

# Installation and Service Manual

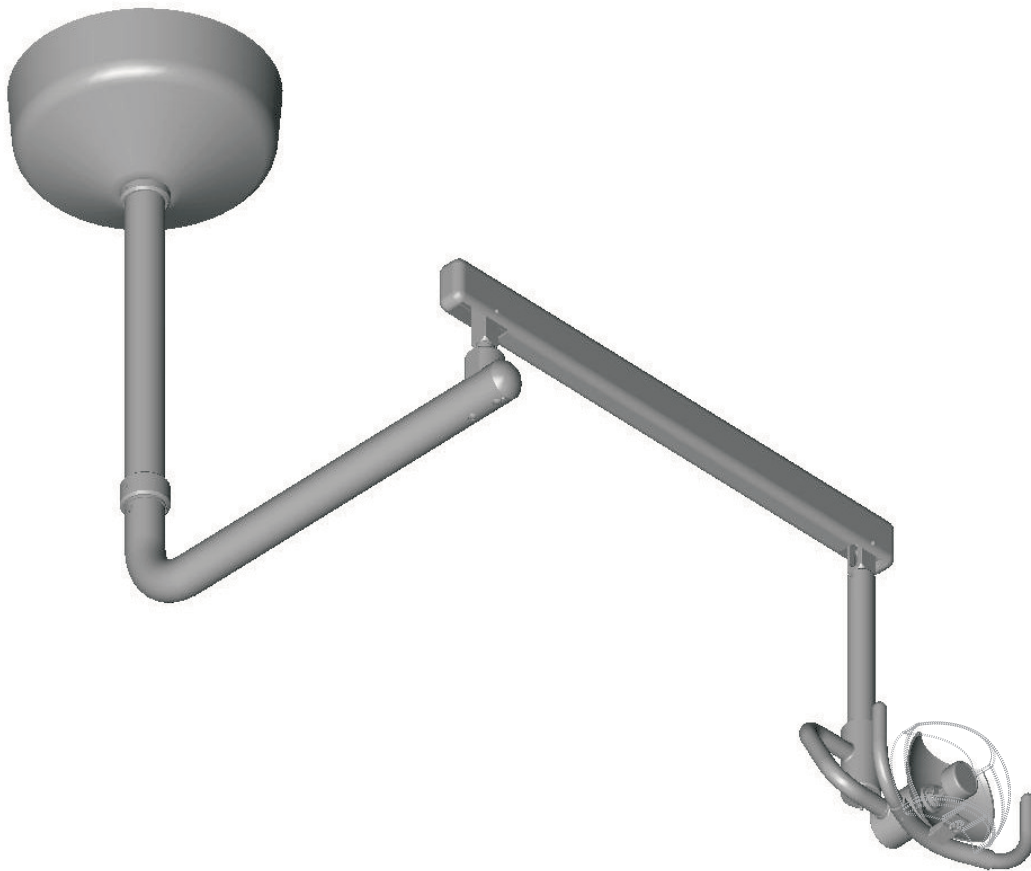
(229-186)

for the

## Ceiling Lights

P/N 24-464-12 (120V Ceiling Light)

P/N 24-464-24 (240V Ceiling Light)







P.O. Box 725 · 4115 24th Avenue Suite A · Forest Grove, Oregon 97116, USA  
www.engledental.com

## INSTALLATION AND OPERATION MANUAL

### **Customer Service:**

7:00 A.M. to 4:30 P.M. (Pacific Time)  
Phone: 800-547-1906  
Fax: 503-357-7286  
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### **Technical Support:**

7:00 A.M. to 4:00 P.M. (Pacific Time)  
Phone: 800-547-1906  
Fax: 503-357-7286  
E-mail: [support@engledental.com](mailto:support@engledental.com)

## Warranty

Products sold to and installed by authorized Engle Dental Systems dealers are guaranteed against defects in materials and workmanship for a period of five (5) years after date of purchase. Engle 300 dental chair Electronic Positioning Components have a Limited Warranty of ten (10) years after date of purchase. Upholstery is guaranteed for one (1) year after date of purchase. All hand-piece illumination systems are guaranteed for six (6) months after date of purchase. This warranty does not cover light bulbs of any kind.

Faulty parts as determined by dealer service representative, will be repaired or replaced; no claim for labor or consequential damages will be allowed. Invoices for replacement parts may be subject to adjustment after the manufacturer has inspected the alleged defective parts.

The warranty does not cover normal wear, stains, cuts, or scratches of upholstery surface finishes, or parts sold to O.E.M. customers.

This warranty does not cover damage resulting from the use of cleaning, disinfecting, or sterilization chemicals and processes.

The warranty does not cover damage from improper installation or maintenance, accident, misuse, or accidents incurred in shipping and handling.

In the event of shipping damage, the purchaser must initiate all claims against the freight carrier in writing within twenty-four (24) hours after the damaged items are received. The claim is the responsibility of the customer.

### PRODUCT MODIFICATIONS

Engle Dental Systems continually works to better our products. We reserve the right to make modifications without notice or obligation to modify previously manufactured products.

# CLEANING AND DISINFECTING ENGLE EQUIPMENT

Infection control in the dental office continues to be a high priority for our customers and end users. O.S.H.A., the A.D.A., and the C.D.C. are also involved in this complex issue.

We will not attempt to specify the required intervals for disinfection nor can we state what is the overall best surface disinfectant. Please refer to the Infection Control Recommendations published by the American Dental Association for further reference.

## Barrier Technique

ENGLE strongly advocates the barrier technique be used whenever possible to preserve the finish and appearance of the equipment. Wherever possible disposable barriers should be used and changed between patients. The barrier technique will ensure maximum long term durability of the surfaces and finishes of equipment.

## Chemical Disinfection

Regardless of the chemical disinfectant used it is imperative that the equipment be thoroughly washed with mild soap and warm water at least once per day. This wash down will minimize the harmful effects of chemical disinfectant residues being allowed to accumulate on the equipment.

When using a chemical disinfectant, always pay strict attention to the manufacturer's application directions of the disinfectant. When using a concentrated disinfectant, always pay strict attention to the manufacturer's diluting directions of the disinfectant. *"Disinfectant solutions that are relatively harmless to surfaces at their recommended strengths can be corrosive at a higher/purer concentrate."*

## Unacceptable Disinfectants

These disinfectants **WILL HARM** the surface finishes of ENGLE equipment and are **NOT RECOMMENDED**.  
USE OF THESE PRODUCTS WILL VOID YOUR WARRANTY.

CHEMICAL COMPOSITION	TRADE NAMES
Strong Phenols/Phenol-Alcohol Combinations	Lysol, Lysol 2, Lysol Professional Coe Foam, Coe Spray Pump, Vitaphone, Omni II
Sodium Hypochlorite/Household Bleach	Clorox, Ajax, Purex
Alcohol	
Household Cleaners	

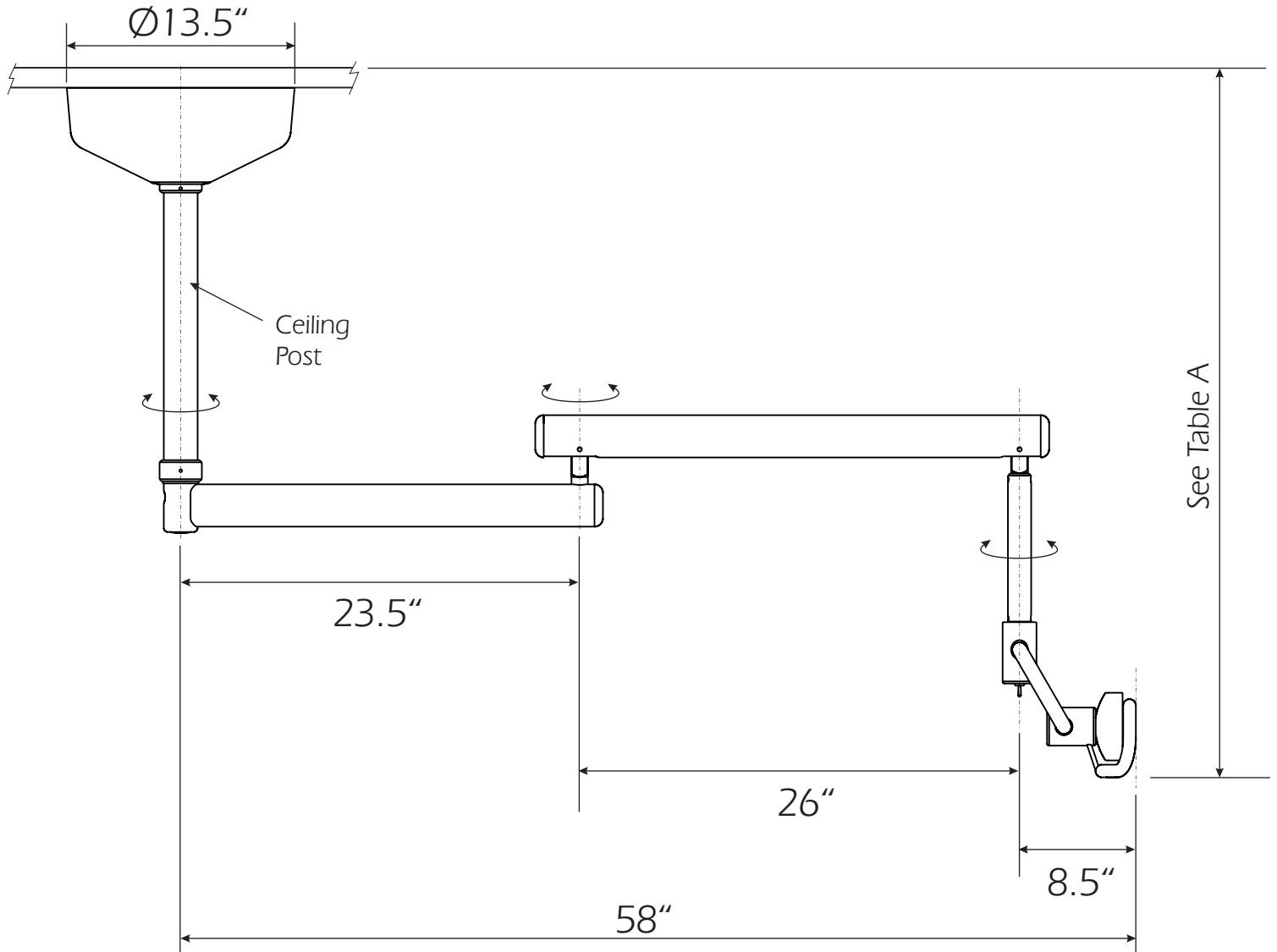
## Conditionally Acceptable Disinfectants\*

These disinfectants have been found to be the LEAST HARMFUL to the equipment surfaces.  
**None of these products are recommended for chair upholstery. Use the barrier technique.**

CHEMICAL COMPOSITION	TRADE NAMES
Iodophors**	Biocide, Aseptic-IDC Wescodyne, SD5, Promedyne, Ido-Five
Mild Phenols	Procide ES, Asepti-Steryl Aerosol
Glutaraldehyde/Phenol sprays	Sterall Spray, Coldspor
Synergized Super Quat	Dis-cide, Cavicide, Kleenaseptic
Phenol/Water Sprays	Top-Cide, Sporidicin Pump Spray, Birex se

\* ENGLE DENTAL SYSTEMS makes no representation as to the disinfectant efficacy of these products. We make no warranty, expressed or implied, that these disinfectants will not damage the surface finishes. Damage and discoloration of the surface finishes is not covered under the warranty.

