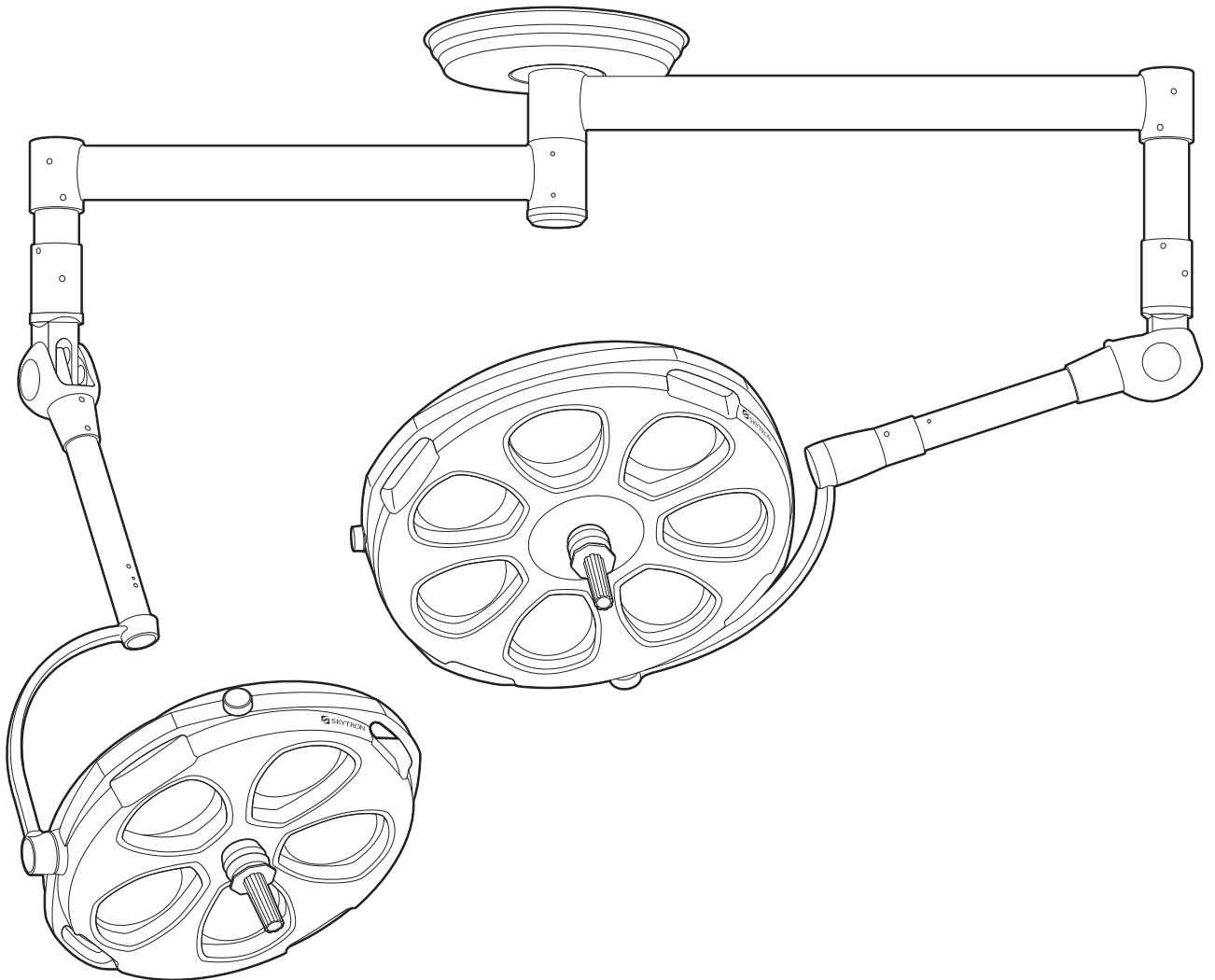


INSTALLATION INSTRUCTIONS



STELLAR

SERIES

SURGICAL LIGHTS

EQUIPMENT LABELS AND SPECIFICATIONS



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



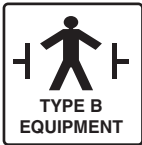
AC VOLTAGE



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

ENTE LA CERTIFIED

TO UL2601-1

CAN/CSA601.1, IEC 60601-2-46



TOOLS REQUIRED:

3/8" DRIVE RATCHET
ALLEN WRENCH SET-METRIC
(2) STEP LADDERS
3/4" DEEP SOCKET, 3/8" DRIVE
#2 PHILLIPS HEAD SCREW DRIVER
UTILITY KNIFE
WIRE CUTTERS

CRIMP PLIERS
DIGITAL LEVEL
TRUE RMS MULTIMETER
PORTABLE LIFT, 750LB. CAPACITY
12" ADJUSTABLE WRENCH
SLOTTED HEAD SCREWDRIVER 1/4"
PUNCHSET 1/8" - 3/8"

Although current at the time of publication, SKYTRON'S policy of continuous development makes this manual subject to change without notice.

ELECTRICAL REQUIREMENTS

This fixture requires that electrical connections are made by a licensed electrician in accordance with state, local and national electrical codes using UL (Underwriters Laboratory) recognized materials.

Do not turn on main power to fixture until all lightheads are installed, connections are complete and the fixture has been reviewed by a SKYTRON representative.

ELECTRICAL HAZARDS EXIST!

Excercise caution when working on this fixture, the installation of this fixture must be made only by qualified and authorized personnel familiar with the essential knowledge and techniques.

CONNECTION MEANS



CAUTION



Connection of the fixture wires must be made using crimp connectors. Main terminal devices shall be so located or shielded that, should a wire of a stranded conductor escape when the conductors are fitted, there is no risk of accidental contact between live parts and accessible parts. Acceptable sheilding methods include UL aproved shrink tubing and electrical tape.

NATIONAL ELECTRICAL CODE, NFPA & ANSI REQUIREMENTS

The installation of connecting cords between equipment parts shall meet the requirements of the Nation Electrical Code, ANSI/NFPA70 as applicable.

BENDING REQUIREMENTS

Connection leads shall be constructed in such a manner that moveable leads in normal use are not bent around a radius of less than five times the outer diameter of the lead concerned. Avoid conditions employing severe bends to ensure the integrity of conductors.

CONDUIT REQUIREMENTS

This fixture requires 2 dedicated conduit raceways at the wall control to separate the 120VAC supply lines from the supply lines to the lighting fixture. Failure to observe this requirement will allow the migration of Electrical Magnetic Interference and will disrupt the operation of the lights.

Use of approved metal conduit shall be employed throughout the fixture's wiring circuit where applicable.

PROTECTIVE MEANS

This fixture requires a properly circuit protected, dedicated, 120VAC, 20 amp circuit. An isolated power supply circuit must be protected by a 20amp, double pole, single throw circuit breaker.

Proper performance and safety of this fixture can only be achieved by an adequate grounding system. Fixture ground must be a dedicated ground point ultimately bonded to the facilities grounding system to prevent the migration of electrical interference generated by other devices.

SPECIAL USER ATTENTION

The procedures described in this manual will be performed by representatives of the owner (staff or contracted service), therefore it is the responsibility of the owner to ensure that all safety precautions are followed.

The following precautionary instructions are used in this manual.



WARNING



Indicates a possibility of personal injury.



CAUTION



Indicates a possibility of damage to equipment.

NOTE

Indicates important facts or helpful hints.



WARNING



The mounting plate must be accurately leveled within 0.1° to prevent lighthouse drift.

NOTE

Special Seismic calculations are available if required.

NOTE

- The multiple arm assemblies are easier to handle during installation if the arms are left taped and tied together.

- In some cases it may be necessary to connect the electrical wires from the wall control to the radial arm junction box before the arm assembly can be bolted to the mounting plate.

- Use two 6" to 8" bolts to hold fixture while connecting wiring.

NOTE

Radial Arm wires are tagged for proper connection to the Wall Control (top arm #1, next arm #2, bottom arm [triple arm models] #3).



CAUTION



Connection of the fixture wires using Crimp Connectors is required due to the low voltage/high amperage electrical requirements.

NOTE

Details may vary depending upon model and support structure fabrication.

ALL fixtures use METRIC fasteners.

NOTE

Determine correct placement for each Balance Mechanism (BOM)/Vertical Support Tube (VST) on the radial arm assembly. The longest VST goes into the top radial arm.

SPECIAL USER ATTENTION

**WARNING**

Apply Blue Loc-Tite to all of the 6mm mounting screws and use a 4mm allen wrench to tighten the screws.

**CAUTION**

The 6mm mounting screws for attaching the VST to the radial arm may be different lengths. Observe any color code markings and make sure the proper screws are installed in the proper holes to avoid any damage to the electrical components.

**WARNING**

DO NOT remove lighthead when support arm is in down position; The balance mechanism will be severely damaged and may result in bodily injury.

**WARNING**

DO NOT remove lighthead when support arm is in down position; The balance mechanism will be severely damaged and may result in bodily injury.

NOTE

- 3/4" conduit and minimum 12AWG wire (3 wires per lighthead) is required between Wall Control and Fixture.

- All wiring to be in accordance with local electrical codes.

NOTE

Hardware required for the installation of the wall control assembly must be provided by the facility

NOTE

Control Box wires are tagged for proper connection to the fixture.

**CAUTION**

120 VAC isolated power supply requires double pole, single throw 20 amp (maximum) breaker.

**CAUTION**

TO AVOID BLOWING FUSES, DO NOT TURN MAIN POWER TO FIXTURE "ON" UNTIL ALL LIGHTHEADS ARE INSTALLED AND ALL WIRING CONNECTIONS ARE COMPLETED.

**CAUTION**

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.

Preinstallation Requirements

1. Appropriate conduit & wiring installed from wall control mount to ceiling mounting structure. Flexible conduit to extend 18" below finished ceiling.
2. 120VAC, dedicated power supply line to be provided at wall control.
3. Paining and flooring must be complete prior to fixture installation.
4. Optional Camera System Models require a 1" conduit from mounting plate to control unit J-box.



MODEL ST2923
1 - 29" Diameter Lighthead
1 - 23" Diameter Lighthead



MODEL ST292323
1 - 29" Diameter Lighthead
2 - 23" Diameter Lightheads



MODEL ST29
1 - 29" Diameter Lighthead

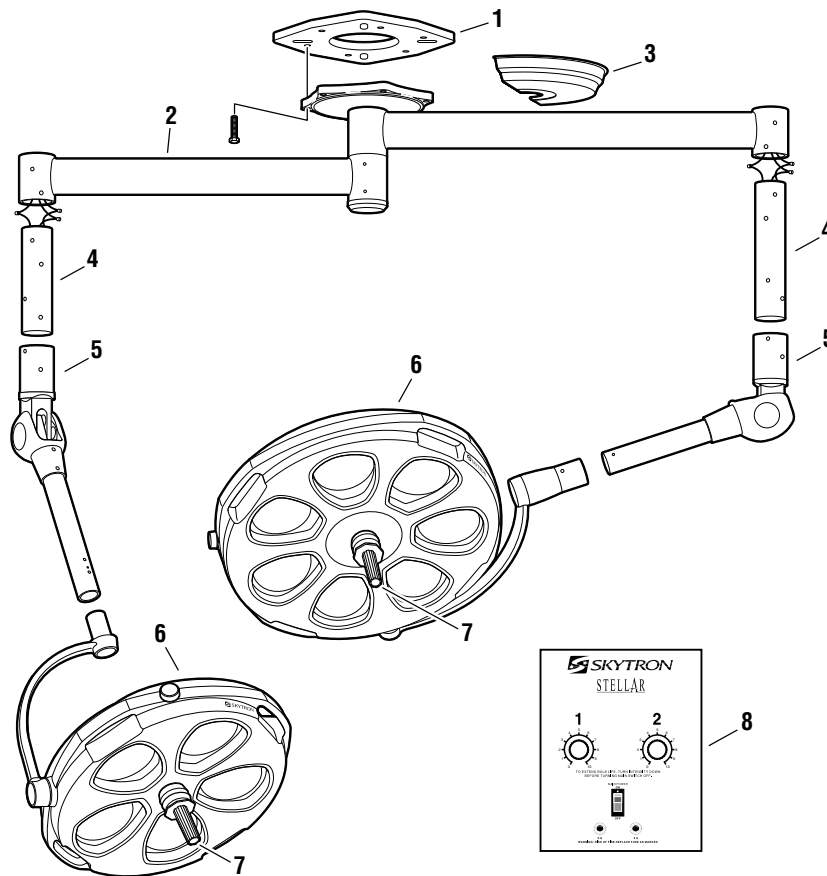
MODEL ST23
1 - 23" Diameter Lighthead



MODEL ST2323
2 - 23" Diameter Lightheads



MODEL ST232323
3 - 23" Diameter Lightheads



TYPICAL INSTALLATION SEQUENCE / COMPONENT IDENTIFICATION

- | | |
|-------------------------------|------------------------------------|
| 1. Mounting Plate | 5. Balance Mechanism(BOM) |
| 2. Radial Arm Assembly(RAA) | 6. Lighthead |
| 3. Ceiling Cover | 7. Sterilizable Positioning Handle |
| 4. Vertical Support Tube(VST) | 8. Wall Control |

INSTALLATION NOTES

- The SKYTRON Surgical Lighting Fixture is normally shipped in two to four crates, depending on the model. A carton containing the Vertical Support Tubes, miscellaneous hardware, and various instructional materials is packed separately.
- Follow the Installation Instructions and utilize the Installation Check List to assure proper installation.
- Special adapter plates for mounting SKYTRON surgical lights on existing mounting structures are available. Contact your SKYTRON representative for special application details.

- Additional materials required for proper installation include Loc-Tite compound.

- Stellar Series lighting fixtures require a wall mounted control box. Single and Dual Lighthead models 8" x 10", for Triple 10" x 13-1/2". 3/4" conduit and minimum 12 AWG wire is required between wall control and fixture. 10 AWG wire is recommended for installations requiring wires between control box and fixture that are longer than 25'.

- Contact SKYTRON representative for Seismic calculations if applicable.

UNCRATING

- Should any damage to the fixture be noted while uncrating, further unpacking should be stopped and the container with all the wrappings held for inspection. The transportation company should be notified immediately so an inspector can be sent. Consult the Damaged Shipment Claim Procedure sheet for further details.

- Personnel uncrating SKYTRON surgical lights should be aware that they are delicate medical equipment and special care in handling should prevail throughout installation.

RADIAL ARM ASSEMBLY

- When the radial arm assembly is removed from the crate and set on the floor prior to mounting it, be sure the mounting flange is toward the floor. If the arm assembly is set on the floor upside down the hub cover may be damaged. See figure 1.

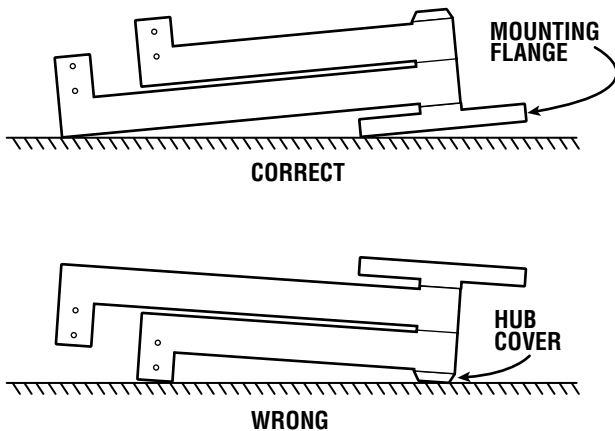


Figure 1. Radial Arm Assembly

LIGHTHEADS

- Use extreme caution when removing the contents from the crates to prevent damage to the lights. Leave the lighthead in their crates until ready to install.

- If the lighthead must be set down after it is removed from the crate, always lay it on the foam shipping block. Do not lay it on the front face.

UNCRATING PROCEDURE

Open the top of the lighthead box and remove the packing material, remove the sterilizable positioning handle and remove lighthead from the crate.

NOTE

Details may vary depending upon model and support structure fabrication.

ALL fixtures use METRIC fasteners.

INSTALLATION PROCEDURE

Specific seismic information is available for applications. Refer to seismic drawings. The lighting fixture should be installed in the following sequence:

1. Mounting Plate
2. Radial Arm Assembly and Ceiling Cover
3. Vertical Support Tubes/ Balance Mechanisms
4. Lighthead
5. Wall Control

1. Mounting Plate

a. Check the strength and stability of the mounting structure. It should be fabricated of steel and welded or bolted to the structural ceiling. It should be braced in a manner that will allow no twisting or lateral motion. In standard installations a steel stiffener plate should be used to connect the 3/4" diameter "all-thread" support rods and to provide an attachment base for the angle-iron sway bracing. The 3/4" diameter support rods should be mounted in a 9-1/2" square pattern and should extend 2-1/4" below the finished ceiling. **See Mounting Structure details in the back of this booklet.**

b. Install the SKYTRON mounting plate on the threaded rods between jam nuts. The plate should normally be located 1-3/8" off the finished ceiling (measured from the bottom of the plate) and accurately leveled, within 0.1 degree, using a digital level. Tighten the jam nuts securely. See figure 2.



WARNING



The mounting plate must be accurately leveled within 0.1° to prevent lighthead drift.

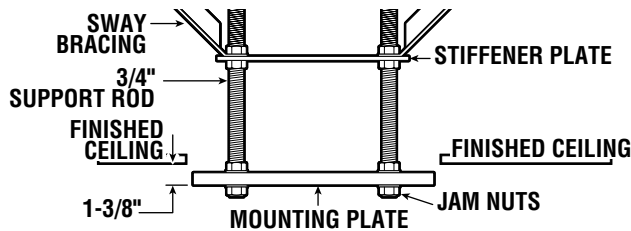


Figure 2. Mounting Plate Installation

NOTE

Specific seismic calculations are available if required.

2. Radial Arm Assembly and Ceiling Cover

NOTE

- The multiple arm assemblies are easier to handle during installation if the arms are left taped and tied together.
- In some cases it may be necessary to connect the electrical wires from the wall control to the radial arm junction box before the arm assembly can be bolted to the mounting plate.
- Use two 6" to 8" bolts to hold fixture while connecting wiring.

a. Install the Radial Arm Assembly(RAA) onto the mounting plate using the bolts provided. Tighten the mounting bolts securely.

NOTE

Radial Arm wires are tagged for proper connection to the Wall Control (top arm #1, next arm #2, bottom arm [triple arm models] #3).

b. Observe wire tags and color codes and connect the electrical wires from the wall control to the radial arm junction box wires.



CAUTION

Connection of the fixture wires using Crimp Connectors is required due to the low voltage/high amperage electrical requirements.

c. Install the ceiling cover and secure. See figure 3.

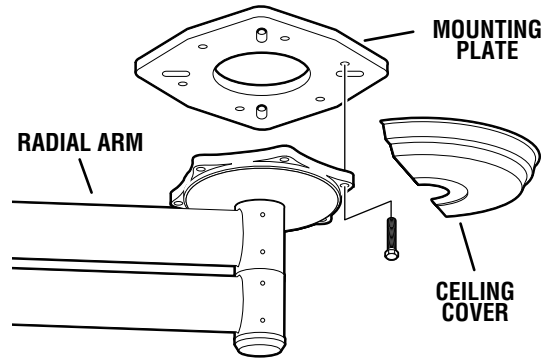


Figure 3. Radial Arm Installation

3. Vertical Support Tubes/Balance Mechanism

NOTE

Determine correct placement for each Balance Mechanism(BOM)/Vertical Support Tube(VST) on the radial arm assembly. The longest VST goes into the top radial arm.



WARNING

Apply Blue Loc-Tite to all of the 6mm mounting screws and use a 4mm allen wrench to tighten the screws.

a. Install the VST on the BOM, apply Blue Loc-Tite to screw threads and secure VST with the allen screws provided. See figure 4.



CAUTION

The 6mm mounting screws for attaching the VST to the radial arm may be different lengths. Observe any color code markings and make sure the proper screws are installed in the proper holes to avoid any damage to the electrical components.

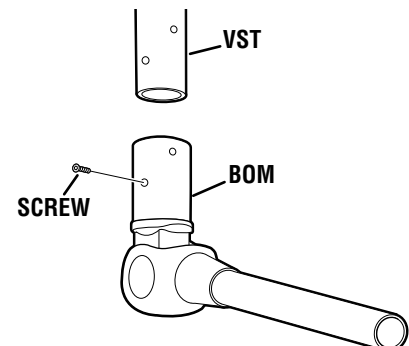


Figure 4. Balance Mechanism

b. Observe the wire colors and connect the wires from the radial arm to the corresponding BOM/VST wires using crimp connectors. See figure 5.

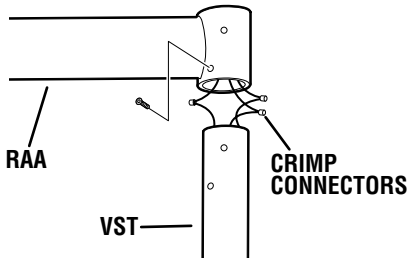


Figure 5. VST to RAA Installation

c. Insert the vertical support tube into the radial arm receptacle. Observe any screw color codes, apply Loc-Tite to screw threads, and secure the BOM/VST assembly with the 6mm mounting screws. Repeat procedure for any remaining BOM/VST assemblies.

4. Model 29 Lighthead

Refer to Model Identification for correct lighthead placement.

a. To make it easier to install the lighthead, locate the support arm of the balance mechanism so that it points inward toward the ceiling cover. This will prevent the radial arm from moving when installing the lighthead. See figure 6.

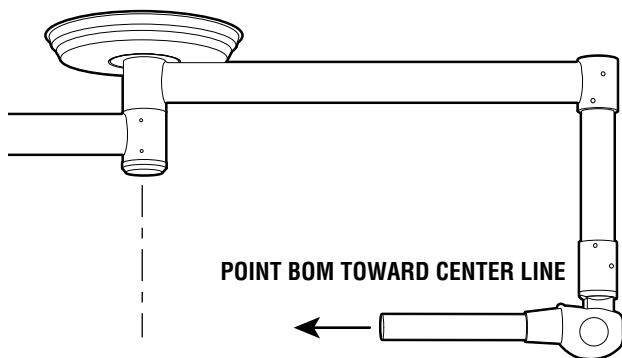


Figure 6.

b. Remove the four (4) screws from the lighthead mounting stub.

c. Install the lighthead mounting collar onto the support arm and secure with the screws previously removed. See figure 7.

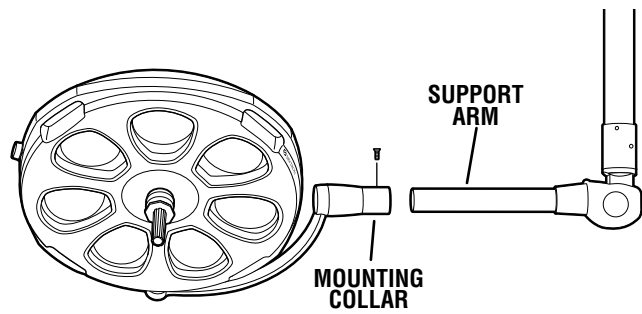


Figure 7. Model 29 Lighthead Installation

d. Pull the lighthead down and remove the Above Horizontal Limit Stops from the BOM. See figure 8.



WARNING



DO NOT remove lighthead when support arm is in down position; The balance mechanism will be severely damaged and may result in bodily injury.

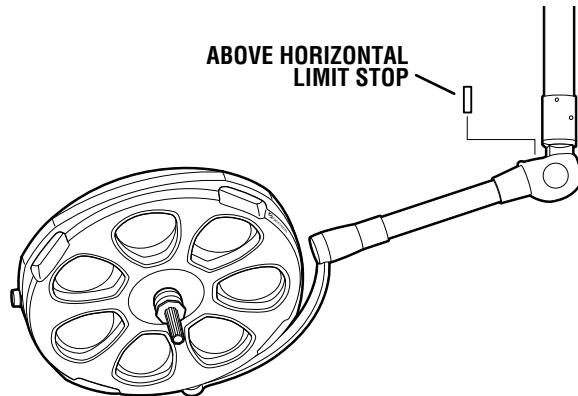


Figure 8. Above Horizontal Limit Stops

4. Model 23 Lighthead

a. To make it easier to install the lighthead, locate the support arm of the balance mechanism so that it points inward toward the ceiling cover. This will prevent the radial arm from moving when installing the lighthead. See figure 6.

b. Remove the four (4) screws from the lighthead mounting stub.

c. Install the lighthead mounting stub into the support arm and secure with the screws previously removed. See figure 9.

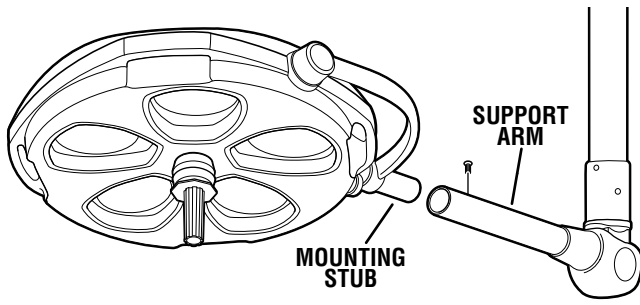


Figure 9. Model 23 Lighthead Installation

d. Pull the lighthead down and remove the Above Horizontal Limit Stops from the BOM. See figure 8.



WARNING

DO NOT remove lighthead when support arm is in down position; The balance mechanism will be severely damaged and may result in bodily injury.

5. Wall Control

NOTE

- 3/4" conduit and minimum 12AWG wire (3 wires per lighthead) is required between Wall Control and Fixture.

- All wiring to be in accordance with local electrical codes.

a. Install wall mounted control box using the following procedures.

b. Remove the transformer tray assembly from the wall control box for ease in wire connection. See figure 10.

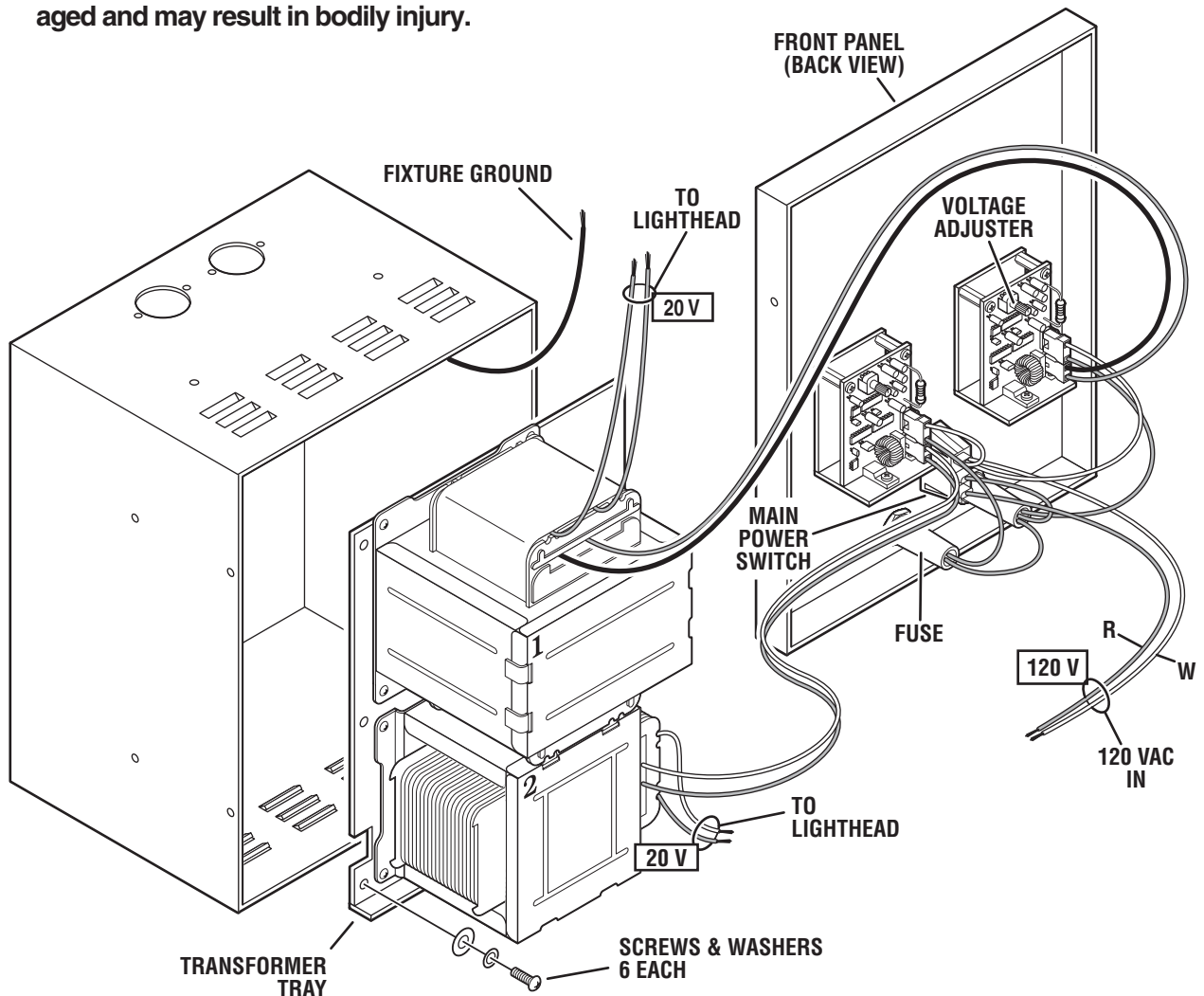
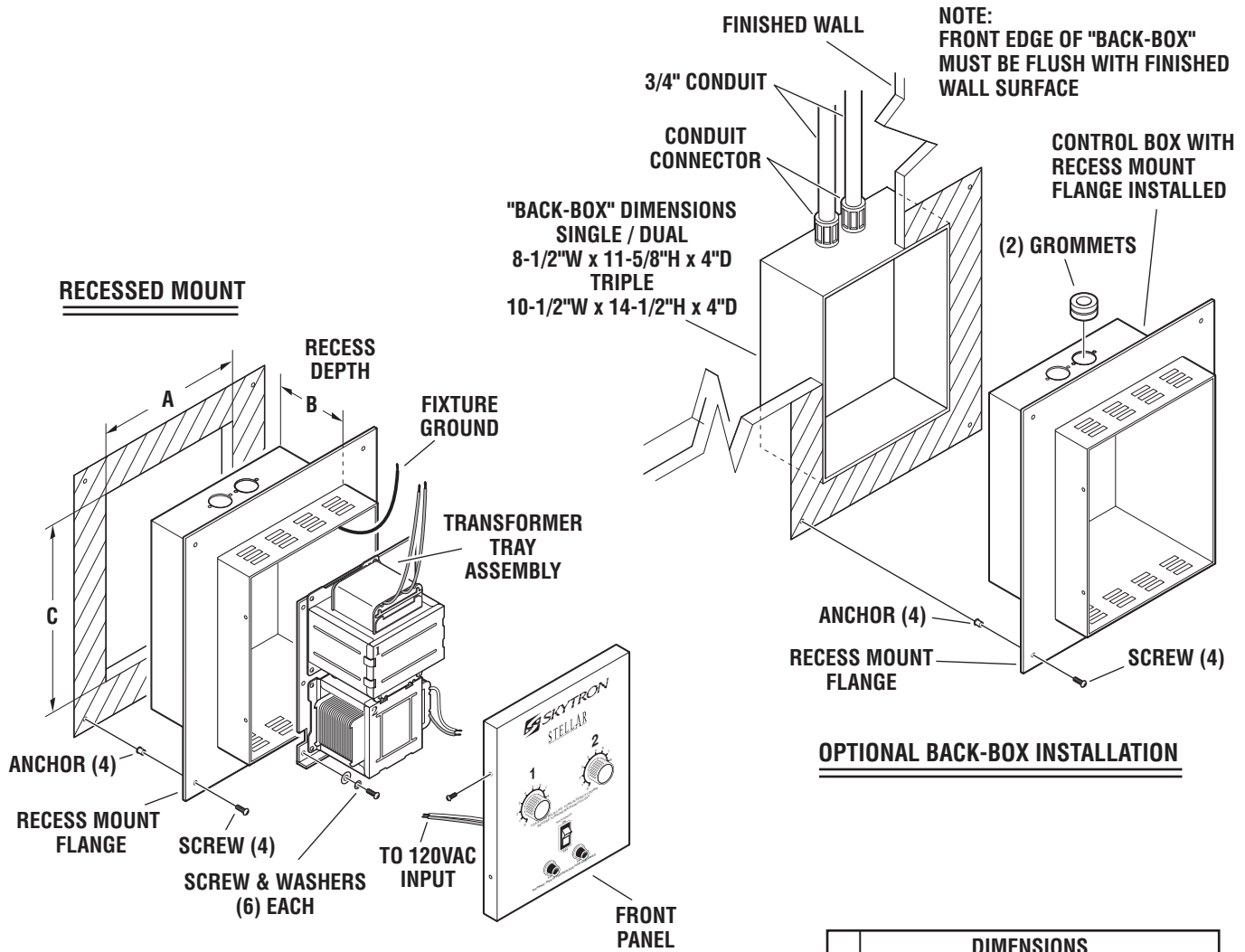


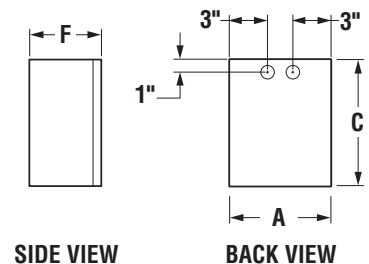
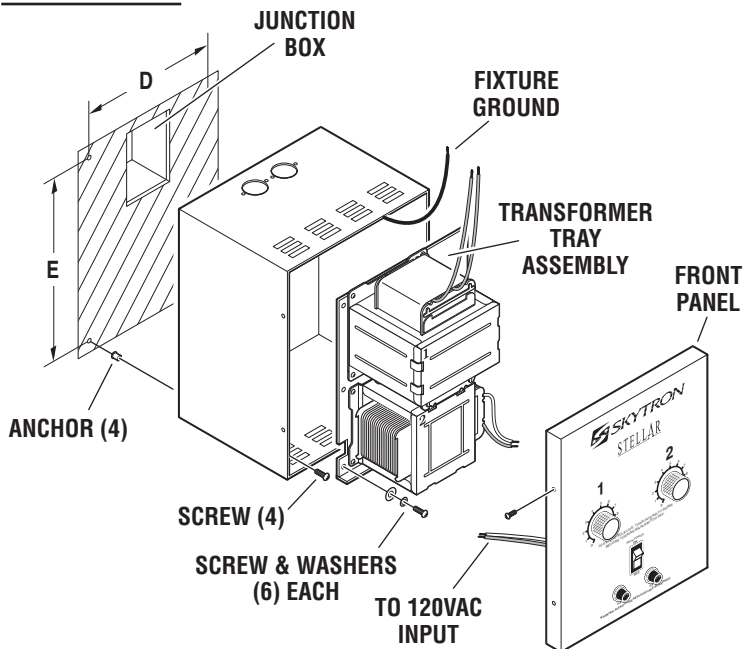
Figure 10. Wall Control



OPTIONAL BACK-BOX INSTALLATION

DIMENSIONS		
	SINGLE OR DUAL	TRIPLE
A	8"	10"
B	4"	4"
C	10"	13-1/2"
D	6-7/8"	8-5/8"
E	7-5/8"	11"
F	5-7/8"	6-3/8"
RECESS MOUNT FLANGE		
	11-3/4"W x 14"H	13-3/4"W x 17-1/4"H

SURFACE MOUNT



Stellar_wallcontrols_install.ai

Figure 11. Wall Control Installation

c. Install the wall control box as desired (surface or recessed mount) as shown in the wall control illustration, figure 11.

NOTE

Hardware required for the installation of the wall control assembly must be provided by the facility

NOTE

Control Box wires are tagged for proper connection to the fixture.

d. Observe wire tags and color codes and connect output leads to appropriate lighthouse wires using crimp connectors. See figure 10.



CAUTION

120 VAC isolated power supply requires double pole, single throw 20 amp (maximum) breaker.

e. Connect 120 VAC power supply to input wires and ground fixture properly.



CAUTION

TO AVOID BLOWING FUSES, DO NOT TURN MAIN POWER TO FIXTURE "ON" UNTIL ALL LIGHTHEADS ARE INSTALLED AND ALL WIRING CONNECTIONS ARE COMPLETED.

Output Voltage Adjustment

a. Remove top cover from VST and test bulb voltage at the wire connections. Turn main power "ON" and set the Dimmer Control for the lighthouse being tested to maximum intensity for the test. Output voltage (at the connectors) should be 20V ± 0.2V. See figure 12.



CAUTION

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.

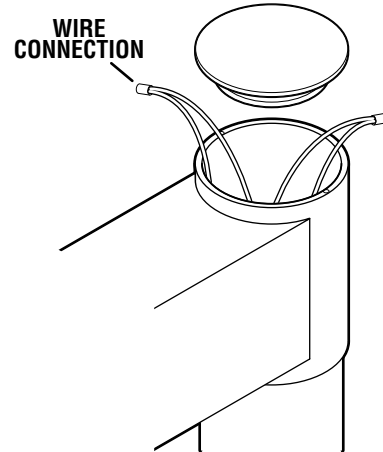


Figure 12. Bulb Voltage Test

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 13.

c. Turn the adjuster clockwise to increase the output voltage, counterclockwise to decrease the voltage.

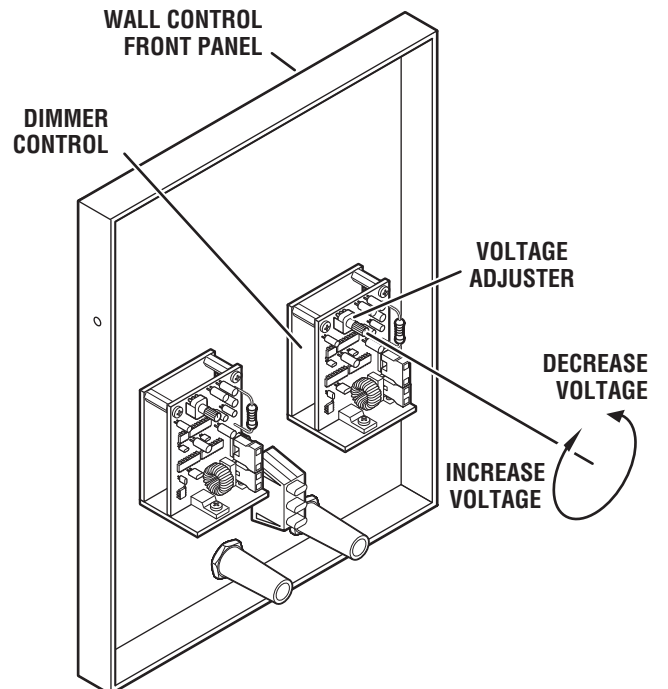
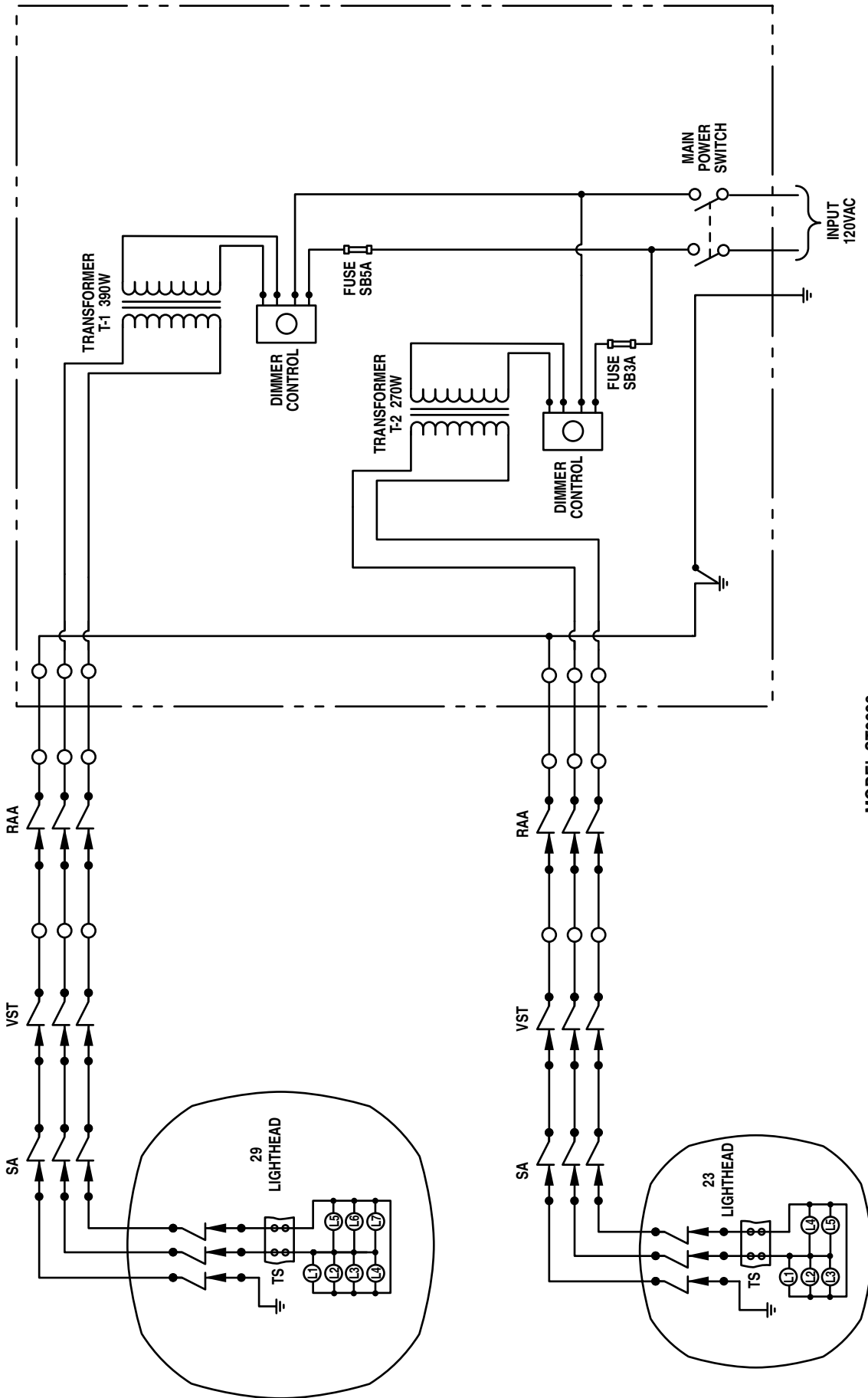


Figure 13. Voltage Adjustment

WIRING DIAGRAM

- - CRIMP CONNECTORS
- - BRUSH BLOCK
- ⌋ - SLIP RING
- T1-T3 - TRANSFORMER
- L1-L8 - BULB
- TS - TERMINAL STRIP
- SA - SUPPORT ARM
- RAA - RADIAL ARM ASSEMBLY
- VST - VERTICAL SUPPORT TUBE

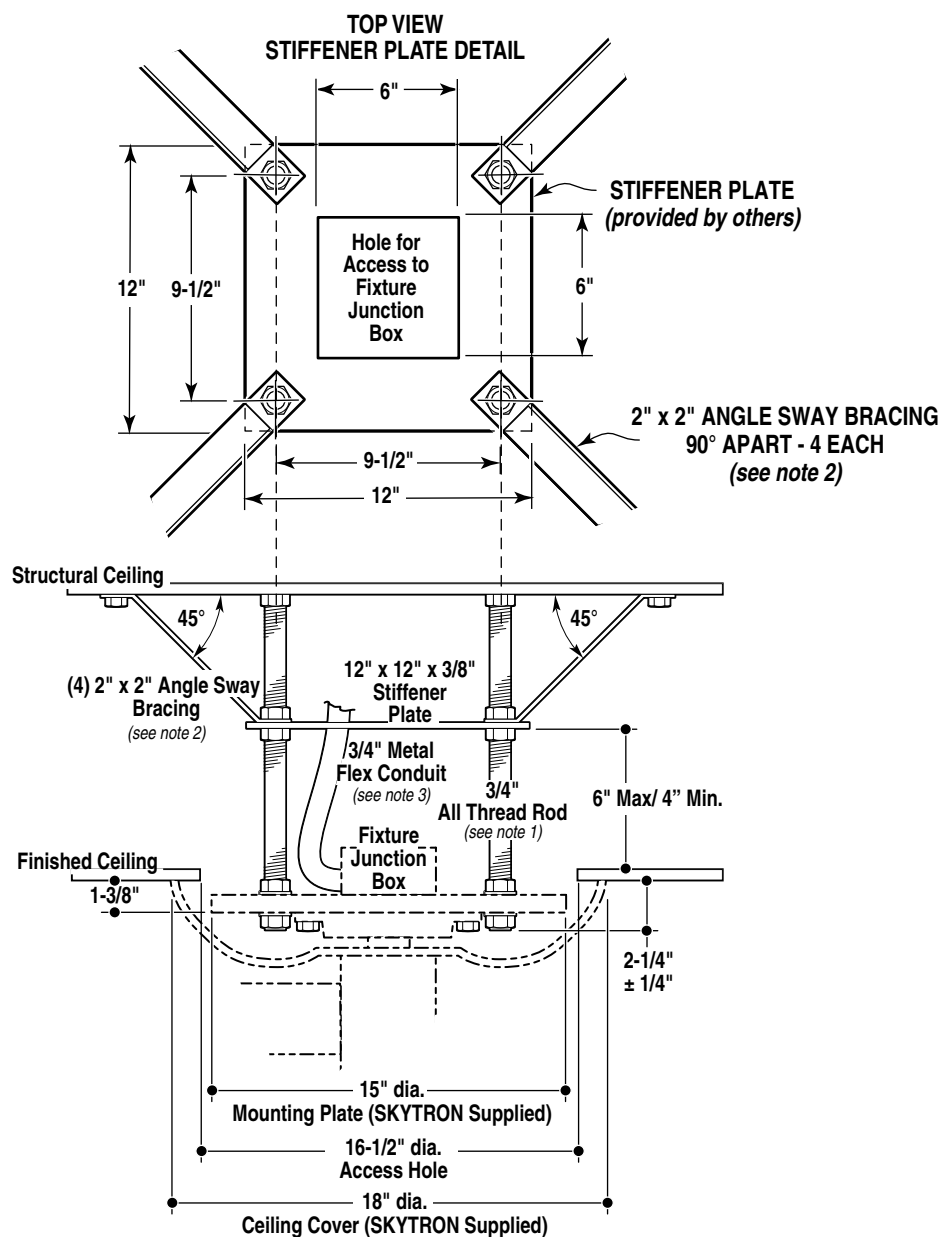


MODEL ST2923

IMPORTANT

120 VAC isolated power supply requires double pole, single throw 20 amp (maximum) breaker.

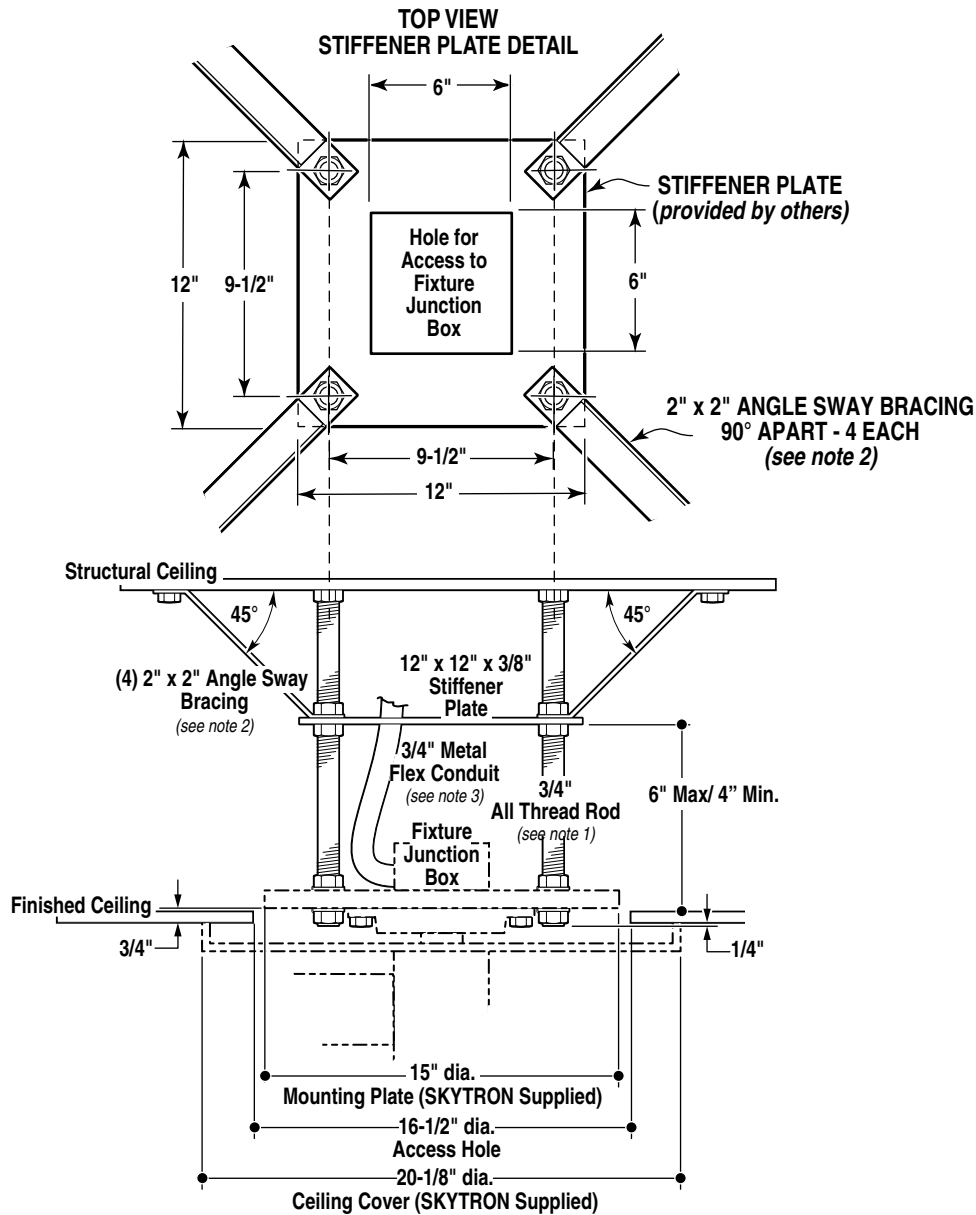
STANDARD MOUNTING STRUCTURE GUIDELINE



NOTES

1. 3/4" support rods located for total support of light, all labor and materials for fabrication supplied by General Contractor. 3/4" nuts and washers for support of SKYTRON mounting plate supplied by contractor (8 ea. required).
2. The mounting structure must be attached to structural ceiling and **BRACED TO ALLOW NO TWISTING OR LATERAL MOTION** and shall be designed not to provide a degree of rotation greater than two-tenths of a degree at the mounting plate.
3. 3/4" metal conduit and minimum 12AWG wire size (3 wires per lighthead) required between fixture and SKYTRON supplied wall control. All metal conduit, wiring, and other electrical materials as well as installation labor for such materials associated with the installation of the SKYTRON surgical light to be provided by Electrical Contractor. All installations of SKYTRON surgical lights should be under the direct supervision of a SKYTRON representative. All wiring to be in accordance with local codes and by a certified electrician.
CONTRACTOR HAS FINAL RESPONSIBILITY for the strength and stability of the Mounting Structure.
4. **This is a GENERAL GUIDELINE ONLY.**

RECESSED MOUNTING STRUCTURE GUIDELINE

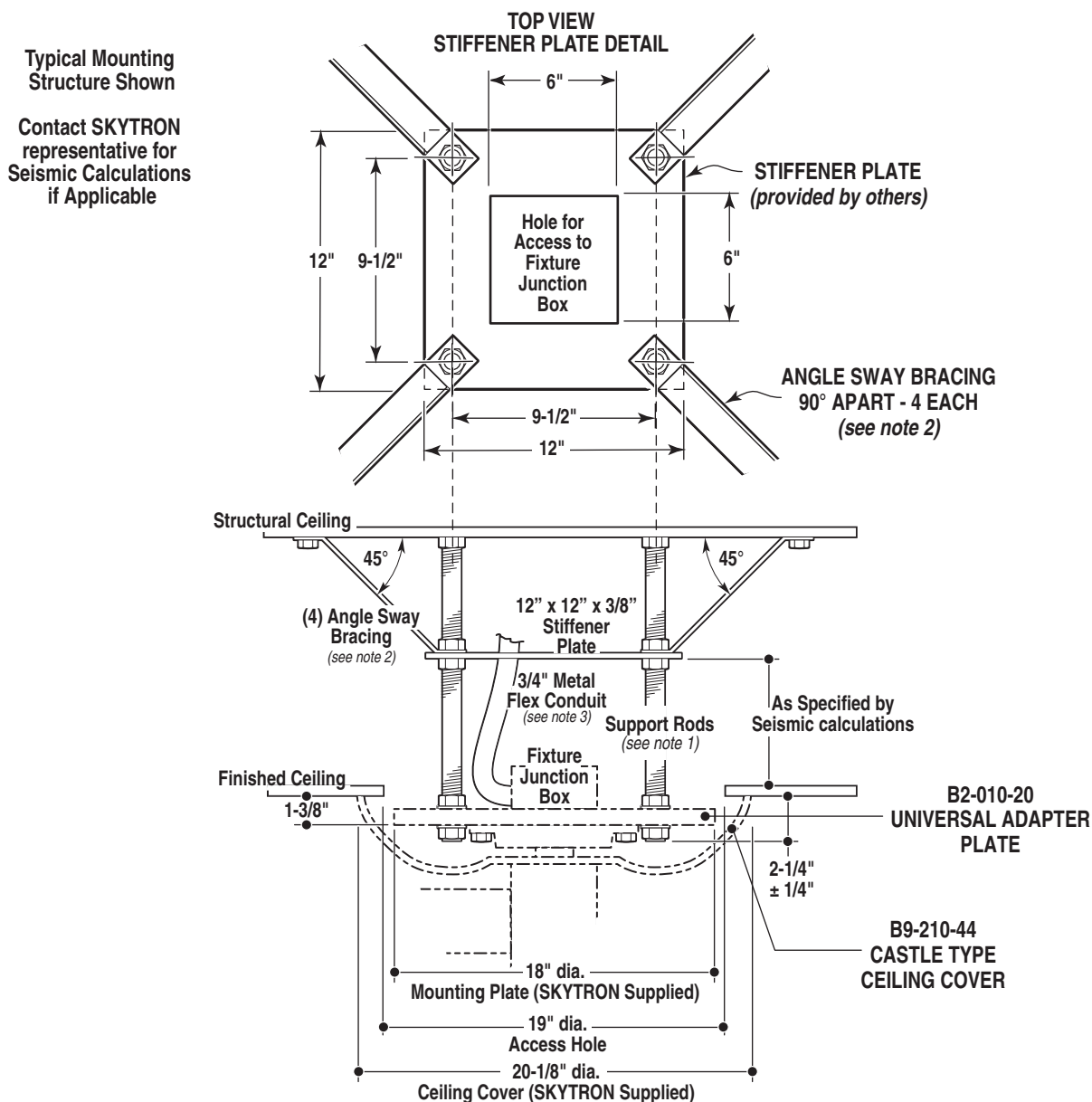


NOTES

1. 3/4" support rods located for total support of light, all labor and materials for fabrication supplied by General Contractor. 3/4" nuts and washers for support of SKYTRON mounting plate supplied by contractor (8 ea. required).
2. The mounting structure must be attached to structural ceiling and **BRACED TO ALLOW NO TWISTING OR LATERAL MOTION** and shall be designed not to provide a degree of rotation greater than two-tenths of a degree at the mounting plate.
3. 3/4" metal conduit and minimum 12AWG wire size (3 wires per lighthouse) required between fixture and SKYTRON supplied wall control. All metal conduit, wiring, and other electrical materials as well as installation labor for such materials associated with the installation of the SKYTRON surgical light to be provided by Electrical Contractor. All installations of SKYTRON surgical lights should be under the direct supervision of a SKYTRON representative. All wiring to be in accordance with local codes and by a certified electrician.
CONTRACTOR HAS FINAL RESPONSIBILITY for the strength and stability of the Mounting Structure.
4. **This is a GENERAL GUIDELINE ONLY.**

HEADROOM CLEARANCE INCREASE - 2"

SEISMIC APPLICATION MOUNTING STRUCTURE GUIDELINE



NOTES

1. Support rods as specified per seismic calculations are to be located for total support of light, all labor and materials for fabrication supplied by General Contractor. Nuts and washers for support of SKYTRON mounting plate supplied by contractor (8 ea. required).
2. The mounting structure must be attached to structural ceiling and **BRACED TO ALLOW NO TWISTING OR LATERAL MOTION** and shall be designed not to provide a degree of rotation greater than two-tenths of a degree at the mounting plate.
3. 3/4" metal conduit and minimum 12AWG wire size (3 wires per lighthead) required between fixture and SKYTRON supplied wall control. All metal conduit, wiring, and other electrical materials as well as installation labor for such materials associated with the installation of the SKYTRON surgical light to be provided by Electrical Contractor. All installations of SKYTRON surgical lights should be under the direct supervision of a SKYTRON representative. All wiring to be in accordance with local codes and by a certified electrician.
CONTRACTOR HAS FINAL RESPONSIBILITY for the strength and stability of the Mounting Structure.
4. **This is a GENERAL GUIDELINE ONLY.**

DAMAGED SHIPMENT CLAIM PROCEDURE

Whenever a shipment suffers damage while in the custody of the transportation company, the responsibility lies with the transportation company, and the value of the damages can be collected from the transportation company if the proper procedures are followed.

When a shipment is received in a damaged condition and due to the appearance of the containers such as a broken crate, torn wrapping, or smashed carton, the contents may have been damaged. That fact should be noted on the Bill of Lading offered by the transportation company. An example of an applicable statement would be; "Received in good order except as noted" or "Crate damaged, possibility of concealed damage." The addition of these types of statements on the shipping documents will automatically give grounds for starting a claim.

If damage cannot be identified on the exterior of the container, but is found when the container is opened, further unpacking should be stopped immediately and the container with all wrapping or packing materials should be held. The transportation company should be notified so an inspector can be sent. Failure to follow either of these two procedures may result in an inability to file a claim and collect for damage done. Returning the container to the sender without such an inspection may prevent filing a claim, because it will divide the responsibility for damage and in many cases the transportation company will return the shipment to the sender without charge after the inspection.

The claim itself may be filed by either the shipper or consignee, but the consignee must notify the transportation company and the shipper that the damage has occurred. Remember that refusal of the shipment or failure to note the possibility of damage on the shipping documents may jeopardize the claim. Also, acceptance of a damaged shipment which has been processed properly to allow for filing a claim, will not jeopardize the position of the consignee. In any case, SKYTRON will see that damage which is not the fault of the consignee or his agents is corrected, if the transportation company does not honor the claim, as long as SKYTRON receives the full cooperation of the consignee in filing the claim.

Some of the papers needed for filing a claim are in the hands of the consignee after the shipment has been received. If SKYTRON must file a claim, we will request these papers by name from the consignee at such time as the claim is under discussion. We will require the originals of these papers and not copies.

Knowledge of the procedures outlined above and your cooperation in submitting damaged shipment claims will help both you, our customer, and SKYTRON by assuring the integrity of our products from manufacturing to installation.

Mounting Structure:

- Fabrication of structure correct _____
- Mounting plate set and level _____
- 3/4" conduit and (min) 12AWG wire from fixture to wall control _____

Wall Control:

- Wiring proper gauge _____
- Wire connections correct _____
- Cover screws installed _____
- Input voltage checked and adjusted as necessary _____

Radial Arm Assembly:

- Mounting bolts installed & tightened _____
- Wiring properly connected & assembly grounded _____
- Ceiling cover installed _____

Miscellaneous:

- Diffuser assemblies clean _____
- Clean fixture with cleaning solution _____

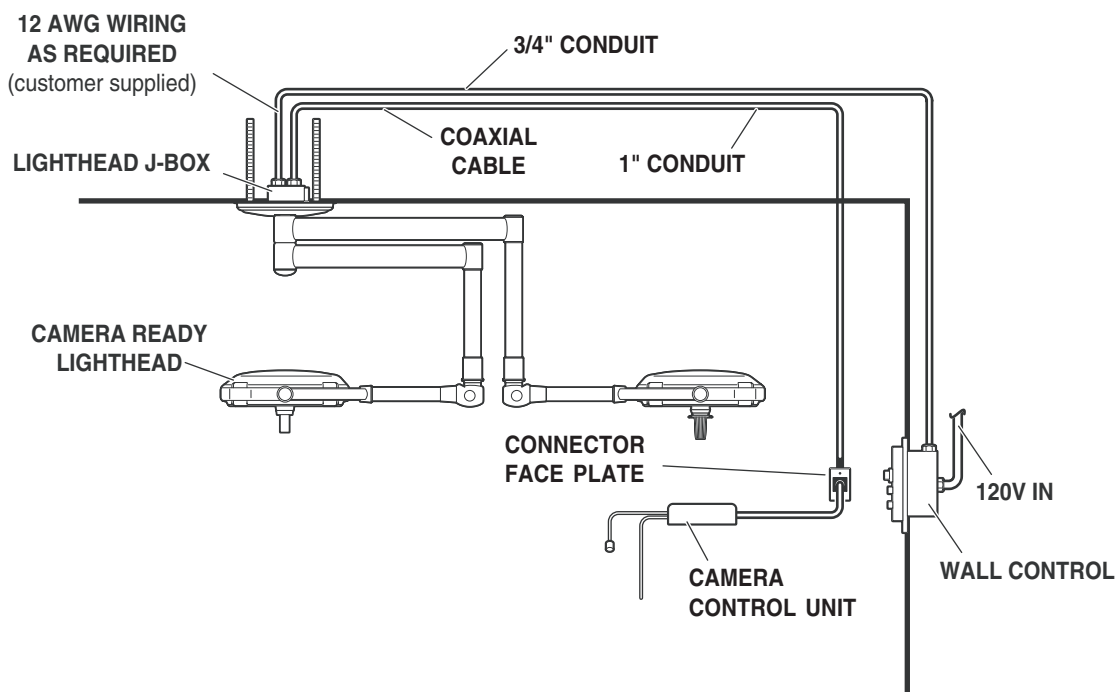
Vertical Support Tubes:

- All BOM/VST's installed and 6 mm mounting screws Loc-tited _____

Lighthouse:

- Mounting stub screws installed _____
- Bulb Voltage checked _____
- Power ON, all bulbs illuminated _____
- Bulbs remain illuminated throughout:
 - RAA rotation _____
 - BOM rotation _____
 - Pitch axis _____
 - Roll axis _____
 - Vertical travel _____
- Center focus handle mounted _____

CAMERA READY LIGHT SYSTEM COMPONENTS

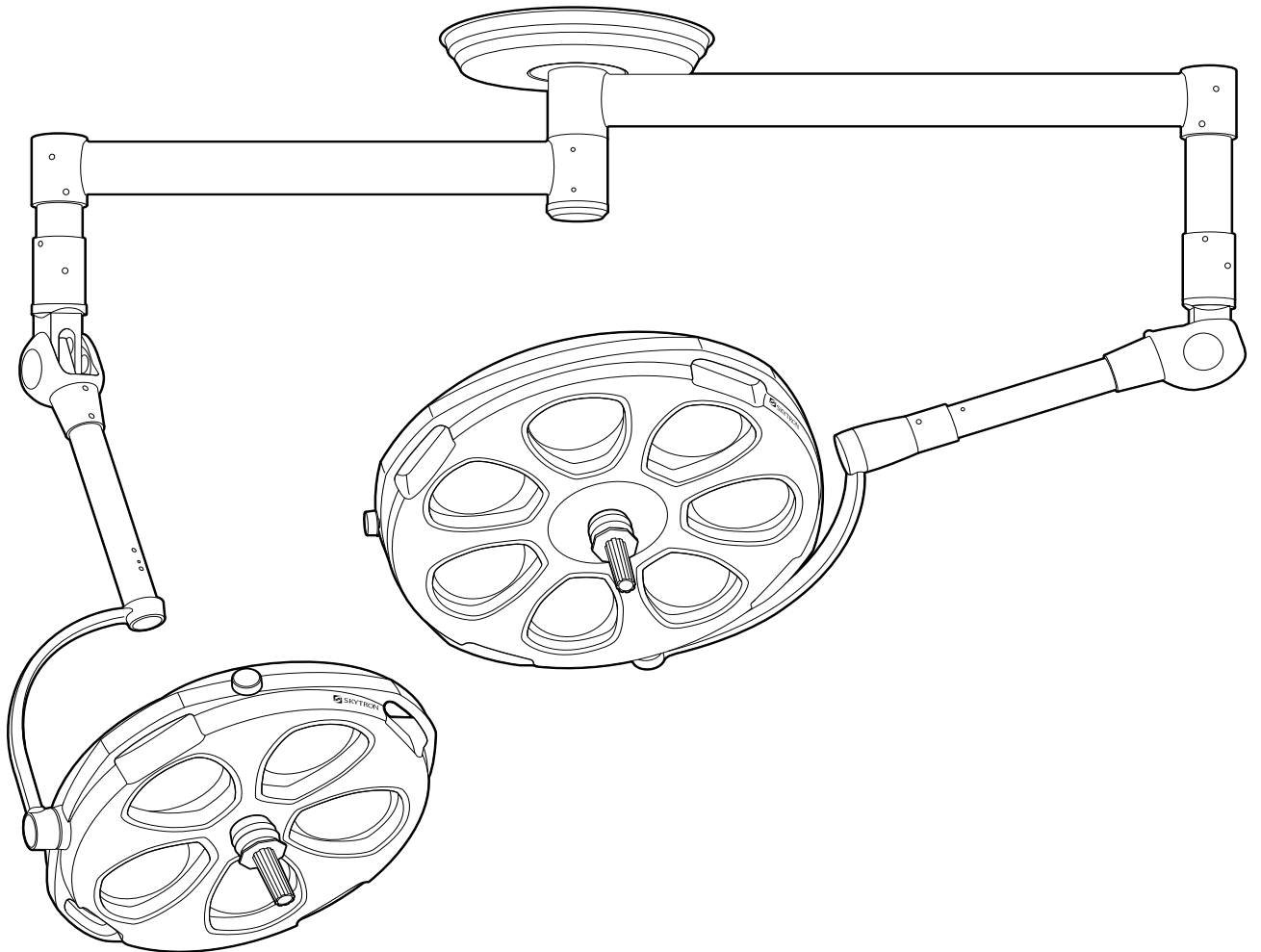




5085 Corporate Exchange Blvd. S.E.
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OPERATORS MANUAL



STELLAR

SERIES SURGICAL LIGHTS

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Indications For Use

The SKYTRON Stellar Series surgical light fixture is intended to be used by medical personnel for the purpose of illuminating surgical sites.

Distributed by:

SKYTRON
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 Grand Rapids, MI 49512 (616) 656-2900
 www.skytron.us

Manufactured by:

DKK Dai-Ichi Shomei Co., LTD
 32-26 Sakashita 1-Chome,
 Itabashi- Ku, Tokyo 174-0043
 JAPAN



WARNING



This equipment is intended for use by healthcare professionals only. This equipment may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the lighthead or shielding the location.



ETL CLASSIFIED
 TO UL60601-1
 CAN/CSA601.1, IEC 60601-2-41

Although current at the time of publication, SKYTRON'S policy of continuous development makes this manual subject to change without notice.

EQUIPMENT LABELS AND SPECIFICATIONS



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



INDICATES DANGEROUS VOLTAGE
100-240V~, 50/60Hz



AC VOLTAGE

3A

FUSE TYPE 3 AMP, SLOW BLOW TYPE

5A

FUSE TYPE 5 AMP, SLOW BLOW TYPE

IPXO RATED, CONTINUOUS OPERATION

PERMISSIBLE ENVIRONMENTAL CONDITIONS

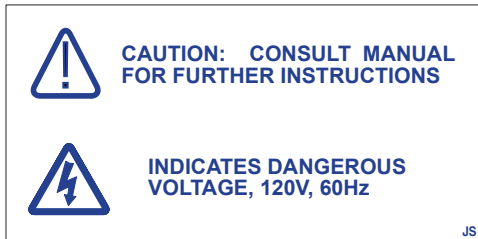
DURING TRANSPORT AND STORAGE (IN ORIGINAL PACKAGING MATERIALS)

- AMBIENT TEMPERATURE: 10° - 60° C (14° - 140° F)
- RELATIVE AIR MOISTURE: 10% - 85%, NO CONDENSATE BUILD-UP
- AIR PRESSURE: 500 hPa - 1060 hPa (14 in-Hg - 31 in-Hg)

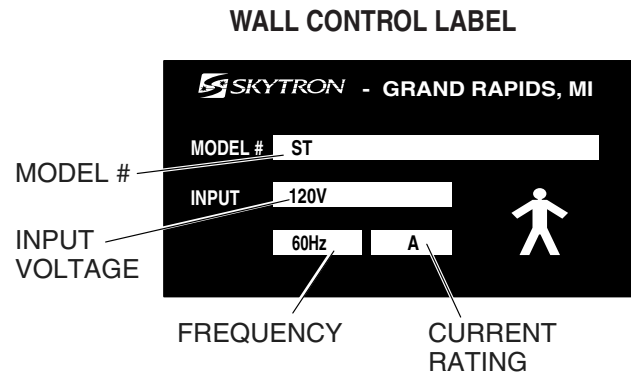
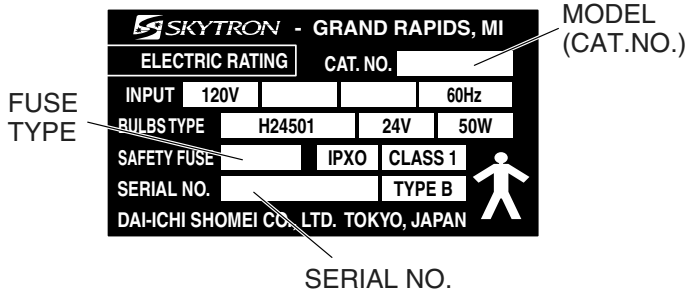
DURING USE - FOR DRY LOCATIONS

- AMBIENT TEMPERATURE: 15° - 30° C (60° - 85° F)
- RELATIVE AIR MOISTURE: 30% - 60% NON CONDENSING
- AIR PRESSURE: 700hPa - 1060 hPa (20.7 in-Hg - 31.3 in-Hg)

Wall Control Label



The lighthouse Data Label contains the lighthouse model number, bulb type, fuse type, electrical specifications and product serial number.



Prior to use, all personnel that may operate this fixture must be instructed in the correct operational procedures.

Initial use should not begin until after the users have been instructed by the manufacturer's representative.

A routine instructional program must be implemented by the facility for proper usage instructions for all personnel that may operate this light.

As with the operation of any surgical light, all hospital personnel should be aware that a certain amount of care must be exercised to maintain patient safety and to keep your SKYTRON light fixture performing at peak efficiency.

The following precautions should be reviewed by all personnel prior to operating the light.



Indicates a possibility of personal injury.



Indicates a possibility of damage to equipment.

NOTE

Indicates important facts or helpful hints

NOTE

To prolong bulb life, the soft-start bulb protection circuit will cause a slight delay before the bulbs will illuminate



Be sure sterile handle is properly secured before using the lighthead. An improperly installed handle could fall out, resulting in possible injury to patient or surgical staff.



In the presence of flammable anesthetics, DO NOT allow the lighthead to be below 60 inches from the floor.

NOTE

SKYTRON products are guaranteed for proper performance with the use of genuine SKYTRON CENTER FOCUS HANDLES. After market competitive handles and other disposable handles will have varying results that could ultimately affect the proper performance and secure engagement of the center focus handle. Such applications are at the discretion of the user to ensure patient safety.

NOTE

All repairs should be made using only authorized SKYTRON replacement parts.



CAUTION



Use of incompatible cleaning agents will cause damage to the fixture. Avoid the use of cleaning solutions which contain high concentrations of alcohol, ethelene glycol, phenol, iodophors, or glutaraldehyde based disinfectants. Staining, pitting, discoloration and diffuser cracking may occur if these are used.



CAUTION



Halogen bulbs are sensitive to body oils. DO NOT handle glass surface of bulb as body oils from your fingers can create a "hot spot" and may cause the bulb to burn out prematurely. This can best be avoided by using the plastic wrapper that the bulb is packaged in or a clean cloth wrapped around the base of the bulb when installing.



WARNING



Be sure the power is turned "OFF" and the bulbs have cooled before changing.



WARNING



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

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.

STELLAR OPTICAL CHARACTERISTICS

Lighthouse Model		ST29	ST23
Color Temperature		3766K	3765K
CRI		94	94
Central Illuminance E_c		159,700 lux	148,000 lux
Light Field Diameter d_{10}		180mm	166mm
Light Field Diameter d_{50}		108mm	92mm
E_e Ratio of Irradiance to Illuminance (milliwatts/m ² per lux)		3.37	1.39
Total Irradiance (watts/m ²)		538	205
UV Energy (watts/m ²)		.92	.31
Chromaticity	X	0.401	0.400
Coordinates	Y	0.413	0.411
(Shadow Dilution) Percentage Remaining Illumination with:	one mask	77.1	36.4
	two masks	37.2	36.6
	tube	89.5	99.7
	tube & 1 mask	68.9	35.2
	tube & 2 masks	34.6	35.7
Depth of Illumination (mm) w/focus control		829	953
Depth of Illumination (mm)		820	681

E_c Illuminance at 1 meter distance from light source without obstruction.

E_e E_e is the measure of radiant power over a specified area. It is expressed in watts per square meter [W/m²]

d_{10} Diameter of a circle around the light field center (point of Illuminance) where the Illuminance reaches 10% of E_c .

d_{50} Diameter of a circle around the light field center (point of Illuminance) where the Illuminance reaches 50% of E_c .

MODEL IDENTIFICATION



MODEL ST2923
1 - 29" Diameter Lighthead
1 - 23" Diameter Lighthead



MODEL ST292323
1 - 29" Diameter Lighthead
2 - 23" Diameter Lightheads



MODEL ST29
1 - 29" Diameter Lighthead



MODEL ST23
1 - 23" Diameter Lighthead



MODEL ST2323
2 - 23" Diameter Lightheads



MODEL ST232323
3 - 23" Diameter Lightheads

INTRODUCTION

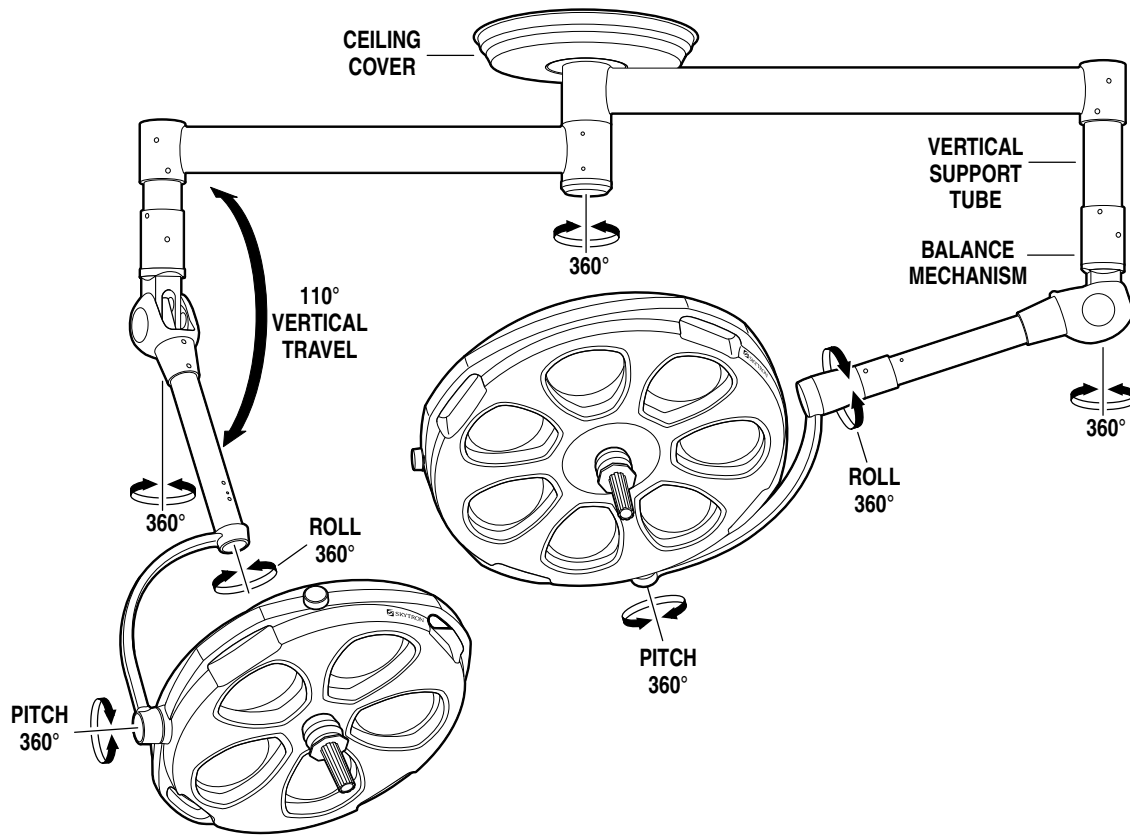


Figure 1. Light Fixture Rotation Capabilities

The Stellar series surgical lighting system from SKYTRON features fully adjustable positioning and focus control for its cool, color-corrected, multiple bulb, light source. Combinations of vertical positioning and multiple rotational capabilities allow the single, dual or triple lighthead models virtually limitless positioning within a thirteen foot diameter area (triple lighthead models).

The fixtures are single point ceiling mounted with a continuous 360 degree rotation capability at the ceiling mount end of the radial support arm. See figure 1. The balance mechanism which is attached to the radial arm by a vertical support tube, provides the lighthead an additional continuous 360 degree rotation point. The balance mechanism is an enclosed spring tension system. This allows vertical movement of the lighthead while maintaining the lighthead position without drifting. The yoke provides additional 360 degree rotation points for lighthead pitch and roll.

The Stellar fixtures have a lighthead vertical travel capability of 110°.

