

## Description

The Ferno® Universal Stair Chair Fastener is designed to secure a compatible chair to the wall of an ambulance or building. Refer to the list of compatible products below.

- 056-7086 Universal Stair Chair Fastener
- 056-7087 Universal Stair Chair Fastener (ICS® Ready)

Both models feature an adjustable lock handle and adjustable wheel blocks. Two plastic-buckle restraints are included. Installation instructions are the same for both models unless otherwise noted.

### Compatible Products

Ferno® Transcend™ Series (excluding Evacuation Chair)

Ferno® EZ-Glide® Series

Ferno® Venice Series

Ferno® FAST Chair Series

Stryker® Stair PRO® \*

### Kit 056-7087 Charging Requirements

Compatible	Not Compatible
✓ Ferno® Transcend™ Series Chair	✗ 59T EZ-Glide® Series Chairs
✓ Transcend Serial Number 23C-194167 or higher	✗ Transcend Serial Number below 23C-194167
✓ Ferno® Battery	✗ Milwaukee® Battery **
✓ Ferno® ICS® kit 056-7082	
✓ 12 VDC Source Power	




\* Stryker® and Stair-PRO® are trademarks of Stryker Corporation, Kalamazoo, MI, USA.

\*\* Milwaukee® is a trademark of Milwaukee Electric Tool Corporation, Brookfield, WI, USA

## SAFETY INFORMATION

### Warning

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

 **WARNING**

**Improper charging can cause injury or damage. Do not charge Milwaukee-brand batteries. Charge only Ferno batteries in a Ferno Transcend series chair.**

**Improper installation can cause injury. Mount the product following the guidelines and instructions in this manual.**

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

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

**Attaching improper items can cause injury. Secure only Ferno-approved, compatible products in the product.**

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

### Notice

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

**NOTICE**

Improper installation can cause damage to the fastener and/or chair. Mount the fastener only as described in this manual.

Do not reuse screws, bolts, nuts, or fasteners. Always use new fasteners when installing parts or making repairs.

### Bloodborne Disease Notice

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








### Compliance

When properly installed and maintained as instructed in this manual, the Universal Stair Chair Fastener meets the following global specifications and standards.

- **Medical Device Directive:** Ferno products meet the requirements of the European Medical Device Directive 93/42/EEC as established by the European Union.
- **EN 1789 Standard:** European vehicle, fastening system, and crash-test standard.
- **Ontario, Canada:** Ontario Land Ambulance Standard; Section 20.1 Main Cot Retention.
- **U.S.A. SAE:** Society of Automotive Engineers SAE J3043 Recommended Practice.
- **U.S.A. KKK-A-1822:** The fastener is for use with ambulances that meet the requirements of the "Star of Life" certification via Federal Ambulance Specification KKK-A-1822.
- **U.S.A. AMD:** Ambulance Manufacturer's Division (AMD) of the National Truck Equipment Association Standard 004.
- **IP56:** Ingress Protection rating. Tested in compliance with dust and water infiltration standards.

### Symbol Glossary

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

Symbol	Definition
	General warning of potential injury
	Read the users' manual (ISO 7000)
	Read the users' manual (ISO 3864)
	Positive electrical charge
	Negative electrical charge
	Lock
	Unlock

## INSTALLING THE FASTENER

### Mounting Guidelines

Use the guidelines here to mount the Universal Stair Chair Fastener inside an ambulance or other motor vehicle. The fastener must be mounted in an upright position.

- **SAE J3043:** Installation requires a backing plate permanently attached to the mounting surface substructure. Stainless steel fasteners must be used to mount the fastener to the mounting surface and backing plate.
  - Backing plates must be large enough to attach to multiple vehicle structural frames or structural reinforcements.
  - Backing plates must be at least 3.0 mm (1/8") thick, with a minimum yield strength of 137 MPa (20,000 psi). Refer to the sample list of acceptable materials at right.
  - Screws must be button-head hex drive, passivated 18-8 stainless steel, M6 x 1 mm thread, long enough to pass through the fastener, mounting surface, backing plate, and be properly seated in the rivet nuts.
  - Rivet nuts must be 18-8 stainless steel heavy-duty, M6 x 1 internal thread, and should be sized to the rivet nut manufacturer's specification for the thickness of the installed backing plate.
- **Mounting Location:** Select a mounting location that is clean, dry, and away from direct heat sources or elements that generate heat.
- **Mounting Surface:** Select a flat mounting surface with a proper backing plate to support the fastener under all conditions of use.
- **Before Installation:** Check behind the mounting location for anything (wiring, oxygen lines, etc.) that might interfere with the installation. If installing inside an ambulance without access to the area behind the mounting surface, contact the ambulance manufacturer for guidance.
- **Fastener with Integrated Charging System (ICS):** Determine a mounting location that best allows the fastener to connect to power and allows cables to be routed without becoming crimped, stepped on, pinched, or posing a tripping hazard. Confirm cables adequately reach the required connection points. Refer to publication 234-3846.
- **Fasteners:** It is the responsibility of the installer to select appropriate mounting points and fasteners that are strong enough to support the fastener and chair under all conditions of use.

Dimensions	Imperial	Metric
Height	37.5"	950 mm
Width	24"	607 mm
Depth	11.75"	300 mm
Weight (Fastener Only)	22 lb	10 kg
Weight (Fastener with ICS)	27 lb	12.2 kg

Parts Required (Not Supplied)	Qty.
Backing Plate (3.0 mm minimum thickness) Material examples: • Aluminum (5052-H32, 6061-T6 or 7075-T6) • Stainless steel (300 Series) • Carbon steel A36, A1008, A1011, or A1018.	1
Button-Head Hex Screw (Passivated 18-8 Stainless Steel, M6x1 mm Thread).	12
18-8 Stainless Steel Heavy-Duty Rivet Nut, M6 x 1 Internal Thread	12

\* Refer to "Mounting Guidelines" at left

Tools Required	Qty.
Drill with 5 mm bit	1
Marker, pen, or similar to mark drilling points	1
Hex wrenches: 2.5 mm, 4 mm, 5 mm	1
Open-end wrench, 10 mm	1

## WARNING

Improper installation can cause injury. Mount the product following the guidelines and instructions in this manual.

