panoramic™

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PC-4000 Service Manual

Model: 801125-5/801125-6

SMD20000 Rev D

Table of Contents

Introduction

Purpose

Panoramic Corporation provides this printed manual as a guide for the operation of the PC-4000 dental panoramic X-ray machine.

The PC-4000 will enable the user to take panoramic X-ray images.

It is imperative that this equipment be installed, serviced, and used by personnel familiar with the precautions required to prevent excessive exposure to both primary and secondary radiation. This equipment features protective designs for limiting both the primary and secondary radiation produced by the X-ray beam. However, design features cannot prevent carelessness, negligence, or lack of knowledge.

Only personnel authorized by Panoramic Corporation are qualified to install and service this equipment. Any attempt to install or service this equipment by anyone not so authorized will void the warranty.

Statement of Compatibility - January 1, 1988

Please address any comments/questions concerning this statement of compatibility to:
Panoramic Corporation ◦ 4321 Goshen Road ◦ Fort Wayne, IN 46818 USA

The only components compatible with the PC-4000 are those supplied with the machine.

Regardless of possible statements made by other manufacturers, no one is authorized or certified to make additions or deletions to this machine. Only the combination of components delivered with the machine is certified compatible by the manufacturer. As compatible accessories become available, Panoramic Corporation will certify them as compatible and make them available to the user.

Statement of Compliance - December 17, 2004

The PC-4000 conforms to the following specifications:

X-ray Generator type: Single phase, half-wave, self rectified, center-grounded in accordance with IEC 60601-2-7:1998

Introduction

Safety

(Class B Device; Shock, Fire, Casualty)

- IEC 60601-1 Medical Electrical Equipment - Part 1: General Requirements for Safety
- IEC 60601-1:1998 + A1:1991 + A2:1995 Medical electrical equipment - Part 1-1: General requirements for safety Collateral standard: Safety requirements for medical electrical systems
- IEC 60601-2-7:1998 Medical electrical equipment - Part 2-7: Particular requirements for the safety of high-voltage generators of diagnostic X-ray generators
- IEC 60601-2-28:1993 Medical electrical equipment - Part 2: Particular requirements for the safety of X-ray source assemblies and X-ray tube assemblies for medical diagnosis
- IEC 60601-2-32:1994 Medical electrical equipment - Part 2: Particular requirements for the safety of associated equipment of X-ray equipment
- EN 60601-1:1990 + A1:1993 + A2:1995 + A3:1996 Medical electrical equipment - Part 1-1: General requirements for safety - Collateral standard: Safety requirements for medical electrical systems
- CAN/CSA C22.2 NO. 601-1-M90 + A1:1994 + A2:1998 Medical Electrical Equipment - Part 1: General Requirements for Safety

X-Ray Evaluation

- IEC 60601-1-3:1994 Medical electrical equipment - Part 1: General requirements for safety - 3. Collateral standard: General requirements for radiation protection in diagnostic X-ray equipment

Software Review

- IEC 60601-1-4:1996 + A1:1999 Medical electrical equipment - Part 1-4: General requirements for safety - Collateral Standard: Programmable electrical medical systems

EMC

(Class B Device):

- EN 60601-1-2:2001 (IEC 60601-1-2:2001) Medical electrical equipment - Part 1-2: General requirements for safety - Collateral standard: Electromagnetic compatibility - Requirements and tests
- EN 55011:1998 + A1:1999 + A2:2002 Industrial, scientific and medical (ISM) radio-frequency equipment - Radio disturbance characteristics - Limits and methods of measurement
- EN 61000-3-2:2000 Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current <= 16 A per phase)
- EN 61000-3-3:1995 + A1:2001 Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection
- EN 60601-1-2:2001 (IEC 60601-1-2:2001) Electromagnetic Compatibility - Requirements and Tests
- EN 61000-4-2:1995 + A1:1998 + A2:2001 (IEC 1000-4-2) Electromagnetic compatibility (EMC)- Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test
- EN 61000-4-3:2002 (IEC 1000-4-3) Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test
- EN 61000-4-4:1995 + A1:2001 + A2:2001 (IEC 1000-4-4) Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test
- EN 61000-4-5:1995 + A1:2001 (IEC 1000-4-5) Electromagnetic compatibility (EMC)- Part 4-5: Testing and measurement techniques - Surge immunity test
- EN 61000-4-6:1996 + A1:2000 (IEC 1000-4-6) Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
- EN 61000-4-8:1993 + A1:2001 (IEC 1000-4-8) Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test
- EN 61000-4-11:1994 + A1:2001 (IEC 1000-4-11) Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests

Introduction

Voltage Regulator Warning
Do not plug this machine into ANY voltage regulating device. Contact Panoramic Corporation with any questions regarding this.

X-ray Shielding Requirements
The requirements for panoramic and cephalometric shielding for building, operator, and patient, depend on state and local regulations. Contact your state Department of Health for compliance information. Compliance could involve a blueprint review, facility check, wall construction, film badge implementation, remote switch installation, and/or a lead apron. It is beyond the scope of this manual to advise on these regulations.

Intended Use
An extraoral source X-ray system is an AC-powered device that produces X-rays and is intended for dental radiographic examination and diagnosis of diseases of the teeth, jaw and oral structures.

Warning Statements
Warning: This X-ray unit may be dangerous to patient and operator unless safe exposure and operating instructions are observed.

During installation, machine is leveled to the floor. Do not move/transport the machine before contacting Panoramic Corporation Service Department at (800)654-2027.

Notice: Ground reliability can only be achieved when this equipment is connected to a hospital only or hospital grade receptacle.

The use of accessory equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Consideration relating to the choice of accessory equipment shall include:

- use of the accessory in the patient vicinity
- evidence that the safety certification of the accessory has been performed in accordance to the appropriate IEC 60601-1 and/or IEC 60601-1-1 harmonized national standard.

Portable and mobile RF Communications equipment can affect medical electrical equipment.

Original document created in English.

Panoramic Corporation requires anyone moving or transporting their machine to contact the service Department at (800) 654-2027.

Symbols & Definitions

SYMBOLS

 Alternating Current

 Type B Equipment

 Attention, Consult Accompanying Documents

 On (power: connection to the mains)

 Off (power: disconnection from the mains)

 Dangerous Voltage

 Protective Earth (ground)

Environmental Specifications

Operating Temperature:	10°C to 40°C (50°F to 105°F)
Storage/Transportation Temperature:	-25°C to 70°C (-13°F to 158°F)
Operating Humidity:	80% maximum relative humidity, noncondensing
Storage/Transportation Humidity:	80% maximum relative humidity, noncondensing
Operating Altitude:	15,000 ft (4,500 m) maximum
Storage/Transportation Altitude:	15,000 ft (4,500 m) maximum

Cleaning and Disinfection

The following parts on the PC-4000 come into contact with the patient during normal operation:

- Black Chinrest
- Temple Supports
- Forehead Support
- Handles

Use 70% Isopropyl Alcohol or Germicidal cloths (or equivalent) to clean and disinfect these parts.

Do not attempt to clean any parts while machine is switched on.

Mode of Operation

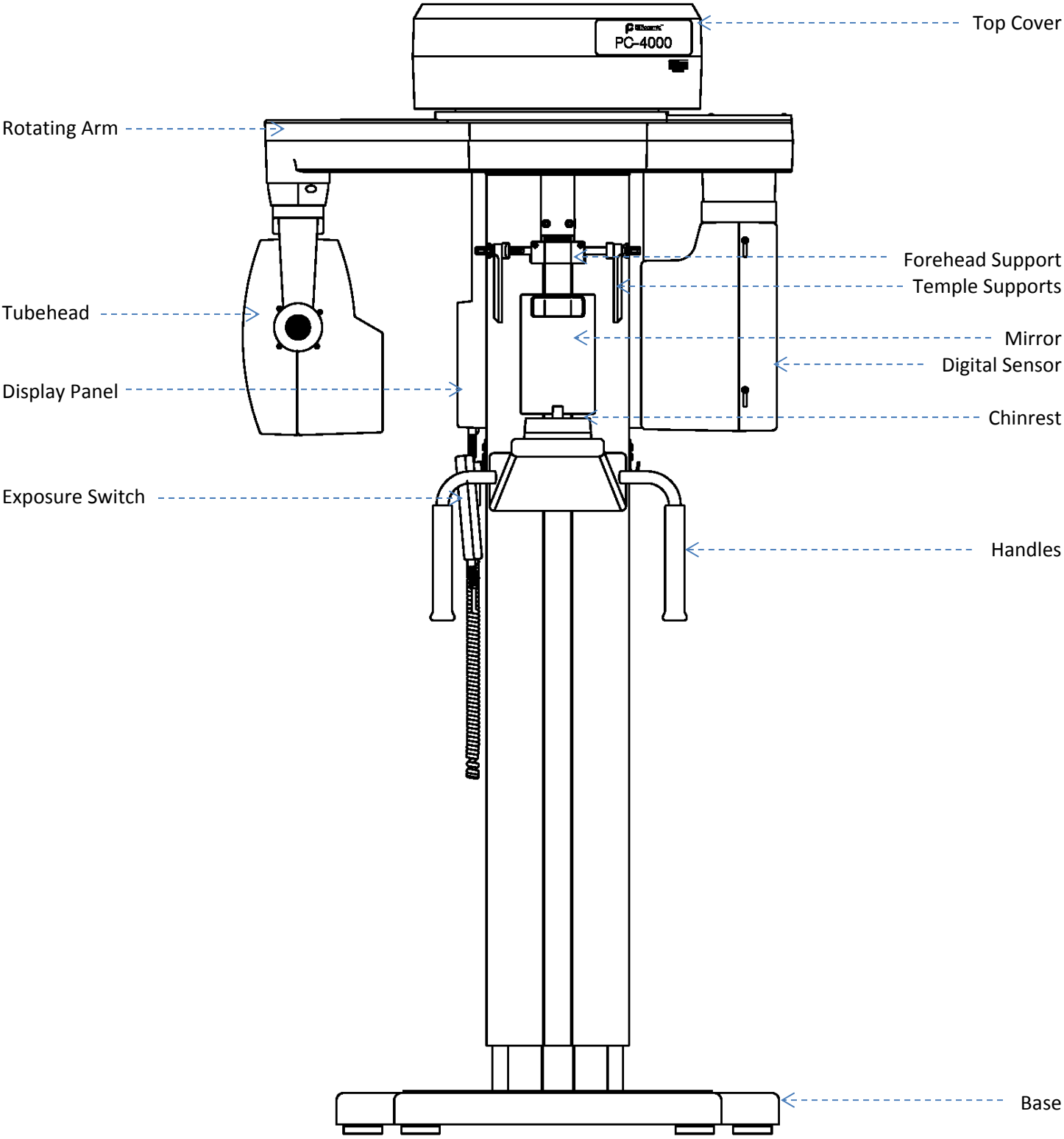
Continuous operation with short time loading.

Electrical Safety

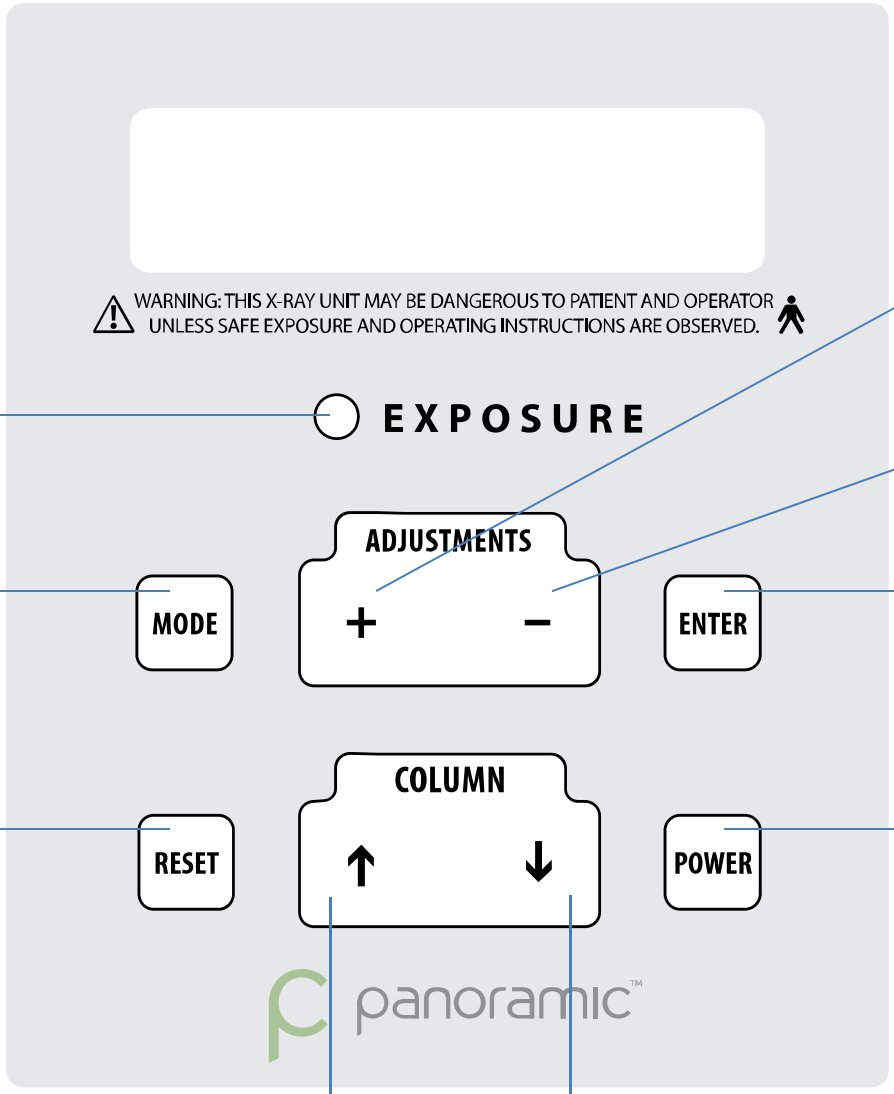
Class I, Type B Applied Parts
Equipment is classified as ordinary equipment (enclosed equipment without protection against ingress of water).

Equipment not suitable for use in the presence of FLAMMABLE ANESTHETIC MIXTURE WITH AIR or WITH OXYGEN or NITROUS OXIDE.

PC-4000 Components



PC-4000 User Interface



Exposure Indicator

Allows user to select function or increase value

Allows user to select function or decrease value

Allows you to scroll to the next screen

Accepts flashing value or move to program to next screen

Allows you to move back one Screen, and after exposure, allows user to reset the rotating arm

Turns machine on and off

Moves machine up in the user mode and scrolls up the menu's in-service mode

Moves machine down in the user mode and scrolls down the menu's in-service mode

Pre-Installation Check

Electrical Requirements
Optimally, the PC-4000 (801125-5) should have a dedicated 105-125 VAC (available 100, or 220 to 240 VAC model 801125-6), 20 A circuit with line regulation of 5% or better. If a dedicated circuit is not available, a regular 20 A circuit will work as long as it is not taxed by other loads beyond 5 A. A standard 115 VAC, three-wire, grounded, electrical outlet should be installed by an electrician behind the machine.

Remote Switch
Some states and local governments require that the exposure switch to be remotely installed. A remote switch kit is available from Panoramic Corporation. Refer to Page 21 for detailed procedures.

Room Height
Measure the height of the room where the machine is to be installed. If the ceiling height is less than maximum travel height of the PC-4000 (approximately *92 inches*) use the Screw Motor Assembly Height Limiting function to restrict the operating movement. Refer to Page 22 for a detailed procedure.

PC-4000 Installation

Tools Required

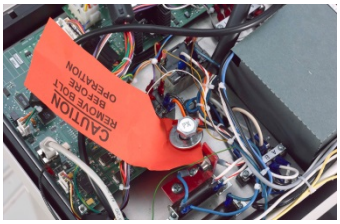
- Multimeter
- Regular and Phillips screwdrivers
- Allen wrenches
- Socket wrench set
- Small fluorescent screen
- Knife
- Level
- Pulse counter or stopwatch

Verify Power

Verify that the outlet is a 110 VAC grounded outlet. Operating range can be from 105-125 VAC. (100, or 220-240 VAC for model 801125-6)

Remove Packaging and Shipping Restraints

1. Carefully remove packaging material from the PC-4000.
2. Remove overhead plastic from machine using a 9/64 Allen Wrench to remove the eight (8) long black socket head cap screws holding the top cover in place.
3. Remove the 3/4" hex head shipping bolt and washer located in the overhead near the Control Board at the back of the machine.
4. If necessary Install the four (4) leveling feet provided in the accessory box with the machine. (*Only Crated Machines*)



Control Panel Installation

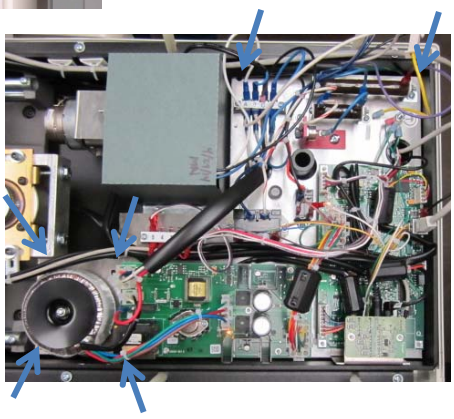
Verify with the doctor, on which side the control panel needs to be located. The machine comes from the factory with the display cable routed on the left side.

To install the display panel on factory routed side:

1. Plug CAT 5 cable into connector on display panel board.
2. Attach Ferrite Core to CAT5 cable near the J6 plug.

To move the display cable routing to the right side:

1. Remove the six (6) phillips head screws holding the electric plate down and prop the electric plate up to gain access to the cable access holes in the chassis.
2. Route the CAT 5 cable through the access hole in chassis as well as rear access hole in the electric plate. Plug cable into J6 on Control PC board as well as connector on display board.
3. Attach Ferrite Core to CAT5 cable end near J6 plug.
4. Press panel against the desired side of the machine and slowly push up. Once it reaches the overhead plastics, you will need to gently push in the middle of the control panel while pushing up, locking the control panel into the overhead plastic.
5. Reattach electric plate by using seven (6) phillips screws from step 1.



