SERVICE MANUAL

Hill-Rom® 1000 Bed

From Hill-Rom

Product No. P1160

For Parts or Technical Assistance
USA (800) 445-3720 Canada (800) 267-2337
International: Contact your distributor.

151693 REV 1

Hill-Rom® 1000 Bed Service Manual

Revisions

Revision Letter	Pages Affected	Date
Original Issue		June 2008

151693 REV 1

First Edition

First Printing 2008

Printed in the USA

The data contained in this manual is subject to change without notice. Hill-Rom makes no commitment to update or keep current, the data contained in this manual.

The only product warranty intended by Hill-Rom is the express, written warranty accompanying the bill of sale to the original purchaser. Hill-Rom makes no other warranty, express or implied, and specifically makes no warranty of merchantability or fitness for a special cause.

Copies of this manual can be obtained from Hill-Rom.

To order copies of this manual, phone 800-445-3720, and submit a parts order for part number 151693.

Table of Contents

Chapter 1 Introduction

1

Purpose

This manual provides requirements for the Hill-Rom® 1000 Bed operation and maintenance. It also includes parts lists (in chapter 5) for ordering replacement components.

Audience

This manual is intended for use by only facility-approved persons. Failure to obey this restriction can cause injury to people and damaged equipment.

Reference Documents

For more data (such as operating instructions, features, and product symbols), refer to the *Hill-Rom® 1000 Bed User Manual* (151692).

Document Symbols

This manual contains different typefaces and symbols to make the content easier to read and understand:

- Standard text—used for regular data.
- **Boldface text**—emphasizes a word or phrase.
- **NOTE:**—sets apart special data or important instruction clarification.
- WARNING, RELATIVE CONTRAINDICATION, or CAUTION

  - A WARNING identifies situations or actions that can have an effect on patient or user safety. To ignore a warning could cause patient or user injury.
  - A RELATIVE CONTRAINDICATION identifies situations or actions that can have an effect on patient safety.
  - A CAUTION identifies special procedures or precautions that persons must obey to help prevent equipment damage.
- CAUGHT HAZARD WARNING

- CHEMICAL HAZARD WARNING

- ELECTRICAL SHOCK HAZARD WARNING

Overview

The Hill-Rom® 1000 Bed is intended for low to moderately acuity patients in the medical/surgical area of the hospital. The Hill-Rom® 1000 Bed can also be used as a general-purpose variable height hospital bed for general care, post-operative care, and general medicine wards.

For more data refer to the *Hill-Rom® 1000 Bed User Manual* (151692).

Before you service the Hill-Rom® 1000 Bed, make sure you have read and understood the contents of this manual. It is important that you read and strictly obey the aspects of safety contained in this manual.

Specifications

Physical Description

For Hill-Rom® 1000 Bed specifications, see table 1-1 on page 1-3 through table 1-7 on page 1-5.

Table 1-1. Dimensions

Feature	Dimension
Total length	100" (254 cm)
Maximum width (siderails stored)	40" (102 cm)
Maximum width (siderails up)	40" (102 cm)
Mattress dimensions:	
Mattress width	35.25" (89.5 cm)
Mattress length	80" (203 cm)
Mattress thickness	6" (15 cm)
Alternate mattresses: Recommended height above the mattress at the deck perimeter to the top of the siderail, per IEC 60601-2-38	8.7" (22.1 cm)
Caster size	6" (15 cm)
Total weight	420 lb (191 kg) without surface, options, or accessories

Table 1-2. Specifications

Feature	Dimension
Head section inclination (maximum)	65°
Knee section inclination (maximum)	20°
Foot section inclination (maximum)	-23°
Maximum height (to top of sleep deck)	32.5" (82.6 cm)
Minimum height (to top of sleep deck)	15.75" (40.00 cm)
Trendelenburg position (maximum)	16°
Safe working load (safe working load includes: patient, accessories, mattress, and etc.)	500 lb (227 kg)

Feature	Dimension
Siderail opening size	4.34" (11.02 cm)
Distance between siderails	< 2.3" (58.4 mm)

Nurse Call Connection Requirements

For data about the Nurse Call connection requirements, refer to the *SideCom® Communication System Design and Application Manual* (DS059).

Mattress Flammability

The sleep surface mattress meets these specifications:

- CAL TB-117, *Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture* (foam)
- 16 CFR 1632, *Standard for the Flammability of Mattresses and Mattress Pads*
- 16 CFR 1633, *Standard for the Flammability (Open Flame) of Mattress Sets*
- CAL TB-129, *Flammability Test Procedures for Mattresses for Use in Public Buildings* (models with fire barrier only)
- BFD IX-II, *Boston Fire Department Mattress Fire Test* (models with fire barrier only)

Table 1-3. Environmental Conditions for Use

Condition	Range
Temperature	32°F to 104°F (0°C to 40°C) ambient temperature
Relative humidity range	30% to 85% non-condensing
Atmospheric Pressure	70 kPa to 106 kPa

Table 1-4. Environmental Conditions for Transport and Storage

Condition	Range
Temperature	-40°F to 158°F (-40°C to 70°C)
Relative humidity	Up to 95%, non-condensing
Pressure	50 kPa to 106 kPa

Table 1-5. AC Power Requirements

Nominal Power Distribution Voltage (Volts)	Nominal Power Distribution Frequency (Hertz)	Maximum Equipment Current (Amps)
120	60	6.0[a]
100-120	50/60	7.5
127	50/60	6.0
220/230/240	50/60	3.5

a. North American power supply configuration.

Table 1-6. Fuse Specifications

Condition	Range
Battery fuse	10 A, 32 V~, ATO
Mains fuse	2 each 2.5 A, 250 V~, 5 x 20 mm, UL 198G Slo-Blo®[a] or equivalent (220, 230, and 240 V beds) 2 each 5 A, 250 V~, .25" x 1.25", UL 198G Slo-Blo® or equivalent (100 V through 127 V beds)

a. Slo-Blo® is a registered trademark of Littelfuse, Inc.

Table 1-7. Regulation, Standards, and Codes

The Hill-Rom® 1000 Bed is designed and manufactured in accordance to these equipment classifications and standards:

Technical and Quality Assurance Standards	UL 60601-1 CSA®[a] C22.2 No. 601.1 IEC 60601-2-38 IEC 60601-1 IEC 60601-1-2 EN ISO 9001 and EN 13485
Equipment Classification per IEC 60601-1	Class I equipment, internally powered equipment
Classification according to EU Directive 93/42/EEC	Class I
Degree of Protection Against Electric Shock	Type B
Degree of Protection Against Ingress of Water	Protection against spraying or splashing water-IPX4
Degree of Protection Against the Presence of Flammable Anaesthetic Mixtures	Not for use with flammable anaesthetics.

Mode of Operation	Continuous operation with intermittent loading, 3 minutes ON/27 minutes OFF
Sound level (except alarms) (measured 1 meter from patient's ear)	< 60 dBA

a. CSA® is a registered trademark of Canadian Standards Association, Inc.

Model Identification

Table 1-8. Model Identification

Model Number	Description
P1160	The Hill-Rom® 1000 Bed

Safety Tips

To help prevent the risk of hospital bed fires, make sure facility staff follow the safety tips in the *FDA Public Health Notification: Safety Tips for Preventing Hospital Bed Fires*. (US only)

WARNING:
Obey the manufacturer's instructions. Failure to do so could cause injury or damaged equipment.

WARNING:
Only facility-approved persons can service the Hill-Rom® 1000 Bed. Services performed by not approved persons could cause injury or damaged equipment.

WARNING:
Obey applicable infection control policies and procedures. Failure to do so could cause the spread of infection.

WARNING:
To prevent injury from sharp edges and rough surfaces, wear gloves.

WARNING:
To decrease the risk of eye injury, wear eye protection.

WARNING:
Do not do anything under an unsupported load. Install applicable temporary supports. Failure to do so could cause injury or damaged equipment.

WARNING:
Make sure the CPR cable is routed through the head section guide bracket correctly: right side to right handle, left side to left handle. Failure to do so could cause patient injury or damaged equipment.

WARNING:
Do not put more weight on the ISS pole than the specified weight capacity. Injury or damaged equipment could occur.

WARNING:
Make sure the caster is correctly positioned with respect to the movements of the hexagonal bar. Failure to do so can cause the brake and steer system to malfunction. Injury or damaged equipment could occur.

WARNING:
Isopropyl alcohol is flammable and toxic to skin, eyes, and the respiratory tract. Do not use near an open flame. Do not use in confined areas. Injury can occur.

WARNING:
Do not put more weight on the IV rod than the specified weight capacity. To do so could cause injury or damaged equipment.

WARNING:
When you lower the top section of an IV rod, always hold the top section of the pole before you pull the release knob. Failure to do so could cause injury or damaged equipment.

WARNING:
When you lower the top section of an ISS pole, always hold the top section of the pole before you twist the release knob. Failure to do so could cause injury or damaged equipment.

WARNING:
If the oxygen tank holder is placed at the foot of the bed, make sure the Knee Up/Down controls are locked out. Failure to do so can cause caregiver, patient, or visitor injury if the foot section fully lowers and the holder becomes dislodged from the bed.

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

SHOCK HAZARD:
The possibility for electrical shock exists with electrical equipment. Failure to follow facility protocols can cause death or injury.

SHOCK HAZARD:
Do not permit the unit to become too moist. Injury or damaged equipment could occur.

SHOCK HAZARD:
An unusually high leakage current is symptomatic of a degradation in the AC power cable and the power supply. A value of the leakage current above 500 microamperes could cause injury.

CAUTION:
Do not use harsh cleaners, solvents, or detergents. Damaged equipment could occur.

CAUTION:
Do not use silicone-based lubricants. Damaged equipment could occur.

CAUTION:
To prevent component damage, make sure that your hands are clean, and **only** touch the P.C. board by its edges.

CAUTION:
When you touch the electronic components, wear an antistatic strap. Failure to do so could cause damaged equipment.

CAUTION:
For shipping and storage, put the removed P.C. board in an antistatic bag. Failure to do so could cause damaged equipment.

CAUTION:
Make sure that the elastic installed on the new motors is not wound around the motor body before you remove it (cut). If necessary, turn the motor end rod in the applicable direction to remove this elastic. It is used to show the correct position of the switches and internal end of travels (EOT) of the motor. The incorrect position of these elements can damage the motor or the structure of the bed.

CAUTION:
Use precaution when you remove the switch panel. Failure to do so could cause damage to the seat area of the switch panel on the siderail.

CAUTION:
Do not mount infusion pumps on the lower section of an IV rod. Interference with head section articulation could occur.

Beds with an Auxiliary Outlet

SHOCK HAZARD:
This bed has two power cords. Disconnect the two power cords before you service the Bed Electrical Enclosure or Auxiliary Outlet Enclosure. Only facility-approved persons can service the Bed Electrical Enclosure or Auxiliary Outlet Enclosure. Injury or damaged equipment could occur.

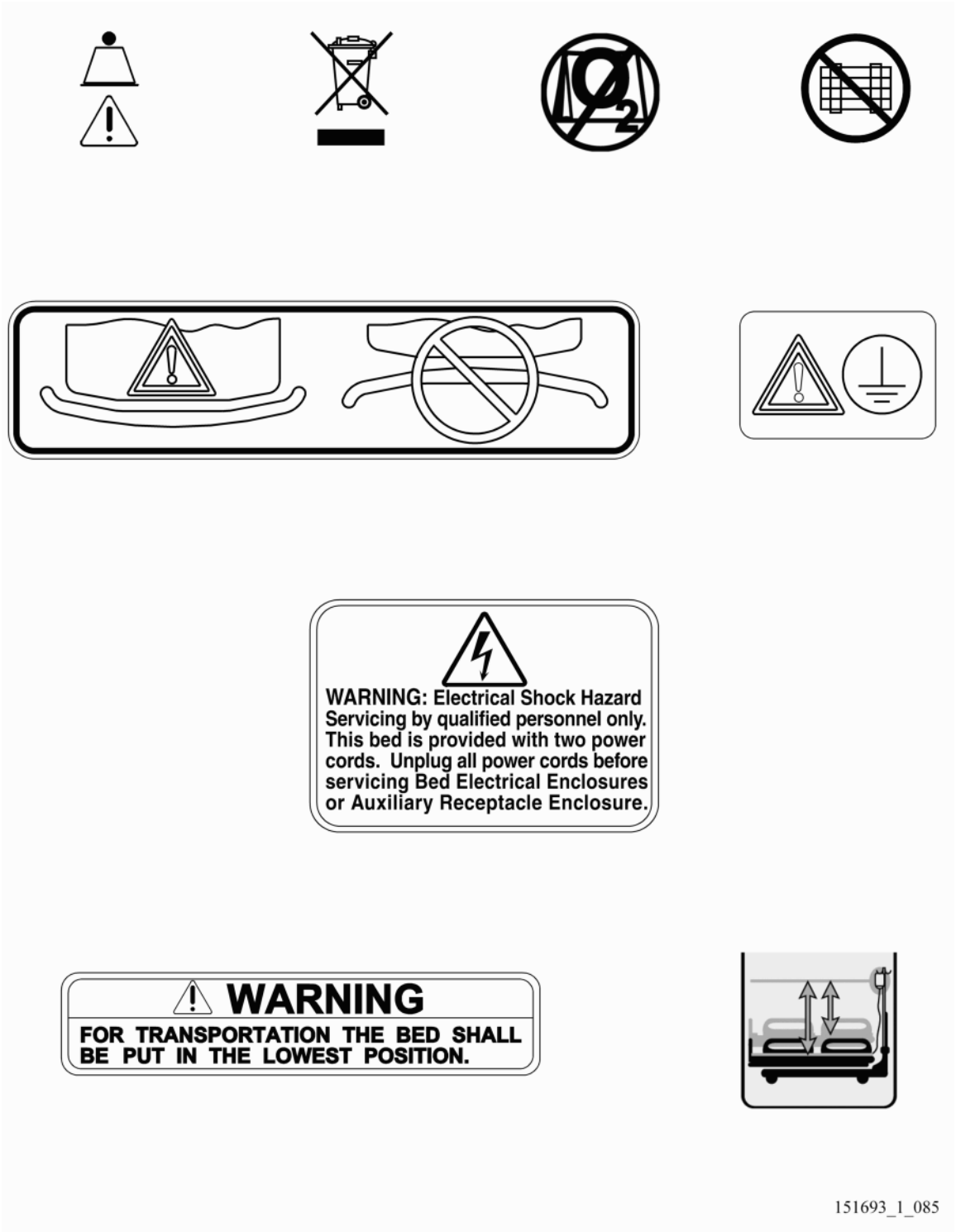
WARNING:
The Auxiliary Outlet ground line is disconnected from the bed ground line. The Auxiliary Outlet does not have battery back-up. Use for non-life support medical equipment only. Failure to do so could cause injury or damaged equipment.

WARNING:
Do not use oxygen enriched sources near the Auxiliary Outlet. Failure to do could cause injury or damaged equipment.

WARNING:
Do not connect the two power cords to the same wall outlet. Connect the power cords to different outlets on disconnected circuits. Failure to do so could cause damaged equipment or the facility power breakers to turn off. **Do not use the Auxiliary Outlet for life support equipment. Connect life support equipment directly into the facility power supply.**

Warning and Caution Labels

Figure 1-5. Warning and Caution Labels



Chapter 2
Troubleshooting Procedures

2

Getting Started

WARNING:
Only facility-approved persons can service the Hill-Rom® 1000 Bed. Service by not approved persons could cause injury or damaged equipment.

Start each procedure in this chapter with step 1. Follow the sequence outlined (each step assumes the last step has been completed). In each step, the operation of the unit can be confirmed by a **Yes** or **No** answer to the statement. Your response will go to a different step in the procedure, a repair analysis procedure (RAP), or a component replacement. If more than one component is listed, replace them in the given order.

To collect data about the problem, start with **Initial Actions**.

To isolate or identify a problem and to make sure of the repair after you complete each corrective procedure (replacing or adjusting a part, installing a connector, etc.), do the **Function Checks**.

To make sure of the repair, do the **Final Actions** after the Function Checks.

If troubleshooting procedures do not isolate the problem, phone Hill-Rom Technical Support at 800-445-3720.

Initial Actions

To collect data from operators about problems with the unit, use Initial Actions. This data helps identify the probable cause.

1. Someone who can tell you about the problem is available.

   Yes **No**
   ↓ → Go to "Function Checks" on page 2-4.

2. Tell this person to demonstrate or tell you about the problem. The problem can be duplicated.

   Yes **No**
   ↓ → Go to "Function Checks" on page 2-4.

3. The problem is a cause of incorrect operator procedure.

   Yes **No**
   ↓ → Refer to table 2-1 on page 2-2, or go to "Function Checks" on page 2-4.

4. Tell the operator to refer to the procedures in the *Hill-Rom® 1000 Bed User Manual* (151692). Do the "Function Checks" on page 2-4 to make sure the Hill-Rom® 1000 Bed operates properly.

Problem/Solution Table

If the problem can be easily identified, use these tables to find the applicable troubleshooting procedure.

Table 2-1. Problem/Solution Table

Problem	Solution
No Functions Work	Go to RAP 2.1 on page 2-11.
Lockout Malfunction	Go to RAP 2.2 on page 2-14.
Hilow Malfunction	Go to RAP 2.3 on page 2-15.
Knee Section Malfunction	Go to RAP 2.4 on page 2-16.
Head Section Malfunction (does not include Automatic Contour)	Go to RAP 2.5 on page 2-17.
Battery Backup Malfunction	Go to RAP 2.6 on page 2-18.
Trendelenburg/Reverse Trendelenburg Malfunction	Go to RAP 2.7 on page 2-19.
CPR Malfunction	Go to RAP 2.8 on page 2-20.
Braking Malfunction	Go to RAP 2.9 on page 2-21.
Steering Malfunction	Go to RAP 2.10 on page 2-22.

Table 2-2. Scale Display Errors

Problem	Solution
Scale Error 0	Go to RAP 2.11 on page 2-23.
Scale Error 1	Go to RAP 2.12 on page 2-24.
Scale Error 2	Go to RAP 2.13 on page 2-25.
Scale Error 3	Go to RAP 2.14 on page 2-26.
Scale Error 4	Go to RAP 2.15 on page 2-27.
Scale Error 5	Go to RAP 2.16 on page 2-28.
Service Required LED Flashes	Go to RAP 2.17 on page 2-29.

Function Checks

A function check is necessary to do an examination of all unit functions. Function checks have the technician go through the operation of the unit. If a specific property of the unit does not operate normally, the technician is referred to a Repair Analysis Procedure (RAP) to identify the problem.

1. The "Initial Actions" have been done.

   Yes **No**
   ↓ → Go to “Initial Actions” on page 2-2.

2. Set the brakes; lift and lock the siderails in the high position. Plug the power cord into an applicable power source.

3. Operate the **Trendelenburg** function.

   This function works.

   Yes **No**
   ↓ → Go to RAP 2.7 on page 2-19.

4. Lock at least one bed function (such as the head section).

   The corresponding indicator is illuminated.

   Yes **No**
   ↓ → Go to RAP 2.2 on page 2-14.

5. Lock out all bed functions.

   All of the lock out indicators illuminate (this does not include the Bed Not Down Indicator).

   Yes **No**
   ↓ → Go to RAP 2.2 on page 2-14.

6. Unlock all of the functions.

   All of the lock out indicators go off (this does not include the Bed Not Down Indicator).

   Yes **No**
   ↓ → Go to RAP 2.2 on page 2-14.

7. Push the **Bed Up** control.

   The bed rises to the high position without stopping or a warning signal sounded.

   Yes **No**
   ↓ → Go to RAP 2.3 on page 2-15.

8. Push the **Bed Down** control.

   The bed goes down to the low position without stopping or a warning signal sounded. Also, the Bed Not Down indicator goes off when the bed reaches the lowest position.

   Yes **No**
   ↓ → Go to RAP 2.3 on page 2-15.

9. Push the **Knee Up** control.

   The knee section rises to the high position without stopping or a warning signal sounded.

   Yes **No**
   ↓ → Go to RAP 2.4 on page 2-16.

10. Push the **Knee Down** control.

    The knee section goes down to the low position without stopping or a warning signal sounded.

    Yes **No**
    ↓ → Go to RAP 2.4 on page 2-16.

11. Push the **Head Up** control.

    The head section rises to the high position without stopping or a warning signal sounded.

    Yes **No**
    ↓ → Go to RAP 2.5 on page 2-17.

12. Push the **Head Down** control.

    The head section goes down to the low position without stopping or a warning signal sounded (ignore the knee section motor).

    Yes **No**
    ↓ → Go to RAP 2.5 on page 2-17.

13. Push the **Head Up** control (to make sure Automatic Contour).

    The head section and knee section rise simultaneously, then the knee section stops at an angle approaching 17° while the head section continues to rise to its highest position.

    Yes **No**
    ↓ → Go to RAP 2.5 on page 2-17.

14. Push the **Head Down** control.

    The head section goes down, then the knee section continues to drop when the head section reaches low position.

    Yes **No**
    ↓ → Go to RAP 2.5 on page 2-17.

15. Disconnect the power from the power source and test the functions examined in step 12 to step 14.

    The bed functions operate correctly.

    Yes **No**
    ↓ → Go to RAP 2.6 on page 2-18.

16. Push the **Knee Down** control until knee section is in the horizontal position. Push the **Dining Chair® Position** control.

    The head section and knee section rise until the required position is reached.

    Yes **No**
    ↓ → Go to RAP 2.5 on page 2-17.

17. Push the **Bed Flat** control.

    The head section, knee section, and foot section go to the horizontal position.

    Yes **No**
    ↓ → Go to RAP 2.5 on page 2-17.

18. Push the **Bed Up** control until the intermediate position is reached, and then operate the **Trendelenburg** control.

    The sleep surface gradually tilts to maximum Trendelenburg without a problem or unusual noise.

    Yes **No**
    ↓ → Go to RAP 2.7 on page 2-19.

19. Push the **Reverse Trendelenburg** control.

    The sleep surface gradually tilts to maximum Reverse Trendelenburg without a problem or unusual noise.

    Yes **No**
    ↓ → Go to RAP 2.7 on page 2-19.

20. Push the **Head Up** control until the section reaches the high position.

NOTE:
Someone should be lying on the bed so that this test can be carried out conclusively.

Pull one of the CPR control handles.

The head section descends quickly to the middle position, then slows until the horizontal position is reached. The movement occurs without a problem or unusual noise. Do the same for the other CPR control handle.

Yes **No**
↓ → Go to RAP 2.8 on page 2-20.

21. Release the CPR control handle and push the **Head Up** control to make sure that the head section motor drive mechanism is working correctly.

The head section rises without a problem or unusual noise.

Yes **No**
↓ → Go to RAP 2.8 on page 2-20.

22. Try to move the bed with the brake still applied.

The four wheels are locked and prevent movement.

Yes **No**
↓ → Go to RAP 2.9 on page 2-21.

23. Set the brakes to Steer and move the bed a sufficient distance to lock the steer caster into position.

The steer caster locks into position.

Yes **No**
↓ → Go to RAP 2.10 on page 2-22.

24. Go to “Final Actions” on page 2-10.

Scale and Bed Exit Function Check

1. Push the **Weight** control. Release the control pod.

   The Hands Off indicator comes on.

   Yes **No**
   ↓ → Replace the control pod P.C. board.
   Go to RAP 4.13 on page 4-41.

2. The system beeps two times.

   The weight is displayed.

   Yes **No**
   ↓ → Replace the control pod P.C. board.
   Go to RAP 4.13 on page 4-41.

3. Push the **lb/kg** control.

   The lb/kg indicator toggles between lb and kg, and kg to lb.

   Yes **No**
   ↓ → Replace the control pod P.C. board.
   Go to RAP 4.13 on page 4-41.

4. Put 50 lb (23 kg) on the center of the bed. Push the **Zero** control.

   Weight display shows “0.0”.

   Yes **No**
   ↓ → Replace scale P.C. board. Go to RAP 4.18 on page 4-52.

5. Remove the weight. Push the **Zero** control.

   Weight display shows “0.0”.

   Yes **No**
   ↓ → Replace the scale P.C. board. Go to RAP 4.18 on page 4-52.

6. Push the **Enable** control on the control pod.

   The Enable indicator comes on.

   Yes **No**
   ↓ → Replace the control pod P.C. board.
   Go to RAP 4.13 on page 4-41.

7. Push the **Tone** control on the control pod.

   The tone sounds.

   Yes **No**
   ↓ → Replace the control pod P.C. board.
   Go to RAP 4.13 on page 4-41.

8. Put 50 lb (23 kg) on the bed.

9. Push the **Bed Exit** control.

   The Bed Exit indicators come on.

   Yes **No**
   ↓ → Replace the scale P.C. board. Go to RAP 4.18 on page 4-52.

10. Remove the weight.

    The alarm sounds.

    Yes **No**
    ↓ → Replace the scale P.C. board. Go to RAP 4.18 on page 4-52.

11. Push the **Bed Exit Alarm** control.

    The alarm goes off and the indicators go off.

    Yes **No**
    ↓ → Replace the scale P.C. board. Go to RAP 4.18 on page 4-52.

12. Go to “Final Actions” on page 2-10.

Final Actions

1. Do the required preventive maintenance procedures. See “Preventive Maintenance” on page 6-5.
2. Complete all required administrative tasks.

2.1 No Functions Work

NOTE:
This procedure assumes that no functions work from the pendant or caregiver controls on the siderails.

SHOCK HAZARD:
The possibility for electrical shock exists with electrical equipment. Failure to follow facility protocols can cause death or injury.

1. Make sure the two AC power fuses are serviceable.

   The fuses are serviceable.

   Yes **No**
   ↓ → Replace the fuses (refer to procedure 4.22 on page 4-61) and then go to "Function Checks" on page 2-4.

2. Make sure all the cables on the siderail interface P.C. board are connected correctly.

   All cables are connected correctly.

   Yes **No**
   ↓ → Connect the cables as required and then go to "Function Checks" on page 2-4.

3. Make sure the AC power cable operates correctly.

   The cable is plugged into the power outlet correctly.

   Yes **No**
   ↓ → Plug the cable into the outlet correctly and then go to "Function Checks" on page 2-4.

4. Disconnect the bed from its power source and use an applicable test device to measure if voltage at the power outlet is present.

   The voltage is correct.

   Yes **No**
   ↓ → Tell the customer of the problem concerning the power outlet. Connect the bed to a working power outlet, and then go to "Function Checks" on page 2-4.

5. Examine the AC power cable for damage.

   The AC power cable is in satisfactory condition.

   Yes **No**
   ↓ → Replace the AC power cable (refer to procedure 4.21 on page 4-58) and then go to "Function Checks" on page 2-4.

6. Use the CPR control to adjust the head section to the high position.

SHOCK HAZARD:
The possibility for electrical shock exists with electrical equipment. Failure to follow facility protocols can cause death or injury.

   a. Remove the power supply cover.

   b. Plug the unit into an applicable power source.

   c. Use a digital multimeter set to AC volts to measure for AC voltage present on the AC power cable.

   The voltage is correct.

   Yes **No**
   ↓ → Replace the AC power cable (refer to procedure 4.21 on page 4-58) and then go to "Function Checks" on page 2-4.

7. Use a digital multimeter set to AC volts to measure for AC voltage present on the transformer connection of the motor control P.C. board.

   The voltage is correct.

   Yes **No**
   ↓ → Replace the motor control P.C. board (refer to procedure 4.15 on page 4-46) and then go to "Function Checks" on page 2-4.

8. Test the interface P.C. board.

   a. Disconnect the patient pendant and siderails.

   b. Connect a known good part.

   c. Connect the patient pendant and siderails to the good part.

   All functions operate correctly.

   Yes **No**
   ↓ → Replace the original interface P.C. board. If this solves the problem, do the "Final Actions" on page 2-10; otherwise speak with Hill-Rom Technical Support.

9. Test the patient pendant and siderail controls.

   a. Disconnect the patient pendant and siderails.

b. Connect a known good part.

c. Connect the patient pendant and siderails to the good part one at a time. Test the functions after a part is connected.

10. Make sure that the patient pendant and caregiver siderail controls operate correctly.

    The functions operate correctly.

    Yes **No**

    ↓ → Replace the patient pendant or siderail as required. If this solves the problem, do the "Final Actions" on page 2-10; otherwise speak with Hill-Rom Technical Support.

11. Go to "Final Actions" on page 2-10.

2.2 Lockout Malfunction

NOTE:
The symptom of this malfunction is after you push the lockout button, none of the indicators flash.

NOTE:
The Bed Not Down indicator does not flash in the steps that include the asterisk symbol (*).

1. At least one of the other functions operate correctly.

   Yes **No**
   ↓ → Go to RAP 2.1 on page 2-11.

2. Make sure the correct connection in the interface box:

   a. Swap siderail cable connections in the power supply.

   b. Push the **Lockout** control.

   All the indicators flash (*).

   Yes **No**
   ↓ → Go to step 4.

3. Replace the siderail interface P.C. board (refer to procedure 4.19 on page 4-54) on the siderail.

4. Do these steps to make sure the caregiver siderail controls operate correctly:

   a. Disconnect the control unit.

   b. Connect a known good part.

   c. Push the function on the caregiver control panel.

   All the LEDs flash (*).

   Yes **No**
   ↓ → Replace the siderail control panel (refer to procedure 4.6 on page 4-19) with the correct configuration. If this solves the problem, do the “Final Actions” on page 2-10; otherwise speak with Hill-Rom Technical Support.

5. Go to “Final Actions” on page 2-10.

2.3 Hilow Malfunction

1. At least one of the other functions works.

   Yes **No**
   ↓ → Go to RAP 2.1 on page 2-11.

2. Identify the related hilow column.

   One hilow column does not operate.

   Yes **No**
   ↓ → Go to step 5.

3. Swap the hilow column connectors #6 and #4 (yellow) on the power supply P.C. board.

   The faulty column operates correctly.

   Yes **No**
   ↓ → Replace the defective column: head hilow (refer to procedure 4.9 on page 4-24) or foot hilow (refer to procedure 4.9 on page 4-24).

4. Replace the motor control P.C board (refer to procedure 4.15 on page 4-46).

5. Go to “Final Actions” on page 2-10.

2.4 Knee Section Malfunction

1. At least one of the other functions operates correctly.

   Yes **No**
   ↓ → Go to RAP 2.1 on page 2-11.

2. Do these steps to make sure the controls operate correctly:

   a. Connect a known good part.

   The controls operate correctly.

   Yes **No**
   ↓ → Go to step 4.

3. Replace the control.

4. Do these steps to make sure the knee section motor operates correctly:

   a. Remove the power supply cover.

   b. Connect a new knee section motor.

   c. Push the **Foot Up/Down** control to lift and lower the knee section.

5. The knee section operates correctly.

   Yes **No**
   ↓ → Replace the knee motor (refer to procedure 4.4 on page 4-13). If this solves the problem, do the "Final Actions" on page 2-10; otherwise speak with Hill-Rom Technical Support.

6. Replace the motor control P.C board (refer to procedure 4.15 on page 4-46).

   This solves the problem.

   Yes **No**
   ↓ → Speak with Hill-Rom technical support.

7. Go to "Final Actions" on page 2-10.

2.5 Head Section Malfunction (does not include Automatic Contour)

1. At least one of the other functions works.

   Yes **No**
   ↓ → Go to RAP 2.1 on page 2-11.

2. Do these steps to make sure controls operate correctly:

   a. Connect a known good part.

   The functions are operating correctly.

   Yes **No**
   ↓ → Go to step 4.

3. Replace the control.

4. Do these steps to make sure head section motor operates correctly:

   a. Push the **Head Up** control and lift the head section to the high position. If this can not be accomplished electrically, use the CPR handle and lift the head section manually.

   b. Remove the power supply cover.

   c. Connect a known good motor.

   d. Push the **Head Up** control to raise then push the **Head Down** control to lower the head section.

   The head section operates correctly.

   Yes **No**
   ↓ → Replace the head motor (refer to procedure 4.2 on page 4-6). If this solves the problem, do the "Final Actions" on page 2-10; otherwise speak with Hill-Rom technical support.

5. Replace the motor control P.C. board (refer to procedure 4.15 on page 4-46).

   This solves the problem.

   Yes **No**
   ↓ → Speak with Hill-Rom technical support.

6. Go to "Final Actions" on page 2-10.

2.6 Battery Backup Malfunction

1. Examine the date on the battery. Replace if it is older than 3 years.

2. Do these steps to make sure the controls operate correctly:

   a. Connect a known good control (pendant or siderail P.C. board).

   The controls operate correctly.

   Yes **No**
   ↓ → Go to step 4.

3. Replace the control(s).

4. Remove the battery cover and make sure the battery is correctly connected.

   The battery is connected correctly.

   Yes **No**
   ↓ → Connect the battery correctly and go to “Function Checks” on page 2-4.

5. Make sure the battery charges correctly.

   a. Plug the bed into an applicable power source and make sure that it remains connected for at least 12 hours without use of the batteries. After 12 hours, disconnect the bed from its power source.

   The bed operates correctly on battery backup after it is charged.

   Yes **No**
   ↓ → Go to step 7.

6. Go to “Final Actions” on page 2-10.

7. Install a new battery to make sure the battery backup is not defective.

   The bed operates correctly with the new battery backup.

   Yes **No**
   ↓ → Speak with Hill-Rom Technical Support.

8. Replace the motor control P.C. board (refer to procedure 4.15). If this solves the problem, do the “Final Actions” on page 2-10; otherwise speak with Hill-Rom Technical Support.

2.7 Trendelenburg/Reverse Trendelenburg Malfunction

Initial conditions: the hilow function works (see "Function Checks" on page 2-4).

1. At least one of the other functions works.

   Yes **No**
   ↓ → Go to RAP 2.1 on page 2-11.

2. Do these steps to make sure the caregiver controls operate correctly:

   a. Disconnect the control unit.

   b. Connect a known good control unit.

   The Trendelenburg/Reverse Trendelenburg function works.

   Yes **No**
   ↓ → Replace the motor control P.C. board (refer to procedure 4.15 on page 4-46). If this solves the problem, do the "Final Actions" on page 2-10; otherwise speak with Hill-Rom Technical Support.

3. Replace the control unit.

   This solves the problem.

   Yes **No**
   ↓ → Speak with Hill-Rom Technical Support.

4. Go to "Final Actions" on page 2-10.

2.8 CPR Malfunction

Initial conditions: the hilow function works (see “Function Checks” on page 2-4).

1. Examine the mechanics of the CPR system:

   a. Remove the seat, knee, and foot sleep deck sections. Make sure the mounting hardware is not damaged and is present on the release mechanism of the head section motor.

   All hardware is attached and not damaged.

   Yes **No**
   ↓ → Replace the parts that are damaged or not present and then go to “Function Checks” on page 2-4.

2. Make sure that the release cable is not broken or damaged.

   The cable is intact.

   Yes **No**
   ↓ → Go to step 4.

3. Make sure that the adjustment of the release cable is correct (refer to procedure 4.3 on page 4-10).

   The adjustment is correct.

   Yes **No**
   ↓ → Adjust the release cable (refer to procedure 4.3 on page 4-10).

4. Replace the head section motor (refer to procedure 4.2 on page 4-6) and release cable subassembly (refer to procedure 4.3 on page 4-10).

   This solves the problem.

   Yes **No**
   ↓ → Speak with Hill-Rom technical support.

5. Go to “Final Actions” on page 2-10.

2.9 Braking Malfunction

1. Examine that the screws or supports are not damaged or loose, and are present on the caster attachments.

   All the screws and supports are attached and not damaged.

   Yes **No**
   ↓ → Replace the parts that are damaged or not present and then go to "Function Checks" on page 2-4.

2. Examine the brake/steer bar. Set it to the Brake position, and then make sure that the four casters are locked by trying to move the bed.

   The braking is correct.

   Yes **No**
   ↓ → Replace the caster(s) (refer to procedure 4.5 on page 4-16) and then go to "Final Actions" on page 2-10.

3. This solves the problem.

   Yes **No**
   ↓ → Speak with Hill-Rom technical support.

4. Go to "Final Actions" on page 2-10.

2.10 Steering Malfunction

1. Set the brake/steer bar to the **Brake** position. Examine that the screws or supports are not damaged, loose and are present on the caster attachments.

   All the supports and screws are attached and not damaged.

   Yes **No**
   ↓ → Replace the damaged or parts that are not present, and then go to "Function Checks" on page 2-4.

2. Examine the steering function. Set the brake/steer bar to the **Steer** position, push the bed lengthways, and make sure that the foot left caster locks in the lengthways direction of the bed.

   The caster locks in the lengthways direction.

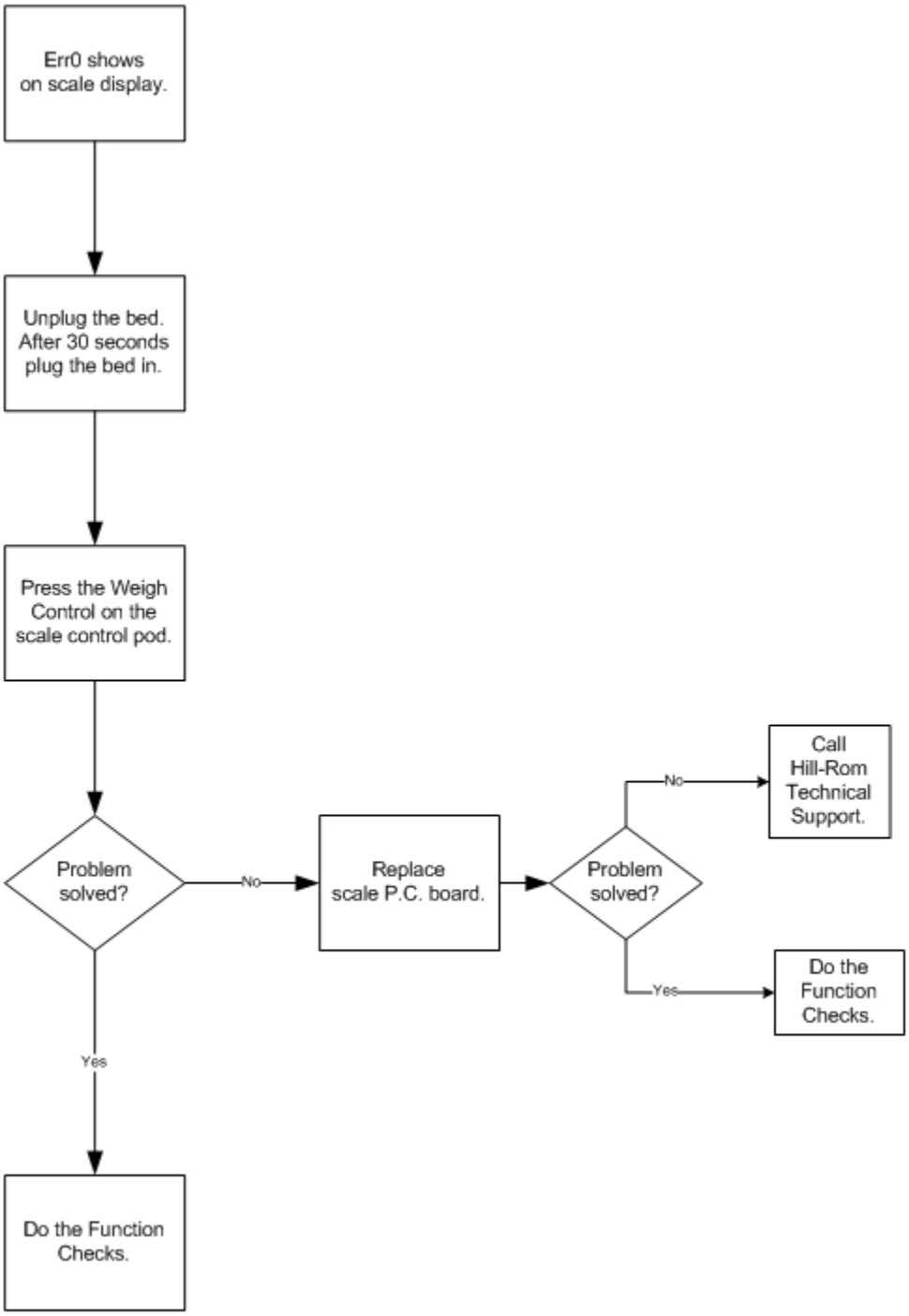
   Yes **No**
   ↓ → Replace the caster (refer to procedure 4.5 on page 4-16). If this solves the problem, do the "Final Actions" on page 2-10; otherwise speak with Hill-Rom technical support.