## Marking the Mounting Surface

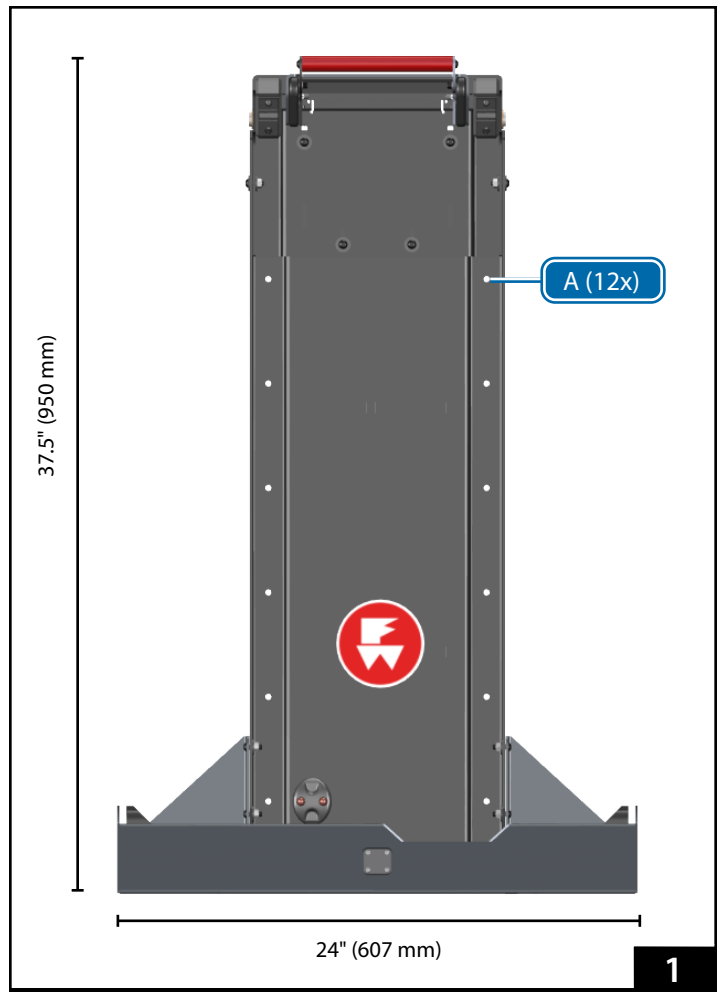
It is the responsibility of the installer to select an appropriate mounting location that is strong enough to support the fastener and attached chair under all conditions of use. Refer to the Mounting Guidelines on page 2.

1. Place the fastener at the proposed installation point. Use the overall dimensions shown in Figure 1, plus additional clearance as needed to operate the fastener and allow the chair to be secured and removed.
2. Using the fastener as a template, mark the 12 mounting points (A) on the wall (Figure 1).

## NOTICE

The installer must select an appropriate mounting location and fasteners that will support the chair and fastener under all conditions of use. Refer to the table on page 2. Select fasteners of appropriate grade (hardness) and length. Use additional support if needed.

Use care to install the fastener level.



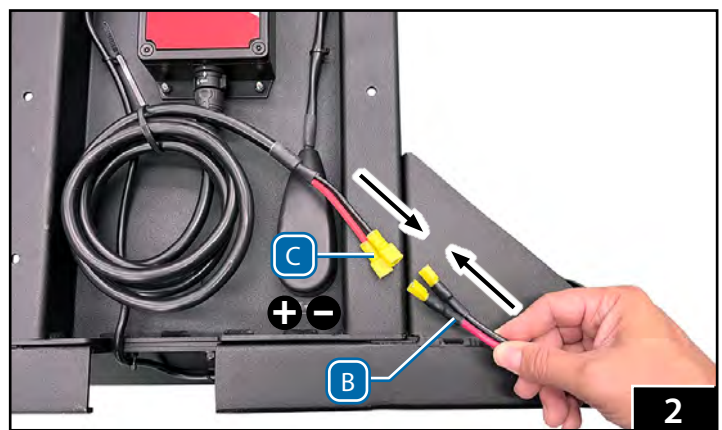
## Connecting the ICS (056-7087 Only)

ICS kit 056-7082 (not included, available separately) contains an ICS supply cable to connect the ICS-ready fastener to ambulance power. Refer to publication 234-3846 to install the ICS supply cable.

1. Test the power to the ICS supply cable before connecting the cable to the fastener. Using a voltmeter, place the positive (+) probe on the red wire contact and the negative (-) probe on the black wire contact. Confirm the power is supplied is nominal 12.8-15.6VDC. If there is no power, confirm the power to the supply cable circuit is ON, or the ambulance ignition is ON. If the power is incorrect, inspect your connections. Refer to the ICS manual for troubleshooting assistance.
2. Confirm the split grommet provided with the ICS kit is installed in the access hole in the wall or floor.
3. Connect the ICS supply cable (B) to the charger input cable (C) connected to the charger on the rear of the fastener. Always match wire colors: red (+) to red (+) and black (-) to black (-), (Figure 2). Confirm each connector is properly seated.

## WARNING

Improper charging can cause injury or damage. Do not charge Milwaukee-brand batteries. Charge only Ferno batteries in a Ferno Transcend series chair.



