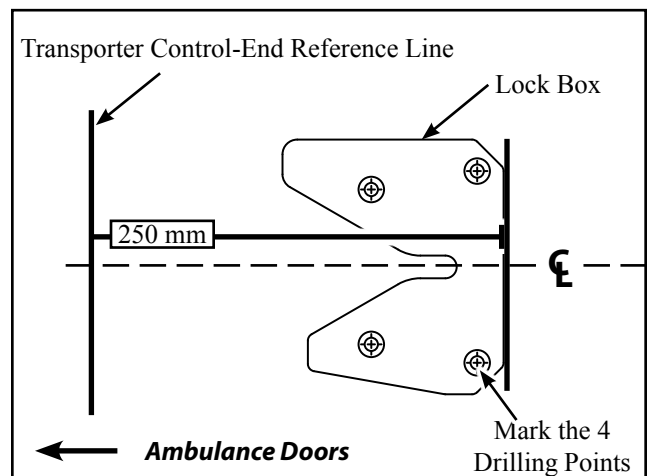
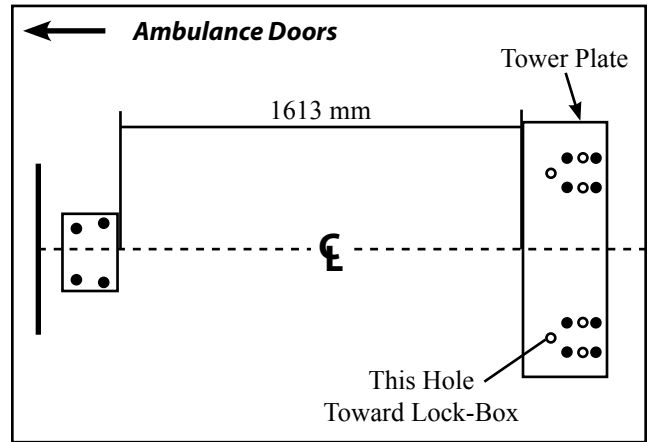


Figure 5 - Marking the Lock-Box Mounting Points

**MEASURING AND MARKING THE TOWER PLATE MOUNTING HOLES**

1. Beginning from the flat edge at the forward end of the lock box, measure 1613 mm (63.505") along the Centerline and mark a point for the large tower plate (Figure 6).
2. Center the tower plate on the Centerline and with the hole pattern as shown in Figure 6.
  - There are two sets of seven holes in a pattern on the tower plate; one hole is separate from a rectangle of six holes and is closer to the long side of the plate. Position the plate with the two separate holes toward the lock box (Figure 6).
  - The ends of the plate on one side have a slight ramp designed for the transporter wheels. These ramps should face up.
  - The six holes designed for mounting the plate to the towers are countersunk. The countersunk-side of the plate should face down (toward the floor).
3. The black dots in Figure 6 represent the mounting holes. The mounting holes are the eight holes that are **NOT** countersunk in the tower plate. The white dots represent the six (smaller) countersunk holes used to mount the plate to the towers. **Mark only the eight mounting holes on the floor, table or tray.**
4. Verify the accuracy of your measurements before proceeding with the installation.
  - Re-measure the distance between the lock box and tower plate and verify both are positioned correctly.
  - Set the lock box and one tower in their marked positions and set the rail in its place. If there is interference between the rail and lock box, the measurements are incorrect.

**Note:** The four mounting points for the fastener rails will be determined as the fastener is set in place.



**Figure 6 - Measuring and Marking the Tower Plate Mounting Points**

**Important**

Verify the accuracy of your measurements before installing the fastener to assure a proper installation and avoid damage to the tray, table or ambulance floor from incorrectly-drilled mounting holes.

