

# Installation and Operation Instructions

## Amico Hub



Read this manual before starting the work.  
This information is necessary for the safe and efficient operation of the equipment.

**A**mico

# Competency and Installation Requirements

This product is a Class 1 medical device that must be compliant to medical regulations CAN/CSA C22.2 No, 60601-2-41:2011/A2:2015-11 ANSI/AAMI ES60601-1:2005/A1:2012-08 Excluding Clause 11.7, Clause 14, and Clause 17. Certified to CAN/CSA C22.2 No. 60601-1:2014 Excluding biocompatibility (clause 11.7) and PEMS (clause 14, EMC (Clause 17).

Installation can only take place by qualified and trained individuals. An Installation Qualification Report is required as proof of system operational validation prior to clinical use. Contact Amico for installation needs.

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# 1. Introduction

Thank you for choosing the Amico Hub.

The Amico Hub integrates the iCE Series Boom System and iCE Series Central Axis System into one streamlined unit, enhancing flexibility and adaptability in operating room configurations.

## **Intended User Profile:**

- The Amico Hub is intended to be used by trained medical practitioners in operating room, procedure rooms, emergency departments, and intensive care units.
- The user must be able to read the words on the mylar control and wall control to be able to operate the Light, Boom and Pendant.
- The user must be able to understand the Instructions of the User Manual and the training provided by Amico sales staff (or other designated personnel).
- User must be able to position the Amico Pendant by pressing the appropriate button on the handle.
- User must be able to position the iCE30m Light by holding the light through the openings.

## **Intended Use:**

- The iCE30m LED Surgical Lighting System is designed to illuminate the surgical field with a cool, bright white light and an adjustable pattern size.
- The iCE Series Boom is designed to provide the facility with convenient connection to electrical power (through medical grade outlets), medical gases and other equipment mounted on the shelves.

## **Patient Criteria:**

- Age: Newborn, bariatric and geriatric
- Weight: Not relevant
- Health: Not relevant
- Nationality: Multiple
- Patient State: Patient is not a user

## **Application:**

- Environment: Operating rooms, procedure rooms, emergency departments, and intensive care units
- Physical: See Section 24 - Storage, Shipping, and Operating Environment
- Frequency of use: Several times a day
- Mobility: Central Axis is fixed to the supporting structure but the extension arm and spring arm can be moved so as to position the surgical light to illuminate the operating field. The Boom Service arms can be moved to adjust the position of the consol
- Training: Training provided by Amico sales staff (or other designated personnel) via hands-on demonstration of the equipment along with the Instructions for Use

## 2. Safety

The following summarizes all warnings and cautions related to the Amico Hub. Warnings and Cautions may be repeated through the installation and operation document.



**WARNING:** The colored safety alert symbol is used to indicate a hazardous situation that, if not avoided, could result in death or serious injury.



### **SPRING-LOADED CRUSH POINT HAZARD**

- The light is to be disconnected from the spring arm in reverse order of its assembly. This may only be carried out after the spring arm has been adjusted to a horizontal position, as the arm is under spring tension and can bounce up leading to serious injuries or physical damages.
- Never attempt to install or remove the Lighthead unless the tension screw is securely locked in place.
- Extend the spring arm and replace the tension screw to lock the arm in the extended position whenever removing the Lighthead.
- DO NOT overtighten the spring arm. Overtightening may lead to the spring arm rapidly popping up causing potential impact and pinching hazards.



### **PINCHING HAZARD**

- Pinch points are created during extreme articulation of the suspension system. Do not place hands on or near the suspension knuckle during Lighthead articulations.
- Fingers can be pinched or cut if inserted into the load adjustment window of the spring arm body. Exercise caution when making adjustments to components inside the spring arm body. The components inside will move when the spring arm is moved up or down. Do not insert fingers or tools into the load adjustment window when the spring arm moves.



### **IMPACT HAZARD**

- DO NOT remove the tension screw from the spring arm joint until the Lighthead has been securely fastened onto the spring arm.



### **PATIENT INJURY HAZARD**

- Failure to engage the light handle cover completely may result in the cover falling from the Lighthead.
- The operator must not touch part mains and patient simultaneously.
- Failure to correctly install end caps and covers drastically increases the risk components falling onto the operator or patient during use of the Amico Hub.
- Ensure the gas adapter is inserted into the correct medical gas outlet and is sealed at all times. If the problem persists, replace the gas outlet immediately.
- Never combine beams from more than two lamp heads, as the resulting irradiance at the spot can exceed 1000 W/m<sup>2</sup> resulting in a higher-than-normal temperature.

## 2. Safety



### **BIOHAZARD**

- Sterile disposables are intended for single use only. Universal precautions must be observed when disposing of any single-use disposable item.
- DO NOT use disposable handle covers if the packaging has been damaged, torn, or opened as the sterility of the cover may be compromised.
- During surgical procedures, do not use the center focusing handle unless a disposable sterile cover is installed. If the focusing light handle (metal/plastic, provided with Lighthead) is used without a disposable cover, the handle is not protected by a sterile covering. (Sterilizable handles are available through Amico Clinical Solutions Corp.)



### **PERSONAL INJURY HAZARD**

- Never perform an installation or removal of the LED light alone. Always have a second person to assist with the installation or removal.
- Ensure the system is disconnected from power before connecting electrical components.
- DO NOT attempt to replace the LED modules unless power is turned off and the Lighthead has cooled.
- DO NOT attempt to replace the lamp unless power to the Lighthead is turned off.
- DO NOT attempt to clean the Lighthead unless power is turned off and the Lighthead has cooled sufficiently.
- DO NOT attempt to adjust the suspension system. Refer to servicing to qualified service personnel.
- During operation, the LED panels attain a high temperature. Serious injury can occur if touched. Allow the lamp to cool before performing any maintenance on the Lighthead.
- The LED light may separate from the spring arm if the key is not properly in place. This may cause serious injury. Always make sure the key is installed correctly.
- Failure to comply with load specifications may cause serious or fatal injuries. Ensure that the LED light load is within the specifications.



## 2. Safety



**CAUTION:** The black and white safety alert symbol indicates a hazardous situation that, if not avoided, could result in minor or moderate injury, or damage to equipment.



### **STORAGE AND USAGE HAZARD**

- Store the Amico Hub in its package for at least 24 hours in the respective room before mounting to equalize temperature differences.
- Make sure all components are in perfect working order before every use.



### **DISPOSAL HAZARD**

- This product contains materials that may require disposal through appropriate licensed and permitted hazardous waste management firms.



### **POSSIBLE EQUIPMENT DAMAGE**

- DO NOT modify this equipment without authorization from ACS.
- Cleaning and disinfecting agents used on this lighting system must be certified by the manufacturer to be compatible with polycarbonate.
- Use only recommended cleaning/disinfecting and/or antistatic agents on the light. Use of alcohol or aerosol spray cleaner/disinfectants containing a substantial amount of alcohol in the formula can damage the polycarbonate lenses. Use manufacturer-recommended cleaners only.
- Use of any disinfectant solution other than Germicidal surface wipes and disinfecting/deodorizing/cleaning wipes may cause discoloration or deformation of the polycarbonate lens surface. Other solutions have not been tested for compatibility or effectiveness.
- Cleaners intended for use on floors must not be used to clean this equipment.
- Prevent leakage of fluids into the interior Lighthouse, do not scratch optical coating on accessible portions of optic assembly when cleaning. Always wear rubber gloves and use only a clean, white, lint-free cloth when wiping surfaces.
- DO NOT touch the glass portion of the lamp with bare fingers, skin oils can cause deterioration of material leading to possible failure of the lamp.
- DO NOT bump light heads into walls or other equipment.
- During all mounting steps, verify that wires are not pinched between spring arms or light heads.
- Avoid cross-threading brake screws, align with extreme care.
- Accessories or replacement parts not purchased from Amico are not to be used as they may negatively affect the equipment or result in equipment damage. Only connect accessories that are compatible with the Amico Boom and Pendant system.
- During the mounting of the LED lights, the entire system (including the ceiling attachment) must be disconnected from the mains. Dismounting the lights from the spring arms or dismantling the sliding contacts otherwise the main control board will be damaged.

## 2. Safety

- Use only Amico-supplied fuses. Any higher rating could cause damage to the LEDs and reduce life of the equipment.
- Connecting equipment to the multiple socket-outlet (MSO) effectively leads to creating a medical equipment (ME) system and the result can be reduced level of safety.
- DO NOT locate an additional multiple socket item when provided as a separate item on the floor.
- DO NOT connect additional MSO or extension cords to the Boom and Pendant.
- DO NOT over-tighten screws to prevent cracking the cover.
- The chain on the end cap must be securely wrapped around cables or hoses within the boom before being reinstalled. Failure to secure the endcap increases the risk of the cap falling.
- Ensure the Red line on the handle ribbon cable lines up with the red line on the ribbon cable coming through the arm. Failure to properly connect will render the handle nonfunctional.
- Use caution when removing the slip ring, damage to this component will impact the performance of the Lighthead.
- Before installation, ensure the 3P or 9P male is not pre-installed in the light yoke. Installing the Lighthead while the 3P or 9P male is installed may result in damage to critical electrical components.
- Ensure screws securing the 3P or 9P male have a locking patch and are fully installed.
- Limit stops should be set with consultation from hospital staff. If no staff is present set stops as per production drawings and so there is no risk of collision with walls or equipment.
- DO NOT rotate the arms more than 360° without setting the stops. Damage to the equipment will occur.
- DO NOT move the boom while the brake shoes are engaged.
- Increasing the spring arm height from the preset height may cause the spring arm and attached equipment to collide with the ceiling or other ceiling-mounted equipment.
- Before moving the Boom, ensure ALL equipment is secured and all obstacles are cleared from the path of motion.
- In the event of an emergency, the arms may be manually pushed out of the way without the requirement of pressing the brake release button. During regular use, the brake pads must be released to prevent wear.



### **INCREASED RISK**

- Failure to correctly install the mounting hardware will lead to the gradual loosening of the mounting fasteners which will lead to a potentially hazardous situation.
- Failure to correctly install the threaded rods and mounting hardware will lead to a potentially hazardous situation.

### 3. Installation Considerations

Please read through these installation instructions thoroughly. Inadequately installed products can lead to early degradation and endanger personnel or property.

#### **Only for trained technical specialist**

These Installation Instructions are intended for a trained technical specialist. Specialists are people who:

- Have acquired their skills through professional training and are appropriately registered (in states in which statutory regulations make such registration necessary).
- Are approved by Amico Clinical Corp. and are trained in the installation of the Boom system.
- Can assess their job and recognize the potential hazards involved based on their professional experience and instruction in the safety-relevant regulations.
- Electrical connections of the boom system may only be carried out by a qualified electrician and the equipment must be isolated from the power supply at all poles.
- The steps described in these Installation Instructions must be followed when installing the boom system. If the pendant system is damaged, installation work must stop.
- The safety, reliability, and performance of the pendant system are only assured if genuine parts from Amico Clinical Corp. are used.
- If you encounter problems that are not covered by these Installation Instructions, please contact your supplier immediately for your safety and of your customers.
- Electrical installations are required to be performed by a qualified electrician. All persons performing electrical tasks must comply with national and international regulations while equipment is disconnected from power mains.
- In the event of damage to the Amico Hub or any of its components during the installation, all assembly work must stop immediately. Contact the supplier for assistance if the level of damage is unclear.

#### **Requirements before installation**

The load-bearing capacity of the ceiling must be checked by a structural engineer and confirmed in a declaration of acceptance.

- The electrical installations of the room must conform to the national regulations.





#### **Unauthorized changes or modifications**

Unauthorized changes or modifications to the Amico Hub are not permitted for safety reasons. Unauthorized changes or modifications will void the manufacturer's guarantee for the pendant system. The manufacturer hereby rejects any liability whatsoever for damage or injury resulting from unauthorized changes or modifications or from using spare parts from other manufacturers.

- The use of parts not supplied by the manufacturer or the manufacturer's agents will void the manufacturer's warranty for the boom system.







## 4. Product Symbol Definitions

### 4.1 SYMBOLS USED IN THIS MANUAL










Symbol	Reference	Title
	ISO 7010-W001	General Warning Sign
	ISO-7010-M002	Refer to Instruction Manual/Booklet
	ISO 7000-0434B	Caution
	ISO 7000 – 3082	Manufacturer

### 4.2 LABEL SYMBOLS

The following symbols can be found on labels on different components of the Amico Hub. Not all system configurations will include all symbols.

Symbol	Reference	Title
	ISO 7000-0434B	Caution
	ISO 7000 – 3082	Manufacturer
	ISO 7000-2497	Date of Manufacture
	ISO 7000-1641	Operator's Manual
	ISO 7000-2493	Catalogue Number
	ISO 7000-2498	Serial Number

## 4. Product Symbol Definitions

Symbol	Reference	Title
	ISO 7010-W001	General Warning Sign
	ISO 7010-W024	Warning; Crushing of Hands
	ISO 7010-W020	Warning; Overhead Obstacle
	ISO-7010-M002	Refer to Instruction Manual/Booklet
	ANSI Z535.4	Electrical Hazard
	ANSI Z535.4	Keep Hands Clear
	EN 50419	WEEE; The product must not be disposed of as unsorted municipal waste but should be collected separately.
	MET-C	MET-C Product Certification
		Class 1 Medical Device

## 5. Equipment Standards and Specifications

### 5.1. STANDARDS

#### 5.1.1. iCE30m LED

The iCE30m LED Series Surgical Lights are designed to comply with the following standards.

<b>Standard(s):</b>	IEC 60601-1 edition 3.1 CAN/CSA-C22.2 No. 60601-1 ANSI/AAMI ES 60601-1 IEC 60601-1-6 IEC 60601-2-41
<b>Product:</b>	Surgical Light
<b>Brand Name:</b>	Amico
<b>Models:</b>	iCE30m 160

#### 5.1.2. iCE Series Boom and Pendant

The iCE Series Boom and Pendant are designed to comply with the following standards.

<b>Standard(s):</b>	EMC to IEC 60601-1-2 4th edition EN 60601-1-2006/A1-2013 EN ISO 14971-2013 EN ISO 11197:2016 CAN/CSA-C22.2 No. 60601-1-2014:03 ANSI/AAMI ES 60601-1:2005/A1:2012
<b>Product:</b>	Amico Series Boom and Pendant
<b>Brand Name:</b>	Amico
<b>Models:</b>	LP; PLP

## 5. Equipment Standards and Specifications

### 5.2. TECHNICAL DATA

#### 5.2.1. iCE30m Lighthead

Performance	Units	Value
Lighthead Diameter	in (cm)	30 (76)
Light Intensity (Central Luminance)	lx (fc)	160,000 (14,870)
Brightness Control	%	50 - 100 (5% in Endo Mode)
Light Field Diameter	in (cm)	7.6 - 12 (19 - 31) <sup>1</sup>
Depth of Illumination (L1+L2) at 60%	in (cm)	16.8 (42.7)
Color Rendering Index (Ra)		97 <sup>2</sup>
R9		>90
R13		>97 <sup>2</sup>
Color Temperature	K	3500/4000/4500/5000 <sup>3</sup>
Shadow Dilution		
Single Mask	%	63
Double Mask	%	52
Cavity	%	99
Single Mask with Cavity	%	61
Double Mask with Cavity	%	50
Number of LEDs (main)		80
Number of Other LEDs		320
LED Service Life	Hours	L70>60,000
Total Radiant Power at Max Intensity	W/m2	515
Power Consumption at Lighthead	w @ 24 VDC	50
Electricity (VAC)		Universal VAC
Emergency Bypass		Yes
Mounting Options		Ceiling/Wall/Mobile Stand
Certificates		MET

All tests conducted per 60601-2-41 standard • <sup>1</sup>LFD has a tolerance of 5% • <sup>2</sup>CRI has a tolerance of 2.5%

• <sup>3</sup>CCT has a tolerance of 15%

Upon request, Amico Clinical Corp. will make available the circuit board diagrams, component parts list, descriptions, calibration instructions or other information that will assist service personnel in conducting repairs to the iCE30m.

Recommended training for safe use of the iCE Light is approximately 30 minutes for users and two (2) hours for biomedical staff.

## 5. Equipment Standards and Specifications

### 5.2.2. iCE Series Boom

<b>Arm Length</b>	1200mm, 1400mm
<b>Console Heights</b>	20" to 60"
<b>Console Sizes</b>	12.5" x 9" / 14" x 12.5" / 18" x 12.5" / 18" x 9"
<b>Rotation</b>	Up to 340 Degrees
<b>Rails</b>	Eight (8) rails for mounting accessories
<b>Shelves</b>	Up to four (4) shelves (shelf wight rating up to 150 lbs)
<b>Drawers</b>	Up to two (2) draws mounted per shelf (drawer weight rating up to 25 lbs)
<b>Input Voltage</b>	120-240 VAC
<b>Power Consumption</b>	200 W
<b>Switch Operation</b>	Momentary
<b>Braking System</b>	Brake switches are provided on the ergonomic control handle on the console along with simplified diagram
<b>Brake type</b>	Spring actuated friction brake
<b>Torque</b>	520 lbs-in
<b>Maximum Weight Load</b>	400 lbs <sup>1</sup>
<b>Customization</b>	Up to 8 Services, med gas or electric circuit. Additional data, blank provisions and custom cut-outs available

<sup>1</sup>Maximum loads are depended on the system configuration.



## 6. Pre-Install Instructions

### 6.1. PRE-INSTALL REQUIREMENTS

The load bearing capacity of the ceiling and mounting structure must be checked by a structural engineer and confirmed in a declaration of acceptance.

All Applicable requirements and testing must be completed prior to installation.