## Mounting the Fastener

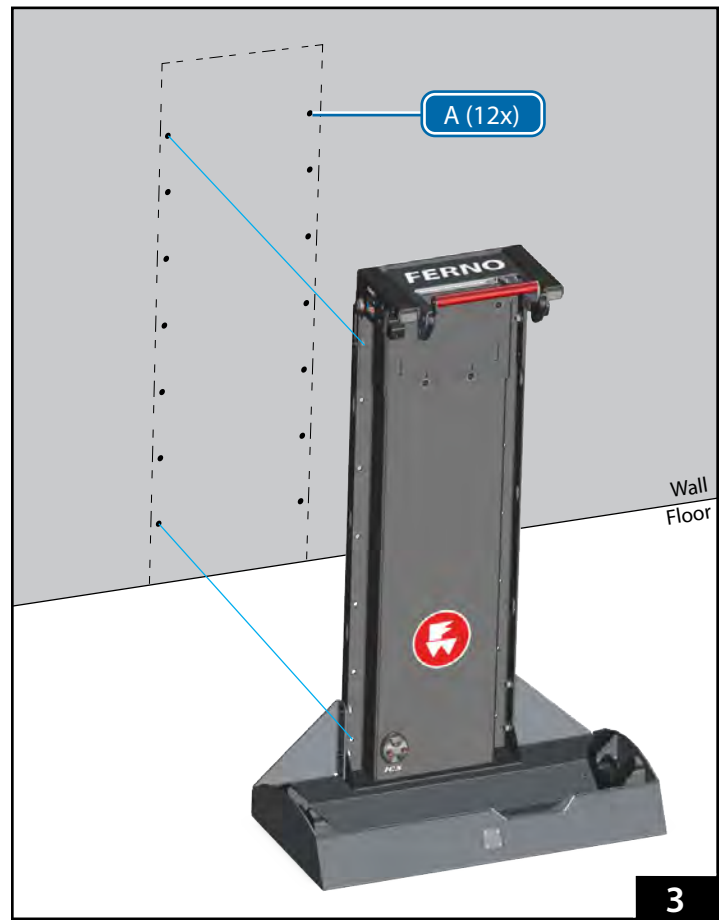
Before drilling into the wall, do the following:

- Inspect for oxygen, brake, fuel lines, or other elements that might interfere with the installation.
  - Inspect and verify the required backing plates can be installed without interference.
  - Consult the ambulance manufacturer for ambulance structural details and ambulance warranty information.
1. Drill a 1/8" (3 mm) pilot hole through the wall at each mounting point (A, 12 total). Pilot holes will allow you to properly align the backing plates and confirm that the installation will not interfere with other ambulance elements.
  2. As required, install backing plates to meet all government regulations for the country in which the fastener will be used.
  3. At each guide hole, drill completely through the wall (and backing plates) using a 5 mm drill bit (Figure 3).
  4. Attach the fastener to the wall using the required button-head hex screws and rivet nuts at each mounting point (A, 12 total, Figure 3).

## NOTICE

Inspect behind the wall for anything (fuel tank, wiring, brake lines, fuel lines, oxygen lines or other items) that might interfere with the installation.

Confirm there is sufficient clearance around the fastener to allow the chair to be moved into and out of the fastener.



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## Adjusting the Fastener

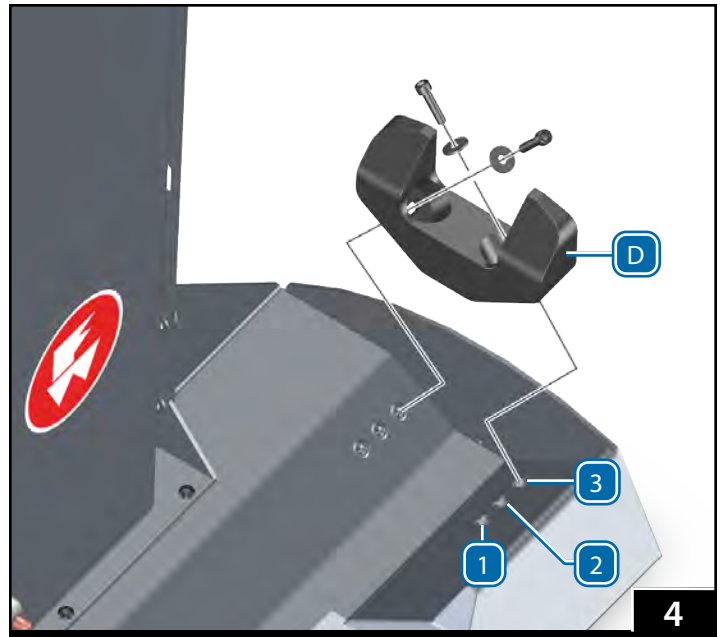
Place the folded chair in the fastener. See "Securing the Chair in the Fastener" on page 10. As needed, adjust the height of the fastener and/or wheel blocks.

### POSITIONING THE WHEEL BLOCKS

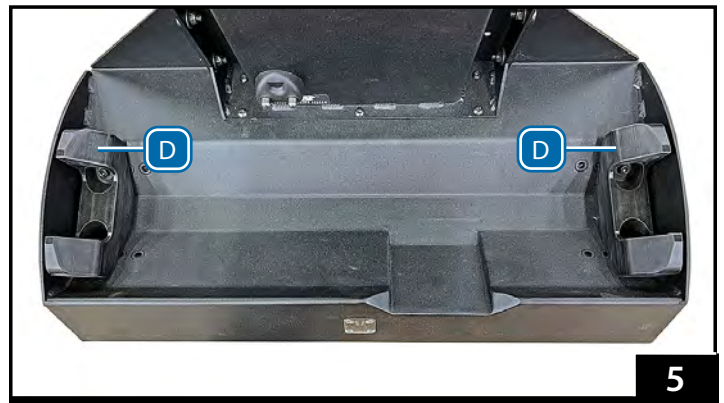
Wheel blocks (D, Figure 5) help hold the chair in place when it is secured in the fastener. Three mounting points are available to suit a variety of compatible chairs. The wheel block mounting holes are slotted to allow additional adjustment so the assigned chair fits snug in the fastener.

