

# ***ECO - Sys***

Dental Light

Model AL-711M

Model AL-712M

Model AL-715M

## **INSTALLATION AND OPERATION INSTRUCTIONS**

### **IMPORTANT**

After installation is completed, check all the bolts, screws and fasteners to confirm that they are securely fastened.

 **Belmont<sup>®</sup>**



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### Intended Use of the Product

This product is intended for the exclusive use for diagnoses, treatments and relative procedures of dentistry, and must be operated or handled by the qualified dentists or by dental staffs under the supervision of the dentist. Such dentists or dental staffs should instruct and/or assist the patients to approach to and leave from the product. Patients should not be allowed to operate or handle the product unless he/she is so instructed.

### Symbols

	Caution It means "caution, warnings, or possibility to danger".		Type B Applied Parts		Manufacturer
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### Environmental condition for Operation

Temperature : 41~104F (5 ~ 40°C)  
 Humidity : 10 ~ 80%  
 Pressure : 8.7~15.4 psi (600 ~ 1060 hpa)

### Environmental condition for Storage

Temperature : 14~122F ( -10 ~ 50°C)  
 Humidity : 10 ~ 80%  
 Pressure : 8.7~15.4 psi (600 ~ 1060 hpa)

### Environmental condition for Transportation

Temperature : 14~122F (-10 ~ 50°C)  
 Humidity : 10 ~ 80%  
 Pressure : 8.7~15.4 psi (600 ~ 1060 hpa)

## **WARNING**

- To avoid the risk of electric shock, this equipment must only be connected to supply mains with protective earth”
- Lamp cover becomes very hot during use.To avoid burning fingers, do not a touch lamp cover.
- Position a light head by holding light handle(s).
- Installation and service work should be conducted by an authorized installation/service personnel only.
- Always put a lamp cover on to avoid burning fingers.

## **WARNING: The followings are prohibited.**

- To modify this equipment.
- To use the equipment under any failure condition.
- To use the equipment without doing the daily and periodical check-up.
- To wipe the plastic covers with any disinfectant or detergent that contains organic solvent.

### **Precautions for Installation**

- Assure that the ceiling and/or framing can provide the 70 lb. (31.5kg) of dead weight capacity and the additional force of movement and positioning of the light.
- Keep the equipment away from water.
- Keep in circumstances safe from influence by temperature, humidity, wind, sun light, air containing salts and minerals.
- Care about stability such as inclination, vibration and impact, including handling and transportation.
- Do not keep the equipment in a place where chemicals are or where gas is emitted.
- During lifting and unpacking of the light, make sure to hold only the designated parts.
- Do not drop or hit the light.
- Do not connect to power supply other than AC120V 60HZ.
- Ground light properly prior to turning power on.
- When the installation process has been completed, verify that all the mechanical and electrical functions are working properly.
- Thick gloves are highly recommended at unpacking.
- Do not modify this equipment.

## **CAUTION**

### **Before use**

- Check connection of switches and make sure that the device functions properly.
- Make sure that grounding wire is connected.
- Make sure that cables are properly and perfectly connected.

## CAUTION

### **During use**

- Do not use the light longer than required for examination or treatment.
- Always watch the patient and the equipment to make sure nothing is wrong.
- If anything wrong is observed with the equipment or the patient, take a proper action, such as stopping the use of equipment as well as keeping the patient in safe.
- Keep an eye on the patient not to touch the equipment.

### **After use**

- Turn off the light.
- Clean the equipment and get it ready for use.

## CAUTION

Do not spray liquids directly onto light surfaces.

In order to prevent damage to electrical components and systems, do not apply excess cleaning solution onto light surfaces.

## **NOTE**

Warranty does not cover damage to equipment caused by disinfectant solutions

### **Replacement of parts (Except the Bulb and Lamp cover)**

Replacement must be done by an professional technician(s) of our company or a company authorized by us.

### [1] SPECIFICATIONS

1. Focal Distance.....29.9"
2. Color Temperature.....4,200° Kelvin at 2,600 FTC
3. Light Intensity..... High : 2,600 FTC  
Low : 1,670 FTC  
Composite Mode : 740 FTC
4. Light Pattern.....8.7" x 3.3" at 29.9"
5. Power Requirement.....AC. 120 V 60 Hz 0.53A
6. Bulb Type.....Tungsten Halogen Type (JA 12-55WD/DL8)

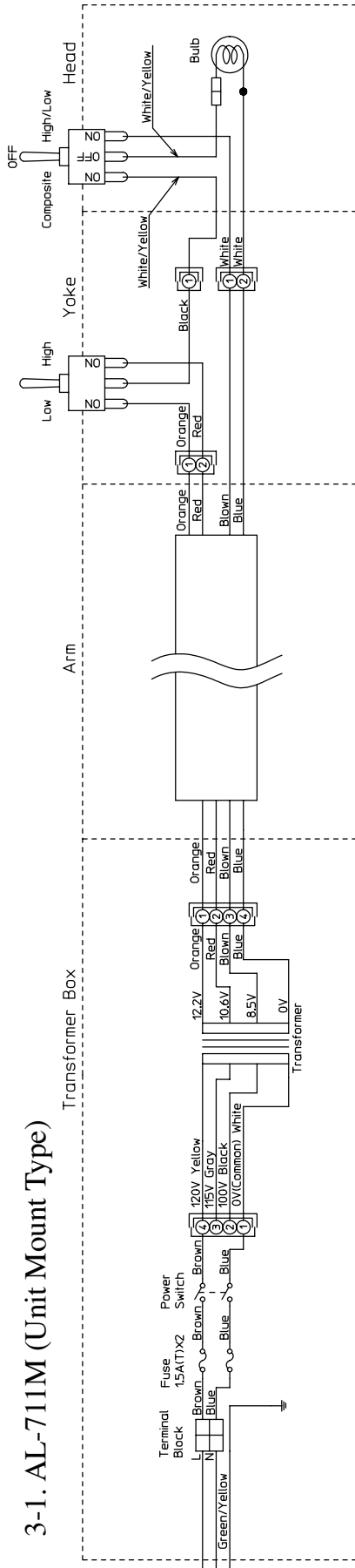
### [2] CLASSIFICATION

- a. Protection against electric shock : Class I Equipment, Type B Applied Parts
- b. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

