VersaCare® Bed

Service Manual

Product No. P3200/P3201

(A through J models)

MAN333 REV 6

Enhancing outcomes for patients and their caregivers.

Hill-Rom

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Manufactured by:

HILL-ROM, INC.
1069 STATE ROUTE 46 E
BATESVILLE, IN 47006-9167 USA

Authorized European Union Representative:
HILL-ROM SAS
B.P. 14 - Z.I. DU TALHOUET
56330 PLUVIGNER
FRANCE
TEL: +33 (0)2 97 50 92 12

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Chapter 1 Introduction

Purpose

This manual is for A through J model beds only.

This manual contains instructions for the operation and maintenance of the VersaCare® 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, product symbols, and specifications), refer to the *VersaCare® Bed User Manual* (USR119).

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.
- ELECTRICAL SHOCK HAZARD WARNING

Model Identification

Model Number	Description
P3200A	Initial release
P3200B/P3201B	Scale based PPM
P3200C/P3201C	Globalization
P3200D/P3201D	Foot of the bed changes
P3200E/P3201E	NaviCare® System option
P3200F/P3201F	Not released
P3200G/P3201G	Head Angle Display and Alarm; Boost® Position System; Brake Not Set Alarm; Line Manager; Integrated IV Transport Handle; cord wrap/IV pole storage clips; and Caregiver control changes
P3200H/P3201H	P500 Surface with/without Advanced Microclimate® Technology (AMT) (next-generation Low Air Loss)
P3200J/P3201J	Scale component changes

Safety Tips

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.

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:
Only facility-authorized persons should service the VersaCare® 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:
Do not work under an unsupported load. Install applicable temporary supports. Failure to do so could cause injury or equipment damage.

WARNING:
Failure to wear protective gloves could cause injury.

WARNING:
Failure to wear eye protection could cause eye injury.

WARNING:
If battery fluid touches skin or clothing, immediately wash it off with clean water. If battery fluid gets in your eyes, immediately flush them with water and consult a physician. Failure to do so could cause injury.

WARNING:
Use extreme care when you remove the mattress retaining strap. Failure to do so could cause injury as the strap snaps out of the retainers.

WARNING:
Turn the circuit breaker to the **Off** position. Failure to do so could cause injury or equipment damage.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

SHOCK HAZARD:
Do not expose the bed to excessive moisture. Injury or equipment damage could occur.

SHOCK HAZARD:
High voltage is present. Use extreme care, or injury could occur.

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

CAUTION:
Do not steam clean or power wash the bed or mattress. Pressure and excessive moisture can damage the mattress and the protective surface of the bed and its electrical components.

CAUTION:
Do not use harsh or abrasive cleansers, solvents, or scouring pads. 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.

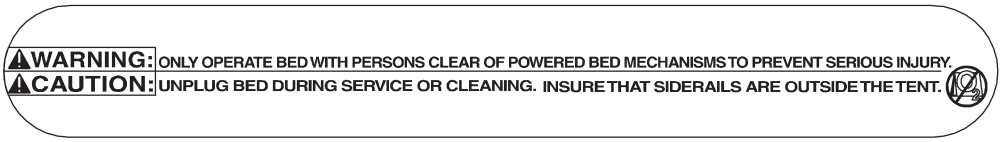
CAUTION:
When you handle electronic components, wear an antistatic strap. Failure to do so could cause component damage.

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

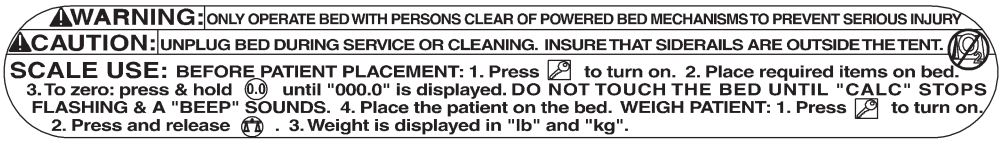
CAUTION:
Make sure the vent holes are clear. Failure to do so could cause overheating and equipment damage.

CAUTION:
Use care when you disconnect the hose from the fitting. Excessive force can damage the fitting.

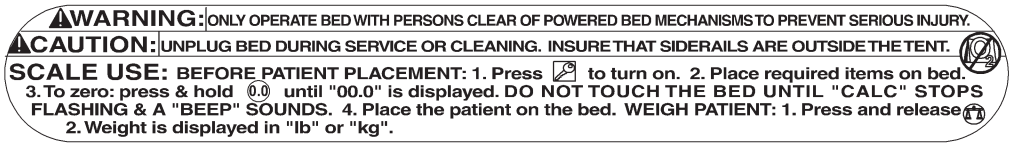
Warning and Caution Labels



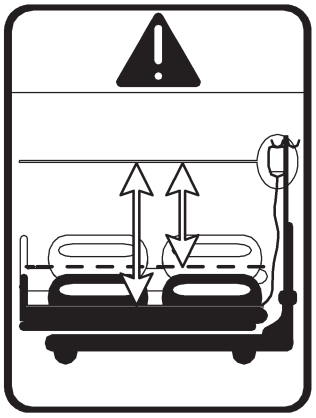
7082501 Siderail Warning



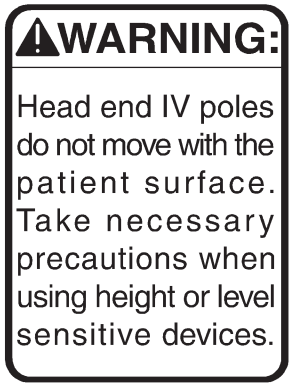
7082502 Siderail Warning with Scale operation instructions (A through F models)



70825104 Siderail Warning with Scale operation instructions (G through J models)



128815 IV Pole Warning



70802 Label Kit (IV Pole Warning; A through J models)

66870 Battery Warning

70802 Label Kit (Foot Warning)

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NOTES:

Chapter 2
Troubleshooting Procedures

2

Getting Started

WARNING:
Only facility-authorized persons should service the VersaCare® 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** 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 isolate the problem, contact Hill-Rom Technical Support.

Initial Actions

Use Initial Actions to gather information from operators concerning problems with the VersaCare® 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 2-7.

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

   Yes **No**
   ↓ → Go to “Function Checks” on page 2-7.

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

   Yes **No**
   ↓ → Refer to “Rapid Problem/Solution Identification Tables” on page 2-3, **or** go to “Function Checks” on page 2-7.

4. Instruct the operator to refer to the procedures in the VersaCare® Bed User Manual. Do the “Function Checks” to make sure the VersaCare® Bed works correctly.

Rapid Problem/Solution Identification Tables

If the Service Required indicator is flashing or solid, use the table below to identify the applicable troubleshooting procedure (see table 2-1 on page 2-3).

Table 2-1. Flashing or Solid Service Required LED

Long Flash	Short Flash	Description	Solution
1	2	Mattress Disconnected	Go to RAP 2.26 on page 2-44.
1	3	Head Angle Sensor Error	Go to RAP 2.27 on page 2-45.
1	5	A Model Bed—Head FSR1 and FSR2 or H Model or Newer Bed with AMT—Blower Current Error	Go to RAP 2.28 on page 2-46. Go to RAP 2.67 on page 2-88 and RAP 2.68 on page 2-89.
2	2	Accumulator Pressure	Go to RAP 2.29 on page 2-47.
2	3	Error Detected In Dynamic Air Module	Replace Air Board.
2	6	Missing 24 VDC Input	Go to RAP 2.30 on page 2-48.
3	1	Not Reaching Head Zone Pressure	Go to RAP 2.31 on page 2-49.
3	2	Not Reaching Seat Zone Pressure	Go to RAP 2.32 on page 2-50.
3	3	Not Reaching Foot Zone Pressure	Go to RAP 2.33 on page 2-51.
3	4	Not Reaching Right Turn Assist Pressure	Go to RAP 2.34 on page 2-52.
3	5	Not Reaching Left Turn Assist Pressure	Go to RAP 2.35 on page 2-53.
4	2	Scale Error	Go to RAP 2.36 on page 2-54.
4	3	Scale Error	Go to RAP 2.36 on page 2-54.
4	4	Scale Error	Go to RAP 2.36 on page 2-54.
Solid			Go to RAP 2.1 on page 2-17.

If the scale/PPM display is showing an error or will not arm, use the table below to identify the applicable troubleshooting procedure (see table 2-2 on page 2-4).

Table 2-2. Scale Display/PPM Errors

Error	Solution
Err0	Go to RAP 2.36 on page 2-54.
Err1	Go to RAP 2.37 on page 2-55.
Err2	Go to RAP 2.38 on page 2-56.
Err3	Go to RAP 2.39 on page 2-57.
PPM will not arm, with scale display	Go to RAP 2.41 on page 2-59.
PPM will not arm, no scale display	Go to RAP 2.42 on page 2-60.
CRC	Go to RAP 2.43 on page 2-61.

For malfunctions not displayed on the scale/PPM display or when the Service Required indicator illuminates, use the table below to identify the applicable troubleshooting procedure (see table 2-3 on page 2-4).

Table 2-3. Miscellaneous Malfunctions

Error	Solution
Motors Do Not Operate	Go to RAP 2.16 on page 2-32.
No AC Power	Go to RAP 2.17 on page 2-33.
AC Power, No Motor Power	Go to RAP 2.18 on page 2-34.
No DC Power	Go to RAP 2.19 on page 2-35.
Power Supply P.C. Board Error Codes	Go to RAP 2.20 on page 2-36.
Siderail Detection Switch Without SideCom® Communication System	Go to RAP 2.22 on page 2-38.
Siderail Detection Switch With SideCom® Communication System	Go to RAP 2.23 on page 2-39.
SideCom® Communication System	Go to RAP 2.40 on page 2-58.
Patient Pendant	Go to RAP 2.44 on page 2-62.
Bed not down indicator flashing	Go to RAP 2.45 on page 2-63.

For IntelliDrive® Transport System errors, use the table below to identify the applicable troubleshooting procedure (see table 2-4 on page 2-5).

Table 2-4. IntelliDrive® Transport System

Error	Solution
Bed Will Not Drive	Go to RAP 2.46 on page 2-64.
Bed Will Not Drive, Wheel Is Down	Go to RAP 2.47 on page 2-65.
Wheel Will Not Stow	Go to RAP 2.48 on page 2-66.
Battery Check	Go to RAP 2.49 on page 2-67.
Steer Switch Check	Go to RAP 2.50 on page 2-68.
PACM Board Power Check	Go to RAP 2.51 on page 2-69.
PACM Board Deployment Check	Go to RAP 2.52 on page 2-70.
PACM Board Drive Check	Go to RAP 2.53 on page 2-71.
Motor Check	Go to RAP 2.54 on page 2-72.
PACM to Junction Board Cable Check	Go to RAP 2.55 on page 2-73.
Handle Enable Switch Check	Go to RAP 2.56 on page 2-74.
Throttle Check	Go to RAP 2.57 on page 2-75.
Handle Gauge Check	Go to RAP 2.58 on page 2-76.
Controller Check	Go to RAP 2.61 on page 2-79.
Visual Inspection	Go to RAP 2.62 on page 2-81.
Junction Board Debugging	Go to RAP 2.63 on page 2-82.

For SafeView® Alerts System errors, use the table below to identify the applicable troubleshooting procedure (see table 2-5 on page 2-6).

Table 2-5. SafeView® Alerts

Problem	Possible Cause	Solution
Both Alerts flash yellow and green.	There is a problem with the Side-Com P.C. board, Siderail Interface P.C. board, or control pod P.C. board.	If there is 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 is on or 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.
	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 cone 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

NOTE:
Use the controls on both sides of the bed to do the functions checks. Do the checks on one side, and then the other.

1. The "Initial Actions" have been performed.

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

2. Operate the trendelenburg function.

   This function works.

   Yes **No**
   ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

3. Lock out the controls for the head, knee, bed up/down, and All Motors.

NOTE:
The All Motors lockout is available on A through F model beds only.

NOTE:
On G through J model beds, when you activate the lockout for the knee up/down control, the controls for the knee up/down **and** foot longer/shorter functions will be locked out.

   The corresponding INDICATOR illuminates.

   Yes **No**
   ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

4. Unlock the controls for the head, knee, bed up/down, and if applicable, All Motors.

   The corresponding INDICATOR goes out.

   Yes **No**
   ↓ → Go to RAP 2.1 on page 2-17.

5. Press the *Bed Up* control of the hilow function.

   The bed rises to the high position without stopping.

   Yes **No**
   ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

6. Press the *Bed Down* control of the hilow function.

   The bed goes down to the low position without stopping. In addition, the Bed Not Down INDICATOR goes off when the bed reaches the maximum low position.

Yes **No**
↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

7. Press the *Knee Up* control of the knee section function.

   The knee section rises to the high position without stopping or the audible alarm sounding during the movement.

   Yes **No**
   ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

8. Press the *Knee Down* control of the knee section function.

   The knee section goes down to the low position without stopping.

   Yes **No**
   ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

9. Press the *Head Up* control of the head section function.

   The head section rises to the high position without stopping.

   Yes **No**
   ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

10. Press the *Head Down* control of the head section function.

    The head section goes down to the low position without stopping.

    Yes **No**
    ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

11. Press the patient *Head Up* control.

    The head section and knee section rise simultaneously, then the knee section stops at an angle approaching 16° while the head section continues to rise to its highest position.

    Yes **No**
    ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

12. Press the patient *Head Down* control.

    The head section goes down, and the knee section lowers simultaneously until it reaches the lowest position while the head section reaches low position.

    Yes **No**
    ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

13. Unplug the bed, activate the battery backup, and test the functions checked in step 10 to step 12.

    The bed works correctly.

Yes **No**
↓ → Go to RAP 2.19 on page 2-35.

14. Press the *Foot Extend/Longer* control

    The foot section extends to the full out position without stopping.

    Yes **No**
    ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

15. Press the *Foot Retract/Shorter* control.

    The foot section retracts to the full in position without stopping.

    Yes **No**
    ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

16. Press the *Chair Position* control.

    The head section and knee section sections rise as long as the control is pressed until the required position is reached and the foot section lowers.

    Yes **No**
    ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

17. Press the *Bed Flat* control.

    The head, knee, and foot sections gradually return to the horizontal as long as the control is pressed. On a G model or newer bed, the sleep deck **and** bed return to the flat and level position.

    Yes **No**
    ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

18. Raise the bed until the intermediate position is reached. Operate the *Trendelenburg* control.

    The sleep surface gradually tilts to maximum trendelenburg without any problem or abnormal noise.

    Yes **No**
    ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

19. Operate the *Reverse Trendelenburg* control.

    The sleep surface gradually tilts to maximum reverse trendelenburg without any problem or abnormal noise.

    Yes **No**
    ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

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

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

Pull each of the CPR handles in turn.

The head section descends quickly up to the mid-travel then the movement is cushioned until the low position is reached. The movement occurs without any problem or abnormal noise.

Yes **No**
↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

21. Continue to hold the CPR handle.

    The bed continues into the Trendelenburg position.

    Yes **No**
    ↓ → Go to RAP 2.1 on page 2-17 or go to RAP 2.16 on page 2-32.

22. Release the CPR handles and operate the head section up to check that the head section motor drive mechanism is working correctly.

    The head section rises without any problem or abnormal noise.

    Yes **No**
    ↓ → Go to RAP 2.1 on page 2-17 **or** go to RAP 2.16 on page 2-32.

23. Set the brakes. Try to move the bed.

    The four wheels are locked and prevent any movement.

    Yes **No**
    ↓ → Replace affected caster.

24. Set the brake/steer pedal to the Steer position and trigger the lengthways locking of the steer caster (non-IntelliDrive® Transport System beds).

    The caster locks in the expected position.

    Yes **No**
    ↓ → Replace affected caster.

25. Raise all of the siderails to the up position. All of the siderails lock in the up position.

    Yes **No**
    ↓ → Go to RAP 2.69.

26. For A through F model beds, go to step 36. For G through J model beds, go to step 27.

27. Make sure the brake is **not** set, and then plug the bed into an applicable power source.

A steady alarm comes on.

Yes **No**
↓ → Go to RAP 2.65 on page 2-86.

28. Set the brake.

    The alarm stops.

    Yes **No**
    ↓ → Go to RAP 2.65 on page 2-86.

29. If the bed has the Boost® Position System option, press and hold the *Boost* control.

    The bed moves to a middle height, the head and knee sections lower, and the bed moves to approximately 7° Trendelenburg.

    Yes **No**
    ↓ → Make sure the lockouts are not engaged. If the lockouts are not engaged, or if the bed still does not operate correctly, go to RAP 2.16 on page 2-32.

30. If the bed has the Head Angle Display option, press the *Bed Flat* control to put the bed in a level position. Look at the angle shown on the display. The angle shown is approximately 0°.

    Yes **No**
    ↓ → Go to RAP 2.66 on page 2-87.

31. 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 62°.

    Yes **No**
    ↓ → Go to RAP 2.66 on page 2-87.

32. 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.

33. 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.

34. 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.

35. 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.

36. If the bed has the IntelliDrive® Transport System installed, do these steps:

    a. Raise the transport handles to the up and locked position.

    b. Disconnect the bed from its power source.

    c. Set the brake/steer control to steer. Make sure the drive wheel deploys.

    d. Grip the transport handles, and press an enable switch on the inside of the handle grips.

    e. Push the handles forward to start forward movement, and then release the enable switch to stop the movement.

    f. Press the enable switch, and then pull the handles toward you to start reverse movement, and then release the enable switch to stop the movement.

    The transport system operates correctly.

    Yes **No**
    ↓ → See table 2-4 on page 2-5.

Treatment/Therapy Surface Function Check

1. Press the *Max-inflate* control on the intermediate siderail. After 30 seconds, wipe your hand across the mattress.

   Verify that the three zones are inflated to a high pressure.

   Yes **No**
   ↓ → Go to RAP 2.24.

2. Press the *Pressure Relief /Normal* control.

   The Pressure Relief/Normal mode is active.

   Yes **No**
   ↓ → Go to RAP 2.24.

3. Articulate the patient surface to the flat position. The three zones are inflated: head, seat, and foot.

   Yes **No**
   ↓ → Go to RAP 2.24.

4. Squeeze and hold pressure on the head section.

   The head section deflates slightly within 30 seconds.

Yes **No**
↓ → Go to RAP 2.24.

5. Release the pressure in the head section.

   The applicable head section inflates slightly within 30 seconds.

   Yes **No**
   ↓ → Go to RAP 2.24.

6. Articulate the head section to 65°. After 30 seconds, wipe your hand firmly across the air mattress to verify that the head, seat, and foot zones are inflated.

   The head zone section has a lower (softer) pressure than the seat zone.

   Yes **No**
   ↓ → Go to RAP 2.24.

7. Make sure the head section is flat, place all four siderails in the up and locked position. Activate the Right Turn Assist control.

   The Right Turn Assist bladder inflates and an alarm sounds when one of the right side siderails is lowered.

   Yes **No**
   ↓ → Go to RAP 2.24.

8. Place all four siderails in the up and locked position. Activate the Left Turn Assist control.

   The Left Turn Assist bladder inflates and an alarm sounds when one of the left side siderails are lowered.

   Yes **No**
   ↓ → Go to RAP 2.24.

Scale and Bed Exit Alarm System Function Checks

1. Make sure the bed is connected to an applicable power source. Put 50 lb (22.7 kg) of weight on the center of the bed, and then press and hold the *Zero* control. The display shows **00.0**.

   Yes **No**
   ↓ → See table 2-2 on page 2-4.

2. Release the *Zero* control. The display shows **CALC**, and then **0.0**.

   Yes **No**
   ↓ → See table 2-2 on page 2-4.

3. Remove the weight, and then press the *Zero* control. The display shows **0.0**.

   Yes **No**
   ↓ → See table 2-2 on page 2-4.

4. Put 50 lb (22.7 kg) of weight on the center of the bed, and then press the *Enable* control. The indicator comes on.

NOTE:
The Enable control must be active for the bed exit controls to operate.

Yes **No**
↓ → See table 2-2 on page 2-4.

5. Press the *Out-of-Bed* mode control. The indicator comes on.

   Yes **No**
   ↓ → See table 2-2 on page 2-4.

6. Remove the weight from the bed. The alarm sounds and the indicator flashes.

   Yes **No**
   ↓ → See table 2-2 on page 2-4.

7. Press one of the bed exit mode controls. The alarm sound stops, and the indicator turns off.

   Yes **No**
   ↓ → See table 2-2 on page 2-4.

8. Repeat step 4 through step 7 for the Patient Position and Bed Exiting modes. In step 6, for the Patient Position mode, move the weight to one side of the bed, near a siderail; for the Bed Exiting mode, put the weight near an egress point.

   These modes operate correctly.

Yes **No**
↓ → See table 2-2 on page 2-4.

9. If the bed has the Alarm Silence feature, do these steps:
   a. Press the *Enable* control, and then press the *Alarm Silence* control. The Alarm Silence indicator comes on.
   b. Cause a bed exit alarm condition. The alarm sound does **not** come on.
   c. Press the *Alarm Silence* control. The Alarm Silence indicator turns off.
   d. Cause a bed exit alarm condition. The alarm sound comes on.
   e. With the Enable control inactive, press the *Alarm Silence* control. The Alarm Silence indicator comes on, and the alarm sound stops.
   f. Put the weight on the center of the bed. The system beeps one time, and the indicator for the applicable Bed Exit mode comes on solid (the system is armed).

   The Alarm Silence feature operates correctly.

Yes **No**
↓ → See table 2-2 on page 2-4.

SafeView® Alerts Function Check

Put 50 lb (22.7 kg) of weight on the center of the bed, and do the checks below. If the lights do not operate correctly, refer to table 2-5 on page 2-6.

1. With the bed 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.

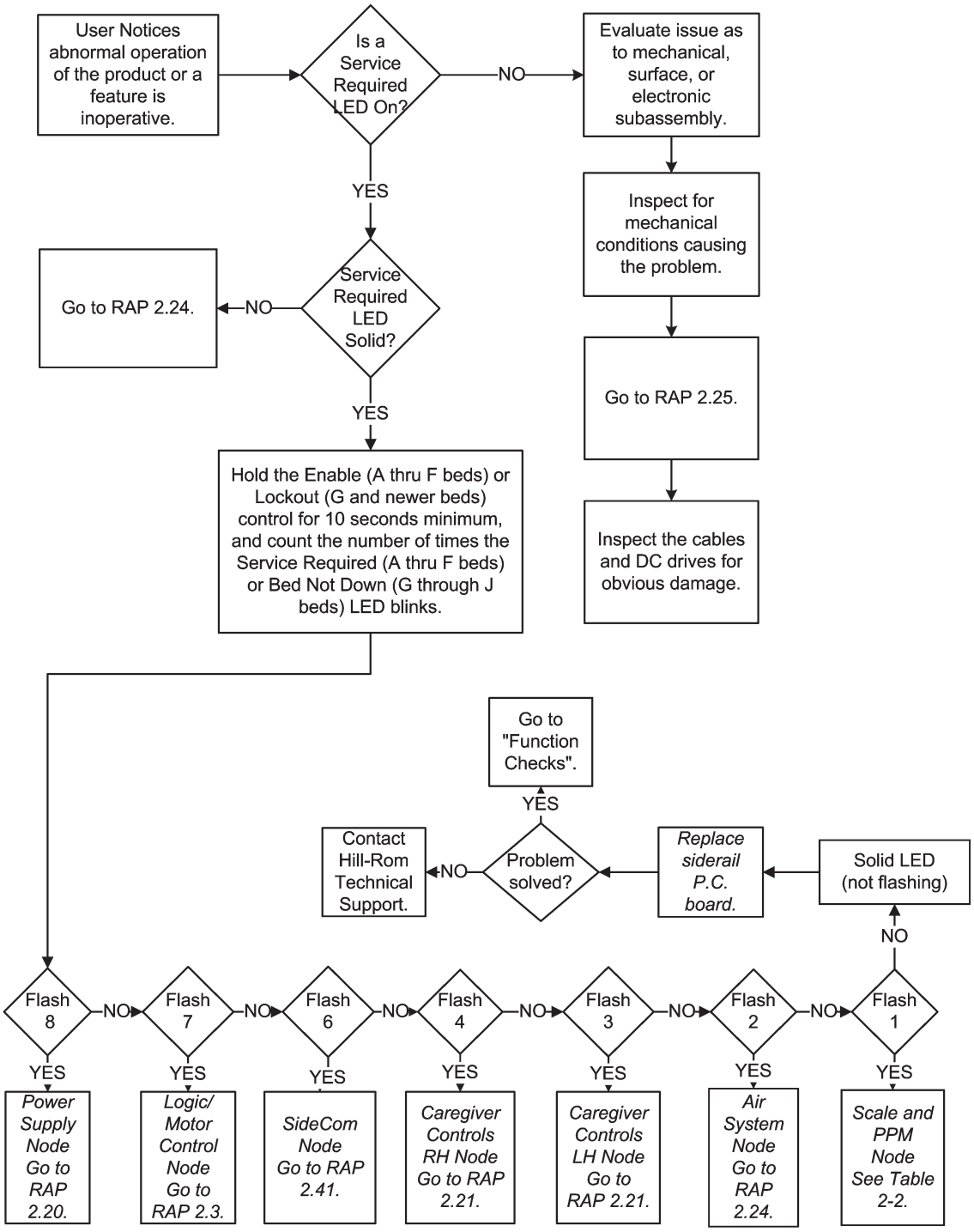
- **Three siderail—**lower one of the foot-end siderails, lower and raise the other foot-end siderail. The lights flash yellow when the siderail is lowered, and the lights are on green when the siderails are up. Repeat for the other side.
- **Four siderail**—lower and raise one siderail at a time. The 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 weight 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.
9. Go to “Final Actions” on page 2-16.

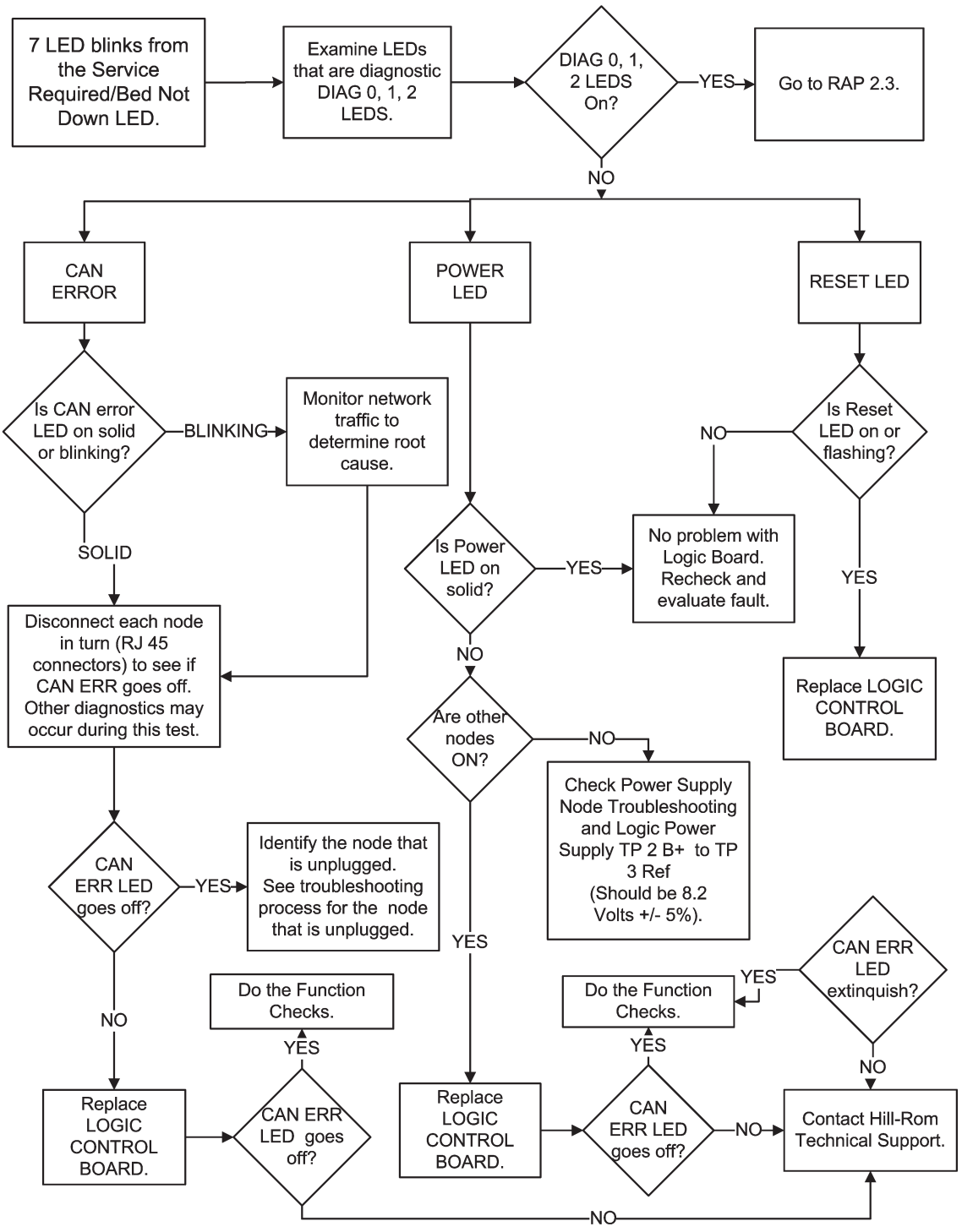
Final Actions

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

2.1 Electronics (Sheet 1 of 2)



2.2 Electronics (Sheet 2 of 2)

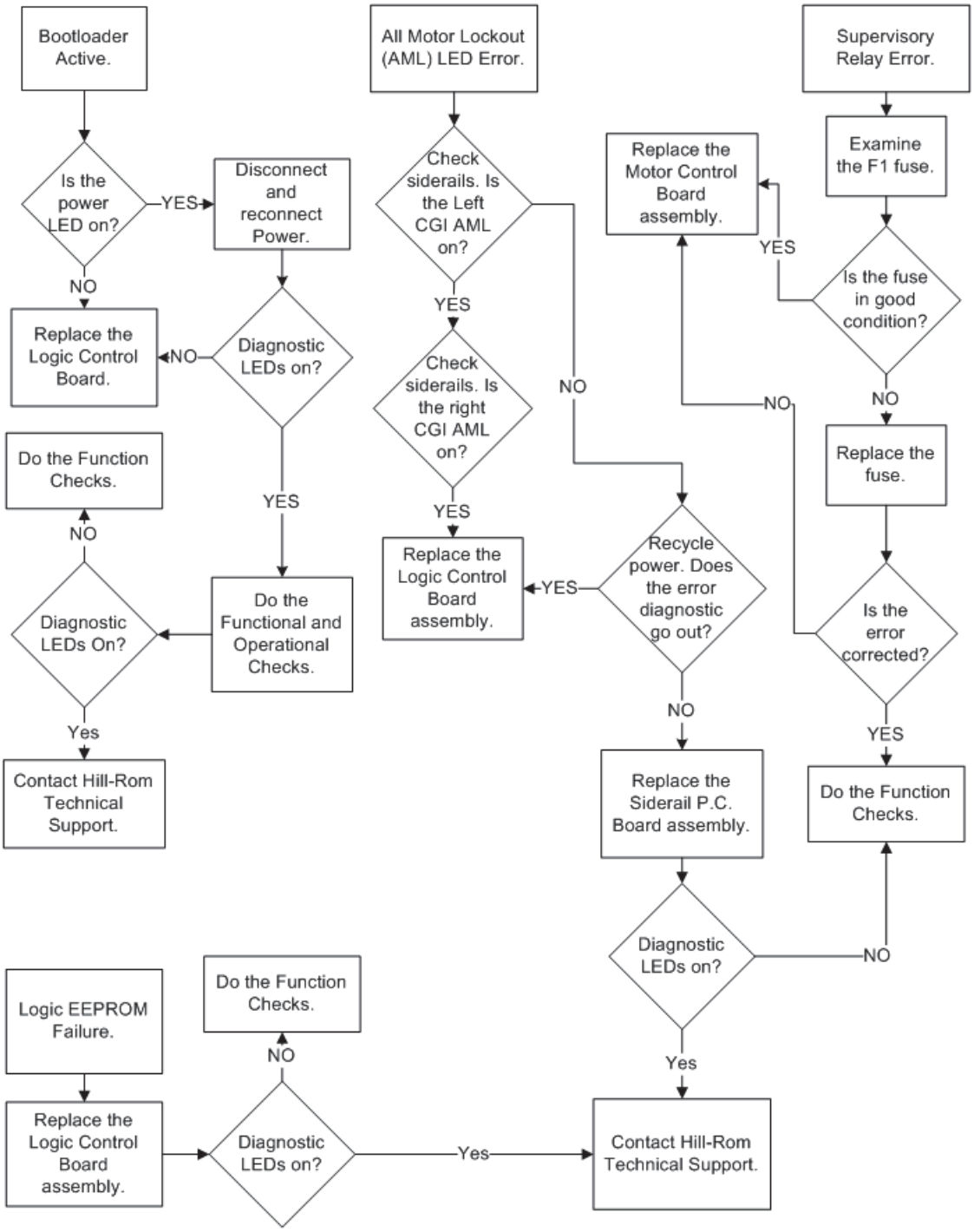


2.3 Logic P.C. Board Diagnostic LED Codes

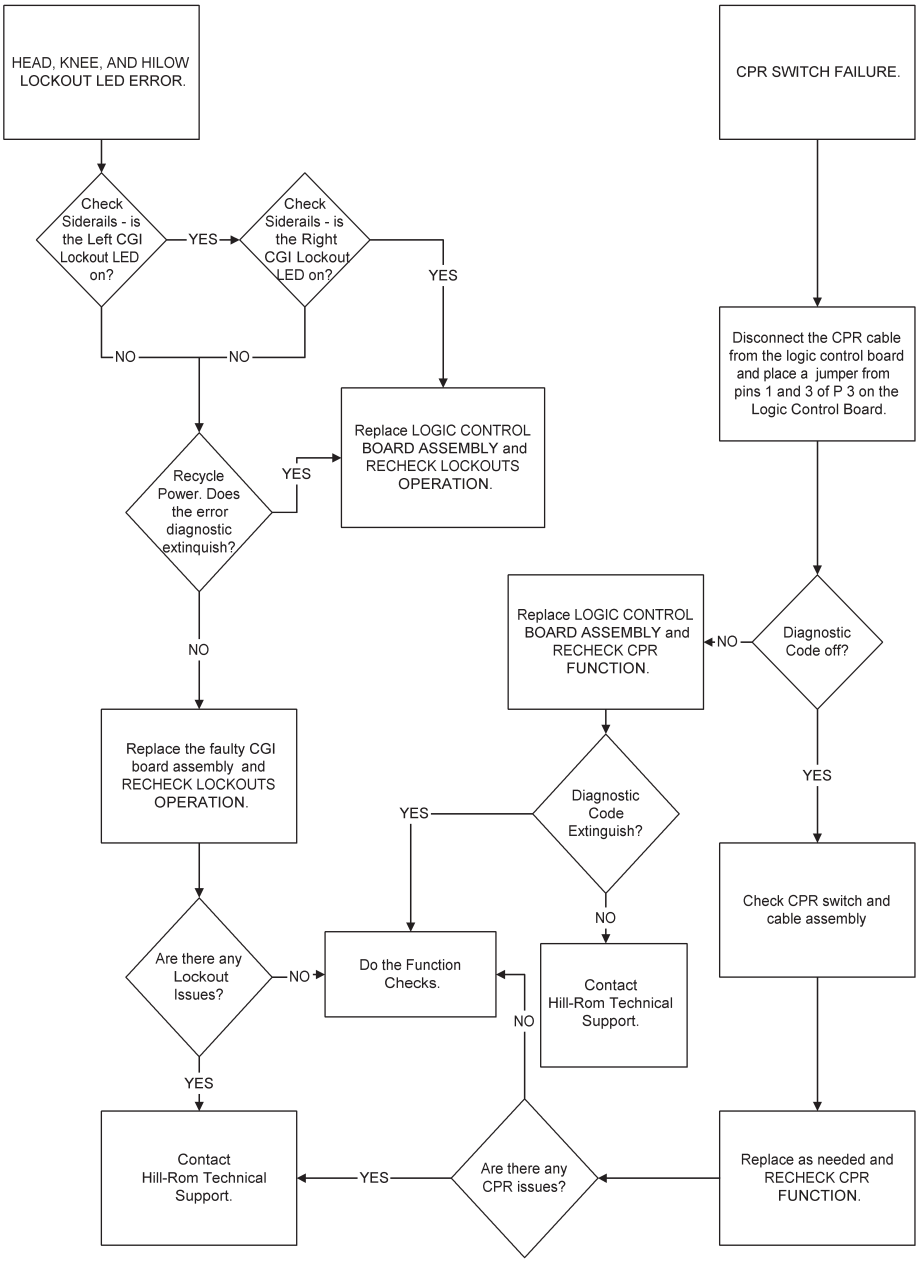
Table 2-6. Logic P.C. Board Diagnostic LED Codes

Error	Red LED	Green LED	Amber LED	Solution
Bootloader	Off	Off	Off	Go to RAP 2.4.
Supervisory Relay Error	Off	Off	Flash	Go to RAP 2.4.
EEPROM Failure	Off	Off	On	Go to RAP 2.4.
All Lockout LED Error	Off	Flash	Off	Go to RAP 2.4.
Head, Knee, Hilow Lockout LED Error	Off	Flash	Flash	Go to RAP 2.5.
CPR Switch Failure	Off	Flash	On	Go to RAP 2.5.
Hilow Head Unexpected Motion	Off	On	Off	Go to RAP 2.6.
Hilow Foot Unexpected Motion	Off	On	Flash	Go to RAP 2.6.
Head Unexpected Motion	Off	On	On	Go to RAP 2.7.
Foot, Knee, Leg Unexpected Motion	Flash	Off	Off	Go to RAP 2.7.
Hilow Head Current Overload	Flash	Off	Flash	Go to RAP 2.8.
Hilow Foot Current Overload	Flash	Off	On	Go to RAP 2.8.
Head Current Overload	Flash	Flash	Off	Go to RAP 2.8.
Knee Current Overload	Flash	Flash	Flash	Go to RAP 2.8.
Foot Current Overload	Flash	Flash	On	Go to RAP 2.8.
Leg Current Overload	Flash	On	Off	Go to RAP 2.8.
Hilow Head Position Rate High	Flash	On	Flash	Go to RAP 2.9.
Hilow Head Position Rate Low	Flash	On	On	Go to RAP 2.10.
Hilow Foot Position Rate High	On	Off	Off	Go to RAP 2.9.
Hilow Foot Position Rate Low	On	Off	Flash	Go to RAP 2.10.
Drive Current Too Low	On	Off	On	Go to RAP 2.11.
Heartbeat Failure	On	Flash	Off	Go to RAP 2.12.
Patient Pendant Failure	On	Flash	Flash	Go to RAP 2.13.
Logic Circuit Failure	On	Flash	On	Go to RAP 2.14.
Unused 1	On	On	Off	
Unused 2	On	On	Flash	
Normal	On	On	On	

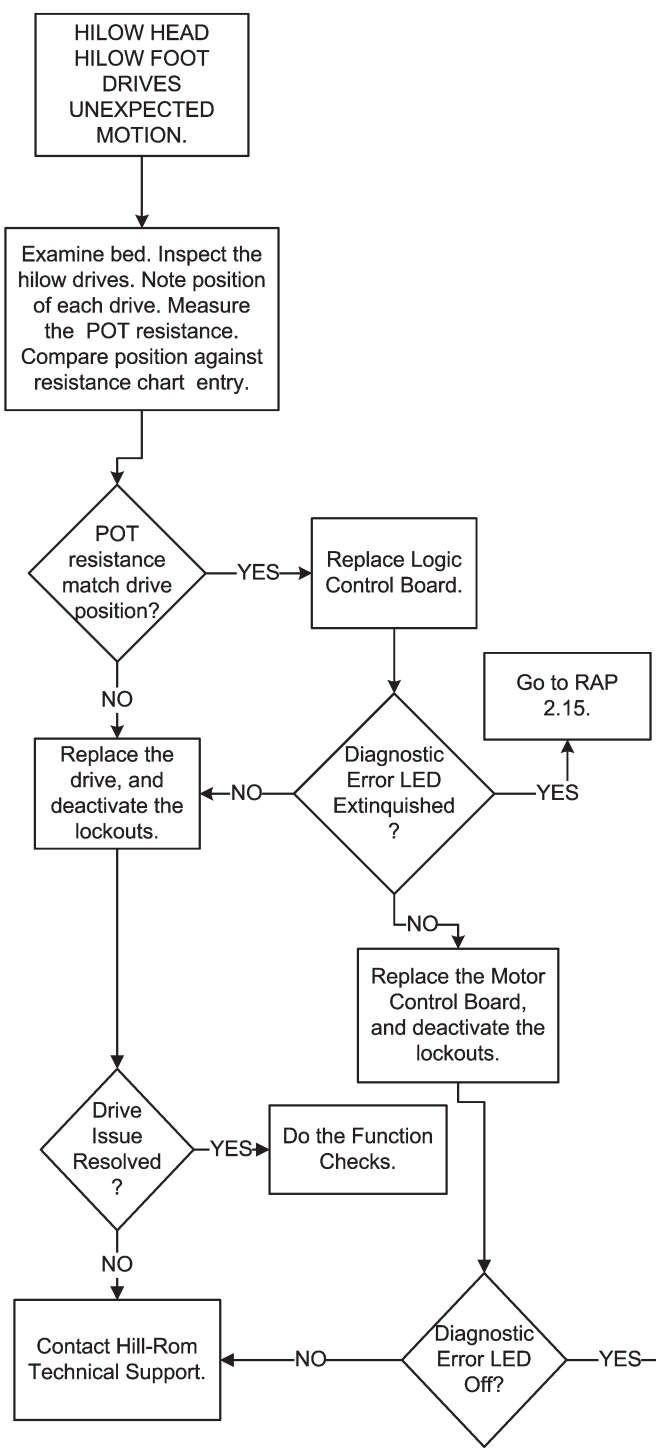
2.4 All Lockout LED Error (A through F model beds only), Bootloader, Supervisory Relay Error, and EEPROM Failure



2.5 Head, Knee, Hilow Lockout LED Error and CPR Switch Failure



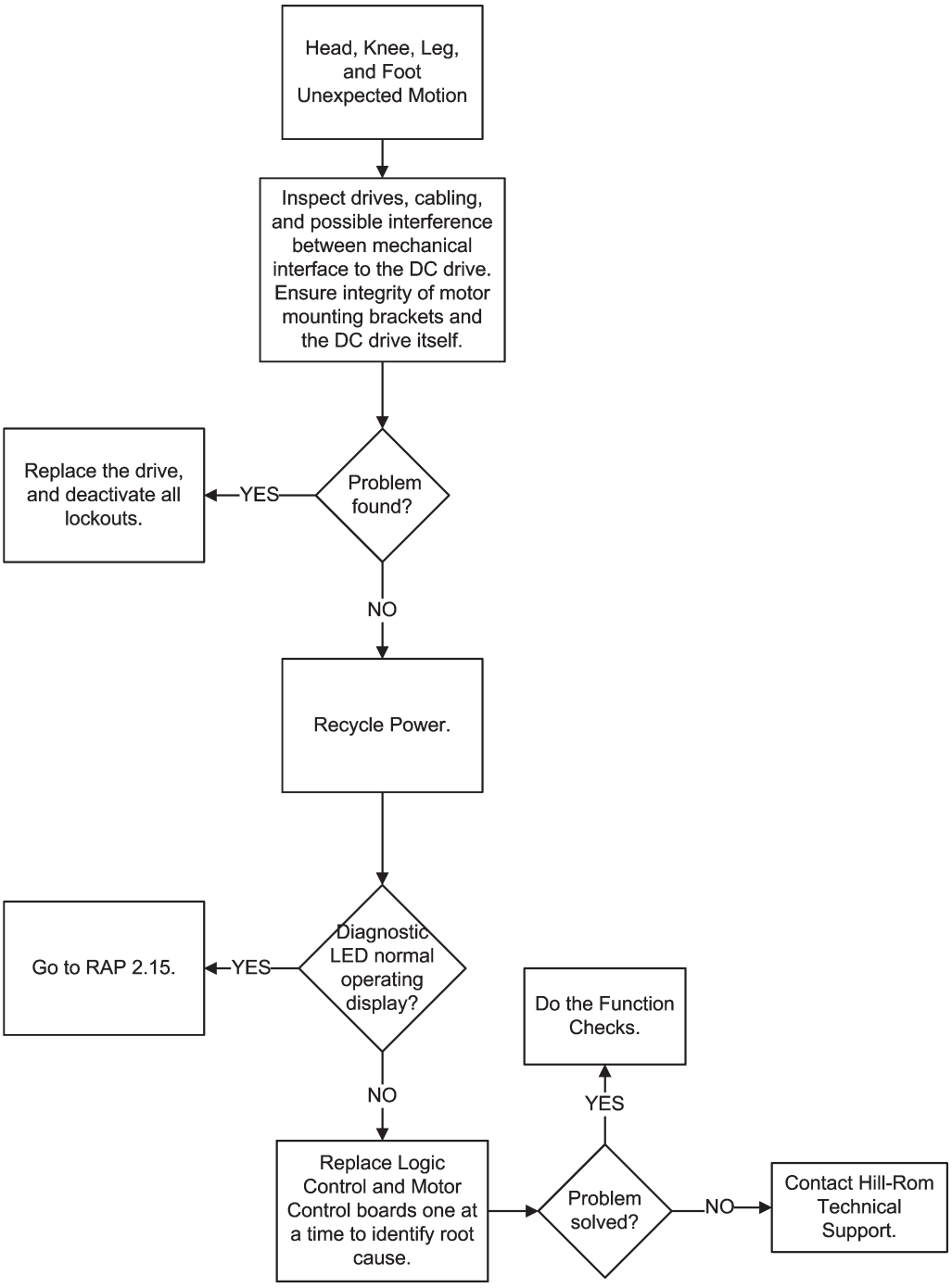
2.6 Hilow Motor Unexpected Motion



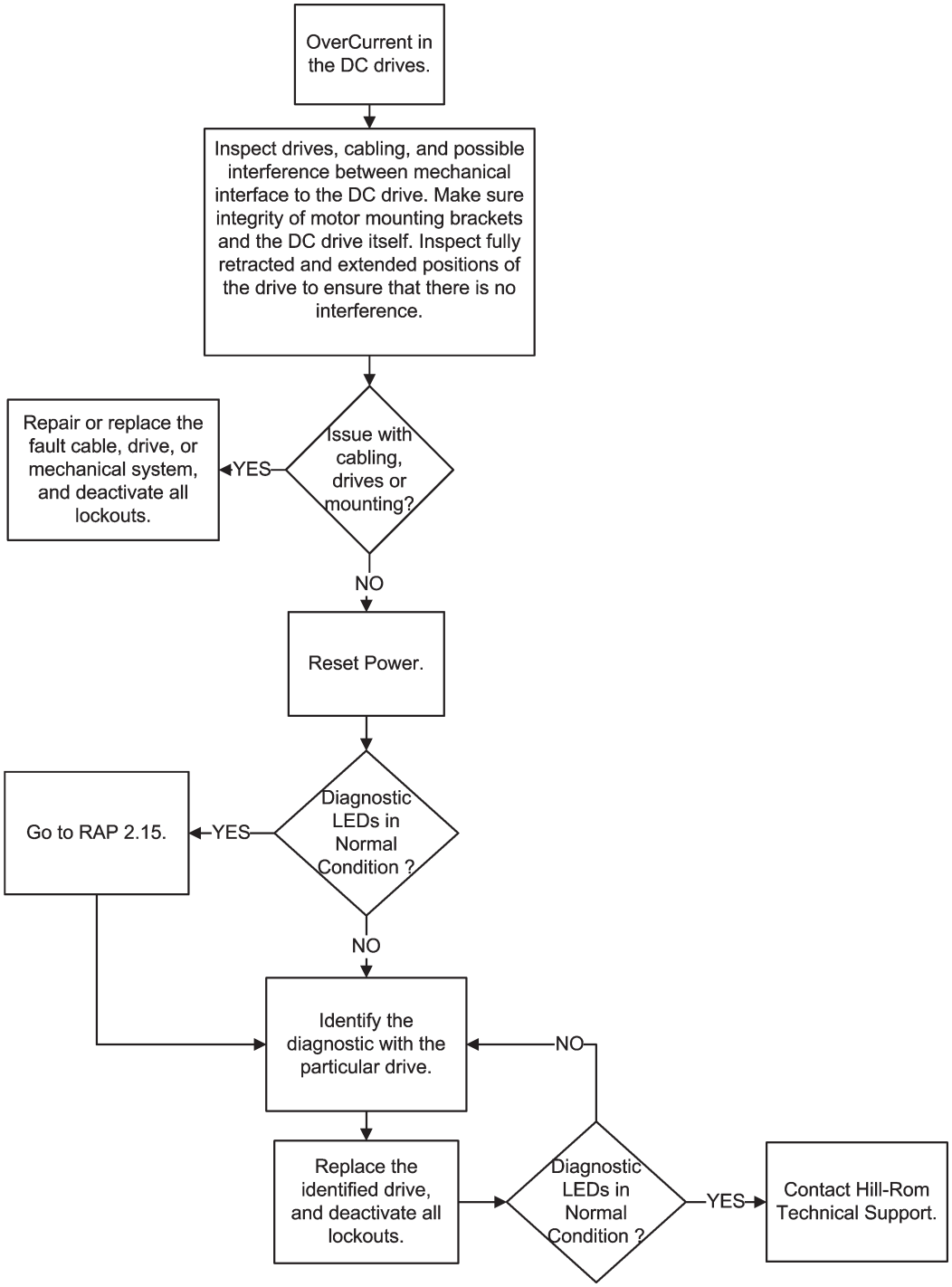
Stroke length of DC Drive
Versus
Resistance of Potentiometer

Stroke Length extended	Rx * see note Drive Extension 34.2 ohms /mm 12 mm pitch Values Approx
Fully Retracted position	Add to retracted position reading (10 to 100 Ohms)
1 mm	34.2
11 mm	376.2
21 mm	718.2
31 mm	1060.2
41 mm	1402.2
51 mm	1744.2
61 mm	2086.2
71 mm	2428.2
81 mm	2770.2
91 mm	3112.2
101 mm	3454.2
111 mm	3796.2
121 mm	4138.2
131 mm	4480.2
141 mm	4822.2
151 mm	5164.2
161 mm	5506.2
171 mm	5848.2
181 mm	6190.2

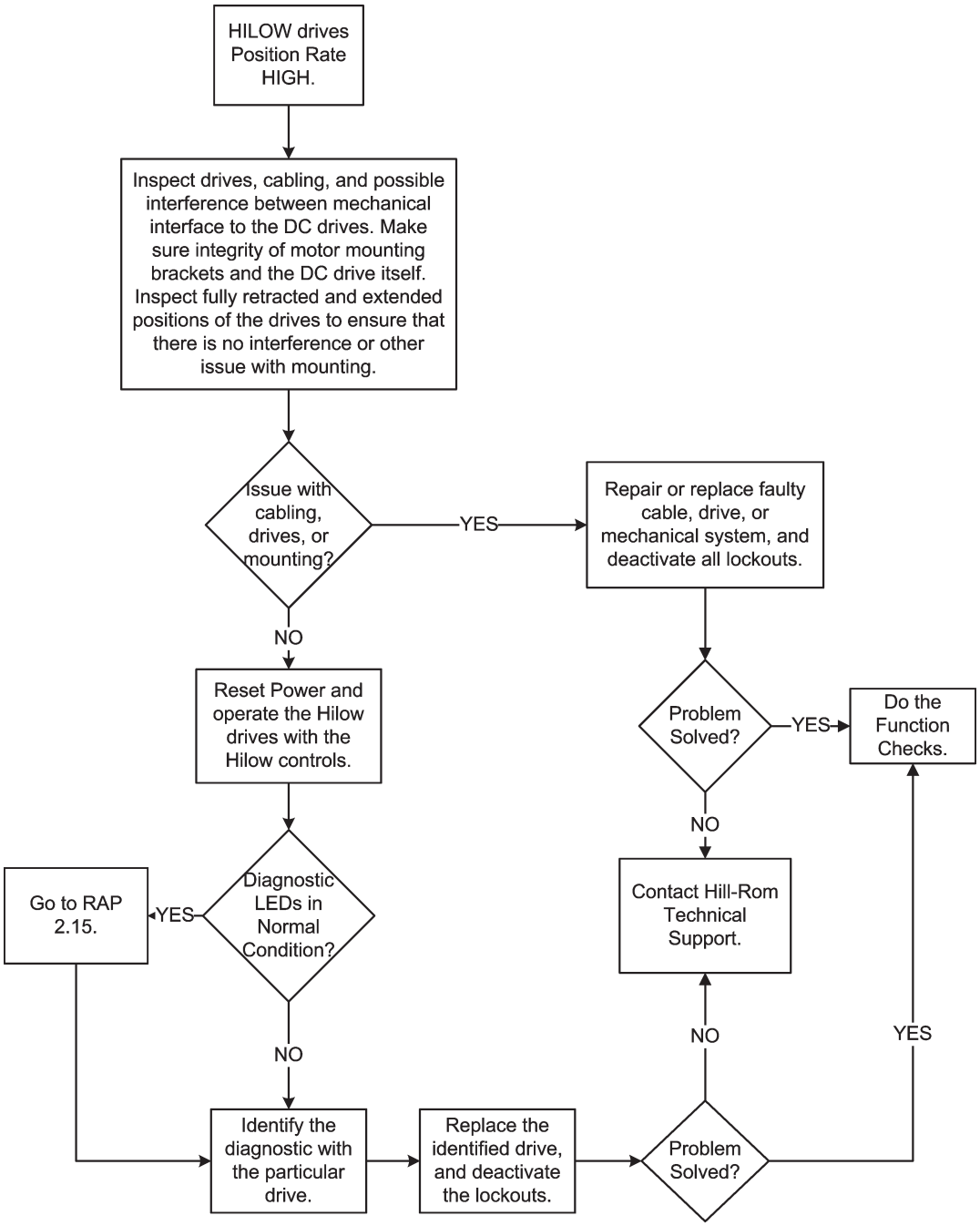
2.7 Head, Knee, Leg, and Foot Motor Unexpected Motion



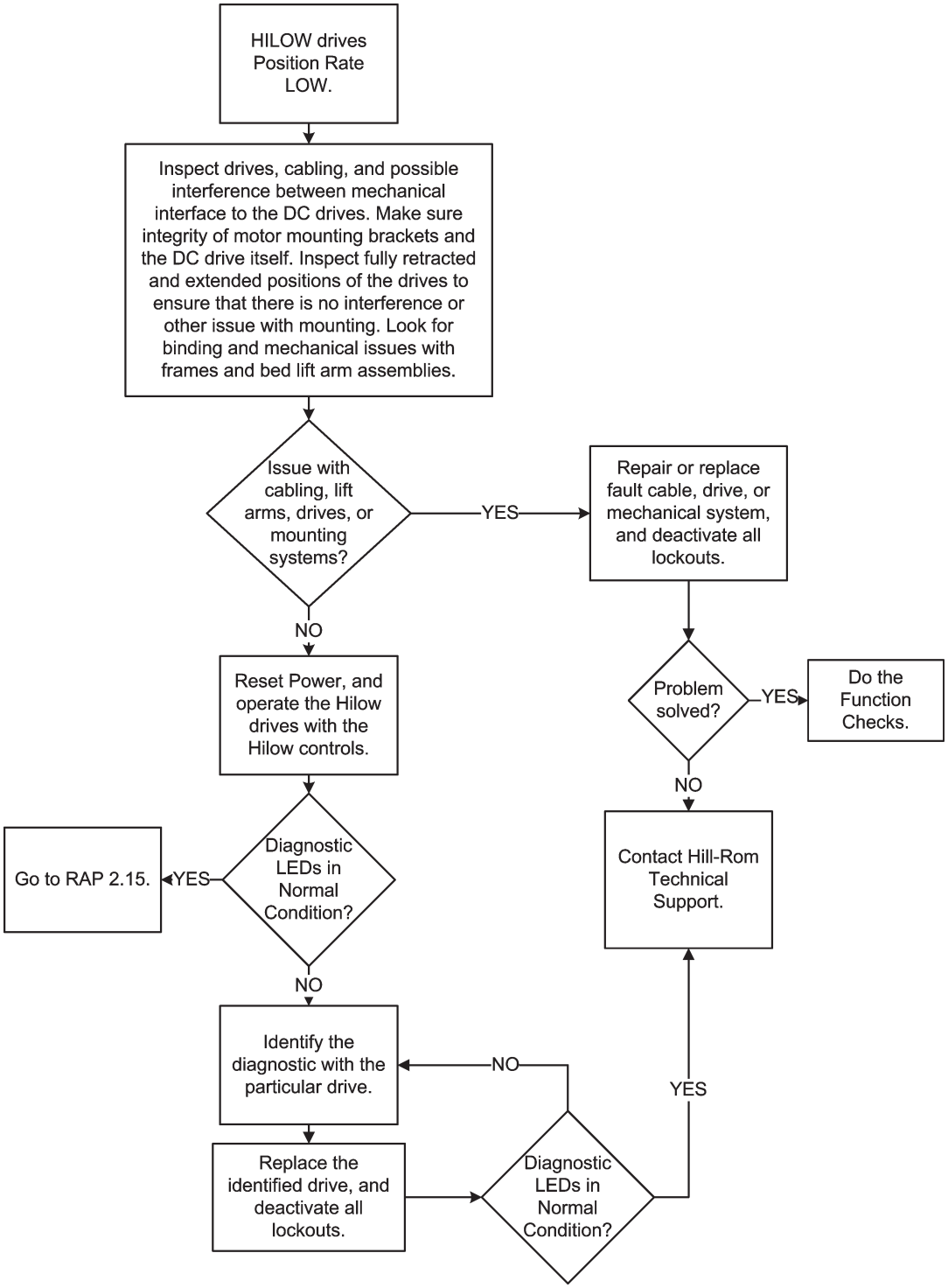
2.8 Motor Overcurrent



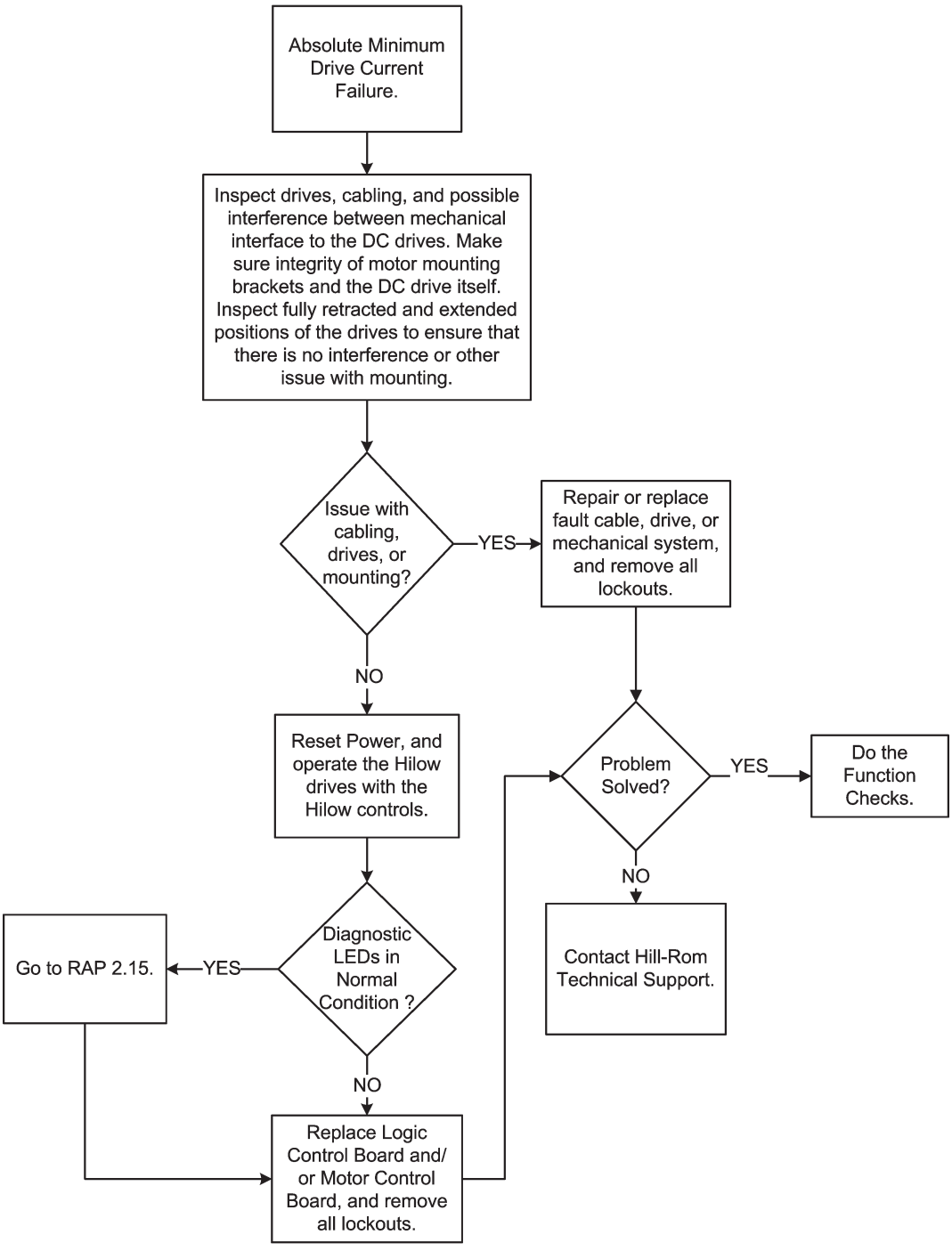
2.9 Hilow Motor Position Rate High



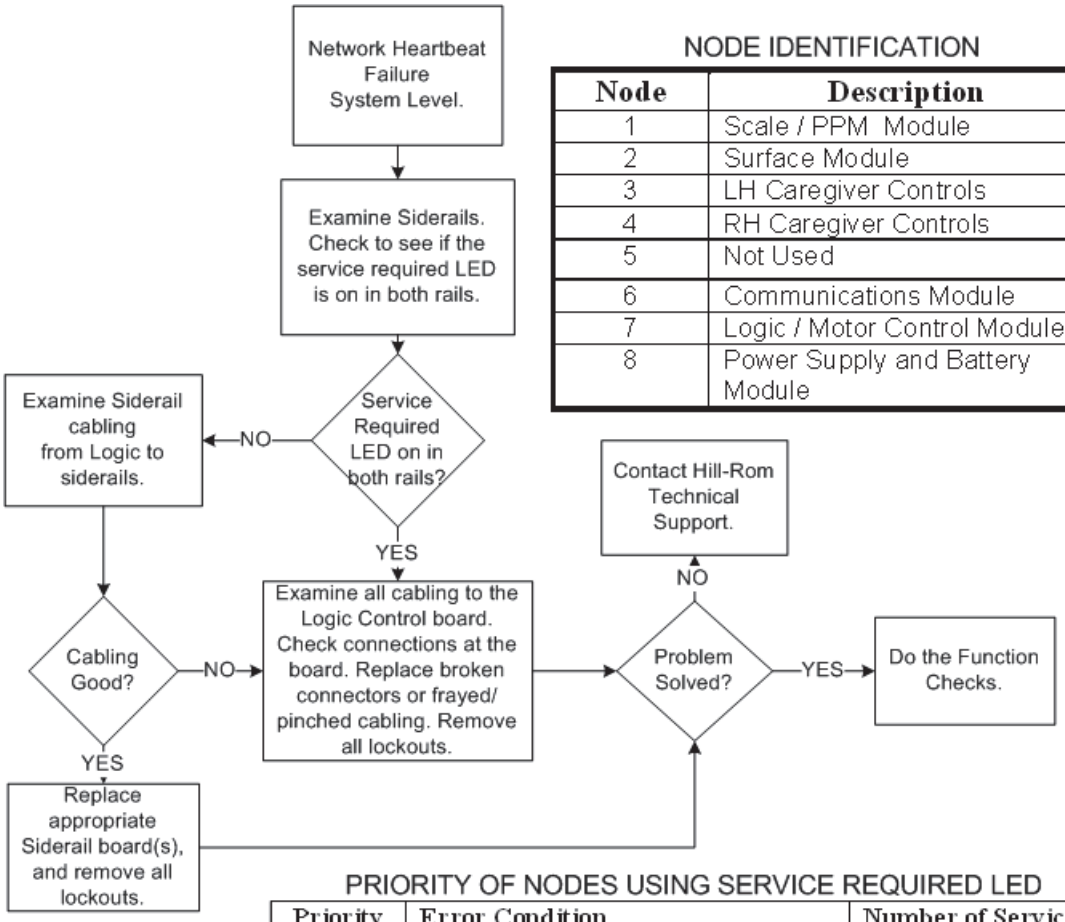
2.10 Hilow Motor Position Rate Low



2.11 Absolute Minimum Drive Current Failure



2.12 Network Heartbeat Failure System Level



NODE IDENTIFICATION

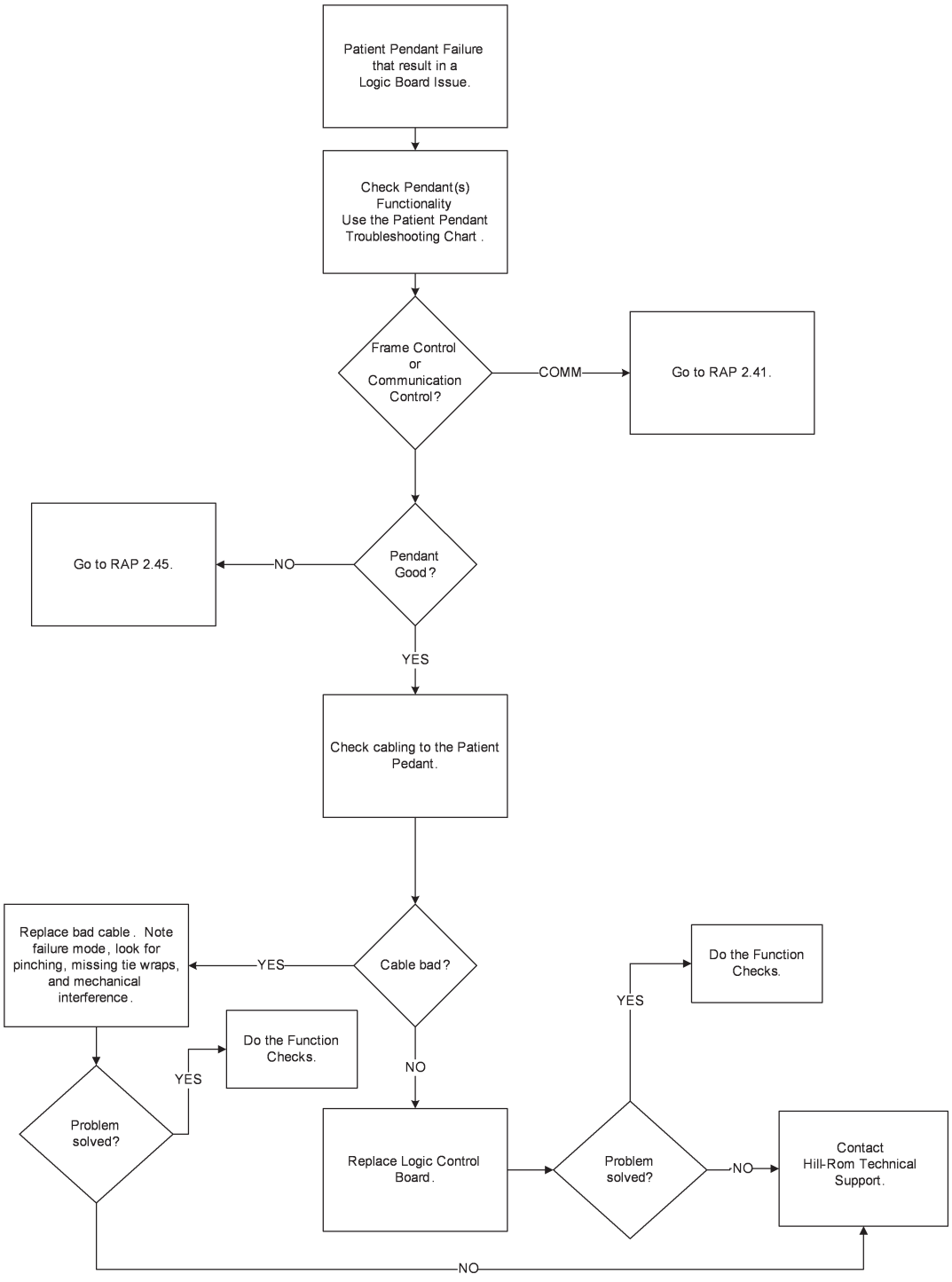
Node	Description
1	Scale / PPM Module
2	Surface Module
3	LH Caregiver Controls
4	RH Caregiver Controls
5	Not Used
6	Communications Module
7	Logic / Motor Control Module
8	Power Supply and Battery Module

PRIORITY OF NODES USING SERVICE REQUIRED LED

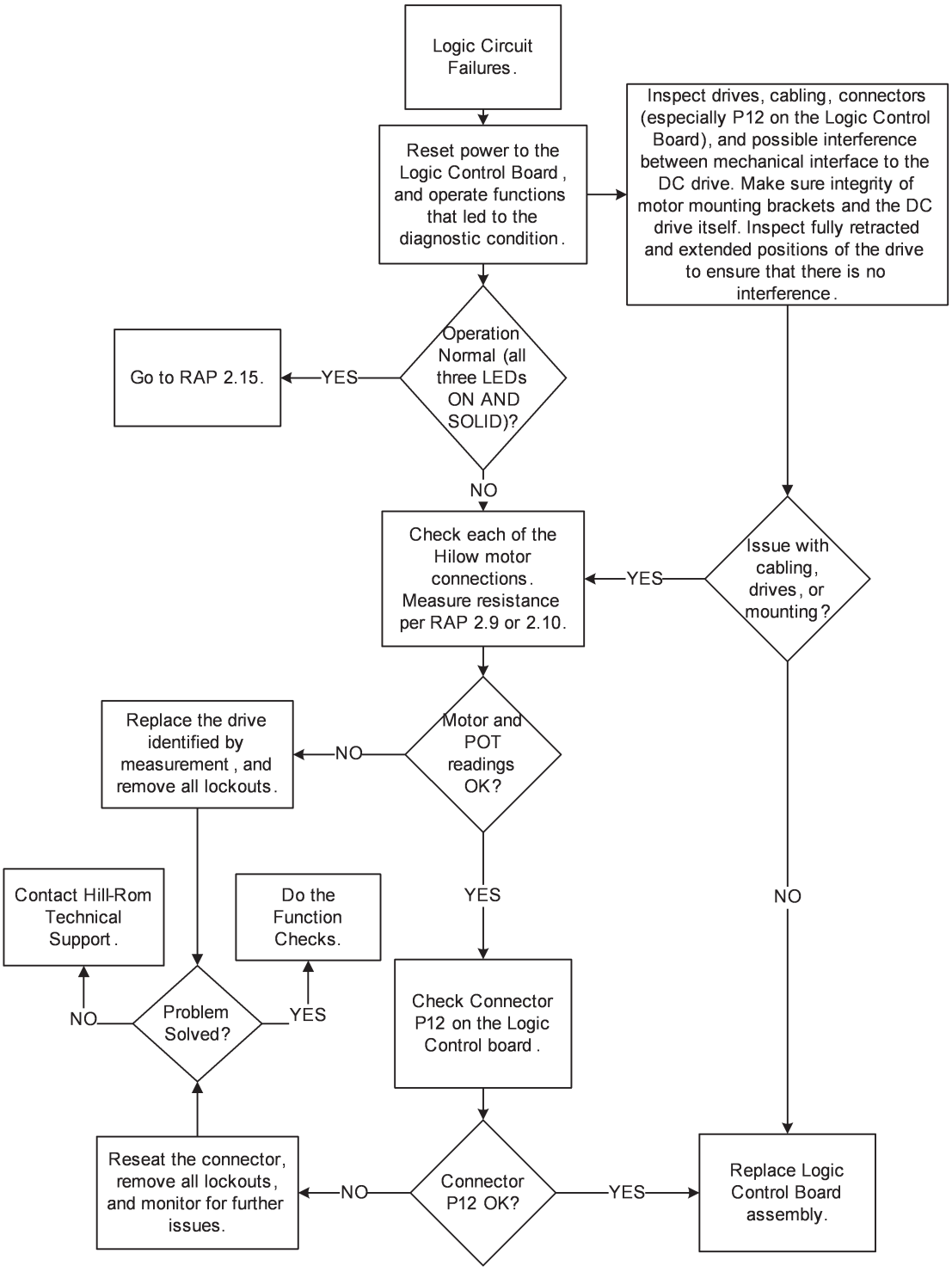
Priority (multiple errors)	Error Condition	Number of Service Required blinks while in Service Mode
1	Node 8 heartbeat error	8
2	Node 7 heartbeat error	7
3	Node 3 or 4 heartbeat or fatal error	3 or 4
4	Node 6 heartbeat error	6
5	Node 2 heartbeat error	2
6	Node 1 heartbeat error	1
7	Node 8 service required command	8
8	Node 7 service required command	7
9	Node 3 or 4 general error	3 or 4
10	Node 2 general error	Go to RAP 2.24.
11	Node 1 scale error	1

Note: Node 3 or 4 heartbeat or fatal error will only be displayed on the opposite node (If the Node 3 heartbeat is missing, Node 4 will display the error code). Node 3 or 4 general error will only be displayed on the node that has the error.

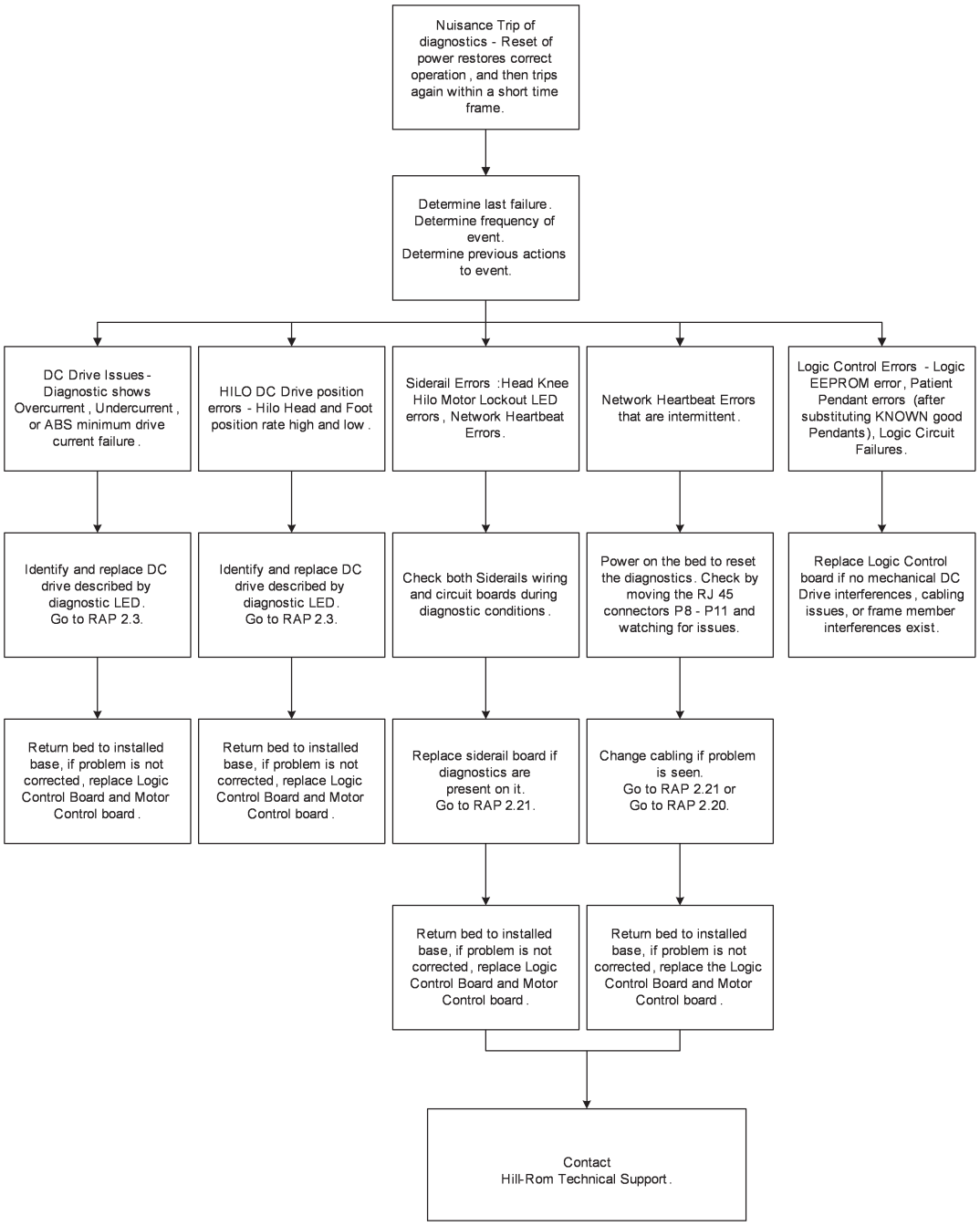
2.13 Patient Pendant Causing Logic P.C. Board Failure



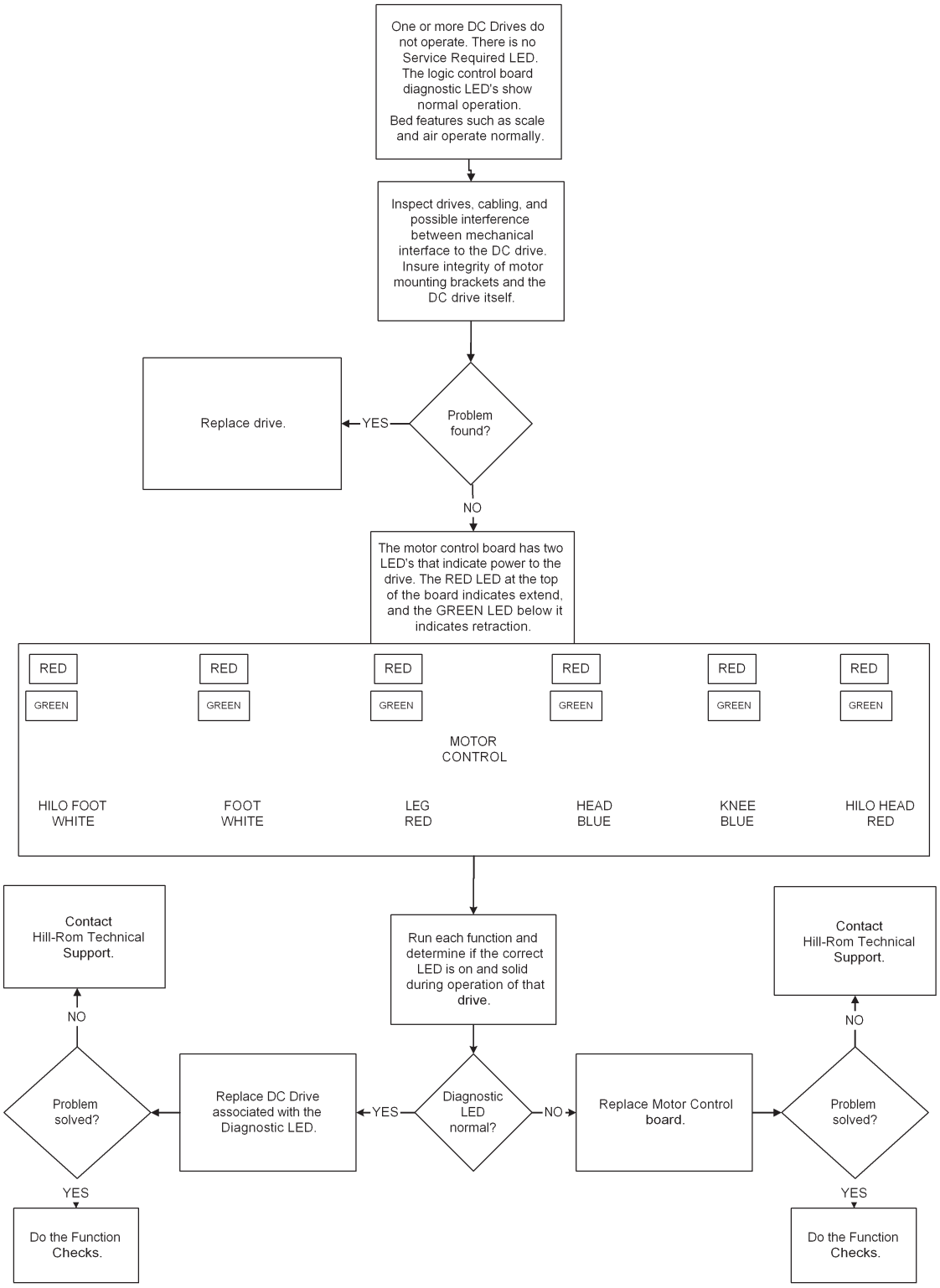
2.14 Logic Circuit Failure



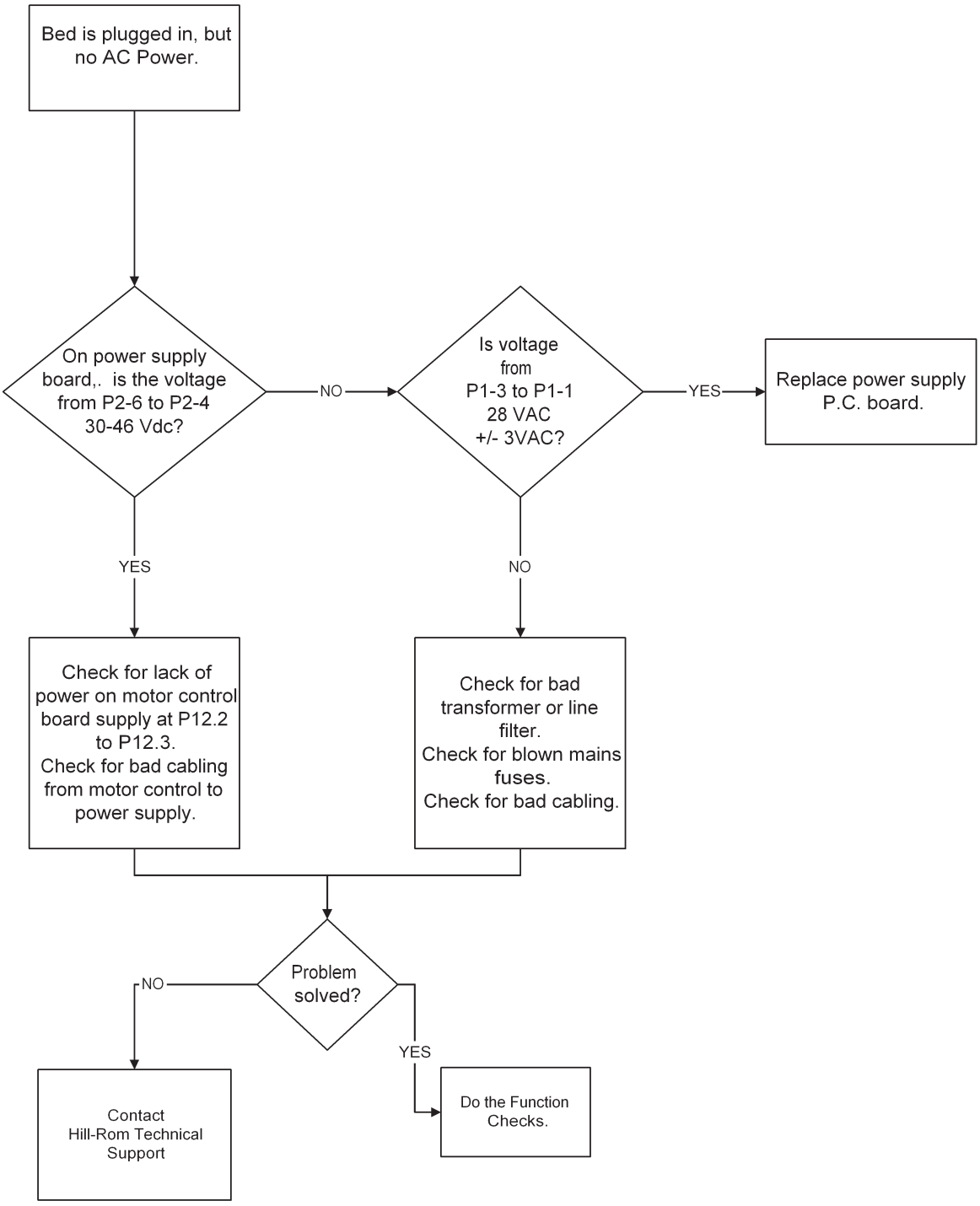
2.15 Nuisance Trip



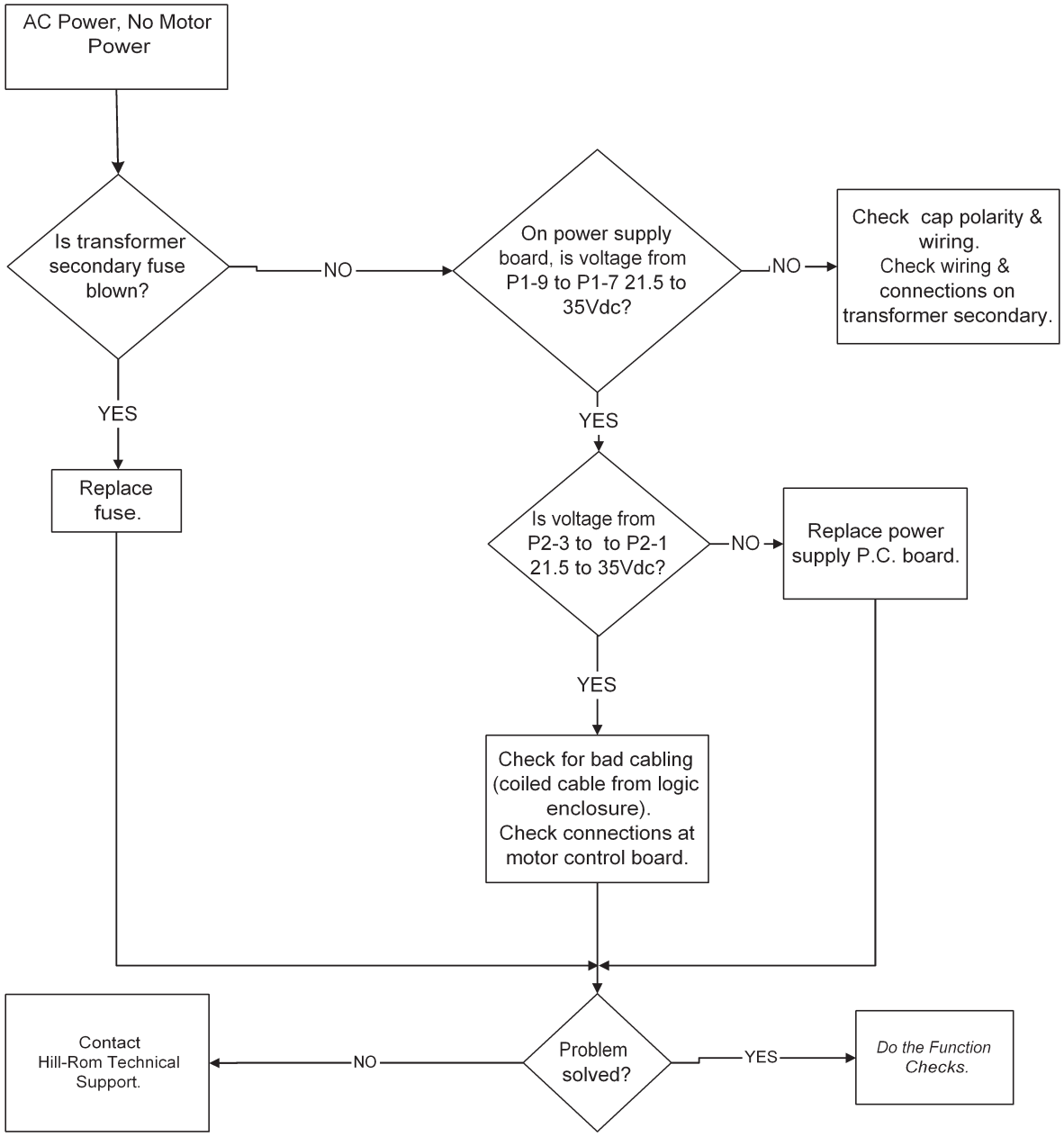
2.16 Motors Do Not Operate



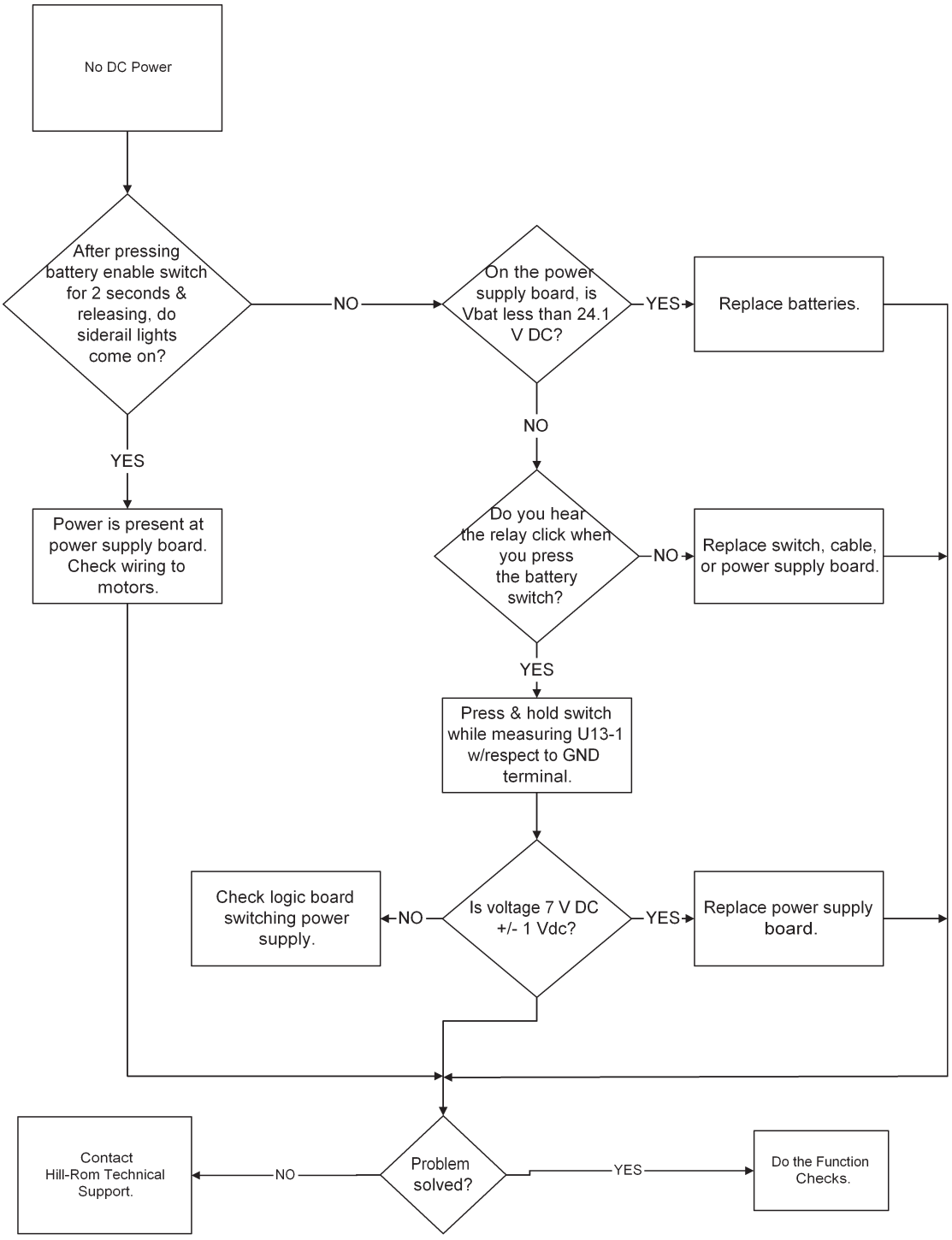
2.17 No AC Power



2.18 AC Power, No Motor Power



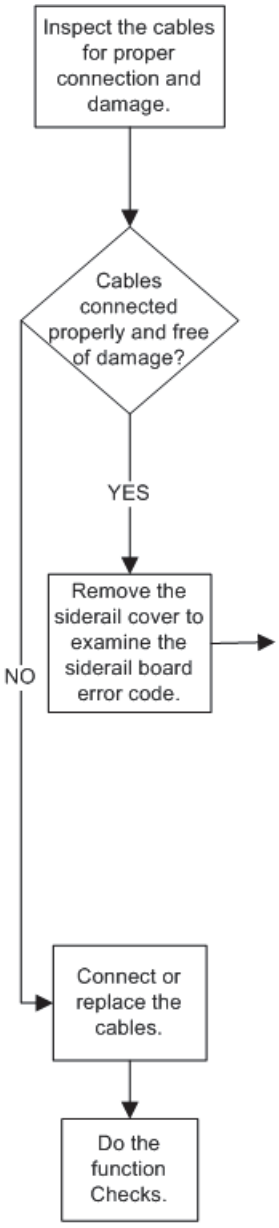
2.19 No DC Power



2.20 Power Supply Error Codes

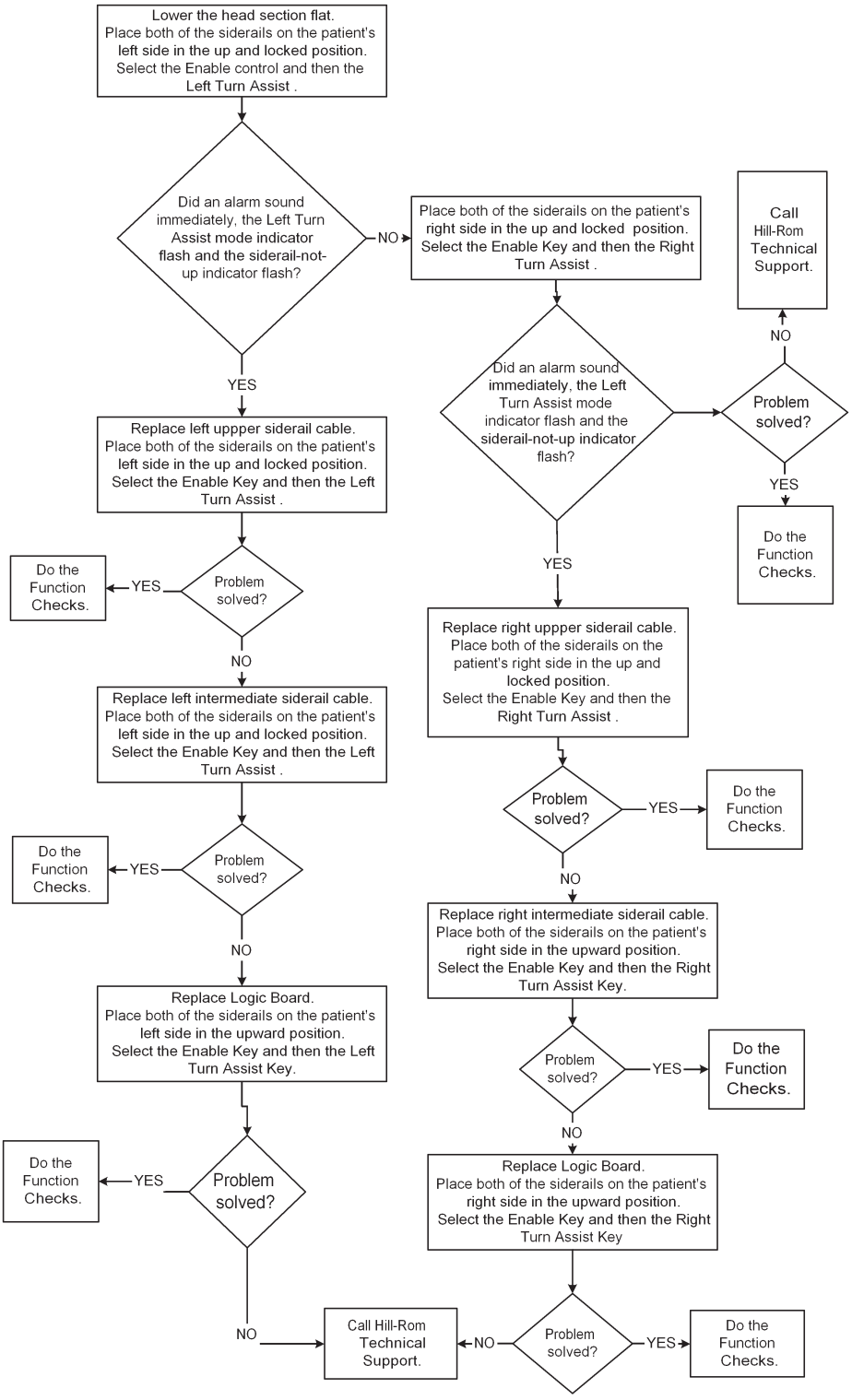
Error #	LED Color	LED DS6	LED DS1	LED DS2	LED DS3	LED DS4	Error	Troubleshooting
0	Red	OFF	OFF	OFF	OFF	OFF	NO ERRORS	Replace board.
1	Red	OFF	OFF	OFF	OFF	ON	STUCK SWITCH	Replace board or faulty caregiver pedal.
10	Red	OFF	ON	OFF	ON	OFF	ENCLOSURE TEMPURATURE	Replace board.
11	Red	OFF	ON	OFF	ON	ON	SMBUS	Replace board.
12	Red	OFF	ON	ON	OFF	OFF	LOW VCC	Replace board.
13	Red	OFF	ON	ON	OFF	ON	LOW BATTERY VOLTAGE	Check battery voltage, battery fuse and replace battery or board
14	Red	OFF	ON	ON	ON	OFF	CHARGE TIME	Replace battery or board.
15	Red	OFF	ON	ON	ON	ON	D TO A COUNT LIMIT	Replace board.
16	Red	ON	OFF	OFF	OFF	OFF	CHARGE CURRENT	Replace board.
18	Red	ON	OFF	OFF	ON	OFF	VOLT/TIME SLOPE	Replace board.
19	Red	ON	OFF	OFF	ON	ON	CURRENT/TIME SLOPE	Replace board.
20	Red	ON	OFF	ON	OFF	OFF	HIGH BATTERY VOLTAGE	Replace board.
21	Red	ON	OFF	ON	OFF	ON	D TO A OUTPUT	Replace board.
22	Red	ON	OFF	ON	ON	OFF	CURRENT MEASUREMENT DIFFERENCE	Replace board.
23	Red	ON	OFF	ON	ON	ON	CURRENT CALCULATION	Replace board.
24	Red	ON	ON	OFF	OFF	OFF	EXTERNAL EEPROM BUS	Replace board.
25	Red	ON	ON	OFF	OFF	ON	CHARGE TIME 2	Check and replace battery or board.

2.21 Siderail Controls Not Working

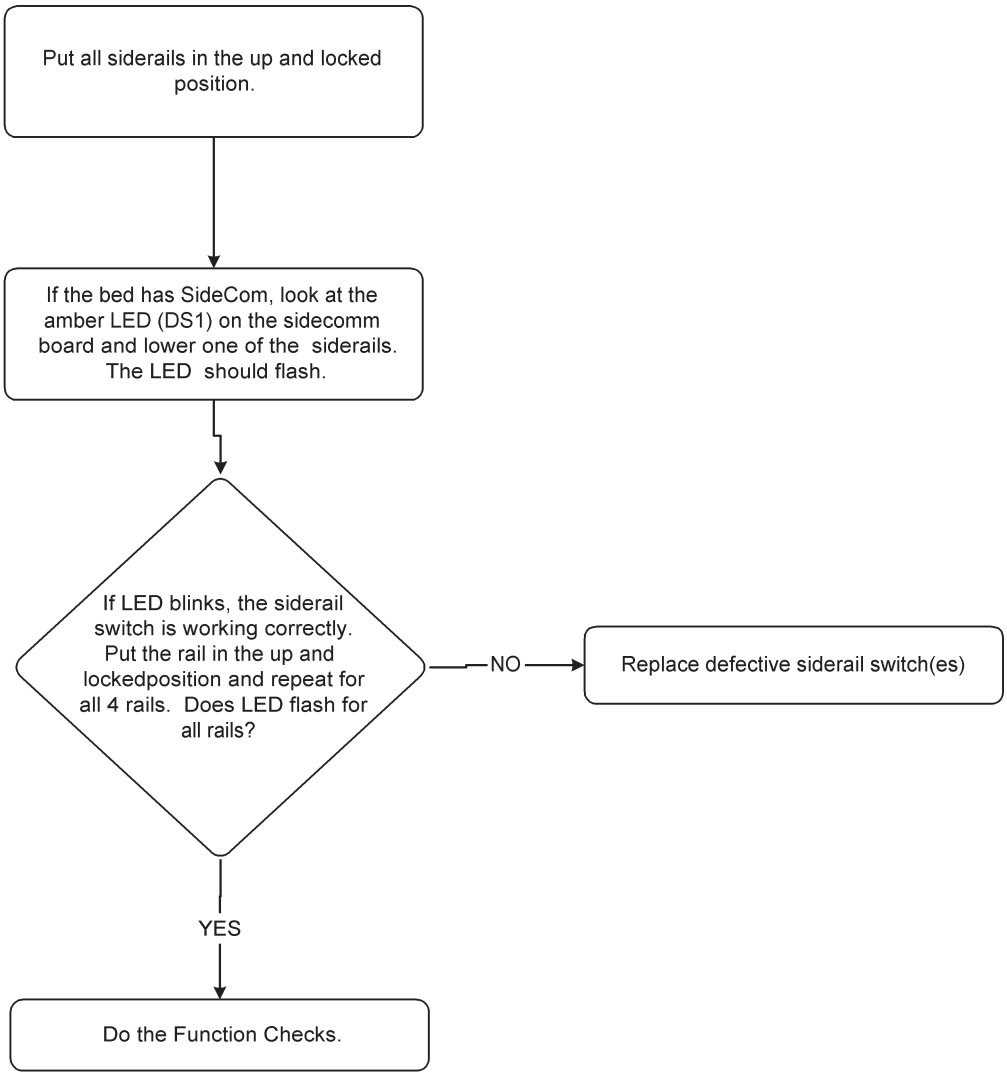


Error Codes	DS 11	DS 12	DS 13	
SYSTEM_LOCKOUT_LED_ERROR	Off	Blink	Off	Indicates conflict between logic lockout status and caregiver lockout led status. Replace the standard caregiver control board.
SYSTEM_BOARD_ID_ERROR	Off	Blink	Blink	Indicates improper cable connection, bad cable, or bad standard caregiver control board.
SYSTEM_EEPROM_ERROR	Blink	Off	Off	Indicates an unsuccessful improper eeprom access. Replace the caregiver control board.
SYSTEM_ADC_TIMEOUT_ERROR	Blink	Off	Blink	Indicates an unsuccessful adc access. Replace the caregiver control board.
SYSTEM_STANDARD_SHIFT_REGISTER_ERROR	Blink	Blink	Off	Indicates a communications error on the standard caregiver control board. Replace the board.
SYSTEM_PATIENT_SHIFT_REGISTER_ERROR	Blink	Blink	Blink	Indicates a communications error between the standard caregiver and the patient control boards. Check the cable that connects them and then each board.
SYSTEM_STANDARD_SWITCH_ERROR	On	On	Blink	Indicates an unanticipated switch voltage reading. Replace the standard caregiver control board.
SYSTEM_STANDARD_STUCK_SWITCH_ERROR	On	Blink	On	A switch on the standard caregiver control board is stuck. Check the label, cover, and then replace the board.
SYSTEM_ENABLE_STUCK_SWITCH_ERROR	On	Blink	Blink	The enable (A thru F beds) or lockout (G and newer beds) switch on the standard caregiver control board is stuck. Check the label, cover, and then replace the board.
SYSTEM_PATIENT_STUCK_SHIFT_SWITCH_ERROR	Blink	On	On	A switch on the patient control board is stuck. Check the label, cover, and then replace the board.
SYSTEM_OPTIONAL_SHIFT_REGISTER_ERROR	Blink	On	Blink	Indicates a communications error between the standard caregiver and optional caregiver control boards. Check the cable that connects them and then each board.
SYSTEM_OPTIONAL_STUCK_SWITCH__ERROR	Blink	Blink	On	A switch on the optional caregiver control board is stuck. Check the label, cover, and then replace the board.
SYSTEM_READ3_EEPROM_ERROR	Blink	Blink	Blink	Indicates and unsuccessful EEPROM access. Replace the caregiver control board.
SYSTEM_BOOST_STUCK_SWITCH_ERROR	Off	Blink	On	Indicates the Boost switch is stuck. Check the label, cover, and then replace the caregiver control board.

