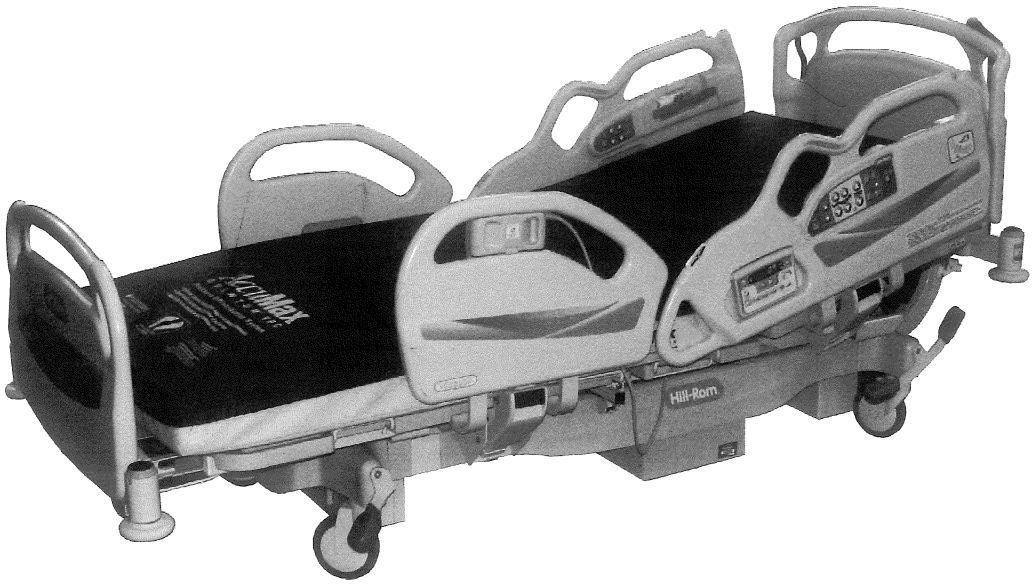
Hillrom™

Advanta™ 2 Bed

Service Manual

Product No. P1190



157723 REV 4

REVISION

PATENTS / PATENT hillrom.com/patents

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Manufactured by:

HILL-ROM DE MEXICO S. DE R.L. DE C.V.
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MEXICO

Distributed by:

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BATESVILLE, IN 47006-9167 USA

This manual (157723) was originally released and supplied in English. For a list of available translations, contact Hill-Rom Technical Support.

Product images and labels are for illustrative purposes only. Actual product and label may vary.

Fourth Edition, 2021-03

First Printing 2009

Printed in the USA

Replace this manual (157723) if it is damaged and/or can not be read.

For product support or to order additional copies of this manual (157723), contact your distributor, local Hill-Rom representative, or go to www.hill-rom.com.

Reference Documents

Advanta™ 2 Bed User Manual (157722)

NOTES:

Table of Contents

Chapter 6:
Cleaning, Disinfecting, and Preventive Maintenance

Chapter 1 Introduction

1

PURPOSE

This manual contains instructions for the operation and maintenance of the Advanta™ 2 Bed. It also includes parts lists (in chapter 5) for you to order replacement parts.

AUDIENCE

This manual is intended for use by only facility-authorized persons. To ignore this restriction could cause severe injury to people and serious damage to equipment.

REFERENCE DOCUMENTS

For more information (such as operating instructions, features, specifications, and product symbols), refer to the *Advanta™ 2 Bed User Manual* (157723).

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, or CAUTION

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

MODEL IDENTIFICATION

Table 1-1. Model Identification

Model Number	Description
P1190A	The Advanta™ 2 Bed

SAFETY TIPS

WARNING:

Warning—Some safety features of the bed may not function or may not operate as intended with mattresses that are not designed specifically for this bed. Check with the mattress manufacturer to make sure that the safety features of the bed have been tested and verified to operate correctly with the replacement mattress. Failure to do so could cause serious personal injury or equipment damage.

NOTE:

Hill-Rom recommends the use of Hill-Rom® mattresses that have been designed and tested specifically for the bed. If you purchase a replacement mattress from Hill-Rom or another manufacturer, make sure that the safety features of the bed have been tested and verified to operate correctly with the replacement mattress. The replacement mattress should meet the applicable regulations and technical standards to minimize the risk of injury to patients and caregivers.
Mattresses should–

- Minimize the gaps where entrapment could occur.
- Allow enough siderail height from the top of the mattress to the top of the siderail to prevent accidental roll-overs.
- Have appropriate firmness to assist with safe patient transfers.
- Not interfere with siderail operation.

For the latest list of mattresses, please contact Customer Service.

WARNING:

Obey all **warnings** throughout the manual and also those below to help prevent injury and/or equipment damage:

- **Warning**—Only facility-authorized persons should service the Advanta™ 2 Bed. Service by unauthorized persons could cause injury or equipment damage.
- **Warning**—Obey all applicable infection control policies and procedures. Failure to do so could cause the spread of infection
- **Warning**—Failure to wear protective gloves may cause injury.
- **Warning**—Failure to wear eye protection may cause eye injury.
- **Warning**—Do not work under an unsupported load. Install applicable temporary supports. Failure to do so could cause personal injury or equipment damage.
- **Warning**—Failure to disconnect the unit from its power source could cause injury or equipment damage.
- **Warning**—Do not expose the unit to excessive moisture. Injury or equipment damage could occur.

BEDS WITH AN AUXILIARY OUTLET

- **Warning**—This bed has two power cords. Disconnect both power cords before you service the Bed Electrical Enclosure or Auxiliary Outlet Enclosure. Only facility-authorized persons should

service the Bed Electrical Enclosure or Auxiliary Outlet Enclosure. Injury or equipment damage could occur.

- **Warning**—The Auxiliary Outlet ground line is separate 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 equipment damage.
- **Warning**—Do not use oxygen enriched sources near the Auxiliary Outlet. Failure to do could cause injury or equipment damage.
- **Warning**—Do not connect both power cords to the same wall outlet. Connect the power cords to different outlets on separate circuits. Failure to do so could cause equipment damage 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.**

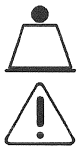
CAUTION:

Obey all **cautions** throughout the manual and also those below to help prevent equipment damage:

- **Caution**—Do not use harsh cleaners, solvents, or detergents. Equipment damage could occur.
- **Caution**—Do not use silicone-based lubricants. Equipment damage could occur.
- **Caution**—To prevent component damage, make sure your hands are clean, and **only** handle the P.C. board by its edges.
- **Caution**—When you handle 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 protective bag. Equipment damage can occur.

WARNING AND CAUTION LABELS

Figure 1-1. Warning and Caution Labels

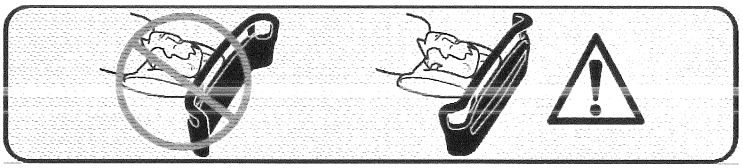


Safe Working Load

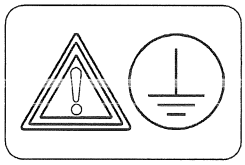
Recycle in accordance with local regulation

No Oxygen Tents

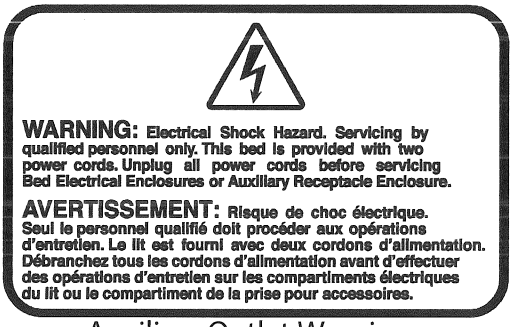
Do not Stack



Headboard Position Indicator

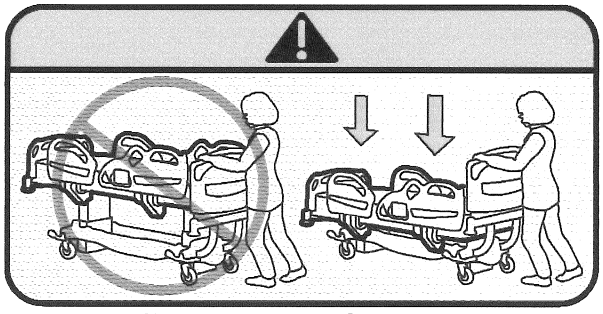


Grounding Point Position

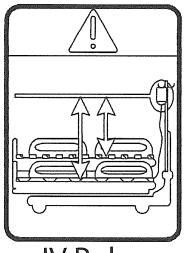


Auxiliary Outlet Warning

Auxiliary Outlet Warning



Transportation Position Warning



IV Pole Warning

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Chapter 2
Troubleshooting

GETTING STARTED

Only facility-authorized persons should service the Advanta™ 2 Bed. Service by unauthorized persons could cause injury or equipment damage.

Begin each procedure in this chapter with step 1. Follow the sequence outlined (each step assumes the previous step has been completed). In each step, the normal operation of the product can be confirmed by a **Yes** or **No** answer to the statement. Your response will lead to another 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 identify a problem and to make sure of the repair after you complete each corrective action (part replacement or adjustment, connector installation, etc.), do the **Function Checks**.

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

If troubleshooting procedures do not identify the problem, contact Hill-Rom Technical Support.

INITIAL ACTIONS

Use Initial Actions to gather information from operators concerning problems with the Advanta™ 2 Bed. Note the symptoms or other information concerning the problem that the operator describes. This information helps identify the probable cause.

1. Someone who can explain the problem is available.

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

2. Ask this person to demonstrate or explain the problem. The problem can be duplicated.

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

3. The problem is a result of improper operator action.

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

4. Instruct the operator to refer to the procedures in the *Advanta™ 2 Bed User Manual* (157722). Do the "Function Checks" to make sure proper operation of the Advanta™ 2 Bed.

PROBLEM/SOLUTION TABLE

If the problem can be easily identified, use the tables below to determine the applicable troubleshooting procedure.

Table 2-1. Problem/Solution Table

Problem	Solution
SafeView® Alerts malfunction	Go to Table 2-4 on page 2-4.
No Functions Operate (caregiver controls, patient side-rail controls, or patient pendant)	Go to RAP 2.1 on page 2-11.
Lockout Malfunction	Go to RAP 2.2 on page 2-12.
Hilow Malfunction	Go to RAP 2.3 on page 2-13.
Knee Section Malfunction	Go to RAP 2.4 on page 2-14.
Head Section Malfunction (excludes Automatic Contour)	Go to RAP 2.5 on page 2-15.
Battery Backup Malfunction	Go to RAP 2.6 on page 2-16.
Foot Section Malfunction	Go to RAP 2.7 on page 2-17.
Trendelenburg/Reverse Trendelenburg Malfunction	Go to RAP 2.8 on page 2-18.
Bed Connected to AC Power, Brakes Not Applied Detection Malfunction	Go to RAP 2.9 on page 2-19.
CPR Malfunction	Go to RAP 2.10 on page 2-20.
Brake Malfunction	Go to RAP 2.11 on page 2-21.
Steer Malfunction	Go to RAP 2.12 on page 2-22.
Siderail Detection Switch Malfunction	Go to RAP 2.22 on page 2-32.

Table 2-2. Scale Display Errors

Problem	Solution
Scale Error 0	Go to RAP 2.13 on page 2-23.
Scale Error 1	Go to RAP 2.14 on page 2-24.
Scale Error 2	Go to RAP 2.15 on page 2-25.
Scale Error 3	Go to RAP 2.16 on page 2-26.
Scale Error 4	Go to RAP 2.17 on page 2-27.
Scale Error 5	Go to RAP 2.18 on page 2-28.
Scale Error 9	Go to RAP 2.19 on page 2-29.
Hd Err	Go to RAP 2.20 on page 2-30.
CAL Hd	Go to RAP 2.21 on page 2-31.

For IntelliDrive® Transport System errors, use the table below to identify the applicable troubleshooting procedure (see Table 2-3 on page 2-3).

Table 2-3. IntelliDrive® Transport System

Error	Solution
Bed Will Not Drive	Go to RAP 2.23 on page 2-33.
Bed Will Not Drive, Wheel Is Down	Go to RAP 2.24 on page 2-34.
Wheel Will Not Stow	Go to RAP 2.25 on page 2-35.
Battery Check	Go to RAP 2.26 on page 2-36.
Steer Switch Check	Go to RAP 2.27 on page 2-37.
PACM Board Power Check	Go to RAP 2.28 on page 2-38.
PACM Board Deployment Check	Go to RAP 2.29 on page 2-39.
PACM Board Drive Check	Go to RAP 2.30 on page 2-40.
Motor Check	Go to RAP 2.31 on page 2-41.
PACM to Junction Board Cable Check	Go to RAP 2.32 on page 2-42.
Handle Enable Switch Check	Go to RAP 2.33 on page 2-43.
Throttle Check	Go to RAP 2.34 on page 2-44.
Handle Gauge Check	Go to RAP 2.35 on page 2-45.
Controller Check	Go to RAP 2.38 on page 2-48.
Visual Inspection	Go to RAP 2.39 on page 2-50.
Junction Board Debugging	Go to RAP 2.40 on page 2-51.

Table 2-4. SafeView® Alerts

Problem	Possible Cause	Solution
Both Alerts flash yellow and green.	There is a problem with the SideCom P.C. board, Siderail Interface P.C. board, control pod P.C. board, or HOB sensor P.C. board.	If there is a problem with any of these boards, there will be additional problems with the bed. Determine which board the additional problems are related to (caregiver and patient controls, facility communication, or pod controls), and then replace that board.
Only one Alert flashes yellow and green.	A cable is loose or disconnected.	Make sure the Alert cables are fully connected to their correct locations.
	The cable on the faulty Alert is damaged.	Switch the cable connections on the siderail interface P.C. board. If the faulty Alert does not operate correctly, replace the light assembly.
	The P.C. board within the faulty Alert assembly is damaged.	Replace the light assembly.
Only one Alert is on.	There is a problem with the siderail interface P.C. board.	Switch the cable connections on the siderail interface P.C. board. If the faulty Alert now operates correctly, replace the board. Otherwise, replace the light assembly.
The bed is plugged in, and the Alerts do not come on.	The Alerts have been deactivated.	Unplug the bed, and then plug the bed in.
	The Bed Exit System is not activated.	Activate the Bed Exit System.
	Both cables are loose or disconnected.	Make sure the cables are fully connected to the correct locations.
	Both cables are damaged.	Replace the light assembly.
	There is a problem with the siderail interface P.C. board.	Replace the board.

FUNCTION CHECKS

1. The "Initial Actions" have been performed.

   Yes **No**
   ↓ → Go to "Initial Actions" on page 2-1.

2. Set the brakes, raise and lock the siderails in the high position. Plug the power cord into an applicable power source.
3. Press the **Trendelenburg/Reverse Trendelendburg** control. The bed goes into the applicable position without stops or alarms.

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

4. Lock out at least one bed function (such as the head section). The applicable indicator comes on and no movement occurs.

   Yes **No**
   ↓ → Go to RAP 2.2 on page 2-12.

5. Lock out all bed functions. All of the lock out indicators come on.

   Yes **No**
   ↓ → Go to RAP 2.2 on page 2-12.

6. Unlock all of the functions. All of the lock out indicators go off.

   Yes **No**
   ↓ → Go to RAP 2.2 on page 2-12.

7. Press the **Bed Up** control. The bed goes into the high position without stops or alarms.

   Yes **No**
   ↓ → Go to RAP 2.3 on page 2-13.

8. Press the **Bed Down** control. The bed goes into the low position without stops or alarms. In addition, the Bed Not Down indicator goes off when the bed reaches the lowest position.

   Yes **No**
   ↓ → Go to RAP 2.3 on page 2-13.

9. Press the **Knee Up** control. The knee section goes into the high position without stops or alarms.

   Yes **No**
   ↓ → Go to RAP 2.4 on page 2-14.

10. Press the **Knee Down** control. The knee section goes into the low position without stops or alarms.

    Yes **No**
    ↓ → Go to RAP 2.4 on page 2-14.

11. Press the **Head Up** control. The head section goes into the high position without stops or alarms.

    Yes **No**
    ↓ → Go to RAP 2.5 on page 2-15.

12. Press the **Head Down** control. The head section goes into the low position without stops or alarms (do not consider the knee section motor).

    Yes **No**
    ↓ → Go to RAP 2.5 on page 2-15.

13. Press the patient **Head Up** control (Automatic Contour). The head section and knee section rise simultaneously, then the knee section stops at approximately 17° while the head section continues to rise to its highest position.

    Yes **No**
    ↓ → Go to RAP 2.5 on page 2-15.

14. Press the patient **Head Down** control. The head and knee section lower at the same time to lowest position.

    Yes **No**
    ↓ → Go to RAP 2.5 on page 2-15.

NOTE:

Steps 15 through 22 are done with the bed unplugged.

15. Unplug the bed from its power source, and do the functions checks in Step 11 to Step 14. The bed functions operate correctly.

    Yes **No**
    ↓ → Go to RAP 2.6 on page 2-16.

16. Press the **Foot Up** control. The knee section rasies to approximately 17°, then foot and knee sections raise to their limits without stops or alarms.

    Yes **No**
    ↓ → Go to RAP 2.7 on page 2-17.

17. Press the **Foot Down** control. The foot and knee sections goes into the low position without stops or alarms.

    Yes **No**
    ↓ → Go to RAP 2.7 on page 2-17.

18. Press the **Dining Chair® Position** control. The bed goes into the chair position without stops or alarms.

    Yes **No**
    ↓ → Go to RAP 2.5 on page 2-15.

19. Press the **Bed Flat** control.The head, knee, and foot sections go into the flat position.

    Yes **No**
    ↓ → Go to RAP 2.5 on page 2-15.

20. Press the **Trendelenburg** control. The bed goes into the Trendelenburg position without stops or alarms.

    Yes **No**
    ↓ → Go to RAP 2.8 on page 2-18.

21. Press the **Reverse Trendelenburg** control. The bed goes into the Reverse Trendelenburg position without stops or alarms.

    Yes **No**
    ↓ → Go to RAP 2.8 on page 2-18.

22. Plug the bed into an applicable power source.
23. Put the brakes in the neutral position. An alarm sounds.

    Yes **No**
    ↓ → Go to RAP 2.9 on page 2-19.

24. Set the brakes. The alarm stops.

    Yes **No**
    ↓ → Go to RAP 2.9 on page 2-19.

25. Press the **Head Up** control until the head section reaches the high position.

NOTE:

Have someone lay on the bed for this test.

26. Pull one of the CPR control handles. The head section lowers quickly to the mid position, then slows until the horizontal position is reached. The movement occurs without stops or abnormal noise. Repeat for the other CPR control handle.

    Yes ↓ **No** → Go to RAP 2.10 on page 2-20.

27. Release the CPR control handle.
28. Press the **Head Up** control. The head section goes to the highest position without stops or abnormal noise.

    Yes ↓ **No** → Go to RAP 2.10 on page 2-20.

29. Try to move the bed with the brake still applied. The four wheels are locked and prevent any movement.

    Yes ↓ **No** → Go to RAP 2.11 on page 2-21.

30. Put the brake/steer pedal to Steer, and move the bed far enough to lock the steer caster into position. The steer caster locks into position.

NOTE:
The Brake Not Set alarm will sound.

Yes ↓ **No** → Go to RAP 2.12 on page 2-22.

31. If the bed has the Head Angle Display option, press the **Bed Flat** and **Bed Down** control to put the bed in the lowest and flat position. Look at the angle shown on the display. The angle shown is 0°.

    Yes ↓ **No** → Go to RAP 2.20 on page 2-30.

32. With the bed level, raise the head section to its highest position. Look at the angle shown on the display. The angle shown is approximately 65°.

    Yes ↓ **No** → Go to RAP 2.20 on page 2-30.

33. If the bed has the 30° Head Angle Alarm option, press the **Enable** control, and then the **30° Head Angle Alarm** control. The indicator for the 30° Head Angle Alarm comes on.

    Yes ↓ **No** → Contact Hill-Rom Technical Support.

34. Lower the head section so it is below 30°. An alarm comes on, and the 30° Head Angle Alarm indicator flashes.

    Yes ↓ **No** → Contact Hill-Rom Technical Support.

35. Raise the head section so it is above 30°. The alarm stops, and the 30° Head Angle Alarm indicator is on solid.

    Yes ↓ **No** → Contact Hill-Rom Technical Support.

36. Press the **Enable** control, and then press the **30° Head Angle Alarm** control. The indicator for the 30° Head Angle Alarm goes off.

    Yes **No**
    ↓ → Contact Hill-Rom Technical Support.

37. For beds with SafeView® Alerts installed, refer to Table 2-4 on page 2-4.
38. Complete all necessary administrative tasks.

SCALE AND BED EXIT FUNCTION CHECK

1. Press the **Weight** control. Release the control pod. The system beeps once, and the Hands Off indicator comes on.

    Yes **No**
    ↓ → Replace the control pod P.C. board.

2. The system beeps once. The weight is displayed.

    Yes **No**
    ↓ → Replace the control pod P.C. board.

3. Press the **lb/kg** control. The lb/kg indicator toggles between lb and kg, then kg and lb.

    Yes **No**
    ↓ → Replace the control pod P.C. board.

4. Put 50 lb (23 kg) on the center of the bed. Press the **Zero** control. Weight display shows 0.0.

    Yes **No**
    ↓ → Replace scale P.C. board.

5. Remove the weight. Press the **Zero** control. Weight display shows 0.0.

    Yes **No**
    ↓ → Replace the scale P.C. board.

6. Put 50 lb (23 kg) on the bed.
7. Press the **Enable** control on the control pod. The Enable indicator comes on.

    Yes **No**
    ↓ → Replace the control pod P.C. board.

8. Press the **Bed Exit** control. The Bed Exit indicators come on.

    Yes **No**
    ↓ → Replace the scale P.C. board.

9. Remove the weight. The alarm sounds.

    Yes **No**
    ↓ → Replace the scale P.C. board.

10. Press the **Enable** control then press and release the **Volume** control on the control pod. The volume changes.

    Yes **No**
    ↓ → Replace the control pod P.C. board.

11. Press the **Enable** control then the **Bed Exit Alarm** control. The alarm goes off and the indicators go off.

    Yes **No**
    ↓ → Replace the scale P.C. board.

12. Complete all necessary administrative tasks.

OBSTACLE DETECT® FEATURE FUNCTION CHECK

1. Do as follows, in three locations on the each side of the bed:
   a. Squeeze and hold the Obstacle Detect® Sensor.
   b. Press the **Bed Down** control. The **Bed Not Down** indicator flashes, and the bed does not go down.
   c. Release the sensor.
   d. Press the **Bed Down** control. The **Bed Not Down** indicator does not flash, and the bed goes down.
   e. While the bed is going down, squeeze the sensor. The **Bed Not Down** indicator flashes, the bed stops then raises for 2 seconds, and stops.
   f. Release the sensor.
   g. Press the **Bed Down** control. The **Bed Not Down** indicator does not flash, and the bed goes down.
2. If any function check fails, go to RAP 2.41 on page 2-53.

SAFEVIEW® ALERTS FUNCTION CHECK

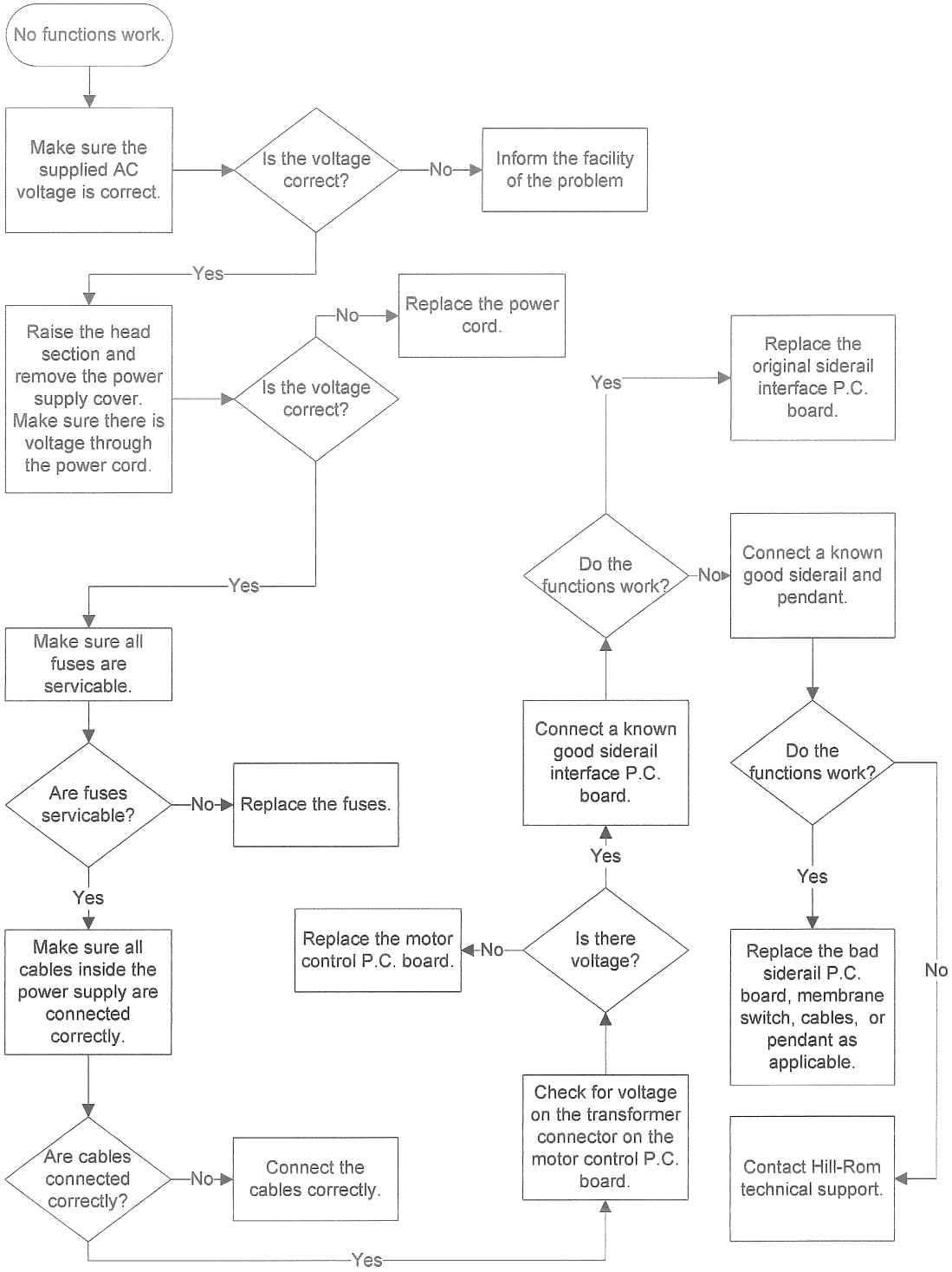
Put 50 lb (23 kg) on the bed, and do the checks below. If the lights do not operate correctly, refer to Table 2-4 on page 2-4.

1. With the bed is in the safe condition as defined below, the lights are on green.
   - The bed is in the low position.
   - The siderails are up (as configured): at least the two head-end siderails and possibly one or both foot-end siderails.
   - The brake is set.
   - The Bed Exit Alarm System is on.
2. Raise and lower the bed. The lights flash yellow when the bed is raised, and the lights are on green when the bed is in the lowest position.
3. For the siderails, do one of these per the configuration:
   - **Two siderail**—lower and raise the head-end siderails one at a time. The lights flash yellow when the siderail is lowered, and the lights are on green when both siderails are up.
   - **Three siderail**—lower one of the foot-end siderails, lower and raise the other foot-end siderail. The lights flash yellow when the siderail is lowered, and the lights are on green when the siderails are up. Repeat for the other side.
   - **Four siderail**—lower and raise one siderail at a time. The lights flash yellow when the siderails is lowered, and the lights are on green when the siderails are up.Lower and raise each of the

configured siderails. The lights flash yellow when a configured siderail is lowered, and the lights are on green when all configured siderails are up.

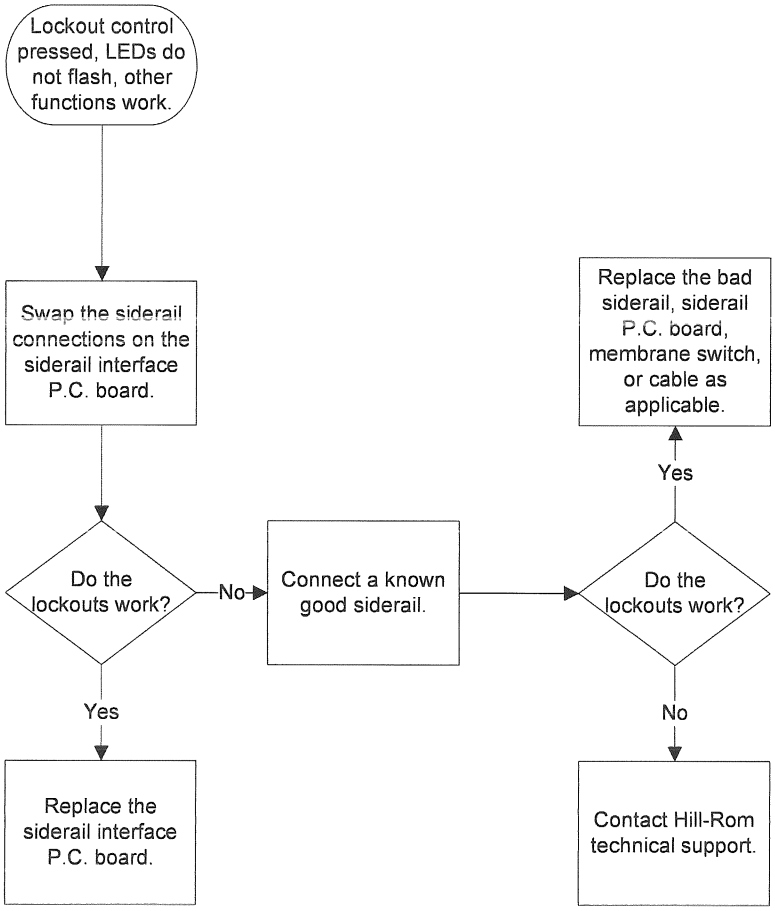
4. Release and set the brake. The lights flash yellow when the brake is released, and the lights are on green when the brake is set.
5. Remove the 50 lb (23 kg) from the bed. The lights flash yellow.
6. Replace the weight, and activate the Bed Exit Alarm System. The lights are on green.
7. Deactivate the Bed Exit Alarm System. The lights are off.
8. Release the brake, raise the bed, and lower the head-end siderails. The lights are off.

2.1 No Functions Operate

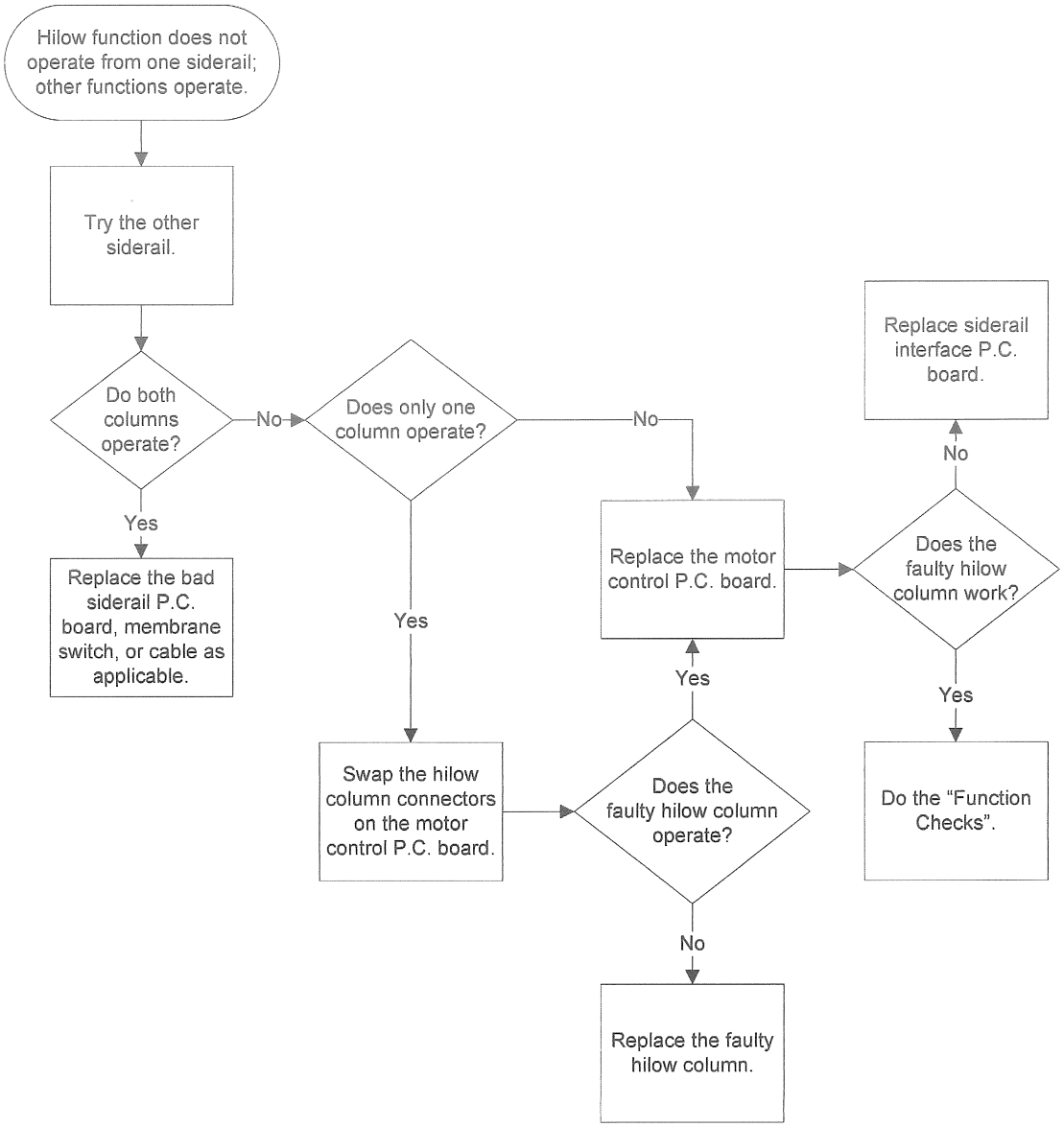


2.2 Lockout Malfunction

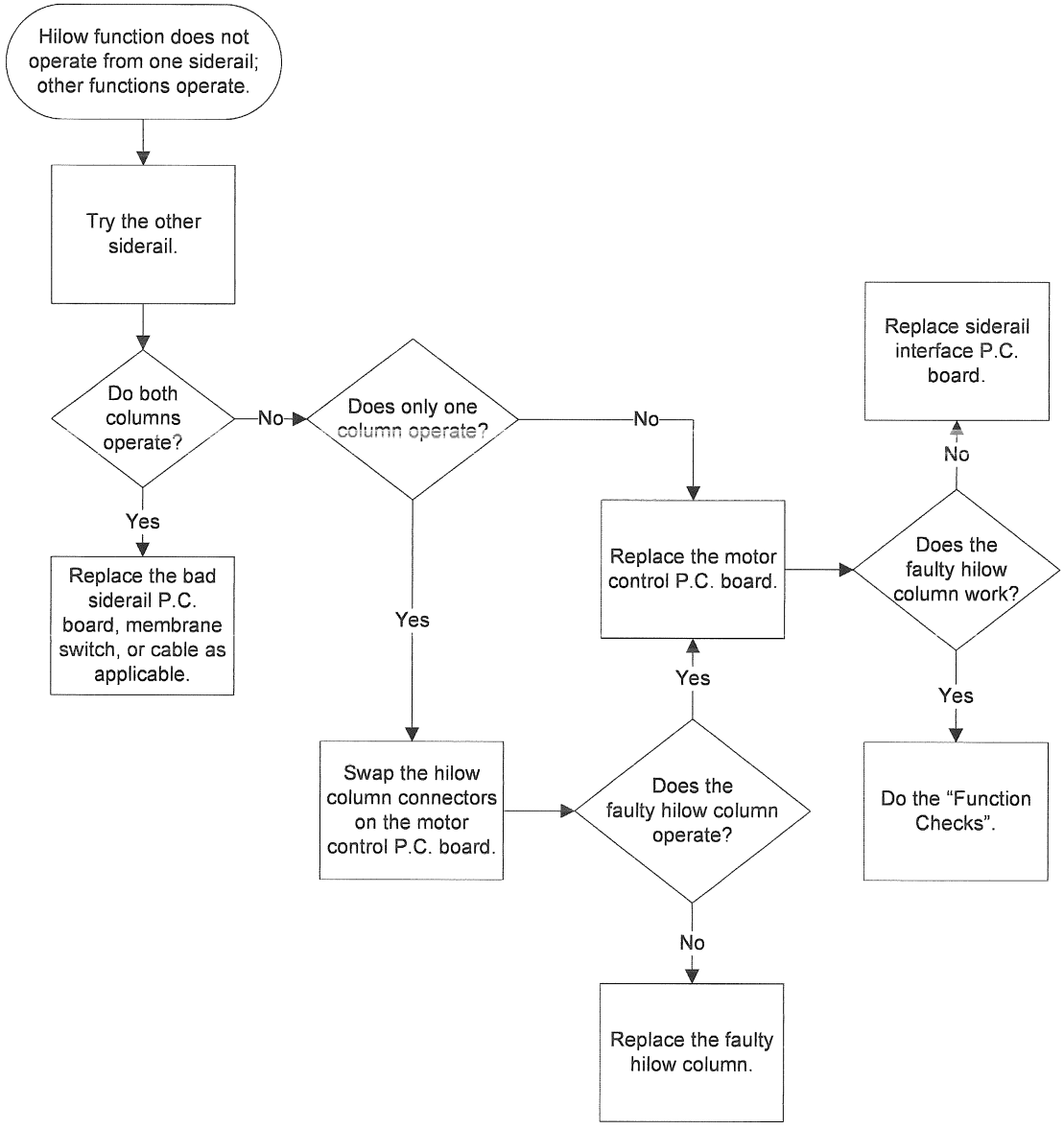
If the lockouts were not active when the bed was disconnected from AC power, but are on when the bed is plugged in, refer to "Battery Backup Malfunction" on page 2-16.



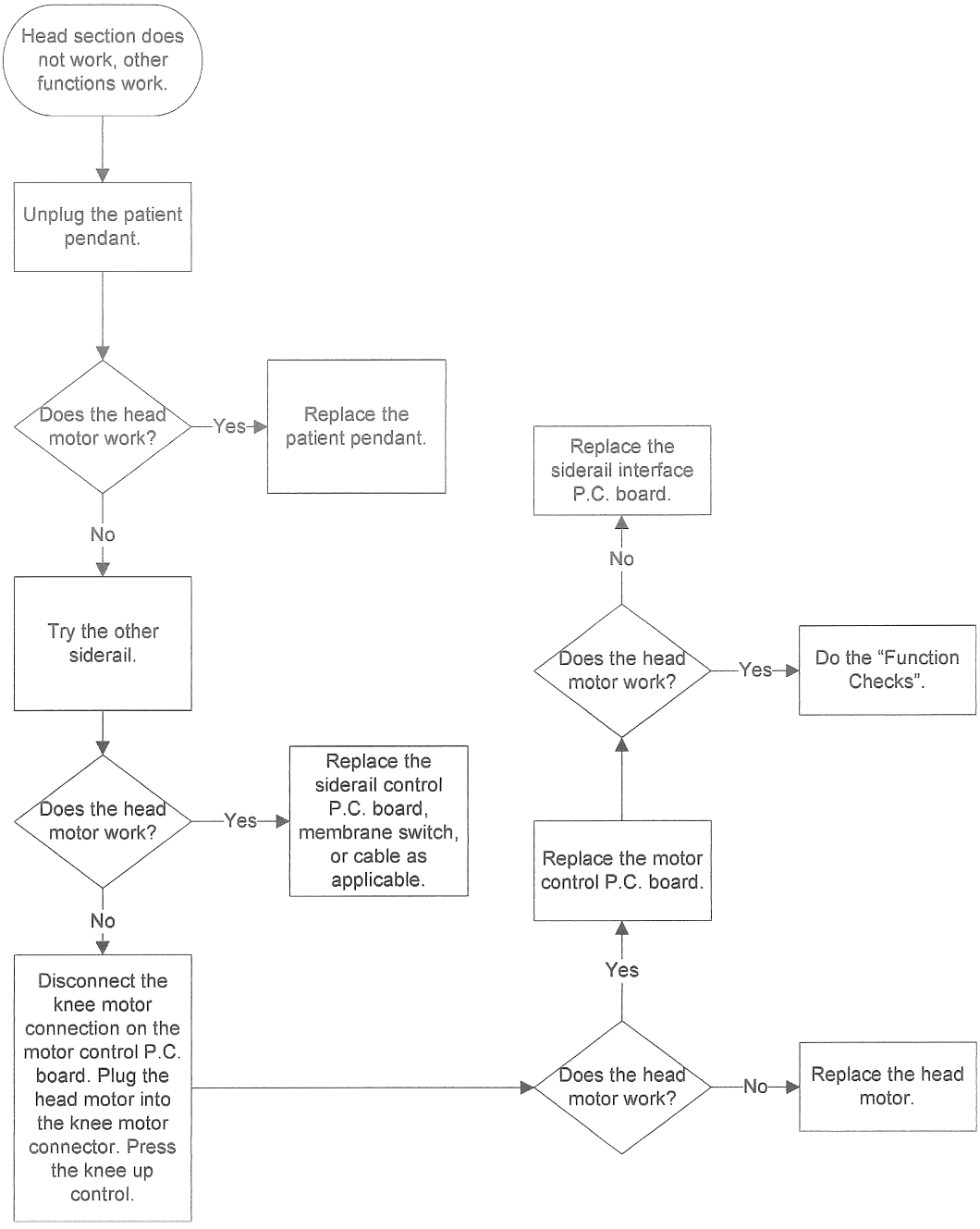
2.3 Hilow Malfunction



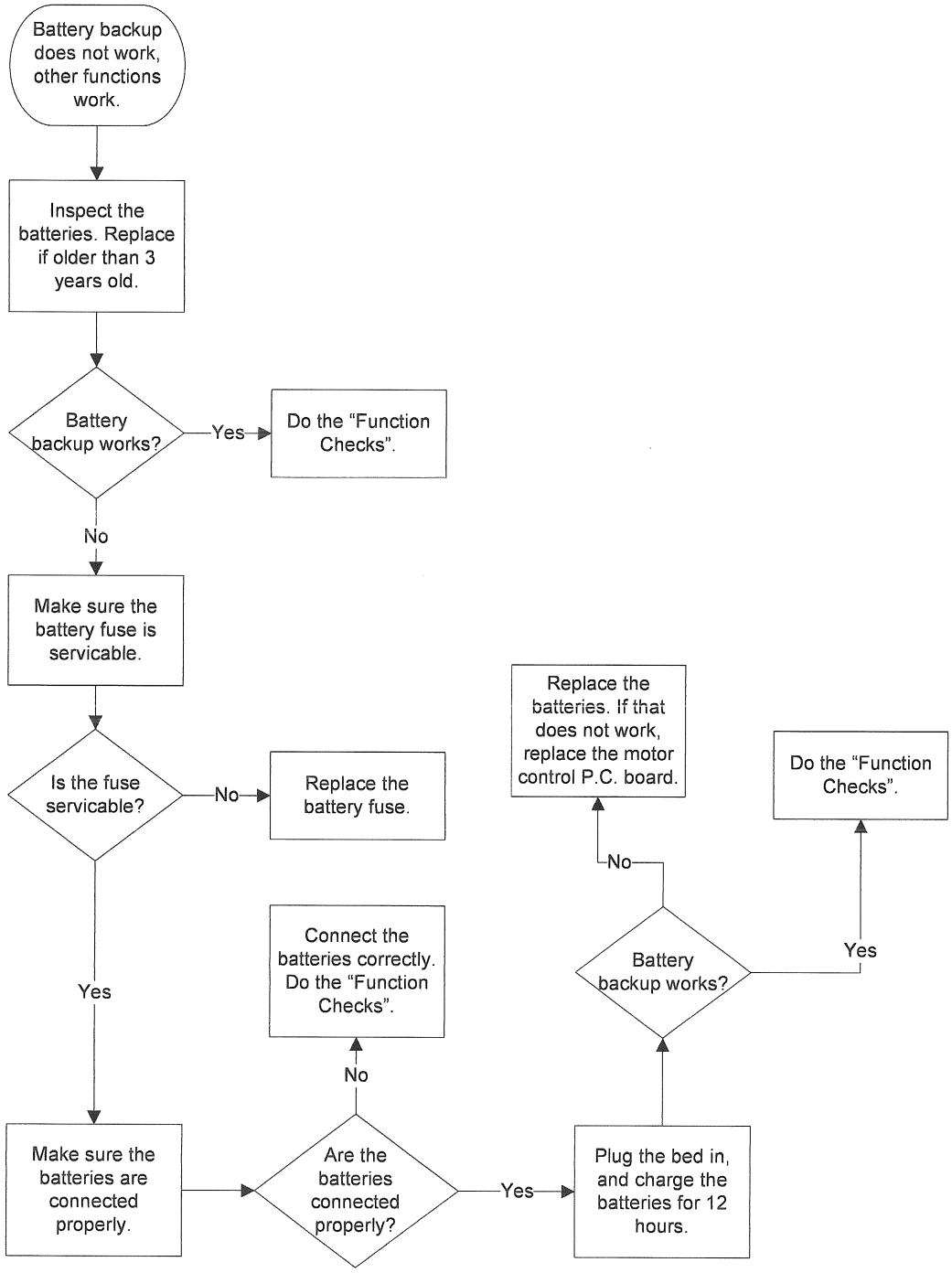
2.4 Knee Section Malfunction



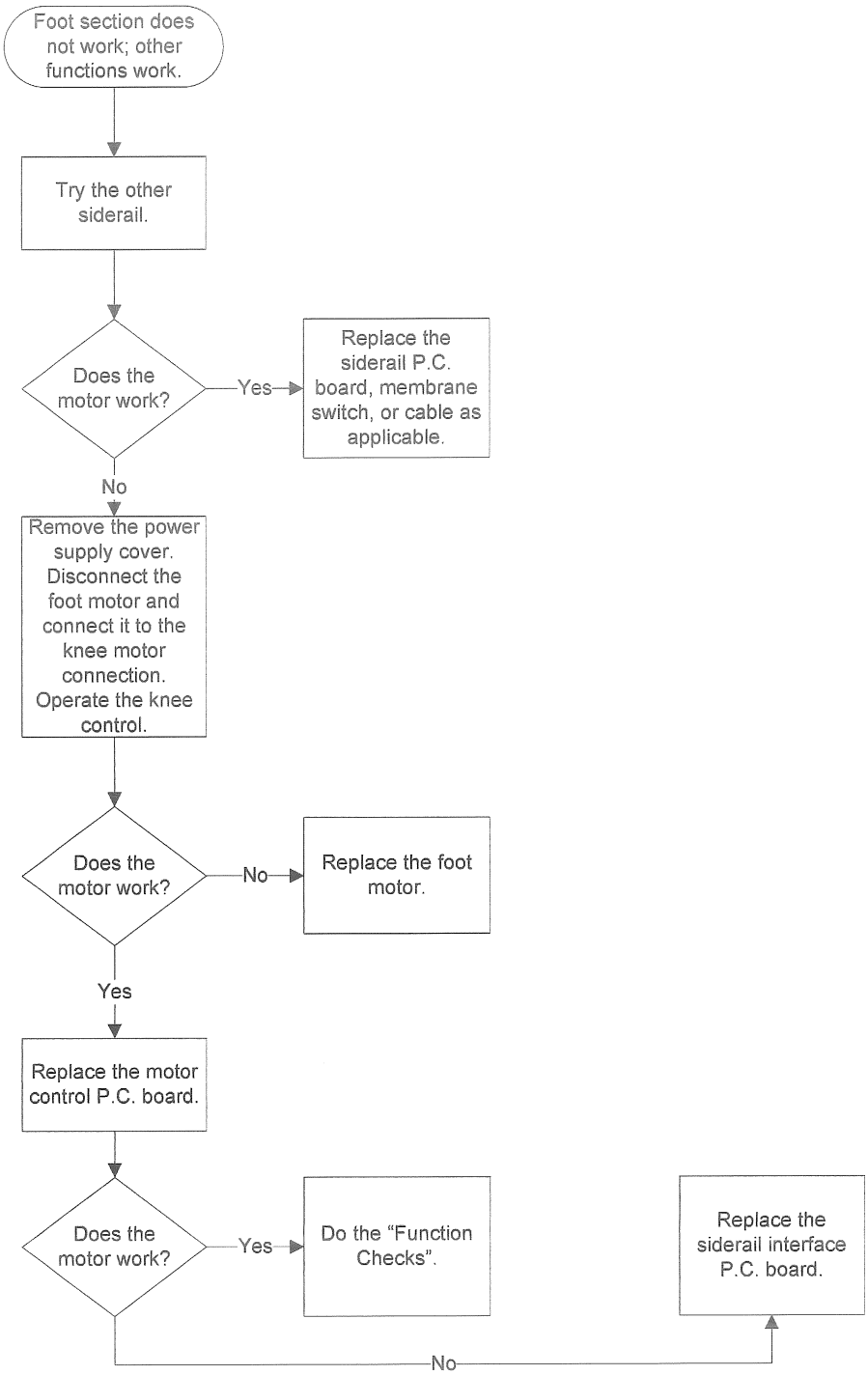
2.5 Head Section Malfunction (excluding Automatic Contour)



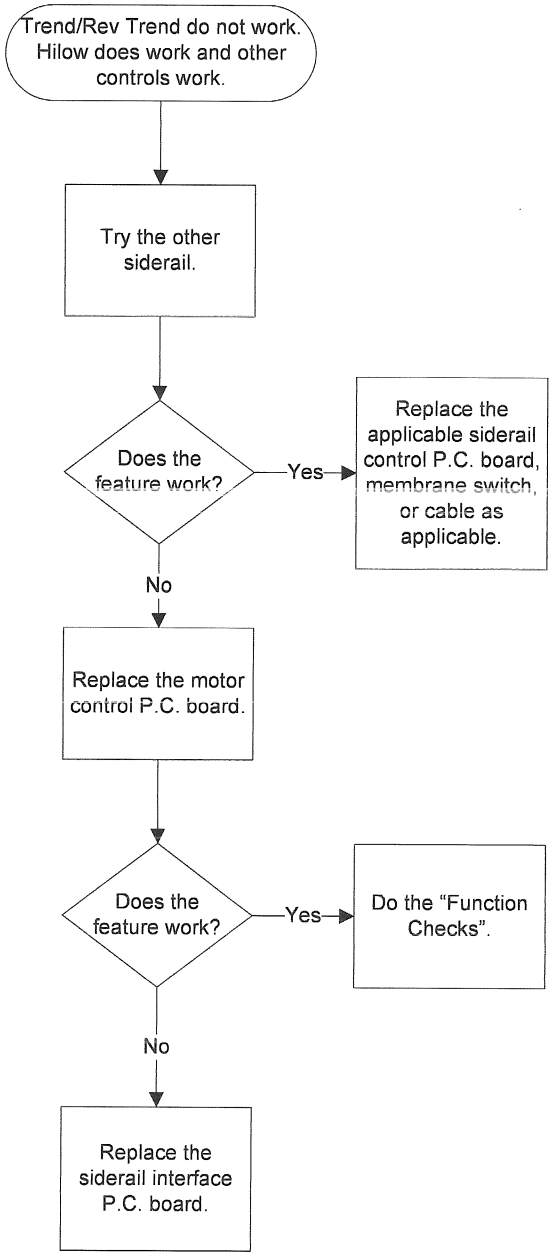
2.6 Battery Backup Malfunction



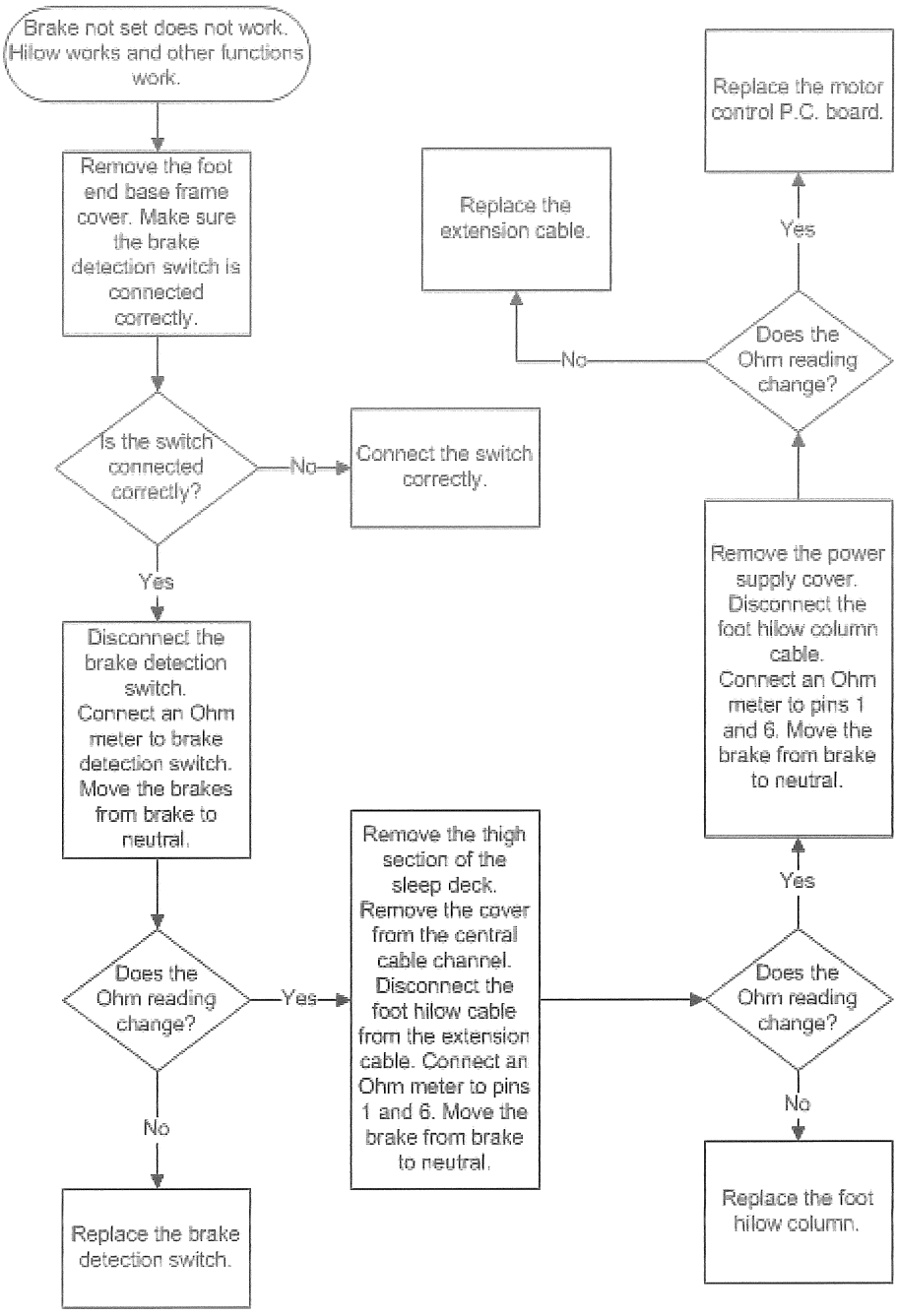
2.7 Foot Section Malfunction



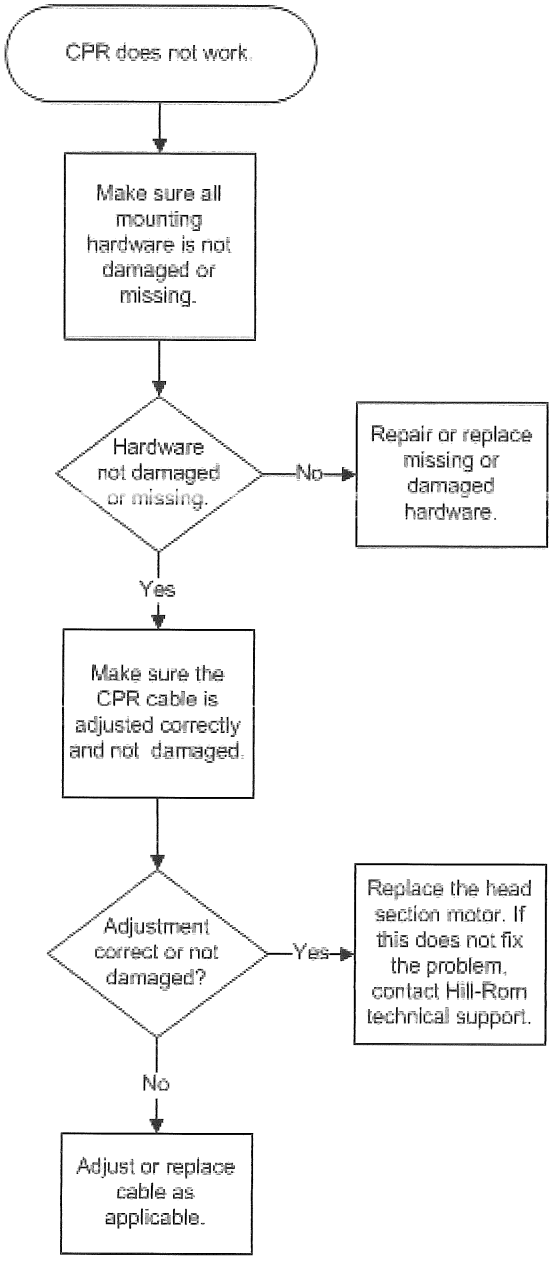
2.8 Trendelenburg/Reverse Trendelenburg Malfunction



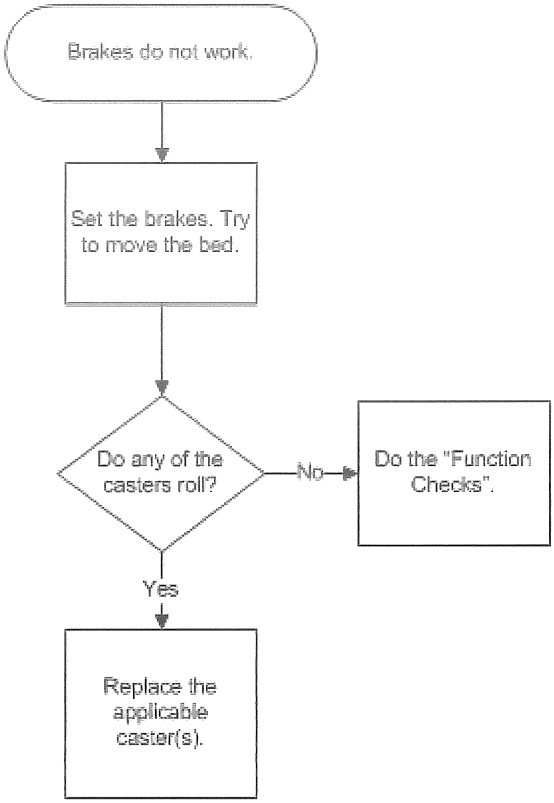
2.9 Bed Connected to AC Power, Brakes Not Applied Detection Malfunction



2.10 CPR Malfunction

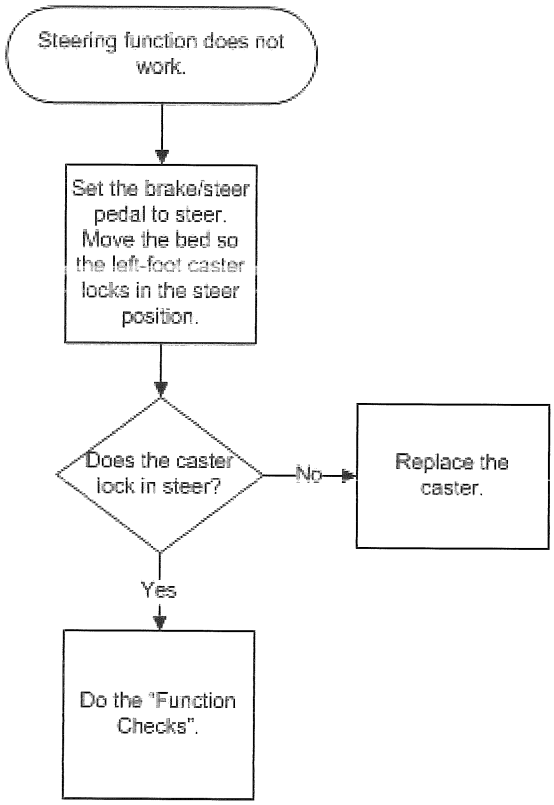


2.11 Braking Malfunction

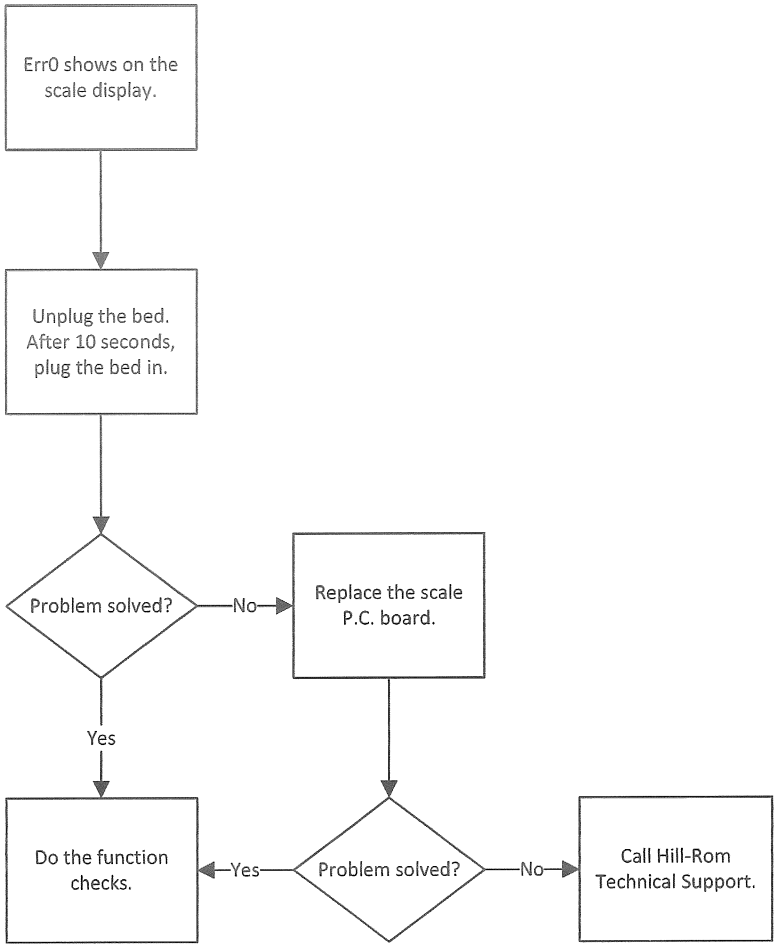


2.12 Steering Malfunction

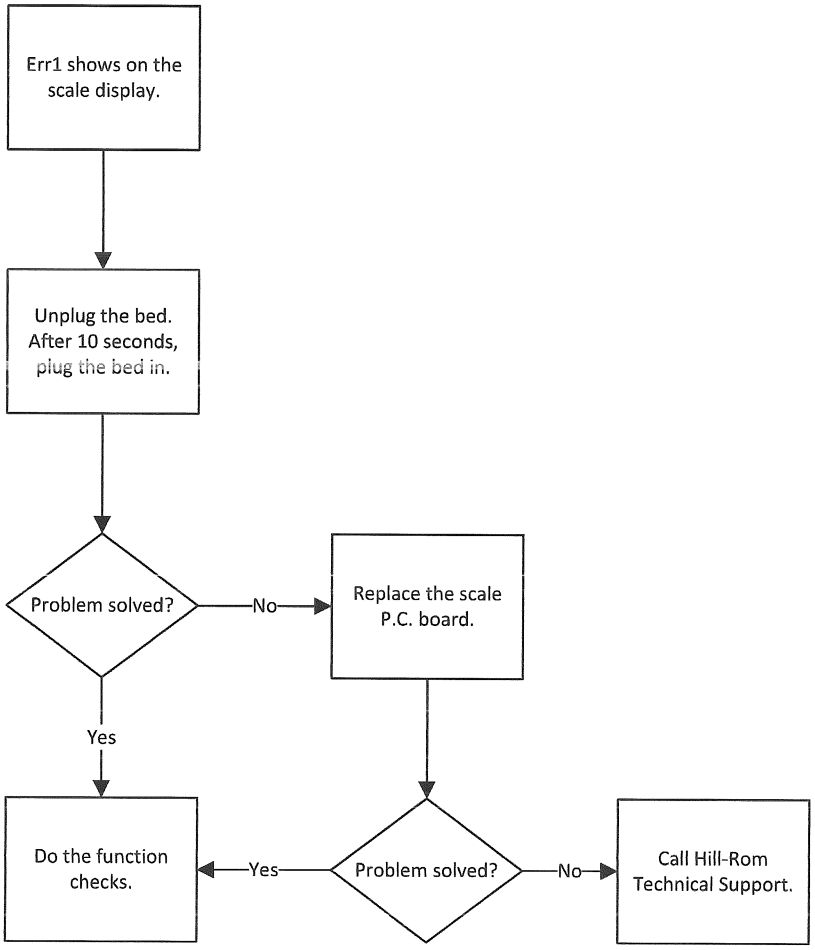
Beds with the IntelliDrive® Transport System or 5th wheel do not have a steer caster.