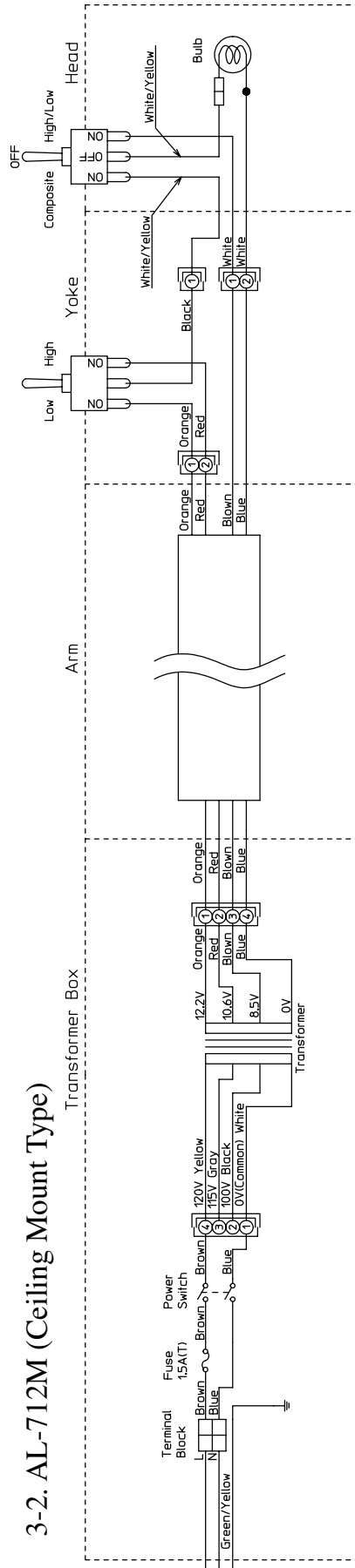


[3] WIRING DIAGRAM

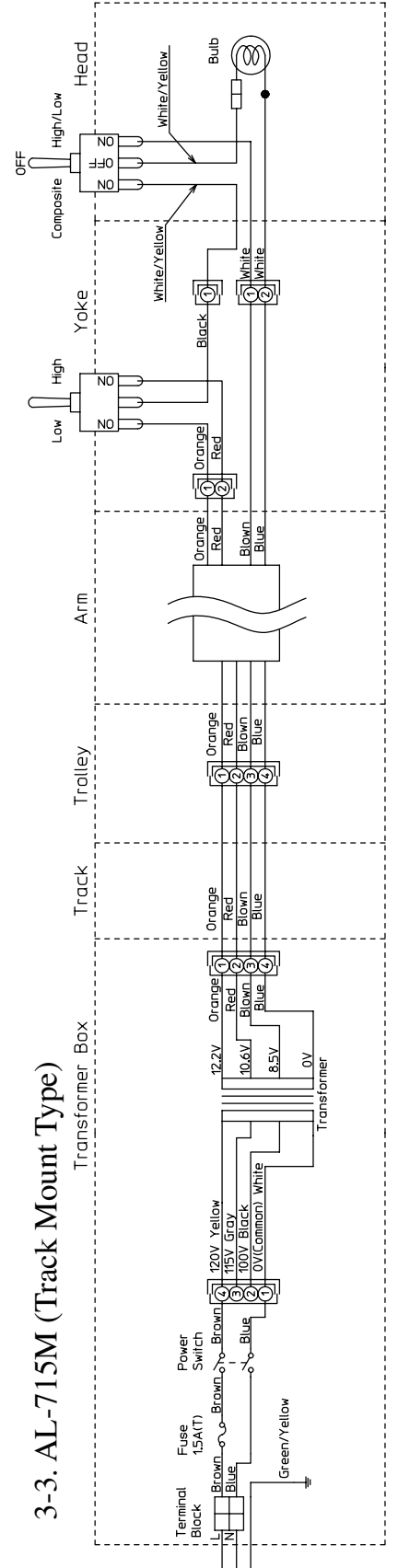
3-1. AL-711M (Unit Mount Type)



3-2. AL-712M (Ceiling Mount Type)

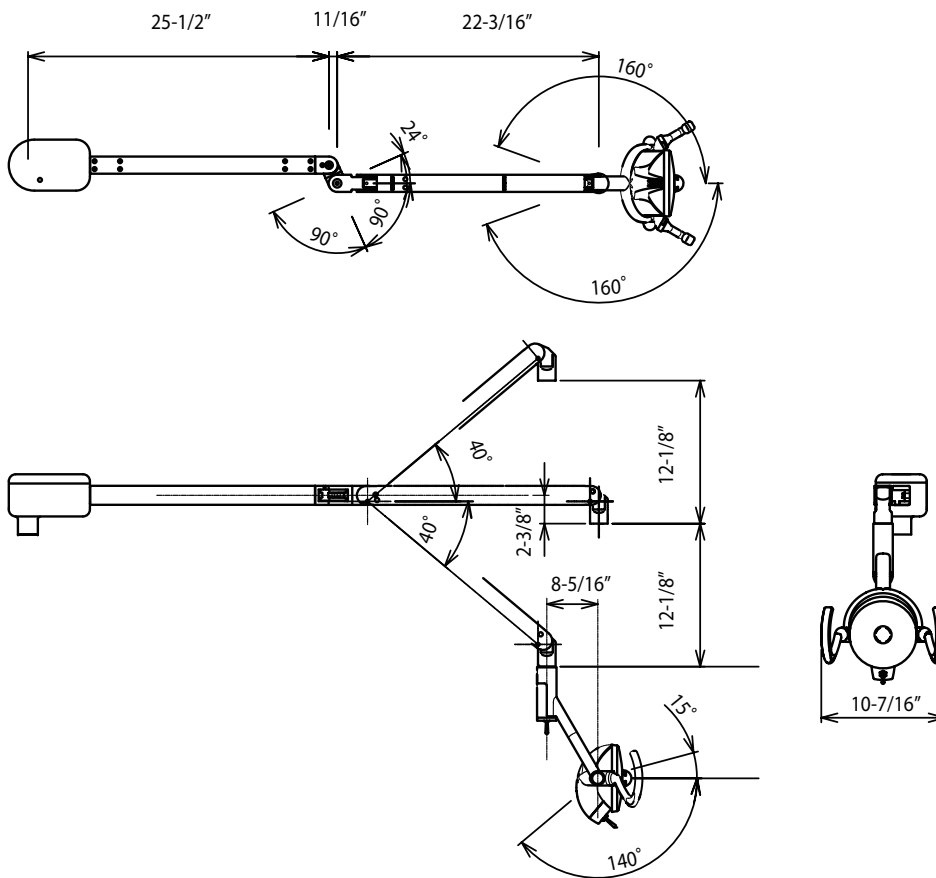


3-3. AL-715M (Track Mount Type)



**[4] UNIT MOUNT TYPE (AL-711M)**

4-1. Dimensions Inches



4-2. Installation Instructions

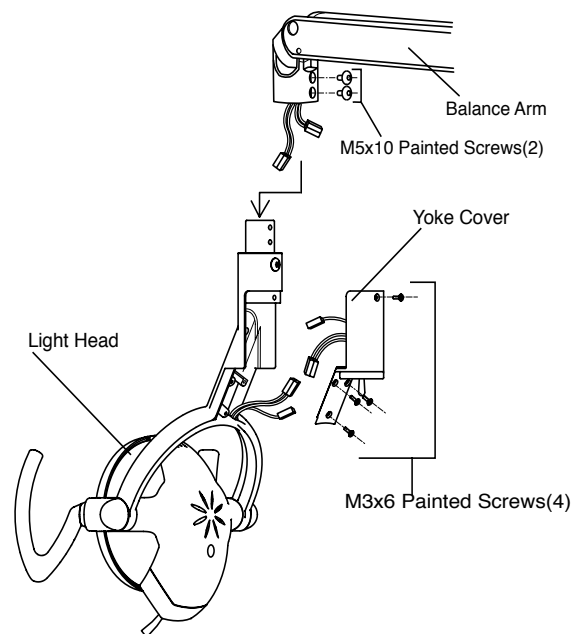
4-2-1. Assembling the head

Assembling the head with the balance arm per the following instruction will be needed.

All necessary parts are included in the carton box.

- M3 x 6 Painted Screw..... 4pcs.
- Yoke Cover..... 1pce.
- M5 x 10 Painted Screw..... 2pcs.

