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CARROLL
HOSPITAL GROUP

User Manual for Spirit™ Beds

Spirit™ • Spirit Plus™ • Spirit Select™

Please read carefully before using your new bed

The Spirit™ Bed



1-70-001-H

Spirit™ Bed – Quick Reference Guide

To Operate the Bed:
Use the footboard staff control or the pendant to raise or lower the head section, the knee section, or the entire bed.

To Operate 'One-Touch CPR':
Push and release the CPR button; head and knee sections will automatically flatten.

To Operate Trendelenburg:
Push and hold the TREND (Trendelenburg) or rev.TREND (Reverse Trendelenburg) button on the footboard control to achieve either function. To automatically level the bed, push and hold the opposite function until the bed stops.

To Operate 'Chair':
Push and hold the CHAIR button. Green LED illuminates when bed angle is attained, then head and knee will raise to full extension. Push and hold button again to remove chair. (Bed will reverse its position each time the CHAIR button is pressed).

To Operate 'Auto Contour':
Press the CONTOUR button so that the green light is on. Knee section will raise automatically when head section is raised. (NOTE: knee lock-out will override Auto Contour).

Lock-Outs:
The pendant can be locked or unlocked (to restrict patient use). Lock-outs for each bed function are located on the footboard staff control underneath each function. When the LOCK button LED is illuminated, patient control of that particular function with the pendant is restricted. If the LOCK button LED is not illuminated, then patient control of that function is permitted.

Master Lock-Out:
To restrict all pendant ***and*** footboard controls, press all three LOCK buttons simultaneously (the LOCK button LED's will sequentially flash). When Master Lock-Out has been activated, the emergency CPR function remains operable.

To Operate Assist Rails™:
Pull the black knob out, then rotate the rail into the desired position. Rail will automatically lock in the "GUARD" and the "ASSIST" positions, but will remain unlocked in the "TRANSFER" position.

To Move and Lock the Bed:
Use the Central "Lock & Steer" system:

BRAKE: All four wheels are locked in "BRAKE" mode
STEER: Foot-end wheels are locked in "STEER" mode, head-end wheels swivel freely
NEUTRAL: All four wheels swivel freely in "NEUTRAL" mode

Power Status Indication:

LED is solid GREEN:	Bed is plugged into an AC power outlet and the battery is fully charged
LED is flashing GREEN:	Bed is plugged into an AC power outlet and the battery is charging
LED is solid RED:	Bed is running on battery power
LED is flashing RED:	Bed is running on battery power but has used up the battery power. Plug bed into an AC power outlet and allow battery to charge for 24 hr
LED is alternating flashing GREEN and RED:	Bed is plugged into AC power outlet but there is a problem with the battery or another component. Service bed immediately

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Spirit Plus™ Bed – Quick Reference Guide

To Operate the Bed:
Use the footboard staff control, rail controls, or the pendant to raise or lower the head section, the knee section, or the entire bed.

To Operate 'One-Touch CPR':
Push and release the CPR button; head and knee sections will automatically flatten.

To Operate Trendelenburg:
Push and hold the TREND (Trendelenburg) or rev.TREND (Reverse Trendelenburg) button on the footboard control to achieve either function. To automatically level the bed, push and hold the opposite function until the bed stops.

To Operate 'Chair':
Push and hold the CHAIR button. Green LED illuminates when bed angle is attained, then head and knee will raise to full extension. Push and hold button again to remove chair. (Bed will reverse its position each time the CHAIR button is pressed).

To Operate 'Auto Contour':
Press the CONTOUR button so that the green light is on. Knee section will raise automatically when head section is raised. (NOTE: KNEE lock-out will override Auto Contour).

Lock-Outs:
The side rail controls and pendant can be locked or unlocked (to restrict patient use). Lock-outs for each bed function are located on the footboard staff control underneath each function. When the LOCK button LED is illuminated, patient control of that particular function with the side rail controls or pendant is restricted. If the LOCK button LED is not illuminated, then patient control of that function is permitted.

Master Lock-Out:
To restrict all side rail, pendant, ***and*** footboard controls, press all three LOCK buttons simultaneously (the LOCK button LED's will sequentially flash). When Master Lock-Out has been activated, the emergency CPR function and Nurse Call remains operable.

To Operate 'Quad Rails':
To lower the rails, gently depress the green push button, then rotate the rail down. Head rails rotate toward the headboard, foot rails rotate toward the footboard. The rail will automatically lock in the UP position.

To Move and Lock the Bed:
Use the Central "Lock & Steer" system:

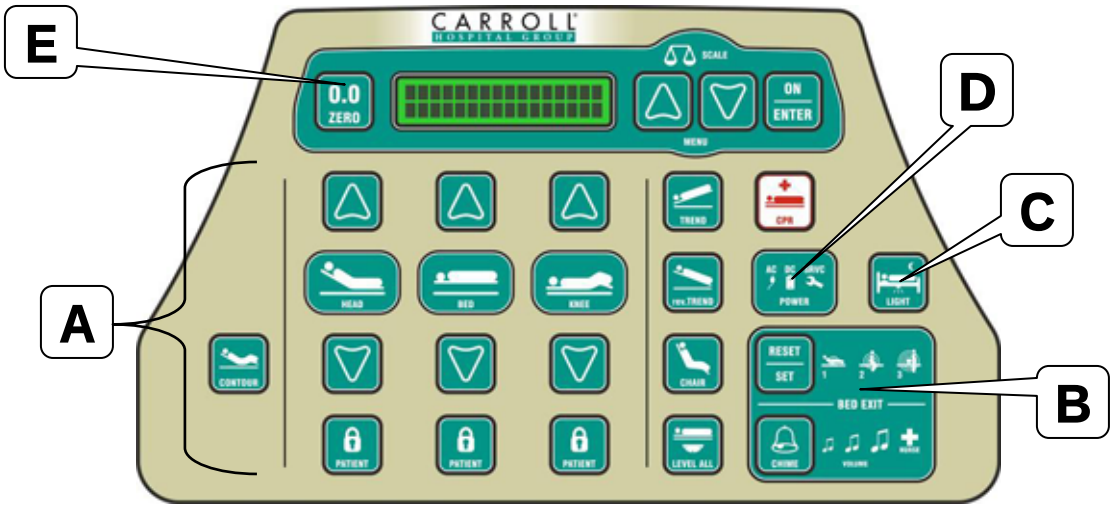
BRAKE: All four wheels are locked in "BRAKE" mode
STEER: Foot-end wheels are locked in "STEER" mode, head-end wheels swivel freely
NEUTRAL: All four wheels swivel freely in "NEUTRAL" mode

Power Status Indication:

LED is solid GREEN:	Bed is plugged into an AC power outlet and the battery is fully charged
LED is flashing GREEN:	Bed is plugged into an AC power outlet and the battery is charging
LED is solid RED:	Bed is running on battery power
LED is flashing RED:	Bed is running on battery power but has used up the battery power. Plug bed into an AC power outlet and allow battery to charge for 24 hr
LED is alternating flashing GREEN and RED:	Bed is plugged into an AC power outlet but there is a problem with the battery or another component. Service bed immediately

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Spirit Select™ Bed – Quick Reference Guide



A Basic Bed Operation

Bed Operation: Use footboard or rail controls to raise or lower head section, knee section, or the entire bed.

One-Touch CPR: Press and release to automatically flatten head and knee in emergency

Trendelenburg: Push and hold TREND or rev.TREND button to achieve function; to level bed, press and hold opposite function until bed automatically stops at level.

Chair: Push and hold CHAIR button until bed stops in chair position; push and hold to remove chair (bed will reverse position each time the CHAIR button is pressed).

Auto Contour: Press CONTOUR button. Illuminated button indicates that the Auto Contour function is active. Knee section will automatically raise when head section is raised (NOTE: KNEE lock-out will override Auto Contour).

Level All: Push and hold to flatten head and knee sections

Lock-Outs: To restrict patient use, press the LOCK button under each function; if the LOCK button is illuminated, patient control of that particular function with the side rail controls or pendant is restricted. If the LOCK button is not illuminated, then patient control of that function is permitted.

Master Lock-Out: To restrict all side rail, pendant, ***and*** footboard controls, press all three LOCK buttons simultaneously (the buttons will sequentially flash). When Master Lock-Out has been activated, the emergency CPR function and Nurse Call remains enabled.

B Bed Exit Alarm

1. Place patient in bed
2. Press SET/RESET button to cycle through the sensitivity levels; stop at appropriate level
3. An audible “chirp” will sound to indicate that the alarm has been armed.
4. Press CHIME button to cycle the through the volume and nurse call levels; stop at appropriate level
5. A ringing alarm can be silenced by:
   - Pressing SET/RESET button (this will shut down alarm mode). Once patient is properly positioned again, you must press SET/RESET to arm; or
   - Returning patient to proper position; a “chirp” will sound to indicate the alarm has been re-activated

Bed Exit Alarm Chime Selection: Press and hold the CHIME button for 5 seconds to cycle through the available chime tones. When the desired chime tone is heard, release the CHIME button to select. The selected chime tone will sound as confirmation that the chime tone has been changed.

C Underbed Light

Press LIGHT button to scroll through brightness levels of underbed light (OFF – LOW – HIGH)

Bed Exit Light: Automatically illuminates when patient exits bed. Automatically turns off when patient re-enters the bed or after 15 minutes has elapsed

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D Power Status Indicator

GREEN AC only	Bed is plugged into an AC power outlet and the battery is fully charged
GREEN AC and flashing AMBER DC	Bed is plugged into an AC power outlet and the battery is charging
AMBER DC only	Bed is running on battery power
AMBER DC and flashing RED ATTN	Bed is running on battery power but has used up the battery power. Plug bed into an AC power outlet and allow battery to charge for 24hr
GREEN AC and flashing RED ATTN	Bed is plugged into an AC power outlet but there is a problem with battery or another component. Service bed immediately

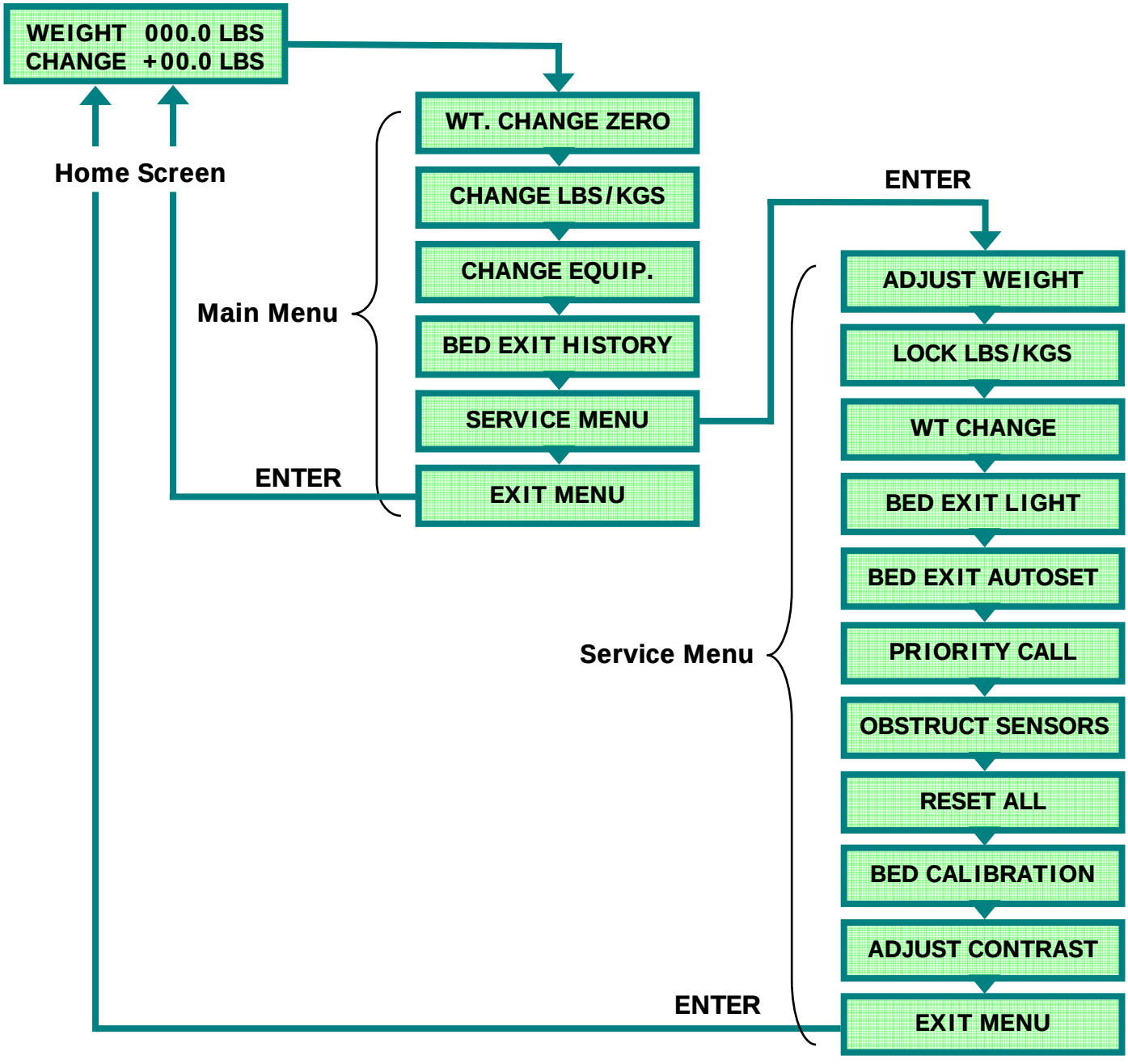
E Patient Scale & LCD Display

Press ON/ENTER button to “wake up” display to show Weight, Wt. Change, and Trend Angle
Use UP/DOWN Arrow buttons to scroll through the following menus
Recommended before each new patient:

- Zero bed
- Reset “Bed Exit History”

Recommended after patient is placed in bed:

- Zero “Weight Change”



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A Message from Carroll Hospital Group

To Our Valued Customers,

Thank you for selecting Carroll Hospital Group as your hospital bed provider, and congratulations on your purchase of a Spirit™ bed. You are a part of the growing majority of healthcare providers that recognize the benefits of a low hospital bed.

Carroll Hospital Group is committed to meeting the needs of our customers through quality products that are innovative, user-friendly, easy to maintain, and most importantly, focused on patient safety. We are sure that your hospital will enjoy the benefits and safety features of the Spirit™ bed for many years to come.

The Spirit™ bed is manufactured in London, Ontario, Canada. Each and every Spirit™ bed is inspected and tested by our team of highly trained and dedicated quality technicians to ensure that all Spirit™ beds meet our strict quality standards before entering your hospital.

Our sales team is focused on providing exceptional sales support before, during, and after the delivery of your Spirit™ beds. If at any time you have questions or concerns regarding your Spirit™ bed, we strongly encourage you to call us at 1-866-516-5446. Our hands-on company philosophy enables us to respond to our customers quickly and effectively.

We recommend that you carefully read this Spirit™ Bed Owner's Manual prior to operating your bed. Becoming acquainted with the safe operation and maintenance procedures outlined in this manual will ensure proper bed use and can extend the service life of the bed.

Sincerely,



Kyle Sobko
Vice President of Sales & Marketing
Carroll Hospital Group

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Section 1:

Specifications & Precautions

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1.1 Full Bed Warranty

Carroll Hospital Group's pro-rated warranty covers manufacturing defect, or failure due to workmanship or materials.

Carroll Hospital Group warrants to the original purchaser of its products that the electrical components are guaranteed to be free from manufacturing defect for one (1) year from the date of purchase.
Carroll Hospital Group warrants to the original purchaser of its products that the product or any part thereof, in the judgment of Carroll Hospital Group, will not be defective in material or workmanship for one (1) year from date of original purchase.
Carroll Hospital Group specifically warrants to the original purchaser of its products that the reinforced fibreglass sections of the mattress deck will not be defective in material or workmanship for twenty (20) years from date of original purchase.

Such defects will be repaired or replaced (at the company's option) free of charge for parts only, provided the defective product is shipped to the factory or an authorized depot at the customer's own expense. Shipping charges for return of the product to the customer will also be at the customer's own expense.

This warranty does not include any labour or shipping charges incurred in replacement part installation or repair of any such part. Carroll Hospital Group's sole obligation and your exclusive remedy under this warranty shall be limited to such repair and/or replacement.

After one year, for the next four years, frame parts only will be covered by the warranty according to the following five (5) year pro rated fee schedule:

2nd year	frame parts only	list price less 60%
3rd year	frame parts only	list price less 40%
4th year	frame parts only	list price less 20%
5th year	frame parts only	list price less 10%

Parts, in the judgment of Carroll Hospital Group, found to be damaged through normal wear and tear, impact, abuse, overloading, fire, lightening, water damage or power surges, brown-outs, improper supply voltage or use of other manufacturer's head and foot boards or accessories will not be covered and parts will be charged out at the full list price.

Any alteration made to and/or performed on the bed and/or one of its components voids this warranty.

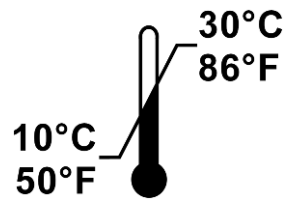
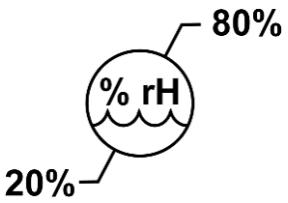
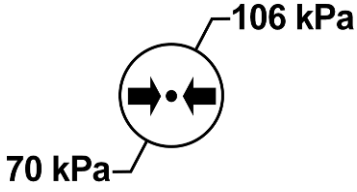
A Return Goods Authorization number (RGA) must be obtained before returning any products or parts to the factory. We regret that no products will be accepted at the factory without an RGA number. No other warranty, expressed or implied by Carroll Hospital Group or its agents shall be considered valid.

Carroll Hospital Group Inc.
153 Towerline Place
London, Ontario
Canada
N6E 2T3

Phone: (519) 963-4010
Fax: (519) 963-4013
Toll Free: (866) 516-5446

1.2 Intended Use

The Spirit™ bed is intended for low to moderate acuity patients in the medical and/or surgical area of the hospital. The Spirit™ bed is also intended for use as a general-purpose variable height hospital bed for general care, post-operative, and general medicine wards.

Environmental Conditions for Normal Use		
		
Ambient Temperature Range	Ambient Humidity Range (Non Condensing)	Atmospheric Pressure Range

1.3 Standard Conventions Used in this Manual

This manual includes information essential to the safety of the patient, staff, and equipment during the normal operation of the Spirit™ bed. Before operating the Spirit™ bed be sure you have read and understood the contents of this manual. It is important that you use this equipment in accordance with the procedures outlined in this manual. As you read through this manual be alert to the four signal words.

⚠ DANGER	Information appearing under the **DANGER** caption concerns the protection of patient, staff, and others from the immediate and imminent hazards that, if not avoided, will result in immediate, serious personal injury or loss of life in addition to equipment damage.
⚠ WARNING	Information appearing under the **WARNING** caption concerns the protection of patient, staff, and others from potential hazards that can result in personal injury or loss of life in addition to equipment damage.
⚠ CAUTION	Information appearing under the **CAUTION** caption concerns the protection of patient, staff, and others from potential hazards that can result in minor personal injury or equipment damage.
NOTE:	Information appearing in a **NOTE** caption provides additional information which is helpful in understanding the item being explained.

1.3.1 Patient Left & Patient Right Determination

Carroll Hospital Group's determination of the "Patient Left" and the "Patient Right" side of the bed is made from the patient's point of view while positioned normally on the bed facing up.

1.4 Symbols Used on the Spirit™ Bed

	PROTECTIVE EARTH GROUND		CARDIOPULMONARY RESUSCITATION (CPR) FUNCTION ONE TOUCH TO FULLY LOWER ALL SECTIONS OF MATTRESS SUPPORT PLATFOM PARALLEL TO BED FRAME		CHAIR FUNCTION PUSH AND HOLD TO BRING PATIENT TO SITTING POSITION
	POTENTIAL EQUALIZATION (EQUIPOTENTIAL POINT)		TRENDELENBURG FUNCTION PUSH AND HOLD TO MOVE THE BED INTO TRENDELENBURG POSITION		CONTOUR FUNCTION TOGGLE TO INITIATE AUTOMATIC ACTION OF KNEE-FOOT SECTION WHEN ACTION IS INITIATED TO HEAD SECTION OF MATTRESS DECK
	WARNING – SAFE WORKING LOAD THE MAXIMUM ALLOWABLE LOAD ON EQUIPMENT IF THE INSTRUCTIONS FOR INSTALLATION AND USE ARE FOLLOWED		REVERSE TRENDELENBURG FUNCTION PUSH AND HOLD TO MOVE THE BED INTO REVERSE TRENDELENBURG POSITION		FUNCTION LOCK-OUT ACTIVATE TOGGLE SWITCH TO RESTRICT FUNCTION OF PATIENT AND PENDANT CONTROL
IP54	INGRESS PROTECTION CODE (IP CODE)		INITIATE ACTION TO HEAD SECTION OF MATTRESS DECK		UP CONTROL ELEVATES THE CORRESPONDING SECTION OF THE MATTRESS DECK
	TYPE B EQUIPMENT		INITIATE ACTION TO ENTIRE MATTRESS DECK (HI-LO)		DOWN CONTROL LOWERS THE CORRESPONDING SECTION OF THE MATTRESS DECK
CLASS 1	EQUIPMENT CLASSIFICATION IN TERMS OF PROTECTION AGAINST ELECTRICAL SHOCK		INITIATE ACTION TO KNEE-FOOT SECTION OF MATTRESS DECK		POWER STATUS INDICATOR (SPIRIT™ & SPIRIT PLUS™)

1.5 Additional Symbols Used on the Spirit Select™ Bed

	SCALE ZERO BUTTON PUSH AND HOLD TO ZERO SCALE		SET/RESET BUTTON PUSH TO TURN ON/OFF AND SELECT DESIRED BED EXIT SENSITIVITY LEVEL		LEVEL ALL FUNCTION PUSH AND HOLD WILL FULLY LOWER ALL SECTIONS OF MATTRESS DECK PARALLEL TO BED FRAME
	DISPLAY ON/ENTER BUTTON PUSH TO ACTIVATE OR "WAKE UP" MENU DISPLAY OR PUSH TO MAKE A MENU SELECTION		CHIME BUTTON PUSH TO CYCLE THROUGH CHIME VOLUME AND NURSE/PRIOIRITY CALL SETTINGS PUSH AND HOLD TO CYCLE THROUGH AVAILABLE CHIME OPTIONS		UNDERBED LIGHT PUSH TO TURN UNDERBED AMBIENT LIGHTING ON/OFF
	MENU SCROLL ARROW BUTTONS PUSH TO SCROLL UP/DOWN THROUGH MENUS		BED EXIT ALARM SENSITIVITY LEVELS		POWER STATUS INDICATOR (SPIRIT SELECT™)
			BED EXIT ALARM VOLUME AND NURSE/PRIORITY CALL ACTIVIATION SETTINGS		

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1.6 Technical Specifications

Certifications	**120V Models**		**230V Models**			
Certified/Conforms to:	CSA 601.1-M90, CSA 60601-2-38 UL 60601-1, IEC 60601-2-38		IEC 60601-1 IEC 60601-2-38			
Articulation Range	**Spirit™**		**Spirit Plus™**		**Spirit Select™**	
Mattress Deck Height - Lowest Elevation	8¾"	222.3 mm	8¾"	222.3 mm	10”	254.0 mm
Mattress Deck Height - Highest Elevation	34"	863.6 mm	34"	863.6 mm	35¼"	895.4 mm
Head Section Angle	0° to 67°		0° to 67°		0° to 71°	
Knee/Foot Section Angle	0° to 25°		0° to 25°		0° to 28°	
Trendelenburg	0° to 14°		0° to 14°		0° to 14°	
Reverse Trendelenburg	0° to -14°		0° to -14°		0° to -14°	
Underbed Patient Lift Clearance (Bed at Highest Elevation)			13" (330.2 mm)			
Underbed Clearance - Lowest Point (Bed at Lowest Elevation)			1¾” (44.5 mm)			
Electrical Specifications			**120V Models**		**230V Models**	
Mode of Operation - Intermittent Operation			Duty: 10% (2 Minutes ON, 18 Minutes OFF)			
Mains Input Voltage			120 Volts AC		230 Volts AC	
Mains Input Current			4.0 Amps		2.1 Amps	
Mains Input Current Frequency			60 Hertz		50 Hertz	
Motor (Actuator) Voltage - Safety Extra Low Voltage (SELV)			24 Volts DC		24 Volts DC	
Controls Voltage - Safety Extra Low Voltage (SELV)			5-12 Volts DC		5-12 Volts DC	
Power Consumption - at Maximum Load (Safe Working Load)			480 Watts		480 Watts	
Power Consumption - at Idle			24 Watts		24 Watts	
Auxiliary Mains AC Outlet - Maximum Output Power			120 Volts AC, 600 Watts		-	
Control Points	**Spirit™**		**Spirit Plus™**		**Spirit Select™**	
Footboard Staff Control	Standard Control		Standard Control		Enhanced Control	
Siderail Controls (Patient and Staff)	-		Standard		Standard	
Six Function Handheld Pendant	Standard		Optional		Optional	
Safety Features						
Protective Earth Ground			Class I			
Electric Shock Protection			Type B			
Enclosure Protection			IPX4			
Dual Foot Pedal - Steer Feature			Engagement of the Foot End Casters (No Swivel)			
Dual Foot Pedal - Lock Feature			Total Lock On All 4 Casters (No Roll, No Swivel)			
On-Board Battery Back-up			Standard			
Convenience Features on Staff Footboard Control						
One-Touch CPR Mode			Standard			
Chair Mode			Standard - Toggle Button with LED			
Auto Contour Mode			Standard - Toggle Button with LED			
Security						
Patient Lock-Out - Bed Elevation (Hi-Lo Operation)			Standard - Toggle Button with LED			
Patient Lock-Out - Head Section			Standard - Toggle Button with LED			
Patient Lock-Out - Knee/Foot Section			Standard - Toggle Button with LED			
Master Lock-Out - All Patient and Staff Control Locations			Standard - Toggle Button with LED’s			
Dimensions and Weight	**Spirit™**		**Spirit Plus™**		**Spirit Select™**	
Length (Overall)	91½”	2324.1mm	91¾”	2330.5mm	91¾”	2330.5mm
Length - Between Head & Foot Boards	82”	2082.8mm	81 ¼”	2063.8mm	81 ¼”	2063.8mm
Length - Mattress Deck	80”	2032.0mm	80”	2032.0mm	80”	2032.0mm
Width - Between Outer Edges of Siderails	41”	1041.4mm	40”	1016.0mm	40”	1016.0mm
Width - Mattress Deck	35”	889.0mm	35”	889.0mm	35”	889.0mm
Weight of Bed (Empty)	372 lbs	169 kg	426 lbs	193 kg	474 lbs	215 kg
Load Capacity (Safe Working Load)	500 lbs	227 kg	500 lbs	227 kg	500 lbs	227 kg
Sound Pressure Level (Measured 1m from Device)						
Bed Operation - at Maximum Load (Safe Working Load)					< 54 dBA	
Bed Exit Alarm Volume Settings	**Low Setting**		**Medium Setting**		**High Setting**	
	54 - 62 dBA		68 - 87 dBA		80 - 101 dBA	
CB10 Confirmation/Notification “Chirp”					< 62 dBA	

**All dimensions are nominal and have approximate manufacturing tolerances of ± ½” (12.7 mm) for length/height and ± 2° for angular dimensions*

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1.7 Important Electrical Precautions

AC Power Outlet Requirements	
120 VAC models	Plug the three prong power supply cord **ONLY** into a properly grounded 120 VAC, 60 Hz power outlet that is rated to at least 10 A.
230 VAC models	Plug the three prong power supply cord **ONLY** into a properly grounded 230 VAC, 50 Hz power outlet that is rated to at least 5 A.



⚠ DANGER

Possible **ELECTROCUTION Hazard**

DO NOT expose the AC power supply cord or other electrical components to water.

DO NOT allow the power supply cord, AC power outlet, auxiliary AC outlet socket (if equipped), actuators, control boxes or pendant (if equipped) to become wet or submerged during normal bed operation or when performing cleaning.

DO NOT submerge the bed frame or electrical parts. **DO NOT** allow liquids to enter electrical components. If a liquid is spilled in or around the bed, unplug the bed before cleaning. Clean up the spill and allow the bed and/or the area around the bed to dry thoroughly before using the controls again.

DO NOT open assemblies such as actuators, control boxes, battery, pendant (if equipped). These parts are not serviceable. Only service technicians, specifically trained to service Carroll Hospital Group Spirit™ beds, should attempt to service bed and/or replace electrical components.

DO NOT use the auxiliary AC outlet socket (if equipped) if the socket receptacles appear to be damaged and/or if the plug (of the device that you are connecting the bed to) does not remain connected when inserted in the outlet socket receptacles.



⚠ DANGER

Possible **EXPLOSION Hazard**

DO NOT use near explosive gases. **DO NOT** operate this bed in the presence of a flammable anaesthetic mixture with air or with nitrous oxide.

DO NOT use this bed in Active Treatment “Ether Environments”.



⚠ DANGER

Possible **FIRE Hazard** exists when connecting (plugging in) the power supply cord to an AC power outlet if oxygen administering equipment is in use.

Use either a patient nasal mask or half length tent, ensuring the tent **NEVER** extends below the mattress deck, when administering oxygen.



⚠ DANGER

Possible **FIRE Hazard** exists if the pendant is not disabled when oxygen administering equipment is in use. If bed is equipped with a pendant, disconnect the pendant from the port at the side of the bed and insert pendant into its holster or attach pendent to bed linen using the included linen clip when not in use.



⚠ WARNING

This equipment may cause electromagnetic disturbances to its environment. The bed has **NOT** been evaluated for electromagnetic compatibility (EMC).

The performance of this equipment may be degraded when exposed to electromagnetic disturbances and/or electrostatic discharge.

⚠ WARNING

Possible **ELECTRIC SHOCK Hazard** exists when servicing bed and/or replacing electrical components.

ALWAYS disconnect bed from the AC power outlet and ensure that the capacitor inside the CB09 control box has been fully discharged before servicing bed and/or replacing any electrical components.



After the bed has been disconnected (unplugged) from the AC power outlet, fully discharge the CB09 control box by sequentially depressing the UP and DOWN buttons on one of the siderail controls or on the pendant (depending upon how bed is equipped) at least 20 times.

DO NOT operate the bed if any actuator has malfunctioned or has been damaged in any manner.

DO NOT open assemblies such as actuators, control boxes, battery, pendant (if equipped). These parts are not serviceable.

Only service technicians, specifically trained to service Carroll Hospital Group Spirit™ beds, should attempt to service bed and/or replace electrical components.

⚠ WARNING

The Spirit™ bed is equipped with a power supply cord storage device located at the head end of the bed. The power supply cord should **ALWAYS** be stowed whenever moving, transporting, or storing the bed.



DO NOT use an extension cord.

DO NOT operate the bed if the power supply cord and/or pendant cord is damaged.

DO NOT roll the bed over the power supply cord or pendant cord.

DO NOT entangle the power supply cord and/or pendant cord on other objects. A pinched power supply cord and/or pendant cord can become damaged and could be dangerous. Be aware of the power supply cord and/or pendant cord location especially when moving the bed.

ALWAYS keep power supply cord and/or pendant cord clear of moving equipment.

⚠ CAUTION



A safety feature of this product includes protection against overheating caused by excessive or extended periods of operation. Depending on the duration, this includes multiple or repeated adjustments or the use of multiple functions at once.

To ensure trouble free operation, **ALWAYS** allow a slight pause between multiple adjustments. **DO NOT** exceed the maximum continuous mode of operation. Refer to page 15 for complete technical specifications.

If thermal protection activation should occur, the bed will not respond to staff commands from any control point and the CB09 control box will need to be replaced.

⚠ CAUTION



When connecting devices, the system shall be evaluated in end use application to ensure compliance to medical device standard 60601.

1.7.1 Battery Back-up

Battery Location

All Spirit™ beds are equipped with a rechargeable, back-up battery. The battery is located under the knee section of the mattress deck mounted to the a bed frame cross member of the patient right side of the bed on all Spirit™ beds. Refer to pages 108 and 110 respectively for battery location.

Battery Charging and Operation Characteristics

The battery is continuously charged when connected to the CB10 control box and the bed is plugged into an AC power outlet. When the bed is unplugged from the AC power outlet, the bed is powered by the battery. Refer to pages 28 and 30 to ensure proper battery cable connection.

The battery is maintenance free, however battery life is not indefinite, and thus semi-annual inspection is required to verify operation. Refer to page 96 for details.

The footboard staff control on Spirit™ beds has a power status indicator. When the ATTN light is flashing, the battery requires inspection. Refer to pages 47 and 48 for power status indication.

In the event the battery is deemed to be faulty, does not hold a charge, will not operate the functions of the bed while the bed is disconnected (unplugged) from the AC power outlet, or if the battery case or mounting hardware has been damaged in any way, replace the battery.



⚠ WARNING

After connecting a battery to the CB10 control box, the bed **MUST** be plugged into an AC power outlet to energize the battery circuit and enable bed operation under battery power. This **MUST** be performed regardless of the battery charge condition.



⚠ WARNING

Emergency bed functions cannot be guaranteed under abnormal operating conditions.

ALWAYS be aware of the power status indicator and take appropriate action when the ATTN light is flashing.

ALWAYS perform periodic battery inspection.



⚠ WARNING

DO NOT connect battery to CB09 control box if your bed is also equipped with a CB10 control box. The battery may overheat causing it to swell, leak acid, and/or explode.

This DC jack in the CB09 control box is no longer configured as a charging circuit for the battery. This DC jack has been modified to provide constant 24VDC power for the CB10 control box.

Connect battery only to CB10 control box. If you have to replace your CB09 control box call Carroll Hospital Group Customer Service to ensure that you have the correct version of this component at (519) 963-4010 or Toll Free 1-866-516-5446.



⚠ WARNING

Lead-acid batteries can be **HAZARDOUS** to your health.

DO NOT open the battery. Avoid contact with internal components. Internal components are Oxide lead and electrolyte.

Short-term exposure – Sulphuric acid may cause irritation of eyes, nose and throat. Prolonged contact may cause severe burns. Long term exposure – repeated contact causes irritation and skin burns. Repeated exposure to mist may cause erosion of teeth, chronic eye irritation and/or chronic inflammation of the nose, throat, and bronchial tubes.



⚠ WARNING

Potential **ELECTROCUTION, EXPLOSION,** and/or **FIRE HAZARD**

These potential hazards could occur resulting in injury or loss of life in addition to equipment damage can occur if battery is replaced with components other than those approved for use on the Spirit™ bed by Carroll Hospital Group.



⚠ WARNING

EXPLOSION or FIRE HAZARD

DO NOT expose the battery to heat. Keep away from flames and sparks



⚠ WARNING

If a sulphuric odour (like a burnt match) is detected, or if any residual leakage is found on or around the area of the battery, **ALWAYS** replace the battery immediately.

In the event a person is exposed to sulphuric acid, flush contacted area with large amounts of water for at least 15 minutes. Remove contaminated clothing and seek medical attention if necessary. An eye wash station and emergency shower should be readily available. If swallowed, give large amounts of water. **DO NOT** induce vomiting. Seek medical attention immediately.

