

# ***HAPI-PLASI 2000***

## ***Helicopter Approach Path Indicator***



## **SERVICE, MAINTENANCE & ILLUSTRATED PARTS MANUAL**

*Manual Number PLF001*

*24 September 2001*

**APPLICABLE TO  
DA500098-3, DA500098-4, DA500099-5, and DA500099-6  
HAPI-PLASI 2000 SYSTEMS**



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# **HAPI-PLASI 2000 SYSTEM HELICOPTER APPROACH PATH INDICATOR**

## **SERVICE, MAINTENANCE & ILLUSTRATED PARTS MANUAL**

### **SECTION I - INTRODUCTION**

#### **1.0 Purpose**

This Manual provides the information required for service of the HAPI-PLASI 2000 System.

The HAPI-PLASI 2000 System will require a minimum of servicing. It is enclosed in a weather tight housing and is designed for continuous unattended operation. With proper installation and adherence to the recommended servicing schedule presented in **Section II**, the System is designed to deliver trouble-free operation. The System may be maintained readily by technician level personnel.

The program outlined in **Section II** provides a recommended servicing schedule based on continuous System usage. The user should consider the schedule as a guide, and based on local environmental conditions and service experience, may find it expedient to either increase or decrease the frequency of some of the listed service actions.

#### **1.1 Description of Systems**

The light beam is generated through the use of optical components, two moveable Shutter Chains, and a Green/Red Filter. One Tungsten-Halogen Lamp is positioned behind a Condenser Lens. For reliability, an Automatic Lamp Changer positions a new Lamp if the one in use should fail. Under normal conditions, average Lamp life is approximately 600 to 650 hours at 108V. At 100V, Lamp life typically doubles.

The pulsing beam is created by a moving chain with rectangular Shutter Elements, positioned in front of and close to the Condenser Lens. The height of the steady green light is a function of the distance between the upper Shutter Elements and the edge of the Red Filter. The number of pulses per second is determined by the number of elements per second that interrupt the pilot's view of the light behind the shutter.

To project a steady red and a red pulsing beam indicating "BELOW GLIDE PATH" information, a Red Filter is installed behind the upper Shutter Element. The Objective Lens inverts the beam so that the upper Shutter Elements generate the pulsing "LOW" beam and the lower Shutter Elements generate the "HIGH" beam. (**See IPL Figure 3**)

#### **1.2 Power**

The basic power supply required at the HAPI-PLASI 2000 System shall be a nominal  $120 \pm 10\%$  VAC, with a frequency of 50 or 60 hertz, single phase alternating current.



To improve the service life of the BVA Lamps, a Voltage Limiter Unit is used to provide reduced and stabilized voltage to the Lamp.

Input power is routed to the Control Module Assembly, which contains the Power Switch, a Circuit Breaker, and all the Control Relays.

### 1.3 Cooling

To dissipate heat created by the Lamp and other electronic components, an Exhaust Fan and a Circulation Fan are mounted within the HAPI-PLASI 2000 System. Internal air is circulated around the Lamp, Condenser Lens and chains, by a single fan mounted over the active Lamp. Outside ambient air is drawn through the System by the Exhaust Fan located on the Front Plate, which exhausts out the front of the HAPI-PLASI 2000 System and down across the window. A replaceable/reusable filter is located at the rear of the Base Plate, inside the Unit.

Temperature Sensors are located at three points in the HAPI-PLASI 2000 System: One inside the Control Module, one mounted under the Circulation Fan, and one mounted to the Pulse Generator Plate above the chain drive motors.

The Control Module will SHUT OFF the Exhaust Fan if the temperature inside the HAPI-PLASI 2000 System is less than 46 degrees F and RESTART the fan above 52 degrees F. It will TURN ON the heaters if the temperature of the Aluminum Plate is less than 32 degrees F and TURN OFF the heaters when the temperature rises above 36 degrees F. The HAPI-PLASI 2000 System will SHUT DOWN if the temperature of the Control Module is above 175 degrees F or if the temperature of the Sensor next to the Circulation Fan goes above 250 degrees F.

### 1.4 Automatic Lamp Changing

The HAPI-PLASI 2000 System contains an Automatic Lamp Changing System that will rotate a new Lamp into Operating Position when the Lamp in service fails. A Current Sensor in the Control Module detects when power is ON and when the Lamp is not drawing current. The Sensor Circuit then switches power to the Lamp Table Solenoid, which rotates the Lamp Table one position, moving a new Lamp into Operating Position. When the fourth Lamp is rotated to the Operating Position, a signal is generated by the Lamp Table, which tells the Control Module not to attempt any further Lamp changes. This signal can also be used to drive a relay for external Last Lamp Indicators.

### 1.5 Photo Sensor (Photo Cell)

Automatic dimming to adjust Lamp brightness for night operation is provided by a Photo Sensor and the Control Module. The Photo Sensor generates a DC voltage, proportional to the ambient light intensity, which is read by the Control Module. If the light intensity is less than 320 lux, the Control Module drives the DIM input of the Voltage Limiter which in turn reduces the Lamp voltage. If the light intensity is greater than 590 lux, the Control Module does not drive the DIM input and full regulated voltage is applied to the Lamp. In either case, a 60-second delay is added



before the DIM input is changed. Night voltage adjustment procedures are described under *Paragraph 4.2* of the HAPI-PLASI 2000 System Operation and Installation Manual.

## 1.6 Tilt Switches

Tilt Switches have been incorporated in the System that will automatically SWITCH OFF the HAPI-PLASI 2000 System if it has been jolted in such a way as to move the housing from more than 0.5 degrees up to 0.5 degrees down. A ten-second time delay is added by the Control Module to prevent the Tilt Switch from responding to ordinary transient disturbances such as taxiing airplanes or hovering helicopters.

## 1.7 Power Control

The HAPI-PLASI 2000 System is controlled with the "ON-OFF-REMOTE" Switch. To manually TURN ON the Unit, the Switch should be in the "ON" Position.

## 1.8 Remote Radio Control

When the "ON-OFF-REMOTE" Switch is in the REMOTE Position, Radio Remote "ON/OFF" control of the HAPI-PLASI 2000 System can be accomplished using an FAA-L-854 RECEIVER/DECODER wired into the HAPI-PLASI Control Circuit. Radio control by keying a transmitter can be accomplished from a tower, operations office, or from an aircraft, and provides "ON/OFF" function and a fifteen minute operational cycle. (See **Figure 17**, Interconnect Diagram)

## 1.9 Signal Failure Modes

The HAPI-PLASI 2000 System is a fail safe design which ensures that any malfunction of beam projection will not result in a hazardous situation for approaching aircraft.

There are three possible failure modes for signal projection.

The first is loss of power to the Unit or the Projector Lamp, which will result in complete loss of signal with no hazard.

The second failure of the Pulse Generator Drive System and the resulting loss of one or both pulses. This type of failure will be detected by Electronic Sensors (Pulse Detectors) and the Unit will SHUT DOWN, resulting in complete loss of signal with no hazard.

The third failure is if the Unit is knocked out of alignment. The Tilt Switch will be activated and will SHUT DOWN the Unit, resulting in complete loss of signal with no hazard. The Tilt Switch is pre-set at the factory on the Inclinator Arm and requires no adjustments.



If either Shutter Chain stops moving, a Slotted Sensor (Missing Pulse Detector) mounted on each chain will indicate that fact to the Control Module. The Control Module will then SHUT DOWN the System and put a chain fault message on the display panel. Since the Missing Pulse Detector signal must alternate between HIGH and LOW states to be valid, any fault in the Missing Pulse Detector -- either shorted or open -- will be detected by the Control Module as a chain fault.



## **SECTION II - RECOMMENDED SERVICING SCHEDULE**

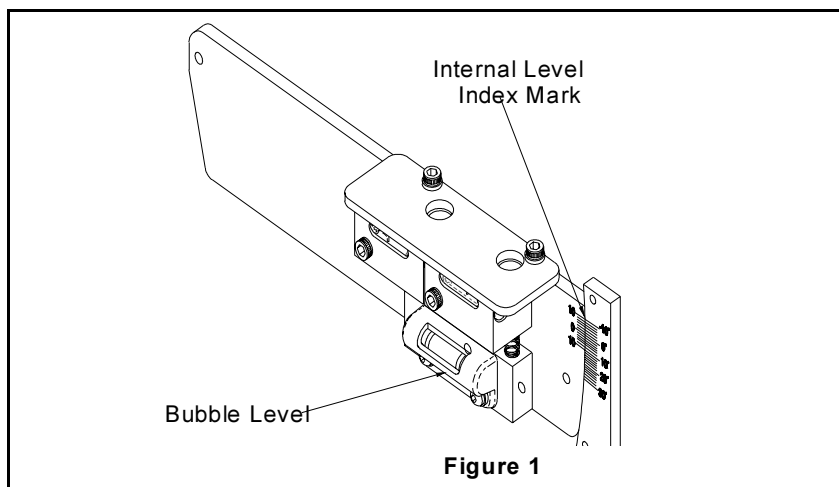
### **2.0 Routine Service**

1. Remove incoming line power before performing service unless noted otherwise.
2. After performing service, carefully replace the shell, ensure that it is firmly seated, and tighten down the hand screw that secures the shell to the main assembly.

### **2.1 Servicing**

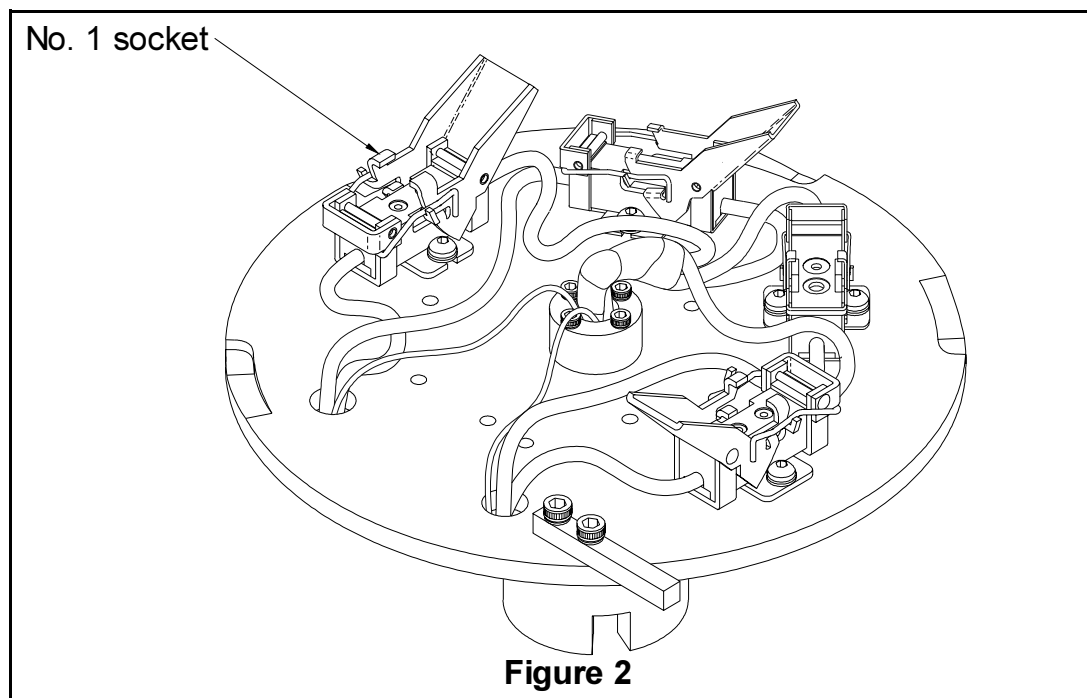
**CAUTION: DO NOT TOUCH LAMPS WITH BARE FINGERS. BODY CHEMICALS WILL CAUSE LAMP TO BECOME OPAQUE. USE CLEAN CLOTH OR GLOVES WHEN HANDLING LAMPS. IF LAMP SURFACES ARE TOUCHED WITH FINGERS, CLEAN WITH ALCOHOL OR SIMILAR CLEANING AGENT.**

<u>Item</u>	<u>Service Frequency</u>	<u>Service Action</u>
Front window- outside.	At Lamp change if required.	1. Clean with optical cleaning solution (Kodak lens cleaning fluid or equivalent) using a lint free cloth or tissue.
Vertical aiming.	Every 6 months, or when Unit is visited.	1. With shell removed, check that the internal level index mark is set to the desired approach angle on the degree scale and that the bubble in the level is centered. <b>(Figure 1)</b>  2. Adjust if required, see Paragraph 3.5.2 of Operation and Installation Manual.

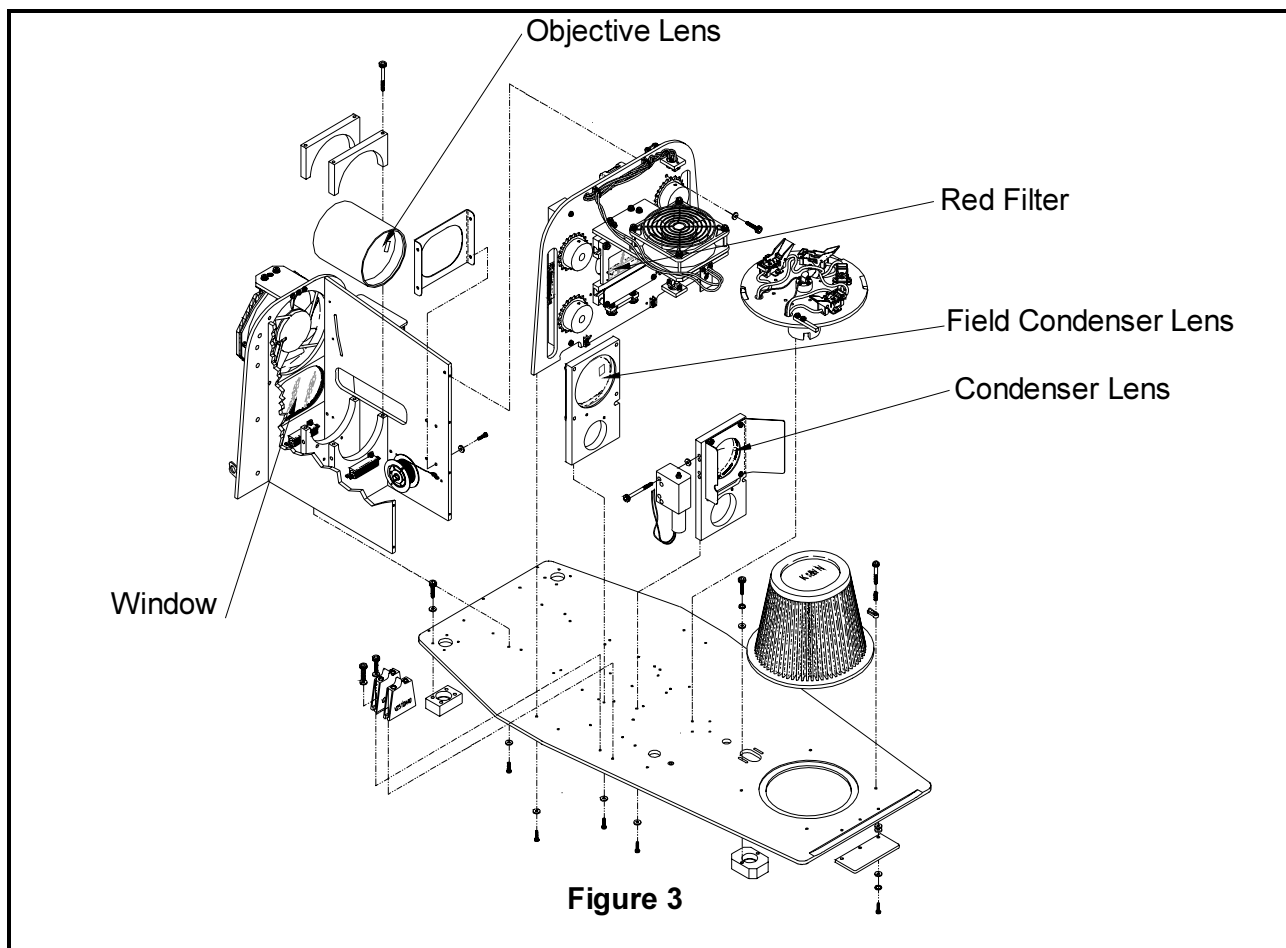




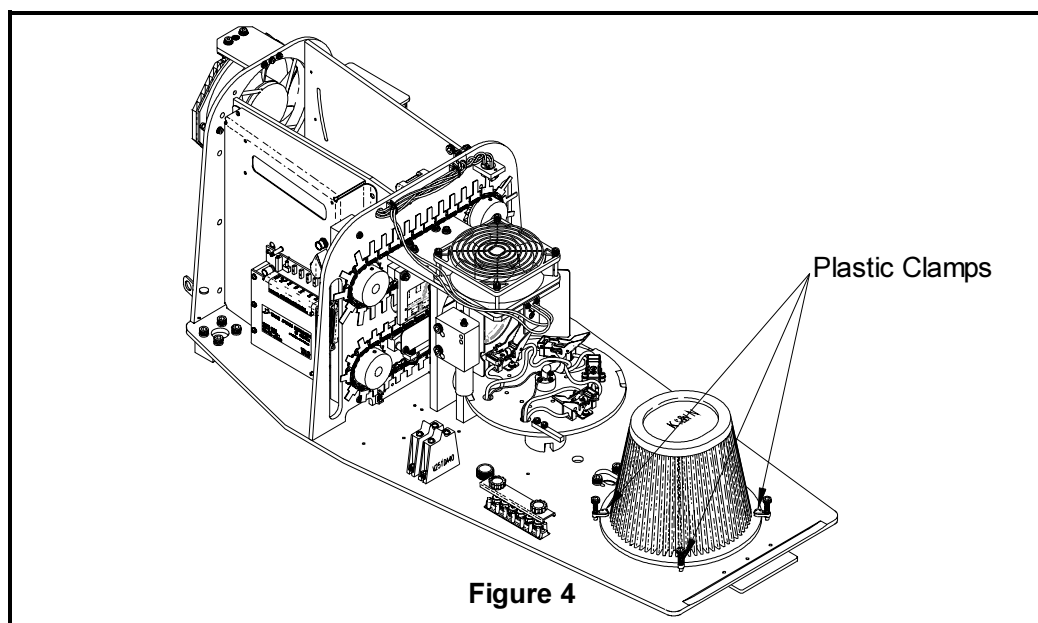
<u>Item</u>	<u>Service Frequency</u>	<u>Service Action</u>
Lamps.	As required.	<ol style="list-style-type: none"> <li>1. Remove all failed Lamps.</li> <li>2. Move Lamp in service to Number 1 socket. <b>(Figure 2)</b></li> <li>3. Install new Lamps in all other sockets.</li> <li>4. Reset Lamp Table so Number 1 Lamp is in Operating Position. (Rotate Clockwise)</li> </ol>



