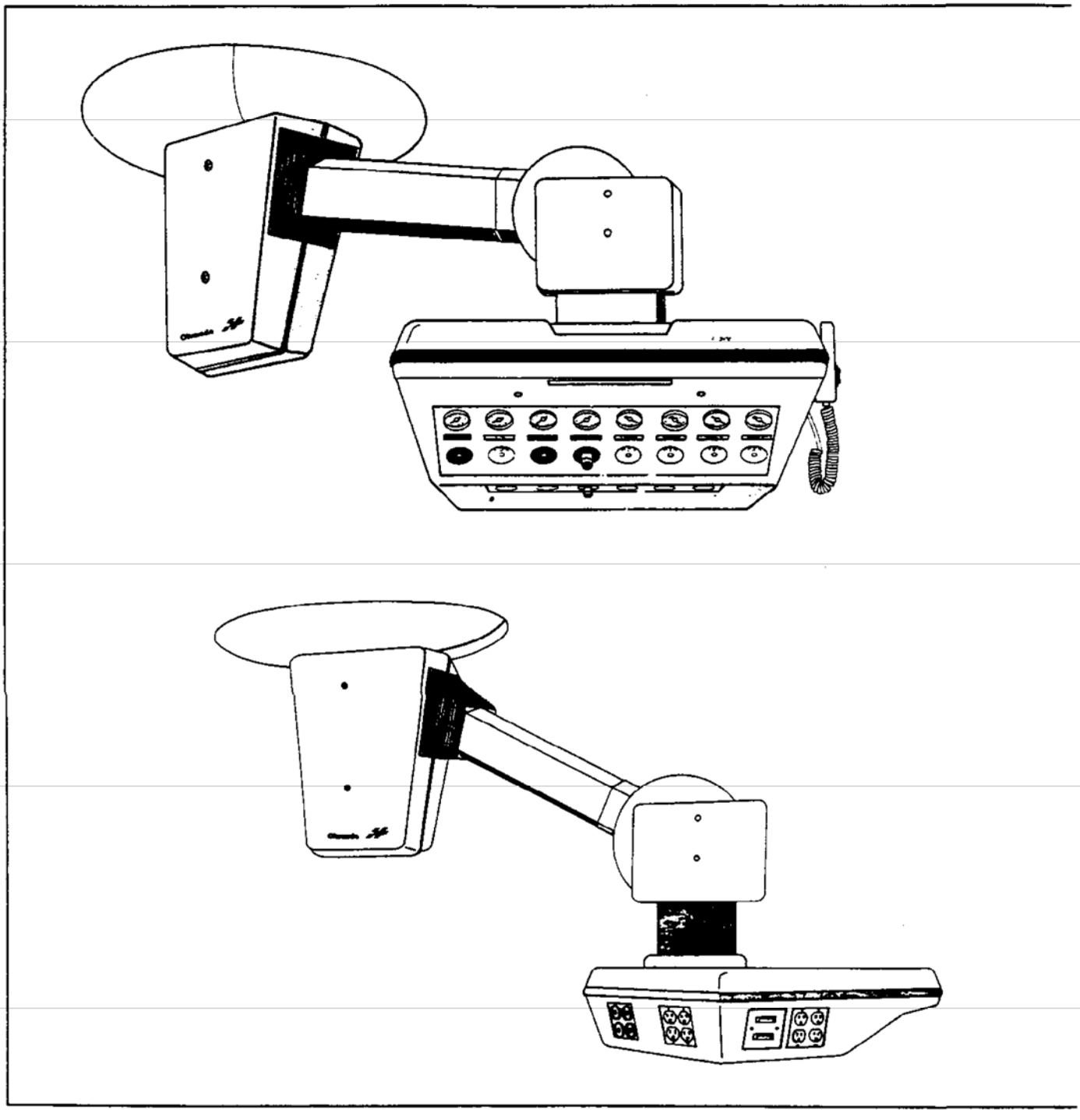
Ohmeda

Multi-Service Pendant
Service Supplement



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Important

The information contained in this service supplement pertains only to those models of products which are marketed by Ohmeda as of the effective date of this manual or the latest revision thereof. This service supplement was prepared for exclusive use by Ohmeda service personnel in light of their training and experience as well as the availability to them of proper tools and test equipment. Consequently, Ohmeda provides this service supplement to its customers purely for the customer's general information only without warranty of the results with respect to any application of such information. Furthermore, because of the wide variety of circumstances under which maintenance and repair activites may be performed and the unique nature of each individual's own experience, capacity, and qualifications, the fact that the customer has received such infomation from Ohmeda does not imply in any way that Ohmeda deems said individual to be qualified to perform any such maintenance or repair service. Moreover, it should not be assumed that every acceptable test and safety procedure or method, precaution, tool, equipment or device referred to within, or that abnormal or unusual circumstances, may not warrant or suggest different or additional procedures or requirements.

This manual is subject to periodic review, update and revision. Customers are cautioned to obtain and consult the latest revision thereof before undertaking any service of the equipment. Comments and suggestions on this manual are invited from our customers. Please send your comments and suggestions to the Manager of Technical Publications, Ohmeda, Ohmeda Drive, Madison, Wisconsin 53707.