- 1) Install the light head to balance arm with two M5 x 10 painted screws.
- 2) Connect the wire harness.
  - 2P connector:orange/ red from balance arm to orange/red wire from yoke cover (same color to be met at each side of connector.)
  - 2P connector:brown/blue from balance arm to white/white from light head.
  - 1P connector : black wire from yoke cover to white wire from light head
- 3) Attach the yoke cover with four M3 x 6 painted screws.



#### 4-2-2. Mounting model AL-711M onto a light pole

- 1) Slide power cord through the pole adapter as shown in FIGURE 1.
- 2) Pull power code through light pole. (a pull string may be helpful for this operation)
- 3) Mount light and pole adapter onto the light pole.
- 4) Attach a hospital grade plug (in Canada, CSA 5-15 Hospital Grade Plug ) to power code end.  
This is to be installed by a licensed electrician only, in accordance with the National Electrical Code(in the USA) or Canadian Electrical Code(in Canada), and local electrical codes as applicable.
- 5) Remove arm locking key (save for possible future shipment).
- 6) To convert to left-hand operation (See FIGURE 2.):
  1. Remove Right/Left Hand Operation Screw below H-bracket (as shown).
  2. Rotate H-bracket to other position and reinsert screw (loosen large upper & lower screws to help in moving bracket).

### WARNING

Do not rotate the swing-arm more than 360°.  
Doing so may cause a breaking of wire.

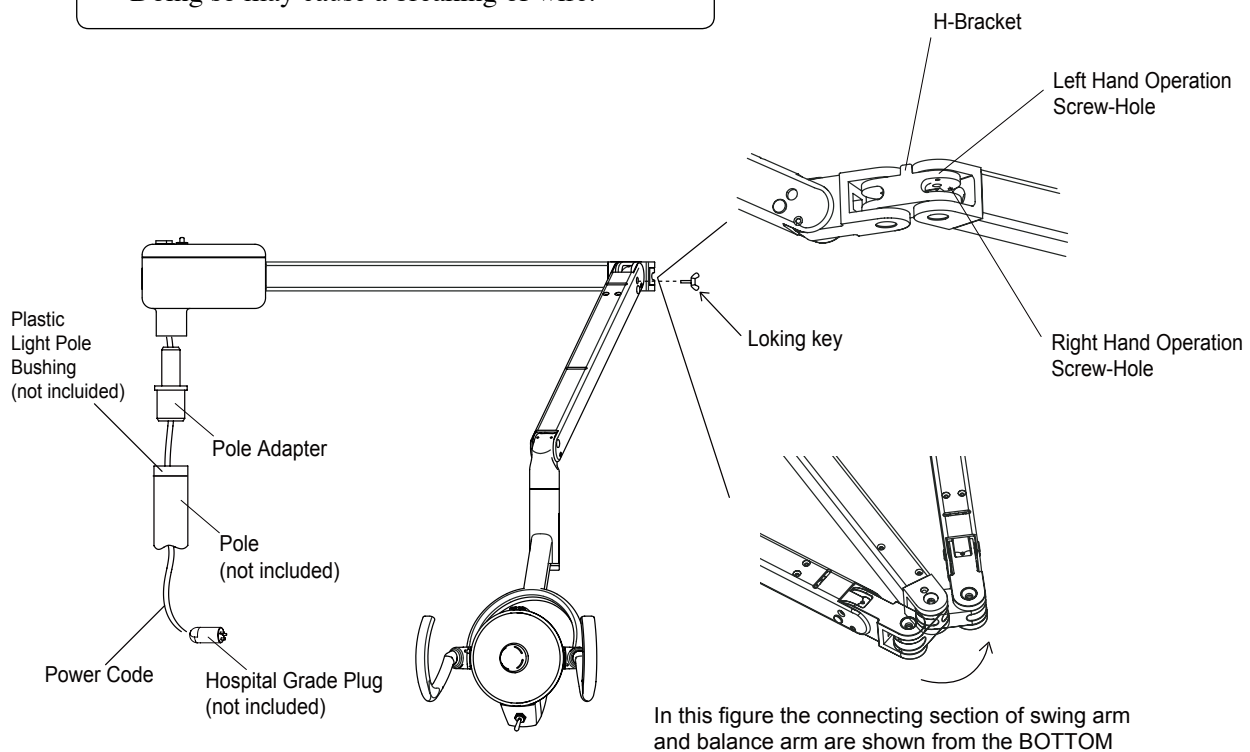
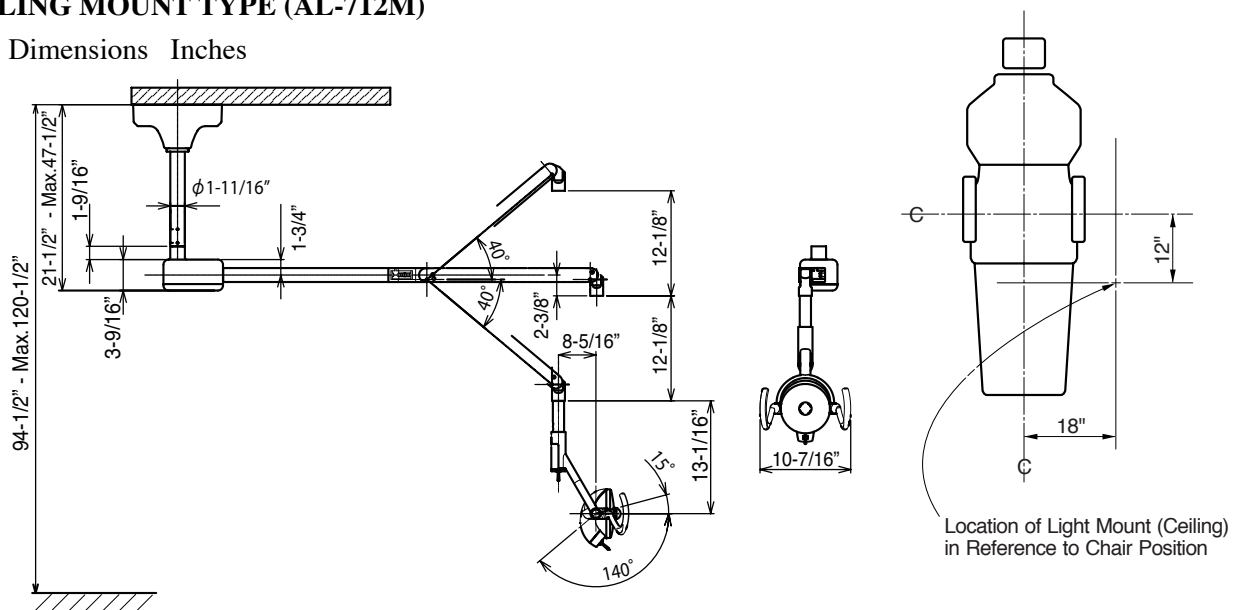


FIGURE 1

FIGURE 2

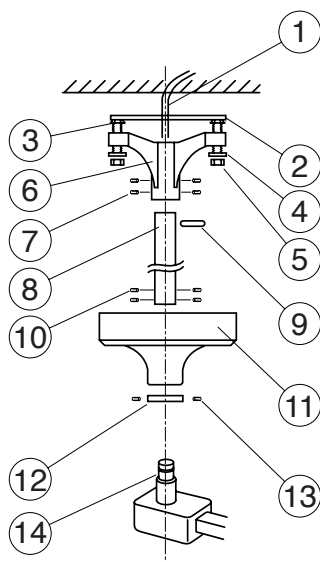
## [5] CEILING MOUNT TYPE (AL-712M)