Refer to the table below and Figure 4 for the recommended initial position. Install both wheel blocks at a matching position. Position 3 (Ferno Transcend, EZ-Glide, or Venice Series Chairs) is shown in Figure 5.

To adjust or change the position of wheel blocks, use a 5 mm hex wrench to remove the two M6 screws and washers from each block. Re-install the blocks at an alternate position.



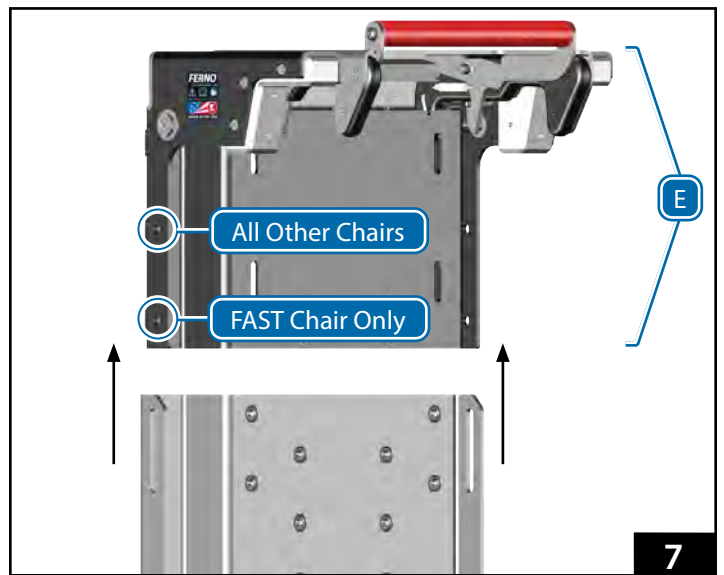
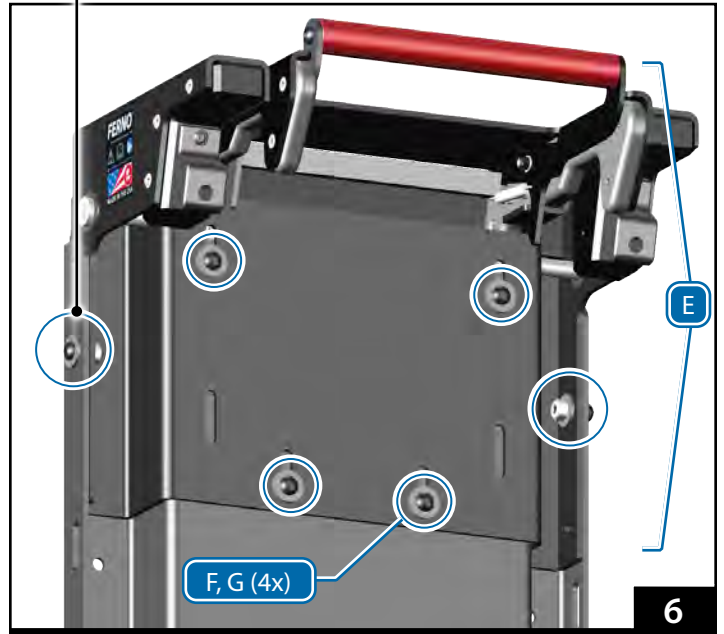
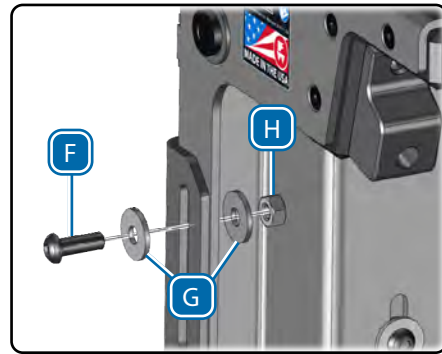
Compatible Chairs	Position
Ferno Transcend Series	3
Ferno EZ-Glide Series	3
Ferno Venice Series	3
Ferno FAST Chair Series	1
Stryker Stair PRO	2



## SETTING THE INITIAL POSITION OF THE LOCK HANDLE ASSEMBLY

The lock handle assembly (E, Figure 6) adjusts up and down to suit various chairs. To adjust the handle assembly:

1. Using a 4 mm hex wrench and 10 mm open-end wrench, remove the M6 screw (F), two washers (G) and locking nut (H) at the side of the fastener (Figure 6). Note: a washer is on each side of the upper handle mount.
2. Repeat Step 1 at the opposite side of the fastener.
3. Use a 4 mm hex wrench to remove the four M6 screws (F) and washers (G) from the fastener front (Figure 6).
4. Slide the lock handle assembly (E) up until both side mounting holes are visible. The Ferno FAST Chair uses the lower set of mounting holes (Figure 7). All other compatible chairs use the upper set of mounting holes.
5. Place one washer (G) on an M6 screw (F).
6. Lower the lock handle assembly onto the base unit. While holding the assembly in position, insert an M6 screw with washer through the proper mounting hole (lower set for the Ferno FAST Chair, upper set for all other compatible chairs, Figure 7).
7. Place a second washer (G) on the M6 screw, then loosely attach the screw using a 4 mm hex wrench, 10 mm open wrench, and a locking nut (H), as shown in the Figure 6 insert. Do not finish tightening the screw and locking nut.
8. Repeat Steps 5-7 to install the screw and washers on the opposite side of the fastener.