If a sulphuric acid spill is found under the bed, dilute the spill cautiously with five to six volumes of water and gradually neutralize with sodium bicarbonate, soda ash or lime. When exposure level is not known, wear NIOSH approved positive pressure self-contained breathing apparatus. Reference North American Emergency Response Guidebook #154. Be sure to wear acid resistant gloves, safety glasses, and acid resistant clothing when cleaning a sulphuric acid spill.



⚠ CAUTION

ALWAYS unplug the bed from the AC power outlet before connecting or disconnecting the battery.



⚠ CAUTION

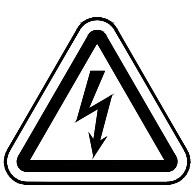
ALWAYS dispose of faulty batteries or batteries that have reached the end of their service life according local laws and regulations.

Lead acid batteries are completely recyclable.

1.7.2 Grounding

This electric bed must be grounded. In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current, thereby reducing the risk of electric shock.

This product is equipped with a cord having an equipment-grounding conductor and a grounded plug. The plug must be inserted into an appropriate AC power outlet that is properly installed and grounded in accordance with all local electrical codes and ordinances.



⚠ DANGER

Improper connection of the equipment-grounding conductor can result in electrocution. Check with a qualified electrician or service person if you are doubtful that the electrical outlet is properly grounded.

DO NOT modify the three prong plug provided. If it will not fit into the AC power outlet, have a proper AC power outlet installed by a qualified electrician.

⚠ CAUTION

Grounding reliability can only be achieved when bed is connected to an equivalent receptacle marked “HOSPITAL ONLY” or “HOSPITAL GRADE”.

1.8 Important Mechanical Precautions

⚠ WARNING

Safe Working Load of Bed

227 kg (500 lbs)

DO NOT overload the bed. The combined weight of patients, visitors, mattress, additional equipment/accessories, and bedding MUST NOT exceed 227 kg (500 lbs)



⚠ WARNING

Safe Working Load of Siderails

80 kg (176 lbs)

DO NOT exceed a 80 kg (176 lbs) load on any siderail



⚠ WARNING

DO NOT use headboards or footboards from other manufacturers on any Spirit™ bed. Spirit™ beds are specifically designed and manufactured for use in conjunction with Carroll Hospital Group accessories. Accessories designed by other manufacturers have not been tested by Carroll Hospital Group and are not recommended for use on Spirit™ beds.

On Spirit™ beds, **ALWAYS** ensure that the head board and foot board brackets are properly attached to the frame.

1.9 General Precautions

⚠ WARNING

DO NOT drop the bed. **DO NOT** allow patients to fall onto and/or jump on the bed.

These types of activity can cause impact loads that can permanently damage the actuators and/or other bed components resulting in an inoperable bed.

In the case of an inoperable bed due to a damaged actuator, replace the actuator immediately. If left unattended, a damaged actuator could result in injury to the patient and/or staff and additional equipment damage.

⚠ WARNING

DO NOT use this product or any available optional equipment without first completely reading and understanding these instructions and any additional instructional material such as owner’s manuals, service manuals, or instruction sheets supplied with this product or optional equipment. If you are unable to understand the warnings, cautions or instructions contact a healthcare professional, your Spirit™ bed dealer, or a service technician, specifically trained to service Carroll Hospital Group Spirit™ beds, before attempting to install and/or use this equipment, otherwise injury to the patient and/or staff and equipment damage may occur.

⚠ WARNING

The initial set up of this bed **MUST** be performed by service technician, specifically trained to service Carroll Hospital Group Spirit™ beds. Procedures other than those described in this manual are not recommended.

⚠ WARNING

Check all parts for shipping damage and test bed to confirm proper operation before putting the bed into active service.

DO NOT use bed if any component damage is discovered or a service technician suspects that damage has occurred. A damaged bed may expose staff and/or patients to unforeseen safety hazards. Contact your Spirit™ bed dealer or a service technician, specifically trained to service Carroll Hospital Group Spirit™ beds, for further instruction.

Before the bed is returned to active service after any adjustment, repair, and/or service have been performed, **ALWAYS** ensure that all attaching hardware is tightened securely.

⚠ WARNING

NEVER allow patients to use trapeze or traction units as a total individual weight support.

Traction units are to be only used for immobilizing a patient in various, therapeutic, traction set ups and/or positions that have been clinically prescribed by a trained healthcare practitioner. Trapeze units (lifting poles) are to be only used to assist patient when repositioning and/or transferring into or out of the bed.

⚠ WARNING

Close supervision by trained healthcare practitioners is **ALWAYS** necessary when this product is used by or near children and/or people with disabilities.

DO NOT let any person climb/crawl underneath the bed, between the bed legs and/or the raised bed frame components at anytime.

⚠ WARNING

ALWAYS keep all moving parts, including the main frame of the bed, the bed legs, the mattress deck, and all actuator shafts free of obstructions (ie: window sills, radiators, chair rails, consoles, blankets/bed linens, heating blankets/pads, tubing, wiring, etc, and other types of products using electric cords which may get tangled around the bed, siderails or legs) during bed operation. **NEVER** store anything under the bed.

⚠ CAUTION

DO NOT stand on the bed or concentrate weight on any particular sections of the mattress deck. Patient body weight should be evenly distributed over the surface of the bed. **DO NOT** lay, sit or lean in such a way that the patient's entire body weight is placed only on elevated head or foot sections of the bed. This includes situation when assisting the patient to reposition and/or transfer into or out of the bed.

Ensure all hinges of the mattress deck sections are properly aligned before raising head or knee sections. All four sections of the mattress deck can be detached for thorough cleaning, sanitization, and maintenance. Refer to page 101 for instructions.

⚠ CAUTION

Use only authorized Carroll Hospital Group replacement parts and/or accessories otherwise the warranty is void. Carroll Hospital Group will not be responsible for any injury to patient and/or staff and/or damage to bed that may result.

⚠ CAUTION



The Spirit™ bed has been supplied from an environmentally aware manufacturer that complies with the Waste of Electrical and Electronic Equipment (WEEE) directive 2002/96/CE. The Spirit™ bed may contain substances that could be harmful to the environment if disposed of in places (landfills, etc) that are not appropriate according to legislation. Please be environmentally responsible and recycle this bed through your recycling facility when the bed has reached the end of its service life.

1.10 Mattress Specifications

A mattress is not included with this bed. A Carroll Hospital Group mattress is recommended. It is recommended that the length and width of the mattress suitably fits the mattress deck. It is also recommended that the mattress has a thickness of 6" (152 mm) but shall not exceed 10” (254 mm).



⚠ WARNING

DO NOT use the bed without a mattress having a thickness of at least 6" (152 mm) but not more than 10” (254 mm) and of recommended dimensions

DO NOT use the bed without a special mattress specifically designed to bend and conform to the shape of the bed.

The mattress **MUST** entirely rest upon the mattress deck.

The mattress **MUST** fit snugly within the 4 corner mattress keepers.

DO NOT use a water filled or gel filled mattress on this bed.



⚠ WARNING

Possible patient **ENTRAPMENT Hazard** or **FALL RISK** if using non-specified mattress.

Patient entrapment may result in injury or death. Use only a mattress of recommended specifications with this bed. Carroll Hospital Group will not be responsible for any injury to patient and/or staff and/or damage to bed that may result with use of non specified mattress.



⚠ WARNING

Carroll Hospital Group recommends that the customer perform a thorough patient assessment to determine if the bed system and mattress selection is appropriate for the patient on the basis of their clinical needs, fall risk, and mental capacity. Carroll Hospital Group is of the belief that to ensure maximum patient safety, there is simply no substitute for frequent patient monitoring by qualified healthcare practitioners. Carroll Hospital Group also recommends that the customer conduct and document a patient entrapment risk assessment for every mattress combination that is intended for use on the Spirit™ bed to identify and address any exposure to areas of potential patient entrapment and/or fall risk as part of a comprehensive and proactive bed safety program.



⚠ WARNING

Carroll Hospital Group has identified that a potential increase to patient **FALL RISK** could possibly exist when using the Spirit™ bed with a mattress having a thickness greater than 6”. Staff should restrict normal use of the bed to help mitigate the increased potential for a patient to fall out of the bed by rolling over top of the siderails (when the mattress deck is in the flat, horizontal position) or by falling past the siderails (when the head section of the mattress deck is elevated to a seated position).

Unless the bed is in its lowest position, **DO NOT** leave the head section of the mattress deck in an elevated position. **DO NOT** leave bed in an elevated position. **ALWAYS** lower the bed to the lowest position when leaving a patient unattended to minimize potential injury to patients from falling out of bed.

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1.11 Standard & Optional Accessories

Accessory	Spirit™	Spirit Plus™	Spirit Select™
4 Corner Mattress Keepers	Standard	Standard	Standard
6 Patient Restraint Loops & 2 Drainage Bag Holders	Standard	Standard	Standard
Wooden Head/Foot Boards	Standard	-	-
Set of Carroll Assist Rails™	Standard	-	-
Patient Handheld Control (Pendant)	Standard	Optional	Optional
Full Length or Partial Length Siderails	Optional	-	-
Moulded Plastic Head/Foot Boards	Not Available	Standard	Standard
Moulded Plastic Quad Siderails c/w Integrated Staff, Patient Controls, and Nurse Call Feature	Not Available	Standard	Standard
Enhanced Footboard Staff Controls with Patient Weight Scale Display & Bed Exit Controls	Not Available	Not Available	Standard
Integrated Patient Weight Scale & Bed Exit System	Not Available	Not Available	Standard
Underbed Obstruction Sensing	Optional	Optional	Optional
Underbed Lighting	Optional	Optional	Optional
Auxiliary AC Power Outlet Socket	Not Available	Optional	Optional
4” (102mm) “Easy Bed” Extension/Retraction System	Not Available	Optional	Optional
4” (102 mm) Bed Extension Kit	Optional	Optional	Optional
Trapeze Adapter	Optional	Optional	Optional
Bed Exit Alarm	Optional	Optional	-

1.12 Storage & Transport

During extended periods of disconnect from an AC power outlet, the battery is susceptible to permanent damage caused by being deep discharged.

All Spirit™ beds are equipped with a disconnect feature which automatically disengages the battery from the battery circuit to prevent damage from being deep discharged. There is no need to disconnect the battery when a Spirit™ bed is going to be put into storage, however, the CB10 control box will continue to draw power until the battery voltage has hit the 18V threshold which triggers the automatic circuit disconnection.

IMPORTANT: A battery voltage of 18V is insufficient to operate the bed. Reconnect bed to an AC power outlet as soon as possible to and allow battery to charge for a period of 24hr to ensure that the bed will reliably operate on battery power when needed.

IMPORTANT: Even if a battery was fully charged when it was unplugged from the CB10 control box, the bed will not operate on battery power if it is simply reconnected to the CB10 control box. The bed must be connected to an AC power outlet to energize the battery circuit. This will enable bed operation on battery power.

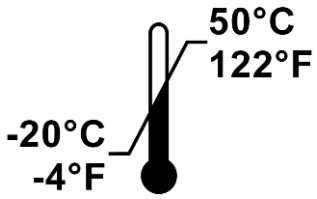
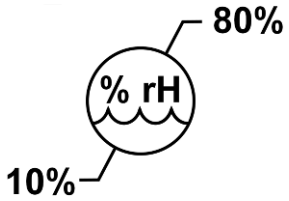
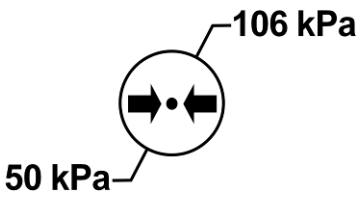
IMPORTANT: To conserve battery life during storage and transport, disconnect the battery from the CB10 control box.

DO NOT re-use any original packaging material to transport the bed.

Only transport the bed by rolling the bed on its casters.

ALWAYS ensure the Central “Lock & Steer” system is in the “BRAKE” position before attempting to lift/lower bed. **ALWAYS** ensure that the Central “Lock & Steer” system is in the “BRAKE” position after the bed is loaded onto transportation vehicle.

Use additional strapping or tie downs as necessary to ensure the bed does not move while in transport.

Environmental Conditions for Storage and Transport		
		
Ambient Temperature Range	Ambient Humidity Range (Non Condensing)	Atmospheric Pressure Range



⚠ CAUTION

DO NOT use the siderails as lifting points for the bed during transportation and/or storage.

DO NOT use the siderails as a means of mechanically restraining the bed during transportation and/or storage.

1.13 Ultra-Low Feature

The Spirit™ product line is a family of ultra-low beds, designed to reduce patient injury due to falls out of bed. Therefore, in an effort to reduce patient injury, **ALWAYS** lower the bed completely to the lowest position before leaving a patient unattended.

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Section 2:

Set-Up Instructions

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2.1 Unpacking Instructions

Upon delivery of the bed, remove all cardboard, Styrofoam, crates, or other packaging material. Follow these instructions to unpack and set up the bed.

⚠ CAUTION

Equipment DAMAGE may result from improper plastic tie wrap removal.

DO NOT cut any trimmed plastic tie wraps (refer to step 3 on page 30). Trimmed plastic tie wraps are permanent features on the Spirit™ bed.

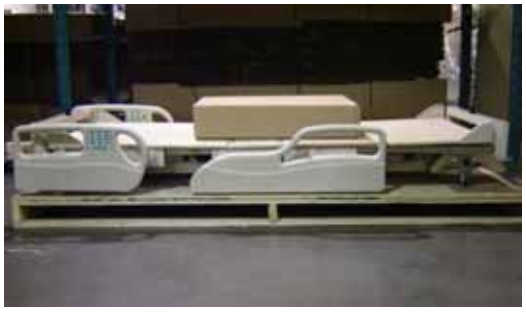
2.1.1 Delivery



If your Spirit™ bed is shipped standing on-end, use two or three people to carefully lower it to the floor. Refer to page 27 for safe lowering instructions.

DO NOT attempt to lower the bed without assistance.

Once the bed is lowered, you may begin the set-up of your Spirit™ bed.



If your Spirit™ bed is shipped on a pallet or in a crate, roll the bed onto the floor and begin the set-up procedure.

For the purpose of clarity, the packaging has been removed from this bed.

⚠ WARNING

BED IS TOP HEAVY!!!

Bed may **TIP OVER** when positioned upright during storage and/or transport



⚠ WARNING

BED IS HEAVY!!!

Improper handling may result in serious injury to personnel and/or damage to bed.

Use proper lifting techniques when lifting or lowering bed.

DO NOT attempt to lower bed without assistance. Refer to page 27 for safe lowering instructions.



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2.1.2 Lowering the Bed



1. Beds in typical position when being transported or stored.

IMPORTANT: BED IS HEAVY!!! Never attempt to lower bed without assistance. The bed is most safely lowered with 3 people as shown in the following steps.



2. Use the corner of the shipping board (bolted to lower end of the bed) to pivot the bed into a position that will allow you to lower the bed.

IMPORTANT: Prior to lowering bed, ensure that you have adequate room. You will require at least eight (8) feet to lower the bed.



3. Firmly grasp the footboard bracket (circled). Begin lowering bed by gently pulling the bed from the upright position and slowing walking backwards.

IMPORTANT: Maintain your hold on the bed. The bed will fall if not held upright at this point.



4. Continue lowering bed by slowing walking backwards.



5. It may be necessary to reposition your grip to allow further lowering of the bed.

IMPORTANT: Communicate with the other people before adjusting your grip!



6. At this point, maintain your grip, lock your arms, and lower the bed to the floor by bending your knees.

IMPORTANT: Do not drop bed!



⚠ WARNING

DO NOT drop the bed when lowering during storage and/or transport. If the bed is dropped, permanent damage to bed components may occur. This may result in an inoperable bed or a bed with severely impaired operation.

DO NOT use a bed that has been dropped. Non obvious damage may have occurred that may expose staff and/or patients to unforeseen safety hazards.

The Central “Lock & Steer” system **MUST** be in the “BRAKE” position prior to attempting to lower/lift the bed. If the brake has not been engaged, the bed may roll away from personnel when lowering/lifting the bed. This may result in a very rapid descent and/or unexpected bed motion that may cause severe **INJURY** to personnel lowering/lifting bed and/or permanent **DAMAGE** to bed.

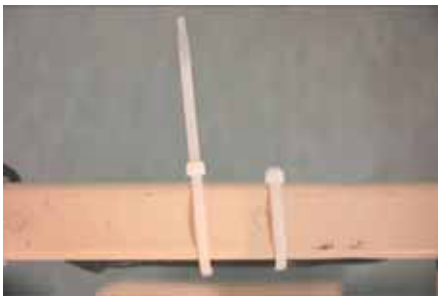
Before lowering/lifting bed, **ALWAYS** attempt to roll/rotate a caster to confirm that the brake is engaged.

DO NOT use the siderails as lifting/lowering points for the bed.

DO NOT use the siderails as a means of mechanically restraining the bed during transportation and/or storage.

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2.2 Set-Up of the Spirit Plus™ & Spirit Select™ Beds

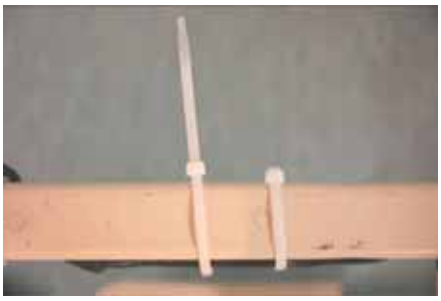
		
1. Remove any remaining packaging straps, plastic tie wraps and/or material from the siderails and/or around the mattress deck.	2. Cut all untrimmed plastic tie wraps. **DO NOT** cut any trimmed plastic tie wraps. Trimmed plastic tie wraps are permanent features on the Spirit™ bed.	3. Raise the knee/foot sections the mattress deck and connect the battery cable to the side DC jack of the CB10 control box as shown above. This will ensure the on-board battery remains fully charged and ready for use.
		
4. Remove the plastic tie wrap around the main power supply cord bundle. Plug the bed into a properly grounded 120V outlet. Exercise caution to ensure that you do not cut into or otherwise damage the insulation of the power supply cord. Press the UP button on either siderail staff controls and elevate bed to a comfortable working height.	5. Remove the wooden shipping stand using a 1/2” deep socket and ratchet. The wooden shipping stand is attached to the headboard mounting bracket with 4 carriage bolts.	6. Remove the four fastener bushings that are inserted into the IV pole mounting holes of the headboard mounting bracket. Discard fastener bushings, fasteners, and wooden shipping stand.

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7. Unpack the headboard and footboard from their separate packaging box.	8. Place the headboard into the bracket assembly at the head end of the bed. Ensure that the headboard is oriented as shown before attempting insertion into mounting bracket. Electrical connector is not live. It is used as an indexing feature to ensure correct headboard installation orientation.	9. Place the footboard into the bracket assembly at the foot end of the bed. Ensure that the footboard is oriented as shown before attempting insertion into mounting bracket. The Staff Control faces away from the bed. Electrical connection is made when footboard is inserted into bracket assembly; footboard becomes inactive when removed
		
10. If your Spirit Plus™ or Spirit Select™ bed is equipped with the optional pendant, plug it into the available port on either side of the bed. Carefully align and screw on threaded retaining cap.	11. Initialize the bed for use: Lower the bed using any control location (footboard staff control, siderail staff control, rail patient, or pendant). Once the lower limit is reached continue to hold the DOWN button for an additional 10 seconds. This process will synchronize the actuators so that the bed will perform properly over time.	12. Your Spirit Plus™ or Spirit Select™ bed is now ready for use.

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2.3 Set-Up of the Spirit™ Bed

		
1. Cut the plastic strapping around the head and foot sections of the mattress deck.	2. Cut all untrimmed plastic tie wraps. **DO NOT** cut any trimmed plastic tie wraps. Trimmed plastic tie wraps are permanent features on the Spirit™ bed.	3. Raise the knee/foot sections the mattress deck and connect the battery cable to the side DC jack of the CB10 control box as shown above. This will ensure the on-board battery remains fully charged and ready for use.
		
4. Remove the plastic tie wrap around the main power supply cord bundle. Plug the bed into a properly grounded 120V outlet. Exercise caution to ensure that you do not cut into or otherwise damage the insulation on the power supply cord.	5. Remove any remaining packaging straps or material from siderails, then locate the pendant strapped to the side of the bed. Press the UP button to elevate the bed to a comfortable working height.	6. Lift the knee/foot sections of the mattress deck then cut the wire tie wrap holding the mattress keeper bag, and remove. If the four corner mattress keepers are already installed on each corner of the bed mattress deck, skip to the step 8.
		
7. Install four corner mattress keepers. Refer to page 35 for installation instructions.	8. Install the Carroll Assist Rails™ siderails if your Spirit™ bed is so equipped. Refer to page 32 for installation instructions.	9. Unpack the headboard and footboard from their separate packaging box.

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10. Place the headboard into the bracket assembly at the head end of the bed. Ensure that the headboard is oriented as shown before attempting insertion into mounting bracket. The headboard posts face towards the wall.	11. Place the footboard into the bracket assembly at the foot end of the bed. Ensure that the footboard is oriented as shown before attempting insertion into mounting bracket. The staff control faces away from the bed.	12. Connect the footboard staff control cord.
		
13. Fasten the bolts through the holes in both sides of the brackets and posts. This will ensure that the footboard is not accidentally removed before the footboard cord is disconnected.	14. Initialize the bed for use: Lower the bed using either the footboard staff control or the pendant. Once the lower limit is reached continue to hold the DOWN button for an additional 10 seconds. This process will synchronize the actuators so that the bed will perform properly.	15. Your Spirit™ bed is now ready for use.

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2.4 Siderail Assemblies

Your Spirit™ bed will be equipped with one of the following four types of siderail assemblies:

Siderail Types	Spirit™	Spirit Plus™	Spirit Select™
Carroll Assist Rails™	Standard	-	-
Full Length Non-Tuck Siderails	Optional	-	-
Partial Length Non-Tuck Siderails	Optional	-	-
Quad Siderails	Not Available	Standard	Standard

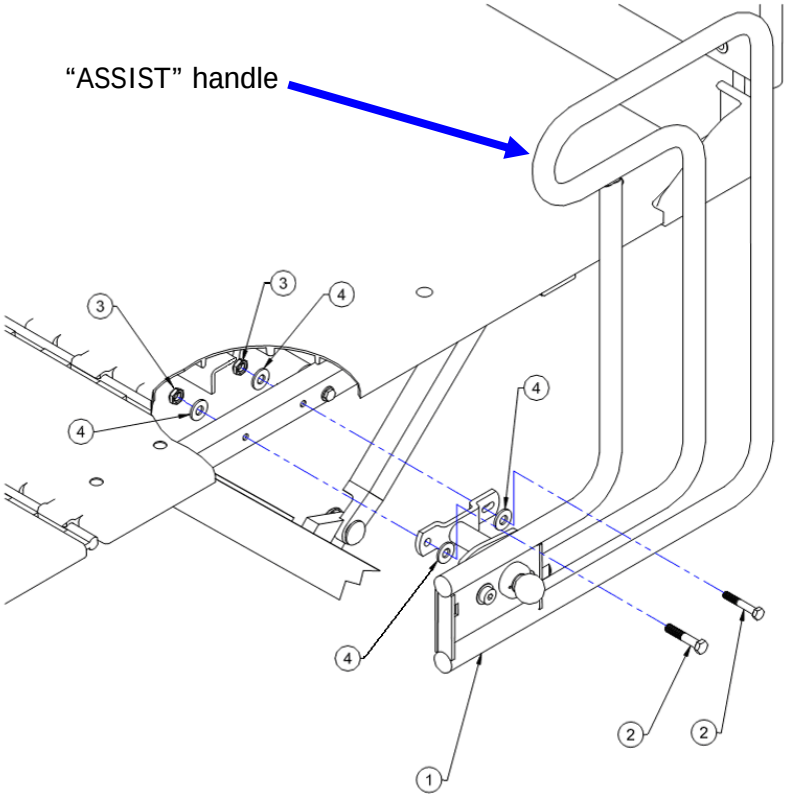
2.4.1 Installing Carroll Assist Rails™

Your Spirit™ bed comes with Carroll Assist Rails™ as standard equipment. The Carroll Assist Rails™ are packaged separately from the bed and must be installed before the bed can be put into service. Remove the assist rails from their packaging and fit them to the main frame rails on either side of the bed.

Installing Carroll Assist Rails™

The release knob **ALWAYS** faces outward and the "ASSIST" handle section of the assist rail points either towards the foot of the bed in the "ASSIST" position, or down in the "GUARD" position.

1. Mounting holes on the main rail of the bed frame are below the mattress deck. Assist rail shown in "ASSIST" position.
2. Place one 3/8 flat washer on the 3/8-16 X 2" long hex head screw and push this from outside the bracket, through the mounting hole in the main rail of the bed frame. Place another 3/8 flat washer over the bolt on the inside of the main frame rail mounting hole then secure with a 3/8-16 locking nut. Tighten with two 9/16" wrenches or socket wrenches.
3. Repeat for second fastener for the assist rail on this side of the bed.
4. Repeat the installation on the other side of the bed for the remaining assist rail assembly.

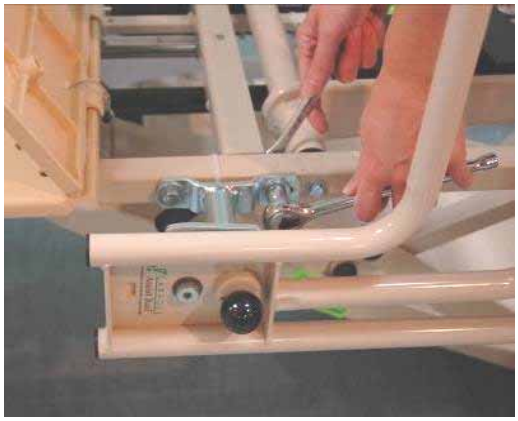


NOTE: PATIENT LEFT SIDE SHOWN

NOTE: HEAD AND SEAT SECTIONS OF MATTRESS DECK AND A FRAME CROSS MEMBER ARE CUT-AWAY FOR CLARITY

ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	CARROLL ASSIST RAIL™ – PATIENT LEFT SIDE (SHOWN) CARROLL ASSIST RAIL™ – PATIENT RIGHT SIDE (NOT SHOWN)	G0899 *(Packaged In A Box)*	1 PAIR
2	3/8-16 X 2 LONG HEX HEAD SCREW	*Included In Box*	4
3	3/8-16 LOCKING NUT	*Included In Box*	4
4	3/8 FLAT WASHER	*Included In Box*	8

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***Hint**: Raising the head section of the mattress deck will allow for better access when mounting the assist rail to the main rail of the bed frame.*

Carroll Assist Rail™ Spacing

When installed properly, the space between the assist rail and the headboard should be as follows:

In "ASSIST" position (Assist Rail™ up):

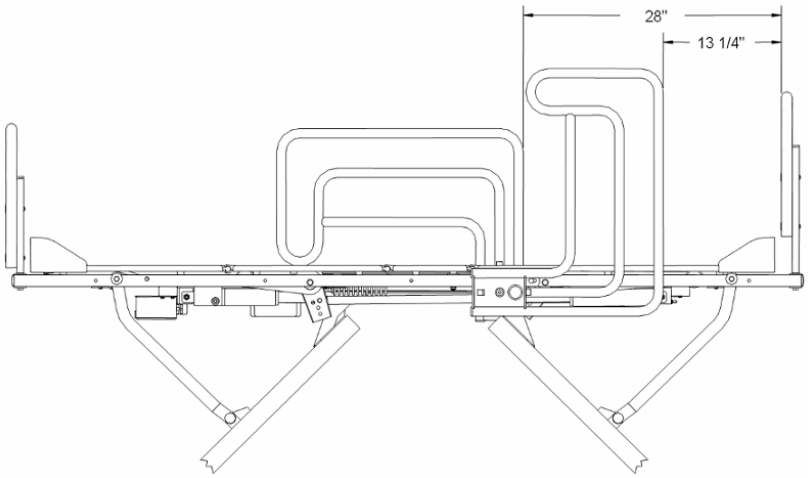
13 ¼" (336.5mm)

In "GUARD" position (Assist Rail™ down):

28" (711mm)

IMPORTANT: After installation, measure the spacing between the headboard and both of the assist rails in both the "ASSIST" and "GUARD" positions.

IMPORTANT: If the actual measured spacing differs from the spacing specified above, carefully inspect the installation to ensure that the assist rails have been mounted using the proper mounting holes.



Carroll Assist Rail™ Rotation

After proper installation, the bracket mounting point will become the pivot point that is fixed on the main bed frame, enabling the assist rail to rotate from the "GUARD" to "ASSIST" to "TRANSFER" position.



⚠ WARNING

FDA Rail Guidelines specify a minimum distance between the rail and the head board. To comply with the guideline, the assist rail bracket must be mounted in the correct mounting holes on the main rail of the bed frame. When mounted correctly, the distance between the Carroll Assist Rail™ and the headboard will be 13 ¼" (336.5mm) when the rail is in the "ASSIST" position and 28" (711mm) when the rail is in the "GUARD" position.

Failure to mount the assist rail correctly may result in **PATIENT ENTRAPMENT**.



⚠ WARNING

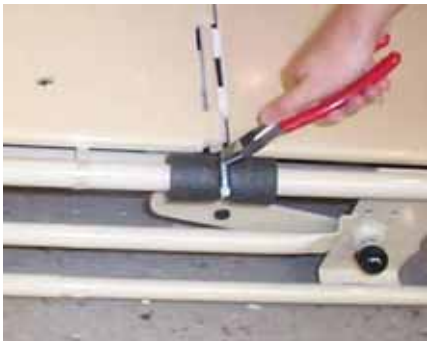
NEVER install two assist rails on the same side of the bed. The assist rail must be used alone (one on either side) or a serious patient entrapment hazard could result.

The left-side and right-side assist rails must be installed on their intended side of the bed, respectively. The assist rails are not interchangeable.

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2.4.2 Full Length & Partial Length Non-Tuck Siderails

Your Spirit™ bed may be equipped with the optional Full Length or Partial Length Non-Tuck siderails.

Unpacking Full Length or Partial Length Siderails		
Both the Full Length and Partial Length Non-Tuck siderails are pre-installed at the factory. They are each held in place, for shipping purposes, with tape and plastic tie wrap.		
		
Cut and remove the plastic tie wrap around the foam	Cut and remove the filament tape around the rails.	The siderails are now free to rotate.

2.4.3 Quad Siderails

Your Spirit Plus™ or Spirit Select™ bed comes with moulded plastic Quad siderails as standard equipment. All four individual rail assemblies of the Quad siderails are pre-installed at the factory.

Unpacking Quad Siderails	
The two foot siderails (two rail assemblies closest to the foot end of the bed) are each held in place, for shipping purposes, with a plastic tie wrap. The two head siderails (two rail assemblies closest to the head end of the bed) are retained by the wooden shipping stand which prevents their rotation during shipping.	
	
Cut and remove the plastic tie wraps restraining the foot siderails to the bed frame.	The foot siderails are now free to rotate.

2.5 Installing Corner Mattress Keepers

Depending on how your bed was shipped, the corner mattress keepers may need to be installed on the bed. All corner mattress keeper fasteners are included in a clear plastic hardware bag inside the corner mattress keeper bag at the foot end of the bed. Refer to step 6 on page 30.

IMPORTANT: There are two left side and two right side corner mattress keepers.

IMPORTANT: Ensure that the longer, tapered edge is parallel with the side of the bed

Corner Mattress Keeper Installation

1. Align square hole in corner mattress keeper with the moulded holes in the head end and foot end sections of the mattress deck as shown.
2. Insert a 1/4-20 X 5/8" long carriage bolt through the top of the corner mattress keeper hole.





3. Lift the mattress deck to gain access. Start a 1/4-20 hex nut on the carriage bolt. Tighten using a 7/16 wrench or socket wrench.
4. Repeat for the second hole on the first corner mattress keeper.
5. Repeat for the three remaining corner mattress keepers.







⚠ CAUTION

DO NOT over-tighten the corner mattress keeper hardware. DAMAGE to mattress deck may occur. Over-tight fasteners could cause the mattress deck to crack.

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Section 3:

Bed Operation

3.1 Central “Lock & Steer” System

Mode	Caster Functionality	Pedal Position
“BRAKE” Mode used to stabilize the bed from shifting. This mode prevents the bed from moving forwards, backwards or sideways.	Casters **DO NOT** swivel or roll	
“NEUTRAL” Mode used only to manoeuvre the bed in a tight area. This mode allows the bed to move forwards, backwards or sideways.	All casters swivel and roll	
“STEER” Mode used when attempting to steer the bed in a desired direction. All caster wheels can still rotate, enabling the bed to move forwards or backwards.	Head end casters swivel Foot end casters **DO NOT** swivel All casters roll	



⚠ WARNING

Unintended bed movement may occur if bed is left in either of the two mobilized positions; “STEER” or “NEUTRAL”.

NEVER leave the bed unattended in either the “STEER” or “NEUTRAL” positions.

ALWAYS engage the “BRAKE” when leaving a patient unattended.

DO NOT attempt to move the bed until the “BRAKE” has been released.



⚠ WARNING

When transferring into or out of the bed, **ALWAYS** ensure that the “BRAKE” is engaged (casters are locked). Inspect the caster locks for correct locking action before actual use.

Even with the “BRAKE” properly engaged (caster properly locked), some flooring surfaces such as tile or wood will allow the bed to move under some conditions. Bed use on surfaces such as these **MUST** be evaluated by the healthcare facility and deemed safe before the bed is put into active service.

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3.1.1 Bed Mobilization & Stabilization

Bed Mobilization

The bed is mobile when the Central “Lock & Steer” pedal is in either the “NEUTRAL” or “STEER” position. Use either of these two pedal positions depending on the situation, when bed mobility is needed.

Enable “Steer”

Fully depress the right side of the Central “Lock & Steer” pedal at either end of the bed. Pedal actuation mechanism should make an audible engagement when switching between modes.

IMPORTANT: Depending upon the orientation of the castors, it may be necessary to roll the bed sideways, in a back and forth motion, at the foot end of the bed until the steering casters become engaged in the “STEER” mode.



Side-to-side motion



Put the bed into “Neutral”

Depress or lift the Central “Lock & Steer” pedal with your foot until the pedal is level. Pedal actuation mechanism should make an audible engagement when switching between modes.

The bed can be put in “NEUTRAL” regardless of caster orientation.



Bed Stabilization

The bed is stable when the Central “Lock & Steer” pedal is in the “BRAKE” position. Use this pedal position whenever the bed is left unattended or when the bed needs to remain stable.

Apply the “BRAKE”

Fully depress the left side of the Central “Lock & Steer” pedal at either end of the bed. Pedal actuation mechanism should make an audible engagement when switching between modes.

The “BRAKE” can be applied regardless of caster orientation.





⚠ WARNING

DO NOT to move the bed until the siderail assemblies have been rotated completely to the raised/closed, UP or “GUARD” position and the locking/latching mechanism has engaged. Refer to page 64 for siderail operation instructions.

NOTE: When the “NEUTRAL” mode is activated properly, the bed should move freely without any unusual noises. If any clicking noises are heard when in the “NEUTRAL” position, stop and ensure that the Central “Lock & Steer” pedal is level. Adjust, if necessary.