Technical Competence

The procedures described in this service supplement should be performed by trained and authorized personnel only. Maintenance should only be undertaken by competent individuals who have a general knowledge of and experience with devices of this nature.

Genuine replacement parts manufactured or sold by Ohmeda must be used for all repairs.

Read completely through each step in every procedure before starting the procedure; any exceptions may result in a failure to properly and safely complete the attempted procedure.

Repair Policy and Procedure

Do not use an improperly functioning unit until all necessary repairs are made and the unit is tested to ascertain that it is functioning in accordance with the manufacturer's published specifications. To insure full reliability, it is recommended that all repairs be performed by an authorized Ohmeda Service Representative. However, if this cannot be done, replacement of those parts designated in the service guide may be undertaken by a competent individual having experience in the repair of devices of this nature.

CAUTION: No repair should ever be attempted by anyone not having experience in the repair of devices of this nature.

Note: Use only Ohmeda replacement parts.

Except for the operator maintenance indicated in the Operation and Maintenance Manual, it is recommended that all other maintenance be performed by an authorized Service Representative of Ohmeda. In the United States, contact the nearest Ohmeda Zone or Regional Service Office for assistance. Outside the United States, contact the nearest authorized Ohmeda Distributor for assistance.

Precautions

Warnings

This system should be installed and tested in accordance with the NFPA 99, "Health Care Facilities," to ensure patient safety.

Contact with the terminals of a charged capacitor can cause electrical shock.

The motor control board is now carrying 115 VAC. Caution must be used to avoid electrical shock.

Before performing maintenance or service on any electrical parts, turn off the circuit breaker from the power source to the Multi-Service Pendant.

Severe shock hazard. Before replacing the actuator, discharge any residual charge in the motor run capacitor. Do this by waiting a few minutes after turning the circuit breaker off, then pressing the handheld controller rocker switch as if to move the Pendant head up and then down. (*Note:* The Pendant head will not move.)

Severe shock hazard. Discharge any residual charge in the motor run capacitor before removing it. Do this by waiting a few minutes after turning the circuit breaker off, then pressing the handheld controller rocker switch as if to move the Pendant head up and then down. (*Note:* The Pendant head will not move.)

Support the actuator when removing the upper mounting pin attaching the actuator piston to the horizontal arm.

Cautions

No repair should ever be attempted by anyone not having experience in the repair of devices of this nature.

Autostop should not be adjusted unless there is a problem.

This procedure requires the use of a support, such as a lift or jack, for the head of the Multi-Service Pendant during replacement of the actuator. Some steps also require two service personnel to perform them safely.

Before performing any maintenance or repair, remove any loose items from the shelf on the Pendant head.

Removal of the actuator will allow the Pendant head to fall unless properly supported.

Remove all load from the actuator by properly supporting the head prior to the next step.

Make sure the piston pin does not rub either side of the upper pivot interface.

1/Introduction

This supplement contains service procedures and technical data for the Multi-Service Pendant. This is considered a supplement to the Multi-Service Pendant Operation and Maintenance Manual. Pertinent information presented in the Operation and Maintenance Manual is not repeated in this service guide. Anyone servicing the Multi-Service Pendant must become familiar with the contents of the Operation and Maintenance Manual before attempting to use this manual.

WARNING: This system should be installed and tested in accordance with the NFPA 99, "Health Care Facilities," to ensure patient safety.

2/Description

General Operation

For a description of the general operation of the Multi-Service Pendant, refer to the Multi-Service Pendant Operation and Maintenance Manual, Sections 2 and 3.

Components

For a description and list of the components of the Multi-Service Pendant, refer to the Multi-Service Pendant Operation and Maintenance Manual, Section 2.

Specifications

For specifications on the Multi-Service Pendant, refer to the Multi-Service Pendant Operation and Maintenance Manual, Section 2.2.

3/Theory of Operation

For an explanation of the theory of operation of the Multi-Service Pendant, refer to the Multi-Service Pendant Operation and Maintenance Manual, Section 3.

4/Field Test Procedures

The following test procedures can be used to check for proper operation of major electrical components of the Multi-Service Pendant. These tests will be beneficial when attempting to troubleshoot a Pendant which will not move vertically. These tests, when performed, will identify the nonfunctional component by process of elimination. Unless otherwise noted, these tests are to be performed with electrical power to Pendant turned off.

4.1 Limit Switches

To check a limit switch for proper operation:

1. Remove the two wires connecting the switch to the motor control board. (Note wire configuration prior to removal in order to facilitate reconnection.)
2. Connect a volt/ohm meter to the switch via the contacts from which the wires were removed in Step 1. With the switch actuator arm in the Up position (switch deactivated), the resistance reading on the volt/ohm meter should be zero ohms. A reading other than zero indicates the limit switch is in need of replacement.
3. With the volt/ohm meter still connected to the switch, activate the switch by manually depressing the switch actuator arm. The reading on the volt/ohm meter should change to infinite ohms when the switch is activated. A reading other than infinite ohms indicates the switch is in need of replacement.
4. To replace a damaged switch, remove it from the limit switch mounting bracket by unscrewing the 4-40 screws which hold the limit switch onto the mounting bracket. Replace the damaged switch with a new one.
5. After verifying that the switch is operational, remove the volt/ohm meter leads and reconnect the wires which were removed in Step 1.
6. Repeat this test for both limit switches.