## 6.7 Assembling the Fastener

### ATTACHING THE STUDS TO THE TOWERS

Items needed:

Tower	2
Studs	8
Vise Grips	May be needed
Acetone/Loctite® primer (not provided)	Small amount
Loctite® 271™ (Red)	Small amount

1. Clean all eight studs with acetone or Loctite® primer before use.
2. Apply 2-3 drops of red Loctite® 271™ (provided) to coat **approximately half** the threads of each of the eight mounting studs.
3. Hand-thread the stud-end with Loctite® into one of the four mounting holes in the base of each tower (Figure 7).
4. If the stud cannot be hand-tightened, use vise grips with a piece of cloth placed over the jaws to gently grip the center of the stud; thread the stud using the vise grips.
5. Repeat Steps 3 and 4 until all eight studs are threaded into the large mounting holes in the base of the towers (Figure 7).
6. Measure the length of the studs after installation. Verify that only 35 mm-41 mm (1-<sup>3</sup>/<sub>8</sub>-1-<sup>5</sup>/<sub>8</sub>" ) of each stud is visible. Tighten as needed.
7. Wipe off excess Loctite®.

### ATTACHING THE PLATE TO THE TOWERS

Items needed:

Tower with Studs	2
Tower Plate	1
M6x1x16 Flat Head Screw	6
4 mm Hex Key (Allen Wrench, Not Provided)	1
Loctite® 271™	Small amount
Acetone/Loctite® Primer (Not Provided)	Small amount

1. Clean the six M6x1x16 flat head screws with acetone or Loctite® primer (not provided) before use.
2. Apply 2-3 drops of red Loctite® 271™ (provided) to coat the threads of the screws.
3. Fit the plate over the eight tower studs, matching the hole pattern in the plate with the hole pattern in the towers (Figure 8) Reminder: the ramp-side of the plate faces up (toward the towers) and the countersunk holes face down (away from the towers).
4. Using a 4 mm hex key and the six prepared screws, attach the plate to the towers (Figure 8). Completely tighten the screws.
5. Wipe off excess Loctite®.

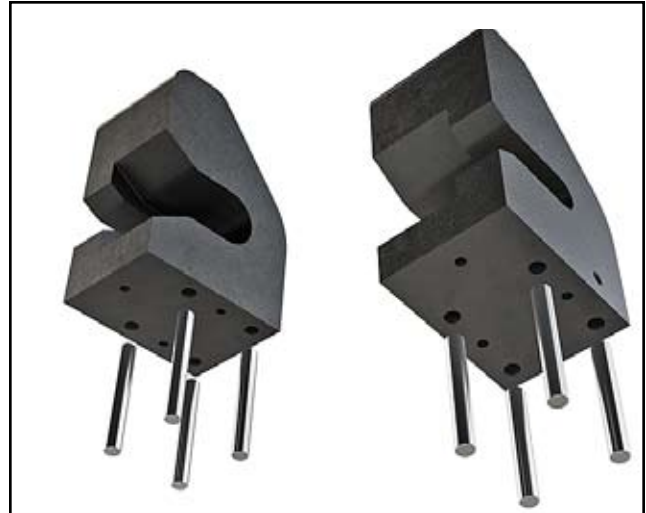


Figure 7 - Attach the Studs to the Towers

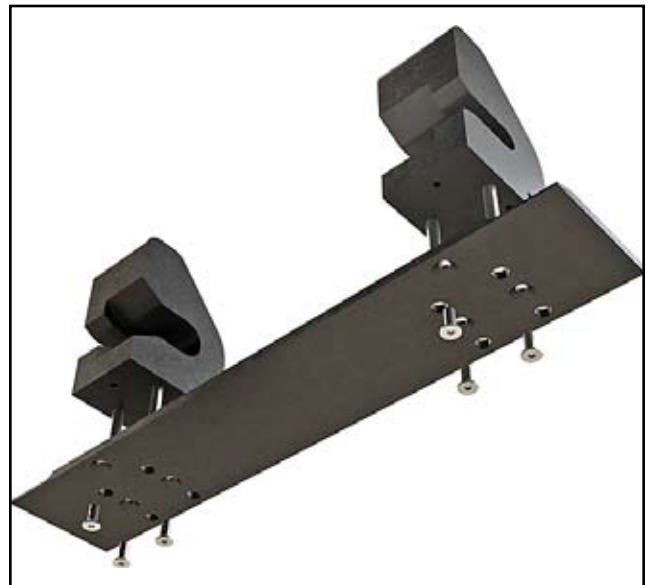


Figure 8 - Attach the Plate to the Towers



**ATTACHING THE CROSSBAR**

*Items needed:*

Tower Assembly	1
Crossbar	1
M6x1x16 Flat Head Screw	8
4 mm Hex Key (Allen Wrench, Not Provided)	1
Loctite® 271™	Small amount
Acetone/Loctite® Primer (Not Provided)	Small amount