\*\* Iodophor based disinfectants will cause yellow staining on many surfaces. Regular washing with soap and water will minimize this staining. Iodophor neutralizers such as Promedyne are also available.



Ceiling Post	Overall Distance from Ceiling	Intended Ceiling Height
24-483	35"	8'
24-467 (std)	41"	8' 6"
24-468	47"	9'

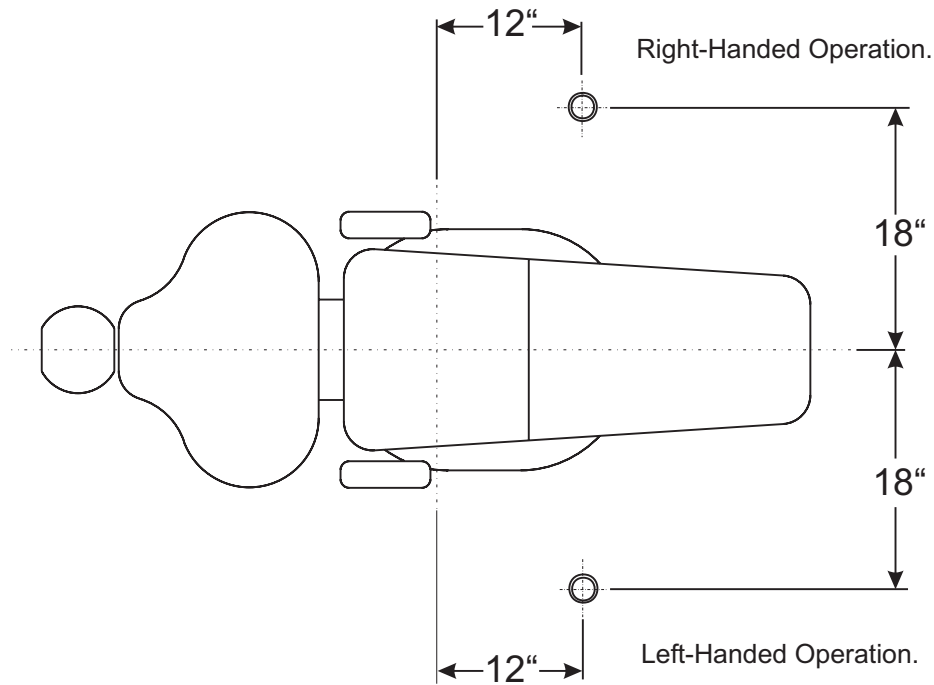
Table A - Height Options

Before installing your Engle Dental Ceiling Light, it is important for you to do the following:

- Check the condition of the shipped parts you have received. If there is any damage, see the 'Guarantee' section of this manual, located at the bottom of the second page, for instructions.
- Check the structure of the ceiling. It will most likely be necessary add to the construction in the ceiling to support the weight of the light. Do this by installing a sturdy board from one ceiling support to the other using lag bolts.

**Important: The ceiling structure must support the weight of the ceiling light. (Up to 200 lbs.)**

Ceiling Light locations in respect to the chair position.



1. Turn to the center of the manual and carefully remove the centerfold page called the Ceiling Light Template. Complete all three steps from that page.

2. Attach the ceiling mounting plate assembly using the given screws and the three 3/16" holes you drilled using the template.

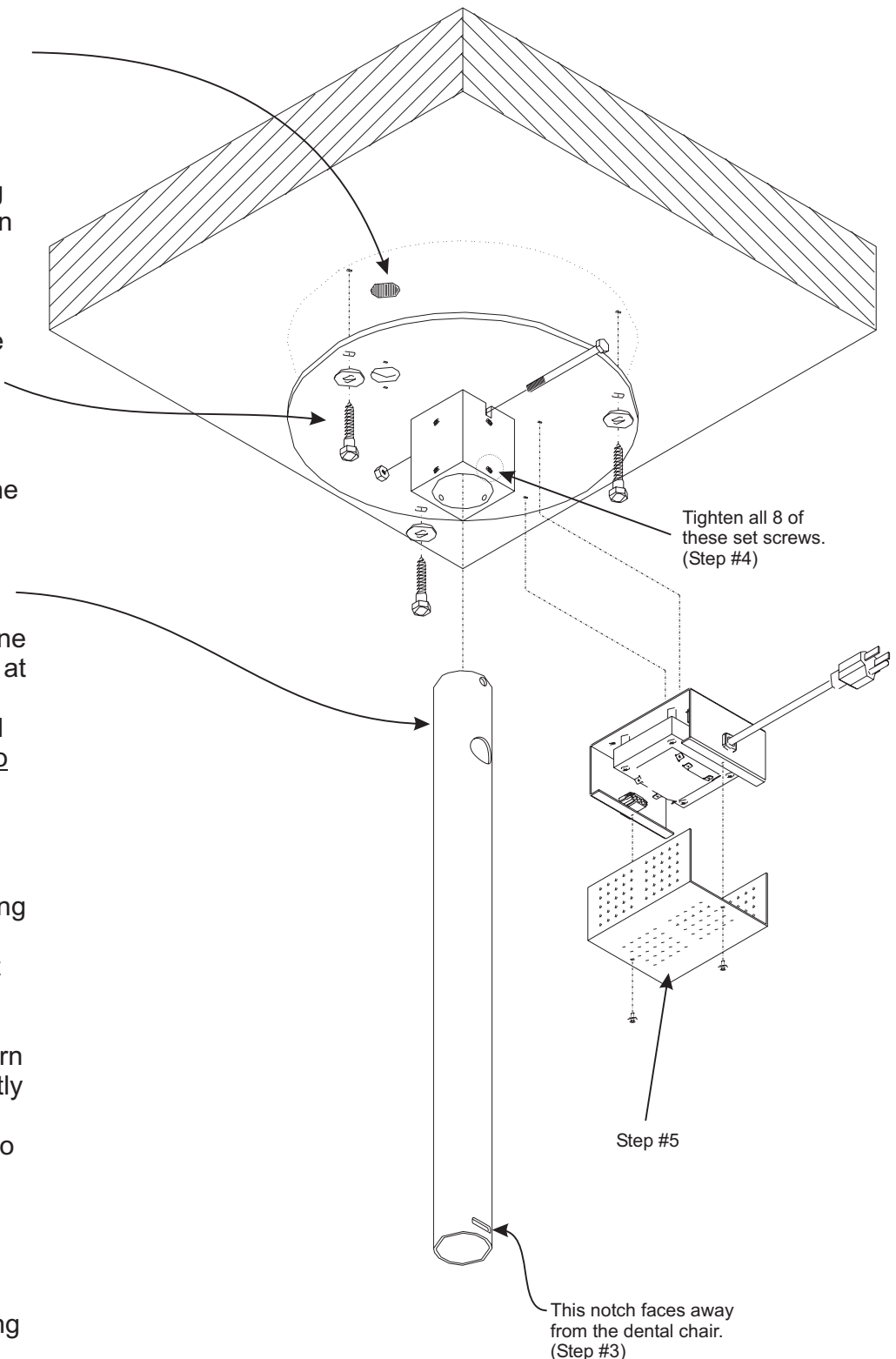
Note: Be sure that the 1" hole that you drilled using the template lines up with the 1" hole on the mounting plate.

3. Attach the ceiling post to the post mount (the post mount is part of the mounting plate assembly). To do this, insert the ceiling post, notched end down, into the post mount. Line the top hole up with the notch at the top of the post mount and attach using the given nut and bolt. Attach the post mount so that the notch at the bottom is facing away from the dental chair.

4. With the ceiling post hanging down, tighten the eight set screws on the side of the post mount.

Note: To be sure that the ceiling light remains plumb, turn every set screw until they lightly touch the ceiling post before tightening them. Use a level to be sure that it is mounted correctly.

5. Remove the chassis cover on the transformer and attach the transformer to the mounting plate using the two given screws. Reattach the chassis cover.



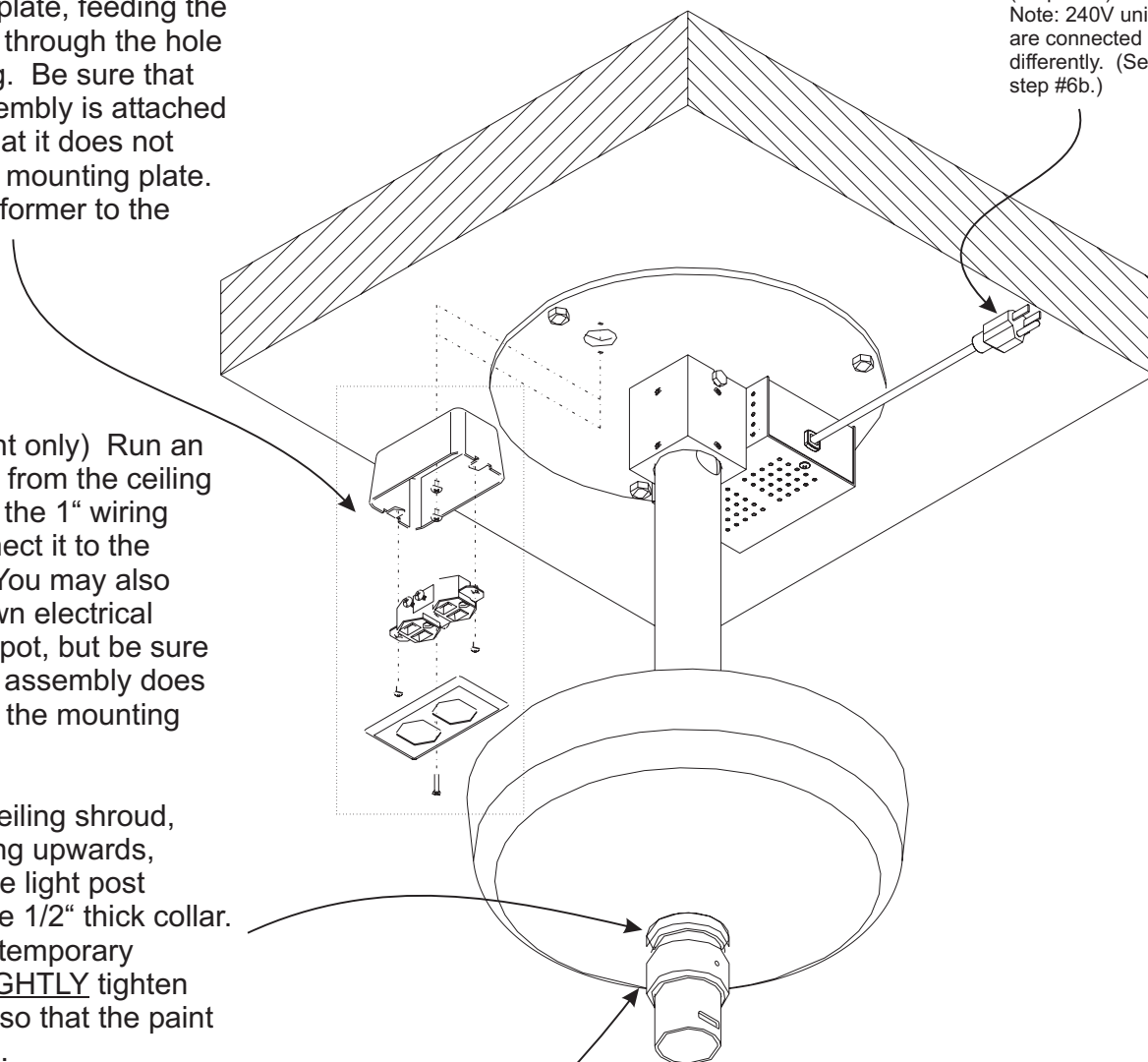
6a. (120V light only) Attach the given electrical outlet assembly over the 1" hole on the mounting plate, feeding the electrical wire through the hole into the ceiling. Be sure that the outlet assembly is attached correctly so that it does not hang over the mounting plate. Plug the transformer to the outlet.