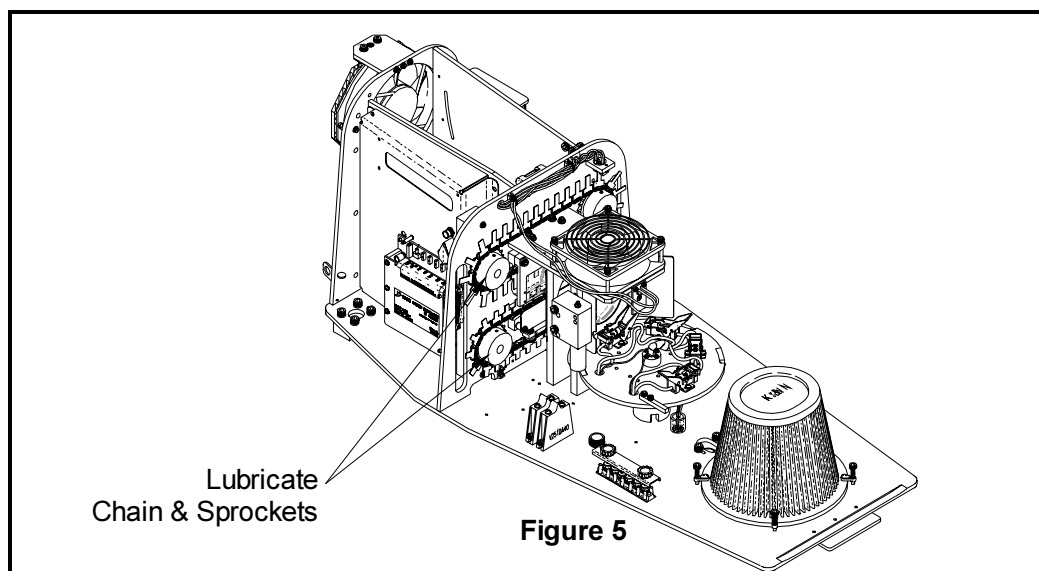
<u>Item</u>	<u>Service Frequency</u>	<u>Service Action</u>
Condenser Lens, Objective Lens, Red Filter, and inside of window.	At Lamp change, if required.	<ol style="list-style-type: none"> <li>1. Clean with optical cleaning fluid (Kodak lens cleaning fluid or equivalent) using a lint free cloth or tissue. <b>(Figure 3)</b></li> <li>2. If any optical components are found damaged, contact DeVore Aviation for instructions at (505) 345-8713.</li> </ol>



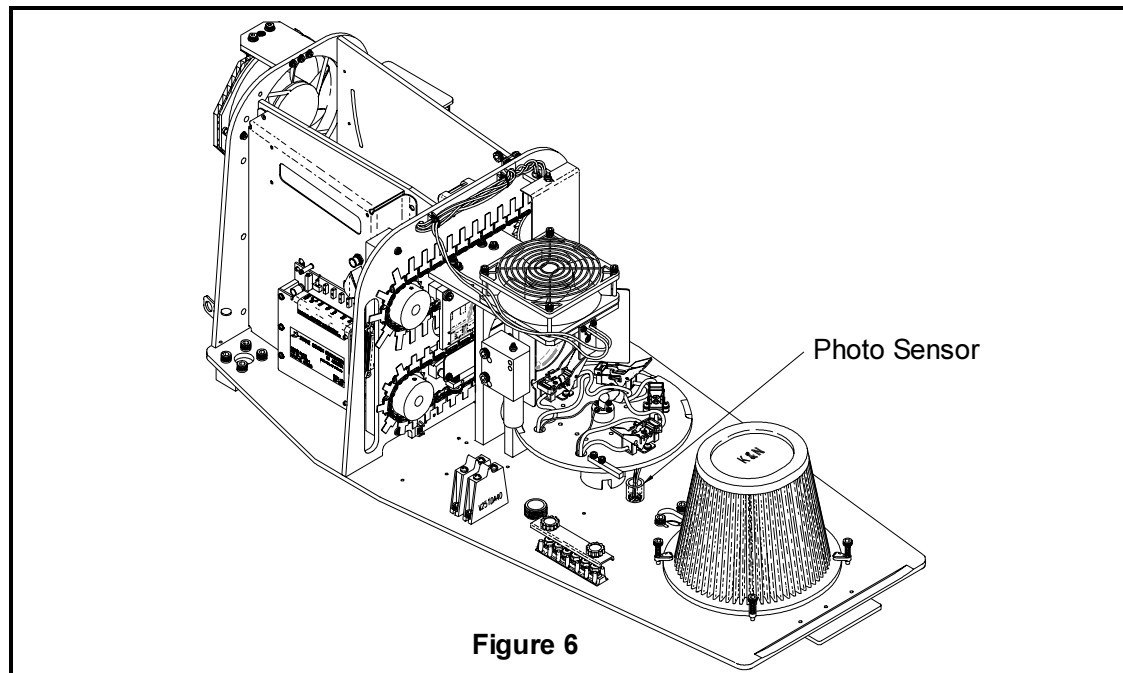
<u>Item</u>	<u>Service Frequency</u>	<u>Service Action</u>
Air inlet.	Every 6 months or as required.	<ol style="list-style-type: none"> <li>1. Inspect Filter. The Filter is washable/reusable; if it is dirty, clean as follows:</li> <li>2. Remove Filter by rotating the four plastic clamps holding it down. <b>(Figure 4)</b></li> <li>3. Lightly tap off surface dust.</li> <li>4. Clean in a solution of warm water and mild soap detergent.</li> <li>5. Rinse the Filter from the inside out. Shake and allow to air dry. Do not use air hose.</li> <li>6. Re-oil Filter element with a light weight filter oil, (light weight motor oil may be used). Re-install Filter.</li> </ol>



<u>Item</u>	<u>Service Frequency</u>	<u>Service Action</u>
Shutter Chains.	Every 6 months.	<ol style="list-style-type: none"> <li>1. Lubricate chains and sprocket teeth with Teflon fortified lubricant (SAE 50 weight non-detergent motor oil may be used if Teflon is not available) (<b>Figure 5</b>). Use sparingly. Apply lubricant only to chain and sprocket teeth. Lubricant must not contaminate the Red Filter or Condenser Lens.</li> <li>2. Check tightness of all sprocket set screws (8 places).</li> <li>3. Check chain tension for upper and lower chains. TURN ON power. With chain running, chain sag should be approximately one-eighth(<math>1/8</math>) to one-quarter (<math>1/4</math>) inch. If necessary, adjust tension per <b>Paragraph 3.0.2</b>.</li> </ol>



<u>Item</u>	<u>Service Frequency</u>	<u>Service Action</u>
Circulation Fan Exhaust Fan.	Every 6 months.	1. With housing open and power on, check for airflow output of the interior Circulation Fan and the Exhaust Fan.
Photo Sensor.	Every 6 months.	1. With System operating on daytime Lamp voltage, cover the Photo Sensor <b>(Figure 6)</b> in signal range to prevent it from seeing any ambient light. Within 45 to 75 seconds, the Lamp voltage should drop to the night setting (58V to 62V). Uncover the Photo Sensor and in 45 to 75 seconds, the Lamp will return to the daytime setting.



## **SECTION III - HAPI-PLASI 2000 SYSTEM MAINTENANCE**

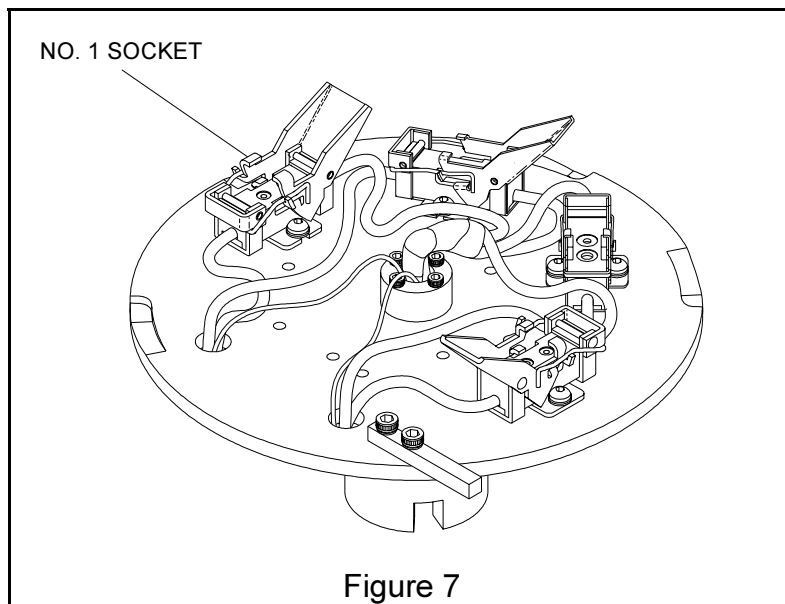
### **3.0 Routine Maintenance**

1. TURN OFF power before performing maintenance unless noted otherwise.

#### **3.0.1 Relamping**

No Tools Required

1. Remove used Lamps by depressing socket lever.
2. Move the operating Lamp, if serviceable, to Number 1 Position (**Figure 7**). (Rotate Clockwise)



**CAUTION: DO NOT TOUCH LAMP GLASS SURFACE. BODY CHEMICALS CAUSE GLASS LAMP ENVELOPE TO BECOME OPAQUE. HANDLE WITH CLEAN CLOTH OR GLOVES. CLEAN GLASS WITH ALCOHOL OR SIMILAR CLEANING AGENT.**

3. Install new BVA (900W, 120V) Lamps. Pull socket lever to secure.
4. Reset Table to move Number 1 Lamp to the Operating Position (**Figure 7**). (Rotate Clockwise)

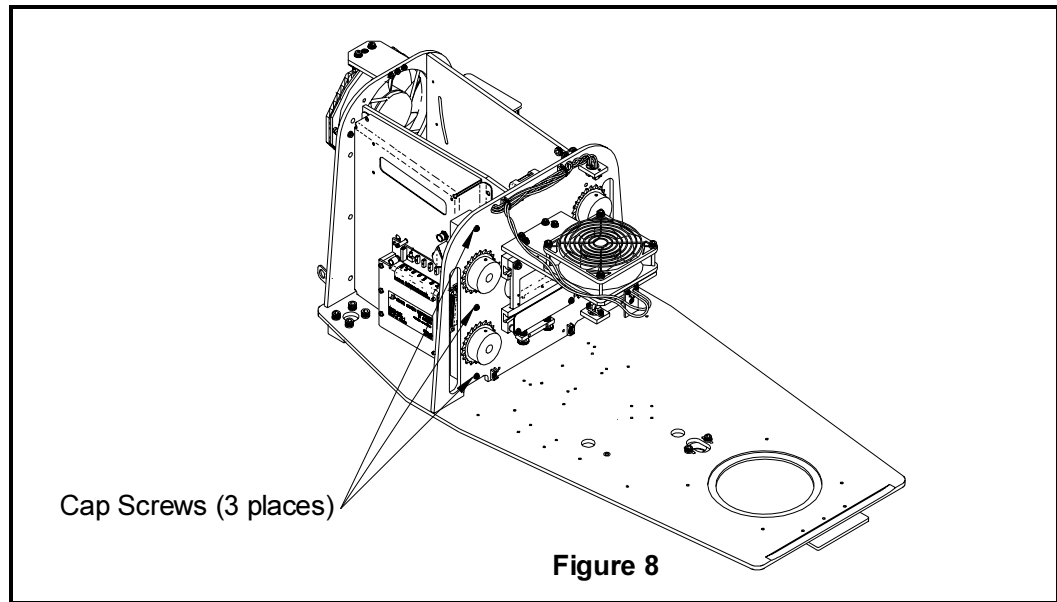
#### **3.0.2 Shutter Chain Tensioning**

Tools Required - 5/32 Allen wrench

1. Remove Control Module, see **Paragraph 3.1.1**.



2. Slightly loosen the cap screws (3 places) (**Figure 8**) that secure the Bearing Block Assembly to the Pulse Generator Plate.



3. Move the Bearing Block Assembly to tension the chains. Both upper and lower chains must be tensioned together.
4. Tighten the three cap screws.
5. Reinstall Control Module.

**NOTE:** Tension is correct when the moving chain can be deflected approximately one eighth (1/8) to one-quarter (1/4) inch with firm touch of a finger.

### 3.1 Component Removal and Installation

#### 3.1.1 Control Module:

Tools Required - #2 Phillips Screwdriver

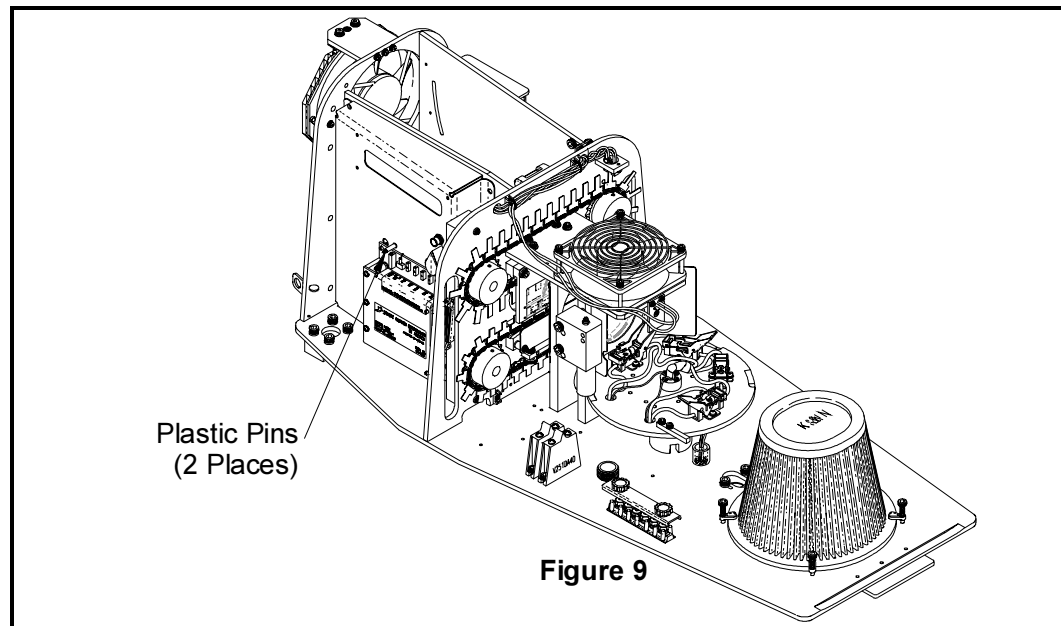
**WARNING: ENSURE THAT LINE POWER COMING IN TO THE HAPI-PLASI 2000 SYSTEM IS TURNED OFF BEFORE REMOVING OR INSTALLING THE CONTROL MODULE!**

Removal:

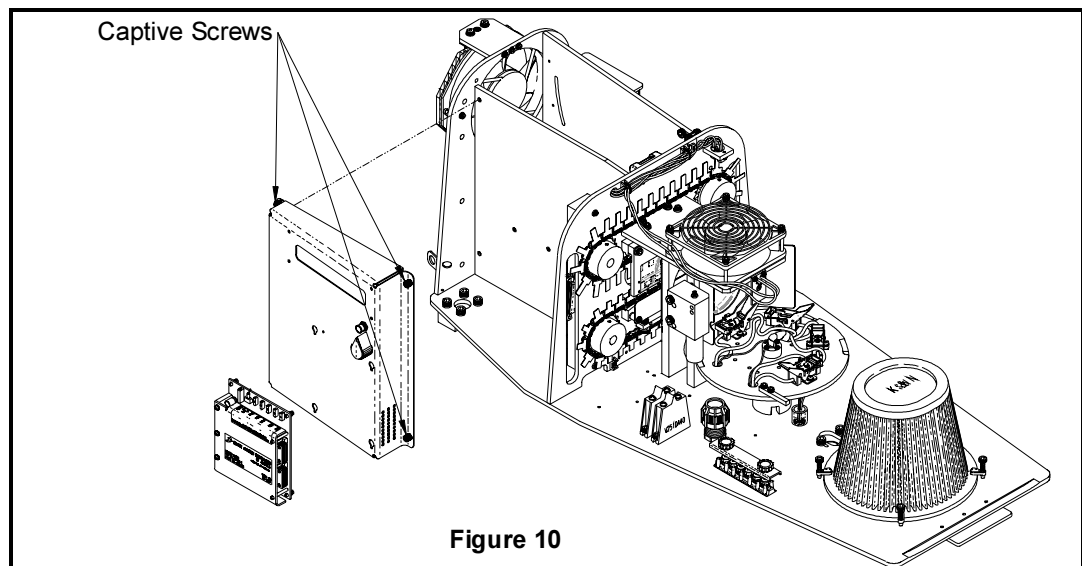
1. Remove the Voltage Limiter:
  - a. Unplug the 6 pin connector from the Voltage Limiter.



- b. Remove the two plastic pins that prevent upward movement of the Voltage Limiter (**Figure 9**).



- c. Lift the Voltage Limiter up and out to remove it from the Control Module case. Place the Voltage Limiter to one side.
2. Carefully unplug the two Terminal Block Connectors from J1 and J2 at the bottom of the Control Module.
3. Unscrew the four screws that hold the Control Module Assembly to the Left Web Assembly. These are captive screws and will remain connected to the Control Module (**Figure 10**).





4. Slide the Control Module upwards until it is free from the rest of the HAPI-PLASI 2000 System.

Installation:

**CAUTION: WHILE INSTALLING CONTROL MODULE, DO NOT PINCH OR ENTANGLE WIRES.**

1. Slide the back surface of the Control Module down the outside surface of the Left Web until the Control Module is an inch or two away from the HAPI-PLASI 2000 System Base Plate.
2. Carefully insert the two Terminal Block Connectors into J1 and J2 at the bottom of the Control Module. Squeeze them firmly in place to ensure that they are fully seated along their entire length.
3. Continue sliding the Control Module down until it is in place, with its captive screws lined up with the matching threaded holes in the Left Web.
4. Screw all four mounting screws into the Web. Then, tighten them.
5. Install the Voltage Limiter. The procedure is the reverse of step 1 of Removal, above.

### 3.1.2 Shutter Motors

Tools Required - Allen Wrenches 1/16", 3/32", 5/32" and needle nose pliers.

**WARNING: ENSURE THAT LINE POWER COMING IN TO THE HAPI-PLASI 2000 SYSTEM IS TURNED OFF BEFORE REMOVING OR INSTALLING MOTORS.**

Removal:

1. Disconnect external power.
2. Remove Control Module, see *Paragraph 3.1.1*.
3. Carefully unplug the Terminal Block Connector from J1 at the bottom of the Control Module, and remove the blue wire from location 20 and the red wire from either location 21 (top motor) or 23 (bottom motor) and the black wire from either location 22 (top motor) or 24 (bottom motor).
4. Remove the motor wires from the wiring harness, cutting off cable ties where necessary.
5. Remove the splice from the blue wire and remove the screws retaining the Missing Pulse Detector.



6. Rotate chain and sprocket until the master link rests on the driven sprocket.
7. Remove the retainer clip from the master link. Remove the link from the Shutter Chain.
8. Remove the Motor Sprocket. Loosen the set screws holding the sprocket shaft to the motor shaft. Remove the Motor Sprocket Shaft.
9. Remove the four cap screws holding the motor to the Pulse Generator Plate.
10. Remove motor.

Installation:

1. The procedure for installing a new motor is the reverse of that for removal. A new splice will be needed to combine all four blue motor wires into one.
2. Tension the Shutter Chains per **Paragraph 3.0.2**.