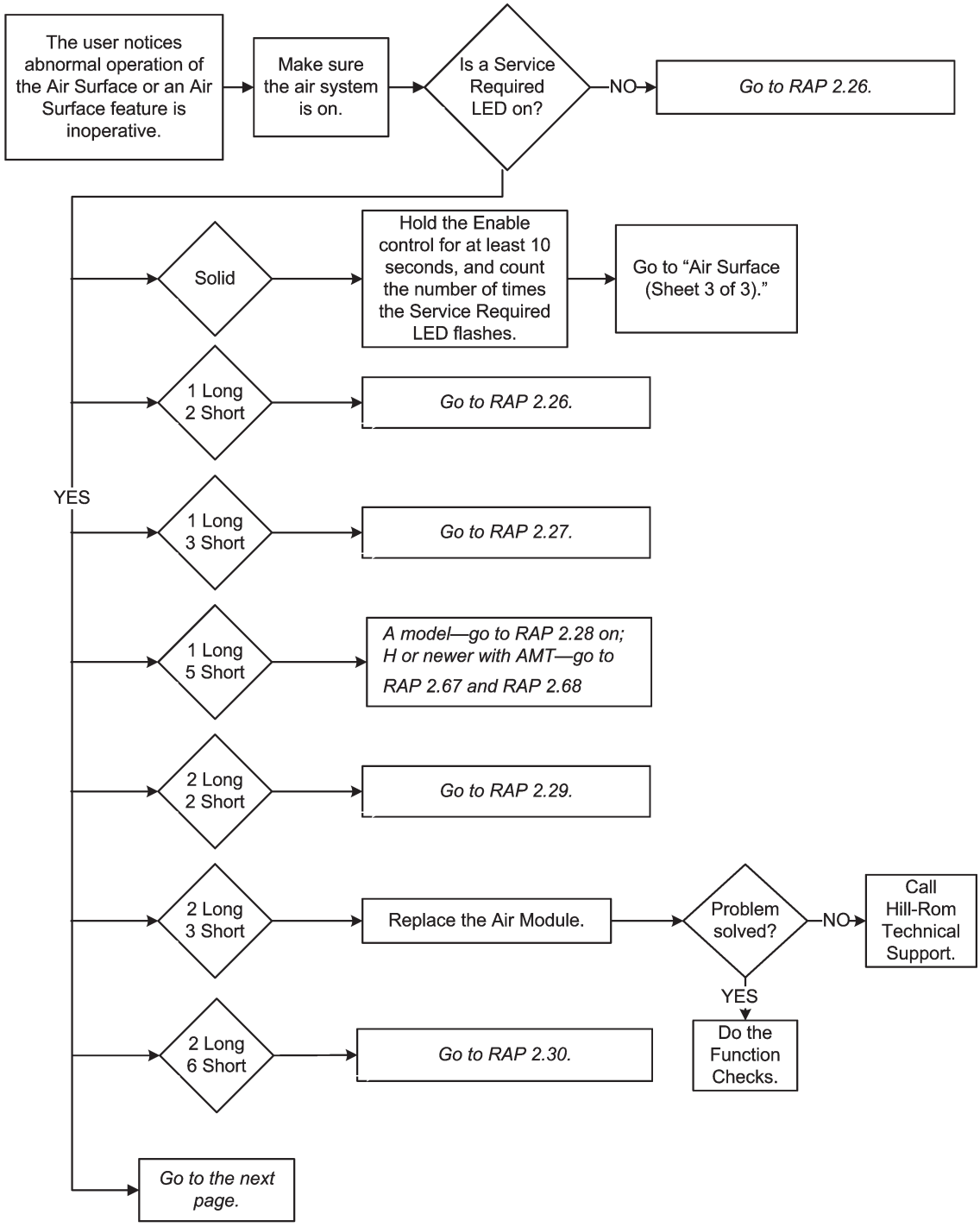
2.22 Siderail Detection Switch Without SideCom® Communication System



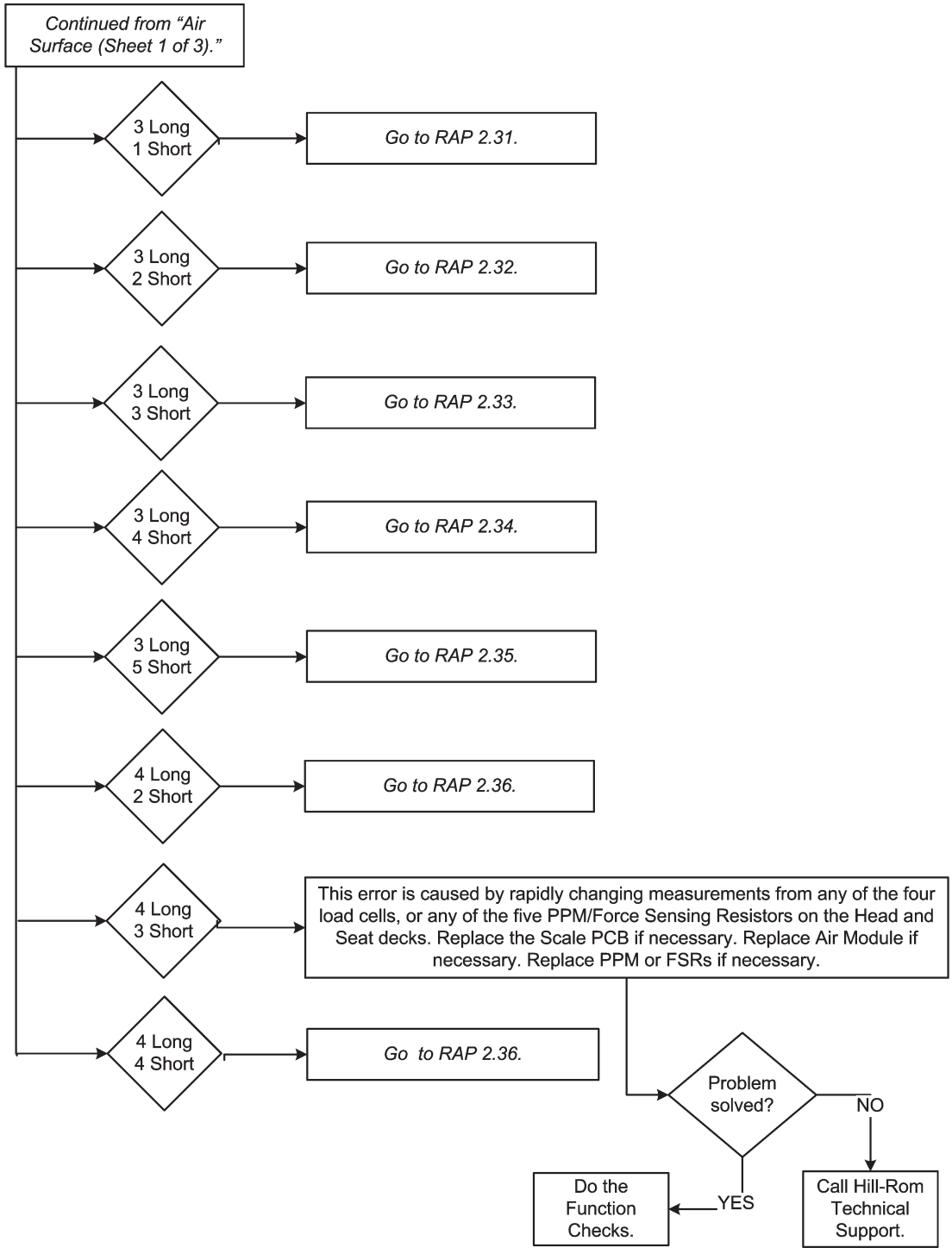
2.23 Siderail Detection Switch With SideCom® Communication System



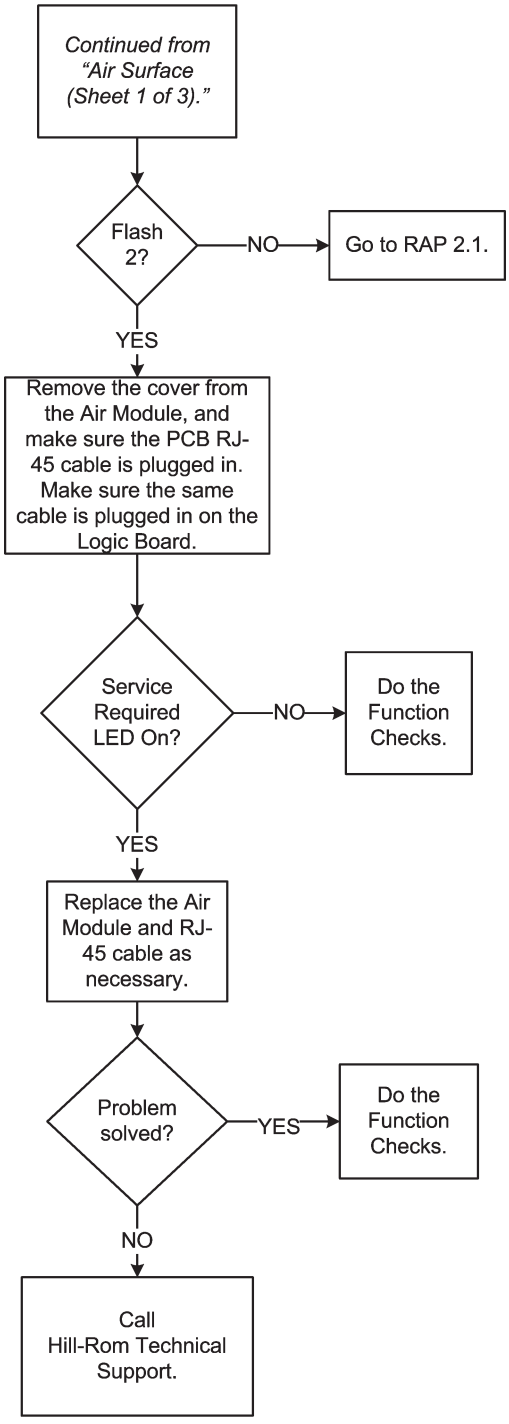
2.24 Air Surface (Sheet 1 of 3)



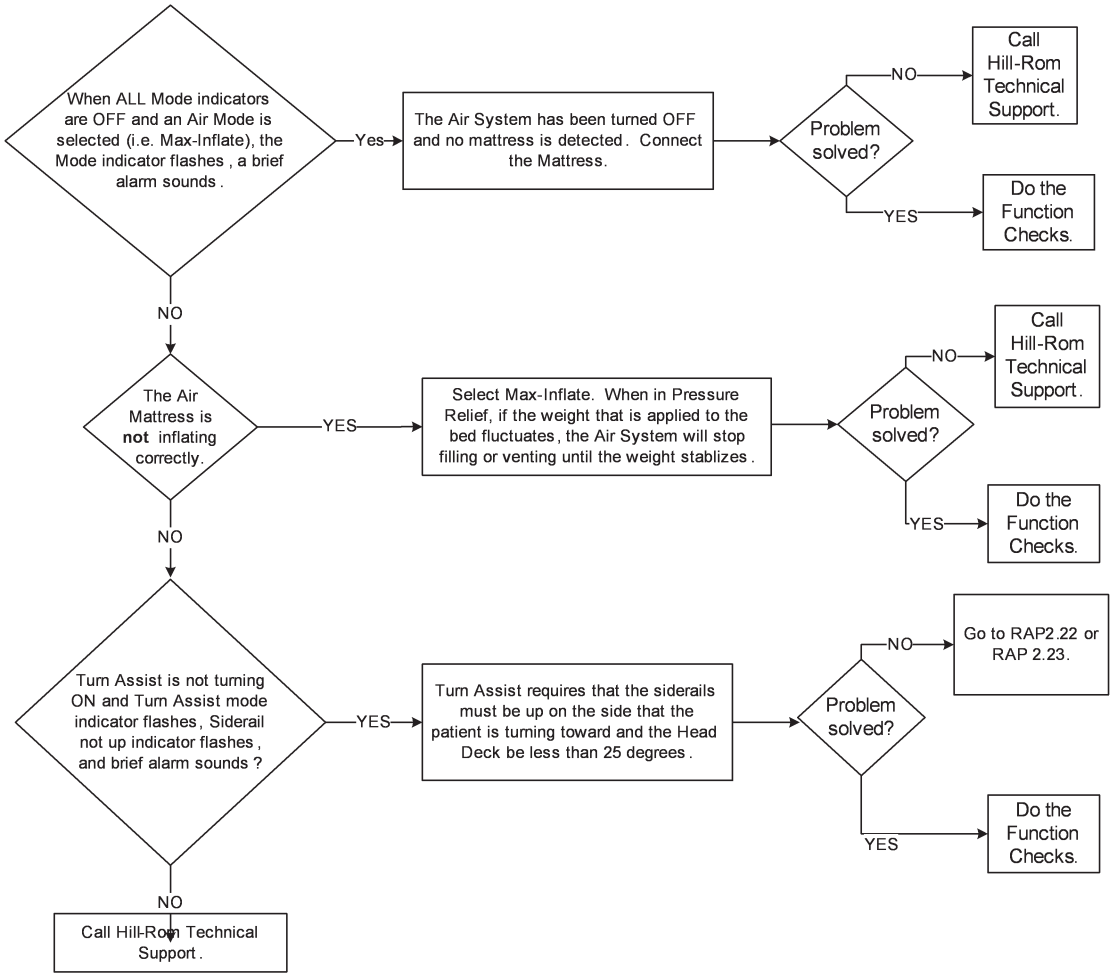
2.24 Air Surface (Sheet 2 of 3)



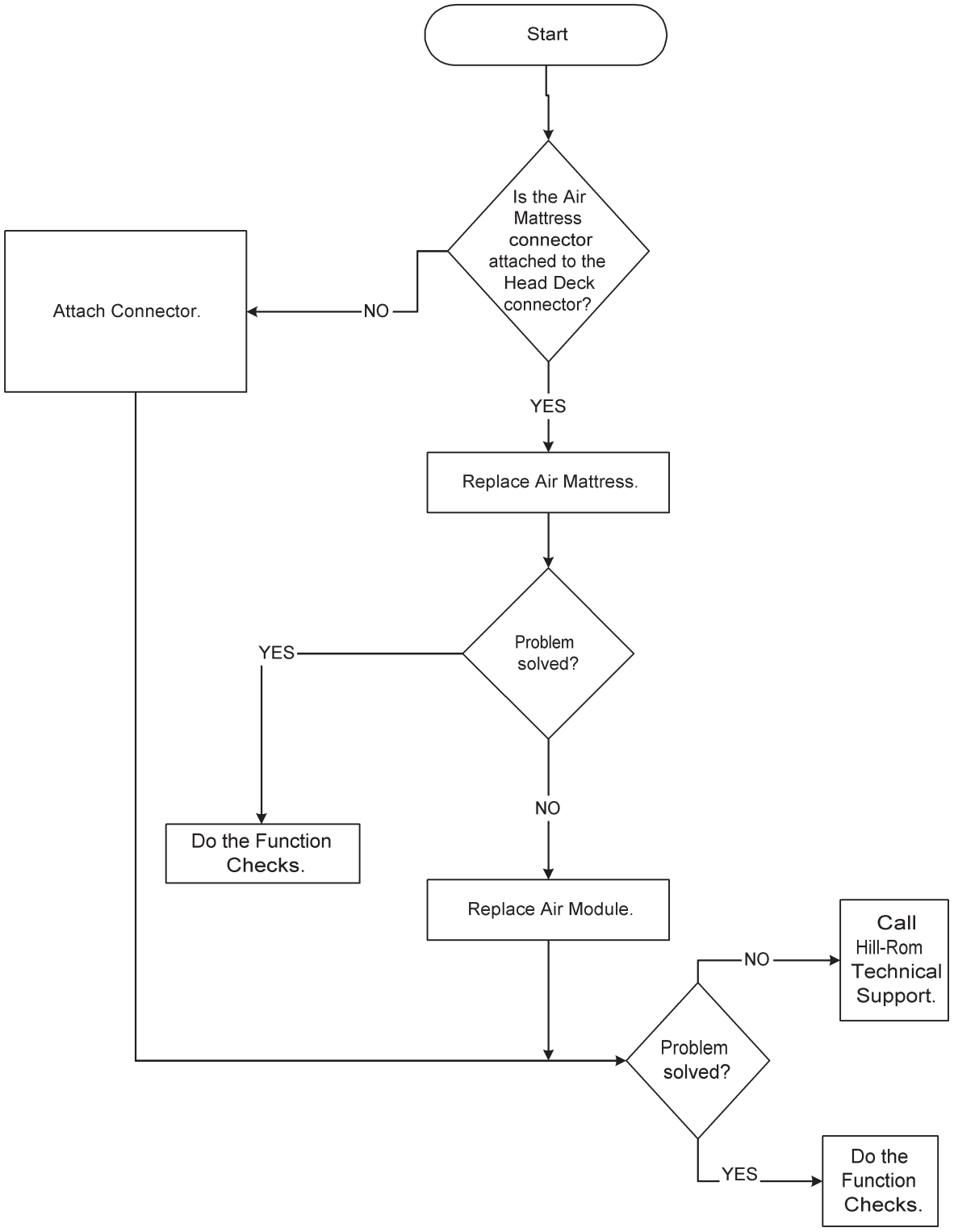
2.24 Air Surface (Sheet 3 of 3)



2.25 System Error, No Flash Code

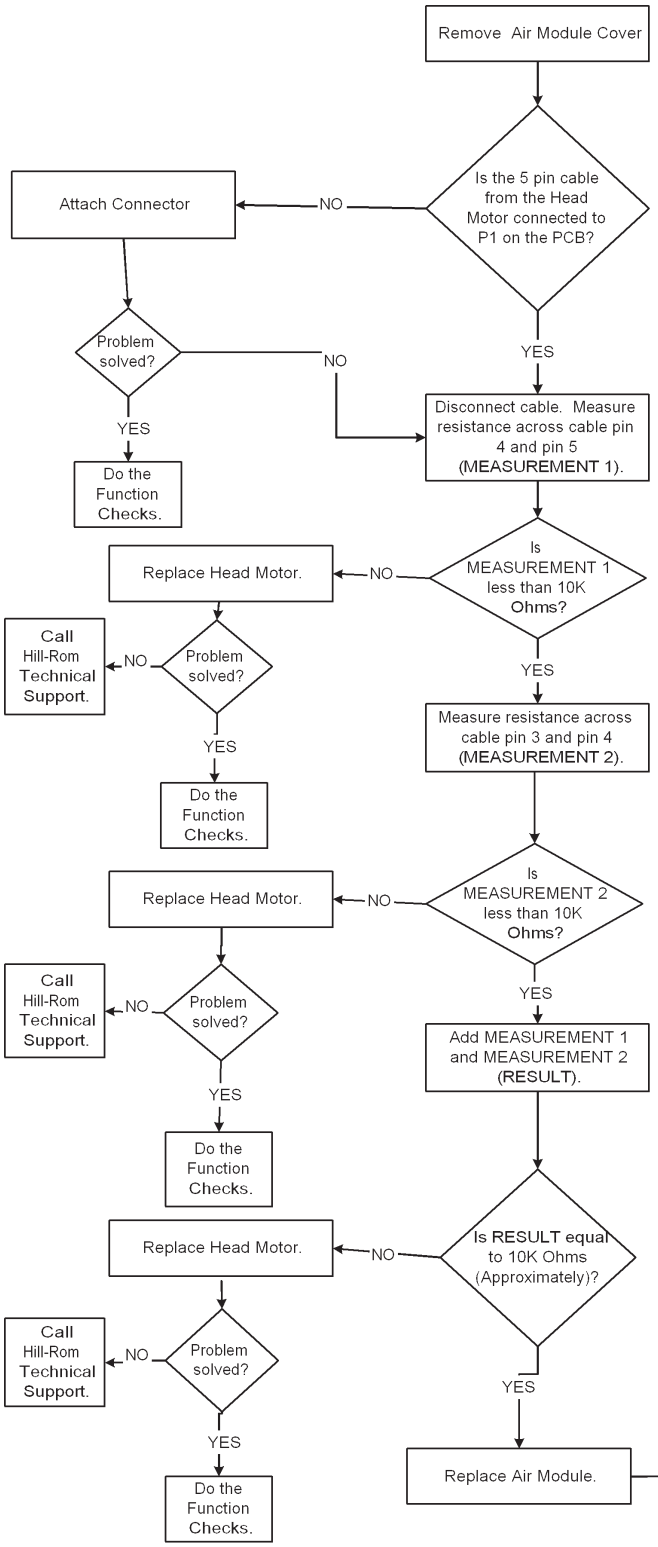


2.26 Mattress Disconnected



2

2.27 Head Angle Sensor Error

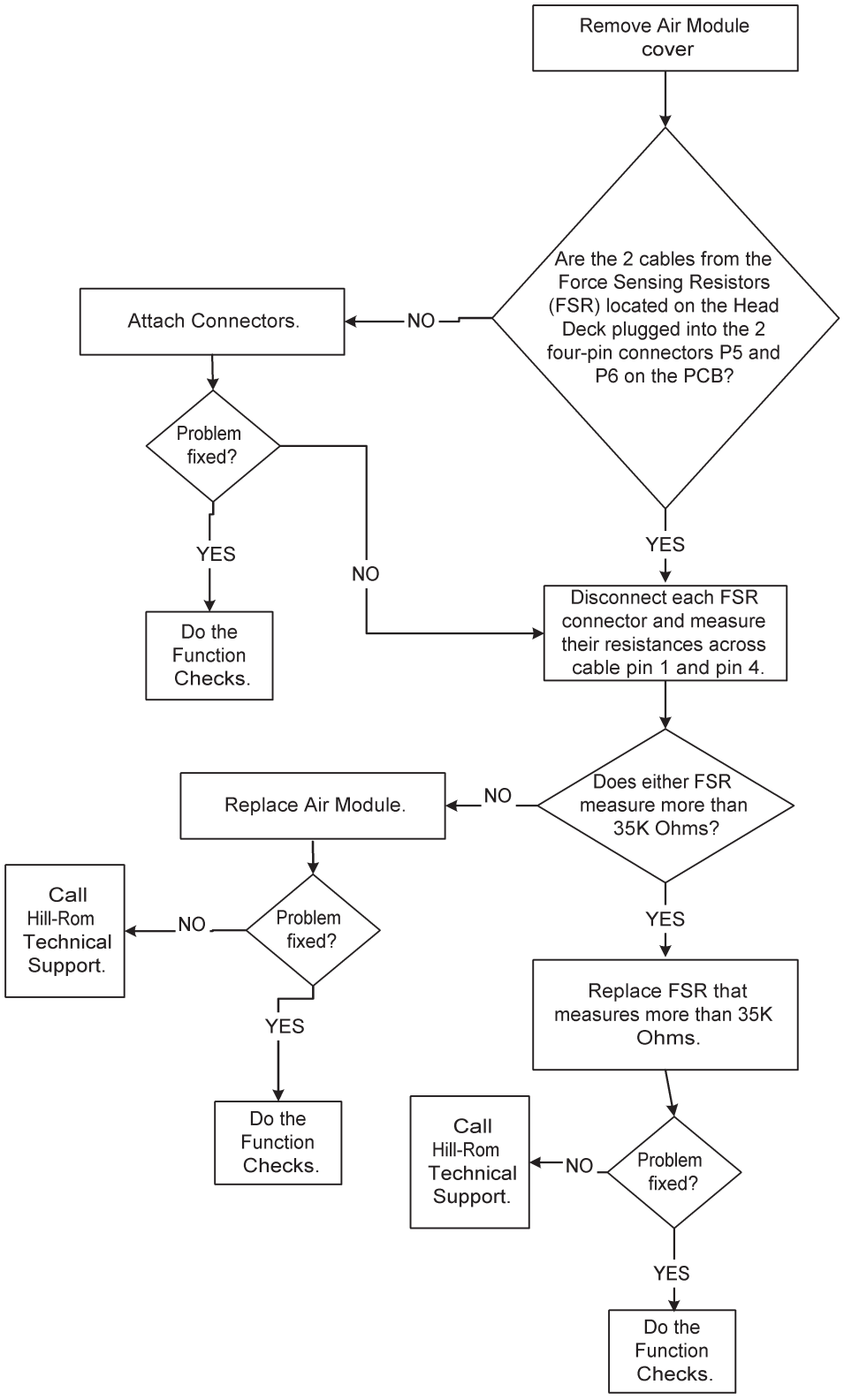


Stroke length of DC Drive
Versus
Resistance of Potentiometer

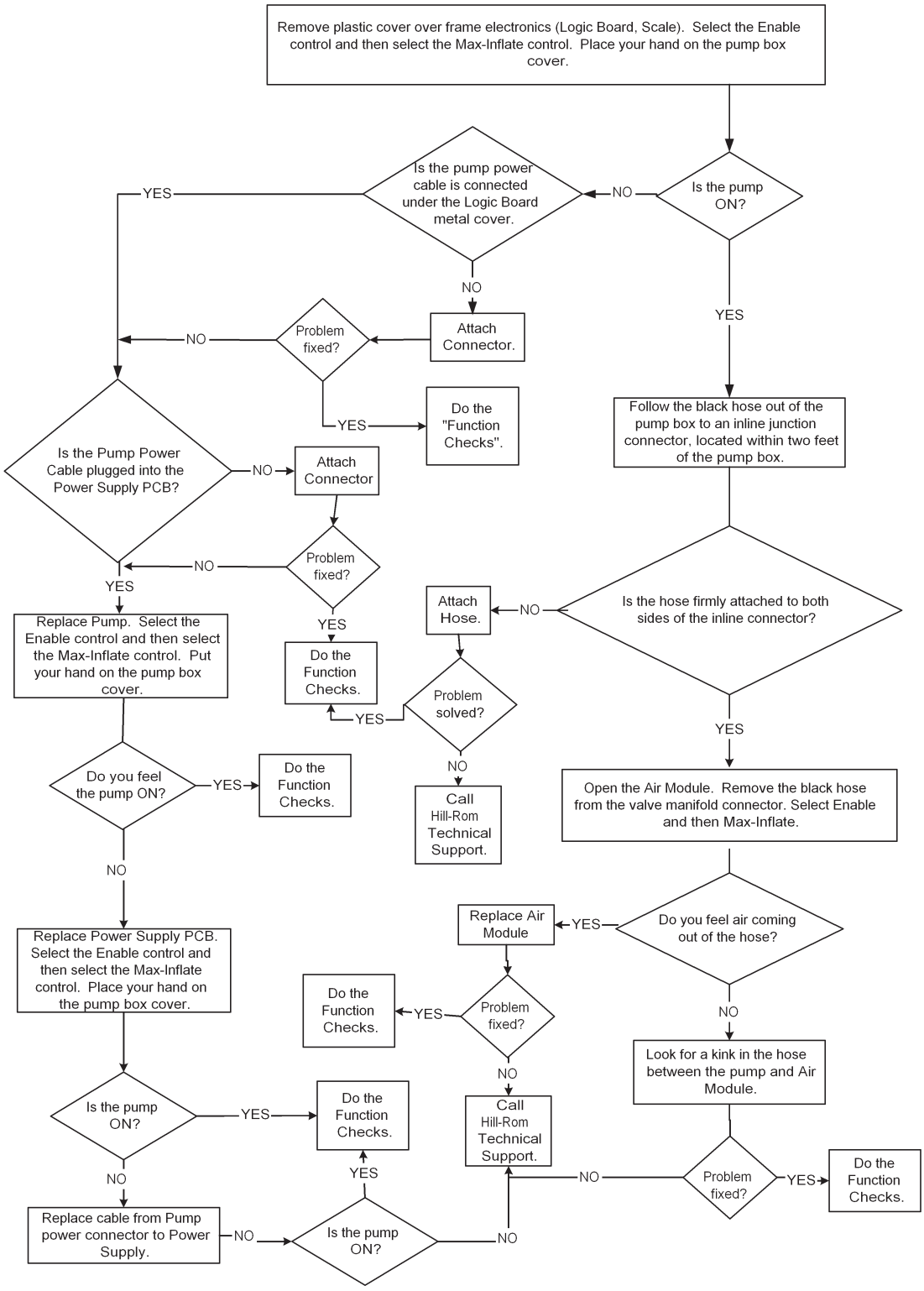
Stroke Length extended	Rx * see note Drive Extension 28.4 ohms /mm Values Approx
Fully Retracted position	Add to retracted position reading
1 mm	128.4
11 mm	412.5
21 mm	696.6
31 mm	980.7
41 mm	1264.8
51 mm	1548.9
61 mm	1833
71 mm	2117.1
81 mm	2401.2
91 mm	2685.3
101 mm	2969.4
111 mm	3253.5
121 mm	3537.6
131 mm	3821.7
141 mm	4105.8
151 mm	4389.9
161 mm	4674
171 mm	4958.1
181 mm	5242.2

NOTE* : Measured from pin 4 of the motor connector to pin 5. Always check pin 4 to pin 3 for the difference of resistance. This is calculated by Rx = 10K - reading from pin 4 to 3

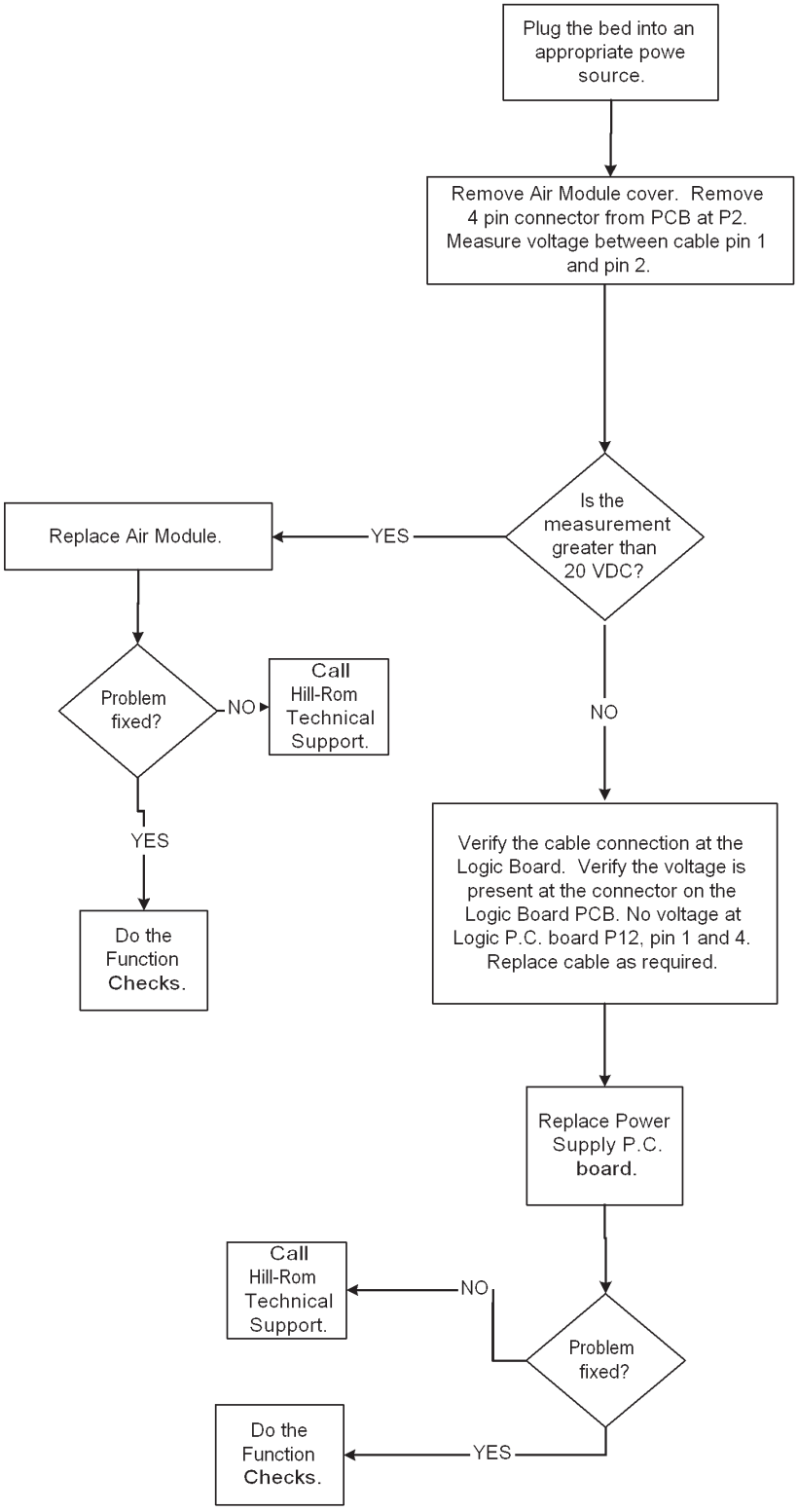
2.28 Head FSR1 and FSR2



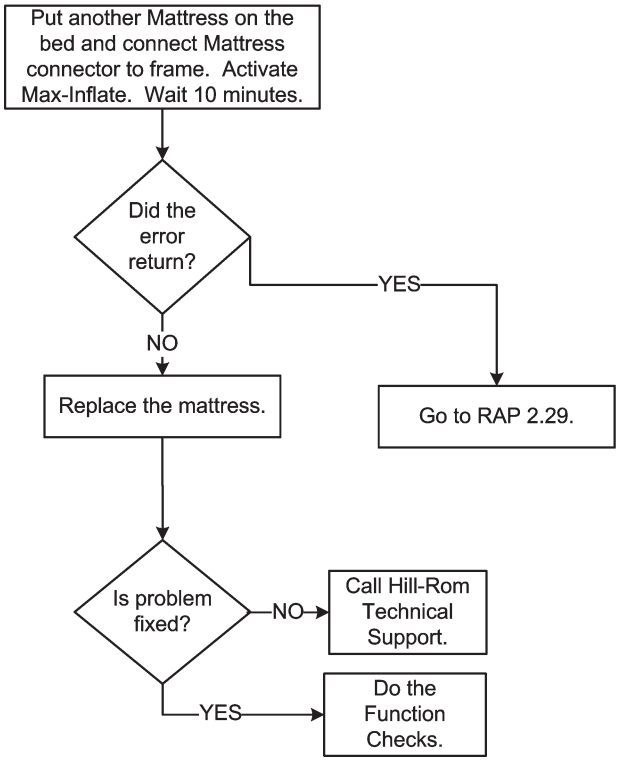
2.29 Accumulator Pressure



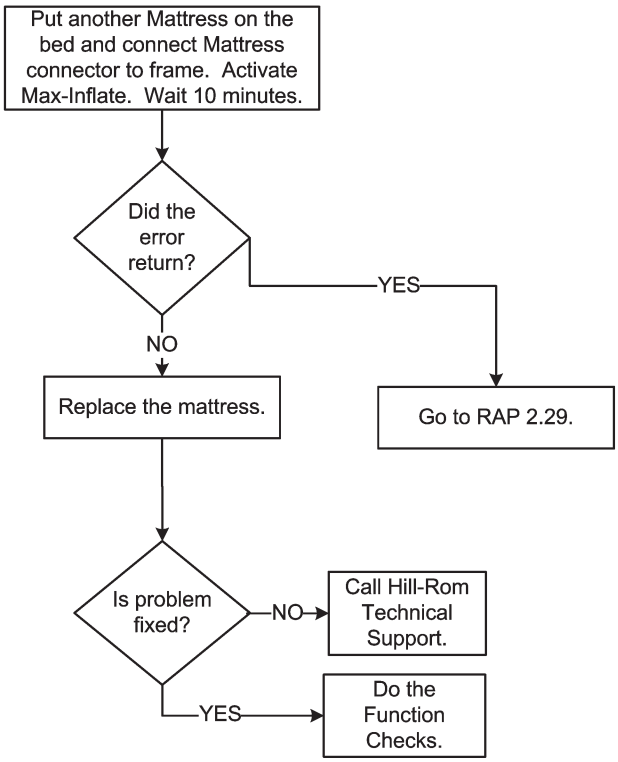
2.30 Missing 24 V DC Input



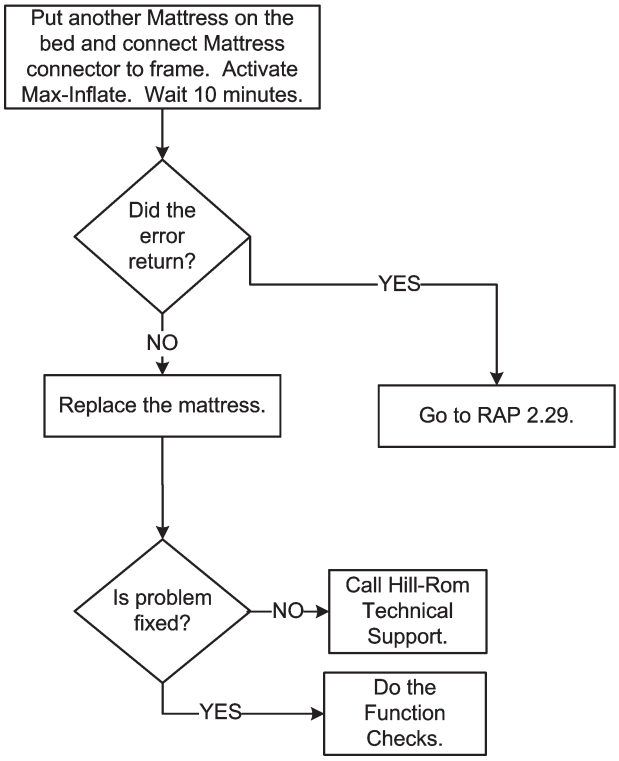
2.31 Not Reaching Head Zone Pressure



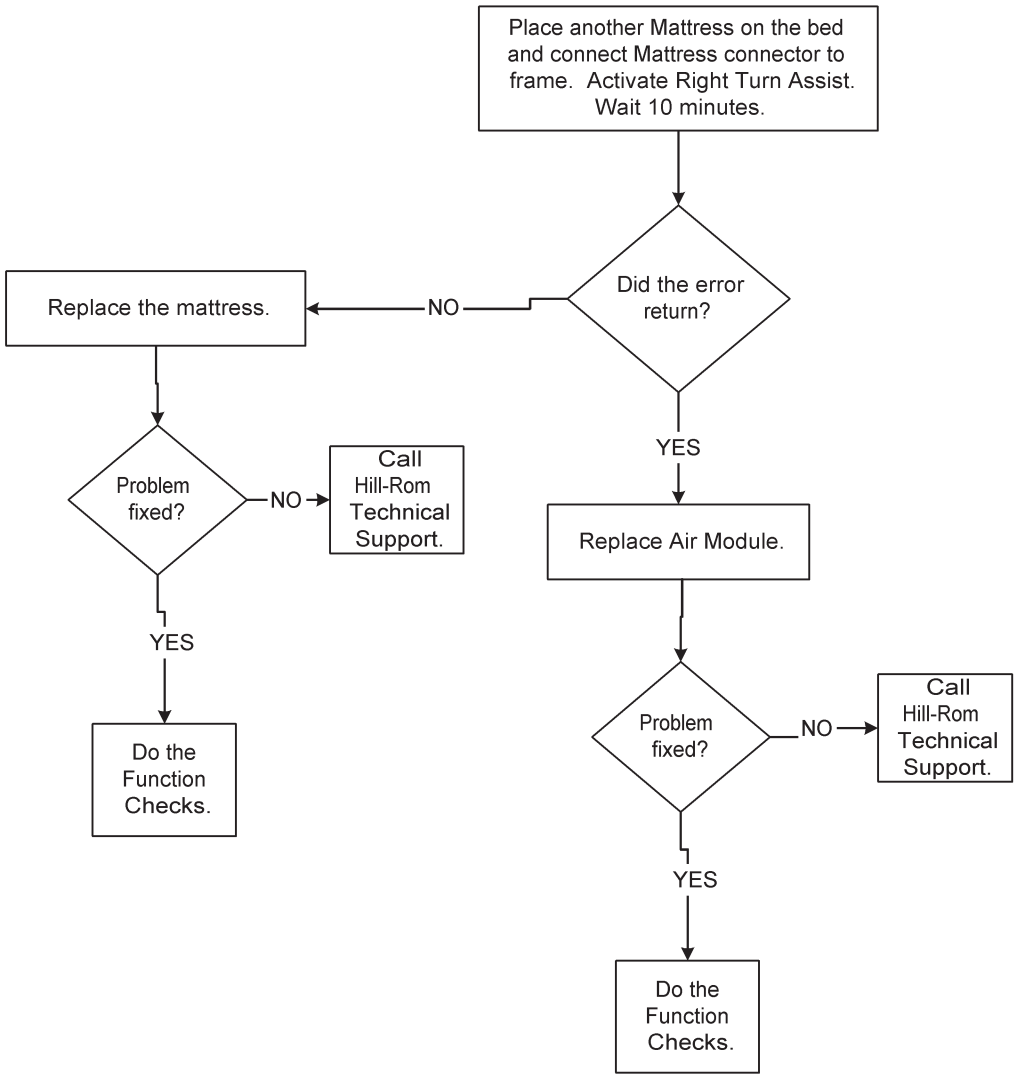
2.32 Not Reaching Seat Zone Pressure



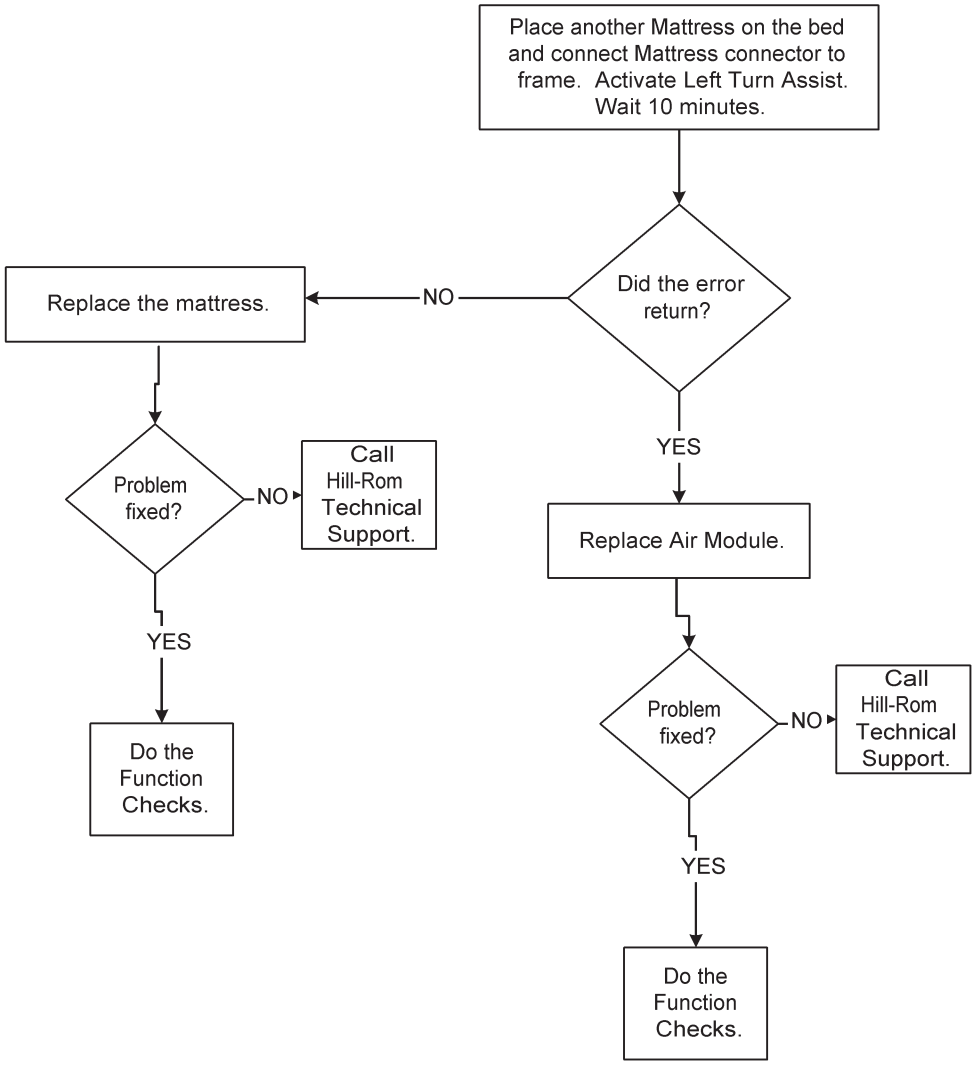
2.33 Not Reaching Foot Zone Pressure



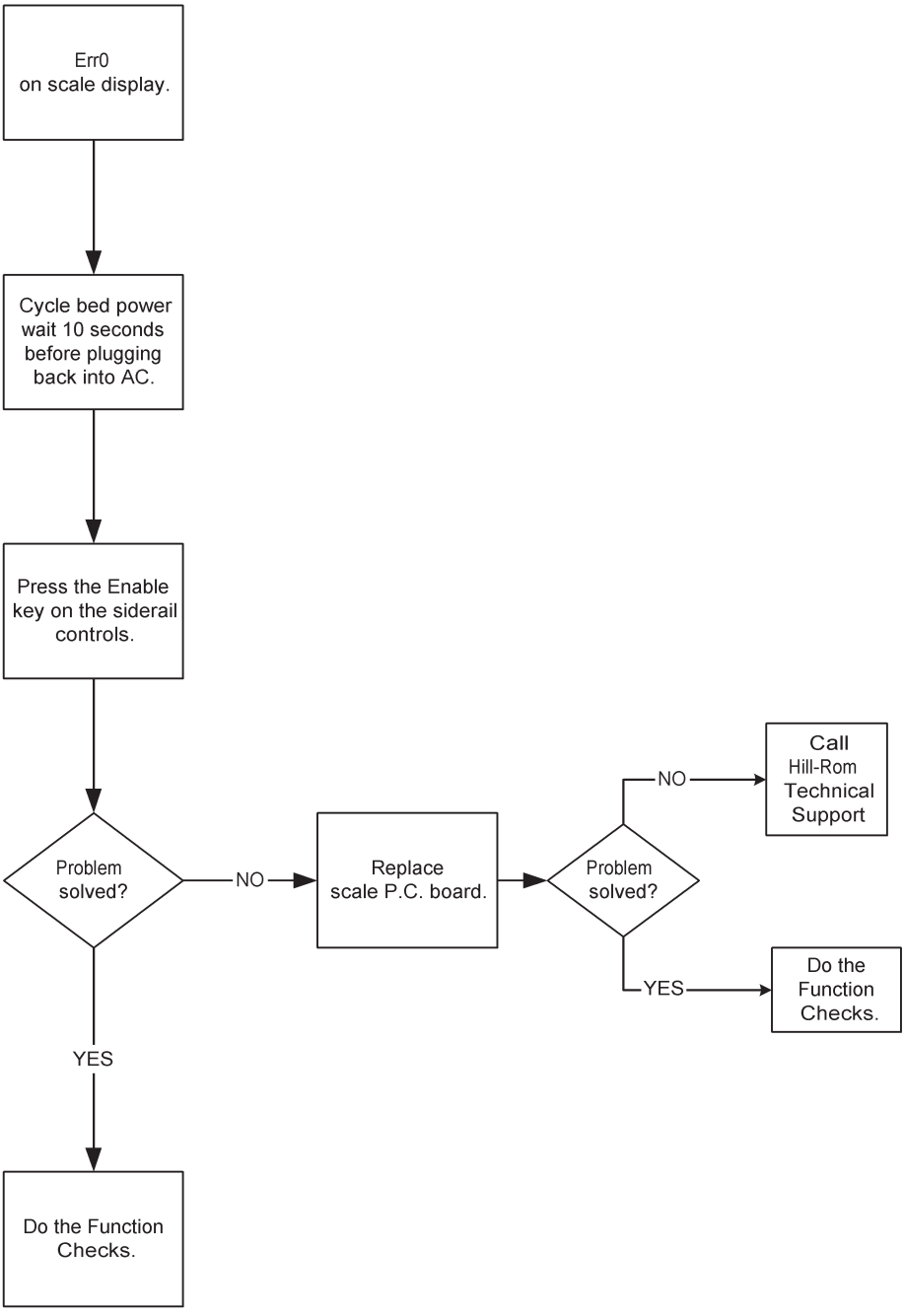
2.34 Not Reaching Right Turn Assist Pressure



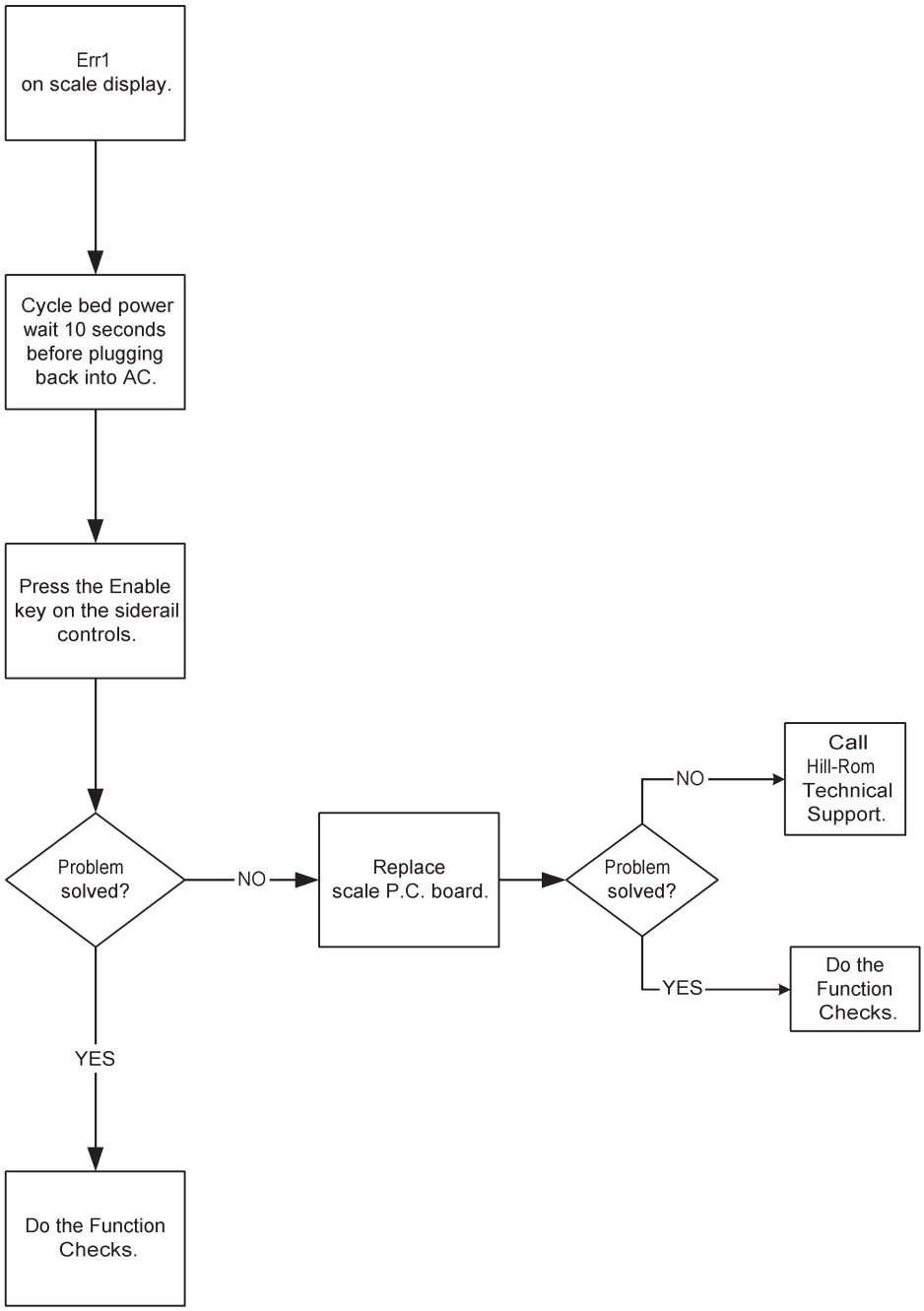
2.35 Not Reaching Left Turn Assist Pressure



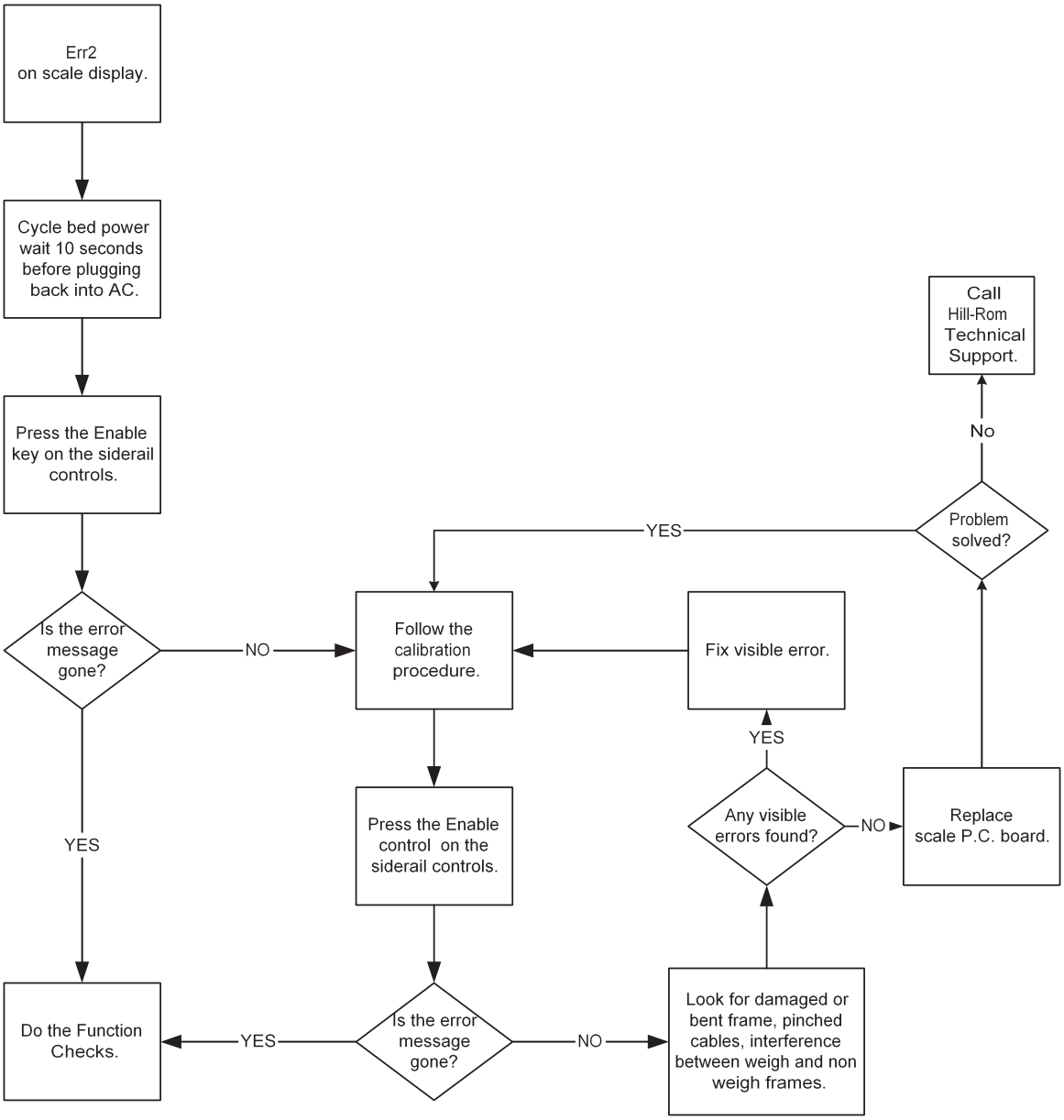
2.36 Scale Error 0



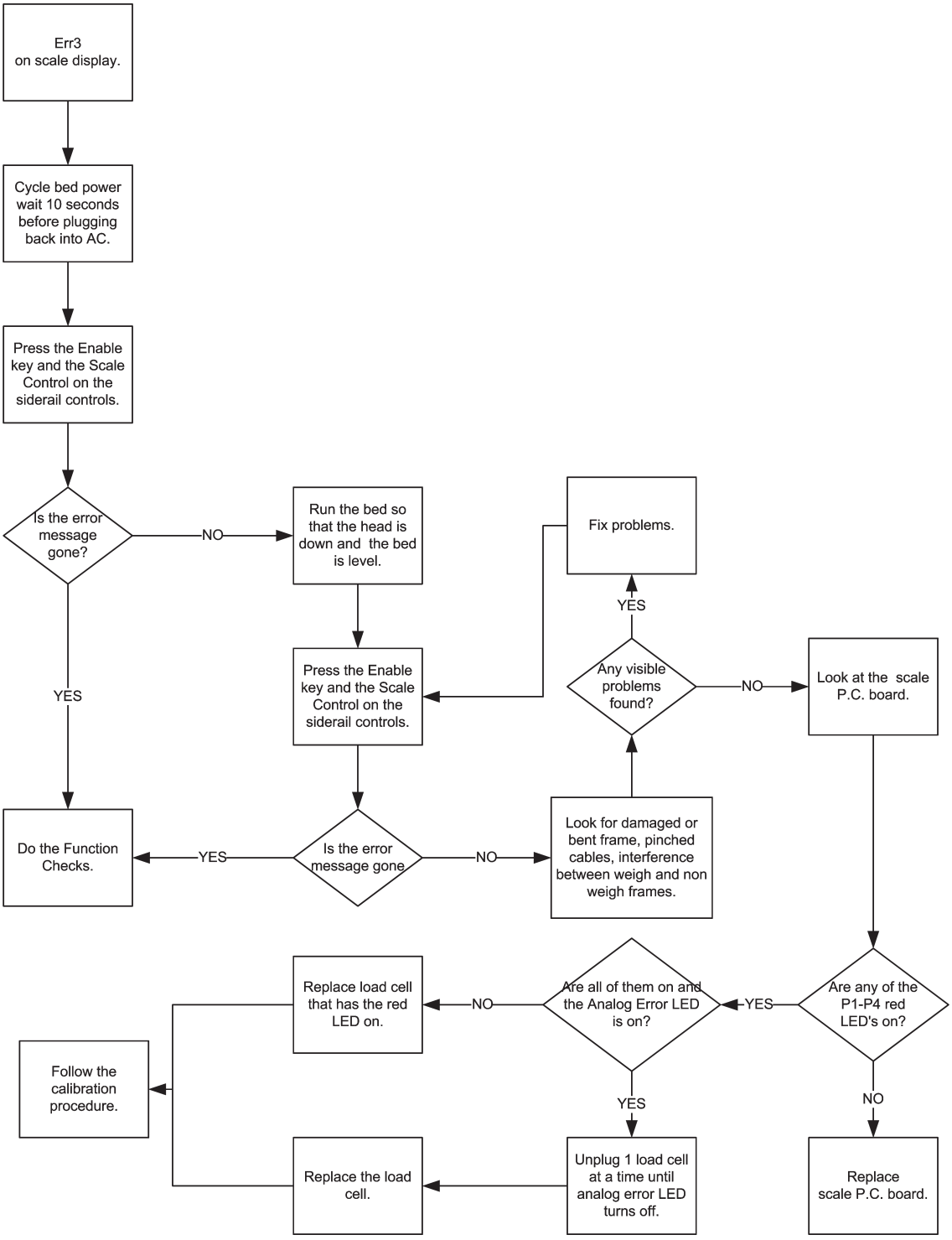
2.37 Scale Error 1



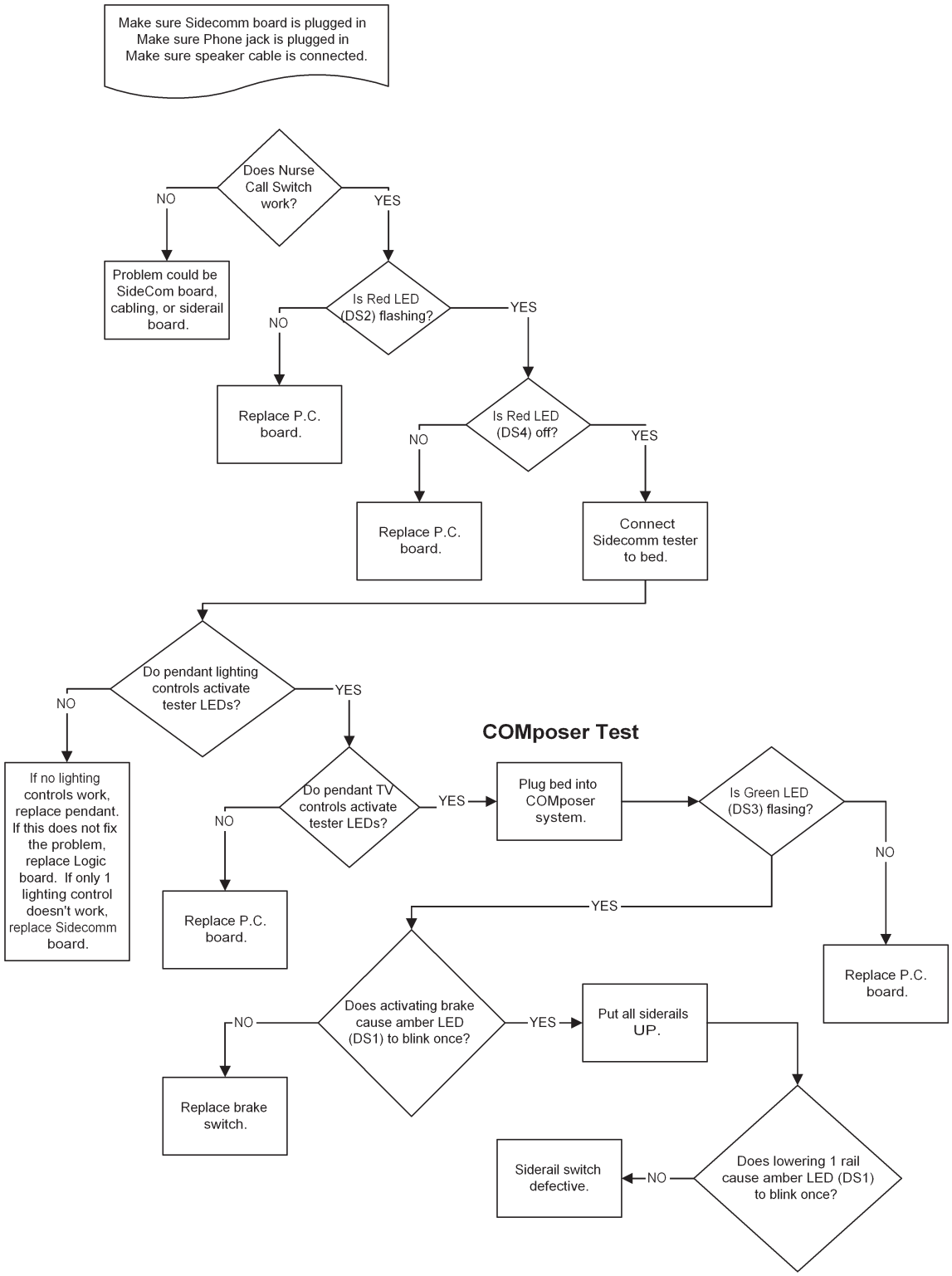
2.38 Scale Error 2



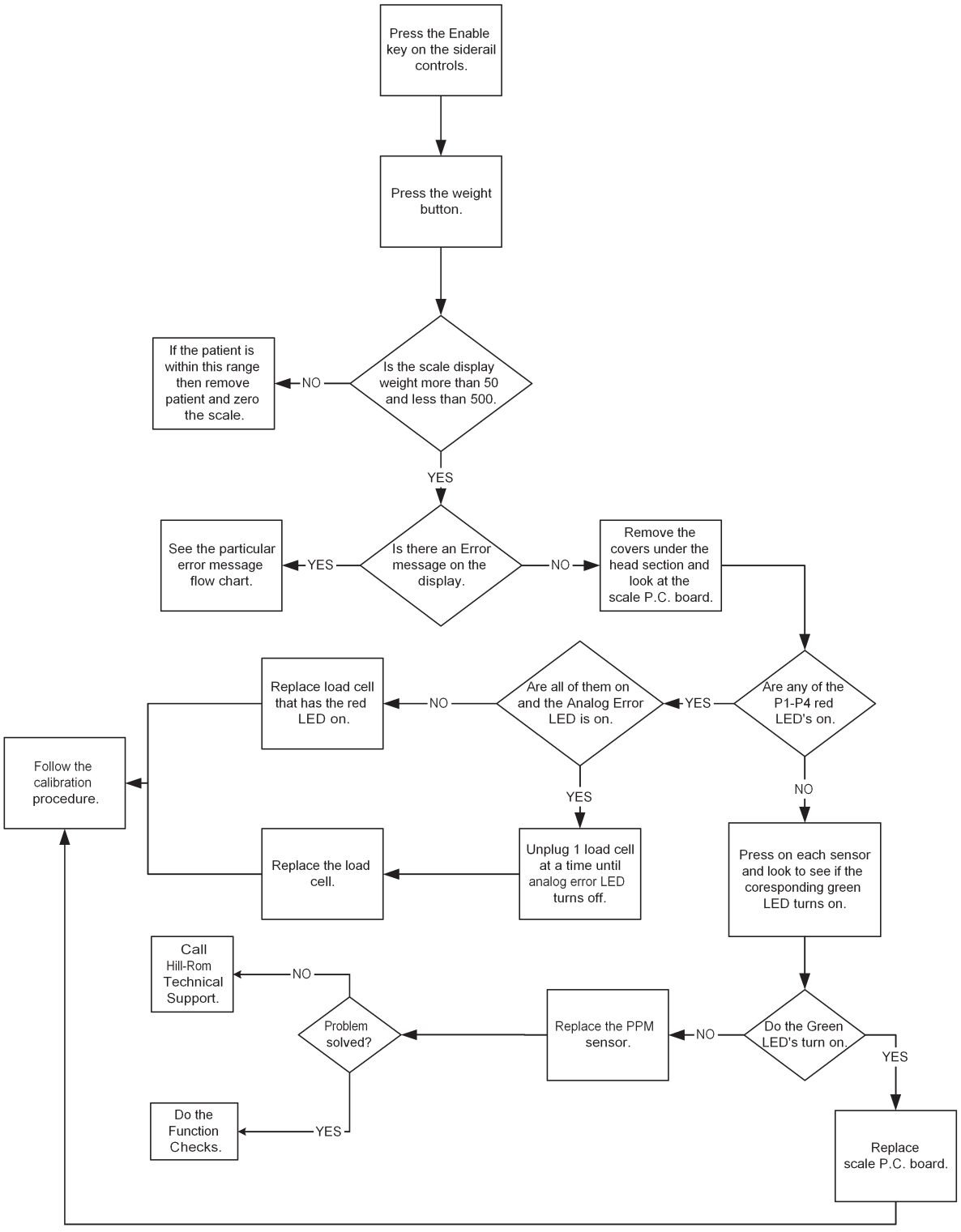
2.39 Scale Error 3



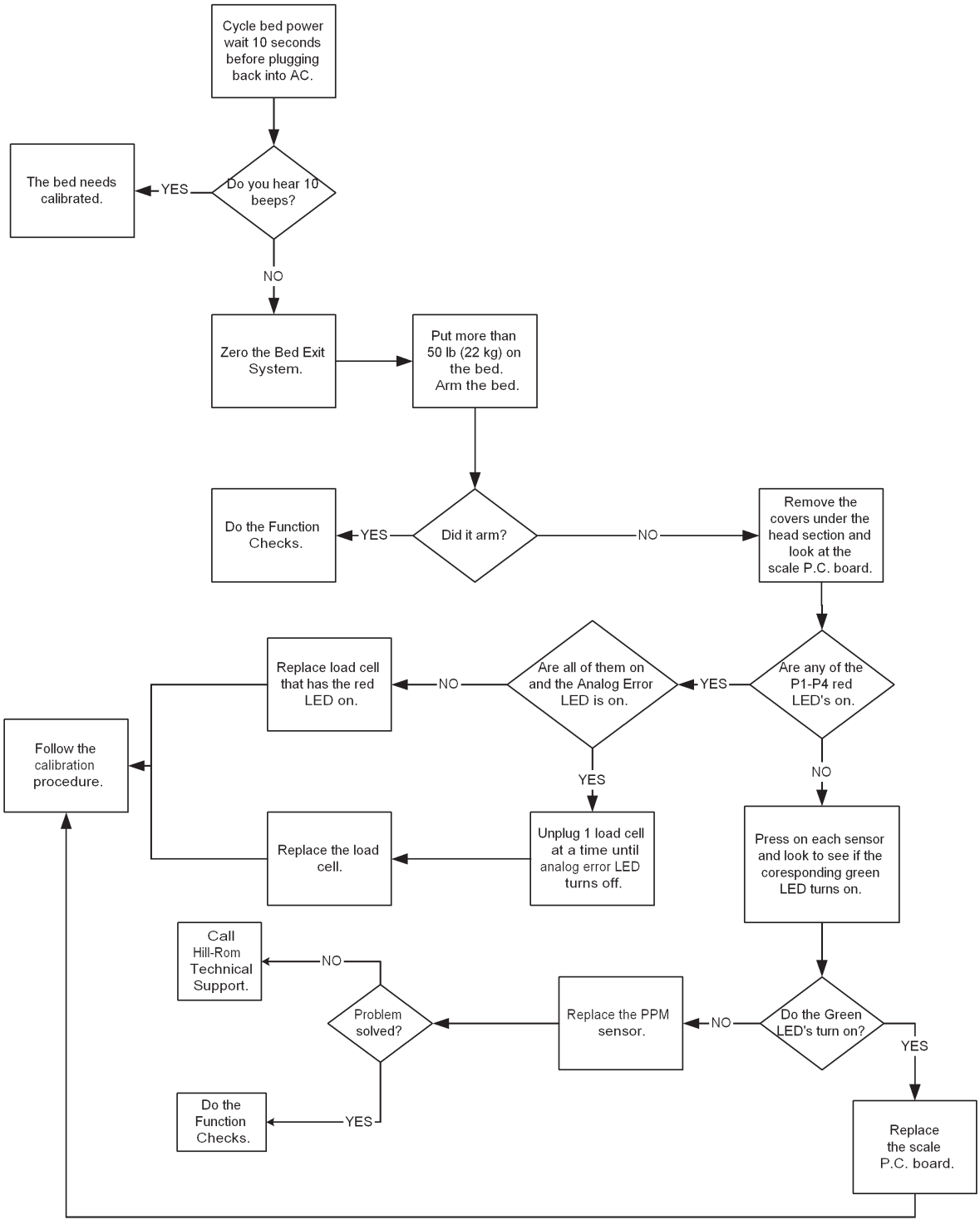
2.40 SideCom® Communication System



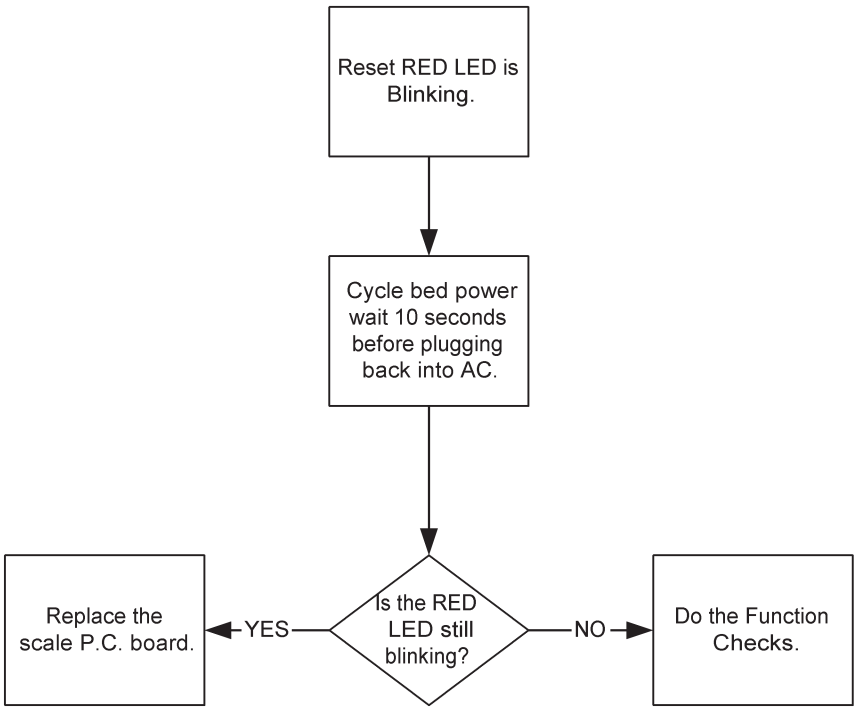
2.41 Patient Position Monitor System with Scale Display



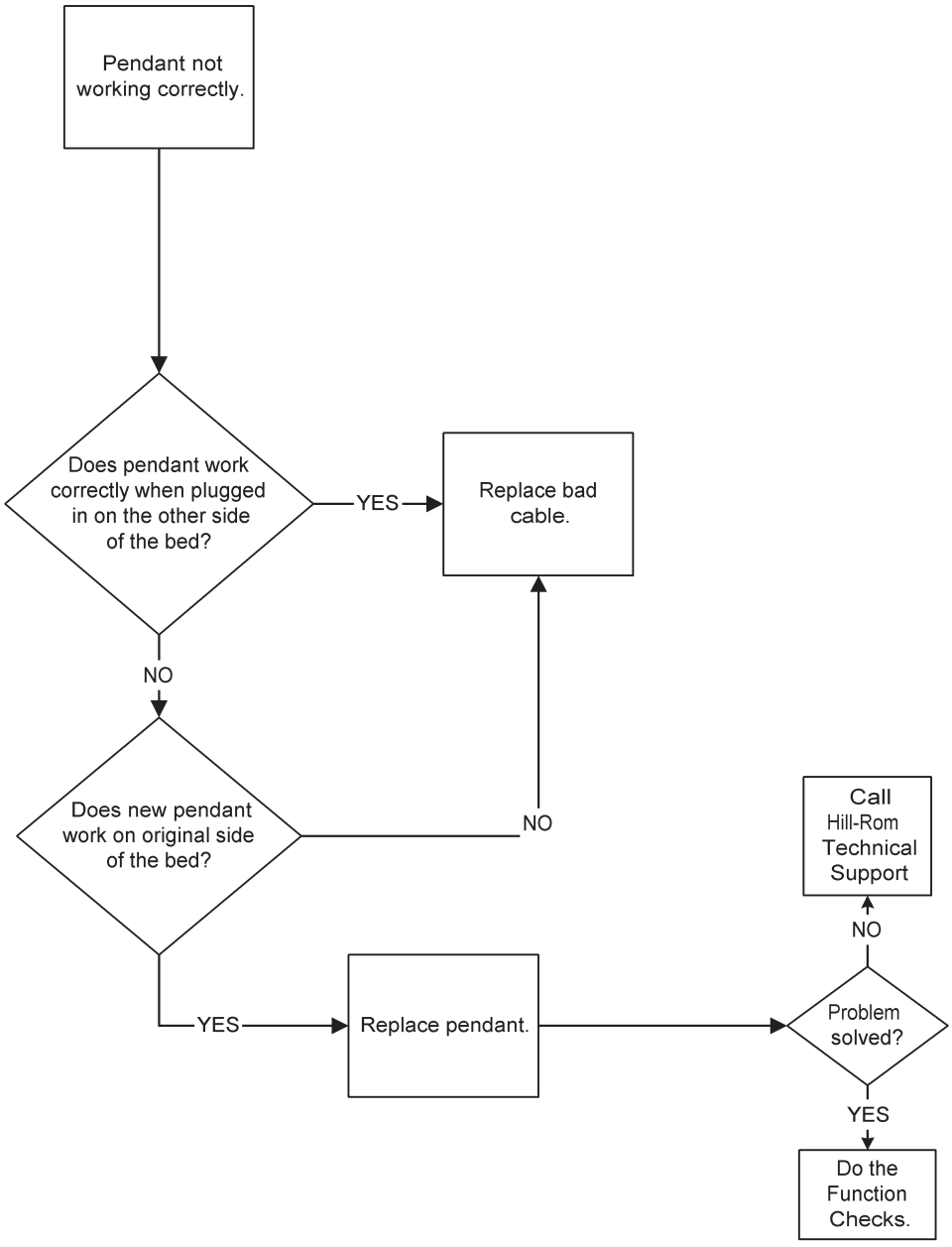
2.42 Patient Position Monitor without Scale Display



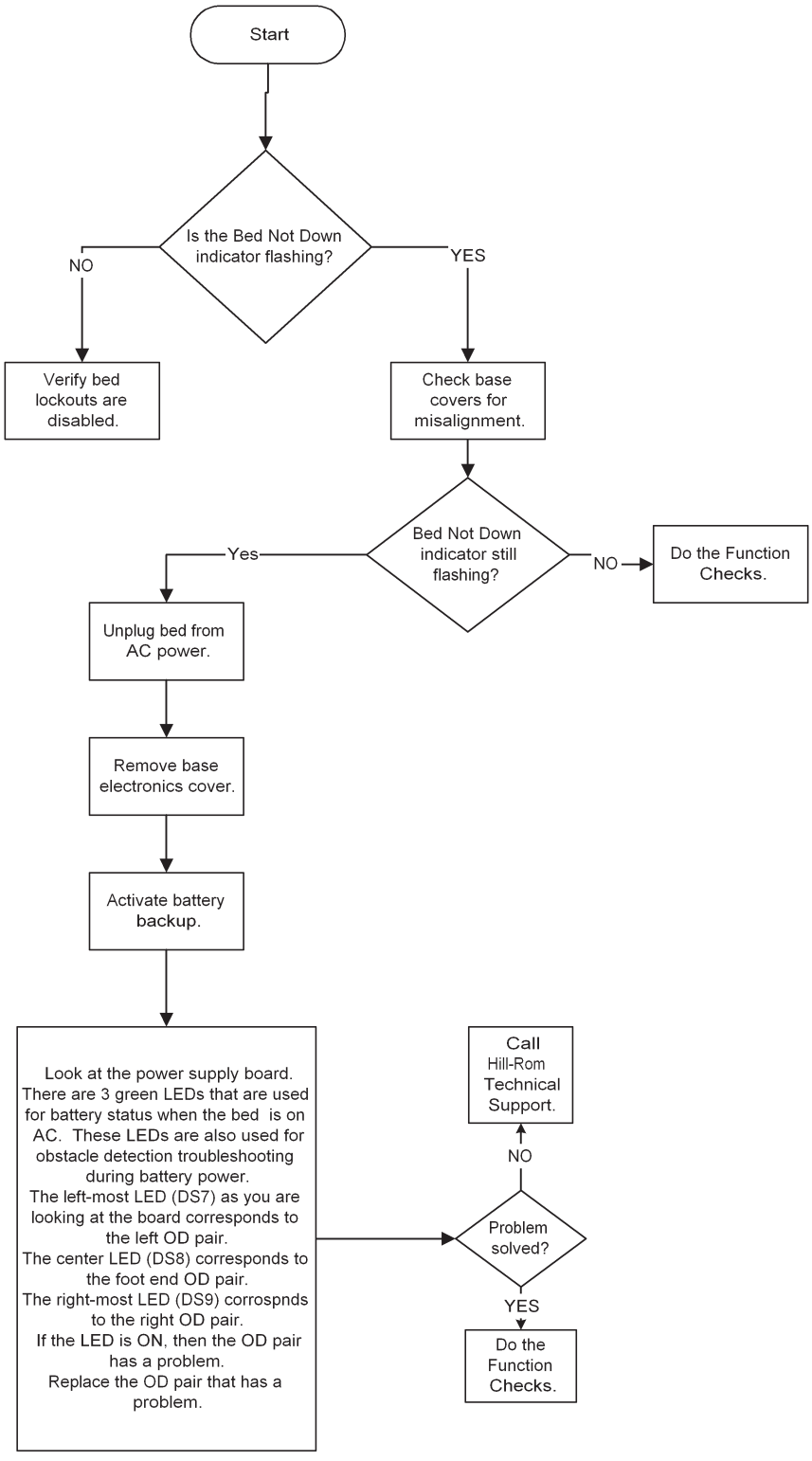
2.43 CRC Error



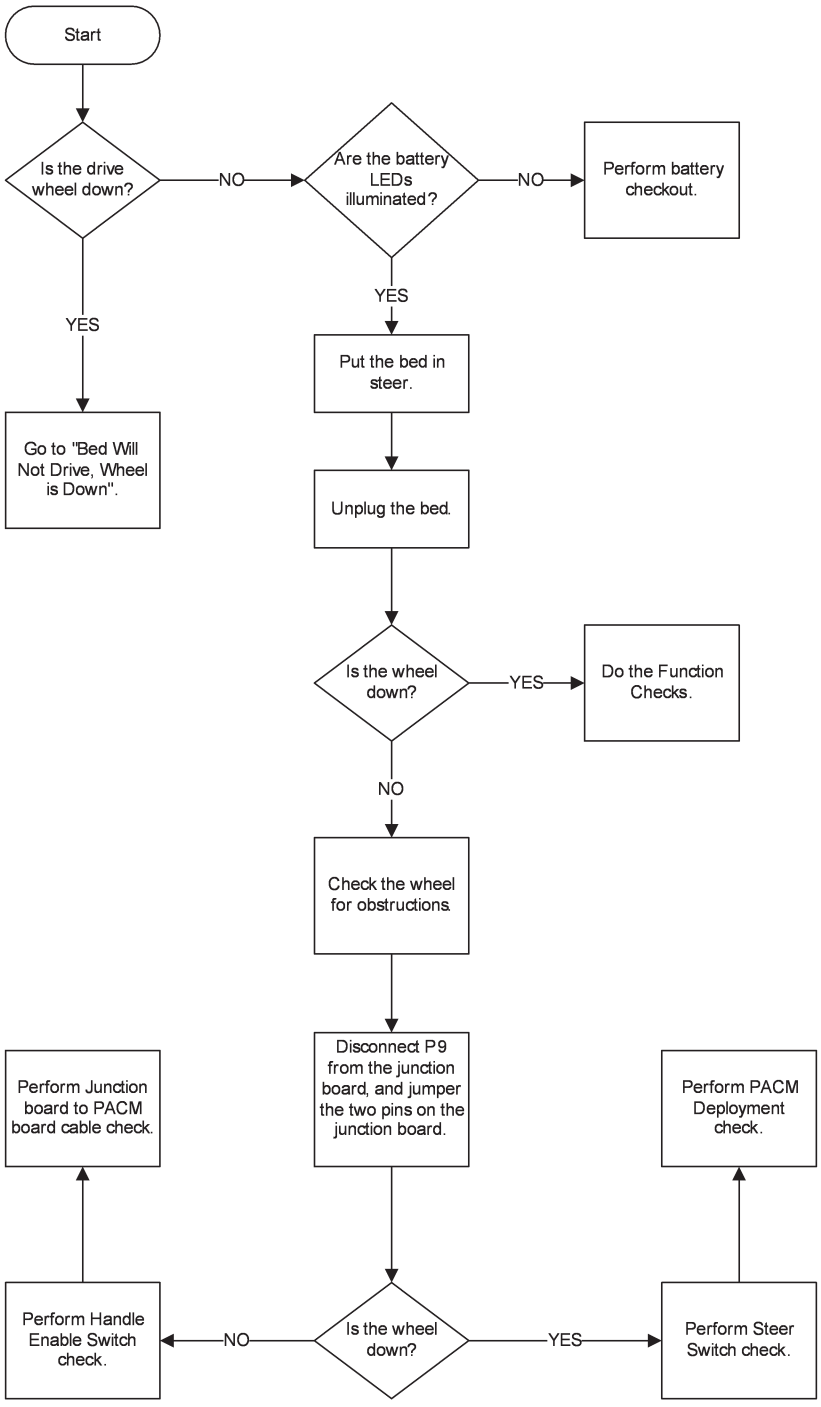
2.44 Patient Pendant



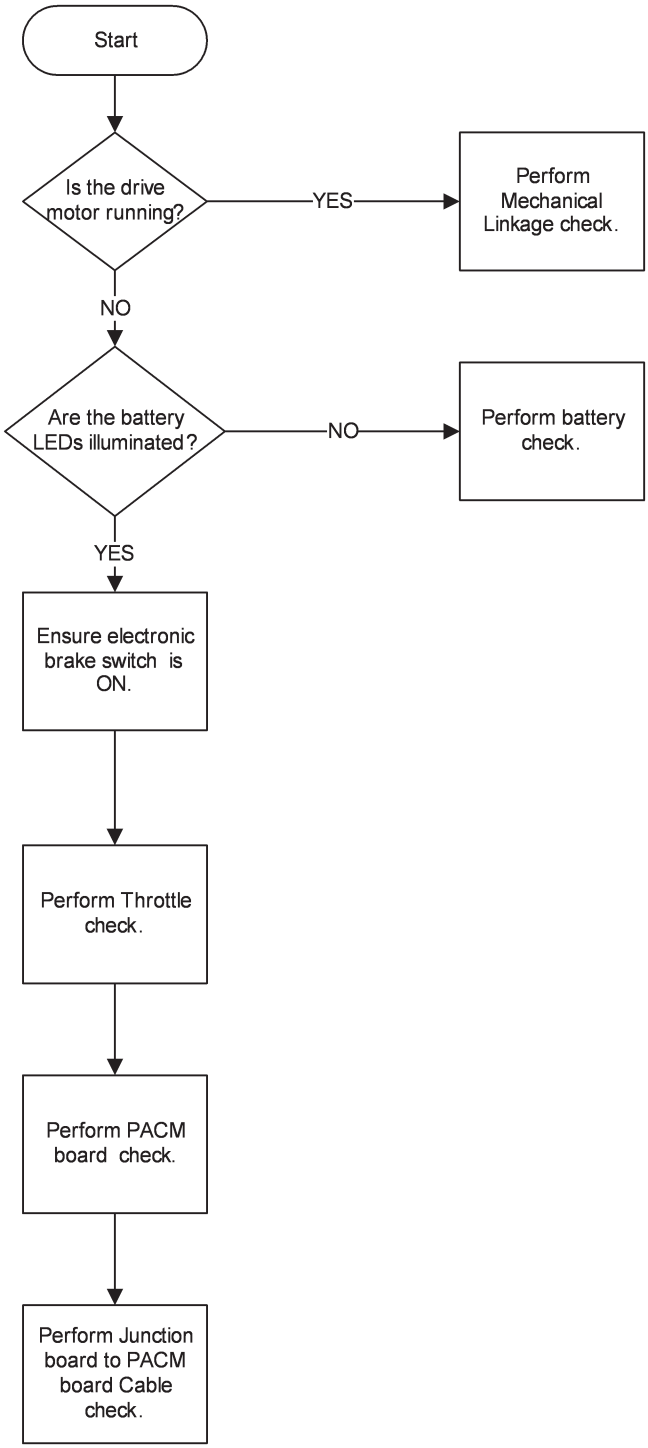
2.45 Obstacle Detection



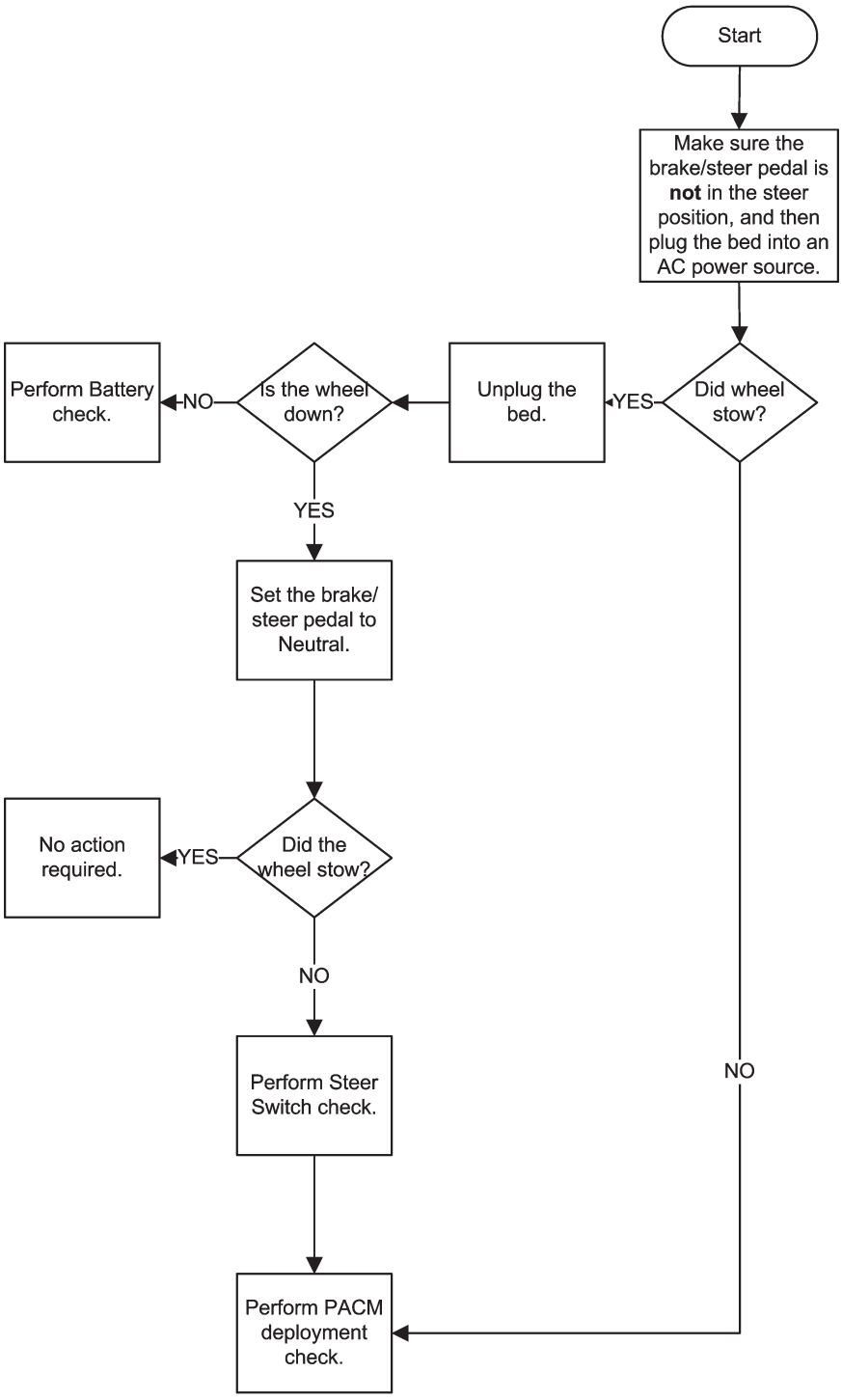
2.46 Bed Will Not Drive (IntelliDrive® Transport System)



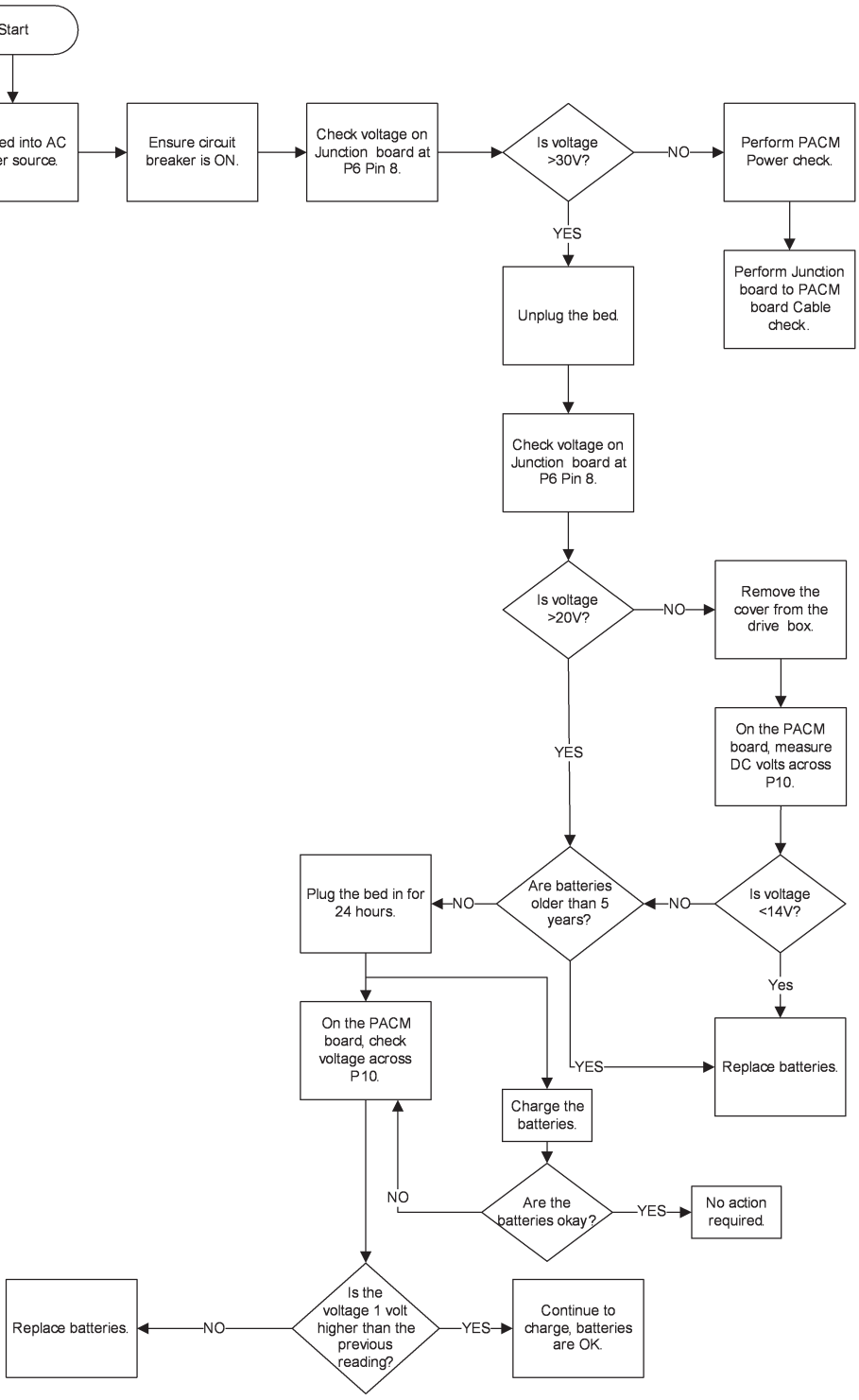
2.47 Bed Will Not Drive, Wheel Is Down (IntelliDrive® Transport System)



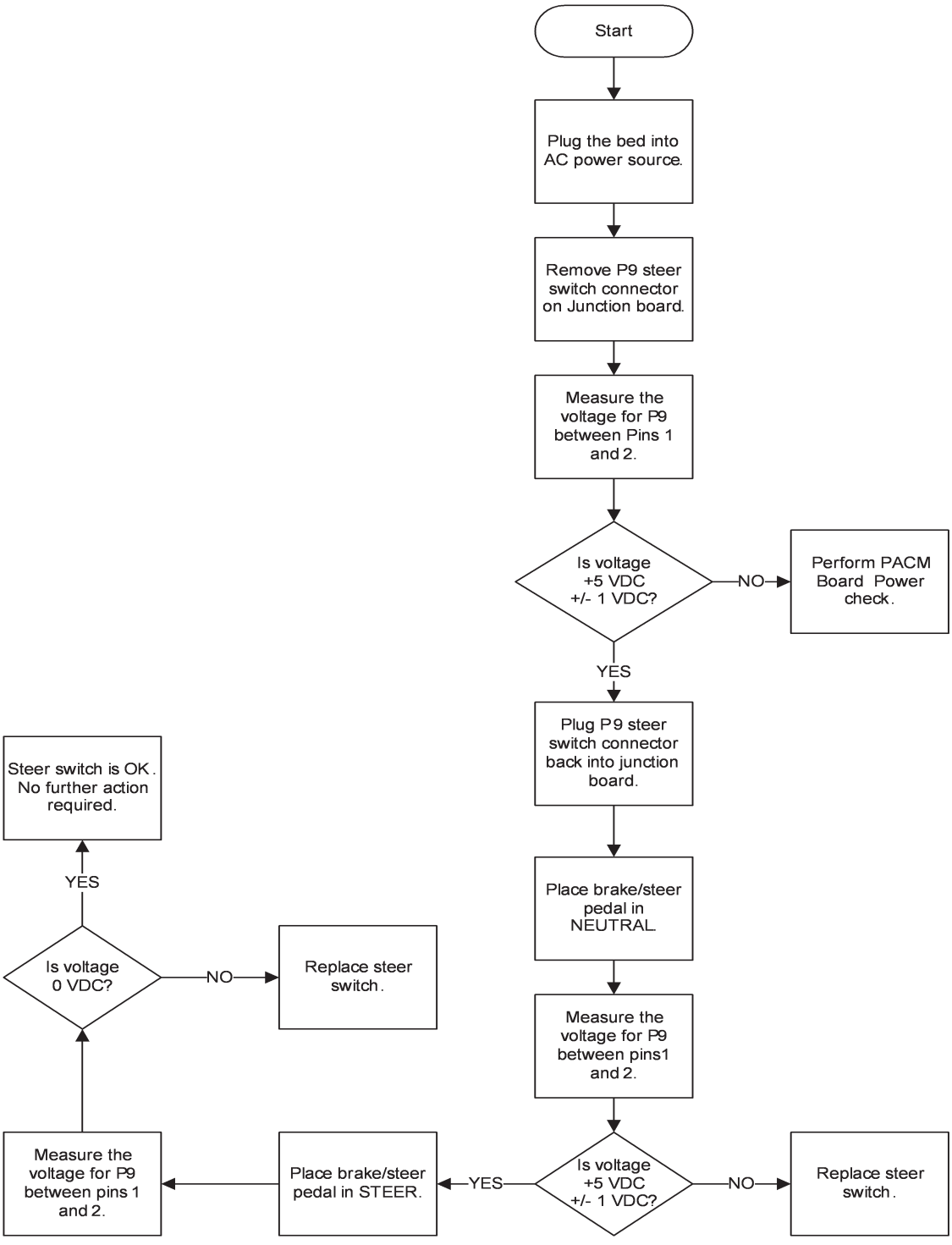
2.48 Wheel Will Not Stow (IntelliDrive® Transport System)



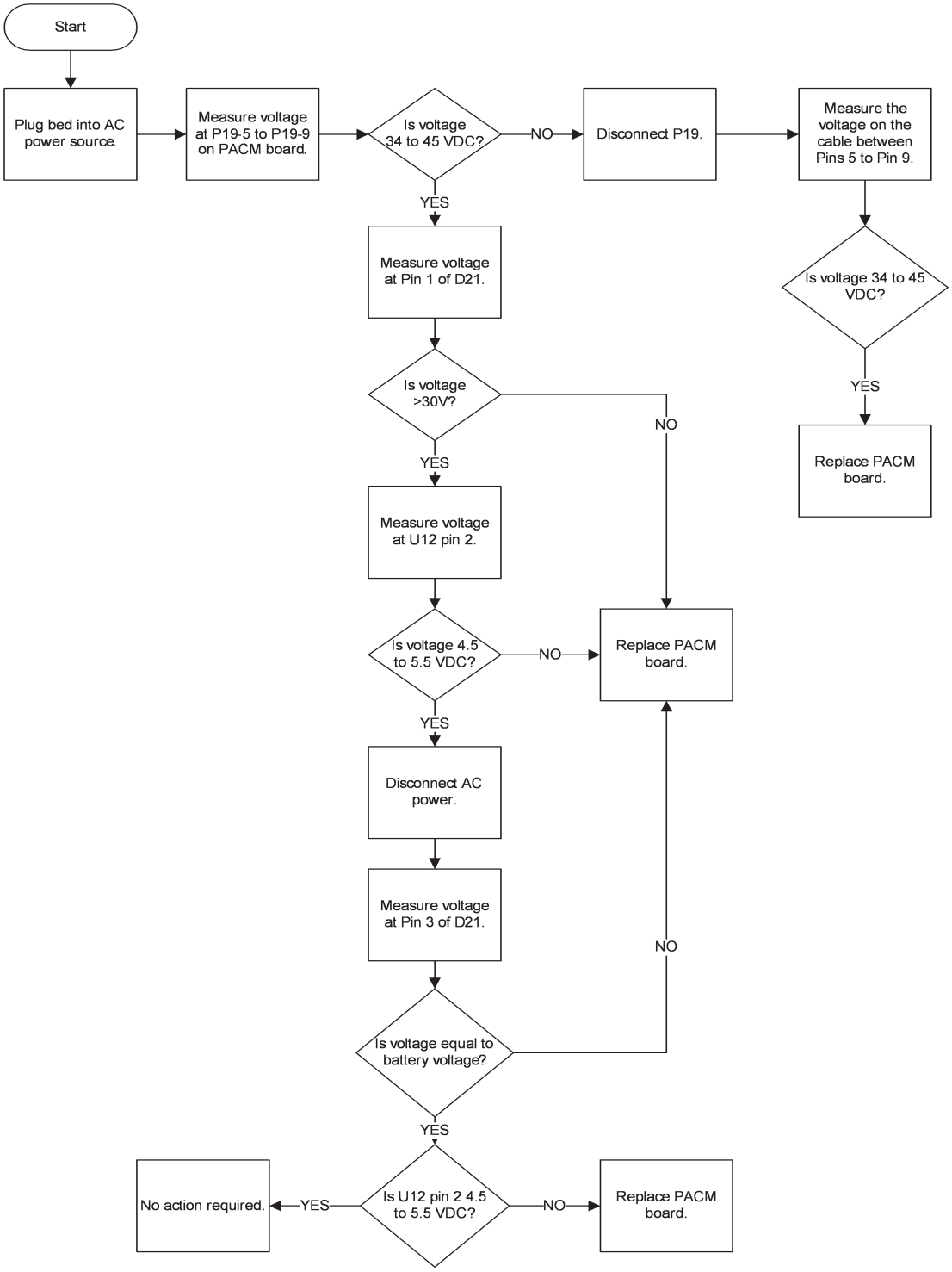
2.49 Battery Check (IntelliDrive® Transport System)



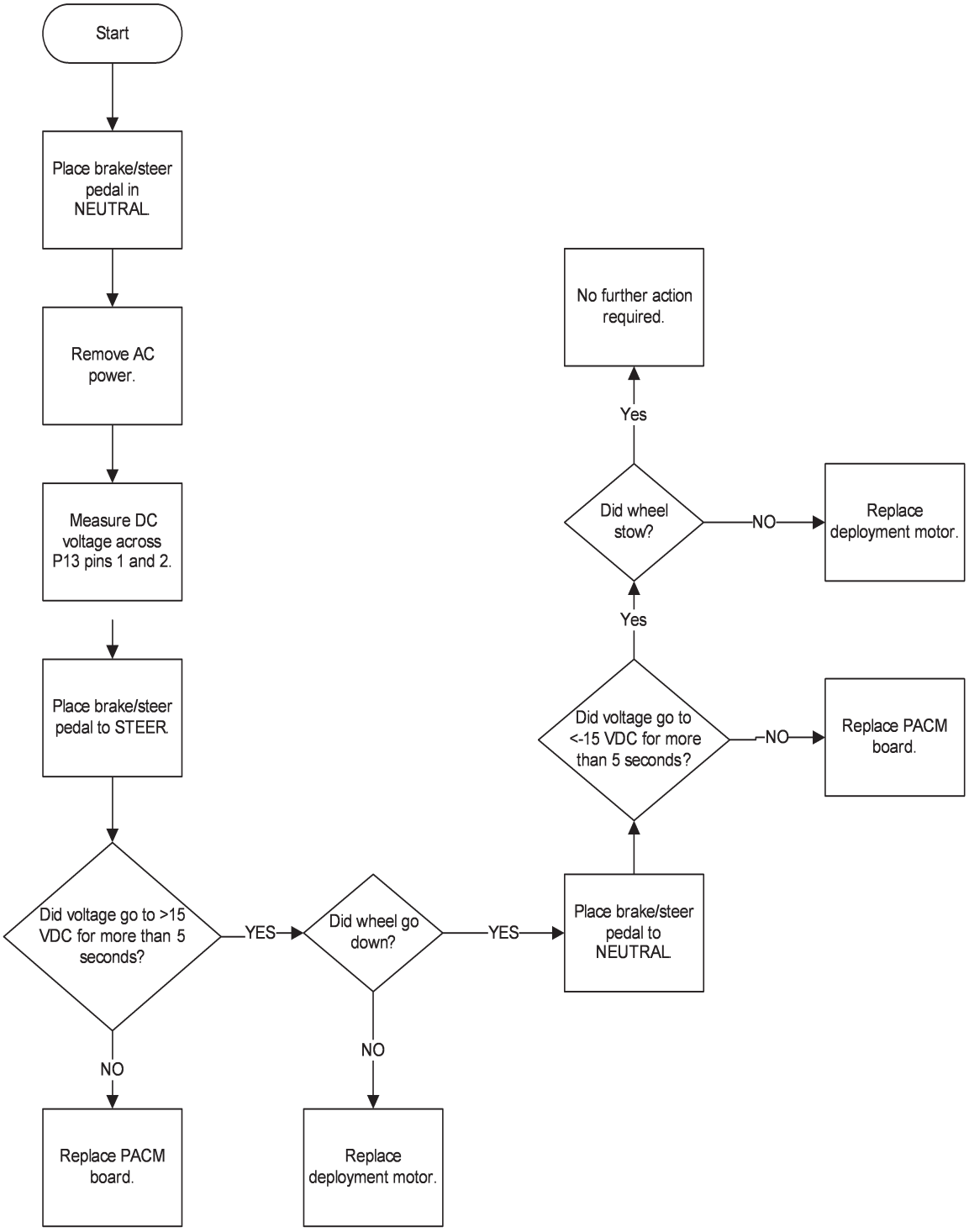
2.50 Steer Switch Check (IntelliDrive® Transport System)



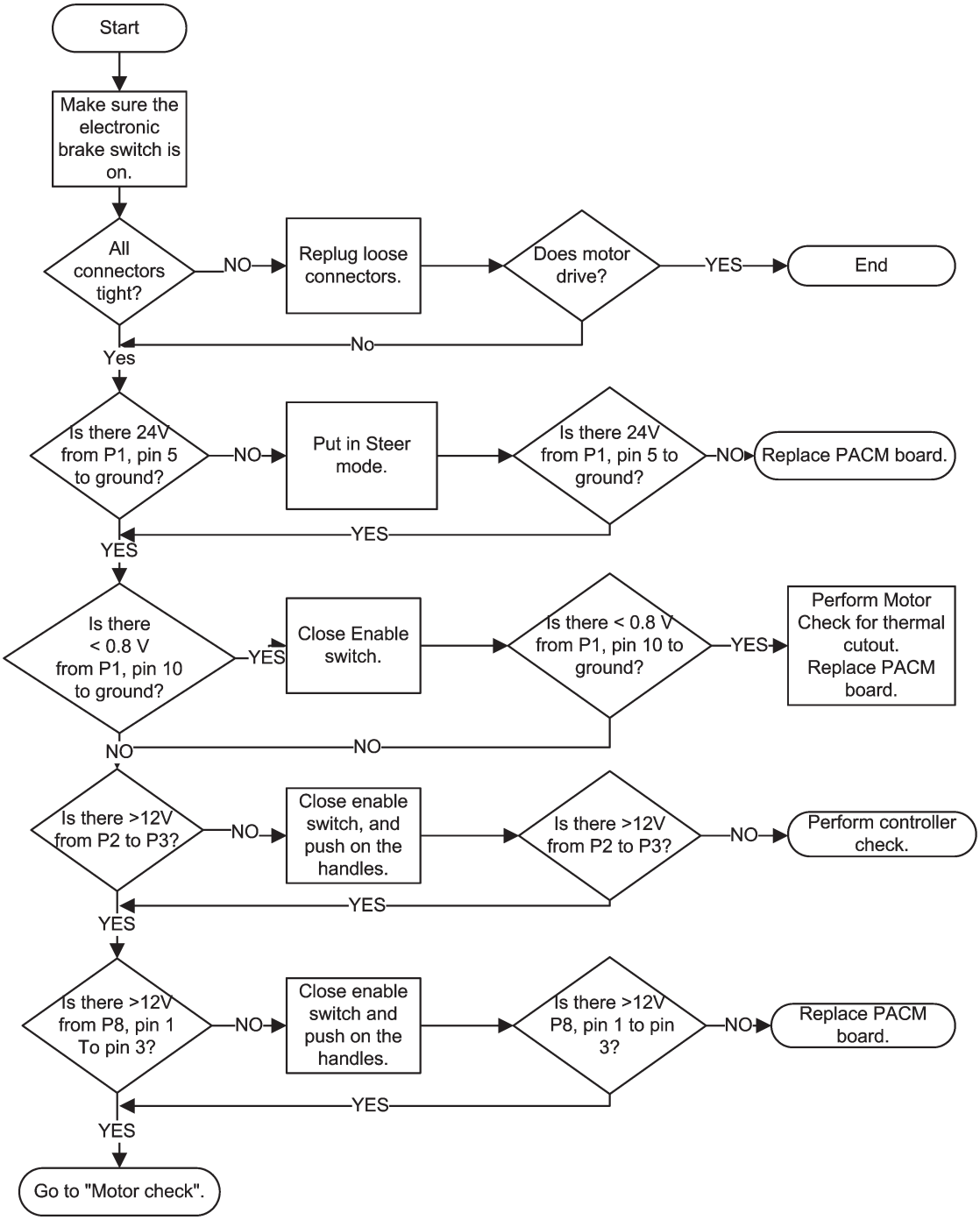
2.51 PACM Board Power Check (IntelliDrive® Transport System)



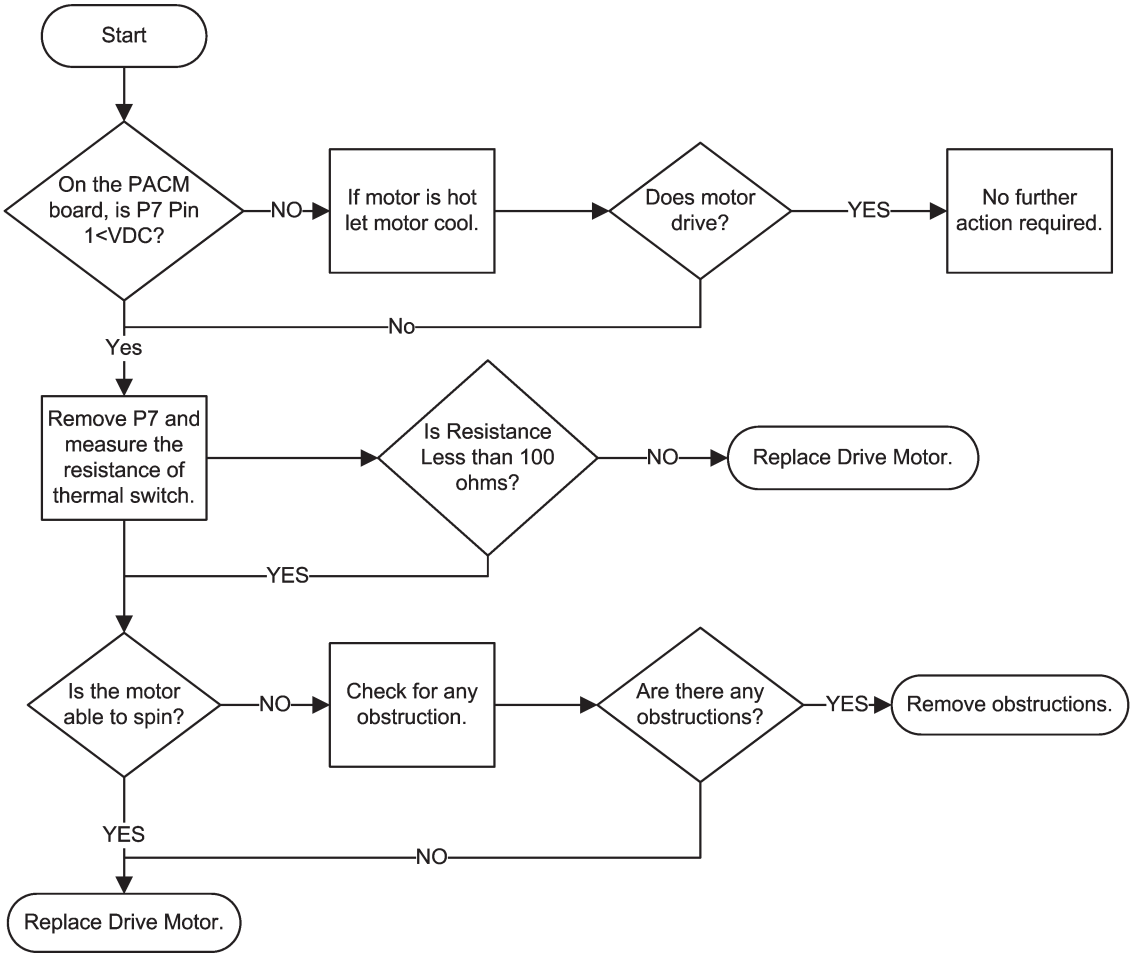
2.52 PACM Board Deployment Check (IntelliDrive® Transport System)



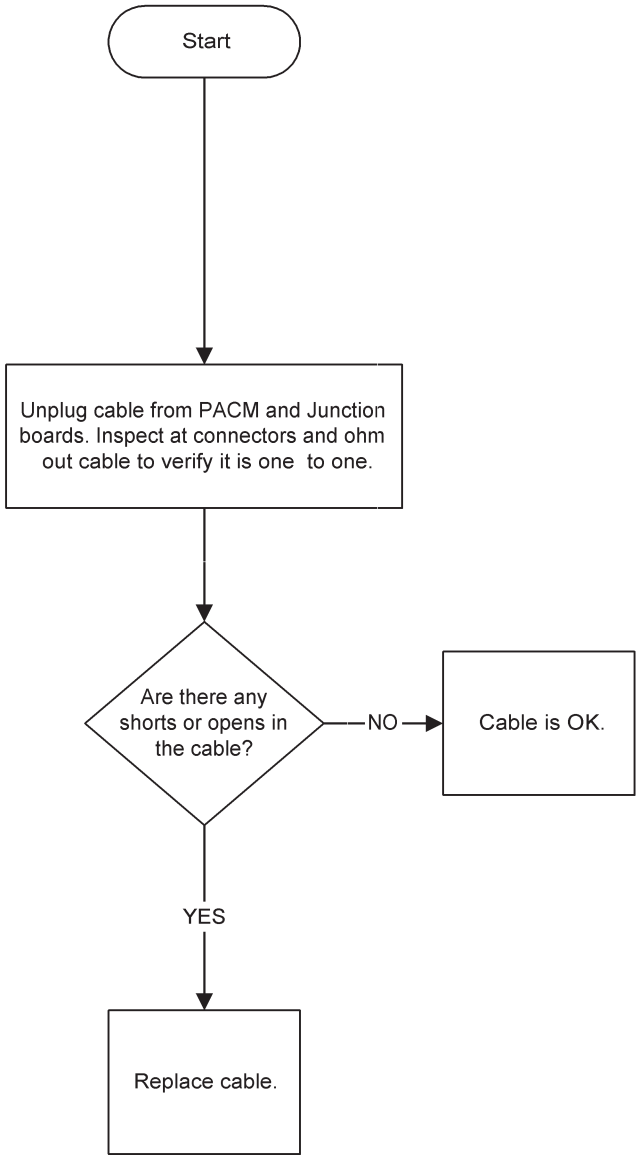
2.53 PACM Board Drive Check (IntelliDrive® Transport System)



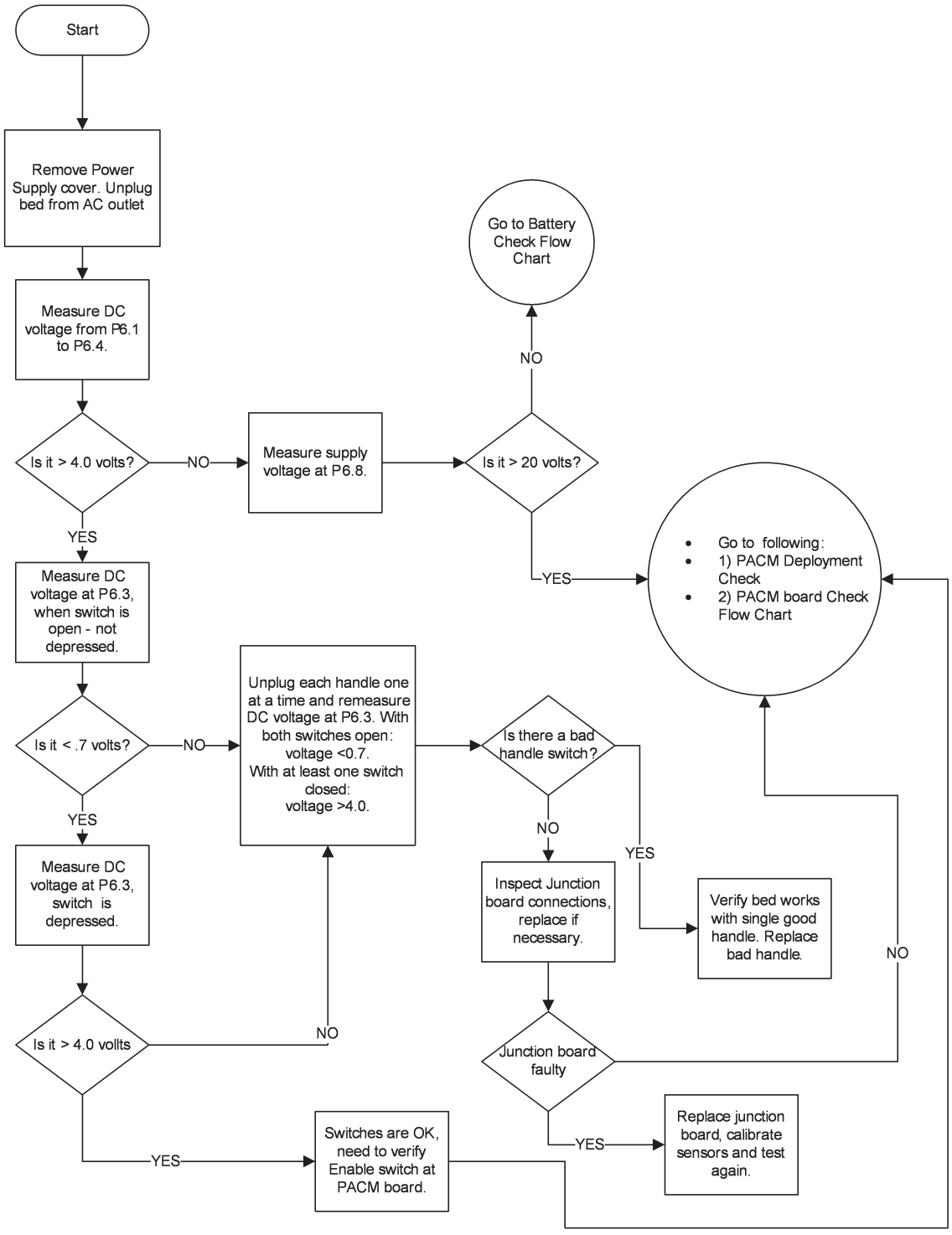
2.54 Motor Check (IntelliDrive® Transport System)



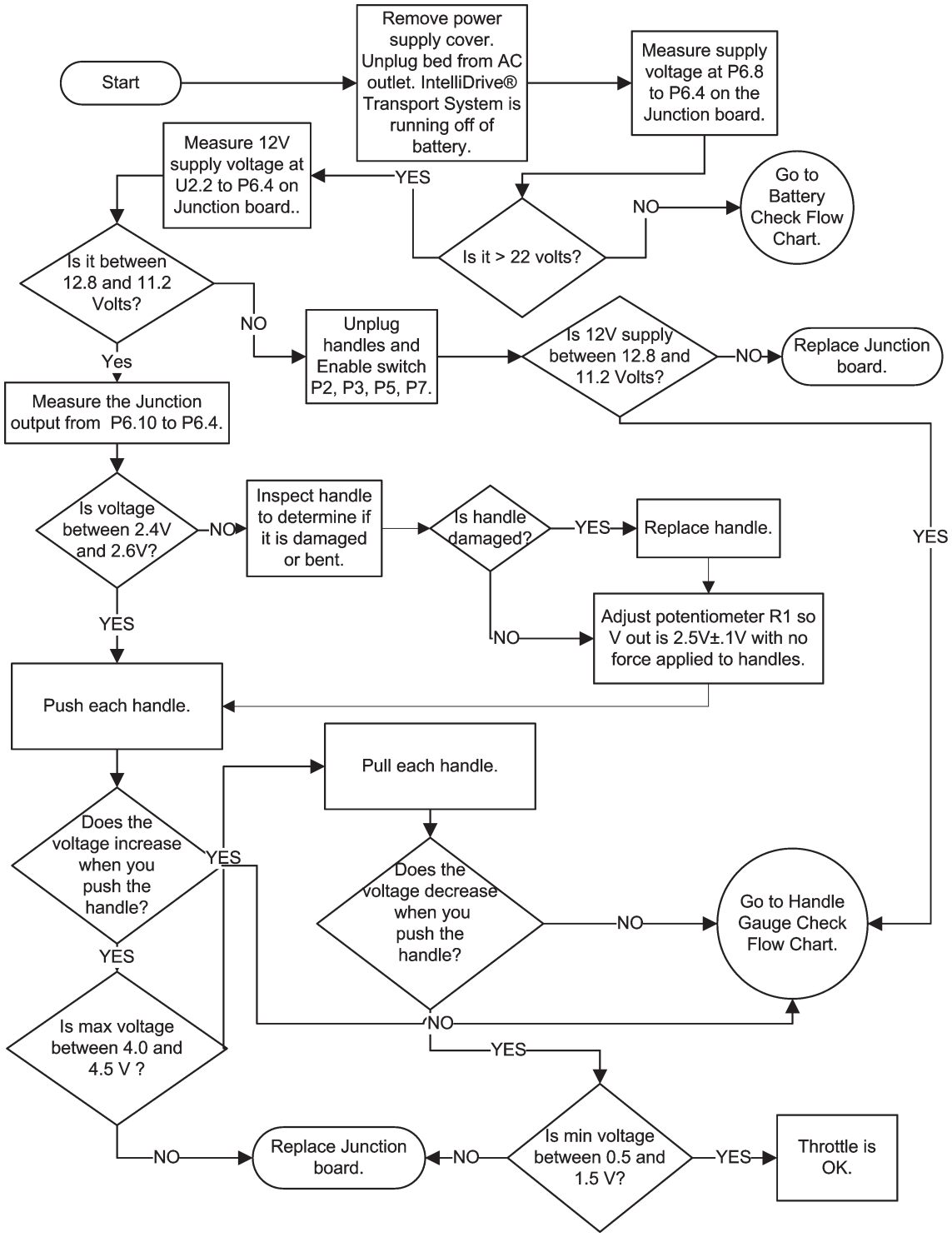
2.55 PACM to Junction Board Cable Check (IntelliDrive® Transport System)



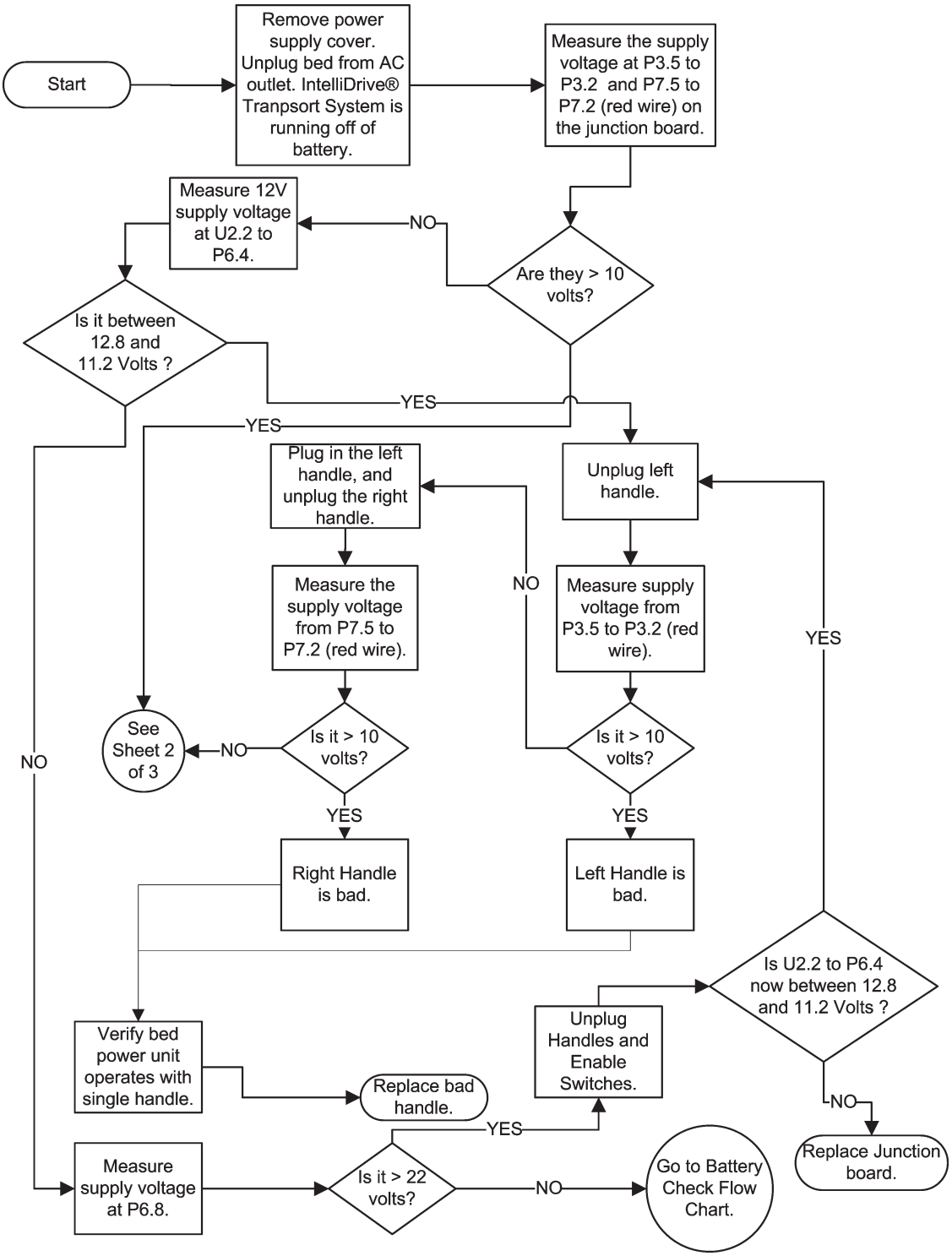
2.56 Handle Enable Switch Check (IntelliDrive® Transport System)



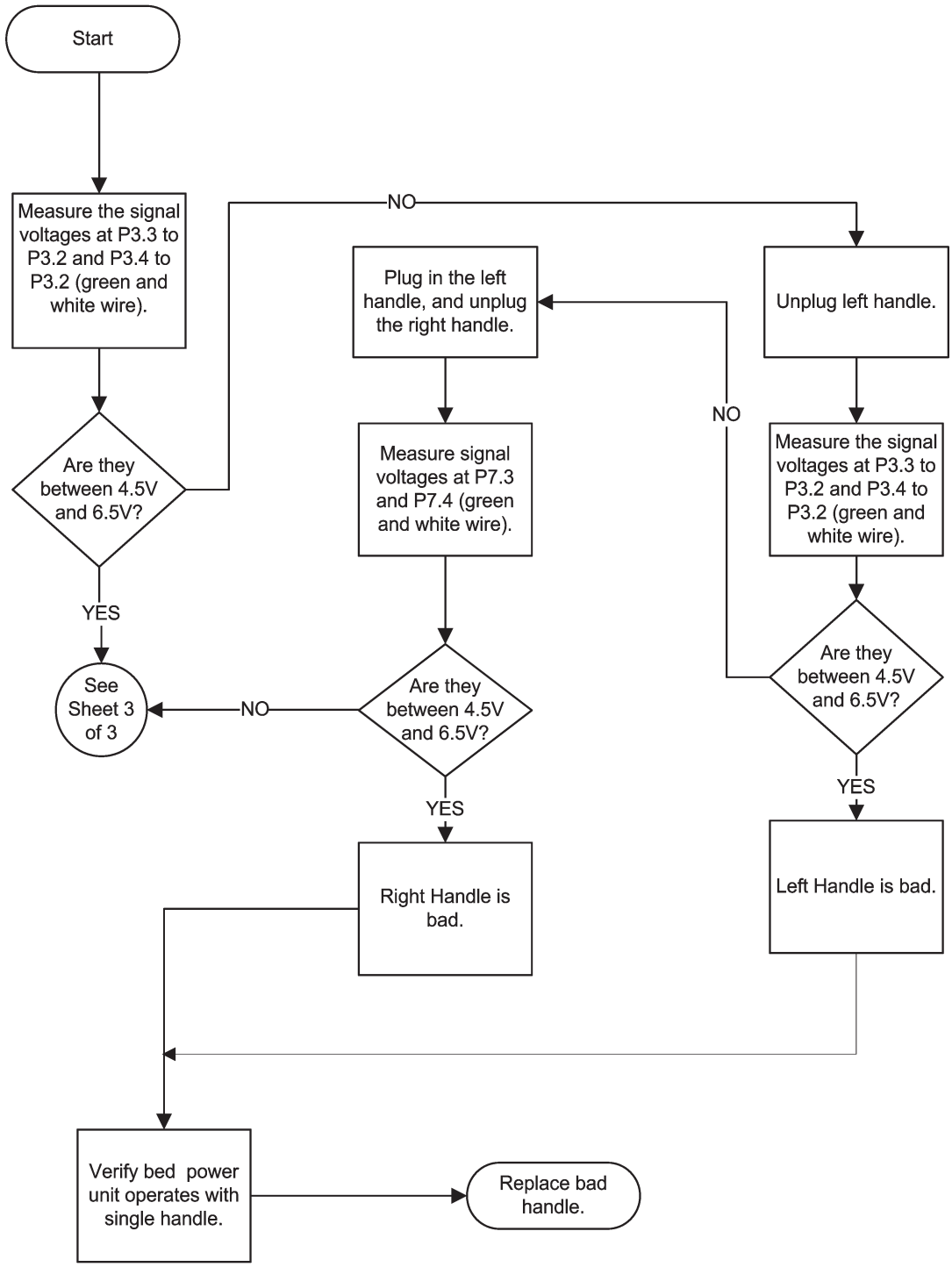
2.57 Throttle Check (IntelliDrive® Transport System)



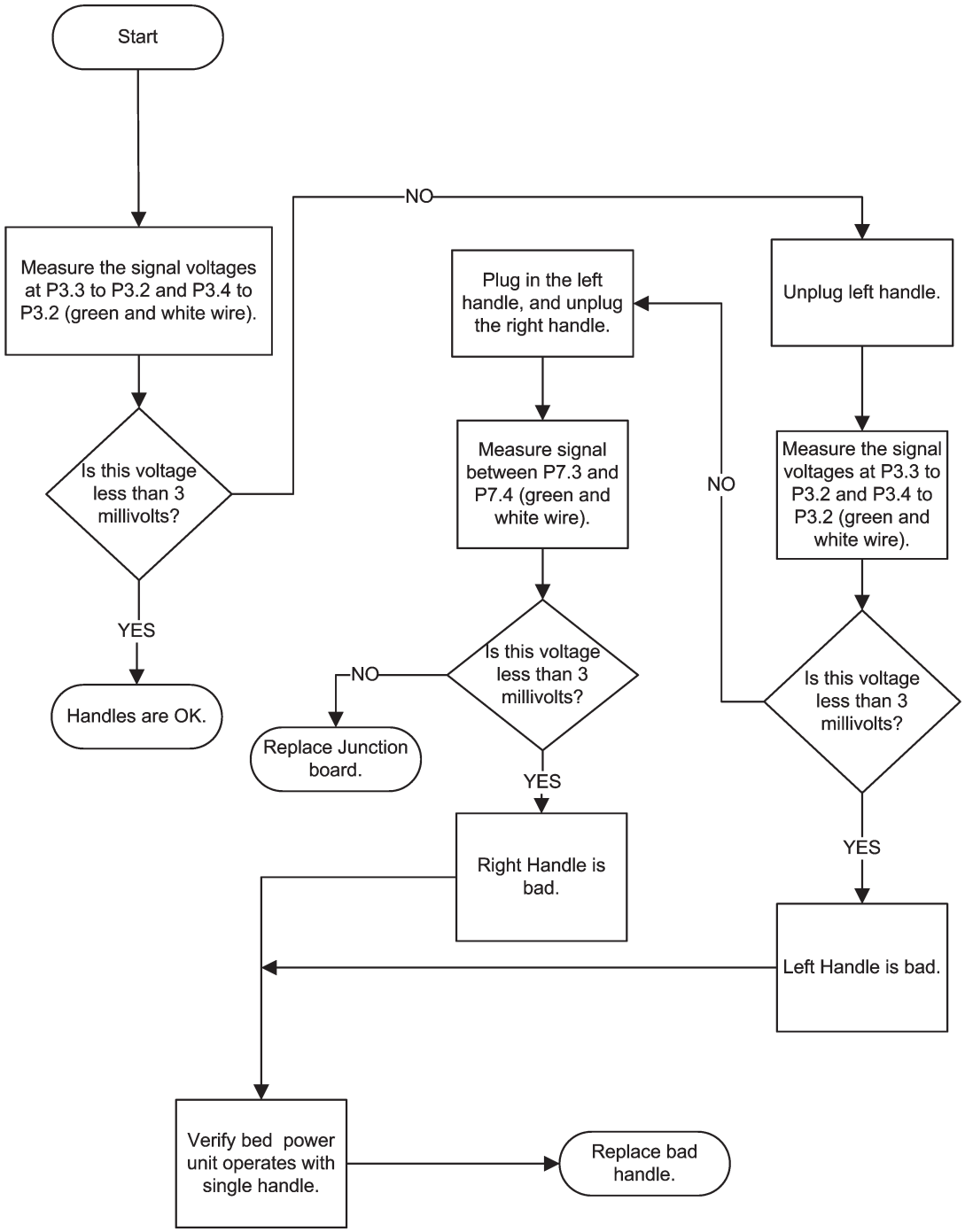
2.58 Handle Gauge Check (IntelliDrive® Transport System) (Sheet 1 of 3)



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



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



2.61 Controller Check—IntelliDrive® Transport System

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

1. Unplug the bed from AC power.
2. Remove the cover from the drive box.
3. Make sure the bed cables that go into the box are connected.
4. Locate DS 1 on the PACM board.
5. Press the Enable switch, and monitor these on DS 1:
   - LED DS 1 is off—The controller is either not powered or is not getting a KSI signal (which should be present if the wheel is deployed).
   - LED DS 1 is on and steady—Controller is operating correctly.
   - LED DS 1 is flashing—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 2-7 on page 2-79 for error codes.

