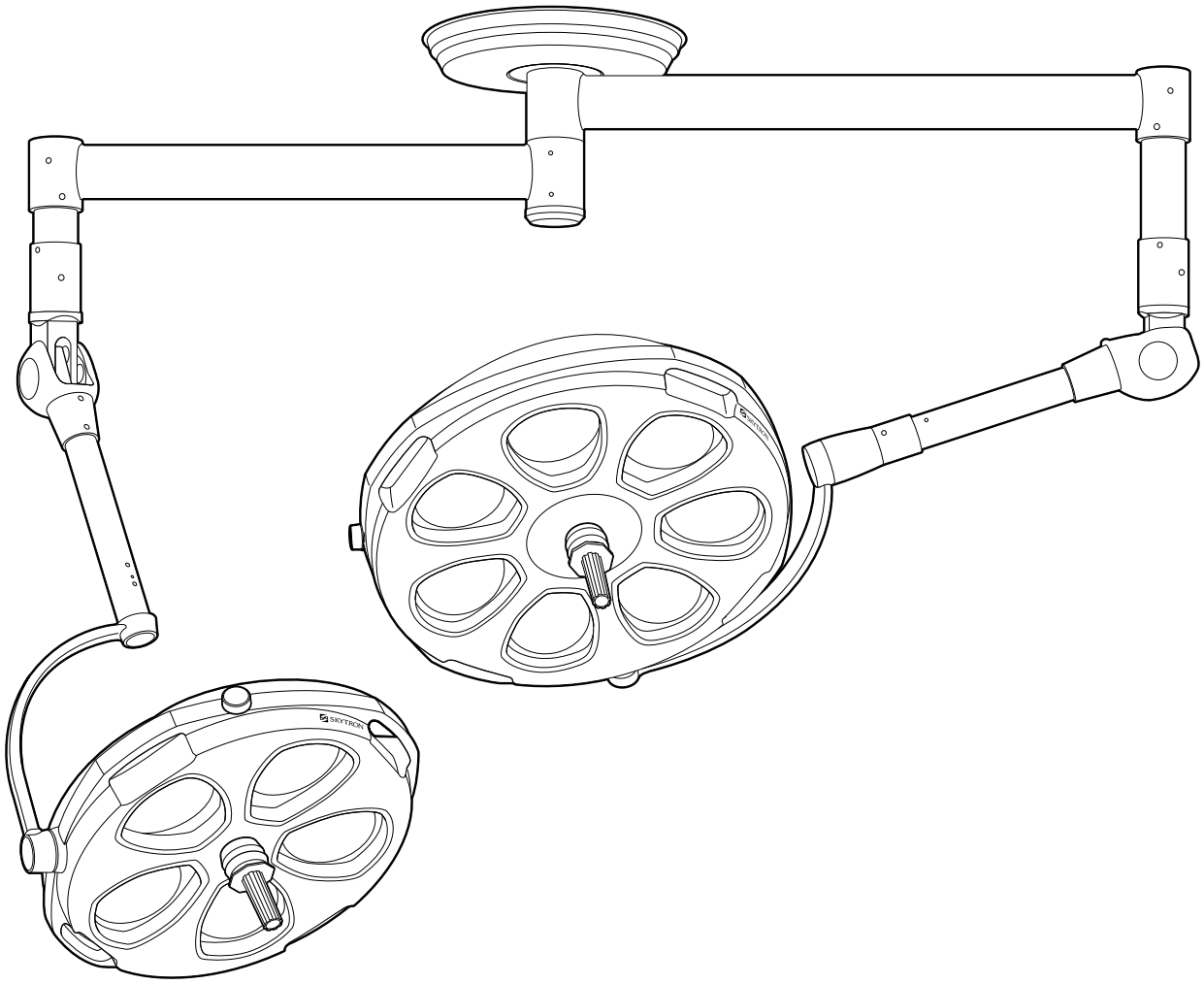
SKYTRON

MAINTENANCE MANUAL



STELLAR

SERIES SURGICAL LIGHTS

REV 12/05

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REV 12/05

EQUIPMENT LABELS AND SPECIFICATIONS

ATTENTION, CONSULT MANUAL FOR FURTHER INSTRUCTIONS.
INDICATES SPECIAL USER ATTENTION.

AC VOLTAGE

FUSE TYPE 3 AMP, SLOW BLOW TYPE

FUSE TYPE 5 AMP, SLOW BLOW TYPE

CLASS I DEFIBRILLATION PROOF, TYPE B EQUIPMENT- IPX4 RATED.
INTERNALLY POWERED EQUIPMENT

FOR DRY LOCATIONS
UNIT TO BE USED ONLY IN SPECIFIED ENVIRONMENTAL CONDITIONS
TEMPERATURE: 15˚ - 30˚ C (60˚ -85˚ F)
HUMIDITY: 30% - 60% RELATIVE HUMIDITY, NON CONDENSING

ENTELA CERTIFIED
TO UL2601-1
CAN/CSA601.1, IEC 60601-2-46

RECOMMENDED TOOL LIST

1 PIN PUNCH SET 1/8" - 3/8"
1 TEFLON TYPE SPRAY LUBRICANT (TRI-FLOW)
1 SET OF PHILLIPS SCREWDRIVERS
1 SET OF FLAT BLADE SCREWDRIVERS
1 DIGITAL LEVEL
1 METRIC, L-TYPE ALLEN WRENCH SET 1.5-8mm
1 PENCIL
1 TRUE RMS VOLTMETER
1 SET OF NON ABRASIVE CLEAN CLOTHS
1 MILD CLEANING AGENT, NON ALCOHOL

1-1. General

To ensure proper operation and extend the life of your SKYTRON surgical lighting fixture, the following preventive maintenance procedures are recommended.

