Hausted® by graham-field

ELECTRIC SURGI-STRETCHER
5E82EYEST, 5E82EYXST
OPERATING MANUAL

SAVE THIS MANUAL FOR FUTURE USE.

CONTENTS

INTRODUCTION — A WORD FROM GF HEALTH PRODUCTS, INC.

This manual contains important information on proper use and maintenance of the Hausted® 5E82 Series Surgi-Stretchers. All personnel involved in the use and maintenance of this equipment must carefully review and comply with the warnings, cautions and instructions contained in this manual. These instructions are important to protect the health and safety of personnel operating these models and should be retained in a conveniently accessible area for quick reference.

Complete instructions for uncrating and putting your new equipment in service, as well as equipment drawings, have been furnished. If missing, contact GF Health Products, Inc. ("GF") for replacement copies, giving the serial number and model number of the unit.

GF Health Products, Inc. carries a complete line of accessories for use with these stretchers; your representative will gladly review these with you.

Indications for Use

The Hausted Surgi-Stretchers are intended for a healthcare professional to use in patient treatment, transport, or recovery. This product has an expected service life of five years.

The articulating head piece with dual operating control knobs allows adjustability and precise movement of the head section. Patient positioning is convenient and easy for both care provider and patient with the electric/battery powered controls for adjustment of height, backrest and knee flex.

To ensure the basic safety of the patient, the stretcher is designed, tested, and evaluated to IEC Standard 60601-1 and in accordance with IEC 60601-2-46 wherein the essential performance in any single fault or combined fault condition is no unwanted movement of the stretcher when in use. See also page 7 Electromagnetic Compatibility (EMC) information. The stretcher is tested and certified to IEC 60601-1-2 (Ed. 4) for EMC.

Service Information

A thorough preventive maintenance program is essential to safe and proper unit operation. This manual contains maintenance schedules and procedures which should be followed for satisfactory equipment performance.

We encourage you to contact GF Health Products, Inc. with maintenance concerns.

Advisory

A listing of the safety precautions to be observed when operating and servicing this equipment can be found in Section 1 of this manual. Do not operate or service the equipment until you have become familiar with this information. Any alteration of this equipment not authorized or performed by GF Health Products, Inc., could affect its operation, will void the warranty, could violate national, state, and local regulations, and could jeopardize your insurance coverage.

Info: Column 1 below applies only if product was purchased outside the U.S.

CE EU REP

EU Authorized Representative:

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Manufactured by:

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www.Hausted.com

Class 1 Equipment

Type B Equipment

Equipment not suitable for use in the presence of flammable anesthetic mixture with air or oxygen or nitrous oxide.

IPX4 Not suitable for continuous operation (Duty Cycle: 10% 2 Min. in 18 Min.)

Info: The base language of this document is ENGLISH. Any translations must be made from the base language document.

1 LIST OF WARNINGS AND CAUTIONS

⚠ **IMPORTANT: Before using the Surgi-Stretcher, please read and adhere to the following safety precautions and warnings. Failure to do so could result in serious personal injury or damage to the Stretcher.**

Always consult your healthcare professional to determine safe methods most suitable for your individual abilities. Protect yourself, your attendant, and the Surgi-Stretcher by having it serviced regularly. If you experience any malfunction, contact your Graham-Field authorized distributor immediately, as a hazardous condition could result, causing personal injury or damage to the Stretcher.

Periodic inspection, adjustment and replacement of worn parts are necessary to provide years of excellent service. Maintenance MUST be performed by qualified personnel ONLY.

SAVE THESE INSTRUCTIONS.

SIGNIFICANCE OF SAFETY STATEMENTS

Please note the following special statements, used throughout this manual, and their significance:

⚠ **DANGER: Indicates a potential hazard situation or unsafe practice that, if not avoided, will result in death or serious personal injury.**

⚠ **WARNING: Indicates a potential hazard situation or unsafe practice that, if not avoided, could result in death or serious personal injury.**

⚠ **CAUTION: Indicates a potential hazard situation or unsafe practice that, if not avoided, could result in minor or moderate personal injury.**

▲ **NOTICE: Indicates a potential hazard situation or unsafe practice that, if not avoided, could result in product or property damage.**

Info: Provides application recommendations or other useful information to ensure that you get the most from your product.

DANGER / WARNING / CAUTION / NOTICE Summary

The following is a listing of the safety precautions which must be observed when operating and servicing this equipment. These precautions are repeated (in whole or in part), where applicable, throughout the manual.

DANGER: To Reduce the Risk of Burns, Fire, or Electric Shock

⚠ **DANGER: SHOCK HAZARD — To reduce the risk of electric shock, unit is to be serviced by qualified personnel only.**

⚠ **DANGER: SHOCK HAZARD — To avoid the risk of electric shock, this equipment must only be connected to supply mains with protective earth.**

WARNING: To Reduce the Risk of Personal Injury

⚠ **WARNING: LACERATION HAZARD — When cutting bands always use a tool specifically designed for that purpose. This will help to avoid personal injuries frequently incurred when bands are cut and tension released.**

⚠ **WARNING: DO NOT sit on end — tipping may occur.**

⚠ **WARNING: Ensure IV rod is inserted completely into socket up to the arrow before applying load.**

WARNING — CAUTIONS AND PROPER OPERATION

⚠ **WARNING: The 5E82 Series stretchers have a maximum patient weight capacity of 800 lb (363 kg), EVENLY DISTRIBUTED.**

⚠ **WARNING: The 5E82 Series stretchers have a maximum weight, including equipment weight, and patient weight of 1200 lb (544 kg), EVENLY DISTRIBUTED.**

⚠ **WARNING: Patient entry, egress and transfer should always be performed with the brakes locked.**

⚠ **WARNING: The patient transport position is pushing from the patient head end in the supine position.**

⚠ **WARNING: The brakes should always be locked and patient side rails up when patient is not in transport.**

⚠ **WARNING: Clip patient pendant to rail when not in use – keep cord clear of moving parts.**

⚠ **WARNING: All electric powered stretchers are equipped with a built-in battery backup system, but the unit should remain plugged into wall receptacle during normal use. The battery backup is intended for transport and EMERGENCY only.**

⚠ **WARNING: The stretcher has a warning label on both the head and foot end stating: "Do not sit on end - as tipping may occur."**

⚠ **WARNING: Patient entry, egress, and transfer from the stretcher should always be from the center side rail location with the side rail in the down position and brakes locked.**

⚠ **WARNING: The back quick drop handles are intended to be used during emergency situations only.**

⚠ **WARNING: To turn on electric controls, plug into wall receptacle. To turn off, remove plug from wall receptacle. Electric powered stretchers do not have a separate on / off switch.**

⚠ **WARNING: ALWAYS disconnect the power source whenever troubleshooting or servicing any electric powered stretcher.**

⚠ **WARNING: Cables can become pinched. Keep cables away from column.**

⚠ **WARNING: Steam cleaning and pressure washing of stretcher is not recommended and can void warranty.**

⚠ **WARNING: DO NOT modify the equipment without the authorization of the manufacturer.**

⚠ **WARNING: When lowering the rails, ensure patient and caregiver body and extremities are clear of pinch points before operating the rail.**

⚠ **WARNING: Keep hands clear of pinch points.**

⚠ **WARNING: Stow away power cord when not in use to prevent injury or damage.**

ELECTROMAGNETIC COMPATIBILITY (EMC) INFORMATION

⚠ **WARNING: Medical Electrical Equipment needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in this manual.**

⚠ **WARNING: Electronic equipment may be influenced by Radio Frequency (RFI). Caution should be exercised with regard to the use of portable communications in the area around such equipment. Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 12 inches (30 cm) to any part of the Hausted equipment including specified Hausted equipment cables. Degradation of the performance of the Hausted equipment could result.**

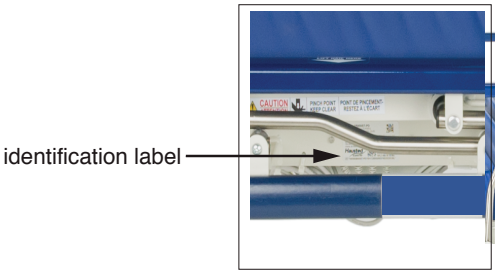
⚠ **WARNING: If RFI causes erratic behavior, unplug the electric Hausted equipment immediately. Leave unplugged while transmission is in progress.**

⚠ **WARNING: The use of accessories, transducers, and cables other than those specified by the manufacturer may result in increased emissions or decreased immunity of the Hausted equipment. GF cables and accessories include motor cables, mains cable, pendant cables, and back up battery and cable.**

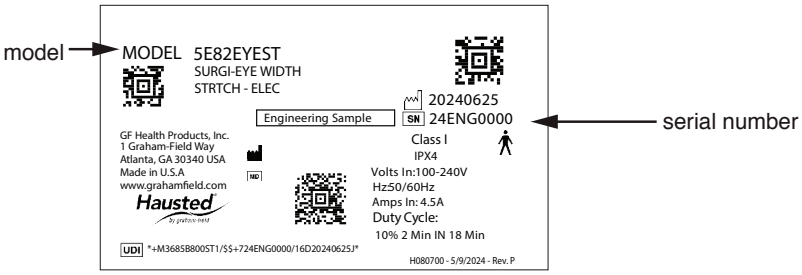
⚠ **WARNING: This equipment should not be used adjacent to or stacked with other equipment. If adjacent or stacked use with other equipment is necessary, this Hausted equipment and the other equipment should be observed to verify that they are operating normally.**

⚠ **WARNING: The EMISSIONS characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is usually required) this equipment might not offer adequate protection to radio frequency communication services. The user might need to take mitigation measures, such as relocating or reorienting the equipment.**

IDENTIFICATION LABEL



Identification label location



Identification label example

The stretcher identification label identifies the stretcher serial number and model, essential information when ordering replacement parts or claiming parts under warranty. The identification label, shown above, is beneath the patient left surface at midpoint of frame. Have this information ready when calling our Customer Service or Technical Support staff at 1.770.368.4700; it will allow us to better assist you and quickly answer your questions and concerns.

2 UNCRATING INSTRUCTIONS

IMPORTANT — REPORT ANY SHIPPING DAMAGE IMMEDIATELY:

⚠ **WARNING: Inform shipper of any damage — leave carton intact. Leave equipment in the receiving area until inspection is complete.**

NOTICE — POSSIBLE EQUIPMENT DAMAGE:

▲ **NOTICE: The crate contains fragile, expensive medical equipment. Uncrate and handle carefully. If after uncrating the equipment you find any damage (no matter how slight), report the damage to GF Health Products, Inc.**

WARNING — PERSONAL INJURY HAZARD:

⚠ **WARNING: When cutting bands, always use tool specifically designed for that purpose. This will help avoid personal injuries possibly incurred when bands are cut and tension is released.**

ENVIRONMENTAL CONDITIONS

Operating	
Temperature	5°C to 40°C
Relative Humidity	20% to 90% @ 86°F (30°C)
Atmospheric Pressure	700 to 1060 hPa

Storage and Transport	
Temperature	-10°C to 50°C
Relative Humidity	20% to 90% @ 86°F (30°C)
Atmospheric Pressure	700 to 1060 hPa

UNPACKING INSTRUCTIONS

IMPORTANT: Follow each step in the order shown in these instructions.
Your Hausted equipment has been carefully packed at our manufacturing plant to ensure safe shipment to your medical facility. There are several procedures you must follow to put your new equipment in service.
These procedures only take a few minutes to complete and all are required to ensure proper operation of the equipment.