3. This solves the problem.

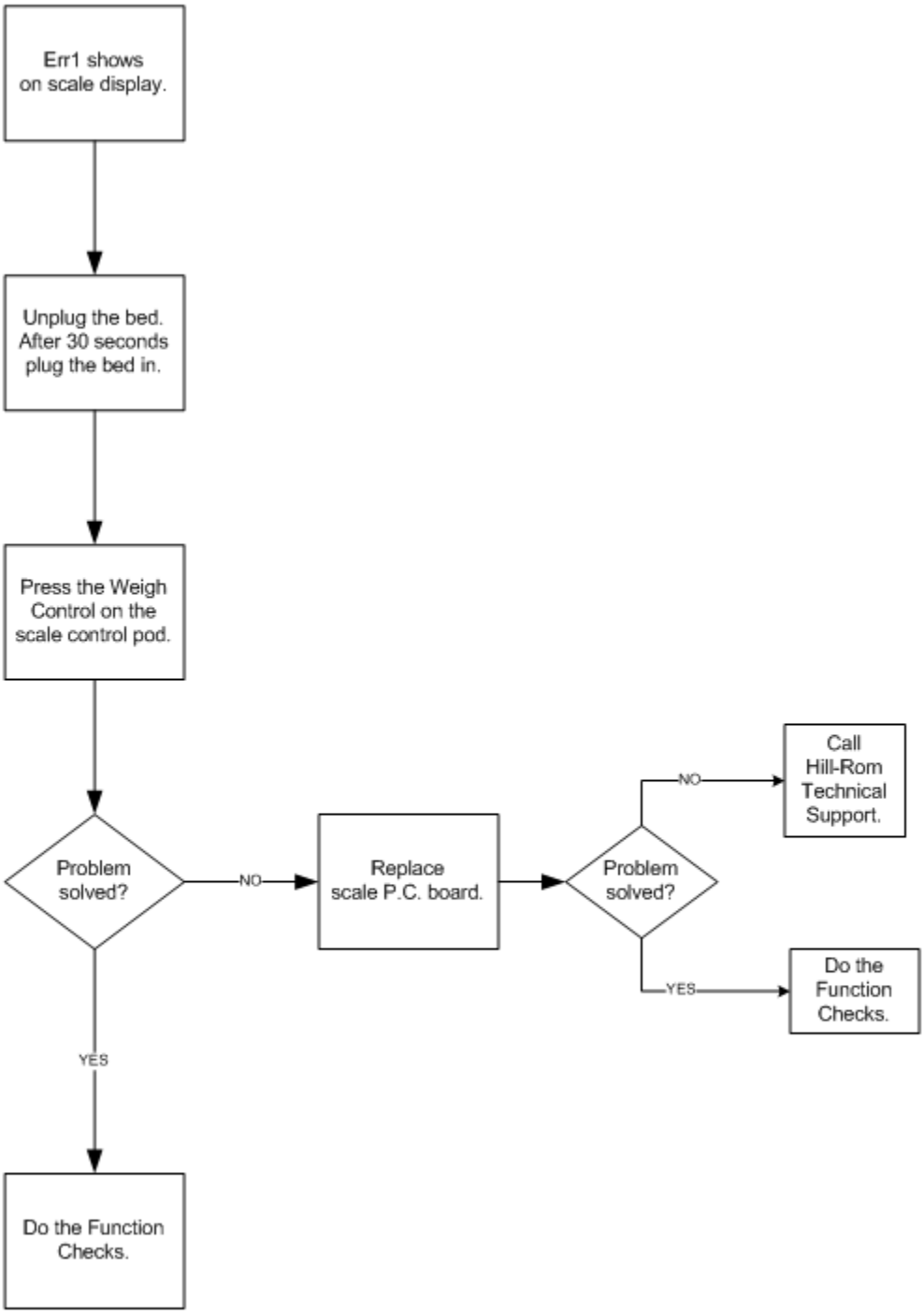
   Yes **No**
   ↓ → Speak with Hill-Rom technical support.

4. Go to "Final Actions" on page 2-10.

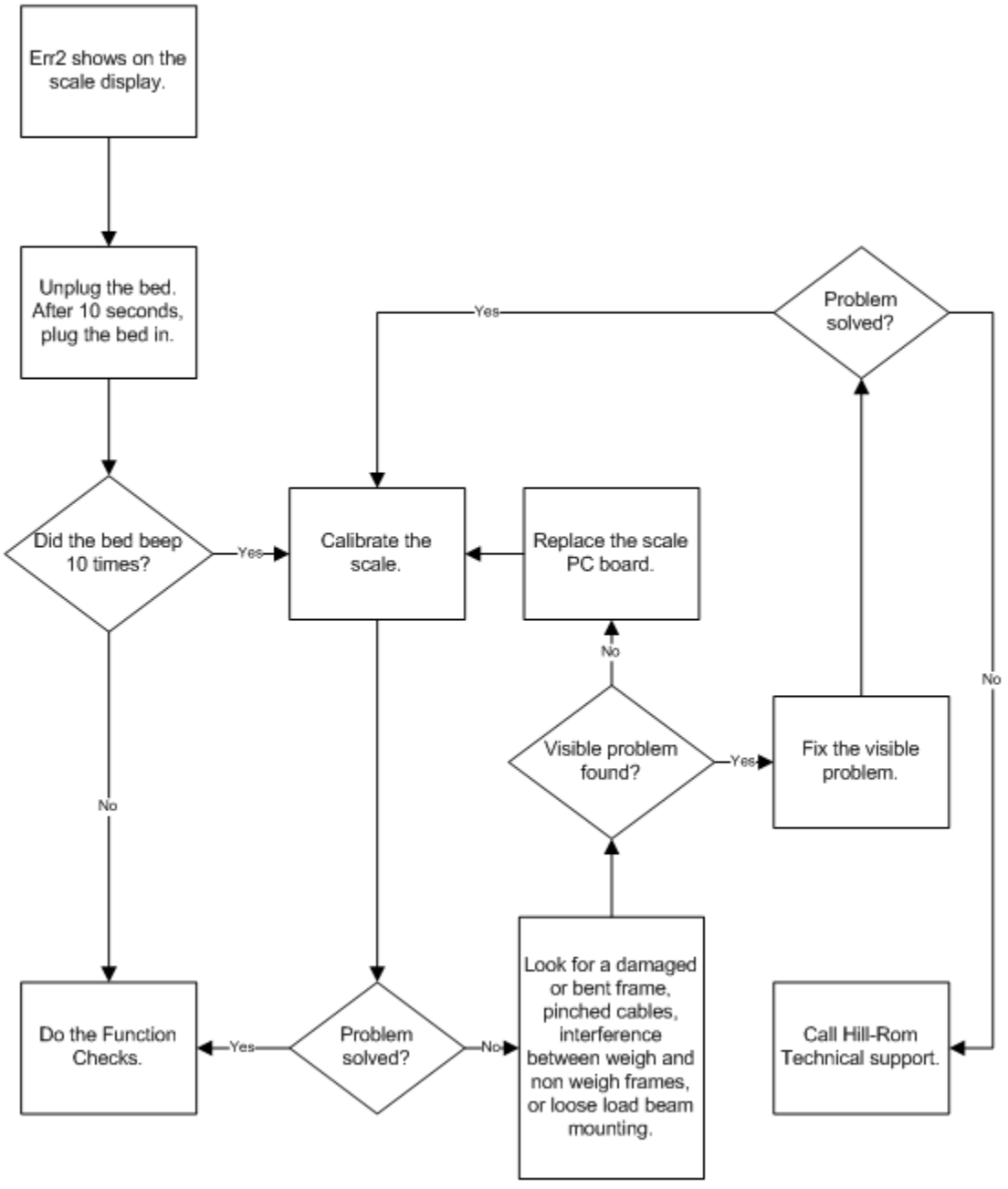
2.11 Scale Error 0



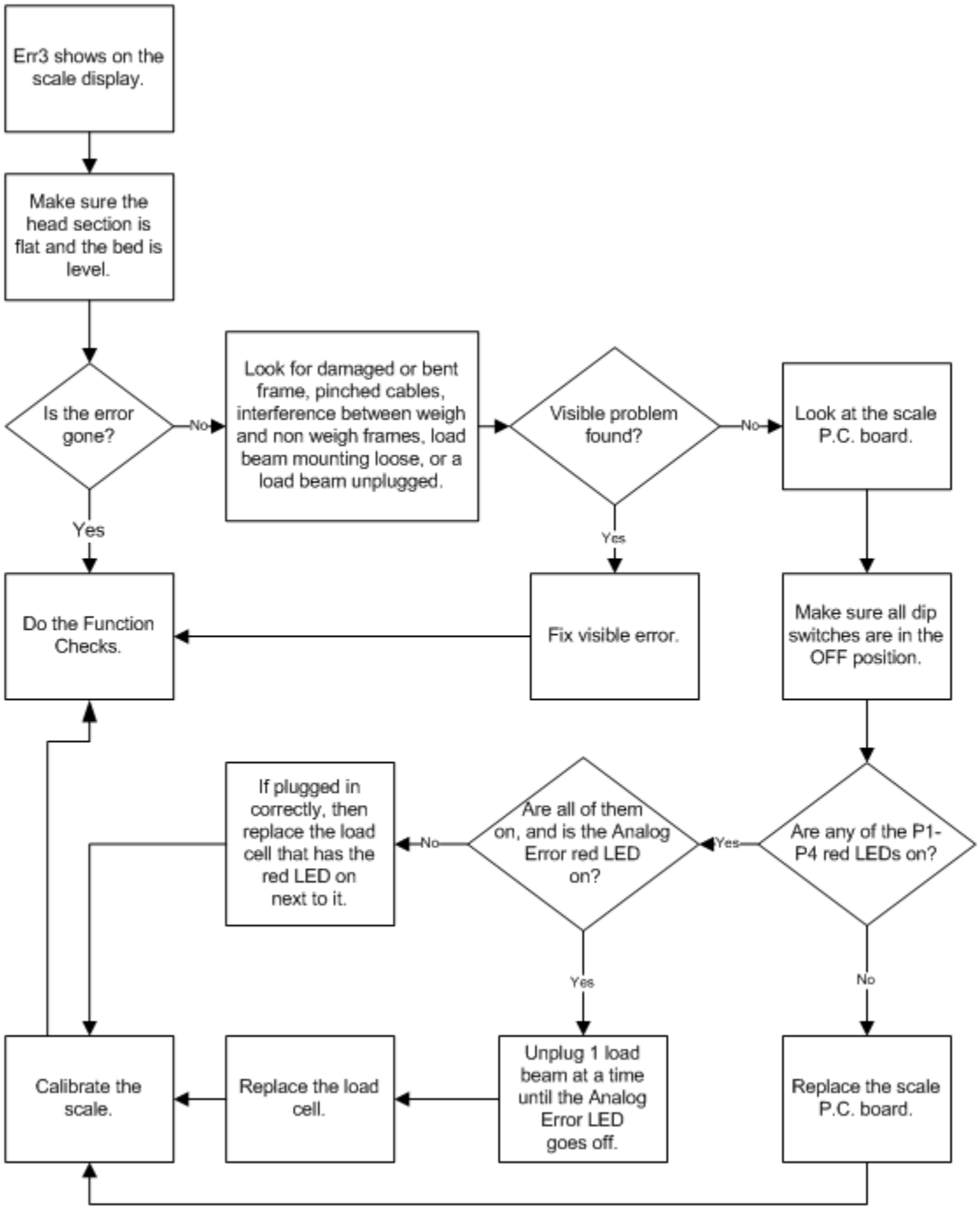
2.12 Scale Error 1



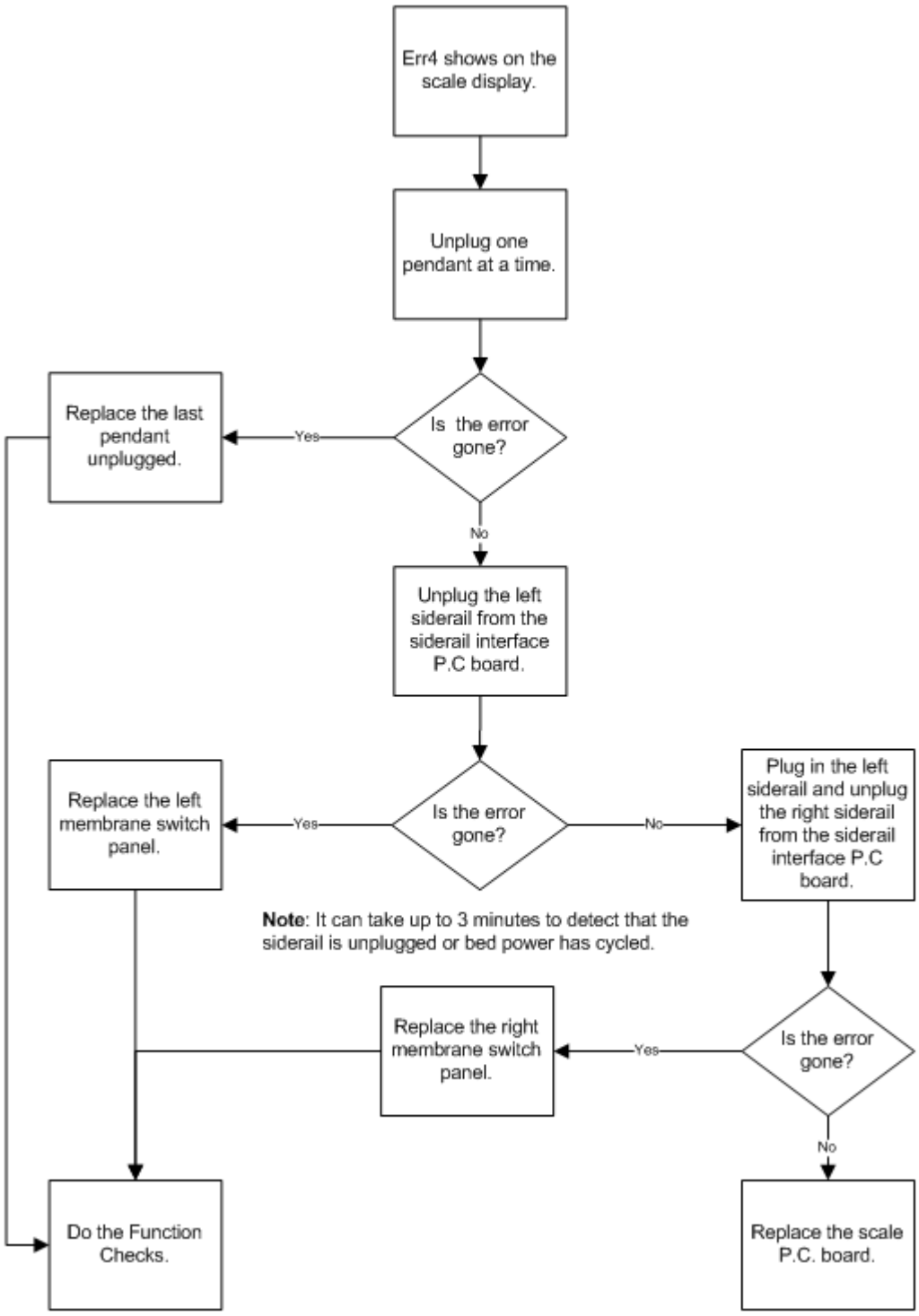
2.13 Scale Error 2



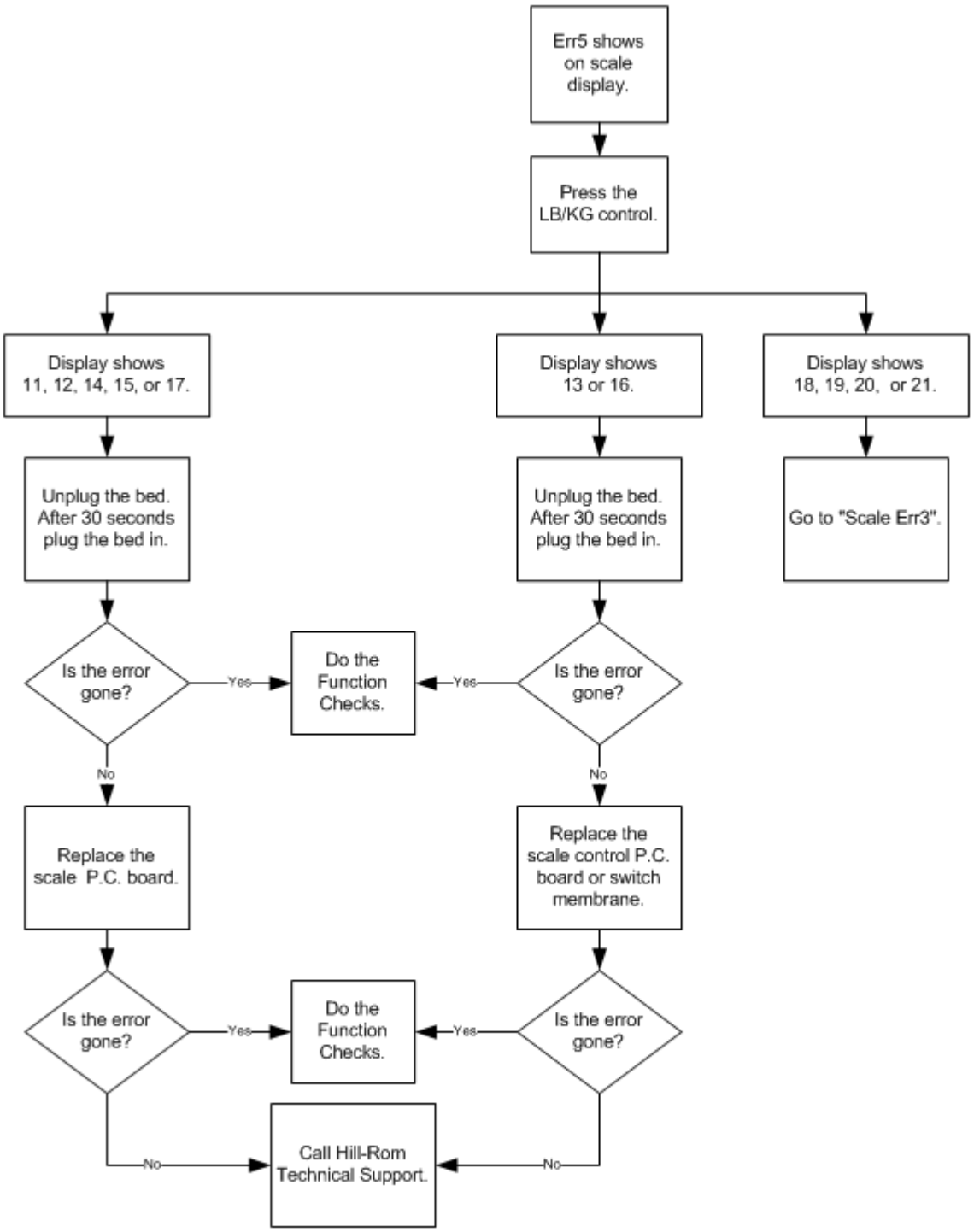
2.14 Scale Error 3



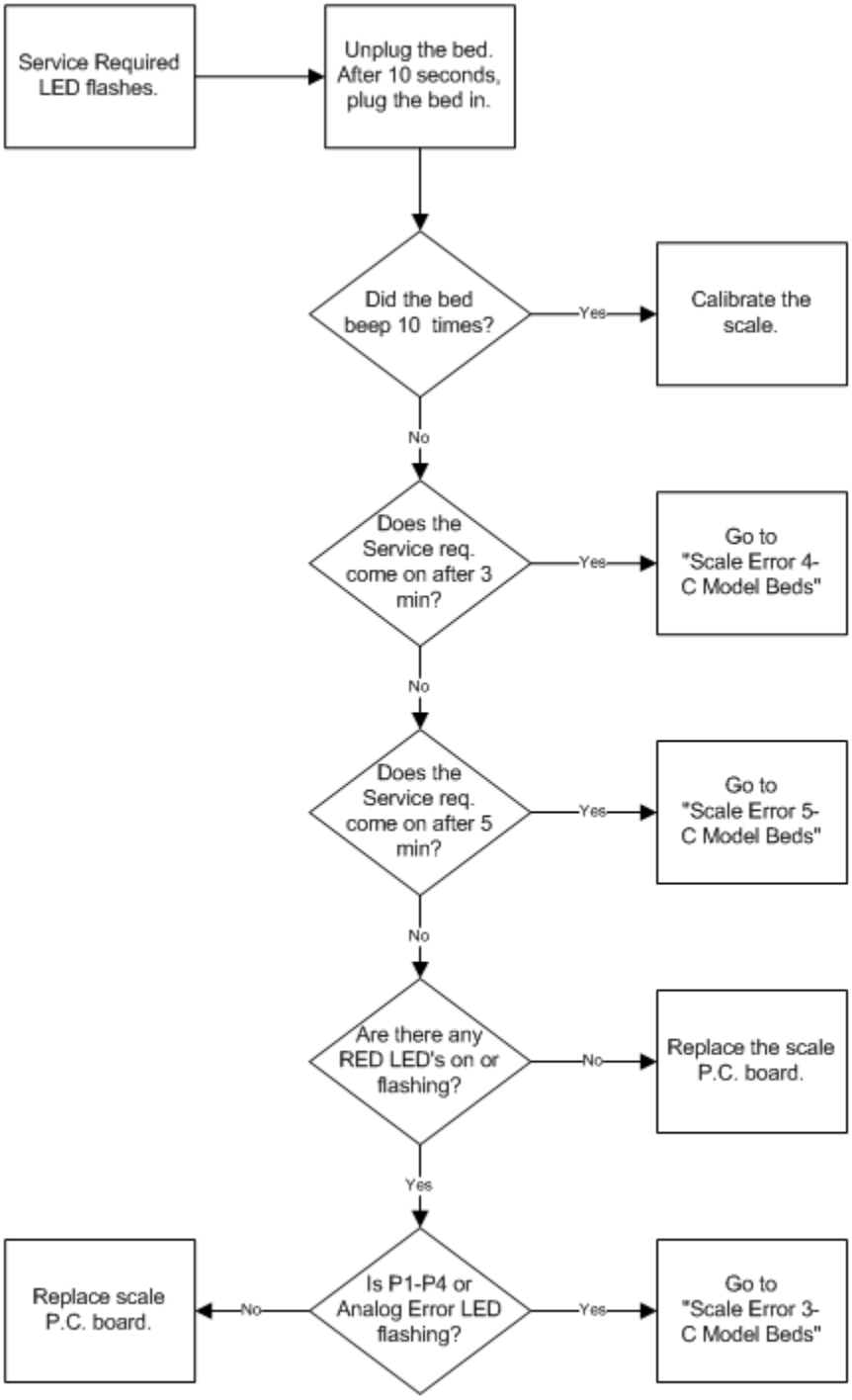
2.15 Scale Error 4



2.16 Scale Error 5



2.17 Service Required LED Flashes



NOTES:

Chapter 3
Theory of Operation

Introduction

The Theories of Operation for the Hill-Rom® 1000 Bed are as follows:

- Mechanical System
- Electrical System

The interaction between these subsystems lets all the operational functions be used.

The electrical functions are driven by low voltage actuators.

Each of the subsystems is identified in the sections that follow. The schematic diagrams are found at the end of this chapter.

Mechanical System

The mechanical subsystem consists of two connected systems:

- Bed frame
- Sleep surface

Retractable Head Section

The retractable head section is achieved by the control of a sliding movement of the head section frame with two sliding blocks in channels at each side of the intermediate frame. This lets the head section frame extend (with respect to the seat section). The hard surface also extends (with respect to the head section frame) in the direction of the head. This is achieved by the two elevation arms of the head section frame that terminate in a gear teeth configuration that is interfaced with the notches in the rear of the head section hard surface. This moves the hard surface in the direction of the head as the head section is raised.

Emergency CPR Release

The CPR control handles are installed at the head of the bed, under each corner of the sleep deck. Pull one of the handles to disengage the driving gear of the head section motor inside the actuator. This lets the head section drop under the pull of gravity, assisted by one spring, cushioned by one damper.

Hilow System

WARNING:
Replace the column if it becomes defective. Do not dismantle the column. Failure to obey this warning could cause injury.

The hilow system features two columns each composed of three sections that slide in relation with each other by a pantograph system. This system is driven by a fixed motor installed at the base of the mechanism. This system lets the unit travel up or down 15.7" (39.9 cm). Upper and lower EOT switches are backed up to make sure of electrical security. It is not necessary for special maintenance during its designed time of use. But, the columns can be replaced or repaired if a failure occurs, but only by Hill-Rom approved persons.

Casters

The bed has four casters: three brake and one brake/steer. Each caster has a 30° inclination activation mechanism and three positions:

- Brake caster—Brake/Neutral/Neutral
- Steer caster—Brake/Neutral/Steer

The brake/steer caster is installed on the left side, foot. Antistatic brake casters are installed in the remaining caster positions. They are identified by a yellow dot on the tire.

Braking

The braking system includes four brake casters that are controlled by the brake/steer bar. The bar consists of two hexagonal bars with a connecting bar situated in the right box-section of the lower frame. The brake/steer bar is directly mounted on the foot hexagonal bar of the bed.

Steering

The left foot caster is the steering caster. It is controlled by the brake/steer bar.

Head and Footboards

The headboard and footboard have an extruded/blow-molded plastic structure with chrome-plated steel clasps for assembly and decorative laminated panels. The headboard and footboard are interchangeable and can be used as a CPR backboard.

Electrical System

The specifications of the bed are as follows:

Table 3-1. Bed Specifications

Description	Specification
Type of protection against electric shock (refer to IEC 60601-1)	Class I
Degree of protection against electric shock (refer to IEC 60601-1)	Type B
Protection against dangerous ingress of water (refer to IEC 60529)	IPX4
Intermittent operation	10% 3 min/27 min
Maximum power load	4.2 A

Table 3-2. Voltage and Frequency

Voltage ± 10%	Frequency	Maximum Current (Amps)	Idle Current (Amps)
100	50/60 Hz	5.75	.57
110	50/60 Hz	4.99	.48
115	50/60 Hz	4.99	.48
120	50 Hz	5.58	.44
120	60 Hz	5.3	.184
127	50/60 Hz	4.95	.48
220	50/60 Hz	3.1	.31
230	50/60 Hz	2.75	.29
240	50/60 Hz	2.46	.29

Refer to the schematic diagram at the end of this section to get specified data for the cabling.

These functions are done by motors and use a very low voltage.

Power Supply Unit Characteristics

Table 3-3. Power Supply Unit Characteristics

Description	Specification
Input characteristics	(see table 3-2 on page 3-4)
Fuse rating on primary	5.0/2.5 A time delay
Output voltage	18 to 40 V AC rectified, filtered

Table 3-4. Maximum Power Load

Voltage	Input Power (Peak)	Input Power (Idle)
100	580 VA	60
110	550 VA	55
115	580 VA	55
120	670 VA	55
127	630 VA	60
220	680 VA	70
230	630 VA	70
240	590 VA	70

The power supply unit is composed of these components:

- Power stage
- Functions controlled by relays and transistors
- Battery charging circuit
- Control logic and specified functions

The functions can be locked out when the caregiver controls are used. When they are not locked out, they may be in use by one of these:

- Patient pendant
- Caregiver controls

Power Stage

The power stage is composed of an AC input transformer. Two anti-surge fuses and an internal self-resetting thermal cutout prevent damage to the input.

There are two transformer options: one has only a one winding primary, for use in 120 V, 60 Hz (North America); and the other has two primaries, multi-tapped, for use in 100, 110, 115, 127, 220, 230, and 240 V, 50/60 Hz and 120 V, 50 Hz applications.

There are two secondaries. Positive Temperature Coefficient (PTC) devices prevent damage to the secondaries. The PTCs are installed on the siderail interface P.C. board. The first secondary, 24.5 V AC, supplies power to the motor control P.C. board. It is rectified and filtered by the motor control P.C. board to supply a voltage of approximately 33 V DC to supply power to the drive motors. The other secondary, 14.5 V AC, is rectified, filtered, and regulated to supply a voltage of 8.5 V DC to supply power to the Scale System, Bed Exit System, and the SideCom® Communication System.

Function Control

The motors are controlled by relays and/or field-effect transistors (FET). In order to prevent these relays from electrical arcing during switching, the FET transistor operates such that when a function is started, the relay closes with no current. In the same way, when a function control is released, the FET cuts the power before the relay opens.

Overload limiting is supplied by controlling the current at the output of each motor. If an overload or mechanical blockage occurs, the supply of the related motor is cut off by a control transistor without affecting the operation of the other motors. This does not include special situations. In this instance, the overload is indicated by a sound. This overload indication also enables failure of a motor EOT to be detected. This does not include the hilow columns, which have an alternate EOT.

Battery Circuit

The bed has a battery backup. This battery backup is internal to the power supply unit. The charging circuit has current limiting based on the level of the battery charge. Charging begins as soon as the unit is connected to AC power. At the end of charging, the load current is very low.

When the power supply is disconnected from the AC power, the battery backup is started by pressing the **Battery** control on the caregiver controls.

The battery charge level is controlled. In this way, a flashing indicator and a low battery buzzer is started during movement, if the battery voltage drops. This is a continuous beep of several seconds that is heard each time a control is pressed.

After power outlet connection, the indicator continues to flash until the battery has charged.

Battery operation is automatically stopped 30 seconds after the end of the last movement.

Battery Characteristics

Table 3-5. Battery Backup Characteristics

Description	Specification
Components	two 12 V, 1.2 Ah batteries
Voltage	24 V DC
Maximum charging time	12 hours
Discharge time (storage), battery connected to bed	Minimum 10 days
Discharge time (storage), battery not connected to bed	3 months

The batteries are sealed lead acid, connected in series. A 10 A fuse is installed on the connection wires.

The battery type has no memory effect and can be charged regularly without constraints.

The capacity of the battery backup after full charge is at least three lift and lower cycles for hilow, head section, knee section, and foot section with the maximum safe working load 400 lb (181 kg) on the bed.

Control Logic and Special Functions

Combined activations of the motor supply these functions:

- Dining Chair® Position
- Automatic Contour
- Trendelenburg and Reverse Trendelenburg function
- Lockout management
- Patient pendant or caregiver siderail control unit interfacing
- Indication of Bed Not in Low Position (see “Detection of Bed Not in Low Position” on page 3-9)

All of these functions are integrated into a complex programmable logic device (CPLD).

Patient Pendant

The patient pendant controls operate at 3.3 V DC supplied by the motor control P.C. board and integrate three primary principles:

- Filtering and amplification of inputs for electrostatic protection and signal formatting
- Multiplexing for the management of the controls
- Demultiplexing for the control of the indicators

Data from the controls and indicators are transmitted in series (link type - SPI) so as to decrease the quantity of wires. The clock signal that starts these changes is controlled by the motor control P.C board. All the data is sent in tens of milliseconds. When the system is in stand-by mode, the power is cut off and the clock signal is no longer controlled. The battery control is thus directly wired so as to have continuous operation.

Motor Characteristics

Table 3-6. Motor Characteristics and Dimensions

Description	Hilow column motor	Head motor	Knee motor
Power	96 W (x2)	120 W	84 W
Voltage	18 to 40 V DC	18 to 40 V DC	18 to 40 V DC
Intermittent service	10% 3 min/27 min	10% 2 min/18 min	10% 6 min/60 min
Actuator/ column travel	400 mm ± 5 mm (15.75")	239 mm ± 2 mm (9.4")	60 mm ± 2 mm (2.36")
Retracted rod/ center distance		445 mm ± 2mm (17.5")	310 mm ± 2mm (12.2")

Management of the Motors

The motor control signals are supplied by the motor control P.C. board. The motor control signal position limits are detected in series by upper and lower internal end of travel (EOT) devices. These devices directly cut off the power supply for the head section and knee section. The knee section motor also has intermediate internal microswitches to control the Automatic Contour and Dining Chair® Position.

The two hilow columns also have upper and lower internal EOT devices. For safety reasons, the two EOT devices are backed up at each end. If one of these safety devices is started, the column can not be used; but, the other functions stay operational.

Complementing these EOT devices, the overload limiting function of the power supply unit provides protection if mechanical failures, obstacles, or overload occurs.

Detection of Bed Not in Low Position

This type of detection is obtained by taking into account the state of the low EOT of the hilow columns. The motor control P.C. board controls the related indicator as soon as one of the two EOTs is released.

Automatic Contour

The motor control P.C. board, on receiving a command from the control unit, controls the Automatic Contour (head section and knee section) operation of the bed. This function is carried out through an intermediate switch of the knee section actuator. When the Head Up function is started while in the horizontal position, the head section and knee section rise until the intermediate internal microswitch of the knee section actuator cuts its power at approximately 20°. The head section actuator continues to operate until it reaches its upper EOT or its control is released. When the Head Down function is started and the head section reaches the low position, the knee section actuator continues operation until it reaches its lower EOT or its control is released.

Dining Chair® Position

The Dining Chair® Position function combines the movements of the bed frame sections and uses the intermediate internal microswitch of the knee section motor for control of the knee and foot sections.

Trendelenburg/Reverse Trendelenburg

The Trendelenburg/Reverse Trendelenburg is a fully electric function accessed by the caregiver. The function is enabled by the Enable control on the caregiver siderail controls. The principle involves controlling the two hilow columns in opposing directions based on the position required, regardless of the initial height and position of the sleep surface. As long as one of the two controls remains pressed, the two columns continue to move until their internal EOT is reached. The maximum inclination can be reached as long as AC power or battery backup is available.

Scale and Bed Exit Alarm System

Power is supplied to the Scale and Bed Exit Alarm Systems by the central power supply. The power supply provides a pre-regulated 8-9 V DC reference to signal GND at 400 mA max, 200 mA typical. The GND is the same among all nodes in the bed. This is important to the network transceiver.

The analog circuitry is a one-chip solution specially designed for scale transducers. It is installed in the frame of the bed as near to the load beams as possible. The load beams are resistive bridge sensors excited by a regulated DC voltage. This regulated voltage is supplied to the beams and to the A/D converter reference input to keep the effects of variations to a minimum.

Each beam is connected to the differential input on the A/D. The Multiplexer and Gain (up to 128) is internally configurable through software. The A/D has the ability to find open or shorted sensors. The part has a second stage sigma-delta converter. The serial interface is SPI compatible, which transfers the data to the controller.

The raw digital data is translated and filtered in software before it is put on the network. If necessary, the accelerometer or motor position can be used to find the level of the bed with respect to the floor and then correct for the cosine error.

The display has five seven-segment digits. The scale node sends a network variable for the caregiver to show. Switches installed on the display board are available to the user to start functions like **Zero** and **Display Weight**. When engaged, the network variable gets updated and read by the scale node.

Switches installed on the outside of the head siderail are available to the caregiver to start functions such as Mode Selection, Off, and Alarm Volume Level. The LEDs show the status of the Bed Exit Alarm System.

All of the Scale and Bed Exit Alarm System functions revolve around the microprocessor on the control board. This is an 8052 variant with internal 32K flash program and 256 + 1.2K EEPROM data memory. External to the microprocessor are the CAN transceiver, accelerometer, watch dog reset circuit, 2K EEPROM, and audio enunciator with three volume settings.

All of the scale functions below are done by the microcontroller on the scale P.C. board:

- Weigh
- Adjust the scale to zero
- Add/delete items
- Set the LB/KG display mode
- Manual weight adjustment

The Bed Exit Alarm System functions below are shared between the scale P.C. board and the scale display P.C. board:

- Arm/Disarm the Bed Exit Alarm System
- Set Bed Exiting mode
- Set the alarm tone
- Set the alarm volume
- Alarm

If the Bed Exit Alarm System is armed, AC power is removed, and the bed has the SideCom®[1] Communication System, the display P.C. board will cause the SideCom® Communication System to send a nurse call. If the Bed Exit Alarm System is armed and the display P.C. board loses communication with the scale P.C. board, the display P.C. board will cause the SideCom® Communication System to send a nurse call.

There is a circuit on the siderail interface P.C. board that detects when a bed articulation control (Head Up, Head Down, Knee Up, Knee Down and such) is pressed and generates a signal to the scale P.C. board. If the scale based Bed Exit Alarm System is armed, it will stop operation in the Bed Exiting mode until the articulation control is released and the signal to the scale P.C. board is removed. When the signal goes away, the Bed Exiting mode starts again and operation resumes.

When the bed is unplugged from AC power, the scale and the Bed Exit Alarm System will not function.

1. SideCom® is a registered trademark of Hill-Rom Services, Inc.

Electrical System Wiring Diagram

Figure 3-1. SideCom® Communication System

Refer to fold-out FO 3-1 at the rear of this manual.

Figure 3-2. Siderail Interface P.C. Board—P/N 72207 and 71514

Refer to fold-out FO 3-2 at the rear of this manual.

Figure 3-3. Caregiver Control

Refer to fold-out FO 3-3 at the rear of this manual.

Figure 3-4. Left Caregiver Signal Conditioning

Refer to fold-out FO 3-4 at the rear of this manual.

Figure 3-5. Bed Control Board Power and Phase Control

Refer to fold-out FO 3-5 at the rear of this manual.

Figure 3-6. Bed Control Board Power Management

Refer to fold-out FO 3-6 at the rear of this manual.

Figure 3-7. Bed Control Board Battery Management

Refer to fold-out FO 3-7 at the rear of this manual.

Figure 3-8. Bed Control Board Clock and Divider

Refer to fold-out FO 3-8 at the rear of this manual.

Figure 3-9. Bed Control Board Relay, FET and Drivers

Refer to fold-out FO 3-9 at the rear of this manual.

Figure 3-10. Bed Control Board PLD and Connector

Refer to fold-out FO 3-10 at the rear of this manual.

Figure 3-11. Bed Wiring Schematic

Refer to fold-out FO 3-11 at the rear of this manual.

Figure 3-12. Bed Control Board Motor Current Limiter

Refer to fold-out FO 3-12 at the rear of this manual.

NOTES:

Chapter 4
Removal, Replacement, and Adjustment Procedures

Tool and Supply Requirements

To service the Hill-Rom® 1000 Bed, these tools and supplies are required:

- #2 phillips head screwdriver
- 10 mm hex key
- 10 mm wrench (2)
- 13 mm socket
- Antistatic strap
- E-ring installation tool
- Extension, 6"
- Isopropyl alcohol
- Jack stand (2)
- Marking pen
- Screwdriver
- Needle nose pliers
- Rags
- Ratchet
- Scissor jack
- Screwdriver
- Small-bladed screwdriver (2)
- Small screwdriver
- Soft faced hammer
- String 10' (305 cm)

- T15 Torx®[1] screwdriver
- T25 Torx® screwdriver
- Tamper resistant Torx® screwdriver
- Tape
- Vise-Grip®[2]
- Wire cutters

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.
2. Vise-Grip® is a registered trademark of American Tool Companies, Inc.

4.1 Sleep Deck

Tools required: #2 phillips head screwdriver
E-ring installation tool
10 mm wrench
Marking pen
Tape

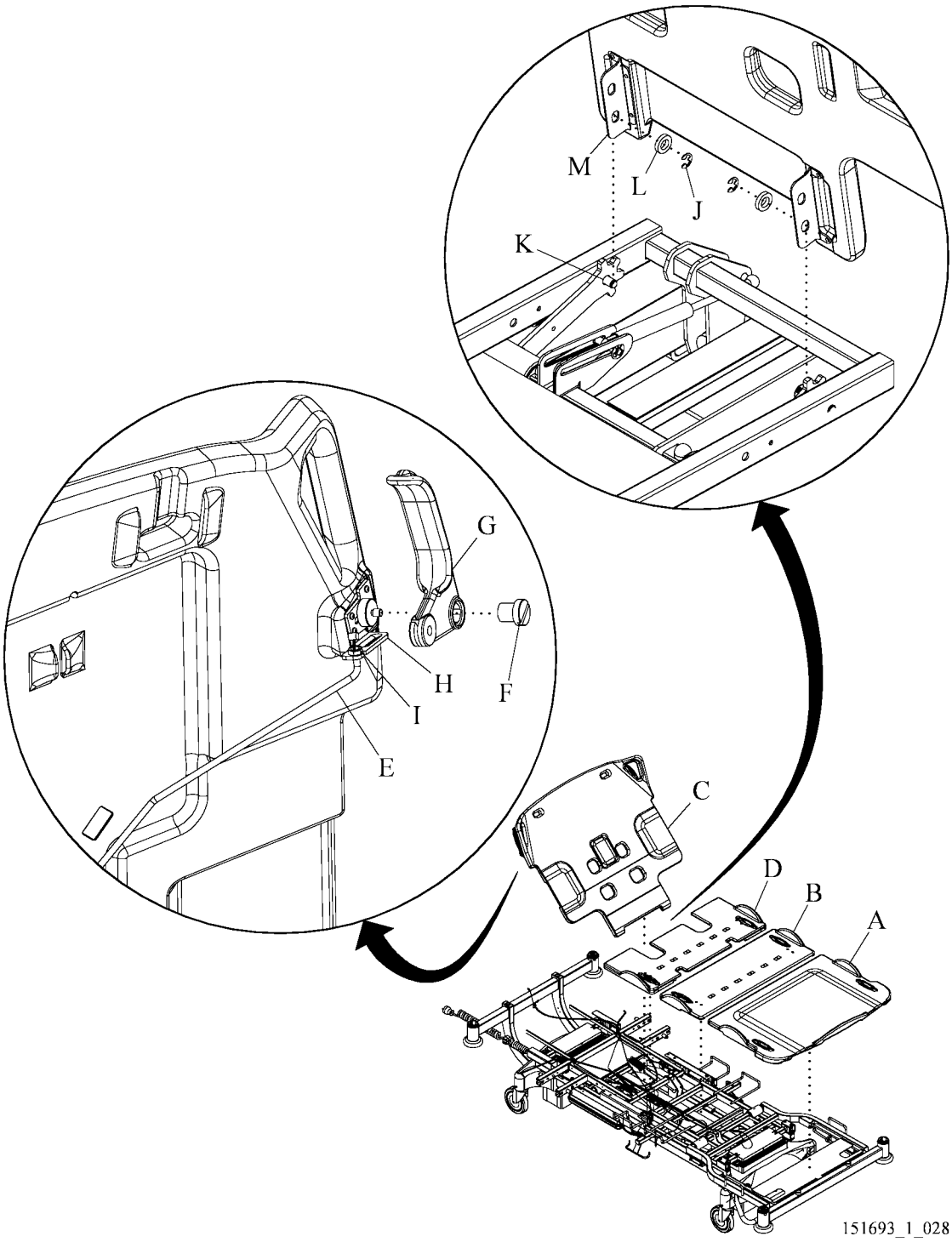
Removal

1. Set the brakes.
2. Lift the head section to the high position.
3. Lower the knee and foot sections to the flat position.

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

4. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
5. For the foot section, hold the section (A) on both ends and remove it from the bed (see figure 4-1 on page 4-4).
6. For the thigh section, hold the section (B) on both ends and remove it from the bed.
7. For the seat section (D), do as follows:
   a. Make sure the head section (C) is in the full up position.
   b. Hold the seat section (D) on one of the two ends and remove it from the bed.
8. For the head section (C), do as follows:
   a. Use the CPR release to lift the head section (C) to the full up position.
   b. Remove the seat section (D).
   c. Identify the CPR cables (E) as left or right for subsequent installation.