NOTE

All repairs should be made using authorized SKYTRON replacement parts.

1-2. Daily Maintenance

Daily or between cases, the lighthead exterior should be wiped down with a mild cleaning agent which will not affect the painted or acrylic parts.

•Avoid the use of cleaning solutions which contain high concentrations of alcohol, ethelene glycol, phenol, iodophors, or glutaraldehyde based disinfectants. Some degree of staining, pitting, and discoloration may occur if these are used.

Always consult with the manufacturer of the cleaning agent for proper application and use. Always spot test on an inconspicuous area before use.

•Avoid personal injury. Do not attempt to clean lighthead unless power is turned off at wall control and fixture has sufficiently cooled.

•Avoid using excessive amounts of spray cleaners near top cover vents. Leakage of fluids into the interior of lighthead may cause corrosion of electrical components.

•Periodically the filter/diffuser assemblies should be removed and dusted with a clean cloth or washed and air dried as a complete assembly.

•DO NOT operate lights without the filter/diffuser assemblies in place.

•Use plexiglass cleaners, DO NOT use alcohol based cleaners on the acrylic diffusers.

1-3. Preventive Maintenance Procedures

The following procedures should be done semi-annually or sooner as needed.

a. Lighthead top cover should be removed and any accumulation of dust or lint removed.

b. Check the focus drive mechanism for proper operation and lubrication. Lubricate the drive gears with lithium grease and all pivot points with a lightweight oil as necessary.

c. The filter/diffuser assemblies should be removed and dusted with a clean cloth or washed and air dried as a complete assembly. Use plexiglass cleaners, DO NOT use alcohol based cleaners on the acrylic diffusers.

d. All attaching hardware (screws, nuts, etc.) should be physically checked for tightness. Any missing hardware MUST be replaced.

WARNING

Apply LOC-TITE to any replacement or loose vertical support tube attaching screws.

e. Rotate the radial arm assemblies around the ceiling mount to check the slip ring/brush block assemblies. With electrical power "ON", if the lights become intermittent or go out, check and repair or replace the brush block or slip ring as necessary.

f. Check the remaining slip ring/brush block assemblies by raising, lowering, and rotating the lighthead through its full range of motion. With electrical power "ON", if the lights become intermittent or go out, check and repair or replace the appropriate brush block or slip ring as necessary.

g. Check all fixture rotation axes for proper adjustment. Adjust as necessary using applicable adjustment procedures from the adjustment section of this manual (Section 2).

h. Check light bulb voltages to ensure maximum bulb life.

1-4. Bulb Changing

Since SKYTRON Surgical Lights contain multiple bulbs, it would not normally be necessary to change a burned out bulb during a surgical procedure. The loss of one or even three bulbs in a large diameter lighthead may be completely unnoticed during use.

To replace a bulb, use the following procedure:

WARNING

Be sure the power is turned "OFF" and the bulb has cooled before changing.

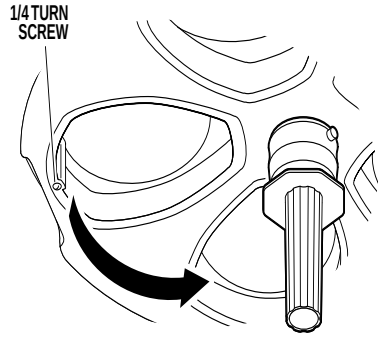


Figure 1-1.

a. Hold the diffuser/filter assembly with one hand, loosen the "1/4-turn" screw and lower the diffuser/filter assembly. See figure 1-1.

WARNING

DO NOT attempt to remove the bulb by pulling on the glass surface or end cap. This may cause the bulb to break off in your hand.

b. Using caution not to touch the reflector surface, hold the bulb by the base and pull it out. See figure 1-2. Slightly working the bulb back and forth may aid in bulb removal.

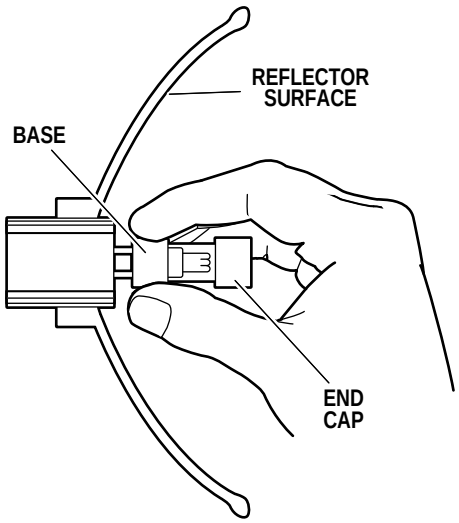


Figure 1-2.