1. Cut the two bands around the shipping carton.
2. Ensure the fifth wheel / power drive wheel clears the edge of the skid when removing product (where applicable), then remove the equipment from the carton.
3. Remove the equipment from the carton. When moving stretcher off the carton, lift up stretcher slightly to ensure the 5th wheel does not get damaged.
4. Check to see if all features of the equipment work properly. If all the features work, advance to step 5. If any features do not work properly, call GF Health Products, Inc. at 1.770.368.4700.

Info: Plug the unit into a wall socket prior to checking any electric features. The battery will reach full charge after approximately 10 hours.

5. Clean the equipment using mild detergent to remove any dirt accumulated during shipment, and place the equipment into service.

3 OPERATING INSTRUCTIONS

3.1 SURGI-STRETCHER SPECIFICATIONS

Info: All dimensions, unless otherwise specified, are in inches and ±.375 (1 cm).
GF Health Products, Inc. reserves the right to change specifications without notice.

Model	Standard Width 5E82EYEST	Wide Width 5E82EYXST
Height Range: High	40 in. ±1 in. [101.6 cm ±2.5 cm]	
Height Range: Low	22 in. ±1 in. [55.9 cm] ±2.5 cm	
Overall Width	32 in. [81.3 cm]	37 in. [94 cm]
Overall Length	92.4 in. [234.7 cm]	
Patient Surface Width	25 in. [63.5 cm]	30 in. [76.2 cm]
Patient Surface Length	85.4 in. [216.9 cm]	
Backrest Degree of Movement	0° - 85° ±2°	
Knee Flex Degree of Movement	0° - 60° ±2°	
Trendelenburg / Reverse Trendelenburg	15° ±2°	
Retracto Rail Height	14 in. [35.6 cm]	
Retracto Rail Length	48 in. [121.9 cm]	
Casters	5.9 in. [15 cm] Electric Lock / Steer	
Maximum Weight Capacity (EVENLY DISTRIBUTED)	800 lb [363 kg]	
Applied Parts:	Pads, Linens, Side Rails, Some Accessories	
Mattress Pad Thickness	3 in. [7.6 cm]	

Electrical Specifications	
Product Classification:	1
Input Voltage:	100V - 240V ~ 50/60 Hz
Amperage:	Max. 4.0A
Duty Cycle:	10% (2 Min. in 18 Min.)
IP Rating:	IPX4 All Models
Grounding Protection:	Type B

3.2 FEATURES, WARNINGS AND PROPER OPERATION OPERATING INSTRUCTIONS

WARNINGS — CAUTIONS AND PROPER OPERATION (See Diagram Below)

A. ⚠ WARNING: Do not sit on end — tipping may occur.

B. ⚠ WARNING: The stretchers have a warning label located at the Head-End (Back Side of Back Section) stating: Maximum patient weight 800 LB (363 kg) for 5E82 models.

C. ⚠ WARNING: Patient entry, egress and transfer should always be done with the brakes locked.

D. ⚠ WARNING: The brakes should always be locked and patient side rails up when patient is not in transport.

E. ⚠ WARNING: The patient pendant has a warning label stating: Clip pendant to rail when not in use — keep cord clear of moving parts. As is stated on the cable adjacent to the pendant.

F. ⚠ WARNING: All electric stretchers are equipped with a built-in battery backup system, but it is recommended that the unit remain plugged into wall receptacle during normal use. The battery backup is recommended for transport and EMERGENCY only.

G. ⚠ WARNING: The back quick drop handles are intended to be used to lower a patient during EMERGENCY situations only.

H. ⚠ WARNING: Ensure rail is locked before leaving patient.

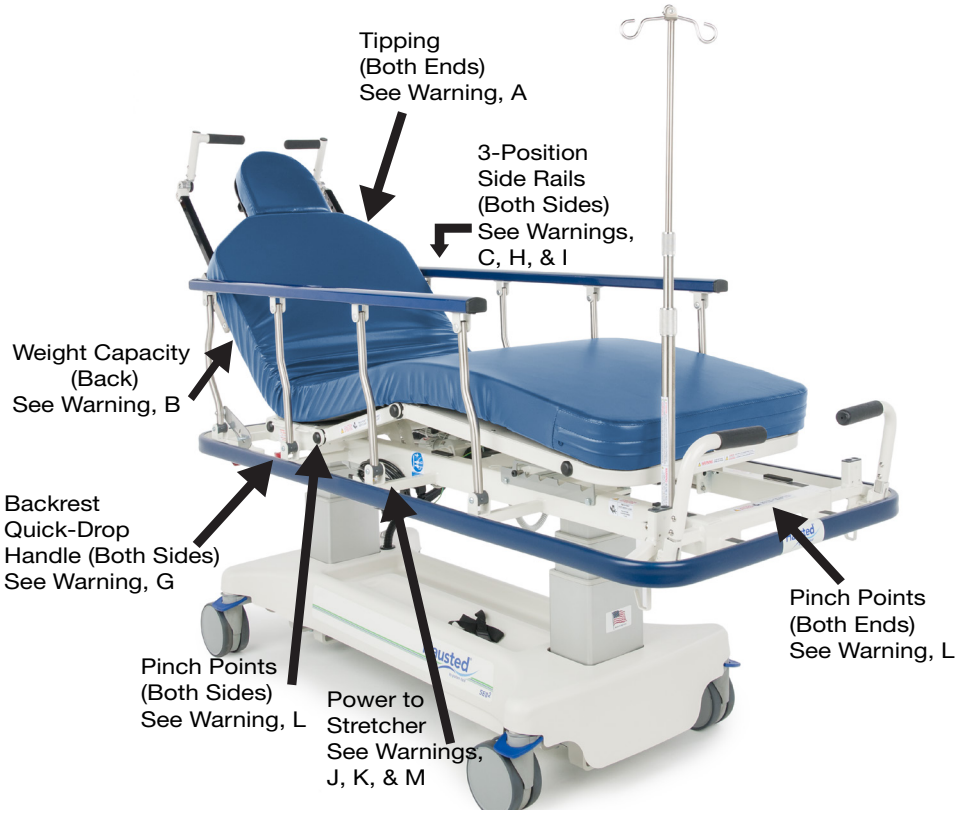
I. ⚠ WARNING: When lowering the rails, ensure patient and caregiver (or attendant) body and extremities are clear of pinch points before operating the rail.

J. ⚠ WARNING: To turn on electric controls, plug into wall receptacle; to turn off, remove plug from wall receptacle. The electric powered stretchers do not have a separate on / off switch.

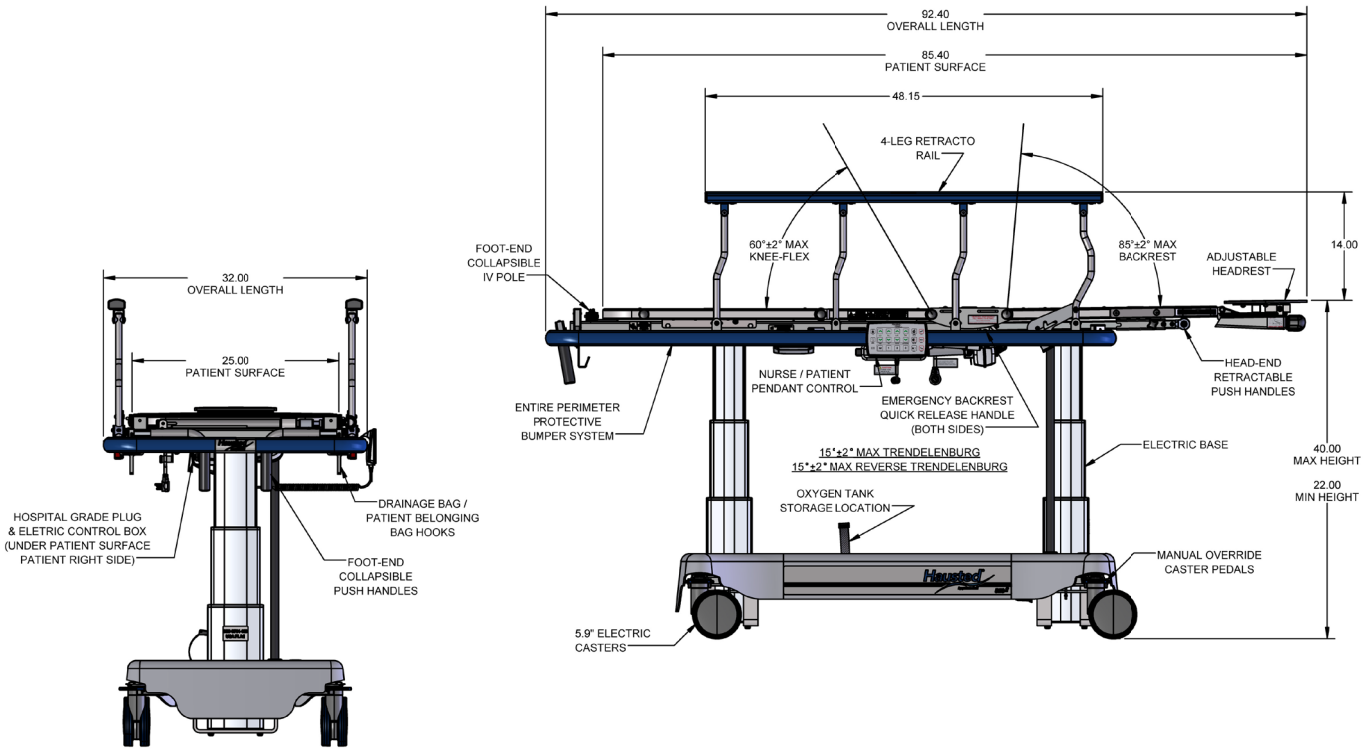
K. ⚠ WARNING: Always disconnect the power source whenever servicing any electric powered stretcher.