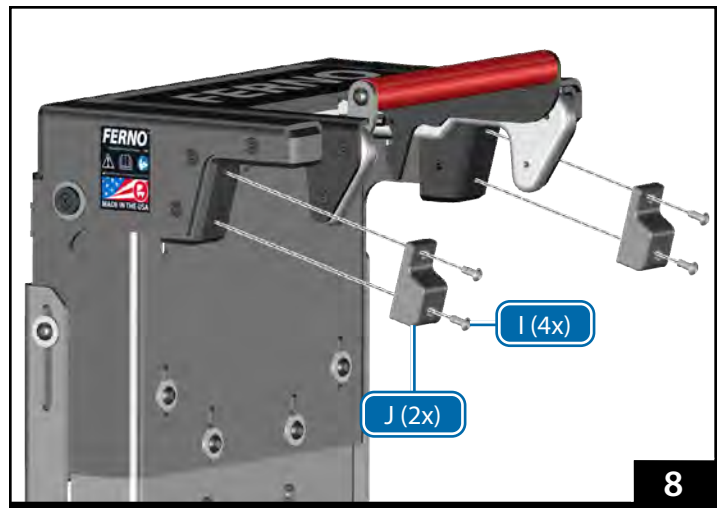


# Universal Stair Chair Fastener

## DETERMINE IF BUMPERS WILL BE USED

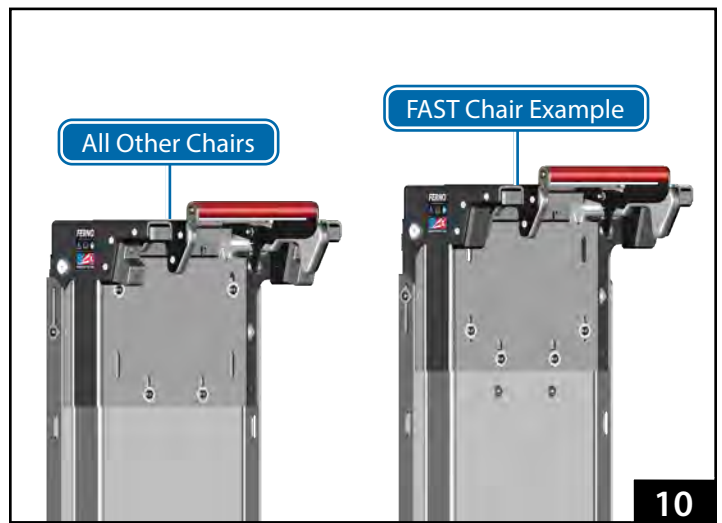
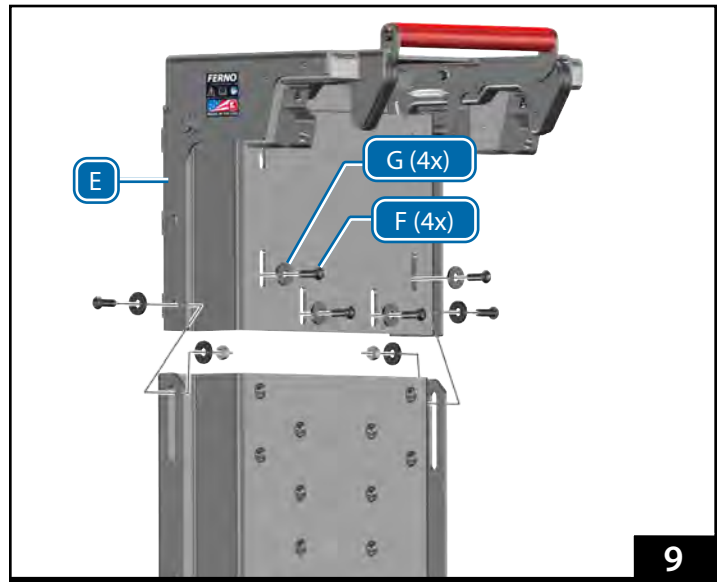
Bumpers are installed inside the lock handle and are designed to help hold the chair upper lift bar when the chair is locked in the fastener. Not all chairs require the bumpers.

1. **Ferno FAST Chair, Ferno 59T EZ-Glide Chair Only:** Use a 2.5 mm hex wrench to remove the four M4 x 10 screws (I) from the bumpers (J). Set aside these parts. Confirm the chair fits the fastener before discarding parts (See "Test the Chair In the Fastener" below).
2. Do not remove the bumpers if pairing any other compatible chair in the fastener.



## TEST THE CHAIR IN THE FASTENER

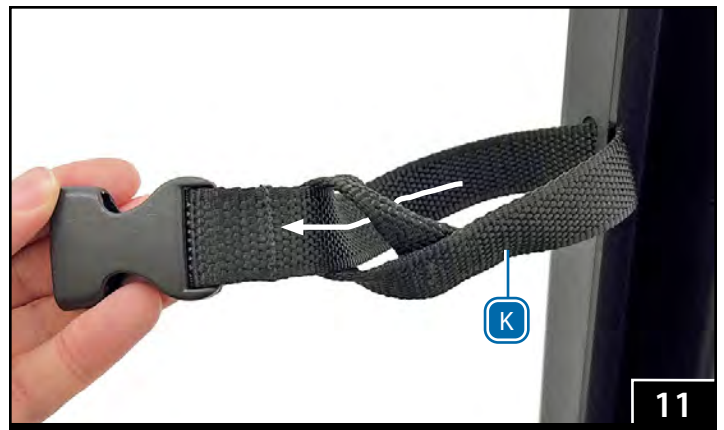
1. Place the chair in the fastener (See Steps 1-4 of "Securing the Chair in the Fastener" on page 10). Raise or lower the lock handle assembly (E) to fit the chair into the lock handle.
2. Confirm the lock handle assembly closes completely over the chair lift bar, without excess space. If there is excess space, re-install the bumpers if you removed them.
3. Confirm the chair fits snug in the fastener at both the top and bottom of the chair. Adjust the wheel blocks and/or lock handle as needed.
4. When the adjustment is complete, remove the chair from the fastener.
5. Place one washer (G) on each of the four M6 screws (F). Using a 4 mm hex wrench, install each screw and washer to the front surface of the fastener (Figure 9 and Figure 10). Note: there are two sets of mounting points. Use the set that have rivet nuts to accept the screws behind the lock handle assembly (E).
6. Using the 4 mm hex wrench and 10 mm open end wrench, completely tighten the side screws and nuts.