4.2 Run Capacitor

To check run capacitor for proper operation:

1. Remove the wires connecting the capacitor to the motor of the linear actuator assembly. The rubber protective boot must be moved out of position in order to access the wire terminals.
2. Completely discharge the capacitor by shorting both terminals with an insulated screwdriver.

   WARNING: Contact with the terminals of a charged capacitor can cause electrical shock.
3. Set a volt/ohm meter to its highest resistance scale and connect one lead to each of the terminals on the capacitor. When the leads are first connected, the resistance should read zero ohms, and the indicated resistance should rapidly increase as the leads are left connected to the capacitor. Remove the leads, discharge the capacitor; reconnect the leads and verify that the initial resistance is again zero ohms. If the resistance value does not increase with the amount of time the leads are connected to the terminals, or if the resistance value does not return to zero ohms after discharge of the capacitor, the run capacitor is in need of replacement.

4.3 Handheld Controller Assembly

To check a handheld controller for proper operation:

Note: In order to perform the following test both limit switches must be in a Deactivated position. Adjust limit switches, if required, to ensure that this condition exists before starting the test.

1. Remove the white wire from pin 6 of J1 on the motor control board, and remove the red and white wire from pin 5 of J1. Connect a volt/ohm meter to these two wires. With the meter set to indicate resistance, it should indicate an open circuit. Depress the Up side of the switch on the handheld controller, the meter should now indicate a closed circuit.
2. If the meter does not indicate an open circuit when the switch is not depressed and a closed circuit when the switch is depressed, the handheld controller assembly is in need of replacement.
3. If the meter does indicate an open circuit when the switch is not depressed and a closed a circuit when the switch is depressed, the Up side of the handheld controller assembly is functional. Reconnect the red and white wire which was removed in Step 1 and proceed to Step 4.
4. Remove the black and white wire from pin 4 of J1 on the motor control board and repeat the test in Step 1, except depress the Down side of the switch instead of the Up side.
5. If the meter does not indicate the same readings described in Step 3, the handheld controller assembly is in need of replacement.
6. If the meter does indicate the same readings described in Step 3, the handheld controller assembly is functional. Reconnect the black and white wire to pin 3 and the white wire to pin 1 and proceed to Section 4.4.

4.4 Motor Control Board

To check a motor control board for proper operation:

1. Remove the red, blue and yellow wires from pins 3, 2 and 1 of J1 on the motor control board. Connect a volt/ohm meter to pins 3 and 1 of J1 on the motor control board and set the meter to indicate volts AC. Restore electrical power to the Pendant.

   WARNING: The motor control board is now carrying 115 VAC. Caution must be used to avoid electrical shock.

2. Depress the Up side of the switch on the handheld controller assembly. The meter now should indicate 115 VAC. Release the switch and the meter now should indicate 0 VAC.
3. Remove one lead of the meter from pin 3 of J1 on the motor control board and connect this lead to pin 2 of J1. Repeat the test in Step 2, except now depress the Down side of the switch.
4. Disconnect electrical power from the Pendant.
5. If the meter does not indicate 115 VAC when the switch is depressed in either Steps 2 or 3, the motor control board is in need of replacement.
6. If the meter does indicate 115 VAC when the switch is depressed in both Steps 2 and 3, the motor control board is functional. Proceed to section 4.5.

4.5 Linear Actuator Assembly

If the limit switches, the run capacitor, the handheld controller assembly and the motor control board all have been tested and verified to be functional, and the Pendant still will not move vertically, then the linear actuator assembly is in need of replacement.

5/Troubleshooting Guide

5.1 Troubleshooting

Use the following table to assist in diagnosing maintenance and repair needs. The table covers only problems with vertical movement of the Pendant. Problems with other Pendant systems are covered in troubleshooting tables in the Operation and Maintenance Manual. This service supplement covers only those repair procedures for adjustment of the automatic autostop and replacement of the actuator assembly. For all other repairs, the tables refer you to the O&M Manual.

Table 1. Pendant Movement

Symptom	Probable Cause	Solution	Reference Section
Pendant will not move vertically	Main power source not connected to Pendant	Connect main power source to Pendant	4.4 (O&M manual)
	Limit switches out of adjustment	Adjust limit switches	3.2 (O&M manual)
	Autostop contacts out of adjustment (Red LED stays on)	Adjust autostop contacts	6.1
	Handheld controller damaged	Replace handheld controller	5.5 (O&M manual)
	Run capacitor damaged	Replace run capacitor	5.6 (O&M manual)
	Motor Control Board damaged	Replace Motor Control Board	5.7 (O&M manual)
	Actuator assembly damaged	Replace actuator Service	6.2

6/Repair Procedure

6.1 Adjusting the Autostop

See Figures 1 and 2.

CAUTION: Autostop should not be adjusted unless there is a problem.