L. ⚠ WARNING: Keep hands clear of pinch points.

M. ⚠ WARNING: Stow away power cord when not in use to prevent injury or damage.

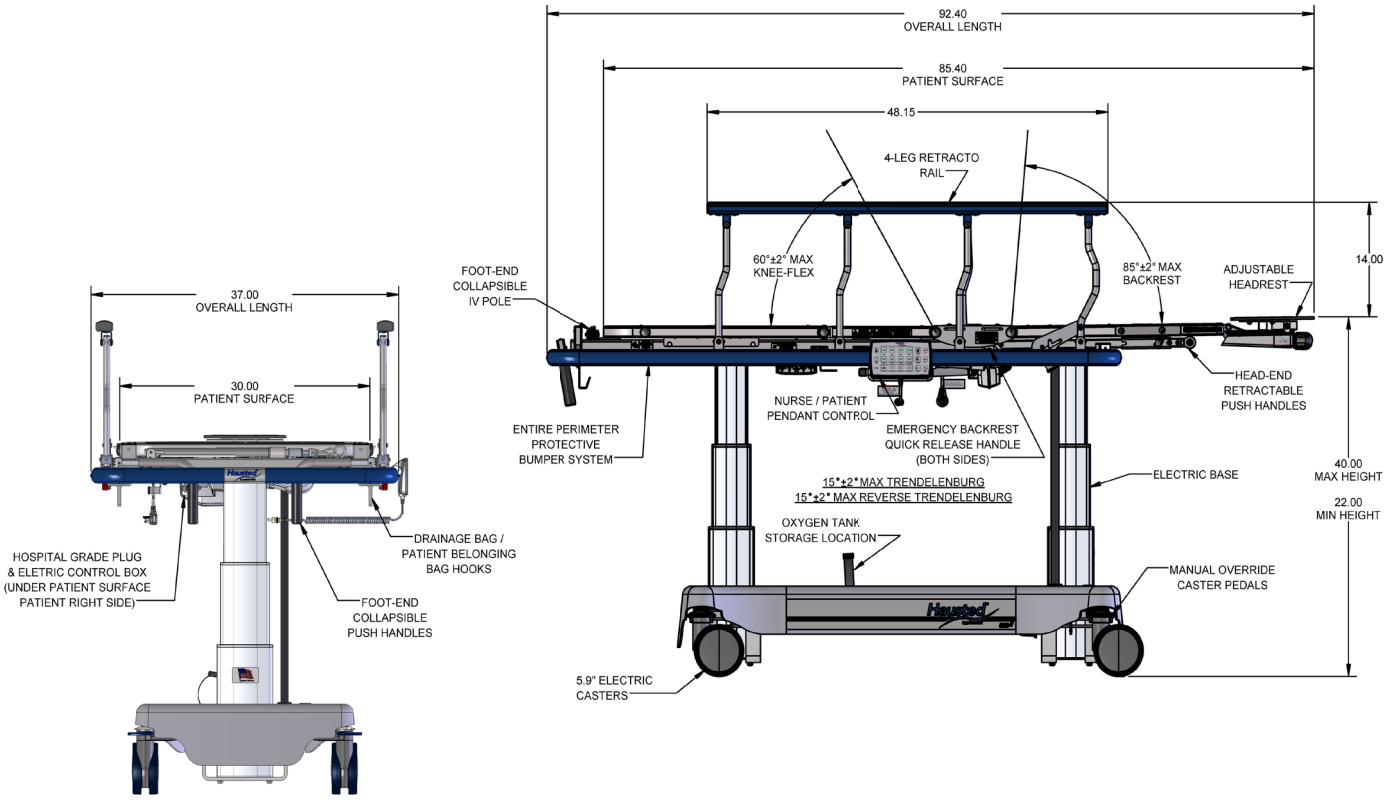


Features (Shown in Illustration of 5E82EYEST below)



WARNINGS — CAUTIONS AND PROPER OPERATION (See List on Previous Page)

Features (Shown in Illustration of 5E82EYXST below)



3.3 BRAKING & STEERING OPERATION WITH SMART CASTER TECHNOLOGY

3.3.1 Applying the Brakes

To apply the four-wheel braking system with the pendant, press the pendant **Brake On/Off** button; the LED above the button then illuminates green (Figure 3.3-1), an audible beep will be heard, and the blue caster pedals on all four corners of the stretcher automatically lower to brake position (Pedal Down) (Figure 3.3-2), and all four caster wheels will then be locked from swiveling and rotating.

Info: To prevent unintended movement, the stretcher is equipped with an Automatic Braking Feature and a Brake Alarm System. The brakes will engage automatically after the unit has been stationary for 3 consecutive minutes. The Brake Alarm will sound (5 quick beeps) at 5 seconds, before the brakes engage to provide warning that the casters have locked.
Info: An audible beep will be heard with each change of caster position (Brake / Neutral / Steer-Lock).

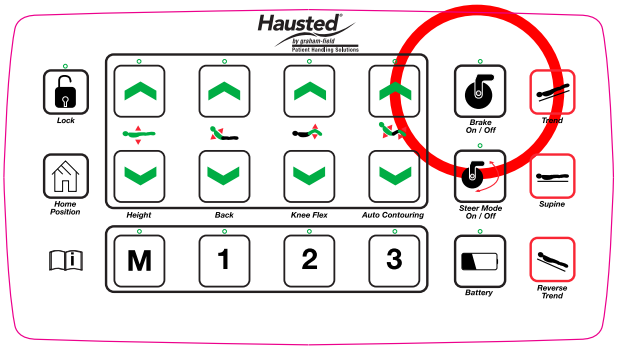


Figure 3.3-1

To apply the four-wheel braking system manually, gently depress the blue caster pedal at any of the four corners of the stretcher until the pedal stops (Figure 3.3-2); the LED above the **Brake On/Off** button then illuminates green (Figure 3.3-1), an audible beep will be heard, and the remaining three pedals will then automatically lower to brake position (Pedal Down) (Figure 3.3-2), and all four caster wheels will then be locked from swiveling and rotating.

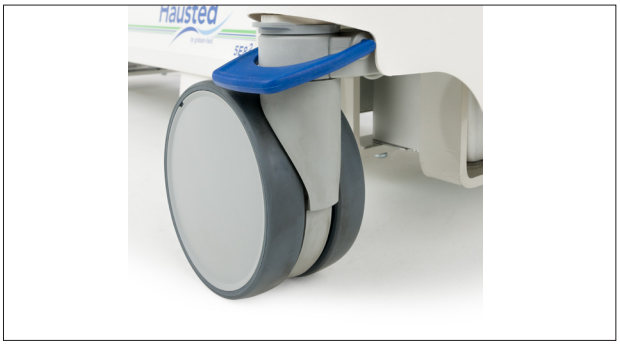


Figure 3.3-2

▲ **NOTICE: DO NOT apply excessive force to pedal when manually applying brakes.**

3.3.2 Unlocking the Brakes

To unlock the brakes with the pendant, press the pendant **Brake On/Off** button; the LED above the button then goes out (Figure 3.3-3), an audible beep will be heard, and the blue caster pedals on all four corners of the stretcher will then automatically rise to neutral position (Pedal Horizontal) (Figure 3.3-4), and all four caster wheels will then rotate and swivel freely.

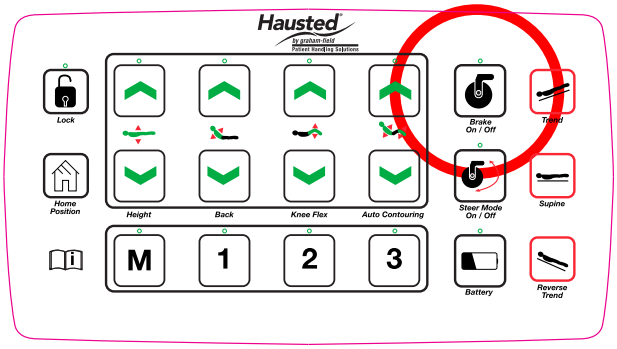


Figure 3.3-3

To unlock the brakes manually, gently lift the blue caster pedal at any of the four corners of the stretcher until the pedal stops (Figure 3.3-6); the LED above the **Brake On/Off** button then goes out (Figure 3.3-3), an audible beep will be heard, and the remaining three pedals will then automatically rise to neutral, and all four caster wheels will then rotate and swivel freely.

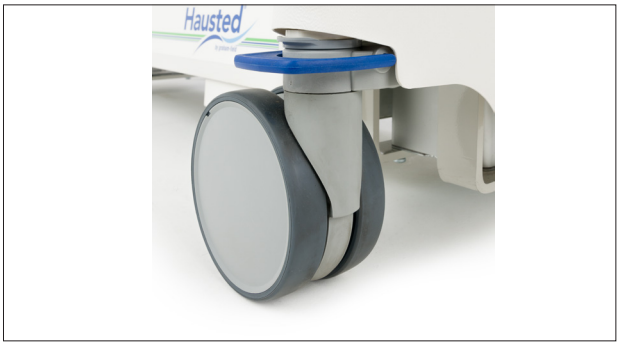


Figure 3.3-4

⚠ **WARNING: Ensure the brakes are locked when the patient is not being transported.**

▲ **NOTICE: DO NOT apply excessive force to the pedal when manually applying the brakes**

3.3.3 Activating Steer Mode — Pendant

To activate Steer Mode with the pendant, press the pendant **Steer Mode On/Off button**. The LED above the button then illuminates green (Figure 3.3-5), an audible beep will be heard, and the blue caster pedals at the patient foot-end of the stretcher will automatically rise to Steer-Lock position (Pedal Up) (Figure 3.3-6). The patient head-end caster pedals will automatically rise to neutral position (Pedal Horizontal) (See Figure 3.3-4 on Page 12), and the stretcher will be ready for transport. From the patient head-end, push the stretcher forward – both front casters will lock into Steer-Lock position. The stretcher will steer along a straight path, maneuver corners, and change direction with minimal effort.

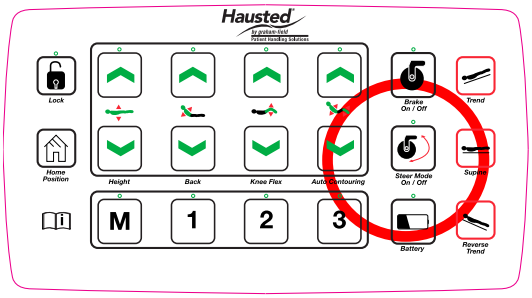


Figure 3.3-5

Figure 3.3-6

NOTE: The steer mode function (both by pendant or manually) is disabled for stretchers with the Navigator Smart Drive System. Activation with the pendant results in an audible beep. Manual activation will immediately return to the neutral position.

Info: The casters will lock into Steer-Lock position when turned to 6 o'clock or 12 o'clock, with the stretchers' patient foot-end being 12 o'clock.

Info: Depending upon how the casters are oriented when they lock, they can lock into Steer-Lock position while trailing (6 o'clock) or Leading (12 o'clock). If the casters lock in the opposite orientations, steering may be more difficult.

Info: The pendant will only lock the patient foot-end casters into Steer-Lock Position, which is ideal for pushing the stretcher from the patient head-end.

3.3.4 Activating Steer Mode – Manually

NOTE: All four casters must be in neutral position (Pedal horizontal) (See Figure 3.3-4 on Page 12) before manually activating Steer Mode.

When pushing from the head end: Make sure all four casters are in neutral position (Pedal Horizontal) (See Figure 3.3-4 on Page 12); activate foot-end Steer Mode by lifting the blue pedal upward on either head-end caster until the pedal stops (Figure 3.3-6). Both foot-end pedals will rise into Steer-Lock position (Pedal Up) (Figure 3.3-6), the head-end pedals will remain in neutral position (Pedal Horizontal) (See Figure 3.3-4 on Page 12), the LED above the pendant **Steer Mode On/Off** button will illuminate green (Figure 3.3-5), and an audible beep will be heard. From the patient head-end, push the stretcher forward – both front casters will lock into Steer-Lock position and the stretcher will be ready for transport.

When pushing from the foot end: Make sure all four casters are in neutral position (Pedal Horizontal) (See Figure 3.3-4 on Page 12); activate head-end Steer Mode by lifting the blue pedal upward on either foot-end caster until the pedal stops (Figure 3.3-6). Both head-end pedals will rise into Steer-Lock position (Pedal Up) (Figure 3.3-6), the foot-end pedals will remain in neutral (Pedal Horizontal) (See Figure 3.3-4 on Page 12), the LED above the pendant **Steer Mode On/Off** button will illuminate green (Figure 3.3-5), and an audible beep will be heard. From the patient foot-end, push the stretcher forward – both front casters will lock into Steer-Lock position and the stretcher will be ready for transport.