Figure 4-1. Sleep Deck



d. Remove the screw (F) that attaches the CPR handle (G) to the CPR mount bracket (H).

e. Remove the CPR handle (G) from the CPR cable (E).

f. Loosen, do not remove, the jam nut (I) that attaches the CPR cable (E) to the CPR mount bracket (H).

g. Do the same for step d through step f for the other side.

h. Remove the E-ring (J) from one side of the lower hinge point (K).

i. Remove the plastic washer (L) from the lower hinge point (K).

j. Do the same for step h and step i for the other side.

k. Move the head section (C) to one side to disengage the hinge bracket (M) from the hinge point (K).

l. Move the head section (C) to the other side to disengage the hinge bracket (M) from the hinge point (K).

m. Slide the head section (C) toward the head end of the bed to disengage it from the head section frame.

n. Remove the head section (C) from the bed.

Replacement

1. Do the removal procedure in opposite order.

NOTE:
The seat section can only be installed when the head section is in the full up position.

2. Make sure the CPR cable is adjusted correctly (refer to procedure 4.3)

3. Do the “Function Checks” on page 2-4.

SHOCK HAZARD:
An unusually high leakage current is symptomatic of a degradation in the AC power cable and the power supply. A value of the leakage current above 500 microamperes could cause injury.

4. Make sure that the leakage current of the bed is compliant (see “Leakage current” on page 6-6 in the Preventive Maintenance Schedule).

5. Do the “Function Checks” on page 2-4.

4.2 Head Section Motor

Tools required: (2) 10 mm wrench
13 mm socket
Ratchet
T25 Torx®[1] screwdriver

Removal

1. Set the brakes.
2. Lift the sleep surface to the highest position.
3. Lift the head section to the highest position.

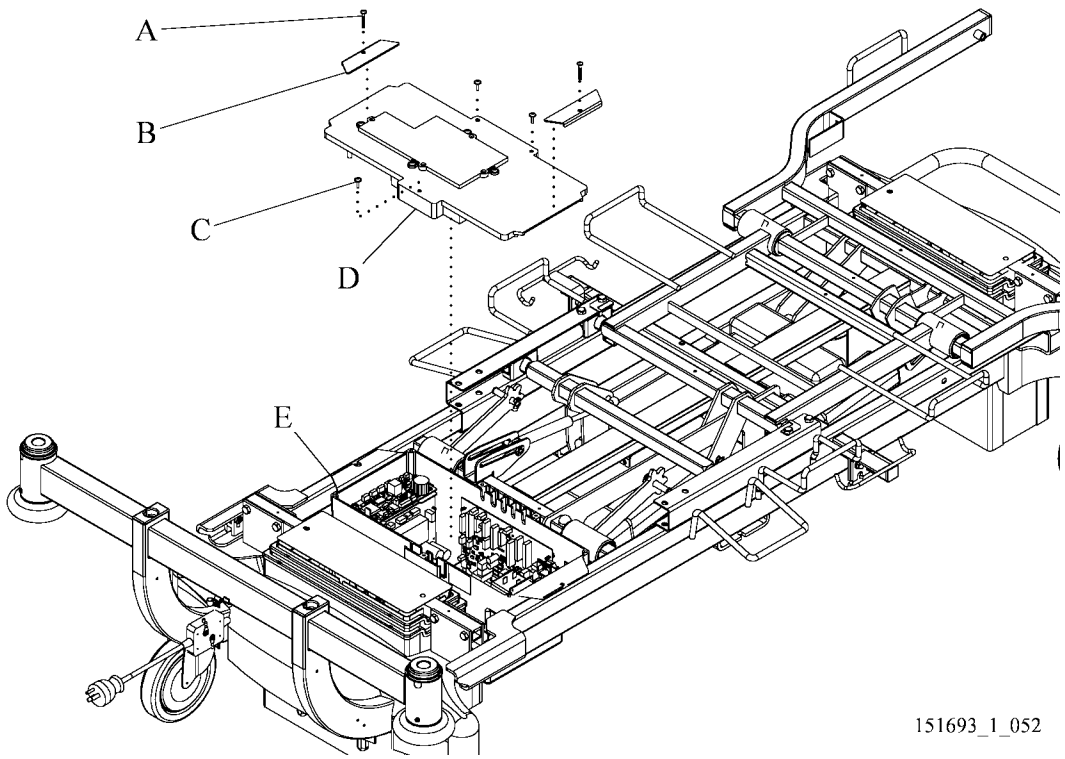
NOTE:
If the head section motor is defective, the CPR control can be used to lift the head section.

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

4. Disconnect the bed from its power source. Let the bed sit for 60 seconds so the battery will time out.
5. Remove the headboard.
6. Remove the seat and knee sections.
7. Do as follows:
   a. Remove the two screws (A) from the retainers (B) (see figure 4-2 on page 4-7).
   b. Remove the retainers (B).
   c. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).
   d. Remove the power supply cover (D).
   e. Disconnect the battery cable from the power supply P.C. board.
   f. Remove the power supply cover (D) from the bed.

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-2. Power Supply

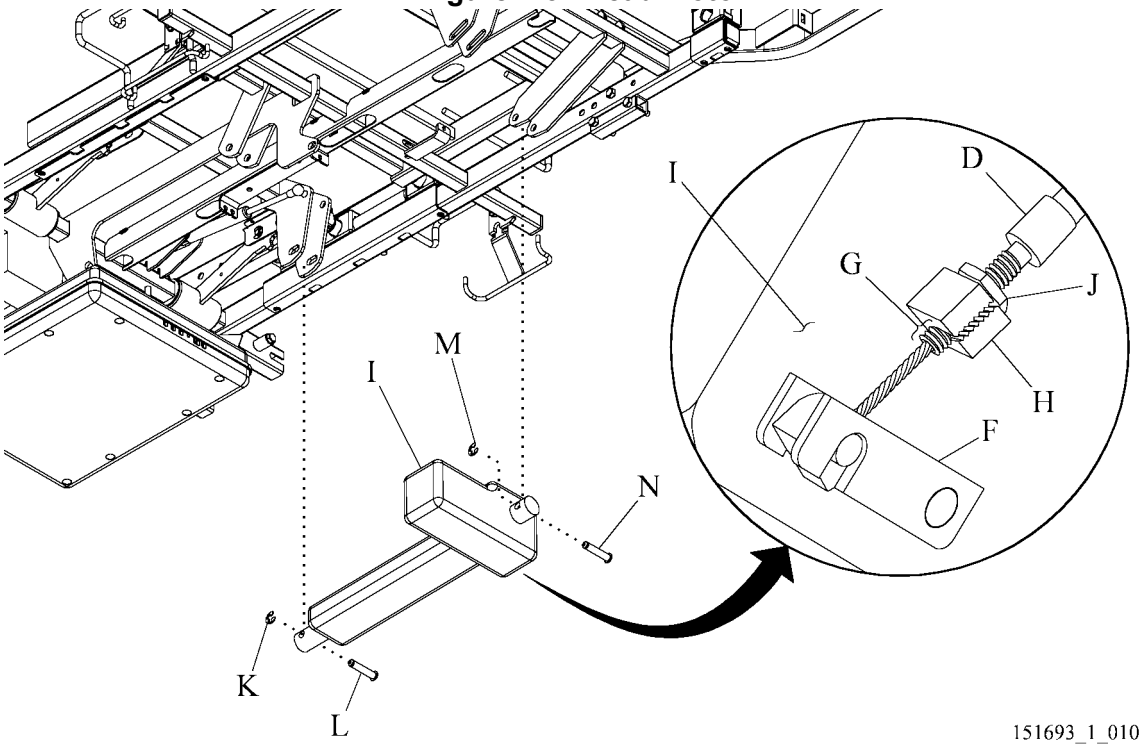


NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

8. On the power supply P.C. board, disconnect the head section motor connector (number 3).

9. Remove the cable cover on the central rail and remove the head section motor cable.

Figure 4-3. Head Motor



10. Use the CPR control to lower the head section to the flat position.

11. Disconnect the CPR cable (E) from the head motor actuator arm (F) (see figure 4-3 on page 4-8).

12. Count the quantity of threads (G) on the CPR cable (E) that extend beyond the cable mount (H) on the head motor (I).

13. Loosen the jam nut (J) on the CPR cable (E).

14. Remove the CPR cable (E) from the cable mount (H).

NOTE:
The CPR cable is threaded into the cable mount.

15. Remove the E-ring (K) from the pin (L) at the rod end of the motor (I).

16. Remove the E-ring (M) from the pin (N) at the body end of the motor (I).

17. While you hold the motor (I), remove the pin (L).

18. While you hold the motor (I), remove the pin (N).

19. Remove the motor (I) from the bed.

Replacement

CAUTION:
Make sure that the elastic installed on the new motors is not wound around the motor body before you remove it (cut). If necessary, turn the motor end rod in the applicable direction to remove this elastic. It is used to show the correct position of the switches and internal EOTs of the motor. The incorrect position of these elements can damage the motor or the structure of the bed.

1. Do the removal procedure in opposite order.
2. Remove the elastic on the motor.
3. The CPR function can start when the CPR handle is approximately halfway through its travel.
4. Adjust the CPR cable as necessary (refer to procedure 4.3).
5. Do the “Function Checks” on page 2-4.

4.3 CPR Cable

Tools required: (2) 10 mm wrench
Small screwdriver

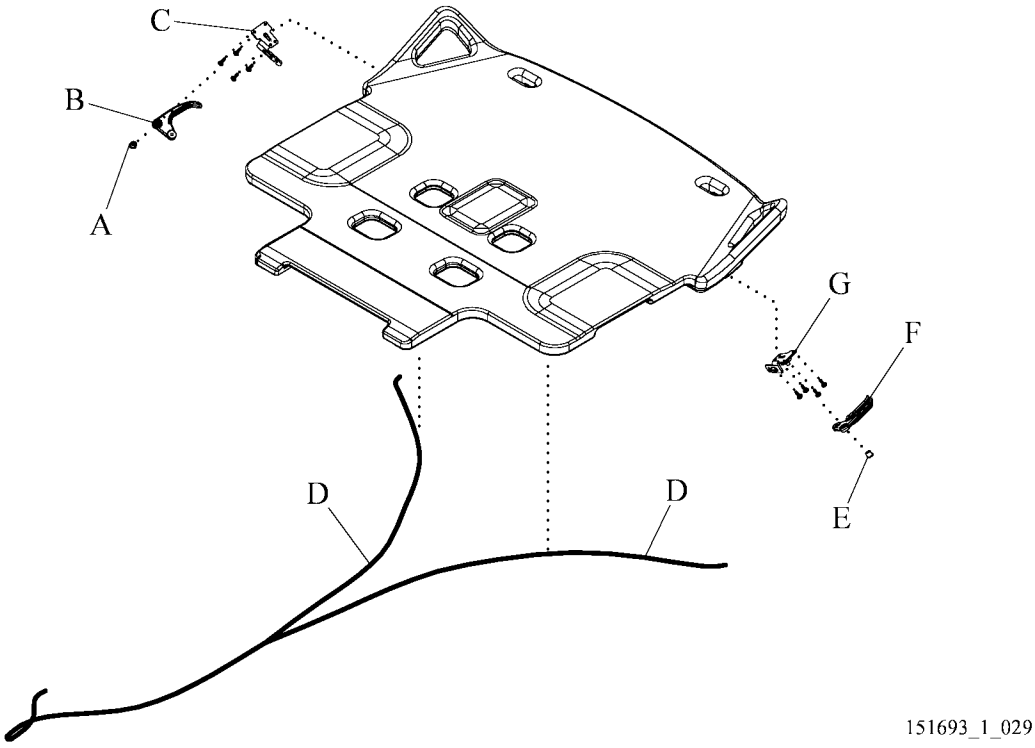
Removal

1. Set the brakes.
2. Lift the head section to the highest position.
3. Lift the sleep surface to the highest position.

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

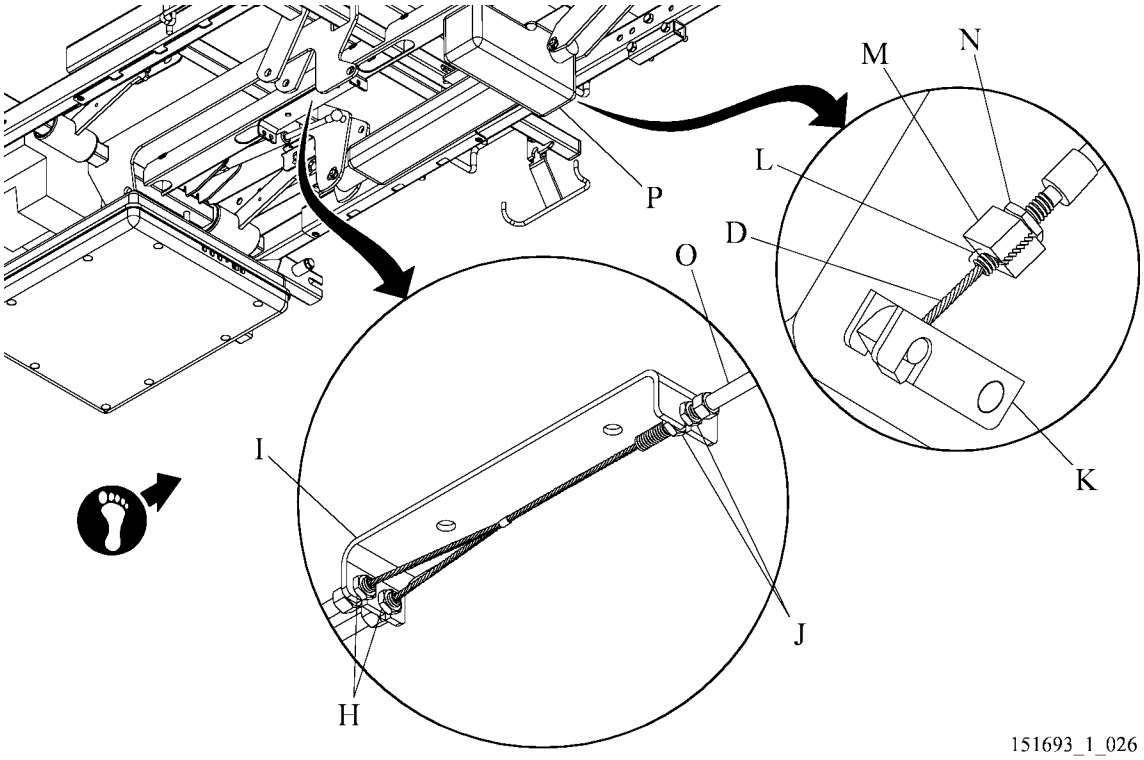
4. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
5. Remove the screw (A) that attaches the right CPR handle (B) to the CPR mounting bracket (C) (see figure 4-4 on page 4-10).

Figure 4-4. CPR Cable



6. Remove the right CPR handle (B) from the CPR cable (D).
7. Loosen the jam nut (not shown) on the CPR cable (D) at the CPR cable mount bracket (C).
8. Remove the screw (E) that attaches the left CPR handle (F) to the CPR mount bracket (G).
9. Remove the left CPR handle (F) from the CPR cable (D).
10. Loosen the jam nut (not shown) on the CPR cable (D) at the CPR cable mount bracket (G).
11. Loosen the two jam nuts (H) that attach the head section CPR cables to the adjuster bracket (I) (see figure 4-5 on page 4-11).

Figure 4-5. CPR Cable Adjustment



12. Loosen the jam nuts (J) that attaches the CPR cable (D) to the adjuster bracket (I).
13. Disconnect the CPR cable (D) from the release mechanism (K).
14. Count the quantity of threads (L) on the CPR cable (D) at the CPR cable mount (M).

15. Loosen the jam nut (N) on the CPR cable (D) at the CPR cable mount (M).

16. Remove the CPR cable (D) from the CPR cable mount (M).

17. Remove the CPR cable (D) from the bed.

Replacement

WARNING:
Make sure the CPR cable is routed through the head section guide bracket correctly: right side to right handle, left side to left handle. Failure to do so could cause patient injury or damaged equipment.

1. Do the removal procedure in opposite order.

2. Make sure to route through the head section guide bracket correctly; right side to right handle, left side to left handle.

Adjustment

1. To add tension in the cable, loosen the two jam nuts (J) and move the cable sheath (O) toward the foot end of the bed to the point where the release mechanism on the head motor (P) begins to move from the neutral position (see figure 4-5 on page 4-11).

2. To release tension in the cable, loosen the two jam nuts (J) and move the cable sheath (O) toward the head end of the bed to the point where the release mechanism on the head motor (P) begins to move from the neutral position.

3. Stop at the point where the release mechanism begins to move from the neutral position.

4. Tighten the two jam nuts (J).

5. Do the “Function Checks” on page 2-4.

4.4 Knee Section Motor

Tools required: 13 mm socket
Ratchet
Extension
E-ring installation tool
T25 Torx®[1] screwdriver

Removal

1. Set the brakes.
2. Lift the sleep surface to the highest position.
3. Lift the head section to the highest position.

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

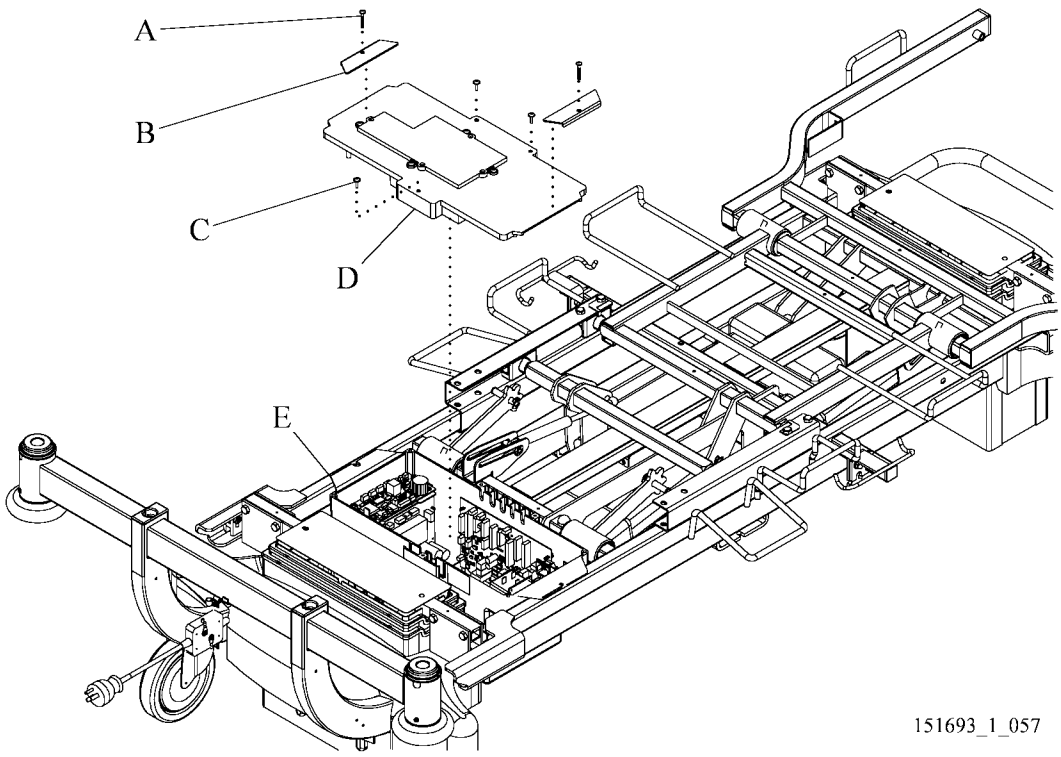
4. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
5. Remove the seat and knee sections.
6. Do as follows:
   a. Remove the two screws (A) from the retainers (B) (see figure 4-6 on page 4-14).
   b. Remove the retainers (B).
   c. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).
   d. Remove the power supply cover (D).

NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

   e. Disconnect the battery cable from the power supply P.C. board.
   f. Remove the power supply cover (D) from the bed.

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-6. B Power Supply



7. On the power supply P.C. board, disconnect the knee section motor connector (number 5).

8. Remove the cable cover on the central rail and remove the knee section motor cable.

9. Remove the knee section motor cable from the bed.

10. Remove the E-ring (F) from the rod end pin (G) (see figure 4-7 on page 4-15).

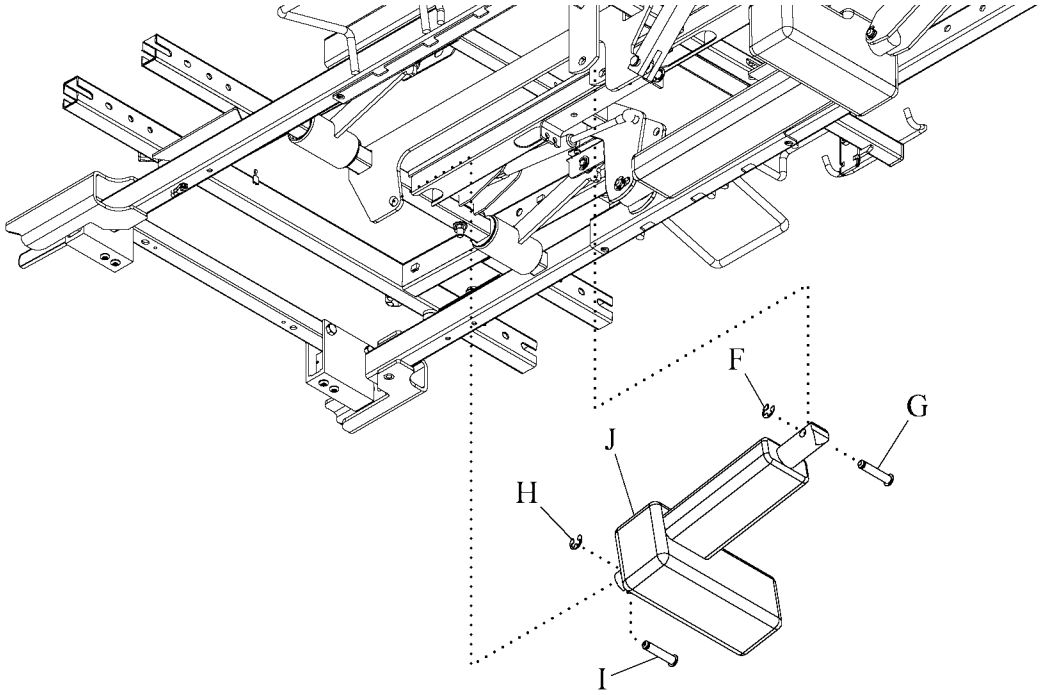
11. Remove the E-ring (H) from the motor end pin (I).

12. While you hold the motor (J), remove the rod end pin (G).

13. While you hold the motor (J), remove the motor end pin (I).

14. Remove the knee motor (J) from the bed.

Figure 4-7. Knee Motor



Replacement

1. Do the removal procedure in opposite order.

CAUTION:
Make sure that the elastic installed on the new motors is not wound around the motor body before you remove it (cut). If necessary, turn the motor end rod in the applicable direction to remove this elastic. Indeed, it is used to show the correct position of the switches and internal EOTs of the motor. The incorrect position of these elements can damage the motor or the structure of the bed.

2. Remove the elastic from the motor.

3. Do the “Function Checks” on page 2-4.

4.5 Caster

Tools required: 13 mm socket
Ratchet
Extension
10 mm hex key
Soft faced hammer
Screwdriver
Scissor jack

Removal

NOTE:
The removal and procedure is the same for the head and foot end casters.

1. Set the brakes.

2. Lift the bed to the highest position.

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.

4. Depending on the caster to be replaced, remove the head or foot frame cover (A) from the bed (B) (see figure 4-8 on page 4-17).

5. Use the scissor jack to lift the bed up sufficiently to permit you remove the caster (F).

6. Remove the two alignment bolts (C).

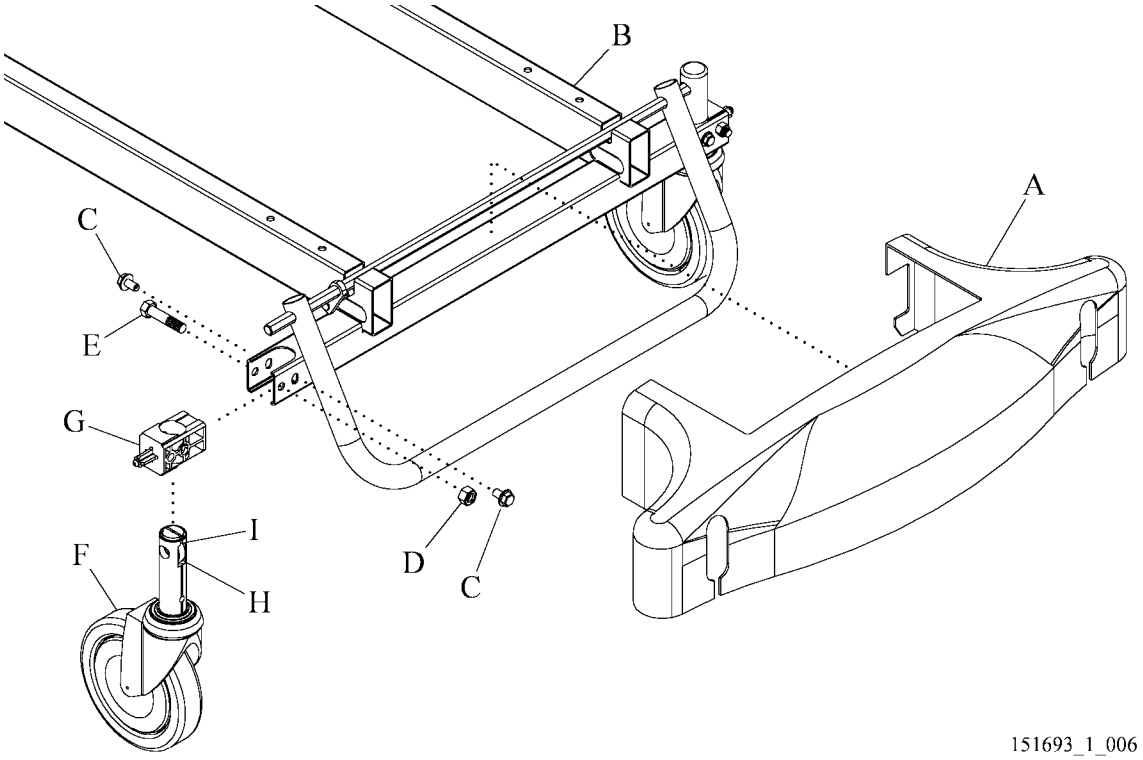
7. Remove the nut (D) and bolt (E).

8. Slide the caster (F) and socket (G) out.

NOTE:
When the caster disengages from the brake bar hex rod, it will fall from the socket.

9. Remove the caster (F) from the socket (G).

Figure 4-8. Caster



Replacement

NOTE:
Brake/steer casters have a black washer on top. Brake casters have a silver-colored plated washer on top.

1. Hold the new caster (F) so the window (H) with the cam (I) showing is to the foot end of the bed.

2. Put the new caster (F) into the socket (G) so the window with the cam showing is to the foot end of the bed.

WARNING:
Make sure the caster is correctly positioned with respect to the movements of the hexagonal bar. Failure to do so can cause the brake and steer system to malfunction. Injury or damaged equipment could occur.

3. Install the new caster (F) and socket (G) into the bed (B) so the window with the cam showing is to the foot end of the bed.

4. Install the two alignment bolts (C).

5. Install the bolt (E) and nut (D) through the socket (G).
6. Make sure that the new caster (F) is braked.
7. If the caster (F) is not braked, do as follows:
   a. Remove the caster (F).
   b. Turn the cam in the caster (F) to the right until the caster (F) is braked.
   c. Install the caster(F).
   d. Make sure the new caster (F) is braked.
   e. Do the same for the other casters as necessary.
8. Install the applicable head or foot frame cover (A).
9. Do the “Function Checks” on page 2-4.

4.6 Siderail Control P.C. Board

Tools required: T25 Torx®[1] screwdriver
T15 Torx® screwdriver
Screwdriver
Isopropyl alcohol
Rags

NOTE:
If you remove the switch panel from the siderail, it will be necessary to install a new switch panel.

Removal

1. Set the brakes.
2. Lift the bed to its highest position.
3. Lift the siderail to the up and locked position

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

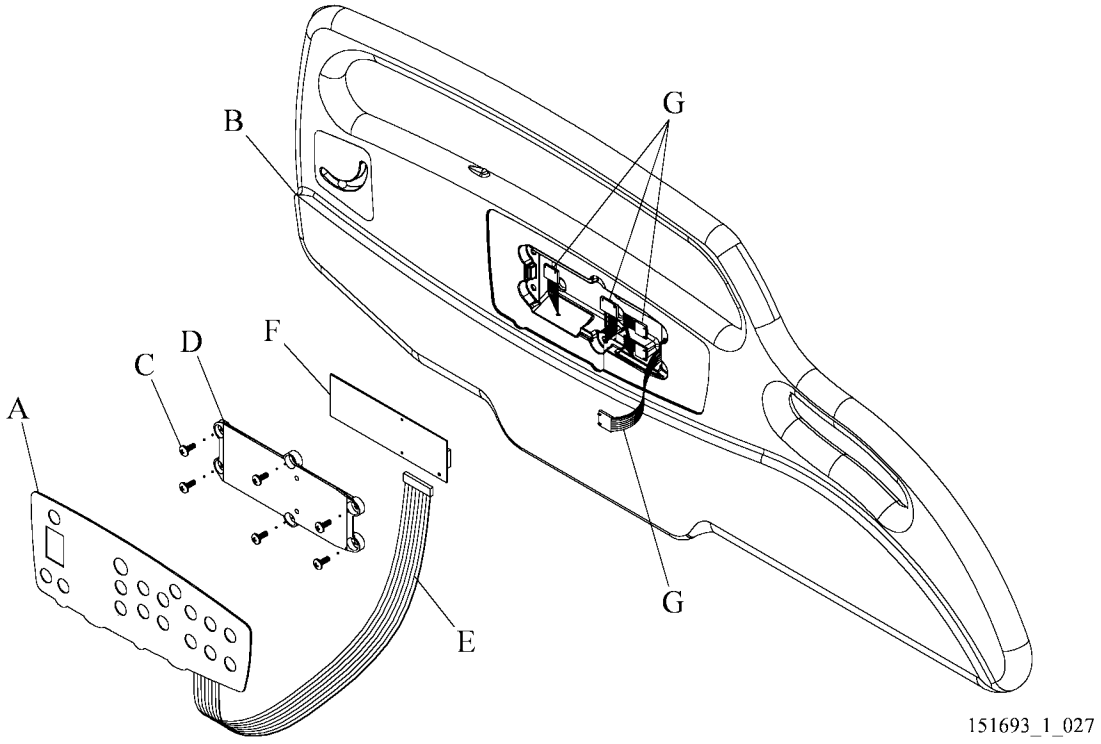
4. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.

CAUTION:
Use precaution when you remove the switch panel. Failure to do so could cause damage to the seating area of the switch panel on the siderail.

5. Start on the bottom edge and remove the switch panel (A) from the siderail (B) (see figure 4-9 on page 4-20).
6. Remove the six screws (C) that attaches the stiffener (D) to the siderail (B).
7. Disconnect the switch panel cable (E) from the siderail control P.C. board (F).
8. Disconnect the siderail cables (G) from the siderail control P.C. board (F).
9. Remove the siderail P.C. board (F) from the stiffener (D).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-9. Siderail Control P.C. Board



WARNING:
Isopropyl alcohol is flammable and toxic to skin, eyes, and the respiratory tract. Do not use near an open flame. Do not use in confined areas. Injury can occur.

10. Use rags and isopropyl alcohol to clean the mount area where the switch panel (A) was installed.

Replacement

1. Connect the new switch panel cable (E) to the siderail control P.C. board (F).
2. Connect the siderail cables (G) to the siderail control P.C. board (F).
3. Install the siderail control P.C. board (F) on the stiffener (D).
4. Install the stiffener (D) into the siderail (B).
5. Install the six screws (C) to attach the stiffener (D) to the siderail (B).
6. Remove the wax paper backing from the new switch panel (A).

7. Install the new switch panel (A) on the siderail (B).
8. Do the “Function Checks” on page 2-4.

4.7 Patient Pendant

Tools required: Small blade screwdriver

Removal

1. Set the brakes.
2. Lift the sleep surface to the highest position.

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Disconnect the pendant cable from pendant mount on the bed.
5. Remove the pendant from the bed.

Replacement

1. Make sure the new pendant has the same functions as the pendant being replaced.
2. Do the removal procedure in opposite order.
3. Do the “Function Checks” on page 2-4.

4.8 Patient Pendant Mount

Tools required: Wire cutters

NOTE:
This procedure is to move the pendant mount from one side of the bed to the other side of the bed.

Removal

1. Set the brakes.

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

2. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
3. Remove the pendant (refer to procedure 4.7).
4. Cut and remove the cable ties that attaches the pendant mount to the bed.

Replacement

1. Move the pendant mount to the opposite side of the bed.
2. Use cable ties to attach the pendant mount to the bed.
3. Do the “Function Checks” on page 2-4.

4.9 Head Hilow Column

Tools required: 13 mm socket
Ratchet
Extension
(2) Jack stands
T25 Torx®[1] screwdriver
T15 Torx® screwdriver
Wire cutters
Antistatic strap

Removal

1. Set the brakes.
2. Remove the headboard.
3. Lift the head section to the full up position.

WARNING:
Do not do anything under an unsupported load. Install applicable supports. Failure to do so could cause injury or damaged equipment.

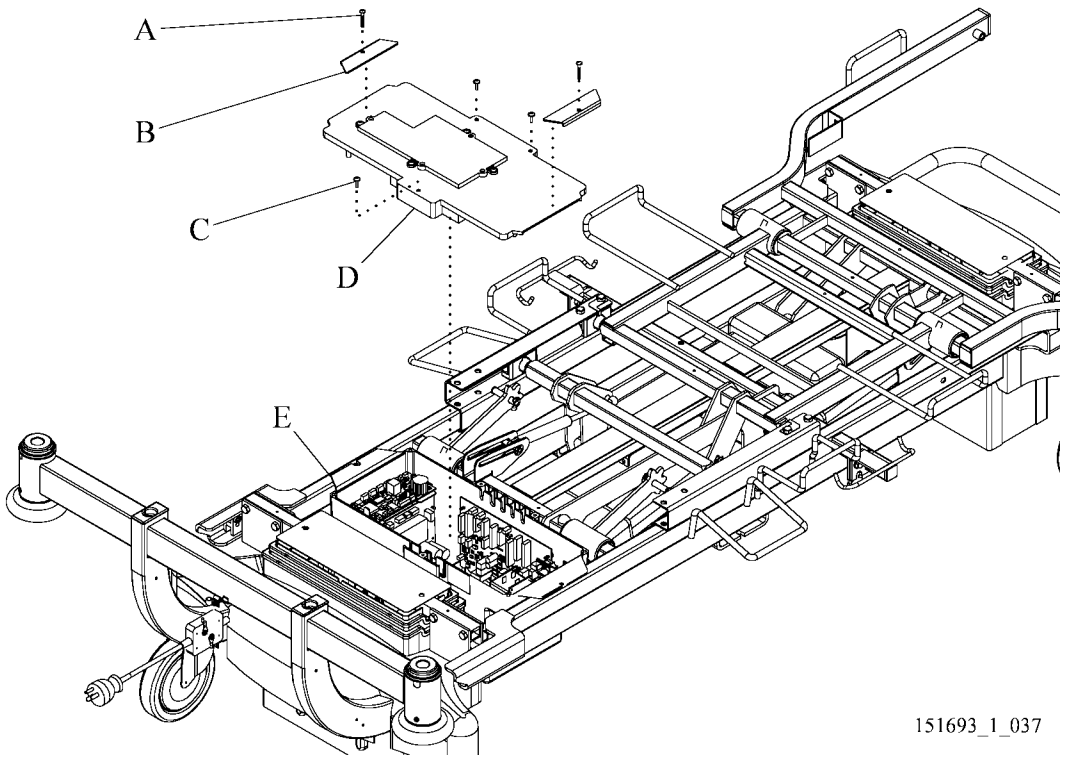
4. Put the jack stands under the articulating frame.
5. Lower the articulating frame on the jack stands.

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

6. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
7. Remove the two screws (A) from the retainers (B) (see figure 4-10 on page 4-25).
8. Remove the retainers (B).
9. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).
10. Remove the power supply cover (D).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-10. Power Supply Cover



NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

11. Disconnect the battery cable from the power supply P.C. board.

12. Remove the power supply cover (D) from the bed.

13. Disconnect the head hilow column cable from the power supply P.C. board.

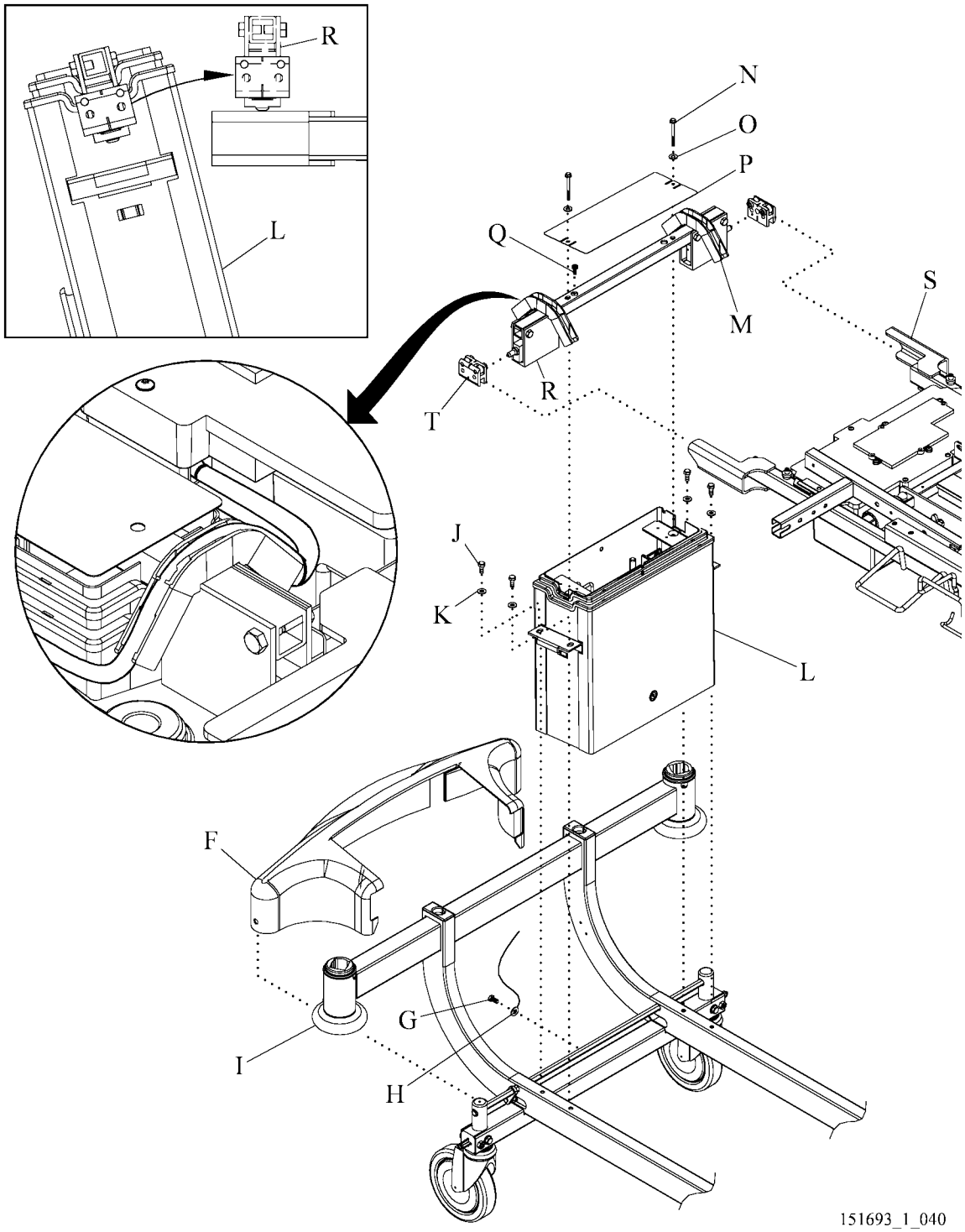
14. Remove the head end base frame cover (F) (see figure 4-11 on page 4-26).

15. Remove the screw (G) that attaches the hilow column ground wire (H) to the bed (I).

16. Remove the four screws (J) and washers (K) that attach the column (L) to the bed (I).

17. Cut and remove the cable ties that attach the power cable, load cell cables, and communication cable to the wire guides (M).

Figure 4-11. Head Hilow Column



18. Remove the two screws (N) and washers (O) from the column cover (P).
19. Remove the column cover (P).
20. Remove the screw (Q) from the load cell bracket (R).
21. Move the column (L) to the head end of the bed until the load cell bracket (R) is not on the weigh frame (S).
22. Remove the load cell bracket (R) and rollers (T) from the column (L).
23. Put the load cell bracket (R) and rollers (T) on the weigh frame (S).
24. Remove the column (L) from the bed (I).

Replacement

1. Put the **new** hilow column (L) in position on the bed (I). Make sure the power cable is to the left side of the bed (I).
2. Connect the cable to the power supply P.C. board (connector 6).
3. Disconnect the **foot** hilow column from the power supply P.C. board.
4. Plug the bed into an applicable power source.
5. Use the **Bed Hilow** control to lift the hilow column to the same height as the bed.

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

6. Disconnect the bed (I) from its power source. Let the bed sit for 60 seconds for the battery to time out.
7. Connect the foot hilow column to the power supply P.C. board.
8. Make a mark on the power cord and communication cable so the edges of the marks are aligned with the edge of the wire guide (M).
9. Put the load cell cables along the side of the power cord and communication cable.
10. Do the removal procedure in opposite order.
11. Plug the bed (I) into an applicable power source.