1. Remove acorn nuts on either side of the intersection shrouds and screws on shroud seams. Remove intersection shrouds.
2. If applicable, remove screws from vertical arm shrouds below intersection shrouds. Slide arm shrouds up and free from rubber splash guard.
3. Slide splash guard and lower pivot shroud (ring) up.
4. Remove (4) Avsafe tamperproof screws from Pendant head top cover.
5. Raise the top cover up to reveal hex screws on each corner.
6. Inspect Autostop contacts at each corner. (See Figure 2.) Tighten all contacts with a 5/32 Allen wrench until the red LED on the front of the Pendant head is illuminated. Then back off each contact one-half (1/2) a turn. This should cause the red Autostop indicator to turn off.
7. Check the Autostop feature for proper operation and readjust if necessary.
8. Replace the top Pendant head cover, the lower pivot shroud, splash guard, vertical arm shrouds and intersection shrouds.

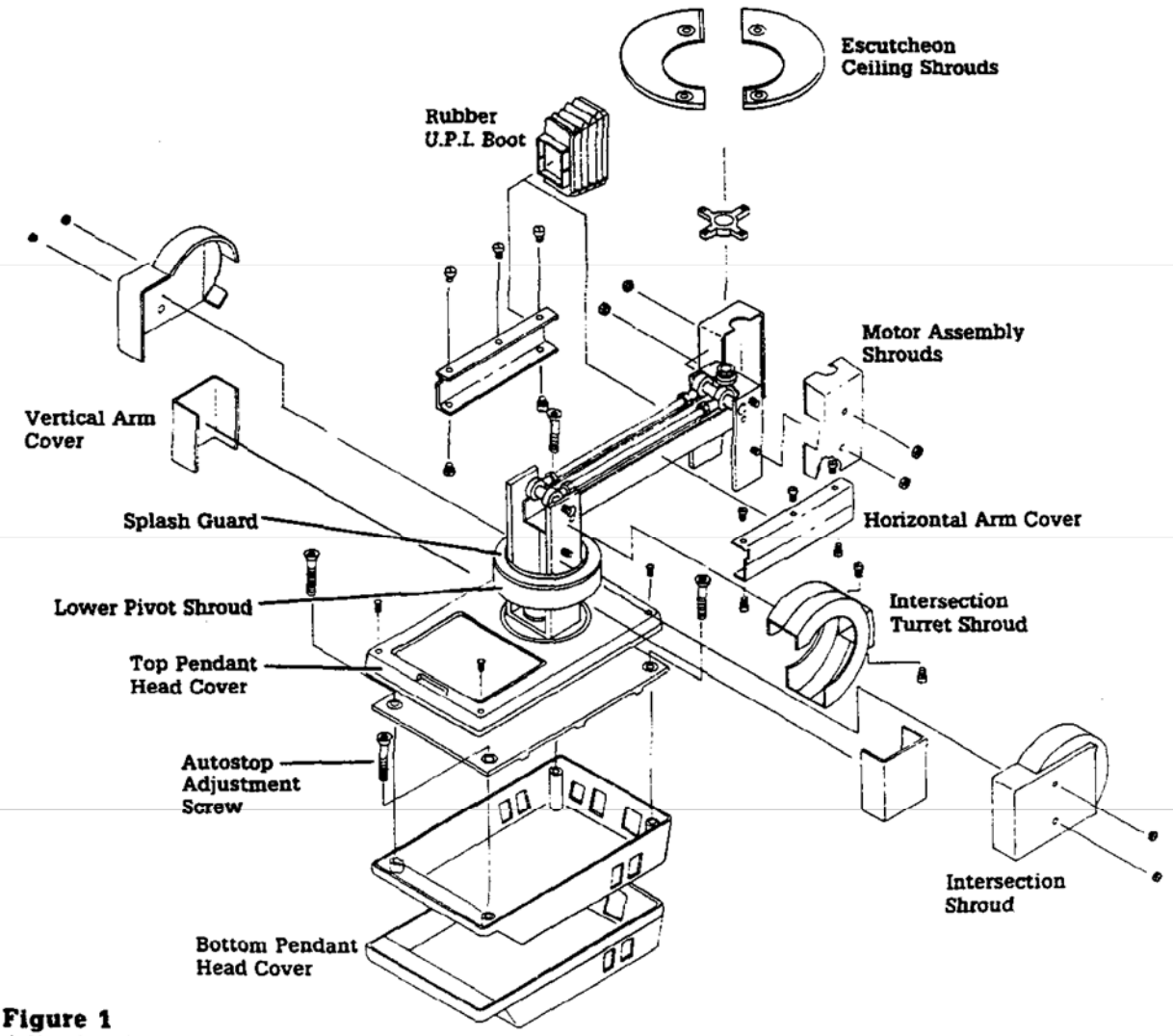


Figure 1
Adjusting the Autostop

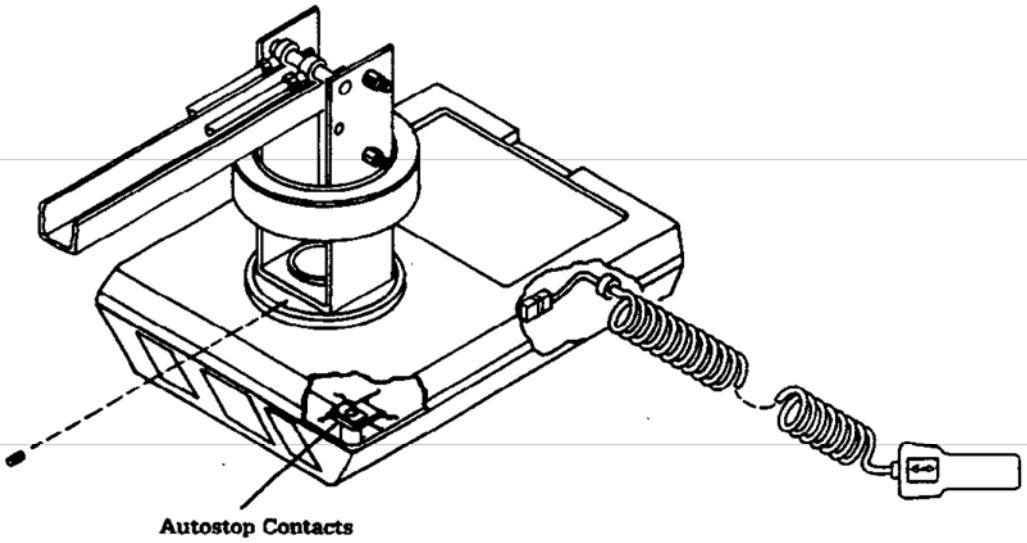


Figure 2
Autostop Contacts

6.2 Replacing the Actuator

Figures 1, 3, 4 and 5.

WARNING: Before performing maintenance or service on any electrical parts, turn off the circuit breaker from the power source to the Multi-Service Pendant.

WARNING: Severe shock hazard. Before replacing the actuator, discharge any residual charge in the motor run capacitor. Do this by waiting a few minutes after turning the circuit breaker off, then pressing the handheld controller rocker switch as if to move the Pendant head up and then down. (*Note:* The Pendant head will not move.)

CAUTION: This procedure requires the use of a support, such as a lift or jack, for the head of the Multi-Service Pendant during replacement of the actuator. Some steps also require two service personnel to perform them safely.