3.2 Bed Control

Depending on the Spirit™ bed you purchased, you will have two or three locations for controlling bed functions.

Control Location	Spirit™	Spirit Plus™	Spirit Select™
Patient Handheld Control (Pendant)	Standard	Optional	Optional
Footboard Staff Control	Standard	Standard	Enhanced
Patient/Staff Siderail Controls	Not Available	Standard	Standard

3.2.1 Patient Handheld Control (Pendant)

The Spirit™ bed has been designed with provisions to connect a patient, handheld, 6 function control (pendant).

The pendant offers patient control of basic bed operations:

- Head UP/DOWN,
- Knee/Foot UP/DOWN
- Bed UP/DOWN



Pendant Storage

For Spirit™ beds, the pendant can be affixed to the bed using a holster that clips between the siderail bars on the outside of the bed. The pendant slips into the holster for easy location and convenient patient access.

OR

For all beds, the pendant can be secured to the bed linens with the included linen clip. Choose a clip location so that the pendant is within easy reach.





Pendant Connection

The pendant can be connected on either side of the bed (the connection port is just beneath the seat section of the mattress deck on both sides of the bed).

To relocate the pendant to the opposite side of the bed, first, unscrew the threaded retaining cap then carefully disconnect the jack. Reconnect the pendant control cable to the existing port on the other side of the bed.





Pendant Port Alignment and Care

Ensure that the indexing arrows are aligned to enable connection. Insert pendant cable into pendant port until o-ring seats into pendant port and then thread on retaining cap to retain this connection.

Any pendant port not in use must **ALWAYS** be capped. The threaded cap is simply screwed onto each end of the pendant T-cable.

If you relocate the pendant to the other side of the bed, ensure that you cap the unused pendant port.





3.3 Bed Positioning

3.3.1 Bed Elevation – HI-LO Operation

To raise the bed, press the BED UP arrow on the footboard staff control, the rail staff controls, or on the pendant. Release the button when the desired elevation has been achieved.	 			
To lower the bed, press the BED DOWN arrow on the footboard staff control, the rail staff controls, or on the pendant. Release the button when the desired elevation has been achieved.	 			

3.3.2 Head Elevation - Head Actuator Operation

To raise the head section of the bed, press the HEAD UP arrow on the footboard staff control, the rail staff/patient controls, or on the pendant. Release the button when the desired elevation has been achieved.	 			
To lower the head section of the bed, press the HEAD DOWN arrow on the footboard staff control, the rail staff/patient controls, or on the pendant. Release the button when the desired elevation has been achieved.	 			

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3.3.3 Knee Elevation - Foot Actuator Operation

To raise the knee section of the bed, press the KNEE UP arrow on the footboard staff control, the rail staff/patient controls, or on the pendant. Release the button when the desired elevation has been achieved.	 			
To lower the knee section of the bed, press the KNEE DOWN arrow on the footboard staff control, the rail staff/patient controls, or on the pendant. Release the button when the desired elevation has been achieved.	 			

3.3.4 Auto Contour Mode

When the head section of the mattress deck is elevated, there is often the tendency for the patient to slide towards the foot end of the bed. The Auto Contour Mode helps to prevent this motion. The Auto Contour mode automatically raises/lowers the knee section to, correspondingly, whenever the head section is raised or lowered.

To activate Auto Contour mode, simply press the CONTOUR button. The green LED in the top right corner of the button (for Spirit™ and Spirit Plus™ beds) or the entire CONTOUR button (for Spirit Select™ beds) will illuminate when the Contour mode has been activated. To de-activate Auto Contour mode, simply press the CONTOUR button again. If the CONTOUR button is not illuminated, Auto Contour mode has been de-activated.	 	

NOTE:	Patient lock-out will override Auto Contour if the knee elevation lock-out has been activated.

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3.3.5 Chair Mode

The Chair mode allows patient to be placed in an upright position.

To activated Chair mode, simply press and hold the CHAIR button.

The bed will first move into a reverse Trendelenburg position and then will articulate into the chair configuration. The green LED in the top right corner of the button (for Spirit™ and Spirit Plus™ beds) will illuminate once the proper reverse Trendelenburg angle has been achieved. The CHAIR button does not illuminate on the Spirit Select™. Release the button anytime when the desired chair contour has been achieved or the bed will stop automatically once the full chair configuration has been achieved.

To de-activate Chair mode, simply press and hold the CHAIR button until the bed is flat. The bed will stop automatically.







⚠ WARNING

The reverse Trendelenburg position is integral to the Chair mode configuration. The Spirit™ bed may shift during reverse Trendelenburg activation.

Activate Chair mode only after the Central “Lock & Steer” system has been put in the “BRAKE” position.

3.4 Emergency & Staff Functions

3.4.1 CPR (Cardiopulmonary Resuscitation) Function

Activation of the CPR function allows one-touch flattening of the mattress deck to facilitate staff administering CPR to the patient.

Press the CPR button on the attendant control pad one time. The head section and knee section will lower to flat position.

The CPR mode does not need deactivation. Simply resume head and knee-foot operation once the CPR action is complete.

To interrupt the CPR mode, touch any other function on the keypad.







⚠ CAUTION

Improper use of CPR mode may cause patient injury.

Once activated, CPR function will lower head and knee sections to flat position automatically. To interrupt CPR function, touch any other button on the keypad.

3.4.2 Trendelenburg Operation

Press and hold the TREND button. Release the button once the desired bed angle between 0º and 14º has been achieved.

To return the bed to the horizontal position, press and hold the rev.TREND button. The bed will automatically stop when the mattress deck has returned to the horizontal position.

On the Spirit Plus™ and Spirit Select™ beds, the Trendelenburg angle is shown on the bed frame angle gauge integral on the staff side of both foot siderails.

On the Spirit Select™ beds, the menu display on the enhanced footboard staff control will show the current Trendelenburg angle. The entire TREND button will also illuminate once the bed has achieved a Trendelenburg angle of greater than 2°.







3.4.3 Reverse Trendelenburg Operation

Press and hold the rev.TREND button on the attendant control pad. Release the button once the desired bed angle between 0º and -14º has been achieved.

To return the bed to the horizontal position, press and hold the TREND button. The bed will automatically stop when the mattress deck has returned to the horizontal position.

On the Spirit Plus™ and Spirit Select™ beds, the reverse Trendelenburg angle is shown on the bed frame angle gauge integral on the staff side of both foot siderails.

On the Spirit Select™ beds, the menu display on the enhanced footboard staff control will show the current reverse Trendelenburg angle. The entire rev.TREND button will also illuminate once the bed has achieved a Reverse Trendelenburg angle greater than 2°







⚠ CAUTION

Patient discomfort may result from normal operation of the Trendelenburg and reverse Trendelenburg function.

Trendelenburg and reverse Trendelenburg modes should only be used on the advice of a medical practitioner.

⚠ WARNING

The Spirit™ bed may shift during Trendelenburg or reverse Trendelenburg activation.

Initiate Trendelenburg or reverse Trendelenburg only after the Central “Lock & Steer” system has been put in the “BRAKE” position.

NOTE: **ACCURACY:** The Trendelenburg and reverse Trendelenburg angles shown on the menu display of the enhanced footboard staff control on the Spirit Select™ has an approximate error of ±2°.

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3.4.4 Patient Lock-Outs

Patient lock-outs restrict the patient from initiating head, knee, and bed elevation from the siderail controls or the pendant. The degree of restriction depends on the lock-out option selected.

Staff may choose to restrict patient access to one, two, or all three bed functions. To restrict a function, press the patient lock-out button under that particular function. The yellow LED in the top right corner of the button (for Spirit™ and Spirit Plus™) or the or the entire lock-out button (for Spirit Select™) will illuminate when patient control of a particular function has been locked-out.

To unlock, simply press the patient lock-out button again. When the patient lock-out button is no longer illuminated, patient control of that particular function has been restored.

IMPORTANT: Patient lock-outs also restrict bed operation from both of the staff rail controls.





NOTE:	When patient lock-outs have been activated, the footboard staff control remains fully active.

3.4.5 Master Lock-Out

To completely restrict access to all bed functions from all control locations (staff and patient controls), use the Master Lock-out function.

To activate the Master Lock-Out, press and hold all three patient lock-out buttons at the same time. All three yellow LED's in the top right corner of the three patient lock-out buttons (for Spirit™ and Spirit Plus™) or all three entire patient lock-out buttons (for Spirit Select™) will flash sequentially to indicate that Master Lock-Out has been activated.

To deactivate the Master Lock-Out function, simply repeat this process. Press and hold all three patient lock-out buttons at the same time. When all three patient lock-out buttons are no longer illuminated, Master Lock-Out has been deactivated and both staff and patient control from all control locations has been restored.





NOTE:	When Master Lock-Out has been activated, the emergency CPR function, Nurse Call, and the underbed light remains operable. On Spirit Select™ beds, the bed exit feature also remain operable.



⚠ WARNING

When a patient is left unattended, the bed should be **ALWAYS** lowered to its lowest position and the bed elevation controls should be locked-out in order to reduce the risk of patient injury.

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3.5 Other Bed Functions & Features

3.5.1 Nurse Call

The Spirit Plus™ and Spirit Select™ beds are equipped with a Nurse Call feature.

The Spirit Plus™ and Spirit Select™ beds are equipped with one Nurse Call port to accommodate Nurse Call control. The Nurse Call port is located on the patient right side of the headboard mounting bracket.	
To operate the Nurse Call feature, press the red NURSE button on the rail patient control (inside of each head rail control). This will send a Nurse Call signal to the nurses' station when appropriately connected to the communication system of your healthcare facility.	
Operation of the Nurse Call feature requires a conventional connection cable (not supplied) to be plugged into the ¼" Phono jack on the headboard mounting bracket and into the designated outlet in the patient station.	
Ensure that the attached "dummy plug" is inserted to an inactive Nurse Call port. The "dummy plug" has an integral lanyard that is screw connected to the headboard mounting bracket to ensure that the "dummy plug" is not lost when the Nurse Call port is being used.	

3.5.2 Standard 37 Pin Connector

The Spirit Plus™ and Spirit Select™ beds are equipped with a standard 37 pin connector to accommodate connection to the communication system typical of most healthcare facilities.

The 37 pin connector is integrated into the headboard mounting bracket directly beside the Nurse Call port on the patient right side of the headboard mounting bracket. The "pin outs" for the 37 pin connector have been configured to work with the communication set-up typical of most 37 pin enabled healthcare facilities. If the configuration of the communication system used in your healthcare facility differs from conventional set-up, successful interconnection can only be guaranteed through the use of interconnection cables that have been specifically configured for your application. If your healthcare facility requires a particular interconnection cable configuration, Carroll Hospital Group offers customized interconnection cables. Contact your sales representative for details.	

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3.5.3 Spirit™ & Spirit Plus™ Power Status Indicator

The enhanced footboard staff control on the Spirit Select™ is equipped with an integrated power status indicator. This cluster of 3 discrete icons indicate the real-time status of power available to operate the bed. The icons will illuminate respective of the source of power, the operation of the battery charging circuit, and the level of battery power.

The battery is continuously charged when connected to the CB10 control box and the bed is plugged into an AC power outlet. If the battery voltage drops below 18VDC, battery power will be automatically disrupted to prevent further discharge which could impact the battery's ability to fully recharge. When the bed is plugged back into an AC power outlet, battery power will be automatically restored.



Indicator LED is Solid GREEN

Bed is connected to an AC power outlet and operating on AC power. The battery is connected to the CB10 control box and is fully charged. Bed is ready to operate on battery power if required. This is the optimum operating condition for the bed.

Indicator LED is Flashing GREEN

Bed is connected to an AC power outlet and operating on AC power. The battery is connected to the CB10 control box but is currently recharging.

Indicator LED is Alternating Flashing GREEN and RED

IMPORTANT: Bed may not reliably operate on battery power if required.

Bed is connected to an AC power outlet and operating on AC power. The battery is connected to the CB10 control box but not holding proper charge. Service bed and/or replace battery immediately.

OR

The battery is not connected to the CB10 control box. Connect battery to CB10 and allow battery to charge for 24hr.

Indicator LED is Solid RED

Bed is disconnected from an AC power outlet and is operating on battery power. The battery is connected to the CB10 control box and has not yet exhausted the available battery power. Bed is OK to operate on battery power but it should be connected to an AC power outlet as soon as is possible to recharge the battery.

IMPORTANT: Exercise caution when operating the bed on battery power. Ensure that only vital and necessary bed functions are performed to extend battery power as long as possible and ensure emergency functions remain available when needed.

Indicator LED is Flashing RED

Bed is disconnected from an AC power outlet and has been operating on battery power. Although the battery is connected to the CB10 control box, it has exhausted its battery power. Reconnect bed to an AC power outlet as soon as possible and allow battery to charge for 24hr.

IMPORTANT: At this point, reliable bed operation cannot be guaranteed although some bed functionality may still be available. Exercise caution operating the bed as the bed will cease operation without warning.

No Indicator LED illumination

IMPORTANT: Bed may NOT operate.

The bed has been disconnected from an AC power outlet and the battery is disconnected from the CB10 control box. Reconnect bed to an AC power outlet and allow battery to charge for 24hr.

OR

The bed has a faulty connection or component (CB09 control box, CB10 control box, battery, and/or connection cable). Confirm all connections and begin troubleshooting potentially faulty components.

OR

The bed has been disconnected from an AC power outlet and the battery has been automatically disengaged from the battery circuit because the voltage has dropped below 18VDC. Reconnect bed to an AC power outlet and allow battery to charge for 24hr.

NOTE:	In-house testing has demonstrated that a new back-up battery, when fully charged, has sufficient power to deliver the equivalent of approximately 5 CPR cycles with a patient weight of 250 lbs. Battery power discharge rate depends upon factors such as patient weight, age of battery, ambient temperature and humidity, and the number of charge/discharge cycles the battery has been subjected to. For example, the heavier the patient, the faster battery power will be exhausted during battery powered bed operation. Conversely, the lighter the patient, battery power may offer a longer duration of battery powered bed operation.

3.5.4 Spirit Select™ Power Status Indicator

The enhanced footboard staff control on the Spirit Select™ is equipped with an integrated power status indicator. This cluster of 3 discrete icons indicate the real-time status of power available to operate the bed. The icons will illuminate respective of the source of power, the operation of the battery charging circuit, and the level of battery power.

The battery is continuously charged when connected to the CB10 control box and the bed is plugged into an AC power outlet. If the battery voltage drops below 18VDC, battery power will be automatically disrupted to prevent further discharge which could impact the battery's ability to fully recharge. When the bed is plugged back into an AC power outlet, battery power will be automatically restored.



AC Light is Solid GREEN

Bed is connected to an AC power outlet and operating on AC power. The battery is connected to the CB10 control box and is fully charged. Bed is ready to operate on battery power if required. This is the optimum operating condition for the bed.

AC Light is Solid GREEN + DC Light is Flashing AMBER

Bed is connected to an AC power outlet and operating on AC power. The battery is connected to the CB10 control box but is currently recharging.

AC Light is Solid GREEN + ATTN Light is Flashing RED

IMPORTANT: Bed may not reliably operate on battery power if required.

Bed is connected to an AC power outlet and operating on AC power. The battery is connected to the CB10 control box but not holding proper charge. Service bed and/or replace battery immediately.

OR

The battery is not connected to the CB10 control box. Connect battery to CB10 and allow battery to charge for 24hr.

DC Light is Solid AMBER

Bed is disconnected from an AC power outlet and is operating on battery power. The battery is connected to the CB10 control box and has not yet exhausted the available battery power. Bed is OK to operate on battery power but it should be connected to an AC power outlet as soon as possible to recharge the battery.

IMPORTANT: Exercise caution when operating the bed on battery power. Ensure that only vital and necessary bed functions are performed to extend battery power as long as possible and ensure emergency functions remain available when needed.

DC Light is Solid AMBER + ATTN Light is Flashing RED

Bed is disconnected from an AC power outlet and has been operating on battery power. Although the battery is connected to the CB10 control box, it has exhausted its battery power. Reconnect bed to an AC power outlet as soon as possible and allow battery to charge for 24hr.

IMPORTANT: At this point, reliable bed operation cannot be guaranteed although some bed functionality may still be available. Exercise caution operating the bed as the bed will cease operation without warning.

NO Light illumination

IMPORTANT: Bed may NOT operate.

The bed has been disconnected from an AC power outlet and the battery is disconnected from the CB10 control box. Reconnect bed to an AC power outlet and allow battery to charge for 24hr.

OR

The bed has a faulty connection or component (CB09 control box, CB10 control box, battery, and/or connection cable). Confirm all connections and begin troubleshooting potentially faulty components.

OR

The bed has been disconnected from an AC power outlet and the battery has been automatically disengaged from the battery circuit because the voltage has dropped below 18VDC. Reconnect bed to an AC power outlet and allow battery to charge for 24hr.

NOTE:

In-house testing has demonstrated that a new back-up battery, when fully charged, has sufficient power to deliver the equivalent of approximately 5 CPR cycles with a patient weight of 250 lbs. Battery power discharge rate depends upon factors such as patient weight, age of battery, ambient temperature and humidity, and the number of charge/discharge cycles the battery has been subjected to. For example, the heavier the patient, the faster battery power will be exhausted during battery powered bed operation. Conversely, the lighter the patient, battery power may offer a longer duration of battery powered bed operation.

3.6 Spirit Select™ Unique Functions & Features

3.6.1 LCD Menu Display

The enhanced footboard staff control on the Spirit Select™ is equipped with an integral LCD menu display. The LCD menu display is activated or "wakes up" when the ON/ENTER, TREND, or rev.TREND buttons are pressed. The LCD menu display automatically turns off or enters "sleep mode" after 20 seconds of keypad inactivity. The contract of the LCD menu is adjustable in the Service Menu. Refer to page 76 for Service Menu navigation and page 87 for instructions.

Home Screen

LB units used for this example

0° TREND angle used for this example

Weight Change NOT SET for this example

When the menu display is activated, the home screen will automatically display the patient weight in either kilograms (KG) or pounds (LB) depending upon which unit of measure has been set for patient weight display.

Pressing the ENTER button will cycle the display on the home screen between:

- The patient weight

AND

- The TREND/rev.TREND angle combined with the patient weight change.

The home screen will go into "sleep" mode (become inactive) after 20 seconds of keypad inactivity has elapsed.







20 second delay ▼



Menu ON/ENTER Button

"ON" Functionality of this Button

Press this button to activate or "wake up" the menu display.

"ENTER" Functionality of this Button

Press this button (as enter button) when prompted by the menu display to make a selection.



Menu UP/DOWN Arrow Buttons

Press the ON/ENTER button to activate or "wake up" the menu display

Press the ARROW buttons to scroll up or down the available menu options

When the desired option is displayed, press the ON/ENTER button to make a selection.





NOTE:	The LCD menu display **WILL NOT** function or become illuminated when bed is operating under battery power. This is to battery power for emergency functions.

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3.6.2 Patient Weigh Scale

The Spirit Select™ is equipped with an integral scale to facilitate the weighing of patients while in the bed. The scale is always activated and will display the patient's weight in either kilograms (KG) or pounds (LB) depending upon which unit of measure has been set for patient weight display. The factory default for patient weight display is imperial pounds (LB).

The Spirit Select™ scale is very sensitive. Patient weight will be determined and displayed most accurately if nothing is touching the bed and the bed is not contacting the wall, patient station, etc.

ACCURACY: The Spirit Select™ scale has an approximate error of 1% of patient weight.

Zeroing the Scale (Establish Tare Value)

LB units used for this example

1. Press and hold the 0.0/ZERO button for 3 seconds. During this period, a message will be displayed to remind staff that the patient must not be in the bed while attempting to zero the scale.
2. Release the 0.0/ZERO button immediately when instructed.
3. DO NOT TOUCH BED during the zeroing process.
4. Ensure that the home screen is displaying a weight of 0.0 LB before allowing the patient to enter the bed.

IMPORTANT: DO NOT zero the scale with a patient in the bed. This will result in a zero patient weight being displayed. If the scale is accidentally zeroed with a patient on the bed, remove patient from bed, re-zero scale and return patient to bed.

If an accidental attempt to zero the scale is initiated with the patient in the bed, simply release the 0.0/ZERO button when the reminder message is displayed.

IMPORTANT: Make sure that all necessary equipment and linens are on the bed prior to zeroing the scale. Placing additional items on the bed or removing items from the bed after the zeroing process will result in an inaccurate patient weight being displayed.











IMPORTANT: If the bed detects any movement while attempting to zero the scale, a warning message will be displayed and the scale zeroing procedure will have to be repeated.



IMPORTANT: The scale cannot be zeroed if the bed has been place in any Trendelenburg or Reverse Trendelenburg angle. Ensure that the bed has been restored to fully horizontal and displaying 0° TREND or revTREND angle before attempting to zero the scale. Refer to page 44 for instructions.



IMPORTANT: The scale cannot be zeroed if the Bed Exit Alarm has been armed. Ensure that the Bed Exit Alarm has been disarmed before attempting to zero the scale. Refer to page 51 for instructions.



3.6.3 Scale Related Activites

There are other activities that can be performed on the Spirit Select™ bed that are directly related the patient weigh scale.

Changing patient weight display units:

- If setting is not locked – refer to page 70 for Main Menu navigation and page 72 for instructions
- If setting is locked – refer to page 76 for Service Menu navigation and page 78 for instructions

Patient weight change zero: refer to page 70 for Main Menu navigation and page 71 for instructions

Change equipment on the bed: refer page 70 for Main Menu navigation and page 73 for instructions

Adjusting patient display weight: refer to page 76 for Service Menu navigation and page 77 for instructions

Weight change alarm: refer to page 76 for Service Menu navigation and page 79 for instructions

NOTE: Carroll Hospital Group recommends that the bed is zeroed prior to use by each new patient and patient weight change is zeroed once the new patient enter the bed.

3.6.4 Bed Exit Feature

The enhanced footboard staff control on the Spirit Select™ is equipped with an integral bed exit feature to help monitor and report patient activity with audible and/or Nurse/Priority Call alarms. This feature is not intended to replace patient monitoring by staff.

The Bed Exit Alarm can be set to three different sensitivity levels corresponding to the level of monitoring a patient requires.

The Bed Exit Alarm can be set to produce an audible bed alarm (three different volume settings) or to send a Nurse/Priority Call alarm or it can be set to produce both audible and Nurse/Priority Call alarms.



Bed Exit Arming, Disarming, and Sensitivity Level Selection

To arm the Bed Exit Alarm:

- Press the SET/RESET button to cycle through the alarm sensitivity levels
- When the desired alarm sensitivity level has been selected, the SET/RESET button and the selected sensitivity level icon will remain illuminated to indicate that the bed exit alarm has been activated.
- An audible “chirp” will also sound to indicate that the Bed Exit Alarm has been armed.

IMPORTANT: The Bed Exit Alarm can ONLY be armed if there is weight on the bed (20lbs minimum).



To disarm the Bed Exit Alarm:

- Press the SET/RESET button to cycle through the three alarm sensitivity levels.
- When the SET/RESET button and no alarm sensitivity icons are illuminated the Bed Exit Alarm has been disarmed.

IMPORTANT: The Bed Exit Alarm can ONLY be disarmed using the SET/RESET button.

The factory default alarm chime setting is audible chime (high volume) and Nurse Call alarm. To change this setting or chime tone refer to the following.



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Bed Exit Alarm Volume Selection

To set the desired Bed Exit Alarm volume, press the CHIME button to begin cycling through the alarm volume settings. There are three alarm volume settings (low, medium, high) and a Nurse/Priority Call setting.

Selecting alarm volume:

- Cycling through the alarm volume settings one time will allow staff to select the desired alarm volume setting **OR** the Nurse/Priority Call alarm that is appropriate.

Selecting alarm volume AND Nurse/Priority Call:

- Cycling through the alarm volume settings a second time will allow staff to select the desired alarm volume setting **AND** the Nurse/Priority Call alarm that is appropriate.

When the desired chime is selected, the CHIME button and the selected alarm volume and/or Nurse/Priority Call icon(s) will remain illuminated.



IMPORTANT: The Nurse Call and Priority Call alarms outputted by the bed can be separated to meet the alarm notification needs of your healthcare facility. Refer to page 76 for Service Menu navigation and page 83 for instructions.

Chime Tone Selection

To change the factory default chime tone, the Bed Exit Alarm must first be activated. Press the SET/RESET button to activate the Bed Exit Alarm.

Press and hold the CHIME button for 5 seconds to begin cycling through the available chime tones. Each chime tone will sound (at the selected volume) for several seconds and will be followed by a brief pause before the next available chime tone begins. When the desired chime tone is heard, release the CHIME button to select. The selected chime tone will sound as confirmation that the chime tone has been changed.



Alarm Silencing

Sensitivity Level 3 used for this example

High Volume AND Nurse/Priority Call used for this example

Once a Bed Exit Alarm has been triggered, it may be silenced by pressing either the SET/RESET or CHIME buttons.





Once the Bed Exit Alarm has been silenced, the SET/RESET or CHIME button icons will flash simultaneously as a visual indicator and reminder to staff that the alarm has been silenced and must be either reset or deactivated.

These button icons will flash until the Bed Exit Alarm has been disarmed (by pressing the SET/RESET button or, once the Bed Exit Alarm has been automatically re-armed if the Autoset feature is ON.



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Locking Bed Exit Alarm Settings

To lock the setting of the Bed Exit Alarm, press and hold both the SET/RESET & CHIME buttons simultaneously for 5 seconds. An audible “chirp” will sound to indicate that the Bed Exit Alarm setting has been locked.

To unlock the Bed Exit Alarm settings, simply repeat this process. An audible “chirp” will sound to indicate that the Bed Exit Alarm setting has been unlocked.



Bed Exit Autoset Functionality

When a patient attempts to exit or does exit the bed (depending upon the alarm sensitivity level selected), the Bed Exit Alarm will be triggered. Staff may silence the alarm by pressing either the SET/RESET or CHIME buttons but would have to remember to reset the Bed Exit Alarm after settling the patient and/or when the patient returned to the bed.

The Autoset feature will allow the bed to automatically re-arm the Bed Exit Alarm after the patient has returned to the bed.

- The Bed Exit Alarm will re-arm itself after a selected time delay period has elapsed. The Autoset feature has three factory set time delay periods to select from: **1, 3, or 9 minute delay**.
- The Bed Exit Alarm will resume patient monitoring operation with the previous alarm settings (sensitivity and volume/Nurse/Priority Call levels).
- An audible “chirp” will sound to indicate that the Bed Exit Alarm has been re-armed.

The factory default setting for the Bed Exit Autoset is ON with a time delay period of 1 minute. This setting can be changed in the Service Menu. Refer to page 76 for Service Menu navigation and page 82 for instructions.

After the patient has returned to the bed and the Bed Exit Alarm has automatically rearmed itself, the following notification will be displayed to remind staff that the Bed Exit Alarm is still armed.

Press ENTER button to acknowledge that the Bed Exit Alarm has been rearmed.

The display menu will automatically return to the home screen.

If the Autoset feature has been set to OFF (disabled) in the service menu, these screens will not appear.





If the patient has not returned to the bed after 10 minutes has elapsed then a notification will be displayed to remind staff that the Bed Exit Alarm is still armed but has been silenced.

Press SET/RESET button to cancel the Bed Exit Alarm.

The display menu will automatically return to the home screen.

If the Autoset feature has been set to OFF (disabled) in the service menu, these screens will not appear.





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3.6.5 Level All Function

The Spirit Select™ is equipped with a Level All function.

Press and hold the Level All button to simultaneously lower both the head and foot sections of the mattress deck. Bed motion will stop automatically when both sections of the mattress deck are parallel with the bed frame.



3.7 Optional Underbed Light

Underbed Light on Spirit Select™ Beds

The Spirit Select™ can be equipped with integrated underbed lighting as an option.

Press the LIGHT button to activate the underbed light and cycle through two (2) brightness settings: LOW or HIGH. The LIGHT button will illuminate when the underbed light is on at either brightness level. When the LIGHT button is no longer illuminated, the underbed light has been de-activated.



Automatic Bed Exit Light on Spirit Select™ Beds

The underbed light can also be set to operate as an automatic Bed Exit Light. The Bed Exit Light improves nighttime visibility around the bed and in the room providing an increased level of patient safety. The Bed Exit Light mode automatically switches the underbed light on just prior to the patient exiting the bed.

In Bed Exit Light mode, the underbed light will remain illuminated until the patient returns to the bed, and automatically switches off after a short delay. If the patient does not immediately return to bed, the underbed light automatically shuts off after 15 minutes has elapsed.

The factory default setting for the Bed Exit Light is ON. This setting can be changed in the Service Menu. Refer to page 76 for Service Menu navigation and page 81 for instructions.

Underbed Light on Spirit™ and Spirit Plus™ Beds

Spirit™ and Spirit Plus™ beds can be equipped with integrated underbed lighting as an option.

The underbed light cannot be deactivated using the footboard staff control. If the underbed light needs to be deactivated, both of the underbed lights need to be disconnected from the CB10Lite control box. Refer to page 113 to identify the two connectors for the underbed lights:

- To disable the underbed lights, disconnect both of the light connectors from the CB10Lite circuit board.
- To enable the underbed lights, connect both of the light connectors to the CB10Lite circuit board.

IMPORTANT: The factory default setting for the underbed light brightness setting is LOW and the underbed lights are always on. There is no HIGH brightness setting or visual indicator on Spirit™ and Spirit Plus™ beds.

NOTE:	Underbed lighting **WILL NOT** function (illuminate) when bed operating under battery power. This is to reserve battery power for emergency functions.

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3.8 Optional Bed Exit Alarm System

System Components

Your bed exit alarm system will include:

- Bed Exit Monitor
- 8 ft long, ¼" phono x ¼" phono Standard Nurse Call System Cable
- 1-Year Replaceable Sensor Pad, 10" x 30"
- Power Cable

Set-Up

1. Plug in the sensor pad connection cable, the power cable, and the nurse call cable.
2. Once the alarm system has been properly configured and tested put the patient into bed. Ensure that the patient's weight is positioned on the bed exit pad area. A short confirmation tone will sound to indicate the patient is now being monitored by the system.
3. When the patient attempts to leave bed, the system will trigger an alarm in the patient's room and at the nurses' station (depending on your setting selection).
4. To turn the bed exit monitor off, pull out the power cable as shown.

Bed Exit Monitor – Front



Nurse Call System Cable | Power Cable | Sensor Pad Connection Cable

Settings

Setting selection is made inside the battery compartment located on the back of the bed exit monitor. You can select from four alarm tones and three volume settings: Hi, Lo, and Nurse Call. A zero (0) or two (2) second alarm delay can also be selected.

Alarm reset settings are located on the side of the bed exit monitor.

- Select **LOCAL/RE** if you want to reset the bed exit monitor by pressing the two re-set buttons simultaneously ***or*** by returning the patient to the bed.
- Select RE ONLY if you want to reset the bed exit monitor ***only*** by returning the patient to bed.

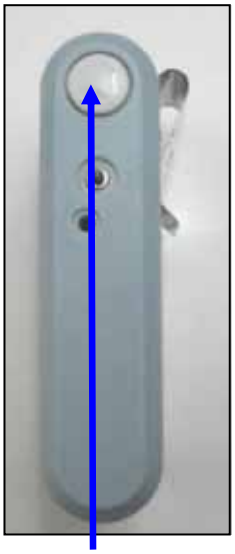
Prior to patient use, it is recommended that you trial the alarm system to determine which settings are preferable for your particular healthcare facility.

Bed Exit Monitor – Back



Settings Selection

Bed Exit Monitor – Side



Reset Button

IMPORTANT: Test your bed exit alarm pad and control unit on a regular basis to ensure it is in proper working order. The sensor pad should be replaced after one year or at any time it has been determined not to be functioning properly

Sensor Pad Replacement

To replace the sensor pad, disconnect the sensor pad connection cable and remove the sensor pad from the seat section of the mattress deck. Cut the plastic tie wraps that secure the cable to the bed frame. Place the new sensor pad on the seat section and re-route the cable along the bed frame, securing the cable to the frame rails with plastic tie wraps. Ensure that the jack is fully plugged into the "Pad" port on the control unit.

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3.9 Optional 4” Bed Extension Kit

Spirit Plus™ used for this example

To accommodate the physical needs of taller patients, Carroll Hospital Group offers an optional extension kit that will increase the length of the mattress deck by 4 inches (101.6 mm) from 80” (203.2 mm) to 84” (213.4 mm).

Your extension kit will include: **Tools not included*

- Metal extension pan
- 4” foam mattress bolster (optional)
- Fasteners: two 5/16-18 X 2” long hex head screws, two 5/16-18 hex locknuts, two 5/16 flat washers





1. Lift the foot section of the mattress deck to access the footboard bracket and cables. Rotate foot section of the mattress deck towards the head of the bed until it comes to rest.



2. Extend the footboard cable so that there is sufficient slack to accommodate the 4” addition.

To perform this step, it may be necessary to cut some of the plastic tie wraps. Replace and trim all cut plastic tie wraps after the footboard cable has been sufficiently slackened.



3. Using a 1/2” socket wrench, loosen and remove the two hex head screws that attaches the footboard bracket to the bed frame.

These fasteners will not be reused.



4. Slide the bracket back 4”. Align the holes in the footboard bracket with the corresponding holes in the main rail of the bed frame.



5. Place one 5/16 flat washer on a hex head screw and insert as shown above. Repeat on other side of the bed



6. Place one 5/16 flat washer over threads of the hex head screw and start a 5/16-18 hex locknut. Tighten using two 1/2" wrenches or socket wrenches. Repeat on other side of the bed.



7. Remove the two foot-end Corner Mattress Keepers. Loosen and remove the four 1/4-20 X 5/8” long carriage bolts and nuts using a 7/16” wrench or socket wrench.

These fasteners will be reused



8. Install the metal extension pan using the fasteners that were removed in the previous step. Tighten with a 7/16” wrench or socket wrench.

DO NOT over tighten fasteners. Refer to page 35 for details.



9. Place the foam mattress bolster into the extension pan.

Your extension kit is now ready for use.

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3.10 Optional Trapeze Adapter

To accommodate the use of commonly available trapeze bars and their corresponding receiver tubes, Carroll Hospital Group offers an optional trapeze adapter that can be mounted easily to headboard brackets on Spirit Plus™ and Spirit Select™ beds.

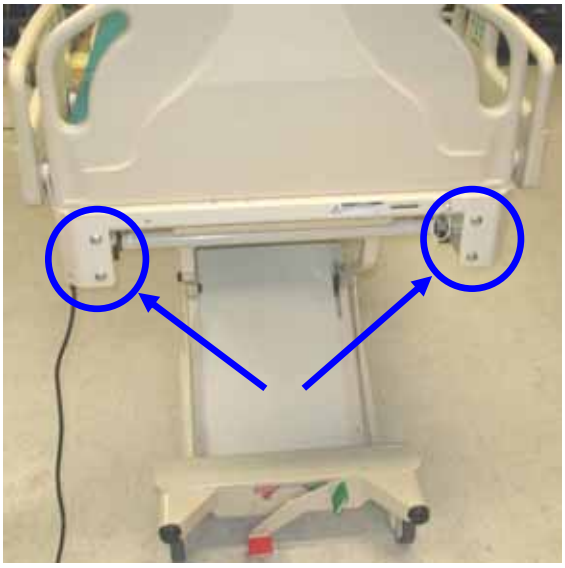
Your trapeze adapter kit (shown right) will include the following items:

- Trapeze adapter
- Fasteners:
  - Four 1/2-13 x 3-1/4” long hex head screws
  - Four 1/2" split lock washers
  - Four 3/8-16 x 3” long carriage bolts
  - Four 3/8” flat washers
  - Four 3/8-16 Nylock hex nuts

**Trapeze bar receiver tube not included. *Tools not included.*



Trapeze Adapter Installation







1. Identify trapeze adapter threaded mounting points (circled in red) on headboard bracket.
2. Remove the four 1/2-13 Philips pan head screws. ***These fasteners will not be reused***
3. Install a 1/2” split lock washer over each 1/2-13 x 3-1/4” long hex head screw.