Plug into outlet.  
(Step #6a.)  
Note: 240V units are connected differently. (See step #6b.)

6b. (240V light only) Run an electrical cord from the ceiling down through the 1" wiring hole and connect it to the transformer. You may also attach your own electrical outlet to this spot, but be sure that the outlet assembly does not hang over the mounting plate.

7. Slide the ceiling shroud, wide part facing upwards, about 5" up the light post followed by the 1/2" thick collar. This is only a temporary location so LIGHTLY tighten the set screw so that the paint is not effected.

8. Slide the 1 1/4" thick collar up the light pole until it is just under the 1/2" shroud. (Make sure that the collar does NOT cover up the oval-shaped notch near the bottom of the light post.) This is also only a temporary location so again, LIGHTLY tighten the set screw.



9. Insert the cap screw into the hole on the support pivot at the end of the ceiling light arm assembly (Note: the hole for the cap screw does not have threads), then slide the ceiling light adapter onto the support pivot. To do this, you will need to feed the wiring that is coming out of the support pivot through the adapter. Be sure that the flanged end of the adapter is not facing up.

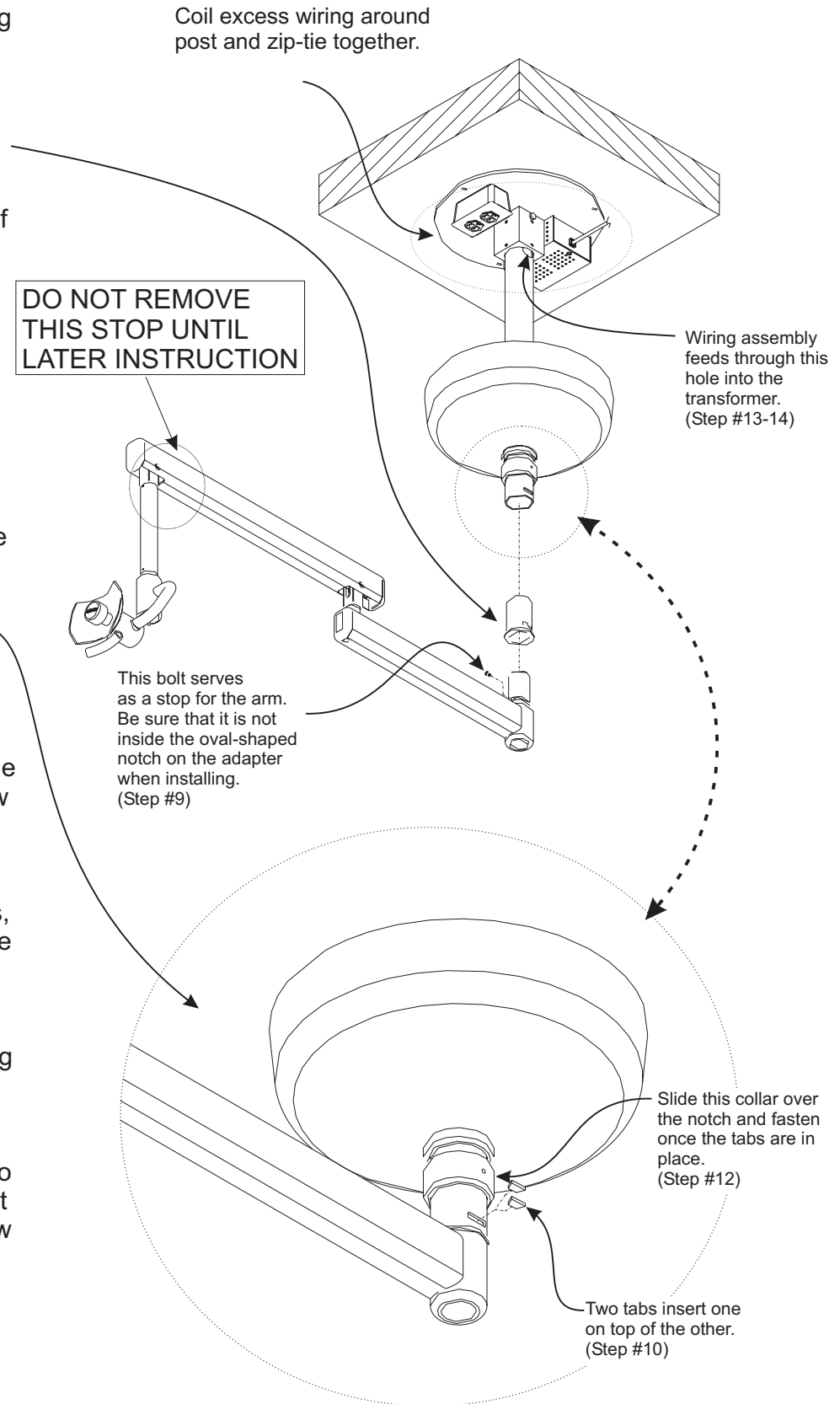
10. Making sure that the notch on the adapter and the notch on the light post are lined up, lift the ceiling light arm assembly and insert it up into the light post. (You will need to feed the wire from the arm assembly up into the light post. Once in place, insert the two retainer tabs into the oval notches. The edge of the tabs should be level with the outside of the light post.

**Important: If the retainer tabs are installed incorrectly, the arm assembly may fall and cause injury.**

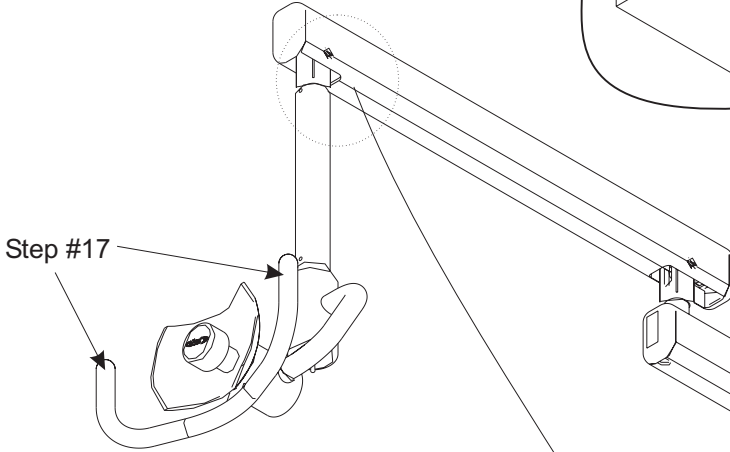
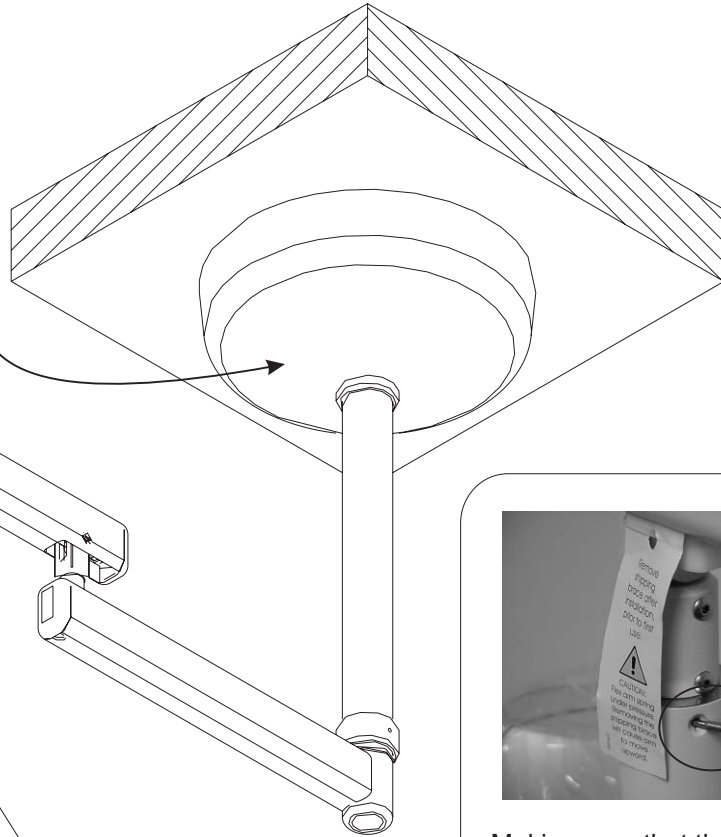
12. With the ceiling arm assembly in place and the retainer tabs securely supporting it, loosen the set screw on the 1 1/4" wide collar from step #8 and allow it to slide down over the notch with the retainer tabs. Tighten the set screw.

13. Using a pair of needle-nosed pliers, carefully pull the end of the wire from the arm assembly out of the large side hole on the light post. Take the wiring assembly from the packaging and plug the spade connectors together, matching the colors of the wires.

14. Coil the excess wiring around the light post and hold in place using the two given zip-ties. Leave enough wiring out of the coil to reach the transformer. Now plug the wire into the transformer. Note: The excess wiring is needed in order to supply the correct amount of resistance for the light.

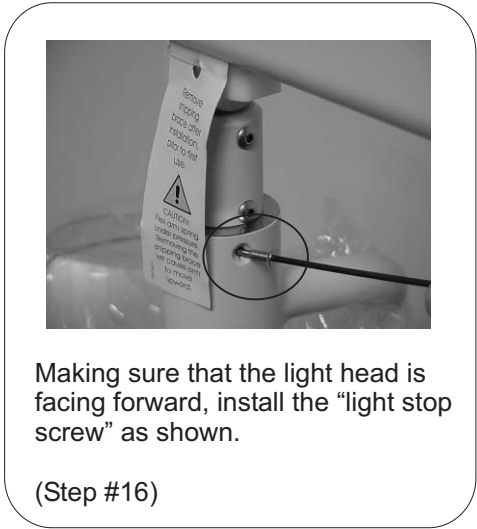


15. Slide the ceiling shroud up the light post until it is resting against the ceiling. Loosen the set screw on the 1/2" collar and snug the collar up to the shroud. Tighten the set screw.