## Attaching Restraints

1. Unbuckle the restraint and separate the straps.
2. Insert the restraint loop (K) of one half of a restraint through the selected attachment point on the fastener, then pass the buckle through the loop (Figure 11).
3. Pull the buckle and webbing through the loop (K) until the loop is snug around the attachment point.
4. Repeat Steps 2 and 3 to attach the other half of the restraint to the selected attachment point on the opposite side of the fastener.
5. Repeat Steps 1-4 to attach the second restraint.
6. Confirm all straps are attached securely.



## Removing Restraints

To remove the restraint from the fastener, first unbuckle it. Then, feed the buckles backward through the loops and remove the straps from the fastener.

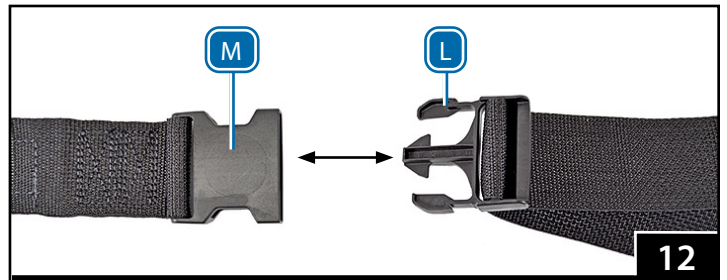
## Using Restraints

To buckle the restraint, insert the prongs of the male buckle (L) into the female buckle/receiver (M) until it locks into place (Figure 12). Always confirm that the buckle is securely fastened.

To unbuckle the restraint, squeeze the outer prongs of the male buckle/tang (L) until they release the female buckle/receiver (M) and separate the straps (Figure 12).

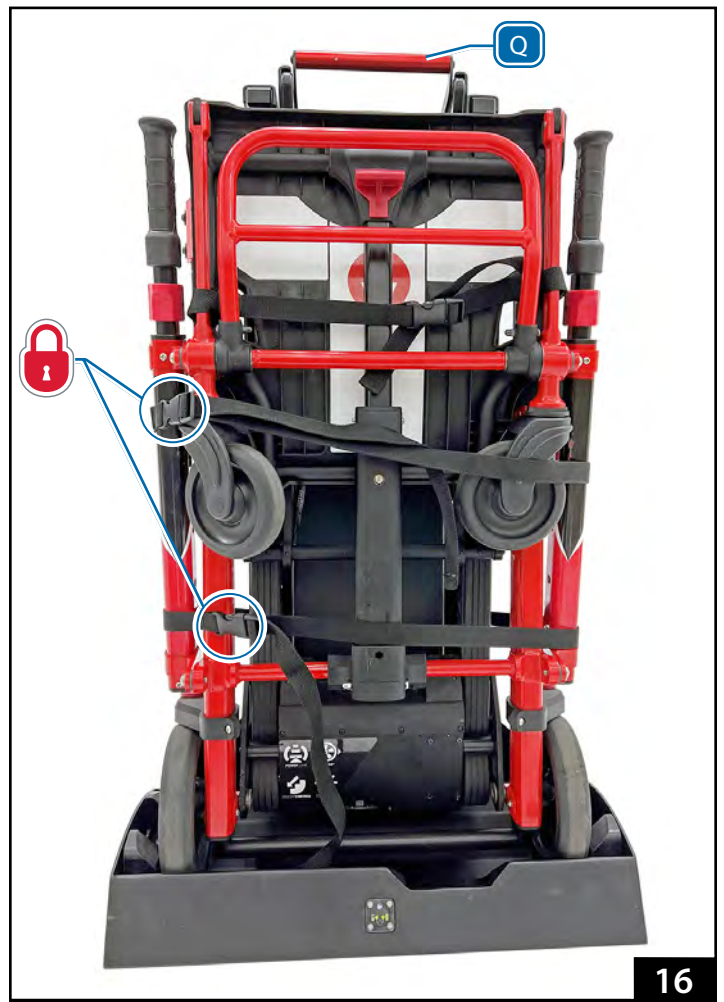
To lengthen a strap (Figure 13): Unbuckle the restraint, then grasp the buckle (L) and turn it perpendicular to the webbing. Pull the buckle outward, away from the strap attachment point until the strap is the desired length (Figure 13).

To shorten a strap: Grasp the hemmed tab (N, Figure 13) and pull the webbing through the buckle (L) until the strap is the desired length.