Table 2-7. 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.

Flash Code	Description	Possible Cause
¤ ¤¤¤¤	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.
¤¤ ¤¤¤	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.

2.62 Visual Inspection—IntelliDrive® Transport System

Tools required: 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.

2.63 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-.7 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 of 4.0 - 5.1 V at P6.1, verify the battery voltage or the battery charging voltage is present. The battery voltage can be measured at P6.8. 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 pressed, the switch closure can be measured across the pins. When neither switch is pressed, an open switch should 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 2.4 V to 2.6 V DC. The voltage output can be adjusted by turning potentiometer R1 until the output signal measures 2.5 V. When either handle is pushed, the output signal will increase until it reaches 4.0 V to 4.5 V. When either handle is pulled the output signal will decrease until it reaches 0.5 V to 1.5 V. This indicates the throttle circuit working correctly.

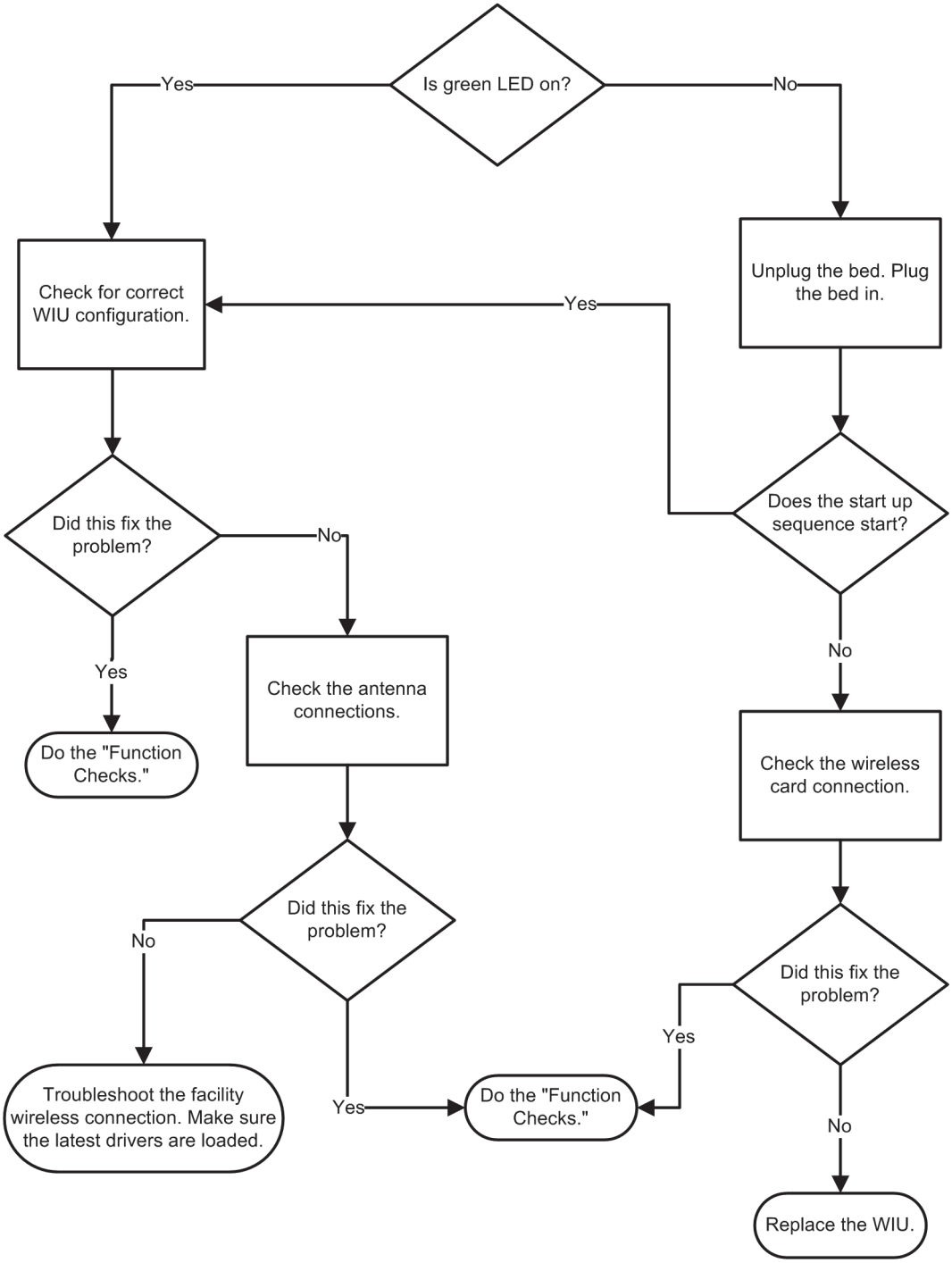
Before making any adjustments verify the supply voltages. The supply voltage at P6.8 will measure more than 22 V on a working system. If no voltage is present, or the battery voltage is low, go to the battery checkout procedure.

The excitation voltage, P3.5 and P7.5 (red wire) will measure 10 V to 12 V 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 10 V, 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 12 V 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 2.5 V with potentiometer R1. Verify the bed power unit operates using the good handle. Replace the damaged handle.

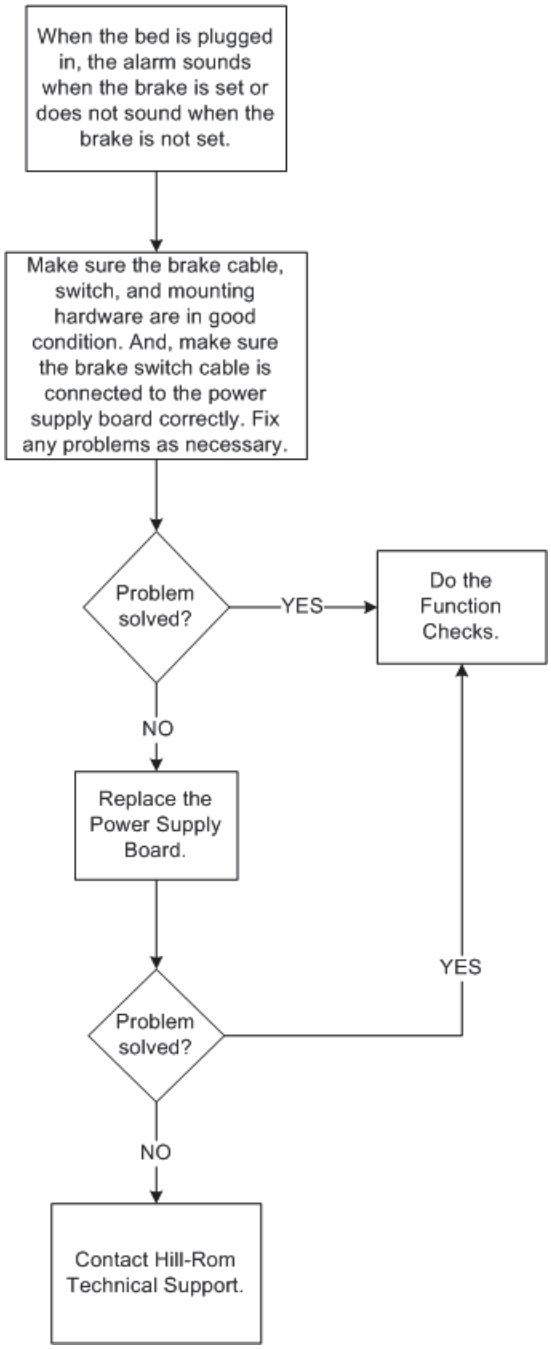
If the output voltage at P1.1 cannot be adjusted to within 2.4 V to 2.6 V using the potentiometer R1, with no force applied to the handles, the strain element may be damaged. The bed will operate with a single handle after the output is adjusted. To check the handles, unplug one of the handles and see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

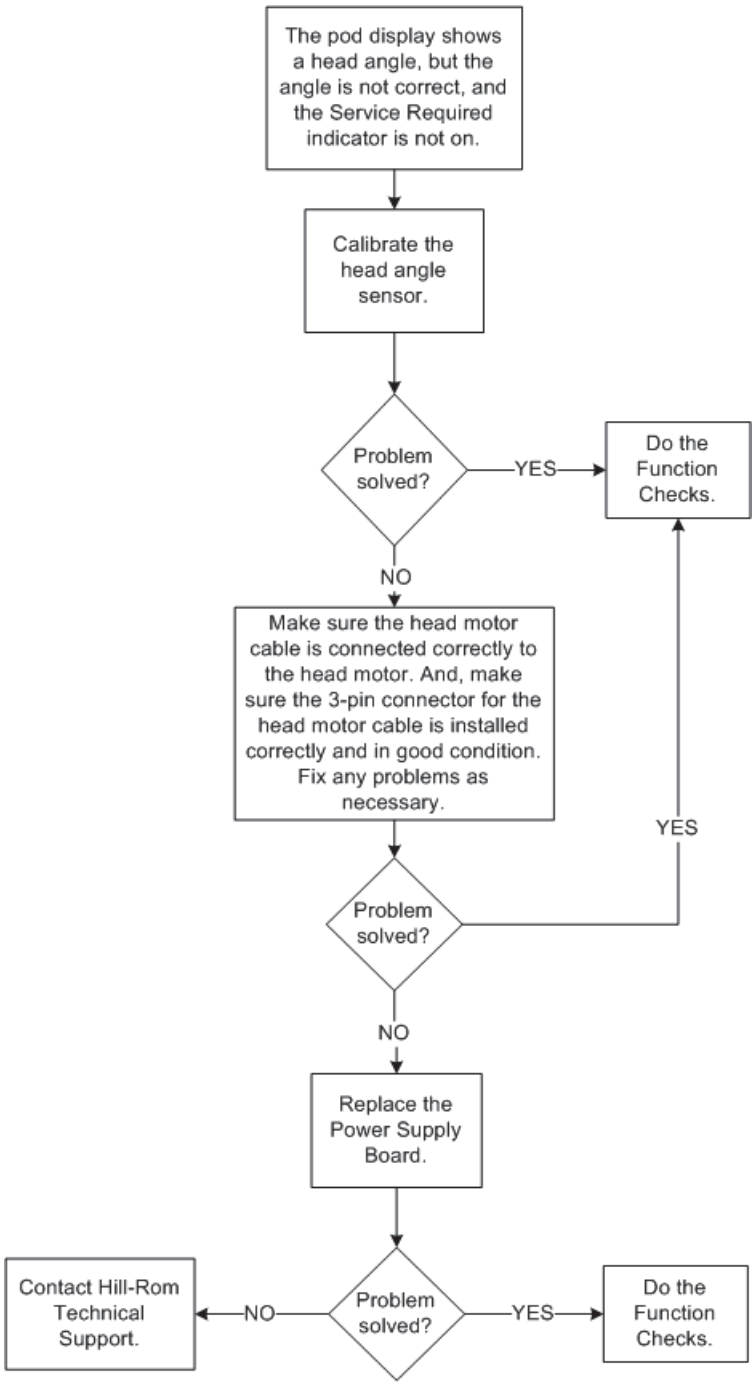
2.64 Wireless Interface Unit Does Not Connect to the Facility



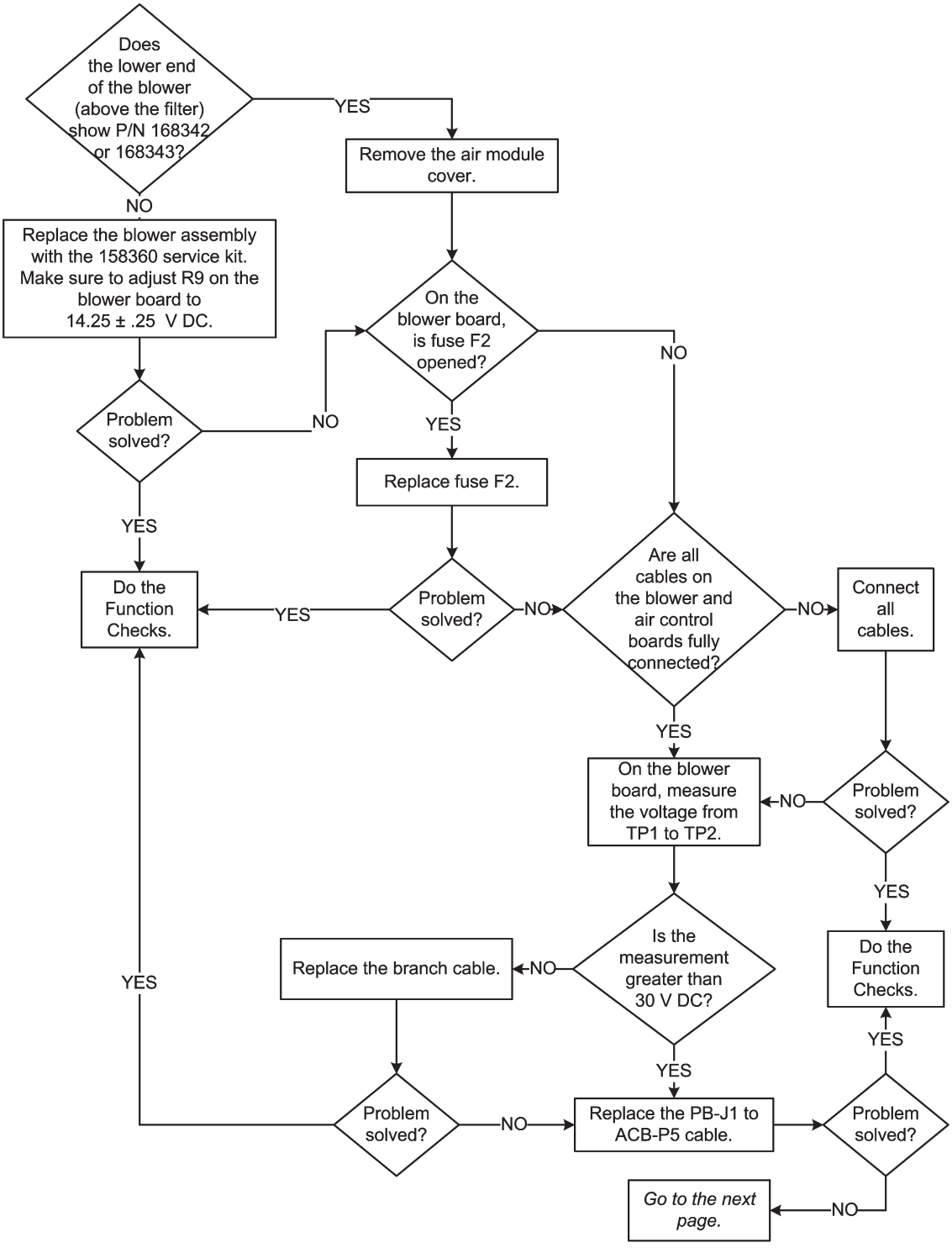
2.65 The Brake Not Set Alarm Does Not Operate Correctly



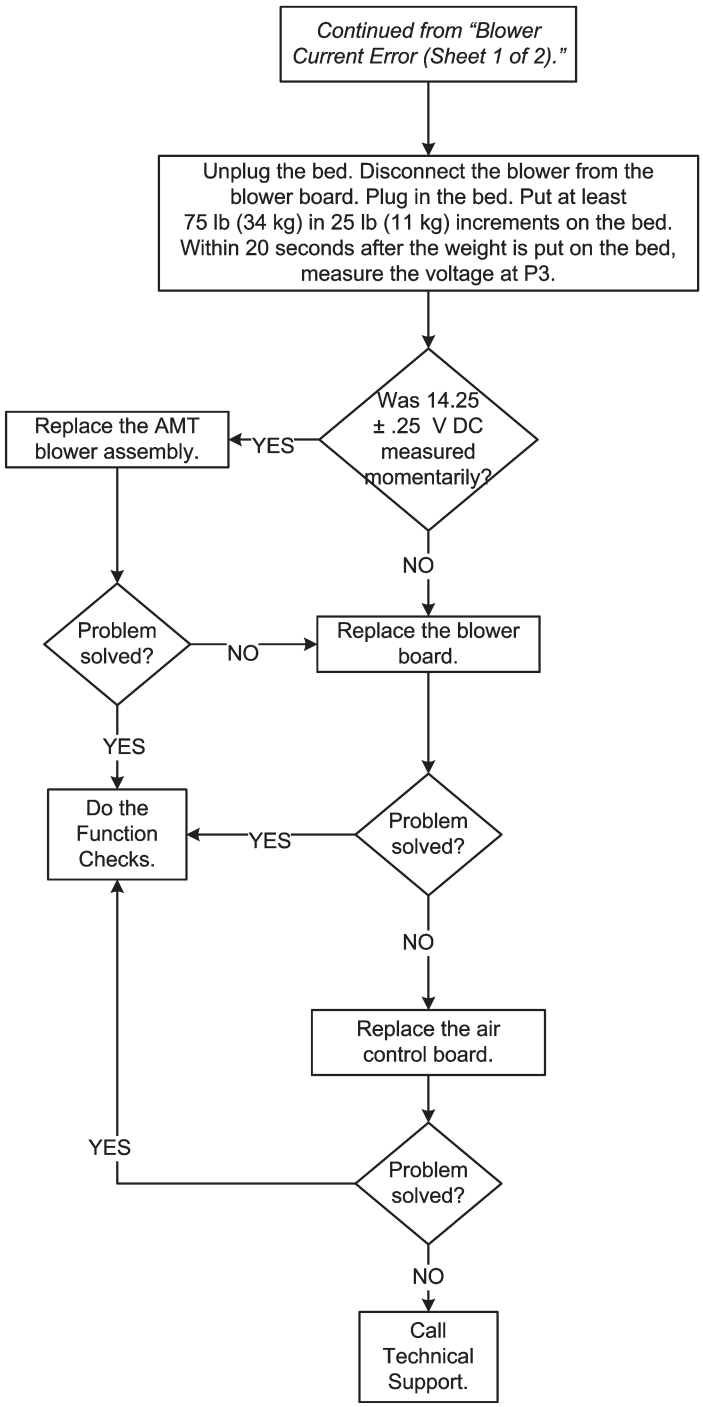
2.66 The Control Pod Display Shows an Incorrect Head Angle



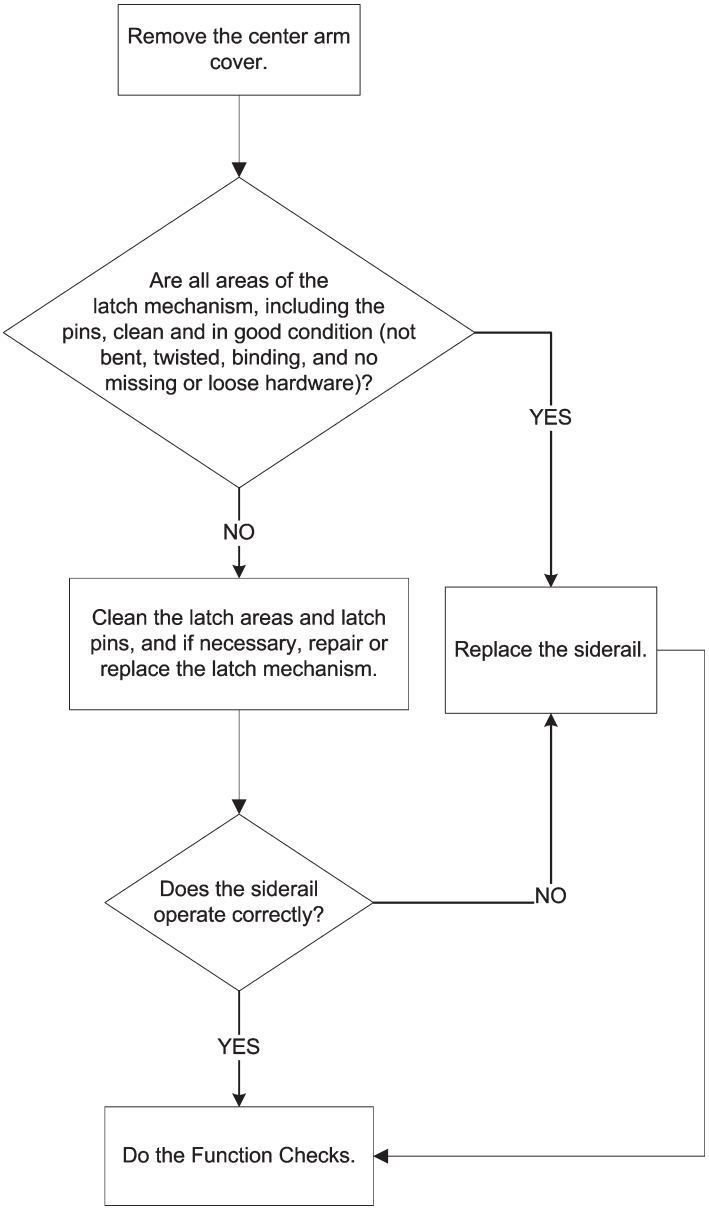
2.67 Blower Current Error (Sheet 1 of 2)



2.68 Blower Current Error (Sheet 2 of 2)



2.69 A Siderail Does Not Latch



Chapter 3
Theory of Operation

Introduction

There are three Theories of Operation for the VersaCare® Bed:

- Mechanical
- Electrical
- Pneumatic

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

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

Mechanical System

The mechanical subsystem consists of these connected systems:

- Base Frame Module
- Hilow Lift Module
- Upper Frame Module
- User Interface Module
- End Panel Module

Base Frame Module

The base frame module consists of the base frame, casters, brake and steer components, power supply and communication electronics, caregiver foot controls, and obstacle detect components. The module houses the components of the power supply and battery backup, communications, and night light. It also provides a mounting location for the power transport system including the drive components and push handles. And it also supports the head panel which is not part of the weighed components on a scale bed. For this reason, contact between a patient, bedding, etc. and the headboard will affect scale readings.

Hilow Lift Module

The high low lift module consists of two lift arms, high low DC drives, and intermediate frame. The lift arms connect to the base by a sliding joint on each end of the bed and are secured to the base with a ground link. The high low lift module connects to the upper frame through load cell blocks for beds with scale, PPM and/or air, or through a non-scale spacer on beds without the those options. Components attached to the intermediate frame and below are not weighed by the scale system.

The high low lift module also controls the Trendelenburg and reverse Trendelenburg function by activating the high low drives in opposite directions to control the angle of the bed. Each high low DC drive includes a potentiometer to provide position feedback to the control system.

Upper Frame Module

The upper frame module consists of a segmented deck, on which the sleep surface rests, and a supporting tubular steel weigh frame. The deck is segmented into three sections: head, knee, and retracting foot. These sections may be moved by the caregiver or patient to change the bed positioning.

If the bed system is equipped with the optional scale, any item placed on the upper frame will be weighed. The load beams are mounted longitudinally on the weigh frame.

User Interface Module

The user interface module consists of left and right head siderails, left and right intermediate siderails, and the patient pendant. In the up position, the siderails are intended to make the patient aware of the proximity of the sleep surface edge. The siderails may be lowered below the patient surface to permit the patient to enter or exit the bed, and to give a caregiver unobstructed access to the patient. Caregiver controls, patient controls, and entertainment controls are mounted on the siderails. The head siderails are mounted to the articulating deck head section, and the intermediate siderails are mounted to the weigh frame. The pendant includes patient controls and can be inserted into either intermediate siderail. The pendant is connected to the weigh frame with a cable which can be attached to either side.

End Panel Module

The end panel module consists of a head panel and a foot panel. The head panel is a flat stationary panel vertically affixed to the base frame near the head

end. The head panel is not weighed with the scale option. The headpanel's intended functions are:

- To provide grip areas for caregivers to use during transport.
- To provide an emergency CPR board

The head panel can be quickly removed by a caregiver for CPR or to gain access to the patient's head from the head end.

The foot panel is located at the foot end. It is affixed to the foot section of the articulating deck in such a way that it remains perpendicular to the surface of the foot section. The footpanel's intended functions are:

- To support the bottoms of the patient's feet in the chair and bed modes to prevent foot drop.
- To provide a support for patients to reposition themselves.
- To provide grip areas for caregivers to use during transport.
- To keep the patient from slipping off the foot end.
- To deter unauthorized patient exit from the foot end.
- Beds with the integrated transport shelf —the shelf provides a way to hold up to 45 lb (20 kg) of miscellaneous medical equipment.

Electrical System

Logic and Motor Control

Power is supplied to the Logic Control by the P3200 linear power supply. The power supply provides an unregulated 19 - 35 V DC reference to signal GND at 2.5 A max, 1.75 A typical (see Power Supply Node HDD for input supply capabilities). The GROUND is common among all nodes in the bed.

The switch mode power supply consists of an input capacitor for input ripple current control, an integrated Switch Mode Control Integrated Circuit, the feedback choke, the output capacitor, and a high current, high speed Schottky diode. This buck regulator provides DC at 8.2 V and provides 3.5 A of current.

The under voltage detection circuit consists of a series resistor and zener diode connected to the input voltage source. The zener voltage, along with the base resistor, provides base current for the NPN bipolar transistor.

When the zener stops conduction due to an under voltage condition, the zener voltage is off, and turns off the transistor. The input voltage through the series resistance turns on the NPN transistor switch to the regulator. This will turn off the regulator.

A diode/bulk capacitor is added to the input of the +5 V regulator to keep the logic supply up longer than the +8.2 V supply. This time depends greatly on load current and functions active.

The Logic Controller consists of an embedded controller, a derivative of the 8051 family. The Input/Output structure is configured as an active low for both input and output. This allows pull ups to be used without the microprocessor running and not cause any operation to occur. The micro processor can be disconnected and not have any inputs or outputs enabled. The clock can also be disabled and not cause any operation to occur. All signals to and from the microprocessor are buffered. All signals that exhibit a slow rise are Schmidt triggered to prevent oscillation from occurring. Debounced inputs are provided for all switch inputs to the microprocessor.

The embedded processor is a Atmel 89C51CC01. This is an 8051 variant with internal 64K flash program and 256 + 1.2K EEPROM data memory. External to the microprocessor are the CAN transceiver, watch dog reset circuit, 2K EEPROM and the buffering circuitry for the H bridge motor controllers, and the sensors for motor position feedback.

The Controller Area Network (CAN) is a common Small Area Network solution that supports distributed product and distributed system architectures. The CAN bus is used to interconnect a network of electronic nodes or modules. Typically, a two wire, twisted pair cable is used for the network interconnection. The CAN protocol is a set of stringent rules, implemented in silicon, that supports the serial transfer of information between two or more nodes. CAN is implemented by a large number of industries including automotive, truck, bus, agriculture, marine, construction, medical, factory automation, textile, and many others. CAN is used as the basis for several major "7-layer" protocol developments such as J1939, CANopen, ISO11783, DeviceNet, and NMEA2000. Each of these large protocol architectures are essentially complete industry-specific network solutions packaged to include defined requirements for the physical layer, address structure, message structure, conversation structure, data structure, and application/ network interface. Pre-packaged "7-layer" protocols provide high value for vertically integrated industries like heavy truck, marine, or factory automation. On the other end of the spectrum, many other companies choose to develop a proprietary distributed product strategy. For both business and technical reasons, these companies internally create a customized "7-layer" CAN-based protocol that is optimized to satisfy their own application-specific requirements. The VersaCare® Bed uses a proprietary CANopen solution, similar to what is used in the automobile industry.

Power Supply

Power Source

The bed is powered by 100, 110, 115, 120, 127, 220, 230, or 240 V AC, 50/60 Hz, single phase power and 24 V DC internal battery power. When AC power is available, the bed is powered by the transformer and the battery is being charged. When AC power is removed, the bed will shut down (no power). To use the battery backup, the user must press the battery enable switch. In battery backup mode, only the motors will function and all nodes will be powered up. After 10 minutes of no function switch activity, the bed will shut down (no power). This is the method used to save battery power.

The two primary fuses are 5.0 A, 250 V, TD, UL, 5X20 for 100, 110, 115, 120, and 127 V beds, and a 2.5 A, 250 V TD, IEC, 5 x 20 mm fuse for the 220, 230, and 240 V beds. The toroidal transformer is designed to provide 24 VDC at node VMOT_UR when the load at this node is 12 A DC. The transformer is designed to provide 36 VDC at node VLOG_UR when the load at this node is 3.5 A DC. At peak load the primary current is 5.7 Arms which corresponds to 684 VA. There are two secondary windings. Secondary 1 is rated at 21Vrms @ 20.4 Arms with regulation < 6%. Secondary 1 provides DC motor power, DC air solenoid power, and AC air pump power. Secondary 1 fuse is a 20 A, 250 V, TD, UL. Secondary 1 has a 25% duty cycle. Secondary 2 provides battery charge power, logic power, IntelliDrive® Transport System charge power. Secondary 2 is rated at 28 Vrms @ 6.5 Arms with < 4% regulation. Secondary 2 has a 100% duty cycle.

For ESD immunity the system ground (Vss) is not connected to earth ground.

The batteries are 7.2 Ahr connected in series for 24 VDC. The battery fuse is 15 A, 250 V, FB, UL, 3AB.

VMOT_UR

VMOT_UR (21.5 - 35 VDC, 24 VDC @ 12 A) is derived from secondary 1 full wave rectified by the external 35 A bridge and filtered by the 68000 uF external capacitor. Resistor, R3, discharges the filter capacitors when AC power is removed. Maximum discharge time is 4 minutes. Relay, K1, provides isolation between VBAT and VMOT_UR. The microprocessor will close the relay when on battery power.

VLOG_UR

BR1 and C38 provide the conditioning for VLOG_UR (30 - 46 VDC, 36 VDC @ 3.5 A).

Air Pump

The circuitry of RT5, Q6, U2, Q10, and P4 provide switched AC power for the air pump. The pump draws 3Arms maximum. The circuitry around U1 detects if power is available for the pump or not. The nominal voltage of the pump is 21 V AC.

Battery Charger

The circuitry around RT4, K3, Q2, Q3, R100, and D6 make up the high current parts of the battery charger. Relay, K3, is a supervisory switch for the charger. The charge voltage and current are regulated by Q2 via Q3. Resistor, R1, is used to sense the charge and discharge current. R12 and R15 provide a scaled voltage for the A to D to read.

MISC

Half of D6 is used for reverse battery protection along with the battery fuse.

AMT Module and Blower Power Supply

The blower power supply supplies a switched, regulated 14.25 VDC voltage to the AMT module. The regulator output is turned on or off by the air control P.C. board. The blower power supply also monitors current, converts it to an analog voltage that is passed through a cable to the air control P.C. board where it is monitored by software. The AMT module supplies high flow, low pressure air flow to the AMT coverlet.

IntelliDrive® Transport System Charge Power

Connector, P5, provides the 1.1 ADC path to the IntelliDrive® Transport System switching regulator board. P5-4 provides feedback to the microprocessor that the IntelliDrive® Transport System cable is connected.

Logic Power

P2-6 provides 1.5 ADC, 20 to 45 VDC power the logic board depending on whether the system is power by AC or DC. Diode, D5, steers the power. Relay, K2, is used to connect or disconnect system logic power when AC power is off.

VCC

U13 regulates VCC to 5 VDC +/- .07. The +8 VDC distributed power is supplied from the logic board.

Microprocessor

U8 is an 8051 CAN version microprocessor. U7 serves as a watch dog, power up reset, and low Vcc reset. U9 serves as the CAN transceiver.

Foot Controls

Connectors, P23 and P24, via Port0 read the foot control (hall effect) switches. The resistors and capacitors provide ESD protection. The night lights are supplied by the regulated +8 VDC and driven by half of U14. Each night light draws approximately 65 mA.

Obstacle Detection

Connectors, P27, P30, P31, and P32, provide power to the three obstacle detect infrared transmitters and detectors. When no obstacles are detected, the detection signal, P31-2, P30-3, and P32-3 is a zero to 5 VDC signal. The signal will be hi for 600 micro seconds and low for 2000 micro seconds. The 74Hc14 squares up the signal. The 100K ohm resistor and 0.1uF capacitor integrate the signal and generate a DC voltage of 3.7 V +/- .25. This signal is read by the analog to digital converter. Any signal less than 3.2 VDC or above 4.2 VDC will be considered an obstacle detection.

AC Detection

The circuitry around Q8 detects the presence or absence of AC power and produces a static binary signal.

Miscellaneous Drivers

Q7 drives the charge supervisory relay, K3. Q11 drives the logic relay, K2. Half of U14 drives the motor power relay, K1. Q9 drives the battery status LED.

Analog Section

U12 is a battery gas gauge. It measures battery charge and discharge currents from the current sense resistor, R100, and converts it to coulombs. The microprocessor uses this data to update the battery status. U15 is a 10 bit digital to analog converter. The D to A ultimately controls the charge transistor, Q2. U11 is a 12 bit analog to digital converter. U19 is a temperature sensor. U10 is used to buffer the battery voltage divider. The OP amp circuit of U10 is a backup measurement device for battery charge current and is used to check the gas gauge current reading.

Nurse Call Relay Power

Diodes, D13, D17,and D26, provide power to the nurse call relay (located on the SideCom® Communication System P.C. board) while AC is on and while AC is off if the battery is capable.

LED Driver

U16 drives five red LEDs used to indicate power supply errors. It also drives three green LEDs used to indicate the battery charging state.

EEPROM

U20 is used to store voltage offset data for the back up charge current opamp, U10, and the battery capacity.

Brake Not Set Switch Connector (G through J model beds)

This **Brake not set** safety switch connector supplies 5 VDC power and interfaces with the **Brake not set** safety switch, which detects if the brake mechanism is not engaged. The safety switch output goes to the logic control (CPLD), and then to the **neuron** which reads the signal status. The switch is on the base frame, but it is a component of the BPM, which is on the weigh frame.

Piezo (G through J model beds)

The piezo (PZ1) is used as an alarm/audio indicator for system use. It is driven by LED driver U24.

Head Position Signal (G through J model beds)

The head position analog signal comes on to the board from P19-2. Its excitation is supplied by P19-5 and P19-1. The signal, supplied by a 10k potentiometer, is buffered and filtered by U25. The filter is an active, unity gain, low-pass, Butterworth type with a cutoff frequency around 4 Hz. The filtered signal is then fed into the A/D, U11 (channel AN4). The head position signal was previously fed into the air board, but was moved to the power supply board to make the signal available to all boards (by the CAN bus).

Brake Signal (G through J model beds)

The brake signal comes on to the board by P6-2. The snap-action type switch is excited with 5 V DC from P6-1. The signal is buffered and fed into the A/D, U11 channel AN3 (even though it is truly a digital signal). The brake signal was previously processed by the SideCom® Communication System P.C.

board, but was moved to the power supply board to make the signal available to all boards (by the CAN bus).

User Interface

Power is supplied to the User Interface system by the P3200 central power supply. The power supply provides a pre-regulated 8.2 VDC +/- 5% referenced to signal GND. The GND is common among all nodes in the bed.

All of the caregiver control functions revolve around the microcontroller on the standard caregiver control board. This is an 8051 variant with internal 32K flash program, 256 + 1.2K EEPROM data memory, and 8 channels of A/D. External to the microcontroller are the CAN transceiver, watch dog reset circuit, serial I/O devices, and analog mux for interface to the microcontroller's A/D converter.

Digital switch inputs and LED outputs are read and set serially. The serial interface is SPI compatible and transfers data to and from the embedded controller.

Three LEDs are provided on the standard caregiver control board to indicate error conditions for troubleshooting.

Switch inputs that control bed motion are redundantly read with the microcontroller's A/D converter by analog multiplexers. For these switches, both analog and digital readings must be valid for a network message to be sent indicating a switch press.

Intelligence for actions pertaining to the caregiver control system resides in other bed modules. It reads the appropriate network variables for indicator updates and sends the status of switches to the appropriate module by network variable updates.

Patient Pendant

The patient pendant works on SPI communication. The pendant has a universal clock connected at pin 1 of the P1 connector. The clock provides a rising logic edge to move data into and out of the pendant.

PENDANT_CS is the pendant select line, which is connected at pin 2 of the P1 connector. The PENDANT_CS line will allow the user request to be read.

On pin 3 of the P1 connector is the Nurse Call connection, when the switch is pressed the bed places a call to the nurse.

GND is pin 4 of the P1 connector, which is logic, ground for the pendant.

Power is supplied to the pendant by the P3200 central logic board. The logic board provides a pre-regulated 8 VDC +/- 10% referenced to signal GND at 400 mA max, 200 mA typical. VCC is pin 6 of the P1 connector, which supplies the pendant with +8VDC for circuit power. Using a low-dropout regulator the voltage is regulated to 5 VDC for logic power.

SPI_IN is the data line for writing to the pendant, which is on pin 7 of the P1 connector. Commands that will be written to the pendant are nurse call and nurse answer.

SPI_OUT located on pin 8 of the P1 connector is the serial data being read from the pendant. This line provides the patient commands to the bed, such as head up, head down, knee up, knee down, room or read lighting, TV, and radio. The output also has a tri-state buffer attached to the line, which allows the data to be routed to the logic board or to be held if the pendant is not selected by the pendant CS line.

SideCom® Communication System

Power is supplied to the SideCom® Communication System by the P3200 central power supply. The power supply provides a pre-regulated 8.2 ± 0.2 VDC referenced to signal GND at 400 mA max, 200 mA typical. The GND is common among all nodes in the bed.

All of the Scale and PPM functions revolve around the microprocessor on the control board. This is an 8051 variant with internal 32K flash program and 256 + 1.2K EEPROM data memory. External to the microprocessor are the CAN transceiver, UTV chip, watch dog reset circuit, SideCom® Communication System relays, and audio attenuator with 16 volume settings.

Scale and Patient Position Monitor

Power is supplied to the Scale/Patient Position Monitor (PPM) system by the P3200 central power supply. The power supply provides a pre-regulated 8-9 V DC referenced to signal GND at 400 mA max, 200 mA 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 Mux 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 being placed on the network. If needed, 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 consists of 5 seven-segment digits. The scale node sends a network variable for the caregiver to display. Switches, located on the display board are available to the user to initiate functions like Zero and display weight. When activated the network variable gets updated and read by the scale node.

A model beds: Three FSRs are located on the sleep surface in strategic positions. They are buffered by an LM324 configured as a DIFF amp. The head sensor is the only one used for the sensitivity mode. The other two are located in the seat section. All Three FSRs are used to detect an out of position. Load beams are used to detect that a patient has left the bed. The FSRs and load beams information is sent to the air node. The FSR is in A/D counts while the load beams information is formatted into pounds using the factory zero as the offset. The factory zero is calculated during calibration only.

B through J model beds: Three FSRs can be located on the sleep surface in strategic positions. They are buffered by an LM324 configured as a DIFF amp. The head sensor is the only one used for the sensitivity mode. The other two are located in the seat section. The load beams are used to detect patient activity. The FSRs and load beams information is sent to the air node. The FSR is in A/D counts while the load beams information is formatted into pounds using the factory zero as the offset. The factory zero is calculated during calibration only.

The FSR output will decrease in resistance with increased force. Each FSR is connected between a 3.3K and a 2.2K resistor to limit the current. The 3.3K are connected to regulated +5 V and the 2.2K are connected to signal GND, forming a simple voltage divider. A differential amplifier then takes the voltage across the FSR. This is fed into a single ended 4 channel 8-bit A/D device internal to the embedded controller.

Switches located on the outside of the head rail are available to the caregiver to initiate functions such as mode selection, off, and alarm volume level. The LEDs indicate status of the PPM system.

All of the Scale and PPM 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.

If the AC power is removed from the bed and the PPM system is armed a priority and Nurse call are placed as well as a local alarm. If for any reason the scale node goes away or cannot communicate the SideCom® Communication System board monitors the scale nodes heartbeat and places the alarm if PPM was armed. Under battery power neither the scale nor PPM systems work.

IntelliDrive® Transport System

Push Handles

The push handles incorporate strain gauge elements to sense the force applied by a caregiver in either a forward or reverse direction. The strain gauges are connected to the junction board. Each push handle also incorporates an enable switch. The enable switches are connected to the junction board.

Junction Board

The junction board produces a regulated 12 VDC signal from the battery voltage to excite the strain gauges in the push handles to produce a signal in response to applied pressure. The strain gauge signals are then combined such that the forces applied to each handle are added together. A net push causes a positive signal, a net pull causes a negative signal. The junction board also contains amplifier circuitry to convert these signals from the strain gauges into a throttle signal for the drive motor controller. A positive signal results in a forward throttle signal to the motor controller. A negative signal yields a reverse throttle signal to the motor controller. The full scale forward throttle signal is about 4.0 volts and the full scale reverse throttle signal is about 1.0 volt. A signal of 2.4 -2.6 V is neutral. These levels make sure that the throttle signal to the motor controller is never out of range for a correctly connected system.

The junction board has connectors for the enable switches in the handles, paralleling the enable switches to produce one enable signal to the IntelliDrive® Transport System box. There is also a connector on the junction board for a steer switch.

Finally, the junction board contains a connector to receive bed power, both to charge the battery and to raise the drive wheel if deployed, regardless of the condition of the battery.

Power Assist Control Module

The Power Assist Control Module (PACM) consists of a printed circuit board mounted to a heat-sink plate. The plate provides essential heat sinking for power components of the circuit board and secondarily provides for mounting the assembly inside the box. The PACM supplies these functions:

- Battery charger
- Battery gas gauge
- Deployment control
- Enable switch logic & relay
- Drive motor over-temperature protection
- Battery shut-off

Battery Charger

The battery charger operates from a nominal 40 VDC produced by the P3200 bed whenever the bed is plugged in. First, a voltage regulator provides a regulated 34 VDC supply. The 34 VDC supply powers the charger. This charger has three modes of operation: trickle charge, bulk charge, and float charge.

The trickle charge mode produces a current of 20 to 30 milliamps to bring the battery voltage up to 22.5 volts. In the event a battery has a defective cell, this low level current will not produce a hazardous situation. If the battery is capable of taking a charge, its voltage will eventually come up to 22.5 V. (If the battery has been deeply discharged, this may take several days.) Once the voltage is above the trickle threshold, the charger circuit changes to mode 2. In this mode, bulk charging occurs during which current is limited to a constant level. The charger stays in this mode until the battery voltage is approximately 29 - 30 volts. At this point the current slowly drops off as the battery nears full charge. When the current drops to 10% of the constant current level, the charger enters mode 3, the float charge mode. In this mode the charger output drops to 27.8 volts to keep the battery topped off. A STATUS output of the charger goes high indicating that charging is complete.

The 34 VDC powers the PACM's logic which, upon sensing correct battery polarity, energizes the battery relay, thereby connecting the battery to the charger and to the IntelliDrive® System circuitry.

Battery Gas Gauge

The battery gas gauge monitors the voltage across a low value resistor in series with the battery as a function of time, interpreting positive voltages as current into the battery (charging) and negative voltages as current out of the battery

(discharging). The gas gauge indicates battery capacity on five output signals, each representing approximately 20% of the nominal battery capacity.

Deployment Control

There are three inputs to the deployment control circuitry: DC power from the bed, the steer switch, and the enable switch. Also, the deployment motor must provide limit switch output to reflect the extended (deployed or down) and retracted (stowed or up) positions of the deployment motor.

If bed power is absent, the steer switch has been closed, neither handle enable switch is closed and the drive mechanism is not down, the logic turns on the deployment motor to lower the mechanism. The logic subsequently turns the motor off when the extended limit switch opens or a twelve second timer times out, or if bed power is applied or the steer switch opens.

Similarly, if the bed power is applied or the steer switch is open and the drive mechanism is not up, the logic turns on the motor to raise the mechanism. The logic subsequently turns the motor off when the retracted limit switch opens or the timer times out, or if bed power is removed or the steer switch closes.

Whenever the mechanism is not down or bed power is present or the steer switch is open, the logic asserts an /INHIBIT signal to the motor controller to prevent it from driving the drive motor. Conversely, if the mechanism is down, bed power is absent and the steer switch is closed, the /INHIBIT signal is removed allowing the motor controller to drive the drive motor.

Enable Switch Logic and Relay

The enable switch, when closed while the drive mechanism is fully down, provides an input to the logic which removes the /INHIBIT input to the motor controller. At the same time, a relay is energized which connects the drive motor to the motor controller output allowing the controller to drive the drive motor. When the enable switch is subsequently opened, the logic again asserts the /INHIBIT signal to the motor controller, causing it to decelerate the drive motor to a stop. The relay opens after a six second delay, allowing the motor controller time to stop the motor before disconnecting the motor from the controller. As a back-up, the normally closed relay contact shorts the motor producing a further braking effect. This effect will slow or stop the drive motor even if the battery becomes disconnected.

Drive Motor Over-temperature Protection

The PACM includes a connection for a normally closed thermal switch. The opening of such a switch produces an input to the logic that causes the /INHIBIT signal to the motor controller to be asserted. The motor controller will bring the drive motor to a stop in this case. In situations where the drive

motor is operated under high load (such as powering the bed up a ramp) for more than a minute or so, self-resetting fuses (PTCs) interrupt the power connection to the motor controller. As with the switch opening, the motor controller will bring the drive motor to a stop. To manually push the bed in either of these circumstances, the drive wheel can be stowed or the manual override switch can disconnect the motor from the short to release the brake. Upon sufficient cool off time for either the thermal switch to close or the PTCs to reset, if the override switch is closed, power assist can be resumed.

Battery Shut-off

The gas gauge chip monitors the battery voltage. When the chip detects the battery at its end of discharge voltage, the logic de-energizes the battery connect relay. This disconnects the battery to prevent it from further discharging.

Also, the PACM includes an input for a manual shut-down switch. If this switch is closed for approximately 6 seconds, the shut-down logic is armed. Opening the switch causes the logic to de-energize the battery connect relay. This disconnects the battery from the electronics. In the event of a stuck shut-down switch, that is, one failed closed, the logic will be armed but never triggered, preventing nuisance shut-downs.

Deployment Motor

The deployment motor is a 24 VDC linear actuator with internal normally closed limit switches to indicate full travel in the extended and the retracted position. The motor circuit is separate from the limit switch circuit so that the driver circuit can shunt the motor to provide higher holding force. The logic can monitor the limit switches to correctly control the driver circuit.

Drive Motor

The drive motor is a 24 VDC, insulation class H, permanent magnet gear motor producing approximately 180 in-lb. of torque at 35 A. The drive motor incorporates a Klixon® YS11 style thermal switch attached to the inside of the motor housing and characterized to open if the temperature of the motor housing reaches 212° F (100° C). This temperature was chosen to track the motor winding at a safe operating temperature.

Battery Capacity Indicator

The battery capacity indicator contains one amber LED to indicate bed power applied or an energized battery relay and five green LEDs to indicate the remaining charge in the battery, each successive LED representing approximately 20 percent of the battery capacity.

The battery capacity indicator also includes a shutdown switch to signal the PACM logic to disconnect the battery.

Pneumatic

The air system contains these components (some components may not be on all models): air mattress, pneumatic system, control board, scale system, left and right force sensing resistors, the blower power supply, AMT module, and the air board software, which manages the entire operation of the above items.

The air mattress contains five air bladders: head, seat, heel, left turn assist and right turn assist. The head, seat, and heel bladders are used to support the patient. The left and right turn assist bladders are used to aid the caregiver in rotating a patient in order to change linens or reposition the patient. The P500 Surface also has the AMT coverlet which supplies an air flow under the patient.

The pneumatic system consists of the pneumatic valves, air compressor, and mattress connector. The control board and software currently support two different valve types. The SMC pneumatic valves are a pilot pressure operated valve. They pull very little current due to their pilot operation; however, the pilot pressure must be maintained in order for the valves to work correctly. The second type is the MAC valve which has a standard solenoid construction. The MAC valves draw much more current than the SMCs and therefore; the MAC valves are pulse width modulated after the valve has been actuated to reduce the amount of current draw. The power supply board controls the air compressor. The air system commands the power supply to turn on the compressor by the CAN network. The mattress connector has a hall effect sensor so as to detect the presence of the air mattress.

The air control board has the hardware to activate the valves, read pressures from the air bladders, read the patient head section force sensing resistors, detect the presence of the air mattress, give an audible alarm to the caregiver, store operating variables in non-volatile memory, measure valve currents and supply voltages, and measure head angle.

The scale system supplies load beam and PPM sensor data by the CAN network. This data, along with the measurements of the head section FSRs (tape-based bed exit only), are used to determine patient weight, detect the presence of a patient, and detect if a patient is sitting up.

The blower power supply supplies regulated voltage to the AMT module and is turned on and off by the air control P.C. board. The blower power supply also monitors the AMT current and send that information to the air control P.C. board.

Schematics

Schematic—Electronics

Figure 3-1. Electronics

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

Schematic—Motor Control P.C. Board (PN 68717)

Figure 3-2. Motor Control P.C. Board (PN 68717)

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

Schematic—Logic Control P.C. Board (PN 69378)

Figure 3-3. Logic Control P.C. Board (PN 69378)

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

Schematic—Siderail Controls

Figure 3-4. Siderail Controls

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

Schematic—Optional Controls

Figure 3-5. Optional Controls

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

Schematic—Patient Controls

Figure 3-6. Patient Controls

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

Schematic—Patient Pendant

Figure 3-7. Patient Pendant

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

Schematic—Power Supply (PN 72289P)

Figure 3-8. Power Supply (PN 72289P)

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

Schematic—Motor Control P.C. Board (PN 72273)

Figure 3-9. Motor Control P.C. Board (PN 72273)

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

Schematic—Power Supply P.C. Board (PN 70786S)

Figure 3-10. Power Supply P.C. Board (PN 70786S)

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

Schematic—Transformer Adapter Cables

Figure 3-11. Transformer Adapter Cables

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

Schematic—Electronics—G through J Model Beds (PN 150183)

Figure 3-12. Electronics Schematic—G through J Model Beds (PN150183)

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

Schematic—Siderail Controls, RH—G through J Model Beds (PN 147581)

Figure 3-13. Siderail Controls, RH—G through J Model Beds (PN 147581)

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

Schematic—Siderail Controls, LH—G through J Model Beds (PN 147584)

Figure 3-14. Siderail Controls, LH—G through J Model Beds (PN 147584)

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

Schematic—Optional Controls—G through J Model Beds (PN 147587)

Figure 3-15. Optional Controls—G through J Model Beds (PN 147587)

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

Schematic—Power Supply—G through J Model Beds (PN 148732)

Figure 3-16. Power Supply—G through J Model Beds (PN 148732)

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

NOTES:

Chapter 4
Removal, Replacement, and Adjustment Procedures

Tool and Supply Requirements

To service the VersaCare® Bed, these tools and supplies are necessary:

- Ratchet
- Extension, 6"
- 3/4" wrench
- 7 mm wrench
- 13 mm wrench
- 13 mm socket
- 17 mm wrench
- T30 Torx® screwdriver
- T25 Torx® screwdriver
- T20 Torx® screwdriver
- T15 Torx® screwdriver
- T10 Torx® screwdriver
- Small screwdriver
- #2 phillips head screwdriver
- Rubber mallet
- E-ring installation tool
- (2) Jack stands
- Scissor jack
- 3/32" punch
- Rivet gun with plastic rivets
- Pot of white petroleum jelly (approx. 400 g)
- 7/64" drill bit
- Drill

- #6-32 tap
- 3/8" nut driver
- Wire cutters
- 2" x 4" x 36" piece of wood
- String, 10' (305 cm)
- 1/4" nut driver
- 1/4" bow end wrench
- Needle nose pliers
- Antistatic strap
- 7/16" deep well socket
- 7/16" open end wrench
- Voltmeter
- Window cleaner
- Rags
- Screwdriver
- Multimeter
- Weight, 100 to 250 lb (45 to 113 kg) (in 25 lb (11 kg) increments)

4.1 Mattress

Tools required: Screwdriver

Removal

1. Set the brakes.
2. Raise the bed to the high position.
3. Press the Enable control on the siderail controls.
4. Simultaneously press both the Max-Inflate and Pressure Relief controls until both indicators go off.

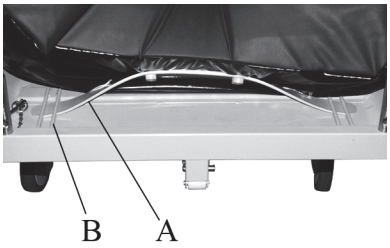
WARNING:
Failure to unplug the bed from its power source could cause injury or equipment damage.

5. Unplug the bed from its power source.
6. Lift the foot end of the mattress.

WARNING:
Use extreme care when you remove the mattress retaining strap. Failure to do so can cause injury as the strap snaps out of the retainers.

7. Carefully remove one side of the mattress retaining strap (A) from the retainer (B) (see figure 4.1 on page 4-3).

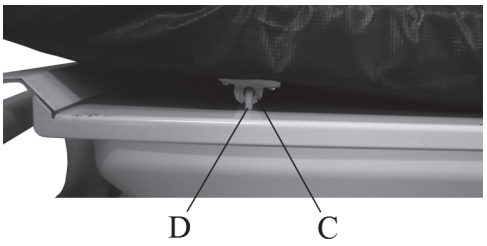
Figure 4-1. Retaining Strap



8. Remove the other side of the mattress retaining strap from the retainer.
9. Remove the headboard.
10. Do as follows for your mattress type:

- **Tempur-Pedic® Mattress with clip attachments**—disconnect the clips (C) from the retainers (D) (see figure 4-2 on page 4-4).

Figure 4-2. Tempur-Pedic® Mattress with Clip Attachments



- **Other Mattresses**—do step 7 and step 8 above.

11. Do as follows for your mattress type:

- **Foam surfaces**—remove the surface.
- **Treatment/therapy surface**, do these:

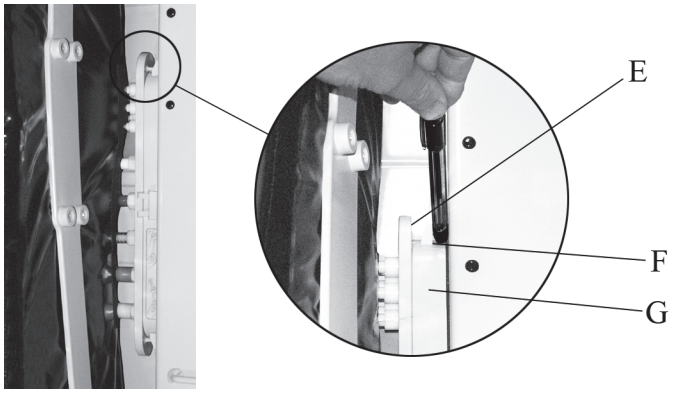
a. Insert a small screwdriver between the surface hose connector (E) and the bed hose connector latch tabs (F) on each end of the connector (G) (see figure 4-3 on page 4-4).

NOTE:
The end of the surface hose connector will pop out of the bed hose connector.

b. **P500 Surface with AMT**—disconnect the AMT blower hose from its bed frame connector.

c. Remove the treatment/therapy surface.

Figure 4-3. Treatment/Therapy Surface



Replacement

1. Do the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-7.

4.2 Caster

Tools required: T25 Torx® screwdriver
Scissor jack
17 mm wrench

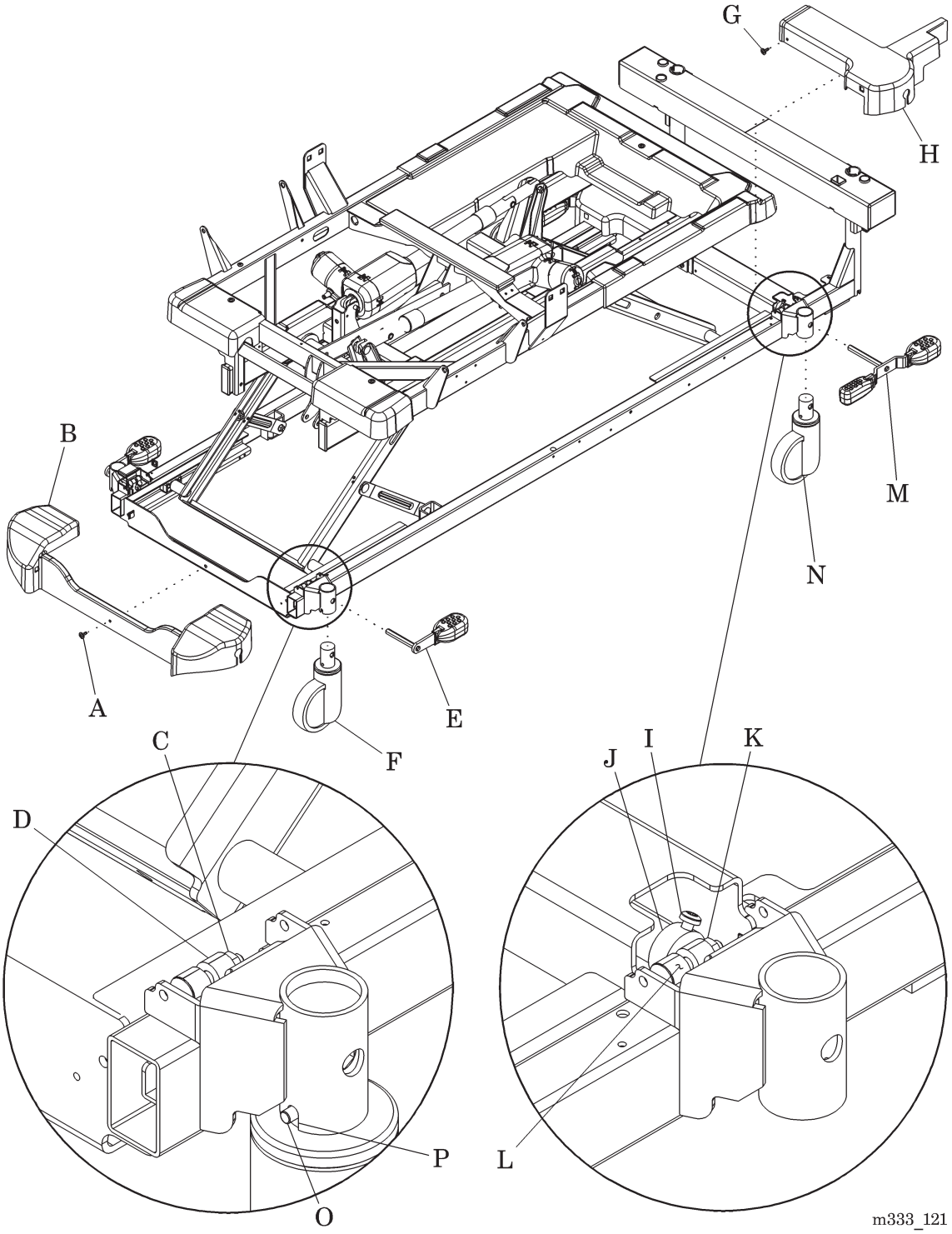
Removal

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

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

3. Disconnect the bed from its power source.
4. For foot end casters, do as follows:
   a. Remove the screw (A) that attaches the foot end cover (B) to the bed (see figure 4-4 on page 4-6).
   b. Remove the foot end cover (B).
   c. Use the scissor jack to raise the corner of the bed that the caster is being removed from.
   d. Loosen the nut (C) on the clamp (D).
   e. Remove the brake/steer pedal (E) from the bed.
   f. Remove the caster (F) from the bed.
5. For head end casters, do as follows:
   a. Remove the screw (G) that attaches the head end cover (H) to the bed.
   b. Remove the head end cover (H).
   c. Use the scissor jack to raise the corner of the bed that the caster is being removed from.
   d. Loosen, but do not remove, the setscrew (I) on the torque tube (J).
   e. Loosen the nut (K) on the clamp (L).
   f. Remove the brake/steer pedal (M) from the bed.
   g. Remove the caster (N) from the bed.

Figure 4-4. Caster



Replacement

NOTE:
The new caster comes in the **neutral** position.

1. For foot end casters, do as follows:
   a. Use the brake/steer pedal (E) to set the caster to the brake position.
   b. Position the new caster so the alignment pin (O) will fit into the slot (P).
   c. Insert the caster (F) into the bed.
   d. Install the brake/steer pedal (E) through the caster (F) and clamp (D).
   e. Tighten the nut (C).
   f. Install the foot end cover (B).
   g. Install the screw (A) to attach the foot end cover (B) to the bed.
   h. Do the "Function Checks" on page 2-7.

2. For head end casters, do as follows:
   a. Use the brake/steer pedal (E) to set the caster to the brake position.
   b. Position the new caster so the alignment pin (O) will fit into the slot (P).
   c. Insert the caster (N) into the bed.
   d. Install the brake/steer pedal (M) through the caster (N) and clamp (L) into the torque tube (J).
   e. Tighten the setscrew (I).
   f. Tighten the nut (K).
   g. Install the head end cover (H).
   h. Install the screw (G).
   i. Do the "Function Checks" on page 2-7.

4.3 CPR Cable

Tools required: T25 Torx® screwdriver
7 mm wrench

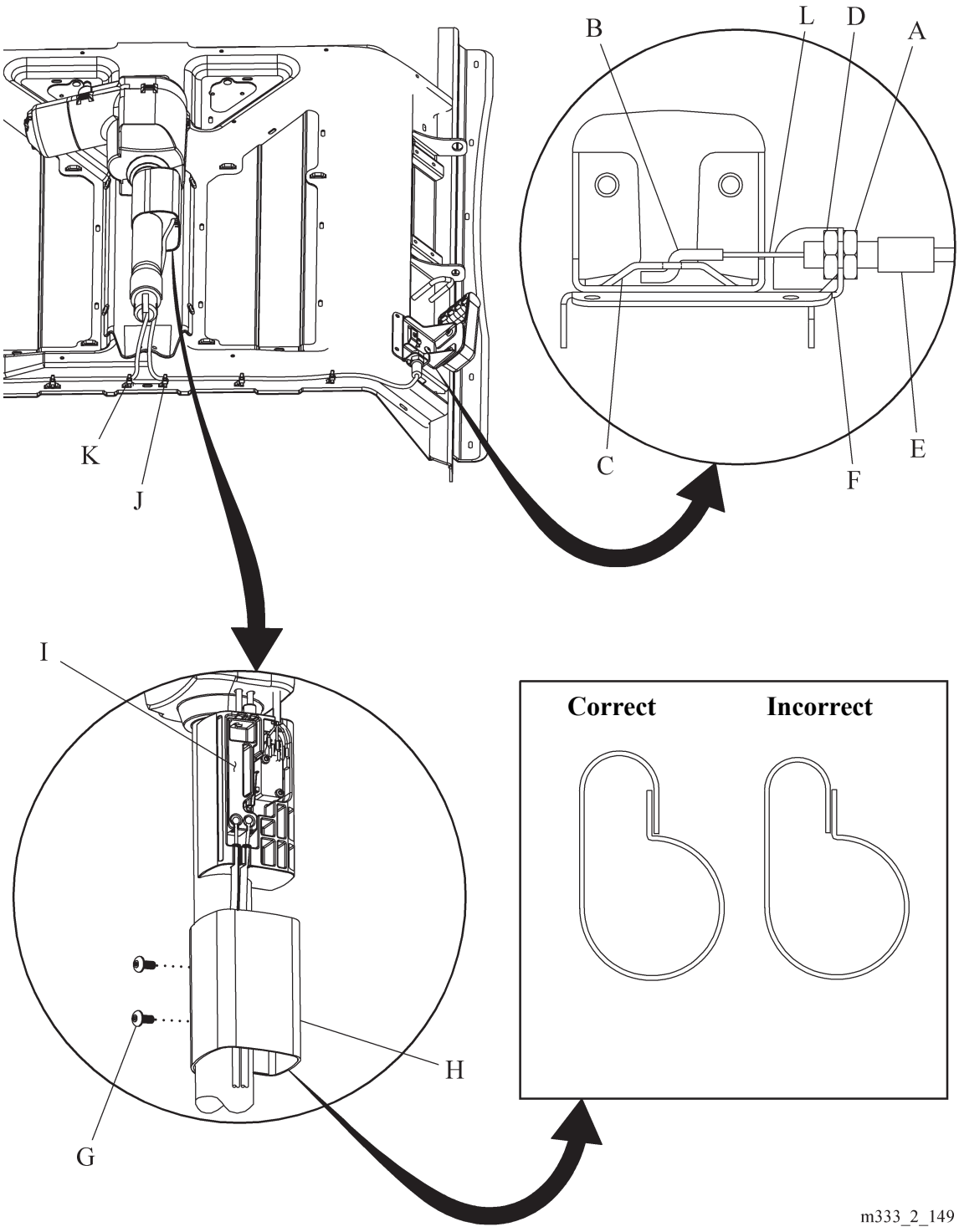
Removal

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

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

4. Disconnect the bed from its power source.
5. Loosen the jam nut (A) (see figure 4-5 on page 4-9).
6. Remove the CPR cable hook (B) from the handle bracket (C).
7. Remove the nut (D).
8. Remove the CPR cable (E) from the mount bracket (F).
9. Remove the two screws (G) from the CPR release cover (H).
10. Slide the CPR release cover (H) down.
11. Remove the CPR cable (E) from the CPR release (I).
12. Cut and remove the two cable ties (J) that attach the CPR cable (E) to the head section (K).
13. Remove the CPR cable from the head section.

Figure 4-5. CPR Cable



Replacement

1. Install the jam nut (A) onto the CPR cable (E).
2. Install the CPR cable (E) into the mount bracket (F).
3. Install, but **do not tighten**, the nut (D) onto the CPR cable (E).
4. Install the CPR cable hook (B) into the handle bracket (C).
5. Route the CPR cable (E) through the CPR release cover (H) to the CPR release (I).
6. Install the CPR cable (E) into the CPR release (I).
7. Use cable ties (J) to attach the CPR cable (E) to the head section (K).
8. Install the CPR release cover (H) onto the CPR release (I).
9. Install the two screws (G) attach the CPR release cover (H) to the CPR release (I).
10. Adjust the CPR cable (E), refer to “Adjustment” on page 4-10.

NOTE:
The two nuts (A) and (D) will be tightened during the adjustment procedure.

Adjustment

1. Pull the CPR cable (E) until the wire (L) is snug and the CPR handle just starts to move.
2. Run the nut (A) against the mount bracket (F).
3. Tighten the nut (D).
4. Make sure the wire (L) is snug, adjust the CPR cable (E) as needed.
5. Pull the CPR handle. The Emergency CPR should activate when the CPR handle travels approximately half way.
6. Do the “Function Checks” on page 2-7.

4.4 Head Siderail

Tools required: T25 Torx® screwdriver
E-ring installation tool
Screwdriver

Removal

1. Set the brakes.
2. Raise the bed to the high position.
3. Raise the head section to the highest position.
4. Raise the siderail being changed to the up and locked position.

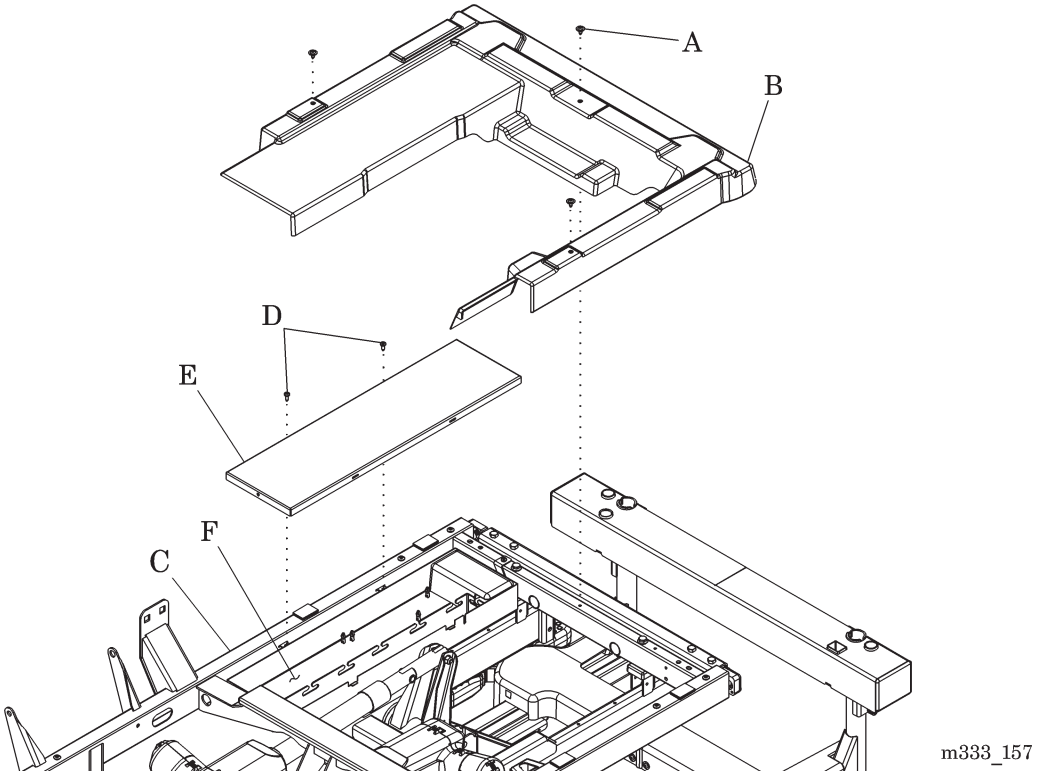
SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

5. Disconnect the bed from its power source.
6. Remove the screws (A) that attach the cover (B) to the bed (C) (see figure 4-6 on page 4-12).
7. Remove the cover (B).
8. Remove the two screws (D) that attach the electronics module cover (E) to the electronics module (F).
9. Remove the electronics module cover (E).
10. Remove the two screws (G) that attach the cable cover (H) to the head section (I) (see figure 4-7 on page 4-13).

NOTE:
The screws being removed should be on the same side as the siderail being replaced.

11. Cut and remove the cable ties (J) that attach the siderail cable to the head section (I).

Figure 4-6. Cover Removal



12. Disconnect the siderail cable from the logic control P.C. board inside the electronics control module.

13. Remove the siderail cable from the behind the cable cover (H).

14. Remove the E-ring (K) and washer (L) from the siderail dampener (M) (see figure 4-8 on page 4-14).

15. Disconnect the dampener (M) from the bracket post (N).

16. Remove the E-ring (O) from the lower D-pin (P).

17. Remove the E-ring (Q) from the upper D-pin (R).

18. Remove the lower D-pin (P).

19. While supporting the siderail, remove the upper D-pin (R).

NOTE:
On a bed built after 26-May-2009, the right-side D-pin bushing will not be present.

Figure 4-7. Cable Routing

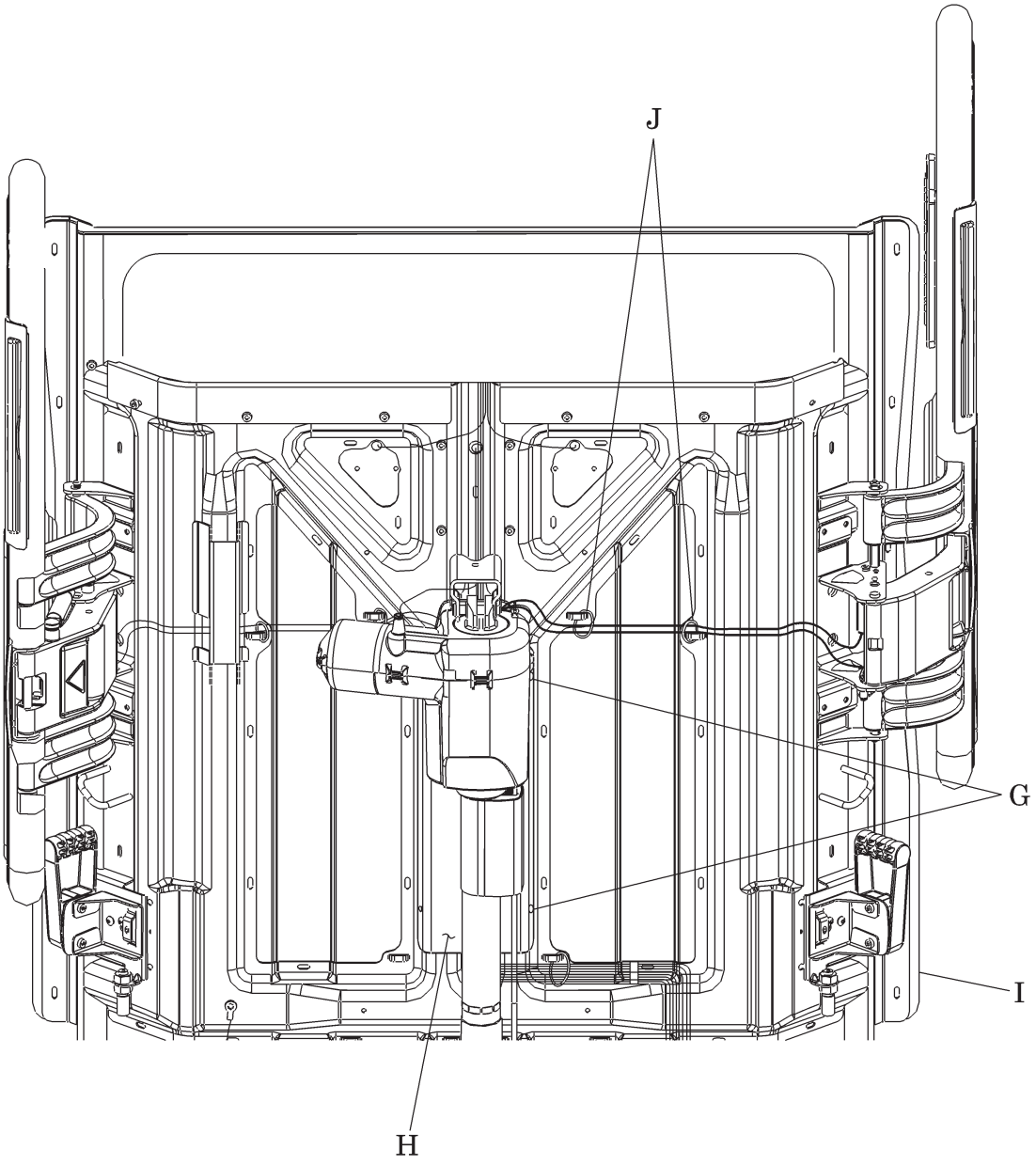
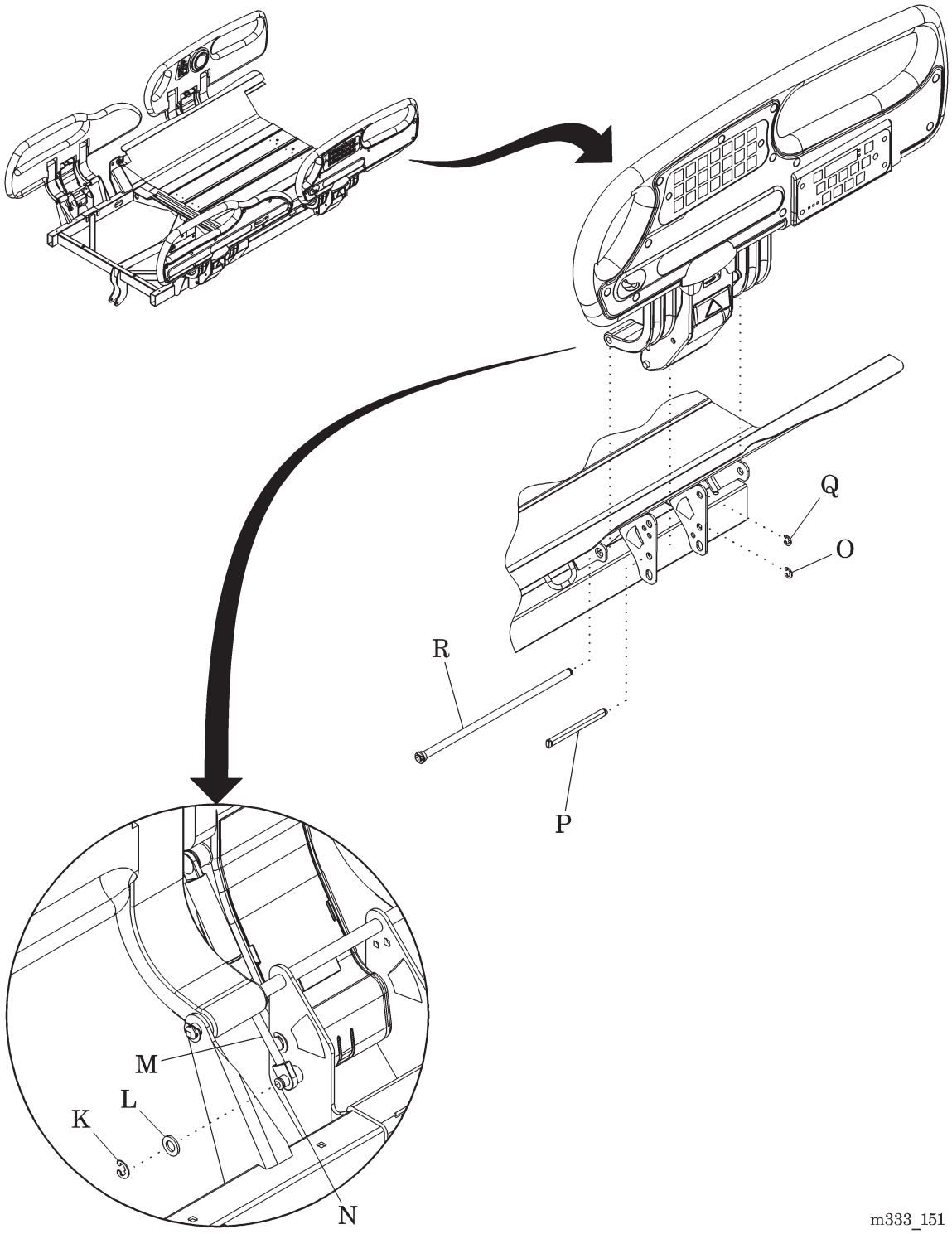


Figure 4-8. Head Siderail



Replacement

1. Do the removal procedure in reverse order.
2. Do the “Function Checks” on page 2-7.

4.5 Intermediate Siderail

Tools required: Screwdriver
E-ring installation tool
Rubber mallet

Removal

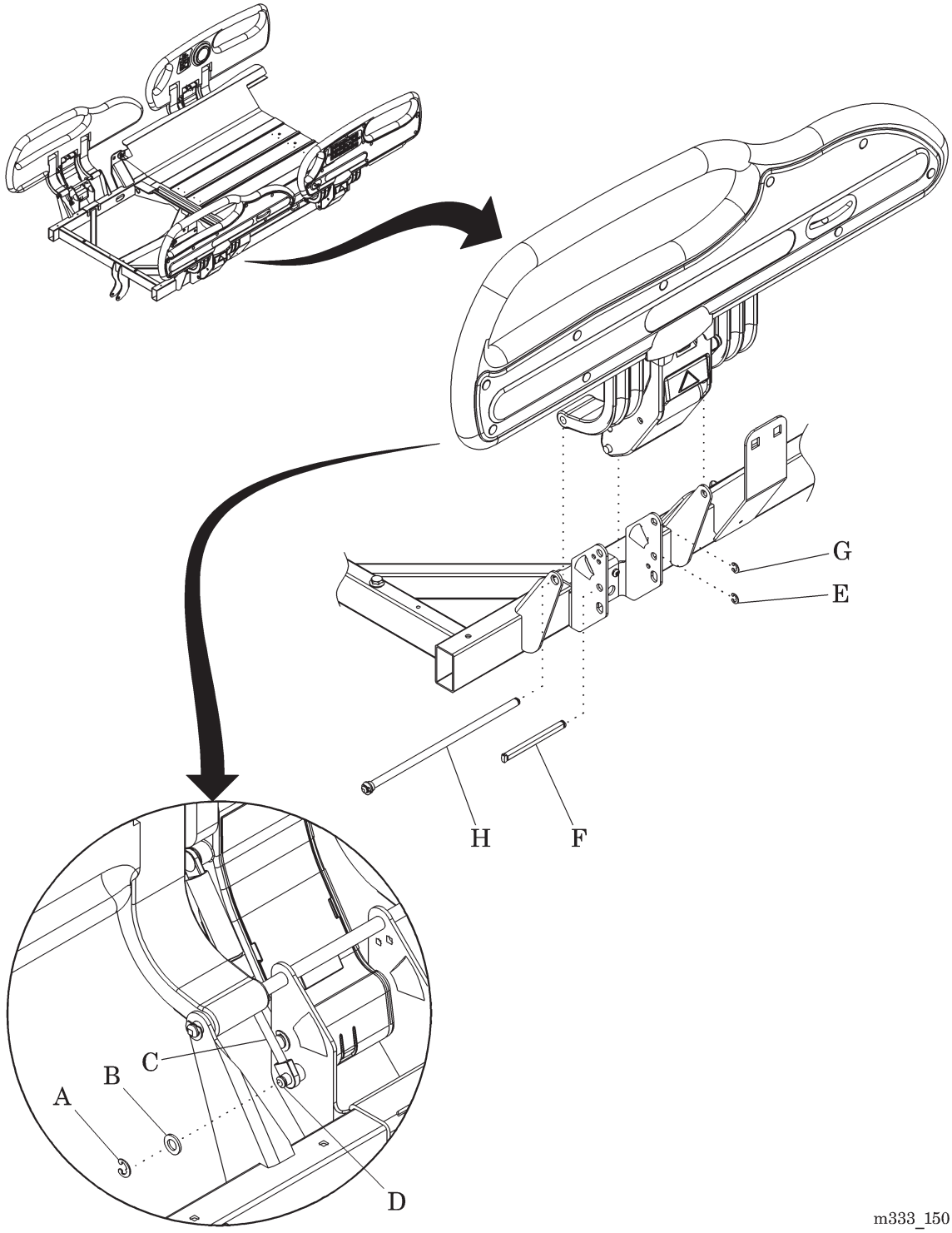
1. Set the brakes.
2. Raise the bed to the high position.
3. Raise the knee section to the highest position.
4. Raise the siderail being changed to the up and locked position.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

5. Disconnect the bed from its power source.
6. Remove the E-ring (A) and washer (B) from the siderail dampener (C) (see figure 4-9 on page 4-17).
7. Disconnect the dampener (C) from the mounting post (D).
8. Remove the head end E-ring (E) from the lower D-pin (F).
9. Remove the head end E-ring (G) from the upper D-pin (H).
10. Unlatch the siderail.
11. Remove the lower D-pin (F).
12. While supporting the siderail, remove the upper D-pin (H).

NOTE:
On a bed built after 26-May-2009, the right-side D-pin bushing will not be present.

Figure 4-9. Intermediate Siderail



Replacement

1. Do the removal procedure in reverse order.
2. Do the “Function Checks” on page 2-7.

4.6 Head Siderail P.C. Board

Tools required:	T15 and T20 Torx® screwdriver		6-32 tap
	Drill	#7/64" drill bit	Antistatic strap

NOTE:
On G through J model beds the head siderail P.C. boards are side specific.

Removal

1. Set the brakes.
2. Raise the bed to the high position.
3. Raise the appropriate siderail to the up and locked position.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

4. Disconnect the bed from its power source.
5. Drill a hole in the center of each screw cover (A) (see figure 4-10 on page 4-20).
6. Use the tap to remove the screw covers (A).
7. Remove the 12 screws (B).
8. Remove the siderail cover (C) from the siderail (D).

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

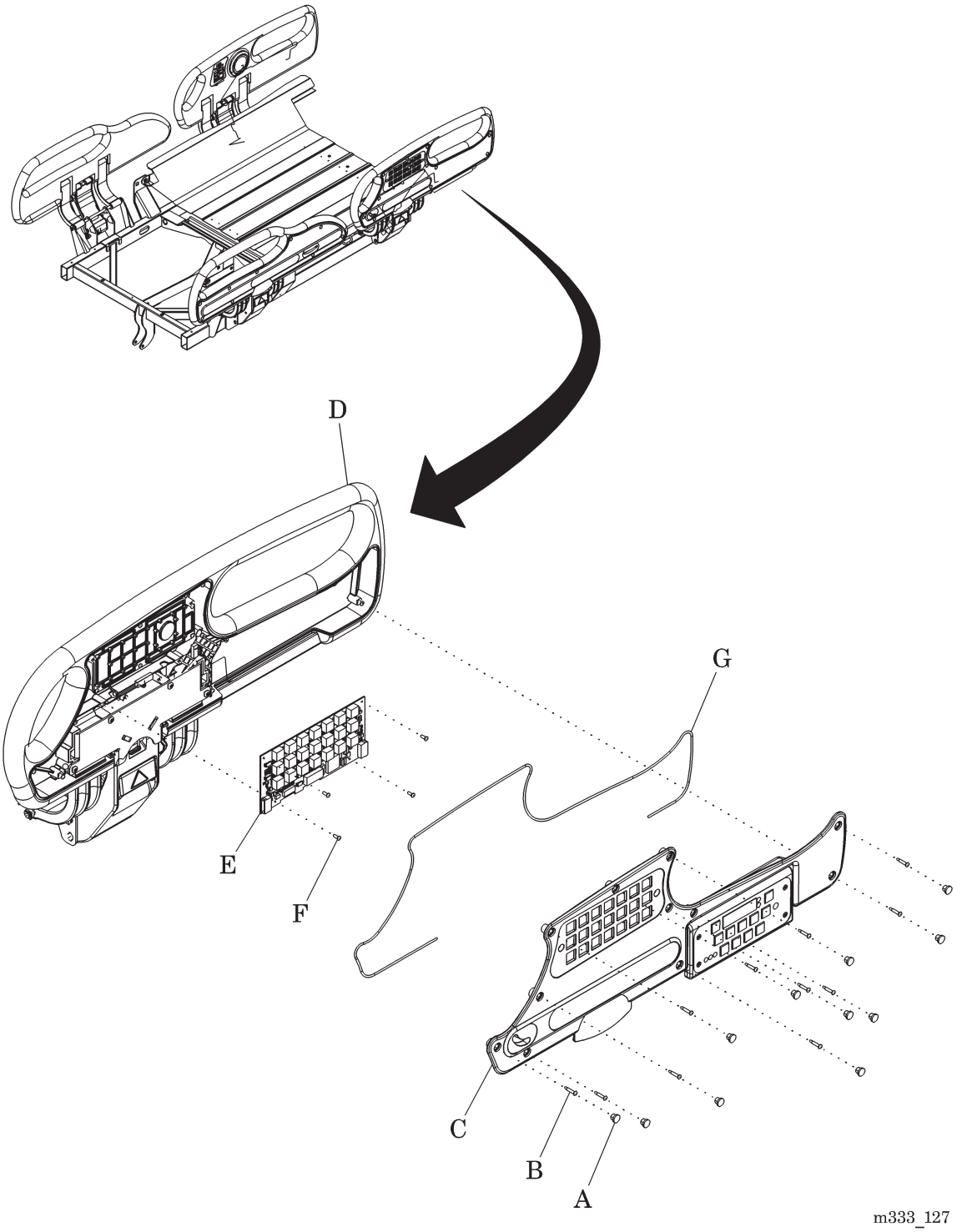
9. Put on the antistatic strap.
10. Disconnect any cable from the P.C. board (E).
11. Remove the four screws (F) that attach the P.C. board (E) to the siderail.
12. Remove the P.C. board (E) from the siderail (D).

Replacement

1. Make sure the gasket (G) is installed in the siderail.
2. Do the removal procedure in reverse order.

3. Do the “Function Checks” on page 2-7.

Figure 4-10. Head Siderail P.C. Board



4.7 Speaker

Tools required: T20 Torx® screwdriver
T15 Torx® screwdriver
Drill 7/64" drill bit #6-32 tap
3/8" nut driver Antistatic strap

Removal

1. Set the brakes.
2. Raise the bed to the high position.
3. Raise the appropriate siderail to the up and locked position.

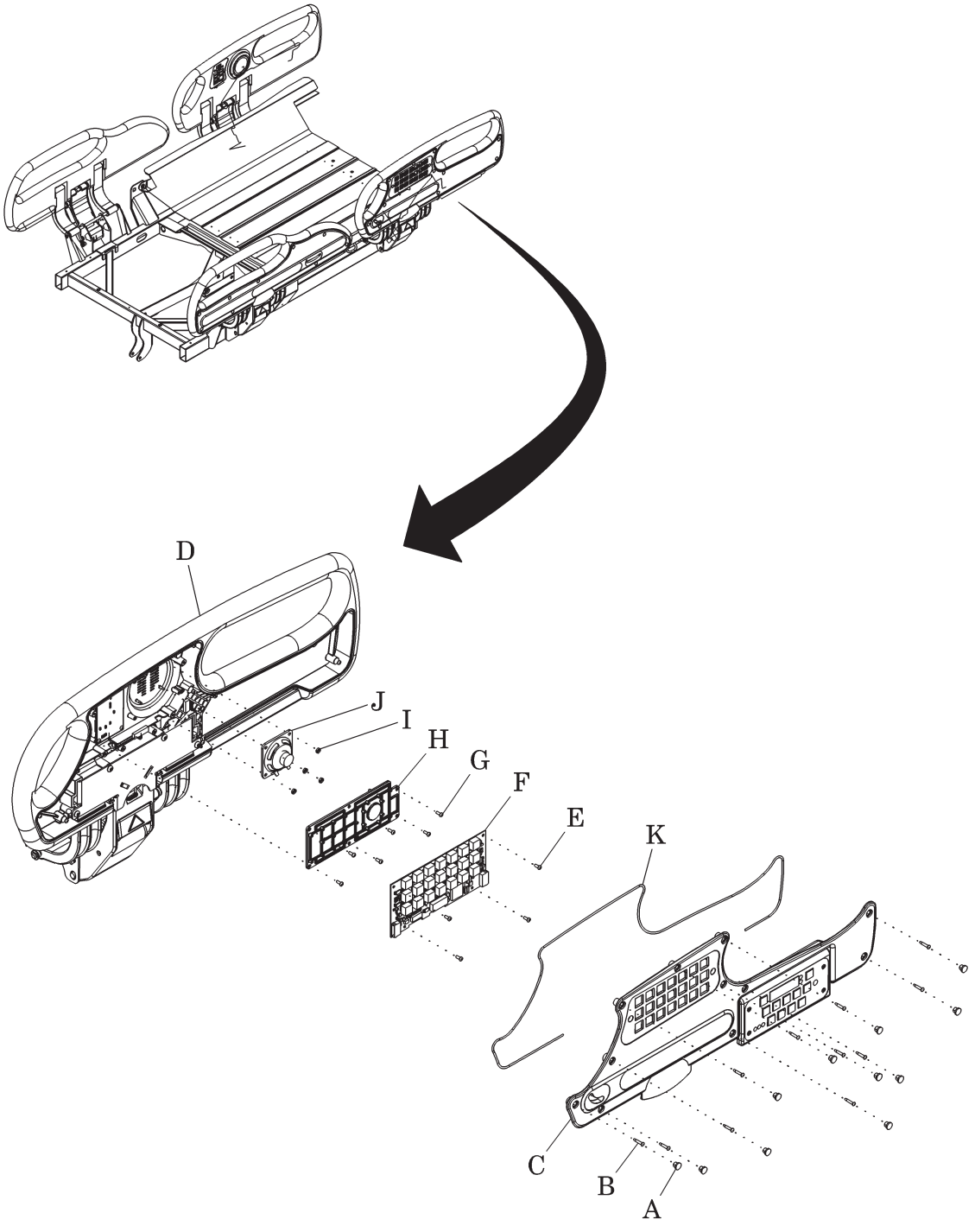
SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

4. Disconnect the bed from its power source.
5. Drill a hole in the center of each screw cover (A) (see figure 4-11 on page 4-22).
6. Use the tap to remove the screw covers (A).
7. Remove the 12 screws (B).
8. Remove the siderail cover (C) from the siderail (D).
9. Put the siderail cover (C) on the bed.

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

10. Put on the antistatic strap.
11. Remove the four screws (E) from the P.C. board (F).
12. Fold down the P.C. board (F).
13. Remove the six screws (G) that attach the stiffener (H) to the siderail (D).
14. Remove the stiffener (H).
15. Remove the four nuts (I) that attach the speaker (J) to the siderail (D).

Figure 4-11. Speaker



16. Remove the speaker (J) from the siderail (D).
17. Disconnect the wires from the speaker (J).

Replacement

1. Make sure the gasket (K) is installed in the siderail.
2. Do the removal procedure in reverse order.
3. Do the “Function Checks” on page 2-7.

4.8 Patient Control P.C. Board

Tools required:

T20 Torx® screwdriver	
T15 Torx® screwdriver	
Drill	7/64" drill bit
#6-32 tap	Antistatic strap

Removal

1. Set the brakes.
2. Raise the bed to the high position.
3. Raise the appropriate siderail to the up and locked position.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

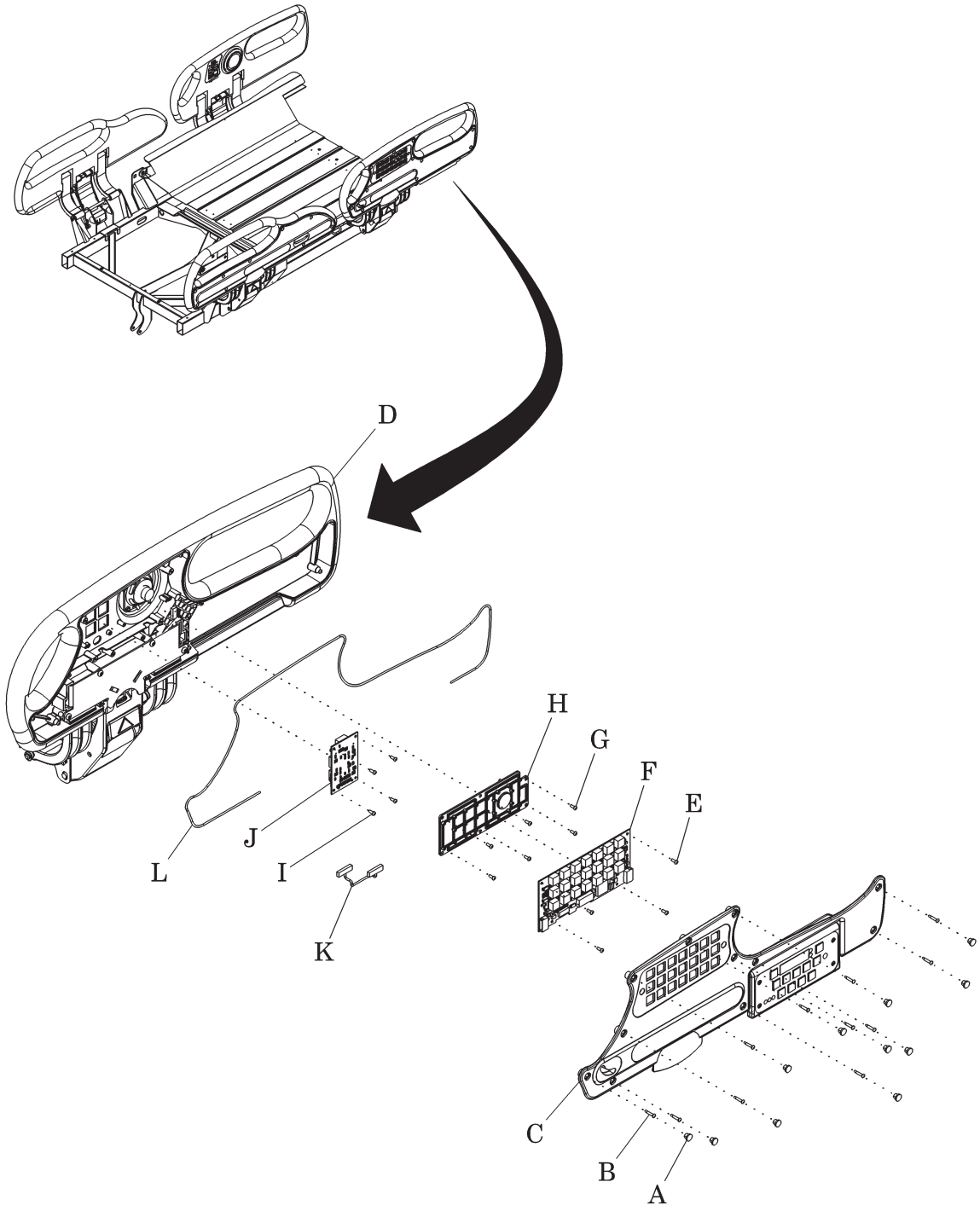
4. Disconnect the bed from its power source.
5. Drill a hole in the center of each screw cover (A) (see figure 4-12 on page 4-25).
6. Use the tap to remove the screw covers (A).
7. Remove the 12 screws (B).
8. Remove the siderail cover (C) from the siderail (D).
9. Put the siderail cover (C) on the bed.

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

10. Put on the antistatic strap.
11. Remove the four screws (E) from the siderail P.C. board (F).
12. Fold down the P.C. board (F).
13. Remove the six screws (G) that attach the stiffener (H) to the siderail (D).
14. Remove the stiffener (H).

15. Remove the four screws (I) that attach the patient control P.C. board (J) to the siderail (D).

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



16. Remove the patient control P.C. board (J) from the siderail (D).

17. Remove the cable (K) between the patient control P.C. board (J) and the siderail P.C. board (F).

Replacement

1. Make sure the gasket (L) is installed in the siderail (D).

2. Do the removal procedure in reverse order.

3. Do the “Function Checks” on page 2-7.

4.9 Control Pod P.C. Board

Tools required:	T20 Torx® screwdriver	
	T15 Torx® screwdriver	
	7/64" drill bit	Drill
	Antistatic strap	#6-32 tap

Removal

1. Set the brakes.
2. Raise the bed to the high position.
3. Raise the appropriate siderail to the up and locked position.

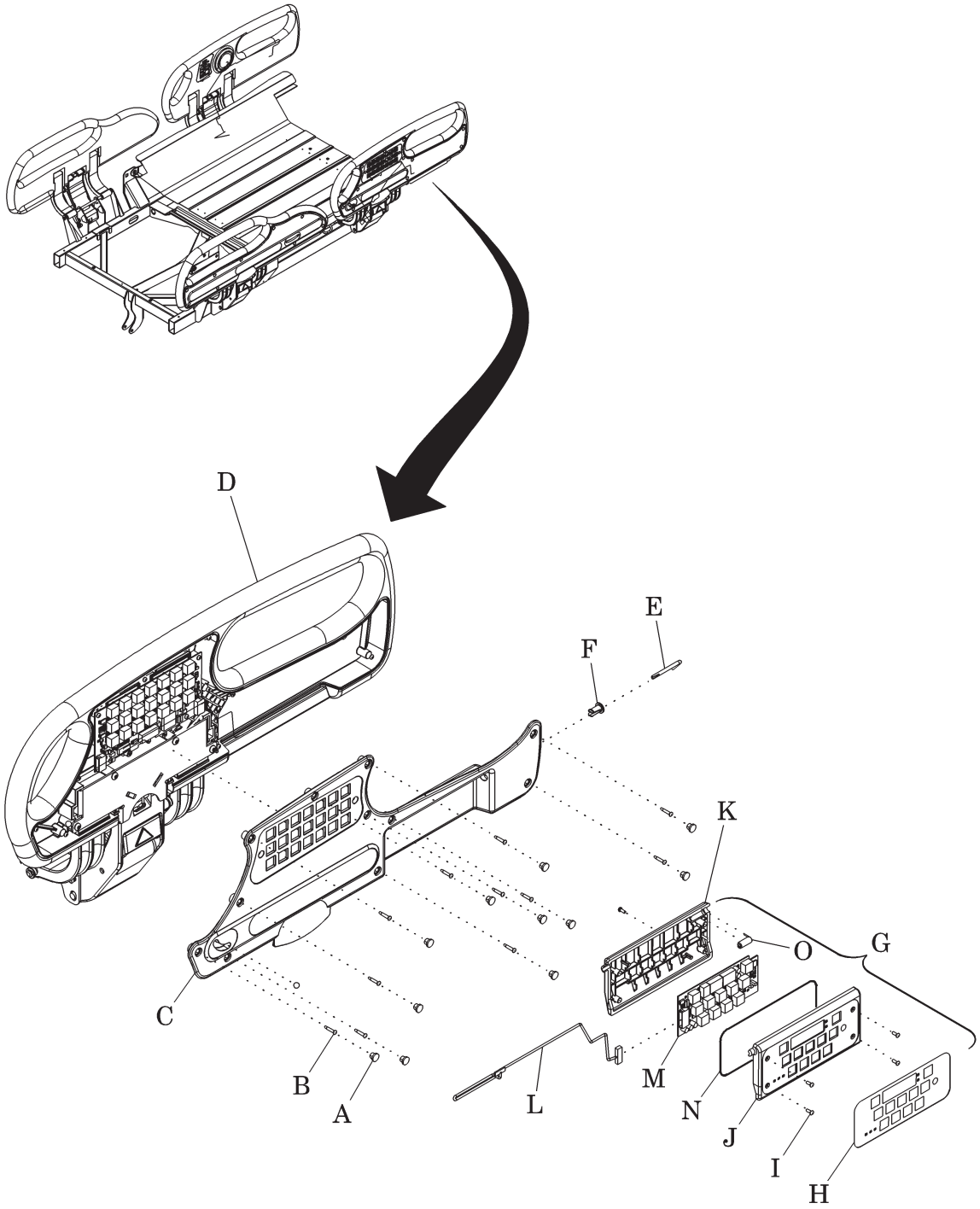
SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

4. Disconnect the bed from its power source.
5. Drill a hole in the center of each screw cover (A) (see figure 4-13 on page 4-28).
6. Use the tap to remove the screw covers (A).
7. Remove the 12 screws (B).
8. Remove the siderail cover (C) from the siderail (D).
9. Place the siderail cover (C) on the bed.
10. Remove the hinge pin (E) from the inside of the siderail cover (C).
11. If the bushing (F) is installed, remove it from the inside of the siderail cover (C).
12. Remove the control pod (G) from the siderail cover (C).
13. Remove the label (H) from the control pod (G).

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

14. Put on the antistatic strap.

Figure 4-13. Control Pod P.C. Board



15. Remove the five screws (I) from the control pod (G).
16. Remove the upper half (J) of the control pod (G) from the lower half (K).
17. Disconnect the cable (L) from the P.C. board (M).
18. Remove the P.C. board (M) from the lower half (K) of the control pod (G).

Replacement

1. With the hinge pin (E) flat, install it by pushing it in until it hits the standoff.
2. Rotate the hinge pin (E) to clear the standoff, then push it in until seated.
3. Make sure the gasket (N) is installed in the pod (G).
4. Make sure the spring (O) is installed in the pod (G).
5. Make sure the gasket (L) is installed in the siderail (D).
6. Do the removal procedure in reverse order.
7. Install a new label (H).
8. Do the “Function Checks” on page 2-7.

4.10 Night Light

Tools required: T25 Torx® screwdriver
Pliers
Wire cutters

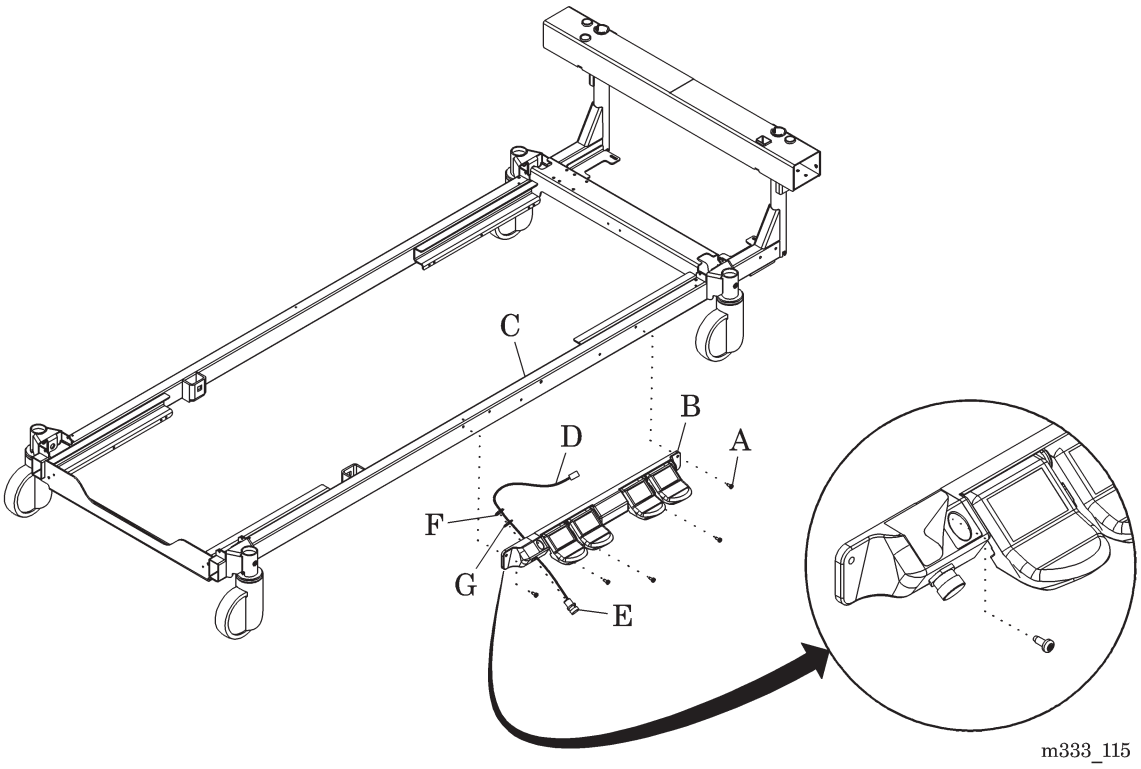
Removal

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

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

3. Disconnect the bed from its power source.
4. Remove the five screws (A) that attach the foot pedal assembly (B) to the bed (C) (see figure 4-14 on page 4-30).

Figure 4-14. Night Light



NOTE:
The fifth screw is located under the blank label.

5. Remove the foot pedal assembly (B) from the bed (C).
6. Remove the wire tie (not shown).
7. Disconnect the night light cable (D) from the foot pedal P.C. board.
8. Remove the nut (F) and washer (G) from the night light (E).
9. Remove the night light (E) from the foot pedal assembly (B).

Replacement

1. Do the removal procedure in reverse order.
2. Install a new blank label over the screw hole.
3. Do the “Function Checks” on page 2-7.