### 5-1. Dimensions Inches



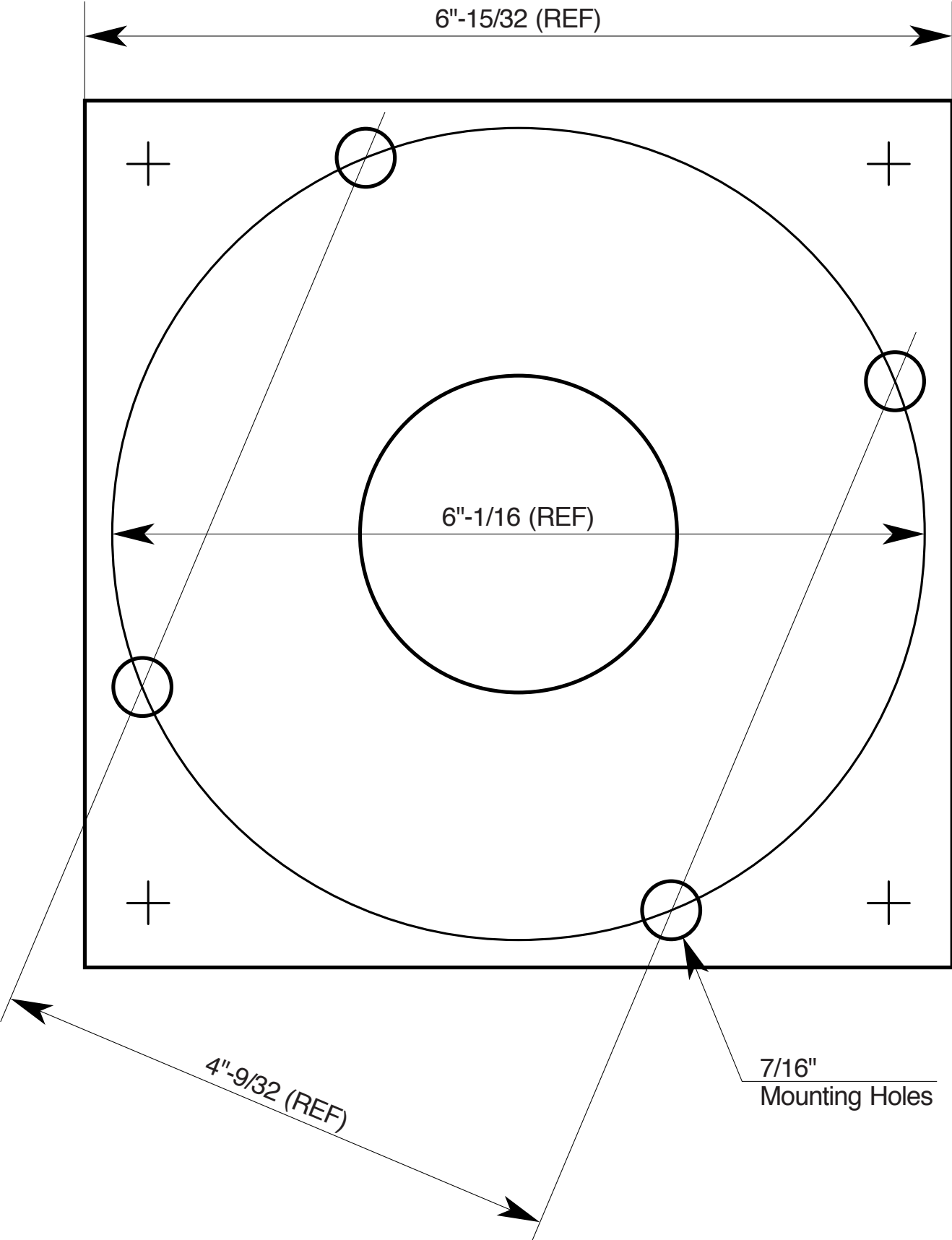
### 5-2. Installation Instructions

- 1) Secure mounting plate to the ceiling, using the parts which will give the equipment a enough structural strength.
- 2) Route the power supply cable (1) through the center of the mounting plate(2).
- 3) Insert the suspension tube(8) into the ceiling flange and secure with roll pin(9) and set screws(7) supplied.
- 4) Use a level to make certain suspension tube is plumb.
- 5) Slide the flange cover(11) and flange cover ring(12) (flat side up) over the suspension tube and secure about half way up the tube. Use only one set screw(13) as you will be moving this on final installation.
- 6) Install the light assembly to the suspension tube by first running the 3 wire cord from the light up through the suspension tube to the ceiling flange.  
Secure light assembly to suspension tube with 4 Allen set screws.
- 7) Connect the power supply cable to the 3 wire cord from the light assembly. Be sure to follow local electrical codes.
- 8) Test light for proper operation.
- 9) Reposition flange cover and secure with flange cover ring - Secure all set screws.



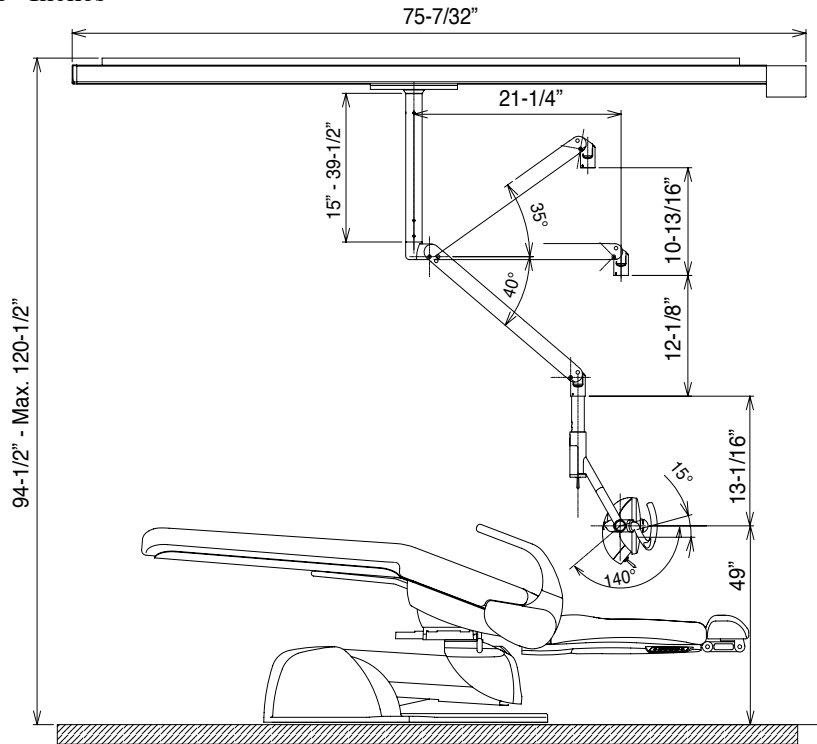
- (1) Power Supply Cable
- (2) Mounting Plate
- (3) Leveling Nut (M8 : 4pcs)
- (4) Washer (M8-Plain Washer / M8-Spring Washer : 4pcs)
- (5) Nut (M8 : 4pcs)
- (6) Ceiling Flange
- (7) Socket Screw for Flange (M6x 8 : 4pcs)
- (8) Suspension Tube
- (9) Roll Pin (6 x 70 : 1pce)
- (10) Socket Screw for Arm (M5 x 8 : 2pcs)
- (11) Flange Cover
- (12) Cover Ring
- (13) Socket Screw for Ring (M5 x 8 : 2pcs)
- (14) Light Assembly

AL 712-M CEILING MOUNTING TEMPLATE



**[6] TRACK LIGHT (AL-715M)**

6-1. Dimensions Inches



6-2. Ceiling Preparation

For safety in operation as well as stability of the light source, the importance of proper ceiling structure cannot be overemphasized. In general, a ceiling structure capable of supporting 200 lb. dead weight is required.