Info: It is not possible to lock the head-end casters into Steer-Lock position with the pendant. This can only be done with the foot-end manual activation.

3.3.5 Deactivating Steer Mode — Pendant

To deactivate Steer Mode with the pendant, press the pendant **Steer Mode On/Off** button. The LED above the button will go out (Figure 3.3-7), and an audible beep will be heard, and the blue casters pedals in Steer-Lock position will automatically lower to neutral (Pedal Horizontal) (See Figure 3.3-4 on Page 12). All four casters will now rotate and swivel freely.

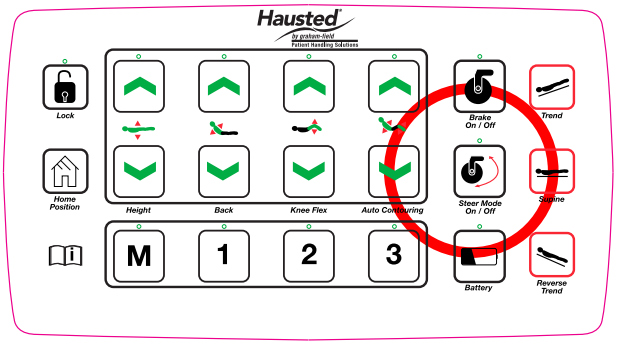


Figure 3.3-7

Info: All four casters must be parallel to each other in the 6 o'clock or 12 o'clock position to be able to properly go into unlock / neutral position. Failure to place casters in this orientation may cause the Steer Mode On/Off button to not deactivate Steer Mode.

3.3.6 Deactivating Steer Mode – Manually

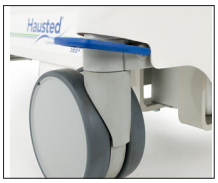
Depress the blue caster pedal down to the neutral position (Pedal Horizontal) (See Figure 3.3-4 on Page 12) on any caster locked in Steer-Lock position. The LED above the **Steer Mode On/Off** button will go out (Figure 3.3-7), an audible beep will be heard, and the other caster in Steer-Lock position will automatically lower to neutral position (Pedal Horizontal) (See Figure 3.3-4 on Page 12). All four casters will now rotate and swivel freely. Depressing the blue pedal down past neutral until it stops will apply all four casters brakes (See Figure 3.3-2 on page 12), locking all four casters into brake position (Pedal Down).

Info: After thirty seconds of no movement, Steer Mode automatically deactivates and all four caster wheels lock into brake position.

⚠ **WARNING: To prevent unintended movement, activate or deactivate Steer Mode *only* while the stretcher is stopped.**

Caster Pedal Positions

The table below shows the blue caster pedal in all three positions.

CASTER PEDAL POSITIONS		
	Pedal Up	Steer-Lock Position
	Pedal Horizontal	Neutral Position (Swivel)
	Pedal Down	Brake Position (Locked)

3.4 ELECTRIC CONTROL LOCATIONS

3.4.1 Pendant Control Storage Location

The pendant is located on the bumper rail on either side of the stretcher (Figure 3.4-1).

▲ **NOTICE: Place pendant on bumper rail when not in use. Keep cord clear of moving parts.**

Figure 3.4-1

3.4.2 Plug Location

This stretcher is equipped with a battery backup for transport but the unit should be plugged into a wall receptacle when not in transport. The plug is located on the patient right side of the stretcher (Figure 3.4-2). Do not position the unit so that it is difficult to disconnect the plug.

⚠ **WARNING: The 5E82 Surgi-Stretcher is equipped with a built in battery backup system: nevertheless, the unit should remain plugged into wall receptacle during normal use. The battery backup is recommended for transport and emergency only.**

Figure 3.4-2

3.4.3 Low Battery Alarm

This stretcher is equipped with an audible and visual low battery alarm. When the system requires charging, a continuous beep will sound during motor operation, the pendant LED above the ***BATTERY*** button will illuminate green, and the control box LED will illuminate amber.

3.4.4 Foot Control

Large red circle indicates optional foot control storage location (Figure 3.4-3). Small red circle indicates foot control plug-in location (Figure 3.4-3), which can also be used as an alternate pendant plug-in location.

Figure 3.4-3

3.5 HEIGHT AND PATIENT SURFACE ADJUSTMENT

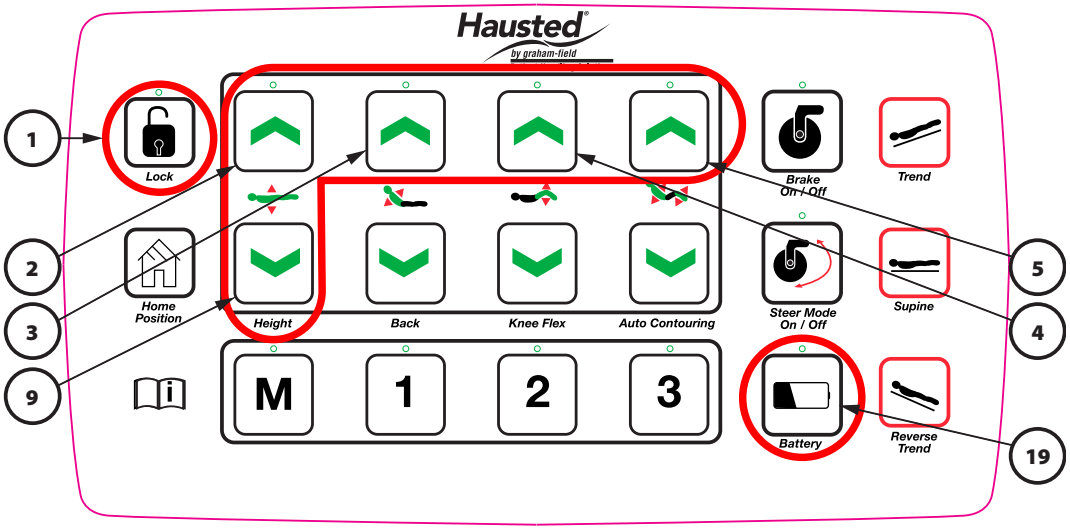
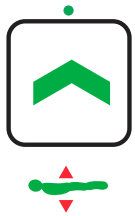


Figure 3.5-1

3.5.1 LOCK / UNLOCK (button 1)

1	 Lock	LOCK	Press and hold LOCK button (1) for three seconds to lock all functions. After five LED flashes, all four UP LED's (2-5) illuminate steady green, indicating they are now locked; an audible signal also indicates when locked and beeps up to three times until button is released.
		UNLOCK	Press and hold LOCK and BATTERY buttons (1 and 19) at the same time to unlock all functions. All UP-LED's will flash with three audible beeps indicating unlocked. All UP-LED's will continue to flash until BOTH buttons are released.
	 Battery	UNLOCK INDIVIDUAL FUNCTION (PATIENT MODE)	Press and hold LOCK button (1) and press each UP button (2-5) to unlock each function individually. As each button is released, its LED will go out, indicating that function is unlocked.

3.5.2 HEIGHT (HI / LO) (buttons 2 and 9)

2		HEIGHT UP	Press and hold HEIGHT button (2) until desired height is achieved. LED illuminates steady green while pressed, goes out when released.
9	Height	HEIGHT DOWN	Press and hold HEIGHT DOWN button (9) until desired height is achieved. LED illuminates steady green while pressed, goes out when released.

3.5 HEIGHT AND PATIENT SURFACE ADJUSTMENT

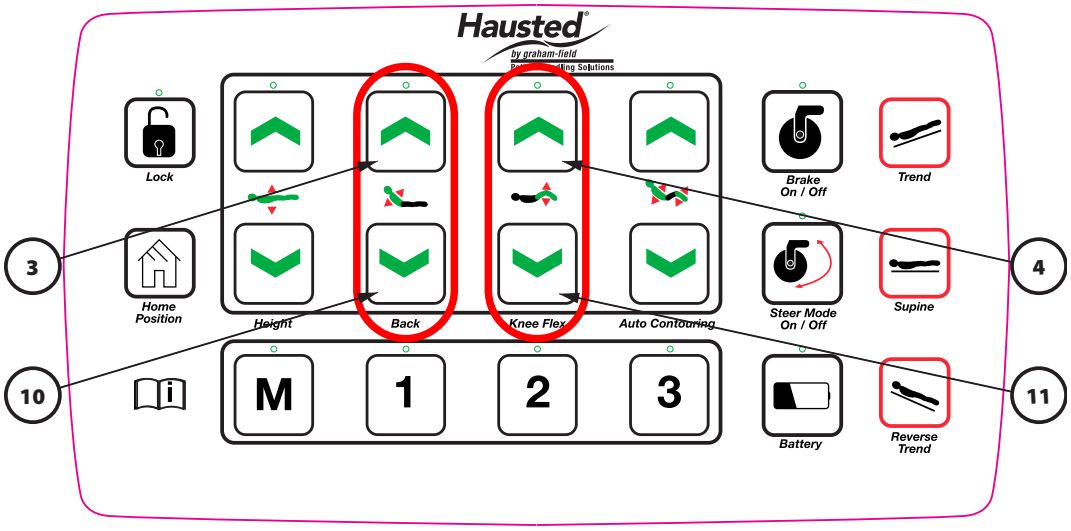
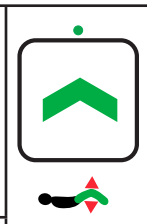


Figure 3.5-2

3.5.3 BACK SECTION UP / DOWN (buttons 3 and 10)

3		BACK UP	Press and hold BACK UP button (3) until desired position is achieved. LED illuminates steady green while pressed, goes out when released.
10		BACK DOWN	Press and hold BACK DOWN button (10) until desired position is achieved. LED illuminates steady green while pressed, goes out when released.

3.5.4 KNEE FLEX UP / DOWN (buttons 4 and 11)

4		KNEE FLEX UP	Press and hold KNEE FLEX UP button (4) until desired position is achieved. LED illuminates steady green while pressed, goes out when released.
11		KNEE FLEX DOWN	Press and hold KNEE FLEX DOWN button (11) until desired position is achieved. LED illuminates steady green while pressed, goes out when released.