IMPORTANT: Ensure that the trapeze adapter is oriented correctly. The holes used to mount the receiver tube are larger in diameter on the side of the trapeze adapter that faces towards the bed. These larger diameter holes are to allow the square section under the head of the carriage bolt to seat and mechanically lock, preventing their rotation, when installing a trapeze bar receiver tube. Ensure that these larger diameter holes are facing towards the bed before installing the trapeze adapter.

4. Confirm trapeze adapter orientation and insert two hex head screws into top two holes of the trapeze adapter.
5. Align these two fasteners with the top two threaded mounting points on headboard bracket. Start both screws by hand to hold trapeze adapter in place.

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6. Insert remaining two hex head screws into the two bottom holes of the trapeze adapter. Start both screws by hand.
7. Completely tighten all four hex head screws.
8. The trapeze adapter is now ready for the attachment of a trapeze bar receiver tube.

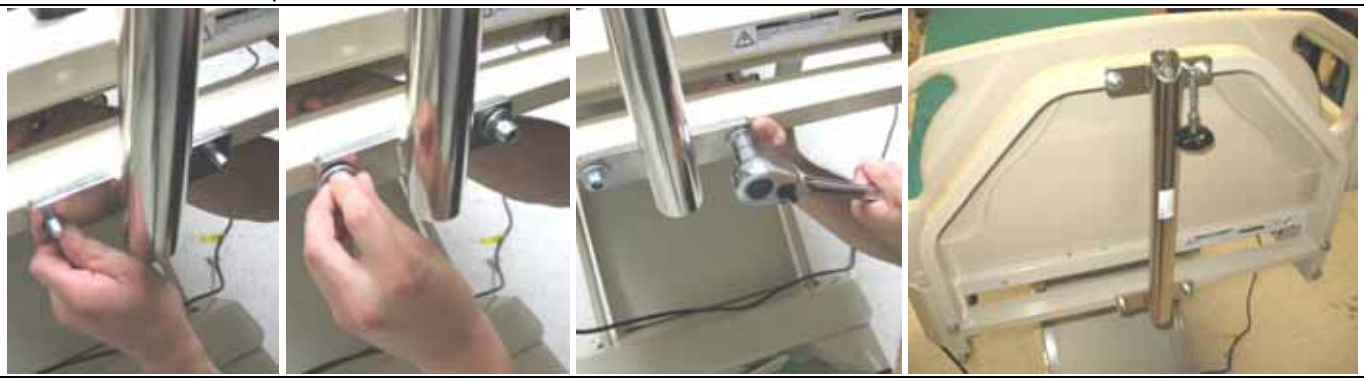
Trapeze Bar Receiver Tube Installation *(Illustrative Purposes ONLY – *not included)*

Carroll Hospital Group's trapeze adapter has been designed to accommodate the attachment of receiver tubes that use a common four bolt-hole pattern. This pattern is used by companies such as Mizuho/OSI, TMI, and Zimmer

IMPORTANT: Carroll Hospital Group does not sell nor endorse the use of any particular commercially available trapeze bars.



1. Remove headboard to gain access to top holes. Install the top two 3/8-16 x 3" long carriage bolts through trapeze adapter holes as shown above.
2. Appropriately align trapeze receiver tube with trapeze adapter and install over the two protruding carriage bolts.
3. Install a 3/8" flat washer over the end of the carriage bolts and thread on a 3/8" Nylock hex nut by hand to hold the receiver tube in place.



4. Repeat for remaining two carriage bolts.
5. Completely tighten all four carriage bolts. Ensure the square section under the head of each carriage bolt is fully seated into its respective thru hole in the trapeze adapter.
6. Reinstall head board.



⚠ CAUTION

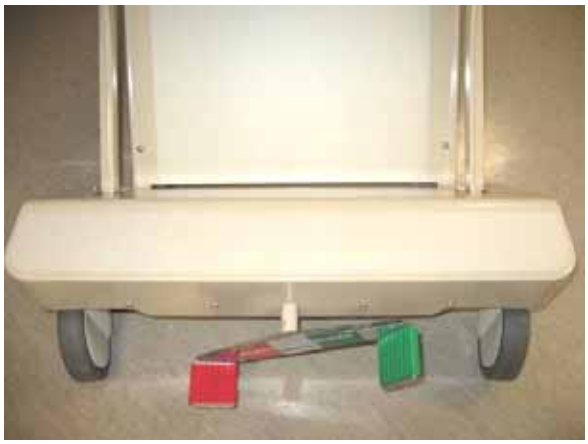
When connecting devices, the system shall be evaluated in end use application to ensure compliance to medical device standard 60601.

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3.11 Optional Underbed Obstruction Sensors

If your Spirit™ bed has been equipped with the optional underbed obstruction sensors, the bed will be outfitted with 6 obstruction sensors as shown below.

IMPORTANT: *The operation of the obstruction sensors is identical for all beds. While all beds have the audible component of this feature, only Spirit Select™ beds have visual indication and message display.*



Obstruction sensors for castor cover





Obstruction sensors for primary leg top and bottom covers

Contact with an Obstruction While the Bed is in Downward Motion

When an obstruction is detected during any downward motion of the bed platform (BED DOWN, initiating Trendelenburg/reverse Trendelenburg operation or Chair mode), the bed will immediately stop all downward motion and the bed platform will automatically elevate up a safety distance of 1". This will provide clearance for removal of the obstruction.

- On Spirit Select™ beds, once an obstruction has been detected, the ***obstruction indicator*** (BED UP button) will begin to flash and an audible "chirp" will sound. A warning message will also be displayed for 5 seconds. The ***obstruction indicator*** will continue to flash to remind staff that an obstruction was detected during the last attempt to initiate downward motion of the bed platform.
- On Spirit™ and Spirit Plus™ beds an audible "chirp" will sound.

Any further attempts to initiate downward motion of the bed platform will not be permitted if an obstruction is still being detected and the bed platform will automatically elevate up an additional safety distance of 1" after each attempt.

Contact with an Obstruction While Bed is Stationary (ie: Bed not in Motion)

When an obstruction is detected prior to any bed movement, all downward motion of the bed platform (BED DOWN, initiating Trendelenburg/reverse Trendelenburg operation or Chair mode) will be automatically disabled.

- On Spirit Select™ beds, the ***obstruction indicator*** will flash until the obstruction is removed. A warning message will also be continuously displayed and an audible "chirp" will sound when any downward motion of the bed platform is attempted. Press the ENTER button to acknowledge and clear the warning message.
- On Spirit™ and Spirit Plus™ beds an audible "chirp" will sound.

Any further attempts to initiate downward motion of the bed platform will not be permitted if an obstruction is still being detected and the bed platform will automatically elevate up an additional safety distance of 1" after each attempt.

On Spirit Select™ beds when the bed no longer detects an obstruction, the ***obstruction indicator*** will stop flashing and normal bed operation will be restored.

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When an Obstruction is not Detected (ie: Obstruction Removed)

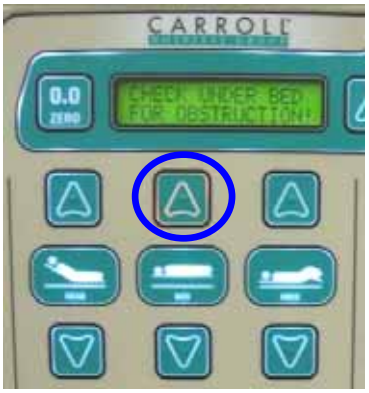
When an obstruction is no longer detected:

- On Spirit Select™ beds, the ***obstruction indicator*** will stop flashing and normal bed operation will be restored.
- On Spirit™ and Spirit Plus™ beds, normal bed operation will be restored.

Visual and Audio Indicators

VISUAL OBSTRUCTION INDICATOR: *(Spirit Select™ only)*

In addition to operating BED UP functionality, the BED UP serves as an ***obstruction indicator*** by illuminating & flashing whenever an obstruction has been detected. The "CHECK UNDER BED FOR OBSTRUCTION" warning message will also be displayed.



AUDIO OBSTRUCTION INDICATOR: *(all beds)*

When an obstruction is contacted during bed motion or if an obstruction is detected prior to any bed lowering motion and a downward motion of the bed platform (BED DOWN, initiating Trendelenburg/reverse Trendelenburg operation or Chair mode) is attempted an audible "chirp" will sound.

Enabling/Disabling the Obstruction Sensors

On Spirit Select™ beds, the obstruction sensors can be enabled/disabled in the Service Menu. Refer to page 76 for Service Menu navigation and page 84 for instructions.

IMPORTANT: The factor default setting for obstruction sensors is ENABLED

On Spirit™ and Spirit Plus™ beds, the obstruction sensors cannot be enabled/disabled using the footboard staff control. The obstruction sensors can only be enabled/disabled by connecting/disconnecting the obstruction sensor circuits from the CB10Lite circuit board. Refer to page 113 to identify the two connectors for the obstruction sensor circuits:

- To disable the obstruction sensors, disconnect both of the obstruction sensor circuits from the CB10Lite circuit board.
- To enable the obstruction sensors, connect both of the obstruction sensor circuits from the CB10Lite circuit board.

IMPORTANT: The factor default setting for obstruction sensors is CONNECTED

Disabled Obstruction Sensor Warning

On Spirit Select™ beds, when the obstruction sensors have been disabled and a downward motion of the bed platform (BED DOWN, initiating Trendelenburg/ reverse Trendelenburg operation or Chair mode) is attempted, a warning message will be displayed for the first two seconds of bed operation to remind staff that the obstruction sensors have been disabled.

IMPORTANT: There is no warning or indicator on Spirit™ and Spirit Plus™ beds. The bed will continue to operate as though it was not equipped with the optional obstruction sensors.



⚠ WARNING

Disabling the obstruction sensors will disable a major safety device on the bed.

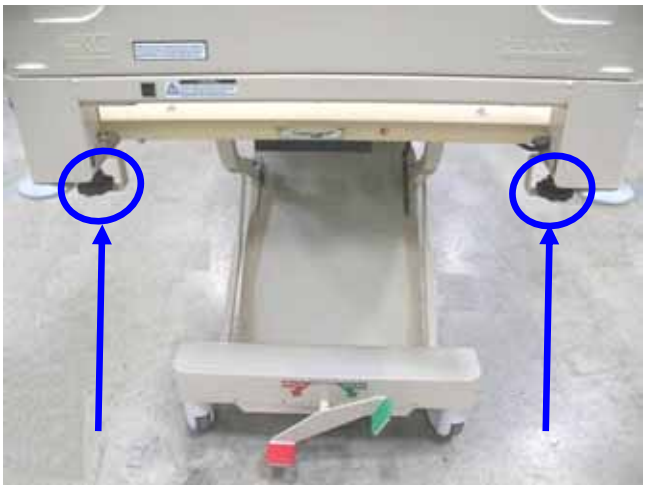
The obstruction sensors should only be disabled in the rare event that normal bed function has been impaired by the malfunction of a component in the obstruction sensing system.

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3.12 Optional “Easy Bed” Extension/Retraction System

To accommodate the physical needs of taller patients, while maintaining the easy of frequent bed movement about space confined healthcare facilities, Carroll Hospital Group offers an optional “Easy Bed” extension system that allows for easy and rapid extension/retraction of the mattress deck by 4 inches (102 mm) from 80” (2032 mm) to 84” (2134 mm). No tools are required to perform bed “Easy Bed” extension/retraction operations.

If your Spirit™ bed has been equipped with the optional “Easy Bed Extension” system, the bed will be outfitted with two clamping knobs and an extendable foot deck section of the mattress deck as shown below.



Clamping Knobs *(viewed from foot end of bed)*



Extendable Foot Deck Section

Bed Extension Procedure



Knob clamped



Knob unclamped and contacting retention bracket

1. Elevate bed to comfortable working height. Unclamp the footboard bracket slide mechanism by turning both knobs counter-clockwise until they come to stop on their retention brackets.



2. Grasp footboard bracket by the corners as shown above. Gently and smoothly pull away from the head of the bed until the footboard bracket slide mechanism contacts its mechanical stops.



Knob fully clamped (knob fastener fully engaged)



Knob not fully clamped (knob fastener not fully engaged)

3. Clamp the footboard bracket slide mechanism by turning both retention knobs clockwise until hand tight.

IMPORTANT: Ensure that the clamping knob fastener extends through the retention hole located in the footboard bracket channel. Typical both sides.



4. Unlock foot deck extension pan by grasping the chrome handle and sliding the locking mechanism towards the patient left side of the bed to the unlocked position (green, unlocked icon)

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5. Grasp the chrome handle as shown at right. Gently and smoothly pull away from the head end of the bed until the foot deck extension pan contacts its mechanical stops.	6. Lock foot deck extension pan by grasping the chrome handle and sliding the locking mechanism towards the patient right side of the bed to the locked position (red, locked icon).



⚠ WARNING

Possible **PATIENT ENTRAPMENT Hazard** could occur if the mattress is not securely located and retained on the mattress deck by the four corner mattress keepers.

NEVER perform a bed extension/retraction with a patient on the bed.

NEVER place a patient on the bed if the mattress is not properly located and retained on the mattress deck by the four corner mattress keepers.



⚠ CAUTION

Possible **UNEXPECTED MOTION** could occur if the slide lock is not in the “lock” position and the mattress deck is articulated from the horizontal position.

When the bed is in either the extended or retracted position, the clamping knob fasteners **MUST** be fully engaged and the slide lock **MUST** be in the “lock” position prior to placing a patient on the bed and/or allowing a patient to return to the bed.

NOTE:

Bed retraction procedure is the same as the above except that the footboard bracket and the foot deck extension pan are pushed towards the head end of the bed until contact is made with their respective mechanical stops.

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3.13 Optional Auxiliary AC Power Outlet Socket

Auxiliary AC Power Outlet Socket

The Spirit Select™ bed can be equipped with an optional auxiliary AC power outlet socket mounted in the patient right side of the footboard bracket. The configuration of the outlet socket is NEMA 5-15R.

IMPORTANT: The auxiliary AC power outlet socket has the following electrical ratings:

MAXIMUM Output Power Rating: 120 Volts AC, 600 Watts

DO NOT exceed maximum output power rating



Auxiliary AC Power Outlet Socket Cover

The auxiliary AC power outlet socket has a cover that is integrated into the footboard bracket. The attachment screw is retained with a nylon nut so that it will not be misplaced when the outlet socket is in use.

IMPORTANT: When the auxiliary AC power outlet socket is not in use, the cover must always be installed over the outlet socket.





Circuit Breaker

The auxiliary AC power outlet socket is protected by a circuit breaker. The circuit breaker is located in the footboard bracket. The circuit breaker is the resettable type. Simply depress the button to re-engage the circuit breaker.

IMPORTANT: The circuit breaker is a safety device that is designed to disengage an electrical circuit when the load exceeds the maximum rating of the circuit. An overloaded circuit may cause irreparable damage to the AC power wiring in the bed. If the circuit breaker trips, it is important to understand what has happened to cause this event. The device(s) the bed is connected to may be drawing too much power and exceeding the circuit breaker rating.

Circuit Breaker Rating: 5 Amps



⚠ WARNING

A circuit breaker is **NOT** designed to act as a ground fault circuit interrupter (GFCI) and **DOES NOT** offer the same level of protection. The circuit breaker is a safety device that is designed to only disengage an electrical circuit when the load exceeds the maximum rating. If the circuit breaker trips, discontinue bed use immediately and have a service technician, specifically trained to service Carroll Hospital Group Spirit™ beds, inspect the wiring.

⚠ CAUTION

The auxiliary AC power outlet socket is rated for a **MAXIMUM 120 Volts AC, 600 Watts** output power.

DO NOT exceed the maximum output power rating.

⚠ CAUTION

DO NOT use the auxiliary AC power outlet socket if the socket receptacles appear to be damaged and/or if the plug (of the device that you are connecting to the bed) does not remain connected when inserted in the outlet socket receptacles.

Only replace this outlet socket with a NEMA 5-15R duplex outlet socket that is marked as hospital grade. Contact Carroll Hospital Group Customer Service for a replacement outlet socket.

3.14 Siderail Operation

All of Carroll Hospital Group's Spirit™ bed siderail assemblies fully comply with FDA and Health Canada patient entrapment reduction guidelines and have successfully passed rail entrapment testing using test procedures outlined by the Hospital Bed Safety Workgroup. Spirit™ bed siderail assemblies were qualified using the Cone and Cylinder Tool as specified by FDA and Health Canada patient entrapment reduction guidelines. Entrapment Test Kits are readily available so ongoing compliance can be monitored by the healthcare provider. For further information, refer to the FDA's website at http://www.fda.gov/cdrh/beds/.

3.14.1 Intended Application/Use of Spirit™ Bed Siderail Assemblies

When fully raised/closed and locked/latched in the UP or "GUARD" position, the siderails define a residence area for patients to rest upon the bed. This provides positive patient location/support helping to protect against the potential for patients to fall from the bed as the siderails give the patient a visual and physical indicator of the edge of the bed. When fully lowered/open in the DOWN or "TRANSFER" position, the siderails permit patient ingress to and egress from the bed. The "ASSIST" position on the Carroll Assist Rails™ and integral handles on the Quad siderails facilitate patient mobility by providing a gripping region during ingress to and egress from the bed.

⚠ WARNING

Safe Working Load of Siderails

80 kg (176 lbs)

DO NOT exceed a 80 kg (176 lbs) load on any siderail



⚠ WARNING

Possible **PATIENT ENTRAPMENT** if use of siderails that are damaged or modified in any way.

NEVER use siderails from other manufacturers and/or with dimensions different that the original components and/or assemblies that came equipped with the bed. Variations in siderail design, (width, height, shape, profiles, opening, locking/latching mechanisms, etc) could cause/contribute to patient entrapment and/or could potentially increase the probability/possibility for patient entrapment.

⚠ CAUTION

DO NOT use the siderails as a patient lifting device/apparatus. . Siderails can be deformed or broken if excessive side loading/pressure is exerted. The siderails are used for the purpose of preventing a patient from inadvertently rolling out of bed.

DO NOT use the siderails as part of a patient restraint mechanism. Siderails are **NOT** intended for nor may be used for restraint purposes. If an patient is capable of inflicting self injury or injury to staff, a physician or other suitably trained healthcare practitioner should be consulted for alternate means of safe patient restraint. The Spirit™ bed is equipped with 6 patient restraint loops for this purpose.

⚠ CAUTION

When operating the bed, **ALWAYS** ensure that the individuals using the bed is positioned properly on the mattress within the confines of the bed.

DO NOT let any patient extremities protrude over the side and/or between the siderails when operating the bed.

⚠ CAUTION

DO NOT use the siderails as lifting points for the bed during transportation and/or storage.

DO NOT use the siderails as a means of mechanically restraining the bed during transportation and/or storage.

3.14.2 Carroll Assist Rails™

Your Spirit™ bed comes with Carroll Assist Rails™ as standard equipment.

Operation of the Carroll Assist Rail™

It is important that caregivers know how to operate the assist rails safely. The assist rails locks in two positions and enables patient transfer in a third, unlocked position.

In the "GUARD" position, the assist rails provide positive patient location and support helping to protect the patient from the potential of falling from the bed.

IMPORTANT: An audible "click" should be heard when the assist rails have been completely rotated into the "GUARD" position as the locking mechanism engages.



In the "ASSIST" position, the assist rails aid patient ingress to and egress from the bed.

IMPORTANT: An audible "click" should be heard when the assist rails have been completely rotated into the "ASSIST" position as the locking mechanism engages.



In the "TRANSFER" position, the assist rails fully rotate out of the way to provide unimpeded and unassisted patient ingress to and egress from the bed and also enables patient transfer by staff.

IMPORTANT: The assist rails will not lock in the "TRANSFER" position.



Change Carroll Assist Rail™ From "Guard" to "Assist" to "Transfer"



1. When the assist rail is locked in the "GUARD" position, pull the release knob at the bottom of the assist rail and rotate the assist rail about the pivot point.



2. As soon as the assist rail begins to rotate, you may let go of the release knob.

The locking mechanism is spring loaded and will not engage until the assist rail has been completely rotated into the "ASSIST" position or back into the "GUARD" position.



3. Continue to rotate the assist rail until it "clicks" into the "ASSIST" position.

To change back into the "GUARD" position or into the "TRANSFER", pull the release knob and rotate the assist rail into the desired position.



4. In the "TRANSFER" position, the assist rail will not lock.



⚠ WARNING

Potential **CRUSH Hazard** exists between the Assist Rail™ mounting bracket and the floor when the bed is at the lowest position.

Lowering the bed may cause injury to staff and/or patient. **ALWAYS** ensure nothing is below BOTH Assist Rail™ mounting brackets (one on each side of the bed) when lowering bed.



⚠ WARNING

DO NOT leave patient unattended when the assist rail is in the "TRANSFER" position.

Once patient transfer has been completed, **ALWAYS** rotate the assist rail to either locking positions; "GUARD" or "ASSIST" positions.

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3.14.3 Full Length & Partial Length Non-Tuck Siderails

Your Spirit™ bed may be equipped with the optional Full Length or Partial Length Non-Tuck siderails (full length non-tuck siderail shown).

Operation of the Full Length & Partial Length Siderails

It is important that caregivers know how to operate the Full Length or Partial Length siderails safely. The Full Length or Partial Length siderails lock in the UP position and enables patient ingress, egress, and transfer in the DOWN position.

In the UP position, the Full Length or Partial Length siderails provide positive patient location and support helping to protect the patient from the potential of falling from the bed.

IMPORTANT: An audible "click" should be heard when each siderail has been completely rotated into the UP position as the locking mechanism engages.



The DOWN position, the Full Length or Partial Length siderails fully rotate out of the way to provide unimpeded and unassisted patient ingress to and egress from the bed and also enables patient transfer by staff.

IMPORTANT: The siderails will not lock in the DOWN position.



Raising the Siderail

Gently lift the siderail to the UP position. The siderail will first arc towards the foot end of the bed then back towards the head end of the bed as it fully rotates to the UP position.

IMPORTANT: An audible "click" should be heard when the siderail has been completely raised to the UP position as the locking mechanism engages.





Lowering the Siderail

Pull the release knob towards you then gently push down on the siderail. The siderail will first arc towards the foot end then back towards the head end as it fully rotates to the DOWN position.

IMPORTANT: The siderails will not lock in the DOWN position.





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3.14.4 Quad Siderails

Your Spirit Plus™ or Spirit Select™ bed comes with moulded plastic Quad siderails as standard equipment.

Operation of the Quad Siderails

It is important that caregivers know how to operate the Quad siderails safely. The Quad siderails lock in the UP position and enables patient ingress, egress, and transfer in the DOWN position.

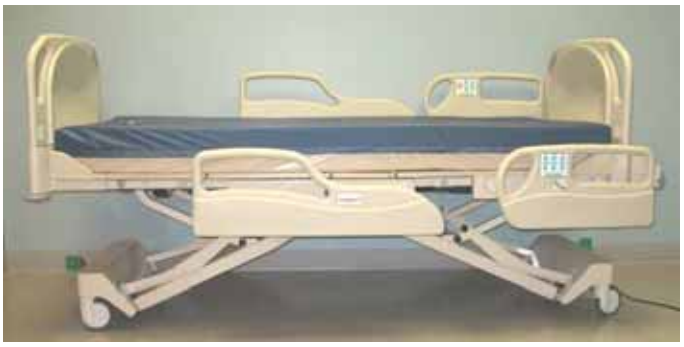
In the UP position, the Quad siderails provide positive patient location and support helping to protect the patient from the potential of falling from the bed.

IMPORTANT: An audible “click” should be heard when each siderail assembly has been completely rotated into the UP position as the locking mechanism engages.



The DOWN position, the Quad siderails fully rotate out of the way to provide unimpeded and unassisted patient ingress to and egress from the bed and also enables patient transfer by staff.

IMPORTANT: The siderails will not lock in the DOWN position.



Raising the Foot Siderails

Gently rotate the foot siderail to the UP position. The foot siderail will first arc toward the foot end of the bed then back towards the head end of the bed as it rotates to the UP position.

IMPORTANT: An audible “click” should be heard when the foot siderail has been completely raised to the UP position as the locking mechanism engages.





Lowering the Foot Siderails

Depress the green push button then gently push down on the foot siderail. The foot siderail will first arc towards the foot end of the bed then back towards the head end of the bed as it rotates to the DOWN position.

IMPORTANT: The foot siderails will not lock in the DOWN position.





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Raising the Head Siderails

Gently rotate the head siderail to the UP position. The head siderail will first arc toward the head end of the bed then back towards the foot end of the bed as it rotates to the UP position.

IMPORTANT: An audible “click” should be heard when the head siderail has been completely raised to the UP position as the locking mechanism engages.




Lowering the Head Siderails

Depress the green push button then gently push down on the head siderail. The head siderail will first arc towards the head end of the bed then back towards the foot end of the bed as it rotates to the DOWN position.

IMPORTANT: The head siderails will not lock in the DOWN position.




Integrated Features

Staff Siderail Controls

The head siderails incorporate integrated staff control that offers staff control of basic bed operations:

- Head UP/DOWN,
- Knee/Foot UP/DOWN
- Bed UP/DOWN

IMPORTANT: Bed operation from this control is disabled when the patient lock-outs are activated.



Patient Siderail Controls

The head siderails incorporate integrated patient control that offers patient control of basic bed operations:

- Head UP/DOWN,
- Knee/Foot UP/DOWN
- Nurse Call feature

IMPORTANT: Bed operation from this control is disabled when the patient lock-outs are activated.

IMPORTANT: The Nurse Call feature remains active if patient lock-outs have been activated.



Angle Gauges

All four siderails have integrated angle gauges:

- The head siderail angle gauge displays the angle of the head section of the mattress deck.
- The foot siderail angle gauge displays the Trendelenburg or reverse Trendelenburg angle



Head Siderail Angle Gauge



Foot Siderail Angle Gauge

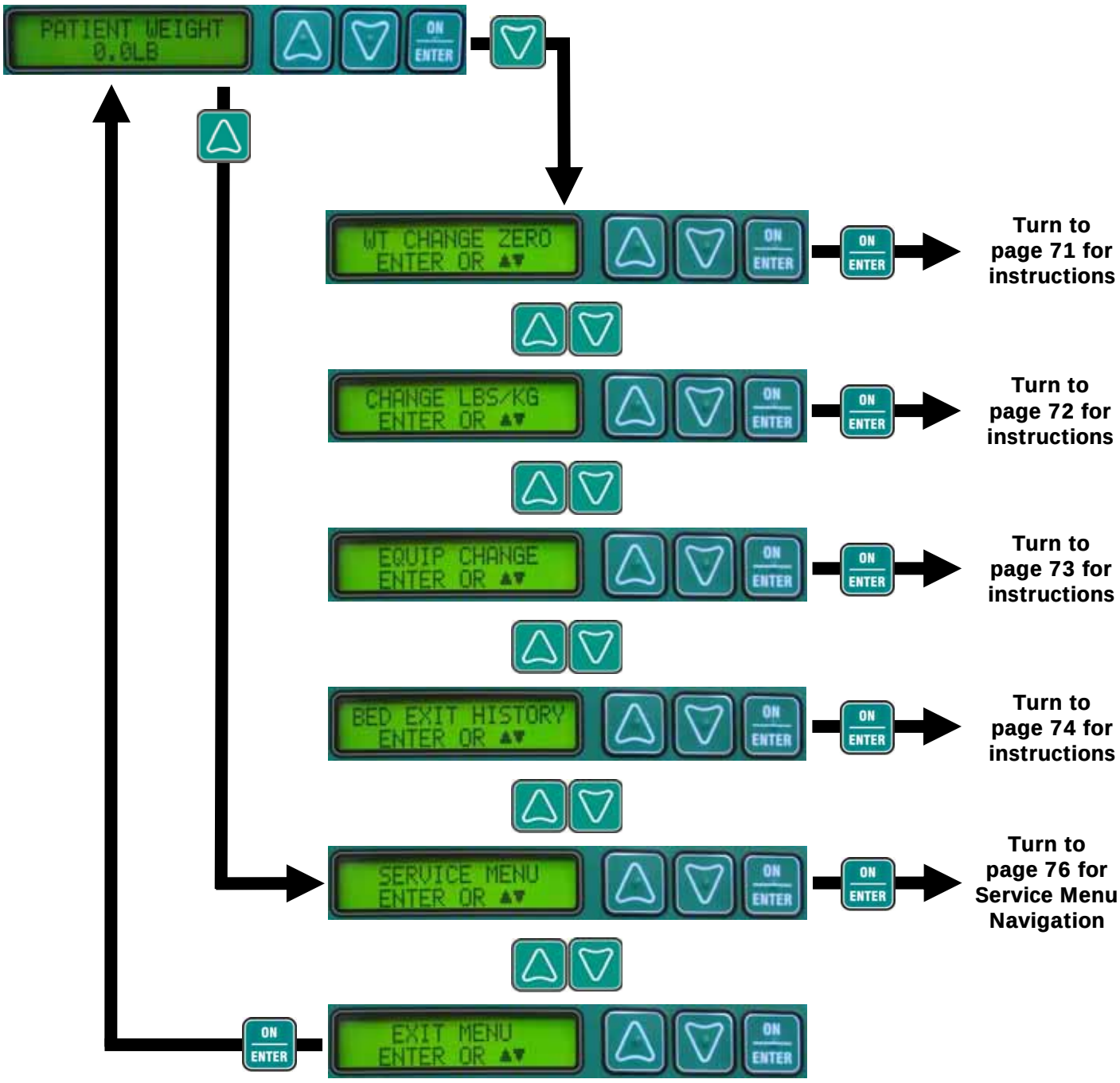
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Section 4:

Menu Screen Navigation

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4.1 Main Menu Navigation



Automatic Return Home Feature

To help staff with display menu navigation, an automatic **"return home"** feature has been included.

How it works:

- After 1 minute of keypad inactivity, the display will automatically enter "sleep" mode. No unselected impact to any setting in any menu screen will occur (example: a setting change attempt has been abandoned).
- Pressing the ENTER button after the display enters "sleep" mode will "wake up" the display at the home screen.

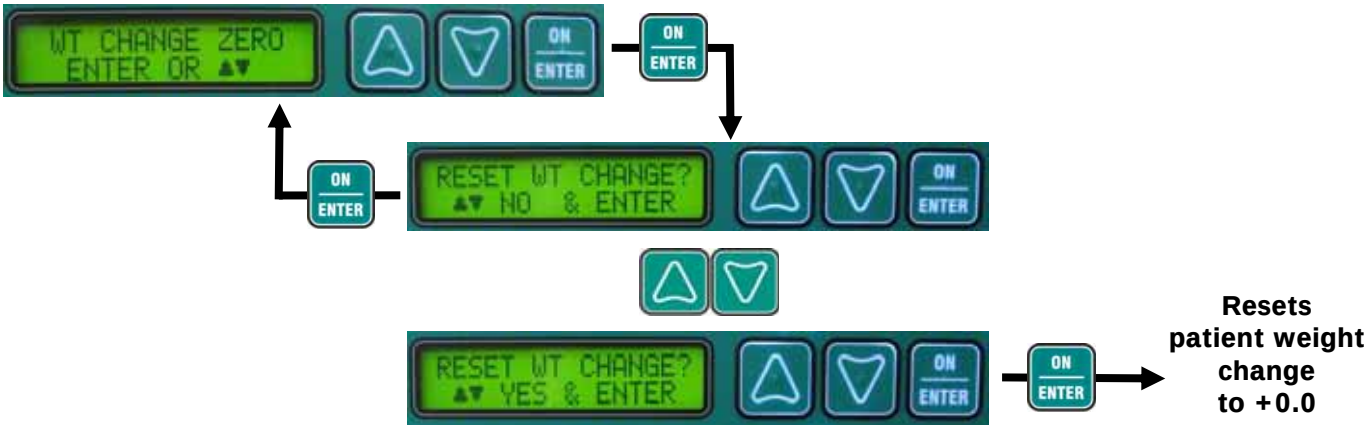
The automatic home screen return feature will work in any menu screen if a setting change selection has not been made (the ENTER button has not be pressed to make a setting change).

Hint: *To avoid having to wait the 1 minute to initiate the automatic* ***"return home"*** *feature, simply remove and replace the footboard. The home screen will be displayed when the menu display powers up.*

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4.1.1 Instructions: Patient Weight Change Zero

From page 70



Patient Weight Change Zero – YES Selected

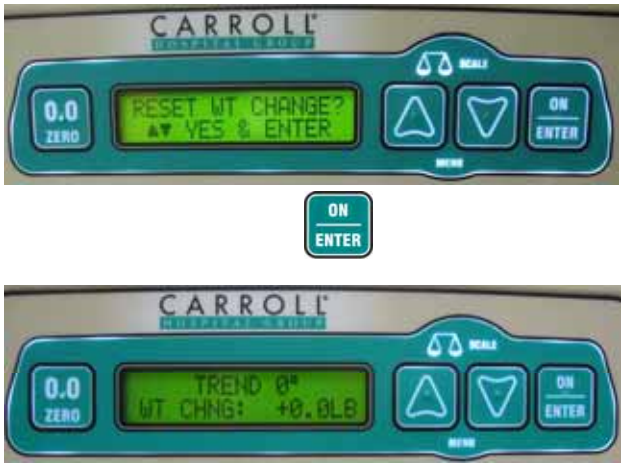
LB units used for this example

To zero the patient weight change:

1. Use the UP/DOWN Arrow buttons to scroll to the "YES" option.
2. Press the ENTER button to zero patient weight change. The display will automatically return to the home screen. Press the ENTER button again to view the patient weight change screen.

The patient weight change will now show +0.0LB.

Patient weight and weight change are displayed in the same unit of measure.



Patient Weight Change Zero – NO Selected

If this selection was made by accident or do you not wish to zero the patient weight change at this point, simply use the UP/DOWN Arrow buttons to scroll to the "NO" option

1. Press the ENTER button to not zero patient weight change. The menu display will automatically return to the "WT CHANGE ZERO" screen of the Main Menu.
2. Use the UP/DOWN Arrow buttons to scroll to the "EXIT MENU" screen of the Main Menu.
3. Press the ENTER button to exit the Main Menu to the home screen.

The patient weight change will remain unchanged.