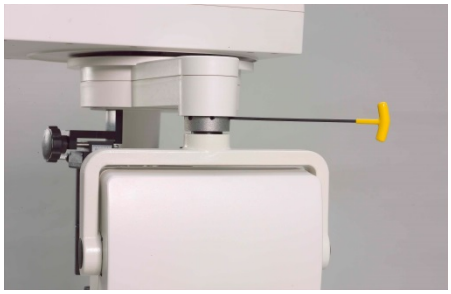
To finish display panel installation:

1. Gently attach the plain panel on the opposite side of the machine, same as step 4.

2. Attach the two (2) supplied black Exposure Switch Hooks to both sides of the column using the two (2) button head cap screws and lockwashers supplied with the accessories.
3. Connect supplied Exposure Switch to display panel.
4. Control Panel installation now complete.

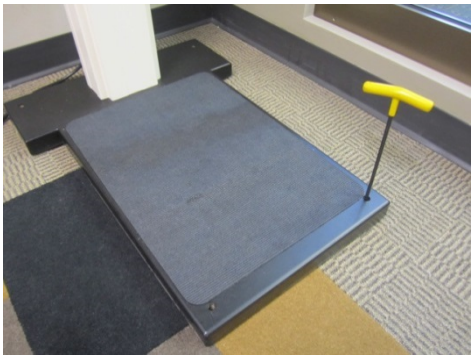
Install Tubehead Assembly

1. Connect the 6-pin molex connector from the end of the rotating arm to the 6-pin connector on the tubehead.
2. Carefully raise the tubehead into position facing the film drum, ensuring that the wires are not stressed or pinched.
3. Tighten the four (4) set screws slightly to allow alignment of the tubehead in a later procedure.



Level Machine

With a level on the underside of the main overhead chassis, level the machine in all directions using the four adjustable feet in each corner of the base.

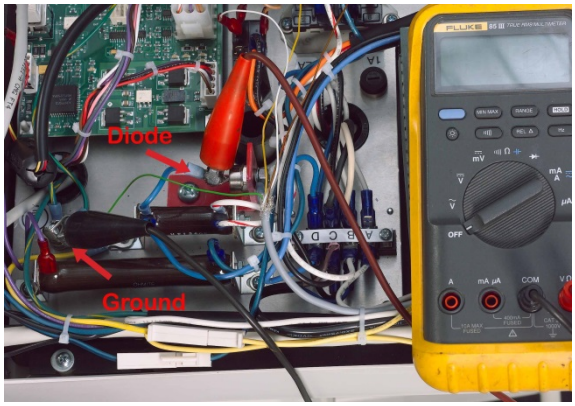


PC-4000 Installation/Calibration

Perform KVP Calibration

1. Plug the Power Cord into the Power Bus at the bottom of the column. Plug machine into the wall and flip the Main Power Button to ON at the base of the unit.
2. To get into Service Mode:
   - First power on the machine at the Control Panel,and press both the MODE and ENTER buttons simultaneously.
     - The screen will display:
       ENTER PASSWORD
       2703
       To enter the password you will press the Adjustment +/- to increase/decrease the flashing variable to the next number you wish to have displayed. After the first value is displayed, press ENTER to move to the next value. After the password is entered, press ENTER a final time to move into the **SERVICE MODE**.

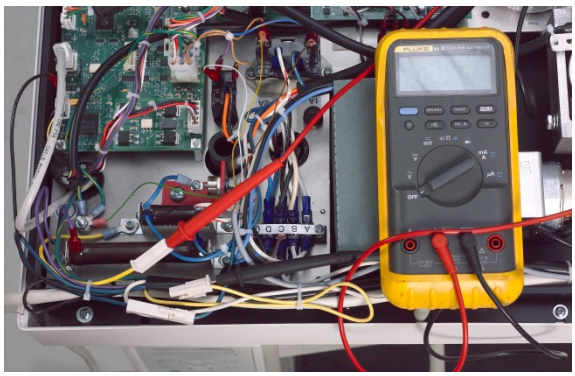
3. Press the MODE Button two (2) times to get :
   KVP CAL 89 VAC
4. Now use your multimeter to check the AC voltage between the Diode and the Ground Stud. *Units with multivolt attached must test voltage between diode and neutral white wire on A-D barrier strip*.



5. Adjust voltage by using +/- buttons until 89v +/- 0.5 is achieved. Press ENTER.
6. Press MODE once to advance to:
   KVP CAL104 VAC
7. Repeat steps 4-6 to achieve 104v +/- 0.5.
8. KVP Calibration is complete. Press MODE once to advance to mA current calibration.

Perform mA Current Calibration

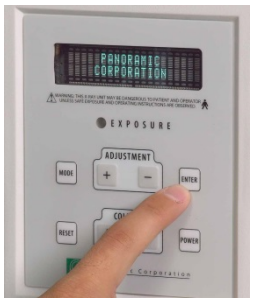
1. Disconnect the yellow wire, 1-pin molex connector in the overhead chassis located near the variac.
2. Connect a DC multimeter in series with the molex connectors, positive lead to the male connector, negative lead to the female connector.
3. Verify display reads:
   6MA CURRENT CAL
   If not, press MODE to advance through menu items until 6MA CURRENT CAL is displayed.
4. Press and hold exposure switch to measure mA output.



5. Adjust current by pressing +/- buttons and take another exposure to get reading.

   NOTE: Contact Panoramic Corporation if the mA cannot be set to 6.0 mA +/- 0.2 mA.

6. Press ENTER once 6.0 mA +/- 0.2 is achieved
7. Press MODE to advance to:
   10MA CURRENT CAL
8. Repeat steps 4-6 until 10 mA +/- 0.2 is achieved. Press ENTER.
9. Remove multimeters and reconnect wires. Current Calibration is complete.

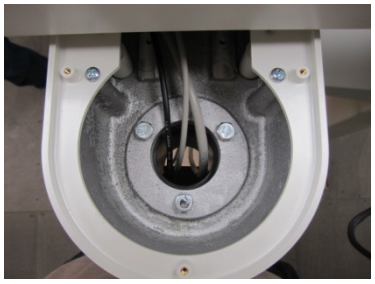


Digital Sensor Installation

Installation Process

1. Remove plastic Wheel Cover off of the end of the rotating arm by removing the three 1/16 black button headed cap screws.

2. Install the digital sensor holder with counter weight using three (3) 7/16 hex head bolts and lockwashers. The counter weight is coated in a Black oxide, the FRONT will have an inscribed line running down the middle of the plate used for beam alignment, and should be mounted facing the x-ray tube.



Beam Alignment

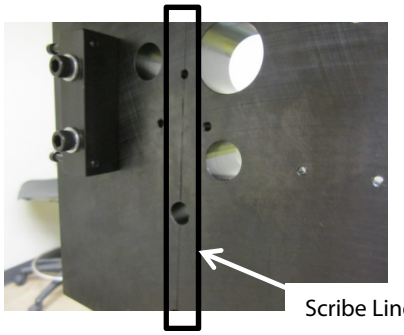
1. This process is very critical to the installation process. You will notice the vertical counter weight has a line inscribed on the front of the counter weight. Tape the small fluoro screen to the edge of the inscribed line such that you will be able to align the x-ray beam to the inscribed line both vertically and horizontally.

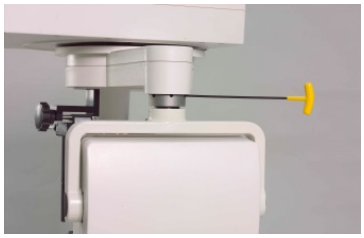
2. Back in Service Mode set the PC-4000 to Beam Alignment and take an exposure.

3. If the beam is not aligned to the inscribed line, using an allen wrench loosen the four (4) set screws at the yoke of the tubehead and repeat the exposure process until the beam is properly aligned to the inscribed line.

4. It is aligned properly once the x-ray beam is vertical along the inscribed line and touches the bottom of the horizontal inscribed line.

5. Upon verification of the beam alignment, tighten the four (4) set screws to ensure the tubehead is locked into position.

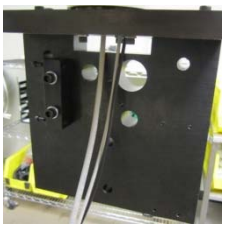




Digital Sensor Installation

Cable Routing

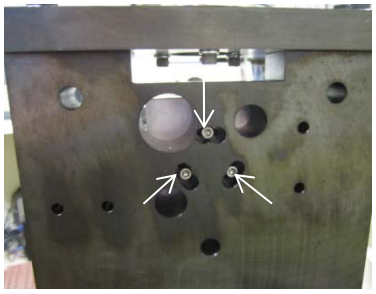
1. Route the data cable, signal cable, and small power cable through to the front of the weighted plates.



Sensor Installation

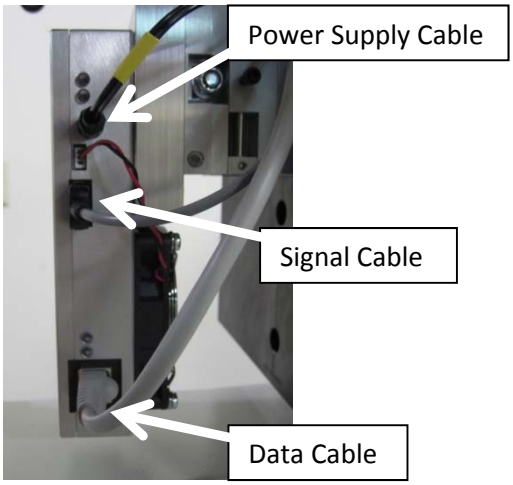
1. The sensor will come pre-assembled from the factory with the alignment stages already installed. These stages allow the sensor to be aligned later in the installation process.

   Very important: *anytime while handling the Sensor, use extreme caution to not bump, hit, or drop the sensor. When placing the sensor on a countertop, please lie it flat on the front face of the sensor and if possible on a soft smooth surface.*



2. Mount the sensor to the vertical counter weight using the three (3) supplied screws through the slotted holes. Leave these screws very slightly loose to provide angle adjustment during mechanical alignment.

3. Connect pre-routed Cat5e Data Cable to sensor.



4. Connect pre-routed Signal Cable and Power Supply Cable.

5. Connect the pre-routed Data Cable with the supplied shielded CAT6 Cable using the supplied CAT6 Coupler.

6. Connect the CAT6 Cable to the installed network card on the computer.

PC-4000 Installation/Calibration

Install Digital Sensor prior to checking pulse counts (page 14)

Perform Pulse Count Calibration

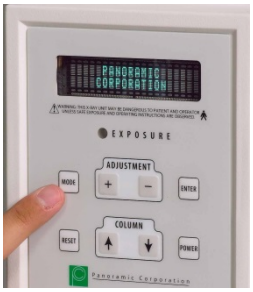
If a pulse counter is available:

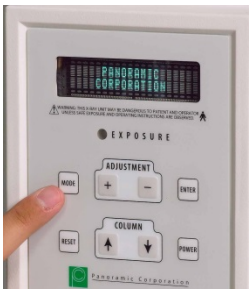
1. Disconnect the blue wire, 1-pin molex connector in the overhead chassis located near the variac.
2. Connect the positive lead of a pulse counter to the male connector, negative lead to the aluminum chassis or neutral wire from the plug.
3. In Service Mode press MODE button (3) three times to scroll thru the program to find: **PAN SPEED LEFT**
4. Display will now show **CAL VAL** (a number). Or press ENTER to reset arm position.
5. Next you will take an exposure (full rotation) and the pulse counter should show 720 pulses +/- 10 pulses. If it does not:
   A. Use the Adjustment +/- buttons to increase/decrease that number after speed accordingly. To calculate that number use the following equation:

      (Number of Pulses your meter read) – 720 = X
      X divided by 720 = (a percentage)

      Take the percentage and multiply that by the number found on the screen. Example:
      Meter read 897 pulses, and the Screen said Speed: 60
      897 – 720 = **177** 177 / 720 = **.25** (.25 + 1) * 60 = **75**

   B. Increase your value from 60 to 75 using the Adjustment +/- buttons.
6. Press Enter.
7. Repeat this procedure until you achieve 720 pulses +/- 10 pulses. When achieved press Enter to save value.
8. Press MODE to advance to **PAN SPEED RIGHT** and repeat pulse count steps 4-7.
9. Press MODE to advance to **TMJ SPEED LEFT**.
10. Next you will take an exposure (tmj) and the pulse counter should show 160 pulses +/- 5 pulses. If it does not: adjust accordingly
11. Press MODE to advance to **TMJ SPEED RIGHT** and repeat pulse count step 10.
12. Disconnect the pulse counter.
13. Reconnect the blue wire, 1-pin molex connector.





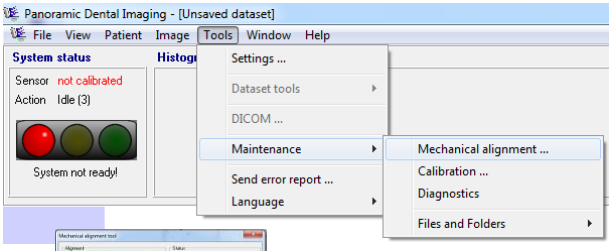
If a pulse counter IS NOT available:

CAUTION: Radiation will be produced during this procedure.

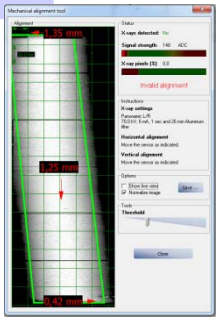
1. Use the MODE button to scroll thru the program to find: PAN SPEED LEFT.
2. Display will now show CAL VAL (a number). Or press ENTER to reset arm position.
3. Use a stopwatch to time the duration of an exposure by timing the exposure indicator fast blink on the Exposure Switch.
4. Press the button on the Exposure Switch. Wait for the Warm Up light slow blink to go off and start the stopwatch simultaneously with the fast blinking LED light on the exposure switch.
5. The stopwatch should show that the exposure is 12 seconds +/- .5 seconds. If it does not:
   A. Use the Adjustment +/- buttons to increase/decrease the value.
   B. Repeat step 4 and 5 until you achieve a 12 second exposure.
6. Press MODE to advance to **PAN SPEED RIGHT** and repeat steps 2-5.
7. Press the MODE button to advance to **TMJ SPEED LEFT**.
8. Using a stopwatch time the duration of exposure similarly to steps 2-5, exposure is about 3 seconds.
9. Press the MODE button to advance to **TMJ SPEED RIGHT**.
10. Using a stopwatch time the duration of exposure similarly to steps 2-5
11. The stopwatch should show a time equal to step 8 +/- .5 seconds. If it does not:
    A. Use the Adjustment +/- buttons to increase/decrease the value.
    B. Repeat until you achieve an equal time.

Digital Sensor Alignment

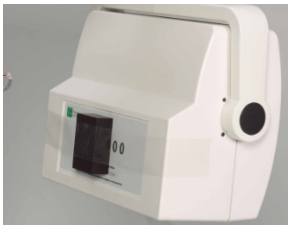
Mechanical alignment within the software



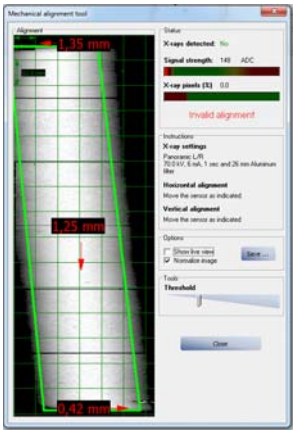
1. Open the Panoramic Application software by double clicking on the icon on your desktop. With the program open, click on Tools on the toolbar. Within the tools menu, select Mechanical Alignment. Your screen should look similar to this:



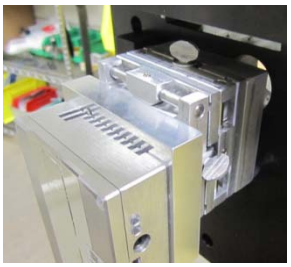
2. In Service Mode, advance to: **Beam Alignment**
   85 KVP 6 mA



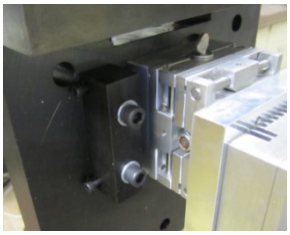
3. Install the provided aluminum filter to the front of the tubehead cover using tape to hold it in place. The filter will need to cover the circular hole in the cover behind the decal.



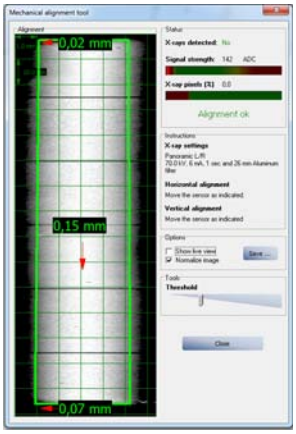
4. Press the exposure button until tubehead fires. Release after 1 second. You will see a green box on the screen signifying the area of radiation. The screen should look like this:
   ***Note**: The machine has a warm-up period before exposure indicated by slow audible beeps*



5. Make adjustments to the position of the sensor using the appropriate thumb screws on the mounting bracket to move the sensor Up/Down and Left/Right. Use the adjustment screws in the Phi lock block in conjunction with the slotted holes in the mounting block for Rotation clockwise/counter clockwise. Using these adjustments bring the x-ray beam into alignment.



6. Repeat these steps until you see on the screen "Alignment OK" Any value which is green in color and less than .20 will be accepted.



7. After alignment is accepted, please tighten the locking screws and the three mounting screws to prevent the mechanical alignment from moving. After you have tightened the locking and mounting screws, please repeat the mechanical alignment shot to verify alignment is still correct.