3.5 HEIGHT AND PATIENT SURFACE ADJUSTMENT

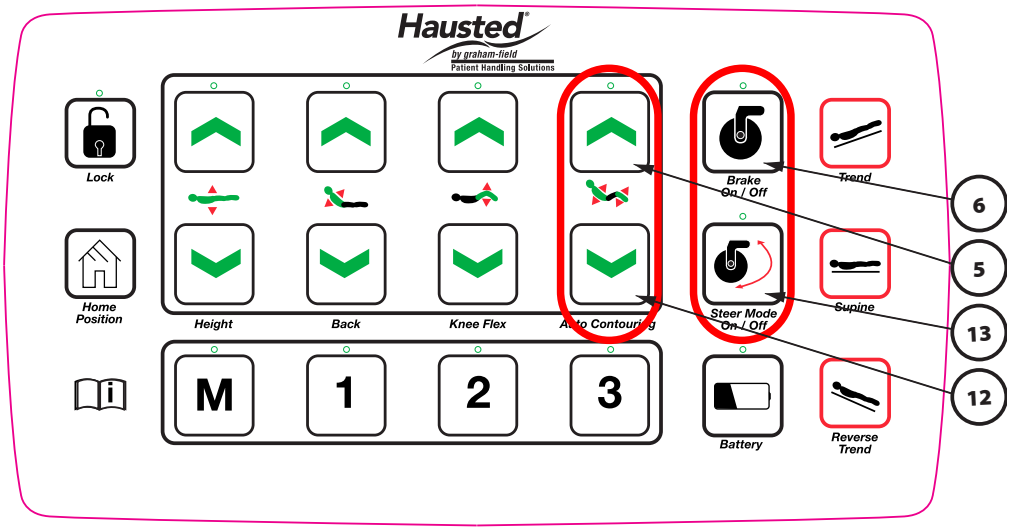
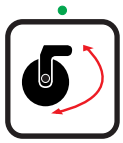


Figure 3.5-3

3.5.5 AUTO CONTOURING UP / DOWN (buttons 5 and 12)

5		AUTO CONTOURING UP	Press and hold AUTO CONTOURING UP button (5) until desired position is achieved. LED illuminates steady green while pressed, goes out when released.
12		AUTO CONTOURING DOWN	Press and hold AUTO CONTOURING DOWN button (12) until desired position is achieved. LED illuminates steady green while pressed, goes out when released.

3.5.6 BRAKE and STEER MODE Operation (buttons 6 and 13)

6		BRAKE	Press BRAKE button (6) to toggle on / off. When brakes are locked (on), LED illuminates steady green; when brakes are unlocked (off), LED goes out. To prevent unintended movement, brakes lock automatically after stretcher is stationary for 3 consecutive minutes. Before brakes engage, a Brake Alarm will sound (5 quick beeps) 5 seconds before.
13		STEER MODE	*Press STEER MODE button (13) to toggle on / off. When steer mode is activated, LED illuminates steady green; when steer mode is off, LED goes out.* *Note: Steer mode is not operable when brake is activated.*

3.5 HEIGHT AND PATIENT SURFACE ADJUSTMENT

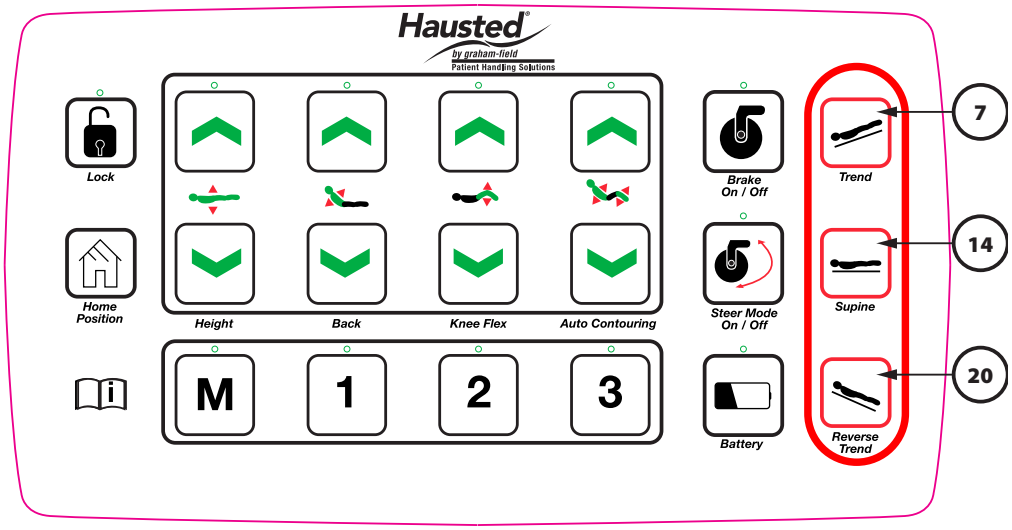


Figure 3.5-4A

3.5.7 TRENDELENBURG, SUPINE and REVERSE TRENDELENBURG Positions (buttons 7, 14 and 20)

7	 Trend	TRENDELENBURG	Press and hold TRENDELENBURG button (7) until desired position is achieved. The stretcher automatically lowers the back and knee-flex sections, tilts backward, and adjusts height. No LED..
14	 Supine	SUPINE	Press and hold SUPINE button (14) until desired position is achieved. The stretcher automatically levels the back and knee-flex sections and adjusts height. No LED.
20	 Reverse Trend	REVERSE TRENDELENBURG	Press and hold REVERSE TRENDELENBURG button (20) until desired position is achieved. The stretcher automatically lowers the back and knee-flex sections, tilts forward, and adjusts height. No LED.

3.5.8 Memory and Preset Functions (Buttons 15-18)

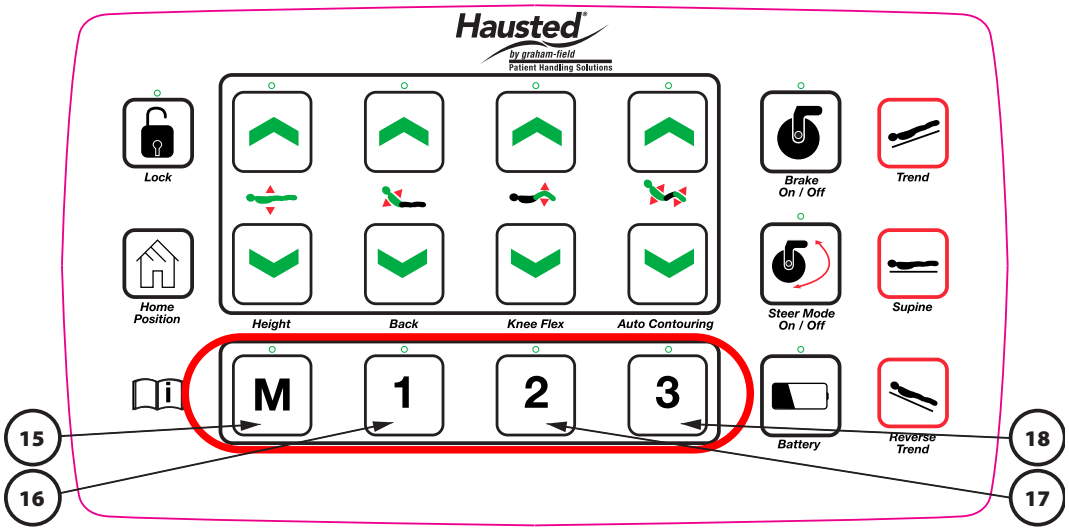
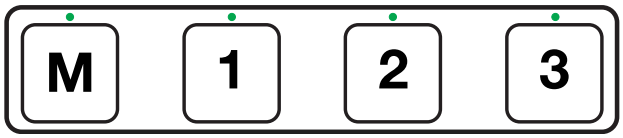


Figure 3.5-4B



15	MEMORY	Position stretcher to desired position. Enter MEMORY MODE by pressing and holding MEMORY button (15) for three seconds until LED flashes. Once MEMORY LED flashes, simultaneously press and hold MEMORY button (15) and desired PRESET button (16, 17, or 18) until beeping stops (MEMORY LED will stop flashing and go out and PRESET LED will illuminate). Once MEMORY button and PRESET button are released, the position saves, LEDs go out, and MEMORY MODE exits. (After entering MEMORY MODE, PRESET buttons that illuminate are already programmed, but can be overwritten; PRESET buttons that don't illuminate are not yet programmed.)
16	PRESET 1	Press and hold PRESET 1 button until saved pre-programmed position is achieved. LED illuminates steady green while pressed, goes out when released.
17	PRESET 2	Press and hold PRESET 2 button until saved pre-programmed position is achieved. LED illuminates steady green while pressed, goes out when released.
18	PRESET 3	Press and hold PRESET 3 button until saved pre-programmed position is achieved. LED illuminates steady green while pressed, goes out when released.

3.5 HEIGHT AND PATIENT SURFACE ADJUSTMENT

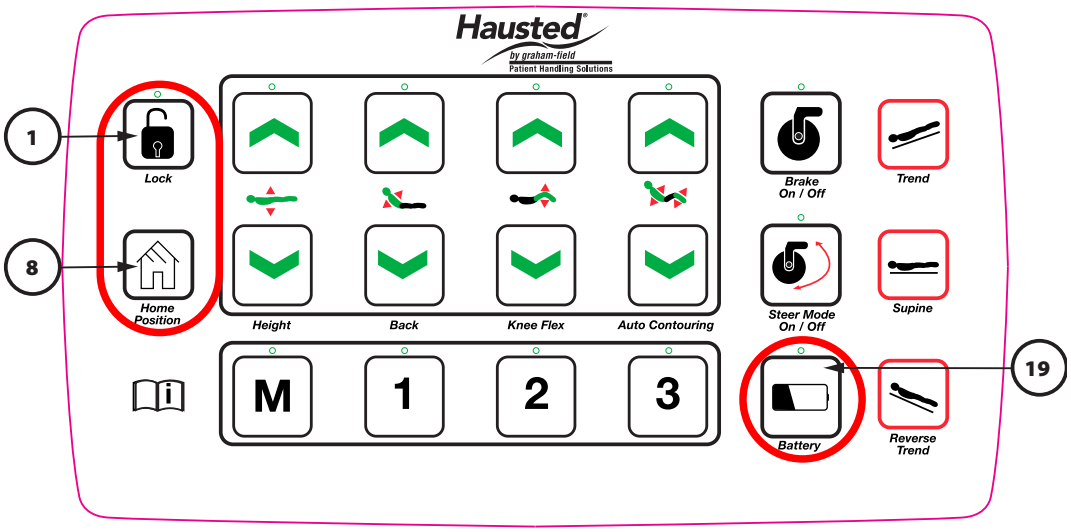


Figure 3.5-5

3.5.9 BATTERY (button 19)

19	Battery	BATTERY	LED illuminates steady green when battery discharges to 20% capacity or less. Stretcher will emit audible beeping sound when using the unit. Press and hold LOCK and BATTERY buttons (1 and 19) at the same time to unlock all functions. All UP-LED's will flash with three audible beeps indicating unlocked. All UP-LED's will continue to flash until BOTH buttons are released.

3.5.10 HOME (button 8)

8	Home Position	HOME	Press and hold HOME button (8). The stretcher automatically lowers the back, and knee-flex sections and adjusts to lowest height. No LED.

3.5.11 Emergency Drop Back

This stretcher is equipped with a manual override function for the back section. This option should only be used in an emergency situation. To activate the emergency drop back, support the back section, and pull outward on either red activating handles located on the patient right and left side under the seat to the rear (Figure 3.5-6).

Figure 3.5-6

Info: When activating the emergency drop back, depending on the back angle, you may need to push down on the back in order to initiate the movement.

Info: When activating the emergency drop back, depending on how far the red activating handle is pulled outward, it is possible to control the descend speed of the back section.

3.6 HEADREST

3.6.1 Adjusting the Headrest

Grasp the right ball style knob (Figure 3.6-1), and rotate it counterclockwise to articulate the head section upward (Figure 3.6-2); rotate the knob clockwise to articulate the head section downward (Figure 3.6-3).

Once the upward articulation has been set, grasp the left ball style knob (Figure 3.6-4), and rotate the knob counterclockwise to articulate the chin tilt upward; rotate the knob clockwise to articulate the chin tilt downward (Figure 3.6-4).