16. Install the "light stop screw".  
(See picture)

17. You may now attach the light head handles, and remove the 'safety stop'.



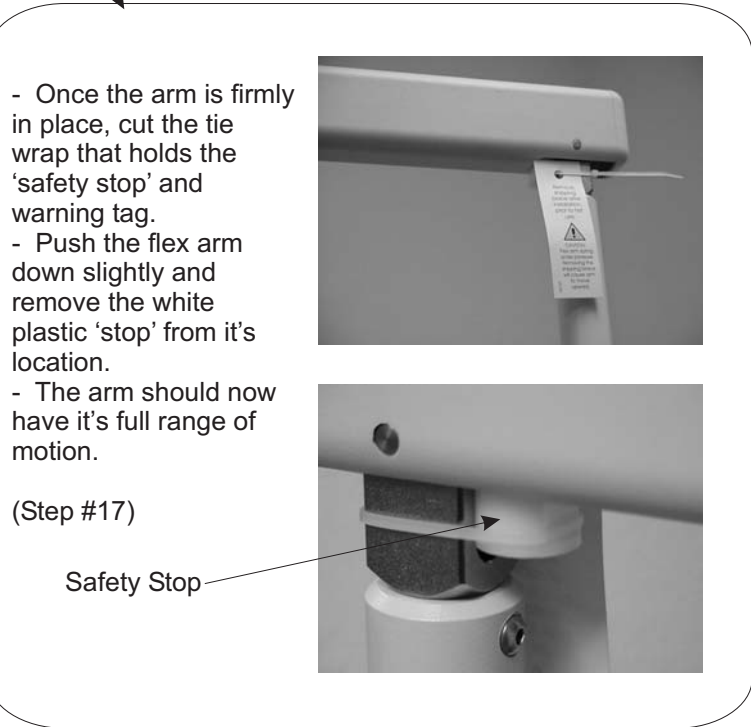
Making sure that the light head is facing forward, install the "light stop screw" as shown.

(Step #16)



- Remove the handles from their packaging.
- Remove the screw from the end of the handle.
- Insert the handle into the light head and fasten screw.

(Step #17)



- Once the arm is firmly in place, cut the tie wrap that holds the 'safety stop' and warning tag.
- Push the flex arm down slightly and remove the white plastic 'stop' from it's location.
- The arm should now have it's full range of motion.

(Step #17)

Safety Stop

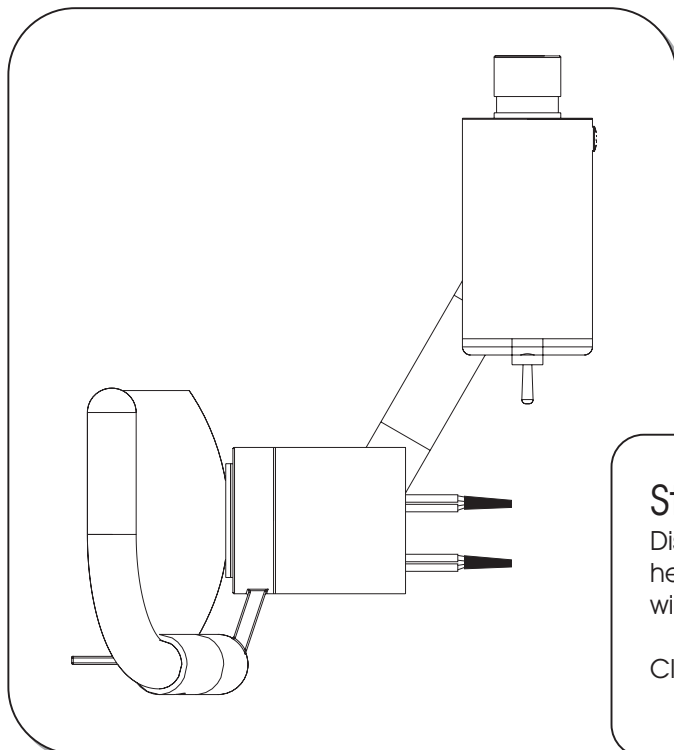
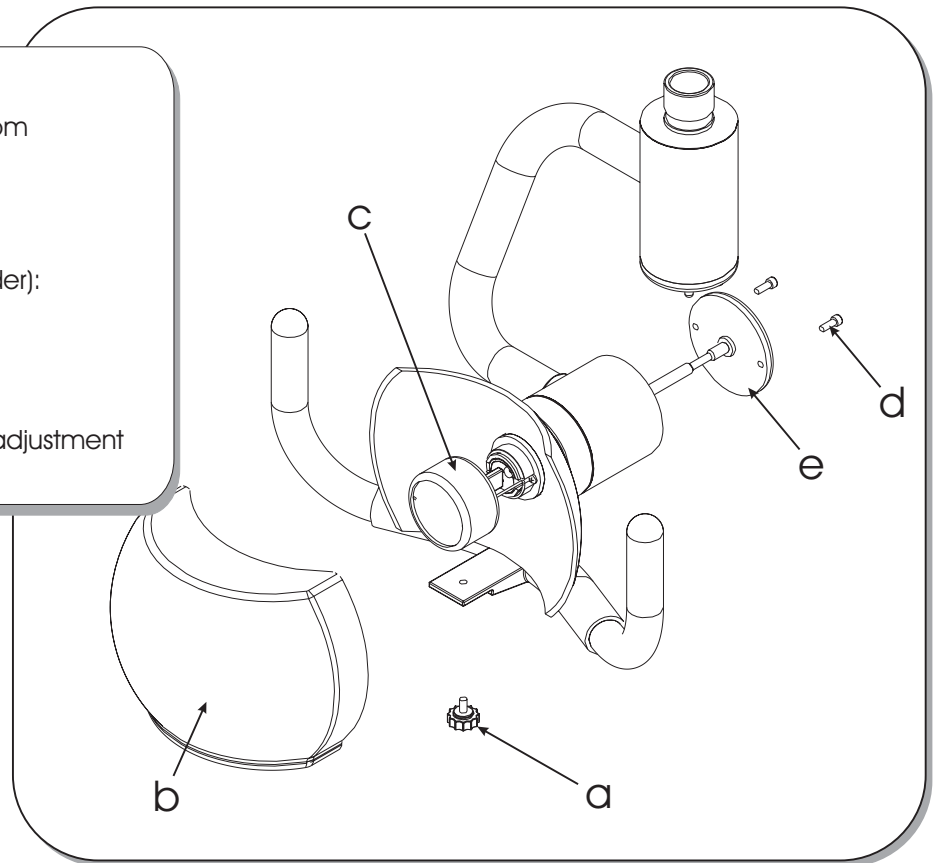
## Step 1

Disconnect the light transformer from electrical power.

## Step 2

Remove the following items (In Order):

- a) Plastic Thumbscrew
- b) Protective Shield
- c) Bulb Shield
- d) 2x Rear Screws
- e) Rear Cover (unscrew the focus adjustment screw)



## Step 3

Disconnect the two sets of wires, by removing the heat shrink wrapping. Be careful not to cut the wires as there is no excess wire to waste.

Clip the zip-tie which holds all 4 wires together.

### Step 4

- a) Loosen the set screw  $\frac{1}{2}$  turn.
- b) Replace the lamp socket. Insert the new lamp socket as far as it will go.
- c) Tighten the set screw, to hold the lamp socket in place.

### Step 5

Reconnect the wires so that each white wire is connected to a brown wire. Secure each connection using the wire nuts provided.

Zip-tie all 4 wires together so that they are not in danger of being crushed by the rotational stop.

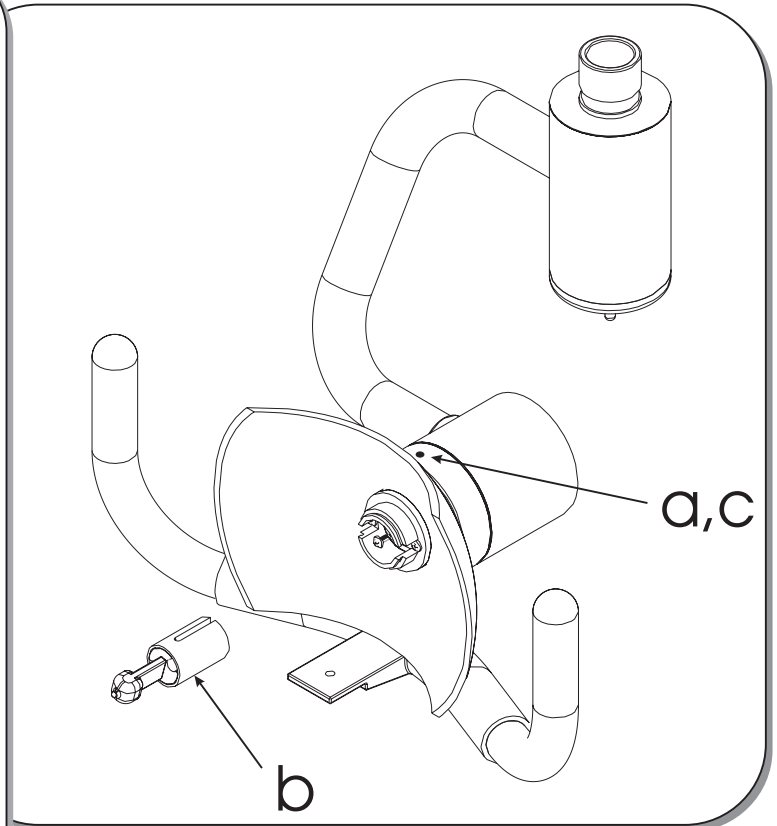
### Step 6

Reattach the Back Cover by first threading the Focus Screw into the new Lamp Socket. Then insert the 2x small screws.

Reattach all other items.

### Step 7

Refocus the light (see IL 284 for instructions).





1. After removing this page, cut out the template and tape it to the area that the ceiling light will be mounted (The large arrow on the template should point in the direction of the chair). Save these instructions until you are through step #3. (Note: The template overlaps the edges of the page. The actual part will be completely circular, so it is best to make your measurements from the center-lines.)

2. Once the template has been mounted correctly to the ceiling, use a 3/16" drill to make 3 pilot holes at the given locations.