Applicable requirements include:

- Mounting Structure Test Jig, Test Report
- Medical Gas Piping Installation, Testing and Certification
- Electrical Services Provided and Certified
- Light Fixture Wall Control and Wiring (if applicable)



Refer to “Pre-Installation Kit Package - Single Mount - Booms”

### 6.2. REQUIRED TOOL LIST

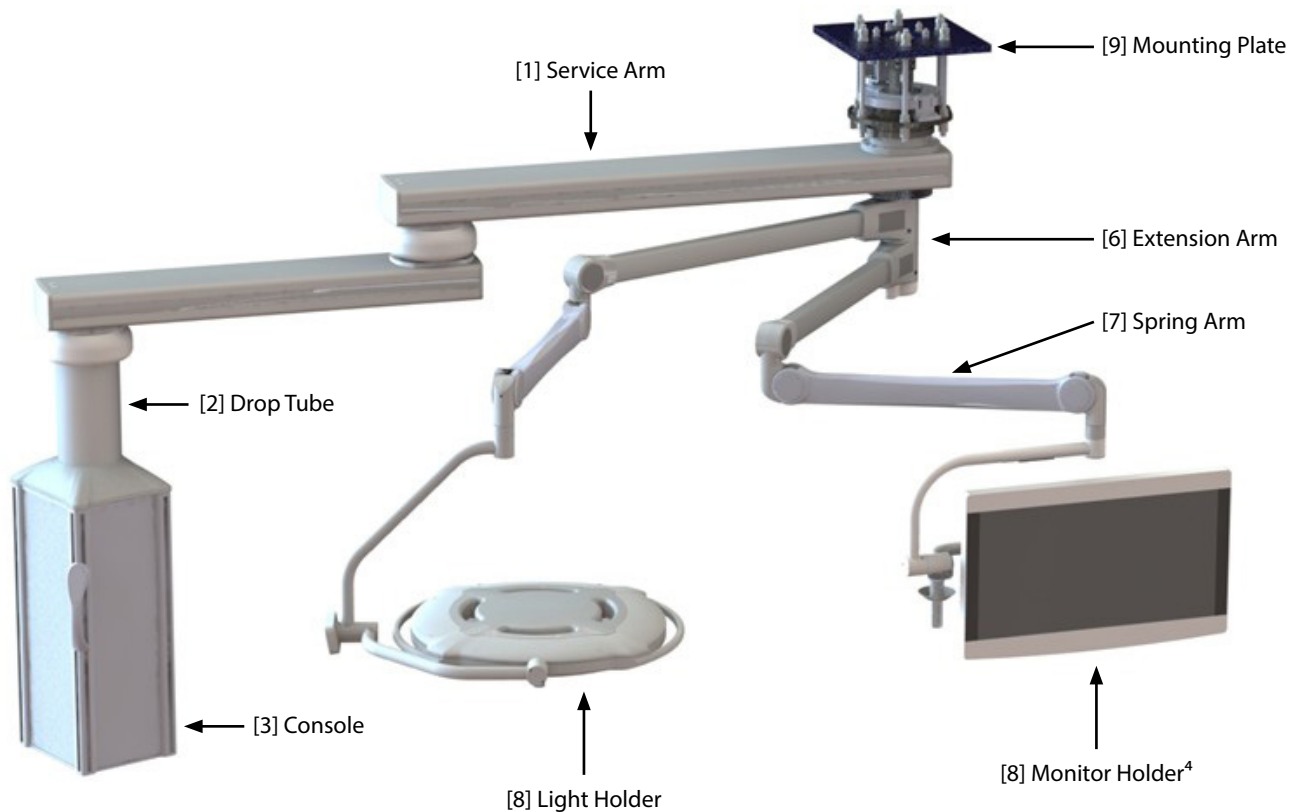
- Safety Shoes
- Safety Gloves
- Genie Lift
- 8' Ladder
- Digital Level
- Tape Measure
- 2x Adjustable Wrench 15/16”
- Metric Allen Key Set
- Imperial Allen Key Set
- Flat Head Screw Driver
- Philips Head Screw Driver
- Spring Puller

All tools and devices employed during the installation of this fixture must be calibrated to original manufacturer’s specifications.

## 7. Components and Scope of Delivery

Each skid contains one full system. The number of systems and skids contents varies between projects. The production package should always be referenced to ensure the correct product is being installed.

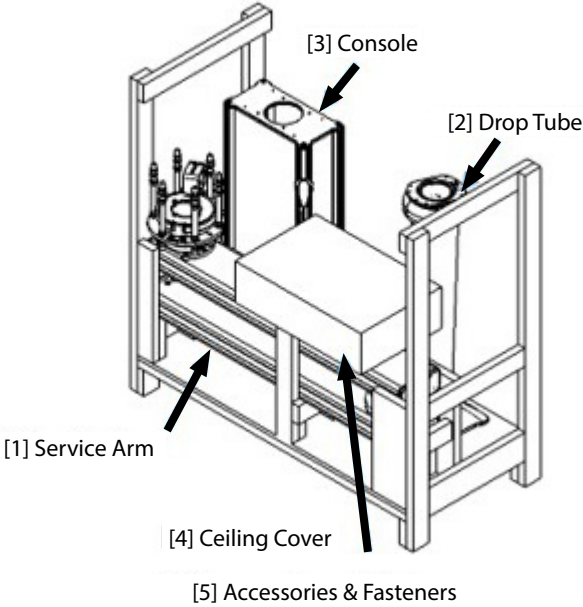
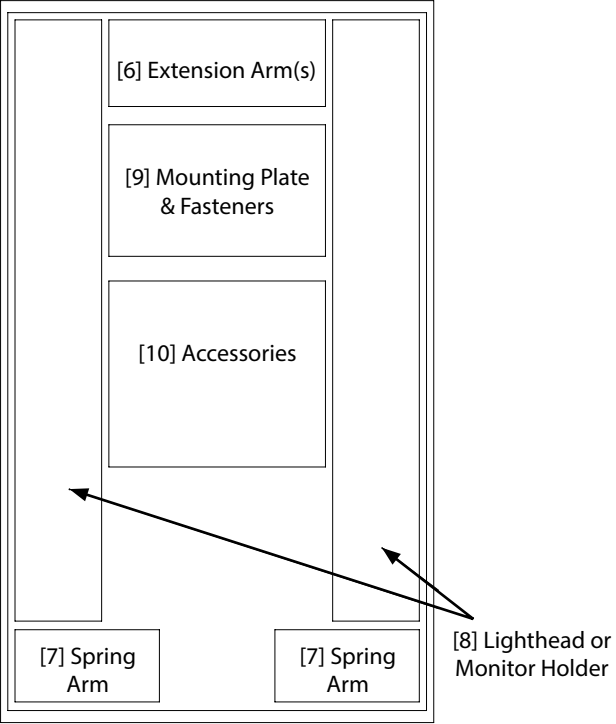
The following is a general overview of what is included in each skid and may vary between projects.



<sup>4</sup>Monitor is not included

**NOTE:** System configuration and included components will vary between projects.

## 7. Components and Scope of Delivery

	
<p>[1] Service Arm:</p> <ul style="list-style-type: none"> <li>• Dual Normal Arm</li> <li>• V-Series</li> </ul> <p>[2] Drop Tube (0 - 48")</p> <p>[3] Console:</p> <ul style="list-style-type: none"> <li>• Equipment Console</li> <li>• Hammer Head Console</li> <li>• Anesthesia Console</li> </ul> <p>[4] Ceiling Cover</p> <p>[5] Fasteners and Accessories</p>	<p>[6]: Extension Arm(s):</p> <ul style="list-style-type: none"> <li>• Single Central Axis</li> <li>• Dual Central Axis</li> <li>• 1-2 Extension Arms</li> </ul> <p>[7]: Spring Arm(s)</p> <p>[8]: Light Head or Monitor Holder</p> <ul style="list-style-type: none"> <li>• Light Head</li> <li>• Single Monitor Holder</li> <li>• Dual Monitor Holder</li> </ul> <p>[9] Mounting Plate and Fasteners</p> <p>[10] Accessories</p>

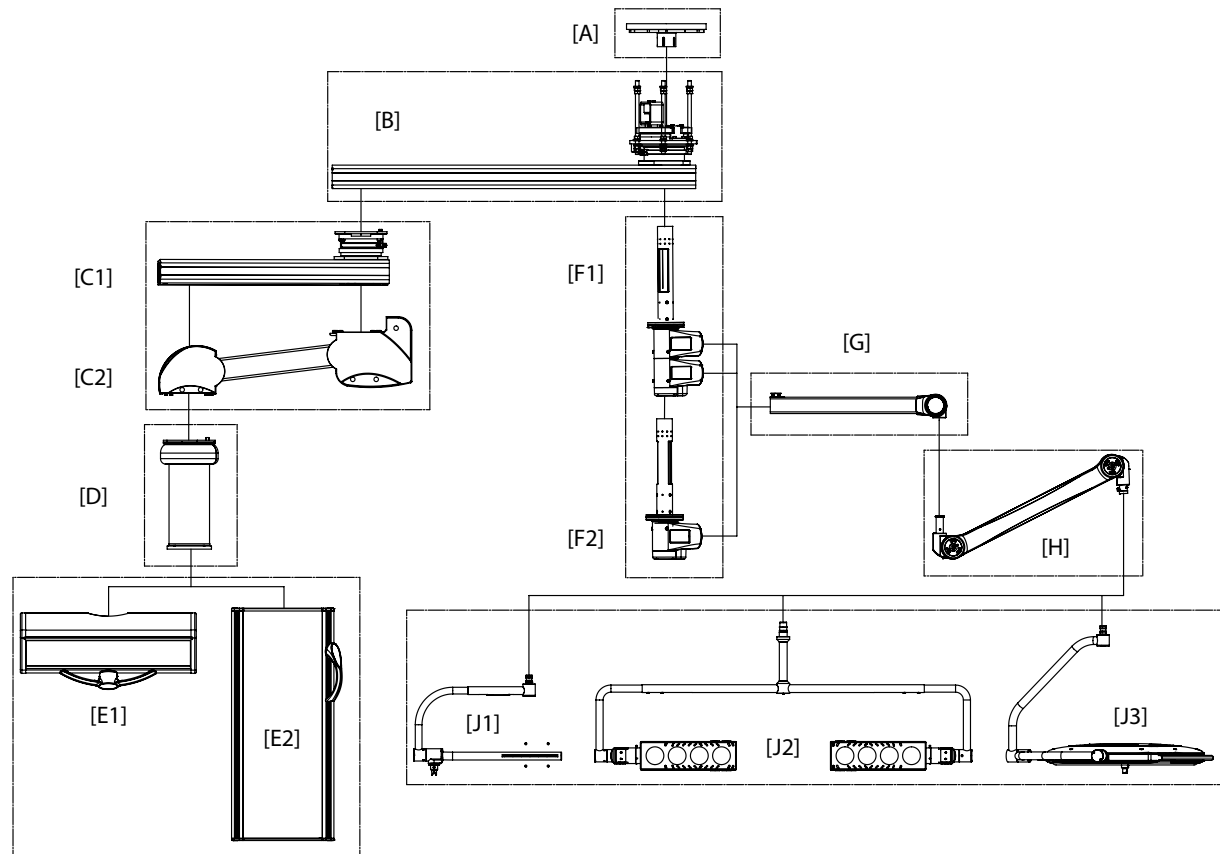
**NOTE:** Packaging contents and orientation will vary slightly between projects.



**HAZARD:** A Genie Lift must be used to lift and move the service arms.

## 8. System Configurations and Installation Sequence

Each Amico Hub consists of both a Boom and Light/Monitor System. The Boom system consists of a fixed height [B & C1] or adjustable height [B & C2] boom arm with either a hammer head [E1], or equipment [E2] console (shelves optional). The lighting system consists of either a dual [F1] or single [F2] system, an extension arm [G], adjustable height spring arm [H] and either a single monitor holder [J1], dual monitor holder [J2] or surgical light [J3].



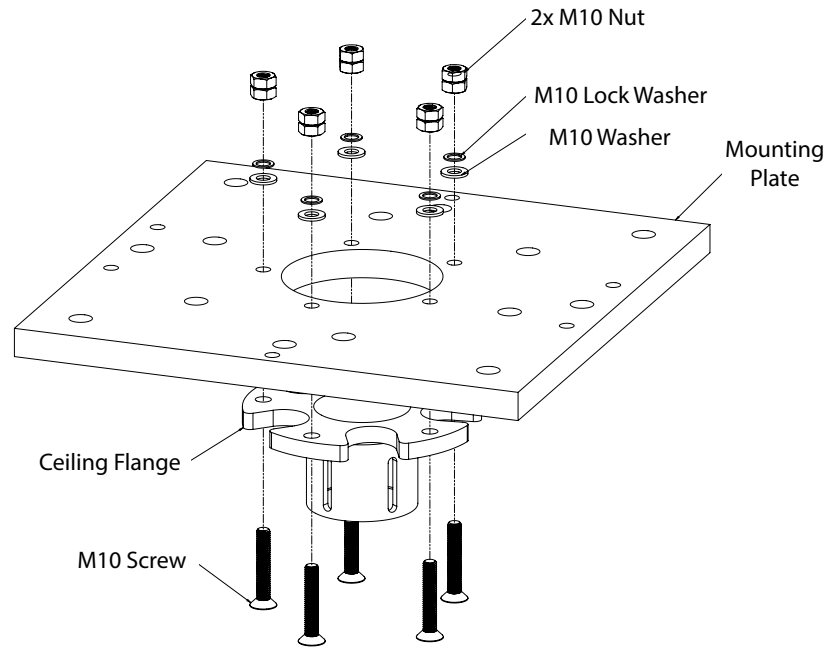
Step	Perform Instructions in	Item Above	Page
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**NOTE:** Components B & C come pre assembled based on project requirements. Components F & G come pre assembled based on project requirements.

## 9. Installing The Mounting Plate

### 9.1. STANDARD INSTALLATION

1. Align the five holes of the central axis flange with the corresponding 5 holes on the Mounting plate.
2. Secure in place with the provided mounting hardware:
  - 5 x M10 Flat head screw
  - 5 x M10 washer
  - 5 x M10 Lock Washer
  - 10 x M10 Nut



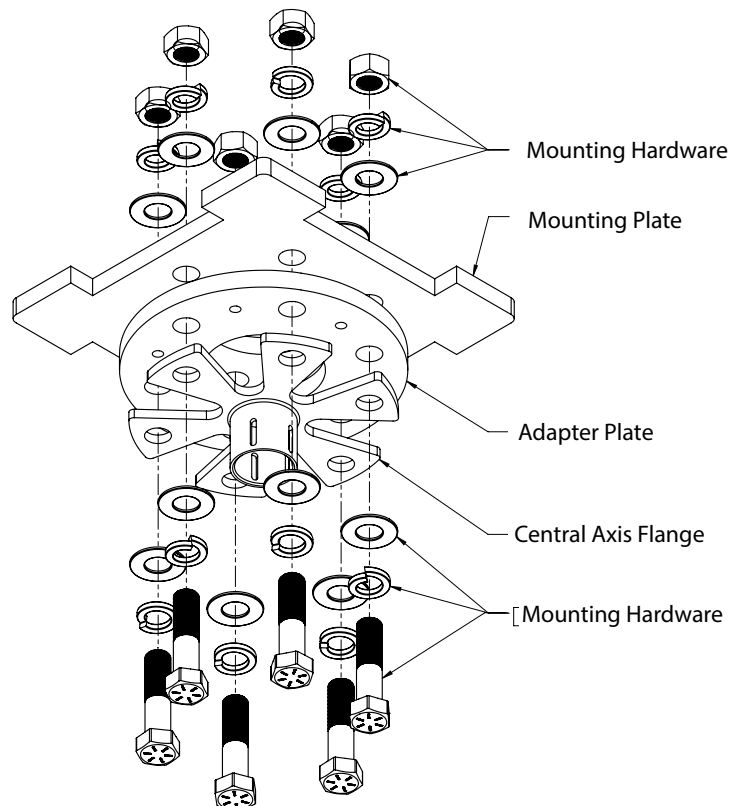
**CAUTION:** Failure to correctly install the mounting hardware will lead to gradual loosening of the mounting fasteners which will lead to a potentially hazardous situation.

### 9.2. RETROFIT INSTALLATION

Retrofits do not include the Amico Universal Anchor Plate. Instead, a custom adapter plate and custom sized central axis flange is used.

1. Align the 6 holes on the central axis flange with the 6 through holes on the adapter plate.
2. Raise both plates up and align with the corresponding holes on the Mounting plate.
3. Secure in place with the provided mounting hardware.

**NOTE:** Mounting hardware will vary between projects depending the existing mounting plate configuration.



## 10. Installing the Service Arms



**HAZARD:** A Genie Lift must be used to lift and move all boom components.

### 10.1. STANDARD INSTALLATION

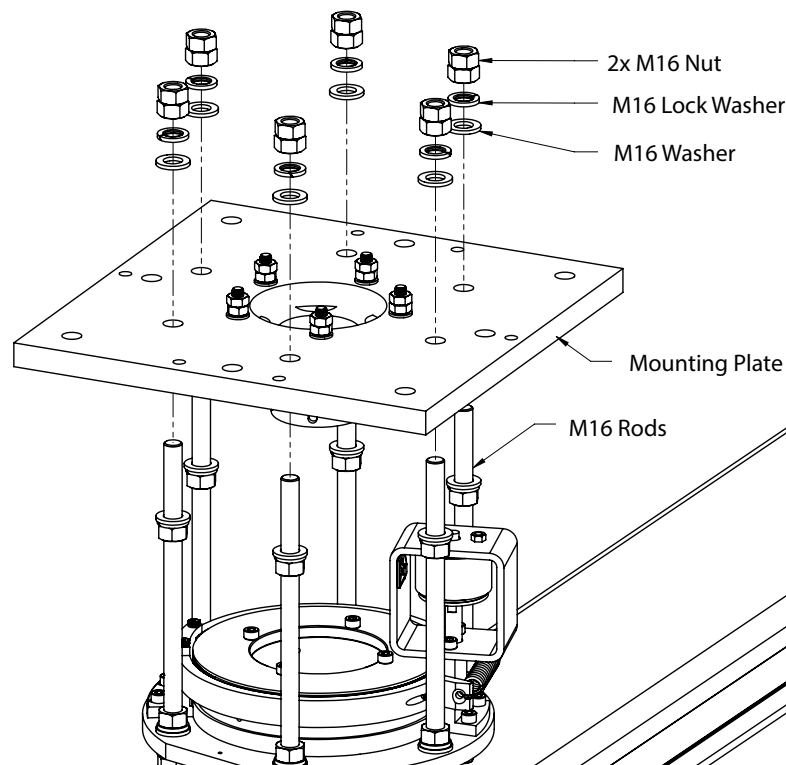
1. Raise the service arm up and align the 6 rods on the service arm with corresponding 6 holes on the mounting plate.