NOTE

Halogen bulbs are sensitive to body oils. DO NOT handle the glass surface of bulb as body oil from your fingers can create a "hot spot" and may cause the bulb to burn out prematurely.

NOTE

To ensure proper operation of your Stellar Light, use ONLY Skytron replacement bulbs Part Number B1-010-28.

c. Holding the replacement bulb by the base, plug it directly into the socket. Do not touch the glass portion of the bulb reflector surface with your fingers. This can best be done by using the plastic wrapper that the bulb is packaged in, or a clean cloth wrapped around the base of the bulb when installing. Be sure bulb base is properly seated in the connector to insure proper focus alignment.

NOTE

To extend the life of the bulb reflector surface, it should NOT be included in normal cleaning. It should be cleaned only if absolutely necessary. Clean gently with a clean, damp, soft cloth and a mild soap solution. NO abrasives.

d. Replace the filter/diffuser assembly by placing the tab into the slot in the lighthead face. Place the assembly in position and secure with 1/4-turn screw.

NOTE

Amount of voltage applied to the bulb will affect bulb life. Over voltage will cause the bulbs to burn out prematurely. Proper applied voltage (to the lighthead) should be 20V ± 0.2V.

1-5. Focus Adjustment

As part of normal Preventive Maintenance, the lighthead focus adjustment should be checked. If an adjustment is necessary, use the following procedures:

a. Remove all filter/diffuser assemblies. Check all bulbs to make sure the bulb base is flat and securely seated in the connector. Remove the lighthead top cover screws and remove the top cover.

b. Position the lighthead 42" from a white test surface. Turn main power "ON" and set intensity on low. Adjust focus control to widest pattern diameter so each bulb can be seen individually. See figure 1-3.

c. Adjust the focus control to check that all bulb patterns will converge on a single spot anywhere from two to six feet from lighthead face.

d. To adjust a misaligned bulb holder, loosen the jam nut on the affected focus rod and turn the adjustment screw as needed to achieve proper alignment. See figure 1-4.

e. Install filter/diffuser assemblies and top cover when adjustments are complete.

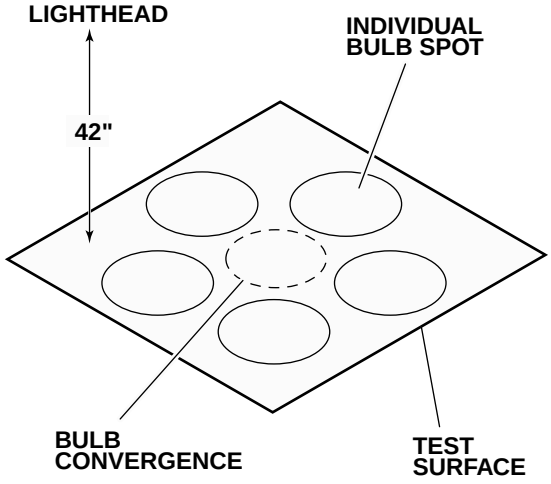


Figure 1-3.

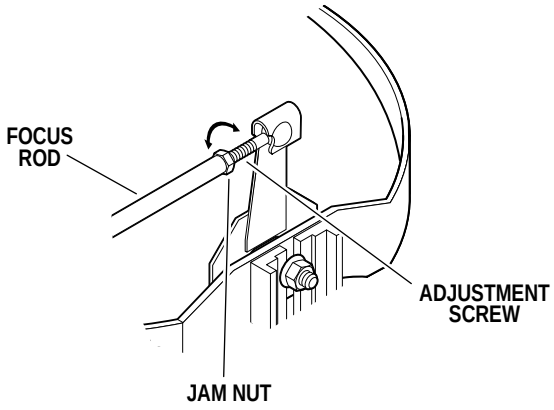


Figure 1-4.