The adjustable focus mechanism which optimizes the light output by superimposing all the light beams into a single spot can be operated by non-sterile personnel using the lighthead mounted focus knob.

All lightheads also have a removable, sterilizable, focus/positioning handle. This allows all final positioning and focus adjustments or changes to be precisely done by the surgeon. See figure 2.

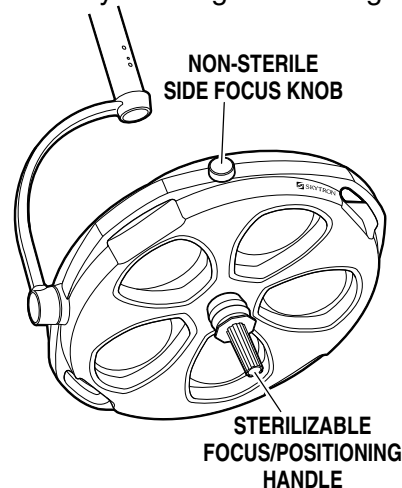


Figure 2. Focus Adjustments

BASIC LIGHTHEAD OPERATION

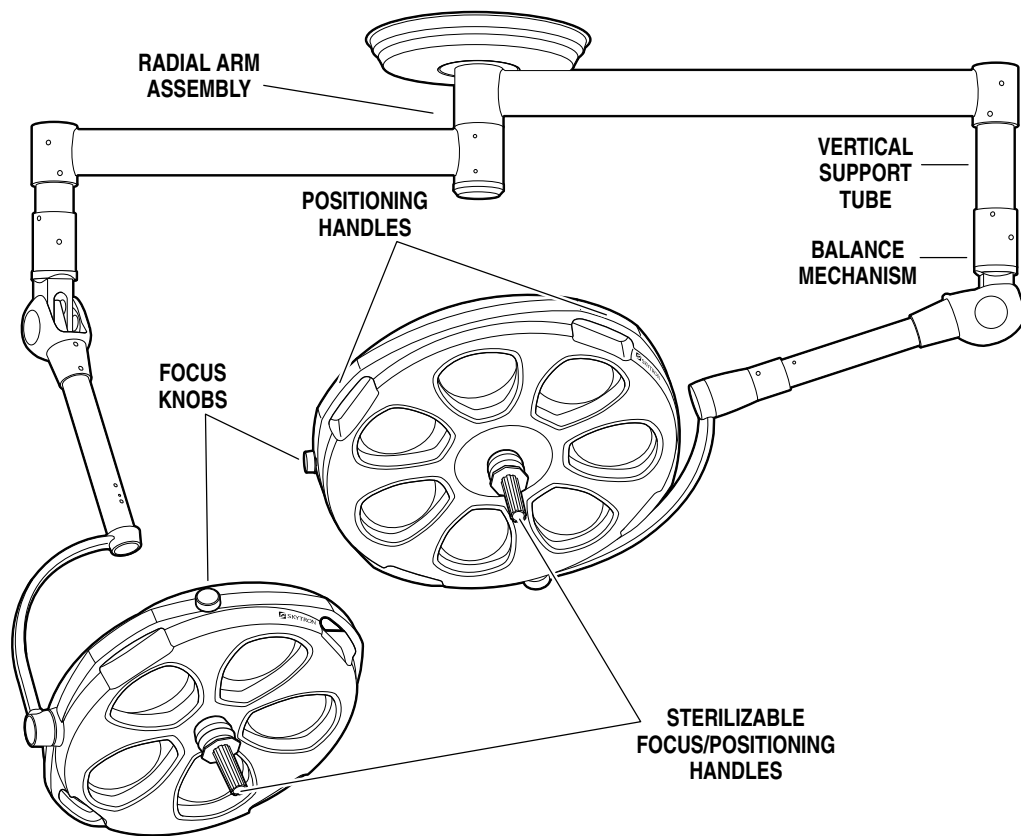


Figure 3. Dual Lighthead Fixture

Use the following instructions to operate the light fixture:

1. Position the lighthead as required by grasping the lighthead positioning handles and moving the lighthead to the desired position. See figure 3.

2. Turn the light fixture main power switch "ON" at the wall mounted control box and select the desired intensity for each lighthead as required. See figure 4. The mid-range position will provide adequate illumination for most procedures. Full intensity will usually only be required for extreme deep cavity cases.

NOTE

To prolong bulb life, the sof-start bulb protection circuit will cause a slight delay before the bulbs will illuminate.

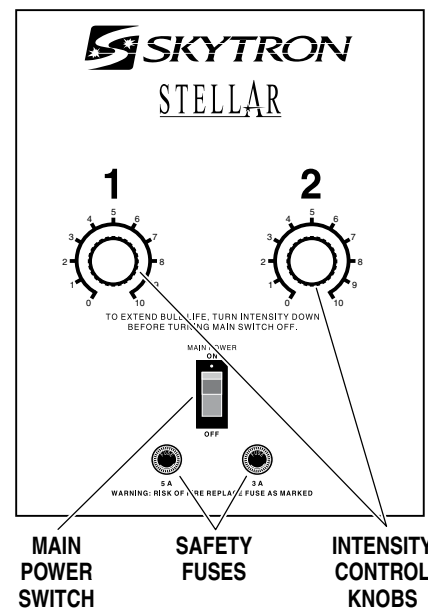


Figure 4. Wall Mounted Control Box

3. When the surgeon is ready to use the light, install the sterilized center focus/positioning handle using the following procedure. See figure 5. Be sure handle is properly secured before using the lighthead. Possible injury to patient or staff could result if a handle is not installed properly.

a. Insert the handle into the lighthead attachment ring.



WARNING



Be sure sterile handle is properly secured before using the lighthead. An improperly installed handle could fall out, resulting in possible injury to patient or surgical staff.

b. Push the handle in, turn it right and left, and pull the handle out to be certain that it is locked (PUSH-TWIST-PULL). A distinct click can be heard when the handle is properly engaged.

c. To remove the handle, push the release button and pull the handle out.

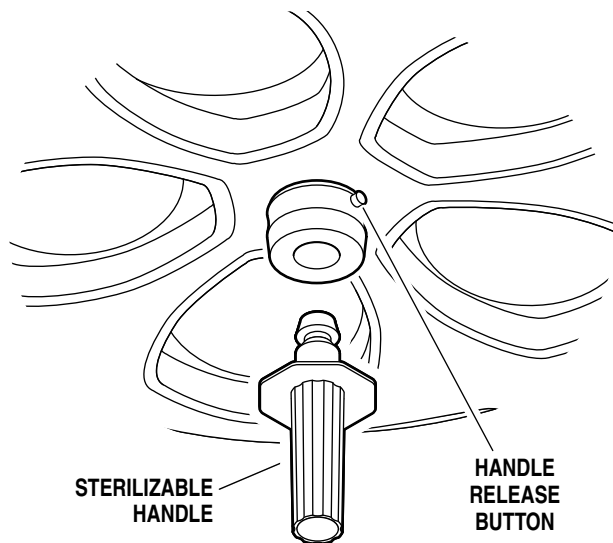


Figure 5. Center Focus/Positioning Handle Installation

4. Adjust the focus by moving either the non-sterile focus knob or the (sterilized) center focus handle until all of the light beams converge on the surgical site forming a single bright spot of light.

5. For low angle lighting approach, the lighthead will move 90° below horizontal. Pull the lighthead down by the positioning handles or the (sterile) positioning/focus handle.



WARNING



In the presence of flammable anesthetics, DO NOT allow the lighthead to travel below 60 inches from the floor.

6. When the light is no longer required, return the lighthead to its full up position. Decrease the intensity at the wall control, and turn the main power switch "OFF".

NOTE

SKYTRON products are guaranteed for proper performance with the use of genuine SKYTRON CENTER FOCUS HANDLES. After market competitive handles and other disposable handles will have varying results that could ultimately affect the proper performance and secure engagement of the center focus handle. Such applications are at the discretion of the user to ensure patient safety.

LIGHTHEAD POSITIONING

General

To obtain the maximum benefit from your SKYTRON surgical lighting system, the following suggestions are offered as a guide for lighthead positioning. Personnel who are trained in proper lighting techniques can plan and set up the lighting arrangements prior to the arrival of the patient. Factors which should be considered when prepositioning surgical lights are:

- Specific procedure to be done
- Patient position during procedure
- Position of surgical team
- Location of instrument trays or tables
- Location of IV stands
- X-ray equipment and personnel
- Anesthesia equipment and personnel
- Angulation and size of surgical cavity

Surgical Table Placement

For most procedures the surgical table should be located with its center point directly under the light fixture's ceiling mount.

Pre-Positioning The Lighthead

Surgical light positioning requirements change not only from procedure to procedure, they also change from surgeon to surgeon. Final light positioning and adjustment will be directed or done directly by the surgeon. The objective of prepositioning is to require a minimum of final adjustments after arrival of the patient. The non-sterile focus control should be located where it can be reached by non-sterile personnel and the sterile positioning/focus handle where they can be reached by the surgeon. Use extreme care when prepositioning lightheads. Bumping lightheads into one another, into walls, or other equipment may alter bulb alignment which affects proper focus adjustment.

The lightheads can be most effectively positioned by using the following procedures:

1. Grasp the positioning handles on the lighthead and pull the lighthead down to shoulder height. Keep the lighthead at approximately a 45° angle to easily position the support yoke. See figure 6.

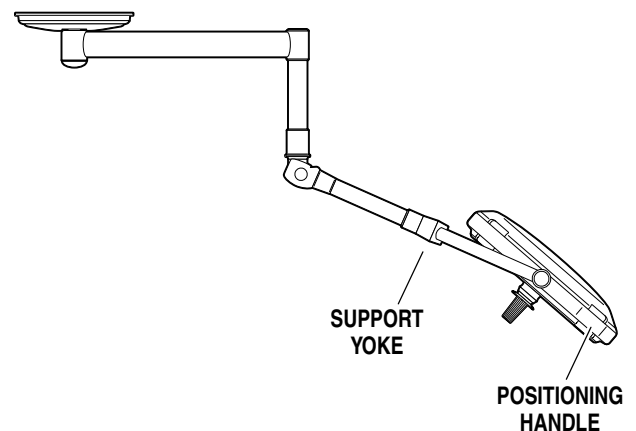


Figure 6.

2. Using the positioning handles, rotate the lighthead around the vertical support until the lighthead is at an approximate 90° angle to the radial arm. See figure 7.

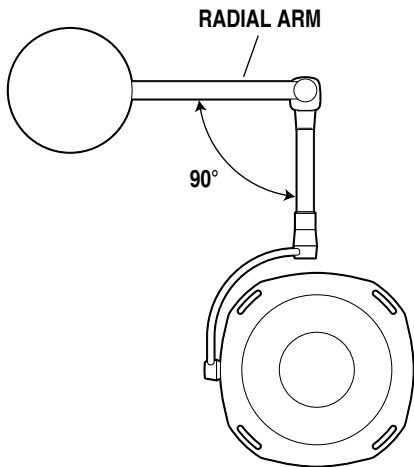


Figure 7.

3. Place the radial arm in the desired position by pushing or pulling the lighthead by the positioning handles as you walk around the surgical table.

4. Refer to figure 8 to approximate the desired radial arm position for locating the lighthead over the patient.

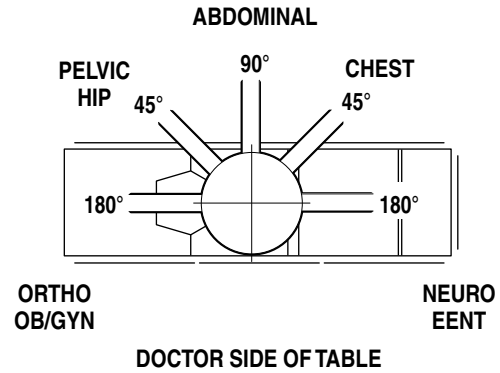


Figure 8. Main Lighthead Radial Arm Positioning

5. With the radial arm in proper position, rotate the lighthead to the desired position and install the sterile positioning/focus handle. Refer to sterile handle installation procedure.

6. Grasp the positioning handles, place the lighthead at an angle and move the lighthead to its full up position.

ILLUMINATION TECHNIQUE

Maximum illumination, shadow reduction, and possible obstruction by the surgeon or surgical staff are also major concerns for lighthouse positioning. The following examples are offered as a basic guide for lighthouse placement for large diameter/satellite, dual lighthouse, or triple lighthouse fixtures.

Large Diameter/Satellite Lighthouse Positioning

The large diameter lighthouse should be pre-positioned over the surgical site. The satellite can be used on either side of the surgeon for augmentation and shadow control.

The large lighthouse should be positioned perpendicular to the bottom of the surgical cavity.

Head

To illuminate the head area, position the large diameter lighthouse radial arm parallel to the table centerline. See figure 9. Position the lighthouse behind the surgeon. Tilt the lighthouse to the desired position using pitch axis movement. This will allow the multiple light sources of the lighthouse to pass around the head and shoulders of the surgeon and at the same time permit adequate head clearance for the surgeon.

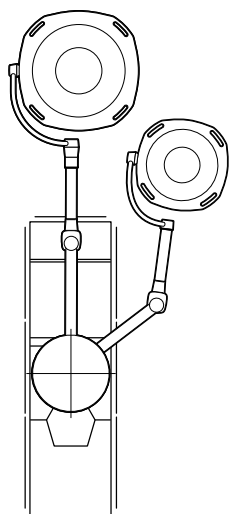


Figure 9.

Tilt the lighthouse to position the focus control knob where it can be easily reached by non-sterile personnel.

Position the satellite to the left or right according to surgeon preference. This allows a second light source to come from another angle which will help eliminate obstructions or shadows.

Torso Area

For most chest and abdominal procedures, position the large lighthouse directly over the surgical site. See figure 10. Position the radial arm on approximately a 45° angle from the surgical table centerline. This position will locate the sterile focus/positioning handle on the lighthouse where it can easily be reached by the surgeon. The focus control will be where it can easily be reached by non-sterile personnel. Position the satellite lighthouse, depending on lighting needs, to augment the larger lighthouse.

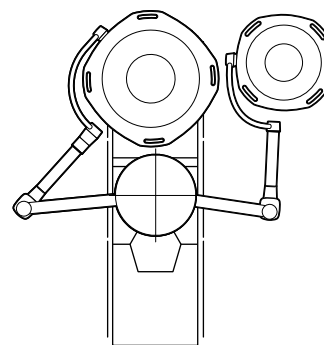


Figure 10.

In some cases such as cholecystectomies and total abdominal hysterectomies, the surgical cavity may be angled. In cases such as this, the large lighthouse should be angled so that the face of the lighthouse is perpendicular to the bottom of the surgical cavity. See figure 11.

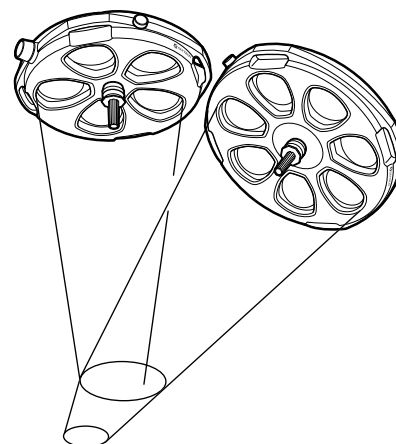


Figure 11.

Some procedures, such as hip pinnings, require both lightheads to be on the same side of the table. See figure 12. In this position the lightheads are behind and adjusted to project light over the head and shoulders of the surgeon. Both lightheads are easily reached for adjustment by non-sterile personnel.

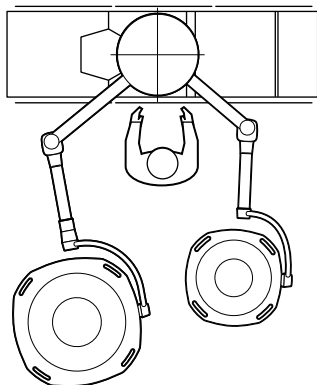


Figure 12.

Perineum

The large diameter lighthead should be positioned at the end of the table for perineal procedures. Locate the radial arm directly in line with the centerline of the table. Once the surgeon has assumed a seated position, the lighthead can be pulled down, angled, and adjusted to provide the necessary illumination over the surgeon's head and shoulders. See figure 13. The satellite lighthead radial arm should be positioned approximately 90° from the other radial arm. Position the satellite lighthead to the right or left of the large lighthead according to surgeon preference. In this position, the focus knobs of both lightheads are located for easy reach by non-sterile personnel.

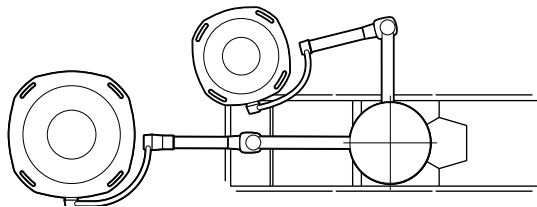


Figure 13.

Dual 23" Diameter Lighthead Positioning

Fixtures containing dual 23" diameter lightheads require some special positioning considerations. The small diameter of the lightheads allows the light source to be more easily obstructed by the surgical staff. It is very important that the surgical site remain illuminated even though the head and hands of the surgeon and the surgical staff may be directly in the central light beam path. In order to minimize shadowing, the lightheads should be positioned so that their light beams are angled into the surgical cavity. Regardless of the surgical site, these lights should be positioned to maintain an angle of approximately 30° about an imaginary line running perpendicular to the bottom of the surgical site. See figure 14.

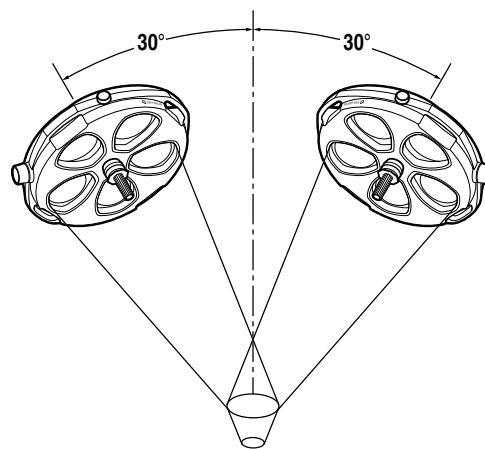


Figure 14.

Tilting the lightheads will give a larger light beam angle. See figure 15. Final positioning and focus adjustments can be done by the surgeon using the sterile focus/positioning handles. Focus controls should be positioned where easily reached by non-sterile personnel.

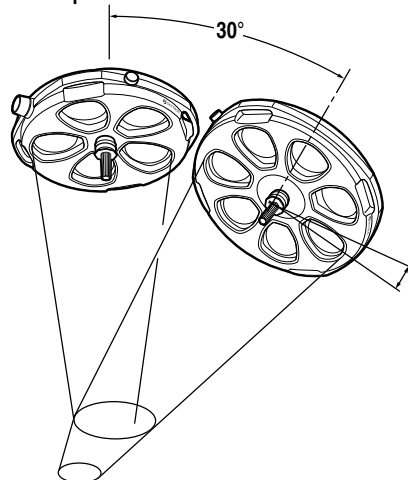


Figure 15.

Triple Lighthead Positioning

Triple lighthead systems will either consist of a large diameter lighthead with two 23" satellites or three 23" lightheads. There are two basic positioning strategies that can be used to obtain the best illumination possible. The first is to align all three lightheads to the centerline of the table with the large lighthead directly over the center of the surgical site. The second is to cluster the lights in a circular arrangement over the surgical site with each lighthead about 120° away from each other. The whole cluster should be positioned to minimize interference with the head and shoulders of the surgical staff. See figure 16.

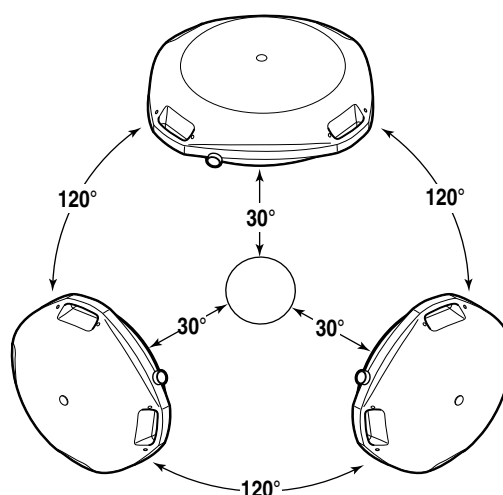


Figure 16.

When an angled cavity is to be illuminated, at least one of the lightheads should be positioned to be perpendicular to the bottom of the cavity.

For head and perineal work, the lights should be positioned as they would for a dual system but with a satellite on each side of the surgeon.

Bell-Shaped Cavities

For most surgical procedures the lighthead will be properly focused with all the light beams converged in one spot at the bottom of the surgical cavity.

However, in the case of a bell-shaped cavity (for example - total abdominal hysterectomy on an obese patient), focusing at the bottom of the cavity may cause more shadow problems. The focal point for the light beams should be above the bottom of the cavity. See figure 17.

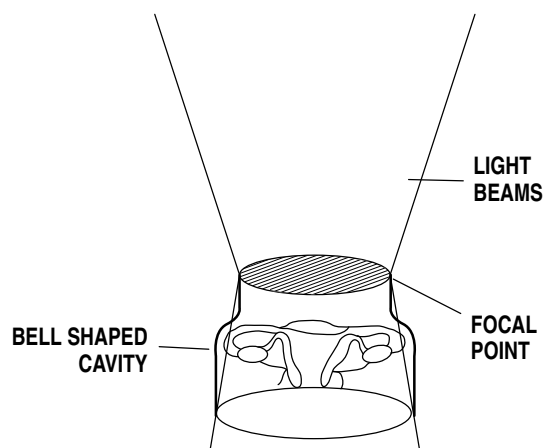


Figure 17.

Beyond the focal point, the light beams spread out like an inverted cone and will more evenly spread the light throughout the bell-shaped cavity.

Other Illumination Considerations

Close attention to surgical light intensity during the case as well as good quality general illumination in the room will help to minimize eye fatigue of surgical personnel.

Dark surgical drapes will help to reduce reflectance. White drapes should be avoided at all times because of high reflectance.

The use of matte and satin finish instruments and retractors also helps to reduce eye fatigue.

MAINTENANCE

General

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

NOTE

All repairs should be made using only authorized SKYTRON replacement parts.

- 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.

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. Do not apply or spray cleaning agents directly on the lighthead.



CAUTION



Use of incompatible cleaning agents will cause damage to the fixture. Avoid the use of cleaning solutions which contain high concentrations of alcohol, ethelene glycol, phenol, iodophors, or glutaraldehyde based disinfectants. Staining, pitting, discoloration and diffuser cracking may occur if these are used.

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

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.

1. Hold the diffuser/filter assembly with one hand, loosen the "1/4-turn" screw and lower the diffuser/filter assembly. See figure 18.

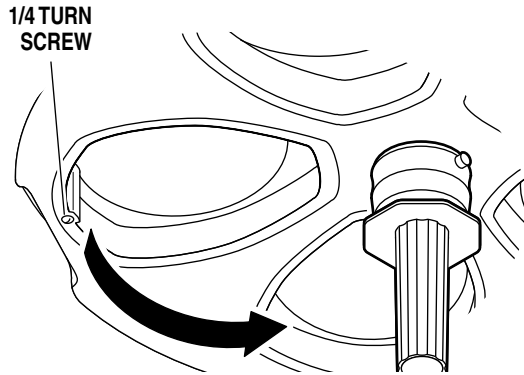


Figure 18.

**CAUTION**

Halogen bulbs are sensitive to body oils. DO NOT handle the glass surface of the bulbs as body oils from your fingers can create a "hot spot" and may cause the bulb to burn out prematurely. This can best be avoided by using the plastic wrapper that the bulb is packaged in or a clean cloth wrapped around the base of the bulb when installing.

**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.

2. Using caution not to touch the reflector surface, hold the bulb by the base and pull it out. See figure 19. Slightly working the bulb back and forth may aid in bulb removal.

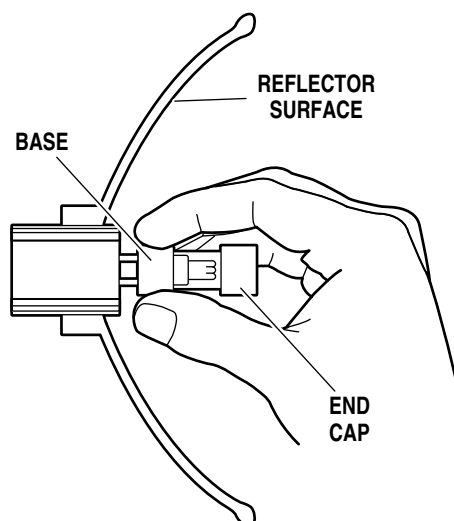


Figure 19.

3. Holding the 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.

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

Handle Cleaning & Sterilization

The sterilizable handles are constructed of heat resistant, impact resistant plastic. They should be cleaned with mild alkaline cleaning products WITHOUT active chlorine. Thoroughly rinse off all cleaners with water. Ensure that the open side of handles are face down.

Recommended sterilization parameters for sterilizable handle:

Steam Sterilization:

134°C (273°F) : 2.3 bars (33.3 PSI)

4 minutes

Always consult current AORN journal recommendations for proper sterilization procedures.

Adjustments

As part of a regular preventive maintenance program, it is suggested that a check of the various positioning axes be made to verify correctness of tension adjustment. If any lighthead drift is noticed, all that is usually necessary is a minor adjustment. Readjustment should be made as per the appropriate instructions contained in the Maintenance Manual. Also, during a scheduled cleaning of the lighthead interior, lubrication of the various moving parts is desirable.

Service

A regular program of preventive maintenance will increase the life of your equipment and keep it operating at peak performance.

Maintenance must be performed by authorized, trained maintenance personnel using SKYTRON authorized replacement parts and service techniques. Service instructions and parts are available from SKYTRON.

Preventive Maintenance contracts are available through your local SKYTRON representative. Details for such a program are available in the Stellar Maintenance Manual.

The end of the useful life of the product is when the product can no longer be serviced to comply with IEC standards as determined by a SKYTRON authorized service representative.

Disposal Instructions

Please contact your SKYTRON authorized representative for disposal of Stellar products or parts in accordance with current environmental regulations for medical products.

To obtain service instructions, replacement parts, factory service or preventive maintenance contracts, contact the SKYTRON representative listed below.

Or contact:

SKYTRON

5085 Corporate Exchange Blvd. S.E.

Grand Rapids, MI 49512

1-800-SKYTRON (1-800-759-8766)

Fax. 1-616-656-2906

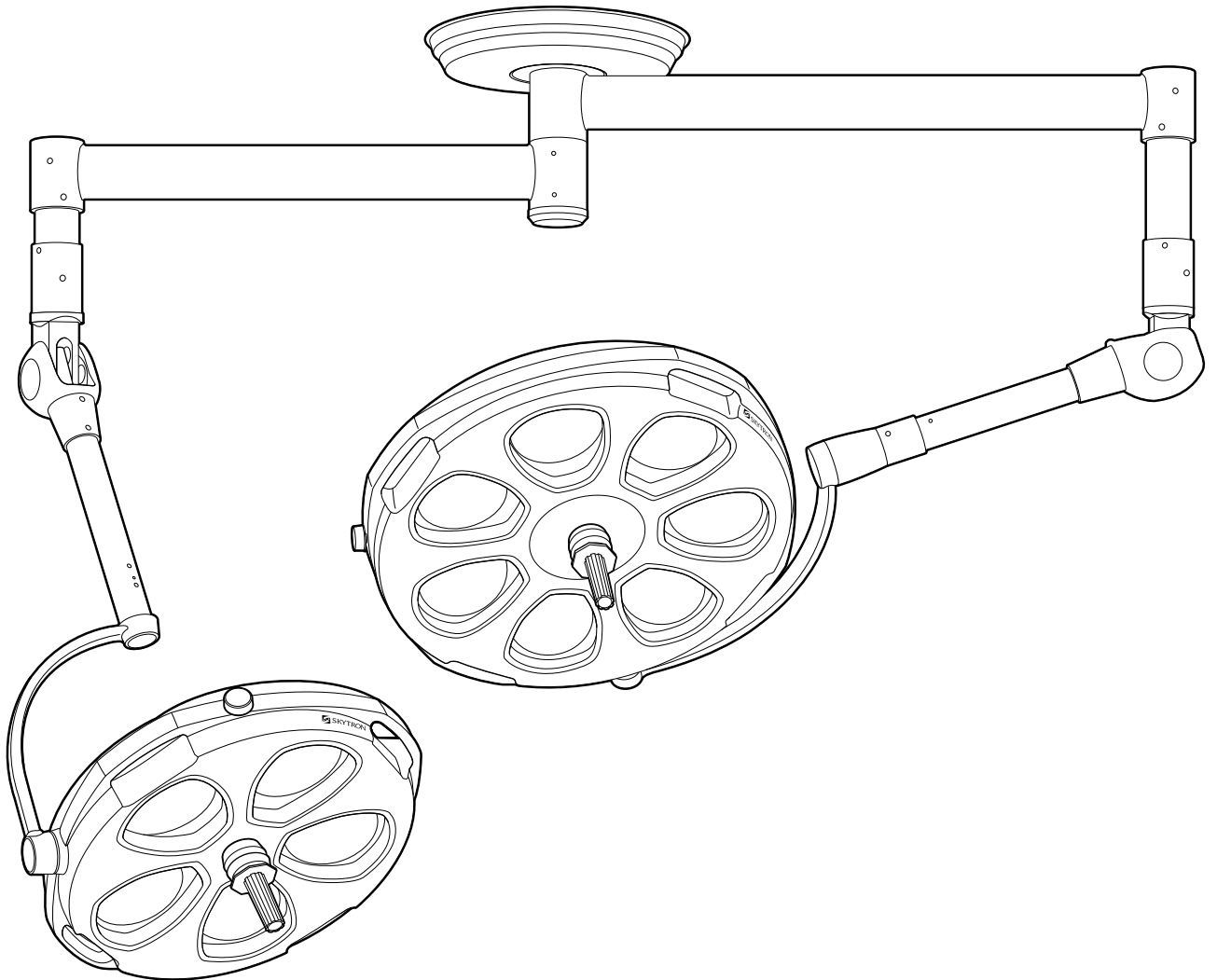


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SKYTRON[®]

PARTS CATALOG



STELLAR

SERIES SURGICAL LIGHTS

INTRODUCTION

This manual contains the exploded views and replacement parts lists for the serviceable components of the SKYTRON STELLAR Series Surgical Lighting fixtures

Each serviceable part in these exploded views is identified by a reference number. Use this number to locate necessary part information in the parts list adjacent to the exploded view.

Always use the complete SKYTRON part number and description when ordering replacement parts.

Abbreviations

As Required.....	A/R
Optional	opt
Serial Number	S.N.
Not Shown.....	NS

The lighthouse Data Label contains the lighthouse model number, bulb type, fuse type, electrical specifications and product serial number.

The diagram shows a rectangular data label with the following text and fields:

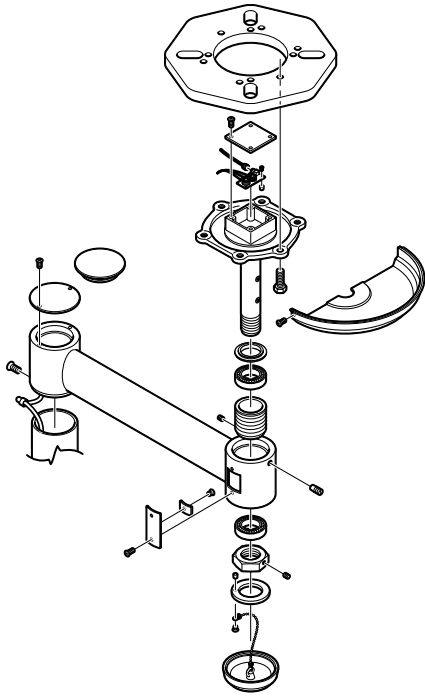
- SKYTRON - GRAND RAPIDS, MI
- ELECTRIC RATING
- CAT. NO. []
- INPUT 120V [] 60Hz
- BULBS TYPE H24501 24V 50W
- SAFETY FUSE [] IPXO CLASS 1
- SERIAL NO. [] TYPE B
- DAI-ICHI SHOMEI CO., LTD. TOKYO, JAPAN

Callouts from the diagram:

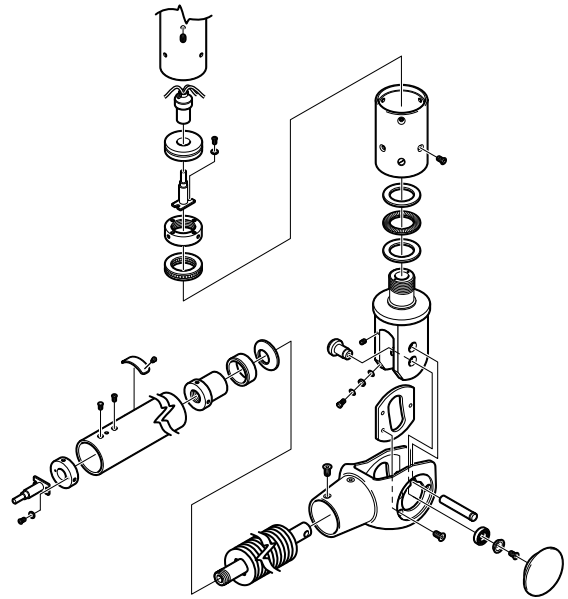
- FUSE TYPE** points to the SAFETY FUSE field.
- MODEL (CAT. NO.)** points to the CAT. NO. field.
- SERIAL NO.** points to the SERIAL NO. field.

Although current at time of publication, SKYTRON's policy of continuous development makes this manual subject to change without notice.

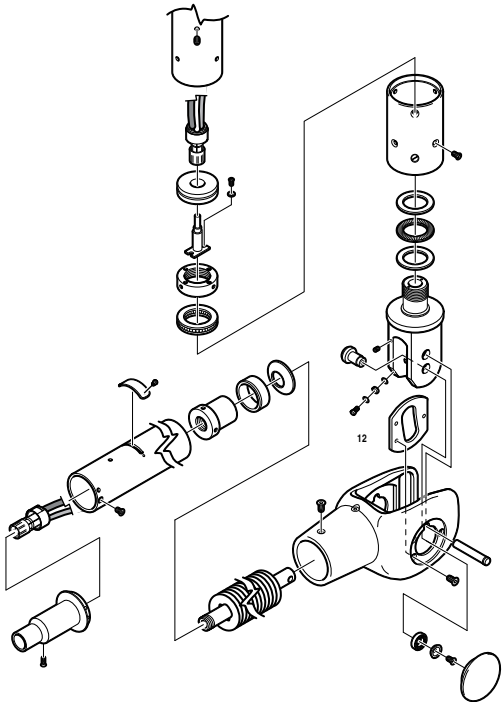
1. Radial Arm Assembly..... Page 6



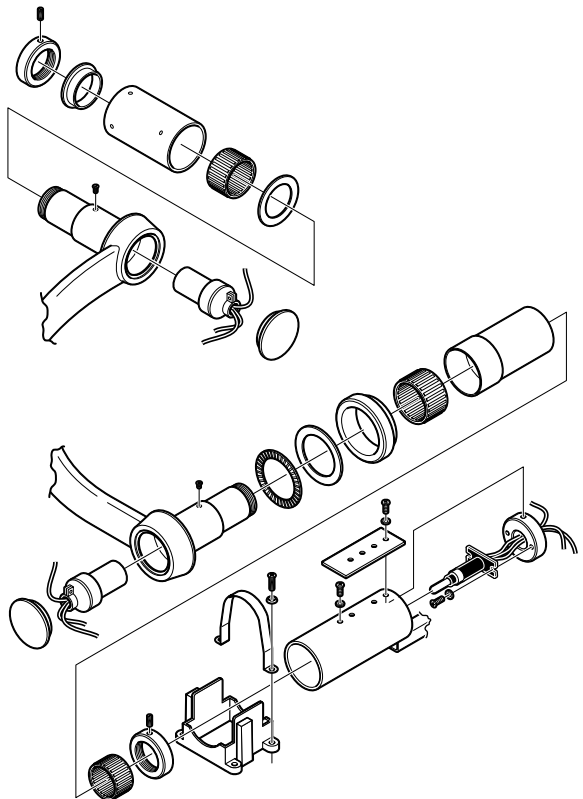
2. Balance Mechanism Assembly - ST23..... Page 8



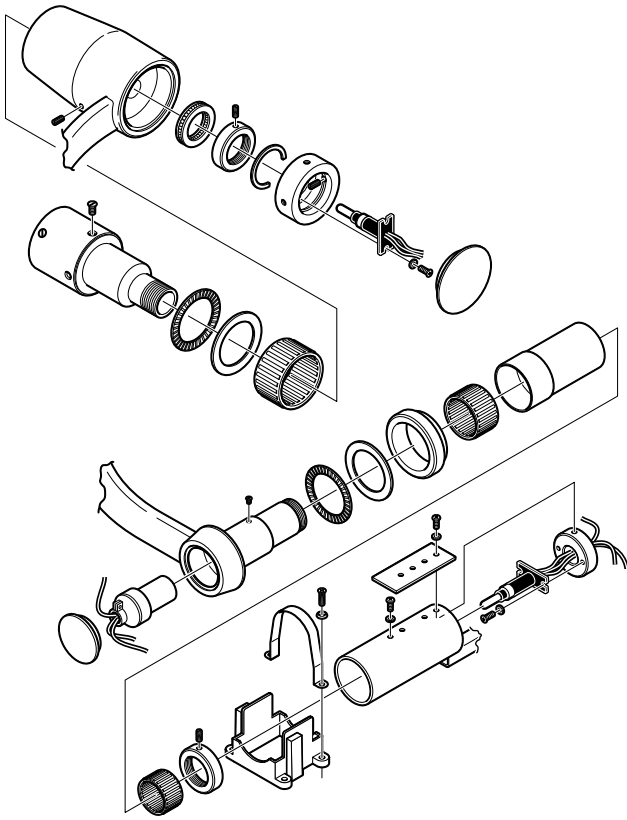
3. Balance Mechanism Assembly - ST29 Page 10



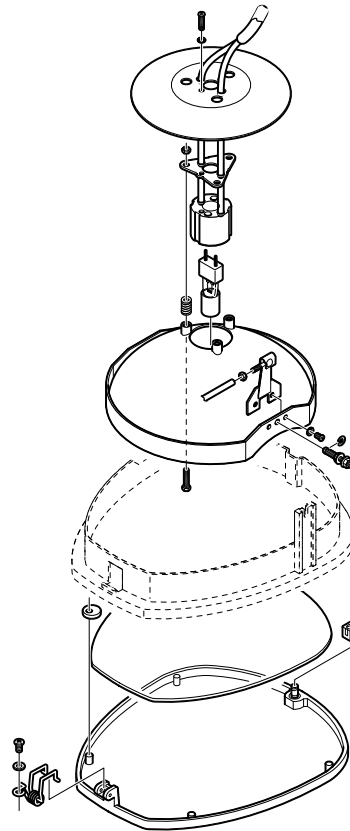
4. Lighthead and Yoke Assembly - ST23..... Page 12



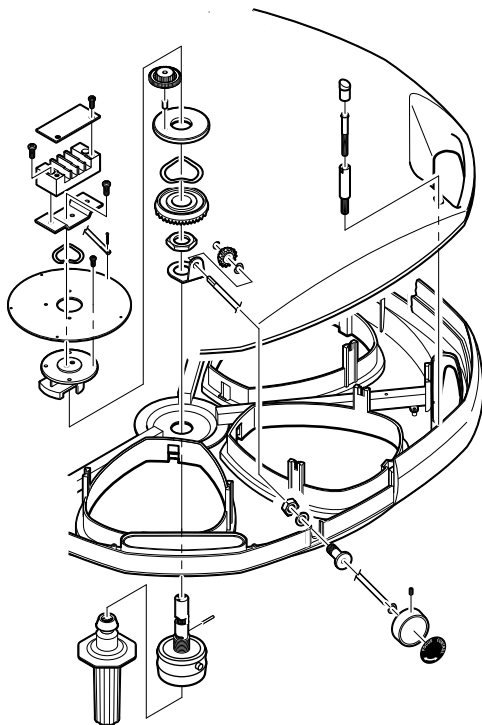
5. Lighthouse Yoke Assembly - ST29..... Page 14



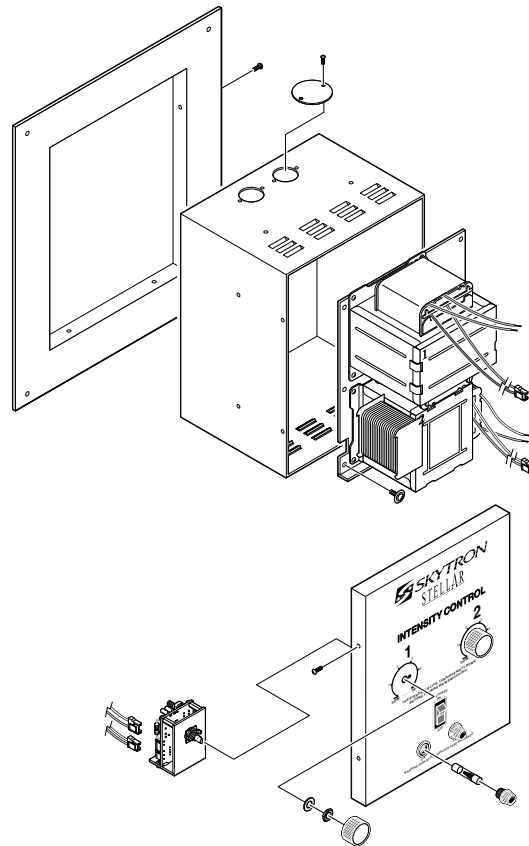
6. Bulb and Reflector Assembly Page 16



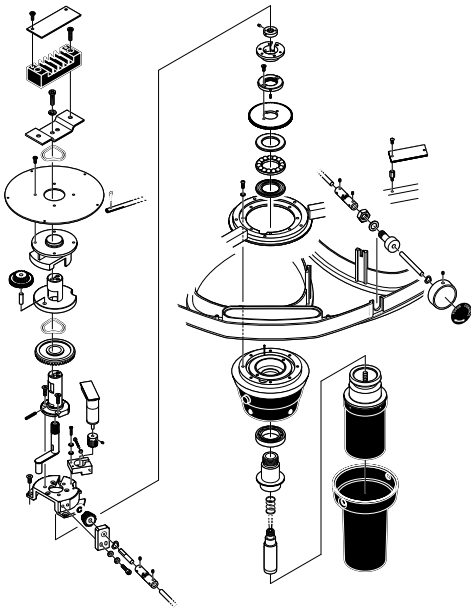
7. Focus Mechanism Assembly..... Page 18



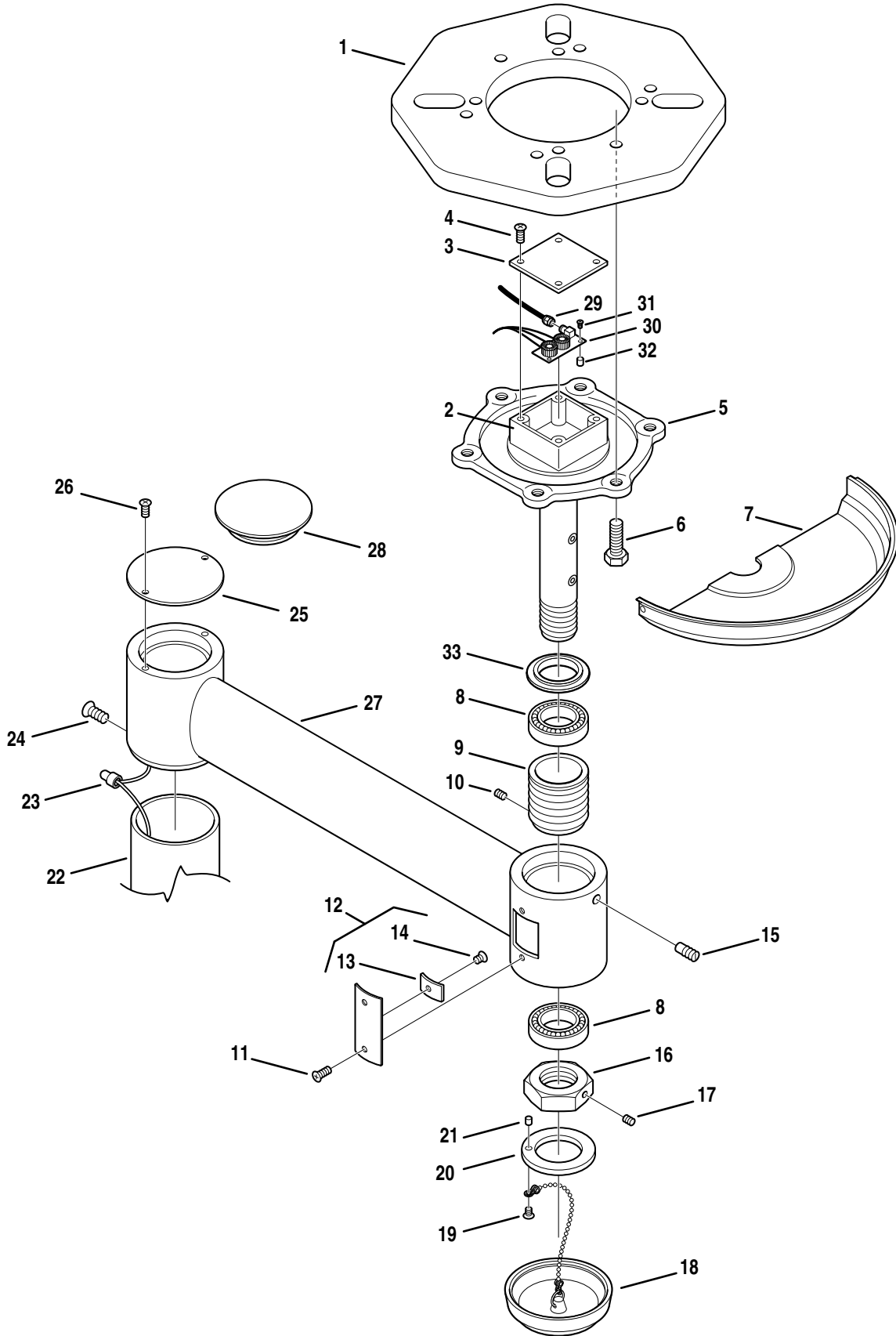
8. Wall Control Assembly..... Page 20



9. TV Lighthouse Components..... Page 22



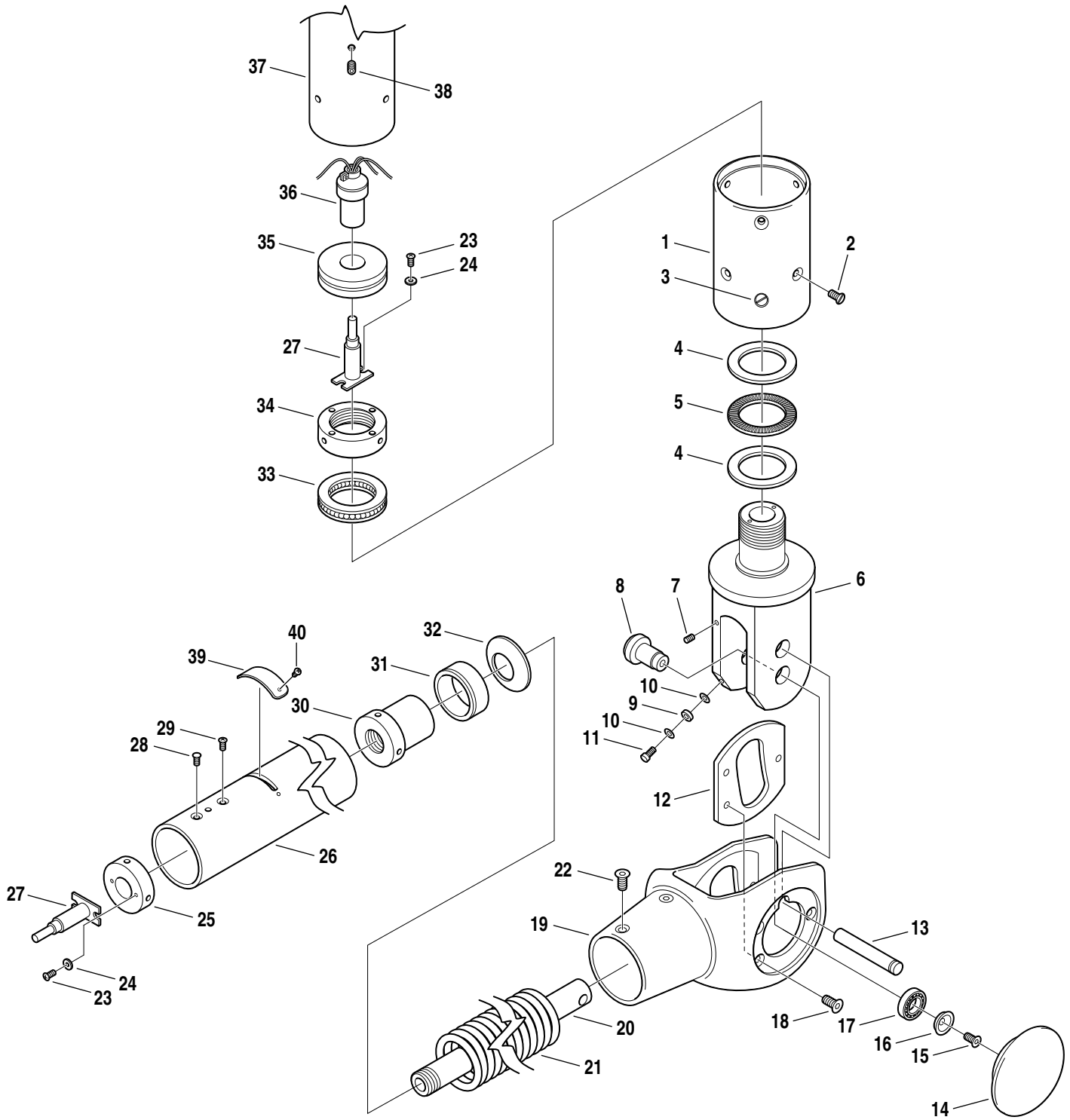
1. RADIAL ARM ASSEMBLY



1. RADIAL ARM ASSEMBLY

Item	Part No.	Description	Qty.
	B2-410-01	RADIAL ARM ASSEMBLY, ST23, ST29	A/R
	B2-410-02	RADIAL ARM ASSEMBLY, ST2323, ST2923	A/R
	B2-410-03	RADIAL ARM ASSEMBLY, ST232323, ST292323	A/R
1	B2-010-01	STANDARD MOUNTING PLATE	1
2	B2-210-06	JUNCTION BOX	1
	B1-450-03-1	JUNCTION BOX, TV	1
3	B2-210-07	•COVER, junction box	1
4	B9-210-23	•SCREW, junction box cover	4
5	B2-410-04	SUPPORT HUB, ST23, ST29	A/R
	B1-420-95	SUPPORT HUB, ST23TV, ST29TV	A/R
	B2-410-05	SUPPORT HUB, ST2323, ST2923	A/R
	B1-420-96	SUPPORT HUB, ST2323TV, ST2923TV	A/R
	B2-410-06	SUPPORT HUB, ST232323, ST292323	A/R
	B1-420-97	SUPPORT HUB, ST232323TV, ST292323TV	A/R
6	B2-010-02	MOUNTING BOLT, 1/2-13.....	6
7	B2-210-31	CEILING COVER	1
8	B2-210-11	TAPERED ROLLER BEARING	A/R
	B2-210-12	BEARING CUP	A/R
9	B2-210-13	SLIP RING	A/R
	B1-420-98	SLIP-RING, TV.....	A/R
10	B2-210-14	SET SCREW, slip ring	A/R
11	B2-210-18	SCREW, cover mounting	A/R
12	B2-310-05	BRUSH BLOCK AND COVER ASSEMBLY, plastic.....	A/R
	B1-420-99	BRUSH BLOCK AND COVER ASSEMBLY, TV	A/R
13	B2-410-07	•BRUSH	A/R
	B1-421-01	•BRUSH, TV	A/R
14	B2-410-08	•SCREW	A/R
15	B2-210-19	BRAKE SCREW	A/R
16	B2-210-26	NUT, retainer	1
17	B2-210-27	SET SCREW.....	1
18	B2-210-58-1	COVER, hub, with chain.....	1
	B2-210-58	COVER, hub	1
19	B2-210-29	SCREW, hub cover retainer	2
20	B2-210-57	RETAINER, hub cover.....	1
21	B2-210-56	SPACER.....	2
22	B3-310-01	VERTICAL SUPPORT TUBE	A/R
23	--	CONNECTOR, crimp	A/R
24	B3-210-12	VST SCREW, M6 x 12	A/R
25	B2-210-24	COVER, receptacle.....	A/R
26	B2-210-25	SCREW, receptacle cover.....	A/R
27	B2-410-09	RADIAL ARM, 35-1/4".....	A/R
	B1-421-02	RADIAL ARM, 35-1/4", TV	A/R
	B2-410-10	RADIAL ARM, 43".....	A/R
	B1-421-03	RADIAL ARM, 43", TV	A/R
	B2-410-11	RADIAL ARM, 50-1/2".....	A/R
28	B2-410-12	COVER, rubber	A/R
29	H7-010-47	CABLE, coaxial, RG59, 50'	1
30	B1-420-05	CIRCUIT BOARD, VFB	1
31	B2-451-36	SCREW, M4 x 6, phillips, countersunk.....	2
32	B2-451-35	STAND-OFF	2
33	B2-410-16	RING, ceiling cover spacer	1
NS	B2-410-14	LABEL, "SKYTRON". Radial Arm	2

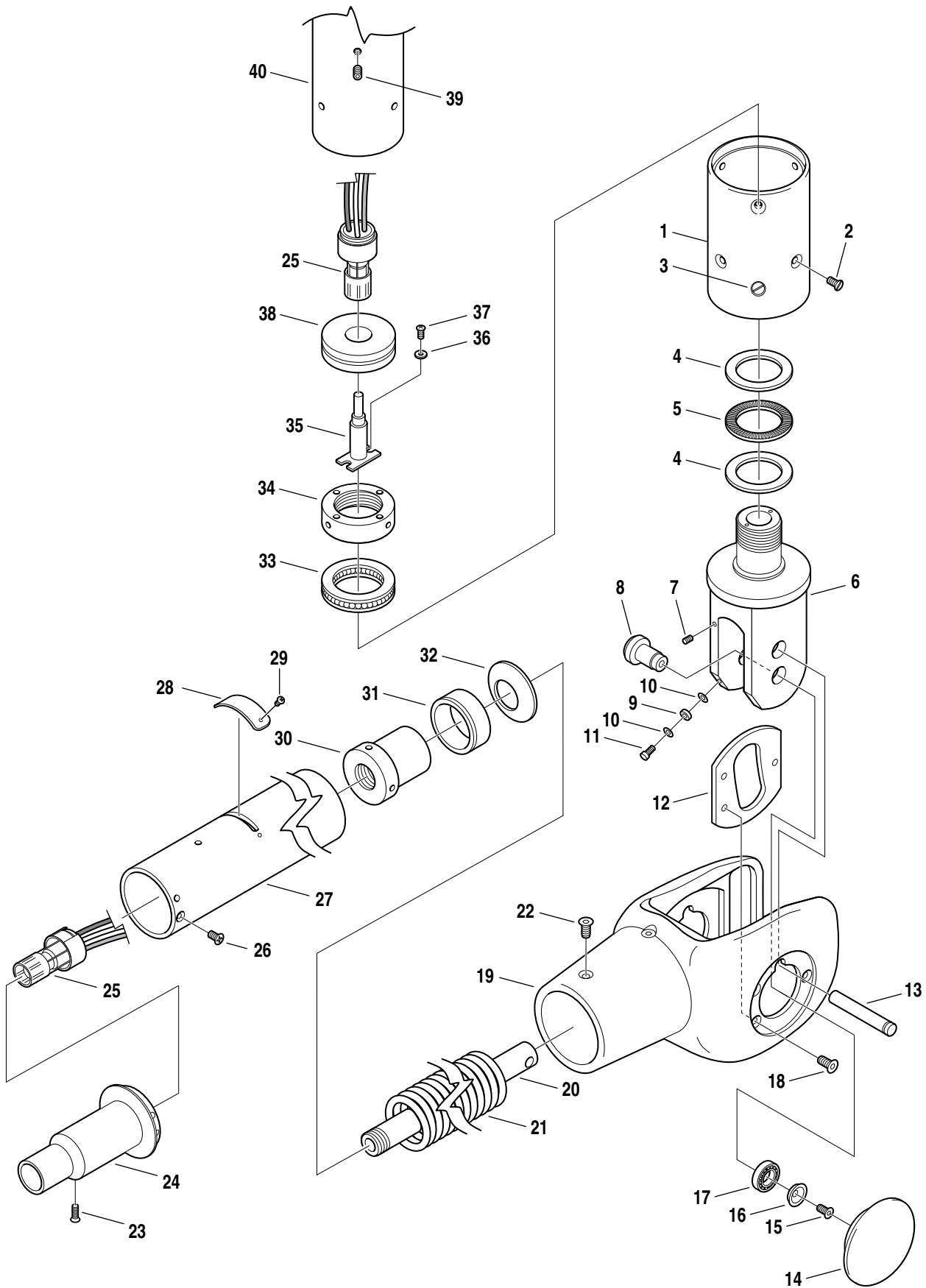
2. BALANCE MECHANISM ASSEMBLY MODEL ST23



2. BALANCE MECHANISM ASSEMBLY MODEL ST23

Item	Part No.	Description	Qty.
	B3-310-00	BALANCE MECHANISM ASSEMBLY, ST23	A/R
	ST23TV BOM	BALANCE MECHANISM ASSEMBLY, ST23TV.....	A/R
1	B3-210-13	SLEEVE, VST	1
2	B3-210-12	VST SCREW, M6 x 12	A/R
3	B3-310-02	PLUG, chrome	1
4	B3-210-14	WASHER, needle bearing.....	2
5	B3-210-15	BEARING, needle	1
6	B3-310-03	JOINT, upper knuckle.....	1
7	B9-210-82	SCREW, set	1
8	B3-210-34	PIN, pivot	2
9	B3-210-33	BEARING.....	2
10	B3-210-32	WASHER, bearing	4
11	B9-210-81	SCREW, allen head, M5 x 25	2
12	B3-310-14	GUIDE, bearing, right	1
	B3-310-15	GUIDE, bearing, left.....	1
13	B3-210-29	PIN.....	1
14	B3-210-28	COVER, side.....	2
15	B9-210-79	SCREW, countersunk, allen head, M5 x 10	2
16	B3-210-30	RETAINER, bearing	2
17	B3-210-31	BEARING.....	2
18	B9-210-80	SCREW, countersunk, allen head.....	6
19	B3-310-04	HOUSING, BOM lower.....	1
20	B3-310-05	SHAFT, main spring	1
21	B3-410-04	SPRING	1
22	B3-310-11	SCREW, countersunk, allen head, M5 x 10	1
	B3-310-19	SCREW, countersunk, allen head, M5 x 20.....	2
23	B9-210-28	SCREW, phillips head, M4 x 8	4
24	B9-210-69	WASHER, M4	4
25	B3-310-16	MOUNT, slip ring.....	1
26	B3-310-07	ARM, yoke support	1
27	B3-210-04	SLIP RING	1
	B3-410-05	SLIP RING, TV (part of assembly).....	1
28	B9-310-04	SCREW, phillips head.....	4
29	B9-310-05	SCREW, phillips head.....	1
30	B3-310-08	NUT, spring adjustment.....	1
31	B3-310-09	COLLAR, adjustment nut	1
32	B3-310-10	WASHER, spring.....	1
33	B3-210-11	BEARING.....	1
34	B3-310-12	NUT.....	1
35	B3-310-13	MOUNT, brush block.....	1
36	B3-210-05	BRUSH BLOCK	1
	B3-410-05	BRUSH BLOCK, TV (part of assembly)	1
37	B3-310-01	VERTICAL SUPPORT TUBE.....	1
	B3-410-01	VERTICAL SUPPORT TUBE, TV	1
38	B9-310-06	SCREW, set	A/R
39	B3-410-02	COVER, adjustment.....	1
40	B3-410-03	SCREW.....	2

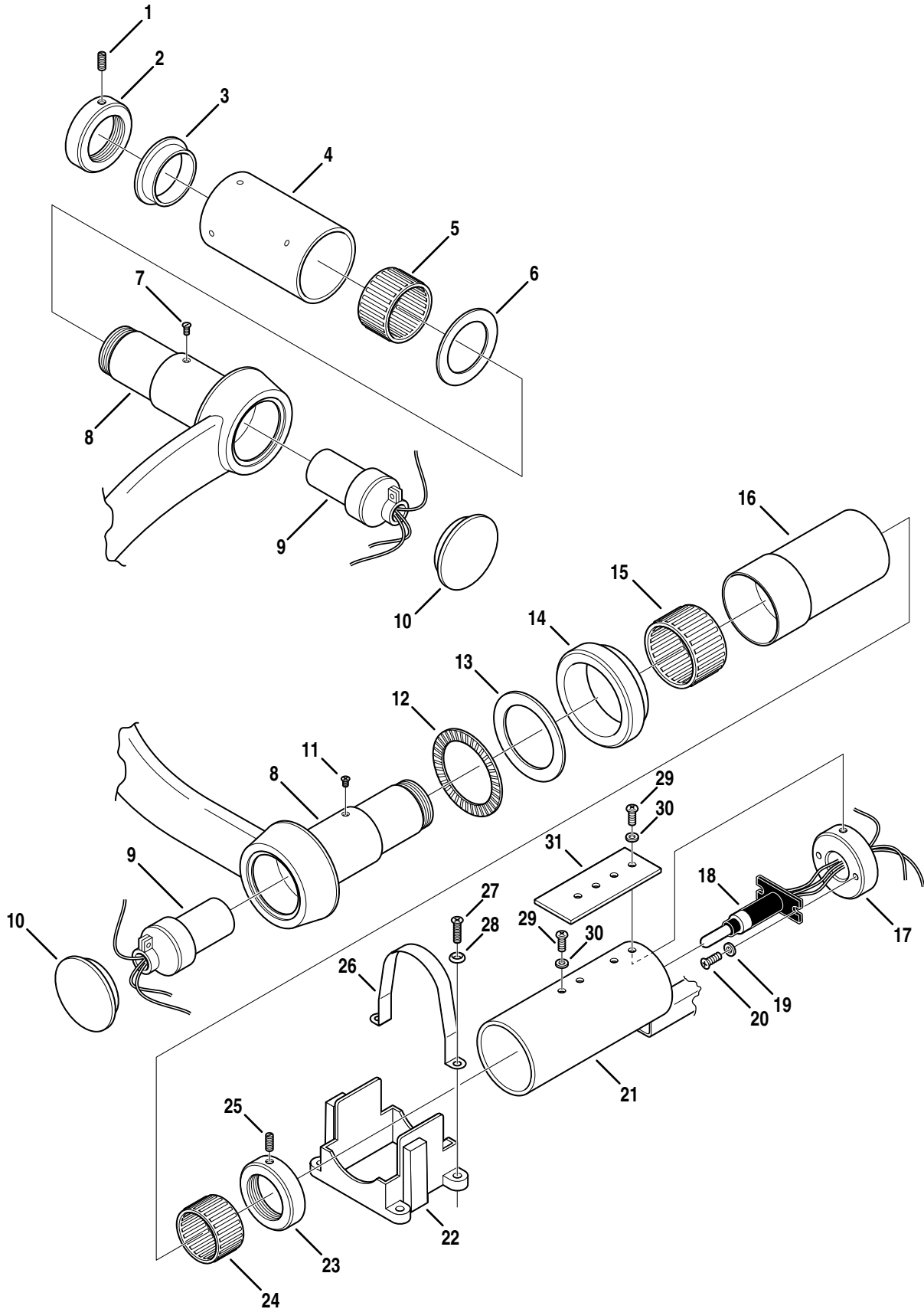
3. BALANCE MECHANISM ASSEMBLY MODEL ST29



3. BALANCE MECHANISM ASSEMBLY MODEL ST29

Item	Part No.	Description	Qty.
	B3-420-00	BALANCE MECHANISM ASSEMBLY, ST29	A/R
	ST29TV BOM	BALANCE MECHANISM ASSEMBLY, ST29TV	A/R
	ST29TV BOM-1	BALANCE MECHANISM ASSEMBLY, ST29TV, S.N. 04010614 & L	A/R
1	B3-210-13	SLEEVE, VST	1
2	B3-210-12	VST SCREW, M6 x 12	A/R
3	B3-310-02	PLUG, chrome	1
4	B3-210-14	WASHER, needle bearing.....	2
5	B3-210-15	BEARING, needle	1
6	B3-420-01	JOINT, upper knuckle.....	1
7	B9-210-82	SCREW, set	1
8	B3-210-34	PIN, pivot	2
9	B3-210-33	BEARING.....	2
10	B3-210-32	WASHER, bearing	4
11	B9-210-81	SCREW, allen head, M5 x 25	2
12	B3-310-14	GUIDE, bearing, right	1
	B3-310-15	GUIDE, bearing, left.....	1
13	B3-210-29	PIN.....	1
14	B3-210-28	COVER, side.....	2
15	B9-210-79	SCREW, ctsk. allen head, M5 x 10	2
16	B3-210-30	RETAINER, bearing	2
17	B3-210-31	BEARING.....	2
18	B9-210-80	SCREW, ctsk. allen head	6
19	B3-420-02	HOUSING, BOM lower.....	1
	B3-420-03	BUSHING.....	2
20	B3-420-04	SHAFT, main spring.....	1
21	B3-420-11	SPRING, S.N. 01030032&L	1
	B3-420-05	SPRING, S.N. 01030031&P.....	1
22	B3-310-11	SCREW, ctsk. allen head, M5 x 10	3
23	B3-420-09	SCREW.....	1
24	B3-420-07	HOUSING, brush block.....	1
	B3-420-07-1	HOUSING, brush block, ST29TV, S.N. 04010614 & L	1
25	B3-210-05	BRUSH BLOCK	1
	B3-410-05	BRUSH BLOCK, TV (part of assembly)	1
26	B3-420-10	SCREW, phillips.....	2
	B3-420-12	SCREW, set, M5 x 10, S.N. 04010614 & L	3
27	B3-420-06	ARM, yoke support	1
	B3-420-06-1	ARM, yoke support, ST29TV, S.N. 04010614 & L.....	1
28	B3-420-08	COVER, adjustment.....	1
29	B3-410-03	SCREW.....	2
30	B3-410-11	NUT, spring adjustment.....	1
31	B3-410-12	COLLAR, adjustment nut	1
32	B3-410-13	WASHER, spring.....	1
33	B3-210-11	BEARING.....	1
34	B3-310-12	NUT.....	1
35	B3-210-04	SLIP RING	1
	B3-410-05	SLIP RING, TV (part of assembly)	1
36	B9-210-69	WASHER, M4	4
37	B9-210-28	SCREW, phillips head, M4x8	4
38	B3-310-13	MOUNT, brush block.....	1
39	B9-310-06	SCREW, set	A/R
40	B3-310-01	VERTICAL SUPPORT TUBE.....	1
	B3-410-01	VERTICAL SUPPORT TUBE, TV	1

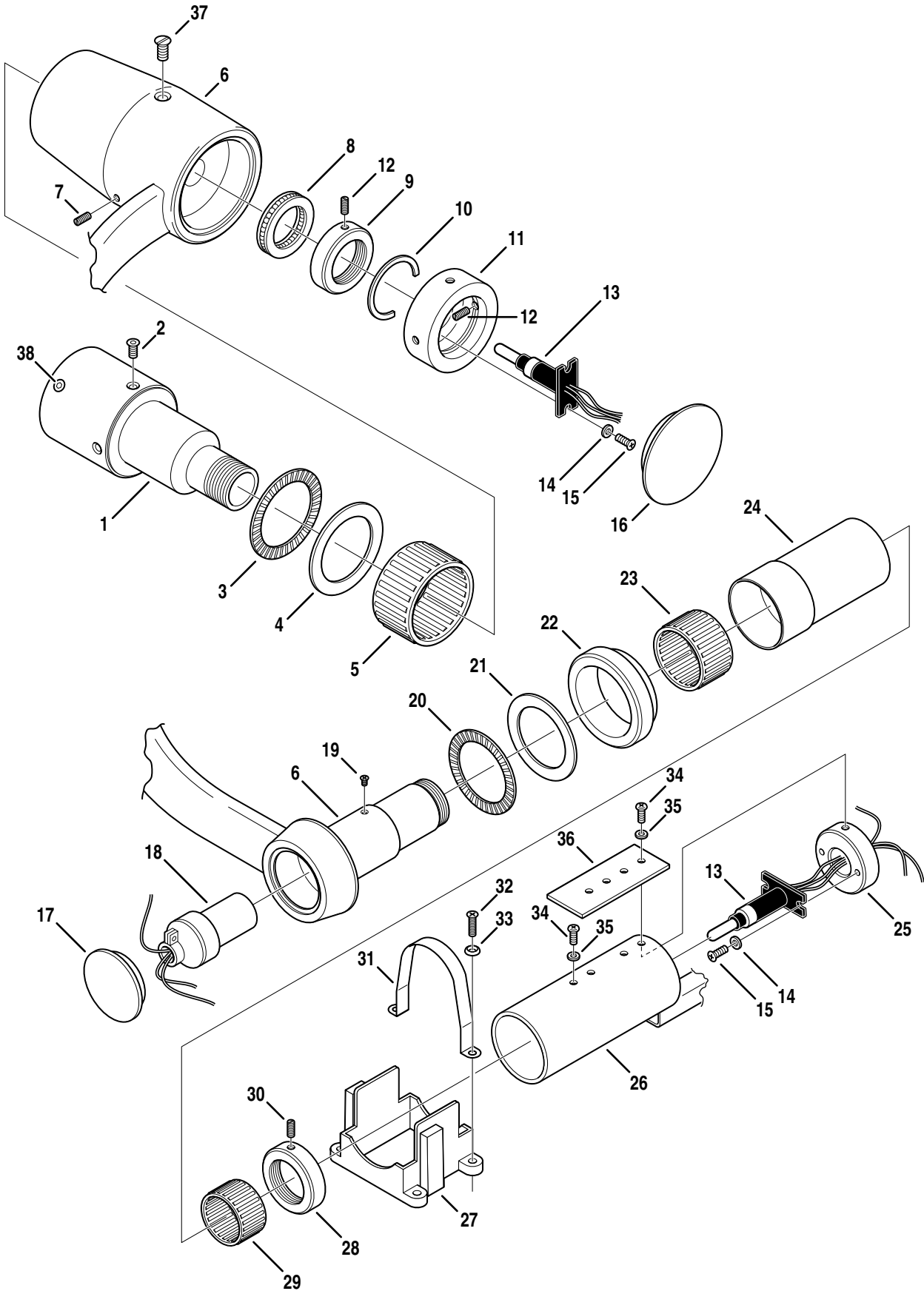
4. LIGHTHEAD YOKE ASSEMBLY MODEL ST23



4. LIGHTHEAD YOKE ASSEMBLY MODEL ST23

Item	Part No.	Description	Qty.
1	B9-310-60	SCREW, set	1
2	B3-220-10	NUT.....	1
3	B3-310-17	BUSHING.....	1
4	B1-410-81	BEARING BODY ASSEMBLY	1
5	B3-220-13	•BEARING, needle.....	1
6	B3-220-14	•WASHER, wear	1
7	B9-210-33	SCREW.....	1
8	B1-410-03	YOKE	1
9	B3-210-05	BRUSH BLOCK	2
	B3-410-05	BRUSH BLOCK, TV (part of assembly)	2
10	B1-220-08	COVER, yoke	2
11	B1-410-04	SCREW.....	1
12	B1-410-05	BEARING, thrust.....	1
13	B1-410-06	WASHER, thrust bearing	1
14	B1-410-07	COVER	1
15	B1-410-08	BEARING, needle	1
16	B1-410-09	BEARING BODY	1
17	B1-410-25	MOUNT, slip ring.....	1
18	B3-210-04	SLIP RING	1
	B3-410-05	SLIP RING, TV (part of assembly).....	1
19	B9-210-69	WASHER, M4	2
20	B9-210-28	SCREW, phillips head, M4 x 8	2
21	B1-410-10	FRAME, inner support, ST23.....	1
22	B1-410-12	MOUNT	1
23	B1-410-13	NUT.....	1
24	B1-410-14	BEARING, needle	1
25	B9-410-07	SCREW, set	1
26	B1-410-15	BAND	2
27	B9-410-09	SCREW, phillips head, M4 x 15	4
28	B9-410-08	WASHER	4
29	B9-410-10	SCREW, M4 x 10	A/R
30	B9-210-69	WASHER, M4	A/R
31	B1-410-16	WEIGHT, balance	A/R

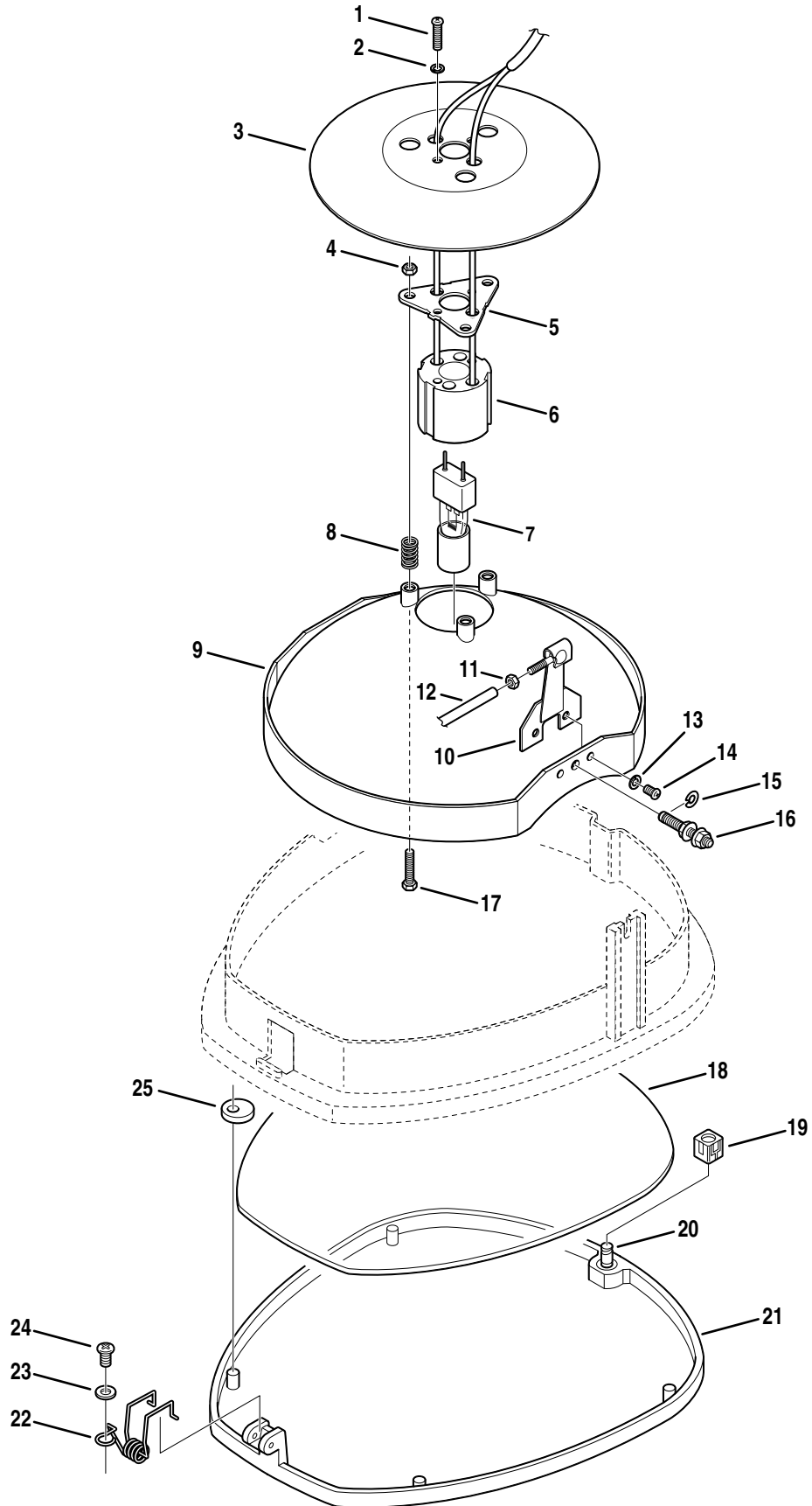
5. LIGHTHEAD YOKE ASSEMBLY MODEL ST29



5. LIGHTHEAD YOKE ASSEMBLY MODEL ST29

Item	Part No.	Description	Qty.
1	B1-410-17	COLLAR AND BEARING SHAFT	1
	B1-410-17-1	COLLAR AND BEARING SHAFT, ST29TV, S.N. 04010614 & L.....	1
2	B9-410-12	SCREW, M5 x 15	3
3	B1-410-18	BEARING, thrust.....	1
4	B1-410-19	WASHER, thrust bearing	1
5	B1-410-20	BEARING, needle	1
6	B1-410-21	YOKE, ST29.....	1
7	B9-410-13	SCREW, set, M4 x 8, cup point.....	1
8	B1-410-22	BEARING	1
9	B1-410-23	NUT.....	1
10	B1-410-24	SNAP RING	1
11	B1-410-25	MOUNT, slip ring.....	1
	B1-410-25-1	MOUNT, slip ring, ST29TV, S.N. 04010614 & L.....	1
12	B9-410-14	SCREW, set, M4 x 8, cone point.....	1
13	B3-210-04	SLIP RING	2
	B3-410-05	SLIP RING, TV (part of assembly)	2
14	B9-210-69	WASHER, M4	4
15	B9-210-28	SCREW, phillips head, M4 x 8	4
16	B1-410-26	COVER, yoke	1
17	B1-220-08	COVER, yoke.....	2
18	B3-210-05	BRUSH BLOCK	2
	B3-410-05	BRUSH BLOCK, TV (part of assembly)	2
19	B1-410-04	SCREW.....	1
20	B1-410-05	BEARING, thrust.....	1
21	B1-410-06	WASHER, thrust bearing	1
22	B1-410-07	COVER	1
23	B1-410-08	BEARING, needle	1
24	B1-410-09	BEARING BODY	1
25	B1-410-10	MOUNT, slip ring.....	1
26	B1-410-11	FRAME, inner support, ST29.....	1
27	B1-410-12	MOUNT	1
28	B1-410-13	NUT.....	1
29	B1-410-14	BEARING, needle	1
30	B9-410-07	SCREW, set.....	1
31	B1-410-15	BAND	2
32	B9-410-09	SCREW, phillips head, M4 x 15.....	4
33	B9-410-08	WASHER	4
34	B9-410-10	SCREW, M4 x 10	A/R
35	B9-210-69	WASHER, M4	A/R
36	B1-410-16	WEIGHT, balance	A/R
37	B1-410-79	SCREW, brake	1
38	B9-410-11	SCREW, M5 x 8	A/R