12. Operate the **Trendelenburg** function to make sure there is no tension in the cables on the column.

13. Do the “Function Checks” on page 2-4.

4.10 Foot Hilow Column

Tools required:

13 mm socket	Ratchet
Extension	(2) Jack stands
T25 Torx®[1] screwdriver	T15 Torx® screwdriver
Wire cutters	Antistatic strap
Vise-Grips®[2]	Marking pen
String, 10' (305 cm)	

Removal

1. Set the brakes.
2. Remove the footboard.
3. Lift the head section to the full up position.
4. Remove the seat section of the sleep deck.
5. Remove the thigh section of the sleep deck.

WARNING:
Do not do anything under an unsupported load. Install applicable supports. Failure to do so could cause injury or damaged equipment.

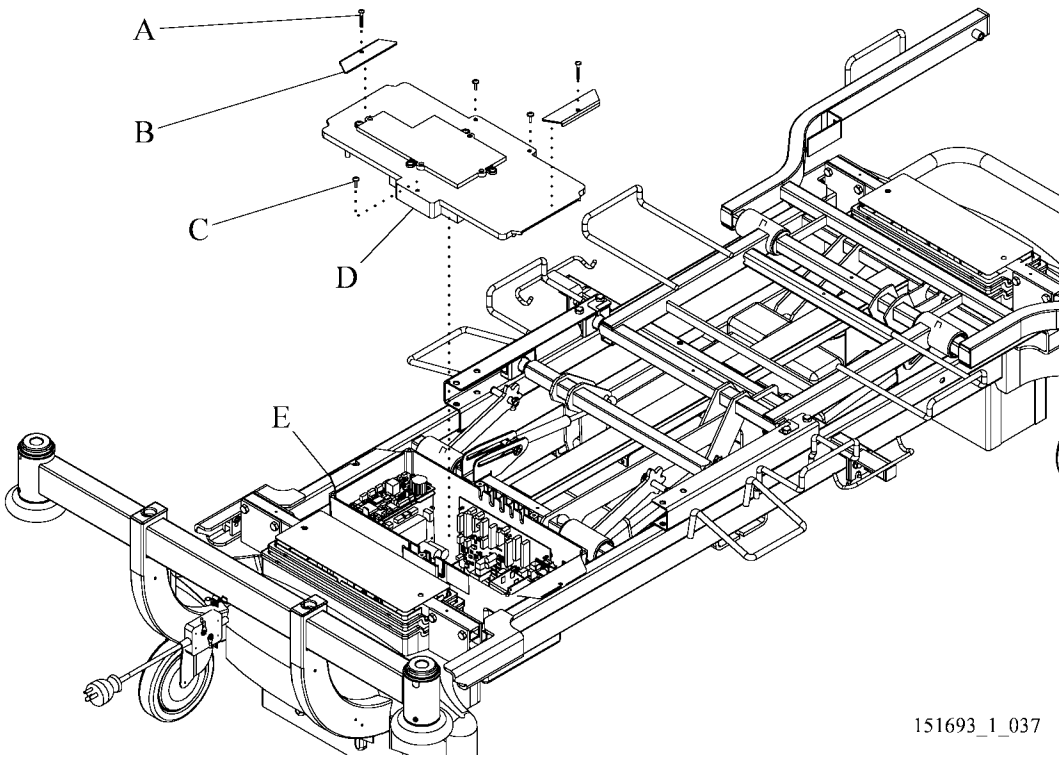
6. Put the jack stands under the articulating frame.
7. Lower the articulating frame on the jack stands.

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

8. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
9. Remove the two screws (A) from the retainers (B) (see figure 4-12 on page 4-30).
10. Remove the retainers (B).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.
2. Vise-Grip® is a registered trademark of American Tool Companies, Inc.

Figure 4-12. Power Supply Cover



11. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).

12. Remove the power supply cover (D).

NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

13. Disconnect the battery cable from the power supply P.C. board.

14. Remove the power supply cover (D) from the bed.

15. Install the Vise-Grips®[1] into the head hilow channel (see figure 4-13 on page 4-31).

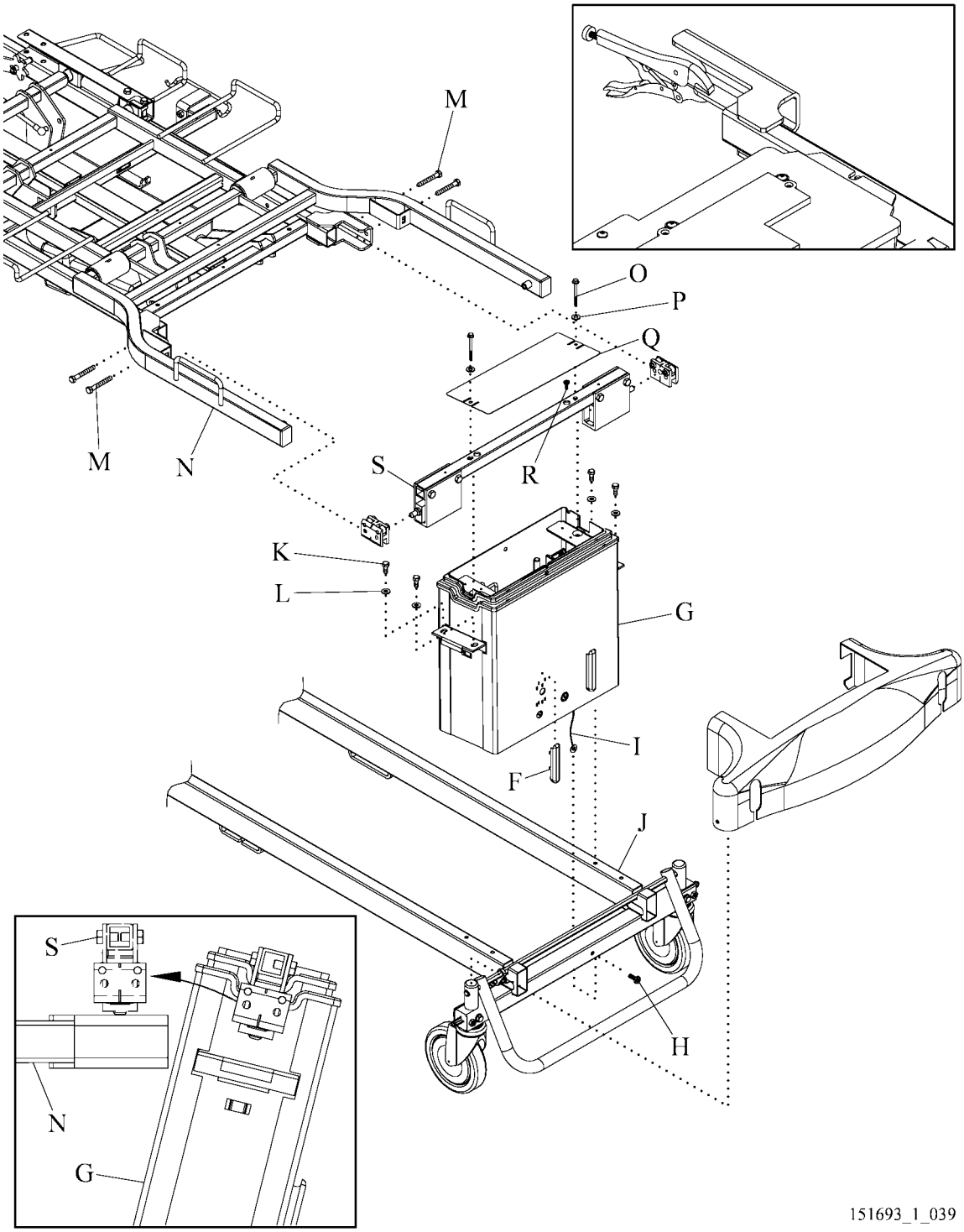
16. Disconnect the column cable from the power supply P.C. board.

17. Attach the string around the end of the column cable.

18. Remove the cover (F) from the bottom of the foot hilow column (G).

1. Vise-Grip® is a registered trademark of Petersen Manufacturing Company, Inc.

Figure 4-13. Foot Hilow Column



19. Remove the screw (H) that attaches the hilow column ground wire (I) to the bed (J).

20. Remove the four screws (K) and washers (L) that attach the foot hilow column (G) to the bed (J).

21. Remove the four screws (M) that attach the foot hilow column (G) to the weigh frame (N).

22. Remove the two screws (O) and washers (P) that attach the column cover (Q) to the foot hilow column (G).

23. Remove the cover (Q).

24. Remove the screw (R) from the load cell bracket (S).

25. Identify the locations of where the cable ties, load cell cables, and the column power cable attach to the bed (J).

26. Cut and remove the cable ties that attach the load cell cables to the weigh frame (N).

27. Move the column (G) to the foot end of the bed (J) until the load cell bracket (S) is not on the weigh frame (N).

28. Remove the load cell bracket (S) from the column (G).

29. Put the load cell bracket on top of the weigh frame (N).

30. Remove the column (G) from the bed (J).

Replacement

1. Put the **new foot hilow** column (G) in position on the bed (J). Make sure the two covers (F) are toward the foot end of the bed.

2. Remove the cover (F) on the base of the **new** column (G).

3. Operate the foot hilow column cable to the central rail.

4. Attach the string around the column cable.

5. Pull the string so the column cable goes to the power supply.

6. Operate the column cable to the power supply P.C. board.

7. Connect the column cable to the power supply P.C. board.

8. Disconnect the **head** hilow column from the power supply P.C. board.
9. Plug the bed into an applicable power source.
10. Use the **Bed Hilow** control to lift the hilow column to the same height as the bed.

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

11. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
12. Connect the head hilow column to the power supply P.C. board.
13. Do the removal procedure in opposite order.
14. Plug the bed into an applicable power source.
15. Operate the **Trendelenburg** function to make sure there is no tension in the cables on the column.
16. Do the “Function Checks” on page 2-4.

4.11 Load Beams

Tools required: 13 mm socket
Ratchet
(2) Jack stands
T15 Torx®[1] screwdriver
Wire cutters
Antistatic strap
String, 10' (305 cm)

NOTE:
The load cell bracket assembly must be changed as an assembly. The load cells are not replaceable.

Removal

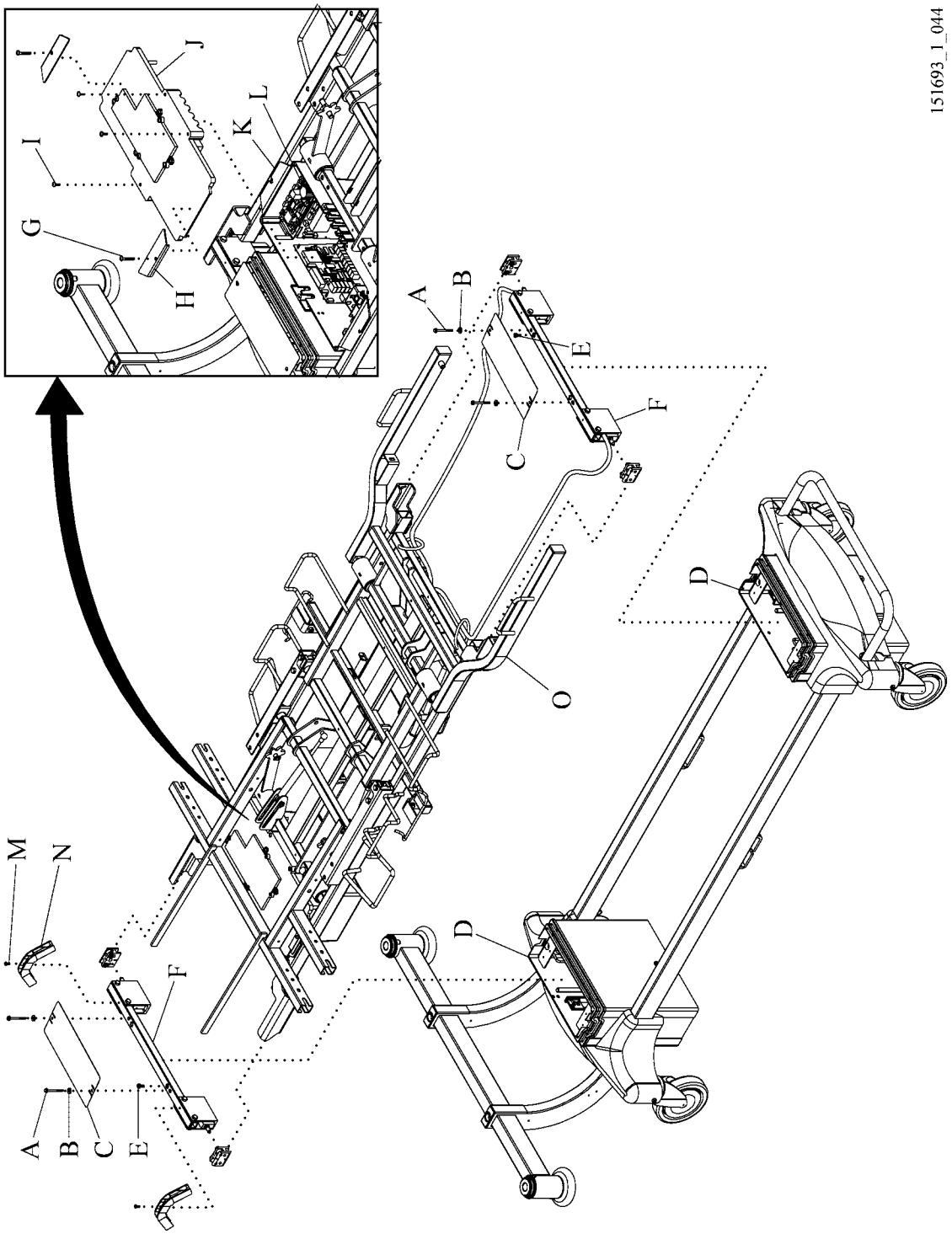
1. Set the brakes.
2. Remove the headboard.
3. Lift the head section to the full up position.
4. For **foot end** load beams, do as follows; otherwise go to step 5:
   a. Remove the foot and seat sections of the sleep deck.
   b. Remove the central channel cover.
   c. Identify the location of the cable ties and load cell cables attached to the bed.

WARNING:
Do not do anything under an unsupported load. Install applicable supports. Failure to do so could cause injury or damaged equipment.

5. Put the jack stands under the articulating frame near the load cells being replaced.
6. Remove the two screws (A) and washers (B) that attach the column cover (C) to the column (D) (see figure 4-14 on page 4-35).
7. Remove the column cover (C).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-14. Load Beams



8. Remove the screw (E) that attaches the load cell bracket (F) to the column (D).

9. Lower the bed until the load cell bracket (F) is not on the column (D).

SHOCK HAZARD:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

10. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.

11. Remove the two screws (G) from the retainers (H).

12. Remove the retainers (H).

13. Remove the three screws (I) that attach the power supply cover (J) to the power supply (K).

14. Remove the power supply cover (J).

NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

15. Disconnect the battery cable from the power supply P.C. board.

16. Remove the power supply cover (J) from the bed.

CAUTION:
When you touch the electronic components, wear an antistatic strap. Failure to do so could cause component damaged equipment.

17. Put on the antistatic strap.

18. Disconnect the load cells from the scale P.C. board (L).

NOTE:
P1 and P4 for head end load cells, and P2 and P3 for foot end load cells.

19. Attach the string around the ends of the load cell cables.

20. Cut and remove the cable ties that attach the load cell cables to the bed.

21. Remove the two screws (M) that attach the two wire guides (N) to the load cell bracket (F).

22. Remove the wire guides (N).
23. Remove the load cell cables from the column (D).
24. Remove the load cell bracket (F) from the weigh frame (O).

Replacement

1. Do the removal procedure in opposite order.
2. Calibrate the scale (see “Scale Calibration” on page 6-11).
3. Do the “Function Checks” on page 2-4.

4.12 Scale Control Pod

Tools required: (2) small-bladed screwdriver
Antistatic strap
T15 Torx®[1] screwdriver

Removal

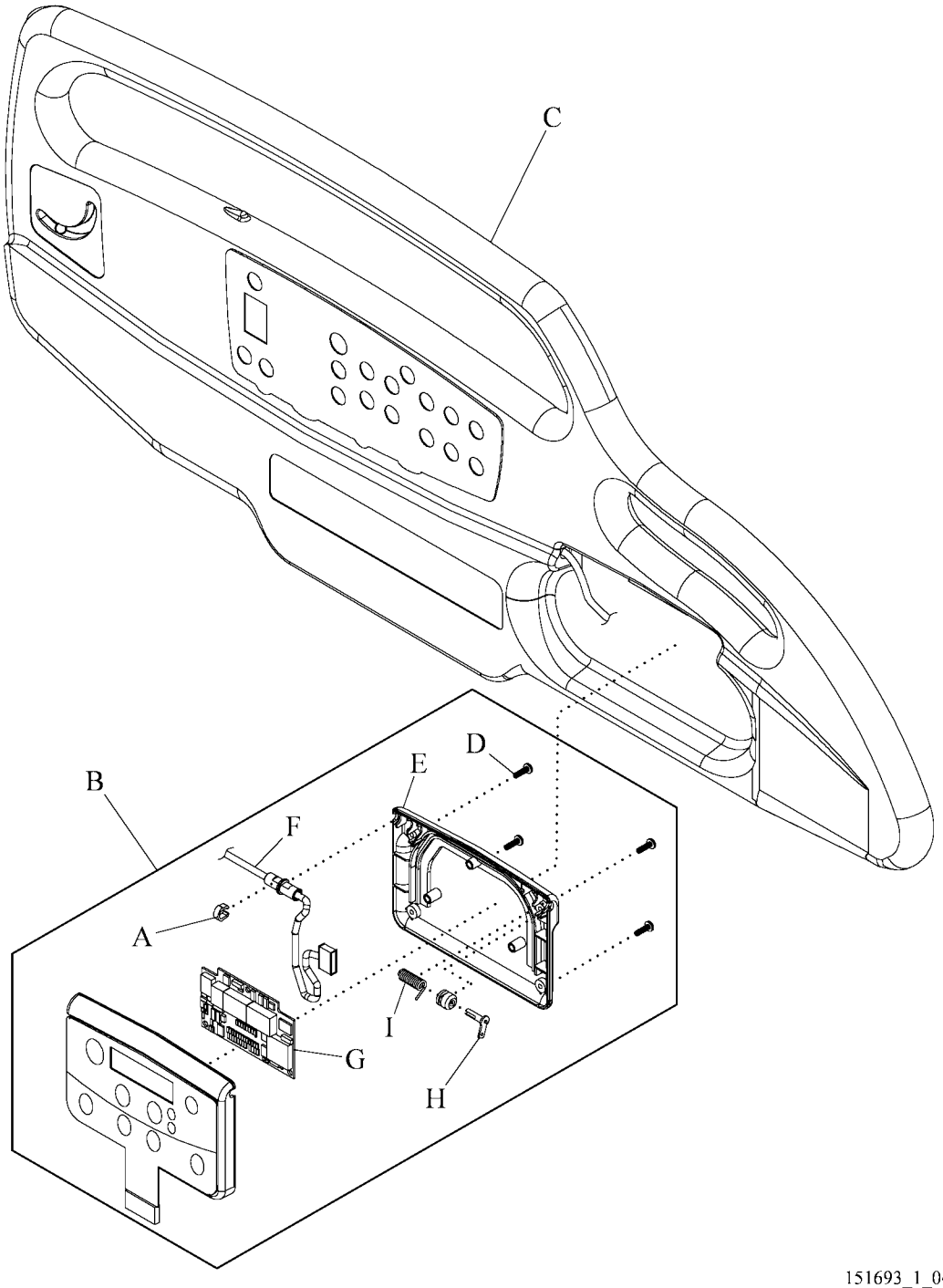
1. Set the brakes.
2. Lift the siderail to the up and locked position.

WARNING:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the spacer (A) (see figure 4-15 on page 4-39).
5. Slide the pod (B) to the head end of the siderail (C).
6. Pull out the foot end of the pod (B).
7. Slide the pod (B) toward the foot end of the siderail (C) and remove it from the siderail (C).
8. Remove the four screws (D) from the rear of the pod (B).
9. Remove the rear of the pod (E).
10. Identify the routing of the cable (F).
11. Disconnect the cable (F) from the P.C. board (G).
12. Remove the weldment (H) from the spring (I).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-15. Scale Control Pod



Replacement

1. Do as follows to the **new** pod:
   a. Remove the four screws (D) from the rear of the pod (B).
   b. Remove the pod rear (E).
   c. Disconnect the cable (F) from the P.C. board (G).
2. Put the new pod (B) in position adjacent to the cable (F) that comes out of the siderail (C).
3. Connect the cable (F) to the P.C. board (G).
4. Do the cable routing as noted before.
5. Install the pod rear (E).
6. Install the four screws (D) to attach the pod rear (E) to the pod (B).
7. Install the weldment (H) into the spring (I).
8. Install the pod (B) into the siderail (C).
9. Slide the pod (B) to the foot end of the siderail (C) so the weldment (H) engages the groove in the siderail.
10. Install the spacer (A).
11. Do the “Function Checks” on page 2-4.

4.13 Scale Control Pod P.C. Board

Tools required: T15 Torx®[1] screwdriver
(2) Small-bladed screwdriver
Antistatic strap

Removal

1. Set the brakes.
2. Lift the siderail to the up and locked position.

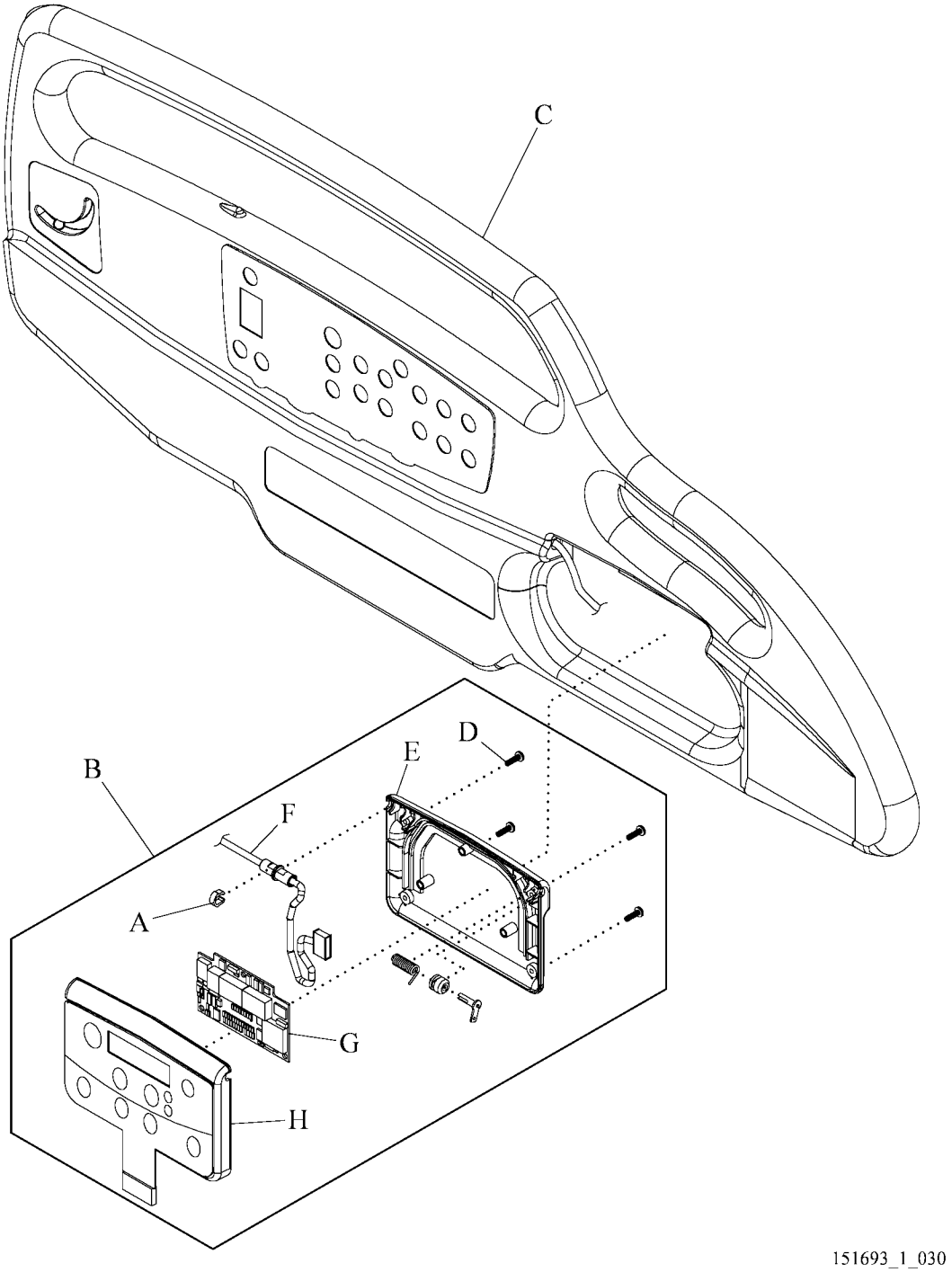
WARNING:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the spacer (A) (see figure 4-16 on page 4-42).
5. Slide the pod (B) to the head end of the siderail (C).
6. Pull out the foot end of the pod (B).
7. Slide the pod (B) to the foot end of the siderail (C), and remove it from the siderail (C).
8. Remove the four screws (D) from the rear of the pod (B).
9. Remove the pod rear (E).
10. Identify the routing of the cable (F).
11. Disconnect the cable (F) from the P.C. board (G).
12. Disconnect the P.C. board (G) from the switch panel cable (H).

4

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-16. P.C. Board Replacement



Replacement

1. Connect the **new** P.C. board (G) to the switch panel cable (H).
2. Connect the cable (F) to the P.C. board (G).
3. Do the cable routing as noted before.
4. Install the pod rear (E).
5. Install the four screws (D) to attach the pod rear (E) to the pod (B).
6. Install the pod (B) into the siderail (C).
7. Slide the pod (B) toward the foot end of the siderail (C) so the weldment engages the groove in the siderail.
8. Install the spacer (A).
9. Do the “Function Checks” on page 2-4.

4.14 Batteries

Tools required: T25 Torx®[1] screwdriver

Removal

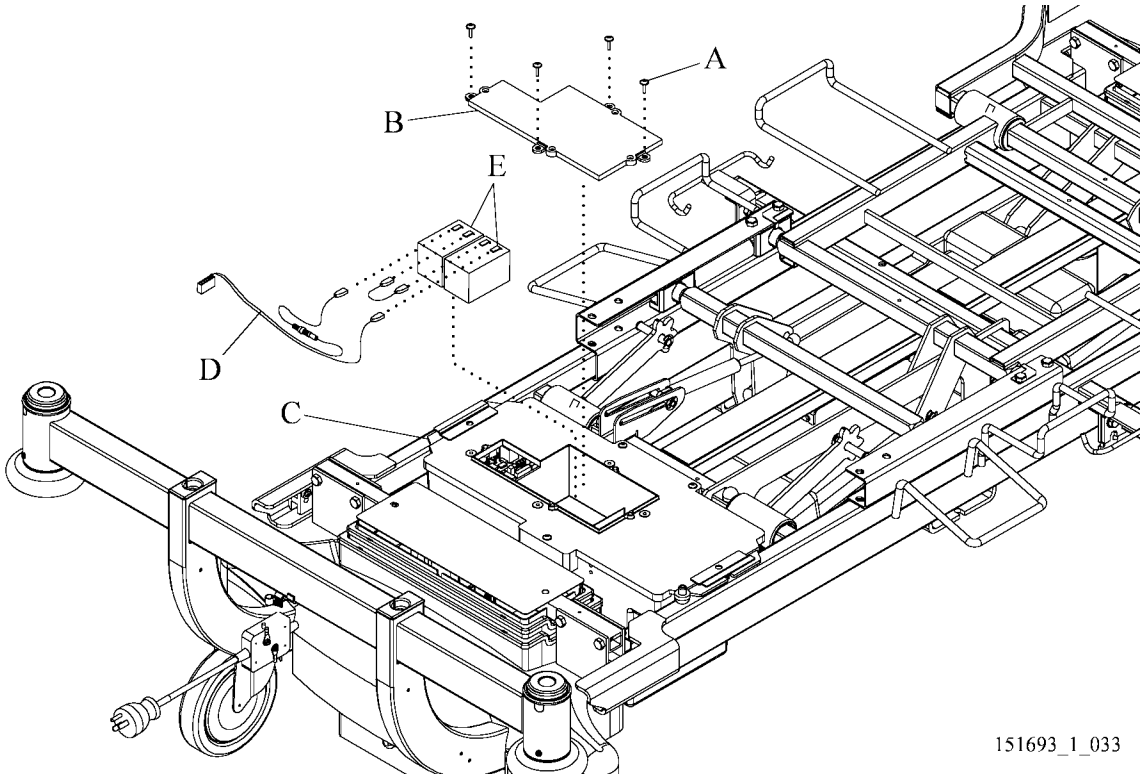
1. Set the brakes.
2. Lift the head section to the full up position.

WARNING:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the four screws (A) that attach the battery cover (B) to the power supply (C) (see figure 4-17 on page 4-45).
5. Remove the battery cover (B).
6. Identify the position of the battery cables (D).
7. Disconnect the cables (D) from the batteries (E).
8. Remove the batteries (E) from the power supply (C).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-17. Batteries



Replacement

1. Do the removal procedure in opposite order.
2. Do the “Function Checks” on page 2-4.

4.15 Motor Control P.C. Board

Tools required: 13 mm socket
Ratchet
Needle nose pliers
Antistatic strap
T25 Torx®[1] screwdriver

Removal

1. Set the brakes.
2. Lift the head section to the full up position.

WARNING:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

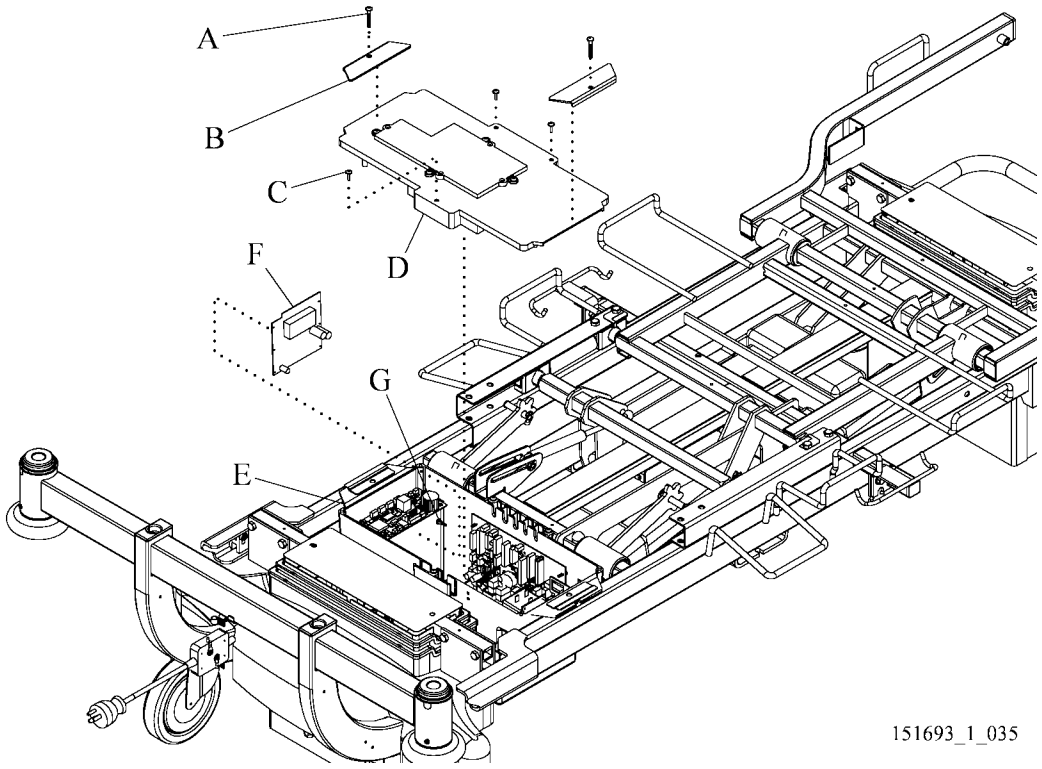
3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the two screws (A) from the retainers (B) (see figure 4-18 on page 4-47).
5. Remove the retainers (B).
6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).
7. Remove the power supply cover (D).

NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

8. Disconnect the battery cable from the power supply P.C. board (F).
9. Remove the power supply cover (D) from the power supply (E).
10. Identify the positions of the cables connected to the power supply P.C. board (F).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-18. Motor Control P.C. Board



CAUTION:
When you touch the electronic components, wear an antistatic strap. Failure to do so could cause component damage.

11. Put on the antistatic strap.
12. Disconnect the cables from the power supply P.C. board (F).
13. Push the ends of the standoffs (G) together.
14. Pull the P.C. board (F) off the standoff (G).
15. Remove the P.C. board (F) from the power supply (E).

Replacement

1. Do the removal procedure in opposite order.
2. Do the “Function Checks” on page 2-4.

4.16 SideCom® Communication System P.C. Board

Tools required: 13 mm socket
Ratchet
Needle nose pliers
Antistatic strap
T25 Torx®[1] screwdriver

Removal

1. Set the brakes.
2. Lift the head section to the full up position.

WARNING:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

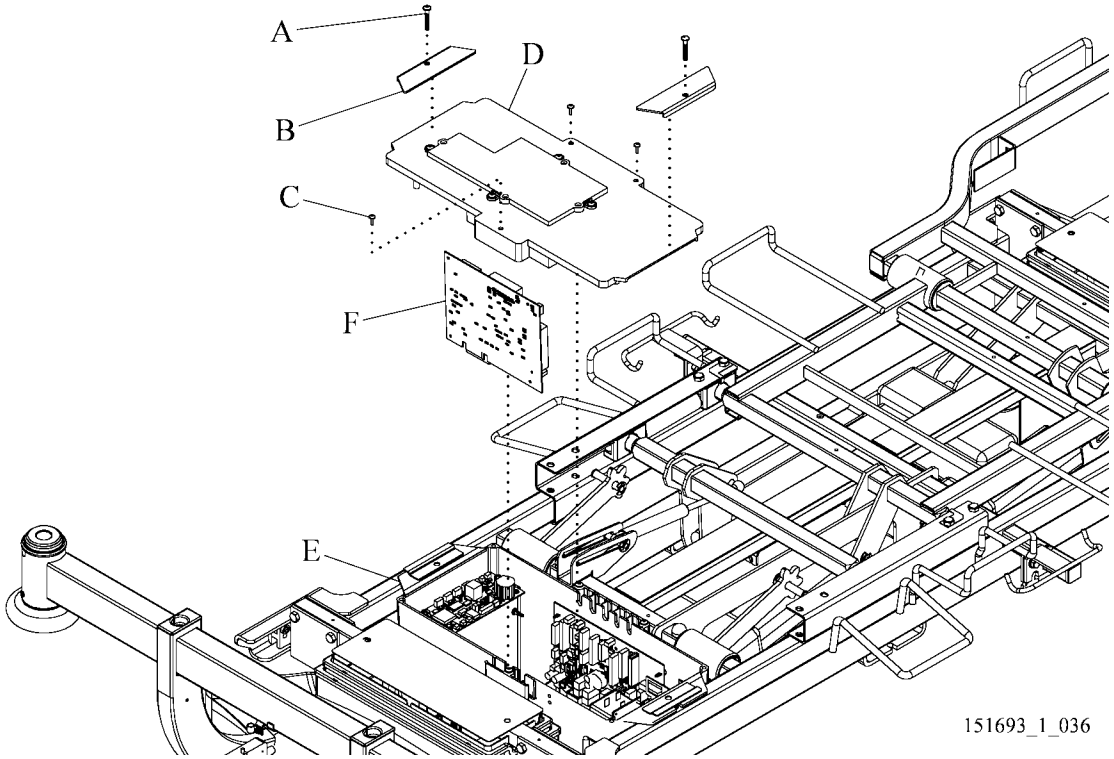
3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the two screws (A) from the retainers (B) (see figure 4-19 on page 4-49).
5. Remove the retainers (B).
6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).
7. Remove the power supply cover (D).

NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

8. Disconnect the battery cable from the power supply P.C. board.
9. Remove the power supply cover (D) from the power supply (E).
10. Identify the positions of the cables connected to the communication P.C. board (F).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-19. SideCom® Communication System P.C. Board



CAUTION:
When you touch the electronic components, wear an antistatic strap. Failure to do so could cause component damage.

11. Put on the antistatic strap.
12. Disconnect the cables from the communication P.C. board (F).
13. Push the ends of the standoffs (G) together.
14. Pull the P.C. board (F) off the standoffs (G).
15. Remove the P.C. board (F) from the power supply (E).

Replacement

1. Do the removal procedure in opposite order.
2. Do the “Function Checks” on page 2-4.

4.17 Line Filter

Tools required: 13 mm socket
Ratchet
Needle nose pliers
Antistatic strap
T15 Torx®[1] screwdriver
T25 Torx® screwdriver

Removal

1. Set the brakes.

2. Lift the head section to the full up position.

WARNING:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.

4. Remove the two screws (A) from the retainers (B) (see figure 4-20 on page 4-51).

5. Remove the retainers (B).

6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).

7. Remove the power supply cover (D).

NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

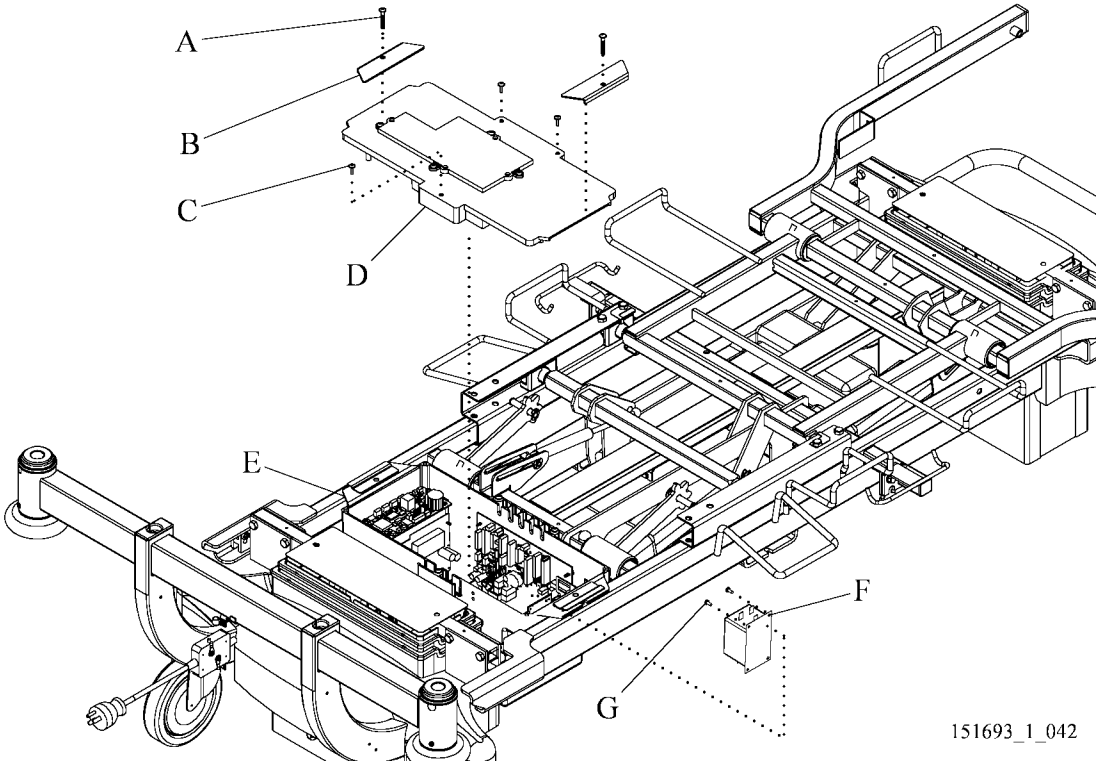
8. Disconnect the battery cable from the power supply P.C. board.

9. Remove the power supply cover (D) from the power supply (E).

10. Identify the positions of the cables connected to the line filter (F).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-20. Line Filter



CAUTION:
When you touch the electronic components, wear an antistatic strap. Failure to do so could cause component damage.

11. Put on the antistatic strap.
12. Disconnect the cables from the line filter (F).
13. Remove the two screws (G) that attach the line filter (F) to the bracket.
14. Remove the line filter (F).

Replacement

1. Do the removal procedure in opposite order.
2. Do the “Function Checks” on page 2-4.

4.18 Scale P.C. Board

Tools required: 13 mm socket
Ratchet
Needle nose pliers
Antistatic strap

Removal

1. Set the brakes.

2. Lift the head section to the full up position.

WARNING:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.

4. Remove the two screws (A) from the retainers (B) (see figure 4-21 on page 4-53).

5. Remove the retainers (B).

6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).