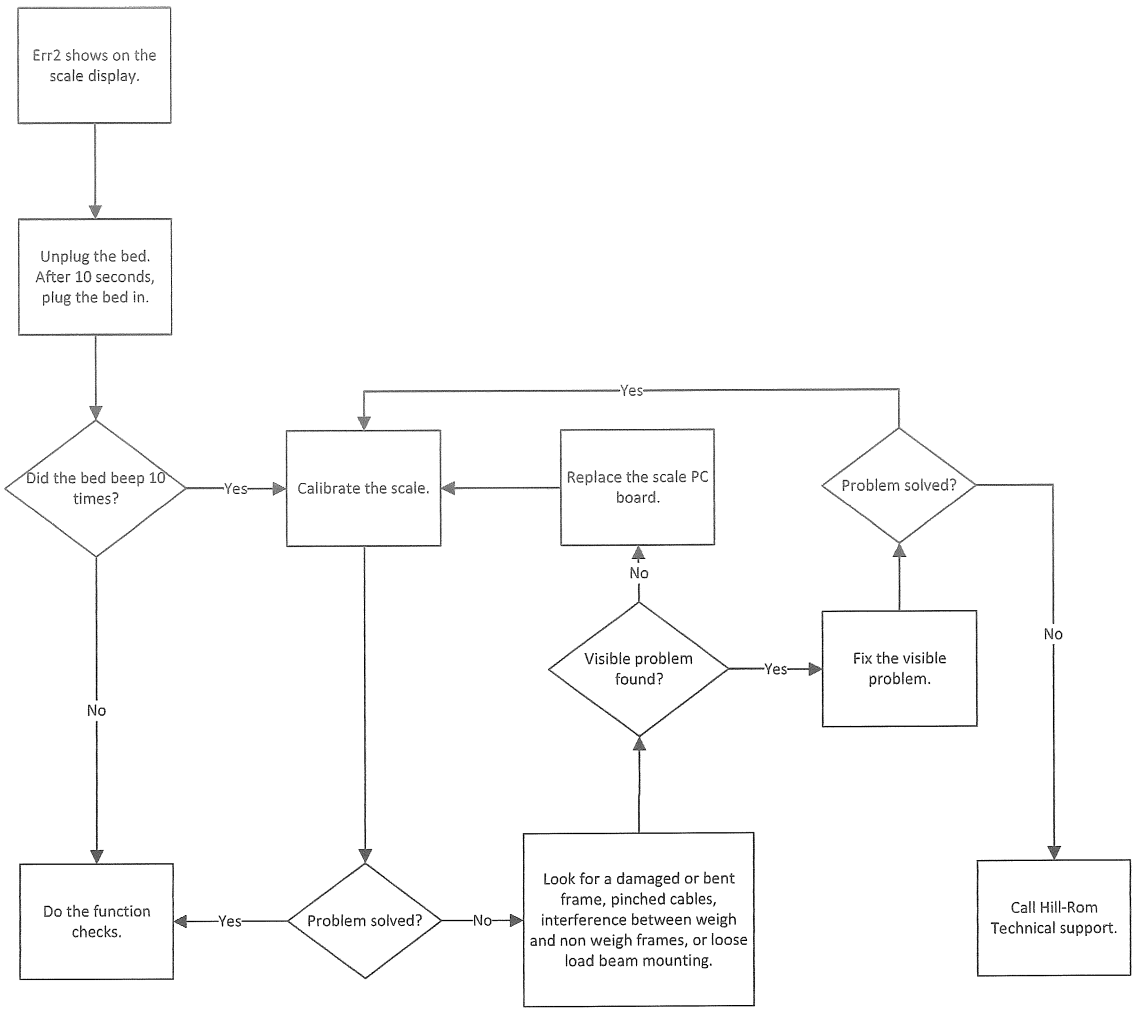
2.13 Scale Error 0



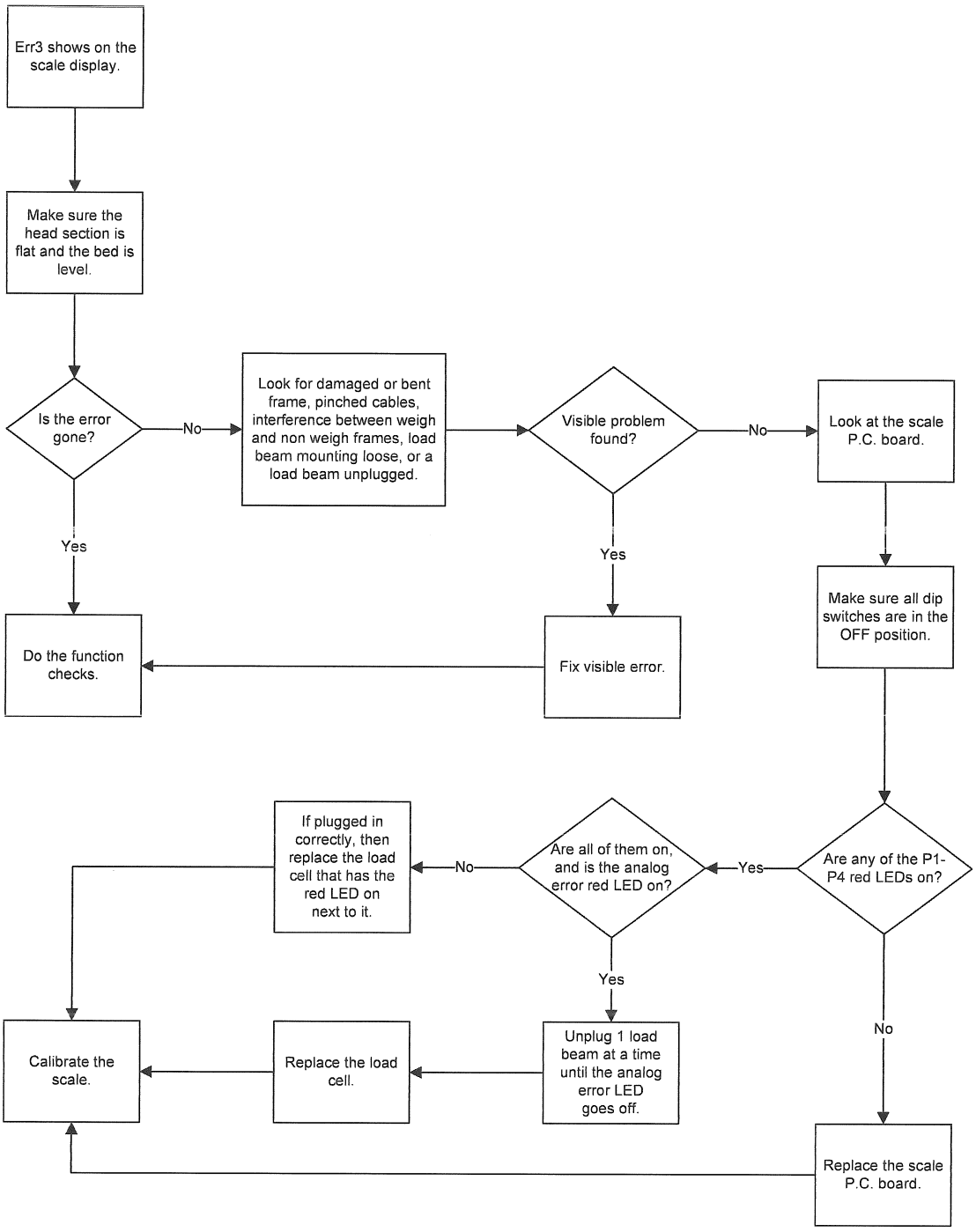
2.14 Scale Error 1



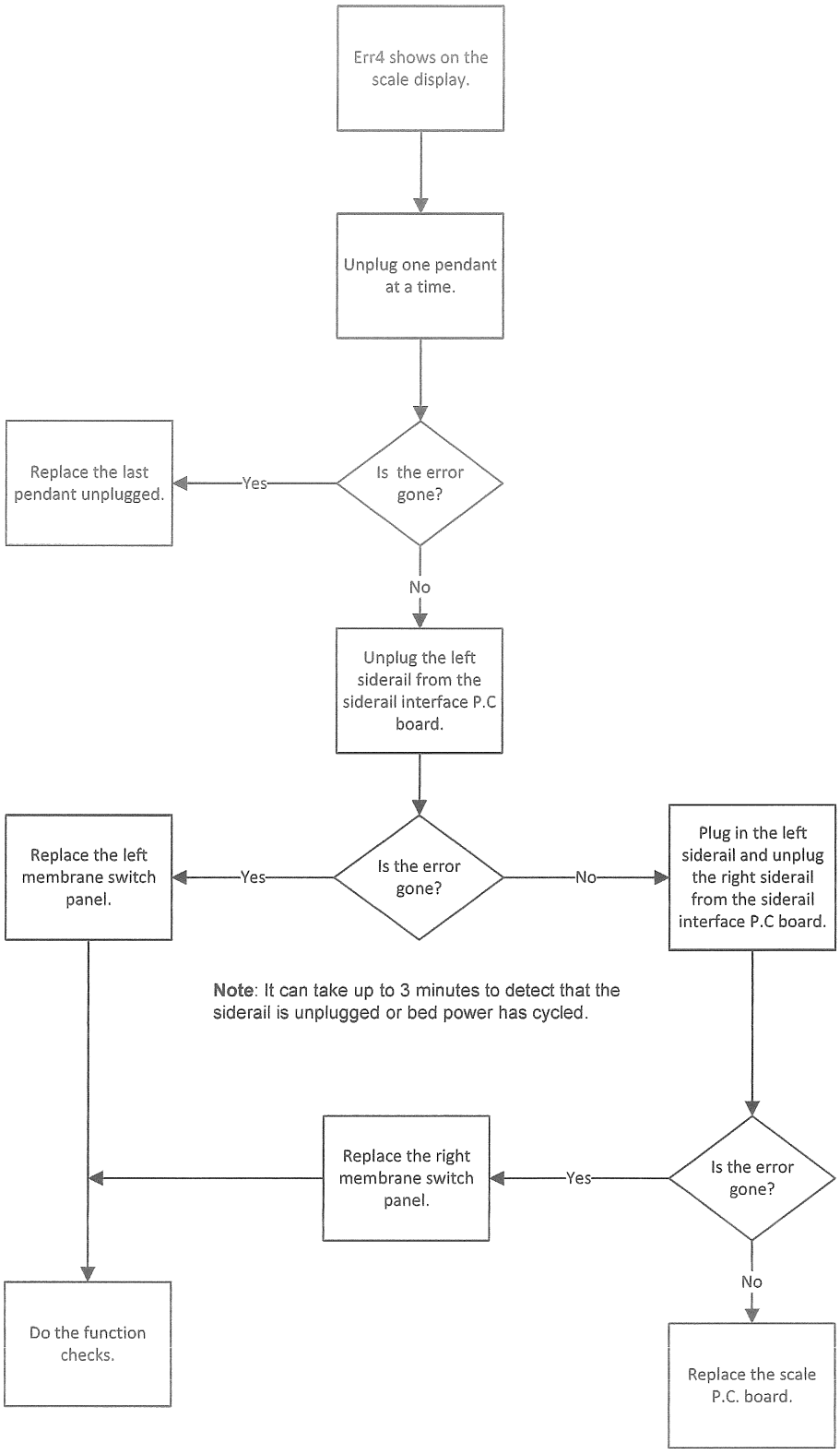
2.15 Scale Error 2



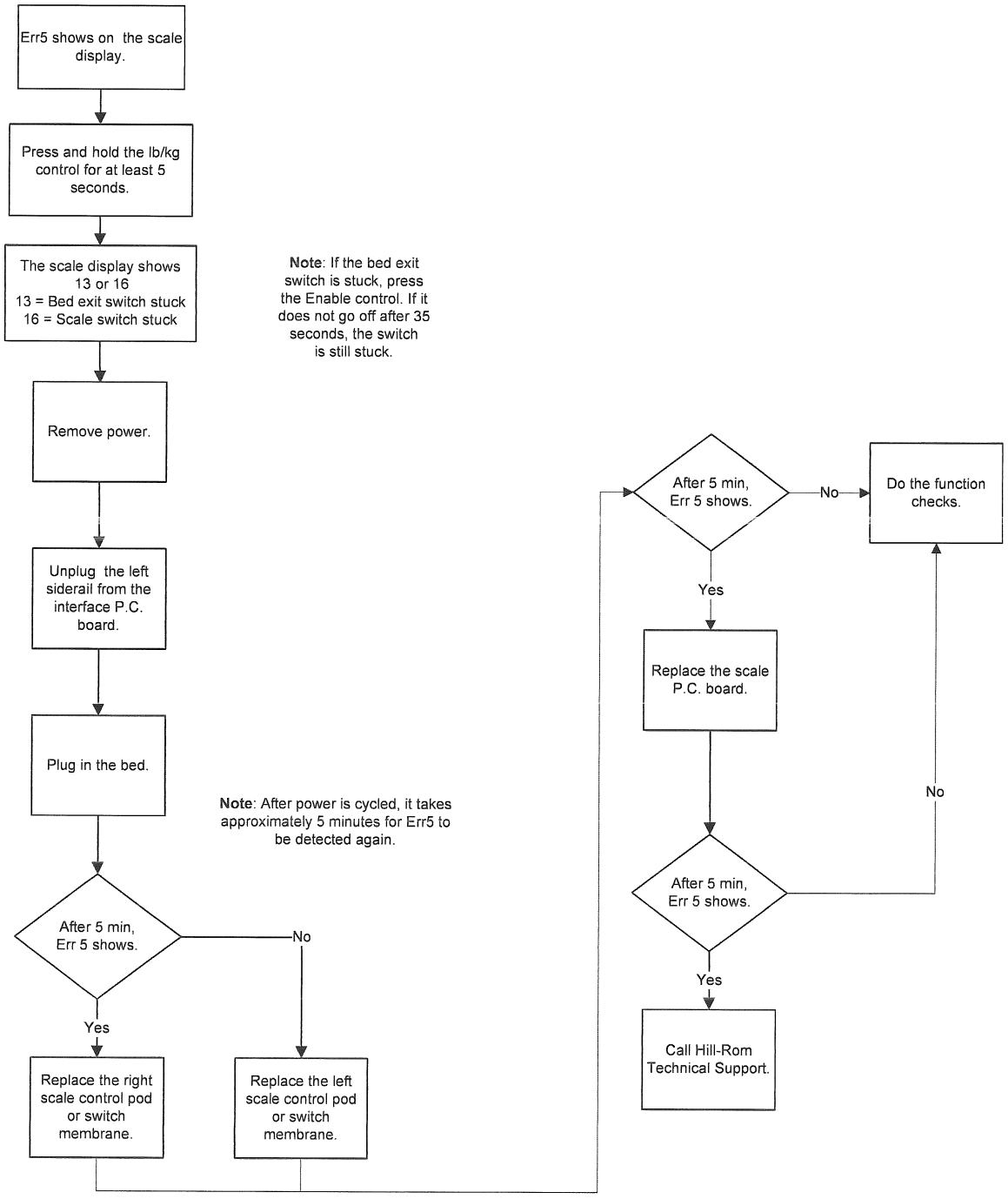
2.16 Scale Error 3



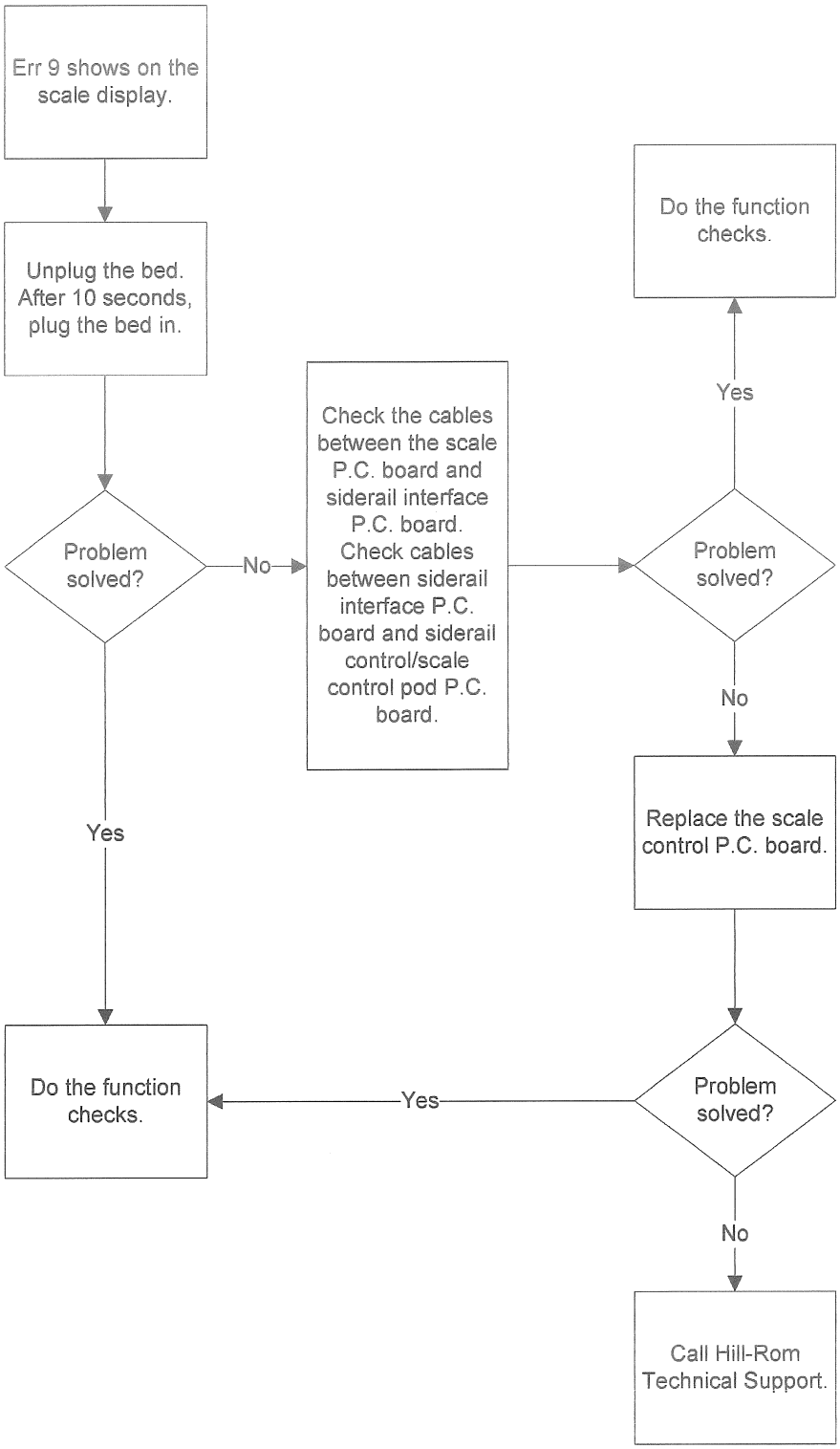
2.17 Scale Error 4



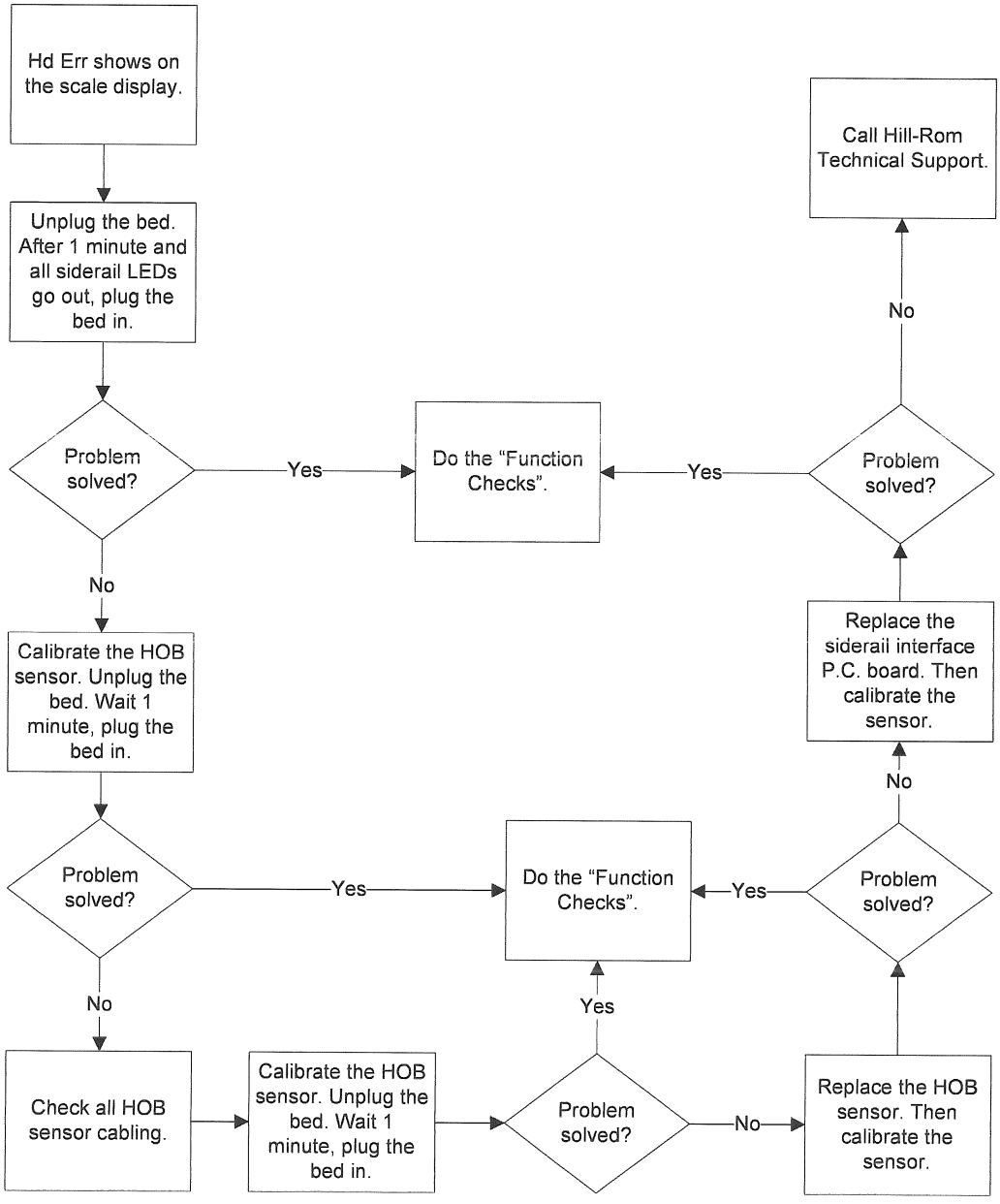
2.18 Scale Error 5



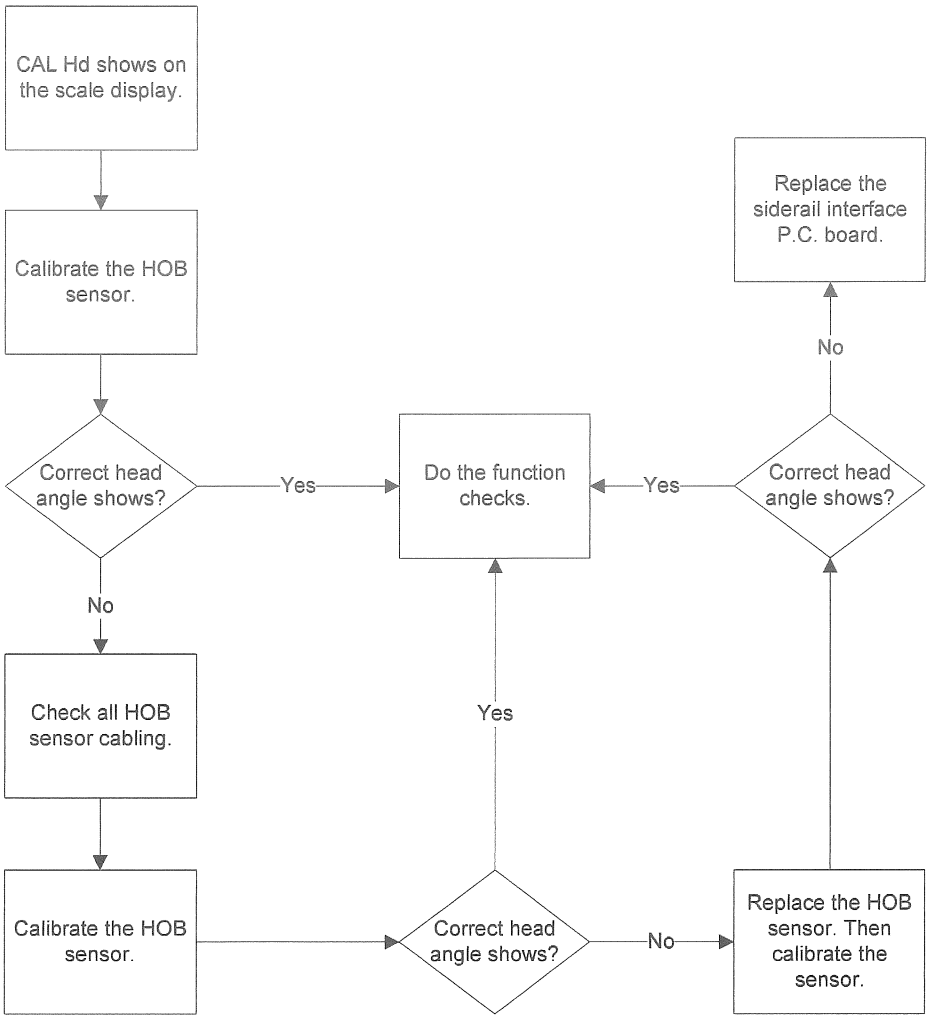
2.19 Scale Error 9



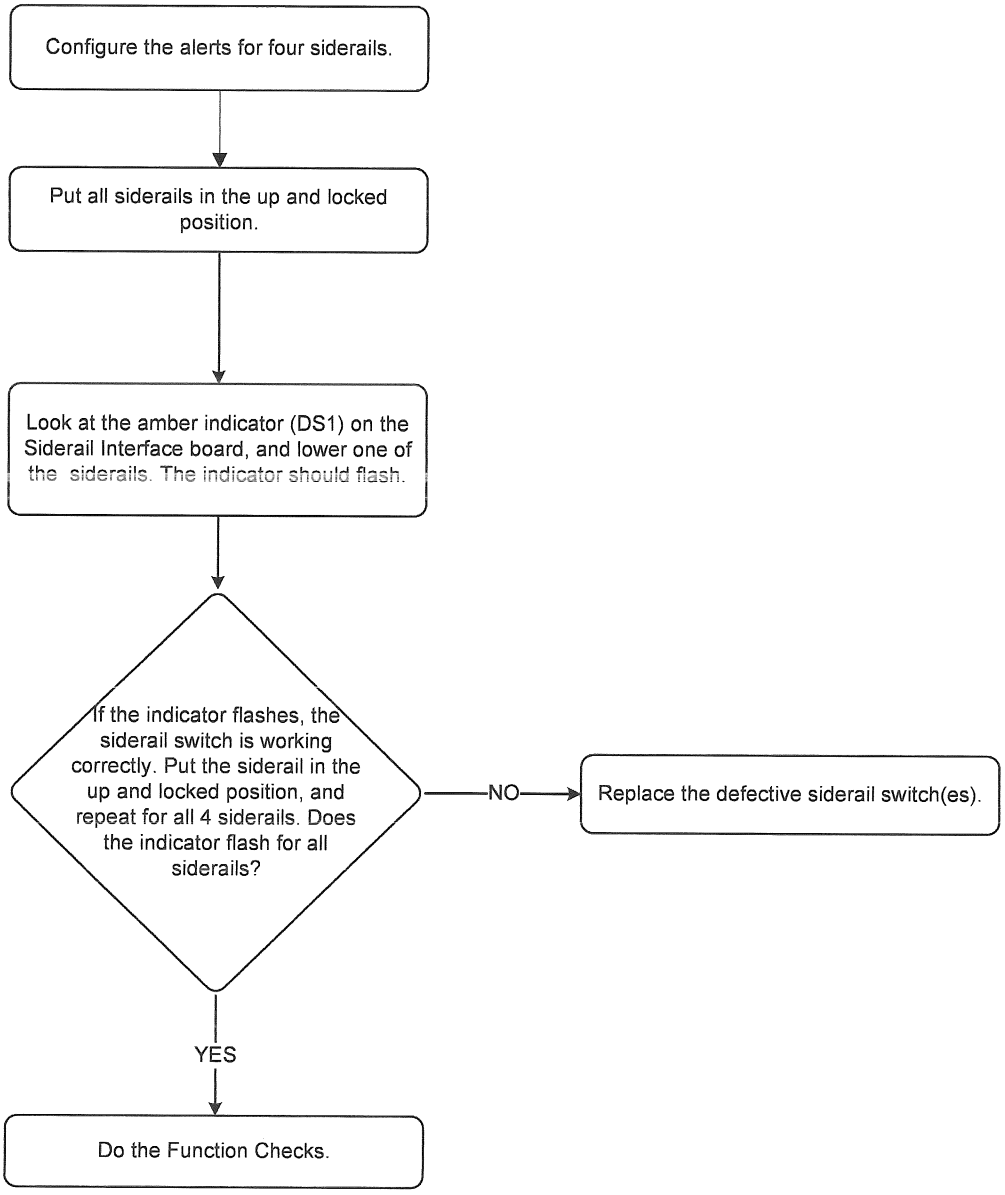
2.20 Head Angle Error



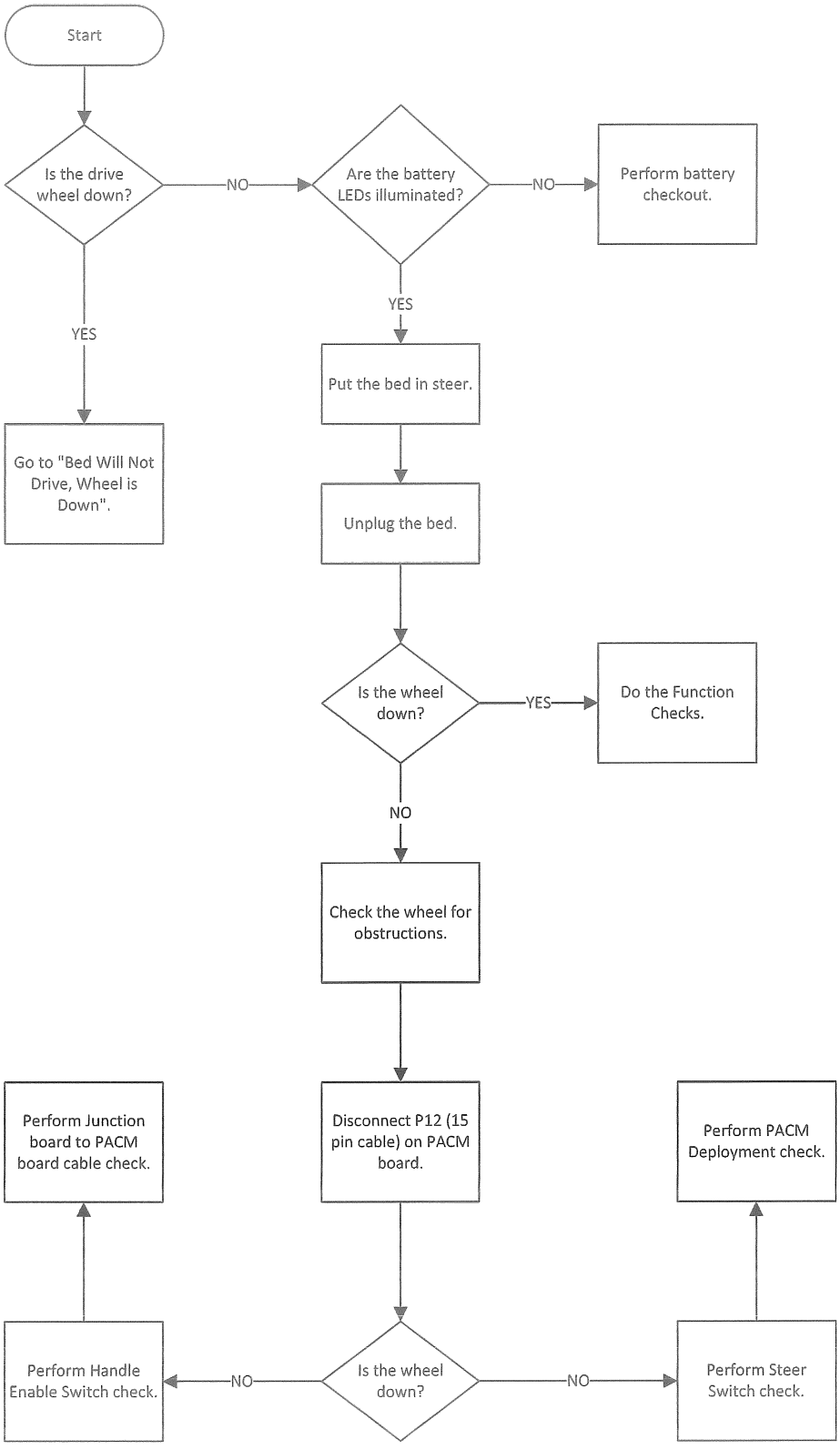
2.21 Head Sensor Calibrator Error



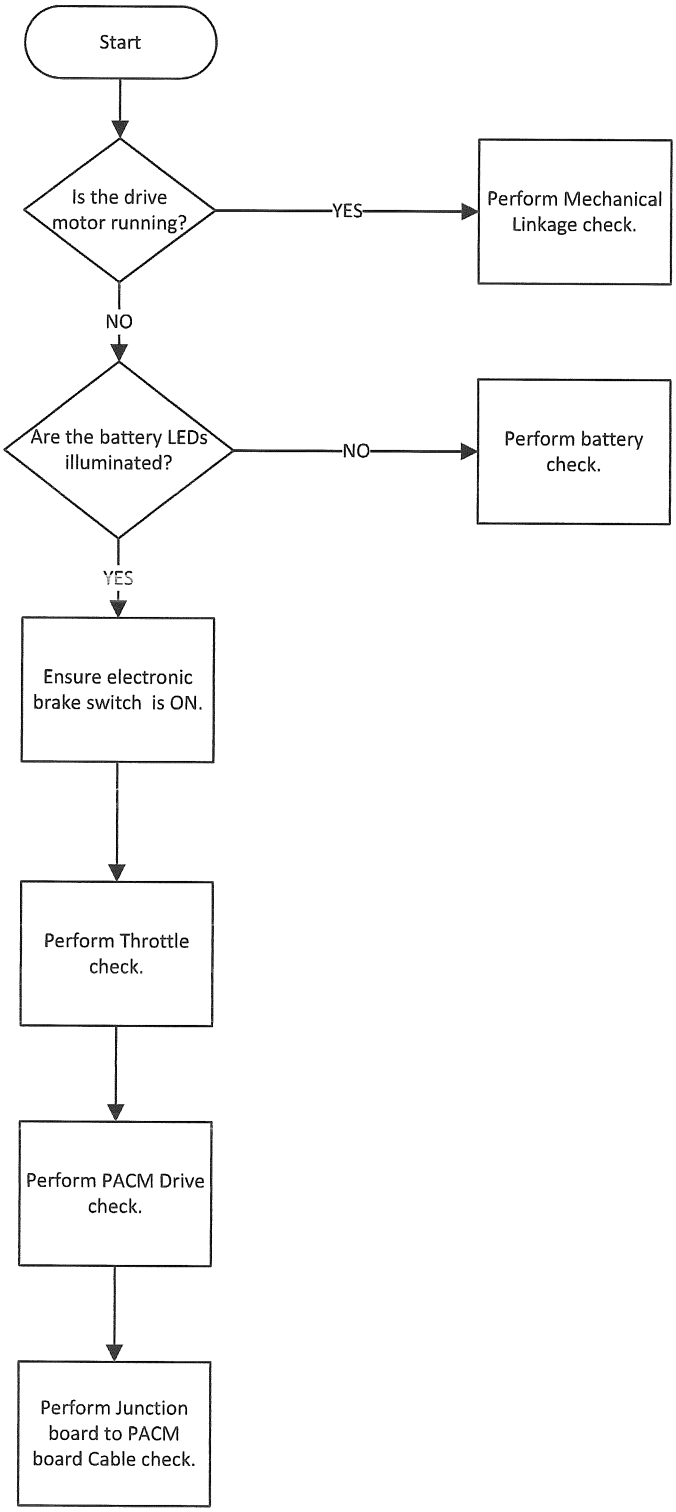
2.22 Siderail Detection Switch Malfunction



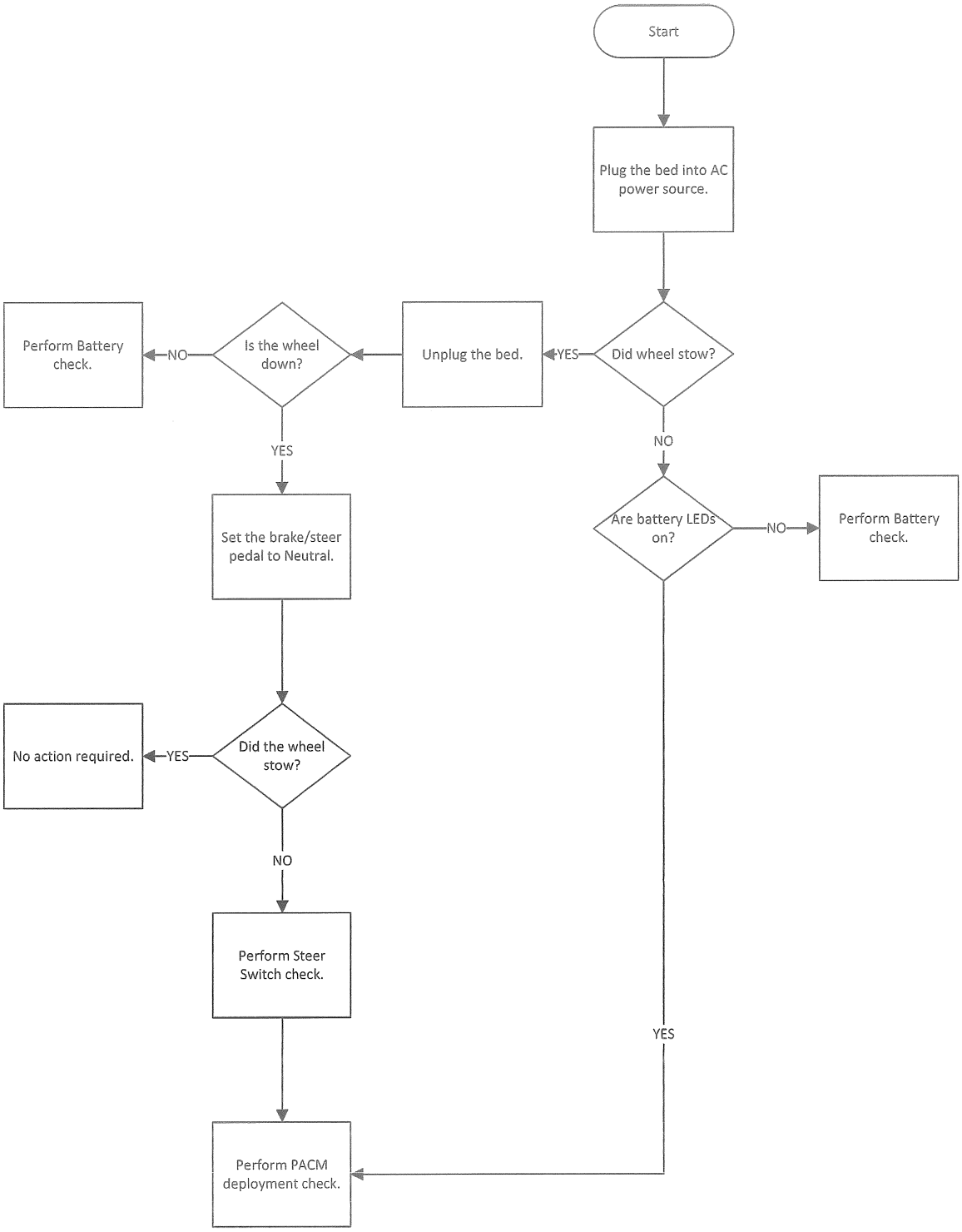
2.23 Bed Will Not Drive (IntelliDrive® Transport System)



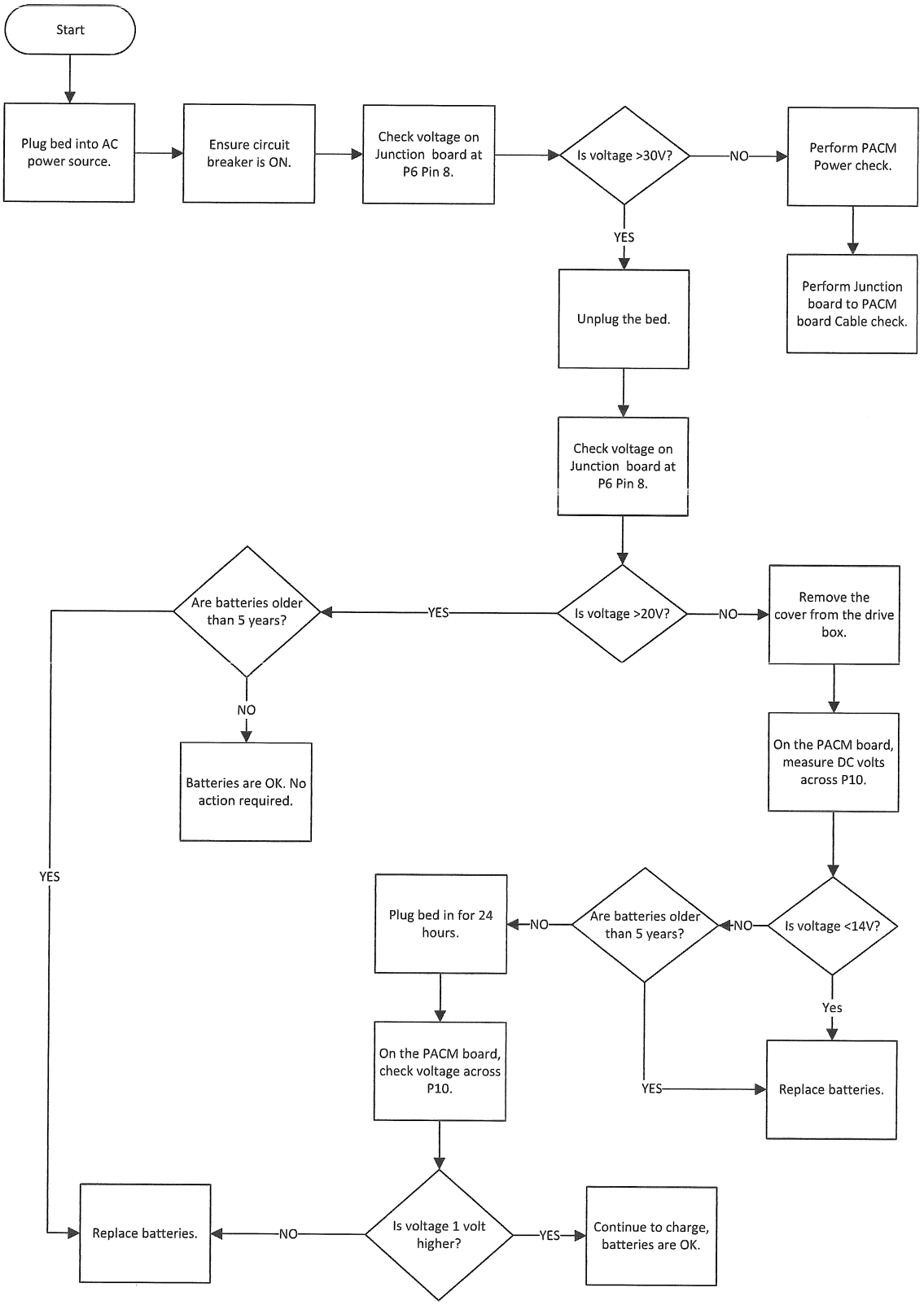
2.24 Bed Will Not Drive, Wheel Is Down (IntelliDrive® Transport System)



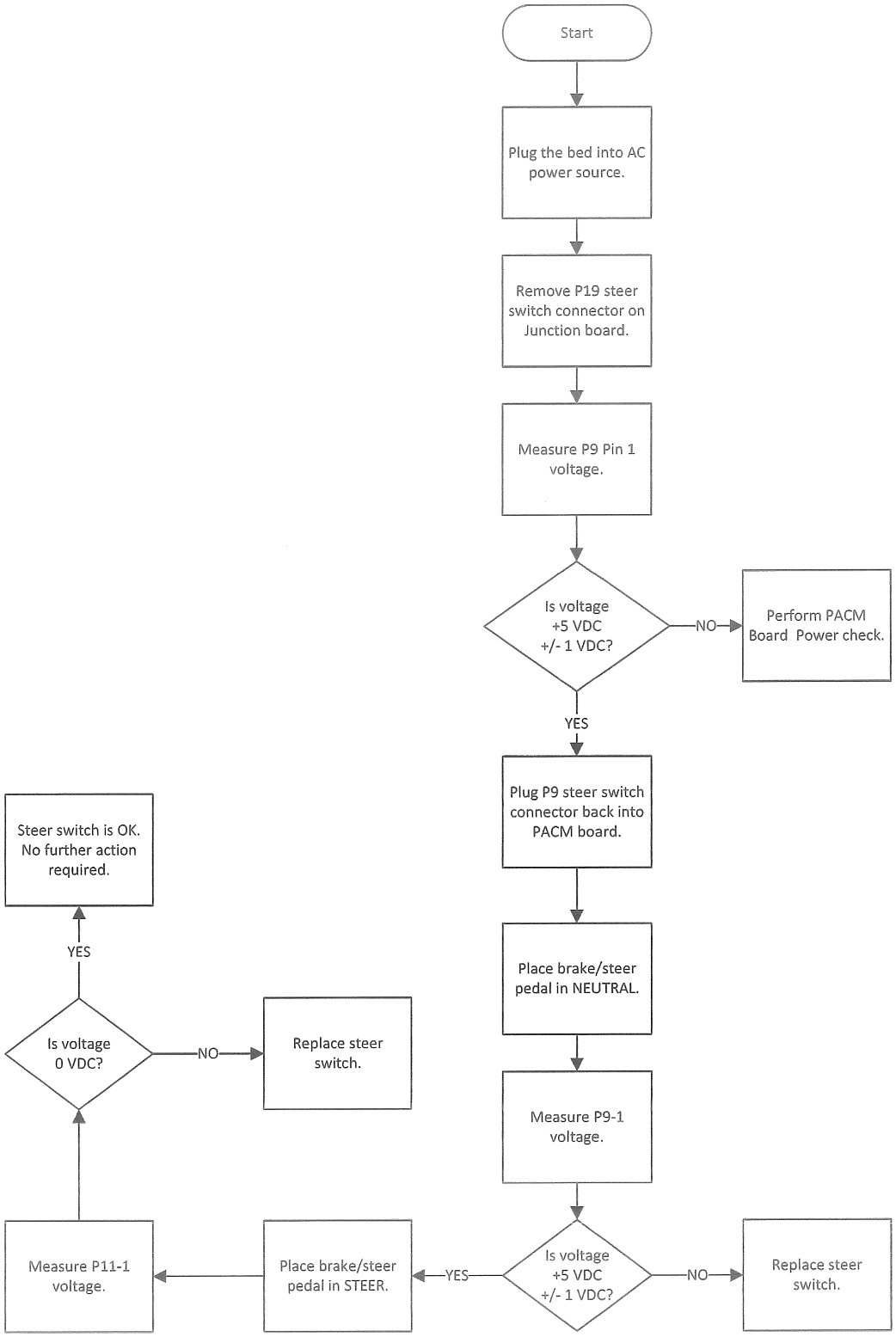
2.25 Wheel Will Not Stow (IntelliDrive® Transport System)



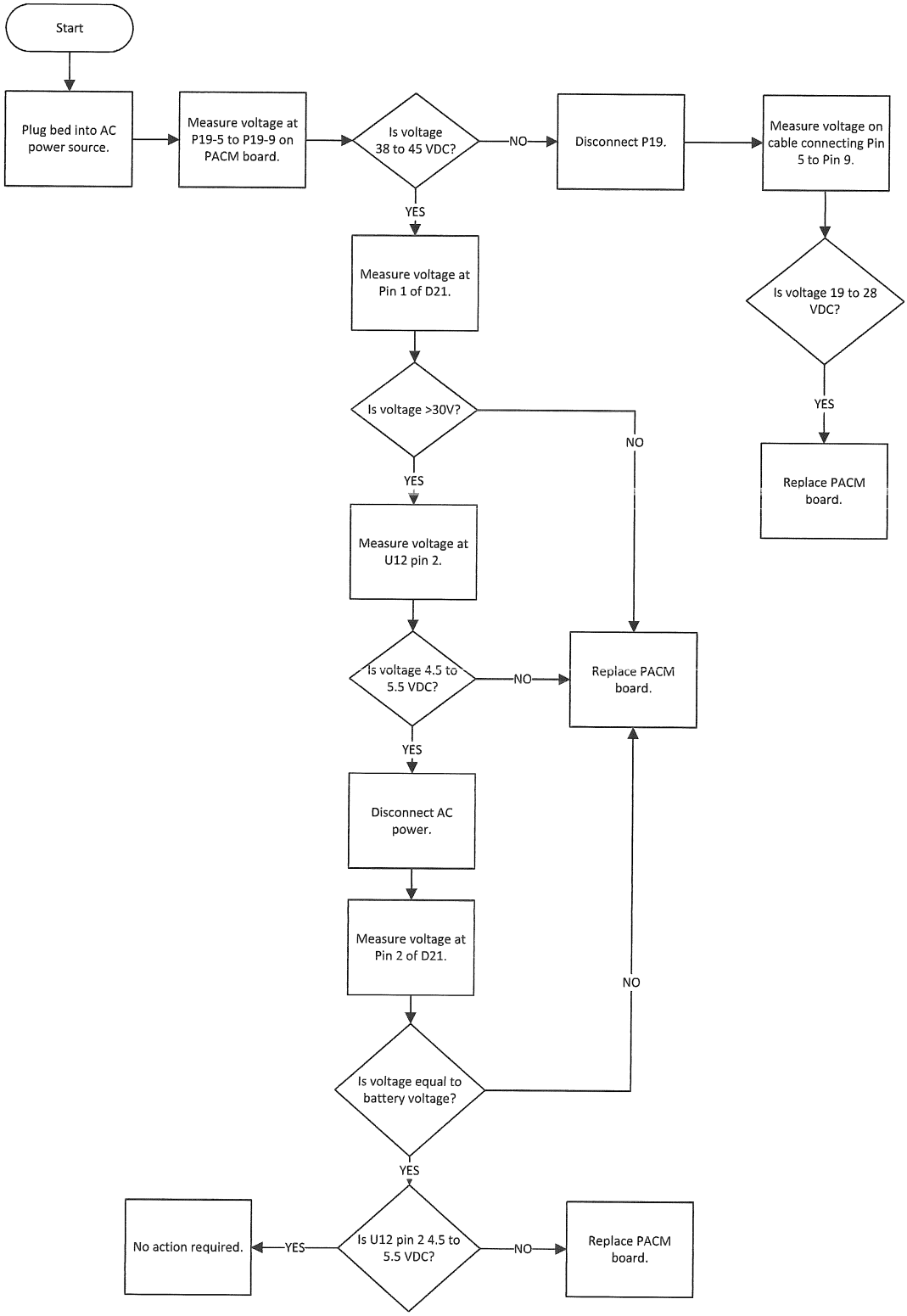
2.26 Battery Check (IntelliDrive® Transport System)



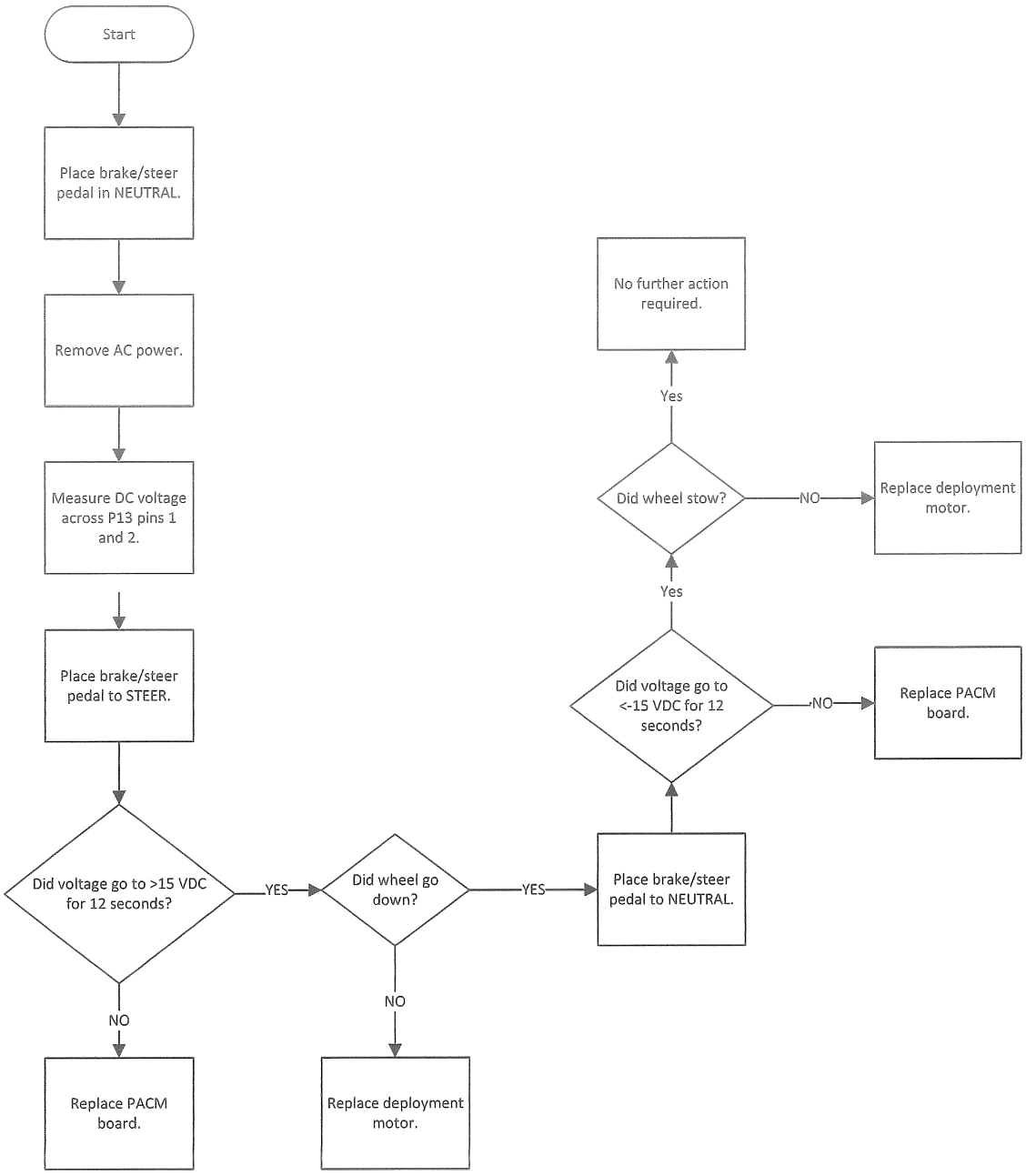
2.27 Steer Switch Check (IntelliDrive® Transport System)



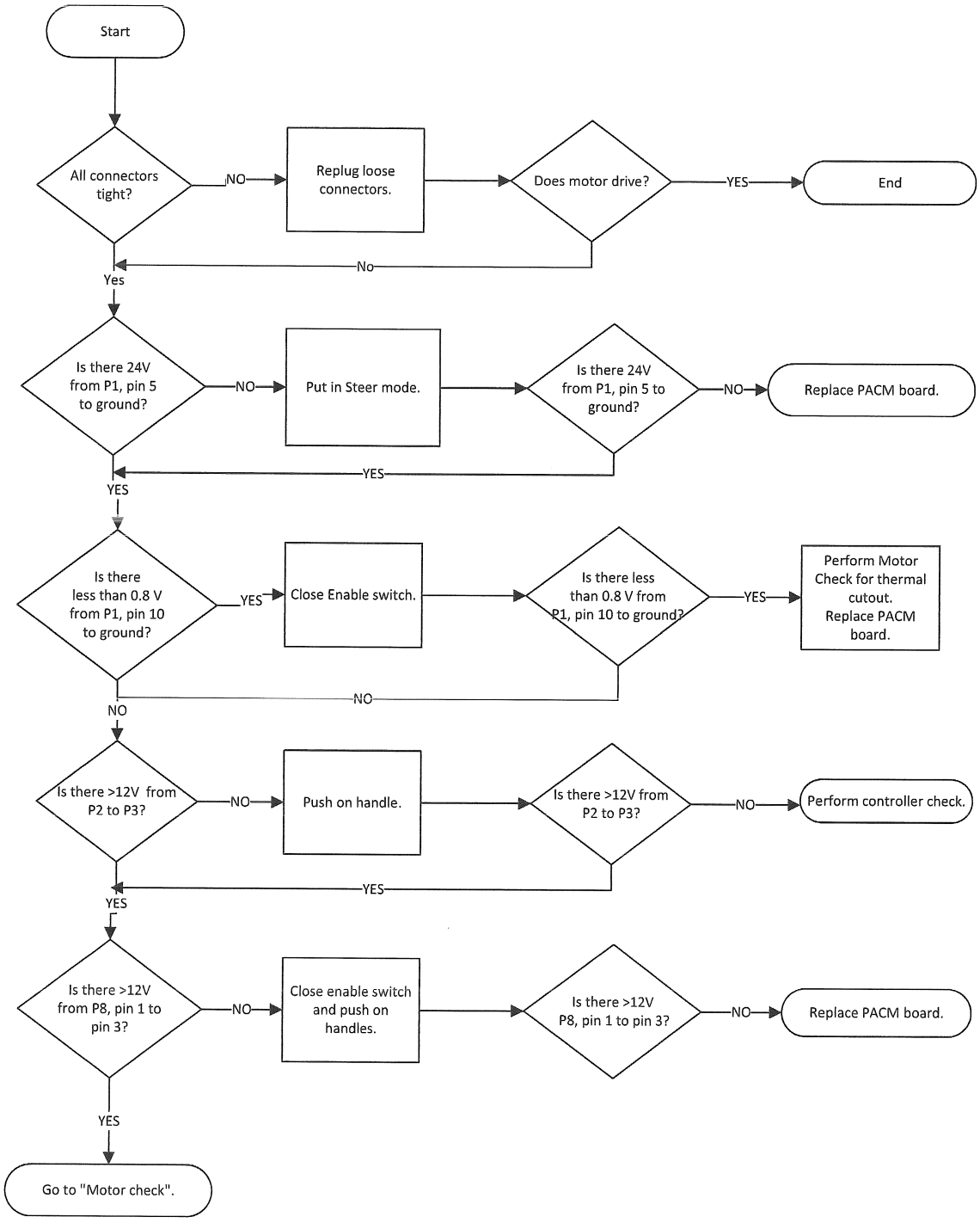
2.28 PACM Board Power Check (IntelliDrive® Transport System)



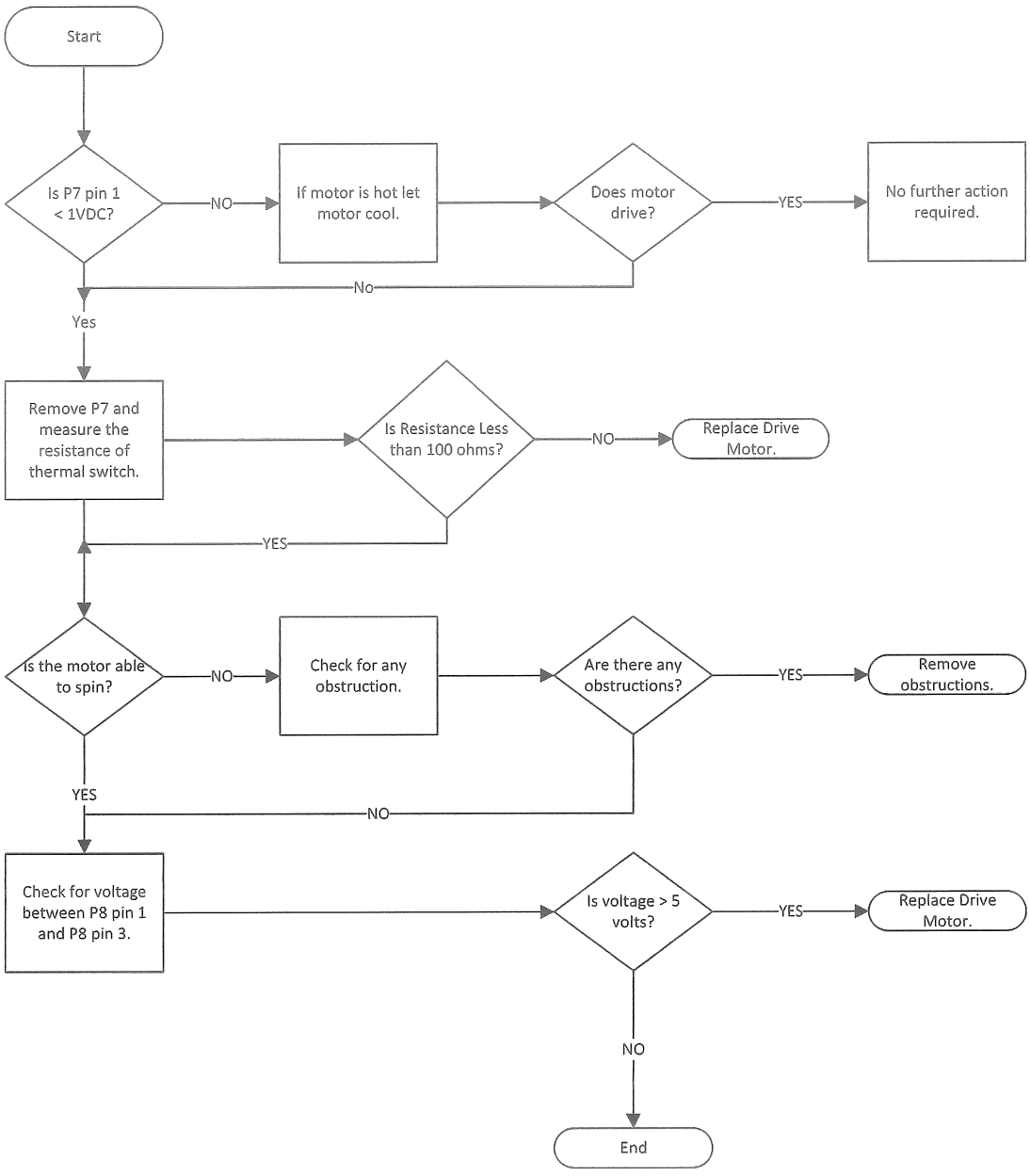
2.29 PACM Board Deployment Check (IntelliDrive® Transport System)



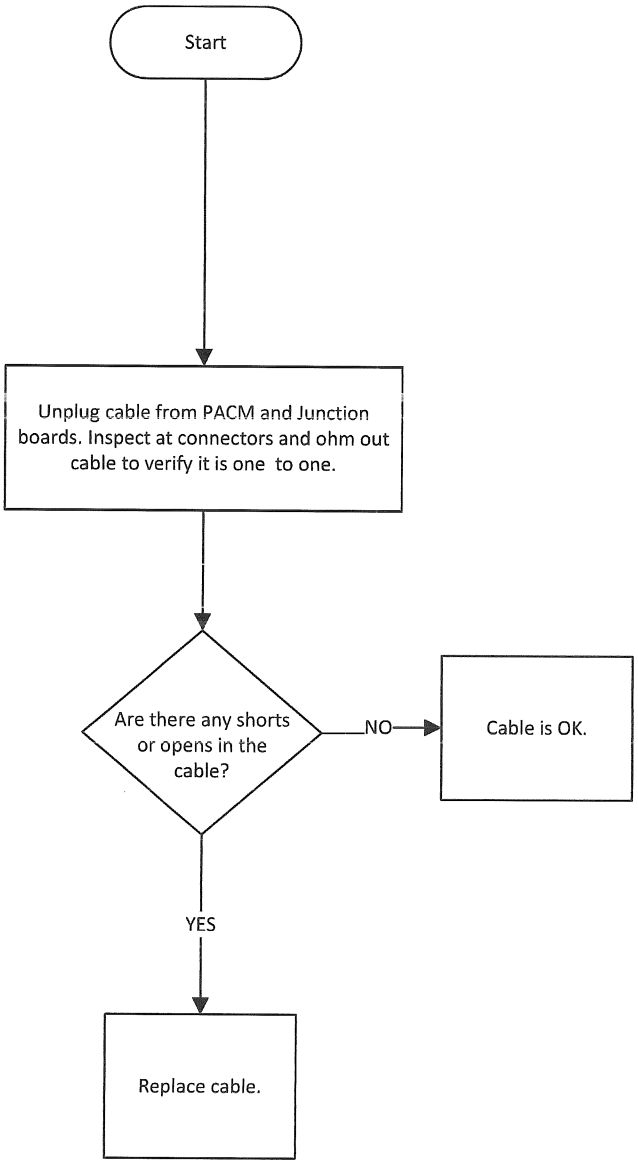
2.30 PACM Board Drive Check (IntelliDrive® Transport System)



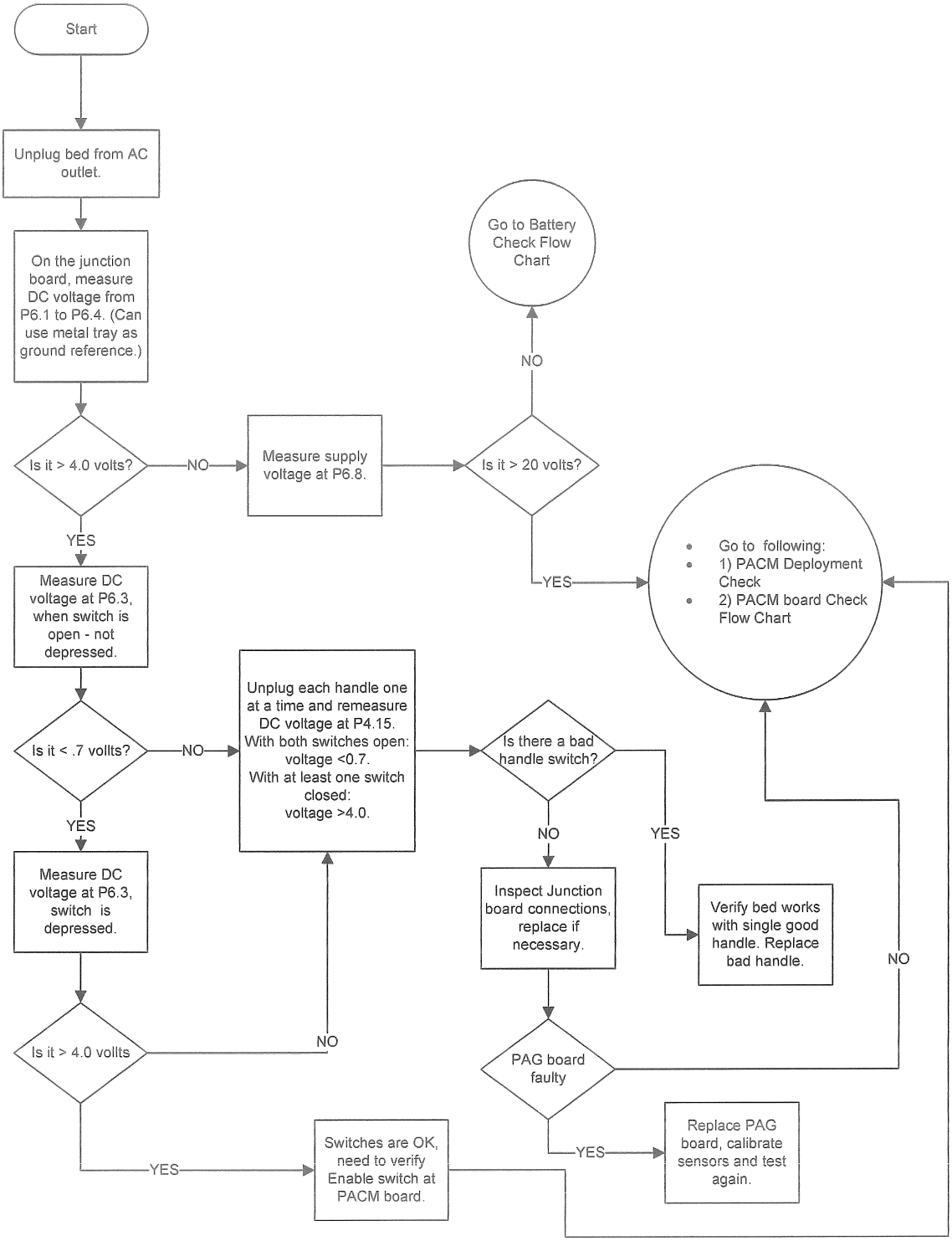
2.31 Motor Check (IntelliDrive® Transport System)



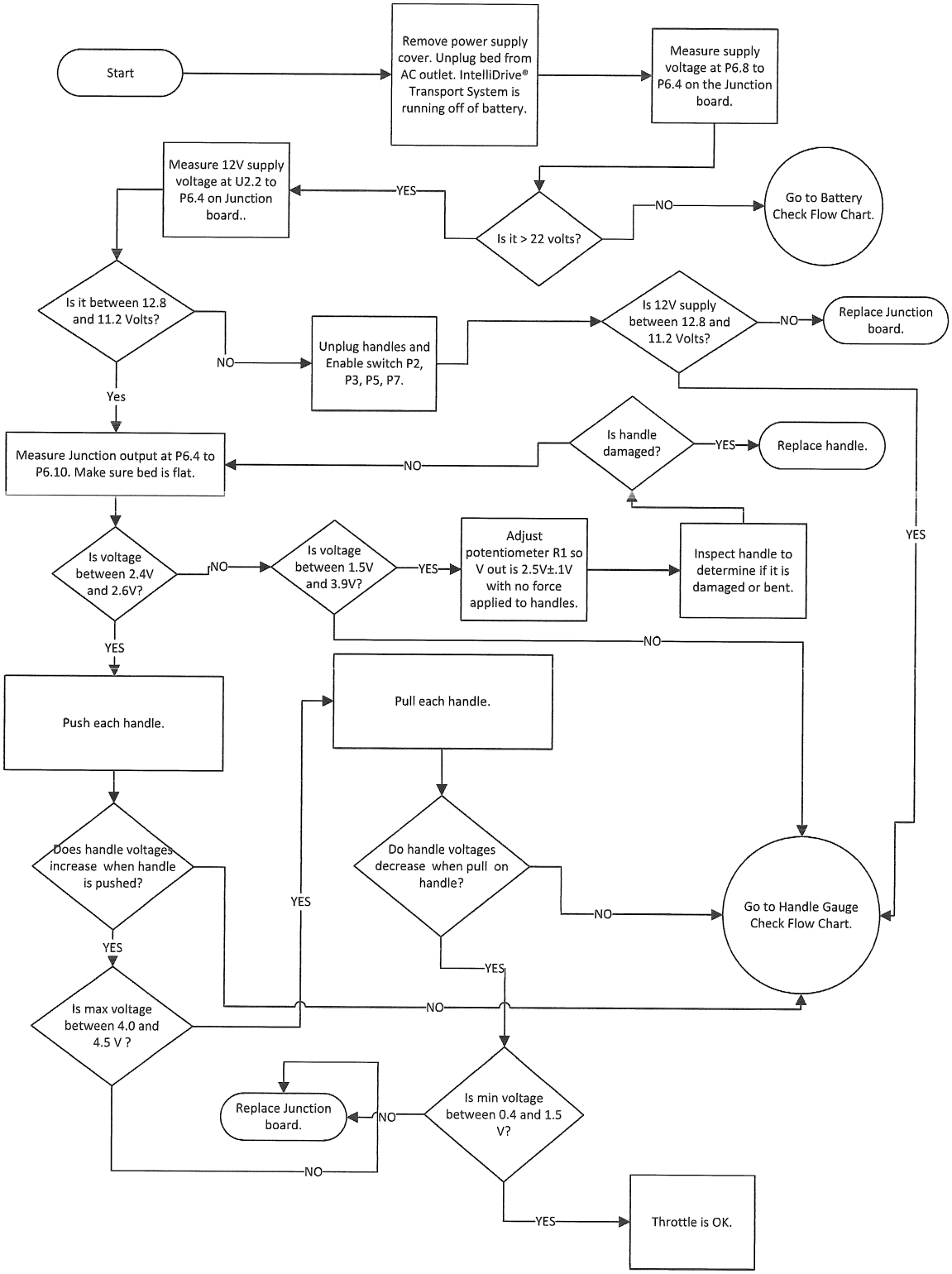
2.32 PACM to Junction Board Cable Check (IntelliDrive® Transport System)



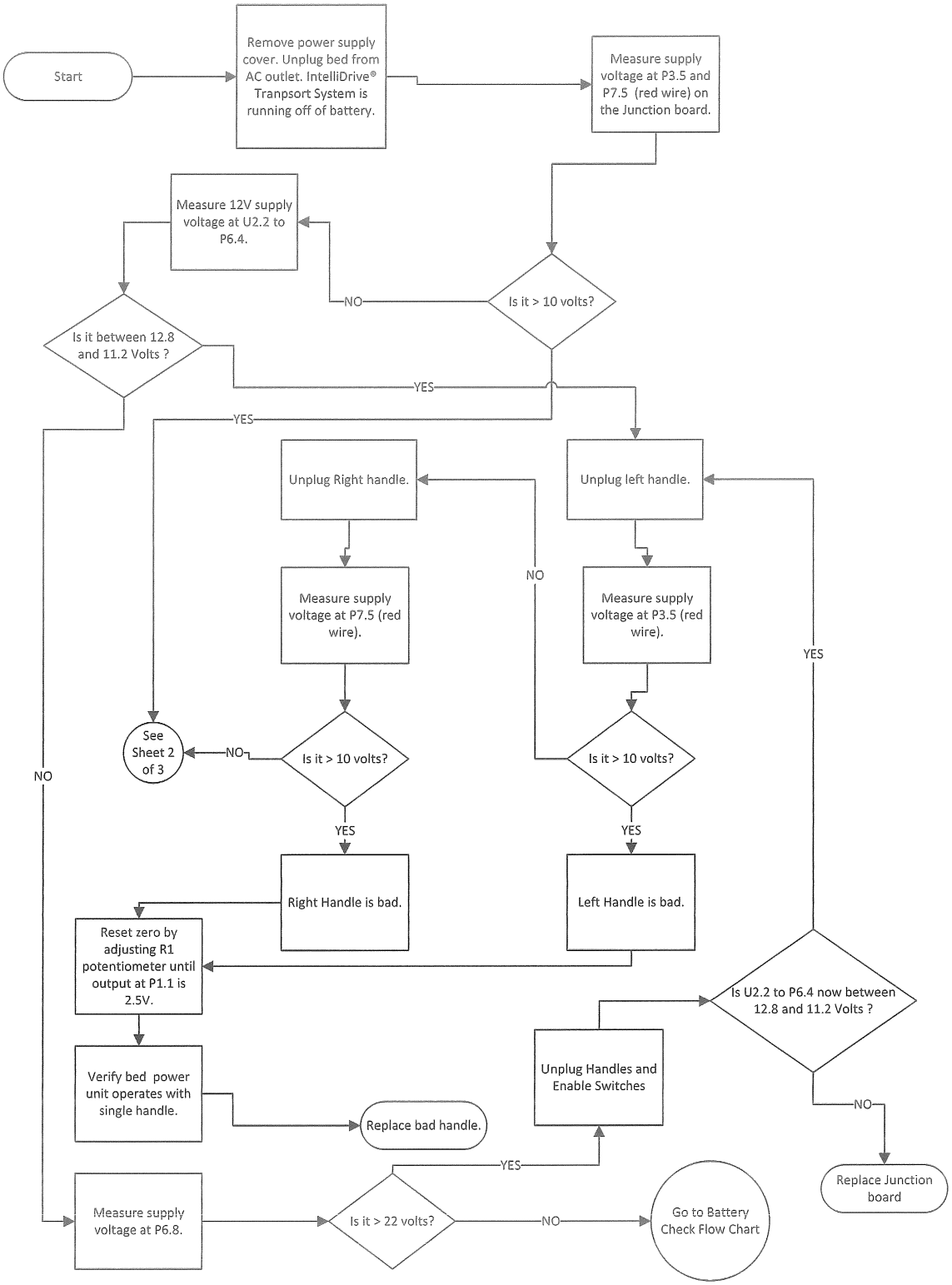
2.33 Handle Enable Switch Check (IntelliDrive® Transport System)



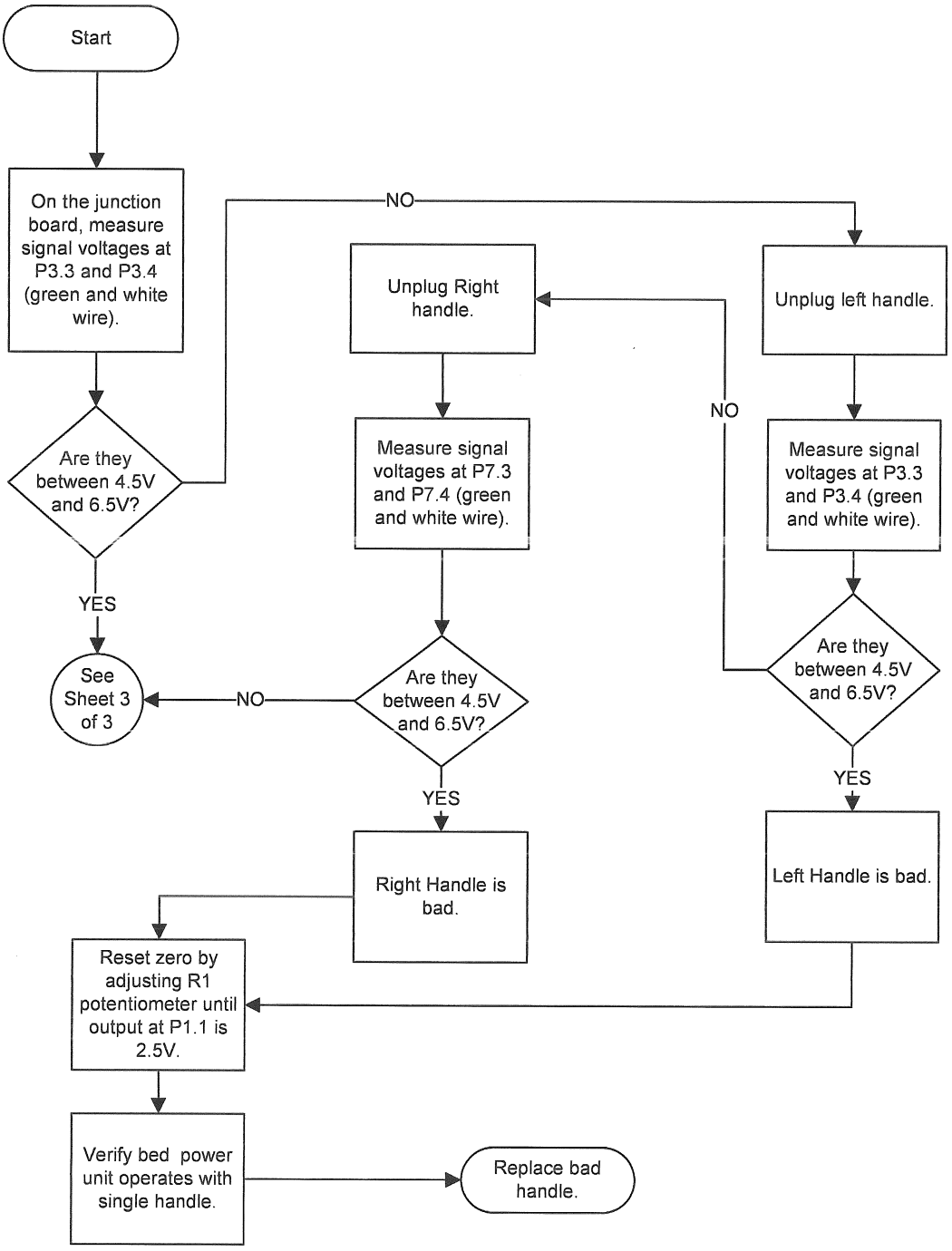
2.34 Throttle Check (IntelliDrive® Transport System)



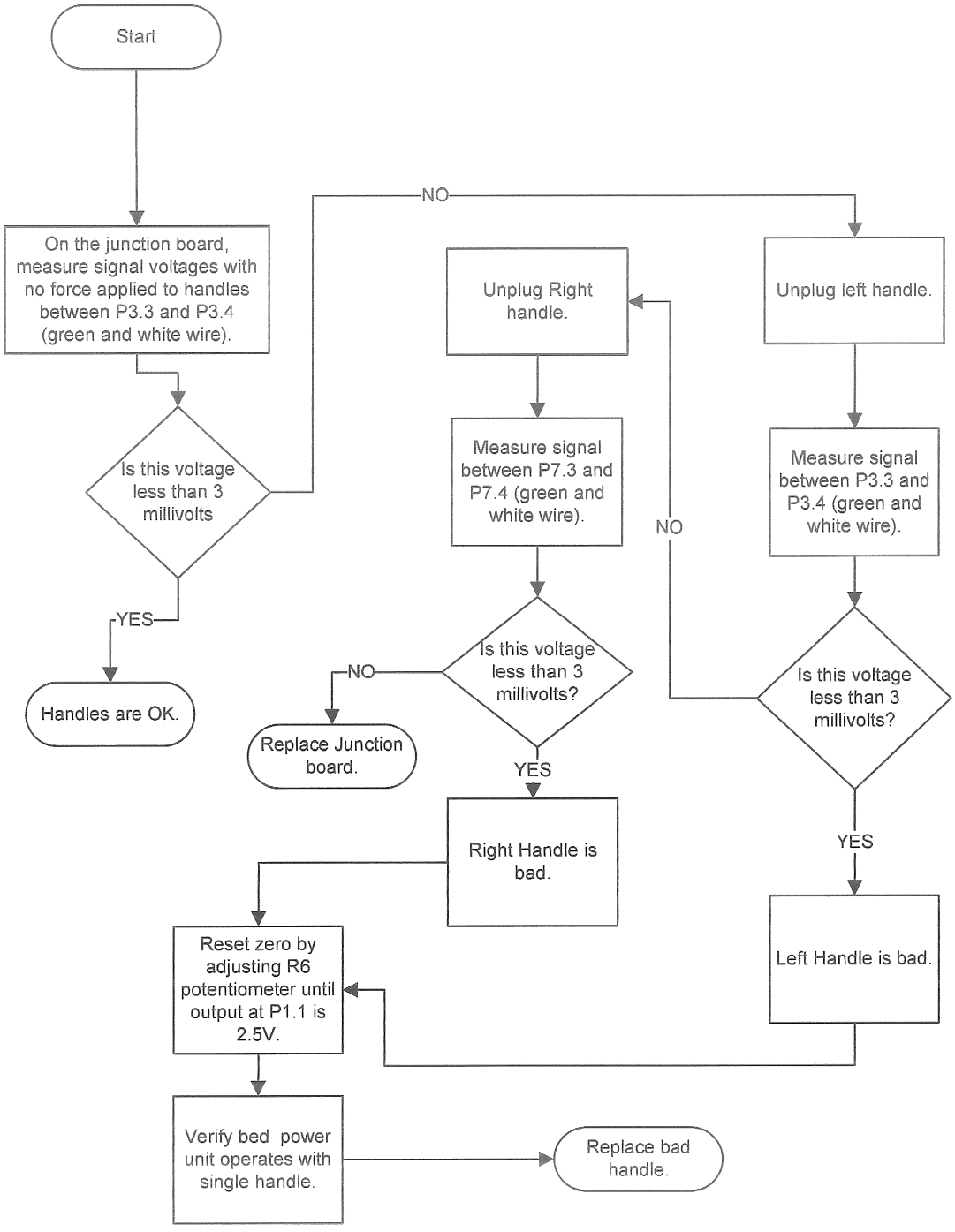
2.35 Handle Gauge Check (IntelliDrive® Transport System) (Sheet 1 of 3)



2.36 Handle Gauge Check (IntelliDrive® Transport System) (Sheet 2 of 3)



2.37 Handle Gauge Check (IntelliDrive® Transport System) (Sheet 3 of 3)



2.38 Controller Check—IntelliDrive® Transport System

1. Remove the drive box from the bed.
2. Place the drive box on wooden supports so the drive belt will not touch the ground when it deploys.
3. Connect the bed cables running into the box.
4. Locate DS 1 on the PACM board.
5. Monitor these on DS 1:
   - LED DS 1 is off—The controller is either not powered or is not getting a KS 1 signal (which should be present if the wheel is deployed).
   - LED DS 1 is on and steady—Controller is operating correctly.
   - LED DS 1flashing—Record the flash pattern. Use the brake and steer pedal to cycle the drive belt. Observe the LED DS 1. If LED DS 1 is still flashing, refer to Table 2-5 on page 2-48 for error codes.