1. Clean the eight M6x1x16 flat head screws with acetone or Loctite® primer (not provided) before use.
2. Apply 2-3 drops of red Loctite® 271™ (provided) to coat the threads of the screws.
3. Position the crossbar with the countersunk holes facing upward (Figure 9).
4. Using a 4 mm hex key, attach the eight screws and crossbar to the towers (Figure 9). Completely tighten the screws into the countersunk holes.
5. Wipe off excess Loctite®.



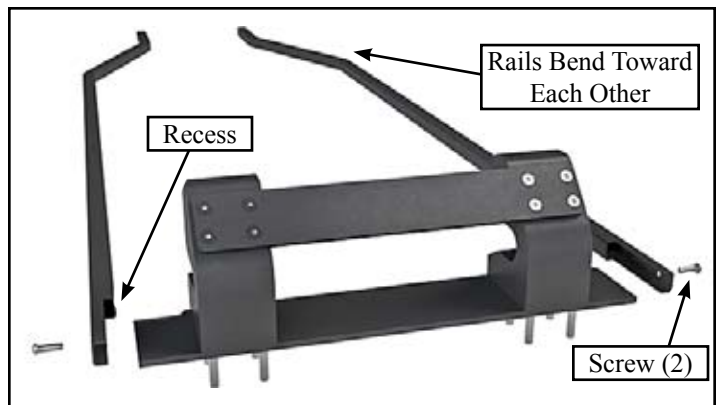
**Figure 9 - Attaching the Crossbar**

**ATTACHING THE RAILS**

*Items needed:*

Tower Assembly	1
Rail	2
M6x1x20 Button Head Screw	2
4 mm Hex Key (Allen Wrench, Not Provided)	1
Loctite® 271™	Small amount
Acetone/Loctite® Primer (Not Provided)	Small amount

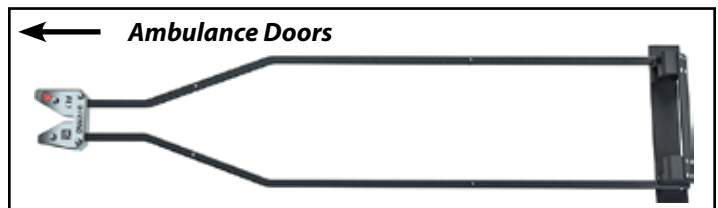
1. Clean the two M6x1x20 button head screws with acetone or Loctite® primer (not provided) before use.
2. Apply 2-3 drops of red Loctite® 271™ (provided) to coat the threads of the screws.
3. Using a 4 mm hex key, attach the rails to the side of the towers (Figure 10). Orient the rails with the recessed area against the side of the tower and with the bends in the rail facing inward, toward the Centerline. Completely tighten the screws.
4. Wipe off excess Loctite®.



**Figure 10 - Attaching the Rails**

**CHECKING THE FASTENER SETUP**

1. Verify that the tower assembly and lock box are sitting on the marks you made in *Marking the Ambulance Floor, Table or Tray* on pages 14 and 15.
2. Verify the rails can be mounted to the ambulance floor, table or tray without interfering with the lock box.
  - o The rails should abut the lock box, or have a small gap between the end of the rails and the lock box.
  - o If the gap between the lock box and rail-ends is more than 25 mm (1"), **or** if the rails interfere with the lock-box placement, re-measure and mark the floor, table or tray for the fastener installation.