CAUTION: Before performing any maintenance or repair, remove any loose items from the shelf on the Pendant head.

Removing the old Actuator

1. Remove acorn nuts on both sides of motor assembly shrouds.
2. Remove motor assembly shrouds.

   Note: Rubber Upper Pivot Interface (U.P.I.) boot is now free and moves easily.
3. Slide rubber U.P.I. boot down the length of the horizontal arm.
4. Place an appropriate support under the Pendant head.

   CAUTION: Removal of the actuator will allow the pendant head to fall unless properly supported.
5. Disconnect all wires from the motor control board to the actuator, noting the wiring configuration. (See Figure 3.)

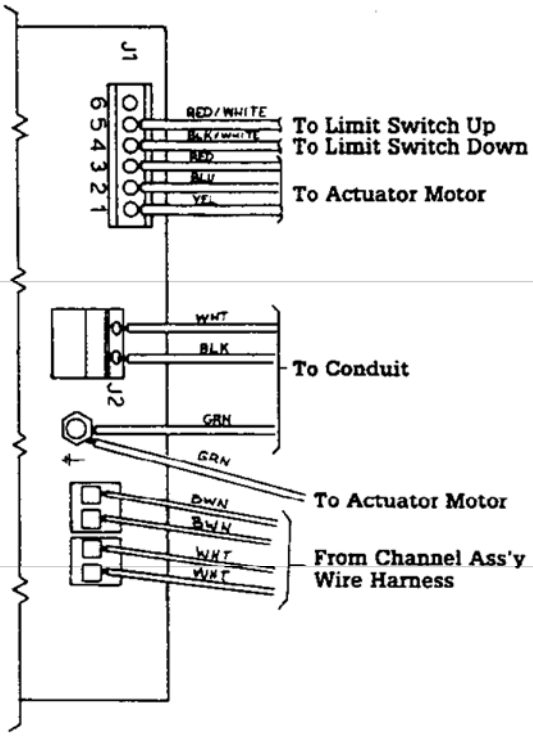


Figure 3
Motor Control Board Wiring

6. Loosen the two screws holding the run capacitor clamp to the upper pivot interface. (See Figure 4.) Do not completely remove the screws.

   WARNING: Severe shock hazard. Discharge any residual charge in the motor run capacitor before removing it. Do this by waiting a few minutes after turning the circuit breaker off, then pressing the handheld controller rocker switch as if to move the Pendant head up and then down. (*Note:* The Pendant head will not move.)

7. Slide the run capacitor toward the horizontal arm and remove it from the run capacitor clamp.

8. Slide the protective rubber terminal boot up the wires and out of the way.

9. Disconnect the wires to the run capacitor, noting the wiring configuration.

10. Remove the four bolts holding the upper pivot interface stiffener bar to the upper pivot interface assembly and remove the stiffener bar.

    CAUTION: Remove all load from the actuator by properly supporting the head prior to the next step.