3. Next, use a 1" drill to make the electrical wiring hole.

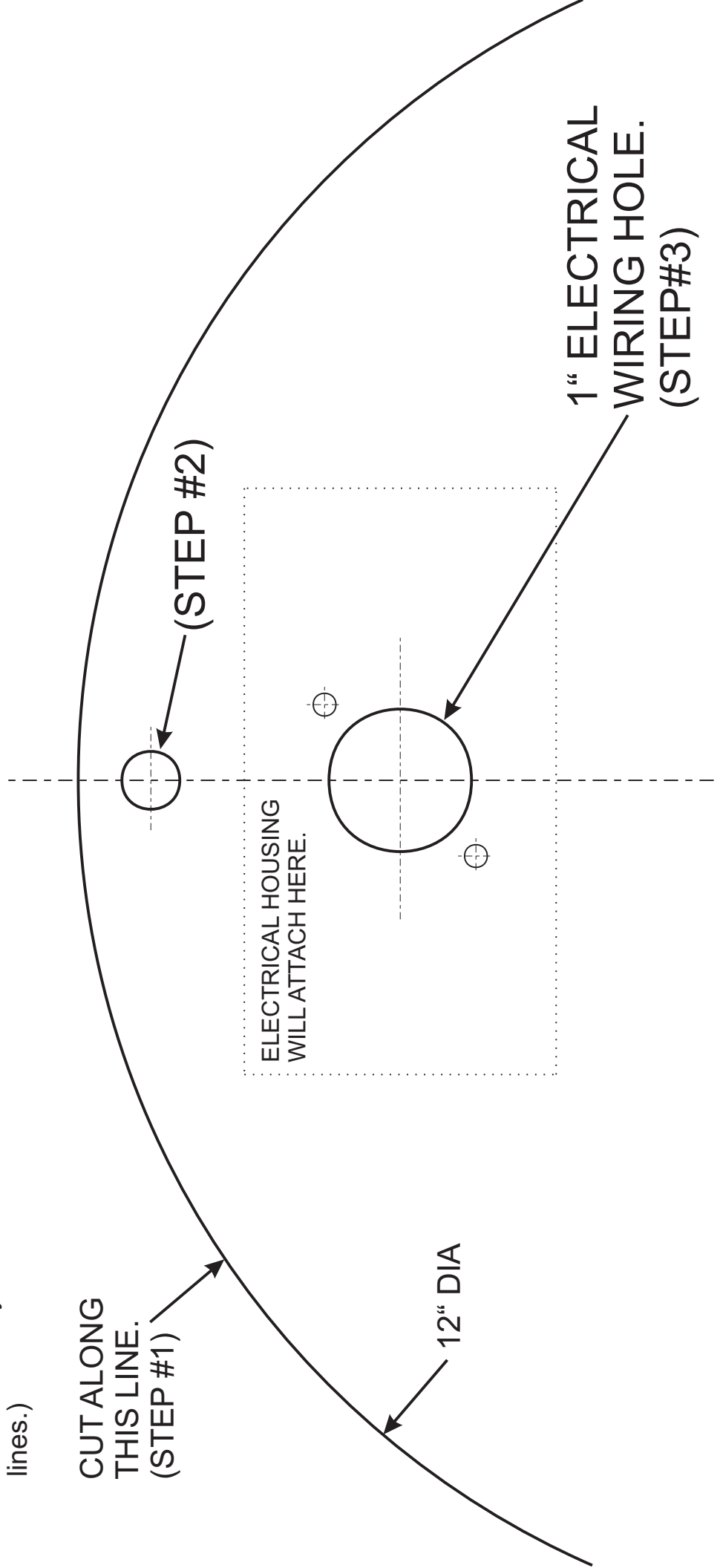
CUT ALONG THIS LINE. (STEP #1)

(STEP #2)

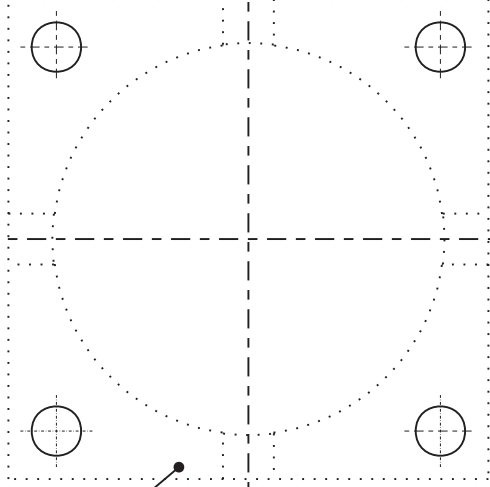
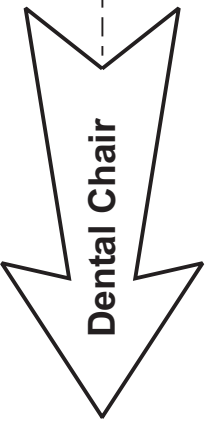
12" DIA

ELECTRICAL HOUSING WILL ATTACH HERE.

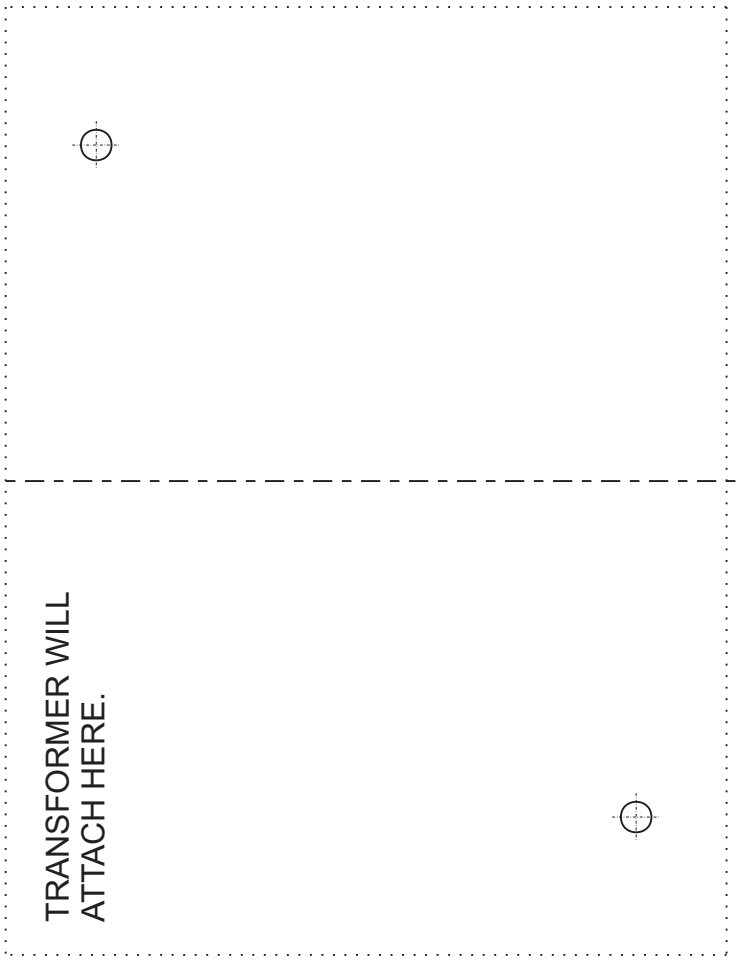
1" ELECTRICAL WIRING HOLE. (STEP#3)



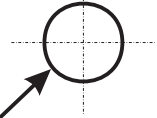
POST MOUNT WILL ATTACH HERE.



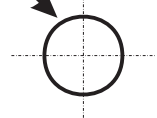
TRANSFORMER WILL ATTACH HERE.



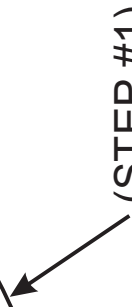
3X 3/16" DRILL (STEP #2)



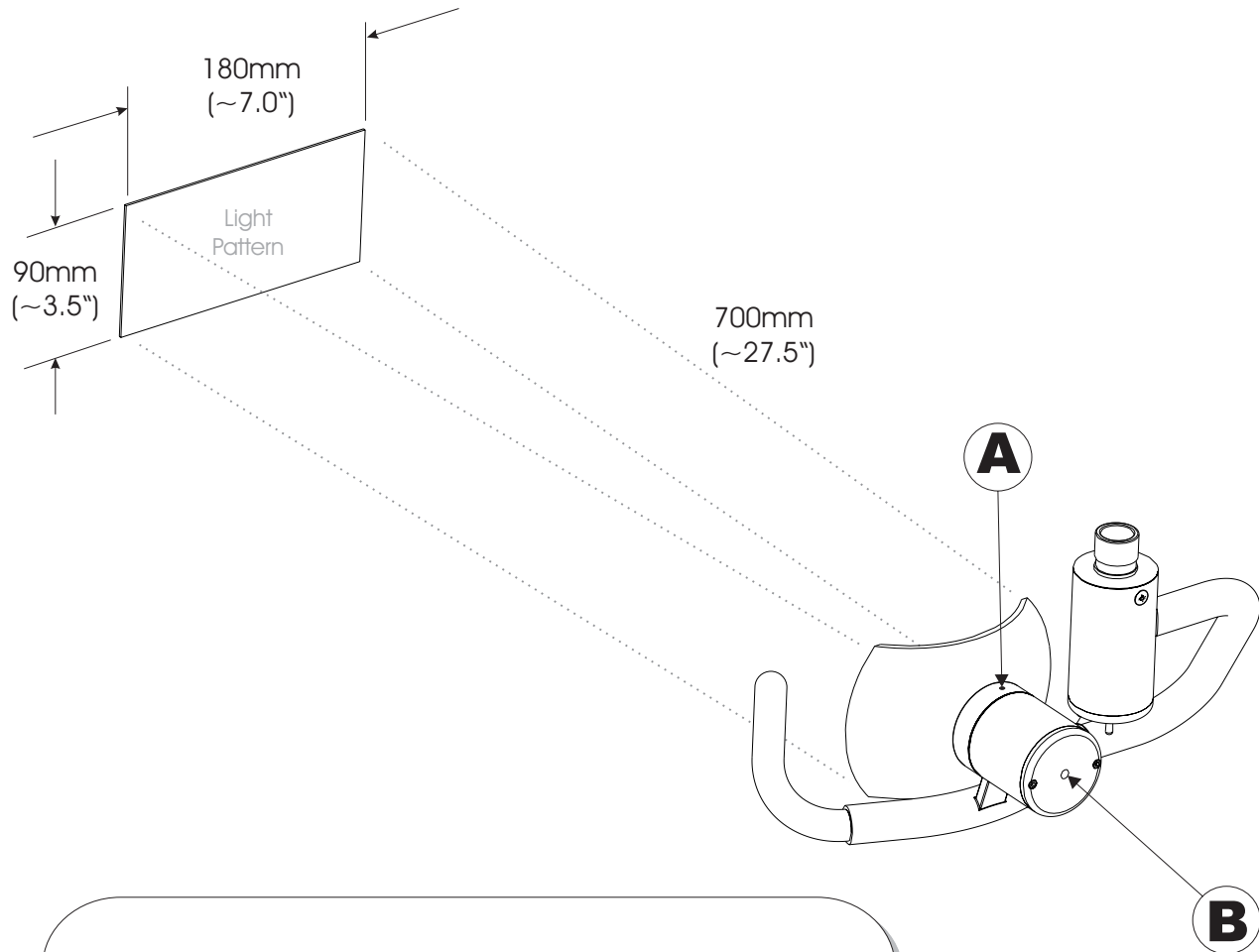
(STEP #2)