**Figure 11 - Top-Down View of Fastener**

## 6.8 Drilling the Holes and Installing the Backing Plates

### ATTACH THE LOCK BOX TO THE FLOOR

Items needed:

Drill with 3 mm and 10 mm size bits	1
Backing plate 165 mm x 102 mm x 6 mm	1
Backing plate 406 mm x 114 mm x 6 mm	1
Welding equipment	as needed

1. Before drilling, inspect under the ambulance floor, table, or tray for obvious obstructions to the installation. Contact the ambulance manufacturer:
  - if the fuel tank, oxygen lines, or other elements are in the way of the installation
  - for information about the ambulance warranty
  - to make sure the backing plates can be installed without interference and welded safely
2. Cautiously drill a small starting hole (or pilot hole) through the floor or tray at each mounting point, using a 3 mm (1/8") diameter drill bit.
3. Align backing plates with the holes. Use backing plates at least the size of those specified in *Backing Plate Specifications* on page 19. Increase the size of the backing plates as needed so that they can be welded to significant structural members of the ambulance.
4. Weld the backing plates beneath the lock-box and tower-mounting points (Figure 12), using a full penetration weld.
5. Using the guide holes, drill completely through the ambulance floor, table, or tray, and the backing plates, using an 10 mm drill bit.

#### Important

Inspect the underside of the ambulance for anything (wiring, brake lines, fuel tank, oxygen lines or other elements) that might interfere with the installation.

#### WARNING

**A fastener installed without backing plates can fail in a crash. Use properly installed backing plates to secure the fastener at its mounting points.**

#### WARNING

**Improperly installed backing plates can fail in a crash. Secure the backing plates to primary structural members of the ambulance.**

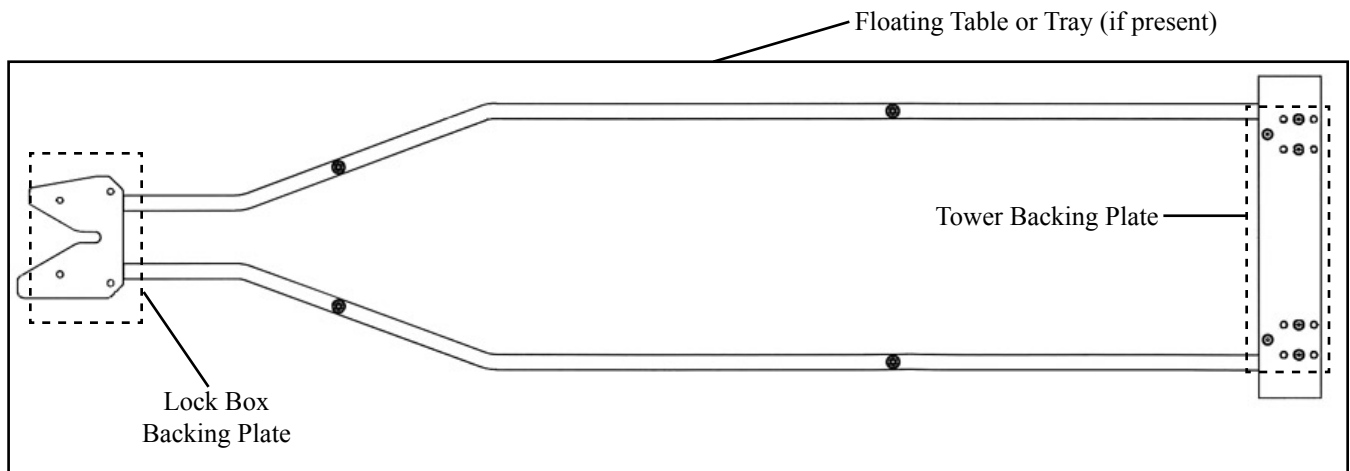
#### Important

The fastener is designed to be installed with backing plates welded to rigid structural frame members beneath the lock-box and tower-mounting points.

If the ambulance does not have the required backing plates, install backing plates as instructed in this manual. Consult the ambulance manufacturer for assistance.

**Important:**  
**Backing Plate Specifications**

- Use A36 grade steel, 6061-T6 grade aluminum, or equivalent for backing plates under the lock box and towers. You do not need to use backing plates under the rail mounting points.
- Use the following size backing plates (minimum). Increase the size of the backing plates as needed so they can be welded at both ends to a rigid structural frame or structural reinforcement.
  - **Lock Box:** 165 mm x 102 mm x 6 mm (6.5"x4"x ¼")
  - **Towers:** 406 mm x 114 mm x 6 mm (16"x4.5"x¼")
- When welding the mounting plates, use a full penetration weld to secure the mounting plates to the rigid structural frame or reinforcement. Spot-welding is not sufficient for a quality installation.
- If mounting to an ambulance tray, the tray must be at least 1.75 mm thick.