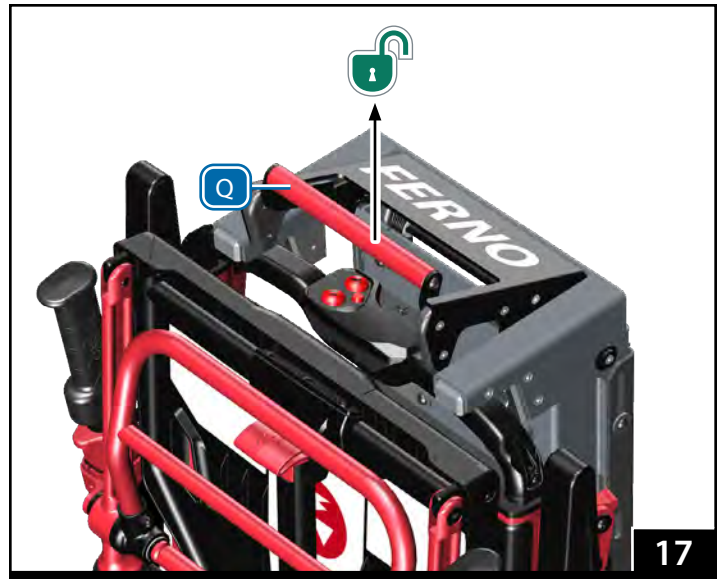
## Securing the Chair in the Fastener

1. Fold and lock the chair in its storage position. For instructions, refer to the chair users' manual.
2. With the chair backrest toward the fastener, roll or set the chair's rear wheels (O) between the fastener wheel blocks (Figure 14).
3. Firmly push the chair lift bar (P) into the fastener top bracket until the fastener lock handle (Q) locks over the lift bar (Figure 14, Figure 15).
4. Confirm the chair is locked in the fastener by attempting to pull the chair away from the fastener without activating the lock handle (Q).
  - o The chair wheels should be contained by the wheel blocks.
  - o The chair lift bar should be inside the fastener lock handle.
  - o If needed, remove the chair and adjust the wheel blocks and/or lock handle. See "Adjusting the Fastener" on page 6.
5. Adjust and buckle both restraints to secure the chair in the fastener (Figure 16).



## Removing the Chair from the Fastener

1. Unbuckle the two restraints.
2. Lift the red lock handle (Q), tilt the chair forward, and remove it from the fastener (Figure 17 and Figure 18).



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## ⚠ WARNING

Improper charging can cause injury or damage. Do not charge Milwaukee-brand batteries with the ICS. Charge only a Transcend series chair equipped with a Ferno battery. See the table, "Kit 056-7087 Charging Requirements" on page 1.

## Charging a Ferno Battery in a Transcend with PowerTraxx

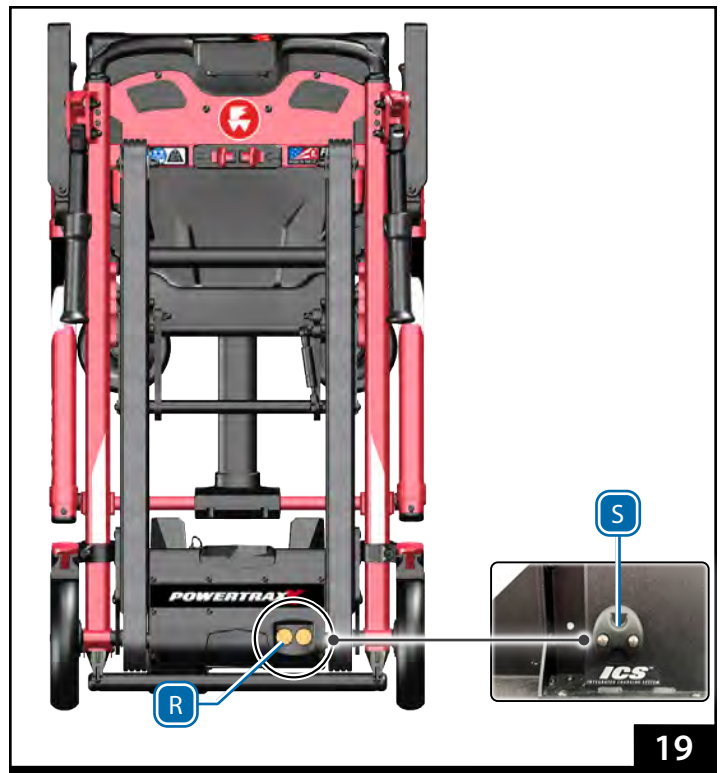
A properly installed and powered Integrated Charging System will recharge the Ferno battery in a 36VDC-powered Ferno Transcend Series Chair when the chair is secured in the fastener.

**Note: The ICS is not designed to charge the Milwaukee-brand battery. Do not charge Milwaukee batteries with the ICS.**

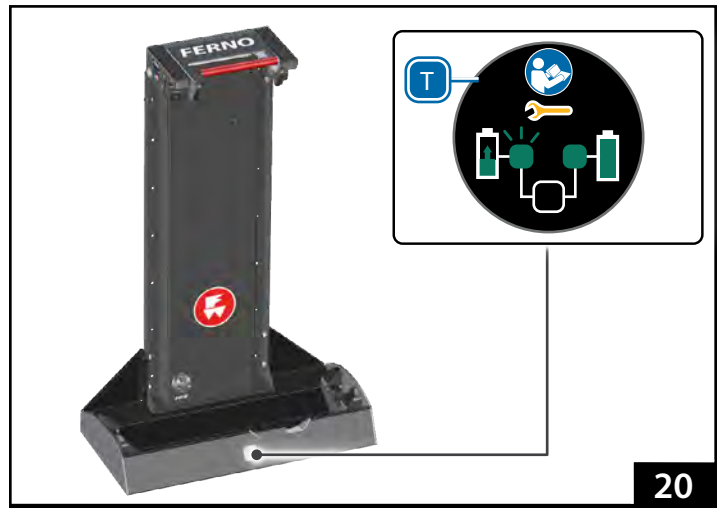
Additional ICS components are required to connect an ICS-ready fastener to ambulance power. Refer to publication 234-3846.

The Transcend with PowerTraxx series chair has flat terminals (R) that compress the charging pins (S) on the fastener (Figure 19) when the chair is locked in the fastener.