Table 2-5. Controller Error Codes

Flash Code	Description	Possible Cause
¤ ¤	Thermal Cutback	1) Make sure the bed temperature is within the normal operating range 58°F to 103°F (15-40 degrees C). 2) Check for mechanical binding or item stuck in drive train or belt. 3) Replace Controller.
¤ ¤¤	Throttle Fault 1	1) Make sure the controller is getting approximately 2.5 V input when the handles are neutral, 4.0 V when they are pushed forward, and 1.0 V when they are pulled back. If these voltages are not present, the problem is in either the Junction board, the cable from controller to PACM board, or the cable from PACM to Junction. 2) If voltages are OK, replace controller.
¤ ¤¤¤	SPD Limit Pot Fault	1) Check the cable from controller to PAC board and cable from PACM to Junction board. 2) Replace Controller. 3) Replace Junction board.
¤ ¤¤¤¤	Low Battery Voltage	1) Make sure the controller is getting correct battery voltage. 2) Replace Controller.
¤ ¤¤¤¤¤	Overvoltage	1) Make sure the controller is getting correct battery voltage. 2) Replace Controller.
¤¤ ¤	Main OFF Fault	1) Check motor wiring. 2) Make sure the controller is getting correct battery voltage. 3) Replace Controller.

Flash Code	Description	Possible Cause
¤¤ ¤¤¤	Main Cont FLTS	1) Check motor wiring. 2) Make sure the controller is getting correct battery voltage. 3) Replace Controller.
¤¤ ¤¤¤¤	Main ON Fault	1) Check motor wiring. 2) Make sure the controller is getting correct battery voltage. 3) Replace Controller.
¤¤¤ ¤	PROC/Wiring Fault	1) Replace Controller.
¤¤¤ ¤¤	Brake ON Fault	1) Replace Controller.
¤¤¤ ¤¤¤	Precharge Fault	1) Make sure the controller is getting correct battery voltage. 2) Replace Controller.
¤¤¤ ¤¤¤¤	Brake OFF Fault	1) Replace Controller.
¤¤¤ ¤¤¤¤¤	HPD	1) Replace Controller.
¤¤¤¤ ¤	Current Sense Fault	1) Check motor wiring. 2) Make sure the controller is getting correct battery voltage. 3) Replace Controller.
¤¤¤¤ ¤¤	HW Failsafe	1) Check motor wiring. 2) Replace controller.
¤¤¤¤ ¤¤¤	EEPROM Fault	1) Replace Controller.
¤¤¤¤ ¤¤¤¤	Power Section Fault	1) Check motor wiring. 2) Make sure the controller is getting correct battery voltage. 3) Replace Controller.

2.39 Visual Inspection—IntelliDrive® Transport System

Tools: Flashlight Inspection mirror

1. Check the unit for external damage.
2. Using the mirror and flashlight, check for debris around the pulleys and levers.
3. Check the belt for damage and proper engagement on the pulleys.
4. Remove the drive unit cover.
5. Inspect the links and levers in the motor area for damage.
6. Remove the drive mechanism cover.
7. Check the tension on the drive belt.
8. Check overall condition of all components in the drive box.
9. Install the drive unit cover.

2.40 Junction Board Debugging—IntelliDrive® Transport System

NOTE:

When working on IntelliDrive® Transport System use extreme caution when servicing the product. Whenever you are measuring voltages or making adjustments to the Junction board, it is suggested that you take the bed out of steer which will raise the wheel and prevent the bed from moving.

Enable Switches

The enable switches are installed in the handles at the handle grip. If either switch is depressed, while force is applied to the handles, the bed will move. If the handles are pushed towards the patient, the bed will move forward. If the handles are pulled, the bed will move backwards. It is fairly simple to check the enable switches. First remove power supply cover so you can see the Junction board. Make sure both enable switches are plugged into the Junction board at P2 and P5. The switches are connected in parallel, or combined on the Junction board. These voltages will be monitored on a working system.

P6.1 4.0-5.1 V

P6.3 0-.5 V when switch is opened

P6.3 4.0-5.1 V when switch is depressed or closed

If you suspect a switch is not working correctly, the switches can be unplugged at P2 and P5. A meter can be used to measure switch continuity from the end of the switch cable. A working switch will close only when the switch is depressed. If it is always opened, or always closed, the switch or cable is defective. In either case replace the handle assembly. The bed will operate if only one switch functions. You can unplug the defective switch from the Junction board and verify the bed power unit operates when using the working switch.

If there is not a voltage at P6.1, verify the battery voltage or the battery charging voltage is present. The battery voltage can be measured at P4.8. This voltage will be greater than 32 V when the bed is plugged into the AC wall outlet. When the bed is unplugged from the AC outlet, the battery voltage at P4.8 will be greater than 22 V, if the batteries are charged. If no voltage is present, or the battery voltage is low, go to the Battery Checkout procedure.

If the switches check out correctly, and the voltage at P6.3 does not toggle when the switch is depressed, there may be a problem on the Junction board or the 14-pin connector at P6. Unplug the cable connected to P6, and inspect the connector pins at P6 on the Junction board. Also, check connectors P2 and P5 where the enable switches plug into the Junction board.

The combined enable switch signal connects to the PACM board via the Junction-PACM board cable. To verify the signal is being received at the PACM board, unplug the 14-pin cable from the PACM board and measure continuity across pins 1 and 3. When either switch is depressed the switch closure can be measured across the pins.

Throttle Debugging

The base part of the handle that connects to the frame contains a strain element that provides an output signal proportional to the force applied to the handle. The handles are very similar to the load beams used in the scale system. The Junction board amplifies this signal and provides an output to the PACM board.

Verify the output signal is correct at P6.10. P6. 4 is used as a ground reference for measuring signals. When no force is applied to the handle the output signal should measure 2.4V to 2.6V DC. The voltage output can be adjusted by turning potentiometer R1 until the output signal measures 2.5V. When either handle is pushed, the output signal will increase until it reaches 4.0V to 4.5V. When either handle is pulled the output signal will decrease until it reaches 0.4V to 1.5V. This indicates the throttle circuit working correctly.

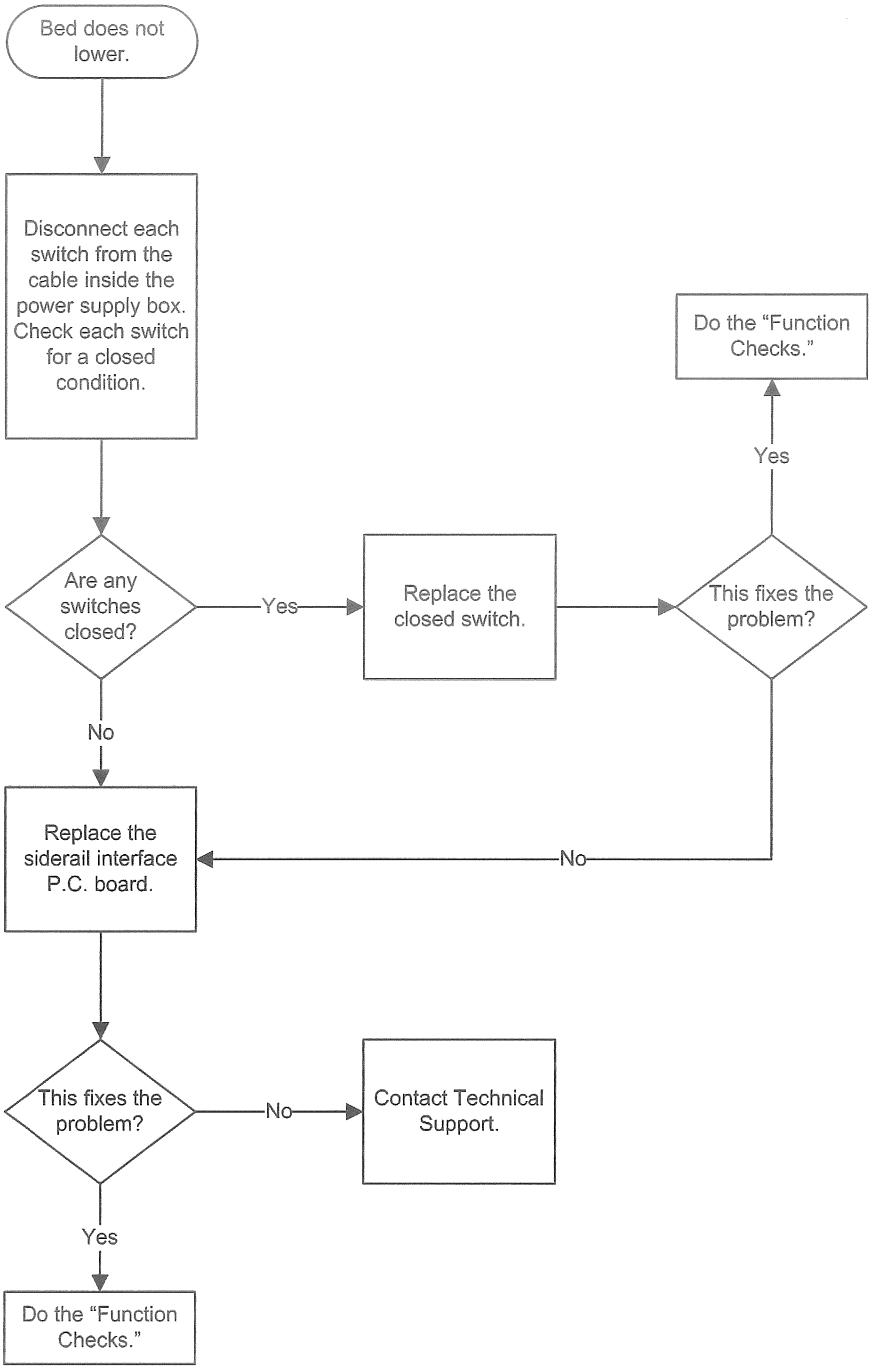
Before making any adjustments verify the supply voltages. The supply voltage at P6.8 will measure more than 22 V on a working system. If no voltage is present, or the battery voltage is low, go to the battery checkout procedure.

The excitation voltage, P3.5 and P7.5 (red wire) will measure 10V to 12V on a working board. Also, the signal voltages at P3.3, P7.3, P3.4, and P7.4 will be approximately ½ the voltage measured at P3.5 and P7.5. These are the green and white wires on the handle connectors P3 and P7. If the excitation voltage is lower than 10V, unplug the connectors P3 and P7 one at a time to see if the voltage comes into range. If this occurs, one of the handles is probably damaged and needs to be replaced. If the voltage never comes into range, verify the 12V supply at U2.2 to P6.4 on the Junction board. If a bad strain element is suspected, unplug the bad handle, readjust the zero output to 2.5V with potentiometer R1. Verify the bed power unit operates using the good handle. Replace the damaged handle.

If the output voltage at P1.1 cannot be adjusted to within 2.4V to 2.6V using the potentiometer R1, with no force applied to the handles, the strain element may be damaged. The bed will operate with a single handle after the output is adjusted. To check the handles, unplug one of the handles and see if R6 can be adjusted so the output signal is 2.5V. The handle that will not allow adjustment of the potentiometer to bring the output signal to 2.5V is the damaged handle.

The motor controller will not operate unless it sees the connection to the 4700 ohm resistor on the Junction board. To verify the signal is being received at the PACM board, unplug the 14-pin cable from the PACM board and measure the resistance across pins 12 and 13. The resistance needs to measure 4700 ohms +/- 5%. If this measurement fails check the cable for continuity and inspect the Junction board. The cable connections are the same on both ends. If the cable checks out, inspect the connector P6 on the Junction board. If the cable is bad, replace the cable, otherwise replace the Junction board.

2.41 Bed Will Not Go Down—Beds with Obstacle Detect® Feature



NOTES:

Chapter 3 Theory of Operation

INTRODUCTION

The Theories of Operation for the Advanta™ 2 Bed are as follows:

- Mechanical System
- Electrical System

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

The Electrical system diagrams are at the end of this chapter.

MECHANICAL SYSTEM

The mechanical subsystem has two connected systems:

- Bed frame
- Sleep surface

RETRACTABLE HEAD SECTION

The retractable head section feature is achieved by controlling 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).

EMERGENCY CPR RELEASE

The CPR control handles are at the head end of the bed, under each corner of the sleep deck. Pulling one of the handles disengages 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, and cushioned by one damper.

EXTENDABLE FOOT SECTION

The extendable foot section lets the caregiver add an additional 3" (76 mm) to the length of the bed. The movement is controlled by a lever under the foot end of the bed. Pulling up on the lever and pulling the foot section out, extends the section. The foot section locks into place when extended or retracted.

HILOW SYSTEM

WARNING:

Warning—The column must be replaced if it becomes defective. The column must never be dismantled. Failure to observe this warning could cause personal 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" (400 mm). Upper and lower end of travel (EOT) switches that are backed up to make sure of electrical security. The system does not require any

special maintenance during its designed period of use. However, the columns can be replaced in the event of a failure, but should never be dismantled or repaired except by Hill-Rom personnel.

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 on the left side, foot end. The antistatic brake caster is identified by a yellow dot on the tire.

NOTE:

Beds with the 5th wheel or IntelliDrive ® Transport System do not have steer casters.

BRAKING

The braking system has four brake casters that are controlled by the brake/steer pedals connected by two hexagonal bars.

STEERING

The left foot-end caster is the steering caster. It is controlled by the brake/steer pedal.

HEAD AND FOOTBOARDS

The headboard and footboard are blow-moulded plastic structures with chrome-plated steel clasps for assembly and decorative laminated panels. The footboard and headboard are **not** interchangeable.

ELECTRICAL SYSTEM

Table 3-1. Voltage and Frequency

Voltage ± 10%	Frequency	Maximum Current (Amps)	Idle Current (Amps)
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

Refer to the schematic diagram at the end of this section for specific information about the cabling.

The bed is operated by a motor control P.C. board. This unit controls the electrical functions of the bed: hilow, head section and knee section with automatic contour, and foot section.

These functions are performed by motors using a very low voltage.

Power Supply Unit Characteristics

Table 3-2. Power Supply Unit Characteristics

Description	Specification
Input characteristics	See Table 3-1 on page 3-2.
Fuse rating on primary	5.0 A time delay
Output voltage	18 to 40 V AC rectified, filtered

Table 3-3. Maximum Power Load

Voltage	Input Power (Peak)	Input Power (Idle)
110	550 VA	55
115	580 VA	55
120	670 VA	55
127	630 VA	60

The motor control P.C. board is made up of these components:

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

The functions may be locked out using the caregiver controls. When they are not locked out, they be used by one of the following:

- Patient pendant
- Patient controls
- Caregiver controls

Power Stage

The power stage is composed of an AC input transformer, protected at the input by two anti-surge fuses and an internal self-resetting thermal cutout. There are two transformer options: one with a single winding primary,
120 V, 60 Hz for use in North America, and the other with two primaries, multi-tapped, for use in 110, 115, and 127 V 50/60 Hz and 120 V, 50 Hz applications.

There are two secondaries, both of which are protected by Positive Temperature Coefficient (PTC) devices. The PTCs are on the siderail interface P.C. board. The first secondary, nominally 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 produce a voltage of approximately 33 V DC to supply power to the drive motors. The other secondary, nominally 14.5 V AC, is rectified, filtered, by the siderail interface P.C. board to produce a voltage of approximately 19 V DC to supply power to the Scale System, siderail interface, siderail, scale pods, and the SideCom® Communication System.

FUNCTION CONTROL

The motors are controlled by relays and/or FET transistors. In order to protect these relays from electrical arcing during switching, the FET transistor operates such that when a function is activated, 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 provided by controlling the current at the output of each motor. In the event of overload or mechanical blockage, the supply of the relevant motor is cut off by a control transistor without affecting the operation of the other motors, except for specific situations. In this case, the overload is indicated by an audible alarm. This overload indication also enables failure of a motor end of travel to be detected, except for the hilow columns, which have a backup end of travel.

BATTERY CIRCUIT

The bed is equipped with battery backup. This battery backup supplies both the motor control and siderails interface P.C. boards. The charging circuit, on the motor control P.C. board, has current limiting according to 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 activated by pressing the Battery control on the caregiver controls.

The battery charge level is controlled. In this way, a flashing indicator and an audible low battery alarm by buzzer are activated 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 connecting to the power outlet, the indicator continues to flash until the battery has charged.

Battery operation is automatically stopped 24 to 140 seconds after the end of the last movement.

Battery Characteristics

Table 3-4. Battery Backup Characteristics

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

The batteries are sealed lead acid, connected in series, and protected by a 10 A fuse on the connection wires.

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

The capacity of the battery backup after full charging is at least two complete cycles with 300 lb (136 kg) on the bed.

Control Logic and Specific Functions

Combined activations of the motor provide the following functions:

- Dining Chair® Position
- Automatic contour
- Trendelenburg and Reverse Trendelenburg function
- Vascular foot

Lockout management

Patient pendant, patient siderail, or caregiver siderail control unit interfacing

Indication of Bed Not in Low Position (see "Detection of Bed Not in Low Position" on page 3-6).

Indication of Bed Connected to AC Power but Brakes not Set (see "Detection of Bed Connected to AC Power but Brakes Not Set" on page 3-6).

All of these functions are integrated into a complex programmable logic device (CPLD) in the motor control P.C. board and a microprocessor in the siderail interface P.C. board.

Patient Pendant

- The patient pendant controls operate at 5 V DC supplied by the siderail interface P.C. board and integrate three main 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 reduce the number of wires. The clock signal that starts these exchanges is controlled by the siderail interface 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 therefore directly wired so as to have continuous operation.

Motor Characteristics

Table 3-5. Motor Characteristics and Dimensions

Description	Hilow column motor	Head motor	Knee motor	Foot motor
Power	96 W (x2)	120 W	84 W	84 W
Voltage	18 to 40 V DC	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	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")	45 mm ± 2 mm (1.77")
Retracted rod/ center distance		445 mm ± 2mm (17.5")	310 mm ± 2mm (12.2")	325 mm ± 2mm (12.8")

Management of the Motors

The motor control signals are supplied by the motor control P.C. board. Their extreme positions 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, knee section, and foot section actuators. In addition, the knee section and foot section motors have 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, they are both backed up at each end. If one of these safety devices is activated, the column cannot be used; however, the other functions remain operational.

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

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 corresponding indicator as soon as one of the two EOTs is released.

Automatic Contour

The Automatic Contour feature works from the **patients** control panel and patient pendant. The motor control P.C. board, upon 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 activated 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 14° to 19°. The head section actuator continues to operate until it reaches its upper EOT or its control is released. When the Head Down function is activated the head and knee sections lower at the same time to the lowest position.

Dining Chair® Position

The Dining Chair® Position function combines the movements of the bed frame sections and uses the intermediate internal microswitches of the knee section and foot section motors to control the interaction between these two sections.

Detection of Bed Connected to AC Power but Brakes Not Set

The detection system operates by a normal on switch, mounted on the foot end crossbar and is activated by the brake/steer pedal. The power supply unit controls an audible alarm if the following two elements occur together: AC power is present and the switch not activated. The audible alarm stops when the brake is applied or when the bed is unplugged from the power source.

Trendelenburg/Reverse Trendelenburg

The Trendelenburg/Reverse Trendelenburg is a fully electric function accessed by the caregiver. The principle involves controlling the two hilow columns in opposing directions according to 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/Bed Exit Alarm System system by the central power supply. The power supply provides a pre-regulated 8.25 V DC reference to signal GND at 400mA max, 200mA typical. The GND is common among all nodes in the bed. This is important to the network transceiver explained later.

The analog circuitry is a single chip solution specially designed for scale transducers. It is located in the frame of the bed as close 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 minimize the effects of variations.

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 detect 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 embedded controller.

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

The display has 5 seven-segment digits. The scale node sends a network variable for the caregiver to display. Switches, 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 on the outside of the head-end 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 performed by the microcontroller on the scale P.C. board:

- Weigh
- Zero the scale
- Add/delete items
- Select 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
- Select Patient Position, Bed Exiting, and Out-of-Bed modes
- Select the alarm tone
- Select the alarm volume
- Alarm

If the Bed Exit Alarm System is armed, AC power is removed, and the bed is equipped with the SideCom® Communication System, the display P.C. board will cause the SideCom® Communication System to send a nurse call. If the Bed Exit 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 Bed Exit Alarm System is armed, it will suspend operation in the Patient Position and Bed Exiting modes until the articulation control is released and the signal to the scale P.C. board is removed. Once the signal goes away, the Patient Position or Bed Exiting mode starts again and normal operation resumes. If any Bed Exit mode is armed, the Out-of-Bed mode is always active, even during bed articulation.

When the bed is unplugged from AC power, neither the scale nor the Bed Exit Alarm System will function.

ELECTRICAL SYSTEM WIRING DIAGRAM

Figure 3-1. Bed Wiring Schematic

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

Figure 3-2. Siderail Interface P.C. Board

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

Figure 3-3. Patient Control

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

Figure 3-4. Siderail 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 Control Board Motor Current Limiter

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

Figure 3-12. Display Pod

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

Figure 3-13. SideCom® Communication System

Refer to fold-out FO 3-13 at the rear of this manual.

Figure 3-14. Accelerometer

Refer to fold-out FO 3-14 at the rear of this manual.

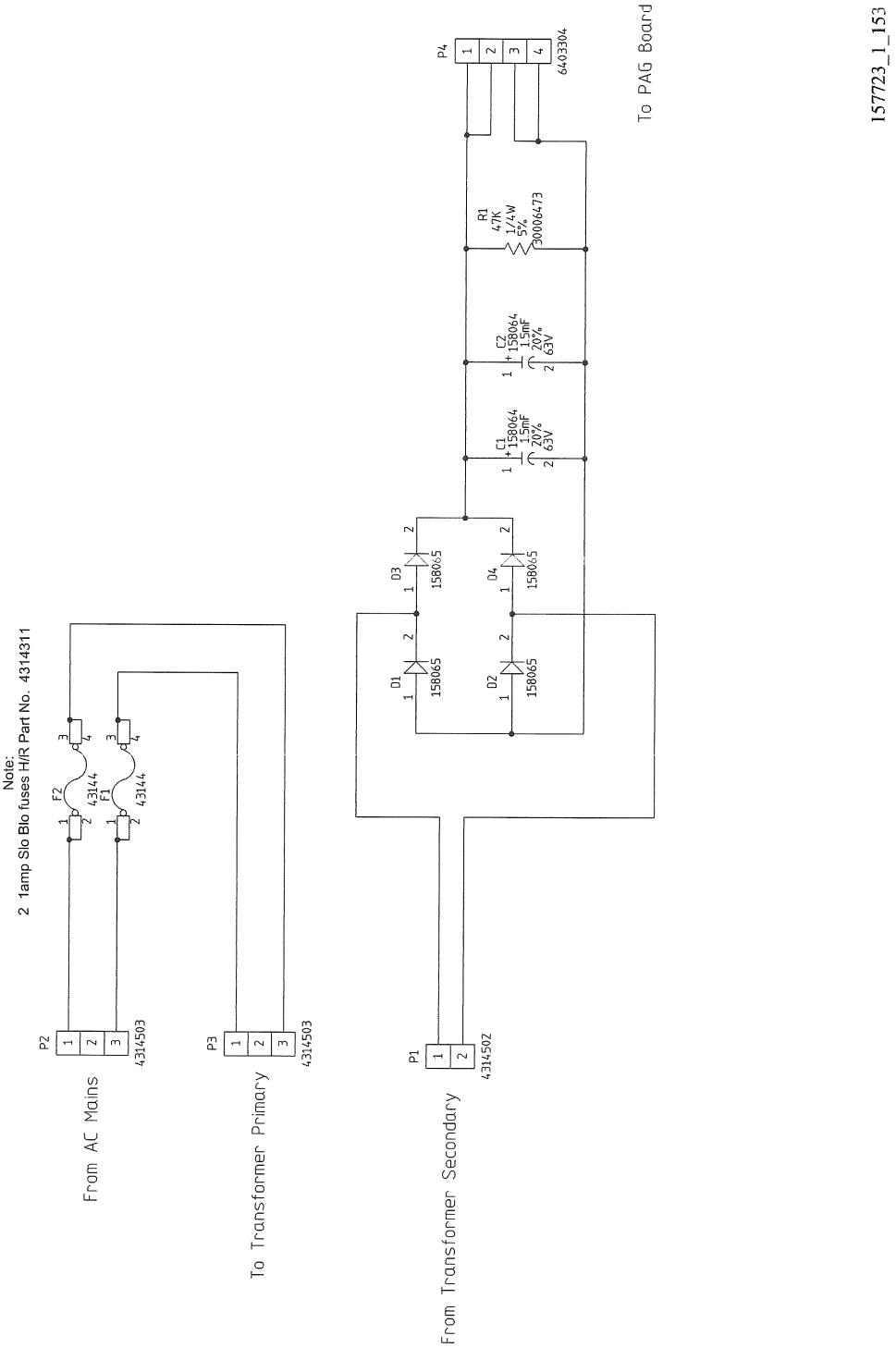
Figure 3-15. Scale P.C. Board

Refer to fold-out FO 3-15 at the rear of this manual.

Figure 3-16. IntelliDrive® Transport System

Refer to fold-out FO 3-16 at the rear of this manual.

Figure 3-17. IntelliDrive® Transport System Power Supply



Chapter 4
Procedures

TOOL AND SUPPLY REQUIREMENTS

Common tools will **not** be listed for every procedure, only special tools. Tools with an asterisk (*) are identified as special tools.

- Ratchet
- Extension, 6"
- (2) 10 mm wrench
- 13 mm wrench
- 13 mm socket
- T25 Torx® screwdriver
- T15 Torx® screwdriver
- 10 mm hex key
- Small screwdriver
- #2 Phillips head screwdriver
- Soft faced hammer
- 8 mm pin punch
- E-ring installation tool
- (2) Jack stand*
- Scissor jack*
- 3/32" punch
- Marker
- Tape
- (2) 4" x 4" x 2' piece of wood
- Rags
- Isopropyl alcohol*
- Wire cutters
- Locking pliers
- Antistatic strap
- String 10' (305 cm)*
- Needle nose pliers
- (2) Small-bladed screwdriver*
- Inclinometer*
- Weight, 50 lb (23 kg) minimum*
- Multimeter*
- Torque wrench, 5 to 75 ft-lb (7 to 102 N·m)*

COMPONENT HANDLING

P.C. BOARD

CAUTION:

To help prevent equipment damage, obey these cautions:

- **Caution**—To help prevent component damage, make sure your hands are clean, and **only** handle 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, place the removed P.C. board in an antistatic protective bag. Equipment damage can occur.

CAUTION:

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

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

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

- Make sure your hands are clean and free of moisture, oily liquids, etc.
- **Only** handle the P.C. board by its outer edges.
- Do not touch the P.C. board components. Finger contact with the board surface and/or with its components can leave a deposit that will result in board (and component) deterioration.
- When you work with electronics, wear an applicable antistatic strap, and make sure it is grounded.
- Service the removed P.C. board at a static-free workstation that is properly grounded.
- For shipping and storage, put the removed P.C. board in an antistatic protective bag.

4.1 Sleep Deck

Removal

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

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

4. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
5. For the foot section (A) and thigh section (B), grip the section on either end, and remove it from the bed (see Figure 4-1 on page 4-4).
6. For the seat section, perform the following:
   a. Make sure the head section (D) is in the full up position.
   b. Grip the seat section (C) on either end and remove it from the bed.
7. For the head section (D), perform the following:
   a. Using the CPR release, raise the head section (D) to the full up position.
   b. Remove the seat section (C).
   c. Mark the CPR cables (G) as left or right for installation later.
   d. Remove the screw (E) securing the CPR handle (F) to the CPR mount bracket (I).
   e. Disconnect the CPR handle (F) from the CPR cable (G).
   f. Loosen, do not remove, the jam nut (H) securing the CPR cable (G) to the CPR mount bracket (I).
   g. Repeat Step d through Step f for the other side.
   h. Remove the E-ring (L) from one side of the lower hinge point (M).
   i. Remove the plastic washer (N) from the lower hinge point (M).
   j. Repeat Step h and Step i for the other side.
   k. Move the head section to one side, and then to the other, to disengage the hinge bracket (O) from the hinge point (M).
   l. Slide the head section (D) toward the head end of the bed to disengage the head section from the frame.
   m. Remove the head section (D) from the bed.

Replacement

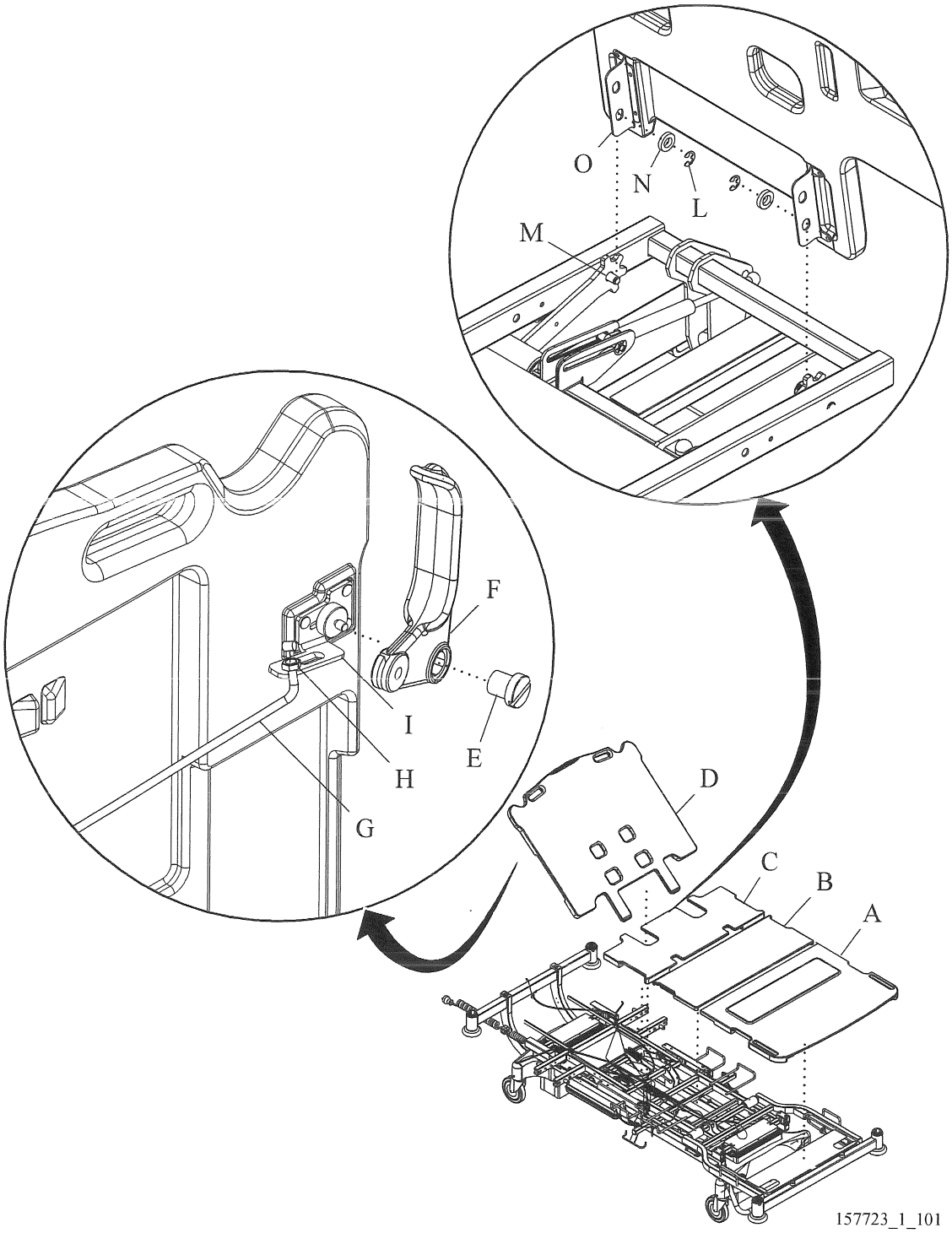
1. Do the removal procedure in reverse order.

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 on page 4-8.
3. Do the "Function Checks" on page 2-4.

Figure 4-1. Sleep Deck



4.2 Head Section Motor

Tools: Screwdriver

Removal

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

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

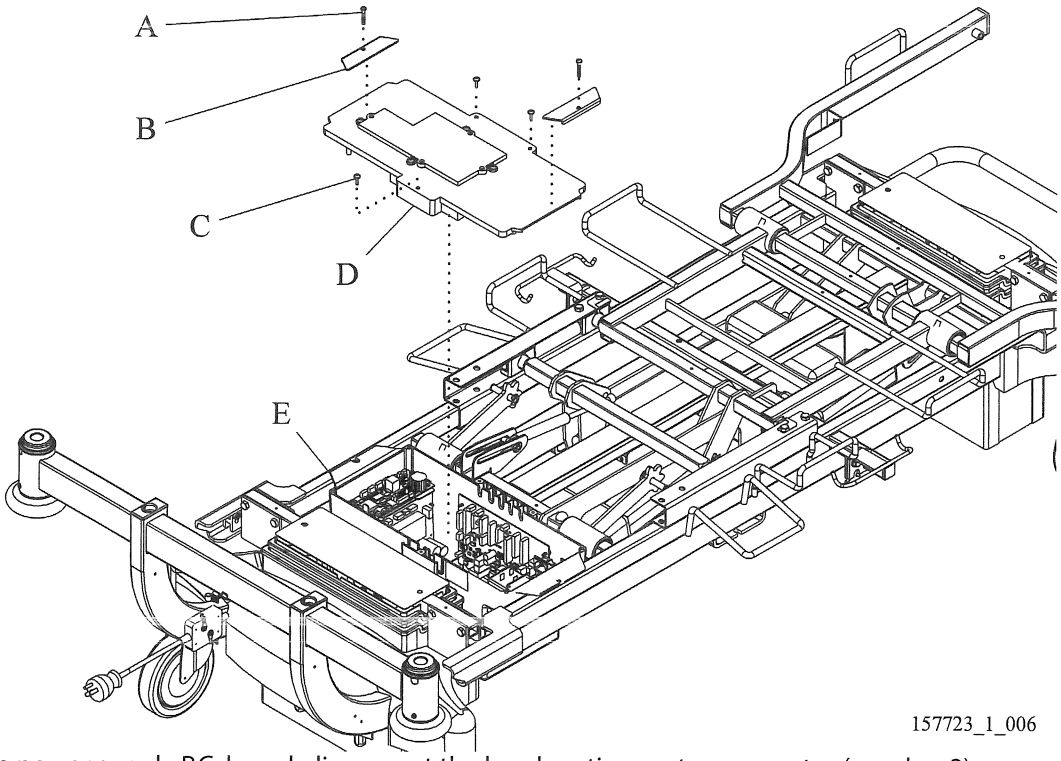
WARNING:
Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

4. Unplug 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. Remove the two screws (A) from the retainers (B) (see Figure 4-2 on page 4-6).
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 (E).

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.

Figure 4-2. Power Supply Cover

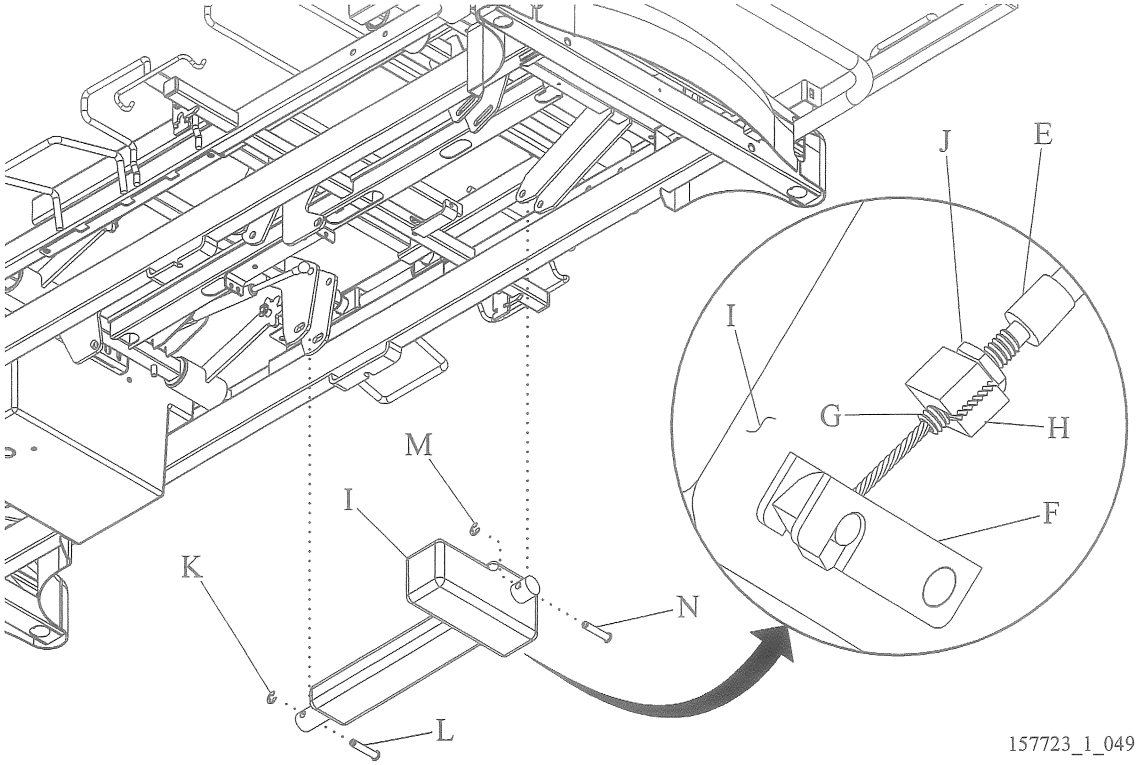


13. On the power supply P.C. board, disconnect the head section motor connector (number 3).
14. Remove the cable cover on the central rail and remove the head section motor cable.
15. Using the CPR control, lower the head section to the flat position.
16. Disconnect the CPR cable (E) from the head motor actuator arm (F) (see Figure 4-3 on page 4-7).
17. Count the number of threads (G) on the CPR cable (E) that extend past the cable mount (H) on the head motor (I).
18. Loosen the jam nut (J) on the CPR cable (F).
19. Remove the CPR cable (F) from the cable mount (H).

NOTE:

The CPR cable is threaded into the cable mount.

Figure 4-3. Head Motor



20. Remove the E-ring (K) from the pin (L) at the rod end of the motor (I).
21. Remove the E-ring (M) from the pin (N) at the body end of the motor (I).
22. While supporting the motor (I), remove the pin (L) .
23. While supporting the motor (I), remove the pin (N).
24. Remove the motor (I) from the bed.

REPLACEMENT

CAUTION:

Caution—Make sure that the elastic found on the new motors is not wound around the motor body before removing it (cut). If necessary, turn the motor end rod in the appropriate direction to unwind this elastic. It is used to indicate the correct position of the switches and internal end of travels of the motor. The incorrect position of these elements may damage the motor or the structure of the bed.

1. Perform the removal procedure in reverse order.
2. Remove the elastic on the motor.
3. Activate the CPR function. The CPR function should activate when the CPR handle is approximately half way through its travel.
4. Adjust the CPR cable as needed. Refer to Procedure 4.3 on page 4-8.
5. Do the "Function Checks" on page 2-4.

4.3 CPR Cable

Tools: None

REMOVAL

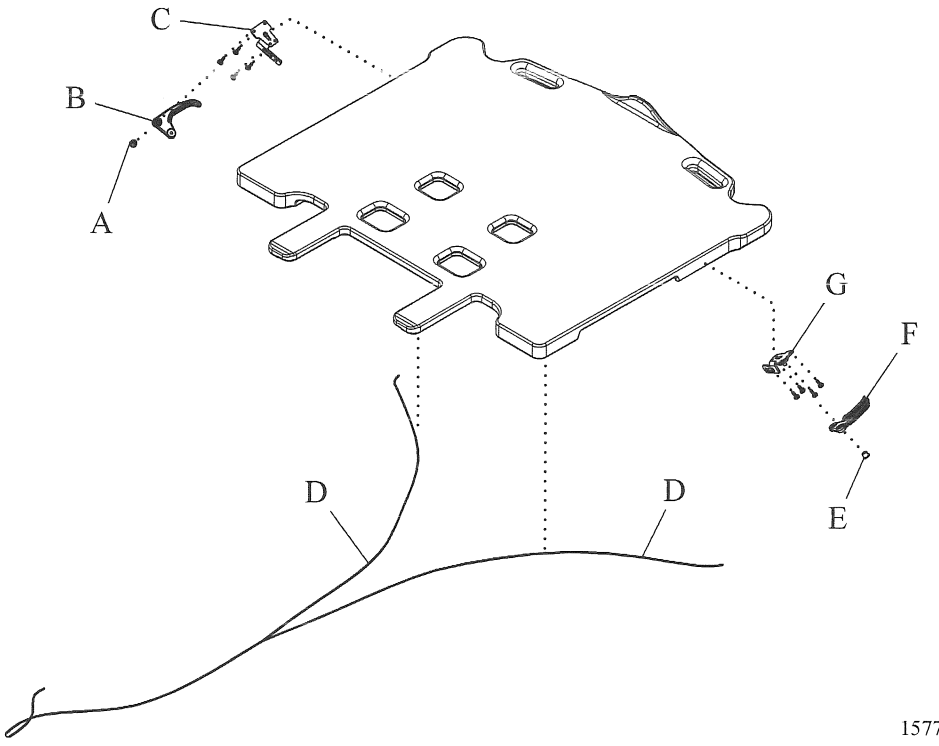
1. Set the brakes.
2. Raise the head section to the highest position.
3. Raise the sleep surface to the highest position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

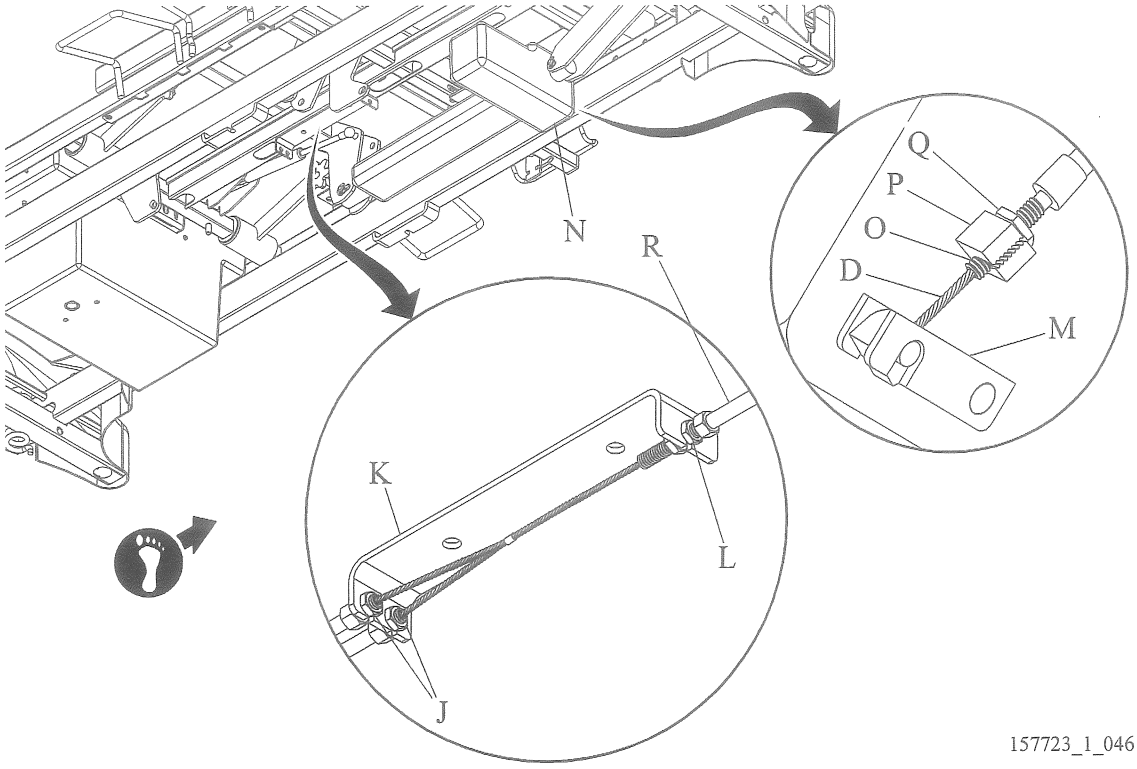
4. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
5. Remove the screw (A) securing the right CPR handle (B) to the CPR mounting bracket (C) (see Figure 4-4 on page 4-8).

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) securing the left CPR handle (F) to the CPR mounting 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 (J) securing the head section CPR cables to the adjuster bracket (K) (see Figure 4-5 on page 4-9).

Figure 4-5. CPR Cable Adjustment



12. Loosen the jam nuts (L) securing the CPR cable (D) to the adjuster bracket (K).
13. Disconnect the CPR cable (D) from the release mechanism (M).
14. Count the number of threads (O) on the CPR cable (D) at the CPR cable mount (P).
15. Loosen the jam nut (Q) on the CPR cable (D) on the CPR cable mount (P).
16. Unscrew the CPR cable (D) from the CPR cable mount (P).
17. Remove the CPR cable (D) from the bed.

REPLACEMENT

WARNING:

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 equipment damage.

1. Perform the removal procedure in reverse 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 (L) and move the cable sheath (R) toward the foot end of the bed to the point where the release mechanism on the head motor begins to move from the neutral position (see Figure 4-5 on page 4-9).

2. To relieve tension in the cable, loosen the two jam nuts (L) and move the cable sheath (R) toward the head end of the bed to the point where the release mechanism on the head motor 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 (L).
5. Do the "Function Checks" on page 2-4.

4.4 Knee Section Motor

Tools: None

REMOVAL

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

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

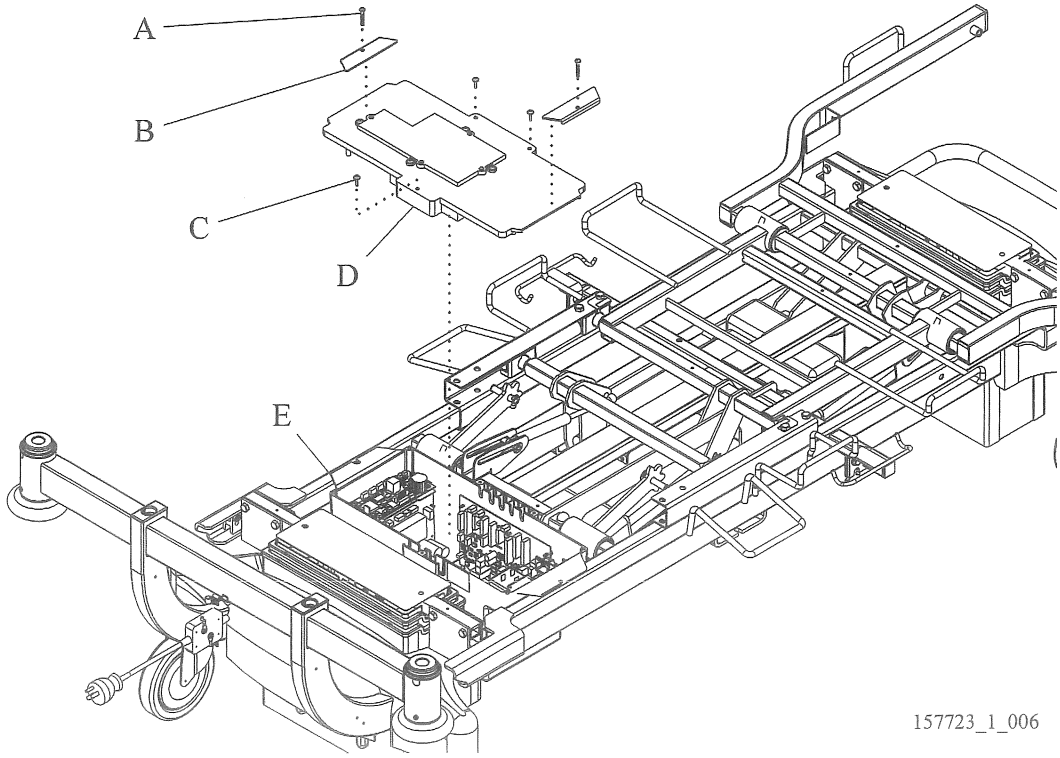
4. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
5. Remove the seat and knee sections.
6. Remove the two screws (A) from the retainers (B) (see Figure 4-6 on page 4-11).
7. Remove the retainers (B).
8. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).
9. Remove the power supply cover (M).

NOTE:

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

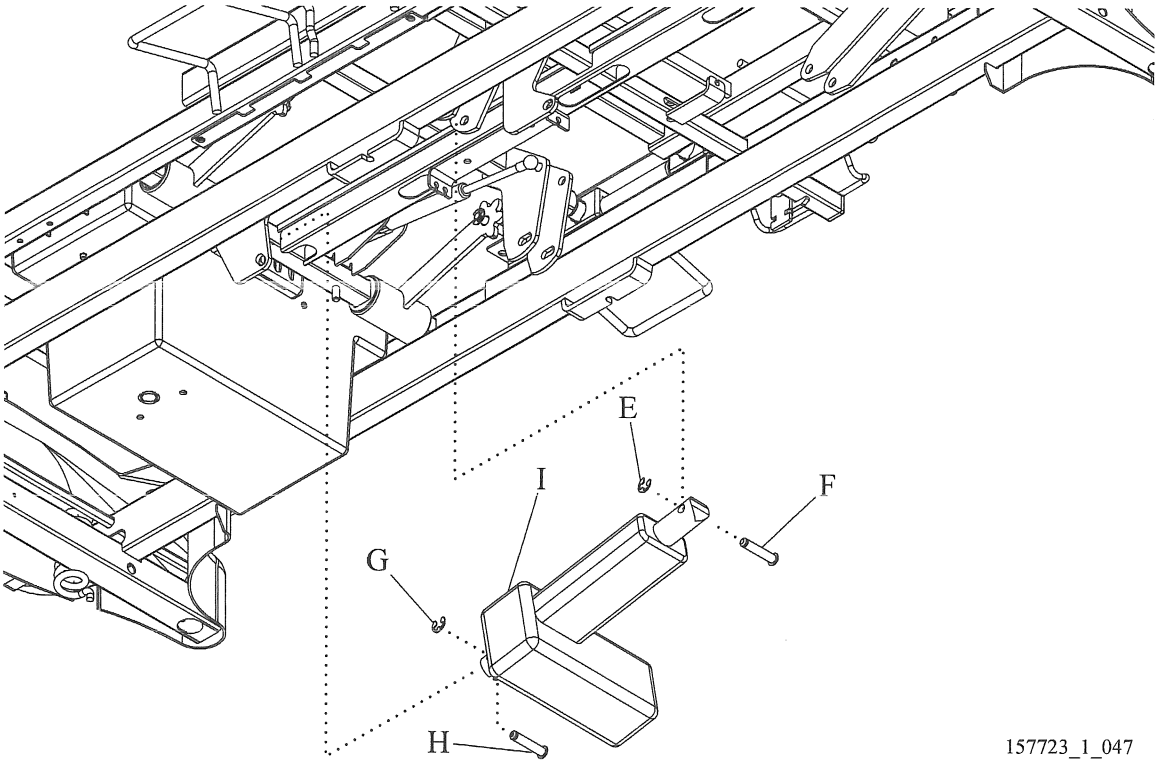
10. Disconnect the battery cable from the power supply P.C. board.
11. Remove the power supply cover (E) from the bed.

Figure 4-6. Power Supply Cover



12. On the power supply P.C. board, disconnect the knee section motor connector (number 5).
13. Remove the cable cover on the central rail and remove the knee section motor cable.
14. Remove the knee section motor cable from the bed.
15. Remove the E-ring (E) from the rod end pin (F) (see Figure 4-7 on page 4-12).
16. Remove the E-ring (G) from the motor end pin (H).
17. While supporting the motor (I), remove the rod end pin (F).
18. While supporting the motor (I), remove the motor end pin (H).
19. Remove the knee motor (I) from the bed.

Figure 4-7. Knee Motor



REPLACEMENT

1. Perform the removal procedure in reverse order.

NOTE:
If you install a new motor, it will be different in appearance from the original motor.

CAUTION:
Caution—Make sure that the elastic found on the new motors is not wound around the motor body before removing it (cut). If necessary, turn the motor end rod in the appropriate direction to unwind this elastic. Indeed, it is used to indicate the correct position of the switches and internal end of travels of the motor. The incorrect position of these elements may 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 Foot Section Motor

Tools: None

Removal

1. Set the brakes.
2. Raise the sleep surface to the highest position.
3. Raise the head section to the highest position.
4. Remove the seat and knee sections.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

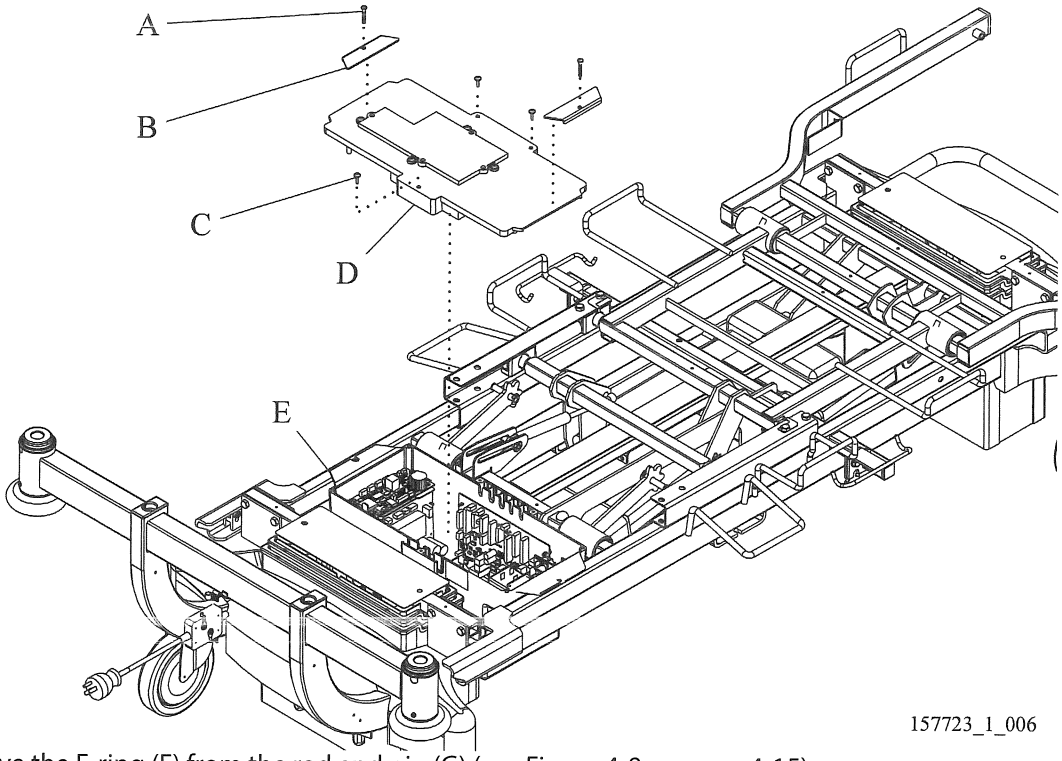
5. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
6. Remove the power supply cover as follows:
   a. Remove the two screws (A) from the retainers (B) (see Figure 4-8 on page 4-14).
   b. Remove the retainers (B).
   c. Remove the three screws (C) that 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.
7. On the power supply P.C. board, disconnect the foot section motor connector (number 2).
8. Remove the cable cover on the central rail and remove the foot section motor cable.
9. Remove the foot section motor cable from the bed.

Figure 4-8. Power Supply Cover



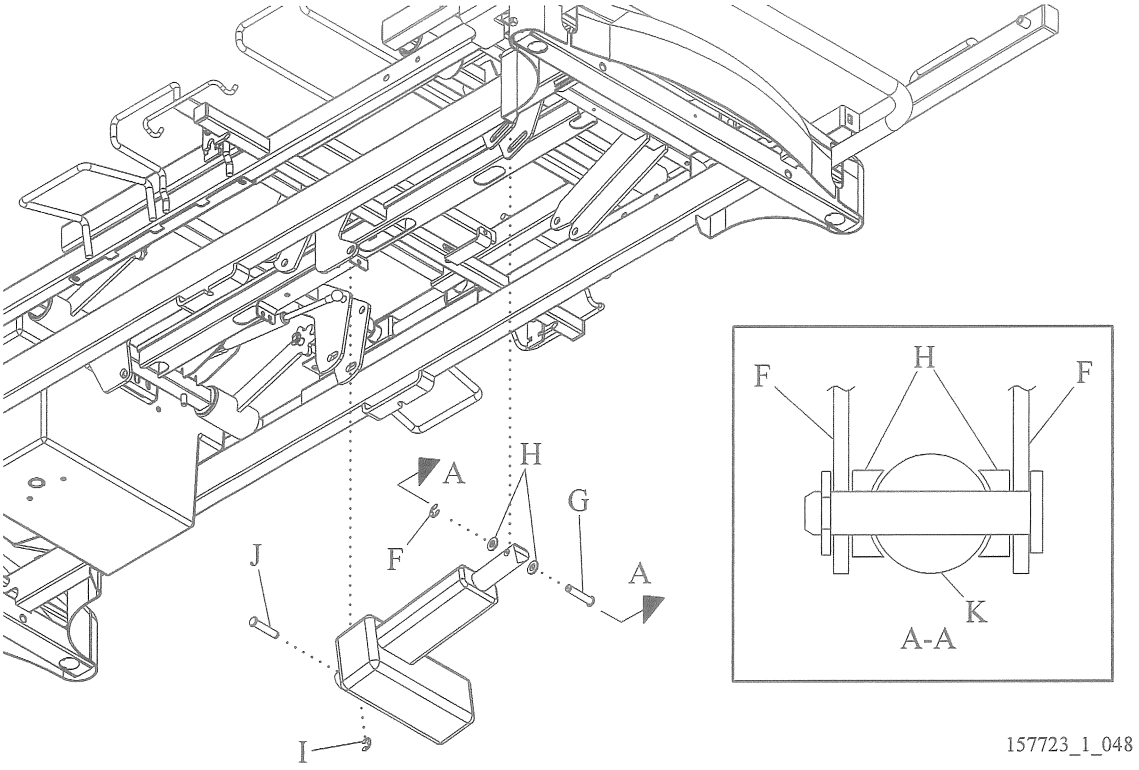
10. Remove the E-ring (F) from the rod end pin (G) (see Figure 4-9 on page 4-15).
11. Remove the E-ring (I) from the motor end pin (J).
12. Remove the pin (G) and two plastic spacers (H).

NOTE:

Note the position of the plastic spacers for installation later.

13. Remove the motor end pin (J).
14. Remove the foot motor (K) from the bed.

Figure 4-9. Foot Motor



4

REPLACEMENT

1. Perform the removal procedure in the reverse order.

NOTE:

If you install a new motor, it will be different in appearance from the original motor.

CAUTION:

Caution—Make sure that the elastic found on the new motors is not wound around the motor body before removing it (cut). If necessary, turn the motor end rod in the appropriate direction to unwind this elastic. Indeed, it is used to indicate the correct position of the switches and internal end of travels of the motor. The incorrect position of these elements may 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.

4.6 Brake Detection Switch or Steer Switch

Tools: None

REMOVAL

NOTE:

The steer switch is at the head-end by the right head-end caster. It is removed the same way as the brake detection switch.

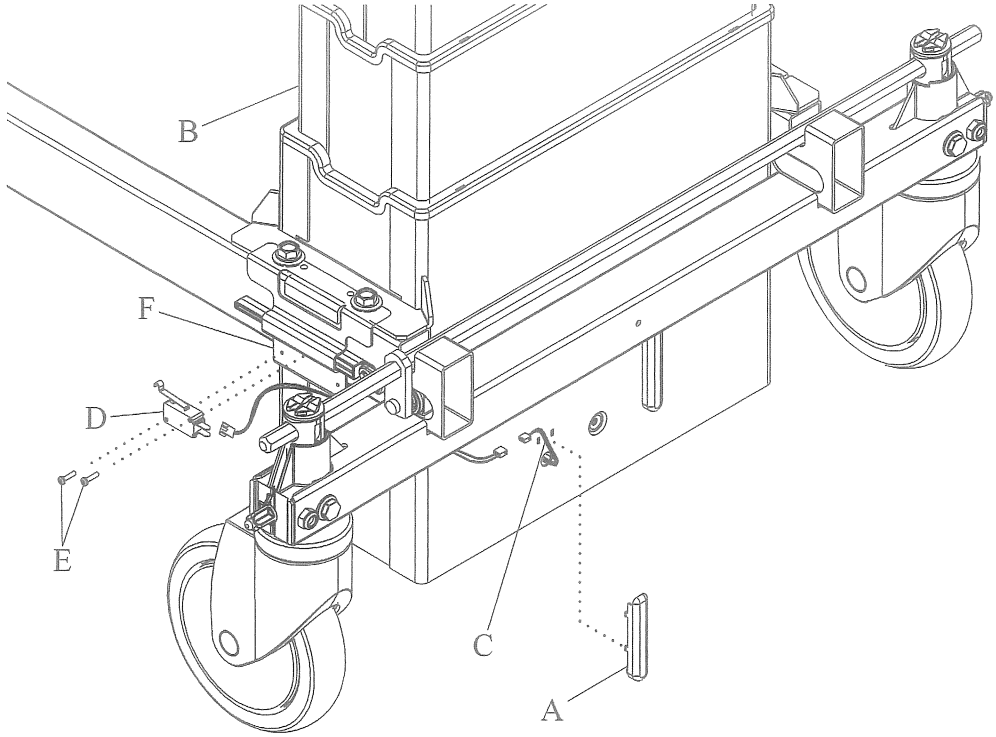
1. Set the brakes.
2. Raise the bed to the highest position.
3. Raise the right, foot-end siderail to the up and locked position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

4. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
5. Remove the foot-end brake/steer pedals.
6. Remove both lower frame covers.
7. Remove the foot-end base frame cover.
8. Remove the cover (A) from the bed right side of the foot hilow column (B) (see Figure 4-10 on page 4-17).
9. Disconnect the cable (C) from the brake detection switch (D).
10. Open the cable track that is under the foot crossbar on the frame, and remove the brake detection switch cable.
11. Remove the two screws (E) that attach the brake detection switch (D) to the bracket (F).
12. Remove the brake detection switch (D).

Figure 4-10. Brake Detection Switch



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REPLACEMENT

1. Perform the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-4.

4.7 Caster

Tools: Scissor jack

REMOVAL

1. Set the brakes.
2. Raise the bed to the highest position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

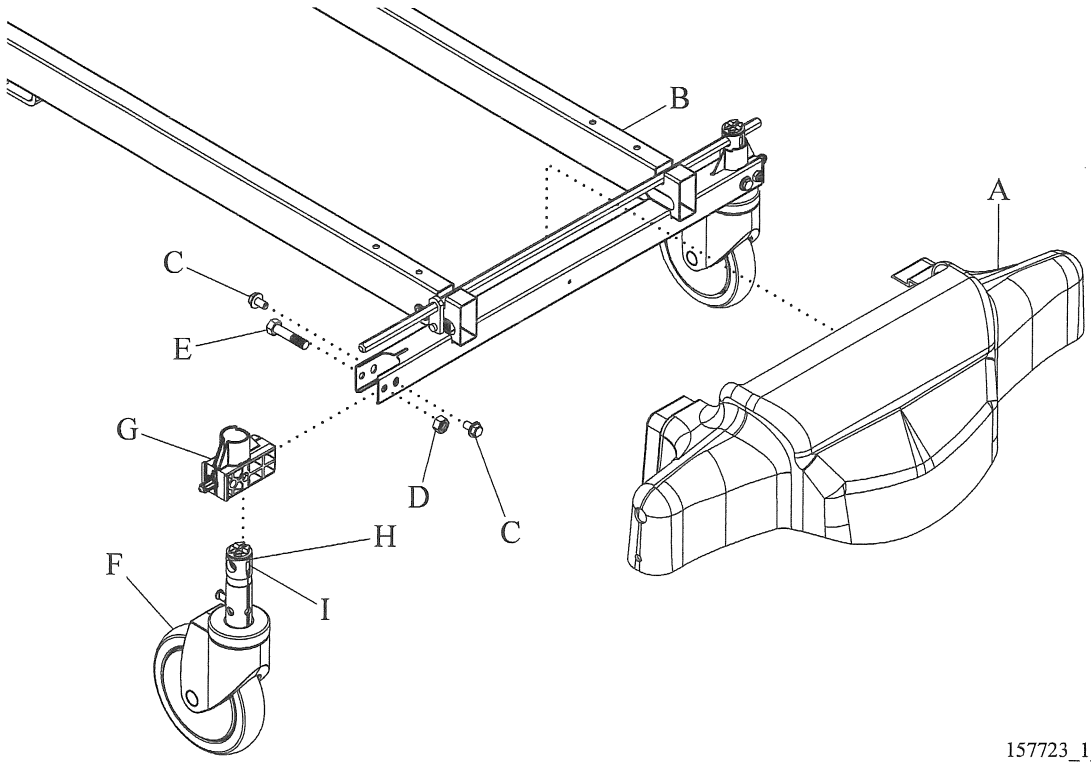
3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Depending on the caster to be replaced, remove the head-end or foot-end brake/steer pedals.
5. Depending on the caster to be replaced, remove the head or foot frame cover (A) from the bed (B) (see Figure 4-11 on page 4-18).
6. Using the scissor jack, raise the bed high enough to remove the caster.
7. Remove the two alignment bolts (C).
8. Remove the nut (D) and bolt (E).
9. Slide the caster (F) and socket (G) out from the bed.

NOTE:

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

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

Figure 4-11. Caster



Replacement

NOTE:

A brake/steer caster has a black washer on top. A brake caster has a silver plated washer on top.

1. Hold the new caster (F) so the window (I) with the cam (H) showing is towards the foot end of the bed.
2. Insert the new caster (F) into the socket (G) so the window (I) with the cam (H) showing is towards the foot end of the bed.

WARNING:

Warning—Make sure the caster is correctly positioned with respect to the movements of the hexagonal bar. Failure to do so may cause the brake and steer system to malfunction. Personal injury or equipment damage could occur.

3. Install the new caster (F) and socket (G) into the bed (B) so the window (H) with the cam (I) showing is towards 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 the new caster is braked.
7. If the caster is not braked, do as follows:
   a. Remove the caster.
   b. Rotate the cam inside the caster clockwise until the caster is braked.
   c. Install the caster.
   d. Make sure the new caster is braked.
   e. Repeat as needed.
8. Install the applicable head-end or foot-end frame cover (A).
9. Install the applicable head-end or foot-end brake/steep pedals.
10. Do the "Function Checks" on page 2-4.

4.8 Siderail Control P.C. Board

Tools: Isopropyl alcohol

NOTE:
Removing the siderail control P.C. board requires the installation of a new switch panel.

REMOVAL

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

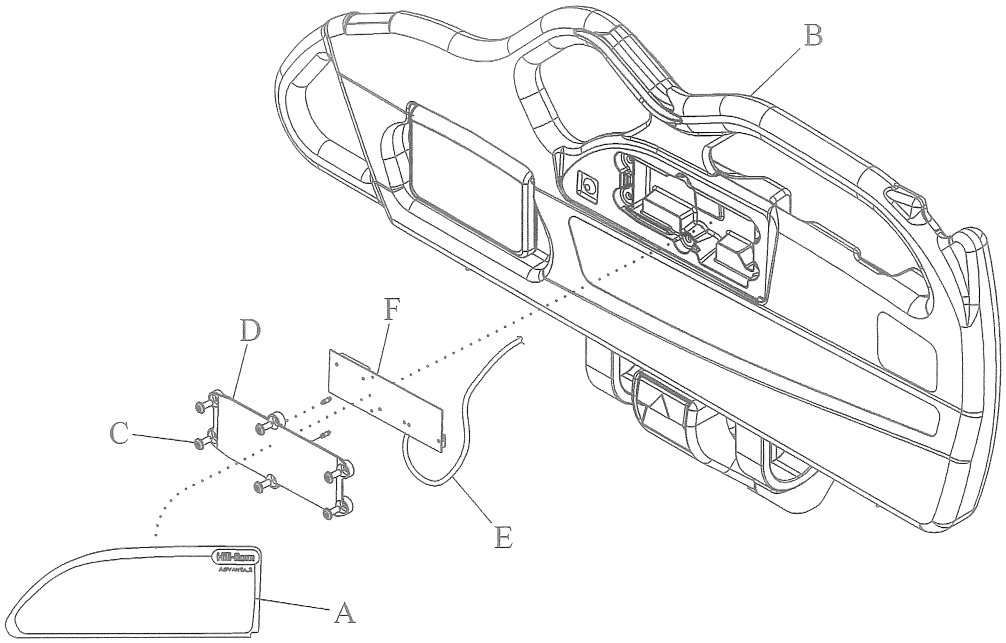
WARNING:
Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

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

CAUTION:
Caution—Use extreme care when removing the switch panel. Failure to do so could cause damage to the seating area of the switch panel on the siderail.

5. Starting on the bottom edge, remove the switch panel (A) from the siderail (B) (see Figure 4-12 on page 4-21).
6. Remove the six screws (C) securing 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 from the siderail control P.C. board (F).
9. Remove the siderail P.C. board (F) from the stiffener (D).

Figure 4-12. Siderail Control P.C. Board



157723_1_102

WARNING:

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. Personal injury may occur.

10. Using rags and Isopropyl alcohol, clean the mounting 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 to the stiffener (D).
4. Install the stiffener (D) into the siderail (B).
5. Install the six screws (C) to secure 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) onto the siderail (B).
8. Do the "Function Checks" on page 2-4.

4.9 Patient Controls

Tools: Isopropyl alcohol

REMOVAL

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

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

4. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
5. Remove the siderail control P.C. board. Refer to Procedure 4.8 on page 4-20.

NOTE:

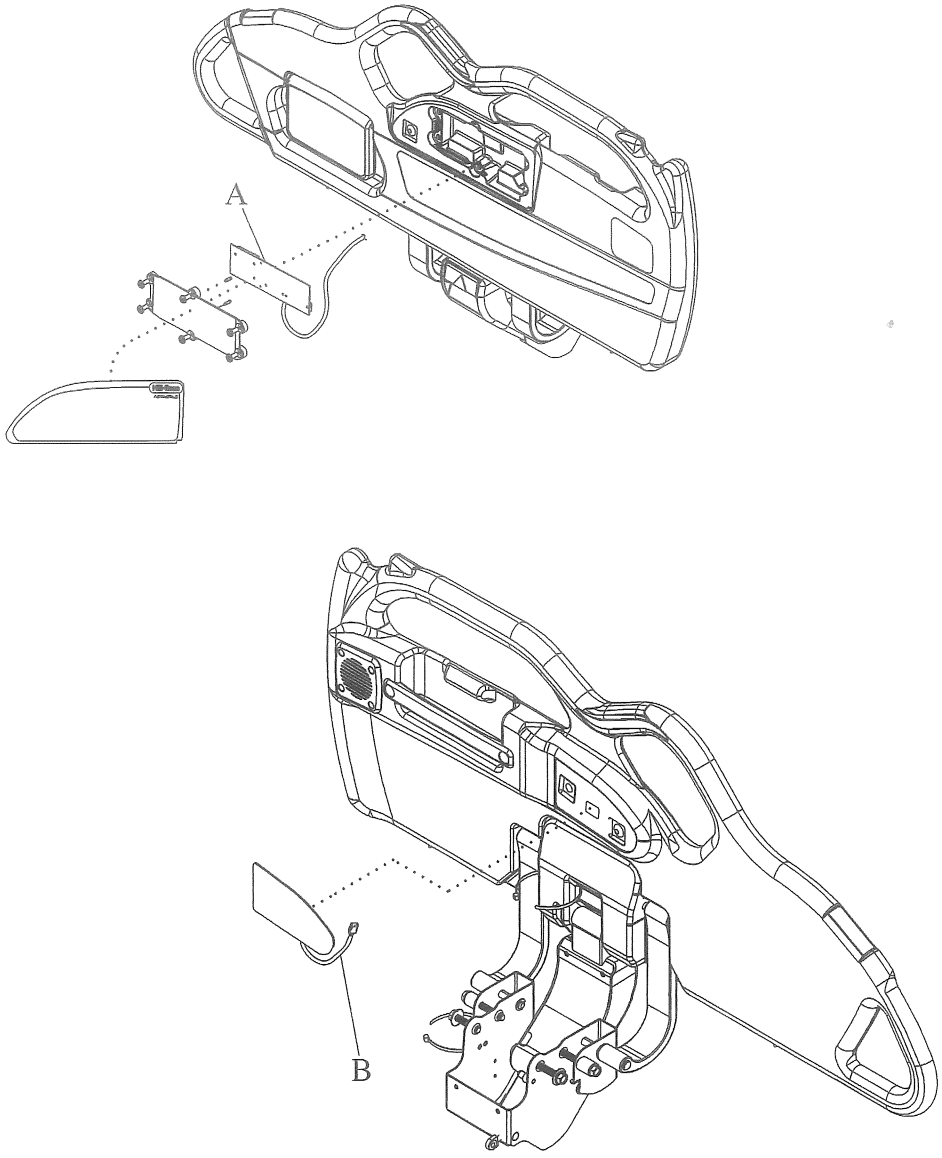
Removing the siderail control P.C. board requires the installation of a new switch panel.