- 1) In conventional ceilings with joists perpendicular to center line of light, attach pallet by at least 6 - 5/16 x 3" lag screws. Suitable holes are provided in pallet for most installations, utilizing 16" or 12" center to center joists. For other spacings or locations, additional holes can be drilled in pallet.

(SEE FIGURE 1.)

**IMPORTANT: Locate transformer end of track at headrest end of chair only.**

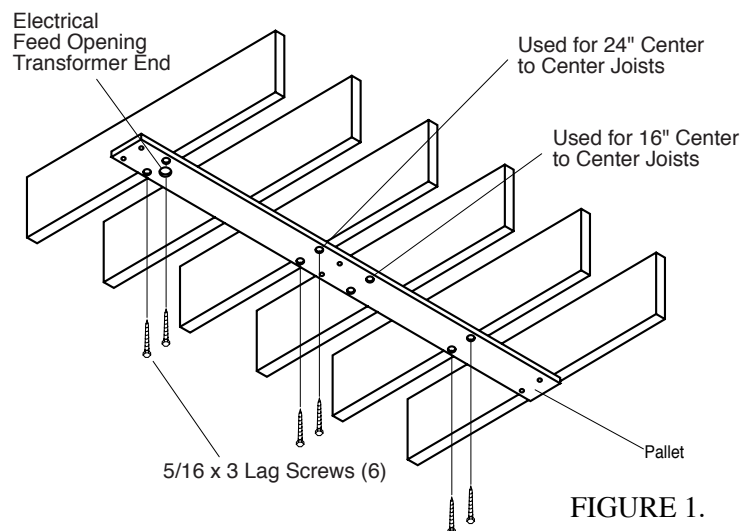


FIGURE 1.

- 2) For conventional ceilings with joists parallel to center line of light, cross blocks must be installed in 3 places to allow mounting with at least 6 - 5/16 x 3" lag screws. (SEE FIGURE 2.)

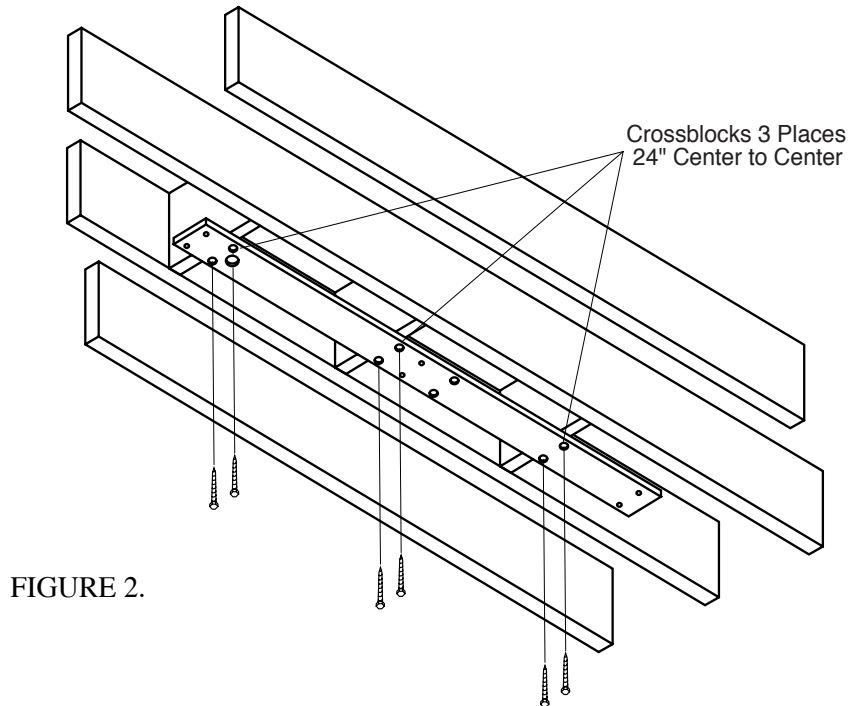


FIGURE 2.

- 3) For suspended ceilings on, appropriate rigid structure must be attached to ceiling framework to provide 200 lb. dead weight capacity. (SEE FIGURE 3.)

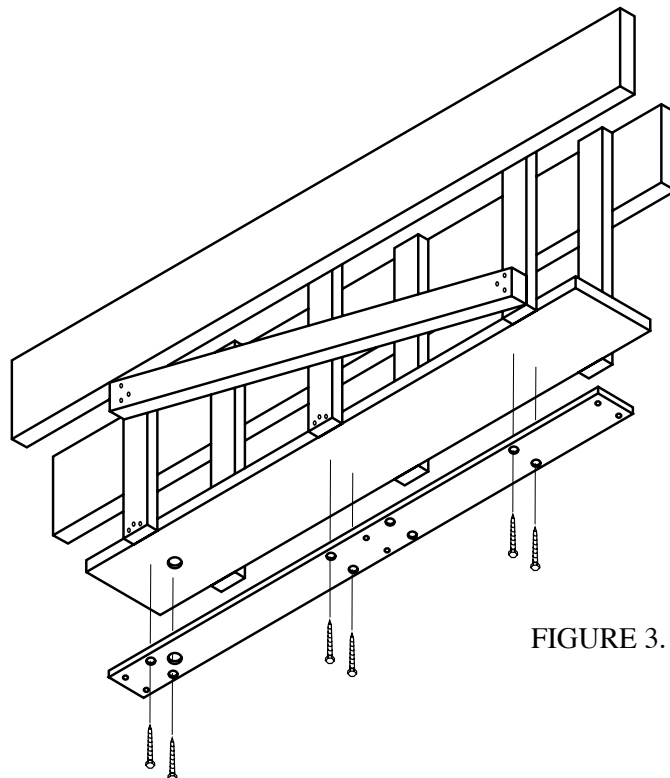


FIGURE 3.

### 6-3. ELECTRICAL PREPARATION

Refer to FIGURE 4 for location of electrical feed opening in pallet, provide 3 wire, 120 V, 60Hz circuit (15 amp. fuse or breaker through flexible conduit with enough slack to protrude at least 2" below pallet when installed. Terminate conduit with 1/2" body box connector suitable for mounting through 3/16 thickness.

A readily accessible shut-off switch for this circuit is recommended. Use wiring suitable for 90°C service.