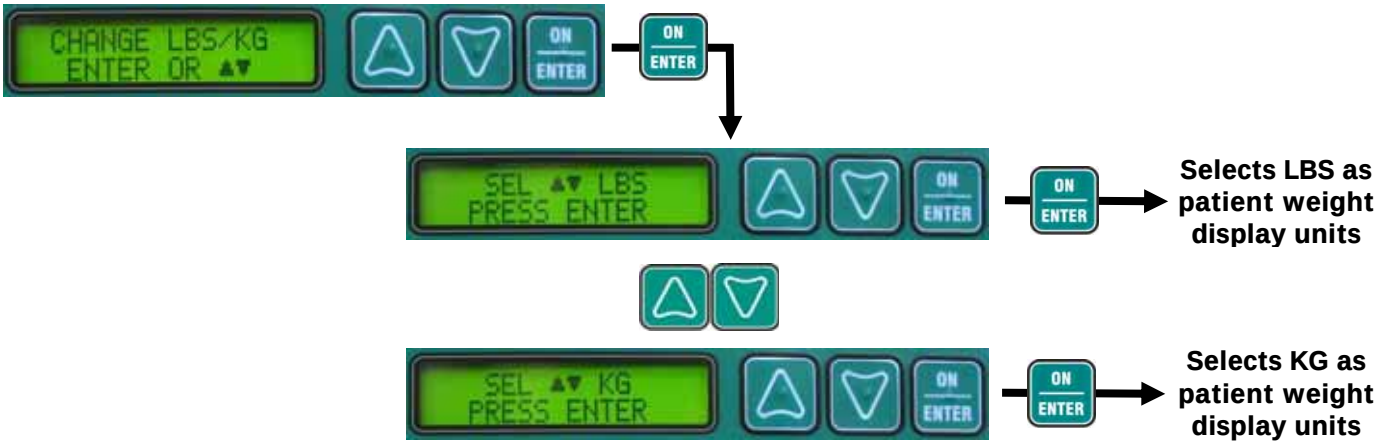


NOTE:	Carroll Hospital Group recommends that the patient weight change is zeroed once a new patient enters the bed.

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4.1.2 Instructions: Change Patient Weight Display Units

From page 70



Changing Patient Weight Display Units

KG units used for this example

To change the patient weight display units:

1. Use the UP/DOWN Arrow buttons to scroll to desired patient weight display units.
2. Press the ENTER button to select the desired display unit. The display will automatically return to the home screen.

The patient weight will now be displayed in the units that were just selected.



Patient Weight Display Units - LOCKED

If the patient weight display units has been locked, the units cannot be changed from the Main Menu and a warning message will be displayed if attempted.

The unit lock and display units can be changed in the Service Menu.

Refer to page 76 for Service Menu navigation and page 78 for instructions.



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4.1.3 Instructions: Change Equipment

From page 70



Allows equipment change without impact to displayed patient weight

Making an Equipment Change to the Bed

LB units used for this example

At any time when the patient is on the bed, staff:

1. Can add additional equipment to the bed after a patient has entered the bed, or
2. Can remove equipment that was on the bed before the patient entered the bed.

To make an equipment change:

1. Press the ENTER button to begin equipment change process. The scale will take a snapshot of the current bed weight (patient, mattress, equipment, lines, etc.)
2. Perform desired equipment addition or removal.
3. Press the ENTER button when done. The scale will take a second snapshot of the new bed weight. The difference between the first and second weight snapshots will simply be ignored by the scale and will not be reflected in the displayed patient weight. The display will automatically return to the home screen.

The displayed patient weight will not reflect the addition or removal of equipment to/from the bed when this procedure is performed.

HINT: *Use this feature when adding additional pillows and/or linen to the bed.*



Movement Detected During Equipment Change Procedure

IMPORTANT: If the bed detects any movement while attempting to perform an equipment change, a warning message will be displayed and the equipment change procedure will have to be repeated.

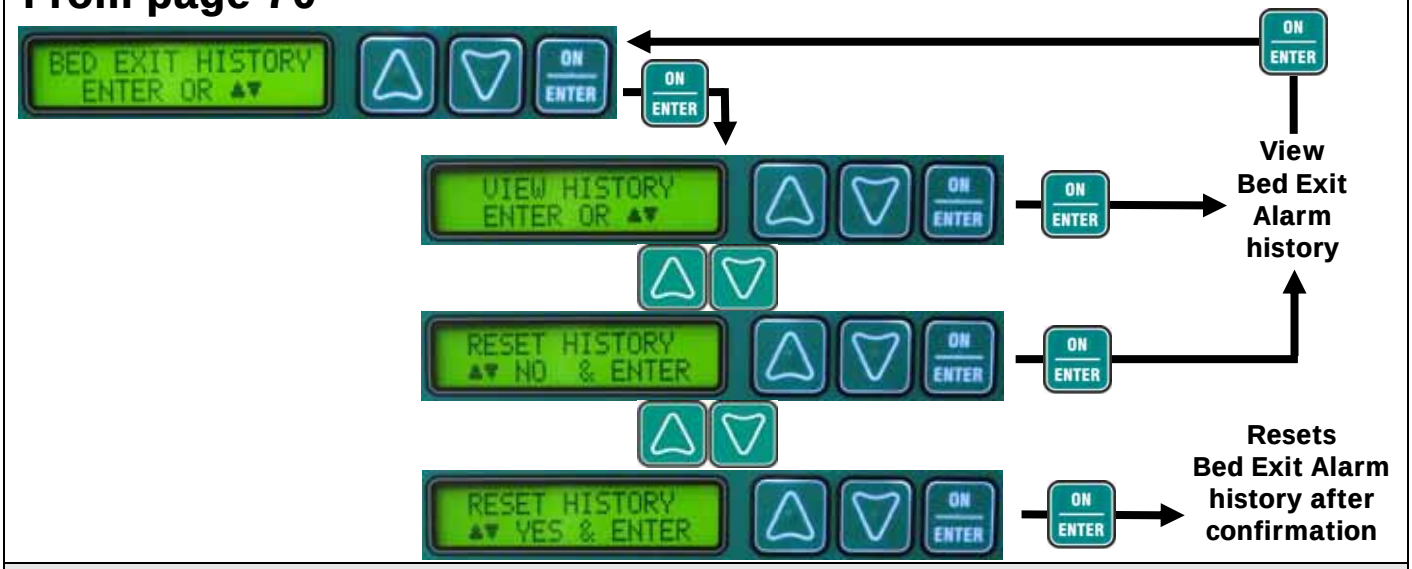
Instruct patient to remain still while performing this procedure.



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4.1.4 Instructions: Bed Exit Alarm History

From page 70



View Bed Exit Alarm History

2 Bed Exit Alarms in history used for this example

To view the bed exit alarm history:

1. Press the ENTER button. The total number of times the bed exit alarm has been triggered, since the last time it was reset, will be displayed.
2. Press the ENTER button to acknowledge that the bed exit history has just been reset. The display will automatically return to the home screen.

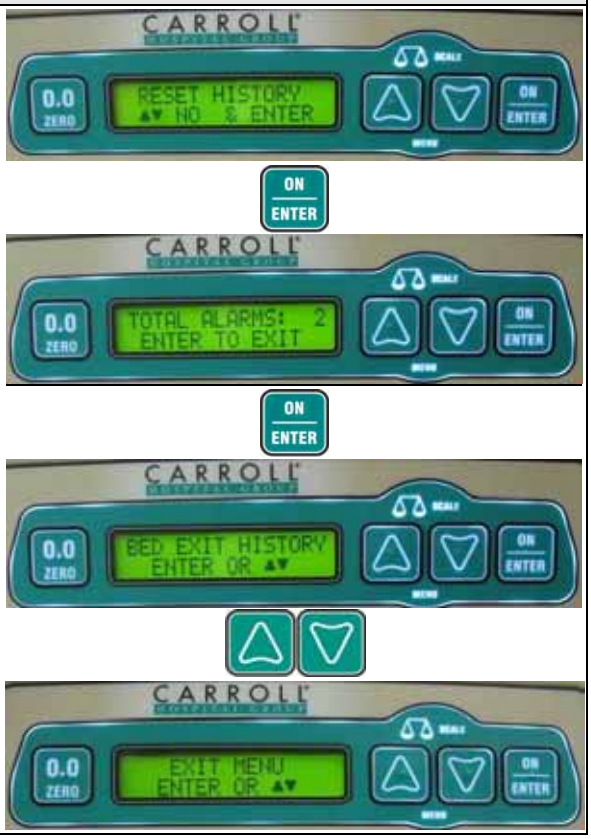


Reset Bed Exit Alarm History – NO Selected

2 Bed Exit Alarms in history used for this example

When a NO selection in the “RESET HISTORY” screen has been made the display will automatically return to the “ALARM HISTORY” screen to show that the alarm history still remains.

1. Press the ENTER button to exit to the “BED EXIT HISTORY” screen to the Main Menu.
2. Use the UP/DOWN Arrow buttons to scroll to the “EXIT MENU” screen of the Main Menu.
3. Press the ENTER button to exit the Main Menu to the home screen.



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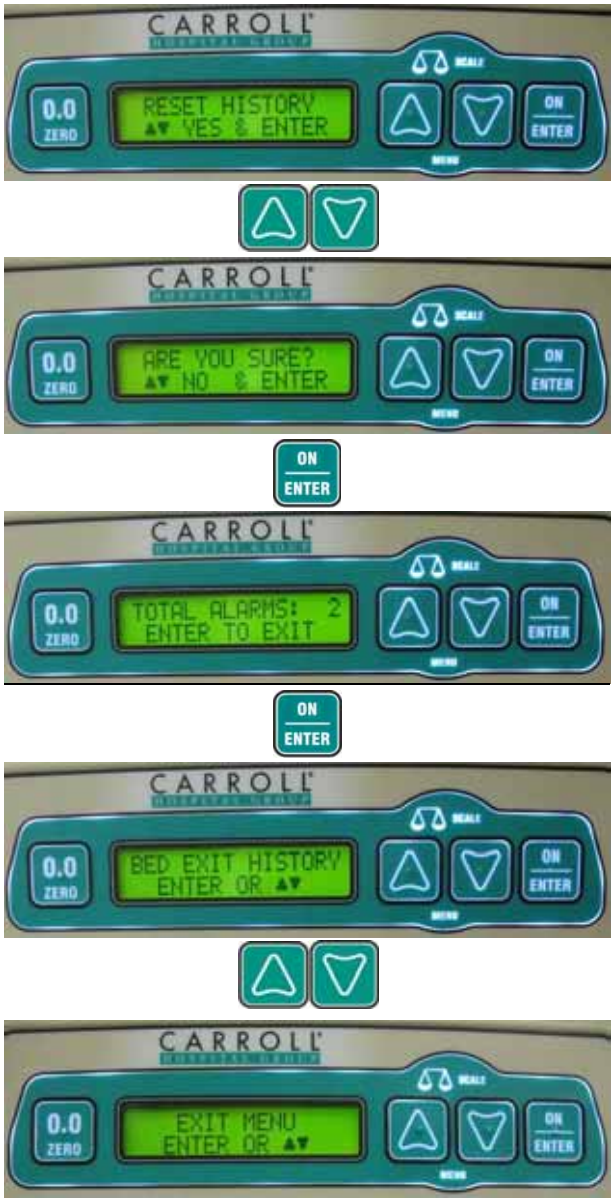
Reset Bed Exit Alarm History – YES Selected

2 Bed Exit Alarms in history used for this example

When a YES selection in the “RESET HISTORY” screen has been made you will be asked to confirm that you wish to reset the bed exit alarm history.

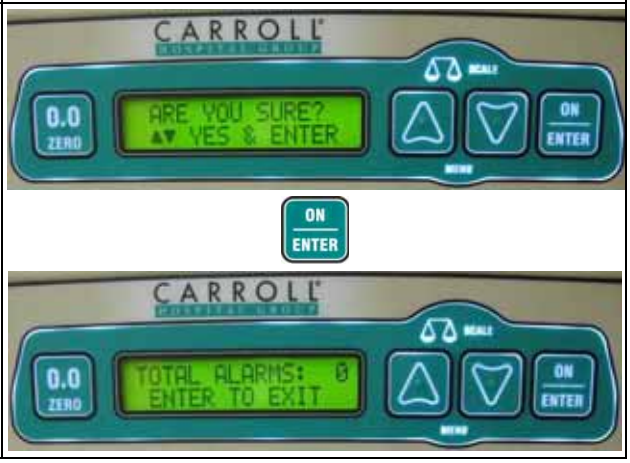
If this selection was made by accident or you do not wish to reset the bed exit alarm history at this point, simply use the UP/DOWN Arrow buttons to scroll to the “NO” option.

1. Press the ENTER button to not reset bed exit alarm history. The display will automatically go to the “ALARM HISTORY” screen to show that the alarm history still remains.
2. Press the ENTER button to exit to the “BED EXIT HISTORY” screen of the Main Menu.
3. Use the UP/DOWN Arrow buttons to scroll to the “EXIT MENU” screen of the Main Menu.
4. Press the ENTER button to exit the Main Menu to the home screen.



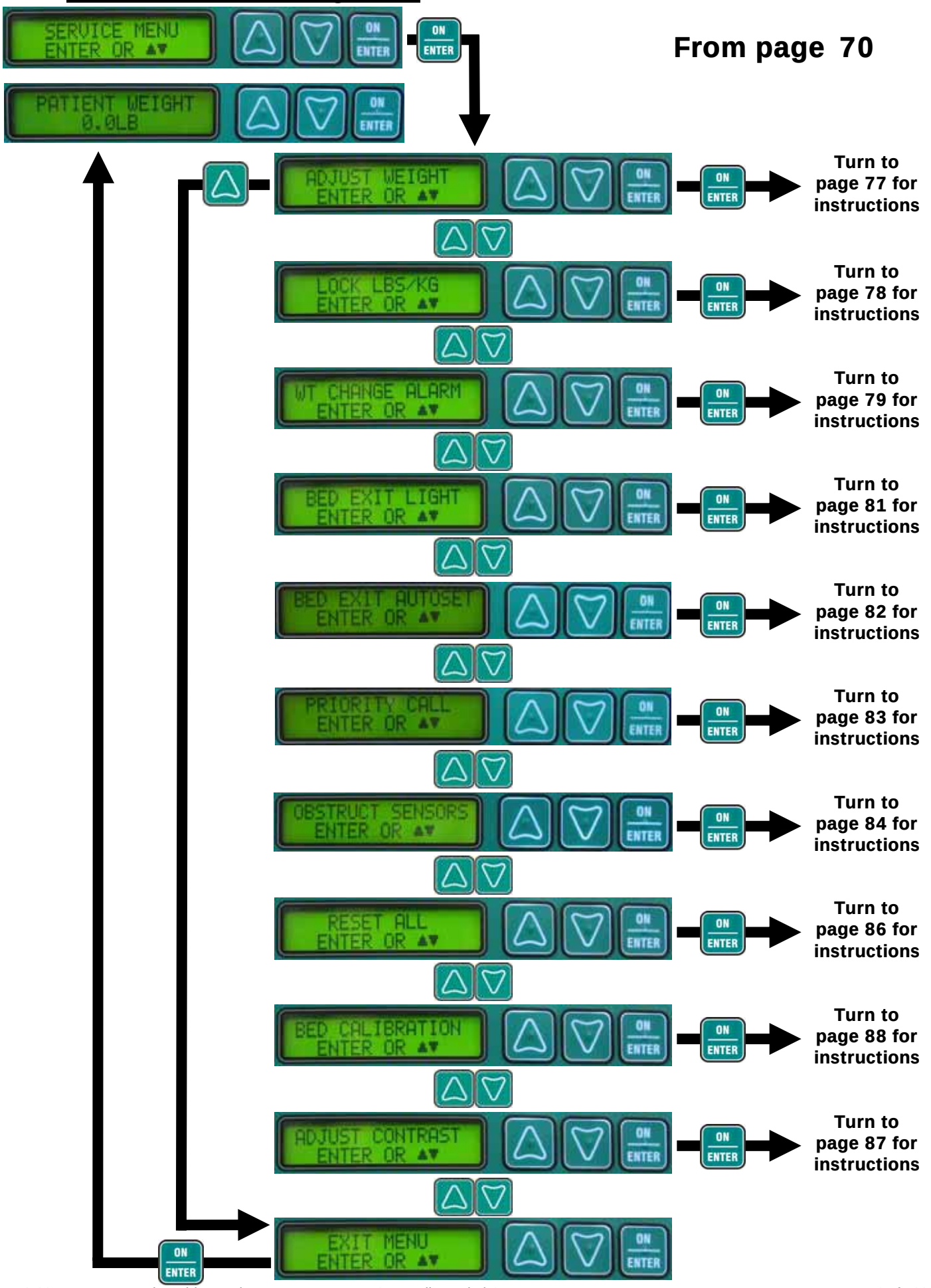
If you do wish to reset the bed exit alarm history at this point, simply use the UP/DOWN Arrow buttons to scroll to the “YES” option.

1. Press the ENTER button to reset bed exit alarm history. The display will automatically go to the “ALARM HISTORY” screen to show that the bed exit alarm history has been reset.
2. Press the ENTER button to acknowledge and exit to the “BED EXIT HISTORY” screen of the Main Menu.
3. Navigate to home screen as instructed above.



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4.2 Service Menu Navigation



From page 70

Turn to page 77 for instructions

Turn to page 78 for instructions

Turn to page 79 for instructions

Turn to page 81 for instructions

Turn to page 82 for instructions

Turn to page 83 for instructions

Turn to page 84 for instructions

Turn to page 86 for instructions

Turn to page 88 for instructions

Turn to page 87 for instructions

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4.2.1 Instructions: Adjust Patient Display Weight

From page 76



Adjusts patient's displayed weight

Adjusting Patient Display Weight

LB units used for this example

2LB increase in patient weight used for this example

Empty bed used for this example

Use the UP/DOWN Arrow buttons to make adjustments to patient's displayed weight.

Each time the UP/DOWN Arrow buttons are pushed, an increase/decrease of 0.5 LB or 0.5 KG (depending upon which unit of measure has been set for patient weight display) will register.

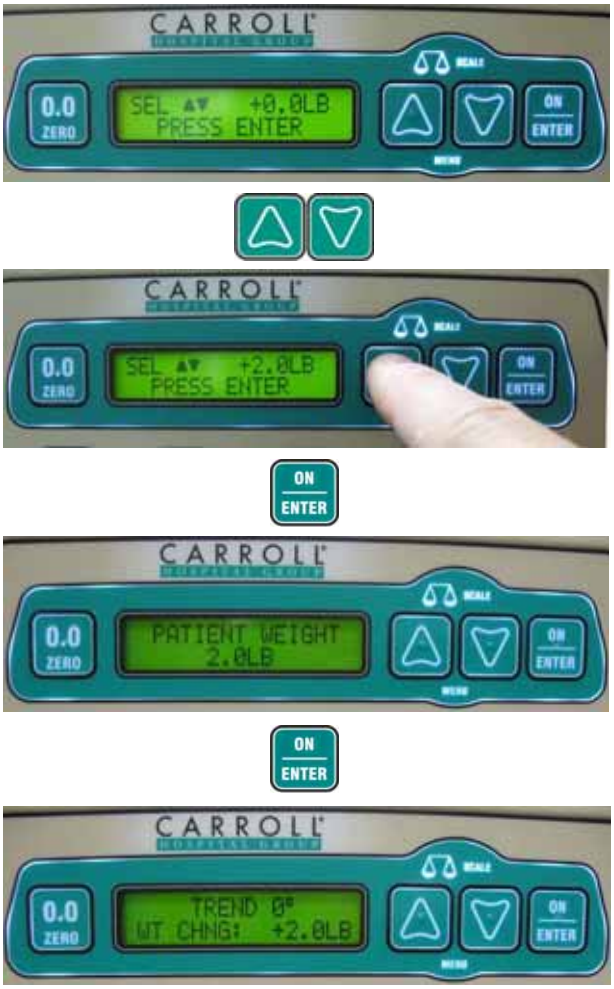
- The UP Arrow button will increase the patient's displayed weight.
- The DOWN Arrow button will decrease the patient's displayed weight.

After the desired increase/decrease has been made,

- Press the ENTER button to input the adjustment. The display will automatically return to the home screen.

The patient display weight will now display the actual patient weight plus this inputted increase ***OR*** the actual patient weight minus this inputted decrease.

- Press the ENTER button again to show the +2.0 LB weight change.



IMPORTANT: To inform staff that the patient's weight has been adjusted, a message will automatically be displayed for 5 seconds each time the display menu is activated or "woken up".

The display of this message can be interrupted by pushing either the UP/DOWN Arrow buttons or the ENTER button.

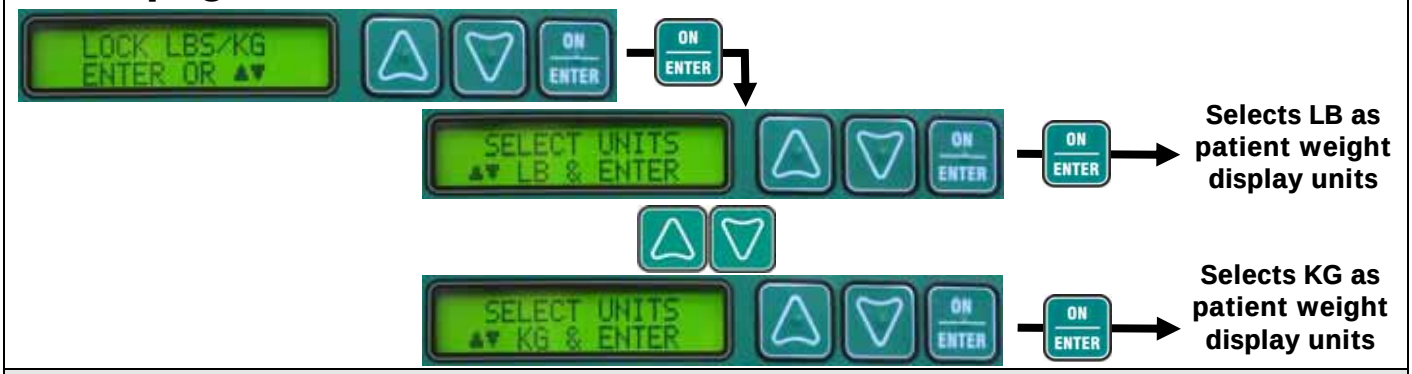


NOTE:	Zeroing the scale will override any adjustments made to patient weight.

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4.2.2 Instructions: Lock Patient Weight Display Units

From page 76



Selecting Patient Weight Display Units

KG units used for this example

1. Use the UP/DOWN Arrow buttons to scroll to the desired unit for patient weight display
2. Press the ENTER button to select desired unit.

Once the patient weight display units have been selected (ENTER button pressed) you will be prompted to lock the units.

If this selection was made by accident or you have decided to not wish to lock the patient weight display units at this point, simply use the UP/DOWN Arrow buttons to scroll to the "NO" option.

3. Press the ENTER button to not lock the units. You will be asked to confirm this selection.
4. After selection confirmation, the display will automatically go to the "UNIT LB/KG UNLOCKED" screen to show that the unit change is not locked. The display will automatically return to the home screen.

IMPORTANT: If the patient weight display unit is unlocked at this point, it can easily be changed from the Main Menu. See page 70 for Main Menu navigation and page 72 for instructions.



If you do wish to lock the patient weight display units, simply use the UP/DOWN Arrow buttons to scroll to the "YES" option.

1. Press the ENTER button to select the lock units. You will be asked to confirm this selection.
2. After selection confirmation, the display will automatically go to the "UNIT LOCKED" screen to show that the unit change has been locked. The display will then automatically return to the home screen.

IMPORTANT: If the patient weight display unit is locked at this point, it cannot be changed from the Main Menu. Staff will need to access the Service Menu to make a unit change.



IMPORTANT: If the patient weight display units have been locked, a message will be displayed asking if you wish to unlock the patient weight display units.

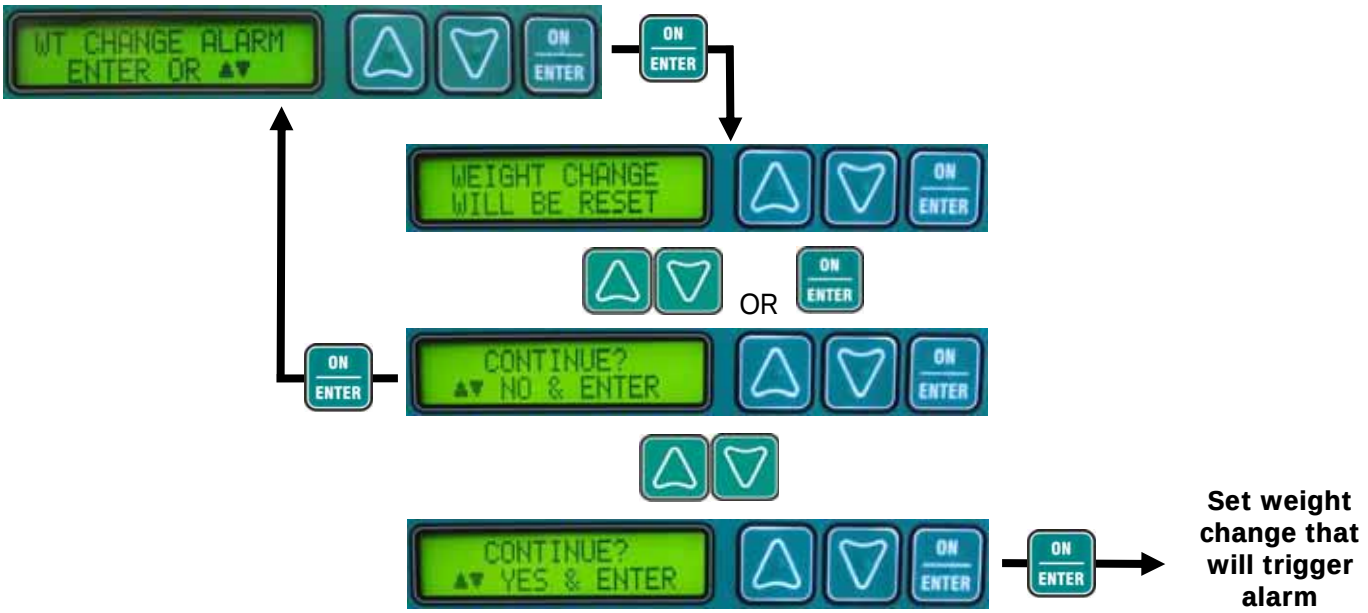
Use the UP/DOWN Arrow buttons to scroll to either the "YES" or "NO" option. Press the ENTER button to select. You will be asked to confirm this selection.



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4.2.3 Instructions: Weight Change Alarm

From page 76



Patient Weight Change Alarm – How It Works

When the weight change alarm is set, the bed takes snapshots of the patient's weight and stores this value. Weight change is a time related event and is assumed to occur gradually. If the difference in the patient's weight equals or exceeds the set amount after an elapsed period of an hour, a weight change alarm is triggered.

If the difference is significantly greater than the set amount, the bed assumes that this occurrence is not related to patient weight change (example: a healthcare practitioner or family member is likely sitting on and/or something has been placed on the bed without using the "Change Equipment" feature – refer to page 70 for Main Menu navigation and page 73 for instructions). In this case the bed simply ignores this change and a patient weight change alarm will not be triggered in this instance.

IMPORTANT: If a weight change alarm is set, all patient weight change tracking data collected prior to setting the alarm will be lost.

KG units used for this example

3KG Patient weight GAIN used for this example

When a weight change alarm is triggered, these two warning messages will flash sequentially on the menu display and will also send a priority call via the Nurse Call system (if connected). There is no audio component to this alarm.

Press the ENTER button to acknowledge that the weight change alarm has been triggered. The display will automatically return to the home screen.

IMPORTANT: Pressing the ENTER button clears the weight change alarm. The weight change alarm settings will also be cleared.

IMPORTANT: The weight change alarm set amount is an absolute value. A patient weight change alarm will be triggered if the patient ***GAINS*** or ***LOSES*** this set amount of weight.





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Setting Patient Weight Change Alarm – YES Selected

KG units used for this example

Each time the UP Arrow button is pushed, an increase of 0.5 LB or 0.5 KG (depending upon which unit of measure has been set for patient weight display) will register.

1. After the desired patient weight change has been made, press the ENTER button to return. The display will automatically return to the “WT CHANGE ALARM” screen of the Service Menu.
2. Use the UP/DOWN Arrow buttons to scroll to the “EXIT MENU” screen of the Service Menu.
3. Press the ENTER button to exit the Service Menu to the home screen.

IMPORTANT: All patient weight change tracking data has been reset and a patient weight change alarm has been set.



Setting Patient Weight Change Alarm – NO Selected

If this selection was made by accident or you do not wish to lose patient weight change tracking and/or set a patient weight change alarm at this point, simply use the UP/DOWN Arrow buttons to scroll to the “NO” option

1. Press the ENTER to not zero patient weight change. The display will automatically return to the “WT CHANGE ZERO” screen of the Main Menu.
2. Use the UP/DOWN Arrow buttons to scroll to the “WT CHANGE ALARM” screen of the Service Menu.
3. Press the ENTER button to exit the Service Menu to the home screen.

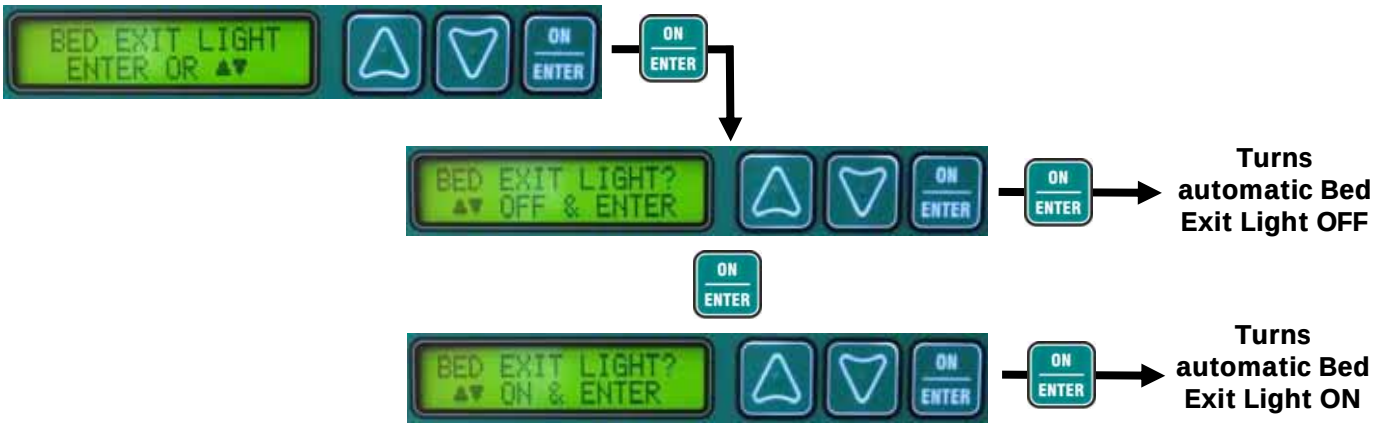
IMPORTANT: All patient weight change tracking data is unchanged and a patient weight change alarm has not been set.



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4.2.4 Instructions: Bed Exit Light

From page 76



Bed Exit Light - ON/OFF Selection Made

After a selection has been made the display will return to the "BED EXIT LIGHT" screen of the Service Menu.

1. Use the UP/DOWN Arrow buttons to scroll to "EXIT MENU" screen of the Service Menu.
2. Press ENTER button to exit the Service Menu to the home screen.

If an ON selection is made, the automatic bed exit light will be activated

If an OFF selection is made, the automatic bed exit light will not be activated.

Refer to page 54 for Bed Exit Light feature description.

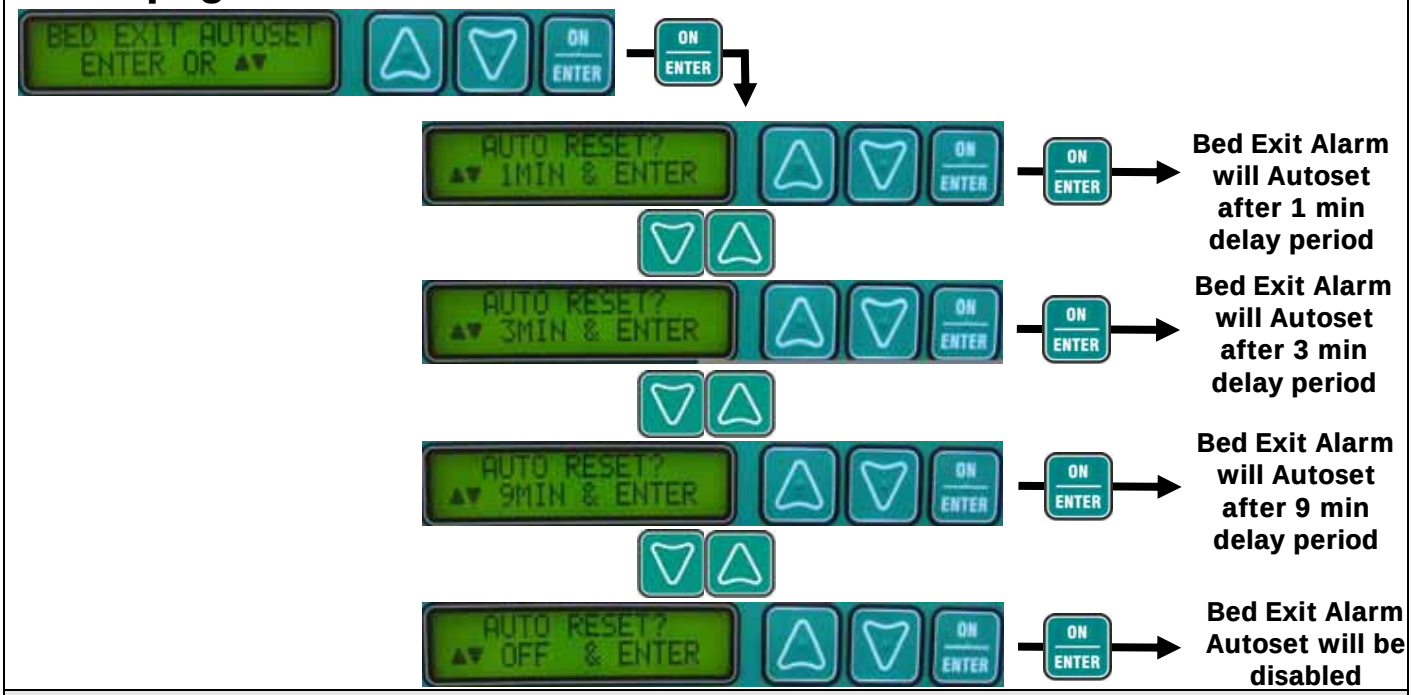
IMPORTANT: The factory default setting for Bed Exit Light is ON.