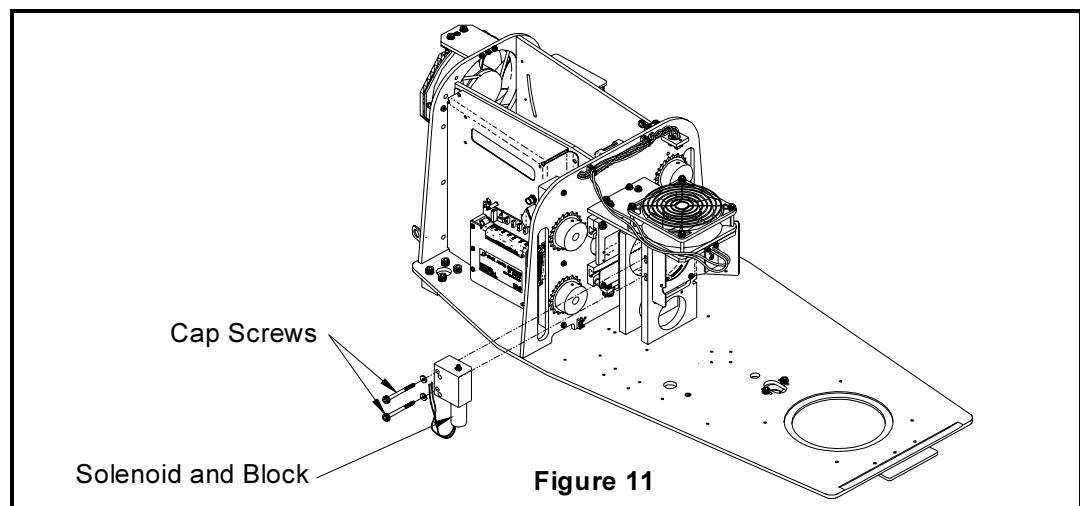
### 3.1.3 Lamp Changer Solenoid

Tools Required - 1/8", 9/64" Allen Wrenches and 3/8" Wrench.

**WARNING: ENSURE THAT LINE POWER COMING IN TO THE HAPI-PLASI 2000 SYSTEM IS TURNED OFF BEFORE REMOVING OR INSTALLING SOLENOID.**

Removal:

1. Carefully unplug the Terminal Block Connector from J2 at the bottom of the Control Module, and remove the black wires from locations 15 and 16.
2. Remove the two cap screws holding the Solenoid Block (**Figure 11**) to the



Lens Mount. Retain insulators between Solenoid Block and Lens Assembly, save for reassembly.

3. Remove the Solenoid wires from the wiring harness, cutting off cable ties where necessary.
4. It is recommended that the Solenoid Assembly be replaced as a unit (Solenoid and Block).

Installation:

**CAUTION: WHEN INSTALLING SOLENOID, TAKE CARE TO REINSTALL INSULATORS BETWEEN THE SOLENOID BLOCK AND THE LENS ASSEMBLY.**

1. The procedure for installing a new Solenoid is the reverse of that for removal. It does not matter which black wire goes in location 15 and which into location 16.
2. Adjust the stop at the top of the Solenoid to limit upward movement of the plunger to between .020" to .040" above the top surface of the Lamp Table (to ensure free movement of the Lamp Table, measure clearance at 5 evenly spaced locations starting at the stop).

#### 3.1.4 Shutter Chain

Tools Required - Allen Wrenches 1/16", 3/32", 5/32" and needle nose pliers.

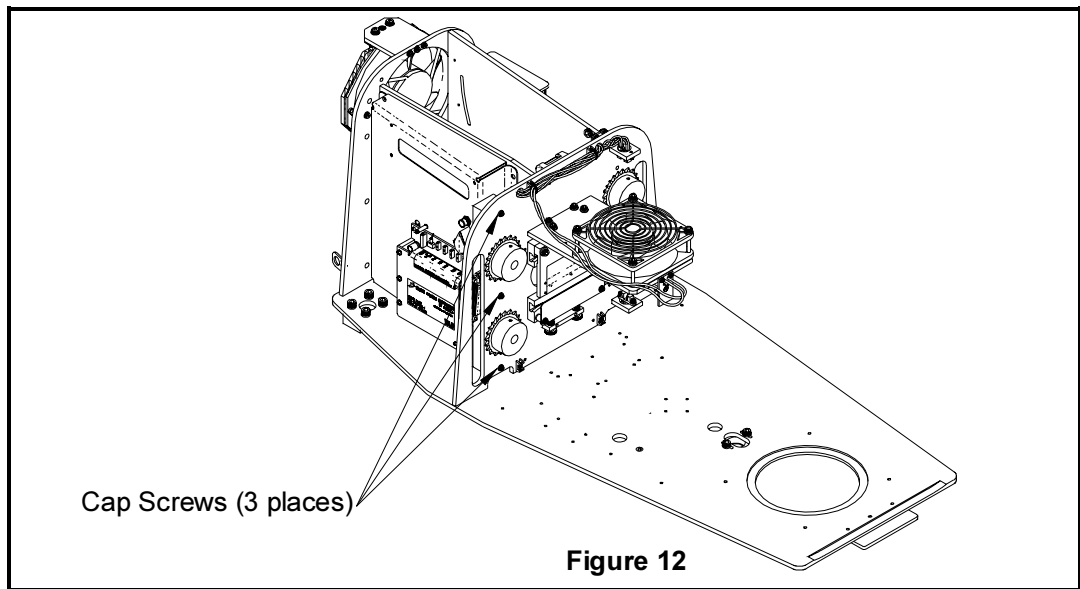
**WARNING: ENSURE THAT THE HAPI-PLASI 2000 SYSTEM IS TURNED OFF AND THE CIRCUIT BREAKER DISENGAGED BEFORE REMOVING OR INSTALLING SHUTTER CHAINS.**

**CAUTION: WHEN REMOVING SHUTTER CHAIN, TAKE CARE TO AVOID DAMAGING SENSORS.**

Removal:

1. Loosen the three cap screws securing the Bearing Block Assembly to the Pulse Generator Plate and push block towards the center of the HAPI-PLASI 2000 System. (*Figure 12*)





2. Remove the retainer clip from the master link. Remove the link from the Shutter Chain.
3. Pull chain out of chain guide and remove from Motor Sprocket.

Installation:

1. To install the Shutter Chain, the procedure is in reverse order of removal.
2. Tension the Shutter Chains per **Paragraph 3.0.2.**

### 3.2 HAPI-PLASI 2000 System Maintenance Tools:

1. Tilt Switch and Level Arm adjustment - 3/8" wrench, level.
2. Adjusting leg height - 3/4" wrenches.
3. Air filter replacement - No tools.



## **SECTION IV - TROUBLE ANALYSIS CHART**

The HAPI-PLASI 2000 System display panel, located inside the Unit in the left front corner, will usually give a message pointing to the fault that caused it to SHUT DOWN (**Figure 13**). Use the Trouble Analysis Chart to determine which actions to take when the HAPI-PLASI 2000 System SHUTS DOWN. In every case, if the recommended actions do not solve the problem, the Control Module could be at fault.

### **Trouble Analysis Chart**

#### **MESSAGE**

#### **PROBABLE CAUSE**

No Message

The Control Module is not operating properly. Check power source. Check Switches and Circuit Breaker. Replace Control Module.

WARMING UP

The temperature of the HAPI-PLASI 2000 System is less than 32 degrees F. If the power to the HAPI-PLASI 2000 System has been only recently applied, this is normal and the HAPI-PLASI 2000 System will warm-up in a few minutes. If the HAPI-PLASI 2000 System is clearly warmer than -36 degrees F, check the Thermal Sensor Assembly that is mounted on the Aluminum Plate near the motors. If the HAPI-PLASI 2000 System is less than 32 degrees F, but does not warm-up, check the heaters.

CHECK CIRC FAN

The Thermal Sensor Assembly that is mounted on the Circulation Fan is greater than 250 degrees F. Check the Circulation Fan. Check the Exhaust Fan. Check the Air Filter. Check the Thermal Sensor Assembly.

ALL LAMPS OUT

The Lamp Table is signaling Last Lamp (Table is in Position 4) and the Lamp is drawing no current. Replace burned out Lamps. Check Lamp Table wiring. Check Lamp Table Switches.

TOP CHAIN FAULT

The Missing Pulse Detector on the top chain is not signaling. Check top chain for binding or obstructions. Check tightness of chain sprocket set screws. Check top chain motor. Check top chain motor wiring. Check Slotted Sensor on top chain.



BOT CHAIN FAULT	The Missing Pulse Detector on the bottom chain is not signaling. Check bottom chain for binding or obstructions. Check tightness of chain sprocket set screws. Check bottom chain motor. Check bottom chain motor wiring. Check Slotted Sensor on bottom chain.
TILT HIGH	The Leveling Arm Sensor is open. Check alignment of the HAPI-PLASI 2000 System. Check wiring to the Tilt Sensors. Check the Mercury Switch in the Tilt Sensor.
TILT LOW	The Leveling Arm Sensor is open. Check alignment of the HAPI-PLASI 2000 System. Check wiring to the Tilt Sensors. Check the Mercury Switch in the Tilt Sensor.
OVERTEMPERATURE	The temperature of the air inside the Control Module is greater than 176 degrees F. Check Exhaust Fan. Check Air Filter. Check for obstructions to air flow.
LINE OVERVOLTAGE	The voltage on the power line into the HAPI-PLASI 2000 System is greater than 135VRMS. Check power source. Check wiring.
SOLENOID FAULT	The Control Module has tried to fire the Solenoid 12 times without seeing any Lamp current nor the Last Lamp signal. Check Solenoid. Check Lamp Table wiring. Check Lamp Table Switches. Check Lamp Table for binding. Check cable reel for proper cable tension.
LOW LINE FAULT	The voltage on the power line into the HAPI-PLASI 2000 System is less than 96VRMS. Check power source. Check wiring.
LIMITER FAULT	The line voltage is okay, the Lamp has been on for more than 1 second, and the voltage out to the Lamp is less than 30VRMS. Check Voltage Limiter. Check wiring to Voltage Limiter and to Lamp Table.