4.11 Foot Pedal Assembly

Tools required: T25 Torx® screwdriver
Wire cutters

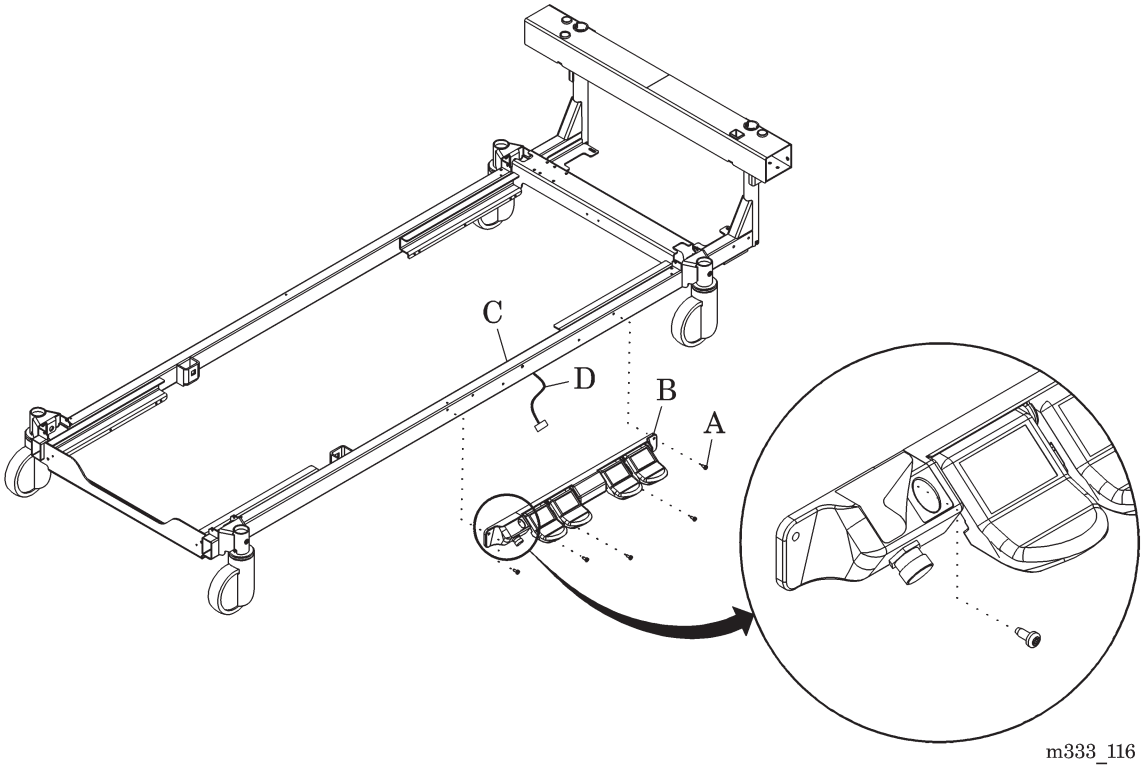
Removal

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

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

3. Disconnect the bed from its power source.
4. Remove the five screws (A) that attach the foot pedal assembly (B) to the bed (C) (see figure 4-15 on page 4-32).

Figure 4-15. Foot Pedal Assembly



NOTE:
The fifth screw is located under the blank label.

5. Remove the foot pedal assembly (B) from the bed (C).
6. Remove the cable tie (not shown).
7. Disconnect the cable (D) from the foot pedal assembly (B).

Replacement

1. Do the removal procedure in reverse order.
2. Install a new blank label over the screw hole.
3. Do the “Function Checks” on page 2-7.

4.12 Air Compressor

Tools required: T25 Torx® screwdriver

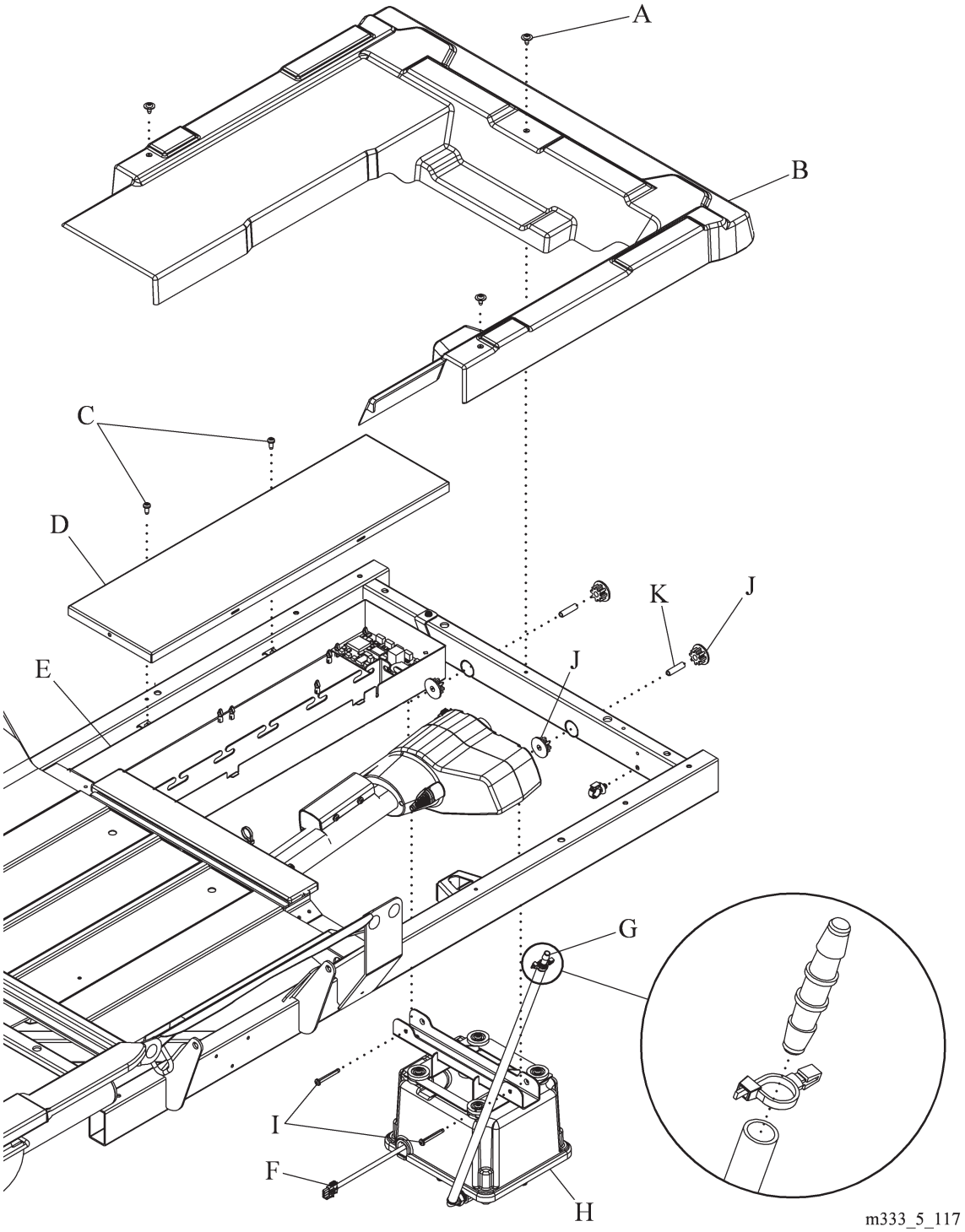
Removal

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

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

4. Disconnect the bed from its power source.
5. Remove the screws (A) that attach the cover (B) to the bed (see figure 4-16 on page 4-35).
6. Remove the cover (B).
7. Remove the two screws (C) that attach the electronics cover (D) to the electronics module (E).
8. Remove the electronics cover (D).
9. Disconnect the power cable (F).
10. Disconnect the air hose (G).
11. While you support the air compressor (H), remove the screws (I) bushings (J), and spacers (K), and then lower the compressor (H).

Figure 4-16. Air Compressor



Replacement

1. Do the removal procedure in reverse order.
2. Do the “Function Checks” on page 2-7.

4.13 Air Module

Tools required: T25 Torx® screwdriver Antistatic strap

Removal

1. Set the brakes.
2. Raise the bed to the high position.
3. Remove the mattress, (refer to procedure 4.1).
4. Raise the head section to the highest position.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

5. Disconnect the bed from its power source.
6. Remove the 11 screws (A) that attach the module cover (B) to the head section (C) (see figure 4-17 on page 4-38).
7. Remove the module cover (B).
8. Remove the two screws (D) that attach the module (E) to the head section (C).

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

9. Put on the antistatic strap.
10. Disconnect all of the cables (F) on the module P.C. board (G) (see figure 4-18 on page 4-39).
11. Disconnect the air hose (H) from the hose connector (I).

NOTE:
Do not disconnect the air hoses between the manifold block and the P.C. board.

12. **Therapy surface with Advanced Microclimate® Technology (AMT) only**—disconnect the AMT blower hose from its bed frame connector and the blower assembly hose.

13. Carefully slide the module (E) out of the head section (C) (see figure 4-17 on page 4-38).

Figure 4-17. Air Module Cover

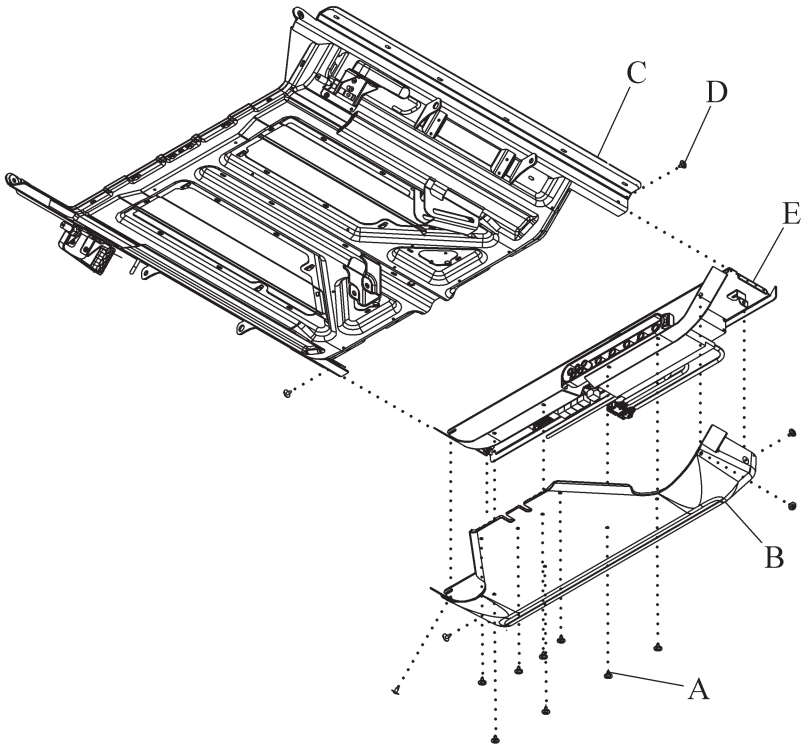
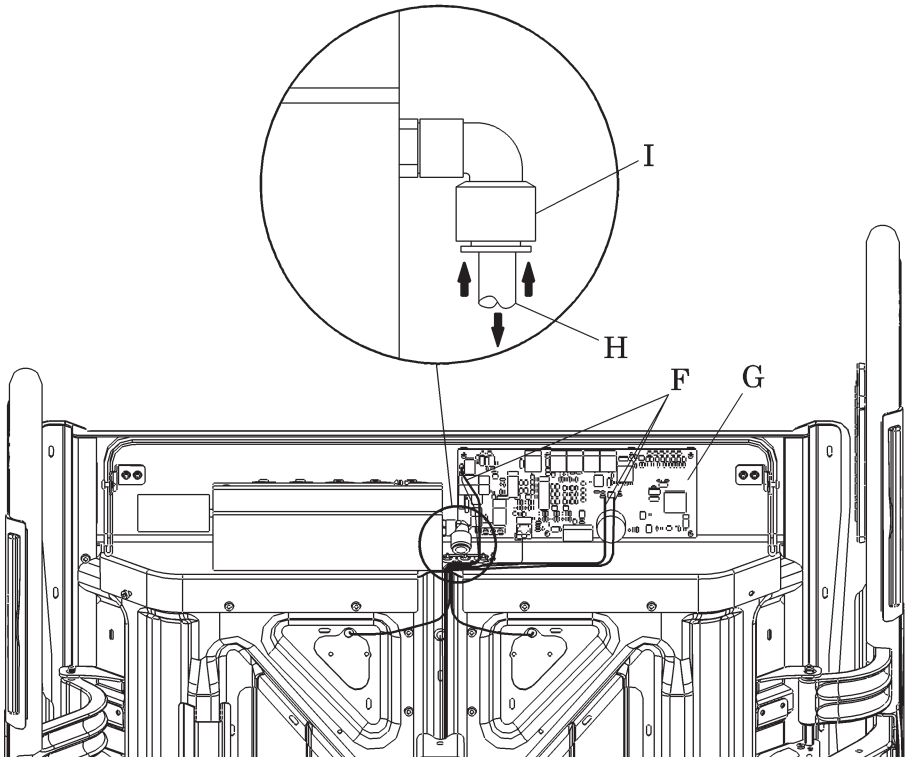


Figure 4-18. Air Module



Replacement

1. Do the removal procedure in reverse order.
2. Do the “Function Checks” on page 2-7.

4.14 Foot Hilow Motor

Tools required: T25 Torx® screwdriver
13 mm wrench
Antistatic strap
Wire cutters
Service kit—drive replacement (130016)

Removal

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

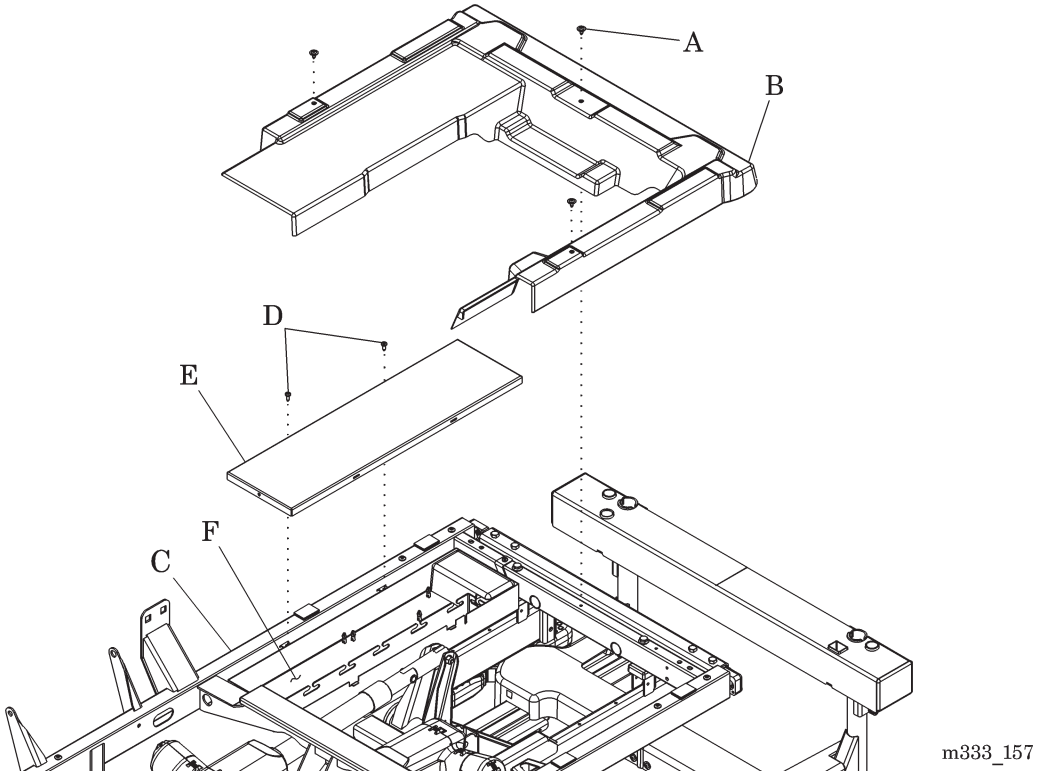
SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

4. Disconnect the bed from its power source.
5. Remove the three screws (A) that attach the cover (B) to the bed (C) (see figure 4-19 on page 4-41).
6. Remove the cover (B).
7. Remove the two screws (D) that attach the electronics module cover (E) to the electronics module (F).
8. Remove the electronics module cover (E).
9. Cut and remove any cable ties that attach the foot hilow drive cable to the electronics module (F).

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

10. Put on the antistatic strap.
11. Disconnect the foot hilow drive cable from the motor control P.C. board inside the electronics module (F).

Figure 4-19. Cover Removal



12. Remove the drive cable from the bed.

13. If the bed is in the lowest position, do as follows, otherwise go to step 14:

    a. Put the scissor jack (G) under the torque tube (H) (see figure 4-20 on page 4-42).

    b. Raise the jack (G) so there is approximately 6" (15 cm) between the intermediate frame (I) and the base frame (J).

NOTE:
It may be necessary to push down on the base frame to separate the intermediate frame from the base frame.

    c. Remove the jack (G).

14. Install the hoist (K) so the hooks (L) catch on the shafts (M) (see figure 4-21 on page 4-43).

NOTE:
If the IntelliDrive® Transport System drive box is installed, the hoist goes on top of the drive box.

Figure 4-20. Scissor Jack Position

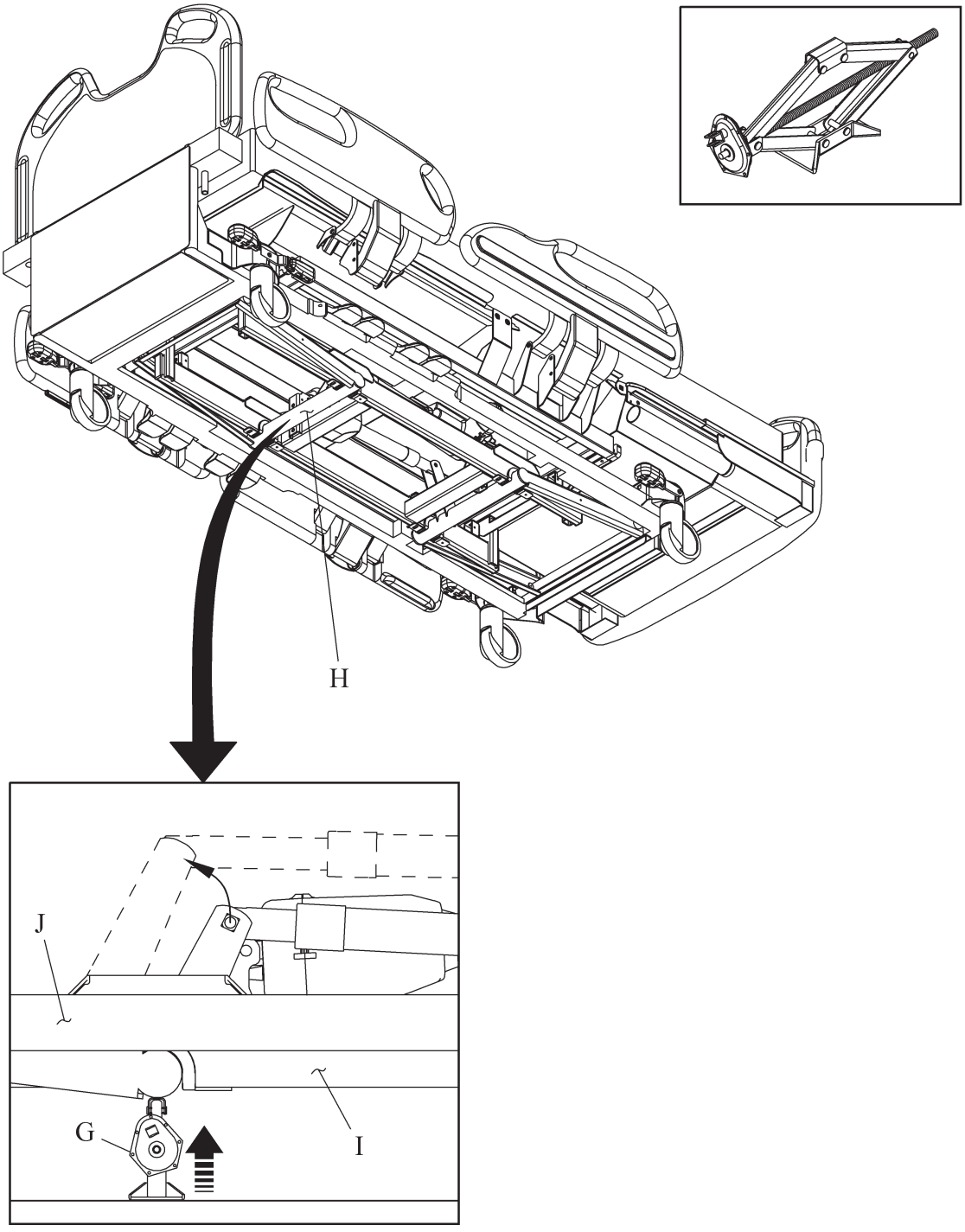
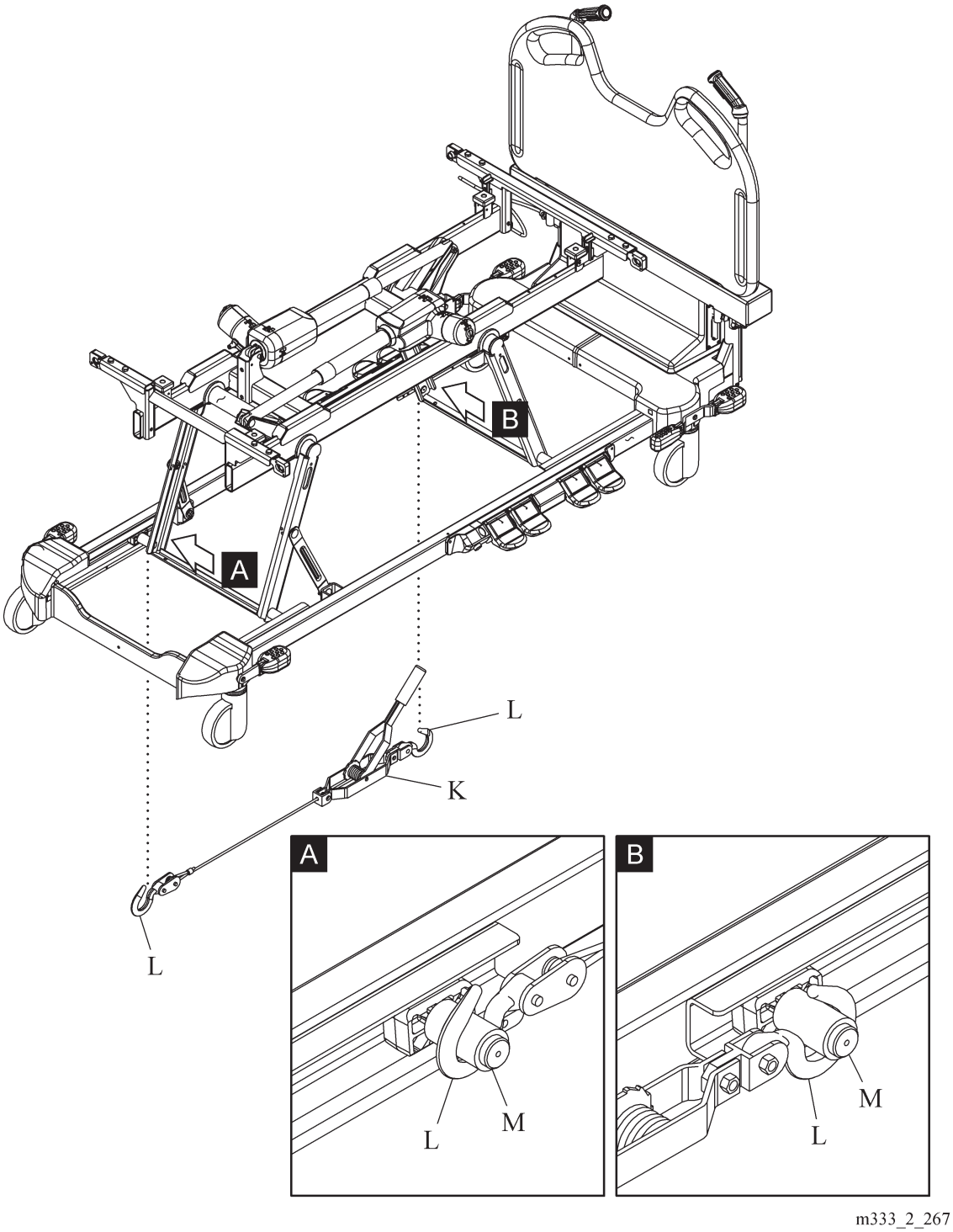


Figure 4-21. Hoist Installation



WARNING:
Failure to have the mounting pins loose enough to remove by hand could cause injury or equipment damage.

15. Tighten the hoist (K) enough to remove pressure from the mounting pins on the foot hilow drive.

16. Remove the rue ring (N) from the pin (O) on the motor end of the foot hilow drive (P) (see figure 4-22 on page 4-45).

17. Remove the nut (R) from the bolt (Q) on the shaft end of the foot hilow drive (P).

18. While supporting the drive (P), remove the pin (O) from the motor end.

19. While supporting the drive (P), remove the bolt (Q) from the shaft end.

20. Remove the drive (P) from the bed.

Replacement

1. Install the motor end of the new motor into the bed.

2. Connect the motor cable to the motor control P.C. board.

3. Plug the bed into an appropriate power source.

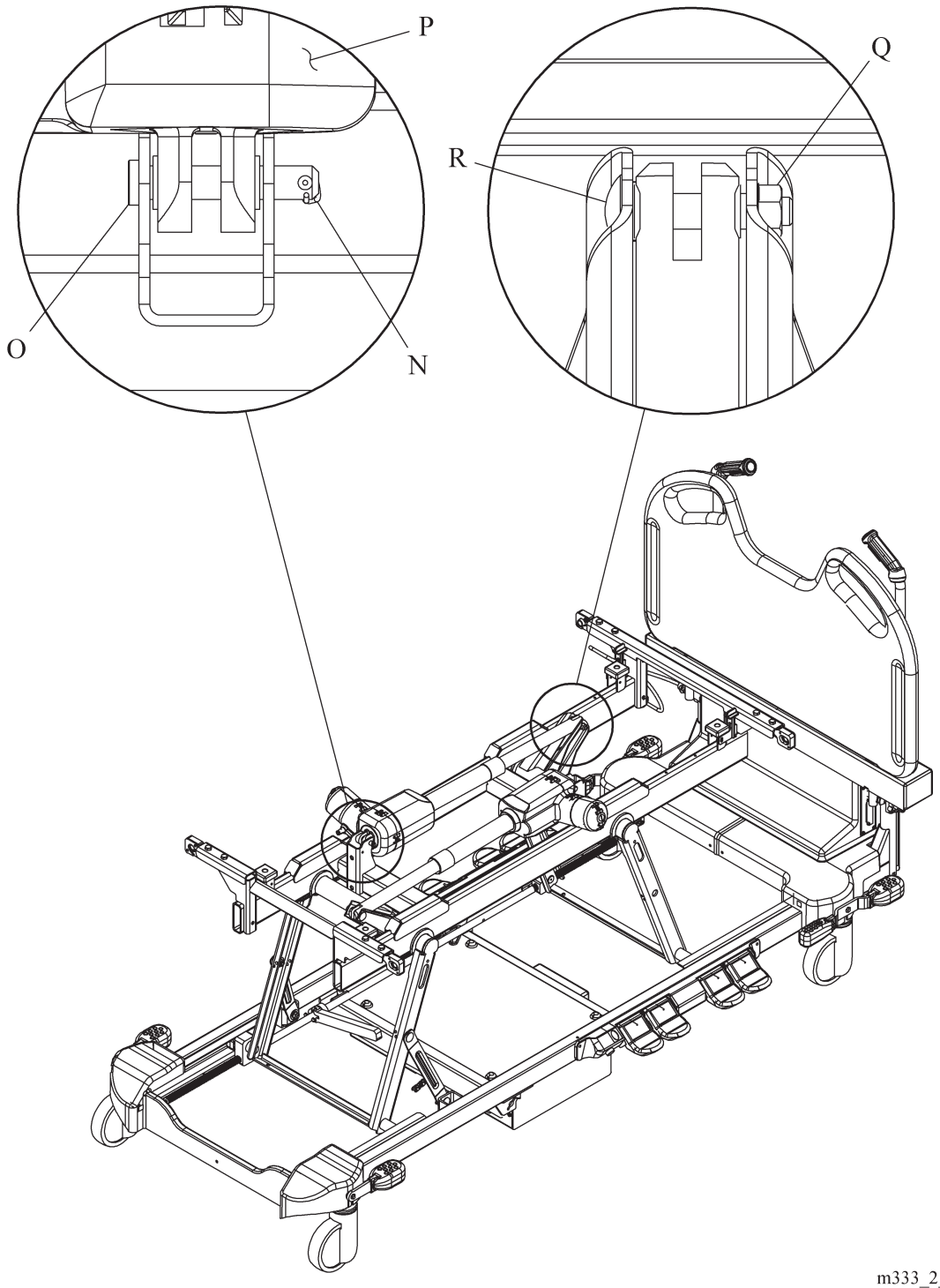
4. Operate the hilow function as necessary to align the shaft end of the motor with the lift arm on the bed.

5. Do the removal procedure in reverse order.

6. For a G model or newer bed with the head angle display, calibrate the head angle sensor (refer to procedure 6.2).

7. Do the “Function Checks” on page 2-7.

Figure 4-22. Motor Removal



4.15 Head Hilow Motor

Tools required: T25 Torx® screwdriver
13 mm wrench
Antistatic strap
Wire cutters
Service kit—drive replacement (130016)

Removal

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

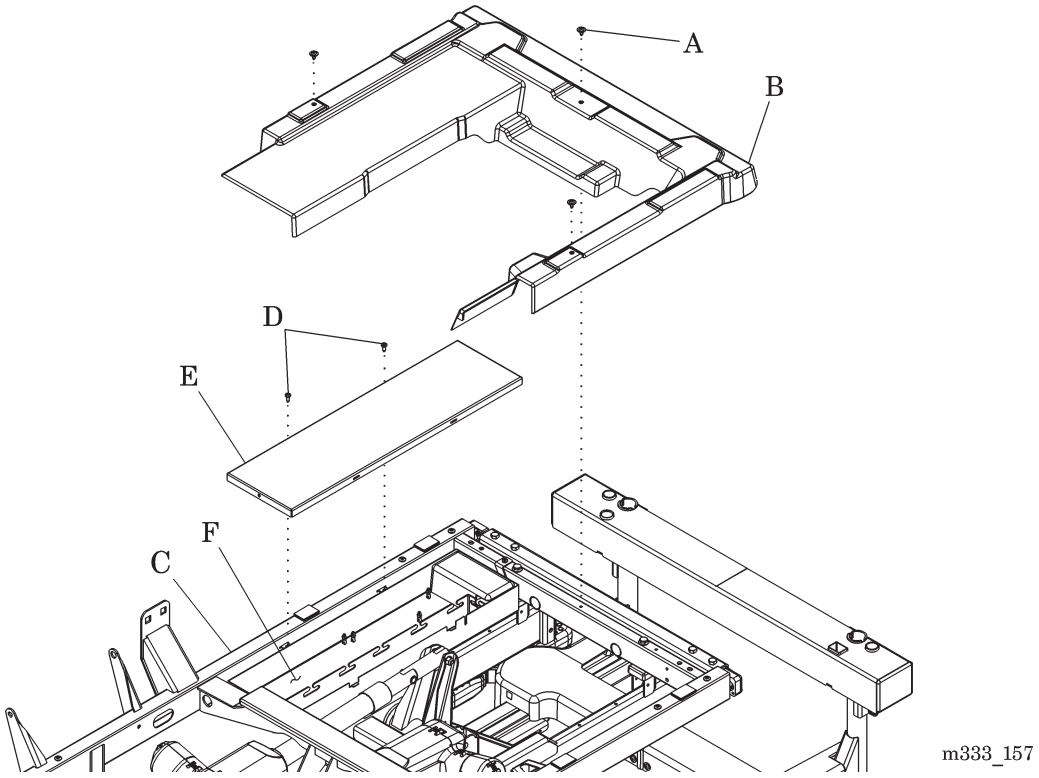
SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

4. Disconnect the bed from its power source.
5. Remove the three screws (A) that attach the cover (B) to the bed (C) (see figure 4-23 on page 4-47).
6. Remove the cover (B).
7. Remove the two screws (D) that attach the electronics module cover (E) to the electronics module (F).
8. Remove the electronics module cover (E).

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

9. Put on the antistatic strap.
10. Cut and remove any cable ties that attach the head hilow drive cable to the electronics module (F).
11. Disconnect the head hilow drive cable from the motor control P.C. board inside the electronics module (F).

Figure 4-23. Cover Removal



12. Remove the drive cable from the bed.
13. Remove the two screws (not shown) that attach the electronics module (F) to the bed (C).
14. Move the electronics module (F) to the side.
15. It is not necessary to disconnect the cables inside the electronics module.
16. If the bed is in the lowest position, do as follows, otherwise go to step 17:
    a. Put the scissor jack (G) under the torque tube (H) (see figure 4-24 on page 4-48).
    b. Raise the jack (G) so there is approximately 6" (15 cm) between the intermediate frame (I) and the base frame (J).
    c. It may be necessary to push down on the base frame to separate the intermediate frame (I) from the base frame (J).
    d. Remove the jack (G).
17. Install the hoist (K) so the hooks (L) catch on the shafts (M) (see figure 4-25 on page 4-49).

Figure 4-24. Scissor Jack Position

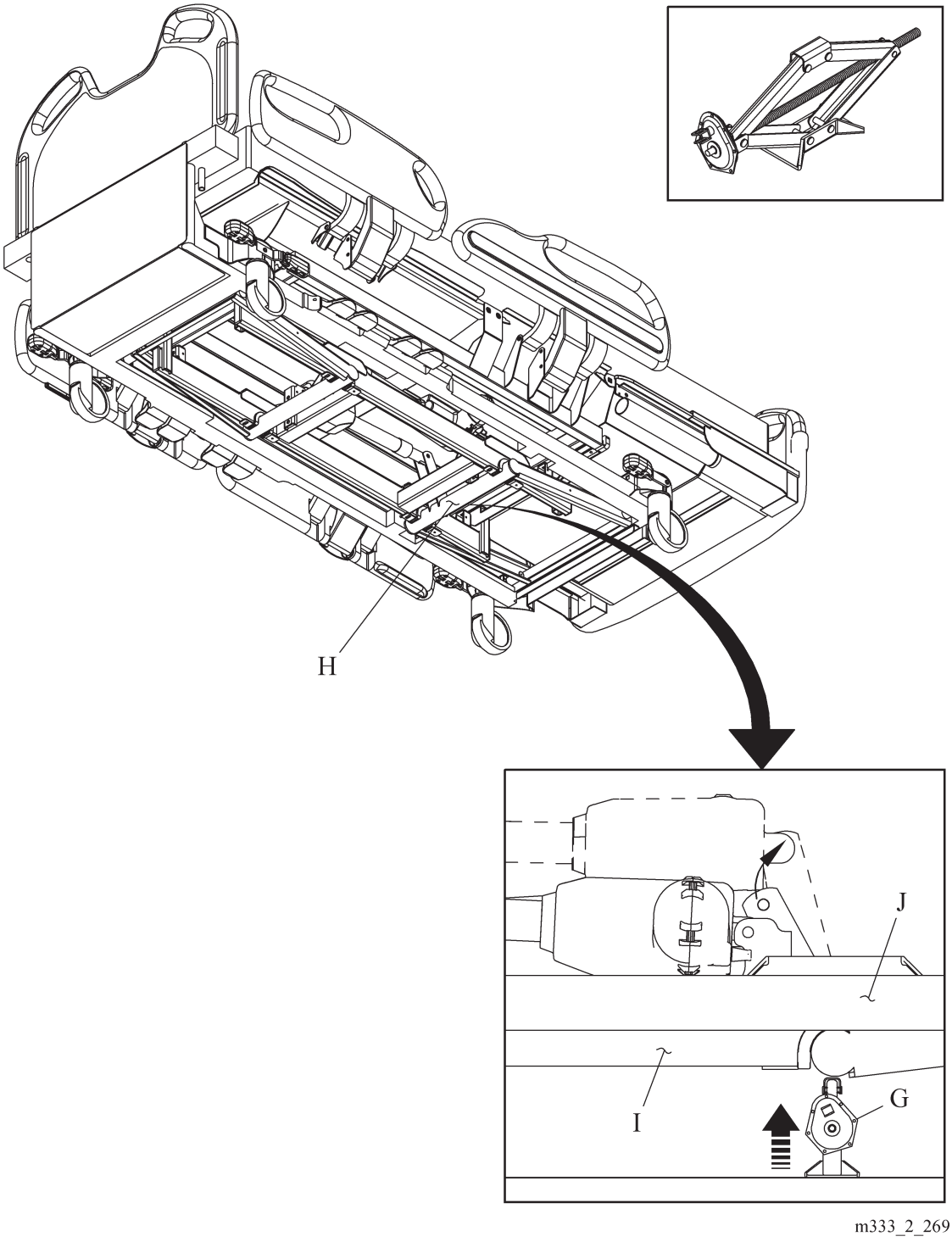
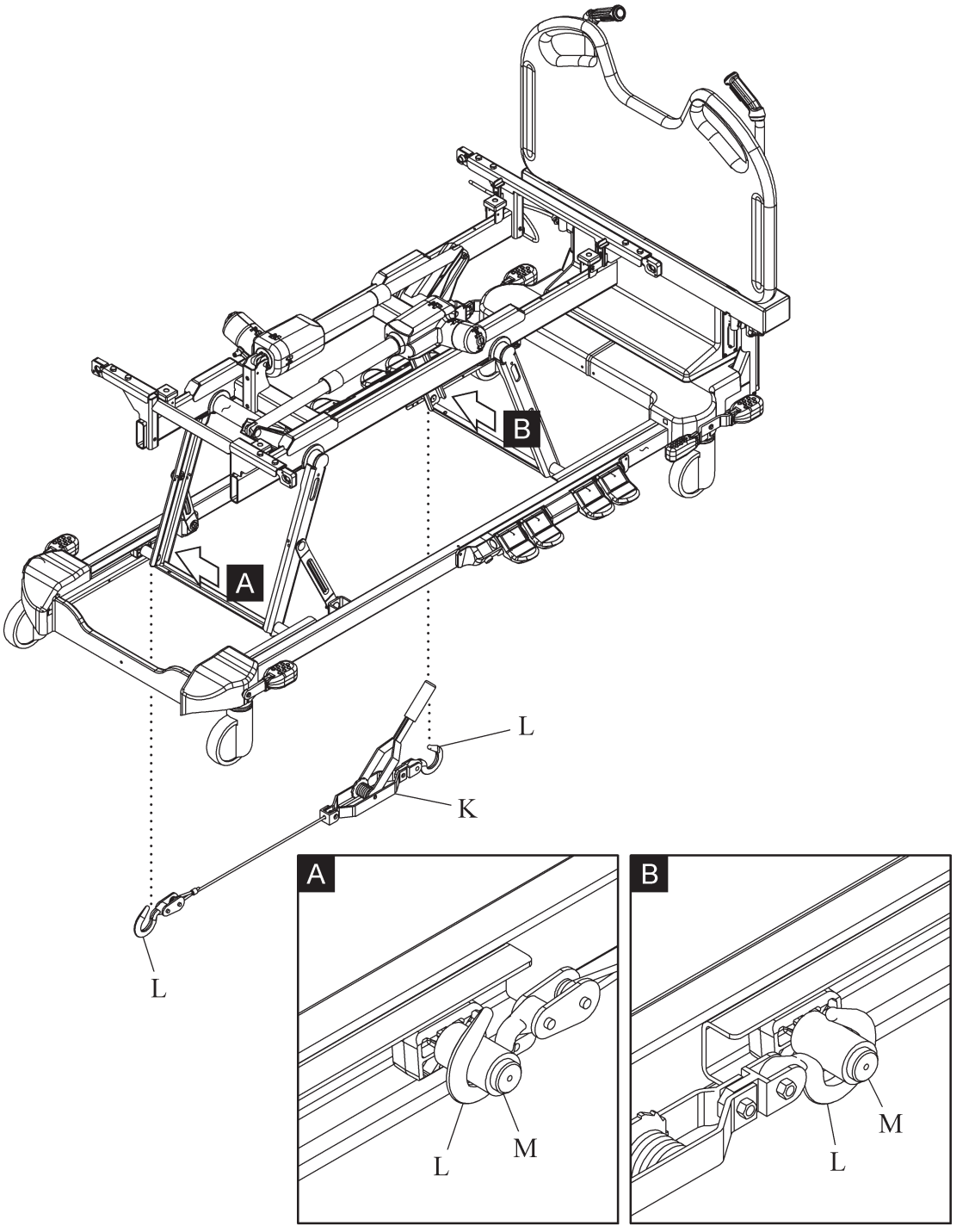


Figure 4-25. Hoist Installation



18. If the IntelliDrive® Transport System drive box is installed, the hoist goes on top of the drive box.

WARNING:
Failure to have the mounting pins loose enough to remove by hand could cause injury or equipment damage.

19. Tighten the hoist (K) enough to remove pressure from the mounting pins on the head hilow drive.

20. Remove the rue ring (N) from the pin (O) on the motor end of the head hilow drive (P) (see figure 4-26 on page 4-51).

21. Remove the nut (R) from the bolt (Q) on the shaft end of the head hilow drive (P).

22. While supporting the drive (P), remove the pin (O) from the motor end.

23. While supporting the drive (P), remove the bolt (Q) from the shaft end.

24. Remove the drive (P) from the bed.

Replacement

1. Install the motor end of the new motor into the bed.

2. Connect the motor cable to the motor control P.C. board.

3. Plug the bed into an appropriate power source.

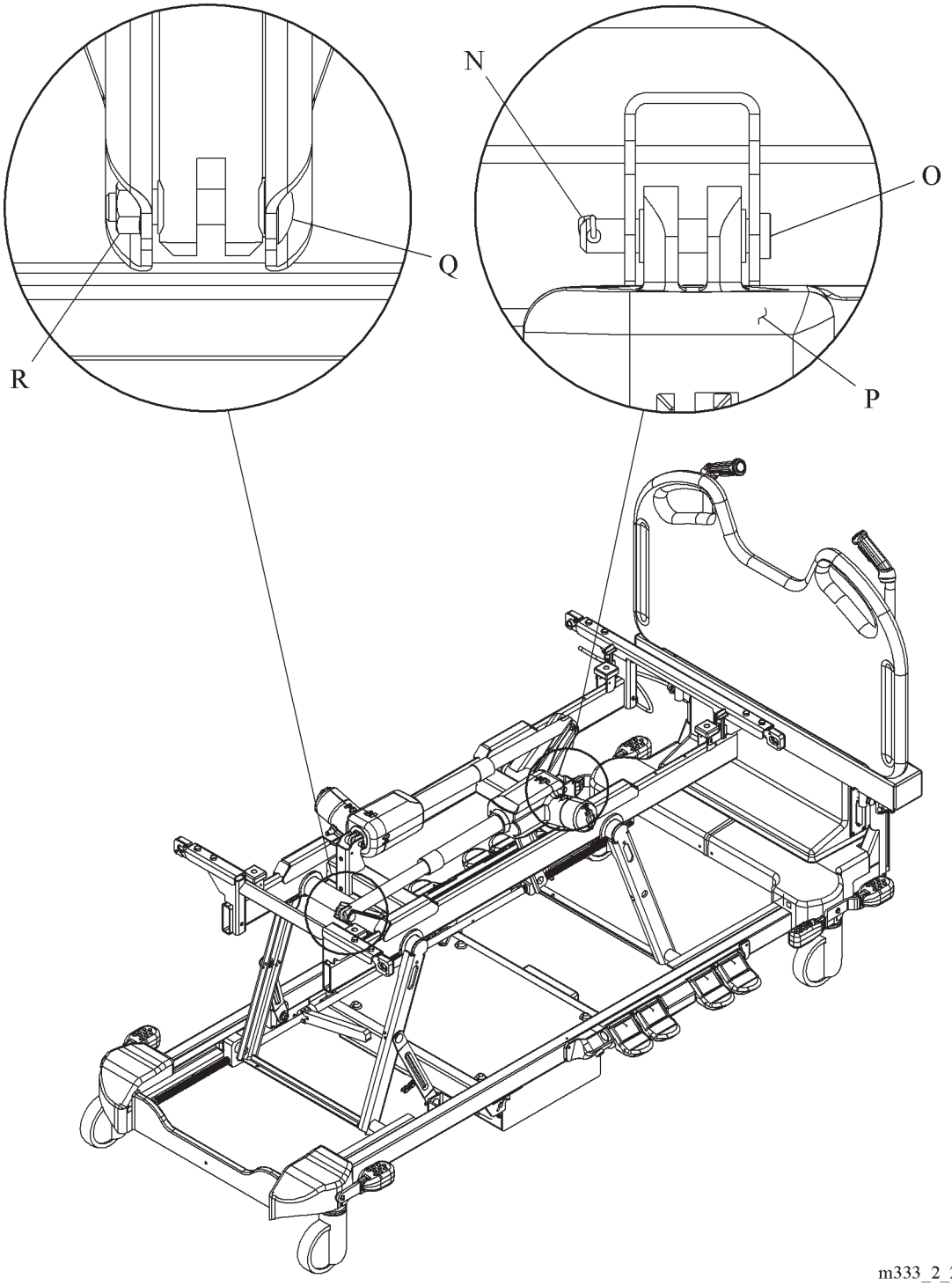
4. Operate the hilow function as necessary to align the shaft end of the motor with the lift arm on the bed.

5. Do the removal procedure in reverse order.

6. For a G model or newer bed with the head angle display, calibrate the head angle sensor (refer to procedure 6.2).

7. Do the “Function Checks” on page 2-7.

Figure 4-26. Motor Removal



4.16 Head Section Motor

Tools required: T25 Torx® screwdriver
Wire cutters
13 mm wrench
2" x 4" x 36" piece of wood

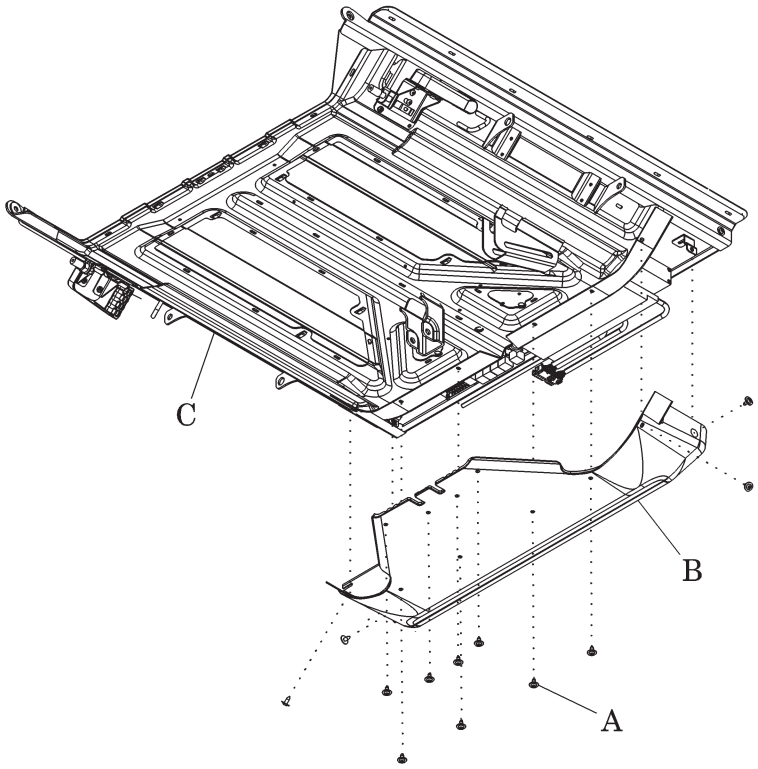
Removal

1. Set the brakes.
2. Raise the bed to the high position.
3. Use the CPR release to raise the head section to the highest position.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

4. Disconnect the bed from its power source.
5. Disconnect the CPR cables from the motor (refer to procedure 4.3).
6. Remove the screws (A) that attach the cover (B) to the head section (C) (see figure 4-27 on page 4-53).
7. Remove the cover (B).
8. If the bed is a non-air bed, disconnect the head section motor adapter cable (not shown).
9. If the bed is an air bed, disconnect the head section motor from the air module P.C. board.

Figure 4-27. Cover Removal



10. Put the piece of wood between the head section and the weigh frame.
11. Remove the two screws (D) that attach the cable cover (E) to the CPR control box (F) (see figure 4-28 on page 4-54).
12. Remove the pin (G) from the CPR actuator pin (H).
13. Slide the CPR control box (F) down to clear the CPR actuator pin (H).
14. Remove the nut (I) from the bolt (J) (see figure 4-29 on page 4-55).
15. Remove the bolt (J) from the mounting bracket (L).
16. Remove the rue ring (M) from the pin (N) on the motor end of the motor (K).
17. While supporting the motor (K), remove the pin (N) from the motor (K).
18. Remove the motor (K) from the head section.

Figure 4-28. CPR Actuator

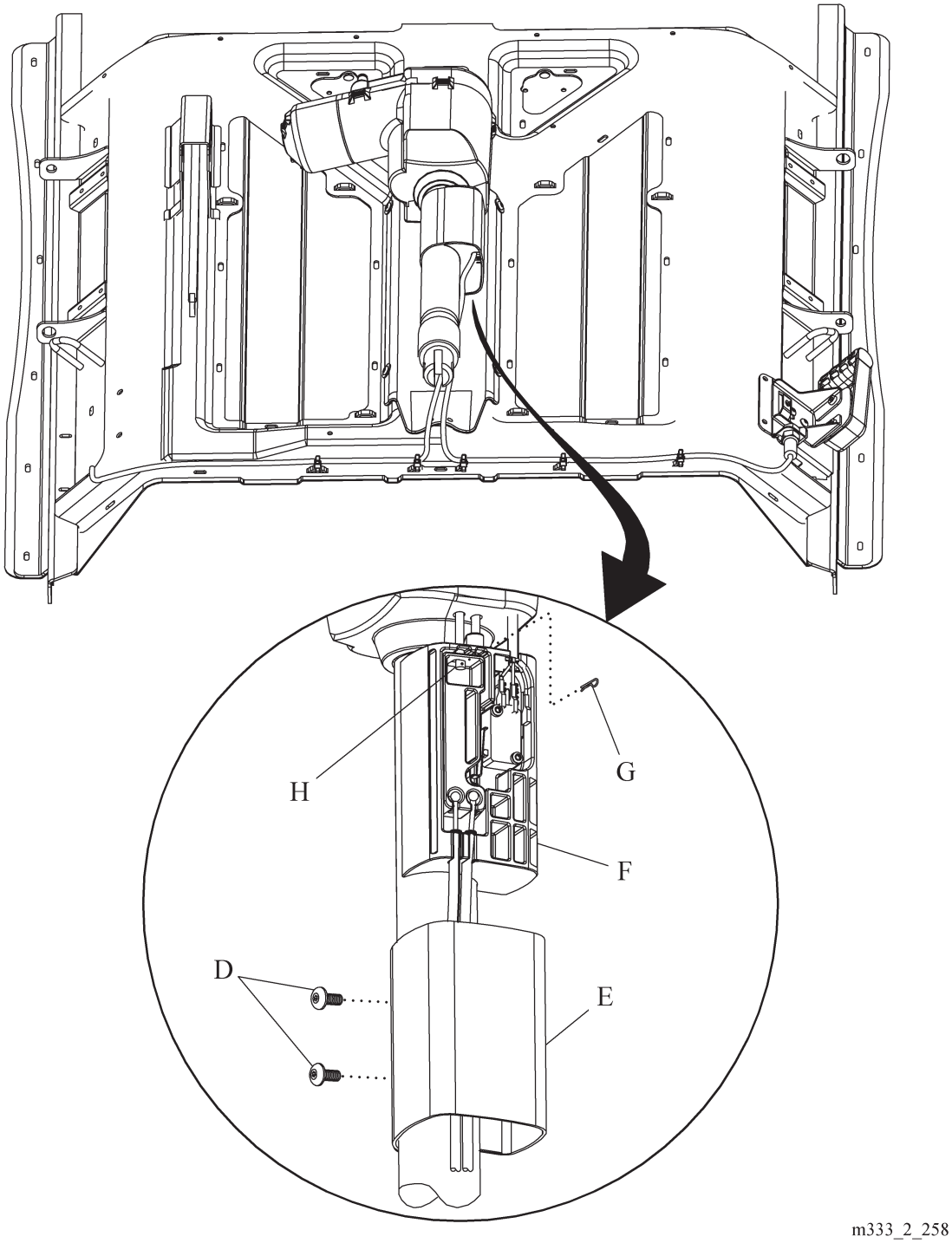
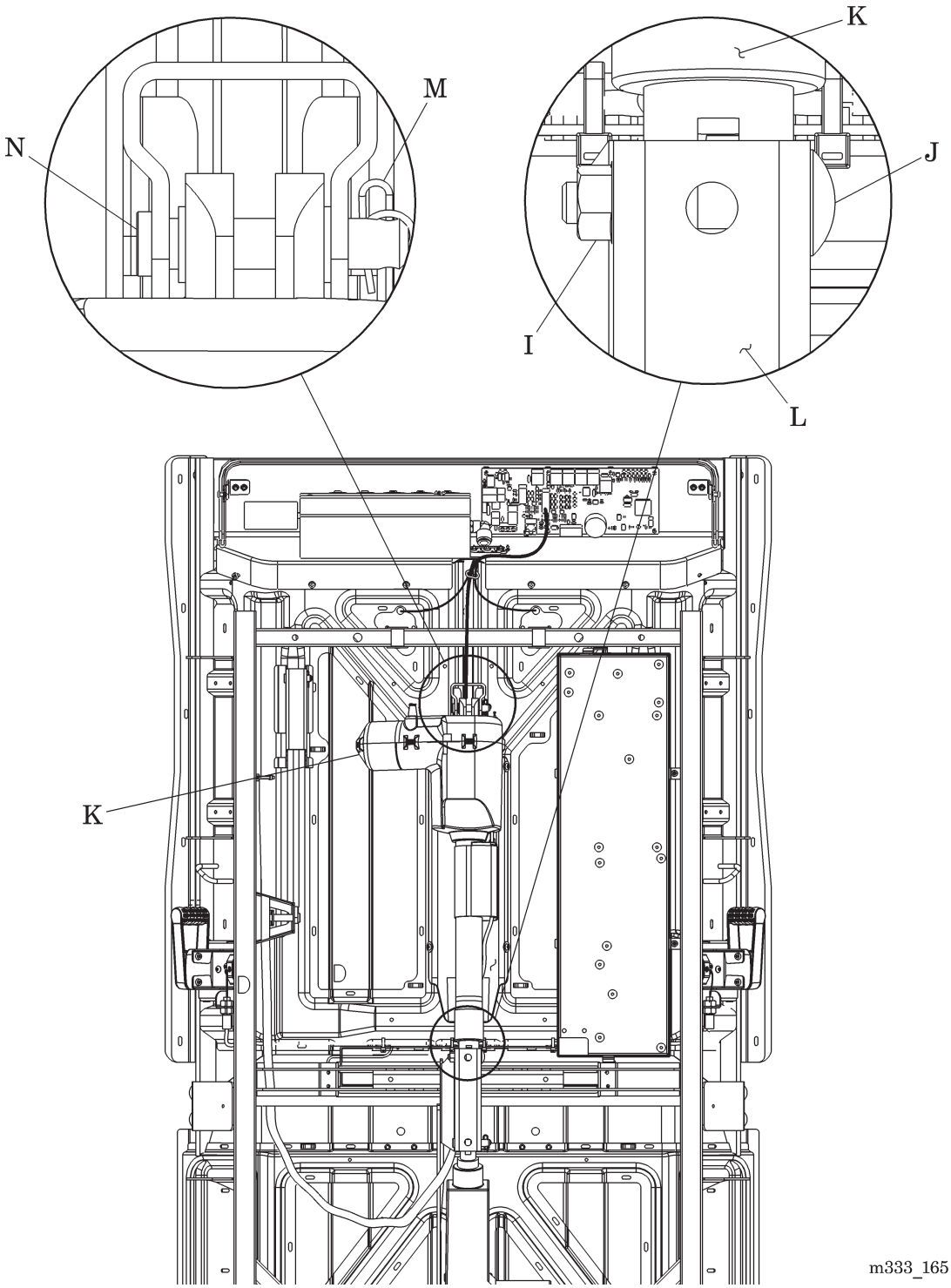


Figure 4-29. Motor Removal



Replacement

1. Do the removal procedure in reverse order.

NOTE:
Connecting the head section motor, and then extending or retracting the motor to align the mount pins may be required.

2. For a G model or newer bed with the head angle display, calibrate the head angle sensor (refer to procedure 6.2).

3. Do the “Function Checks” on page 2-7.

4.17 Knee Section Motor

Tools required: T25 Torx® screwdriver
Wire cutters
13 mm wrench
Jack stands

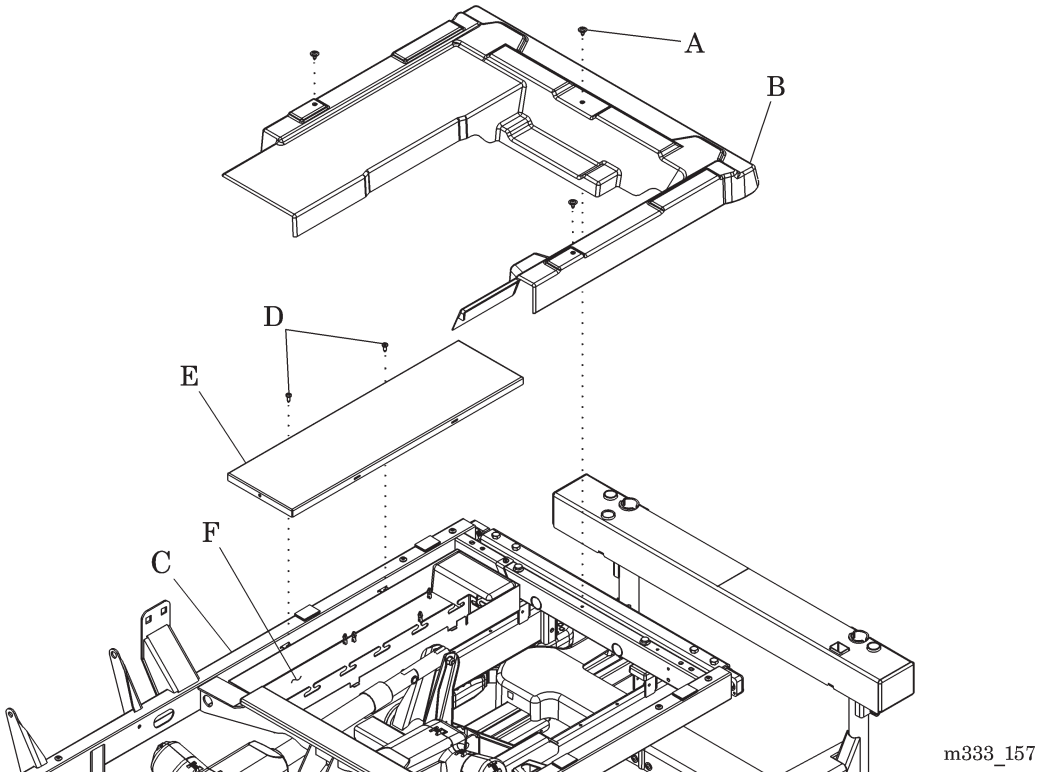
Removal

1. Set the brakes.
2. Raise the bed to the high position.
3. Raise the head section to the highest position.
4. Place the jack stands under the knee section.
5. Carefully lower the bed onto the jack stands to relieve pressure on the knee motor.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

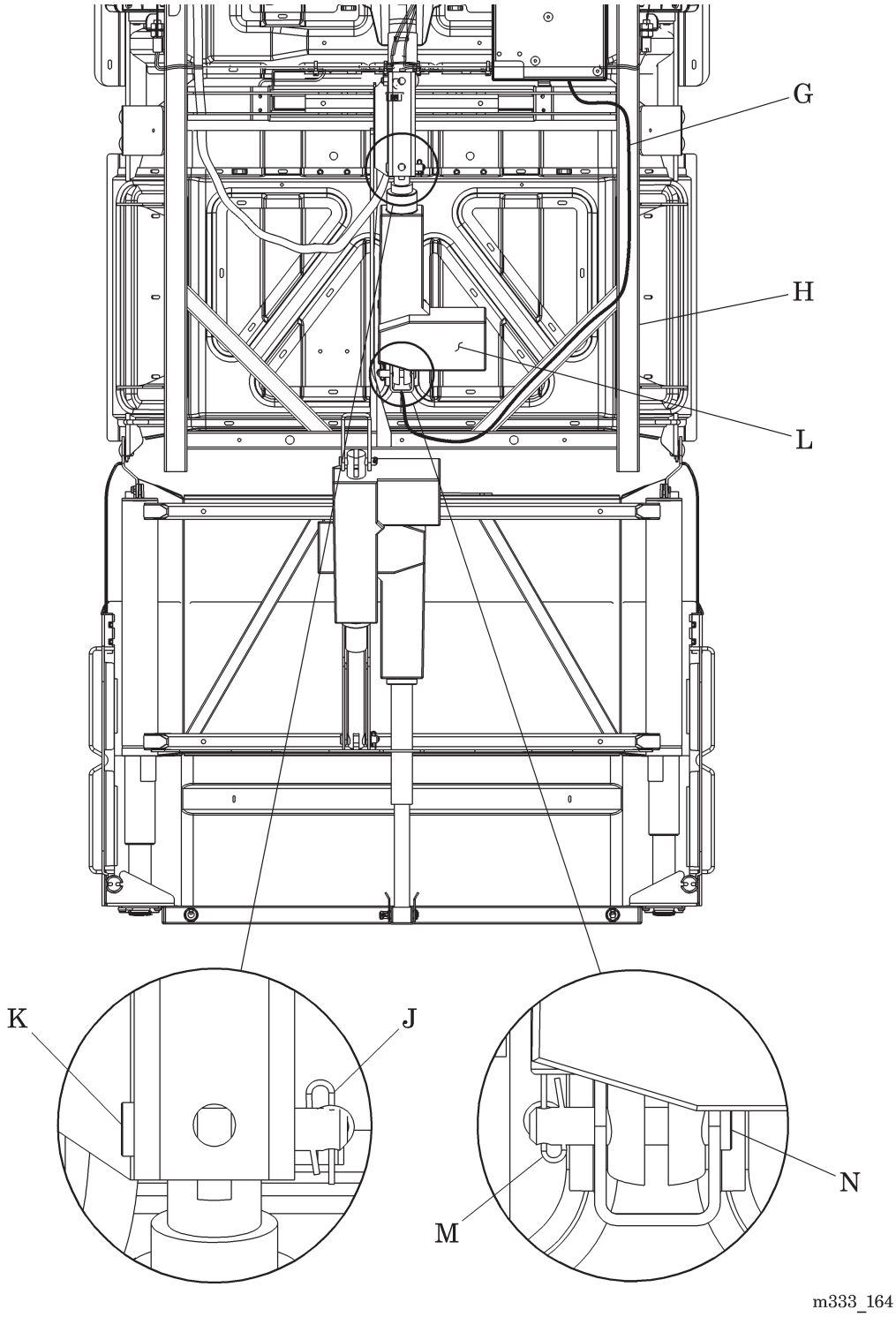
6. Disconnect the bed from its power source.
7. Remove the screws (A) that attach the cover (B) to the bed (C) (see figure 4-30 on page 4-58).
8. Remove the cover (B).
9. Remove the two screws (D) that attach the electronics module cover (E) to the electronics module (F).
10. Remove the electronics module cover (E).
11. Disconnect the knee section motor from the motor control P.C. board inside the electronics module (F).
12. Cut and remove any cable ties that attach the motor cable (G) to the bed frame (H) (see figure 4-31 on page 4-59).
13. Remove the rue ring (J) from the pin (K) at the foot end of the motor (L).
14. Remove the rue ring (M) from the pin (N) at the head end of the motor (L).

Figure 4-30. Cover Removal



15. While supporting the motor (L), remove the foot end pin (K).
16. While supporting the motor (L), remove the head end pin (N).
17. Remove the motor (L) from the bed.

Figure 4-31. Motor Removal



Replacement

1. Do the removal procedure in reverse order.

NOTE:
Connecting the knee motor, and then extending or retracting the motor to align the mount pins may be required.

2. Do the “Function Checks” on page 2-7.

4.18 Foot Motor

Tools required: T25 Torx® screwdriver
Wire cutters
Jack stands

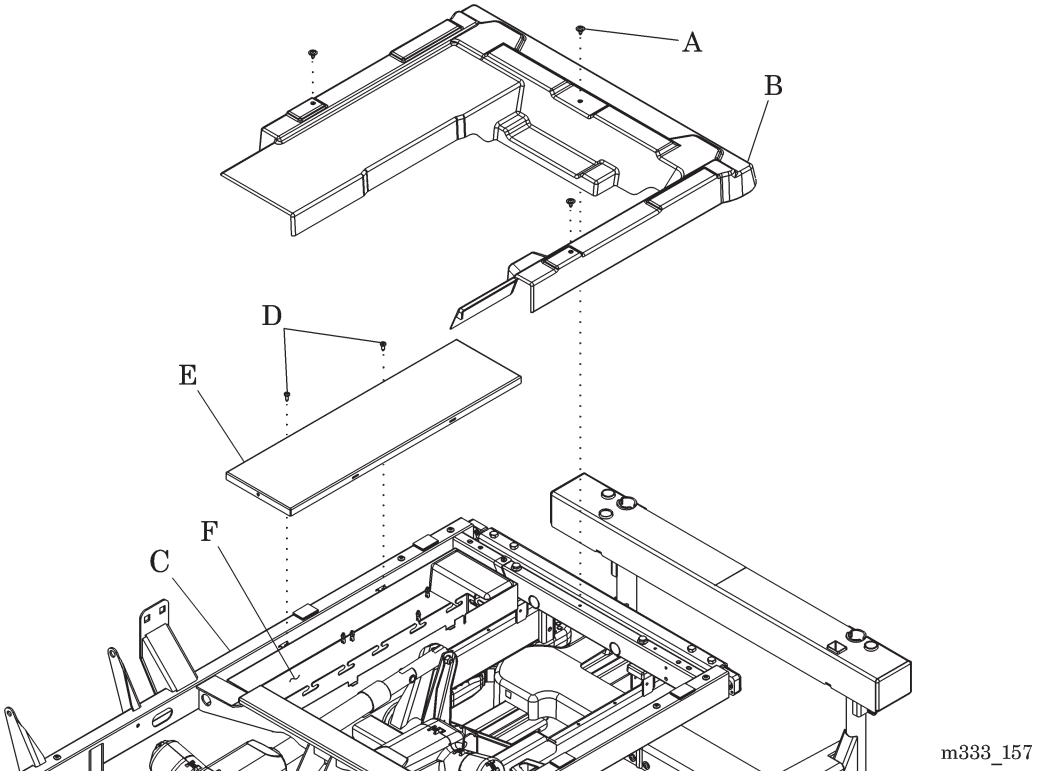
Removal

1. Set the brakes.
2. Raise the bed to the high position.
3. Raise the head section to the highest position.
4. Put the jack stands under the foot section.
5. Carefully lower the bed onto the jack stands to relieve pressure on the foot motor.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

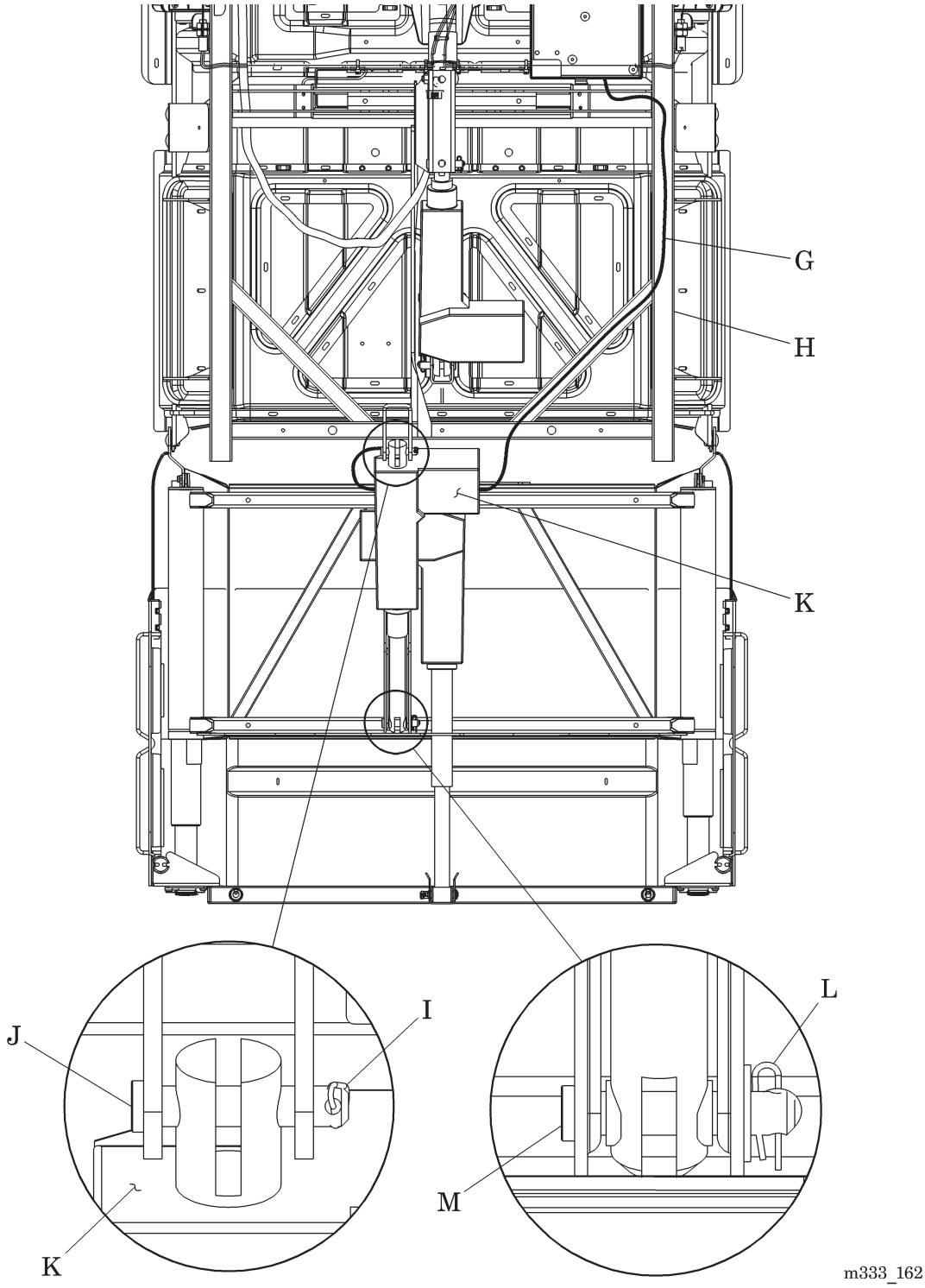
6. Disconnect the bed from its power source.
7. Remove the screws (A) that attach the cover (B) to the bed (C) (see figure 4-32 on page 4-62).
8. Remove the cover (B).
9. Remove the two screws (D) that attach the electronics module cover (E) to the electronics module (F).
10. Remove the electronics module cover (E).
11. Disconnect the foot section motor from the motor control P.C. board inside the electronics module (F).
12. Cut and remove any cable ties that attach the motor cable (G) to the bed frame (H) (see figure 4-33 on page 4-63).
13. Remove the rue ring (I) from the pin (J) at the foot end of the motor (K).
14. Remove the rue ring (L) from the pin (M) at the head end of the motor (K).

Figure 4-32. Cover Removal



15. While supporting the motor (K), remove the foot end pin (J).
16. While supporting the motor (K), remove the head end pin (M).
17. Remove the motor (K) from the bed.

Figure 4-33. Motor Removal



Replacement

1. Do the removal procedure in reverse order.

NOTE:
Connecting the foot motor, and then extending or retracting the motor to align the mount pins may be required.

2. Do the “Function Checks” on page 2-7.

4.19 Foot Extend Motor

Tools required: T25 Torx® screwdriver
Wire cutters

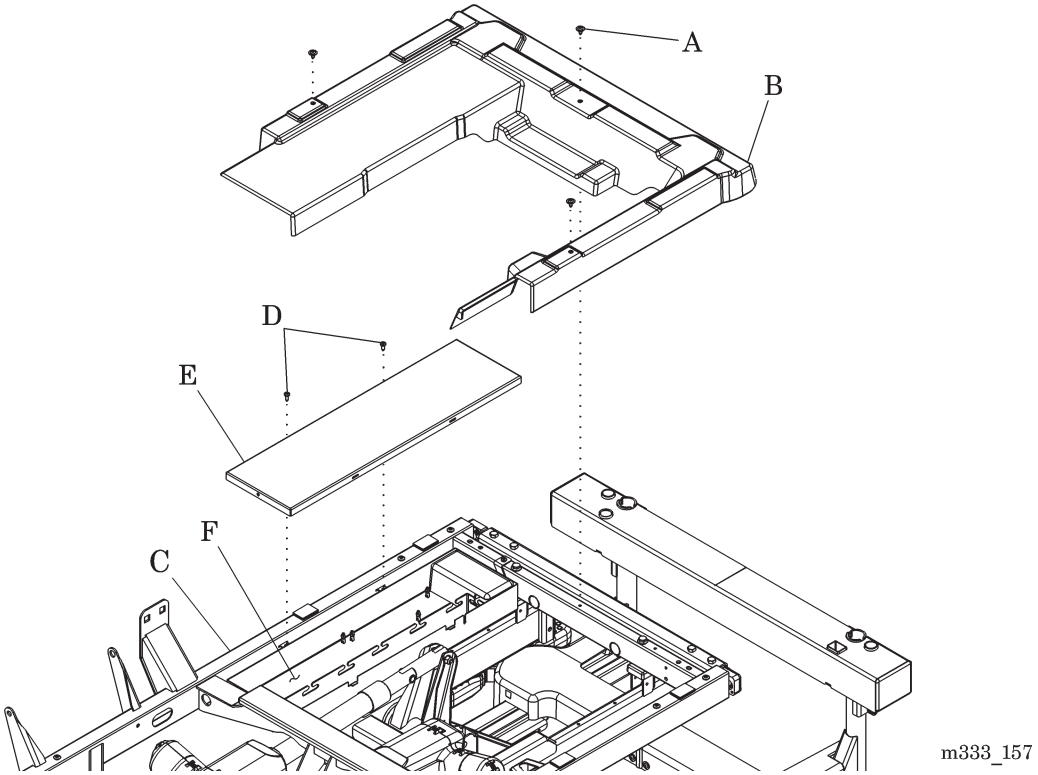
Removal

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

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

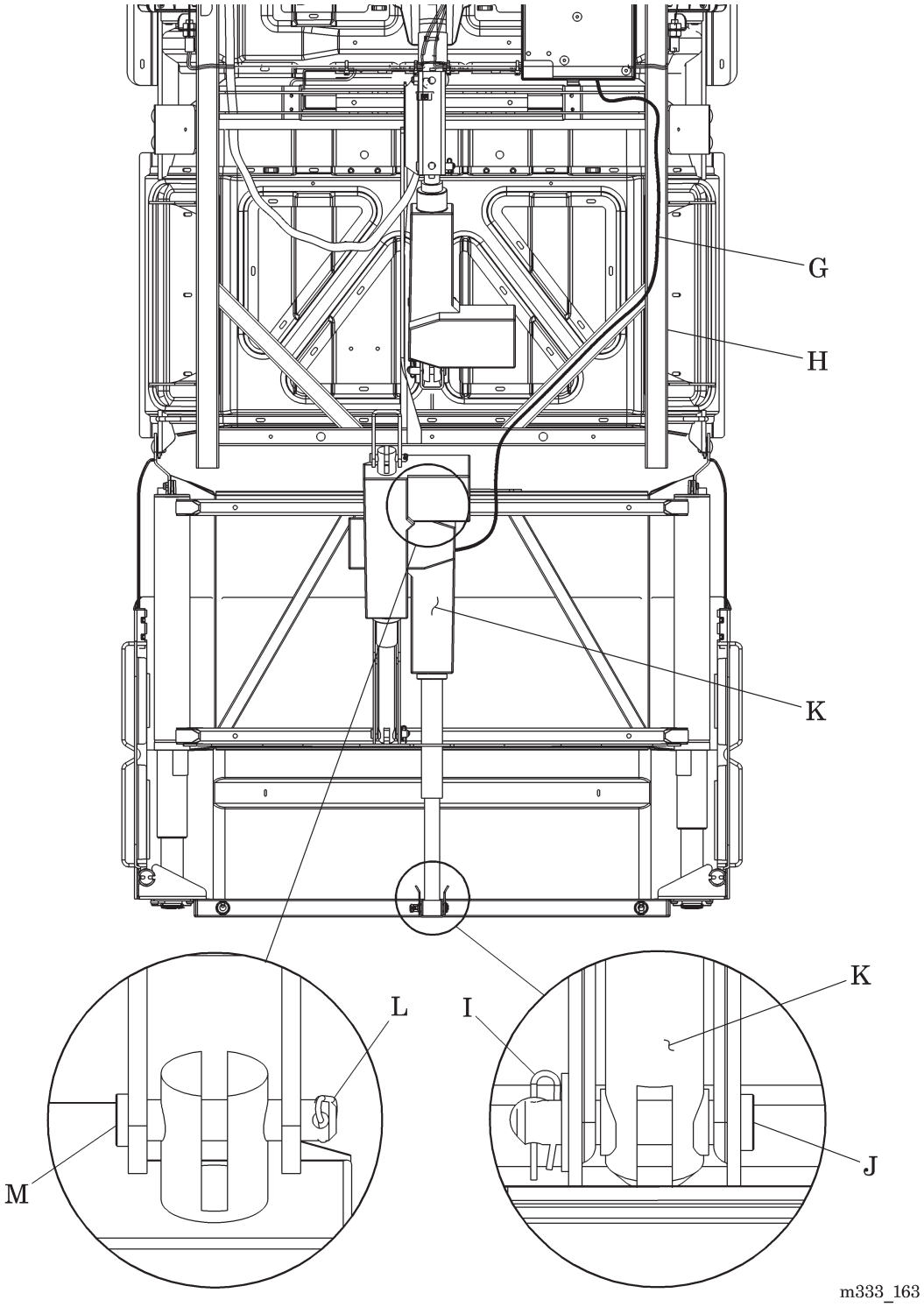
4. Disconnect the bed from its power source.
5. Remove the screws (A) that attach the cover (B) to the bed (C) (see figure 4-34 on page 4-66).
6. Remove the cover (B).
7. Remove the two screws (D) that attach the electronics module cover (E) to the electronics module (F).
8. Remove the electronics module cover (E).
9. Disconnect the foot section motor from the motor control P.C. board inside the electronics module (F).
10. Cut and remove any cable ties that attach the motor cable (G) to the bed frame (H) (see figure 4-35 on page 4-67).
11. Remove the rue ring (I) from the pin (J) at the foot end of the motor (K).
12. Remove the rue ring (L) from the pin (M) at the head end of the motor (K).

Figure 4-34. Cover Removal



13. While supporting the motor (K), remove the foot end pin (J).
14. While supporting the motor (K), remove the head end pin (M).
15. Remove the motor (K) from the bed.

Figure 4-35. Motor Removal



Replacement

1. Do the removal procedure in reverse order.

NOTE:
Connecting the foot extension motor, and then extending or retracting the motor to align the mount pins may be required.

2. Do the “Function Checks” on page 2-7.

4.20 Load Beam—A through H Models

Tools required:
- T25 Torx® screwdriver
- Wire cutters
- Antistatic strap
- 13 mm wrench
- String, 10' (305 cm)

Removal

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

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

4. Disconnect the bed from its power source.
5. Remove the screws (A) that attach the cover (B) to the bed (C) (see figure 4-36 on page 4-70).
6. Remove the cover (B).

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

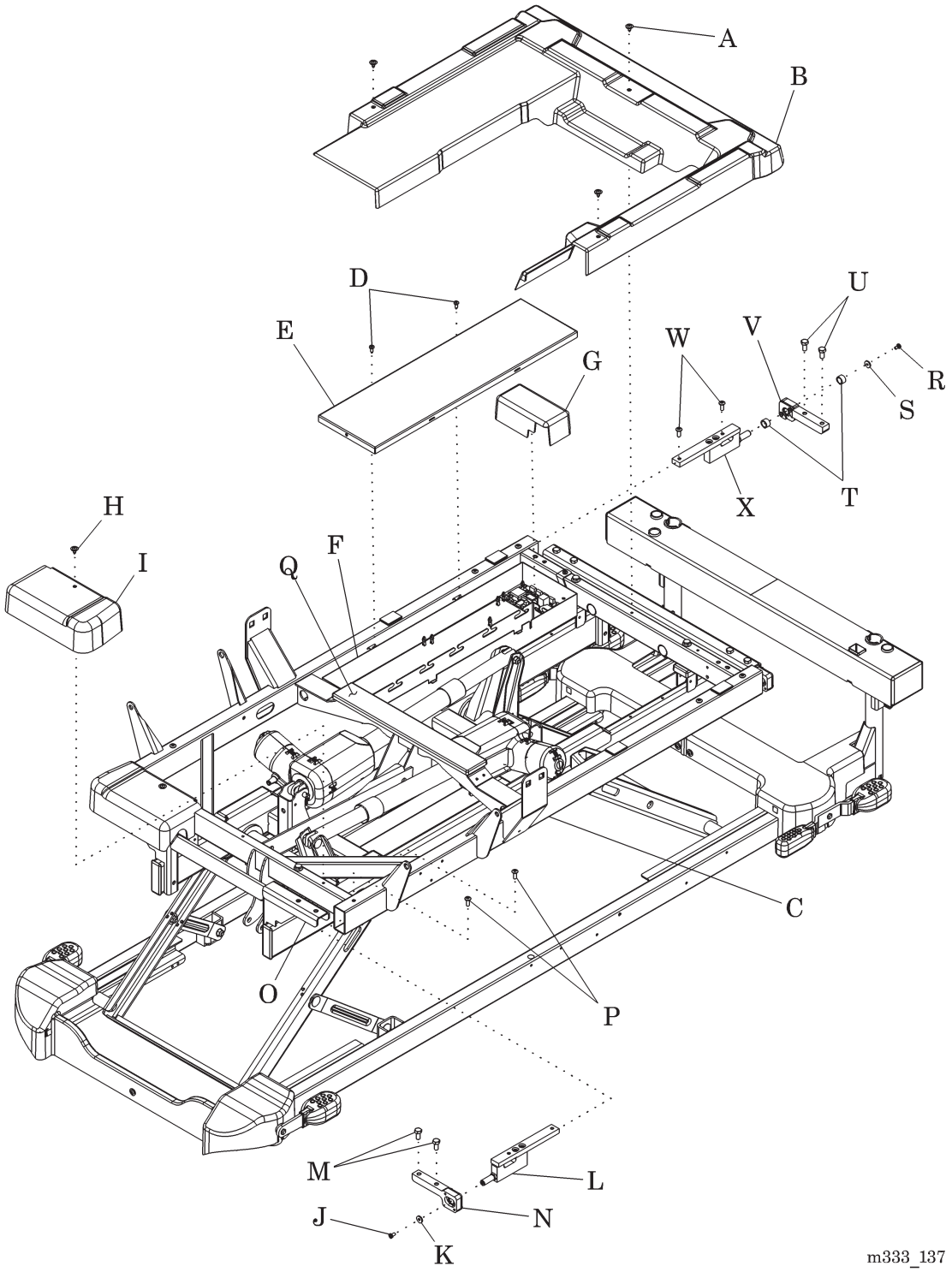
7. Put on the antistatic strap.
8. Remove the two screws (D) that attach the electronics module cover (E) to the electronics module (F).
9. Remove the electronics module cover (E).
10. If installed, remove the cover (G).
11. Disconnect the affected load beam cable from the scale P.C. board.
12. Tie the string to the end of the load beam cable.
13. For the foot end and left head end load beam, do as follows:
    a. Remove the screw (H) that attaches the foot cover (I) to the bed (C).

NOTE:
The foot cover does not need to be removed for the left head end load beam.

b. Remove the cover (I).

c. Remove the screw (J) and washer (K) from the end of the load beam (L).

Figure 4-36. Load Beam—A through H Models



d. Remove the two bolts (M) that attach the block (N) to the intermediate frame (O).

e. Remove the block (N) from the intermediate frame (O).

f. Remove the block (N) from the load beam (L).

g. Remove the two screws (P) that attach the load beam (L) to the bed (C).

h. Remove the channel cover (Q).

i. Remove the load beam (L) from the bed (C).

NOTE:
The string will act as a pull string for routing the new load beam cable through the bed during installation.

14. For the right head end load beam, do as follows:

a. Remove the screw (R) and washer (S) from the end of the load beam (X).

b. Remove the outer plastic spacer (T) from the load beam (X).

c. Remove the two bolts (U) that attach the block (V) to the intermediate frame (O).

d. Remove the block (V) from the intermediate frame (O).

e. Remove the inner plastic spacer (T) from the load beam (X).

f. Remove the two screws (W) that attach the load beam (X) to the intermediate frame (O).

g. Remove the load beam from the bed (C).

NOTE:
The string will act as a pull string for routing the new load beam cable through the bed during installation.

Replacement

1. Do the removal procedure in reverse order.

2. Calibrate the scale (see “Scale Calibration” on page 6-15).

3. Do the “Function Checks” on page 2-7.

4.21 Load Beam—J Models

Tools required: T30 Torx® screwdriver
T25 Torx® screwdriver
Wire cutters
String, 10' (305 cm)
Antistatic strap

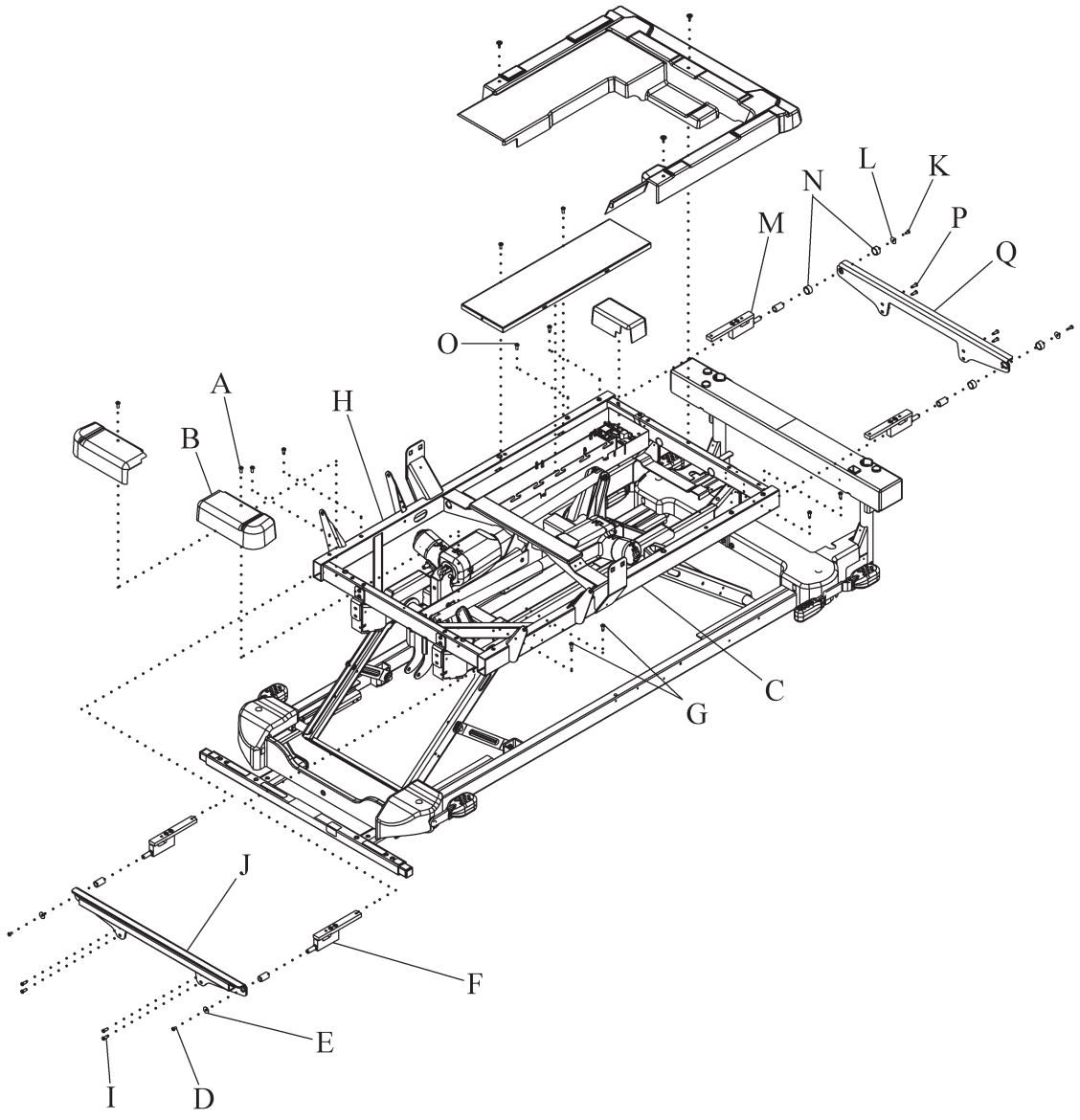
Removal

1. Do step 1 through step 12 on page 4-69.
2. For a foot end load beam, do as follows:
   a. Remove the screws (A) that attach the foot covers (B) to the bed (C).
   b. Remove the covers (B).
   c. Remove the screws (D) and washers (E) from the end of the load beams (F).
   d. Remove the screws (G) that attach the load beams (F) to the bed (C).
   e. Raise the intermediate frame (H) to remove pressure from the load beam (F).
   f. Push the load beams (F) into the bed frame.
   g. Remove the four screws (I) that attach the end plate (J) to the bed (C).
   h. Remove the load beam (F).

NOTE:
The string will act as a pull string for routing the new load beam cable through the bed during installation.

3. For a head end load beam, do as follows:
   a. Remove the screws (K) and washers (L) from the end of the load beams (M).
   b. Remove the outer plastic spacers (N) from the load beams (M).
   c. Remove the screws (O) that attach the load beams (M) to the bed (C).
   d. Raise the intermediate frame (H) to remove pressure from the load beams (M).
   e. Push the load beams (M) into the bed frame.
   f. Remove the four screws (P) that attach the end plate (Q) to the bed (C).

Figure 4-37. Load Beam—J Models



g. Remove the inner plastic spacers (N) from the load beams (M).

h. Remove the load beam (M).

NOTE:
The string will act as a pull string for routing the new load beam cable through the bed during installation.

Replacement

1. Do the removal procedure in reverse order.
2. Calibrate the scale (see “Scale Calibration” on page 6-15).
3. Do the “Function Checks” on page 2-7.

4.22 Battery

Tools required: T20 Torx® screwdriver
T25 Torx® screwdriver
Wire cutters

Removal

NOTE:
The batteries must be replaced in pairs.

1. Set the brakes.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

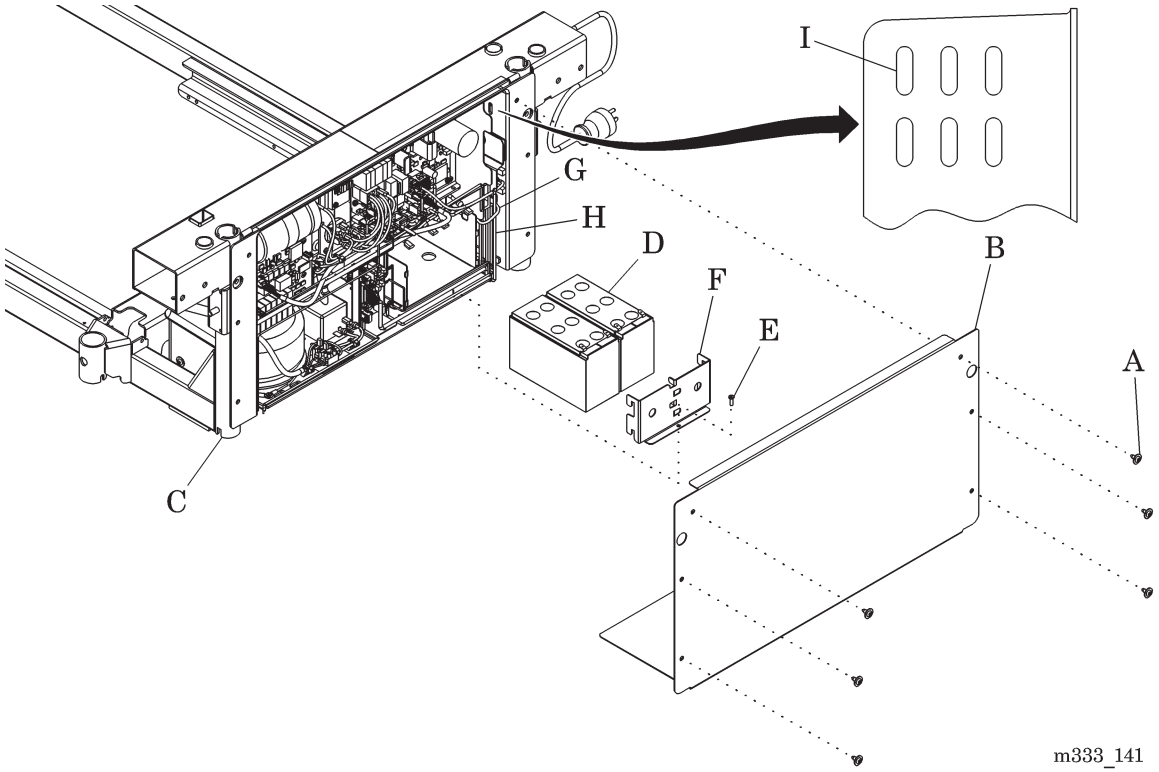
2. Disconnect the bed from its power source.

NOTE:
If the battery function is active, the bed must be plugged in, then unplugged to deactivate the battery.

3. Remove the six screws (A) that attach the power supply module cover (B) to the bed (C) (see figure 4-38 on page 4-76).
4. Remove the cover (B).
5. Make note of the position of the cables on the batteries (D).
6. Remove the cable tie (G) from the wire bundle (H).
7. Disconnect the cables on the batteries (D).
8. Remove the screw (E) that attaches the bracket (F) to the bed (C).
9. Remove the bracket (F).

WARNING:
If battery fluid touches skin or clothing, immediately wash it off with clean water. If battery fluid gets in your eyes, immediately flush them with water and consult a physician. Failure to do so could cause injury.

Figure 4-38. Batteries



10. Remove the batteries (D).

11. Dispose of the batteries according to local regulations.

CAUTION:
Make sure the vent holes are clear. Failure to do so could cause overheating and equipment damage.

12. Make sure the vent holes (I) in the power supply module are clear.

Replacement

1. Do the removal procedure in reverse order.
2. Do the “Function Checks” on page 2-7.

4.23 AC Power Fuses

Tools required: T25 Torx® Screwdriver

Removal

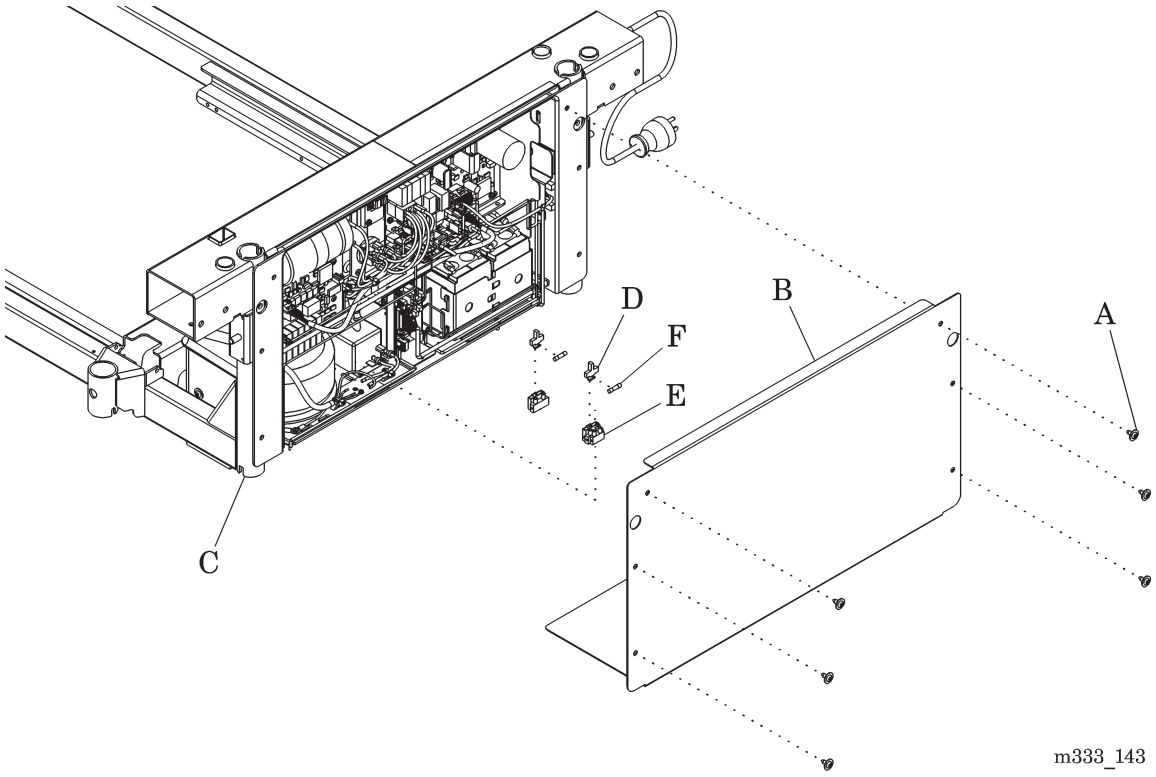
1. Set the brakes.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

2. Disconnect the bed from its power source.

3. Remove the six screws (A) that attach the power supply module cover (B) to the bed (C) (see figure 4-39 on page 4-77).

Figure 4-39. AC Power Fuse



4. Remove the cover (B).

5. Remove the fuse holder (D) from the fuse block (E).

6. Remove the fuse (F) from the fuse holder (D).

Replacement

1. Do the removal procedure in reverse order.
2. Do the “Function Checks” on page 2-7.

4.24 Transformer and Battery Fuse

Tools required: T25 Torx® screwdriver

Removal

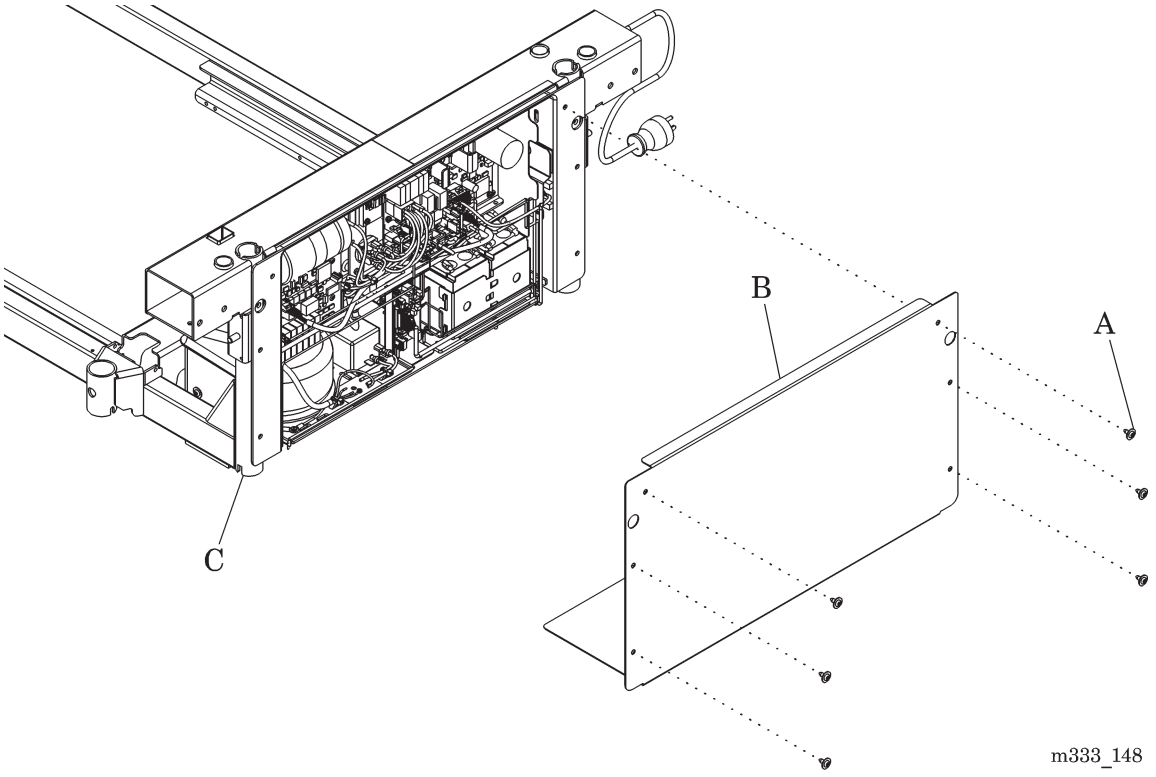
1. Set the brakes.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

2. Disconnect the bed from its power source.

3. Remove the six screws (A) that attach the power supply module cover (B) to the bed (C) (see figure 4-40 on page 4-79).

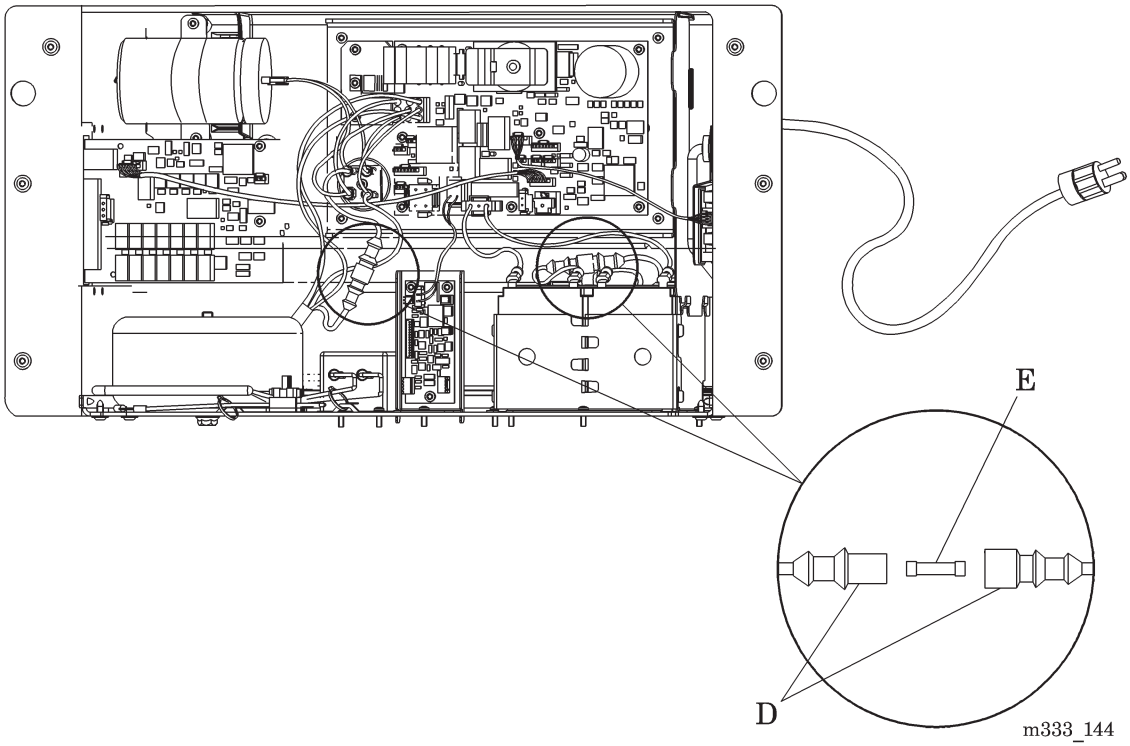
Figure 4-40. Cover Removal



4. Remove the cover (B).

5. Locate the appropriate fuse holder (D) (see figure 4-41 on page 4-80).

Figure 4-41. Fuse Holder



6. Separate the two halves of the holder (D).
7. Remove the fuse (E) from the holder (D).

Replacement

1. Do the removal procedure in reverse order.
2. Do the “Function Checks” on page 2-7.

4.25 Power Cord

Tools required: T25 Torx® screwdriver
Small screwdriver
17 mm wrench
Wire cutters

Removal

1. Set the brakes.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

2. Disconnect the bed from its power source.

3. Remove the six screws (A) that attach the power supply cover (B) to the bed (C) (see figure 4-42 on page 4-82).

4. Remove the batteries (refer to procedure 4.22).

5. Remove the jam nut (D) from the strain relief (E).

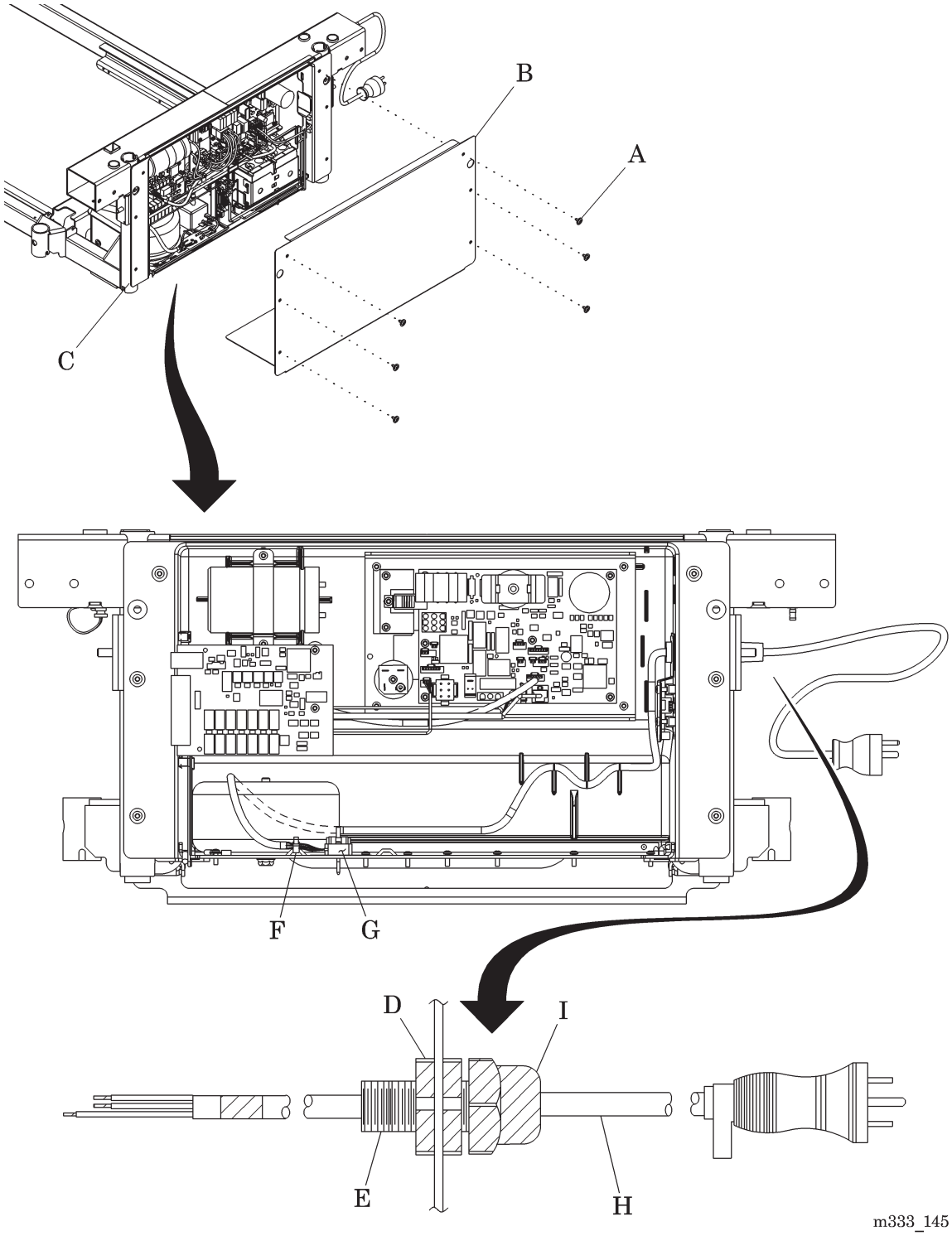
NOTE:
The jam nut can only be removed from the power cord after the power cord is disconnected from the fuse blocks.

6. Disconnect the power cord (H) from the fuse blocks (G) by loosening the screws in the fuse blocks (G).

7. Cut and remove the cable tie (F) that attaches the power cord wires to the bed.

8. Remove the power cord (H) and strain relief (E) from the bed (C).

Figure 4-42. Power Cord



Replacement

1. Do the removal procedure in reverse order.
2. Make sure the nut (I) is tight.
3. Do the “Function Checks” on page 2-7.

4.26 Power Supply P.C. Board

Tools required: T25 Torx® screwdriver Antistatic strap

Removal

1. Set the brakes.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

2. Disconnect the bed from its power source.

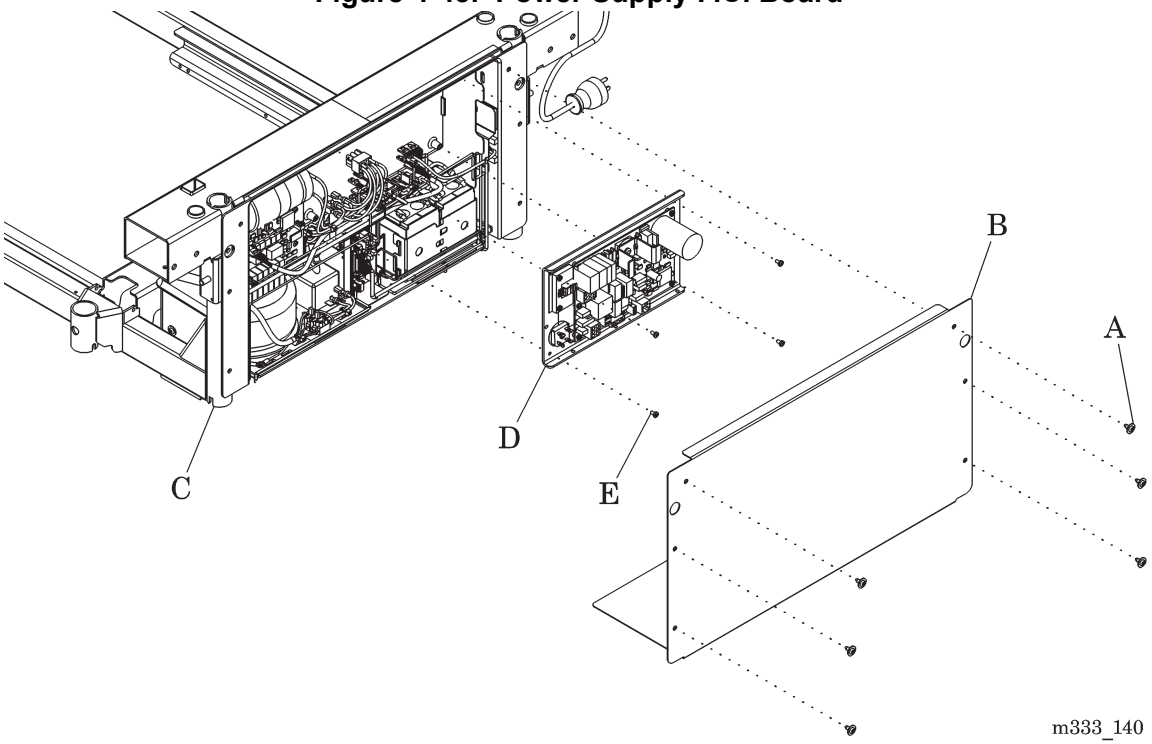
CAUTION:
When you handle electronic components, wear an antistatic strap. Failure to do so could cause component damage.

3. Put on the antistatic strap.

4. Remove the six screws (A) that attach the power supply cover (B) to the bed (C) (see figure 4-43 on page 4-84).

5. Remove the power supply cover (B).

Figure 4-43. Power Supply P.C. Board



6. Disconnect the cables on the power supply P.C. board (D).
7. Remove the four screws (E) that attach the power supply P.C. board (D) to the bed (C).
8. Remove the power supply P.C. board (D) from the bed (C).

Replacement

1. Do the removal procedure in reverse order.
2. Do the “Function Checks” on page 2-7.

4.27 SideCom® Communication System P.C. Board

Tools required: T25 Torx® screwdriver
T15 Torx screwdriver
1/4" nut driver
Antistatic strap

Removal

1. Set the brakes.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

2. Disconnect the bed from its power source.

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

3. Put on the antistatic strap.

4. Remove the six screws (A) that attach the power supply cover (B) to the bed (C) (see figure 4-44 on page 4-87).

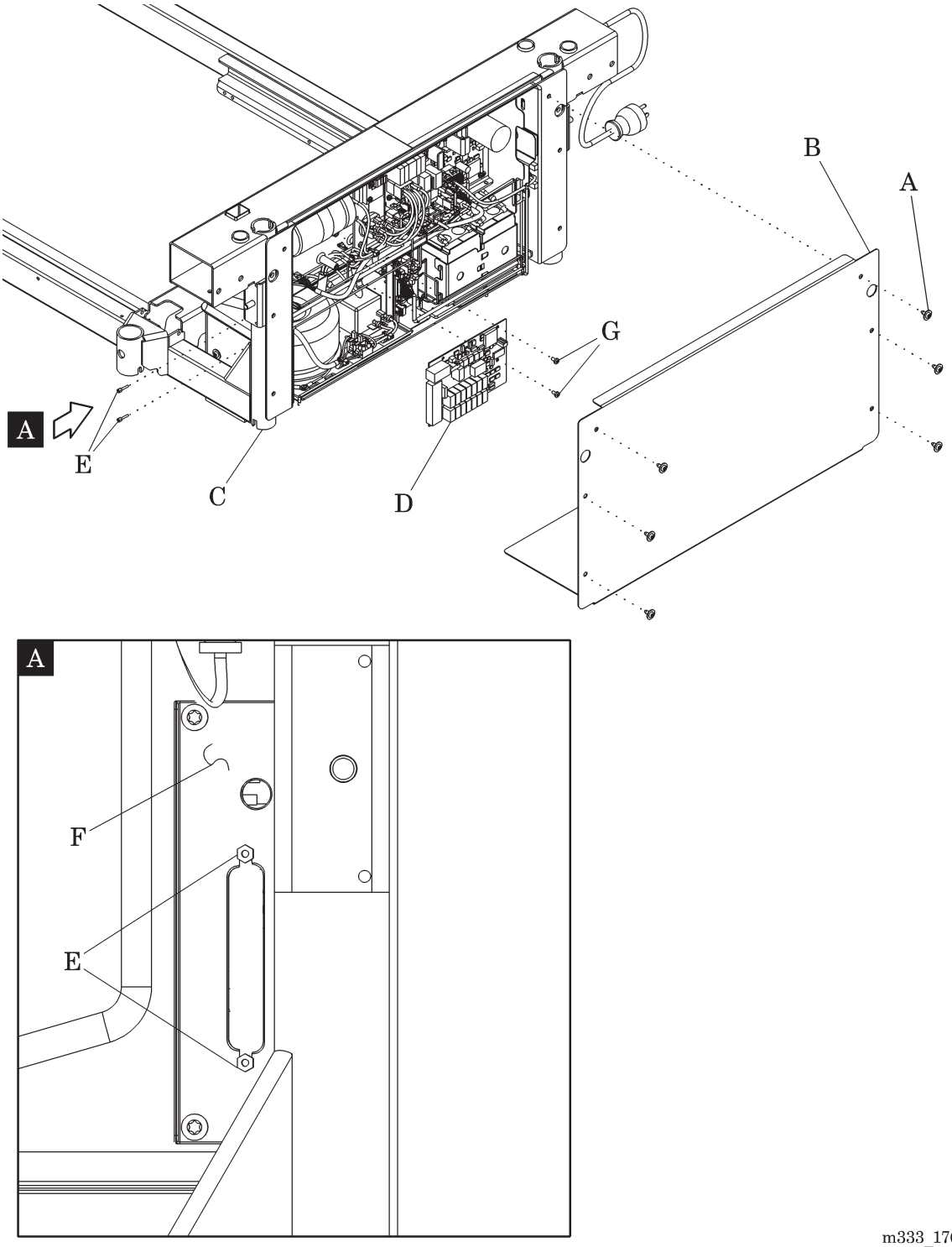
5. Remove the power supply cover (B).