6. Disconnect the patient control switch panel (B) from the siderail control P.C. board (A).
7. Remove the patient control switch panel (B).

REPLACEMENT

1. Remove the wax paper from the new patient control switch panel (B).
2. Install the new patient control switch panel (B).
3. Connect the new patient control switch panel (B) to the siderail control P.C. board (A).
4. Install the siderail control P.C. board. Refer to Procedure 4.8 on page 4-20.
5. Do the "Function Checks" on page 2-4.

Figure 4-13. Patient Controls



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4.10 Patient Pendant

Tools: Small blade screwdriver

REMOVAL

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

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug 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. Perform the removal procedure in reverse order.
3. Do the "Function Checks" on page 2-4.

4.11 Patient Pendant Mount Cable

Tools: None

NOTE:

This procedure is for moving the pendant mount cable from one side of the bed to the other side of the bed.

REMOVAL

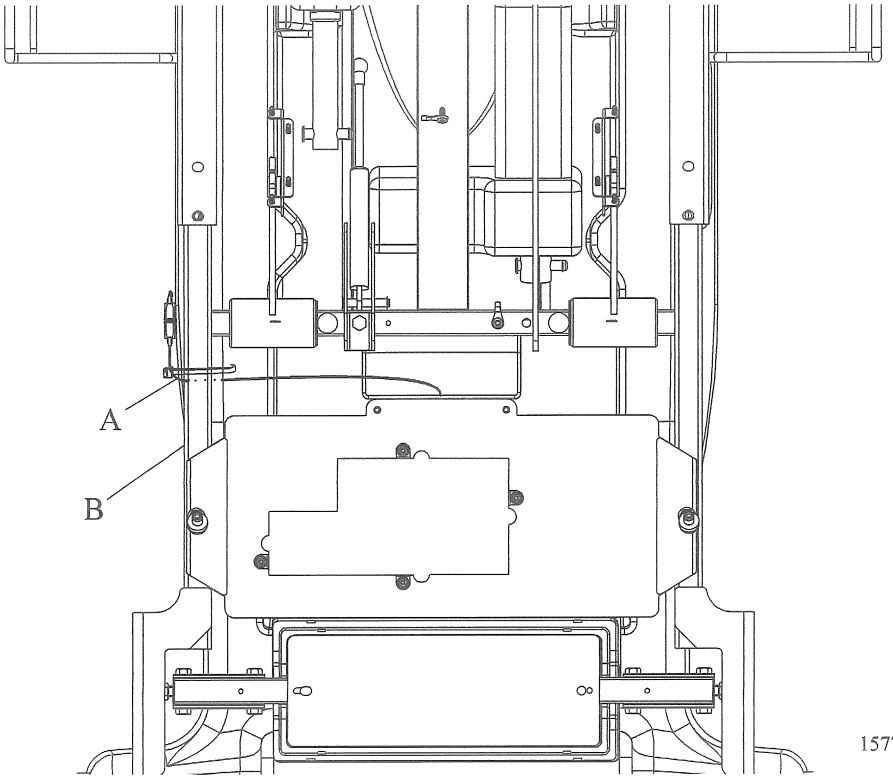
1. Set the brakes.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

2. Unplug 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 4.10 on page 4-24.
4. Cut and remove the cable tie (A) that secure the pendant mount cable (B) to the bed (see Figure 4-14 on page 4-25).

Figure 4-14. Patient Pendant Mount Cable



REPLACEMENT

1. Move the pendant mount to the opposite side of the bed.
2. Use a cable tie (A) to secure the pendant mount cable (B) to the bed.
3. Do the "Function Checks" on page 2-4.

4.12 Head Hilow Column

Tools: (2) Jack stand

REMOVAL

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

WARNING:

Warning—Do not work under an unsupported load. Install appropriate supports. Failure to do so could cause personal injury or equipment damage.

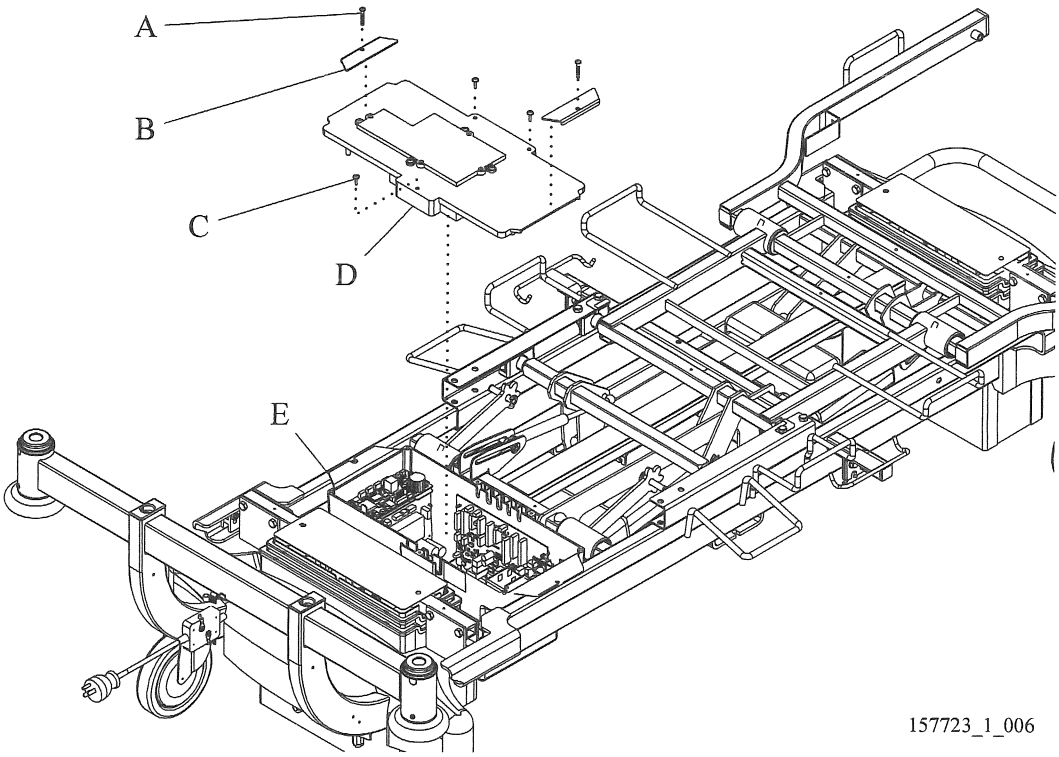
4. Place the jack stands under the articulating frame.
5. Lower the articulating frame onto the jack stands.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

6. Unplug 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 4-15 on page 4-26).
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).

Figure 4-15. 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 brake/steer pedals (G).
15. Remove the head-end base frame cover (H).
16. Remove the screw (I) that attaches the hilow column ground wire (J) to the bed (see Figure 4-16 on page 4-28).
17. Remove the four screws (K) and washers (L) that attach the column (M) to the bed.
18. Cut and remove the cable ties that attach the power cable, load cell cables, and communication cable to the wire guides (N).
19. Remove the two screws (O) and washers (P) from the column cover (Q).
20. Remove the column cover (Q).
21. Remove the screw (R) from the load cell bracket (S).
22. Move the column (M) towards the head end of the bed until the load cell bracket (S) is away from the weigh frame (T).
23. Remove the load cell bracket (S) and rollers (U) from the column (M).
24. Put the load cell bracket (S) and rollers (U) on the weigh frame (T).
25. Remove the column (M) from the bed.

REPLACEMENT

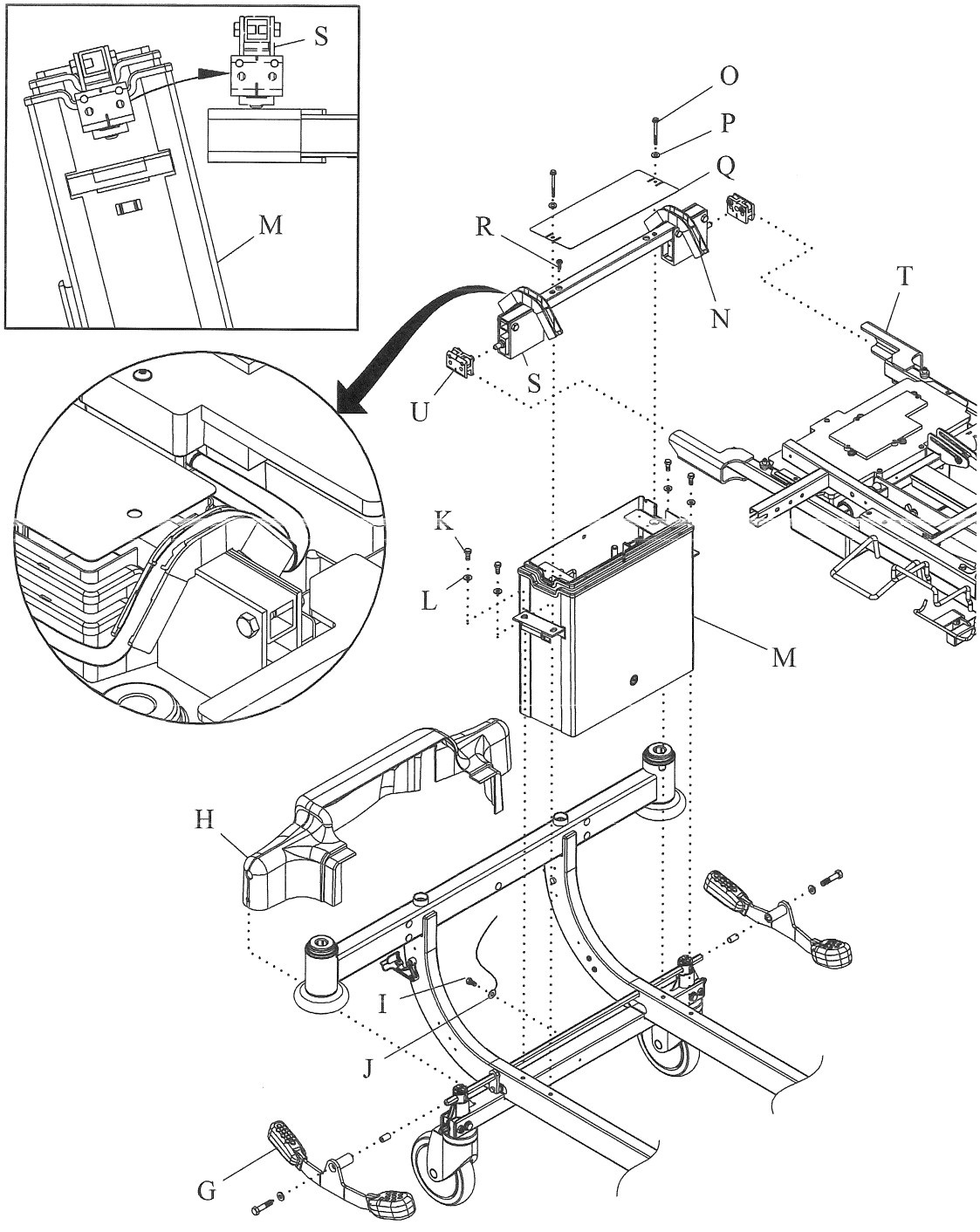
1. Put the **new** hilow column (M) in position on the bed. Make sure the power cable is toward the left side of the bed.
2. Connect the cable to the power supply P.C. board (connector 6).
3. Disconnect the **foot** hilow column from the power supply P.C. board.
4. Plug the bed into an appropriate power source.
5. Use the **Bed Up/Down** control to raise the hilow column to the same height as the bed.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

6. Unplug the bed 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. Put the mark on the power cord and communication cable so the edges of the marks are even with the edge of the wire guide.
9. Put the load cell cables along the side of the power cord and communication cable.
10. Perform the Removal procedure in reverse order.
11. Plug the bed into an appropriate 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.

Figure 4-16. Head Hilow Column



4.13 Foot Hilow Column

Tools: (2) Jack stands
String, 10' (305 cm)

REMOVAL

1. Set the brakes.
2. Remove the footboard.
3. Raise 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:

Warning—Do not work under an unsupported load. Install appropriate supports. Failure to do so could cause personal injury or equipment damage.

6. Place the jack stands under the articulating frame.
7. Lower the articulating frame onto the jack stands.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

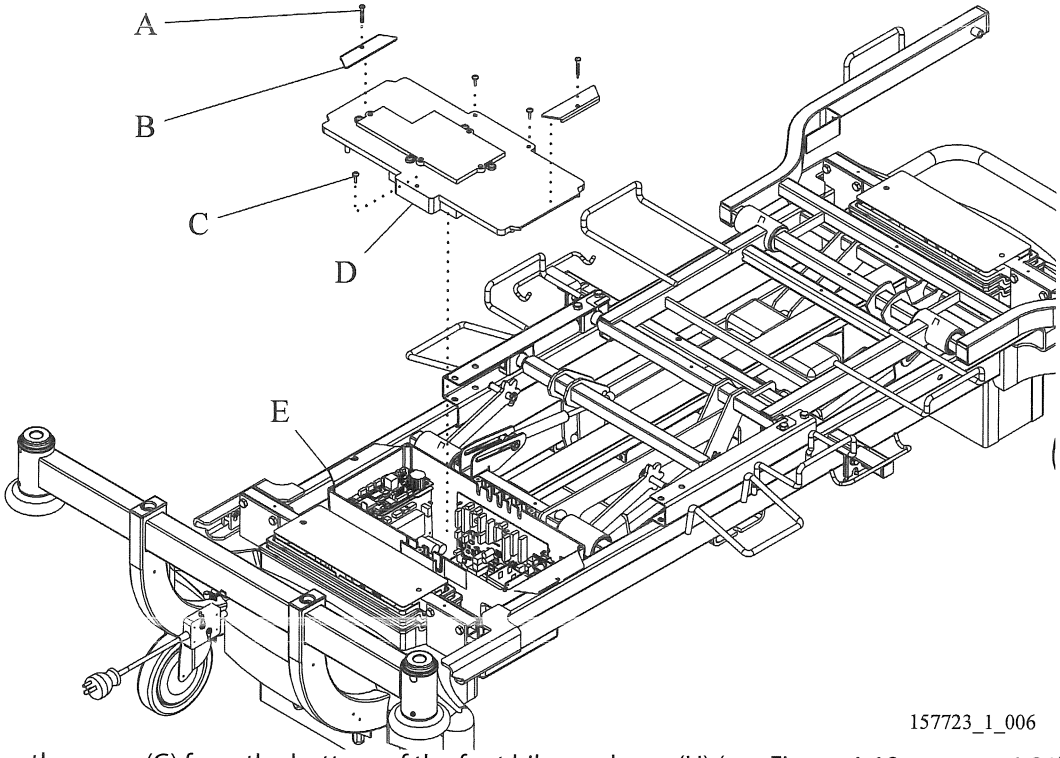
8. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
9. Remove the two screws (A) from the retainers (B) (see Figure 4-17 on page 4-30).
10. Remove the retainers (B).
11. Remove the three screws (C) that attach the power supply cover (D) to the power supply (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.

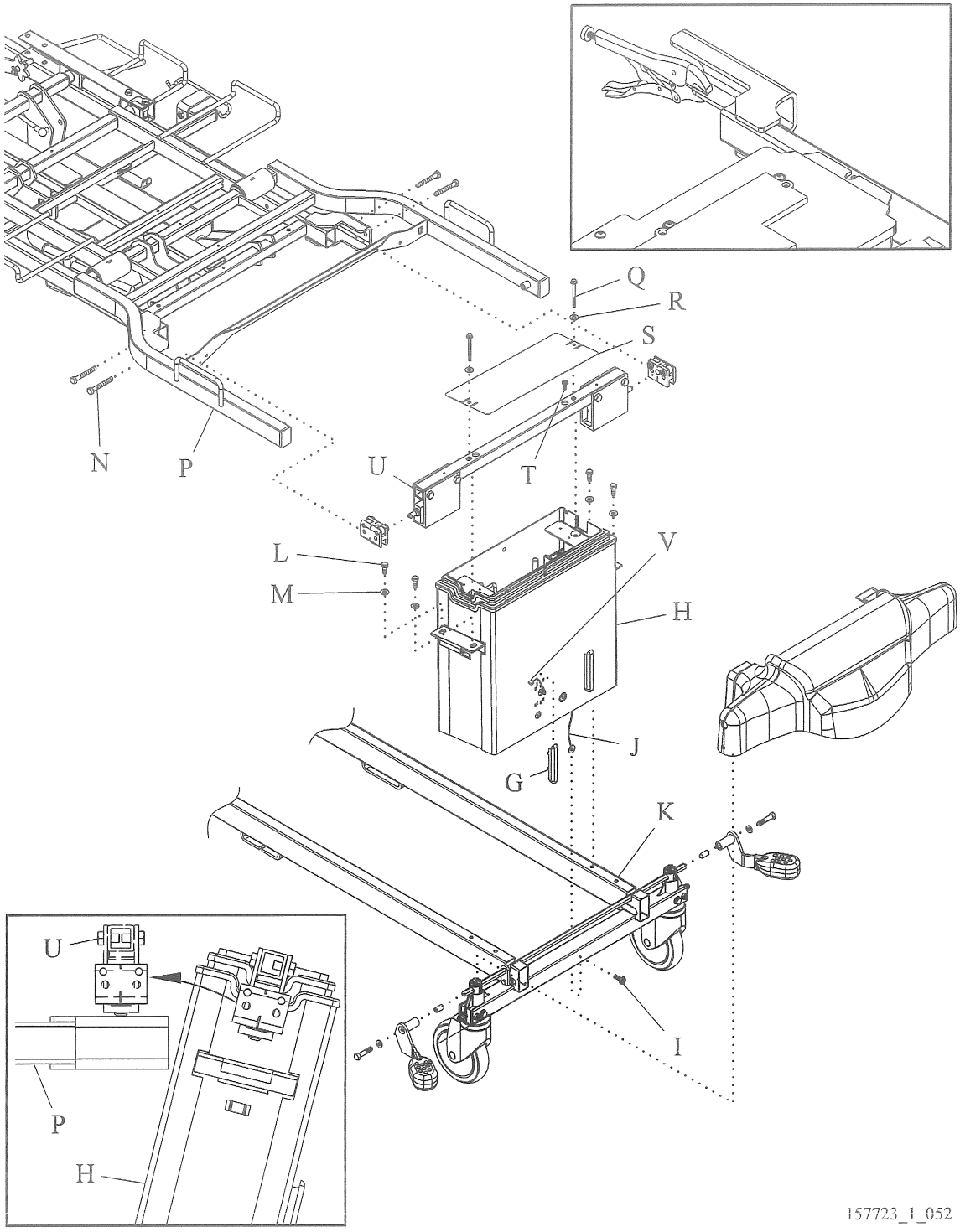
13. Disconnect the battery cable from the power supply P.C. board.
14. Remove the power supply cover (D) from the bed.
15. Install the locking pliers into the head hilow channel.
16. Disconnect the column cable from the power supply P.C. board.
17. Tie the string around the end of the column cable.
18. Remove the foot-end brake/steer pedals.

Figure 4-17. Power Supply Cover



19. Remove the cover (G) from the bottom of the foot hilow column (H) (see Figure 4-18 on page 4-31).
20. Remove the screw (I) that attaches the hilow column ground wire (J) to the bed (K).
21. Remove the four screws (L) and washers (M) that attach the foot hilow column (H) to the bed (K).
22. Remove the four screws (N) that attach the foot hilow column (H) to the weigh frame (P).
23. Remove the two screws (Q) and washers (R) that attach the column cover (S) to the foot hilow column (H).
24. Remove the cover (S).
25. Remove the screw (T) from the load beam bracket (U).
26. Mark the locations of where the cable ties, load beam cables, and the column power cable attach to the bed.
27. Cut and remove the cable ties that attach the load cell cables to the weigh frame (P).
28. Move the column (H) towards the foot end of the bed (K) until the load beam bracket (U) is away from the weigh frame (P).
29. Remove the load beam bracket (U) from the column (H).
30. Put the load beam bracket on top of the weigh frame (U).
31. Remove the column (H) from the bed (K).
32. Disconnect the brake detection switch cable (V).

Figure 4-18. Foot Hilow Column



4

REPLACEMENT

1. Put the **new foot hilow** column (H) in position on the bed (K). Make sure the two covers (G) are toward the foot end of the bed.
2. Remove the cover (G) from the base of the **new** column (H).
3. Run the foot hilow column cable to the central rail.
4. Tie the string around the column cable.
5. Pull the string so the column cable goes to the power supply.
6. Run 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 appropriate power source.
10. Use the **Bed Up/Down** control to raise the hilow column (H) to the same height as the bed.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

11. Unplug 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. Perform the removal procedure in reverse order.
14. Plug the bed into an appropriate 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.

4.14 Load Beam

Tools: (2) Jack stands
String, 10' (305 cm)

NOTE:
The load beam bracket assembly must be replaced as an assembly; the individual load cells can not be replaced.

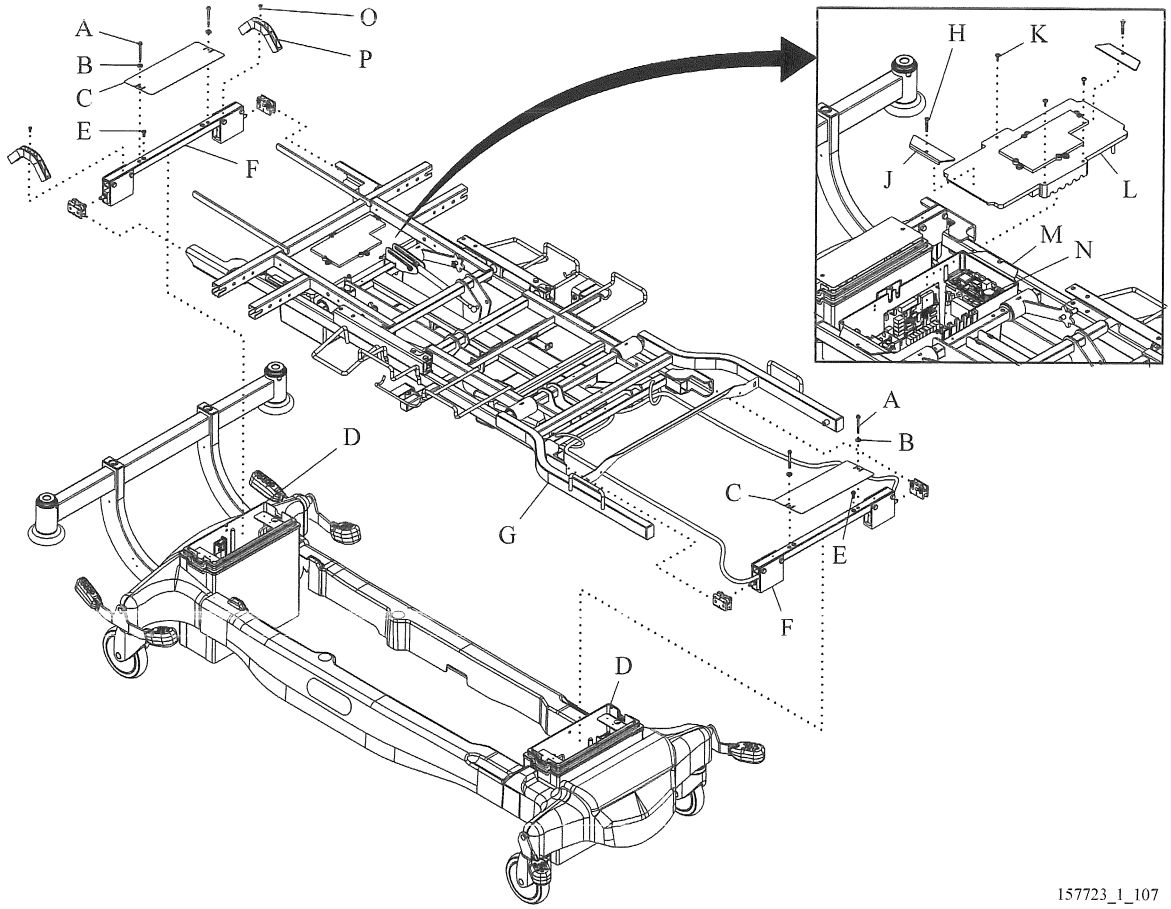
REMOVAL

1. Set the brakes.
2. Remove the headboard.
3. Raise 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. Mark the location of the cable ties that attach the load beam cables to the bed.

WARNING:
Warning—Do not work under an unsupported load. Install appropriate supports. Failure to do so could cause injury or equipment damage.

5. Place 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 4-19 on page 4-34).
7. Remove the column cover (C).

Figure 4-19. 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 away from the column (D).

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

10. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
11. Remove the two screws (H) from the retainers (J).
12. Remove the retainers (J).
13. Remove the three screws (K) that attach the power supply cover (L) to the power supply (M).
14. Remove the power supply cover (L).

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 (L) from the bed.

CAUTION:

Caution—Failure to wear an antistatic strap when you handle electronic components cause component damage.

17. Put on the antistatic strap.
18. Disconnect the load cells from the scale P.C. board (N).

NOTE:

P1 and P4 are for head-end load beam, and P2 and P3 are for foot-end load beams.

19. Tie 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 (O) that attach the two wire guides (P) to the load cell bracket (F).
22. Remove the wire guides (P).
23. Remove the load cell cables from the column (D).
24. Remove the load cell bracket (F) from the weigh frame (G).

Replacement

1. Do the Removal procedure in reverse order.
2. Calibrate the scale. Refer to "Scale Calibration" on page 4-47.
3. Do the "Function Checks" on page 2-4.

4.15 Scale Control Pod and P.C. Board

Tools: (2) small-bladed screwdriver

REMOVAL

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

WARNING:

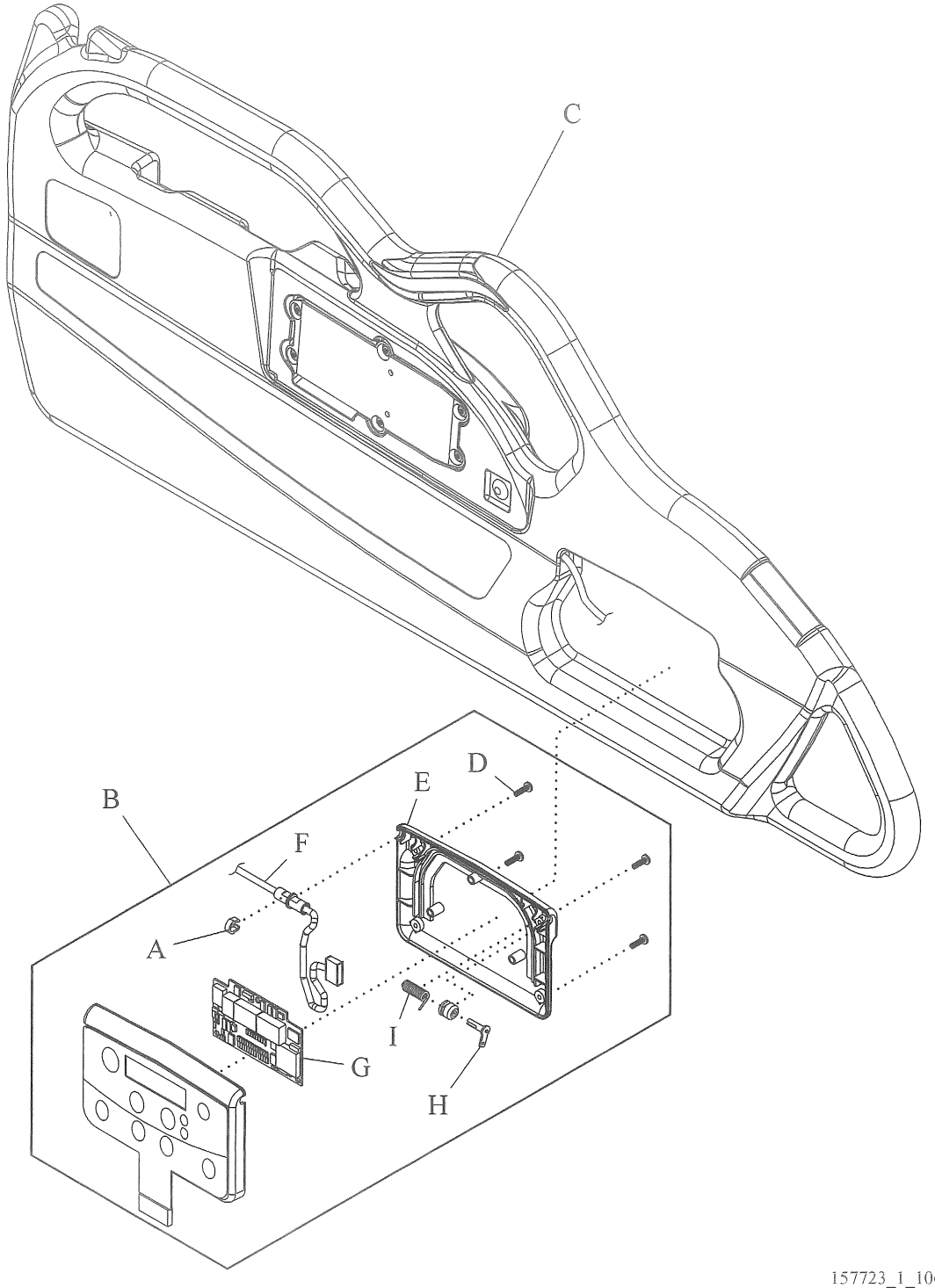
Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug 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 4-20 on page 4-37).
5. Slide the pod (B) towards 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 back of the pod (B).
9. Remove the pod back (E).
10. Note the position of the cable (F).
11. Disconnect the cable (F) from the P.C. board (G).
12. If replacing the P.C. board (G), remove it from the pod (E).
13. Remove the weldment (H) from the spring (I).

REPLACEMENT

1. Do as follows on the **new** pod:
   a. Remove the four screws (D) from the back of the pod (B).
   b. Remove the pod back (E).
   c. Disconnect the cable (F) from the P.C. board (G).
2. Put the new pod (B) in position next 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 earlier.
5. Install the pod back (E).
6. Install the four screws (D) to attach the pod back (E) to the pod (B).
7. Install the weldment (H), removed earlier, into the spring (I).
8. Install the pod (B) into the siderail (C).
9. Slide the pod (B) towards 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.

Figure 4-20. Control Pod



4.16 Bed Batteries

Tools: None

REMOVAL

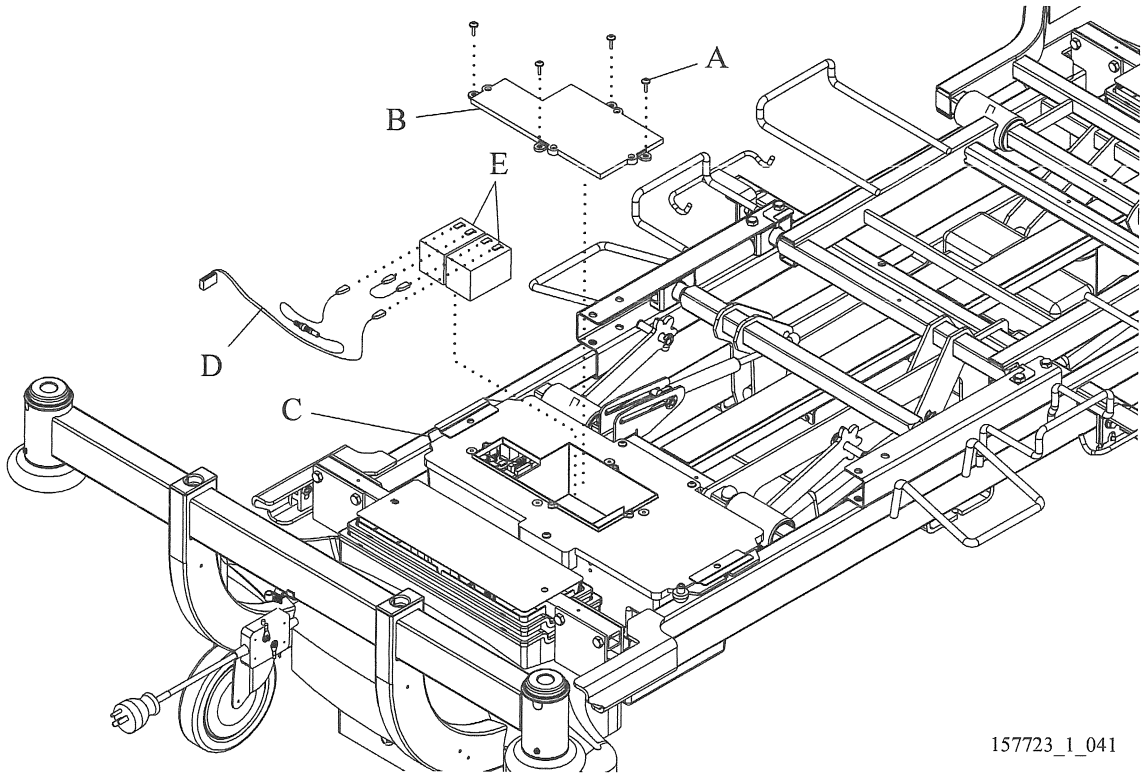
1. Set the brakes.
2. Raise the head section to the full up position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug 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 4-21 on page 4-38).
5. Remove the battery cover (B).
6. Note 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).

Figure 4-21. Batteries



REPLACEMENT

1. Do the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-4.
3. Dispose of the batteries in accordance with local and federal standards.

4.17 Motor Control P.C. Board

Tools: None

REMOVAL

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

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

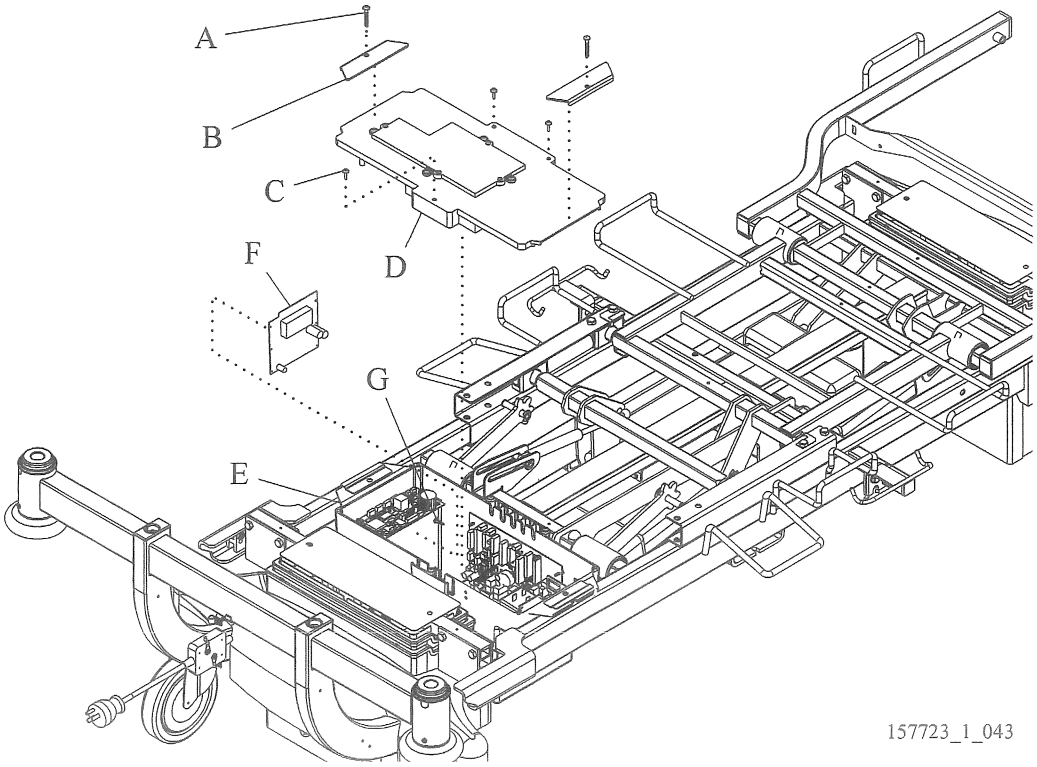
3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the two screws (A) from the retainers (B) (see Figure 4-22 on page 4-39).
5. Remove the retainers (B).
6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (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. Note the positions of the cables connected to the power supply P.C. board (F).

Figure 4-22. Motor Control P.C. Board



CAUTION:

Caution—When handling 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 (G).
13. Pinch the ends of the standoffs (G).
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 reverse order.
2. Do the "Function Checks" on page 2-4.

4.18 SideCom® Communication System P.C. Board

Tools: None

REMOVAL

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

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

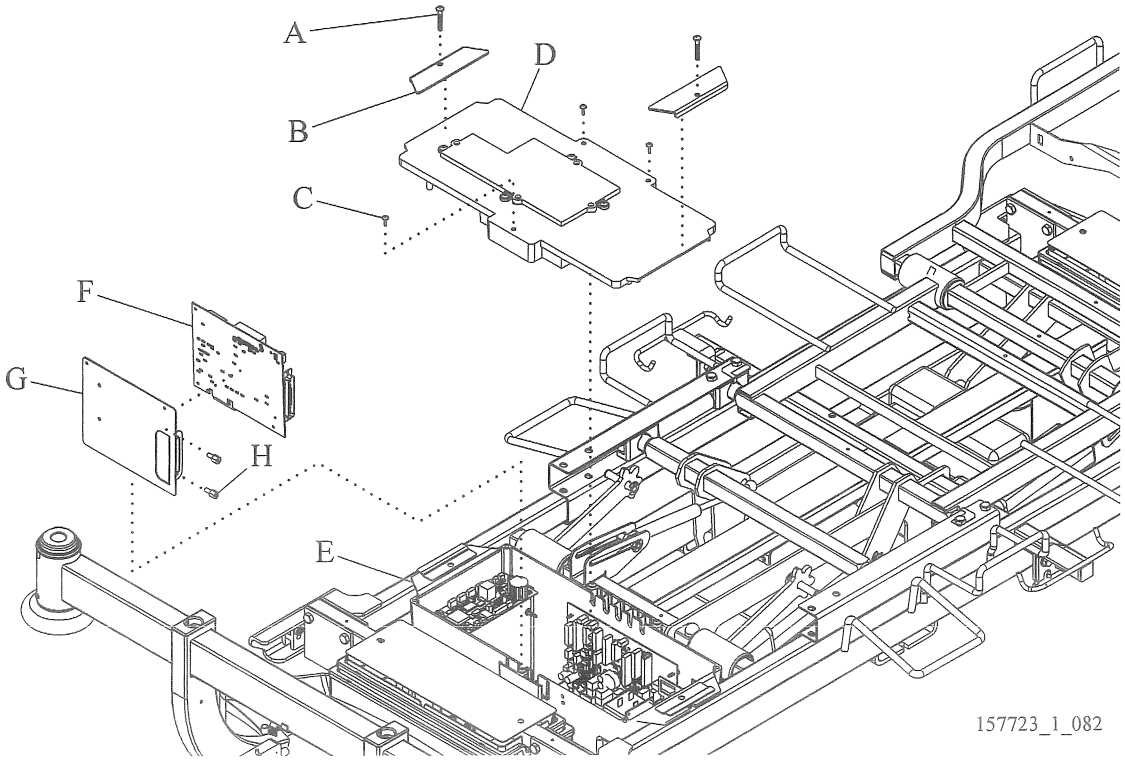
3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the two screws (A) from the retainers (B) (see Figure 4-23 on page 4-41).
5. Remove the retainers (B).
6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (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. Note the positions of the cables connected to the communication P.C. board (F).

Figure 4-23. Communication P.C. Board



CAUTION:

Caution—When handling 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. Remove the P.C. board do as follows:
    a. Pinch the ends of the standoffs, and remove the SideCom adapter bracket (G) from the power supply (E).
    b. Remove the two screws (H) that attach the P.C. board (F) to the adapter bracket (G).
    c. Pinch the ends of the standoffs, and remove the P.C. board (F) from the adapter bracket (G).

REPLACEMENT

1. Do the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-4.

4.19 Line Filter

Tools: None

REMOVAL

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

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

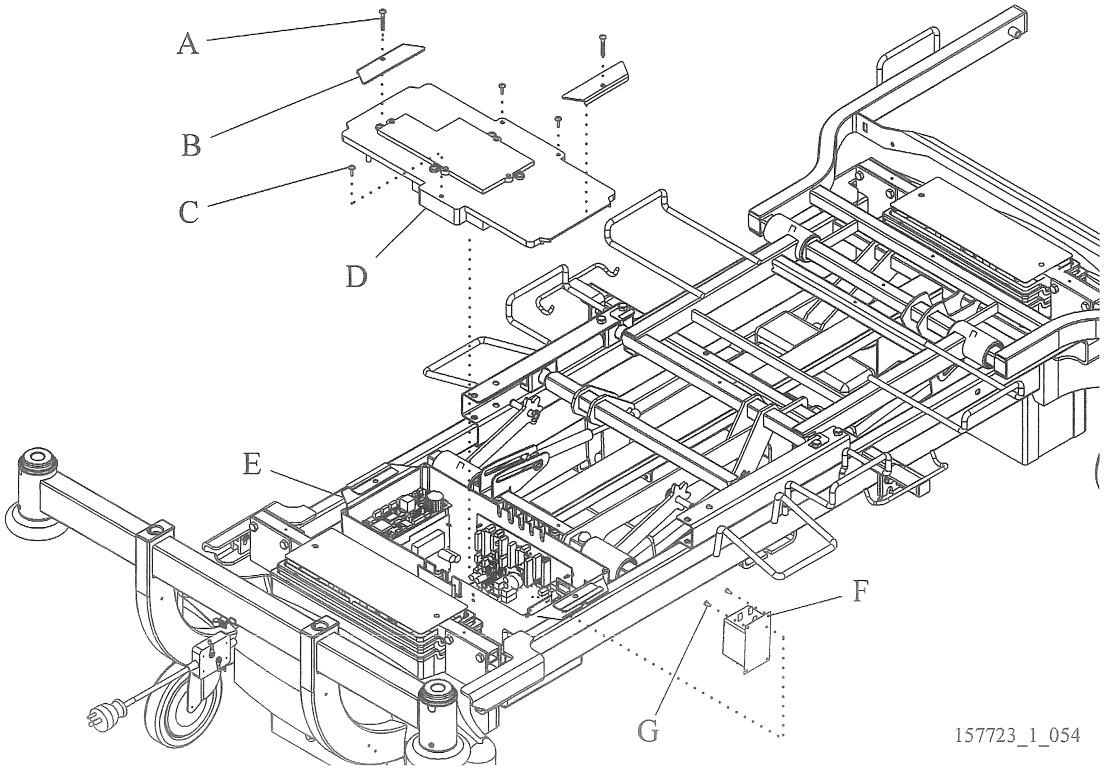
3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the two screws (A) from the retainers (B) (see Figure 4-24 on page 4-43).
5. Remove the retainers (B).
6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (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. Note the positions of the cables connected to the line filter (F).

Figure 4-24. Line Filter



CAUTION:

Caution—When handling 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) the bracket.
14. Remove the line filter (F).

REPLACEMENT

1. Do the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-4.

4.20 Scale P.C. Board

Tools: None

REMOVAL

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

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

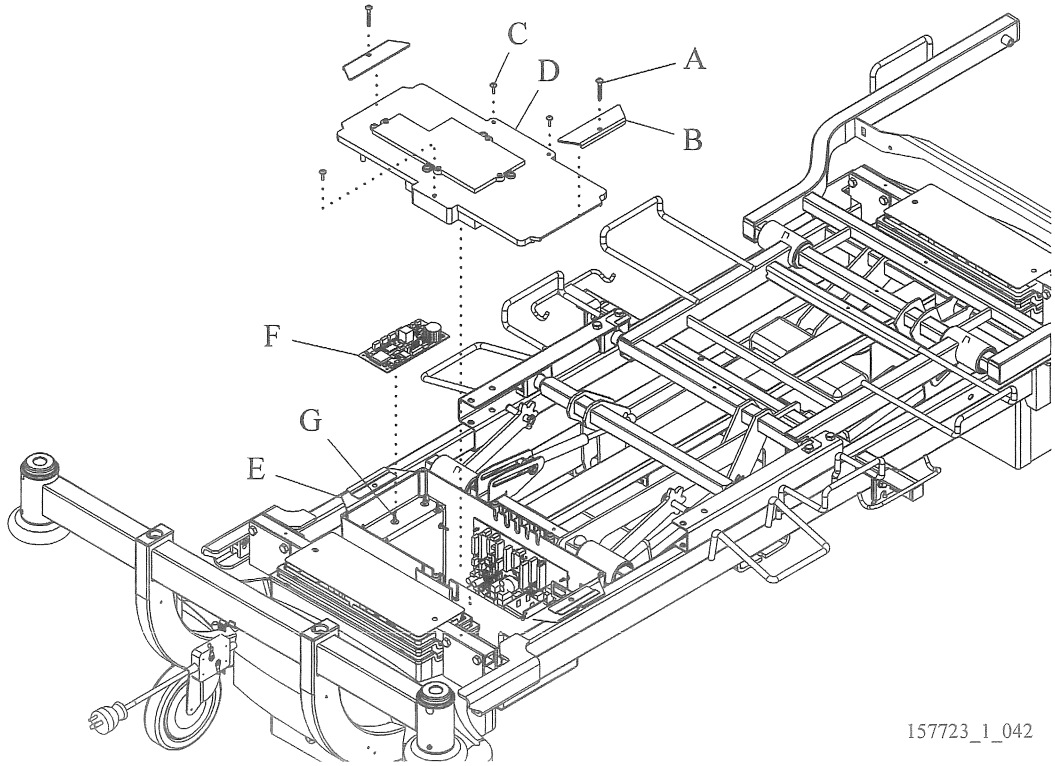
3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the two screws (A) from the retainers (B) (see Figure 4-25 on page 4-45).
5. Remove the retainers (B).
6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (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) power supply (E).
10. Note the positions of the cables connected to the scale P.C. board (F).

Figure 4-25. Scale P.C. Board



CAUTION:

Caution—When handling 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. Pinch the ends of the standoffs (G).
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 reverse order.
2. Calibrate the scale. Refer to "Calibration" on page 4-89.
3. Do the "Function Checks" on page 2-4.

4.21 Scale Calibration

Tools: 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. Place the 250 lb (113 kg) weight over the load beam.
   b. Wait 1 minute, then remove the weight.
4. Raise the head section to the highest position.
5. Remove the four screws (A) that attach the battery cover (B) to the power supply (C) (see Figure 4-26 on page 4-48).
6. Remove the battery cover (B).
7. 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.
8. Lower the head section.
9. Put 25 lb (11 kg) of weight in the center of the bed. **Do not** put the calibration weight on the bed at this time.

WARNING:

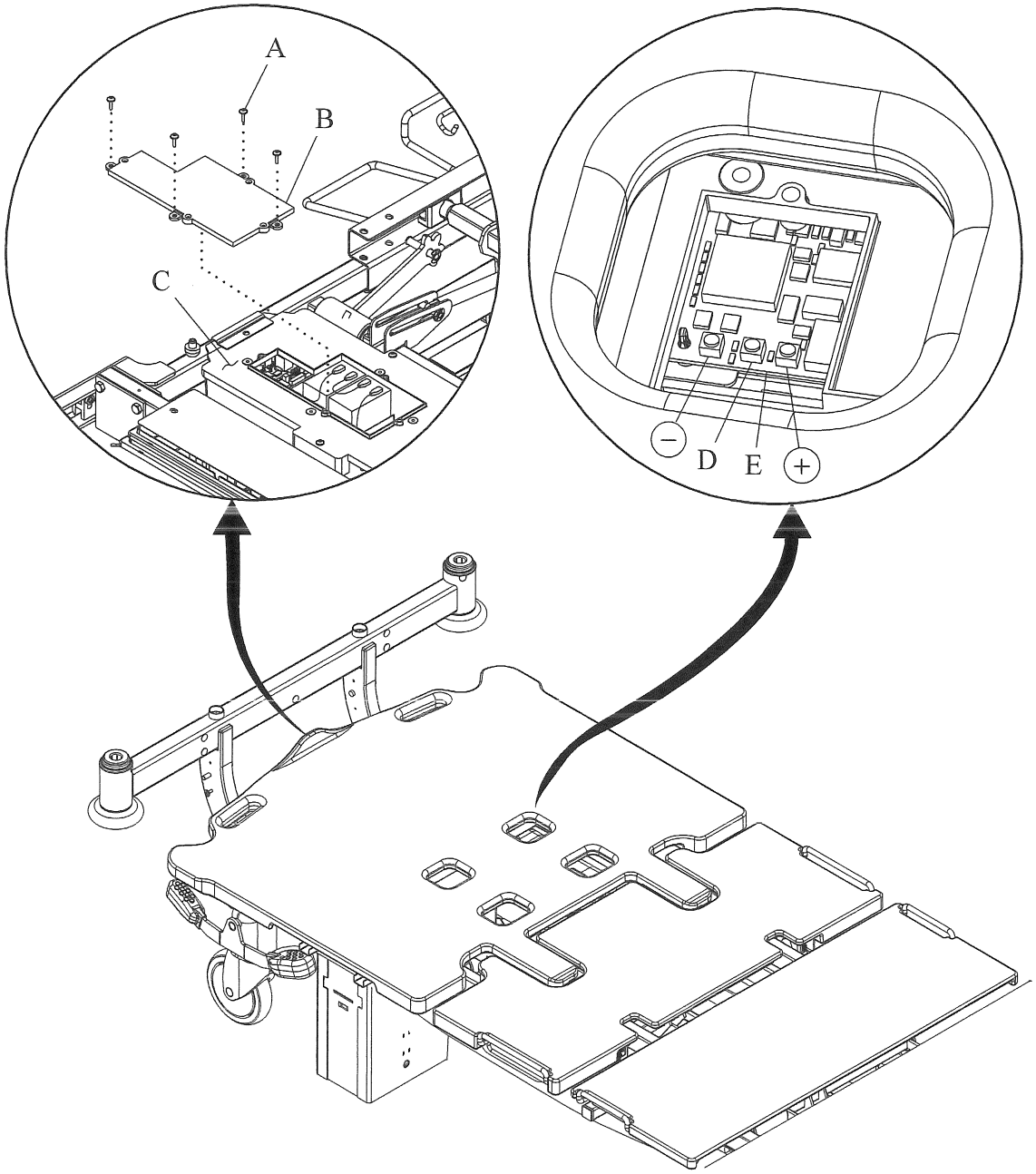
Warning—The potential for electrical shock exists with electrical equipment. Failure to follow facility protocols may cause death or serious personal injury.

10. Press 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).

Figure 4-26. Scale Calibration Switch

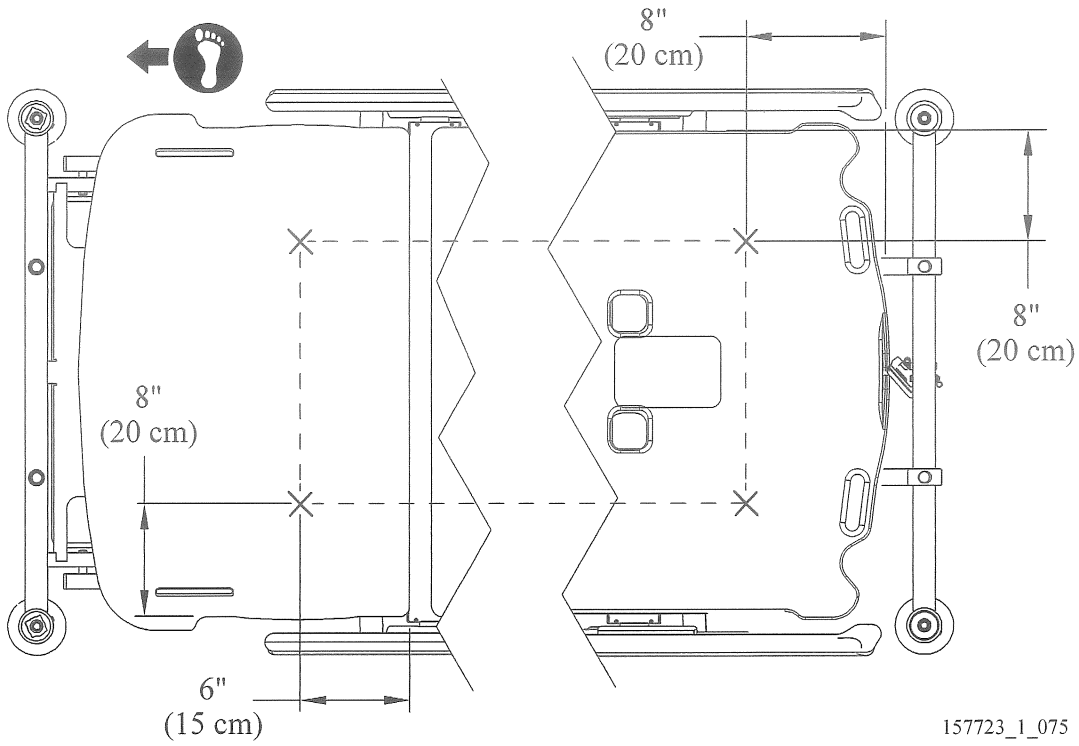


11. Use the + and - switches (next to the calibration switch) to adjust the weight to match the calibration weight. The calibration weight is 100 lb (45.4 kg).

12. When the correct weight is shown, press and release the calibration switch. The display shows **CAL0**. **Do not** touch the bed as it zeroes.
13. When the bed has zeroed, the display shows **CAL1** and one tone sounds.
14. 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 4-27 on page 4-49).

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

Figure 4-27. Calibration Weight Position



15. After approximately 30 seconds, the display shows **CAL2** and two tones will sound.

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

16. Remove the calibration weight. **Do not** touch the bed.
17. After approximately 30 seconds, the display shows **CAL3** and three tones sound.
18. Add the calibration weight to the left foot of the bed over the load cell. **Do not** touch the bed.
19. After approximately 30 seconds, the display shows **CAL4** and four tones sound.
20. Remove the calibration weight. **Do not** touch the bed.
21. After approximately 30 seconds, the display changes to **CAL5** and five tones sound.
22. Add the calibration weight to the right foot of the bed, over the load cell. **Do not** touch the bed.
23. After approximately 30 seconds, the display changes to **CAL6** and six tones sound.
24. Remove the calibration weight. **Do not** touch the bed.
25. After approximately 30 seconds, the display changes to **CAL7** and seven tones sound.

26. Move the calibration weight to the right head of the bed over the load cell. **Do not** touch the bed.
27. After approximately 30 seconds, the bed beeps.
28. Move the calibration weight to the middle of the bed.
29. Take a weight reading.
30. Make sure the weight shown on the scale display matches the calibration weight.
31. Remove the calibration weight.
32. Raise the head section to the highest position.

WARNING:

Warning—Failure to unplug the bed could cause personal injury or equipment damage.

33. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
34. Install the battery cover (B) on the power supply (C) (see Figure 4-26 on page 4-48).
35. Install the four screws (A) to attach the battery cover (B) to the power supply).
36. Plug the bed into an applicable power source.
37. Do the "Function Checks" on page 2-4.

4.22 Siderail Interface P.C. Board

Tools: None

REMOVAL

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

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

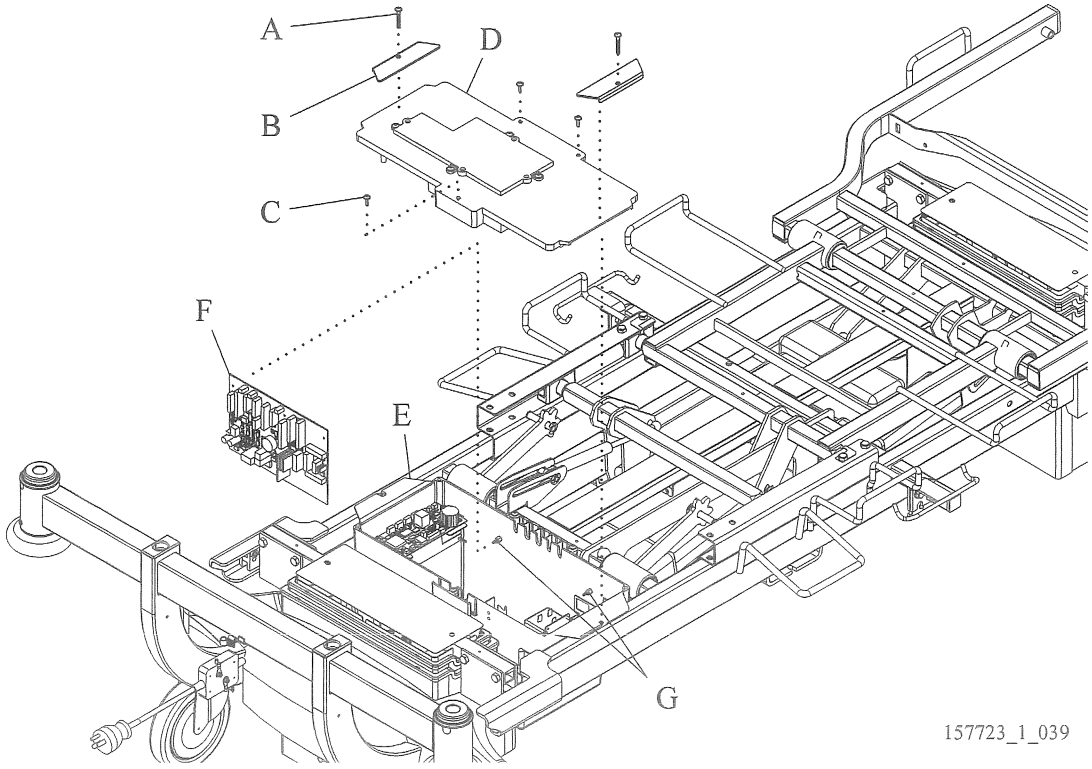
3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the two screws (A) from the retainers (B) (see Figure 4-28 on page 4-51).
5. Remove the retainers (B).
6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (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. Note the positions of the cables connected to the interface P.C. board (F).

Figure 4-28. Interface P.C. Board



CAUTION:

Caution—When handling 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. Pinch the ends of the standoffs (G).
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 reverse order.
2. Calibrate the head angle sensor. Refer to Procedure 4.39 on page 4-88.
3. Do the "Function Checks" on page 2-4.

4.23 Transformer

Tools: None

REMOVAL

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

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

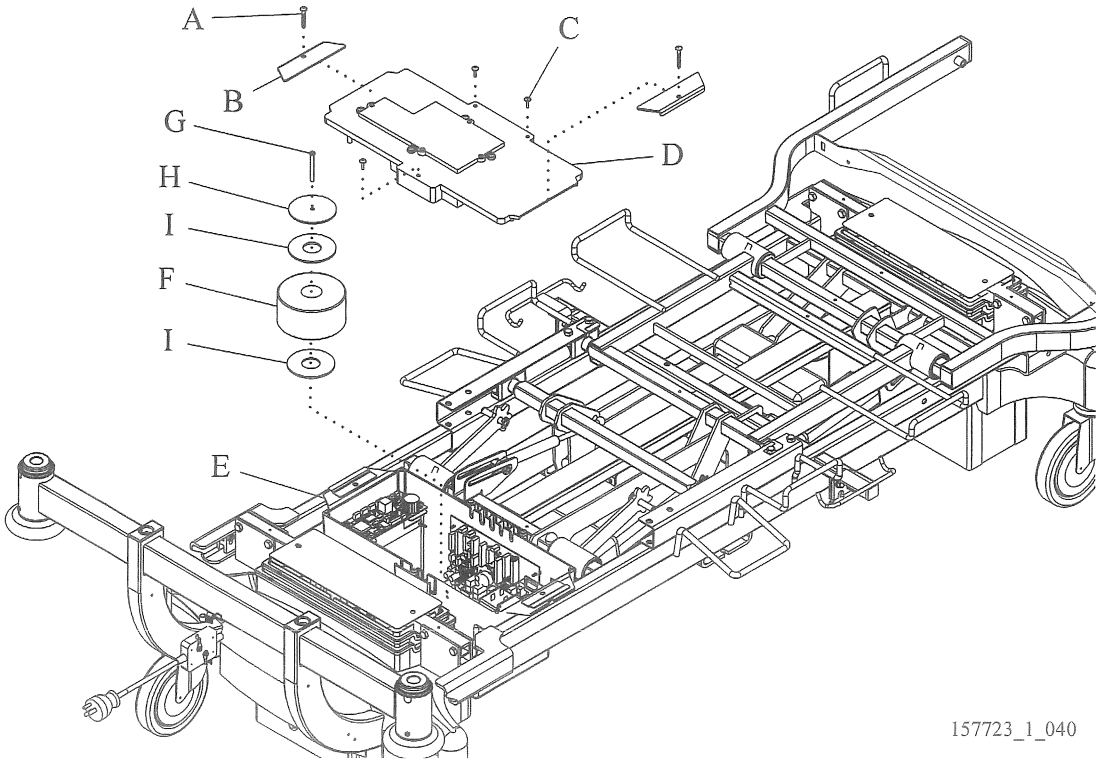
3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the two screws (A) from the retainers (B) (see Figure 4-29 on page 4-53).
5. Remove the retainers (B).
6. Remove the three screws (C) that attach the power supply cover (D) to the power supply (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).
10. Note the positions of the cables connected to the transformer (F).

Figure 4-29. Transformer



CAUTION:

Caution—When handling 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 (H) that secures 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 reverse order.
2. Do the "Function Checks" on page 2-4.

4.24 Power Cord—Beds without IntelliDrive® Transport System

Tools: None

Removal

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

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug 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 (C) (see Figure 4-30 on page 4-56).
5. Remove the retainers (C).
6. Remove the three screws (D) that attach the power supply cover (E) to the power supply (F).
7. Remove the power supply cover (E).

NOTE:

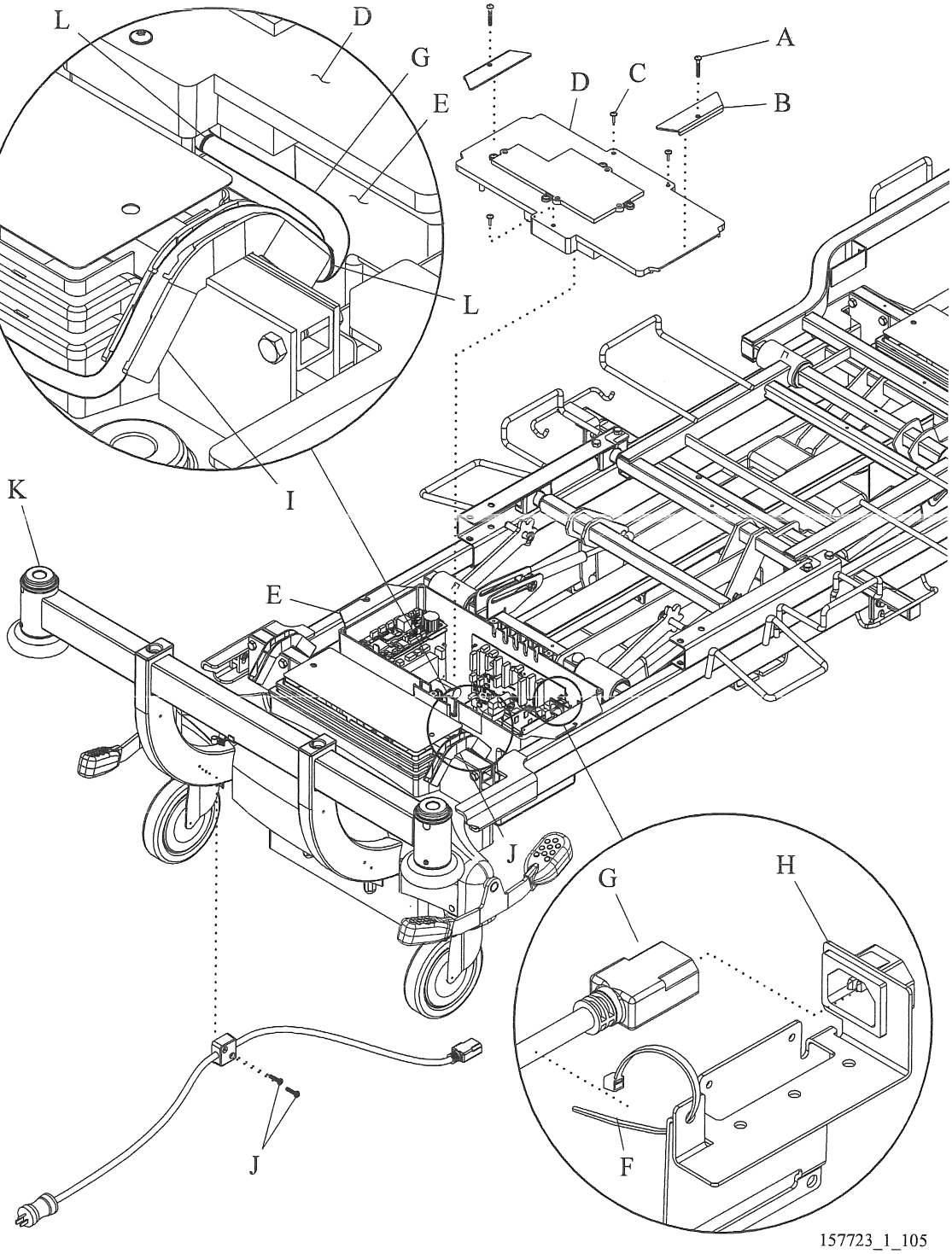
The power supply cover is connected to the power supply P.C. board by the battery cable.

8. Disconnect the battery cable from the power supply P.C. board.
9. Remove the power supply cover (E).
10. Cut and remove the wire 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).
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. Put the mark (L) on the power cord (G) so the edge of the mark (L) is even with the edge of the wire guide (I).
2. Do the removal procedure in reverse order.
3. Do the "Function Checks" on page 2-4.

Figure 4-30. Power Cord



4.25 Power Cord—Beds with IntelliDrive® Transport System

Tools: None

REMOVAL

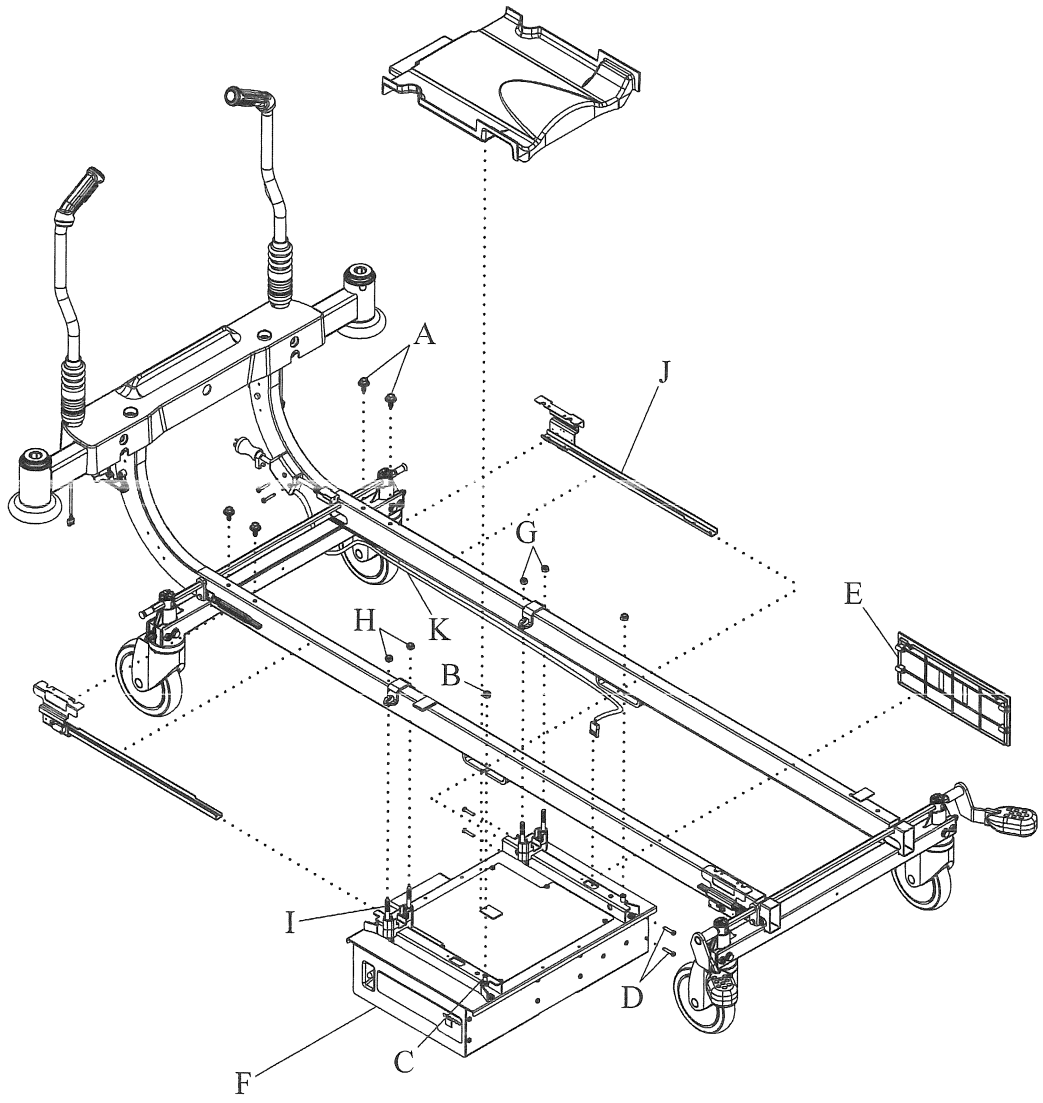
1. Set the brakes.
2. Raise the head section to the full up position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Disconnect the bed power cord from the power supply. Refer to Procedure 4.24 on page 4-55.
5. Remove the head-end brake/steer pedals.
6. Remove both lower frame covers.
7. Remove the head-end caster cover.
8. Loosen the two left-side hilow tower bolts (A) (see Figure 4-31 on page 4-58).
9. Loosen, do not remove, the two nuts (B) on the front mount bolts (C).
10. Remove the four screws (D) that attach the left-side end panel (E) to the drive box (F).
11. Disconnect the power cord from the power supply.
12. Loosen the four nuts (G and H) on the U-bolts (I) until the nuts are flush with the top of the U-bolts.
13. Remove two nuts (G) from the left-side U-bolt (I).
14. Turn the left-side U-bolt (I) down.
15. Lower the cable channel (J).
16. Remove the power cord (K) from the drive box (F) and cable channel (J).

Figure 4-31. Power Cord Removal



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REPLACEMENT

1. Do the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-4.

4.26 Fuses

Tools: None

REMOVAL

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

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Do one of these:
   a. For main fuses, go to step 5.
   b. For battery fuse, go to step 6.
   c. For IntelliDrive® Transport System, go to step 7.

NOTE:

Replace both fuses at the same time.

5. For the mains fuses, do as follows.
   a. Remove the two screws (A) from the retainers (B) (see Figure 4-32 on page 4-60).
   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.

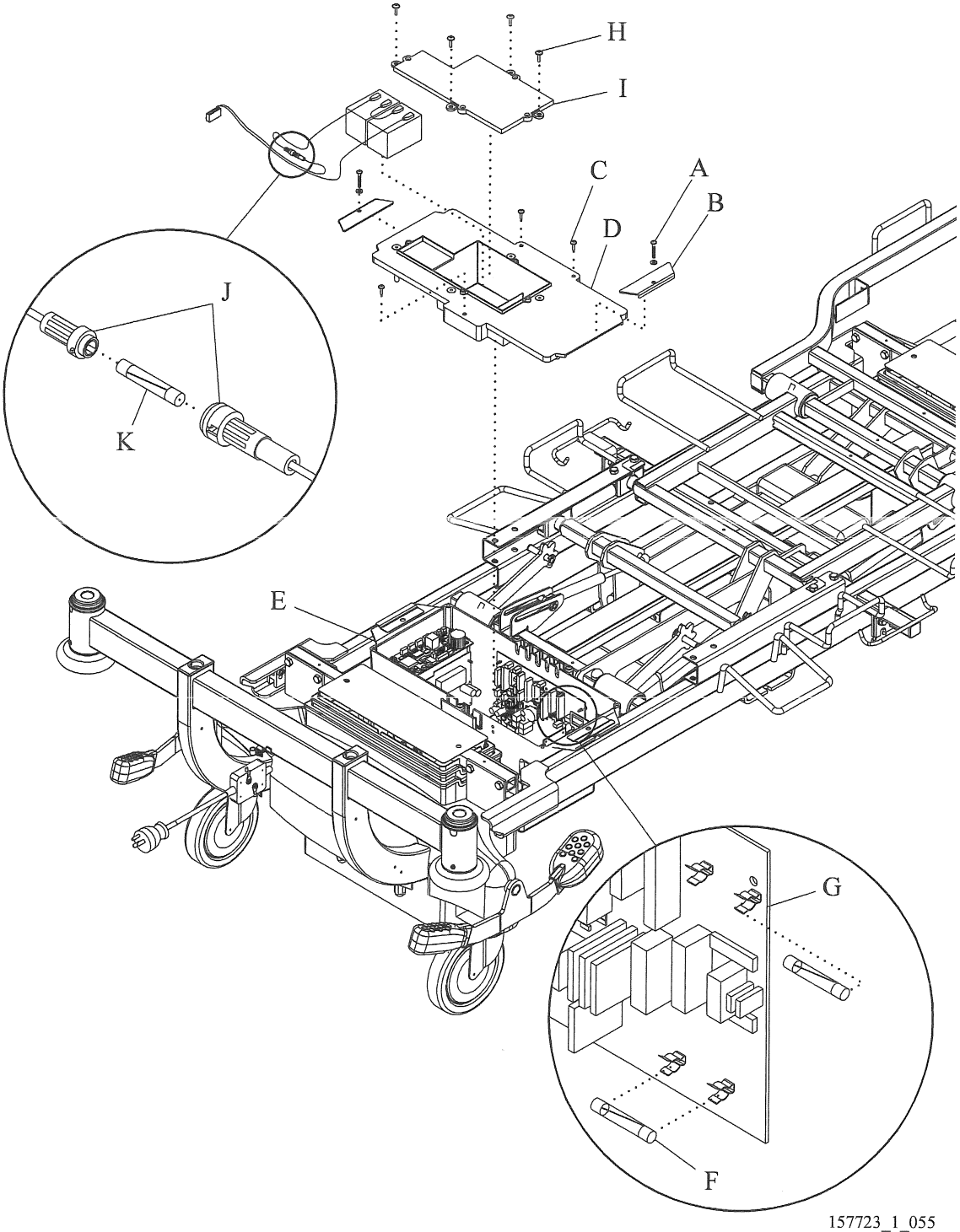
   e. Disconnect the battery cable from the power supply P.C. board.
   f. Remove the power supply cover (D).