**NOTE:** Ensure that there is already one washer, one lock washer, and one nut on each of the rods prior to raising the arm.

2. Secure the 6 rods with the provided hardware:
  - 6x M16 Washer
  - 6x M16 Lock Washer
  - 12x M16 Nut
3. Adjust the height of the ceiling bearing such that the top of the service arm is at the correct height relative to the ceiling as per the production package.
4. Adjust the level of the system so that it is leveled within  $0.1^\circ$  in all planes.

**NOTE:** A digital level must be used and measured by going across the center of the ceiling bearing in all panels (3, 6, 9, and 12 o'clock positions).

5. Check that all lock washers are fully compressed.



# 10. Installing the Service Arms



**HAZARD:** Failure to correctly install the mounting hardware will lead to gradual loosening of the mounting fasteners which will lead to a potentially hazardous situation.

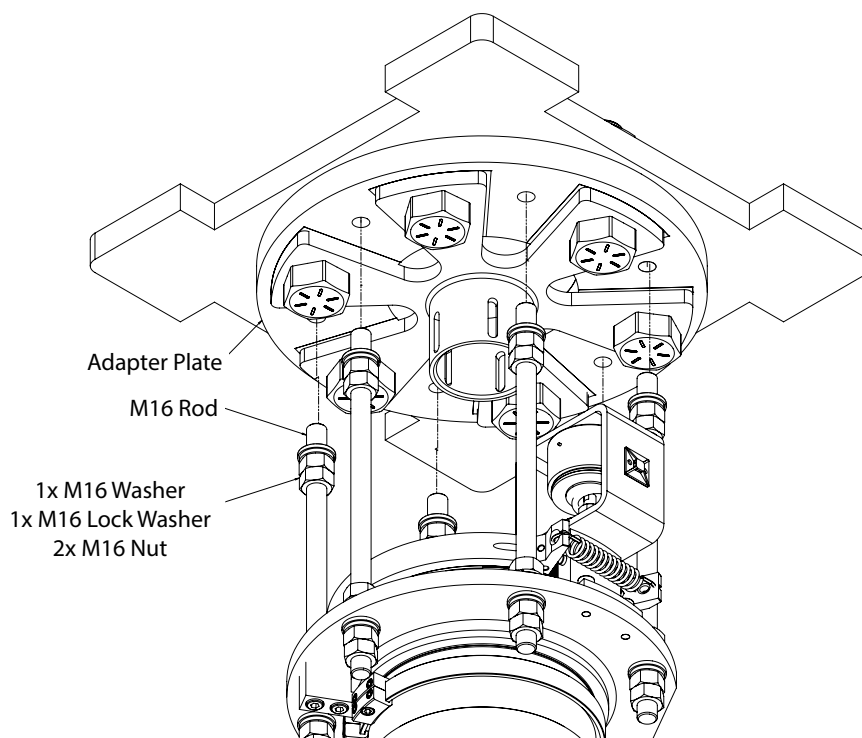
**NOTE:** Top of the ceiling flange must be within 7.5"-8.9" from the bottom of the mounting plate.

## 10.2. RETROFIT INSTALLATION

1. Raise the service arm up and align the 6 rods on the service arm with corresponding 6 holes on the adapter plate.

**NOTE:** Ensure that there is already one washer, one lock washer, and one nut on each of the rods prior to raising the arm.

2. Screw the 6 rods into the adapter plate until they make contact with the mounting plate on the opposite side.
3. Secure in place with the washer, lock washer, and nuts ensuring all lock washers are fully compressed.
4. Adjust the height and level of the boom by adjusting the mounting hardware at the bearing flange.



**HAZARD:** Failure to correctly install the threaded rods and mounting hardware will lead to a potential hazardous situation.

**NOTE:** A digital level must be used and measured by going across the center of the ceiling bearing in all planes (3, 6, 9, and 12 o'clock positions).

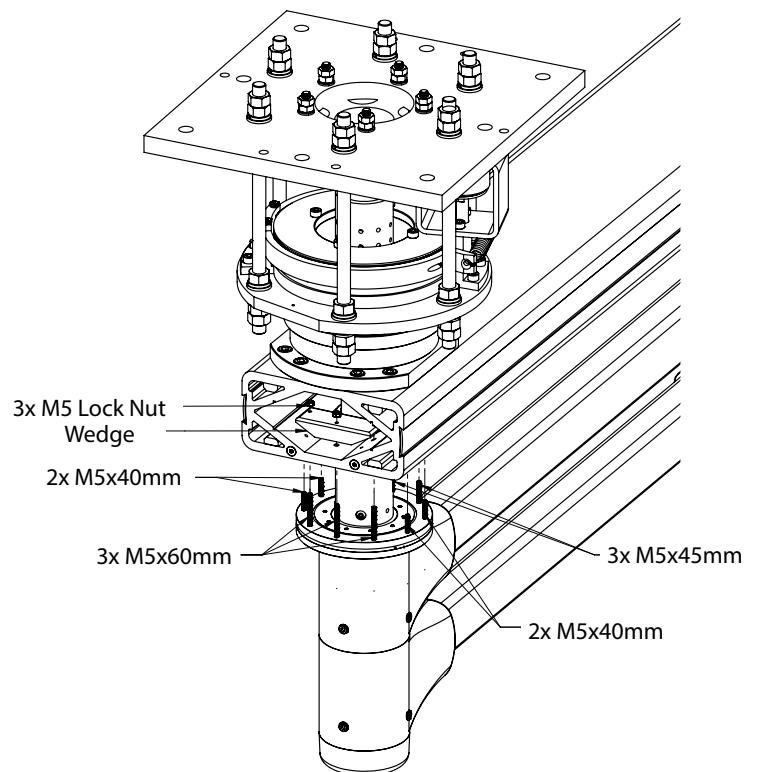
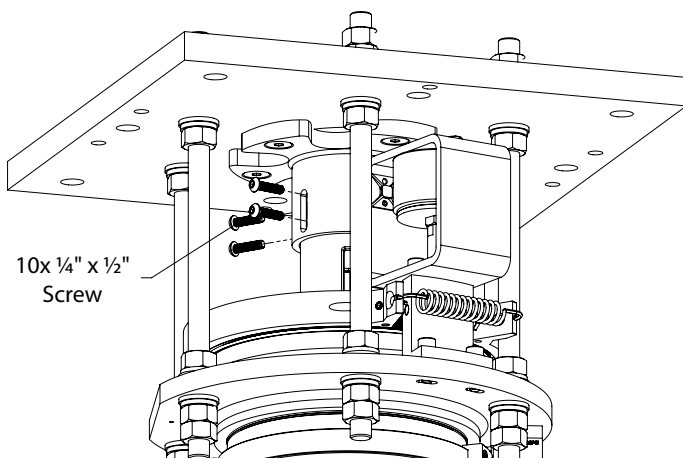
**NOTE:** Top of the ceiling flange must be within 7.9"-9.1" from the bottom of the adapter plate.

# 11. Installing the Extension Arms

1. Raise the Central Axis and Extension arms up through the ceiling bearing of the boom and into the ceiling flange.
2. Install three (3) M5x45mm screws in the three holes furthest from the end cap.
3. Install four (4) M5x40mm screws in the four holes closet to the long edges of the extension arm (2 per side).
4. Remove the end cap and place the wedge over the three (3) holes closest to the end of the extension arm.
5. Install the final three M5x60mm screws through the bearing and wedge. Secure each with an M5 lock nut.
6. Reinstall the endcap.
7. Secure the central axis to the central axis flange with ten (10) ¼"-20 x 0.5" screws.

**NOTE:** Loosely install all screws prior to tightening. Tighten in a star pattern.

**NOTE:** The Solenoid may have to be removed to improve access to two (2) of the screws.

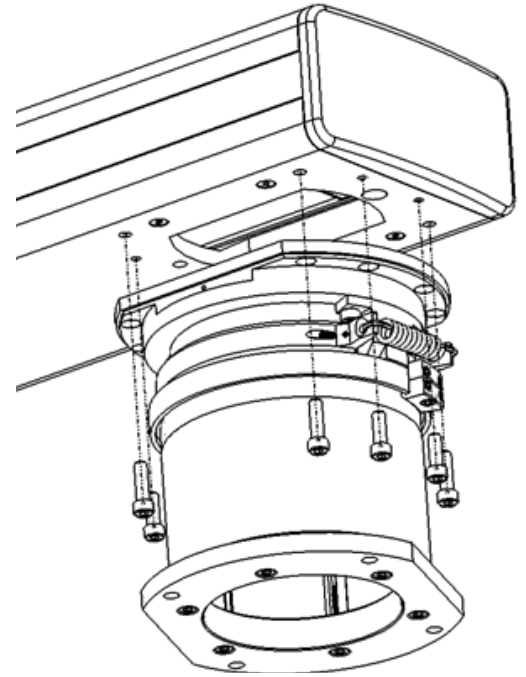




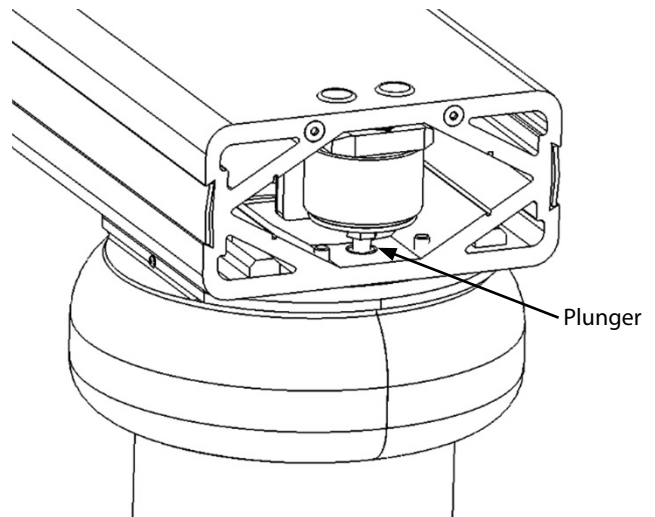
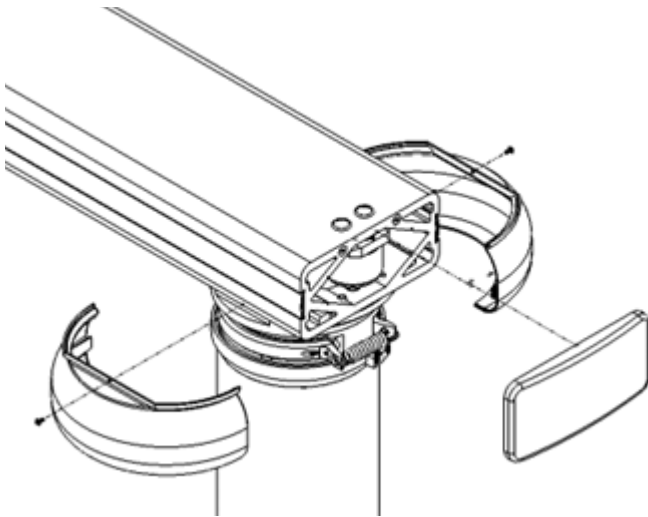
## 12. Installing the Drop Tube

1. Line up the drop tube below the service arm such that the spring is facing outwards.
2. Secure in place using eight (8) M8 Lock Washers four M8x30mm Screws on the outer holes and four (4) M8x25mm screws on the inner holes. For a V-Series Arm M8x16mm screws will be used on all locations.
3. Remove the end cap to access the solenoid. Screw in the top of the plunger to the bottom of the solenoid.
4. Install the Bearing Covers by clicking both sides together around the bearing and securing with a Flanged button head screw.

**NOTE:** Prior to installing covers check that the limit stoppers are set in the correct position (Section 18.1).



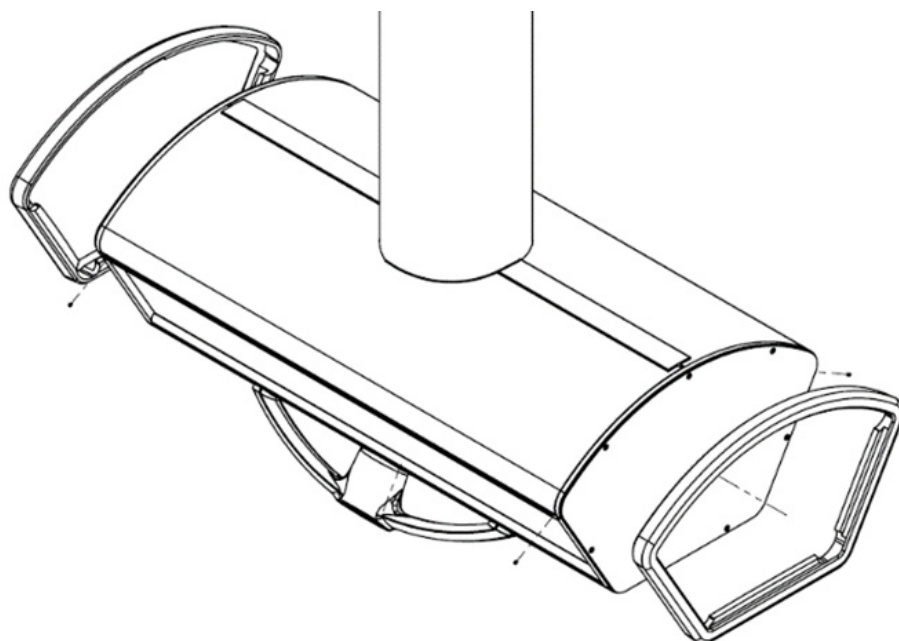
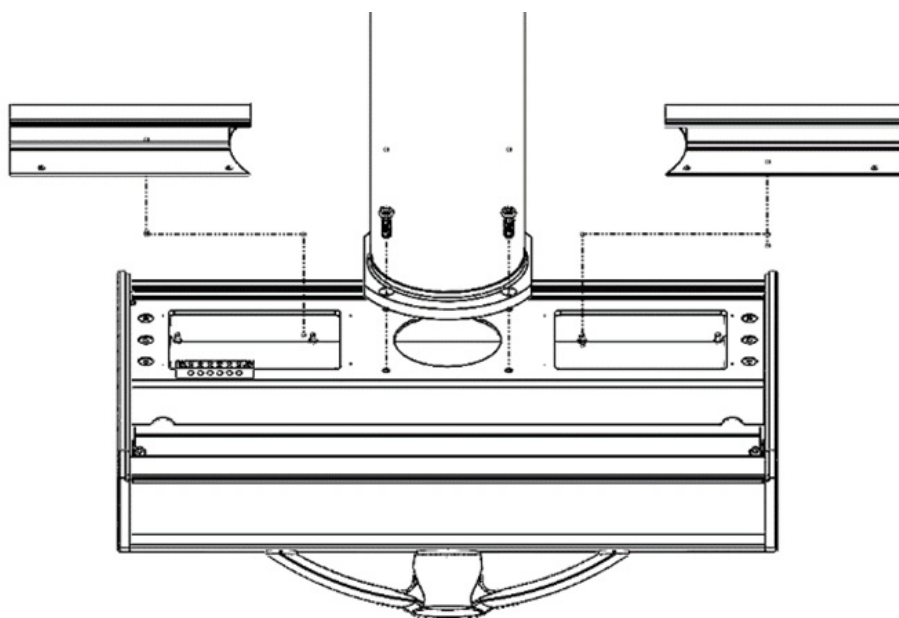
**CAUTION:** Do not over-tighten screws to prevent cracking cover. The chain on the end cap must be securely wrapped around the cables or hoses within the boom prior to being reinstalled.



# 13. Installing the Console

## 13.1. HAMMER HEAD CONSOLE

1. Remove the extrusion plates held by 8xM3 screws.
2. Align the console under the drop tube and secure with four (4) M10 screw, flat washers, and lock nuts.
3. Reinstall the extrusion plates.
4. Slide the top covers into the extrusion, pushing the curved edges down into the groove and securing with 4 set screws.
5. Install the seal on both sides of the console.



# 13. Installing the Console

## 13.2. EQUIPMENT & ANESTHESIA CONSOLE

1. Open the service console by unscrewing the #10- $\frac{3}{4}$ " screws located under the white screw caps.
2. Align the console below the drop tube and secure with four (4) M10 screws, washers and lock nuts.
3. Lower the console cover and secure with one (1) M5 toothed nut on each of the rods.
4. Connect the handle by plugging in the ribbon cable from the handle to the one running through the arm.