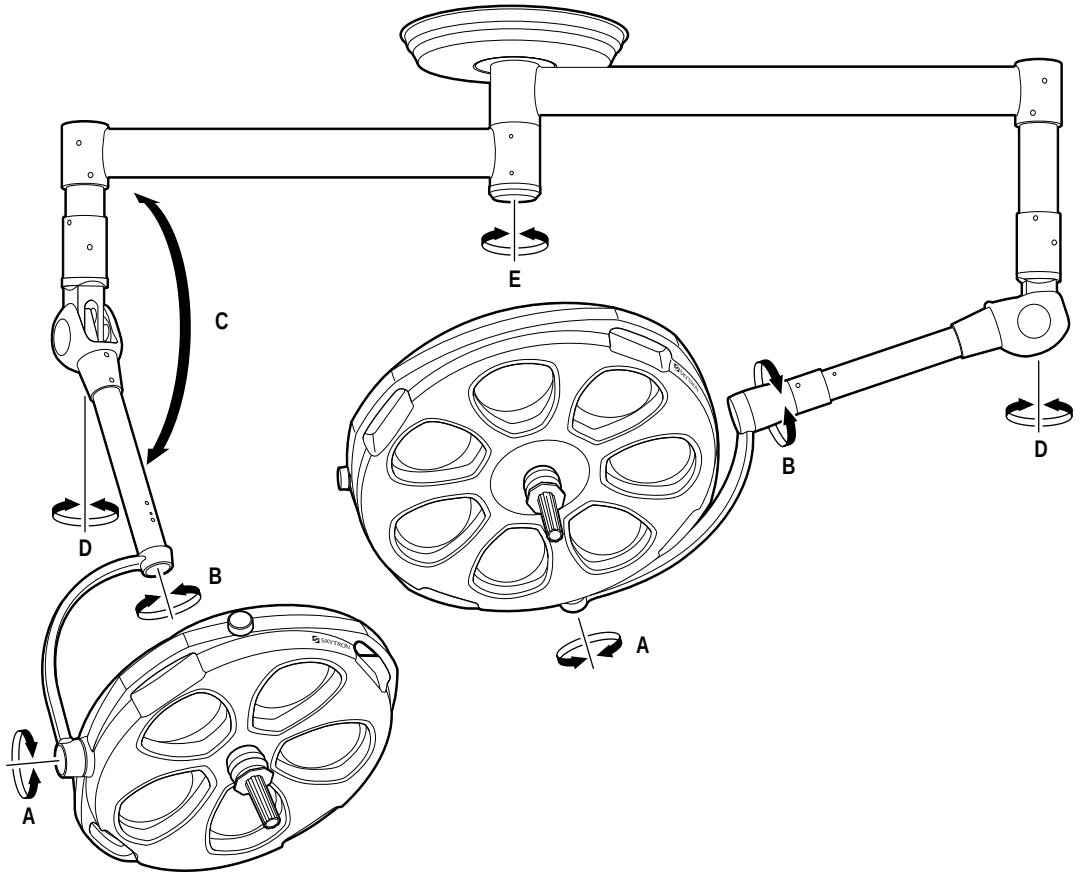
WARNING

Do not remove lighthead when support arm is in down position. The balance mechanism will be severely damaged.

SECTION II POSITIONING AXES ADJUSTMENT

2-1. General

As a part of normal preventive maintenance, all fixture rotation axes adjustments should be checked and adjusted as necessary. Refer to figure 2-1 for location of desired check or adjustment procedure.



A-Lighthead Pitch Axis **paragraph 2-2**
B-Lighthead Roll Axis-
•Model 29 lighthead **paragraph 2-3**
•Model 23 lighthead **paragraph 2-4**
C-Vertical Travel Tension **paragraph 2-5**
D-Lighthead Horizontal Rotation **paragraph 2-6**
E-Radial Arm Horizontal Rotation **paragraph 2-7**

Figure 2-1. Fixture Rotation Axis

2-2. Lighthead Pitch Adjustment

a. Check the pitch axis tension of each lighthead by moving it through its full range of motion. See figure 2-2.

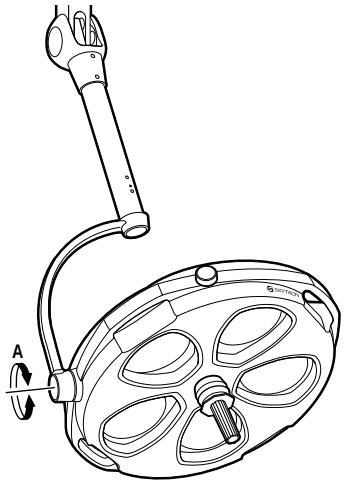


Figure 2-2. Lighthead Pitch

b. The lighthead should move freely yet maintain its position without drifting. If an adjustment is required, remove the top cover, refer to figure 2-3 and proceed as follows:

c. Rotate the lighthead until an allen set screw is visible through the adjustment hole. Loosen the set screw, rotate the lighthead 180° and loosen the second set screw.

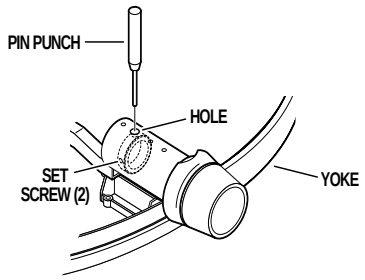


Figure 2-3. Lighthead Pitch Adjustment

d. Rotate the lighthead until a hole is visible and insert a pin punch into the hole in the adjustment nut.

e. With the nut held captive with the pin punch, rotate the lighthead clockwise to increase the friction or counterclockwise to decrease the friction.

f. Remove pin punch and check adjustment. Tighten set screws and replace top cover when adjustment is complete.

2-3. Model 29 Lighthead Roll Adjustment

a. Check the roll axis tension of the model 29 lighthead by moving it through its full 360° range of travel. See figure 2-4.