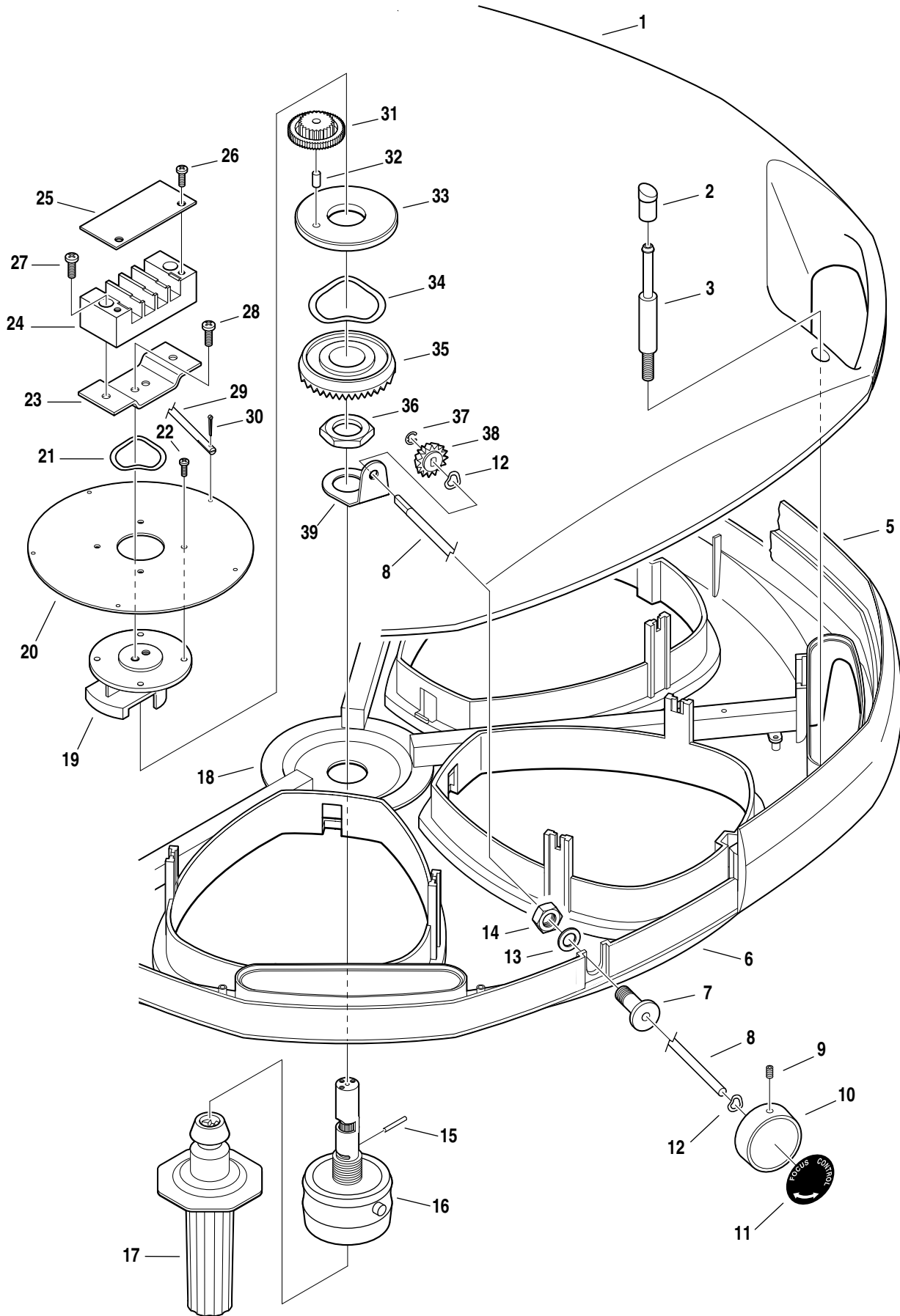
6. BULB AND RELECTOR ASSEMBLY



6. BULB AND REFLECTOR ASSEMBLY

Item	Part No.	Description	Qty.
1	B9-410-15	SCREW, phillips, M3 x 25	2
2	B9-410-16	WASHER, M3	2
3	B1-410-27	HEAT SINK	1
4	B9-410-17	NUT, hex, M4	3
5	B1-410-28	MOUNT, bulb socket	1
6	B1-410-29	SOCKET, bulb	1
7	B1-010-28	BULB, halogen, 24501	1
8	B1-410-30	SPRING	3
9	B1-410-31	REFLECTOR	1
10	B1-410-32	LINK, focus.....	1
11	B9-410-18	NUT.....	1
12	B1-410-33	ROD, focus, ST23	1
	B1-410-34	ROD, focus, ST29	1
13	B9-410-19	WASHER	2
14	B9-410-20	SCREW.....	2
15	B9-410-21	E-RING	2
16	B1-410-35	PIVOT HARDWARE.....	2
17	B9-410-22	BOLT, hex, M4 x 20.....	3
--	B1-410-77	DIFFUSER/FILTER ASSEMBLY	1
18	B1-410-36	FILTER.....	1
19	B1-410-37	RETAINER, 1/4 turn screw.....	1
20	B1-410-83	SCREW, 1/4 turn, with silicon ring and plastic washer	1
21	B1-410-39	DIFFUSER	1
22	B1-410-40	RETAINER, diffuser	1
23	B9-410-23	WASHER	1
24	B9-410-24	SCREW.....	1
25	B1-410-41	MOUNT, filter	4

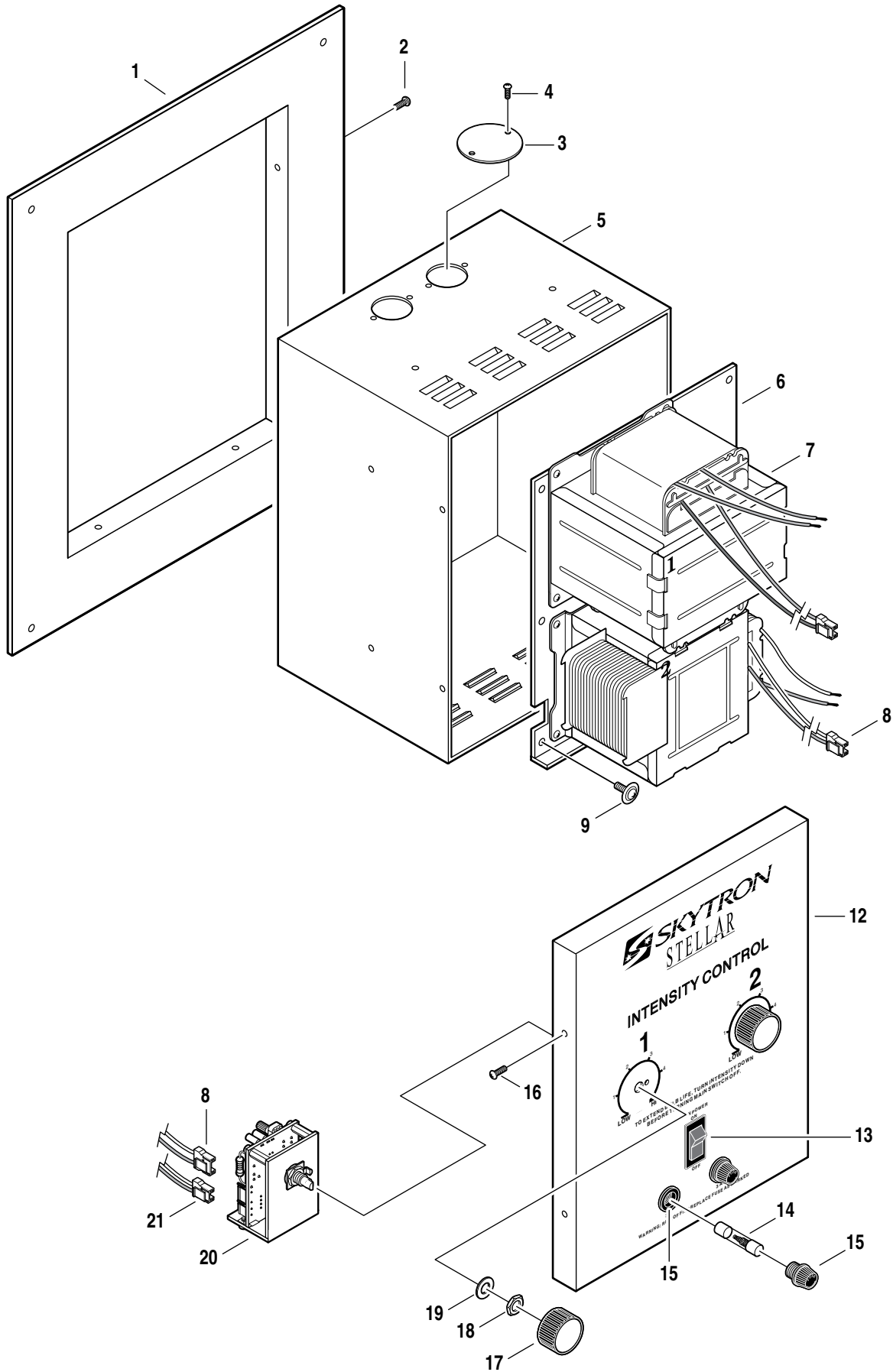
7. FOCUS MECHANISM ASSEMBLY



7. FOCUS MECHANISM ASSEMBLY

Item	Part No.	Description	Qty.
	B1-410-01	LIGHTHEAD ASSEMBLY, ST23	A/R
	B1-410-02	LIGHTHEAD ASSEMBLY, ST29	A/R
1	B1-410-69	TOP COVER, ST23.....	1
	B1-410-70	TOP COVER, ST29.....	1
2	B1-410-73-1	CAP.....	A/R
3	B1-410-78	BOLT, cap mount.....	A/R
5	B1-410-67	TRIM SEAL, ST23	1
	B1-410-68	TRIM SEAL, ST29	1
6	B1-410-65	FRONT FACE, ST23.....	1
	B1-410-66	FRONT FACE, ST29.....	1
7	B1-410-60	SUPPORT, focus shaft.....	1
8	B1-410-53	SHAFT, focus, ST23.....	1
	B1-410-54	SHAFT, focus, ST29.....	1
9	B1-410-61	SCREW, set	2
10	B1-410-63	KNOB, focus	1
11	B1-410-62	LABEL, focus control.....	1
12	B1-410-55	WASHER, wave	2
13	B1-410-59	WASHER	1
14	B1-410-58	NUT.....	1
15	B1-410-50	PIN.....	1
16	B1-410-64	C.F. ENGAGEMENT HEAD ASSEMBLY	1
17	B1-410-82	HANDLE, sterilizable, focus/positioning.....	1
18	B1-410-10	FRAME, inner support, ST23.....	1
	B1-410-11	FRAME, inner support, ST29.....	1
19	B1-410-44	GEAR RACK AND PIVOT	1
20	B1-410-42	FOCUS RING, ST23.....	1
	B1-410-43	FOCUS RING, ST29.....	1
21	B1-210-32	WASHER, wave	1
22	B9-410-44	SCREW, self tapping, M3 x 8.....	4
23	B1-210-33	BRACKET, terminal strip mounting	1
24	B1-210-34	TERMINAL STRIP	1
25	B1-210-35	•COVER, terminal strip	1
26	B9-210-35	•SCREW, terminal strip cover	2
27	B9-210-34	SCREW, terminal strip mounting	2
28	B9-210-36	SCREW, bracket mounting	2
29	B1-410-33	ROD, focus, ST23	5
	B1-410-34	ROD, focus, ST29	7
30	B1-010-12	PIN, cotter	A/R
31	B1-410-45	GEAR.....	1
32	B1-410-46	PIN, gear pivot	1
33	B1-410-47	MOUNT, gear	1
34	B1-410-48	WASHER, wave	1
35	B1-410-49	GEAR, bevel	1
36	B1-410-51	NUT.....	1
37	B1-410-57	E-RING	1
38	B1-410-56	GEAR, pinion	1
39	B1-410-52	MOUNT, focus rod.....	1

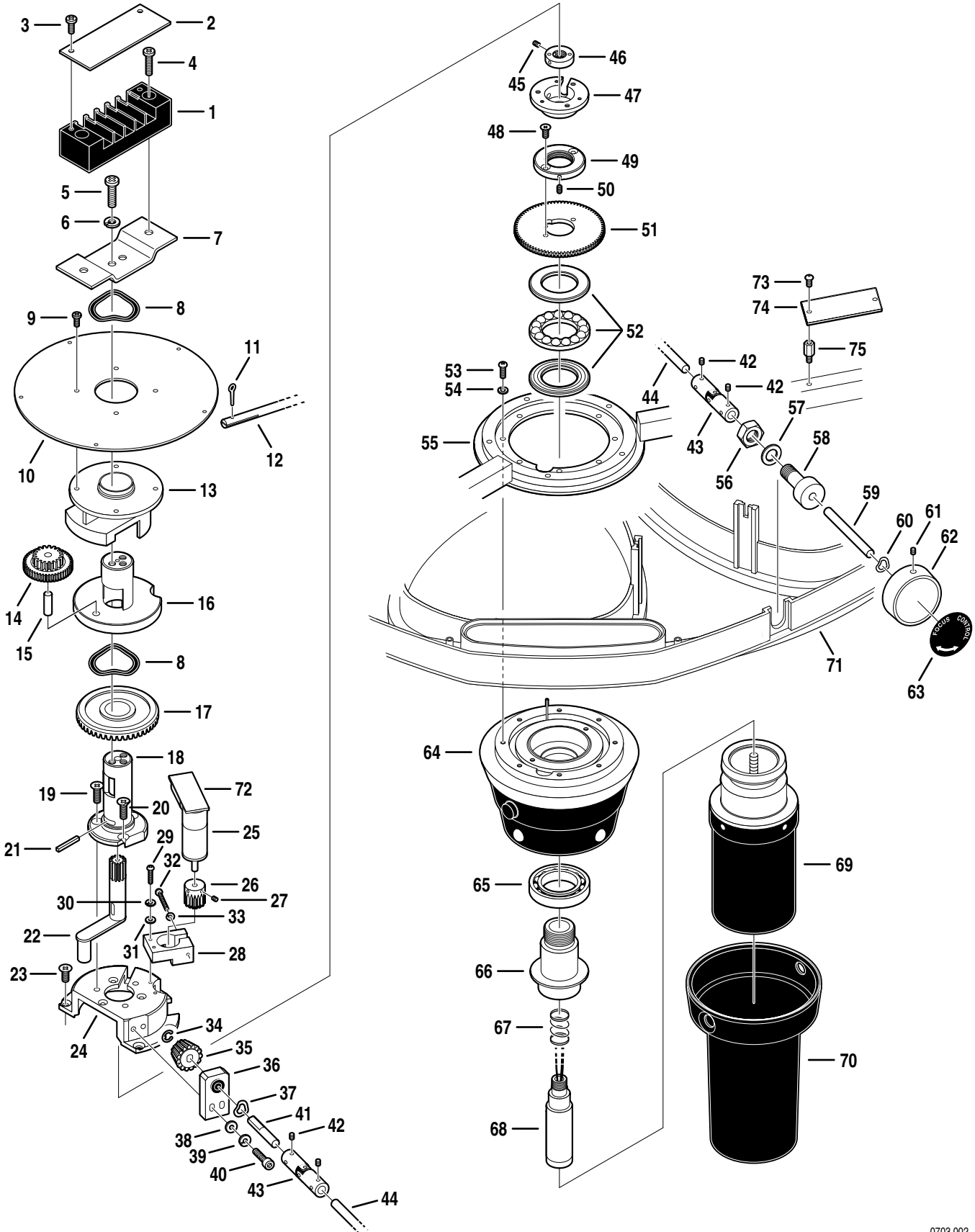
8. WALL CONTROL ASSEMBLY



8. WALL CONTROL ASSEMBLY

Item	Part No.	Description	Qty.
	B9-410-01	WALLCONTROL, ST23, ST23TV	A/R
	B9-410-02	WALL CONTROL, ST2323, ST2323TV	A/R
	B9-410-03	WALL CONTROL, ST232323, ST232323TV	A/R
	B9-410-04	WALL CONTROL, ST29, ST29TV	A/R
	B9-410-05	WALL CONTROL, ST2923, ST29TV23, ST2923TV	A/R
	B9-410-06	WALL CONTROL, ST292323, ST29TV2323, ST292323TV	A/R
1	B9-310-07	FLANGE, recess mount, single or dual.....	1
	B9-310-08	FLANGE, recess mount, triple	1
2	B9-210-40	SCREW, flange mounting	8
3	B9-210-09	COVER, electrical access	2
4	B9-210-41	SCREW, cover mounting	4
5	B9-410-27	HOUSING, wall control, single or dual.....	1
	B9-410-28	HOUSING, wall control, triple	1
6	B9-410-29	PLATE, transformer mount, ST23	1
	B9-410-30	PLATE, transformer mount, ST2323	1
	B9-410-31	PLATE, transformer mount, ST232323	1
	B9-410-32	PLATE, transformer mount, ST29	1
	B9-410-33	PLATE, transformer mount, ST2923	1
	B9-410-34	PLATE, transformer mount, ST292323	1
7	B9-410-25	TRANSFORMER, ST23.....	A/R
	B9-410-26	TRANSFORMER, ST29.....	A/R
8	B9-410-35	CONNECTOR, 2 pin	A/R
9	B9-210-43	SCREW, phillips, M4 x 8, w/washers	A/R
12	B9-410-36	PANEL, wall control front, ST23.....	1
	B9-410-37	PANEL, wall control front, ST2323.....	1
	B9-410-38	PANEL, wall control front, ST232323.....	1
	B9-410-39	PANEL, wall control front, ST29.....	1
	B9-410-40	PANEL, wall control front, ST2923.....	1
	B9-410-41	PANEL, wall control front, ST292323.....	1
13	B9-210-16	SWITCH, main power, green	1
	B4-242-73	SWITCH, main DPST, yellow	1
14	B9-210-21	FUSE, 250V, 3A	A/R
	B9-210-22	FUSE, 250V, 5A	A/R
15	B9-310-25	FUSE HOLDER	A/R
16	B9-210-43	SCREW w/ washers.....	4
17	B9-210-20	KNOB, dimmer control	A/R
18	B9-210-71	NUT, dimmer control	A/R
19	B9-210-70	WASHER	A/R
20	B9-410-42	DIMMER CONTROL ASSEMBLY	A/R
21	B9-410-43	CONNECTOR, 2 pin	A/R

9. TV LIGHTHEAD COMPONENTS

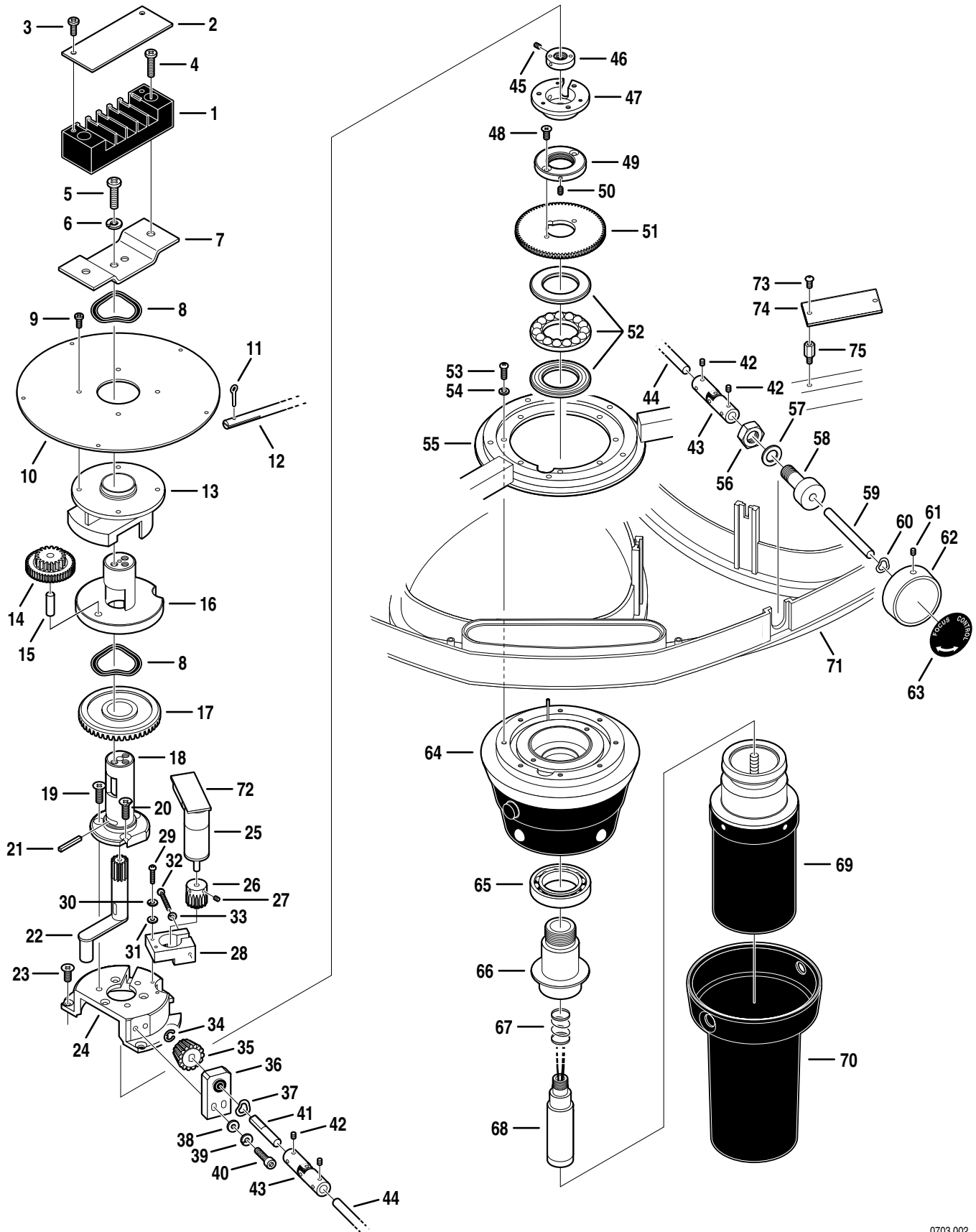


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9. TV LIGHTHEAD COMPONENTS

Item	Part No.	Description	Qty.
1	B1-420-40	TERMINAL STRIP	1
2	B1-420-41	•COVER, terminal strip	1
3	B9-210-35	•SCREW, terminal strip cover	2
4	B9-210-34	SCREW, terminal strip mounting	2
5	B1-420-42	SCREW, bracket mounting	2
6	B1-420-43	WASHER, lock	2
7	B1-420-44	BRACKET, terminal strip mounting	1
8	B1-420-45	WASHER, wave	2
9	B9-410-13	SCREW, self-tapping, M3 x 8	4
10	B1-410-42	FOCUS RING, ST23TV	1
	B1-410-43	FOCUS RING, ST29TV	1
11	B1-010-12	PIN, cotter	A/R
12	B1-410-33	ROD, focus, ST23TV	5
	B1-410-34	ROD, focus, ST29TV	7
13	B1-420-46	GEAR RACK & PIVOT	1
14	B1-410-45	GEAR	1
15	B1-410-46	PIN, gear pivot	1
16	B1-420-47	MOUNT, gear	1
17	B1-410-49	GEAR, bevel	1
18	B1-420-48	ENGAGEMENT HEAD	1
19	B1-420-49	SCREW, phillips, countersunk	2
20	B1-420-50	SCREW, phillips, countersunk (special)	1
21	B1-420-51	PIN, square	1
22	B1-420-52	LINK, gear	1
23	B1-420-53	SCREW, phillips, countersunk	A/R
24	B1-420-54	MOUNT	1
25	B1-420-55	MOTOR	1
26	B1-420-56	GEAR	1
27	B1-420-57	SCREW, set	A/R
28	B1-420-58	MOTOR MOUNT	1
29	B1-420-59	SCREW	2
30	B1-420-60	WASHER, lock	2
31	B1-420-61	WASHER, flat	2
32	B1-420-62	SCREW	1
33	B1-420-63	WASHER, lock	1
34	B1-420-64	E-RING	1
35	B1-410-56	GEAR, pinion	1
36	B1-420-65	PILLOW BLOCK	1
37	B1-410-48	WASHER, wave	1
38	B1-420-93	WASHER, flat	2
39	B1-420-66	WASHER, lock	2
40	B1-420-67	BOLT, allen	2
41	B1-420-68	SHAFT	1
42	B1-420-69	SCREW, set	4
43	B1-420-70	UNIVERSAL JOINT	2
44	B1-420-71	SHAFT, intermediate focus, ST23TV	1
	B1-420-72	SHAFT, intermediate focus, ST29TV	1
45	B1-420-73	SCREW, set	A/R
46	B1-420-74	NUT	1
47	B1-420-75	CASE	1
48	B1-420-76	SCREW	2

9. TV LIGHTHEAD COMPONENTS (continued)



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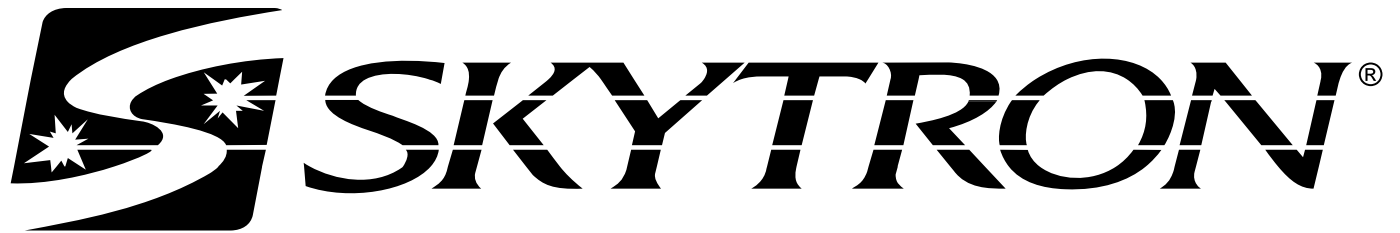
9. TV LIGHTHEAD COMPONENTS (continued)

Item	Part No.	Description	Qty.
49	B1-420-77	NUT.....	1
50	B1-420-78	SCREW, set.....	A/R
51	B1-420-79	GEAR.....	1
52	B1-420-80	THRUST BEARING ASSEMBLY.....	1
53	B1-420-81	SCREW.....	A/R
54	B1-420-82	WASHER, lock.....	A/R
55	B1-420-83	FRAME, inner support, ST23TV.....	1
	B1-420-84	FRAME, inner support, ST29TV.....	1
56	B1-410-58	NUT.....	1
57	B1-410-59	WASHER.....	1
58	B1-410-60	SUPPORT, focus shaft.....	1
59	B1-420-85	SHAFT, focus.....	1
60	B1-410-55	WASHER, wave.....	1
61	B1-410-61	SCREW, set.....	A/R
62	B1-410-63	KNOB, focus.....	1
63	B1-410-62	LABEL, focus control.....	1
64	B1-420-86	HOUSING.....	1
65	B1-420-87	BEARING.....	1
66	B1-420-88	PIVOT.....	1
67	B1-420-89	SPRING.....	1
68	B1-420-90	CAMERA CONNECTOR.....	1
69	B1-420-08	CAMERA, TVII.....	1
	B1-420-03-NE	CAMERA, TVII, non EMI.....	1
	B1-420-03	CAMERA, TVI.....	1
70	B1-410-80	SLEEVE, sterilizable, camera cover.....	1
71	B1-420-91	FRONT FACE, ST23TV.....	1
	B1-420-92	FRONT FACE, ST29TV.....	1
72	B1-421-06	CIRCUIT BOARD, motor.....	1
73	B1-420-94	SCREW.....	2
74	B1-421-04	CIRCUIT BOARD.....	1
75	B1-421-05	STAND-OFF.....	2
NS	B1-420-30	FACEPLATE & CONNECTOR, camera control.....	1
NS	B1-420-07	CAMERA CONTROL UNIT, TVII.....	1
	B1-420-01-NE	CAMERA CONTROL UNIT, TVII, non EMI.....	1
NS	B1-420-01	CAMERA CONTROL UNIT, TVI.....	1
NS	B1-420-02	COUNTERWEIGHT.....	1

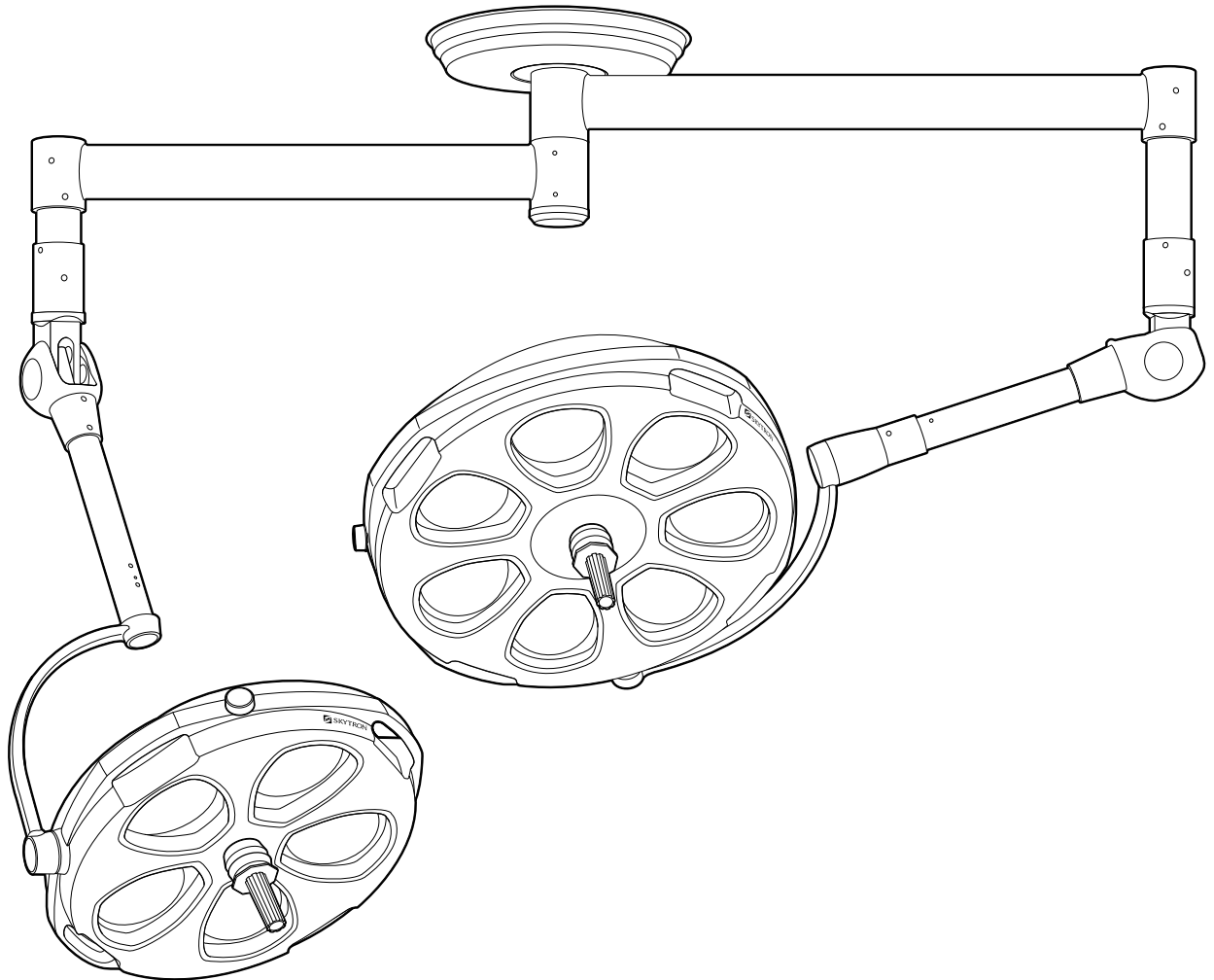
TVI and TVII items are not compatible



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MAINTENANCE MANUAL



STELLAR

SERIES SURGICAL LIGHTS

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Although current at the time of publication, SKYTRON'S policy of continuous development makes this manual subject to change without notice.

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

ENTE LA CERTIFIED

TO UL2601-1

CAN/CSA601.1, IEC 60601-2-46

US



C

RECOMMENDED TOOL LIST

- | | |
|--|---|
| 1 PIN PUNCH SET 1/8" - 3/8" | 1 METRIC, L-TYPE ALLEN WRENCH SET 1.5-8mm |
| 1 TEFLON TYPE SPRAY LUBRICANT (TRI-FLOW) | 1 PENCIL |
| 1 SET OF PHILLIPS SCREWDRIVERS | 1 TRUE RMS VOLTMETER |
| 1 SET OF FLAT BLADE SCREWDRIVERS | 1 SET OF NON ABRASIVE CLEAN CLOTHS |
| 1 DIGITAL LEVEL | 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 lighthouse 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, ethylene 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 lighthouse 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 lighthouse 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. Lighthouse 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. Torque yoke allen screws to 3.5Nm (2.6 ft.lbs).

- d. 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.

- e. 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.

- f. 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.

- g. Check the remaining slip ring/brush block assemblies by raising, lowering, and rotating the lighthouse 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.

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

- i. 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 lighthouse 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.

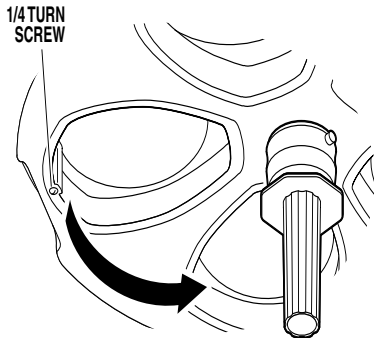


Figure 1-1.

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.

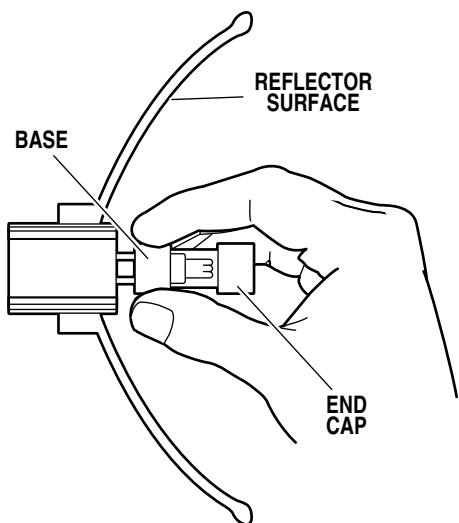


Figure 1-2.

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 StellarLight, 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 lighthouse 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 lighthouse) should be 20V ± 0.2V.

1-5. Focus Adjustment

As part of normal Preventive Maintenance, the lighthouse 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 lighthouse top cover screws and remove the top cover.
- b. Position the lighthouse 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.

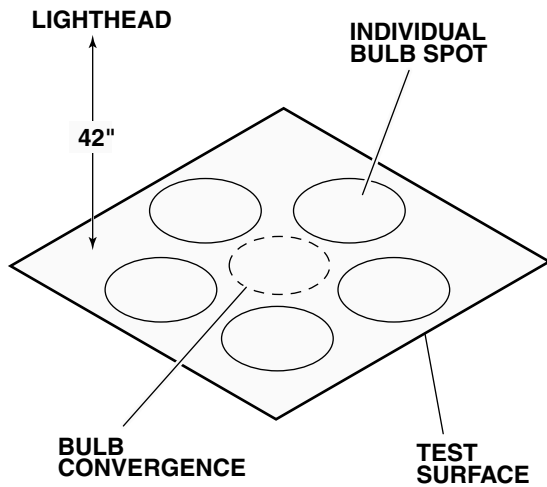


Figure 1-3.

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

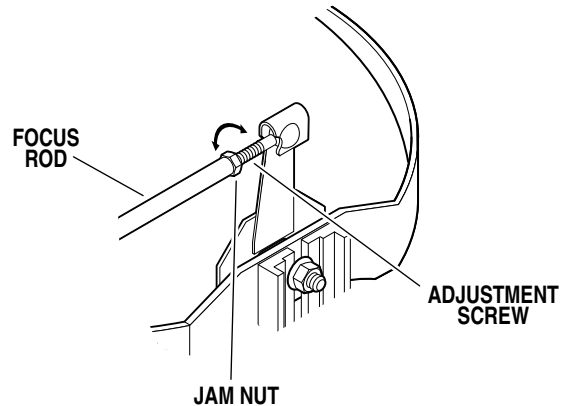


Figure 1-4.

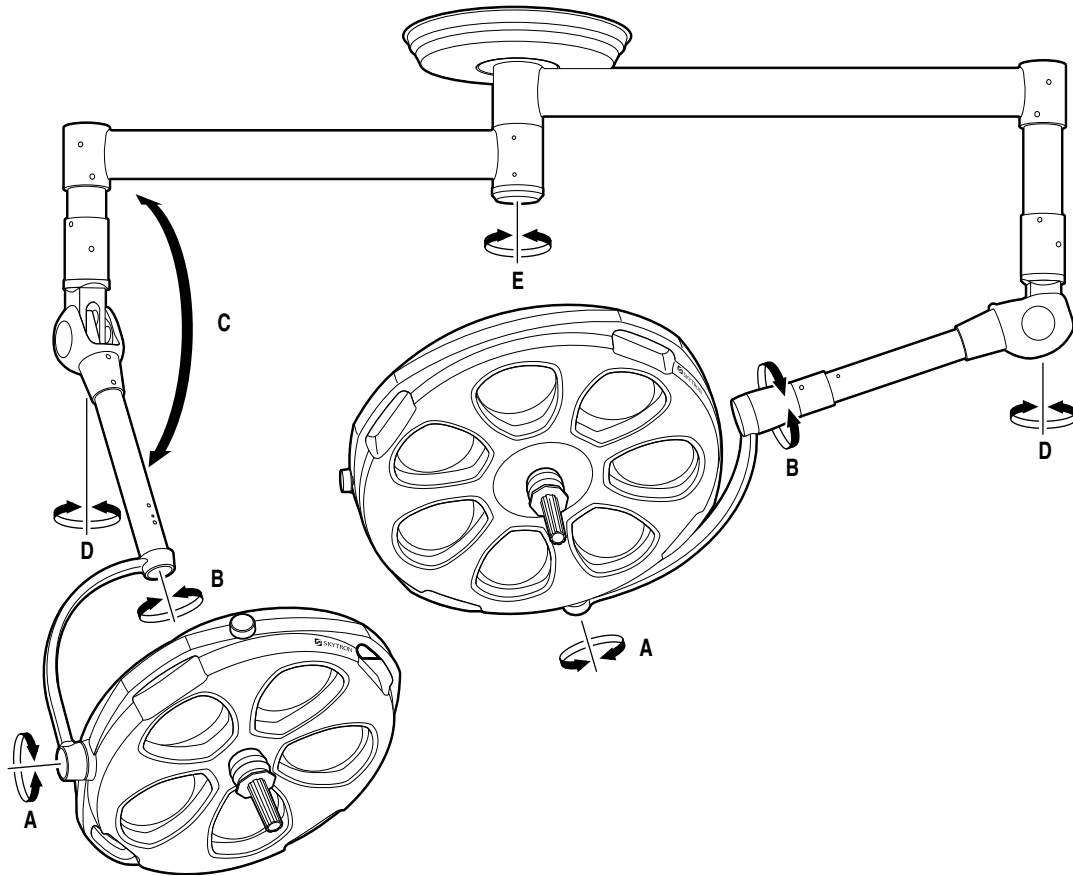
WARNING

Do not remove lighthouse 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
B-Lighthead Roll Axis-
 •Model 29 lighthead
 •Model 23 lighthead

paragraph 2-2
 paragraph 2-3
 paragraph 2-4

C-Vertical Travel Tension
D-Lighthead Horizontal
 Rotation
E-Radial Arm Horizontal
 Rotation

paragraph 2-5
 paragraph 2-6
 paragraph 2-7

Figure 2-1. Fixture Rotation Axis

2-2. Lighthouse Pitch Adjustment

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

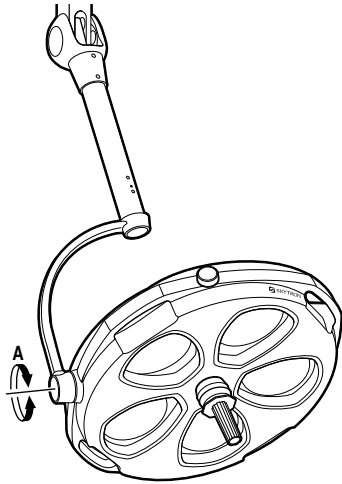


Figure 2-2. Lighthouse Pitch

b. The lighthouse 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 lighthouse until an allen set screw is visible through the adjustment hole. Loosen the set screw, rotate the lighthouse 180° and loosen the second set screw.

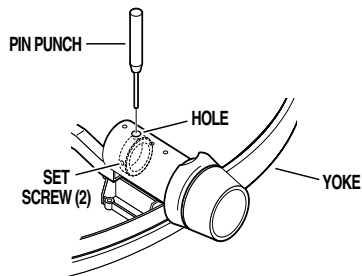


Figure 2-3. Lighthouse Pitch Adjustment

d. Rotate the lighthouse 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 lighthouse 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 Lighthouse Roll Adjustment

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

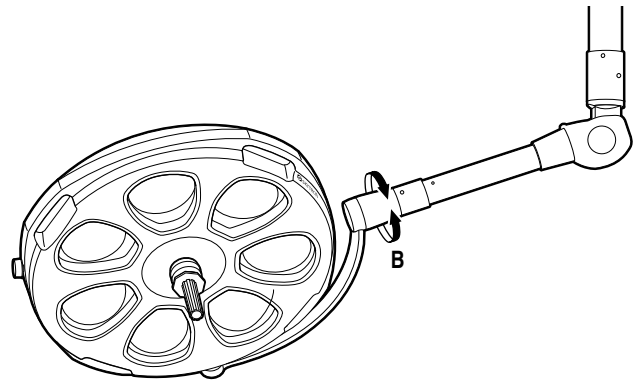


Figure 2-4. Model 29 Lighthouse Roll

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

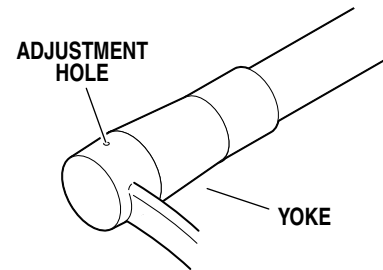


Figure 2-5. Model 29 Roll Adjustment

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 lighthouse for proper tension. Repeat adjustment procedure if necessary. After the adjustment is correct, be sure to tighten the set screw

2-4. Model 23 Lighthouse Roll Adjustment

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

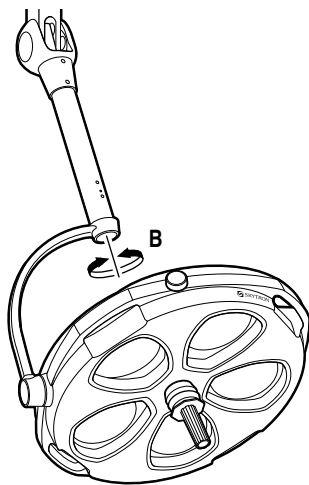


Figure 2-6. Model 23 Lighthouse Roll

b. The lighthouse 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.

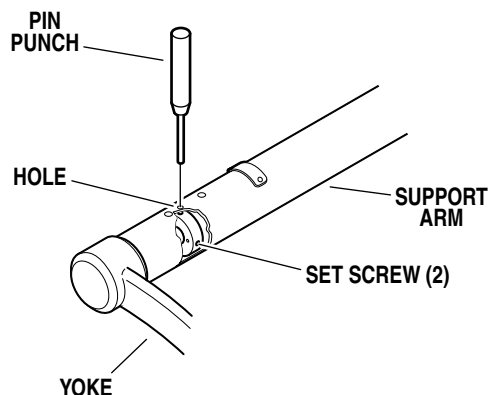


Figure 2-7. Model 23 Roll Adjustment

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 lighthouse 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 lighthouse throughout its range of vertical motion. See figure 2-8.

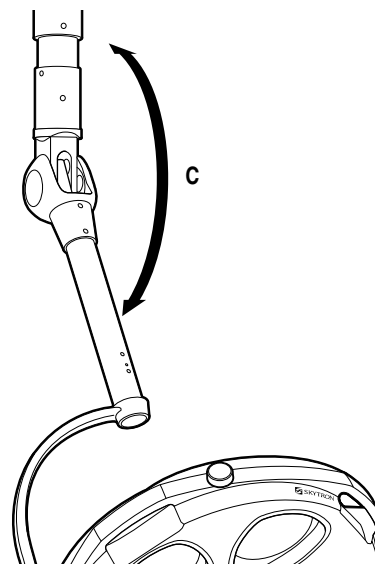


Figure 2-8. Lighthouse Vertical Travel

b. The lighthouse 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 lighthouse downward until the adjustment nut is visible through the adjustment slot in the support arm.

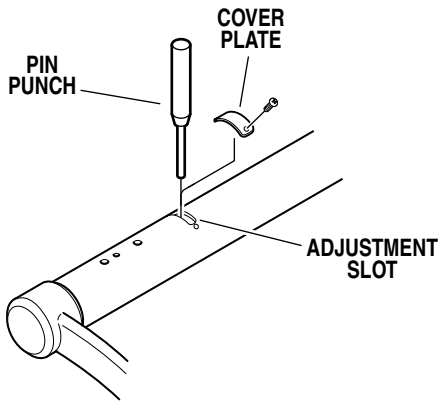


Figure 2-9. Vertical Travel Adjustment

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 lighthouse 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 lighthouse through its full range of travel around the Balance Mechanism. See figure 2-10.

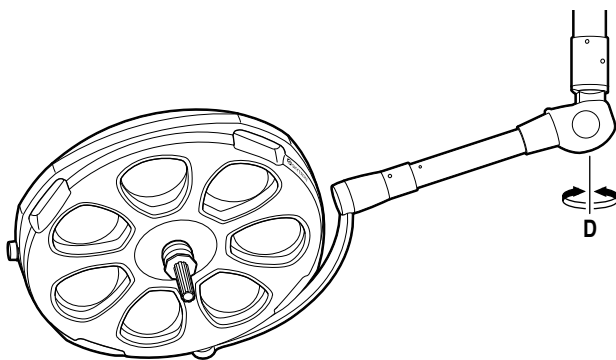


Figure 2-10. Horizontal Rotation

b. The lighthouse 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 lighthouse 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 lighthouse 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 lighthouse several times in both directions and recheck for proper tension.

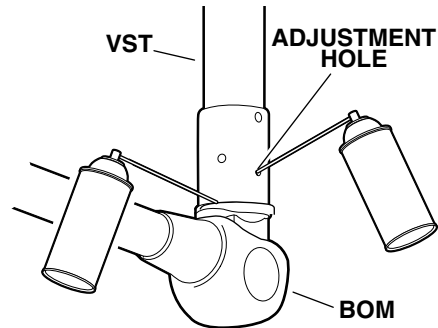


Figure 2-11 . BOM Lubrication

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:

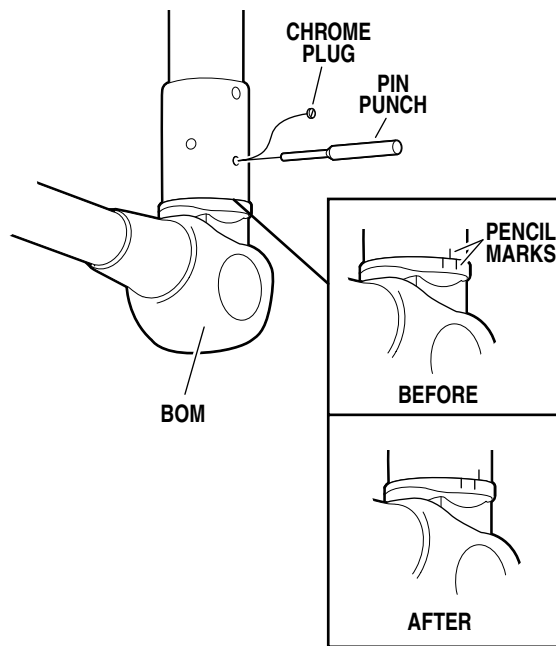


Figure 2-12. Horizontal Rotation Adjustment

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 lighthouse around the Balance Mechanism until any setscrews are visible through the adjustment hole and loosen them.

f. Continue to rotate the lighthouse 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 lighthouse 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 lighthouse 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 lighthouse so that the pencil marks are approximately 1/8" apart. Turn the lighthouse 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 lighthouse to make this adjustment.

i. Remove the pin punch and check the lighthouse 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.

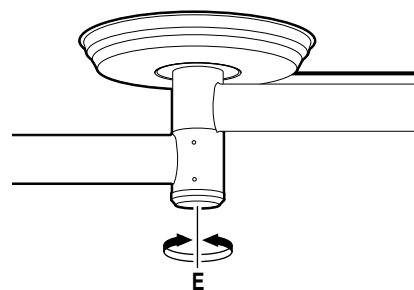


Figure 2-13.

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 lighthouse should be $20\text{VAC} \pm 0.2\text{V}$. 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 lighthouse being tested to maximum intensity for the test. Output voltage (at the connectors) should be $20\text{V} \pm 0.2\text{V}$. See figure 2-14.

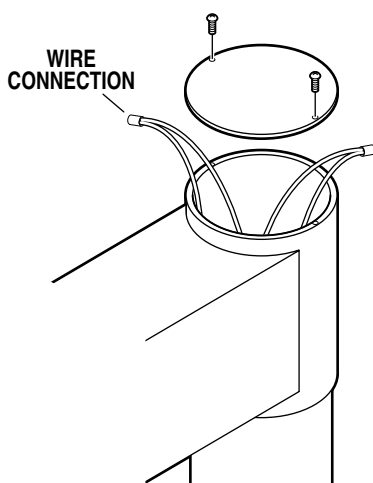


Figure 2-14. Bulb Voltage Test

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

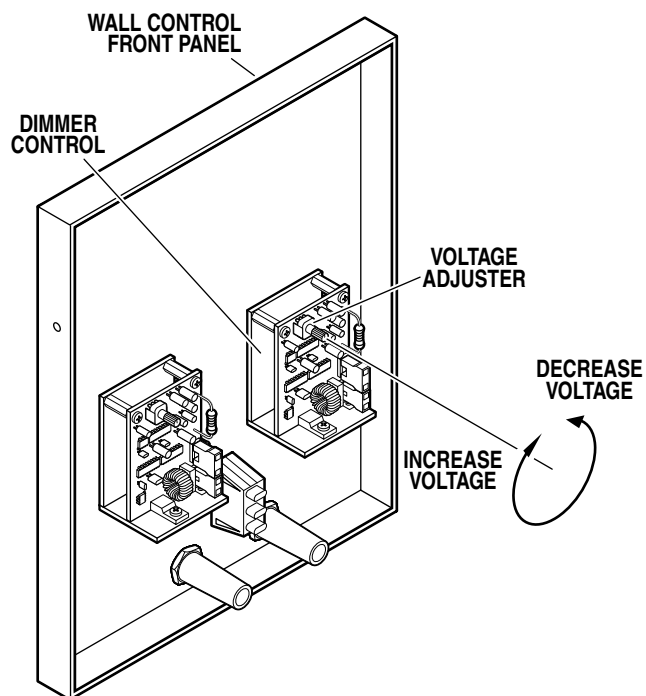


Figure 2-15. Voltage Adjustment

c. Turn the adjuster clockwise to increase the output voltage, counterclockwise to decrease the voltage. Proper voltage at the connectors should be $20\text{V} \pm 0.2\text{V}$.

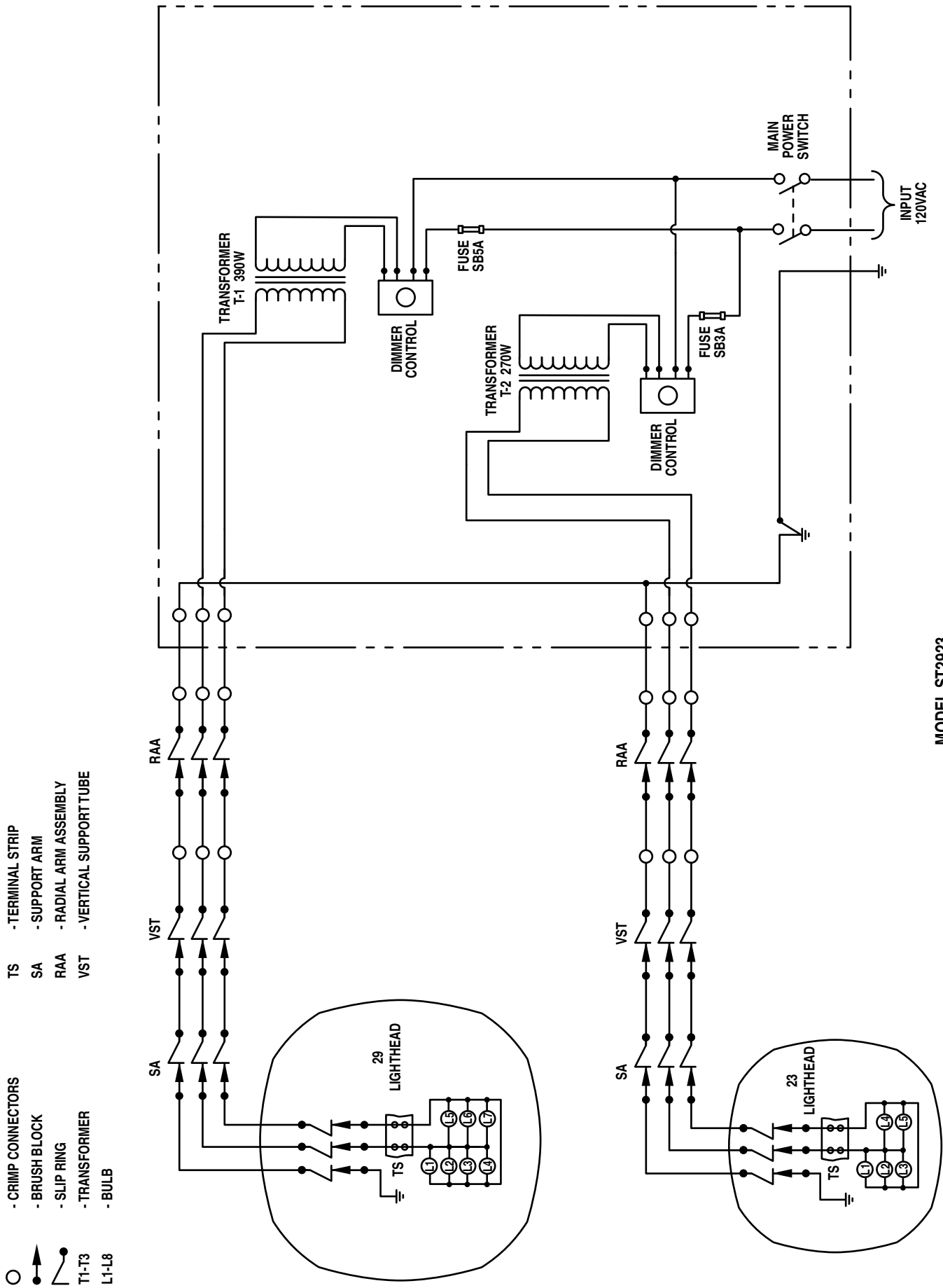
Service

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
5085 Corporate Exchange Blvd., S.E.
Grand Rapids, MI 49512
Phone (616) 656-2900.

WIRING DIAGRAM



MODEL ST2923

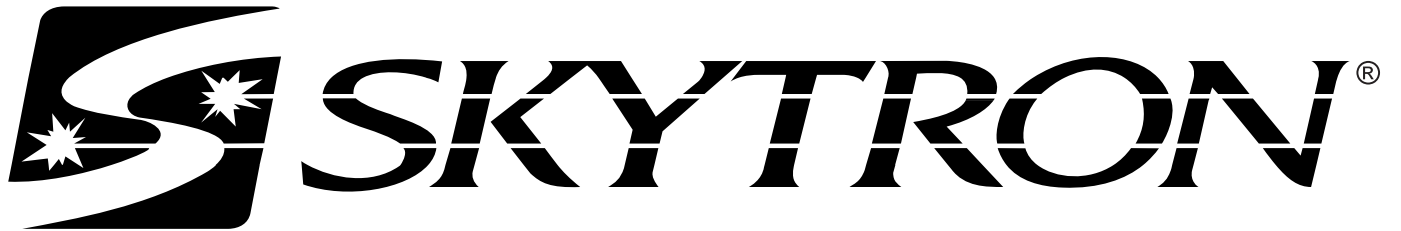
- CRIMP CONNECTORS
- BRUSH BLOCK
- SLIP RING
- TRANSFORMER
- BULB

- TS - TERMINAL STRIP
- SA - SUPPORT ARM
- RAA - RADIAL ARM ASSEMBLY
- VST - VERTICAL SUPPORT TUBE





5085 Corporate Exchange Blvd. S.E.
Grand Rapids, MI 49512 • 1.616.656.2900 • FAX 1.616.656.2906



INSTALLATION INSTRUCTIONS



STELLAR

LFS SERIES

EQUIPMENT LABELS AND SPECIFICATIONS



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



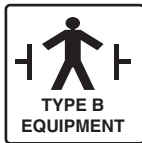
AC VOLTAGE



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

ENTECLA CERTIFIED

TO UL2601-1

CAN/CSA601.1, IEC 60601-2-46



TOOLS REQUIRED:

3/8" DRIVE RATCHET
ALLEN WRENCH SET-METRIC
(2) STEP LADDERS
1" DEEP SOCKET, 3/8" DRIVE
#2 PHILLIPS HEAD SCREW DRIVER
UTILITY KNIFE
WIRE CUTTERS

CRIMP PLIERS
DIGITAL LEVEL
TRUE RMS MULTIMETER
PORTABLE LIFT, 750LB. CAPACITY
12" ADJUSTABLE WRENCH
SLOTTED HEAD SCREWDRIVER 1/4"
PUNCHSET 1/8" - 3/8"

Although current at the time of publication, SKYTRON'S policy of continuous development makes this manual subject to change without notice.

ELECTRICAL REQUIREMENTS

This fixture requires that electrical connections are made by a licensed electrician in accordance with state, local and national electrical codes using UL (Underwriters Laboratory) recognized materials.

Do not turn on main power to fixture until all lightheads are installed, connections are complete and the fixture has been reviewed by a SKYTRON representative.

ELECTRICAL HAZARDS EXIST!

Excercise caution when working on this fixture, the installation of this fixture must be made only by qualified and authorized personnel familiar with the essential knowledge and techniques.

CONNECTION MEANS



CAUTION



Connection of the fixture wires must be made using crimp connectors. Main terminal devices shall be so located or shielded that, should a wire of a stranded conductor escape when the conductors are fitted, there is no risk of accidental contact between live parts and accessible parts. Acceptable sheilding methods include UL aproved shrink tubing and electrical tape.

NATIONAL ELECTRICAL CODE, NFPA & ANSI REQUIREMENTS

The installation of connecting cords between equipment parts shall meet the requirements of the Nation Electrical Code, ANSI/NFPA70 as applicable.

BENDING REQUIREMENTS

Connection leads shall be constructed in such a manner that moveable leads in normal use are not bent around a radius of less than five times the outer diameter of the lead concerned. Avoid conditions employing severe bends to ensure the integrity of conductors.

CONDUIT REQUIREMENTS

This fixture requires 2 dedicated conduit raceways at the wall control to separate the 120VAC supply lines from the supply lines to the lighting fixture. Failure to observe this requirement will allow the migration of Electrical Magnetic Interference and will disrupt the operation of the lights.

Use of approved metal conduit shall be employed throughout the fixture's wiring circuit where applicable.

PROTECTIVE MEANS

This fixture requires a properly circuit protected, dedicated, 120VAC, 20 amp circuit. An isolated power supply circuit must be protected by a 20amp, double pole, single throw circuit breaker.

Proper performance and safety of this fixture can only be achieved by an adequate grounding system. Fixture ground must be a dedicated ground point ultimately bonded to the facilities grounding system to prevent the migration of electrical interference generated by other devices.

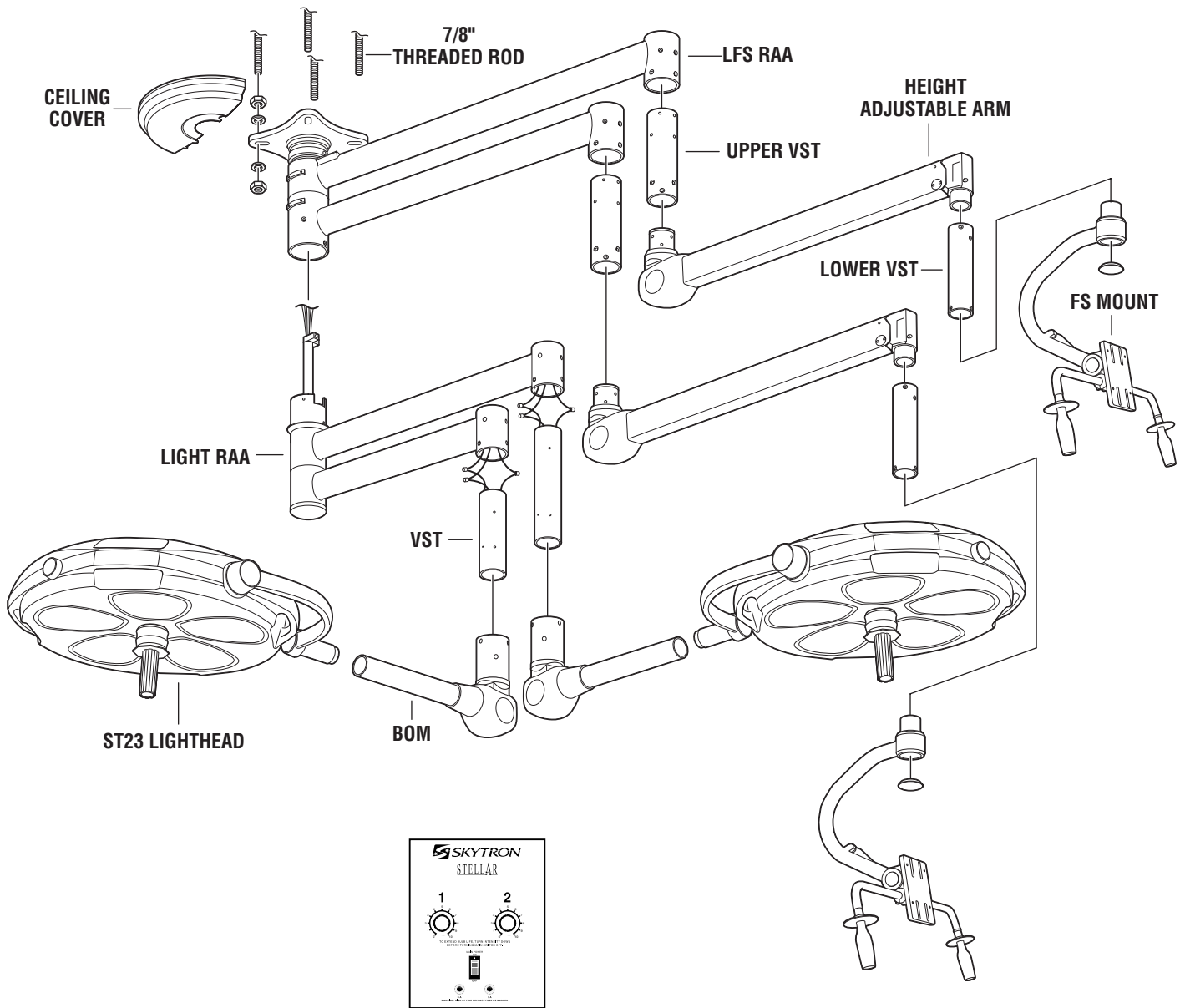


Figure 1.

**TYPICAL INSTALLATION SEQUENCE /
COMPONENT IDENTIFICATION**

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Mounting Hub and Flatscreen Mount Arm Assembly 2. Flatscreen Cables 3. Light Arm Assembly 4. Vertical Support Tubes/Balance Mechanism | <ol style="list-style-type: none"> 5. Lighthead 6. Height Adjustable Arm 7. Flatscreen Mount 8. Upper Flatscreen Radial Arm Stop Adjustment 9. Ceiling Cover 10. Wall Control |
|---|---|

INSTALLATION NOTES

- The SKYTRON Surgical Lighting Fixture is normally shipped in four to six crates, depending on the model. A carton containing the Vertical Support Tubes, miscellaneous hardware, and various instructional materials is packed separately.
- Follow the Installation Instructions and utilize the Installation Check List to assure proper installation.
- Additional materials required for proper installation include Loc-Tite compound.
- Lighting fixtures require a wall mounted control box. Single and Dual Lighthouse models 8" x 10", for Triple 10" x 13-1/2". 3/4" conduit and minimum 12 AWG wire is required between wall control and fixture. 10 AWG wire is recommended for installations requiring wires between control box and fixture that are longer than 25'.
- A 14AWG, 115V power cord with an IEC female plug is provided for power to the flatscreen monitor. Communication/video cables are provided by others.
- Skytron does not typically provide the flatscreen monitor. Please consult with supplier for specific details and requirements. Monitor weight cannot exceed 18 lbs.
- The mounting structure for all four arm systems must pass the SKYTRON "Test Jig" procedure. Refer to the Mounting Structure Guideline on page 15.

IMPORTANT NOTES

UNCRATING

- Should any damage to the fixture be noted while uncrating, further unpacking should be stopped and the container with all the wrappings held for inspection. The transportation company should be notified immediately so an inspector can be sent. Consult the Damaged Shipment Claim Procedure sheet for further details.
- Personnel uncrating SKYTRON surgical lights should be aware that they are delicate medical equipment and special care in handling should prevail throughout installation.

LIGHTHEADS

- Use extreme caution when removing the contents from the crates to prevent damage to the lights. Leave the lighthouse in their crates until ready to install.
- If the lighthouse must be set down after it is removed from the crate, lay it on the foam shipping block. Do not lay it on the front face.

NOTE

Details may vary depending upon model and support structure fabrication.

ALL fixtures use METRIC fasteners.

INSTALLATION PROCEDURE

The lighting fixture should be installed in the following sequence:

1. Mounting Hub and Flatscreen Mount Arm Assembly
2. Flatscreen Cables
3. Light Arm Assembly
4. Vertical Support Tubes/ Balance Mechanisms
5. Lighthoods
6. Height Adjustable Arm
7. Flatscreen Mount
8. Wall Control

1. Mounting Structure

a. Check the strength and stability of the mounting structure. It should be fabricated of steel and welded or bolted to the structural ceiling. It should be braced in a manner that will allow no twisting or lateral motion. The 7/8" diameter support rods should extend 2-1/4" below the finished ceiling for LFS models and 1-1/4" below the finished ceiling for LFSLFS models. See Mounting Structure Guidelines in the back of this booklet. For Seismic Applications please contact your local SKYTRON distributors. Differences exist.

b. Install the Radial Arm and Mounting Hub assembly on the threaded rods between jam nuts. The LFS hub should be 1-1/4" off the finished ceiling (measured from the bottom of the plate) and accurately leveled, within 0.1 degree, using a digital level. Tighten the jam nuts securely. The LFSLFS hub should be flush with the ceiling. See figure 2.

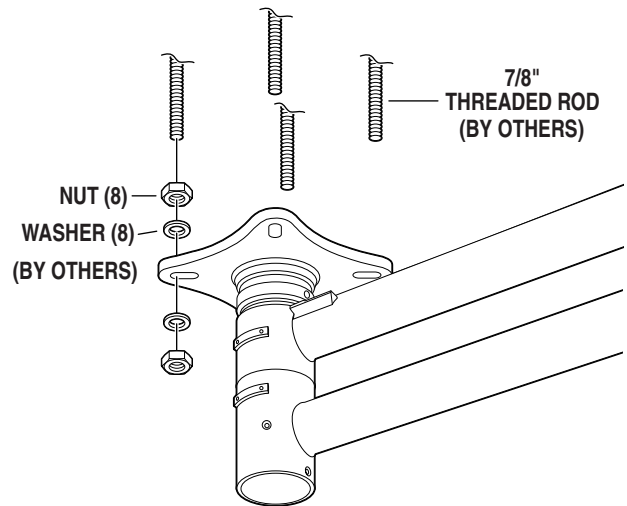


Figure 2. Mounting Hub Installation



WARNING



The mounting hub must be accurately leveled within 0.1° to prevent lighthead drift.

2. Flatscreen Cables

a. Before installing the light radial arm, route all video monitor cabling. If cabling is not available, a pull cable should be routed to ease later installation.

b. A 30mm (1.25") raceway is provided to accommodate video cabling. Refer to minimally invasive supply company for specific requirements prior to installation. Always follow manufacturers specific bend radii and state and local code requirements when installing such cabling.

3. Light Radial Arm Assembly

NOTE

The multiple arm assemblies are easier to handle during installation if the arms are left taped and tied together.

- a. Install the Light Radial Arm Assembly(RAA) into the receptacle on the Flatscreen Arm assembly and secure with (6) M6 x 10 screws. Align the joint shaft of the light radial arm to the hub assembly and install (2) M8 x 30 Allen bolts.

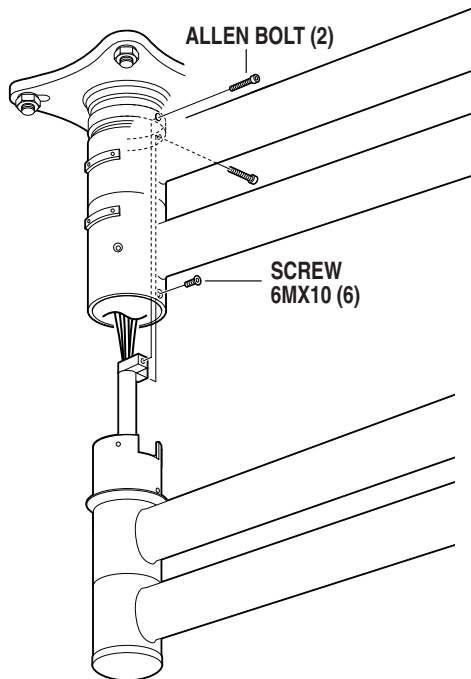


Figure 3. Radial Arm Installation

NOTE

Radial Arm wires are tagged for proper connection to the Wall Control (top arm #1, next arm #2, bottom arm [triple arm models] #3).

- b. Observe wire tags and color codes and connect the electrical wires from the wall control to the radial arm junction box wires.

NOTE

Connection of the fixture wires using Crimp Connectors is required due to the low voltage/high amperage electrical requirements.

4. Vertical Support Tubes/Balance Mechanism

NOTE

Determine correct placement for each Balance Mechanism(BOM)/Vertical Support Tube(VST) on the radial arm assembly. The longest VST goes into the top radial arm.



WARNING



Apply Loc-Tite to all of the 6mm mounting screws and use a 4mm allen wrench to tighten the screws.

- a. Install the VST on the BOM, apply Loc-Tite to screw threads and secure VST with the allen screws provided. See figure 4.



CAUTION



The 6mm mounting screws for attaching the VST to the radial arm may be different lengths. Observe any color code markings and make sure the proper screws are installed in the proper holes to avoid any damage to the electrical components.

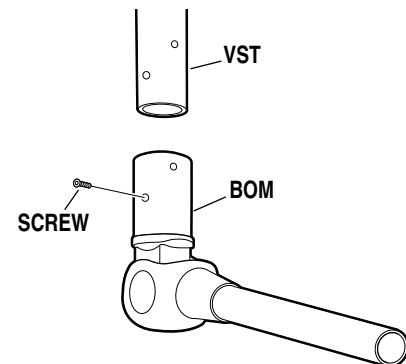


Figure 4. Balance Mechanism

b. Observe the wire colors and connect the wires from the radial arm to the corresponding BOM/VST wires using crimp connectors. See figure 5.

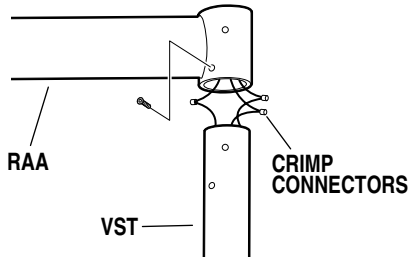


Figure 5. VST to RAA Installation

c. Insert the vertical support tube into the radial arm receptacle. Observe any screw color codes, apply Loc-Tite to screw threads, and secure the BOM/VST assembly with the 6mm mounting screws. Repeat procedure for any remaining BOM/VST assemblies.

b. Remove the four (4) screws from the light-head mounting stub.

c. Install the lighthouse mounting collar onto the support arm and secure with the screws previously removed. See figure 7.

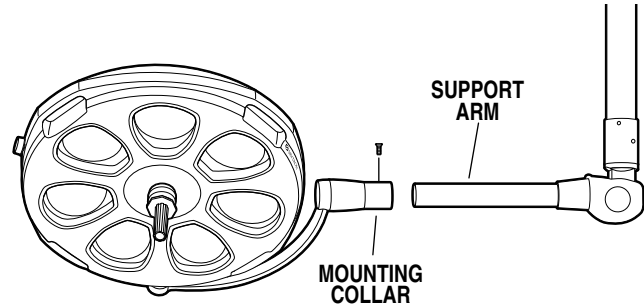


Figure 7. Model 29 Lighthouse Installation

d. Pull the lighthouse down and remove the Above Horizontal Limit Stops from the BOM. See figure 8.

5. Lighthouses

Model 29 Lighthouse

a. To make it easier to install the lighthouse, locate the support arm of the balance mechanism so that it points inward toward the ceiling cover. This will prevent the radial arm from moving when installing the lighthouse. See figure 6.

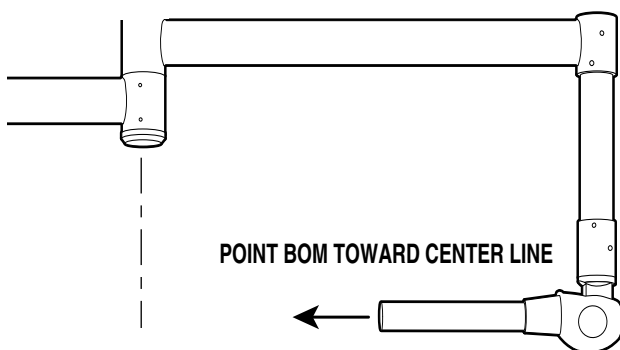


Figure 6.



WARNING



DO NOT remove lighthouse when support arm is in down position; The balance mechanism will be severely damaged and may result in bodily injury.

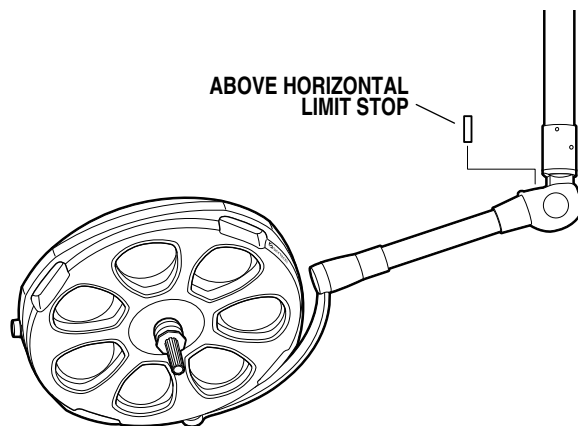


Figure 8. Above Horizontal Limit Stops

Model 23 or 19 Lighthead

a. To make it easier to install the lighthead, locate the support arm of the balance mechanism so that it points inward toward the ceiling cover. This will prevent the radial arm from moving when installing the lighthead. See figure 6.

b. Remove the four (4) screws from the lighthead mounting stub.

c. Install the lighthead mounting stub into the support arm and secure with the screws previously removed. See figure 9.

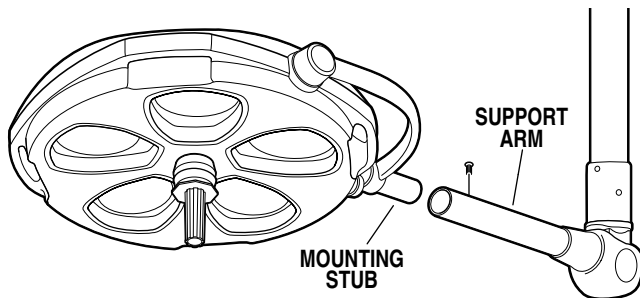


Figure 9. Model 23 or 19 Lighthead Installation (ST23 Lighthead shown)

d. Pull the lighthead down and remove the Above Horizontal Limit Stops from the BOM. See figure 8.



DO NOT remove lighthead when support arm is in down position; The balance mechanism will be severely damaged and may result in bodily injury.

6. Height Adjustable Arm

a. Install the Upper VST (longest) in the Flatscreen Radial Arm and secure with the (6) M6 x 10 screws.

b. Rotate mounting stub of Height Adjustable Arm clockwise until it contacts the stop.

c. Align Height Adjustable Arm in line with upper radial arm as shown in figure 10.