(STEP #1)



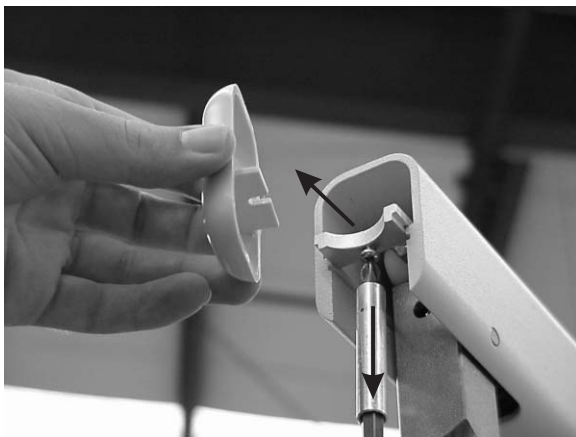
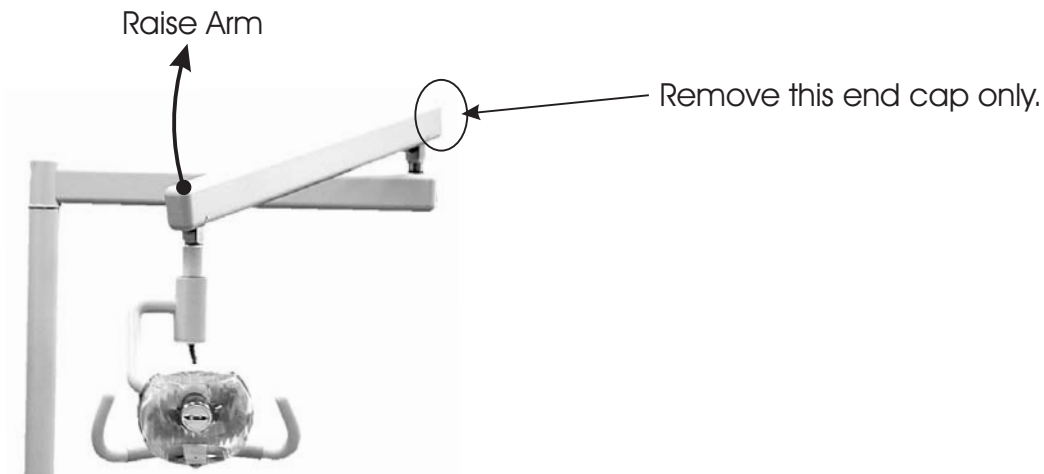




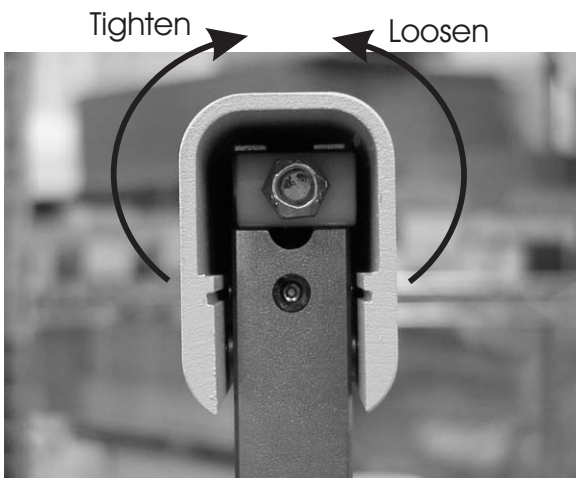
1. Loosen the set screw marked "A"  $\frac{1}{2}$  turn, using a 1.5mm allen wrench. Over loosening this set screw will require taking the light head apart.

2. Adjust the screw marked "B", using a 4mm allen wrench, until the desired light pattern is achieved.

3. Tighten the set screw marked "A" until you feel slight pressure on the set screw.



1 - Remove the end cap and attachment piece from the back end of the light arm. Do this by loosening the screw from under the arm and sliding the cap straight out. Next, raise the light head to its highest elevation.



2 - Once the end cap is removed and the arm is raised up, the adjustment nut is exposed. If the light arm is sinking when it should be at rest, tighten the adjustment nut. If the light arm strays upwards, then loosen the nut.  
(Note: This step requires a 1/2" hex socket.)

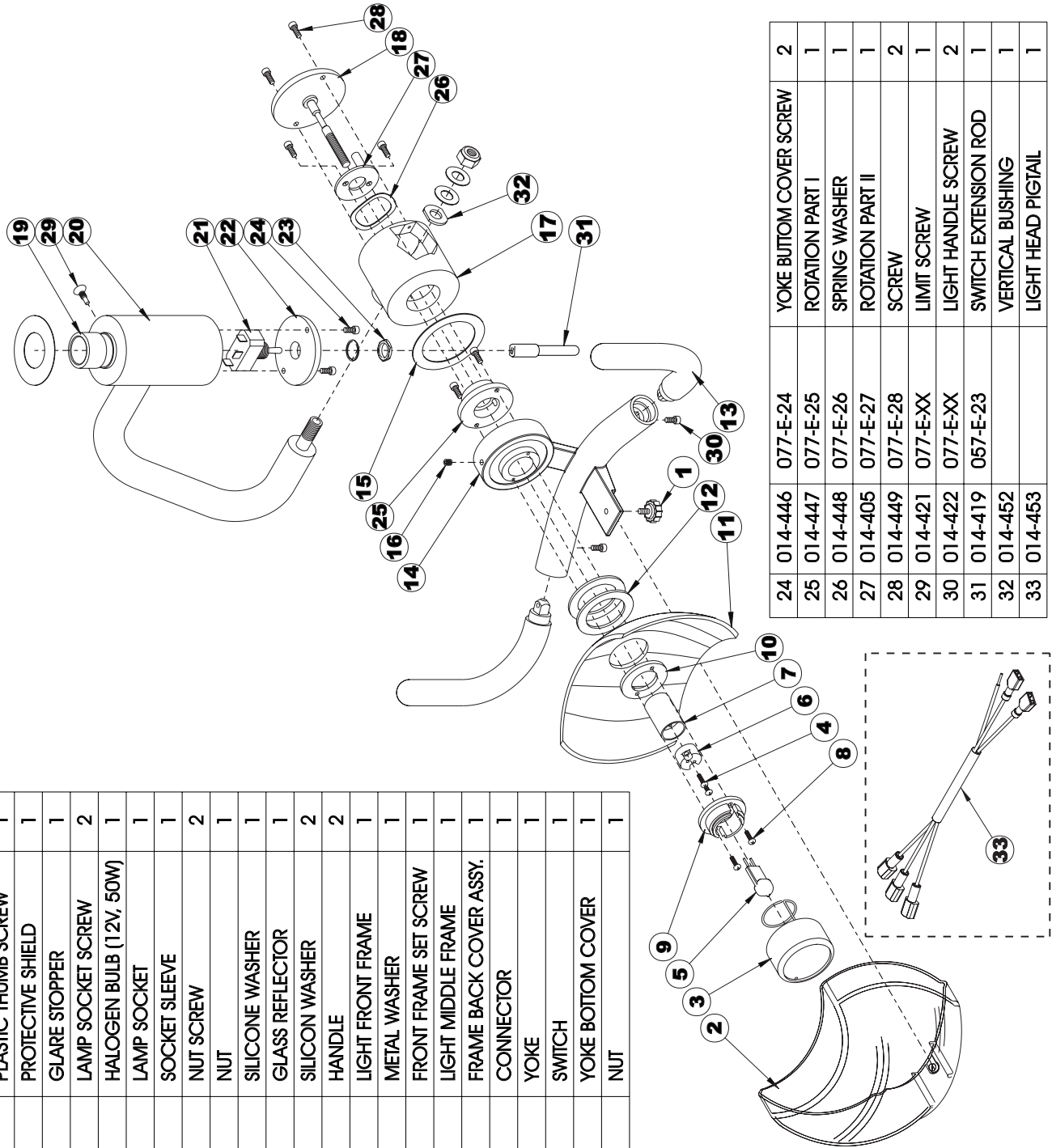
3 - Ensure that the arm tension is satisfactory and adjust as needed. Once you are finished, reattach the end cap and attachment piece.

# Sequoia Dental Light Parts List - (014-301-01)

IL 288

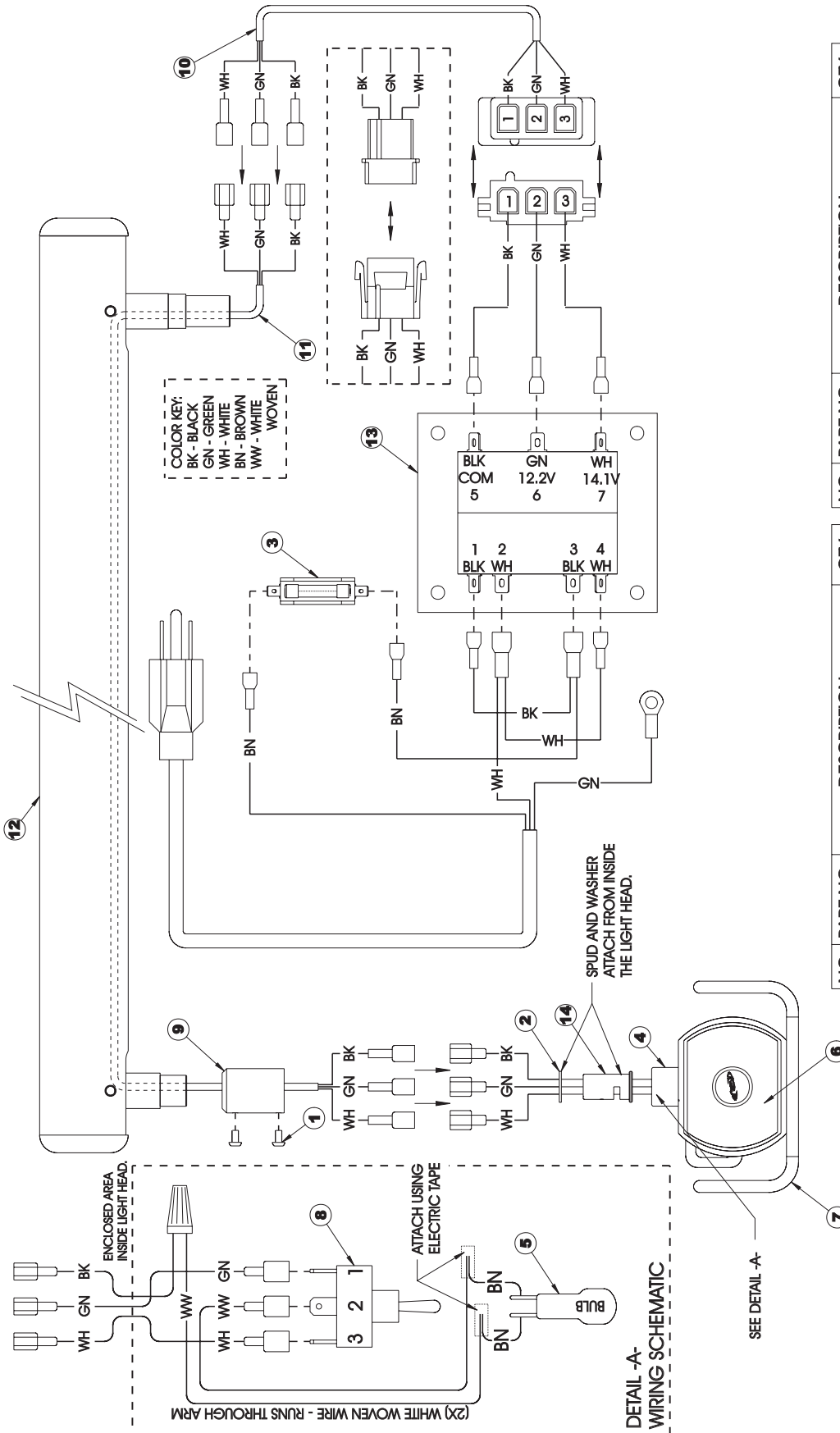
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NO.	PART NO.	GLOWS PART NO.	DESCRIPTION	QTY.
1	014-400	077-E-01	PLASTIC THUMB SCREW	1
2	014-366	077-E-02	PROTECTIVE SHIELD	1
3	014-401	077-E-03	GLARE STOPPER	1
4	014-432	077-E-04	LAMP SOCKET SCREW	2
5	014-364	077-E-05	HALOGEN BULB (12V, 50W)	1
6	014-387	077-E-06	LAMP SOCKET	1
7	014-433	077-E-07	SOCKET SLEEVE	1
8	014-434	077-E-08	NUT SCREW	2
9	014-435	077-E-09	NUT	1
10	014-436	077-E-10	SILICONE WASHER	1
11	014-365	077-E-11	GLASS REFLECTOR	1
12	014-437	077-E-12	SILICON WASHER	2
13	014-403	077-E-13	HANDLE	2
14	014-438	077-E-14	LIGHT FRONT FRAME	1
15	014-450	077-E-15	METAL WASHER	1
16	014-440	077-E-16	FRONT FRAME SET SCREW	1
17	014-441	077-E-17	LIGHT MIDDLE FRAME	1
18	014-442	077-E-18	FRAME BACK COVER ASSY.	1
19	014-420	077-E-19	CONNECTOR	1
20	014-443	077-E-20	YOKE	1
21	014-404	077-E-21	SWITCH	1
22	014-444	077-E-22	YOKE BOTTOM COVER	1
23	014-445	077-E-23	NUT	1