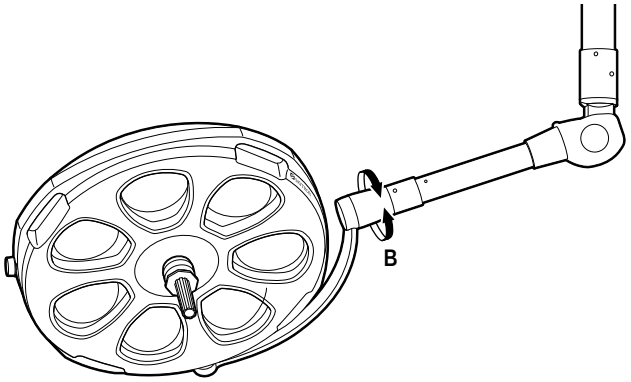


Figure 2-4. Model 29 Lighthead Roll

b. The lighthead should move freely yet maintain its position without drifting. If the lighthead drifts, refer to figure 2-5 and proceed as follows:

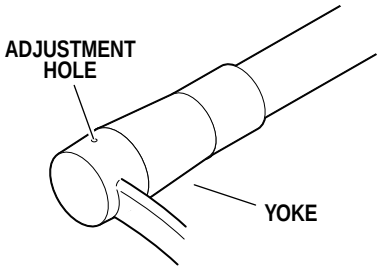


Figure 2-5. Model 29 Roll Adjustment

c. Rotate the yoke until an allen set screw is visible through the adjustment hole and loosen the set screw.

d. Continue to rotate the yoke until a 5mm hole is visible through the hole. Insert a pin punch into the hole in the adjustment nut.

e. With the tension nut held captive with the pin punch, rotate the yoke clockwise (viewed from the front) to increase the friction and counterclockwise to decrease the friction.

f. Remove pin punch and check the lighthead for proper tension. Repeat adjustment procedure if necessary. After the adjustment is correct, be sure to tighten the set screw

2-4. Model 23 Lighthead Roll Adjustment

a. Check the roll axis tension of the model 23 lighthead by moving it through its full 360° range of travel. See figure 2-6.

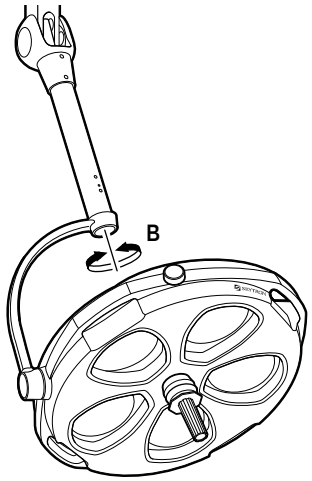


Figure 2-6. Model 23 Lighthead Roll

b. The lighthead should move freely yet maintain its position without drifting. If an adjustment is required, refer to figure 2-7 and proceed as follows:

c. Rotate the yoke until an allen set screw is visible through the adjustment hole and loosen the set screw. Rotate the yoke 180° and loosen the second set screw.

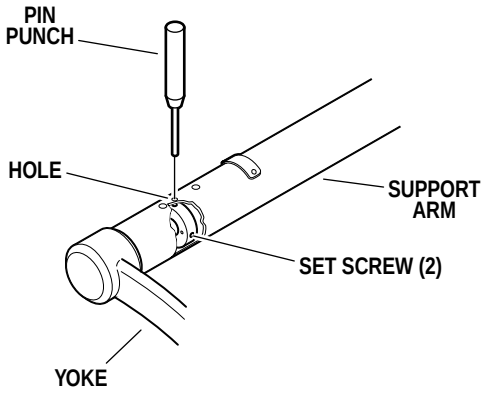


Figure 2-7. Model 23 Roll Adjustment

d. Continue to rotate the yoke until a 5mm hole is visible through the hole. Insert a pin punch into the hole in the adjustment nut.

e. With the tension nut held captive with the pin punch, rotate the yoke clockwise (viewed from the front) to increase the friction and counterclockwise to decrease the friction.

f. Remove pin punch and check the lighthead for proper tension. Repeat adjustment procedure if necessary. After the adjustment is correct, be sure to tighten the set screws.

2-5. Vertical Travel Tension Adjustment

a. Check the adjustment of the Balance Mechanism for its capacity to support the lighthead throughout its range of vertical motion. See figure 2-8.

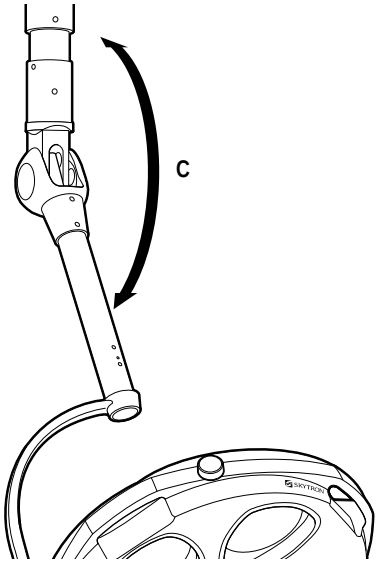


Figure 2-8. Lighthead Vertical Travel

b. The lighthead should move freely yet maintain its selected position within the range of motion without drifting. If an adjustment is necessary, refer to figure 2-9, and proceed as follows.

c. Remove two screws securing the cover plate and remove the cover plate from the Horizontal Support Arm.

d. Pull the lighthead downward until the adjustment nut is visible through the adjustment slot in the support arm.