CAUTION:

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

   g. Put on the antistatic strap.
   h. Remove the fuses (F) from the interface P.C. board (G).

Figure 4-32. Fuses



6. 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).

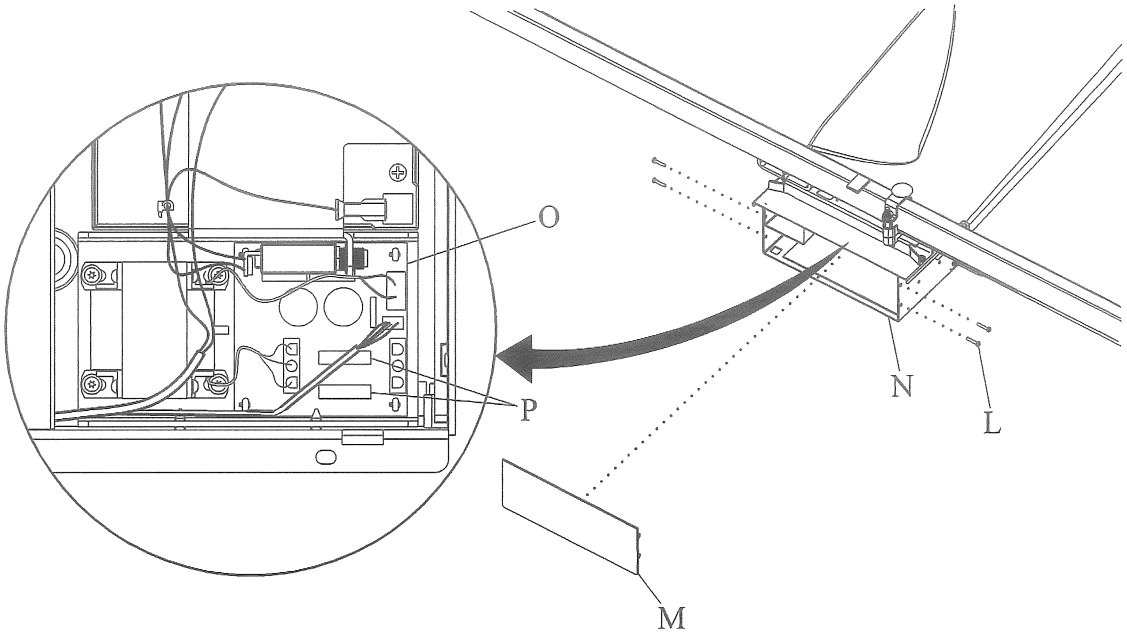
NOTE:

The fuse holder is a twist type fuse holder.

d. Remove the fuse (K).

7. For IntelliDrive® Transport System, do as follows:
   a. Remove the four screws (L) that secure the end cover (M) to the drive box (N) (see Figure 4-33 on page 4-61).
   b. Remove the end cover (M)
   c. Find the power supply P.C. board (O).
   d. Remove the two fuses (P).

Figure 4-33. IntelliDrive® Transport System Fuses



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REPLACEMENT

1. Do the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-4.

4.27 Fifth Wheel

Tools: Scissor jack

REMOVAL

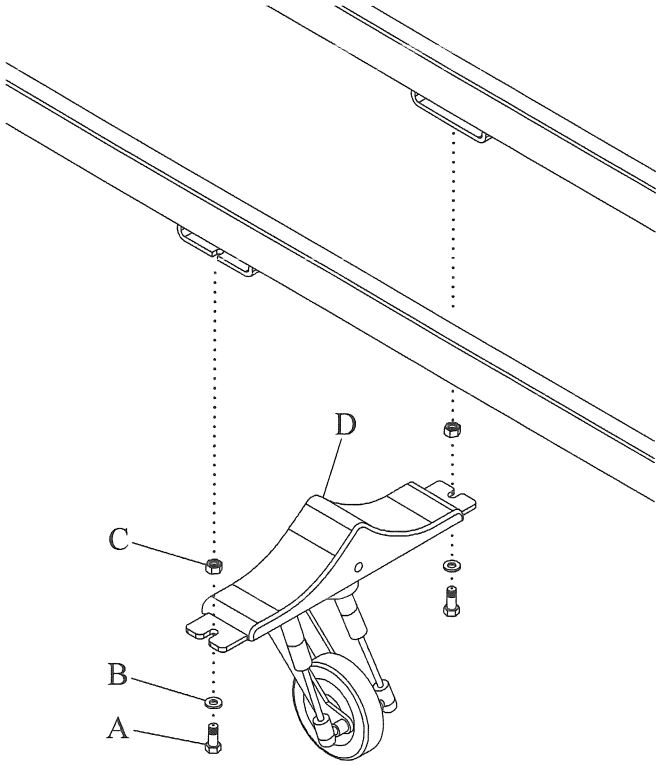
1. Set the brakes.
2. Raise the bed to its highest position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Use the scissor jack to raise the bed high enough to remove the fifth wheel.
5. Remove the screws (A), washers (B), and locknuts (C) from the fifth wheel (D) (see Figure 4-34 on page 4-62).
6. Remove the fifth wheel (D).

Figure 4-34. Fifth Wheel



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REPLACEMENT

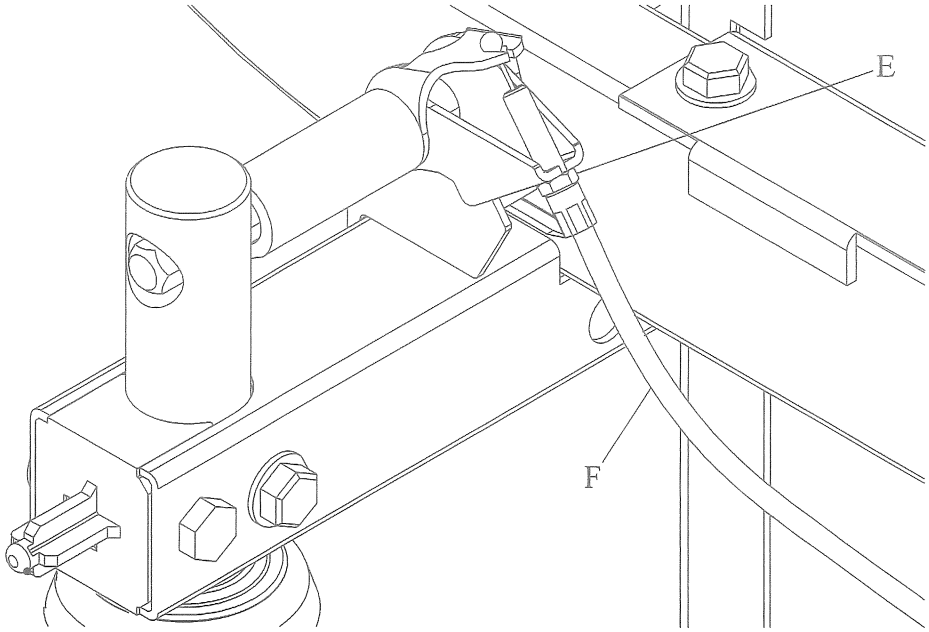
1. Do the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-4.

ADJUSTMENT

1. Put the brake/steer pedals IN the **Neutral** position. Make sure the 5th wheel turns.

2. Put the brake/steer pedals in the **Steer** position. Make sure the 5th wheel locks in line with the bed frame. If it does not, then do as follows:
   a. Loosen the jam nut (E) on the control cable (F) (see Figure 4-35 on page 4-63).

Figure 4-35. Cable Adjustment



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   b. Turn the control cable (F) counterclockwise to decrease cable tension, or clockwise to increase cable tension.
   c. Tighten the jam nut (E).
   d. Repeat steps 1 and 2 to make sure the 5th wheel operates correctly.

4.28 Brake/Steer Pedal

Tools: None

REMOVAL

1. Set the brakes.
2. Raise the bed to its highest position.

WARNING:

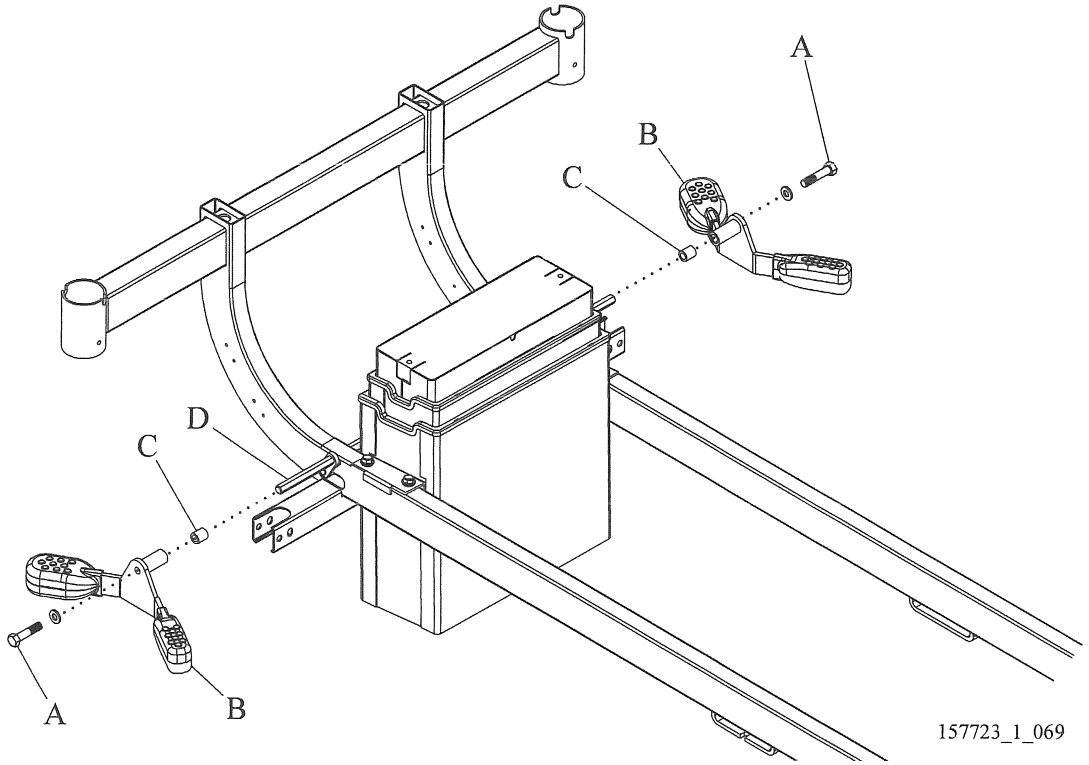
Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the screws (A) from the brake pedal (B). (see Figure 4-36 on page 4-64).
5. Remove the brake pedal (B) and spacers (C) from the brake rod (D).

REPLACEMENT

1. Do the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-4.

Figure 4-36. Pedal (The head-End is shown)



4.29 Auxiliary Outlet

Tools: Multimeter

REMOVAL

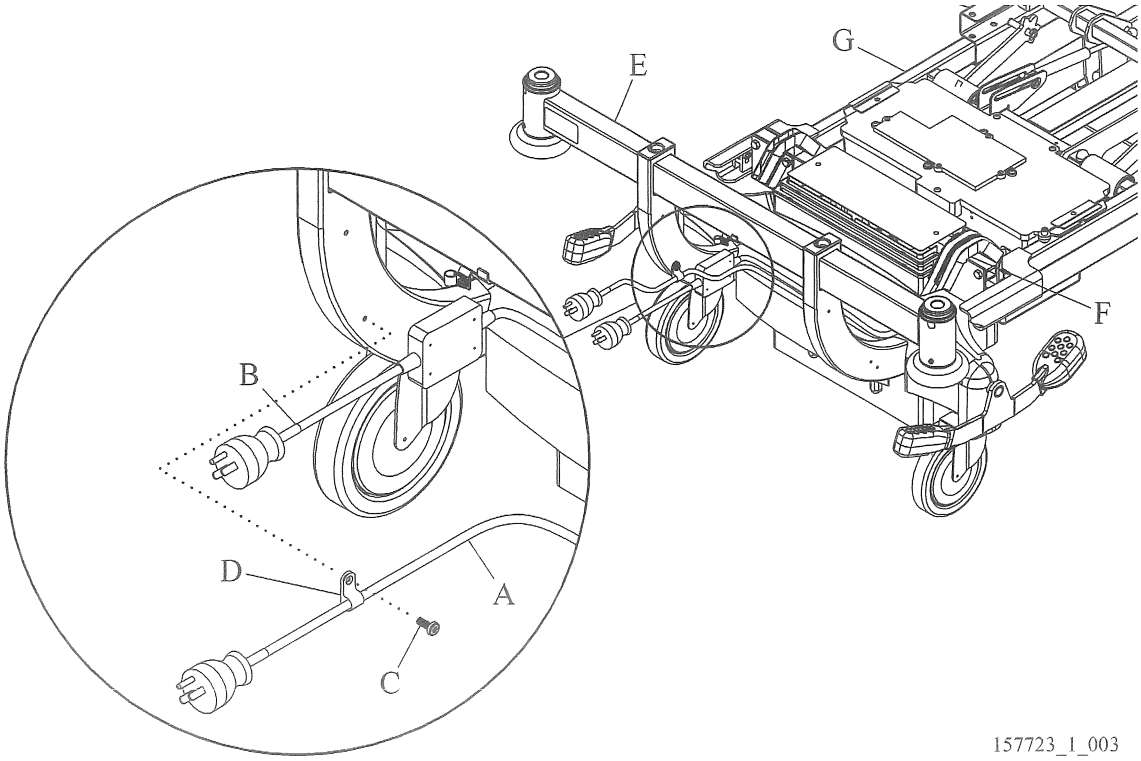
1. Set the brakes.
2. Raise the bed to the full up position.
3. Raise the head, knee, and foot sections to the full up position.
4. Raise the left siderails to the up and locked position.

WARNING:

Warning—This bed has two power cords. Failure to disconnect both power cords from their power source could cause injury or equipment damage.

5. Disconnect both power cords (A and B) from their power source. Let the bed sit for 60 seconds for the battery to time out (see Figure 4-37 on page 4-65.)
6. Remove the headboard.
7. Remove the screw (C) that attaches the cable clamp (D) to the head-end crosstube (E).
8. Remove the cable clamp (D) from the outlet power cord (A).
9. Remove the cable ties that hold the outlet power cord to the wire guide (F) and intermediate frame (G).

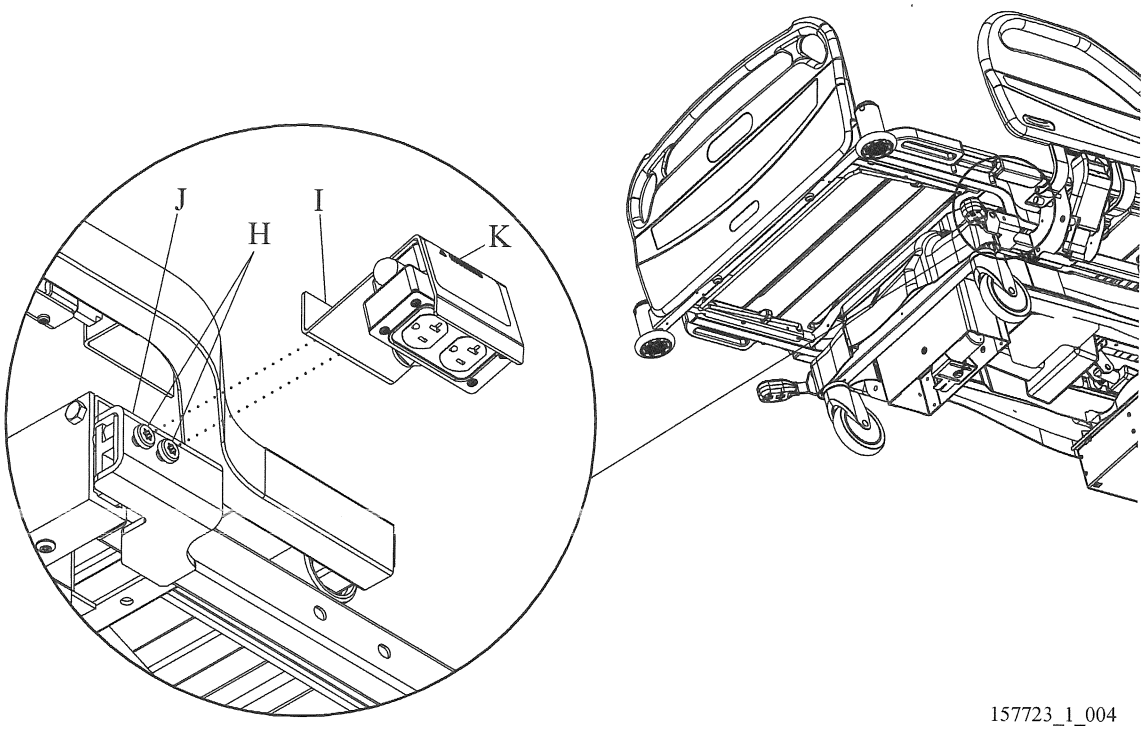
Figure 4-37. Outlet Power Cord Removal



10. Loosen the two screws (H) that attach the mounting bracket (I) to the slide block assembly (J) (see Figure 4-38 on page 4-66).

11. Remove the mounting bracket (I) from the slide block assembly (J).
12. Remove the auxiliary outlet assembly (K) from the bed.

Figure 4-38. Outlet Removal



REPLACEMENT

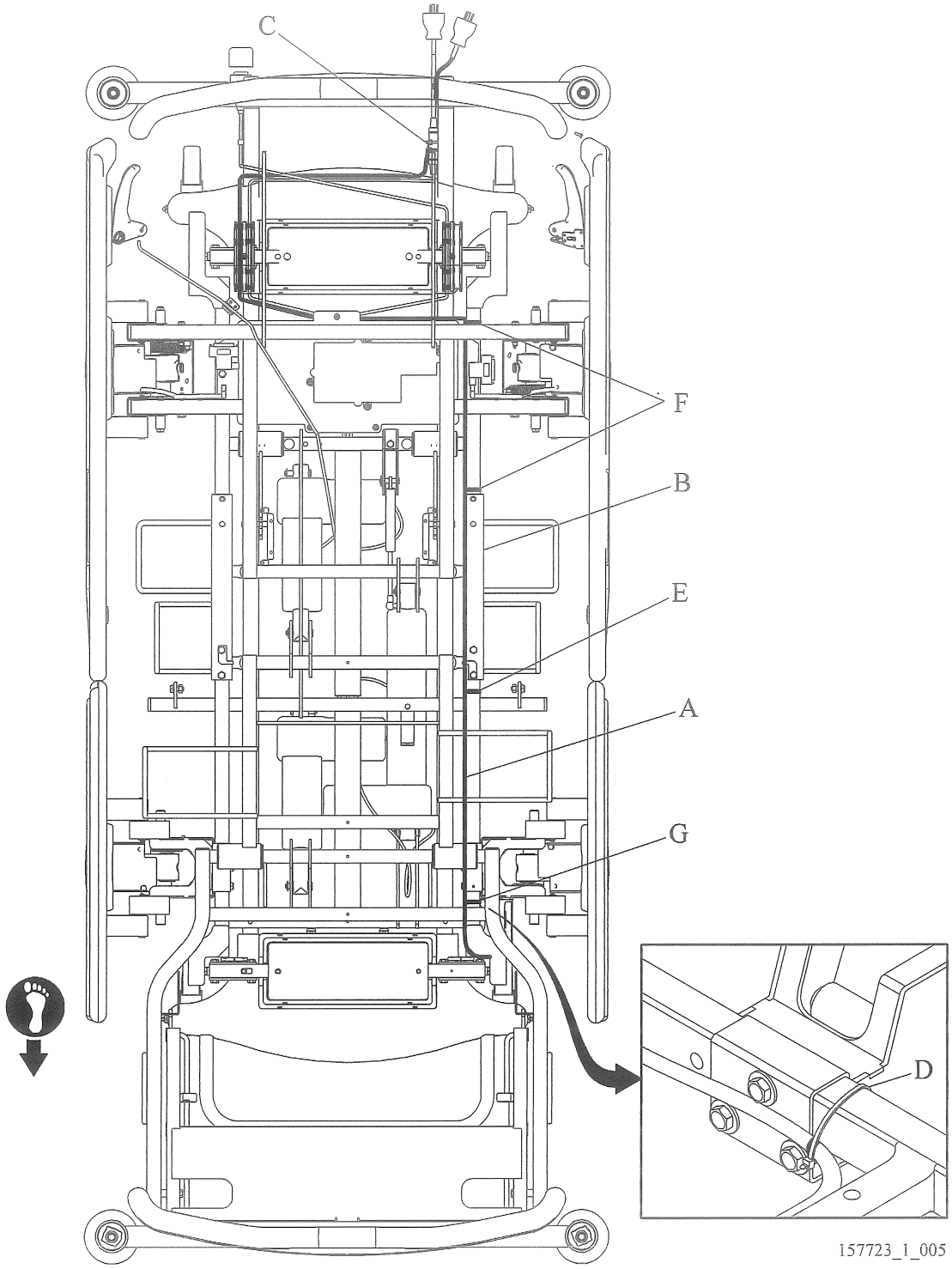
1. Do the removal procedure in reverse order. When you install the outlet power cord (A) (see Figure 4-39 on page 4-67), do as follows:
   a. Put the outlet power cord (A) along the inside of the intermediate frame (G) toward the head end of the bed.
   b. Install cable ties (L) to hold the outlet power cord (A) to the intermediate frame (G) at the locations shown on the cord (A).
   c. At the head end of the bed, put the outlet power cord (A) in the wire guide (F) (see Figure 4-37 on page 4-65).
   d. Install cable ties at the locations shown to hold the outlet power cord (A), bed power cord (B), and load cell cable to the wire guide (F).

NOTE:

The black stripe on the outlet power cord should be at the foot-end edge of the wire guide.

2. Make sure there is **no** continuity between the Line, Neutral, and Ground lines on the auxiliary outlet to the bed frame.
3. Do the "Function Checks" on page 2-4. Make sure there is no interference between the outlet power cord and the bed frame when you lower the head, knee, and foot sections.

Figure 4-39. Outlet Power Cord Routing



4.30 SafeView® Alerts

Tools: Weight, 50 lb (23 kg) minimum

Removal and Replacement

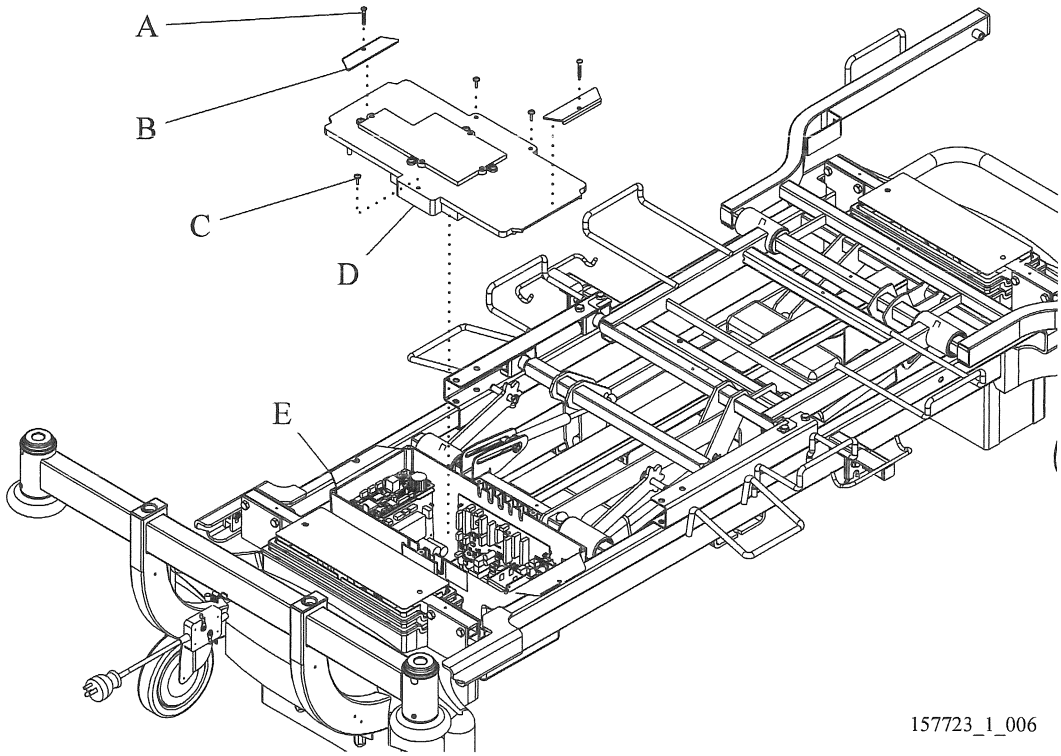
1. Set the brakes.
2. Fully extend the foot section.
3. Raise the bed to the high position.
4. Raise the head section to the highest position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

5. Unplug the bed from its power source. Let the bed sit for 60 seconds s for the battery to time out.
6. Remove the two screws (A) from the retainers (B) (see Figure 4-40 on page 4-68).
7. Remove the retainers (B).
8. Remove the three screws (C) that attach the power supply cover (D) to the power supply (E).
9. Remove the power supply cover (D).

Figure 4-40. Cover Removal



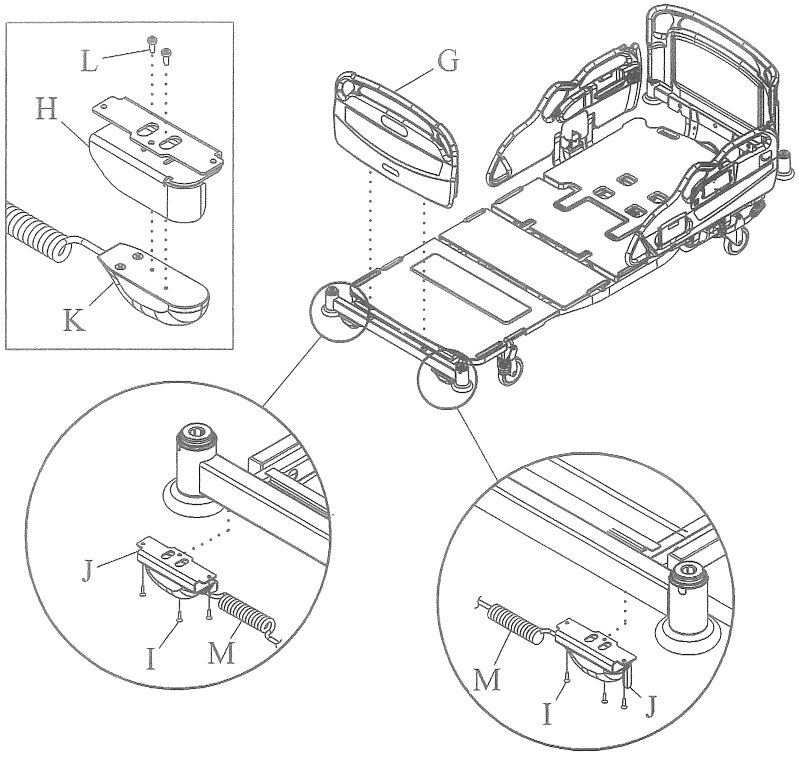
NOTE:

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

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

12. Remove the footboard (G) (see Figure 4-41 on page 4-69).

Figure 4-41. Lights Installation



13. Do as follows to remove each light assembly bracket (H) from the bed:
    a. Remove the three screws (I) that attach the light assembly bracket (H) to the end of the bed. Keep the three screws (I).
    b. Remove the light assembly bracket (H).
14. Do as follows for each new light assembly (J):
    a. Install the light (K) on the bracket (H) so the screw holes on the light (K) and the bracket (H) are aligned.
    b. Install two screws (L) to attach the light (K) to the bracket (H).
    c. Put the light assembly bracket (H) in the position where the old light assembly bracket was removed. Make sure the screw holes on the bed and the bracket (H) are aligned.

NOTE:

The light assemblies are left- and right-side specific.

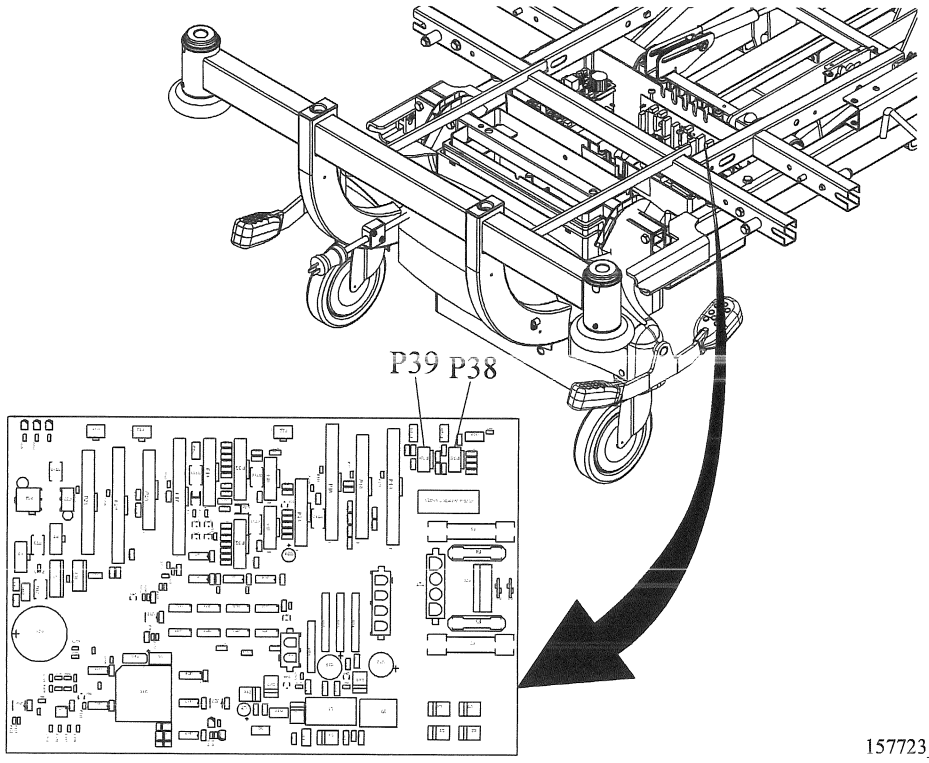
    d. Install the three screws (I) to attach the light assembly (J) to the bed.
15. From the foot end of the bed, put the new light assembly cables (M) to the siderail interface P.C. board.
16. Remove the cable ties and the old light assembly cables (M), and then install new cable ties to hold the new light assembly cables (M) on the bed.

CAUTION:

Caution—Failure to wear an antistatic strap when you handle electronic components could cause component damage.

17. Put on the antistatic strap.
18. At the siderail interface P.C. board, disconnect the old light assembly cables from positions P38 and P39 (see Figure 4-42 on page 4-70).

Figure 4-42. Cable Connection



19. Connect the new light assembly cables to positions P38 and P39 (the cables are not connector specific).
20. Remove and discard the old light assemblies.
21. Connect the bed to AC power. If the lights flash yellow and green, there is a technical problem with the lights. Make sure all part installations and cable connections are correct.
22. Put the bed is in the safe condition as follows:
    - Put the bed in the low position.
    - Put the applicable siderails up as configured. Refer to "Configure the Siderails for the Safe Bed Condition" on page 4-71.
    - Set the brake.
23. Put a minimum of 50 lb (23 kg) of weight on the bed.
24. Activate The Bed Exit Alarm System, and then do these checks to make sure the lights operate correctly:
    a. With the bed in the safe condition, the lights are on green.

b. Raise, and then lower the bed. The lights flash yellow when the bed is raised, and the lights are on green when the bed is in the low position.

c. Lower, and then raise each siderail (two head end, and as applicable, one or both foot end). The lights flash yellow when one of the siderails is lowered, and the lights are on green when all applicable siderails are up.

d. Release, and then set the brake. The lights flash yellow when the brake is released, and the lights are on green when the brake is set.

e. Deactivate the Bed Exit Alarm System. The lights are off.

25. Remove the 50 lb (23 kg) of weight from the bed.
26. Do the "Function Checks" on page 2-4.

Configure the Siderails for the Safe Bed Condition

At a minimum, the two head-end siderails must be up for the lights to show green. To configure the system so that one or both of the foot siderails must also be up for the lights to show green, do as follows:

1. Put the two head-end and one or both of the foot-end siderails in the up position.
2. Press these controls at the same time for five seconds: Knee Up, Knee Down, Bed Up, and Bed Down. The lights will flash green for three seconds to let you know the configuration was set.
3. To change the configuration so that only the two head-end siderails must be up, do Step 2 with only the two head-end siderails up.

4.31 IntelliDrive® Transport Handles

Tools: None

REMOVAL

1. Set the brakes.
2. Raise the bed to the high position.
3. Raise the head section to the highest position.

WARNING:

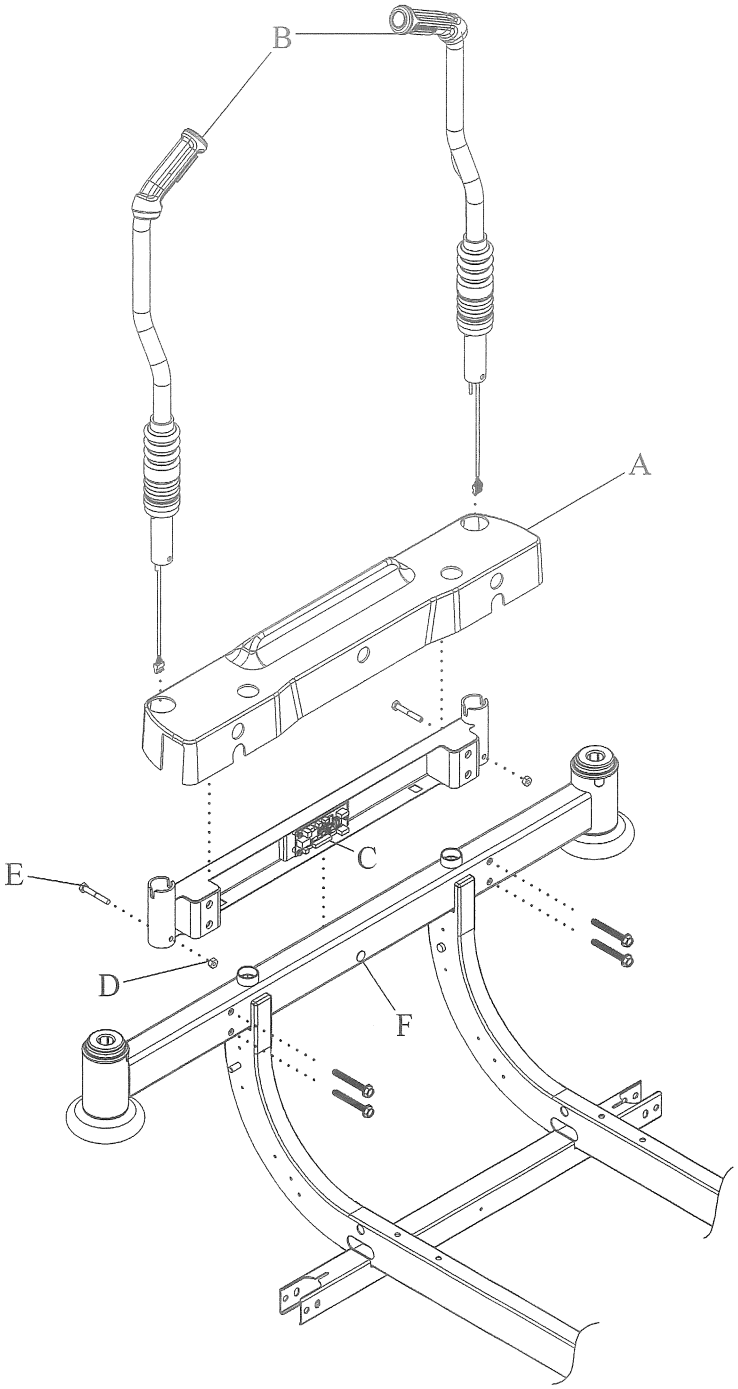
Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

4. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
5. Raise the frame cover (A) (see Figure 4-43 on page 4-73).
6. Disconnect the applicable handle (B) from the interface P.C. board (C).
7. Cut and remove any cable ties that attach the handle cable to the bed.
8. Remove the nut (D) and bolt (E) from the applicable handle (B).
9. Remove the handle (B).

REPLACEMENT

1. Install the new handle (B) in the bed.
2. Install the bolt (E) through the handle (B) and bed.
3. Install the nut (D) on the bolt (E).
4. Connect the handle cable to the interface P.C. board (C).
   - Connect the enable switch cable (two-pin) to connector **P5** on the interface P.C. board (C).
   - Connect the strain gauge cable (five-pin) to connector **P2** on the interface P.C. board (C).
5. Install cable ties where they were removed earlier.
6. Use a common ground to make sure the voltage on the interface P.C. board (C) at **P6**, pin 1, is between 2.49 V DC and 2.51 V DC. If necessary, adjust **R8** through the hole (FO in the frame.
7. Lower the frame cover (A).
8. Do the "Function Checks" on page 2-4.

Figure 4-43. Transport Handles



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4.32 IntelliDrive® Batteries

Tools: None

REMOVAL

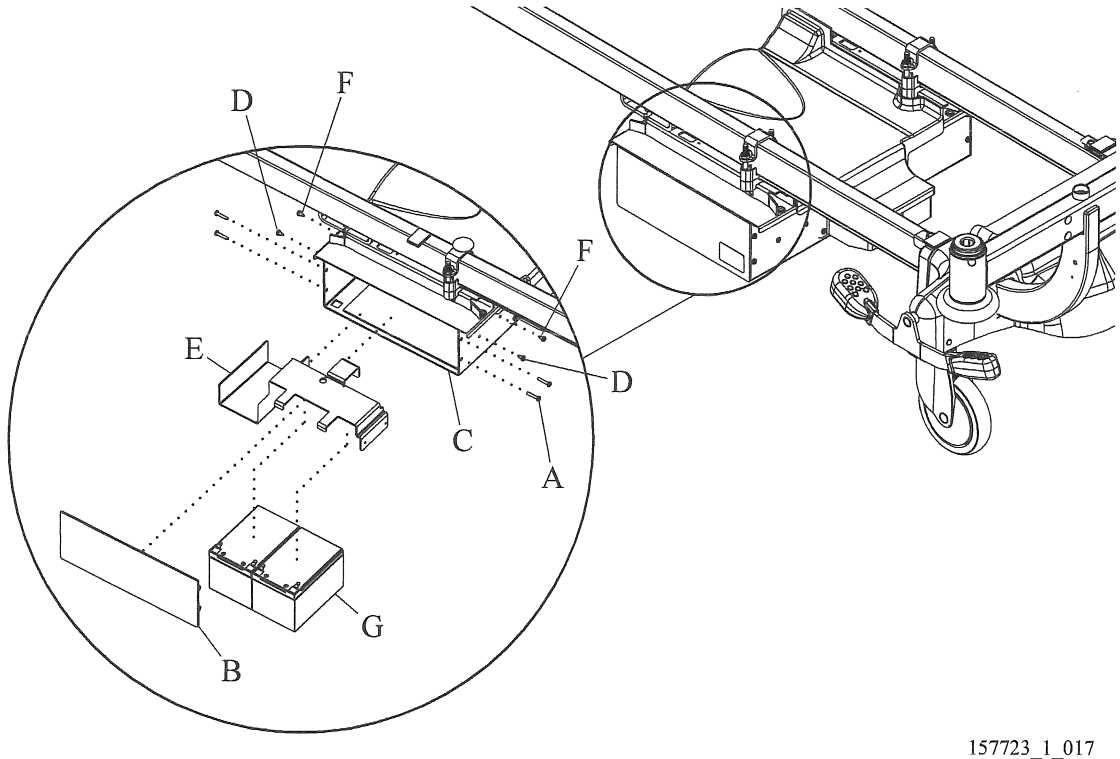
1. Set the brakes.
2. Raise the bed to the high position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug 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 left-end panel (B) to the drive box (C) (see Figure 4-44 on page 4-74).
5. Disconnect the power cord from the power supply.
6. Remove the two screws (D) that attach the battery bracket (E) to the drive box (C).
7. Loosen, do not remove, the two screws (F) that attach the battery bracket (E) to the drive box (C).
8. Rotate the battery bracket (E) up.
9. Slide the batteries (G) part way out of the drive box (C).
10. Note the position of the battery wires.
11. Disconnect the battery wires.
12. Remove the batteries (G) from the drive box (C).

Figure 4-44. Batteries



157723_1_017

Replacement

1. Put the new batteries (G) in the drive box (C).
2. Connect the battery wires to the batteries (G).
3. Install the batteries (G) in the drive box (C).
4. Do the rest of the removal procedure in reverse order.
5. Do the "Function Checks" on page 2-4.
6. Dispose of the batteries in accordance with local and federal standards.

4.33 IntelliDrive® Interface P.C. Board

Tools: Multimeter

REMOVAL

1. Set the brakes.
2. Raise the bed to the high position.
3. Raise the head section to the highest position.

WARNING:

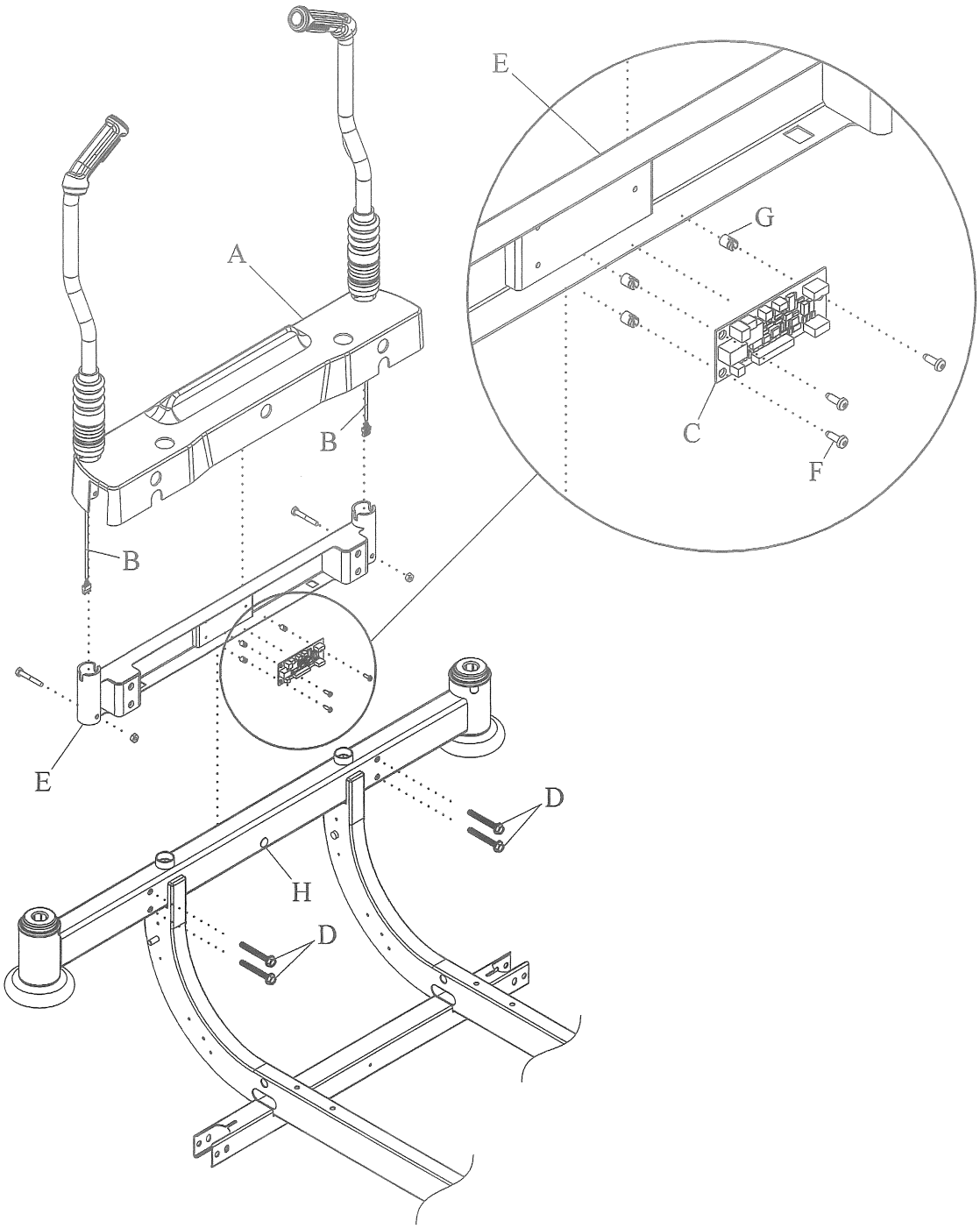
Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

4. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
5. Raise the frame cover (A) (see Figure 4-45 on page 4-77).
6. Disconnect the handle cables (B) from the interface P.C. board (C).
7. Disconnect the interface to PACM cable.
8. Remove the four bolts (D) that attach the mount bracket (E) to the bed.
9. Remove the mount bracket (E) and put it on a flat surface.
10. Remove the three screws (F) and spacers (G) that attach the P.C. board (C) to the mount bracket (E).
11. Remove the P.C. board (C).

REPLACEMENT

1. Do the removal procedure in reverse.
2. Connect the handle cables (B) to the interface P.C. board (C).
   - Connect the enable switch cable (two-pin) to connector **P5** on the interface P.C. board (C).
   - Connect the strain gauge cable (five-pin) to connector **P2** on the interface P.C. board (C).
3. Connect the interface to PACM cable.
4. Install wire ties where they were removed earlier.
5. Use a common ground to make sure the voltage on the interface P.C. board (C) at **P6**, pin 1, is between 2.49 V DC and 2.51 V DC. If necessary, adjust **R8** through the hole (H) in the frame.
6. Do the "Function Checks" on page 2-4.

Figure 4-45. Interface P.C. Board



4.34 IntelliDrive® PACM Board

Tools: None

REMOVAL

1. Set the brakes.
2. Raise the bed to the high position.

WARNING:

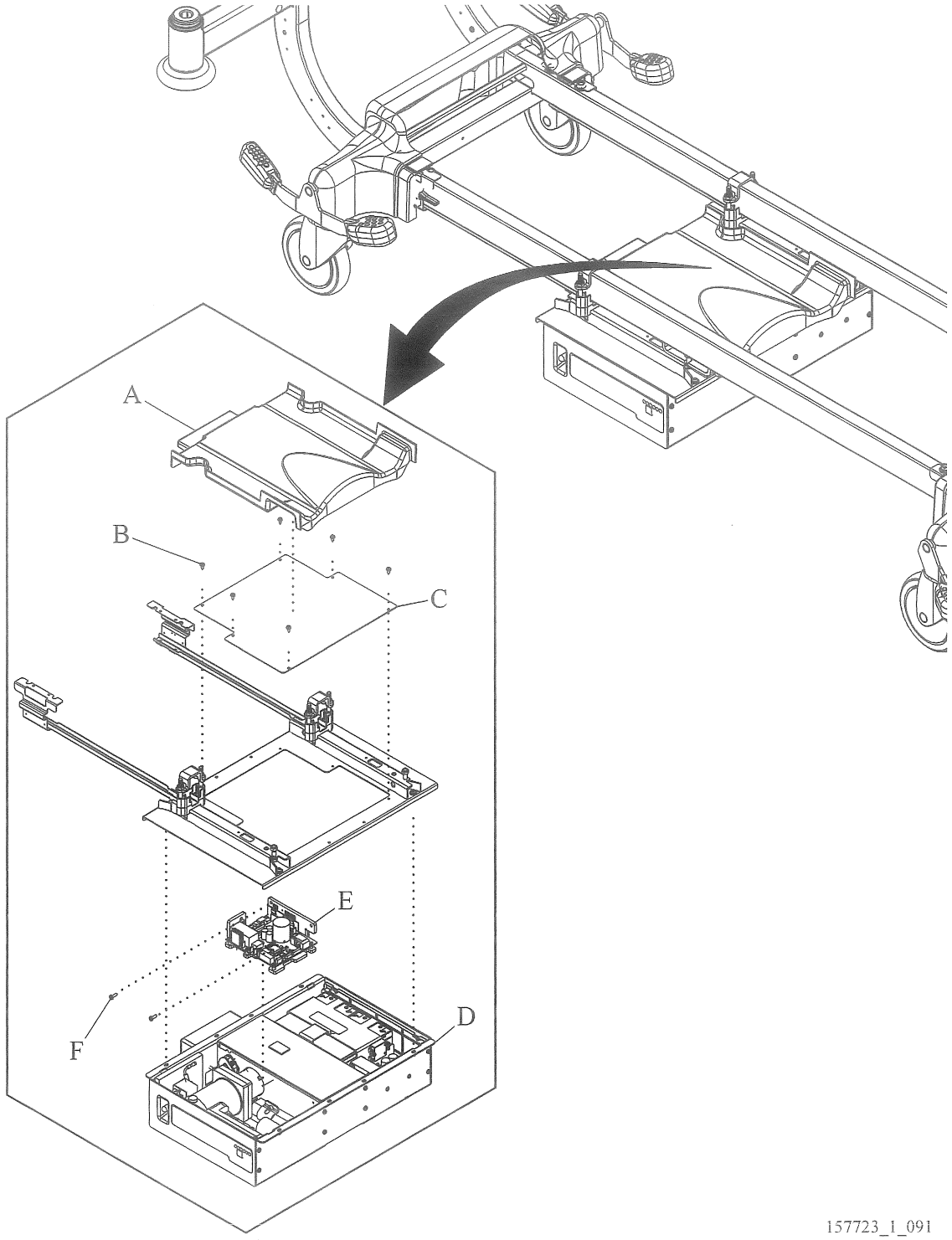
Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove both lower frame covers.
5. Remove the drive box cover (A) (see Figure 4-46 on page 4-79).
6. Remove the six screws (B) that attach the cover plate (C) to the drive box (D).
7. Remove the cover plate (C).
8. Disconnect all the cables from the PACM board (E).
9. Remove the two screws (F) that attach the PACM board (E) to the drive box (D).
10. Remove the PACM board (E).

REPLACEMENT

1. Do the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-4.

Figure 4-46. PACM Board



4.35 IntelliDrive® Motor Controller

Tools: None

REMOVAL

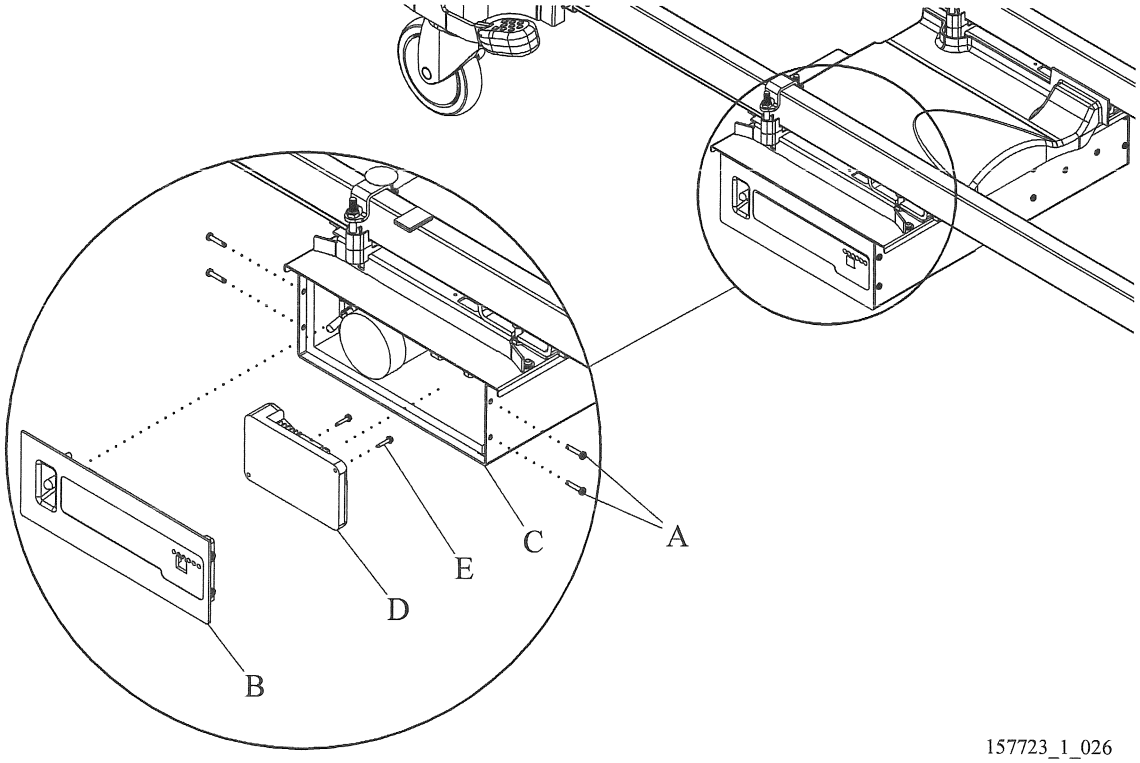
1. Set the brakes.
2. Raise the bed to the high position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug 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 right-end cover (B) to the drive box (C) (see Figure 4-47 on page 4-80).
5. Remove the cover (B).
6. Disconnect the cables from the motor controller (D).
7. Remove the two screws (E) that attach the motor controller (D) to the cover (B).
8. Remove the motor controller (D).

Figure 4-47. Motor Controller



REPLACEMENT

1. Do the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-4.

4.36 IntelliDrive® Drive Box

Tools: None

REMOVAL

1. Set the brakes.
2. Raise the bed to the high position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the left and right lower frame covers.
5. Remove the drive box cover (A) (see Figure 4-48 on page 4-82).
6. Remove the six screws (B) that attach the cover plate (C) to the drive box (D).
7. Remove the cover plate (C).
8. Remove the four screws (E) from the left-end cover (F).
9. Disconnect the power cord from the power supply.
10. Disconnect the interface board-to-PACM board cable.
11. Remove the two nuts (G) from the front mount bolts (H).

NOTE:

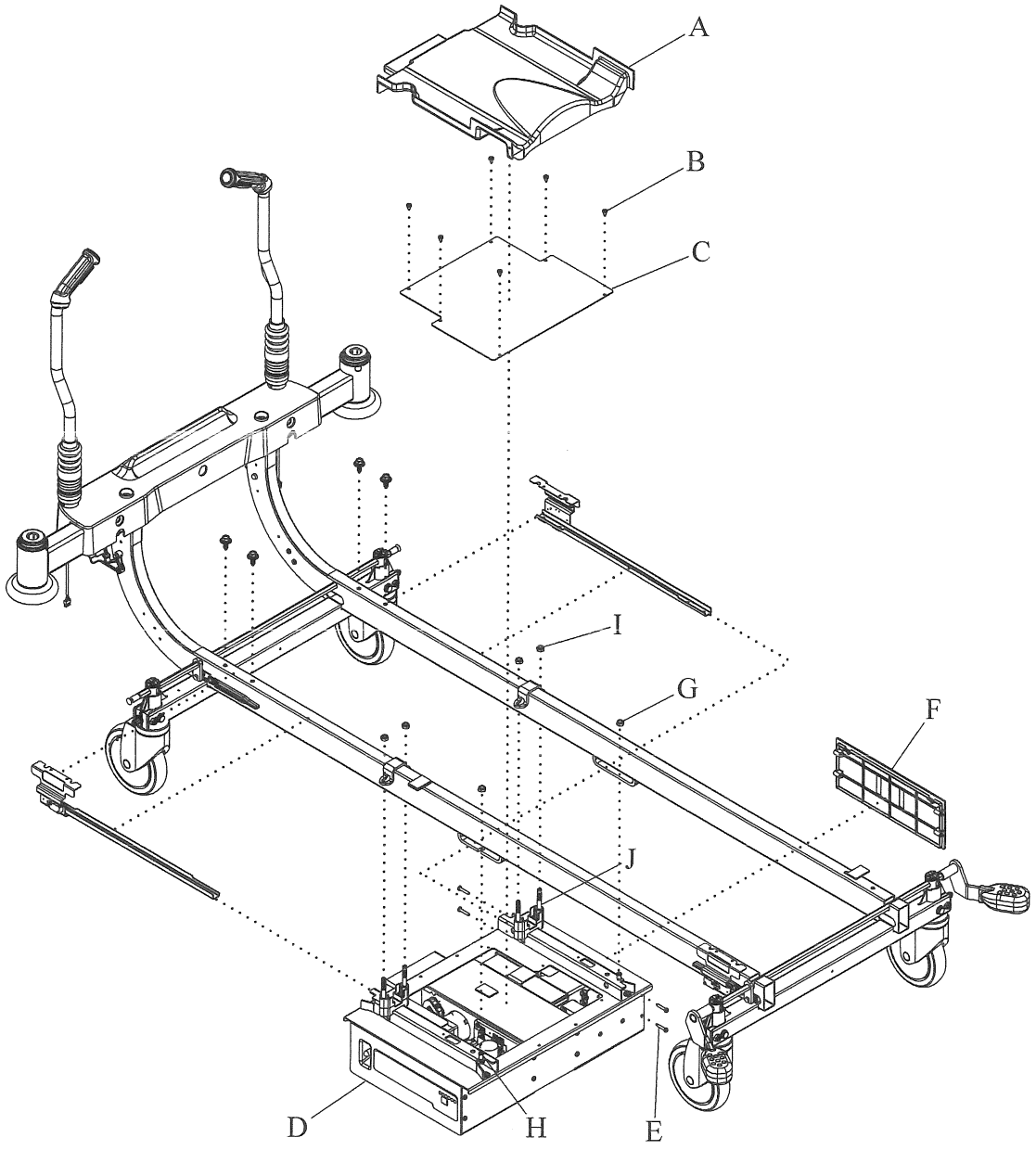
The forward mount bolts are welded to the drive box.

12. Loosen evenly and remove the four nuts (I) on the U-bolts (J).
13. Slide the drive box (D) out from the bed.

REPLACEMENT

1. Do the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-4.

Figure 4-48. Drive Box



4.37 IntelliDrive® Drive Motor

Tools: None

REMOVAL

1. Set the brakes.
2. Raise the bed to the high position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the drive box. Refer to Procedure 4.36 on page 4-81.
5. Disconnect the two drive motor cables (A) from the PACM board (B) (see Figure 4-49 on page 4-84).
6. Disconnect the four controller wires (C) from the PACM board (B).
7. Disconnect the controller harness (D) from the PACM board (B).
8. Disconnect the battery cable (E) from the PACM board (B).
9. Remove the cover (F).
10. Remove the 12 screws (G) that attach the drive assembly (H) to the drive box.

NOTE:

It may be necessary to loosen the remaining screws on the box so the drive assembly can be easily removed.

11. Remove the drive assembly (H) from the drive box.
12. Loosen the nut (I) on the linear actuator lever (J).
13. Disconnect the linear actuator lever (J) from the drive assembly rod (K).
14. Remove the drive assembly (H) from the motor mounting plate (L).
15. Remove the drive motor coupler (M) from the drive motor (N).
16. Remove the four screws (O) that attach the drive motor (N) to the motor mounting plate (L).
17. Remove the drive motor (N) from the motor mounting plate (L).

REPLACEMENT

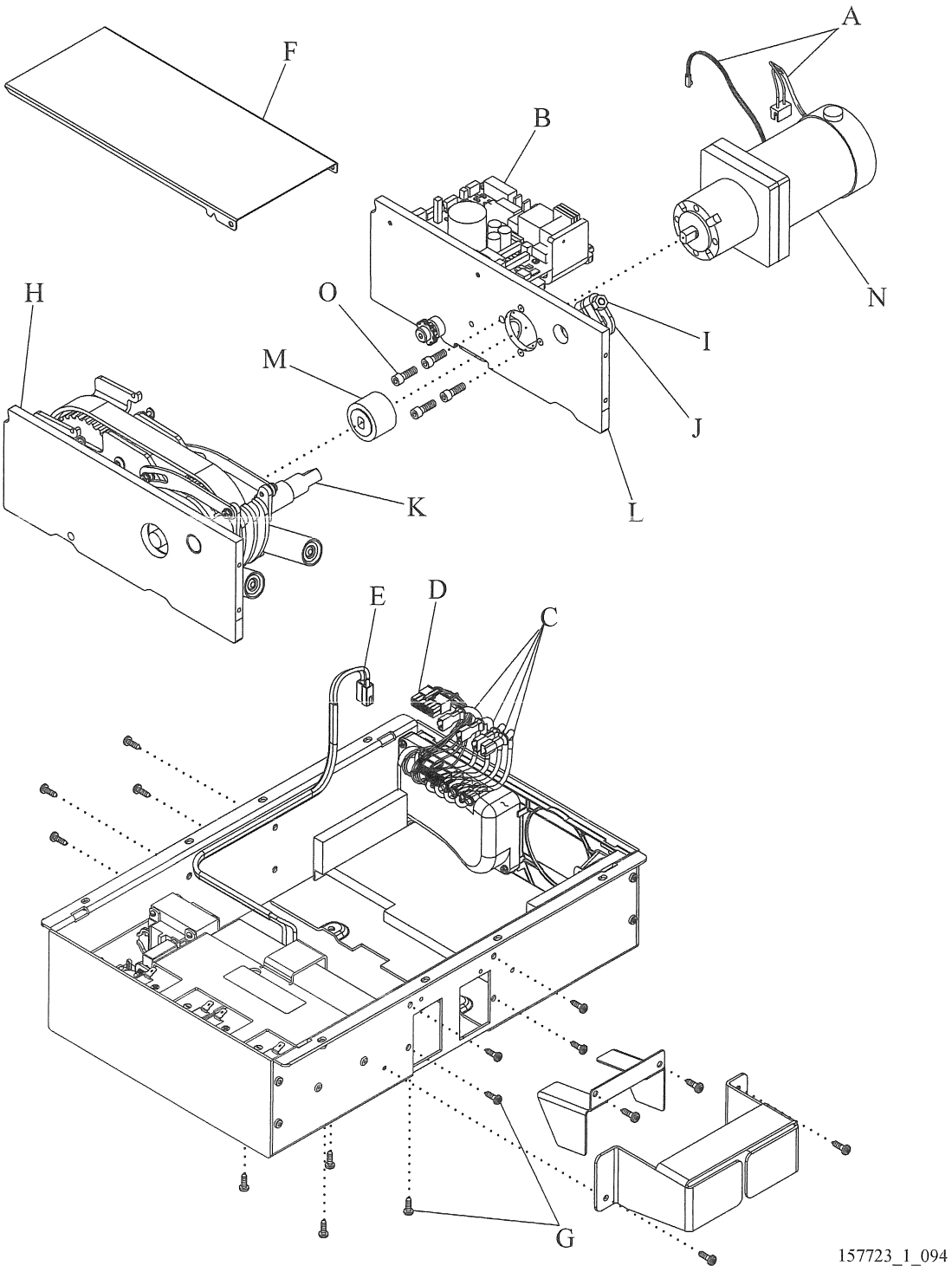
1. Do the removal procedure in reverse order.

NOTE:

The battery end of the drive box goes toward the patients left side of the bed.

2. Do the "Function Checks" on page 2-4.

Figure 4-49. Drive Motor



4.38 IntelliDrive® Drive Unit

Tools: None

REMOVAL

1. Set the brakes.
2. Raise the bed to the high position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

3. Unplug the bed from its power source. Let the bed sit for 60 seconds s for the battery to time out.
4. Remove the drive box. Refer to Procedure 4.36 on page 4-81.
5. Remove the cover (A) (see Figure 4-50 on page 4-86).
6. Remove the 12 screws (B) that attach the drive assembly (C) to the drive box.

NOTE:

It may be necessary to loosen the remaining screws on the box so the drive assembly can be easily removed.

7. Remove the drive assembly (C) from the drive box.
8. Loosen the nut (D) on the linear actuator lever (E).
9. Disconnect the linear actuator lever (E) from the drive assembly rod (F).
10. Remove the drive assembly (C) from the motor mounting plate (G).
11. Remove the drive plate (H) from the drive assembly (C).
12. Remove the chain and spring assembly (I) from the plate (J) (see Figure 4-51 on page 4-87).

Figure 4-50. Drive Unit

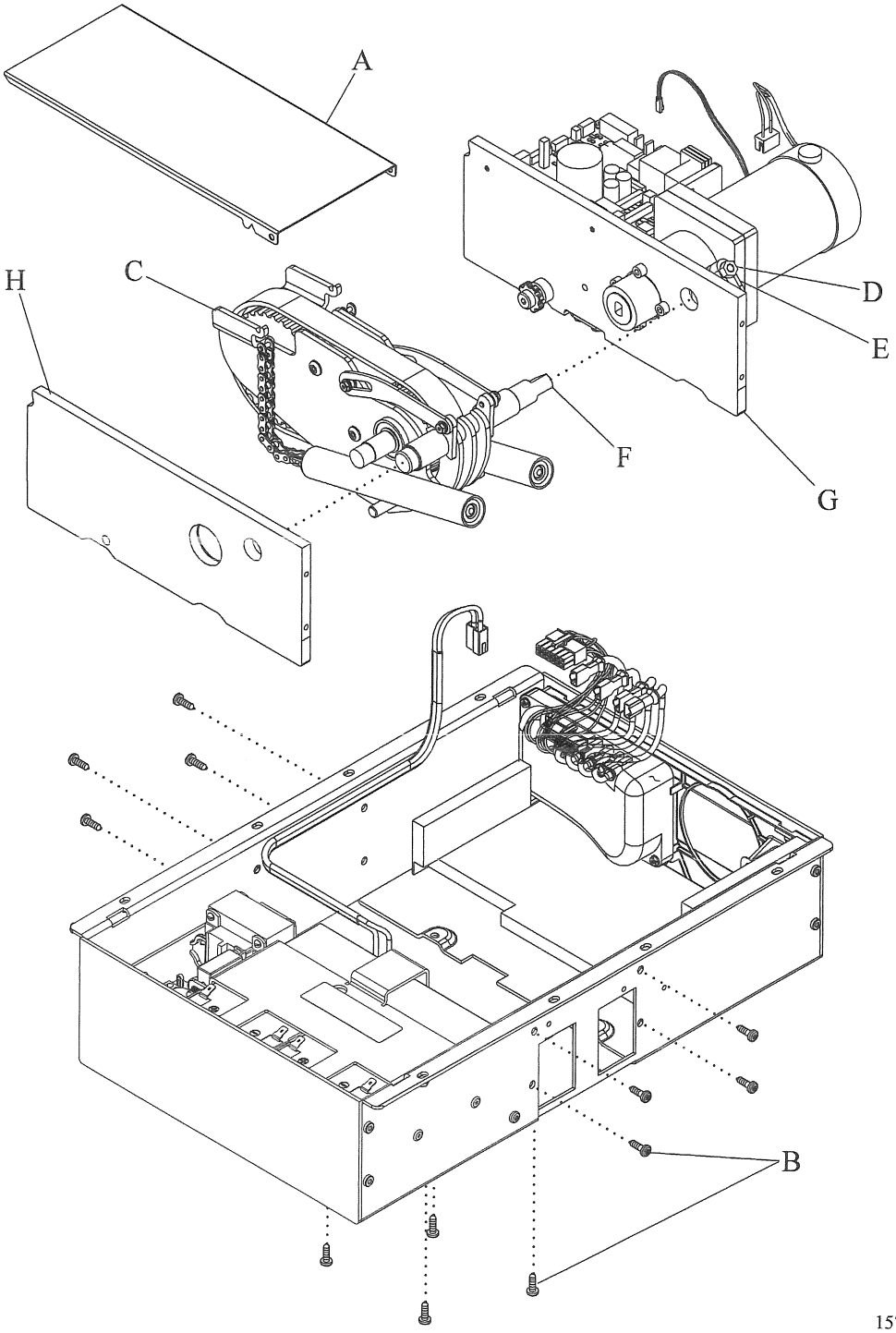
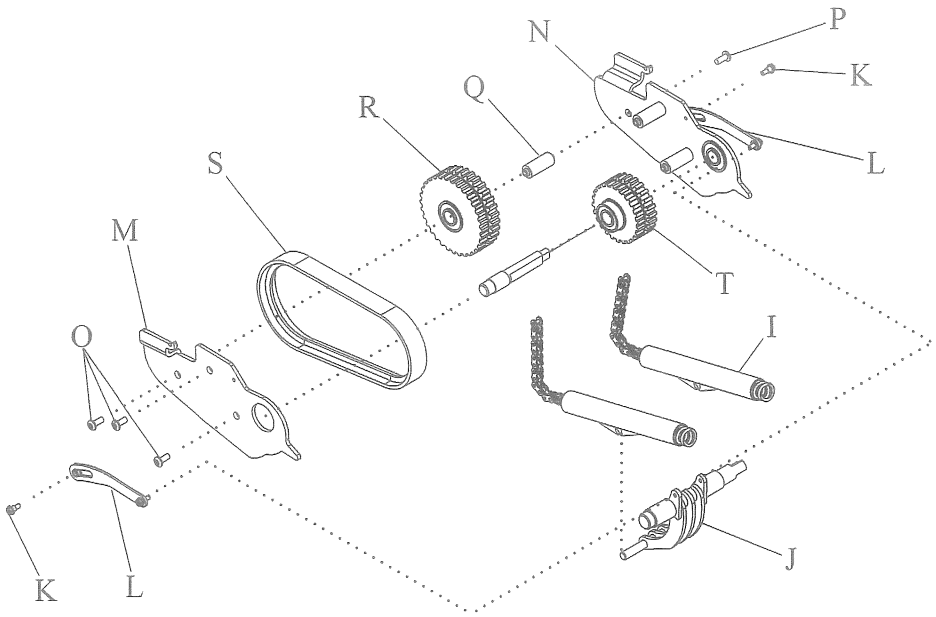


Figure 4-51. Drive Belt



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13. Remove the two screws (K) that attach the return links (L) to the pulley side plates (M and N).
14. Turn the return links (L) up and out of the way.
15. Remove the three screws (O) that attach the left-side pulley plate (M) to the drive assembly.
16. Remove the left-side pulley plate (M).
17. Remove the screw (P) that attaches the right-side pulley plate (N) to the pulley shaft (Q).
18. Remove the pulley (R) and belt (S) from the drive assembly.
19. Remove the belt (S) from the two pulleys (R and T).

Replacement

1. Do the removal procedure in reverse order.
2. The battery end of the drive box goes toward the patients left side of the bed.
3. Do the "Function Checks" on page 2-4.

4.39 Head Angle Sensor

Tools: Inclinometer

REMOVAL

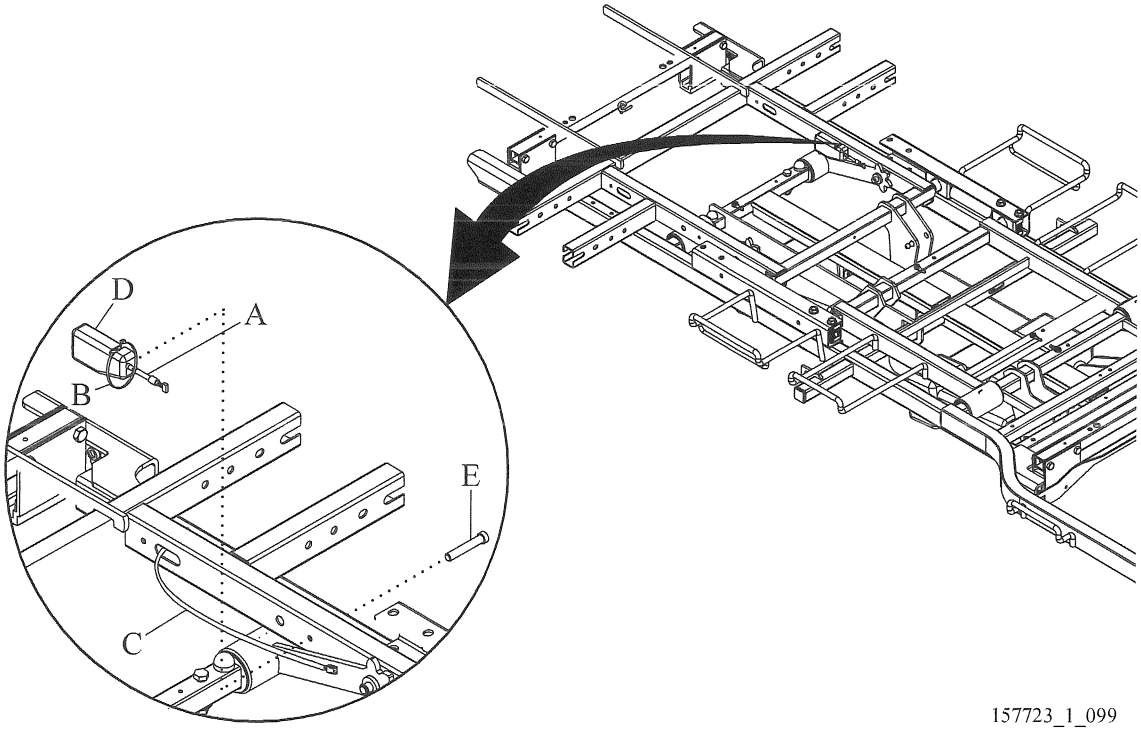
1. Set the brakes.
2. Raise the bed to the high position.
3. Raise the head section to the highest position.

WARNING:

Warning—Failure to unplug the bed from its power source could cause injury or equipment damage.

4. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
5. Remove the power supply cover.
6. Disconnect the sensor cable (A) from the siderail control P.C. board (see Figure 4-52 on page 4-88).
7. Cut and remove the cable tie (B) that attaches the siderail cable (C) to the sensor (D).
8. Cut and remove the cable ties that attach the sensor cable (A) to the bed.
9. Remove the bolt (E) that attaches the sensor to the bed.
10. Remove the sensor (D) from the bed.

Figure 4-52. Sensor



REPLACEMENT

1. Do the removal procedure in reverse order.
2. Do the Calibration below.

CALIBRATION

1. Connect the bed to mains power.
2. Fully lower the head section.
3. Attach the inclinometer to the head section frame.
4. Put the bed in calibration mode as follows:
   a. Press and hold the **Lockout** control.
   b. Press and hold the **Lockout**, **Trendelenburg**, and **Reverse Trendelenburg** controls until a buzzer comes on and the scale control shows **CAL 5**.
5. Raise the head section to 5°.
6. Press the **Lockout** control. The scale control shows "CAL 30".
7. Raise the head section to 30°.
8. Press the **Lockout** control. The scale control shows "CAL 50".
9. Raise the head section to 50°.
10. Press the **Lockout** control. The scale control shows 50°.
11. Press and hold the **Lockout**, **Trendelenburg**, and **Reverse Trendelenburg** controls to take the bed out of calibration mode.
12. Raise and lower the head section to make sure the angle changes on the control pod.
13. Raise the head section above 30°.
14. Turn on the Head of Bed alarm.
15. Lower the head section below 30°. Make sure the alarm comes on.
16. Turn off the Head of Bed alarm.
17. Do the "Function Checks" on page 2-4.

4.40 Traction Frame Support Module (P1181B)

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

REMOVAL

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

WARNING:

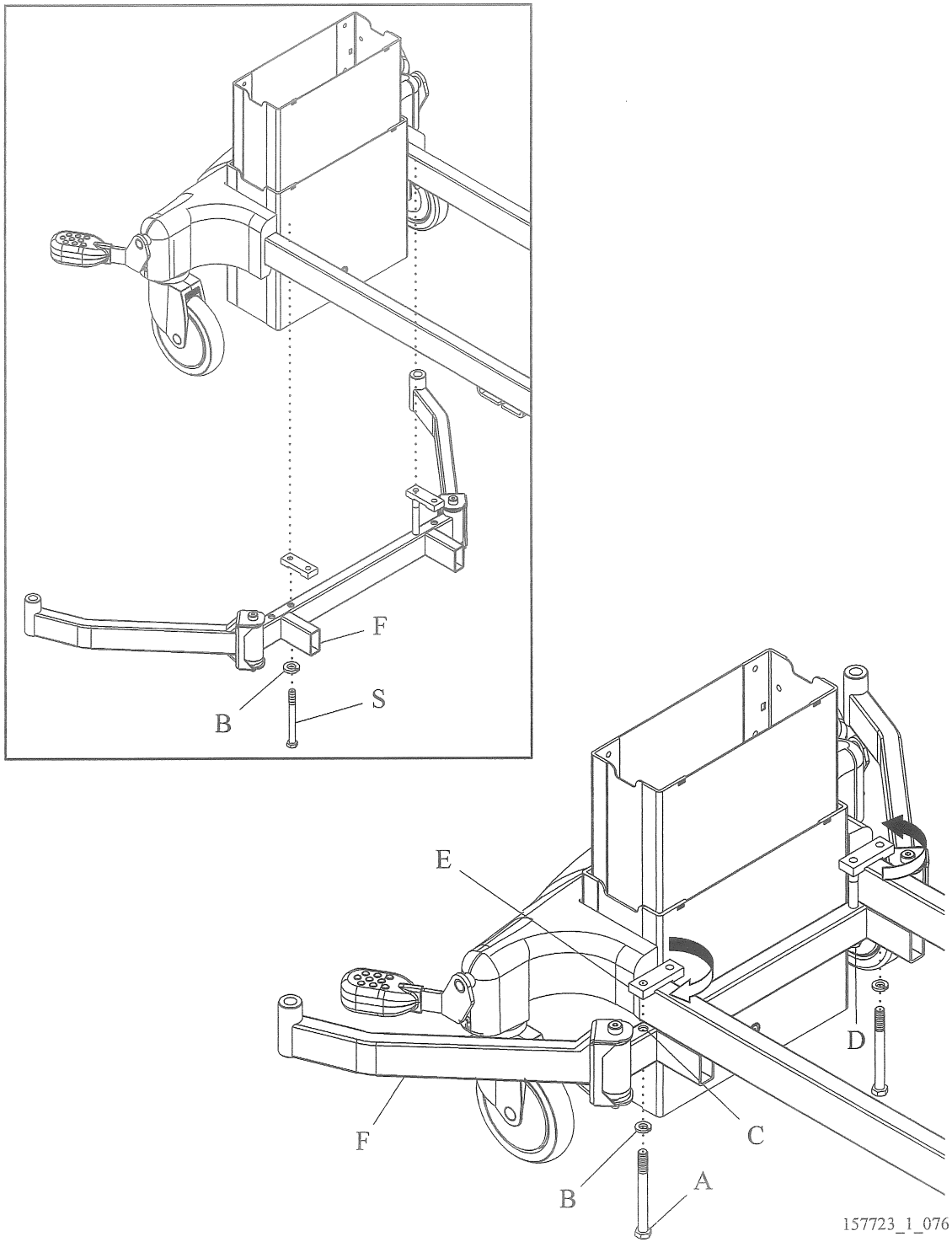
Warning—Failure to unplug the bed could cause personal injury or equipment damage.

3. Unplug the bed from its power source. Let the bed sit for 60 seconds for the battery to time out.
4. Remove the two bolts (A) and washers (B) from the outer holes (C) (see Figure 4-53 on page 4-91).
5. Loosen, do not remove, the two inner bolts (D).
6. Turn the nut plate (E) away from the frame.
7. Remove the module (F) from the bed.

INSTALLATION

1. Do the removal procedure in reverse order.
2. Tighten all four bolts (A and D) to 40 ft-lb (54 N·m) of torque.

Figure 4-53. Traction Frame Support Module Installation



4.41 Obstacle Detect Sensor Strip

Tools: 13 mm wrench T25 Torx® screwdriver Anti-static strap

REMOVAL

1. Set the brakes.
2. Raise the bed to a comfortable working height.
3. Fully raise the head section.

WARNING:

Warning—Failure to unplug the bed can cause injury or equipment damage.

4. Unplug the bed, and let it sit for 60 seconds to allow the battery to time out.
5. Remove the power supply cover.

CAUTION:

Caution—Failure to wear an antistatic wrist strap can cause equipment damage.

6. Put on the antistatic wrist strap, and connect it to a bonding location.
7. Disconnect the sensor strip from the siderail interface P.C. board cable.
8. Remove the screws (A) on each end of the sensor strip (B) and remove the sensor strip (B) (see figure 1 on page 8). Do not remove the middle screws (C).

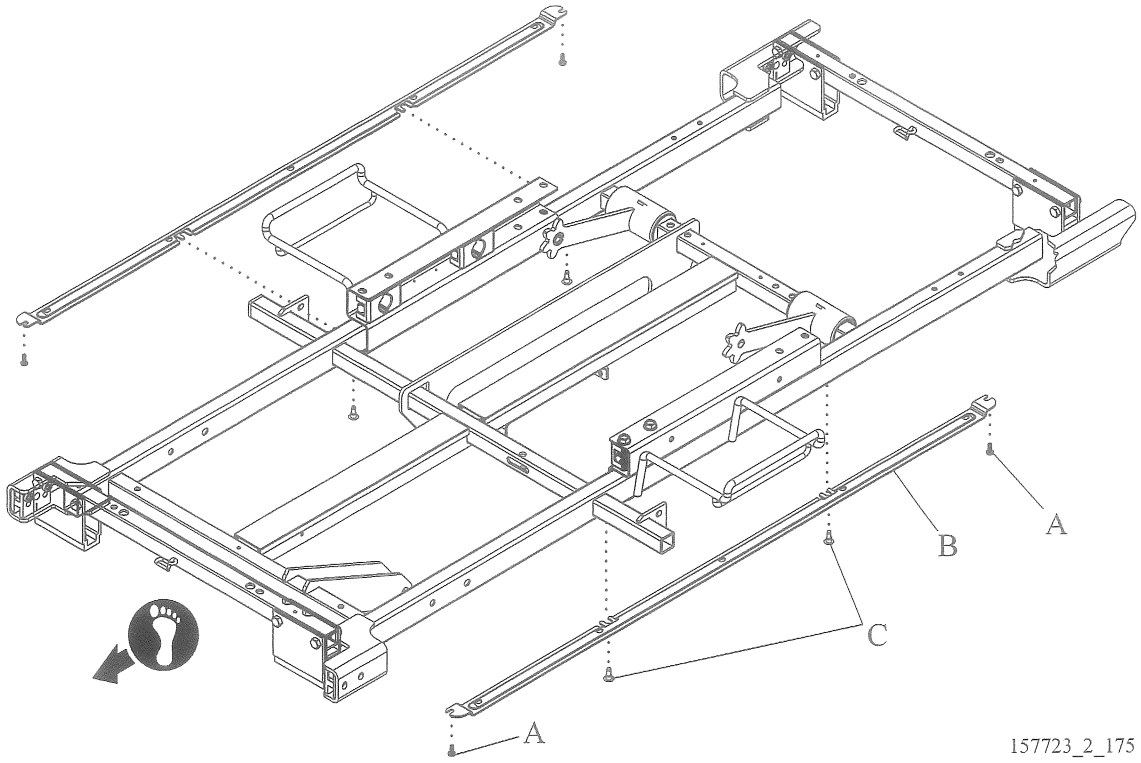
REPLACEMENT

1. Do the removal procedure in reverse order.

NOTE:

The sensor strips are side specific.

Figure 4-54. Obstacle Detect Sensor Strip



4

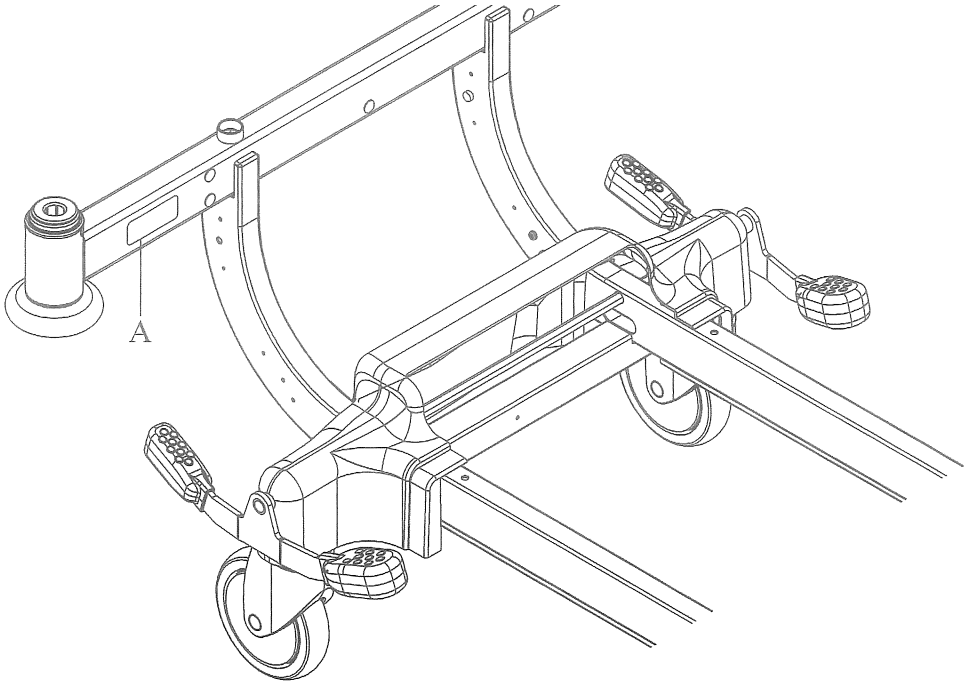
NOTES:

Chapter 5
Parts List

SERVICE PARTS ORDERING

Use the parts lists in this manual to identify the necessary part number(s). 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



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Call Hill-Rom Technical Support at (800) 445-3720 with the following information:

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

To promptly order parts, request part prices and availability, or follow up on a service order, use the following 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 ground transportation unless specified

Address all inquiries to:

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

Address all return goods to:

ATTN SERVICE STORES
RITTER PLANT EAST END DOOR R33
HILL-ROM, INC.
COUNTY ROAD 300E
BATESVILLE IN 47006

NOTE:

To eliminate possible delays or incorrect billings, **do not** return any items without a Return Material Authorization (RMA) number. When a return is requested, 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, obtain one by phoning Hill-Rom Technical Support at(800) 445-3720.

EXCHANGE POLICY

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

IN-WARRANTY EXCHANGES

In some cases, Hill-Rom will request that parts/products be returned for inspection. When this occurs, you are expected to return parts/products within 30 days of receipt of the exchange part. If you fail to return the inoperative parts/products within the 30 day period, Hill-Rom will invoice your facility for the full selling price of the parts/products.

NOTE:

The preceding billing procedure pertains **only** to parts/products that Hill-Rom requests to be returned.

In some cases, the invoice accompanying the parts will show the full selling price (only for internal use at Hill-Rom). Do not confuse this price with your price.

Do not return any parts without an RMA number. When parts/products have been requested to be returned, Hill-Rom will include an RMA packet with the parts/products shipment. If an RMA number is not available, obtain one by phoning Hill-Rom Technical Support at (800) 445-3720.

OUT-OF-WARRANTY EXCHANGES

You are expected to return the inoperative parts/products within 30 days of receipt of the exchange part. Hill-Rom will include an RMA packet with the parts/products shipment. If an RMA number is not available, obtain one by phoning Hill-Rom Technical Support at (800) 445-3720. Hill-Rom will invoice your facility for the full selling price of the parts/products. Upon return of the inoperative parts/products, Hill-Rom will issue a credit to your facility for **the difference between the exchange price and the full selling price of the parts/products**.

LIMITED 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 following warranty.

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, call Hill-Rom Technical Support Department at (800) 445-3720, Monday through Friday. In Canada, call Hill-Rom Technical Support Department at (800) 267-2337, Monday through Friday. Outside the United States and Canada, call your authorized Hill-Rom Distributor. In order to expedite service, we request you furnish the following 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 requested by Hill-Rom, products or parts for which a warranty claim is made shall be returned prepaid to Hill-Rom's factory.

OUT OF WARRANTY EXCHANGE POLICY

After the expiration of the original warranty, upon request, Hill-Rom will ship as a replacement, components such as selected: motors and printed circuit boards, for like units returned to Hill-Rom by the original purchaser at a substantial savings. Please call 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 performed 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 routine 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.

ADM004 REV 4 July 2010

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

RECOMMENDED SPARE PARTS

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

Table 5-1. Recommended Spare Parts

Part Number	Quantity	Description
16646201	1	Pendant, without SideCom® Communication System
16646202	1	Pendant, with SideCom® Communication System
128594	2	Fuse, battery
128595	2	Fuse, SideCom® Communication System
138884	1	Head motor (Use with CPR cable 71520)
167986	1	Thigh motor
167987	1	Leg motor
16213301	1	Caster, brake
16213303	1	Caster, brake/steer (non-IntelliDrive beds)
16213302	1	Caster, conductive
38827	1 can	Paint, light neutral
4314311	2	Fuse, 5 x 20 mm, 1A, 250 V SLOBLO (IntelliDrive beds)
133251	2	Fuse,.25 x 1.25, 5A, 250 V, TD, 3AG
	1	Hilow column
155963	1	Siderail interface P.C. board
148822	1	P.C. board scale
132628	1	P.C. board, motor control
156499	1	SideCom® Communication System P.C board, standard
157438	1	SideCom® Communication System P.C board, Zenith
133167	1	Power cord, NEMA5-15P, 10A/250V
133008	1	Power cord, NEMA5-15P, 13A/125V
155973	1	Strap, SR stowage
156511	2	Screw, mach, pan, TX, M4, 0.787
155981	2	Label, strap screw cover FD

Base Frame (Sheet 1 of 2)

Figure 5-2. Base Frame (Sheet 1 of 2)

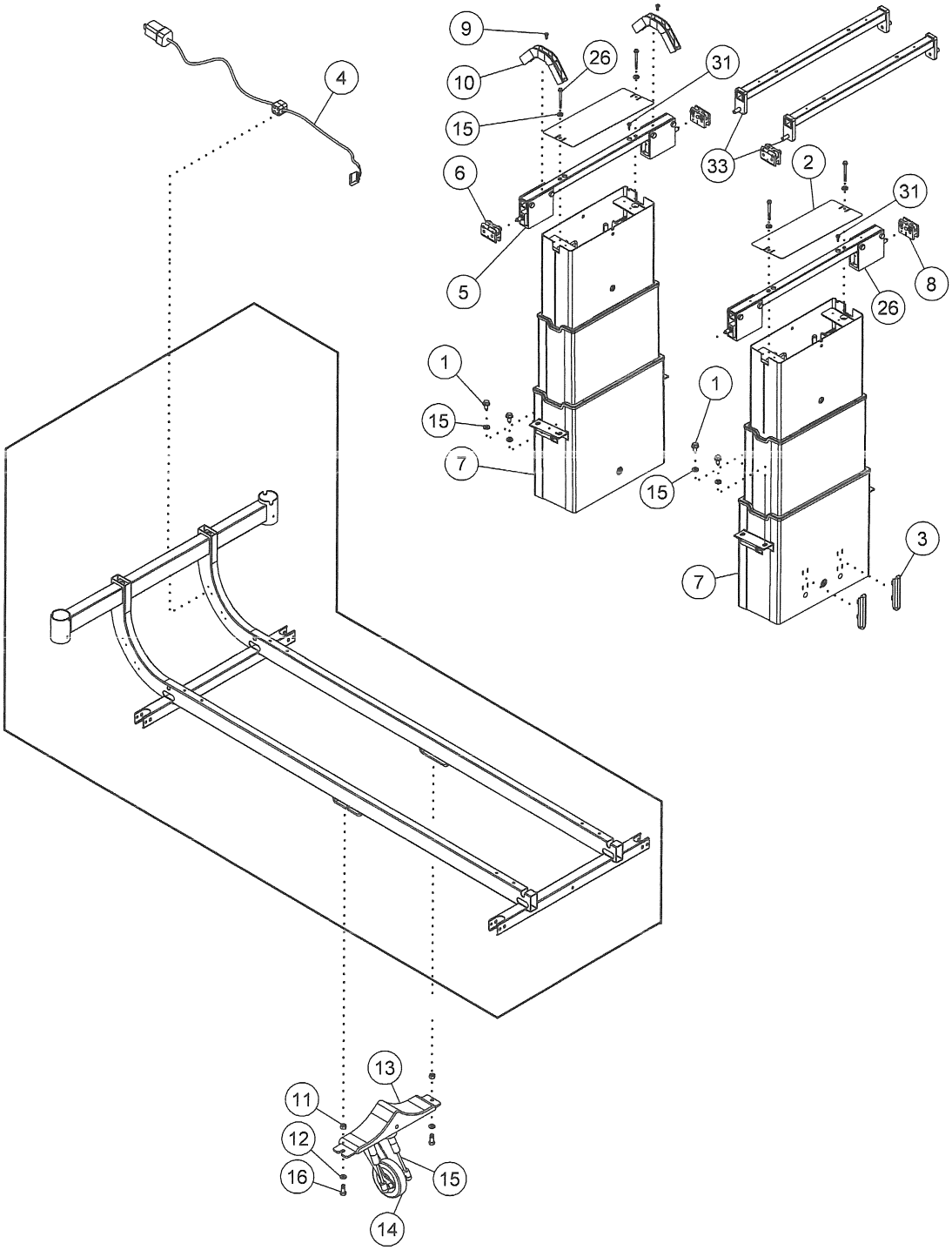

Table 5-2. Base Frame (Sheet 1 of 2)

Item Number	Part Number	Quantity	Description
1	VI0610A	8	Screw
2	132180	2	Cover, column
3	S30545K	4	Cover
4	133167	1	Power cord, NEMA5-15P, 10A/250V
	133008	1	Power cord, NEMA5-15P, 13A/125V
5	190026	2	Load beam assembly
6	132080	2	Slide block
7	CA0025	2	Hilow column
8	132054	2	Slide block assembly
9	VI0613A	4	Screw
10	132369	2	Wire guide, plastic
11	VI0367	2	Locknut
12	VI0616A	2	Washer
13	F11260A	1	5th wheel cover
14	RO0112A	1	Caster (5th wheel)
15	VE0142A	2	5th wheel gas cylinder
16	VI0610A	2	Screw

Base Frame (Sheet 2 of 2)

Figure 5-3. Base Frame (Sheet 2 of 2)

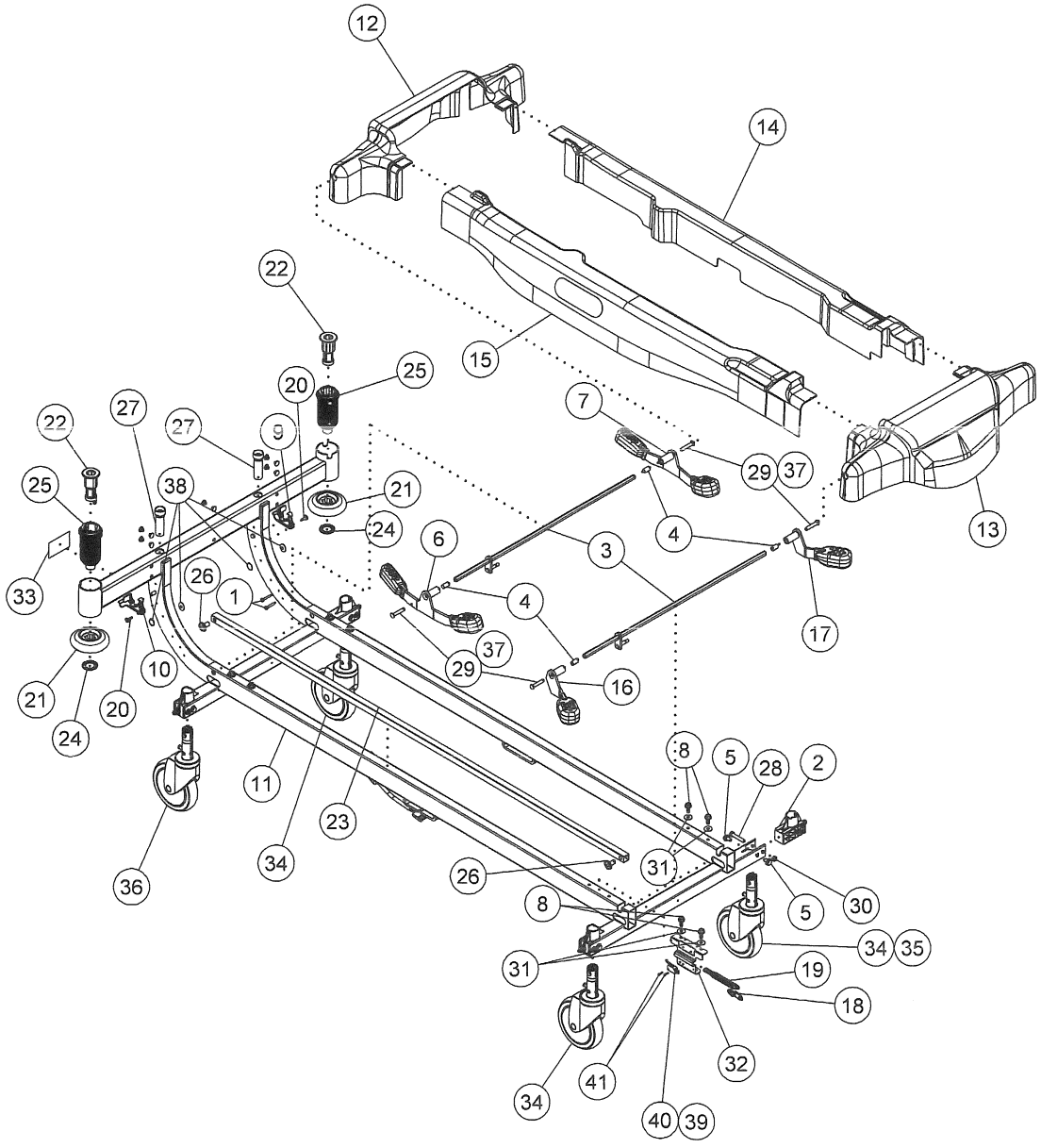

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Table 5-3. Base Frame (Sheet 2 of 2)

Item Number	Part Number	Quantity	Description
1	136561	2	Screw
2	140430	4	Caster socket
3	141260	2	Hex rod assembly
4	141308	4	Spacer
5	143178	8	Screw
6	148237	1	Brake/steer pedal, rh
7	149238	1	Brake/steer pedal, lh
8	150620	8	Screw
9	15107601	1	Cord wrap, lh
10	15107602	1	Cord wrap, rh
11	155385	1	Lower frame assembly
12	164126	1	Head shroud
13	164127	1	Foot shroud
14	165376	1	Base shroud, lh
15	165375	1	Base shroud, rh
16	156550	1	Brake/steer pedal, rh
17	156551	1	Brake/steer pedal, lh
18	156873	1	Brake switch link
19	156874	1	Brake switch cam
20	70882	2	Screw
21	71082	2	Bumper
22	71438	2	IV pole adapter
23	F11203A	1	Brake/steer link
24	QD0663	2	Washer
25	143678	2	Socket
26	S30527K	2	Plastic bushing
27	S30534L	2	Socket
28	VI0020	4	Screw
29	VI0302	4	Screw
30	VI0367	4	Nut
31	VI0616A	8	Washer
32	155408	1	Brake switch bracket
33	147971	1	Label
34	16213301	1	Caster, brake
35	16213303	1	Caster, brake/steer (non-IntelliDrive beds)
36	16213302	1	Caster, conductive
37	64467	As required	Loctite® adhesive
38	33358	4	Plug

Item Number	Part Number	Quantity	Description
39	73096	1	Wire tie
40	158018	1	Brake switch assembly
41	157932	2	Screw
Not Shown	60786	2	Screw, Cap, RND, MXST, 10-32, .750

Foot Extension

Figure 5-4. Foot Extension

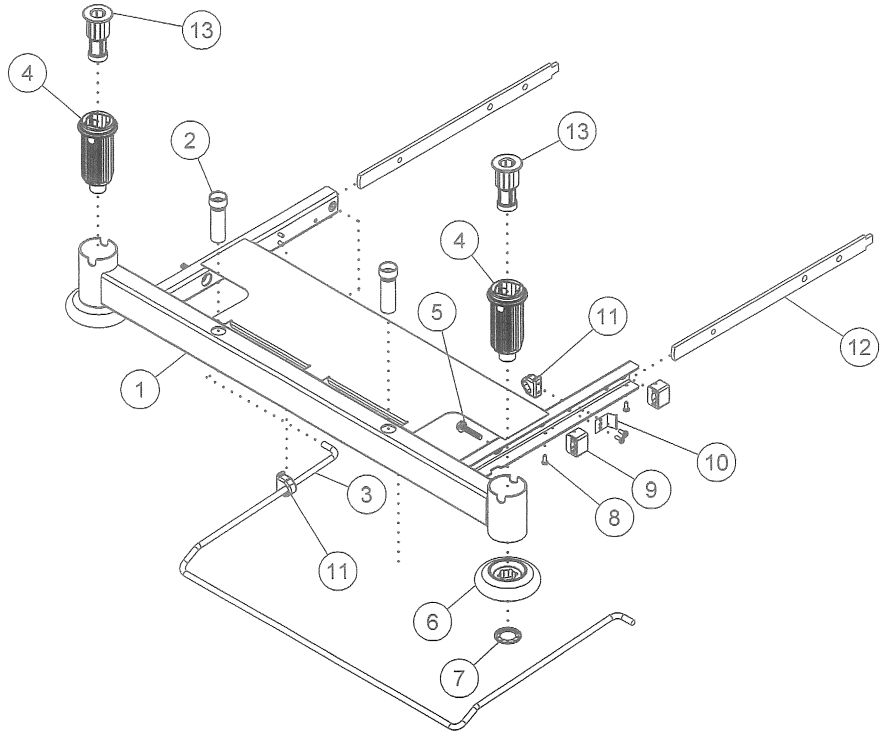

Table 5-4. Foot Extension

Item Number	Part Number	Quantity	Description
1	154275	1	Weldment
2	S30534L	2	Fixing device
3	71266	1	Release handle
4	143678	2	Socket
5	150621	2	Screw
6	71082	2	Bumper
7	QD0663	2	Washer
8	VI0402	8	Screw
9	S30315A	4	Extension pad
10	S20998B	2	Leaf
11	S30314	2	Guide
12	155521	2	Bar
13	71438	2	Adapter
Not Shown	60786	2	Screw, Cap, RND, MXST, 10-32, .750

Articulating Frame (Sheet 1 of 2)

Figure 5-5. Articulating Frame (Sheet 1 of 2)

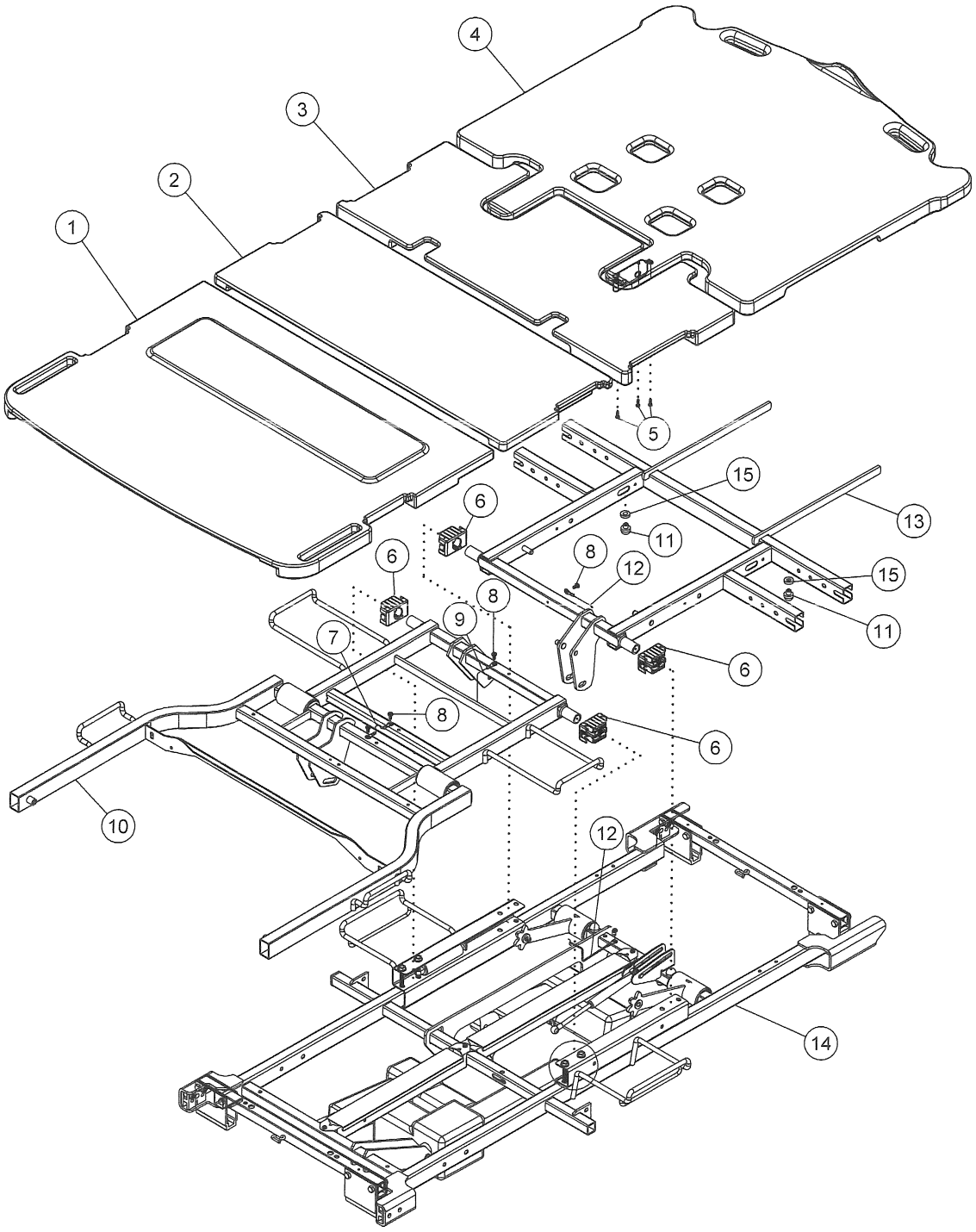

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Table 5-5. Articulating Frame (Sheet 1 of 2)

Item Number	Part Number	Quantity	Description
1	155184	1	Sleep surface, foot
2	155183	1	Sleep surface, knee
3	155182	1	Sleep surface, thigh
4	155186	1	Sleep surface, head
5	156394	3	Screw
6	S30531K	4	Bushing
7	QD0630	1	Ground strap
8	147268	2	Screw
9	QD2346	1	Ground strap
10	184263	1	Weldment, leg and thigh
11	QD1545A	2	Bumper
12	QD2345	1	Ground strap
13	184265	1	Weldment, bracket
14	184080	1	Weldment, intermediate frame

Articulating Frame (Sheet 2 of 2)

Figure 5-6. Articulating Frame (Sheet 2 of 2)

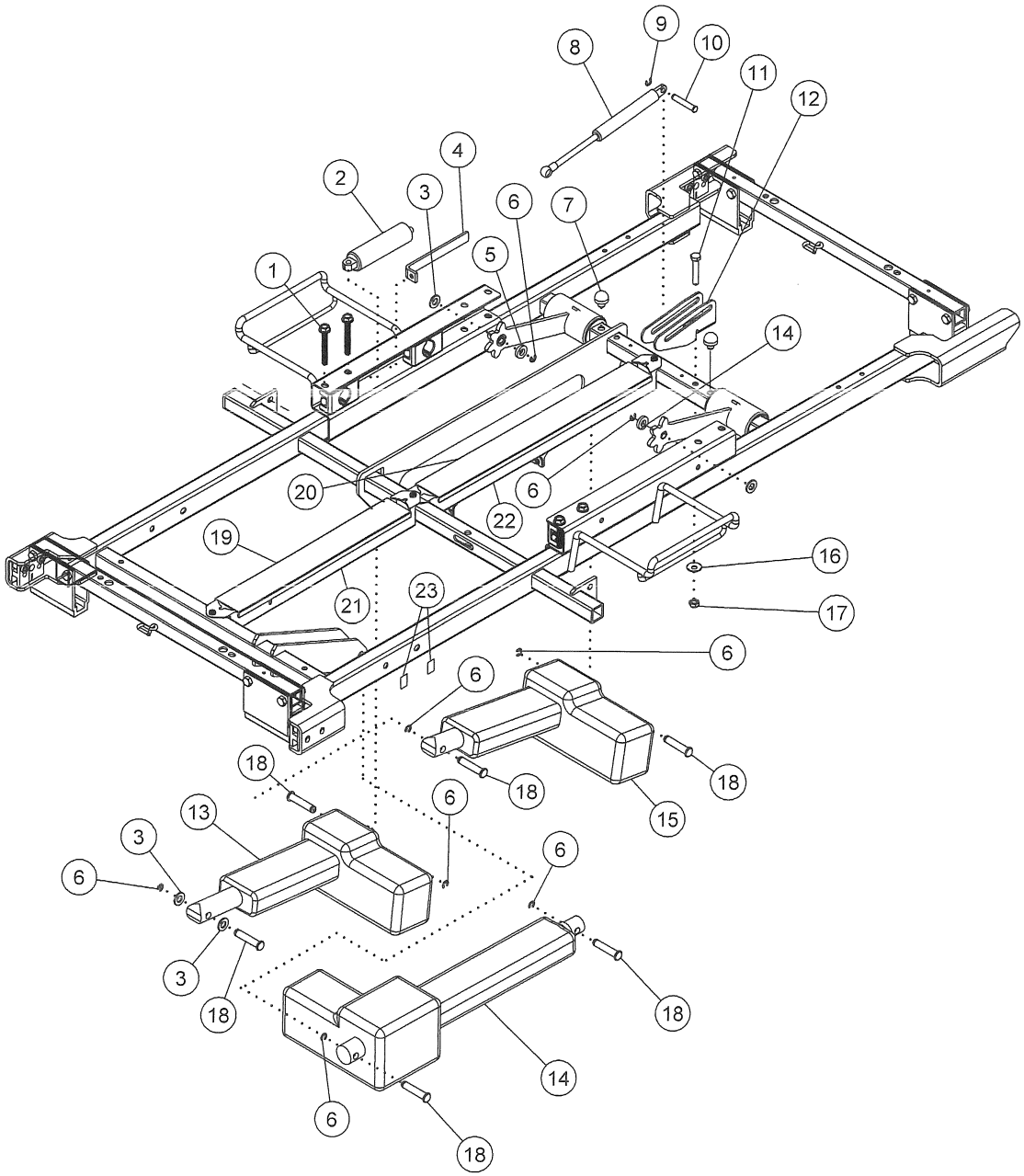

Table 5-6. Articulating Frame (Sheet 2 of 2)

Item Number	Part Number	Quantity	Description
1	150622	8	Screw
2	VE0135B	1	Shock absorber
3	RM74478A	4	Washer
4	S20964A	1	Bracket
5	QD0394A	2	Brace
6	RM74803A	8	E-ring
7	QD1545A	2	Bumper
8	72494	1	Gas spring
9	RM74804A	1	E-ring
10	S10850	1	Pin
11	VI0020	1	Screw
12	146667	1	Bracket
13	167987	1	Leg motor
14	138884	1	Head motor
15	167986	1	Thigh motor
16	VI0616A	1	Washer
17	VI0367	1	Nut
18	S10959A	6	Pin
19	187893	1	Wire stretcher cover, foot
20	187892	1	Wire stretcher cover, head

Head Siderail—Right

Figure 5-7. Head Siderail—Right

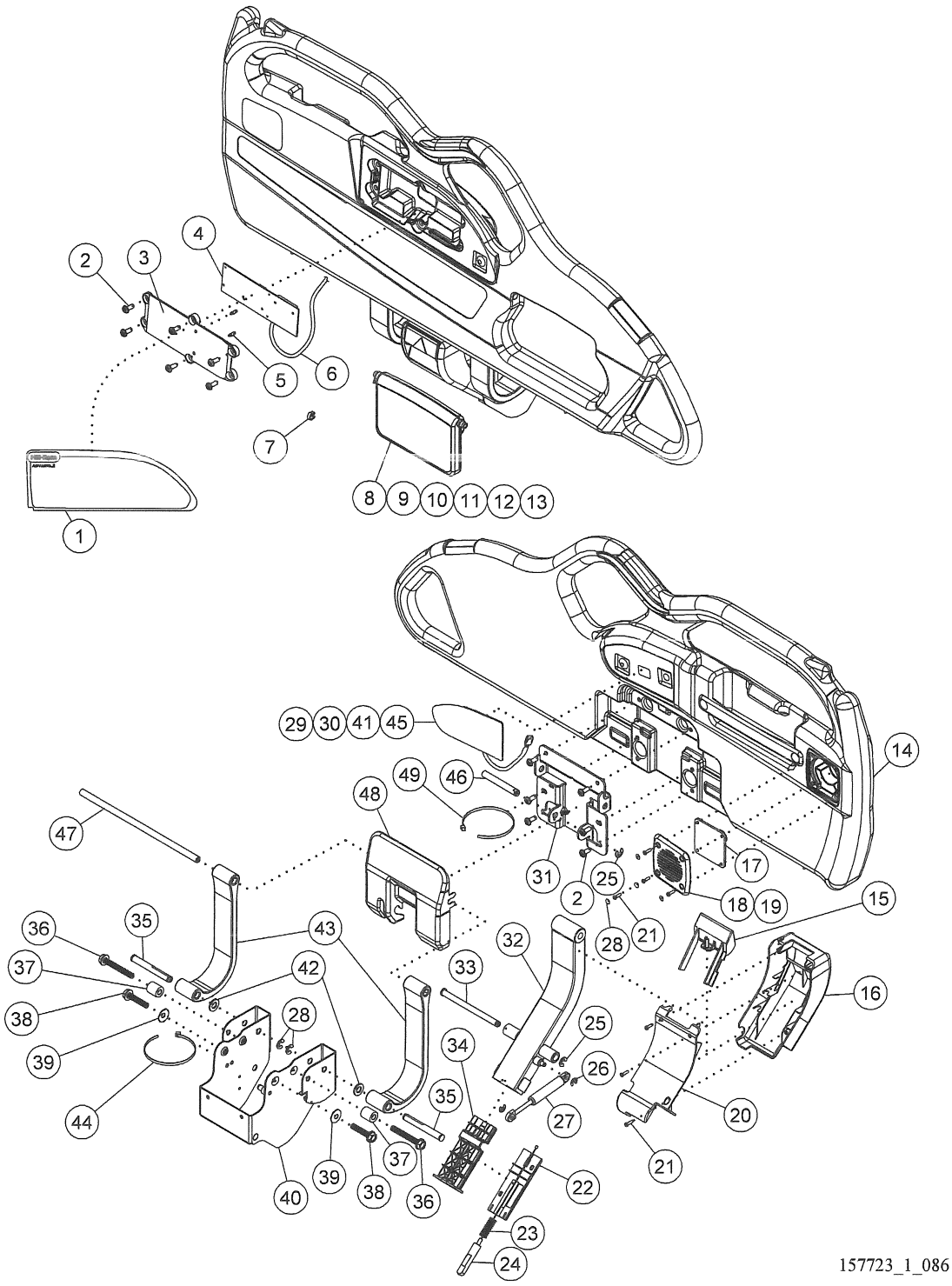

Table 5-7. Head Siderail—Right

Item Number	Part Number	Quantity	Description
1	155460	1	Caregiver controls, base, with NC, rh
	155830	1	Caregiver controls, w/o NC, rh
	157531	1	Caregiver controls, with NC, rh, Int
	157535	1	Caregiver controls, international, w/o NC, rh
2	VI0601A	12	Screw
3	72581	1	Support
4	155560	1	P.C. board
5	72656	2	Standoff
6	155448	1	Cable
7	129442	1	Spacer
8	155577	1	Pod, 3 mode PPM/HOB/Navicare, rh
9	157563	1	Pod, international, rh
10	156674	1	Pod, 3 mode PPM/HOB, rh
11	157643	1	Pod, international, 3 mode PPM/HOB, rh
12	156676	1	Pod, 1 mode PPM/HOB, rh
13	157645	1	Pod, international, 1 mode PPM/HOB, rh
14	156510	1	Siderail, with pod, rh
	156935	1	Siderail, without pod, rh
15	71085	1	Handle
16	71086	1	Center arm
17	70746	1	Speaker
18	156677	1	Speaker cover
19	156693	1	Speaker cover, blank
20	151632	1	Cover, with magnets
21	72862	7	Screw
22	S30511K	1	Base plate
23	S20972A	1	Spring
24	71658	1	Release handle
25	RM74803A	4	E-ring
26	70354	2	E-ring
27	155452	1	Damper
28		4	Screw cover
29	155463	1	Patient controls, rh
30	155972	1	Patient controls, without NC
31	146661	1	Bracket
32	155445	1	Center arm weldment
33	SI0953B	1	Pin
34	S30512K	1	Base plate

Item Number	Part Number	Quantity	Description
35	S10956B	1	Pin
36	150622	2	Screw
37	QD1663C	2	Bushing
38	150621	2	Screw
39	VI0616A	2	Washer
40	15627248	1	Bracket
41	157510	1	Patient controls, international, with NC
42	RM74478A	2	Washer
43	146657	2	Arm
44	QD0404	1	Strap
45	155972	1	Patient controls, international, without NC
46	S10952B	1	Pin
47	S10951B	1	Pin
48	71436	1	Cover
49	73096	1	Cable tie
Not Shown	16005102	1	Label, hip indicator, rh

NOTES:

Head Siderail—Left

Figure 5-8. Head Siderail—Left

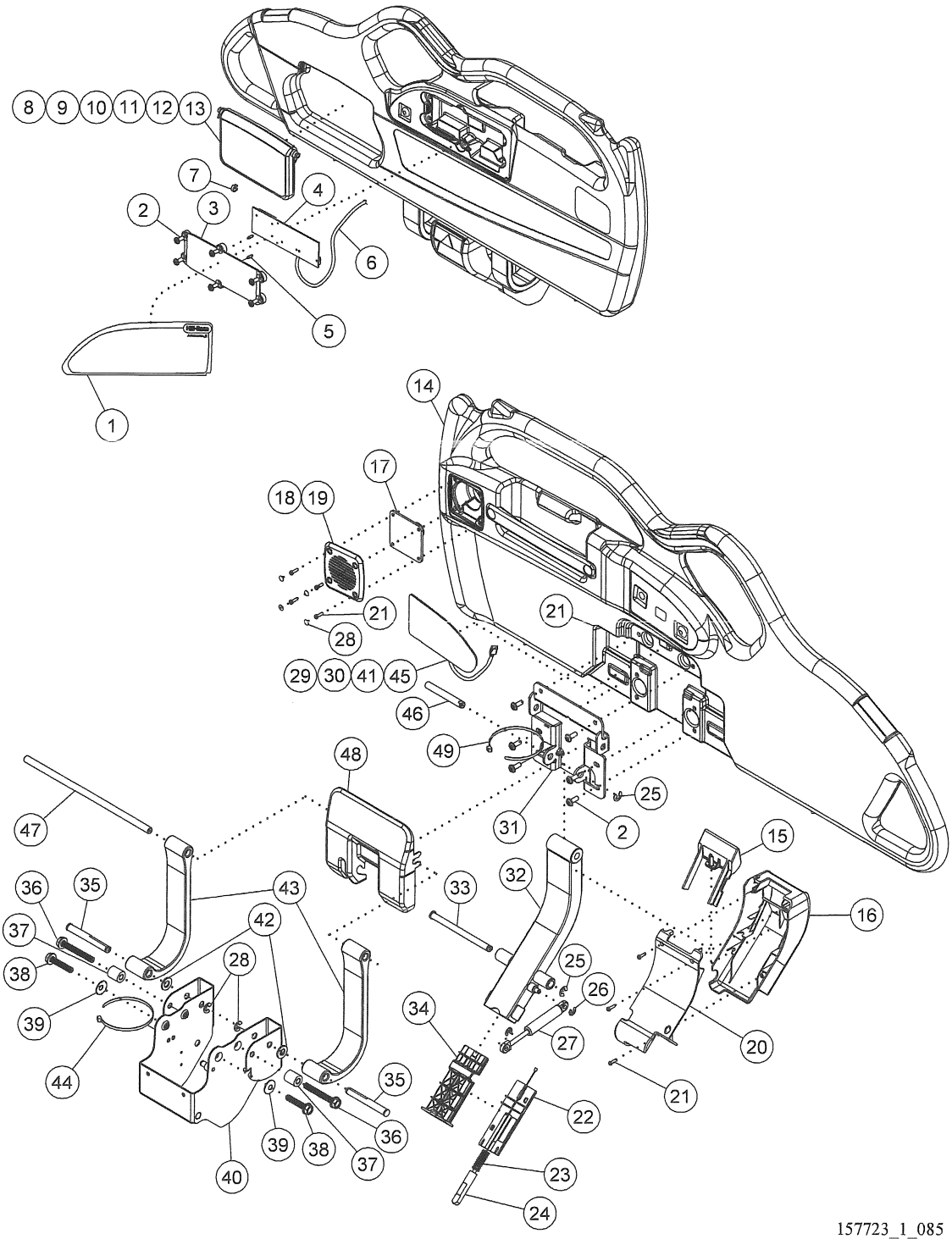

Table 5-8. Head Siderail —Left

Item Number	Part Number	Quantity	Description
1	155461	1	Caregiver controls, base, lh, with NC
	155831	1	Caregiver controls, w/o NC, lh
	157533	1	Caregiver controls, with NC, lh, Int
	157536	1	Caregiver controls, international, w/o NC, lh
2	VI0601A	12	Screw
3	72581	1	Support
4	155560	1	P.C. board
5	72656	2	Standoff
6	155448	1	Cable
7	129442	1	Spacer
8	155578	1	Pod, 3 mode PPM/HOB/Navicare, lh
9	157562	1	Pod, international, HOB, Navicare, lh
10	156673	1	Pod, 3 mode PPM/HOB
11	157642	1	Pod, international, 3 mode PPM/HOB, lh
12	156675	1	Pod, 1 mode PPM/HOB, lh
13	157644	1	Pod, international, 1 mode PPM/HOB, lh
14	156509	1	Siderail, with pod, lh
	156934	1	Siderail, without pod, lh
15	71085	1	Handle
16	71086	1	Center arm
17	70746	1	Speaker
18	156677	1	Speaker cover
19	156693	1	Speaker cover, blank
20	151632	1	Cover, with magnets
21	72862	7	Screw
22	S30511K	1	Base plate
23	S20972A	1	Spring
24	71658	1	Release handle
25	RM74803A	4	E-ring
26	70354	2	E-ring
27	155452	1	Damper
28		4	Screw cover
29	155462	1	Patient controls, lh
30	155971	1	Patient controls, without NC
31	146661	1	Bracket
32	155445	1	Center arm weldment
33	SI0953B	1	Pin
34	S30512K	1	Base plate

Item Number	Part Number	Quantity	Description
35	S10956B	1	Pin
36	150622	2	Screw
37	QD1663C	2	Bushing
38	150621	2	Screw
39	VI0616A	2	Washer
40	15627248	1	Bracket
41	157540	1	Patient controls, international, with NC
42	RM74478A	2	Washer
43	146657	2	Arm
44	QD0404	1	Strap
45	155971	1	Patient controls, international, without NC
46	S10952B	1	Pin
47	S10951B	1	Pin
48	71436	1	Cover
49	73096	1	Cable tie
Not Shown	16005101	1	Label, hip indicator, lh
Not Shown	60786	2	Screw, Cap, RND, MXST, 10-32, .750

NOTES:

Foot Siderail—Right

Figure 5-9. Foot Siderail—Right

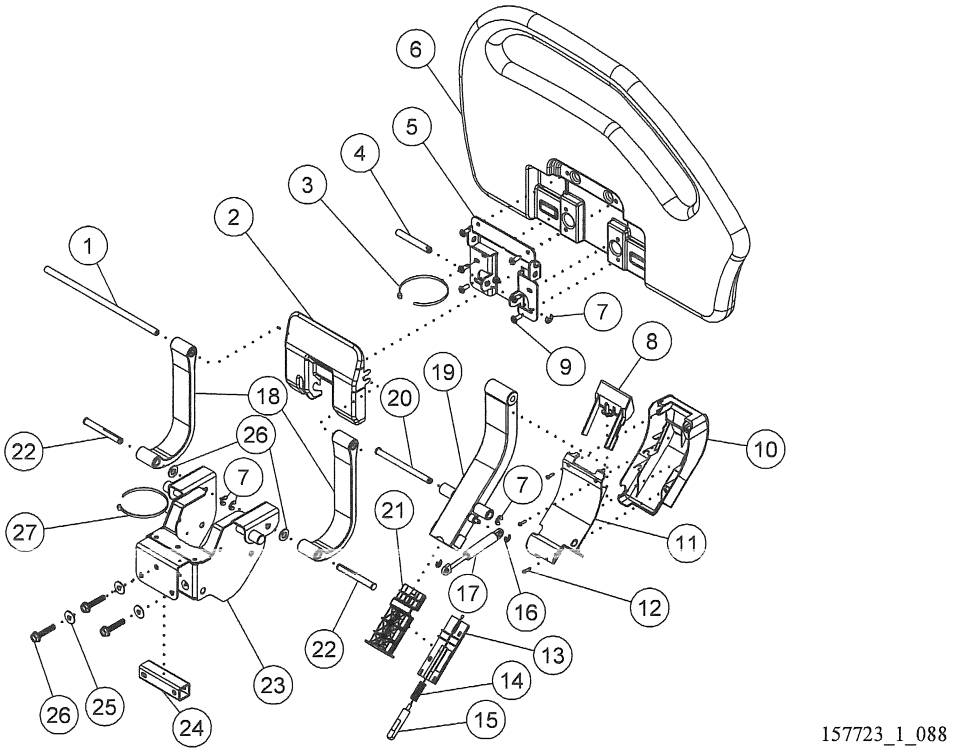

Table 5-9. Foot Siderail—Right

Item Number	Part Number	Quantity	Description
1	S10951B	1	Pin
2	71436	1	Cover
3	73096	1	Cable tie
4	S10952B	1	Pin
5	146661	1	Bracket
6	156938	1	Foot siderail, rh
7	RM74803A	5	E-ring
8	71085	1	Handle
9	VI0601A	6	Screw
10	71086	1	Center arm
11	151632	1	Cover with magnet
12	72862	3	Screw
13	S30511K	1	Base plate
14	S20972A	1	Spring
15	71658	1	Release cable
16	70354	1	E-ring
17	155452	1	Damper
18	146657	2	Arm
19	188409	1	Weldment, center arm
20	S10953B	1	Pin
21	S30512K	1	Base plate
22	S10956B	1	Pin
23	15656848	1	Bracket
24	146665	1	Spacer
25	VI0616A	1	Washer
26	150621	2	Screw
27	QD0404	1	Strap
28	RM74478A	1	Washer

Foot Siderail—Left

Figure 5-10. Foot Siderail—Left

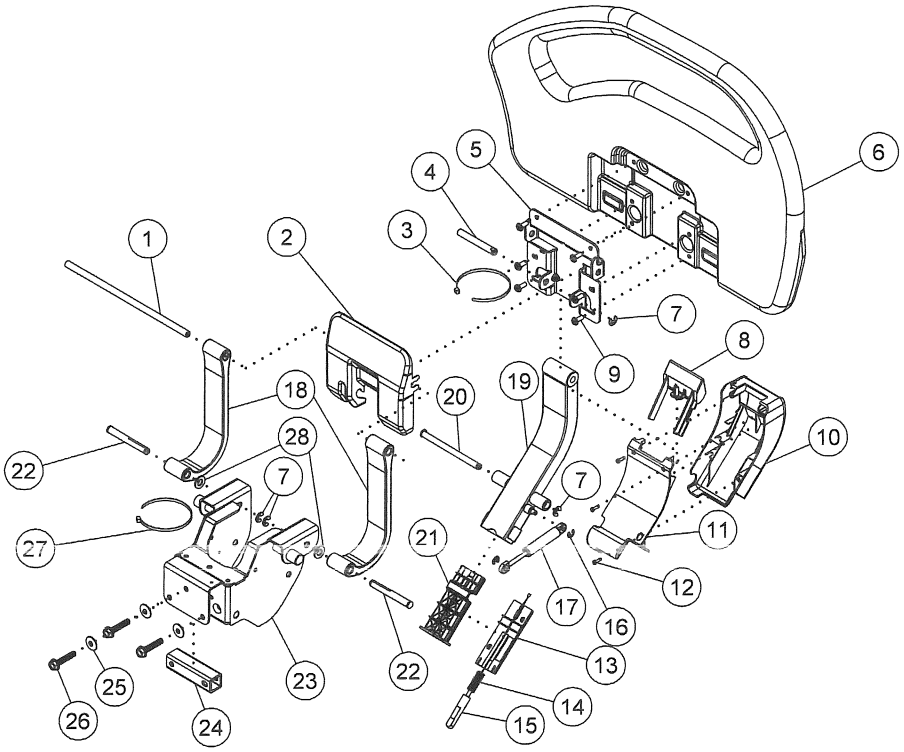

Table 5-10. Foot Siderail—Left

Item Number	Part Number	Quantity	Description
1	S10951B	1	Pin
2	71436	1	Cover
3	73096	1	Cable tie
4	S10952B	1	Pin
5	146661	1	Bracket
6	156937	1	Foot siderail, lh
7	RM74803A	5	E-ring
8	71085	1	Handle
9	VI0601A	6	Screw
10	71086	1	Center arm
11	151632	1	Cover with magnet
12	72862	3	Screw
13	S30511K	1	Base plate
14	S20972A	1	Spring
15	71658	1	Release cable
16	70354	1	E-ring
17	155452	1	Damper
18	146657	2	Arm
19	155445	1	Weldment, center arm
20	S10953B	1	Pin
21	S30512K	1	Base plate
22	S10956B	1	Pin
23	15656848	1	Bracket
24	146665	1	Spacer
25	VI0616A	1	Washer
26	150621	2	Screw
27	QD0404	1	Strap
28	RM74478A	1	Washer

Footboard and Headboard

Figure 5-11. Footboard and Headboard

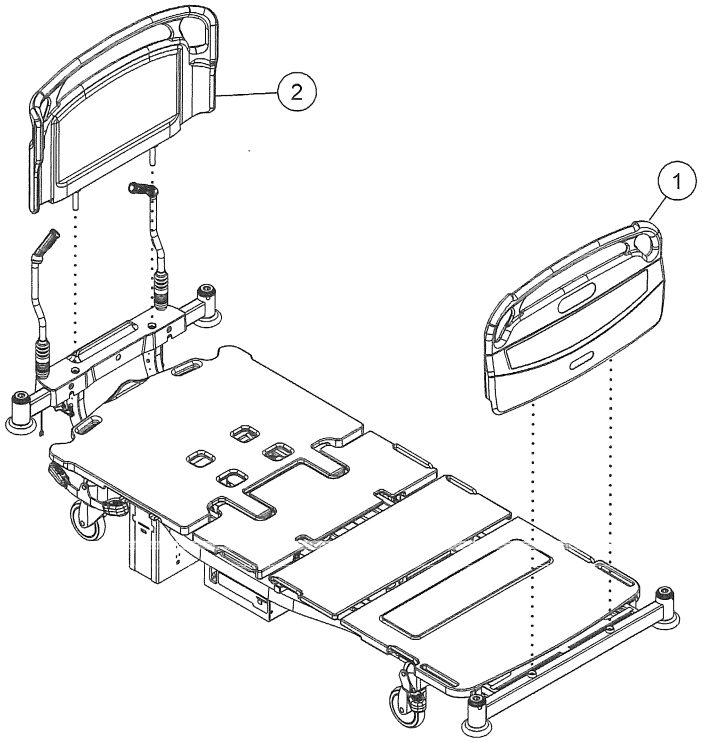

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Table 5-11. Footboard and Headboard

Item Number	Part Number	Quantity	Description
1	156800	1	Footboard
2	156801	1	Headboard

CPR Cables

Figure 5-12. CPR Cables

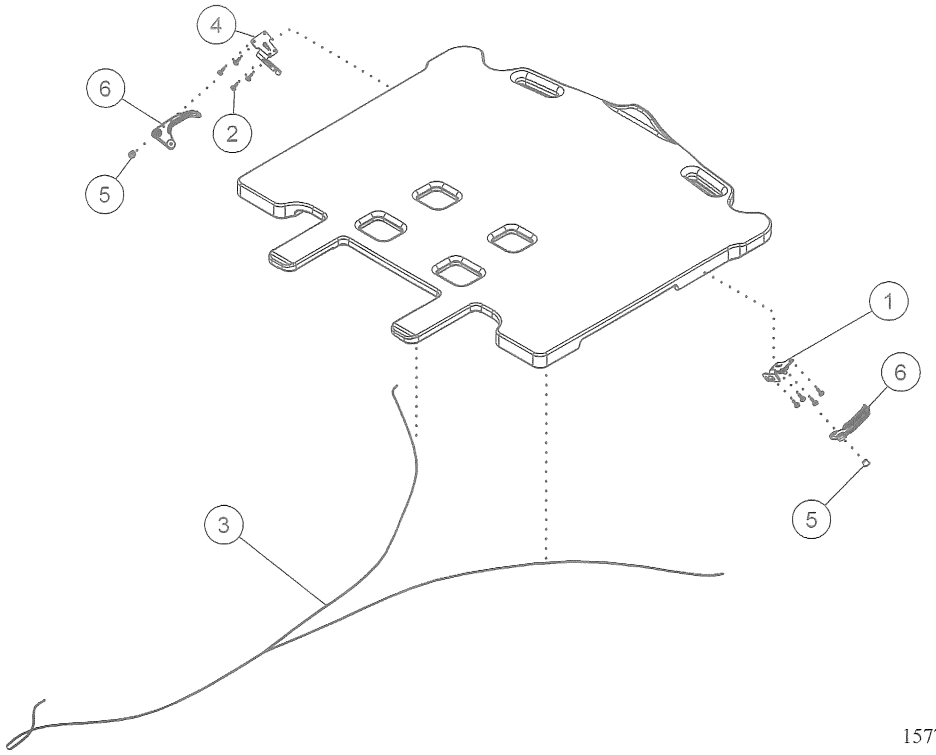

Table 5-12. CPR Cables

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

Control Cables

Figure 5-13. Control Cables

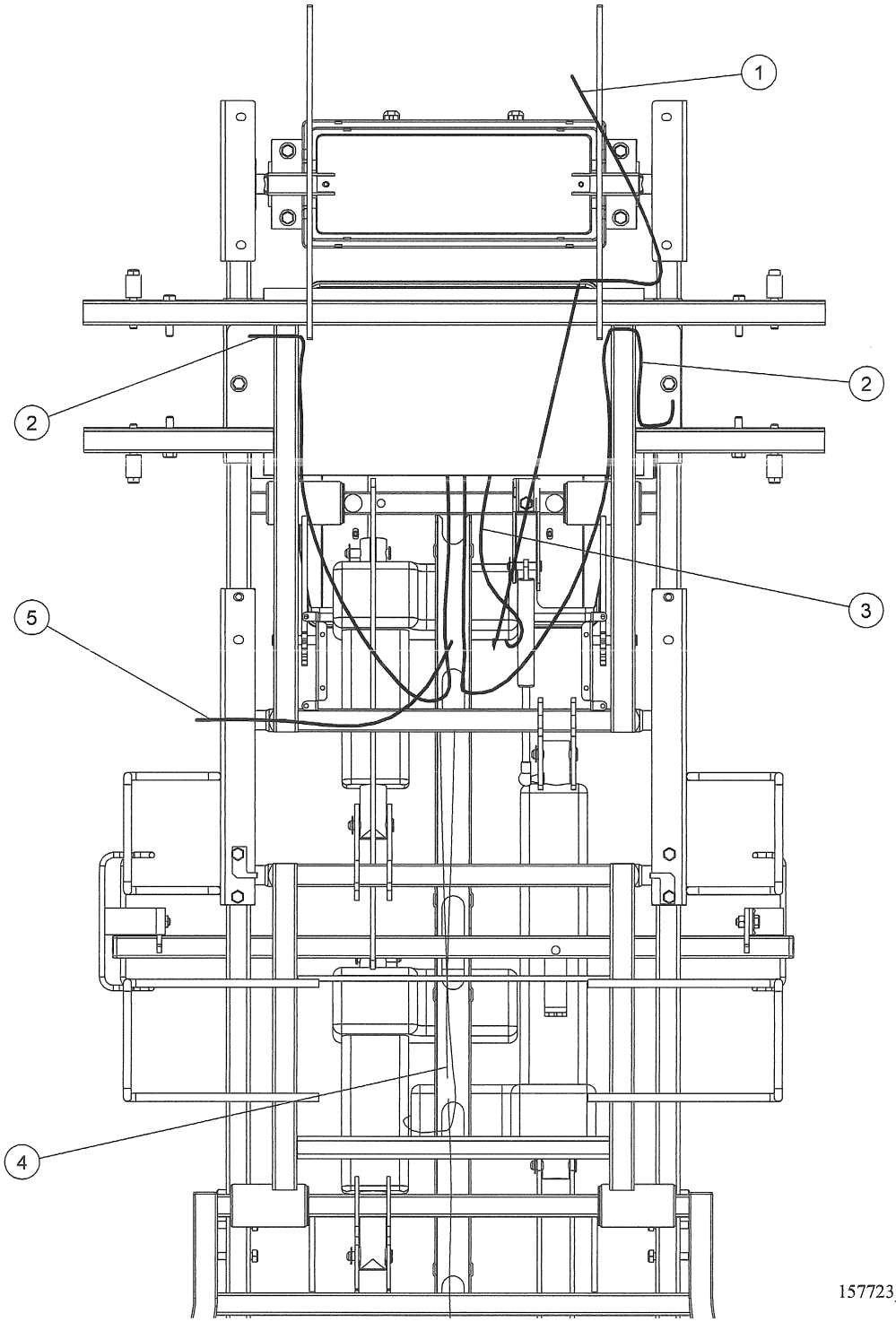

Table 5-13. Control Cables

Item Number	Part Number	Quantity	Description
1	141805	1	SideCom® Communication System cable
2	141806	1 (per side)	Siderail cable
3	71761	1	Pendant cable
4	137763	1	Cable, external alarm
Not shown	16646201	1	Pendant, without SideCom® Communication System
Not shown	16646202	1	Pendant, with SideCom® Communication System
Not shown	141807	1 (per side)	Siderail interconnect cable
Not shown	154236	1	Harness, battery with fuse holder
Not shown	154239	1	Harness, switch adapter
	163865	1	Harness, switch adapter—beds with Obstacle Detect®
Not shown	154237	1	Cable, SideCom power
Not shown	71761	1	SideCom® Communication System interconnect cable

SAFEVIEW® ALERTS

Figure 5-14. SafeView® Alerts

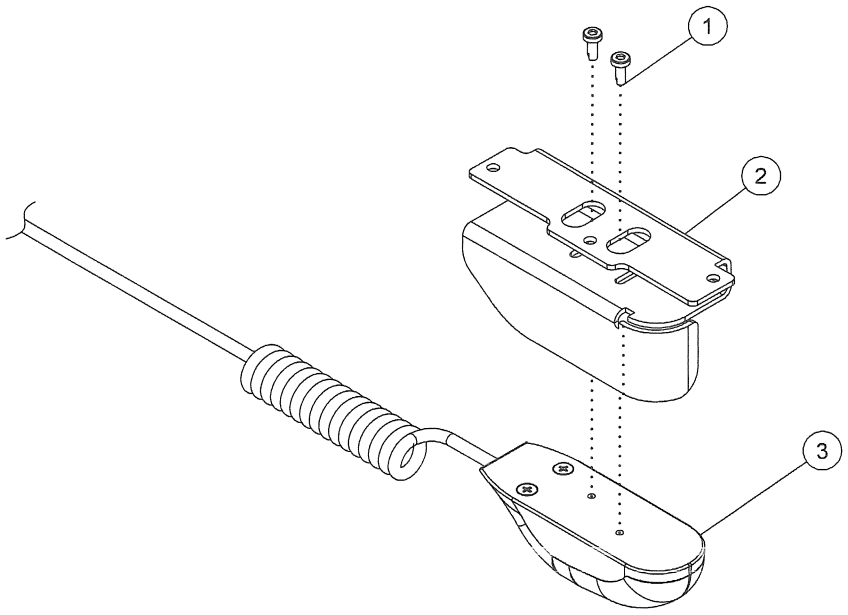

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Table 5-14. SafeView® Alerts

Item Number	Part Number	Quantity	Description
1	42142	4	Screw
2	15677202	1	Bracket, rh
	15677201	1	Bracket, lh
3	154238	2	Light assembly

NOTES:

AUXILIARY OUTLET

Figure 5-15. Auxiliary Outlet

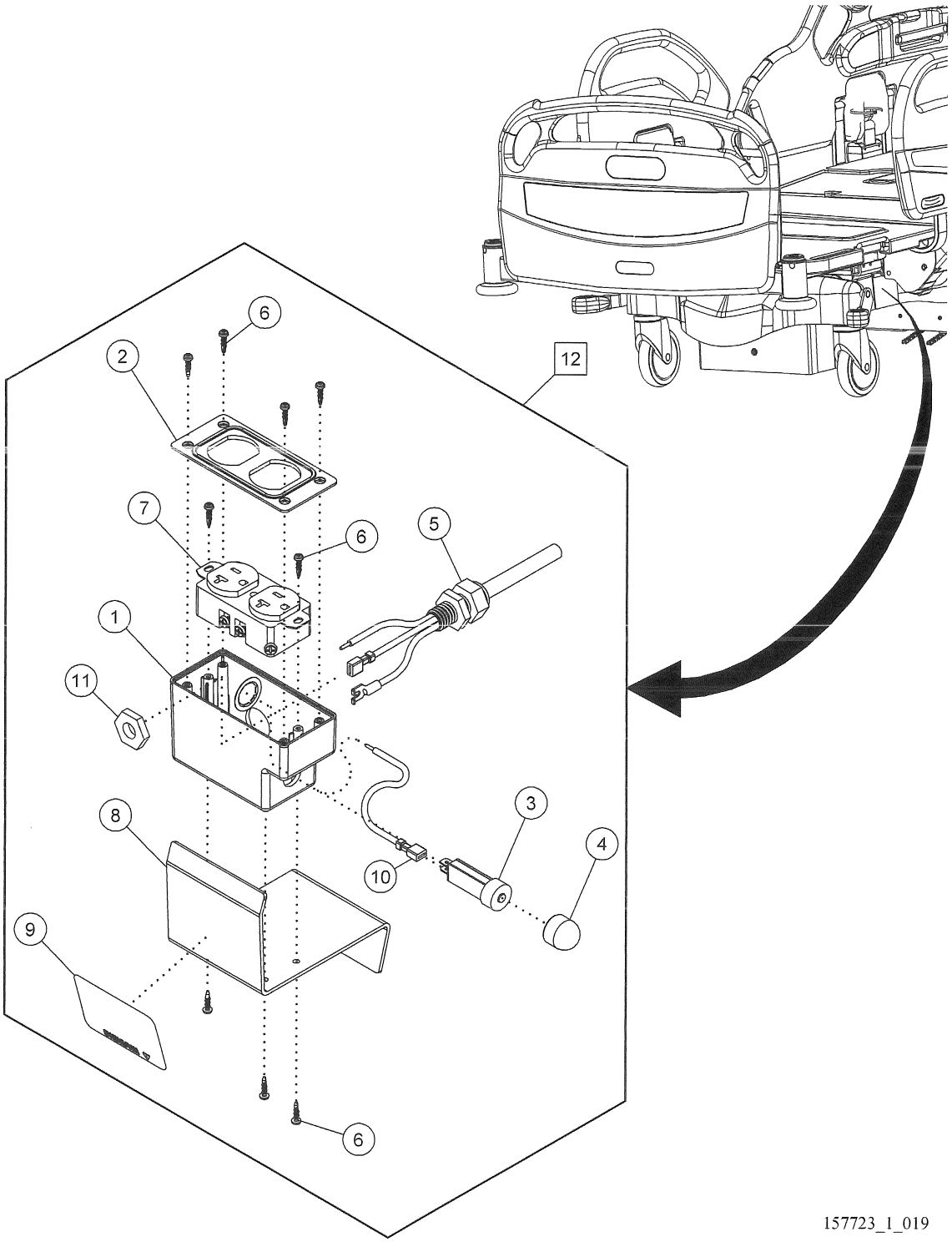

Table 5-15. Auxiliary Outlet

Item Number	Part Number	Quantity	Description
1	139905	1	Auxiliary outlet box
2	139906	1	Auxiliary outlet cover
3	44507	1	Circuit breaker, 8 A, 250 V AC
4	140387	1	Protective transparent boot
5	147739	1	Cable
6	4214102	9	Screw
7	28439	1	Outlet, duplex, 20 A, ivory
8	14804848S	1	Mounting bracket
9	140276	1	Label, warning
10	66539	1	Wire assembly, receptacle
11	125670	1	Locking nut
12	P1178A	1	Auxiliary outlet assembly

Motor Control Box

Figure 5-16. Motor Control Box

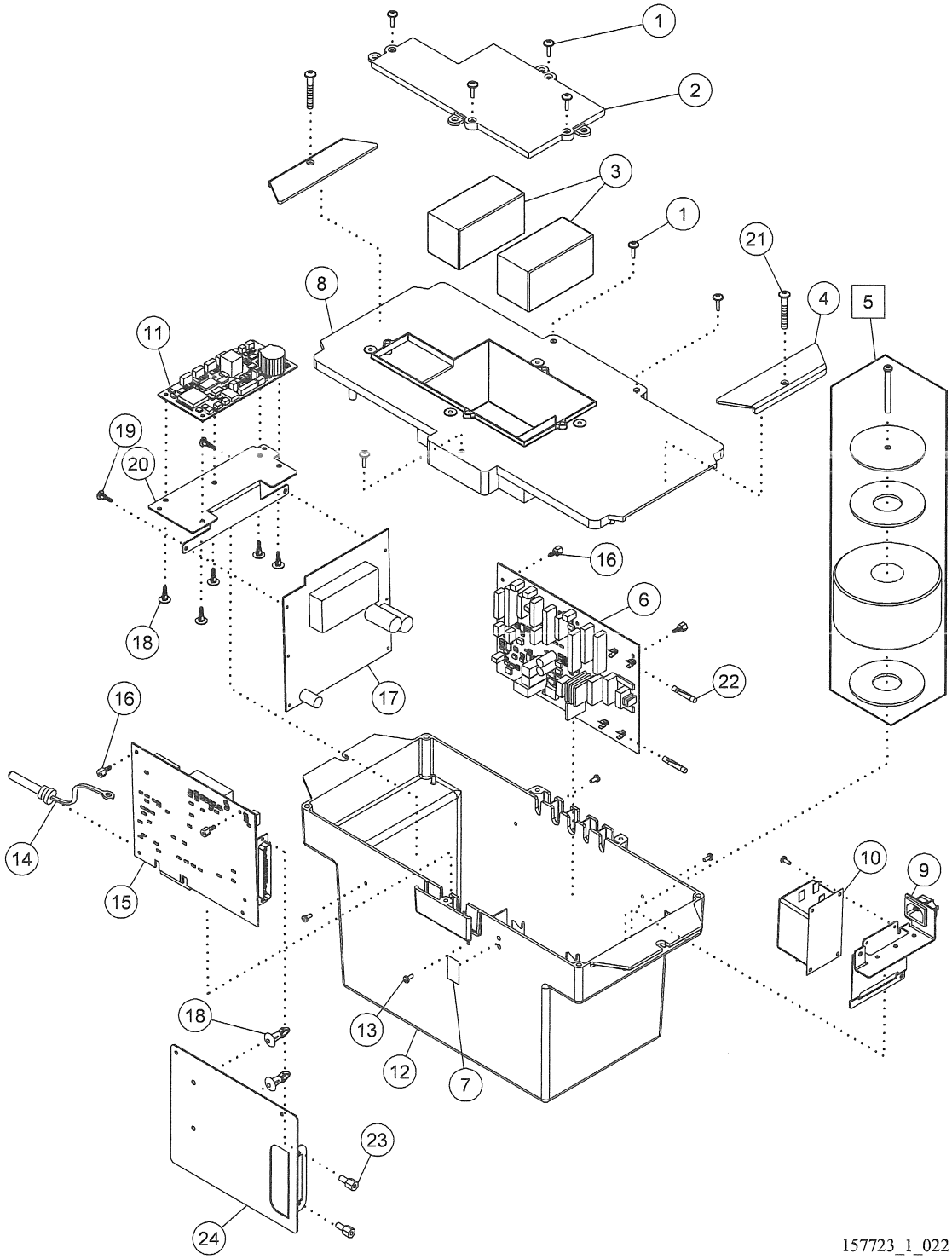

Table 5-16. Motor Control Box

Item Number	Part Number	Quantity	Description
1	VI0601A	7	Screw
2	160283	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	155963	1	Siderail interface P.C. board
	162996	1	Siderail interface P.C. board—beds with Obstacle Detect®
7	127865	1	Label, blank
8	160282	1	Battery compartment assembly
9	132094	1	Power cord mount
10	70611	1	Line filter
11	148822	1	P.C. board assy, scale
12	130628	1	Electrical enclosure
13	VI0395	4	Screw
14	34512	1	Connector plug
15	157438	1	Assembly, SideCom® Communication System P.C. board, Zenith
	156499	1	Assembly, SideCom® Communication System P.C. board, beds with NaviCare/SafeView
16	132934	5	Circuit board support (standoff)
17	132628	1	P.C. board, motor control
18	3976301	7	Standoff
19	132935	2	Circuit board support (standoff)
20	132093	1	Scale board mount
21	150621	2	Screw
22	133251	2	Fuse, 5A, 0.25" x 1.25"
23	28968	2	Screw lock
24	156668	1	Bracket, Sidecom adapter