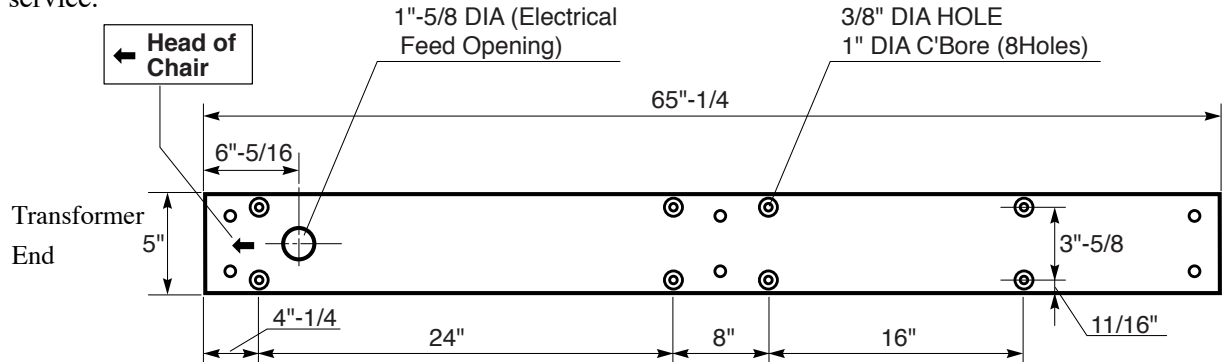
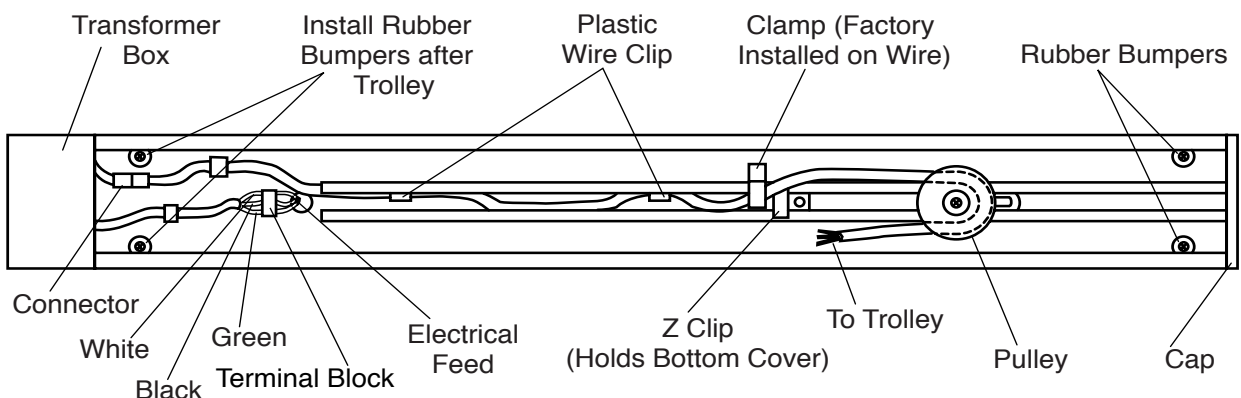


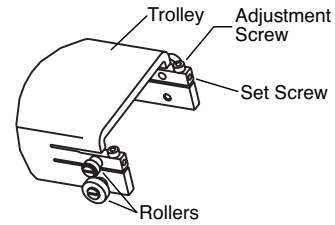
FIGURE 4.

### 6-4. INSTALLATION INSTRUCTIONS

- 1) Lead out the power supply cable from the ceiling where the track light is mounted.
- 2) Run the power supply cable through the electrical feed opening in the pallet and mount pallet to ceiling.
- 3) Place track against pallet and slightly engage two mounting bolts(M8 x 25 Hex. Head bolt:6pcs and M8 spring washer:6pcs) at end opposite the electrical opening.
- 4) Allowing the free end to hang down slightly for access, install the conduit box connector to the track.
- 5) Finish bolting track securely to pallet.
- 6) Connect wires from feed to terminal block.
- 7) Slide trolley onto track (end near electrical opening) with arrow on trolley oriented toward pulley on track.
- 8) Carefully guide wire from trolley, around spring loaded pulley and back toward transformer end of track.
- 9) Attach retainer clamp to small screw(M4x8 : 1pce) in track. Clip free end of trolley wire into plastic clip near end.
- 10) Install rubber bumpers both ends of track in holes provided.
- 11) This is to be installed by a licensed electrician only, in accordance with the National Electrical Code(in the USA) or Canadian Electrical Code(in Canada), and local electrical codes as applicable.

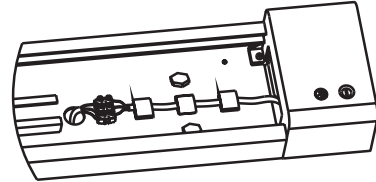


12) Check operation of trolley. It is factory adjusted to provide smooth effortless travel, without play; however rollers can be readjusted if necessary. Loosen set screw and adjust socket cap screw to vary roller clearance.



13) Unpack transformer / housing assembly and mount to track with screws (M4x15 Screw with plain washer & spring washer : 2pcs) provided.

14) Attach pigtail leads to corresponding power line wires at terminal block. Retain wires under plastic clip.



15) Connect plug-in transformer connector to trolley wire harness.

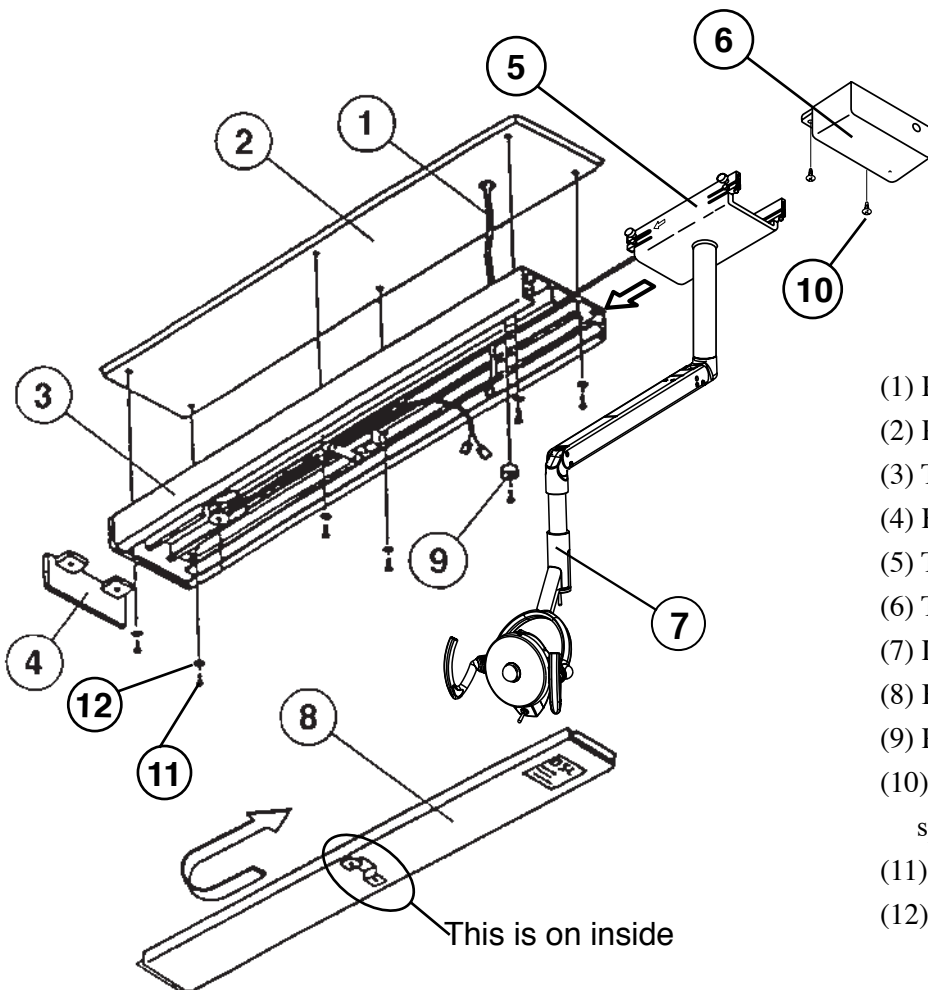
16) Carefully slide bottom cover onto track from the end on the opposite side of the transformer end. Be sure to engage lip inside of the bottom covers onto the Z bracket on the track.