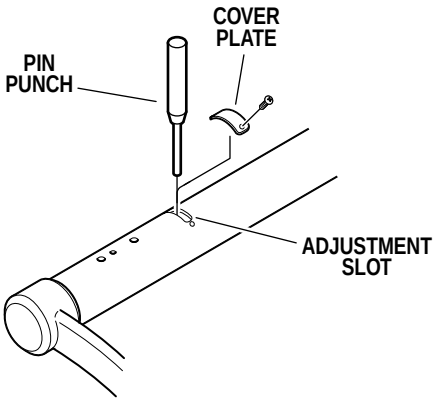


Figure 2-9. Vertical Travel Adjustment

e. Insert a pin punch through the adjustment slot and into a hole of the spring tension adjustment nut. Using the pin punch, turn the adjustment nut clockwise to increase the tension, counterclockwise to decrease the tension.

f. Remove the pin punch, check and repeat adjustment procedure as necessary to achieve proper spring tension. The lighthead should be able to hold its position at any angle from the VST.

g. Reinstall cover plate on the Horizontal Support Arm.

2-6. Horizontal Rotation Axis Adjustment

a. Check horizontal rotation axis adjustment by moving the lighthead through its full range of travel around the Balance Mechanism. See figure 2-10.

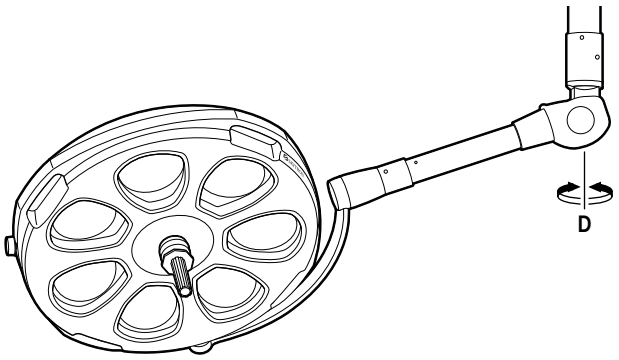


Figure 2-10. Horizontal Rotation

b. The lighthead should maintain its position without drifting, yet move freely around the Balance Mechanism. Normally this adjustment is correct from the factory and does not change. If the lighthead drifts, the most likely cause is an unlevel mounting plate.

NOTE

•Recheck the mounting plate to make sure it is absolutely level. In most cases, releveling the mounting plate will solve any drifting problems.

•If the lighthead sticks or is difficult to move, before making any adjustments, lubricate the BOM needle bearings with a Teflon type spray lubricant such as TRI-FLOW (available from Richardson-Vicks, Inc., Memphis, TN) or equivalent. See figure 2-11. After spraying, rotate the lighthead several times in both directions and recheck for proper tension.

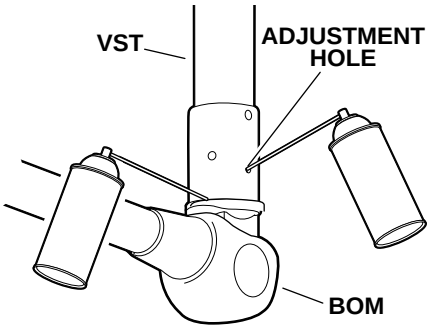


Figure 2-11 . BOM Lubrication

c. If releveling the mounting plate or lubricating the BOM needle bearings does not correct the problem, an adjustment may be required. This adjustment is made by increasing or decreasing the bearing preload. Refer to figure 2-12 and proceed as follows:

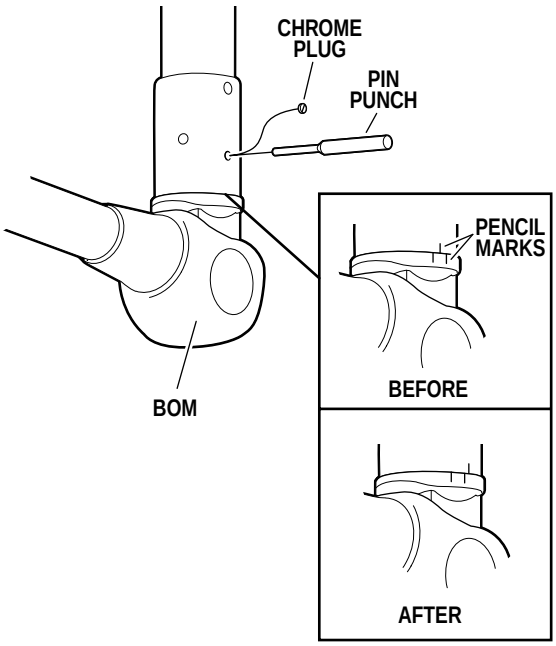


Figure 2-12. Horizontal Rotation Adjustment

d. Locate the adjustment hole. This hole is located just beneath the lower VST screws in the BOM and has a slotted head chrome plug in it.