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4.2.5 Instructions: Bed Exit Alarm Autoset

From page 76



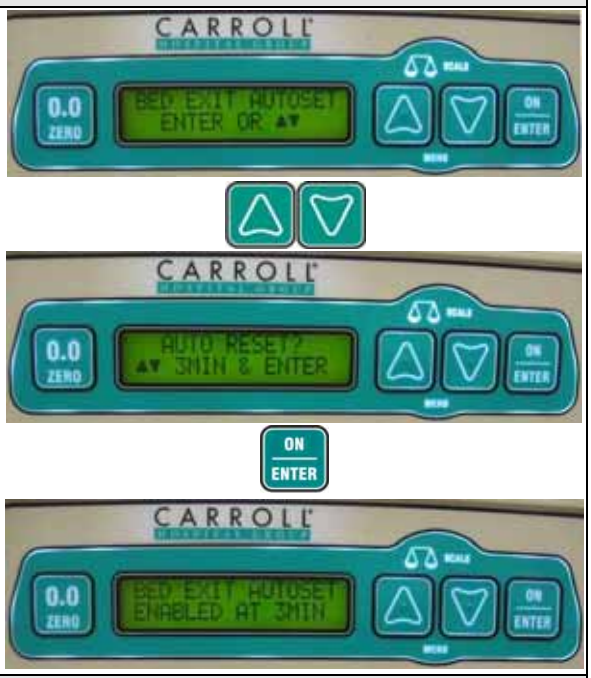
Arming Bed Exit Alarm Autoset

3 minute delay period used for this example

1. Use the UP/DOWN Arrow buttons to scroll through the three factory set time delay options.
2. Press the ENTER button to select desired delay period. You will be asked to confirm this selection.
3. After selection confirmation, the display will automatically go to the "BED EXIT AUTOSET ENABLED AT 3MIN" screen to show that the Bed Exit Autoset has been armed. The display will automatically return to the home screen.

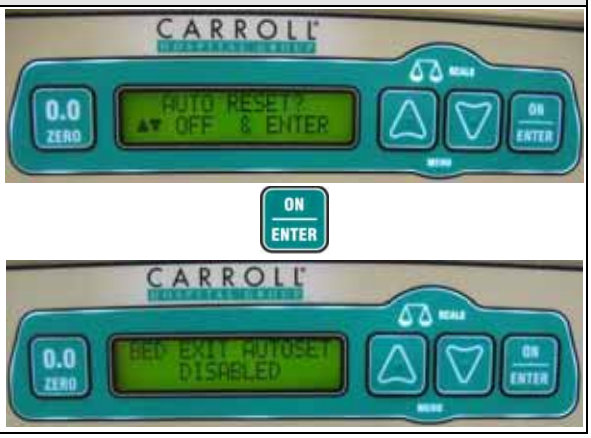
IMPORTANT: Refer to page 53 for instructions on Bed Exit Alarm Autoset.

IMPORTANT: The factory default setting for Bed Exit Alarm Autoset is 3 minute delay period.



Disarming Bed Exit Alarm Autoset

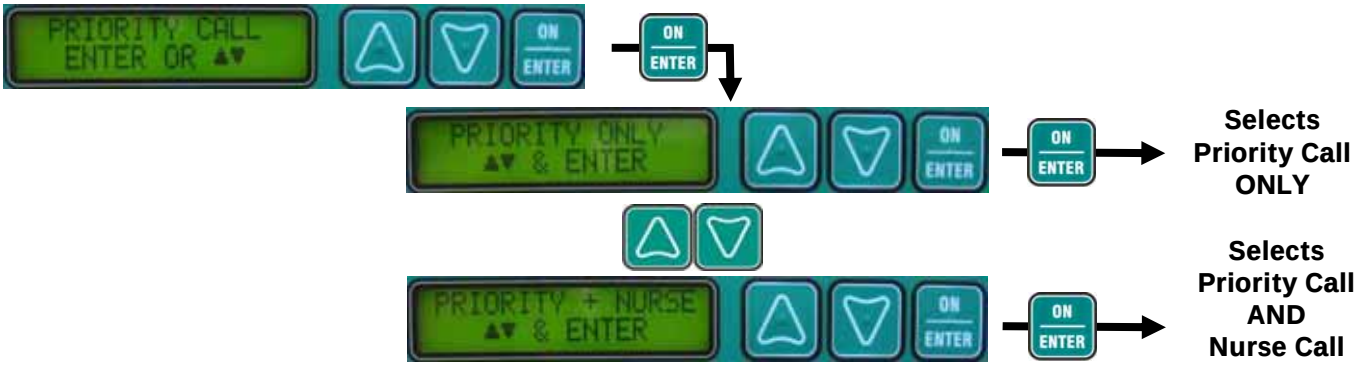
1. Use the UP/DOWN Arrow buttons to scroll through the three factory set time delay options to the off selection.
2. Press the ENTER button. You will be asked to confirm this selection.
3. After selection confirmation, the display will automatically go to the "BED EXIT AUTOSET DISABLED" screen to show that the Bed Exit Autoset has been armed. The display will automatically return to the home screen.



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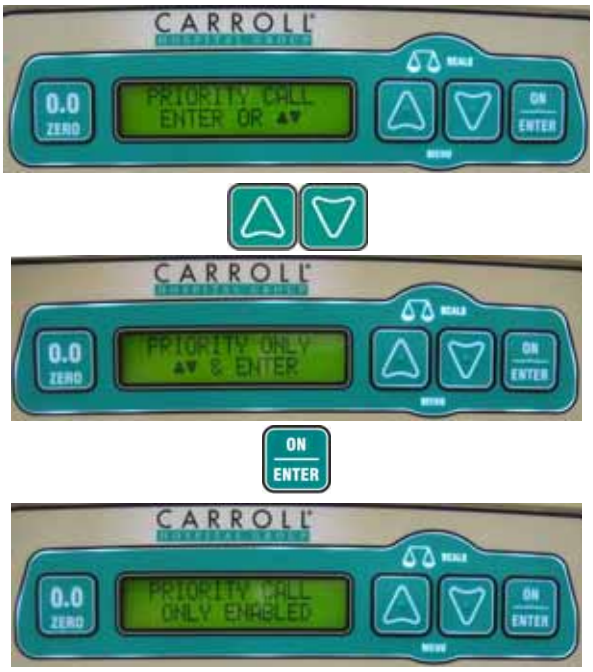
4.2.6 Instructions: Priority Call

From page 76



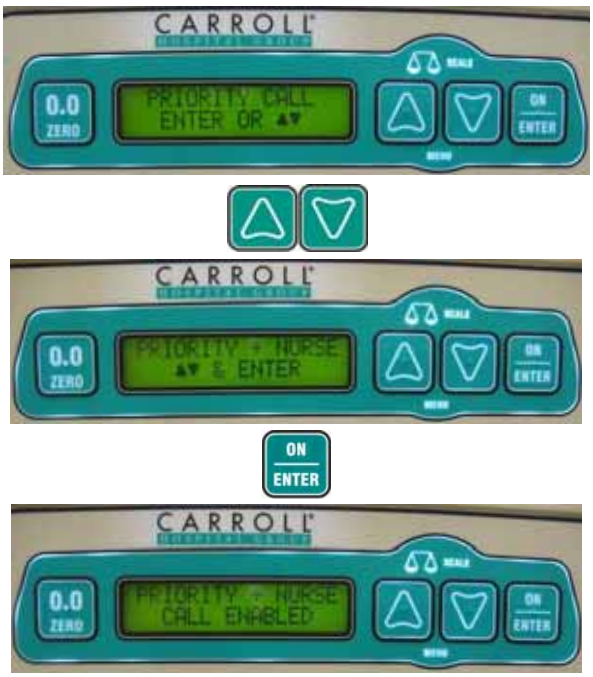
To Select Priority Call ONLY

1. Use the UP/DOWN Arrow buttons to scroll to the "PRIORITY ONLY" option.
2. Press the ENTER button to make this selection. You will be asked to confirm this selection.
3. After selection confirmation, the display will automatically go to the "PRIORITY CALL ONLY ENABLED" screen to show that this setting has been selected. The display will automatically return to the home screen.



To Select Priority Call AND Nurse Call

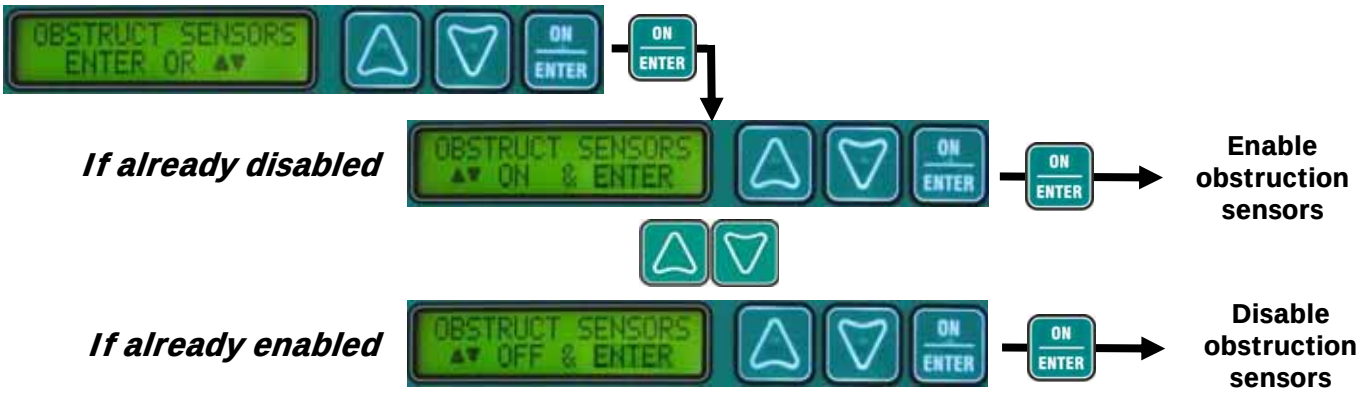
1. Use the UP/DOWN Arrow buttons to scroll to the "PRIORITY + NURSE" option.
2. Press the ENTER button to make this selection. You will be asked to confirm this selection.
3. After selection confirmation, the display will automatically go to the "PRIORITY + NURSE CALL ENABLED" screen to show that this setting has been selected. The display will automatically return to the home screen.



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4.2.7 Instructions: Obstruction Sensors – Enable / Disable

From page 76



Enabling Obstruction Sensors (ON Selected)

When an ON selection in the "OBSTRUCT SENSORS" screen has been made you will be asked to confirm that you wish to enable the obstruction sensors.

If this selection was made by accident or you do not wish to enable the obstruction sensors at this point, simply use the UP/DOWN Arrow buttons to scroll to the "NO" option.

1. Press the ENTER button to not enable the obstruction sensors. The display will automatically return to the "OBSTRUCT SENSORS" screen of the Service Menu.
2. Use the UP/DOWN Arrow button to scroll to the "EXIT MENU" screen of the Service Menu.
3. Press the ENTER button to exit the Service Menu to the home screen.



If you do wish to enable the obstruction sensors at this point, simply use the UP/DOWN Arrow buttons to scroll to the "YES" option.

1. Press the ENTER button to enable the obstruction sensors. The menu display will automatically go to the "OBSTRUCTION SENSORS DISABLED" screen to show that the obstruction sensors have been enabled.
2. Press the ENTER button to acknowledge that the obstruction sensors have just been disabled. The display will automatically return to the home screen



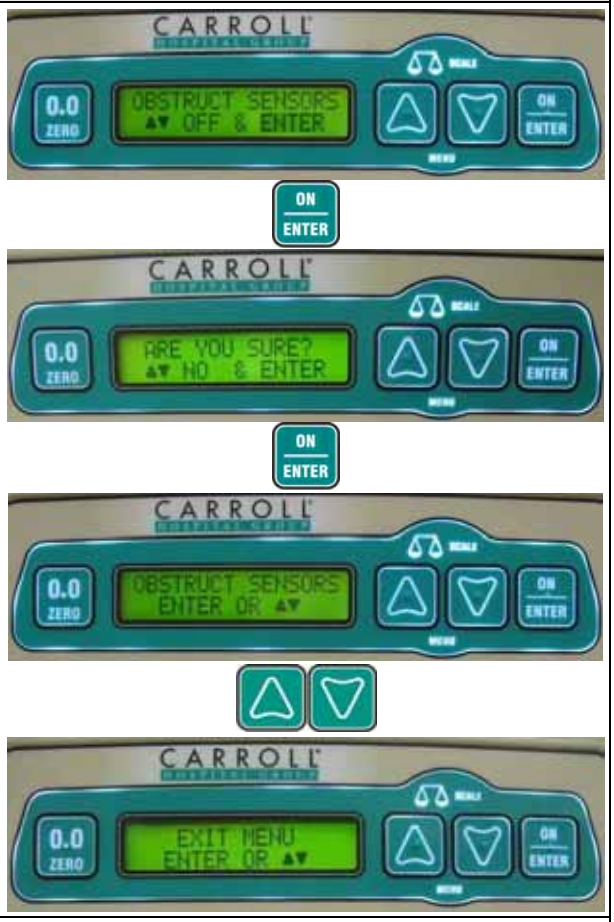
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Disabling Obstruction Sensors (OFF Selected)

When an OFF selection in the “OBSTRUCT SENSORS” screen has been made you will be asked to confirm that you wish to disable the obstruction sensors.

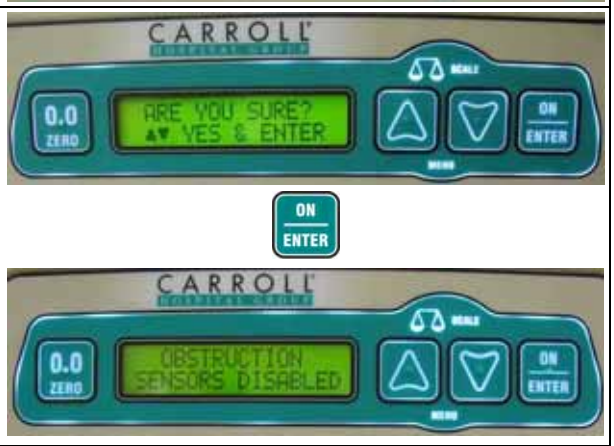
If this selection was made by accident or you do not wish to disable the obstruction sensors at this point, simply use the UP/DOWN Arrow buttons to scroll to the “NO” option.

1. Press the ENTER button to not disable the obstruction sensors. The display will automatically return to the “OBSTRUCT SENSORS” screen of the Service Menu.
2. Use the UP/DOWN Arrow button to scroll to the “EXIT MENU” screen of the Service Menu.
3. Press the ENTER button to exit the Service Menu to the home screen.



If you do wish to disable the obstruction sensors at this point, simply use the UP/DOWN Arrow buttons to scroll to the “YES” option.

1. Press the ENTER button to disable the obstruction sensors. The display will automatically go to the “OBSTRUCTION SENSORS DISABLED” screen to show that the obstruction sensors have been disabled.
2. Press the ENTER button to acknowledge that the obstruction sensors have just been disabled. The display will automatically return to the home screen



When initiating any downward motion of the bed platform (BED DOWN, Trendelenburg/reverse Trendelenburg operation or Chair mode), a warning message will be displayed for the first 3 seconds of bed motion to remind staff that the obstruction sensors have been disabled.



⚠ WARNING

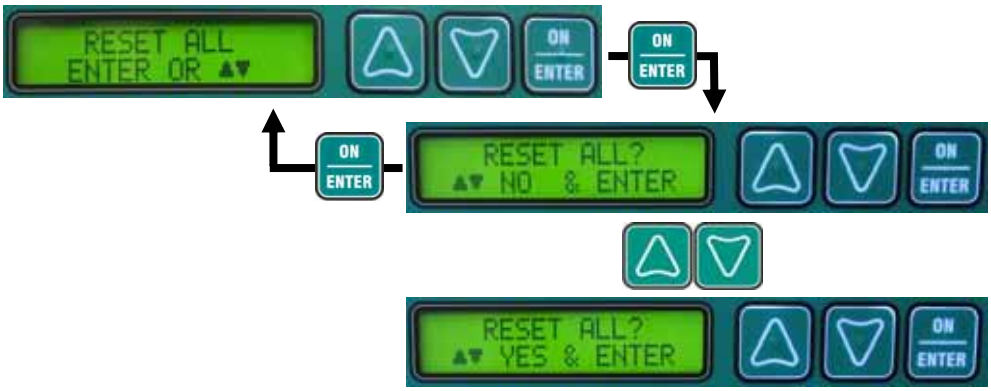
Turning off the obstruction sensors will disable a major safety device on the bed.

The obstruction sensors should only be disabled in the rare event that normal bed function has been impaired by a malfunction of a component in the obstruction sensing system.

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4.2.8 Instructions: Reset All

From page 76



Reset All Settings – Impact

Performing a "Reset All" will impact the following settings:

- ☑ Bed Exit History – *Cleared*
- ☑ Patient Weight Change – *Cleared*
- ☑ Patient Weight Change Alarm – *Cleared/Disabled*

Performing a "Reset All" will not impact the following settings:

- ☒ Scale Calibration
- ☒ Angle Calibration
- ☒ Bed Exit Light Setting
- ☒ LCD Contrast Setting
- ☒ Obstruction Sensors Enabling/Disabling
- ☒ Nurse Call/Priority Call Selection
- ☒ Patient Weight Display Unit Selection

Reset All Settings

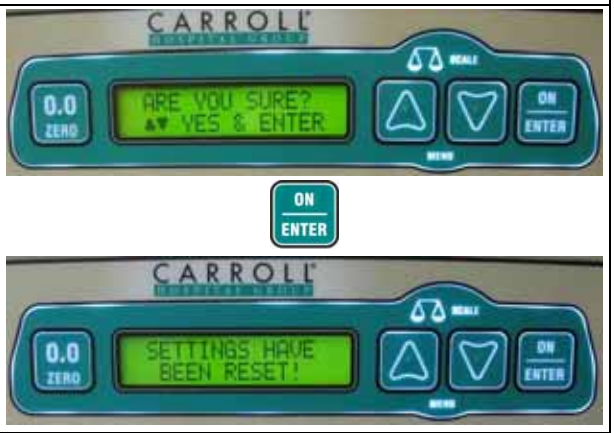
If this selection was made by accident or you do not wish to reset the current settings at this point, simply use the UP/DOWN Arrow buttons to scroll to the "NO" option.

1. Press ENTER button to exit to the "RESET ALL" screen of the Service Menu.
2. Use the UP/DOWN Arrow buttons to scroll to the "EXIT MENU" screen of the Service Menu.
3. Press ENTER button to exit the Service Menu to the home screen.



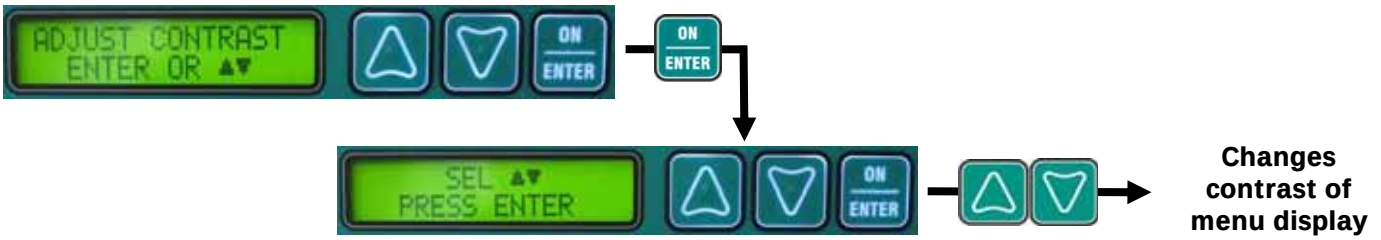
If you do wish to reset the current settings at this point, simply use the UP/DOWN Arrow buttons to scroll to the "YES" option.

1. Press the ENTER button to reset all current settings. The menu display will automatically go to the "SETTINGS HAVE BEEN RESET" screen to show that the settings have been reset.
2. Press the ENTER button to acknowledge and exit to the "RESET ALL" screen of the Service menu.
3. Navigate to home screen as instructed above.



4.2.9 Instructions: Adjust Menu Display Contrast

From page 76



Selecting Desired Contrast Level

LB units used for this example

Use the UP/DOWN Arrow buttons to adjust the level of contrast on the menu display.

Each time the UP/DOWN Arrow buttons are pushed, the contrast will darken/lighten one preset level.

- The UP Arrow button will increase the contrast of the menu display (words darker with respect to the backlit background). ***Maximum contrast setting shown.***
- The DOWN Arrow button will decrease the contrast of the menu display (words lighter with respect to the backlit background). ***Minimum contrast setting shown.***

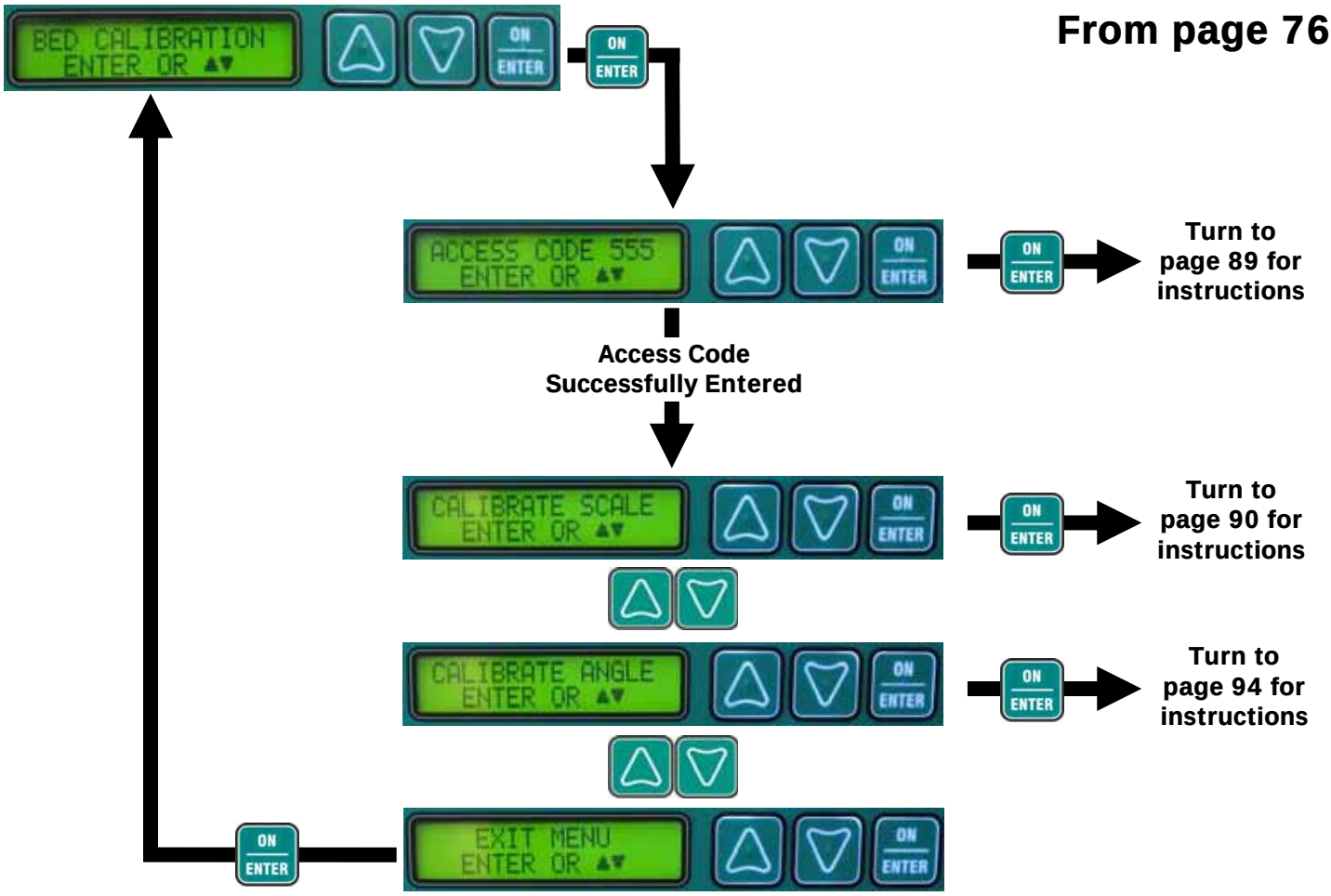
Press the ENTER button to set once the desired level of contrast has been achieved. The display will automatically return to the home screen.



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4.3 Calibration Menu Navigation

From page 76



NOTE:	A scale or bed angle calibration attempt may be abandoned at any time. Simply remove the footboard from the bed and then replace it. The home screen will appear when the menu display is powered up. The scale and bed angle calibration will, respectively, revert to their previous, successfully completed calibration settings to enable scale functionality.

NOTE:	The scale must be calibrated if any/all of the load cells have been replaced. However, the scale calibration procedure must be initiated by staff. Scale calibration will automatically be initiated if the CB10 control box is replaced.

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4.3.1 Instructions: Inputting Access Code

From page 88



OR Calibration Initiated by Replacement of Components

If the CB10 control box has been replaced, the scale calibration process will automatically be initiated when the bed is first powered up. The display will show the following message. The scale calibration procedure must be completed before the bed can be put into service.



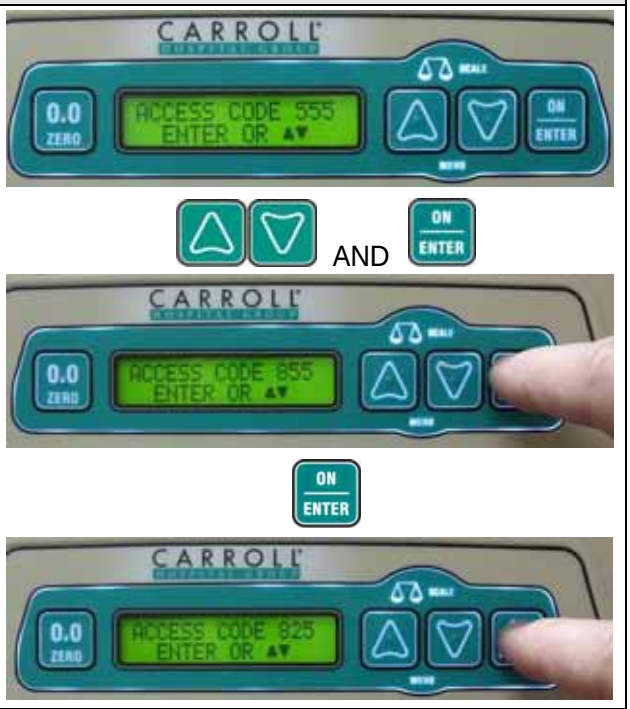
Entering the Access Code

Carroll Hospital Group Access Code: 825

The access code must be entered to begin scale calibration. To enter the access code:

1. Use the UP/DOWN Arrow buttons to scroll to each respective number of the access code.
2. Press ENTER button to input each number of the access code. The cursor will shift to the next number when the ENTER button is pushed.
3. When **825** has been inputted, press ENTER button to enter access code.

The access code is not customizable



IMPORTANT: If an incorrect access code is entered, a warning message will be displayed and the display will automatically return to the "BED CALIBRATION" screen to allow for another attempt.



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4.3.2 Instructions: Scale Calibration

From page 88



Begin scale calibration procedure

1. The first step of the scale calibration procedure is to perform the bed angle calibration. Refer to page 94 for instructions.
2. After the successful completion of the bed angle calibration, return to this page to continue with scale calibration procedure.
3. Elevate the bed to a comfortable working height.

Preparing the Bed for Calibration

Immediately following the successful completion of the bed angle calibration procedure, you will be instructed to clear the bed of all equipment (mattress, lines, etc). Ideally, the mattress deck should be bare.

IMPORTANT: DO NOT place the calibration masses on the bed at this point.





Set Calibration Units and Weight

KG units used for this example

You will now be asked to set the calibration weight. This is the total sum of the certified calibration masses used to the calibration procedure.

1. Press ENTER button to begin.
2. Use the UP/DOWN Arrow buttons to select the units that correspond to the calibration masses that will be used.
3. Press ENTER button to select the appropriate units. You will automatically be taken to the calibration weight input screen.
4. Each time the UP/DOWN Arrow buttons are pushed, an increase/decrease of 1 LB or 1 KG (depending upon which unit was just selected) will register.
5. After the appropriate calibration mass has been inputted, press ENTER button to set calibration weight.

IMPORTANT: Correctly setting the calibration weight and then using that exact total sum of calibration mass is essential to ensure the accuracy of the scale. For this reason, Carroll Hospital Group strongly recommends the use of certified calibration masses.















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Scale Calibration Procedure

It is important to position the calibration masses as shown below. The positions shown below locate the calibration masses directly over each respective load cell. This will produce the best calibration results.













LH = Patient Left, Head end of Bed.

1. Place calibration masses at the patient left, head end of the bed. Press ENTER button when the weights are in correct position. A confirmation “chirp” will sound to indicate that this step was successful.

LF = Patient Left, Foot end of Bed.

2. Place calibration masses at the patient left, foot end of the bed. Press ENTER button when the weights are in correct position.. A confirmation “chirp” will sound to indicate that this step was successful.

RF = Patient Right, Foot end of Bed.

3. Place calibration masses at the patient right, foot end of the bed. Press ENTER button when the weights are in correct position. A confirmation “chirp” will sound to indicate that this step was successful.













RH = Patient Right, Head end of Bed.

4. Place calibration masses at the patient right, head end of the bed. Press ENTER button when the weights are in correct position. A confirmation “chirp” will sound to indicate that this step was successful.

LF = Patient Left, Foot end of Bed.

5. Place calibration masses at the patient left, foot end of the bed. Press ENTER button when the weights are in correct position.. A confirmation “chirp” will sound to indicate that this step was successful.

LH = Patient Left, Head end of Bed.

6. Place calibration masses at the patient left, head end of the bed. Press ENTER button when the weights are in correct position. A confirmation “chirp” will sound to indicate that this step was successful.

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RH = Patient Right, Head end of Bed.

7. Place calibration masses at the patient right, head end of the bed. Press ENTER button when the weights are in correct position. A confirmation “chirp” will sound to indicate that this step was successful.





RF = Patient Right, Foot end of Bed.

8. Place calibration masses at the patient right, foot end of the bed. Press ENTER button when the weights are in correct position. A confirmation “chirp” will sound to indicate that this step was successful.





CEN = Center of Bed.

9. Place calibration masses at the center of the bed. Press ENTER button when the weights are in correct position. A confirmation “chirp” will sound to indicate that this step was successful.

IMPORTANT: If the bed detects movement during any stage of the scale calibration procedure, a warning message will be displayed and that particular step will have to be repeated.





The load cell locations are assigned in the CB10 control box during the first 4 steps of the calibration procedure. Once assigned, each load cell will then “remember” where it’s assigned location.

IMPORTANT: If the bed detects that the calibration masses are located in an incorrect location during steps 5-9, a warning message will be displayed. Relocate the calibration masses to the correct location and press the ENTER button to continue with scale calibration.



NOTE:	To ensure scale accuracy, use only ASTM, OIML, NIST (or equivalent) certified test masses when performing scale calibration. If your healthcare facility does not have certified test masses, enlist the service of an accredited calibration laboratory/service to perform scale calibration. Ensure that the calibration laboratory/service has been accredited by Measurement Canada (or equivalent “weights and measures” certifying body/agency).

NOTE:	A scale is most accurate and delivers superior repeatability when it has been calibrated within the range that the scale is expected to typically operate. For this reason, Carroll Hospital Group recommends that minimum weight is 60kg (132.3 lbs) is used to calibrate the scale.

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10. Leaving the calibration masses in the bed center, place the bed in the maximum Trendelenburg position. Press and hold the TREND button. Press ENTER button once the bed automatically stops in the maximum Trendelenburg position. A confirmation “chirp” will sound to indicate that this step was successful.









11. Leaving the calibration masses in the bed center, place the bed in the maximum reverse Trendelenburg position. Press and hold the rev.TREND button. Press ENTER button once the bed automatically stops in the maximum reverse Trendelenburg position. A confirmation “chirp” will sound to indicate that this step was successful.

12. After successful completion of the calibration procedure, a message will be displayed. Press ENTER button to continue. Press and hold the TREND button to level bed. The bed will stop automatically when the mattress deck is level with the floor. The scale has now been successfully calibrated and the bed is now ready for use.



If the bed detects a problem during any stage of the scale calibration procedure, a warning message will be displayed.

1. Press ENTER button to acknowledge calibration procedure failure.
2. The display will automatically return you the beginning of the calibration procedure.
3. Press ENTER button to start calibration procedure again or allow display to time out or remove and replace footboard to abandon scale calibration attempt at this time.

IMPORTANT: If the calibration procedure fails a second time, the bed may require service and/or component replacement.









⚠ WARNING

The Spirit™ bed may shift during Trendelenburg or reverse Trendelenburg activation.

Initiate Trendelenburg or reverse Trendelenburg only after the Central “Lock & Steer” system has been put in the “BRAKE” position.

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4.3.3 Instructions: Bed Angle Calibration

From page 88





Begin bed angle calibration procedure

Bed Angle Calibration Procedure

To begin the bed angle calibration procedure:

1. Press ENTER button.
2. You will be instructed to lower the bed down to the floor. Press and hold the BED DOWN button to lower bed. **CAUTION: Ensure nothing is under bed prior to lowering bed.**
3. Press ENTER button when the bed has been fully lowered and all bed motion automatically stops. A confirmation “chirp” will sound to indicate that the bed angle has been reset. The display will automatically return to home screen.

IMPORTANT: Because of manufacturing tolerances, the mass of the bed alone may be insufficient to completely compress the Hi-Lo springs. To ensure that the bed is sitting flat (the mattress deck is parallel with floor) in the lowest position, Carroll Hospital Group recommends that the bed angle is calibrated with at least 60kg (132.2 lbs) on the bed.

Hint: *Perform bed angle calibration with a patient or another staff personnel laying on the bed.*















NOTE:	Calibrating the bed angle is the first step of scale calibration. If the scale has just been calibrated or is about to be calibrated, there is no particular reason to calibrate the bed angle as a separate step.

NOTE:	Carroll Hospital Group strongly recommends re-calibrating the bed angle if a major bed component (example, Hi-Lo actuator, Hi-Lo spring, primary leg, frame element, caster assembly, etc) has been replaced.

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Section 5:

Care & Maintenance

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5.1 Regular Maintenance & Cleaning

Very little maintenance is required to keep the Spirit™ bed in good working order.

All metal components are power coat painted and therefore are protected from corrosion. In the event that the paint become scratched or chipped, use a matching enamel touch up paint. Refer to page 103 for paint specifications.
All working joints are factory lubricated and therefore are protected against wear and require no specific maintenance for the service life of the bed. In the event that lubrication may be required, Carroll Hospital Group recommends the use of only white petroleum jelly to lubricate any working joint. Lubricate all affected working joints when servicing the bed and/or replacing components.
Considering that the intended use of this bed is to operate in a temperature and humidity controlled environment, the bed has been designed such that material fatigue and ageing should not be a concern. Refer page 23 for environmental limits specifications.



⚠ CAUTION

Equipment or property **DAMAGE** or patient **INJURY** may occur if the following are not followed:

DO NOT use solvents, alcohol or petroleum products on the surface. **DO NOT** steam clean or pressure wash.

DO NOT submerge the bed frame or electrical parts. **DO NOT** allow liquids to enter electrical components. If a liquid is spilled in or around the bed, unplug the bed before cleaning. Clean up the spill and allow the bed and/or the area around the bed to dry thoroughly before using the controls again.

DO NOT open assemblies such as actuators, control boxes, battery, pendant (if equipped). These parts are not serviceable. Only service technicians, specifically trained to service Carroll Hospital Group Spirit™ beds, should attempt to service bed and/or replace electrical or other components.

Before the bed is returned to active service after any adjustment, repair, and/or service have been performed, **ALWAYS** ensure that all attaching hardware is tightened securely.