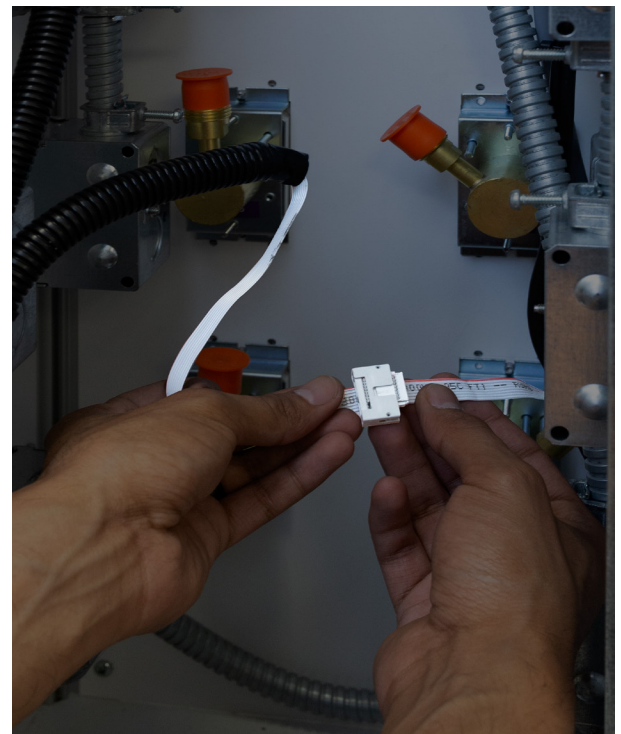
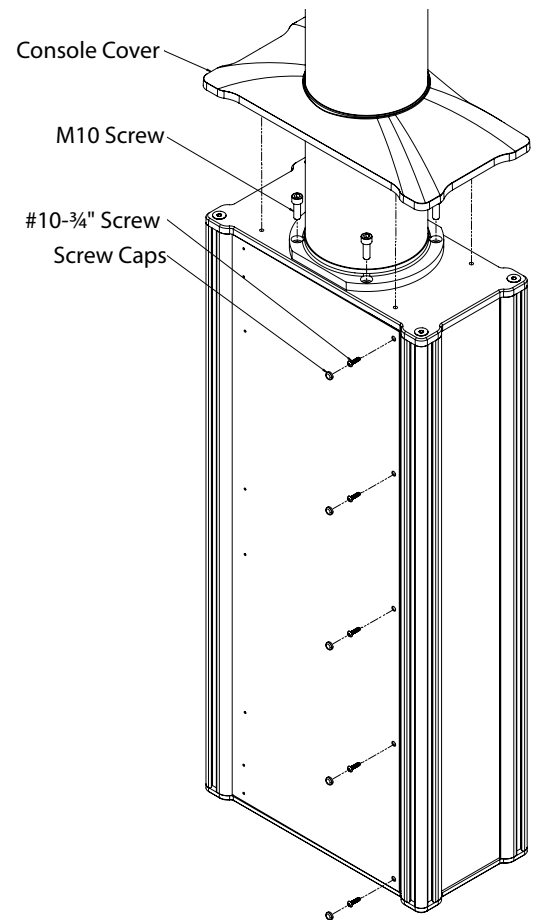


**WARNING:** Ensure system is disconnected from power prior to connecting electrical components.



**CAUTION:** Ensure the Red line on the handle ribbon cable lines up with the red line on the ribbon cable coming through the arm. Failure to properly connect will render the handle nonfunctional.

5. Close the console by reinstalling the #10- $\frac{3}{4}$ " screws ensuring each is covered with the screw cap.

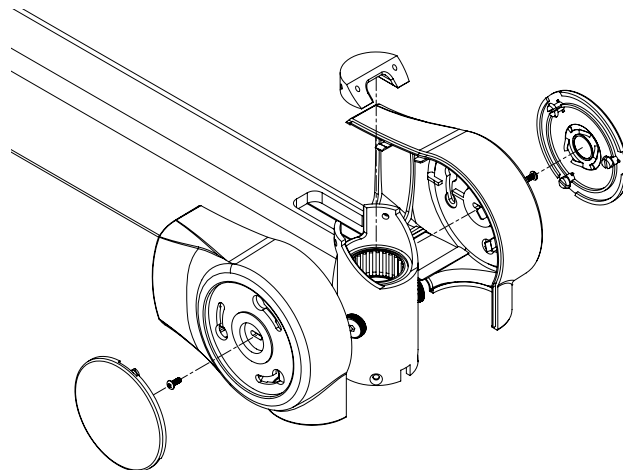


## 14. Installing the Spring Arm

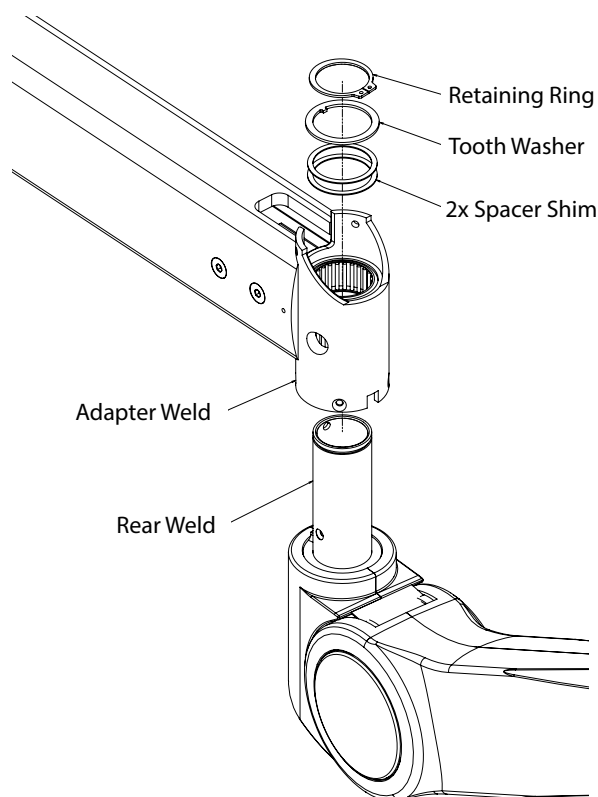
1. Remove the grey plastic covers by gently pressing and rotating counterclockwise. Remove the two (2) M4 screws securing both sides of the white plastic cover and pull both covers apart.
2. Use a Phillips head screw driver to remove the two (2) 6-8 screws on either side on the top of the adapter weld and remove the metal slip ring holder. (Lights only).



**CAUTION:** Use caution when removing the slip ring, damage to this component will impact the performance of the Lighthouse.



3. Loosen the two friction screws in the side of the adapter weld. (Section 18.4) Slide the rear weld tube of the Spring Arm into the adapter weld through the bottom. Ensure that the rear weld tube is inserted all the way in, pressure must be applied upwards to the area directly below the adapter weld.
4. On the top side of the adapter weld, put two (2) spacer shims onto the extruding rear weld tube.
5. Place the tooth washer on top of the two (2) spacer shims. Insert the tooth into the hole located in the back of the rear weld tube and slide the tooth washer over the lip until it sits around the rear weld tube.
6. Lock the Spring Arm in place using a retaining ring. Make sure that the retaining ring sits fully in the groove cut out.
7. Gently pull down on the arm to ensure it is secured and all components are aligned.
8. Remount the pole tab using the two (2) 6-8 screws on either side of the adapter weld. Ensure friction screws are put back and screwed in all the way.
9. Reinstall the extension arm covers by following step one (1) in reverse.



# 15. Installing the Spring Arm Mounted Equipment

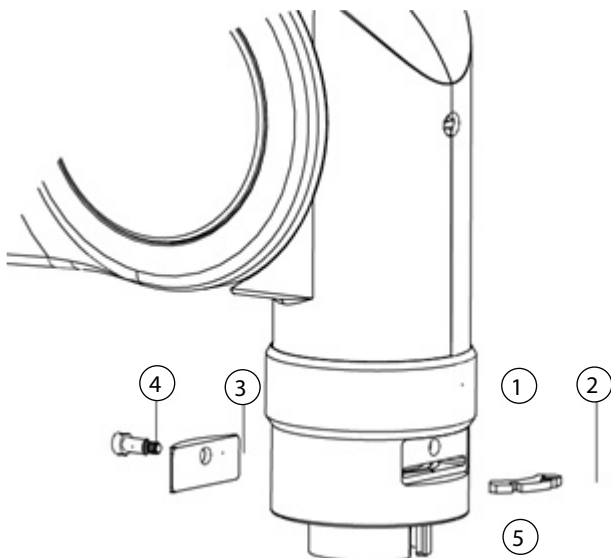


## WARNING

- Never perform an installation or removal of the LED light alone. Always have a second person to assist with the installation or removal.
- Always disconnect the spring arm system from the power supply when installing or removing the LED light. Failure to do so may result in electric shock.
- The light is to be disconnected from the spring arm in reverse order of its assembly. This may only be carried out after the spring arm has been adjusted to a horizontal position, as the arm is under spring tension and can bounce up leading to serious impacts.
- The LED light may separate from the spring arm if the key is not properly in place. This may cause serious injury. Always make sure that the key is installed correctly.
- Failure to comply with load specifications may cause serious or fatal injuries. Ensure that the LED light load is within the specifications.

## 15.1. REMOVING THE SAFETY PLUG

1. Use a 2mm Allen key to unscrew the M3 screw [4] and take out the cotter holder cover [3] from the back.
2. Rotate the cotter holder [1] 180° and slide it upwards so that the slot lines up with the slot in the stem [5]. The cotter pin [2] should be exposed.
3. Using a small flat head screwdriver, remove the cotter pin [2] from the groove in the device end stem.
4. Once the locking key has been removed, slide the safety plug out from the light-head end of the spring arm.

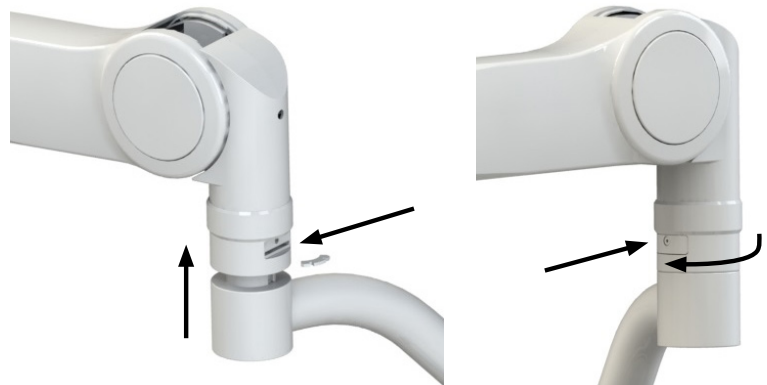


Item	Description
1	Cotter Holder
2	Cotter Pin
3	Cotter Holder Cover
4	M3 Screw
5	Groove

# 15. Installing the Spring Arm Mounted Equipment

## 15.2. INSTALLING THE MONITOR

1. While keeping the assembly straight, insert the end of the yoke upwards into the front weld tube. Use a cotter pin to secure the yoke in place.
2. Slide the cotter holder down to touch the yoke and turn 180° and secure the cotter holder cover using an M3 screw.

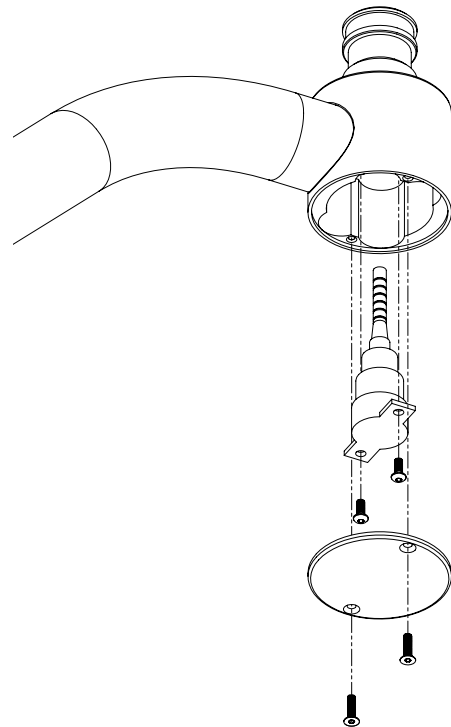


## 15.3. INSTALLING THE LIGHT HEAD



**CAUTION:** Prior to install ensure the 3P or 9P male is not pre installed in the light yoke. Installing the Lighthead while the 3P or 9P male is installed may result in damage to critical electrical components.

1. While keeping the assembly straight, insert the end of the yoke upwards into the front weld tube. Use a cotter pin to secure the yoke in place.
2. Slide the cotter holder down to touch the yoke and turn 180° and secure the cotter holder cover using an M3 screw.
3. Open the cover at the top of the yoke by removing the two (2) M3 screws.
4. Insert the 3P or 9P male straight up into the corresponding 3P or 9P female in the spring arm. Secure in place with two (2) Philips head screws.



**CAUTION:** Ensure all electrical components are seated correctly prior to connecting to power. Failure to correctly install components will impact the Lighthead performance. Ensure screws securing the 3P or 9P male have a locking patch and are fully installed.

5. Connect the cables from the 3P or 9P male to the corresponding cables within the Lighthead yoke.
6. Push the cables into the yoke axle and reinstall the cover.



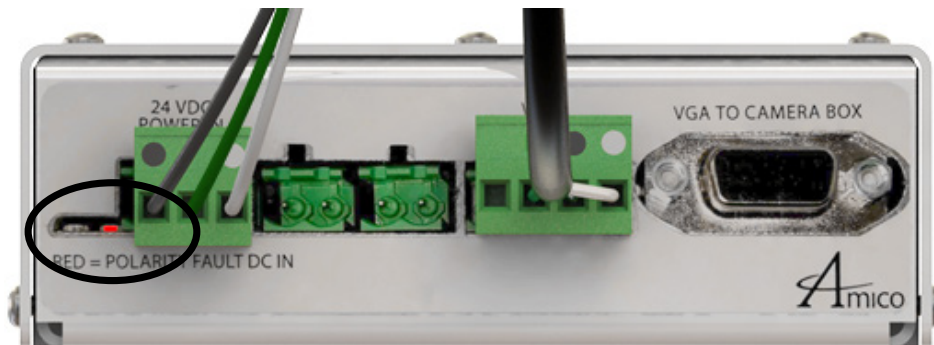
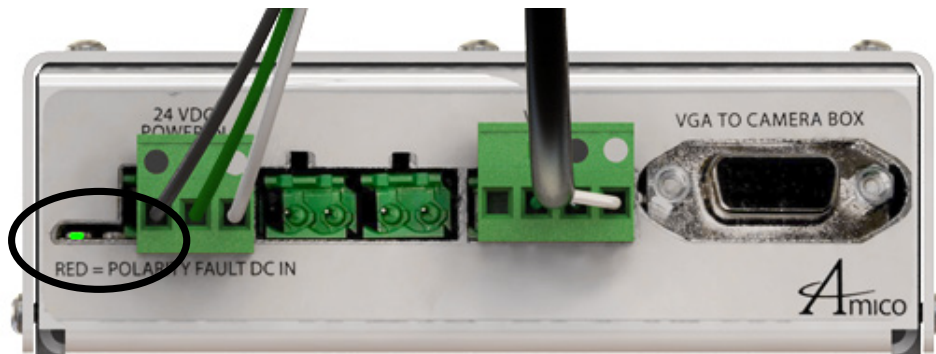
## 16. Installing the Terminal Box

1. Place the terminal box securely on top of the mounting plate.
2. Connect all wire harnesses per configuration.
3. Use cable ties to secure all loose wires together to a structure.

**NOTE:** If the system contains two (2) lights, there will be two terminal Boxes.

The iCE30m Lights come with wire harness pre-installed on all related component. Plug in all the required components depending on your configuration.

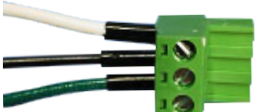
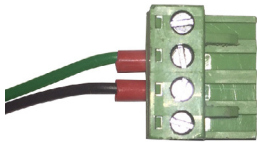
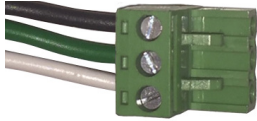



If the power supply is working correctly, a green LED should turn on. If there is a fault with the power supply, a RED LED would turn on instead. See trouble Shooting (section 23.2) for further instructions.



# 16. Installing the Terminal Box

## 16.1. PRE-WIRED HARNESSSES

All harnesses are pre wired onto all of the components needed for installation.

Pre wired Harnesses	Connect To	Wiring Description	Reference Figure
iCE30m/iCE25m Lamphead	Light In	<ul style="list-style-type: none"> <li>White: +24 VDC</li> <li>Black: Negative</li> <li>Green (18 AWG): Communication</li> </ul>	
iCE30m/iCE25m Wall Control	Wall Control	<ul style="list-style-type: none"> <li>Blank</li> <li>Green (18 AWG): Communication</li> <li>Black: Negative</li> <li>White: +24 VDC</li> </ul>	
24 VDC Power Supply	24 VDC Power In	<ul style="list-style-type: none"> <li>Black : Negative</li> <li>Green (12 AWG): Ground (if applicable)</li> <li>White: +24 VDC</li> </ul>	
Camera Control Box Cable	VGA to Camera Box	<ul style="list-style-type: none"> <li>Standard SVGA-15 Cable</li> <li>Included in camera adder and spring arm camera units</li> </ul>	
Camera Video/Data Cable	Camera In	<ul style="list-style-type: none"> <li>Custom DSUB9 Cable</li> <li>Included in camera adder, camera ready and spring arm camera units</li> </ul>	
Camera Power Cable	Power Pass Through	<ul style="list-style-type: none"> <li>Custom Barrel Connectors</li> <li>Positive Centre; +12VDC</li> <li>Included in spring arm camera units</li> </ul>	





# 17. Installing Accessories

## 17.1. HANDLES

### 17.1.1. Non-Sterilizable Handle (Plastic/Aluminum)

1. At delivery the lamp is equipped with an aluminum or plastic non-sterilizable handle. This handle must not be sterilized as it will cause damage to the handle.
2. The handles will be supplied with disposable, sterile covers. Handle disposable covers often become unsterile during an operation. Therefore, always keep extra disposable handle covers available for exchange.
3. An in-light camera may be purchased as an accessory to the lamp. In this case, you can remove the handle using the below steps:
  - To remove, press the release button and pull the handle away from the light.
  - To attach, insert the handle into the handle adapter until a “click” is heard.

### 17.1.2. Smart Handle (Option Available)

Smart Handle offers doctors the capacity to control the brightness levels and allows them to turn the lights ON/OFF. Smart handle operates using a specific non-sterile plastic handle and sterile cover. The functions of the smart handle are as follows.

1. ON: Quick Tap
2. Brightness: Each tap transitions brightness from Level 1 to Level 5 continuously
3. OFF: Long Press

## 17.2. 4K AND HD CAMERA

### 17.2.1. Camera Installation

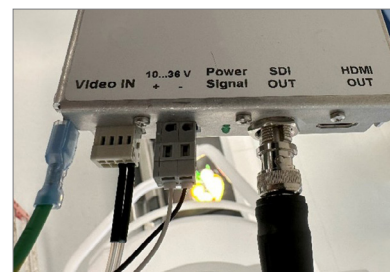
1. Align the red line of on the camera with the red line on the Lighthead camera housing and slide the camera in all the way.
2. Close the levers on either side of the camera. The red line should not be visible once closed.