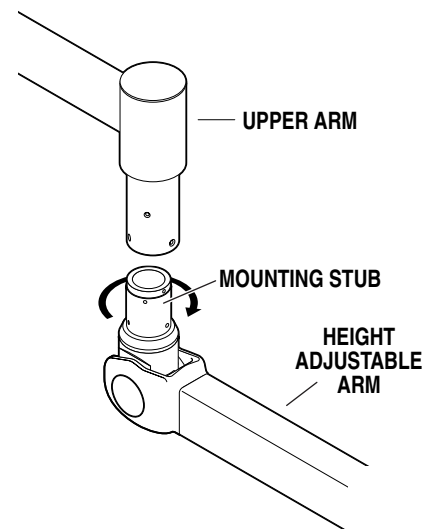
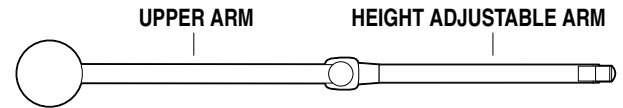


Figure 10.

d. Install the Height Adjustable Arm in the Upper VST and secure with (6) M6 x 8 screws. See figure 11.

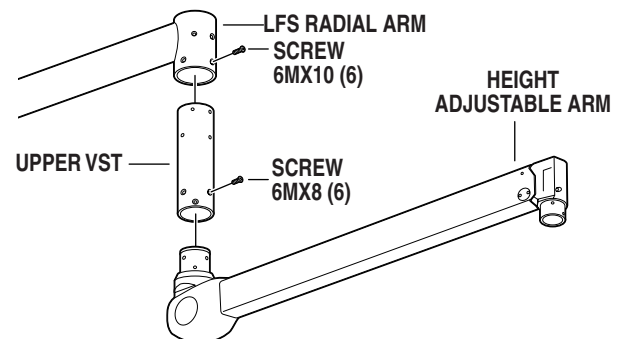


Figure 11.

7. Flatscreen Mount

a. Route all cabling or pullstring through arm assembly and install the Lower VST on the Height Adjustable Arm and secure with (4) M6 x 8 screws.

b. Install the Flatscreen Mount into the Lower VST and secure with (4) M6 x 8 screws. See figure 12.

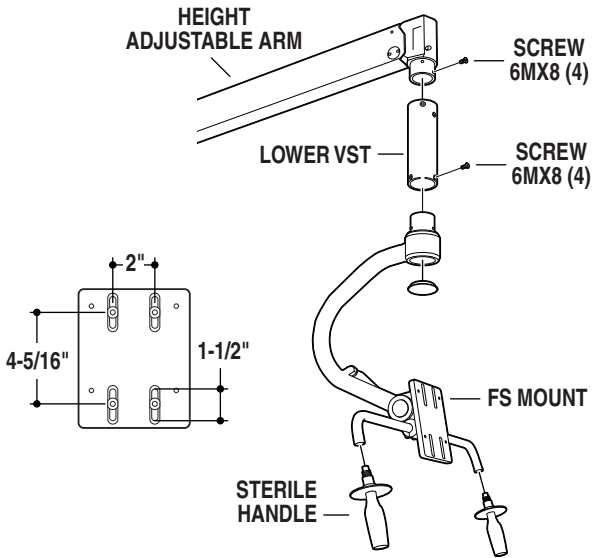


Figure 12.

c. Install the (2) sterilizable positioning handles.

d. Install the flatscreen monitor according to manufacturer's instructions and connect all video and power cables.

e. Check the vertical tension adjustment of the Height Adjustable Arm for its capacity to support the flatscreen monitor throughout its range of motion. The monitor should move freely yet maintain its selected position without drifting. If an adjustment is necessary, refer to figure 13 and proceed as follows:

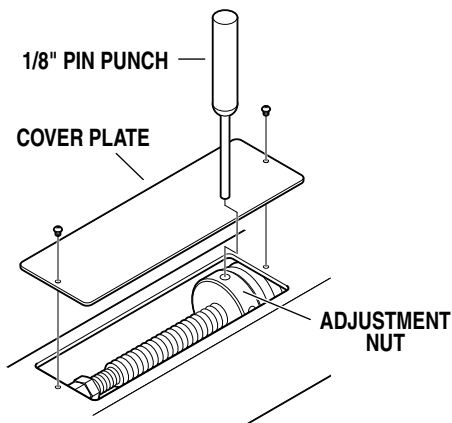


Figure 13.

NOTE

The System can support and balance a monitor weight up to 22 lbs. Exceeding the weight will result in poor balance and performance.

f. Remove the cover plate on the top of the Height Adjustable Arm for access to the tension adjustment nut. Insert a 1/8" pin punch into a hole in the adjustment and turn the nut as required to achieve proper tension - clockwise to increase tension, counterclockwise to decrease tension. Replace access cover when adjustment is complete.

g. Check the adjustment for the flatscreen monitor pitch axis. The monitor should move freely yet maintain its selected position without drifting. If an adjustment is necessary, refer to figure 14 and proceed as follows:

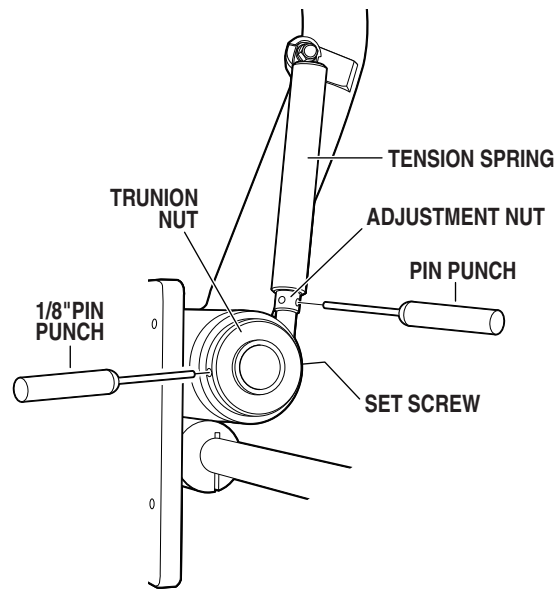


Figure 14.

h. Loosen set screw on trunnion nut, insert a 1/8" pin punch into hole opposite set screw location and adjust trunnion nut as required - clockwise to increase tension, counter clockwise to decrease tension. Tighten set screw when adjustment is complete.

i. For fine adjustment, rotate the monitor downward until the adjustment nut is visible on the tension spring assembly. Using a pin punch, turn the adjustment nut until proper tension is achieved.

8. Upper Flatscreen Radial Arm Stop Adjustment

The Flatscreen Radial Arm has a ball stop mechanism that allows 340° of rotation in 30° increments. Use the following procedure to set the stop locations.

a. Determine the degree of stop rotation and the location for the stops based on the room layout. The recommended stop location is over the head end of the table, this will allow the most flexibility for positioning the monitor. Refer to figure 15.

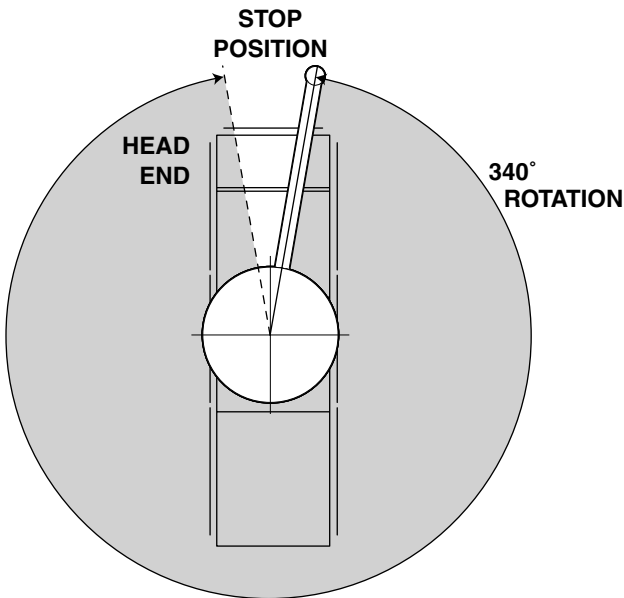


Figure 15.

b. To alter the stop position, refer to figure 16 and use the following procedures:

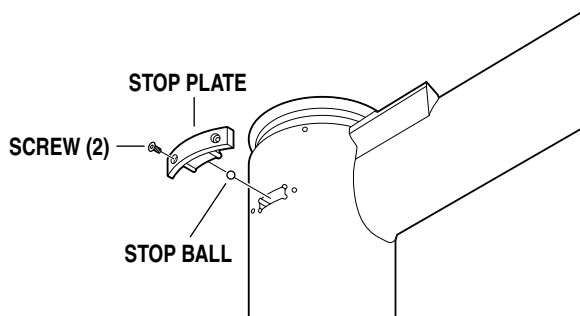


Figure 16.

c. Rotate the upper radial arm until the stop is contacted.

d. Remove the 2 screws securing the stop plate, remove the stop plate and stop ball.

e. Rotate the arm to the desired stop position, install the stop ball, install the stop plate and secure with the 2 screws.

9. Ceiling Cover

When all adjustments are complete and cables are routed, install the ceiling cover.

LFS models: Position and snap the two ceiling cover pieces together.

LFSLFS models: Install lower ceiling covers and secure with the screws and trim washers provided. See figure 17.

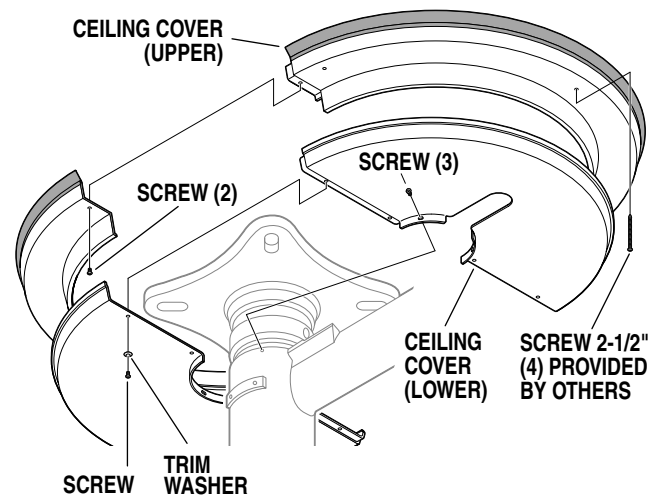


Figure 17.

Assemble the upper ceiling covers, center the upper cover in the lower cover and secure the upper cover to the ceiling using appropriate fasteners.

10. Wall Control

NOTE

•3/4" conduit and minimum 12AWG wire (3 wires per lighthouse) is required between Wall Control and Fixture.

•All wiring to be in accordance with local electrical codes.

a. Install wall mounted control box using the following procedures.

b. Remove the transformer tray assembly from the wall control box for ease in wire connection. See figure 18.

c. Install the wall control box as desired (surface or recessed mount) as shown in the wall control illustration, figure 19.

NOTE

Control Box wires are tagged for proper connection to the fixture.

d. Observe wire tags and color codes and connect output leads to appropriate lighthouse wires using crimp connectors. See figure 18.

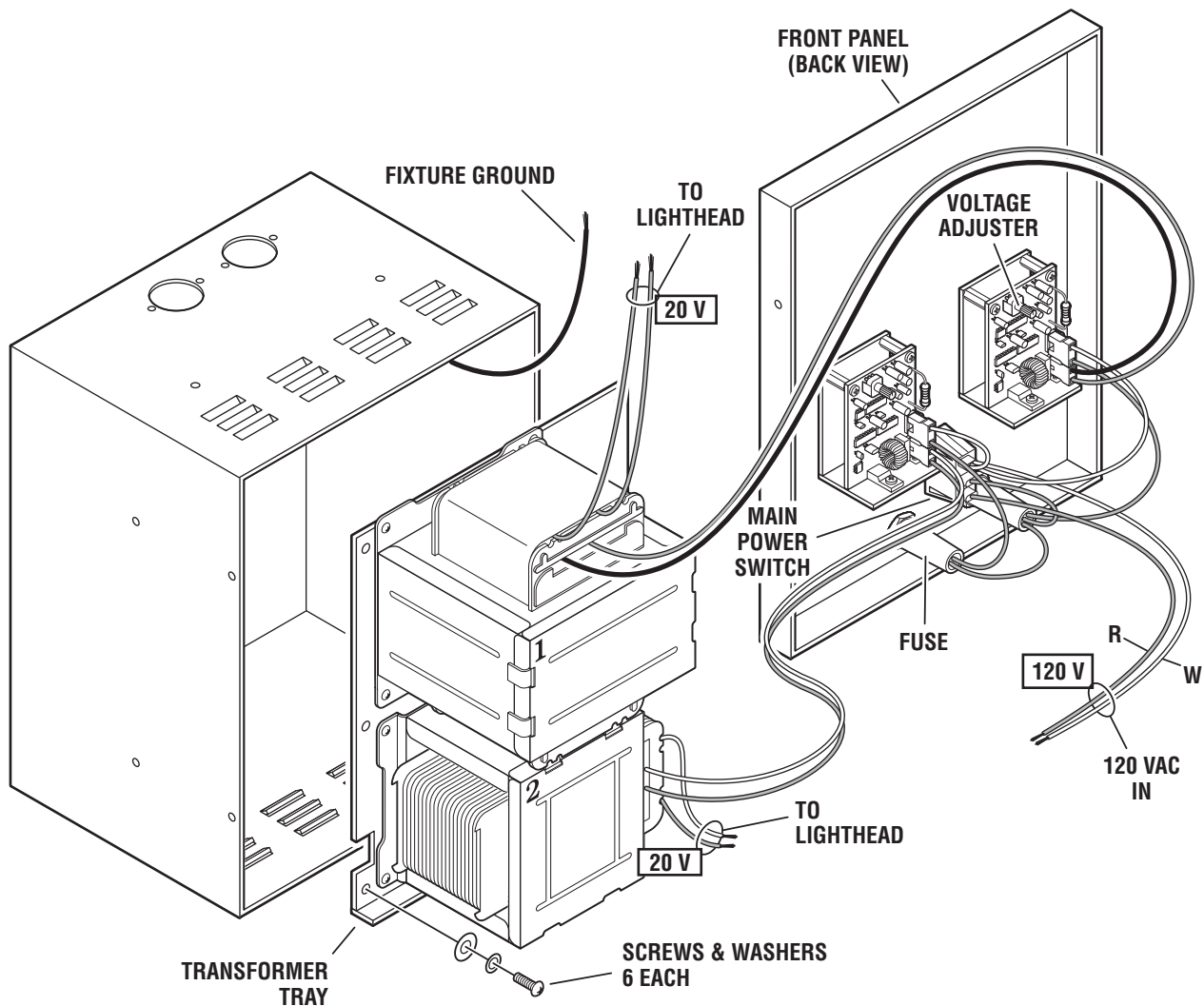


Figure 18. Wall Control

IMPORTANT

120 VAC isolated power supply requires double pole, single throw 20 amp (maximum) breaker.

- e. Connect 120 VAC power supply to input wires and ground fixture properly.



CAUTION



TO AVOID BLOWING FUSES, DO NOT TURN MAIN POWER TO FIXTURE "ON" UNTIL ALL LIGHTHEADS ARE INSTALLED AND ALL WIRING CONNECTIONS ARE COMPLETED.

11. Output Voltage Adjustment

- a. Remove top cover from VST and test bulb voltage at the wire connections. Turn main power "ON" and set the Dimmer Control for the lighthouse being tested to maximum intensity for the test. Output voltage (at the connectors) should be $20V \pm 0.2V$. See figure 20.

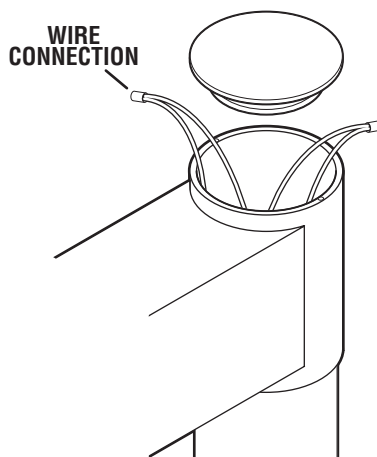


Figure 20. Bulb Voltage Test

IMPORTANT

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.

- b. Adjust the voltage to the lighthouse by turning the adjuster on the back of the appropriate dimmer control in the wall control. See figure 21.

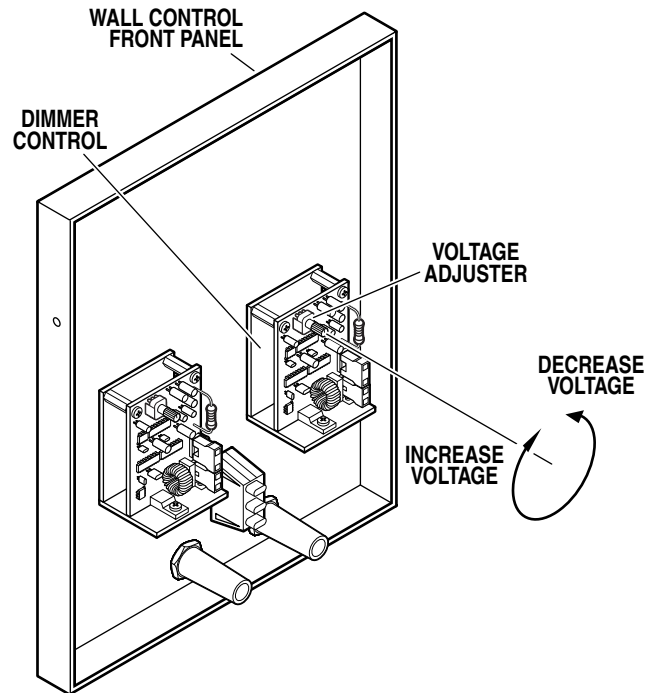


Figure 21. Voltage Adjustment

- c. Turn the adjuster clockwise to increase the output voltage, counterclockwise to decrease the voltage.

MOUNTING STRUCTURE GUIDELINE

Foreword

Skytron's objective is to provide a program and guideline to assist individuals (hospital owners, architects, structural engineers) responsible for the design of mounting structures.

The mounting structure of a Skytron fixture should always be considered the most important detail of any project prior to installation. Skytron's ceiling mounted systems depend upon properly designed and installed mounting structures to deliver years of dependable, service-free performance.

We realize that individual mounting structures vary in design due to unique structural requirements, physical obstructions, structural member availability and room layout limitations, to name a few.

The Mounting Structure Guideline is a successful, proven design. The design consists of a welded, "flanged pipe" assembly combined with (4) angled sway braces ("kickers"). A structural steel pipe combined with welded steel plates on each end facilitate its attachment to the structural ceiling and provide an attachment point for the Skytron fixture. This is a simple effective design that is forgiving to restricting structural conditions that are usually encountered during fabrication.

This design is also eliminates "guess work" by the steel fabricator when compared to structures that are fabricated on site with angle iron. In many cases the "flanged pipe" assembly can be pre-fabricated reducing the on-site construction time and eliminating the need to correct structural problems associated with angle iron structures.

The process of building a proper mounting structure can be complemented with Skytron's continued support on the project. Once the structures are fabricated, Skytron will perform a visual inspection and on-site consultation followed by an actual performance test. The performance test of the structure essentially involves hanging a "test jig" from the structure, and then measuring the amount of rotation that occurs at the mounting plate using an inclinometer (digital level). The test jig is similar in size, shape, and weight to the Skytron fixtures. In other words, once the test jig is installed and the proper weights have been added to simulate the product's moment load, a reading is taken on the digital level to verify that there is no more than two-tenths of a degree of rotational movement at the mounting plate.

Rotation of the mounting plate causes the radial arm(s) to become out of level and drift. For a structure to meet Skytron specifications, we require that the mounting plate does not rotate more than two-tenths of a degree while loaded with the specified weight and moment.

The testing process should occur in the early stages of construction to provide optimal time if additional reinforcement is needed on the structure. This should be performed prior to the completion of the finished ceiling.

Skytron's program is available to help you and provide you with the necessary counseling. However, the final responsibility to insure that the structure is adequate and meets specification lies with the structural engineer and the contractor for the project.

Our support services are geared to minimize the effort on all parties involved and to insure a successful product installation.

We recognize that not all situations will permit the use of this "Pipe Structure". Please contact SKYTRON with your special needs so that we may be able to guide you to other alternatives.

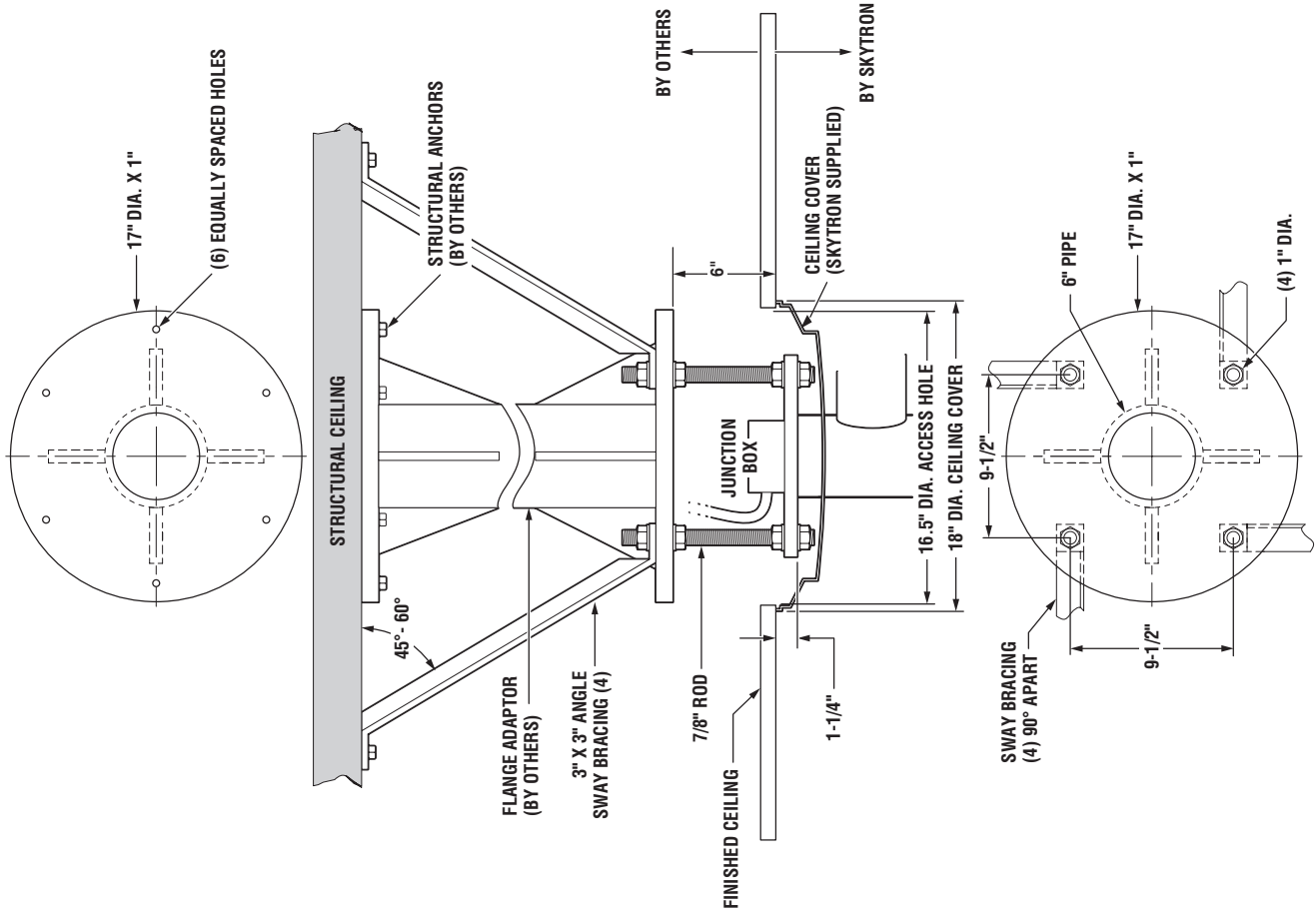
NOTES

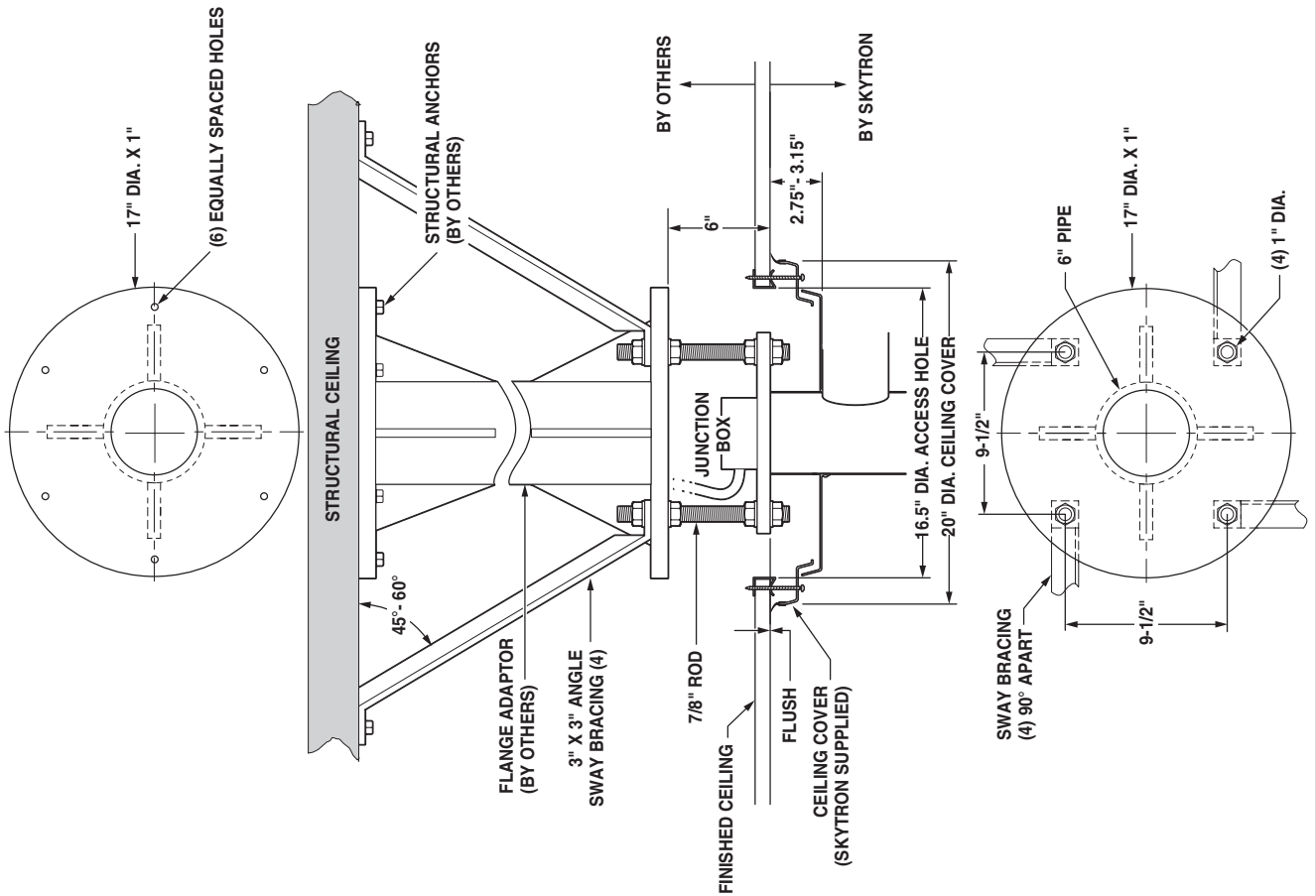
1. 7/8" support rods located for total support of light, all labor and materials for fabrication supplied by General Contractor. 7/8" nuts and washers for support of SKYTRON fixture supplied by contractor (16 ea. required).
2. The mounting structure must be attached to structural ceiling and **BRACED TO ALLOW NO TWISTING OR LATERAL MOTION** and shall be designed not to provide a degree of rotation greater than two-tenths of a degree at the mounting plate or the fixture mounting hub.
3. All 4 arm fixture installations require the mounting structure to be tested and comply with SKYTRON test jig requirements.
4. 120VAC 20A power supply required to junction box for monitor. Power cord with IEC female plug for monitor, supplied by SKYTRON. 3/4" conduit and minimum 12AWG wire size (3 wires per lighthead) required between fixture and SKYTRON supplied wall control. All conduit, wiring, and other electrical materials as well as installation labor for such materials associated with the installation of the SKYTRON surgical light to be provided by Electrical Contractor. All installations of SKYTRON surgical lights should be under the direct supervision of a SKYTRON representative. All wiring to be in accordance with local codes. Installation requiring power modules for flatscreen application require a NEMA 4 enclosure provided by others.
5. Video cable for monitor routed through arm at installation to be provided by customer. Approximately 15 feet of cable is required from mounting hub to monitor.
6. TV light systems require 50 feet RG59U coaxial cable from junction box to camera control unit faceplate, supplied by SKYTRON.
7. CONTRACTOR HAS FINAL RESPONSIBILITY for the strength and stability of the Mounting Structure.

This is a GENERAL GUIDELINE ONLY.

Consult specific Seismic calculations if applicable.

LFS MOUNTING STRUCTURE GUIDELINE





NOTES

1. 7/8" support rods located for total support of light, all labor and materials for fabrication supplied by General Contractor. 7/8" nuts and washers for support of SKYTRON fixture supplied by contractor (16 ea. required).
2. The mounting structure must be attached to structural ceiling and **BRACED TO ALLOW NO TWISTING OR LATERAL MOTION** and shall be designed not to provide a degree of rotation greater than two-tenths of a degree at the mounting plate or the fixture mounting hub.
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5. Video cable for monitor routed through arm at installation to be provided by customer. Approximately 15 feet of cable is required from mounting hub to monitor.
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7. **CONTRACTOR HAS FINAL RESPONSIBILITY** for the strength and stability of the Mounting Structure.

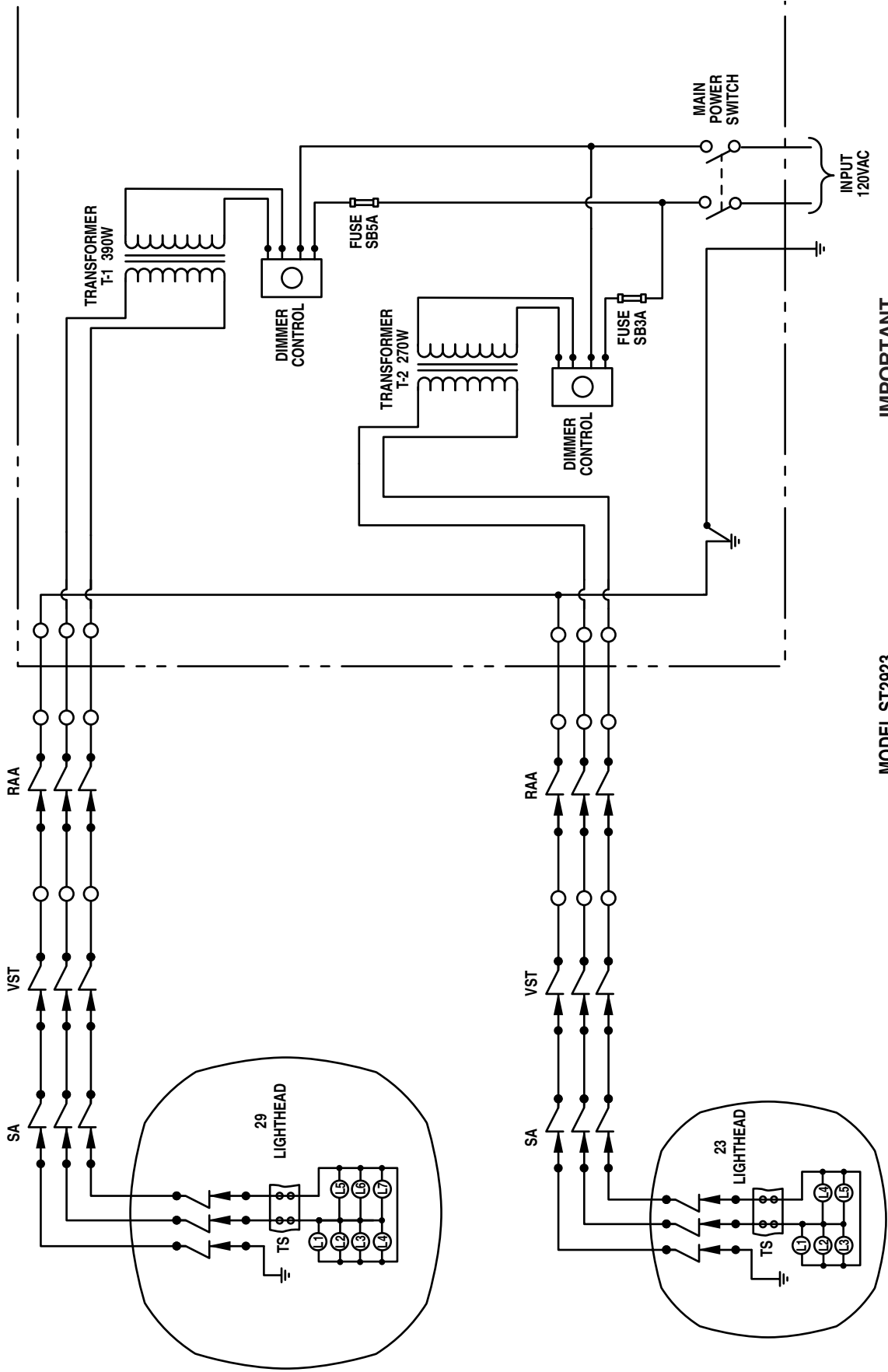
This is a GENERAL GUIDELINE ONLY.

Consult specific Seismic calculations if applicable.

LFSFLS MOUNTING STRUCTURE GUIDELINE

TYPICAL WIRING DIAGRAM

- - CRIMP CONNECTORS
- - BRUSH BLOCK
- - SLIP RING
- - TRANSFORMER
- - BULB
- TS - TERMINAL STRIP
- SA - SUPPORT ARM
- RAA - RADIAL ARM ASSEMBLY
- VST - VERTICAL SUPPORT TUBE



IMPORTANT

120 VAC isolated power supply requires double pole, single throw 20 amp (maximum) breaker.

MODEL ST2923

INSTALLATION CHECK LIST

Mounting Structure:

Fabrication of structure correct _____
Mounting plate set and level _____
3/4" conduit and (min) 12AWG wire
from fixture to wall control _____

Radial Arm Assembly:

Mounting bolts installed & tightened _____
Wiring properly connected & assembly grounded _____
Ceiling cover installed _____
Rotation stops set properly _____

Vertical Support Tubes:

All BOM/VST's installed and 6 mm
mounting screws Loc-tited _____

Headroom Clearance

Lighthouse:

Mounting stub screws installed _____
Bulb Voltage checked _____
Power ON, all bulbs illuminated
Bulbs remain illuminated throughout:
•RAA rotation _____
•BOM rotation _____
•Pitch axis _____
•Roll axis _____
•Vertical travel _____
Center focus handle mounted _____

Wall Control:

Wiring proper gauge _____
Wire connections correct _____
Cover screws installed _____
Input voltage checked and
adjusted as necessary _____

Miscellaneous:

Diffuser assemblies clean _____
Clean fixture with cleaning solution _____

Flatscreen Monitor Mount:

Vertical Tension adjusted on height
adjustable arm _____
Monitor Mount pitch axis adjusted _____
Cabling secured and properly routed _____
Proper headroom clearances met _____

DAMAGED SHIPMENT CLAIM PROCEDURE

Whenever a shipment suffers damage while in the custody of the transportation company, the responsibility lies with the transportation company, and the value of the damages can be collected from the transportation company if the proper procedures are followed.

When a shipment is received in a damaged condition and due to the appearance of the containers such as a broken crate, torn wrapping, or smashed carton, the contents may have been damaged. That fact should be noted on the Bill of Lading offered by the transportation company. An example of an applicable statement would be; "Received in good order except as noted" or "Crate damaged, possibility of concealed damage." The addition of these types of statements on the shipping documents will automatically give grounds for starting a claim.

If damage cannot be identified on the exterior of the container, but is found when the container is opened, further unpacking should be stopped immediately and the container with all wrapping or packing materials should be held. The transportation company should be notified so an inspector can be sent. Failure to follow either of these two procedures may result in an inability to file a claim and collect for damage done. Returning the container to the sender without such an inspection may prevent filing a claim, because it will divide the responsibility for damage and in many cases the transportation company will return the shipment to the sender without charge after the inspection.

The claim itself may be filed by either the shipper or consignee, but the consignee must notify the transportation company and the shipper that the damage has occurred. Remember that refusal of the shipment or failure to note the possibility of damage on the shipping documents may jeopardize the claim. Also, acceptance of a damaged shipment which has been processed properly to allow for filing a claim, will not jeopardize the position of the consignee. In any case, SKYTRON will see that damage which is not the fault of the consignee or his agents is corrected, if the transportation company does not honor the claim, as long as SKYTRON receives the full cooperation of the consignee in filing the claim.

Some of the papers needed for filing a claim are in the hands of the consignee after the shipment has been received. If SKYTRON must file a claim, we will request these papers by name from the consignee at such time as the claim is under discussion. We will require the originals of these papers and not copies.

Knowledge of the procedures outlined above and your cooperation in submitting damaged shipment claims will help both you, our customer, and SKYTRON by assuring the integrity of our products from manufacturing to installation.



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Grand Rapids, MI 49512 • 1.616.656.2900 • FAX 1.616.656.2906

STELLAR

LFS SERIES



SKYTRON®

OWNERS MANUAL

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Revised	3/06
Revised	9/07
Revised	6/08

Although current at time of publication, SKYTRON's policy of continuous development makes this manual subject to change without notice.

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

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



The lighthouse Data Label contains the lighthouse model number, bulb type, fuse type, electrical specifications and product serial number.

SKYTRON - GRAND RAPIDS, MI			
ELECTRIC RATING	CAT. NO. []		
INPUT	120V	[]	60Hz
BULBS TYPE	H24501	24V	50W
SAFETY FUSE	[]	IPXO	CLASS 1
SERIAL NO.	[]	TYPE B	
DAI-ICHI SHOMEI CO., LTD. TOKYO, JAPAN			

FUSE TYPE →
 SERIAL NO. →
 MODEL (CAT. NO.) →

SPECIAL USER ATTENTION

Prior to use, all personnel that may operate this light must be instructed in the correct operational procedures.

Initial use should not begin until after the users have been instructed by the manufacturer's representative.

A routine instructional program must be implemented by the facility for proper usage instructions for all personnel that may operate this light.

As with the operation of any surgical light, all hospital personnel should be aware that a certain amount of care must be exercised to maintain patient safety and to keep your SKYTRON light fixture performing at peak efficiency.

To help assure the highest degree of operating safety for user and patient, SKYTRON has provided precautionary instructions throughout this manual.

The following is a summary of the important precautionary instructions:



WARNING



Indicates a possibility of personal injury.



CAUTION



Indicates a possibility of damage to equipment.

NOTE

Indicates important facts or helpful hints.

NOTE

To prolong bulb life, the sof-start bulb protection circuit will cause a slight delay before the bubs will illuminate.



WARNING



Be sure the power is turned "OFF" and the bulbs have cooled before changing.

NOTE

Always make sure that the handle is properly engaged. Failure to perform this procedure could result in the inadvertent release of the center focus handle.



WARNING



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

NOTE

SKYTRON products are guaranteed for proper performance with the use of genuine SKYTRON CENTER FOCUS HANDLES. After market competitive handles and other disposable handles will have varying results that could ultimately affect the proper performance and secure engagement of the center focus handle. Such applications are at the discretion of the user to ensure patient safety.

NOTE

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



CAUTION



To ensure product performance, product longevity, and patient/staff safety, always take caution to avoid impact to the fixture when positioning.

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.

NOTE

For LFSLFS position the second arm in the same way on the opposite side of the table.

NOTE

The system can support and balance a monitor weight up to 22 lbs. Exceeding the weight will result in poor balance and performance.

NOTE

All repairs should be made using only authorized SKYTRON replacement parts.

NOTE

Refer to applicable light model maintenance and parts manuals for light fixture components.

INTRODUCTION

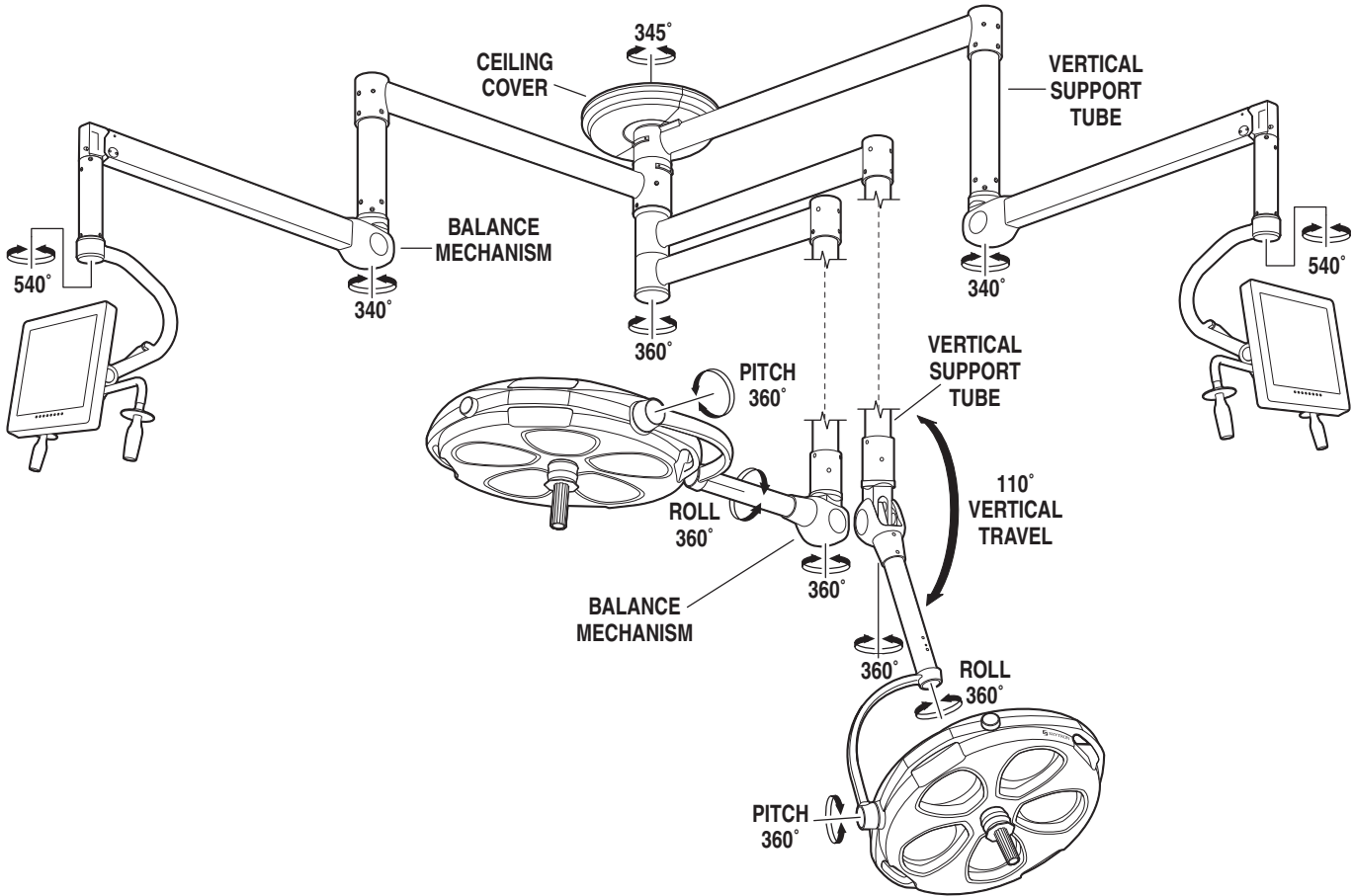


Figure 1. Light Fixture Rotation Capabilities

The Stellar LFS series combines flatscreen monitor mounting with a surgical lighting system from a single ceiling mount.

The LFS model allows a single flatscreen monitor mount to be combined with up to 3 separate lightheads. The LFSLFS model combines 2 flatscreen monitor mounts with up to 2 separate lightheads.

The LFS radial arm assembly allows up to 90" of reach for the flatscreen monitor with 345° of rotation capability at the ceiling mount. Vertical travel of up to 45.5" is provided.

The lighthead models available for use with the LFS system include ST19WC, ST23, ST23TV, ST29 and ST29TV. The ST19WC model is fixed focus, the remaining models are all focusable.

The Stellar series surgical lighting system from SKYTRON features fully adjustable positioning and focus control for its cool, color-corrected, multiple bulb, light source. Combinations of vertical positioning and multiple rotational capabilities allow the single, dual or triple lighthead models virtually limitless positioning.

The fixtures are single point ceiling mounted with a continuous 360 degree rotation capability at the ceiling mount end of the radial support arm. See figure 1. The balance mechanism which is attached to the radial arm by a vertical support tube, provides the lighthead an additional continuous 360 degree rotation point. The balance mechanism is an enclosed spring tension system. This allows vertical movement of the lighthead while maintaining the lighthead position without drifting. The yoke provides additional 360 degree rotation points for lighthead pitch and roll.

The Stellar fixtures have a lighthead vertical travel capability of 110°.

The adjustable focus mechanism which optimizes the light output by superimposing all the light beams into a single spot can be operated by non-sterile personnel using the lighthead mounted focus knob.

All lightheads also have a removable, sterilizable, focus/positioning handle. This allows all final positioning and focus adjustments or changes to be precisely done by the surgeon. See figure 2.

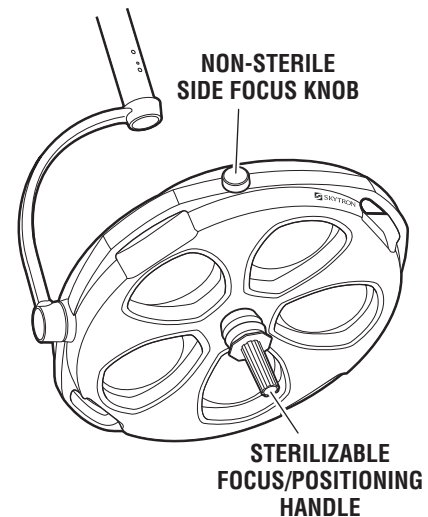


Figure 2. Focus Adjustments

BASIC LIGHTHEAD OPERATION

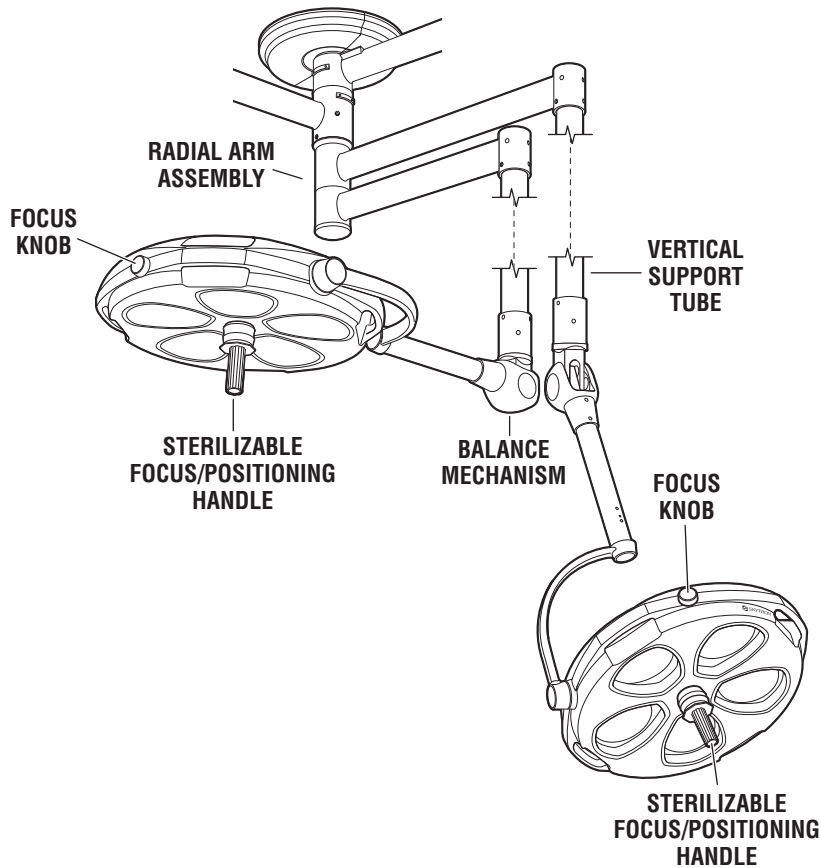


Figure 3. Dual Lighthouse Fixture

Use the following instructions to operate the light fixture:

1. Position the lighthouses as required by grasping the lighthouse positioning handles and moving the lighthouse to the desired position. See figure 3.

2. Turn the light fixture main power switch "ON" at the wall mounted control box and select the desired intensity for each lighthouse as required. See figure 4. The mid-range position will provide adequate illumination for most procedures. Full intensity will usually only be required for extreme deep cavity cases.

NOTE

To prolong bulb life, the soft-start bulb protection circuit will cause a slight delay before the bulbs will illuminate.

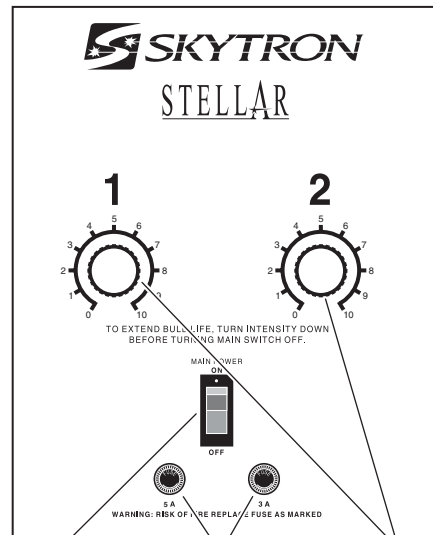


Figure 4. Wall Mounted Control Box

3. When the surgeon is ready to use the light, install the sterilized center focus/positioning handle using the following procedure. See figure 5. Be sure handle is properly secured before using the lighthead. Possible injury to patient or staff could result if a handle is not installed properly.

a. Insert the handle into the lighthead attachment ring.

NOTE

Always make sure that the handle is properly engaged. Failure to perform this procedure could result in the inadvertent release of the center focus handle.

b. Push the handle in, turn it right and left, and pull the handle out to be certain that it is locked (PUSH-TWIST-PULL). A distinct click can be heard when the handle is properly engaged.

c. To remove the handle, push the release button and pull the handle out.

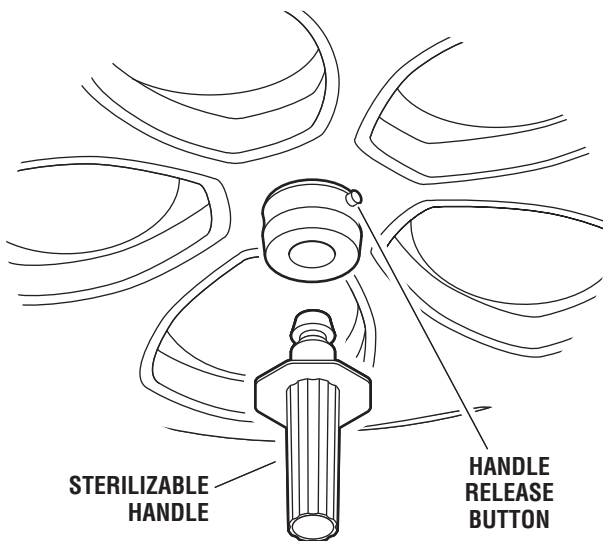


Figure 5. Center Focus/Positioning Handle Installation

4. Adjust the focus by moving either the non-sterile focus knob or the (sterilized) center focus handle until all of the light beams converge on the surgical site forming a single bright spot of light.

5. For low angle lighting approach, the lighthead will move 90° below horizontal. Pull the lighthead down by the positioning handles or the (sterile) positioning/focus handle.

In the presence of flammable anesthetics, DO NOT allow the lighthead to travel below 60 inches from the floor.

6. When the light is no longer required, return the lighthead to its full up position. Decrease the intensity at the wall control, and turn the main power switch "OFF".

NOTE

SKYTRON products are guaranteed for proper performance with the use of genuine SKYTRON CENTER FOCUS HANDLES. After market competitive handles and other disposable handles will have varying results that could ultimately affect the proper performance and secure engagement of the center focus handle. Such applications are at the discretion of the user to ensure patient safety.

LIGHTHEAD POSITIONING

General

To obtain the maximum benefit from your SKYTRON surgical lighting system, the following suggestions are offered as a guide for lighthead positioning. Personnel who are trained in proper lighting techniques can plan and set up the lighting arrangements prior to the arrival of the patient. Factors which should be considered when repositioning surgical lights are:

- Specific procedure to be done
- Patient position during procedure
- Position of surgical team
- Location of instrument trays or tables
- Location of IV stands
- X-ray equipment and personnel
- Anesthesia equipment and personnel
- Angulation and size of surgical cavity

Surgical Table Placement

For most procedures the surgical table should be located with its center point directly under the light fixture's ceiling mount.

Pre-Positioning The Lighthead

Surgical light positioning requirements change not only from procedure to procedure, they also change from surgeon to surgeon. Final light positioning and adjustment will be directed or done directly by the surgeon. The objective of prepositioning is to require a minimum of final adjustments after arrival of the patient. The non-sterile focus control should be located where it can be reached by non-sterile personnel and the sterile positioning/focus handle where they can be reached by the surgeon. Use extreme care when prepositioning lightheads. Bumping lightheads into one another, into walls, or other equipment may alter bulb alignment which affects proper focus adjustment.



CAUTION



To ensure product performance, product longevity, and patient/staff safety, always take caution to avoid impact to the fixture when positioning.

The lightheads can be most effectively positioned by using the following procedures:

1. Grasp the positioning handles on the lighthead and pull the lighthead down to shoulder height. Keep the lighthead at approximately a 45° angle to easily position the support yoke. See figure 6.

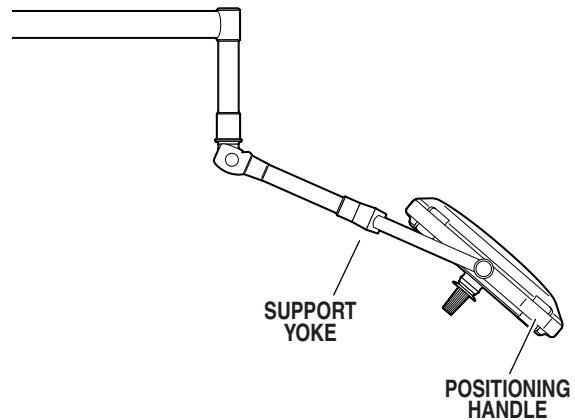


Figure 6.

2. Using the positioning handles, rotate the lighthead around the vertical support until the lighthead is at an approximate 90° angle to the radial arm. See figure 7.

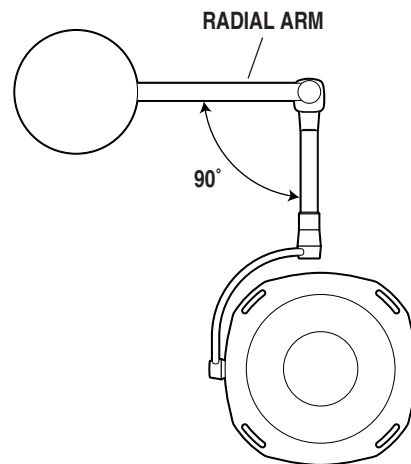


Figure 7.

3. Place the radial arm in the desired position by pushing or pulling the lighthouse by the positioning handles as you walk around the surgical table.

4. Refer to figure 8 to approximate the desired radial arm position for locating the lighthouse over the patient.

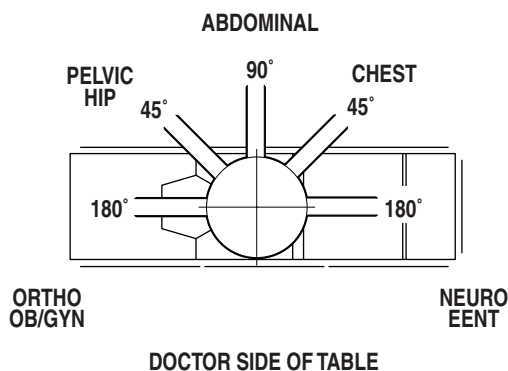


Figure 8. Main Lighthouse Radial Arm Positioning

5. With the radial arm in proper position, rotate the lighthouse to the desired position and install the sterile positioning/focus handle. Refer to sterile handle installation procedure.

6. Grasp the positioning handles, place the lighthouse at an angle and move the lighthouse to its full up position.

Flatscreen Monitor Positioning

The upper radial arm of the flatscreen monitor mount should be pre-positioned on the opposite side of the table from the surgeon at approximately 90° from the table center line. See figure 9.

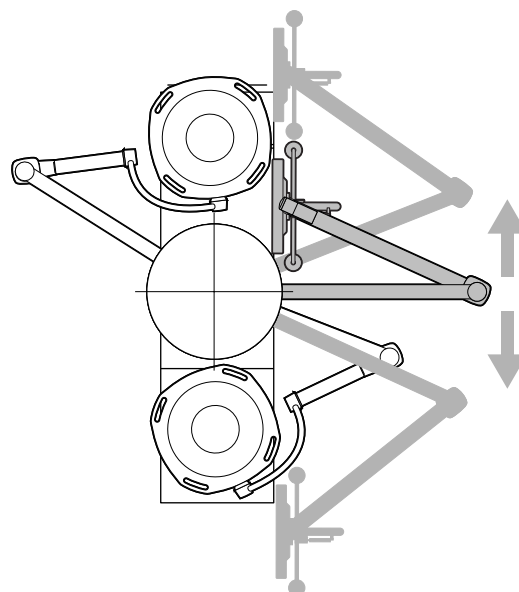


Figure 9.

The lower arm should be positioned under the upper arm. In this position the monitor can be easily moved up or down the full length of the table without interfering with the lighthouses. The monitor can be pushed up out of the way until it is needed.

Two sterilizable handles are provided for final monitor positioning or for changes required during the procedure. Prior to the start of the procedure the sterilizable handles can be installed. Insert the sterile handles into the receptacle and turn clockwise until tight.

NOTE

For LFSLFS position the second arm in the same way on the opposite side of the table.

ILLUMINATION TECHNIQUE

Maximum illumination, shadow reduction, and possible obstruction by the surgeon or surgical staff are also major concerns for lighthead positioning. The following examples are offered as a basic guide for lighthead placement for large diameter/satellite, dual lighthead, or triple lighthead fixtures.

Large Diameter/Satellite Lighthead Positioning

The large diameter lighthead should be pre-positioned over the surgical site. The satellite can be used on either side of the surgeon for augmentation and shadow control.

The large lighthead should be positioned perpendicular to the bottom of the surgical cavity.

Head

To illuminate the head area, position the large diameter lighthead radial arm parallel to the table centerline. See figure 10. Position the lighthead behind the surgeon. Tilt the lighthead to the desired position using pitch axis movement. This will allow the multiple light sources of the lighthead to pass around the head and shoulders of the surgeon and at the same time permit adequate head clearance for the surgeon.

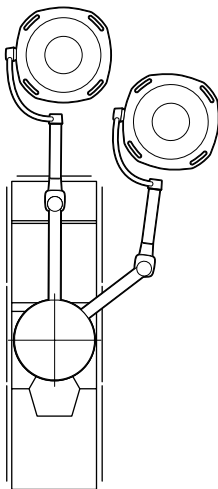


Figure 10.

Tilt the lighthead to position the focus control knob where it can be easily reached by non-sterile personnel.

Position the satellite to the left or right according to surgeon preference. This allows a second light source to come from another angle which will help eliminate obstructions or shadows.

Torso Area

For most chest and abdominal procedures, position the large lighthead directly over the surgical site. See figure 11. Position the radial arm on approximately a 45° angle from the surgical table centerline. This position will locate the sterile focus/positioning handle on the lighthead where it can easily be reached by the surgeon. The focus control will be where it can easily be reached by non-sterile personnel. Position the satellite lighthead, depending on lighting needs, to augment the larger lighthead.

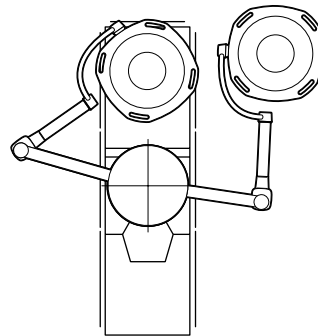


Figure 11.



CAUTION



To ensure product performance, product longevity, and patient/staff safety, always take caution to avoid impact to the fixture when positioning.

In some cases such as cholecystectomies and total abdominal hysterectomies, the surgical cavity may be angled. In cases such as this, the large lighthead should be angled so that the face of the lighthead is perpendicular to the bottom of the surgical cavity. See figure 12.

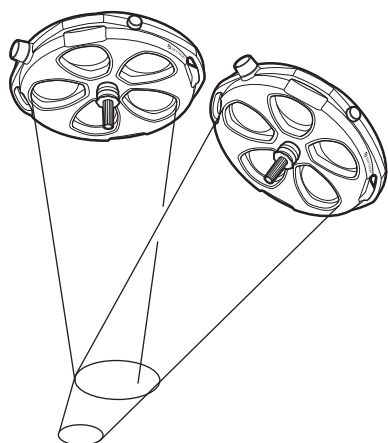


Figure 12.

Some procedures, such as hip pinnings, require both lightheads to be on the same side of the table. See figure 13. In this position the lightheads are behind and adjusted to project light over the head and shoulders of the surgeon. Both lightheads are easily reached for adjustment by non-sterile personnel.

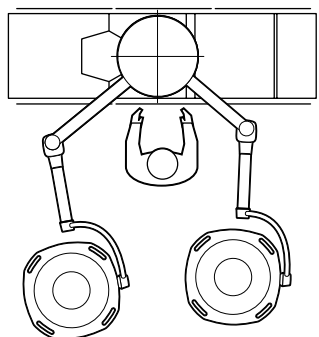


Figure 13.

Perineum

The large diameter lighthead should be positioned at the end of the table for perineal procedures. Locate the radial arm directly in line with the centerline of the table. Once the surgeon has assumed a seated position, the lighthead can be pulled down, angled, and adjusted to provide the necessary illumination over the surgeon's head and shoulders. See figure 14. The satellite lighthead radial arm should be positioned approximately 90° from the other radial arm. Position the satellite lighthead to the right or left of the large lighthead according to surgeon preference. In this position, the focus knobs of both lightheads are located for easy reach by non-sterile personnel.

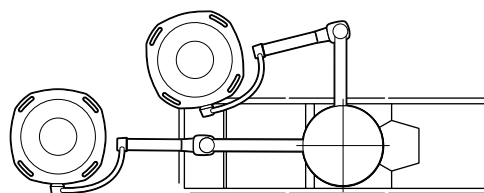


Figure 14.

Dual 23" Diameter Lighthead Positioning

Fixtures containing dual 23" diameter lightheads require some special positioning considerations. The small diameter of the lightheads allows the light source to be more easily obstructed by the surgical staff. It is very important that the surgical site remain illuminated even though the head and hands of the surgeon and the surgical staff may be directly in the central light beam path. In order to minimize shadowing, the lightheads should be positioned so that their light beams are angled into the surgical cavity. Regardless of the surgical site, these lights should be positioned to maintain an angle of approximately 30° about an imaginary line running perpendicular to the bottom of the surgical site. See figure 15.

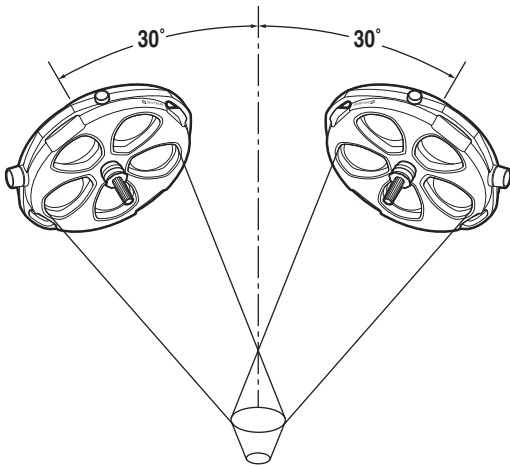


Figure 15.

Tilting the lightheads will give a larger light beam angle. See figure 16. Final positioning and focus adjustments can be done by the surgeon using the sterile focus/positioning handles. Focus controls should be positioned where easily reached by non-sterile personnel.

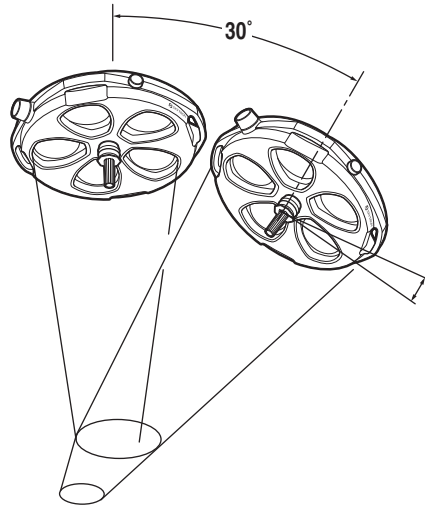


Figure 16.



CAUTION



To ensure product performance, product longevity, and patient/staff safety, always take caution to avoid impact to the fixture when positioning.

Triple Lighthouse Positioning

Triple lighthouse systems will either consist of a large diameter lighthouse with two 23" satellites or three 23" lighthouses. There are two basic positioning strategies that can be used to obtain the best illumination possible. The first is to align all three lighthouses to the centerline of the table with the large lighthouse directly over the center of the surgical site. The second is to cluster the lights in a circular arrangement over the surgical site with each lighthouse about 120° away from each other. The whole cluster should be positioned to minimize interference with the head and shoulders of the surgical staff. See figure 17.

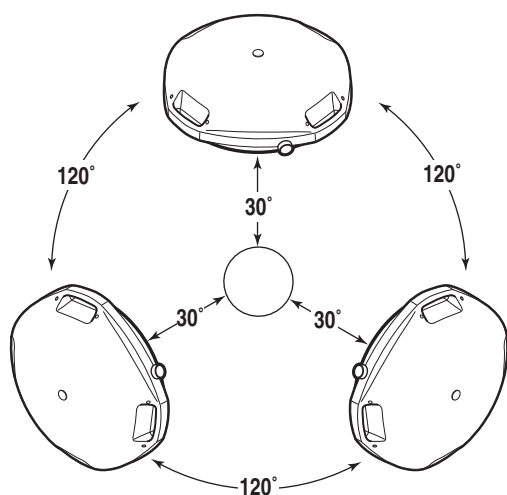


Figure 17.

When an angled cavity is to be illuminated, at least one of the lighthouses should be positioned to be perpendicular to the bottom of the cavity.

For head and perineal work, the lights should be positioned as they would for a dual system but with a satellite on each side of the surgeon.

Bell-Shaped Cavities

For most surgical procedures the lighthouse will be properly focused with all the light beams converged in one spot at the bottom of the surgical cavity.

However, in the case of a bell-shaped cavity (for example - total abdominal hysterectomy on an obese patient), focusing at the bottom of the cavity may cause more shadow problems. The focal point for the light beams should be above the bottom of the cavity. See figure 18.

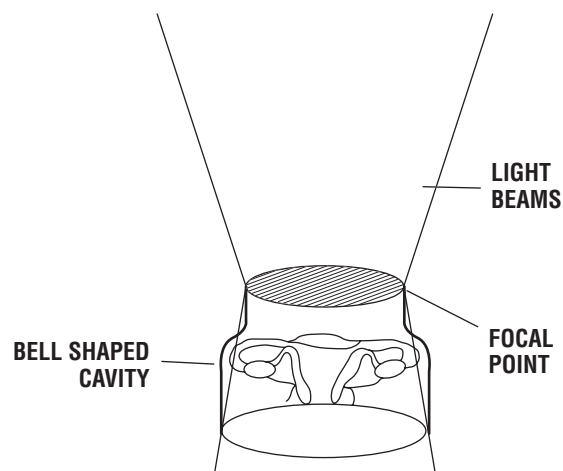


Figure 18.

Beyond the focal point, the light beams spread out like an inverted cone and will more evenly spread the light throughout the bell-shaped cavity.

Other Illumination Considerations

Close attention to surgical light intensity during the case as well as good quality general illumination in the room will help to minimize eye fatigue of surgical personnel.

Dark surgical drapes will help to reduce reflectance. White drapes should be avoided at all times because of high reflectance.

The use of matte and satin finish instruments and retractors also helps to reduce eye fatigue.

General

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

NOTE

All repairs should be made using only authorized SKYTRON replacement parts.

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.

- Inspect the light heads and fixture for visible damage. Report damage immediately to SKYTRON representative.

- Avoid the use of cleaning solutions which contain high concentrations of alcohol, ethylene glycol, phenol, iodophors, or glutaraldehyde based disinfectants. Some degree of staining, pitting, peeling 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.

Sterilization

Recommended sterilization parameters for sterilizable handle:

- Prevac, 270° F, 4 minutes
- Gravity, 250° F, 30 minutes
- Flash, 270° F, 3 minutes

Always consult current AORN journal recommendations for proper sterilization procedures.

Adjustments

As part of a regular preventive maintenance program, it is suggested that a check of the various positioning axes be made to verify correctness of tension adjustment. If any drift is noticed, all that is usually necessary is a minor adjustment. Readjustment should be made as per the appropriate instructions contained in the Maintenance and Adjustment Manual for the specific model lighthead. Also, during a scheduled cleaning of the lighthead interior, lubrication of the various moving parts is desirable.

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.

1. Hold the diffuser/filter assembly with one hand, loosen the "1/4-turn" screw and lower the diffuser/filter assembly. See figure 19.

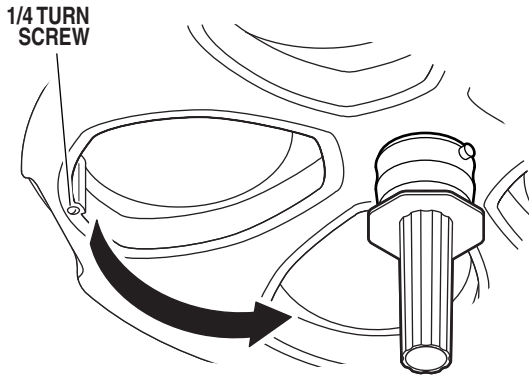


Figure 19.



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.

2. Using caution not to touch the reflector surface, hold the bulb by the base and pull it out. See figure 20. Slightly working the bulb back and forth may aid in bulb removal.

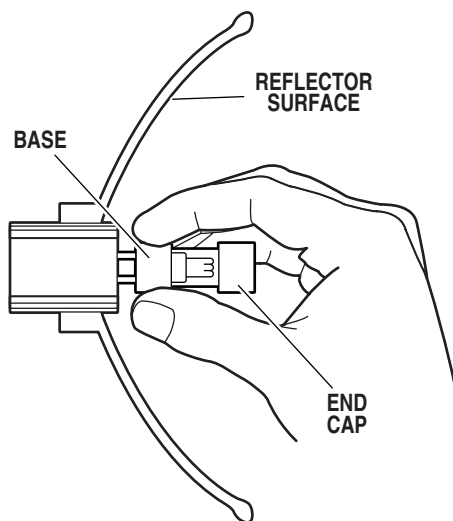


Figure 20.

NOTE

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

3. Holding the 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.

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

LFS Height Adjustable Arm Tension Adjustment

a. Check the vertical tension adjustment of the Height Adjustable Arm for its capacity to support the flatscreen monitor throughout its range of motion. The monitor should move freely yet maintain its selected position without drifting. If an adjustment is necessary, refer to figure 21 and proceed as follows:

NOTE

The System can support and balance a monitor weight up to 22 lbs. Exceeding the weight will result in poor balance and performance.

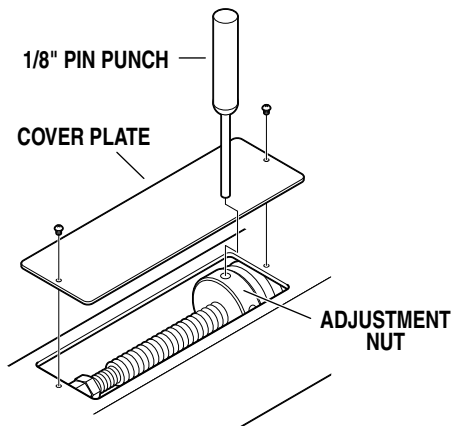


Figure 21

b. Remove the cover plate on the top of the Height Adjustable Arm for access to the tension adjustment nut. Insert a 1/8" pin punch into a hole in the adjustment and turn the nut as required to achieve proper tension - clockwise to increase tension, counterclockwise to decrease tension. Replace access cover when adjustment is complete.

c. Check the adjustment for the flatscreen monitor pitch axis. The monitor should move freely yet maintain its selected position without drifting. If an adjustment is necessary, refer to figure 22 and proceed as follows:

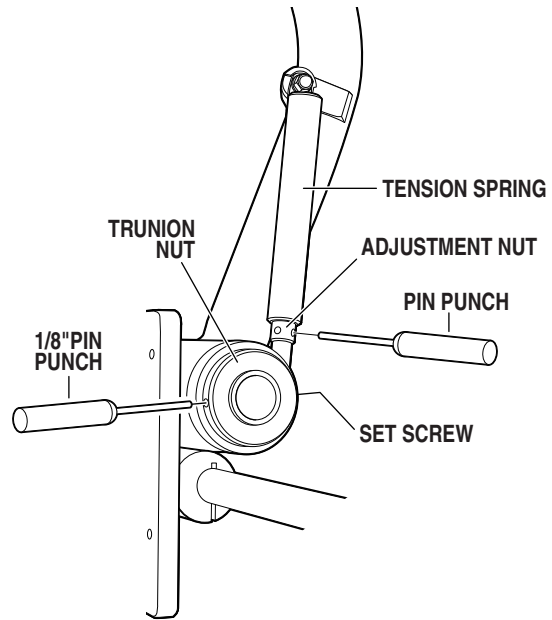


Figure 22

d. Loosen set screw on trunion nut, insert a 1/8" pin punch into hole opposite set screw location and adjust trunion nut as required - clockwise to increase tension, counter clockwise to decrease tension. Tighten set screw when adjustment is complete.

e. For fine adjustment, rotate the monitor downward until the adjustment nut is visible on the tension spring assembly. Using a pin punch, turn the adjustment nut until proper tension is achieved.

Service

A regular program of preventive maintenance will increase the life of your equipment and keep it operating at peak performance.

Maintenance can be performed by authorized, trained maintenance personnel using SKYTRON authorized replacement parts and service techniques. Service instructions and parts are available from SKYTRON.

Preventive Maintenance contracts are available through your local SKYTRON representative.

To obtain service instructions, replacement parts, factory service or preventive maintenance contracts, contact the SKYTRON representative listed below.

NOTE

Refer to applicable light model maintenance and parts manuals for light fixture components.

Or contact:

SKYTRON

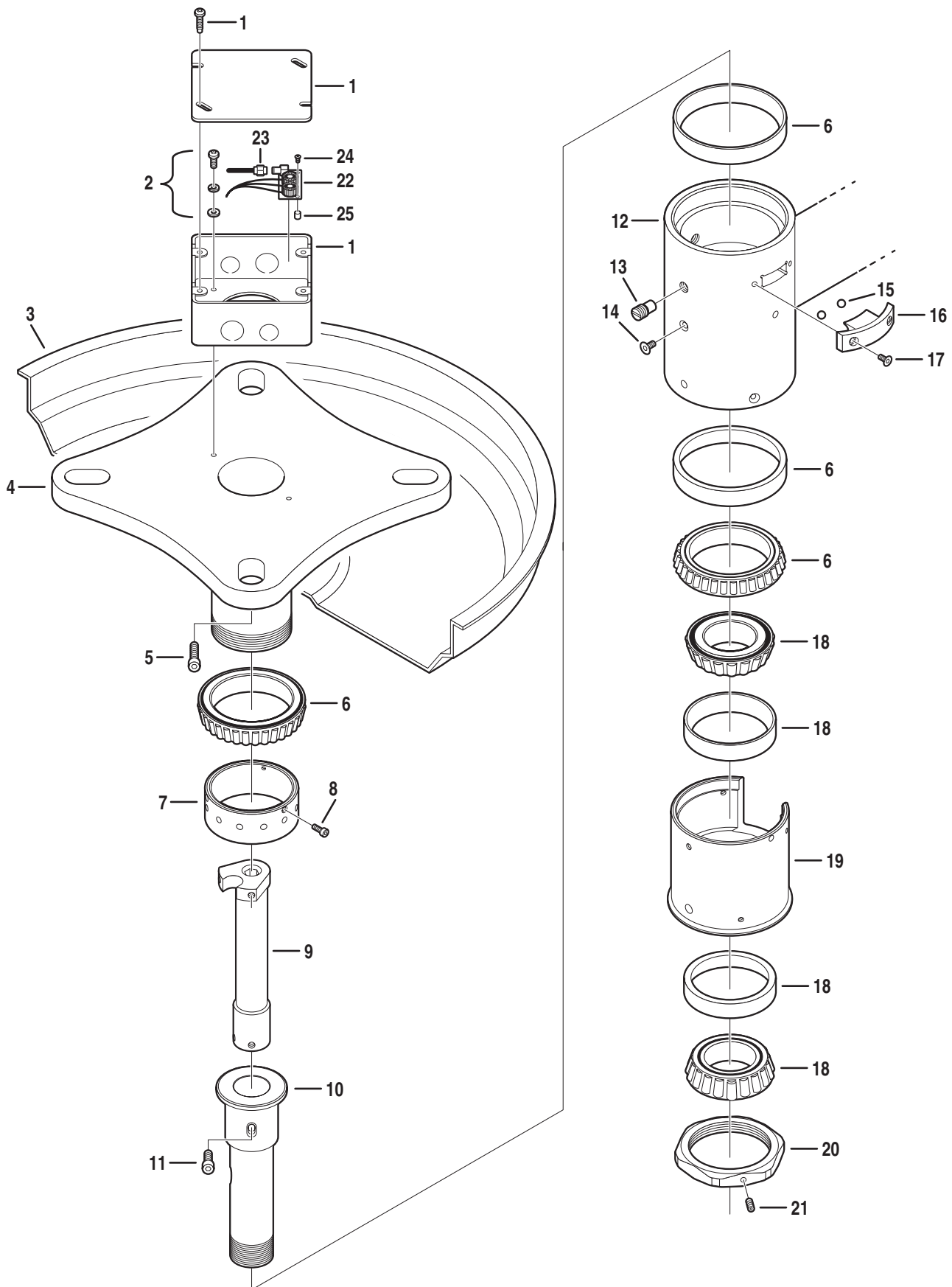
5085 Corporate Exchange Blvd. S.E.