5.1.1 Sanitizing Method

All surfaces may be cleaned with:	
✓	Soapy water, or
✓	Any common consumer disinfecting product, or
✓	Most non-abrasive commercially available disinfecting products

5.1.2 Semi Annual Inspections

Control Location Inspection
Perform all bed functions from all control points: footboard staff control, patient/staff siderail controls (Spirit Plus™ and Spirit Select™ beds), and pendant (if equipped).
Battery Inspection
Confirm the following: • Bed is plugged into an AC power outlet. • Battery is connected to the CB10 control box. • The power status indicator has **ONLY** a solid Green AC light. If other light are on/flashing, refer to pages 47 and 48 for instructions and take appropriate action before continuing with inspection. Unplug the bed from the AC power outlet and perform all bed functions, including emergency functions, to test bed operation under battery power. This will verify that the battery is holding a proper charge sufficient to deliver emergency functions when needed. Replace battery if performance is inadequate.

5.1.3 Yearly Inspections & Maintenance

Inspect for damaged or loose wiring. Have a qualified service personnel, specifically trained to service Spirit™ beds, replace any frayed or damaged cords and/or secure any loose wiring.
Inspect the control boxes and actuators to ensure that the enclosures are not cracked or damaged.
Inspect the footboard staff control, siderail controls, and pendant to ensure that the overlays covering these controls are not cracked or damaged.
Inspect all grounding wires and Equipotential conductor. Ensure they are securely fastened to the bed frame.
Tighten, adjust and/or replace any parts or screws, bolts, clevis/hitch/cotter pins, etc. that are loose or show signs of wear.

5.1.4 Specific Maintenance Requirements for Siderail Assemblies

Perform monthly inspection of siderails to ensure that they are in good working order and continue to operate properly.

Spirit™ Beds with Carroll Assist Rails™
Ensure that each siderail fully and smoothly rotates from the “TRANSFER” position to the “ASSIST” and/or “GUARD” positions. Ensure that no binding and/or grinding noises are caused when the siderails are rotated. If a siderail fails to rotate fully and smoothly, service and/or replace siderail assembly.
Ensure that the locking/latching mechanism reliably self-engages when the siderails are fully rotated to the raised/closed to the “ASSIST” and/or “GUARD” positions. If locking/latching mechanism fails to reliably self-engage service and/or replace siderail assembly.
Ensure that the locking/latching mechanism completely disengages when the knob is pulled outwards permitting the siderails to fully rotate to the “TRANSFER” position. If locking/latching mechanism fails to completely disengage, service and/or replace siderail assembly.

Spirit™ Beds with Full Length or Partial Length Siderails
Ensure that each siderail fully and smoothly rotates from the DOWN position to the UP position. Ensure that no binding and/or grinding noises are caused when the siderails are rotated. If a siderail fails to rotate fully and smoothly, service and/or replace siderail assembly.
Ensure that the locking/latching mechanism reliably self-engages when the siderails are fully rotated to the raised/closed to the “ASSIST” and/or “GUARD” positions. If locking/latching mechanism fails to reliably self-engage service and/or replace siderail assembly.
Ensure that the locking/latching mechanism completely disengages when the knob is pulled outwards permitting the siderails to fully rotate to the “TRANSFER” position. If locking/latching mechanism fails to completely disengage, service and/or replace siderail assembly.

Spirit Plus™ & Spirit Select™ Beds
Ensure that each siderail fully and smoothly rotates from the DOWN position to the UP position. Ensure that no binding and/or grinding noises are caused when the siderails are rotated. If a siderail fails to rotate fully and smoothly, service and/or replace siderail assembly.
Ensure that the locking/latching mechanism reliably self-engages when the siderails are fully rotated to the raised/closed position. If locking/latching mechanism fails to reliably self-engage service and/or replace siderail assembly.
Ensure that the locking/latching mechanism completely disengages when the push button is depressed permitting the siderails to fully rotate to the lowered/open position. If locking/latching mechanism fails to completely disengage service and/or replace siderail assembly.



⚠ WARNING

Patient entrapment within, under, between, and beside siderails may cause injury or death. Ensure only specified mattress (minimum 6" thick) is used on bed. Ensure that mattress is in good condition and maintains proper resilience. If mattress is exhibiting any signs of wear (ie: reduced cross sectional thickness, reduced resilience, etc) stop use immediately and replace mattress to limit patient exposure to a potential rail entrapment situation.



⚠ WARNING

To help minimize the potential for patient entrapment, Carroll Hospital Group recommends that the customer perform thorough inspection of all siderail assemblies to confirm continued compliance to IEC 60601-2-38 by conducting annual examinations of each siderail assembly to test described in IEC 60601-2-38, Amendment 1, Clause 23.101. If testing results indicate a potential risk of patient rail entrapment, discontinue patient bed use and remove the bed from active service immediately.

If your Spirit™ bed is equipped with the underbed obstruction sensing option, perform monthly inspection of all six obstruction sensor pads to ensure that they are in good working order and continue to operate properly.

Obstruction Sensor Inspection
Ensure that contact at any point on each of the six obstruction sensor pads stops all downward bed motion.
Ensure that the bed automatically elevates the 1" safety distance.
For Spirit™ and Spirit Plus™ beds, ensure audible warnings are present as described on page 59.
For Spirit Select™ beds, ensure audible and visual warnings are present as described on page 59.
Replace any obstruction sensor pad that fails to operate correctly or consistently.

5.1.5 Specific Maintenance Requirements for Spirit Select™ Beds

Perform annual calibration of the scale on your Spirit Select™ bed or immediately following the replacement of one or more load cells and/or the CB10 control box. Refer to page 88 for Calibration Menu navigation and page 90 for scale calibration instructions.

NOTE: To ensure scale accuracy, use only ASTM, OIML, NIST (or equivalent) certified test masses when performing scale calibration. If your healthcare facility does not have certified test masses, enlist the service of an accredited calibration laboratory/service to perform scale calibration. Ensure that the calibration laboratory/service has been accredited by Measurement Canada (or equivalent "weights and measures" certifying body/agency).

NOTE: Calibrating the bed angle is the first step of scale calibration. If the scale has just been calibrated or is about to be calibrated, there is no particular reason to calibrate the bed angle as a separate step.

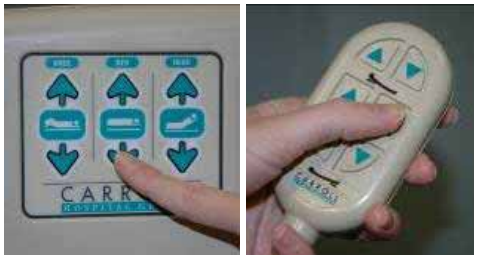
5.2 Controls Servicing

5.2.1 Soft Reset of Controls

If in the rare event that the two Hi-Lo actuators become out-of-sync with one another, the bed may not completely lower or the mattress deck on the bed may appear to be in a slight angle similar to when it has been put into a Trendelenburg or reverse Trendelenburg position. The bed may also cease to perform all elevation/descent bed motion. In this case, the bed may require a "soft reset" to re-establish proper Hi-Lo actuator synchronization and/or restore proper bed operation.

Soft Reset Procedure

1. Press and hold the BED DOWN button from either of the staff siderail controls (or pendant if equipped) for 10 seconds. After 10 seconds has elapsed, the bed will automatically begin to lower. One end of the bed may completely lower before the other. This is perfectly normal.
2. Continue to hold the BED DOWN button until both ends of the bed have been completely lowered and the bed automatically stops all motion. The Hi-Lo actuators have now been re-synchronized.



5.2.2 Hard Reset of Controls

If the CB10 control box firmware has been updated or, in the rare event communication is lost between the footboard staff controls and the CB10 control box, the controls may require a "hard reset" to re-establish proper component-to-component communication and/or restore proper bed operation.

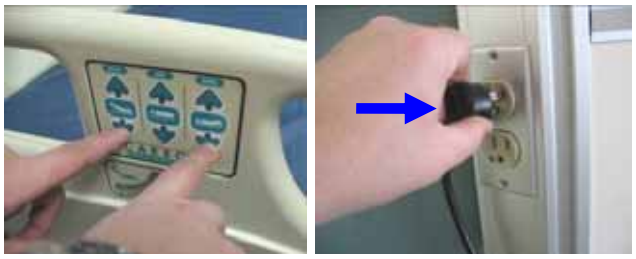
IMPORTANT: This event does not occur by simply removing the footboard from the bed as would be routinely performed during normal use of the bed.

Hard Reset Procedure

1. Disengage the foot and knee deck sections of the mattress deck to gain access to the CB10 control box. Refer to page 101 for instructions.
2. Disconnect (unplug) the bed from the AC power outlet.
3. Disconnect battery cable from the side of the CB10 control box. This will disrupt power to the CB10 control box and the close the battery charging circuit relay. Wait 5 seconds to ensure that the CB10 circuit board is de-energized. Reconnect battery cable into the side of the CB10 control box.
4. Press and hold the HEAD DOWN and KNEE DOWN buttons from either of the staff siderail controls while you reconnect (plug in) the bed to an AC power outlet. A confirmation "chirp" will sound to indicate the successful completion of the "hard reset" procedure.
5. Re-engage the deck sections by aligning the hinge fingers and pressing the two deck sections together. Refer to page 101 for instructions.







IMPORTANT: The Spirit Select™ scale must be zeroed after every "hard reset".

HINT: *It may be helpful to have another person plug in the power supply cord while you press and hold the HEAD DOWN and KNEE DOWN buttons.*

NOTE:	The scale does not require re-calibration after a "soft reset" or a "hard reset".

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5.2.3 Updating the CB10 Firmware

The firmware on Carroll Hospital Group beds can be updated using a “miniSD” card. Each CB10 control box is equipped with a miniSD card slot to facilitate the firmware update procedure.

Accessing the Card Slot in the CB10 Control Box

To access the miniSD card slot:

1. Elevate the bed to its maximum height.
2. The miniSD card slot is now easily accessible. It is located in the lower patient right side of the CB10 control box at the foot end of the bed.

HINT: *It may be easier to access the miniSD card slot while kneeling at the foot end of the elevated bed looking towards the head end of the bed under the mattress deck rather than attempting to access it from above with the deck sections removed.*



Firmware Update Procedure

1. Disconnect (unplug) the bed from the AC power outlet.
2. Disconnect battery cable from the CB10 control box.



3. Gently insert miniSD card into the card slot in CB10 control box until it is fully seated.
4. Reconnect (plug in) the bed to the AC power outlet.

The firmware update process will be automatically initiated and will take approximately one minute to complete. The CB10 will then automatically reboot.



IMPORTANT: DO NOT interrupt the firmware update process. Premature removal of the SD card could result in an incomplete firmware flash. This may render the CB10 control box inoperable!

Once the menu display returns to the home screen, the firmware has been successfully updated and you may now remove the miniSD card from the CB10 control box.

5. Disconnect (unplug) the bed from the AC power outlet.
6. Remove miniSD card from the CB10 control box.



7. Perform a “hard reset” of the controls. Refer to page 99 for instructions.

The bed with the updated firmware is now ready for use.

IMPORTANT: On Spirit Select™ beds, the scale **MUST** be zeroed. Refer to page 50 for instructions.

Loading & Confirming Firmware Versions	
New versions of firmware can be loaded onto the miniSD card by first inserting it into any commercially available miniSD to SD card adapter and then inserting into a standard SD card reader. Optionally, the firmware could be loaded onto a microSD card by first inserting it into any commercially available microSD USB reader. The CB10 firmware can then be updated by inserting the microSD into any commercially available miniSD card adapter. **IMPORTANT:** The miniSD (or microSD) card cannot be HC format. The firmware version that is on a miniSD card can be confirmed by viewing the ".VER" text file that is also contained on the card along with the firmware program. Contact Carroll Hospital Group Customer Service to obtain the latest firmware version.	
IMPORTANT: Carroll Hospital Group maintains a history file for every Spirit™ bed. After the firmware has been successfully updated, contact Carroll Hospital Group Customer Service at (519) 963-4010 or Toll Free 1 (866) 516-5446 with the date of the firmware update, the bed serial number, and the firmware version number to ensure that the bed's history file is appropriately updated. **IMPORTANT:** The firmware update procedure will not initiate if the firmware version on the miniSD card is older (numerically lower) or equivalent than the current CB10 firmware version. Only beds with firmware version of 2.10 or newer (numerically higher) can be updated using the miniSD card. If the firmware update procedure failed to automatically initiate, contact Carroll Hospital Group Customer Service for alternate firmware update options.	

5.3 Mattress Deck Removal

All four sections of the composite mattress deck can be detached for thorough cleaning, sanitization, and maintenance.

5.3.1 Mattress Deck Removal - Foot Section

		
1. Lift the foot and knee sections together until the angle between them is 90º.	2. Lift the foot section away from the knee section at the hinge, to separate the sections.	3. Disengage the metal foot bail from the mounting holes.

NOTE:	If you are attempting to gain access to the CB10 control box, the foot section of the mattress deck does not need to be removed from the bed. After performing Step 2, simply lay the knee section back down against the bed frame and rotate the foot section up and rest it against the footboard. The CB10 control box is now accessible.

5.3.2 Mattress Deck Removal - Knee Section

Once the foot section is removed, the knee section can be separated from the stationary seat section. Lift the knee section until it is at 90° to the seat section.

Using a horizontal force, strike the knee section near the hinge to separate these two sections.





5.3.3 Mattress Deck Removal - Head Section

Lift the head section until it is at a 90° angle to the stationary (bolted) seat section. The head section can now be lifted straight up, detaching it from bed.

IMPORTANT! On Spirit Plus™ and Spirit Select™ beds, the head section is attached to the head gatch assembly with two shoulder screws through the head siderail mounting bracket. Ensure that these fasteners are removed from the head gatch assembly and that the siderail control cables are disconnected before removing the head section.





5.3.4 Mattress Deck Removal - Seat Section

The seat section is attached to the bed frame with two bolt and nut fasteners. Although it is not designed for routine removal, it can be removed, if necessary.

Using a 1/2" wrench, loosen and remove the hex nut from the carriage bolt beneath the main rail.

Repeat for second fastener holding the seat section on the other side of the bed.

Save these fasteners for seat section reattachment.

The seat section can now be lifted off the frame.





NOTE:

Re-engage the deck sections by aligning the hinge fingers and pressing the two deck sections together.

When reinstalling any section of the mattress deck, ensure that all hinges are **COMPLETELY** engaged before attempting to articulate the connection.

Check for proper engagement by gently articulating the head, knee, and foot sections of the mattress deck up and down. The head, knee, and foot sections of mattress deck should articulate freely without binding.

5.4 Before Calling The Factory

To ensure prompt and accurate attention to your concerns please have the following information available before you call:

Spirit™ Bed Service Call Information	
Your facility's **phone number**: *(Where you can be reached):*	
Your facility's **fax number** *(If Available)*:	
Bed(s) **Model and Type**:	
Bed(s) **Serial Number**	
Date of Purchase:	
List of **defective part(s)** (*Identify by part number, or describe relative to nearest numbered part)*:	
List of deficiencies or **Type of problem**:	

NOTE:	Carroll Hospital Group's determination of the "Patient Left" and the "Patient Right" side of the bed is made from the patient's point of view while positioned normally on the bed facing up.

If you have carefully followed all of this instructions contained in this manual, you should expect many years of trouble free service. If you're not 100% satisfied with your bed, please call your sales representative or the factory immediately.
It's always better to ask if you have any questions such as hole drilling locations in head and foot boards, or before performing electrical service and/or modifications, or continuing to use a bed that has been damaged and/or is exhibiting signs of minor damage. These activities could lead to more serious consequences such as potential injury to patient and staff and/or equipment damage.
If you require further information regarding circuit diagrams, component part lists, descriptions etc. please contact Carroll Hospital Group Customer Service.

Call Carroll Hospital Group Inc. at (519) 963-4010 or Toll Free 1 (866) 516-5446.

Mailing Address: Carroll Hospital Group Inc.
153 Towerline Place
London, Ontario
Canada
N6E 2T3

5.5 Colour Information

Touch up paint Sherwin Williams Auto #5A-30041 – Gatsby Cream (formerly #35-30041 – Cream)

Headboard/Footboard Colour Options for Spirit™ Bed	**Colour Option Number**
Almond	1
Solar Oak	2
Kensington Maple (previously Honey Maple)	3
Monticello Maple (previously Caramel Cherry)	4
African Walnut (previously Regal Mahogany)	5

5.6 Troubleshooting Guide

NOTE:	Prior to using the Troubleshooting Guide, perform a brief function test on the bed. Check all functions initiated from both the footboard staff control and the patient control (staff/patient rail control and/or pendant) to determine which functions are not working.

Problem / Failure	Recommended Action
Bed is connected (plugged in) to an AC power outlet but appears to be “frozen” Power status indicators may or may not be illuminated/flashing	Cycle the power on/off to reset the controls and re-establish proper communication between the CB09 and CB10 control boxes. 1. Disconnect battery from CB10 control box 2. Disconnect (unplug) bed from the AC power outlet 3. After the bed has been disconnected from the AC power outlet, fully discharge the CB09 control box by sequentially depressing the UP and DOWN buttons on one of the siderail controls or on the pendant (depending upon how bed is equipped) at least 20 times 4. Reconnect (plug in) the bed to the AC power outlet 5. Test any bed function from any control point to confirm proper bed control has been restored 6. Reconnect battery to CB10 control box 7. Call for Technical Assistance
Bed is connected (plugged in) to an AC power outlet but bed is not functioning Power status indicators may or may not be illuminated/flashing	1. Check to ensure bed is connected (plugged in) to an AC power outlet 2. Check AC outlet for power 3. Check Master Lockout. Hold all three patient lock-out buttons at same time to lock/unlock, then try bed functions 4. Lift head section of the mattress deck and remove dust shield from on top of CB09 control box. Check for green power light (LED). If no light, check to ensure that the power cord has been fully inserted into the inlet receptacle of the CB09 control box 5. Check to ensure that the communication cable that runs between the CB09 and CB10 control boxes is fully inserted into the port on the CB09 control box 6. Call for Technical Assistance
Some bed articulations no longer working or are intermittent regardless of control point Power status indicators may or may not be illuminated/flashing	If the head and/or foot sections of mattress deck no longer elevate/lower **OR** bed will no longer raise/lower **OR** bed motion is intermittent it is necessary to ensure proper connections. 1. Lift head section of the mattress deck and remove dust shield from on top of CB09 control box 2. Check to ensure that every actuator colour coded cable has been fully inserted into port on the CB09 with the corresponding colour code 3. Check to ensure that the power and the communication cable that run between the CB09 and CB10 control boxes are fully inserted into their respective ports on the CB09 control box 4. Lift foot section of the mattress deck and removed the cover from the CB10 control box 5. Check to ensure that every connector is firmly connected to its respective header on the CB10 circuit board 6. Test any bed function from any control point to confirm proper bed control has been restored 7. Call for Technical Assistance

Patient controls working properly, footboard staff control not working	3. Check to ensure footboard is completely down into bracket 4. Check cable connection under lower left side of footboard 5. Check to make sure that there is no damage to Blindmate connectors (plastic connector between bottom of footboard and footboard mounting bracket) 6. Check footboard staff control cable connection into CB10 control box under foot section of mattress deck 7. Replace footboard control
Footboard staff control working properly, rail controls not working	1. Some functions may be locked out. Check patient lock-out buttons on footboard. Patient lock-out prevents bed operation from rail controls 2. Check rail controls on both sides of bed. If only one rail control is not working skip to next section. If both rail controls are not working, continue to next step 3. Check cable connections from rail to port on bed frame (ensure jack is fully inserted into port) 4. Check pendant connection into CB10 control box under foot section of mattress deck 5. Replace CB10 Control Box
Siderail control working on one side of the bed only	1. Check cable connection (ensure connector is fully inserted into T-cable port) 2. Unplug rail connection at port and replace with pendant (if available). If pendant works, replace inoperable rail control. If pendant doesn't work, replace T-Cable
Footboard staff control working properly, pendant not working	1. Some functions may be locked out. Check patient lock-out buttons on footboard. Patient lock-out prevents bed operation from the pendant 2. Check cable connection from pendant to port on bed frame 3. Check pendant connection into CB10 control box under foot section of mattress deck 4. Unplug pendant from current port and plug into port on opposite side of bed. If pendant works in new port, replace T-Cable. If pendant does not work in new port, continue to next step 5. Test pendant on a properly functioning bed (if available). If pendant works, replace CB10 control box. If pendant doesn't work, replace pendant
Only some functions working on the rail controls or pendant	1. Some functions may be locked out. Check patient lock-out buttons on footboard. Amber LED on patient lock-out button prevents the bed operation from the rail controls and pendant 2. Check cable connection from rail control to port on bed frame 3. Check pendant connection into CB10 control box under foot section of mattress deck 4. Replace rail control or pendant
Bed will not lower all the way or the bed appears to be a slight Trendelenburg or reverse Trendelenburg angle. **OR** The bed has cease to perform all elevation/descent motion.	The Hi-Lo actuators are likely out-of-sync. The bed requires a "soft reset" to re-establish proper Hi-Lo actuator synchronization and/or restore proper bed operation. 1. Refer to page 99 for "soft reset" procedure.

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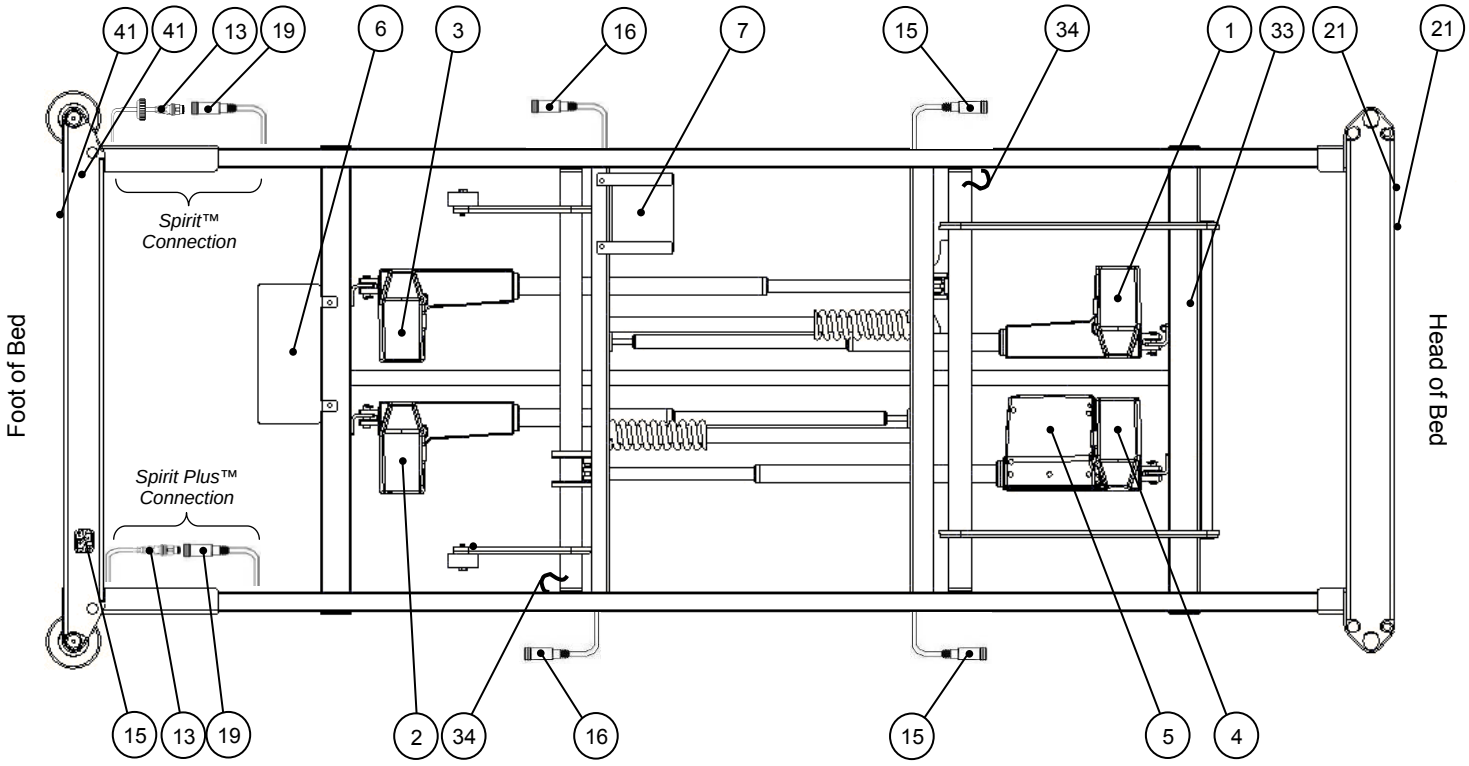
Bed will not run on DC power	1. Check to see if indicator LED on the Power Status Indicator is flashing RED. If flashing, check to see if the battery has been disconnected from the CB10 control box. Connect DC plug into DC jack in the side of the CB10 control box 2. The battery is connected but voltage has dropped below 18VDC and the battery has been automatically disconnected from battery circuit. Ensure bed is connected (plugged in) to an AC power outlet and allow battery to recharge. Confirm indicator LED is flashing GREEN and RED on the Power Status Indicator 3. If the service icon of the Power Status Indicator remains on after lengthy recharge period, replace battery 4. If the service icon of the Power Status Indicator remains on after battery replacement, replace CB10 control box
Bed Equipped With Obstruction Sensing Option Bed does not automatically stop when one or more obstructions sensors is contacted	1. Confirm which obstruction sensor(s) is(are) not working 2. Check to see if interconnection cables (between sensors) are connected or have been twisted. Replace interconnection cables 3. Check to see if interconnection cables (between sensor and CB10 control box) are connected or have been twisted. Replace interconnection cables. 4. Replace faulty obstruction sensor(s)
Bed Equipped With Obstruction Sensing Option Bed will not lower when DOWN button pressed Bed behaves like it is contacting an obstruction when none are obvious	1. Check Bed UP button on footboard staff control. If illuminated, check under bed for any obstruction that is contacting any of the obstruction sensors. Remove obstruction. Confirm Bed UP button is not illuminated 2. If no obstruction is present, carefully inspect each obstruction sensor for signs of damage (gouge, dent, etc). Damage could cause false switch contact to be made. If no damage is obvious, continue to next step. If damage is obvious, replace damaged obstruction sensor(s) The obstruction sensors are linked in “series” to form an electrical circuit. The circuit series is linked as follows: CB10 control box, interconnection cable, top leg cover sensor, interconnection cable, caster cover sensor, interconnection cable, bottom leg cover sensor 3. Disconnect interconnection cables (between sensors) to isolate the faulty obstruction sensor(s). Begin by disconnecting one of the bottom leg cover sensors from the circuit. Check Bed UP button on footboard staff control. If illuminated, continue by disconnecting the other bottom leg cover sensor. Check Bed UP button on footboard staff control. If illuminated, continue by disconnecting one caster cover sensor from the circuit. Continue this process until the Bed UP button is no longer illuminated 4. Reconnect obstruction sensor cables for functional obstruction sensors. Confirm Bed UP button is not illuminated 5. Replace damaged obstruction sensor(s)

5.7 Troubleshooting Guide for Unique Features of Spirit Select™ Bed

Problem / Failure	Recommended Action
Footboard staff control does not power up No icons illuminate on Power Status Indicator and/or display does not activate	1. Check to see if the bed is operable. If not operable, check to ensure bed is connected to AC power. If not plugged in, connect bed to an AC power outlet and allow battery to recharge 2. Check to see if the bed is operable from either rail controls or pendant (if equipped). If bed is operable, continue to next step. If the bed is not operable from rail controls, check rail and pendant T-cable connections at rail and in CB10 control box 3. If bed is operable from footboard control, continue to next step. If the bed is not operable from the footboard control check above sections. Check footboard staff control cable connection into CB10 control box 4. If bed remains inoperable, check to see if a supply cable has been disconnected from the CB09 and/or the CB10 control box. Connect DC supply cable at both control boxes 5. If bed remains inoperable, either the DC supply cable and/or a component has failed. Replace DC supply cable 6. Replace footboard control 7. Replace CB10 control box
Bed will not run on DC power	1. Check to see if ATTN icon on the Power Status Indicator is illuminated. If illuminated, check to see if the battery has been disconnected from the CB10 control box. Connect DC plug into DC jack in the side of the CB10 control box 2. The battery is connected but voltage has dropped below 18VDC and the battery has been automatically disconnected from charging circuit. Ensure bed is connected (plugged in) to an AC power outlet)and allow battery to recharge. Confirm AC icon is solid green and the DC icon is flashing on the Power Status Indicator 3. If the ATTN icon of the Power Status Indicator remains on after lengthy recharge period, replace battery 4. If the ATTN icon of the Power Status Indicator remains on after battery replacement, replace CB10 control box
Patient weight not correct	1. Remove patient from bed. Zero scale. Allow patient to re-enter bed 2. Remove patient from bed. Calibrate scale. Allow patient to re-enter bed
Automatic bed exit light does not work	1. Confirm underbed lights work by toggling button on footboard control. If underbed lights turn on, continue to next step. If underbed lights do not turn on, check connection in CB10 control box. Replace underbed light 2. Check Bed Exit Light is set to on in Service Menu
Can't zero scale (establishing Tare value)	The bed cannot be zeroed if the bed is in a slight Trendelenburg or reverse Trendelenburg angle. Ensure that the menu display is showing a TREND/revTREND angle of 0°. A slight bed angle may be difficult to notice 1. Press and hold the Trend button to level the mattress deck until the bed automatically stops motion. If the angle of the mattress deck becomes even more obvious, press and hold the revTREND button. Refer to page 44 for instructions 2. Attempt to zero the scale
Can't set bed exit alarm	The bed exit alarm cannot be set if the bed has not been zeroed between patients. 1. Remove patient from bed. Zero scale. Allow patient to re-enter bed 2. Attempt to set bed exit alarm

5.8 Schematics & Technical

5.8.1 Spirit™ & Spirit Plus™ Wiring Schematic

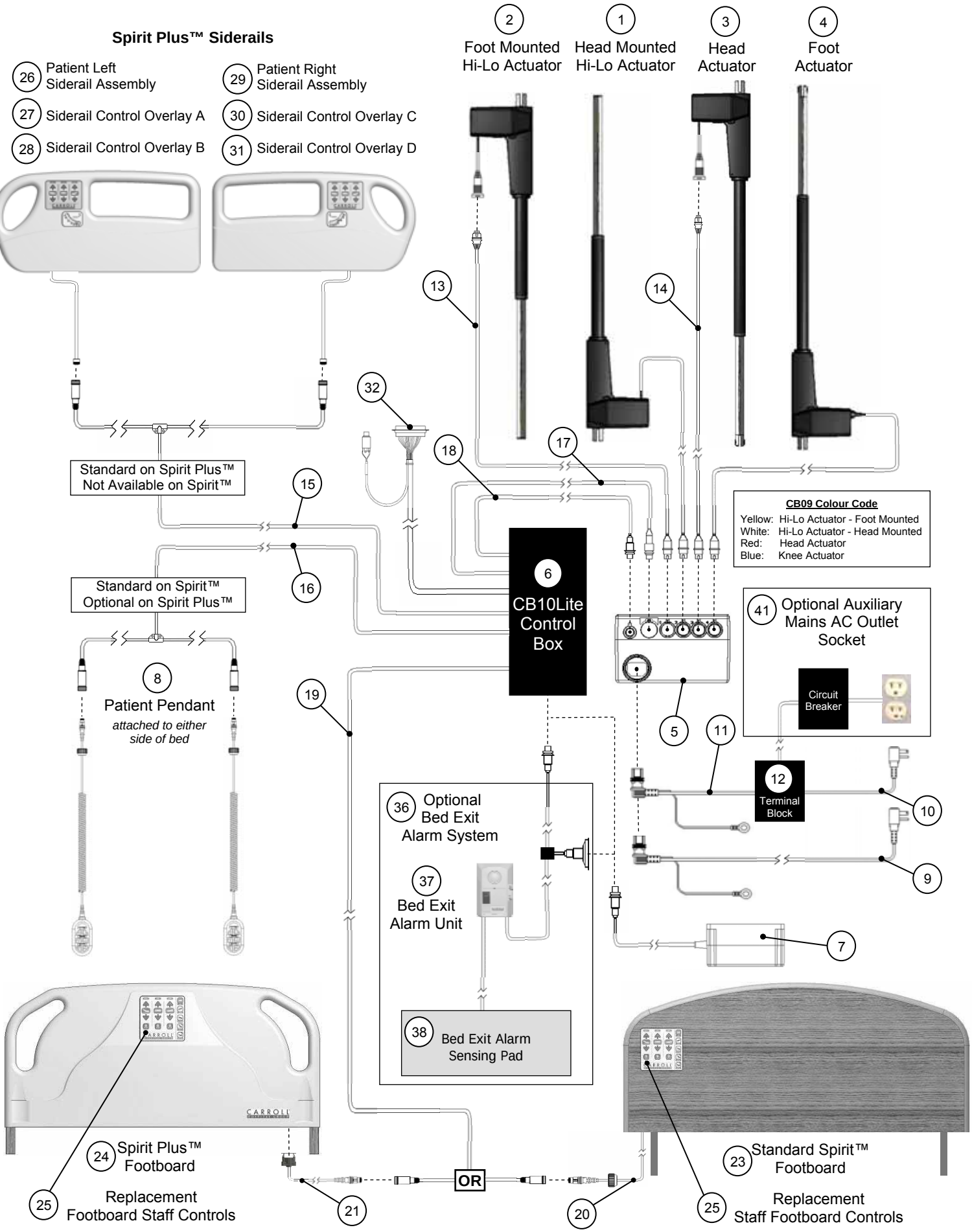


NOTE: Spirit Plus™ shown. For the purposes of clarity, the mattress deck sections, head/foot boards, bed legs, and other wiring systems are not shown