### 17.2.2. Camera Receiver Box Installation

The camera receiver box can be placed in any secure location above the system where it will not be disturbed, however it must be grounded:

1. Connect the tan video in wire harness into its labeled port.
2. Connect the Grey 10-36V wire harness into its labeled port.
3. Plug the quick connect on the grounding cable onto the camera receiver box.
4. Secure the opposite end of the cable to a grounded metal structure.
5. Connect the video output cable (SDI or HDMI) into its labeled port.



# 18. System Adjustments

## 18.1. LIMIT STOPPER ADJUSTMENT



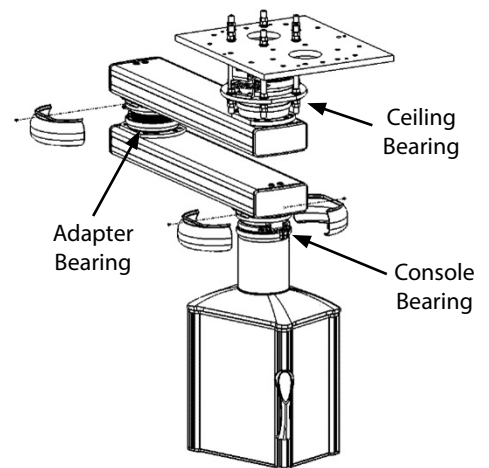
**CAUTION:** Limit stops should be set with consultation from hospital staff. If no staff is present set stops as per production drawings so there is no risk of collision with walls or equipments. DO NOT rotate the arms more than 360° without setting the stops. Damage to the equipment will occur. DO NOT move the boom while the brake shoes are engaged. Connect to power and open the brake shoes prior to movement.

All Boom bearing contains an adjustable stop mechanism which can be set to allow between 0° and 320° of motion.

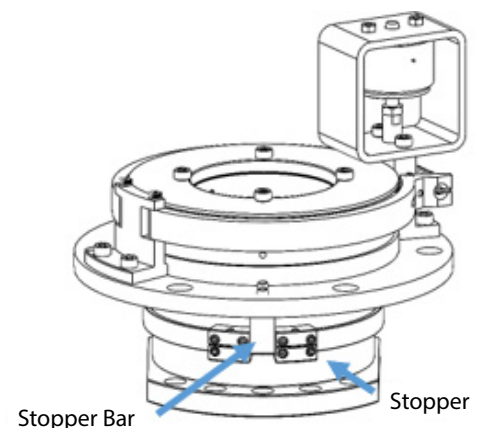
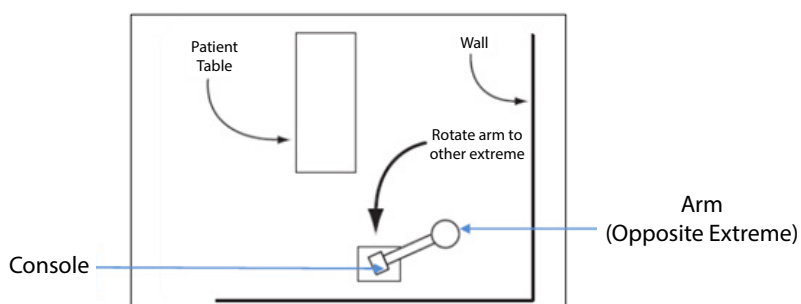
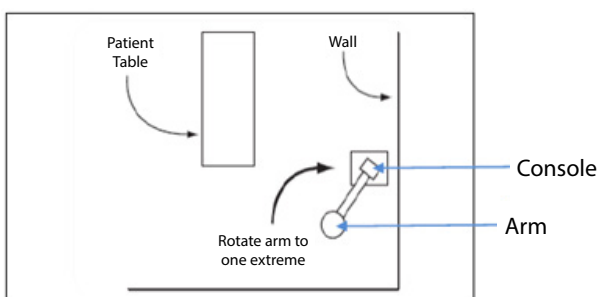
After the service arms have been installed both the ceiling and adapter bearings stop can be adjusted in relation to the room. The console bearing can be adjusted after the console has been installed.

In a normal system there are three joints of rotation. The ceiling, the adapter and the console.

Both the adapter and console are located behind the bearing covers. Which can be removed by unscrewing the two flanged button head screws and pulling the cover apart. The ceiling bearing will be located above the finished ceiling line.



1. Loosen the eight (8) set screws securing the stoppers.
2. Move the Boom to the first desired stop location. Secure one (1) stopper in place so that it is snug beside the stopper bar on the side of the direction which you are resisting.
3. Rotate the boom in the opposite direction to the second stop location.



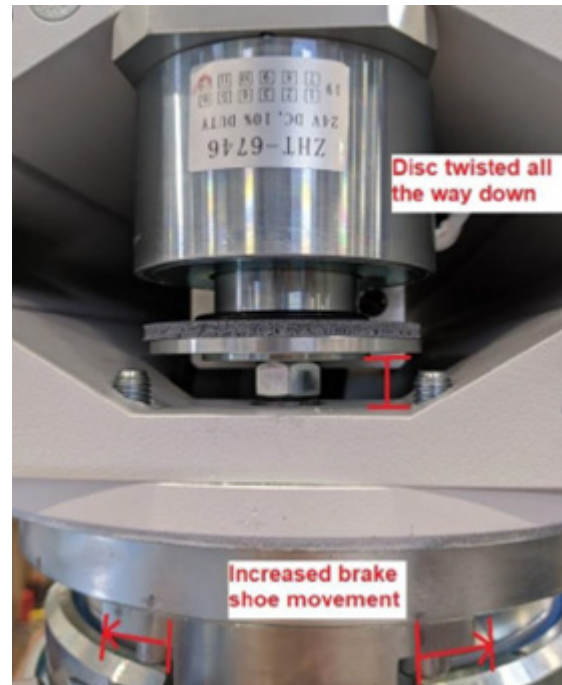
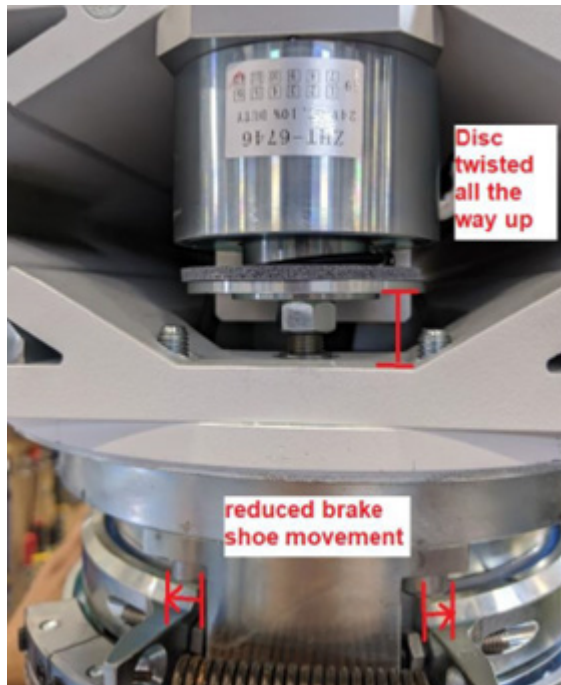
# 18. System Adjustments

## 18.2. BOOM BRAKE ADJUSTMENTS

In the event that the boom arms are too loose or too tight after install, the brakes must be adjusted. There are several ways to adjust the brake. First adjust the brake shoes by adjusting the solenoid (18.2.1.). If the brakes remain too loose or too tight, adjust the brake screws (18.2.2.).

### 18.2.1. Solenoid Adjustment

1. To open, remove the end cap located over the effected bearing to find the solenoid. If the ceiling brake is drifting, the solenoid can be found above the brake assembly above ceiling.
2. Gently turn the disk to effect how far the brake shoes are pushed out and retract.
  - Twisting the disc all the way up: reduces movement of the brake shoe. Makes the brakes tighter.
  - Twist the disc all the way down: increases the movement of the brake shoe.

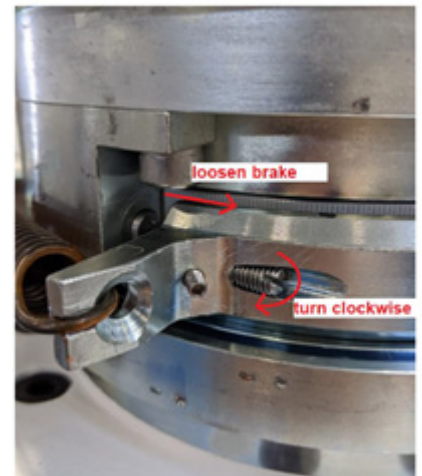
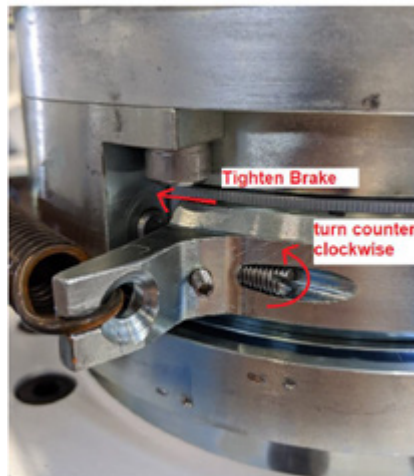


# 18. System Adjustments

## 18.2.2. Screw Adjustment

1. Remove the bearing covers to access the brake shoes. The ceiling bearing can be accessed above ceiling
2. Loosen the set screws which hold the system in place on both shoes
3. Adjust the flat head screw on each shoe
  - Turn the screw counterclockwise to tighten the brake
  - Turn the screw clockwise to loosen the brake
4. Retighten the set screw
5. Reinstall the bearing cover

**NOTE:** Both sides must be tightened equally to prevent unequal wear of the brake pads.



# 18. System Adjustments

## 18.3. ADJUSTING SPRING ARM TENSION

To adjust the tension of the spring arm, use a 6mm T-handle to turn the setscrew in the end of the spring arm which connects to the extension arm.

- Clockwise to decrease tension.
- Counterclockwise to increase tension.

**NOTE:** Spring should be in up position to make adjustment easier.



**WARNING:** Do not overtighten spring arm. Overtightening may lead to spring arm rapidly popping up causing potential impact and pinching hazards.

Fingers can be pinched or cut if inserted into the load adjustment window of the spring arm body. Exercise caution when making adjustments to components inside the spring arm body. Components inside will move when spring arm is moved up or down. Do not insert fingers or tools into the load adjustment window when the spring arm is moving.



**CAUTION:** If a spring arm supports a load that is greater (or less) than the force of the spring, the spring arm will not stay perfectly in place because the weight of the load pulls the spring arm downward (or upward).

The spring arm supplied has a specific spring with a specific load range. Please refer to your product sticker attached to the arm for your exact load ranges. Not adhering to these load ranges may result in permanent damage to the spring, causing the arm to drift and prematurely fail. Replacement or service by a technician may be required.

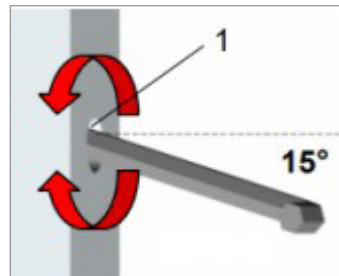
# 18. System Adjustments

## 18.4. ADJUSTING SPRING ARM HEIGHT

To adjust the maximum height, use a 5mm T-Handle to turn the height adjustment screw in the front of the spring arm.

- Clockwise to lower the maximum height.
- Counter clockwise to increase the maximum height.

**NOTE:** Maximum height is 45°. Minimum height is 0°.



**CAUTION:** Increasing height from the preset height may cause the spring arm and attached equipment to collide with the ceiling or other ceiling mounted equipment.

## 18.5. FRICTION BRAKES

1. Prepare the brake install by arranging the parts on a 4mm hex T-handle.

**NOTE:** make sure there is grease on the brake tab from the packaging. If there is no grease on it, apply a thin layer of Glacier FM Grease (supplied with an application stick in the polyethene bag) to the concave surface of the tab.



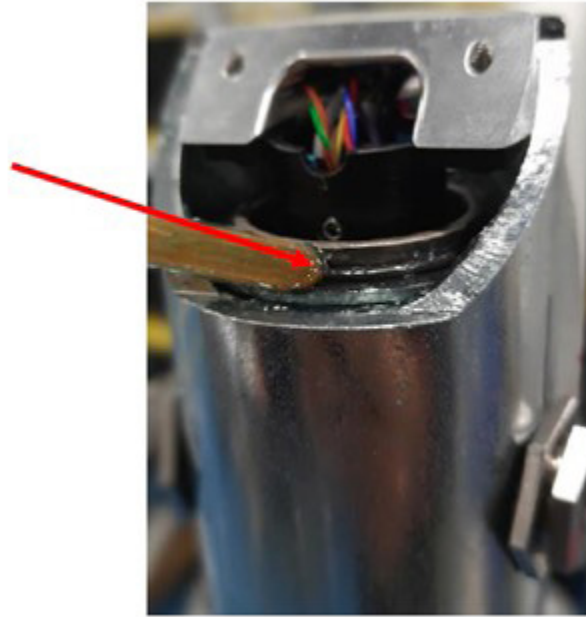


## 18. System Adjustments

2. Apply a thin layer of Glacier FM Grease (supplied with an application stick in the polythene bag) around the spring arm tube where the retaining ring and toothed washer are installed. Rotate the area full 360° while applying grease to ensure all surfaces are coated.

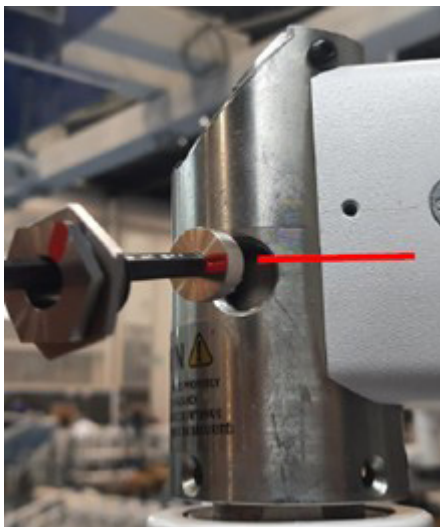


**CAUTION:** Ensure the grease does not make contact with electrical components such as the slip ring.



3. With the 4mm T-Handle slide the brake tab into the adapter.

**NOTE:** Ensure the red line marked on the tab is parallel to the extension arm's longer side. This line must remain parallel through the whole installation.



## 18. System Adjustments

4. While holding onto the brake tab with the 4mm T-handle, slide the brake screw closer to the adapter and screw in **by hand** just enough to hold onto the threads in the adapter. While doing so ensure that the red mark on the screw will be perpendicular to the extension arm as shown.



5. Repeat steps 1 to 4 on the opposite side of the adapter.
6. Hand tightens the screw without using tools to ensure brake tab stays aligned. Use of tools at this step may cause the tab to become misaligned.
7. When the screw can no longer be tightened by hand make a mark on the adapter aligned with the red line on the screw and label it as "O" for origin.

**NOTE:** The origin may be different on both sides of the adapter.





## 18. System Adjustments

8. Move the spring arm so that it is in its highest position and completely folded in. Position the arm on the opposite side of the brake that is being adjusted. This will be considered the 'Start point' to check for drift.

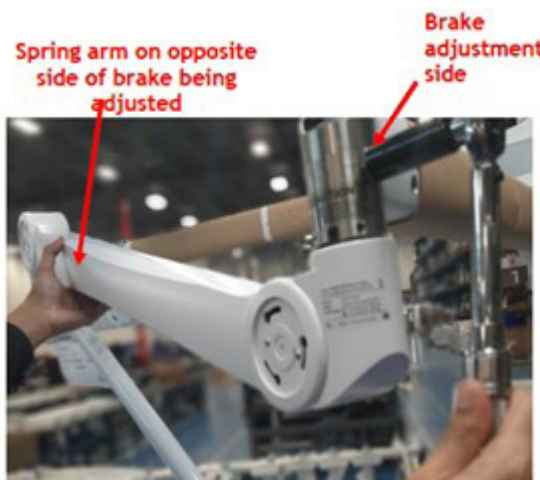


Start Point

9. Use a 17mm socket or adjustable wrench to tighten the screw in 45 degrees. While tightening the screw move the spring arm through a 120-degree motion.



Screw at Origin



Spring arm moved back and forth on opposite side of the adapter here brakes are being adjusted



Screw at 45 degree turn

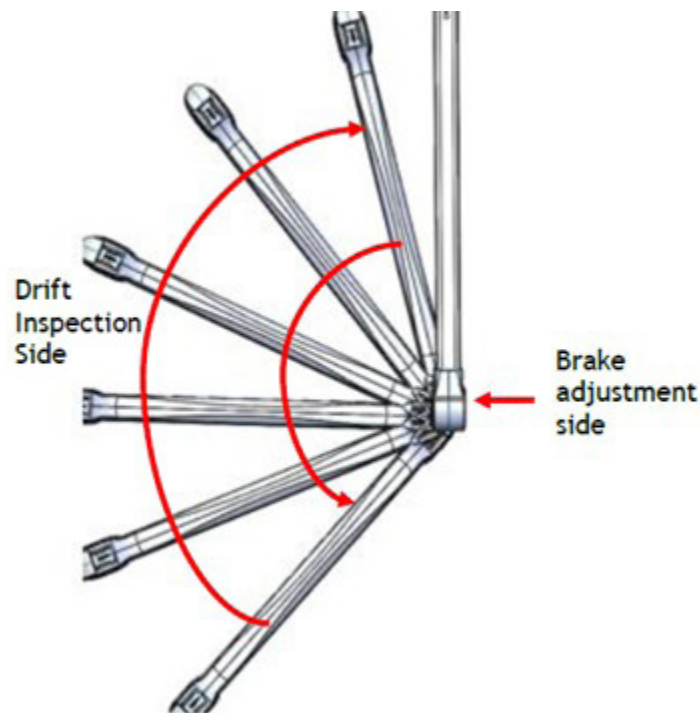
10. Repeat steps 8 to 9 for the second screw.