Grand Rapids, MI 49512

1-800-SKYTRON (1-800-759-8766)

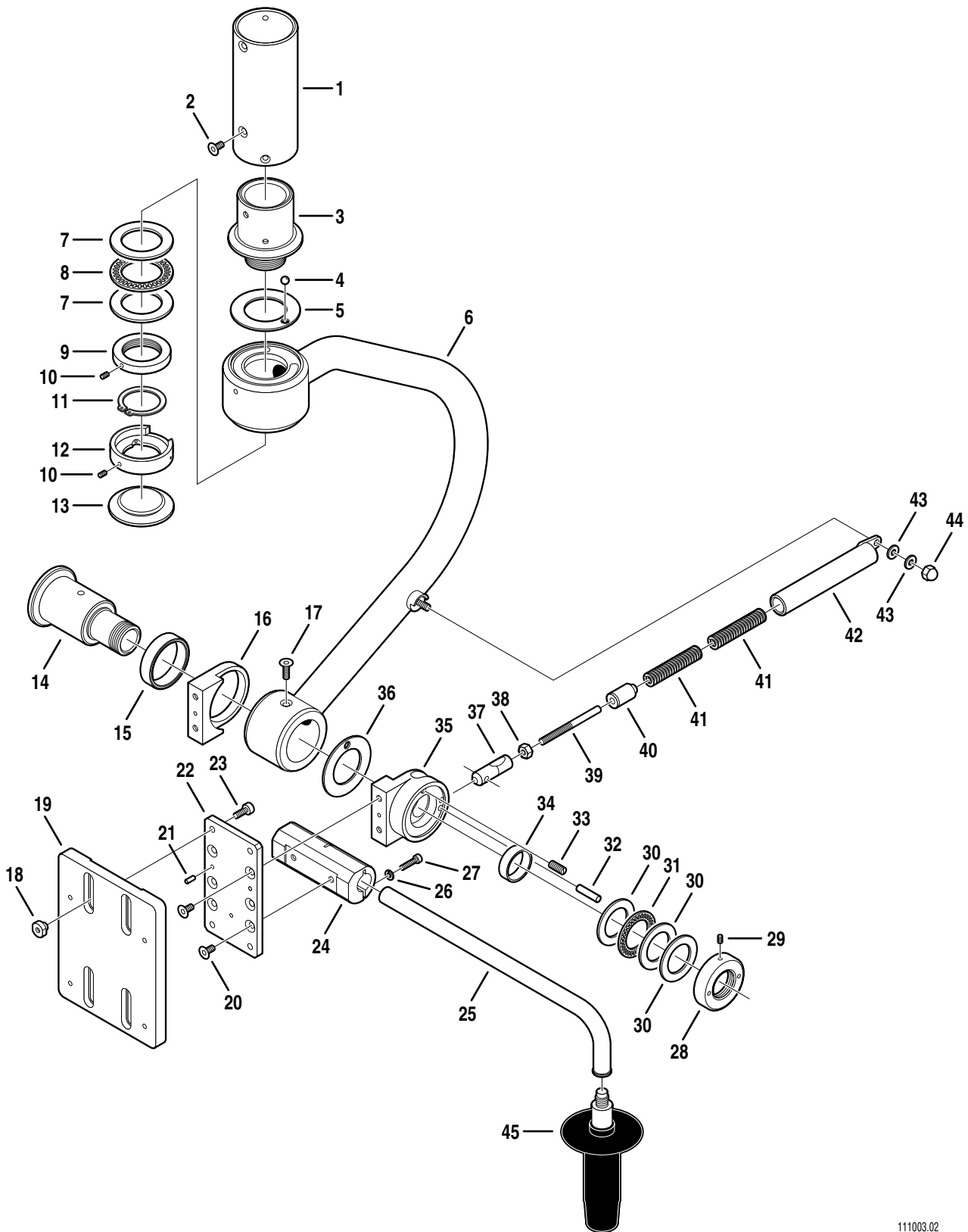
Fax. 1-616-656-2906

1. HUB AND RADIAL ARM ASSEMBLY



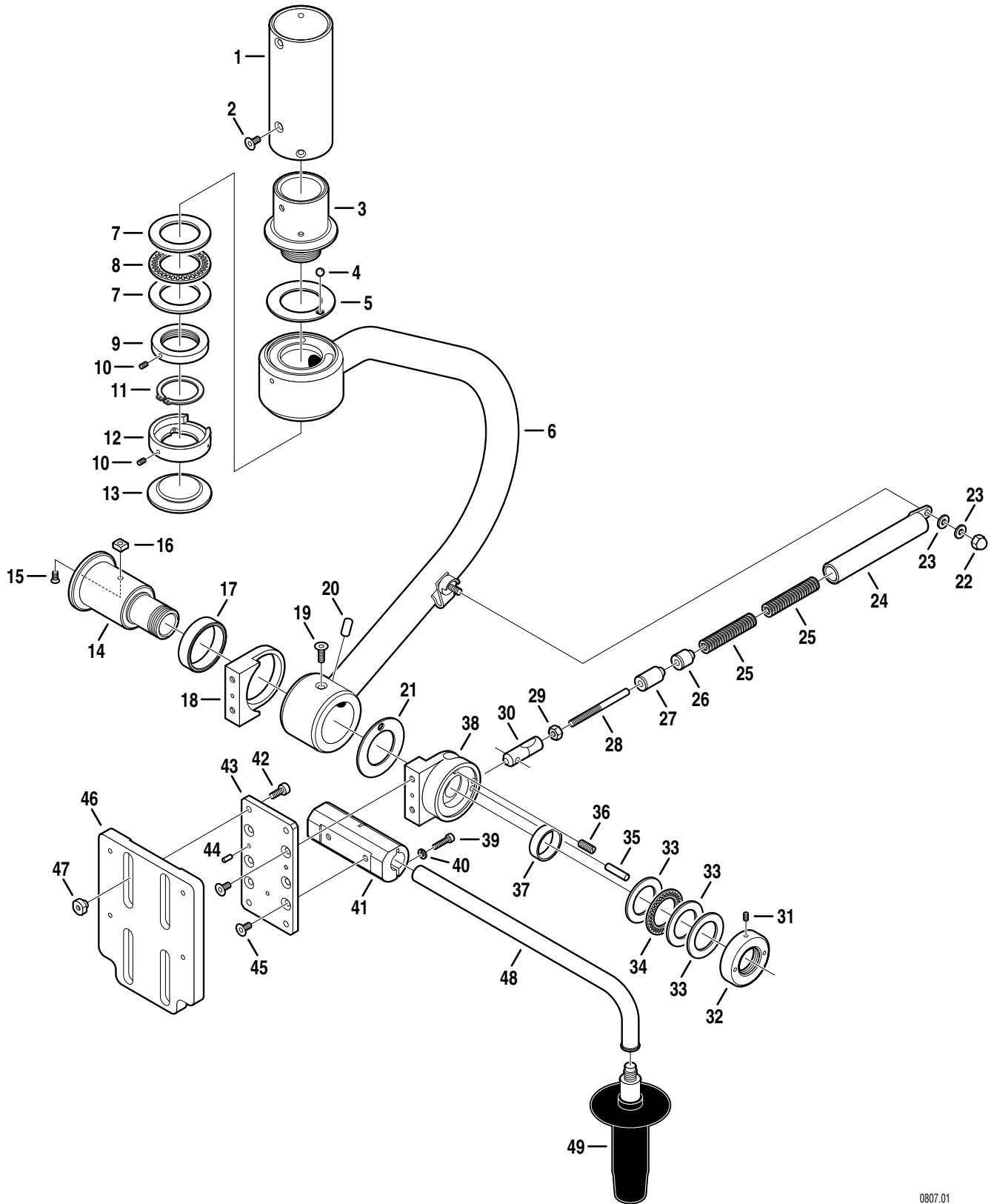
111003.01mj

Item	Part No.	Description	Qty.
1	B2-450-03-1	JUNCTION BOX ASSEMBLY	1
2	B9-210-43	SCREW, phillips, M4 x8 w/ washers	2
3	B2-450-04	CEILING COVER (LFS models)	1
	B2-450-04-1	CEILING COVER (LFSLFS models)	1
4	B2-450-05	SUPPORT HUB (LFS models)	1
	B2-450-06	SUPPORT HUB (LFSLFS models)	1
5	B2-450-07	BOLT, allen, M8 x30	2
6	B2-450-08	TAPERED ROLLER BEARING ASSEMBLY	A/R
7	B2-450-10	COLLAR, stop	A/R
8	B2-450-09	BOLT, allen, M5 x10	A/R
9	B2-450-11	JOINT SHAFT (LFS models)	1
	B2-450-12	JOINT SHAFT (LFSLFS models)	1
10	----	SPINDLE (specify model)	1
11	B2-450-13	BOLT, allen, M8 x15	2
12	B2-450-14	RADIAL ARM, 43.0"	A/R
	B2-450-15	RADIAL ARM, 50.6" (LFS models)	A/R
	B2-450-16	RADIAL ARM, 50.6" (LFSLFS models)	A/R
13	B2-450-17	BRAKE SCREW	A/R
14	B3-210-12	SCREW, allen, countersunk, M6 x 12	A/R
15	B2-450-19	STOP, ball, 8mm	A/R
16	B2-450-20	PLATE, stop	A/R
17	B2-450-21	SCREW, allen, countersunk, M5 x12	A/R
18	B2-450-22	TAPERED ROLLER BEARING ASSEMBLY	2
19	B2-450-23	BEARING BODY	1
20	B2-450-24	NUT, retainer.....	1
21	B2-450-25	SCREW, set, M5 x 8	2
22	B1-420-05	CIRCUIT BOARD, VFB	A/R
23	H7-010-47	CABLE, coaxial, RG59U, 50'	A/R
24	B2-451-36	SCREW, phillips, countersunk, M4 x 6	A/R
25	B2-451-35	STAND-OFF	A/R



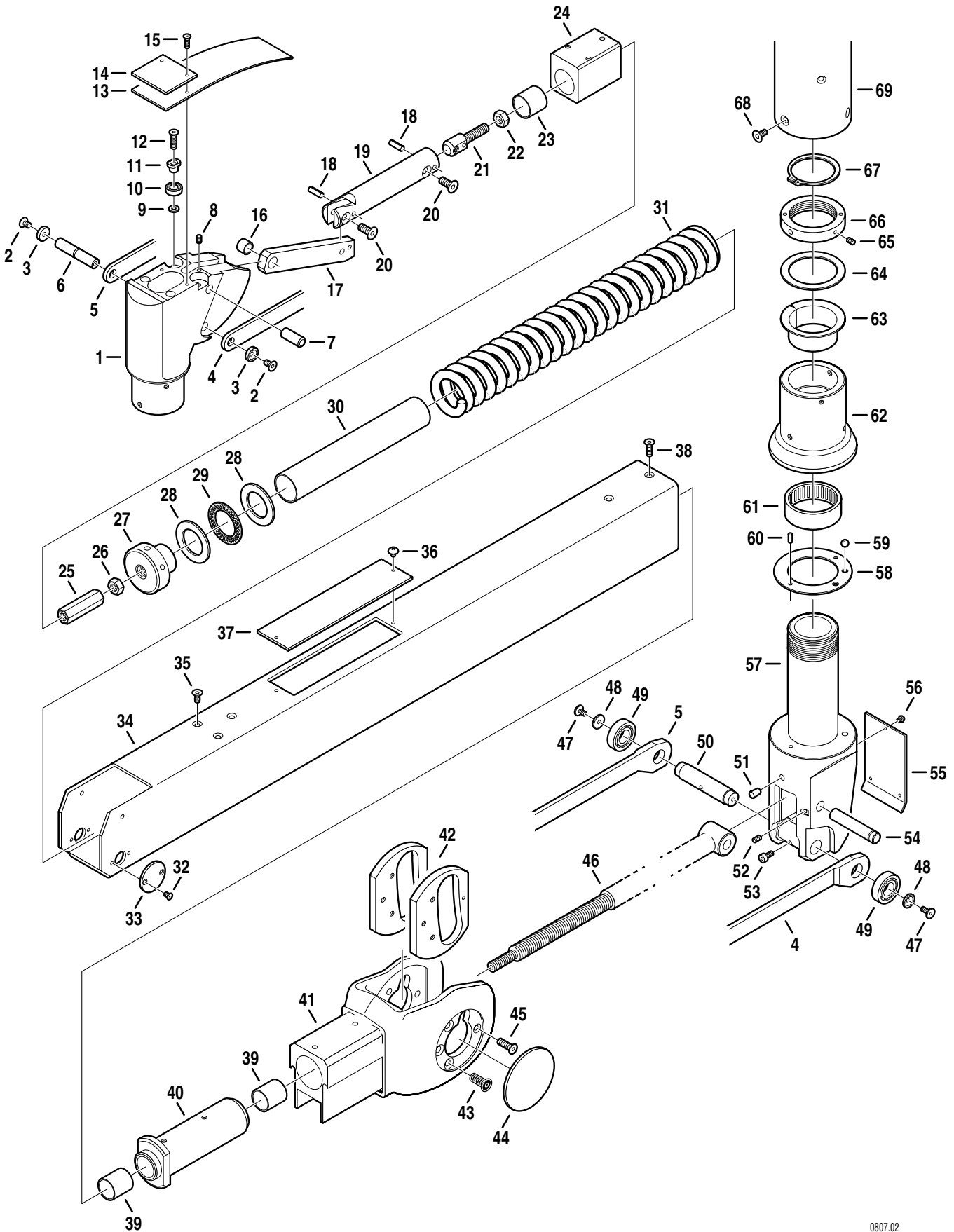
111003.02

Item	Part No.	Description	Qty.
1	B2-450-27	VST, lower	1
2	B2-450-18	SCREW, allen, countersunk, M6x12	8
--	B2-450-28	FLATSCREEN BRACKET ASSEMBLY	1
3	B2-450-49	•SHAFT, bearing	1
4	B2-450-19	•BALL, 8mm	1
5	B2-450-29	•RETAINER, ball	1
6	B2-450-30	•YOKE	1
7	B2-450-31	•WASHER, thrust	2
8	B2-450-32	•BEARING, thrust	1
9	B2-450-33	•NUT	1
10	B2-450-34	•SCREW, set, M4x8	4
11	B2-450-35	•SNAP RING	1
12	B2-450-36	•MOUNT	1
13	B2-450-37	•COVER, yoke	1
14	B2-450-38	•SHAFT, bearing	1
15	B2-450-39	•BUSHING, shaft	1
16	B2-450-40	•COLLAR, right	1
17	B2-450-41	•SCREW, allen, countersunk, M6x14	1
18	B2-450-42	•NUT, special	4
19	B2-450-43	•BRACKET, for 15" or 19" monitors	1
	B2-451-39	•BRACKET, for 19" or 23" monitors	1
20	B2-450-18	•SCREW, allen, countersunk, M6x12	6
21	B2-450-44	•PIN, roll	A/R
22	B2-450-45	•PLATE, mounting	1
23	B2-450-46	•BOLT, allen, M6x15	4
24	B2-450-47	•CLAMP, handle bar	1
25	B2-450-48	•BAR, handle	2
26	B9-410-66	•WASHER, lock, M5	4
27	B2-450-50	•BOLT, allen, M5x20	4
28	B2-450-51	•NUT	1
29	B2-450-34	•SCREW, set, M4x8	A/R
30	B2-450-52	•WASHER, thrust	3
31	B2-450-53	•BEARING, thrust	1
32	B2-450-54	•PIN, pivot	1
33	B2-450-55	•DETENT HARDWARE	1
34	B2-450-56	•BUSHING	1
35	B2-450-57	•COLLAR, left	1
36	B2-450-58	•RETAINER, detent	1
37	B2-450-59	•JOINT, pivot	1
38	B2-450-60	•NUT, adjusting	1
39	B2-450-61	•SHAFT, pivot	1
40	B2-450-62	•BUSHING	1
41	B2-450-63	•SPRING	2
42	B2-450-64	•CYLINDER	1
43	B2-450-65	•WASHER, M6	2
44	B2-450-66	•NUT, acorn, M6	1
45	A1-010-29-1	HANDLE	2



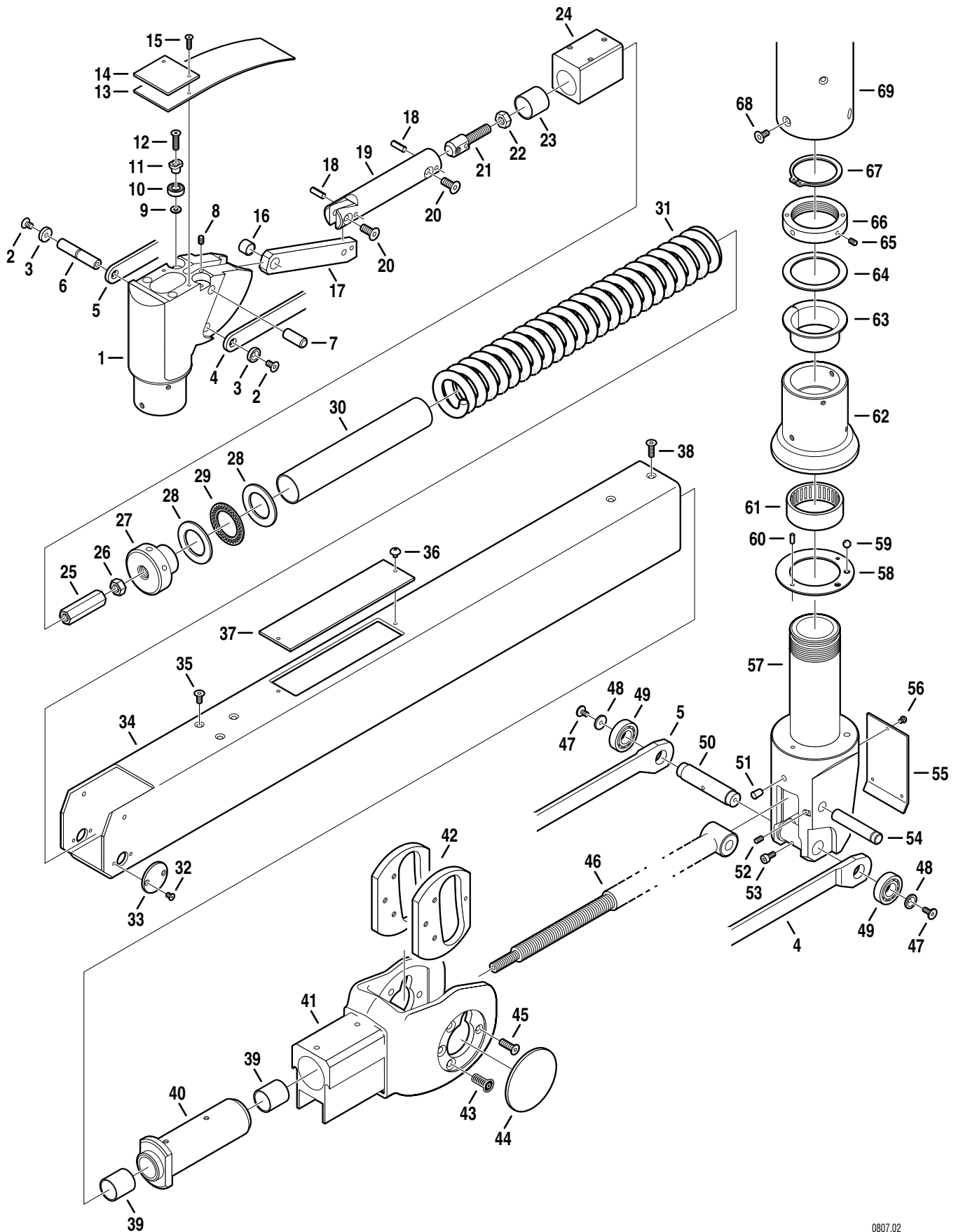
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Item	Part No.	Description	Qty.
1	B2-450-27	VST, lower	1
2	B2-450-18	SCREW, allen, countersunk, M6x12	8
--	B2-451-41	FLATSCREEN BRACKET ASSEMBLY W/ NYLON STOP PIN	1
3	B2-450-49	•SHAFT, bearing	1
4	B2-450-19	•BALL, 8mm	1
5	B2-450-29	•RETAINER, ball	1
6	B2-451-42	•YOKE	1
7	B2-450-31	•WASHER, thrust	2
8	B2-450-32	•BEARING, thrust	1
9	B2-450-33	•NUT	1
10	B2-450-34	•SCREW, set, M4x8	4
11	B2-450-35	•SNAP RING	1
12	B2-450-36	•MOUNT	1
13	B2-450-37	•COVER, yoke	1
14	B2-451-43	•SHAFT, bearing	1
15	B2-451-44	•SCREW, phillips, countersunk, M4 x 8	1
16	B2-451-45	•BLOCK, stop	1
17	B2-450-39	•BUSHING, shaft	1
18	B2-450-40	•COLLAR, right	1
19	B2-450-41	•SCREW, allen, countersunk, M6x14	1
20	B2-451-46	•STOPPER, pin	1
21	B2-450-58	•RETAINER, detent	1
22	B2-450-66	•NUT, acorn, M6	1
23	B2-450-65	•WASHER, M6	2
24	B2-451-47	•CYLINDER	1
25	B2-451-48	•SPRING	2
26	B2-451-49	•BUSHING	1
27	B2-451-50	•BUSHING	1
28	B2-451-51	•SHAFT, pivot	1
29	B2-450-60	•NUT, adjusting	1
30	B2-451-52	•JOINT, pivot	1
31	B2-450-34	•SCREW, set, M4x8	A/R
32	B2-450-51	•NUT	1
33	B2-450-52	•WASHER, thrust	3
34	B2-450-53	•BEARING, thrust	1
35	B2-450-54	•PIN, pivot	1
36	B2-450-55	•DETENT HARDWARE	1
37	B2-450-56	•BUSHING	1
38	B2-450-57	•COLLAR, left	1
39	B2-450-50	•BOLT, allen, M5x20	4
40	B9-410-66	•WASHER, lock, M5	4
41	B2-450-47	•CLAMP, handle bar	2
42	B2-450-46	•BOLT, allen, M6x15	4
43	B2-450-45	•PLATE, mounting	1
44	B2-450-44	•PIN, roll	A/R
45	B2-450-18	•SCREW, allen, countersunk, M6x12	6
46	B2-451-53	•BRACKET	1
47	B2-450-42	•NUT, special	4
48	B2-451-54	•BAR, handle	2
49	A1-010-29-1	HANDLE	2



0807.02

Item	Part No.	Description	Qty.
1	B2-451-55	VST HOUSING	1
2	B2-450-70	SCREW, allen, countersunk, M5x8	2
3	B2-450-71	GUIDE, bearing	2
4	B2-450-72	LINK, right	1
5	B2-450-73	LINK, left	1
6	B2-450-74	PIN, pivot	1
7	B2-450-76	PIN, pivot	2
8	B2-450-77	SCREW, set, M4x6	1
9	B2-450-78	WASHER, flat, M4	2
10	B2-450-79	BEARING	2
11	B2-450-80	SLEEVE, bearing	2
12	B2-450-81	SCREW, phillips, M4x18	2
13	B2-450-82	COVER	1
14	B2-450-83	PLATE, cover	1
15	B2-450-84	SCREW, phillips, M3x10	2
16	B2-450-85	BUSHING	1
17	B2-450-86	LINK	1
18	B2-450-87	PIN, pivot	2
19	B2-450-88	LINK	1
20	B2-450-89	SCREW, allen, countersunk, M6x16	2
21	B2-450-90	LINK	1
22	B2-450-91	NUT, adjusting	1
23	B2-450-92	BUSHING	1
24	B2-450-93	MOUNT	1
25	B2-450-94	NUT, adjusting	1
26	B2-450-95	NUT, adjusting	1
27	B2-450-96	NUT	1
28	B2-450-97	WASHER, thrust	2
29	B2-450-98	BEARING, thrust	1
30	B2-450-99	SLEEVE, wire	1
31	B2-451-01	SPRING	1
32	B2-451-07	SCREW, phillips	A/R
33	B2-451-06	COVER, access	2
34	B2-451-03	HOUSING, arm	1
35	B2-450-21	SCREW, allen, countersunk, M5x12	3
36	B2-451-04	SCREW, phillips	A/R
37	B2-451-05	COVER, adjustment	1
38	B2-451-02	SCREW, allen, countersunk, M5x18	2
39	B2-451-08	BUSHING	2
40	B2-451-09	BLOCK, spring stop	1
41	B2-451-10	HOUSING, BOM, lower	1
42	B2-451-13	GUIDE, bearing, right	1
	B2-451-13-1	GUIDE, bearing, left	1
43	B2-450-89	BOLT, allen, countersunk, M6x16	6
44	B2-451-12	COVER, side	2
45	B2-451-11	BOLT, allen, countersunk, M5x15	2
46	B2-451-14	SHAFT, main spring	1
47	B2-451-15	SCREW, allen, countersunk, M5x10	2
48	B2-451-16	GUIDE, bearing	2
49	B2-451-17	BEARING	2
50	B2-451-18	SHAFT, bearing	1



0807.02

Item	Part No.	Description	Qty.
51	B2-451-19	PLUG	1
52	B2-450-77	SCREW, set, M4x6	1
53	B2-450-09	BOLT, allen, M5x10	1
54	B2-451-20	PIN, pivot	1
55	B2-451-21	COVER	1
56	B2-451-22	SCREW, phillips	A/R
57	B2-451-23	JOINT, upper knuckle	1
58	B2-451-24	WASHER, thrust	1
59	B2-451-25	BALL, 6mm	1
60	B2-451-26	PIN, locating	A/R
61	B2-451-27	BEARING, needle	1
62	B2-451-28	SLEEVE, VST	1
63	B2-451-29	BUSHING	1
64	B2-451-30	WASHER	1
65	B2-450-77	SCREW, set, M4x6	A/R
66	B2-451-31	NUT	1
67	B2-451-32	SNAP RING	1
68	B3-210-12	SCREW, allen, countersunk, M6x12	A/R
69	B2-451-33	VST, upper	1



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TVII HANDLE CAMERA SYSTEM



SKYTRON

OWNERS MANUAL

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Although current at the time of publication, SKYTRON'S policy of continuous development makes this manual subject to change without notice.

MODEL ID
STELLAR SERIES



ST23TV



ST29TV



ST2323TV



ST2923TV



ST29TV23



ST232323TV



ST292323TV



ST29TV2323

**MODEL ID
MILLENNIUM SERIES**



ML24TV



ML2424TV



ML242424TV

SPECIAL USER ATTENTION

To help assure the highest degree of operating safety for user and patient, SKYTRON has provided precautionary instructions throughout this manual.

As with the operation of any surgical light, all hospital personnel should be aware that a certain amount of care must be exercised to maintain patient safety and to keep your SKYTRON Surgical Light performing at peak efficiency.

The following is a summary of the important precautionary instructions:

- Connector faceplate may be wall mounted, installed in a cabinet or installed on a Skyboom carrier.

- Make sure Main Power Switch on the light fixture Wall Control is in the OFF position before installing or removing the camera.

- Make sure Camera Assembly is securely locked in lighthead before moving lighthead into use position.

- Sterilizable cover must be removed prior to removing camera.

- Do not attempt to focus or position the lighthead using the camera body. Damage to the camera rotation motor may result.

- Do not push in the Camera Release Button on the Lighthead Attachment Ring above the sterile handle, as this will cause the camera to disengage from the lighthead.

- Refer to Skytron Stellar Series or Millennium Gold Series operators Manual for light fixture operation.

INTRODUCTION

SKYTRON'S TVII Handle Camera System provides high quality video to camera ready (TV Series) lightheads. The Sony single chip camera provides quality levels that are comparable to many 3 chip systems. The system design permits transport from room to room, wherever other TV Series lightheads are available. The camera control unit can be connected to any existing monitor. A convenient wall jack is provided for camera control connection. The TVII system can be used on SKYTRON Stellar series (ST23TV and ST29TV) or Millennium Gold series (ML24TV) camera ready lightheads (ST23TV lighthead shown in this publication). The TV lightheads may be single radial arm mounted, part of a multiple lighthead fixture or combined with a SKYTRON Skyboom on a Central mount fixture,



Figure 1. TVII Handle Camera in ST23TV Lighthead

The TV series lighthead option includes the Camera Ready Lighthead, a counterweight for use when the light is to be operated with the camera removed, a sterilizable camera cover that is used for a positioning/focus handle and a connector face plate with a 50 foot coaxial cable that connects to the camera/light fixture.

The connector faceplate allows a quick connect or disconnect point for the camera control unit. The faceplate is mounted near where the camera con-

trol unit is to be located. It can be wall mounted, installed within a cabinet such as a nurse documentation center or installed on a SKYTRON Skyboom Equipment Carrier. Refer to page 10 for TV system components.

The TVII Handle Camera system consists of the camera, a camera control unit and a control cable. The camera mounts in the center of the lighthead and the sterilizable cover allows sterile positioning and focus control for the lighthead.

INSTALLATION

Camera Installation



CAUTION



Make sure Main Power Switch on the light fixture Wall Control is in the OFF position before installing or removing the camera.

Use the following procedure to install the camera system.



Figure 2.

Move lighthouse to the full down position, and turn the lighthouse so it faces up as shown in figure 2.

Insert the Camera Assembly into the lighthouse attachment ring. Push and twist the camera to lock it into position. Pull out on the camera to verify that it is fully locked into position.



Figure 3.



CAUTION



Make sure Camera Assembly is securely locked in lighthouse before moving lighthouse into use position.

Camera Removal

To remove the camera assembly from the lighthouse, hold the camera firmly, and press the camera release button on the lighthouse attachment ring (figure 3). Carefully pull the camera assembly straight out of the attachment ring.

NOTE

Sterilizable cover must be removed prior to removing camera.

Counterweight

The counterweight must be installed to maintain the proper weight required to balance the lighthouse when the camera is not installed.

Install the counterweight in the lighthouse and ensure that it is fully engaged by pulling and slightly turning it. Refer to figure 4.

To remove the counterweight from the lighthouse, hold the counterweight firmly, and press the camera release button on the lighthouse attachment ring (figure 3).

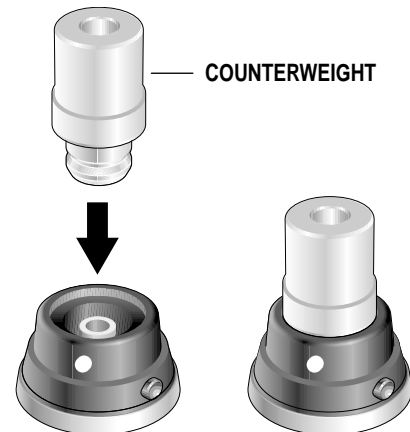


Figure 4. Counterweight

Sterilizable Cover



CAUTION



Do not attempt to focus or position the lighthead using the camera body. Damage to the camera rotation motor may result.



CAUTION



Do not push in the Camera Release Button on the Lighthead Attachment Ring above the sterile handle, as this will cause the camera to disengage from the lighthead.



Figure 5.

Recommended sterilization parameters for the sterilizable cover:

- a. Prevac, 270° F, 4 minutes
- b. Gravity Wrapped, 250° F, 30 minutes
- c. Gravity Flash, 270° F, 3 minutes

Always consult current AORN journal recommendations for proper sterilization procedures.

The camera has a sterilizable cover that, when installed, allows sterile positioning and focus control for the lighthead. There is also a non-sterile focus knob on the lighthead.

To install the sterile cover, align the holes in the cover with the cover locking pins on the camera attachment ring and slide the cover on until it locks on the two pins. See figure 5. To remove the sterile cover, push the two white pins in and remove the sterile cover.

OPERATION

Turn main power switch on at the Wall Control. Adjust the intensity control. The intensity control must be set to at least 20% for the camera to produce a video signal.

The focus of the bulbs within the lighthead can be adjusted by rotating the sterilizable cover or the side focus knob. See figure 6.

NOTE

Refer to Skytron Stellar Series or Millennium Gold Series operators Manual for light fixture operation.



Figure 6.

Camera Control Unit Configuration

1. Attach the Coaxial Cable from the connector on the faceplate to the camera control unit (CCU). See figure 7.

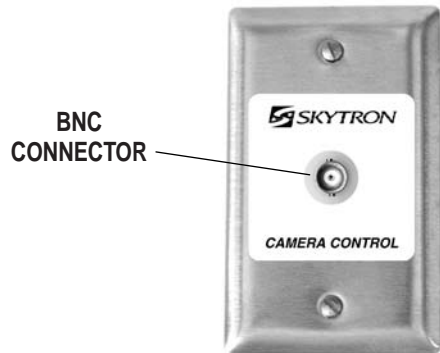


Figure 7. Camera Control Connector Faceplate

2. Connect the video out cable (SVHS or BNC) from the camera control unit to the monitor.

3. Connect the power cord to the CCU and plug into 120 VAC outlet. See figure 8.

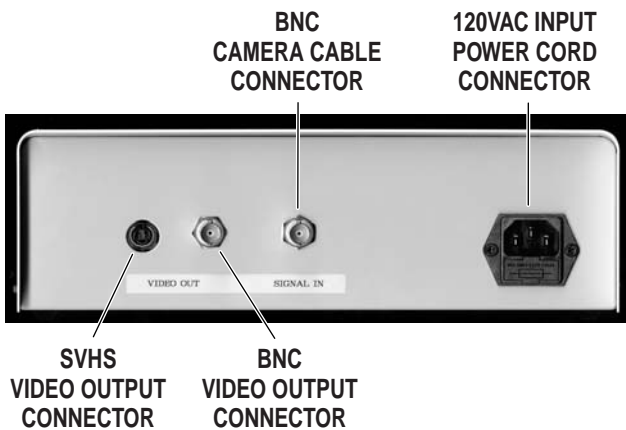


Figure 8. Camera Control Unit, back view

Camera Control Unit

The Camera Control Unit provides controls for camera rotation, manual or automatic adjustment of Iris (Aperture), Zoom and Focus. Refer to figure 9 for control locations.

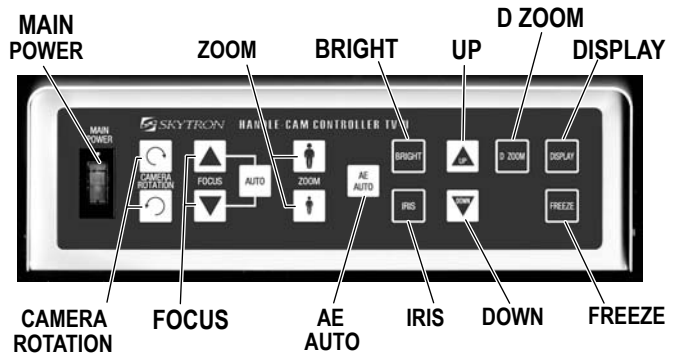









Figure 9. Camera Control Unit, front view

Description of Controls

MAIN POWER Switch - supplies power to the camera and control unit. Switch illuminates (green) when power is ON.

CAMERA ROTATION - allows clockwise and counterclockwise rotation of the camera. Press the  button for clockwise rotation. Press the  for counterclockwise rotation.

FOCUS - controls the focus of the camera lens. When Main Power switch is turned ON the Focus control is set to automatic. To operate the Focus control manually, press the AUTO button. The Focus symbol will display on the monitor when in the manual mode. Press the  or  button as required to obtain proper focus. Pressing the  button sets the focus in the telephoto range. Pressing the  button sets the focus in the wide angle range. Press the AUTO button again to activate the automatic function.

ZOOM - controls the image size. To make the subject larger, press the  button. To make the subject smaller, press the  button.

AE AUTO - allows automatic control of both IRIS and BRIGHT functions.

BRIGHT - adjusts both the gain and iris using an internal algorithm according to a brightness level freely set by the user. Exposure is controlled by gain when dark, and by iris when bright.

IRIS (Aperture) - controls the video signal brightness by opening or closing the iris of the camera to allow more or less light to enter the camera. When Main Power switch is turned ON the Iris control is set to automatic. To operate the Iris control manually, press the AE AUTO button. The "F" stop setting will display on the monitor when in the manual mode. Press the UP button to increase the brightness. Press the DOWN button to decrease the brightness. Press the AE AUTO button again to activate the automatic function.

UP / DOWN - used with IRIS and BRIGHT options.

D ZOOM - controls digital zoom function. When activated, extends zoom ratio from 10X to 40X.

DISPLAY - displays the current iris, zoom and focus settings on the monitor.

FREEZE - press to capture present view "snapshot". Press again to resume normal operation.

The Handle Camera system consists of a Lighthouse handle mounted, super compact color CCD camera with a 10X zoom, high speed auto focus lens. Controls are provided for camera rotation, focus, zoom, Bright - Iris adjustment, digital zoom and freeze. Composite and SVHS outputs are available.

SPECIFICATIONS:

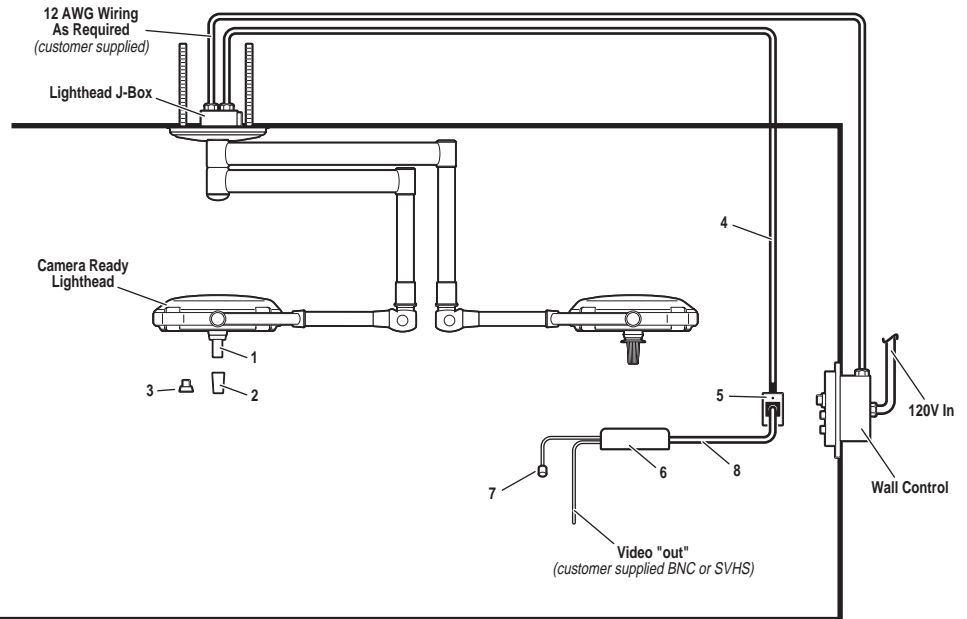
Image Sensor	1/4" IT, Super HAD CCD with Digital Signal Processor (DSP)
Video Signal Out	Composite or SVHS
Picture Elements	768 (H) x 494 (V)
Resolution	470 TV lines
Lens	10x Zoom f=4.2 to 42 mm (F1.8 to F2.9)
Zoom Ratio	40x (10x optical, 4x digital)
Angle of View (H)	Approx. 46 degrees (wide end) to 5.0 degrees (tele end)
Min. Object Distance	10mm (wide end) : 1000mm (tele end)
Iris	Automatic/Manual
Min. Sensitivity	2.0 Lux
S/N Ratio	50dB +
White Balance	Auto
Electronic Shutter	1/1 to 1/10,000 sec., 22 steps
Gain	Auto/Manual (-3 to 28dB, 2dB steps)
AE Control	Auto, Manual, Priority mode, Bright, EV comp. Back light comp.

SYSTEM COMPONENTS

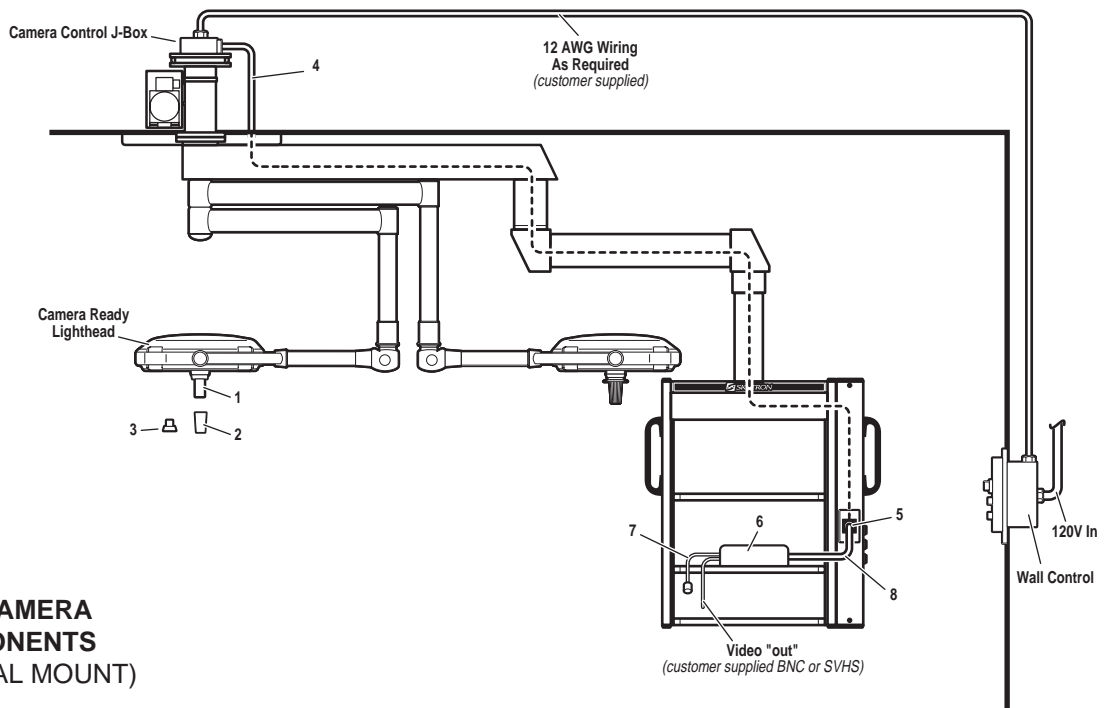
NOTE

Connector Faceplate may be

- Wall mounted
- Installed in a cabinet
- Installed on Skyboom carrier



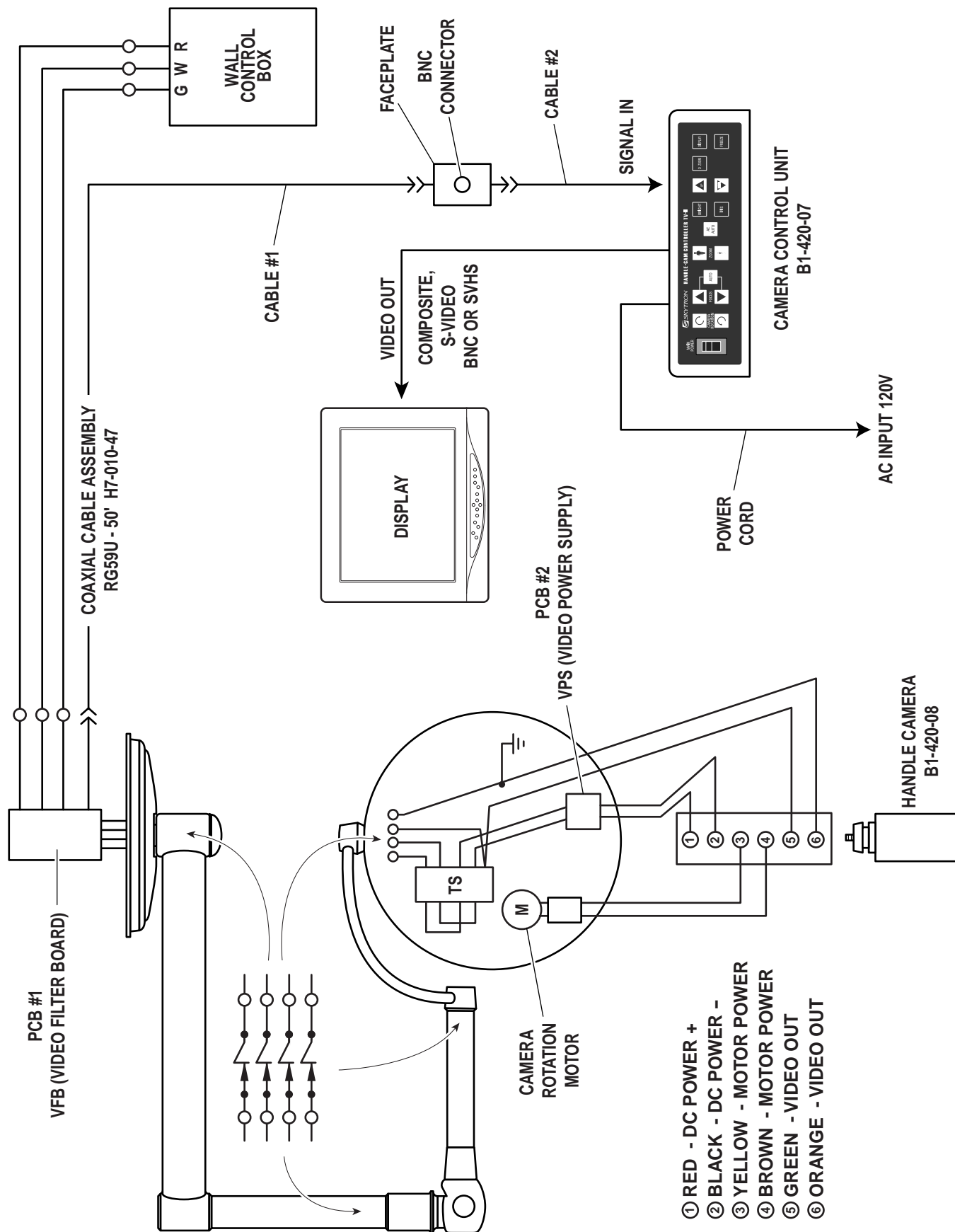
TV-II HANDLE CAMERA SYSTEM COMPONENTS



TV-II HANDLE CAMERA SYSTEM COMPONENTS (SKYBOOM CENTRAL MOUNT)

Item	Part No.	Description	Qty.
1	B1-420-08	CAMERA	1
2	B1-410-76	SLEEVE, sterilizable, camera cover	1
3	B1-420-02	COUNTERWEIGHT	1
4	H7-010-47	CABLE ASSEMBLY, coaxial, RG59, 50 ft.	1
5	B1-420-30	CONNECTOR & FACEPLATE, camera control	1
6	B1-420-07	CAMERA CONTROL UNIT	1
7	B9-211-04	POWER CORD, camera control unit	1
8	H7-010-29	CABLE, coaxial, RG59 (specify length)	SP
	H7-010-23	CONNECTOR, BNC, male	2

TVII CAMERA SYSTEM



DAMAGED SHIPMENT CLAIM PROCEDURE

Whenever a shipment suffers damage while in the custody of the transportation company, the responsibility lies with the transportation company, and the value of the damages can be collected from the transportation company if the proper procedures are followed.

When a shipment is received in a damaged condition and due to the appearance of the containers such as a broken crate, torn wrapping, or smashed carton, the contents may have been damaged. That fact should be noted on the Bill of Lading offered by the transportation company. An example of an applicable statement would be; "Received in good order except as noted" or "Crate damaged, possibility of concealed damage." The addition of these types of statements on the shipping documents will automatically give grounds for starting a claim.

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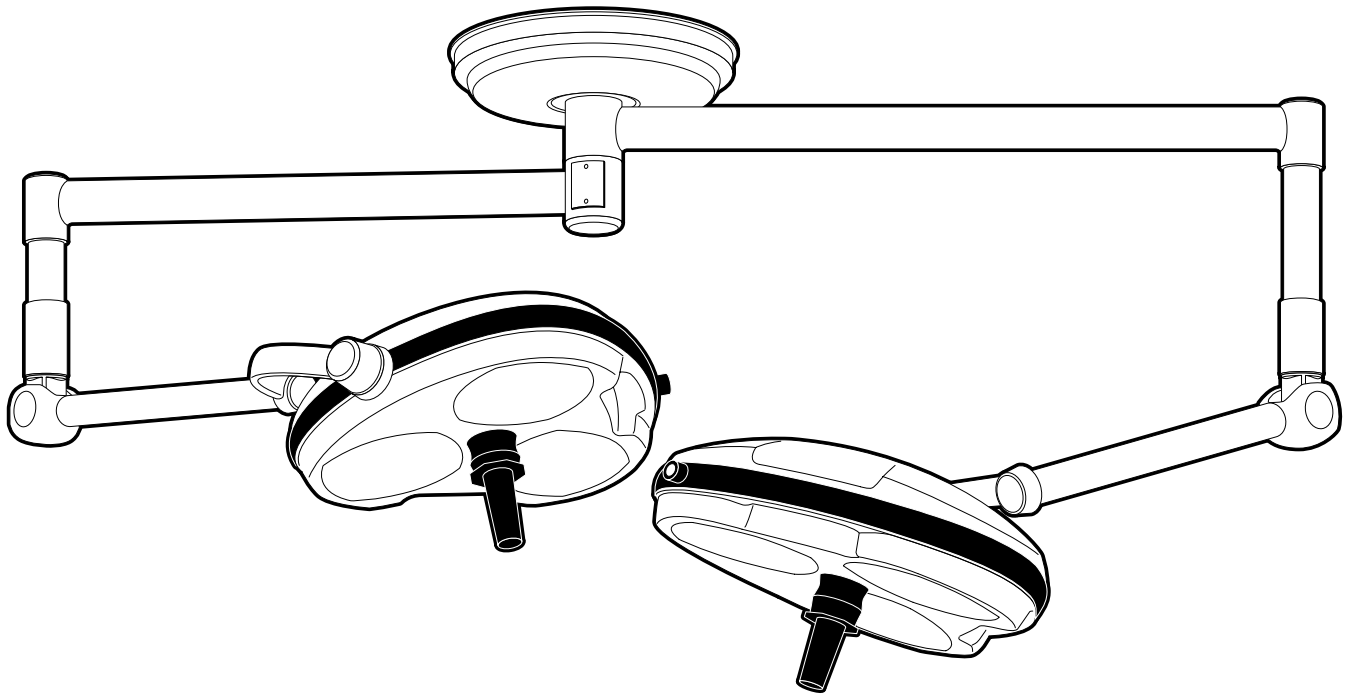
The claim itself may be filed by either the shipper or consignee, but the consignee must notify the transportation company and the shipper that the damage has occurred. Remember that refusal of the shipment or failure to note the possibility of damage on the shipping documents may jeopardize the claim. Also, acceptance of a damaged shipment which has been processed properly to allow for filing a claim, will not jeopardize the position of the consignee. In any case, SKYTRON will see that damage which is not the fault of the consignee or his agents is corrected, if the transportation company does not honor the claim, as long as SKYTRON receives the full cooperation of the consignee in filing the claim.

Some of the papers needed for filing a claim are in the hands of the consignee after the shipment has been received. If SKYTRON must file a claim, we will request these papers by name from the consignee at such time as the claim is under discussion. We will require the originals of these papers and not copies.

Knowledge of the procedures outlined above and your cooperation in submitting damaged shipment claims will help both you, our customer, and SKYTRON by assuring the integrity of our products from manufacturing to installation.



INSTALLATION INSTRUCTIONS



ST19

SERIES SURGICAL LIGHTS

EQUIPMENT LABELS AND SPECIFICATIONS



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



AC VOLTAGE



FUSE TYPE 3 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

ENTELED CERTIFIED

TO UL2601-1

CAN/CSA601.1, IEC 60601-2-46



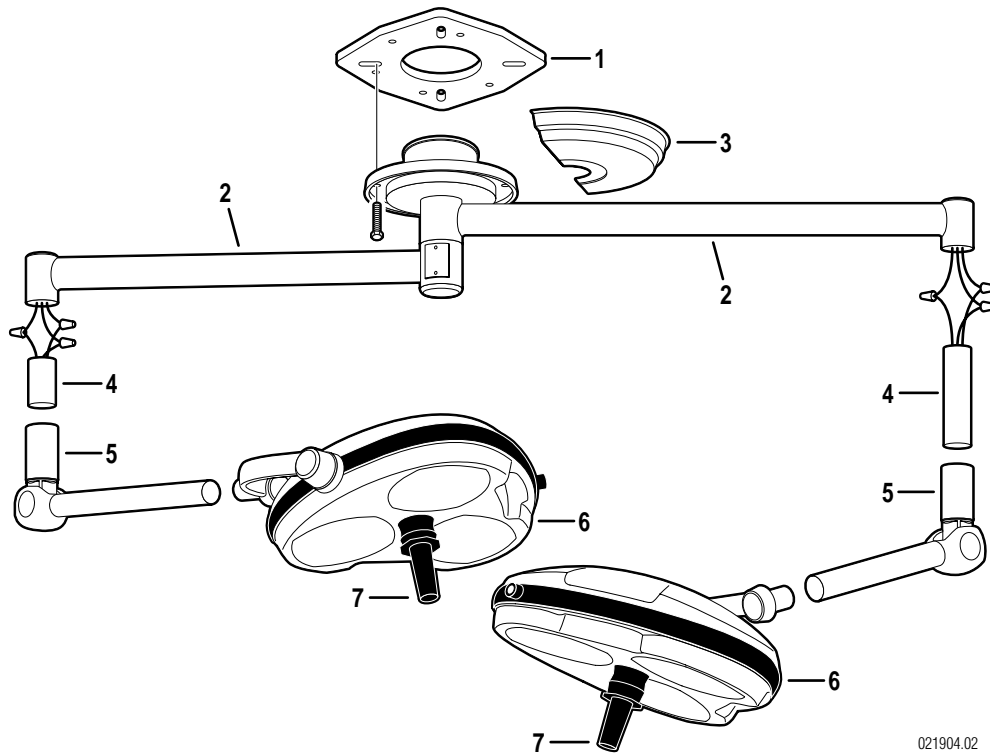
TOOLS REQUIRED:

3/8" DRIVE RATCHET
ALLEN WRENCH SET-METRIC
(2) STEP LADDERS
3/4" DEEP SOCKET, 3/8" DRIVE
#2 PHILLIPS HEAD SCREW DRIVER
UTILITY KNIFE
WIRE CUTTERS

CRIMP PLIERS
DIGITAL LEVEL
TRUE RMS MULTIMETER
PORTABLE LIFT, 750LB. CAPACITY
12" ADJUSTABLE WRENCH
SLOTTED HEAD SCREWDRIVER 1/4"
PUNCHSET 1/8" - 3/8"

REV 6/06

Although current at the time of publication, SKYTRON'S policy of continuous development makes this manual subject to change without notice.



021904.02

TYPICAL INSTALLATION SEQUENCE / COMPONENT IDENTIFICATION

- | | |
|-------------------------------|------------------------------------|
| 1. Mounting Plate | 5. Balance Mechanism(BOM) |
| 2. Radial Arm Assembly(RAA) | 6. Lighthead |
| 3. Ceiling Cover | 7. Sterilizable Positioning Handle |
| 4. Vertical Support Tube(VST) | |

INSTALLATION NOTES

- The SKYTRON Surgical Lighting Fixture is normally shipped in two to three crates, depending on the model. A carton containing the Vertical Support Tubes, miscellaneous hardware, and various instructional materials is packed separately.

- Follow the Installation Instructions and utilize the Installation Check List to assure proper installation.

- Additional materials required for proper installation include Blue Loc-Tite compound.

- Special adapter plates for mounting SKYTRON surgical lights on existing mounting structures are available. Contact your SKYTRON representative for special application details.

- Contact SKYTRON representative for Seismic calculations if applicable.

IMPORTANT NOTES

UNCRATING

- Should any damage to the fixture be noted while uncrating, further unpacking should be stopped and the container with all the wrappings held for inspection. The transportation company should be notified immediately so an inspector can be sent. Consult the Damaged Shipment Claim Procedure sheet for further details.

- Personnel uncrating SKYTRON surgical lights should be aware that they are delicate medical equipment and special care in handling should prevail throughout installation.

- Use extreme caution when removing the contents from the crates to prevent damage to the lights. Leave the lightheads in their crates until ready to install.

- If the lighthead must be set down after it is removed from the crate, always lay it on the front face on the foam shipping block. Do not lay it on the front face.

UNCRATING PROCEDURE

Open the top of the lighthead box and remove the packing material, remove the sterilizable positioning handle and remove lighthead from the crate.

NOTE

Details may vary depending upon model and support structure fabrication.

ALL fixtures use METRIC fasteners.

INSTALLATION PROCEDURE

The lighting fixture should be installed in the following sequence:

1. Mounting Plate
2. Radial Arm Assembly and Ceiling Cover
3. Vertical Support Tubes/ Balance Mechanisms
4. Lightheads

1. Mounting Plate

a. Check the strength and stability of the mounting structure. It should be fabricated of steel and welded or bolted to the structural ceiling. It should be braced in a manner that will allow no twisting or lateral motion. A steel stiffener plate should be used to connect the 3/4" diameter "all-thread" support rods and to provide an attachment base for the angle-iron sway bracing. The 3/4" diameter support rods should be mounted in a 9-1/2" square pattern and should extend 2-1/4" below the finished ceiling. **See Mounting Structure details in the back of this booklet.**

b. Install the SKYTRON mounting plate on the threaded rods between jam nuts. The plate should normally be located 1-1/4" off the finished ceiling (measured from the bottom of the plate) and accurately leveled, within 0.1 degree, using a digital level. Tighten the jam nuts securely. See figure 1.



WARNING



The mounting plate must be accurately leveled to prevent lighthead drift.

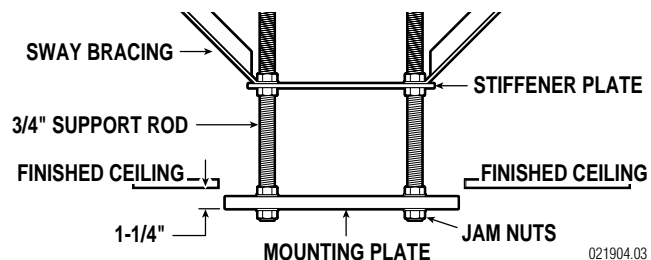


Figure 1. Mounting Plate Installation

Consult specific Seismic calculations if applicable.

2. Radial Arm Assembly and Ceiling Cover

NOTE

- The multiple arm assemblies are easier to handle during installation if the arms are left taped and tied together.
- In some cases it may be necessary to connect the electrical wires to the radial arm junction box before the arm assembly can be bolted to the mounting plate.

a. Install the Radial Arm Assembly(RAA) onto the mounting plate using the bolts provided. Tighten the mounting bolts securely.



CAUTION



TO AVOID BLOWING FUSES, DO NOT TURN MAIN POWER TO FIXTURE "ON" UNTIL ALL LIGHTHEADS ARE INSTALLED AND ALL WIRING CONNECTIONS ARE COMPLETED.

b. Observe color codes and connect the transformer wires to a 120VAC, 60Hz power supply using a DPST wall switch

NOTE

Connection of the fixture wires using Crimp Connectors is recommended .

c. Install the ceiling cover and secure. See figure 2.

3. Vertical Support Tubes/Balance Mechanism

NOTE

Determine correct placement for each Balance Mechanism(BOM)/Vertical Support Tube(VST) on the radial arm assembly. The longest VST goes into the top radial arm.



WARNING



Apply Loc-Tite to all of the 5mm mounting screws and use a 3mm allen wrench to tighten the screws.

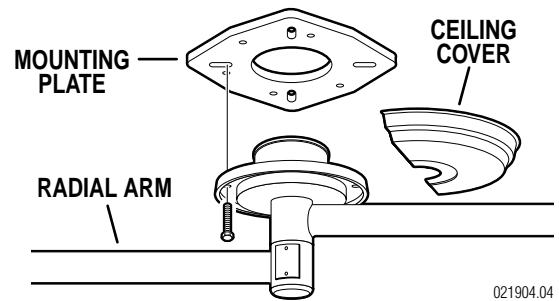


Figure 2. Radial Arm Installation

a. Install the VST on the BOM, apply Loc-Tite to screw threads and secure VST with the allen screws provided. See figure 3.

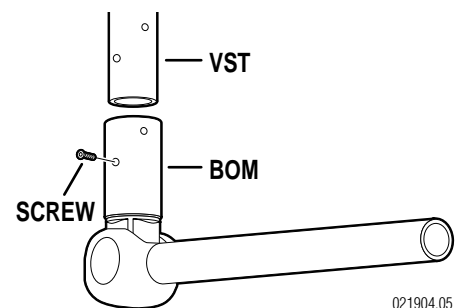


Figure 3. Balance Mechanism

b. Observe the wire colors and connect the wires from the radial arm to the corresponding BOM/VST wires using crimp connectors. See figure 4.

c. Insert the vertical support tube into the radial arm receptacle. Observe any screw color codes, apply Loc-Tite to screw threads, and secure the BOM/VST assembly with the 5mm mounting screws. Repeat procedure for any remaining BOM/VST assemblies.

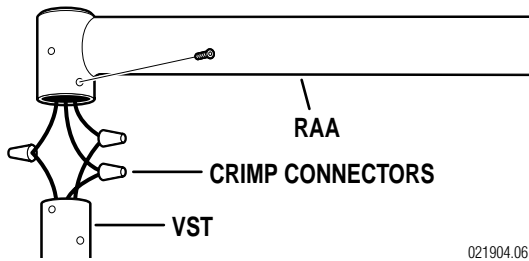


Figure 4. VST to RAA Installation

4. Lighthouse

a. To make it easier to install the lighthouse, locate the support arm of the balance mechanism so that it points inward toward the ceiling cover. This will prevent the radial arm from moving when installing the lighthouse. See figure 5.

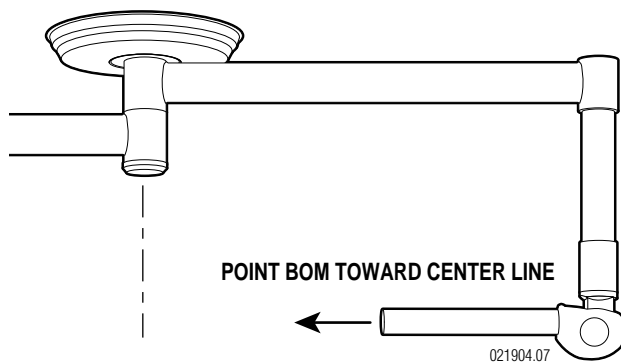


Figure 5.

b. Remove the four (4) screws from the lighthouse mounting stub.

c. Install the lighthouse mounting stub into the support arm and secure with the screws previously removed. See figure 6.

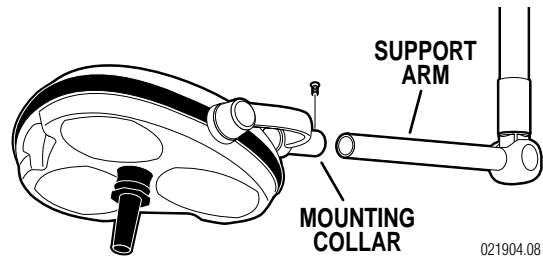


Figure 6. Lighthouse Installation

d. Pull the lighthouse down and remove the Above Horizontal Limit Stops from the BOM. See figure 7.



WARNING



DO NOT remove lighthouse when support arm is in down position; The balance mechanism will be severely damaged and may result in bodily injury.

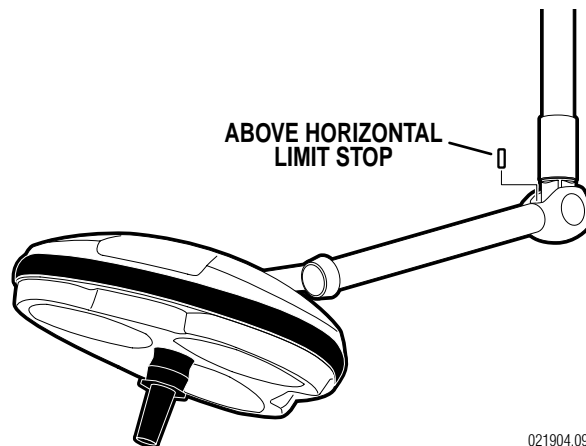


Figure 7. Above Horizontal Limit Stops

Output Voltage Adjustment

a. Remove the top cover using the following procedure: See figure 8.

1. Carefully move trim strip for access to the corner plate screws and remove the (3) top screws.

2. Using a 1/8" straight blade screwdriver, release the (4) lock tabs and remove the top cover.

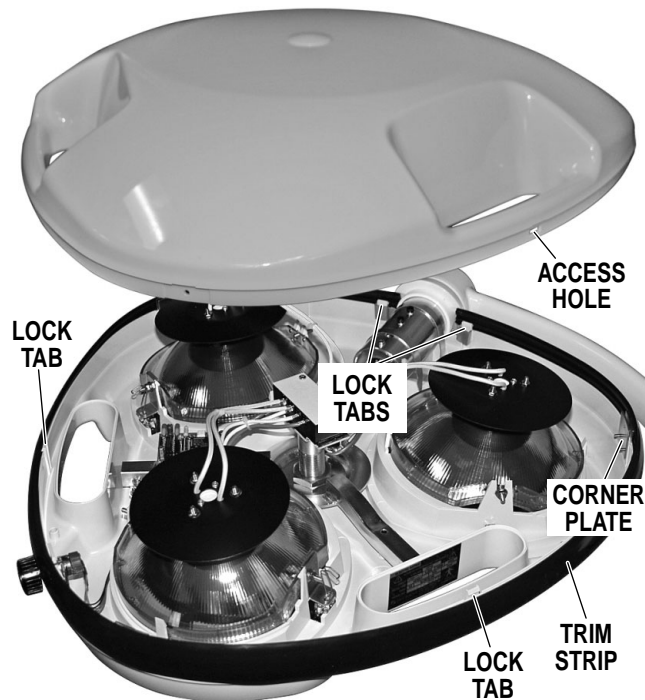


Figure 8. Top Cover Removal

b. Test bulb voltage at the terminal strip. Turn main power "ON" and set the Dimmer Control to maximum intensity for the test. Output voltage (at the terminals) should be $20V \pm 0.2V$. See figure 9.

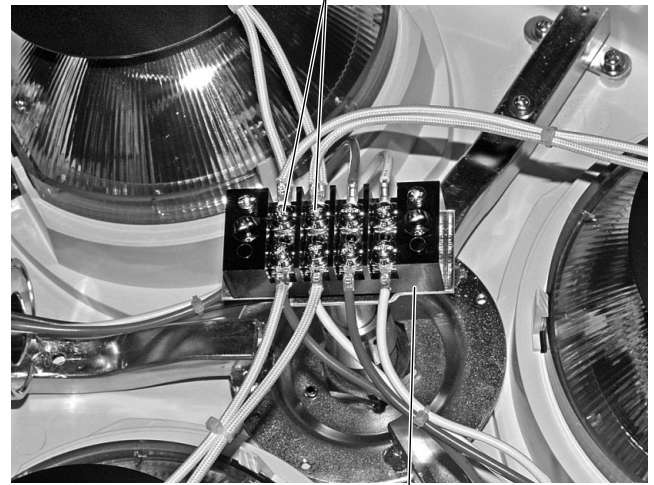


CAUTION



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.

LIGHT TERMINALS

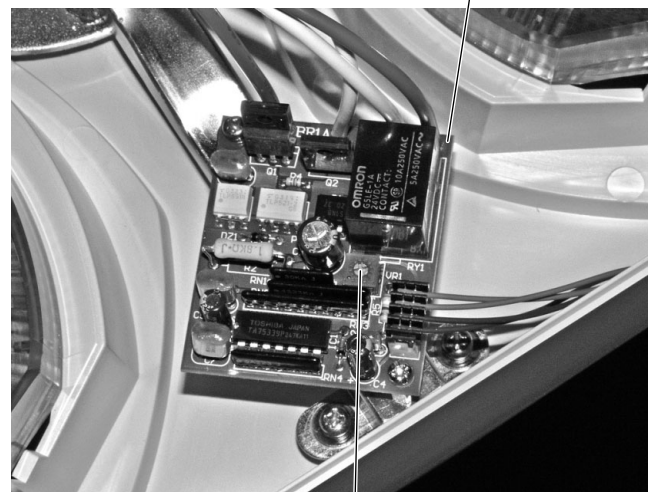


TERMINAL STRIP

Figure 9. Bulb Voltage Test

c. Adjust the voltage to the lighthouse by turning the adjuster on the lighthouse circuit board. See figure 10.

CIRCUIT BOARD



ADJUSTER

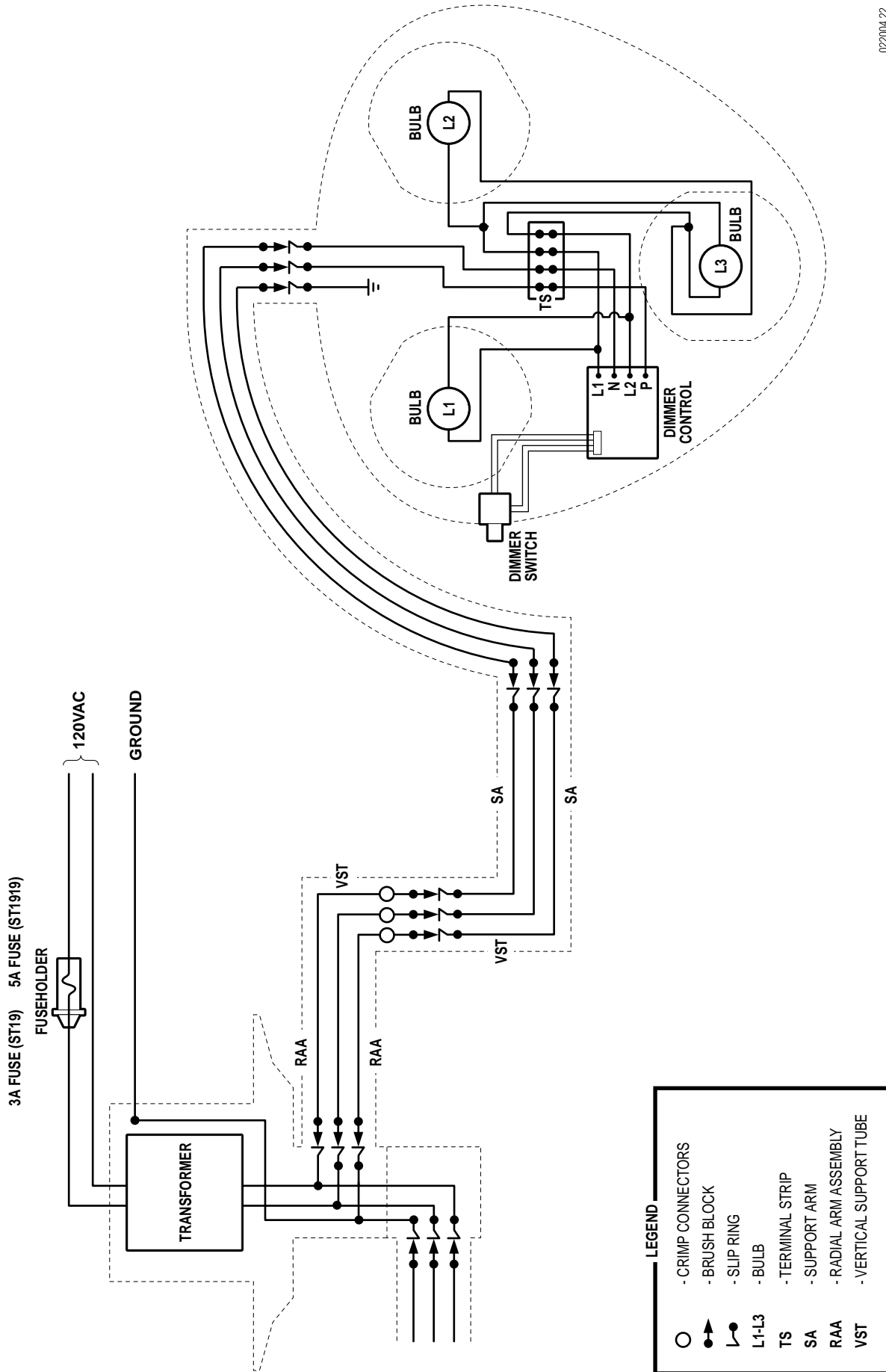
Figure 10. Voltage Adjustment

d. Turn the adjuster clockwise to increase the output voltage, counterclockwise to decrease the voltage.

e. Install top cover and secure with the (3) screws removed from the corner plates. Do not overtighten screws.

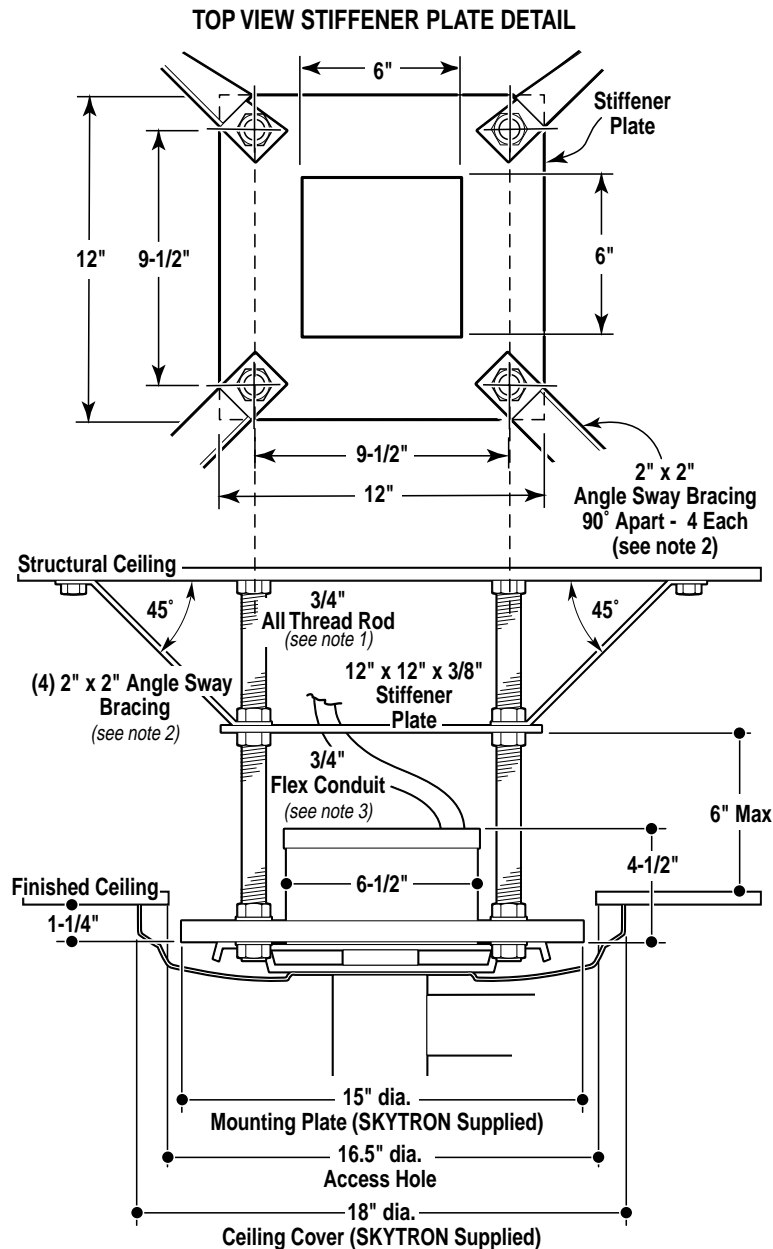
WIRING DIAGRAM ST1919

022004.22



LEGEND

- - CRIMP CONNECTORS
- - BRUSH BLOCK
- ◐ - SLIP RING
- - BULB
- L1-L3
- TS - TERMINAL STRIP
- SA - SUPPORT ARM
- RAA - RADIAL ARM ASSEMBLY
- VST - VERTICAL SUPPORT TUBE



NOTES

1. 3/4" support rods located for total support of light, all labor and materials for fabrication supplied by General Contractor. 3/4" nuts and washers for support of SKYTRON mounting plate supplied by contractor (8 ea. required).
2. The mounting structure must be braced to allow no more than 0.2 of a degree of rotation.
3. All conduit, wiring, and other electrical materials as well as installation labor for such materials associated with the installation of the SKYTRON surgical light to be provided by Electrical Contractor. All installations of SKYTRON surgical lights should be under the direct supervision of a SKYTRON representative. All wiring to be in accordance with local codes.
4. CONTRACTOR HAS FINAL RESPONSIBILITY for the strength and stability of the Mounting Structure.
5. Consult your SKYTRON representative for lower ceiling heights and special applications.

Contact SKYTRON representative for Seismic calculations if applicable.

MOUNTING STRUCTURE GUIDELINE
<p style="margin: 0;">5000 36th Street S.E. • Grand Rapids, MI 49512 1.800.SKYTRON • 1.616.957.0500 • FAX 1.616.957.5053</p>

DAMAGED SHIPMENT CLAIM PROCEDURE

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Knowledge of the procedures outlined above and your cooperation in submitting damaged shipment claims will help both you, our customer, and SKYTRON by assuring the integrity of our products from manufacturing to installation.