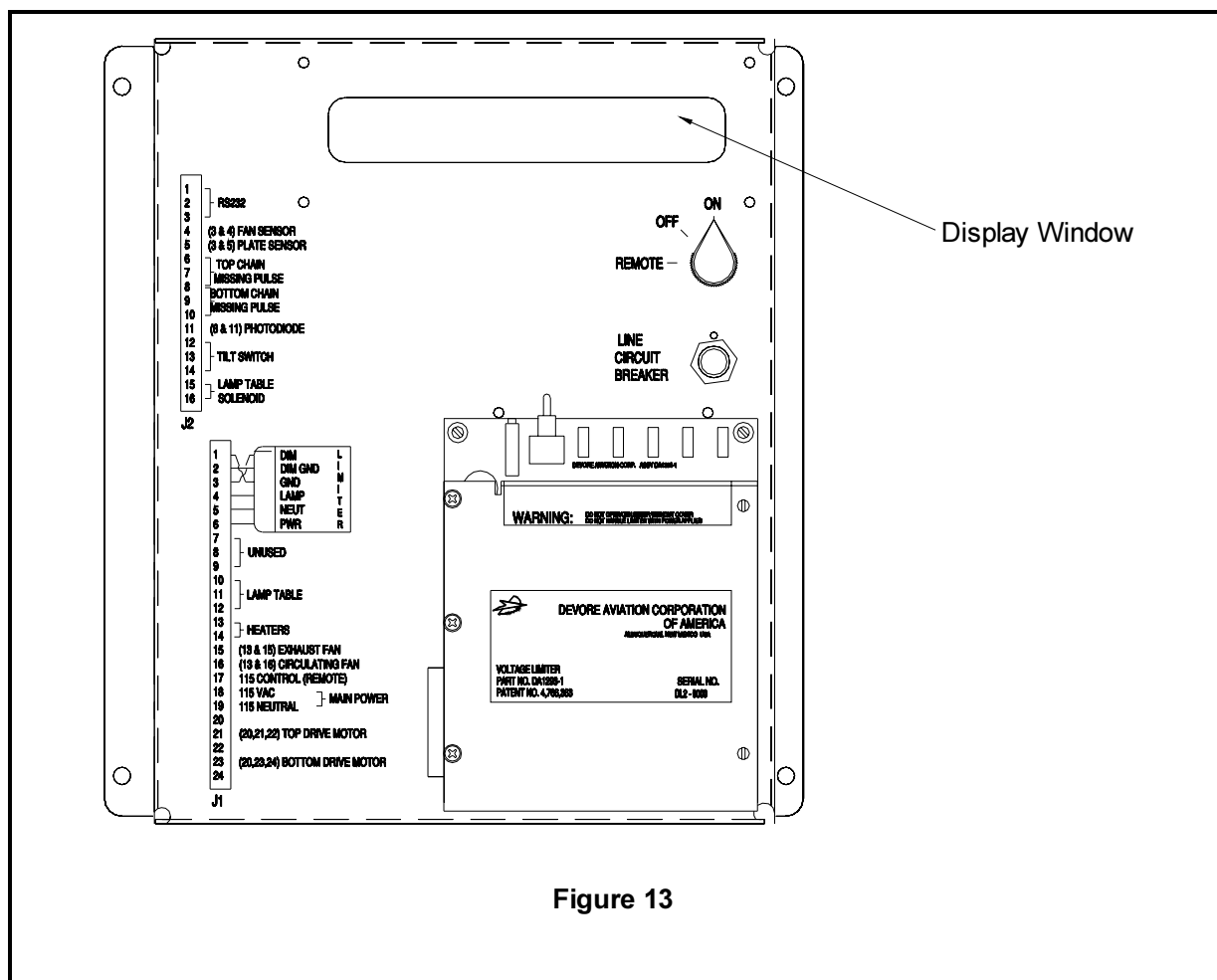


Figure 13



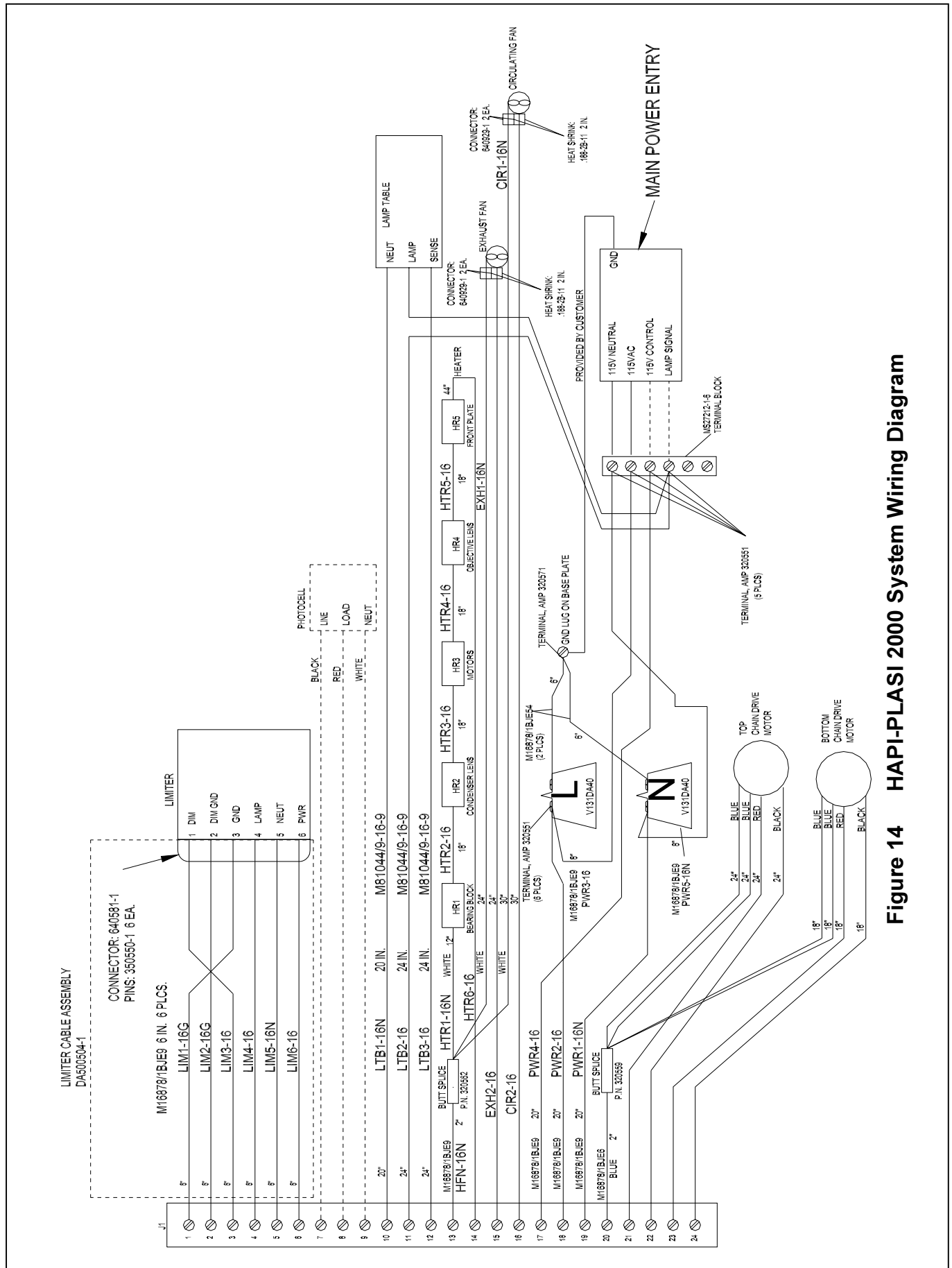


Figure 14 HAPI-PLASI 2000 System Wiring Diagram



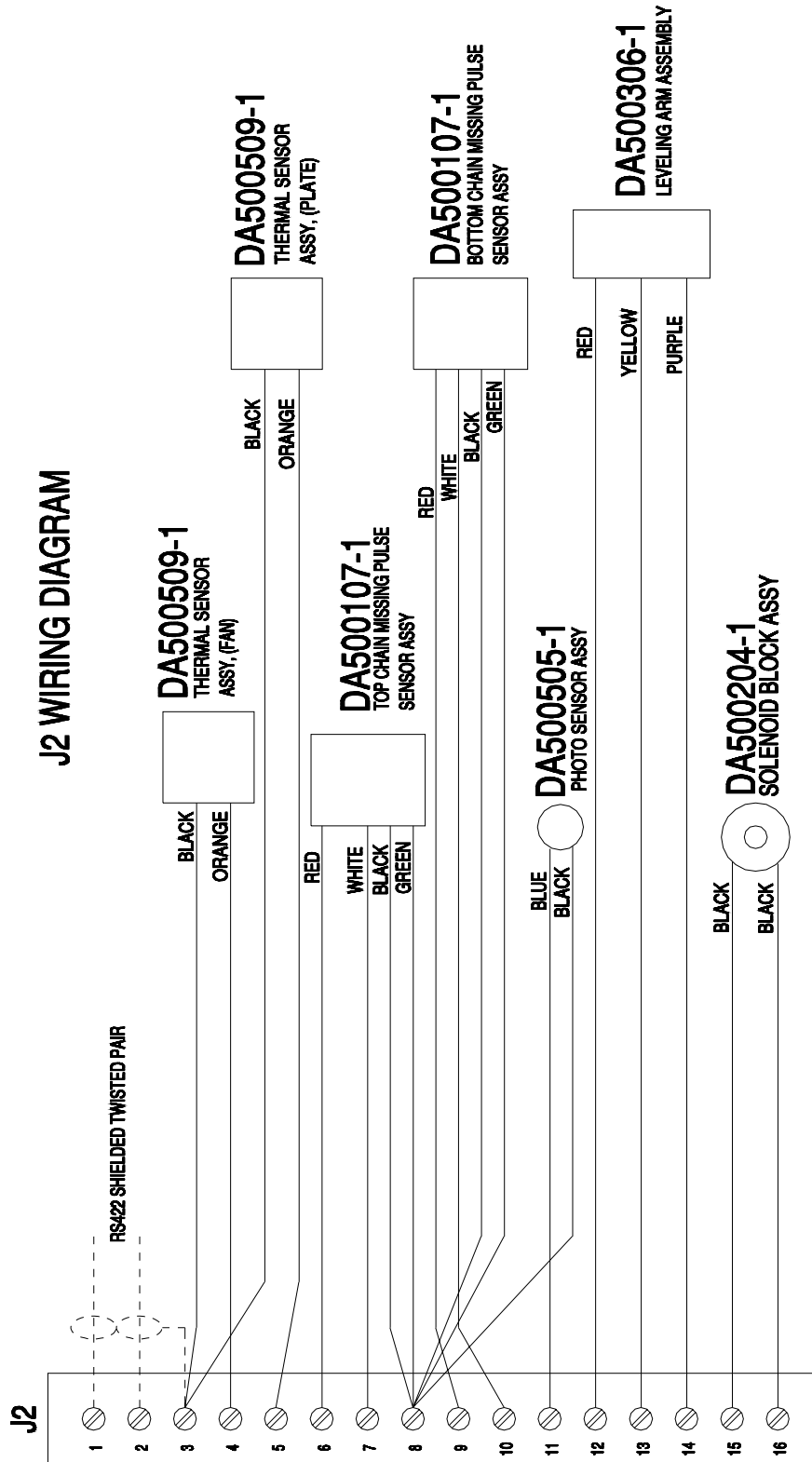
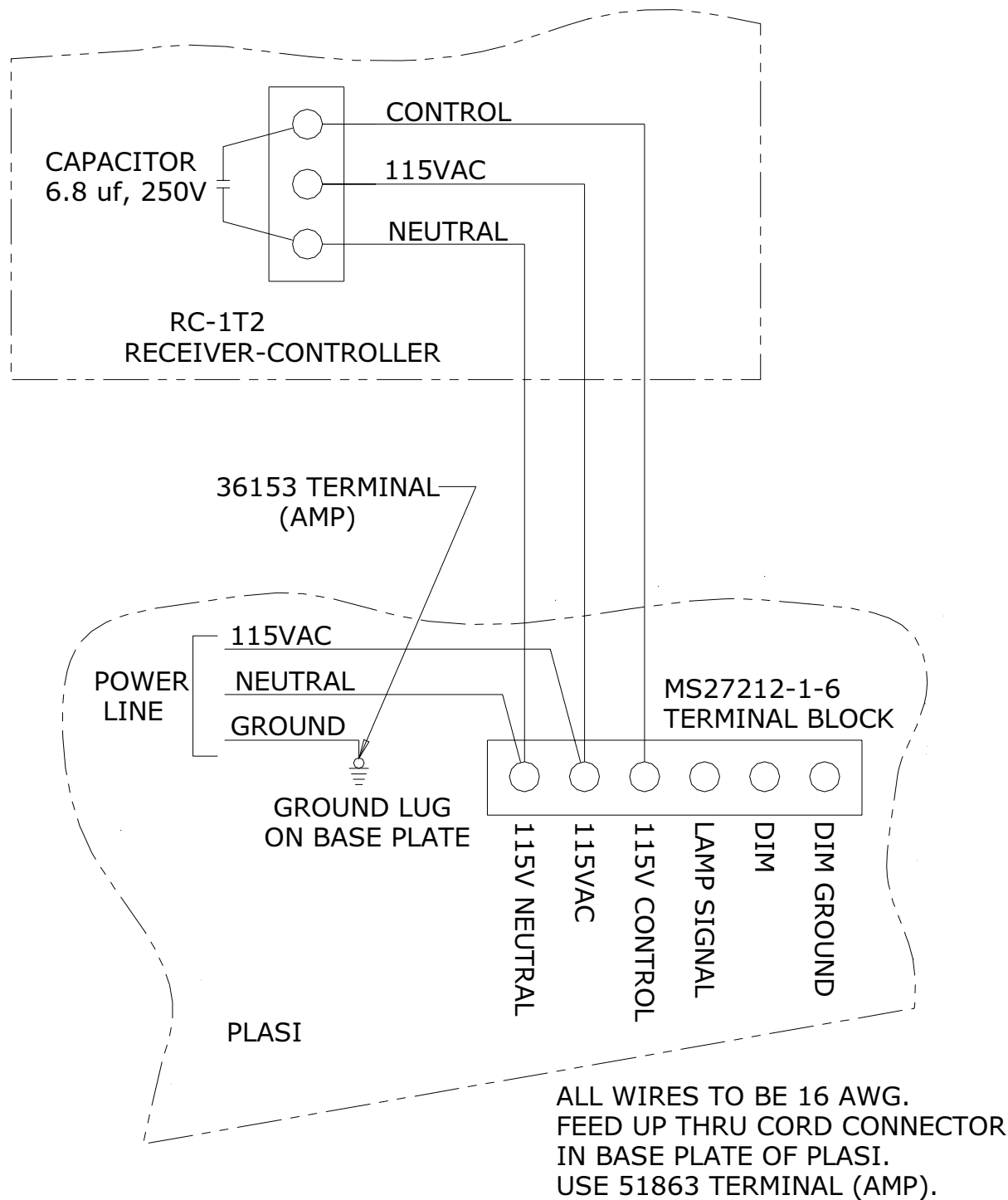


Figure 15 J2 Wiring Diagram







**Figure 17 Interconnect Diagram - HAPI-PLASI to Radio Receiver Controller**



## SECTION V - HAPI-PLASI 2000 SYSTEM ILLUSTRATED PARTS LIST

### INTRODUCTION

This illustrated parts manual is designed to permit identification of replacement parts, when necessary, for the HAPI-PLASI 2000 System. Parts lists identification will include the following breakdown information:

1. Item Number column identifies the individual part with its corresponding illustration.
2. Part Number column identifies the DeVore Aviation Corporation Part Number, AN, MS, NAS, or commercial part numbers used as original or replacement equipment.
3. Description column lists the functional name of the identified part. This name is used when placing an order for the replacement parts.
4. Quantity column provides for noted assembly and sub-assembly total requirements of each individual part.

**IPL Figure 10 Bearing Block Assembly**

Item Number	Part Number	Description	Quantity
-	DA500109-1	BEARING BLOCK ASSEMBLY	-
1	DA500114-11	BEARING BLOCK, PULSE GENERATOR	1
2	DA500115-11	SHAFT, DRIVEN, PASSIVATED	2
3	DA1455-1	BEARING (SEE DRAWING FOR PART NUMBERS AVAIL.)	4
4	CS-10	COLLAR	2
5	620-10	RESISTOR, 10 OHM 30W 5% TYPE 620 (RCD)	1

**\*\*\*\*\*NOTE\*\*\*\*\***

DO NOT USE THIS MANUAL FOR ANY PURPOSE EXCEPT FOR ITS INTENDED USE AS A PARTS REPLACEMENT CATALOG. MANUFACTURE SPECIFICATIONS, RATINGS, AND REPAIR PROCEDURES CAN BE FOUND IN THE HAPI-PLASI 2000 SYSTEM SERVICE AND MAINTENANCE SECTIONS OF THIS MANUAL.



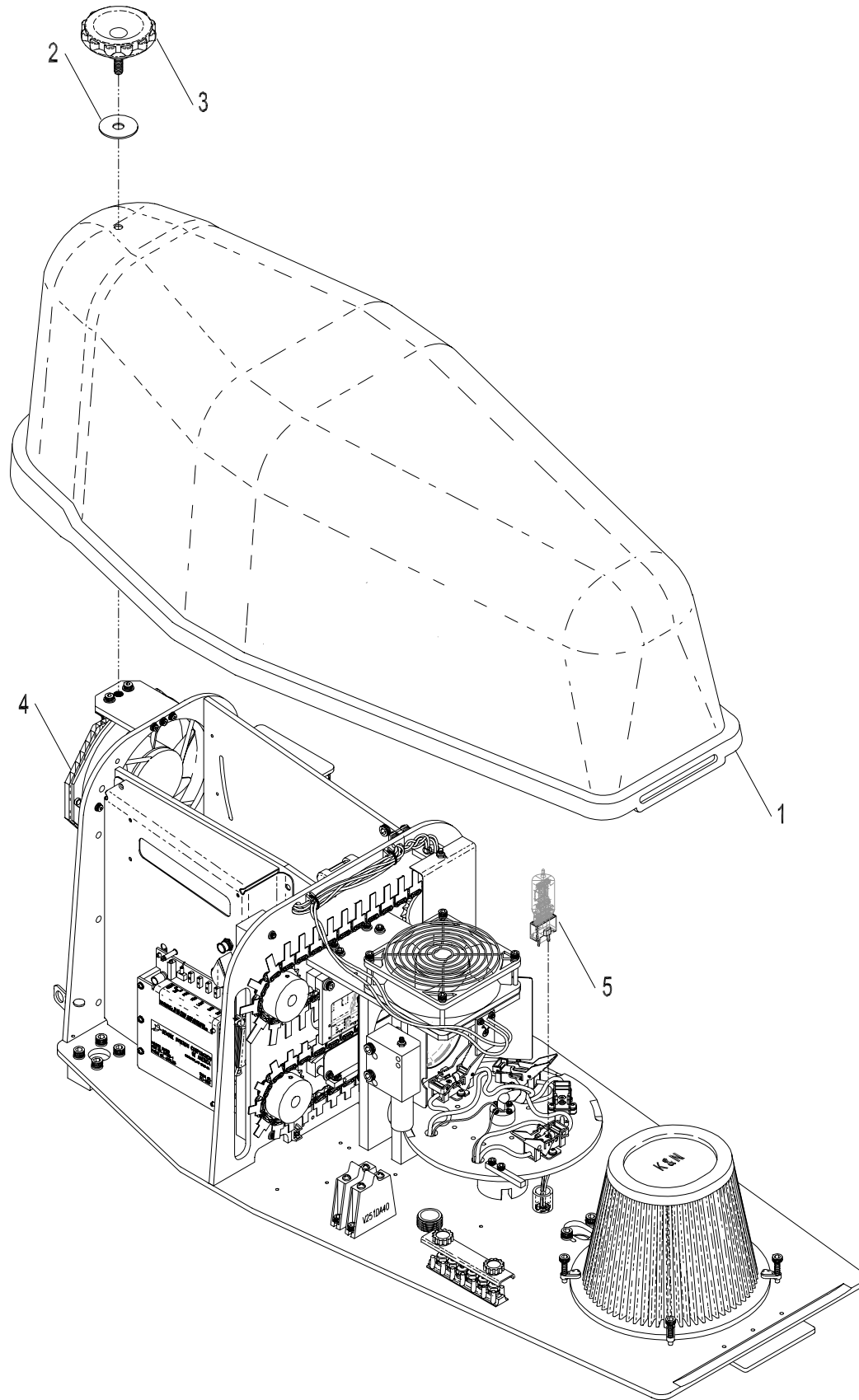
**NOTE:** When ordering replacement components or assemblies, be sure that the mounting hardware for the installation corresponds to the next higher assembly or installation procedure requirements.

DeVore Aviation Corporation reserves the right to change or cancel any assemblies, assembly components, parts lists, or illustrations represented here without prior notice. It further reserves the right to substitute components whenever such substitution does not interfere with the functional operation of the HAPI-PLASI 2000 System.



IPL Figure 1

## HAPI-PLASI 2000 System Assembly



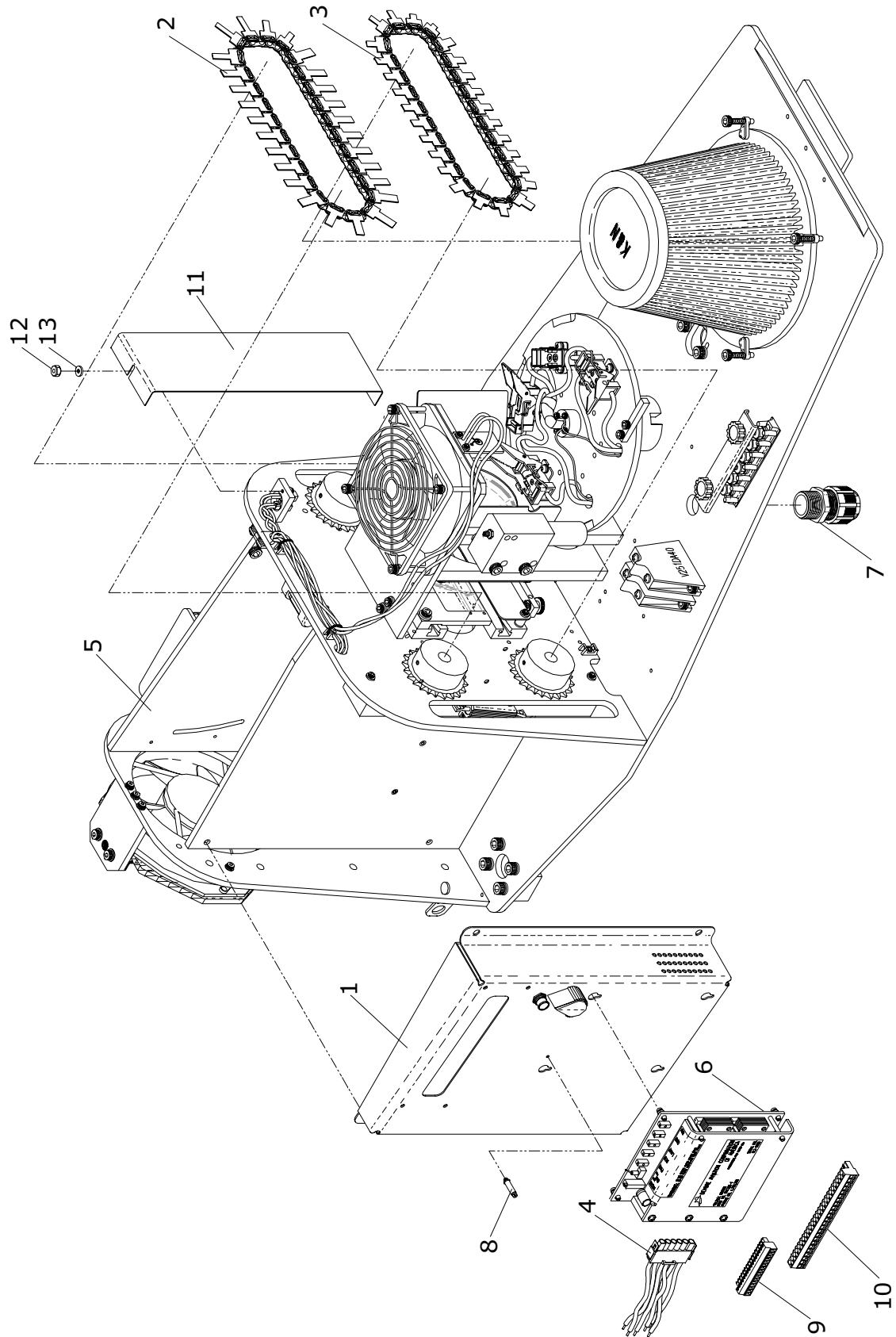
## IPL Figure 1 HAPI-PLASI 2000 System Assembly

Item Number	Part Number	Description	Quantity
-	DA500100-5	HAPI-PLASI 2000 ASSEMBLY (60Hz)	-
-	DA500100-6	HAPI-PLASI 2000 ASSEMBLY (50Hz)	-
1	DA500609-1	SHELL ASSEMBLY	1
2	DA500147-13	WASHER, SEALING	1
3	DA500147-11	RETAINING KNOB	1
4	DA500102-5	PULSE GENERATOR ASSEMBLY, HAPI (60 HZ)	1
4	DA500102-6	PULSE GENERATOR ASSEMBLY, HAPI (50 HZ)	1
5	BVA	LAMP, ANSI# BVA, 900W, 120V, TUNGSTEN HALOGEN	4



IPL Figure 2

# Pulse Generator Assembly





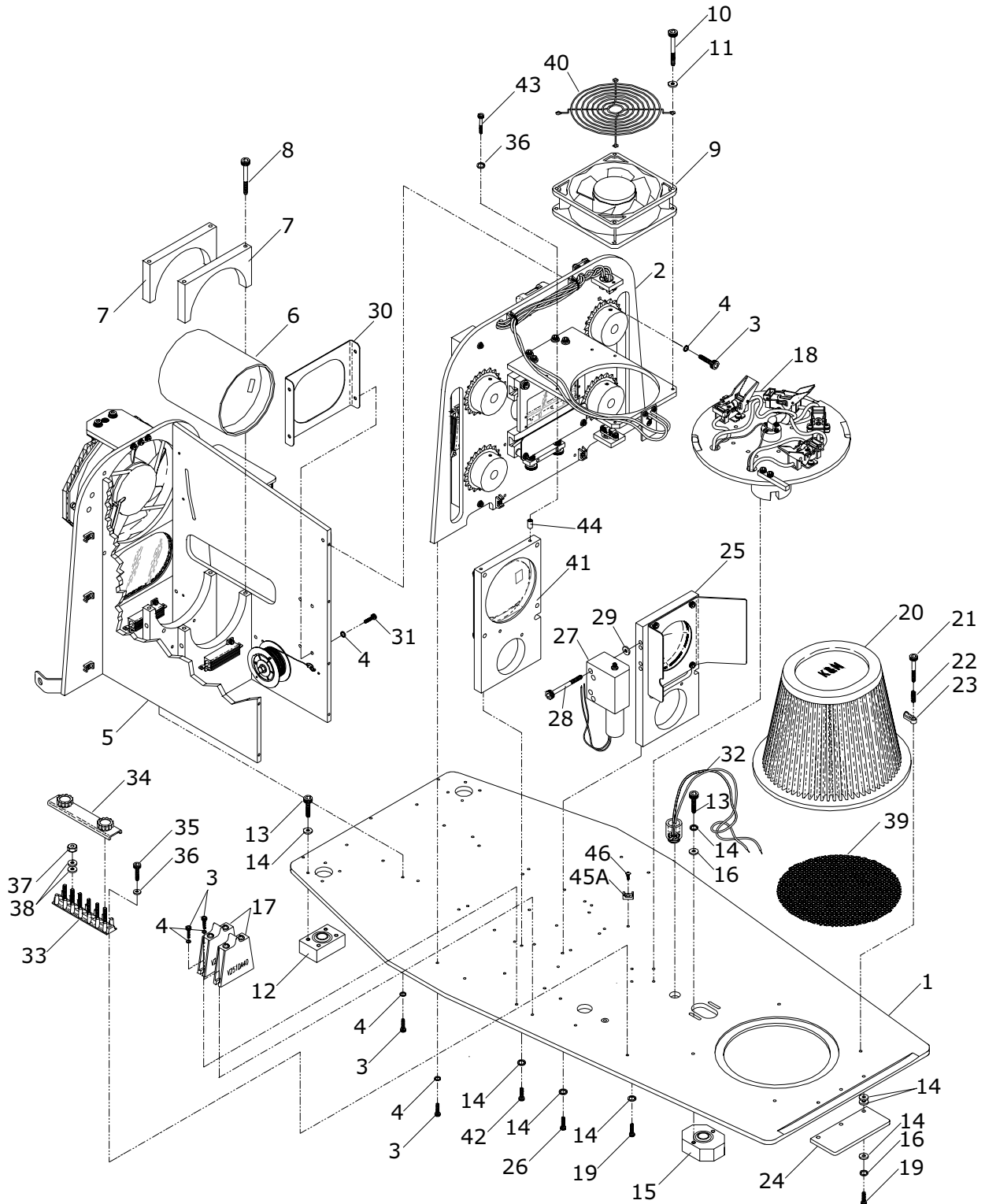
## IPL Figure 2 Pulse Generator Assembly