7. Remove the power supply cover (D).

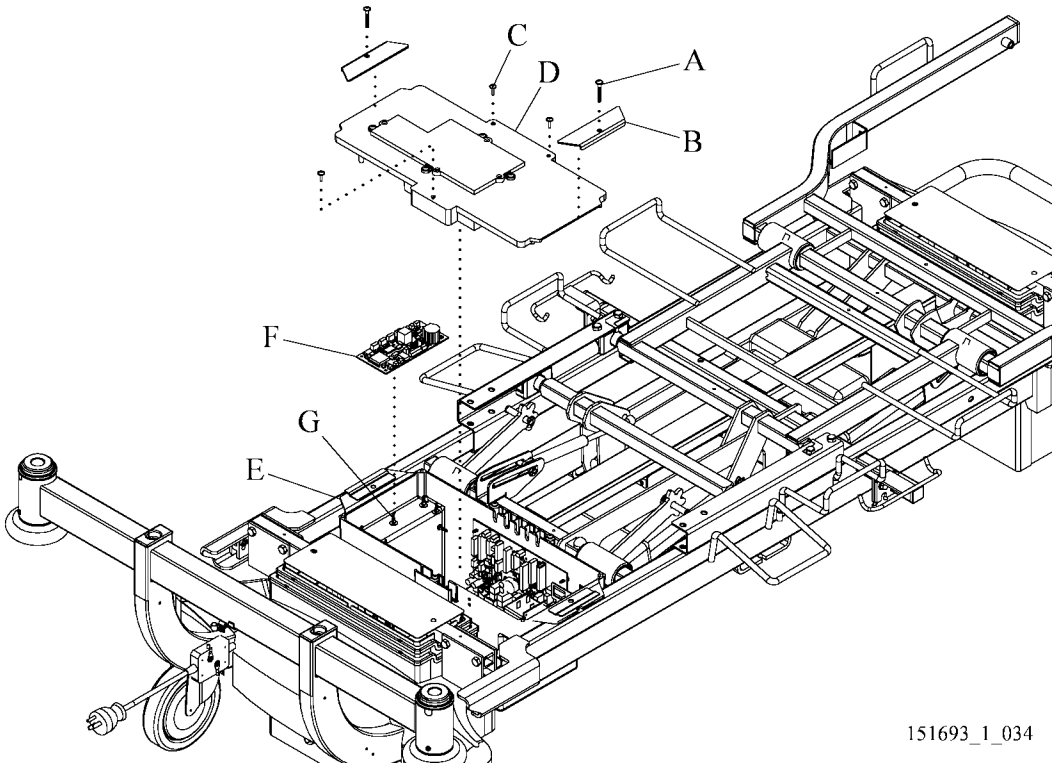
NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

8. Disconnect the battery cable from the power supply P.C. board.

9. Remove the power supply cover (D) from the power supply (E).

10. Identify the positions of the cables connected to the scale P.C. board (F).

Figure 4-21. Scale P.C. Board



CAUTION:
When you touch the electronic components, wear an antistatic strap. Failure to do so could cause component damage.

11. Put on the antistatic strap.
12. Disconnect the cables from the scale P.C. board (F).
13. Push the ends of the standoffs (G) together.
14. Pull the P.C. board (F) off the standoffs (G).
15. Remove the P.C. board (F) from the power supply (E).

Replacement

1. Do the removal procedure in opposite order.
2. Calibrate the scale (see “Scale Calibration” on page 6-11).
3. Do the “Function Checks” on page 2-4.

4.19 Siderail Interface P.C. Board

Tools required: 13 mm socket
Ratchet
Needle nose pliers
Antistatic strap
T25 Torx®[1] screwdriver

Removal

1. Set the brakes.
2. Lift the head section to the full up position.

WARNING:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

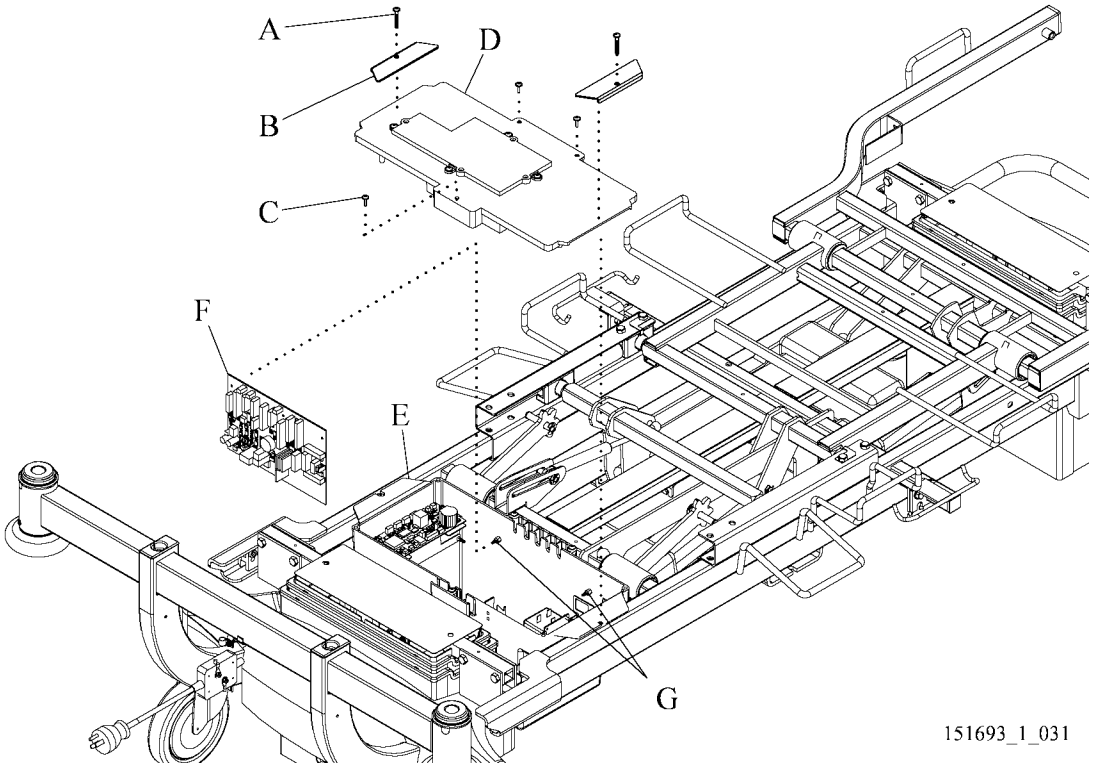
3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the two screws (A) from the retainers (B) (see figure 4-22 on page 4-55).
5. Remove the retainers (B).
6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).
7. Remove the power supply cover (D).

NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

8. Disconnect the battery cable from the power supply P.C. board.
9. Remove the power supply cover (D) from the power supply (E).
10. Identify the positions of the cables connected to the interface P.C. board (F).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-22. Interface P.C. Board



CAUTION:
When you touch the electronic components, wear an antistatic strap. Failure to do so could cause component damage.

11. Put on the antistatic strap.
12. Disconnect the cables from the interface P.C. board (F).
13. Push the ends of the standoffs (G) together.
14. Pull the P.C. board (F) off the standoffs (G).
15. Remove the P.C. board (F) from the power supply (E).

Replacement

1. Do the removal procedure in opposite order.
2. Do the “Function Checks” on page 2-4.

4.20 Transformer

Tools required: 13 mm socket
Ratchet
Antistatic strap
T25 Torx®[1] screwdriver

Removal

1. Set the brakes.
2. Lift the head section to the full up position.

WARNING:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

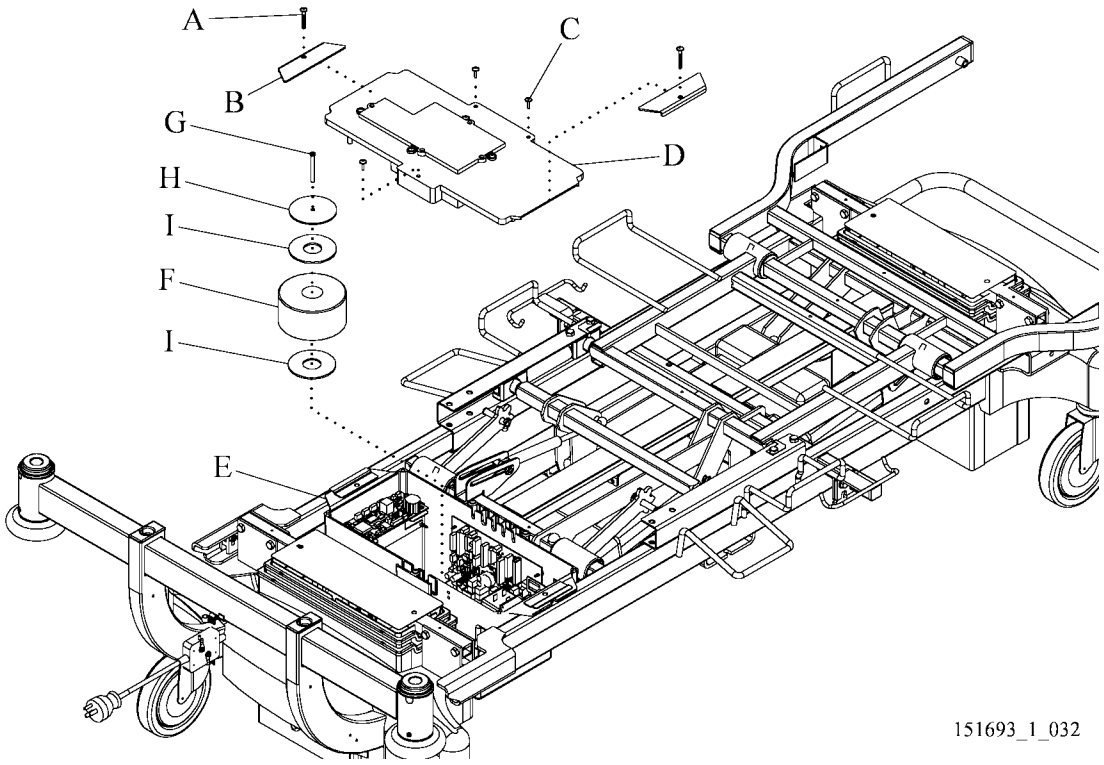
3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the two screws (A) from the retainers (B) (see figure 4-23 on page 4-57).
5. Remove the retainers (B).
6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).
7. Remove the power supply cover (D).

NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

8. Disconnect the battery cable from the power supply P.C. board.
9. Remove the power supply cover (D) from the power supply (E).
10. Identify the positions of the cables connected to the transformer (F).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-23. Transformer



CAUTION:
When you touch the electronic components, wear an antistatic strap. Failure to do so could cause component damage.

11. Put on the antistatic strap.
12. Disconnect the cables from the transformer (F).
13. Remove the screw (G) that attaches the transformer (F) the power supply (E).
14. Remove the washer (H) and spacers (I) from the transformer (F).
15. Remove the transformer (F).

Replacement

1. Do the removal procedure in opposite order.
2. Do the “Function Checks” on page 2-4.

4.21 Power Cord

Tools required: 13 mm socket
Ratchet
Wire cutters
T25 Torx®[1] screwdriver

Removal

1. Set the brakes.
2. Lift the head section to the full up position.

WARNING:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

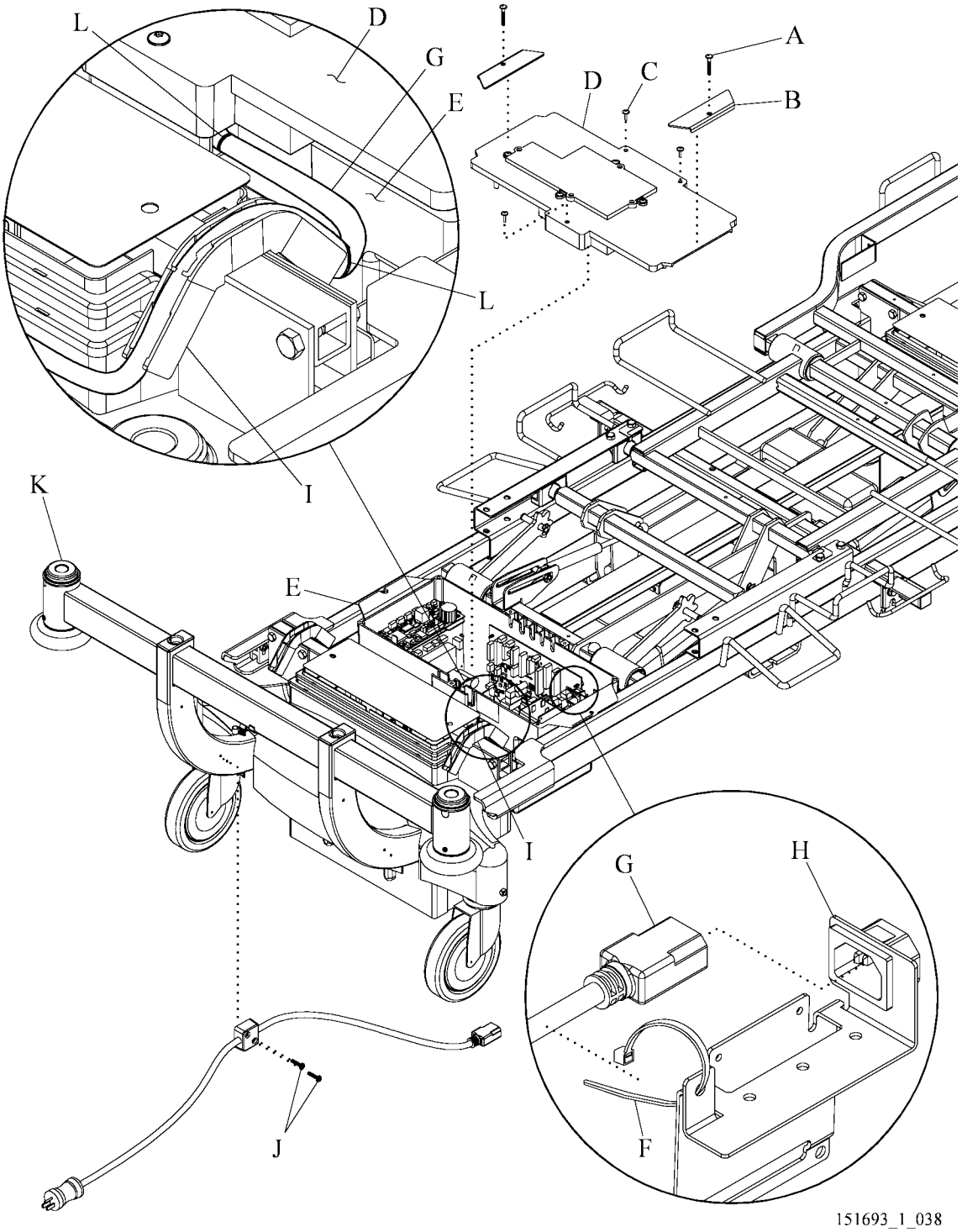
3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the two screws (A) from the retainers (B) (see figure 4-24 on page 4-59).
5. Remove the retainers (B).
6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).
7. Remove the power supply cover (D).

NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

8. Disconnect the battery cable from the power supply P.C. board.
9. Remove the power supply cover (D) from the power supply (E).
10. Cut and remove the cable tie (F) that attaches the power cord (G) to the bracket (H).
11. Cut and remove the cable ties that attach the power cord (G) to the wire guide (I).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-24. Power Cord



12. Remove the two screws (J) that attach the power cord (G) to the bed (K).

13. Remove the power cord (G) from the bed (K).

Replacement

1. Make a mark (L) on the power cord (G) so the edge of the mark (L) is even with the edge of the wire guide (I) (see detail in figure 4-24 on page 4-59).

2. Make another mark (L) on the power cord (G) so the edge of the mark (L) is even with the enclosure entrance on the power supply (E).

3. Do the removal procedure in opposite order.

4. Do the “Function Checks” on page 2-4.

4.22 Fuses

Tools required: 13 mm socket
Ratchet
Antistatic strap
T25 Torx®[1] screwdriver

Removal

1. Set the brakes.
2. Lift the head section to the full up position.

WARNING:
Disconnect the bed from its power source. Failure to do so could cause injury or damaged equipment.

3. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. For the mains fuses, do as follows; otherwise go to step 5.
   a. Remove the two screws (A) from the retainers (B) (see figure 4-25 on page 4-62).
   b. Remove the retainers (B).
   c. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).
   d. Remove the power supply cover (D).

NOTE:
The power supply cover is connected to the power supply P.C. board by the battery cable.

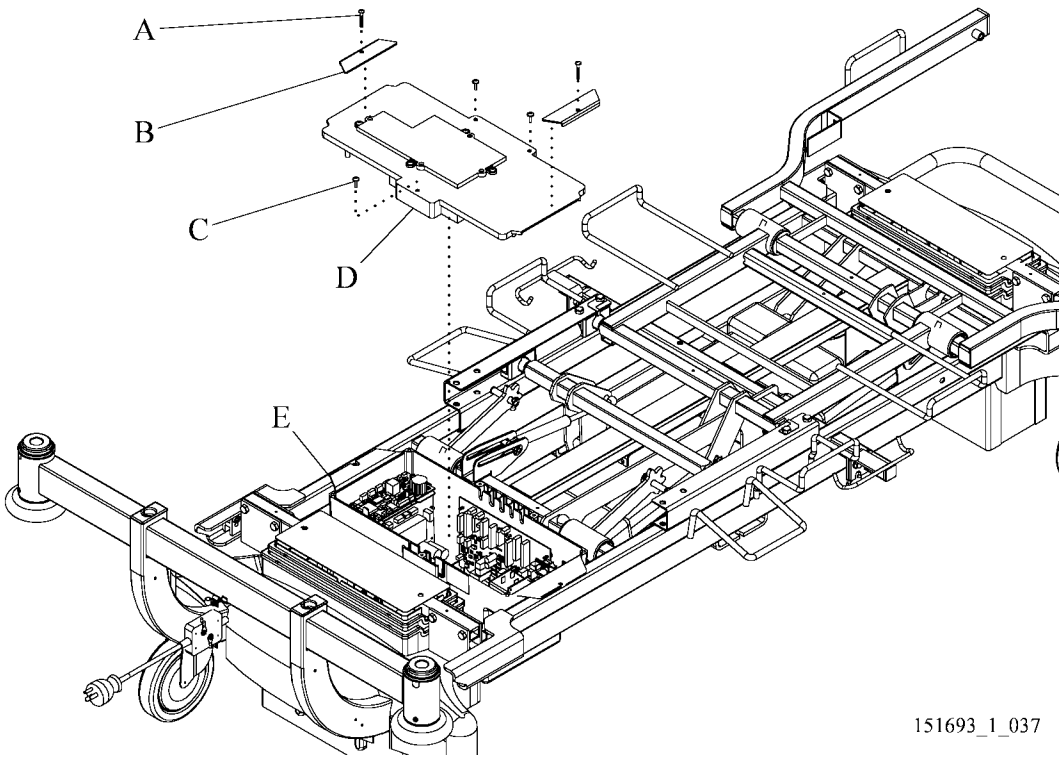
   e. Disconnect the battery cable from the power supply P.C. board.
   f. Remove the power supply cover (D) from the power supply (E).

CAUTION:
When you touch the electronic components, wear an antistatic strap. Failure to do so could cause component damage.

   g. Put on the antistatic strap.

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 4-25. Power Supply Cover



h. Remove two fuses (F) from the interface P.C. board (G) (see figure 4-26 on page 4-63).

NOTE:
Replace the two fuses at the same time.

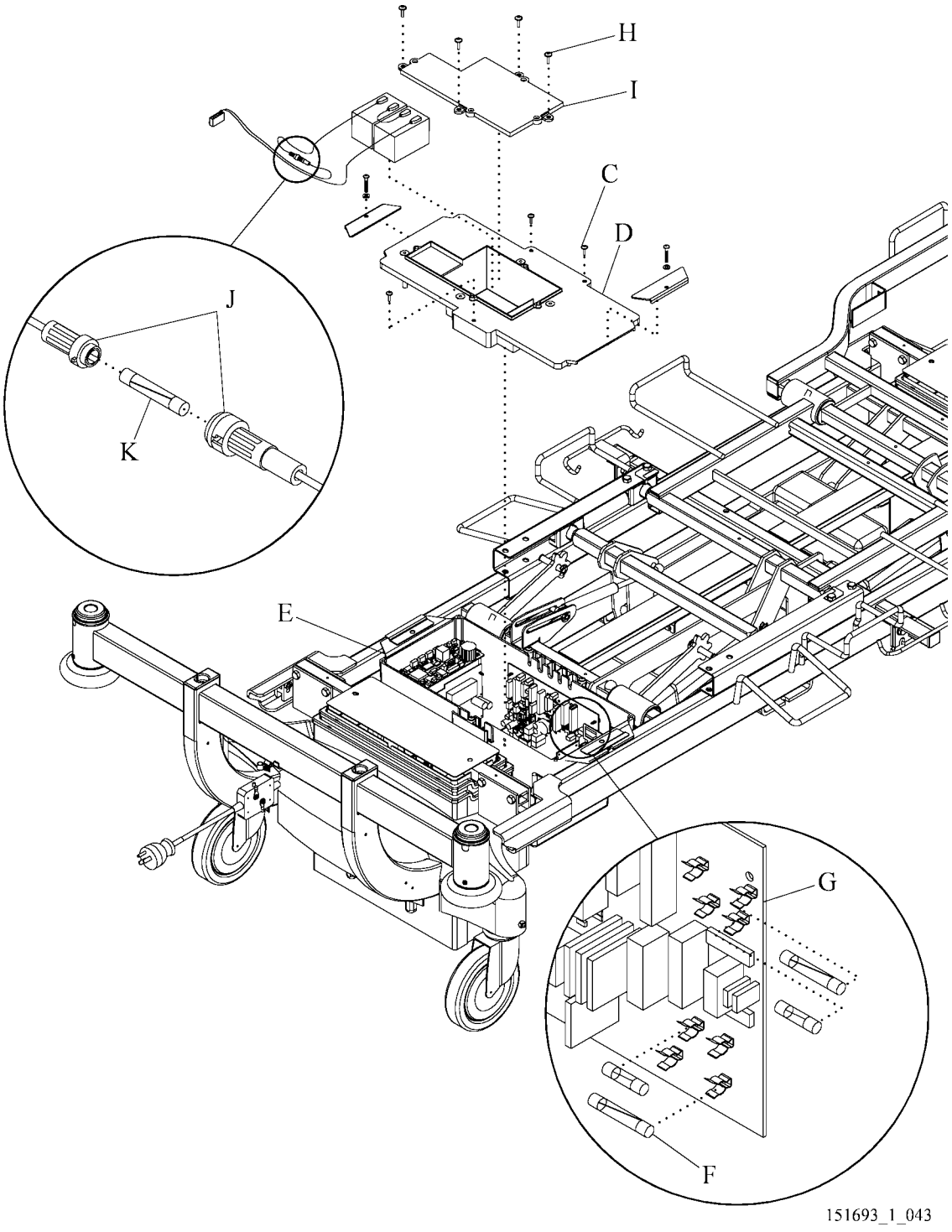
NOTE:
The longer fuses are for the 100 V through 127 V beds. The shorter fuses are for the 220 V through 240 V beds.

5. For the battery fuses, do as follows:
   a. Remove the three screws (H) from the battery cover (I).
   b. Remove the battery cover (I).
   c. Open the fuse holder (J).

NOTE:
The fuse holder is a twist type fuse holder.

   d. Remove the fuse (K).

Figure 4-26. Fuses



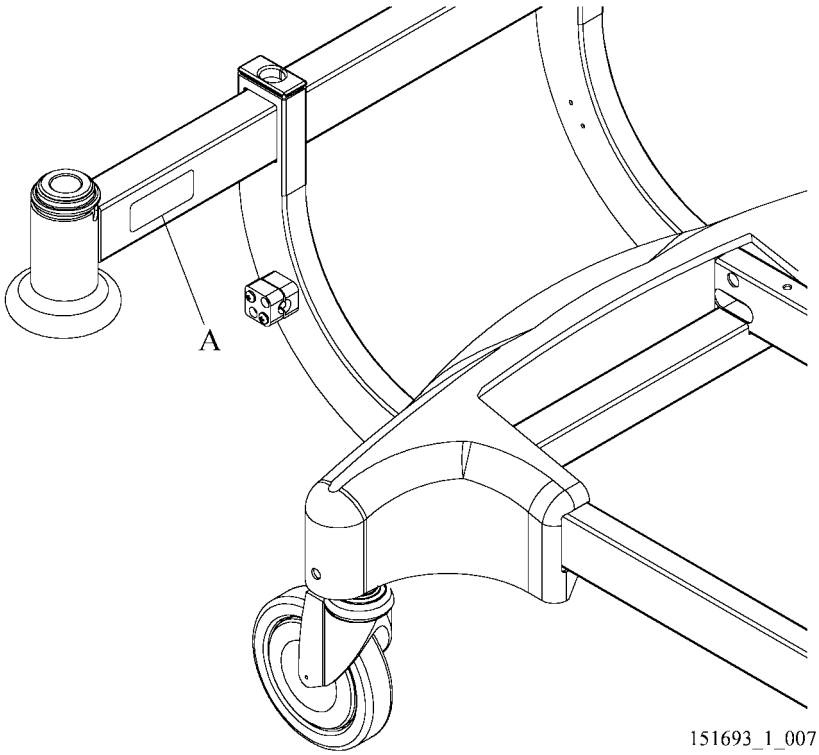
NOTES:

Chapter 5
Parts List

Service Parts Ordering

Use the parts lists in this manual to identify the part number(s) you need. Find the product number and serial number on the product identification label (A) (see figure 5-1 on page 5-1).

Figure 5-1. Product Identification Label Location



5

When it is necessary to order parts phone Hill-Rom Technical Support and supply this data:

- Customer account number
- Purchase order number
- Product number
- Serial number
- Part number(s)

To promptly order parts, inquire about part prices and availability, or follow up on a service order, use this Hill-Rom fax number:

812-934-8472

Terms:

- Net 30 days
- F.O.B. Batesville, IN
- Prepaid shipping charges added to invoice
- All orders shipped by ground transportation unless specified

Address all inquiries to:

ATTN TECHNICAL SUPPORT—PARTS
HILL-ROM COMPANY, INC.
1069 STATE ROUTE 46 E
BATESVILLE IN 47006-9167

Address all return goods to:

ATTN SERVICE STORES
DISTRIBUTION CENTER DOOR D23
HILL-ROM COMPANY, INC.
COUNTY ROAD 300E
BATESVILLE IN 47006-9167

NOTE:
To remove possible delays or incorrect billings, **do not** send any items without a Return Material Authorization (RMA) number. When a return is inquired about, an RMA packet is included with each order. This packet includes an RMA number, instructions, and a shipping label. If an RMA number is not available, phone Hill-Rom Technical Support.

Exchange Policy

The policies that follow are for in-warranty and out-of-warranty exchanges from Hill-Rom.

In-Warranty Exchanges

In some instances, Hill-Rom will want the bad parts/products to be sent back for inspection. When this occurs, you are expected to send the parts/products in 30 days or less of receipt of the replacement part. If you fail to send the parts or products that do not operate in the 30 days or less, Hill-Rom will invoice your facility for the full selling price of the parts/products.

NOTE:
The above billing procedure is **only** for parts/products that Hill-Rom inquires to be sent back.

In some instances, the invoice accompanying the parts will show the full selling price (only for internal use at Hill-Rom). This is not your price.

Do not send any parts without a RMA number. When parts/products have been inquired to be sent back, Hill-Rom will include a RMA packet with the parts/products shipment. If a RMA number is not available, phone Hill-Rom Technical Support.

Out-of-Warranty Exchanges

You are expected to send the parts or products that do not operate in 30 days or less of the receipt of the replacement part. Hill-Rom will include a RMA packet with the parts/products shipment. If a RMA number is not available, phone Hill-Rom Technical Support. Hill-Rom will invoice your facility for the full selling price of the parts/products. On return of the parts or products that do not operate, Hill-Rom will give a credit to your facility for **the difference between the replacement price and the full selling price of the parts/products**.

Warranty

HILL-ROM COMPANY, INC.
LIMITED WARRANTY

Hill-Rom Company, Inc. (Hill-Rom) has a long tradition of providing superior products and service to our customers. Our goal is "Total Customer Satisfaction". In that spirit, Hill-Rom is proud to offer the warranty that follows.

GENERAL WARRANTY (APPLICABLE UNLESS A SPECIFIC WARRANTY IS LISTED)

Hill-Rom warrants to the original purchaser that its products and replacement parts shall be free from defects in material and workmanship for a period of one (1) year from date of delivery. Hill-Rom's obligation under this warranty is expressly limited to supplying replacement parts and/or service for, or replacing, at its option, any product which is, in the sole discretion of Hill-Rom, found to be defective. In addition to the foregoing one year warranty, Hill-Rom warrants to the original purchaser that the frame and welds on its products will be free from structural defects for the life of the product. Any product upgrade or modification initiated by Hill-Rom does not affect the original product warranty.

SPECIFIC WARRANTIES

MATTRESS WARRANTIES

Hill-Rom warrants to the original purchaser that its mattress product shall be free from defects in material and workmanship for a period of two (2) years from date of delivery. However, electro mechanical mattress components (compressors, valves, printed circuit boards, hoses, and couplers) are covered by the general one (1) year warranty.

EXPENDABLES WARRANTIES

A sixty (60) day limited warranty from date of delivery applies to expendable parts such as cushions, coverlets, software diskettes, locator badge batteries, dome light incandescent bulbs, overhead fluorescent tubes, heating elements, temperature probes, filter sheets, and microspheres. This warranty is limited to replacement of the parts covered.

TO OBTAIN PARTS AND SERVICE

In the United States, phone Hill-Rom Technical Support Department at 800-445-3720, Monday through Friday. In Canada, phone Hill-Rom Technical Support Department at 800-267-2337, Monday through Friday. Outside the United States and Canada, phone your authorized Hill-Rom Distributor. In order to expedite service, we tell you to furnish this information: customer identification number, product model number, serial number, and description of problem. A qualified specialist will provide, via telephone (United States and Canada), or FAX (Outside the United States and Canada), troubleshooting assistance for facility personnel and provide necessary parts to make repairs. If troubleshooting determines the need for on-site technical service, a qualified service representative will be dispatched. Replacement of non-technical items will be the responsibility of the customer. If Hill-Rom inquires, products or parts for which a warranty claim is made shall be sent back prepaid to Hill-Rom's factory.

OUT OF WARRANTY EXCHANGE POLICY

After the expiration of the original warranty, on inquiry, Hill-Rom will ship as a replacement, components such as selected: motors and printed circuit boards, for like units sent back to Hill-Rom by the original purchaser at a substantial savings. Please phone Hill-Rom Technical Support Department for current pricing.

PARTS AVAILABILITY POLICY

Hill-Rom will offer parts for new and remanufactured products for ten (10) years from date of sale; for communications products for five (5) years from date of sale.

Note: Some original component parts and assemblies may not be available; functional equivalents may be substituted.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS WARRANTIES AND IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF PURPOSE. HILL-ROM'S OBLIGATION UNDER THESE WARRANTIES SHALL NOT INCLUDE ANY LIABILITY FOR LOSS OF PROFITS, DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES OR DELAYS. Some states, provinces, or countries do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply. Any improper or negligent use, any alterations or repairs not in accordance with Hill-Rom's manuals or done by others in such manner as in Hill-Rom's sole judgment affects the product materially and adversely, shall void these warranties. These warranties do not cover failures due to misuse, abuse, neglect, or lack of regular maintenance. No employee or representative of Hill-Rom is authorized to change these warranties in any way or grant any other warranty unless in writing and signed by a Hill-Rom officer. These warranties provide specific legal rights; but, there may be other available rights, which vary from state to state, province to province, or country to country.

Revised July 6, 2001

Hill-Rom Company, Inc., 1069 State Route 46 E, Batesville, IN 47006-9167

NOTES:

Recommended Spare Parts

For a recommended spare parts list to service five or more units, see table 5-1 on page 5-6.

Table 5-1. Recommended Spare Parts

Part Number	Quantity	Description
71073	1	Pendant, without SideCom® Communication System
72781	1	Pendant, with SideCom® Communication System
128594	2	Fuse, battery
128595	2	Fuse, SideCom® Communication System
VE0137C	1	Head motor
VE0138C	1	Thigh motor
AG0034	2	Brake detection switch
RO0108A	1	Caster, brake
RO0110A	1	Caster, brake/steer
38827	1 can	Paint, light neutral
131555	1	TR25 screw
71535 or 71646 or 71644	1 1 1	Label, siderail control, rh, with bed exit and nurse call Label, siderail control, rh, bed function only Label, siderail control, rh, with bed exit, but without nurse call
71538 or 71647 or 71645	1 1 1	Label, siderail control, lh, with bed exit and nurse call Label, siderail control, lh, bed function only Label, siderail control, lh, with bed exit, but without nurse call
152001 or 141280 or 141282	1 1 1	Label, caregiver control, bed function and nurse call, lh Label, caregiver control, bed function, bed exit, and nurse call, lh Label, caregiver control, bed function, bed exit, lh

Part Number	Quantity	Description
152000 or 152001 or 141216 or 141218	1 1 1 1	Label, caregiver control, bed function, rh Label, caregiver control, bed function and nurse call, rh Label, caregiver control, bed function, bed exit, and nurse call, rh Label, caregiver control, bed function, bed exit, rh
133167	1	Power cord, NEMA5-15P, 10A/250V
133168	1	Power cord, 2073:2000, 10A/250V
133169	1	Power cord, BS1363/A, 10A/250V
133170	1	Power cord, CEE 7/7, 10A/250V
133171	1	Power cord, AS3112 (Clear), 10A/250V
133172	1	Power cord, GB2099.1-'96, 10A/250V
133173	1	Power cord, BS546, 10A/250V
133174	1	Power cord, CE1,23-16-V11, 10A/250V
133175	1	Power cord, NEMA5-15P, 13A/100V
133176	1	Power cord, NEMA5-15P, 13A/110V
134752	1	Power cord, SB107-2-D1-10A, 10A/250V

Footboard and Headboard

Figure 5-2. Footboard and Headboard

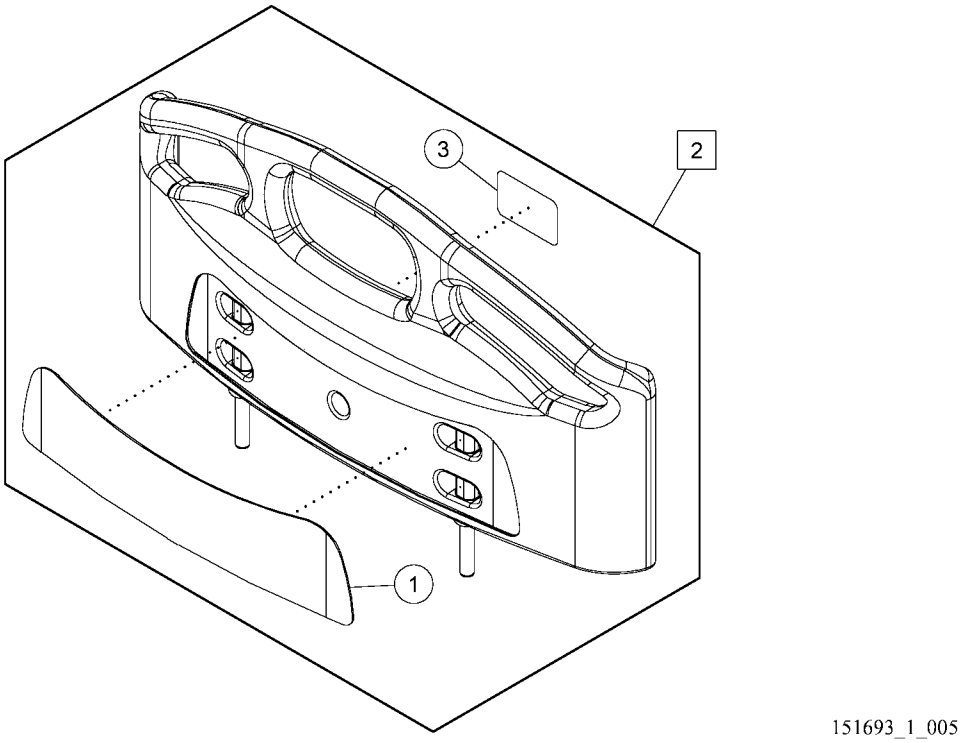


Table 5-2. Footboard and Headboard

Item Number	Part Number	Quantity	Description
1	71650	1	Label
2	CA0004	1	Footboard or headboard assembly
3	71549	1	CPR label

NOTES:

Base Frame

Figure 5-3. Base Frame

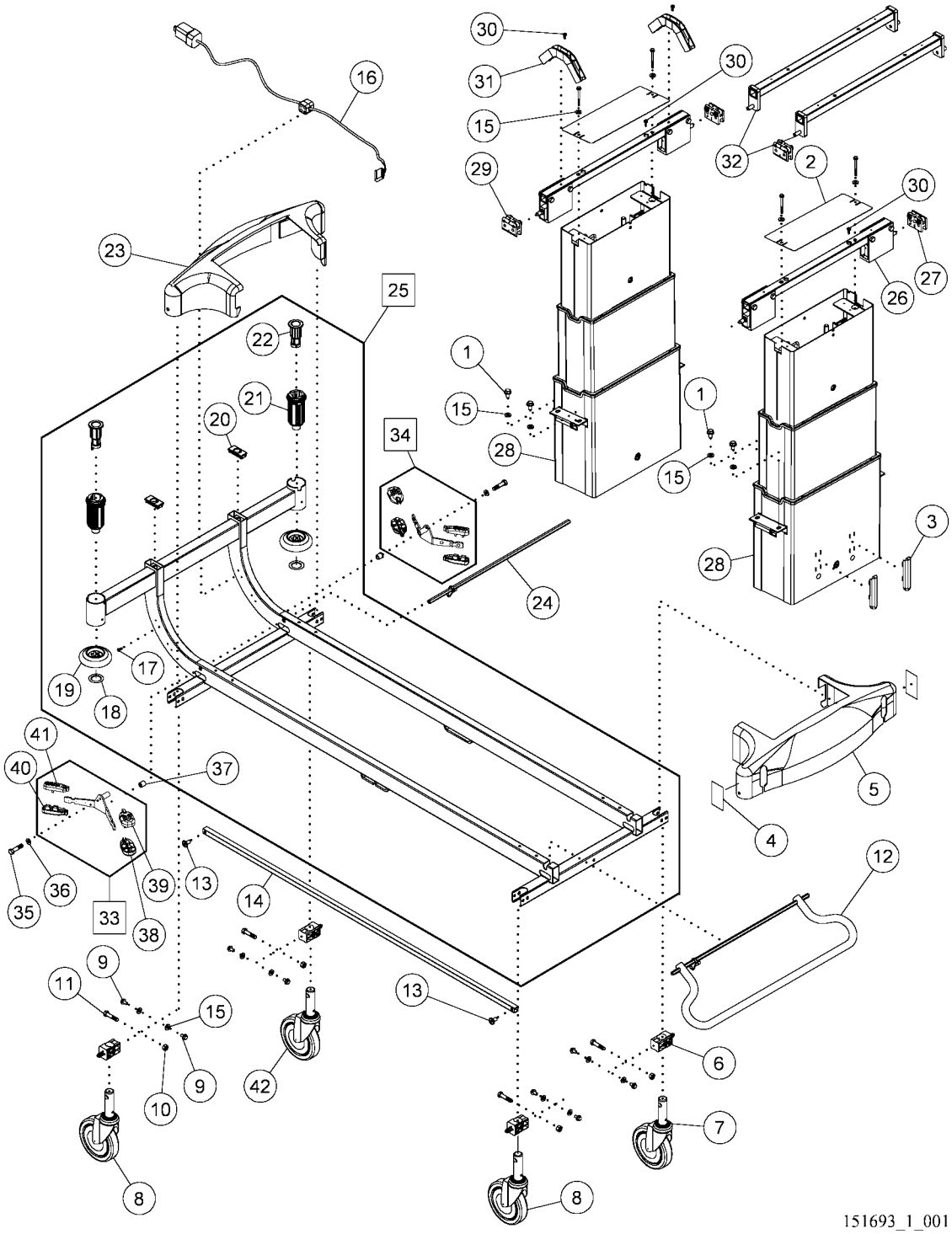


Table 5-3. Base Frame

Item Number	Part Number	Quantity	Description
1	VI0610A	8	Screw
2	132180	2	Cover, column
3	S30545K	4	Cover
4	71649	1	Label, brake/steer position, lh
	71788	1	Label, brake/steer position, rh
5	CA0011	1	Foot end brake cover
6	S30528K	4	Caster support
7	RO0110A	1	Caster, brake/steer
8	RO0108A	2	Caster, brake, anti-static
9	VI0326	8	Screw
10	VI0361	4	Nut
11	VI0020	4	Bolt
12	CAG002	1	Brake/steer pedal
13	S30527K	2	Plastic bushing
14	F11203A	1	Brake bar
15	VI0616A	16	Washer
16	133167	1	Power cord, NEMA5-15P, 10A/250V
	133168	1	Power cord, 2073:2000, 10A/250V
	133169	1	Power cord, BS1363/A, 10A/250V
	133170	1	Power cord, CEE 7/7, 10A/250V
	133171	1	Power cord, AS3112 (Clear), 10A/250V
	133172	1	Power cord, GB2099.1-'96, 10A/250V
	133173	1	Power cord, BS546, 10A/250V
	133174	1	Power cord, CE1,23-16-V11, 10A/250V
	133175	1	Power cord, NEMA5-15P, 13A/100V
	133176	1	Power cord, NEMA5-15P, 13A/110V
	134752	1	Power cord, SB107-2-D1-10A, 10A/250V
17	VI0613A	1	Screw
18	QD0663	2	Washer
19	71082	2	Bumper
20	S305342	2	End cover
21	S30283B	2	Accessory socket
22	71438	2	Adapter, IV pole

Item Number	Part Number	Quantity	Description
23	141340	1	Shroud
24	CA026	1	Brake rod assembly, hex
25	CA0006	1	Base frame assembly
26	132251	2	Load beam assembly
27	132054	2	Slide block
28	CA0025	2	Hilow column
29	132080	2	Slide block assembly
30	VI0613A	4	Screw
31	132369	2	Wire guide, plastic
32	132822	2	Cross beam weldment, non-scale
33	141258	1	Brake pedal assembly, RH
34	141259	1	Brake pedal assembly, LH
35	VI0020	2	Screw
36	VI0616A	2	Washer
37	141308	2	Spacer, pedal
38	70778	2	Brake/steer pedal, bottom (large) green
39	70779	2	Brake/steer pedal, top (large) green
40	70780	2	Brake/steer pedal, bottom (small) orange
41	70781	2	Brake/steer pedal, top (small) orange
42	RO0106A	1	Caster

NOTES:

Articulating Frame

Figure 5-4. Articulating Frame

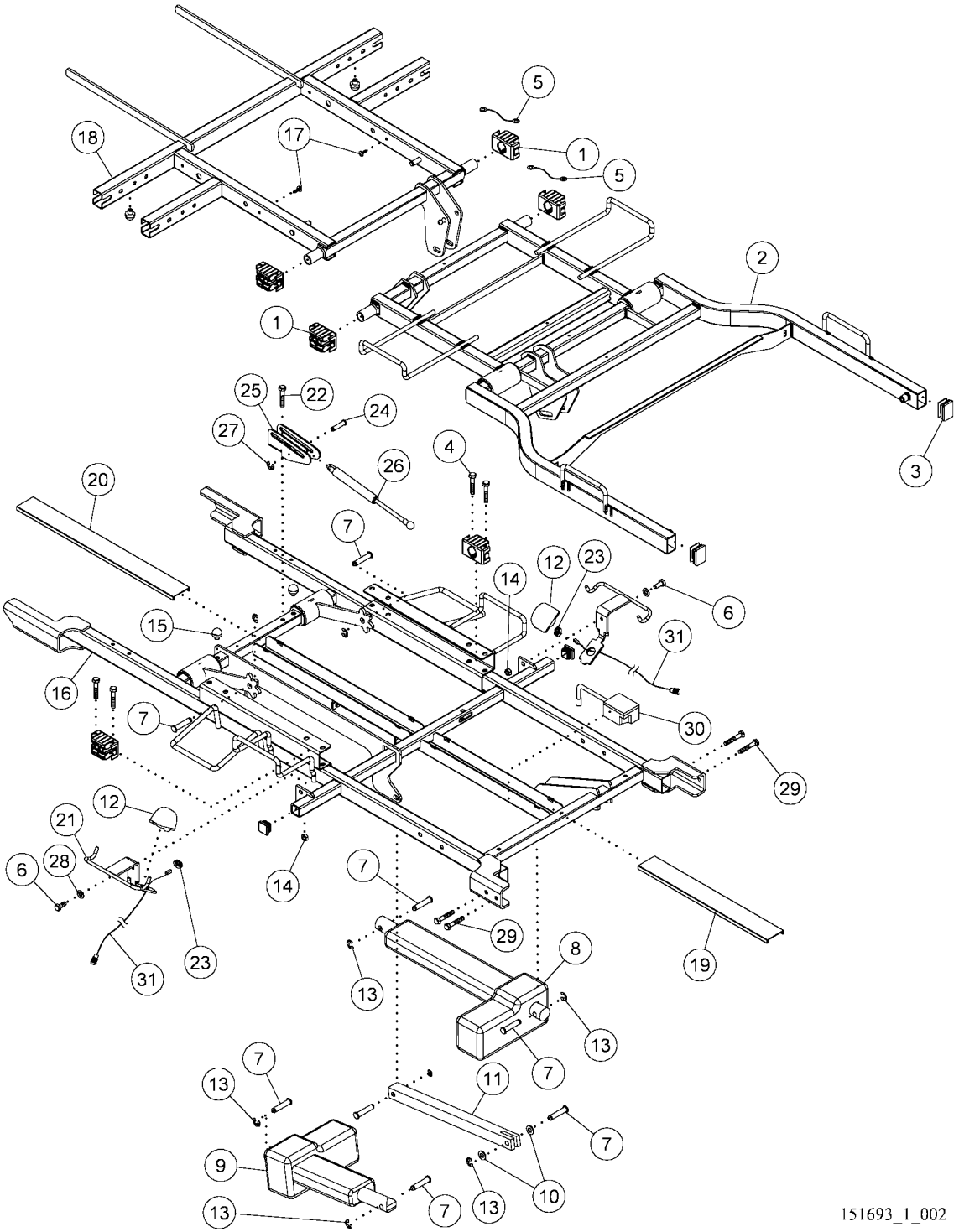


Table 5-4. Articulating Frame

Item Number	Part Number	Quantity	Description
1	S30531K	4	Bearing
2	71267	1	Weldment, thigh and leg, frame
3	QD0589	2	Ear cap
4	VI0609A	8	Screw
5	QD2346	1	Ground strap, thigh frame to intermediate frame
	QD2345	1	Ground strap, head frame to intermediate frame
6	VI0610A	2	Screw
7	S10959A	7	Pin, pivot
8	138884	1	Motor, head section
9	VE0138D	1	Motor, thigh section
10	151729	2	Bushing
11	151728	1	Solid tube drive insert
12	137762	2	Night light housing
13	RM74803A	7	E-clip
14	VI0361	5	Nut
15	QD1545A	4	Bumper
16	CAG001	1	Weldment, intermediate frame
17	72274	4	Mount, cable tie
18	72854	1	Backrest weldment
19	S30555K	1	Cover, short cable tray
20	S30548K	1	Cover, long cable tray
21	71495	2	Weldment, drainage hook
22	VI0609A	2	Screw
23	71991	2	Nut
24	S10850	1	Pivot pin
25	72619	1	Bracket, CPR gas spring mount
26	72494	1	Gas spring
27	RM74804A	1	E-clip
28	VI0616A	4	Washer
29	VI0608	4	Screw
30	138271	1	Alarm, external assembly

Item Number	Part Number	Quantity	Description
31	138036	2	Night light

NOTES:

Foot Section

Figure 5-5. Foot Section

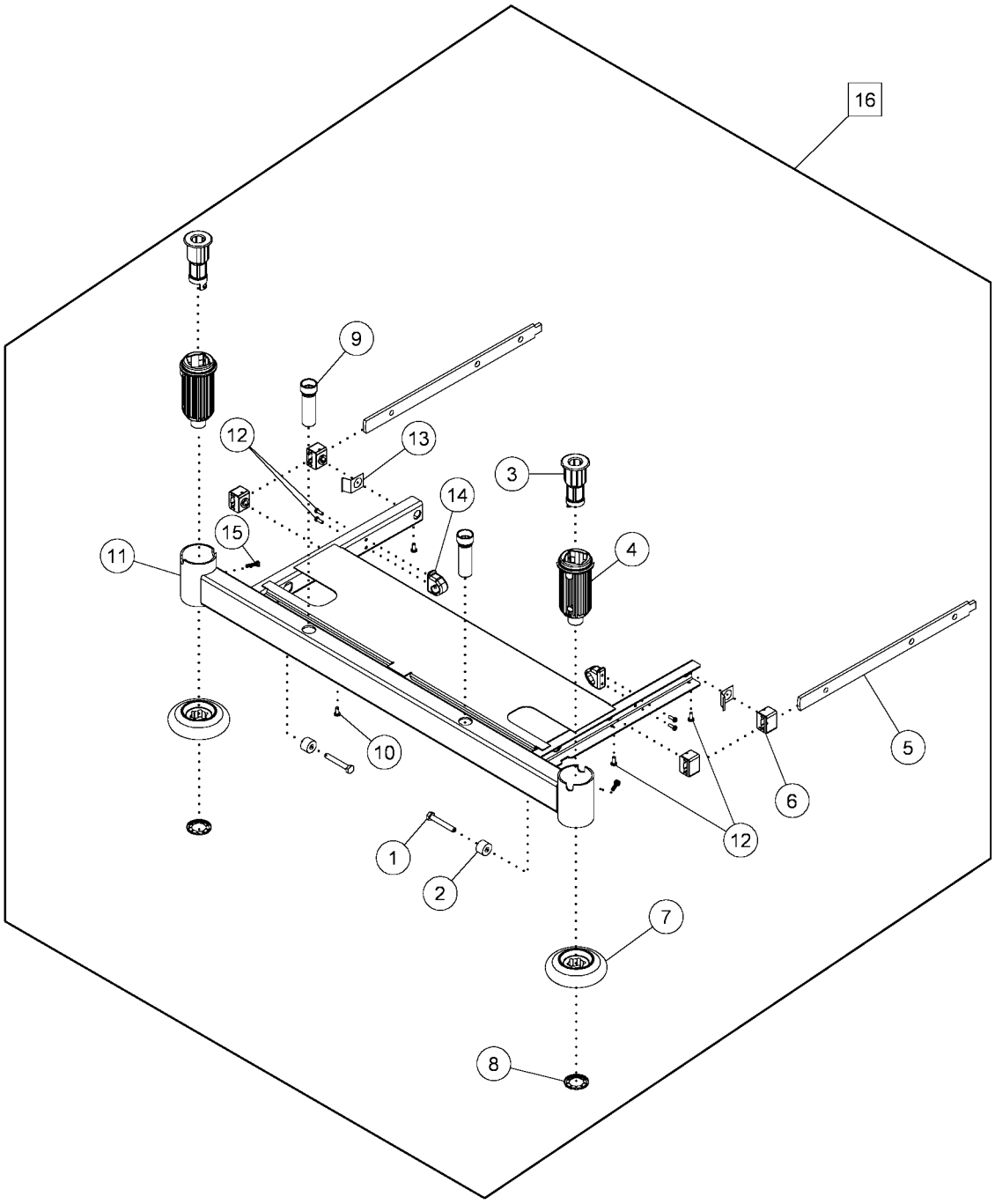


Table 5-5. Foot Section

Item Number	Part Number	Quantity	Description
1	151729	2	Screw
2	VI0608A	2	Bushing
3	71438	2	Adapter, IV pole
4	S30283B	2	Accessory carrier
5	71265	2	Bar, foot extension
6	S30315A	4	Extension pad
7	71082	2	Bumper
8	QD0663	2	Push nut
9	S30534L	2	Fixing device
10	VI0554A	8	Screw
11	71262	1	Weldment, foot extension
12	VI0554A	8	Screw
13	S20998B	2	Blade
14	S30314	2	Stage poignee extension
15	VI0613A	2	Screw
16	72858	1	Assembly, foot extension

Head Siderail

Figure 5-6. Head Siderail

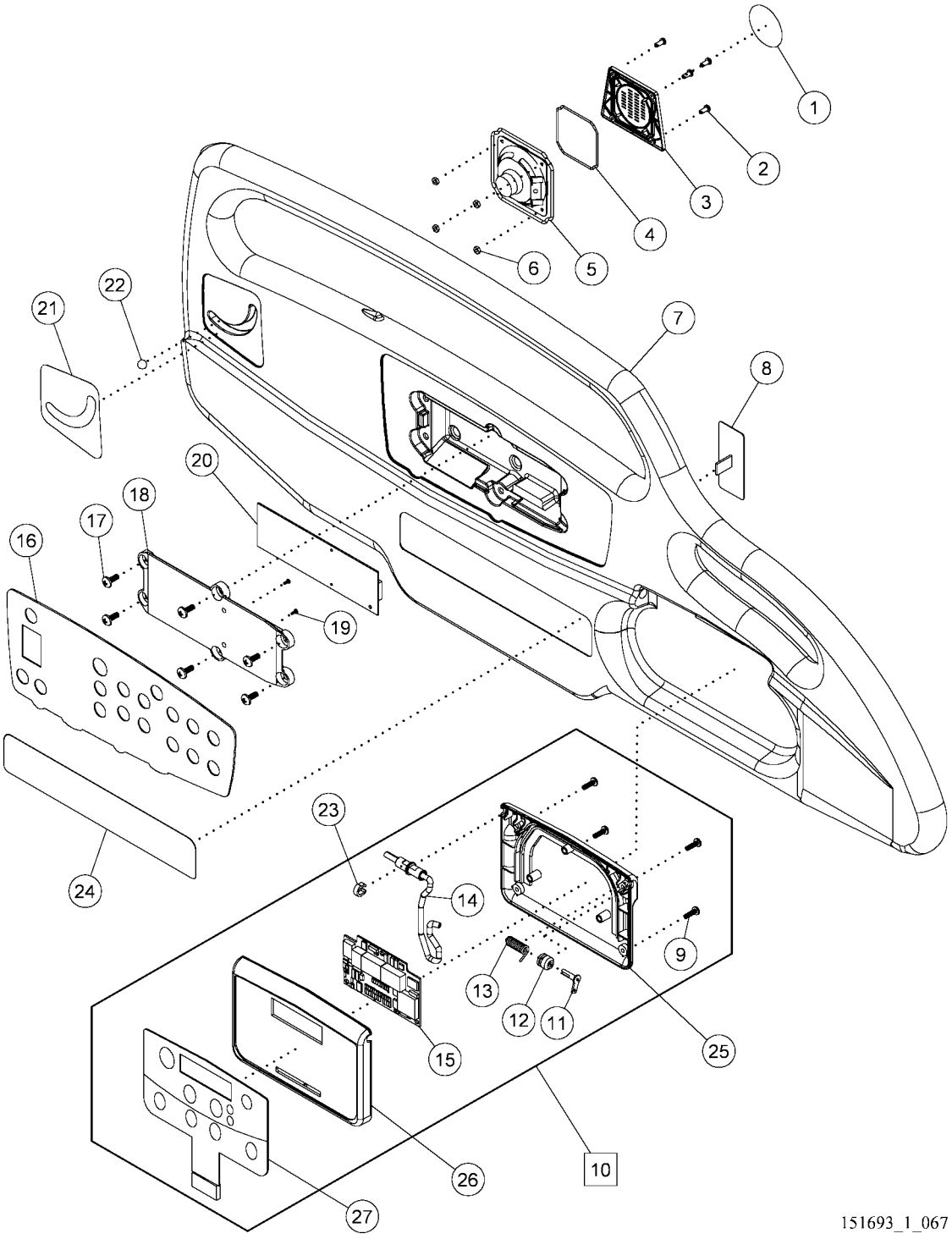


Table 5-6. Head Siderail

Item Number	Part Number	Quantity	Description
1	72290	1	Label, blank, speaker cover
2	72862	4 or 8	Screw hi-lo
3	71090	1	Speaker cover
4	71091	1	Gasket, cover
5	70746	1	Speaker
6	28562	4	Nut
7	128804	1	Siderail, rh (scale beds)
	129656	1	Siderail, lh (scale beds)
	71019	1	Siderail, rh (non-scale beds)
	71062	1	Siderail, lh (non-scale beds)
8	71536	1	Membrane switch, nurse call
	71795	1	Label, nurse call, blank
9	4214102	4	Screw
10	138231	1	Scale display, with bed exit, rh
	138233	1	Scale display, bed exit only, rh
	131572	1	Scale display, scale only, rh
	138230	1	Scale display, with bed exit, lh
	138232	1	Scale display, bed exit only, lh
	131571	1	Scale display, scale only, lh
11	131724	1	Display axle, weldment, short, lh
	129658	1	Display axle, weldment, long, rh
12	129441	1	Pivot insert
13	49199	1	Spring
14	73004	1	Cable assembly
15	133197	1	Assembly, scale display P.C. board
16	152002	1	Label, caregiver control, bed function, lh
	152003	1	Label, caregiver control, bed function and nurse call, lh
	152000		Label, caregiver control, bed function, rh
	152001		Label, caregiver control, bed function and nurse call, rh
17	VI0601A	12 or 24	Screw
18	72581	1	Support, siderail P.C. board
19	72656	4	Standoff, P.C. board mount

Item Number	Part Number	Quantity	Description
20	125939	1	Siderail signal conditioning P.C. board, rh
	71514	1	Siderail signal conditioning P.C. board, lh
21	72820	1	Label, angle indicator, rh
	72821	1	Label, angle indicator, lh
22	QD1653A	1	Level ball
23	129442	1	Spacer
24	131857	1	Label, scale (English)
	133011	1	Label, scale (Japanese)
	133012	1	Label, scale (Simplified Chinese)
	133013	1	Label, scale (French)
	133015	1	Label, scale (Traditional Chinese)
	133016	1	Label, scale (Thai)
	133017	1	Label, scale (Korean)
	133018	1	Label, scale (Portuguese)
	133019	1	Label, scale (Spanish)
25	128806	1	Scale display housing, back
26	138197	1	Scale display housing, front
27	128749	1	Scale display membrane

NOTES:

Head Siderail Mounting

Figure 5-7. Head Siderail Mounting

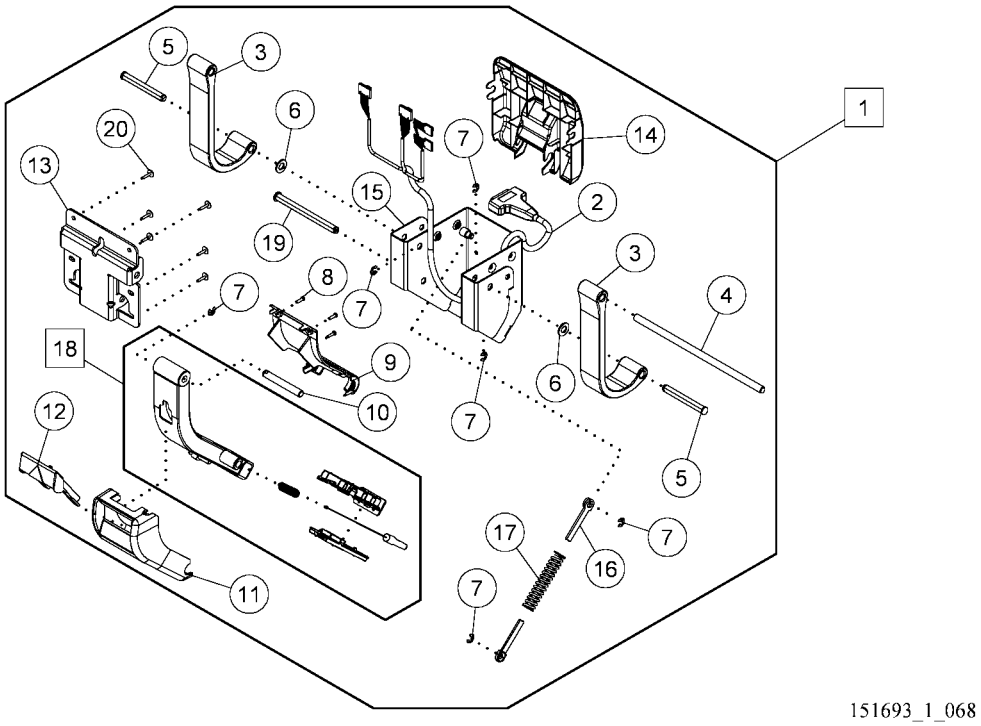


Table 5-7. Head Siderail Mounting

Item Number	Part Number	Quantity	Description
1	CA0007	1	Siderail mount assembly, head
2	71372	1	Siderail cable
3	S40029A	2	Siderail arm, painted
4	S10951B	1	Pivot pin, outer arm, upper
5	S10956B	2	Pivot pin, outer, lower
6	RM74478A	2	Washer, nylon
7	RM74803A	6	E-clip
8	72862	3	Screw
9	71087	1	Cover, siderail center arm
10	S10952B	1	Pivot pin, center arm, upper
11	71086	1	Enclosure, center arm
12	71085	1	Handle, siderail

Item Number	Part Number	Quantity	Description
13	S20950F	1	Siderail mount, painted
14	71436	1	Cover, head
15	71840	1	Head siderail mounting bracket, painted
16	72991	2	Assembly, spring guide, head
17	72791	1	Spring, siderail dampening, head
18	71654	1	Siderail center arm assembly, painted
19	S10953B	1	Pivot pin, center arm, lower
20	VI0601A	6	Screw

Foot Siderail

Figure 5-8. Foot Siderail

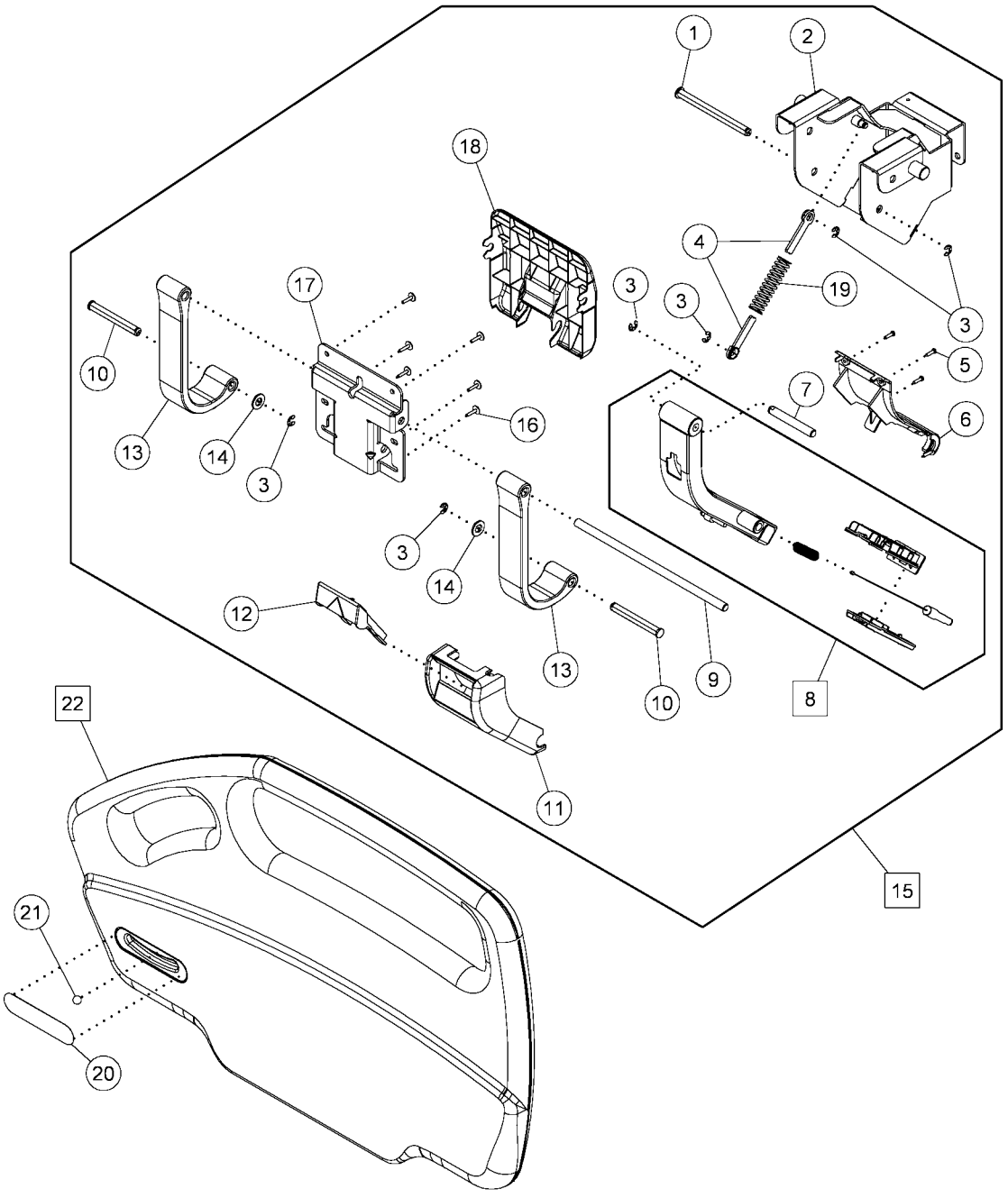


Table 5-8. Foot Siderail

Item Number	Part Number	Quantity	Description
1	S10953B	1	Pivot pin, center arm, lower
2	71427	1	Weldment, foot siderail mounting bracket
3	RM74803A	6	E-clip
4	72990	2	Spring guide, assembly
5	72862	3	Screw, hilow
6	71087	1	Cover, center arm
7	S10952B	1	Pivot pin, center arm, upper
8	71654	1	Weldment, center arm assembly
9	S10951B	1	Pivot pin, outer arm, upper
10	S10956B	2	Pivot pin
11	71086	1	Enclosure, center arm
12	71085	1	Handle, siderail
13	S40029A	2	Siderail arm, painted
14	RM74478A	2	Washer, nylon
15	CA0008	1	Foot siderail mechanism assembly
16	VI0601A	6	Screw
17	S20950F	1	Siderail mount, painted
18	71436	1	Cover, head
19	72792	1	Spring, siderail, foot
20	71656	1	Label
21	QD1653A	1	Level ball
22	71018	1	Siderail assembly, foot end, rh
	71061	1	Siderail assembly, foot end, lh

Plastic Sleep Deck

Figure 5-9. Plastic Sleep Deck

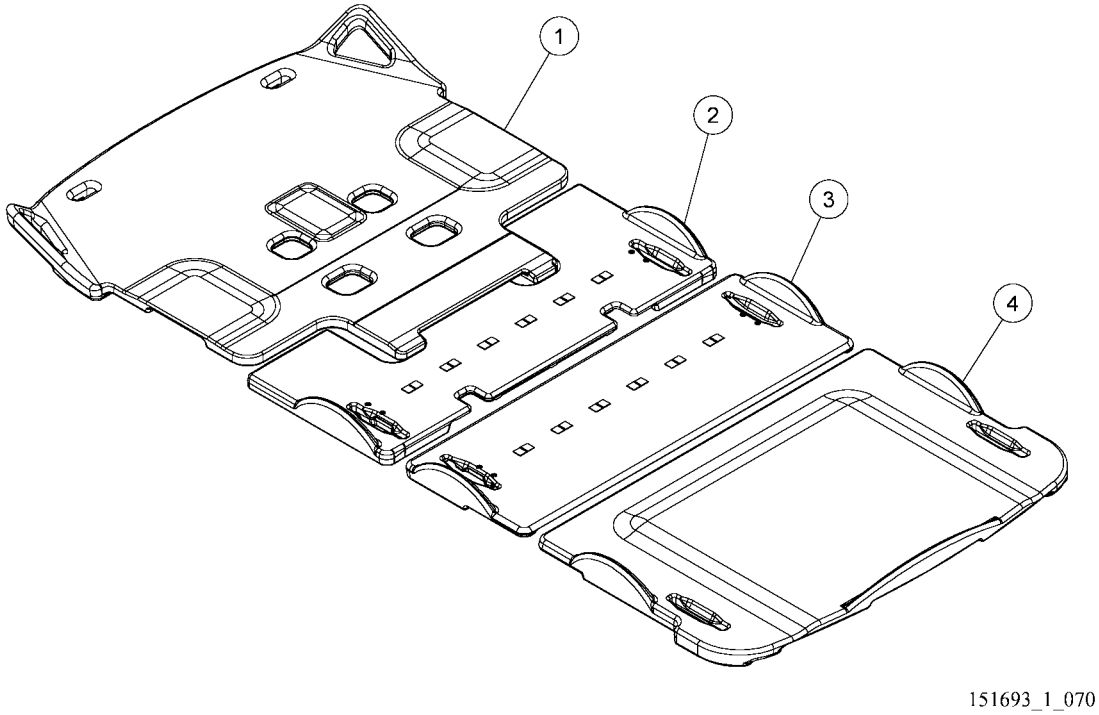


Table 5-9. Plastic Sleep Deck

Item Number	Part Number	Quantity	Description
1	71038	1	Sleep surface, backrest
2	71037	1	Sleep surface, seat
3	71036	1	Sleep surface, knee
4	71035	1	Sleep surface, foot

NOTES:

Motor Control Box

Figure 5-10. Motor Control Box

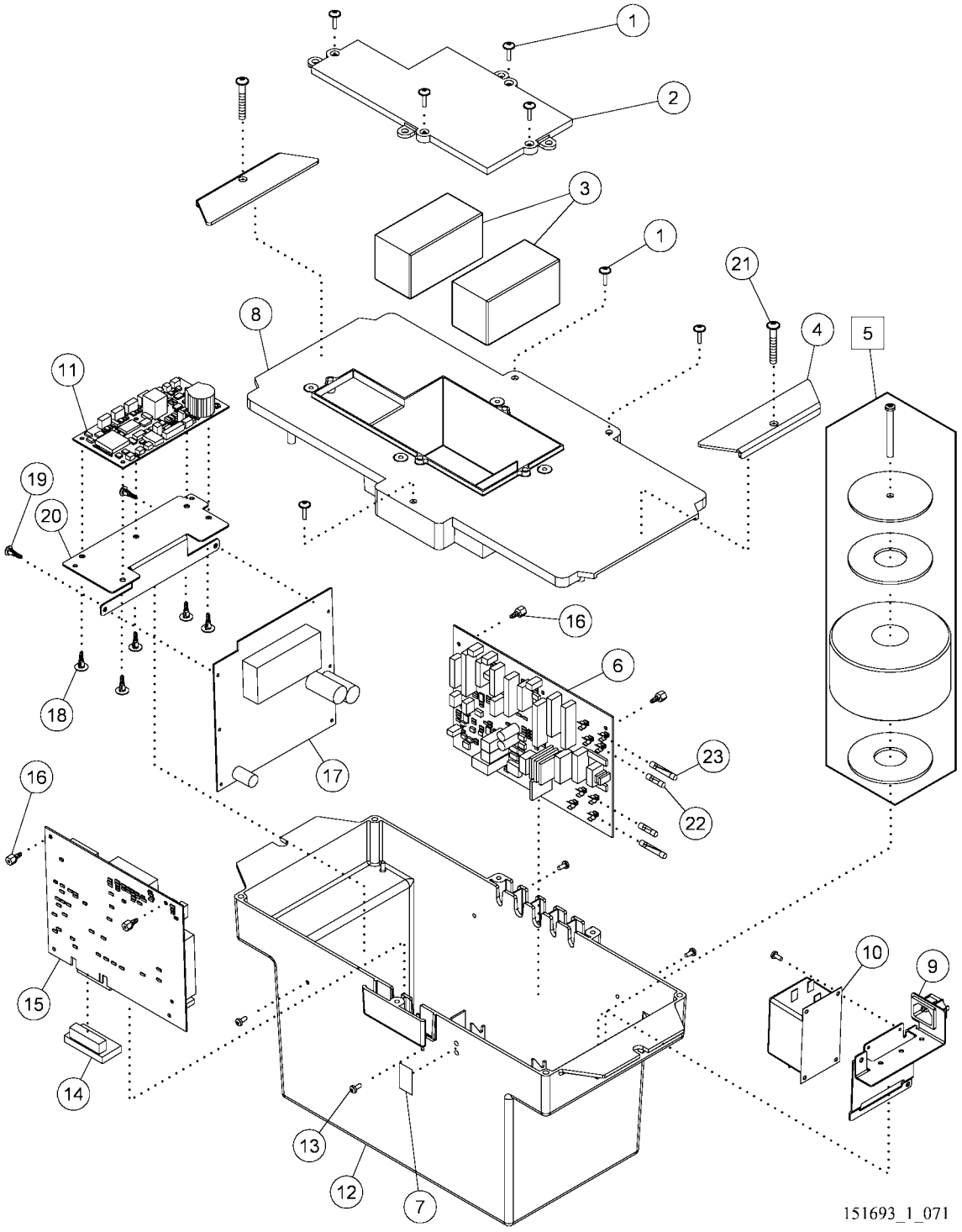


Table 5-10. Motor Control Box

Item Number	Part Number	Quantity	Description
1	VI0601A	7	Screw
2	132547	1	Cover assembly, battery compartment
3	QD1642A	2	Battery, 12 V
4	132219	2	Washer
5	128816	1	Transformer, North America
	128829	1	Transformer, International
6	137613	1	Assembly, siderail interface P.C. board
7	127865	1	Label, blank
8	132546	1	Cover
9	132094	1	Power cord mount
10	70611	1	Line filter
11	150139	1	P.C. board assy, scale and PPM, 400 lb
	148822	1	P.C. board assy, scale and PPM, 500 lb (E model and newer bed)
	148823	1	P.C. board assy, PPM only, 500 lb
	148824	1	P.C. board assy, scale only, 500 lb
12	130628	1	Electrical enclosure
13	VI0395	4	Screw
14	4476703	1	UTV adapter, Zenith 92
	4476701	1	UTV adapter, standard analog
15	129741	1	Assembly, SideCom® Communication System P.C. board
16	132934	5	Circuit board support (standoff)
17	132628	1	P.C. board, motor control
18	3976301	5	Standoff
19	132935	2	Circuit board support (standoff)
20	132093	1	Scale board mount
21	VI0608A	2	Screw
22	7061002	2	Fuse, 2.5A, 5 x 20 mm
23	133251	2	Fuse, 5A, 0.25" x 1.25"

CPR Cables

Figure 5-11. CPR Cables

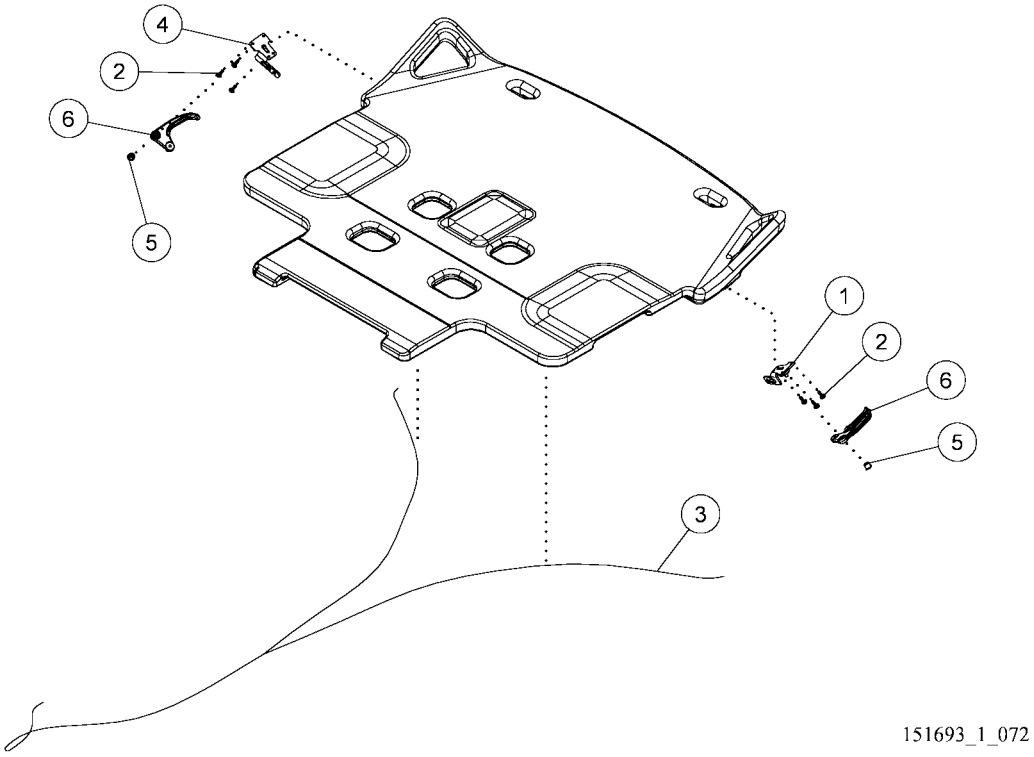


Table 5-11. CPR Cables

Item Number	Part Number	Quantity	Description
1	71527	1	Weldment, CPR bracket and spacer
2	132082	6	Rivet
3	71520	1	CPR cable
4	71526	1	Weldment, CPR bracket and spacer, rh
5	VI0361	2	Nut
6	71660	2	Handle, CPR, red

NOTES:

Control Cables

Figure 5-12. Control Cables

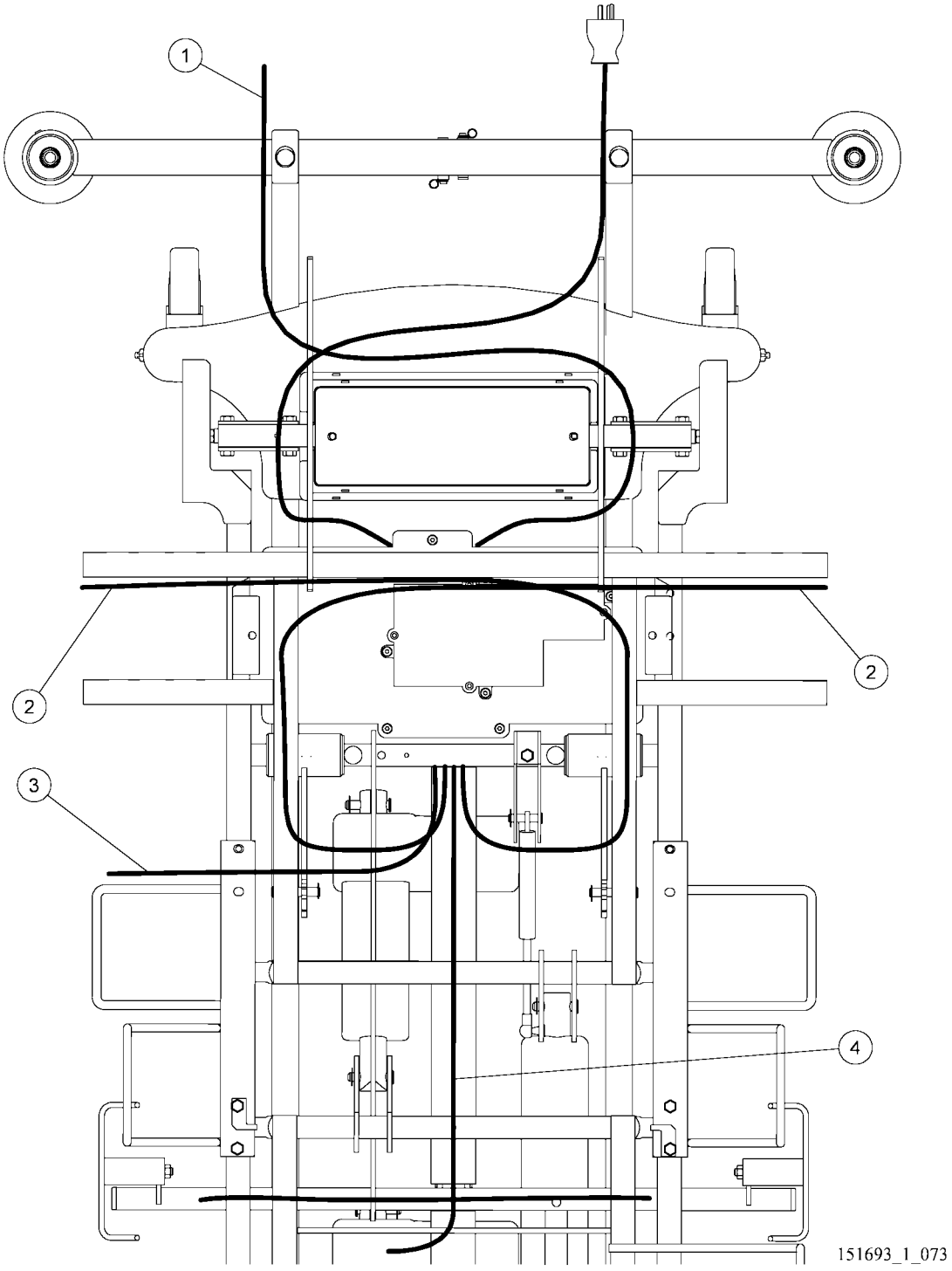


Table 5-12. Control Cables

Item Number	Part Number	Quantity	Description
1	141805	1	SideCom® Communication System cable
2	141806	1 (each side)	Siderail cable
3	71761	1	Pendant cable
4	137763	1	Cable, external alarm
5 (not shown)	71073	1	Pendant, without SideCom® Communication System
6 (not shown)	72781	1	Pendant, with SideCom® Communication System
7 (not shown)	141807	1 (each side)	Siderail interconnect cable

NOTES:

Chapter 6
General Procedures

Clean and Disinfect

We recommend that you clean and disinfect the Hill-Rom® 1000 Bed between patient use and regularly during extended patient stays. Refer to your facility's cleaning and disinfection policies, and obey the guidelines below.

WARNING:
Obey the manufacturer's instructions. Failure to do so could cause injury or damaged equipment.

SHOCK HAZARD:
Disconnect the unit from its power source. Failure to do so could cause injury or damaged equipment.

SHOCK HAZARD:
The possibility for electrical shock exists with electrical equipment. Failure to follow facility protocol could cause death or injury.

SHOCK HAZARD:
Do not permit the unit to become too moist. Injury or damaged equipment could occur.

CAUTION:
Make sure the bed frame is dry before you put the mattress on the bed. Failure to do so could cause damaged equipment.

CAUTION:
Do not use harsh cleaners, solvents, or detergents. Damaged equipment could occur.

CAUTION:
Do not steam clean or power wash the bed or mattress. Pressure and too much moisture can damage the mattress and the surfaces of the bed and its electrical components.

Clean

1. Disconnect the bed.
2. Remove all linens.
3. Use these to clean the bed:
   - A soft cloth soaked with warm water and a facility-approved general cleaning soap/detergent solution. Make sure the cloth is not so wet as to cause the cleaning solution to pool or flood on the mattress or other bed components.
   - A soft brush to remove stains and resistant soil. Do not use harsh or abrasive cleansers, solvents, or scouring pads.
4. Clean the bed. Give special attention to these areas:
   - Headboard—thoroughly clean as this is a high-touch area
   - Footboard
   - Siderails—thoroughly clean the high-touch areas such as the upper and under sides of the siderail releases, pendants, and patient controls
   - Bed frame
   - Casters
   - All other bed components
   - Fully-extended IV pole
   - Bed accessories that can be used again such as the mattress and patient helper

NOTE:
If you turn the mattress to clean it, make sure the cleaning solution does not pool or flow on to the other side or edges of the mattress. This can permit fluid to get into the mattress air outlets and zipper closures that ordinarily are sealed by the ticking flaps.

5. Examine the condition of the mattress. If there are holes, tears, or other signs of damage or deterioration of the ticking, replace the mattress.
6. Disinfect the bed as described next.

Disinfect

Wipe down all surfaces with a facility-approved disinfectant, used in accordance with the manufacturer's instructions. Give special attention to high-touch areas such as the siderails, upper and under sides of siderail releases, pendants, patient controls, and headboards.

Component Handling

CAUTION:
To aid in the prevention of component damage, make sure your hands are clean, and **only** touch the P.C. board by its edges.

CAUTION:
When handling electronic components, wear an antistatic strap. Failure to do so could cause component damage.

CAUTION:
For shipping and storage, put the removed P.C. board in an antistatic bag. Damaged equipment can occur.