INSTALLATION CHECK LIST

Mounting Structure:

Fabrication of structure correct _____
Mounting plate set and level _____

Wall Control:

Wiring proper gauge _____
Wire connections correct _____
Cover screws installed _____
Input voltage checked and _____
adjusted as necessary _____

Radial Arm Assembly:

Mounting bolts installed & tightened _____
Wiring properly connected & _____
assembly grounded _____
Ceiling cover installed _____

Miscellaneous:

Diffuser assemblies clean _____
Clean fixture with cleaning solution _____

Vertical Support Tubes:

All BOM/VST's installed and 6 mm _____
mounting screws Loc-tited _____

Lighthouse:

Mounting stub screws installed _____
Bulb Voltage checked _____
Power ON, all bulbs illuminated _____
Bulbs remain illuminated throughout:
•RAA rotation _____
•BOM rotation _____
•Pitch axis _____
•Roll axis _____
•Vertical travel _____
Center positioning handle mounted _____

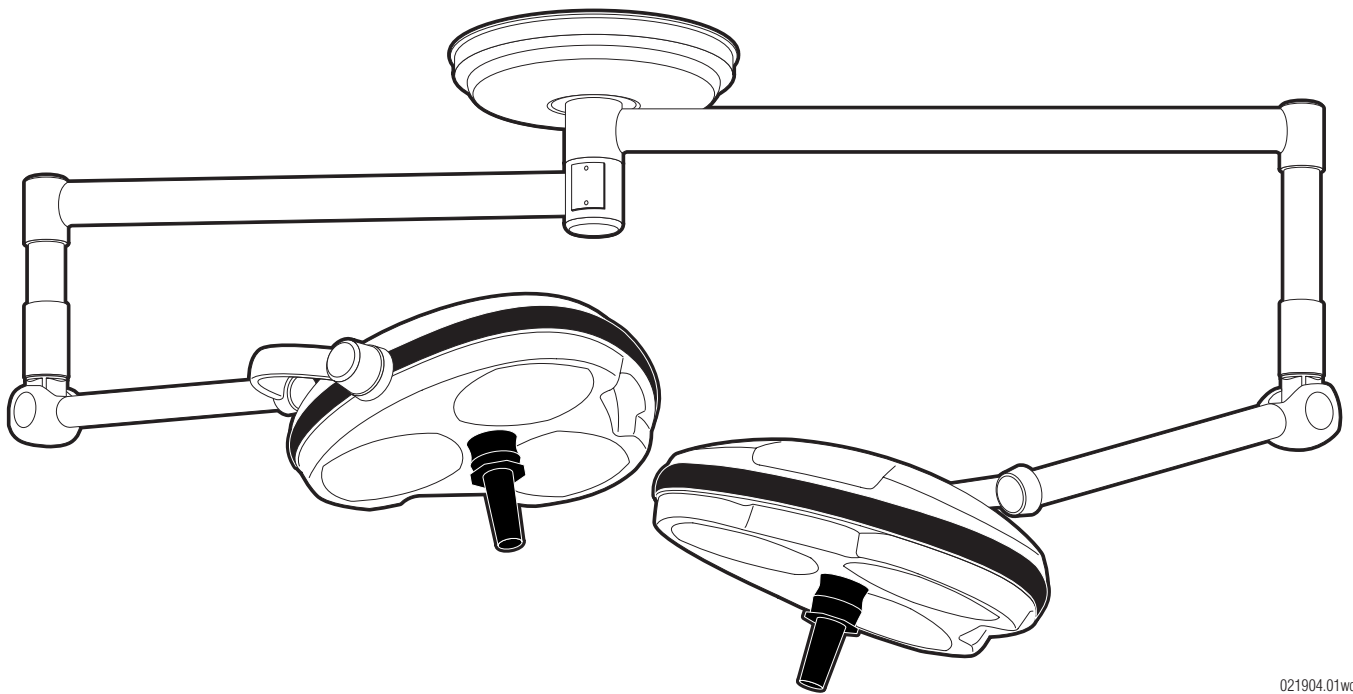


5085 Corporate Exchange Blvd. S.E.
Grand Rapids, MI 49512

1.800.SKYTRON • 1.616.656.2900 • FAX 1.616.656.2906



INSTALLATION INSTRUCTIONS



021904.01wc

ST19-WC

SERIES SURGICAL LIGHTS

EQUIPMENT LABELS AND SPECIFICATIONS



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



AC VOLTAGE



FUSE TYPE 3 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

ENTECLA CERTIFIED

TO UL2601-1

CAN/CSA601.1, IEC 60601-2-46



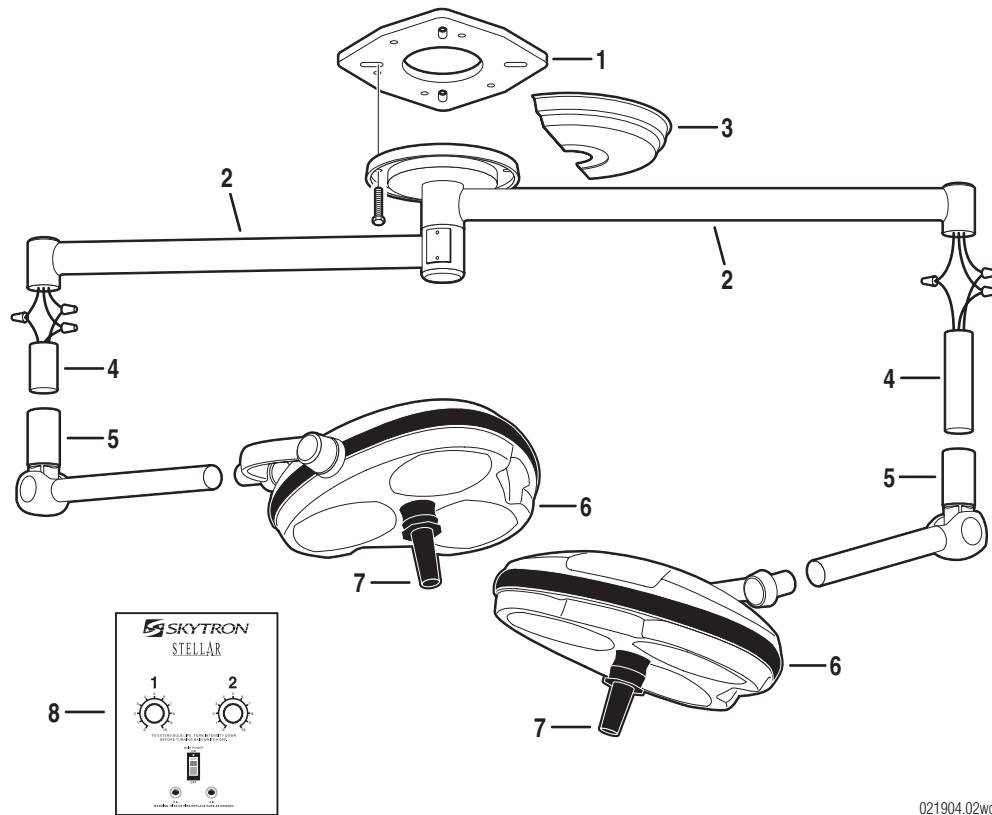
TOOLS REQUIRED:

3/8" DRIVE RATCHET
ALLEN WRENCH SET-METRIC
(2) STEP LADDERS
3/4" DEEP SOCKET, 3/8" DRIVE
#2 PHILLIPS HEAD SCREW DRIVER
UTILITY KNIFE
WIRE CUTTERS

CRIMP PLIERS
DIGITAL LEVEL
TRUE RMS MULTIMETER
PORTABLE LIFT, 750LB. CAPACITY
12" ADJUSTABLE WRENCH
SLOTTED HEAD SCREWDRIVER 1/4"
PUNCHSET 1/8" - 3/8"

REV 12/06

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**TYPICAL INSTALLATION SEQUENCE /
COMPONENT IDENTIFICATION**

- | | |
|--------------------------------|------------------------------------|
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| 2. Radial Arm Assembly (RAA) | 6. Lighthead |
| 3. Ceiling Cover | 7. Sterilizable Positioning Handle |
| 4. Vertical Support Tube (VST) | 8. Wall Control |

INSTALLATION NOTES

- The SKYTRON Surgical Lighting Fixture is normally shipped in two to three crates, depending on the model. A carton containing the Vertical Support Tubes, miscellaneous hardware, and various instructional materials is packed separately.
- Follow the Installation Instructions and utilize the Installation Check List to assure proper installation.
- Special adapter plates for mounting SKYTRON surgical lights on existing mounting structures are available. Contact your SKYTRON representative for special application details.

- Additional materials required for proper installation include Blue Loc-Tite compound.
- Stellar ST19WC Series lighting fixtures require a wall mounted control box (8" x 10"). 3/4" conduit and minimum 12 AWG wire is required between wall control and fixture. 10 AWG wire is recommended for installations requiring wires between control box and fixture that are longer than 25'.
- Contact SKYTRON representative for Seismic calculations if applicable.

IMPORTANT NOTES

UNCRATING

- Should any damage to the fixture be noted while uncrating, further unpacking should be stopped and the container with all the wrappings held for inspection. The transportation company should be notified immediately so an inspector can be sent. Consult the Damaged Shipment Claim Procedure sheet for further details.
- Personnel uncrating SKYTRON surgical lights should be aware that they are delicate medical equipment and special care in handling should prevail throughout installation.
- Use extreme caution when removing the contents from the crates to prevent damage to the lights. Leave the lightheads in their crates until ready to install.
- If the lighthead must be set down after it is removed from the crate, always lay it on the front face. If available, lay it on the foam shipping block. Do not lay it on the front face.

UNCRATING PROCEDURE

Open the top of the lighthead box and remove the packing material, remove the sterilizable positioning handle and remove lighthead from the crate.

NOTE

Details may vary depending upon model and support structure fabrication.

ALL fixtures use METRIC fasteners.

INSTALLATION PROCEDURE

The lighting fixture should be installed in the following sequence:

1. Mounting Plate
2. Radial Arm Assembly and Ceiling Cover
3. Vertical Support Tubes/ Balance Mechanisms
4. Lightheads
5. Wall Control

1. Mounting Plate

a. Check the strength and stability of the mounting structure. It should be fabricated of steel and welded or bolted to the structural ceiling. It should be braced in a manner that will allow no twisting or lateral motion. A steel stiffener plate should be used to connect the 3/4" diameter "all-thread" support rods and to provide an attachment base for the angle-iron sway bracing. The 3/4" diameter support rods should be mounted in a 9-1/2" square pattern and should extend 2-1/4" below the finished ceiling. **See Mounting Structure details in the back of this booklet.**

b. Install the SKYTRON mounting plate on the threaded rods between jam nuts. The plate should normally be located 1-1/4" off the finished ceiling (measured from the bottom of the plate) and accurately leveled, within 0.1 degree, using a digital level. Tighten the jam nuts securely. See figure 1.



WARNING

The mounting plate must be accurately leveled to prevent lighthead drift.

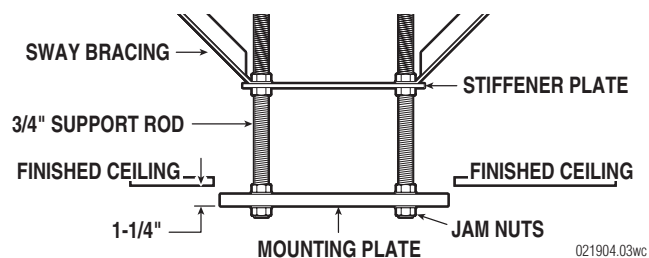


Figure 1. Mounting Plate Installation

Consult specific Seismic calculations if applicable.

2. Radial Arm Assembly and Ceiling Cover

NOTE

- The multiple arm assemblies are easier to handle during installation if the arms are left taped and tied together.
- In some cases it may be necessary to connect the electrical wires from the wall control to the radial arm junction box before the arm assembly can be bolted to the mounting plate.

a. Install the Radial Arm Assembly(RAA) onto the mounting plate using the bolts provided. Tighten the mounting bolts securely.

NOTE

Radial Arm wires are tagged for proper connection to the Wall Control (top arm #1, next arm #2).

b. Observe wire tags and color codes and connect the electrical wires from the wall control to the radial arm junction box wires.

NOTE

Connection of the fixture wires using Crimp Connectors is recommended due to the low voltage/high amperage electrical requirements.

c. Install the ceiling cover and secure. See figure 2.

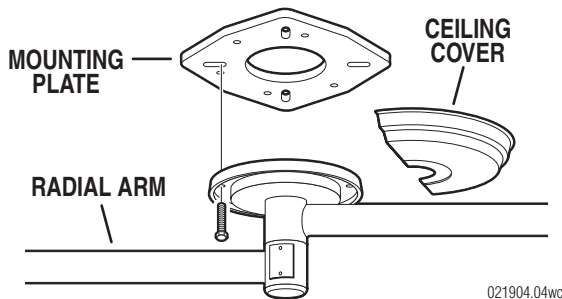


Figure 2. Radial Arm Installation

3. Vertical Support Tubes/Balance Mechanism

NOTE

Determine correct placement for each Balance Mechanism(BOM)/Vertical Support Tube(VST) on the radial arm assembly. The longest VST goes into the top radial arm.



WARNING



Apply Loc-Tite to all of the 5mm mounting screws and use a 3mm allen wrench to tighten the screws.

a. Install the VST on the BOM, apply Loc-Tite to screw threads and secure VST with the allen screws provided. See figure 3.

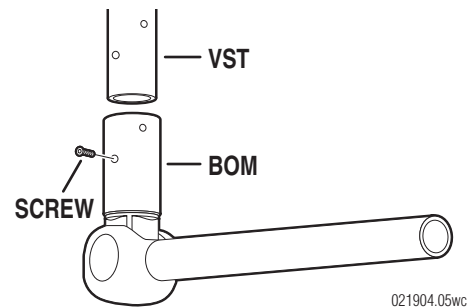


Figure 4. Balance Mechanism

b. Observe the wire colors and connect the wires from the radial arm to the corresponding BOM/VST wires using crimp connectors. See figure 4.

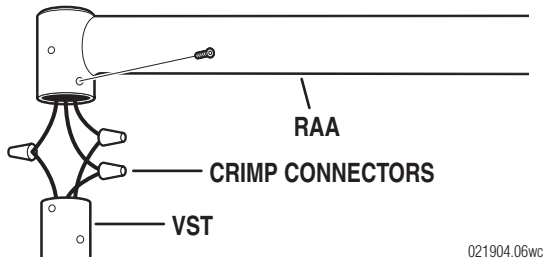


Figure 4. VST to RAA Installation

c. Insert the vertical support tube into the radial arm receptacle. Observe any screw color codes, apply Loc-Tite to screw threads, and secure the BOM/VST assembly with the 5mm mounting screws. Repeat procedure for any remaining BOM/VST assemblies.

4. Lighthouse

a. To make it easier to install the lighthouse, locate the support arm of the balance mechanism so that it points inward toward the ceiling cover. This will prevent the radial arm from moving when installing the lighthouse. See figure 5.

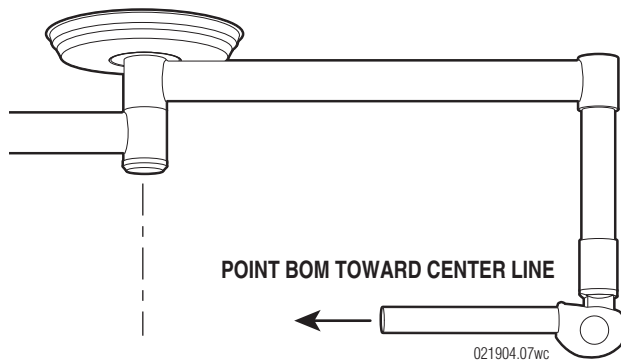


Figure 5.

b. Remove the four (4) screws from the light-head mounting stub.

c. Install the lighthouse mounting collar onto the support arm and secure with the screws previously removed. See figure 6.

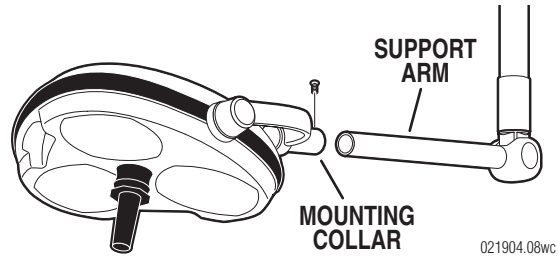


Figure 6. Lighthouse Installation

d. Pull the lighthouse down and remove the Above Horizontal Limit Stops from the BOM. See figure 7.



DO NOT remove lighthouse when support arm is in down position; The balance mechanism will be severely damaged and may result in bodily injury.

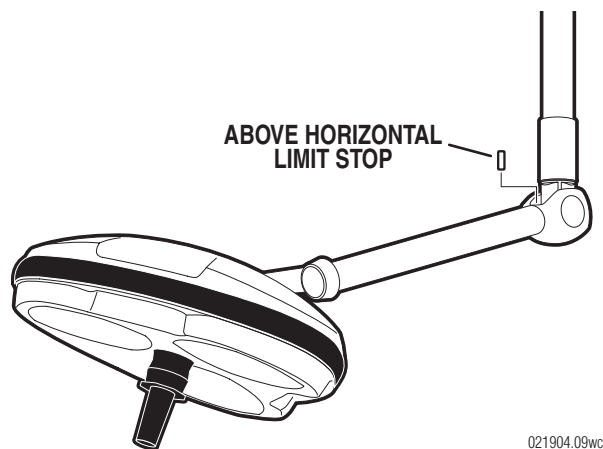


Figure 7. Above Horizontal Limit Stops

5. Wall Control

NOTE

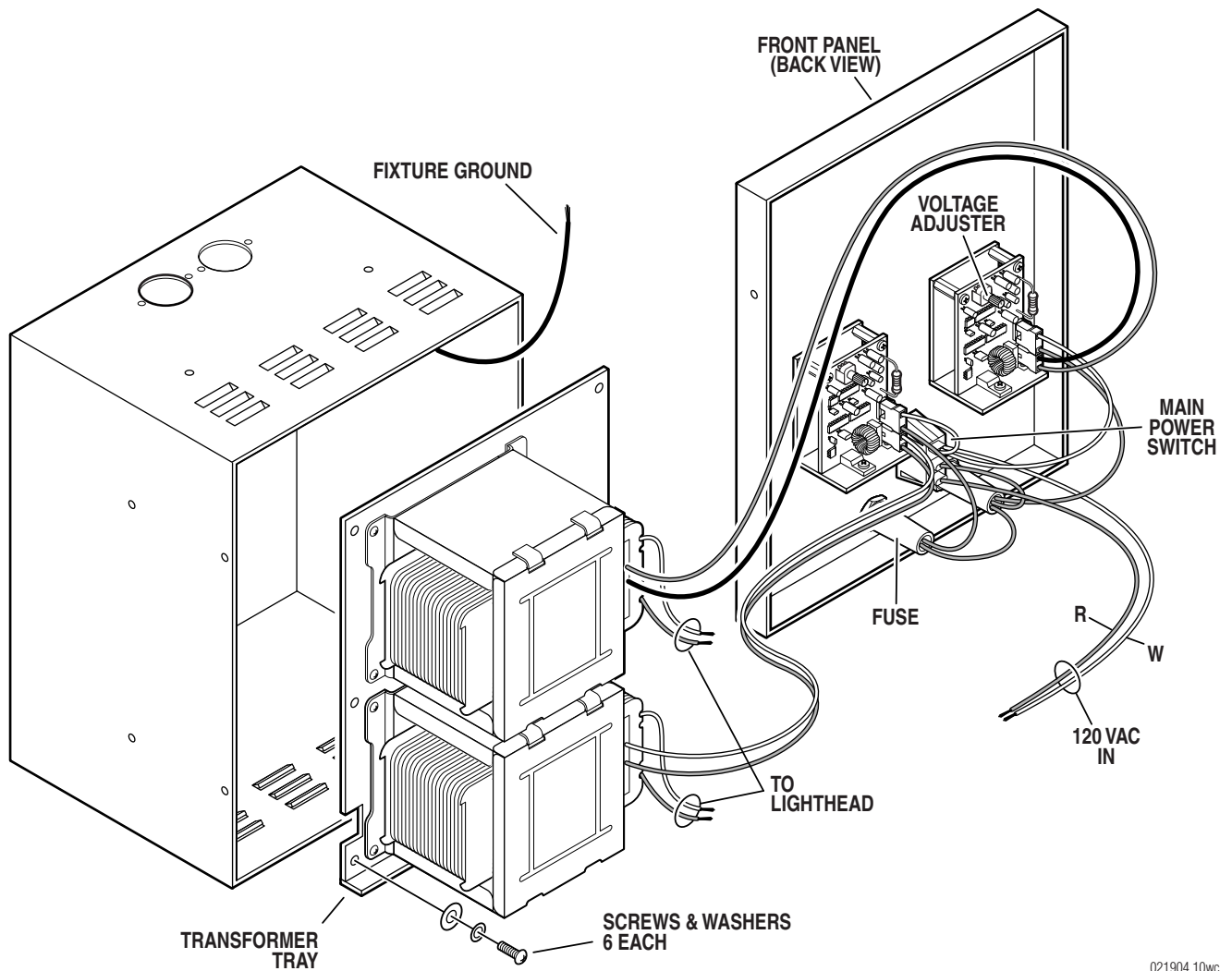
- 3/4" conduit and minimum 12AWG wire (2 wires per lighthead plus fixture ground) is required between Wall Control and Fixture.
- All wiring to be in accordance with local electrical codes.
- Control Box wires are tagged for proper connection to the fixture.

a. Install wall mounted control box using the following procedures.

b. Remove the transformer tray assembly from the wall control box for ease in wire connection. See figure 8.

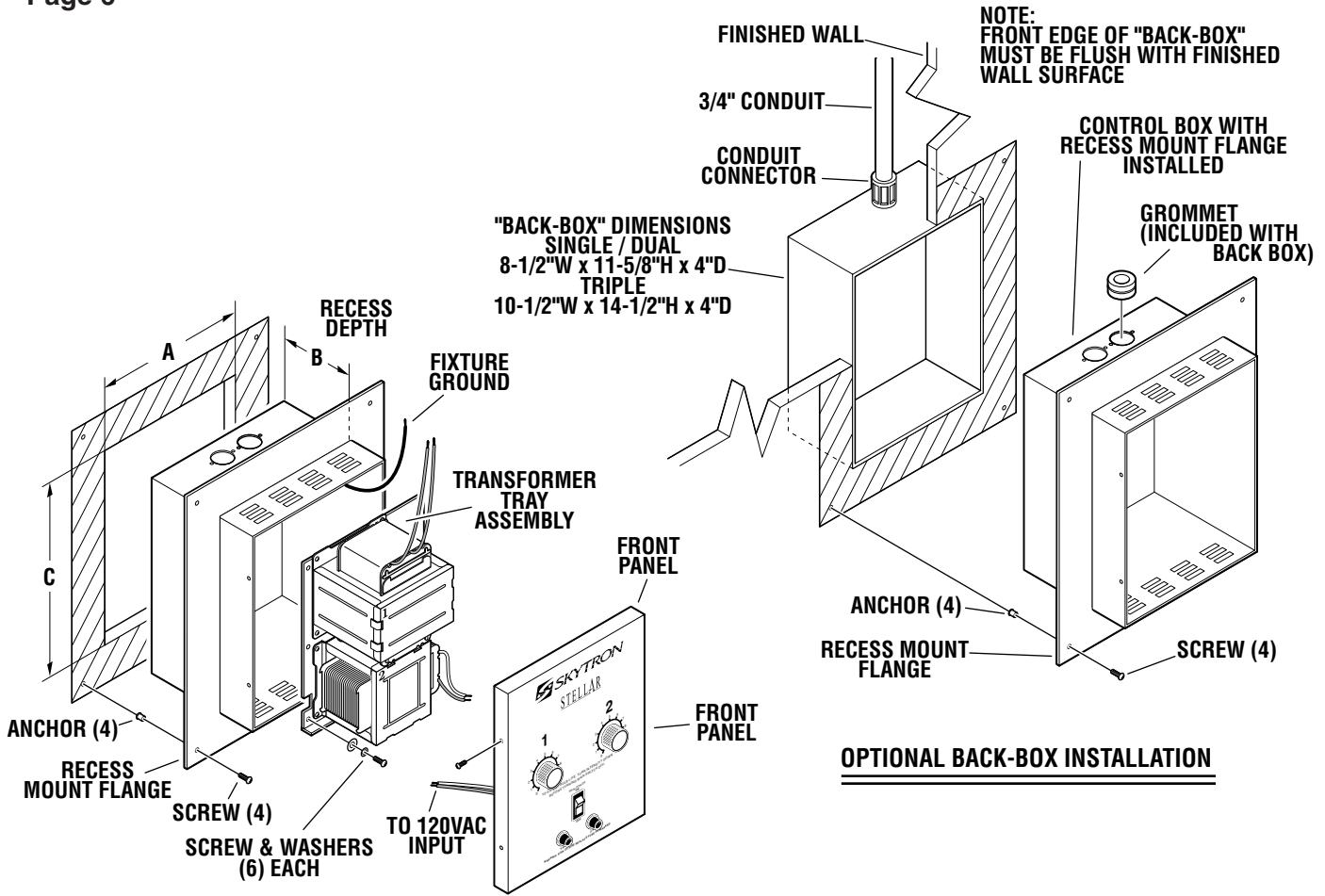
c. Install the wall control box as desired (surface or recessed mount) as shown in the wall control illustration, figure 9.

d. Observe wire tags and color codes and connect output leads to appropriate lighthead wires using crimp connectors. See figure 8.



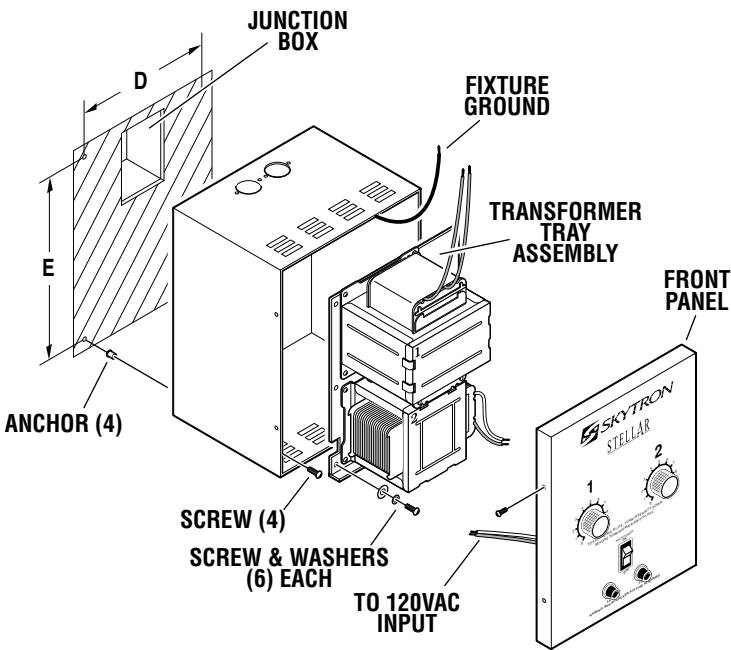
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Figure 8. Wall Control

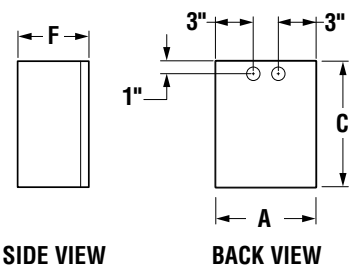


OPTIONAL BACK-BOX INSTALLATION

RECESSED MOUNT



DIMENSIONS		
	SINGLE OR DUAL	TRIPLE
A	8"	10"
B	4"	4"
C	10"	13-1/2"
D	6-7/8"	8-5/8"
E	7-5/8"	11"
F	5-7/8"	6-3/8"
RECESS MOUNT FLANGE		
	11-3/4"W x 14"H	13-3/4"W x 17-1/4"H



021904.11wc

Figure 9. Wall Control Installation

NOTE

120 VAC isolated power supply requires double pole, single throw 20 amp (maximum) breaker.

- e. Connect 120 VAC power supply to input wires and ground fixture properly.



TO AVOID BLOWING FUSES, DO NOT TURN MAIN POWER TO FIXTURE "ON" UNTIL ALL LIGHTHEADS ARE INSTALLED AND ALL WIRING CONNECTIONS ARE COMPLETED.

Output Voltage Adjustment

- a. Remove top cover from VST receptacle and test bulb voltage at the wire connections. See figure 10.

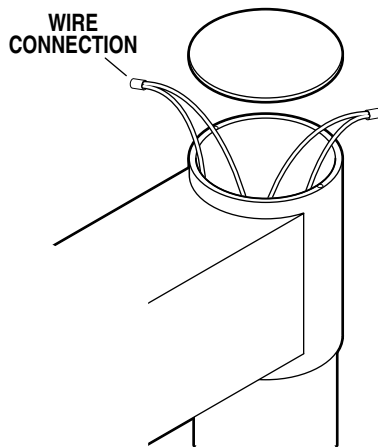


Figure 10. Top Cover Removal

- b. Turn main power "ON" and set the Dimmer Control for the lighthouse being tested to maximum intensity for the test. Output voltage (at the connectors) should be $20V \pm 0.2V$. See figure 11.

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.

- c. Adjust the voltage to the lighthouse by turning the adjuster on the back of the appropriate dimmer control in the wall control.

- d. Turn the adjuster clockwise to increase the output voltage, counterclockwise to decrease the voltage. See figure 12.

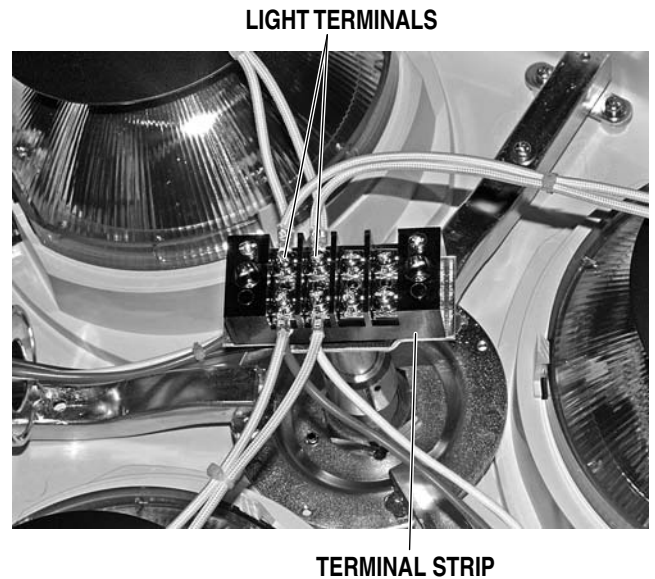
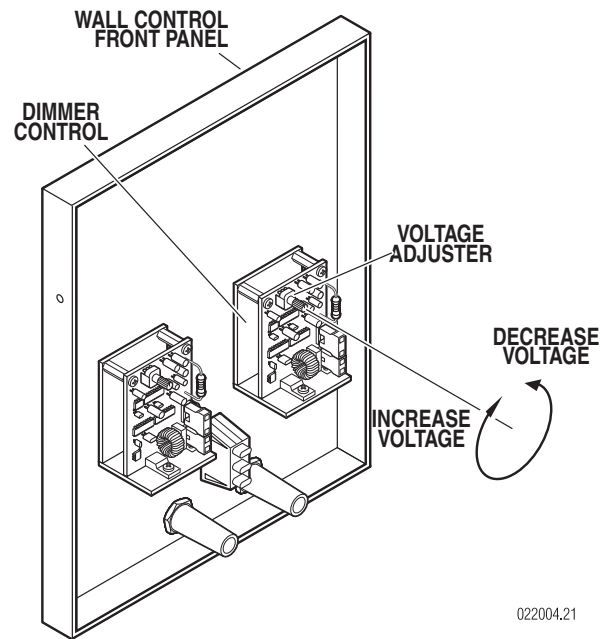


Figure 11. Bulb Voltage Test

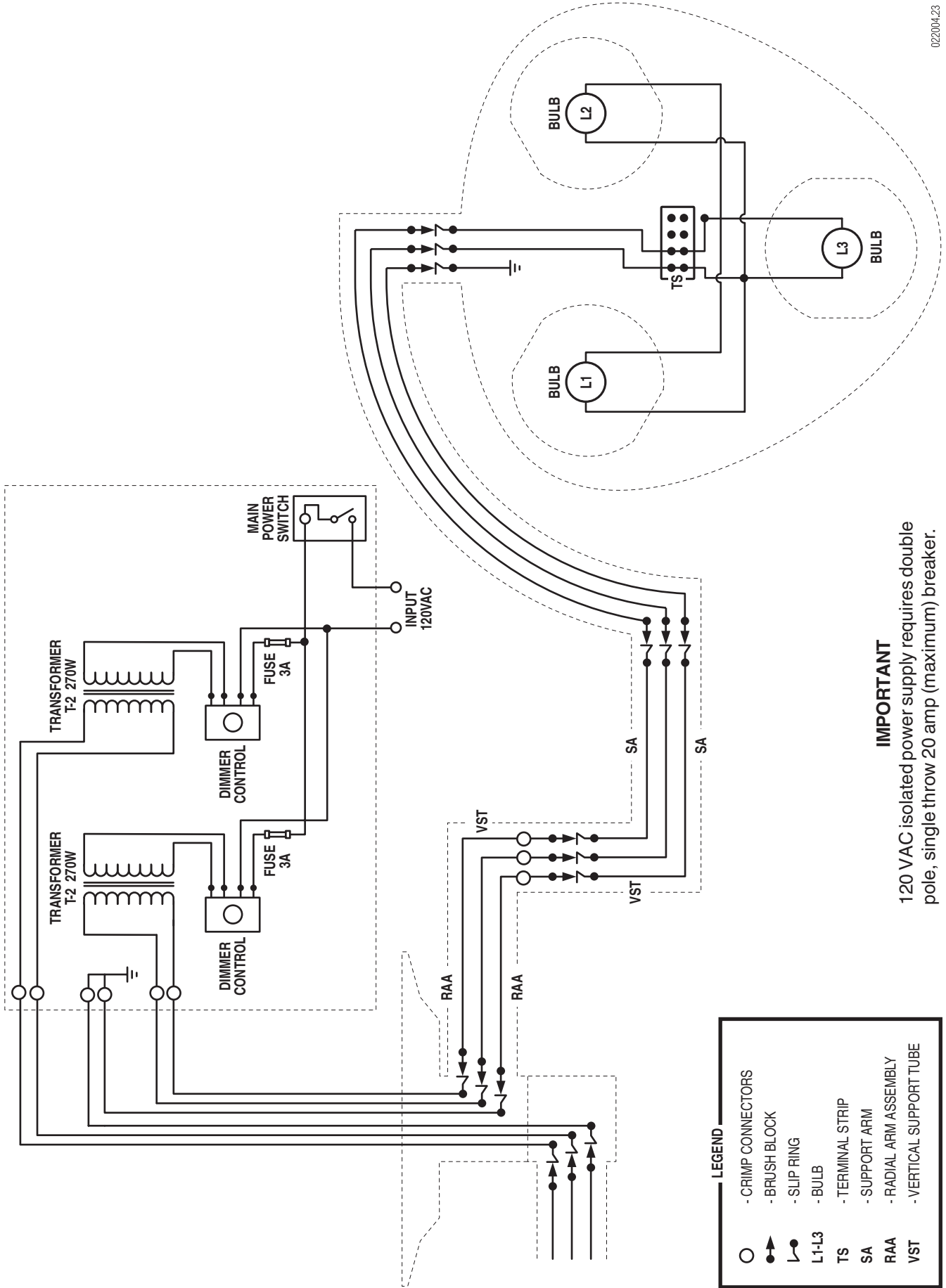


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Figure 12. Voltage Adjustment

WIRING DIAGRAM ST1919WC

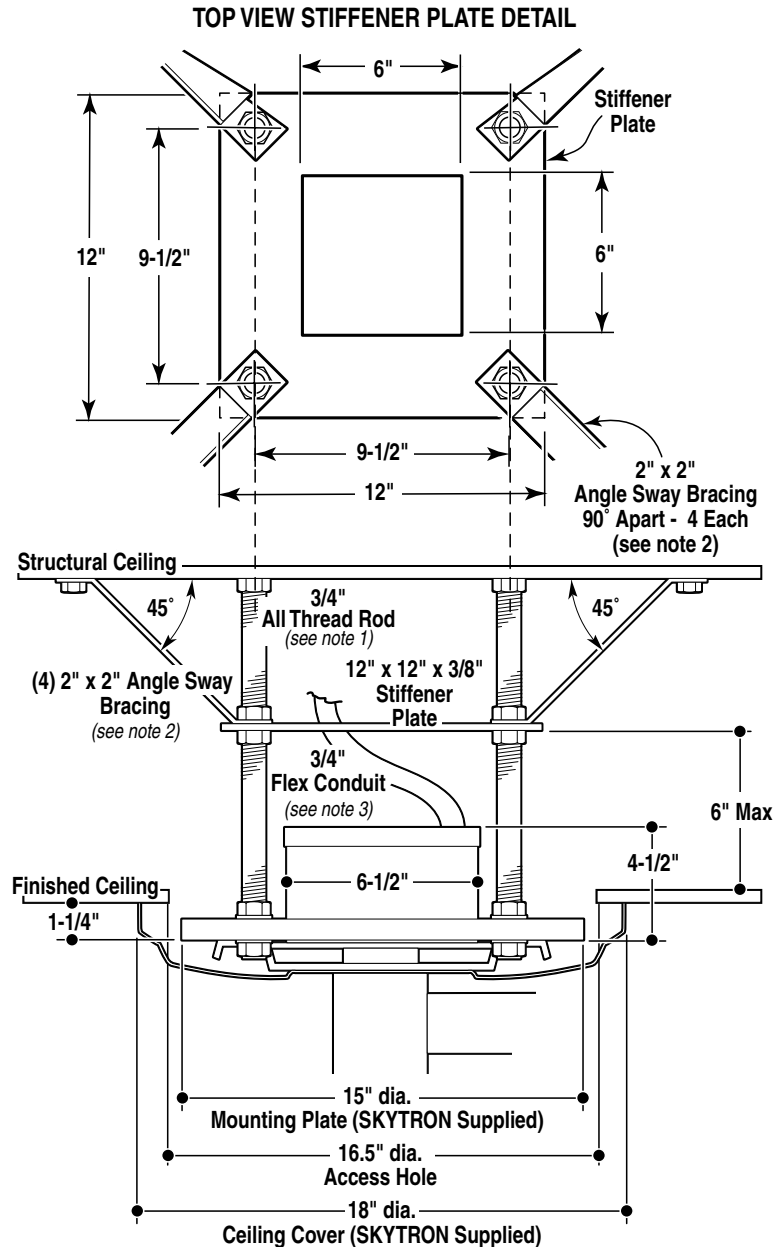
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IMPORTANT
120 VAC isolated power supply requires double pole, single throw 20 amp (maximum) breaker.

LEGEND

- - CRIMP CONNECTORS
- - BRUSH BLOCK
- ⬆ - SLIP RING
- ⬇ - BULB
- L1-L3 - TERMINAL STRIP
- TS - SUPPORT ARM
- SA - RADIAL ARM ASSEMBLY
- RAA - VERTICAL SUPPORT TUBE
- VST



NOTES

1. 3/4" support rods located for total support of light, all labor and materials for fabrication supplied by General Contractor. 3/4" nuts and washers for support of SKYTRON mounting plate supplied by contractor (8 ea. required).
2. The mounting structure must be braced to allow no more than 0.2 of a degree of rotation.
3. All conduit, wiring, and other electrical materials as well as installation labor for such materials associated with the installation of the SKYTRON surgical light to be provided by Electrical Contractor. All installations of SKYTRON surgical lights should be under the direct supervision of a SKYTRON representative. All wiring to be in accordance with local codes.
4. CONTRACTOR HAS FINAL RESPONSIBILITY for the strength and stability of the Mounting Structure.
5. Consult your SKYTRON representative for lower ceiling heights and special applications.

Contact SKYTRON representative for Seismic calculations if applicable.

MOUNTING STRUCTURE GUIDELINE



5000 36th Street S.E. • Grand Rapids, MI 49512
1.800.SKYTRON • 1.616.957.0500 • FAX 1.616.957.5053

DAMAGED SHIPMENT CLAIM PROCEDURE

Whenever a shipment suffers damage while in the custody of the transportation company, the responsibility lies with the transportation company, and the value of the damages can be collected from the transportation company if the proper procedures are followed.

When a shipment is received in a damaged condition and due to the appearance of the containers such as a broken crate, torn wrapping, or smashed carton, the contents may have been damaged. That fact should be noted on the Bill of Lading offered by the transportation company. An example of an applicable statement would be; "Received in good order except as noted" or "Crate damaged, possibility of concealed damage." The addition of these types of statements on the shipping documents will automatically give grounds for starting a claim.

If damage cannot be identified on the exterior of the container, but is found when the container is opened, further unpacking should be stopped immediately and the container with all wrapping or packing materials should be held. The transportation company should be notified so an inspector can be sent. Failure to follow either of these two procedures may result in an inability to file a claim and collect for damage done. Returning the container to the sender without such an inspection may prevent filing a claim, because it will divide the responsibility for damage and in many cases the transportation company will return the shipment to the sender without charge after the inspection.

The claim itself may be filed by either the shipper or consignee, but the consignee must notify the transportation company and the shipper that the damage has occurred. Remember that refusal of the shipment or failure to note the possibility of damage on the shipping documents may jeopardize the claim. Also, acceptance of a damaged shipment which has been processed properly to allow for filing a claim, will not jeopardize the position of the consignee. In any case, SKYTRON will see that damage which is not the fault of the consignee or his agents is corrected, if the transportation company does not honor the claim, as long as SKYTRON receives the full cooperation of the consignee in filing the claim.

Some of the papers needed for filing a claim are in the hands of the consignee after the shipment has been received. If SKYTRON must file a claim, we will request these papers by name from the consignee at such time as the claim is under discussion. We will require the originals of these papers and not copies.

Knowledge of the procedures outlined above and your cooperation in submitting damaged shipment claims will help both you, our customer, and SKYTRON by assuring the integrity of our products from manufacturing to installation.

INSTALLATION CHECK LIST

Mounting Structure:

- Fabrication of structure correct _____
- Mounting plate set and level _____
- 3/4" conduit and (min) 12AWG wire _____
from fixture to wall control

Radial Arm Assembly:

- Mounting bolts installed & tightened _____
- Wiring properly connected & _____
assembly grounded
- Ceiling cover installed _____

Vertical Support Tubes:

- All BOM/VST's installed and 6 mm _____
mounting screws Loc-tited

Lighthouse:

- Mounting stub screws installed _____
- Bulb Voltage checked _____
- Power ON, all bulbs illuminated _____
- Bulbs remain illuminated throughout:
 - RAA rotation _____
 - BOM rotation _____
 - Pitch axis _____
 - Roll axis _____
 - Vertical travel _____
- Center positioning handle mounted _____

Wall Control:

- Wiring proper gauge _____
- Wire connections correct _____
- Cover screws installed _____
- Input voltage checked and _____
adjusted as necessary

Miscellaneous:

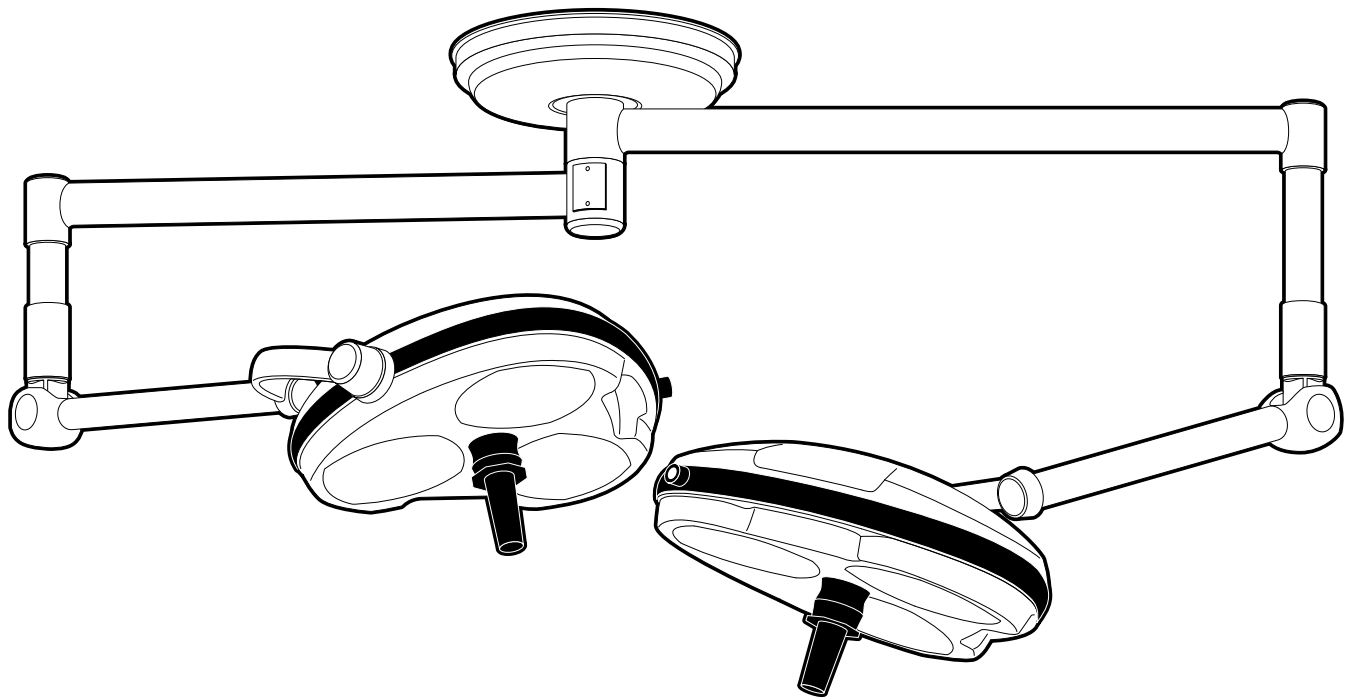
- Diffuser assemblies clean _____
- Clean fixture with cleaning solution _____



5085 Corporate Exchange Blvd. S.E.
Grand Rapids, MI 49512
1.800.SKYTRON • 1.616.656.2900 • FAX 1.616.656.2906

ST19

SERIES SURGICAL LIGHTS



OWNERS MANUAL

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Indications For Use

The SKYTRON ST19 Series surgical light fixture is intended to be used by medical personnel for the purpose of illuminating surgical sites.

Distributed by:

SKYTRON
5085 Corporate Exchange Blvd. S.E.
Grand Rapids, MI 49512 (616) 656-2900
www.skytron.us

Manufactured by:

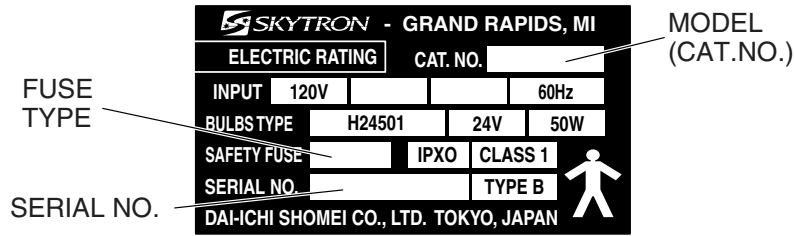
DKK Dai-Ichi Shomei Co., LTD
32-26 Sakashita 1-Chome,
Itabashi- Ku, Tokyo 174-0043
JAPAN

Although current at the time of publication, SKYTRON'S policy of continuous development makes this manual subject to change without notice.



EQUIPMENT LABELS AND SPECIFICATIONS

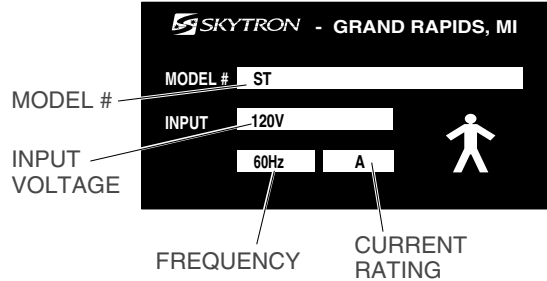
The lighthouse Data Label contains the lighthouse model number, bulb type, fuse type, electrical specifications and product serial number.



Wall Control Label



WALL CONTROL LABEL



"WARNING" - "RISK OF FIRE. REPLACE WITH 24V, 50W TUNGSTEN HALOGEN LAMP."

AVERTISSEMENT - RISQUE D'INCENDIE REMPLACER PAR LAMPE HALOGENÈ AU TUNGSTÈNE 24V, 50W

ST19 OPTICAL CHARACTERISTICS

Lighthouse Model		ST19
Color Temperature		3840K
CRI		94
Total Irradiance (watts/m ²)		113.5
Chromaticity	X	0.397
Coordinates	Y	0.412

EQUIPMENT LABELS AND SPECIFICATIONS



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



INDICATES DANGEROUS VOLTAGE
100-240V~, 50/60Hz



AC VOLTAGE



FUSE TYPE 3 AMP, SLOW BLOW TYPE

IPXO RATED, CONTINUOUS OPERATION



WARNING



This equipment is intended for use by healthcare professionals only. This equipment may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the lighthouse or shielding the location.

PERMISSIBLE ENVIRONMENTAL CONDITIONS

DURING TRANSPORT AND STORAGE (IN ORIGINAL PACKAGING MATERIALS)

- AMBIENT TEMPERATURE: 10° - 60° C (14° - 140° F)
- RELATIVE AIR MOISTURE: 10% - 85%, NO CONDENSATE BUILD-UP
- AIR PRESSURE: 500 hPa - 1060 hPa (14 in-Hg - 31 in-Hg)

DURING USE - FOR DRY LOCATIONS

- AMBIENT TEMPERATURE: 15° - 30° C (60° - 85° F)
- RELATIVE AIR MOISTURE: 30% - 60% NON CONDENSING
- AIR PRESSURE: 700hPa - 1060 hPa (20.7 in-Hg - 31.3 in-Hg)



ETL CLASSIFIED

TO UL60601-1

CAN/CSA601.1, IEC 60601-2-41

SPECIAL USER ATTENTION

Prior to use, all personnel that may operate this fixture must be instructed in the correct operational procedures.

Initial use should not begin until after the users have been instructed by the manufacturer's representative.

A routine instructional program must be implemented by the facility for proper usage instructions for all personnel that may operate this light.

As with the operation of any surgical light, all hospital personnel should be aware that a certain amount of care must be exercised to maintain patient safety and to keep your SKYTRON light fixture performing at peak efficiency.

The following precautions should be reviewed by all personnel prior to operating the light.



WARNING



Indicates a possibility of personal injury.



CAUTION



Indicates a possibility of damage to equipment.

NOTE

Indicates important facts or helpful hints.



WARNING



DO NOT use this fixture in the presence of FLAMMABLE GASES.

NOTE

To prolong bulb life, the sof-start bulb protection circuit will cause a slight delay before the bulbs will illuminate.



WARNING



Be sure sterile handle is properly secured before using the lighthead. An improperly installed handle could fall out, resulting in possible injury to patient or surgical staff.



CAUTION



Use extreme care when positioning lightheads. Bumping lightheads into one another, into walls, or other equipment may alter bulb alignment which affects proper focus adjustment.

NOTE

All repairs should be made using only authorized SKYTRON replacement parts.

SPECIAL USER ATTENTION**CAUTION**

Use of incompatible cleaning agents will cause damage to the fixture. Avoid the use of cleaning solutions which contain high concentrations of alcohol, ethelene glycol, phenol, iodophors, or glutaraldehyde based disinfectants. Staining, pitting, discoloration and diffuser cracking may occur if these are used.

**WARNING**

Be sure the power is turned "OFF" and the bulbs have cooled before changing.

**WARNING**

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

**CAUTION**

Halogen bulbs are sensitive to body oils. DO NOT handle the glass surface of the bulbs as body oils from your fingers can create a "hot spot" and may cause the bulb to burn out prematurely. This can best be avoided by using the plastic wrapper that the bulb is packaged in or a clean cloth wrapped around the base of the bulb when installing.

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.

**WARNING**

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

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 4-10. After spraying, rotate the lighthead several times in both directions and recheck for proper tension.

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.

SECTION I INTRODUCTION

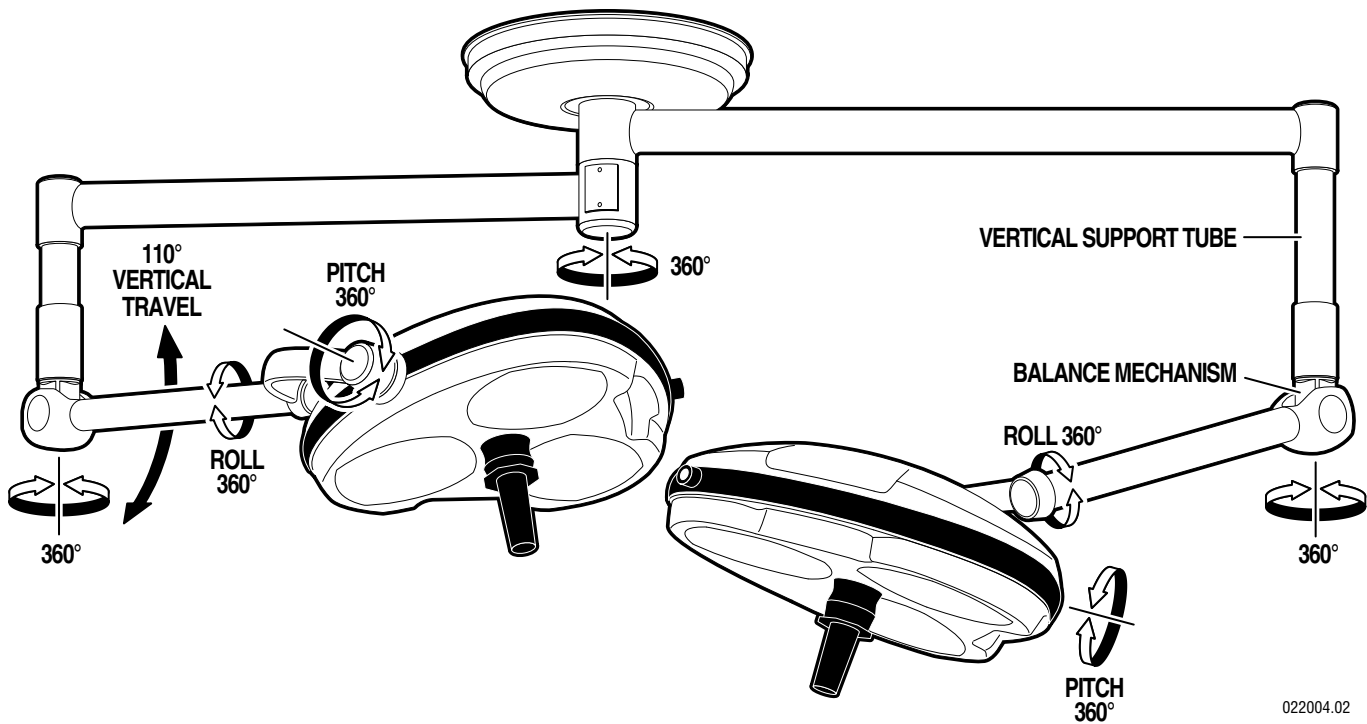


Figure 1-1. Light Fixture Rotation Capabilities

The Stellar ST19 series surgical lighting system from SKYTRON features fully adjustable positioning control for its cool, color-corrected, multiple bulb, light source. Combinations of vertical positioning and multiple rotational capabilities allow the single or dual lighthead models virtually limitless positioning.

The fixtures are single point ceiling mounted with a continuous 360° rotation capability at the ceiling mount end of the radial support arm. See figure 1-1. The balance mechanism which is attached to the radial arm by a vertical support tube, provides the lighthead an additional continuous 360° rotation point. The balance mechanism is an enclosed spring tension system. This allows vertical movement of the lighthead while maintaining the lighthead position without drifting. The yoke provides additional 360° rotation points for lighthead pitch and roll.

The ST19 fixtures have a lighthead vertical travel capability of 110°.

The standard ST19 series has a lighthead mounted ON/OFF/Intensity control switch and the fixture fuse is located in the Ceiling Cover. The ST19WC series utilizes a Wall Control which contains the Main Power switch, Intensity control and fuses.

All lightheads have a removable, sterilizable, positioning handle. This allows all final positioning adjustments or changes to be precisely done by the surgeon. Non-sterile handles are also provided for Nurse positioning. See figure 1-2.

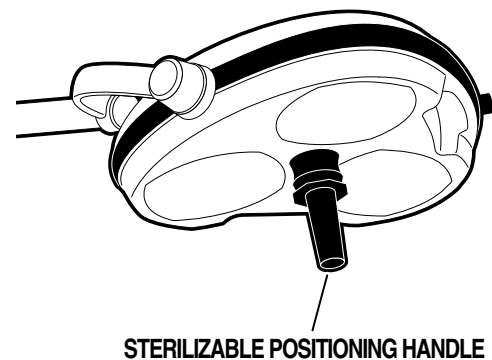


Figure 1-2. Positioning Adjustments

SECTION II OPERATION

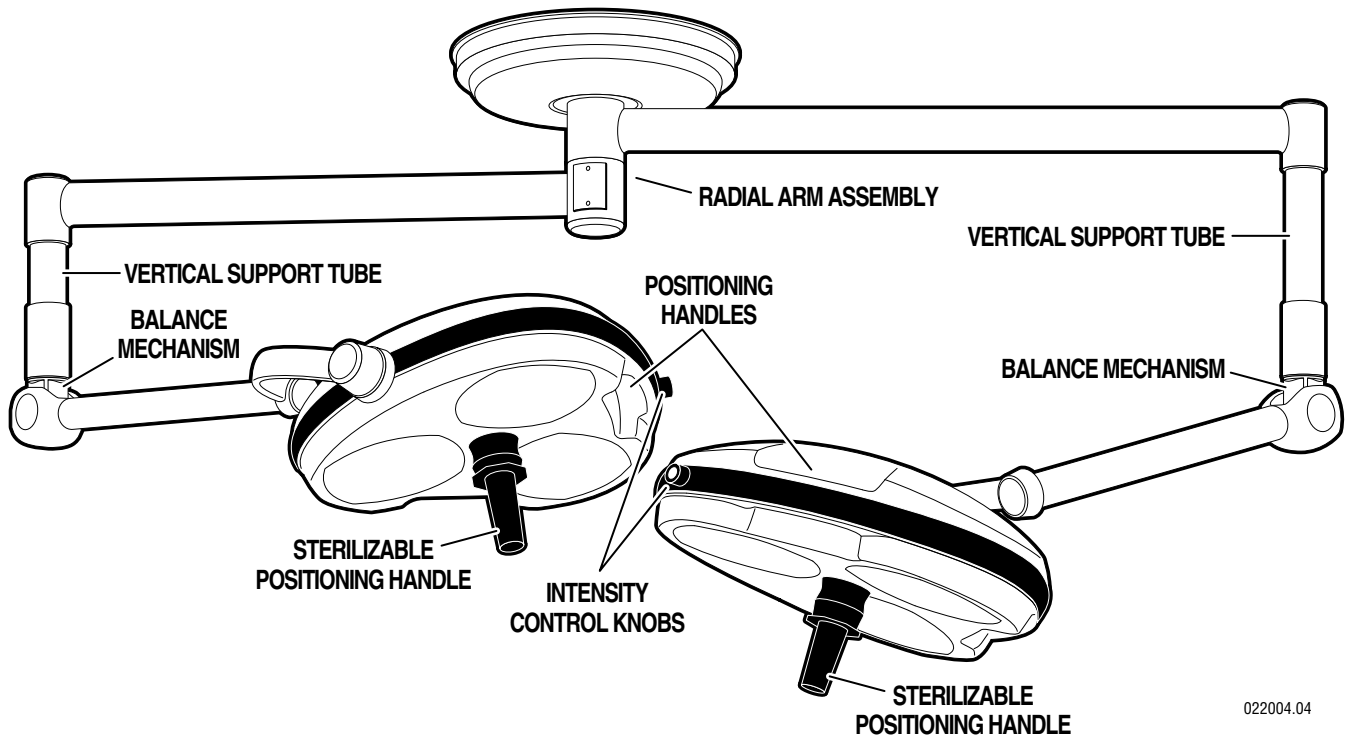


Figure 2-1. Dual Lighthead Fixture

Use the following instructions to operate the light fixture:

a. Position the lighthead as required by grasping the lighthead positioning handles and moving the lighthead to the desired position. See figure 2-1.



WARNING



DO NOT use this fixture in the presence of **FLAMMABLE GASES**.

b. Turn the light fixture main power switch "ON" at the wall mounted switch or Wall control (ST19WC & ST1919WC models) and select the desired intensity for each lighthead as required. See figure 2-1 or 2-2. The mid-range position will provide adequate illumination for most procedures. Full intensity will usually only be required for extreme deep cavity cases.

NOTE

To prolong bulb life, the soft-start bulb protection circuit will cause a slight delay before the bulbs will illuminate.

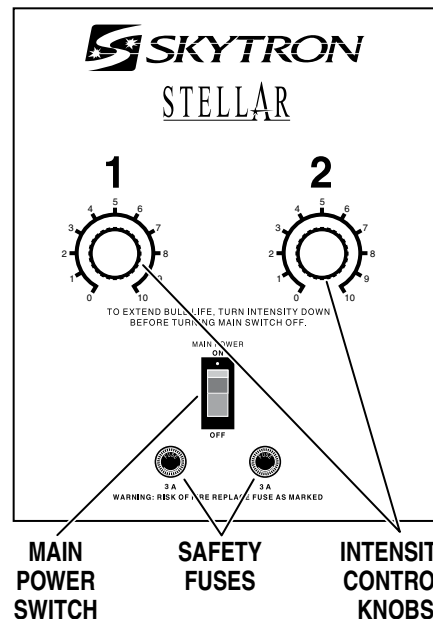


Figure 2-2. ST1919WC Wall Mounted Control Box

022004.05

c. When the surgeon is ready to use the light, install the sterilized center positioning handle using the following procedure. See figure 2-3. Be sure handle is properly secured before using the lighthead. Possible injury to patient or staff could result if a handle is not installed properly.

1. Insert the handle into the lighthead attachment ring.



WARNING



Be sure sterile handle is properly secured before using the lighthead. An improperly installed handle could fall out, resulting in possible injury to patient or surgical staff.

2. Push the handle in, turn it right and left, and pull the handle out to be certain that it is locked (PUSH-TWIST-PULL). A distinct click can be heard when the handle is properly engaged.

3. To remove the handle, push the release button and pull the handle out.

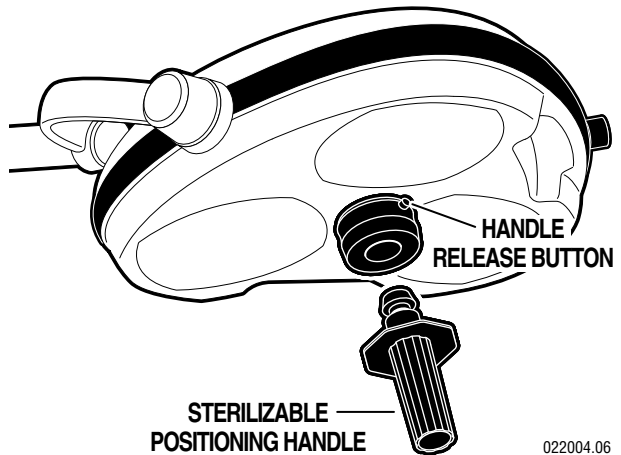


Figure 2-3. Sterile Positioning Handle Installation

d. For low angle lighting approach, the lighthead will move 90° below horizontal. Pull the lighthead down by the positioning handles or the (sterile) positioning handle.



CAUTION



Use extreme care when positioning lightheads. Bumping lightheads into one another, into walls, or other equipment may alter bulb alignment which affects proper focus adjustment.

e. When the light is no longer required, return the lighthead to its full up position. Decrease the intensity and turn the main power switch "OFF".

SECTION III MAINTENANCE

3-1. General

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

NOTE

All repairs should be made using only authorized SKYTRON replacement parts.

3-2. 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. Do not apply or spray cleaning agents directly on the lighthead.



CAUTION



Use of incompatible cleaning agents will cause damage to the fixture. Avoid the use of cleaning solutions which contain high concentrations of alcohol, ethelene glycol, phenol, iodophors, or glutaraldehyde based disinfectants. Staining, pitting, discoloration and diffuser cracking may occur if these are used.

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

3-3. Handle Cleaning & Sterilization

The sterilizable handles are constructed of heat resistant, impact resistant plastic. They should be cleaned with mild alkaline cleaning products WITHOUT active chlorine. Thoroughly rinse off all cleaners with water. Ensure that the open side of handles are face down.

Recommended sterilization parameters for sterilizable handle:

Steam Sterilization:

134°C (273°F) : 2.3 bars (33.3 PSI)
4 minutes

Always consult current AORN journal recommendations for proper sterilization procedures.

3-4. 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.

To replace a bulb, use the following procedure:



WARNING



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

a. Hold the diffuser/filter assembly with one hand, loosen the "1/4-turn" screw and lower the diffuser/filter assembly. See figure 3-1.

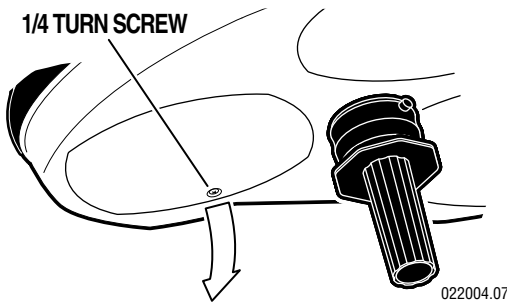


Figure 3-1.



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 3-2. Slightly working the bulb back and forth may aid in bulb removal.

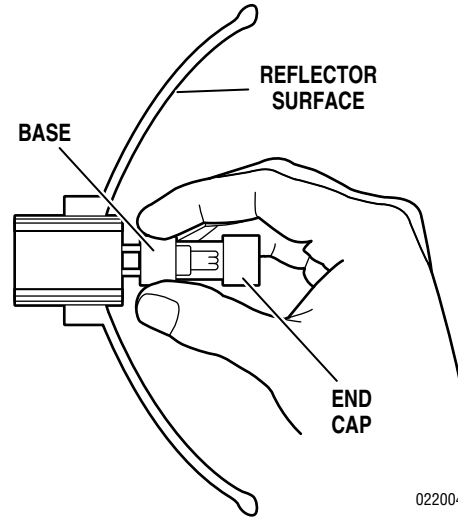


Figure 3-2.



CAUTION



Halogen bulbs are sensitive to body oils. DO NOT handle the glass surface of the bulbs as body oils from your fingers can create a "hot spot" and may cause the bulb to burn out prematurely. This can best be avoided by using the plastic wrapper that the bulb is packaged in or a clean cloth wrapped around the base of the bulb when installing.

c. Holding the 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 diffuser/filter assembly by placing the tab into the lighthouse face. Place the assembly in position and secure it with the "1/4-turn" screw.

3-5. Preventive Maintenance Procedures

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

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

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

**WARNING**

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

c. 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.

d. Check the remaining slip ring/brush block assemblies by raising, lowering, and rotating the lighthouse 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.

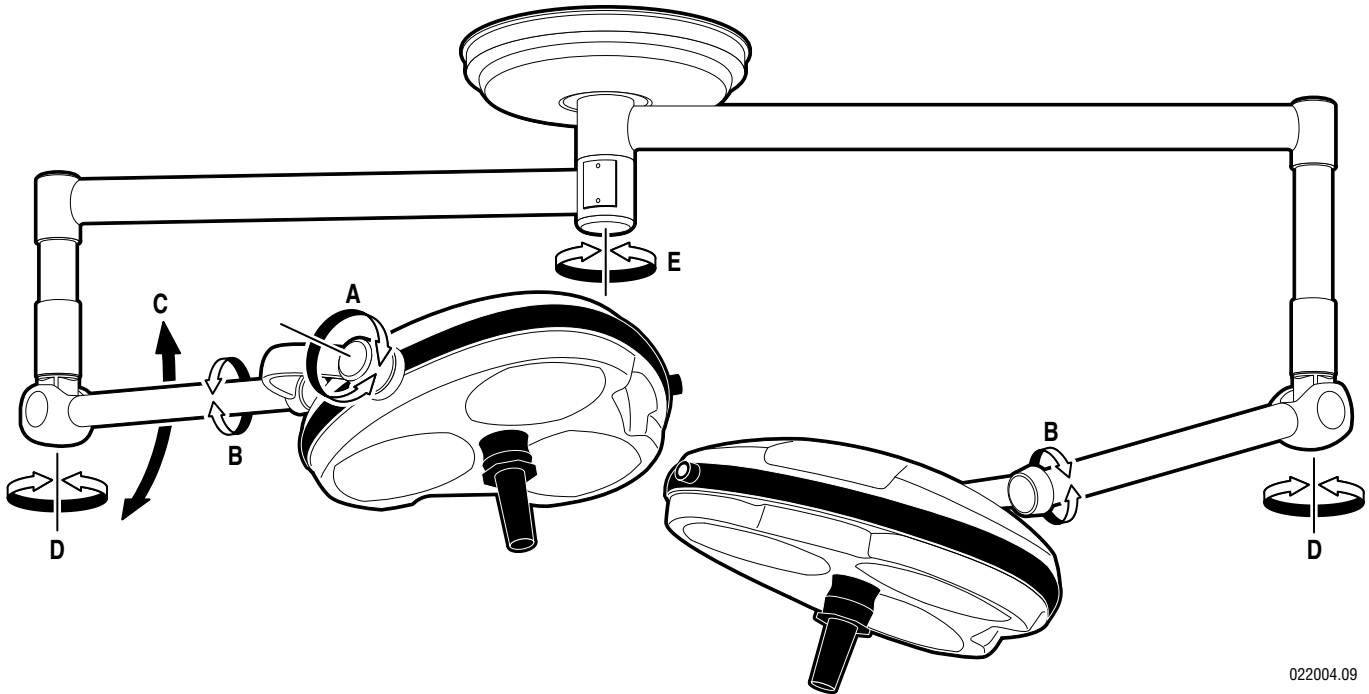
e. Check all fixture rotation axes for proper adjustment. Adjust as necessary using applicable adjustment procedures from the adjustment section of this manual (Section IV).

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

SECTION IV ADJUSTMENT

4-1. General

As a part of normal preventive maintenance, all fixture rotation axes adjustments should be checked and adjusted as necessary. Refer to figure 4-1 for location of desired check or adjustment procedure.



022004.09

- A - Lighthead Pitch Axis-----paragraph 4-2
- B - Lighthead Roll Axis -----paragraph 4-3
- C - Vertical Travel Tension-----paragraph 4-4
- D - Lighthead Horizontal Rotation -----paragraph 4-5
- E - Radial Arm Horizontal Rotation-----paragraph 4-6

Figure 4-1. Fixture Rotation Axis

4-2. Lighthouse Pitch Adjustment

a. Check the pitch axis tension of each lighthouse by moving it through its full range of motion. See figure 4-2.

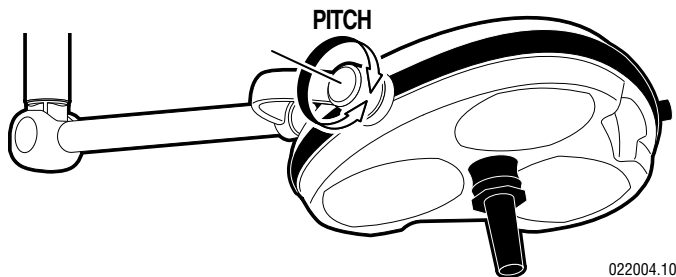


Figure 4-2. Lighthouse pitch

b. The lighthouse should move freely yet maintain its position without drifting. If an adjustment is required, remove the top cover and proceed as follows:

1. Carefully move trim strip for access to the corner plate screws and remove the (3) top screws. See figure 4-3.

2. Using a 1/8" straight blade screwdriver, release the (4) lock tabs and remove the top cover.



Figure 4-3. Top Cover Removal

c. Rotate the lighthouse until an allen set screw is visible through the adjustment hole. Loosen the set screw, rotate the lighthouse 180° and loosen the second set screw. See figure 4-4.

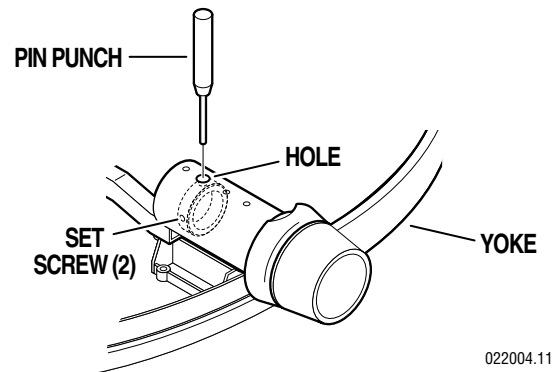


Figure 4-4. Lighthouse pitch adjustment

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

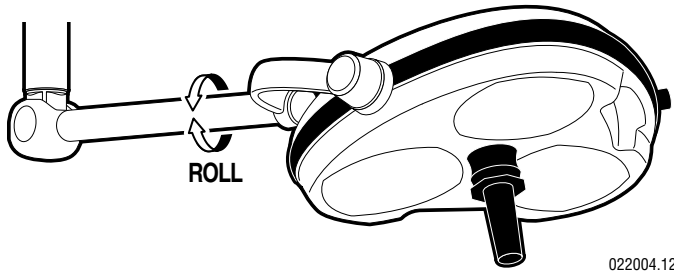
e. With the nut held captive with the pin punch, rotate the lighthouse clockwise to increase the friction or counterclockwise to decrease the friction.

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

g. Install top cover and secure with the (3) screws removed from the corner plates. Do not overtighten screws.

4-3. Lighthouse Roll Adjustment

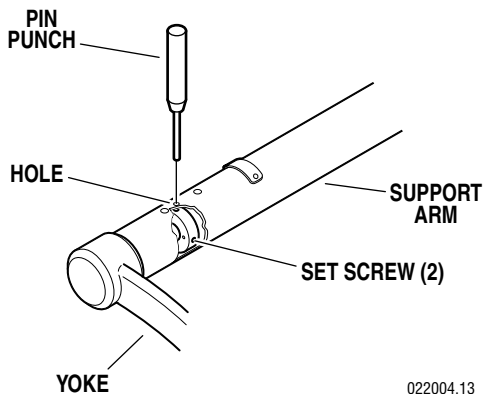
a. Check the roll axis tension of the lighthouse by moving it through its full 360° range of travel. See figure 4-5.



022004.12

Figure 4-5. Lighthouse Roll

b. The lighthouse should move freely yet maintain its position without drifting. If an adjustment is required, refer to figure 4-6 and proceed as follows:



022004.13

Figure 4-6. Roll Adjustment

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.

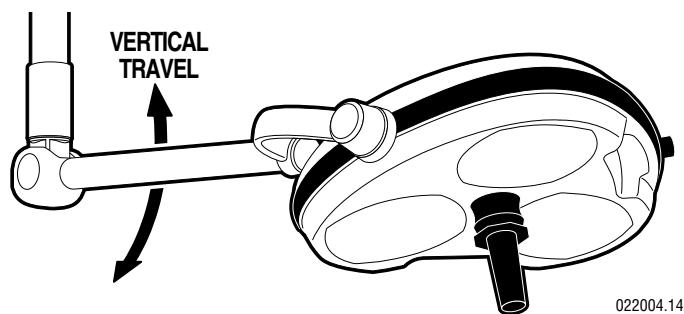
d. Continue to rotate the yoke until a 5mm hole is visible through the hole. Insert a pin punch into the hole in the adjustment nut.

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 lighthouse for proper tension. Repeat adjustment procedure if necessary. After the adjustment is correct, be sure to tighten the set screws.

4-4. Vertical Travel Tension Adjustment

a. Check the adjustment of the Balance Mechanism for its capacity to support the lighthouse throughout its range of vertical motion. See figure 4-7.



022004.14

Figure 4-7. Lighthouse 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 4-8, and proceed as follows:

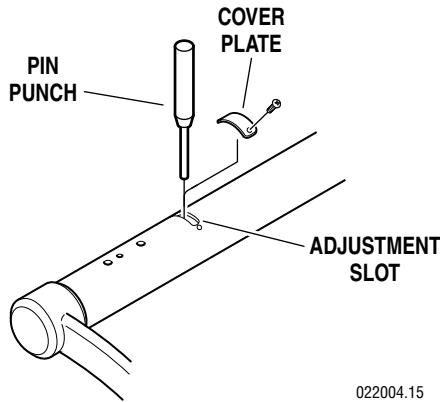


Figure 4-8. Vertical Travel Adjustment

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.

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.

4-5. Lighthead Horizontal Rotation Adjustment

a. Check horizontal rotation axis adjustment by moving the lighthead through its full range of travel around the Balance Mechanism. See figure 4-9.

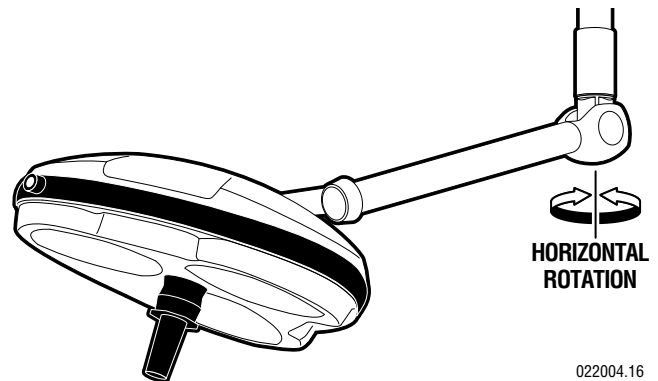


Figure 4-9. Horizontal Rotation

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 4-10. After spraying, rotate the lighthead several times in both directions and recheck for proper tension.

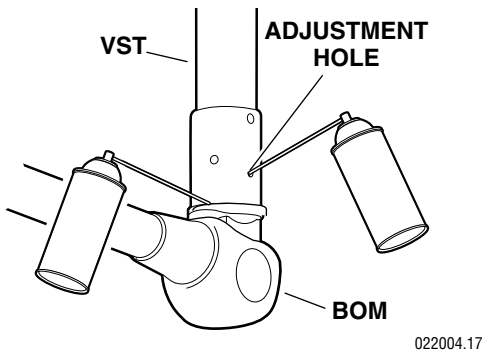


Figure 4-10. BOM Lubrication

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 4-11 and proceed as follows:

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.