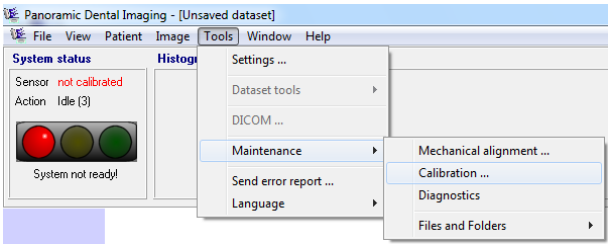
8. Your sensor is now mechanically aligned to the beam of radiation.

Digital Sensor Calibration

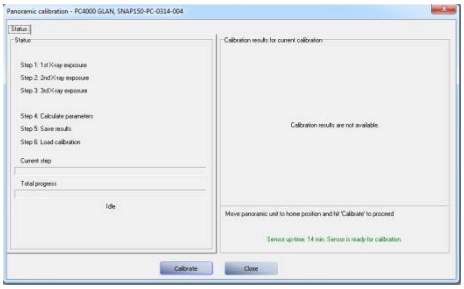
Calibration of sensor within the software

1. Power the PC-4000 off at the control panel only, then on, and operate the machine using the user menu for the calibration process.

2. In the tools menu, now select the option to Calibrate. Your screen should now appear like this:



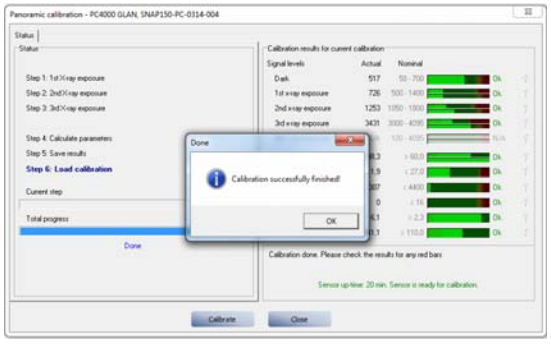
3. Press the Calibrate button on the bottom of the calibration window.



4. Now take an exposure at 70kVP with the 26 mm filter. Press the exposure button and allow the machine to rotate one full rotation. The screen will show that it is calculating. Press the reset button and wait for rotating arm to return.

5. Once the first exposures information is collected, take an exposure at 75kVP with the 26 mm filter. Press the exposure button and allow the machine to take a second full rotation. The screen will show that it is calculating. Press the reset button and wait for the rotating arm to return.

6. Repeat exposure <u>without</u> filter at 75kVP.



7. After the software is done calibrating, you will see a series of Green bars on the Right side of the screen which should look like this:

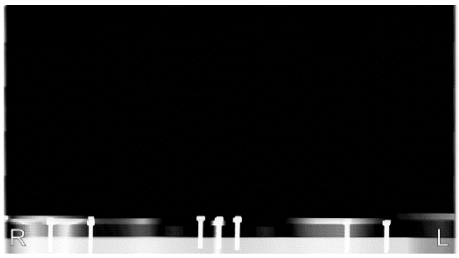
8. Acceptable calibration files are in the color range of Brown, Yellow and Green. Anything in the RED, please call Panoramic tech support for assistance.

Perform PIN Test *(Re-enter the Service Mode, page 13)*

1. Press MODE until you see: PIN TEST
   Press ENTER to reset arm position if needed.

2. Press Adjustment +/- buttons to select:
   PIN TEST LEFT or PIN TEST RIGHT
   Press ENTER to reset arm position if needed.

3. Place PIN test tool in chinrest. Depress EXPOSURE button, screen will display "Warm Up in Progress" and have a slow beep, exposure will then start, LED light will now display on Control Panel indicating radiation is present and the rotating arm will begin to rotate.



4. While viewing the pin test image on the monitor, inspect each set of pins to verify that they overlap. Each set of pins are to overlap at a minimum of 50%. If they do not meet these criteria, adjust the pin test, take another exposure, and re-measure.

5. While viewing the pin test image again, measure from the center pin outwards to the extreme left and right pins. The difference between both the left and right measurements must not exceed 7mm in length. If the measurement does not meet these criteria, readjust the pin test, take another exposure, and re-measure.

6. When complete save a copy of the pin test for submission.

PC-4000 Installation

Installation of the Plastic covers

1. After the mechanical alignment is complete and the calibration has been set, you may now install the Plastic covers over the sensor.
2. Carefully place the front and rear sensor covers over the counter weight and sensor. Align the mounting holes to the side holes on the counter weight plate.
3. Press from the bottom of the front plastic cover to assure the covers are shifted UP as high as possible providing the maximum shoulder clearance.
4. Install the four (4) allen screws to attach the covers. ***Do not over-tighten the screws because it can cause damage to the plastic covers***

Re-install the Wheel Cover

1. Re-install the wheel cover using the three (3) previously removed black button head cap screws.

Install Top Cover

1. Place top Plastic Cover on the overhead.
2. Re-install the eight (8) long black socket head cap screws from the underside to secure the upper plastic to the lower. ***Do not over-tighten these screws because it can cause damage to the top cover***.

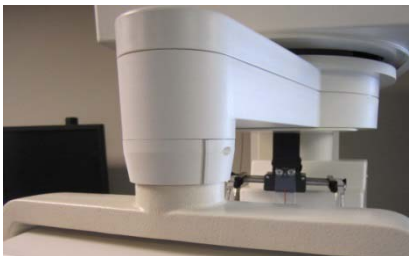
Tip: For ease of installation be sure to start every screw and then going back to tightening them all.

Install Temple Supports

1. Install the two (2) supplied temple supports using the supplied hardware.

Install Yoke Collar

1. Install the two (2) supplied yoke collar covers using the supplied hardware.



Post-Installation Steps

Training of the office staff

1. Training will include instructions on care for the digital sensor, proper steps in turning the system ON/OFF, instructions on getting into the Panoramic software, and/or Imaging software the Doctor has running within his office environment.

2. Office staff will also need instruction on proper patient alignment when taking an exposure and safety guidelines.

3. Please reference the User Manual.

4. Complete the Panoramic Corporation Installation Report, FDA 2579 paperwork, Panoramic Corporation Training Checklist and distribute accordingly.

5. Please reference the Panoramic Corporation website www.pancorp.com for helpful user videos and easy access to our online store for ordering PC-4000 supplies.

Remote Exposure Switch Installation

A remote exposure switch kit is available from Panoramic Corporation.
The remote exposure switch must be installed if state or local regulations require it.

Prior to the installation of a PC-4000, an electrician will need to install the following:

- A 2" x 4" electrical box at standard outlet height on the wall directly behind the machine.
- A 2" x 4" electrical box at necessary location and height for the remote switch.
- A 2-conductor, low voltage (24 VAC) wire routed between the 2 boxes with sufficient excess at each end to make connections.

Remote Switch Kit Contains:

- One lighted pushbutton switch with attached leads
- One stainless steel wall plate
- One RJ-45 single port wall plate w/ screw terminals
- Two wire nuts
- Wiring instructions

Remote Exposure Switch Installation

1. Wire the RJ-45 wall jack according to the supplied instructions making sure the correct wire is attached to position 1 and the correct wire is attached to position 2 and secure the plate to the wall box located behind the machine.

2. Mount the supplied lighted remote switch into the stainless steel wall plate provide in the kit

3. Wire the lighted pushbutton switch according to the supplied instructions making sure to connect the lead from the COM terminal to the wire from position 1 of the RJ-45 jack and to connect the lead from the (+) lamp terminal to the wire from position 2 of the RJ-45 jack. Secure these wiring connections with the supplied wire nuts from the kit.

4. Mount the lighted pushbutton and wall plate onto the remaining wall box.

5. Power off the machine.

6. Remove the Exposure Switch Assembly from the exposure cord by just unplugging the CAT5 cord from the base of the exposure switch.

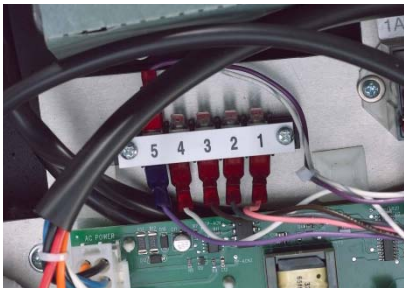
7. Plug the CAT5 cord from the display panel on the machine into the RJ-45 wall plate located near the machine.

8. Power the machine on and verify that the remote switch functions properly.

Screw Motor Assembly Height Limit

The PC-4000 incorporates a height adjustment limit switch that will stop the machine from rising past a predetermined height. This limit height, factory set at approximately 92", can be adjusted for low ceilings in 3" increments down to approximately 83".

1. Power the PC-4000 OFF.
2. Remove the 8 screws holding the top cover.
3. At the back of the machine, you will see terminal strip marked 1-5.

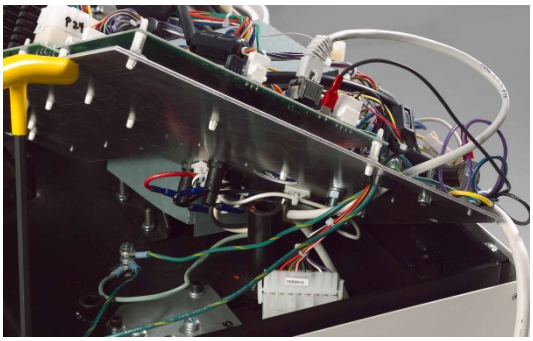


4. The factory setting is on terminal 5.
5. You can move the single white wire to any other terminal lowering the machine height 3" for each terminal marking. Marking #1 is the lowest.
6. Power the PC-4000 ON.
7. Using the Up/Down switch on the display panel, raise the machine and verify the height adjustment is automatically terminated.

Screw Motor Assembly Exchange

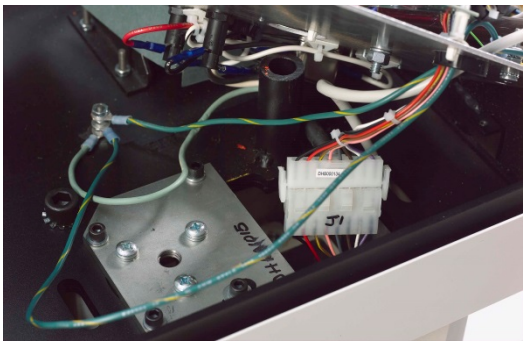
Screw Motor Exchange.

1. Power the PC-4000 ON.
2. Lower the machine to the lowest position.
3. Power the PC-4000 OFF.
4. Remove the screws from the top cover of the machine
5. Remove the corner screws from the overhead aluminum chassis.
6. Prop the aluminum chassis up to gain access to the screw motor assembly.
7. Disconnect wire harness.
8. **Be sure to brace the outer column to keep the machine up off of the base.** This makes installing the replacement easier as well and can be achieved with a simple block of wood.



9. Loosen the bottom mount of the screwmotor.

Bottom Mount is a 3/16" allen bolt located in a blind hole below the power inlet.
Do not completely remove this bolt.

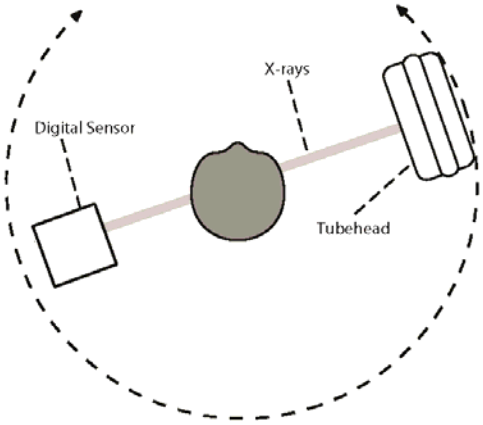


10. Loosen the 4 bolts from the top of the screwmotor.
11. Lift screw motor assembly out of column.
12. Lower replacement motor down into the column.
13. Align bottom mount.
14. Tighten 4 upper bolts.
15. Tighten bottom mounting bolt.
16. Connect wire harness.
17. Lower aluminum chassis and tighten corner screws.
18. Power the PC-4000 ON
19. Test lift mechanism by pressing column up/down button.
20. Reinstall top cover.

Panoramic Radiography

Panoramic Radiography has been in use for over 30 years. In digital panoramic radiography, the X-ray source and digital sensor rotate around the patient's head at the same speed.

X-rays are emitted from the tubehead in a very narrow vertical band, pass through the patient's head (where some are absorbed), and strike the digital sensor. Since the patient is between the X-ray source and the sensor, the amount of X-rays that reach the sensor will vary depending on the density of the patient's anatomy. Dense matter, such as bone, will absorb more of the X-rays than less dense matter, such as tissue. Less X-rays reach the sensor when striking the teeth, causing them to appear on the screen as lighter areas. More X-rays reach the sensor when striking tissue, causing it to appear on the screen as darker areas.



In order to pass as many X-rays through the patient's head as possible, the tubehead is tilted at a slight upward angle to:

1. Move the dense portion of the skull out of the path of the X-rays.
2. Cause the upper and lower anterior root tips to be aligned vertically.
3. Stretch the vertebrae in the neck to allow the X-rays to pass more efficiently through the vertebrae to expose the anterior teeth.

As the tubehead and digital sensor rotate around the patient, the sensor is gradually exposed by a narrow vertical band. It is imperative that the sensor be aligned and that nothing blocks the path of rotation while the exposure is in progress.

Maintenance Schedule

Panoramic Corporation strongly recommends a preventive maintenance be performed on your equipment at least every two years. All service requests must be submitted through Panoramic Corporation's Service Department by calling our toll-free number at (800) 654-2027.

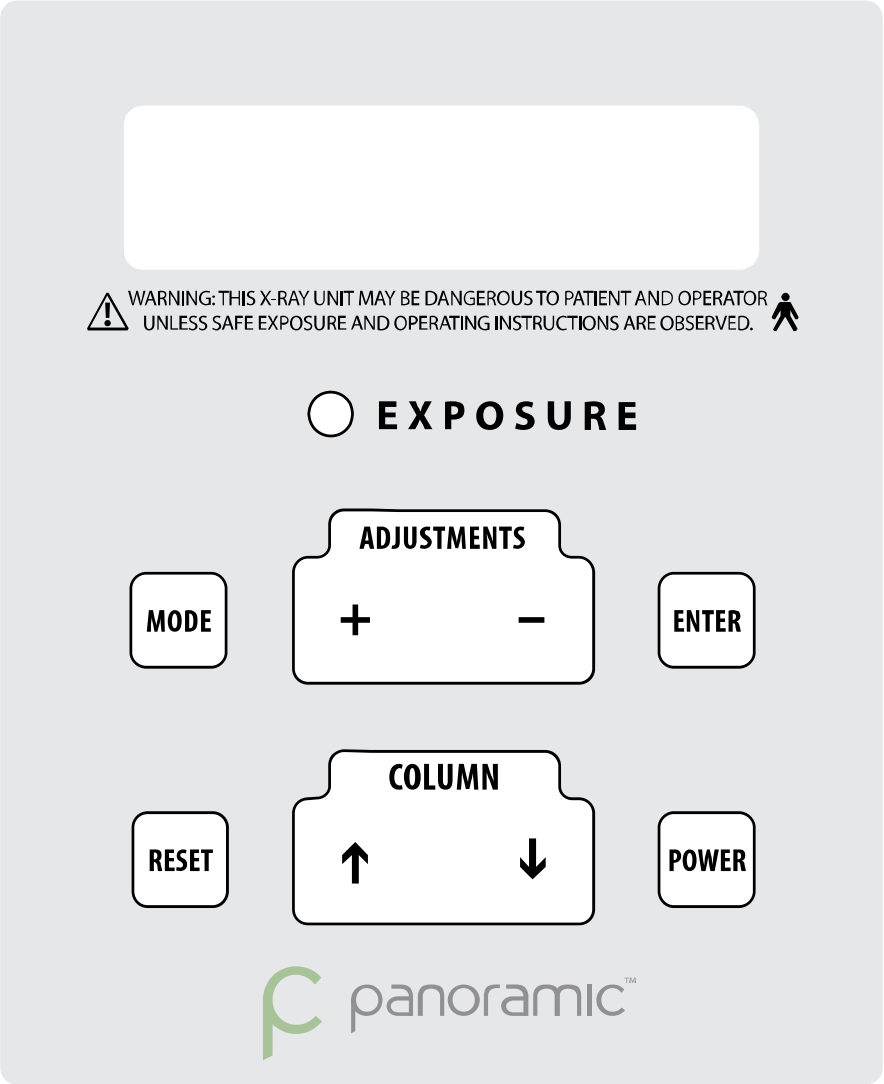
Panoramic has an extensive network of independent installation and service organizations throughout the U.S. and Canada to install and service our products. The Independent Representatives have been specifically trained by our organization in the service and installation of Panoramic products. We strongly recommend that you use one of our Independent Representatives to service Panoramic products. To the extent you use third parties other than Independent Representatives to service Panoramic products, we cannot accept responsibility or liability for any work performed by those third parties and any resulting damages or liability attributable thereto. In no event shall Panoramic be liable to you or any other third party for any direct, indirect, punitive, incidental, consequential or special damages or lost profits arising from, relating to or connected with, the installation of or repair of a Panoramic product by someone other than an Independent Representative.

Always refer to your state and local regulations to determine how often to perform a preventive maintenance on your equipment as the regulations may supersede manufacturers' recommendation.