Info: After understanding which knob creates which action, quick and smooth infinite adjustment can be achieved by rotating the knobs simultaneously (Figure 3.6-5).

Figure 3.6-1

Figure 3.6-2

Figure 3.6-3

Figure 3.6-4

Figure 3.6-5

3.7 COMMON OPTIONAL ACCESSORIES

3.7.1 Mounting the Wrist Rest

Insert the **Wrist Rest** into one of the appropriate three square sockets under the headrest (Figures 3.7-1 & 3.7-2). Rotate the T-knob on the back of the **Wrist Rest** (Figure 3.7-3) clockwise to lock it into place.

▲ **NOTICE: Ensure the Wrist Rest is secure before applying any pressure.**

3.7.2 Adjusting the Wrist Rest

Once the **Wrist Rest** has been properly installed per 3.7-2, the height can be adjusted as needed. Support the **Wrist Rest** and loosen the black knob on the side of the support post (Figure 3.7-4).

Position the **Wrist Rest** to the desired height and rotation. Tighten the black knob located on the side of the support post (Figure 3.7-4).

▲ **NOTICE: Ensure the Wrist Rest is secure before applying any pressure.**

Figure 3.7-1

Figure 3.7-2

Figure 3.7-3

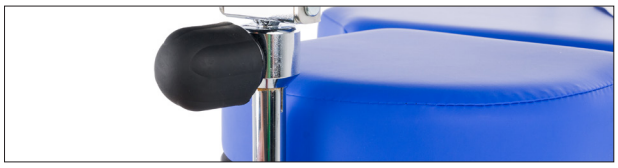


Figure 3.7-4

3.8 HEAD-END PUSH HANDLES

3.8.1 Operating the Push Handles

Push Handles are stowed away when not in use (Figure 3.8-1).

Push Handles may be operated with the back in either raised or lowered position.

Rotating and Positioning the Hand Grips

In units without the Navigation Smart Drive System. The **Hand Grips** rotate 360˚ in 10˚ increments. To rotate a **Hand Grip** (Figure 3.8-2), hold it firmly, press the black button (Figure 3.8-3), rotate the **Hand Grip** to the desired position, and release the button.

In units with Navigation Smart Drive System, the **Hand Grips** do not rotate 360˚ on the right **Hand Grip**. A stop has been installed on the units with Navigation Smart Drive System.

Operating the Push Handles with the Back in Raised Position

Rotate the Push Handles to the desired position with the back in raised position (Figure 3-8.4).

Operating the Push Handles with the Back in Lowered Position

Pull out and hold the **Push Handle Release Plungers** (Figure 3.8-1) and extend the **Push Handles** to the end position. Rotate the Push Handles to the desired position with the back in lowered position (Figure 3.8-5).

⚠ **WARNING: To prevent unintended interference, ensure Push Handles are stowed away as shown in Figure 3.8-1 when not in use.**

3.8.2 Operating Foot-End Push Handles

To use the Push Handles, rotate the Push Handles outward and push down into the handle bracket (Figure 3.8-6).

To stow away Push Handles, Pull Push Handles up and out of bracket, then rotate the Push Handles inward.

Figure 3.8-1

Figure 3.8-2

Figure 3.8-3

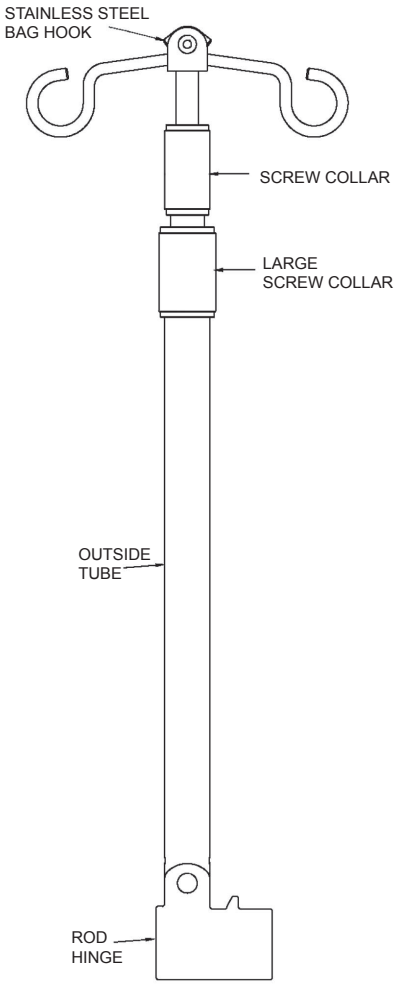
Figure 3.8-4

Figure 3.8-5

Figure 3.8-6

3.9 PERMANENTLY MOUNTED IV ROD OPERATION (ALL MODELS)

Refer to Figure on Right



⚠ **WARNING: PERSONAL INJURY HAZARD - Ensure IV Rod is inserted completely into socket up to the arrow before applying any load.**

3.9.1 Putting IV Rod in UP position

1. Grasp IV Rod and rotate upward until it stops.
2. Push down on IV Rod until it slides firmly into rod hinge socket.

3.9.2 Extending IV Rod

1. Rotate screw collar, or large screw collar, until loosened adequately to allow inner tube to easily slide up or down within outside tube.
2. Lift up on top of IV Rod until desired height is achieved.
3. Tighten collar screw(s) until hand tight.

3.9.3 Retracting IV Rod

1. Support extended portion of IV Rod with one hand.
2. Rotate screw collar until loosened.
3. Lower IV Rod until desired height is achieved, then re-tighten screw collar.
4. Repeat process with second screw collar as required.

3.10 PATIENT RAIL OPERATION (ALL MODELS)

⚠ **WARNING: Always ensure the rail is locked in position before leaving the patient unattended.**

3.10.1 Raising the Rail

Grasp the rail top cap in the middle of the rail (Figure 3.10-1) and lift.

Figure 3.10-1

3.10.2 Half Height

Grasp the rail and lift the red trigger under the litter top (Figure 3.10-2) while lowering the rail. When the rail starts to move down, release the trigger. Lower the rail until it locks into half height position.

Figure 3.10-2

3.10.3 Lowering the Rail

Grasp the rail and lift the red trigger under the litter top (Figure 3.10.2) while lowering the rail. Continue to lift the trigger until the rail is all the way down.

⚠ **WARNING: When lowering the rails, ensure patient and caregiver body and extremities are clear of pinch points before operating the rail (Figure 3.10-3).**

⚠ **WARNING: Ensure both rails are in upright locked position before leaving patient.**

Figure 3.10-3

4 TROUBLESHOOTING GUIDE

4.1 ELECTRIC POWERED STRETCHERS

⚠ **DANGER: SHOCK HAZARD — To reduce the risk of electric shock, DO NOT remove the cover. Unit is to be serviced by qualified service personnel (minimum 1 year medical equipment service and repair experience) only.**

⚠ **DANGER: SHOCK HAZARD — ALWAYS disconnect the power source whenever troubleshooting or servicing any electric powered stretcher.**

If	Then
One motor or one column does not move but all others are operating correctly.	Step 1: Check all motor and column plug connections at the controller.
	Step 2: If a column does not move: Check the connection at the column.
	Step 3: Plug a connector from the faulty component into a different socket. If the component does not run: Replace that component. If the component runs: Test pendant by plugging a functioning component into the non-functioning socket on the controller. If this component does not run, replace the pendant. If replacing the pendant does not fix the problem, then replace the controller.
Nothing moves.	Step 1: Plug unit into main supply wall receptacle, then observe the pilot light on the controller. If the pilot light is off: Replace the controller. If the pilot light is on: 1. Check the nurse control plug connection at the controller. 2. Check the pendant control plug connection at the controller. 3. Ensure all lockout functions are deactivated. 4. Contact GF Health Products, Inc. for further help and instruction.
The unit runs when plugged into wall receptacle, but does not run on battery backup.	Step 1: Plug unit into a wall receptacle overnight. If the battery doesn't hold a charge, replace the battery (section 4.2).

4.2 BATTERY REPLACEMENT INSTRUCTIONS

Info: The stretcher utilizes a unique battery specific to this unit. To order, contact Graham-Field Customer Service at 1.770.368.4700.

1. Locate the battery and control box near the front column on the patient right side.
2. Using a flat-head screwdriver, depress the battery mounting tab shown.
3. Remove the control box and battery by sliding them away from you until they become detached.
4. Using a flat-head screwdriver, depress the control box mounting tab.
5. Seperate the battery from the control box by pulling toward yourself while supporting the control box.
6. Open the battery cord access cover using a flat-head screwdriver to depress the two locking tabs.
7. Remove the cable from the battery and replace it with a new battery.
8. To reinstall the battery, repeat previous steps in reverse order.

Figure 4.2-1

Figure 4.2-2

Figure 4.2-3

Figure 4.2-4

Figure 4.2-5

Figure 4.2-6

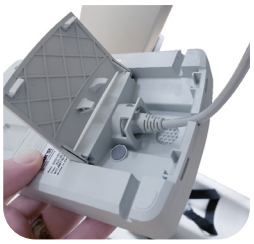


Figure 4.2-7

GF Health Products, Inc. may be contacted at 1.770.368.4700 for additional information required to service or repair the equipment.

5 PREVENTIVE MAINTENANCE FOR THE USER

Component	Cleaning Procedure	Schedule	Cleaning Agent *	Special Notes
Pads / Mattresses	Wipe with damp cloth to remove any foreign material	After each use	Routine hospital grade disinfectants, soap and water	Use only medium strength cleaners Do not steam clean or pressure wash
Stretcher	Wipe with damp cloth to remove any foreign material		Routine hospital grade disinfectants, soap and water	Lubricate pivot points after cleaning
Electrical components	Wipe external surfaces ONLY with damp cloth to remove any foreign material		Routine hospital grade disinfectants, soap and water	Use only medium strength cleaners
Mechanical stretcher components	Wipe with damp cloth to remove any foreign material		Routine hospital grade disinfectants, soap and water	Lubricate pivot points after cleaning
Mechanical accessories	Wipe with damp cloth to remove any foreign material		Routine hospital grade disinfectants, soap and water	Lubricate pivot points after cleaning

Procedure	Schedule	Material
Lubricate all moving and sliding parts and hinge points	Every 3 months	Lubricating oil, light-duty grease, wax stick lubricant or Never-Seez lubricant
⚠ NEVER LUBRICATE ACTUATORS OR COLUMNS ⚠		
Inspect all fasteners to ensure proper fit, position and tightness, including nuts, bolts, etc.	Every 3 months	Proper size wrench and screwdriver
Inspect all surfaces and remove any sharp or burred areas; apply touch-up paint where required		Metal file, proper color paint (specify color when ordering)

* Disinfecting and Cleaning Upholstery - ALWAYS follow manufacturer's recommended dilution	
Disinfectants for vinyl products	Phenolic disinfectants are the best choice for vinyl
	Properly diluted quaternaries are also acceptable for vinyl
	Quaternary / Isopropyl disinfectants ARE NOT recommended for vinyl
Disinfectants for urethane products	Quaternary disinfectants are recommended for urethane
	Quaternary / Isopropyl disinfectants are recommended for urethane
	Phenolics SHOULD BE AVOIDED on urethane
Disinfectants for all products	All fabrics may be cleaned with a 1:10 dilution of household bleaches containing 5.25% sodium hypochlorite as recommended by the Centers for Disease Control in Atlanta, Georgia; there is no harmful effect on the fabric
	Disinfectants applied at full concentration or in highly concentrated solutions will decrease the useful life of fabric
	Iodophor-type disinfectants used on fabric may result in staining
Soils or Stains	Use neutral soapsuds and lukewarm water; DO NOT use harsh cleansers, solvents or detergents
Hard-To-Clean Spots	Use standard household / vinyl cleansers and a soft bristle brush on troublesome spots or stains; pre-soak heavy, dried-on soil
Laundering	**Laundering Vinyl-laminated, Polyurethane-coated, or Rubber-coated fabric IS NOT recommended; l**aundering may substantially decrease the useful life of the fabric

▲ NOTICE — POSSIBLE EQUIPMENT DAMAGE HAZARD: Steam cleaning and pressure washing of stretcher is not recommended and can void warranty.