INTELLIDRIVE® TRANSPORT SYSTEM (SHEET 1 OF 3)

Figure 5-17. IntelliDrive® Transport System (Sheet 1 of 3)

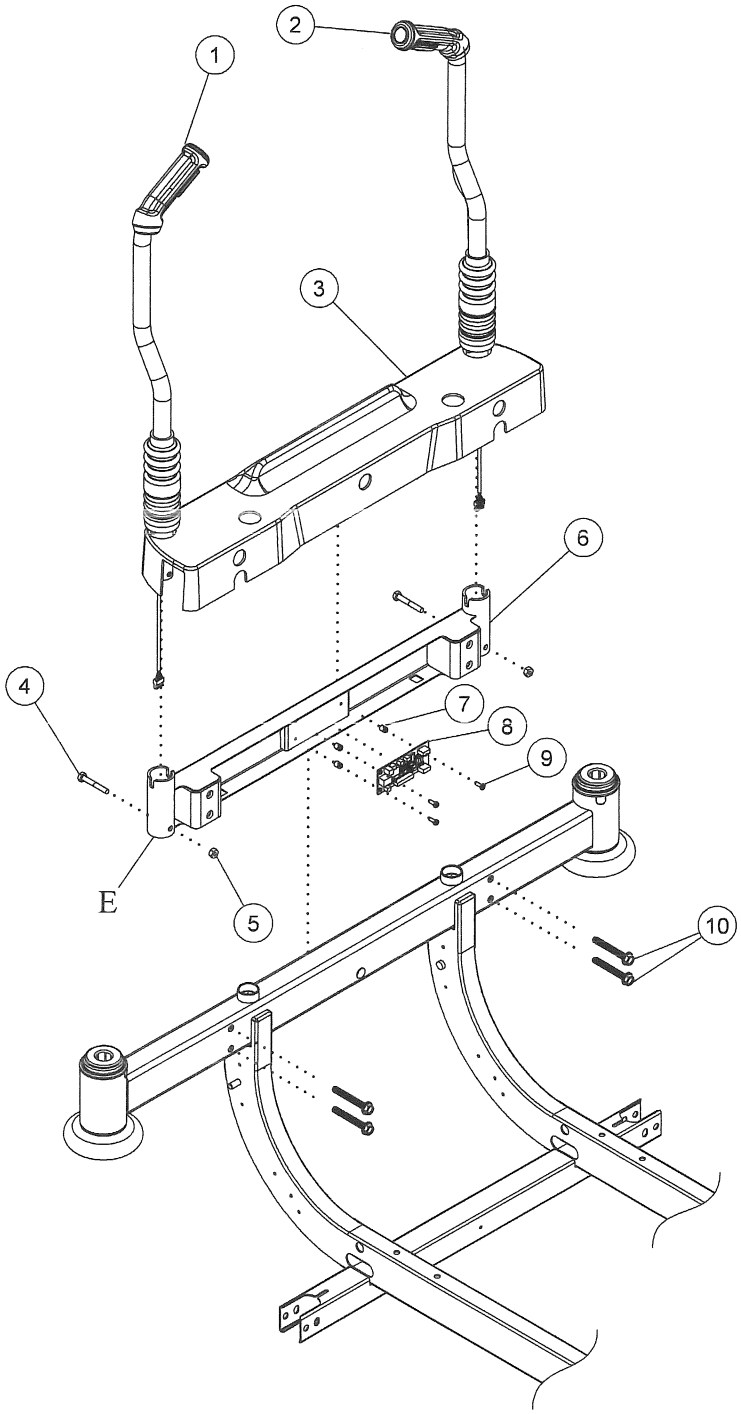

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Table 5-17. IntelliDrive® Transport System (Sheet 1 of 3)

Item Number	Part Number	Quantity	Description
1	15113502	1	Handle, rh
2	15113501	1	Handle, lh
3	157501	1	Cover
4	9001828	2	Screw
5	4435	2	Nut
6	155393	1	Weldment
7	69725	3	Spacer
8	72299	1	P.C. board
9	69988	3	Screw
10	150622	4	Screw

INTELLIDRIVE® TRANSPORT SYSTEM (SHEET 2 OF 3)

Figure 5-18. IntelliDrive® Transport System (Sheet 2 of 3)

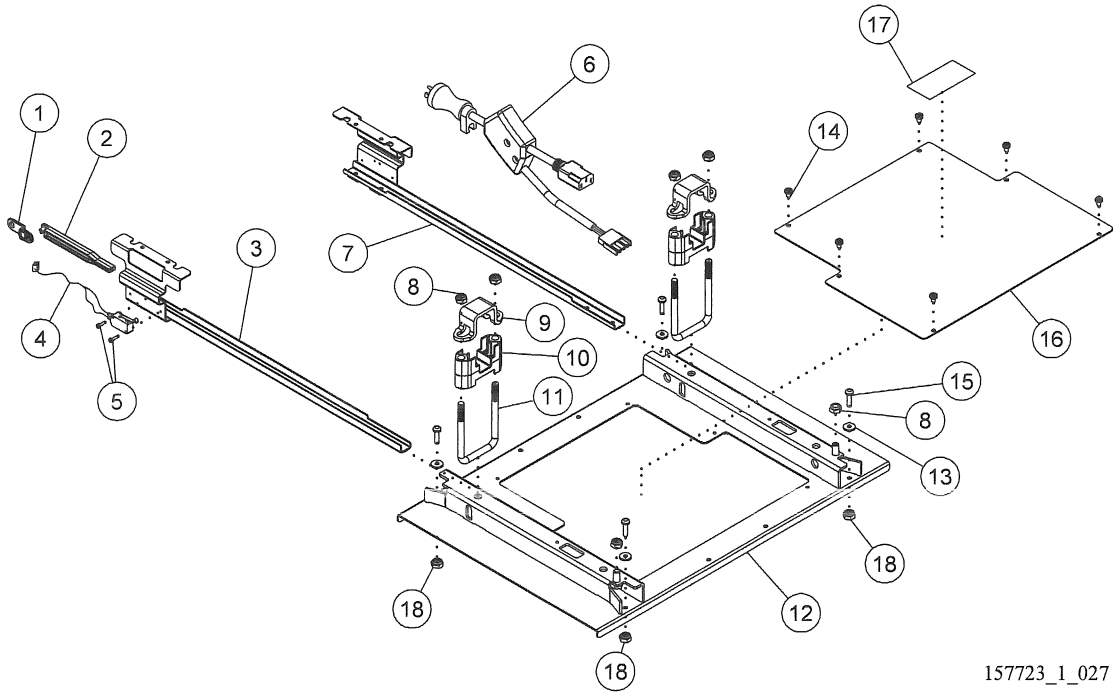

Table 5-18. IntelliDrive® Transport System (Sheet 2 of 3)

Item Number	Part Number	Quantity	Description
1	156873	1	Link
2	156874	1	Cam
3	155405	1	Weldment, cable, rh
4	158134	1	Switch assembly
5	157932	2	Screw
6	M04011	1	Power cord
7	155406	1	Weldment, cable, lh
8	VI0367	4	Nut
9	155714	2	Top clamp
10	155713	2	Spacer
11	155712	2	Clamp
12	156795	1	Weldment, mount
13	70684	2	Washer
14	43878	6	Screw
15	70747	4	Screw
16	157614	1	Service cover
17	158061	1	Label, shock hazard
18	157938	4	Nut

INTELLIDRIVE® TRANSPORT SYSTEM (SHEET 3 OF 3)

Figure 5-19. IntelliDrive® Transport System (Sheet 3 of 3)

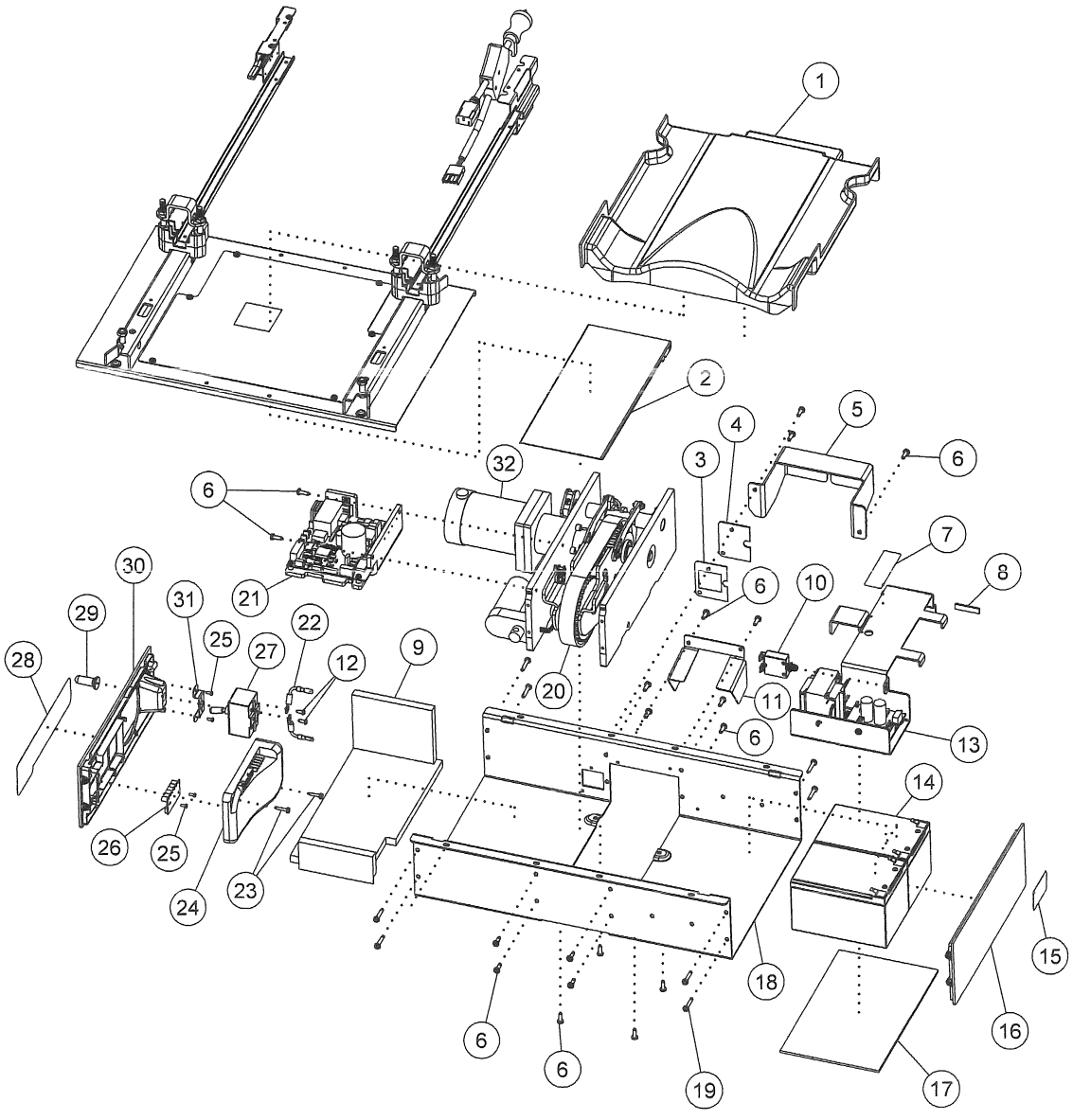

Table 5-19. IntelliDrive® Transport System (Sheet 3 of 3)

Item Number	Part Number	Quantity	Description
1	156452	1	Cover
2	70468	1	Cover, drive mechanism
3	128991	1	Gasket
4	128988	1	Cover, actuator lever
5	128987	1	Spring hood
6	69077	21	Screw
7	30252	1	Label
8	69354ALT	1	Foam
9	68865ALT1	1	Sound reducing kit
10	68268	1	Circuit breaker
11	70470	1	Spring guide
12	137663	2	Screw
13	156991	1	Power supply assembly
14	139105	2	Battery
15	70811	1	Label, serial number
16	69931	1	End plate, battery
17	68869	1	Battery pad
18	128984	1	Pan
19	42140	8	Screw
20	68285ALT01	1	Drive belt
21	186753	1	PACM PCB Assembly
22	152344	2	Cable assembly
23	49508	2	Screw
24	68307	1	Motor controller
25	4214101	2	Screw
26	72300	1	P.C. board, battery indicator
27	68867	1	Toggle switch
28	70813	1	Label
29	72135	1	Boot
30	69932	1	End plate, motor
31	70469	1	Bracket
32	71529ALT	1	Drive motor
Not shown	4314311	2	Fuse, 5 x 20 mm, 1A, 250 V SLOBLO
Not Shown	207257	1	Cable PAG to PACM

SIDERAIL SWITCHES

Figure 5-20. Siderail Switches

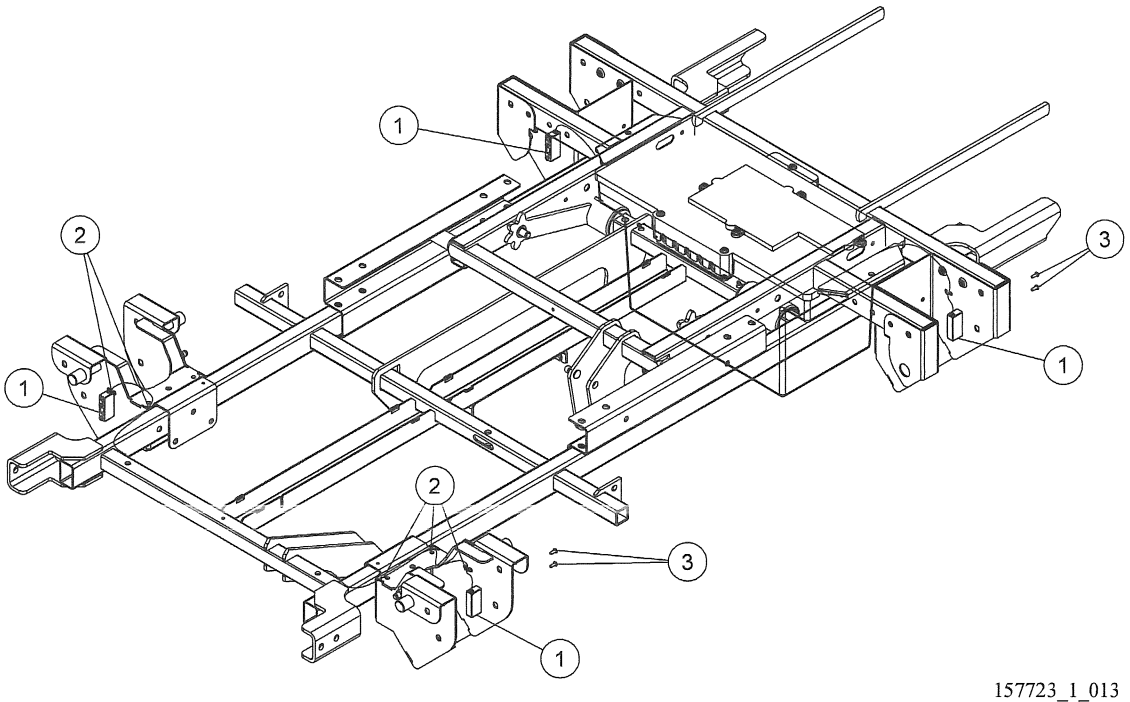

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Table 5-20. Siderail Switches

Item Number	Part Number	Quantity	Description
1	151315	4	Switch
2	73096	5	Cable tie
3	6561406	8	Screw

HEAD ANGLE SENSOR

Figure 5-21. Head Angle Sensor

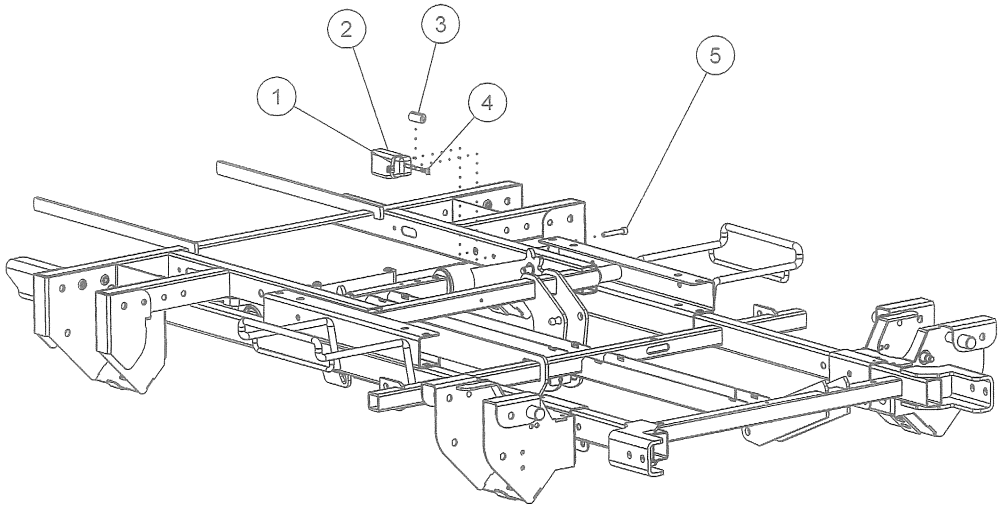

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Table 5-21. Head Angle Sensor

Item Number	Part Number	Quantity	Description
1	73096	1	Cable tie
2	156921	1	Sensor
3	150828	1	EMI clamp
4	14460	2	Cable tie
5	157900	1	Screw

DECORATIVE PANEL INSERTS

Figure 5-22. Decorative Panel Inserts

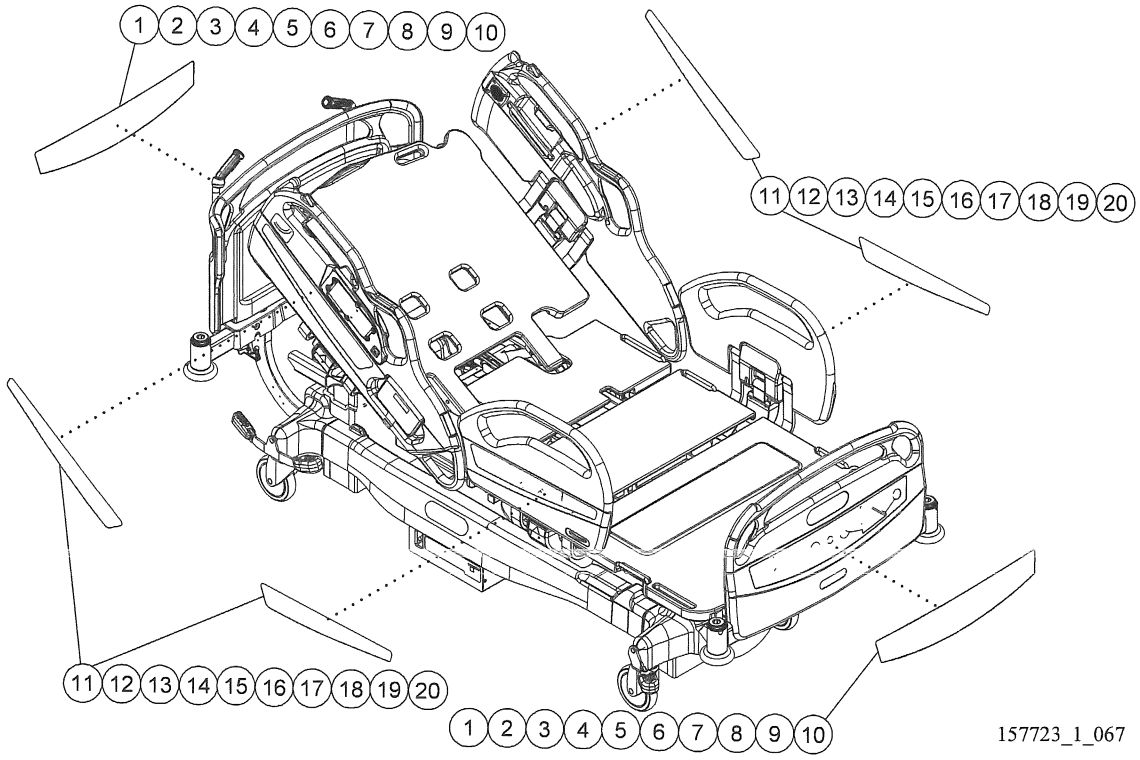

Table 5-22. Decorative Panel Inserts

Item Number	Part Number	Quantity	Description
1	15717201	2	Label, light blue
2	15717202	2	Label, Hill-Rom blue
3	15717203	2	Label, aqua
4	15717204	2	Label, yellow
5	15717205	2	Label, pediatrics
6	15717206	2	Label, light oak
7	15717207	2	Label, medium oak
8	15717208	2	Label, wild cherry
9	15717209	2	Label, dark cherry
10	15717210	2	Label, natural maple
11	15717101	4	Label, light blue
12	15717102	4	Label, Hill-Rom blue
13	15717103	4	Label, aqua
14	15717104	4	Label, yellow
15	15717105	4	Label, pediatrics
16	15717106	4	Label, light oak
17	15717107	4	Label, medium oak

Item Number	Part Number	Quantity	Description
18	15717108	4	Label, wild cherry
19	15717109	4	Label, dark cherry
20	15717110	4	Label, natural maple

OBSTACLE DETECT® FEATURE

Figure 5-23. Obstacle Detect® Feature

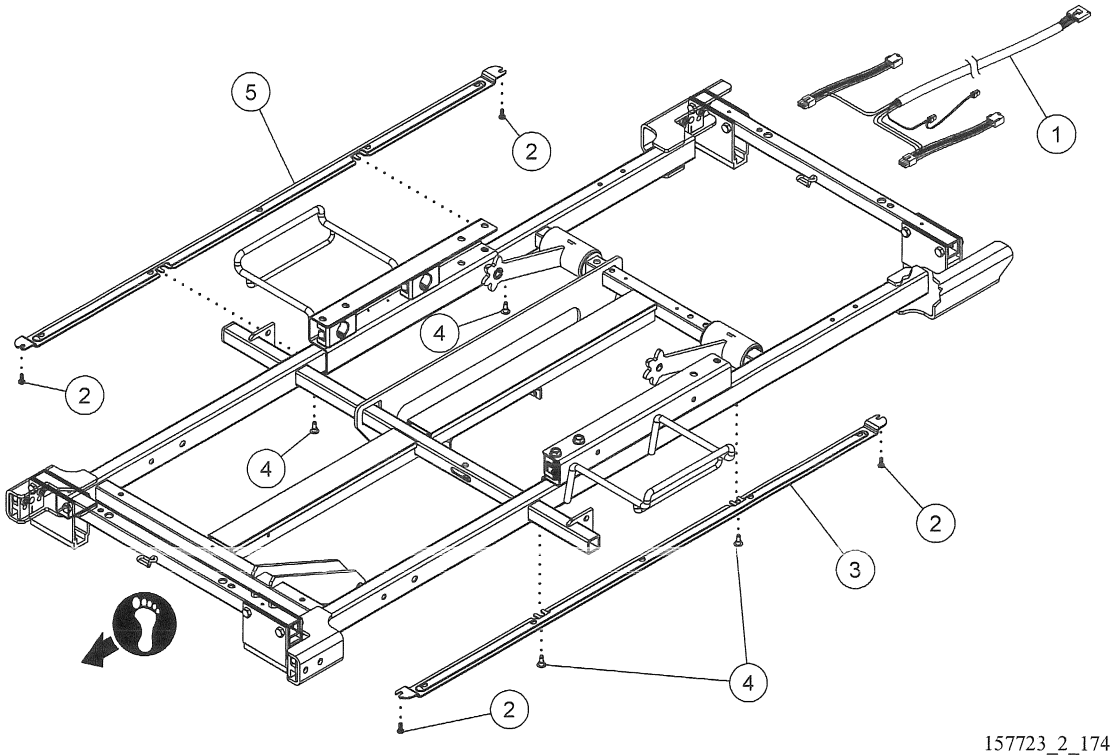

Table 5-23. Obstacle Detect® Features

Item Number	Part Number	Quantity	Description
1	163865	1	Obstacle Detect switch adapter harness
2	10866	4	Screw, pan head
3	167601	1	Switch assembly, lh
4	126950	4	Screw shoulder
5	167602	1	Switch assembly, rh

NOTES:

5TH WHEEL—SPRING TYPE

Figure 5-24. 5th Wheel—Spring Type

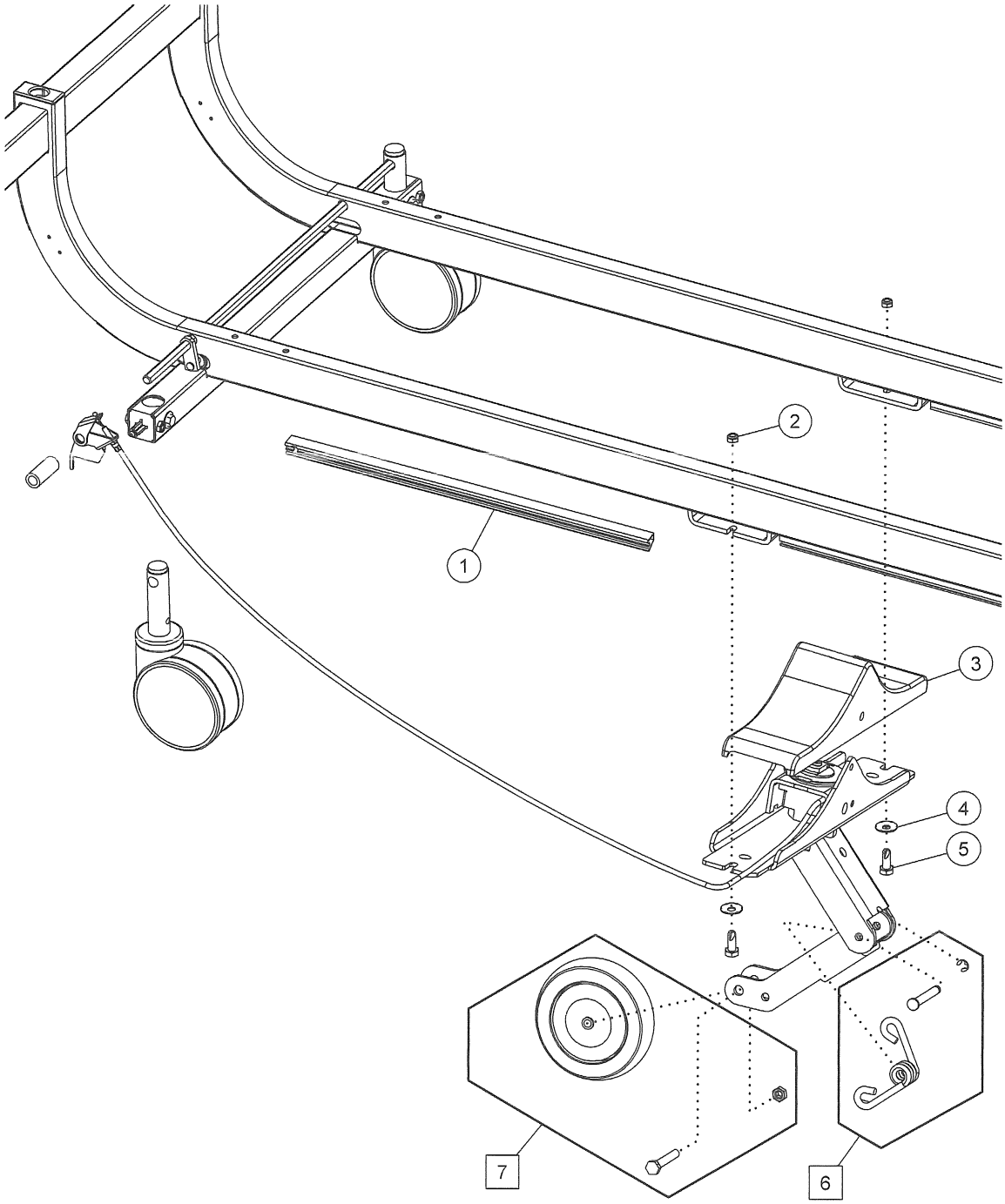

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Table 5-24. 5th Wheel—Spring Type

Item Number	Part Number	Quantity	Description
1	F10332S	1	L-duct
2	VI0367	2	Locknut
3	F11260A	1	Cover
4	VI0616A	2	Washer
5	VI0610A	2	Screw
6	AG16147	1	Spring kit
7	AG0100	1	Caster kit

NOTES:

Chapter 6
Cleaning, Disinfecting, and Preventive Maintenance

CLEANING/DISINFECTING

For cleaning and disinfecting instructions, refer to the *Advanta™ 2 Bed User Manual* (157722).

LUBRICATION REQUIREMENTS

There are no required lubrications for the Advanta™ 2 Bed.

WARNING:

Warning—Failure to use lubrication products in accordance with the manufacturer's instructions could cause equipment damage.

CAUTION:

Caution—Do not use silicone-based lubricants. Equipment damage could occur.

Oilite® bearings and bushings are used in several locations on the system. By retaining oil, the pores give a self-lubricating quality to the bearings and bushings. If any silicone-based lubricant is applied to the bearings and bushings or anywhere else on the system, this self-lubricating quality is neutralized.

It is safe to apply these lubricants to the system:

Part Number	Description
8252 (100)	2 oz m-1 oil (apply to Oilite® bearings and bushings)
SA3351 (100)	4 oz lithium grease

PREVENTIVE MAINTENANCE

WARNING:

Warning—Only facility-authorized persons should service the Advanta™ 2 Bed. Service by unauthorized persons could cause injury or equipment damage.

The Advanta™ 2 should be subject to an effective maintenance program. This will help make sure of a long, operative life for the Advanta™ 2 Bed. The PM will help to reduce downtime due to excessive wear failures.

The PM Checklist that follows is designed to keep a maintenance history for one Advanta™ 2 Bed. The PM Checklist is to be used along with the "Specified Checks" on page 6-2. The Specified Checks include specific items to examine as you complete the PM Checklist.

An annual service of the bed is advised in order to maintain its characteristics and performance.

Every 3 years, the bed batteries should be replaced by a facility-authorized maintenance person.

Every 5 years, the IntelliDrive® Transport System batteries should be replaced by a facility-authorized maintenance person.

Specified Checks

If any of these checks fail, repair or replace the part as applicable. If the repair or replacement does not correct the problem, remove the unit from service and contact Hill-Rom technical support.

Table 6-1. Specified Checks

Function	Procedure
Overall condition, frame and welded assemblies	Examine the overall condition of the bed. Make sure that the structure and welded assemblies are in good working condition and that there are not any dents, twisted parts, corrosion, or loose, broken, or missing hardware. Replace or repair parts as necessary. Examine the bed for scratches and corrosion. Do any necessary repairs or paint retouches, replace parts if necessary. Examine the symmetry of the bed, and make sure that the bed frame and base are not twisted. Replace or repair parts as necessary. Make sure that all labels (including the head angle and Trendelenburg angle indicators) are installed and can be read. Make sure that the labels are not worn or torn. Replace labels as necessary. Examine for loose or missing hardware. Replace or adjust as necessary.
Headboard and footboard	Examine the appearance, attachment, and safety of the headboard and footboard. Replace as necessary. Make sure that the headboard and footboard are not loose, and that the posts are installed correctly. Make sure that the laminates are not peeling and that there are not any sharp edges.
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 any 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 past 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 past their useful life. • Any signs of damage to the cable. • Any exposed wires. Replace the power cord, if damaged.

Function	Procedure
Leakage current	Unplug the bed from its power source. Connect the bed to the safety tester, and connect this device to the power outlet. Make sure the bed is correctly supplied by the test device: control unit LEDs lit (unlock the functions if necessary). Measure the leakage current without operating any 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. Put an inspection sticker on the bed.
Patient pendant	Disconnect the patient pendant, and check the condition of the connector. Then reconnect or replace the pendant. Press each of the buttons for several seconds to check that they activate the correct function and that they do not work intermittently. Each movement must be continuous. Replace the pendant if necessary. Make sure that: • The pendant cable is not damaged. • The pendant is not damaged. • The membrane is not worn or torn. • The pendant remains secured to the siderail. • There are no missing or broken parts. Replace or repair the pendant as necessary.
Patient and caregiver siderail controls	Make sure that the controls are in good condition and that the membranes are not worn or torn. Do the "Function Checks" on page 2-4. Make sure that the bed does not fail any of the function checks. Replace or repair parts as necessary.
Hilow columns	Inspect the column assembly for the presence and tightness of the attachment screws and the snap ring at the bottom of the column. Repair as necessary. Make sure that all covers are installed and in the correct position and orientation. Replace or adjust as necessary. Make sure that the bearings are installed and in good condition. Replace parts as necessary. Make sure that the cables are routed correctly and do not bind or pinch when the bed is articulated. Adjust the cable routing as necessary. Fully raise 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 can be heard 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 the hilow function if necessary. Replace parts as necessary.

Function	Procedure
Head section motor	Examine the actuator assembly. Make sure the pins and retaining clips are present and intact. Replace or adjust parts as necessary. Fully raise and lower the head section. Make sure that there is no friction or unusual noises and that you do not hear an overload indication can be heard during the movement. Lubricate, adjust, or replace parts as necessary.
Plastic sleep deck	Fully raise and lower the head section. Examine for binding during the head section movement. Replace or repair parts as necessary. Make sure that the hard surface and its drive system are in good condition. Make sure that there is no friction or unusual noises. If there are abnormal noises or any friction, check the pivot points, bearings, and drive motors. Replace or adjust parts as necessary. Remove each hard surface (this does not include the head section) and examine its condition. Replace or adjust as necessary.
CPR release	Examine the handles, brackets, and cables. Make sure that they are in good condition and secured to the bed. Make sure that the bracket and assembly are not bent or damaged. Make sure that the cable is not corroded. Replace or repair parts as necessary. Make sure that the screws are installed and fully tightened. Replace or tighten the screws as necessary. Fully raise the head section, then activate one of the CPR releases. Make sure that the head section lowers. Adjust the CPR cable as necessary. Do the same test on the other side of the bed. Make sure that the CPR mechanism on the head motor is in good condition. Release the CPR handles and make sure that the mechanism locks correctly when you operate the **Head Up** control for a approximately five seconds. Make sure that you observe the elevation movement. If the head section does not go up, go to "CPR Malfunction" on page 2-20. Replace parts as necessary. Replace the head section motor as necessary.
Head section gas springs	Examine the assembly of the gas springs. Make sure that the screws are present and fully tightened. Make sure that the assembly is not damaged. Tighten screws or replace parts as necessary. Make sure that there is no oil on the shaft. If there is oil on the shaft, use a cloth to remove the oil. Raise and lower head section several times. If oil appears, replace the gas spring. Fully raise the head section. Activate the CPR function. Make sure that the head section lowers rapidly to the intermediate position then gradually to the low position. Replace parts as necessary.
Knee/Thigh section motor	Examine the knee/thigh section motor. Make sure that the pins and retaining clips are installed and in good condition. Replace or adjust parts as necessary. Fully raise and lower knee section. Make sure there is no friction or unusual noises and that you do not hear an overload indication can be heard during the movement. Lubricate, adjust, or replace parts as necessary.

Function	Procedure
Automatic Contour	Make sure that the knee section goes up automatically to mid-height when the head section is raised from the low position. Make sure that the knee section goes down automatically when the head section is lowered and the head section reaches the low position. Replace the actuator or defective unit if necessary.
Foot section motor	Raise the knee section to the mid-height position. Inspect the foot actuator. Make sure the pins and retaining rings are present. Fully raise and lower the foot section. Make sure that there is no friction or unusual noises and that you do not hear an overload indication during the movement. Lubricate, adjust, or replace parts as necessary.
Dining Chair® Position	Make sure that the chair, head section, thigh section, and foot section functions operate correctly. Activate the chair function, and make sure that the three sections adjust to the required position. Put the sleep deck in the flat position. Troubleshoot and replace parts as necessary.
Trendelenburg/Reverse Trendelenburg	Activate the Trendelenburg function and the Reverse Trendelenburg function. Make sure that the bed goes into the correct position. Make sure there is no friction or unusual noises and that you do not hear an overload indication during the movement. Lubricate, adjust, or replace parts as necessary.
Battery	Make sure that the bed is unplugged from its power source. Use the caregiver controls to operate all the functions of the bed. Replace the batteries as necessary. Examine the date indicated on the batteries, and replace the battery if the date is over three years old.
Scale System	Make sure that the scale display is not broken and that the display can be read. Make sure that the scale control membranes are not broken, cracked, or worn. Make sure that the enable key function operates correctly. Replace parts as necessary. Put weights on the bed. With each change in the total weight, make sure that the scale shows the correct weight. Calibrate the scale as necessary. Refer to"Scale Calibration Switch" on page 4-48. Make sure that the load beams, cables, and P.C. board are in good condition. Troubleshoot the scale if any error messages show. Refer to Procedure 2.13 on page 2-23 through Procedure 2.19 on page 2-29.
Bed Exit System	Make sure that the control membranes are not broken, cracked, or worn. Make sure that the enable key operates correctly. Make sure the Bed Exit System operates correctly in all bed exit modes. Make sure that the alarm is loud and produces a clear sound. Replace worn or defective parts as necessary.

Function	Procedure
Siderails	Make sure the head and foot siderails are not bent or twisted and that all the covers are present. Replace parts as necessary. Make sure that there is not any loose or missing hardware such as screws, bolts, rivets, and latch components. Replace or tighten parts as necessary. Make sure the latch mechanism operates correctly. Make sure that you hear a click when you raise the siderail to the fully up position. Remove the siderail cover, and make sure that the mounting screws are tight. Examine the cable routing for pinching, binding, and damage. Adjust the cable routing as necessary. Make sure all functions on the caregiver control operate correctly. Repair or replace the siderail as necessary.
Foot extension	Operate the foot extension to make sure that the movement is correct and that it locks properly in the different positions when the lever is released. Repair or replace the foot extension as necessary.
Pivot points	Make sure that the articulations of the bed operate without making any noise (hilow column bearings, head and thigh sections). Lubricate as necessary.
Casters	Make sure that the casters do not have any flat spots, cuts, or other damage. Make sure that the tread of the casters is not excessively worn. Clean or replace the casters as necessary.
Fifth Wheel	Make sure that the fifth wheel does not have any flat spots, cuts, or other damage. Make sure that the tread of the wheel is not excessively worn. Clean or replace the fifth wheel as necessary. Make sure that the fifth wheel moves and turns correctly and makes good contact with the floor. Replace the fifth wheel if necessary. Make sure that the mounting bar is not broken. Replace the mounting bar as necessary.

Function	Procedure
Braking and steering	Make sure that the pedals, pedal covers, brake pads, linkages, and hex rods, are all in good condition. Replace parts as necessary. **Brake function:** • Apply the brake. While the brake is applied, examine each caster and make sure that the casters do not move. If the casters move, examine the brake components for wear. Replace or adjust parts as necessary. • Make sure that the brake function is easy to engage and disengage. If it is difficult to engage or disengage, go to "Braking Malfunction" on page 2-21. • Make sure that the brake disengages when the pedal is put in the neutral position. Replace or adjust parts as necessary. **Steer function:** • Apply the steer. While the steer is applied, move the bed and make sure that the steer caster locks in the steer position. Make sure that the steer caster does not come out of the steer position. Replace or adjust parts as necessary. • Make sure that the steer function is easy to engage and disengage. If it is difficult to engage or disengage, go to "Steering Malfunction" on page 2-22. • Make sure that the steer caster is not locked in the steer position when the pedal is put in the neutral position. Make sure that all casters rotate freely. Replace or adjust parts as necessary. **Brake Alarm System** Connect the bed to a wall power source, and set the brake to neutral. Make sure that the alarm activates and that you can hear it. If you can not hear the alarm, troubleshoot the alarm and replace parts as necessary. Make sure that the alarm deactivates when the brake is set while the bed is connected to a wall power source. Make sure that the brake alarm switch is in the correct position. Adjust or replace parts as necessary.
Nurse Call	Make sure that the nurse call operates correctly. Make sure that the membrane is not damaged.

Function	Procedure
Accessories	Make sure that all accessories that are installed on the bed operate correctly. Replace any missing or damaged parts. Do the following as applicable: **IV Pole** • Make sure that the IV pole is in good condition and there are no sharp edges, broken or missing knobs, broken or missing hooks, or corrosion. • Make sure that the IV pole latches at each level. • Make sure that the IV pole adapter is not missing, damaged, or loose. • Replace parts as necessary. **Oxygen Tank Holder** • Make sure that the oxygen tank holder is in good condition and is not broken, cracked, or missing. Make sure that the J-hooks are the correct size. Replace parts as necessary. **Patient Helper** • Make sure that there is not any missing hardware. Replace parts as necessary.
SideCom® Communication System	Examine and test the communication junction box. Make sure the SideCom® Communication System features operate correctly. Inspect the communication cable, including the male and female pins in the plug. Make sure that the cable is not missing and that there are no cuts, dents, or exposed wires. Replace parts as necessary.
SafeView® Alerts	Make sure the Alerts operate correctly. Repair or replace parts as necessary.

Function	Procedure
IntelliDrive® Transport System	Make sure of these: • The Service indicator is not flashing. • During operation, there is not loud clicking noises (such as metal that hits against metal). These noises could occur if there is an issue with a chain. • The drive wheel is not worn and it stows and deploys correctly. • The batteries do not need replaced. If the batteries are more than three years old, replace them. **Drive belt** Look for damage. Replace if you see any of these: • Belt is off of the pulley • Divot is greater that ½" (12.7 mm) in length • Internal steel belt is broken and comes out of the surface of the belt • Material breakdown due to unknown foreign substance **Transport Handles** • Each handle can operate the transport system in forward and reverse directions. • Refer to "Throttle Check (IntelliDrive® Transport System)" on page 2-44. Repair or replace parts as necessary.

PREVENTIVE MAINTENANCE CHECKLIST

Table 6-2. Preventive Maintenance Checklist

Date:	
Date of Last Preventive Maintenance:	
Manufacturer:	Hill-Rom
Model Number:	
Serial Number:	
Technician Doing Preventive Maintenance:	

Function	Procedure		
Overall condition: frame and welded assemblies	The frame is in good condition.	Pass	Fail
	The welded assemblies are in good condition.	Pass	Fail
	The frame is even and is not twisted.	Pass	Fail
	The bed is not corroded severely or scratched.	Pass	Fail
	The labels are installed, and the labels can be read.	Pass	Fail
	There are no loose, broken, or missing parts.	Pass	Fail
	If Fail, what part?		
Headboard and Footboard	The headboard and footboard are in good condition.	Pass	Fail
	The headboard and footboard are securely attached.	Pass	Fail
Power cord	The wall plug is a one-piece molded assembly.	Pass	Fail
	There is no discoloration of the plug molding around the plug blades.	Pass	Fail
	There are no signs of cracking.	Pass	Fail
	The power cord is not damaged, and does not have exposed wires.	Pass	Fail
Leakage current	The leakage current measures less than 100 µA when no functions are used.	Pass	Fail
	Current:		µA
	The resistance measures less than 0.2 ohms	Pass	Fail
	Resistance:		ohms
Patient Pendant	The pendant is in good condition.	Pass	Fail
	The connector and connector pins are not damaged.	Pass	Fail
	All pendant controls operate correctly.	Pass	Fail
	The control membranes are in good condition.	Pass	Fail
	The cable is not cut, dented, or damaged, and there are no exposed cables.	Pass	Fail
	The latch spring kit is present and in good condition.	Pass	Fail
	The pendant stays attached to the siderail.	Pass	Fail

Function	Procedure		
Patient and Caregiver Controls	The control panel membranes are not broken, cracked, or worn.	Pass	Fail
	The lockout function operates correctly. Controls can be locked and unlocked with the lockout function.	Pass	Fail
	All functions operate with the corresponding controls.	Pass	Fail
Hilow columns	All screws and attachments are secure and not missing.	Pass	Fail
	All covers are present and in good condition.	Pass	Fail
	Bearings are present and in good condition.	Pass	Fail
	The hilow cable is correctly routed.	Pass	Fail
	There are no unusual noises when the hilow function is activated.	Pass	Fail
	The **Bed Not Down** indicator operates correctly.	Pass	Fail
Head Section Motor	The actuator assembly is in good condition and there are no parts missing.	Pass	Fail
	The head section can move through the complete range of motion.	Pass	Fail
	There are no unusual noises when the **Head Up** or **Head Down** function is used to raise or lower the head section.	Pass	Fail
Sleep Deck	The sleep deck is in good condition.	Pass	Fail
	The sleep surface does not bind when the bed is articulated.	Pass	Fail
	There are no unusual noises when the bed is articulated.	Pass	Fail
CPR Release	The handles, cables, and CPR actuator on the head motor are in good condition.	Pass	Fail
	Both CPR handles lower the head end of the sleep deck when activated.	Pass	Fail
	The CPR cable is not corroded.	Pass	Fail
	The **Head Up** control raises the head section after the CPR release is used to lower the head section.	Pass	Fail
	The hex nuts on the CPR cable and the shoulder screw on the CPR handle are tight.	Pass	Fail
Head section gas spring	The assembly is in good condition, and all screws are tight. There is no missing hardware.	Pass	Fail
	The gas spring does not leak.	Pass	Fail
	The CPR release lowers the head section rapidly to the intermediate position and then slowly to the low position.	Pass	Fail

Function	Procedure		
Knee/Thigh Section Motor	The actuator assembly is in good condition, and there are no parts missing.	Pass	Fail
	The knee section can move through the complete range of motion.	Pass	Fail
	There are no unusual noises when the **Knee Up** or **Knee Down** function is used to raise or lower the knee section.	Pass	Fail
Automatic Contour	The knee section raises to mid-height when the head section is raised, and lowers when the head section is lowered.	Pass	Fail
Dining Chair® Position	All three sections move to the correct position when the **Chair** control is activated.	Pass	Fail
	The sleep deck returns to the flat position when the **Bed Flat** control is activated.	Pass	Fail
Trendelenburg/Reverse Trendelenburg	The **Trendelenburg** or **Reverse Trendelenburg** function operates correctly when the **Trendelenburg** or **Reverse Trendelenburg** function is activated.	Pass	Fail
	There are no unusual noises when the bed is articulated.	Pass	Fail
Battery	All bed functions operate on battery power.	Pass	Fail
	If the batteries are more than 3 years old, replace the batteries. Are the batteries more than 3 years old?	Yes	No
Scale System	The scale control panel membranes are not broken, cracked, or worn.	Pass	Fail
	The scale display is in good condition and can be read.	Pass	Fail
	The scale shows the correct value when a known weight is placed on the bed and weighed.	Pass	Fail
	The scale does not show any errors and operates correctly.	Pass	Fail
Bed Exit System	The control panel membranes are not broken, cracked, or worn.	Pass	Fail
	The Enable control and other controls operate correctly.	Pass	Fail
	The alarm operates correctly and can be heard.	Pass	Fail
Siderails	The siderails are in good condition.	Pass	Fail
	The siderails are not bent or twisted, and all of the covers are present.	Pass	Fail
	The mounting screws are secure.	Pass	Fail
	There are no loose, broken, or missing parts.	Pass	Fail
	If Fail, what part?		
	The latch mechanisms operate correctly.	Pass	Fail
	The siderails raise and lower easily.	Pass	Fail
Foot Extension	The foot extension operates correctly and locks into the correct positions.	Pass	Fail

Function	Procedure		
Pivot Points	The bed does not make unusual noise when it is articulated.	Pass	Fail
Casters	The casters are in good condition.	Pass	Fail
	The casters are not obstructed.	Pass	Fail
	The bed moves smoothly and is not loud.	Pass	Fail
	The casters do not make unusual noise when the bed is moved.	Pass	Fail
Fifth Wheel	The wheel is in good condition.	Pass	Fail
	The wheel is not obstructed.	Pass	Fail
	The fifth wheel moves smoothly and is not loud.	Pass	Fail
	The fifth wheel activates correctly when the brake/steer pedal is put in the steer position.	Pass	Fail
Brake and steer functions	The brake/steer mechanism is in good condition.	Pass	Fail
	The brake function is easy to engage and disengage.	Pass	Fail
	The brake prevents the bed from moving.	Pass	Fail
	The casters roll freely when the brakes/steer control is in the neutral or steer position.	Pass	Fail
	The steer function is easy to engage and disengage.	Pass	Fail
	The steer caster (left foot) locks in position and does not come out of position.	Pass	Fail
	The bed moves in a straight line when pushed forward after the steer caster is locked in position.	Pass	Fail
	When the bed is connected to wall power and the brake/steer mechanism is in the neutral or steer position, the brake-not-set alarm can be heard.	Pass	Fail
	When the bed is connected to wall power, and the brake/steer mechanism is in the brake position, the brake-not-set alarm can not be heard.	Pass	Fail
Nurse Call	The nurse call function can send a call to the nurse station.	Pass	Fail
	The nurse call control membrane is not broken, cracked, or worn.	Pass	Fail
IV Pole	If the bed does not have an IV pole, ignore this section. Does the bed have an IV pole?	Yes	No
	The IV pole does not have sharp edges or rust.	Pass	Fail
	The knobs and hooks are not broken or missing.	Pass	Fail
	The IV pole latches at the different position stops.	Pass	Fail
Oxygen Tank Holder	If the bed does not have an oxygen tank holder, ignore this section. Does the bed have an oxygen tank holder?	Yes	No
	The plastic tank holder is not broken, cracked, or missing.	Pass	Fail
	The metal J-hooks are the correct size.	Pass	Fail

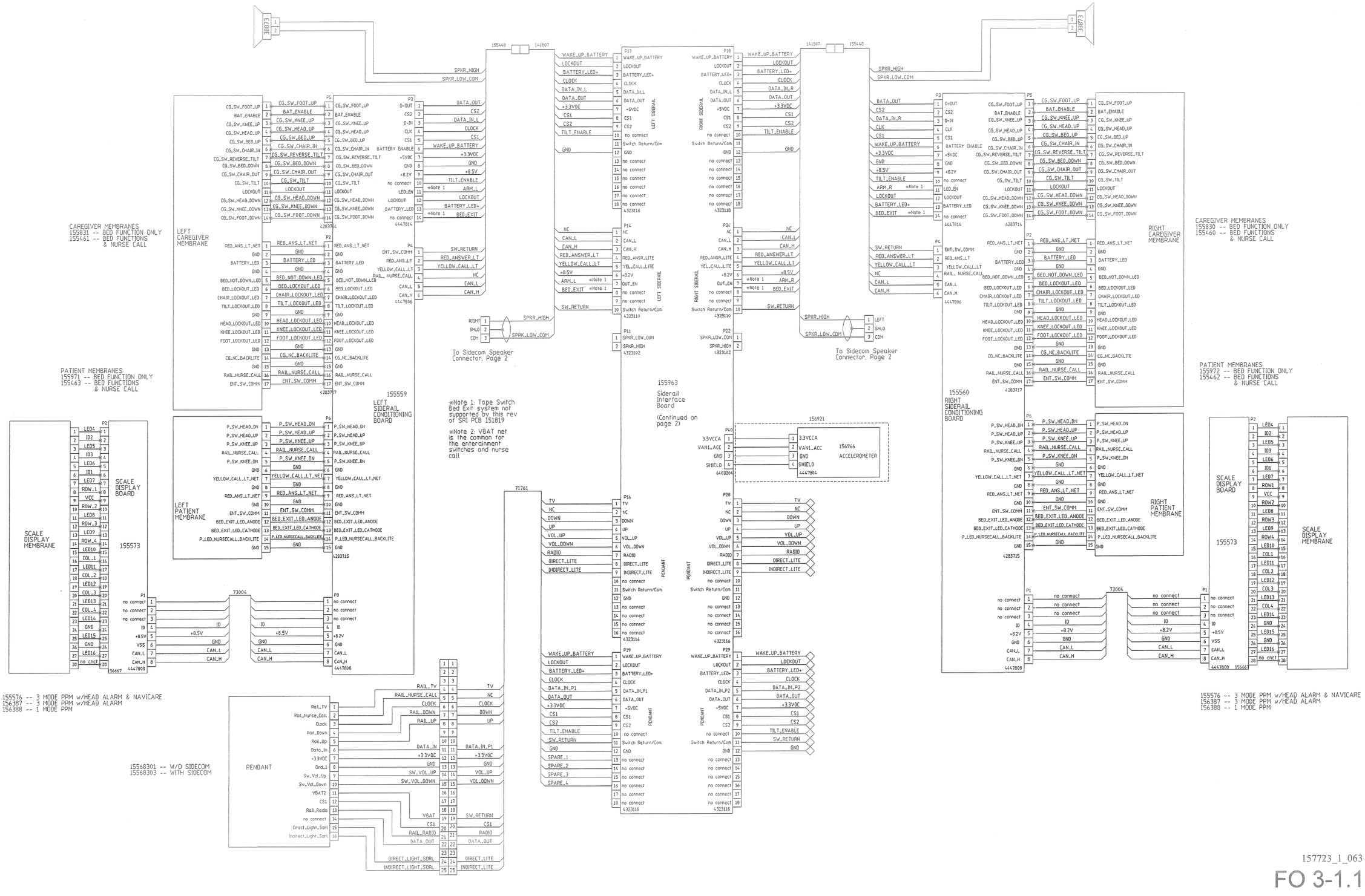
Function	Procedure		
Patient Helper	If the bed does not have a patient helper, ignore this section. Does the bed have a patient helper?	Yes	No
	The patient helper is in good condition, and there is no missing hardware.	Pass	Fail
SideCom® Communication System	The SideCom® Communication System operates correctly.	Pass	Fail
	The SideCom® Communication System control board is not damaged.	Pass	Fail
	The SideCom® Communication System cable is not missing and does not have dents, cuts, or damage.	Pass	Fail
	The SideCom® Communication System cable does not have damaged pins at the connectors.	Pass	Fail
Safeview® Alerts	The Safeview® Alerts set and operate correctly.	Pass	Fail
IntelliDrive® Transport System	Each handle operates the IntelliDrive® Transport System in the forward and reverse directions.	Pass	Fail
	There are no unusual noises, particularly loud clicking noises.	Pass	Fail
	The drive wheel is not worn and is in good condition.	Pass	Fail
	The drive wheel goes down when the brake/steer pedal is put in the steer position and goes up when the brake/steer pedal is put in the neutral and brake positions.	Pass	Fail
	The belt is in the correct position and is in good condition.	Pass	Fail
	If the batteries are more than 3 years old, replace the batteries. Are the batteries more than 3 years old?	Yes	No
Other Accessories	Make sure that all accessories operate correctly. List the accessories and circle Pass/Fail as applicable.		
		Pass	Fail
		Pass	Fail
		Pass	Fail
		Pass	Fail

Notes:

Did the bed fail any items on the Preventive Maintenance Checklist?	Yes - Complete the rest of this table	No - Keep this Checklist for record purposes
Corrective actions completed:		
List of parts replaced:	Part:	Cost:
Total cost:		

NOTES:

Bed Wiring Schematic (Sheet 1 of 2)



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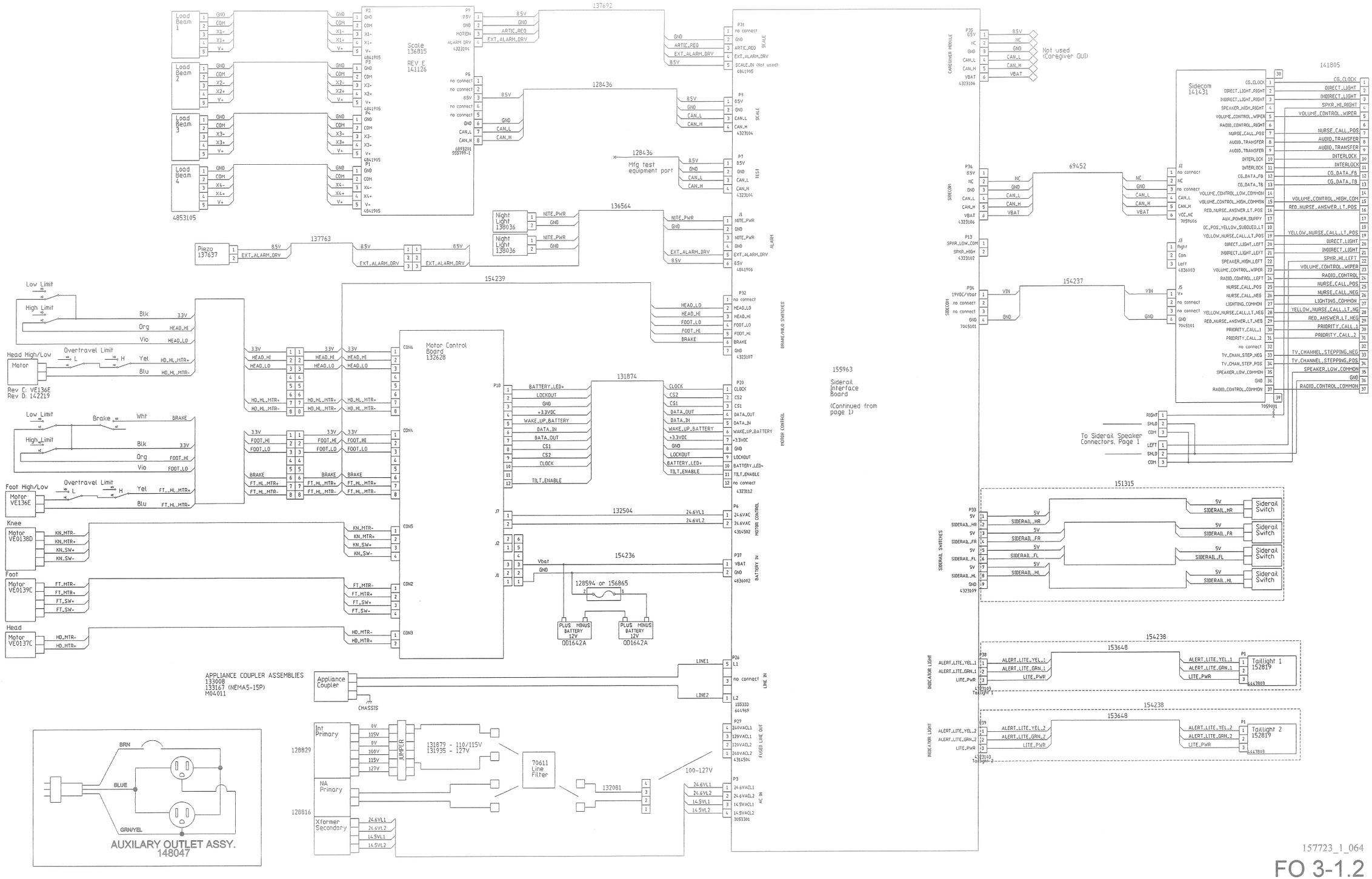
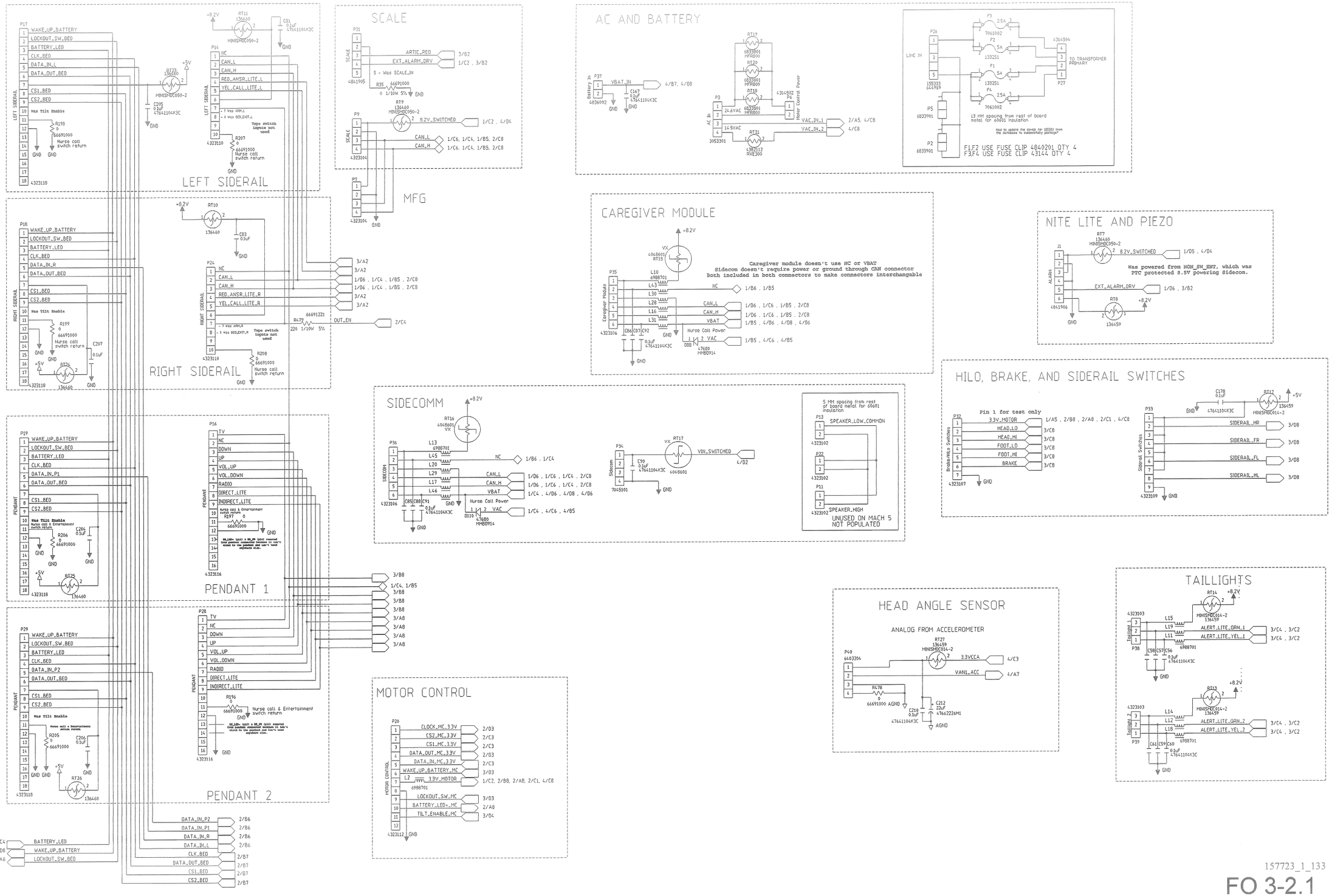
FO 3-1.1

Bed Wiring Schematic (Sheet 1 of 2)



Siderail Interface P.C. Board (Sheet 1 of 4)



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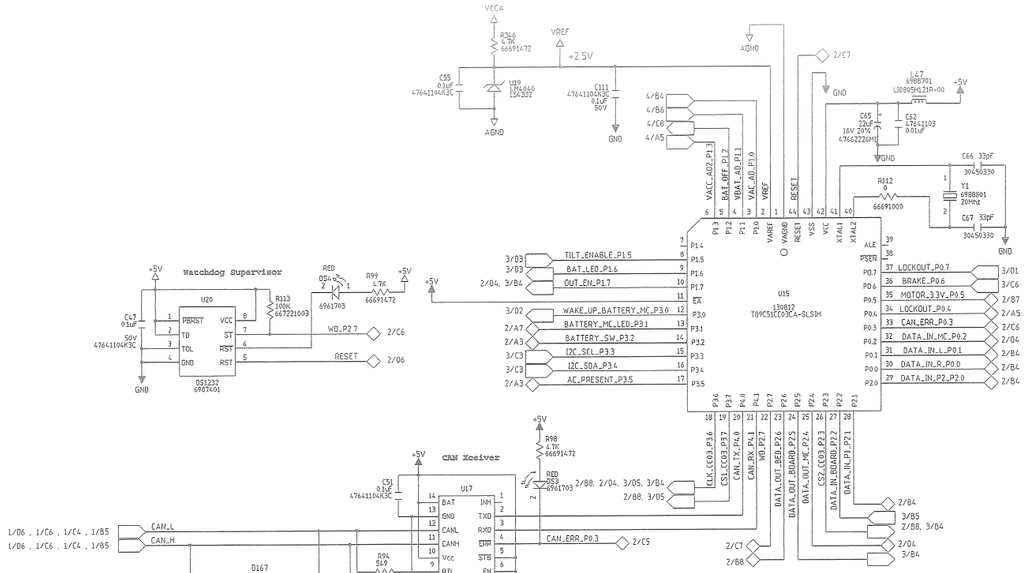
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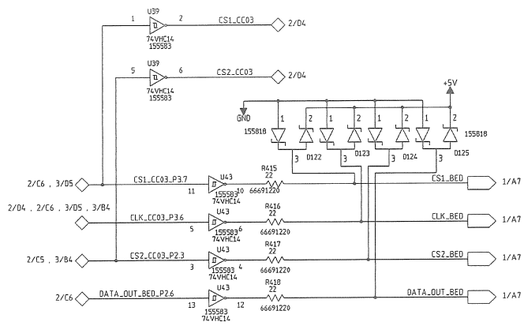
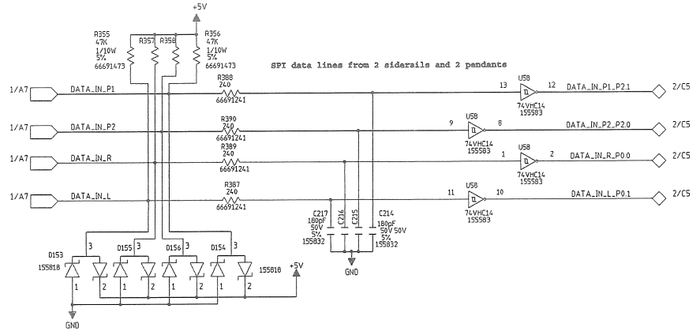
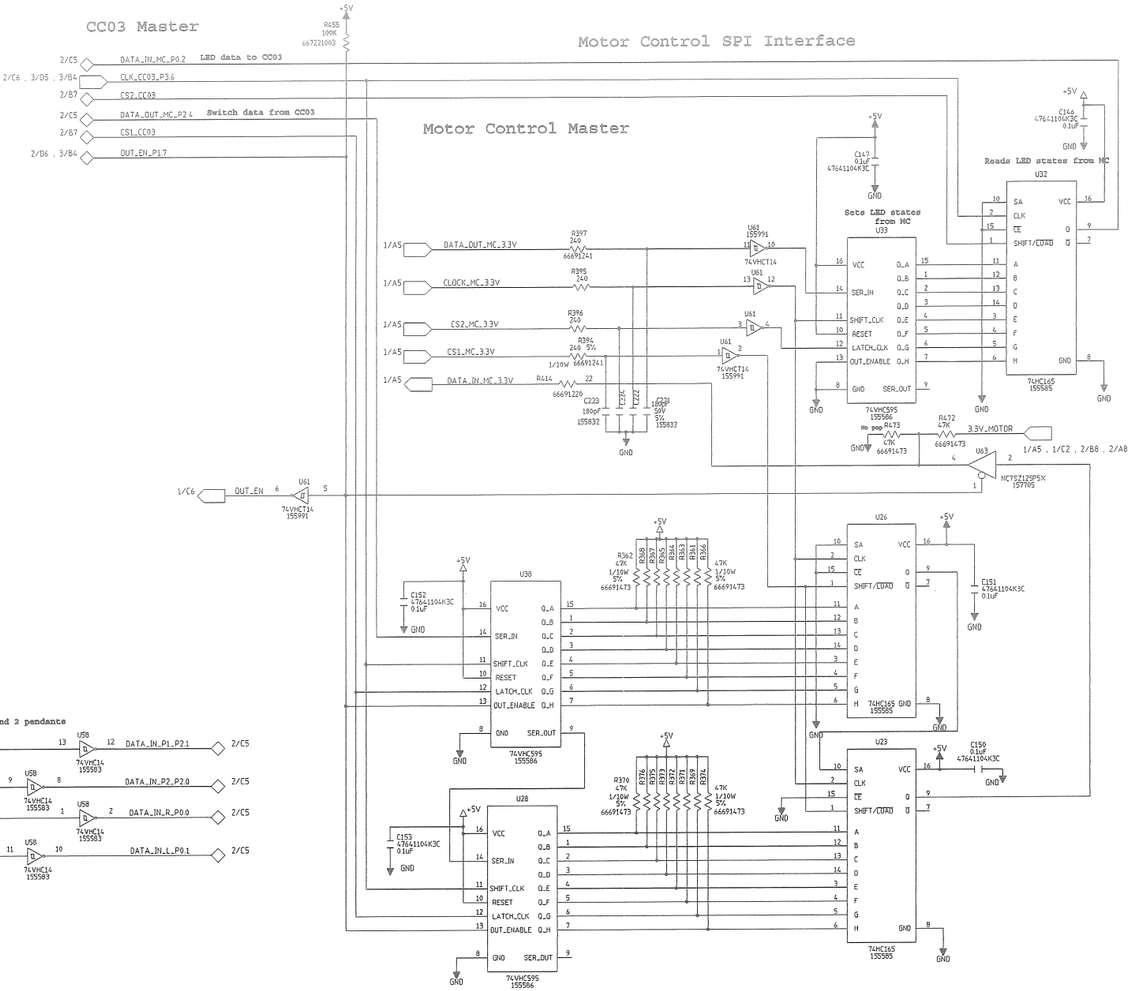
TRC4L0
TSA332
C111
47641104K3C
0.1uF
50V
C55
0.1uF
47641104K3C
R366
4.7K
66691472
GND
4/B4
4/B6
4/C8
4/A5
VACC_AD2_P1.3
BAT_AD_P1.2
VBAT_AD_P1.1
VAC_AD_P1.0
VAREF
RESET
VSS
VCC
XTAL1
XTAL2
ALE
PSEN
P1.4
P1.5
P1.6
P1.7
EA
P3.0
P3.1
P3.2
P3.3
P3.4
P3.5
P0.7
P0.6
P0.5
P0.4
P0.3
P0.2
P0.1
P0.0
P2.0
U15
T89C51CC03CA-SLSIM
TILT_ENABLE_P1.5
BAT_LED_P1.6
OUT_EN_P1.7
WAKE_UP_BATTERY_MC_P3.0
BATTERY_MC_LED_P3.1
BATTERY_SW_P3.2
I2C_SCL_P3.3
I2C_SDA_P3.4
AC_PRESENT_P3.5
LOCKOUT_P0.7
BRAKE_P0.6
MOTOR_3.3V_P0.5
LOCKOUT_P0.4
CAN_ERR_P0.3
DATA_IN_MC_P0.2
DATA_IN_L_P0.1
DATA_IN_R_P0.0
DATA_IN_P2_P2.0
L47
6988701
LI0805HS2R1R-00
C65
22uF
16V 20%
47622226M1
C62
47641103
0.01uF
C66 33pF
30450330
C67 33pF
30450330
Y1
6988801
20MHz
R112
0
66691000
Watchdog Supervisor
U20
DS1232
6987491
PBRST
TD
TOL
GND
VCC
ST
RST
RST
C47
0.1uF
50V
47641104K3C
RED
0S4-5
6961703
R113
100K
667221003
R99
4.7K
66691472
WD_P2.7
RESET
2/C6
2/D6
CAN Xceiver
U17
CAN_L
CAN_H
CANL
CANH
Vcc
RTL
RTH
INH
TXD
RXD
ERR
STB
EN
WAKE
6893301
TJA1054
C51
0.1uF
47641104K3C
R98
4.7K
66691472
RED
0S3
6961703
R94
549
476225490
R95
549
D167
CAN_ERR_P0.3
2/C5
2/B8, 2/D4, 3/D5, 3/B4
2/B8, 3/D5
2/C7
2/B8
2/B4
3/B5
2/B8, 3/B4
2/D4
3/B4
1/D6 , 1/C6 , 1/C4 , 1/B5
1/D6 , 1/C6 , 1/C4 , 1/B5


U39
74VHC14
155583
CS1_CC03
2/D4
CS2_CC03
2/D4
GND
155818
+5V
0122
0123
0124
0125
2/C6 , 3/D5
CS1_CC03_P3.7
R415
22
66691220
CS1_BED
1/A7
2/D4 , 2/C6 , 3/D5 , 3/B4
CLK_CC03_P3.6
R416
22
66691220
CLK_BED
2/C5 , 3/B4
CS2_CC03_P2.3
R417
22
66691220
CS2_BED
2/C6
DATA_OUT_BED_P2.6
R418
22
66691220
DATA_OUT_BED
U43
155583
74VHC14


SPI data lines from 2 sidarails and 2 pandants
DATA_IN_P1
DATA_IN_P2
DATA_IN_R
DATA_IN_L
1/A7
R355
47K
1/10W
5%
66691473
R357
R358
R356
47K
1/10W
5%
66691473
R388
240
66691241
R390
240
66691241
R389
240
66691241
R387
240
66691241
U59
U58
74VHC14
155583
DATA_IN_P1_P2.1
DATA_IN_P2_P2.0
DATA_IN_R_P0.0
DATA_IN_L_P0.1
2/C5
D153
D155
D156
D154
155818
C217
180pF
50V
5%
155832
C216
C215
C214
+5V
GND