Owners of Panoramic Corporation X-Ray machines must call Panoramic Corporation Service Department for all reasons listed below but not limited to:

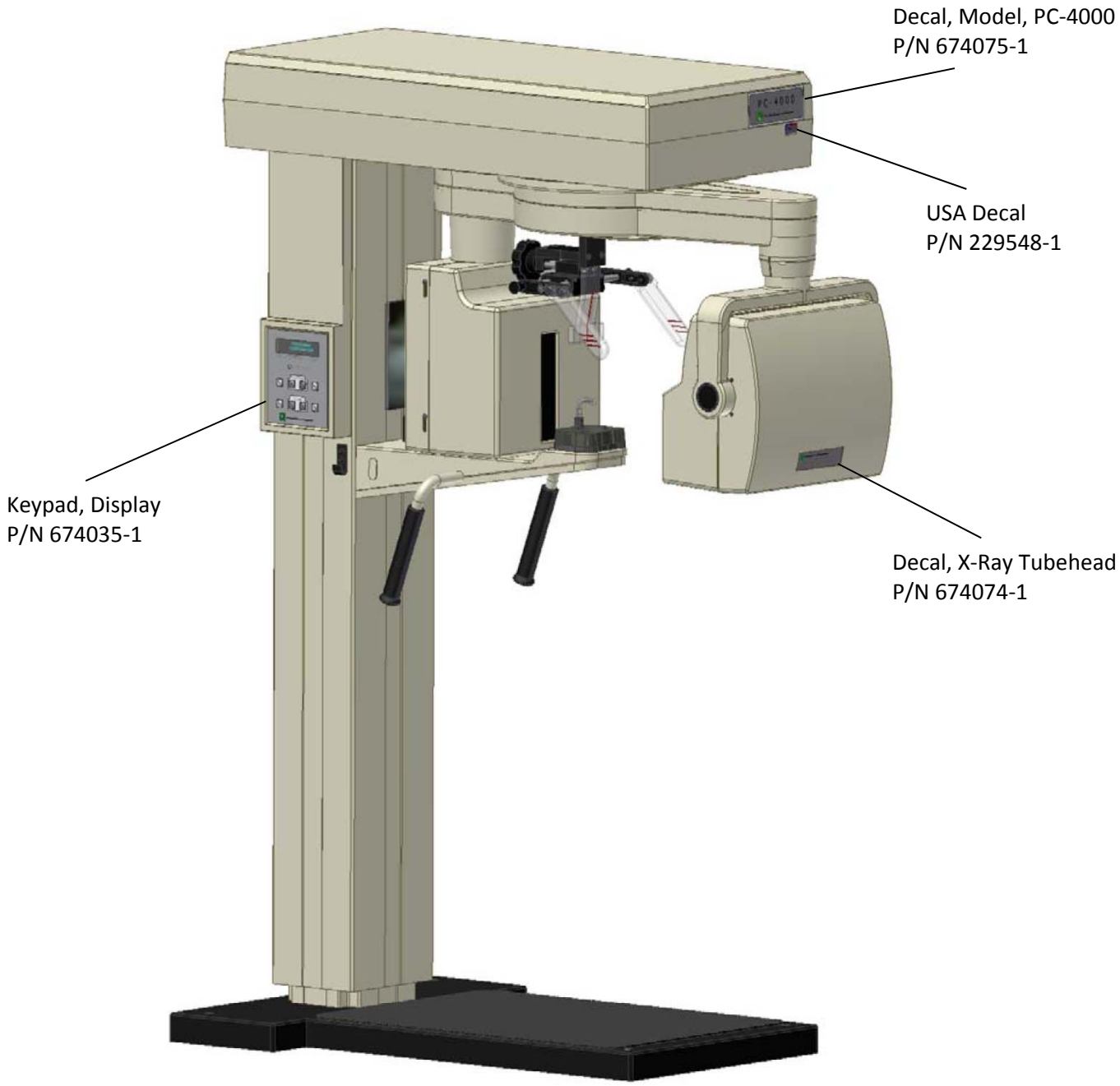
- Preventive maintenance at least every two years
- Physical relocation of machine
- Changing the power source to a different power source from original installation
- Questions/Help related to compliance with your state, and local regulations regarding radiological equipment
- Corrective Maintenance
- Physical damage that may affect radiation safety
- Interrupted movement, unusual noises, leaks, etc.

To schedule a preventive maintenance on your equipment contact the Service Department by dialing our toll-free number at (800) 654-2027.



Control Panel

Labeling

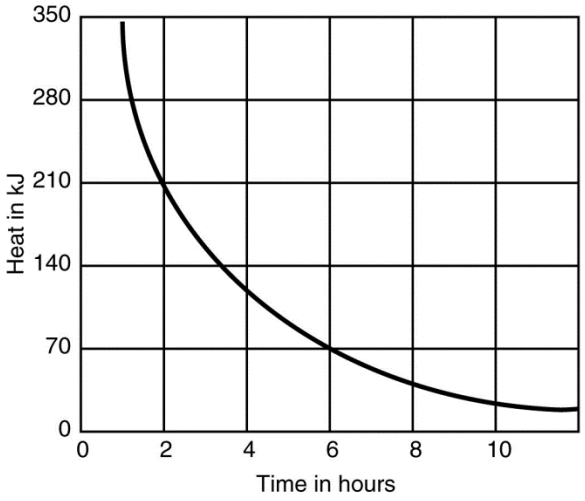

Decal, Model, PC-4000
P/N 674075-1
USA Decal
P/N 229548-1
Keypad, Display
P/N 674035-1
Decal, X-Ray Tubehead
P/N 674074-1

Labeling


Decal, Plain
P/N 674046-1
PC-4000
Decal, Tubehead Aperture, PC-4000
P/N 300958-1
Label, Mains
P/N 674071-1

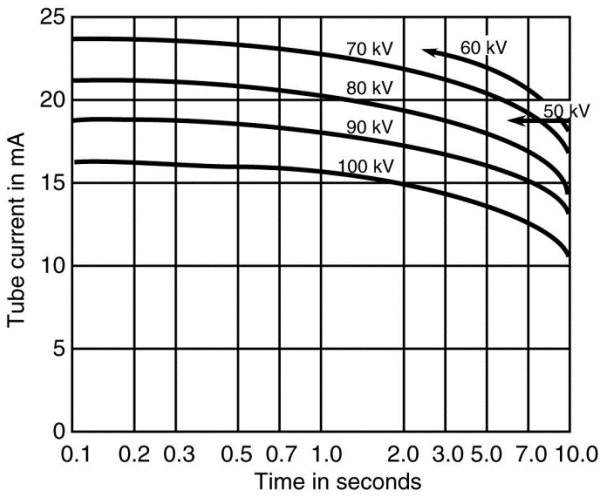
PC-4000 Specifications

Tube Housing Thermal Characteristics

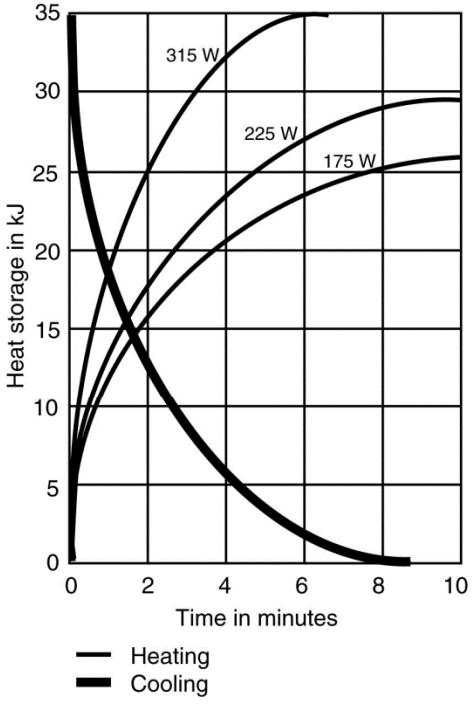


1 kJ=1400 H.U. 1 Watt=1.4 H.U./sec

Tube Maximum Current

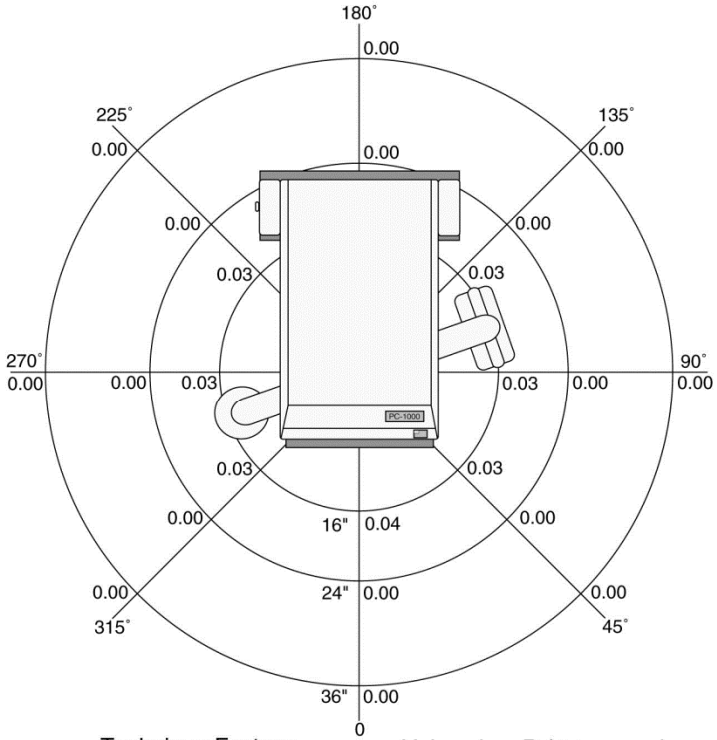


Anode Thermal Characteristics



Self-rectified Focal spot: 0.5 mm

Radiation Scatter Survey



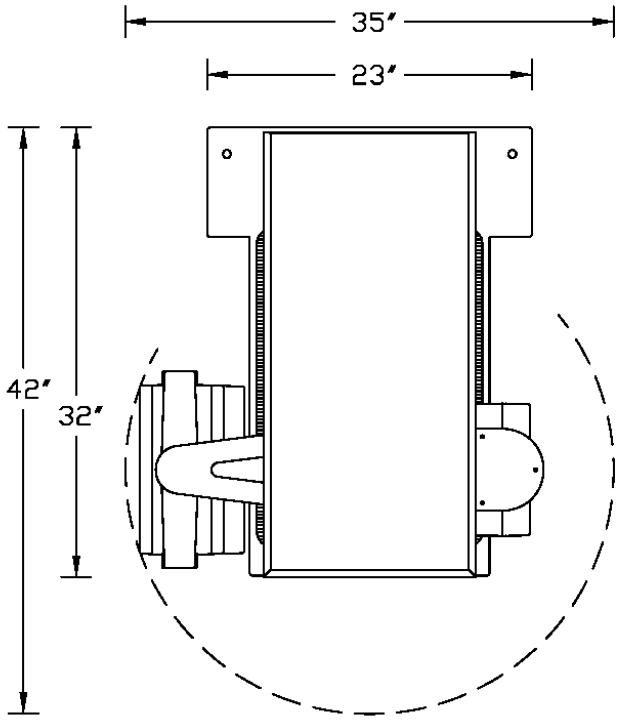
Technique Factors: Values in mR / 14 second exposure
Tube Current: 6.0 mA
Tube Voltage: 90 kVp
Exposure Duration: 14 seconds

Method:
Survey meter (Nuclear Associtates Model 06-107) at level of phantom skull at each position for duration of exposure.

PC-4000 Specifications

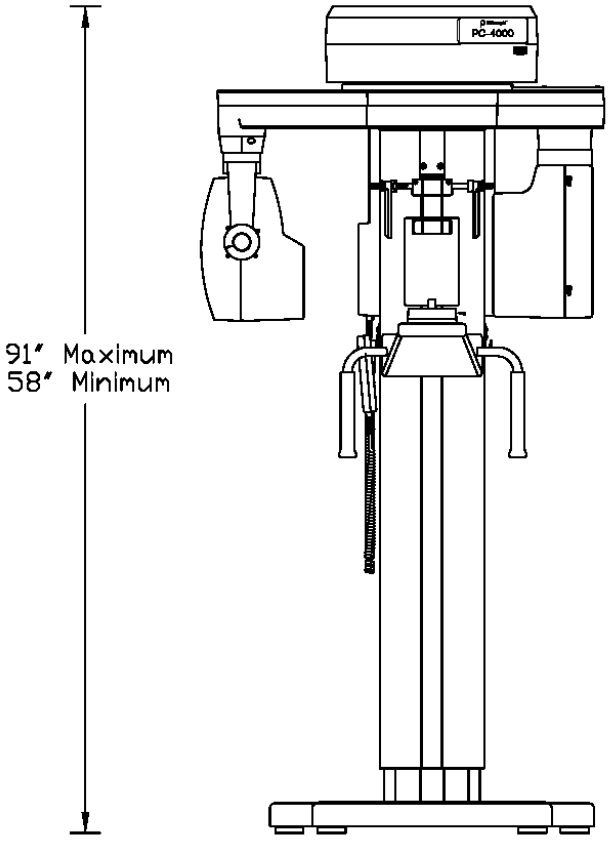
Power Ratings	Model 801125-5: 105-125 VAC, 50/60 Hz, 10A Model 801125-6: 100/230/240 VAC, 50/60 Hz, 10A		
Generator Type	Single-phase, half-wave, self-rectified, center-grounded.		
Duty Cycle	At 90 kVp/6 mA - One 12 second exposure every 5 minutes to a maximum of 30 exposures.		
Tubehead Assembly	**X-ray Tube**		Brand X-Ray or K-Alpha
	Rated Tube Potential Peak		100 kVp
	Leakage Technique Factors		90 kVp/6 mA
	Inherent Filtration		1 mm
	Added Aluminum Filtration		1.8 mm
	Total Filtration		2.8 mm
X-ray Tube	**Manufacturer**		Brand X-Ray or K-Alpha
	Type		BX-4P0.5 or KAX-90-10-P
	Focal Spot		.5 mm x .5 mm
	Maximum Peak Voltage		100 kVp
	Anode Heat Dissipation Rate	250 Watts	1 Watt=1.4 H.U./sec.
	Anode Heat Storage Capacity	35 kJ	1 kJ=1400 H.U.
Statement of Deviation	**Peak Tube Potential**		± 12% over range of rated line voltage
	Tube Current		± 10% over line voltage
	Exposure Time		± 10% over line voltage
Measurement Techniques	**Exposure Time**		Measured with Engineered Systems & Design Model XR201MS pulse counter.
	Tube Current		Measured directly with a DC mA meter having a basic accuracy of no less than ± 3%.
	Peak Tube Potential		Measured using a computerized kVp measurement system NeroMax Victoreen. System accuracy is ± 3% exclusive of waveform, inherent filtration, and reproducibility.
	Maximum Line Current		Machine set at 90 kVp/6 mA

PC-4000 Physical Dimensions



Physical Dimensions
35" W x 42" D x 91" H

Minimum Working Space
48" W x 48" D x 91" H



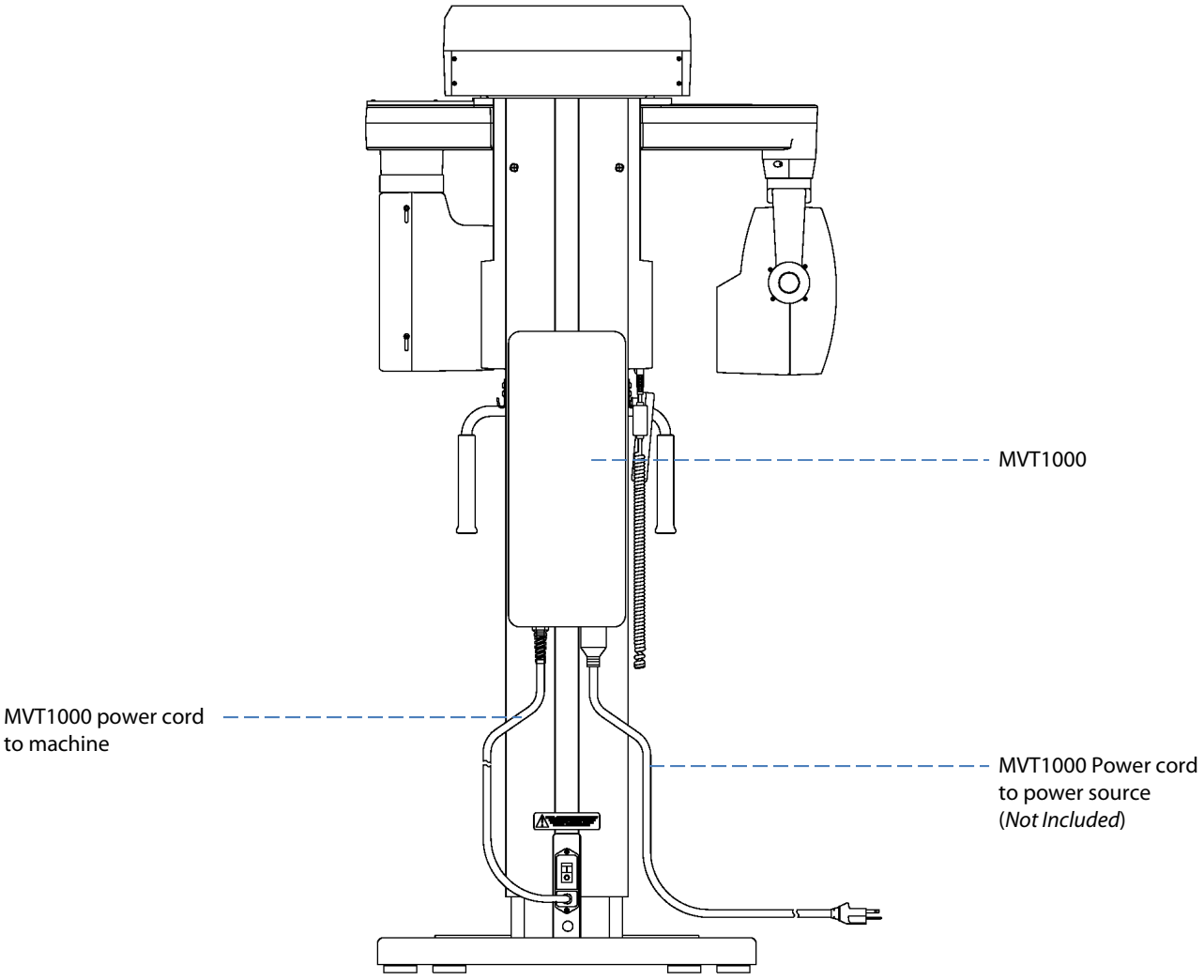
The PC-4000 weighs approximately 415 pounds and is freestanding, requiring no extra support in the wall or floor.