Info: For more detailed information, please contact GF Health Products, Inc. at 1.770.368.4700.

Info: GF Health Products, Inc. offers customized Preventive Maintenance Service Programs for Hausted products; contact your GF sales representative for further information.

6 OPTIONAL ACCESSORIES

Universal Accessories	
H000E1700	IV Rod, 42" Fixed Height
H000018	IV Rod, Telescoping Stainless 27" to 50" Height 2-Section with Holder
HSA080018	IV Pole Pendant Holder
H080770	IV and MONITOR ROD, Telescoping Stainless Steel
HSA400700	Surgical Accessories Rail - Pair
HSA080016	Surgical Bar Adapter for Retracto Rail Models - 5E82 & 5B800
HSA080025	Surgical Accessory Rail, Back Section
HSA080017	Surgical Armboard (HP141210538) with 2" Navy Pad (HP150830167)
HSA080029	Orthopedic Hand Surgery Board
HSA080015	Acc'y, Patient Safety Strap W/ Buckle and Clip
HSA080021	Next-Gen Oxyflex Diffusion & Extraction System
HSA080010	Mounting Bracket for Vertical O2 Tank Holder
H12845000	Vertical O2 Tank Holder
HSA080039	Vertical O2 Tank Holder w/ Mounting Bracket
HSA080014	Acc'y, FS3 Switch - Hi / Lo
HSA080022	Patient Tray - Next-Gen Stretchers
H000N4500	Folding Monitor Shelf
H00WN4500	Folding Monitor Shelf - Extra Wide
H00CR7B00	Folding Foot Extension / Footboard / Headboard Combination with Chart Holder - Standard Width
HSA080023	Lateral X-Ray Cassette Holder
H06883600	Extension Footboard / Monitor Shelf With Chart Holder - Standard Width
H06884600	Extension Footboard / Monitor Shelf with Chart Holder – Wide Width
H0CRW6B00	Stationary Footboard / Headboard with Chart Holder – Wide Width
H00006B00	Stationary Footboard / Headboard - Standard Width
H000W6B00	Stationary Footboard / Headboard – Wide Width
HPD0612	Pad Set, 4-Leg Retracto Rail - Navy
HSA400600	Oxyflex II with Flexible Support Structure and Adapter
HSA007900	Oxyflex II with Flexible Support Structure and Tuck Plate
HSA008000	Disposable Oxyflex II Diffusion Tray Including 24" Tube (Qty 25)
HSA078500	Wrist Rest, Dual Lateral
HSA078600	Wrist Rest, Full U (Over the Brow)
HSP100400	Wrist Rest, Tall (Gray)
HP150830447B	Contoured Headrest 2" with Lateral Support
HP150830448B	Contoured Headrest 3" with Lateral Support
HSA063500B	Contoured Headrest 4" with Lateral Support
H0101ST	Contoured Headrest Set - 2", 3", & 4"
H00CR6B00	Stationary Footboard / Headboard with Chart Holder - Standard Width
HSA080041	Dual-Hand Pendant Kit – Stretchers

⚠ **WARNING: It is recommended that only accessories approved by GF Health Products, Inc. be used with this device. The use of accessories, transducers, and cables other than those specified by the manufacturer may result in increased emissions or decreased immunity of the Hausted equipment.**

Info: To order accessories, or for more detailed information on accessories, please contact GF Health Products, Inc. at 1.770.368.4700.

7 GF HEALTH PRODUCTS, INC. LIMITED WARRANTY FOR HAUSTED

SCOPE OF WARRANTY

GF Health Products, Inc. ("GF") warrants to the original purchaser only that it will replace or repair components, at GF's sole discretion, that are defective in material or workmanship under normal use and service. All warranties are conditioned upon the proper use of the products strictly in accordance with good commercial practice and applicable GF instructions and manuals, including proper use and maintenance. To the extent that a third party warrants a component, GF conveys all of its rights under that warranty to the original purchaser, to the extent permitted.
This limited warranty shall only apply to defects that are reported in accordance with the provisions set forth in this warranty document, within the applicable warranty period and which, upon examination by GF or its authorized representative, prove to be a warranty item. (See Obtaining Warranty Service below) This limited warranty is not transferable.
The warranted components and time periods are set forth below:

COMPONENT	PARTS WARRANTY
Frame	5 years
Casters	1 year
Electrical components	2 years
Hydraulics	1 year
Mechanical Components:	3 years
Original and Replacement Upholstered Tops ǂ:	1 year
Replacement Parts ǂ:	90 days

* Labor is not included in the warranty.
ǂ Upholstery is only warranted on material supplied by GF.
ǂ The warranty period is as designated above. If a part is replaced under warranty, the original warranty period will not be affected. All other replacement parts will be subject to the warranty period specified.

The applicable warranty period shall commence from date of shipment to the original customer, unless there is an expiration date on the component in which case the warranty shall expire on the earlier of warranty period or the expiration date.

OBTAINING WARRANTY SERVICE

Customers located in the United States who wish to report a warranty issue, must contact GF directly by calling 1.770.368.4700 or by e-mailing a request to cs@grahamfield.com. Customers located outside the United States must contact the Distributor from whom they purchased the products. In both cases, further directions will be provided once the initial contact is made. This limited warranty shall only apply to defects that are reported within the applicable warranty period. Failure to abide by the specific directions will result in denial of the warranty claim.
The warranty does not cover and GF shall not be liable for the following:

1. Defects, damage, or other conditions caused, in whole or in part, by misuse, abuse, negligence, alteration, accident, freight damage, tampering or failure to seek and obtain repair or replacement in a timely manner;
2. Products which are not installed, used, or properly cleaned and maintained as required in the official manual for the applicable product;
3. Products considered to be of a non-durable nature including, but not limited to: filters, fuses, gaskets, lubricants, and charts;
4. Accessories or parts not provided by GF;
5. Matching of color, grain or texture except to commercially acceptable standards;
6. Changes in color caused by natural or artificial light:
7. Charges by anyone for adjustments, repairs, replacement parts, installation or other work performed upon or in connection with such products which are not expressly authorized in writing, in advance, by GF;
8. Any labor or shipping charges incurred in the replacement part installation or repair;
9. Costs and expenses of regular maintenance and cleaning; and
10. Representations and warranties made by any person or entity other than GF.

ENTIRE WARRANTY, EXCLUSIVE REMEDY AND CONSEQUENTIAL DAMAGES DISCLAIMER

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NOTES:

1) Additional terms and conditions may apply. See GF's General Terms and Conditions on its website: www.grahamfield.com.
2) Freight claims must be notated on the appropriate shipping documents and must be made with immediacy. International, federal and state regulations govern specific requirements for freight claims. Failure to abide by those regulations may result in a denial of the freight claim. GF will assist you in filing the freight claim.
3) Claims for any short shipment must be made within three (3) days of the invoice date.

8 DISPOSAL AND KEY TO SYMBOLS

DISPOSAL

Hausted equipment and accessories can be disposed of.

We recommend disassembling and dividing the equipment and components into different waste groups such as: metal, cable, electronic, recoverable resource and plastic for recycling or combustion.

Most plastic components are provided with a plastic types code and fiber content to aid sorting of plastic parts.

Product	Metal Scrap	Cable Scrap	Electronic Scrap	Plastic Recycling or Combustion
5E82EYEST / 5E82EYXST	X	X	X	X

Info: Dispose of lithium battery attached to the control box in accordance with local regulations.

KEY TO SYMBOLS

The following symbols are used on Hausted product labels.

	Protective Earth		Manufacturer
	Earth Ground		Keep Dry
	General Warning Sign		Fragile, Handle with Care
CE	CE Mark		Electrical and Electronic Equipment
ETL CLASSIFIED Intertek	ETL		Consult Instructions for Use
EU REP	European Authorized Representative		Caution
	Disconnect before Service		Pinch Point
MD	Medical Device	UDI	Unique Device Identifier
	Type B Applied Part		

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9 APPENDIX

9.1 GUIDANCE AND MANUFACTURER'S DECLARATION — ELECTROMAGNETIC EMISSIONS

The Hausted Stretchers are intended for use in the electromagnetic environment specified below. The customer or the user of the Hausted Stretchers should assure that they are used in such an environment.		
Emissions Test	**Compliance**	**Electromagnetic Environment — Guidance**
RF emissions CISPR 11	Group 1	The Hausted Stretchers use RF energy only for their internal function. Therefore, their RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. The Hausted Stretchers are suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF emissions CISPR 11	Class A	
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations / flicker emissions IEC 61000-3-3	Complies	

9.2 ENCLOSURE PORT [1]

Phenomenon	Basic EMC standard or test method	IMMUNITY TEST LEVELS
		Professional healthcare facility environment
ELECTROSTATIC DISCHARGE	IEC 61000-4-2	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV air
Radiated RF EM fields [a)]	IEC 61000-4-3	3 V/m [f)] 80 MHz – 2,7 GHz [b)] 80 % AM at 1 kHz [c)]
Proximity fields from RF wireless communications equipment	IEC 61000-4-3	See Table 9.3.
RATED power frequency magnetic fields [d) e)]	IEC 61000-4-8	30 A/m [g)] 50 Hz or 60 Hz

a) The interface between the PATIENT physiological signal simulation, if used, and the ME EQUIPMENT or ME SYSTEM shall be located within 0,1 m of the vertical plane of the uniform field area in one orientation of the ME EQUIPMENT or ME SYSTEM.

b) ME EQUIPMENT and ME SYSTEMS that intentionally receive RF electromagnetic energy for the purpose of their operation shall be tested at the frequency of reception. Testing may be performed at other modulation frequencies identified by the RISK MANAGEMENT PROCESS. This test assesses the BASIC SAFETY and ESSENTIAL PERFORMANCE of an intentional receiver when an ambient signal is in the passband. It is understood that the receiver might not achieve normal reception during the test.

c) Testing may be performed at other modulation frequencies identified by the RISK MANAGEMENT PROCESS.

d) Applies only to ME EQUIPMENT and ME SYSTEMS with magnetically sensitive components or circuitry.

e) During the test, the ME EQUIPMENT or ME SYSTEM may be powered at any NOMINAL input voltage, but with the same frequency as the test signal (see Table 1).

f) Before modulation is applied.

g) This test level assumes a minimum distance between the ME EQUIPMENT or ME SYSTEM and sources of power frequency magnetic field of at least 15 cm. If the RISK ANALYSIS shows that the ME EQUIPMENT or ME SYSTEM will be used closer than 15 cm to sources of power frequency magnetic field, the IMMUNITY TEST LEVEL shall be adjusted as appropriate for the minimum expected distance.