CC03 Master
Motor Control SPI Interface
Motor Control Master
2/C5
DATA_IN_MC_P0.2
LED data to CC03
2/B8 , 2/C6 , 3/D5 , 3/B4
CLK_CC03_P3.6
2/B7
CS2_CC03
2/C5
DATA_OUT_MC_P2.4
Switch data from CC03
2/B7
CS1_CC03
2/D6 , 3/B4
OUT_EN_P1.7
R455
100K
667221003
+5V
1/A5
DATA_OUT_MC_3.3V
CLOCK_MC_3.3V
CS2_MC_3.3V
CS1_MC_3.3V
DATA_IN_MC_3.3V
R397
240
66691241
R395
240
R396
240
R394
240
5%
1/10W
66691241
R414
22
66691220
C223
180pF
50V
5%
155832
C222
.1uF
C221
.1uF
U61
155991
74VHCT14
GND
C147
0.1uF
47641104K3C
Sets LED states
from MC
U33
74VHC595
155586
VCC
SER_IN
SHIFT_CLK
RESET
LATCH_CLK
OUT_ENABLE
GND
SER_OUT
0_A
0_B
0_C
0_D
0_E
0_F
0_G
0_H
C166
47641104K3C
0.1uF
Reads LED states from MC
U32
74HC165
155585
SA
CLK
CE
SHIFT/LOAD
Q
Q
A
B
C
D
E
F
G
H
R472
47K
66691473
3.3V_MOTOR
no pop
R473
47K
66691473
U63
HCT5Z129PSX
157705
1/A5 , 1/C2 , 2/B8 , 2/A8 , 4/C8
1/C6
OUT_EN
U61
74VHCT14
155991
C192
47641104K3C
0.1uF
U30
U26
U23
U28
R362
47K
1/10W
5%
66691473
R363
R364
R365
R366
R367
R368
R369
R370
R371
R372
R373
R374
C151
47641104K3C
0.1uF
C153
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C159
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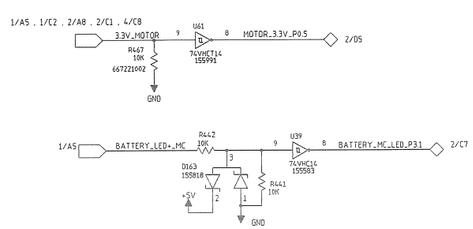
0.1uF
C150
47641104K3C
0.1uF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667221002
U61
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MOTOR_3.3V_P0.5
2/D5
GND
1/A5
BATTERY_LED+_MC
R442
10K
U39
74VHC14
155583
BATTERY_MC_LED_P3.1
2/C7
D163
155818
R441
10K
+5V
1/A5 , 1/C2 , 2/B8 , 2/C1 , 4/C8
3.3V_MOTOR
U63
NCT5212SPSX
157705
C232
0.1uF
U43
74VHC14
155583
C198
0.1uF
U42
74VHC14
155583
C154
0.1uF
U39
74VHC14
155583
C145
0.1uF
U40
74VHC14
155583
C159
0.1uF
47641104K3C
U58
74VHC14
155583
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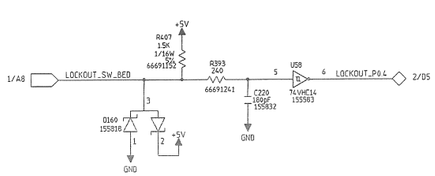
155991
C260
0.1uF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LOCKOUT_SW_BED
R407
15K
1/16W
5%
66691152
R393
240
66691241
U58
74VHC14
155583
LOCKOUT_P0.4
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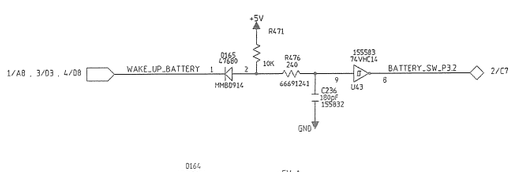
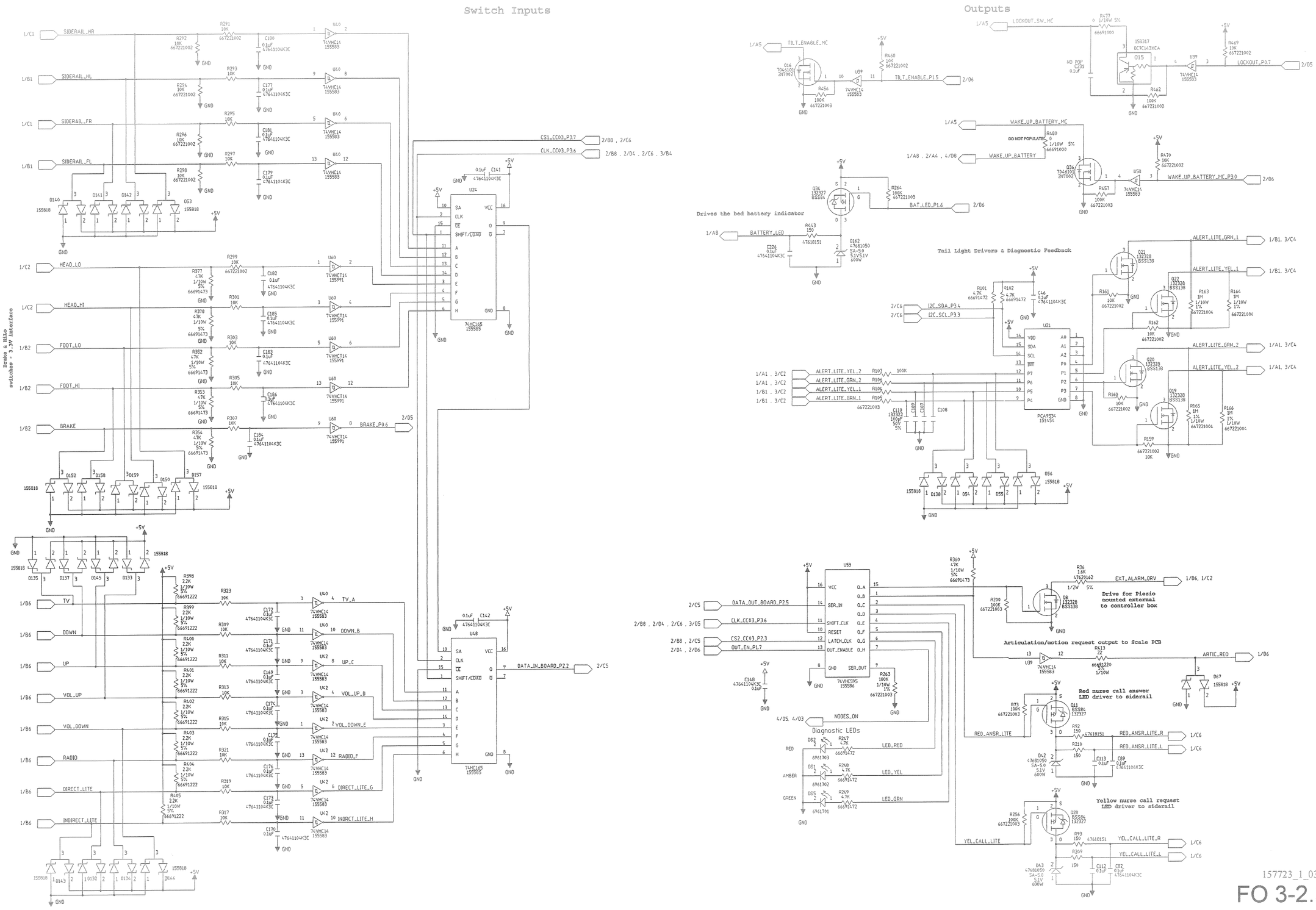
C220
180pF
50V
5%
155832
D160
155818
GND


1/A8 , 3/D3 , 4/D8
WAKE_UP_BATTERY
R471
10K
R465
47680
MMBD914
R476
240
66691241
155583
74VHC14
U43
BATTERY_SW_P3.2
2/C7
C236
180pF
50V
5%
155832
GND
1/D3 , 4/C8
VAC_IN_1
D164
MMBD914
47680
R465
100K
667221003
Q166
136447
BZX84
6.2V
Q37
855138
132320
R461
499K
1/10W
1%
667224993
U43
155583
74VHC14
AC_PRESENT_P3.5
2/C7
C230
0.1uF
47641104K3C
R466
100K
667221003
U60
155991
74VHCT14
R429
0
66691000
GND

Siderail Interface P.C. Board (Sheet 3 of 4)



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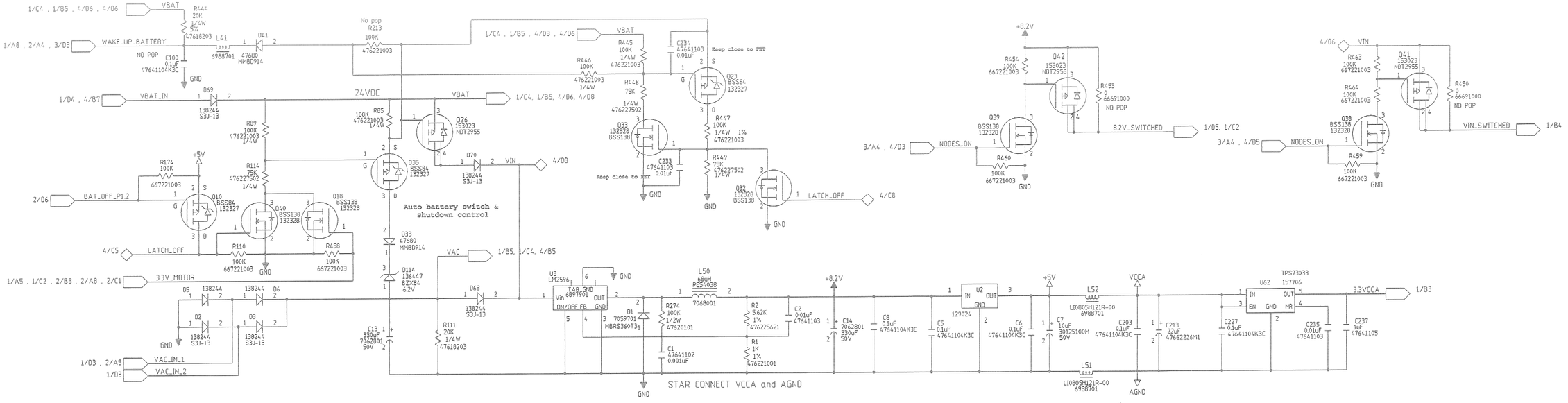
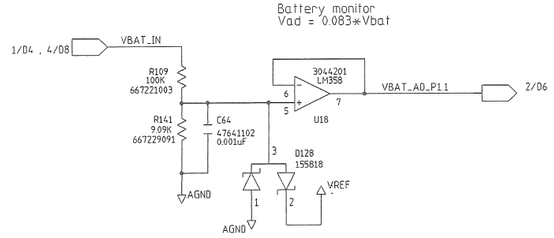
FO 3-2.3

Siderail Interface P.C. Board (Sheet 4 of 4)

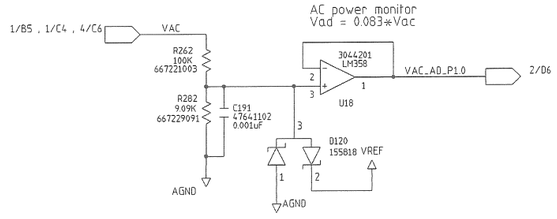
POWER SUPPLY AND BATTERY MGMT

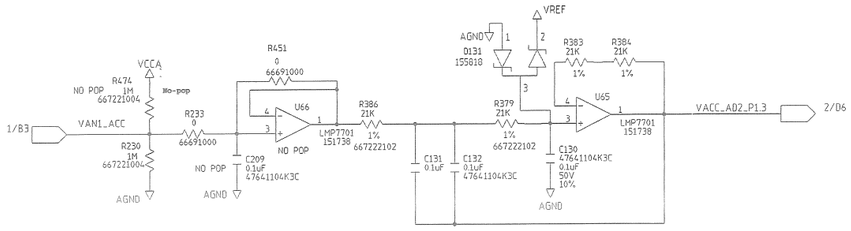


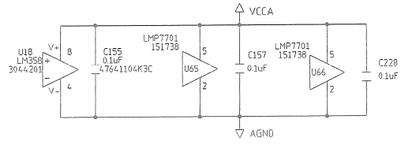
Battery monitor
Vad = 0.083*Vbat



AC power monitor
Vad = 0.083*Vac







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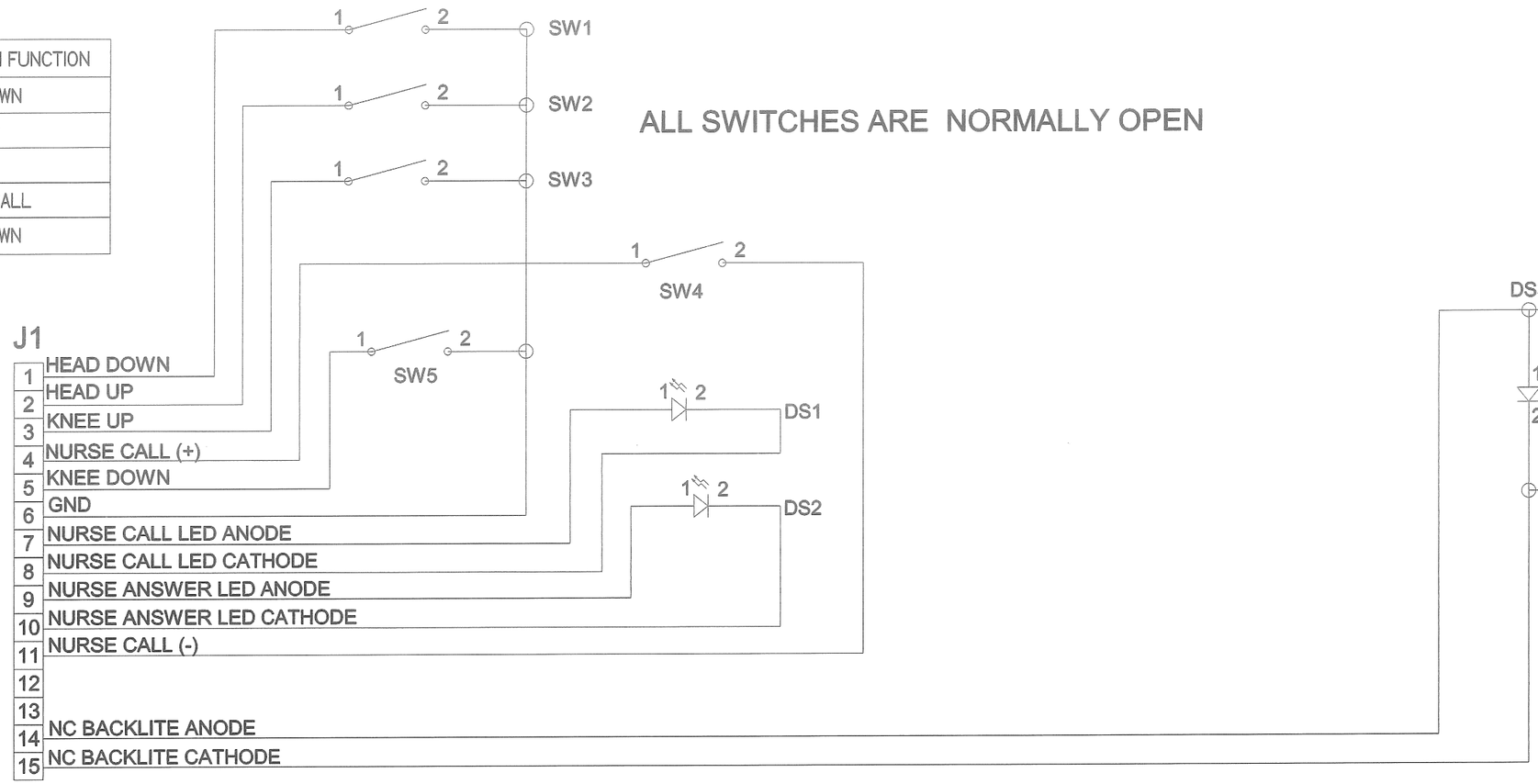
FO 3-2.4

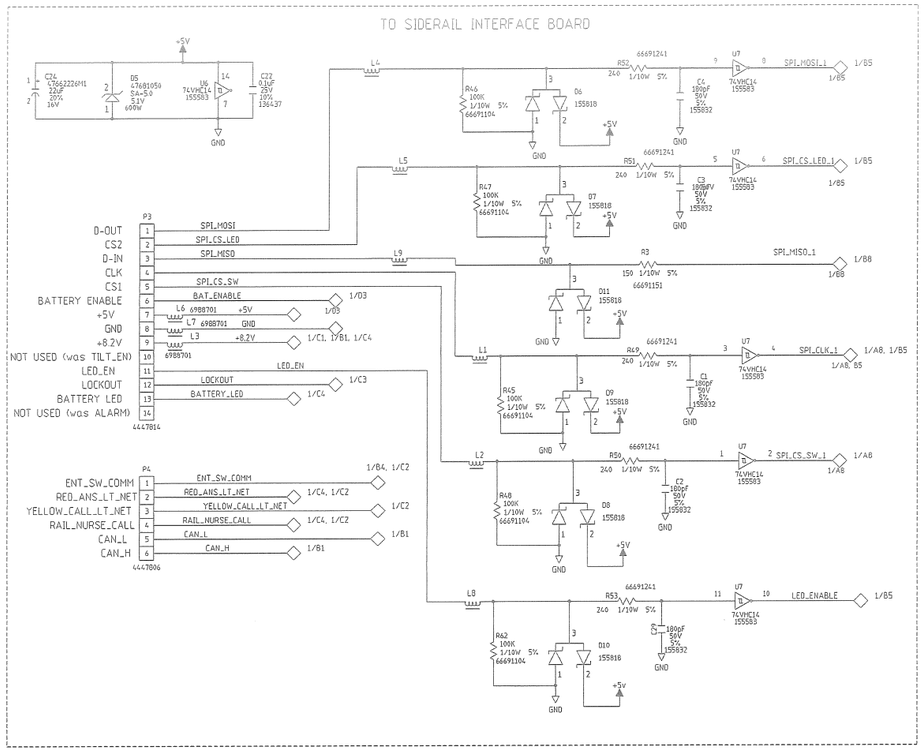
SWITCH NO.	SWITCH FUNCTION
SW1	HEAD DOWN
SW2	HEAD UP
SW3	KNEE UP
SW4	NURSE CALL
SW5	KNEE DOWN

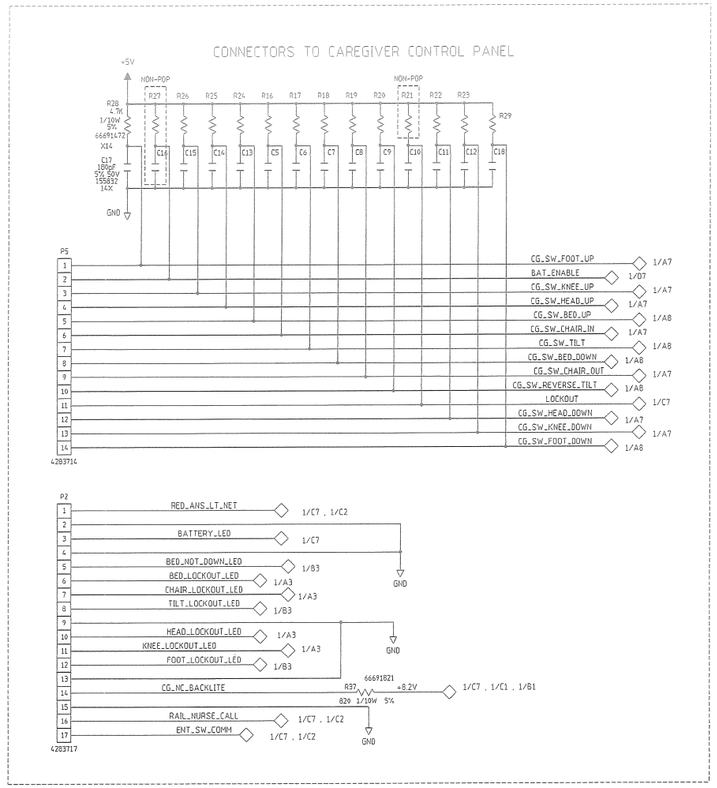


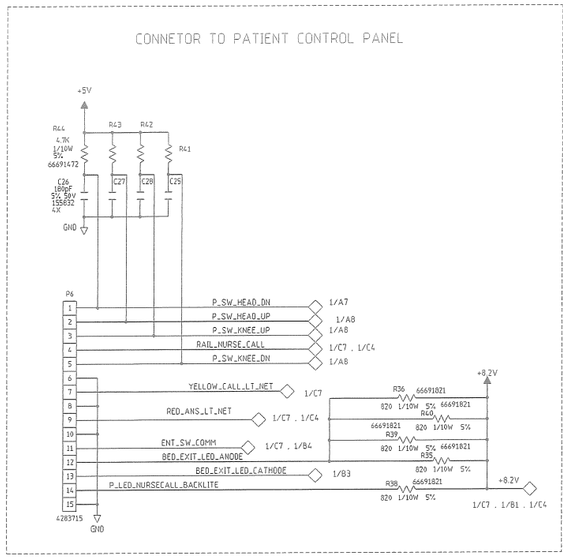
ALL SWITCHES ARE NORMALLY OPEN

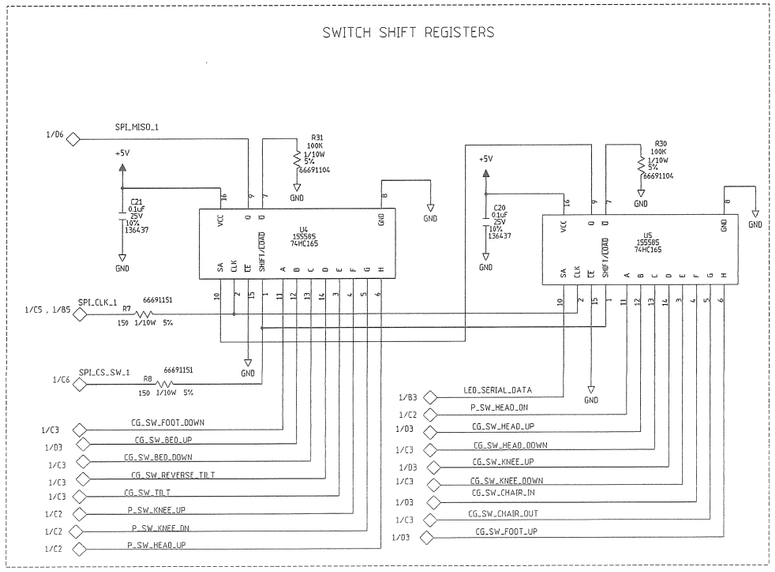
LED	COLOR	LED FUNCTION
DS1	YELLOW	NURSE CALL
DS2	GREEN	NURSE ANSWER
DS3	YELLOW	NURSE CALL BACKLITE
DS4	YELLOW	NURSE CALL BACKLITE
DS5	YELLOW	NURSE CALL BACKLITE
DS6	YELLOW	NURSE CALL BACKLITE

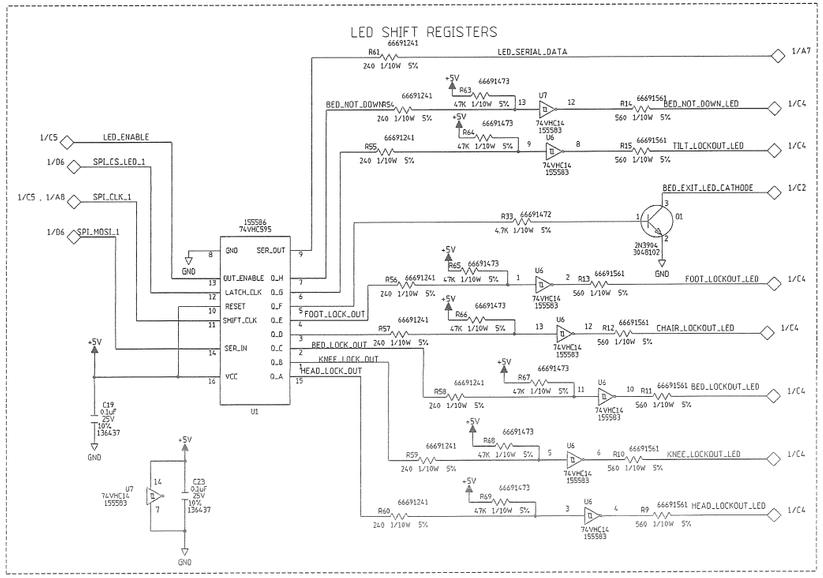
Siderail Signal Conditioning

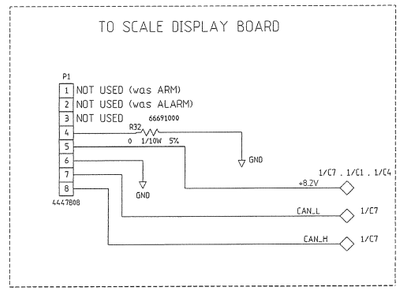








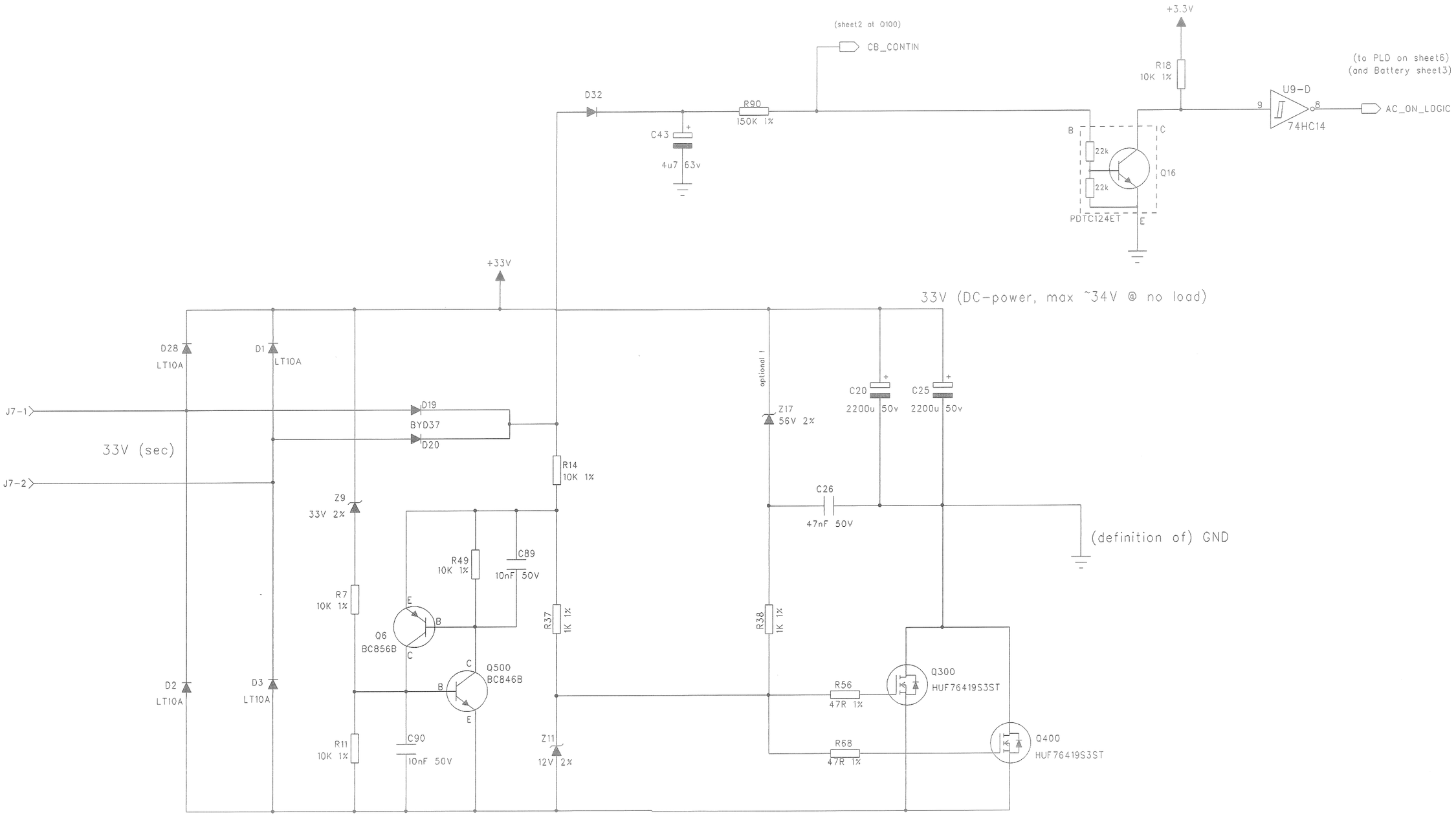


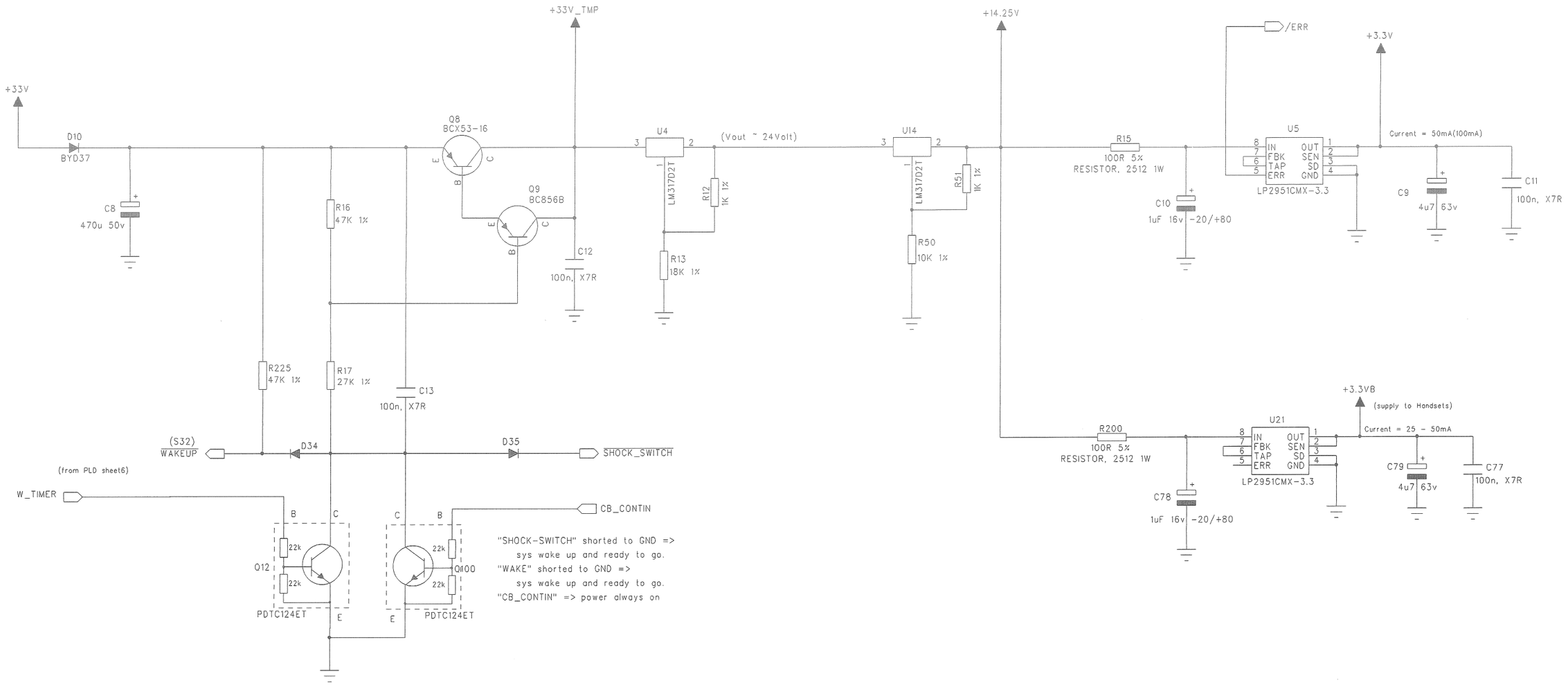


PCB 155965

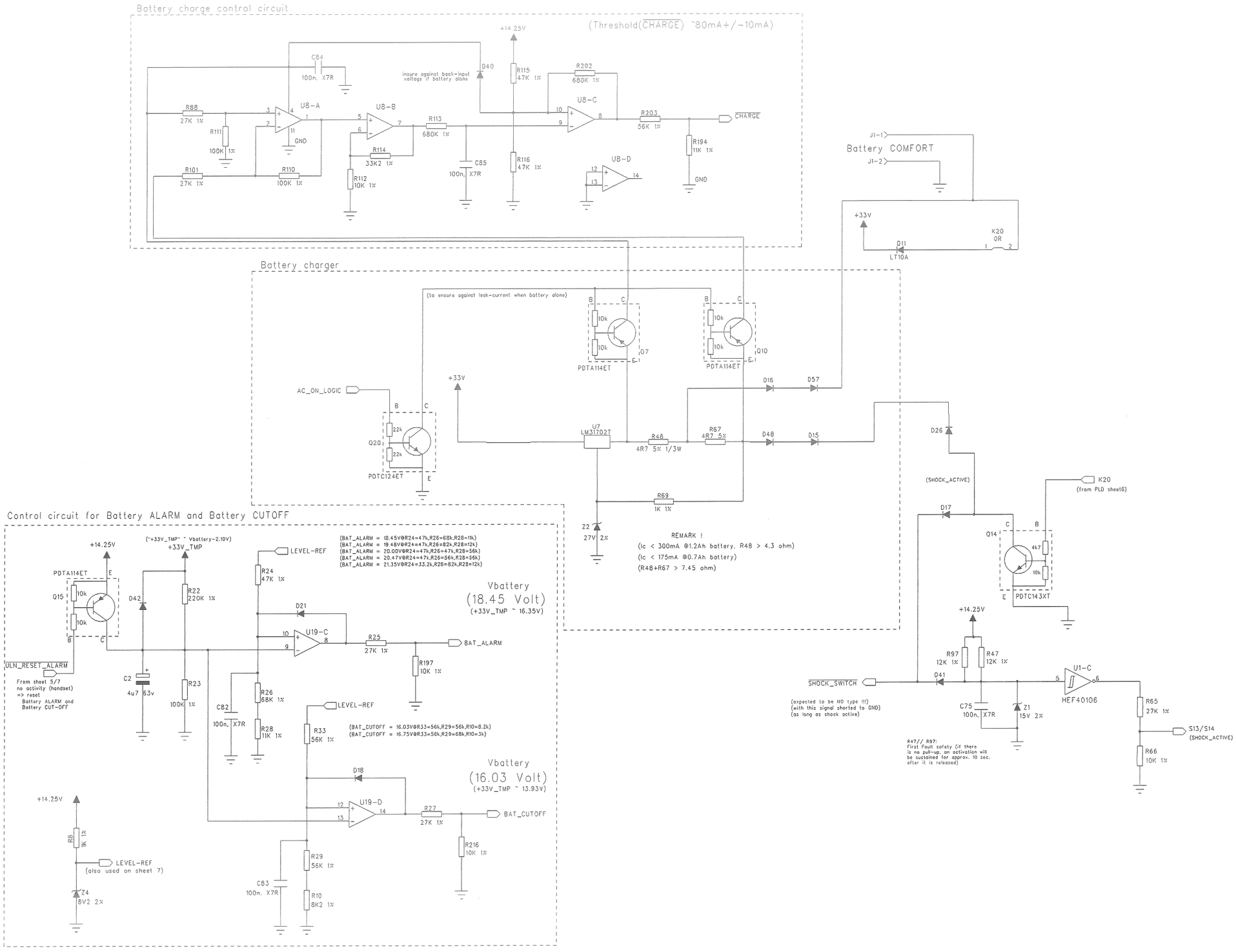
ASSY 155559

Bed Control Board Power and Phase Control



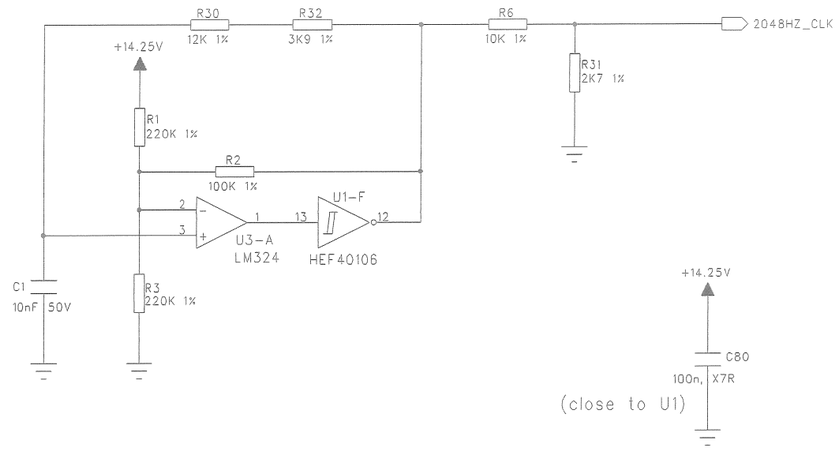

+33V
D10
BYD37
C8
470u 50v
Q8
BCX53-16
Q9
BC856B
+33V_TMP
C12
100n, X7R
U4
LM317D2T
R12
1K 1%
R13
18K 1%
(Vout ~ 24Volt)
U14
LM317D2T
R51
1K 1%
R50
10K 1%
+14.25V
R15
100R 5%
RESISTOR, 2512 1W
C10
1uF 16v -20/+80
/ERR
+3.3V
U5
IN
FBK
TAP
ERR
OUT
SEN
SD
GND
LP2951CMX-3.3
Current = 50mA(100mA)
C9
4u7 63v
C11
100n, X7R
R16
47K 1%
R225
47K 1%
R17
27K 1%
C13
100n, X7R
(S32)
WAKEUP
D34
D35
SHOCK_SWITCH
(from PLD sheet6)
W_TIMER
CB_CONTIN
Q12
Q100
22k
PDTC124ET
"SHOCK-SWITCH" shorted to GND =>
sys wake up and ready to go.
"WAKE" shorted to GND =>
sys wake up and ready to go.
"CB_CONTIN" => power always on
+3.3VB
(supply to Handsets)
R200
100R 5%
RESISTOR, 2512 1W
C78
1uF 16v -20/+80
U21
LP2951CMX-3.3
Current = 25 - 50mA
C79
4u7 63v
C77
100n, X7R

Bed Control Board Battery Management



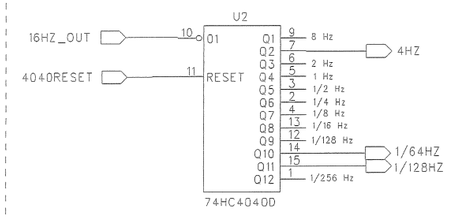
Bed Control Board Clock and Divider

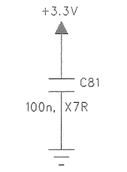
Clock Generator



Divider

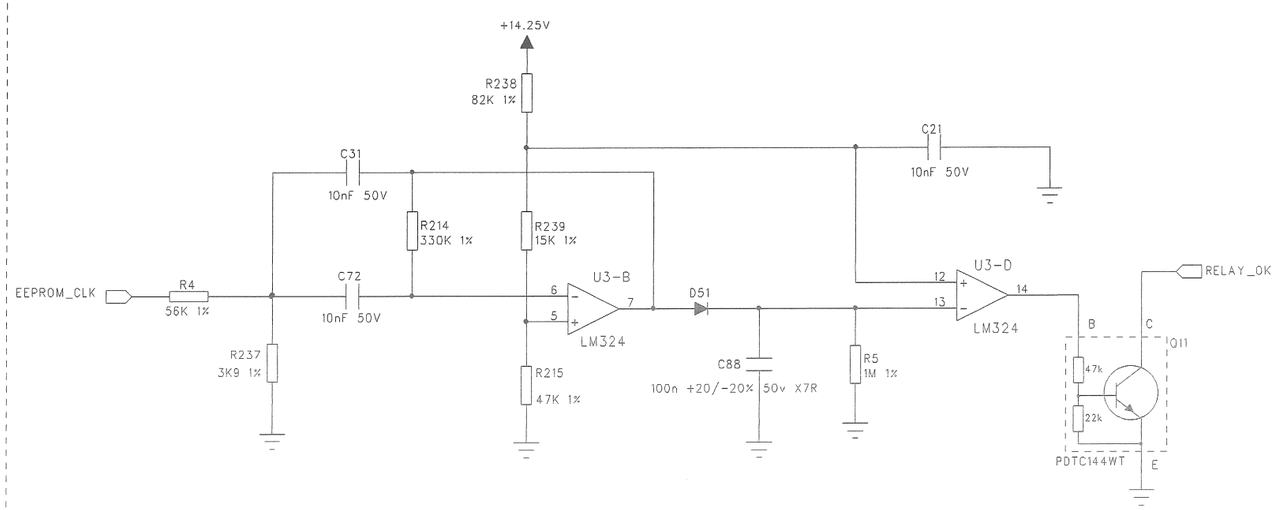
Generates slow clocks for
timers and blinking of LED's

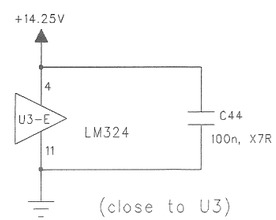




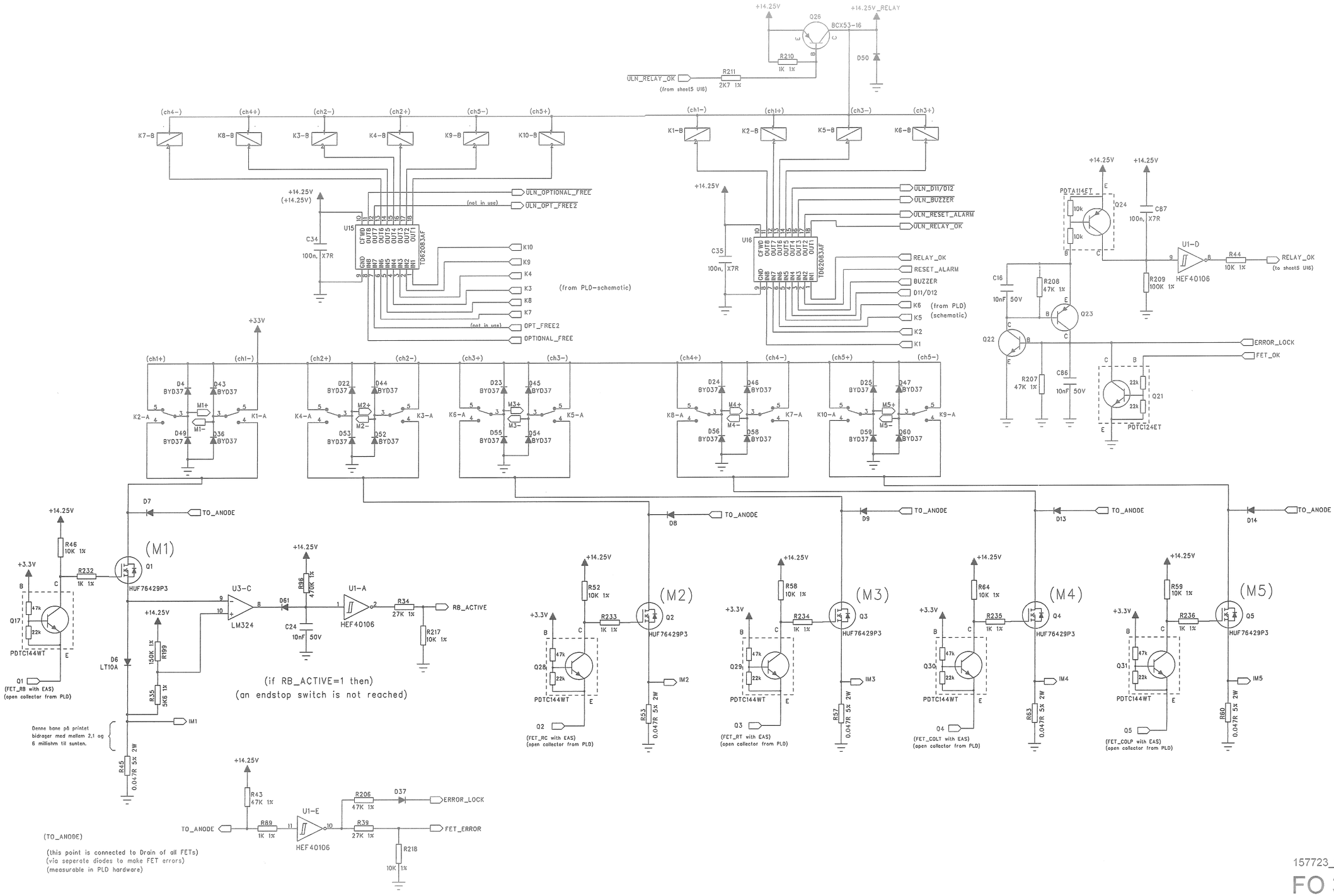
Frequency Surveillance

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

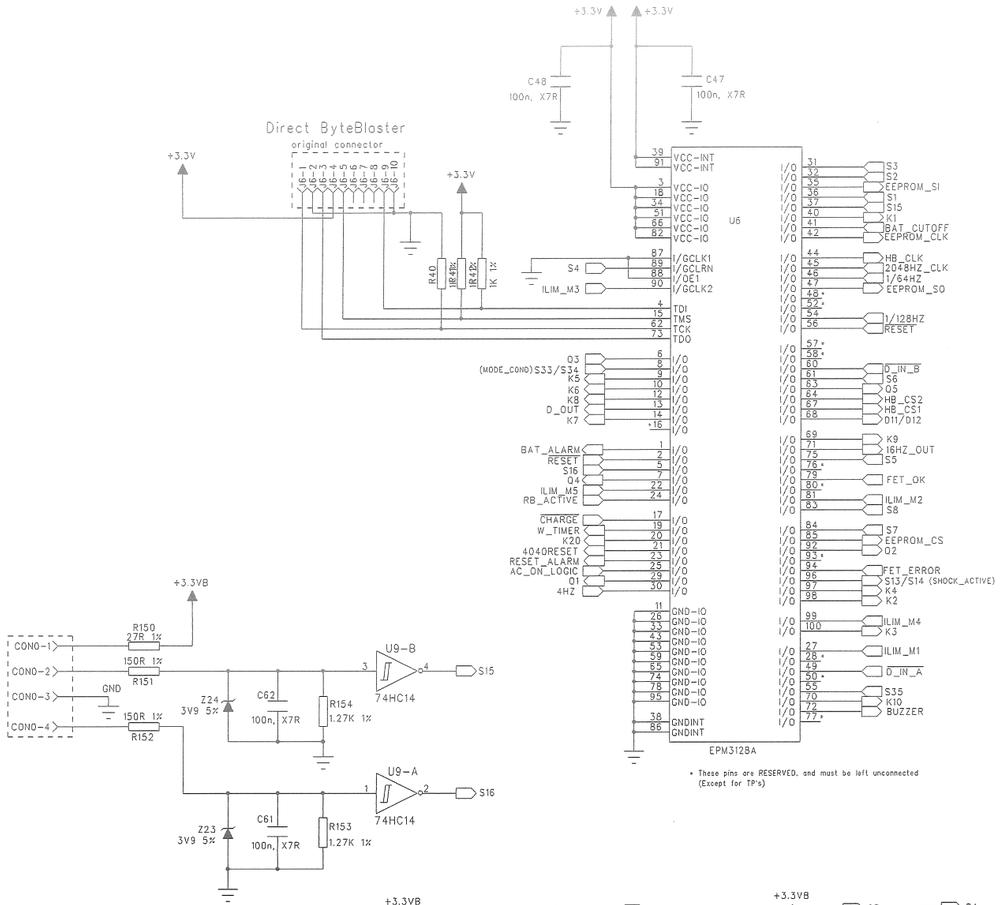


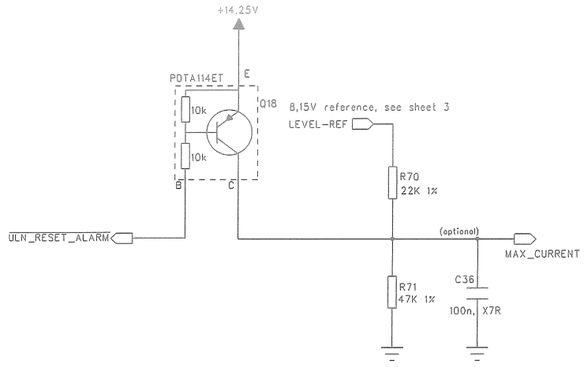


Bed Control Board Relay, FET, and Drivers

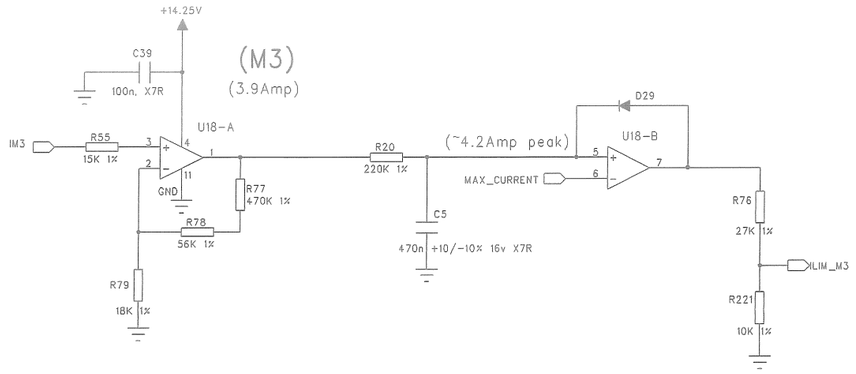


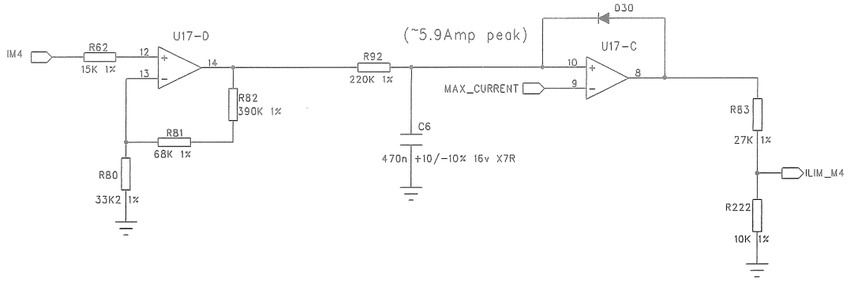
Bed Control Board PLD and Connector

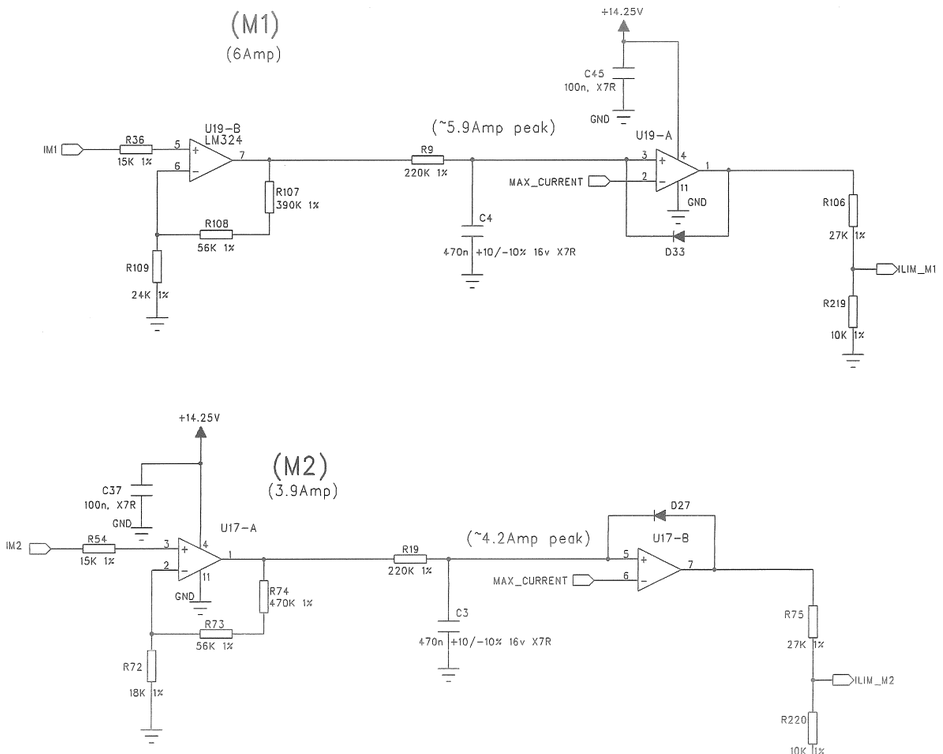


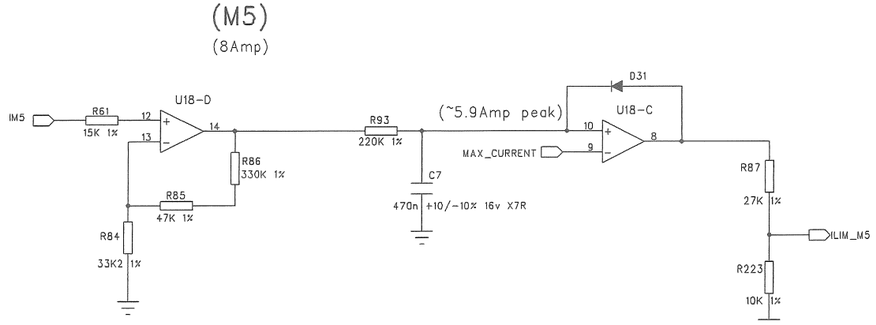


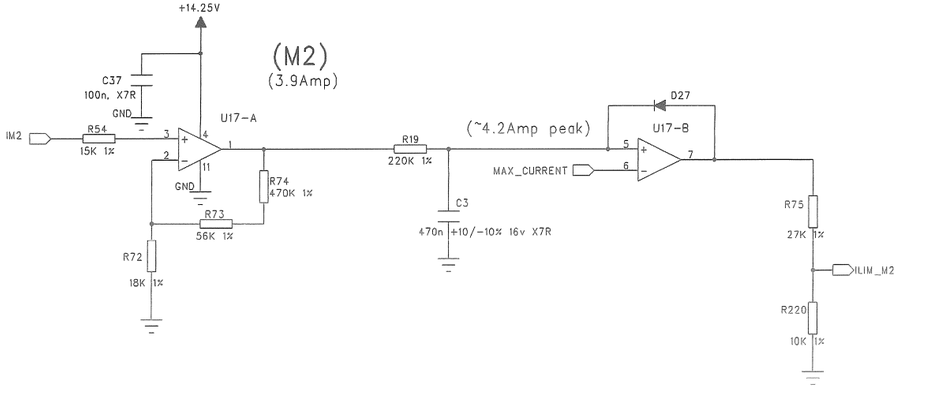
RESET of Current limiters (=> unlock of battery alarm)



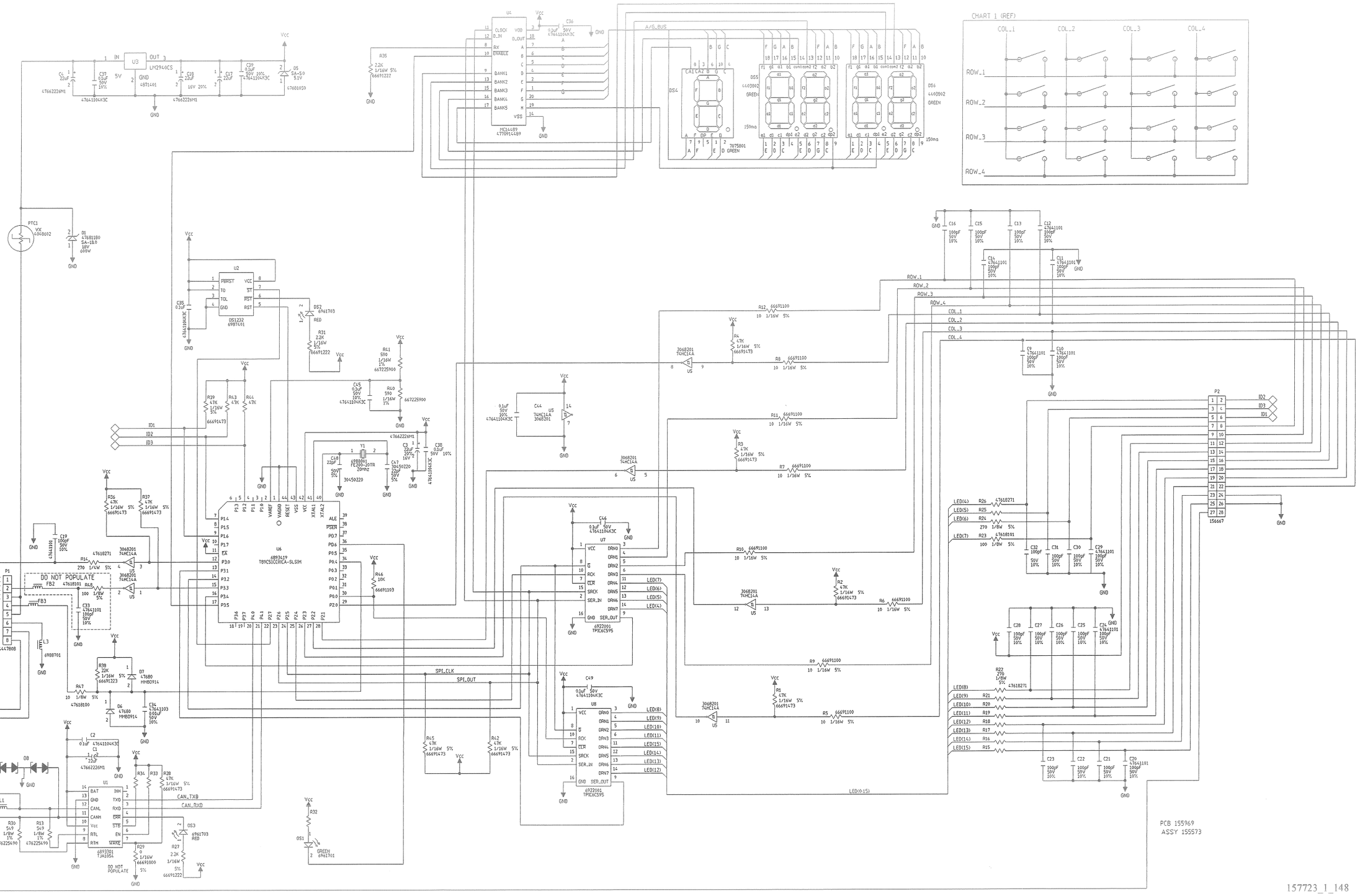








Display Pod



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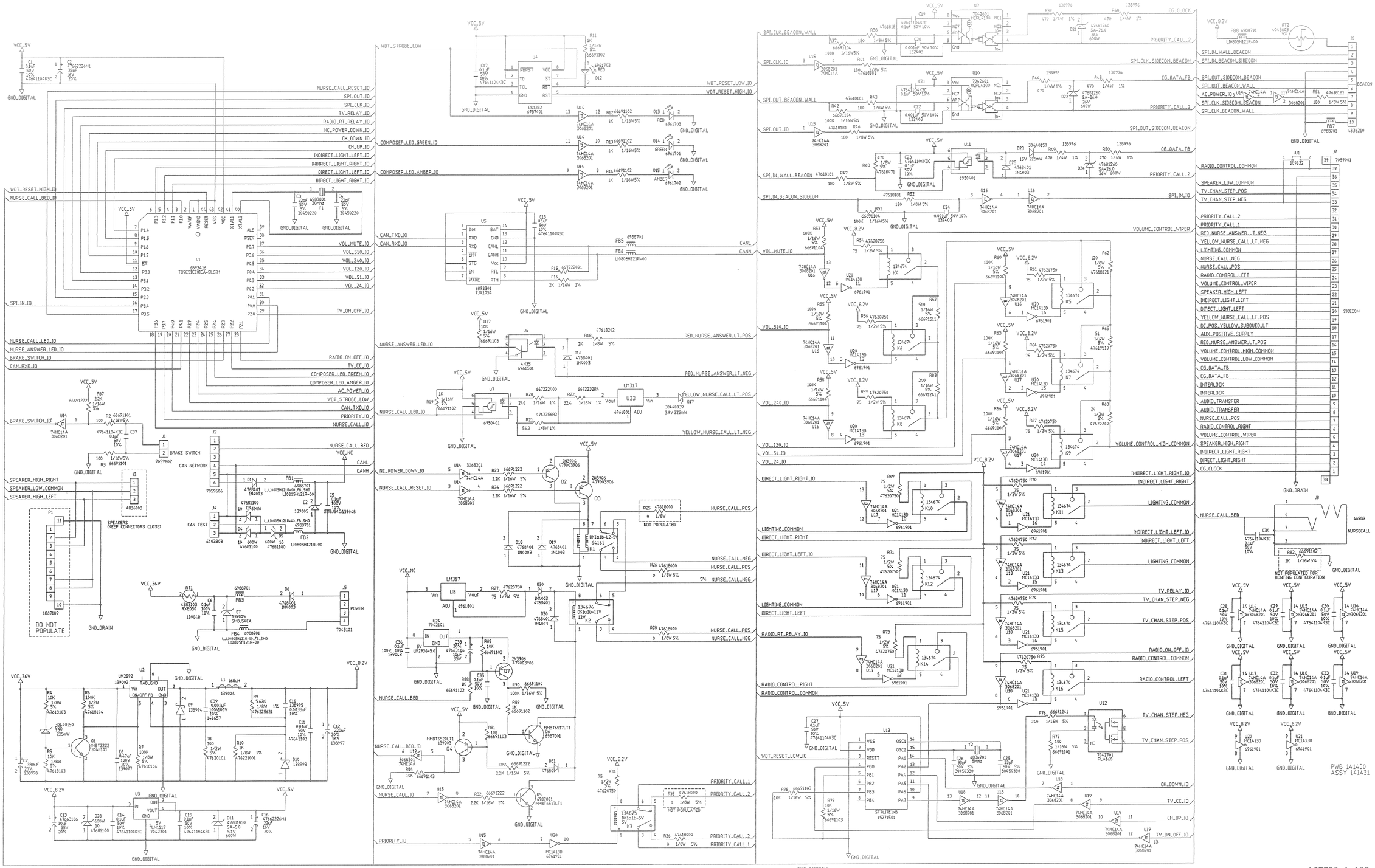
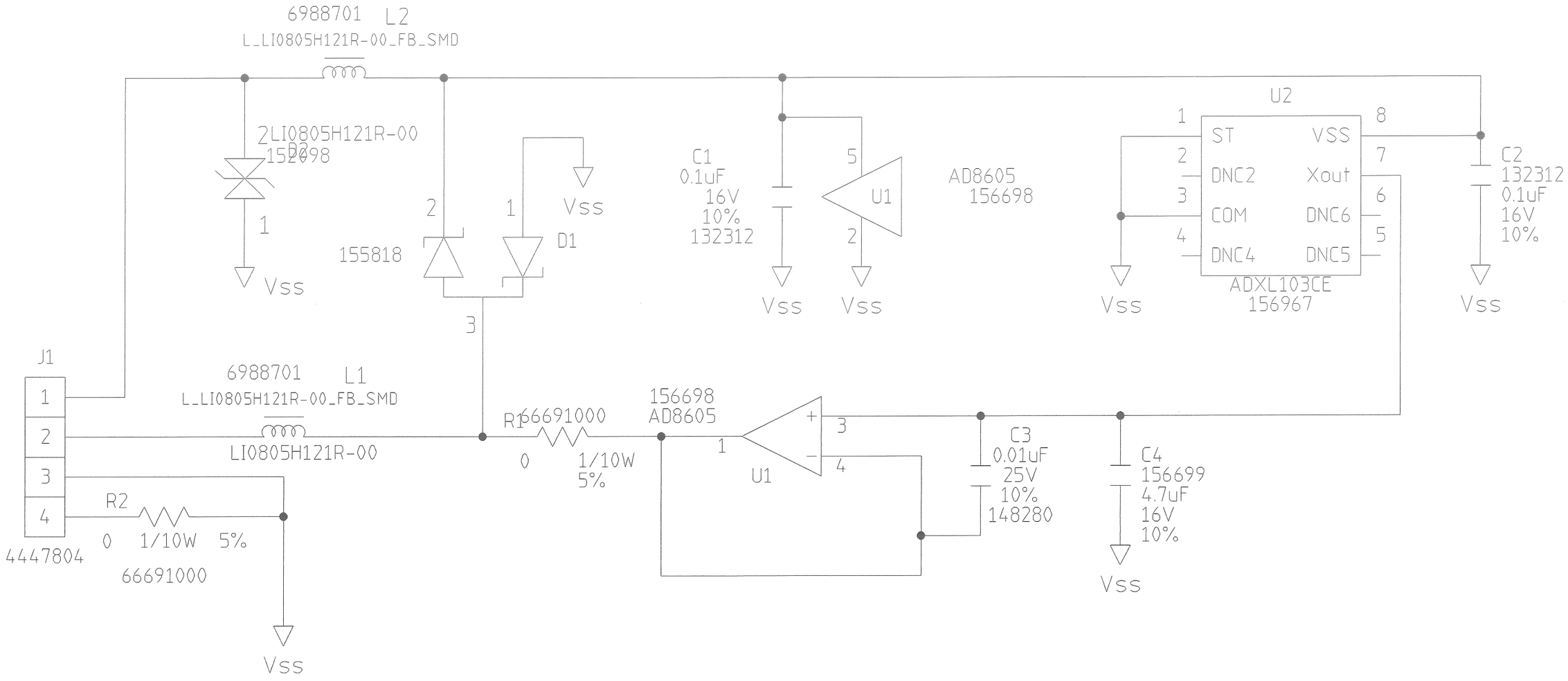
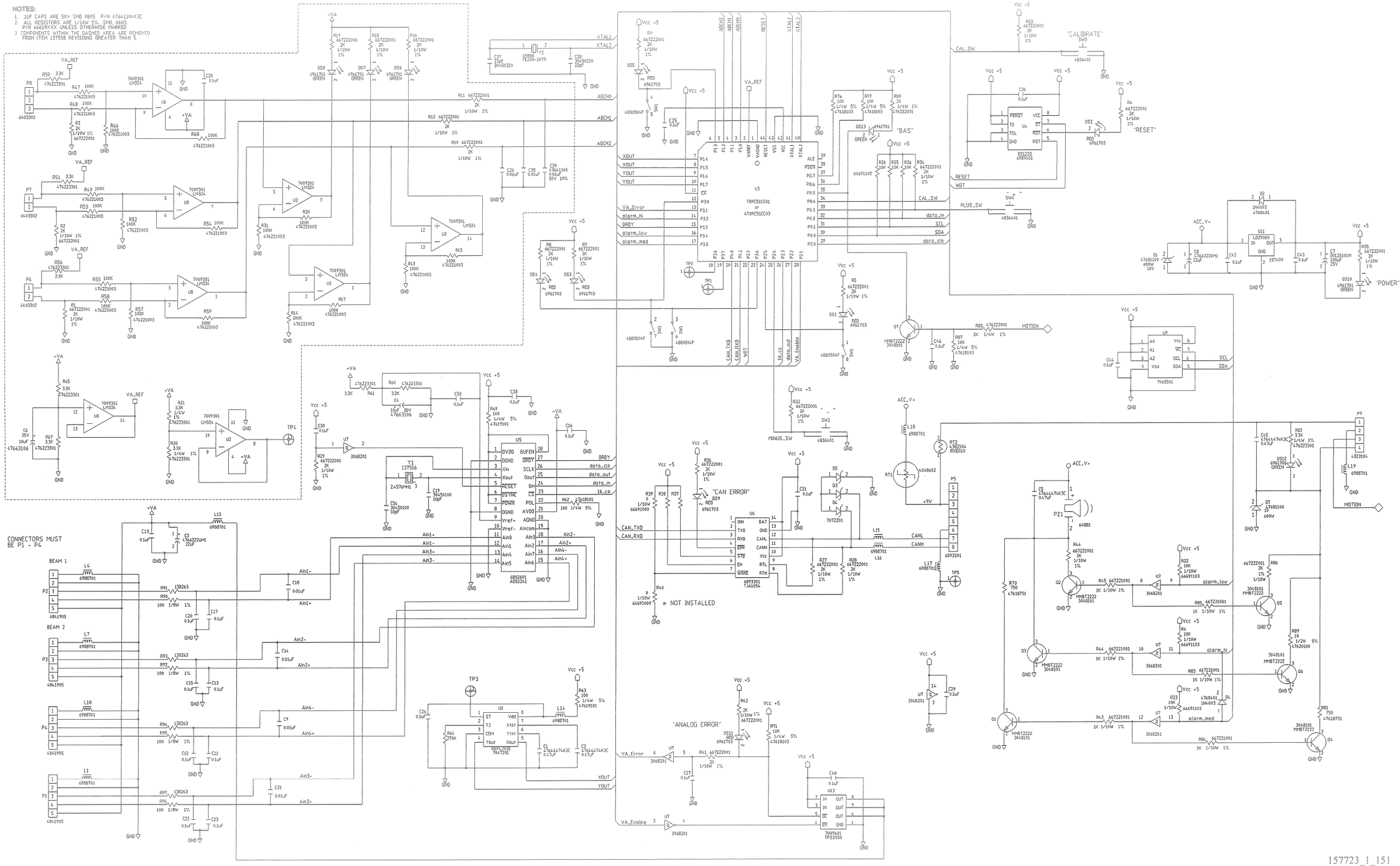

U1
6893416
T89C51CC01CA-SLSIM
NURSE_CALL_RESET_IO
SPI_OUT_IO
SPI_CLK_IO
TV_RELAY_IO
RADIO_RT_RELAY_IO
NC_POWER_DOWN_IO
CH_DOWN_IO
CH_UP_IO
INDIRECT_LIGHT_LEFT_IO
INDIRECT_LIGHT_RIGHT_IO
DIRECT_LIGHT_LEFT_IO
DIRECT_LIGHT_RIGHT_IO
WDT_RESET_HIGH_IO
NURSE_CALL_BED_IO
VOL_MUTE_IO
VOL_510_IO
VOL_240_IO
VOL_120_IO
VOL_51_IO
VOL_24_IO
SPI_IN_IO
TV_ON_OFF_IO
NURSE_CALL_LED_IO
NURSE_ANSWER_LED_IO
BRAKE_SWITCH_IO
CAN_RXD_IO
RADIO_ON_OFF_IO
TV_CC_IO
COMPOSER_LED_GREEN_IO
COMPOSER_LED_AMBER_IO
AC_POWER_IO
WDT_STROBE_LOW
CAN_TXD_IO
PRIORITY_IO
NURSE_CALL_IO
NURSE_CALL_BED
VCC_NC
CANL
CANH
SPEAKER_HIGH_RIGHT
SPEAKER_LOW_COMMON
SPEAKER_HIGH_LEFT
SPEAKERS
(KEEP CONNECTORS CLOSED)
DO_NOT
POPULATE
BRAKE SWITCH
CAN NETWORK
CAN TEST
POWER
GND_DRAIN
GND_DIGITAL
VCC_5V
VCC_8.2V
VCC_36V
WDT_STROBE_LOW
WDT_RESET_LOW_IO
WDT_RESET_HIGH_IO
COMPOSER_LED_GREEN_IO
COMPOSER_LED_AMBER_IO
CAN_TXD_IO
CAN_RXD_IO
NURSE_ANSWER_LED_IO
RED_NURSE_ANSWER_LT_POS
RED_NURSE_ANSWER_LT_NEG
NURSE_CALL_LED_IO
YELLOW_NURSE_CALL_LT_POS
YELLOW_NURSE_CALL_LT_NEG
NC_POWER_DOWN_IO
NURSE_CALL_RESET_IO
NURSE_CALL_POS
NURSE_CALL_NEG
PRIORITY_IO
PRIORITY_CALL_1
PRIORITY_CALL_2
NOT POPULATED
SPI_CLK_BEACON_WALL
SPI_CLK_IO
SPI_CLK_SIDECOM_BEACON
CG_CLOCK
SPI_OUT_BEACON_WALL
SPI_OUT_IO
SPI_OUT_SIDECOM_BEACON
CG_DATA_FB
SPI_IN_WALL_BEACON
SPI_IN_BEACON_SIDECOM
SPI_IN_IO
CG_DATA_TB
LIGHTING_COMMON
DIRECT_LIGHT_RIGHT
DIRECT_LIGHT_LEFT
RADIO_RT_RELAY_IO
RADIO_CONTROL_RIGHT
RADIO_CONTROL_COMMON
VOLUME_CONTROL_WIPER
VOLUME_CONTROL_HIGH_COMMON
INDIRECT_LIGHT_RIGHT_IO
INDIRECT_LIGHT_LEFT_IO
TV_CHAN_STEP_NEG
TV_CHAN_STEP_POS
RADIO_ON_OFF_IO
RADIO_CONTROL_LEFT
TV_CC_IO
CH_UP_IO
TV_ON_OFF_IO
BUS_SIDECOM
SIDECOM
BEACON
NURSECALL
PWB 141430
ASSY 141431


6988701 L2
L_LI0805H121R-00_FB_SMD
2LI0805H121R-00
D2
152698
1
Vss
155818
2
1
Vss
D1
3
C1
0.1uF
16V
10%
132312
Vss
5
U1
2
Vss
AD8605
156698
U2
1
ST
2
DNC2
3
COM
4
DNC4
8
VSS
7
Xout
6
DNC6
5
DNC5
ADXL103CE
156967
Vss
C2
132312
0.1uF
16V
10%
Vss
J1
1
2
3
4
4447804
6988701 L1
L_LI0805H121R-00_FB_SMD
LI0805H121R-00
R2
0 1/10W 5%
66691000
Vss
R1
66691000
0 1/10W
5%
156698
AD8605
1
U1
+
−
3
4
C3
0.01uF
25V
10%
148280
C4
156699
4.7uF
16V
10%
Vss



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FO 3-15

INTELLIDRIVE MACH5 OPTION