6. Disconnect all cables from the SideCom® Communication System P.C. board (D).

7. Remove the two screws (E) that attach the connector cover (F) to the P.C. board (D).

8. Remove the two screws (G) that attach the P.C. board (D) to the bed (C).

Figure 4-44. SideCom® Communication System P.C. Board



Replacement

1. Do the removal procedure in reverse order.
2. Do the “Function Checks” on page 2-7.

4.28 Sensor Strip

Tools required: Rubber hammer
3/32" punch
T25 Torx® screwdriver
Wire cutters
Rivet gun with plastic rivets

Removal

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

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

4. Disconnect the bed from its power source.
5. For two short sensor strips and the middle sensor strip on the head section, do as follows:
   a. Remove the screws (A) that attach the cover (B) to the bed (C) (see figure 4-45 on page 4-90).
   b. Remove the cover (B).
   c. Remove the two screws (D) that attach the electronics module cover (E) to the electronics module (F).
   d. Remove the electronics module cover (E).
   e. If installed, remove the shield (G).
   f. Disconnect the sensor strip cable from the scale P.C. board.
   g. Use the punch and hammer to punch out the center of the four rivets (I) that attach the sensor strip (H) to the bed (see figure 4-46 on page 4-90).
   h. Remove the sensor strip (H) from the sleep deck (J).

Figure 4-45. Cover Removal

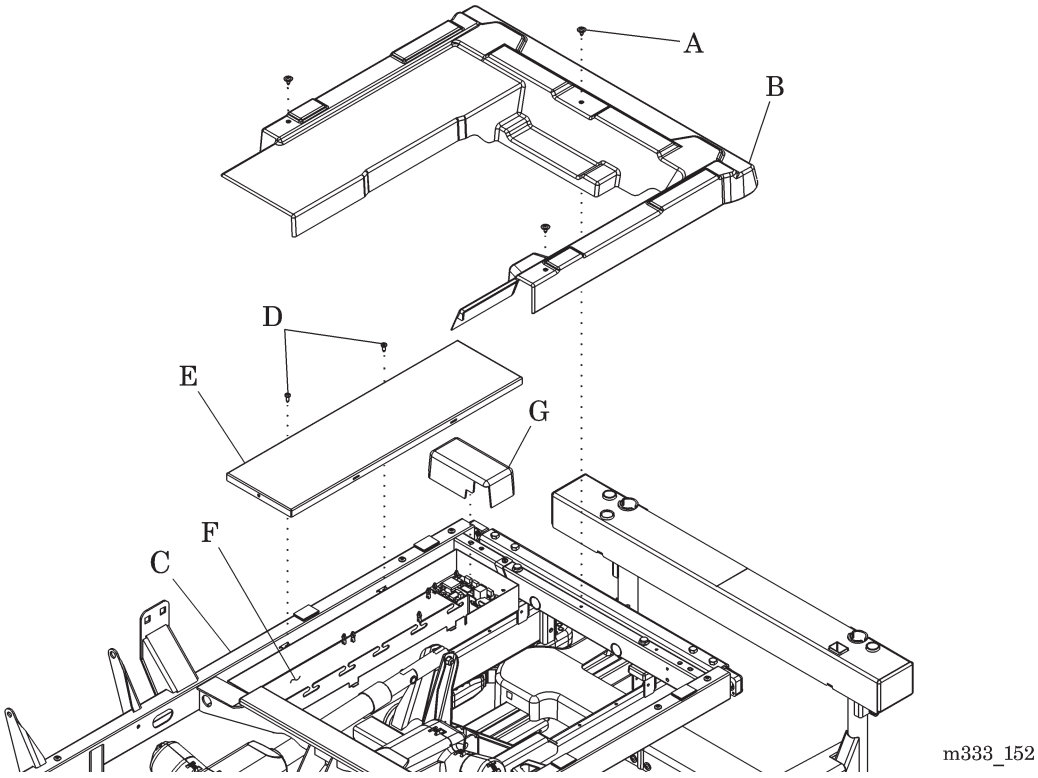
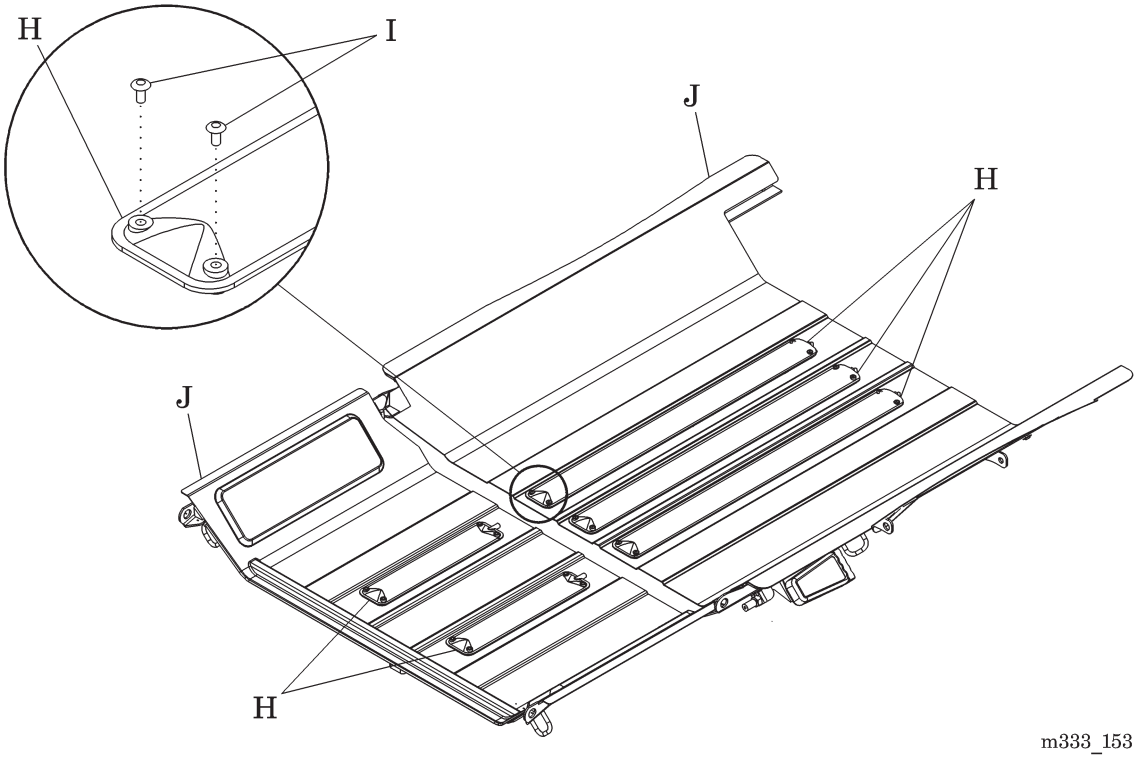
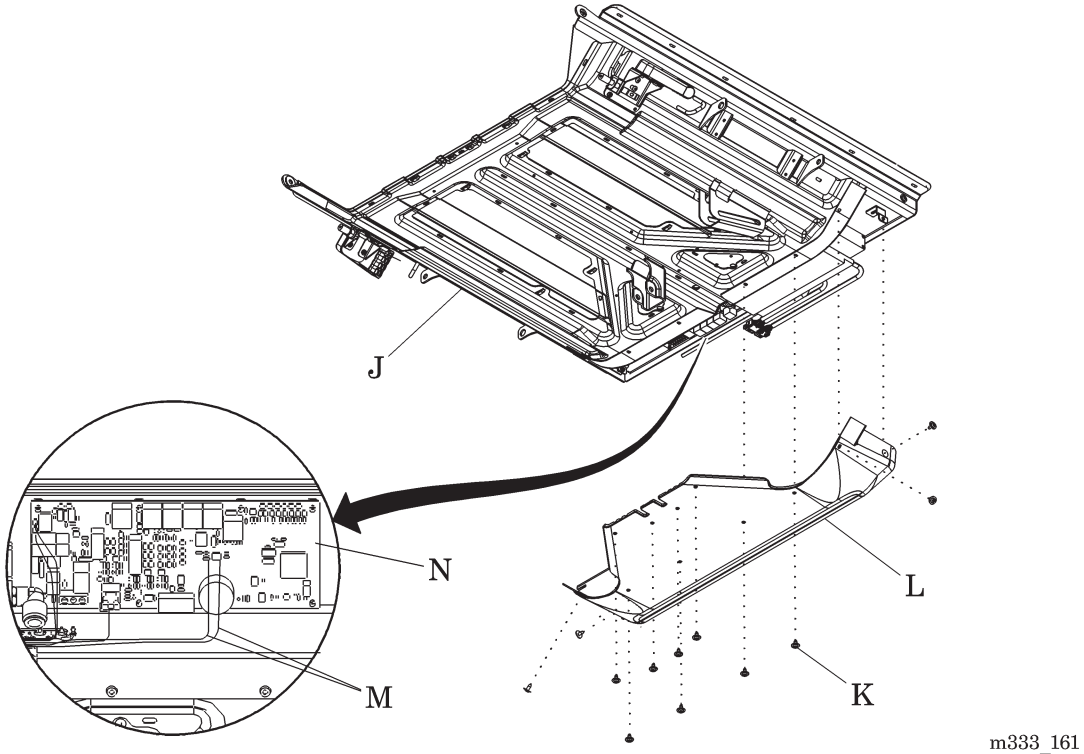


Figure 4-46. Sensor Strip



6. For the two outer sensor strips (H) on the head section, do as follows:
   a. Remove the 11 screws (K) that attach the air module cover (L) to the sleep deck (J) (see figure 4-47 on page 4-91).

Figure 4-47. Air Module Sensor Strip



   b. Remove the air module cover (L).
   c. Disconnect the sensor cable (M) from the air control P.C. board (N).
   d. Use the punch and hammer to punch out the center of the four rivets (I) that attach the sensor strip (H) to the sleep deck (J) (see figure 4-46 on page 4-90).
   e. Remove the sensor strip (H) from the sleep deck (J).

Replacement

1. Do the removal procedure in reverse order.
2. Do the "Function Checks" on page 2-7.

4.29 Obstacle Detect

Tools required: T25Torx® screwdriver
Small screwdriver

Removal

1. Set the brakes.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

2. Disconnect the bed from its power source.

3. For the head end detectors, do as follows:
   a. Remove the screw (A) and fastener (L) that attach the head end cover (B) to the bed (C) (see figure 4-48 on page 4-93).
   b. Remove the head end cover (B).
   c. Use the small screwdriver under the snaps to carefully remove the obstacle detect cover (D).
   d. For new model obstacle detect covers, remove the screw (M) from the obstacle detect cover (D).
   e. Remove the P.C. board (E) from the cover (D).
   f. Disconnect the cable (F) from the P.C. board (E).

4. For the foot end detectors, do as follows:
   a. Remove the screw (G) and fastener (L) that attach the foot end cover (H) to the bed (C) (see figure 4-49 on page 4-94).
   b. Remove the foot end cover (H).
   c. Use the small screwdriver under the snaps to carefully remove the obstacle detect cover (I).
   d. For new model obstacle detect covers, remove the screw (N) from the obstacle detect cover (I).
   e. Remove the P.C. board (J) from the cover (I).
   f. Disconnect the cable (K) from the P.C. board (J).

Figure 4-48. Head End Obstacle Detect

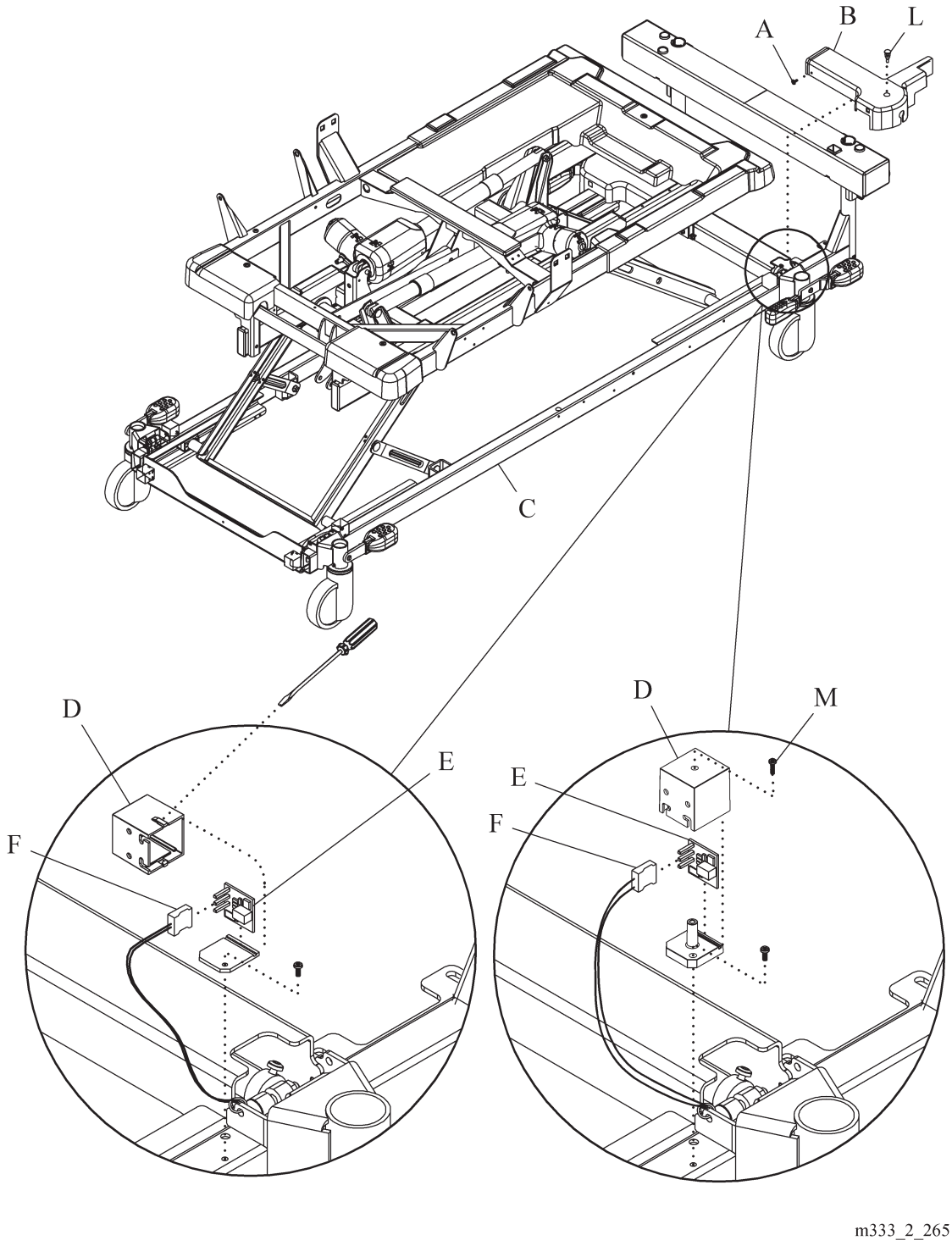
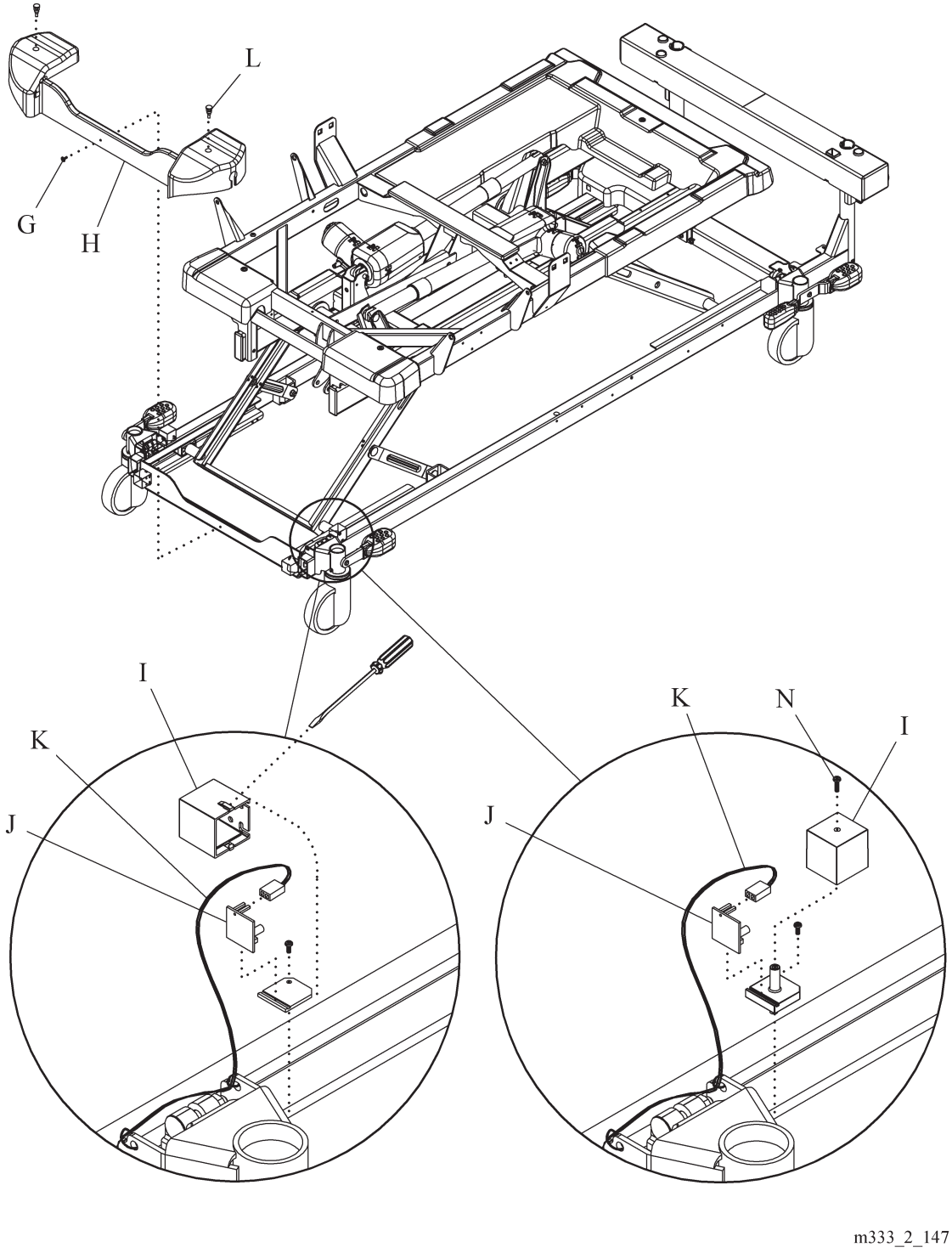


Figure 4-49. Foot End Obstacle Detect



Replacement

1. Do the removal procedure in reverse order.

NOTE:
For the detectors and emitters mounted on the side of the bed, the cable connector goes to the inside of the bed frame.

NOTE:
For the detectors and emitters mounted across the foot end of the bed, the cable connector goes down.

2. Do the “Function Checks” on page 2-7.

4.30 Logic Control P.C. Board

Tools required: T25 Torx® screwdriver
Needle nose pliers
Antistatic strap

Removal

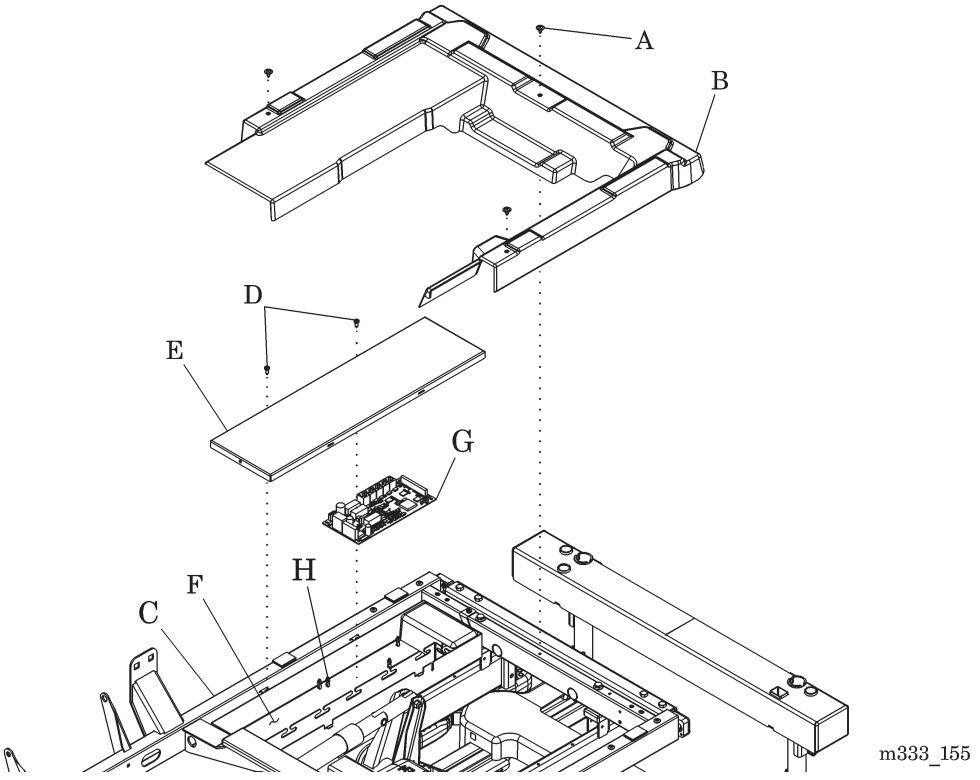
1. Set the brakes.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

2. Disconnect the bed from its power source.

3. Remove the screws (A) that attach the cover (B) to the bed (C) (see figure 4-50 on page 4-96).

Figure 4-50. Logic Control P.C. Board



4. Remove the cover (B).

5. Remove the two screws (D) that attach the electronics module cover (E) to the electronics module (F).

6. Remove the electronics module cover (E).

7. Disconnect the cables on the logic control P.C. board (G).

8. Use the needle nose pliers to pinch the ends of the stand-offs (H) that attach the P.C. board (G) to the electronics module (F).

9. Remove the P.C. board (G).

Replacement

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

1. Put on the antistatic strap.

2. Do the removal procedure in reverse order.

3. For a G through J model bed with the head angle display, calibrate the head angle sensor (refer to procedure 6.2).

4. Do the “Function Checks” on page 2-7.

4.31 Motor Control P.C. Board

Tools required: T25 Torx® screwdriver
Needle nose pliers
Antistatic strap

Removal

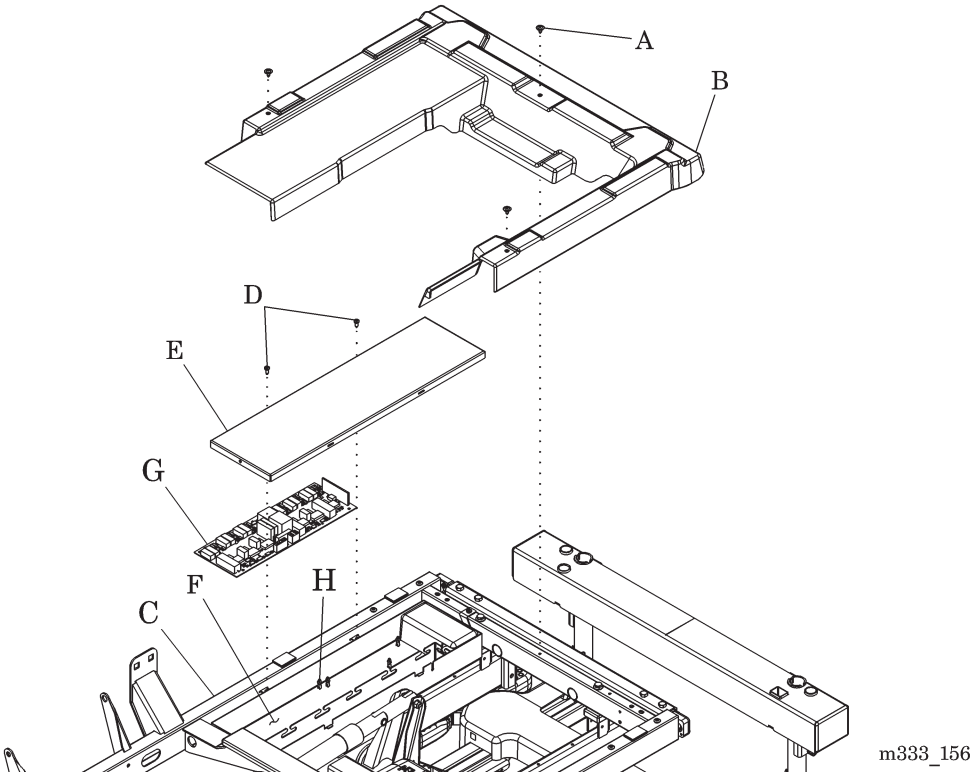
1. Set the brakes.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

2. Disconnect the bed from its power source.

3. Remove the screws (A) that attach the cover (B) to the bed (C) (see figure 4-51 on page 4-98)

Figure 4-51. Motor Control P.C. Board



4. Remove the cover (B).

5. Remove the two screws (D) that attach the electronics module cover (E) to the electronics module (F).

6. Remove the electronics module cover (E).

7. Disconnect the cables on the motor control P.C. board (G).

8. Use the needle nose pliers to pinch the ends of the stand-offs (H) that attach the P.C. board (G) to the electronics module (F).

9. Remove the P.C. board (G).

Replacement

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

1. Put on the antistatic strap.

2. Do the removal procedure in reverse order.

3. Do the “Function Checks” on page 2-7.

4.32 Scale System P.C. Board

Tools required: T25 Torx® screwdriver
Needle nose pliers
Antistatic strap

Removal

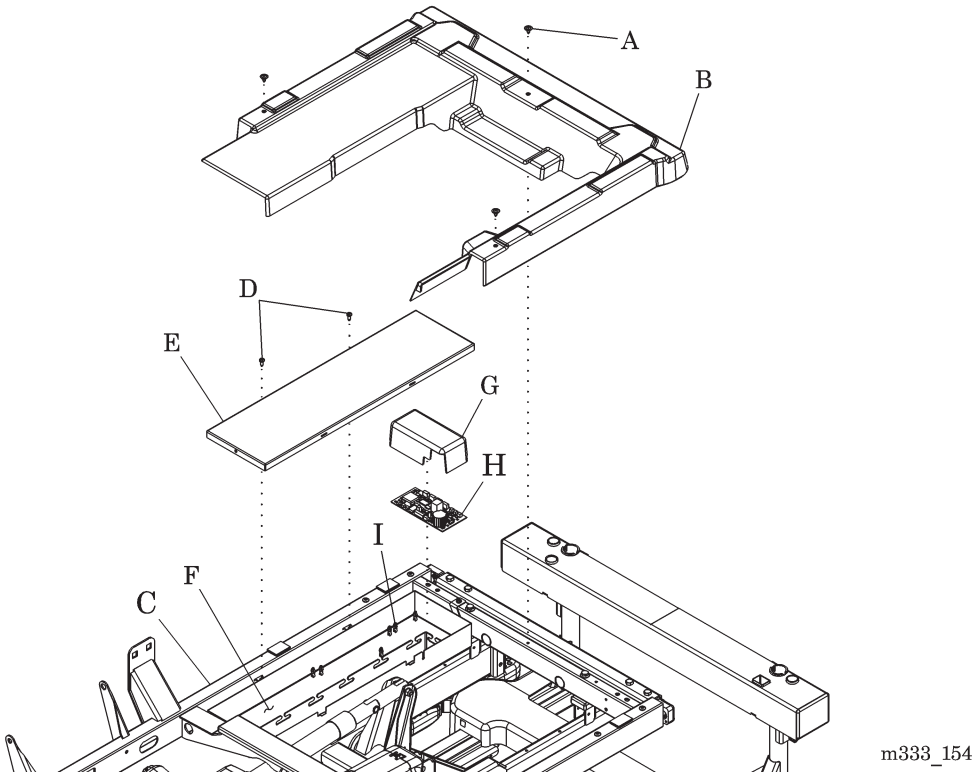
1. Set the brakes.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

2. Disconnect the bed from its power source.

3. Remove the screws (A) that attach the cover (B) to the bed (C) (see figure 4-52 on page 4-100)

Figure 4-52. Scale P.C. Board



4. Remove the cover (B).

5. Remove the two screws (D) that attach the electronics module cover (E) to the electronics module (F).

6. Remove the electronics module cover (E).
7. Remove the scale P.C. board cover (G).
8. Disconnect the cables on the scale P.C. board (H).
9. Use the needle nose pliers to pinch the ends of the stand-offs (I) that attach the P.C. board (H) to the electronics module (F).
10. Remove the P.C. board (H).

Replacement

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

1. Put on the antistatic strap.
2. Do the removal procedure in reverse order.

NOTE:
Connector P1 is left-head, P2 is left-foot, P3 is foot-right, and P4 is head-right.

3. Calibrate the scale. See “Scale Calibration” on page 6-15.
4. Do the “Function Checks” on page 2-7.

4.33 IntelliDrive® Transport System Interface P.C. Board

Tools required: T25 Torx® screwdriver Antistatic strap

Removal

1. Set the brakes.

SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

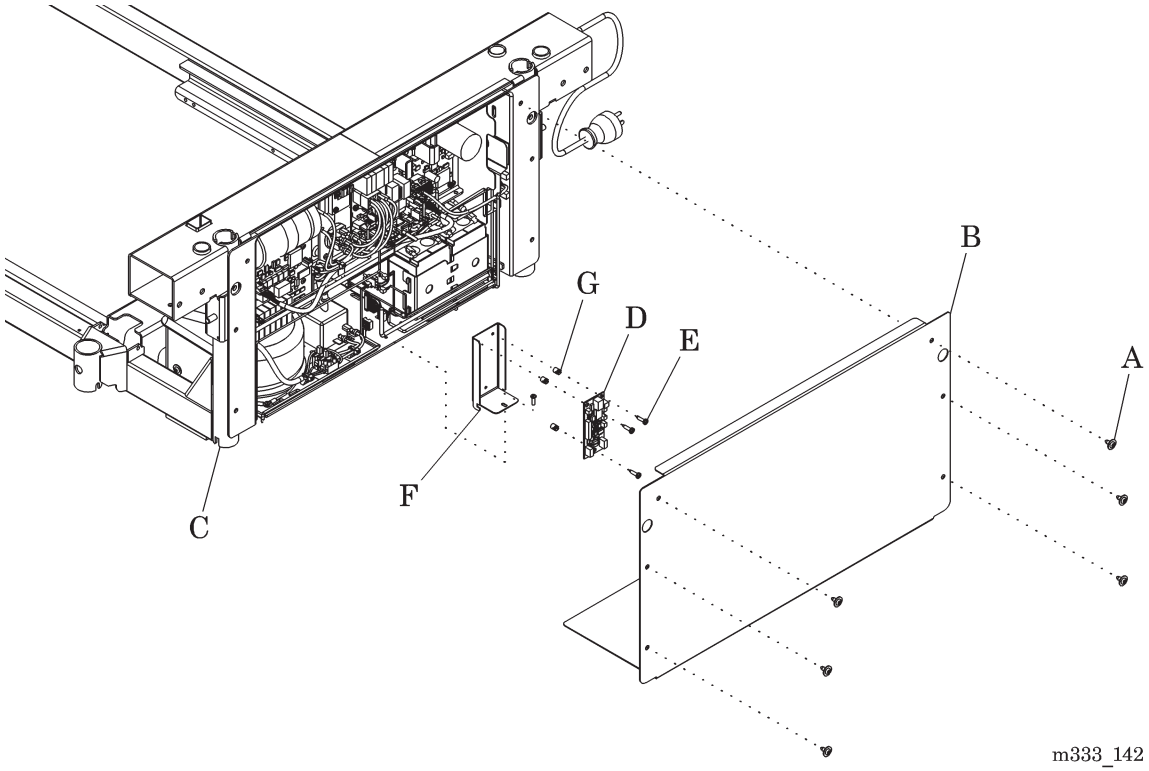
2. Disconnect the bed from its power source.

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

3. Put on the antistatic strap.

4. Remove the six screws (A) that attach the power supply cover (B) to the bed (C) (see figure 4-53 on page 4-102).

Figure 4-53. Interface P.C. Board



5. Remove the power supply cover (B).
6. Disconnect all the cables on the interface P.C. board (D).
7. Remove the three screws (E) that attach the interface P.C. board (D) to the mount bracket (F).
8. Remove the interface P.C. board (D) and spacers (G).

Replacement

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

1. Put on the antistatic strap.
2. Do the removal procedure in reverse order.
3. Calibrate the push handles.
4. Do the “Function Checks” on page 2-7.

4.34 Battery—IntelliDrive® Transport System

Tools required: T25 Torx® head screwdriver
1/4" box end wrench

Removal

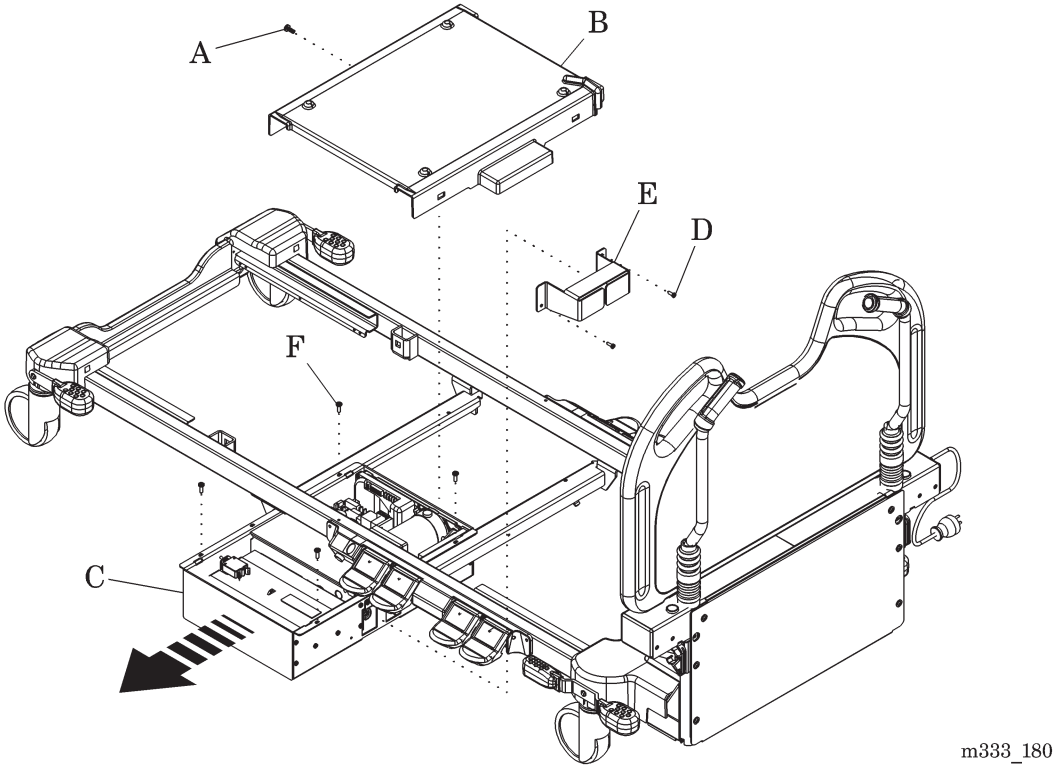
1. Set the brakes.

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

2. Disconnect the bed from its power source.

3. Remove the screw (A) that attaches the cover (B) to the drive box (C) (see figure 4-54 on page 4-104).

Figure 4-54. Cover Removal



4. Remove the cover (B).

5. Disconnect the cable inside the cover (B) from the PACM board.

6. Remove the two screws (D) that attach the shroud (E) to the drive box (C).

7. Remove the shroud (E).

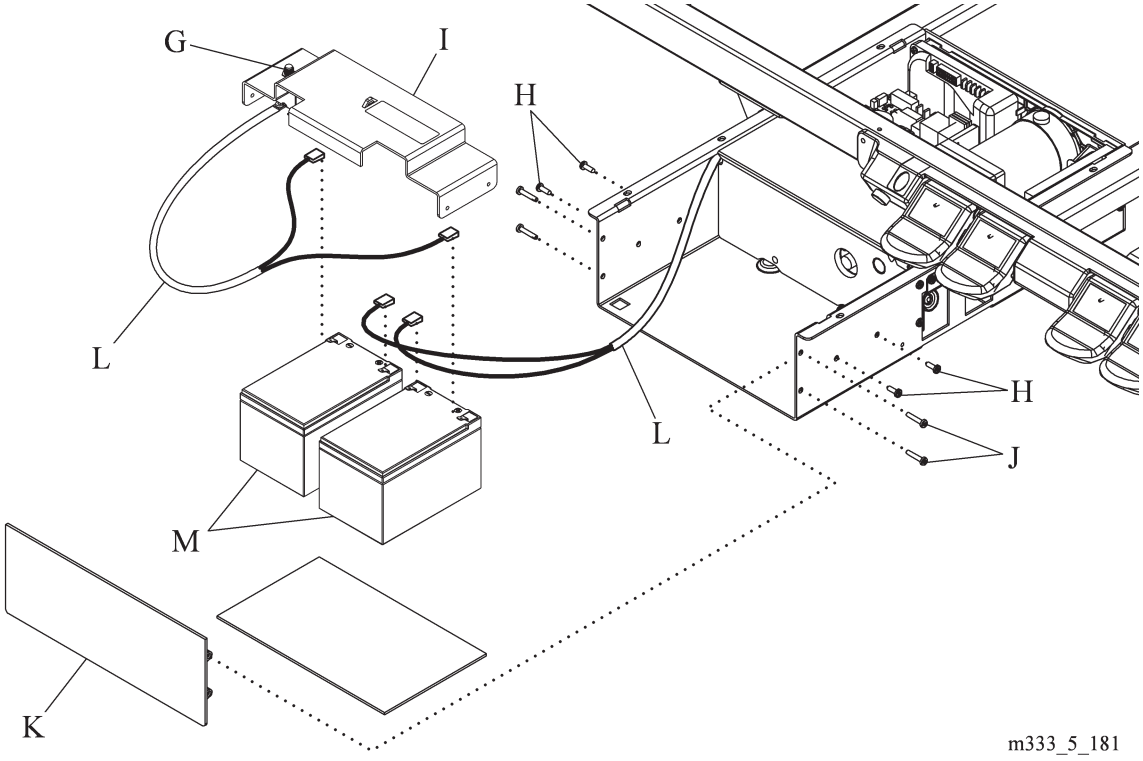
8. Remove the four screws (F) that attach the drive box (C) to the bed.

9. Slide the drive box (C) to the patient's left side of the bed.

WARNING:
Turn the circuit breaker to the **Off** position. Failure to do so could cause injury or equipment damage.

10. Turn the circuit breaker (G) to the **off** position (see figure 4-55 on page 4-105).

Figure 4-55. Battery Removal—IntelliDrive® Transport System



11. Remove the four screws (H) that attach the retaining bracket (I) to the drive box.

12. Remove the retaining bracket (I).

13. Remove the four screws (J) that attach the end plate (K) to the drive box.

14. Remove the end plate (K).

15. Disconnect the cables (L) from the batteries (M).

WARNING:
If battery fluid touches skin or clothing, immediately wash it off with clean water. If battery fluid gets in your eyes, immediately flush them with water and consult a physician. Failure to do so could cause injury.

16. Remove the batteries (M) from the drive box.

17. Dispose of the batteries (M) according to local regulations.

Replacement

1. Do the removal procedure in reverse order.

WARNING:
Make sure the black wire on the battery is connected to the negative terminal on the battery and the red wire is connected to the positive terminal on the battery. Failure to do could cause injury or equipment damage.

2. Connect the black wire to the negative terminal and the red wire to the positive terminal on the battery.

3. Do the “Function Checks” on page 2-7.

4.35 PACM Board—IntelliDrive® Transport System

Tools required: T25 Torx® screwdriver Antistatic strap

Removal

1. Set the brakes.

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

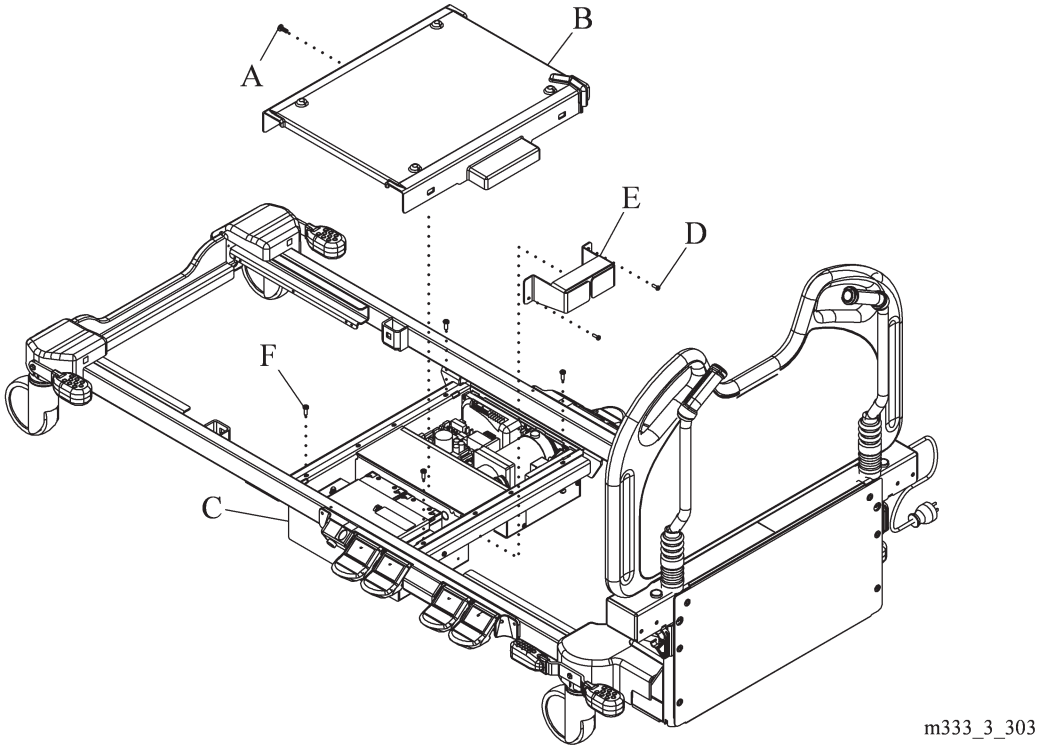
2. Disconnect the bed from its power source.

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

3. Put on the antistatic strap.

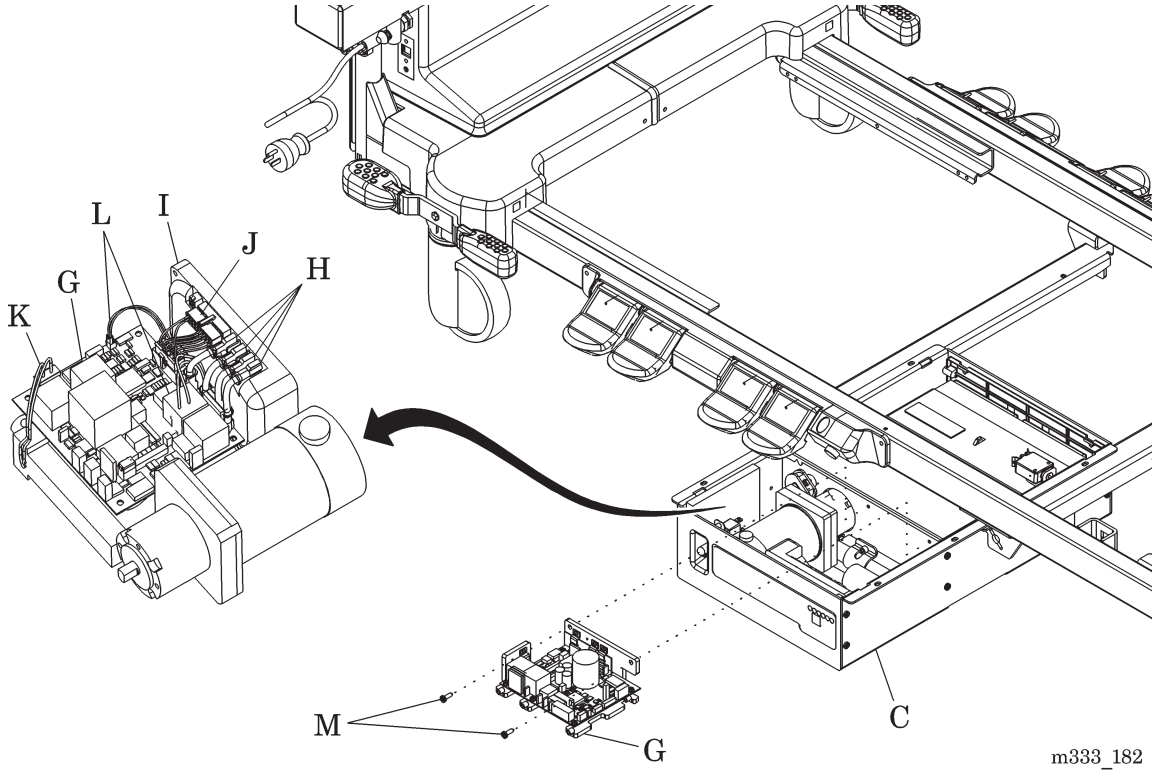
4. Remove the screw (A) that attaches the cover (B) to the drive box (C) (see figure 4-56 on page 4-107).

Figure 4-56. Cover Removal



5. Remove the cover (B).
6. Disconnect the cable inside the cover (B) from the PACM board.
7. Remove the two screws (D) that attach the shroud (E) to the drive box (C).
8. Remove the shroud (E).
9. Remove the four screws (F) that attach the drive box (C) to the bed.
10. Slide the drive box (F) to the patient's right side of the bed.
11. Disconnect the four wires (H) connecting the PACM board (G) to the motor controller (I) (see figure 4-57 on page 4-108).

Figure 4-57. PACM Board Removal



12. Disconnect the motor controller harness (J) from the PACM board (G).
13. Disconnect the linear actuator cable (K) from the PACM board (G).
14. Disconnect the two drive motor cables (L) from the PACM board (G).
15. Remove the two screws (M) that attach the PACM board (G) to the drive box (C).

16. Remove the PACM board (G) from the drive box (C).

Replacement

1. Do the removal procedure in reverse order.
2. Do the “Function Checks” on page 2-7.

4.36 Drive Motor—IntelliDrive® Transport System

Tools required: T25 Torx® screwdriver
#2 phillips head screwdriver
7/16" deep well socket
Ratchet

Removal

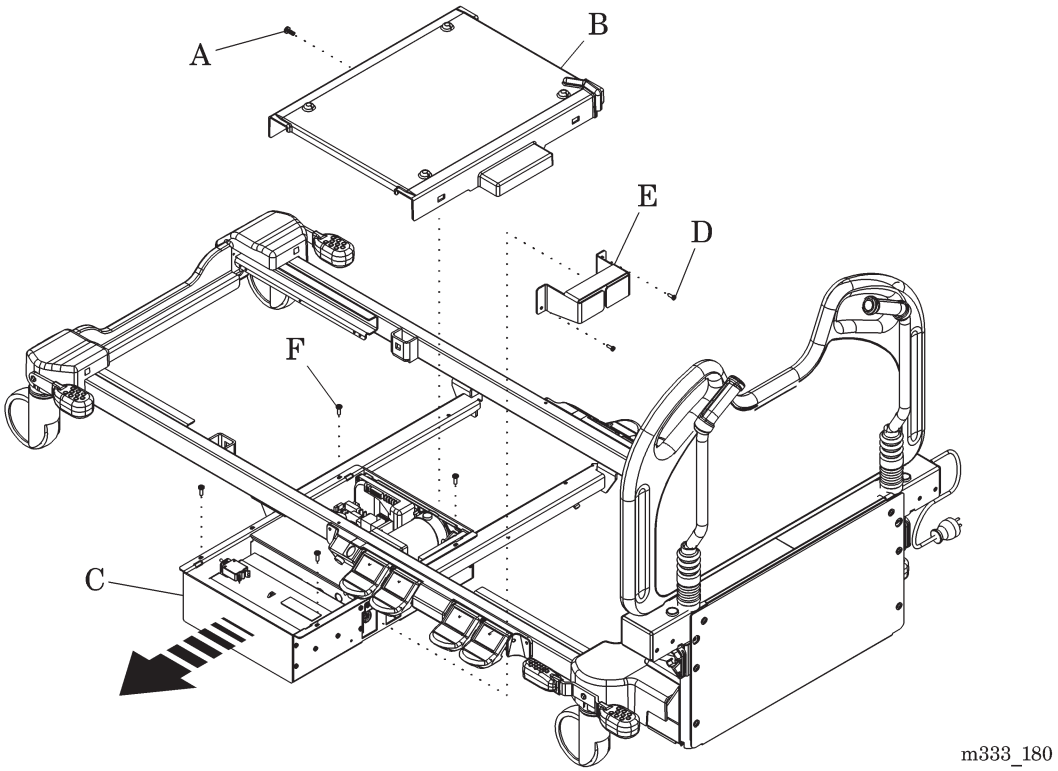
1. Set the brakes.

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

2. Disconnect the bed from its power source.

3. Remove the screw (A) that attaches the cover (B) to the drive box (C) (see figure 4-58 on page 4-110).

Figure 4-58. Cover Removal



4. Remove the cover (B).

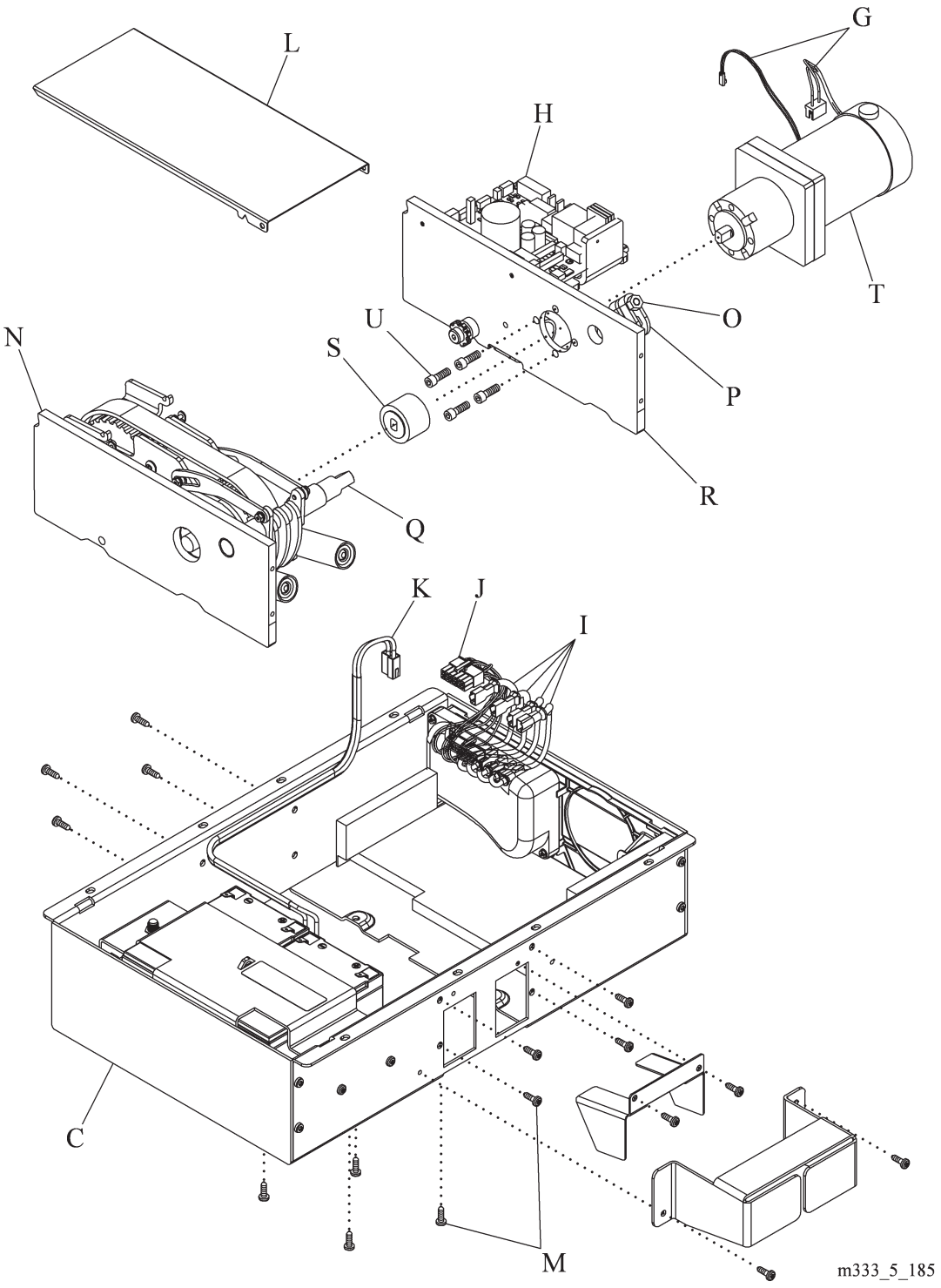
5. Disconnect the cable inside the cover (B) from the PACM board.

6. Remove the two screws (D) that attach the shroud (E) to the drive box (C).
7. Remove the shroud (E).
8. Remove the four screws (F) that attach the drive box (C) to the bed.
9. Remove the drive box (C) from the bed.
10. Disconnect the two drive motor cables (G) from the PACM board (H) (see figure 4-59 on page 4-112).
11. Disconnect the four controller wires (I) from the PACM board (H).
12. Disconnect the controller harness (J) from the PACM board (H).
13. Disconnect the battery cable (K) from the PACM board (H).
14. Remove the cover (L).
15. Remove the 12 screws (M) that attach the drive assembly (N) to the drive box (C).

NOTE:
The remaining screws on the box may need to be loosened to allow the drive assembly to be easily removed.

16. Remove the drive assembly (N) from the drive box (C).
17. Loosen the nut (O) on the linear actuator lever (P).
18. Disconnect the linear actuator lever (P) from the drive assembly rod (Q).
19. Remove the drive assembly (N) from the motor mounting plate (R).
20. Remove the drive motor coupler (S) from the drive motor (T).
21. Remove the four screws (U) that attach the drive motor (T) to the motor mounting plate (R).
22. Remove the drive motor (T) from the motor mounting plate (R).

Figure 4-59. Drive Motor Removal



Replacement

1. Do the removal procedure in reverse order.

NOTE:
The battery end of the drive box goes toward the patient's left side of the bed.

2. Do the "Function Checks" on page 2-7.

4.37 Drive Belt—IntelliDrive® Transport System

Tools required: T25 Torx® head screwdriver

Removal

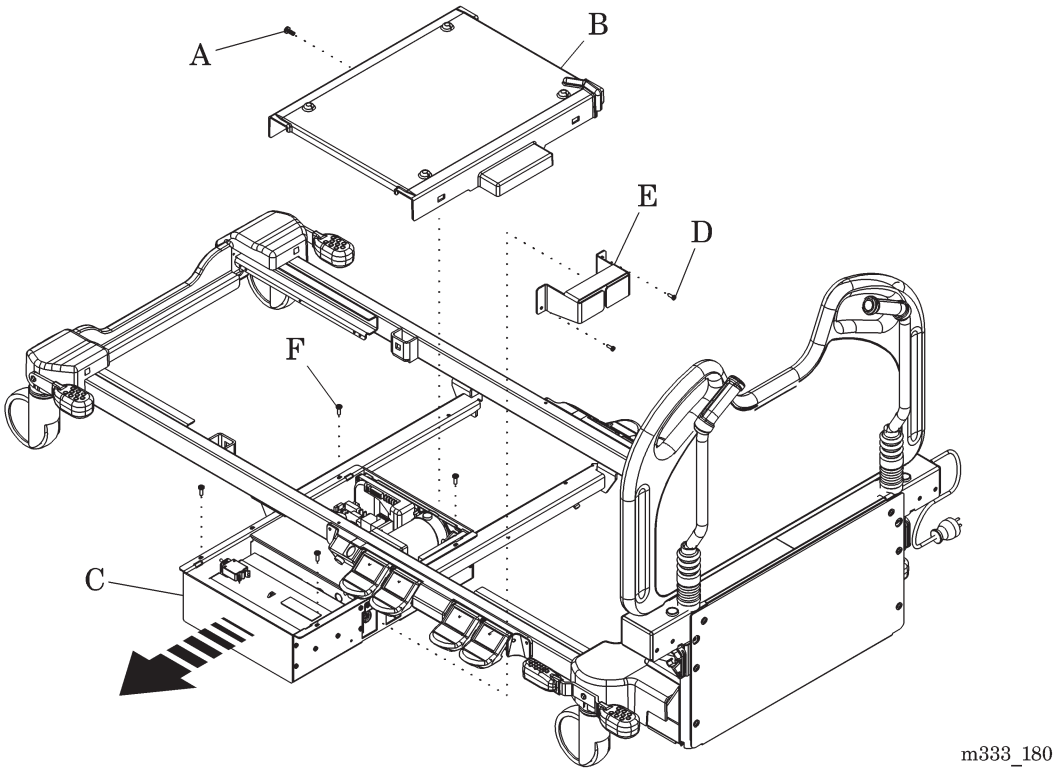
1. Set the brakes.

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

2. Disconnect the bed from its power source.

3. Remove the screw (A) that attaches the cover (B) to the drive box (C) (see figure 4-60 on page 4-114).

Figure 4-60. Cover Removal



4. Remove the cover (B).

5. Disconnect the cable inside the cover (B) from the PACM board.

6. Remove the two screws (D) that attach the shroud (E) to the drive box (C).

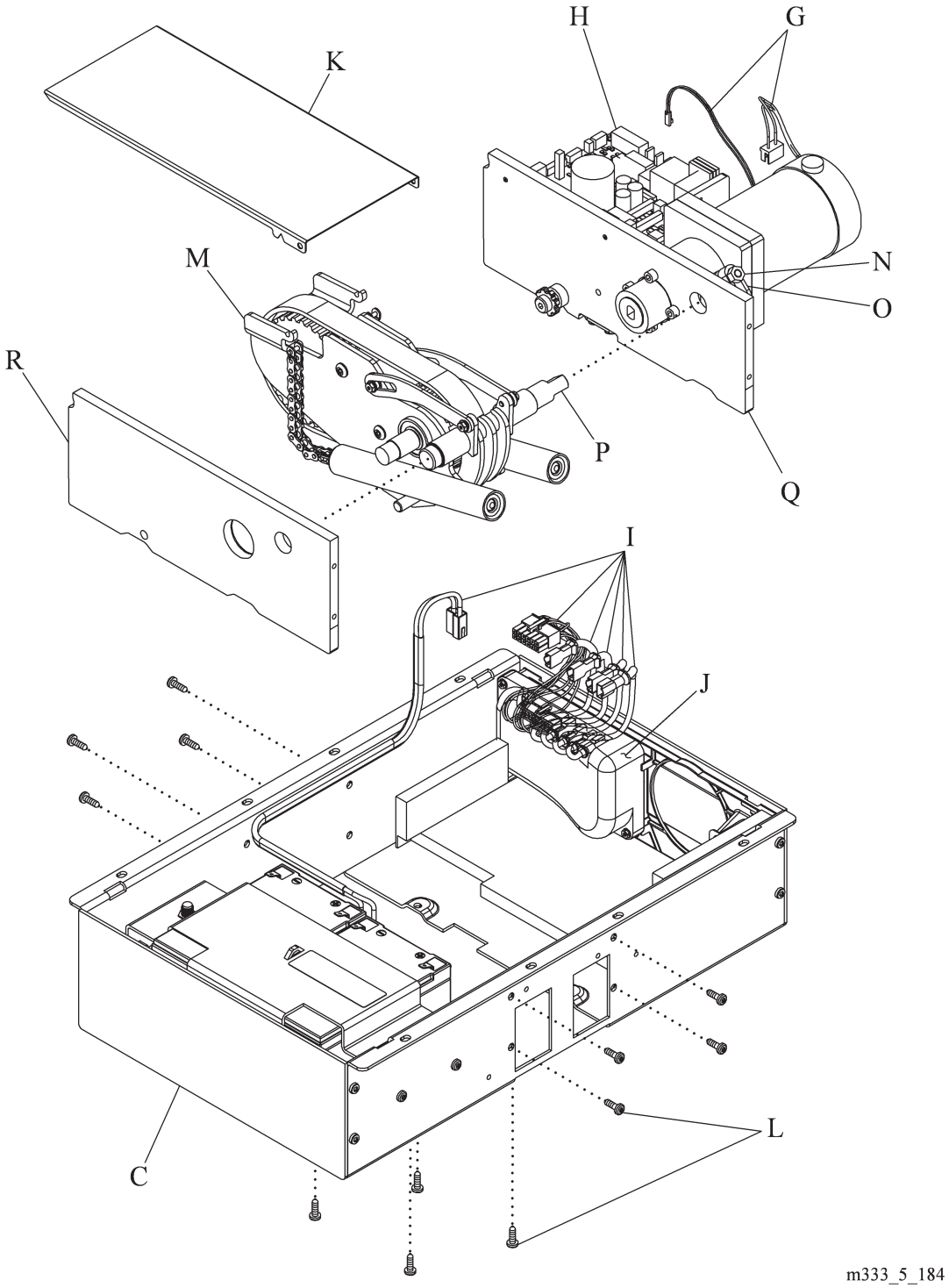
7. Remove the shroud (E).

8. Remove the four screws (F) that attach the drive box (C) to the bed.
9. Remove the drive box (C) from the bed.
10. Disconnect the two drive motor cables (G) from the PACM board (H) (see figure 4-61 on page 4-116).
11. Disconnect the wires (I) from the controller (J) and the PACM board (H).
12. Remove the cover (K).
13. Remove the 12 screws (L) that attach the drive assembly (M) to the drive box (C).

NOTE:
The remaining screws may need to be loosened to allow the drive assembly to be easily removed.

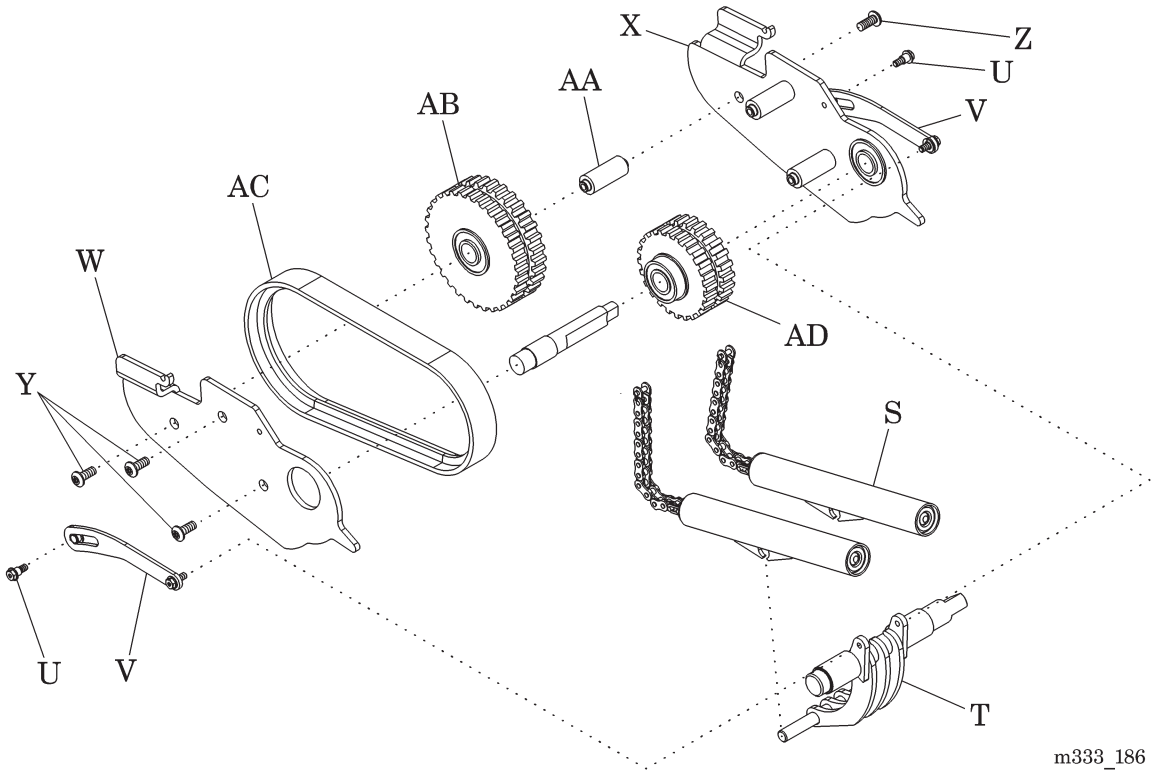
14. Remove the drive assembly (M) from the drive box (C).
15. Loosen the nut (N) on the linear actuator lever (O).
16. Disconnect the linear actuator lever (O) from the drive assembly rod (P).
17. Remove the drive assembly (M) from the motor mounting plate (Q).
18. Remove the drive plate (R) from the drive assembly (M).

Figure 4-61. Drive Unit Removal



19. Remove the chain and spring assembly (S) from the plate (T) (see figure 4-62 on page 4-117).

Figure 4-62. Drive Belt Removal



20. Remove the two screws (U) that attach the return links (V) to the pulley side plates (W) and (X).

21. Rotate the return links (V) up and out of the way.

22. Remove the three screws (Y) that attach the left-side pulley plate (W) to the drive assembly.

23. Remove the left-side pulley plate (W).

24. Remove the screw (Z) that attach the right-side pulley plate (X) to the pulley shaft (AA).

25. Remove the pulley (AB) and belt (AC) from the drive assembly.

26. Remove the belt (AC) from the two pulleys (AB) and (AD).

NOTE:
Each pulley has a groove running down the middle of it to accept the raised section on the drive belt.

Replacement

1. Do the removal procedure in reverse order.
2. Do the “Function Checks” on page 2-7.

4.38 Transport Handle—IntelliDrive® Transport System

Tools required: T25 Torx® head screwdriver
Wire cutters
7/16" open end wrench
Voltmeter
Jewelers screwdriver

Removal

1. Set the brakes.

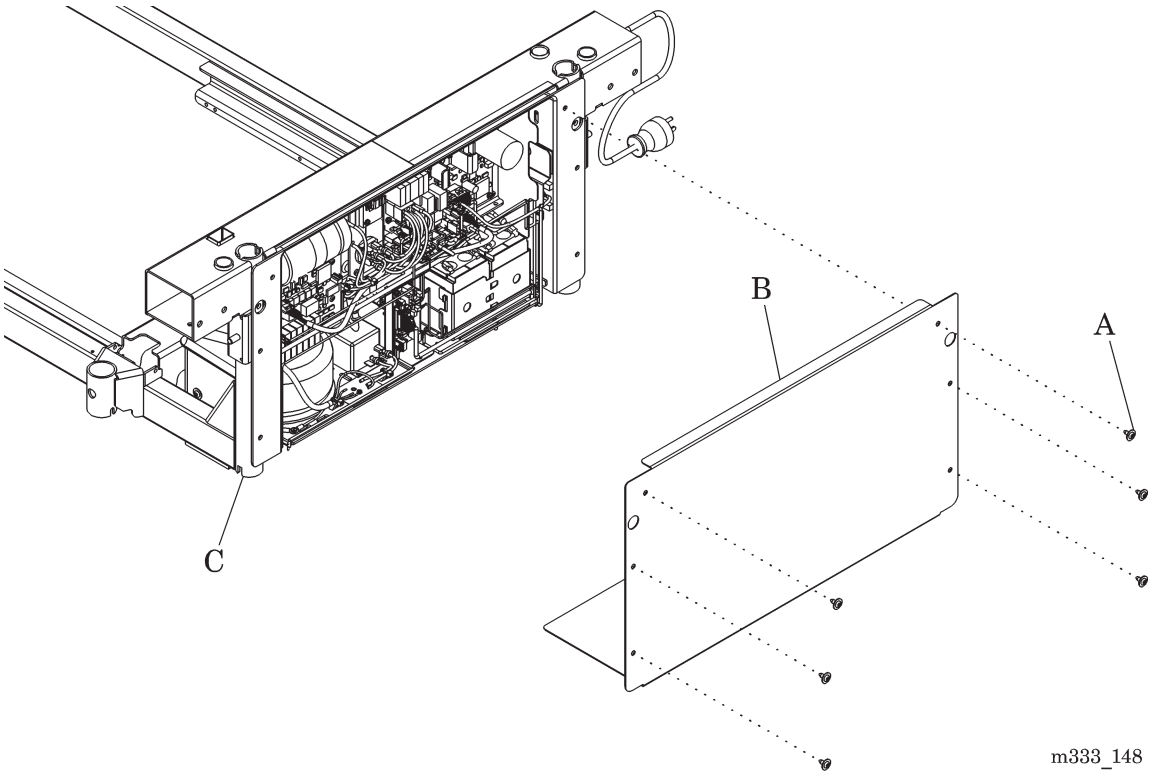
SHOCK HAZARD:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

2. Disconnect the bed from its power source.

3. Remove the six screws (A) that attach the power supply cover (B) to the bed (C) (see figure 4-63 on page 4-119).

4. Remove the power supply cover (B) from the bed (C).

Figure 4-63. Cover Removal

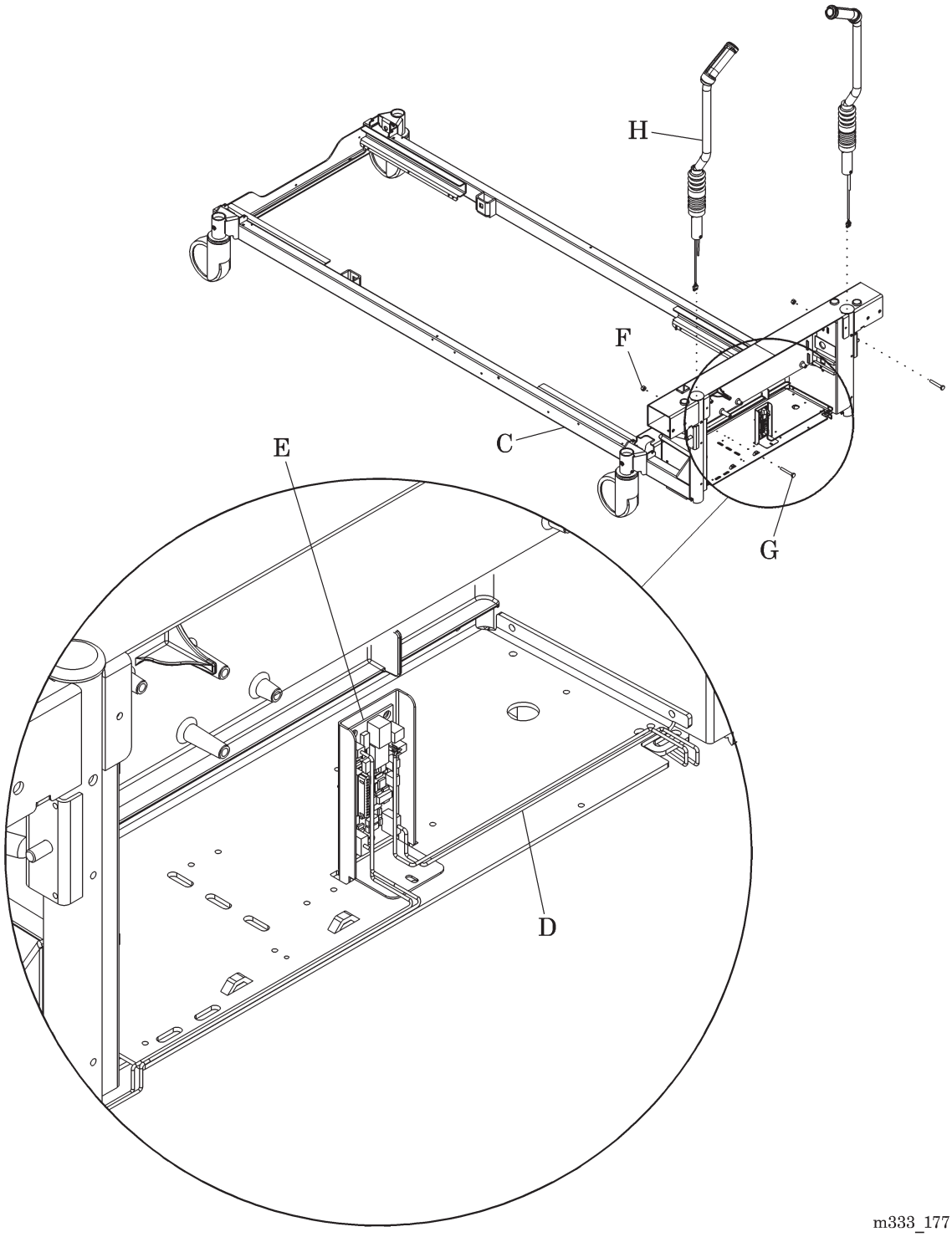


5. Disconnect the transport handle cables (D) from the interface P.C. board (E) (see figure 4-64 on page 4-121).

6. Remove the nut (F) and screw (G) that attach the transport handle (H) to the bed (C).

7. Remove the transport handle (H) from the bed (C).

Figure 4-64. Transport Handle



Replacement

1. Thread the transport handle cables (D) of the new transport handle (H) through the bed (C).
2. Install the transport handle (H) on the bed (C).
3. Align the mounting hole in the transport handle (H) with the hole in the bed (C).
4. Install the screw (G) and nut (F) through the bed (C) and transport handle (H).
5. Stow the transport handle (H).
6. Route and connect the transport handle cables (D) to the interface P.C. board (E):
   - Connect the enable switch cable (two-pin) to connector **P5** on the interface P.C. board (E).
   - Connect the strain gauge cable (five-pin) to connector **P2** on the interface P.C. board (E).
7. Use a common ground to make sure the voltage on the interface P.C. board (E) at **P6**, pin 1, is between 2.49 V DC and 2.51 V DC. If necessary, adjust **R8**.
8. Install the power supply cover (B) onto the bed (C) (see figure 4-63 on page 4-119).
9. Install the six screws (A) attach the power supply cover (B) to the bed (C).
10. Do the “Function Checks” on page 2-7.

4.39 Motor Controller—IntelliDrive® Transport System

Tools required: T25 and T15 Torx® head screwdrivers
Antistatic strap

Removal

1. Set the brakes.

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

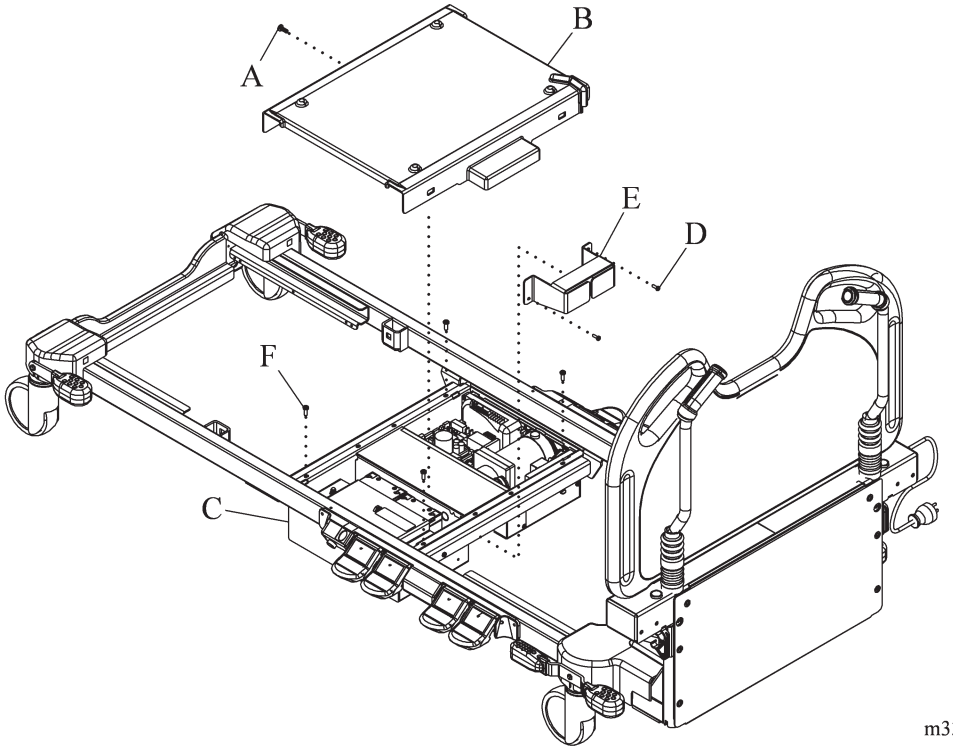
2. Disconnect the bed from its power source.

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

3. Put on the antistatic strap.

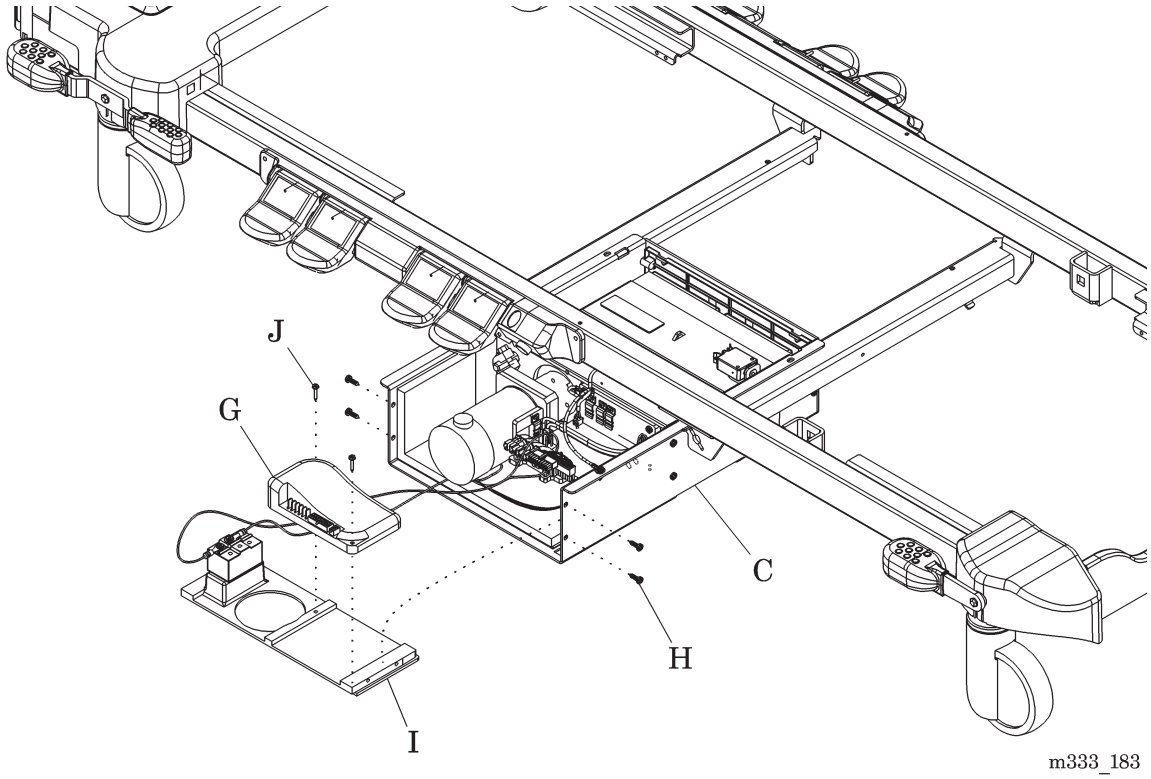
4. Remove the screw (A) that attaches the cover (B) to the drive box (C) (see figure 4-65 on page 4-123).

Figure 4-65. Cover Removal



5. Remove the cover (B).
6. Disconnect the cable inside the cover (B) from the PACM board.
7. Remove the two screws (D) that attach the shroud (E) to the drive box (C).
8. Remove the shroud (E).
9. Remove the four screws (F) that attach the drive box (C) to the bed.
10. Slide the drive box (C) to the patient's right side of the bed until the motor controller is exposed.
11. Disconnect the wires from the motor controller (G) (see figure 4-66 on page 4-124).

Figure 4-66. Motor Controller



12. Remove the four screws (H) that attach the end plate (I) to the drive box (C).
13. Remove the end plate (I) from the drive box (C).

NOTE:
There is no need to disconnect the wires from the override switch in the end plate.

14. Remove the two screws (J) that attach the motor controller (G) to the end plate (I).

15. Remove the motor controller (G) from the end plate (I).

Replacement

1. Do the removal procedure in reverse order.

2. Do the “Function Checks” on page 2-7.

4.40 Head Section Bladder Assembly

Tools required: Window cleaner
Wire cutters
Rags

Removal

1. Set the brakes.
2. Raise the sleep surface to a comfortable working height.

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

3. Disconnect the bed from its power source.
4. Unzip the ticking (A) on the mattress (see figure 4-67 on page 4-127).
5. Pull the ticking (A) to the foot end of the mattress.
6. **Active Integrated Response® Treatment Surface (AIR) manufactured before January 2010**—pull the shear liner (B) to the foot end of the mattress.
7. Pull the fire barrier (C) to the foot end of the mattress to expose the head section bladder assembly (D).

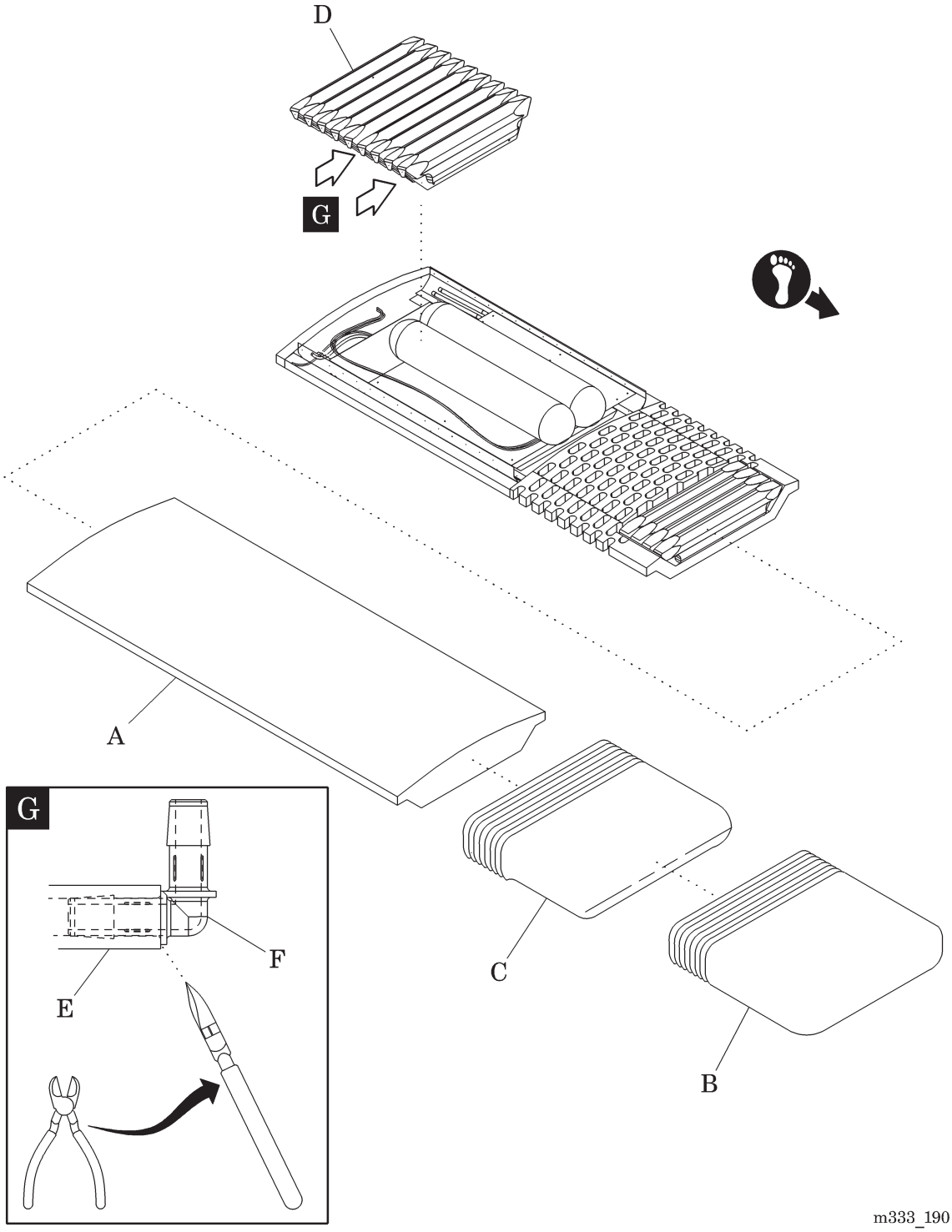
CAUTION:
Use care when you disconnect the hose from the fitting. Excessive force can damage the fitting.

8. On the right side of the fifth and ninth bladders (pink in color), disconnect the fitting (F) from the hose (E).

NOTE:
Putting the wire cutters between the fitting and hose, and then wiggling the wire cutters back and forth will loosen the hose enough for easy removal.

9. Disconnect the snaps on each end of each bladder (two snaps per end of each bladder).
10. Remove the head section bladder assembly (D) from the mattress.

Figure 4-67. Bladder Removal
(AIR surface manufactured before January 2010 is shown)



Replacement

1. Lightly spray the ends of the fitting (F) with window cleaner.
2. Install the fitting (F) onto the bladder port until fully seated.
3. Do the removal procedure in reverse order.
4. Do the “Function Checks” on page 2-7.

4.41 Seat Section Bladder Assembly

Tools required: Window cleaner
Wire cutters
Rags

Removal

1. Set the brakes.
2. Raise the sleep surface to a comfortable working height.

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

3. Disconnect the bed from its power source.
4. Unzip the ticking (A) on the mattress (see figure 4-68 on page 4-130).
5. Pull the ticking (A) to the foot end of the mattress.
6. **AIR surface manufactured before January 2010**—pull the shear liner (B) to the foot end of the mattress.—pull the shear liner (B) to the foot end of the mattress.
7. Pull the fire barrier (C) to the foot end of the mattress to expose the seat section bladder assembly (D).

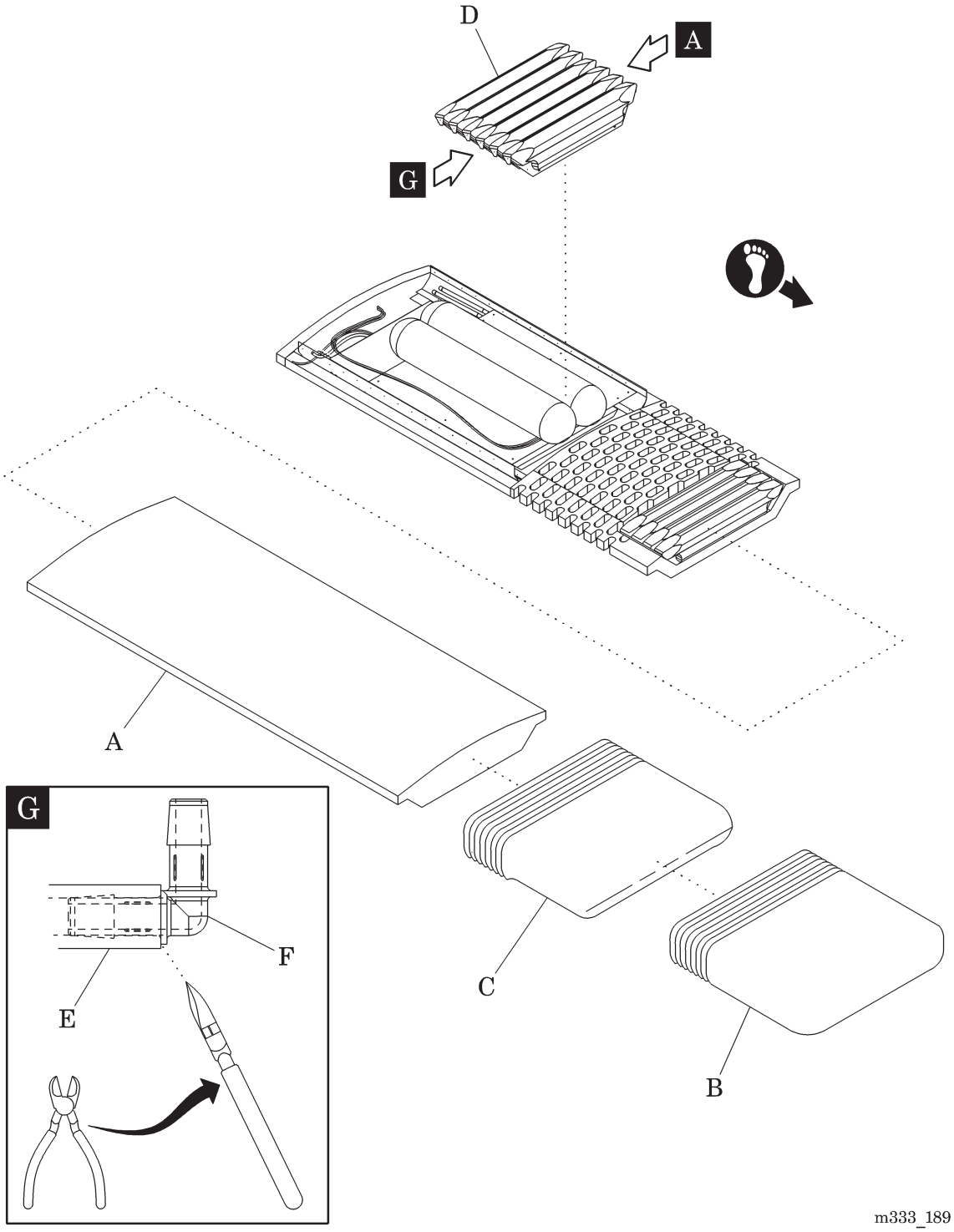
CAUTION:
Use care when you disconnect the hose from the fitting. Excessive force can damage the fitting.

8. On the right side of the fourth bladder (pink in color), disconnect the fitting (F) from the hose (E).
9. On the left side, disconnect the fitting (F) from the orange tube.

NOTE:
Putting the wire cutters between the hose and fitting, and then wiggling the wire cutters back and forth will loosen the hose enough for easy removal.

10. Disconnect the snaps on each end of each bladder (two snaps per end of each bladder).
11. Remove the seat section bladder assembly (D) from the mattress.

Figure 4-68. Bladder Removal
(AIR surface manufactured before January 2010 is shown)



Replacement

1. Lightly spray the ends of the fitting (F) with window cleaner.
2. On the right side, install the fitting (F) into the bladder port until fully seated.
3. On the left side, install the fitting into the orange tube.
4. Do the removal procedure in reverse order.
5. Do the “Function Checks” on page 2-7.

4.42 Foot Section Bladder Assembly

Tools required: Window cleaner
Wire cutters
Rags

Removal

1. Set the brakes.
2. Raise the sleep surface to a comfortable working height.

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

3. Disconnect the bed from its power source.
4. Unzip the ticking (A) on the mattress (see figure 4-69 on page 4-133).
5. Pull the ticking (A) to the foot end of the mattress.
6. **AIR surface manufactured before January 2010**—pull the shear liner (B) to the foot end of the mattress.
7. Pull the fire barrier (C) to the foot end of the mattress to expose the foot section bladder assembly (D).

CAUTION:
Use care when you disconnect the hose from the fitting. Excessive force can damage the fitting.

8. On the right side of the first and fourth bladders, disconnect the fitting (F) from the bladder ports.

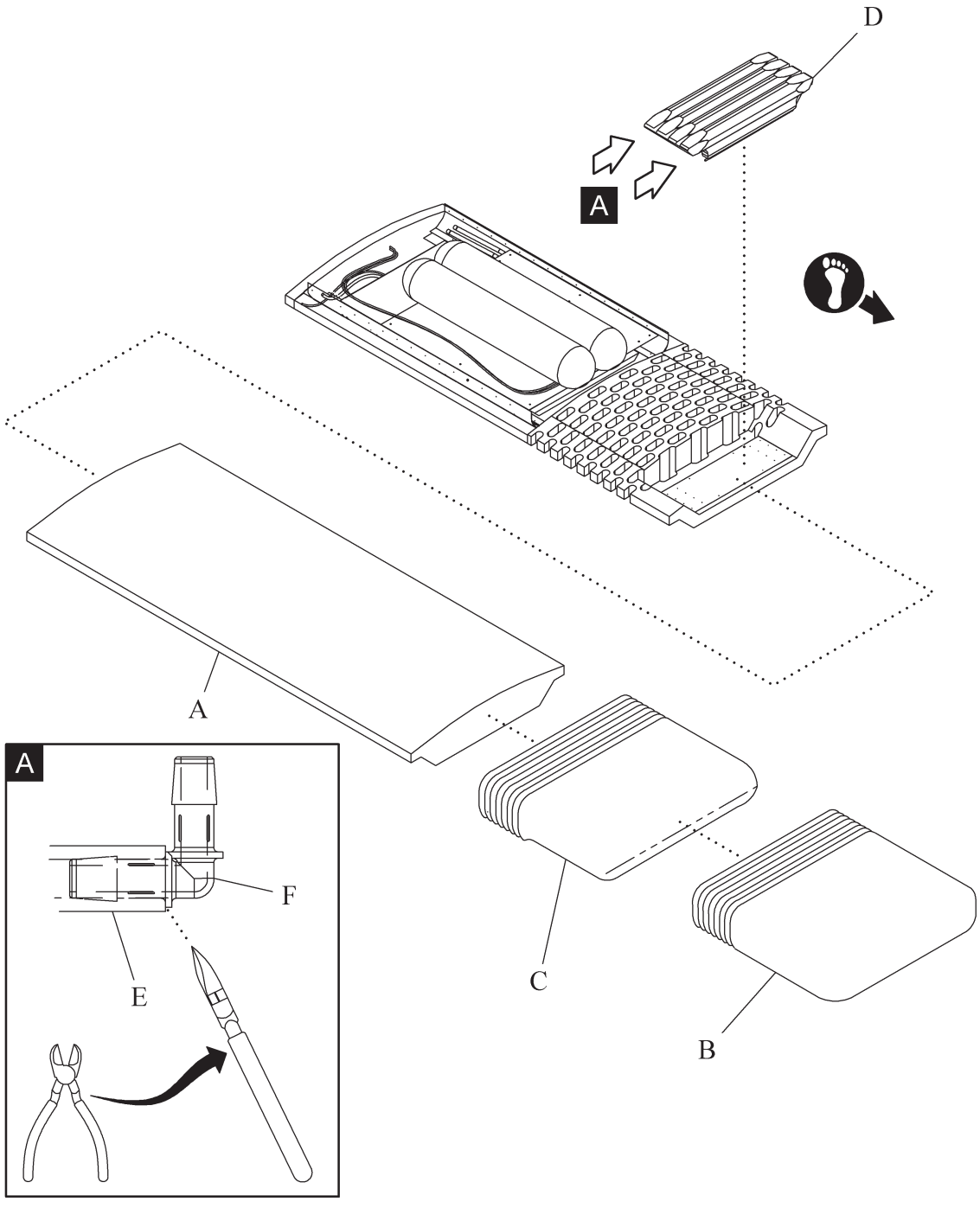
NOTE:
Putting the wire cutters between the hose and fitting, and then wiggling the wire cutters back and forth will loosen the hose enough for easy removal.

9. Disconnect the snaps on the ends of each bladder (D).

NOTE:
There are two snaps on each end of the bladder.

10. Remove the foot section bladder assembly (D) from the mattress.

Figure 4-69. Bladder Removal
(AIR surface manufactured before January 2010 is shown)



Replacement

1. Lightly spray the ends of the fitting (F) with window cleaner.
2. Install the fitting (F) into the bladder ports until fully seated.
3. Do the removal procedure in reverse order.
4. Do the “Function Checks” on page 2-7.

4.43 Turn Assist Bladder Assembly

Tools required: Window cleaner
Wire cutters
Rags

Removal

1. Set the brakes.
2. Raise the sleep surface to a comfortable working height.

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

3. Disconnect the bed from its power source.
4. Unzip the ticking (A) on the mattress (see figure 4-70 on page 4-136).
5. Pull the ticking (A) to the foot end of the mattress.
6. Pull the shear liner (B) to the foot end of the mattress.
7. Pull the fire barrier (C) to the foot end of the mattress to expose the head and seat section bladder assemblies.

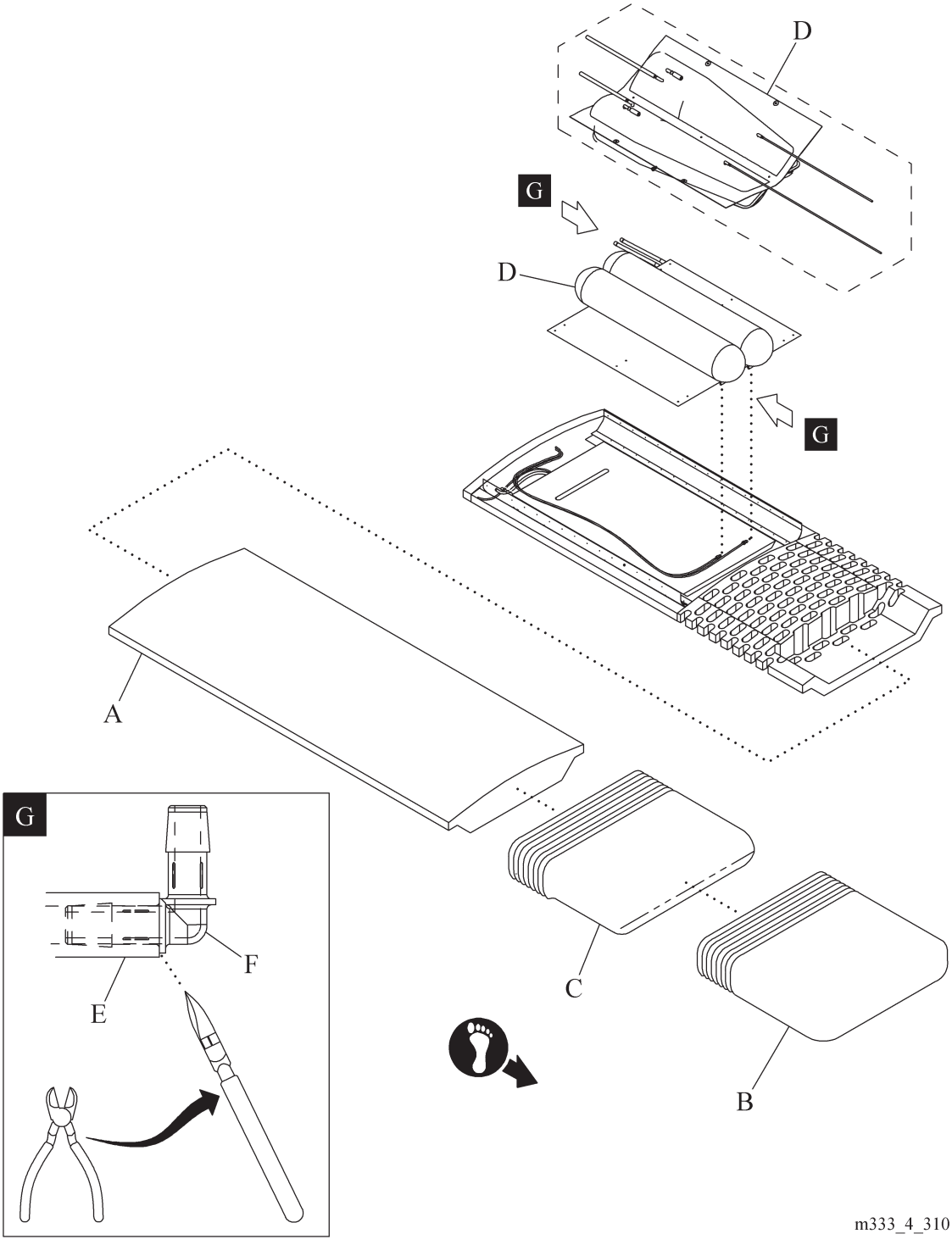
CAUTION:
Use care when you disconnect the hose from the fitting. Excessive force can damage the fitting.

8. At the head end of the bladder assembly (D), disconnect the fittings (F) from the bladder ports.

NOTE:
Putting the wire cutters between the hose and fitting, and then wiggling the wire cutters back and forth will loosen the hose enough for easy removal.

9. At the foot end of the bladder assembly (D), disconnect fittings (F) from the bladder ports.
10. Disconnect the 12 snaps on the bladder assembly (six snaps per side).
11. Remove the turn assist bladder assembly (D) from the mattress.

Figure 4-70. Turn Assist Bladder Assembly (both styles of the turn assist bladders are shown)



Replacement

1. Lightly spray the ends of the fitting (F) with window cleaner.
2. Install the fittings (F) into the bladder ports until fully seated.
3. Do the removal procedure in reverse order.
4. Do the “Function Checks” on page 2-7.

4.44 Wireless Interface Unit

Tools required:	T25 Torx® screwdriver	Wire cutters
	Antistatic strap	5/16" socket
	Ratchet	Cable tie (5)

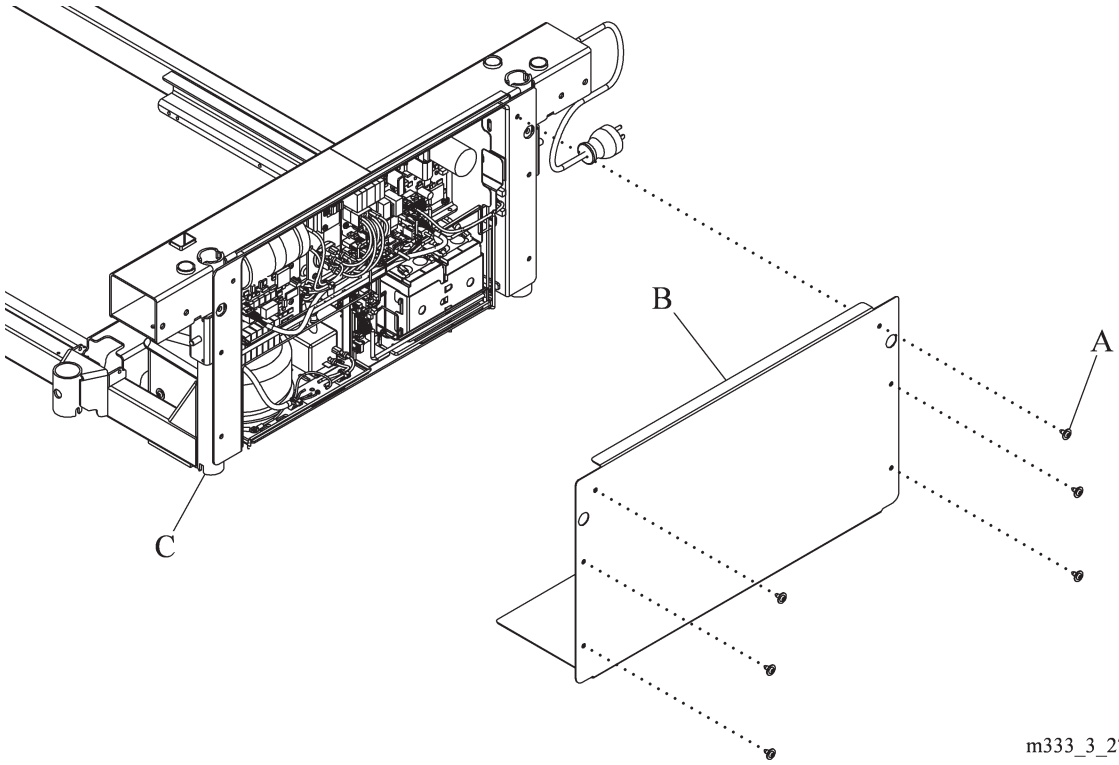
Removal

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

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

4. Disconnect the bed from its power source.
5. Remove the six screws (A) that attach the power supply cover (B) to the bed (C) (see figure 4-71 on page 4-138).
6. Remove the power supply cover (B).

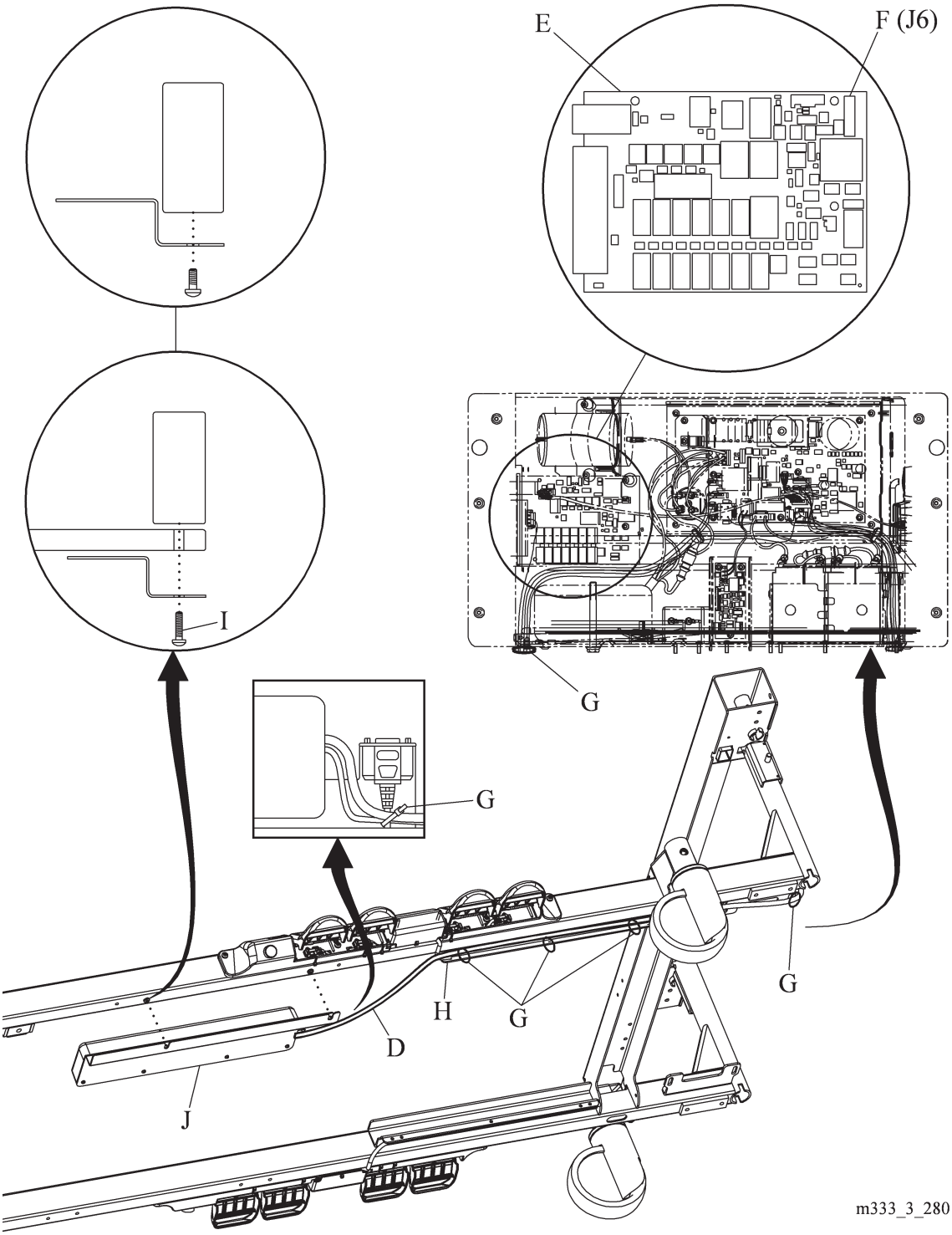
Figure 4-71. Power Supply Cover



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

7. Put on the antistatic strap.
8. Disconnect the cable (D) from the communication P.C. board (E) at connector J6 (F) (see figure 4-72 on page 4-140).
9. Make a note of the position of the cable ties (G) that attach the cable (D) to the lift arm track (H).
10. Cut and remove the cable ties (G) that attach the cable (D) to the lift arm track (H).
11. Loosen the two screws (I) that attach the wireless module (J) to the bed (C).
12. Remove the WIU (J).

Figure 4-72. Wireless Interface Unit



Replacement

1. Do the removal procedure in reverse order.
2. Do the “Function Checks” on page 2-7.
3. Configure the WIU. Refer to *The NaviCare® System Software Installation Guide* (P004443).

4.45 Line Manager

Tools required: 3/4" wrench

Removal

1. Set the brakes.
2. Raise the bed to the highest position.
3. Raise the head section to 15°.

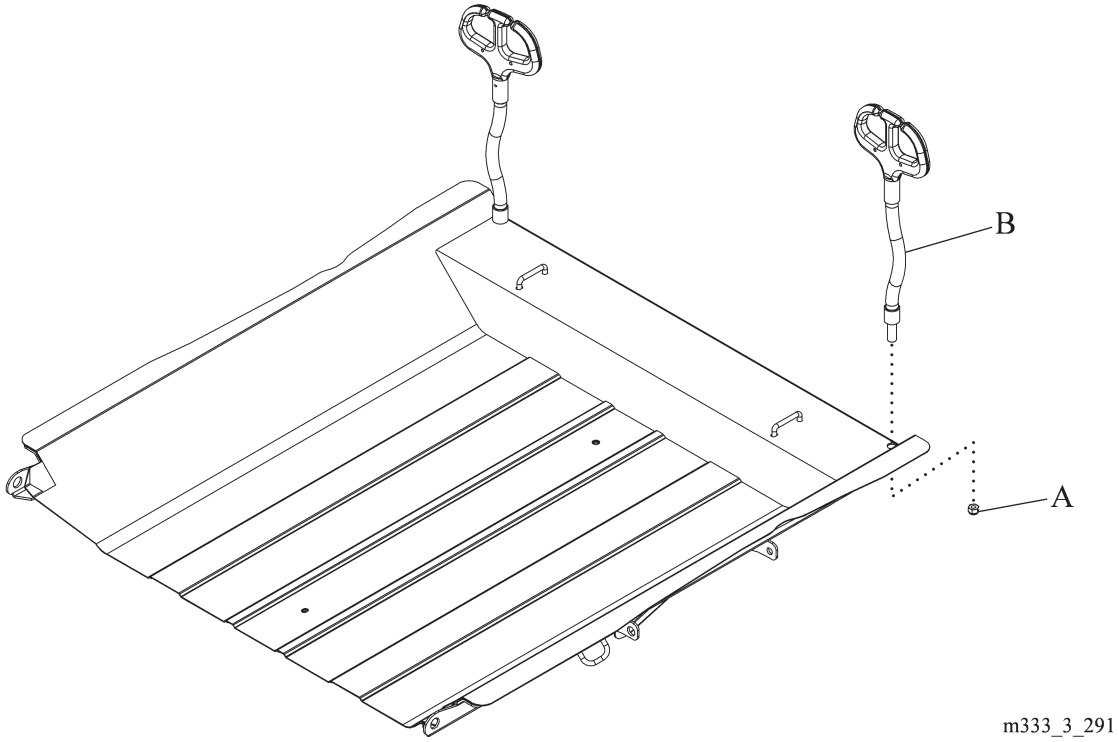
WARNING:
Failure to disconnect the bed from its power source could cause injury or equipment damage.

4. Unplug the bed from its power source.
5. Remove the headboard.
6. Disconnect the mattress.
7. Pull the mattress down approximately 12" (30.5 cm).
8. Remove the nut (A) that attaches the line manager to the bed.
9. Remove the line manager (B) from the bed.

Replacement

1. Do the removal procedure in reverse order.

Figure 4-73. Line Manager



4.46 Auxiliary Outlet

Tools required: T25 Torx® screwdriver, Wire cutters, Multimeter

Removal

1. Set the brakes.
2. Raise the bed to the full up position.
3. Raise the foot section to the full up position.
4. Raise the head section to the full up position.
5. Raise the left-side siderails to the up and locked position.

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

6. Disconnect both the bed and the auxiliary outlet from their power source.
7. Remove the headboard.
8. Remove the screw (A) that attaches the base frame strain relief (B) to the base frame crosstube (C) (see detail “Z” in figure 4-74 on page 4-145).
9. For H model and earlier beds, do as follows:
   a. Remove the screw (D) that attaches the intermediate frame strain relief (E) to the intermediate frame (F) (see detail “Y” in figure 4-74 on page 4-145).
   b. Remove the three cable ties (G) that hold the outlet cable (H) on the intermediate frame (F) (see detail “AA” in figure 4-75 on page 4-146).
10. For some earlier J model beds and all J model beds previously re-routed, refer to 4-77 on page 4-150 and do the replacement in reverse order.
11. For later J model beds do as follows:
    a. Remove the screw (D) that attaches the intermediate frame strain relief (E for non-scale beds or I for scale beds) to the intermediate frame (F) (see detail “Y” in figure 4-74 on page 4-145).
    b. Remove the five clips and cable ties (G) that hold the outlet cable (H) on the weigh frame (J) (see detail “BB” in figure 4-75 on page 4-146).