24	014-446	077-E-24	YOKE BOTTOM COVER SCREW	2
25	014-447	077-E-25	ROTATION PART I	1
26	014-448	077-E-26	SPRING WASHER	1
27	014-405	077-E-27	ROTATION PART II	1
28	014-449	077-E-28	SCREW	2
29	014-421	077-E-XX	LIMIT SCREW	1
30	014-422	077-E-XX	LIGHT HANDLE SCREW	2
31	014-419	067-E-23	SWITCH EXTENSION ROD	1
32	014-452		VERTICAL BUSHING	1
33	014-453		LIGHT HEAD PIGTAIL	1

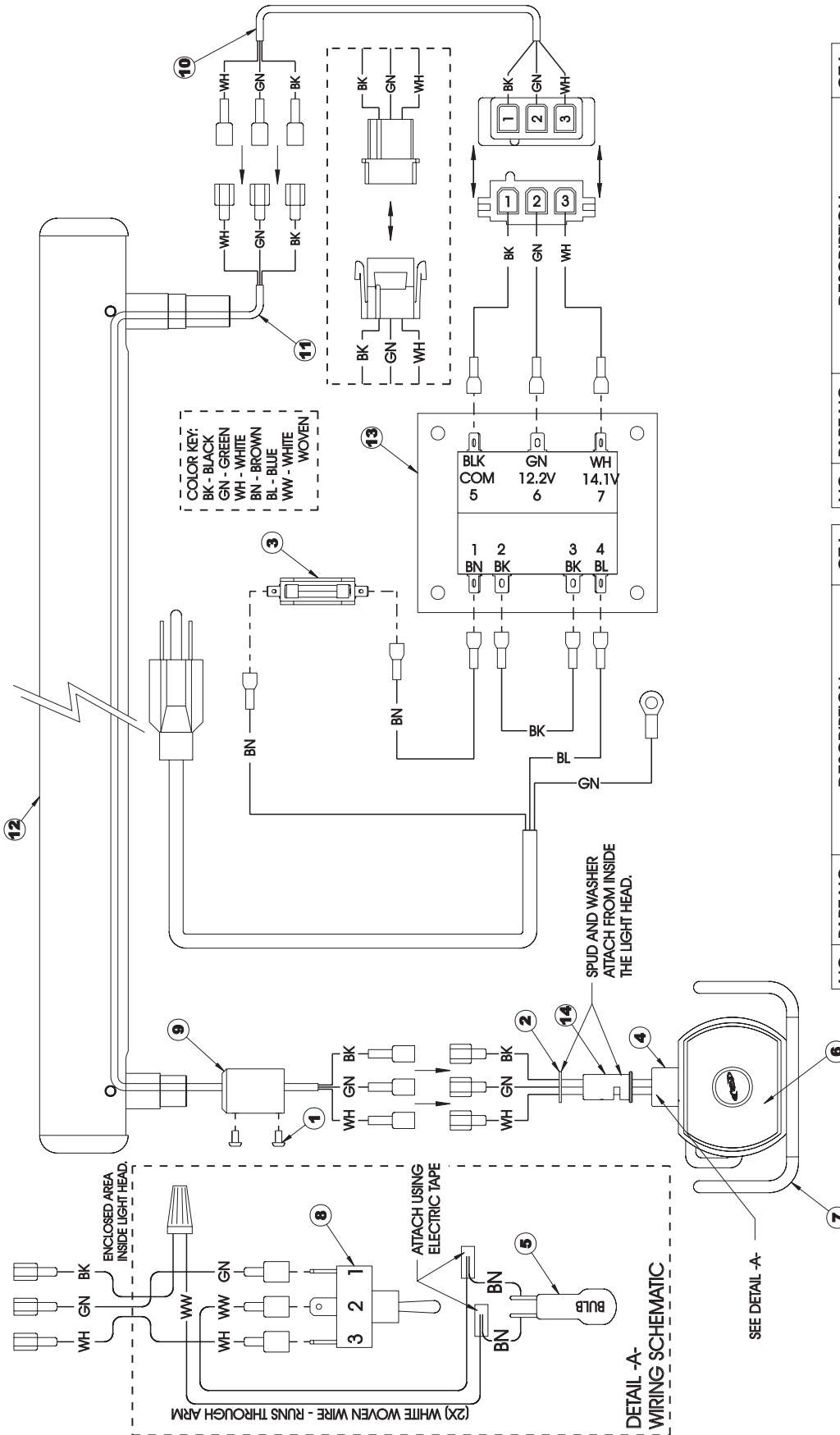
# Dental Light Electrical Diagram (120V)



NO.	PART NO.	DESCRIPTION	QTY.
1	001-20	SCREW	2
2	004-78	WASHER	1
3	014-294	FUSE 1 AMP	1
4	014-301	LIGHT HEAD ASSY.	1
5	014-364	BULB (12V,50W)	1
6	014-366	SHIELD	1
7	014-403	HANDLE	2
8	014-404	SWITCH	1
9	24-422	CONNECTOR	1
10	24-452	LIGHT CORD ASSY. - UMBILICAL	1
11	24-453	LIGHT CORD ASSY.- ARM	1
12	24-456	ARM ASSY.	1
13	24-461	TRANSFORMER - 120V 50/60 HZ	1
14	24-484	LIGHT HEAD SPUD	1

**120V Light**

# Dental Light Electrical Diagram (240V)



NO.	PART NO.	DESCRIPTION	QTY.
8	014-404	SWITCH	1
9	24-422	CONNECTOR	1
10	24-452	LIGHT CORD ASSY. - UMBILICAL	1
11	24-453	LIGHT CORD ASSY.- ARM	1
12	24-456	ARM ASSY.	1
13	24-461	TRANSFORMER - 120V 50/60 HZ	1
14	24-484	LIGHT HEAD SPUD	1

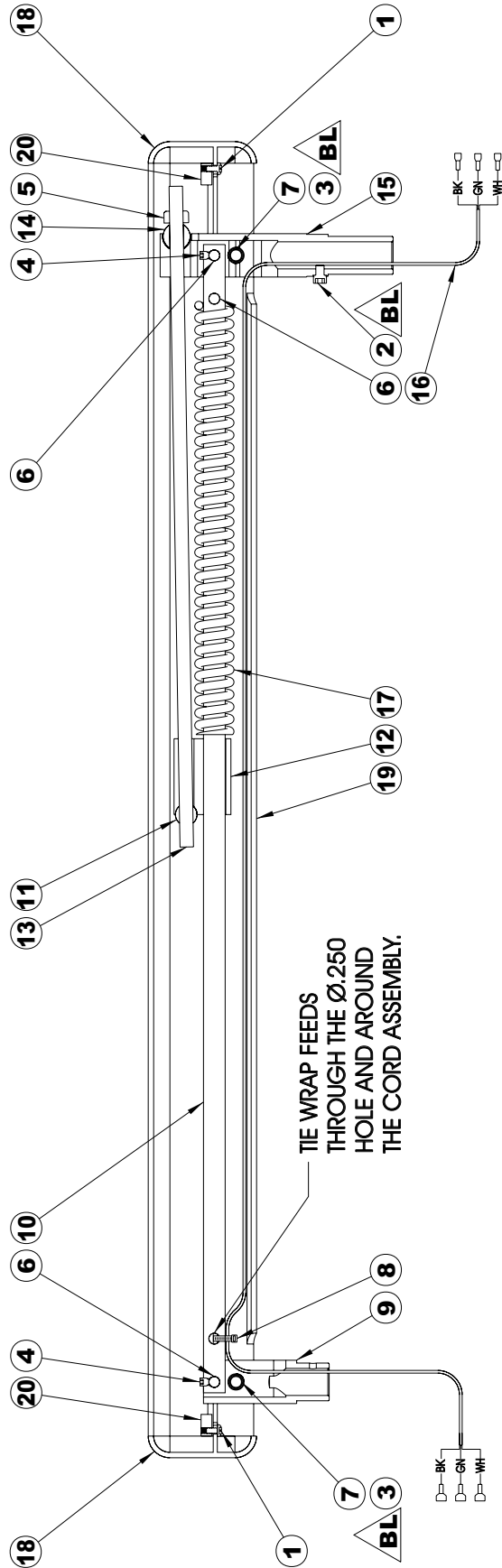
NO.	PART NO.	DESCRIPTION	QTY.
1	001-20	SCREW	2
2	004-78	WASHER	1
3	014-374	FUSE .5 AMP	1
4	014-301	LIGHT HEAD ASSY.	1
5	014-364	BULB (12V,50W)	1
6	014-366	SHIELD	1
7	014-403	HANDLE	2