## 18. System Adjustments

11. After both screws are tightened check for drift by positioning the spring arm in six (6) different locations (about 20° apart) starting from the closest to the extension arm (completely folded in) to 120° apart (when spring arm is fully extended out).

**NOTE:** 'Drift' is any undesirable movement of the spring arm about the extension arm. It can happen at any location around the extension arm which prevents precise positioning of the light/monitor in an OR.

**NOTE:** Always check for drift in both clockwise and counterclockwise directions at six (6) spots.



12. If the spring arm still drifts repeat steps 8 to 11 until drift is no longer observed.

## 18. System Adjustments

13. Once the arm no longer drifts on both sides of the extension arm. Mark the adapter and label it as '1'.



Screw after 135 degree turn from origin

14. Tighten both screws and additional 20 degrees from position 1. This is to ensure the brake tab is well secured on the tube and there is sufficient braking force to hold the spring arm in its position over time.

This adds more resistance to the motion of the spring arm. So, in some cases, while moving the spring arm, the extension arm might move along with it. In this situation, make sure the three (3) brake screws on the extension arm are adjusted/tightened to ensure the spring arm can be moved independent of the extension arm.

To check the movement of the extension arm, have the spring arm positioned at 90° to the extension arm as shown in the image and then push/pull the extension arm to rotate it about the central axis.

**NOTE:** Make sure the three (3) brakes on the extension arm are not tightened beyond a point where it becomes very difficult to move it. If it needs to be adjusted beyond this point, then first loosen the brake on the spring arm and then adjust the brakes on the extension arm. Ensure that the spring arm brakes are not loosened beyond the initial point '1'.

15. Now clear the ladder and anything in the way and rotate the spring arm around the extension arm for a minimum of five (5) times back and forth (not in full circles) checking for the below items.
- Drift of the spring arm at different points on both sides of the adapter while positioning the spring arm at the highest position, equal to the extension arm and then at the lowest position.
  - Make sure to check for drift both in clockwise and counter clock direction while rotating the spring arm around the extension arm.
  - While rotating the spring arm, the extension arm should not move along with it. This usually happens at the cross-over from one side of the adapter to the other side.
  - Check for stiffness on the extension arm motion and adjust the brakes on the bearing housing if needed.
16. If any of the four (4) checks fail, adjust the brakes accordingly and test again.

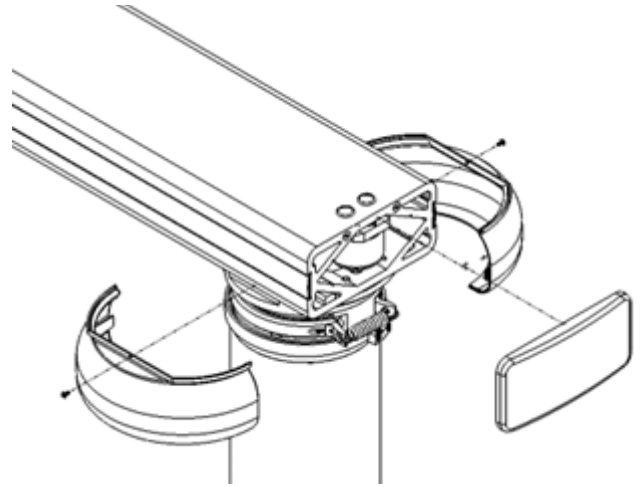
If there is no more drift and the arms can move independently, proceed to putting the front covers on. (Section 17.6.). One (1) leg of the gray cap must be cut using a wire cutter. This leg will be installed over where the friction screw is.

# 19. Installing Covers

## 19.1. INSTALLING THE BOOM BEARING COVER

Install the Bearing Covers by clicking both sides together around the bearing and securing with a Flanged button head screw.

For the end cap first wrap the chain around cables or hoses within the boom. Align the magnets on the cap with the metal components on the boom arm and press the cover into place.

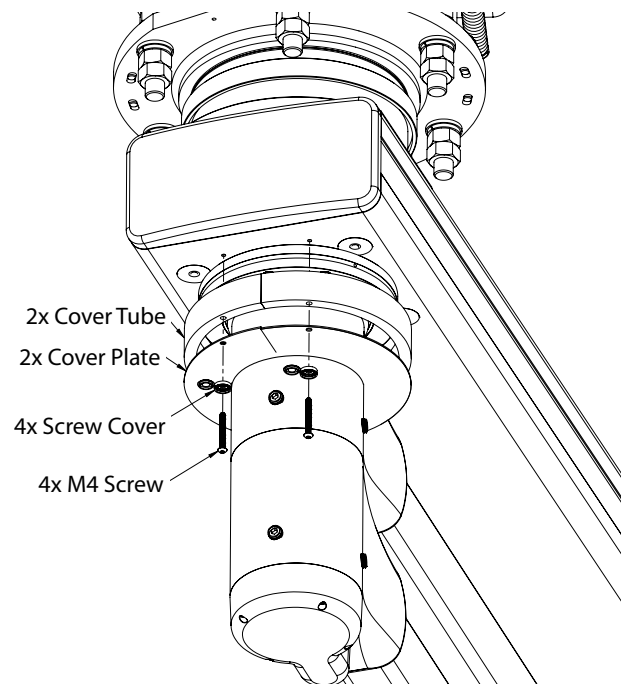


**CAUTION:** Do not over tighten the screws to prevent cracking the cover.

The chain on the end cap **MUST** be securely wrapped around cables or hoses within the boom prior to being reinstalled.

## 19.2. INSTALLING THE CENTRAL AXIS BEARING COVER

1. Align one (1) cover plate beneath one Cover tube.
2. Raise up and secure around the bearing with two (2) M4 screws, each with a screw cap.
3. Repeat for the other side.

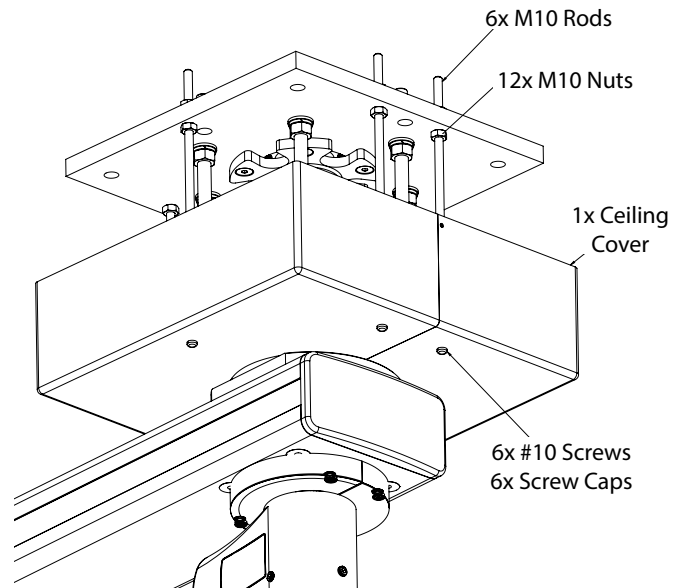


# 19. Installing Covers

## 19.3. INSTALLING THE CEILING COVER

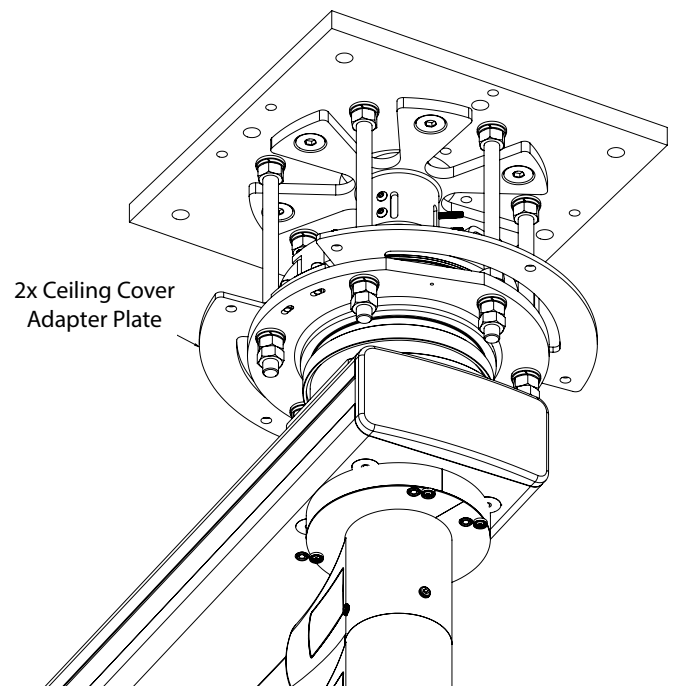
### 19.3.1. Standard Install

1. Secure six (6) of the M10 ceiling mounting rods to the mounting plate with two M10 Nuts. Ensure the bottom of each of the rods is approximately where the bottom of the ceiling cover will be.
2. Click both sides of the ceiling cover together around the ceiling drop tube and raise up so that the corresponding holes on the cover align with the six (6) rods.
3. Secure in place with six (6) #10 button head screws each with a screw cap installed.
4. Adjust the rods from the mounting plate to ensure the top of the cover sits flush with the ceiling line.




### 19.3.2. Retrofit Install

1. Follow the steps outlined in section 19.3.1. Installing The Ceiling Cover for a standard install. Instead of securing the mounting rods to the mounting plate, secure the to the ceiling cover adapter plate.
2. This plate should come pre secured to the top of the ceiling bearing flange.



# 19. Installing Covers

## 19.4. SPRING ARM COVER

**WARNING:** Pinch points are created during extreme articulation of the suspension system. Do not place hands on or near the suspension knuckle during Lighthouse articulations. Do not insert fingers or tools into the spring arm while it is moving.

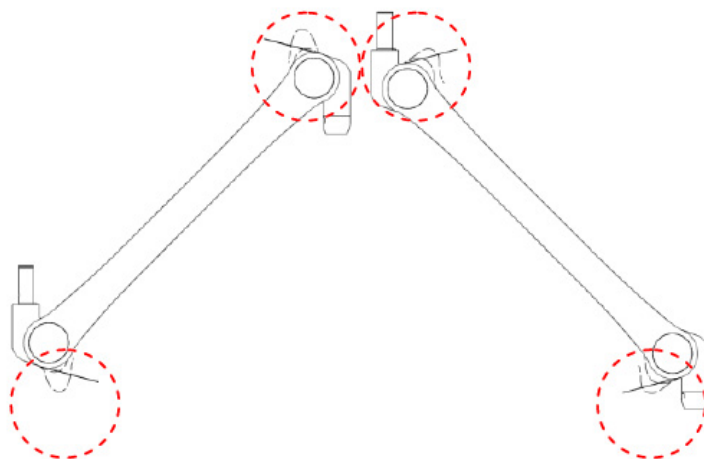
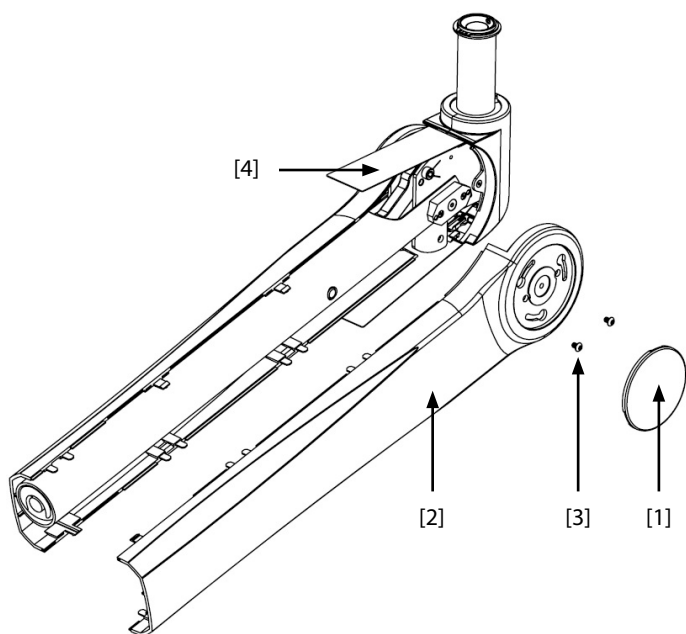
In order to access the spring arm to carry out load, parallel and vertical adjustments; as well as access for cable routing, you must be able to remove the plastic covers surrounding the spring arm.

### Removal:

1. Remove all four (4) plug covers [1] first by rotating each one counter clockwise until you hear a \*click\* and removing them from the spring arm main covers [2].
2. Remove four (4) screws [3] from one main cover using a 2.5 mm Allen Key and pry the first cover off.
3. Remove the last four (4) screws from the second main cover, then remove the final cover. Be sure not to damage the sliding flap covers [4] when removing the main covers.

### Installation:

1. In order to install the plastic covers, carry out the preceding steps in reverse.
2. Do not attempt to install the main covers with the sliding cover flaps installed. 6. Leave the flap covers extended and raise the spring arm to its highest and lowest positions and slide each flap into its groove when all other plastic covers have been assembled.



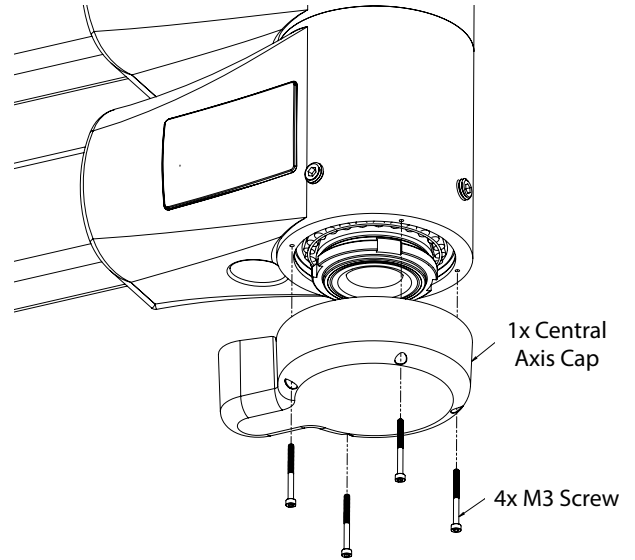
Item	Description
1	Plug Covers
2	Spring Arm Main Covers
3	Screws
4	Sliding Flap Covers

# 19. Installing Covers

## 19.5. CENTRAL AXIS BASE CAP

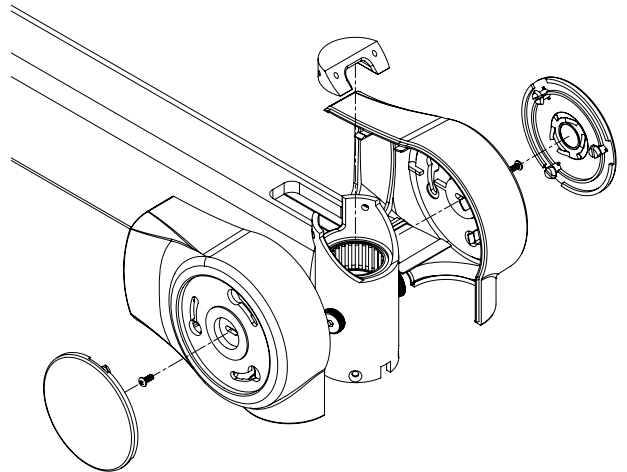
The Base cap should only be removed when integration cables need to be ran through the extension arm. Refer to section 20.2. for instructions on how to route monitor integration cables.

The cap is secured by 4x M3 screws. Ensure the cap is aligned such that the protruding section is pointing towards the extension arm.



## 19.6. EXTENSION ARM COVERS

1. Remove the round caps by gently pressing in and rotating counter clockwise.
2. Remove the two (2) M3 screws on either side of the extension arm.
3. Pull the two (2) sides of the cover apart.



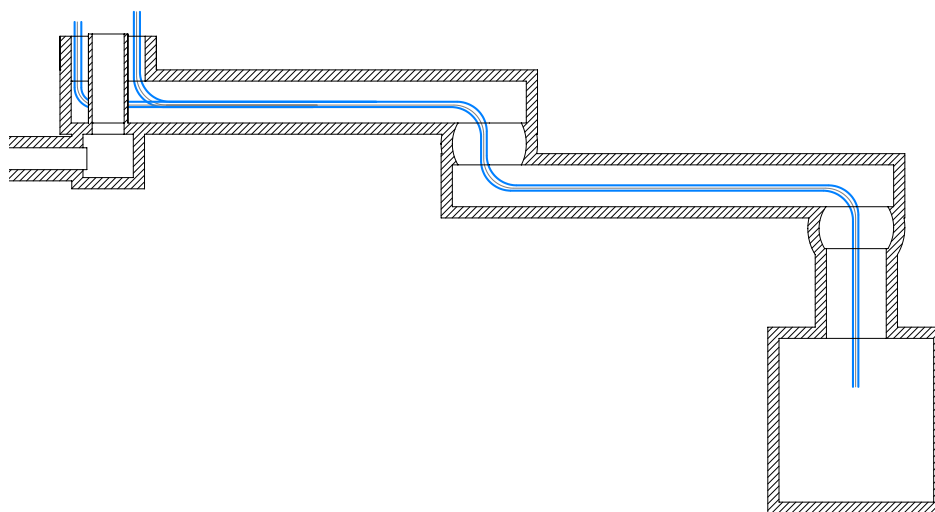
**CAUTION:** When reinstalling the covers ensure the round covers are fully rotated and clicked into place.



## 20. Cable Routing

### 20.1. ROUTING GAS LINES AND ELECTRICAL CONDUIT

All cables and gas lines must be passed through the center of each bearing within the boom and pendant system. At the ceiling bearing all lines must be passed around the central axis tube. If any lines are passed through the tube there is an increase risk of the cables being pinched and/or damaged.