Figure 4-74. Outlet Cable Removal

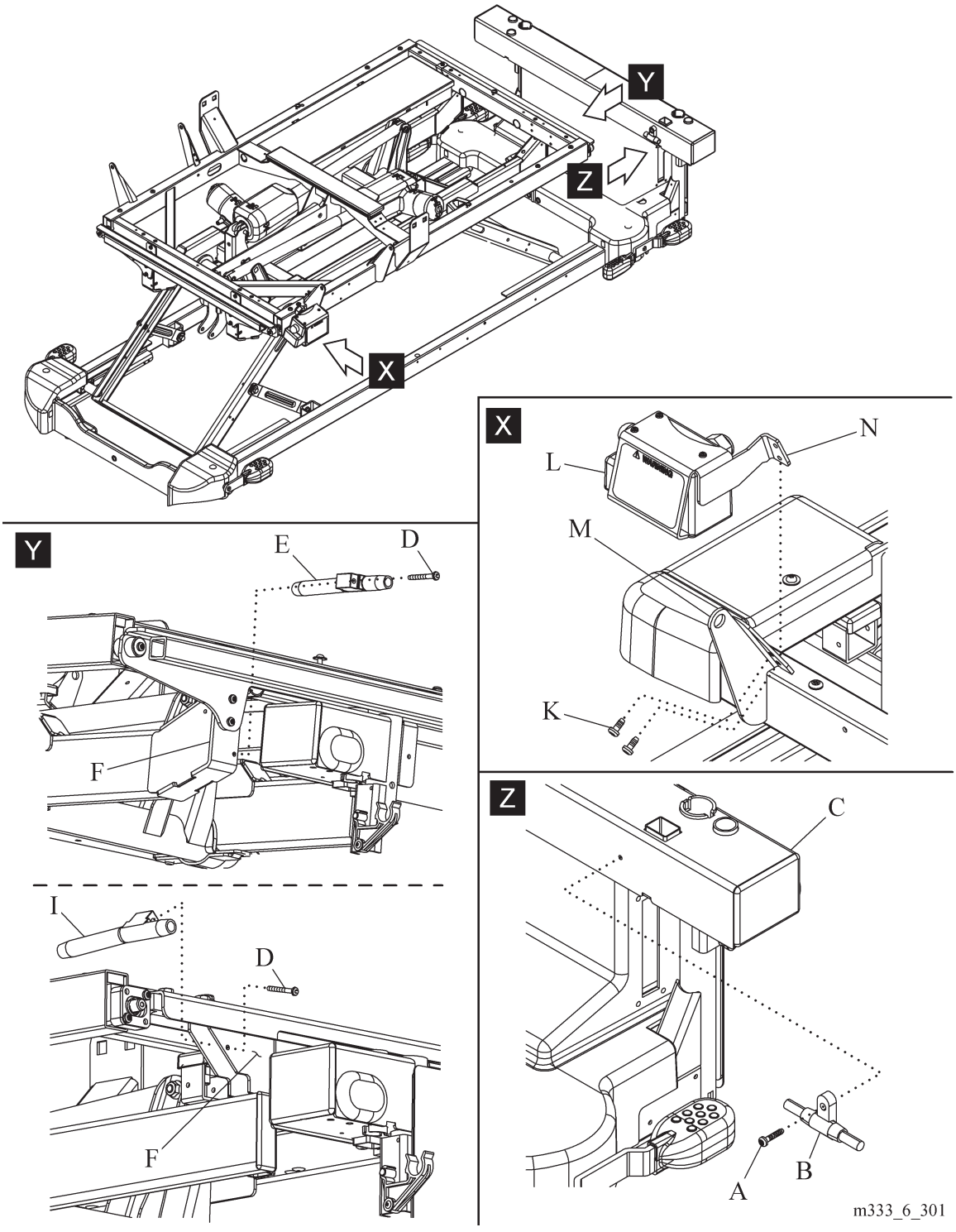
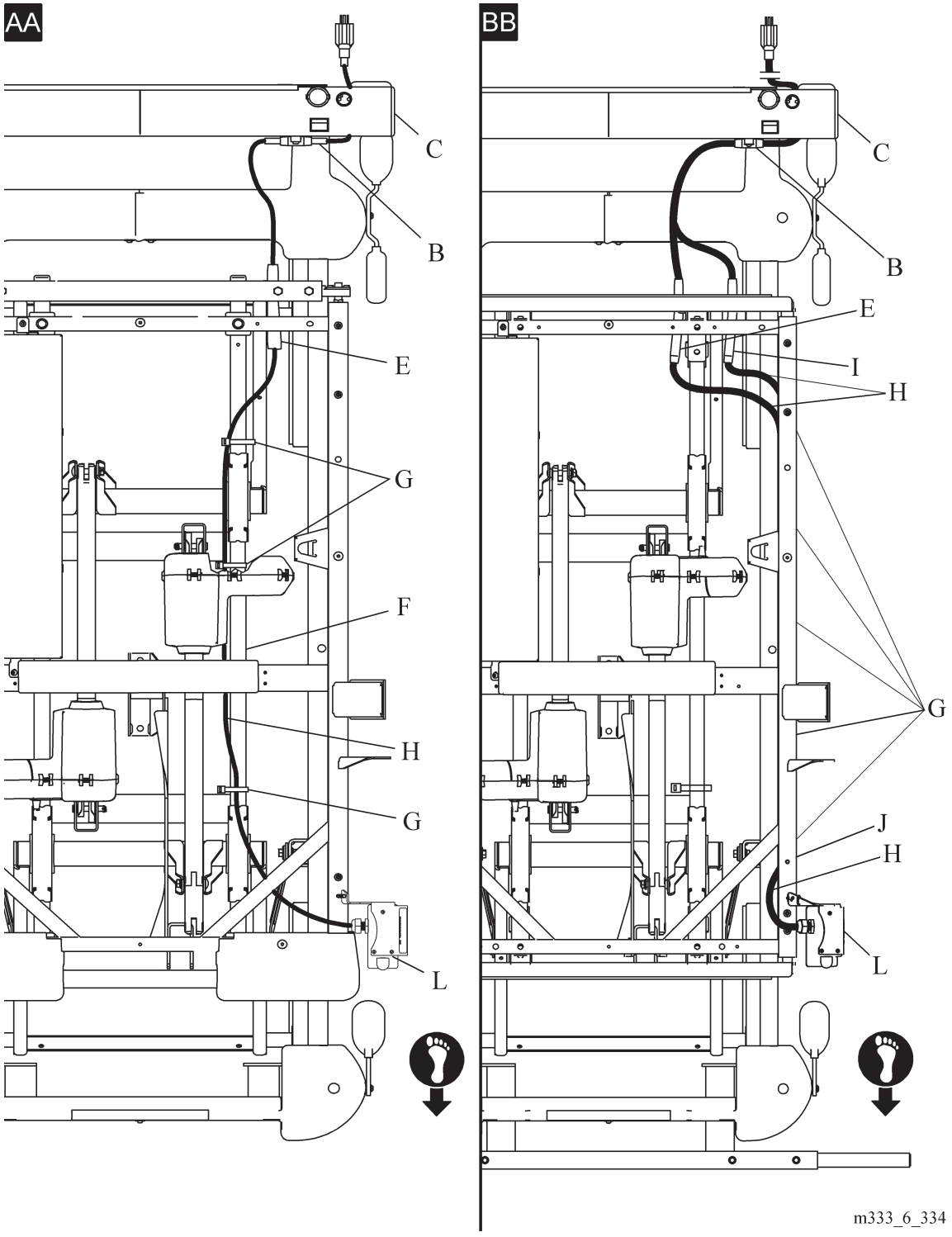


Figure 4-75. Cable Removal—Original Cable Routings



The original cable routing for the H model and earlier beds is shown in (AA) with the later J model beds shown in (BB). Some early J model beds already had the new routing as shown in Figure 4-77 on page 4-150.

12. Remove the two screws (K) that attach the outlet box (L) to the siderail mount (M) (see detail "X" in figure 4-74 on page 4-145).

13. Remove the auxiliary outlet assembly from the bed.

Replacement

1. Put the outlet box (L) so that the outlet box bracket (N) is on the top side of the siderail mount (M) (see detail "X" in figure 4-74 on page 4-145).

2. Install the two screws (K) through the siderail mount (M) to secure the outlet box (L) to the siderail mount (M).

3. Put the outlet cable (H) under the diagonal brace (O) of the weigh frame (J), down to the intermediate frame (F) and along the outside surface of the intermediate frame (F) towards the head of the bed until it reaches the cross member bar (P) of the weigh frame (J). See the applicable figure:
   - For H model and earlier beds, see figure 4-76 on page 4-149.
   - For J model beds, see figure 4-77 on page 4-150.

4. Put the outlet cable (H) between the cross member bar (P) of the weigh frame and the top of the intermediate frame (F) to cross the cable (H) from the outside surface of the intermediate frame (F) to the inside surface.

NOTE:
The plug on the outlet cable (H) will not fit through the space between the intermediate frame (F), its cross member, and the foot hilow motor (Q).

5. In order to continue the outlet cable (H) along the inside surface of the intermediate frame (F), put the outlet cable plug through the space formed by the outside surface of the intermediate frame (F) and the foot hilow motor cable. Be careful not to bind the foot hilow motor cable between the auxiliary outlet cable (H) and the intermediate frame (F).

6. Push the outlet cable (H) between the bottom of the foot hilow motor (Q) and the top of the intermediate frame (F) to move the cable to its routing along the inside surface of the intermediate frame (F).

7. For H model and earlier beds, do as follows:
   a. Cross the strain relief (I) to the outside of the intermediate frame (F) and attach with screw (D) (see detail "Y" in figure 4-74 on page 4-145).
   b. Install the three cable ties (R) at the locations marked on the outlet cable (H) to attach it to the intermediate frame (F) (see figure 4-76 on page 4-149).

8. For J model beds, do as follows:

a. Put the strain relief (E) to the inside of the intermediate frame (F) and attach with screw (D) (see detail "Y" in figure 4-74 on page 4-145).

b. Install the three cable ties (R) at the locations marked on the outlet cable (H) to attach it to the intermediate frame (F) (see figure 4-77 on page 4-150).

9. Use the screw (A) to attach the strain relief (B) to the base frame cross tube (C) (see detail "Z" in 4-74 on page 4-145).

10. Install the headboard.

11. Use the multimeter to make sure there is **no** continuity between the Line, Neutral, and Ground lines of the auxiliary outlet and the bed frame.

12. Do the "Function Checks" on page 2-7. 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 4-76. New Routing for Outlet Cable—H Model and Earlier Beds

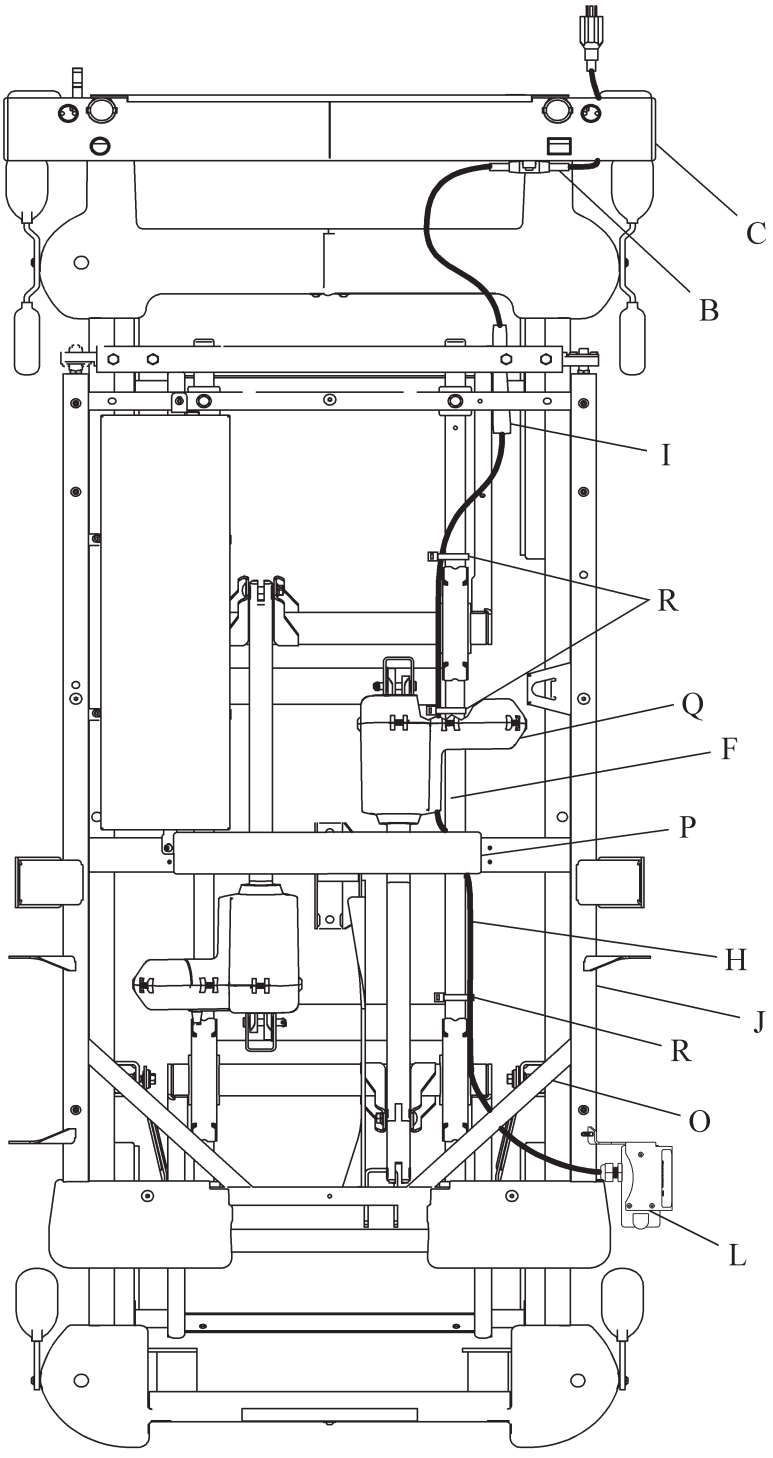
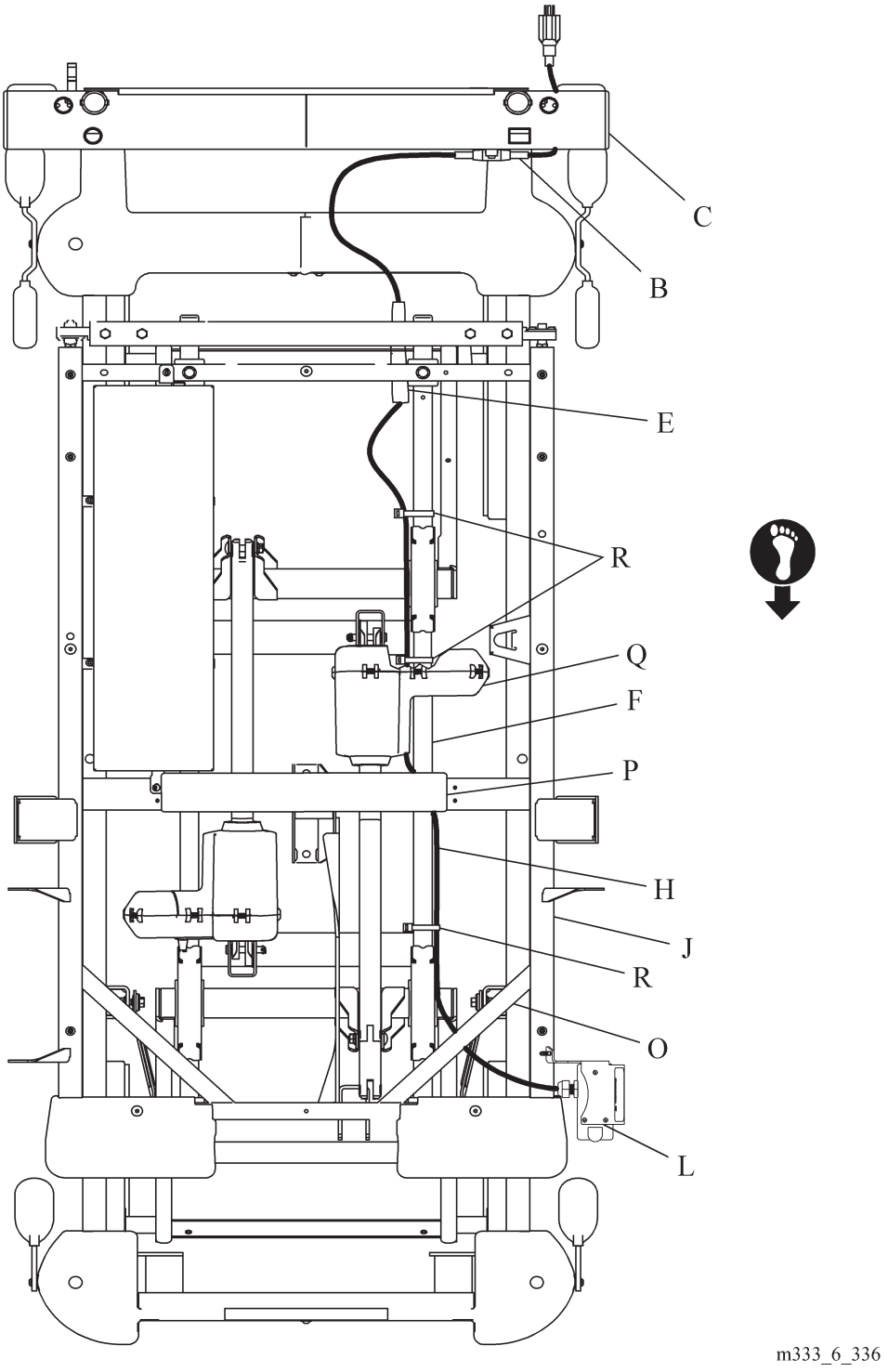


Figure 4-77. New Routing for Outlet Cable —J Model Beds



4.47 Blower Assembly—Surfaces with AMT

Tools required: T25 Torx® screwdriver, Screwdriver, Wire cutters, 13 mm wrench, 2" x 4" x 36" piece of wood

NOTE:
If it is necessary to find the numbers of hours the blower assembly has operated, go to page 4-154.

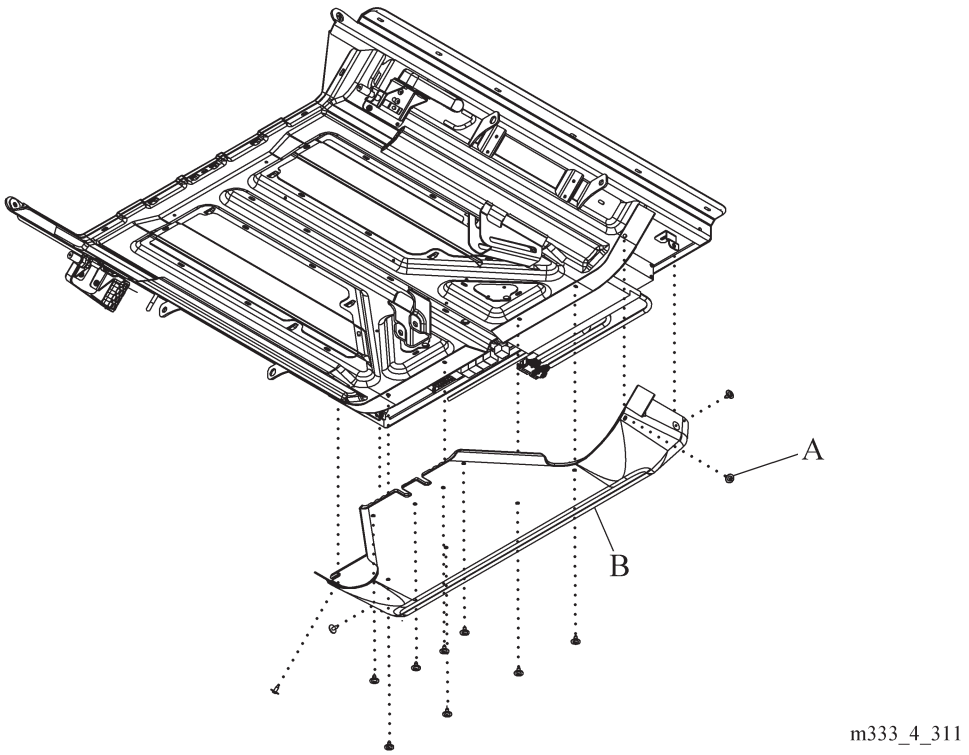
Removal

1. Set the brake.
2. Raise the bed to its highest position.
3. Remove the footboard and headboard.
4. Remove the surface from the bed. Refer to “Mattress” on page 4-3.
5. Raise the head section to its highest position.

SHOCK HAZARD:
Failure to unplug the bed from its power source could cause injury or equipment damage.

6. Unplug the bed.
7. Remove the screws (A) that attach the air module cover (B) to the bed, and remove the cover (B) (see figure 4-78 on page 4-152).

Figure 4-78. Cover Removal



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

8. Put on the antistatic strap.

9. Disconnect the blower assembly cable (C) from P3 on the blower power supply (D).

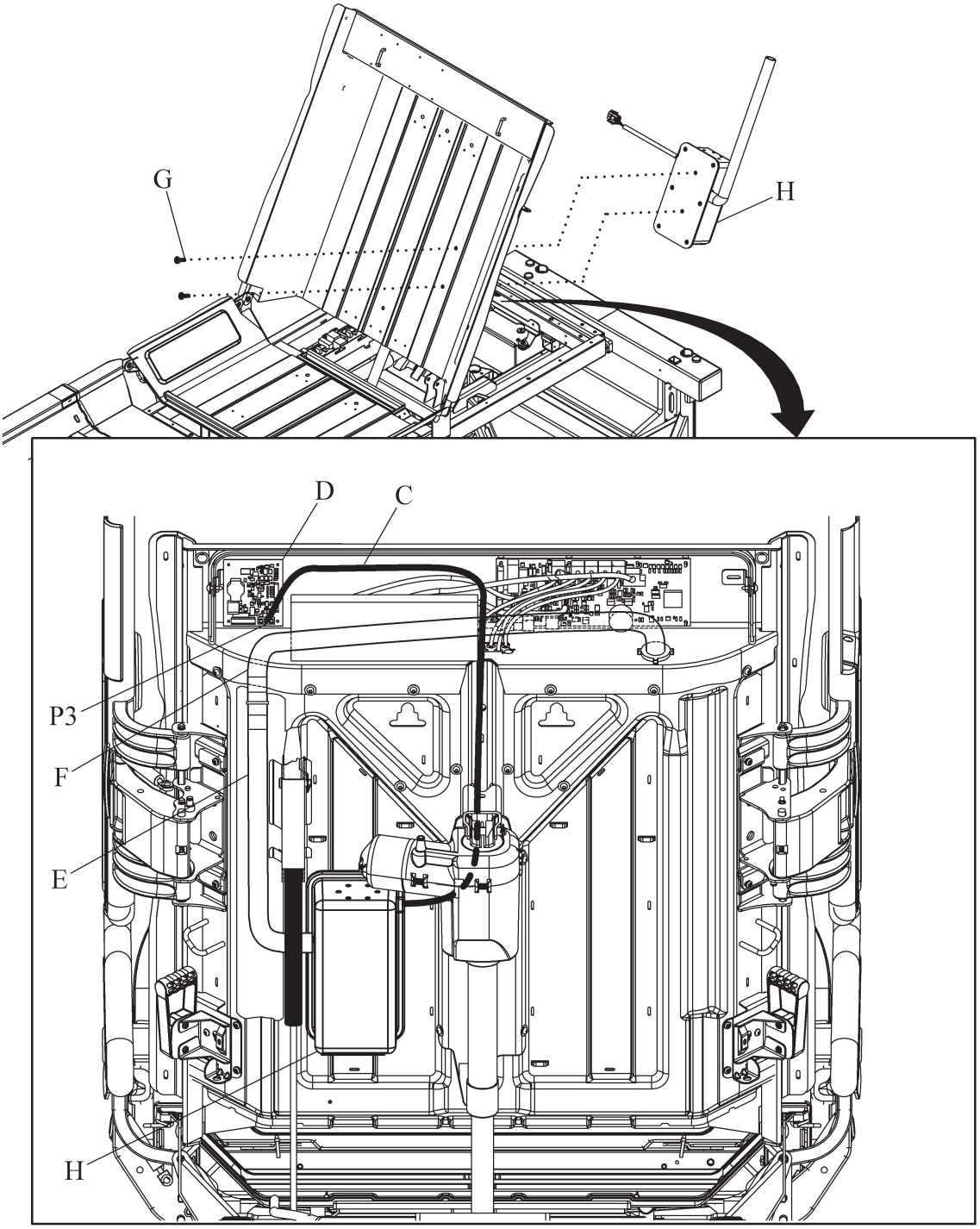
10. Disconnect the head section motor. Refer to “Head Section Motor” in the service manual.

11. Remove the blower assembly cable (C) from the other cables that go through the head section motor mount bracket.

12. Disconnect the blower assembly hose (E) from the AMT hose (F).

13. Remove the two screws (G) that attach the blower assembly (H) to the bed.

Figure 4-79. Blower Assembly Removal



Replacement

1. Do the removal procedure in reverse order.
2. Set the blower assembly timer to zero. see “Set the Blower Assembly Timer to Zero” on page 4-154.
3. Do the “Function Checks” on page 2-7.

Set the Blower Assembly Timer to Zero

1. On the control pod, press and hold the **Turn R**, **Turn L**, **Max-Inflate**, and **Normal** controls. You will hear a beep.

NOTE:
It takes approximately five seconds for the beep to sound.

2. After the beep, release **only** the **Max-Inflate** and **Normal** controls. You will hear a beep.
3. After the beep, as you continue to press and hold the **Turn R** and **Turn L** controls, press and hold the **Max-Inflate** and **Normal** controls. You will hear a beep.
4. After the beep, release **all** of the controls. When you hear three beeps, you will know the timer has been set to zero.

Find the Number of Hours the Blower Assembly has Operated

1. On the control pod, press and hold the **Turn R**, **Turn L**, **Max-Inflate**, and **Normal** controls. You will hear a beep.

NOTE:
It takes approximately five seconds for the beep to sound.

2. After the beep, release **only** the **Turn R** and **Turn L** controls. You will hear a beep.
3. After the beep, as you continue to press and hold the **Max-Inflate** and **Normal** controls, press and hold the **Turn R** and **Turn L** controls for approximately five seconds, and then release the controls.

4. After you release the controls, listen to the sequence of beeps. The beeps correspond to the stored number of hours. Each position (1000, 10,000, and 100,000) is separated by a five-second long pause. A three-second long beep at the end of the sequence lets you know the sequence is complete.
   - Short beeps = the number for that position
   - One long beep = 0 for that position

   Here is an example for a unit that has operated for 132,000 hours:
   - 1000 position = 2 short beeps, a five-second pause
   - 10,000 position = 3 short beeps, a five-second pause
   - 100,000 position = 1 short beep, a five-second pause, and then a three-second long beep that lets you know the sequence is complete

4.48 Air Control P.C. Board or Blower Power Supply

Tools required: T25 Torx® screwdriver Antistatic strap

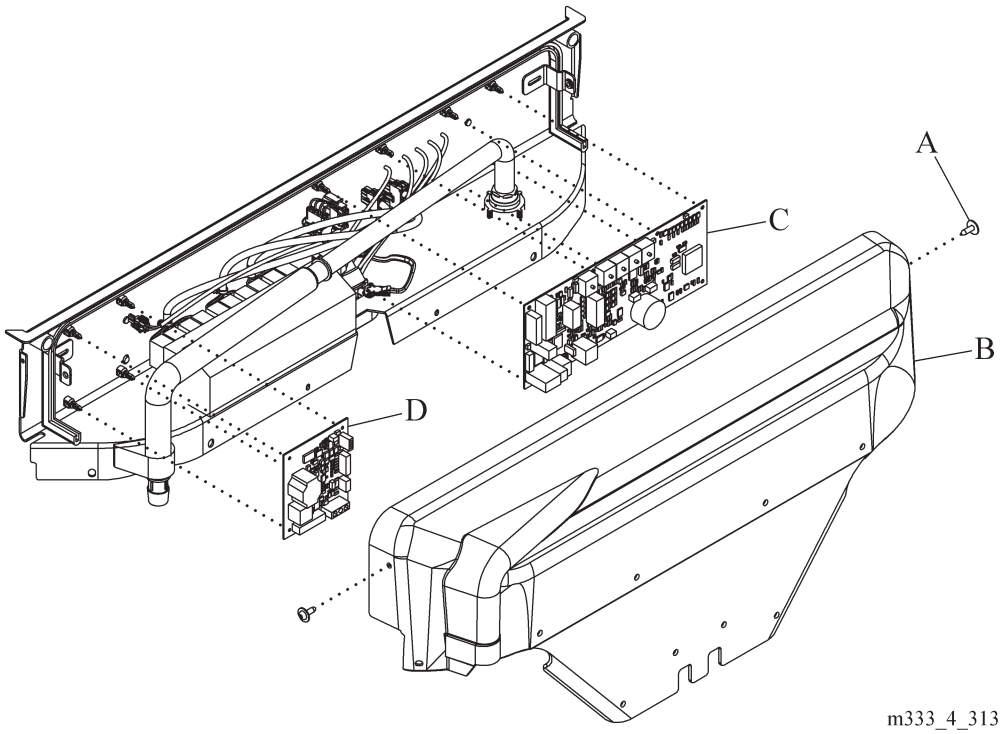
Removal

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

SHOCK HAZARD:
Failure to unplug the bed from its power source could cause injury or equipment damage.

4. Unplug the bed from its power source.
5. Remove the 12 screws (A) that attach the air module cover (B) to the head section (see figure 4-80 on page 4-156).

Figure 4-80. P.C. Board Removal



6. Remove the air module cover (B).

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

7. Put on the antistatic strap.

8. Make a note of the cable connections on the air control P.C. board (C) or blower power supply board (D).

9. Disconnect all cables from the applicable P.C. board (C or D).

10. Remove the applicable P.C. board (C or D) from the head section.

Replacement

1. Do the removal procedure in reverse order.

2. Set the patient weight offset (see "Set the Patient Weight Offset" on page 4-157).

NOTE:
If the surface, headboard, footboard, bed equipment, and/or bed linens were removed, install them before you zero the air system.

3. **Air control P.C. board only**—configure the board. Refer to "Configure the Air Control Board" on page 4-158.

4. Do the "Function Checks" on page 2-7.

Set the Patient Weight Offset

1. On the control pod, press and hold the **Turn R** and **Max-Inflate** controls. You will hear a beep.

NOTE:
It takes approximately five seconds for the beep to sound.

2. After the beep, as you continue to press and hold the **Turn R** and **Max-Inflate** controls, press and hold the **Turn L** and **Normal** controls. You will hear two beeps.

3. After the beeps, release **all** of the controls. When you hear three beeps, you will know the patient weight offset for the air system has been set.

Configure the Air Control Board

Select Bladder Type

1. On the control pod, press and hold the **Turn R**, **Turn L**, **Max-Inflate**, and **Normal** controls. You will hear a beep.

NOTE:
It takes approximately five seconds for the beep to sound.

2. After the beep, release **only** the **Turn L** and **Max-Inflate** controls. You will hear a beep.

3. After the beep, as you continue to press and hold the **Turn R** and **Normal** controls, press and hold the **Turn L** and **Max-Inflate** controls. You will hear a beep.

4. After the beep, release **all** of the controls. You will hear one or two beeps: one beep identifies AIR bladders (on surfaces manufactured before January 1, 2010); two beeps identify P500 bladders or AIR bladders (on surfaces manufactured after January 1, 2010).

Select AMT or Non-AMT (for P500 Surfaces without AMT Built before January 1, 2010 and AIR Surfaces Built after January 1, 2010)

1. On the control pod, press and hold the **Turn R**, **Turn L**, **Max-Inflate**, and **Normal** controls. You will hear a beep.

NOTE:
It takes approximately five seconds for the beep to sound.

2. After the beep, release **only** the **Turn R** and **Max-Inflate** controls. You will hear a beep.

3. After the beep, as you continue to press and hold the **Turn L** and **Normal** controls, press and hold the **Turn R** and **Max-Inflate** controls. You will hear a beep.

4. After the beep, release **all** of the controls. You will hear four or five beeps: if four beeps, AMT is **off**; if five beeps, AMT is **on**.

4.49 SafeView® Alerts

Tools required: T25 Torx® screwdriver, Needle nose pliers, Wire cutters, Antistatic strap, Weight, 50 lb (23 kg) minimum

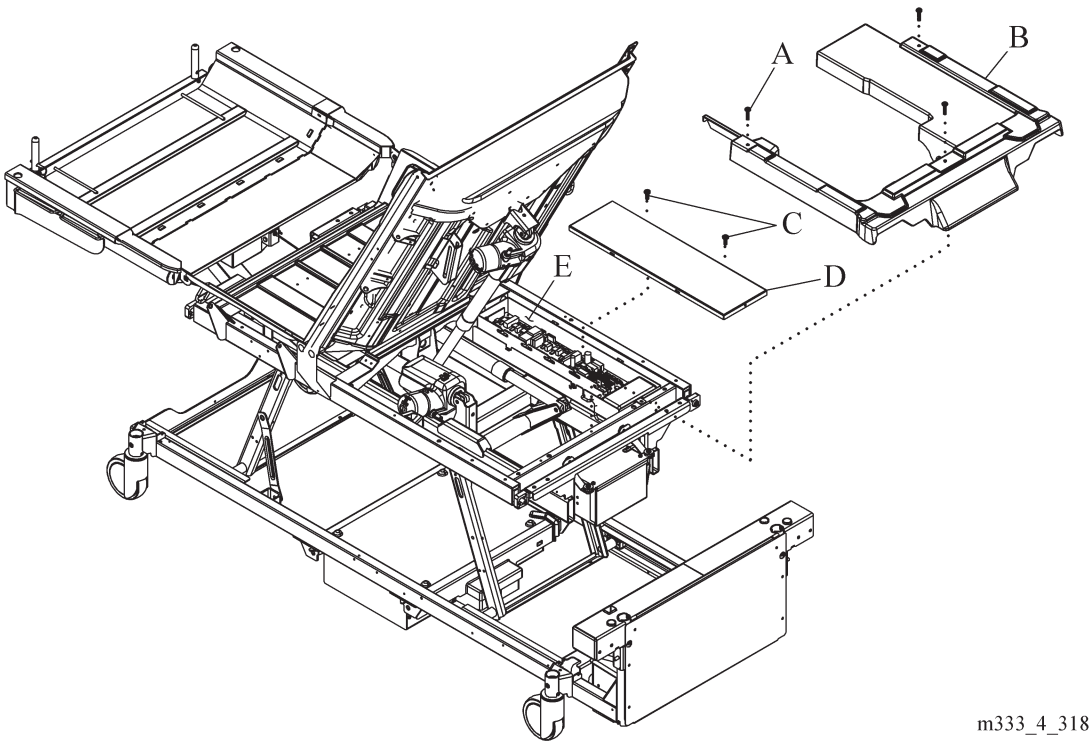
Removal and Replacement

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.

SHOCK HAZARD:
Failure to unplug the bed from its power source could cause injury or equipment damage.

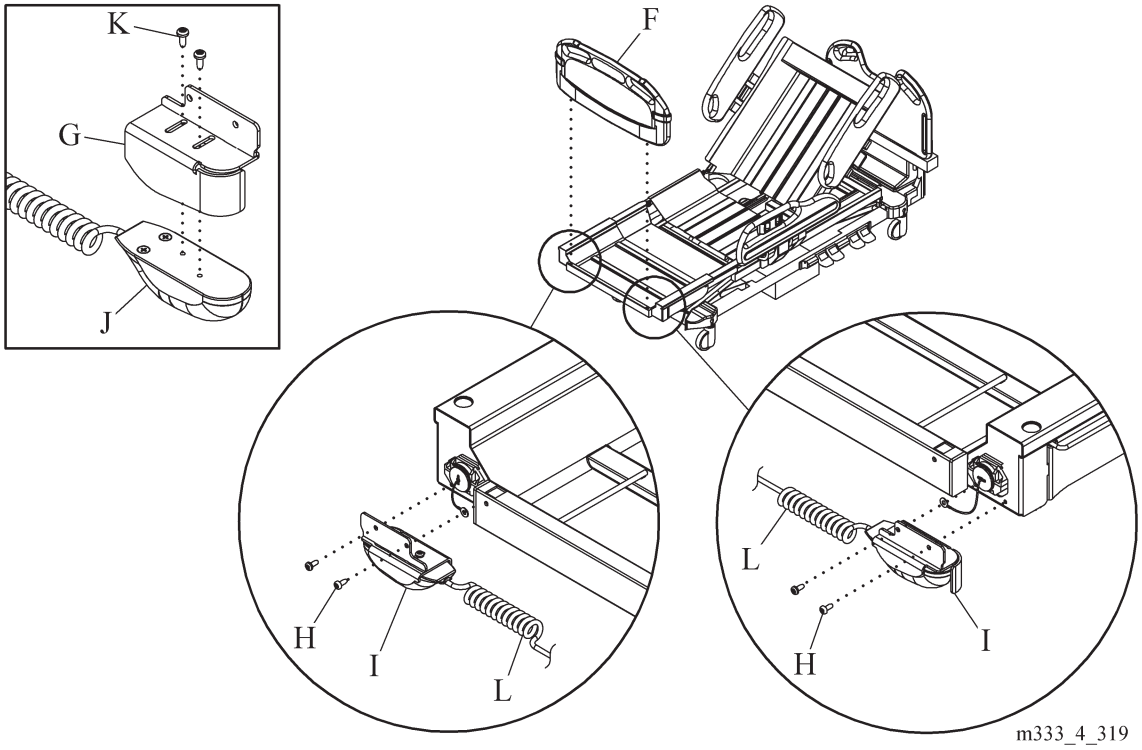
5. Unplug the bed.
6. At the head end of the bed, remove the screws (A) that attach the weigh frame cover (B) to the bed (see figure 4-81 on page 4-160).

Figure 4-81. Cover Removal



7. Remove the weigh frame cover (B).
8. Remove the two screws (C) that attach the electronics module cover (D) to the electronics module (E).
9. Remove the electronics module cover (D).
10. Remove the footboard (F) from the bed (see figure 4-82 on page 4-161).

Figure 4-82. Lights Installation



11. Do as follows to remove each light assembly weldment (G) from the bed:
    a. Remove the two screws (H) that attach the light assembly weldment (G) to the end of the bed. Keep the two screws (H).

NOTE:
One of the screws will have a ground wire installed.

    b. Remove the light assembly weldment (G).

12. Do as follows for each new light assembly (I):
    a. Install the light (J) on the weldment (G) so the screw holes on the light (J) and the weldment (G) are aligned.
    b. Install two screws (K) to attach the light (J) to the weldment (G).
    c. Put the light assembly weldment (G) in the position where the old light assembly weldment was removed. Make sure the screw holes on the bed and the weldment (G) are aligned.

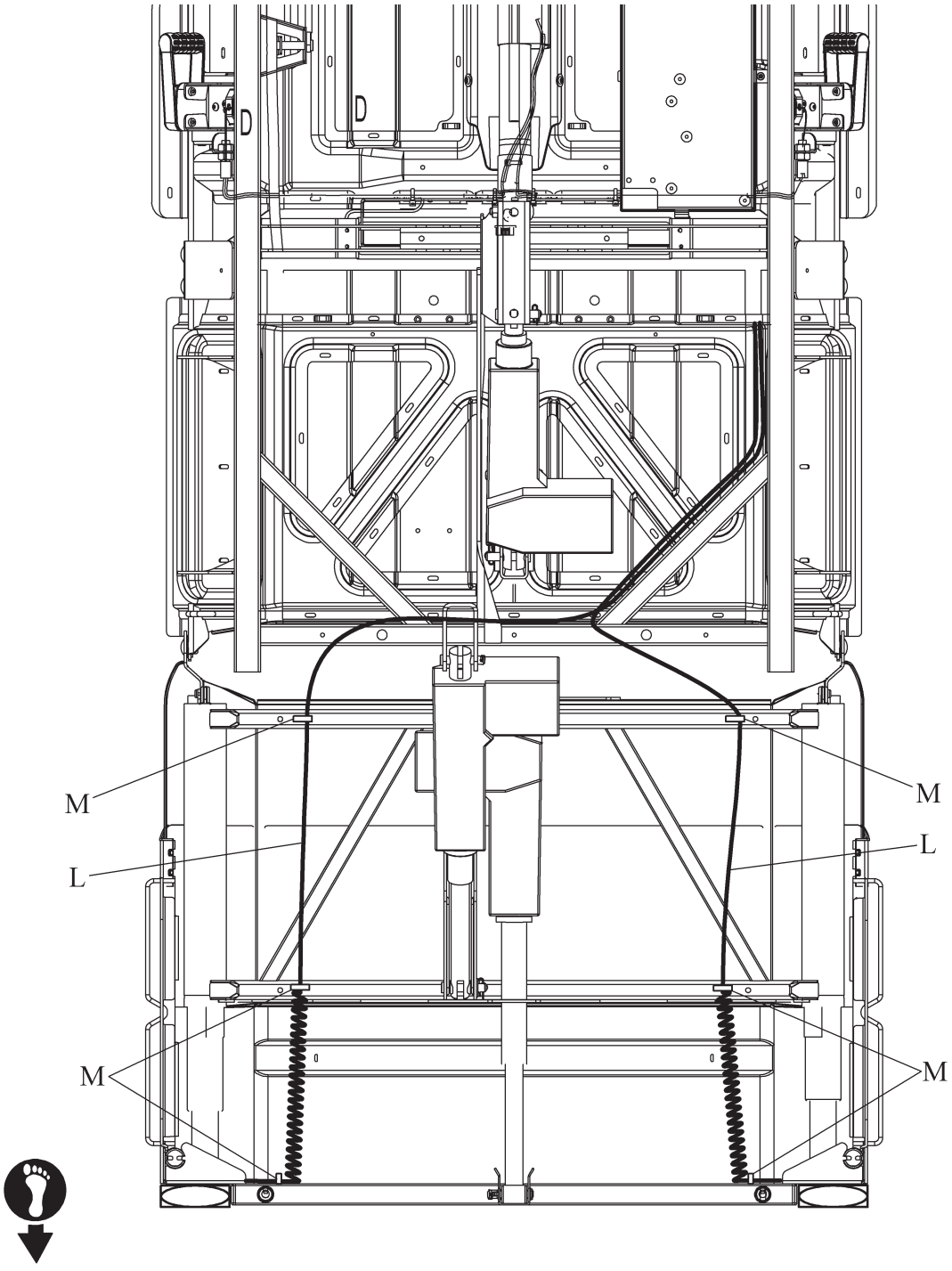
NOTE:
The light assemblies are left- and right-side specific.

d. Install the two screws (H) to attach the light assembly (I) to the bed.

NOTE:
Make sure the ground wire is installed on the applicable screw.

13. From the foot end of the bed, put the new light assembly cables (L) to the logic control P.C. board (see figure 4-83 on page 4-163). Remove the cable ties (M) and the old light assembly cables (L), and then install new cable ties (M) to hold the new light assembly cables (L) on the bed.

Figure 4-83. Cable Routing (Bottom View)



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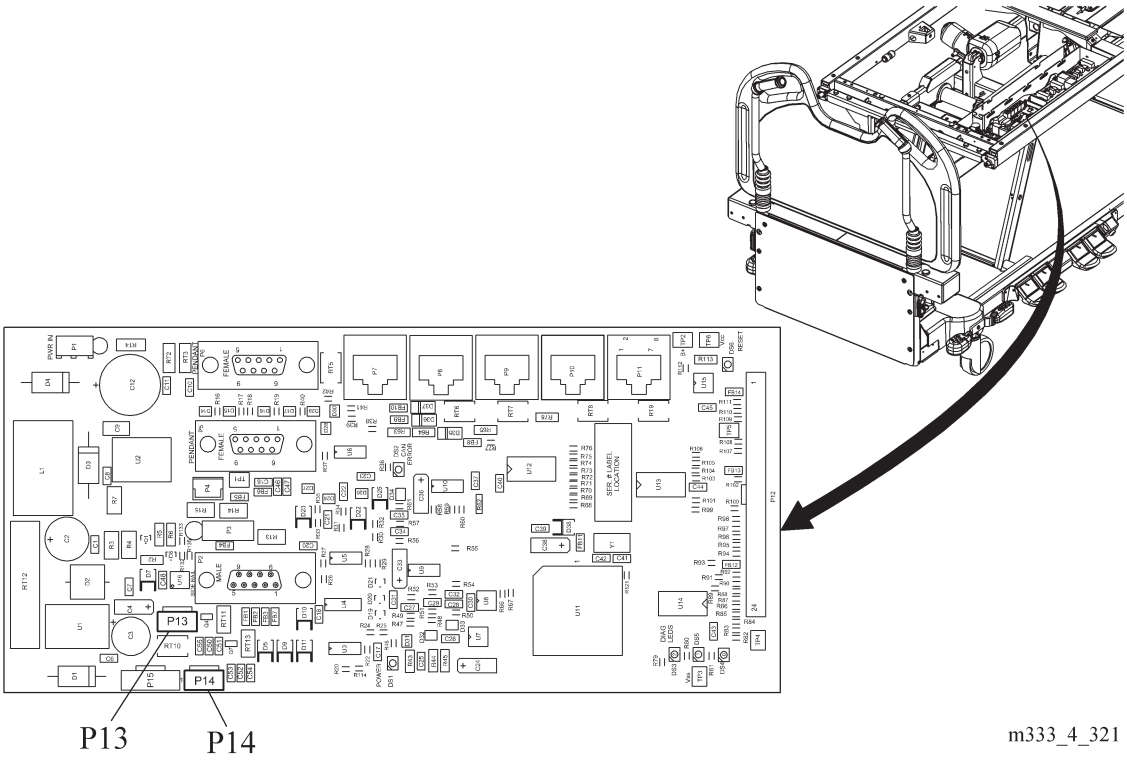
CAUTION:
Failure to wear an antistatic strap when you handle electronic components could cause component damage.

14. Put on the antistatic strap.

15. At the logic control P.C. board, disconnect the old light assembly cables from positions P13 and P14 (see figure 4-84 on page 4-164).

Figure 4-84. Cable Connection



16. Connect the new light assembly cables to positions P13 and P14 (the cables are not connector specific).

17. Remove and discard the old light assemblies.

18. 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.

19. Put the bed is in the safe condition as follows:
    - Put the bed in the low position.

- Put the applicable siderails up as configured (see “Configure the Siderails for the Safe Bed Condition” on page 4-166).
- Set the brake.
- If the bed has the optional head angle alarm, activate it.

NOTE:
If the bed has the optional head angle alarm, **and** it is active, it is included in the safe condition requirements.

20. Put a minimum of 50 lb (23 kg) of weight on the bed.

21. 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 configured siderail. The lights flash yellow when one of the configured siderails is lowered, and the lights are on green when all configured 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. If the bed has the head angle alarm, **and** it is active, lower the head of the bed until the alarm comes on, and then raise the head of the bed until the alarm stops. The lights flash yellow when the head section is in an alarm condition, and the lights are on green when the head section is raised above the alarm condition.
    f. Deactivate the Bed Exit Alarm System. The lights are off.

NOTE:
An active head angle alarm will cause the lights to flash yellow whenever the bed goes into an alarm condition. This occurs whether the Bed Exit Alarm System is active or inactive.

NOTE:
The lights are off when the Bed Exit Alarm System is not active, the lights have been deactivated, the bed operates on battery power, or the bed is disconnected from AC power.

22. Remove the 50 lb (23 kg) of weight from the bed.

23. Do the “Function Checks” on page 2-7.

Configure the Siderails for the Safe Bed Condition

For the safe bed condition, the factory configuration is that both head-end siderails must be up. The system may be configured so that one or both of the intermediate siderails must also be up.

These are the three siderail configurations for the Alerts:

- The head siderails up.
- The head siderails and one intermediate siderail up

NOTE:
The system does not know if the right or left intermediate siderail is up.

- All siderails up.

1. To configure the system, put the siderails in one of the configurations shown above.

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 is 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. Make sure the lights operate as configured:
   a. Put the siderails in the applicable configuration.
   b. Make sure the lights are on green.
   c. One at a time, lower and then raise each configured siderail. Make sure the lights flash yellow when one of the configured siderails is lowered, and the lights are on green when all configured siderails are up.

NOTE:
If more than the configured siderails are **up**, the system will not alert. It only alerts when the configured siderails are **down**.

Deactivate the SafeView® Alerts

If you want to activate the Bed Exit Alarm System, but do not want the lights on, do as follows:

1. Make sure the Bed Exit Alarm System is not active. Refer to “Bed Exit Alarm System (B through J model beds)” in the *VersaCare® Bed User Manual* (USR119).

2. Press and release the Enable control.

3. Press and hold the applicable Bed Exit control.

4. Continue to press the Bed Exit control, and press the Volume control for approximately three seconds. The lights will flash green for three seconds to let you know the configuration is set. The Bed Exit Alarm System will be active, and the lights will be off.

NOTE:
The lights will stay off until you activate the Bed Exit Alarm System again or you disconnect the bed from AC power and then connect the bed to AC power.

NOTE:
If the lights are deactivated on a bed with the optional head angle alarm that is active, the lights will **not** flash yellow if the head section goes below the specified angle.

4.50 Change the Scale Units—Beds with the Bed Exit Alarm Silence Feature

The default units shown on the scale display is both pounds (lb) and kilograms (kg). To change the units to lb or kg only, use the control pod to do these:

1. Make sure the Enable control indicator is off.

2. Press and hold the *Zero* control. After approximately five seconds, as you continue to press the *Zero* control, press and hold the *Weigh* control. When you hear a beep, release both controls. The display will be in configuration mode with the current unit setting highlighted: lb only, kg only, or lb/kg.

3. Press and release the *Weigh* control to move through the settings. When you reach the applicable setting, release the control and wait until you hear a beep (approximately ten seconds). The display will store the new configuration and exit the configuration mode.

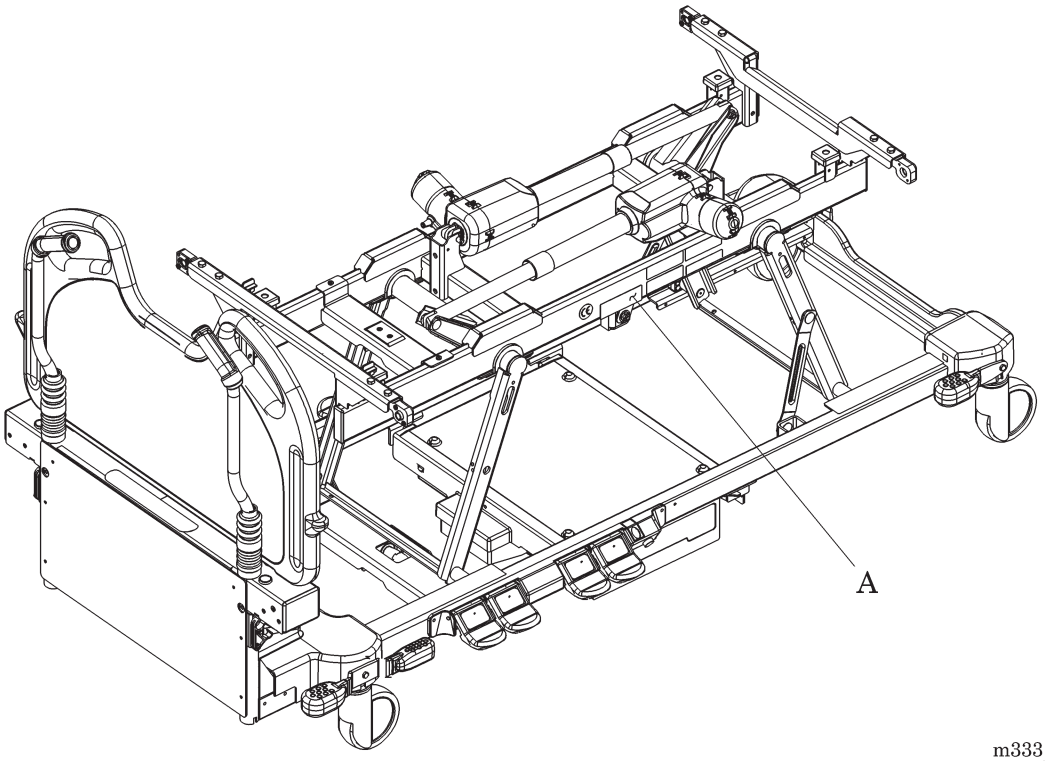
NOTE:
If you do not press the Weigh control within ten seconds, you will hear a beep to let you know that the selected configuration will be stored and the display is exiting configuration mode.

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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Contact Hill-Rom Technical Support with this data:

- 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 this Hill-Rom fax number:

812-934-8472

Terms:

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

Address all inquiries to:

ATTN TECHNICAL SUPPORT—PARTS
HILL-ROM, 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 47006-9167

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, contact Hill-Rom Technical Support.

Exchange Policy

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

In-Warranty Exchanges

In some 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, contact Hill-Rom Technical Support.

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, contact Hill-Rom Technical Support. 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**.

NOTES:

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.

Revised July 6, 2001

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

Warranty Statement—Wireless Interface Unit

This warranty statement **only** applies to the wireless interface unit.

The following is a general description of the Limited Warranty that accompanies NaviCare® System soft-ware. Please refer to the applicable Equipment Purchase and License Agreement for additional provisions and customer specific variations of the terms and conditions of this Limited Warranty. Any variations between the Agreement and the below Limited Warranty shall be resolved in favor of the Equipment Purchase and License Agreement Warranty. Hill-Rom warrants for a period of fifteen (15) months from the date of delivery or twelve (12) months from the date of installation, whichever occurs first, that NaviCare shall perform in accordance with its published specifications and the documentation. Hill-Rom warrants that the hardware be free from defects in material and workmanship during the period outlined above and that the Licensed Software shall perform substantially in accordance with the published specifications and documentation. Hill-Rom's obligations under this warranty are expressly limited to repairing or replacing, at its option within such period, any component of the system, which is, in the reasonable discretion of Hill-Rom, found defective. THE FOREGOING EXPRESS WAR-RANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. HILL-ROM DOES NOT WARRANT THAT THE OPERATION OF THE SYSTEM WILL BE ERROR FREE OR UNINTERRUPTED. HILL-ROM SHALL NOT BE LIABILE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES INCLUDING LOST REVENUES AND LOST PROFITS EVEN IF NOTIFIED IN ADVANCE OF THE POSSIBILITY OF SUCH DAMAGES. Hill-Rom reserves the right, within its sole discretion, to amend this Limited Warranty with respect to future NaviCare purchases.

Recommended Spare Parts

For a recommended spare parts list to service five or more units, see table 5-1 on page 5-7.

Table 5-1. Recommended Spare Parts

Part Number	Quantity	Description
129674	1	Hardware kit
130785	4	Tube cap
71039	1	Caster cover assembly, head, rh
70169	1	Caster cover assembly, head, lh
69581	2	End cap
70277	2	IV clip
69777	4	Slide
6997203	1	Hilow motor
144641L	1	Head section motor
69580	1	Caster cover, foot end
6390601	2	Caster, 5" (125 mm), brake
6390602	2	Caster, 5" (125 mm), brake/steer
7042501	1	Nightlight assembly
144933	1	Foot control assembly, lh
144934	1	Foot control assembly, rh
71007	1	Cover, head
7100602	1	Cover, foot, rh
7100601	1	Cover, foot, lh
72476	1	Gasket
69839	1	Pin
150680	1	Bushing
70377	1	Gasket
4840501	2	Battery
70883	1	Gasket
34512P	1	Dummy plug
7061001	1	Fuse, 120 V beds
69361	1	Transformer, 120 V beds
69726	1	Capacitor

Part Number	Quantity	Description
7038101	1	Wiper, upper, rh
70463	1	Wiper, movable
7000203	1	Motor, foot extension
7038102	1	Wiper, upper, lh
16201221S	1	Assembly, air pump
72578	24	Cover, screw
7074901	1	PPM sensor, head
7074902	2	PPM sensor, seat
36790	60	Rivet, plastic
71051	2	Sensor strip, head end (air beds only)
69996	1	Gasket
72284P	1	P.C. board, pod (A through F models)
147589	1	P.C. board, pod (G through J models)
142000	1	P.C. board, head siderail (A through F models)
147583XXS[a]	1	P.C. board, head siderail, rh (G through J models)
147586XXS[a]	1	P.C. board, head siderail, lh (G through J models)
70786S	1	P.C. board, power supply board assembly (A through J models)
72270	1	P.C. board, logic control assembly
72273P	1	P.C. board, motor control assembly

a. XX = 01 - 09 depending on the options installed on the bed.

NOTES:

Base Frame—A through H Models

Figure 5-2. Base Frame—A through H Models

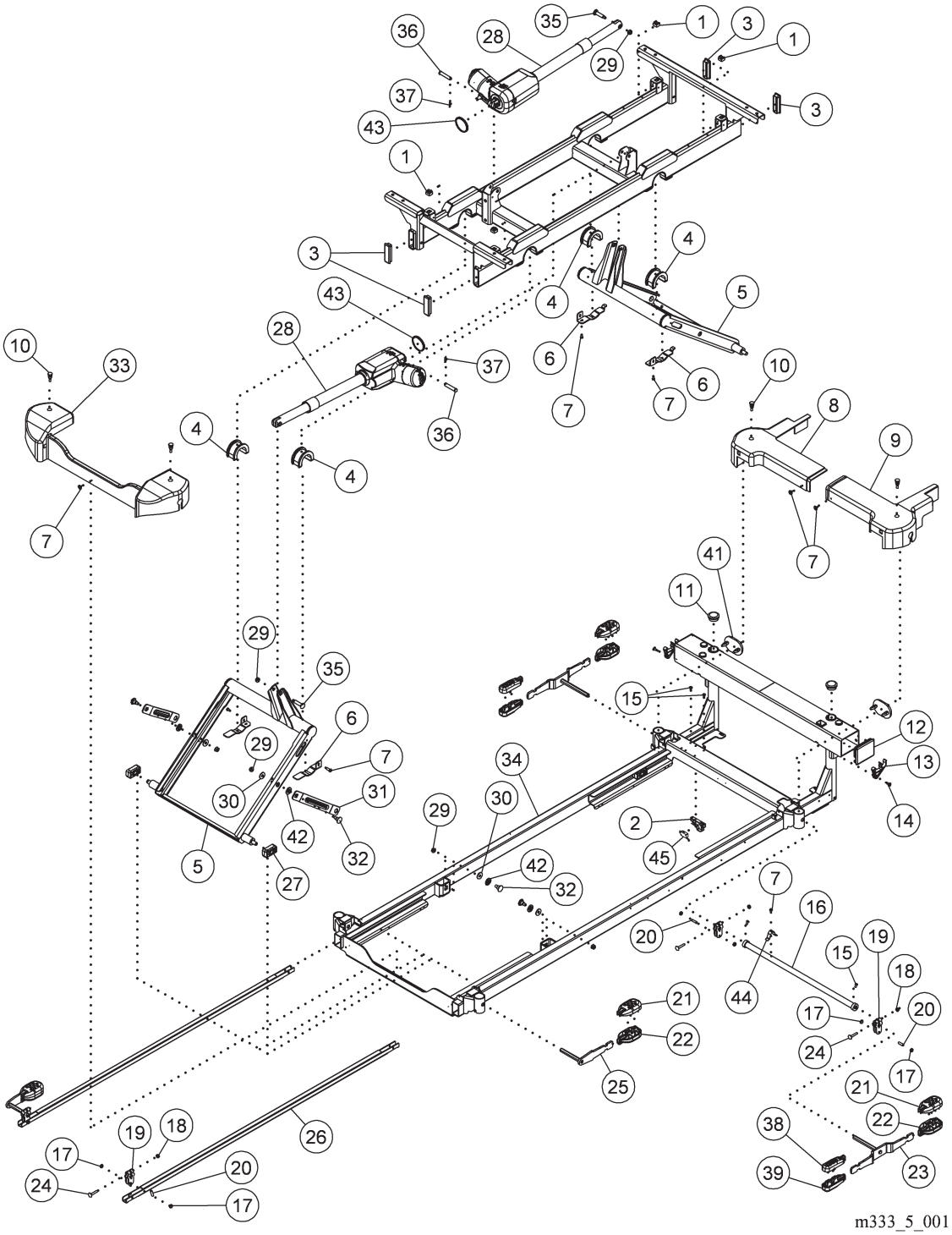

Table 5-2. Base Frame—A through H Models

Item Number	Part Number	Quantity	Description
1	70750	4	Nut, cage (non-scale beds)
2	146349	1	Brake switch assembly (A through F models)
	149420	1	Brake switch assembly (G through J models)
3	130785	4	Tube cap
4	69771	4	Bearing, plastic, lift arm
5	189260	2	Weldment, lift arm (A through E models)
	179098	2	Weldment, lift arm (G through J models)
6	16377901S	2	Bracket, bearing to lift arm, rh
	16377902S	2	Bracket, bearing to lift arm, lh
7	71993	7	Screw
8	71039	1	Caster cover, head end right
9	70169	1	Caster cover, head end left
10	129623	4	Fastener
11	70833	2	Cover
12	69581	2	End cap, head end
13	14941601	1	IV clip/cord wrap with label, lh
	14941602	1	IV clip/cord wrap with label, rh
14	70882	2	Screw
15	70342	4	Screw
16	6958748S	1	Torque tube
17	69548	8	Bushing, brake/steer
18	70376	4	Nut
19	70771PL	4	Bracket, brake/steer arm
20	70346	4	Pin, dowel
21	70779	4	Brake/steer pedal, top, large
22	70778	4	Brake/steer pedal, bottom, large
23	6957148S	2	Brake/steer pedal weldment (head end)
24	70375	4	Bolt
25	146053S	1	Weldment, brake/steer, left
	146052S	1	Weldment, brake/steer, right
26	6955748	2	Brake/steer link

Item Number	Part Number	Quantity	Description
27	69777	4	Slide, hilow lift
28	6997203	2	Drive, hilow
29	7037608	6	Nut
30	137956	4	Washer
31	151203[a]	2	Ground link
32	165539	4	Bolt
33	69580	1	Caster cover, foot end
34	13405048S	1	Weldment, base
35	165534	2	Bolt
36	70787	2	Pin, clevis
37	61615	2	Rue ring, cotter
38	70781	2	Brake/steer pedal, top, small
39	70780	2	Brake/steer pedal, bottom, small
40	19512	2	Switch
41	72037	2	Bumper
42	151377	4	Bushing
43	72360	2	Insulator ring
44	69575	1	Lever, brake/steer switch

a. For backwards compatibility, item 42 (bushing) must be part number 151377.

NOTES:

Base Frame—J Model

Figure 5-3. Base Frame—J Model

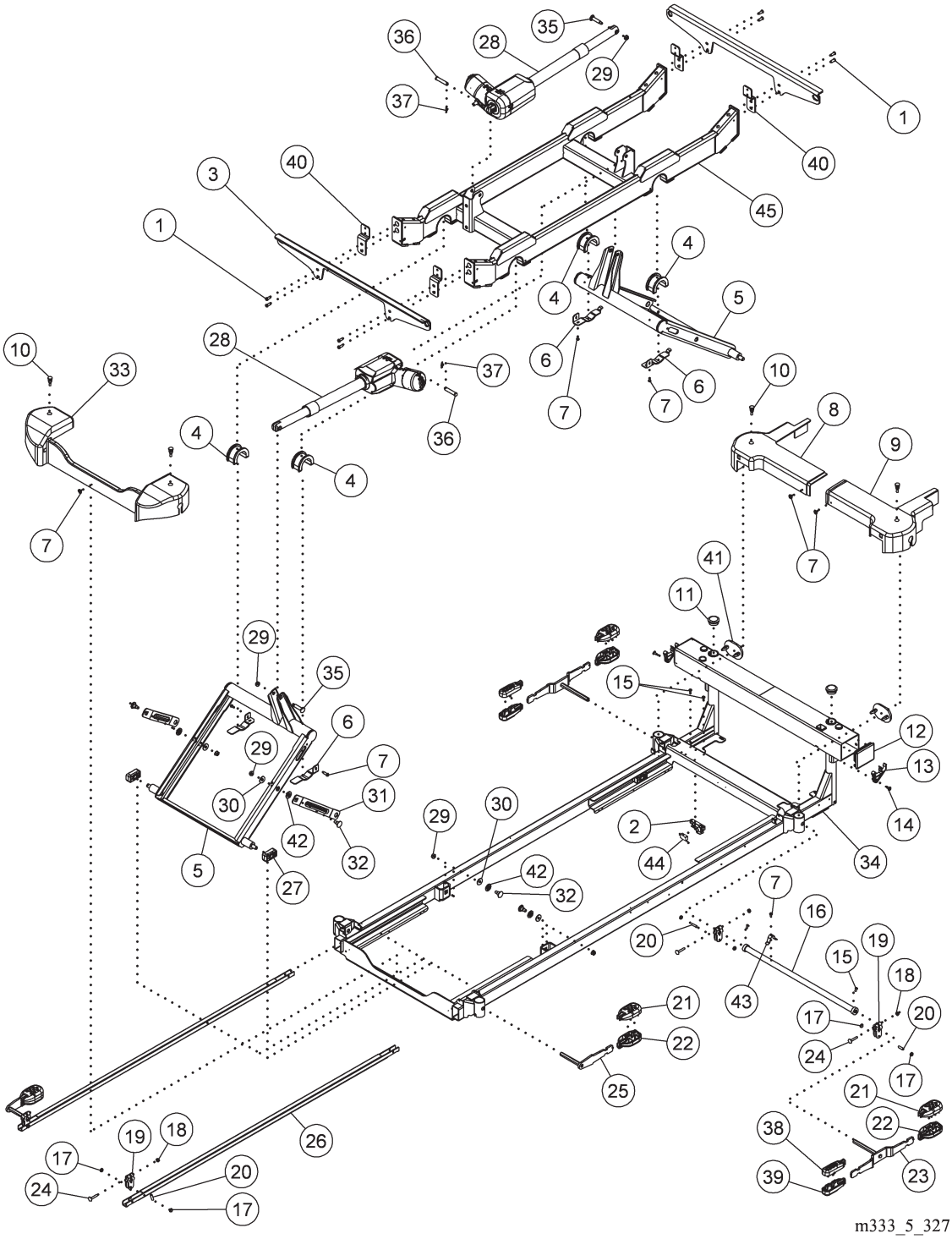

Table 5-3. Base Frame—J Model

Item Number	Part Number	Quantity	Description
1	70762	8	Screw
2	149420	1	Brake switch assembly
3	160686S	2	Weldment, end plate
4	69771	4	Bearing, plastic, lift arm
5	179098	2	Weldment, lift arm
6	16377901S	2	Bracket, bearing to lift arm, rh
	16377902S	2	Bracket, bearing to lift arm, lh
7	71993	7	Screw
8	71039	1	Caster cover, head end right
9	70169	1	Caster cover, head end left
10	129623	4	Fastener
11	70833	2	Cover
12	69581	2	End cap, head end
13	14941601	1	IV clip/cord wrap with label, lh
	14941602	1	IV clip/cord wrap with label, rh
14	70882	2	Screw
15	70342	2 or 6	Screw (bed without scale) Screw (bed with scale)
16	6958748S	1	Torque tube
17	69548	8	Bushing, brake/steer
18	70376	4	Nut
19	70771PL	4	Bracket, brake/steer arm
20	70346	4	Pin, dowel
21	70779	4	Brake/steer pedal, top, large
22	70778	4	Brake/steer pedal, bottom, large
23	6957148S	2	Brake/steer pedal weldment (head end)
24	70375	4	Bolt
25	146053S	1	Weldment, brake/steer, left
	146052S	1	Weldment, brake/steer, right
26	6955748	2	Brake/steer link
27	69777	4	Slide, hilow lift
28	6997203	2	Drive, hilow

Item Number	Part Number	Quantity	Description
29	7037608	6	Nut
30	137956	4	Washer
31	151203	2	Ground link
32	165539	4	Bolt
33	69580	1	Caster cover, foot end
34	13405048S	1	Weldment, base
35	165534	2	Bolt
36	70787	2	Pin, clevis
37	61615	2	Rue ring, cotter
38	70781	2	Brake/steer pedal, top, small
39	70780	2	Brake/steer pedal, bottom, small
40	156831	4	Bracket, no scale, weight to intermediate
41	72037	2	Bumper
42	151377	4	Bushing
43	69575	1	Lever, brake/steer switch
44	19512	2	Switch
45	156802S	1	Weldment, intermediate frame

NOTES:

Obstacle Detection

Figure 5-4. Obstacle Detection

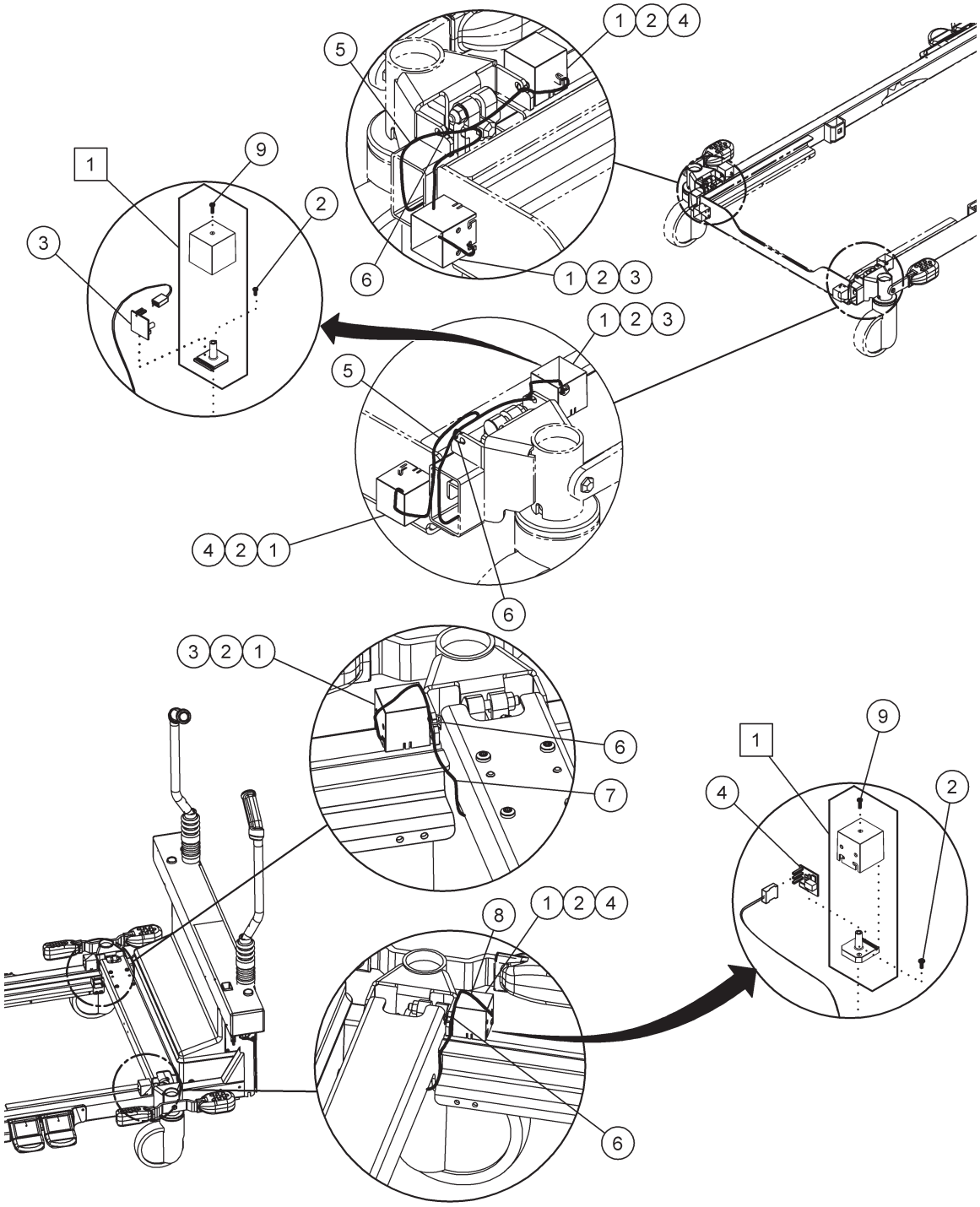

Table 5-4. Obstacle Detection

Item Number	Part Number	Quantity	Description
1	134080[a]	1	Obstacle detect service kit
2	69988	1	Screw
3	72294P	1	Emitter
4	72293P	1	Detector
5	69455	1 (per side)	Cable assembly, foot end
6	19124	1	Wire tie
7	69221	1	Cable assembly, head right
8	69456	1	Cable assembly, head left
9	71639	1	Screw, hi-lo

a. The obstacle detect service kit contains the base, cover and the assembly screw, but not the emitter or detector.

Casters

Figure 5-5. Casters

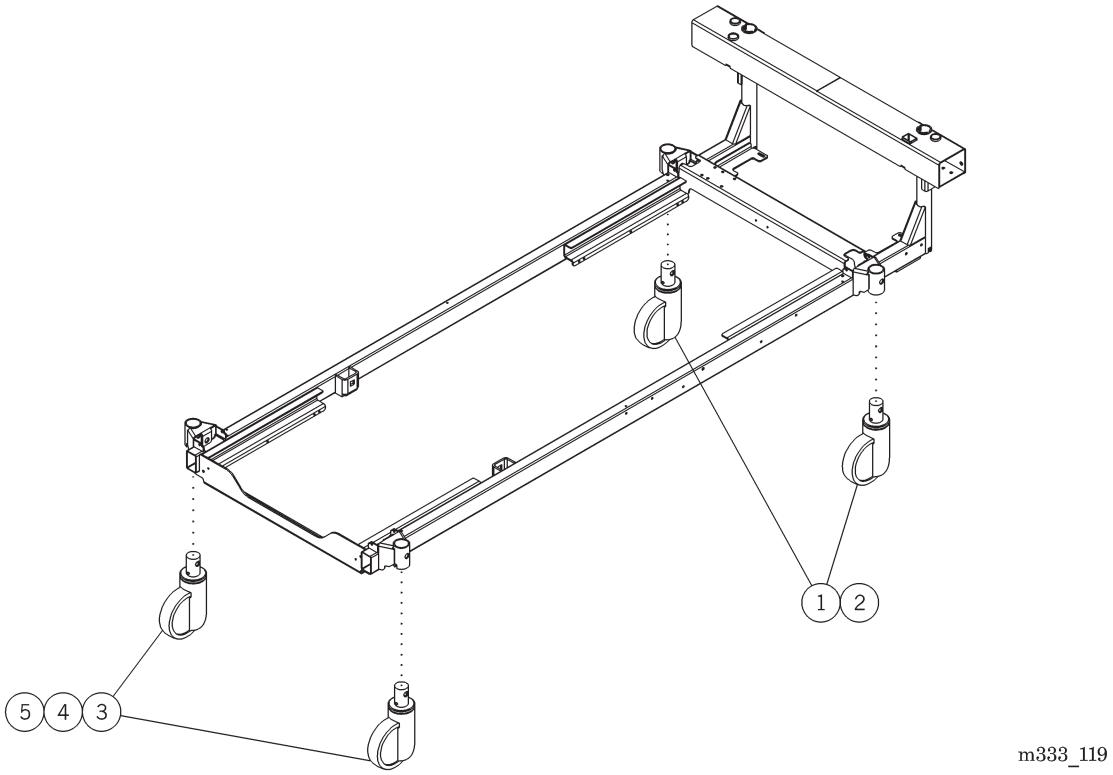

Table 5-5. Casters

Item Number	Part Number	Quantity	Description
1	6390601	2	Caster, 5" (12.7 cm) brake
2	7247801	2	Caster, 6" (15 cm) brake
3	6390602	2	Caster, 5" (12.7 cm) brake/steer
4	7247803	2	Caster, 6" (15 cm) brake/steer
5	7247802	2	Caster, 6" (15 cm) brake (IntelliDrive® Transport System only)

Foot Controls

Figure 5-6. Foot Controls

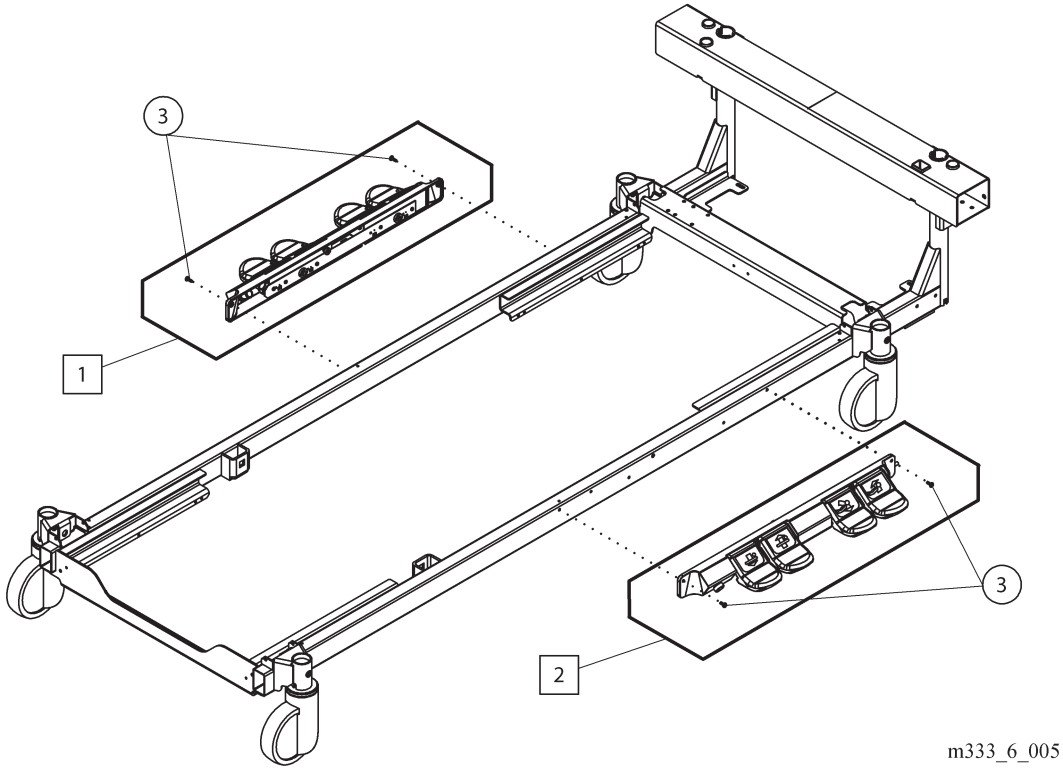

Table 5-6. Foot Controls

Item Number	Part Number	Quantity	Description
1	144934	1	Foot control assembly, rh
2	144933	2	Foot control assembly, lh
3	181224	4	Screw, rlg, pan, tx, m5, 12
Not shown	7042401	1	Switch, hall effect
Not shown	69905PL	1	Shaft, pedal
Not shown	69906	4	Spring, pedal

Articulating Frame—A through H Models

Figure 5-7. Articulating Frame—A through H Models

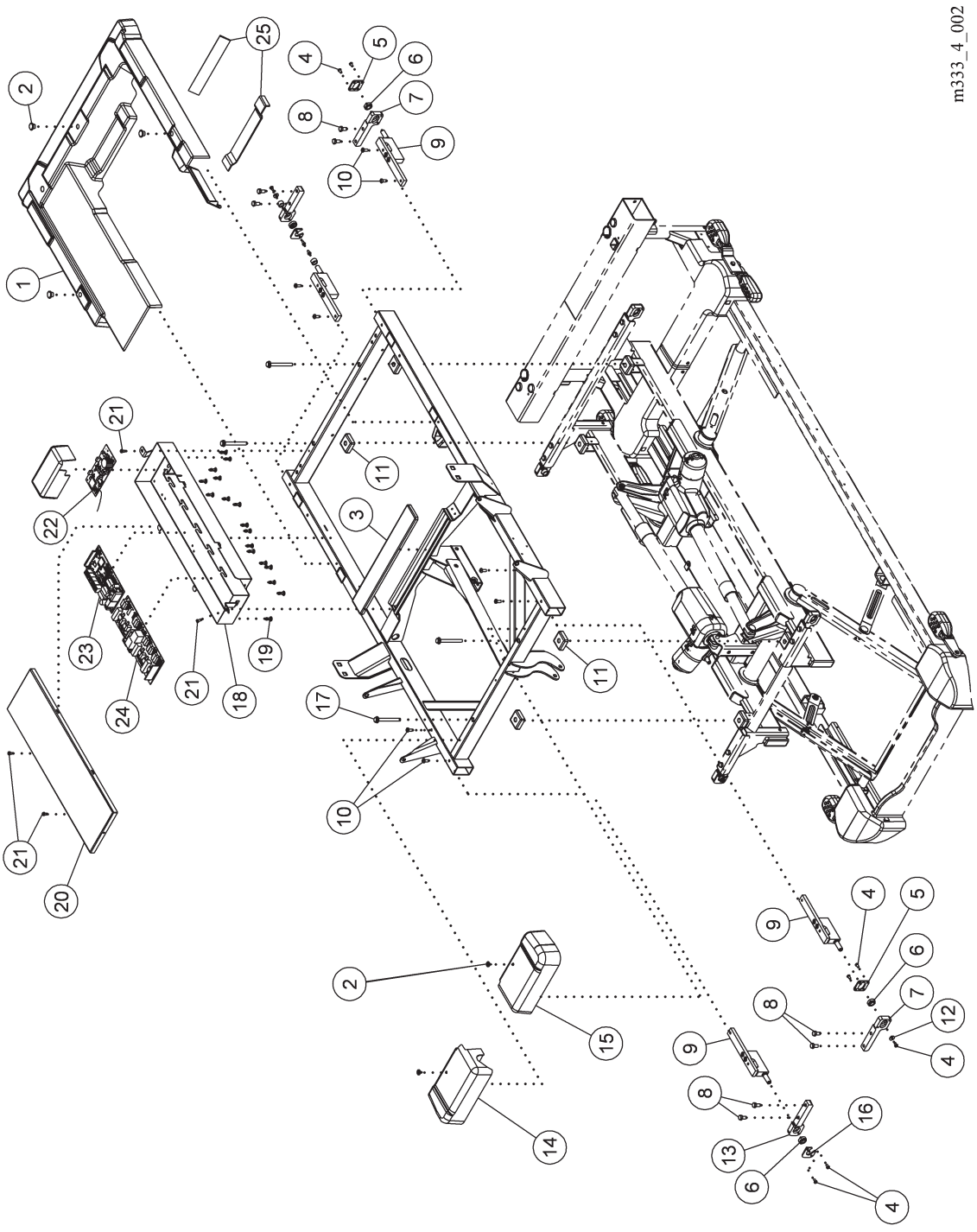

Table 5-7. Articulating Frame—A through H Models

Item Number	Part Number	Quantity	Description
1	71007	1	Cover, head end weigh frame
2	71993	1	Screw
3	70390	1	Cover
4	70342	5	Screw
5	70994PL	2	Plate, bearing keeper, slot
6	70167	4	Bearing
7	136043	2	Block, intermediate frame to load cell
8	70060	8	Screw
9	6995801	4	Load cell assembly
10	49521	8	Screw
11	70453	4	Spacer, non-scale bed
12	70684	2	Washer
13	136041	2	Block, left intermediate frame to load cell
14	7100602	1	Cover, foot end, rh
15	7100601	1	Cover, foot end, lh
16	70166PL	2	Plate, bearing keeper (hole)
17	70450	4	Screw, non-scale beds
18	6970348S	1	Electronic enclosure
19	3976301	17	Standoff
20	6970048S	1	Lid
21	70341	4	Screw
22	137558	1	P.C. board, scale
23	151208	1	Logic control P.C. board
24	72273P	1	Motor control P.C. board
25	132261	2	Foam, sound, weigh frame cover
Not shown	28968	4	Screw lock (for patient pendant connector)

Articulating Frame—J Model

Figure 5-8. Articulating Frame—J Model

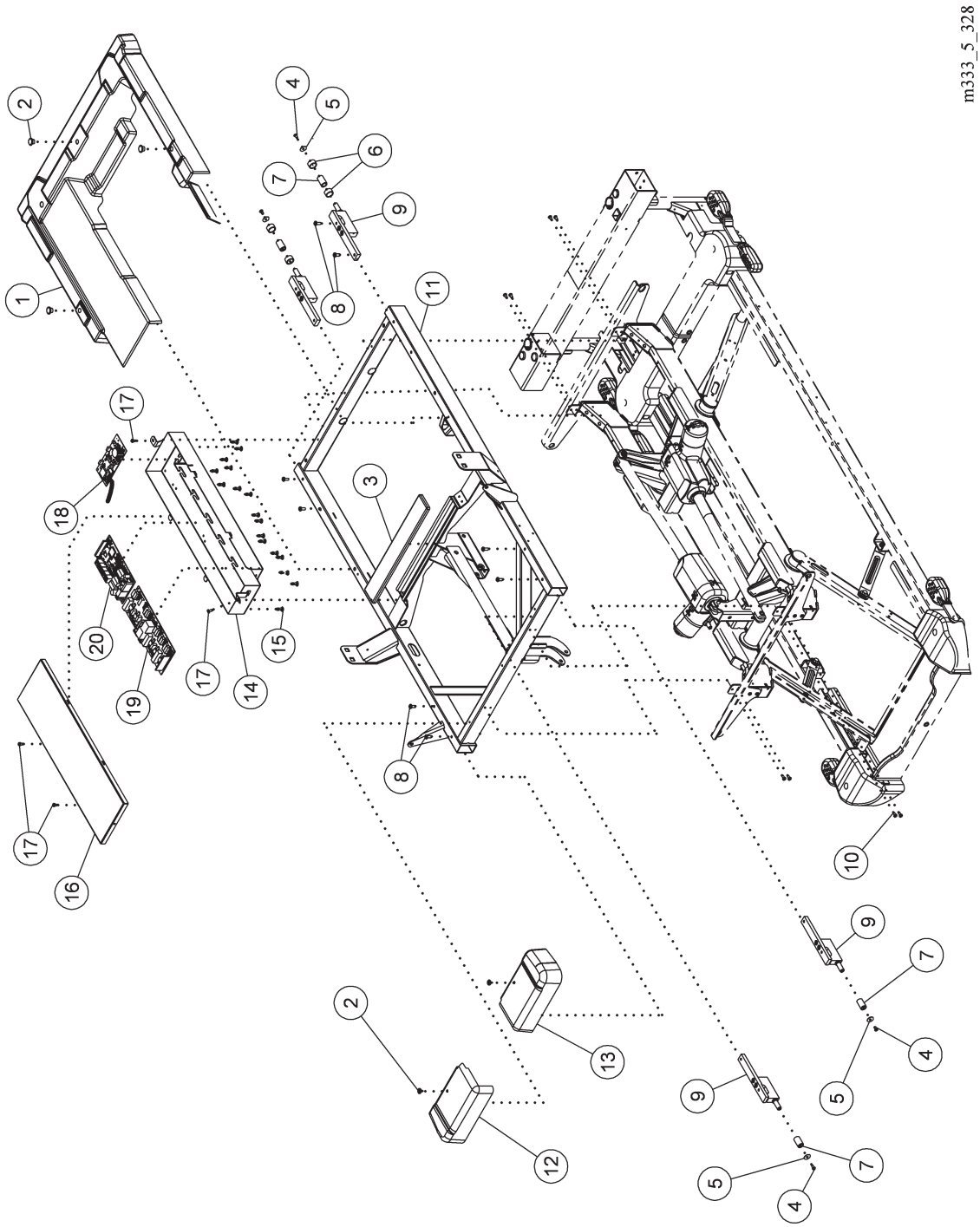

Table 5-8. Articulating Frame—J Model

Item Number	Part Number	Quantity	Description
1	71007	1	Cover, head end weigh frame
2	71993	5	Screw
3	70390	1	Cover
4	70342	4	Screw
5	135969	4	Washer, flat
6	156834	4	Spacer, load cell
7	158619	4	Sleeve, load cell
8	49521	8	Screw
9	6995801	4	Load cell assembly
10	70341	8	Screw
11	156806	1	Weldment, weigh frame
12	15683602	1	Cover, foot end, rh
13	15683601	1	Cover, foot end, lh
14	6970348	1	Weldment, L/S PCB Box
15	3976301	17	Standoff
16	6970048	1	Lid
17	70341	4	Screw
18	137558	1	P.C. board, scale
19	72273P	1	Motor control P.C. board
20	151208	1	Logic control P.C. board
Not shown	28968	4	Screw lock (for patient pendant connector)

Head Siderail (A through F Bed Models)

Figure 5-9. Head Siderail (A through F Bed Models)

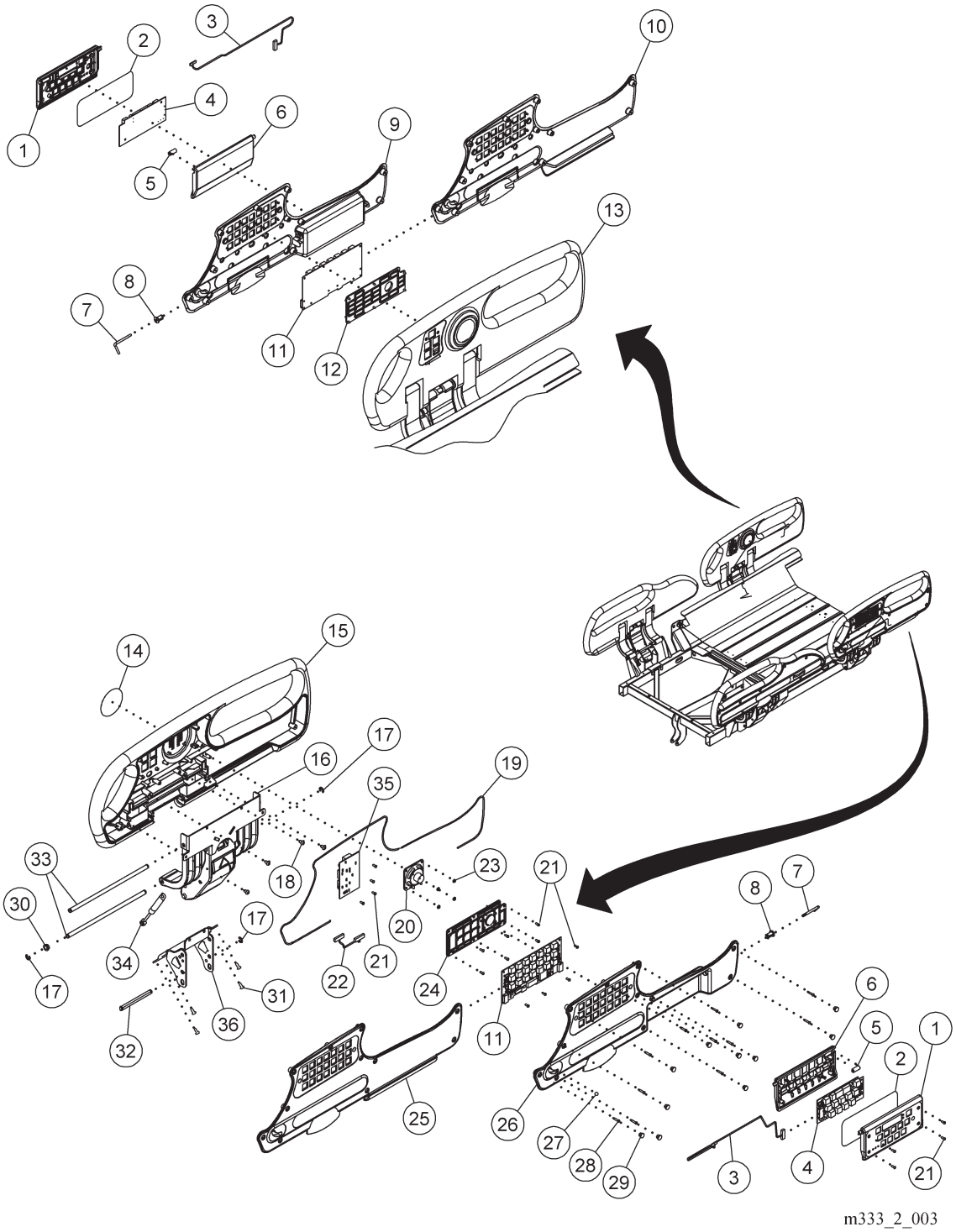

Table 5-9. Head Siderail (A through F Bed Models)

Item Number	Part Number	Quantity	Description
1	69830	1	Cover, front
2	72476	1	Gasket
3	69449	1	Cable assembly
4	72284P	1	P.C. board assembly
5	49199	1	Spring, lh
6	69831	1	Cover, back
7	69839	1	Shaft
8	150680	1	Bushing
9	6981102	1	Siderail cover, with pod, rh
10	6981104	1	Siderail cover, without pod, rh
11	72282P	1	P.C. board, caregiver control (A through D models)
	142000	1	P.C. board, caregiver control (E model)
12	6982104	1	P.C. board support plate, rh
13	6979402	1	Siderail, head end, rh
14	49453	2	Label, blank speaker
15	6979401	1	Siderail, head end, lh
16	69790PL	1	Mount bracket
17	35325	3	E-ring
18	69817	4	Screw
19	70377	1	Gasket, siderail
20	70746	1	Speaker
21	4214101	18	Screw
22	69450	1	Cable assembly, patient controls
23	28562	4	Nut, pal
24	6982103	1	P.C. board support plate, lh
25	6981103	1	Siderail cover, without pod, lh
26	6981101	1	Siderail cover, with pod, lh
27	47272	1	Level ball
28	71639	12	Screw
29	72578	12	Cover, screw
30	36570	1	Bushing (beds built before 11-May-2009)
31	70341	4	Screw

Item Number	Part Number	Quantity	Description
32	69838PL	1	D-pin, siderail, short
33	69798PL	1	D-pin, siderail, long
34	67230	1	Dampener
35	72283P	1	P.C. board, patient control
36	70282PL	1	Mount bracket
Not shown	127888	1	Siderail assembly, head, lh, with pod
Not shown	127889	1	Siderail assembly, head, rh, with pod
Not shown	127890	1	Siderail assembly, head, lh, without pod
Not shown	127891	1	Siderail assembly, head, rh, without pod

NOTES:

Intermediate Siderail

Figure 5-10. Intermediate Siderail

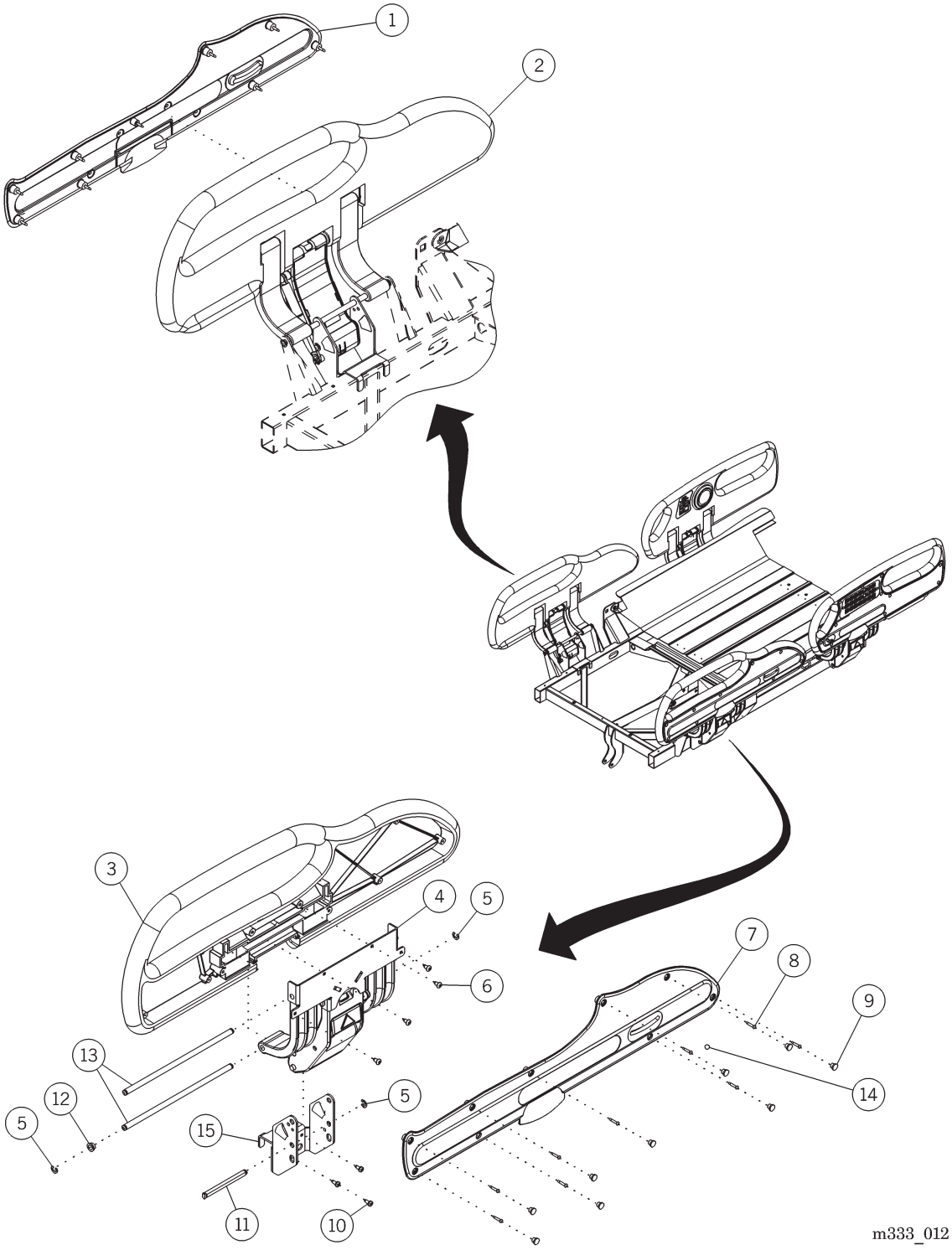

Table 5-10. Intermediate Siderail

Item Number	Part Number	Quantity	Description
1	6982302	1	Intermediate siderail cover, rh
2	6979202	1	Intermediate siderail, rh
3	6979201	1	Intermediate siderail, lh
4	69790PL	1	Mount bracket
5	35325	3	E-ring
6	69817	4	Screw
7	6982301	1	Intermediate siderail cover, lh
8	71639	9	Screw
9	72578	9	Cover, screw
10	70341	3	Screw
11	69838PL	1	D-pin, siderail, short
12	36570	1	Bushing (beds built before 26-May-2009)
13	69798PL	1	D-pin, siderail, long
14	47272	1	Level ball
15	70360PL	1	Mount bracket
16	127892	1	Siderail assembly, complete, lh
17	127893	1	Siderail assembly, complete, rh

Siderail Center Arm Assembly

Figure 5-11. Siderail Center Arm Assembly

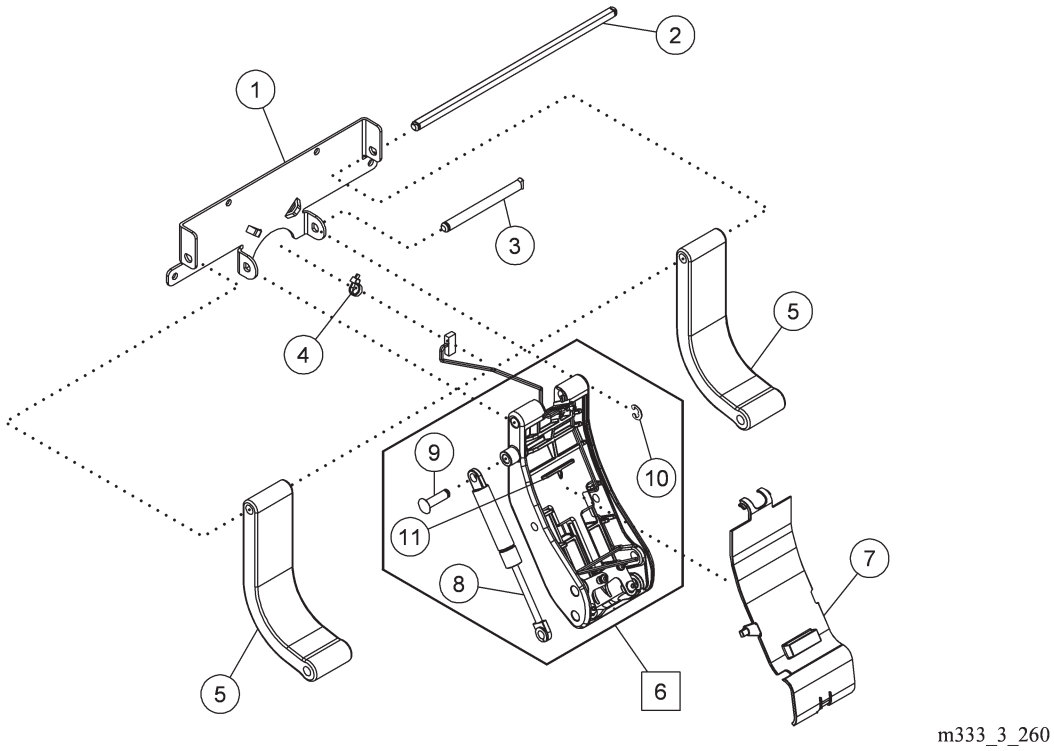

Table 5-11. Siderail Center Arm Assembly

Item Number	Part Number	Quantity	Description
1	69790PL	1	Mount bracket
2	69798PL	1	D-pin, long
3	69838PL	1	D-pin, short
4	19124	1	Wire tie (head siderails only)
5	69796	2	Outer arm
6	69843S	1	Center arm assembly
7	71113	1	Magnet heatstake assembly
8	67230	1	Dampener assembly, compression
9	43394	1	Clevis pin
10	35325	1	Retaining ring, E
11	69822	1	Handle, siderail latch

NOTES:

Power Supply (Sheet 1 of 2)

Figure 5-12. Power Supply (Sheet 1 of 2)

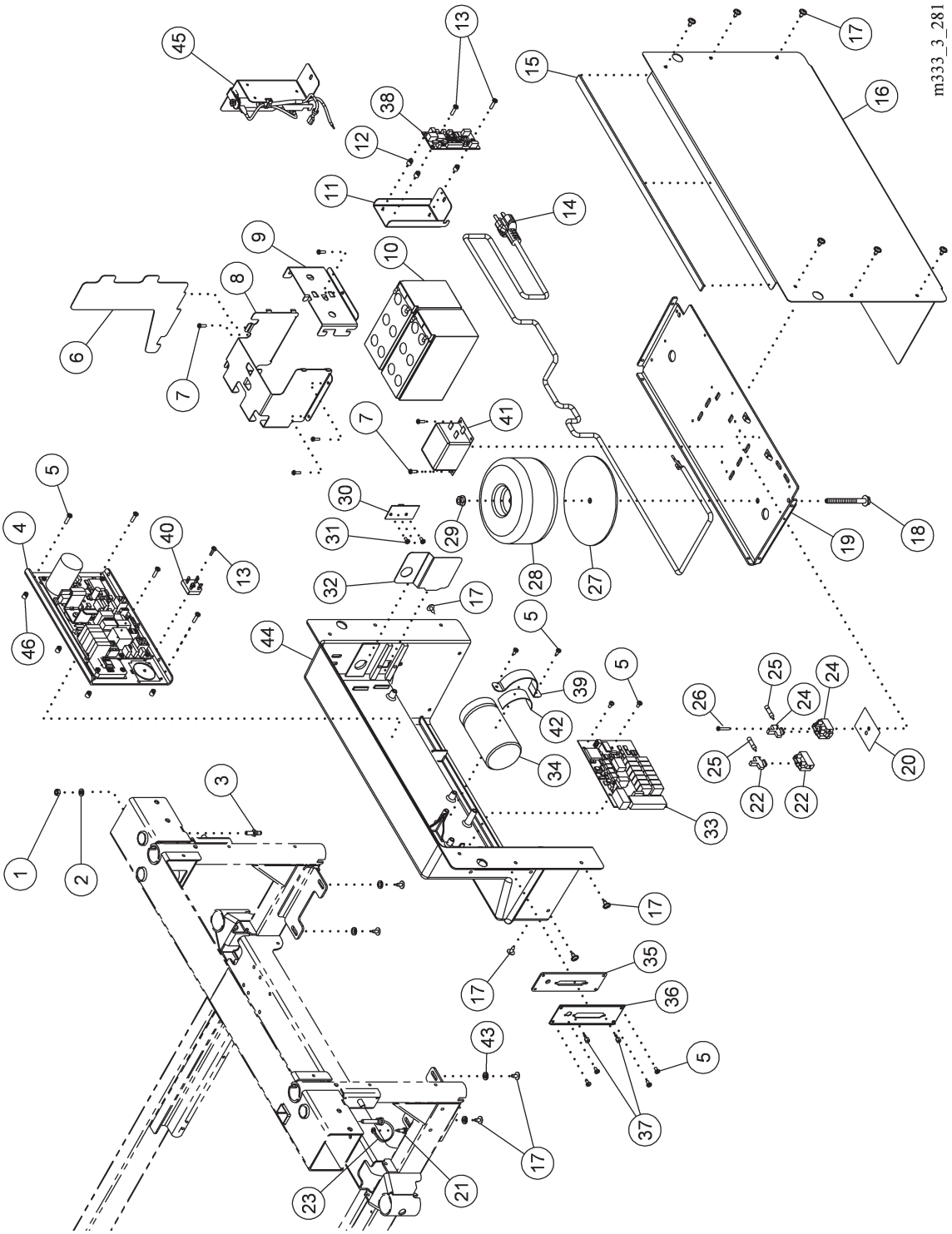

Table 5-12. Power Supply (Sheet 1 of 2)

Item Number	Part Number	Quantity	Description
1	44126	1	Nut (230 V beds only)
2	44128	1	Washer (230 V beds only)
3	44125	1	Plug (230 V beds only)
4	70786S	1	Power supply P.C. board
5	69812	12	Screw
6	6956548	1	Divider, power supply
7	69988	2	Screw
8	6956648	1	Bracket
9	6956748	1	Bracket
10	4840501	2	Battery (North America)
11	70356PL	1	Mounting plate (IntelliDrive® Transport System only)
12	69725	3	Standoff (IntelliDrive® Transport System only)
13	70344	2	Screw (IntelliDrive® Transport System only)
14	13416606	1	Power cord (230 V, Italy)
	13416613	1	Power cord, (120 V beds)
	13416602	1	Power cord, (230 V UK beds)
	13416601	1	Power cord, (230 V EU beds)
	13416604	1	Power cord, (230 V Swiss beds)
15	70883	1	Gasket, power supply
16	6959848	1	Back panel
17	71993	6	Screw
18	70450	1	Screw
19	69562PL	1	Bottom plate
20	70801	1	Label, fuse block
21	70341	1	Screw
22	4413806	1	Fuse holder, terminal block
23	34512P	1	Dummy plug
24	4413807	1	Fuse block
25	7061002	2	Fuse, 2.5 A, 250 V (220/230/240 V beds)
	7061001	2	Fuse, 5 A, 250 V (100/110/115/120/127 V beds)

Item Number	Part Number	Quantity	Description
26	70348	1	Screw
27	70751	1	Pad, transformer
28	134068	1	Transformer, 660 V A (230 V beds)
	69361	1	Transformer, 666 V A (120 V beds)
29	RM74938A	1	Nut, locking
30	72301P	1	Battery enable switch assembly
31	69812	2	Screw
32	71690	1	Cover, P.C. board enable switch
33	72298P[a]	1	SideCom® Communication System P.C. board (A through D models)
	141998	1	SideCom® Communication System P.C. board (E through J models)
34	69726	1	Capacitor
35	69573	1	Gasket, SideCom® Communication System
36	69593	1	Cover, SideCom® Communication System
	7078348	1	Cover, blank
37	42006	2	Screw
38	72299P	1	Junction P.C. board, IntelliDrive® Transport System beds only
39	7063848	1	Clamp
40	4992802	1	Bridge rectifier
41	70611	1	Power line filter
42	65790	1	Gasket
43	44128	4	Washer
44	69588	1	Cover, power supply
45	138386P[b]	1	Power resistor assembly
46	69725	7	Standoff

a. Note: your P.C. board part number may differ based on the nurse call configuration.
b. Beds with serial number G164AD7965 and higher only.