P.C. Board

Be careful with the P.C. board when you service it, or these problems can occur:

- P.C. board damage
- Shortened P.C. board life
- Unit malfunctions

When you service the P.C. board, do as follows:

- Make sure hands are clean and have no moisture, oily liquids, etc.
- **Only** touch the P.C. board by its outer edges.
- Do not touch the P.C. board components. If you permit your finger to touch the board surface and/or its components you can make a deposit that will cause the board (and component) deterioration.
- When you work with electronics, wear an applicable antistatic strap, and make sure it is correctly grounded.
- Service the removed P.C. board at a static-free workstation that is correctly grounded.
- For shipping and storage, put the removed P.C. board in an antistatic bag.

Lubrication Requirements

There are no lubrication requirements for the Hill-Rom® 1000 Bed.

Preventive Maintenance

WARNING:
Only facility-authorized persons can service the Hill-Rom® 1000 Bed. Service by not approved persons could cause injury or damaged equipment.

It is necessary for the Hill-Rom® 1000 Bed to have an effective maintenance program. We recommend that you do annual preventive maintenance (PM) and testing for Joint Commission certification. PM and testing not only meet Joint Commission requirements but can help make sure of a long, operative life for the Hill-Rom® 1000 Bed. PM will keep downtime due to too much wear to a minimum.

The PM schedule that follows guides you through a PM procedure on the Hill-Rom® 1000 Bed. During this PM process, examine each item on the schedule, and make the necessary adjustments.

Follow the PM schedule with the related PM checklist. This checklist is designed to keep a running maintenance history and subsequent repair costs for one Hill-Rom® 1000 Bed. But, your facility can modify this checklist or design another to fit your needs. Two effective ways to decrease downtime and make sure the patient remains comfortable are to keep accurate records and properly service the Hill-Rom® 1000 Bed.

Preventive Maintenance Schedule

Table 6-1. Preventive Maintenance Schedule

Function	Procedure
Overall condition, frame and welded assemblies	Examine the overall condition of the bed. Examine that the structure and welded assemblies are in good working condition and that there are no impacts or corrosion. Do necessary repairs or paint retouches. Replace parts if necessary. Monitor the symmetry of the bed and make sure that the bed frame and base are not twisted. Do necessary repairs or paint retouches. Make sure that all labels are installed and can be read. Replace them if necessary. Examine the hardware to make sure it is present and not loose. Replace or adjust if necessary.
Headboard and footboard	Examine the appearance, attachment and safety of the headboard and footboard. Replace if necessary.
AC power cord	Examine the plug for damage. Make sure the plug is a one-piece molded plug assembly. If it is not, replace the plug cord assembly. Replace plug cord assembly that shows any of these: • Discoloration of the plug molding around the plug blades; this could occur if the plug blades have overheated or arced. • Any signs of cracking; this could occur if the plug has been bent and straightened to a point beyond its useful life. • Loose fit of the plug blade (the plug blade moves in the molding); this could occur if the molding has overheated or the blades have been bent and straightened to a point beyond their useful life. Replace the power cord, if damaged.
Leakage current	Disconnect the bed from its power source. Connect the bed to the safety tester and connect this device to the power outlet. Make sure that the bed is correctly supplied by the test device: control unit LEDs lit (unlock the functions if necessary). Measure the leakage current without operating a function. (The value must be less than 100 µA.) Examine the AC power cable and power supply unit if the value is outside of the specifications (0.2 Ohms). Replace the AC power cable or power supply unit if necessary.

Function	Procedure
Patient pendant	Disconnect the patient pendant and examine the condition of the connector. Then connect or replace the pendant. Test each of the buttons to make sure that they start the correct function and that they do not work intermittently when each button is pressed for several seconds. Each movement must be continuous. Replace the pendant if necessary.
Hilow columns	Examine the column assembly and make sure the attachment screws and the snap ring at the bottom of the column is present and tight. Repair as necessary. Fully lift and lower the bed frame one time. Make sure there is no friction or unusual noises and that you do not hear an overload indication signal during the movement. Make sure the Bed Not Down position indicator illuminates on the control pendant, and goes out when the bed is in the low position. Replace the defective column(s) if a malfunction occurs. Troubleshoot if you are in doubt.
Head section motor	Examine the actuator assembly. Make sure the pins and retaining clips are present and intact. Fully lift and lower the head section. Make sure there is no friction or unusual noises, and that you do not hear an overload indication during the movement. Repair if necessary.
Plastic sleep deck	Fully lift and lower the head section. Examine for binding during the head section movement. Make sure the hard surface and its drive system are in good condition. Make sure there is no friction or unusual noises. Replace damaged parts. Remove each hard surface (this does not include the head section) and examine its condition. Replace if necessary.
CPR release	Examine the handles, cables, and CPR mechanism on the head motor. Make sure the screws are present and fully tightened. Make sure the two CPR release handles, cable, and CPR mechanism on the head motor are in good condition. Lift the head section to the high position, then start one of the CPR releases. Make sure the head section lowers. Adjust the CPR cable as necessary. Do the same tests on the other side of the bed. Release the CPR handles and make sure the mechanism locks correctly when you operate the **Head Up** control for a approximately five seconds. Be sure to monitor the elevation movement. Replace the head section motor as necessary.

Function	Procedure
Head section gas springs	Examine the assembly of the gas springs. Make sure that the screws are present and fully tightened. Make sure there is no oil on its shaft. Fully lift the head section. Start the CPR function. Make sure the head section lowers quickly to the intermediate position then gradually to the low position. Replace if necessary.
Knee section motor	Examine the knee section motor. Make sure the pins and retaining clips are present. Fully lift and lower knee section. Make sure there is no friction or unusual noises and that you do not hear an overload indication during the movement. Replace if necessary.
Automatic Contour	Make sure the knee section rises up to middle-height when the head section is raised from the low position, and that it lowers automatically when the head section lowers and the head section reaches the low position. Replace the actuator or defective unit if necessary.
Dining Chair® Position	Make sure the chair, head section, thigh section, and foot section functions are not locked out. Start the chair function and make sure the three sections go to their required positions. Put the sleep deck to the flat position. Troubleshoot if required.
Trendelenburg/ Reverse Trendelenburg	Start the **Trendelenburg** function. Make sure there is no friction or unusual noises, and that you do not hear an overload indication during the movement. Start the **Reverse Trendelenburg** function. Make sure there is no friction or unusual noises, and that you do not hear an overload indication during the movement. Replace if necessary.
Battery	Make sure that the bed is unplugged from its power source. Operate all the functions with use of the caregiver controls. Charge the batteries or replace them if necessary. Examine the date indicated on the batteries and replace the battery if the date is over three years.
Scale System	Calibrate the scale. Refer to“Scale Calibration” on page 6-11.
Bed Exit System	Make sure the Bed Exit System operates correctly. Replace worn or defective parts as necessary.

Function	Procedure
Siderails	Make sure the head and foot siderails are not bent or twisted. Make sure the latch mechanism operates correctly. A click must be heard. Remove the siderail cover, and make sure the mounting screws are tight. Examine the cable routing for pinching, binding, and damage. Make sure all functions on the caregiver control operate correctly. Repair or replace the siderail if necessary.
Foot Extension	Operate the foot section to make sure the movement is correct and that it locks properly in the different positions when the lever is released. Repair or replace the foot extension if necessary.
Pivot points	Make sure the articulations of the bed operate without making a noise (high/low column bearings, head and thigh sections). Lubricate if necessary.
Casters	Examine for cuts, wear and quality of the tread, and such. Replace if necessary.
Braking and steering	Examine the brakes to see whether the bed moves when the brake bar or the LH/RH brake pedals are pressed. Repair if necessary. Make sure the steering mechanism operates correctly. Replace or adjust the steering control elements of the steering caster if necessary. Replace the caster if necessary. Plug the bed into an applicable power source and set the brakes to neutral. Make sure the alarm is heard. Set the brakes on the bed. Make sure the alarm stops sounding.
Accessories	Make sure the correct operation of accessories installed on the bed. Replace parts that are not present or damaged.
SideCom® Communication System	Examine and test the communication junction box. Make sure the SideCom® Communication System features operate correctly. Examine the communication cable; include the male and female pins in the plug. Replace if necessary.

Preventive Maintenance Checklist

Table 6-2. Preventive Maintenance Checklist

Date																					Functions
Hill-Rom	**Manufacturer**																				Overall condition
																					Head and footboards
																					AC power cable
																					Leakage current
																					Patient pendant
																					Hilow columns
																					Head section motor
																					Plastic sleep deck
	Model Number																				CPR release
																					Head section gas spring
																					Knee section motor
																					Automatic Contour
																					Dining Chair® Position
																					Trendelenburg
	Serial Number																				Battery
																					Scale Calibration
																					Bed Exit System
																					Siderails
																					Pivot points
																					Casters
																					Braking and steering
																					Accessories
																					SideCom® Communication System
Total Cost for this Page																					**Labor Time:**
																					Repair Cost:
																					Examined by:
																					Legend L=Lube C=Clean A=Adjust R=Repair or Replace O=Okay N=Not Applicable Remarks:

6.1 Scale Calibration

Tools required: T25 Torx®[1] screwdriver
250 lb (113 kg) of weight in 25 lb (11 kg) increments

1. Make sure the sleep deck is flat.
2. Remove the mattress and footboard.
3. If a load beam was replaced, do as follows, or go to step 3:
   a. Put the 250 lb (113 kg) weight over the load beam.
   b. Wait 1 minute, then remove the weight.
4. Lift the head section to the highest position.

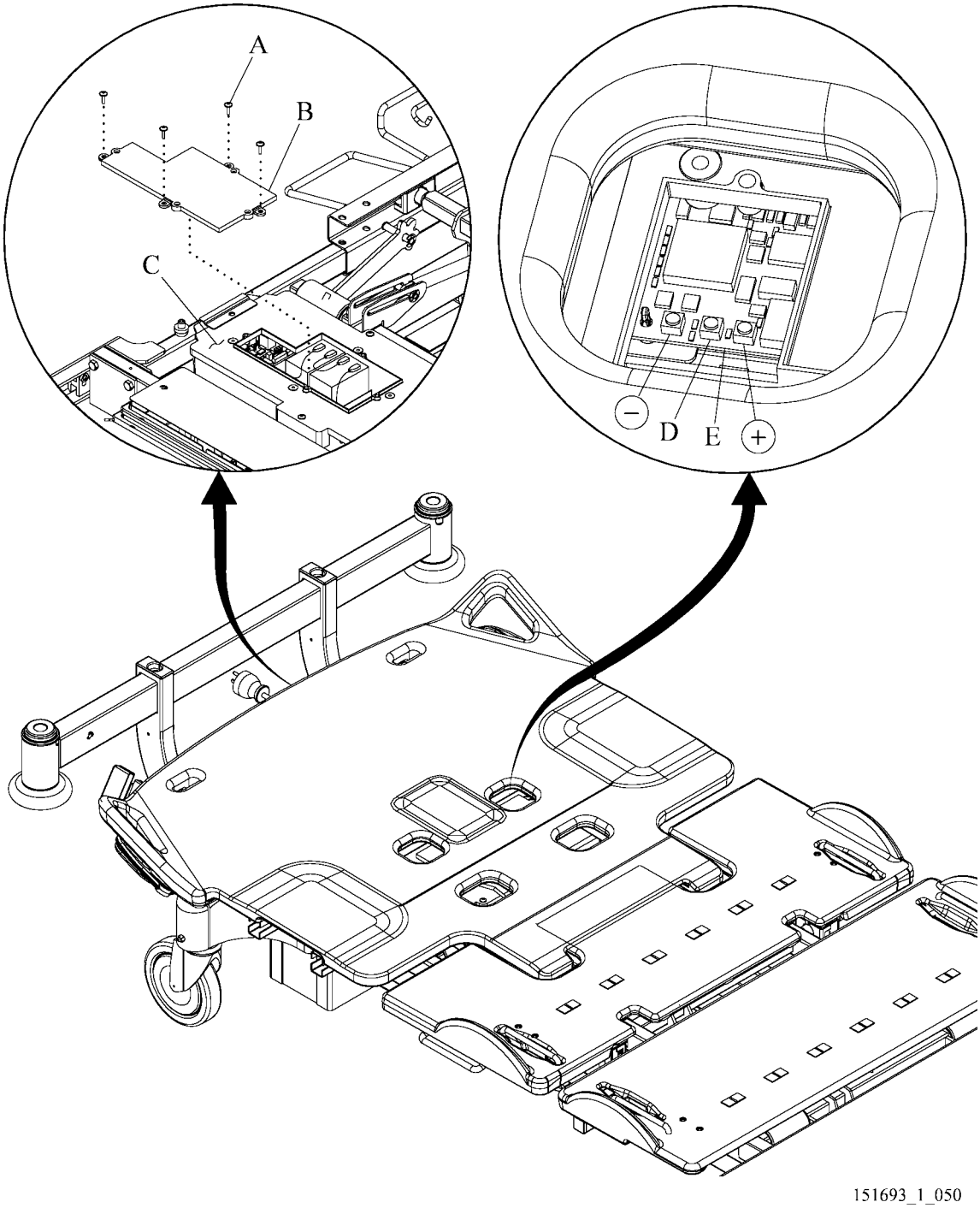
SHOCK HAZARD:
The possibility for electrical shock exists with electrical equipment. Failure to follow facility protocols can cause death or injury.

5. Follow facility protocols when you touch the electrical equipment.
6. Remove the four screws (A) that attach the battery cover (B) to the power supply (C) (see figure 6-1 on page 6-12).
7. Remove the battery cover (B).
8. Make sure the load cells are connected to the correct connector on the scale P.C. board as follows:
   a. Lift up on each corner of the weigh frame.
   b. Make sure the indicator on the scale P.C. board comes on for the correct position: P1 is left head, P2 is left foot, P3 is right foot, and P4 is right head.
   c. Make corrections as necessary.
9. Lower the head section.
10. Push and release the calibration switch (D) on the scale P.C. board (E). The display changes to 45.0.

NOTE:
If the scale P.C. board was changed, the scale display will **only** show kilograms until the scale is calibrated and the display has been changed to pounds (lb).

1. Torx® is a registered trademark of Acument Intellectual Properties, LLC.

Figure 6-1. Scale Calibration Switch



11. Use the + and - switches (adjacent to the calibration switch) to adjust the weight to be the same as the calibration weight.

12. The calibration weight is 100 lb (45.4 kg).

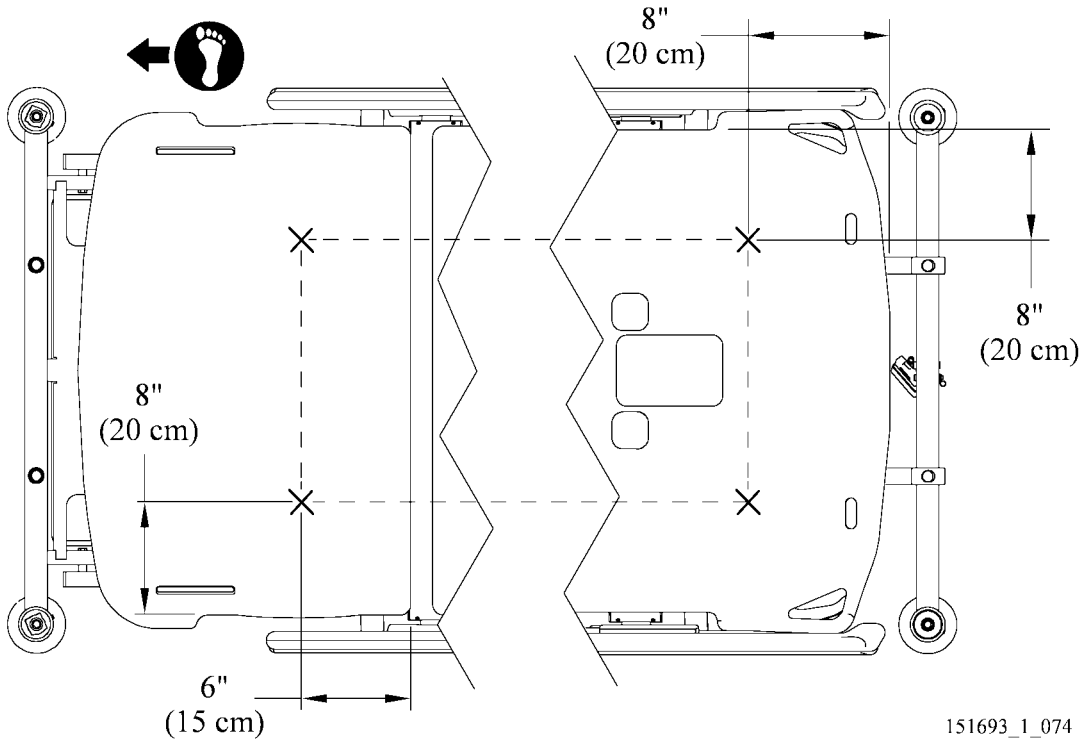
13. When the correct weight is shown, push and release the calibration switch. The display shows “CAL0”. **Do not** touch the bed as it adjusts to zero.

14. When the bed has been adjusted to zero, the display shows “CAL1” and one tone sounds.

15. Add the 100 lb (45.4 kg) calibration weight to the left head of the bed over the load cell. **Do not** touch the bed (see figure 6-2 on page 6-13).

NOTE:
For best results, put the weight over the load cell.

Figure 6-2. Calibration Weight Position



16. After approximately 30 seconds the display shows “CAL2” and two tones will sound.

NOTE:
The time can be different because of the environmental conditions.

17. Remove the calibration weight. **Do not** touch the bed.
18. After approximately 30 seconds, the display shows “CAL3” and three tones sound.
19. Add the calibration weight to the left foot of the bed over the load cell. **Do not** touch the bed.
20. After approximately 30 seconds, the display shows “CAL4” and four tones sound.
21. Remove the calibration weight. **Do not** touch the bed.
22. After approximately 30 seconds, the display changes to “CAL5” and five tones sound.
23. Add the calibration weight to the right foot of the bed, over the load cell. **Do not** touch the bed.
24. After approximately 30 seconds, the display changes to “CAL6” and six tones sound.
25. Remove the calibration weight. **Do not** touch the bed.
26. After approximately 30 seconds, the display changes to “CAL7” and seven tones sound.
27. Add the calibration weight to the right head of the bed over the load cell. **Do not** touch the bed.
28. After approximately 30 seconds, the bed beeps.
29. Move the calibration weight to the middle of the bed.
30. Take a weight value.
31. Make sure the weight shown on the scale display matches the calibration weight.
32. Remove the calibration weight.
33. Lift the head section to the highest position.

WARNING:
Failure to disconnect the bed could cause injury or damaged equipment.

34. Disconnect the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.

35. Install the battery cover (B) on the power supply (C) (see figure 6-1 on page 6-12).

36. Install the four screws (A) to attach the battery cover (B) to the power supply).

37. Plug the bed into an applicable power source.

38. Do the “Function Checks” on page 2-4.

NOTES:

Chapter 7
Accessories

Accessories

Table 7-1. Accessories List

Product Number	Description
P158A	Infusion Support System (ISS) Transfer Pole
P27601	Oxygen Tank Holder
P2217	IV Pole
P163	ISS Socket Adapter
P1181B	Traction frame support module
P1180	Patient Helper Support
P1176	Patient Helper, Fixed Position, kit
P1177	Patient Helper, Adjustable Position, kit

7.1 Infusion Support System—P158

Tools required: None

The Infusion Support System (ISS) consists of a movable and adjustable IV rod that attaches to the head end of the system. The pole supports IV pumps or bags in a vertical orientation and raises or lowers the pumps or bags with respect to the bed frame.

Each Infusion Support System can support one infusion pump plus two liters of intravenous solution.

Installation

WARNING:
Do not put more weight on the ISS pole than the specified weight capacity. Injury or damaged equipment could occur.

WARNING:
When you lower the upper section of an ISS pole, always hold the upper section of the pole before you twist the release knob. Failure to do so could cause injury or damaged equipment.

1. Install the P163 adapter into one of the four equipment sockets.
2. Install the ISS pole into the adapter.
3. Hang up to 40 lb (18 kg) on the ISS pole.

CAUTION:
Do not mount infusion pumps on the lower section of an IV rod. Interference with head section articulation could occur.

4. Hang pumps on the upper section of an ISS pole.

Removal

Do the installation procedure in opposite order.

7.2 Oxygen Tank Holder—P27601

Tools required: None

The Oxygen Tank Holder attaches to the bed in a vertical position, and accommodates one E-size oxygen tank with a regulator. The mounting points are installed at each corner of the bed and permit the affixed oxygen tank holders to pivot.

WARNING:
If the oxygen tank holder is placed at the foot end of the bed, make sure the Knee Up/Down controls are locked out. Failure to do so can cause caregiver, patient, or visitor injury if the foot section fully lowers and the holder becomes dislodged from the bed.

Installation

1. Install the mounting bar vertically into an equipment socket at one corner of the bed.
2. Put one E-size oxygen tank in the holder.
3. Tighten the holder thumbscrew.

NOTE:
The thumbscrew keeps the oxygen tank from rotating in the holder.

Removal

1. Loosen the thumbscrew that holds the tank correctly in the holder.
2. Lift the tank out of the holder.
3. Lift up on the tank holder, and remove it from the equipment socket.

7.3 IV Pole—P2217

Tools required: None

The IV pole is a telescopic pole that you can remove, and installs at one of the four corners of the system in the holes supplied.

WARNING:
Do not put more weight on the IV rod than the specified weight capacity; injury or damaged equipment could occur.

WARNING:
When you lower the upper section of an IV rod, always hold the upper section of the pole before you pull the release knob. Failure to do so could cause injury or damaged equipment.

Installation

Install the IV rod in an equipment socket at one corner of the bed.

Removal

Do the installation procedure in opposite order to remove the IV Rod.

7.4 Traction Frame Support Module—P1181B

Tools required: 19 mm wrench
Ratchet
Torque wrench, 5 to 75 ft-lb (7 to 102 N·m)

Installation

1. Set the brakes.
2. Lift the bed to the full up position.

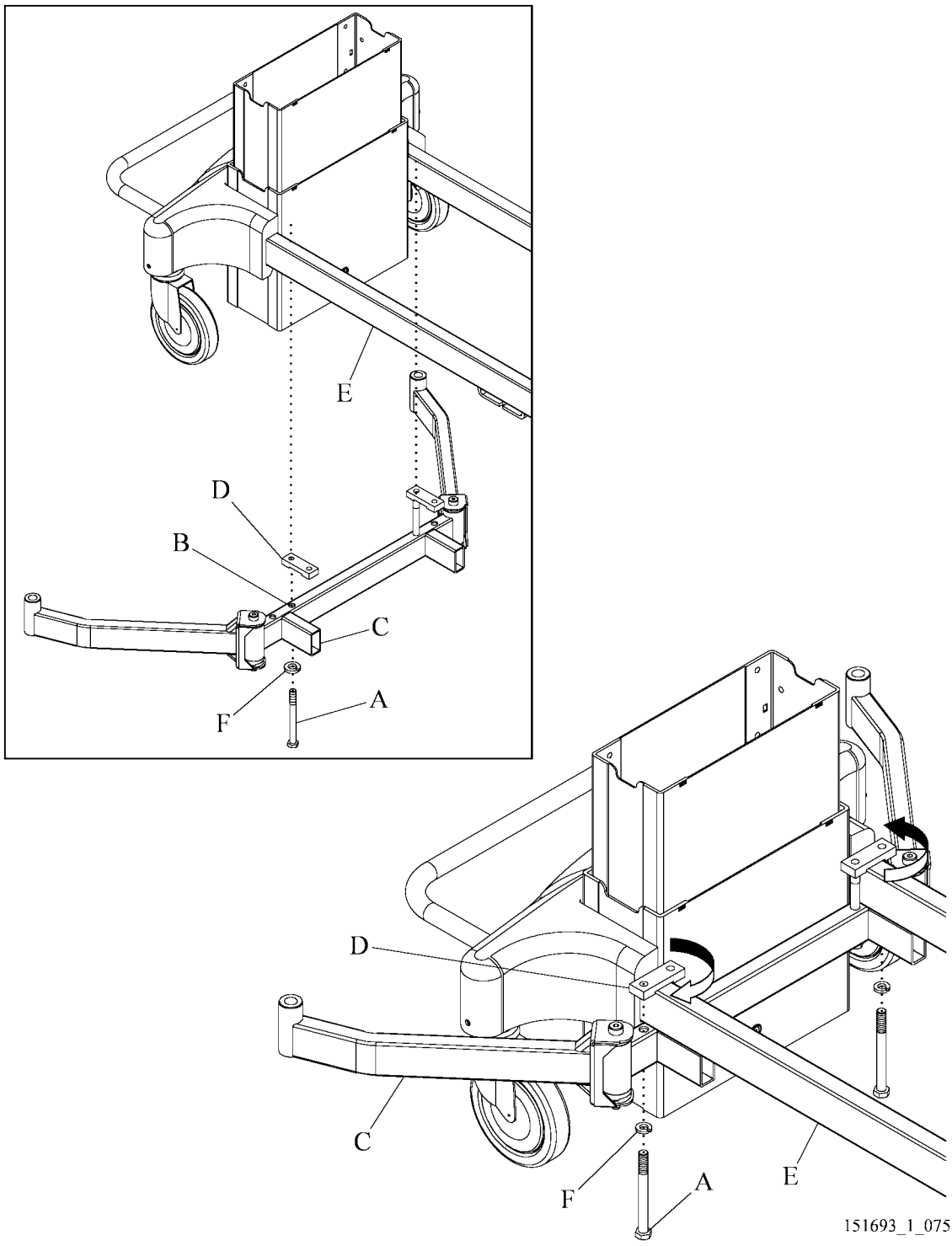
SHOCK HAZARD:
Failure to disconnect the bed could cause injury or damaged equipment.

3. Disconnect the bed from its power source. Let the bed sit for 60 seconds to let the battery time out.
4. Do as follows for each side:
   a. Install one bolt (A) and washer (F) in the inner hole (B) of the module (C) (see figure 7-1 on page 7-6).
   b. Install, but **do not** tighten, one nut plate (D) on the bolt (A).
5. Move the module (C) under the bed (E).
6. Lift the module (C) so it touches the bottom of the bed (E).
7. Turn the nut plate (D) so that it supports the weight of the module (C).
8. Install two bolts (A) and washers (F) through the outer holes in the module (C) and into the nut plates (D).
9. Slide the module (C) so it is against the hilow tower.
10. Tighten all four bolts (A) to 40 ft-lb (54 N·m) of torque.

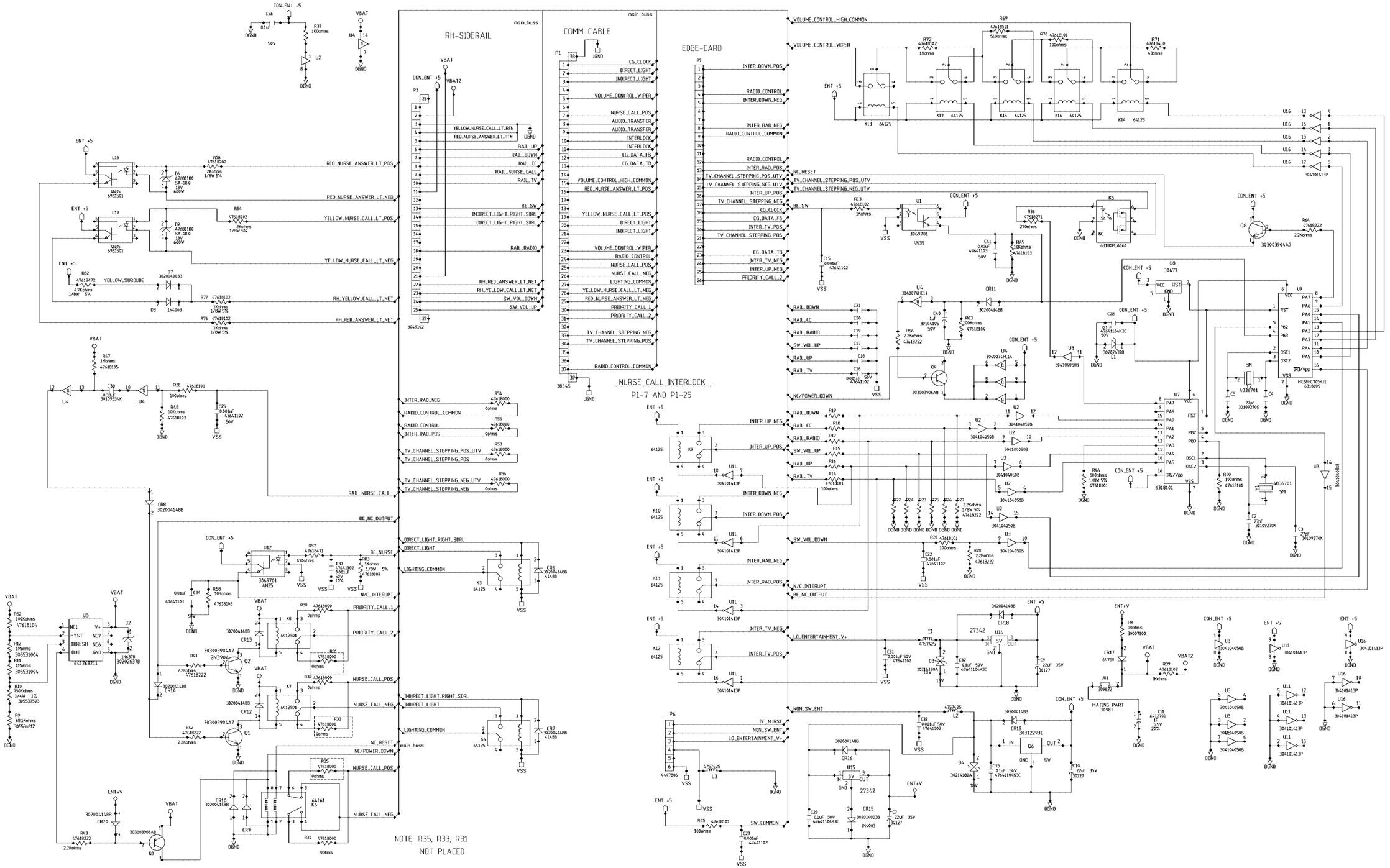
Removal

Do the installation procedure in opposite order to remove the traction frame.

Figure 7-1. Traction Frame Support Module Installation



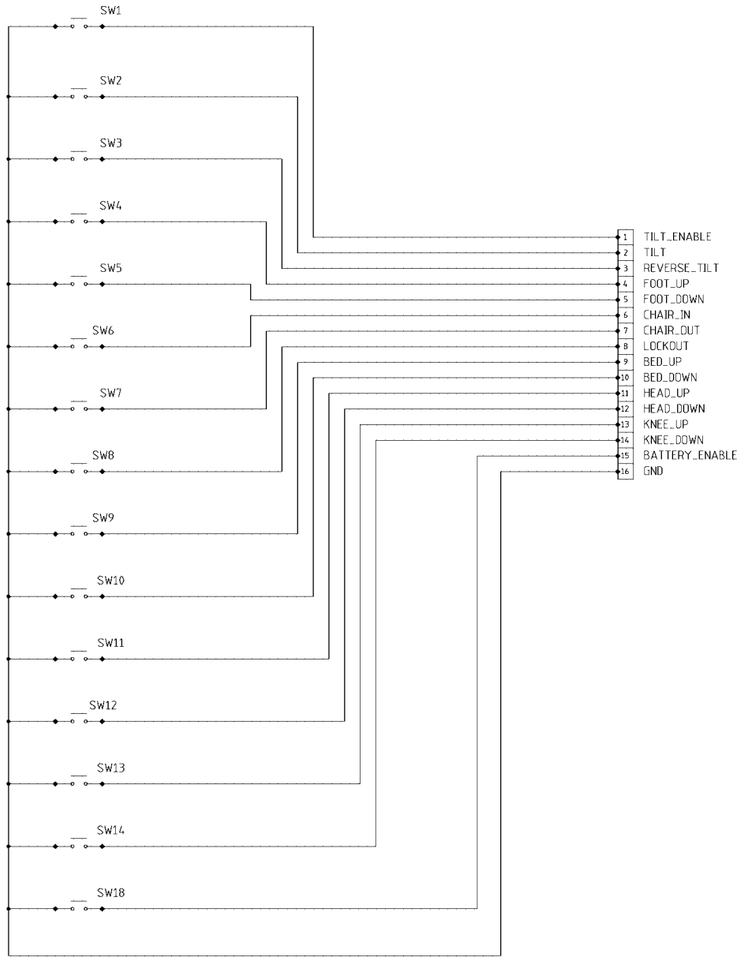
SideCom® Communication System

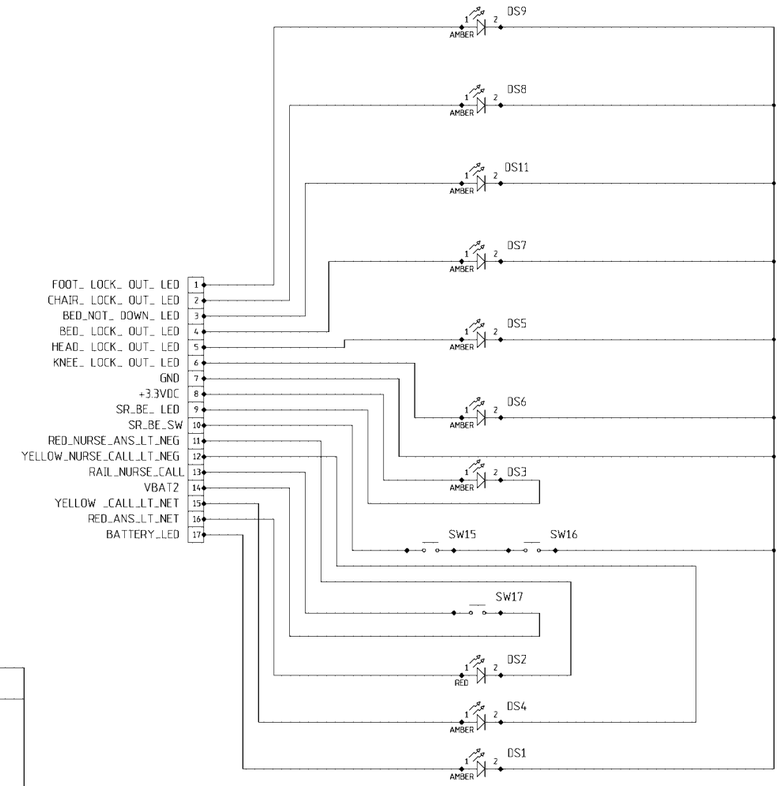


151693_1_014

FO 3-1

Siderail Interface P.C. Board—72207 and 71514

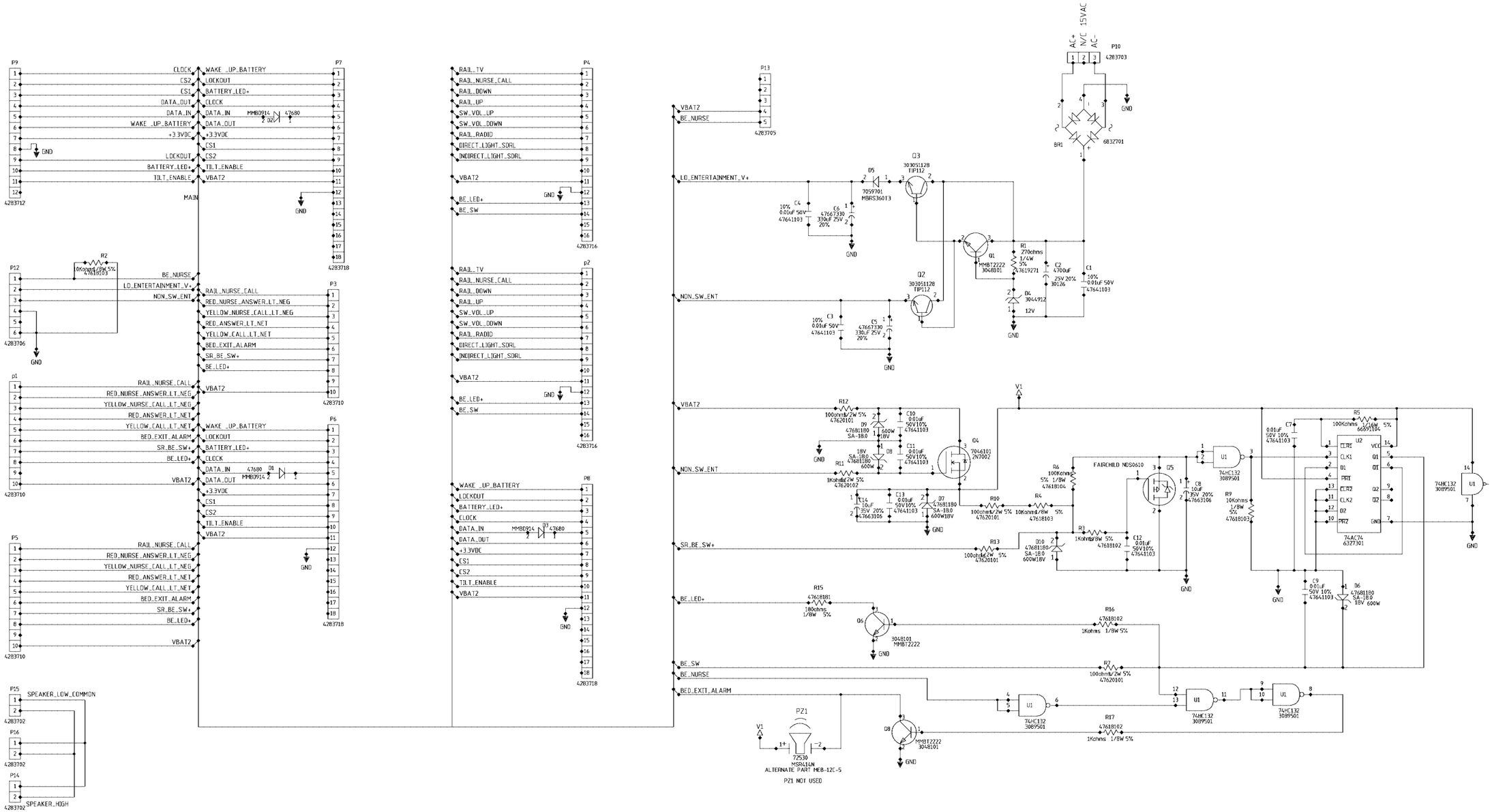




SWITCH NUMBER	SWITCH FUNCTION
SW1	TILT_ENABLE
SW2	TILT
SW3	REVERSE_TILT
SW4	FOOT_UP
SW5	FOOT_DOWN
SW6	CHAIR_IN
SW7	CHAIR_OUT
SW8	LOCKOUT
SW9	BED_UP
SW10	BED_DOWN
SW11	HEAD_UP
SW12	HEAD_DOWN
SW13	KNEE_UP
SW14	KNEE_DOWN
SW15 & SW16	SR_BE_SW
SW17	RAIL_NURSE_CALL
	VBAT2
SW18	BATTERY_ENABLE

LED	COLOR	FUNCTION
DS1	AMBER	BATTERY LED+
DS2	AMBER	NURSE CALL
DS3	AMBER	BED_EXIT
DS4	RED	NURSE ANSWER
DS5	AMBER	HEAD LOCK OUT
DS6	AMBER	KNEE LOCK OUT
DS7	AMBER	BED LOCK OUT
DS8	AMBER	CHAIR LOCK OUT
DS9	AMBER	FOOT LOCK OUT
DS11	AMBER	BED NOT DOWN