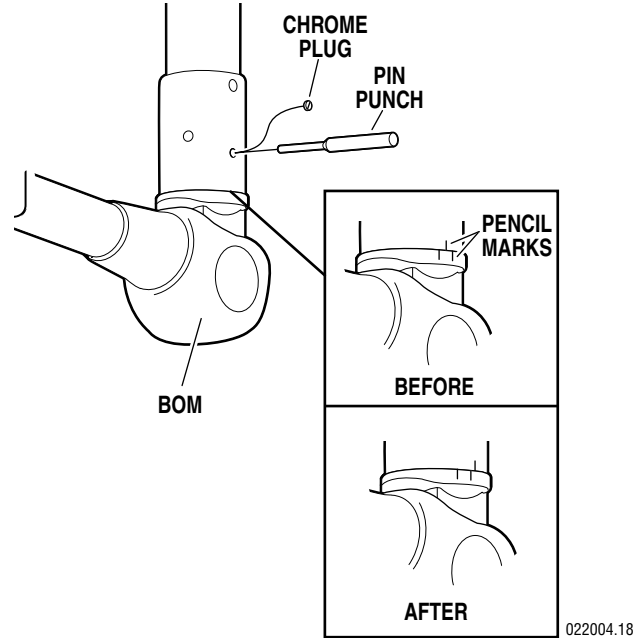


Figure 4-11. Horizontal Rotation Adjustment

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 4-11. 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 4-11.

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.

4-6. Radial Arm Horizontal Rotation Adjustment

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 4-12.

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 uneven 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.

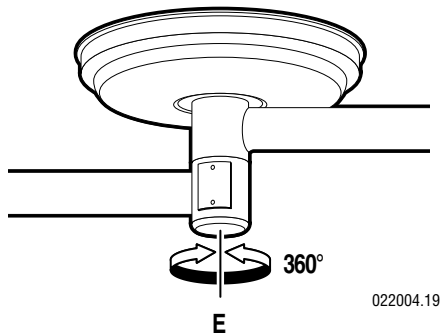


Figure 4-12.

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.

4-7. Bulb Voltage Adjustment

To insure maximum intensity and to prolong bulb life, the voltage applied to the lighthouse should be $20\text{VAC} \pm 0.2\text{V}$. Use the following procedures to test and adjust the bulb applied voltage.

Remove the top cover using the following procedure: See figure 4-13.

a. Carefully move trim strip for access to the corner plate screws and remove the (3) top screws.

b. Using a 1/8" straight blade screwdriver, release the (4) lock tabs and remove the top cover.

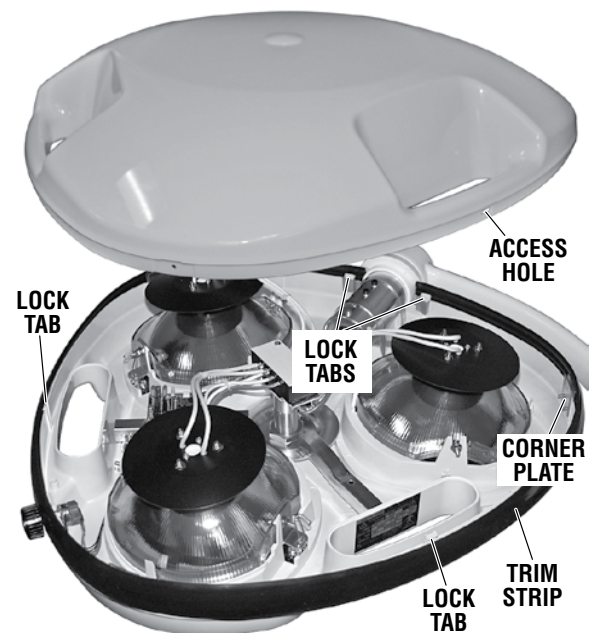


Figure 4-13. Top Cover Removal

ST19 Models

a. Test bulb voltage at the terminal strip. Turn main power "ON" and set the Dimmer Control to maximum intensity for the test. Output voltage (at the terminals) should be $20V \pm 0.2V$. See figure 4-14.

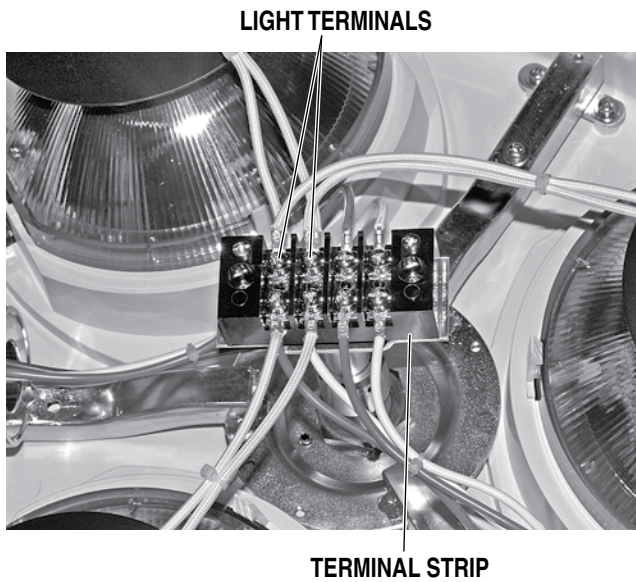


Figure 4-14. Bulb Voltage Test

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.

b. Adjust the voltage to the lighthouse by turning the adjuster on the lighthouse circuit board. See figure 4-15.

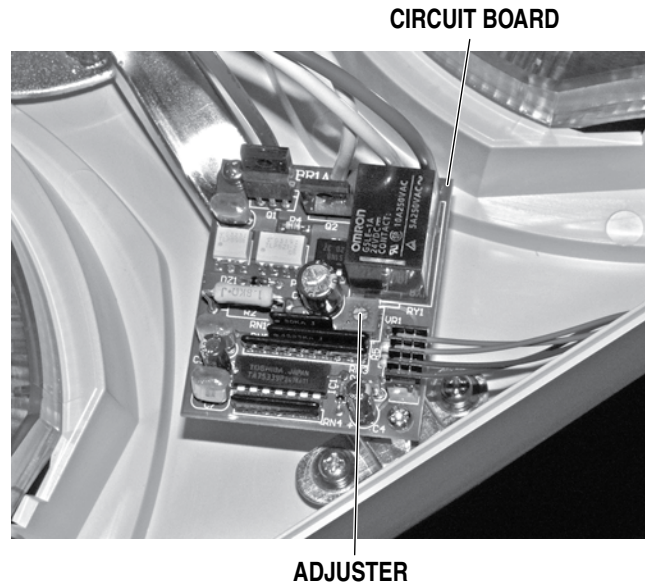


Figure 4-15. Voltage Adjustment (ST19)

c. Turn the adjuster clockwise to increase the output voltage, counterclockwise to decrease the voltage.

d. Install top cover and secure with the (3) screws removed from the corner plates. Do not overtighten screws.

ST19WC Models

a. Test bulb voltage at the terminal strip. Turn main power "ON" and set the Dimmer Control for the lighthouse being tested to maximum intensity for the test. Output voltage (at the terminals) should be $20V \pm 0.2V$. See figure 4-14.

b. Adjust the voltage to the lighthouse by turning the adjuster on the back of the appropriate dimmer control in the wall control. See figure 4-16.

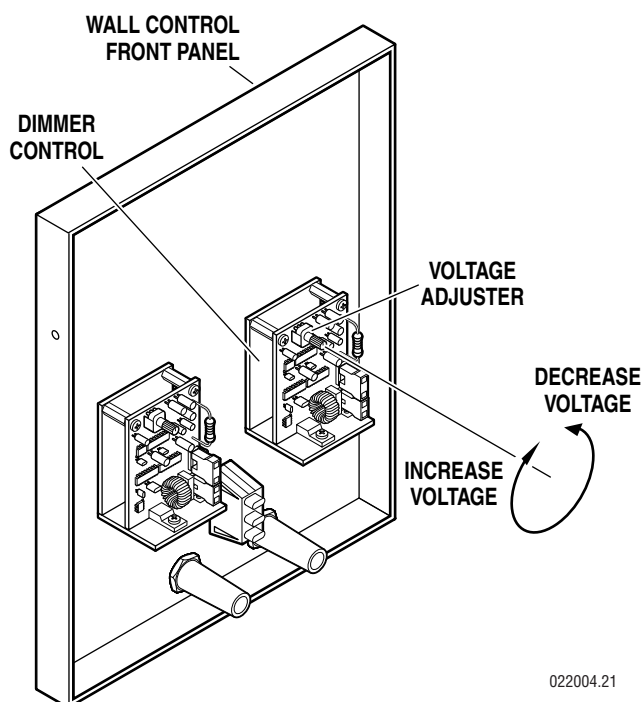


Figure 4-16. Voltage Adjustment (ST19WC)

c. Turn the adjuster clockwise to increase the output voltage, counterclockwise to decrease the voltage.

Service

A regular program of preventive maintenance will increase the life of your equipment and keep it operating at peak performance.

Maintenance must be performed by authorized, trained maintenance personnel using SKYTRON authorized replacement parts and service techniques. Service instructions and parts are available from SKYTRON.

Preventive Maintenance contracts are available through your local SKYTRON representative. Details for such a program are available in Section 3-5 of this manual.

The end of the useful life of the product is when the product can no longer be serviced to comply with IEC standards as determined by a SKYTRON authorized service representative.

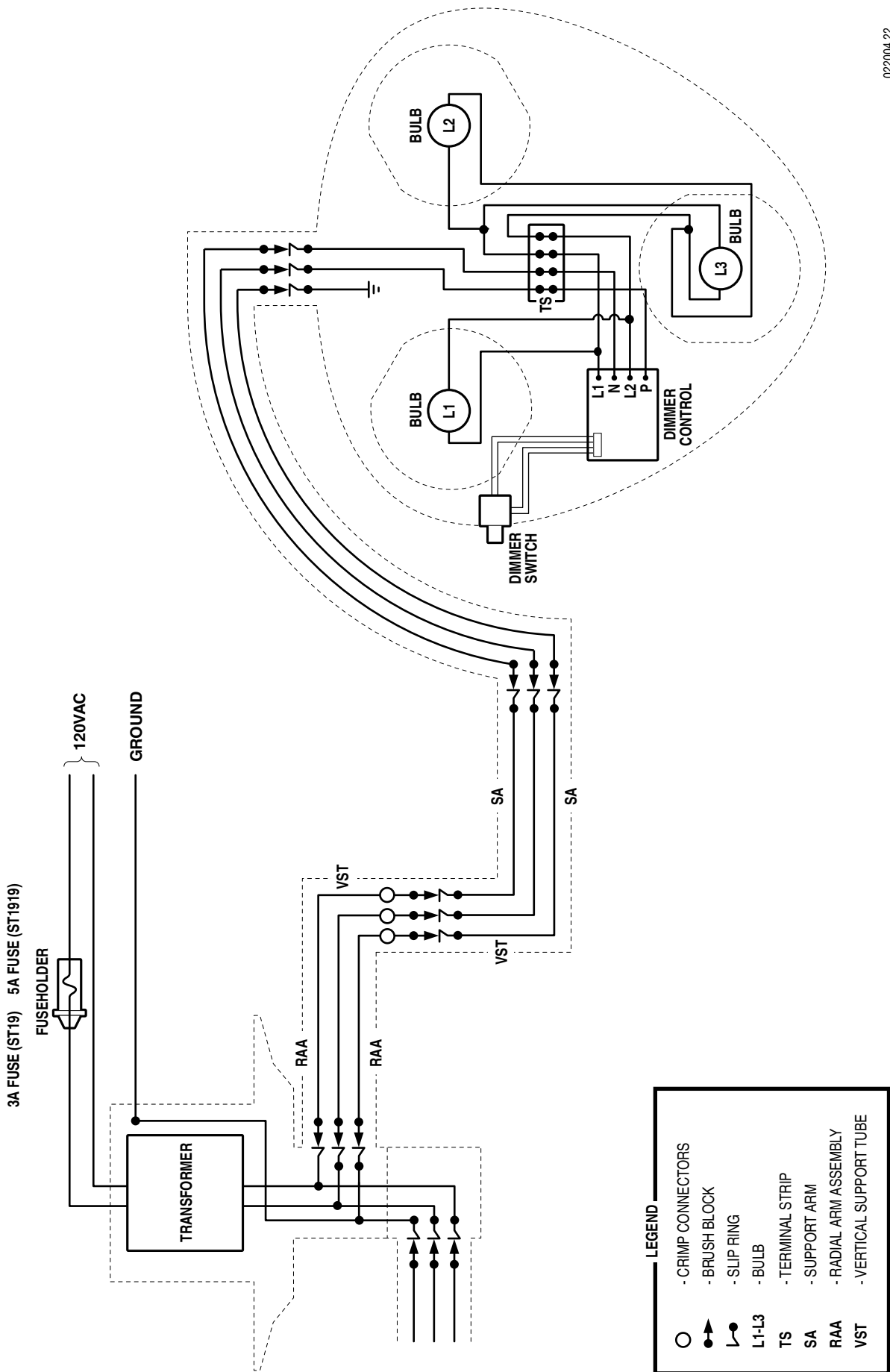
Disposal Instructions

Please contact your SKYTRON authorized representative for disposal of Stellar products or parts in accordance with current environmental regulations for medical products.

To obtain service instructions, replacement parts, factory service or preventive maintenance contracts, contact the SKYTRON representative listed below.

Or contact:

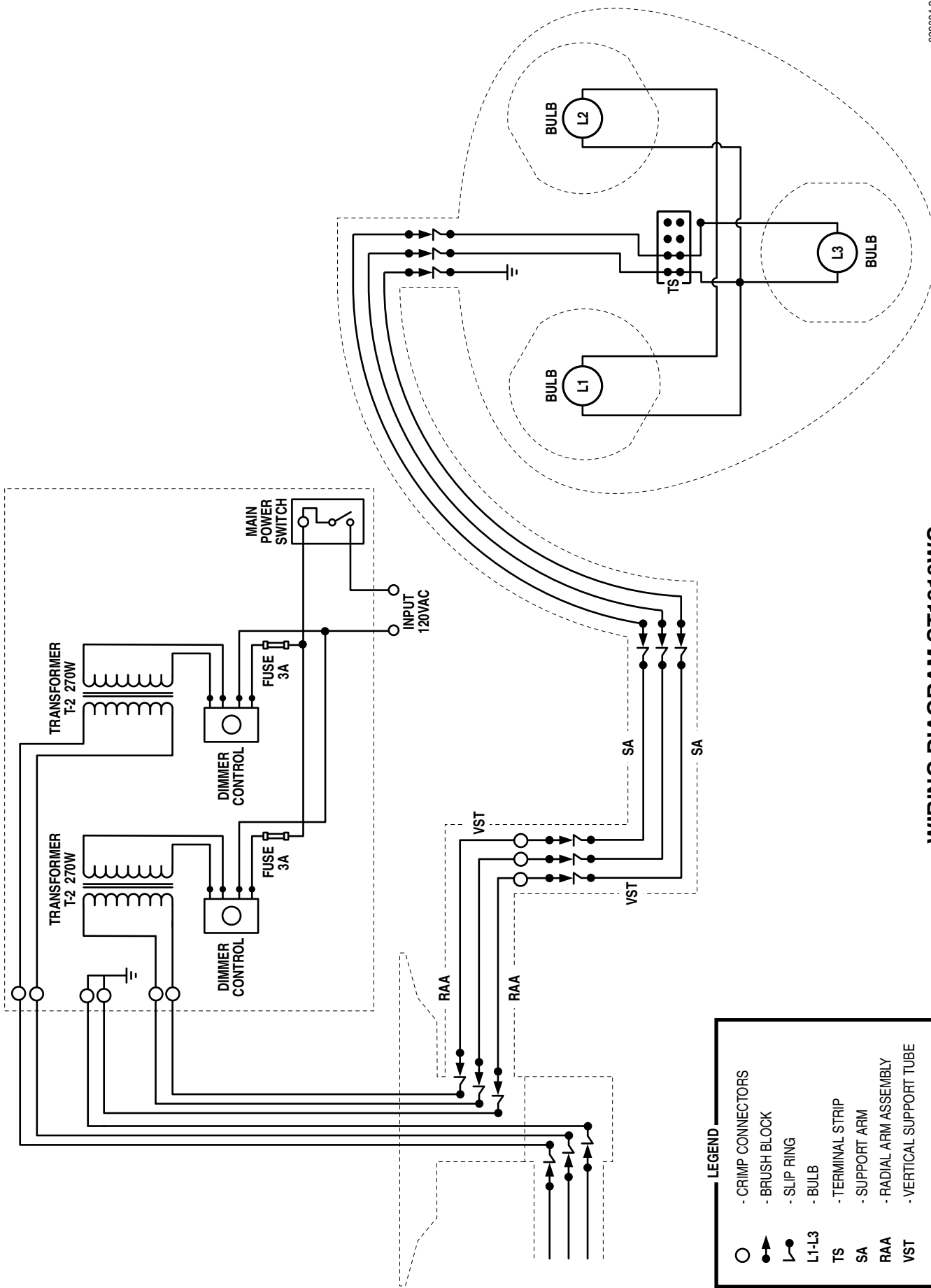
SKYTRON
5085 Corporate Exchange Blvd. S.E.
Grand Rapids, MI 49512
1-800-SKYTRON (1-800-759-8766)
Fax. 1-616-656-2906



LEGEND

- - CRIMP CONNECTORS
- - BRUSH BLOCK
- ⤴ - SLIP RING
- ⦿ - BULB
- L1-L3 - TERMINAL STRIP
- TS - SUPPORT ARM
- SA - RADIAL ARM ASSEMBLY
- RAA - VERTICAL SUPPORT TUBE
- VST

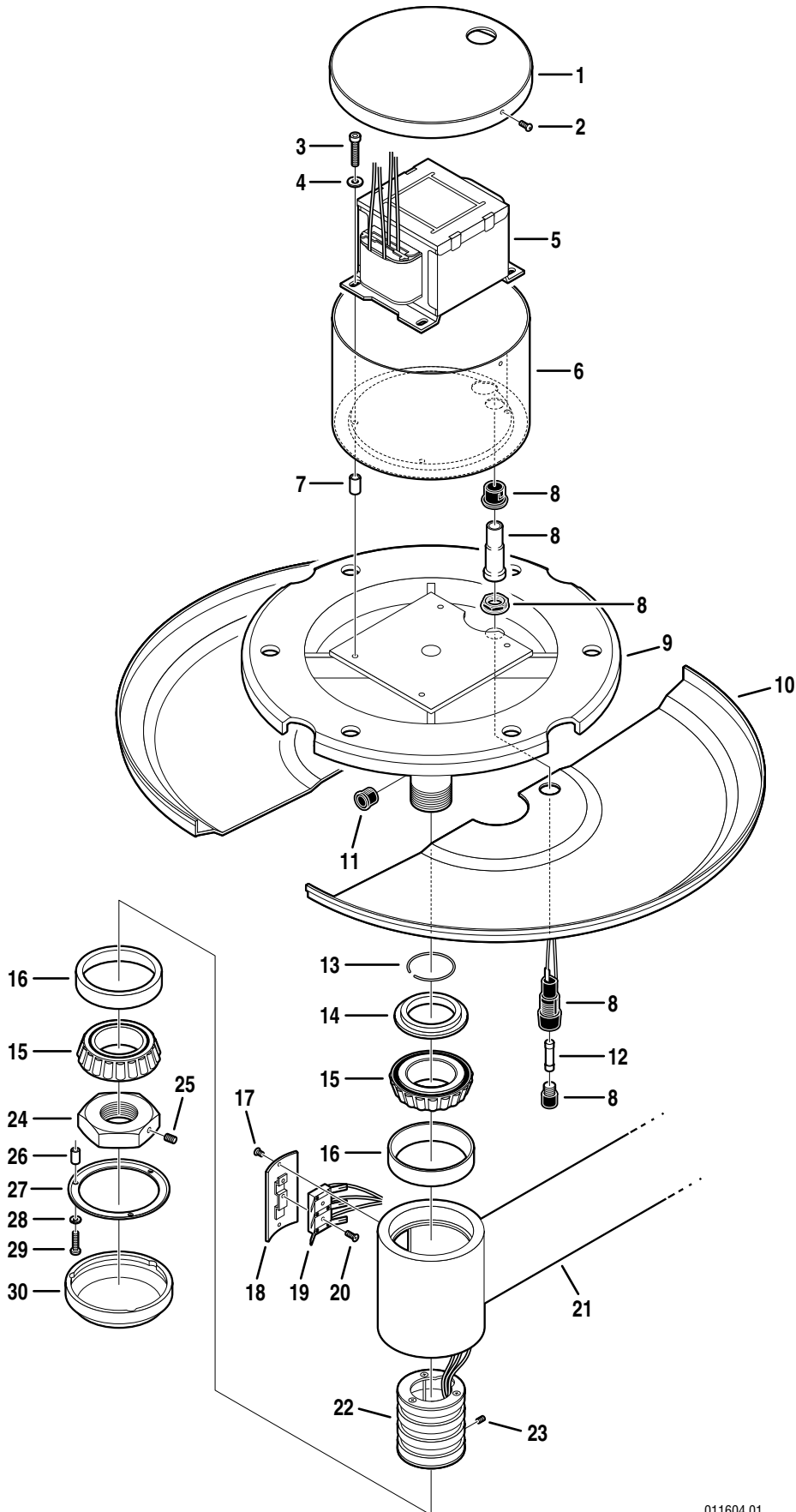
WIRING DIAGRAM ST1919



WIRING DIAGRAM ST1919WC

LEGEND	
○	- CRIMP CONNECTORS
●	- BRUSH BLOCK
⬆	- SLIP RING
⊖	- BULB
L1-L3	- TERMINAL STRIP
TS	- SUPPORT ARM
SA	- RADIAL ARM ASSEMBLY
RAA	- VERTICAL SUPPORT TUBE
VST	

SECTION V. REPLACEMENT PARTS
5-1. MOUNTING HUB AND RADIAL ARM ASSEMBLY

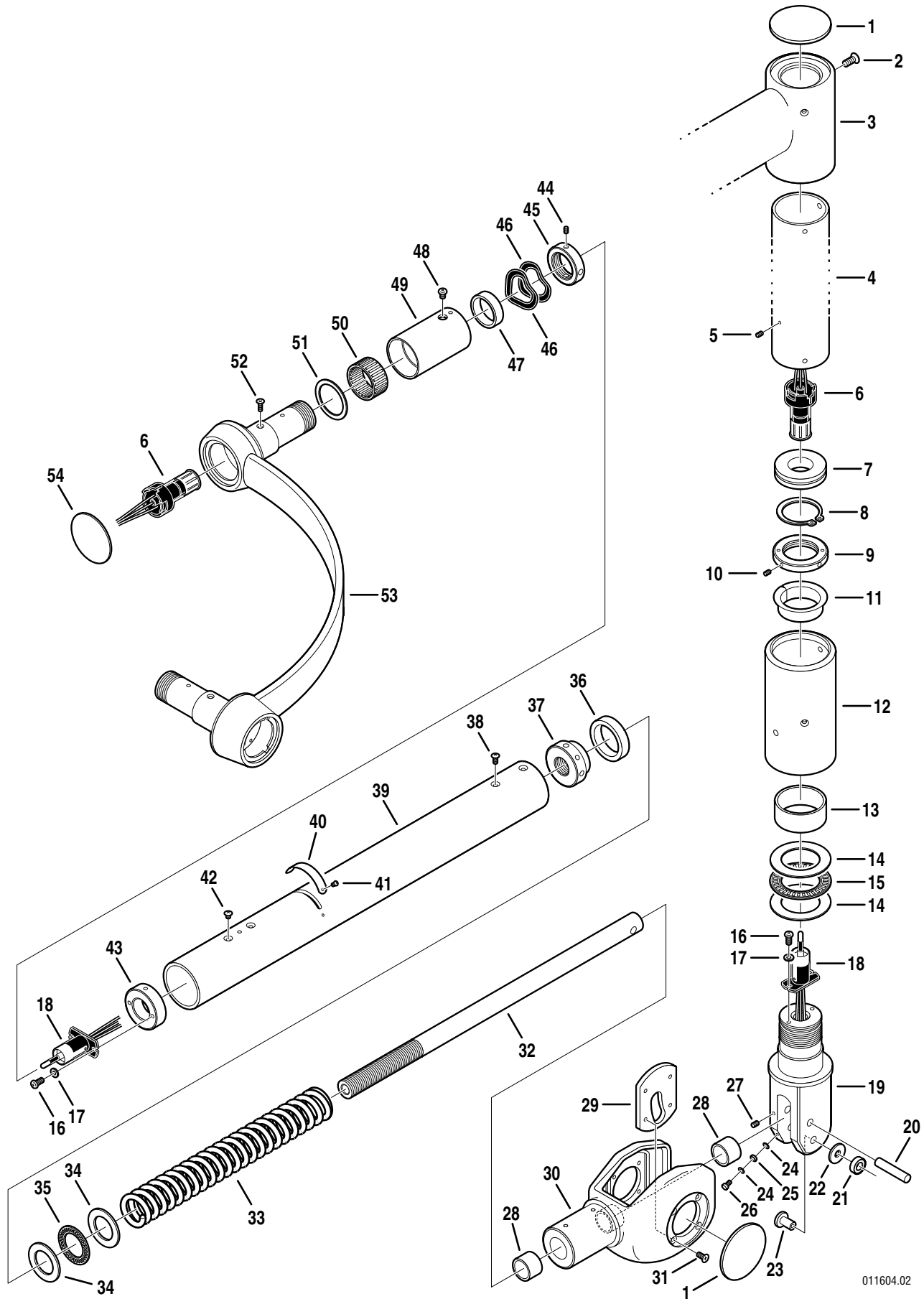


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5-1. MOUNTING HUB AND RADIAL ARM ASSEMBLY

Item	Part No.	Description	Qty.
1	B4-342-69	COVER, junction box	1
2	B4-030-43	SCREW, phillips, M3x8	3
3	B9-210-81	BOLT, allen, M5x25	4
4	B4-342-02	WASHER, flat, M5.....	4
5	B9-410-25	TRANSFORMER (ST19)	1
	B9-410-26	TRANSFORMER (ST1919)	1
6	B4-342-03	JUNCTION BOX	1
7	B4-342-04	STAND-OFF, junction box	4
8	B4-342-05	FUSEHOLDER ASSEMBLY.....	1
9	B4-341-01	MOUNTING HUB, ST19	1
	B4-341-30	MOUNTING HUB, ST1919	1
10	B4-341-02	CEILING COVER	1
11	B4-342-06	GROMMET	1
12	B9-210-21	FUSE, 250V, 3A (ST19).....	1
	B9-210-22	FUSE, 250V, 5A (ST1919).....	1
13	B4-342-07	SNAP RING	1
14	B4-342-08	SPACER.....	1
15	B4-342-09	BEARING ASSEMBLY, tapered roller	A/R
16	----	RACE, bearing	A/R
17	B4-342-11	SCREW, phillips, M3x4	A/R
18	B4-342-12	COVER, brush block	A/R
19	B4-342-13	BRUSH BLOCK	A/R
20	B4-342-14	SCREW, phillips, M3x8 (countersunk)	A/R
21	B4-341-03	RADIAL ARM, 1000mm	A/R
	B4-341-31	RADIAL ARM, 895mm	A/R
22	B4-342-15	SLIP RING	A/R
23	B2-210-14	SCREW, set, slip ring.....	A/R
24	B2-210-61	NUT, retainer	1
25	B2-210-27	SCREW, set	1
26	B2-210-56	SPACER.....	3
27	B4-341-04	RETAINER, hub cover.....	1
28	B4-342-16	WASHER, lock, M3	3
29	B4-342-17	SCREW, phillips, M3x16	3
30	B4-341-05	COVER, hub	1
NS	B2-010-01	STANDARD MOUNTING PLATE	1

5-2. BALANCE MECHANISM AND YOKE ASSEMBLIES

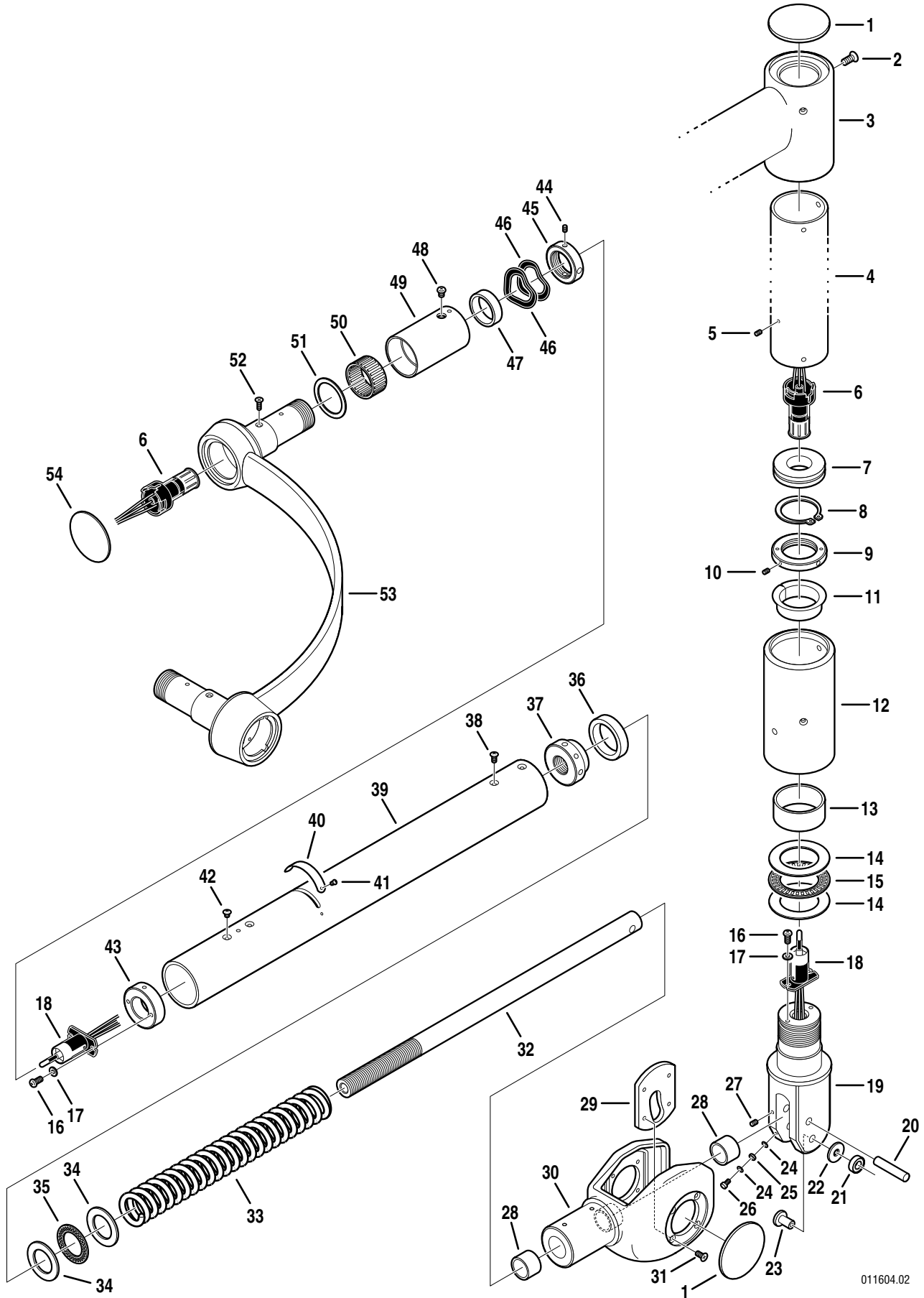


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5-2. BALANCE MECHANISM AND YOKE ASSEMBLIES

Item	Part No.	Description	Qty.
1	B4-341-06	COVER, rubber	3
2	B4-242-23	SCREW, phillips, M5x12	1
3	----	RADIAL ARM	1
4	B4-341-07	VERTICAL SUPPORT TUBE	A/R
5	B9-310-06	SCREW, set	A/R
6	B3-210-05	BRUSH BLOCK	2
7	B3-310-13	MOUNT, brush block	1
8	B4-242-11	SNAP RING	1
9	B4-242-10	NUT	1
10	B1-010-37	SCREW, set, M4x8	A/R
11	B4-342-18	BUSHING	1
12	B4-341-08	SLEEVE, VST	1
13	B4-342-19	BUSHING	1
14	B4-342-20	WASHER, needle bearing (large)	2
15	B4-342-21	NEEDLE BEARING (large)	1
16	B9-210-28	SCREW, phillips, M4x8	4
17	B9-210-69	WASHER, flat, M4	4
18	B3-210-04	SLIP RING	2
19	B4-341-09	JOINT, upper knuckle	1
20	B4-242-20	PIN	1
21	B4-242-19	BEARING	2
22	B4-242-18	WASHER	2
23	B4-242-17	PIN, pivot	2
24	B3-210-32	WASHER, bearing	4
25	B3-210-33	BEARING	2
26	B9-210-81	SCREW, allen, M5x25	2
27	B9-210-82	SCREW, set	2
28	B4-342-22	BUSHING	2
29	B4-242-21	GUIDE, bearing, left	1
	B4-242-22	GUIDE, bearing, right	1
30	B4-341-10	HOUSING, BOM, lower	1
31	B4-242-23	SCREW, phillips, M4x12	8
32	B4-342-23	SHAFT, balance	1
33	B4-342-24	SPRING	1
34	B4-342-25	WASHER, needle bearing, (small)	2
35	B4-342-26	NEEDLE BEARING, (small)	1
36	B4-342-27	BUSHING	1
37	B4-342-28	NUT, spring adjustment	1
38	B9-210-28	SCREW, phillips, M4x8	3
39	B4-341-11	SUPPORT ARM	1
40	B3-410-02	COVER, adjustment	1
41	B3-410-03	SCREW	2
42	B3-220-15	SCREW, phillips, M4x6	4
43	B4-342-29	MOUNT, slip ring	1
44	B1-010-37	SCREW, set, M4x8	A/R
45	B1-230-14	NUT	1
46	B4-342-30	WASHER, wave	2

5-2. BALANCE MECHANISM AND YOKE ASSEMBLIES (continued)

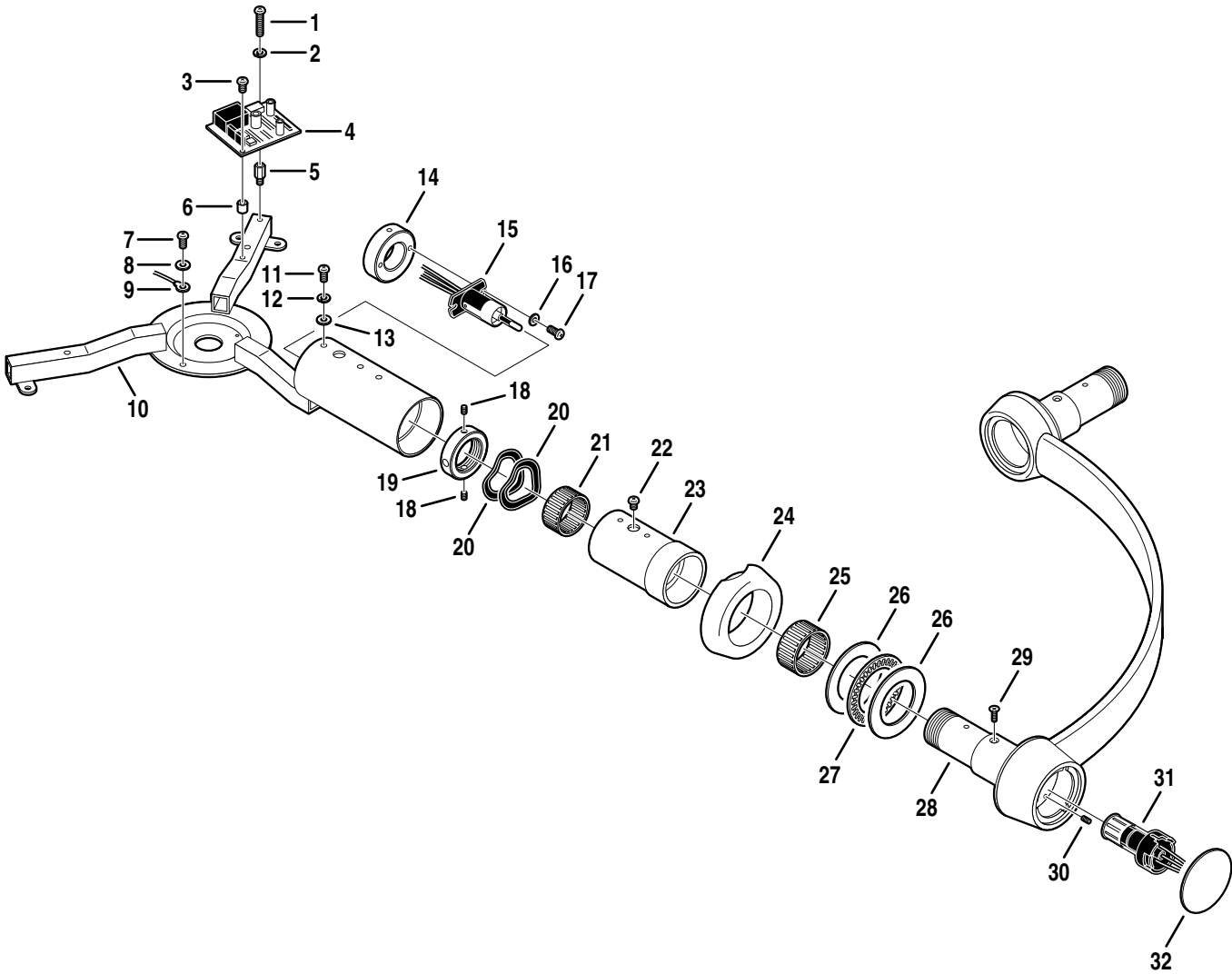


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5-2. BALANCE MECHANISM AND YOKE ASSEMBLIES (continued)

Item	Part No.	Description	Qty.
47	B4-342-31	BUSHING.....	1
48	B4-342-32	SCREW, phillips, M4x4	2
49	B4-341-12	BEARING BODY	1
50	B4-342-33	BEARING, needle	1
51	B4-342-34	WASHER, needle bearing.....	1
52	B4-342-35	SCREW, phillips, countersunk, M3x10.....	1
53	B4-341-13	YOKE, lighthouse.....	1
54	B4-341-14	COVER, yoke	1
	B4-242-69	WIRE, red, 14 awg.....	A/R
	B4-242-70	WIRE, white, 14 awg.....	A/R
	B4-242-71	WIRE, green, 14 awg.....	A/R

5-3. YOKE ASSEMBLY

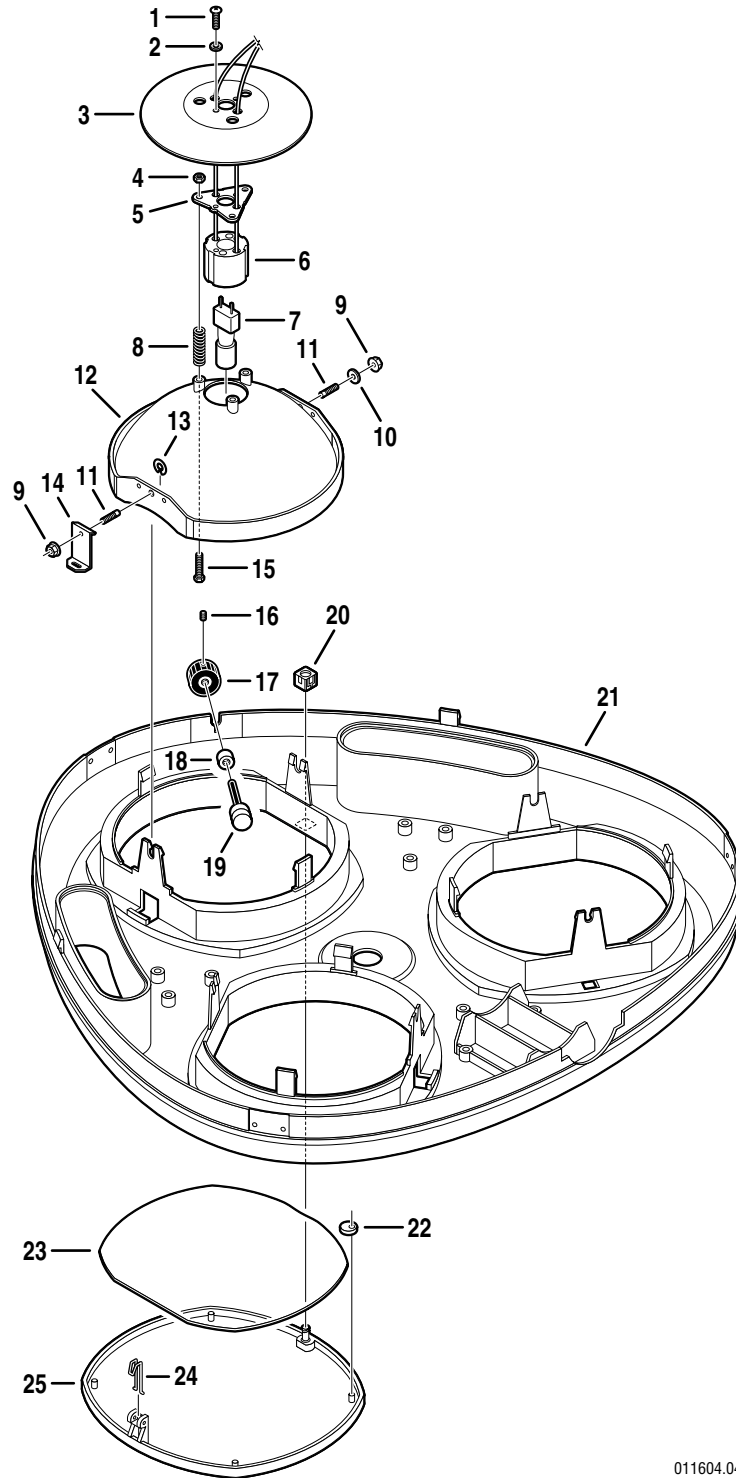


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5-3. YOKE ASSEMBLY

Item	Part No.	Description	Qty.
1	B4-342-17	SCREW, phillips, M3x16	A/R
2	B4-342-16	WASHER, lock, M3	A/R
3	B4-342-36	SCREW, phillips, M3x6	A/R
4	B4-340-01-1	CIRCUIT BOARD	A/R
5	B4-342-37	STAND-OFF	A/R
6	B4-342-38	SPACER	A/R
7	B9-210-28	SCREW, phillips, M4x8	A/R
8	B9-210-69	WASHER, flat, M4	A/R
9	----	GROUND WIRE	1
10	B4-340-02	FRAME, inner support	1
11	B9-210-28	SCREW, phillips, M4x8	A/R
12	B4-210-14	WASHER, lock, M4	A/R
13	B9-210-69	WASHER, flat, M4	A/R
14	B4-342-29	MOUNT, slip ring	1
15	B3-210-04	SLIP RING	1
16	B9-210-69	WASHER, flat, M4	2
17	B9-210-28	SCREW, M4x8	2
18	B1-010-37	SCREW, set, M4x8	A/R
19	B1-230-14	NUT	1
20	B4-342-30	WASHER, wave	2
21	B4-342-39	BEARING, needle (small)	1
22	B4-342-32	SCREW, phillips, M4x4	1
23	B4-341-15	BEARING BODY	1
24	B4-342-40	RUBBER TRIM	1
25	B4-342-33	BEARING, needle (large)	1
26	B4-342-20	WASHER, needle bearing	2
27	B4-342-21	BEARING, needle	1
28	B4-341-16	YOKE, lighthouse	1
29	B4-342-35	SCREW, phillips, countersunk, M3x10	1
30	B4-342-41	SCREW, set	A/R
31	B3-210-05	BRUSH BLOCK	1
32	B4-341-14	COVER, yoke	1

5-4. BULB AND REFLECTOR ASSEMBLY

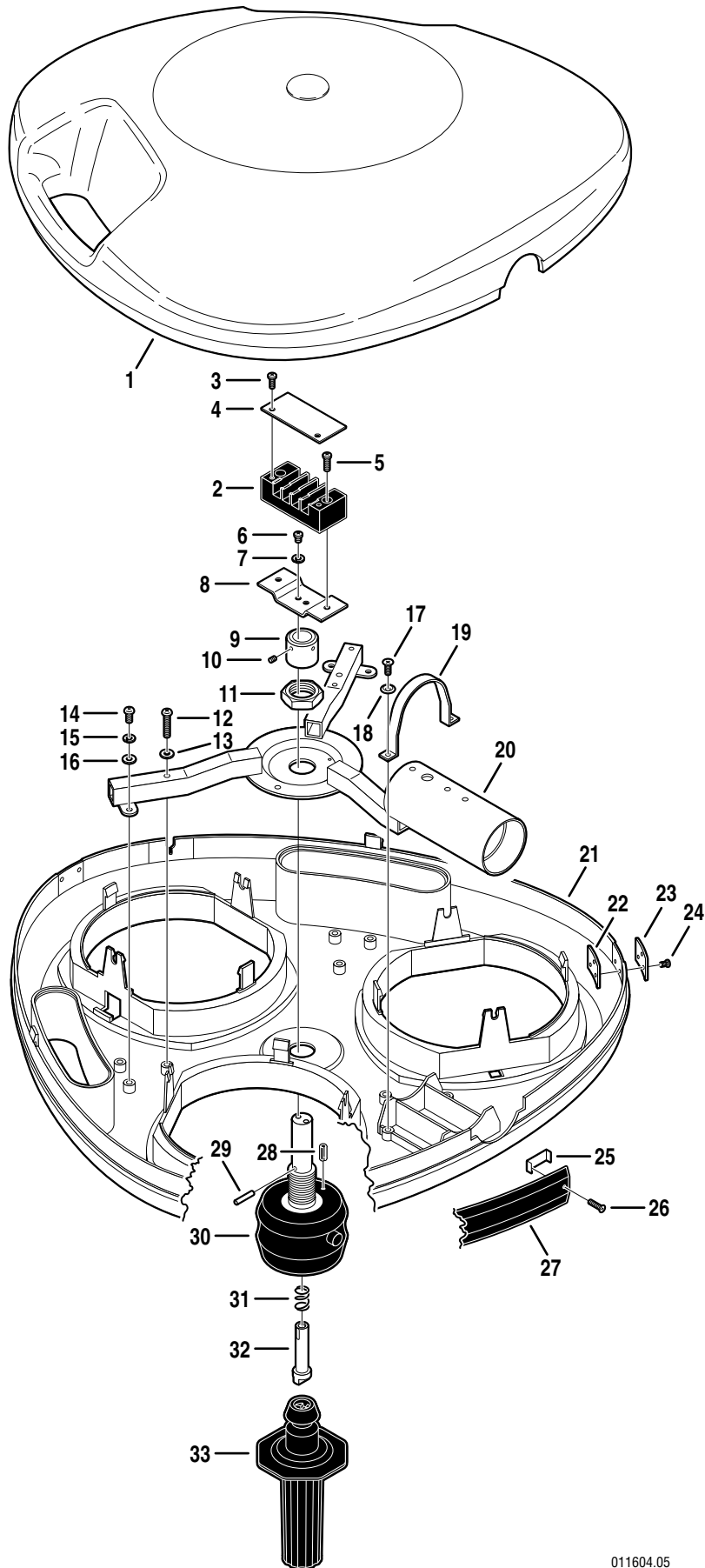


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5-4. BULB AND REFLECTOR ASSEMBLY

Item	Part No.	Description	Qty.
1	B9-410-15	SCREW, phillips, M3x25	6
2	B9-410-16	WASHER, flat, M3.....	6
3	B1-410-27	HEAT SINK	3
4	B9-410-17	NUT, hex, M4	9
5	B1-410-28	MOUNT, bulb socket	3
6	B1-410-29	SOCKET, bulb.....	3
7	B1-010-28	BULB, halogen, 24v, 50w.....	3
8	B1-410-30	SPRING	9
9	B4-020-22	NUT, hex, M4	6
10	B5-010-99	WASHER, flat, M4.....	3
11	B4-242-31	SCREW, reflector.....	6
12	B1-410-31	REFLECTOR	3
13	B9-410-21	E-RING	6
14	B4-342-42	BRACKET	3
15	B9-410-22	BOLT, hex, M4x20.....	9
16	B4-020-39	SCREW, set, M3x4	1
17	B4-240-01	KNOB, intensity control.....	1
18	B4-342-44	NUT, intensity control	1
19	B4-340-03	INTENSITY CONTROL ASSEMBLY	1
20	B1-410-37	RETAINER, 1/4 turn screw.....	3
21	B4-340-04	FACE, lighthouse	1
22	B1-410-41	MOUNT, filter	12
23	B4-240-06	FILTER	3
24	B4-342-45	SPRING, diffuser	3
25	B4-240-07	DIFFUSER.....	3

5-5. LIGHTHEAD ASSEMBLY

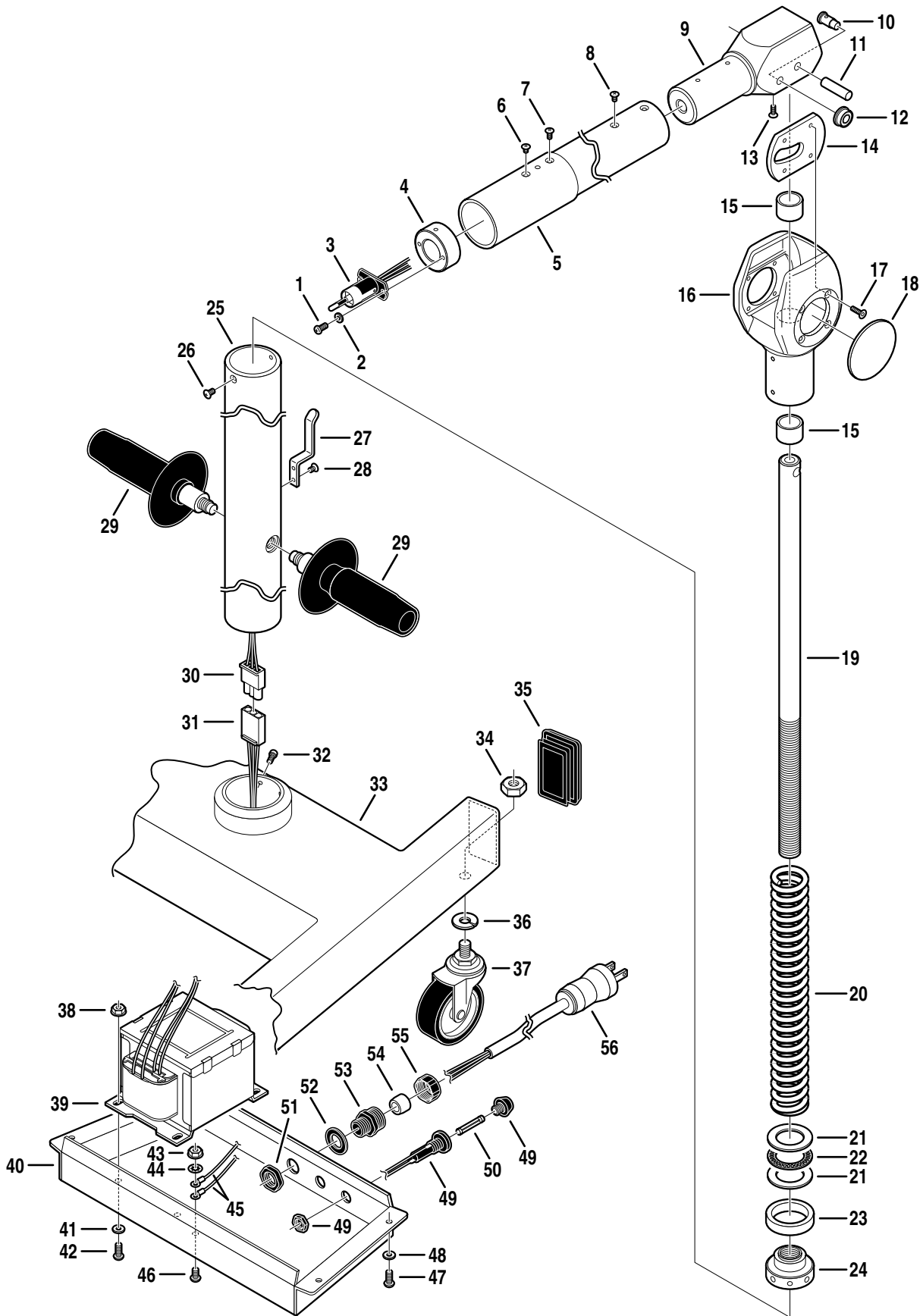


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5-5. LIGHTHEAD ASSEMBLY

Item	Part No.	Description	Qty.
1	B4-340-05	TOP COVER, lighthouse.....	1
2	B1-210-34	TERMINAL STRIP	1
3	B9-210-35	•SCREW, terminal strip cover	2
4	B1-210-35	•COVER, terminal strip	1
5	B9-210-34	SCREW, terminal strip mounting	2
6	B3-220-15	SCREW, bracket mounting, M4x6, phillips.....	2
7	B4-210-14	WASHER, lock, M4	2
8	B1-210-33	BRACKET, terminal strip mounting	1
9	B4-342-46	COLLAR.....	1
10	B4-030-67	SCREW, set, M4x5	2
11	B1-410-51	NUT, hex	1
12	B4-342-47	SCREW, phillips, M4x22	A/R
13	B5-010-99	WASHER, flat, M4.....	A/R
14	B3-220-16	SCREW, phillips, M4x8	A/R
15	B4-210-14	WASHER, lock, M4	A/R
16	B5-010-99	WASHER, flat, M4.....	A/R
17	B4-242-23	SCREW, phillips, M4x12	4
18	B9-410-08	WASHER, special	4
19	B1-410-15	BAND	2
20	B4-340-02	FRAME, inner support	1
21	B4-340-04	FACE, lighthouse	1
22	B4-340-06	PLATE, inner	3
23	B4-340-07	PLATE, outer	3
24	B4-342-48	SCREW, phillips, M3x10	9
25	B4-340-08	CLIP, belt.....	2
26	B4-342-49	SCREW, phillips, countersunk, M3x12.....	2
27	B4-340-09	BELT	1
28	B4-342-50	PIN, roll	1
29	B1-410-50	PIN.....	1
30	B4-340-10	HANDLE, engagement head assembly	1
31	B4-342-51	SPRING	1
32	B4-340-11	LOCK, handle	1
33	B1-210-50	HANDLE, sterilizable, positioning	1

5-6. ST19S - STAND MODEL ASSEMBLY

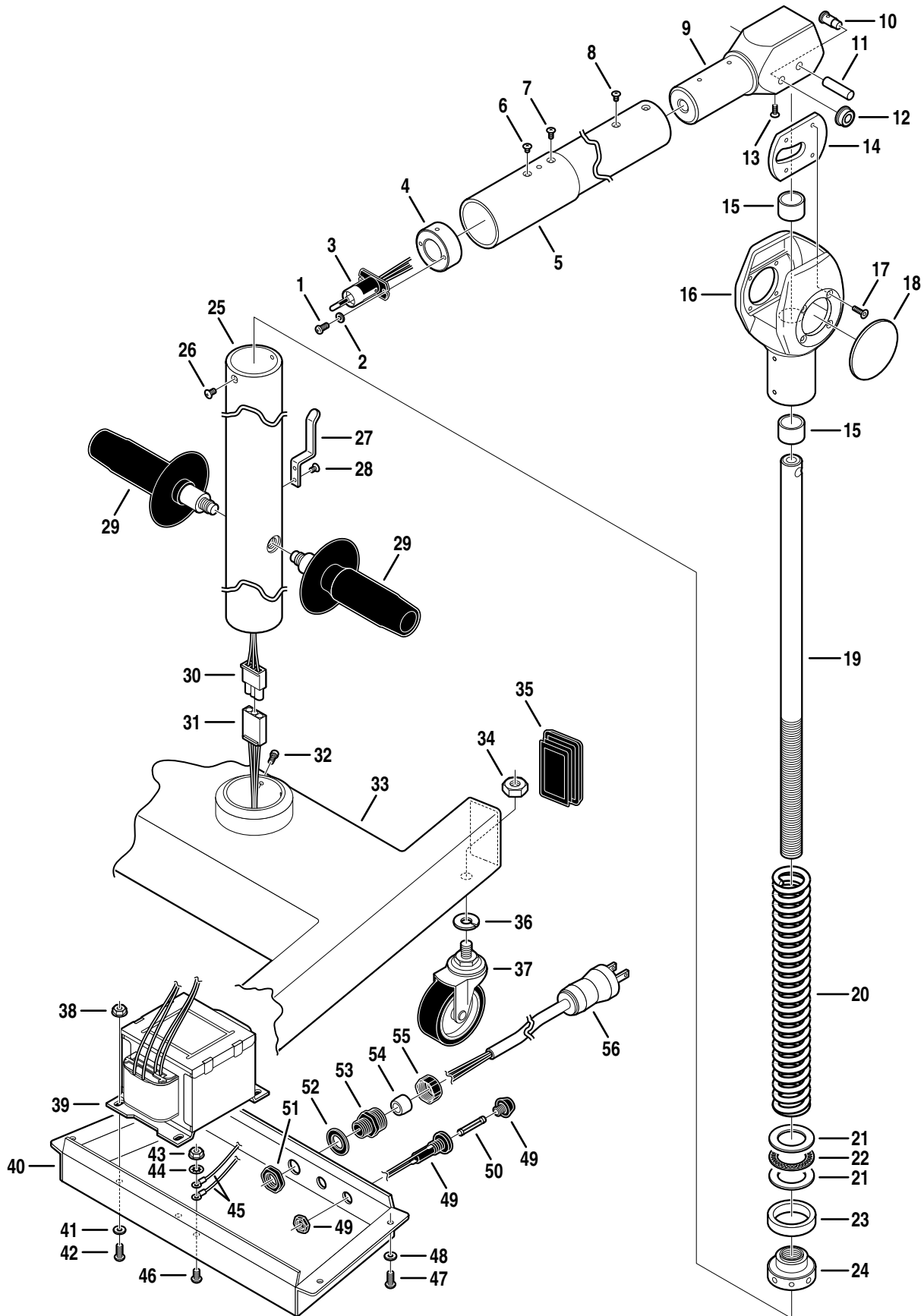


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5-6. ST19S - STAND MODEL ASSEMBLY

Item	Part No.	Description	Qty.
1	B9-210-28	SCREW, phillips, M4x8	2
2	B9-210-69	WASHER, flat, M4.....	2
3	B3-210-04	SLIP RING	1
4	B4-342-52	MOUNT, slip ring.....	1
5	B4-341-17	SUPPORT ARM.....	1
6	B3-220-15	SCREW, phillips, M4x6	4
7	B5-011-03	SCREW, phillips, M4x10	1
8	B4-342-53	SCREW, phillips, M4x9	4
9	B4-341-18	JOINT, upper knuckle.....	1
10	B4-341-19	PIN, pivot	2
11	B4-341-20	PIN.....	1
12	B4-342-54	ROLLER.....	2
13	B4-342-55	SCREW, allen head, countersunk, M4x13.....	2
14	B4-341-21	GUIDE, bearing, left.....	1
	B4-341-22	GUIDE, bearing, right	1
15	B4-342-22	BUSHING.....	2
16	B4-341-29	HOUSING, BOM	1
17	B4-342-56	SCREW, allen head, countersunk, M4x14.....	8
18	B4-341-06	COVER, rubber.....	2
19	B4-341-23	SHAFT, balance	1
20	B4-341-24	SPRING	1
21	B4-342-25	WASHER, needle bearing.....	2
22	B4-342-26	NEEDLE BEARING	1
23	B4-342-27	BUSHING, nylon	1
24	B4-342-28	NUT, spring adjustment.....	1
25	B4-341-25	STAND POLE.....	1
26	B4-342-57	SCREW, phillips, M4x9	3
27	B4-242-45	CORD HOOK.....	2
28	B5-011-03	SCREW, phillips, M4x10	4
29	A1-010-29-1	HANDLE, positioning	2
30	B4-342-58	CONNECTOR, male, 3-pin	1
31	B4-342-59	CONNECTOR, female, 3-pin	1
32	B4-211-03	BOLT, allen head, M5x10	2
33	B4-341-26	BASE	1
34	B4-242-49	NUT.....	4
35	B4-341-32	COVER, base.....	4
36	B4-242-50	WASHER, lock	4
37	B4-341-27	CASTER	4
38	B4-342-60	NUT, lock, M4.....	4
39	B9-410-25	TRANSFORMER	1
40	B4-341-28	HOUSING, transformer.....	1
41	B5-010-99	WASHER, flat, M4.....	4
42	B5-011-03	SCREW, phillips, M4x10	4
43	B4-342-61	NUT, lock, M4.....	1
44	B4-342-62	WASHER, star, M4.....	1
45	----	GROUND WIRES	2
46	B3-220-16	SCREW, phillips, M4x8	1
47	B4-342-63	SCREW, phillips, M4x10	4

5-6. ST19S - STAND MODEL ASSEMBLY (continued)

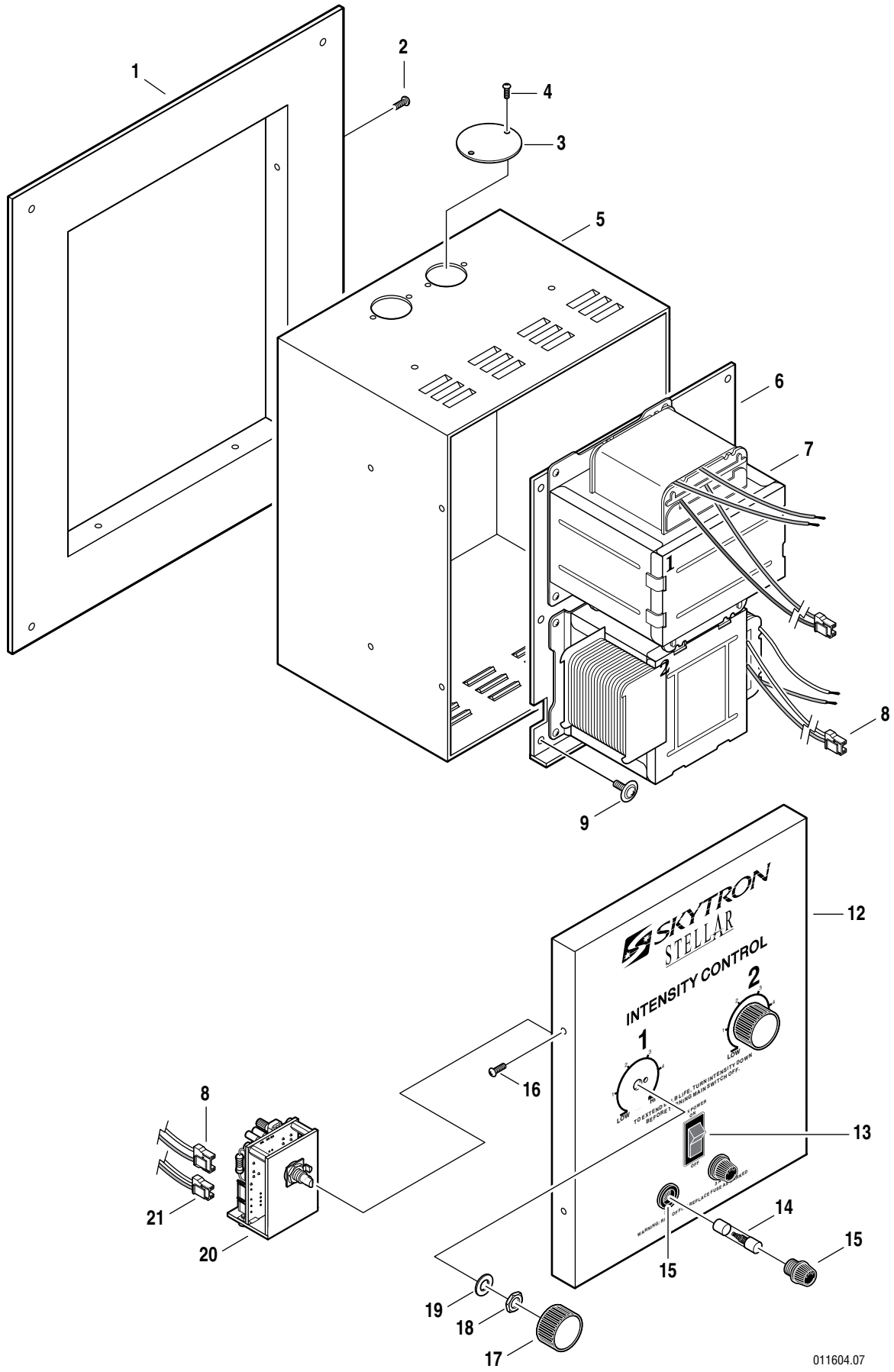


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5-6. ST19S - STAND MODEL ASSEMBLY (continued)

Item	Part No.	Description	Qty.
48	B5-010-99	WASHER, flat, M4.....	4
49	B1-010-01	FUSE HOLDER ASSEMBLY.....	2
50	B9-210-21	FUSE, 250V, 3A.....	2
51	B4-342-64	NUT, plastic.....	1
52	B4-342-65	GASKET	1
53	B4-342-66	BODY	1
54	B4-342-67	BUSHING, compression	1
55	B4-342-68	NUT, compression.....	1
56	B4-242-48	CORD, power	1

5-7. WALL CONTROL ASSEMBLY



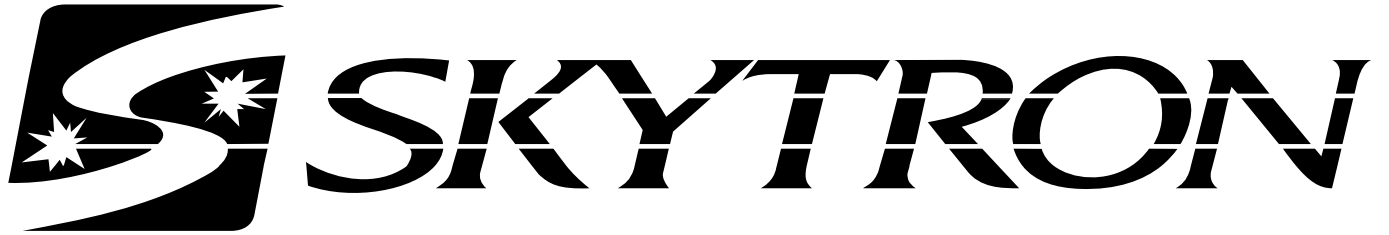
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5-7. WALL CONTROL ASSEMBLY

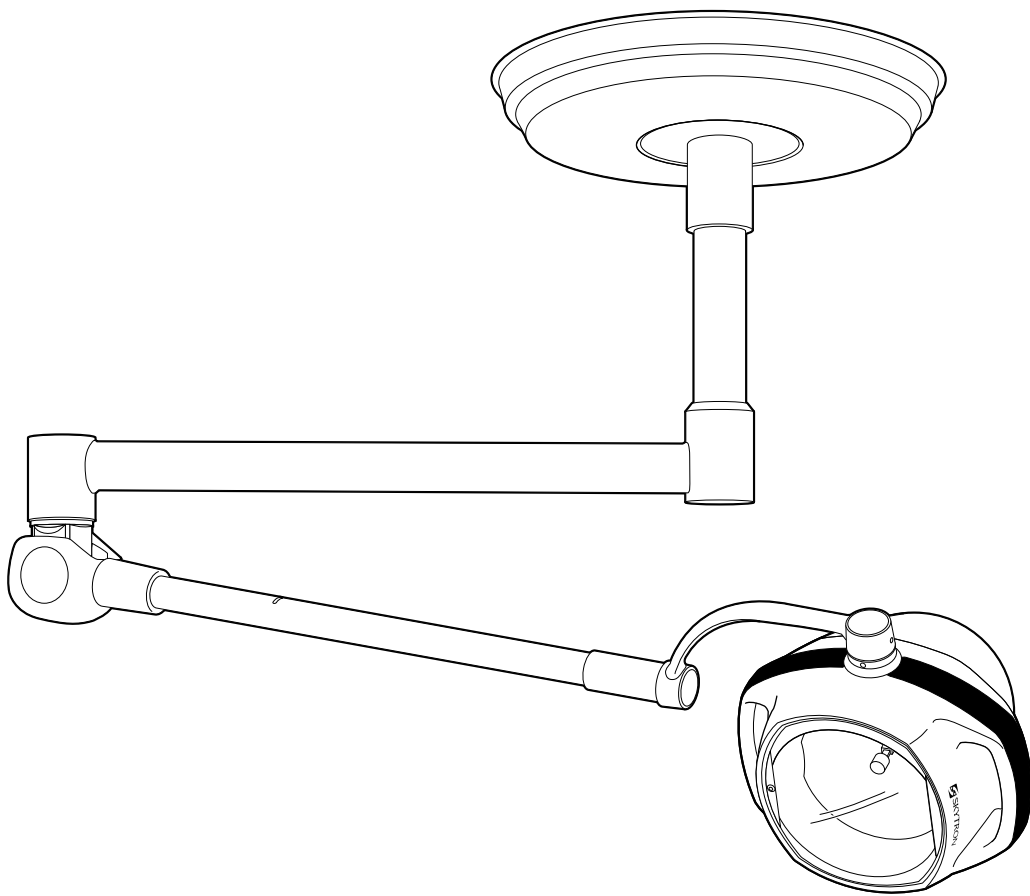
Item	Part No.	Description	Qty.
	B9-410-01	WALL CONTROL, ST19WC	A/R
	B9-410-02	WALL CONTROL, ST1919WC	A/R
1	B9-310-07	FLANGE, recess mount, single or dual.....	1
2	B9-210-40	SCREW, flange mounting	8
3	B9-210-09	COVER, electrical access	2
4	B9-210-41	SCREW, cover mounting	4
5	B9-410-27	HOUSING, wall control, single or dual.....	2
6	B9-410-29	PLATE, transformer mount, ST19WC	1
	B9-410-30	PLATE, transformer mount, ST1919WC	1
7	B9-410-25	TRANSFORMER	A/R
8	B9-410-35	CONNECTOR, 2 pin	A/R
9	B9-210-43	SCREW, phillips, M4 x 8, w/washers	A/R
12	B9-410-36	PANEL, wall control front, ST19WC	1
	B9-410-37	PANEL, wall control front, ST1919WC	1
13	B9-210-16	SWITCH, main power	1
14	B9-210-21	FUSE, 250V, 3A	A/R
15	B9-310-25	FUSE HOLDER	A/R
16	B9-210-43	SCREW w/washers.....	4
17	B9-210-20	KNOB, dimmer control	A/R
18	B9-210-71	NUT, dimmer control	A/R
19	B9-210-70	WASHER	A/R
20	B9-410-42	DIMMER CONTROL ASSEMBLY	A/R
21	B9-410-43	CONNECTOR, 2 pin	A/R



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INSTALLATION INSTRUCTIONS



STELLAR ST9 SERIES EXAMINATION LIGHTS

REV 6/07

EQUIPMENT LABELS AND SPECIFICATIONS



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



AC VOLTAGE



FUSE TYPE 3 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

ENTE LA CERTIFIED

TO UL2601-1

CAN/CSA601.1, IEC 60601-2-46



TOOLS REQUIRED:

3/8" DRIVE RATCHET
ALLEN WRENCH SET-METRIC
STEP LADDER
3/4" DEEP SOCKET, 3/8" DRIVE
#2 PHILLIPS HEAD SCREW DRIVER
UTILITY KNIFE
WIRE CUTTERS
CRIMP PLIERS
DIGITAL LEVEL
TRUE RMS MULTIMETER
12" ADJUSTABLE WRENCH
SLOTTED HEAD SCREWDRIVER 1/4"
PUNCHSET 1/8" - 3/8"

UNCRATING

•Should any damage to the SKYTRON Examination light be noted while uncrating, further unpacking should be stopped and the container with all the wrappings held for inspection. The transportation company should be notified IMMEDIATELY so an inspector can be sent. Consult the Damaged Shipment Claim Procedure for further details.

•Personnel uncrating and installing SKYTRON Examination lights should be aware that they are delicate medical equipment and special care in handling should prevail throughout installation.

INSTALLATION INSTRUCTIONS

Model ST9 Ceiling Mount

1. Check the strength and stability of the mounting structure. See figure 1. The four 1/2" diameter threaded rods should be securely mounted to the ceiling for total support of the fixture. These rods are mounted in a 6-5/16" square pattern and should extend 2.25" below the finished ceiling. Refer to Mounting Structure Guideline on page 7.

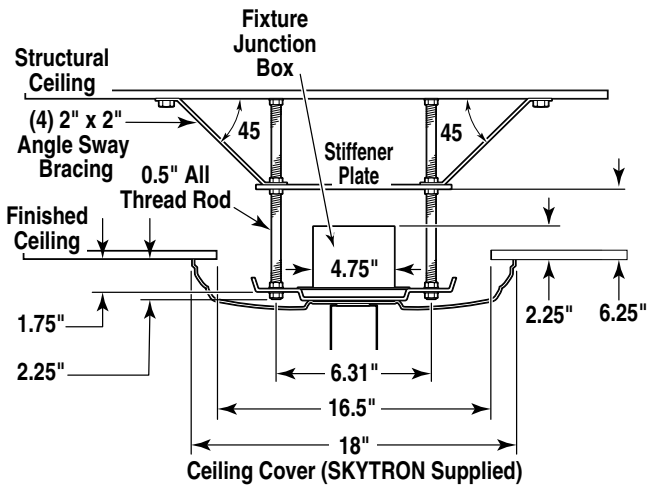


Figure 1. Mounting Structure

2. Connect the transformer wires to a 120 VAC 60 Hz power source using a DPST wall switch and ground the fixture properly. Use conduit between the transformer housing and the junction box.

3. Install the mounting hub assembly on the threaded rods between the jam nuts. The bottom of the mounting hub should be 1-3/4" from the finished ceiling (see figure 1) for proper ceiling cover fit.

NOTE

The mounting hub assembly must be plumb within 0.1 degree to prevent lighthouse drift.

4. Install the ceiling cover. See figure 2.

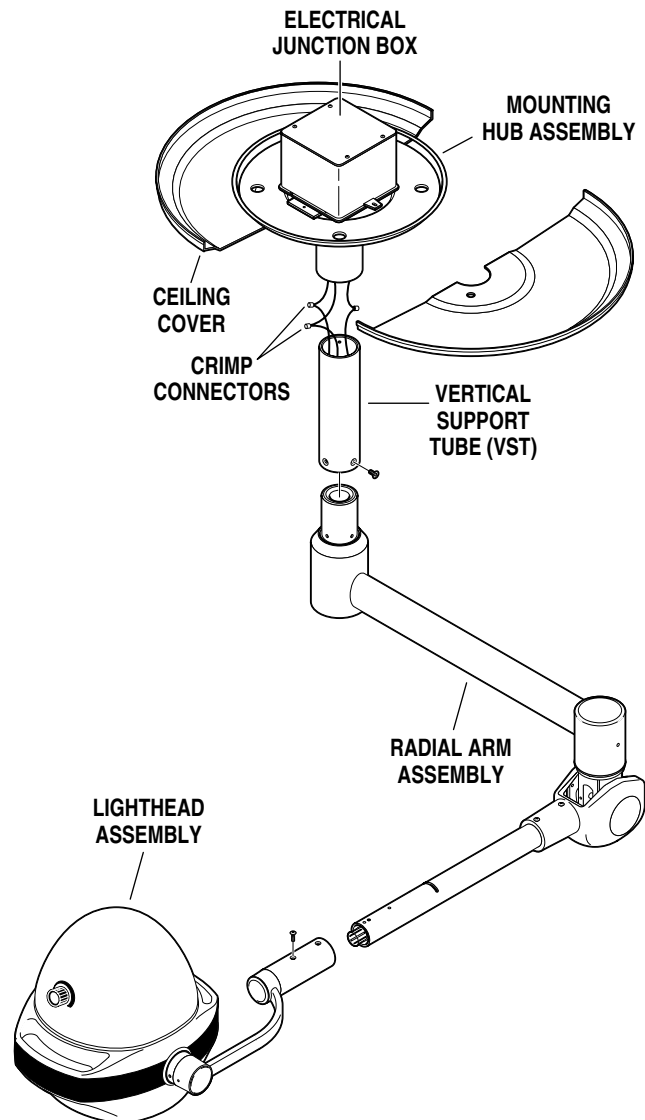


Figure 2. Model ST9 Installation Sequence

NOTE

- All SKYTRON supplied fasteners are metric thread.
- Apply Loc-Tite to all of the VST mounting screws.

5. Thread electrical wires through and install the Vertical Support Tube onto the radial arm assembly, apply Loc-Tite to the mounting screw threads and secure with 6 screws.

NOTE

For installations requiring a minimum length Vertical Support Tube, secure the tube with to the Radial Arm first using three M6x10 flat head screws in the bottom holes of the tube only. See figure 3. Secure the Radial Arm and tube to the Mounting Hub with (3) M6x10 flat head screws in the top holes and (3) M6x15 screws in the bottom holes.

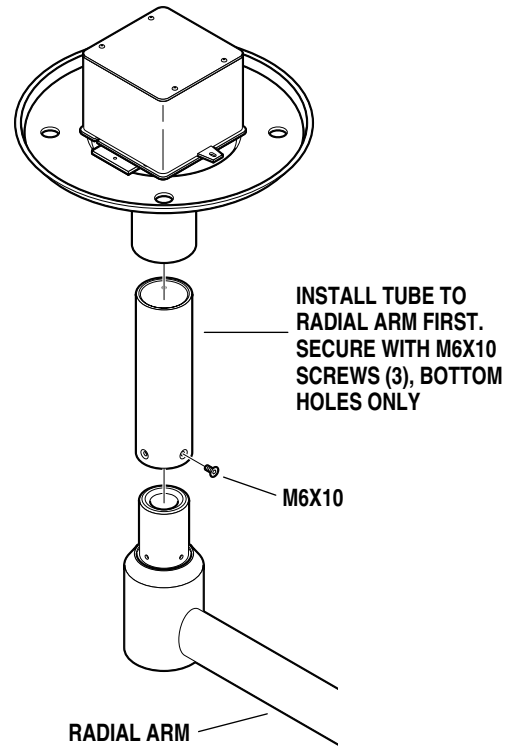


Figure 3. Minimum Length VST Installation

6. Trim the electrical wires and connect the wires from the Vertical Support Tube (VST) to the wires from the Mounting Hub (red to red, white to white) using crimp connectors. Install the Radial Arm Assembly, apply Loc-Tite to the mounting screw threads, observe any screw color code and secure with 6 screws.