NOTES:

Power Supply (Sheet 2 of 2)

Figure 5-13. Power Supply (Sheet 2 of 2)

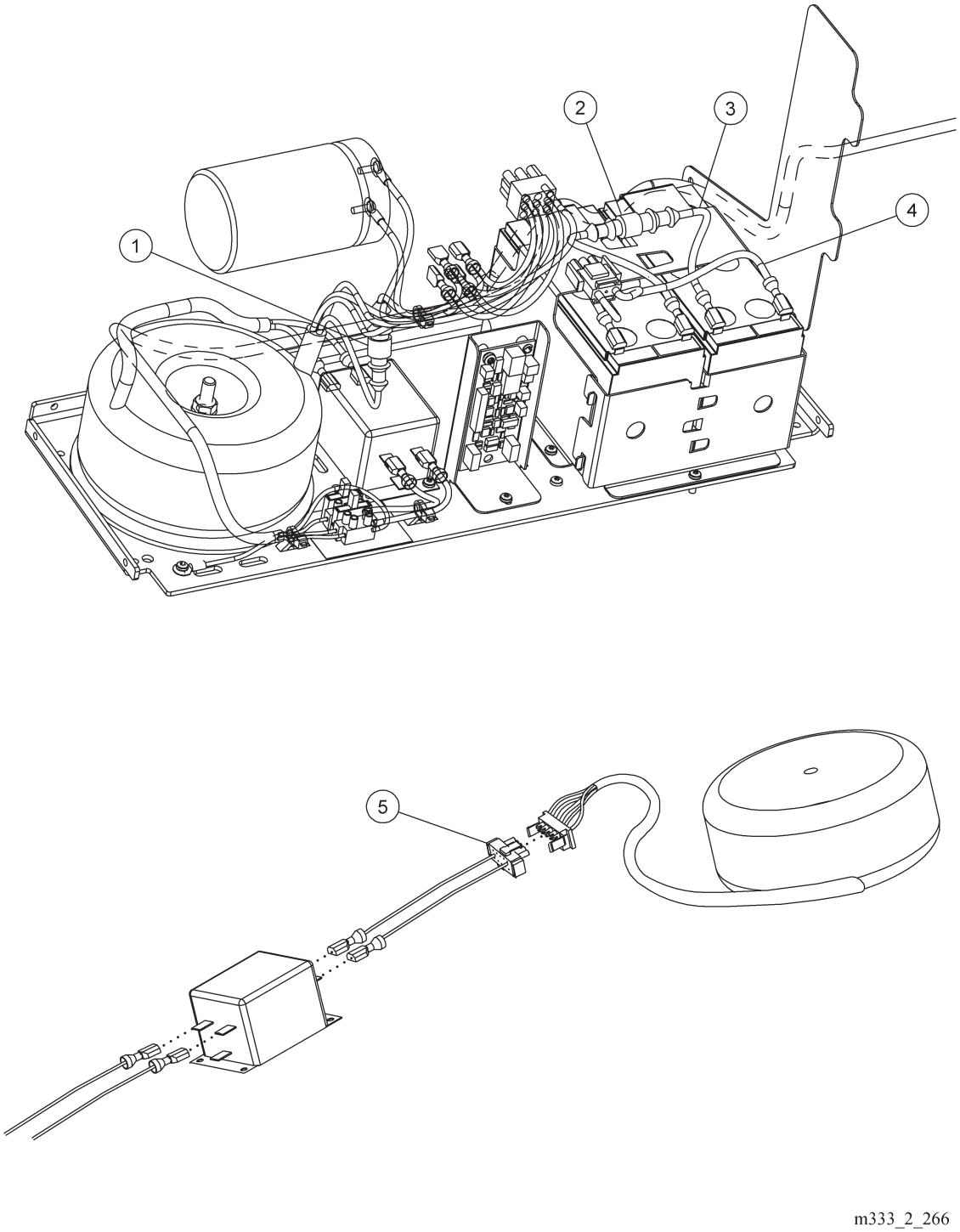

Table 5-13. Power Supply (Sheet 2 of 2)

Item Number	Part Number	Quantity	Description
1	4302338	1	Fuse, 20 A
2	7061201	1	Fuse, 15 A
3	69458	1	Cable assembly, battery fuse
4	69461	1	Cable assembly, battery power
5	134060	1	Cable assembly, transformer adapter, 100 V
	134061		Cable assembly, transformer adapter, 110 V
	134063		Cable assembly, transformer adapter, 115 V
	134063		Cable assembly, transformer adapter, 120 V
	134064		Cable assembly, transformer adapter, 127 V
	134065		Cable assembly, transformer adapter, 220 V
	134066		Cable assembly, transformer adapter, 230 V
	134067		Cable assembly, transformer adapter, 240 V

Foot Extension—C Model and Older Beds

Figure 5-14. Foot Extension—C Model and Older Beds

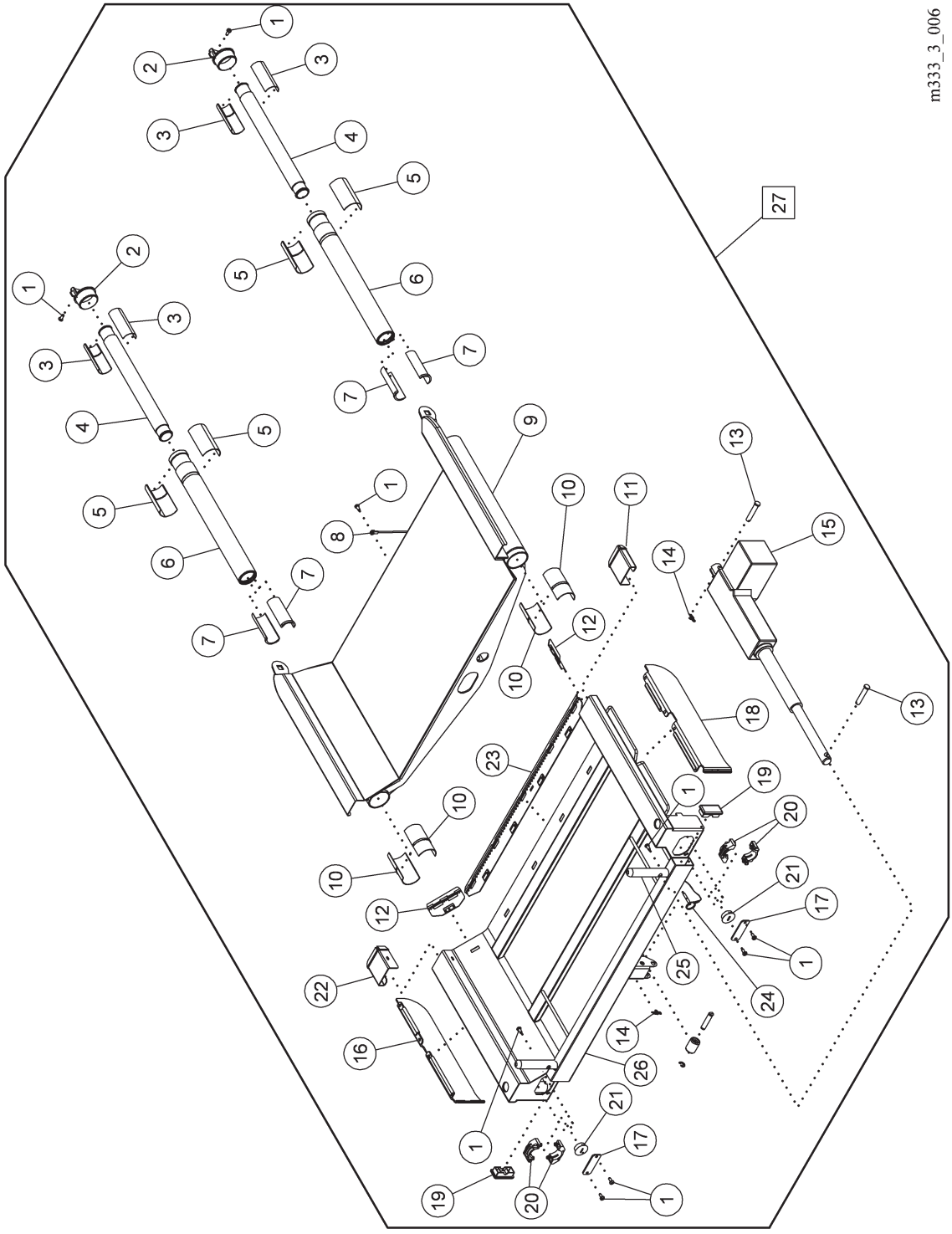

Table 5-14. Foot Extension—C Model and Older Beds

Item Number	Part Number	Quantity	Description
1	70341	9	Screw
2	69910	2	Tube, end cap, fixed, foot
3	47209	4	Split bushing, rear, inner, foot
4	47218PL	2	Tube, slide, inner
5	47207	4	Split bushing, rear, outer, foot
6	70475PL	2	Tube, slide inner
7	47208	4	Split bushing, front, inner, side
8	3924008S	1	Ground strap assembly, 9"
9	6963548S	1	Weldment
10	72435	4	Split bushing, front, outer side
11	7038101	1	Wiper, upper, foot section
12	70463	2	Wiper, moving foot side
13	70787	2	Pin, clevis
14	61615	2	Rue ring
15	7000203	1	Drive, foot extension
16	7015402	1	Cover, foot assembly tube, rh
17	69639PL	2	Retainer bar, foot slide
18	7015401	1	Cover, foot assembly tube, lh
19	4917702	2	Plug, frame tube
20	69917	4	Terminator, foot side
21	71270	2	Hole plug
22	7038102	1	Wiper, upper, foot section
23	70785	1	wiper, long
24	66733	1	Chain
25	69638	2	Footboard post
26	6963648S	1	Moving foot section weldment
27	6995648S	1	Retracting foot section assembly

Footboard—C Model and Older Beds

Figure 5-15. Footboard—C Model and Older Beds

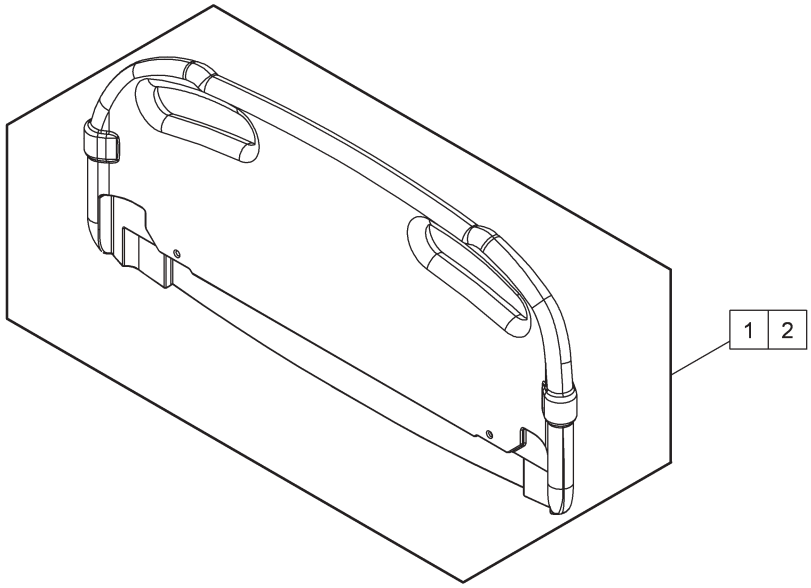

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Table 5-15. Footboard—C Model and Older Beds

Item Number	Part Number	Quantity	Description
1	136003	1	Footboard (capital beds only)
2	127491	1	Footboard (rental beds only)

Headboard

Figure 5-16. Headboard

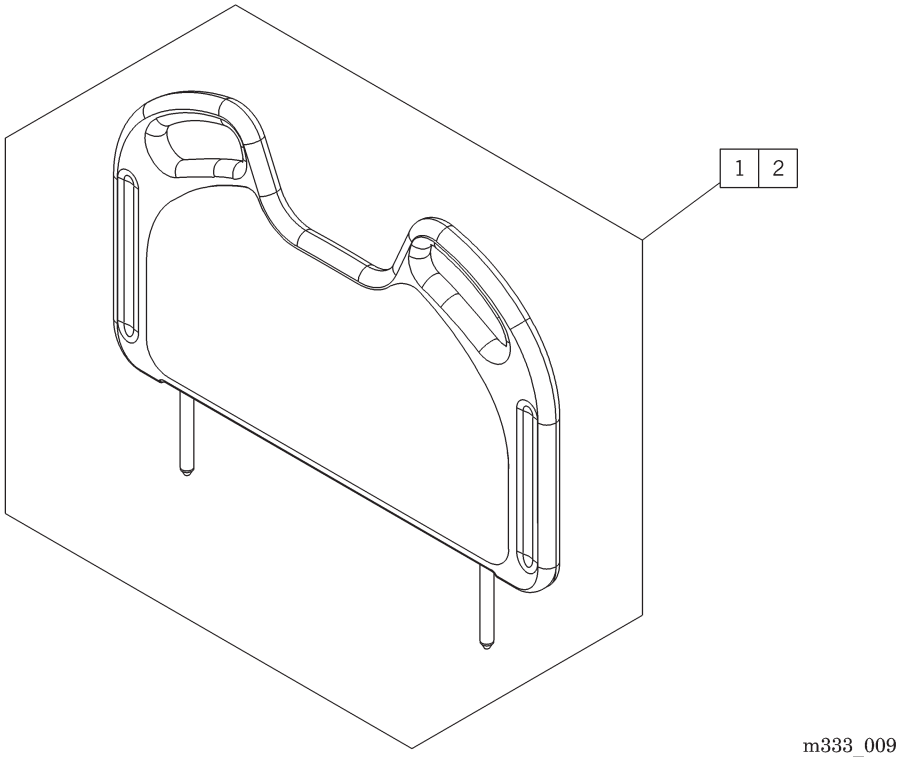

Table 5-16. Headboard

Item Number	Part Number	Quantity	Description
1	127488	1	Headboard (capital beds only)
2	127489	1	Headboard (rental beds only)

Sensor Strips

Figure 5-17. Sensor Strips

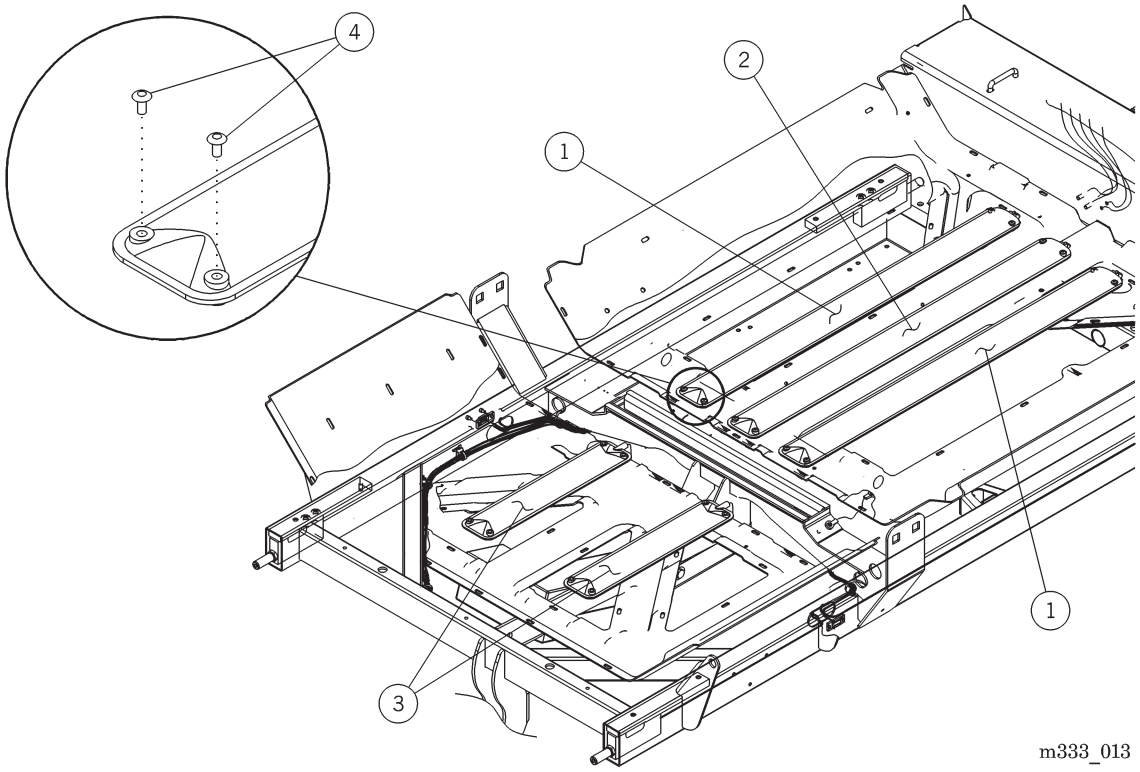

Table 5-17. Sensor Strips

Item Number	Part Number	Quantity	Description
1	71051	2	Air, head sensor strip
2	7074901	1	PPM sensor, head
3	7074902	2	PPM sensor, seat
4	36790	20	Rivet, drive

NOTES:

Sleep Deck

Figure 5-18. Sleep Deck

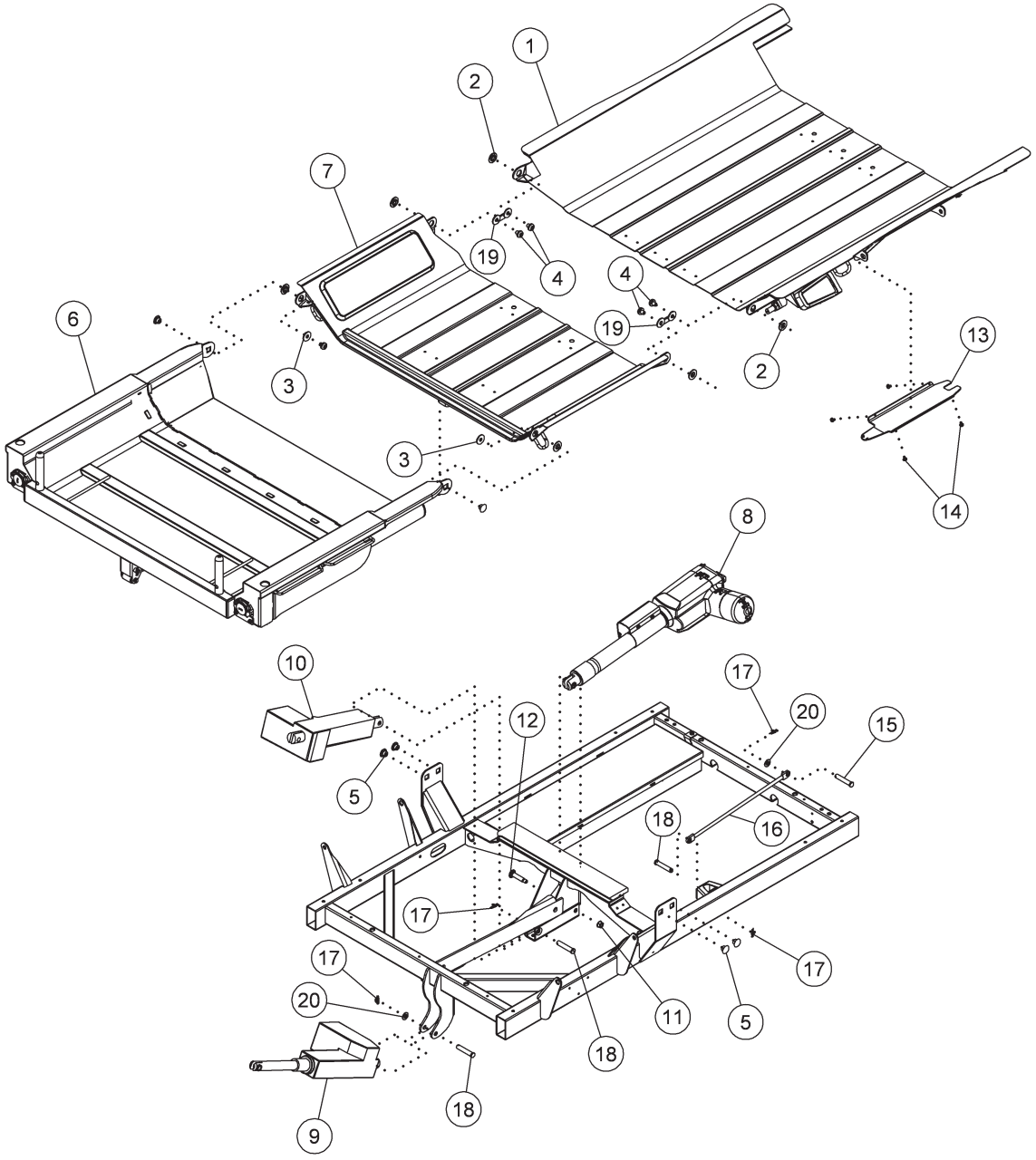

Table 5-18. Sleep Deck

Item Number	Part Number	Quantity	Description
1	140421S	1	Weldment, head deck
2	4630	6	Bushing
3	70222	2	Washer
4	69966	6	Screw
5	69643	6	Nut
6	138437S	1	Retracting foot section assembly
7	140422	1	Weldment, seat deck
8	144641L	1	Head drive
9	7000202	1	Leg drive
10	7000201	1	Knee drive
11	7037608[a]	1	Nut, Nylok®
12	165534	1	Bolt
13	69680	1	Cover, wire, head deck
14	71993	4	Screw
15	61653	1	Pin, CPR damper
16	69969	1	Damper, head deck
17	61615	4	Rue ring
18	70787	2	Pin, clevis
19	134193	2	Spacer
20	4540	2	Washer

a. For backwards compatibility, you must use 7037608 with165534.

IntelliDrive® Transport System

Figure 5-19. IntelliDrive® Transport System

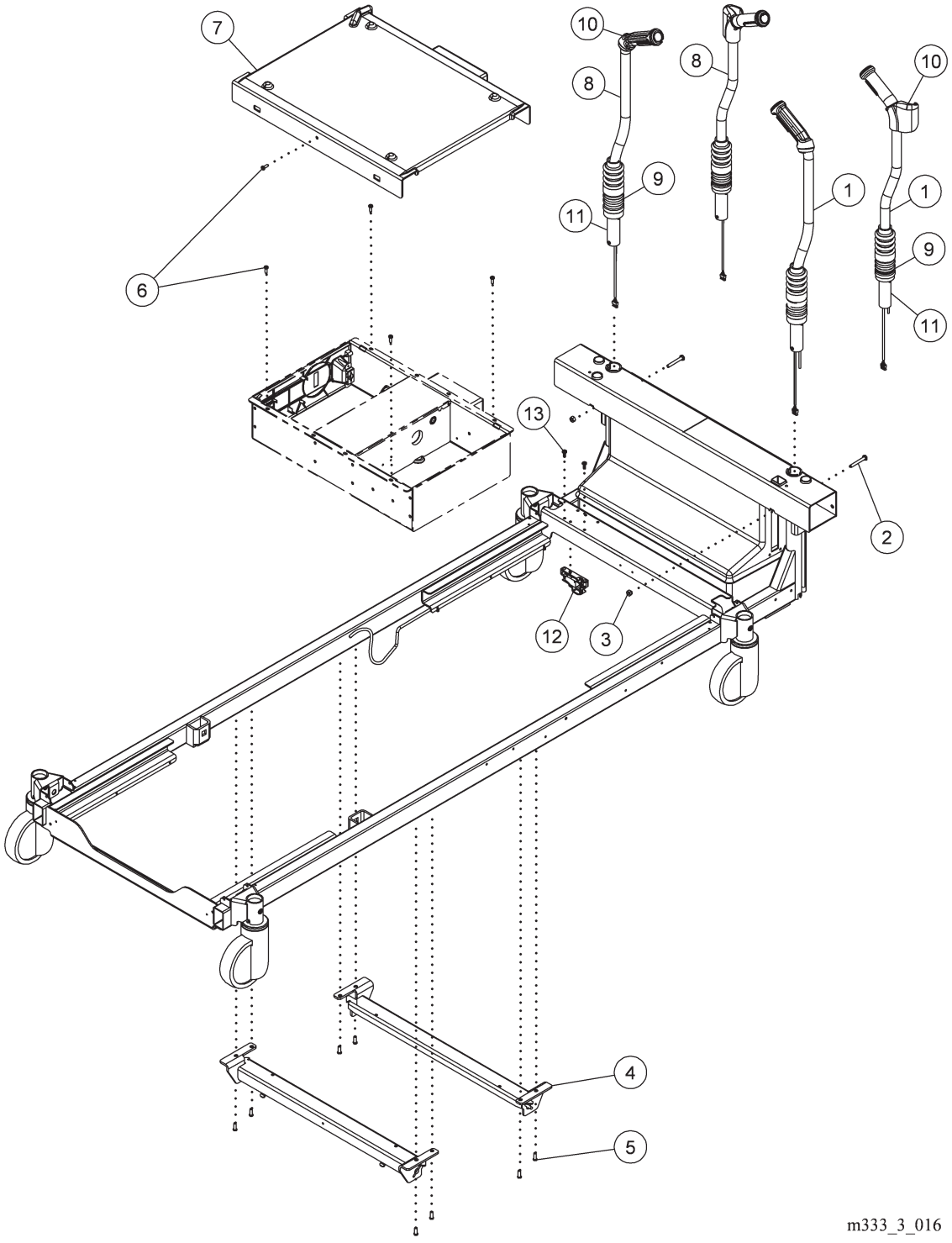

Table 5-19. IntelliDrive® Transport System

Item Number	Part Number	Quantity	Description
1	7006601S	1	Push handle assembly, lh (A through F models)
	15113501S	1	Push handle assembly, lh (G through J models)
	15113503	1	Push handle assembly, IV, lh (G through J models)
2	9001828	2	Screw
3	9023404	2	Nut
4	6973448	2	Weldment, mounting bracket
5	70762	8	Screw
6	69077	5	Screw
7	70050	1	Cover
8	7006602S	1	Push handle assembly, rh (A through F models)
	15113502S	1	Push handle assembly, rh (G through J models)
	15113504	1	Push handle assembly, IV, rh (G through J models)
9	69130	2	Handle bellows
10	6836201	1	Handle grip, lh (no IV holder)
	6836202	1	Handle grip, rh (no IV holder)
	14949101	1	Handle, IV, lh
	14949102	1	Handle, IV, rh
11	68349	2	Handle strain gauge assembly
12	146350	1	Steer switch assembly
13	42142	2	Screw
Not shown	19512	1	Limit switch

IntelliDrive® Transport System—Drive Box

Figure 5-20. IntelliDrive® Transport System—Drive Box

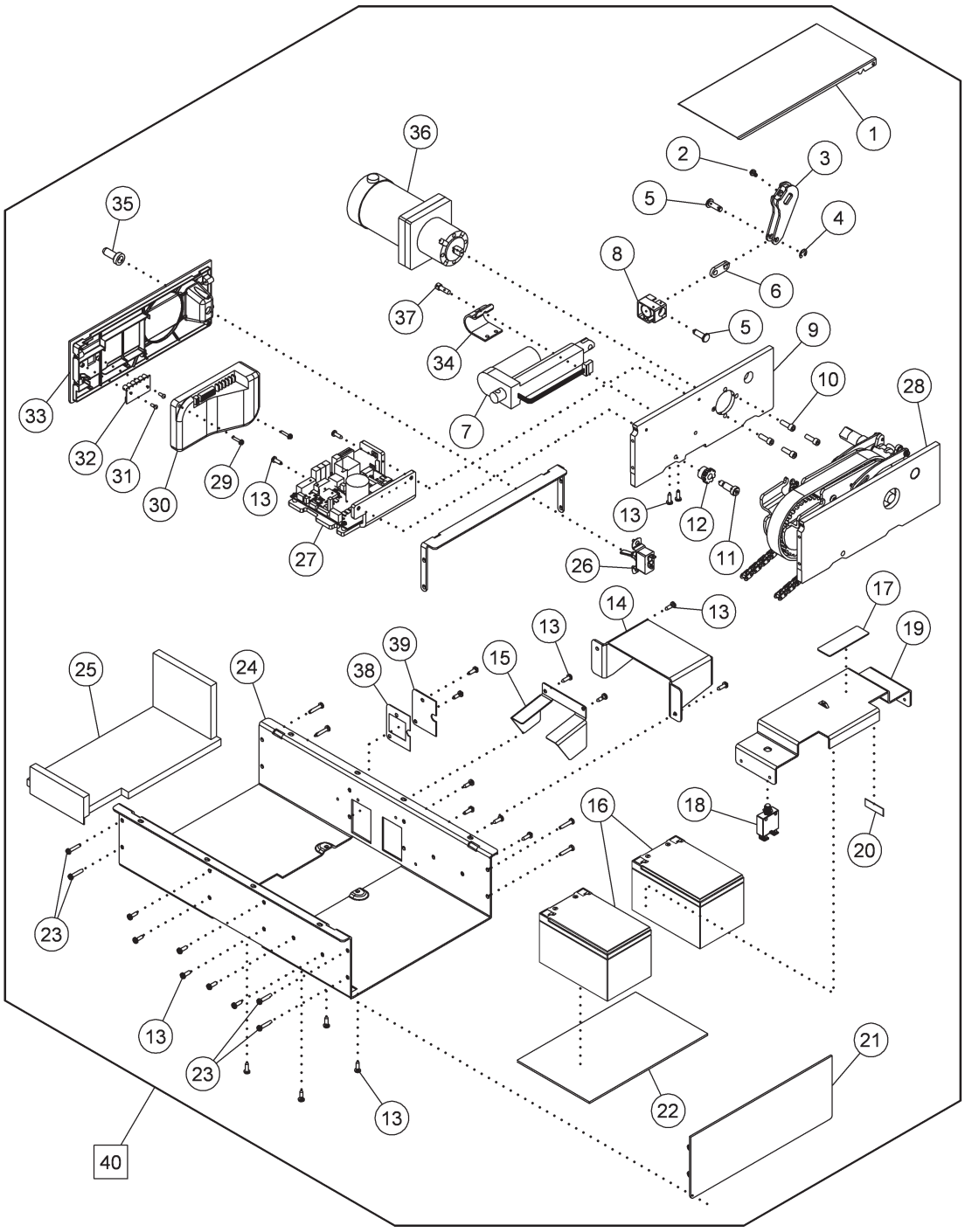

Table 5-20. IntelliDrive® Transport System—Drive Box

Item Number	Part Number	Quantity	Description
1	7046848	1	Cover, drive mechanism
2	70342	1	Screw
3	70411PL	1	Weldment, lever, linear actuator
4	35325	1	E-ring
5	35306PL	4	Hinge pin
6	128983	1	Link
7	69739	1	Linear actuator
8	70052	1	Guide, linear actuator
9	128990S	1	Motor mount, assembly
10	43728	5	Screw
11	69824	2	Screw
12	68306	2	Sprocket
13	69077	27	Screw
14	128987	1	Spring hood
15	7047048	1	Spring guide
16	139105	2	Battery, 12 V
17	30252	1	Label
18	68295	1	Circuit breaker
19	139121	1	Bracket, battery retainer
20	69354	1	Foam, battery retainer
21	69931	1	End plate
22	68869	1	Pad, battery
23	42140	8	Screw
24	128984	1	Pan
25	68865	1	Sound reducing kit
26	68867	1	Switch
27	72302	1	PACM P.C. board
28	128985	1	Plate
29	49508	2	Screw
30	150254	1	Motor controller
31	42414	4	Screw
32	72300	1	Battery indicator
33	69932	1	End plate, motor side

Item Number	Part Number	Quantity	Description
34	7046748	1	Strap, mounting linear actuator
35	72135	1	Boot, toggle switch
36	71529	1	Motor gear
37	43728	5	Screw
38	128991	1	Gasket, actuator lever
39	128988	1	Cover, actuator lever
40	M00094	1	Powered transport drive

NOTES:

IntelliDrive® Transport System—Drive Belt

Figure 5-21. IntelliDrive® Transport System—Drive Belt

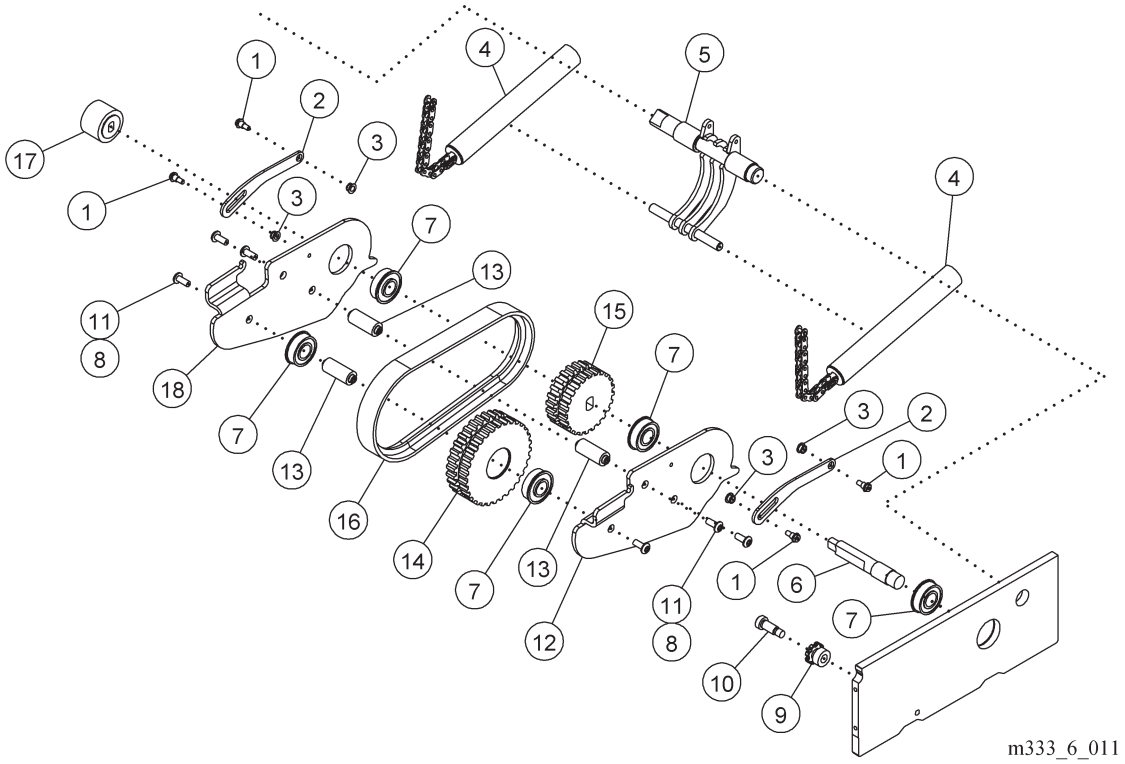

Table 5-21. IntelliDrive® Transport System—Drive Belt

Item Number	Part Number	Quantity	Description
1	68809	4	Screw
2	70636	2	Return link
3	68808	4	Bearing
4	69751S	2	Spring/chain assembly
5	6974302PL	1	Weldment
6	68291	1	Drive shaft
7	68284	5	Bearing
8	SA3618	As required	Loctite® 242
9	68306	2	Sprocket
10	69824	2	Screw
11	49521	6	Screw
12	6974501PL	1	Pulley side plate, lh
13	68290	6	Shaft, drive pulley
14	162398	1	Pulley, 32 teeth
15	68286	1	Pulley, 24 teeth
16	68285	1	Belt
17	68292	1	Coupling drive
18	6974502PL	1	Pulley side plate, rh

AIR Surface (P3251E) (manufactured before January 2010)

Figure 5-22. AIR Surface (P3251E)

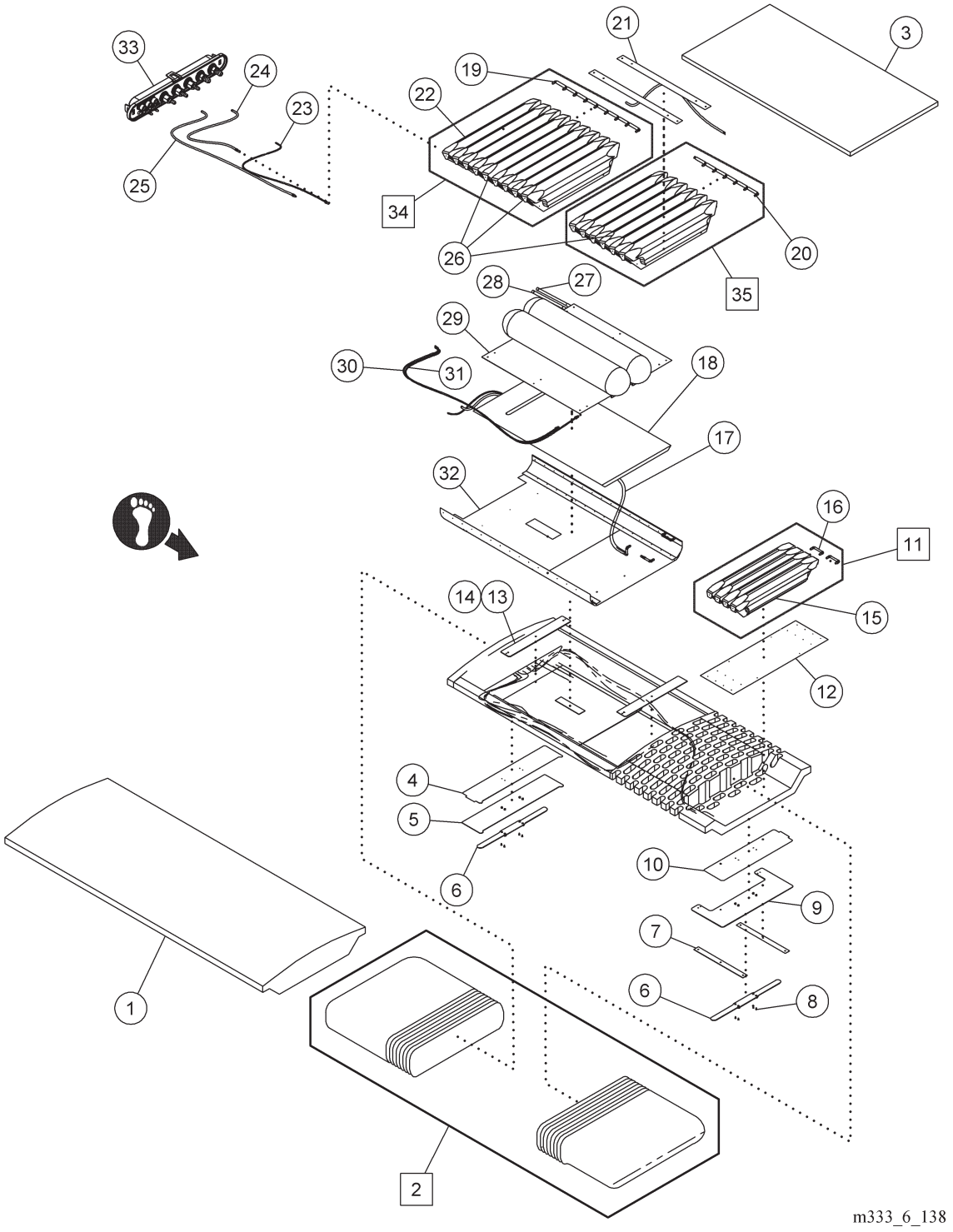

Table 5-22. AIR Surface (P3251E)

Item Number	Part Number	Quantity	Description
1	129671	1	Ticking
2	148102	1	Kit, P3251, fire barrier/shear liner
3	142140	1	Comfort filler foam assembly
4	1000070072	1	Tape, anchor plate, head end
5	1500010046	1	Plate, anchor head
6	1500010044	2	Strip, anchor
7	1000050687	2	Pattern, attachment strap, foot
8	0010330111	8	Screw
9	1500010045	1	Plate, foot anchor
10	1000070073	1	Tape, anchor plate, foot
11	129670	1	Foot section bladder assembly
12	100-005-0688	1	Pattern, substrate
13	1500010050	2	Plate, anchor
14	1000070077	2	Tape
15	1000040239	4	Bladder, cushion foot
16	1500050247	3	Connector tube, foot assembly
17	1500050246	1	Foot fill/sensor tube assembly (clear)
18	0700010135	1	Head/seat filler foam assembly
19	1500050242	1	Head connector tube assembly
20	1500050244	1	Seat fill tube assembly (red)
21	100-005-686	2	Pattern, attachment strap
22	1000040237	12	Bladder, cushion, single port
23	1500050243	1	Head sensor tube assembly (white)
24	1500050241	1	Head fill tube assembly (white)
25	1500050245	1	Seat sensor tube assembly (red)
26	1000040238	3	Bladder, cushion, dual port
27	1500050256	1	Right turn assist fill tube, assembly (yellow)
28	1500050248	1	Left turn assist fill tube assembly (green)
29	1000040236	1	Bladder, cushion, turn assist
30	1500050257	1	Left turn assist sensor tube assembly (green)

Item Number	Part Number	Quantity	Description
31	1500050249	1	Right turn assist sensor tube assembly (yellow)
32	142273	1	Substrate, cushion mounting assembly
33	153913S	1	Interface connector assembly
34	129668	1	Head section bladder assembly
35	129669	1	Seat section bladder assembly
Not shown	171232	1	Foam wedge service kit
Not shown	0010080019	114	Rivet, female
Not shown	0010080021	114	Rivet, male

NOTES:

Short Stay Surface (P3250E)

Figure 5-23. Short Stay Surface (P3250E)

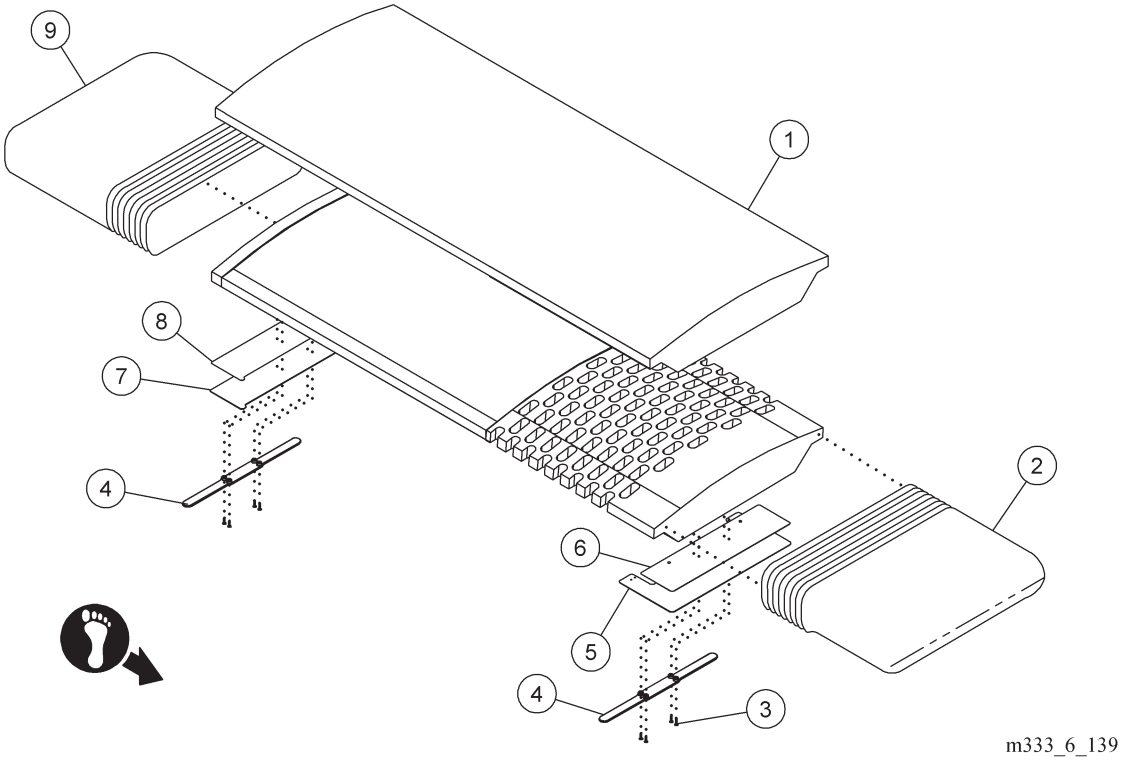

Table 5-23. Short Stay Surface (P3250E)

Item Number	Part Number	Quantity	Description
1	149906	1	Ticking assembly
2	156678	1	Fire barrier
3	0010330111	8	Screw
4	1500010044	2	Strip, anchor
5	1500010045	1	Plate, anchor, foot
6	1000070073	1	Tape, anchor plate, foot
7	1500010046	1	Plate, anchor, head
8	1000070072	1	Tape, anchor plate, head
9	1000130002	1	Shear liner

Permanent IV Pole

Figure 5-24. Permanent IV Pole

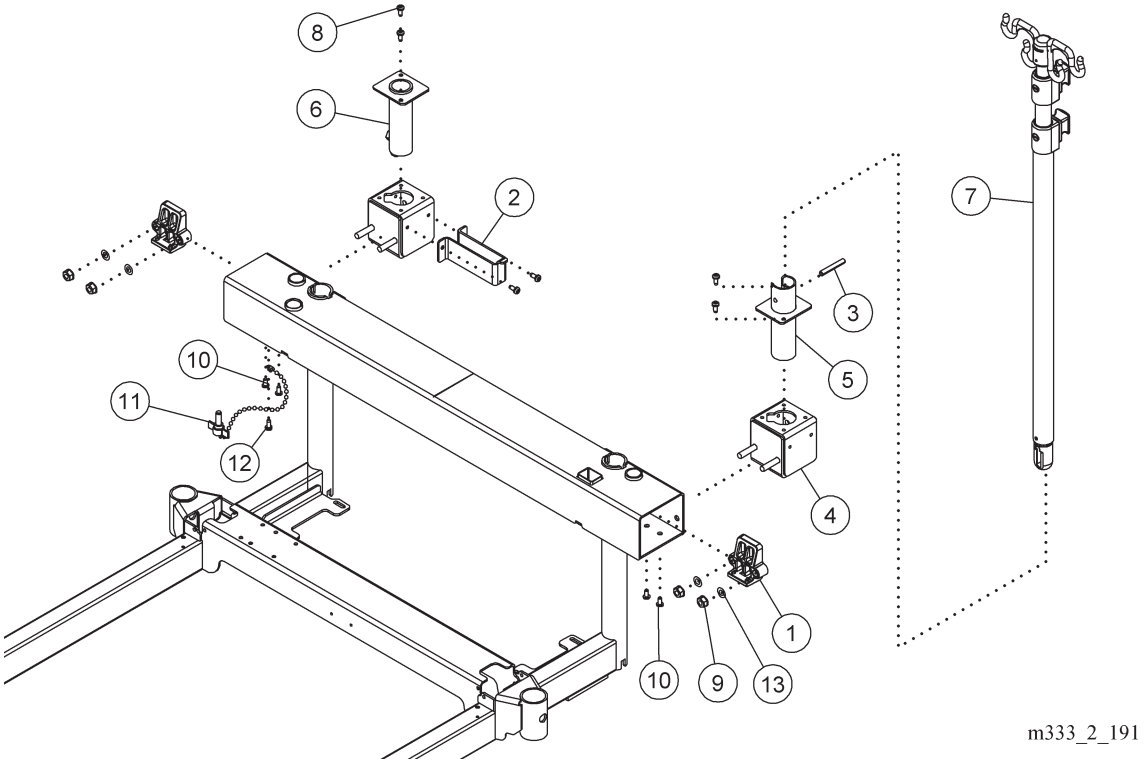

Table 5-24. Permanent IV Pole

Item Number	Part Number	Quantity	Description
1	71623	2	Bracket
2	7222048	1	IV hook rest
3	4604602	1	Pin
4	7221948	2	Weldment, IV support
5	71651PL	1	Weldment, IV Pole mount
6	72323PL	1	Weldment, ISS socket
7	126378	1	Permanent IV Pole assembly
8	70341	6	Screw
9	70428	4	Nut
10	70342	4	Screw
11	38129	1	Chain and knob assembly
12	18252	1	Screw
13	127357	4	Washer

Labels—A through F Model Beds (Sheet 1 of 2)

Figure 5-25. Labels—A through F Model Beds (Sheet 1 of 2)

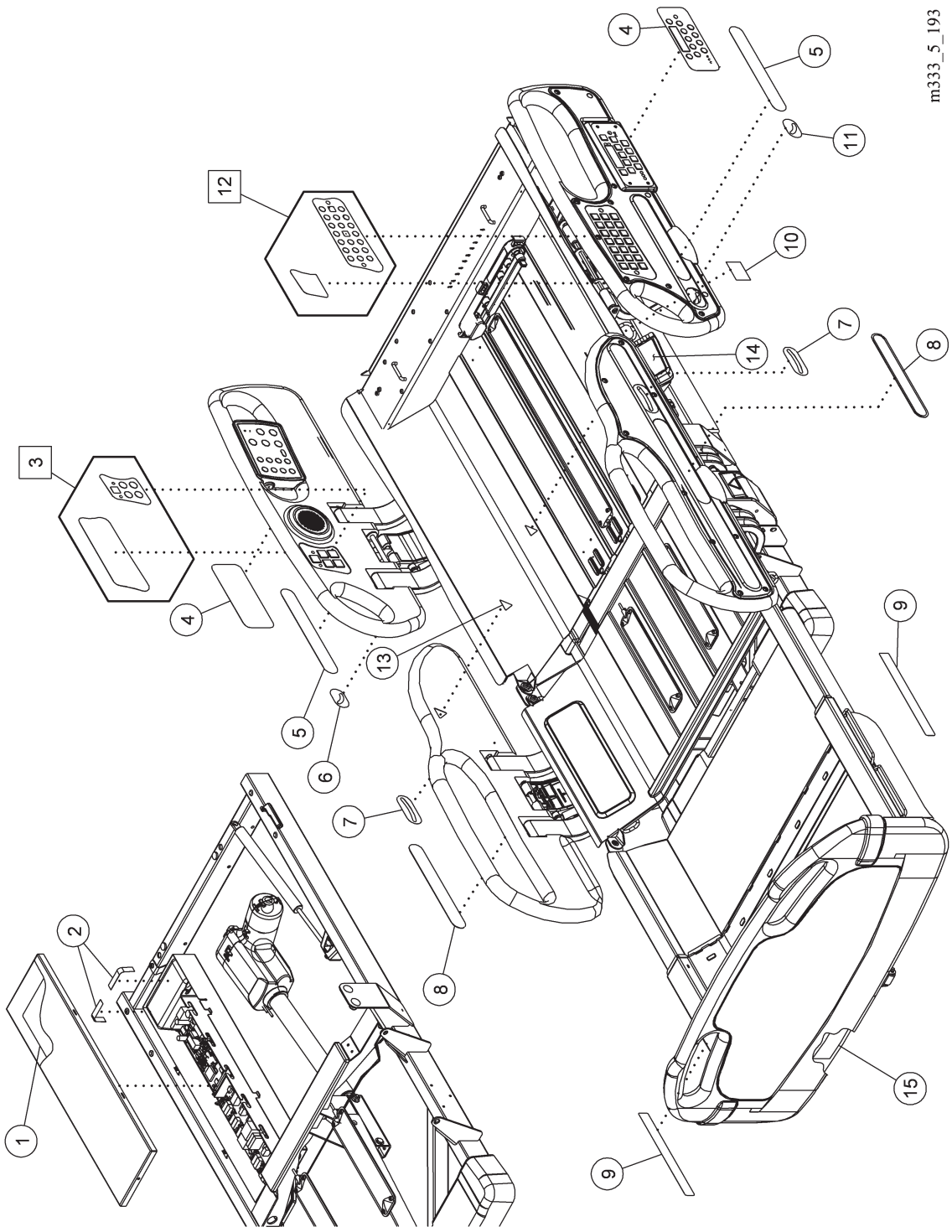

Table 5-25. Labels—A through F Model Beds (Sheet 1 of 2)

Item Number	Part Number	Quantity	Description
1	70944	1	Label, logic diagnostic code
2	71046	2	Label, seal, (OIML scale beds only)
3	6982502	1	Label, siderail, with Nurse Call, rh (A through D models)
	6982602	1	Label, siderail, without Nurse Call, rh (A through D models)
	141414	1	Label, siderail, with NaviCare, rh (E model)
	142625	1	Label, siderail, without NaviCare, without NEL, rh (E model)
	142623	1	Label, siderail, without NaviCare, with NEL, rh (E model)
	141412	1	Label, siderail, with NaviCare, with NEL, rh (E model)
	166331	1	Label, siderail, with NEL, PPMS, and NaviCare, rh
	166374	1	Label, siderail, with PPMS and NaviCare, without NEL, rh
4	14302201	1	Label, pod, scale only
	7087602	1	Label, pod, scale and PPM
	7087603	1	Label, pod, scale, PPM and air
	7087604	1	Label, pod, PPM only
	14302205	1	Label, pod, air only
	14302206	1	Label, pod, air, scale
	7087607	1	Label, pod, air, PPM
	7087608	1	Label, pod, scale (European only)
	7087609	1	Label, pod, scale, air (European only)

Item Number	Part Number	Quantity	Description
5	7082502	1	Label, siderail warning and scale instructions—English
	7082501	1	Label, siderail warning—English
	70825302	1	Label, siderail warning and scale instructions—French
	70825402	1	Label, siderail warning and scale instructions—Spanish
	70825502	1	Label, siderail warning and scale instructions—Portuguese
	70825301	1	Label, siderail warning—French
	70825401	1	Label, siderail warning—Spanish
	70825501	1	Label, siderail warning—Portuguese
6	7081602	1	Label, head elevation, rh
7	69814	1	Label, Trendelenburg
8	149709	1	Label, Hill-Rom logo
9	70799	1	Label, heel relief zone (air beds only)
10	70802	1	Label kit (patient restraint)
11	7081601	1	Label, head elevation, lh
12	6982501	1	Label, siderail, with Nurse Call, lh (A through D models)
	6982601	1	Label, siderail, without Nurse Call, lh (A through D models)
	141413	1	Label, siderail, with NaviCare, lh (E model)
	142624	1	Label, siderail, without NaviCare, without NEL, lh (E model)
	142622	1	Label, siderail, without NaviCare, with NEL, lh (E model)
	141411	1	Label, siderail, with NaviCare, with NEL, lh (E model)
	166332	1	Label, siderail, with NEL, PPMS, and NaviCare, lh
	166375	1	Label, siderail, with PPMS and NaviCare, without NEL, lh
13	140467	1	Label, hip location—International

Item Number	Part Number	Quantity	Description
14	70802	1	Label kit (CPR, rh)
		1	Label kit (CPR, lh)
15	70802	1	Label kit, (pinch point warning)

Labels—A through F Model Beds (Sheet 2 of 2)

Figure 5-26. Labels—A through F Model Beds (Sheet 2 of 2)

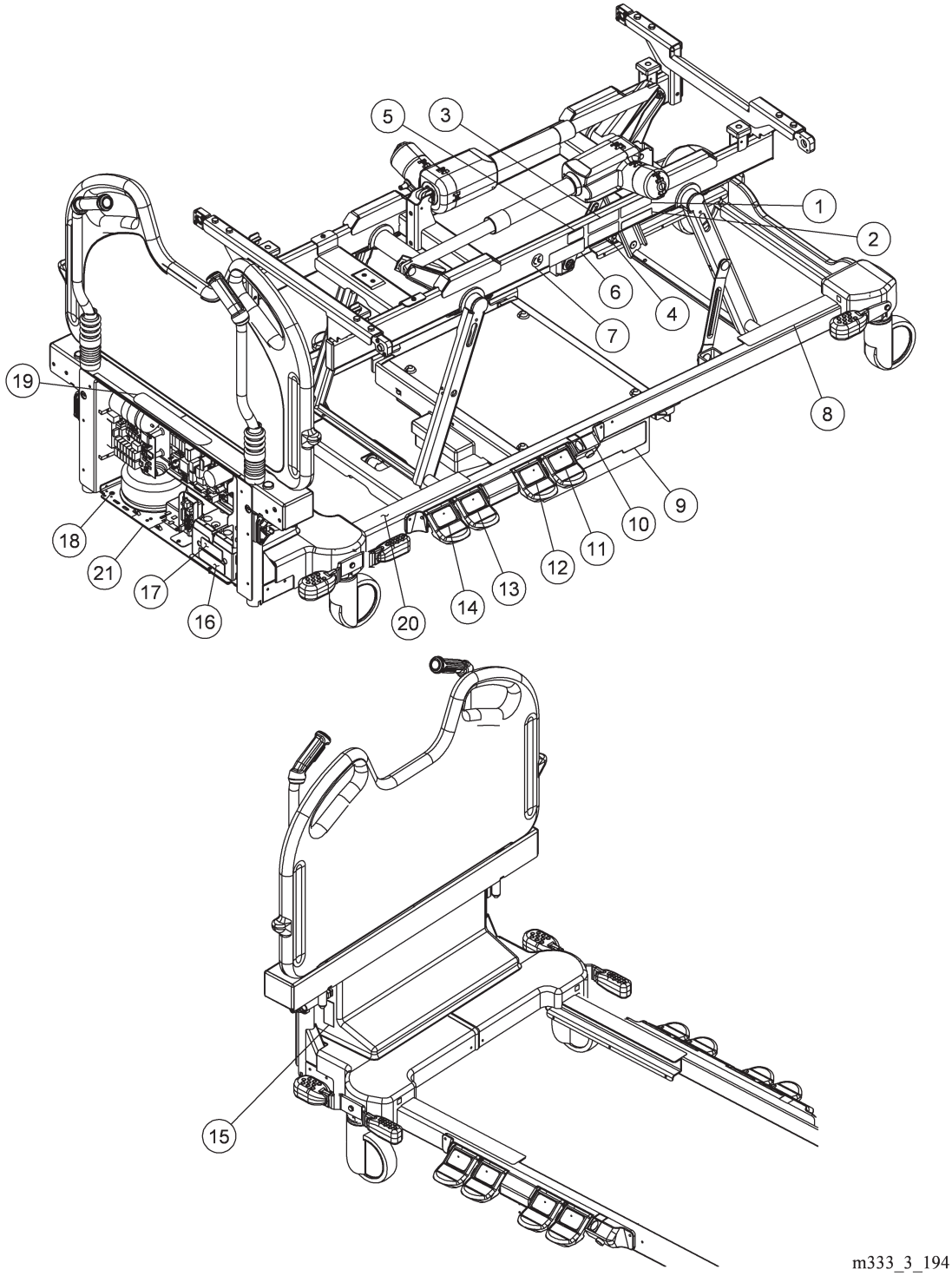

Table 5-26. Labels—A through F Model Beds (Sheet 2 of 2)

Item Number	Part Number	Quantity	Description
1	43163	1	Overlay, calibration label
2	70802	1	Label kit (patent number label)
3	70814	1	Gravity zone (EN beds only)
4	7081502	1	EN scale label
5	127951	1	Serial number (Rental beds)
6	126930	1	Serial number
7	64068	1	CE mark (scale beds only)
	46770	1	CE mark (no scale)
8	70802	1	Label kit (no step, foot end)
9	7081301	1	Label, IntelliDrive® Transport System — English
	7081303	1	Label, IntelliDrive® Transport System — French
	7081304	1	Label, IntelliDrive® Transport System — Spanish
	7081305	1	Label, IntelliDrive® Transport System — Portuguese
10	70802	1	Label kit (blank)
11	70898	1	Label kit (foot controls, bed down, rh)
	70898	1	Label kit (foot controls, bed down, lh)
12	70898	1	Label kit (foot controls, bed up, rh)
	70898	1	Label kit (foot controls, bed up, lh)
13	70898	1	Label kit (foot controls, head down, rh)
	70898	1	Label kit (foot controls, head down. lh)
14	70898	1	Label kit (foot controls, head up, lh)
	70898	1	Label kit (foot controls, head up, rh)
15	70803	1	Label, battery power switch
16	30252	1	Label
17	66870	1	Label, battery warning
18	44002	1	Label, protective earth
19	70812	1	Label, IntelliDrive® Transport System push handle
20	70802	1	Label kit (no step, head end)
21	70801	1	Label, fuse block

CPR Cable

Figure 5-27. CPR Cable

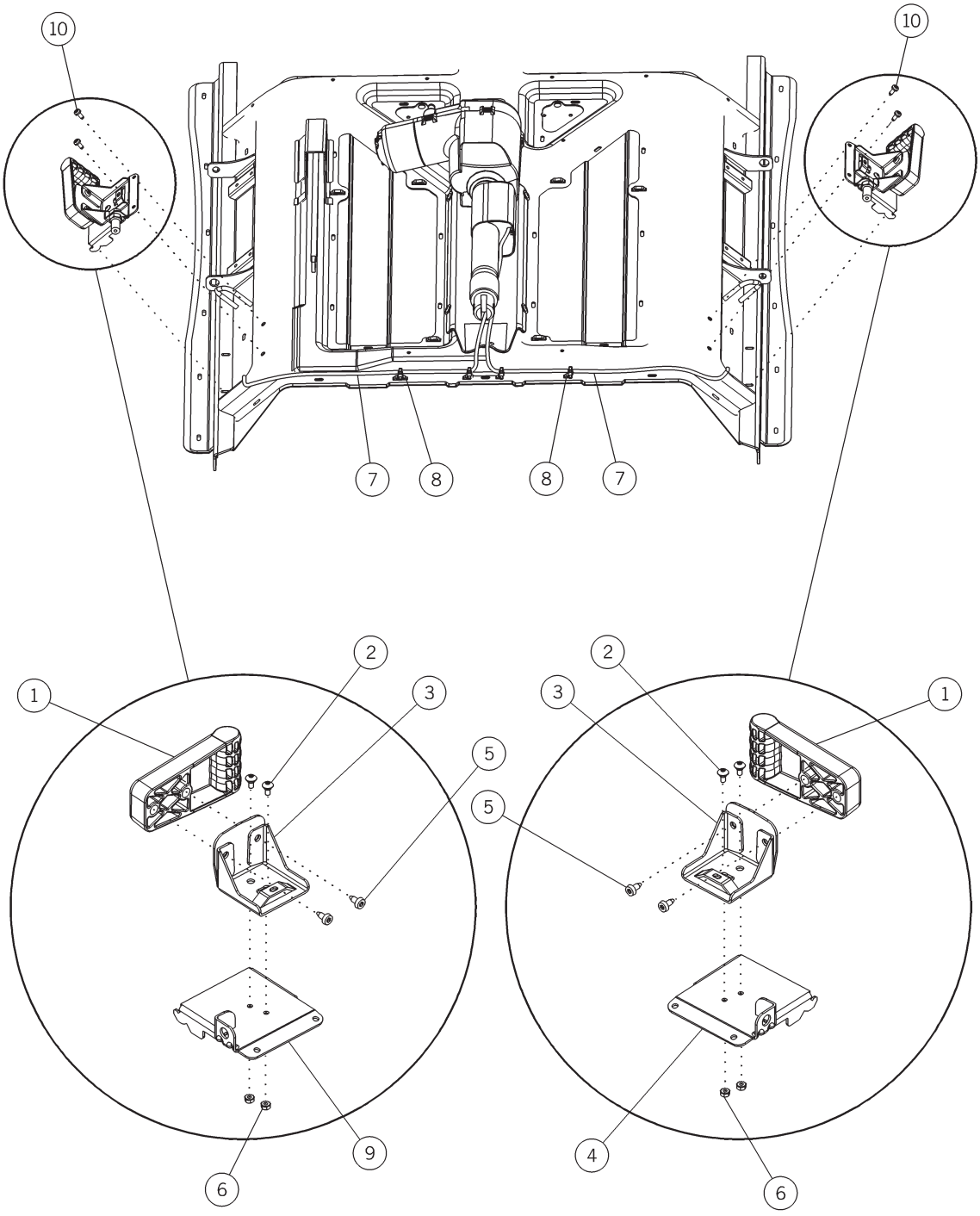

Table 5-27. CPR Cable

Item Number	Part Number	Quantity	Description
1	70412	1	Handle
2	69846	2	Screw
3	69689PL	1	Pivot bracket
4	6968702PL	1	Base bracket, rh
5	70342	2	Screw
6	70398	2	Nut
7	69753	1	Cable
8	19124	2	Cable tie
9	6968701PL	1	Base bracket, lh
10	70341	2	Screw

Wireless Interface Unit

Figure 5-28. Wireless Interface Unit

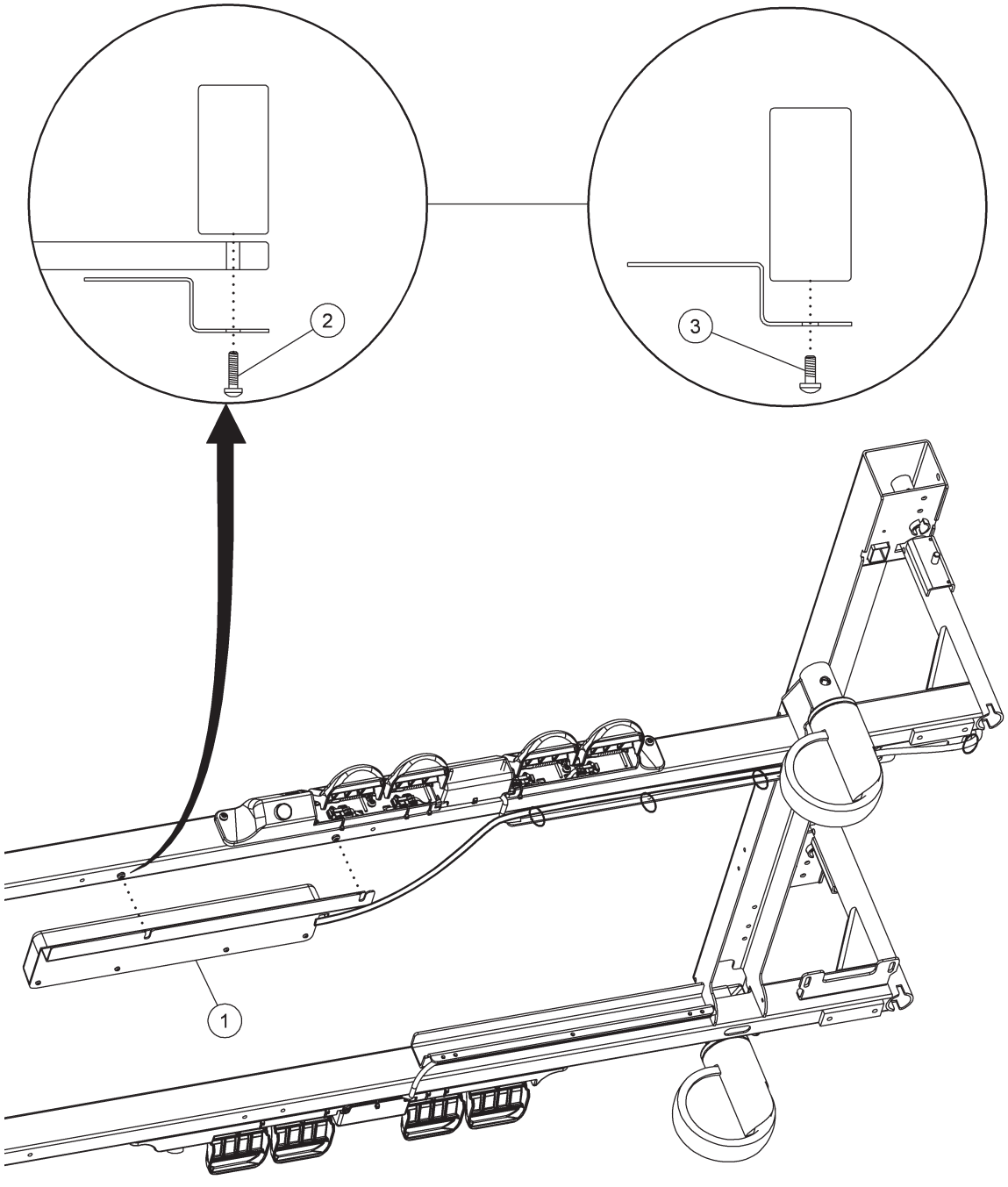

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Table 5-28. Wireless Interface Unit

Item Number	Part Number	Quantity	Description
1	141997	1	Wireless assembly
2	70762	2	Screw (long), for use with IntelliDrive® Transport System beds
3	142348	2	Screw (short), for use with non-IntelliDrive® Transport System beds
4	14200848S	1	Mount bracket

Footboard—D through J Model Beds

Figure 5-29. Footboard—D through J Model Beds

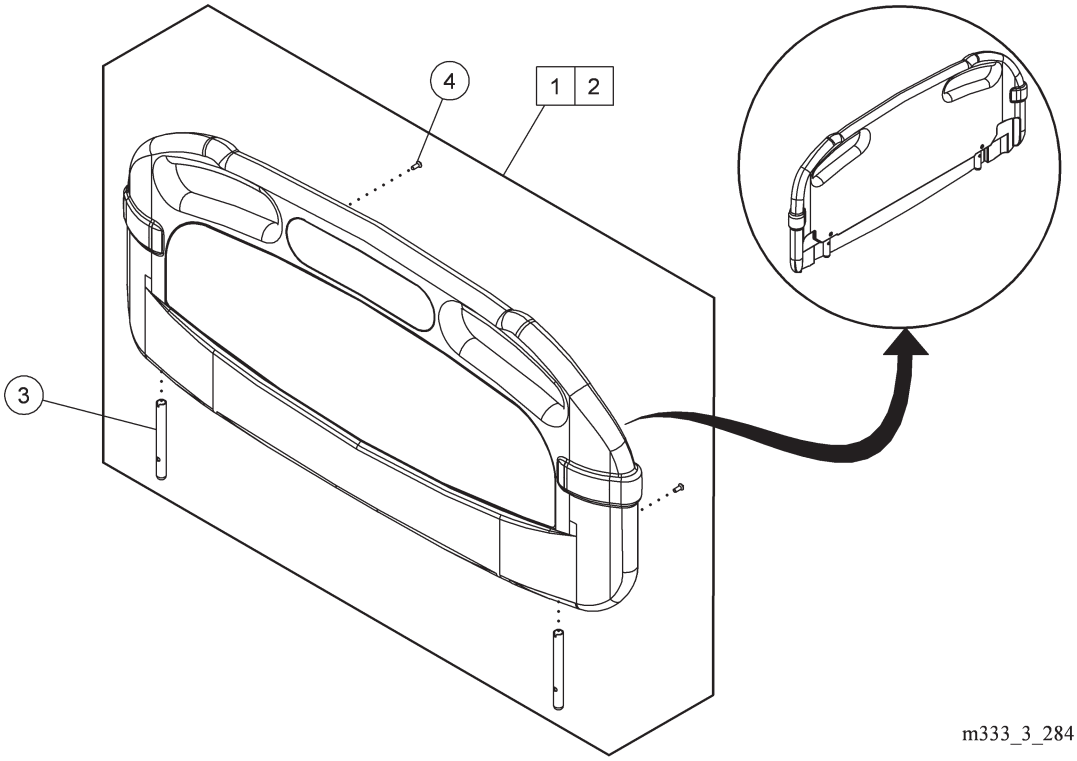


Table 5-29. Footboard—D through J Model Beds

Item Number	Part Number	Quantity	Description
1	136003	1	Footboard (capital beds only)
2	136004	1	Footboard (rental beds only)
3	135554	2	Round tube
4	138076	2	Screw

NOTES:

Foot Extension—D through J Model Beds

Figure 5-30. Foot Extension—D through J Model Beds

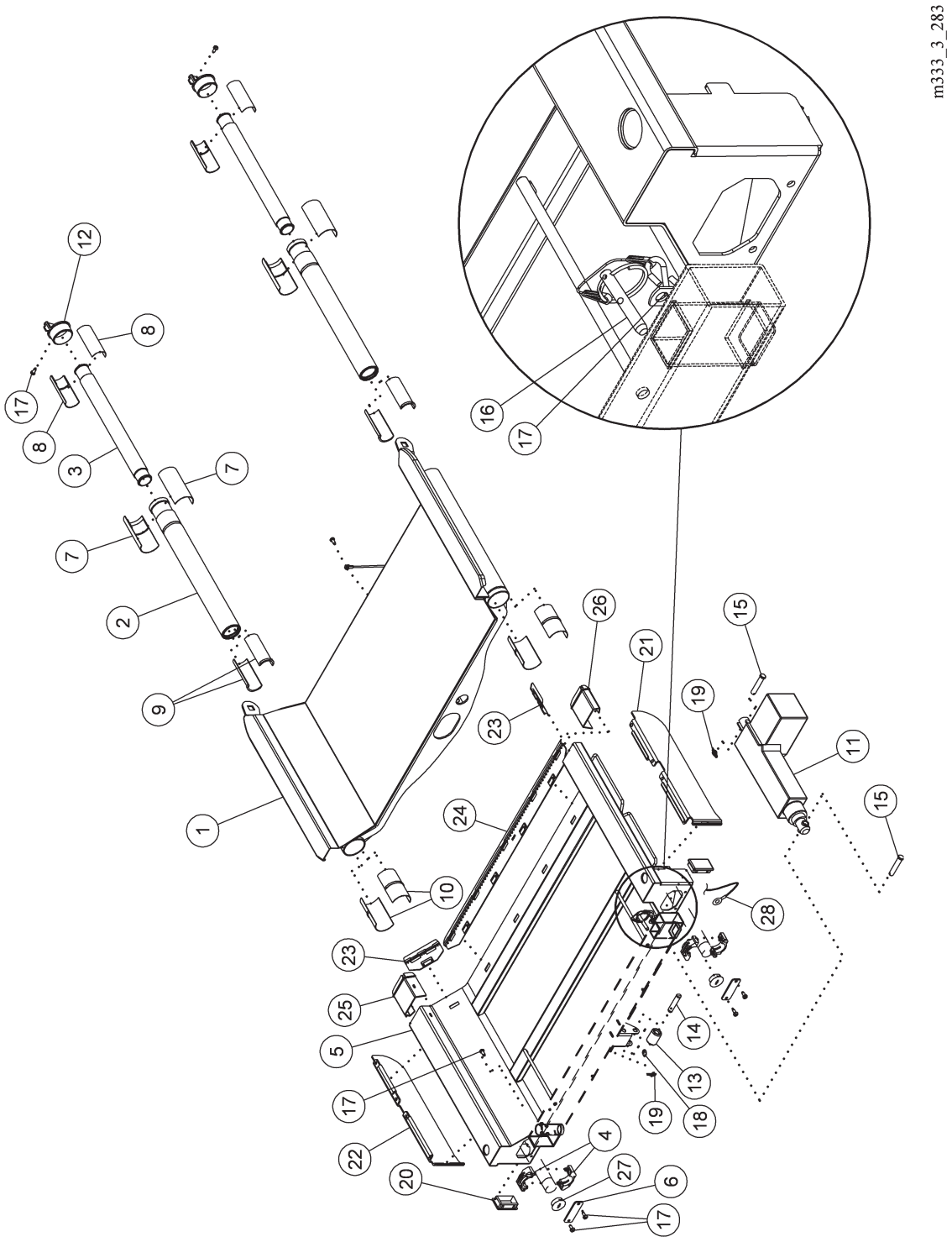


Table 5-30. Foot Extension—D through J Model Beds

Item Number	Part Number	Quantity	Description
1	6963548S	1	Weldment, fixed foot section
2	70475PL	2	Tube, intermediate foot
3	47218PL	2	Tube, inner slide
4	69917	4	Terminator, foot slide
5	145035S	1	Foot section, moving
6	69639PL	2	Retainer, foot slide
7	47207	4	Split bushing, rear, outer, foot
8	47209	4	Split bushing, rear, inner, foot
9	47208	4	Split bushing, front, inner, foot
10	72435	4	Split bushing, front, outer, foot
11	7000203	1	Actuator, foot extend
12	69910	2	Tube end cap, fixed foot
13	69719	1	Roller, foot section
14	4727106PL	1	D-pin
15	70787	2	Pin, clevis
16	66733	1	Release pin
17	70341	9	Screw, pan head
18	35325	1	E-ring
19	61615	2	Rue ring
20	135624	2	End plug
21	7015401	1	Cover, tube, foot extend tube, lh
22	7015402	1	Cover, tube, foot extend tube, rh
23	70463	2	Wiper, moving, foot, side
24	70785	1	Wiper, moving, foot, bottom
25	7038102	1	Wiper, upper, foot section, rh
26	7038101	1	Wiper, upper, foot section, lh
27	71270	2	Hole plug, foot tube
28	3924008S	1	Ground wire, fixed foot

Auxiliary Outlet

Figure 5-31. Auxiliary Outlet

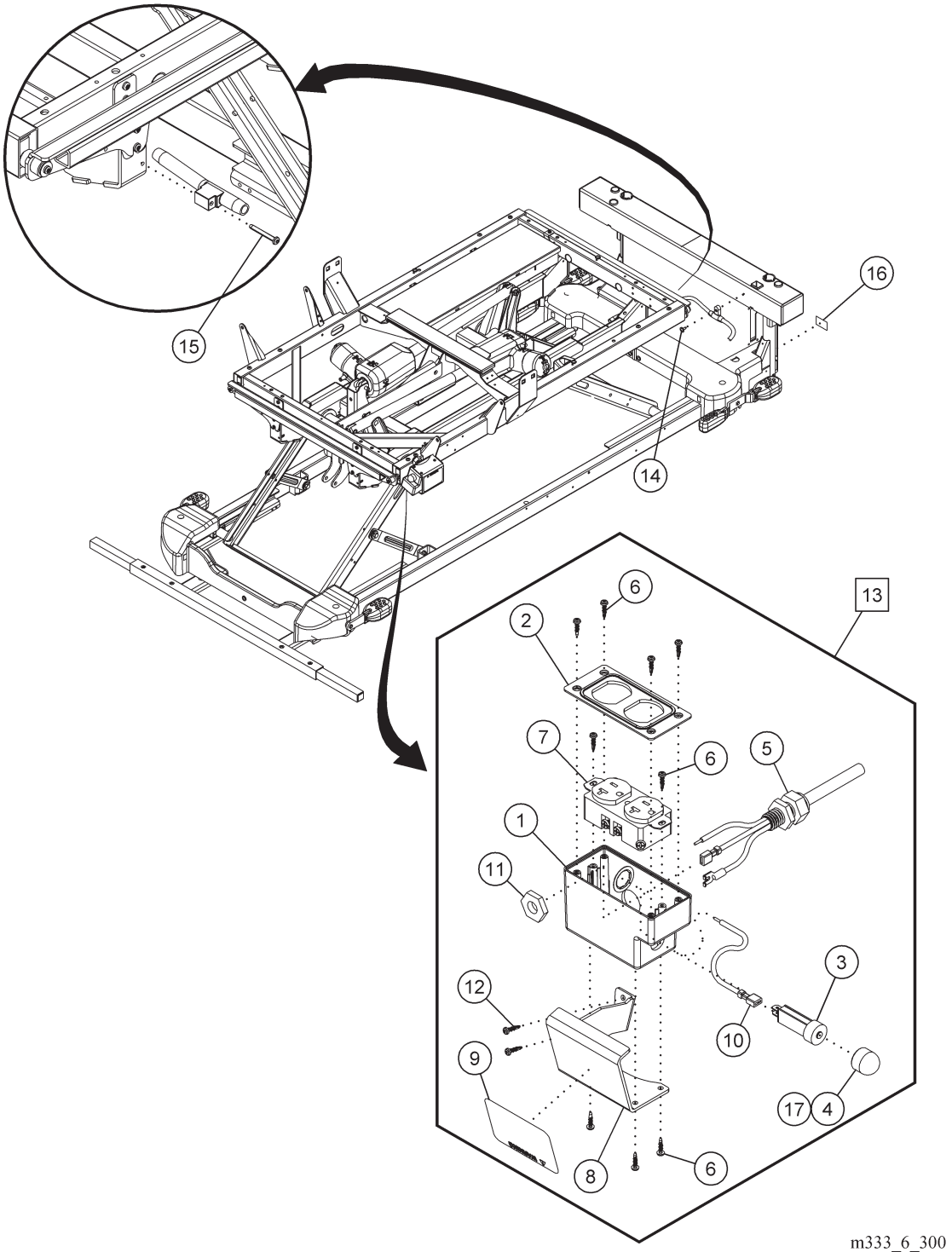


Table 5-31. Auxiliary Outlet

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	140127	1	Cable assembly
6	4214102	9	Screw
7	28439	1	Outlet, duplex, 20 A, ivory
8	139868	1	Mounting bracket
9	140276	1	Label, warning
10	66539	1	Wire assembly, receptacle
11	125670	1	Locking nut
12	70341	2	Screw, roll, pan, tx, M5-0.8, 0.472, stl
13	140144	1	Auxiliary outlet assembly
14	163030	1	Screw, roll, pan, tx, M5, 25, stl, zn
15	69990	1	Screw, roll, pan, tx, M5-0.8, 40, stl, zn
16	140275	1	Label, warning, electrical, shock
17	39172	As required	Loctite® 414
Not shown	31844	3	Cable tie

Line Manager

Figure 5-32. Line Manager

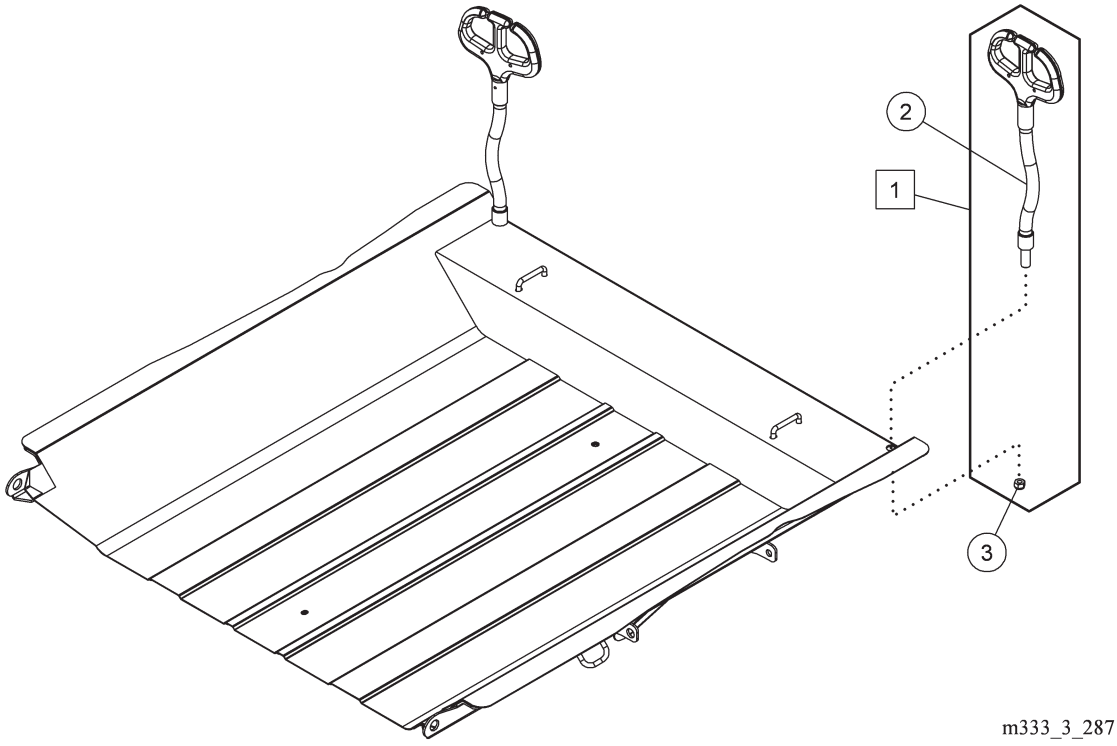


Table 5-32. Line Manager

Item Number	Part Number	Quantity	Description
1	147109	1	Kit, line manager
2	146287	2	Flex arm
3	152908	2	Nut

Footboard with Integrated Transport Shelf

Figure 5-33. Footboard with Integrated Transport Shelf

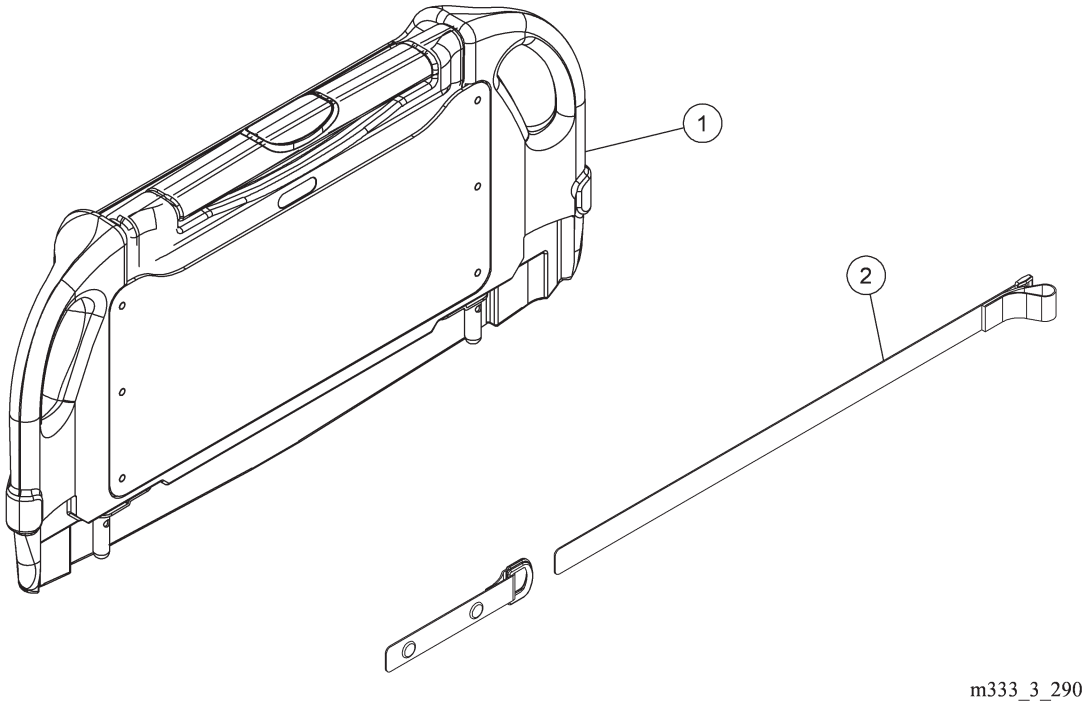


Table 5-33. Integrated Transport Shelf

Item Number	Part Number	Quantity	Description
1	P419A	1	Transport shelf assembly
2	152272S	1	Equipment strap, shelf

Integrated IV Transport Handle (G through J Model Beds)

Figure 5-34. Integrated IV Transport Handle (G through J Model Beds)

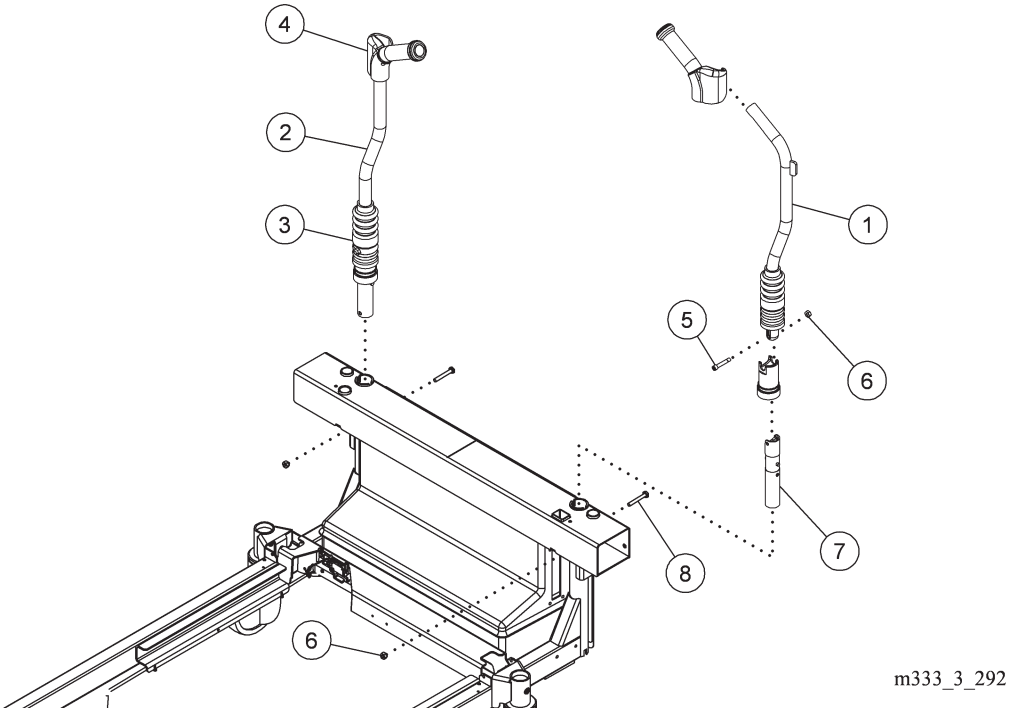


Table 5-34. Integrated IV Transport Handle (G through J Model Beds)

Item Number	Part Number	Quantity	Description
1	15113505	1	Assembly, push handle, IV, lh
2	15113506	1	Assembly, push handle, IV, rh
3	69130	1	Handle bellows
4	14949103	1	Handle, IV only, lh
	14949104	1	Handle, IV only, rh
5	68302	2	Screw
6	9023404	4	Nut
7	6834901	2	Tube assembly, base handle
8	9001832	2	Screw

NOTES:

Head Siderail—G through J Model Beds

Figure 5-35. Head Siderail—G through J Model Beds

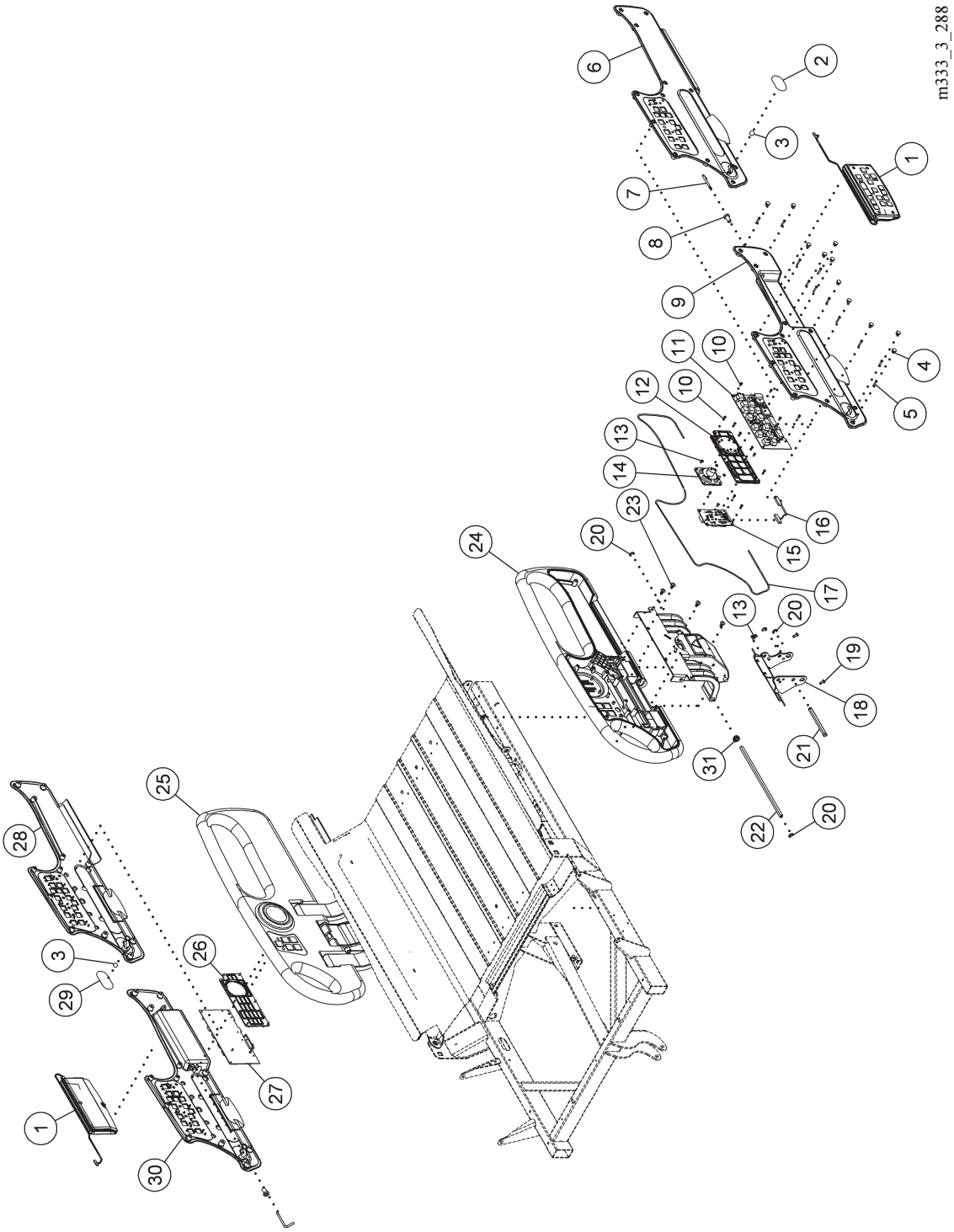


Table 5-35. Head Siderail—G through J Model Beds

Item Number	Part Number	Quantity	Description
1	152096	1	Pod assembly
2	7081601	1	Label, head elevation, lh
3	47272	1	Ball angle indicator
4	72578	12	Cover, screw
5	71639	12	Screw, hilow
6	6981107	1	Siderail cover without pod, lh
7	69839	1	Shaft, GCI pin
8	150680	1	Bushing, GCI siderail
9	6981105	1	Siderail cover, with pod, lh
10	4214101	14	Screw, hilow
11	147586XXS[a]	1	P.C. board, caregiver control, lh
12	6982103	1	P.C. board support plate, lh
13	28562	4	Nut, pal
14	38873	1	Speaker
15	72283P	1	P.C. board assembly, patient
16	69450	1	Cable, patient controls
17	70377	1	Gasket, siderail
18	70282PL	1	Bracket, head deck to siderail weldment
19	70341	4	Screw
20	35325	4	E-ring
21	69838PL	2	D-pin, siderail short
22	69798PL	1	D-pin, siderail long
23	69817	4	Screw, button head
24	6979401	1	Head siderail base, lh
25	6979402	1	Head siderail base, rh
26	6982104	1	P.C. board support plate, rh
27	147583XXS[a]	1	P.C. board, caregiver control, rh
28	6981108	1	Siderail cover without pod, rh
29	7081602	1	Label, head elevation, rh
30	6981106	1	Siderail cover with pod, rh
31	36570	1	Bushing (beds built before 11-May-2009)

a. XX = 01 - 09 depending on the options installed on the bed.

Labels—G through J Model Beds (Sheet 1 of 2)

Figure 5-36. Labels—G through J Model Beds (Sheet 1 of 2)

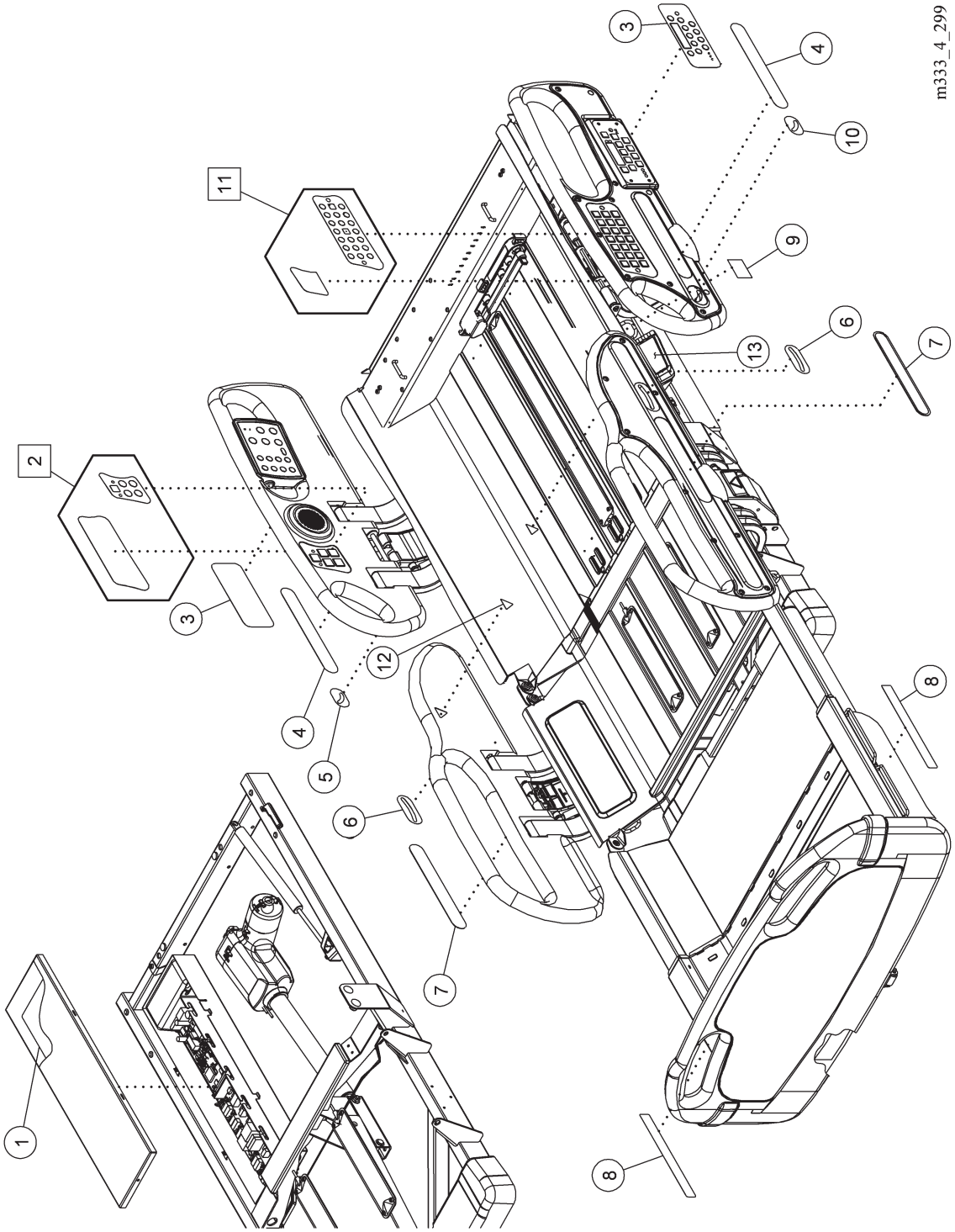


Table 5-36. Labels—G through J Model Beds (Sheet 1 of 2)

Item Number	Part Number	Quantity	Description
1	70944	1	Label, logic diagnostic code
2	14951802	1	Label, siderail, with Nurse Call, rh
	14951702	1	Label, siderail, without Nurse Call, rh
	14951804	1	Label, siderail, with Nurse Call, without Boost®, rh
	14951704	1	Label, siderail, without Nurse Call and Brake not Set, rh
	14951706	1	Label, siderail, without Nurse Call and Boost®, rh
3	14966703	1	Label, pod, air, PPM, NaviCare, scale, head of bed
	14966704	1	Label, pod, air, PPM, scale, head of bed
	14966705	1	Label, pod, PPM, NaviCare, scale
	14966706	1	Label, pod, PPM, scale, head of bed
	14966710	1	Label, pod, air
	14966711	1	Label, pod, air, PPM, NaviCare
	14966712	1	Label, pod, air, PPM
	14966713	1	Label, pod, PPM, NaviCare
	14966714	1	Label, pod, PPM
	14966716	1	Label, pod, scale
	14966718	1	Label, pod, air, scale
	14966719	1	Label, pod, air, PPM, NaviCare, scale
	14966720	1	Label, pod, air, PPM, scale
	14966721	1	Label, pod, PPM, NaviCare, scale
	14966722	1	Label, pod, PPM, scale
	14966723	1	Label, pod, air, no display
	14966724	1	Label, pod, air, PPM, NaviCare, no display
	14966725	1	Label, pod, air, PPM, no display
	14966726	1	Label, pod, PPM, NaviCare, no display
	14966727	1	Label, pod, PPM, no display
	14966730	1	Label, pod, air, PPMS, NaviCare, scale, head of bed

Item Number	Part Number	Quantity	Description
	14966732	1	Label, pod, PPMS, NaviCare, scale, head of bed
	14966738	1	Label, pod, air, PPMS, NaviCare, scale
	14966740	1	Label, pod, PPMS, NaviCare, scale
4	70825104	1	Label, siderail warning and scale instructions—English
	70825304	1	Label, siderail warning and scale instructions—French
	70825404	1	Label, siderail warning and scale instructions—Spanish
	70825504	1	Label, siderail warning and scale instructions—Portuguese
	70825904	1	Label, siderail warning and scale instructions—Arabic
	708251004	1	Label, siderail warning and scale instructions—Traditional Chinese
	708251104	1	Label, siderail warning and scale instructions—Simplified Chinese
	708251204	1	Label, siderail warning and scale instructions—Japanese
	708251304	1	Label, siderail warning and scale instructions—Greek
	708251504	1	Label, siderail warning and scale instructions—Thai
	708251604	1	Label, siderail warning and scale instructions—Korean
	7082501	1	Label, siderail warning—English
	70825301	1	Label, siderail warning—French
	70825401	1	Label, siderail warning—Spanish
	70825501	1	Label, siderail warning—Portuguese
	70825901	1	Label, siderail warning—Arabic
	708251001	1	Label, siderail warning—Traditional Chinese
	708251101	1	Label, siderail warning—Simplified Chinese
	708251201	1	Label, siderail warning—Japanese
	708251301	1	Label, siderail warning—Greek

Item Number	Part Number	Quantity	Description
	708251501	1	Label, siderail warning—Thai
	708251601	1	Label, siderail warning—Korean
5	7081602	1	Label, head elevation, rh
6	69814	1	Label, Trendelenburg
7	149709	1	Label, Hill-Rom logo
8	70799	1	Label, heel relief zone (air beds only)
9	70802	1	Label kit (patient restraint)
10	7081601	1	Label, head elevation, lh
11	14951801	1	Label, siderail, with Nurse Call, lh
	14951701	1	Label, siderail, without Nurse Call, lh
	14951803	1	Label, siderail, with Nurse Call, without Boost®, lh
	14951703	1	Label, siderail, without Nurse Call and Brake not Set, lh
	14951705	1	Label, siderail, without Nurse Call and Boost®, lh
12	140467	2	Label, hip location—International
13	70802	1	Label kit (CPR, rh)
		1	Label kit (CPR, lh)
Not shown	6718302	1	Label, Brazil inmetro
Not shown	161805	1	Label, Brazil inmetro

Labels—G through J Model Beds (Sheet 2 of 2)

Figure 5-37. Labels—G through J Model Beds (Sheet 2 of 2)

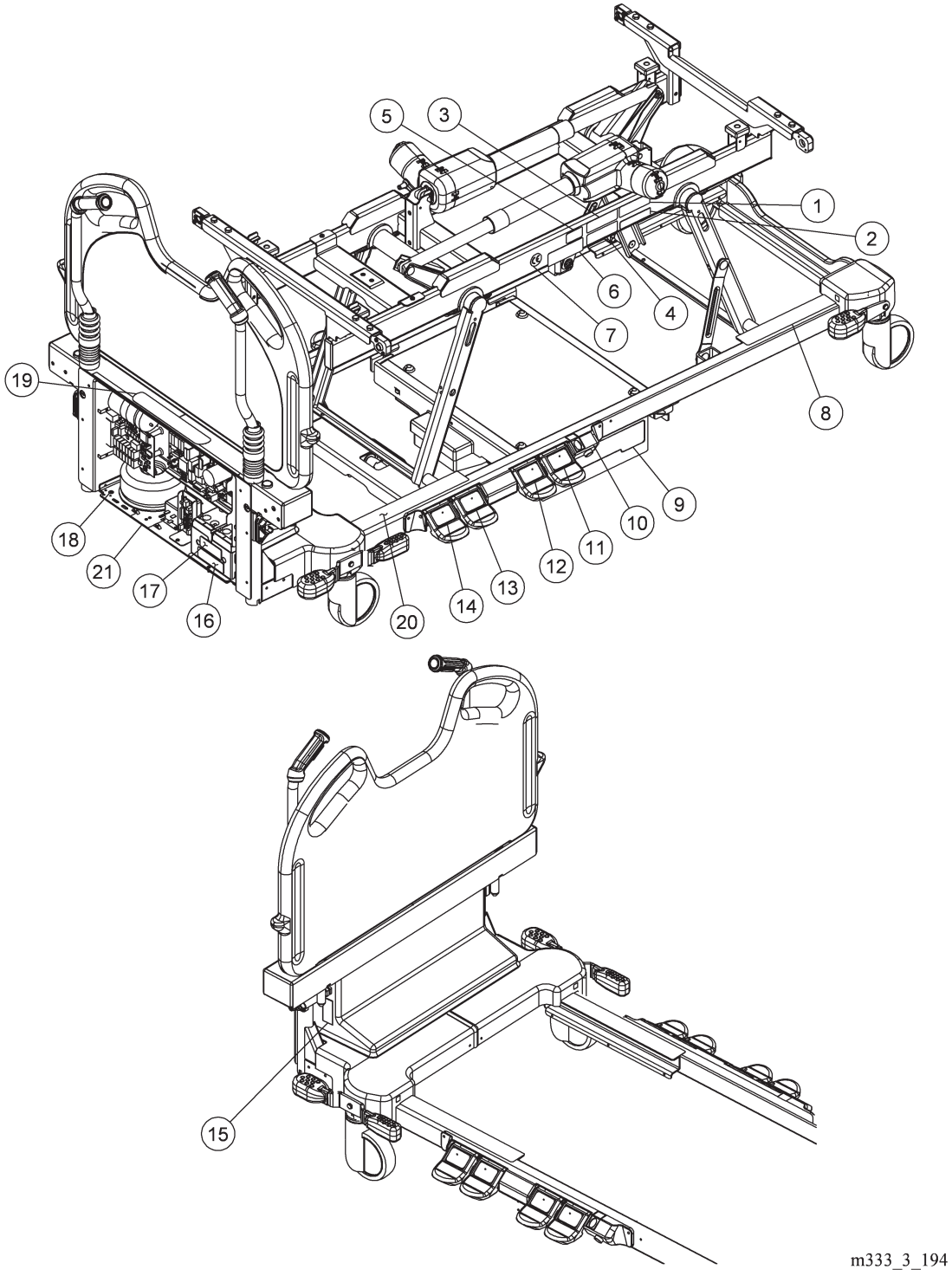


Table 5-37. Labels—G through J Model Beds (Sheet 2 of 2)

Item Number	Part Number	Quantity	Description
1	43163	1	Overlay, calibration label
2	70802	1	Label kit (patent number label)
3	70814	1	Gravity zone (EN beds only)
4	7081502	1	EN scale label
5	127951	1	Serial number (Rental beds)
6	126930	1	Serial number
7	64068	1	CE mark (scale beds only)
	46770	1	CE mark (no scale)
8	70802	1	Label kit (no step, foot end)
9	7081301	1	Label, IntelliDrive® Transport System—English
	7081303	1	Label, IntelliDrive® Transport System—French
	7081304	1	Label, IntelliDrive® Transport System—Spanish
	7081305	1	Label, IntelliDrive® Transport System—Portuguese
	7081309	1	Label, IntelliDrive® Transport System—Arabic
	7081310	1	Label, IntelliDrive® Transport System—Traditional Chinese
	7081311	1	Label, IntelliDrive® Transport System—Simplified Chinese
	7081312	1	Label, IntelliDrive® Transport System—Japanese
	7081313	1	Label, IntelliDrive® Transport System—Greek
	7081315	1	Label, IntelliDrive® Transport System—Thai
	7081316	1	Label, IntelliDrive® Transport System—Korean
10	70802	1	Label kit (blank)
11	70898	1	Label kit (foot controls, bed down, rh)
	70898	1	Label kit (foot controls, bed down, lh)

Item Number	Part Number	Quantity	Description
12	70898	1	Label kit (foot controls, bed up, rh)
	70898	1	Label kit (foot controls, bed up, lh)
13	70898	1	Label kit (foot controls, head down, rh)
	70898	1	Label kit (foot controls, head down. lh)
14	70898	1	Label kit (foot controls, head up, lh)
	70898	1	Label kit (foot controls, head up, rh)
15	70803	1	Label, battery power switch
16			
17	30252	1	Label
18	66870	1	Label, battery warning
19	44002	1	Label, protective earth
20	70812	1	Label, IntelliDrive® Transport System push handle
21	70802	1	Label kit (no step, head end)
22	70801	1	Label, fuse block

NOTES:

P500 Surface (P3254A) and AIR Surface (P3254A) (manufactured after January 1, 2010)

Figure 5-38. P500 and AIR Surfaces (P3254A)

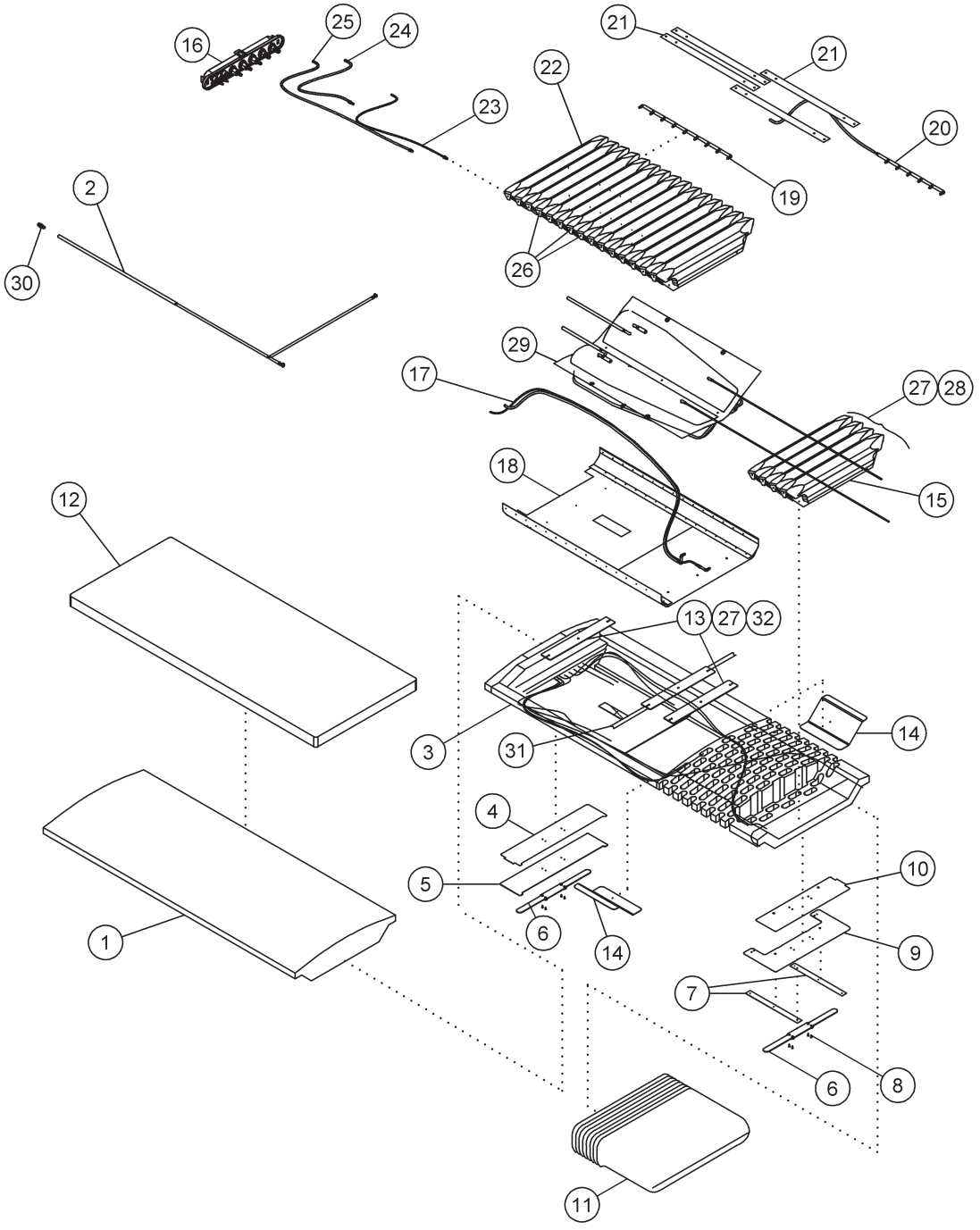


Table 5-38. P500 and AIR Surfaces (P3254A)

Item Number	Part Number	Quantity	Description
1	153964	1	Mattress ticking
2	153890	1	AMT tubing (surfaces with AMT only)
3	153840	1	Foam bucket assembly
4	1000070072	1	Tape, anchor plate, head
5	1500010046	1	Plate, head anchor
6	1500010044	2	Strip, anchor
7	1000050687	2	Pattern, attachment strap, foot
8	0010330111	8	Screw
9	1500010045	1	Plate, foot anchor
10	1000070073	1	Tape, anchor plate, foot
11	156678	1	Fire barrier
12	153889	1	AMT coverlet assembly, silver with x-ray
	154550	1	Non-AMT coverlet assembly
13	1500010050	2	Plate, anchor, CMS
14	127501	2	Plate, seat stiffener
15	151450	1	Bladder, foot assembly
16	153913S	1	Interface connector assembly
17	141082	1	Foot fill/sensor tube assembly
18	142273	1	Substrate, cushion mounting assembly
19	1500050242	1	Head connector tube assembly
20	1500050244	1	Seat fill tube assembly
21	1000050686	4	Attachment strap, seat
22	1000040237	12	Bladder, cushion, single port
23	1500050243	1	Head sensor tube assembly
24	141081	1	Head fill tube assembly
25	1500050245	1	Seat sensor tube assembly
26	1000040238	3	Bladder, cushion, dual port
27	0010080019	114	Female nylon snap rivet
28	0010080021	105	Male nylon snap rivet
29	152265S	1	Turn assist assembly
30	161221	1	Fitting
31	139068S	1	Strap assembly, seat
32	0010080022	9	Male nylon snap rivet

Air Compressor—P500 Surface and AIR Surface

Figure 5-39. Air Compressor—P500 and AIR Surfaces

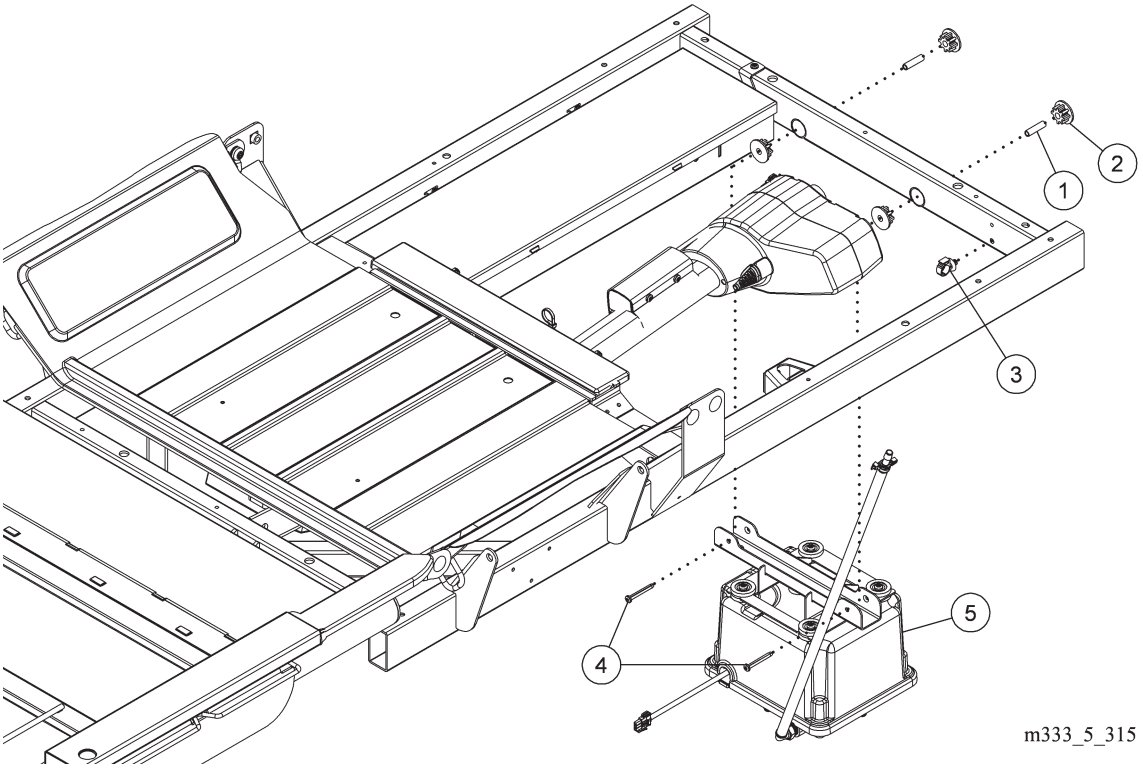


Table 5-39. Air Compressor—P500 and AIR Surfaces

Item Number	Part Number	Quantity	Description
1	72232PL	2	Bushing, spacer
2	72230	4	Bushing
3	70133	1	Cable clamp
4	69990	2	Screw
5	16201221S	1	Assembly, air pump

NOTES:

Air Module—AIR Surface (manufactured before January 2010)

Figure 5-40. Air Module—Active Integrated Response® Treatment Surface

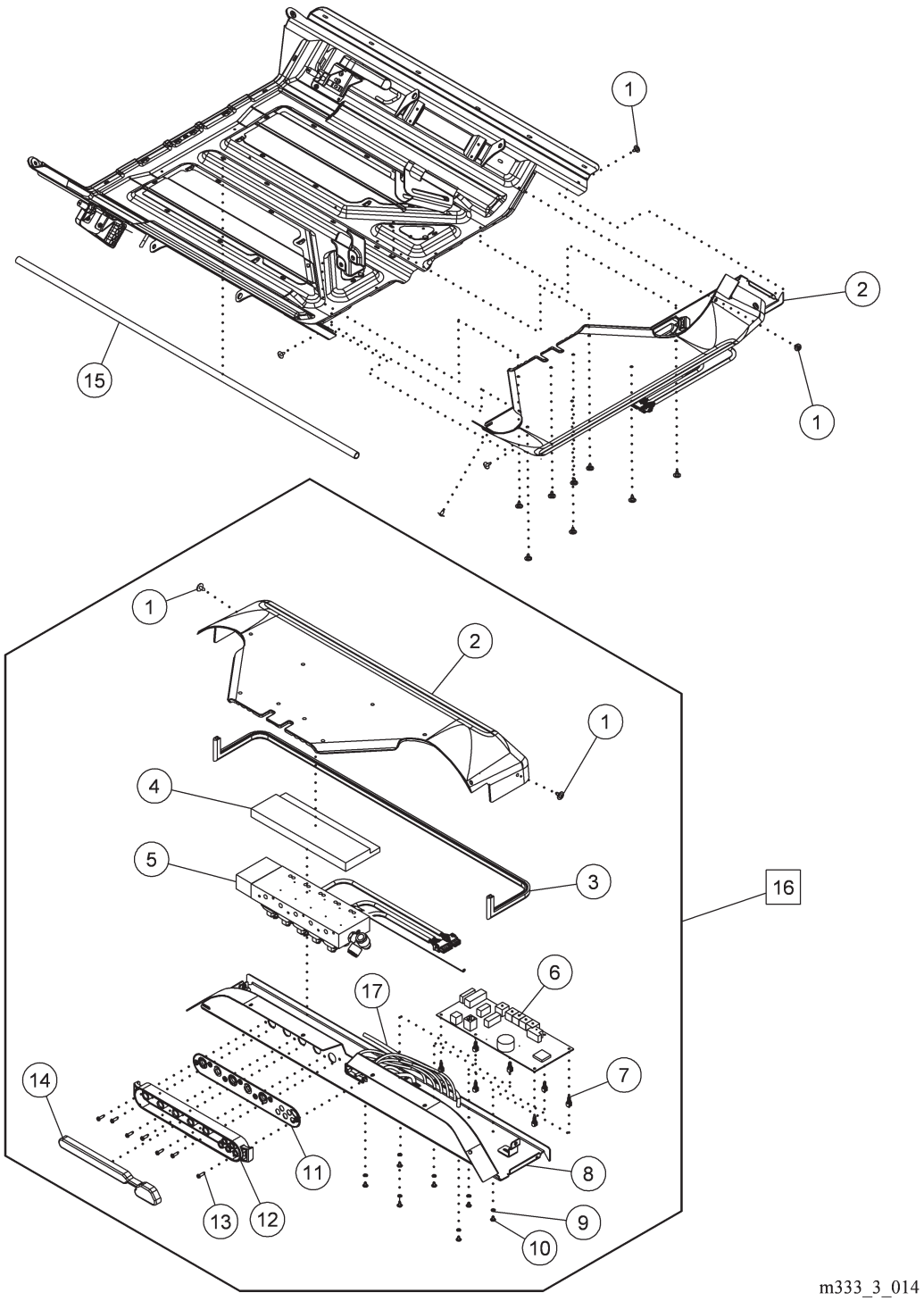


Table 5-40. Air Module—Active Integrated Response® Treatment Surface

Item Number	Part Number	Quantity	Description
1	71993	14	Screw
2	69977	1	Cover, head deck air box
3	69996	1	Gasket, head deck air box
4	154520	1	Foam diffuser
5	69937	1	Air manifold
6	141148SA	1	P.C. board air control
7	69953	7	Standoff, rivet, snap
8	7084048S	1	Weldment, head deck air box
9	71012	7	Washer, neoprene
10	70064	7	Rivet
11	69943	1	Gasket, air manifold
12	69941	1	Connector
13	69988	7	Screw
14	71011	1	Cover, shipping
15	69947	1	Hose
16	127895	1	Manifold assembly, air
Not shown	7042401	1	Switch, hall effect
Not shown	70343	2	Screw
Not shown	70752	5	Sensor hose

Air Module—P500 Surface and AIR Surface (manufactured after January 1, 2010)

Figure 5-41. Air Module—P500 and AIR Surfaces

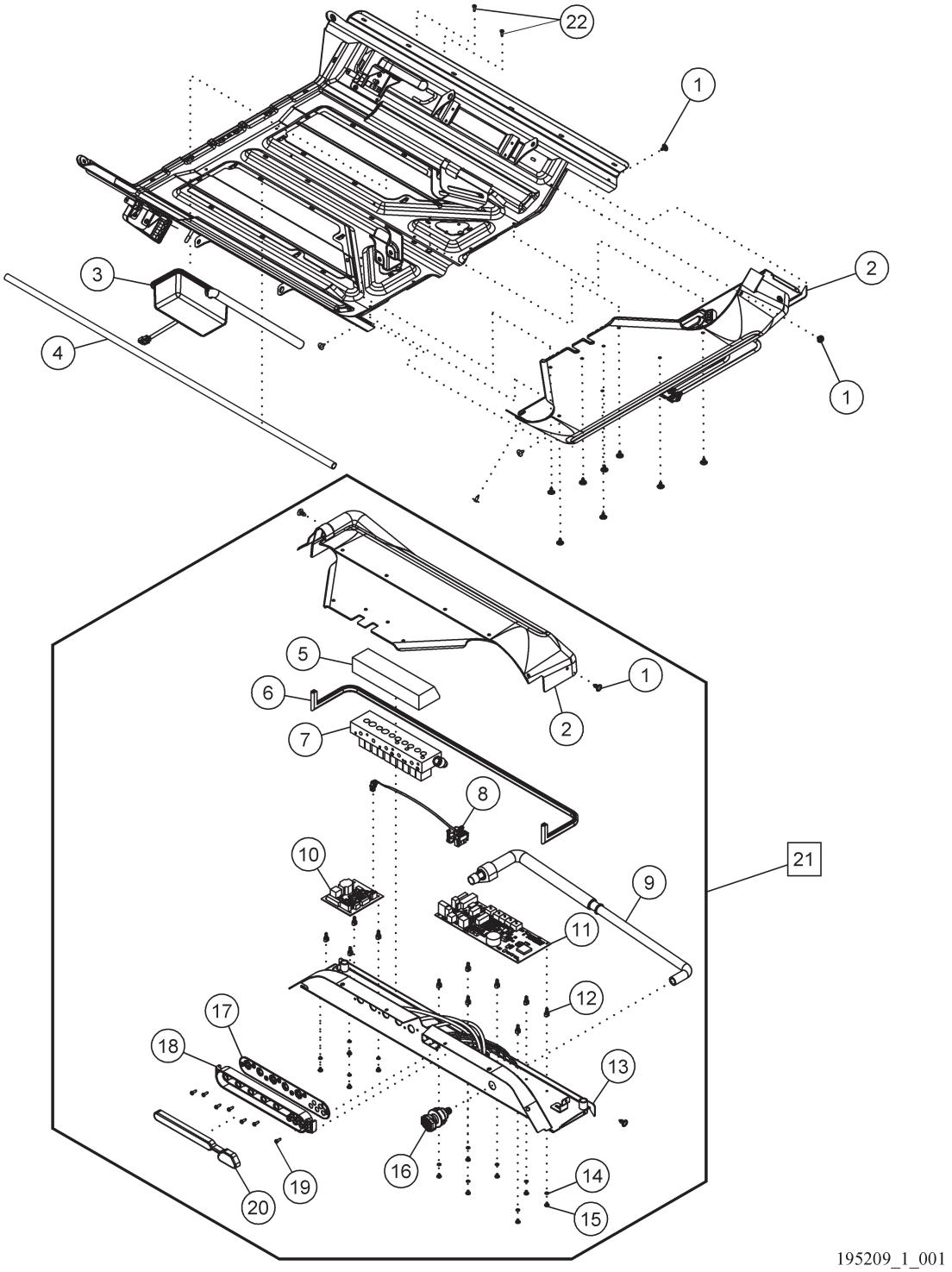


Table 5-41. Air Module—P500 and AIR Surfaces

Item Number	Part Number	Quantity	Description
1	71993	14	Screw
2	162644	1	Cover, head deck electronics
3	158360	1	Muffler assembly, AMT
4	69947	1	Hose
5	154520	1	Foam, manifold cover
6	69996	1	Gasket, head deck air box
7	69937	1	Air manifold
8	154211	1	Cable, branch, AMT
9	177989[a]	1	Tube assembly, AMT
10	154421	1	PCB, blower power, AMT
11	141148	1	PCB, air surface control, non-AMT
	155094	1	PCB, air surface control, AMT
12	69953	7	Standoff, rivet, snap
13	7084048S	1	Weldment, head deck air box, non-AMT
	154602	1	Weldment, head deck air box, AMT, without Line Manager
14	71012	7	Washer, neoprene
15	70064	7	Rivet
16	152751	1	Coupling, 1/2", female, AMT
	177990	1	Coupling, 3/4", female, AMT
17	69943	1	Gasket, air manifold
18	69941	1	Connector
19	69988	7	Screw
20	71011	1	Shipping cover
21	M0111508S	1	Air module, P500 with and without AMT
22	163030	2	Screw, AMT
Not shown	7042401	1	Switch, hall effect, AMT
Not shown	70343	2	Screw
Not shown	70752	5	Sensor hose
Not shown	154579	1	Label, non P500, AIR
Not shown	154212	1	Cable, PB-J1 to ACB-P-5, AMT

a. If item 9, part number 177989 is used, item 16, part number 177990 must be used with it.