**CAUTION:** Failure to correctly route gas lines and cables increases the risk of damages to the system, gas leaks and electrical failure.

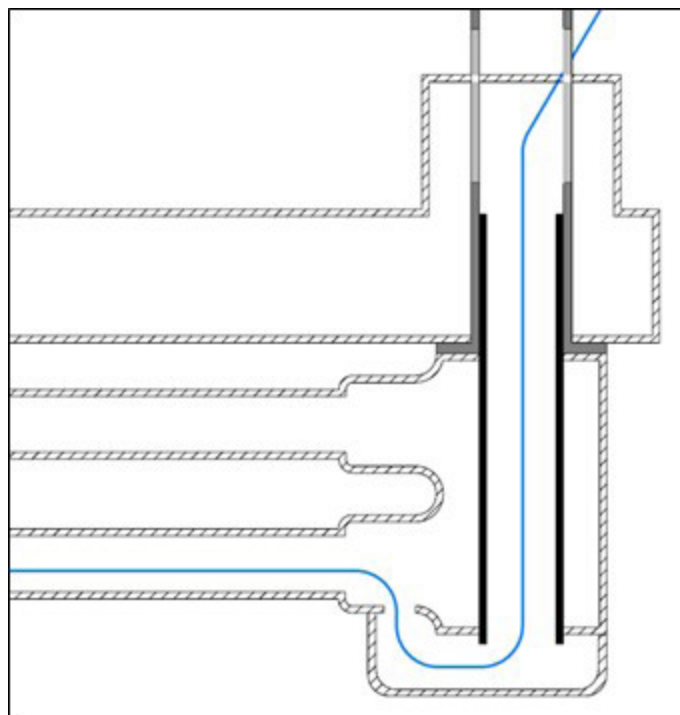
### 20.2. ROUTING MONITOR CABLES

All power and communication cables for the lights and/or camera along with all monitor integration cables must pass through the center of the central axis tube.

All monitor integration cables must be passed through the bottom of the central axis and back up through the cutout in the bottom of the bearing arm housing. Refer to section 17.5 Central Axis Base Cap for instructions on how to remove the cover.



**CAUTION:** Failure to correctly route gas lines and cables increase the risk of damages to the system, gas leaks and electrical failure.






# 21. Operation

## 21.1. BOOM

### Moving the Arm:

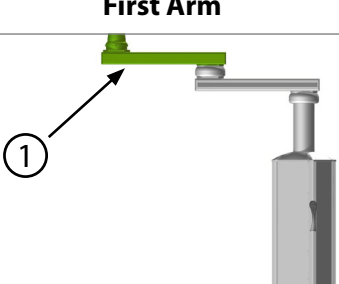
1. To Begin moving Amico's Boom arm, locate the electric brake handle that is mounted on the service console.
2. Press and hold the required button to move the boom.
3. The green LED Light on the handle will illuminate to indicate the brake has been released successfully.




A circular inset showing a close-up of the Amico console. A finger is pressing Button One, which is labeled with a circled "1". The button has a green LED light that is illuminated.

**Button One**

**First Arm**

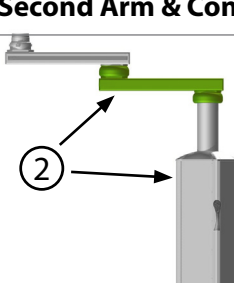
A diagram of the boom arm assembly. An arrow labeled with a circled "1" points to the first arm of the boom.

Press and hold Button One (1) to release the First Arm of the Boom.


A circular inset showing a close-up of the Amico console. A finger is pressing Button Two, which is labeled with a circled "2". The button has a green LED light that is illuminated.

**Button Two**

**Second Arm & Console**

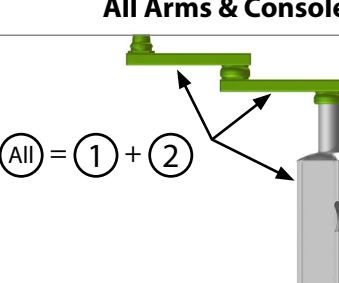
A diagram of the boom arm assembly. An arrow labeled with a circled "2" points to the second arm of the boom, and another arrow labeled with a circled "2" points to the console.

Press and hold Button Two (2) to release the Second Arm of the Boom and the Console.

A circular inset showing a close-up of the Amico console. A finger is pressing Button All, which is labeled with a circled "All". The button has a green LED light that is illuminated.

**Button All**

**All Arms & Console**

A diagram of the boom arm assembly. Arrows labeled with a circled "All" point to the first arm, the second arm, and the console. Below the diagram, the text "All = 1 + 2" is shown.

Press and hold Button All (All) to release all Arms controlled by Buttons One (1) and Two (2) and the Console.



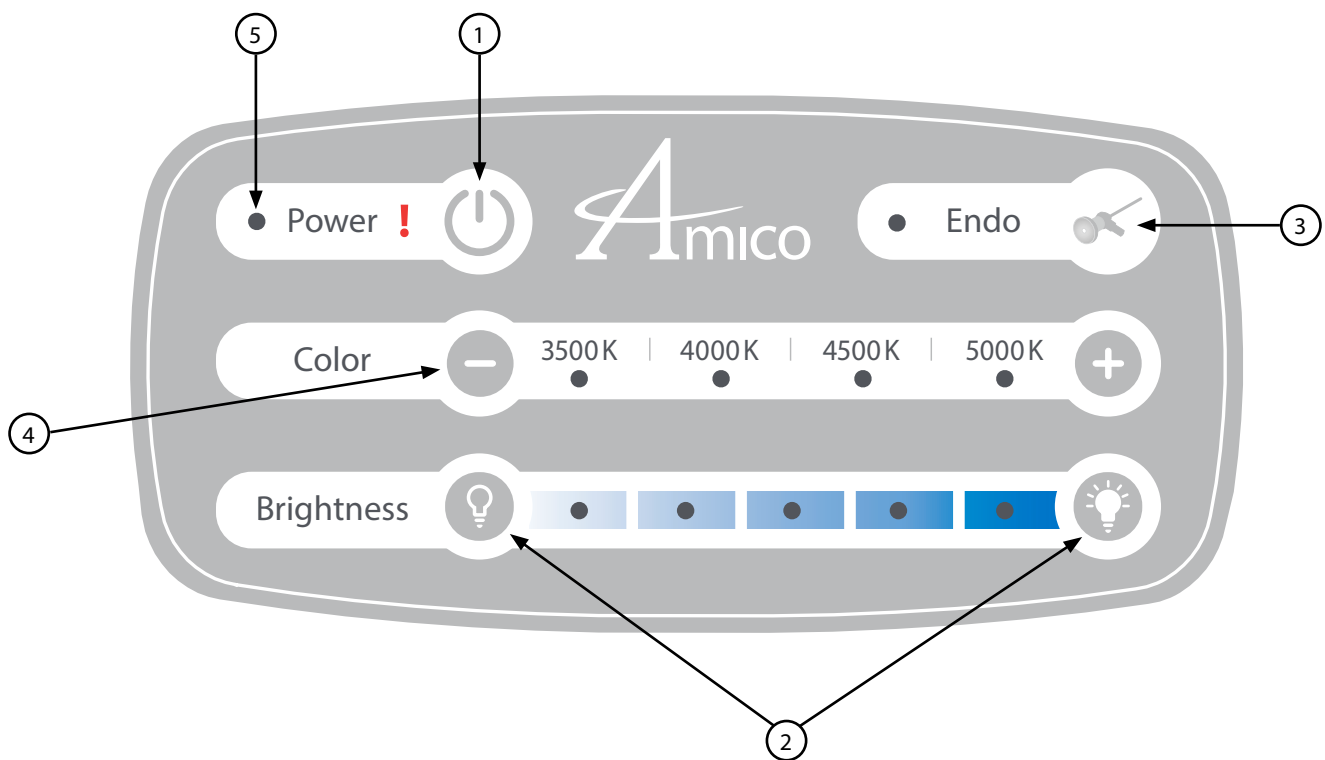
**CAUTION:** Prior to Moving the Boom, ensure ALL equipment is secured and all obstacles are cleared from the path of motion. In the event of an emergency, the arms may be manually pushed out of the way without the requirement of pressing the brake release button. During regular use the brake pads must be released to prevent wear.

# 21. Operation

## 21.2. LIGHTS

### 21.2.1. Lighthouse Control Panel

1. Turning the light ON and OFF: The LED will light up when the lamp is in the ON position.
2. Adjusting the light brightness: The brightness can be adjusted to 50% - 100% (total of five (5) steps). Brightness level indicators show the current brightness level of the LED.
3. Switching to Endo mode: To deactivate Endo mode, any brightness or Endo buttons can be pressed.
4. The color can be adjusted from warmer to cooler from 3500 K - 5000 K. Use the + and - keys to adjust color.
5. A blinking red light indicates an issue with lamp head and activation of automatic backup board. 6. Wall control panel available as an option.



## 21. Operation

### 21.2.2. Wall Control Panel for Light

The Wall Control Panel will have the exact same features as the Light head Control Panel. The Wall Control Panel is a feature provided at an additional cost.

### 21.2.3. Automatic Emergency Backup Board

Amico iCE30m LED Lights come equipped with an automatic backup circuit board which ensures that the light works all the time.

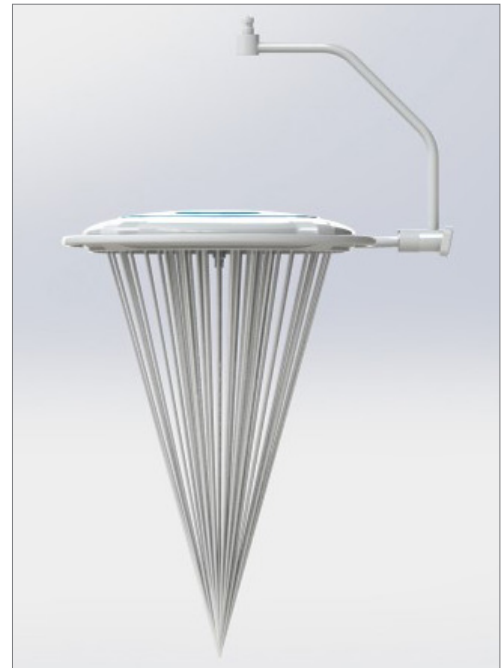
### 21.2.4. Beam Size Adjustment

Amico iCE30m Series LED Lights come with a handle for adjusting the beams. By turning the handle, the beam size can be expanded or shrunk. This creates a beam ranging from 7.6" - 12" (193mm - 305mm).

Beam Focused in to Form a 7.6" (193 mm) Diameter Light Field



The Center Handle or the In-Light Camera is used to Expand or Shrink the Beam Size



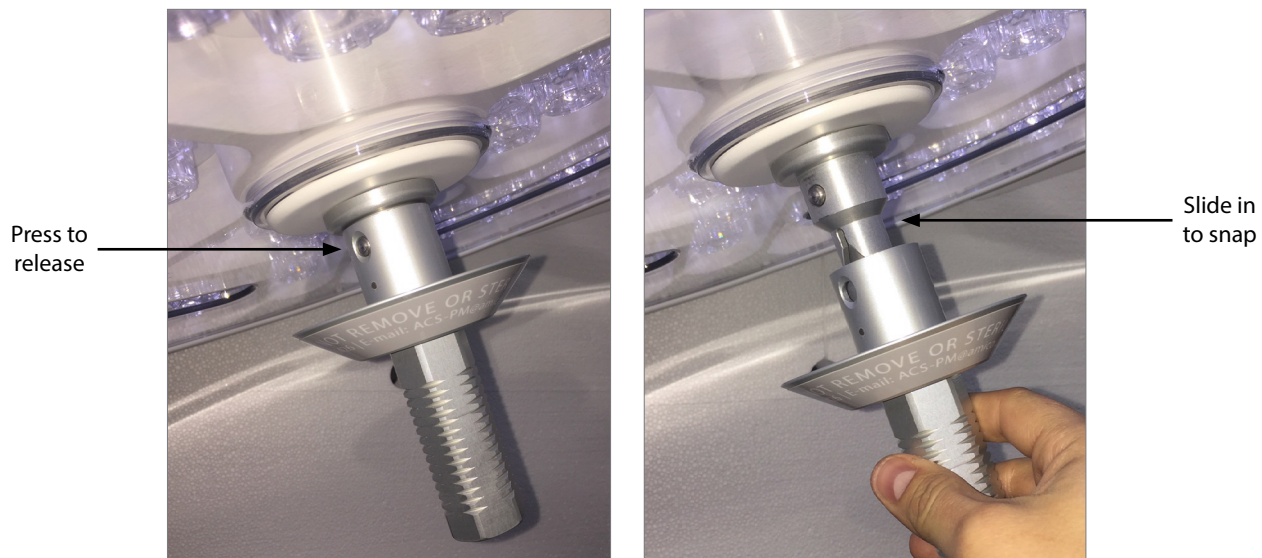
Expanded Beam



## 21. Operation

### 21.2.5. Non-Sterilizable Handle (Plastic/Aluminum)

1. At delivery, the lamp is equipped with an aluminum or plastic non-sterilizable handle. This handle must not be sterilized as it will cause damage to the handle.
2. The handles will be supplied with disposable, sterile covers. Handle disposable covers often become unsterile during an operation. Therefore, always keep extra disposable handle covers available for exchange.
3. An in-light camera may be purchased as an accessory to the lamp. In this case, you can remove the handle using the below steps:
  - To remove - press the release button and pull the handle away from the light.
  - To attach - simply insert the handle into the handle adapter until a “click” is heard.

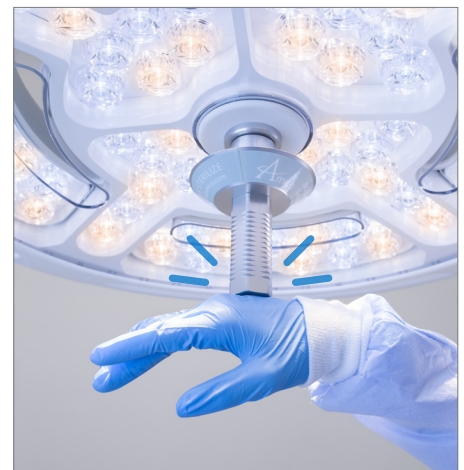


Disconnecting and Reconnecting Non-Sterilizable Handle

### 21.2.6. Smart Handle (Option Available)

Smart Handle offers doctors the capability to control the brightness levels and allows them to turn the lights ON/OFF. Smart Handle operates using a specific non-sterile plastic handle and sterile cover. The functions of the Smart Handle are as follow:

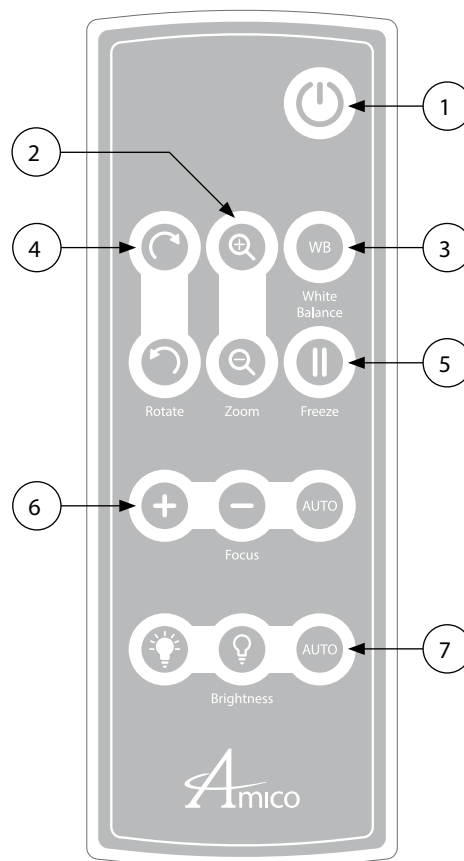
1. ON: Quick tap
2. Brightness: Each tap transitions brightness from Level 1 to Level 5 continuously
3. OFF: Long press



# 21. Operation

## 21.2.7. Camera

1. Pressing the Power button turns the camera ON and OFF.
2. Zoom in and out as required with these buttons.
3. White Balance: Place a white sheet in front of the camera such that the entire visible surface is occupied by the white sheet. Press and hold the "WB" button for 5-6 seconds to trigger the white balance.
4. Rotate camera is unlimited ( $0^{\circ}$  -  $360^{\circ}$ ).
5. To freeze the image, press Freeze button. Press the button again to continue viewing with camera.
6. Adjust the Focus feature to focus on the required area. The Auto Focus feature is initiated automatically on startup for user convenience (the Auto button will light up for easy indication). To deactivate Auto Focus, press either of the two (2) Focus buttons.
7. Adjusting the brightness (camera iris) of the camera as required. The Auto Brightness feature is initiated automatically on startup for user convenience (the Auto button will light up for easy indication). To deactivate Auto Brightness press either of the two (2) Brightness buttons.



## 22. Cleaning and Disinfecting the Unit

The exterior of the Amico Boom and Pendant should only be cleaned/disinfected using the recommended cleaning agents listed below. Other chemicals and/or liquids not listed should not be used to clean and disinfect the products.

To start, dampen a cloth with the cleaning agent and wipe down entire exterior of the products. Take great care to ensure that no liquids get inside the Amico Boom and Pendant as it is not dripping proof or water tight. Failure to protect the products from liquids may result in damage to the lift and may cause personal injury.

1. The Amico lamp system has a high-quality surface which can be cleaned with conventional cleaning agents.

- Virox Accel TB
- Virox 5
- Dispatch Hospital Cleaner disinfectant towels with Bleach
- Clorox Healthcare Professional Disinfecting Bleach Wipes
- Sani-cloth super germicidal disposable wipes \*Cannot be used on the clear screen
- Viroidin-X \*Can-not be used on the clear screen
- Clinell cleaning wipes (Sporicidal & Universal)
- Oxivir Tb Wipes
- Avert Wipes

2. The lens system (front glass) is made of a high-quality clear acrylic.

a. Pay attention to the following during cleaning:

- i. Never wipe over the lens system with a dry cloth (always clean with a wet/damp cloth).
- ii. Do not use disinfectants with any alcohol.
- iii. In addition, the following disinfectants may be used to clean the lens.