The factory configuration is shipped with the control panel mounted on the patient's left side, unless specified by the customer prior to shipping. The control panel can be easily relocated to the right side at the time of installation.

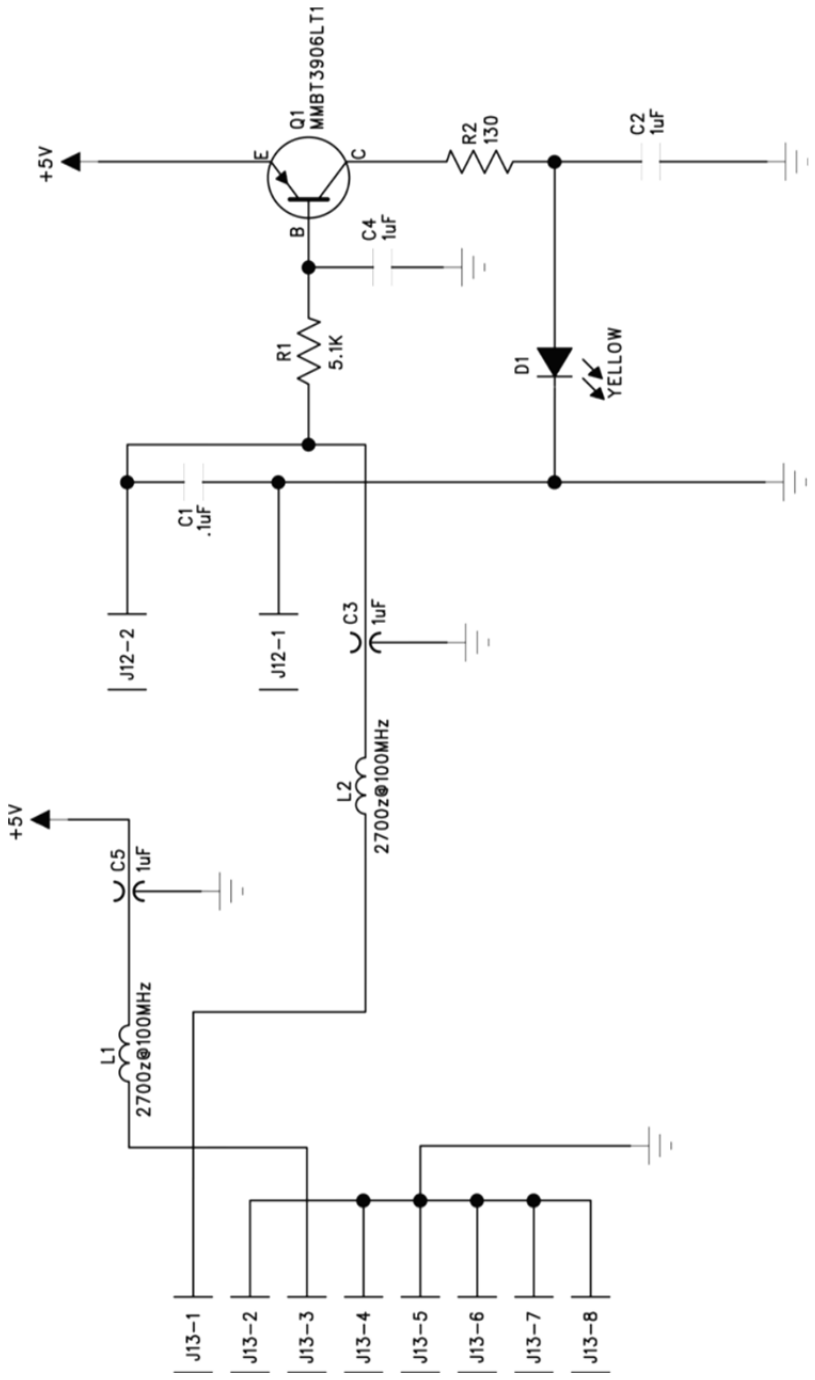
Note: The FDA requires that the technique factors (kVp meter) be viewable during the exposure.

PC-4000 Multi Volt Attachment

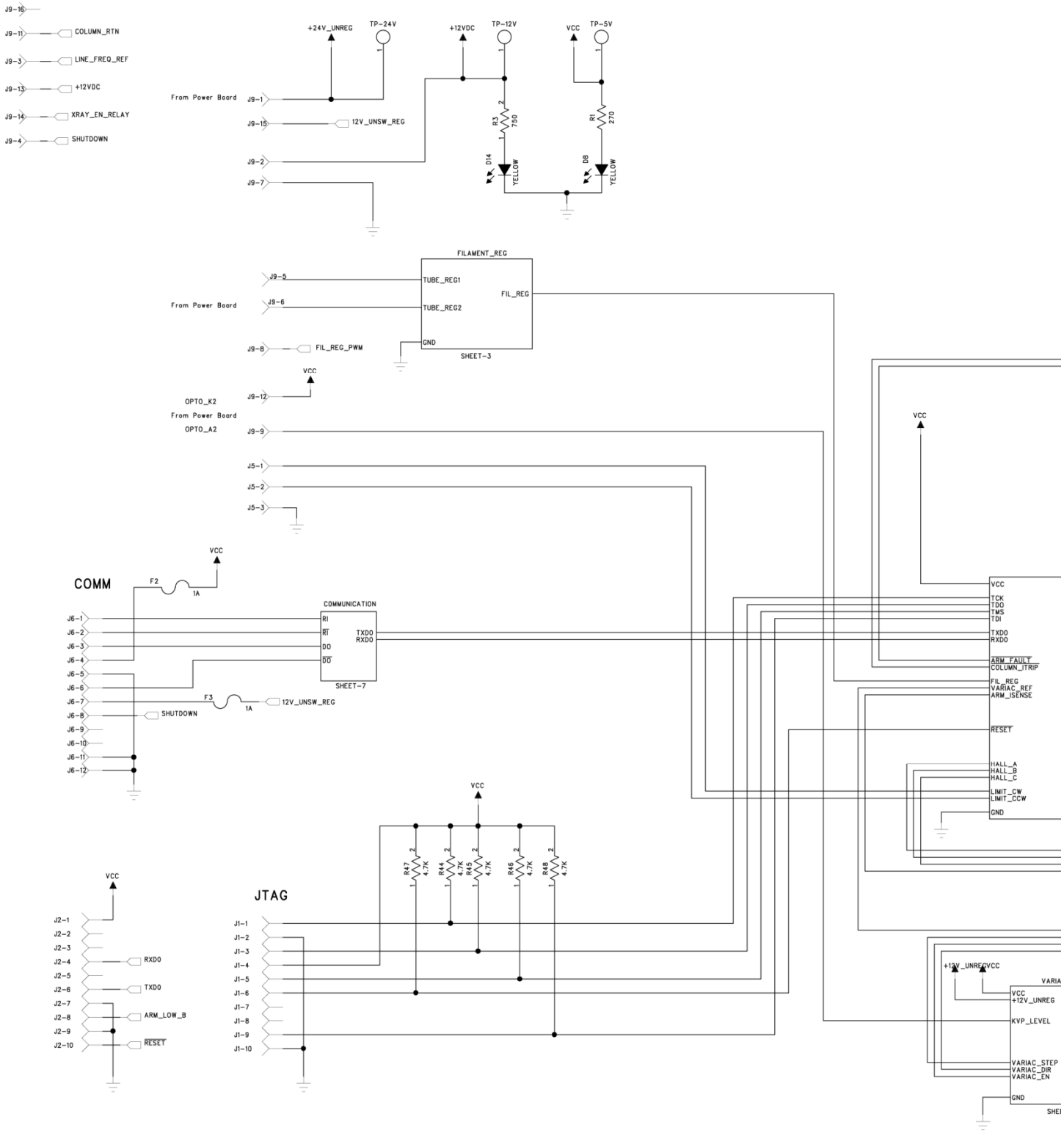
Model 801125-6 includes MVT1000 attached to the rear of the machine. MVT1000 power cords must be connected as shown.