Item Number	Part Number	Description	Quantity
-	DA500102-5	PULSE GENERATOR ASSEMBLY (60 HZ)	-
-	DA500102-6	PULSE GENERATOR ASSEMBLY (50 HZ)	-
1	DA500507-1	CONTROL MODULE ASSEMBLY (60 HZ)	1
1	DA500507-3	CONTROL MODULE ASSEMBLY (50 HZ)	1
2	DA500720-9	SHUTTER CHAIN ASSEMBLY (ICAO, HAPI UPPER)	1
3	DA500720-7	SHUTTER CHAIN ASSEMBLY (ICAO, HAPI LOWER)	1
4	DA500504-1	LIMITER CABLE ASSEMBLY	1
5	DA500103-5	MAIN GENERATOR ASSEMBLY (ICAO 60HZ)	1
5	DA500103-7	MAIN GENERATOR ASSEMBLY (ICAO 50 HZ)	1
6	DA1293-1	LIMITER II ASSEMBLY	1
7	2932NM	CORD CONNECTOR	1
8	27MSP00625	5-8 PCB POST	2
9	1803714	PLUG CONNECTOR 0.15, 16 PIN (COMBICON)	1
10	1757239	PLUG CONNECTOR 0.2, 24 PIN (COMBICON)	1
11	DA500153-11	SHIELD PLATE	1
12	HNL4-40C	HEX NUT, LOCKING-NYLON INSERT, MACHINE SCREW, 4-40, STAINLESS STEEL	1
13	WA-4-C	WASHER, # 4, THICK, FLAT, STAINLESS STEEL	1



IPL Figure 3

# Main Generator Assembly



### IPL Figure 3 Main Generator Assembly

Item Number	Part Number	Description	Quantity
-	DA500103-5	MAIN GENERATOR ASSEMBLY (60 HZ)	-
-	DA500103-7	MAIN GENERATOR ASSEMBLY (50 HZ)	-
1	DA500112-11	BASE PLATE	1
2	DA500104-5	GENERATOR PLATE ASSEMBLY, (ICAO, 60HZ)	1
2	DA500104-7	GENERATOR PLATE ASSEMBLY, (ICAO, 50 HZ)	1
3	SHCS6-32X.50C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL, 6-32 X .50 LONG	28
4	WA-6-SLC	WASHER, # 6, SPLIT LOCK, STAINLESS STEEL	36
5	DA500142-1	WEB ASSEMBLY	1
6	402-100	PROJECTOR (OBJECTIVE) LENS, 8EFL, 4"OD BARREL	1
7	DA500121-13	LENS CLAMP	2
8	SHCS6-32X2.00C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL, 6-32 X 2.00 LONG	4
9	DA1423-1	CIRCULATION FAN	1
10	SHCS6-32X1.75C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL, 6-32 X 1.75 LONG	4
11	WA-6-LC	WASHER, # 6, THIN, FLAT, STAINLESS STEEL	4
12	DA500130-1	LATCH BLOCK ASSEMBLY	2
13	SHCS10-32X.875C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 10-32 X .875 LONG	10



### IPL Figure 3 Main Generator Assembly

Item Number	Part Number	Description	Quantity
14	WA-10-SLC	WASHER, # 10, SPLIT LOCK, STAINLESS STEEL	22
15	DA500126-1	FOOT ASSEMBLY, REAR	1
16	WA-10-LC	WASHER, # 10, THIN, FLAT, STAINLESS STEEL	9
17	V131DA40	VARISTOR	2
18	DA500201-1	LAMP CHANGER ASSEMBLY	1
19	SHCS10-32X.75C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 10-32 X .75 LONG	7
20	DA500157-1	FILTER ASSEMBLY (E-2875 AND .38X.50-4G-24)	1
21	9X25-0624	SHOULDER BOLT	4
22	C0240-020-0880S	SPRING	4
23	L-5507	RETAINER	4
24	DA500150-11	TANG, SHELL RETAINER	1
25	DA500106-1	ASPHERIC CONDENSER LENS ASSEMBLY	1
26	SHCS10-32X.50C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 10-32 X .50 LONG	4
27	DA500204-1	SOLENOID BLOCK ASSEMBLY	1
28	SHCS8-32X1.25C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 8-32 X 1.25 LONG	2
29	00003007-1	WASHER	2
30	DA500151-11	BAFFLE	2



### IPL Figure 3 Main Generator Assembly

Item Number	Part Number	Description	Quantity
31	SHCS6-32X.25C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 6-32 X .25 LONG	8
32	DA500505-1	PHOTO SENSOR ASSEMBLY	1
33	MS27212-1-6	TERMINAL BOARD ASSEMBLY	1
34	MS18029-1S-6	COVER ASSEMBLY	1
35	SHCS4-40X.375C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 4-40 X .375 LONG	2
36	WA-4-SLC	WASHER, # 4, SPLIT LOCK, STAINLESS STEEL	2
37	MS21083N06	NUT, HEX, SELF-LOCKING	6
38	WA-6-C	WASHER, # 6, THICK, FLAT, STAINLESS STEEL	12
39	DA500152-11	SCREEN, FILTER	1
40	08170	FINGER GUARD, MUFFIN FAN, MD24B2 (COMAIR)	1
41	DA500108-1	FIELD CONDENSER LENS ASSEMBLY	1
42	SHCS4-40X1.25C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 4-40 X 1.25 LONG	2
43	.312R4-40X.75A	SPACER, ROUND UNTHREADED	2
44	WA-4-C	WASHER, # 4, THICK, FLAT, STAINLESS STEEL	3
45A	TM1S4-M	CABLE TIE CLAMP	4
45B	PLT1M-MO	CABLE TIE (NOT ILLUSTRATED)	12



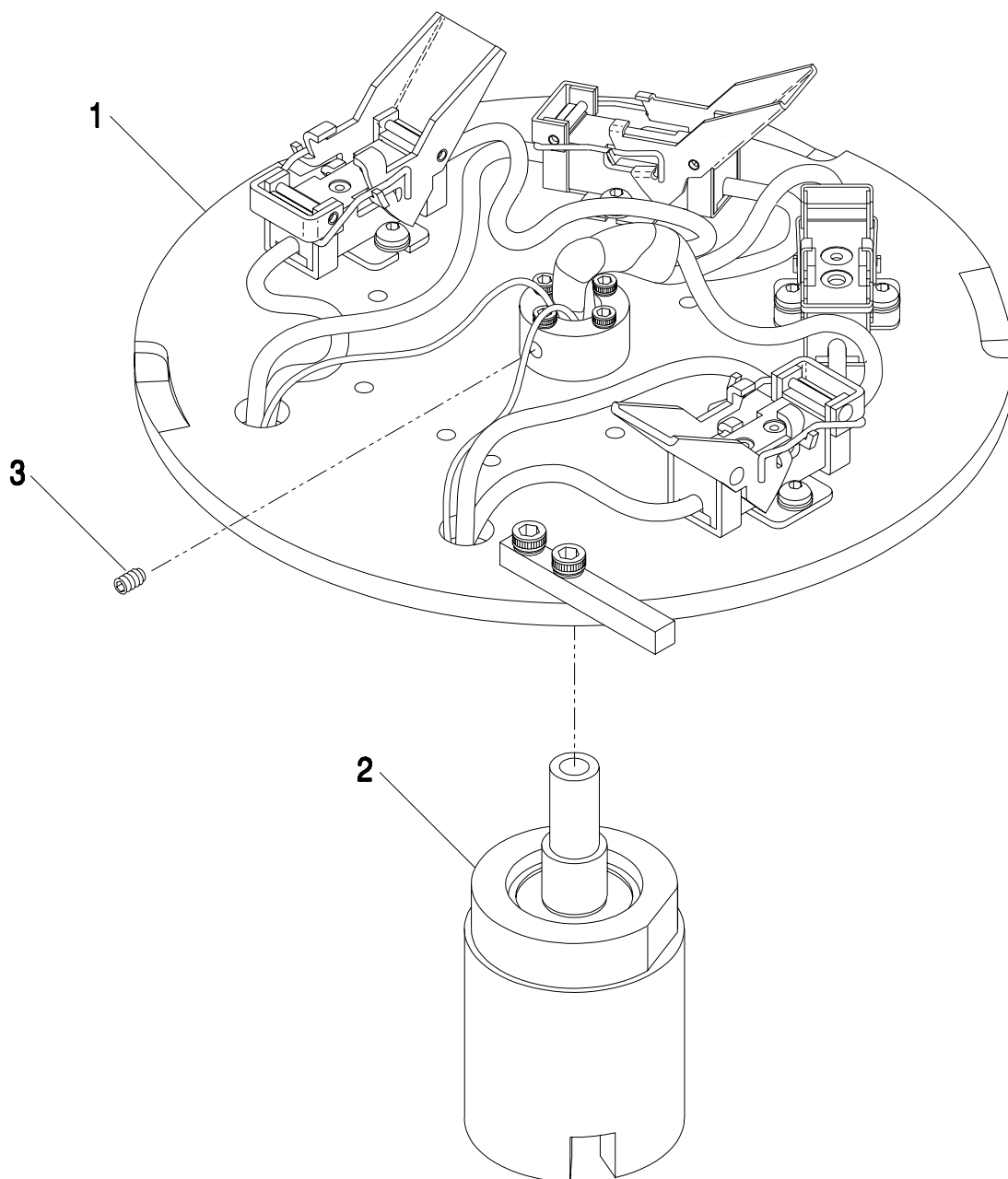
### IPL Figure 3 Main Generator Assembly

Item Number	Part Number	Description	Quantity
46	SBHC4-40X.25C	SCREW, BUTTON HEAD, STAINLESS STEEL 4-40 X .25 LONG	4



IPL Figure 4

Lamp Changer Assembly



### IPL Figure 4 Lamp Changer Assembly

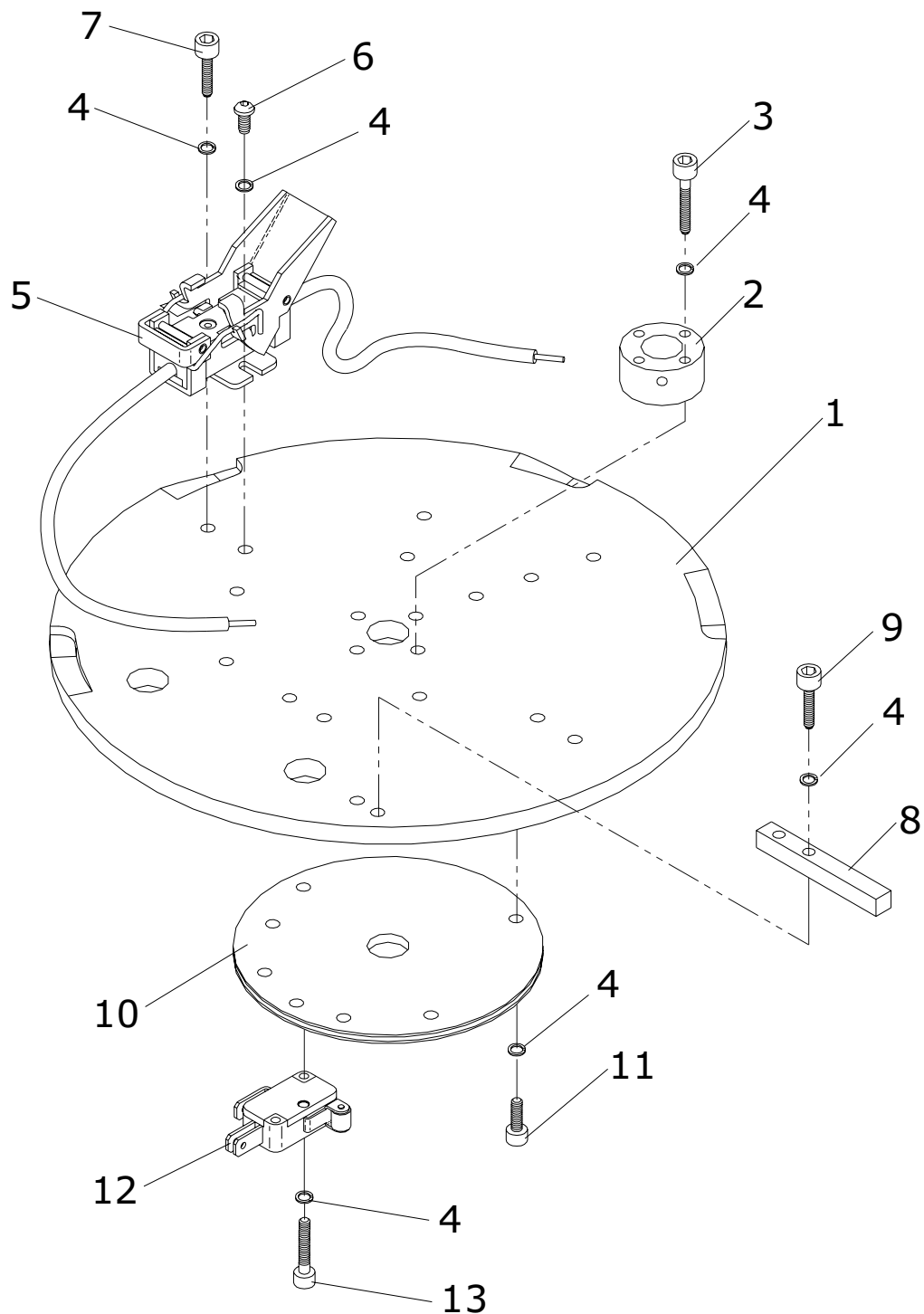
Item Number	Part Number	Description	Quantity
-	DA500201-1	LAMP CHANGER ASSEMBLY	-
1	DA500202-1	LAMP TABLE ASSEMBLY	1
2	DA500203-1	PEDESTAL ASSEMBLY, LAMP TABLE	1
3	SS6-32X.187C	SET SCREW, CUP POINT, SOCKET HEAD, STAINLESS STEEL, 6-32 X .187 LONG	1





IPL Figure 5

Lamp Table Assembly



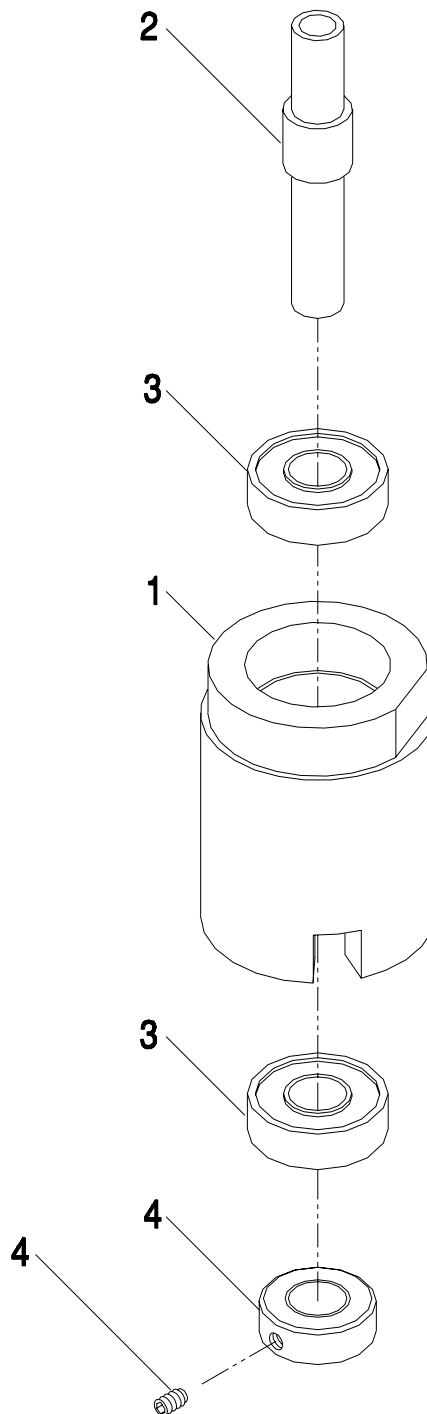
## IPL Figure 5 Lamp Table Assembly

Item Number	Part Number	Description	Quantity
-	DA500202-1	LAMP TABLE ASSEMBLY	-
1	DA500210-11	LAMP TABLE	1
2	DA500212-11	HUB, LAMP TABLE	1
3	SHCS4-40X.75C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 4-40 X .75 LONG	4
4	WA-4-SLC	WASHER, # 4, SPLIT LOCK, STAINLESS STEEL	21
5	DA1410-1	SOCKET	4
6	SBHC4-40X.25C	SCREW, BUTTON HEAD CAP, STAINLESS STEEL 4-40 X .25C	7
7	SHCS4-40X.50C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 4-40 X .50 LONG	1
8	DA500215-11	STOP, LAMP TABLE	1
9	SHCS4-40X.50C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 4-40 X .50 LONG	2
10	DA500211-11	DRIVE WHEEL, LAMP TABLE	1
11	SHCS4-40X.375C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 4-40 X .375 LONG	1
12	V3L-139-D9	MICRO SWITCH W-SPADE LUGS (HONEYWELL)	3
13	SHCS4-40X.75C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 4-40 X .75 LONG	6