7. Install the lighthouse assembly on the lower support arm and secure with the 2 Phillips head screws.

Model ST9W

1. Attach wall mount housing to concrete wall using 4 bolts, washers, and anchors as shown in figure 4. Locate housing 70" from the floor and within 4 feet of a duplex outlet for 120 VAC, 60 Hz power supply. Mark and drill 4 holes in wall, insert anchors and seat them in place. Install 4 bolts and washers and secure housing to anchors.

NOTE

Mounting will vary depending on wall construction. Method used, however, must be capable of holding a 35 pound cantilevered fixture weight at the wall.

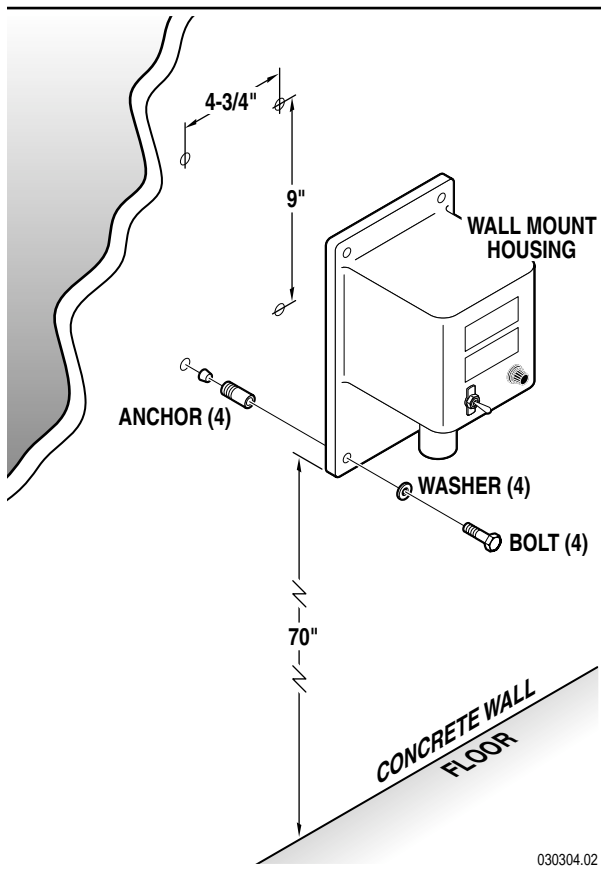


Figure 4. Model ST9W Mounting

2. Remove the allen bolts, lockwashers and the retainer plate from the mounting stub. See figure 5.

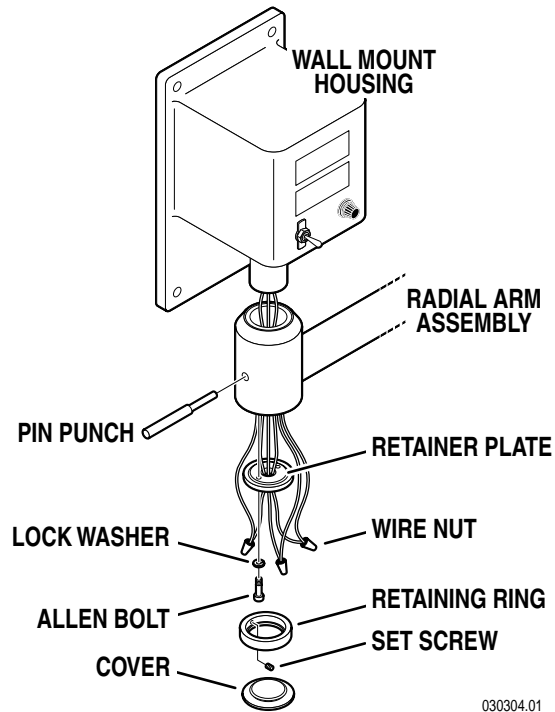


Figure 5. ST9W Radial Arm Installation

3. Remove cover from radial arm, loosen the set screws and remove the retaining ring.

4. Grease the mounting stub, install the radial arm and hold in position with a pin punch.

5. Thread housing electrical wires through center hole in retainer plate, install retainer plate and secure with allen bolts and lockwashers. Trim electrical wires and connect them (red to red, white to white) using wire nuts.

6. Install retaining ring and cover.

7. Install the lighthouse assembly on the lower support arm and secure with the 2 Phillips head screws.

NOTE

Power cord twist lock plug requires NEMA L5-15R, 15A, 125V receptacle; Hubball HBL4710 or equivalent.

8. Plug power cord into twist lock receptacle.

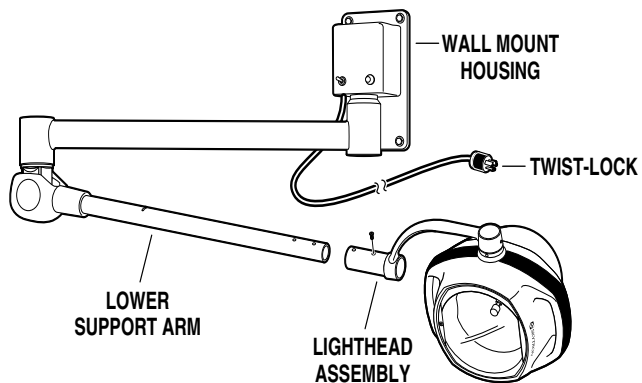


Figure 6. Model ST9W Lighthouse Installation

DAMAGED SHIPMENT CLAIM PROCEDURE

Whenever a shipment suffers damage while in the custody of the transportation company, the responsibility lies with the transportation company, and the value of the damages can be collected from the transportation company if the proper procedures are followed.

When a shipment is received in a damaged condition, and due to the appearance of the containers such as a broken crate, torn wrapping, or smashed carton the contents may have been damaged. That fact should be noted on the Bill of Lading offered by the transportation company. An example of an applicable statement would be; "Received in good order except as noted" or "Crate damaged, possibility of concealed damage." The addition of these types of statements on the shipping documents will automatically give grounds for starting a claim.

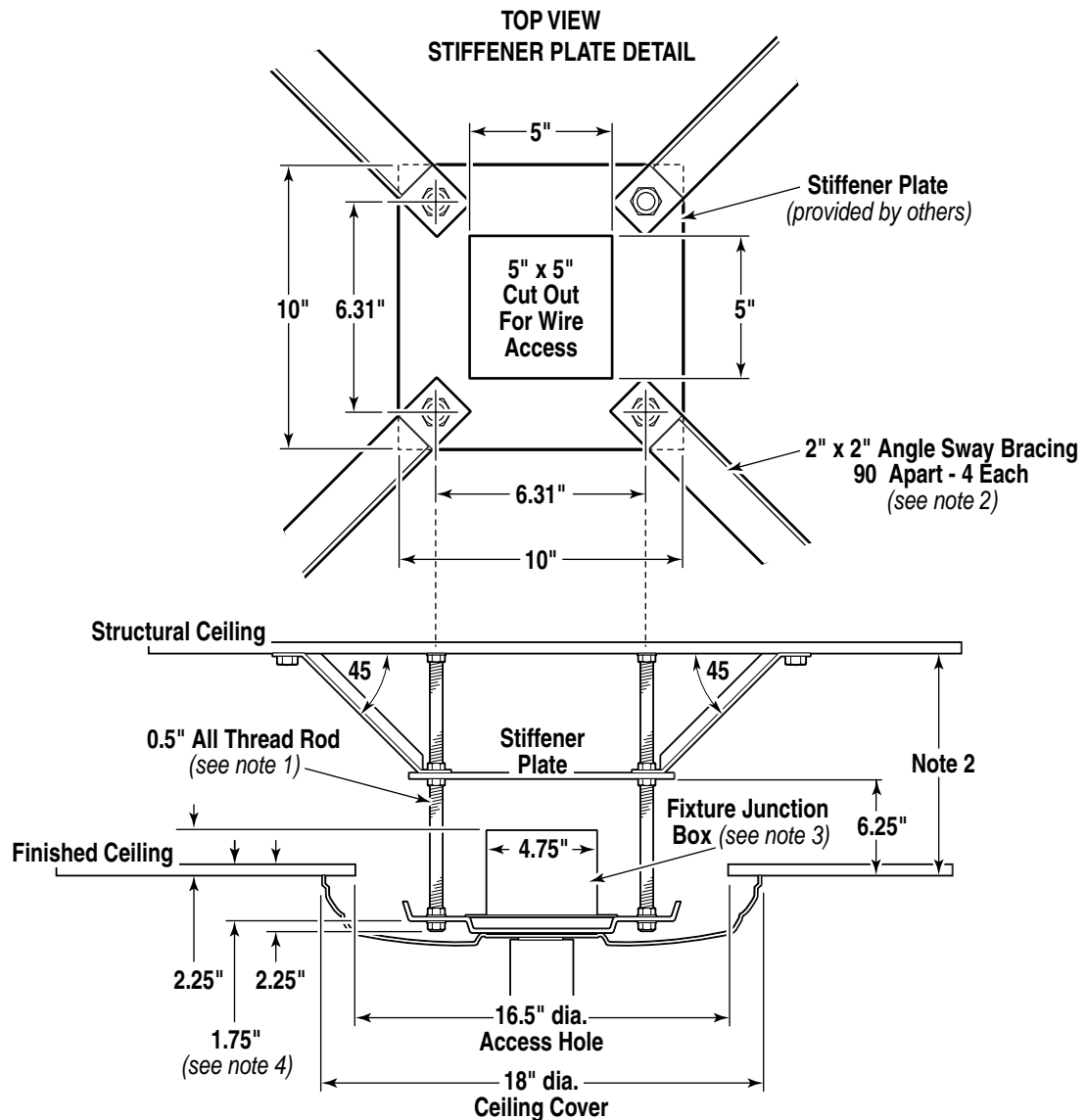
If damage cannot be identified on the exterior of the container, but is found when the container is opened, further unpacking should be stopped immediately and the container with all wrapping or packing materials should be held. The transportation company should be notified so an inspector can be sent. Failure to follow either of these two procedures may result in an inability to file a claim and collect for damage done. Returning the container to the sender without such an inspection may prevent filing a claim, because it will divide the responsibility for damage and in many cases the

transportation company will return the shipment to the sender without charge after the inspection.

The claim itself may be filed by either the shipper or consignee, but the consignee must notify the transportation company and the shipper that the damage has occurred. Remember that refusal of the shipment or failure to note the possibility of damage on the shipping documents may jeopardize the claim. Also, acceptance of a damaged shipment which has been processed properly to allow for filing a claim, will not jeopardize the position of the consignee. In any case, SKYTRON will see that damage which is not the fault of the consignee or his agents is corrected, if the transportation company does not honor the claim, as long as SKYTRON receives the full cooperation of the consignee in filing the claim.

Some of the papers needed for filing a claim are in the hands of the consignee after the shipment has been received. If SKYTRON must file a claim, we will request these papers by name from the consignee at such time as the claim is under discussion. We will require the originals of these papers and not copies.

Knowledge of the procedures outlined above and your cooperation in submitting damaged shipment claims, will help both you, our customer, and SKYTRON by assuring the integrity of our products from manufacturing to installation.



NOTES

1. 1/2" support rods located for total support of light, all labor and materials for mounting structure fabrication supplied by General Contractor. Fixture to be level at mounting and positioned as shown to assure proper fit of ceiling cover.
2. For support rod length over 48", two stiffener plates and two sets of Sway Bracing may be required (contact SKYTRON representative). For support rod lengths of 12" or less, sway braces may be omitted.
3. All conduit, wiring, and other electrical materials as well as installation labor for such materials associated with the installation of the SKYTRON surgical light to be provided by Electrical Contractor. All installations of SKYTRON surgical lights should be under the direct supervision of a SKYTRON representative. All wiring to be in accordance with local codes. 120VAC power supply to control fixture to be via DPST "On- Off" switch, not SKYTRON supplied.
4. Fixture to be level at mounting and positioned as shown to assure proper fit of ceiling cover.
5. CONTRACTOR HAS FINAL RESPONSIBILITY for the strength and stability of the Mounting Structure.

**CONSULT SPECIFIC SEISMIC
CALCULATIONS IF APPLICABLE**

ST9 MOUNTING STRUCTURE GUIDELINE

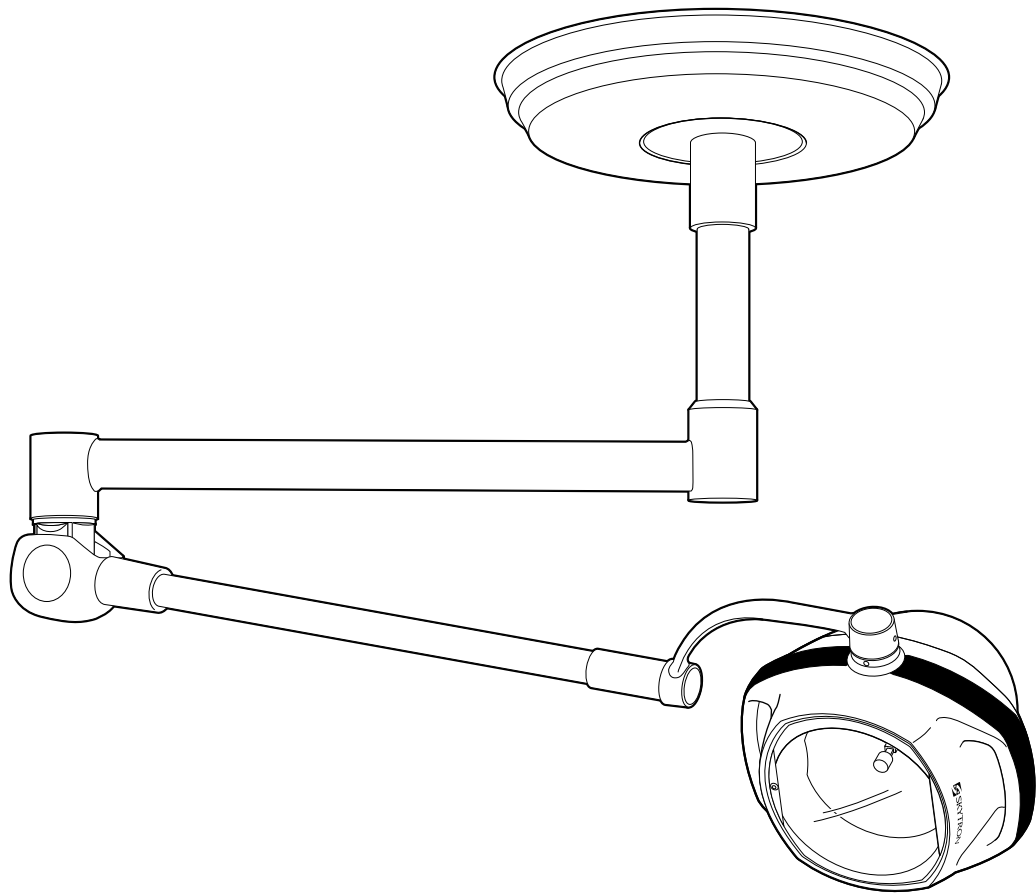




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STELLAR ST9 SERIES ***EXAMINATION LIGHTS***



OWNERS MANUAL

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Indications For Use

The SKYTRON ST9 Series examination light fixture is intended to be used by medical personnel for examinations and procedures.

RECOMMENDED TOOL LIST

1	PIN PUNCH SET 1/8", 1/4" & 3/16"	Original printing	4/03
1	SET OF PHILLIPS SCREWDRIVERS	Revised.....	5/04
1	SET OF FLAT BLADE SCREWDRIVERS	Revised.....	8/05
1	DIGITAL LEVEL	Revised.....	8/07
1	METRIC, L-TYPE ALLEN WRENCH SET 1.5-8mm	Revised.....	9/08
1	TRUE RMS MULTIMETER	Revised.....	3/10

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32-26 Sakashita 1-Chome,
Itabashi- Ku, Tokyo 174-0043
JAPAN

Although current at the time of publication, SKYTRON'S policy of continuous development makes this manual subject to change without notice.



EQUIPMENT LABELS AND SPECIFICATIONS



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



INDICATES DANGEROUS VOLTAGE
100-240V~, 50/60Hz



AC VOLTAGE

FUSE TYPE 1.75 AMP, FAST ACTING (FA)

IPXO RATED, CONTINUOUS OPERATION



WARNING



This equipment is intended for use by healthcare professionals only. This equipment may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the lighthouse or shielding the location.

PERMISSIBLE ENVIRONMENTAL CONDITIONS

DURING TRANSPORT AND STORAGE (IN ORIGINAL PACKAGING MATERIALS)

- AMBIENT TEMPERATURE: 10° - 60° C (14° - 140° F)
- RELATIVE AIR MOISTURE: 10% - 85%, NO CONDENSATE BUILD-UP
- AIR PRESSURE: 500 hPa - 1060 hPa (14 in-Hg - 31 in-Hg)

DURING USE - FOR DRY LOCATIONS

- AMBIENT TEMPERATURE: 15° - 30° C (60° - 85° F)
- RELATIVE AIR MOISTURE: 30% - 60% NON CONDENSING
- AIR PRESSURE: 700hPa - 1060 hPa (20.7 in-Hg - 31.3 in-Hg)



ETL CLASSIFIED
TO UL60601-1
CAN/CSA601.1, IEC 60601-2-41

EQUIPMENT LABELS AND SPECIFICATIONS

"WARNING" - "RISK OF FIRE. REPLACE WITH 24V, 75W TUNGSTEN HALOGEN LAMP."

"AVERTISSEMENT" - "RISQUE D'INCENDIE. REMPLACER PAR LAMPE HALOGÈNE AU TUNGSTÈNE 24V, 75W."

ST9W

NOTE:
GROUNDING RELIABILITY CAN ONLY BE ACHIEVED WHEN THE EQUIPMENT IS CONNECTED TO AN EQUIVALENT RECEPTACLE MARKED (HOSPITAL ONLY) OR (HOSPITAL GRADE)

NOTE:
LA FIABILITÉ DE LA MISE À LA TERRE PEUT SEULEMENT ÊTRE ATTEINTE LORSQUE L'ÉQUIPEMENT EST BRANCHÉ À UNE PRISE DE COURANT MARQUÉE (HÔPITAL SEULEMENT) OU (GRADE D'HÔPITAL) OU ÉQUIVALENT.

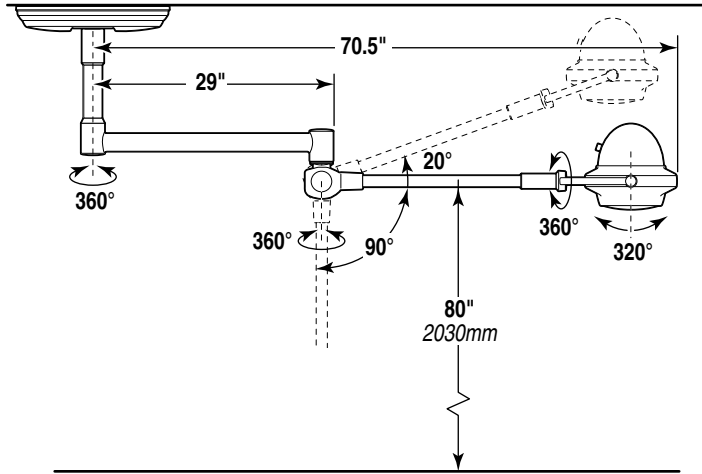
WARNING - FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATING OF FUSE.
1.75A FAST ACTING

AVERTISSEMENT. Pour continuer de protection Contre au risque de feu, remplacer seulement avec La même caractère classé comme de fusée.

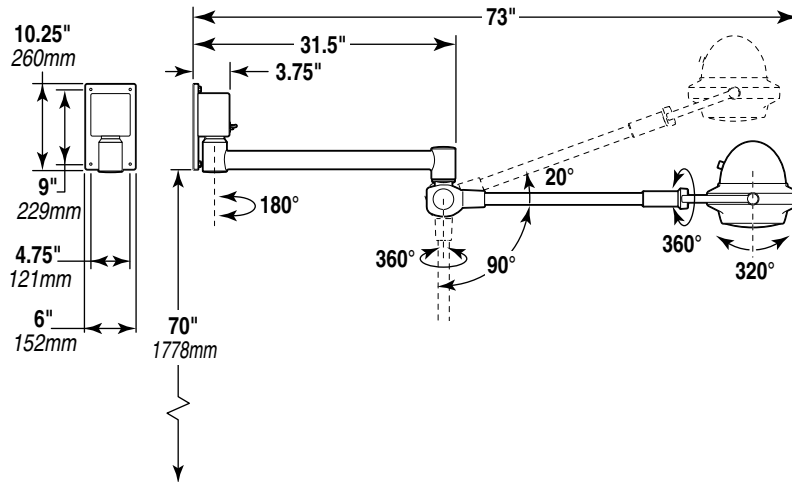
The lighthouse Data Label contains the lighthouse model number, bulb type, fuse type, electrical specifications and product serial number.

SKYTRON - GRAND RAPIDS, MI			
ELECTRIC RATING		CAT. NO. []	
INPUT	120V	[]	60Hz
BULBS TYPE	H2475	24V	75W
SAFETY FUSE	[]	IPXO	CLASS 1
SERIAL NO.	[]	TYPE B	
DAI-ICHI SHOMEI CO., LTD. TOKYO, JAPAN			

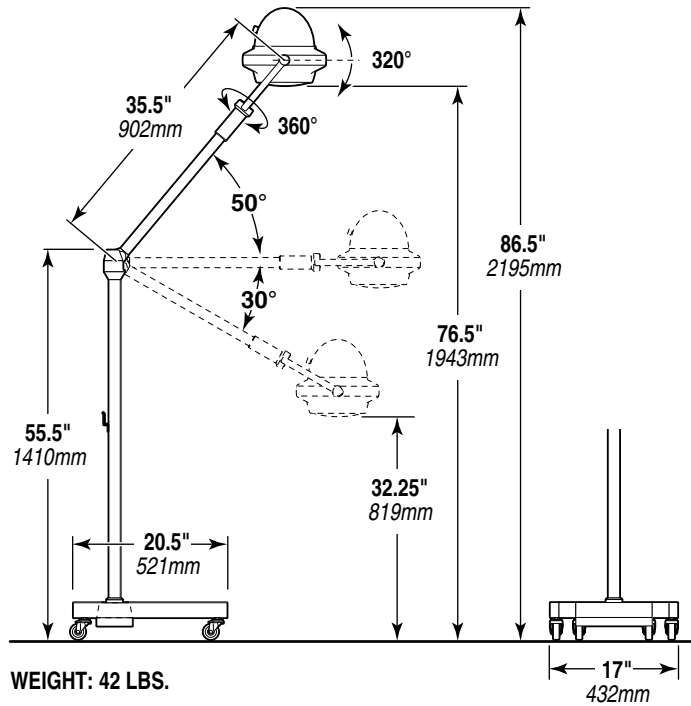
ST9



ST9W



ST9S



WEIGHT: 42 LBS.

Model ST9, Ceiling Mount

1. Turn the power to the light fixture "ON" at the wall switch if applicable. Turn the power to the lighthead "ON" at the lighthead mounted Intensity control. See figure 1-1.

NOTE

To prolong bulb life, the Sof-Start bulb protection circuit will cause a slight delay before the bulb will illuminate.

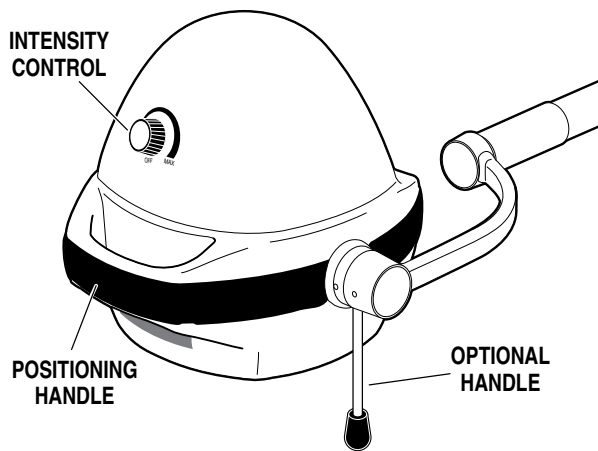


Figure 1-1. Model ST9 Lighthead

2. Using the positioning handle or the optional sterile handle, place the lighthead in the desired position. Rotate the intensity control to select the desired intensity. Refer to figure 1-2 for full positioning capabilities.

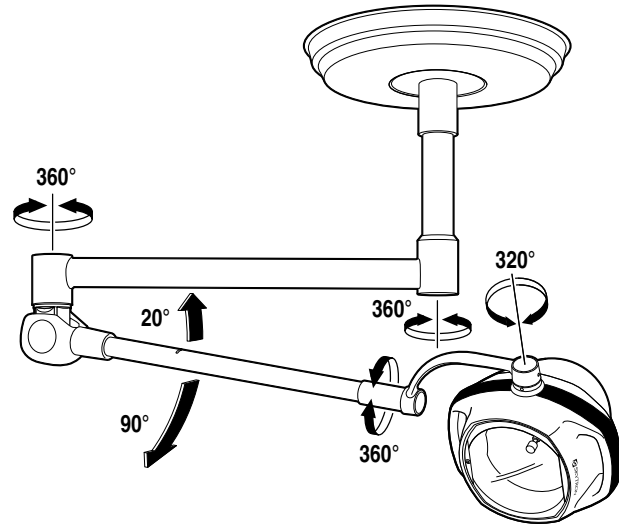


Figure 1-2. Model ST9

3. When the light is no longer required, turn the power to the light "OFF" at the lighthead mounted intensity control, return the lighthead to its full upright position and turn the power "OFF" at the wall switch if applicable.

Model ST9W, Wall Mount

1. Turn the power to the light fixture "ON" at the fixture "On/Off" switch located on the wall mount housing. See figure 1-3. Turn the power to the lighthouse "ON" at the lighthouse mounted Intensity control. See figure 1-1.

NOTE

To prolong bulb life, the Sof-Start bulb protection circuit will cause a slight delay before the bulb will illuminate.

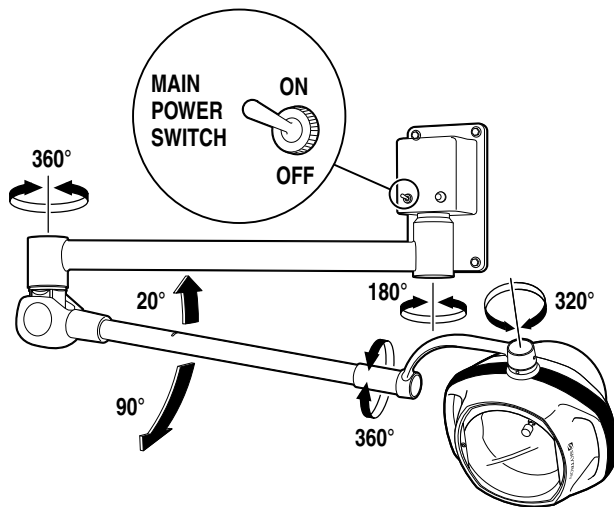


Figure 1-3. Model ST9W

2. Using the positioning handle, place the lighthouse in the desired position. Rotate the intensity control to select the desired intensity. Refer to figure 1-3 for full positioning capabilities.

3. When the light is no longer required, turn the power to the light "OFF" at the lighthouse mounted intensity control, return the lighthouse to its horizontal position against the wall and turn the power "OFF" at the fixture "On/Off" switch.

Model ST9S, Portable Stand

1. Plug the power cord into 120 VAC outlet.
2. Using the positioning handle, place the lighthouse in the desired position. Rotate the intensity control to turn the power to the fixture "ON" and select the desired intensity.

NOTE

To prolong bulb life, the Sof-Start bulb protection circuit will cause a slight delay before the bulb will illuminate.



CAUTION



Exercise caution when rolling the stand light to avoid getting caught on obstacles laying on the floor. Avoid a tripping hazard.



CAUTION



To ensure proper circuit grounding reliability and protection, always plug the fixture into a properly circuit protected electrical outlet.

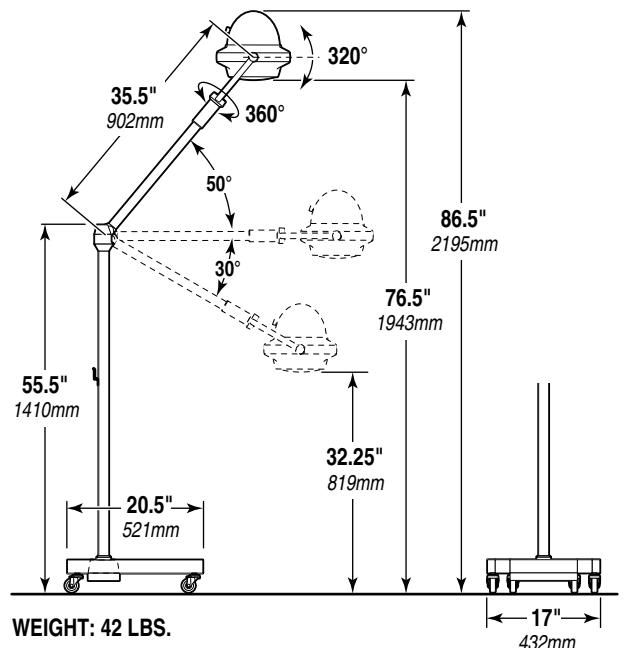


Figure 1-4. Model ST9S

SECTION II MAINTENANCE

General

To insure proper operation and extend the life of your SKYTRON examination lighting system, the following preventive maintenance procedures are recommended.

NOTE

All repairs should be made using only authorized SKYTRON replacement parts.

Daily Maintenance

Daily or between cases, the light fixture should be wiped down with a mild cleaning solution which will not affect the painted or acrylic parts.

- Before attempting cleaning, be sure power to the lighthouse is "OFF" and the fixture has sufficiently cooled.
- Avoid the use of cleaning solutions which contain high concentrations of alcohol, ethylene 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.

- Use plexi-glass cleaners, DO NOT use alcohol based cleaners on the acrylic diffusers.
- Avoid using excessive amounts of spray cleaners. Leakage of fluids into the lighthouse interior may cause corrosion of electrical components.

Semi-Annual (6-months) Maintenance

- Clean diffuser/Filter Assembly
- DO NOT operate light without the filter/diffuser in place.
- Lubricate as necessary
- Check input and bulb voltage
- Check all fastening hardware
- Perform all necessary adjustments

Adjustments

As part of a regular preventive maintenance program, it is suggested that a check of the various positioning axes be made to verify proper tension adjustments. If any lighthouse drift is noticed, all that is usually necessary is a minor adjustment. Adjustments can be accomplished following the procedures in the adjustment section of this manual.

Service

A regular program of preventive maintenance will increase the life of your equipment and keep it operating at peak performance.

Maintenance must be performed by authorized, trained maintenance personnel using SKYTRON authorized replacement parts and service techniques. Service instructions and parts are available from SKYTRON.

Preventive Maintenance contracts are available through your local SKYTRON representative.

The end of the useful life of the product is when the product can no longer be serviced to comply with IEC standards as determined by a SKYTRON authorized service representative.

Disposal Instructions

Please contact your SKYTRON authorized representative for disposal of Stellar products or parts in accordance with current environmental regulations for medical products.

To obtain service instructions, replacement parts, factory service or preventive maintenance contracts, contact the SKYTRON representative listed below.

Or contact:

SKYTRON
5085 Corporate Exchange Blvd. S.E.
Grand Rapids, MI 49512
1-800-SKYTRON (1-800-759-8766)
Fax. 1-616-656-2906

Bulb Replacement

To replace the Halogen bulb, use the following procedure:

1. Ensure electrical power to the light is "OFF" and the bulb has cooled before changing.
2. Hold the diffuser with one hand, loosen the 1/4 turn screw and lower the diffuser assembly. See figure 2-1.

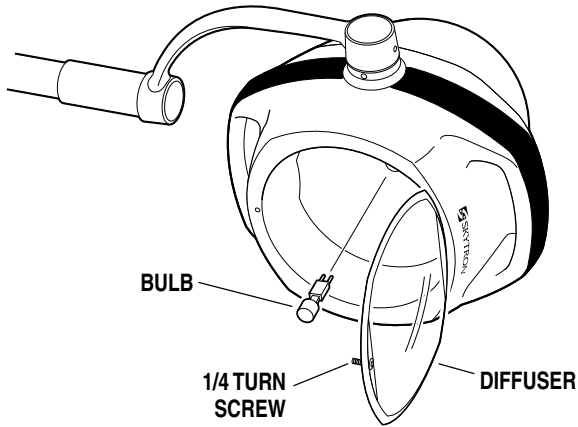


Figure 2-1.



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.

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

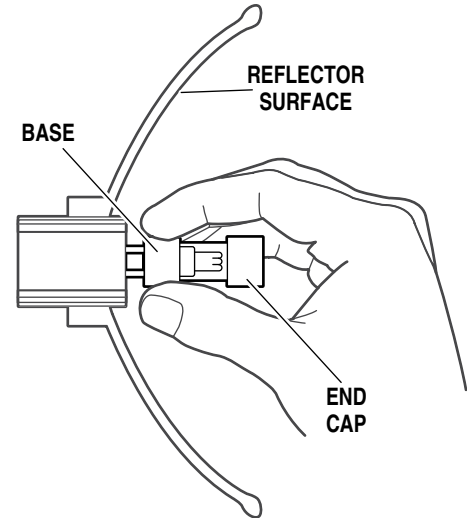


Figure 2-2.

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.

4. Holding the bulb by the base, plug it directly into the socket. DO NOT touch the glass portion of the bulb or 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.

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.

5. Replace the diffuser/filter assembly and secure with the diffuser 1/4 turn screw. DO NOT over tighten screw.

SECTION III ADJUSTMENTS

Check the light fixture axis tension adjustments by moving the lighthead through its full range of travel. See figure 3-1. All axis should move freely yet maintain any position without drifting. If an adjustment is required, use the following procedures.

NOTE

All fasteners are metric thread and require metric tools.

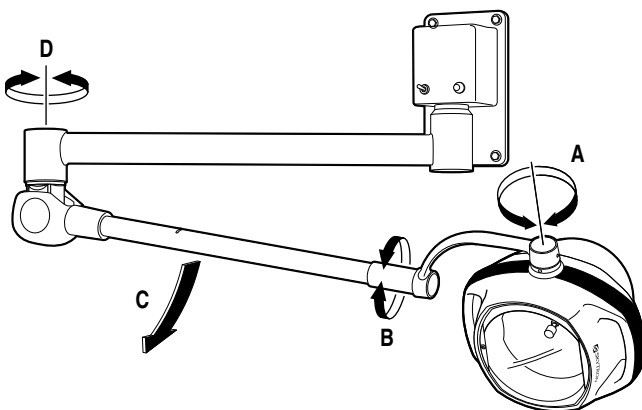
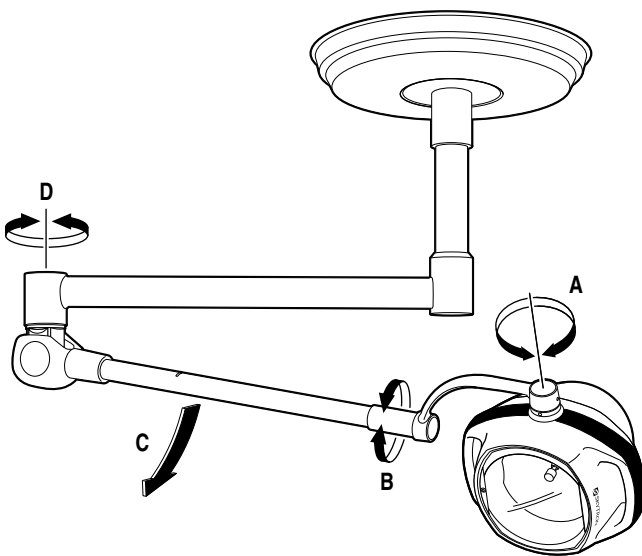


Figure 3-1. Adjustment Axis



WARNING



Disconnect electrical power to the fixture before attempting adjustments.

A. Lighthead Pitch Adjustment.

1. Locate the adjustment hole in the lighthead yoke. See figure 3-2.

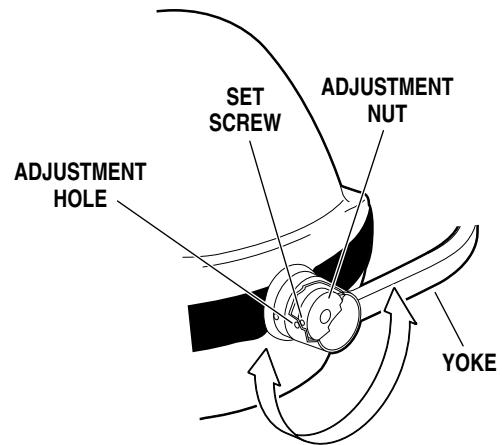


Figure 3-2. Lighthead Pitch Adjustment

2. Rotate the lighthead until a set screw is visible through the adjustment hole and loosen the set screw with an allen wrench.

3. Leave the allen wrench firmly seated in the set screw; this will hold the adjustment nut captive. Slightly rotate the lighthead clockwise (viewed from the yoke side) to decrease tension and counter-clockwise to increase tension, as necessary.

4. When proper tension has been achieved, retighten set screw and remove the allen wrench.

B. Lighthead Roll Adjustment

1. Locate the adjustment hole in the bottom of the support arm collar. See figure 3-3.



CAUTION



Be sure electrical power is "OFF"

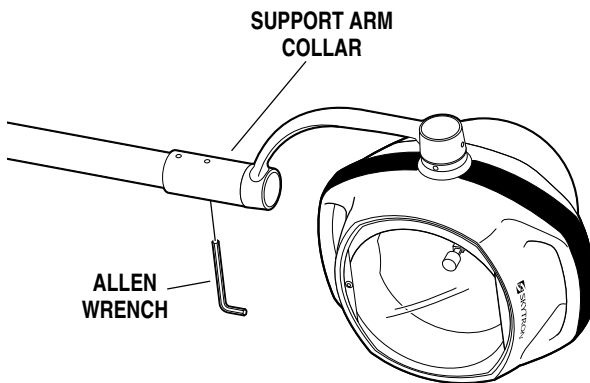


Figure 3-3. Lighthead Roll Adjustment

2. Rotate the lighthead until a set screw is visible through the adjustment hole and loosen the set screw with an allen wrench.

3. Leave the allen wrench firmly seated in the set screw; this will hold the adjustment nut captive. Slightly rotate the lighthead clockwise (viewed from the yoke side) to decrease tension and counterclockwise to increase tension, as necessary.

4. When proper tension has been achieved, retighten set screw and remove the allen wrench.

C. Vertical Travel

The vertical travel spring tension is set at the factory (ceiling and wall mount models) and should not need adjusting. However, if an adjustment is necessary, use the following procedure. See figure 3-4.

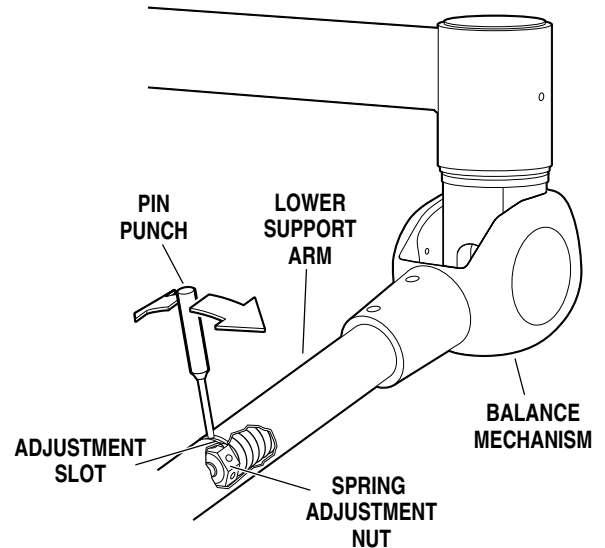


Figure 3-4. Vertical Travel Adjustment

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

2. Insert a pin punch through the adjustment slot and into one of the holes in the adjustment nut. Using the pin punch, turn the adjustment nut clockwise to increase the tension, counterclockwise to decrease the tension.

3. Test vertical travel and repeat adjustment procedure as needed.

D. Lighthead Horizontal Rotation Adjustment

The lighthead should maintain its position without drifting, yet move freely. Normally this adjustment is correct from the factory and does not change. If the lighthead drifts, the most probable cause is a non-plumb mounting hub.

Recheck the fixture mounting hub to make sure that it is plumb. In most cases this will solve any drifting problems. If not, use the following adjustment procedure to adjust the bearing preload. See figure 3-5.

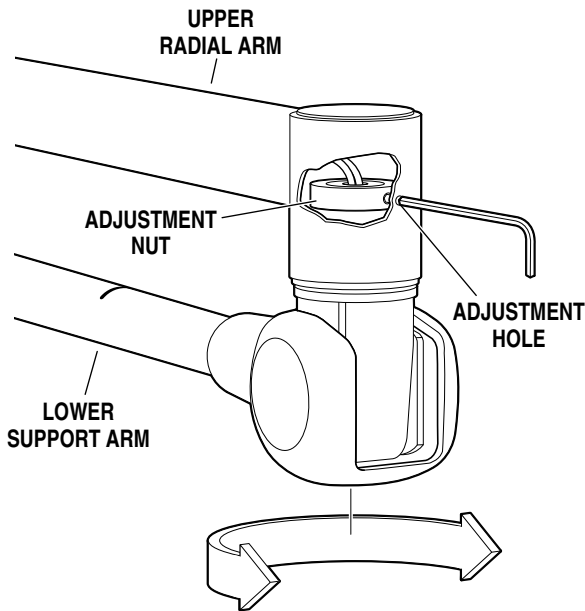


Figure 3-5. Horizontal Rotation Adjustment

1. Locate the adjustment hole and rotate the lower support arm until a set screw is visible in the adjustment nut. Loosen the set screw with an allen wrench.

2. Leave the allen wrench firmly seated in the set screw; this will hold the adjustment nut captive. Carefully rotate the lower support arm slightly. Move the arm counterclockwise (viewed from the bottom) to decrease tension and clockwise to increase the tension.

3. Tighten the set screw, remove the allen wrench and recheck the tension adjustment.

Bulb Voltage

The ST9 series is equipped with a voltage compensation device that will deliver the necessary bulb output with a voltage range of between 110VAC and 120VAC. Routine bulb voltage adjustments are not necessary if supply voltage falls within this range.

SECTION IV. REPLACEMENT PARTS

This section contains the exploded views and replacement parts lists for the serviceable components of the SKYTRON ST9 Series Lighting fixtures

Each serviceable part in these exploded views is identified by a reference number. Use this number to locate necessary part information in the parts list adjacent to the exploded view.

Always use the complete SKYTRON part number and description when ordering replacement parts.

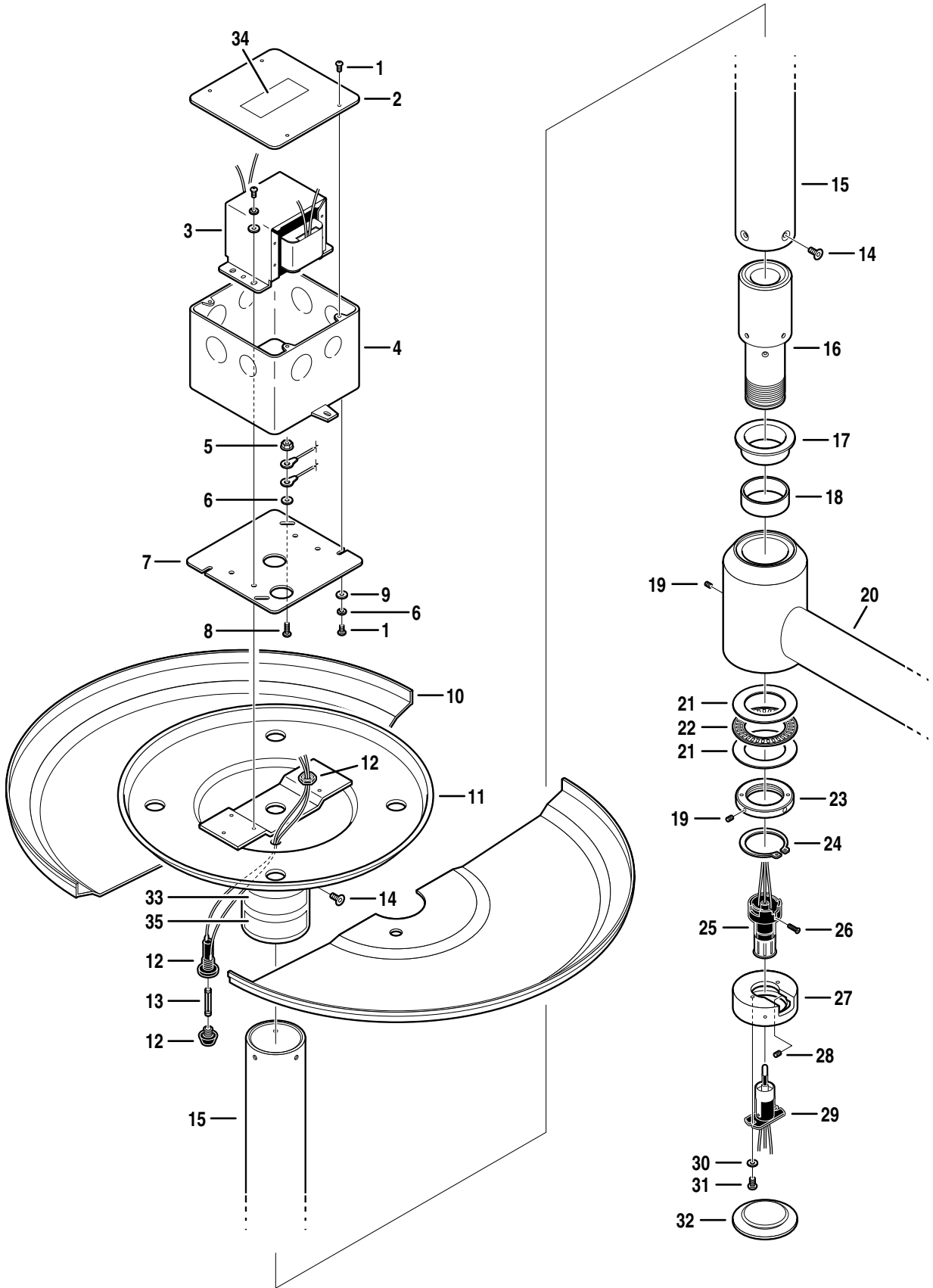
Abbreviations

As Required.....	A/R
Optional	opt
Serial Number	S.N.
Not Shown.....	NS

ST9 OPTICAL CHARACTERISTICS

Lighthouse Model		ST9
Color Temperature		3355K
CRI		95
Total Irradiance (watts/m ²)		50.0
Chromaticity	X	0.425
Coordinates	Y	0.423

1. CEILING MOUNT ASSEMBLY

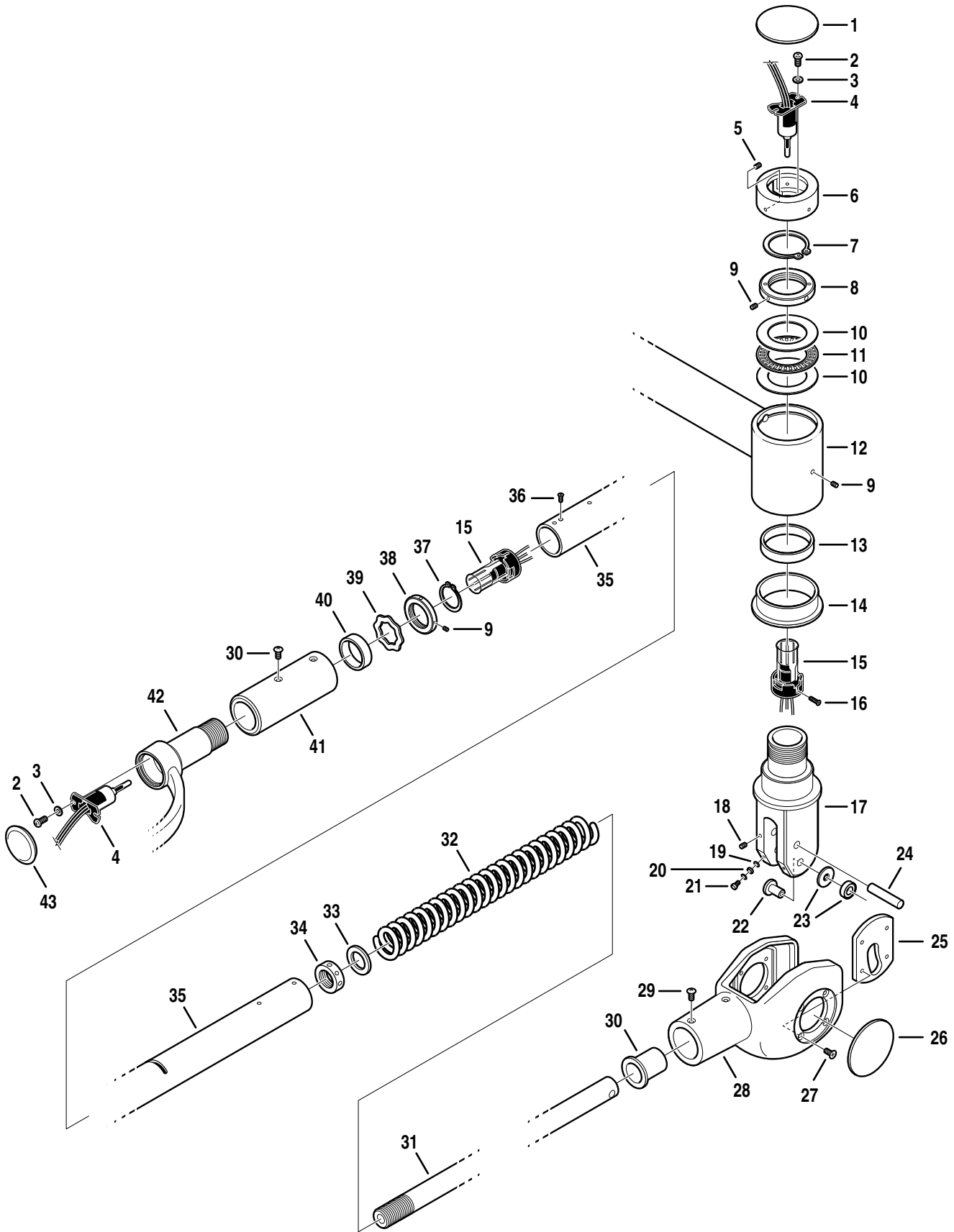


st9.0203.001

1. CEILING MOUNT ASSEMBLY

Item	Part No.	Description	Qty.
1	B5-011-03	SCREW, phillips, M4x10	A/R
2	B4-242-63	COVER, transformer housing	1
3	B4-242-72	TRANSFORMER, 80W, 25V	1
4	B4-242-03	HOUSING, transformer	1
5	B4-020-22	NUT, M4	A/R
6	B4-210-14	WASHER, lock, M4	A/R
7	B4-242-04	PLATE, transformer mounting	1
8	B9-410-09	SCREW, phillips, M4x15	A/R
9	B5-010-99	WASHER, flat, M4	A/R
10	B4-241-01	CEILING COVER	1
11	B4-241-02	MOUNTING HUB	1
12	B1-010-01	FUSEHOLDER ASSEMBLY	1
13	B4-242-64	FUSE, 1.75 A FA	1
14	B3-310-11	SCREW, allen, countersunk, M5x10	8
15	B4-241-03	VERTICAL SUPPORT TUBE (VST)	1
16	B4-241-04	PIVOT SHAFT	1
17	B4-242-05	BUSHING	1
18	B4-242-06	BUSHING	1
19	B1-010-36	SCREW, set, M4x6	2
20	B4-241-05	UPPER ARM	1
21	B4-242-08	WASHER, thrust	2
22	B4-242-09	BEARING, thrust	1
23	B4-242-10	NUT	1
24	B4-242-11	SNAP RING	1
25	B3-210-05	BRUSH BLOCK	1
26	B5-010-81	SCREW, phillips M3x10	1
27	B4-242-13	MOUNT, slip ring	1
28	B1-010-37	SCREW, set, M4x8	3
29	B3-210-04	SLIP RING	1
30	B5-010-99	WASHER, flat, M4	A/R
31	B3-220-16	SCREW, phillips, M4x8	2
32	B4-241-06	COVER	1
33	B4-242-65	DECAL, fuse type	1
34	B4-242-66	DECAL, caution	1
35	B4-242-67	DECAL, serial number	1
	B4-242-68	DECAL, Entela	1

2. BALANCE MECHANISM ASSEMBLY

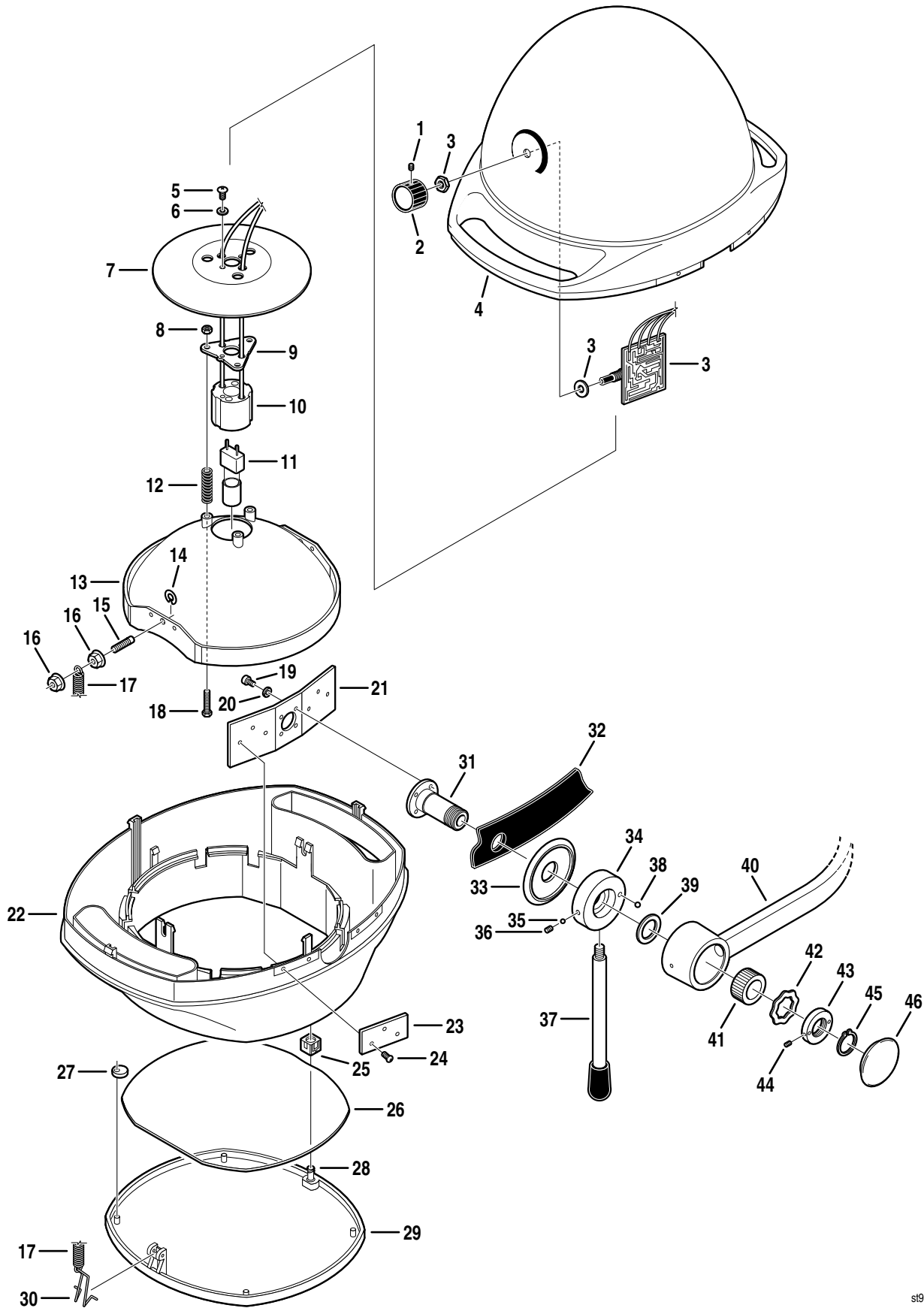


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2. BALANCE MECHANISM ASSEMBLY

Item	Part No.	Description	Qty.
1	B4-241-06	COVER	1
2	B3-220-16	SCREW, phillips, M4x8	4
3	B5-010-99	WASHER, flat, M4.....	4
4	B3-210-04	SLIP RING	2
5	B4-020-39	SCREW, set, M3x4	3
6	B4-242-13	MOUNT, slip ring.....	1
7	B4-242-11	SNAP RING	1
8	B4-242-10	NUT.....	1
9	B1-010-37	SCREW, set, M4x8	4
10	B4-242-08	WASHER, thrust	2
11	B4-242-09	BEARING, thrust.....	1
12	B4-241-05	UPPER ARM.....	1
13	B4-242-15	BUSHING.....	1
14	B4-242-16	BUSHING.....	1
15	B3-210-05	BRUSH BLOCK	2
16	B5-010-81	SCREW, phillips, M3x10	1
17	B4-241-07	JOINT, upper knuckle.....	1
18	B9-210-82	SET SCREW.....	2
19	B3-210-32	WASHER, bearing	4
20	B3-210-33	BEARING	2
21	B9-210-81	SCREW, allen, M5x25	2
22	B4-242-17	PIN, pivot	2
23	B4-242-18	WASHER & BEARING ASSEMBLY	2
24	B4-242-20	PIN.....	1
25	B4-242-21	GUIDE, bearing, left.....	1
	B4-242-22	GUIDE, bearing, right	1
26	B4-241-06	COVER	2
27	B4-242-23	SCREW, phillips, countersunk, M4x12.....	8
28	B4-241-08	HOUSING, BOM, lower.....	1
29	B5-011-03	SCREW, phillips, M4x10	4
30	B4-242-24	BUSHING.....	1
31	B4-241-09	SHAFT, balance	1
32	B4-241-10	SPRING	1
33	B4-242-25	WASHER	1
34	B4-242-26	NUT, spring adjustment.....	1
35	B4-241-11	SUPPORT ARM.....	1
36	B5-010-81	SCREW, phillips, M3x10	1
37	B4-242-27	SNAP RING	1
38	B4-242-28	NUT.....	1
39	B4-242-29	WASHER, wave	1
40	B4-242-30	BUSHING.....	1
41	B4-241-12	BEARING BODY	1
42	B4-241-13	YOKE, lighthouse.....	1
43	B4-241-14	COVER, yoke	1
	B4-242-69	WIRE, red, 14AWG.....	A/R
	B4-242-70	WIRE, white, 14AWG	A/R
	B4-242-71	WIRE, green, 14AWG	A/R

3. ST9 LIGHTHEAD ASSEMBLY

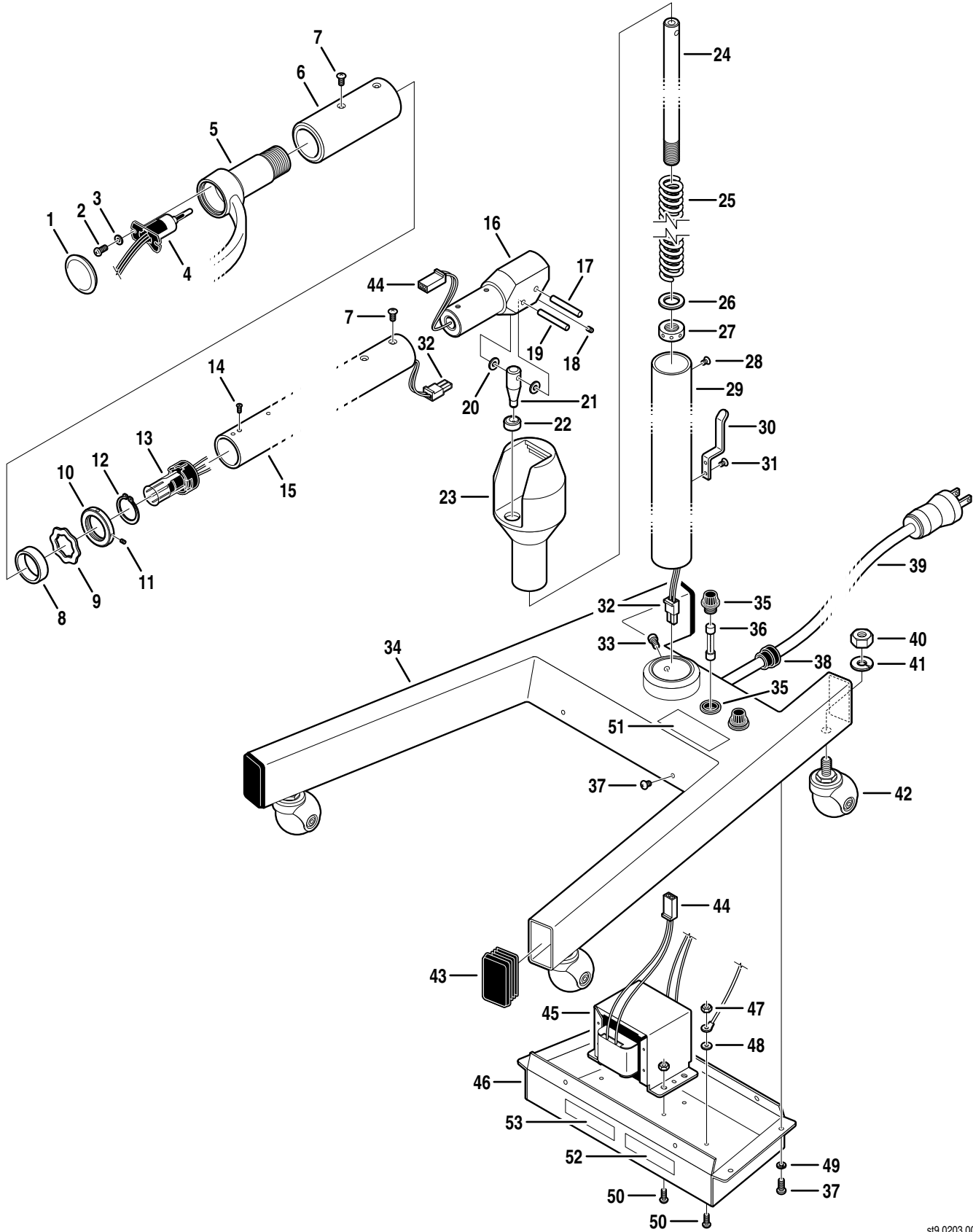


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3. ST9 LIGHTHEAD ASSEMBLY

Item	Part No.	Description	Qty.
1	B4-020-39	SCREW, set, M3x4	1
2	B9-210-20	KNOB, intensity control	1
3	B4-240-02	INTENSITY CONTROL ASSEMBLY	1
4	B4-240-03	SHELL, lighthouse	1
5	B9-410-15	SCREW, phillips, M3x25	2
6	B9-410-16	WASHER, flat, M3	2
7	B1-410-27	HEAT SINK	1
8	B9-410-17	NUT, hex, M4	3
9	B1-410-28	MOUNT, bulb socket	1
10	B1-410-29	SOCKET, bulb	1
11	B4-010-29	BULB, halogen, 24V, 75W	1
12	B1-410-30	SPRING	3
13	B1-410-31	REFLECTOR	1
14	B9-410-21	E-RING	2
15	B4-242-31	SCREW, reflector	2
16	B4-020-22	NUT, hex, M4	3
17	B4-242-32	SPRING	1
18	B9-410-22	BOLT, hex, M4x20	3
19	B4-030-19	BOLT, allen, M4x12	4
20	B4-210-14	WASHER, lock, M4	4
21	B4-242-33	PLATE, trunion	1
22	B4-240-05	FACE, lighthouse	1
23	B4-242-34	PLATE	2
24	B4-030-43	SCREW, M3x8	6
25	B1-410-37	RETAINER, 1/4 turn screw	1
26	B4-240-06	FILTER	1
27	B1-410-41	MOUNT, filter	4
28	B1-410-38	SCREW, 1/4 turn	1
29	B4-240-07	DIFFUSER	1
30	B4-242-35	SPRING, diffuser	1
31	B4-241-15	TRUNION (A)	1
32	B4-240-08	BELT	1
33	B4-240-09	COVER	1
34	B4-241-16	TRUNION (B)	1
35	B4-241-17	BALL, 4mm	1
36	B4-242-36	SCREW, cover	1
37	B4-242-02	HANDLE, sterilizable positioning	opt.
38	B4-241-18	BALL, 5mm	1
39	B4-242-37	WASHER	1
40	B4-241-13	YOKE, lighthouse	1
41	B4-242-38	BEARING, needle	1
42	B4-242-39	WASHER, wave	1
43	B4-242-40	NUT	1
44	B1-010-37	SCREW, set, M4x8	1
45	B4-242-41	SNAP RING	1
46	B4-241-19	COVER	1

4. PORTABLE STAND ASSEMBLY

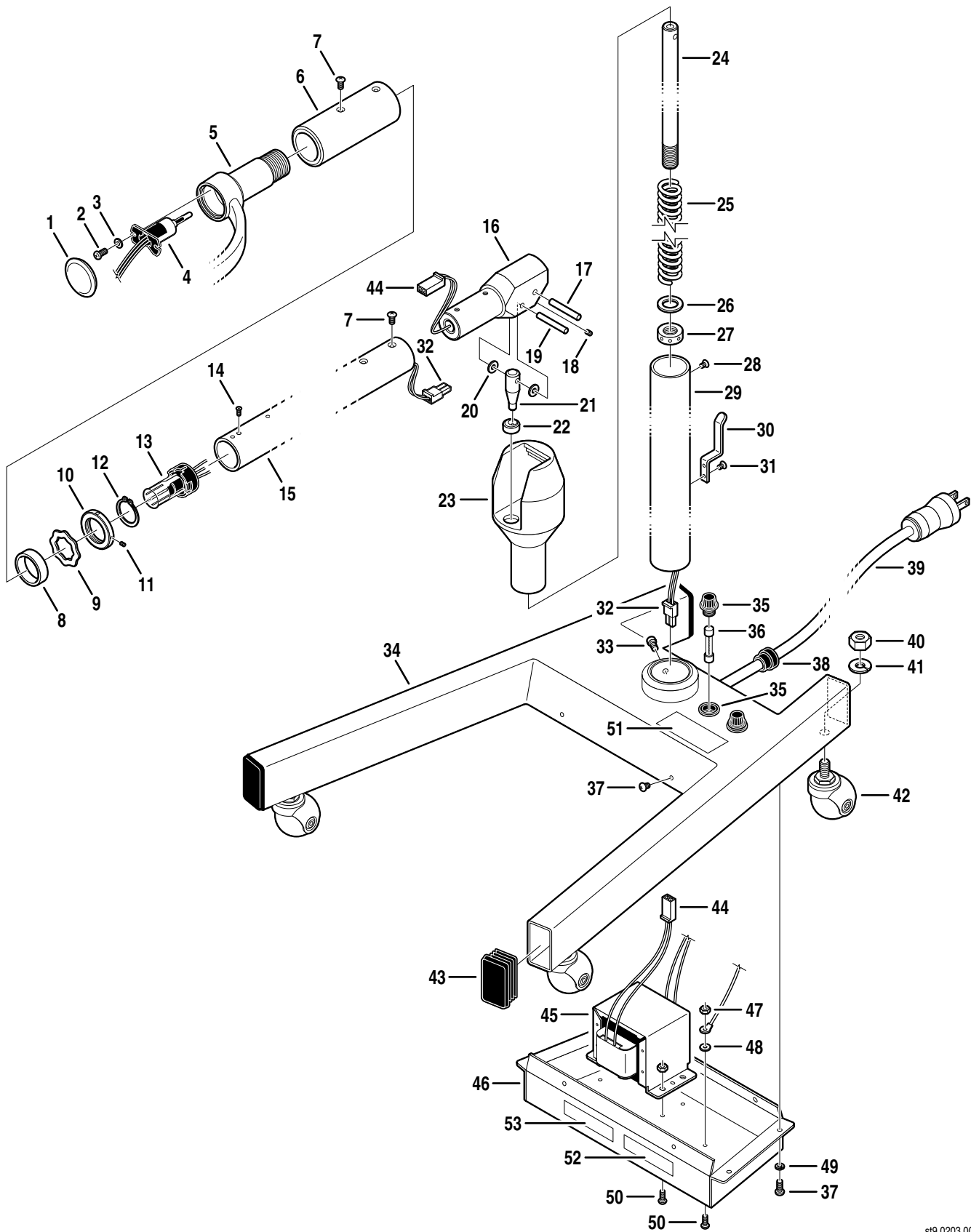


st9.0203.004

4. PORTABLE STAND ASSEMBLY

Item	Part No.	Description	Qty.
1	B4-241-14	COVER, yoke	1
2	B3-220-16	SCREW, phillips, M4x8	2
3	B5-010-99	WASHER, flat, M4.....	2
4	B3-210-04	SLIP RING	1
5	B4-241-13	YOKE, lighthouse.....	1
6	B4-241-12	BEARING BODY	1
7	B5-011-03	SCREW, phillips, M4x10	4
8	B4-242-30	BUSHING.....	1
9	B4-242-29	WASHER, wave	1
10	B4-242-28	NUT.....	1
11	B1-010-37	SCREW, set, M4x8	1
12	B4-242-27	SNAP RING	1
13	B3-210-05	BRUSH BLOCK	1
14	B5-010-81	SCREW, phillips, M3x10	1
15	B4-241-20	SUPPORT ARM.....	1
16	B4-241-21	JOINT, upper knuckle.....	1
17	B4-241-22	PIN, pivot (A).....	1
18	B1-010-37	SCREW, set, M4x8	1
19	B4-241-23	PIN, pivot (B).....	1
20	B4-242-42	WASHER, pivot pin (B)	2
21	B4-241-24	LEVER	1
22	B4-241-25	LEVER SOCKET	1
23	B4-241-26	JOINT, lower knuckle	1
24	B4-241-27	BALANCE SHAFT	1
25	B4-241-28	SPRING	1
26	B4-242-43	WASHER	1
27	B4-242-44	NUT.....	1
28	B5-011-03	SCREW, phillips, M4x10	2
29	B4-241-29	STAND POLE.....	1
30	B4-242-45	CORD HOOK.....	1
31	B5-011-03	SCREW, phillips, M4x10	2
32	B4-242-46	CONNECTOR, male, 2-pin.....	2
33	B4-211-03	SCREW, allen, M5x10	2
34	B4-241-30	BASE	1
35	B1-010-01	FUSE HOLDER ASSEMBLY.....	2
36	B4-242-64	FUSE, 1.75A, FA.....	2
37	B3-220-16	SCREW, phillips, M4x8	8
38	B4-242-47	GROMMET	1
39	B4-242-48	CORD, power	1
40	B4-242-49	NUT.....	4
41	B4-242-50	WASHER, lock	4
42	B4-242-51	CASTER	4
43	B4-241-31	COVER, base.....	4
44	B4-242-52	CONNECTOR, female, 2-pin	2
45	B4-220-25	TRANSFORMER, 80W, 25V.....	1
46	B4-241-32	HOUSING, transformer.....	1
47	B4-020-22	NUT, M4.....	5
48	B5-010-99	WASHER, flat, M4.....	A/R

4. PORTABLE STAND ASSEMBLY (continued)

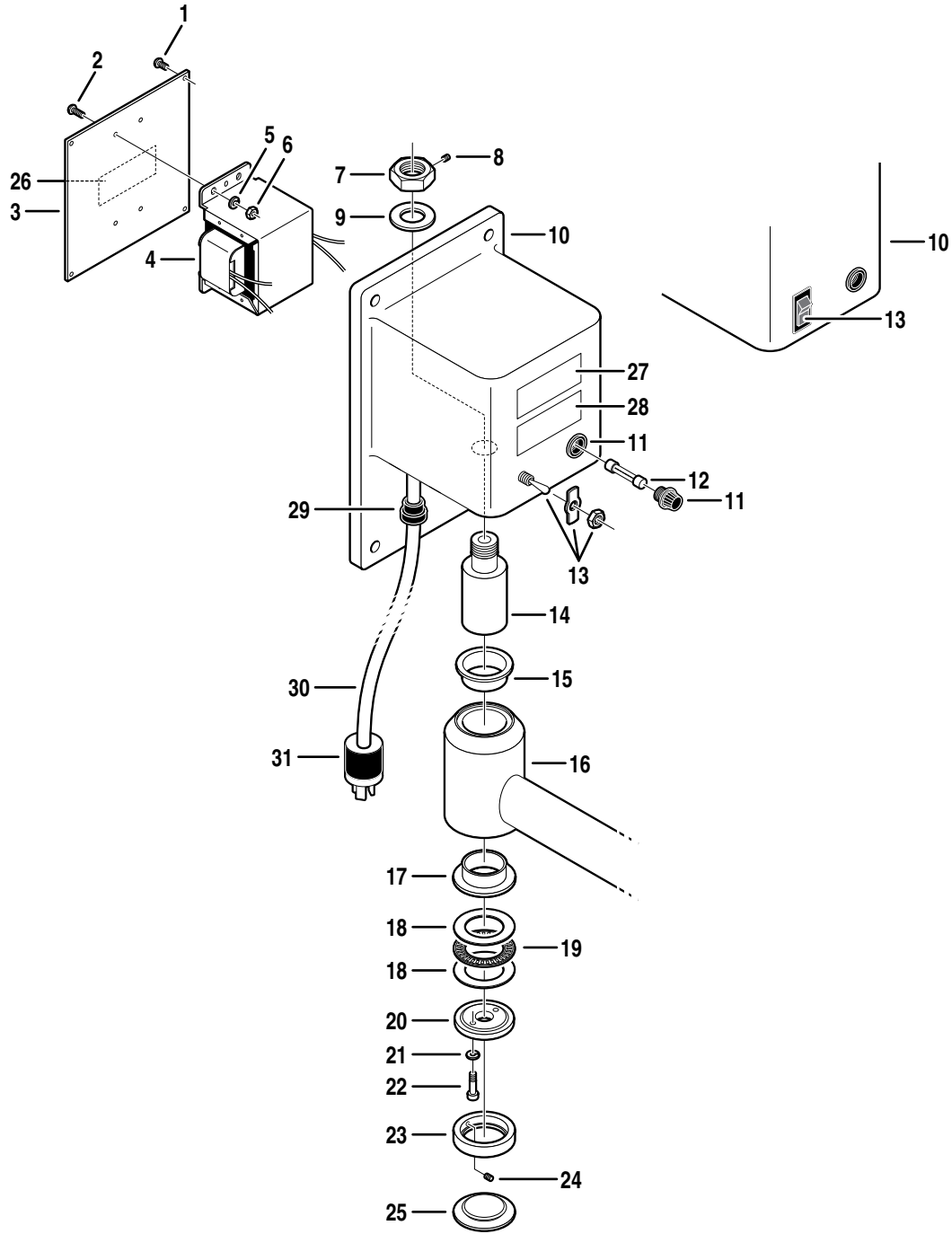


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4. PORTABLE STAND ASSEMBLY (continued)

Item	Part No.	Description	Qty.
49	B4-210-14	WASHER, lock, M4	A/R
50	B4-242-53	SCREW, phillips, M4x12	5
51	B4-242-65	DECAL, fuse type	1
52	B4-242-66	DECAL, caution	1
53	B4-242-67	DECAL, serial number	1

5. WALL MOUNT ASSEMBLY



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5. WALL MOUNT ASSEMBLY

Item	Part No.	Description	Qty.
1	B3-220-16	SCREW, phillips, M4x8	4
2	B4-242-53	SCREW, phillips, M4x12	4
3	B4-242-54	PLATE, transformer mounting	1
4	B4-220-25	TRANSFORMER, 80W, 25V	1
5	B4-210-14	WASHER, lock, M4	4
6	B4-020-22	NUT, M4	4
7	B4-242-55	NUT	1
8	B1-010-37	SCREW, set, M4x8	1
9	B4-242-56	WASHER	1
10	B4-241-33	HOUSING, wall mount, S.N. 05051769 & P.	1
	B4-241-33-1	HOUSING, wall mount, SPST switch	1
	B4-241-35	HOUSING, wall mount, DPST switch	1
11	B1-010-01	FUSE HOLDER ASSEMBLY	1
12	B4-242-64	FUSE, 1.75A, FA	1
13	B4-242-57	SWITCH ASSEMBLY, S.N. 05051769 & P.	1
	B9-210-16	SWITCH, main power, SPST, green	1
	B4-242-73	SWITCH, main power, DPST, yellow	1
14	B4-241-34	BEARING SHAFT	1
15	B4-242-58	BUSHING	1
16	B4-241-05	UPPER ARM	1
17	B4-242-59	BUSHING	1
18	B4-242-08	WASHER, thrust	2
19	B4-242-09	BEARING, thrust	1
20	B4-242-60	MOUNT	1
21	B1-240-03	WASHER, lock, M6	2
22	B4-242-61	BOLT, allen, M6x15	2
23	B4-242-62	MOUNT PLATE	1
24	B1-010-37	SCREW, set, M4x8	3
25	B4-241-06	COVER	1
26	B4-242-66	DECAL, caution	1
27	B4-242-67	DECAL, serial number	1
28	B4-242-65	DECAL, fuse type	1
29	B4-242-47	GROMMET	1
30	B4-242-74	CORD, power	1
31	B4-242-73	PLUG, twist lock	1



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