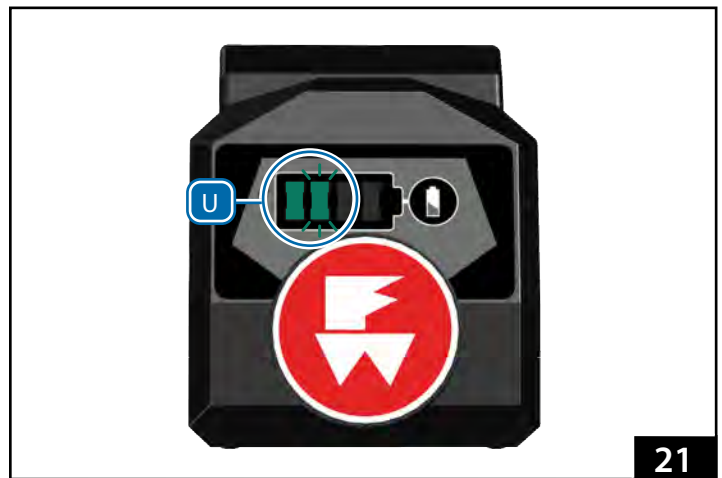
1. Have a qualified person with electrical knowledge install ICS components and connect to ambulance source power. See "Connecting the ICS (056-7087 Only)" on page 4.
2. Confirm the ICS has power (ambulance is connected to shore power or ambulance ignition or switched circuit power ON).
3. Confirm the fastener is mounted securely to the ambulance wall.
4. Load a Transcend with PowerTraxx into the fastener.
5. Check the remote indicator (T) on the fastener (Figure 20).
  - Light flashing: battery charging
  - Light solid: full charge
  - Amber wrench: service required/check connections
6. Check the indicator lights on the Ferno battery (Figure 21). Confirm the battery is being charged.
7. If the battery and/or remote indicator lights do not light, confirm the ICS has power (ignition or switch circuit ON). If needed, remove the fastener from the wall and confirm all cables are correctly connected, per the ICS installation manual. Contact Ferno for assistance. See "Ferno Customer Relations" on page 14.
8. Remove the Transcend with PowerTraxx from the fastener. Confirm the remote indicator lights are OFF.



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## Maintenance Schedule

The fastener requires regular maintenance. Set up and follow a maintenance schedule. The table at right represents minimum intervals for maintenance. When using maintenance products, follow the manufacturers' directions and read the manufacturers' material safety data sheets.

Minimum Maintenance	Each Use	As Needed	Monthly
Disinfecting	•		
Cleaning		•	
Inspecting		•	•

## Disinfecting and Cleaning

### RESTRAINTS

To disinfect, apply disinfectant to all restraint surfaces, following the disinfectant manufacturer's instructions for application method and contact time. Wipe with a clean cloth.

To clean:

1. Remove the restraint from the equipment and buckle it.
2. Place the restraint inside a mesh bag (not provided) and place it in a washing machine.
3. Launder the restraint in warm water, using a disinfectant soap and gentle agitation. Do not use bleach.
4. Remove the restraint from the mesh bag and hang to air dry. Do not put the restraint in a dryer.
5. Attach only dry restraints to the equipment.

### FASTENER

To disinfect, remove the chair from 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.

To clean, first verify that all cords, cables, connectors, etc. are properly connected. Add a mild soap or cleaning solution to warm water, using the recommended dilution. Hand clean all surfaces with warm water and a mild detergent. Rinse with warm, clear water. Dry with a towel or allow the fastener to air-dry.

## Lubrication

The fastener does not require lubrication. Disinfect and clean only.

## Inspecting

Have your service's equipment maintenance personnel inspect the fastener regularly. Follow the checklist at right.

If inspection shows damage or excessive wear, remove the fastener from service until repair is made.

### WARNING

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

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

**Attaching improper items can cause injury. Secure only Ferno-approved, compatible products in the product.**

### NOTICE

Disinfectants and cleaners containing bleach, phenolics, or iodines can cause damage. Do not use products containing these chemicals.

### Inspection Checklist

- Are all components present?
- Are all nuts and bolts securely in place?
- Does the release handle function properly?
- Is the fastener securely fastened to the wall?
- If equipped with ICS, does the fastener charge the battery when a compatible Ferno powered chair is attached?

## Ferno Customer Relations

For assistance or information, please contact your Ferno distributor. If you do not have a Ferno distributor, please contact Ferno Customer Relations at Ferno-Washington, Inc., 70 Weil Way Wilmington, Ohio 45177-9371, U.S.A.

### 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

### OTHER LOCATIONS

Telephone	Country Code +1.937.382.1451
Fax	Country Code +1.937.382.6569
Internet	<a href="http://www.ferno.com">www.ferno.com</a>

## Repairs or Parts

In the United States and Canada, contact EMSAR, the only organization authorized by Ferno to manage, service, and repair Ferno products.



Telephone (Toll-free)	1.800.73.EMSAR
Telephone (Worldwide)	1.937.383.1052
Fax (Worldwide)	1.937.383.1051
Internet	<a href="http://www.EMSAR.com">www.EMSAR.com</a>

## Limited Warranty Statement

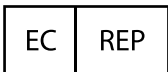
The products sold by Ferno are covered by a limited warranty, which is printed on all Ferno invoices. The complete terms and conditions of the limited warranty, and the limitations of liability and disclaimers, are also available upon request by calling Ferno at 1.800.733.3766 or 1.937.382.1451.

## Adverse Event Notice

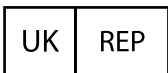
In the event of an adverse event or serious incident related to the use of this device, the end user/operator must report the incident to Ferno-Washington, Inc. at 70 Weil Way, Wilmington, Ohio 45177 USA, 1-877-733-0911, or via email at [tscordinator@ferno.com](mailto:tscordinator@ferno.com). If the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



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