**Figure 12 - Backing Plate Placement**

## 6.9 Mounting the Fastener

### ATTACH THE LOCK BOX TO THE FLOOR

Items needed:

Lock Box	1
M8x1.25x70 Flat Head Screw	4
.313" SAE (.688"x.344"x.063") Washer	4
M8 Center Lock Nut	4
5 mm Hex Key (Allen Wrench, Not Provided)	1
13 mm Crescent or Socket Wrench	1

1. Position the lock box with its mounting holes aligned with the holes in the floor (Figure 13).
2. Insert four M8 flat-head screws through the lock box; the floor, table or tray; and the backing plates. Use the provided screws or longer screws if needed (see *Items Supplied and Required*, page 12).
3. From beneath the ambulance floor or tray, place a .313" flat washer on a screw and then use a 5 mm hex key and 13 mm crescent or socket wrench to begin threading an M8 center lock nut onto the screw but do not finish tightening the lock nut.
4. Repeat Step 3 for all four mounting points. Do not finish tightening the nuts.

**Note:** The screws must extend beyond the nuts a **minimum** of 19 mm when completely tightened later (See *Securing the Fastener*, page 21). Use longer screws if needed.

### MOUNTING THE TOWERS

Items needed:

Tower Assembly	1
.313" SAE (.688"x.344"x.063") Washer	8
M8 Center Lock Nut	8
13 mm Crescent or Socket Wrench	1

1. Align the tower assembly over the mounting holes in the ambulance floor, table, or tray.
2. Insert the eight studs through the floor, table or tray and the backing plate.
3. From beneath the ambulance floor, table or tray, place a .313" flat washer on a stud, then use a 13 mm crescent or socket wrench to thread a M8 center lock nuts onto the stud but do not finish tightening the nut (Figure 14).
4. Repeat Step 3 for all eight mounting points. Do not finish tightening the nuts.
5. Use the studs provided, or use your own, longer screws if needed (see *Items Supplied and Required*, page 12).

**Note:** The studs must extend beyond the nuts a **minimum** of 19 mm when completely tightened later (See *Securing the Fastener*, page 21). Use longer screws if needed.



Figure 13 - Mounting the Lock Box



Figure 14 - Mounting the Towers

**MARKING THE RAIL-MOUNTING POINTS  
AND SECURING THE FASTENER**

Items needed:

Assembled FL1 Fastener	1
M6x1x60 Button Head Screw	4
Nylon Spacer	4
¼" Metal Washer	4
M6 Center Lock Nut	4
Drill with 6.5 mm bit	1
4 mm Hex Key (Allen Wrench, Not Provided)	1
10 mm Crescent or Socket Wrench	1

After the fastener is in place on the ambulance floor and all screws are partially-tightened:

1. Locate the rail-bolt mounting points (Figure 15).
2. Refer to the measurements in Figure 15. Do not flex the rails away from one another or squeeze them together. The rails should rest at about the measurements indicated. Use a marker, pen, or other device to mark the four mounting points on the ambulance floor.
3. Carefully drill through the ambulance floor, table or tray at each rail mounting point using a 6.5 mm drill bit.
4. Slide a nylon spacer (supplied) between the rail and the ambulance floor, table, or tray.

5. Insert a M6x1x60 button head screw through the rail, nylon spacer, and the floor, table, or tray at each mounting point.
6. Place a ¼" flat washer on each M6x1x60 screw and then use a 5 mm hex key and 10 mm crescent or socket wrench to thread an M6 center lock nut at each mounting point. You do not need to use backing plates at the rail mounting points.

**Note:** Do not overtighten the bolts - excessive force on the rails can damage them.

7. Finish tightening **ALL** mounting hardware for the lock box, towers, and rails.

**6.10 Testing the Fastener**

Load a Ferno® Mondial™ or EFX transporter into the fastener, following the instructions in the transporter users' manual and the instructions in *Using the Fastener*, page 8.

Inspect the fastener for proper locking and unlocking of the transporter, as well as secure mounting to the floor, table, or tray. When the installation passes the test, the fastener may be placed in service.