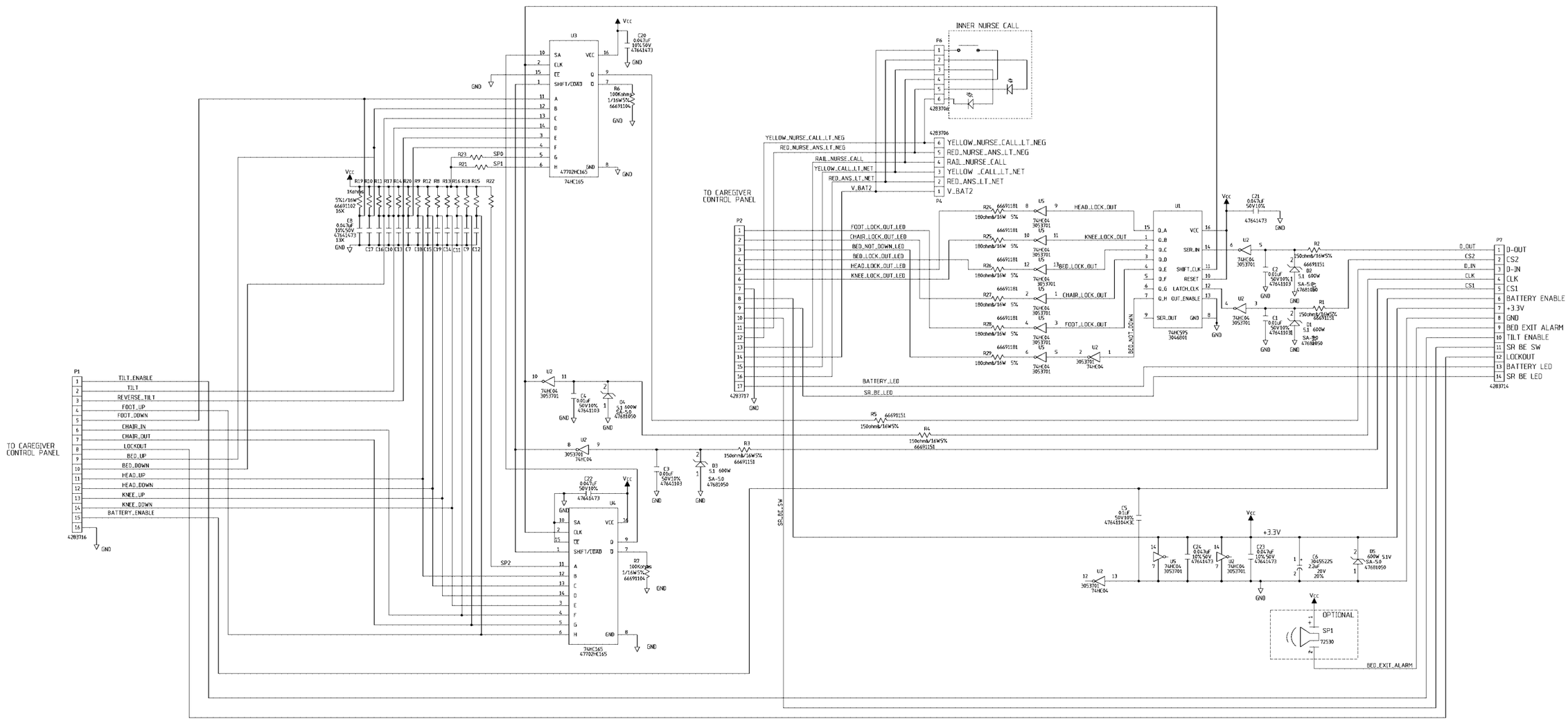
Caregiver Control



151693_1_016

FO 3-3

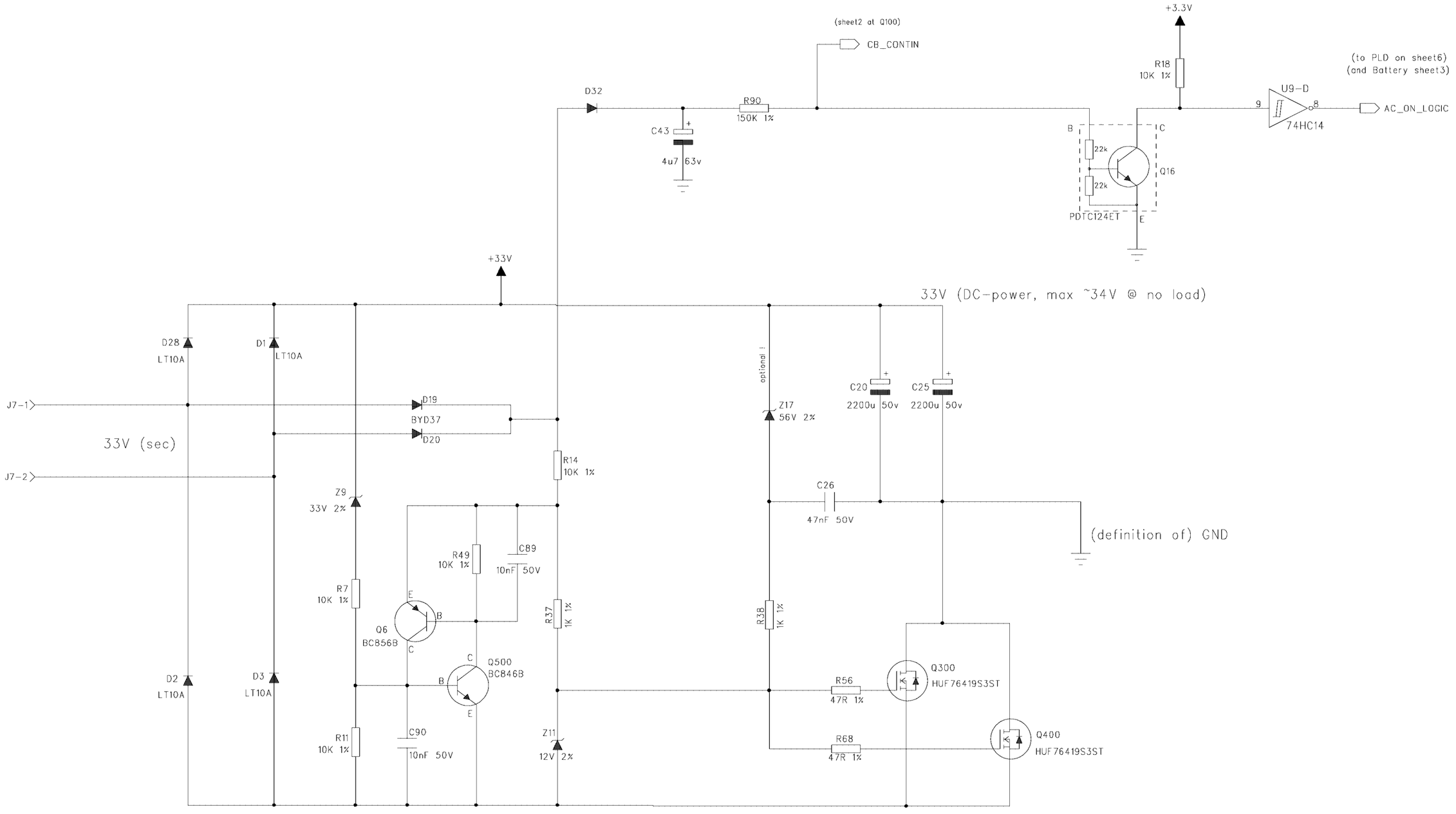
Left Caregiver Signal Conditioning



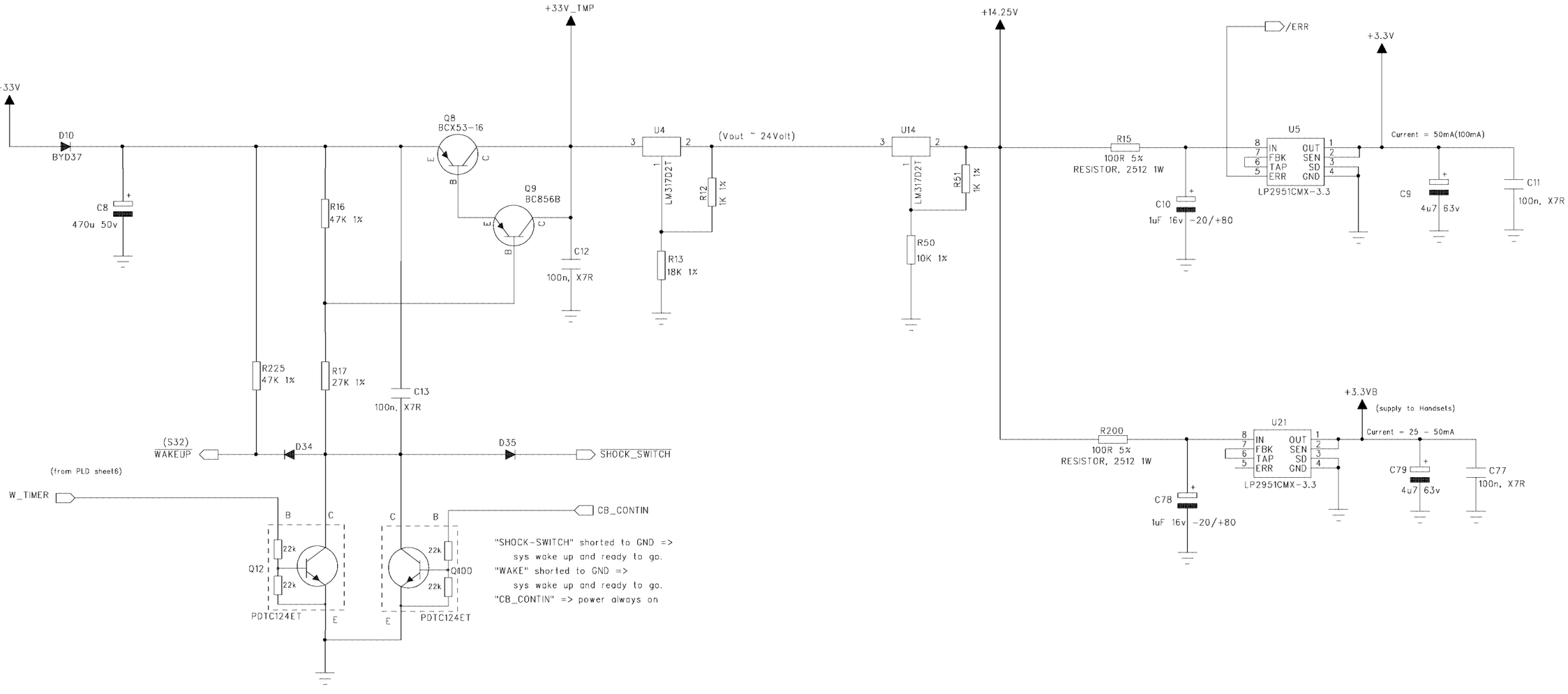
151693_1_017

FO 3-4

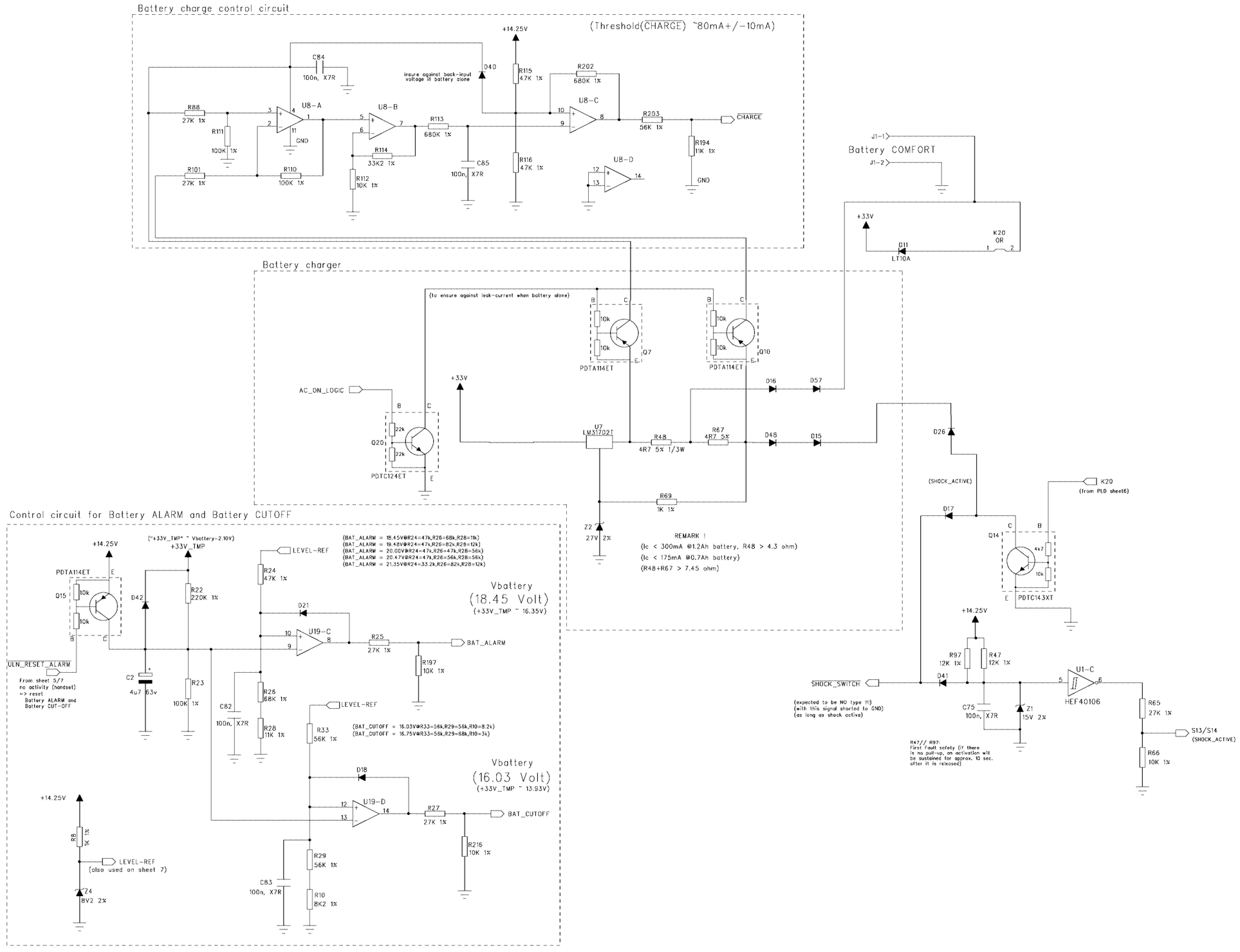
Bed Control Board Power and Phase Control



Bed Control Board Power Management

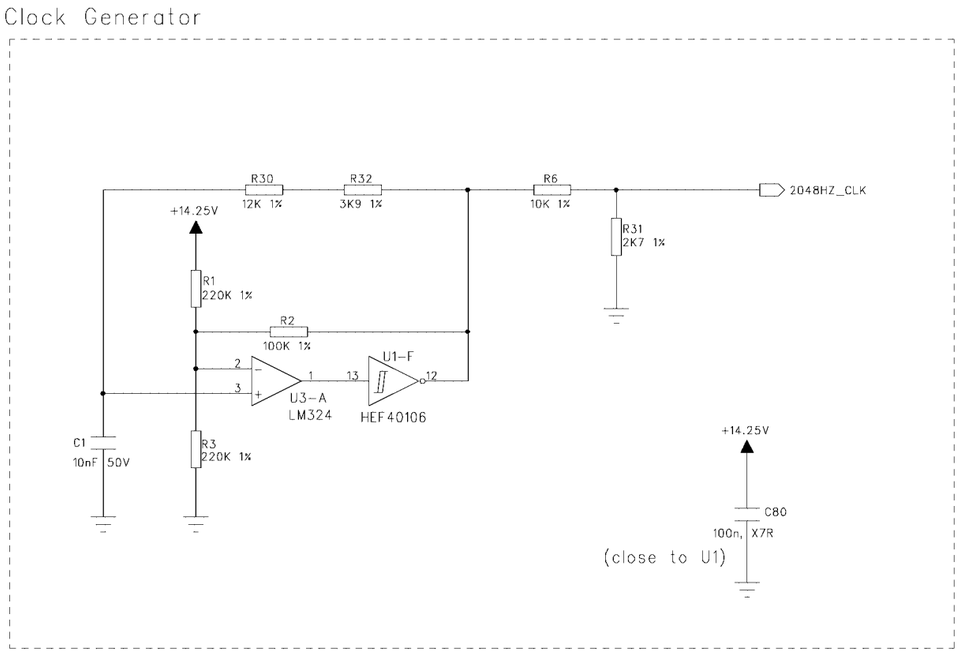


Bed Control Board Battery Management



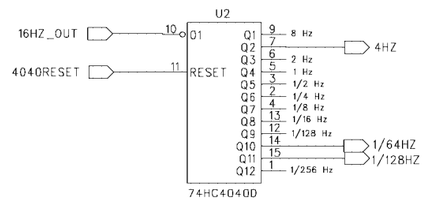
Bed Control Board Clock and Divider

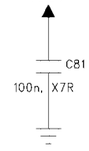
Clock Generator



Divider

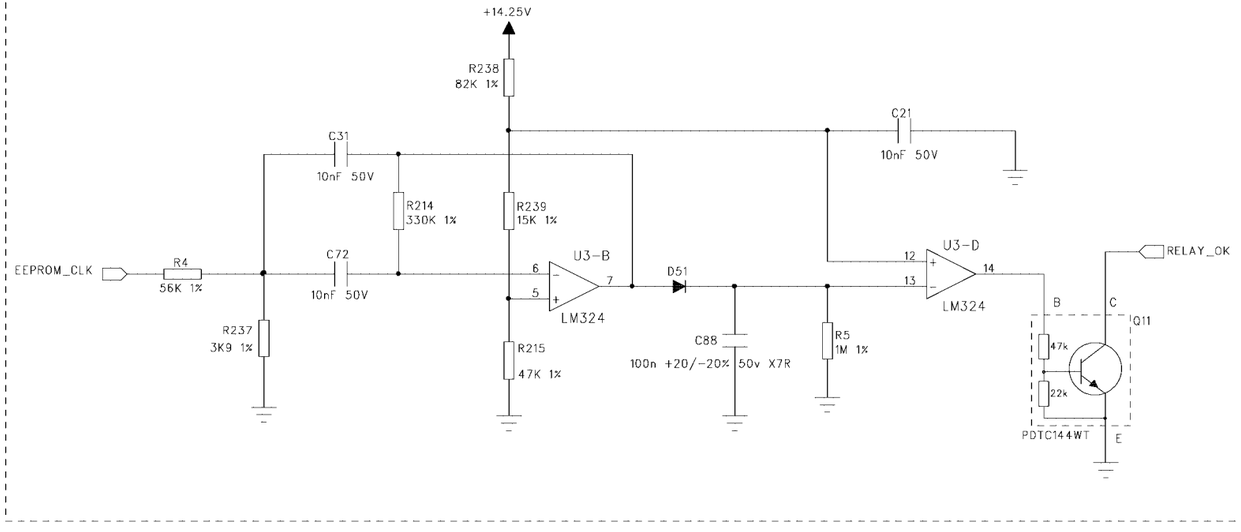
Generates slow clocks for
timers and blinking of LED's

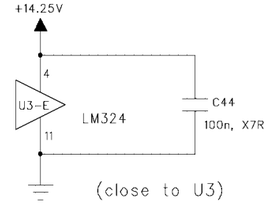




Frequency Surveillance

If the frequency on EEPROM_CLK differs from
512HZ +120/- 180 (approx), the relays will be inhibited

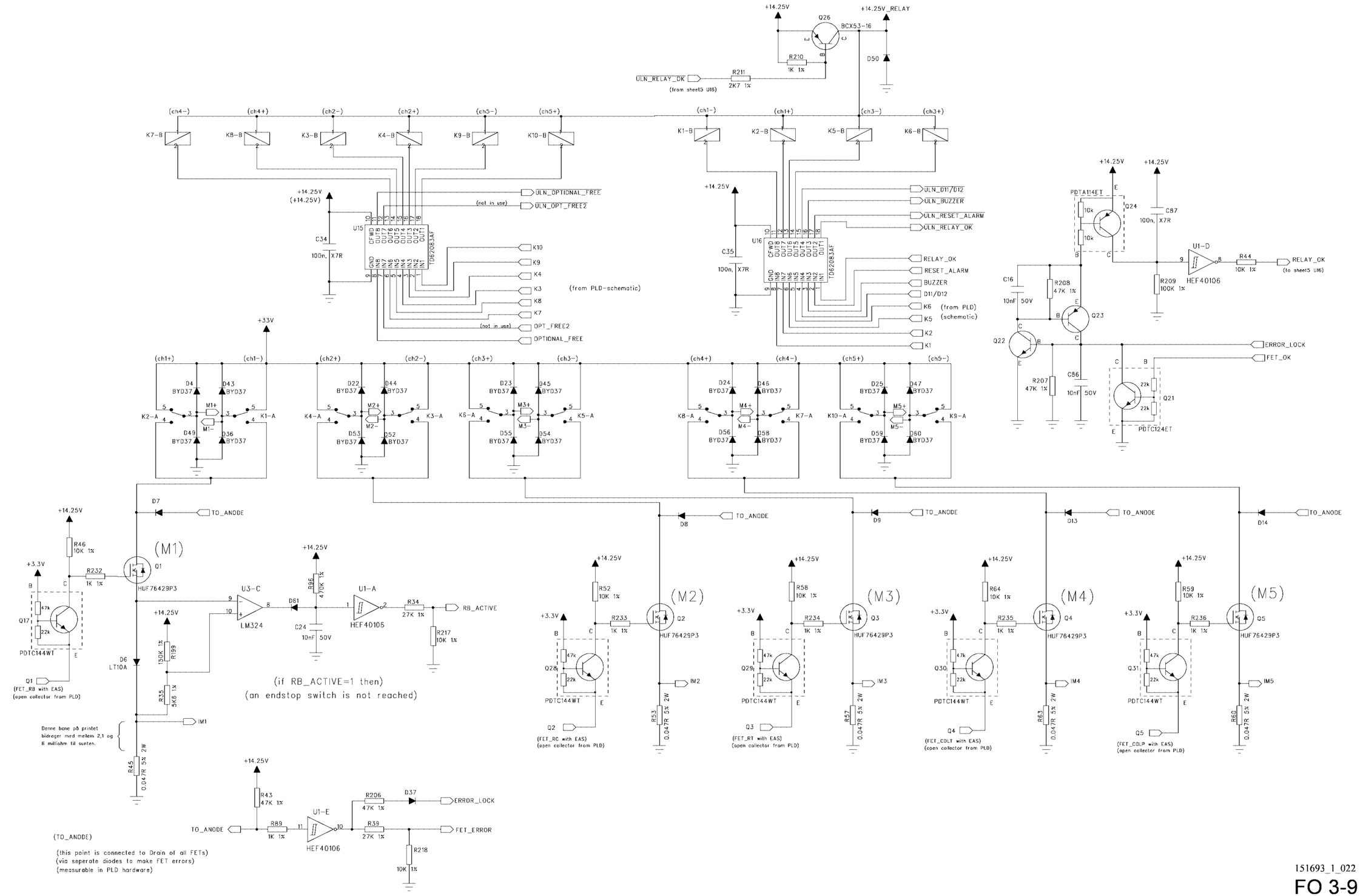




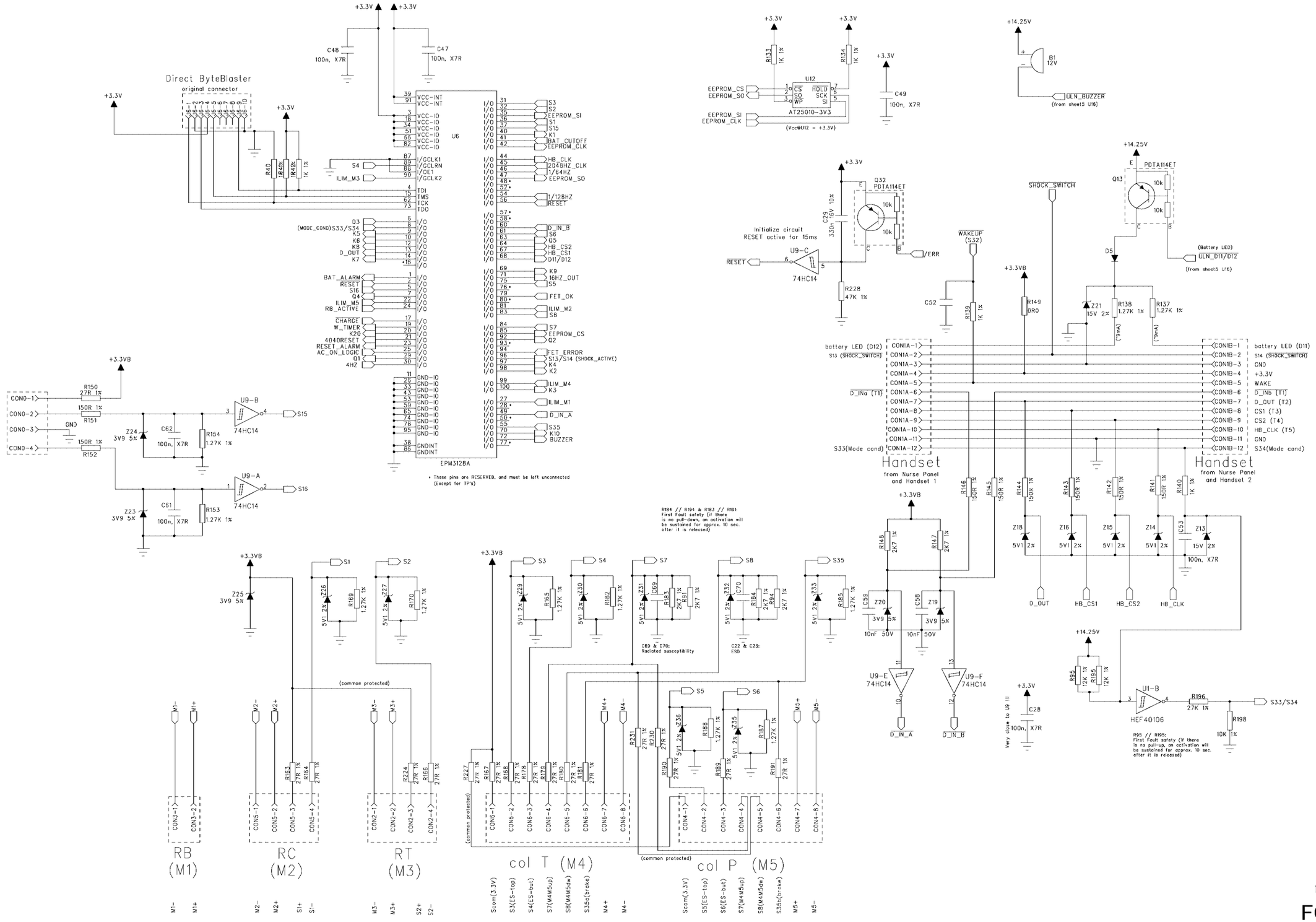
151693_1_021

FO 3-8

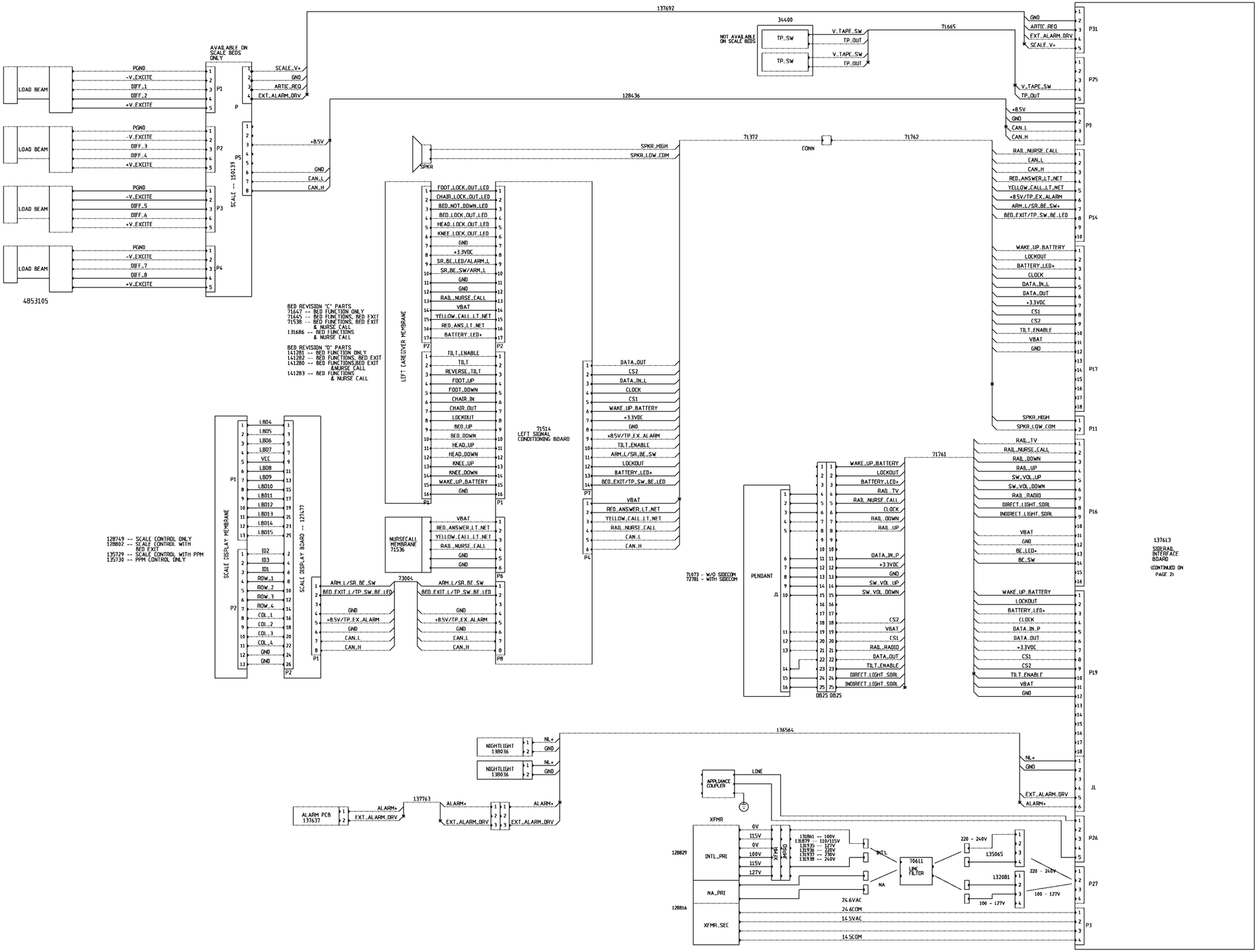
Bed Control Board Relay, FET and Drivers



Bed Control Board PLD and Connector



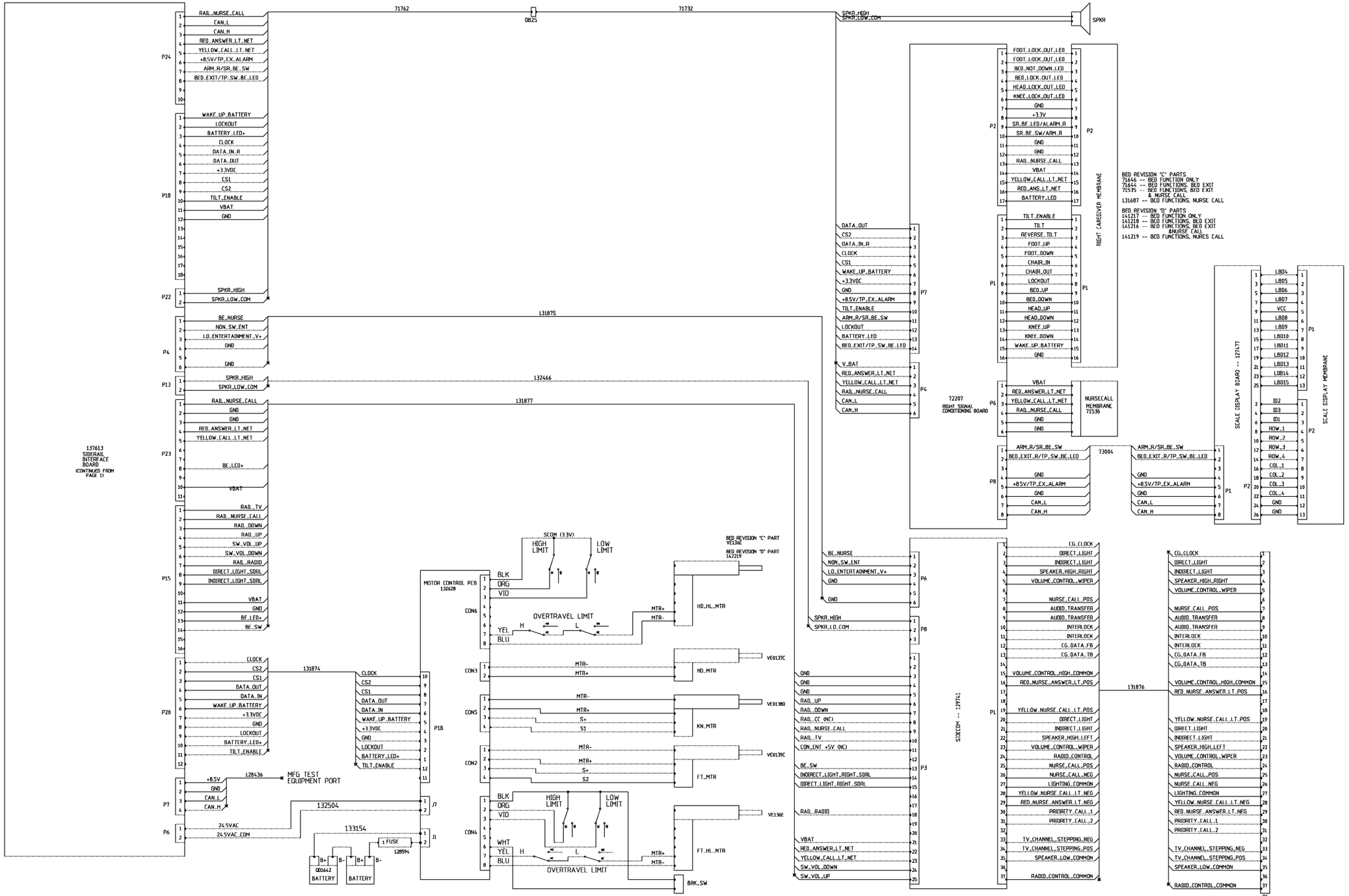
Bed Wiring Schematic (Sheet 1 of 2)



151693_1_003

FO 3-11.1

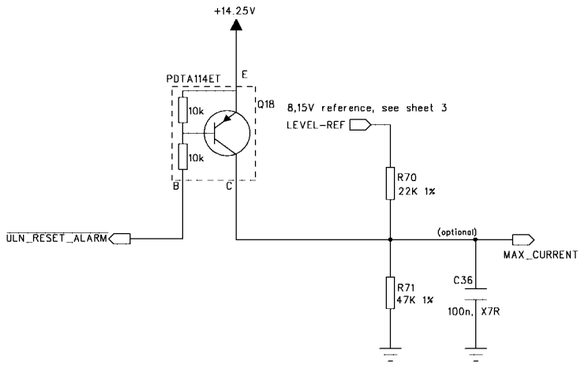
Bed Wiring Schematic (Sheet 2 of 2)



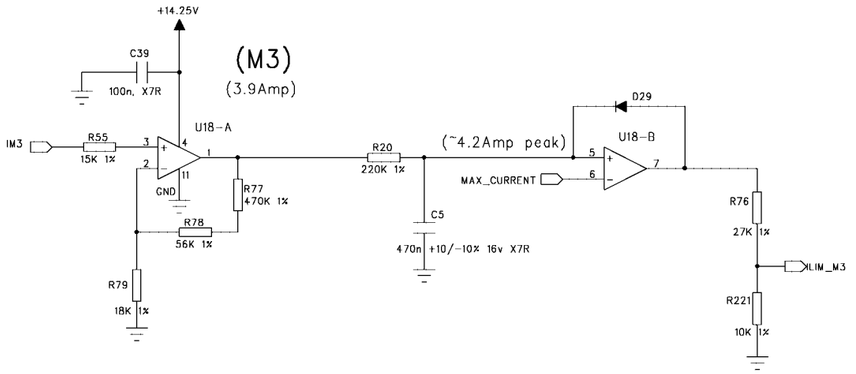
151693_1_076

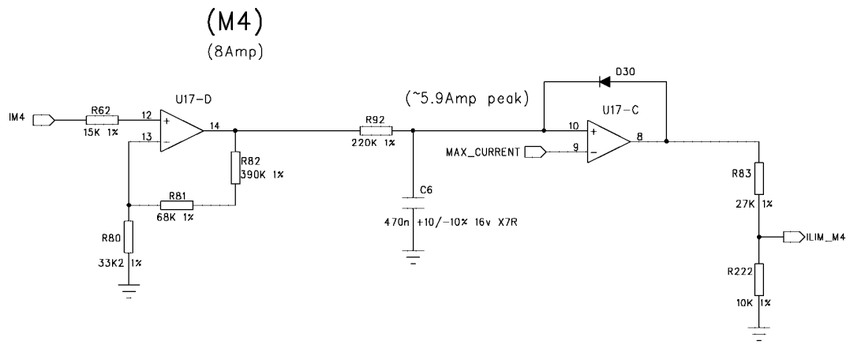
FO 3-11.2

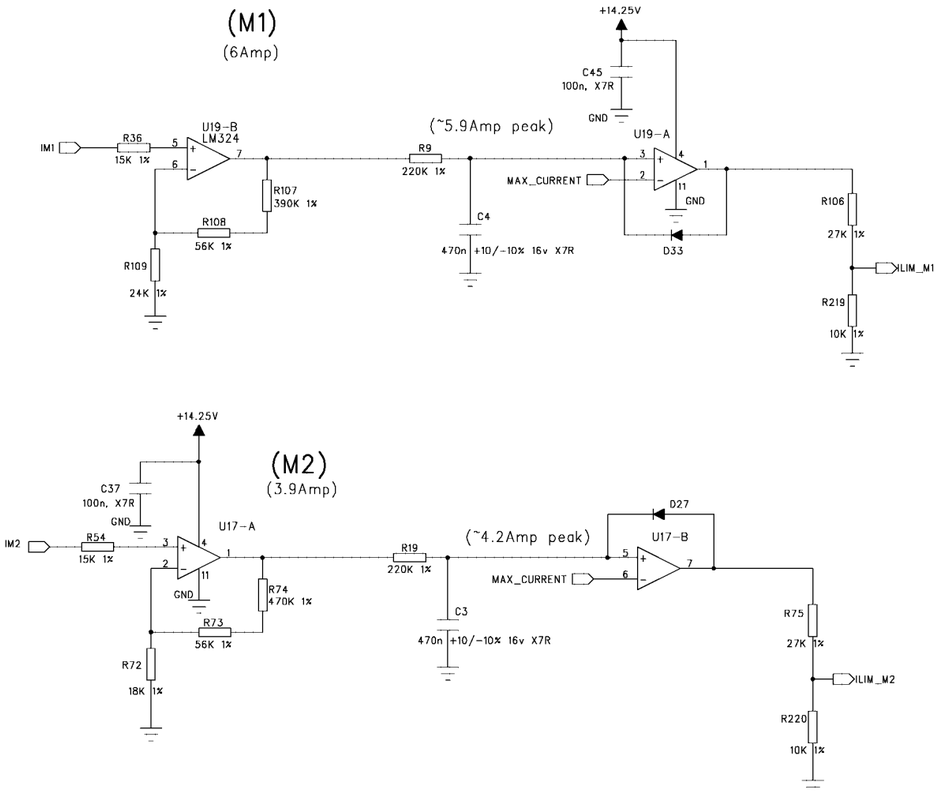
Bed Control Board Motor Current Limiter

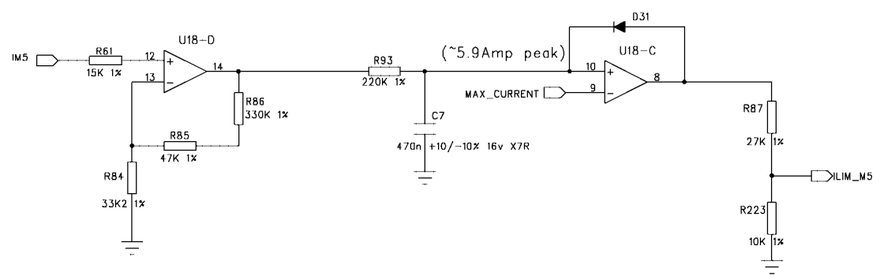


RESET of Current limiters (=> unlock of battery alarm)









Global Headquarters US
Hill-Rom Company, Inc.
1069 State Route 46 E
Batesville, IN 47006-9167
Tel: 800-445-3720
www.hill-rom.com

US Rental Therapy
Hill-Rom Company, Inc.
Tel: 800-638-2546

St. Paul, MN
Hill-Rom Company, Inc.
Tel: 651-490-1468 or 800-426-4224
www.thevest.com

International
Hill-Rom Company, Inc.
Tel: +1 (0)812 934 8173
Fax: +1 (0)812 934 7191
www.hill-rom.com
international@hill-rom.com

Australia
Hill-Rom Australia Pty. Ltd.
Tel: +61 (0)2 8814 3000
Fax: +61 (0)2 8814 3030

Belgique/België
Hill-Rom Medical Services BV
Tel: +31 (0)347 / 32 35 32
Fax: +31 (0)347 / 32 35 00

Canada
Hill-Rom Canada
Tel: 800-267-2337

中国
Hill-Rom Shanghai
Tel: +86 (0)21 5396 6933
Fax: +86 (0)21 5383 3136

Deutschland
Hill-Rom GmbH
Tel: +49 (0)211 16450 0
Fax: +49 (0)211 16450 182

España
Hill-Rom Iberia S.L.
Tel: +34 (0)93 685 6009
Fax: +34 (0)93 666 5570

France
Hill-Rom SAS
Tel: +33 (0)2 97 50 92 12
Service: +33 (0)820 01 23 45
Fax: +33 (0)2 97 50 92 00

香港 Hong Kong
Hill-Rom Asia Ltd.
Tel: +852 (0)2297-2395
Fax: +852 (0)2297-0090

Ireland
Hill-Rom Ltd.
Tel: +353 (0)1 413 6005
Fax: +353 (0)1 413 6030
dublin.sales@hill-rom.com

Italia
Hill-Rom S.p.A.
Tel: +39 (0)02 / 950541
Fax: +39 (0)02 / 95328578

日本
Hill-Rom Japan
Tel: +81 (0)3 5715 3420
Fax: +81 (0)3 5715 3425

대한민국
c/o Hill-Rom Japan
Tel: +81 (0)3 5715 3420
Fax: +81 (0)3 5715 3425

Nederland
Hill-Rom Medical Services BV
Tel: +31 (0)347 / 32 35 32
Fax: +31 (0)347 / 32 35 00

New Zealand
Hill-Rom Australia Pty. Ltd.
Tel: +61 (0)2 8814 3000
Fax: +61 (0)2 8814 3030

Nordic Region:
Sverige, Denmark, Norge
Hill-Rom AB
Tel: +46 (0)8 564 353 60
Fax: +46 (0)8 564 353 61
se.marketing@hill-rom.com

Österreich
Hill-Rom Austria GmbH
Tel: +43 (0)2243 / 28550
Fax: +43 (0)2243 / 28550-19
austria@hill-rom.com

Portugal
Hill-Rom Iberia S.L.
Tel: +34 (0)93 685 6009
Fax: +34 (0)93 666 5570

South East Asia
Hill-Rom Singapore
Tel: +65 (0)6391 1322
Fax: +65 (0)6391 1324

Suisse/Schweiz
Hill-Rom SA
Tel: +41 (0)21 / 706 21 30
Fax: +41 (0)21 / 706 21 33
hrch.info@hill-rom

United Kingdom
Hill-Rom Ltd.
Tel: +44 (0)1530 411000
Fax: +44 (0)1530 411555