NP100 Prevention Foam Surface (P100A7)

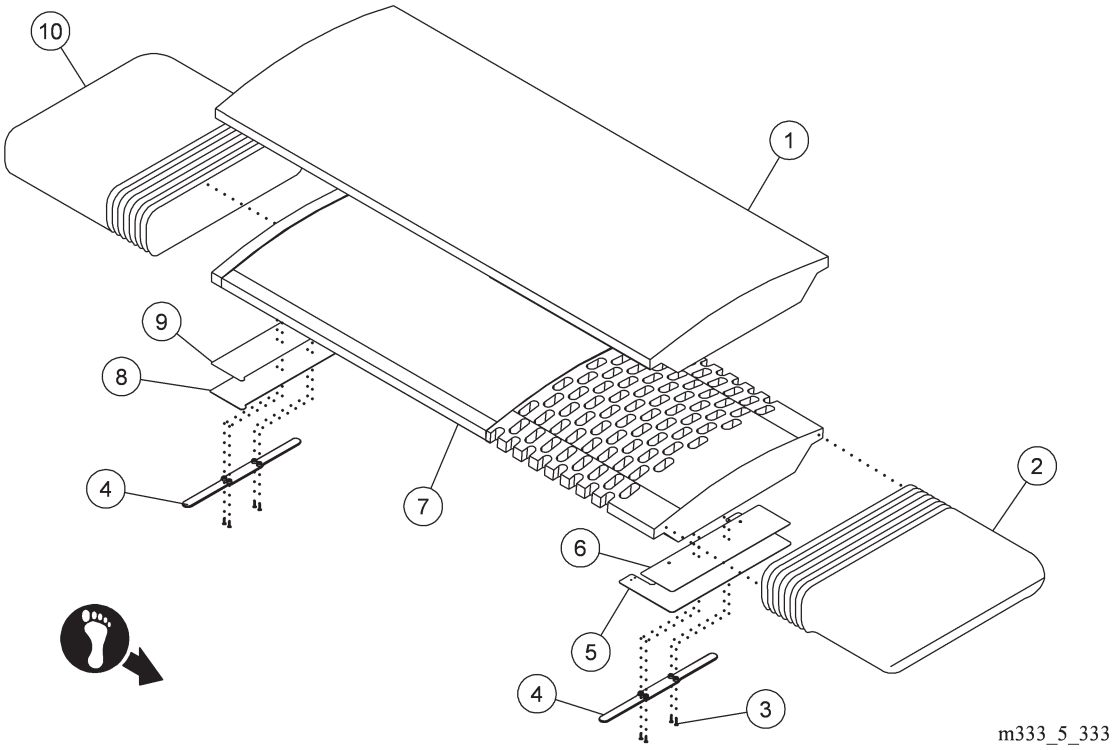


Figure 5-42. NP100 Prevention Foam Surface (P100A7)

Item Number	Part Number	Quantity	Description
1	149906	1	Ticking assembly
2	1000100006	1	Fire barrier
3	0010330111	8	Screw
4	1500010044	2	Strip, anchor
5	1500010045	1	Plate, anchor, foot
6	1000070073	1	Tape, anchor plate, foot
7	138662	1	Foam
8	1500010046	1	Plate, anchor, head
9	1000070072	1	Tape, anchor plate, head
10	148102	1	Kit, fire barrier and shear liner

SafeView® Alerts

Figure 5-43. SafeView® Alerts

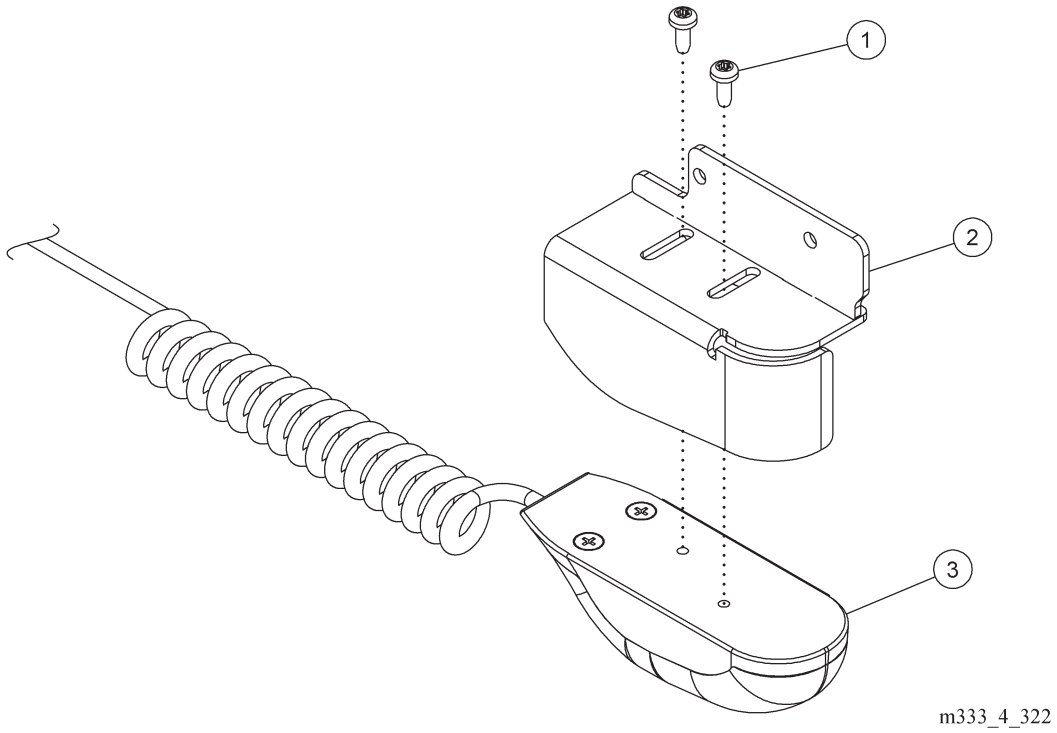


Table 5-42. SafeView® Alerts

Item Number	Part Number	Quantity	Description
1	42142	4	Screw
2	15356001S	1	Weldment, lh
	15356002S	1	Weldment, rh
3	152647	2	Light assembly

NOTES:

Chapter 6
General Procedures

Clean and Disinfect

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

WARNING:
Follow the product manufacturer's instructions. Failure to do so could cause injury or equipment damage.

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

SHOCK HAZARD:
Failure to unplug the bed from its power source before you clean or disinfect the bed could cause injury or equipment damage.

SHOCK HAZARD:
Do not expose the bed to excessive moisture. Injury or equipment damage could occur.

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

CAUTION:
Do not use harsh or abrasive cleansers, solvents, or scouring pads. Equipment damage could occur.

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

NOTE:
Always disinfect Hill-Rom surfaces thoroughly after each use according to facility protocol.

Clean

1. Unplug the bed.
2. Remove all linens.
3. Use these to clean the bed:
    - A soft cloth soaked with warm water and a facility-approved general cleaning soap/detergent solution. Make sure the cloth is not so wet as to cause the cleaning solution to pool or flood on the mattress or other bed components.
    - A soft brush to remove stains and resistant soil. Do not use harsh or abrasive cleansers, solvents, or scouring pads.
4. Clean the bed. Give special attention to these areas:
    - Headboard—thoroughly clean as this is a high-touch area
    - Footboard—remove from the bed, and thoroughly clean as this is a high-touch area
    - Siderails—thoroughly clean the high-touch areas (such as the upper and under sides of the siderail releases, pendants, and patient controls) and the latch areas and latch pins of the mount brackets
    - Bed frame
    - Casters
    - All other bed components
    - Fully-extended IV pole
    - Bed accessories that can be used again such as the mattress (See “Clean the Mattress and the AMT Coverlet” on page 6-3.)

NOTE:
If you turn the mattress to clean it, make sure the cleaning solution does not pool or flow on to the other side or edges of the mattress. This may permit fluid

to get into the mattress air outlets and zipper closures that ordinarily are protected by the ticking flaps.

5. Examine the condition of the mattress. If there are holes, tears, or other signs of damage or deterioration of the ticking, replace the mattress.

6. Disinfect the bed (see below).

Disinfect

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

Clean the Mattress and the AMT Coverlet

NOTE:
We recommend that you wipe down the P500 Surface or AIR Surface (manufactured after January 1, 2010) to clean it. In cases of heavy soil, you can machine wash the coverlet. We also recommend that you clean the surface every 60 days for patients who are on the mattress longer than 60 days.

Clean and Disinfect an NP100, Active Integrated Response®, or P500 Surface and AMT Coverlet

1. Make sure the bed is unplugged.

2. If applicable, remove the sleep surface from the bed. See “Mattress” on page 4-3.

3. Wipe down the surface with chlorine bleach (50 ppm to 150 ppm) or mild detergent and warm water followed by an approved intermediate level disinfectant, such as CSI disinfectant cleaner.

NOTE:
2.5 oz of bleach per 10 gal of water is approximately 100 ppm of available chlorine.

4. Let the bleach or disinfectant remain in contact with the surface as instructed in the manufacturer’s instructions.

5. Remove the bleach or disinfectant, and rinse with warm water.

6. Let the mattress and/or coverlet completely air dry.

7. If the sleep surface was removed, install it on the bed. See “Mattress” on page 4-3.

Machine Wash the AMT Coverlet

1. Remove the coverlet.

2. Machine-wash the coverlet with chlorine bleach (50 ppm to 150 ppm) or detergent and an effective intermediate level disinfectant, such as CSI disinfectant cleaner. (For customers in the US, the disinfectant should be registered with the Environmental Protection Agency.)

NOTE:
2.5 oz of bleach per 10 gal of water is approximately 100 ppm of available chlorine.

- Use the bleach or disinfectant as instructed in the manufacturer’s instructions.
- To determine the amount of bleach or disinfectant to use, determine the amount of water in the washer, and follow the manufacturer’s dilution instructions.
- During the wash cycle, soak the coverlet in the disinfectant or bleach.
- Let the coverlet rinse thoroughly in clean water.

CAUTION:
Do **not** use high temperatures to dry the coverlet. Air dry or select a low or non-heat dry cycle such as air fluff. High temperatures could destroy the coating that makes the coverlet waterproof yet breathable.

3. Use the **lowest** temperature setting of the dryer to dry the coverlet. Do **not** use high temperatures.

4. Put the coverlet on the mattress.

Component Handling

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.

P.C. Board

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 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 cause board (and component) deterioration.
- When you work with electronics, wear an applicable antistatic strap, and make sure it is correctly grounded.
- Service the removed P.C. board at a static-free workstation that is correctly grounded.
- For shipping and storage, put the removed P.C. board in an antistatic protective bag.

Preventive Maintenance

WARNING:
Only facility-authorized persons should service the VersaCare® Bed. Service by unauthorized persons could cause injury or equipment damage.

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

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

Follow the PM schedule with the corresponding PM checklist. This checklist is designed to keep a running maintenance history and subsequent repair costs for one VersaCare® Bed. However, your facility can modify this checklist or design another to fit your needs. Two effective ways to reduce downtime and make sure the patient remains comfortable are to keep close records and maintain the VersaCare® Bed.

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

Preventive Maintenance Schedule

Function	Procedure
Overall condition, frame and welded assemblies	Examine the overall aspect of the bed. Examine all visible surfaces for cosmetic damages, replace as necessary (plastic end caps, e.g.). Examine that the structure and welded assemblies are in good working condition and that there are no impacts or corrosion. Replace as necessary. Do any necessary repairs or paint retouches, replace if necessary. Look at the symmetry of the bed and make sure the bed frame and base are not twisted. Do any necessary repairs or paint retouches. Examine that all labels are installed and can be read; replace them if necessary.
Headboard and footboard	Examine the appearance, attachment, and safety of the headboard and footboard. Replace if necessary.
AC power cord	Examine the plug for damage. Make sure the plug is a one-piece molded plug assembly. If it is not, replace the plug cord assembly. Replace any plug cord assembly that shows any of these: • Discoloration of the plug molding around the plug blades. • Any signs of cracking. • Loose fit of the plug blade (the plug blade moves in the molding). • Verify that the strain relief p-clip is present. Replace the power cord, if damaged.
Coil cable	Examine the coil cable that runs from the power supply and along the lift arm, especially the lower section that may contact the head-end caster. Make sure there are no cuts or exposed wires. Replace the cable, if damaged.

Function	Procedure
Leakage current	Disconnect the power connector from the power outlet. Connect the power connector of the bed to the test device and connect this device to the power outlet. Make sure the bed is correctly supplied by the test device: control unit LEDs are on (unlock the functions if necessary). Take leakage current measures without operating any function. The value must be less than 100 µA. Measure the ground resistance. Make sure the electrical ground resistance reading is not more than the maximum specification of 200 milliohms. Examine the AC power cable and power supply unit if the value is outside of the specifications. Replace the AC power cable or power supply unit if necessary.
Patient pendant	Disconnect the patient pendant and examine the condition of the connector. Then connect or replace the pendant. Press each of the controls to make sure that they engage the correct function and they do not work intermittently. Each movement must be continuous. Replace the pendant if necessary. Troubleshoot in the event of a doubt.
Hilow motors	Examine the motors for the presence and tightness of the attachment hardware. Replace as necessary. Fully raise and lower the bed. If the bed does not fully raise or lower, calibrate the bed position sensor (G-J beds only). See page 6-18. Make sure there is no friction or abnormal noises and no audible overload indication can be heard during the movement. Make sure the Bed Not Down LED lights up on the siderail and goes out when the bed is in low position. Replace the defective motor(s) in the event of a malfunction. Troubleshoot in the event of a doubt.

Function	Procedure
Head section motor	Examine the motor for the presence and tightness of the attachment hardware. Replace as necessary. Fully raise and lower the head section. If the head section does not fully raise or lower, calibrate the bed position sensor (G-J beds only). See page 6-18 Make sure there is no friction or abnormal noises and no audible overload indication can be heard during the movement. Replace in the event of a malfunction.
Sleep deck	Fully raise and lower the head section. Examine for binding during the head section movement. Make sure the hard surface and its drive system under the head section are in good condition. Make sure there is no friction or abnormal noises. Replace any damaged parts. Replace if necessary.
CPR release	Examine the condition of the two CPR release handles, CPR cable, and CPR mechanism on the head motor. Make sure the screws are installed and fully tightened. Operate the head section to the high position, then engage one of the CPR releases. Make sure the head section lowers. Adjust the CPR cable as necessary. Do the same tests on the other side of the bed. Release the CPR handles and make sure the mechanism locks correctly when you operate the Head Up control for a few seconds. The head section must rise. Replace the head section motor in the event of a malfunction or the CPR cable if broken.
Emergency Trendelenburg	Engage the *Emergency Trendelenburg* function from both sides. Make sure there is no friction or abnormal noises and no audible overload indication can be heard during the movement. Replace the defective part in the event of a malfunction or abnormal noises. Troubleshoot in the event of a malfunction.

Function	Procedure
Head section gas spring	Examine the gas spring assembly. Make sure all hardware is installed and fully tightened. Replace as necessary. Make sure there is no oil on its shaft. Raise the head section to the full up position. Engage the CPR function. Make sure the head section lowers rapidly to the intermediate position and then gradually to the low position. Replace the gas springs if necessary.
Knee section motor	Examine the knee section motor. Examine for presence and tightness of the attachment hardware. Replace as necessary. Fully raise and lower the knee section. Make sure there is no friction or abnormal noises and no audible overload indication can be heard during the movement. Replace in the event of a malfunction.
Automatic Contour	Make sure the knee section rises up to mid-height when the head section is raised from the low position, and it lowers automatically when the head section lowers and the head section reaches the low position. Troubleshoot and replace the actuator or defective unit if necessary.
Foot section motor	Raise the knee section to the mid-height position. Examine the assembly of the foot actuator. Examine for presence and tightness of the attachment hardware. Replace as necessary. Fully raise and lower the foot section by using the chair function. Make sure there is no friction or abnormal noises and that no audible overload indication can be heard during the movement. Replace in the event of a malfunction or abnormal noises.
Chair position	Make sure the Chair, head section, thigh section and foot section functions are not locked out. Engage the chair function, and make sure the three sections move to the correct position. Press the *Bed Flat* control, and make sure the sleep deck returns to the flat position. Troubleshoot in the event of a malfunction.

Function	Procedure
Trendelenburg/ Reverse Trendelenburg	Engage the *Trendelenburg* function on the caregiver control panel. Make sure there is no friction or abnormal noises and no audible overload indication can be heard during the movement. Engage the *Reverse Trendelenburg* function on the caregiver controls. Make sure there is no friction or abnormal noises and no audible overload indication can be heard during the movement. Replace the defective part in the event of a malfunction or abnormal noises. Troubleshoot in the event of a malfunction.
Battery	Make sure the bed is unplugged from the power outlet. Engage the Battery control. Use the caregiver controls to operate all the functions. Charge the batteries or replace them if necessary. Make sure the battery vent holes in the power supply module are not blocked. Troubleshoot in the event of a malfunction. In all cases examine the date shown on the battery. Replace the battery if the date is over three years.
Siderails	Make sure the head and intermediate siderails are not bent or twisted. Make sure the siderails lock correctly in the high position and you hear the latch **click**. Gently pull on each siderail to make sure it latched correctly. If the siderail is difficult to latch, make sure the latch components are clean, and look for obstructions. Release each siderail from the up position, and let it fall freely. The siderail should lower slowly and smoothly. Make sure the latch mechanism of each siderail is in good condition. Make sure all functions on the caregiver control work correctly. Repair or replace the siderails as necessary.

Function	Procedure
Foot extension	Examine the foot motor. Examine for presence and tightness of the attachment hardware. Replace as necessary. Fully extend and retract the foot section. Make sure there is no friction or abnormal noises and no audible overload indication can be heard during the movement. Replace in the event of a malfunction or abnormal noises.
Pivot points	Make sure the bed articulates without making any noise. Lubricate as necessary.
Casters	Examine for cuts, wear and quality of the tread, etc. Replace if necessary.
Braking and steering	Examine the brakes to see whether the bed moves when the brakes are set. Replace as necessary. Verify that the brake alarm is functioning (G through J beds only). Examine the steering mechanism. Replace or adjust the steering control elements of the steering caster if necessary. Replace the caster if necessary. Troubleshoot in the event of a malfunction.
Accessories	Make sure any accessories installed on the bed work correctly. Replace any missing or damaged parts if necessary.
Scale System	With the bed connected to the applicable power outlet, do as follows: 1. Put the bed in this position: fully raised, flat, and the foot section fully lengthened. 2. Zero the scale. 3. Put 100 lb (45.4 kg) of calibrated weight on the bed, distributed between the seat and chest sections. 4. Take a weight reading. It should read between 99 lb and 101 lb (44.9 kg and 45.8 kg): • If the reading is correct, no further action is necessary. • If the reading is not correct, examine the weigh frame for interference. – If there is an interference, make repairs as necessary, and then do step 3 and step 4 again. – If there is no interference, Go to “Scale Calibration” on page 6-15. Make sure all scale functions operate correctly.

Function	Procedure
SideCom® Communication System	Examine and test the communication junction box. Make sure the SideCom® Communication System feature works correctly. Examine the communication cable, include the male and female pins in the plug.
Drive belt (IntelliDrive® Transport System)	Examine for damage. Replace if any of these have occurred: • Belt is off of the pulley • Divot is greater that ½" (12.7 mm) in length • Internal steel belt is broken and protrudes out of the surface of the belt • Material breakdown due to unknown foreign substance
Sleep surface	Inspect the outer cover for signs of abrasion, punctures, rips, cuts, tears, fluid ingress or other damage to the upper and lower ticking. Replace as necessary. If the ticking is removable, remove the ticking and inspect for fluid ingress or foam delamination (fire barriers or structural mesh may need to be removed first). Replace as necessary. **Treatment/therapy surface**—make sure all connectors are installed and are not damaged or loose. Replace as necessary.
Head Angle display (G through J model beds)	Raise the bed to its highest position, and fully lower the head section. The display should show approximately 0°. Fully raise the head section. The display should show approximately 62°. If the angles shown are not correct, calibrate the head angle sensor (refer to procedure 6.2).
Blower Assembly (P500 Surface with AMT only)	Find the number of hours the assembly has operated (see page 4-154). If the assembly has operated 30,000 hours or more, replace the assembly (see “Blower Assembly—Surfaces with AMT” on page 4-151).
SafeView® Alerts	Make sure the Alerts operate correctly. Repair or replace parts as necessary.

Preventive Maintenance Checklist

Table 6-1. Preventive Maintenance Checklist

Date																					**Functions**
Hill-Rom	**Manufacturer**																				Overall condition
																					Head and footboard
																					AC power cord
																					Coil cable
																					Leakage current
																					Patient pendant
																					Hilow motors
																					Head section motor
																					Sleep deck
	Model Number																				CPR release
																					Head section gas spring
																					Knee section motor
																					Automatic contour
																					Foot section motor
																					Chair position
																					Trendelenburg/Reverse
																					Trendelenburg
	Serial Number																				Battery
																					Siderails
																					Foot extension
																					Pivot points
																					Casters
																					Braking and steering
																					Accessories
																					SideCom®
																					IntelliDrive®
	Total Cost for this Page																				Sleep surface
																					Head angle display
																					Blower assembly
																					SafeView® Alerts
																					Labor Time:
																					Repair Cost:
																					Inspected by:
																					Legend L=Lube C=Clean A=Adjust R=Repair or Replace O=Okay N=Not Applicable Remarks:

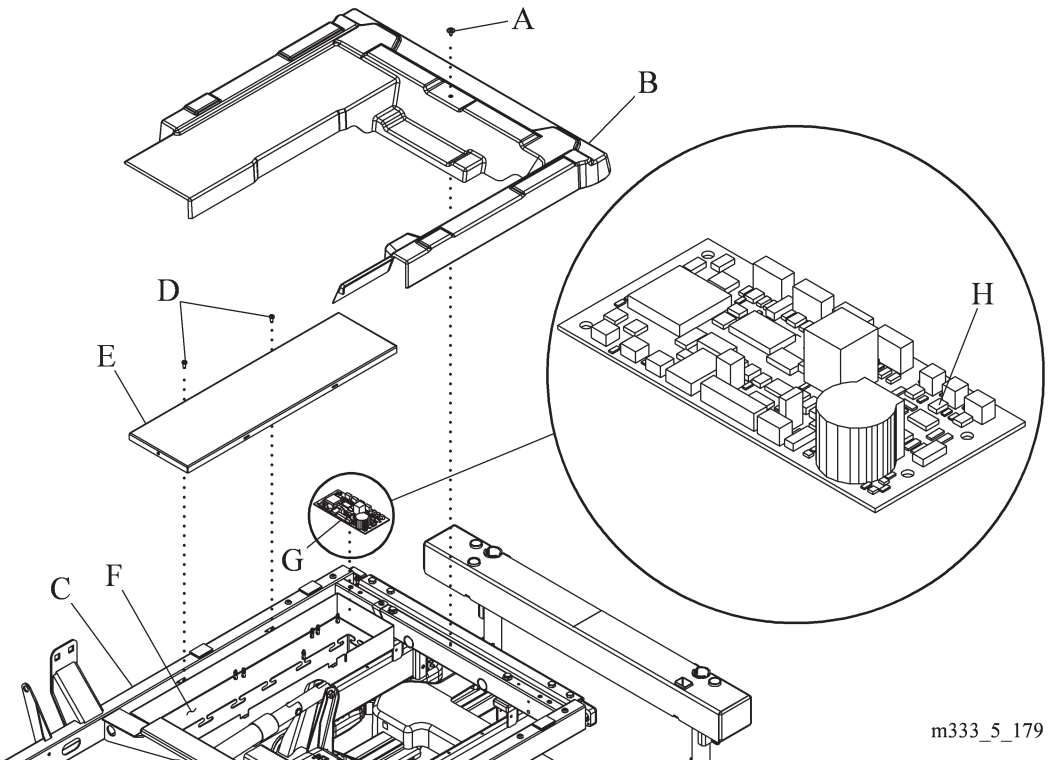
6.1 Scale Calibration

Tools required: T25 Torx® screwdriver
Weight, 100 to 250 lb (45 to 113 kg) (in 25 lb (11 kg) increments)

The scale calibration weight must be between 100 and 250 lb (45.0 kg and 113.0 kg).

1. Put the bed in the middle position or a height that is easy to add and remove the weights.
2. Make sure the bed is level.
3. Set the brakes.
4. Raise the head section to the highest position.
5. Remove the screw (A) that attaches the cover (B) to the bed (C) (see figure 6-1 on page 6-15).

Figure 6-1. Scale Calibration Switch



6. Remove the cover (B).

7. Remove the two screws (D) that attach the electronics module cover (E) to the electronics module (F).

8. Remove the electronics module cover (E).

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

9. Do as follows for your bed configuration:

   Bed with the Scale Display

   a. Press and release the calibration switch (H) on the scale P.C. board (G). The display changes to 100.0.

   b. Use the +/- switches (next to the calibration switch) to adjust the weight up and down to match the calibration weight.

   c. When the correct weight shows, press and release the calibration switch (H). The display changes to CAL0. Do not touch the bed as it zeroes.

   d. Go to step 10.

   Bed without the Scale Display (bed with a Treatment/Therapy Surface and/or the Bed Exit option)

   a. Press and release the calibration switch (H) on the scale P.C. board (G) twice. The bed will zero. Do not touch the bed as it zeroes.

   b. Go to step 10.

10. When the display changes to CAL1 and/or one tone sounds, lower the head section to the flat position.

11. Put the calibration weight on the left head of the bed. The display changes to CAL2 and/or two tones sound.

NOTE:
If the bed does not have the scale display, listen for audible tones to guide you through the procedure.

NOTE:
When you put the calibration weight on the bed, make sure to put it over the load cell.

NOTE:
It takes approximately 30 seconds for the display to change and/or tones to sound. (The time may be different because of environmental conditions.)

12. Remove the calibration weight. The display changes to CAL3 and/or three tones sound.

13. Put the calibration weight on the left foot of the bed. The display changes to CAL4 and/or four tones sound.

14. Remove the calibration weight. The display changes to CAL5 and/or five tones sound.

15. Put the calibration weight on the right foot of the bed. The display changes to CAL6 and/or six tones sound.

16. Remove the calibration weight. The display changes to CAL7 and/or seven tones sound.

17. Put the calibration weight on the right head of the bed. The display changes to OFF and/or 1 tone sounds. The calibration is complete.

18. Remove the calibration weight.

19. Unplug the power cord, and then plug in the power cord to reset the bed.

20. Do as follows for your bed configuration to make sure the scale system operates correctly:

    Bed with a Treatment/Therapy Surface—make sure all Surface modes operate correctly.

    Bed with the Scale Display

    a. Press the *Enable* control.

    b. Press and hold the *Zero* control until 00.0 is shown (HOLD will be displayed until 00.0 is displayed), and then release the control.

    c. Put the calibration weight on the bed, and make sure the weight shown on the display matches the calibration weight.

    Bed with Bed Exit (no scale display)

    a. Press and hold the *Zero* (0.0) control for 1 second. Release the control and the control pod. When one tone sounds, the scale is zeroed.

    b. Use the calibration weight to make sure all Bed Exit modes operate correctly.

21. Remove the calibration weight from the bed.

22. Install the covers (B) and (E).

6.2 Bed Position Sensor and Head Angle Sensor Calibration (G through J model beds)

1. Press and hold for 5 seconds the Lockout, Trendelenburg, and Reverse Trendelenburg controls. You will hear a beep. This puts the bed in calibration mode.

2. Fully lower the head section.

3. Press and hold the Trendelenburg and the Head Down controls until you hear a beep.

4. Fully raise the head section.

5. Press and hold the Trendelenburg and the Head Up controls until you hear a beep.

6. Fully lower the bed.

7. Press and hold the Trendelenburg and the Bed Down controls until you hear a beep.

8. Fully raise the bed.

9. Press and hold the Trendelenburg and the Bed Up controls until you hear a beep.

10. Press and hold the Trendelenburg and Foot Retract/Shorter controls until you hear a beep. This keeps the setting.

NOTE:
All four positions must be set or the settings will not be kept.

Chapter 7
Accessories

Accessories

Table 7-1. Accessories List

Product Number	Description
P158	Infusion Support System
P276	Oxygen Tank Holder
P2217	Standard IV Pole
P844G48	Patient Helper Adapter Bracket
P3211B	Fracture Frame Adapter Bracket
P2222A	Permanent IV Pole

7.1 Infusion Support System—P158

Tools required: None

WARNING:
Do not exceed IV rod weight capacity. Personal injury or equipment damage could occur.

Hang up to 40 lb (18.1 kg) on an IV rod.

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

Hang pumps only on the upper section of an IV rod.

WARNING:
When lowering the upper section of an IV rod, always grasp and hold the upper section of the pole before pulling the release knob. Failure to do so could result in personal injury or equipment damage.

Installation

1. Install the P163 adapter bracket into the desired location.
2. Install the ISS pole into the adapter bracket.

Removal

Reverse the installation procedure to remove the ISS pole.

7.2 Oxygen Tank Holder—P276

Tools required: None

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

Installation

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

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

Removal

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

7.3 Standard IV Pole—P2217

Tools required: None

WARNING:
Do not exceed IV rod weight capacity, personal injury or equipment damage could result.

WARNING:
When lowering the upper section of an IV rod, always grasp and hold the upper section of the pole before pulling the release knob. Failure to do so could result in personal injury or equipment damage.

Installation

1. Install the IV pole in an equipment socket at any corner of the bed.
2. Rotate the IV pole a quarter turn to lock it into place.

Removal

Reverse the installation procedure to remove the IV Rod.

7.4 Patient Helper Adapter Bracket—P844G

Tools required: None

Installation

Refer to the manufacturer's instructions for installation.

Removal

Refer to the manufacturer's instructions for removal.

7.5 Fracture Frame Adapter Bracket—P3211B

Tools required: None

Installation

Refer to the manufacturer's instructions for installation.

Removal

Refer to the manufacturer's instructions for removal.

7.6 Permanent IV Pole—P2222A

Tools required: T25 Torx® screwdriver
13mm open end wrench

Installation

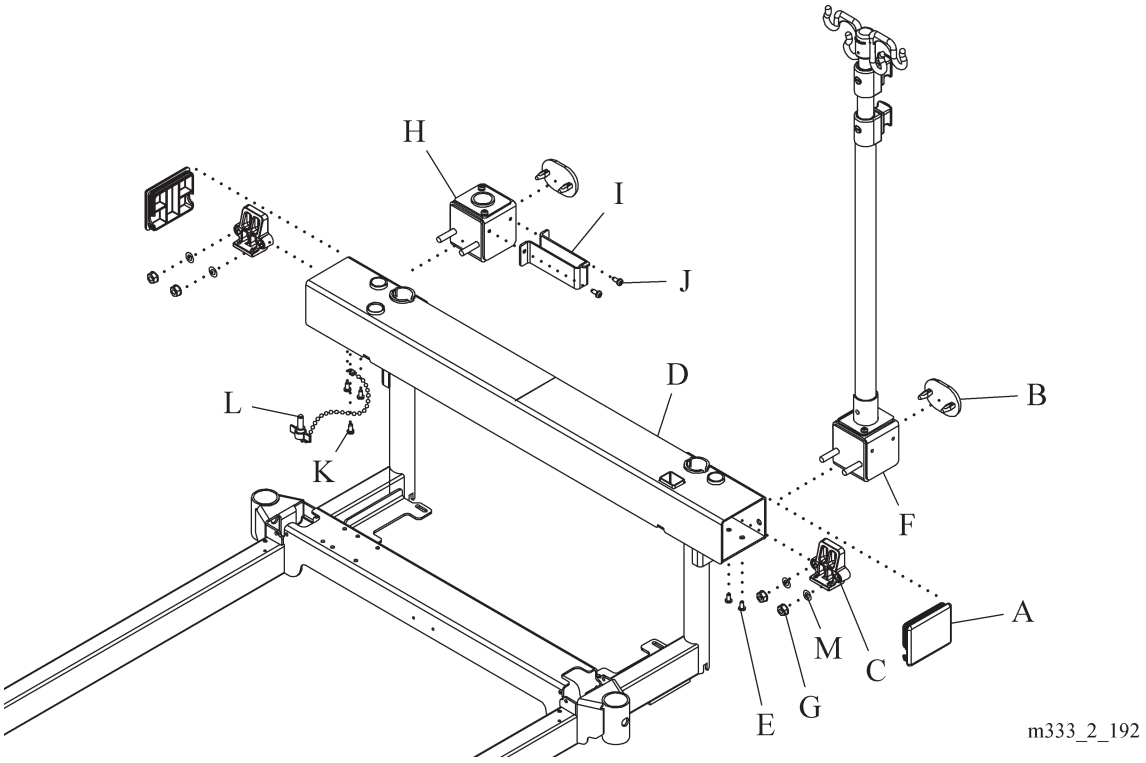
1. Set the brakes.

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

2. Disconnect the bed from its power source.

3. Remove the end caps (A) (see figure 7-1 on page 7-7).

Figure 7-1. Permanent IV Pole



4. Remove the bumpers (B).

5. Do the following for each side of the bed:
   a. Insert the bracket (C) into the tube frame (D).

b. Align the holes in the bracket (C) with the holes in the tube frame (D).

c. Install, but do not tighten, the screws (E) through the tube frame (D) into the bracket (C).

d. Install the weldment (F) through the tube frame (D) into the bracket (C).

e. Install the two washers (M) onto the weldment (F).

f. Install the two nuts (G) onto the weldment (F).

g. Tighten the screws (E) and nuts (G).

h. Install the end cap (A) into the tube frame (D).

i. Install the bumper (B) into the weldment (F).

6. For the right side weldment (H), do the following:

   a. Align the holes in the bracket (I) with the holes in the weldment (H).

   b. Install the two screws (J) to attach the bracket (I) to the weldment (H).

   c. Install the screw (K) to attach the chain and knob (L) to the tube frame (D).

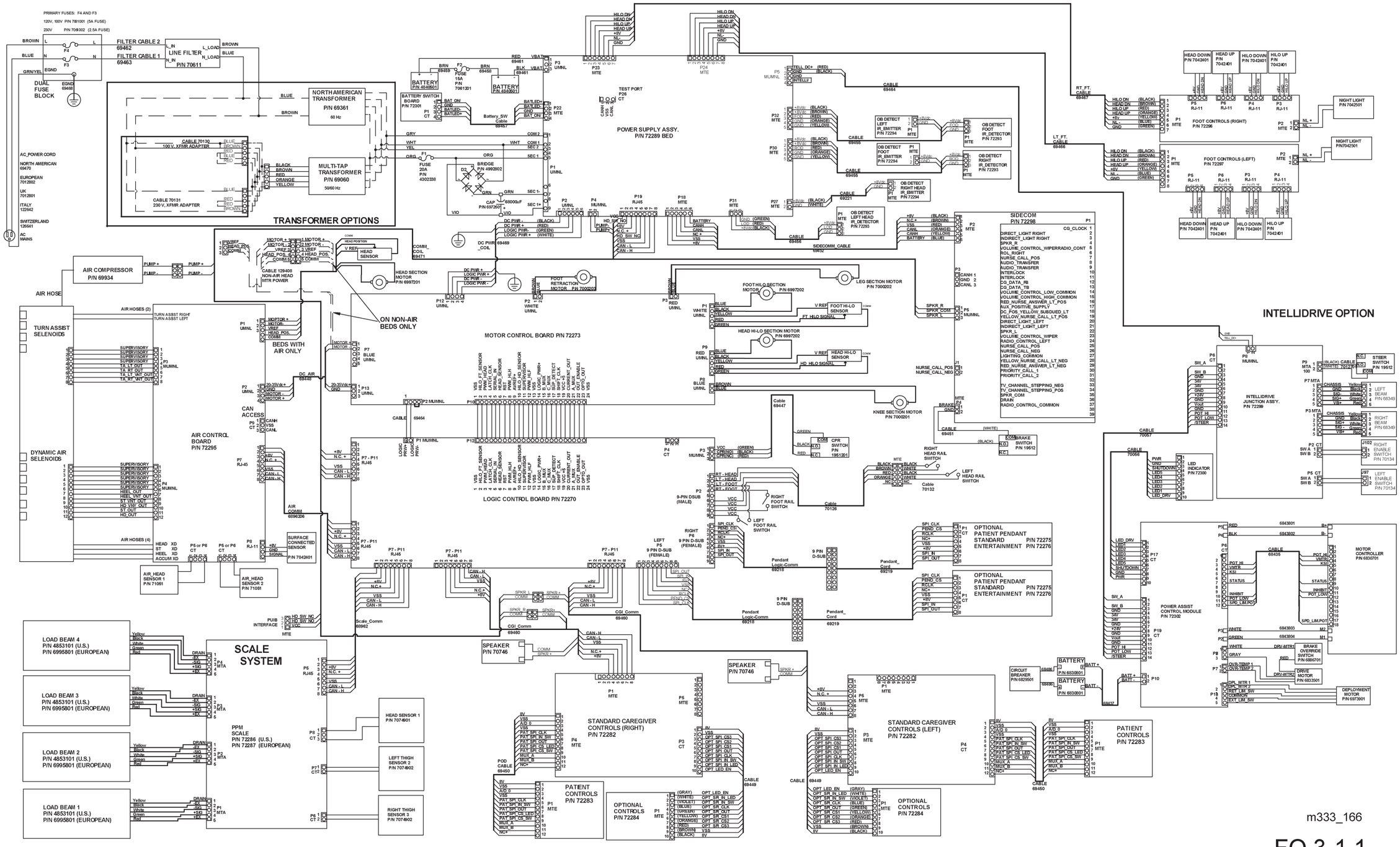
   d. Install the chain and knob (L) into the weldment (H).

Removal

1. Perform the removal procedure in reverse order.

2. Do the “Function Checks” on page 2-7.

Electronics Schematic (P3200) (Sheet 1 of 3)



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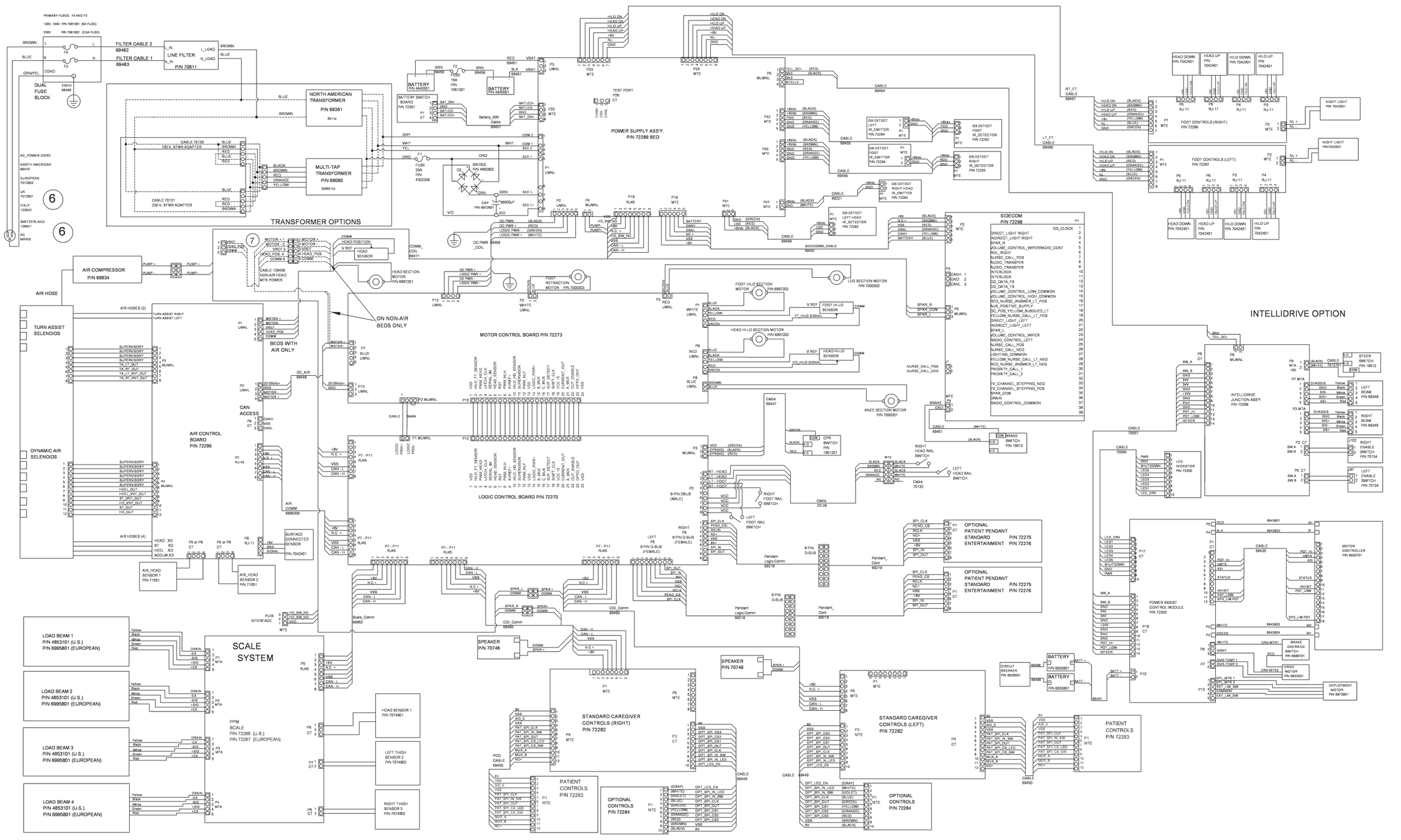
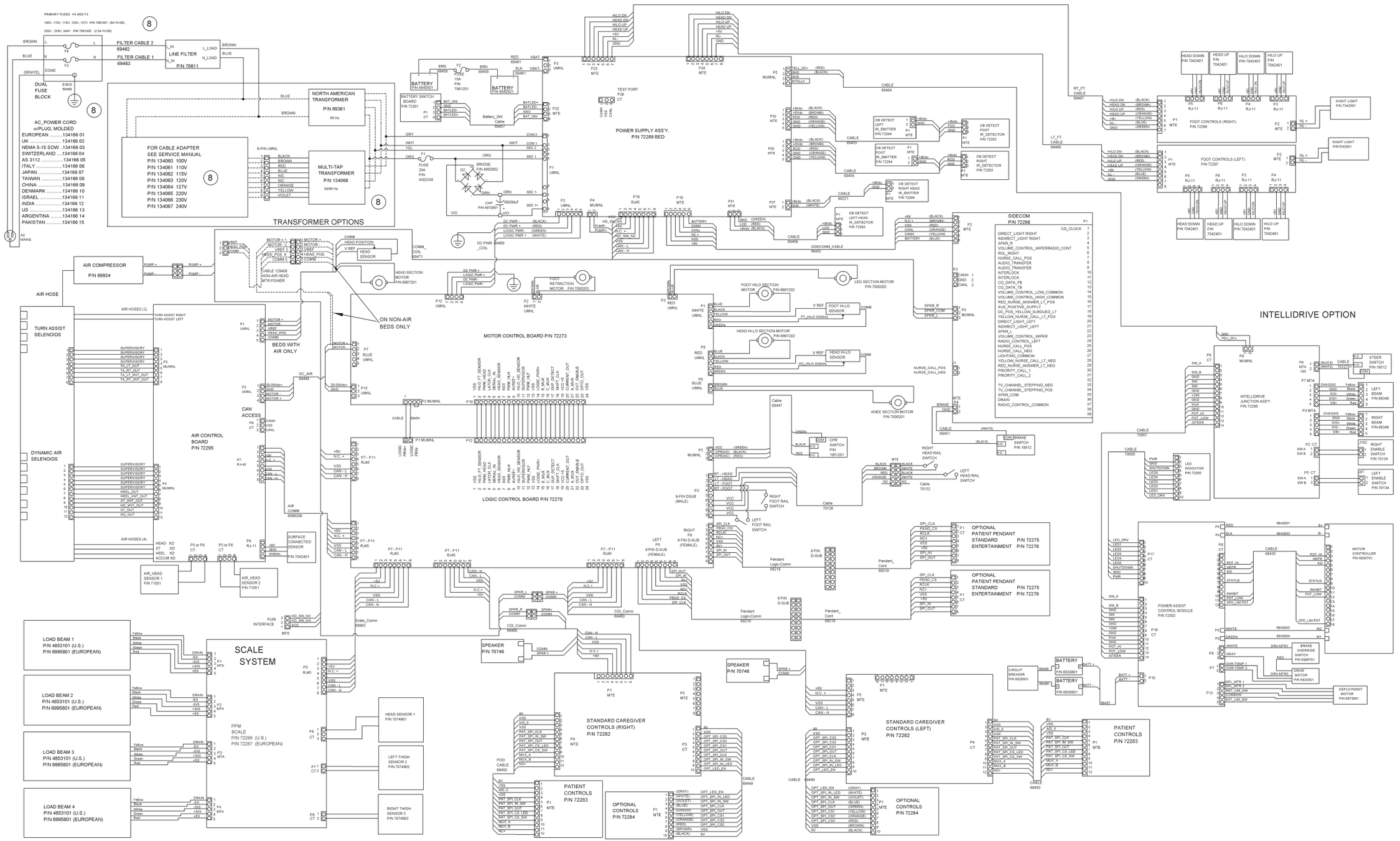
FO 3-1.1

Electronics Schematic (P3200) (Sheet 2 of 3)



Electronics Schematic (P3200) (Sheet 3 of 3)



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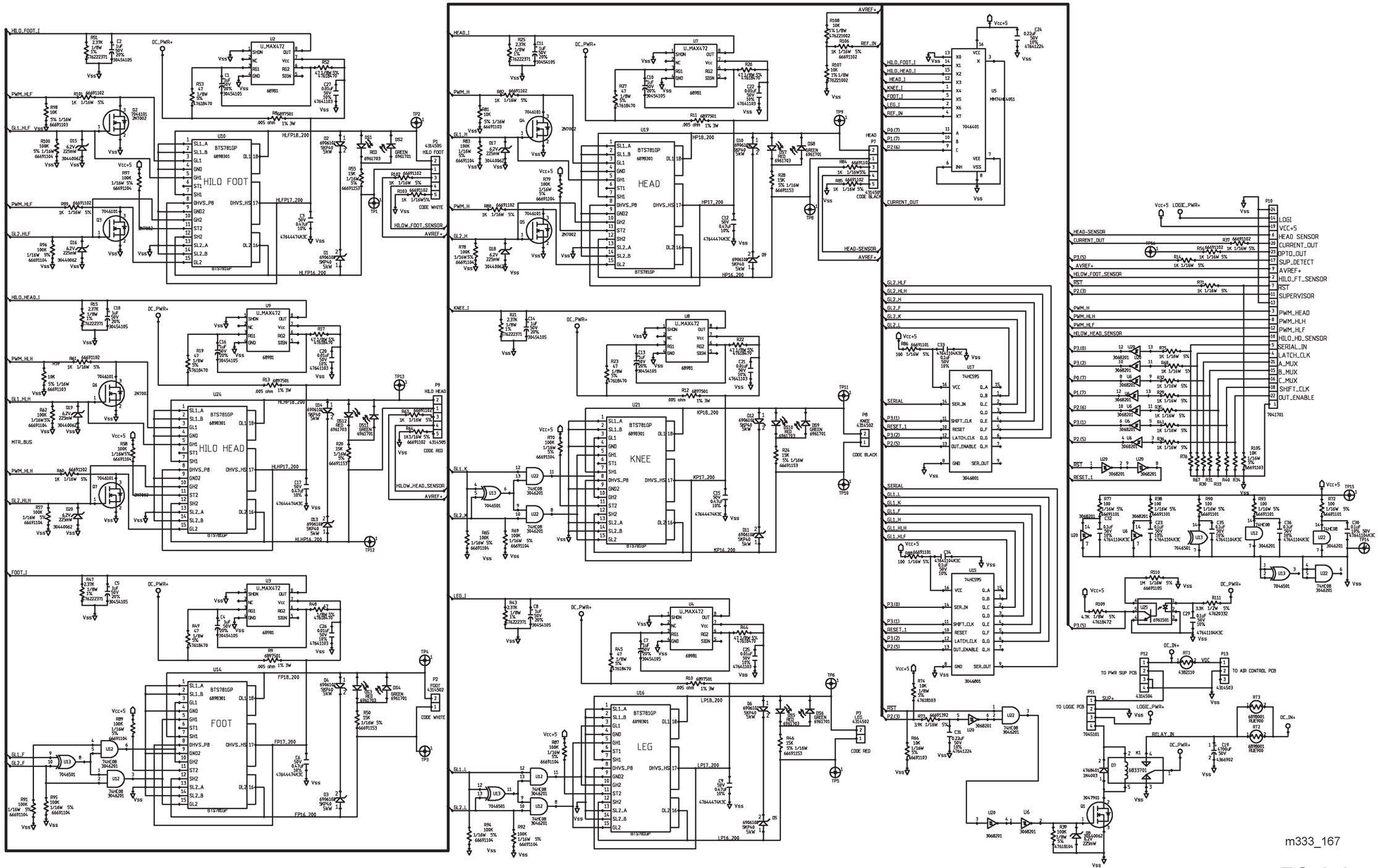
FO 3-1.3

Motor Control P.C. Board Schematic (PN 68717)



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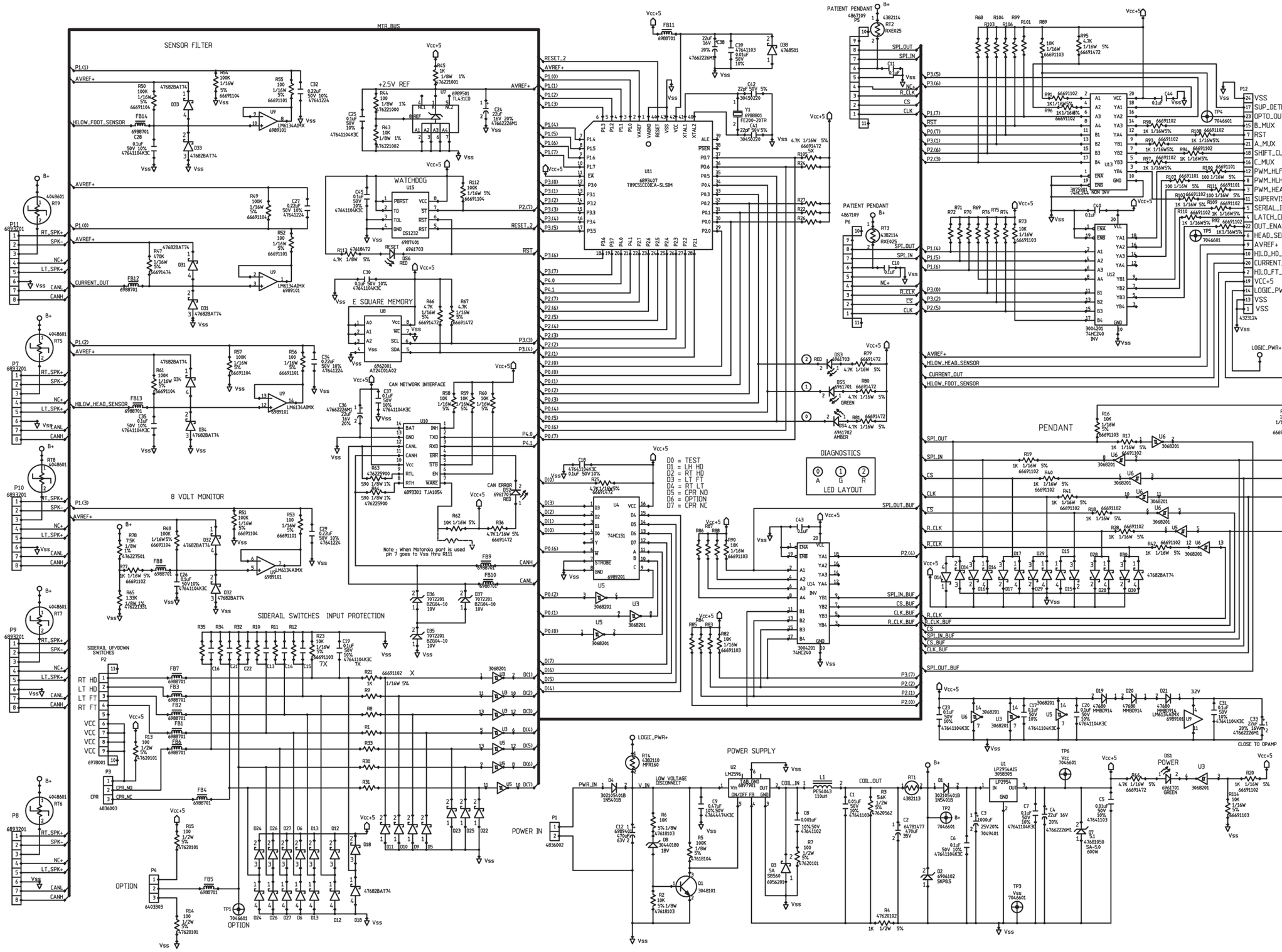
FO 3-2

Logic Control P.C. Board Schematic (PN 69378)



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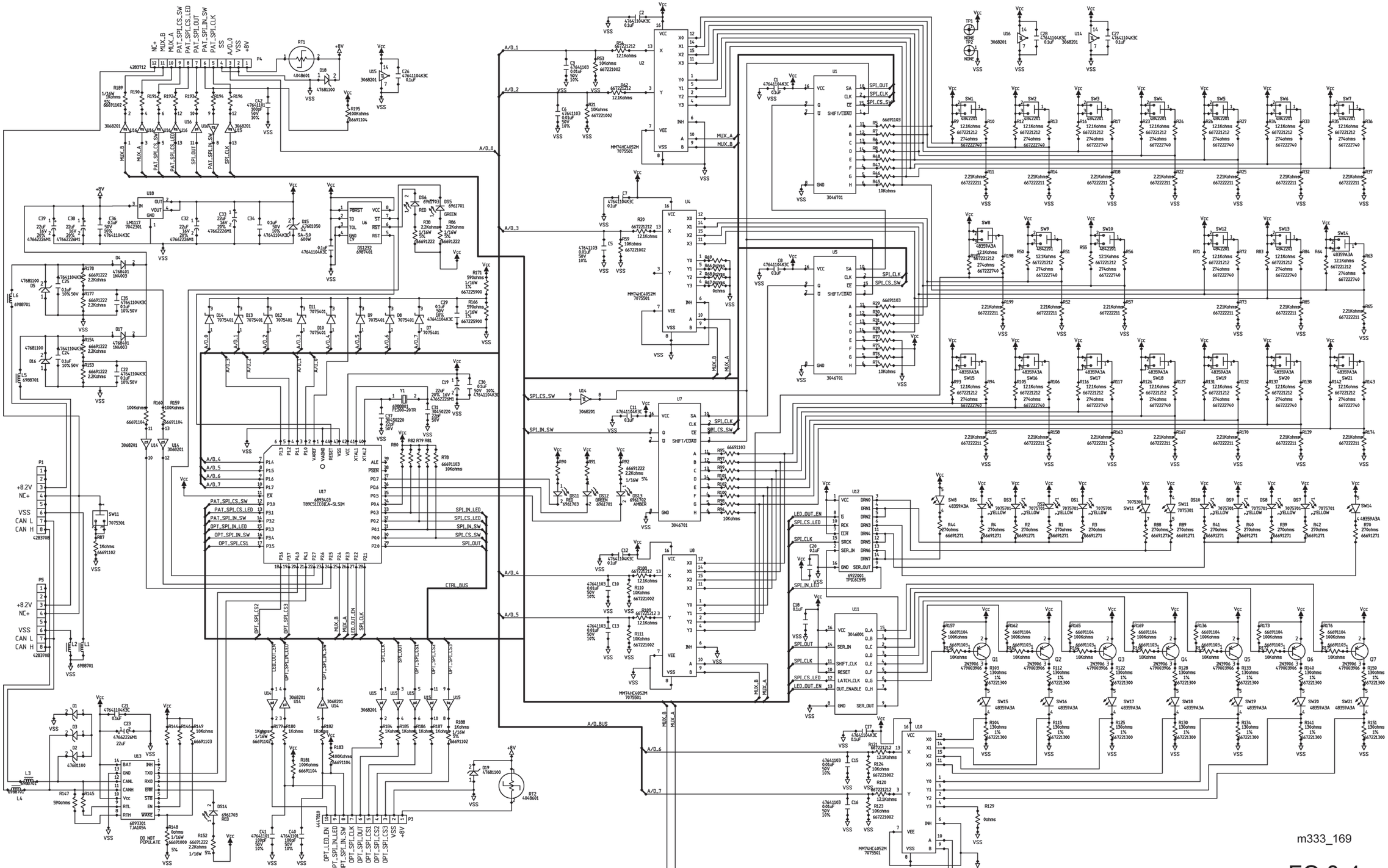
FO 3-3

Siderail Controls Schematic



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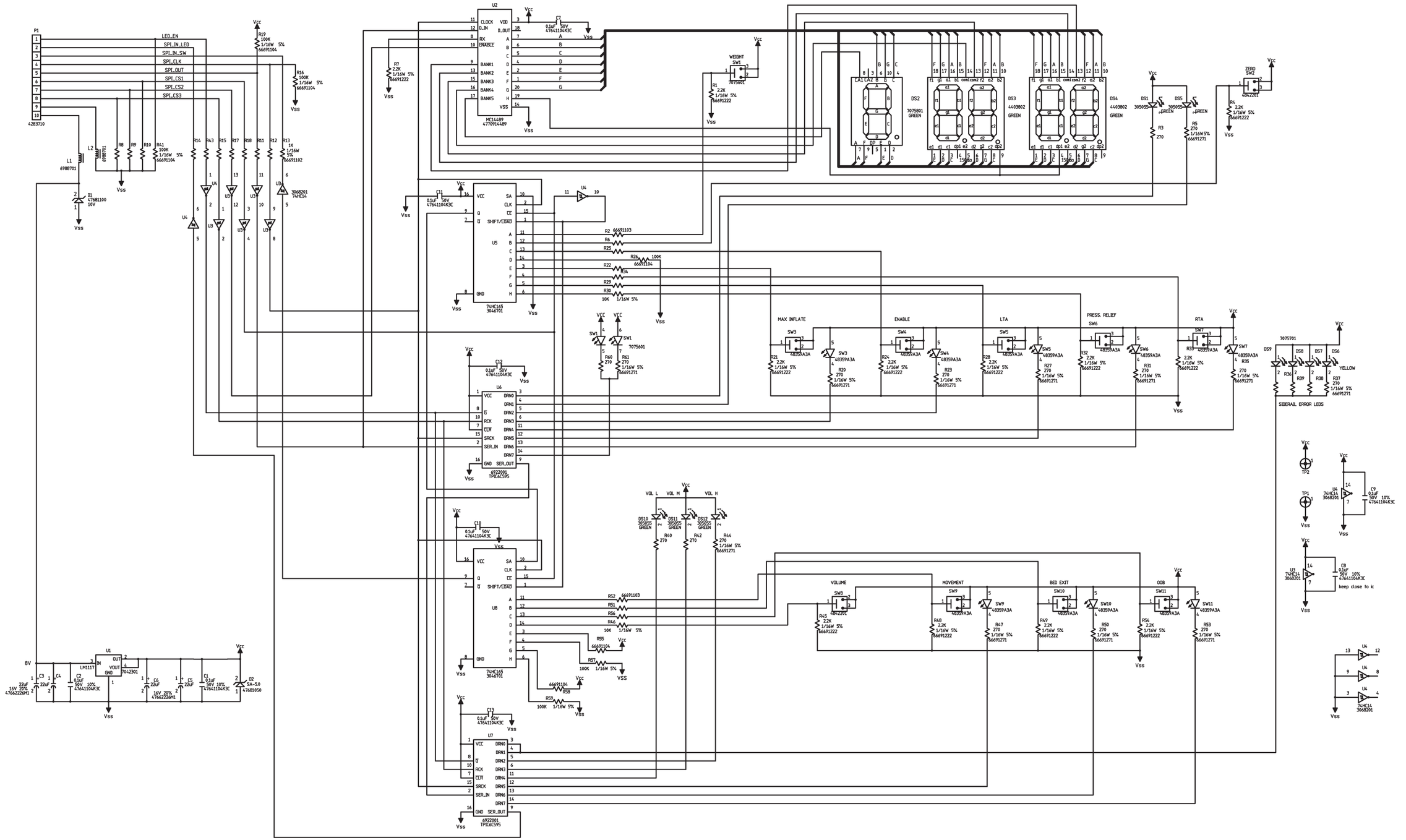
FO 3-4

Optional Controls Schematic



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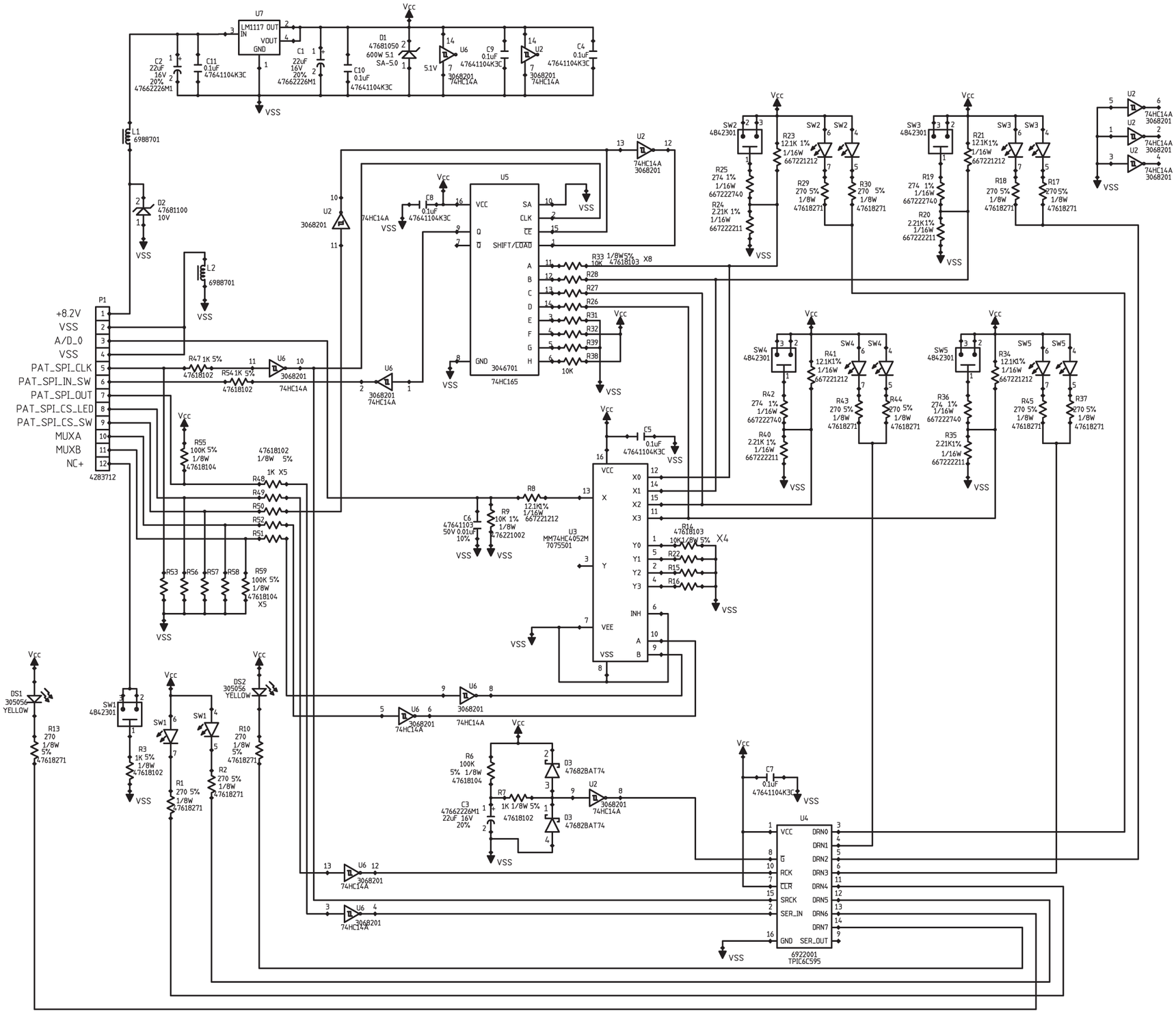
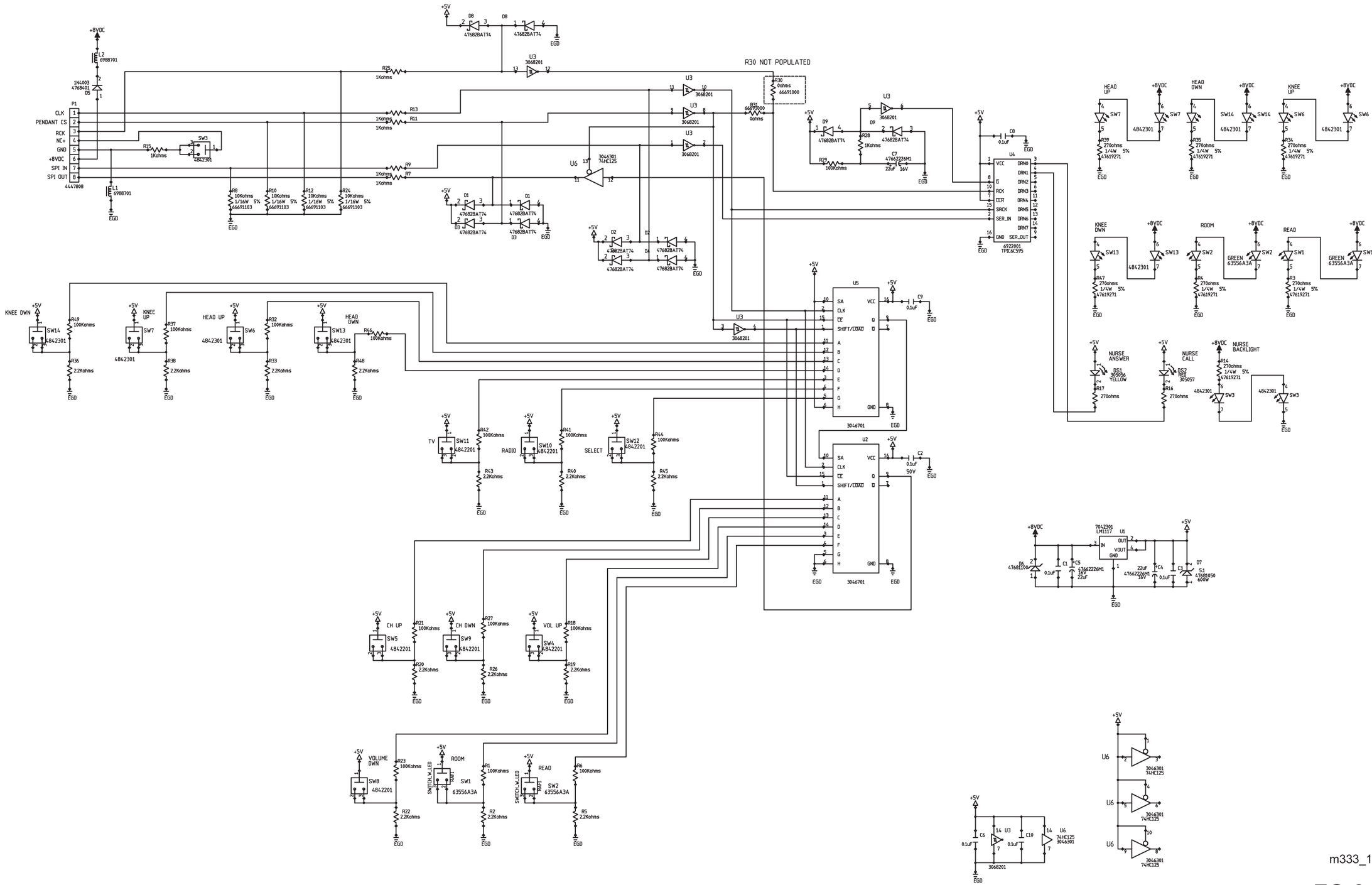
FO 3-5

Patient Controls Schematic



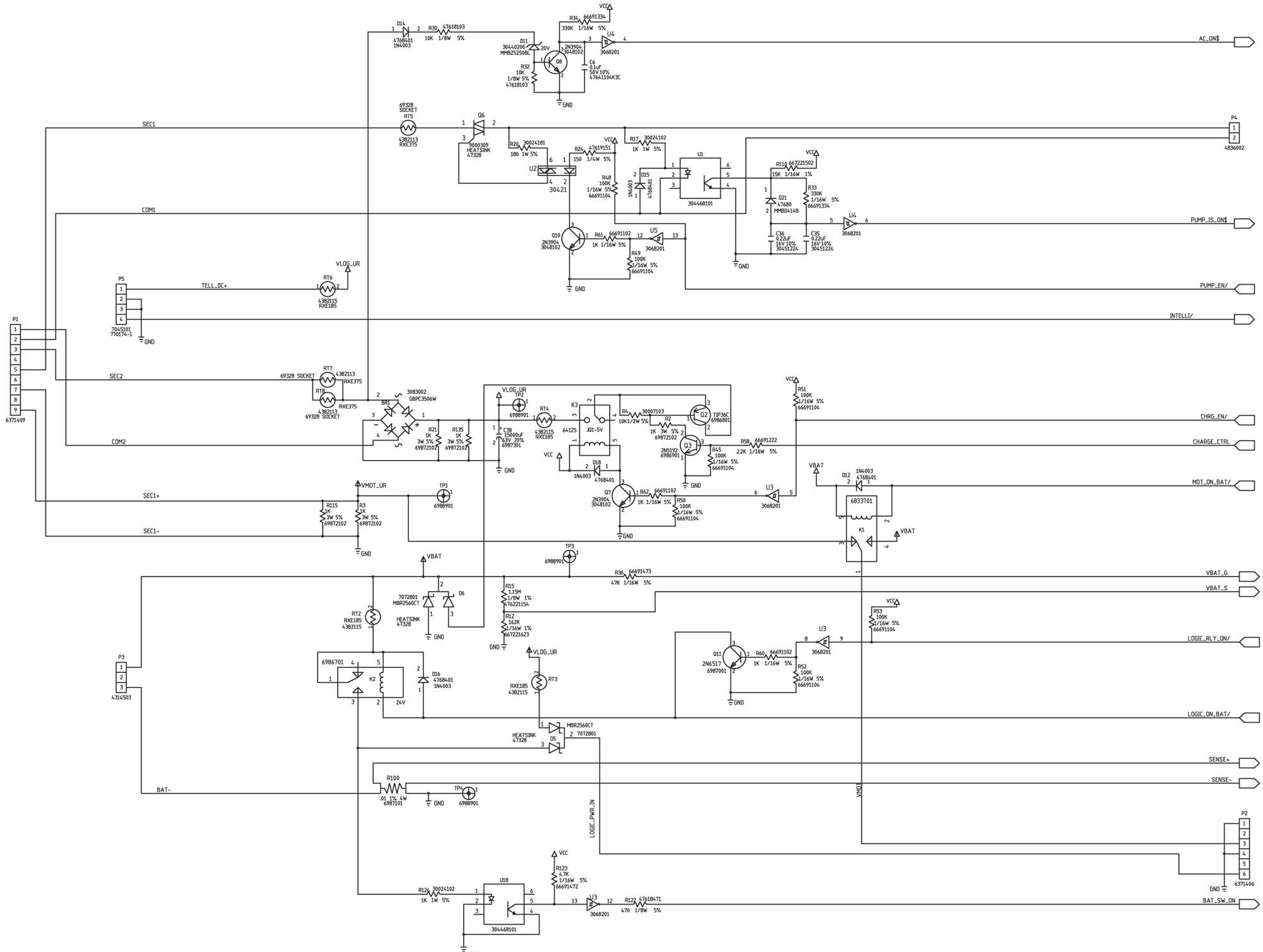
Patient Pendant Schematic



m333_172

FO 3-7

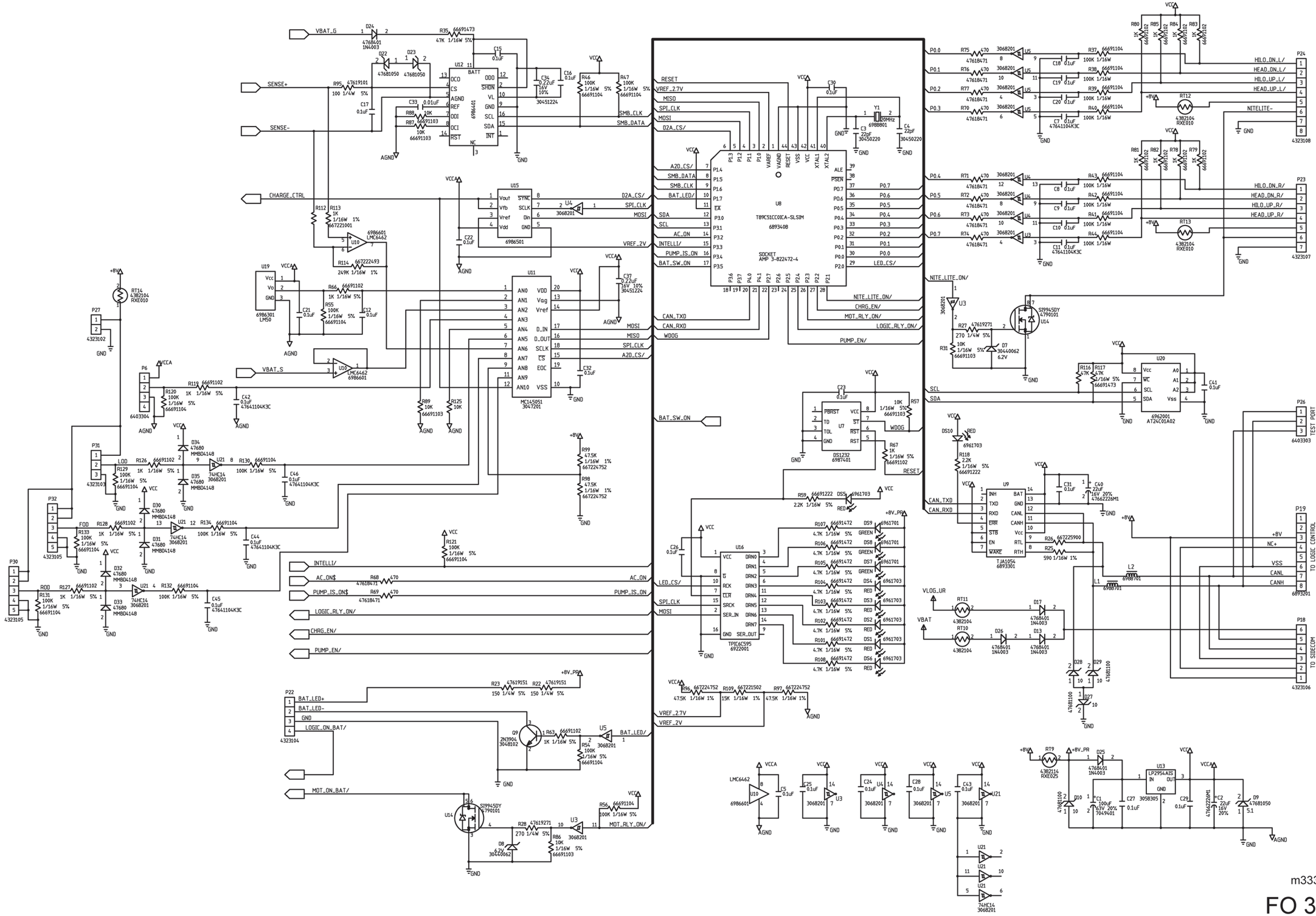
Power Supply (PN 72289) (Sheet 1 of 2)



m333_261

FO 3-8.1

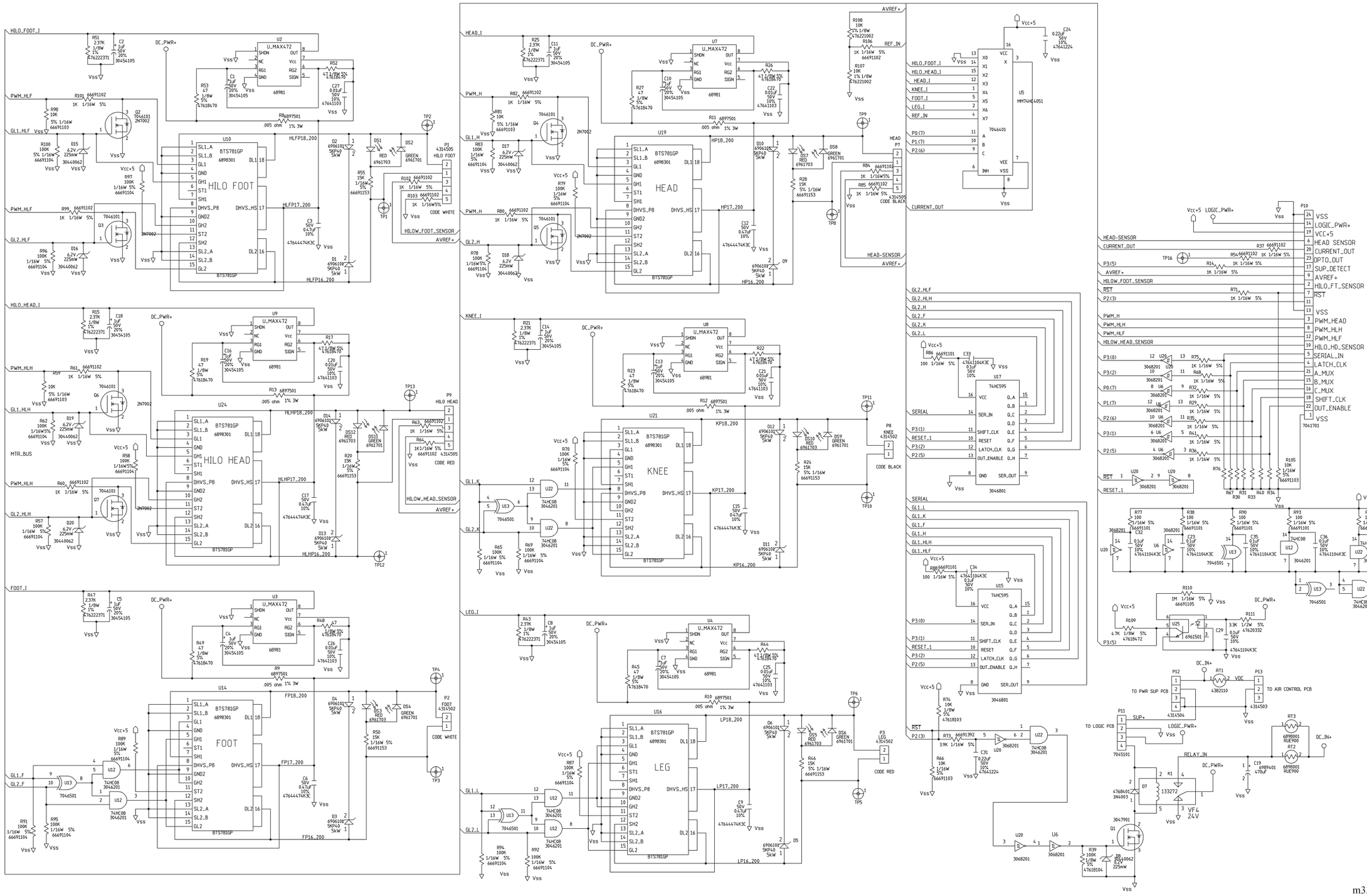
Power Supply (PN 72289) (Sheet 2 of 2)



m333_262

FO 3-8.2

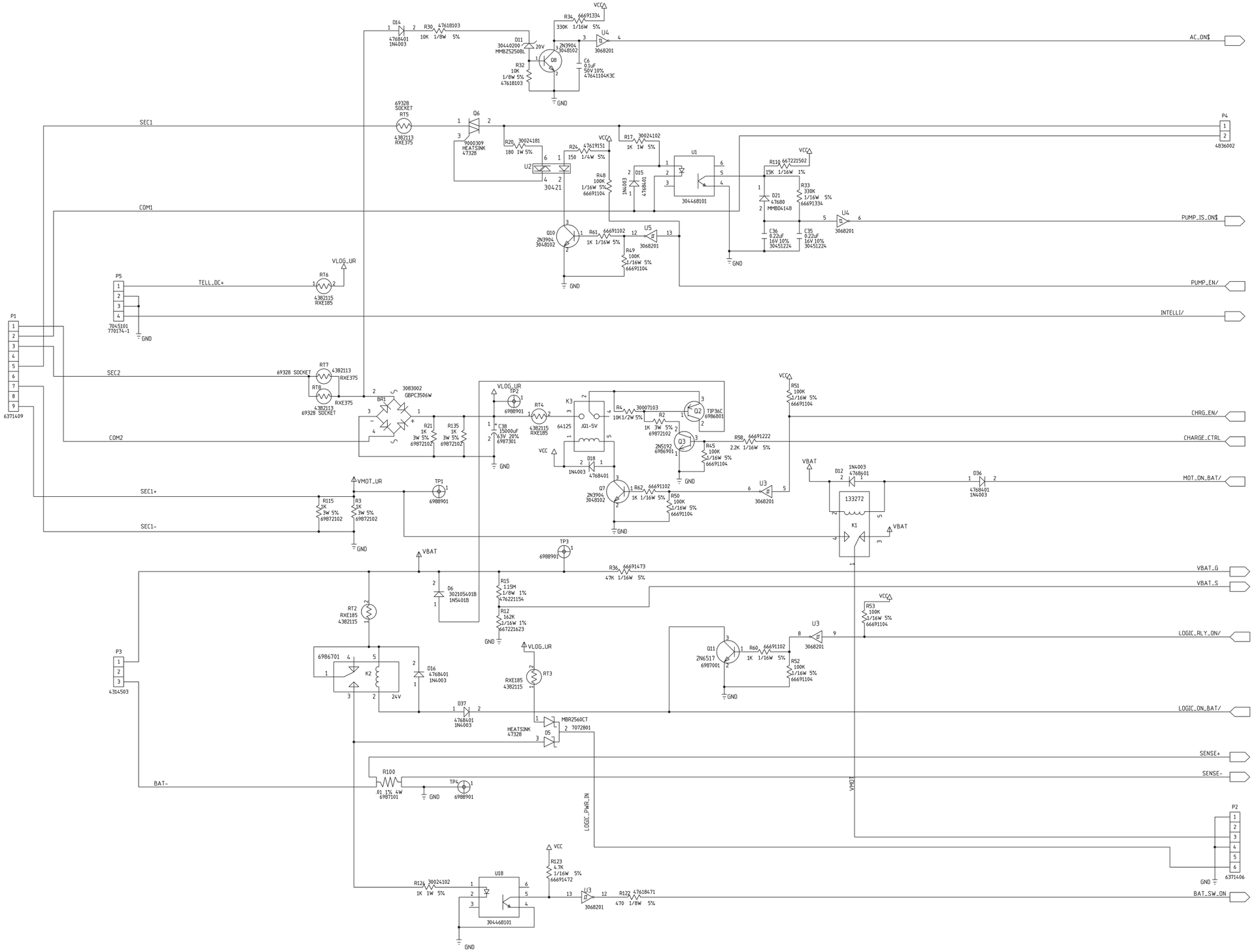
Motor Control P.C. Board (PN 72273)



m333_2_276

FO 3-9

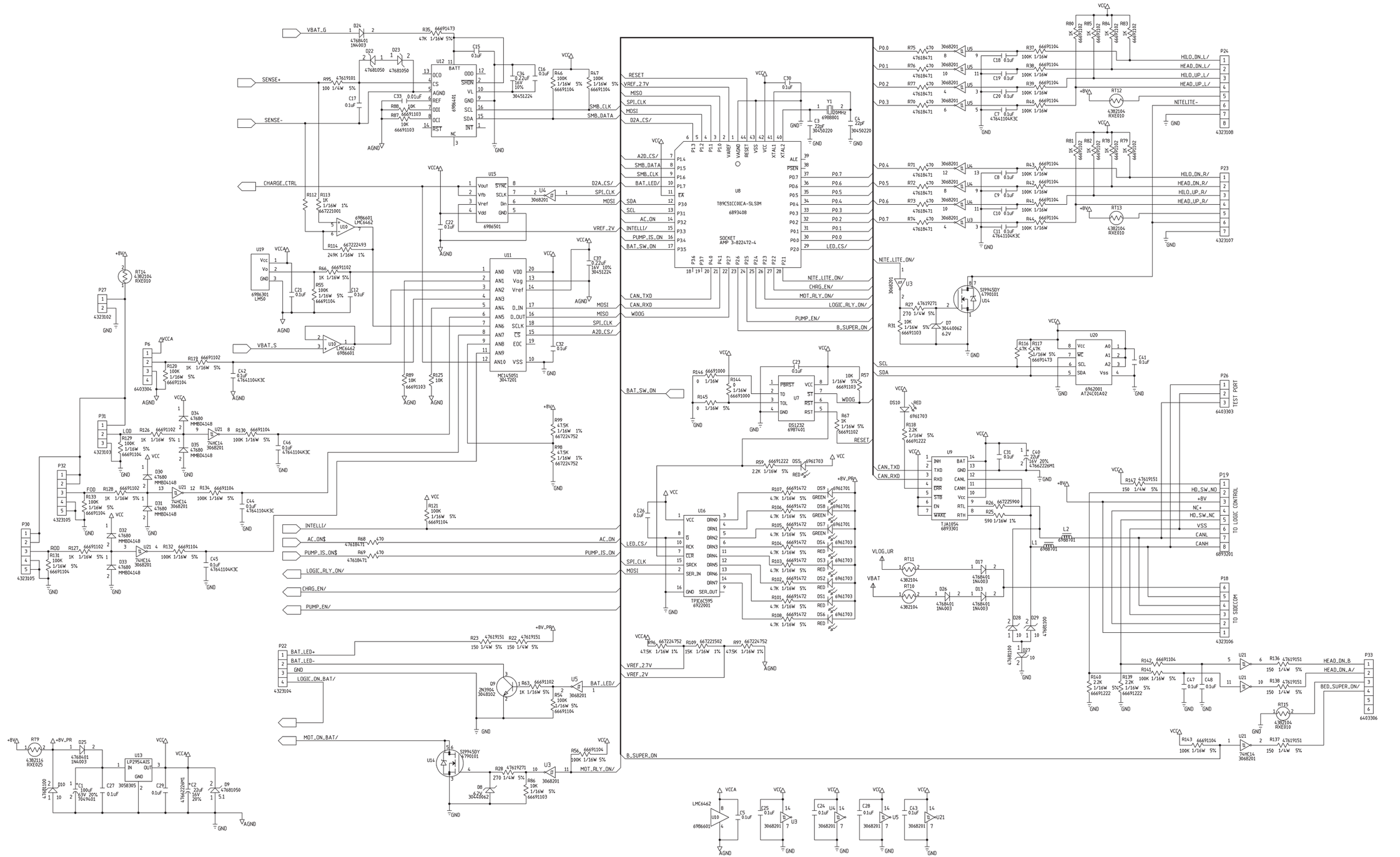
Power Supply P.C. Board (PN 70786) (Sheet 1 of 2)



m333_2_277

FO 3-10.1

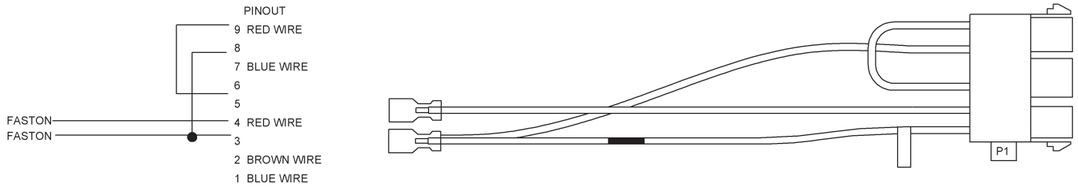
Power Supply P.C. Board (PN 70786) (Sheet 2 of 2)



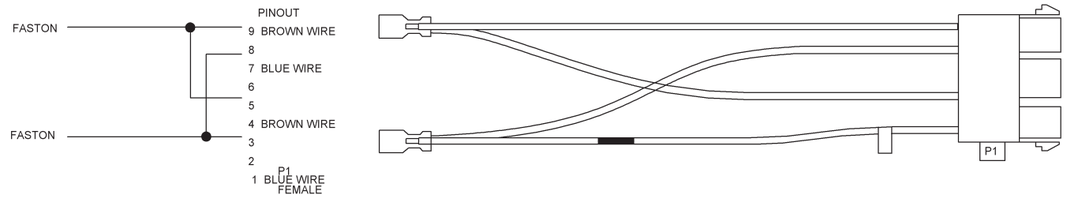
m333_2_278

FO 3-10.2

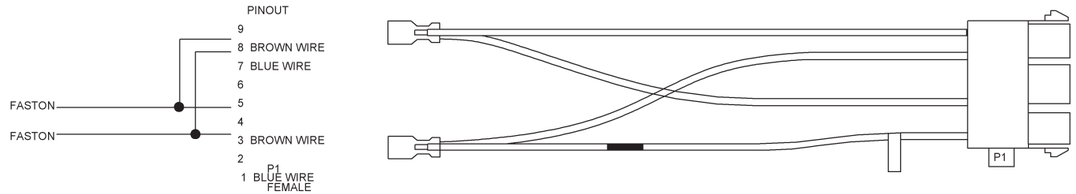
Transformer Adapter Cables



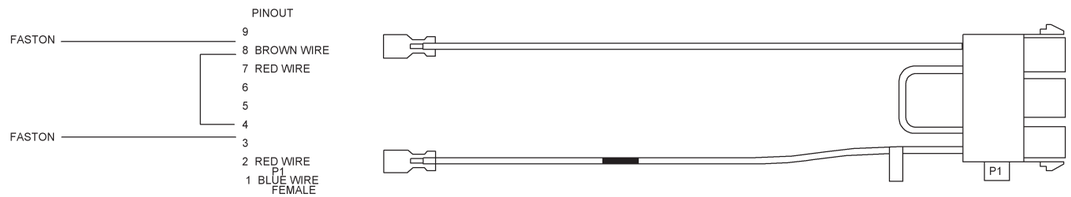
134060, 100 V



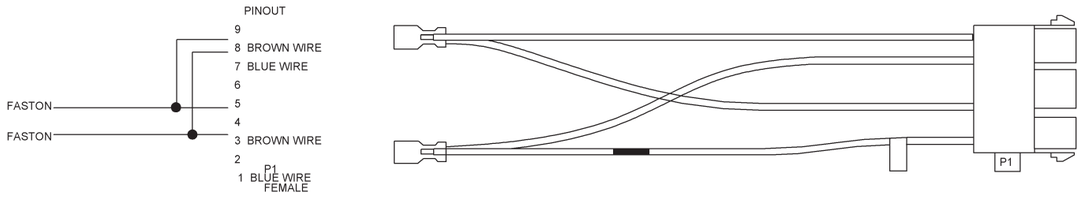
134064, 127 V



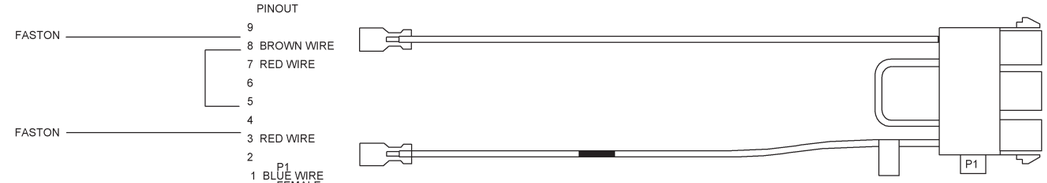
134061, 110 V



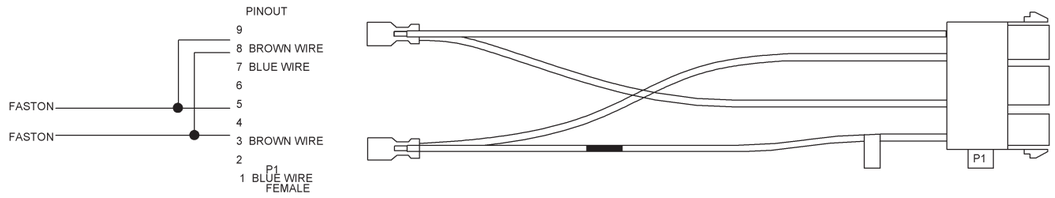
134065, 220 V



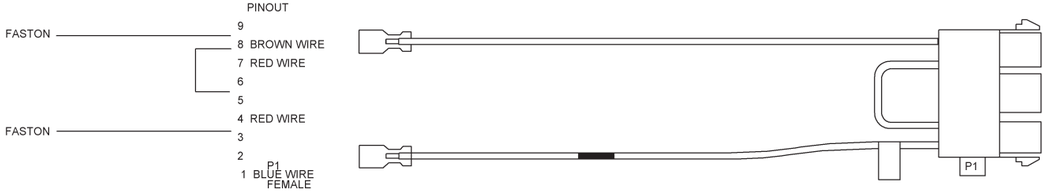
134062, 115 V



134066, 230 V

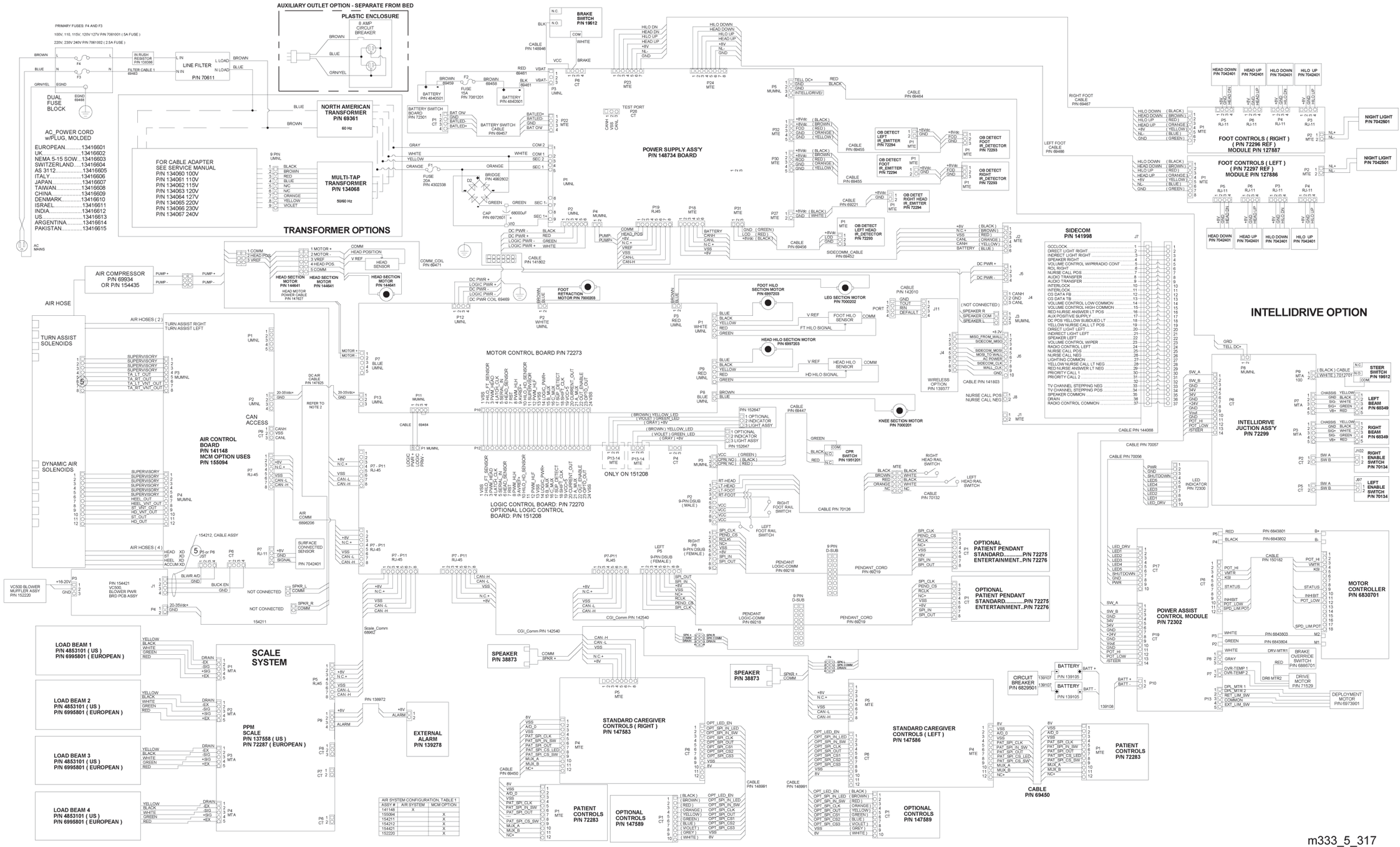


134063, 120 V



134067, 240 V

Electronics Schematic—G through J Model Beds (P/N 150183)



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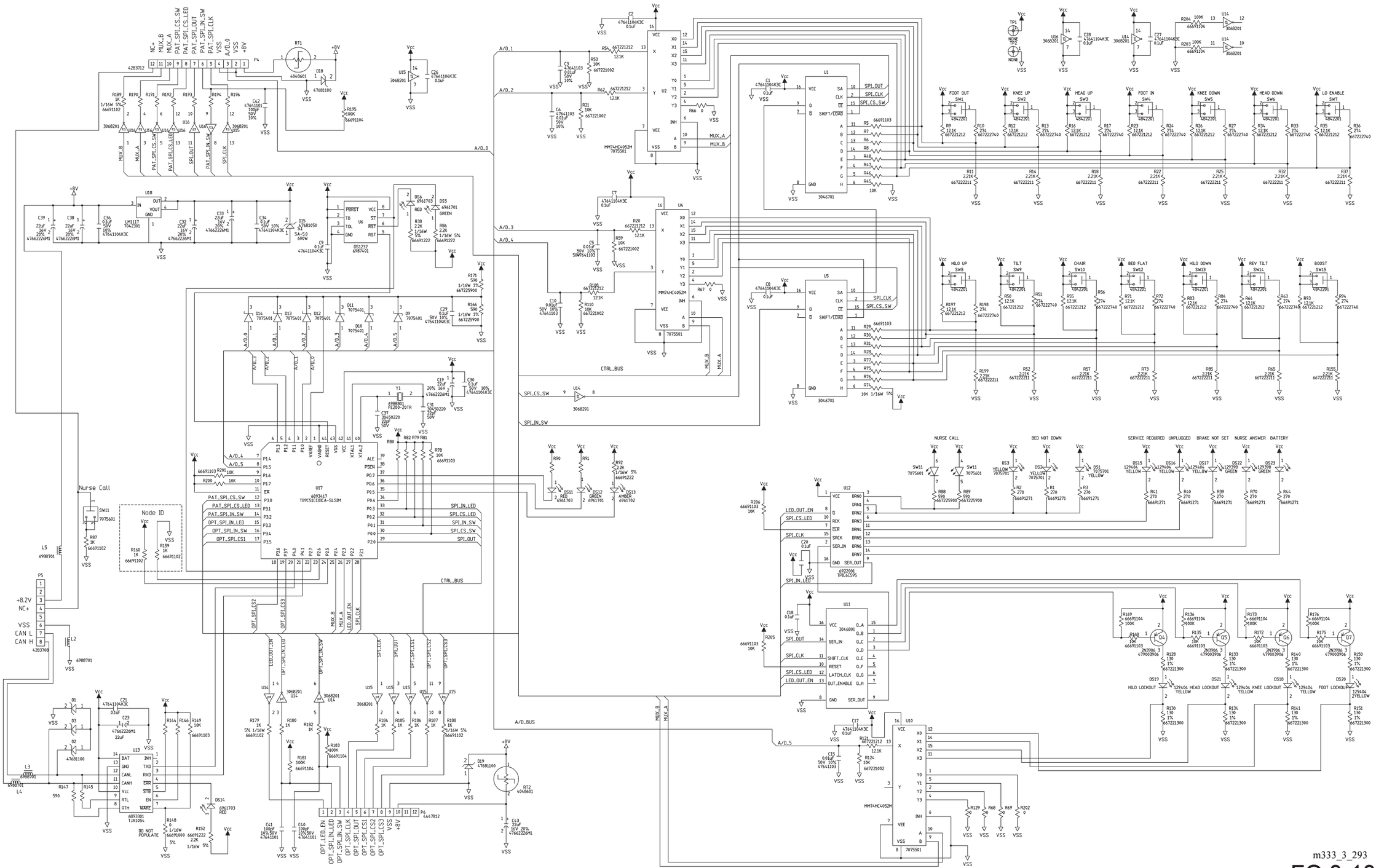
FO 3-12

Siderail Controls, RH—G through J Model Beds (P/N 147581)



Siderail Controls, LH—G through J Model Beds (P/N 147584)

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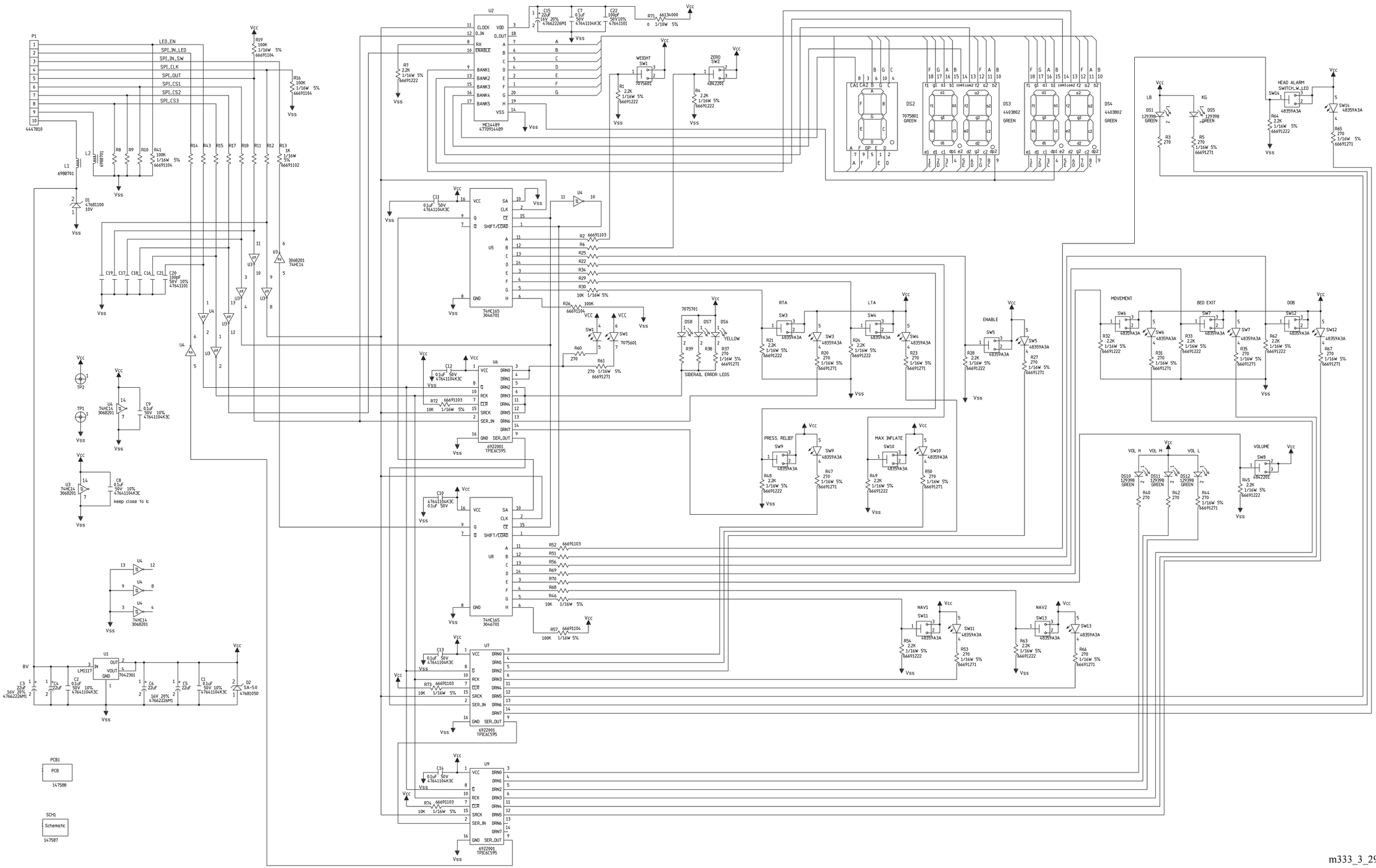
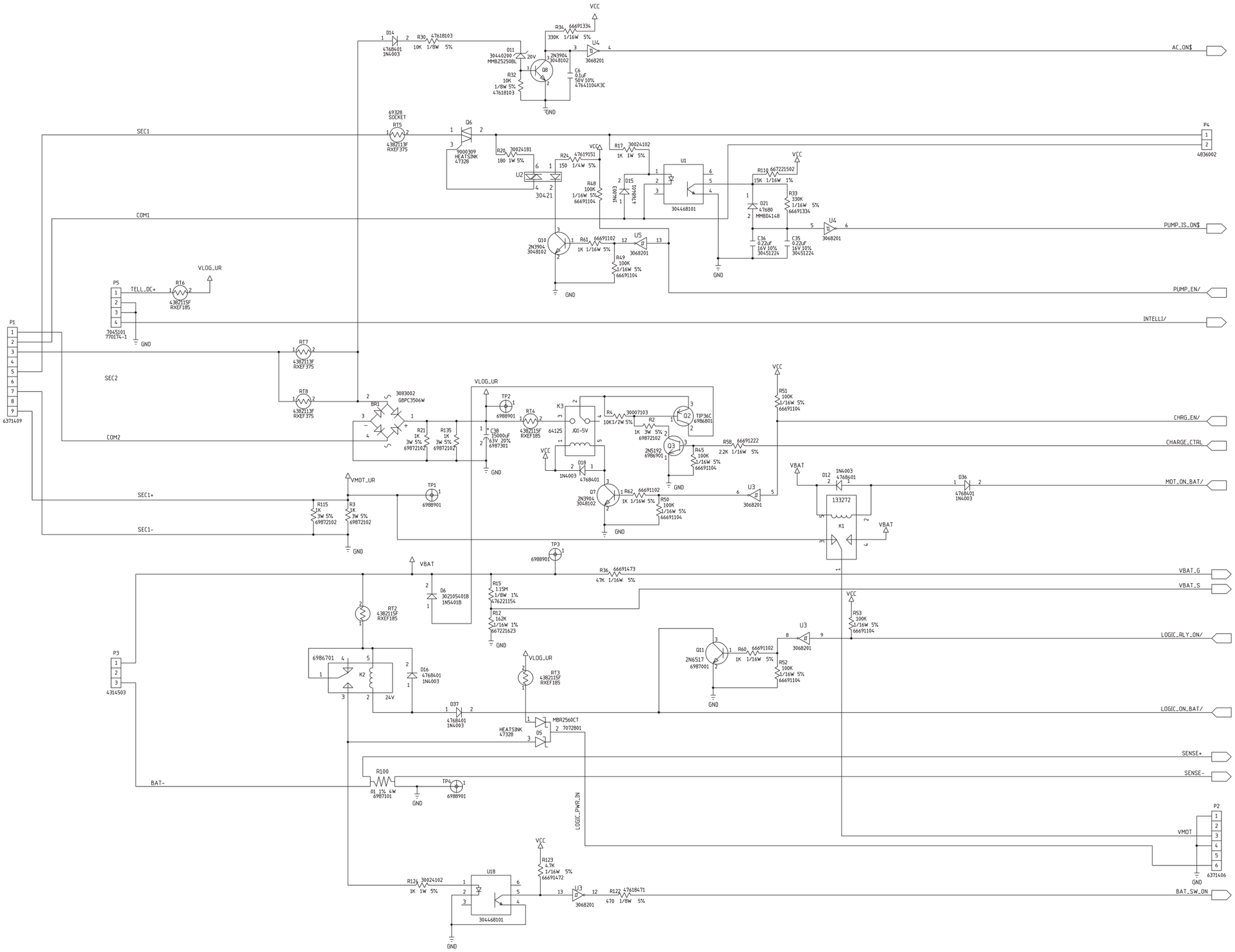
intentionally left blank

Optional Controls, LH—G through J Model Beds (P/N 147587)



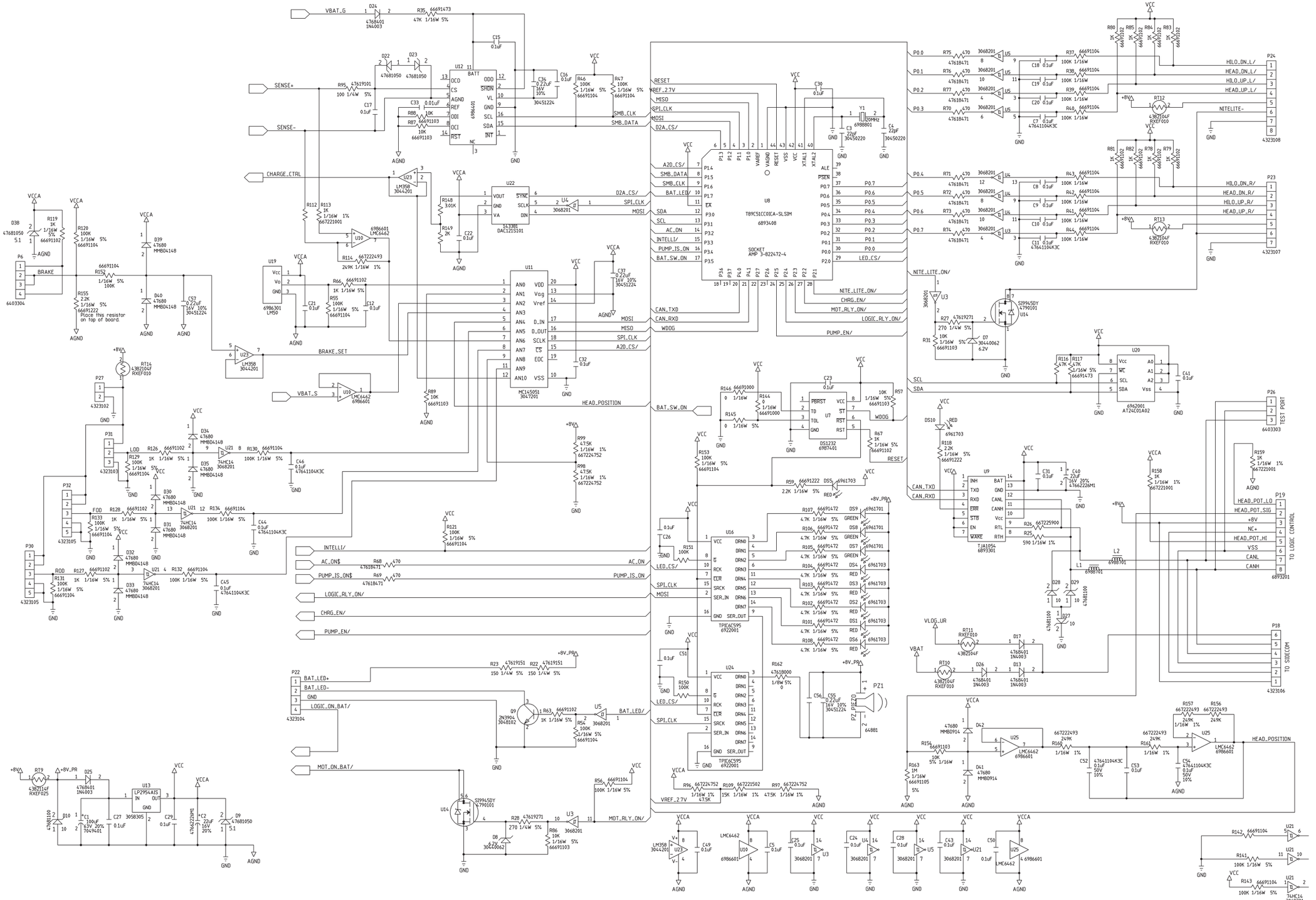
Power Supply—G through J Model Beds (Sheet 1 of 2) (P/N 148732)



m333_3_296

FO 3-16.1

Power Supply—G through J Model Beds (Sheet 2 of 2) (P/N 148732)



m333_3_297

FO 3-16.2


Hill-Rom