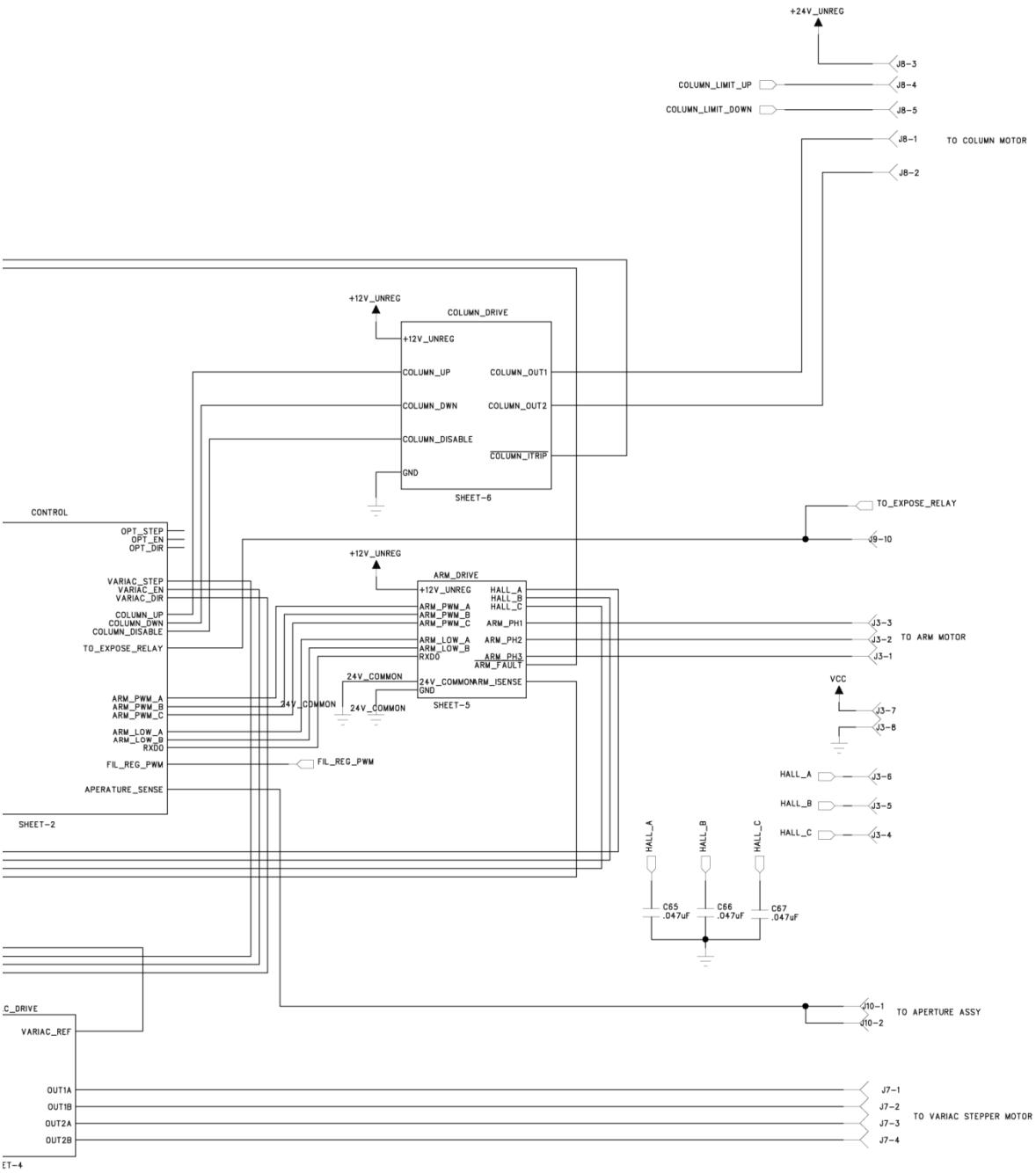
Schematics – Exposure Switch



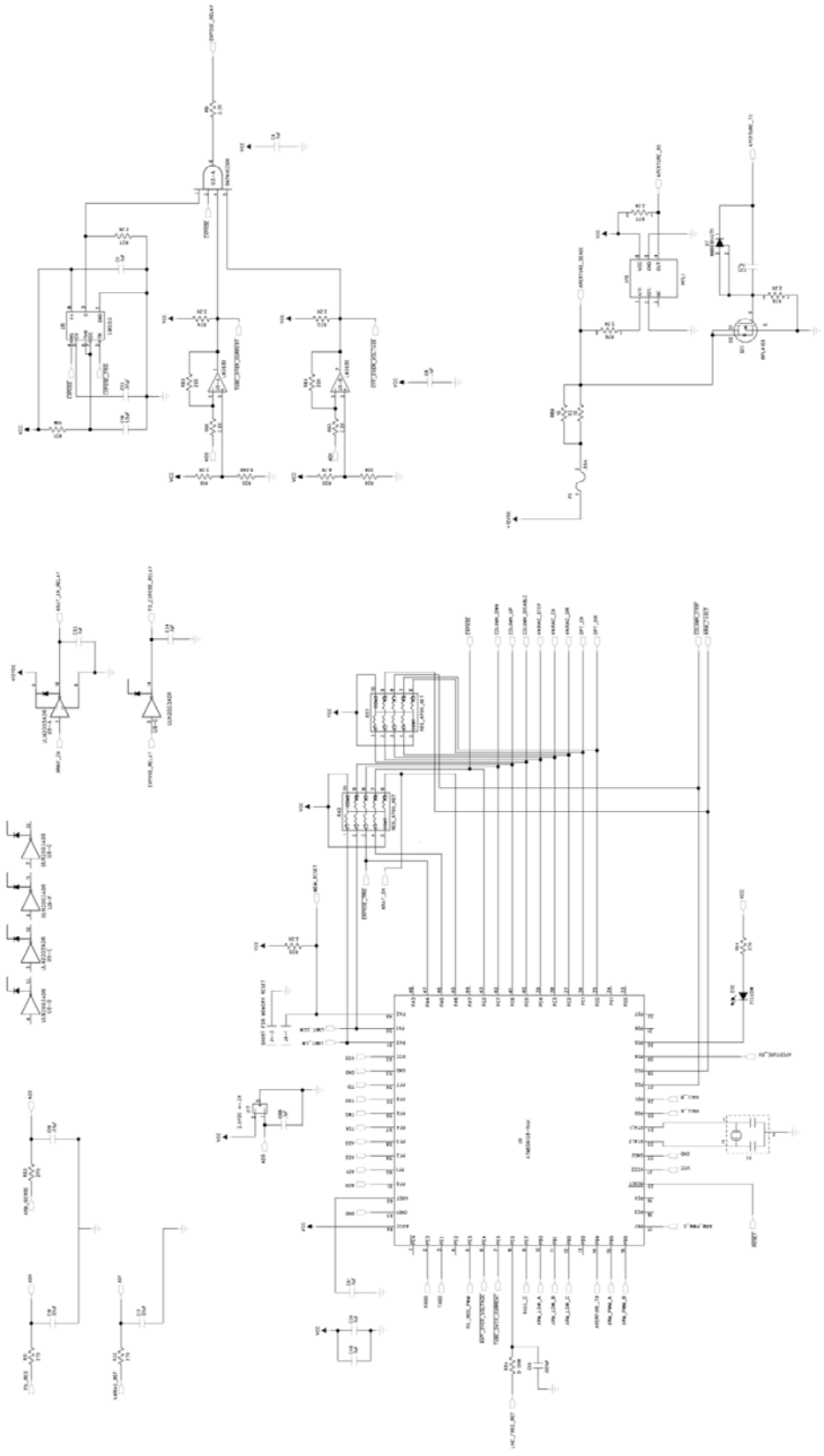
Schematics – Control Board



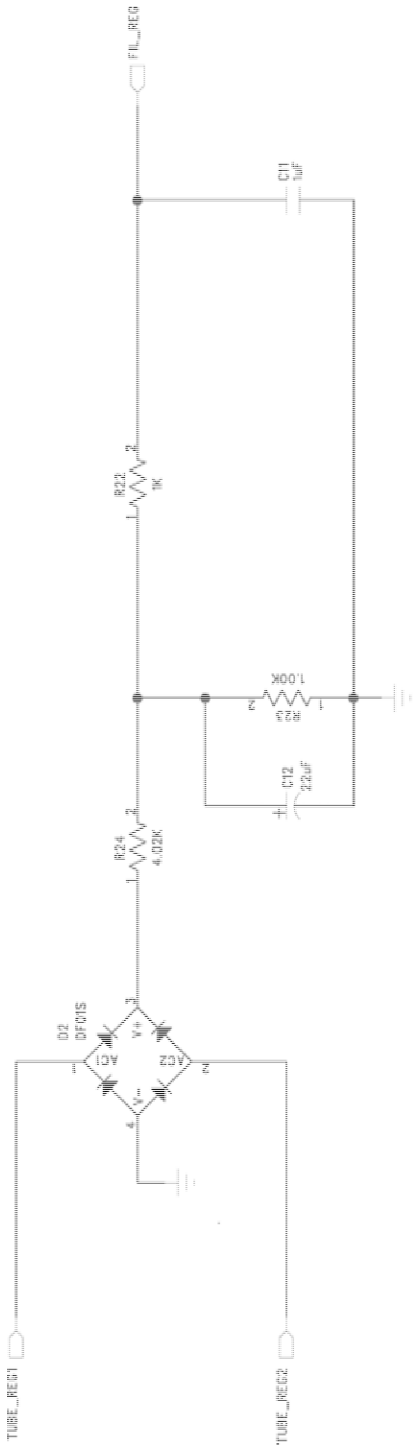
Schematics – Control Board



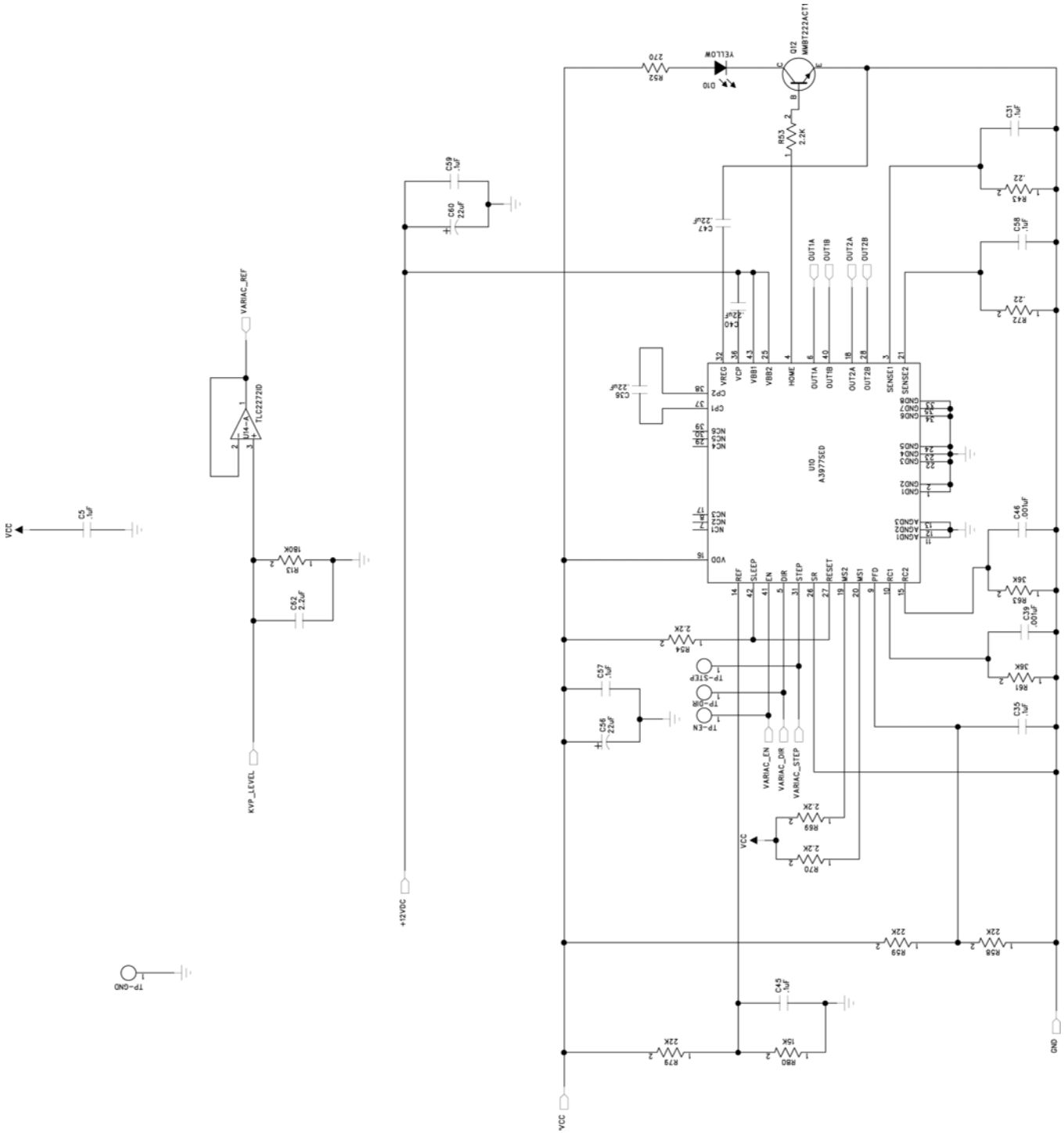
Schematics – Control



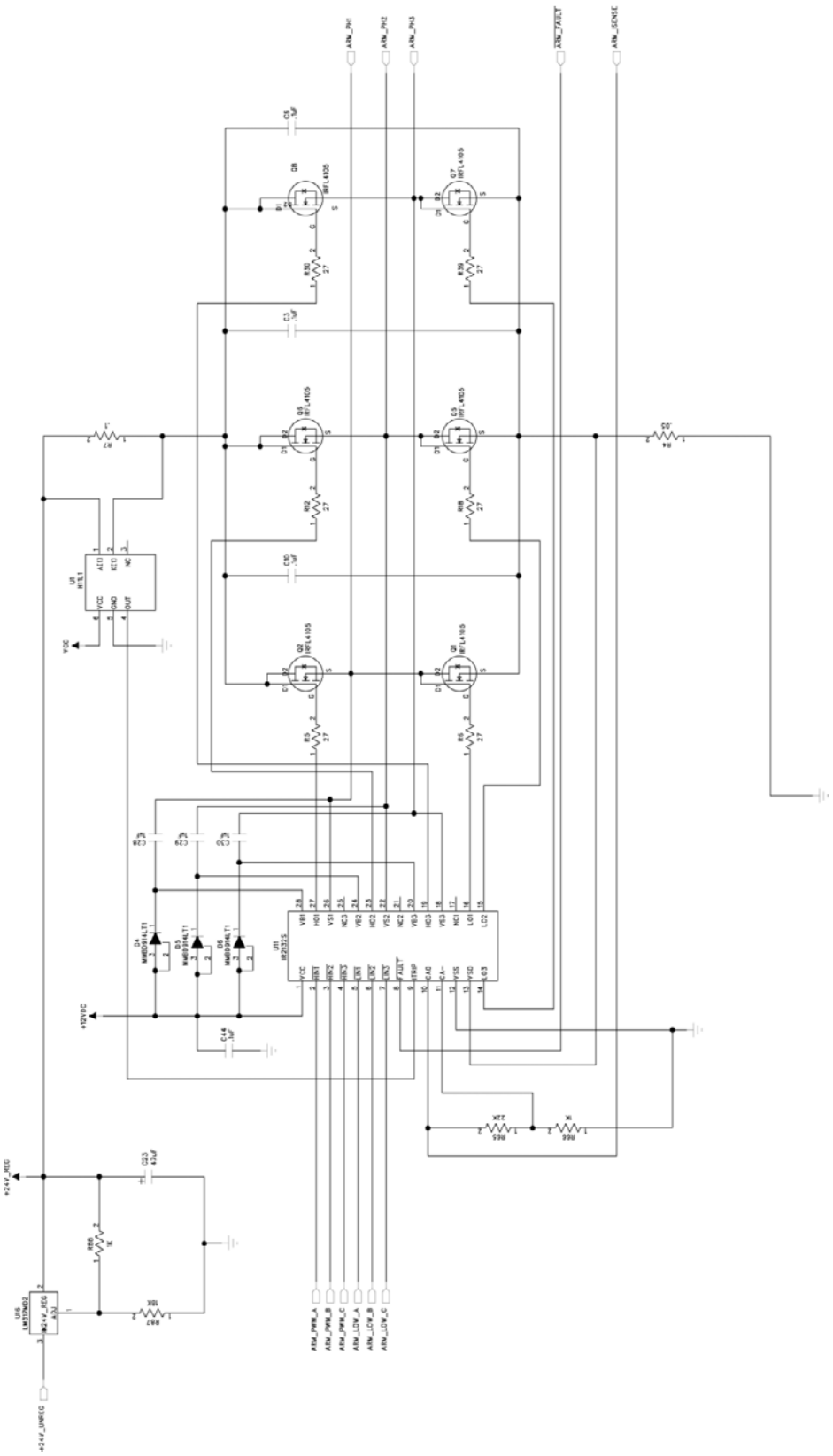
Schematics – Control/Filament Reg.