9.3 ENCLOSURE PORT IMMUNITY TO RF WIRELESS COMMUNICATIONS EQUIPMENT [1]

Test frequency (MHz)	Band [a] (MHz)	Service [a]	Modulation [b]	Maximum power (W)	Distance (m)	IMMUNITY TEST LEVEL (V/m)
385	380 –390	TETRA 400	Pulse modulation [b] 18 Hz	1,8	0,3	27
450	430 – 470	GMRS 460, FRS 460	FM [c] ± 5 kHz deviation 1 kHz sine	2	0,3	28
710	704 – 787	LTE Band 13, 17	Pulse modulation [b] 217 Hz	0,2	0,3	9
745						
780						
810	800 – 960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation [b] 18 Hz	2	0,3	28
870						
930						
1 720	1 700 – 1 990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation [b] 217 Hz	2	0,3	28
1 845						
1 970						
2 450	2 400 – 2 570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation [b] 217 Hz	2	0,3	28
5 240	5 100 – 5 800	WLAN 802.11 a/n	Pulse modulation [b] 217 Hz	0,2	0,3	9
5 500						
5 785						

9.4 INPUT AC POWER PORT [1]

Phenomenon	Basic EMC standard	IMMUNITY TEST LEVELS
		Professional healthcare facility environment
Electrical fast transients / bursts [a) l) o)]	IEC 61000-4-4	± 2 kV 100 kHz repetition frequency
Surges [a) b) j) o)] Line-to-line	IEC 61000-4-5	± 0,5 kV, ± 1 kV
Surges [a) b) j) k) o)] Line-to-ground	IEC 61000-4-5	± 0,5 kV, ± 1 kV, ± 2 kV
Conducted disturbances induced by RF fields [c) d) o)]	IEC 61000-4-6	3 V [m)] 0,15 MHz – 80 MHz 6 V [m)] in ISM bands between 0,15 MHz and 80 MHz [n)] 80 % AM at 1 kHz [e)]
Voltage dips [f) p) r)]	IEC 61000-4-11	0 % U_T; 0,5 cycle [g)] At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° [q)]
		0 % U_T; 1 cycle and 70 % U_T; 25/30 cycles [h)] Single phase: at 0°
Voltage interruptions [f) i) o) r)]	IEC 61000-4-11	0 % U_T; 250/300 cycle [h)]

a) The test may be performed at any one power input voltage within the ME EQUIPMENT or ME SYSTEM RATED voltage range. If the ME EQUIPMENT or ME SYSTEM is tested at one power input voltage, it is not necessary to re-test at additional voltages.

b) All ME EQUIPMENT and ME SYSTEM cables are attached during the test.

c) Calibration for current injection clamps shall be performed in a 150 Ω system.

d) If the frequency stepping skips over an ISM or amateur band, as applicable, an additional test frequency shall be used in the ISM or amateur radio band. This applies to each ISM and amateur radio band within the specified frequency range.

e) Testing may be performed at other modulation frequencies identified by the RISK MANAGEMENT PROCESS.

f) ME EQUIPMENT and ME SYSTEMS with a d.c. power input intended for use with a.c.-to-d.c. converters shall be tested using a converter that meets the specifications of the MANUFACTURER of the ME EQUIPMENT or ME SYSTEM. The IMMUNITY TEST LEVELS are applied to the a.c. power input of the converter.

g) Applicable only to ME EQUIPMENT and ME SYSTEMS connected to single-phase a.c. mains.

h) E.g. 10/12 means 10 periods at 50 Hz or 12 periods at 60 Hz.

i) ME EQUIPMENT and ME SYSTEMS with RATED input current greater than 16 A / phase shall be interrupted once for 250/300 cycles at any angle and at all phases at the same time (if applicable). ME EQUIPMENT and ME SYSTEMS with battery backup shall resume line power operation after the test. For ME EQUIPMENT and ME SYSTEMS with RATED input current not exceeding 16 A, all phases shall be interrupted simultaneously.

9.4 CONTINUED

j) ME EQUIPMENT and ME SYSTEMS that do not have a surge protection device in the primary power circuit may be tested only at ± 2 kV line(s) to earth and ± 1 kV line(s) to line(s).

k) Not applicable to CLASS II ME EQUIPMENT and ME SYSTEMS.

l) Direct coupling shall be used.

m) r.m.s., before modulation is applied.

n) The ISM (industrial, scientific and medical) bands between 0,15 MHz and 80 MHz are 6,765 MHz to 6,795 MHz; 13,553 MHz to 13,567 MHz; 26,957 MHz to 27,283 MHz; and 40,66 MHz to 40,70 MHz. The amateur radio bands between 0,15 MHz and 80 MHz are 1,8 MHz to 2,0 MHz, 3,5 MHz to 4,0 MHz, 5,3 MHz to 5,4 MHz, 7 MHz to 7,3 MHz, 10,1 MHz to 10,15 MHz, 14 MHz to 14,2 MHz, 18,07 MHz to 18,17 MHz, 21,0 MHz to 21,4 MHz, 24,89 MHz to 24,99 MHz, 28,0 MHz to 29,7 MHz and 50,0 MHz to 54,0 MHz.

o) Applicable to ME EQUIPMENT and ME SYSTEMS with RATED input current less than or equal to 16 A / phase and ME EQUIPMENT and ME SYSTEMS with RATED input current greater than 16 A / phase.

p) Applicable to ME EQUIPMENT and ME SYSTEMS with RATED input current less than or equal to 16 A / phase.

q) At some phase angles, applying this test to ME EQUIPMENT with transformer mains power input might cause an overcurrent protection device to open. This can occur due to magnetic flux saturation of the transformer core after the voltage dip. If this occurs, the ME EQUIPMENT or ME SYSTEM shall provide BASIC SAFETY during and after the test.

r) For ME EQUIPMENT and ME SYSTEMS that have multiple voltage settings or auto ranging voltage capability, the test shall be performed at the minimum and maximum RATED input voltage. ME EQUIPMENT and ME SYSTEMS with a RATED input voltage range of less than 25 % of the highest RATED input voltage shall be tested at one RATED input voltage within the range. See Table 1 Note c) for examples calculations.

9.5 PATIENT COUPLING PORT [1]

Phenomenon	Basic EMC standard	IMMUNITY TEST LEVELS
		Professional healthcare facility environment
ELECTROSTATIC DISCHARGE [c)]	IEC 61000-4-2	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV air
Conducted disturbances induced by RF fields [a)]	IEC 61000-4-6	3 V [b)] 0,15 MHz – 80 MHz 6 V [b)] in ISM bands between 0,15 MHz and 80 MHz 80 % AM at 1 kHz

a) The following apply:

- All PATIENT-COUPLED cables shall be tested, either individually or bundled
- PATIENT-COUPLED cables shall be tested using a current clamp unless a current clamp is not suitable. In cases were a current clamp is not suitable, an EM clamp shall be used.
- No intentional decoupling device shall be used between the injection point and the PATIENT COUPLING POINT in any case.
- Testing may be performed at other modulation frequencies identified by the RISK MANAGEMENT PROCESS.
- Tubes that are intentionally filled with conductive liquids and intended to be connected to a PATIENT shall be considered to be PATIENT-COUPLED cables.
- If the frequency stepping skips over an ISM or amateur radio band, as applicable, an additional test frequency shall be used in the ISM or amateur radio band. This applies to each ISM and amateur radio band within the specified frequency range.
- The ISM (industrial, scientific and medical) bands between 0,15 MHz and 80 MHz are 6,765 MHz to 6,795 MHz; 13,553 MHz to 13,567 MHz; 26,957 MHz to 27,283 MHz; and 40,66 MHz to 40,70 MHz. The amateur radio bands between 0,15 MHz and 80 MHz are 1,8 MHz to 2,0 MHz, 3,5 MHz to 4,0 MHz, 5,3 MHz to 5,4 MHz, 7 MHz to 7,3 MHz, 10,1 MHz to 10,15 MHz, 14 MHz to 14,2 MHz, 18,07 MHz to 18,17 MHz, 21,0 MHz to 21,4 MHz, 24,89 MHz to 24,99 MHz, 28,0 MHz to 29,7 MHz and 50,0 MHz to 54,0 MHz.

b) r.m.s., before modulation is applied

c) Discharges shall be applied with no connection to an artificial hand and no connection to PATIENT simulation. PATIENT simulation may be connected after the test as needed in order to verify BASIC SAFETY and ESSENTIAL PERFORMANCE.

9.6 SIGNAL INPUT/OUTPUT PARTS PORT [1]

Phenomenon	Basic EMC standard	IMMUNITY TEST LEVELS
		Professional healthcare facility environment
ELECTROSTATIC DISCHARGE [e)]	IEC 61000-4-2	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV air
Electrical fast transients / bursts [b) f)]	IEC 61000-4-4	± 1 kV 100 kHz repetition frequency
Surges Line-to-ground [a)]	IEC 61000-4-5	± 2 kV
Conducted disturbances induced by RF fields [b) d) g)]	IEC 61000-4-6	3 V [h)] 0,15 MHz – 80 MHz 6 V [h)] in ISM bands between 0,15 MHz and 80 MHz [i)] 80 % AM at 1 kHz [c)]

a) This test applies only to output lines intended to connect directly to outdoor cables.

b) SIP/SOPS whose maximum cable length is less than 3 m in length are excluded.

c) Testing may be performed at other modulation frequencies identified by the RISK MANAGEMENT PROCESS.

d) Calibration for current injection clamps shall be performed in a 150 Ω system.

e) Connectors shall be tested per 8.3.2 and Table 4 of IEC 61000-4-2:2008. For insulated connector shells, perform air discharge testing to the connector shell and the pins using the rounded tip finger of the ESD generator, with the exception that the only connector pins that are tested are those that can be contacted or touched, under conditions of INTENDED USE, by the standard test finger shown in Figure 6 of the general standard, applied in a bent or straight position.

f) Capacitive coupling shall be used.

g) If the frequency stepping skips over an ISM or amateur radio band, as applicable, an additional test frequency shall be used in the ISM or amateur radio band. This applies to each ISM and amateur radio band within the specified frequency range.

h) r.m.s., before modulation is applied.

i) The ISM (industrial, scientific and medical) bands between 150 kHz and 80 MHz are 6,765 MHz to 6,795 MHz; 13,553 MHz to 13,567 MHz; 26,957 MHz to 27,283 MHz; and 40,66 MHz to 40,70 MHz. The amateur radio bands between 0,15 MHz and 80 MHz are 1,8 MHz to 2,0 MHz, 3,5 MHz to 4,0 MHz, 5,3 MHz to 5,4 MHz, 7 MHz to 7,3 MHz, 10,1 MHz to 10,15 MHz, 14 MHz to 14,2 MHz, 18,07 MHz to 18,17 MHz, 21,0 MHz to 21,4 MHz, 24,89 MHz to 24,99 MHz, 28,0 MHz to 29,7 MHz and 50,0 MHz to 54,0 MHz.

9.7 NOTES TO SECTION 9

1. 60601-1-2 © IEC:2014

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