17) Install end-cap with screws (Screw with plain washer & spring washer M4x15 : 2pcs) provided.

18) Slide trolley back and forth checking for binding or rubbing.

19) Confirm that balance arm is properly adjusted to stay where it is placed. If necessary, move head up or down to expose appropriate cross drilled nut and adjust with tool provided. (See SECTION 7, adjusting tension of balance arm.)

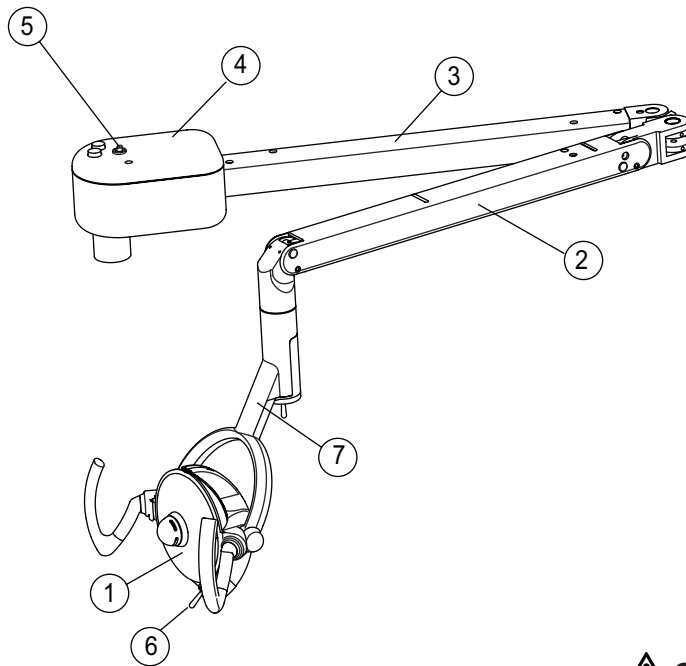
20) Turn on power and check electrical operation of light.



- (1) Power supply cable
- (2) Pallet
- (3) Track
- (4) End-cap
- (5) Trolley
- (6) Transformer Box
- (7) Light Assembly
- (8) Bottom Cover
- (9) Rubber bumper(4pcs)
- (10) Screw with plain washer & spring washer M4x15(2 pcs)
- (11) Hex Head Bolt M8x25(6 pcs)
- (12) Spring Washer M8 (6 pcs)

## [7] OPERATING INSTRUCTIONS

### 7-1. Major Parts Identification



- (1) Head Assembly
- (2) Balance Arm Assembly
- (3) Rigid Arm Assembly
- (4) Transformer Housing Assembly
- (5) Power Switch
- (6) Manual Switch
- (7) Intensity Switch

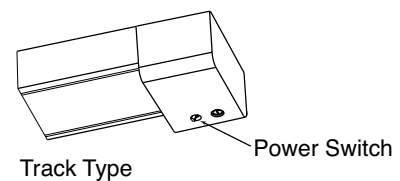
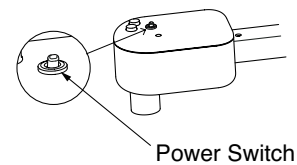
### CAUTION

CAUTION-Electric shock hazard, do not remove cover. Refer servicing to qualified service personnel

### 7-2. Power Switch

Flip the toggle switch to the side marked with ' I ' to turn on the light.

- I ; ON
- O ; OFF



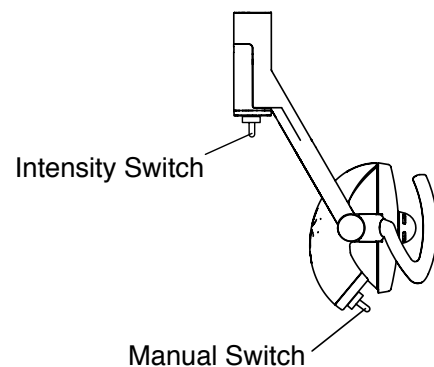
### 7-3. Manual Switch

Operation (High or Low) beam ; Flip toggle to left  
(HIGH or LOW is decided by the intensity switch)

- Off ; Flip toggle to center
- Composite Mode beam ; Flip toggle to right

### 7-4. Intensity Switch

- High beam ; Flip toggle to left
- Low beam ; Flip toggle to right



## [8] ADJUSTMENTS

### 8-1. Adjusting Tension of Balance Arm

Use slot A when making adjustment for upward / downward drifting of balance arm.

Insert adjusting bar into slot A on top of balance arm, turn spring adjustment nut clockwise for more tension ; counterclockwise for less tension.

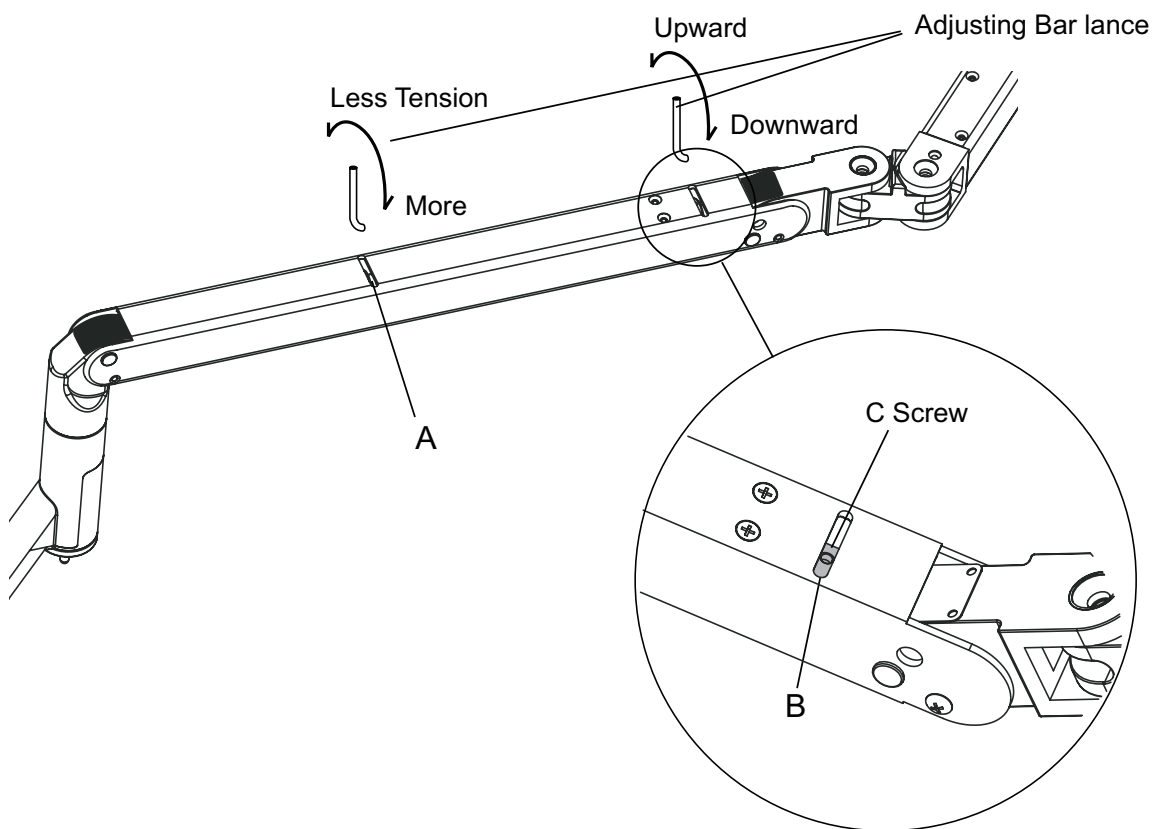
### 8-2. Adjusting Angle of Light Head

Use slot B when adjusting light head angle.