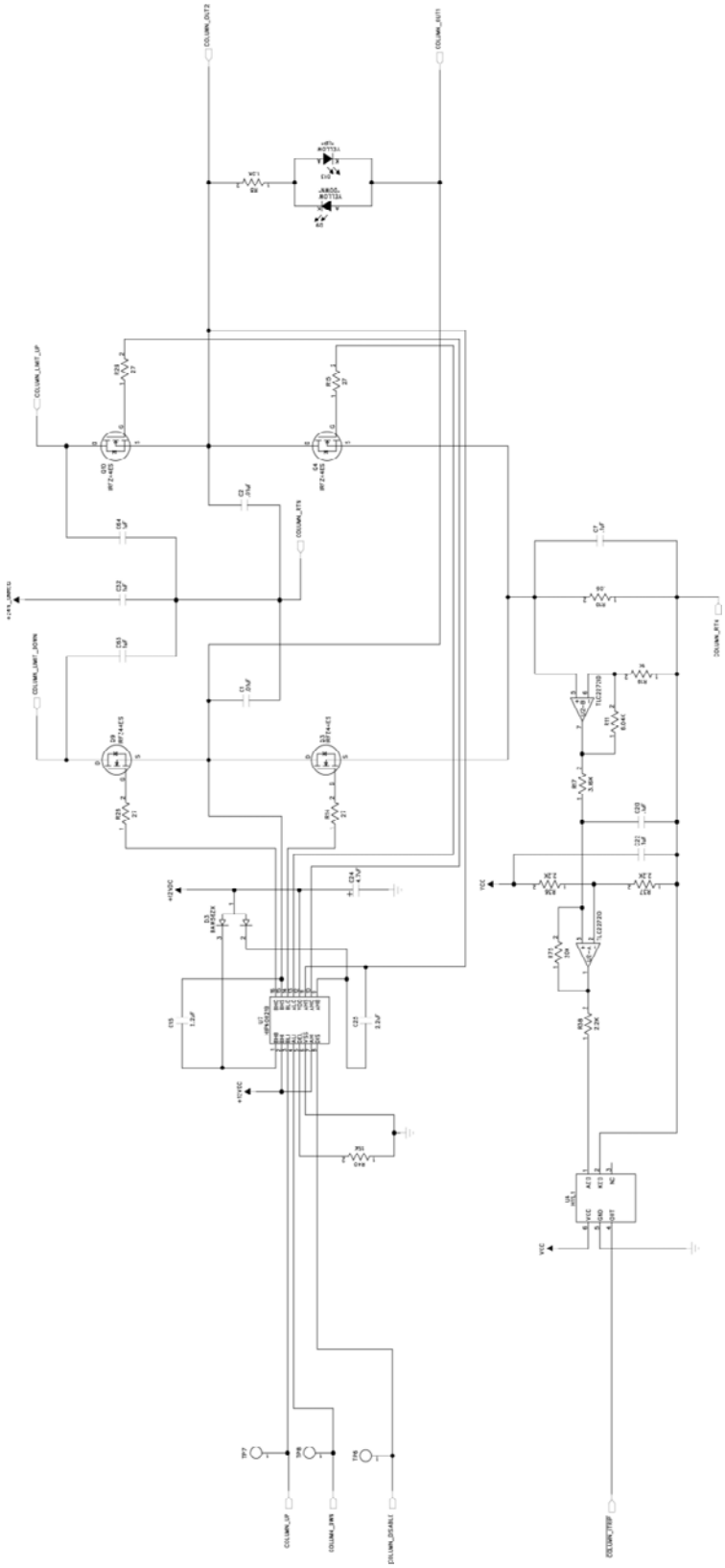
Schematics – Control/Variac Drive



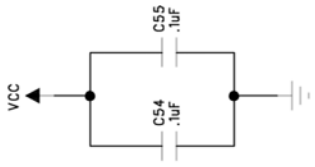
Schematics – Control/Arm Drive

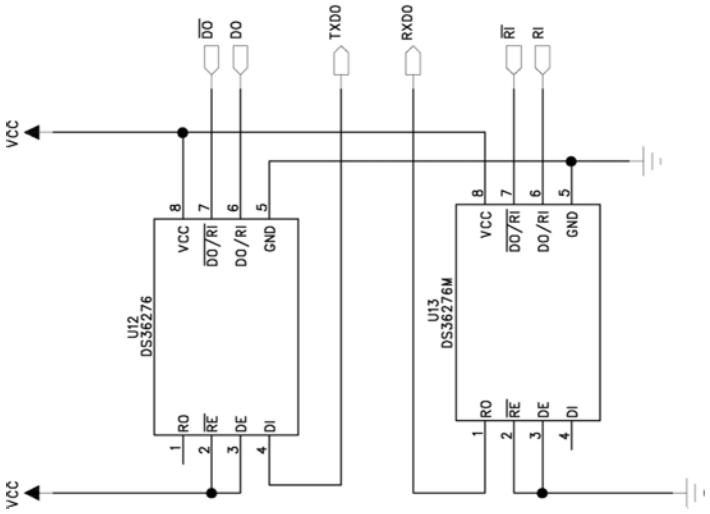


Schematics – Control/Column Drive

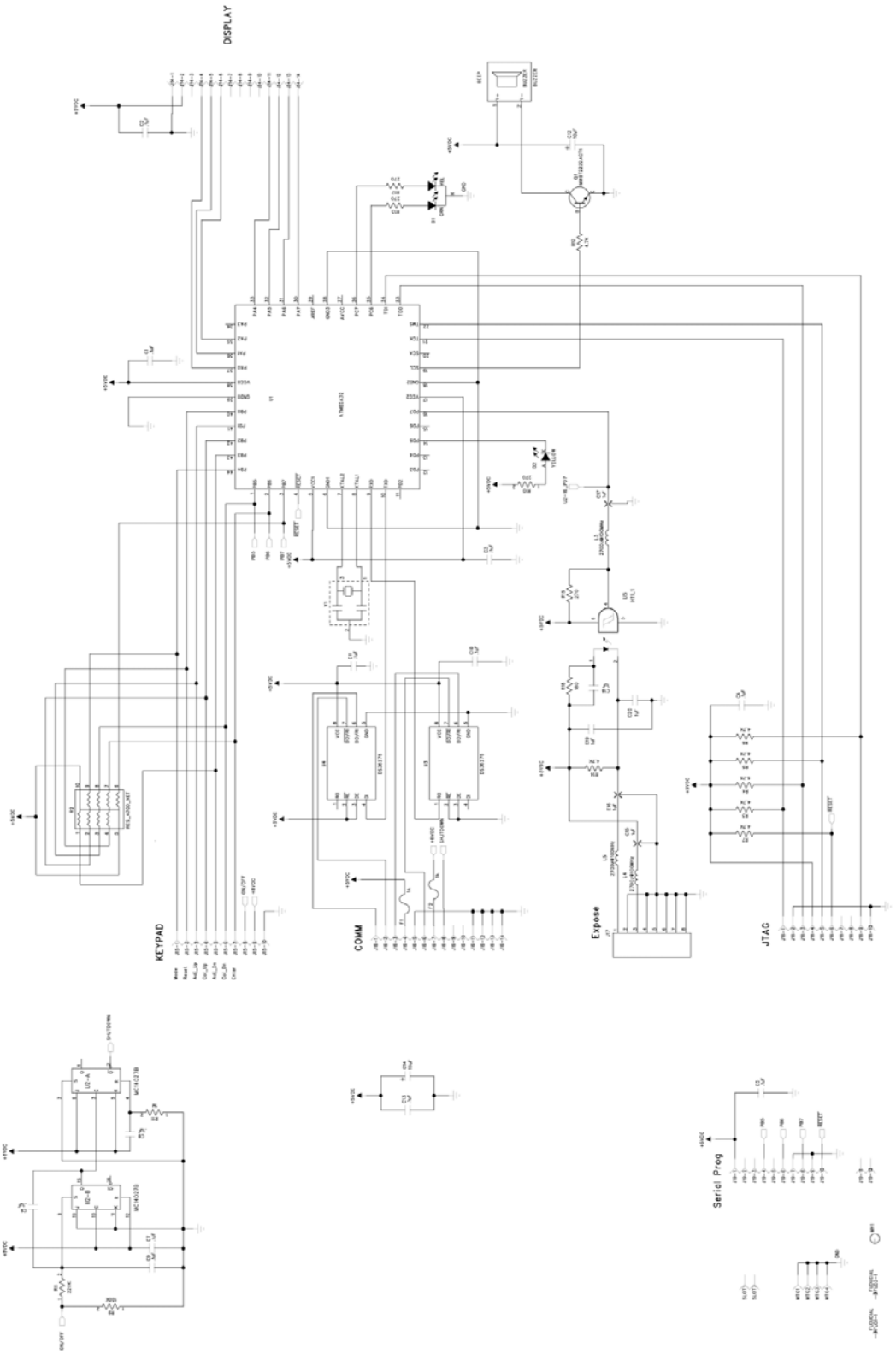


Schematics – Control/Communication

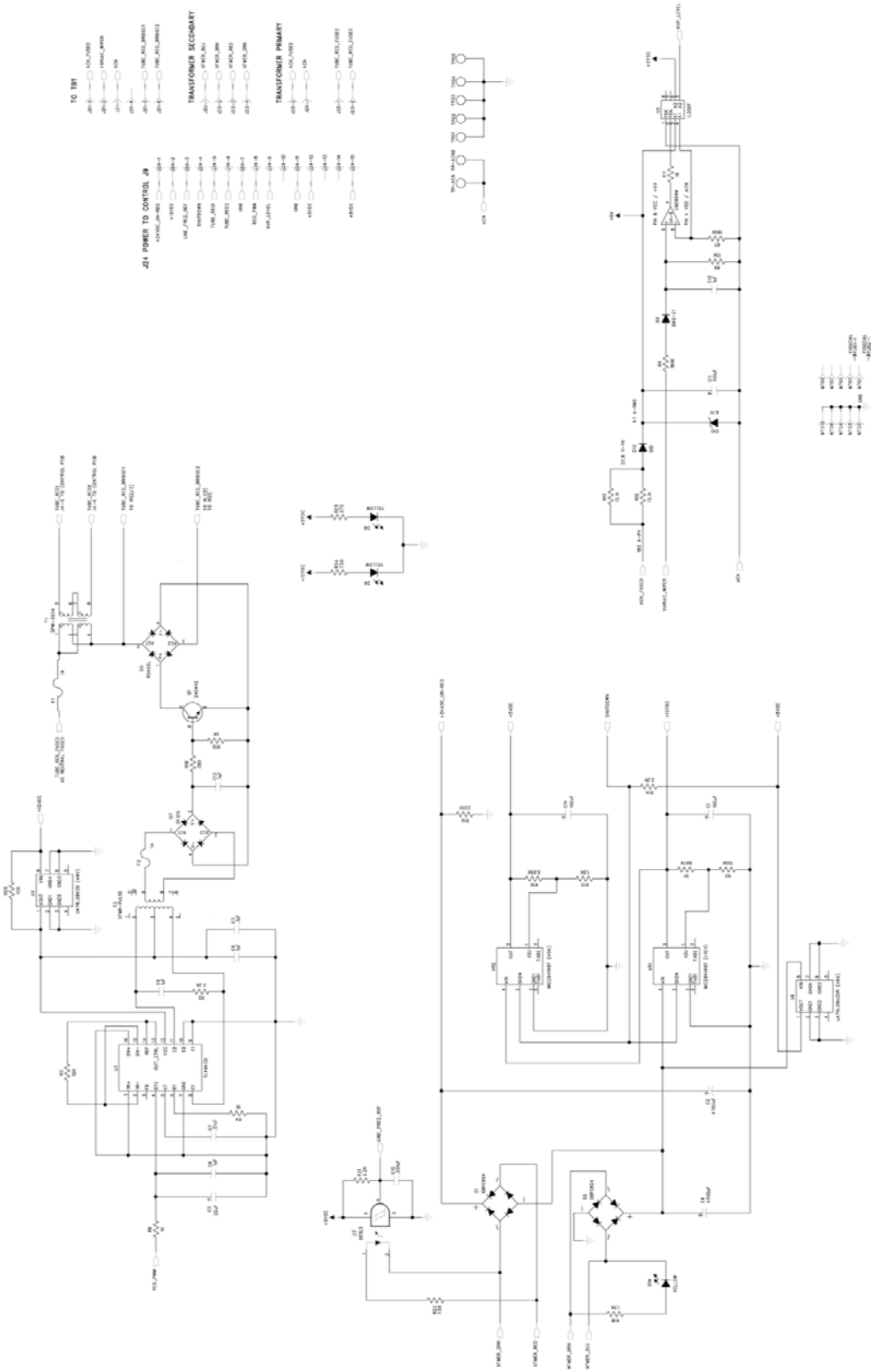




Schematics – Interface/Display

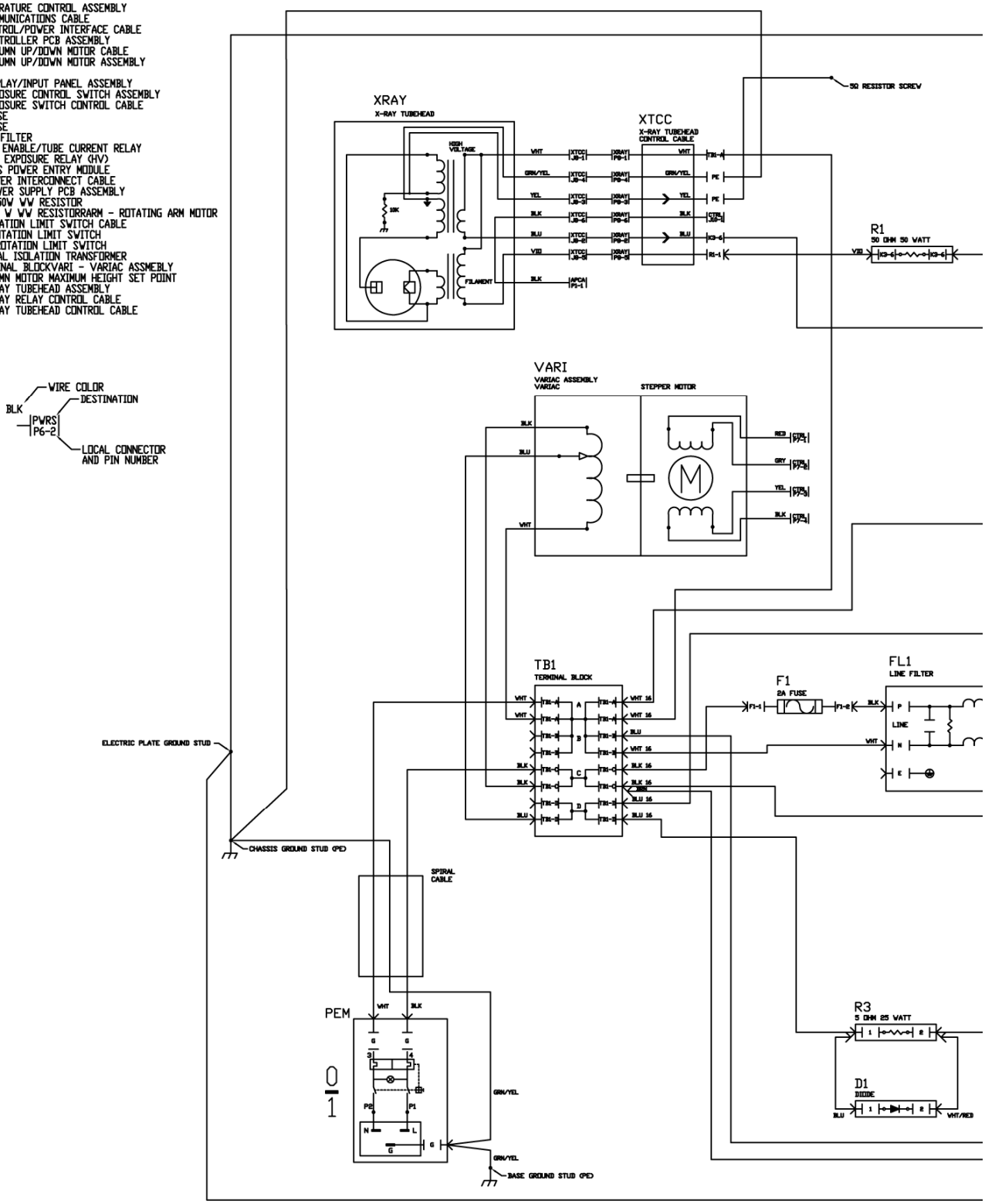


Schematics – Power Supply

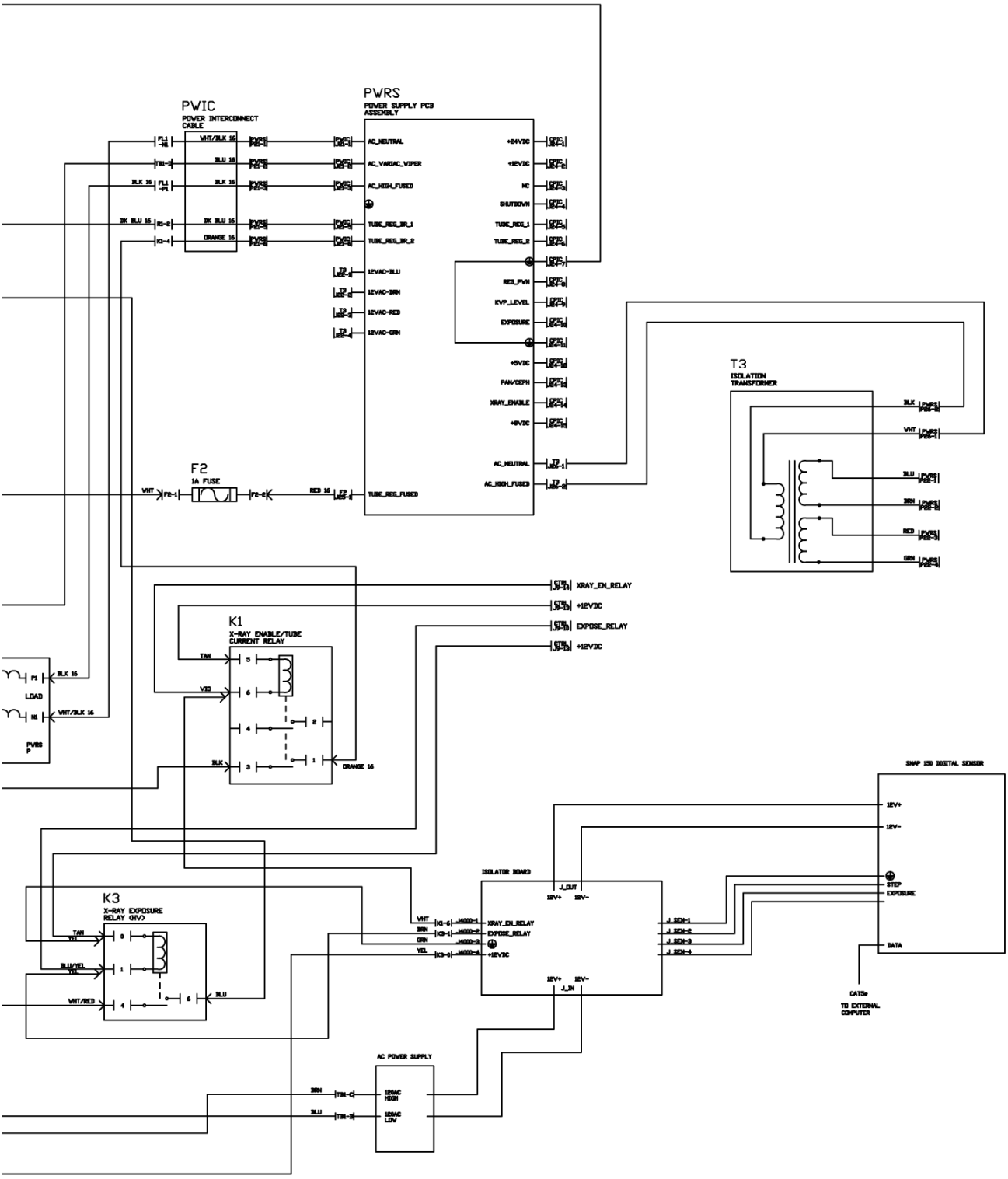


Schematics – Wiring

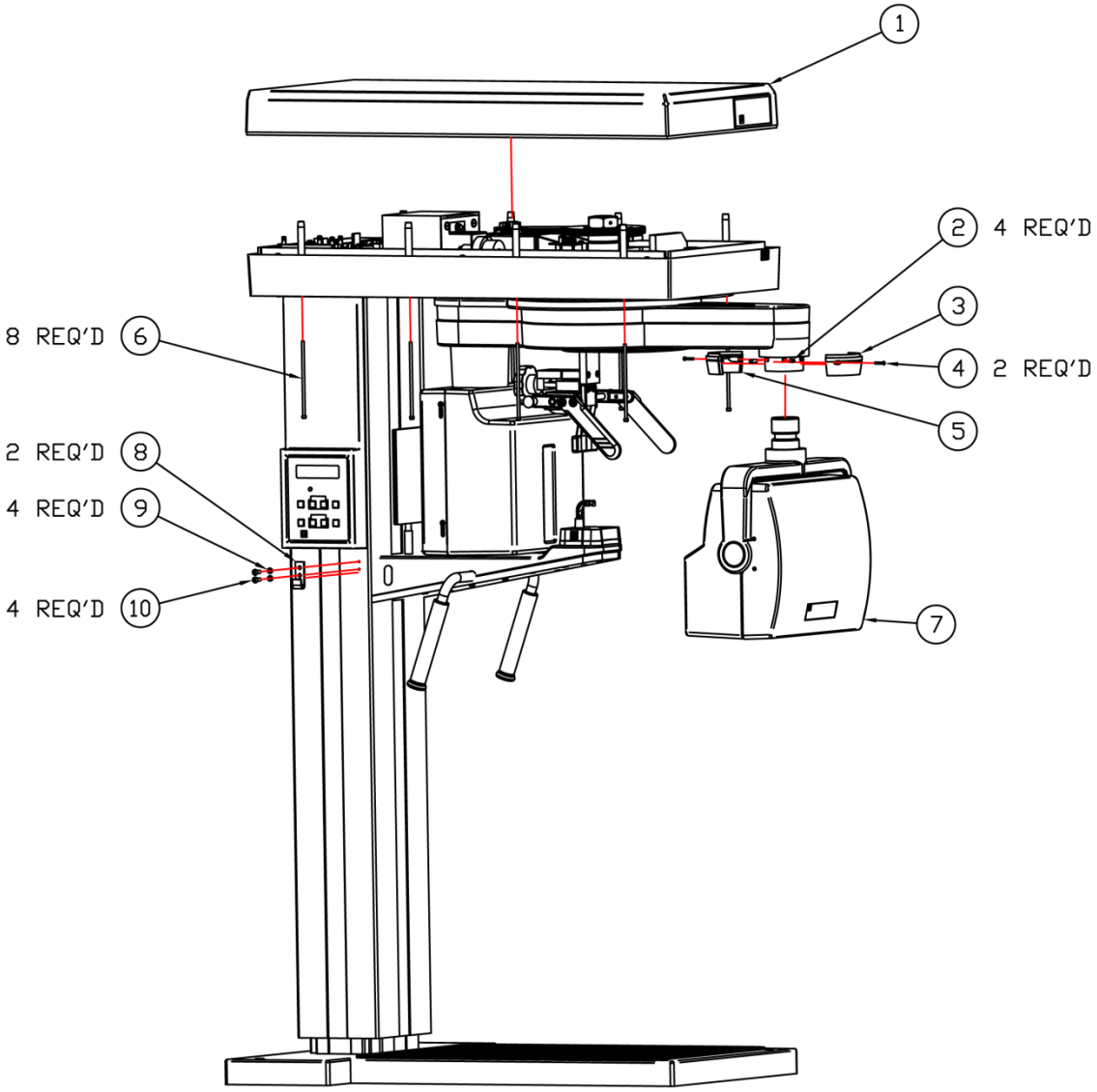
APCA - APERATURE CONTROL ASSEMBLY
COMC - COMMUNICATIONS CABLE
CPIC - CONTROL/POWER INTERFACE CABLE
CTRL - CONTROLLER PCB ASSEMBLY
CUDC - COLUMN UP/DOWN MOTOR CABLE
CUDM - COLUMN UP/DOWN MOTOR ASSEMBLY
D1 - DIODE
DIPL - DISPLAY/INPUT PANEL ASSEMBLY
ECSA - EXPOSURE CONTROL SWITCH ASSEMBLY
ECSC - EXPOSURE SWITCH CONTROL CABLE
F1 - 2A FUSE
F2 - 1A FUSE
FL1 - LINE FILTER
K1 - X-RAY ENABLE/TUBE CURRENT RELAY
K3 - X-RAY EXPOSURE RELAY (HV)
PEM - MAINS POWER ENTRY MODULE
PWIC - POWER INTERCONNECT CABLE
PWRS - POWER SUPPLY PCB ASSEMBLY
R1 - 50 Ω 50W WW RESISTOR
R3 - 5Ω 25 W WW RESISTORRARM - ROTATING ARM MOTOR
RLSC - ROTATION LIMIT SWITCH CABLE
S5 - CW ROTATION LIMIT SWITCH
S6 - CCW ROTATION LIMIT SWITCH
T3 - TORIDAL ISOLATION TRANSFORMER
TB1 - TERMINAL BLOCKVARI - VARIAC ASSMEBLY
TB2 - COLUMN MOTOR MAXIMUM HEIGHT SET POINT
XRAY - X-RAY TUBEHEAD ASSEMBLY
XRCC - X-RAY RELAY CONTROL CABLE
XTCC - X-RAY TUBEHEAD CONTROL CABLE