11. Loosen the two actuator mounting bolts by turning them counterclockwise until the lower actuator mounting clevis is free of both actuator mounting bolts. (See Figure 5.) It is not necessary to completely remove the bolts. The actuator is now attached to the upper pivot interface assembly only by the upper actuator piston pin.

12. Adjust the height of the Pendant head so the holes in the horizontal arm for the actuator piston pin align with the two holes on either side of the upper pivot interface.

13. Loosen the retaining set screw for the upper actuator mounting pin on the upper side of the horizontal arm.

    WARNING: Support the actuator when removing the upper mounting pin attaching the actuator piston to the horizontal arm.

14. Use a flat punch to tap the upper actuator mounting pin through one side of the horizontal arm and through the actuator piston until the actuator is free. Tap the pin only far enough to free the actuator piston. Do not tap the pin completely through both sides of the horizontal arm.

15. Lower the actuator out of the upper pivot inter face.

    Note: The actuator is not further serviceable. Replace the actuator if it is defective.

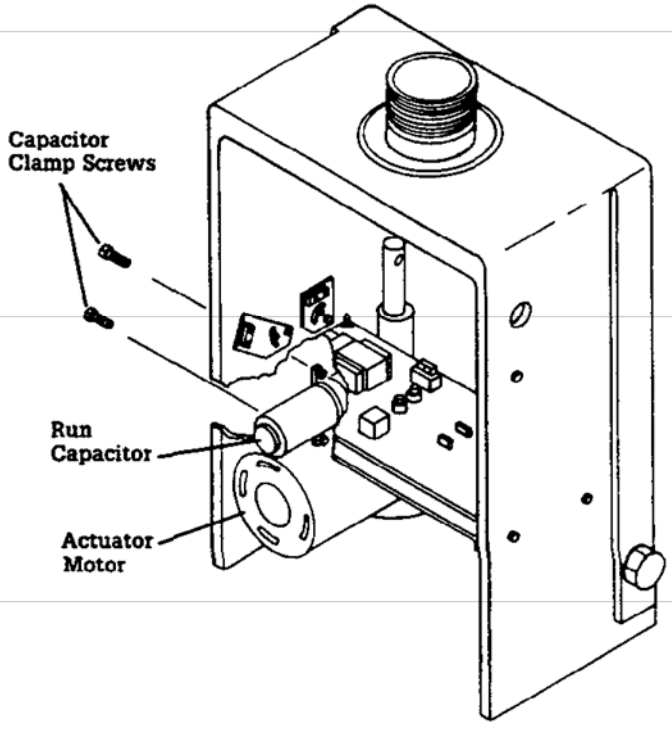


Figure 4
Replacing the Actuator

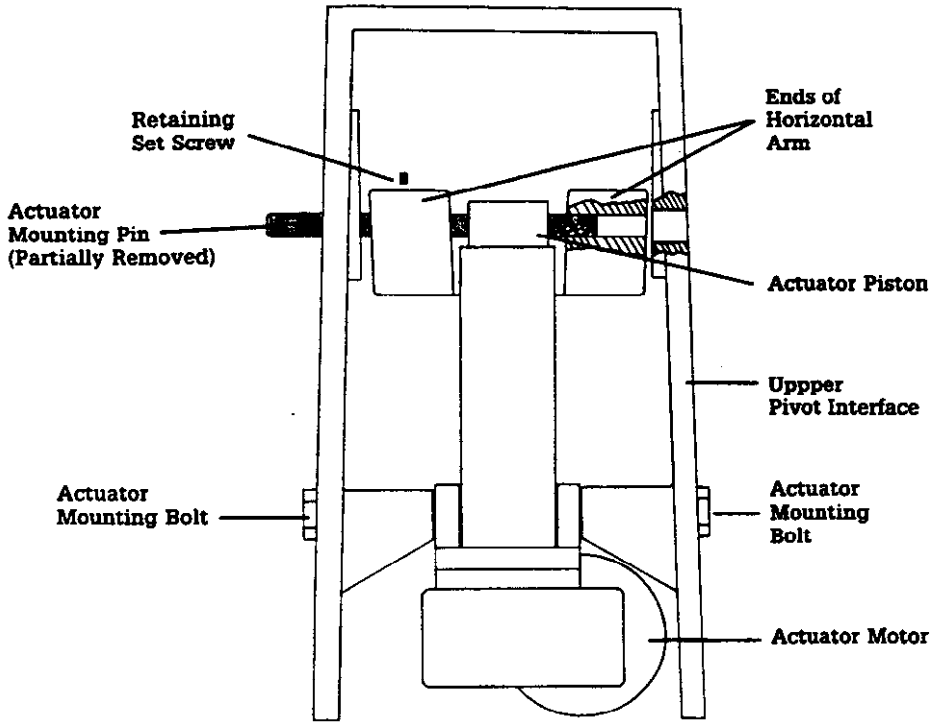


Figure 5
Upper Pivot Interface Assembly and Actuator (Rear View)

Installing the new Actuator

1. Raise the new actuator into the correct position.
2. Align the hole in the new actuator piston with the piston pin and each hole on either side of the horizontal arm.
3. Use a flat punch to tap the piston pin through the actuator piston and into the opposite hole in the horizontal arm so the pin is centered in the horizontal arm.