IPL Figure 6

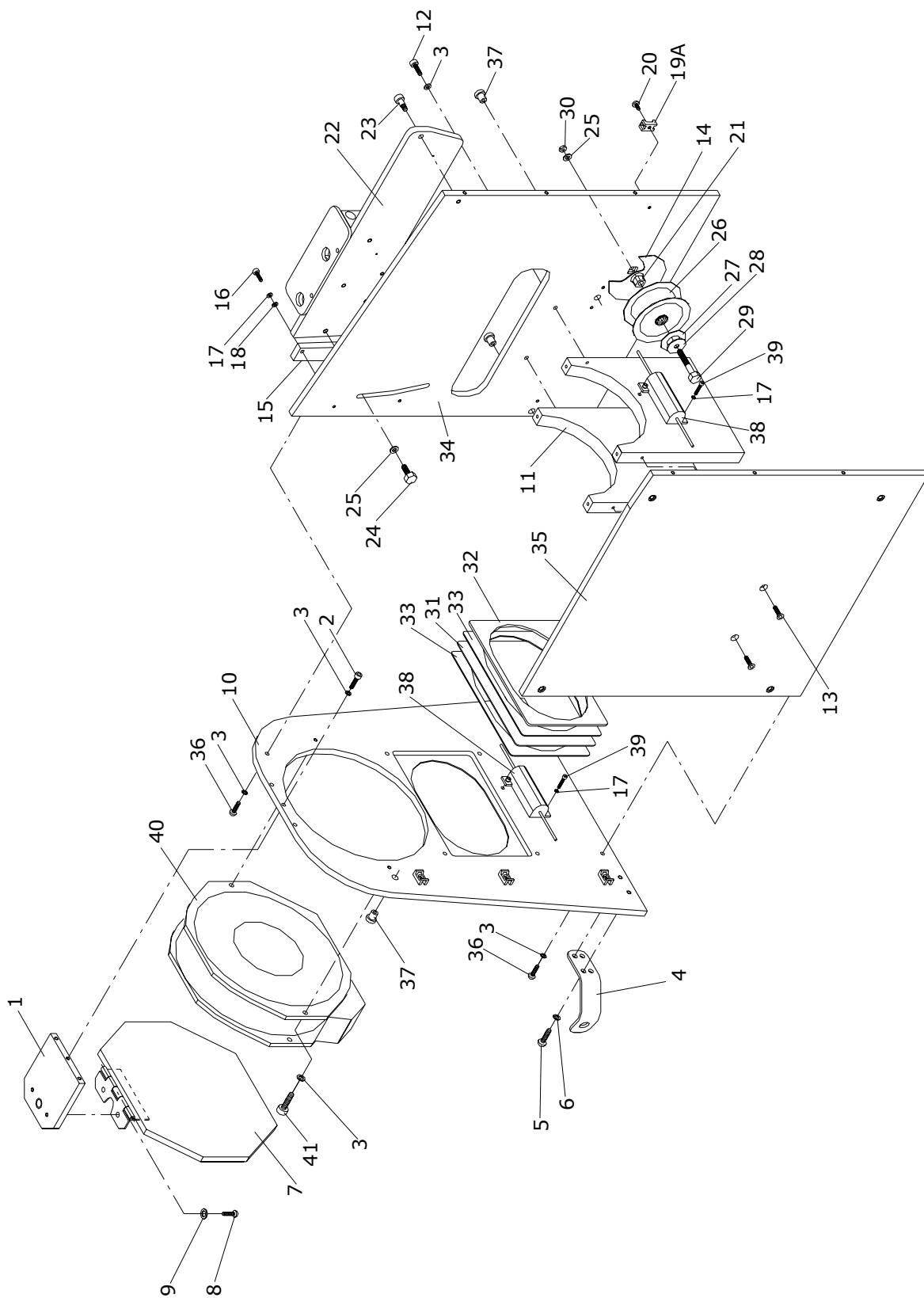
Lamp Table Pedestal Assembly



## IPL Figure 6 Lamp Table Pedestal Assembly

Item Number	Part Number	Description	Quantity
-	DA500203-1	LAMP TABLE PEDESTAL ASSEMBLY	-
1	DA500213-11	PEDESTAL, LAMP TABLE	1
2	DA500115-11	SHAFT, DRIVEN, PASSIVATED	1
3	DA1455-1	BEARING (SEE DRAWING FOR PART NUMBERS AVAILABLE.)	2
4	CS-10	COLLAR	1





IPL Figure 7      Web Assembly



## IPL Figure 7 Web Assembly

Item Number	Part Number	Description	Quantity
-	DA500142-1	WEB ASSEMBLY	-
1	DA500145-11	SUPPORT PLATE	1
2	SHCS6-32X.625C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL, 6-32 X .625 LONG	3
3	WA-6-SLC	WASHER, # 6, SPLIT LOCK, STAINLESS STEEL	14
4	DA500146-11	LATCH BRACKET	2
5	SBHC8-32X.375C	SCREW, SOCKET BUTTON HEAD CAP, STAINLESS STEEL, 8-32 x .375 LONG	4
6	WA-8-SLC	WASHER, # 8, SPLIT LOCK, STAINLESS STEEL	4
7	DA500148-1	FLAPPER DOOR ASSEMBLY	1
8	SBHC6-32X.25C	SCREW, SOCKET BUTTON HEAD CAP, STAINLESS STEEL, 6-32 X .25 LONG	2
9	WA-6-C	WASHER, # 6, THICK, FLAT, STAINLESS STEEL	2
10	DA500111-11	WINDOW SUPPORT	1
11	DA500121	LENS SUPPORT AND CLAMP	2
12	SHCS6-32X.50C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL, 6-32 X .50 LONG	2
13	SFHC6-32X.50C	SCREW, SOCKET FLAT HEAD CAP, STAINLESS STEEL, 6-32 X .50 LONG	2
14	FMG41021-11	WASHER, TEFLON, .70 DIA	1
15	DA500316-11	VERNIER BLOCK	1



## IPL Figure 7 Web Assembly

Item Number	Part Number	Description	Quantity
16	SBHC4-40X.50C	SCREW, SOCKET BUTTON HEAD CAP, STAINLESS STEEL 4-40 X .50 LONG	2
17	WA-4-SLC	WASHER, # 4, SPLIT LOCK, STAINLESS STEEL	6
18	WA-4-LC	WASHER, # 4, THIN, FLAT, STAINLESS STEEL	2
19A	TM1S4-M	CABLE TIE CLAMP	7
19B	PLT1M-M0	CABLE TIE (NOT ILLUSTRATED)	12
20	SBHC4-40X.25C	SCREW, SOCKET BUTTON HEAD CAP, STAINLESS STEEL 4-40 X .25 LONG	7
21	FMG41020-13	BLOCK, REEL (.225 THICK)	1
22	DA500306-1	LEVELING ARM ASSEMBLY	1
23	9X25-0608	SHOULDER BOLT	1
24	AN3-4A	BOLT	1
25	WA-10-C	WASHER, # 10, THICK, FLAT, STAINLESS STEEL	2
26	DA500208-1	REEL ASSEMBLY	1
27	FMG41021-13	WASHER, TEFLON .70 DIA	1
28	AN970-3	WASHER	1
29	AN3-14A	BOLT	1
30	MS21083N3	NUT	1
31	DA500136-11	WINDOW (CLEAR GLASS)	1

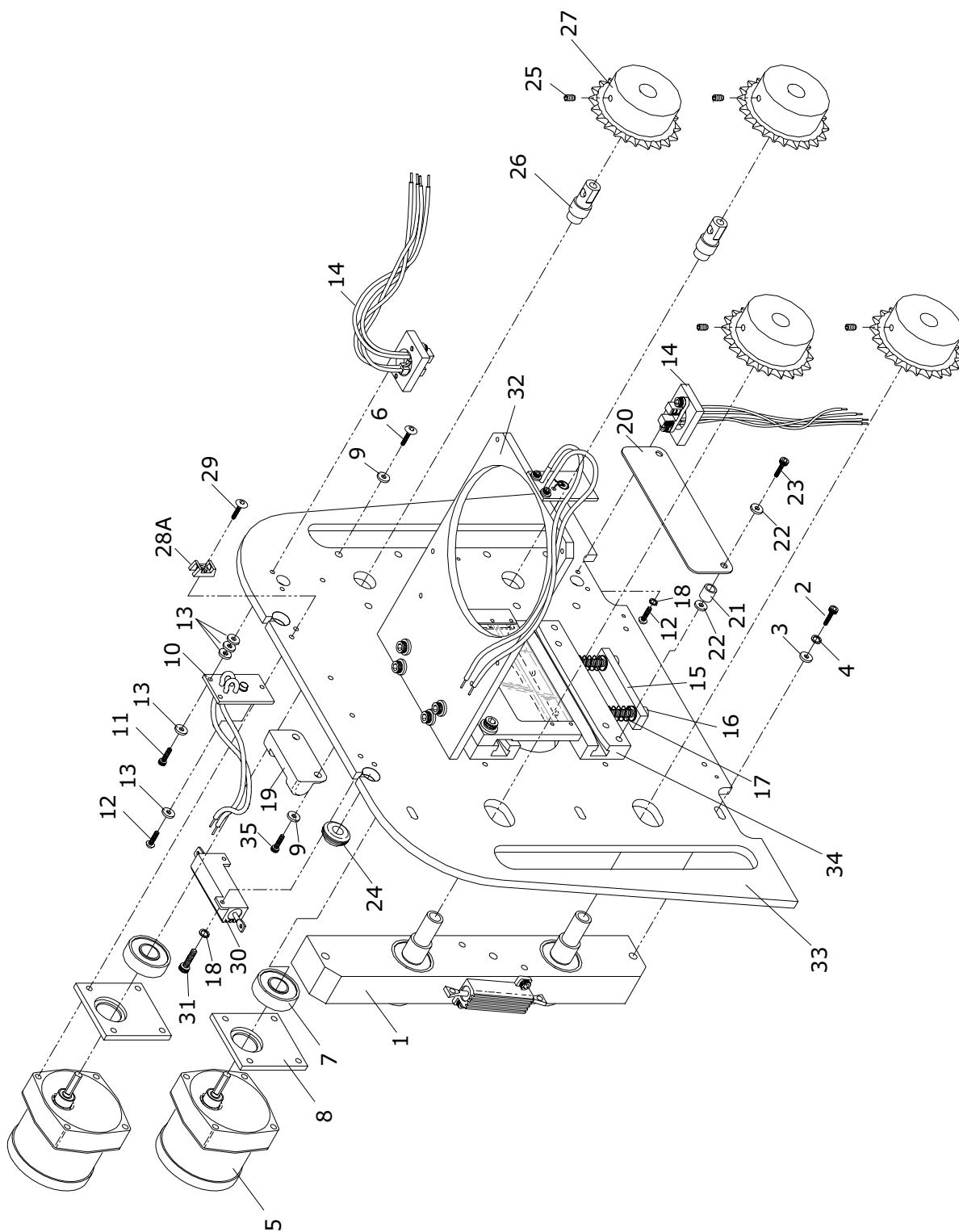


## IPL Figure 7 Web Assembly

Item Number	Part Number	Description	Quantity
32	DA500135-13	CLAMP PLATE	1
33	DA500135-11	GASKET, WINDOW FROM 1-32(0.32") THICK MAT'L.	2
34	DA500110-13	SUPPORT WEB	1
35	DA500110-11	SUPPORT WEB	1
36	SBHC6-32X.50C	SCREW, SOCKET BUTTON HEAD CAP, STAINLESS STEEL, 6-32 X .50 LONG	7
37	9305K21	BUSHING BUMPER, RUBBER, FLAT TOP	3
38	620-10	RESISTOR, 10 OHM 30W 5%, TYPE 620 (RCD)	2
39	SHCS4-40X.375C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 4-40 X .375 LONG	4
40	DA1422-1	EXHAUST FAN ASSEMBLY	1
41	SHCS6-32X.75C	SCREW, SOCKET HEAD CAP STAINLESS STEEL, 6-32 X .75 LONG	2







IPL Figure 8 Generator Plate Assembly



## IPL Figure 8 Generator Plate Assembly

Item Number	Part Number	Description	Quantity
-	DA500104-5	GENERATOR PLATE ASSEMBLY (60 HZ)	-
-	DA500104-7	GENERATOR PLATE ASSEMBLY (50 HZ)	-
1	DA500109-1	BEARING BLOCK ASSEMBLY	1
2	SHCS10-32X.75C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 10-32 X .75 LONG	4
3	WA-10-LC	WASHER, # 10, THIN, FLAT, STAINLESS STEEL	9
4	WA-10-SLC	WASHER, # 10, SPLIT LOCK, STAINLESS STEEL	3
5	SP3732	MOTOR, 115V 60HZ WITH SPECIAL SHAFT & LEADS	2
5	SP3733	MOTOR, 115V 50HZ WITH SPECIAL SHAFT & LEADS	2
6	SBHC8-32X.50C	SCREW, SOCKET BUTTON HEAD CAP STAINLESS STEEL, 8-32 X .50 LONG	2
7	DA1455-1 **	BEARING	2
8	DA500155-11 **	BEARING BLOCK	2
9	WA-8-SLC	WASHER, # 8, SPLIT LOCK, STAINLESS STEEL	10
10	DA500509-1	THERMAL SENSOR ASSEMBLY	1
11	SBHC4-40X.75C	SCREW, SOCKET BUTTON HEAD CAP, STAINLESS STEEL, 4-40 X .75 LONG	2
12	SBHC4-40X.50C	SCREW, SOCKET BUTTON HEAD CAP, STAINLESS STEEL 4-40 X .50 LONG	5
13	WA-4-C	WASHER, # 4, THICK, FLAT, STAINLESS STEEL	14



## IPL Figure 8 Generator Plate Assembly

Item Number	Part Number	Description	Quantity
14	DA500107-1	SENSOR ASSEMBLY, MISSING PULSE	2
15	DA500119-11	ADJUSTMENT BLOCK	1
16	SHCS4-48X1.0C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 4-48 X 1.0 LONG	2
17	C0240-020-0880S	SPRING	2
18	WA-4-SLC	WASHER, # 4, SPLIT LOCK, STAINLESS STEEL	4
19	DA1427-1	BUBBLE LEVEL	1
20	DA500128-11	SHIELD	1
21	.375R10-32X.50A	SPACER	2
22	WA-10-C	WASHER, # 10, THICK FLAT, STAINLESS STEEL	4
23	SHCS10-32X.875C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL, 10-32 X .875 LONG	5
24	MS35489-93 **	GROMMET	2
25	SS1/4-20X.375C *	SET SCREW, CUP POINT, SOCKET HEAD, STAINLESS STEEL, 1/4-20 X .375 LONG	2
26	DA500156-11 **	SHAFT ADAPTER, DRIVEN	2
27	35BS18-1/2HT	SPROCKET	4
28A	TM1S4-M	CABLE TIE CLAMP	6
28B	PLT1M-MO	CABLE TIE (NOT ILLUSTRATED)	6

\* Serial Numbers Before and Including 53015    \*\* Serial Numbers After and Including 53016



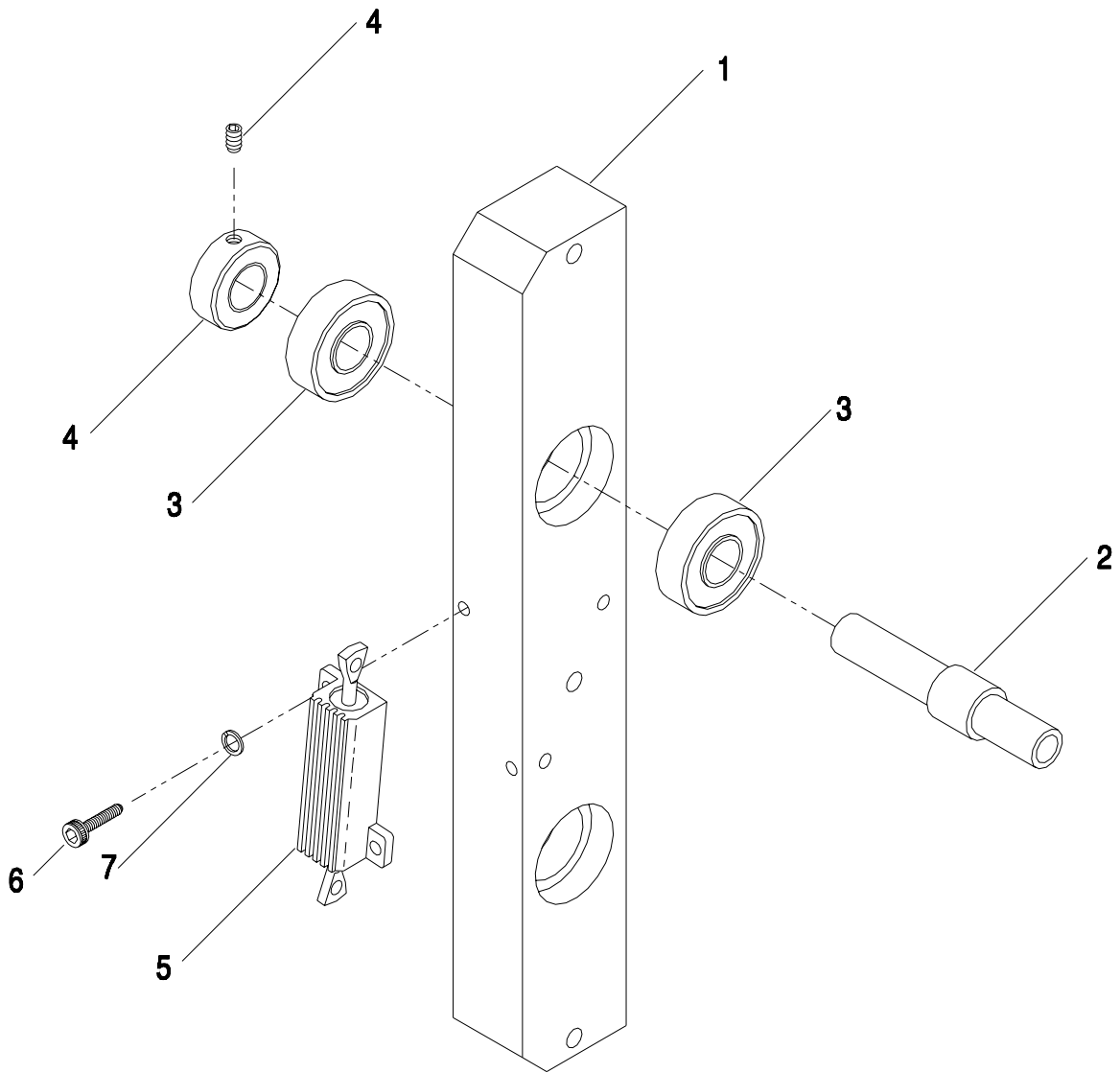
## IPL Figure 8 Generator Plate Assembly

Item Number	Part Number	Description	Quantity
29	SBHC4-40X.25C	SCREW, SOCKET BUTTON HEAD CAP, STAINLESS STEEL, 4-40 X .25 LONG	6
30	620-10	RESISTOR	1
31	SHCS4-40X.375C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL, 4-40 X .375 LONG	2
32	DA500105-3	CHAIN GUIDE AND FILTER ASSEMBLY	1
33	DA50013-11	PULSE GENERATOR PLATE	1
34	DA500117-11	CHAIN GUIDE	1
35	SBHC8-32X.375C	SCREW, SOCKET BUTTON HEAD CAP, STAINLESS 8-32 X.375	2