- Virox Accel TB (Accelerated Hydrogen Peroxide 0.5%)
- Virox 5
- Dispatch Hospital Cleaner disinfectant towels with Bleach
- Clorox Healthcare Professional Disinfecting Bleach Wipes
- Clinell cleaning wipes (Sporicidal & Universal)
- Oxivir Tb Wipes
- Avert Wipes

iv. Wipe the lens system after cleaning with an anti-static, smooth cloth.

*\* Always follow instructions outlined by the cleaning agent manufacturer. Do not deviate without approval from Manufacturer.*

*\*\* Do not exceed the recommended cleaning time outlined by the manufacturer.*

*\*\*\* Always wipe parts with anti-static, non-fluffy cloth to remove excess cleaning agent.*

*\*\*\*\* Do NOT use any agents not listed above, as it may result in premature failure of product.*



## 23. Maintenance

### 23.1. PREVENTATIVE MAINTENANCE

#### 23.1.1. Structural Fasteners

All structural fasteners should be checked annually.

#### 23.1.2. Service Arms

The bearings of the arms and service console should be checked annually for movement when the brake is activated. The arm should also be checked to ensure it is leveled.

#### 23.1.3. Electrical Brake System

Inspection for the wiring or the electric brake must be made on an annual basis to ensure proper connection. Systematic inspection of the electric brake will also reduce the potential of a short circuit to the system.

#### 23.1.4. Medical Gas Outlets

The medical gas outlets should be inspected periodically (at least once per year). The gas valve assemblies should be examined to ensure proper operation (ease of inserting a gas fitting or locking).

Check for leaks with or without the adapter inserted. If the gas outlet is leaking, first determine whether the screws on the gas outlet face plate have been over-tightened (indicated by the “bowing” of the face plate).

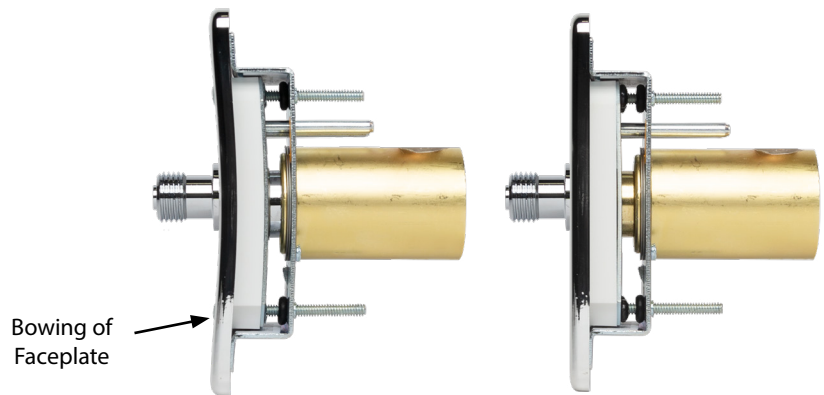
Second, examine the tightness of the hose fitting to determine whether a loose hose fitting is the cause of the leak.



**WARNING:** Ensure the gas adapter is inserted into the correct medical gas outlet and is sealed at all times. If the problem persists, replace the gas outlet immediately.



Medical Gas Outlet



Outlet Faceplate Inspection

## 23.Maintenance

Proper flow of the gas valve should be tested annually against the following standards:

### NFPA-99 (2005)

Types of Gases Flow Rate	Flow Rate (SCFM)	Static Pressure (PSI)	Max Allowable Pressure Drop (PSI)
Medical Gases	3.5	50 - 55	5.0
Support Gases	5.0	160 - 185	5.0
Vacuum	3.0	9.9	4.1

### CSA-9170-1

Types of Gases		Test Pressure (kPa)	Test Flow (L/min)	Max Allowable Pressure Drop (kPa)
Medical Gases	Low Flow	320 (46.4 PSI)	40 (1.41 SCFM)	15 (2.18 PSI)
	High Flow	320 (46.4 PSI)	350 (12.35 SCFM)	70 (10.15 PSI)
Support Gases	Low Flow	560 (81.2 PSI)	350 (12.35 SCFM)	15 (2.18 PSI)
	High Flow	5.8 (40 kPa)	25 (0.8825 SCFM)	70 (10.15 PSI)

The following tests must be carried out on the flexible hoses per ISO 7396-1:2007.

- Test for leakage, test for obstruction, test for particulate contamination.
- Test for flow and pressure drop, and test for cross connection, and test of gas identify.

All hose assemblies comply with ISO 5359:2014.



## 23. Maintenance

### 23.1.5. Electrical Outlets

The electrical outlets should be inspected annually for voltage drop when maximum current load is applied. A drop in voltage can indicate a problem with the wiring system inside the arm. As a result, more serious problems may follow.

### 23.1.6. iCE30m LED Light

Amico iCE Series LED Lights are supplied with brakes on the suspension fixture and on the lamp housing. If necessary, adjust these brakes after installation. If the lamp is difficult to move, or if it does not keep its position, the brake forces need to be adjusted. When adjusting brakes refer to section 16.4.

Preventative maintenance of the light should be done every two (2) years. This includes a technical and mechanical check-up.

### 23.1.7. Spring Arm

The spring arm should be inspected bi-annually by a qualified technician for the following:

1. The Spring Arm and Lighthouse moves smoothly without any noise or grinding.
2. Locking key thickness must not be less than 0.060" (1.52mm) thick and 0.250" (6.35mm) deep at any point.
3. Ensure that the Spring Arm does not have any cracks or damage to the paint or plastic covers.
4. The Spring Arm should not drift when loaded.
5. Lubricate the moving joints with approved grease.

The following should be checked annually by a qualified technician:

6. All labels are attached and are legible.
7. All spring arm components are not deformed.
8. All moving parts are free from squeaking and are not loose.
9. Rotational stops are working correctly.
10. All components are free from collision damage.
11. Welds are free from cracks.
12. Load, parallel, brake and vertical adjustments are conducted to ensure the spring arm is performing correctly.

## 23. Maintenance

### 23.2. TROUBLE SHOOTING

Should problems arise with the use of the Amico Boom and Pendant, review the following chart. Find the fault and complete the recommended solution. If the fault is not found and/or the solution does not correct the problem contact ACS at [acs-service@amico.com](mailto:acs-service@amico.com).

Fault	Recommended Solution
<b>Boom Portion</b>	
If the handle control fails to operate	In an emergency, move the arms with the brake system engaged
If the brakes are not working properly	The pads may need to be replaced, if there is the case contact ACS
If there is a gas leak in the system	Shutdown power and perform a leak test
<b>Lights Portion</b>	
The emergency red light indicator is "O"	Qualified technician to replace the main board on the yoke
A Button on the main mylar controller has stopped functioning	The mylar controller may need to be replaced
A button on the wall mylar controller has stopped functioning	The wall mylar controller may need to be replaced
Light head is drifting	Tighten up the exposed screws on the yokes or the central axis using a 3/8" flat head screwdriver.
Glass is dirty	Follow section 11. Cleaning and Disinfecting
An LED is not functioning	The pod needs to be replaced by a qualified technician
<b>Terminal Box</b>	
The red LED is on and nothing is working	Carefully check the power supply's voltage should be 24 VDC. If not then the power supply will have to be changed
The green LED is on but the lights do not power on	Check that the connection of the Light "IN" is properly plugged in. If it is there might be a problem with the light
The green LED is on and the Lights work, the camera however does not turn on	Check if the VGA connection and the DSUB9 connection are secure. Also check the VGA connection on the camera control box is secure
The LED's on the power supply box do not turn on, and nothing is working	Make sure the main power is on. If it is and the LED indicator is still off, turn off the main power again and double check your connections.



For additional service and repair guidelines refer to the **iCE Series Boom Service and Repair Manual** and **iCE30m LED Service Manual**.

## 24. Storage, Shipping and Operating Environment

### 24.1. OPERATION

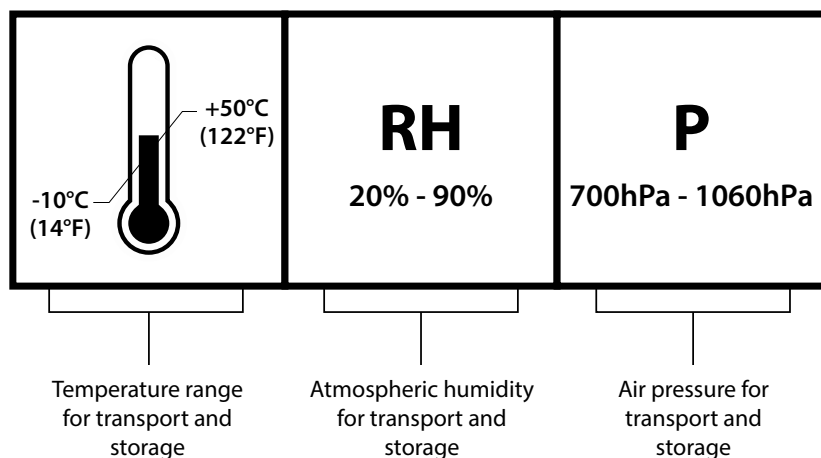
	Minimum	Maximum
Temperature	+10°C	+30°C
Relative Atmospheric Humidity	30%	75%
Air Pressure	700 hPa	1060 hPa

### 24.2. TRANSPORT/STORAGE

	Minimum	Maximum
Temperature	-10°C	+50°C
Relative Atmospheric Humidity	20%	90%
Air Pressure	700 hPa	1060 hPa

Amico Equipment is designed to withstand the elements during its life installed in a controlled hospital environment. During storage, however, the environmental conditions can vary due to transportation and storage locations. Below is a set of rules that must be followed to prevent damage to the product and maximize product life:

1. Amico product must NOT be stored in a damp or wet environment with no protection against the elements. The Warranty will be void if these rules are not followed.
2. Always ensure the packaging is not damaged when storing product for long term. Patch the packaging (bubble wrap, shrink wrap) if punctured.
3. Storage/Transport conditions with length of period less than 1 month are as follows:
  - a. Temperature = +10°C to +40°C
  - b. Relative Humidity = 20% to 90%



## 25. Guidance and Manufacturer's Declaration - Electromagnetic Emissions

### 25.1. ELECTROMAGNETIC COMPLIANCE DATA FOR AMICO BOOM AND PENDANT

#### Guidance and Manufacturer's Declaration - Electromagnetic Emissions

The equipment or system is intended for use in the electromagnetic environment specified below. The customer or the user of the Amico equipment or system should assure that it is used in such an environment.

Boom and Pendant is intended for use in the electromagnetic environment specified below. The customer or the user of the Amico Boom and Pendant should assure that it is used in such an environment.

Emissions	Compliance	Electromagnetic Environment - Guidance
RF Emissions CISPR 11	Group 1	The Amico Boom and Pendant uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class A	The Amico Boom and Pendant is suitable for use in all establishments other than domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuations / Flicker Emissions IEC 61000-3-3	Complies	

## 25. Guidance and Manufacturer's Declaration - Electromagnetic Emissions


The Amico Hub is intended for use in the electromagnetic environment specified below. The customer or the user of the Amico Boom and Pendant should assure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment - Guidance
Electrostatic Discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical Fast Transient/Burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±1 kV for power supply lines ±0.250 kV for input/output lines	The Main power supply quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	±1 kV line(s) to line(s) ±2 kV line(s) to earth	Main power quality should be that of a typical commercial or hospital environment.
Voltage Dips, Short Interruptions, and Voltage Variations on Power Supply Input Lines IEC 61000-4-11	<5% UT (>95% dip in UT) for 0,5 cycle 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles <5% UT (>95% dip in UT) for 5 sec	<5 % UT (>95% dip in UT) for 0,5 cycle 40 % UT (60% dip in UT) for 5 cycles 70 % UT (30% dip in UT) for 25 cycles <5 % UT (>95% dip in UT) for 5 sec	The Main power supply quality should be that of a typical commercial or hospital environment.  If the user of the Amico Boom and Pendant requires continued operation during main power interruptions, it is recommended that the Amico Boom and Pendant be powered from an interruptible power supply or a battery.
Power Frequency (50/60 Hz) Magnetic Field IEC 61000-4-8	3 A/m	Not Applicable	Power frequency magnetic fields should be at levels characteristic of a typical commercial or hospital environment.

**NOTE:** UT is the A.C. mains voltage prior to application of the test level.

## 25. Guidance and Manufacturer's Declaration - Electromagnetic Emissions

The ME EQUIPMENT or ME SYSTEM is intended for use in the electromagnetic environment specified below. The customer or the user of the ME EQUIPMENT or ME SYSTEM should assure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment - Guidance
<p>Conducted RF IEC 61000-4-6</p> <p>Radiated RF IEC 61000-4-3</p>	<p>3 Vrms 150 kHz to 80 MHz</p> <p>3 V/m 80 MHz to 2,5 GHz</p>	<p>3 Vrms</p> <p>3 V/m</p>	<p>Portable and mobile RF communications equipment should be used no closer to any part of the ME EQUIPMENT or ME SYSTEM, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance:  <math>d = 1.2\sqrt{P}</math>      80 MHz to 800 MHz  <math>d = 2.3\sqrt{P}</math>      800 MHz to 2,5 GHz</p> <p>Where <b>P</b> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <b>d</b> is the recommended separation distance in metres (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey (a) should be less than the compliance level in each frequency range (b)</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 

**Note 1:** At 80 MHz and 800 MHz, the higher frequency range applies.

**Note 2:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

- Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones, land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be accurately predicted. To assess the electromagnetic environment for fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the ME EQUIPMENT or ME SYSTEM is used exceeds the applicable RF compliance level above, the ME EQUIPMENT or ME SYSTEM should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the ME EQUIPMENT or ME SYSTEM.
- Over the frequency range of 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

## 25. Guidance and Manufacturer's Declaration - Electromagnetic Emissions

### 25.2. RECOMMENDED SEPARATION DISTANCES BETWEEN PORTABLE AND MOBILE RF COMMUNICATIONS EQUIPMENT AND THE EQUIPMENT OF SYSTEM

The Amico Boom and Pendant is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Amico Boom and Pendant can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Amico Boom and Pendant as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2.5 GHz
	$d=1.2\sqrt{P}$	$d=1.2\sqrt{P}$	$d=2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance (d) in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where (P) is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

**NOTE:** At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

**NOTE:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

## 26. Disposal

1. The Amico Hub doesn't contain any dangerous goods.
2. The components of the Amico Hub should be properly disposed of at the end of its shelf-life.
3. Ensure that the materials are carefully separated.
4. The electrical - conducting boards should be submitted to an appropriate recycling facility.
5. The rest of the components should be disposed of in methods applicable to the contained materials.

## 27. Warranty Policy

Amico Clinical Solutions Corp. will warrant its manufactured equipment for up to five (5) years from date of installation. Amico Clinical Solutions Corp.'s warranty will not cover any disposable, sterilizable or single use products.

Pendant systems are warranted to be free of defects for five (5) years from date of installation. During the first twelve (12) months after installation, Amico Clinical Solutions Corp. will, at its own cost, repair and/or replace any part on site or at the factory which has proven to be defective. After the first twelve (12) months, Amico Clinical Solutions Corp. will only provide replacement parts; shipping and installation costs will be borne by the customer.

ICE series surgical lamp heads are warranted to be free of defects for five (5) years from date of installation. During the first twelve (12) months after installation, Amico Clinical Solutions Corp. will, at its own cost, repair and/or replace any part on site or at the factory which has proven to be defective. After the first twelve (12) months, Amico Clinical Solutions Corp. will only provide replacement parts; shipping and installation costs will be borne by the customer.

Monitors are warranted as per the warranty provided by the monitor manufacturer selected by the customer or Amico Clinical Solutions Corp.

Monitor holders are warranted to be free of defects for five (5) years from date of installation. During the first twelve (12) months after installation, Amico Clinical Solutions Corp. will, at its own cost, repair and/or replace any part on site or at the factory which has proven to be defective. After the first twelve (12) months, Amico Clinical Solutions Corp. will only provide replacement parts; shipping and installation costs will be borne by the customer.

HD Cameras, in-light or spring arm mounted, are warranted for a period of twelve (12) months from date of installation. During this period, Amico Clinical Solutions Corp. will, at its own cost, repair and/or replace any part on site or at the factory which has proven to be defective.

Suspension systems for the surgical lamps and monitor holders are warranted for a period of twelve (12) months from date of installation. During this period Amico Clinical Solutions Corp. will, at its own cost, repair and/or replace any part on site or at the factory which has proven to be defective.

Amico manufactured accessories are warranted to be free of defects for five (5) years from date of installation. During the first twelve (12) months after installation, Amico Clinical Solutions Corp. will, at its own cost, repair and/or replace any part on site or at the factory which has proven to be defective. After the first twelve (12) months, Amico Clinical Solutions Corp. will only provide replacement parts; shipping and installation costs will be borne by the customer.

This warranty is valid only when the equipment described above has been properly installed as outlined in the Amico Clinical Solutions Corp. specifications. The validity of this warranty also depends on the proper usage and timely servicing of our equipment according to Amico Clinical Solutions Corp.'s recommendations. Amico Clinical Solutions Corp. does not cover damages as a result of shipment failures, accidents, misuse, abuse, neglect, mishandling, alteration, misapplication or damages which may be attributed to acts of God.

Amico Clinical Solutions Corp. shall not be liable for incidental or consequential damages resulting from the use/misuse of the equipment.

All claims for warranty must first be approved by Amico Clinical Solutions Corp.'s service department at: **acs-service@amico.com** or through Amico's direct lines: **905-747-2032** or **1-833-843-8470**. A valid Return Goods Authorization (RGA) number must be obtained from Amico Clinical Solution Corp. prior to commencement of any service work. Warranty work which has not been preauthorized by Amico Clinical Solutions Corp. will not be reimbursed.



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[www.amico.com](http://www.amico.com)

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