   CAUTION: Make sure the piston pin does not rub either side of the upper pivot interface.
4. Tighten the retaining set screw for the actuator pin on the upper side of the horizontal arm to lock the pin into position.
5. Adjust the height of the Pendant head support so the lower mounting clevis of the actuator is aligned with the mounting bolts in the upper pivot interface.
6. Tighten the actuator mounting bolts until the lower mounting clevis of the actuator is securely held by each. Be careful not to over-tighten the mounting bolts.
7. Reattach the upper pivot interface stiffener bar.
8. Attach the wires to the new run capacitor in the same configuration as the old wires were connected.
9. Slide the protective rubber boot back over the terminal connections.
10. Slide the new run capacitor into the run capacitor clamp.
11. Tighten the two screws holding the run capacitor clamp to the upper pivot interface.
12. Reconnect all wires to the motor control board. See Figure 3.
13. Double check all electrical and mechanical connections.
14. Remove the Pendant head support and restore power to the Multi-Service Pendant.
15. Test the Pendant for proper actuator operation.

    Note: It may be necessary to readjust the Pendant vertical motion. See Section 3.2 of the Operation and Maintenance Manual.
16. When proper operation and correct range of vertical movement have been verified, replace the rubber U.P.I. boot, the motor assembly shrouds and the acorn nuts.

7/Illustrated Parts List

For an illustrated parts list for the Multi-Service Pendant, refer to the Multi-Service Pendant Operation and Maintenance Manual, Section 6.

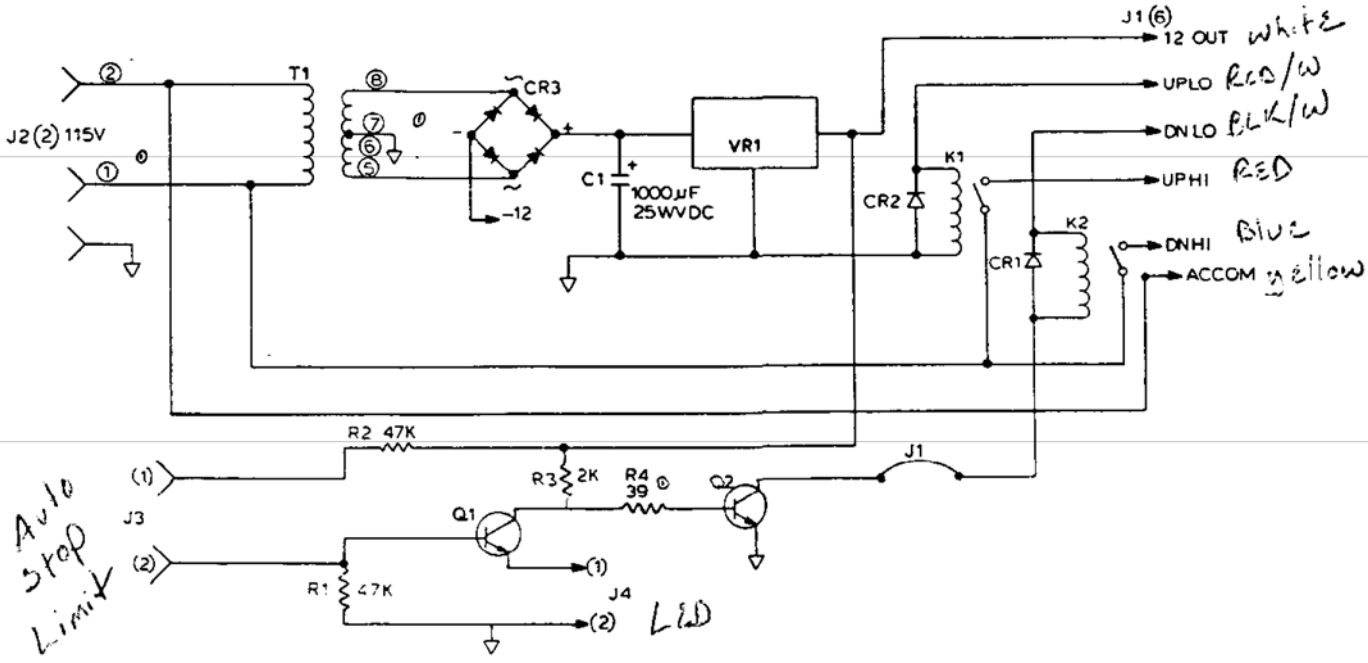
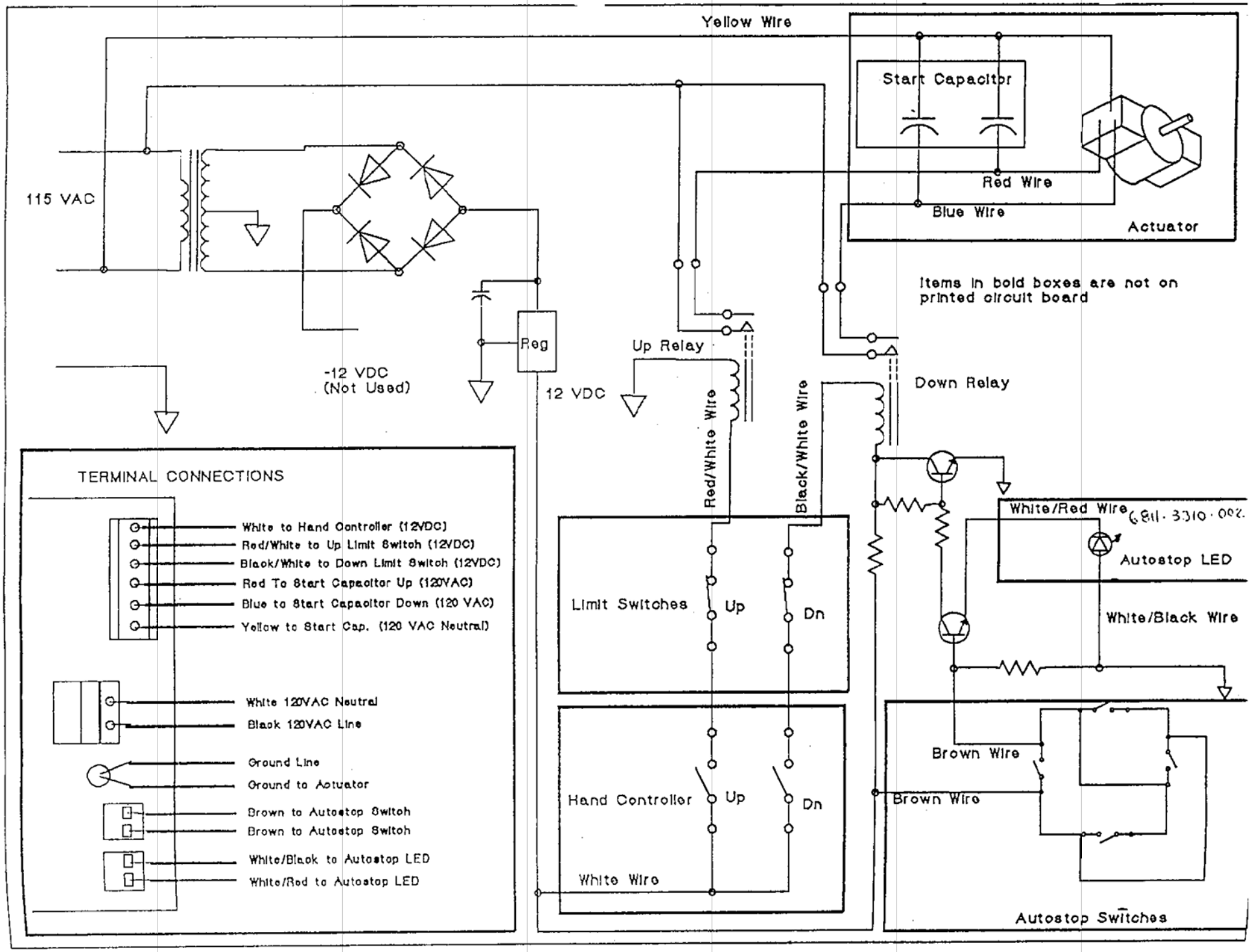