IPL Figure 9

Bearing Block Assembly



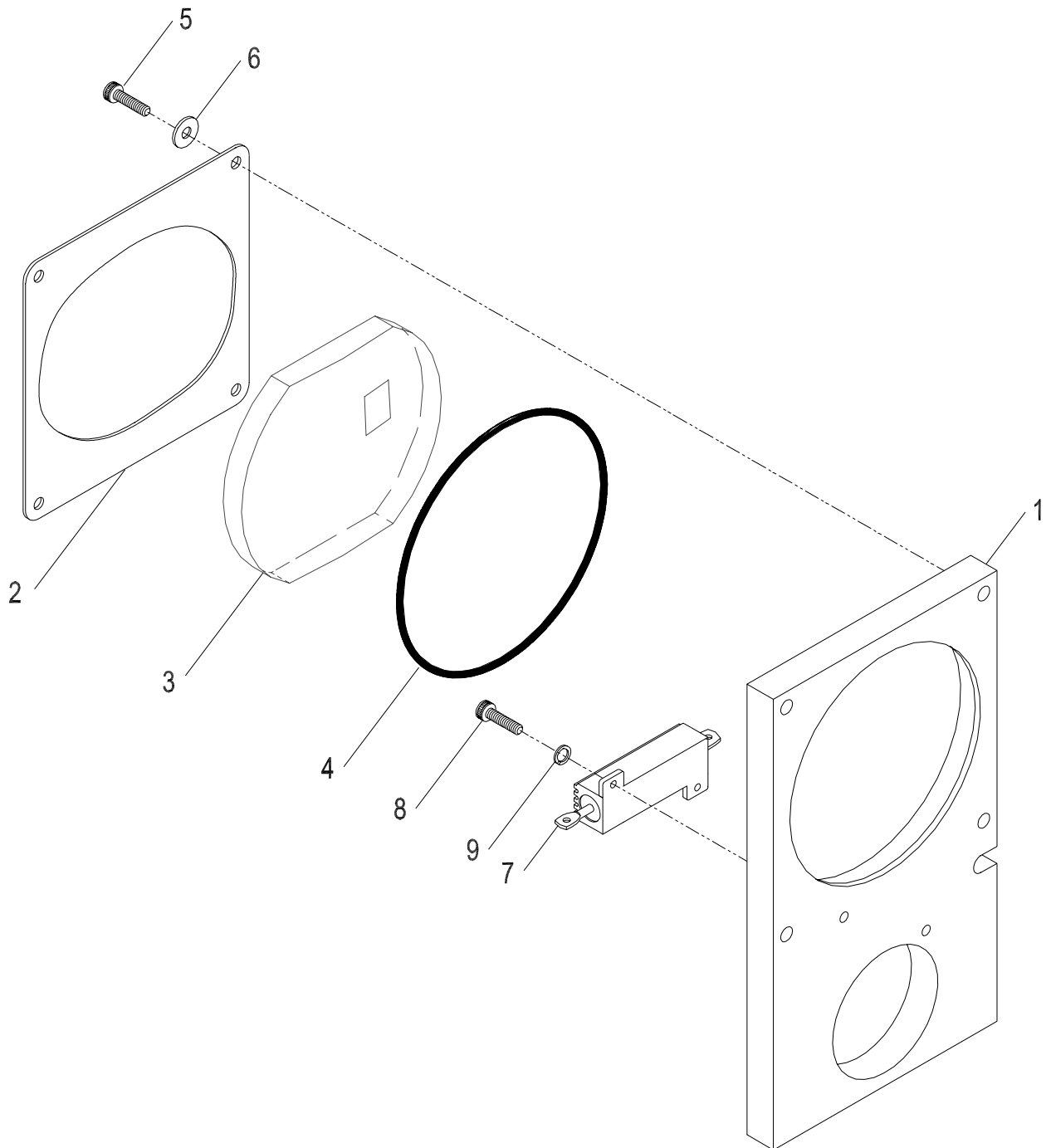
## IPL Figure 9 Bearing Block Assembly

Item Number	Part Number	Description	Quantity
-	DA500109-1	BEARING BLOCK ASSEMBLY	-
1	DA500114-11	BEARING BLOCK, PULSE GENERATOR	1
2	DA500115-11	SHAFT, DRIVEN, PASSIVATED	2
3	DA1455-11	BEARING (SEE DRAWING FOR PART NUMBERS AVAILABLE)	4
4	CS-10	COLLAR	2
5	620-10	RESISTOR, 10 OHM 30W 5%, TYPE 620 (RCD)	1
6	SHCS4-40X.50C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 4-40 X .50 LONG	2
7	WA-4-SLC	WASHER, # 4, SPLIT LOCK, STAINLESS STEEL	2



IPL Figure 10

Field Condenser Lens Assembly



## IPL Figure 10 Field Condenser Lens Assembly

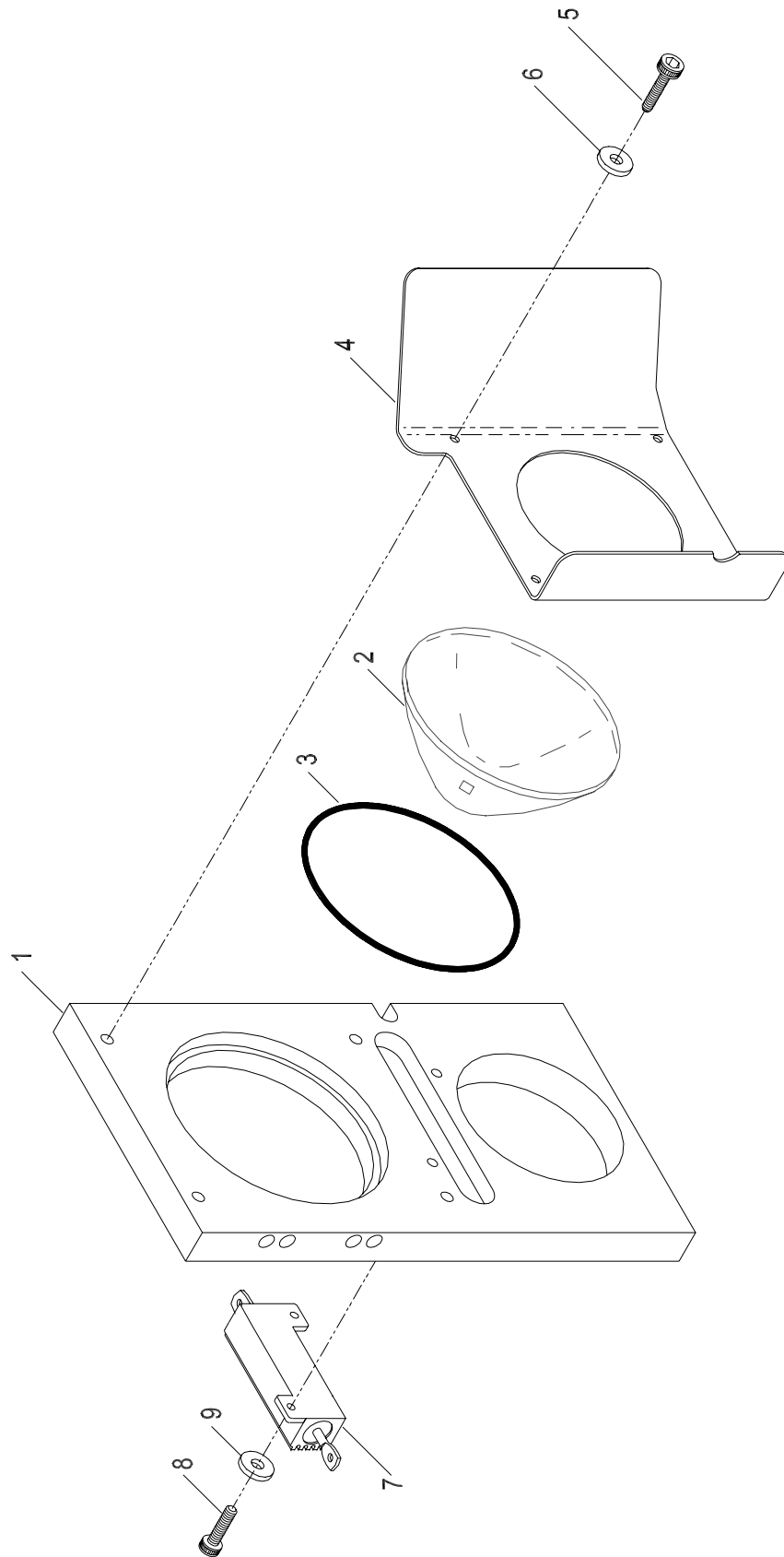
Item Number	Part Number	Description	Quantity
-	DA500108-1	FIELD CONDENSER LENS ASSEMBLY	-
1	DA500124-11	LENS HOLDER, FIELD CONDENSER LENS	1
2	DA500120-11	LENS CLAMP, CONDENSER (ELLIPTICAL)	1
3	402-110	FIELD CONDENSER LENS, 3.4 ACROSS FLAT	1
4	2-044V884	O-RING	1
5	SBHC6-32X.375C	SCREW, SOCKET, BUTTON HEAD, CAP, STAINLESS STEEL 6-32 X .375 LONG	4
6	WA-6-LC	WASHER, # 6, THIN, FLAT, STAINLESS STEEL	4
7	620-10	RESISTOR, 10 OHM 30W 5%, TYPE 620 (RCD)	1
8	SHCS4-40X.50C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 4-40 X .50 LONG	2
9	WA-4-SLC	WASHER, # 4, SPLIT LOCK, STAINLESS STEEL	2





IPL Figure 11

Condenser Lens Assembly



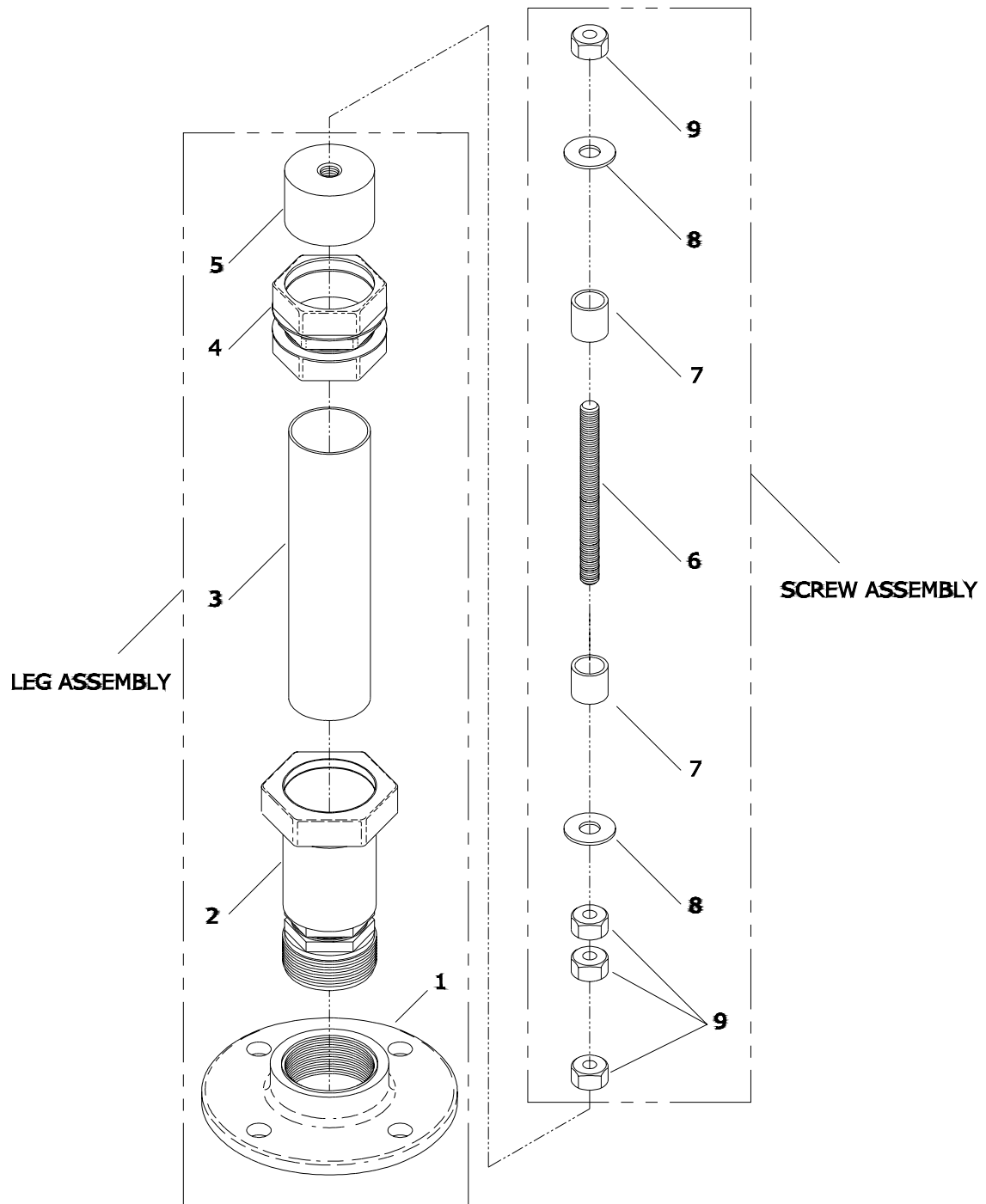
## IPL Figure 11 Condenser Lens Assembly

Item Number	Part Number	Description	Quantity
-	DA500106-1	ASPHERIC CONDENSER LENS ASSEMBLY	-
1	DA500123-11	LENS HOLDER	1
2	01-LAG023	CONDENSER LENS	1
3	2-149V884	GASKET	1
4	DA500120-13	LENS CLAMP, CONDENSER	1
5	SBHC6-32X.375C	SCREW, SOCKET, BUTTON HEAD CAP, STAINLESS STEEL 6-32 X .375 LONG	4
6	WA-6-LC	WASHER, # 6, THIN, FLAT, STAINLESS STEEL	4
7	620-10	RESISTOR, 10 OHM 30W 5%, TYPE 620 (RCD)	1
8	SHCS4-40X.50C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL 4-40 X .50 LONG	2
9	WA-4-SLC	WASHER, # 4, SPLIT LOCK, STAINLESS STEEL	2



IPL Figure 12

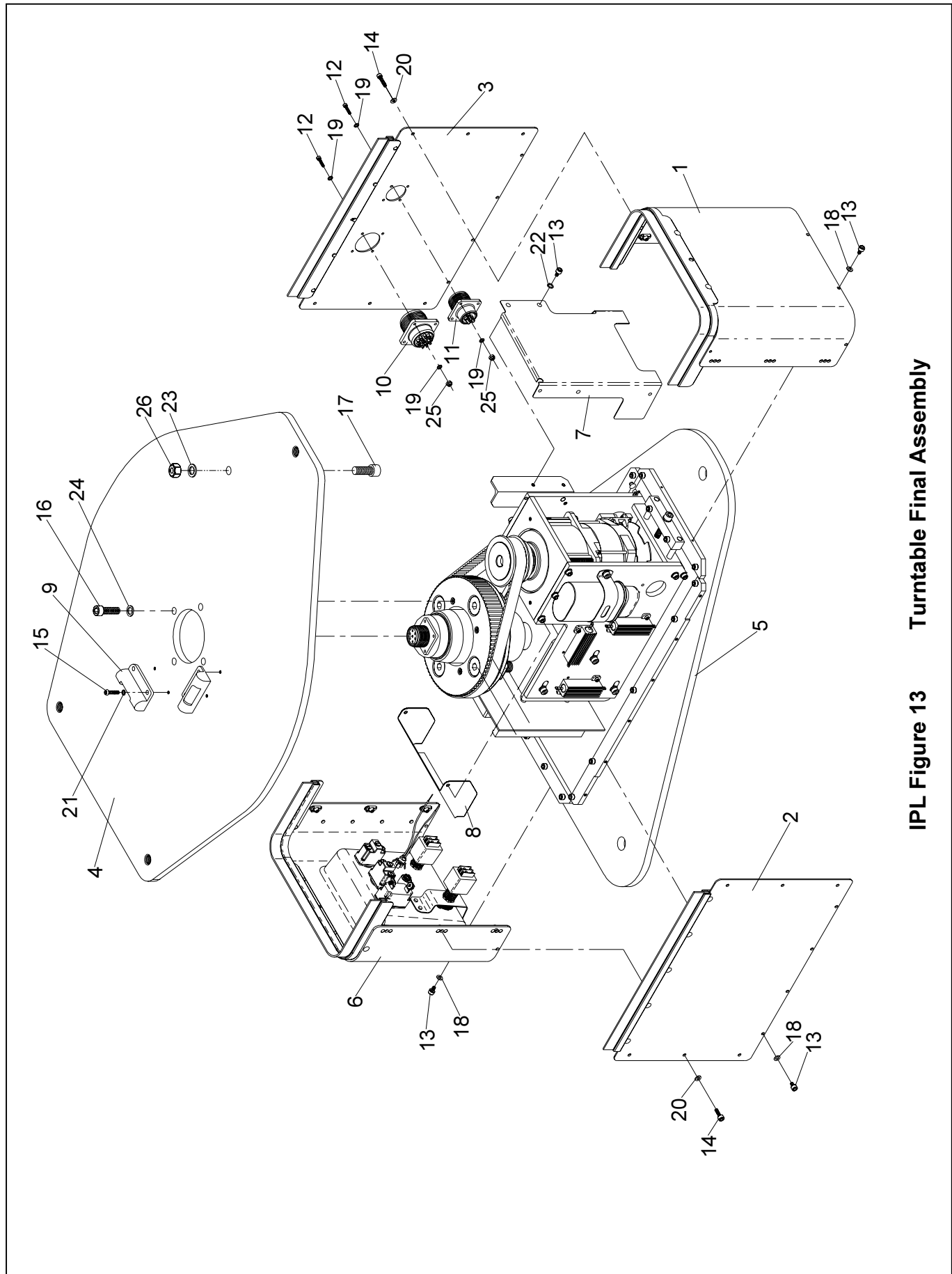
Leg Assembly/Screw Assembly



## IPL Figure 12 Leg Assembly/Screw Assembly

Item Number	Part Number	Description	Quantity
-	DA1209-17	LEG SUB ASSEMBLY (FRANGIBLE PLASI SUPPORT)	3
1	HM6071	MOUNTING FLANGE	1
2	AU5792	FRANGIBLE COUPLING	1
3	DA1209-13	LEG	1
4	DA1487-1	COUPLING ASSEMBLY - COMPRESSION	1
5	AS6025	LEG PLUNGER	1
-	DA500143-1	SCREW ASSEMBLY, ADJUSTMENT (FRONT)	2
6	DA1464-17	ADJUSTMENT SCREW (FRONT)	1
7	.625R.527X.50C	SPACER	2
8	NAS1149C0863R	WASHER	2
9	DA1462-11	NUT, JAM	4
-	DA500143-3	SCREW ASSEMBLY, ADJUSTMENT (REAR)	1
6	DA1464-15	ADJUSTMENT SCREW (REAR)	1
7	.625R.527X.50C	SPACER	2
8	NAS1149C0863R	WASHER	2
9	DA1462-11	NUT, JAM	4