**240V Light**

# Front Arm Assembly - Light (24-456)

IL 333

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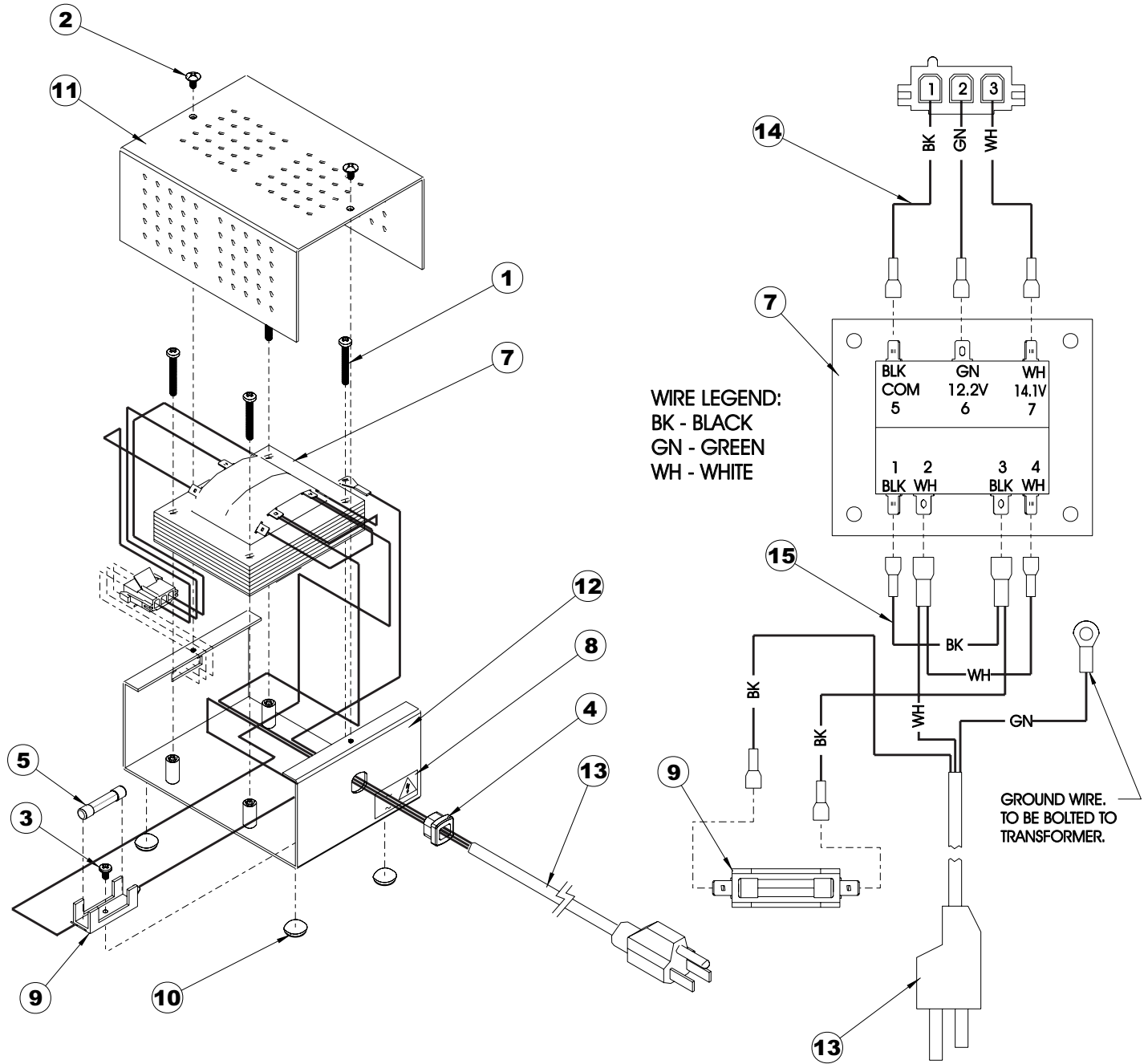
COLOR CODE	
BK	- BLACK
GN	- GREEN
WH	- WHITE

NO.	PART NO.	DESCRIPTION	QTY.
14	24-429	ADJUSTMENT ROD BEARING	1
15	24-431	REAR KNUCKLE	1
16	24-453	CORD ASSY.	1
17	71-931	SPRING	1
18	216-047	END CAP	2
19	216-057	ARM HOUSING	1
20	216-044	END CAP MOUNT	2

NO.	PART NO.	DESCRIPTION	QTY.
7	006-26	PIN	2
8	007-01	TIE WRAP	1
9	24-424	FRONT KNUCKLE	1
10	24-425	SPRING ROD	1
11	24-426	ADJUSTMENT NUT	1
12	24-427	SPRING CONTAINER	1
13	24-428	ADJUSTMENT ROD	1

**▲BL** NEATLY APPLY BLUE LOCITITE TO THREADS.

NO.	PART NO.	DESCRIPTION	QTY.
1	001-18	SCREW	2
2	001-213	SCREW ▲BL	1
3	001-216	SCREW ▲BL	4
4	003-17	SET SCREW	2
5	005-54	LOCK NUT	1
6	006-22	PIN	3

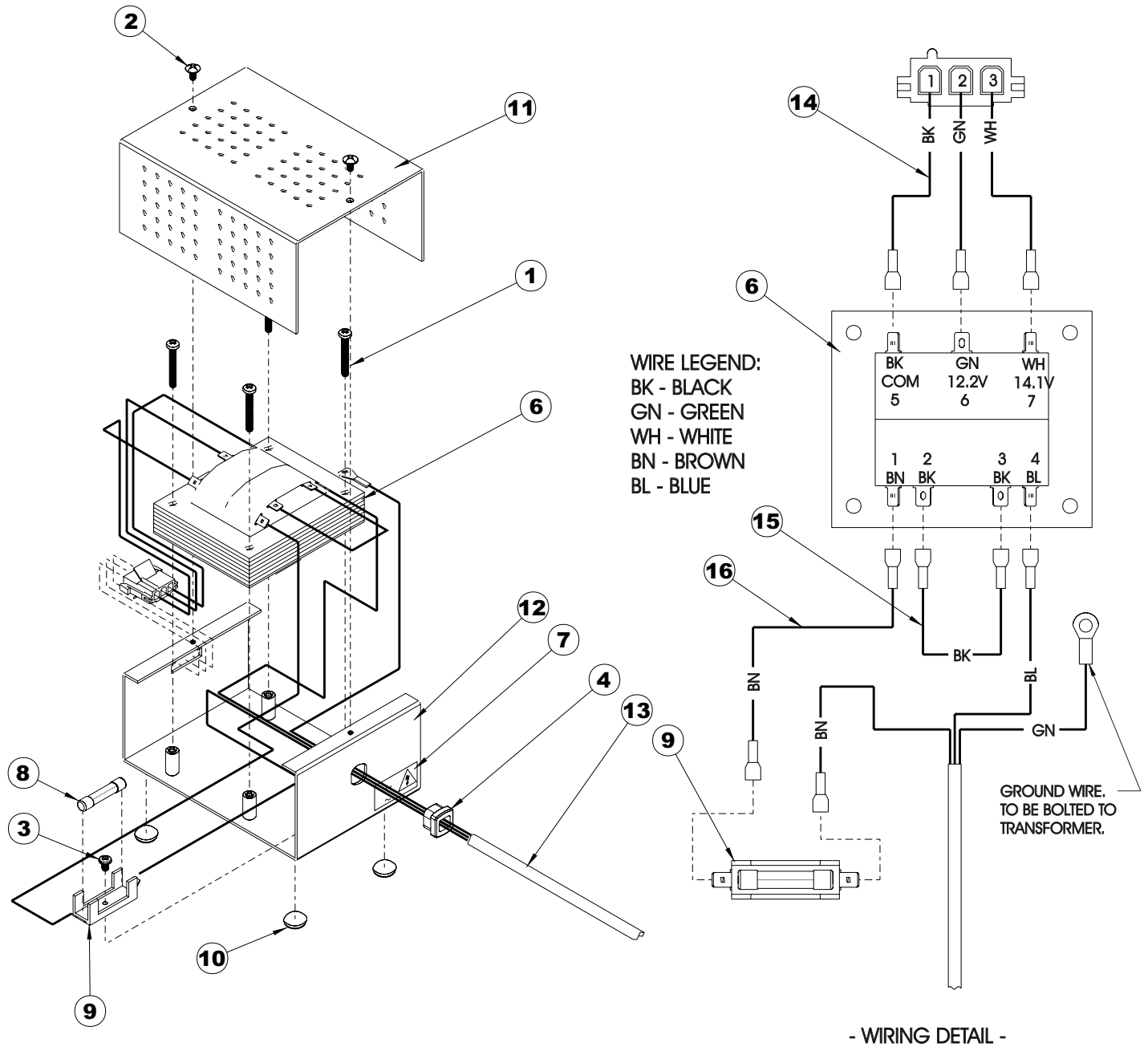


- WIRING DETAIL -

NO.	PART NO.	DESCRIPTION	QTY.
1	001-69	SCREW	4
2	001-70	SCREW	2
3	001-191	SCREW	1
4	014-02	STRAIN RELIEF	1
5	014-294	FUSE - 1 AMP	1
6	014-336	PROTECTIVE GROUND TAG*	1
7	014-369	TRANSFORMER - 65W	1
8	014-370	HIGH VOLTAGE TAG	1

NO.	PART NO.	DESCRIPTION	QTY.
9	014-381	FUSE HOLDER	1
10	020-102	PAD	4
11	24-448	COVER - TRANSFORMER	1
12	24-449	CHASSIS - TRANSFORMER	1
13	24-450	POWER CORD ASSY.	1
14	24-457	SECONDARY POWER WIRE ASSY	1
15	24-458	PRIMARY POWER WIRE ASSY	1

\* INDICATES PART NOT SHOWN.



\* INDICATES PART NOT SHOWN.

NO.	PART NO.	DESCRIPTION	QTY.
1	001-69	SCREW	4
2	001-70	SCREW	2
3	001-191	SCREW	1
4	014-02	STRAIN RELIEF	1
5	014-336	PROTECTIVE GROUND TAG*	1
6	014-369	TRANSFORMER - 65W	1
7	014-370	HIGH VOLTAGE TAG	1
8	014-374	FUSE - .5 AMP	1

NO.	PART NO.	DESCRIPTION	QTY.
9	014-381	FUSE HOLDER	1
10	020-102	PAD	4
11	24-448	COVER - TRANSFORMER	1
12	24-449	CHASSIS - TRANSFORMER	1
13	24-451	POWER CORD ASSY.	1
14	24-457	SECONDARY POWER WIRE ASSY	1
15	24-459	PRIMARY JUMPER - 240V	1
16	24-460	PRIMARY POWER WIRE ASSY - 240V	1