Figure 8
Component Layout and Schematic


Yellow Wire
Start Capacitor
Red Wire
Blue Wire
Actuator
115 VAC
Items in bold boxes are not on printed circuit board
Reg
-12 VDC
(Not Used)
12 VDC
Up Relay
Down Relay
Red/White Wire
Black/White Wire
TERMINAL CONNECTIONS
White to Hand Controller (12VDC)
Red/White to Up Limit Switch (12VDC)
Black/White to Down Limit Switch (12VDC)
Red To Start Capacitor Up (120VAC)
Blue to Start Capacitor Down (120 VAC)
Yellow to Start Cap. (120 VAC Neutral)
White 120VAC Neutral
Black 120VAC Line
Ground Line
Ground to Actuator
Brown to Autostop Switch
Brown to Autostop Switch
White/Black to Autostop LED
White/Red to Autostop LED
Limit Switches
Up
Dn
Hand Controller
Up
Dn
White Wire
White/Red Wire
6811-3310-002
Autostop LED
White/Black Wire
Brown Wire
Brown Wire
Autostop Switches

Notes

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Regional Service Offices
Eastern Region
Ohmeda
Fort Lee Executive Park
One Executive Drive
Fort Lee NJ 07024
800 922 0443 Outside NJ
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Midwestern Region
Ohmeda
2101 S Arlington Heights Rd
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International
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71 Great North Road
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Latin America, Caribbean
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Telex 810 8486057

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Technical Support
Ohmeda
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Canada Service Centre
Ohmeda
172 Belfield Road
Rexdale Ontario M9W 1H1
416 243 9533
Telex 06989362

In the USA, please call Customer Service at 800 556 5596 for additional information or to place an order.

Medical Engineering

Ohmeda
2775 Northwoods Parkway
PO Box 4225
Norcross GA 30091 4225 USA
800 556 5596
Telex 4946693

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