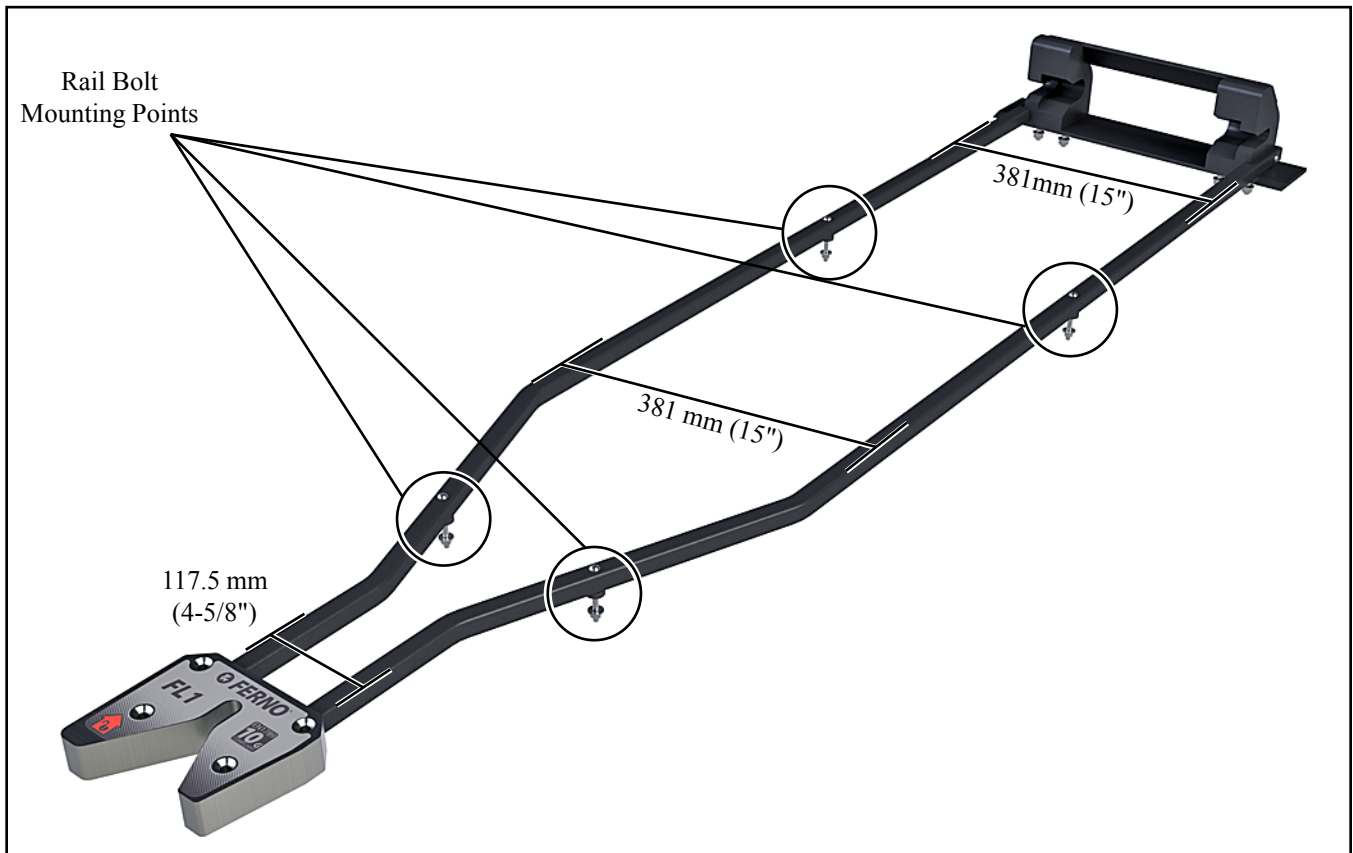


Figure 15 - Securing the Rails

## 7 - PARTS AND SERVICE

### 7.1 Service - Worldwide

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



#### WARNING

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



#### WARNING

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

<b>TRAINING RECORD</b>		
<b>Date</b>	<b>Name</b>	<b>Training Method</b>

<b>MAINTENANCE RECORD</b>		
<b>Date</b>	<b>Maintenance Performed</b>	<b>By</b>