ITEM	DESCRIPTION		ORDER THIS P/N
1	Hi-Lo Actuator (Mounted at Head of Bed)		E0138 (LA31-U456-XX)*
2	Hi-Lo Actuator (Mounted at Foot of Bed)		E0139 (LA31-U455-XX)*
3	Spirit Select™ Head Actuator		E0137 (LA31-U468-XX)*
4	Spirit Select™ Knee Actuator		E0035 (LA31-U087-XX)
5	Spirit Select™ CB09 Control Box	***120V models***	E0092*
		230V models	E0126
6	CB10Lite Control Box Assembly c/w Circuit Board and Enclosure		E0125
7	Back-up Battery c/w Mounting Bracket Attached		E0052 (BA1802-1300-000)
8	Six Function Hand Pendant with Coiled Cable, 10 Pin Plug Connection, and Screw-on Threaded Retaining Cap		E0143
9	Spirit™ Power Supply Cord	***120V models***	E0030
		230V models	E0002
10	Spirit Plus™ Power Supply Cord (AC Power Outlet To Terminal Block)	***120V models***	E0183
		230V models	E0217
11	Spirit Plus™ Power Supply Cord with 12" Flying Lead Grounding Wire (Terminal Block to CB09 Control Box)		E0186
12	Spirit Plus™ AC Power Supply Terminal Block		E0208
13	Extension Cable – Foot Mounted Hi-Lo Actuator (Yellow Tape)		E0144
14	Extension Cable – Head Actuator (Red Tape)		E0145
15	T-Cable (Siderails Controls)		E0060
16	T-Cable (Pendant) *Standard on Spirit™, only on Spirit Plus™ with optional item 35*		E0063
17	Communication Cable (CB09 Control Box to CB10 Control box)		E0064
18	CB10 Power Cable (CB09 Control Box to CB10 Control box)		E0067
19	CB10 Footboard Cable (CB10 to Foot End of Bed Cable)		E0151
20	Spirit™ Footboard Cable (10P4C Cable to Footboard Staff Control, Mounted Inside Footboard – *connector exposed*)		E0024
21	Spirit Plus™ Footboard Bracket Cable (Blindmate Male 4 Pin Connector to 10P4C Connector)		E0015
22	Spirit Plus™ Footboard Cable (Blindmate Female 4 Pin Receptacle to Footboard Staff Control, Mounted Inside Footboard - *not shown*)		E0016
23	Spirit™ Footboard Assembly c/w Item 25		G0832–? (refer to page 103 for Colour Option Number)
24	Spirit Plus™ Footboard Assembly c/w Item 25		G1154
25	Footboard Staff Control c/w Overlay		E0132
26	Spirit Plus™ Patient Left Head Siderail Assembly c/w Circuit Board and Connection Cable and Items 27 & 28		G1447
27	Spirit Plus™ Siderail Control Overlay A (Patient Left – Outside Overlay)		G1123
28	Spirit Plus™ Siderail Control Overlay B (Patient Left – Inside Overlay)	***120V models***	G1124
		230V models	G1224
29	Spirit Plus™ Patient Right Head Siderail Assembly c/w Circuit Board and Connection Cable and Items 30 & 31		G1446
30	Spirit Plus™ Siderail Control Overlay C (Patient Right – Inside Overlay)	***120V models***	G1125
		230V models	G1225
31	Spirit Plus™ Siderail Control Overlay D (Patient Right – Outside Overlay)		G1126
32	Spirit Plus™ Patient Station Cable (c/w Integrated Nurse Call ¼" Phono Jack)		E0078
33	Equipotential Conductor		E0051
34	Grounding Wire 4.75" Long c/w (2x) #10 x ¾ long TEK Screw and (2x) #10 External Tooth Star Washer		E0149 c/w (2X) F0062 and (2x) F0091
OPTIONAL FEATURES/EQUIPMENT			
35	Six Function Hand Pendant with Coiled Cable, 10 Pin Plug Connection, and Screw-on Threaded Retaining Cap		E0143
36	Bed Exit Package c/w Alarm Unit, Sensing Pad, and all Electrical Wiring		BES PACKAGE
37	Replacement Bed Exit Alarm Unit		BES BOX ONLY
38	Replacement Bed Exit Alarm Sensing Pad		BES PAD ONLY
39	Underbed Light *(not shown in either diagram)*		Refer to pages 110 and 111
40	Obstruction Sensor Components *(not shown in either diagram)*		Refer to pages 110 and 111
41	Spirit Plus™ Auxiliary AC Power Outlet Socket Components		Refer to pages 110 and 111

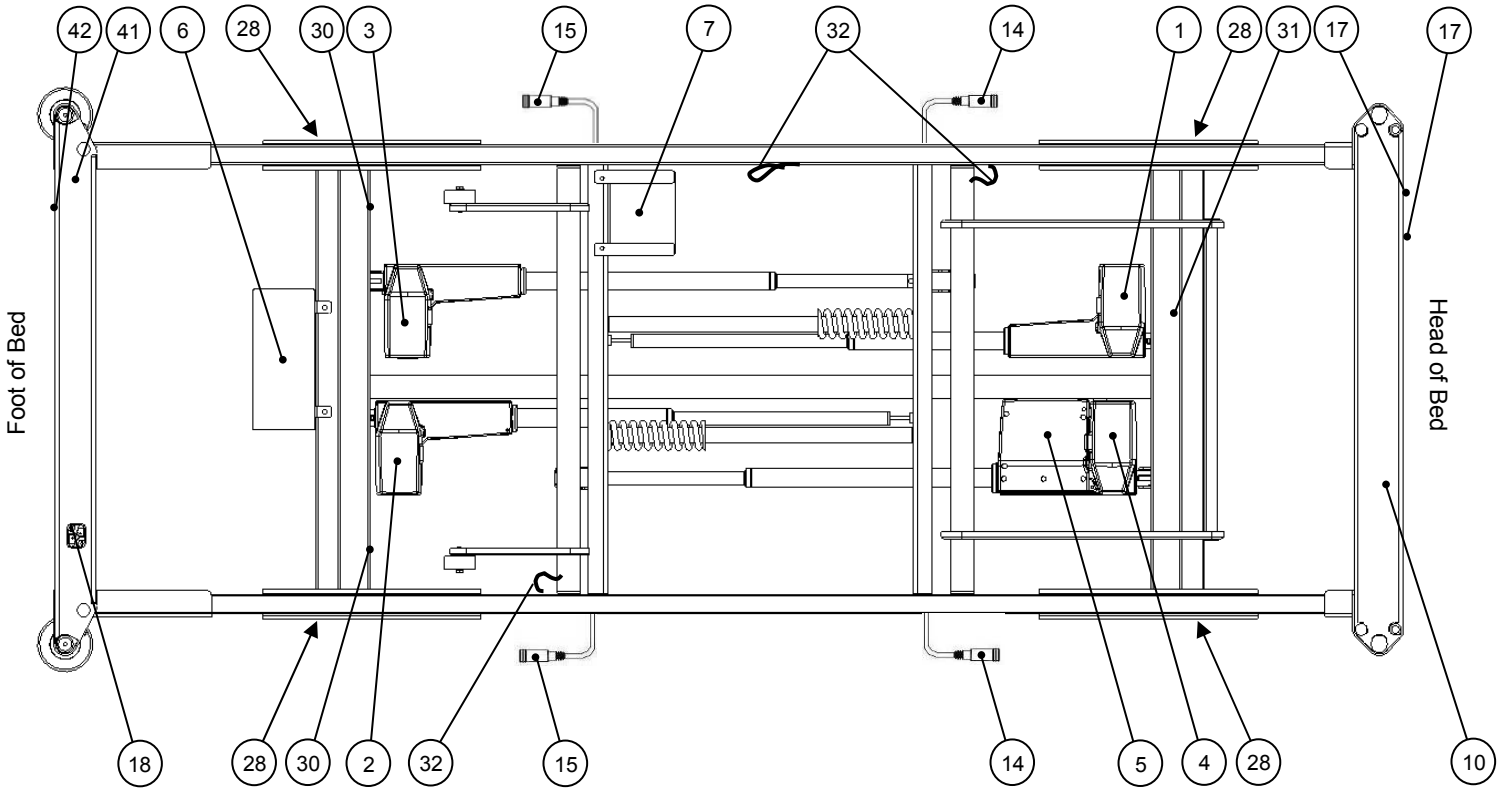
If you are replacing the CB09 control box and/or the part numbers on your actuators are different from what is listed above, contact Customer Service to ensure that you order the correct parts for your bed.* ***Carroll Hospital Group Customer Service: (519) 963-4010 or Toll Free 1-866-516-5446*

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5.8.2 Spirit Select™ Wiring Schematic

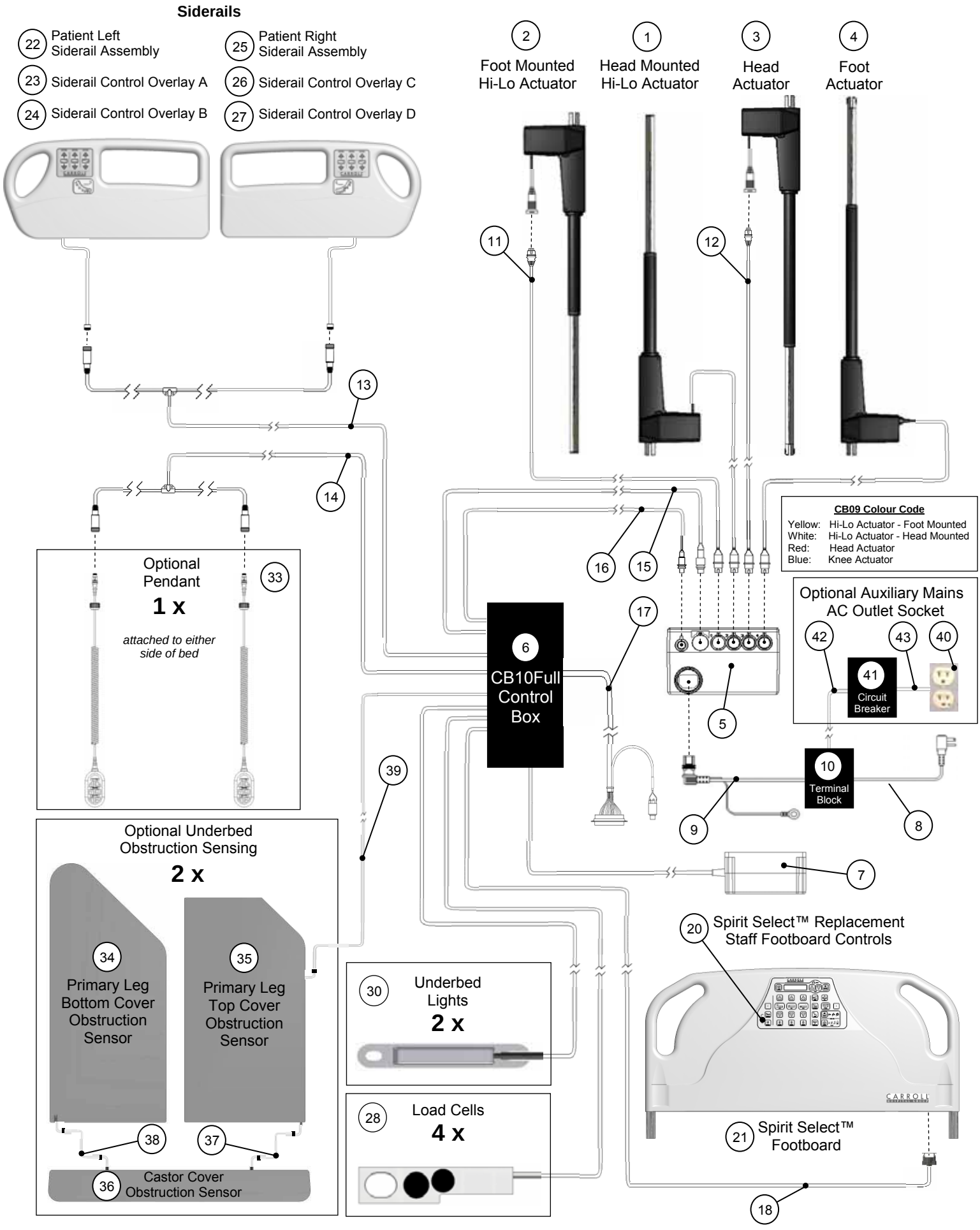


NOTE: For the purposes of clarity, the mattress deck sections, head/foot boards, bed legs, and other wiring systems are not shown

ITEM	DESCRIPTION		ORDER THIS P/N
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2	Hi-Lo Actuator (Mounted at Foot of Bed)		E0139 (LA31-U455-XX)*
3	Spirit Select™ Head Actuator		E0140 (LA31-U404-XX)
4	Spirit Select™ Knee Actuator		E0141 (LA31-U405-XX)
5	Spirit Select™ CB09 Control Box	***120V models***	E0092*
		230V models	E0126
6	CB10Full Control Box Assembly c/w Circuit Board and Enclosure		E0100
7	Back-up Battery c/w Mounting Bracket Attached		E0052 (BA1802-1300-000)
8	Power Supply Cord (AC Power Outlet To Terminal Block)	***120V models***	E0183
		230V models	E0217
9	Power Supply Cord with 12" Flying Lead Grounding Wire (Terminal Block to CB09 Control Box)		E0186
10	AC Power Supply Terminal Block		E0208
11	Extension Cable – Foot Mounted Hi-Lo Actuator (Yellow Tape)		E0144
12	Extension Cable – Head Actuator (Red Tape)		E0145
13	T-Cable (Siderails Controls)		E0060
14	T-Cable (Pendant) *only present if bed is ordered with optional Item 31*		E0063
15	Communication Cable (CB09 Control Box to CB10 Control box)		E0064
16	CB10 Power Cable (CB09 Control Box to CB10 Control box)		E0067
17	Patient Station Cable (c/w Integrated Nurse Call ¼" Phono Jack)		E0078
18	Footboard Bracket Cable (Blindmate Male 4 Pin Connector to CB10)		E0073
19	Footboard Cable (Blindmate Female 4 Pin Receptacle to Footboard Staff Control, Mounted Inside Footboard - *not shown*)		E0070
20	Footboard Staff Control c/w Overlay		E0210
21	Footboard Assembly c/w Item 17		G1442
22	Patient Left Head Siderail Assembly c/w Circuit Board and Connection Cable and Items 20 & 21		G1447
23	Siderail Control Overlay A (Patient Left – Outside Overlay)		G1123
24	Siderail Control Overlay B (Patient Left – Inside Overlay)	***120V models***	G1124
		230V models	G1224
25	Patient Right Head Siderail Assembly c/w Circuit Board and Connection Cable and Items 23 & 24		G1446
26	Siderail Control Overlay C (Patient Right – Inside Overlay)	***120V models***	G1125
		230V models	G1225
27	Siderail Control Overlay D (Patient Right – Outside Overlay)		G1126
28	Load Cell		E0150
29	Load Cell Bushing (2 Mounted inside each Load Cell – *not shown)*		G1431
30	Underbed Light		E0088
31	Equipotential Conductor		E0051
32	Grounding Wire 4.75" Long c/w (2x) #10 x ¾ long TEK Screw and (2x) #10 External Tooth Star Washer		E0149 c/w (2X) F0062 and (2x) F0091
OPTIONAL FEATURES/EQUIPMENT			
33	Six Function Hand Pendant with Coiled Cable, 10 Pin Plug Connection, and Screw-on Threaded Retaining Cap		E0143
34	Primary Leg Bottom Cover Obstruction Sensor		E0105
35	Primary Leg Top Cover Obstruction Sensor		E0107
36	Caster Cover Obstruction Sensor		E0109
37	Obstruction Sensor Interconnection Cable (Connection Between Top Cover and Caster Cover Sensors)		E0119
38	Obstruction Sensor Interconnection Cable (Connection Between Bottom Cover and Caster Cover Sensors)		E0121
39	Obstruction Sensor Connection Cable (Connection Between Top Cover and CB10 Control box)		E0084
40	Auxiliary AC Power Outlet Socket		E0184
41	Auxiliary AC Power Outlet Socket Circuit Breaker		E0185
42	Auxiliary AC Power Outlet Socket Supply Cord (Terminal Block to Auxiliary AC Power Outlet Socket)		E0187
43	Circuit Breaker Lead Wire		E0205

If you are replacing the CB09 control box and/or the part numbers on your actuators are different from what is listed above, contact Customer Service to ensure that you order the correct parts for your bed.* ***Carroll Hospital Group Customer Service: (519) 963-4010 or Toll Free 1-866-516-5446*

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5.8.3 Electrical Connections – Overview



CB09 Control Box
CB09 is common for all Spirit™ beds.



CB10 Control Box
CB10Lite control box – Spirit™ and Spirit Plus™
CB10Full control box – Spirit Select™



Communication Cable (8 pin, DIN style, double keyed connector)
Carries communication between CB09 control box and COMM header on CB10 control box



DC Power Cable (Ø5.5 mm X Ø2.5 mm male plug end)
Provides 24VDC power from CB09 control box to DC power input header on CB10 control box



Colour Code

Yellow: Hi-Lo Actuator (Mounted at Foot End of Bed)

White: Hi-Lo Actuator Extension Cable (Mounted at Head End of Bed)

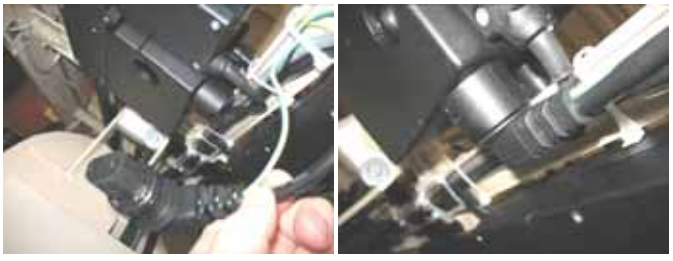
Red: Head Actuator Extension Cable

Blue: Knee Actuator

Actuator Cable Plug (4 pin, DIN style, double keyed connector)
Hi-Lo Actuators are common for all Spirit™ beds. Head/Knee actuators are unique to Spirit Select™



Foot Mounted Actuator Extension Cables (4 pin, DIN style, double keyed connector to 6 pin modular connector)
Connects foot mounted actuator cables to CB09 control box



CB09 Control Box Power Supply Cable (IEC 320 C13 female plug end)
Typical on all beds



Battery Connection Cable (Ø5.5 mm X Ø2.5 mm male plug end)
Typical on all beds

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⚠ WARNING

Some versions of CB09 control boxes are **NOT** interchangeable.

If your Spirit™ bed is not equipped with a CB10 control box but contains additional electrical components (such as a DJB Junction Box), then this bed uses an older version of the CB09 control box.

If you have to replace your CB09 control box call Carroll Hospital Group Customer Service to ensure that you have the correct version of this component at (519) 963-4010 or Toll Free 1-866-516-5446.

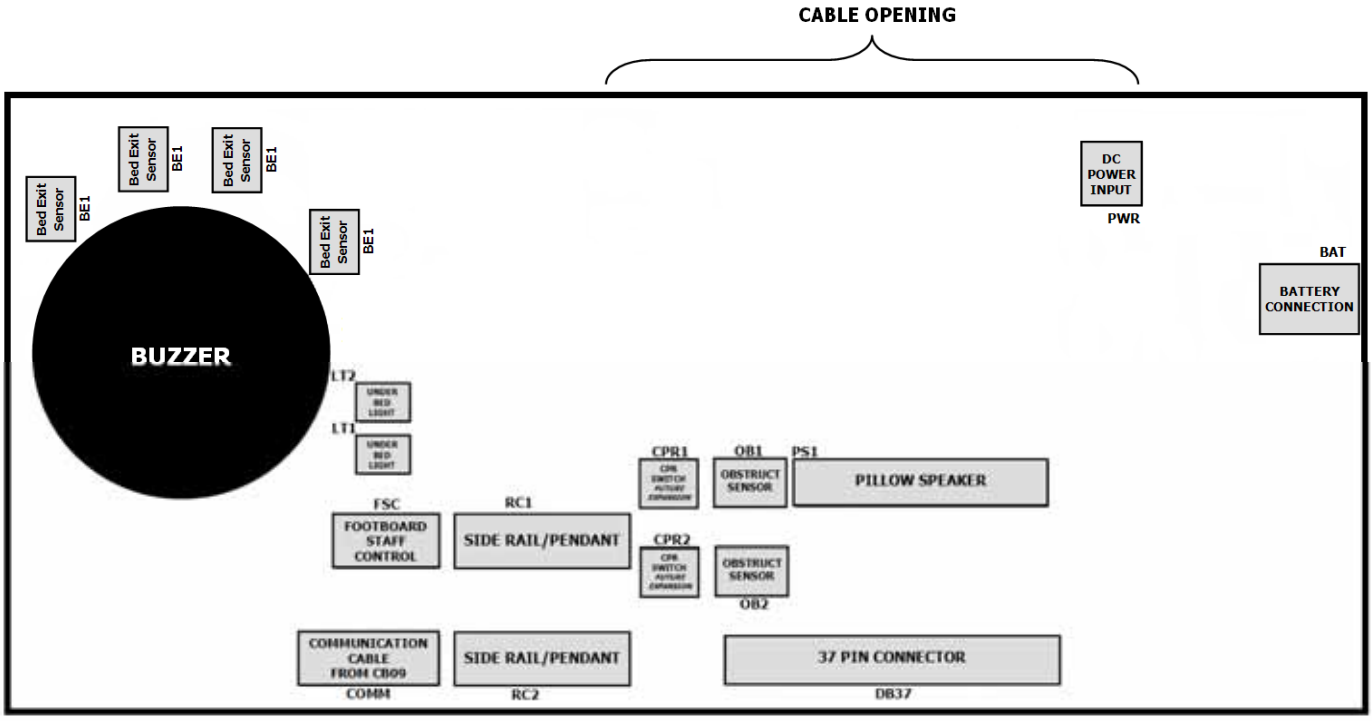
5.8.4 Spirit™ and Spirit Plus™ CB10Lite Control Box – Overview



CB10Lite cable connections shown: communication cable (p/n E0064), power cable (p/n E0067), footboard staff control cable (E0151), siderail t-cable (E0060), and patient station cable (E0078)



CB10Lite serial number label (affixed to enclosure next to battery connection)



NOTE:

There are multiple connection points for the bed exit sensors (if equipped).

The bed exit feature will **NOT** operate properly unless the bed exit sensors are connected to their respective connection points.

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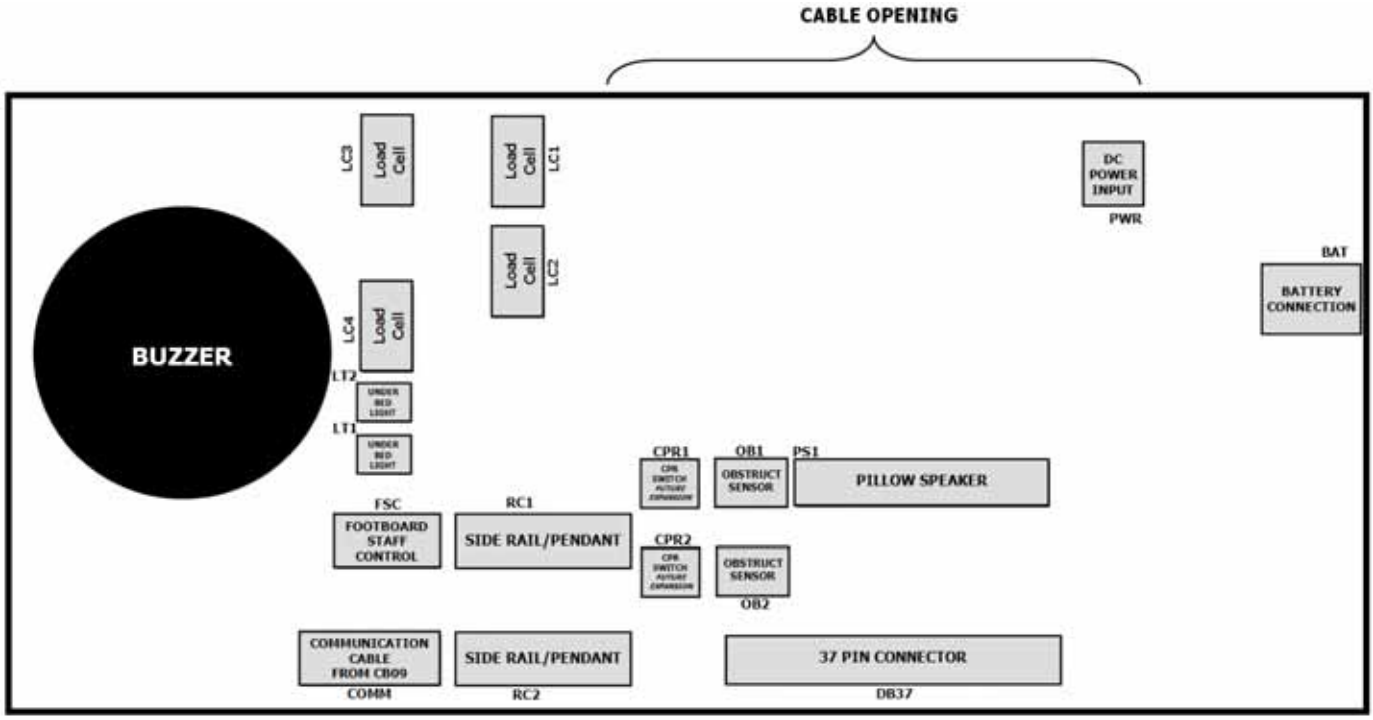
5.8.5 Spirit Select™ CB10Full Control Box – Overview



CB10Full cable connections shown: communication cable (p/n E0064), power cable (p/n E0067), footboard staff control cable (E0151), siderail t-cable (E0060), underbed lights (2 x E0088), load cells (4 x E0084)and patient station cable (E0078)



CB10Full serial number label (affixed to enclosure next to battery connection)



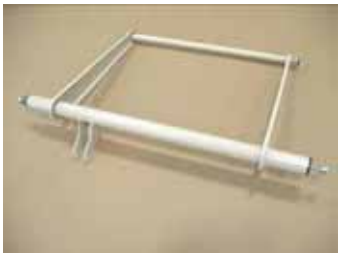
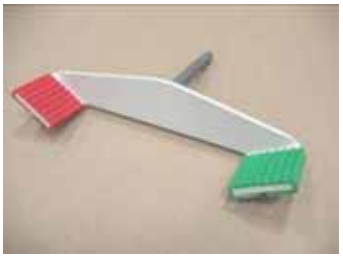
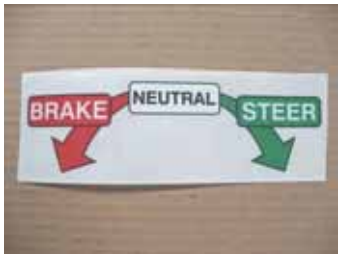
NOTE:	There are multiple connection points for the load cells, siderail controls, pendant, underbed lights, and obstruction sensors (if equipped). The bed will operate properly with these features connected to any of their respective connection points, however, if load cell cables are plugged into different connection points, the bed **MUST** be recalibrated.

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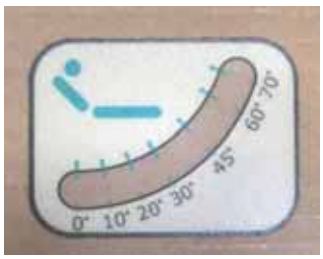
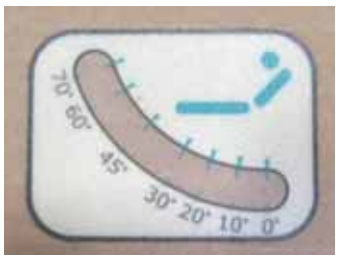
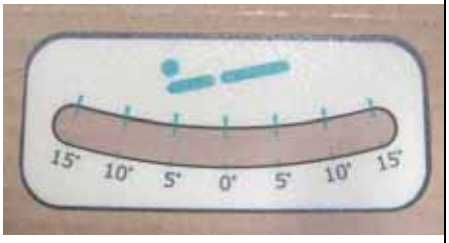
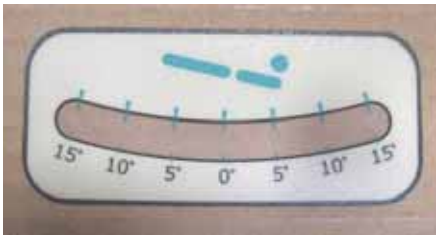
5.9 Service Parts

		
Mattress Deck – Head Section for Spirit™ P/N: G0922	Mattress Deck – Head Section for Spirit Plus™ & Spirit Select™ P/N: G0922M	Mattress Deck – Seat Section P/N: G0923
		
Mattress Deck – Knee Section P/N: G0921	Mattress Deck – Foot Section P/N: G0920	Mattress Deck – Complete "Easy Bed" Foot Section Assembly P/N: G1500
		
Corner Mattress Keeper A (Patient Right Foot, Patient Left Head) P/N: G0838	Corner Mattress Keeper B (Patient Left Foot, Patient Right Head) P/N: G0839	Footboard Bracket Insert (Patient Left) P/N: G1272
		
Footboard Bracket Insert (Patient Right) P/N: G1271	Headboard Bracket Insert (Patient Right) P/N: G1274	Headboard Bracket Insert (Patient Left) P/N: G1273
		
Foot Bail P/N: G0835P	Foot End Corner Bumper P/N: C0027	Foot Gatch & Spirit™ Head Gatch Wheel P/N: C0021
		
1" X 2" 11GA Rectangular Plug P/N: C0032	1 1/4" X 11GA Square Plug P/N: C0049	Head End Caster Bumper P/N: C0051

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Control Arm Assembly (*Part Comes c/w Frame Fasteners*) P/N: G0972P	Suspension Arm A P/N: G1071P	Suspension Arm B P/N: G1072P
		
Primary Leg Assembly *(Part Comes c/w Caster Bracket Fasteners)* P/N: G0962P	Foot Gatch Assembly – Spirit™ & Spirit Plus™ *(Part Comes c/w Frame Fasteners and Wheels)* P/N: G0912	Foot Gatch Assembly – Spirit Select™ *(Part Comes c/w Frame Fasteners and Wheels)* P/N: G1362
		
Head Gatch Assembly – Spirit™ *(Part Comes c/w Frame Fasteners and Wheels)* P/N: G0913	Head Gatch Assembly – Spirit Plus™ *(Part Comes c/w Frame and Rail Fasteners)* P/N: G1366	Head Gatch Assembly – Spirit Select™ *(Part Comes c/w Frame and Rail Fasteners)* P/N: G1363
		
Seat Deck Support Tube *(1" diameter x 29-5/8" long)* P/N: G1601P	Head Rail Bracket Sway Bar *(5/8" diameter x 27" long)* P/N: G1140P	Linear Guide Block P/N: G0952
		
Gatch Socket P/N: G0909 Gatch Socket Pivot Pin P/N: G0910	Painted Brake Pedal – Foot End P/N: G1458 Painted Brake Pedal – Head End P/N: G1459	Brake & Steer Decal P/N: G1460
		
Caster Change Lever *(c/w Set Screw)* P/N: G1383	Foot Pedal Cable Lever *(c/w Spring Pins)* P/N: G1380	Pedal Lever Linkage P/N: G1381

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Caster Hex Rod P/N: G0918	Head End Caster– Swivel with Total Lock *(Green Label)* P/N: C0019	Foot End Caster – Swivel with Directional and Total Lock *(Red Label)* P/N: C0020
		
Foot Rail Molded Panel *(Patient Left)* P/N: G1107	Foot Rail Molded Panel *(Patient Right)* P/N: G1106	Head Rail Electrical Assembly *(Patient Left)* P/N: G1447
		
Head Rail Electrical Assembly *(Patient Right)* P/N: G1446	Siderail Staff Control Overlay *(Outside Patient Left)* P/N: G1123	Siderail Staff Control Overlay *(Outside Patient Right)* P/N: G1126
		
Siderail Patient Control Overlay [120V] *(Inside Patient Left)* P/N: G1124	Siderail Patient Control Overlay [120V] *(Inside Patient Right)* P/N: G1125	Siderail Patient Control Overlay [230V] *(Inside Patient Left)* P/N: G1224
		
Siderail Patient Control Overlay [230V] *(Inside Patient Right)* P/N: G1225	Head Deck Angle Overlay *(Patient Right)* P/N: G1279	Head Deck Angle Overlay *(Patient Left)* P/N: G1280
		
Trendelenburg Angle Overlay *(Patient Right)* P/N: G1281	Trendelenburg Angle Overlay *(Patient Left)* P/N: G1282	Angle Gauge Chrome Ball P/N: C0013

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Spirit Plus™ Headboard Assembly P/N: G1154	Spirit™ & Spirit Plus™ Footboard Staff Control P/N: E0132	Spirit Plus™ & Spirit Select™ Headboard Assembly P/N: G1155
		
Spirit Select™ Headboard Assembly P/N: G1442	Spirit Select™ Footboard Staff Control P/N: E0210	Spirit Plus™ & Spirit Select™ Headboard Key (Blindmate Socket) P/N: E0233
		
Spirit™ Wood Footboard Assembly P/N: G0832-? Refer to page 103 for Colour Option Number	Spirit™ Wood Headboard Assembly P/N: G0820-? Refer to page 103 for Colour Option Number	Spirit™ Wood Head/Foot Board IV Pole Insert P/N: G????
		
Hi-Lo Actuator – Mounted at Head End *(LA31-U456, White Tape on Cable)* P/N: E0138	Hi-Lo Actuator – Mounted at Foot End *(LA31-U455, Yellow Tape on Cable)* P/N: E0139	Knee Actuator – Spirit™ & Spirit Plus™ *(LA31-U087, Blue Tape on Cable)* P/N: E0035
		
Head Actuator – Spirit™ & Spirit Plus™ *(LA31-U468, Red Tape on Cable)* P/N: E0137	Knee Actuator – Spirit Select™ *(LA31-U405, Blue Tape on Cable)* P/N: E0141	Head Actuator – Spirit Select™ *(LA31-U404, Red Tape on Cable)* P/N: E0140
		
Foot Mounted Hi-Lo Actuator Extension Cable P/N: E0144	Head Actuator Extension Cable P/N: E0145	24VDC Battery Assembly *(Part Comes c/w Brackets and Bracket Fasteners)* P/N: E0052

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CB09 Control Box 120V CB09 Control Box 230V	P/N: E0092 P/N: E0126	CB10Lite Control Box – Spirit™ & Spirit Plus™ *(Part Comes c/w lid and lid fasteners)*	P/N: E0125	CB10Full Control Box – Spirit Select™ *(Part Comes c/w lid and lid fasteners)*	P/N: E0100
					
Spirit Plus™ & Spirit Select™ Power Cord (*AC power outlet to terminal block)* *120V (shown)* *230V*	 P/N: E0183 P/N: E0217	Spirit Plus™ & Spirit Select™ Power Cord *(terminal block to CB09)* *120V (shown)* *230V*	 P/N: E0186 P/N: E0222	AC Power Supply Terminal Block	P/N: E0208
					
Hospital Grade Duplex Receptacle	P/N: E0184	5A Thermal Circuit Breaker	P/N: E0185	Spirit Plus™ & Spirit Select™ Auxiliary Outlet Supply Power Cord	P/N: E0187
					
Spirit ™ Power Cord	P/N: E0030	6 Function Hand Pendant	P/N: E0143	Pendant T-Cable	P/N: E0063M
					
CB09 to CB10 Communication Cable	P/N: E0064	CB09 to CB10 Power Cable	P/N: E0067	Patient Station Cable	P/N: E0078
					
Siderail Controls T-Cable	P/N: E0060M	Underbed Light *(Light May Not Be Exactly As Shown)*	P/N: E0088	Spirit™ & Spirit Plus™ CB10Lite Footboard Cable	P/N: E0151

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Load Cell	P/N: E0150	Load Cell Bushing	P/N: G1431	Spirit Select™ Footboard Staff Control Cable	P/N: E0073
					
Spirit Plus™ Footboard Bracket Cable	P/N: E0015M	Spirit Plus™ Footboard Staff Control Cable	P/N: E0016M	Spirit Select™ Footboard Bracket Cable	P/N: E0070
					
Obstruction Sensor – Bottom Cover	P/N: E0207	Obstruction Sensor – Top Cover	P/N: E0107	Obstruction Sensor – Caster Cover	P/N: E0109
					
CB10 Obstruction Cable	P/N: E0084	Obstruction Sensor Link Cable A *(Connects Top Cover Sensor to Caster Cover Sensor)*	P/N: E0119	Obstruction Sensor Link Cable B *(Connects Caster Cover Sensor to Bottom Cover Sensor)*	P/N: E0121
					
Bed Exit System *(complete)*	P/N: A2700	Bed Exit System Alarm Unit	P/N: A2701	Bed Exit Pad	P/N: A2702
					
Bed Exit Cable	P/N: A2704M	“Easy Bed” Retention Knob Knob Bushing	P/N: C0057 P/N: G1487	Nurse Call Dummy Plug Assembly	P/N: G1235

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