e. Remove the chrome plug, rotate the lighthead around the Balance Mechanism until any set screws are visible through the adjustment hole and loosen them.

f. Continue to rotate the lighthead until a hole in the nut is visible through the adjustment hole. Insert a pin punch through the adjustment hole and into the hole in the nut.

g. To determine the amount of adjustment, rotate the lighthead so the pin punch is touching one side of the adjustment hole and use a pencil to mark a reference line as shown in figure 2-12. Rotate the lighthead so the pin punch is touching the other side of the adjustment hole and mark another reference line as shown in figure 2-12.

h. With the nut held captive by the pin punch, rotate the lighthead so that the pencil marks are approximately 1/8" apart. Turn the lighthead clockwise (viewed from the bottom) to increase the tension and counterclockwise to decrease the tension. In some cases it may require considerable force on the lighthead to make this adjustment.

i. Remove the pin punch and check the lighthead for proper tension. Repeat adjustment procedure if necessary. When proper adjustment has been achieved, tighten the set screws and install the chrome plug.

2-7. Radial Arm Horizontal Rotation Axis

a. Check the horizontal rotation axis tension by moving the Radial Arms through their full range of travel around the center mounting hub. Refer to figure 2-13.

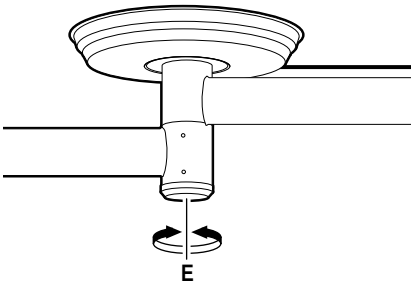


Figure 2-13.

b. The Radial Arms should maintain their position without drifting yet move freely around the hub. Normally this adjustment is correct from the factory and does not change. If the Radial Arms drift, the most probable cause is an unlevel mounting plate.

NOTE

Recheck the mounting plate to make sure it is absolutely level. In most cases releveling the plate will solve any drifting problem.

c. If releveling the mounting plate does not correct the drift, or the Radial Arms are difficult to move, the bearing preload must be adjusted. This requires the use of special tools. Contact your SKYTRON dealer for assistance.

2-8. Bulb Voltage Adjustment

To insure maximum intensity and to prolong bulb life, the voltage applied to the lighthead should be 20VAC ± 0.2V. Use the following procedures to test and adjust the bulb applied voltage.

NOTE

The internal circuitry used in the Stellar system requires the use of a **true RMS type digital voltmeter** to accurately set the bulb voltage. Premature bulb failure will result from incorrect voltage

a. Remove top cover from VST end of radial arm and test bulb voltage at the wire connections. Turn main power "ON" and set the Dimmer Control for the lighthead being tested to maximum intensity for the test. Output voltage (at the connectors) should be 20V ± 0.2V. See figure 2-14.

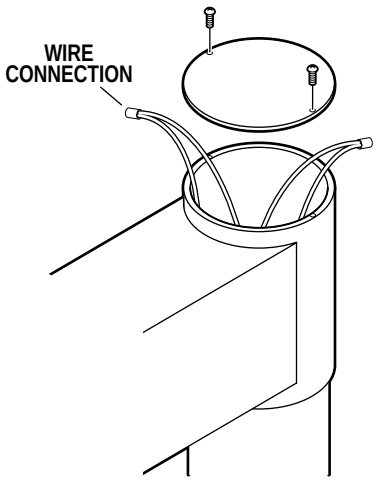


Figure 2-14. Bulb Voltage Test

b. Adjust the voltage to the lighthead by turning the adjuster on the back of the appropriate dimmer control in the wall control. See figure 2-15.