IPL Figure 13 Turntable Final Assembly



## IPL Figure 13 Turntable Final Assembly

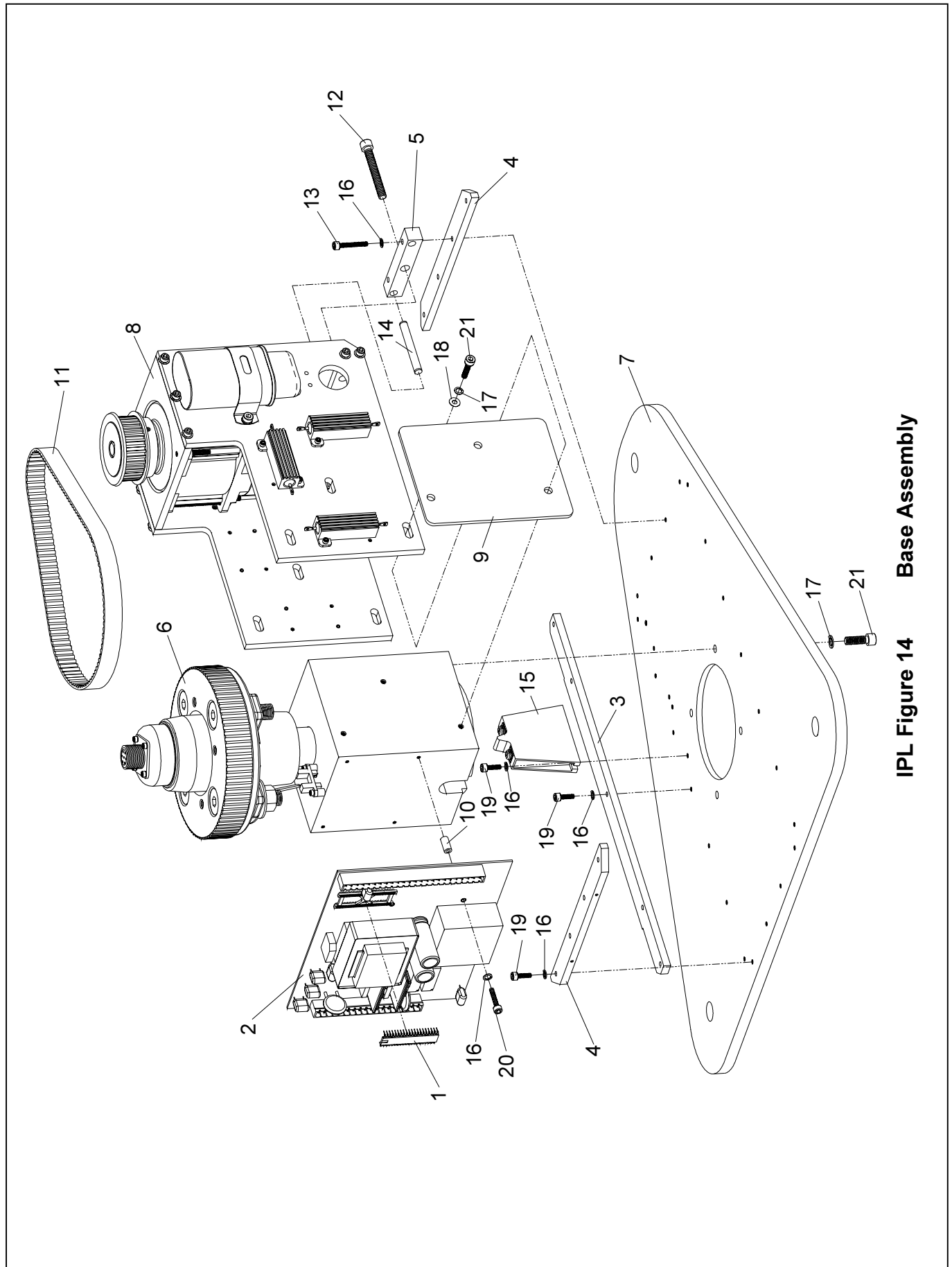
Item Number	Part Number	Description	Quantity
-	DA500905-1	TURN TABLE FINAL ASSEMBLY	-
1	DA500930-3	END PANEL ASSEMBLY	1
2	DA500945-3	SIDE PANEL ASSEMBLY, RH	1
3	DA500945-1	SIDE PANEL ASSEMBLY, LH	1
4	DA500911-11	TABLE TOP, TURNTABLE	1
5	DA500906-1	BASE ASSEMBLY	1
6	DA500907-1	DOOR PANEL ASSEMBLY	1
7	DA500976-11	DUST COVER, AFT	1
8	DA500975-11	DUST COVER, FWD	1
9	DA1427-1	BUBBLE LEVEL	2
10	MS3102-R20-33S	RECEPTACLE	1
11	MS3102-R16-10P	RECEPTACLE	1
12	SHCS4-40X.50C	SCREW, SOCKET HEAD CAP, 4-40 X 1/2, SS	8
13	SHCS6-32X.25C	SCREW, SOCKET HEAD CAP, 6-32 X 1/4, SS	18
14	SHCS6-32X.50C	SCREW, SOCKET HEAD CAP, 6-32 X 1/2, SS	12
15	SBHC6-32X.50C	SCREW, SOCKET BUTTON HEAD, 6-32 X 1/2, SS	4
16	SHCS5/16-18X1C	SCREW, SOCKET HEAD CAP, 5/16-18 X 1.0, SS	4
17	SHCS3/8-24X1.0	SCREW, SOCKET HEAD CAP, 3/8-24 X 1.0, SS	1



### IPL Figure 13 Turntable Final Assembly

Item Number	Part Number	Description	Quantity
18	NAS620A4	NAS WASHER	16
19	WA-4-C	WASHER, #4, THICK, STAINLESS STEEL	16
20	WA-6-C	WASHER, #6, THICK, STAINLESS STEEL	12
21	WA-6-LC	WASHER, #6, THIN, STAINLESS STEEL	4
22	WA-6-SLC	WASHER, #6, SPLIT LOCK, STAINLESS STEEL	2
23	NAS1149C0663R	WASHER	1
24	WA-5/16-C	WASHER, # 5/16, THICK, STAINLESS STEEL	4
25	MS21044N04	NUT	8
26	MS21044N6	NUT	1





IPL Figure 14 Base Assembly





## IPL Figure 14 Base Assembly

Item Number	Part Number	Description	Quantity
-	DA500906-1	BASE ASSEMBLY	-
1	DA500955-1	TURNTABLE CONTROLLER CHIP	1
2	DA500950-1	CIRCUIT BOARD ASSEMBLY	1
3	DA500927-13	BAR, ENCLOSURE	2
4	DA500927-11	BAR, ENCLOSURE	2
5	DA500938-11	TENSIONER BLOCK	1
6	DA500908-1	SPINDLE ASSEMBLY	1
7	DA500912-11	BASE PLATE, TURNTABLE	1
8	DA500909-1	MOTOR BRACKET ASSEMBLY	1
9	DA500936-13	SPACER	2
10	94639A303	STANDOFF	4
11	5MR-600-15	BELT, GATES	1
12	SHCS1/4-28X2.0C	SCREW, SOCKET HEAD CAP, 1/4-28 X 2.0, SS	1
13	SHCS6-32X1.0C	SCREW, SOCKET HEAD CAP, 6-32 X 1.0, SS	2
14	9Y31-0864	DOWEL	2
15	V131DA40	VARISTOR	2
16	WA-6-SLC	WASHER, #6, SPLIT LOCK, STAINLESS STEEL	26
17	WA-1/4-SLC	WASHER, 1/4, SPLIT LOCK, STAINLESS STEEL	10



### IPL Figure 14 Base Assembly

Item Number	Part Number	Description	Quantity
18	WA-1/4-C	WASHER, 1/4, THICK, STAINLESS STEEL	6
19	SHCS6-32X.50C	SCREW, SOCKET HEAD CAP, 6-32 X 1/2, SS	20
20	SHCS6-32X.75C	SCREW, SOCKET HEAD CAP, 6-32 X 3/4, SS	4
21	SHCS1/4-20X.75C	SCREW, SOCKET HEAD CAP, 1/4-20 X 3/4, SS	10





## IPL Figure 15 Spindle Assembly

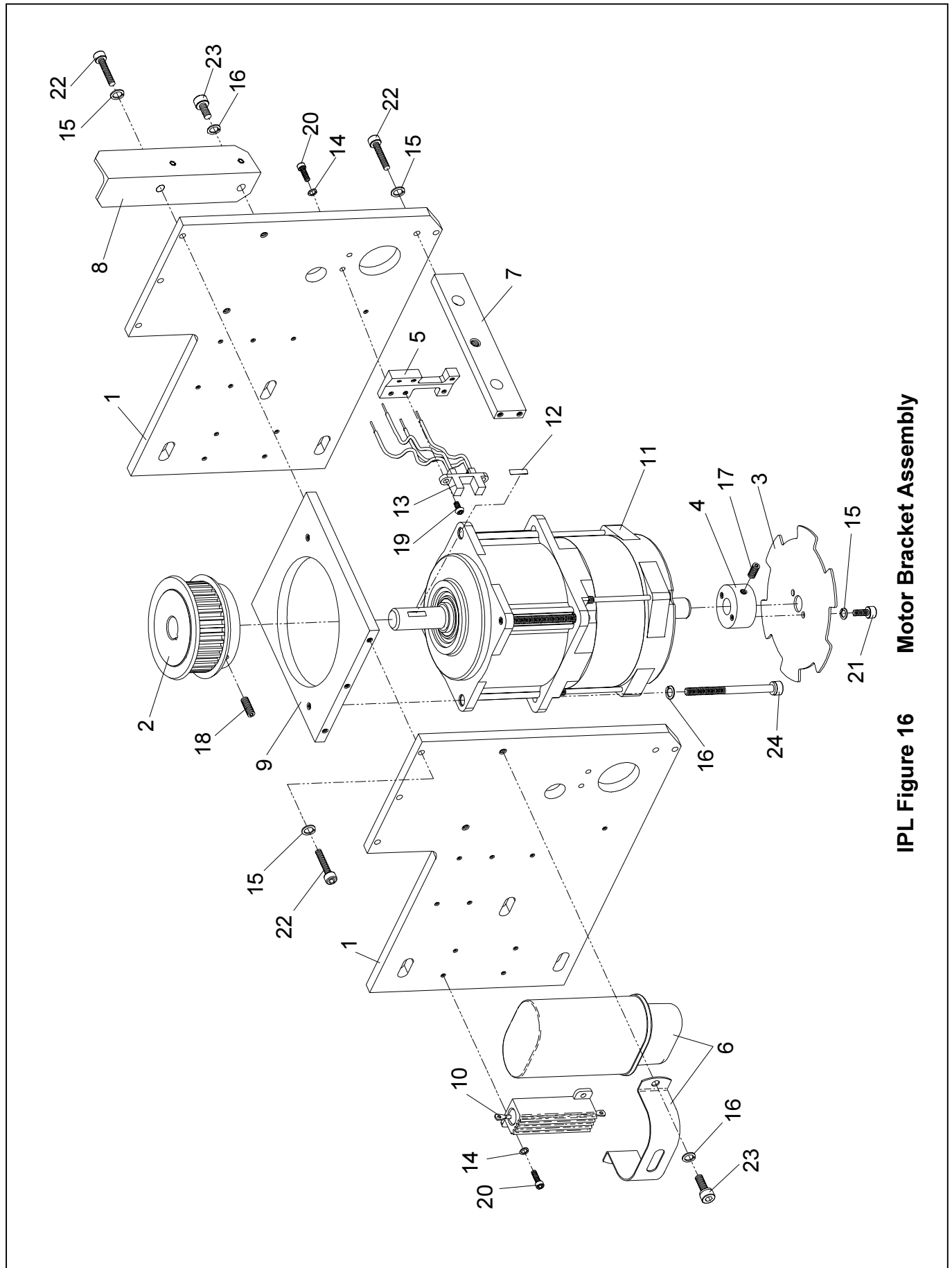
Item Number	Part Number	Description	Quantity
-	DA500908-1	SPINDLE ASSEMBLY	-
1	DA500925-11	DUST COVER	1
2	DA500946-3	CABLE ASSEMBLY	1
3	SHCS4-40X.375C	SCREW, SOCKET HEAD, CAP, STAINLESS STEEL 4-40 X .375 LONG	4
4	NAS620C4	WASHER	4
5	NAS1149F169OP	WASHER 1" ID STEEL CAD II PLATING	1
6	DA500941-11	SPINDLE SHAFT	1
7	SS10-32X.50C	SET SCREW, CUP POINT, SOCKET HEAD, STAINLESS STEEL , 10-32 X .50 LONG	1
8	SHCS4-40X.50C	SCREW, SOCKET HEAD CAP, STAINLESS STEEL, 4-40 X .50 LONG	2
9	SFHC1/2-20X2.5C	SCREW, SOCKET FLAT HEAD CAP, STAINLESS STEEL 1/2 -20 X 2.5 LONG	2
10	SFHC1/2-20X2.0C	SCREW, SOCKET FLAT HEAD CAP, STAINLESS STEEL 1/2 -20 X 2.0 LONG	2
11	OPB810W51	SLOTTED SENSOR (OPTEK)	1
12	MS21044N8	NUT	2
13	L44643	BEARING CONE FOR 1" SPINDLE	2
14	GS1	DUST SEAL	1
15	DA500937-11	HUB	1



## IPL Figure 15 Spindle Assembly

Item Number	Part Number	Description	Quantity
16	DA500921-11	POINTER, HOME	1
17	DA500918-11	SPROCKET	1
18	DA500910-11	SPINDLE BLOCK	1
19	AN1	CASTLE NUT FOR 1" SPINDLE	1
20	90309A219	STANDOFF (25-PK)	2
21	WA-1/2-C	WASHER, # 1/2, THICK, FLAT, STAINLESS STEEL	2
22	MS21042L04	NUT	4
23	SS1/4-20X.375C	SET SCREW, CUP POINT, SOCKET HEAD, STAINLESS STEEL, 1/4 - 20 X .375 LONG	2





IPL Figure 16 Motor Bracket Assembly



## IPL Figure 16 Motor Bracket Assembly

Item Number	Part Number	Description	Quantity
-	DA500909-1	MOTOR BRACKET ASSEMBLY	-
1	DA500935-11	SUPPORT BRACKET, MOTOR	2
2	DA500919-11	SPROCKET, DRIVER	1
3	DA500915-11	ENCODER DISK, TURNTABLE	1
4	DA500914-11	ENCODER HUB, TURNTABLE	1
5	DA500913-11	SENSOR MOUNT, TURNTABLE	1
6	DA1471-1	CAPACITOR ASSY	1
7	DA500939-11	TENSIONER BAR	1
8	DA500949-11	MECHANICAL STOP	1
9	DA500936-11	PLATE, MOTOR SUPPORT	1
10	620-10	RESISTOR, 10 OHM 30W 5%, TYPE 620 (RCD)	5
11	SS221LEG20	GEARMOTOR 72RPM DOUBLE ENDED SHAFT, SUPERIOR	1
12	WK1/8X5/8	WOODRUFF KEY	1
13	OPB810W51	SLOTTED SENSOR (OPTEK)	2
14	WA-4-SLC	WASHER, #4, SPLIT LOCK, STAINLESS STEEL	12
15	WA-6-SLC	WASHER, #6, SPLIT LOCK, STAINLESS STEEL	12
16	WA-10-SLC	WASHER, #10, SPLIT LOCK, STAINLESS STEEL	5

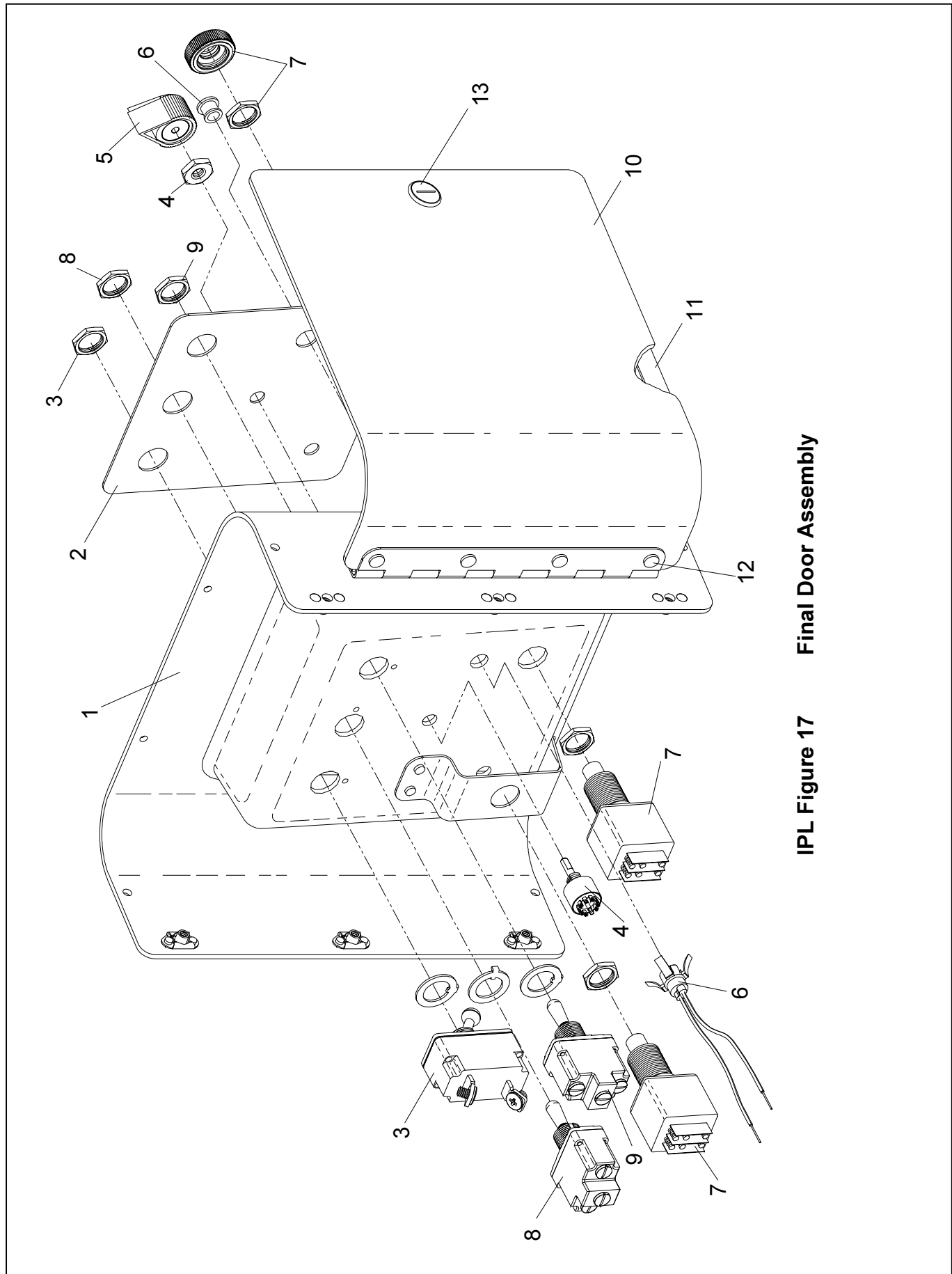


## IPL Figure 16 Motor Bracket Assembly

Item Number	Part Number	Description	Quantity
17	SS8-32X.375C	SET SCREW, 8-32 X 3/8, STAINLESS STEEL	1
18	SS10-32X.50C	SET SCREW, 10-32 X 1/2, STAINLESS STEEL	1
19	SBHC4-40X.25C	SCREW, SOCKET BUTTON HEAD, 4-40 X 1/4, SS	4
20	SHCS4-40X.375C	SCREW, SOCKET HEAD CAP, 4-40 X 3/8, SS	12
21	SHCS6-32X.375C	SCREW, SOCKET HEAD CAP, 6-32 X 3/8, SS	2
22	SHCS6-32X.75C	SCREW, SOCKET HEAD CAP, 6-32 X 3/4, SS	10
23	SHCS10-32X.50C	SCREW, SOCKET HEAD CAP, 10-32 X 1/2, SS	3
24	SHCS10-32X2.25C	SCREW, SOCKET HEAD CAP, 10-32 X 2 1/4, SS	2







IPL Figure 17 Final Door Assembly



## IPL Figure 17 Final Door Assembly

Item Number	Part Number	Description	Quantity
-	DA500907-1	FINAL DOOR PANEL ASSEMBLY	-
1	DA500930-1	DOOR PANEL ASSEMBLY	1
2	DA500926-11	FACE PLATE	1
3	MS24509-A-15	CIRCUIT BREAKER, 15 AMP TOGGLE SWITCH	1
4	MA04S1NZGF	ROTARY SWITCH (C-K)	1
5	70-4-1G	POINTER KNOB (EHC)	1
6	5400A5	LED LIGHT (GREEN)	1
7	2PB901-T2	PUSHBUTTON SWITCH (MICROSWITCH)	2
8	1TL1-7	TOGGLE SWITCH (MICROSWITCH)	1
9	1TL1-1	TOGGLE SWITCH (MICROSWITCH)	1
10	DA500904-1	DOOR ASSEMBLY	1
11	8512K14	FOAM	18"
12	MS20426AD4-3	RIVET	4
13	1768A4	CAM LOCK	1