Lift the balance arm to upmost position, and hold it.

Loosen screw C.

Insert adjusting bar into slot B on top of balance arm, turn spring adjustment nut clockwise for downward angle ; counterclockwise for upward angle.



## [9] HALOGEN BULB REPLACEMENT

### CAUTION

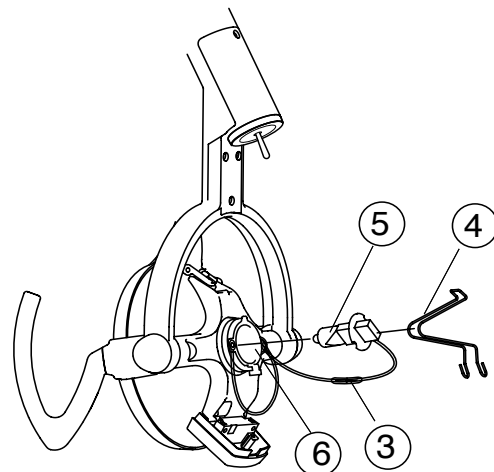
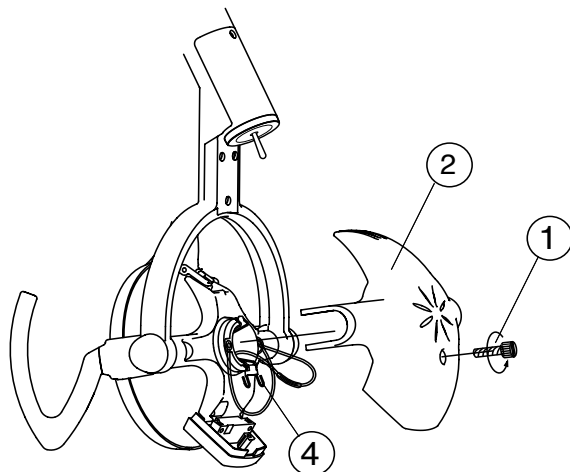
Make sure the power supply is turned off.

Halogen bulb and surrounding parts be hot immediately after the lamp goes off. Wait until they get cool down.

### IMPORTANT

Do not touch glass with bare hand. Halogen bulb surface must be clean. Oil or body moisture will affect bulb span of life. If glass surface is touched, clean with alcohol.

- 1) To install replacement halogen bulb, turn light off and remove back cover by loosening stopper screw.
- 2) Disconnect the electrical connector of halogen bulb.
- 3) Unlock the spring clip and pull the electrical wire of halogen bulb to remove the halogen bulb from socket.
- 4) Attach the electrical wire of new halogen bulb and insert halogen bulb into socket.
- 5) After new halogen bulb is seated in housing, insert and lock spring clip into position.
- 6) Reattach back cover.



1. Stopper Screw
2. Back Cover
3. Electrical wire of halogenbulb

4. Spring Clip
5. Halogen Bulb
6. Socket

### CAUTION

Replace halogen bulb only with type JA-12V-55WD/DL8 obtainable through your local dealer or contact Belmont Equipment.

## [10] CLEANING, MAINTENANCE PARTS & DISPOSAL

### 10-1. Cleaning

 **CAUTION**

Allow light to cool prior to cleaning.

Use a soft cloth or cotton only to gently clean surfaces. Use of other materials can scratch and damage surfaces. Covers can be cleaned with a soft cloth or cotton moistened with alcohol.

The reflector can be cleaned with a soft and dry cloth or cotton with extreme care.

### 10-2. Maintenance Parts

Bulb, Lamp cover and fuse are maintenance parts.

Period for repair and supplying parts

We will supply parts of the equipment for 10 years, after the manufacturing of this equipment is discontinued.

### 10-3. Lifetime

Provided that the recommended and authorized care and maintenance are correctly performed, the working lifetime of this equipment is 10 years from the date of initial shipment from the manufacturer.

### 10-4. Disposal

This is not an infectious device, but prior to disposal make sure that no parts of the device is infected.

Follow the federal, state and local regulations for disposal.

## [11] MAINTENANCE AND INSPECTION

Guide for daily maintenance and inspection (Maintenance and inspection by user)

Management of maintenance and inspection of medical equipment should be implemented by the user (medical inspection). In case the user does not implement such management, it is permitted that such management is outsourced to a qualified entity such as a medical equipment repair company.

For safe use of this product, it is necessary that inspection should be conducted in the specified frequency on the items described below.

No.	Item	Frequency	Inspection Method and diagnosis	Influence if inspection is not conducted	Maintenance required in case of nonconformity
1	Appearance of Lamp Cover	Before start	Check deformation, scratches by eyes	Deterioration of optical performance	Change a lamp cover
2	Lamp cover is firmly attached or not	Before start	Pull the lamp cover. Make sure that the lamp cover doesn't fall	Lamp cover may fall.	Reattach a lamp cover
3	Light bulb	Before start	Check whether the light brinks or not due to the poor connection.	Light bulb turns very hot. This could shorten bulb life.	Securely insert a light bulb into the bulb holder
4	Light switch	Before start	Set Sensor/Manual switch to Manual. Confirms the light turns on.	Light doesn't function.	Replace a light bulb
5	Intensity switch	Before start	Change intensity.	It may cause the difficulty at dental practice.	Turn off the light. Call customer service.
6	Functionality of Balance Arm	Before start	Swing the balance arm up/down. Swing the balance arm right/left. Make sure the balance arm stops and holds its position.	Light head doesn't stay at the desired position.	Adjust the tension of the balance arm. Follow instructions on page 12.
7	Vertical rotation of the Light head	Before start	Rotate the light head up/down. Make sure the light head stops and holds its position.	Light head doesn't stay at the desired position.	Adjust the tension of vertical rotation. Follow instructions on page 12.
8	Light head angle	Before start	Confirms the light head is vertically aligned.	Light head doesn't stay at the desired position.	Adjust the angle of the light head.
9	Light head rotation	Before start	Rotate the light head right/left. Make sure the light rotate 160° to each direction.	Light head rotates freely. This may cause the snapping of a wire.	Call customer service.
10	Care exterior	Before start	Chemical and dirt on the product exterior must be cleaned.	Discoloration and deterioration to the exterior, and corrosion and rusting to metallic components may arise.	Executes wiping in accordance with "Cleaning Instructions"
11	Other 1	Once every week	Make sure that no abnormal noise occurs when the product is operated.	Light may not function right.	Turn off the light. Call customer service.
12	Other 2		If the light has not been used for a long time, make sure the light functions correctly and safely.	/	If the light malfunctions, call customer service.

# NOTE



**BELMONT EQUIPMENT, Division of Takara Belmont USA, Inc.**

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