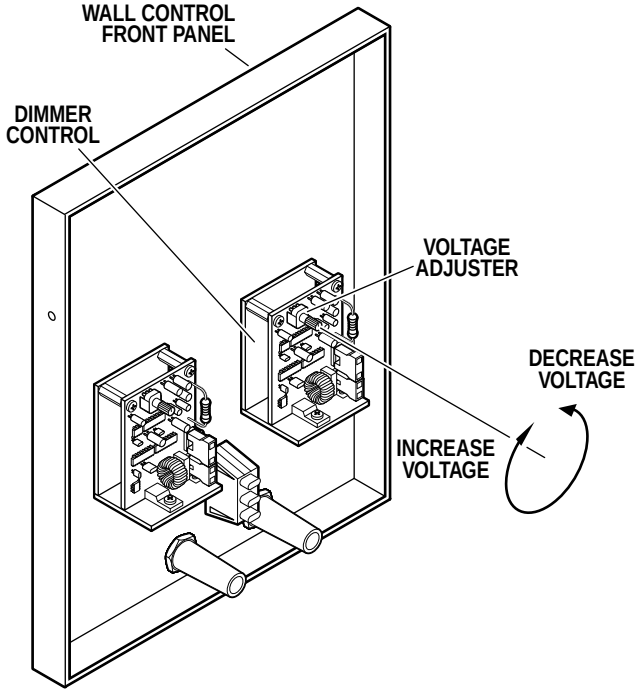


Figure 2-15. Voltage Adjustment

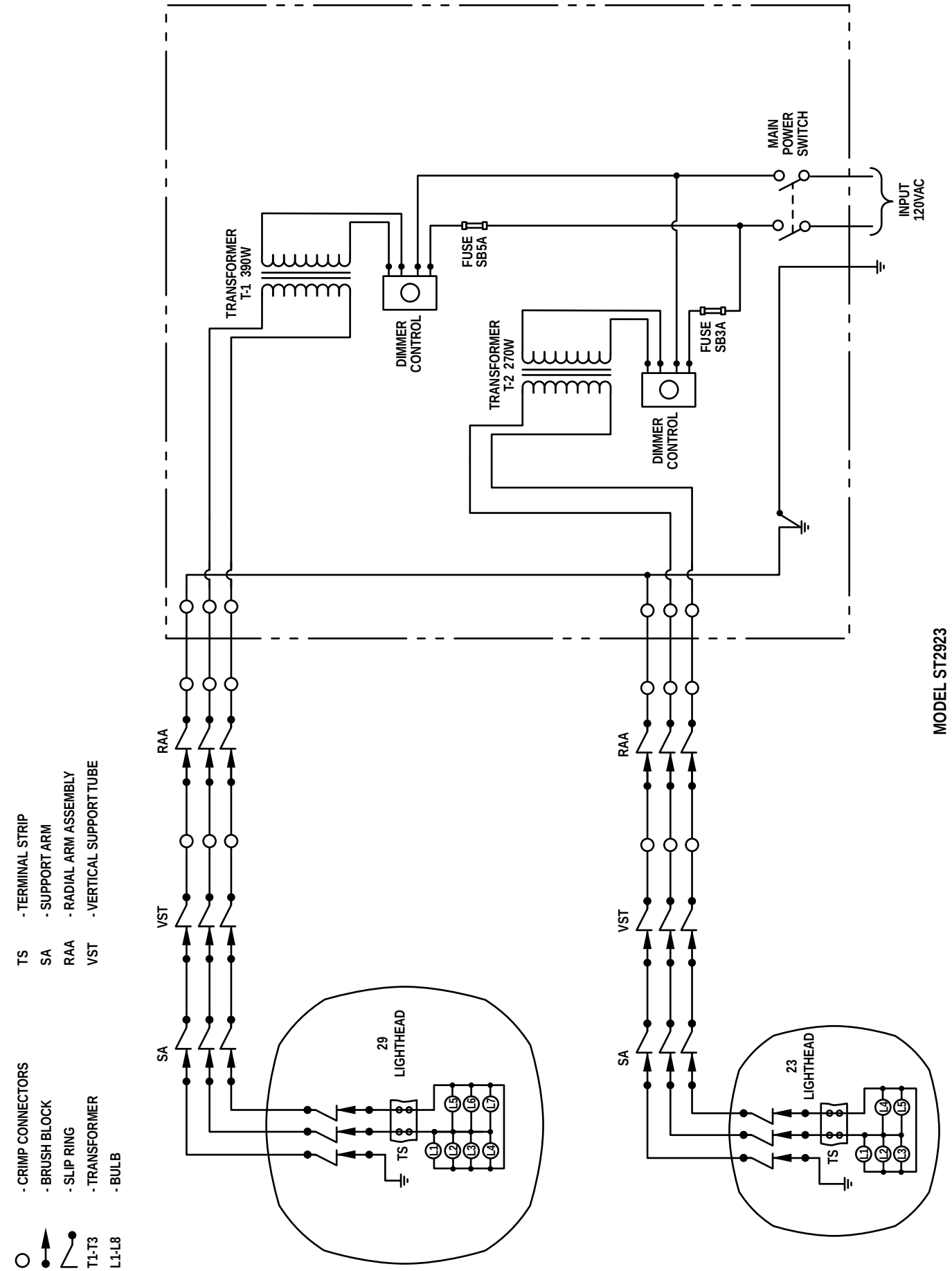
c. Turn the adjuster clockwise to increase the output voltage, counterclockwise to decrease the voltage. Proper voltage at the connectors should be 20V ± 0.2V.

Service

Preventative maintenance performed by SKYTRON factory trained service representatives, using authorized parts and service techniques, will assure the extended and reliable performance of your SKYTRON Surgical Light.

For factory service contact your nearest SKYTRON dealer or write: SKYTRON, 5000 - 36th St., S.E., Grand Rapids, MI 49512 / Phone (616) 957-0500.

WIRING DIAGRAM



MODEL ST2923

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