Schematics – Wiring

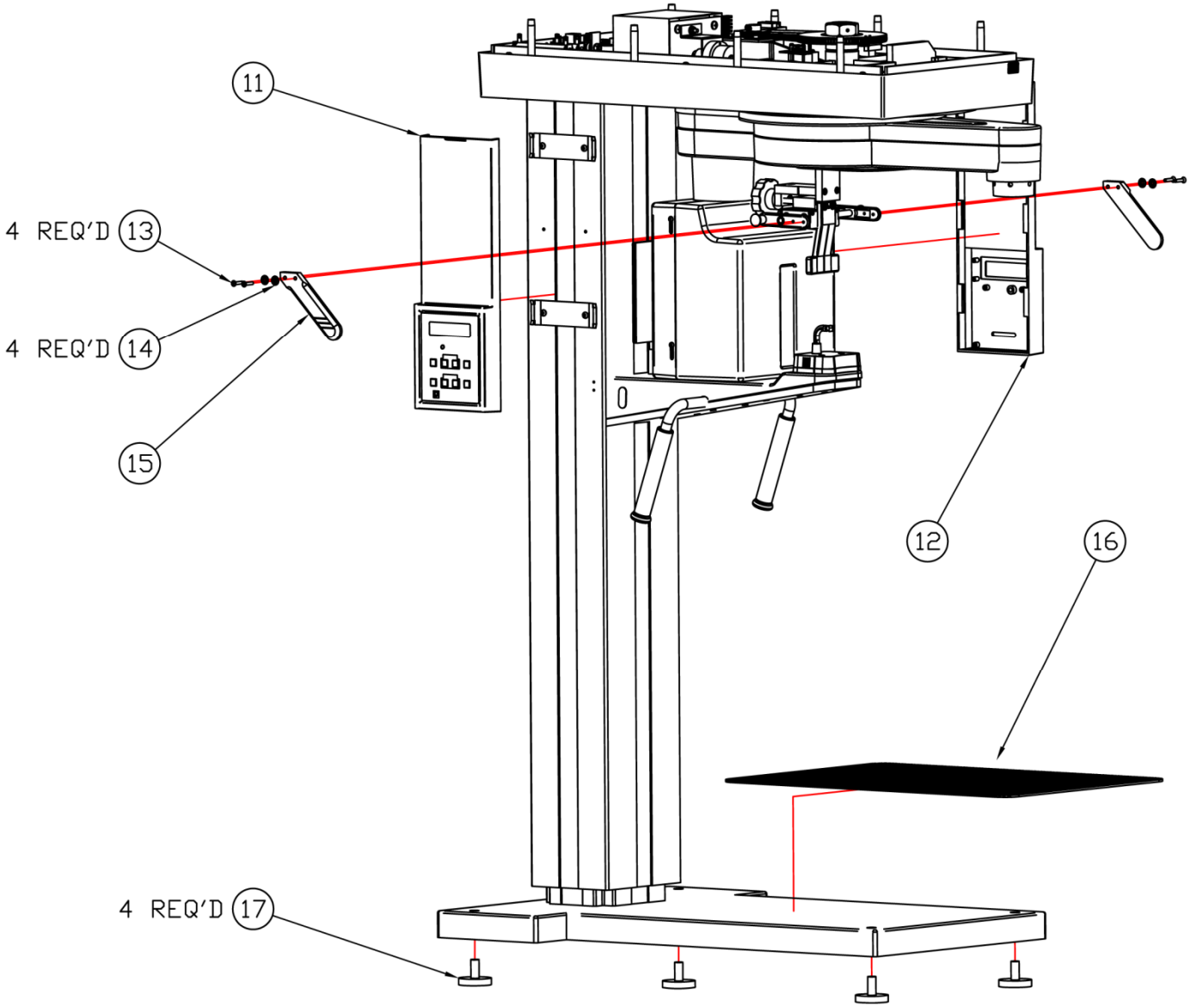


Final Assembly



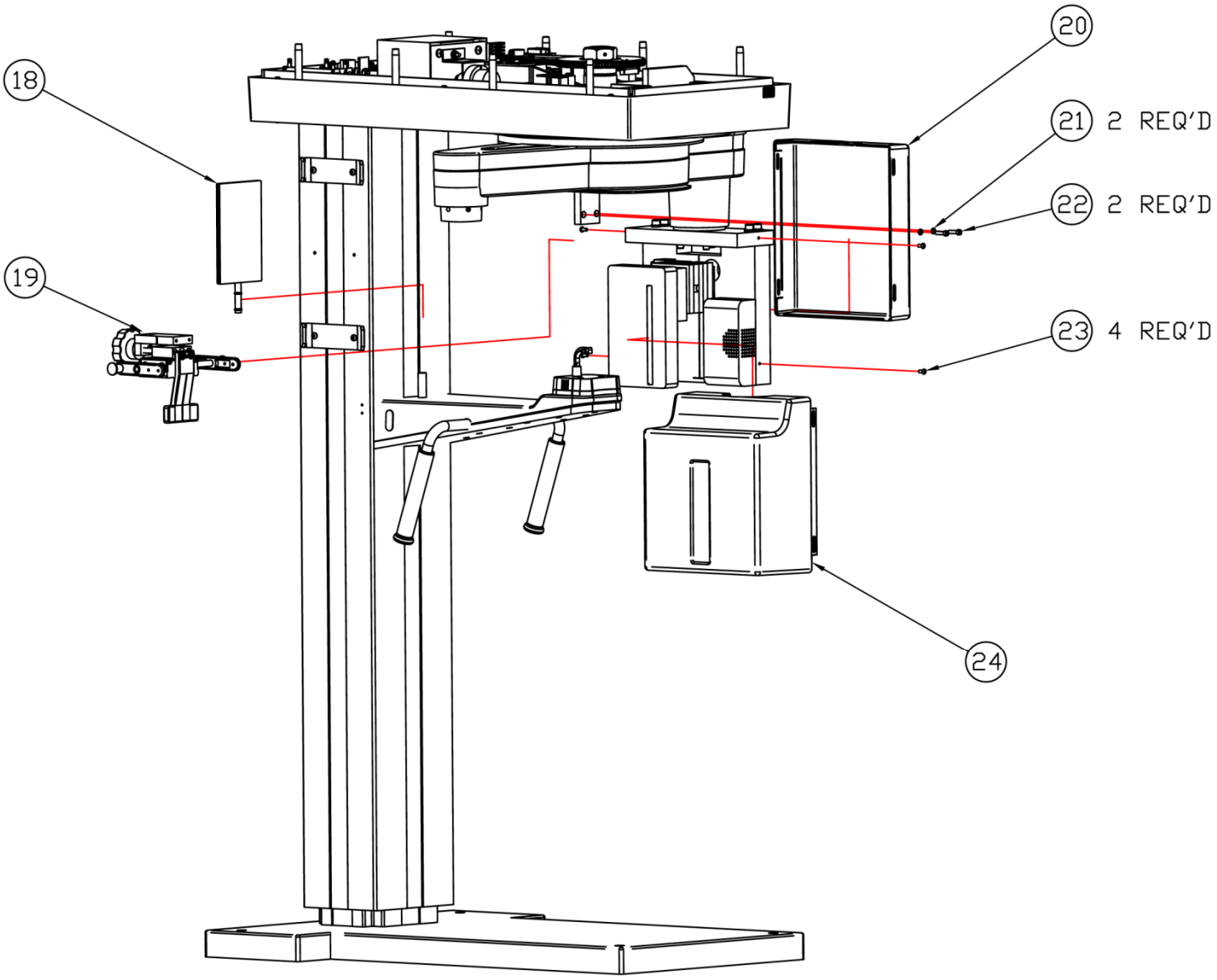
Item #	Part #	Description
1	300904-1	Cover, Chassis, Top
2	550033-523	Setscrew, 5/16-18, HFDOG
3	301054-2	Cover, Yoke Collar, Modified
4	550179-1	PHSMS, #4 X 3/4
5	301054-1	Cover, Yoke Collar
6	550168-1	SHCS 8-32 Special
7		Tubehead
8	301010-1	Hook, Exposure Switch
9	550148-10	Lockwasher, Split, #10
10	550035-31	BHCS, #10-24 X .63, Black

Final Assembly



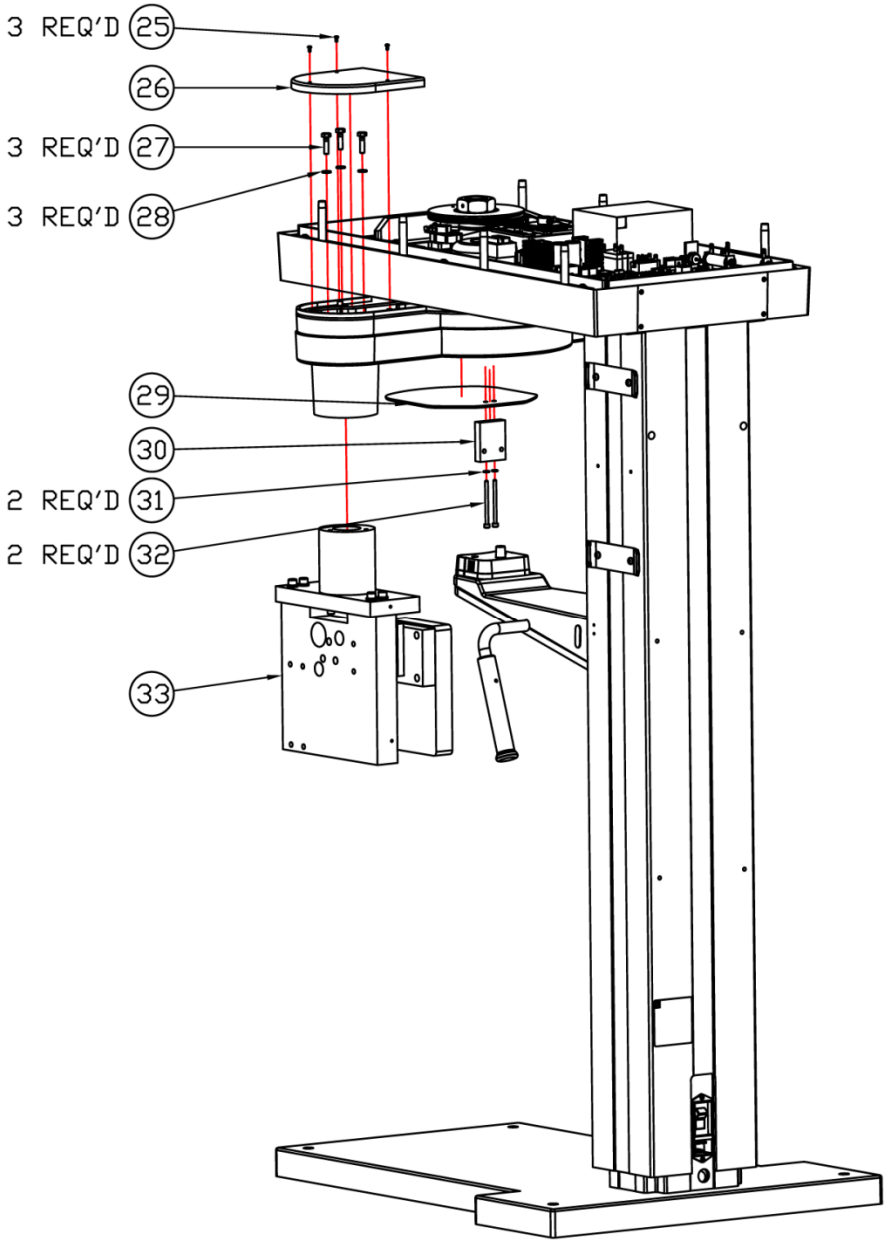
Item #	Part #	Description
11	801165-1	Display Panel Assembly
12	801192-1	Panel Assembly, Plain
13	318028-96	FHMS, 8-32 X 3/4, SS, PHIL
14	133223-1	Washer, Special, Head Support
15	229053-1	Support Head Left
15	229052-1	Support Head Right
16	318555-2	Tread, Foot
17	229847-2	Assembly, Leveling Foot

Final Assembly



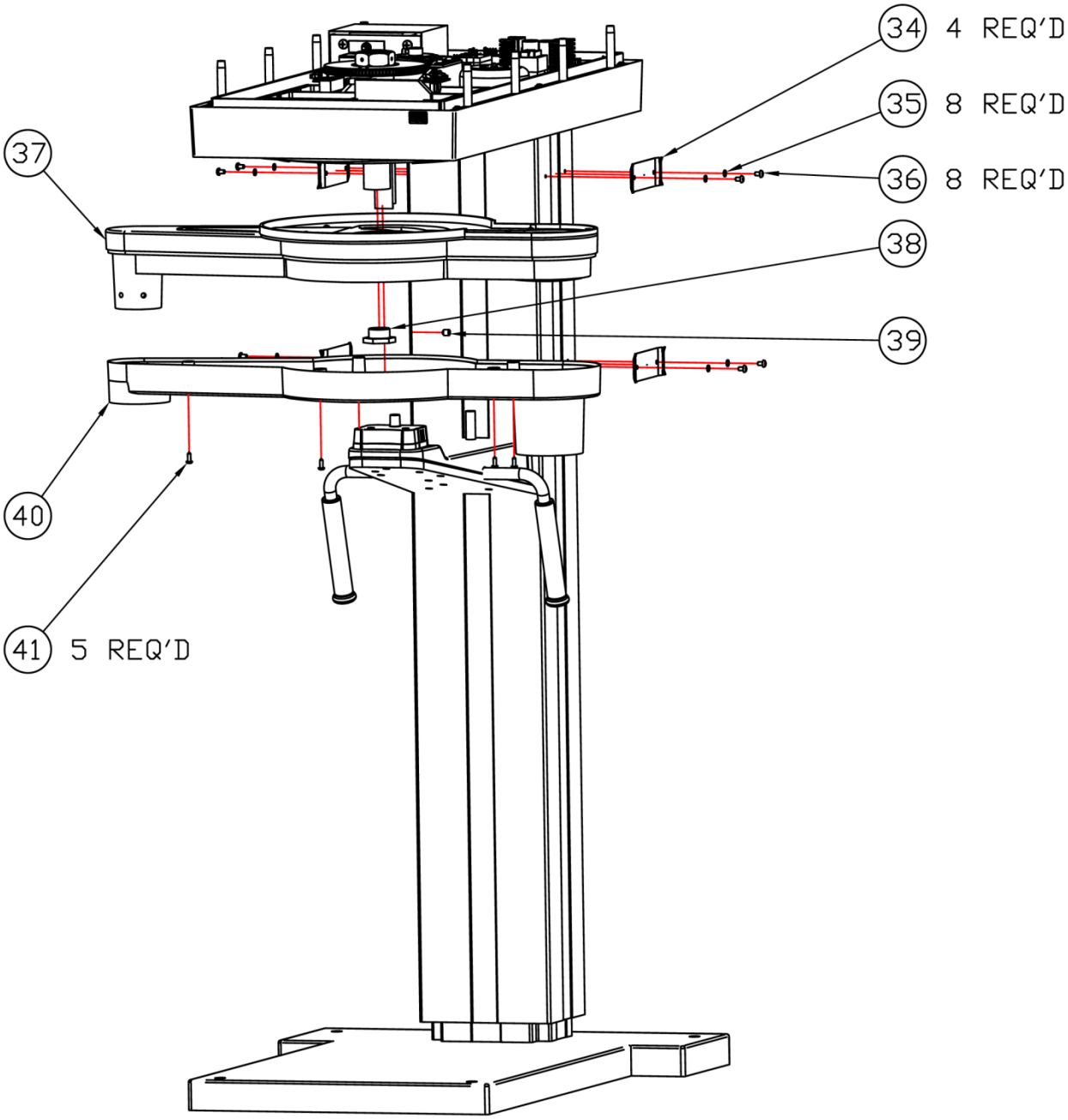
Item #	Part #	Description
18	801321-1	Mirror Assembly
19	419340-4	Head Support Assembly
20	301188-1	AJAT Cover, Rear
21	550148-10	Lockwasher, Split, #10
22	550052-035	SHCS, 10-24 X 3/4, Coarse, Blk
23	550100-23	#8-32 X 3/8 BHCS
24	301189-1	AJAT Cover, Front

Final Assembly



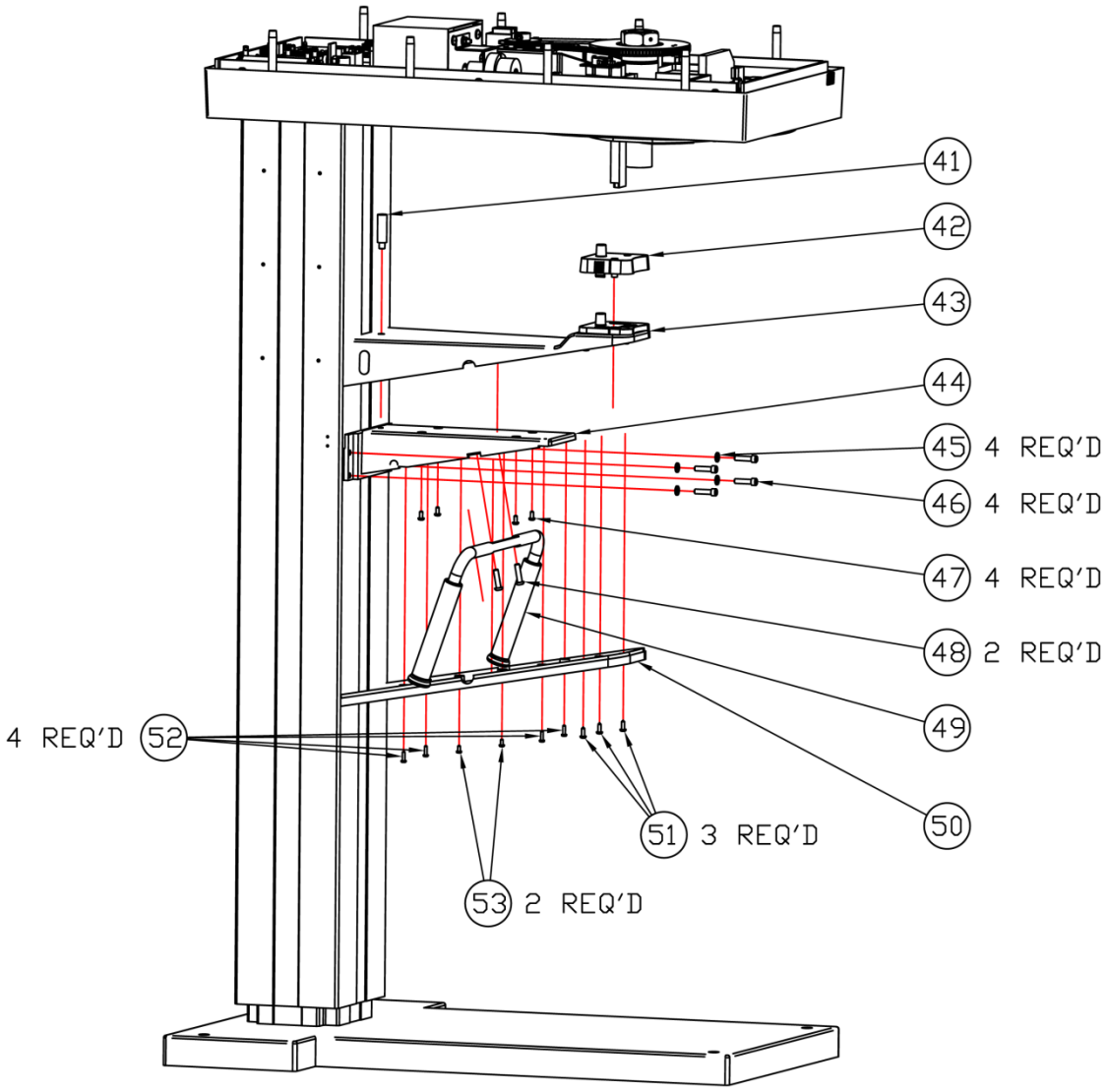
Item #	Part #	Description
25	550035-7	BHCS, #4-40 X .25, Black
26	300754-1	Cover, Wheel
27	550151-05	HHCS, 1/4-20 X 1, Zinc
28	550148-13	Lockwasher, Split, ¼
29	301107-1.002	Fixed Cover, Finished
30	301116-2.001	Sliding Plate Support
31	550148-10	Lockwasher, Split, #10
32	550052-043	SHCS, 10-24 X 1/2, Coarse
33	801405-1	AJAT Camera Holder Assembly

Final Assembly



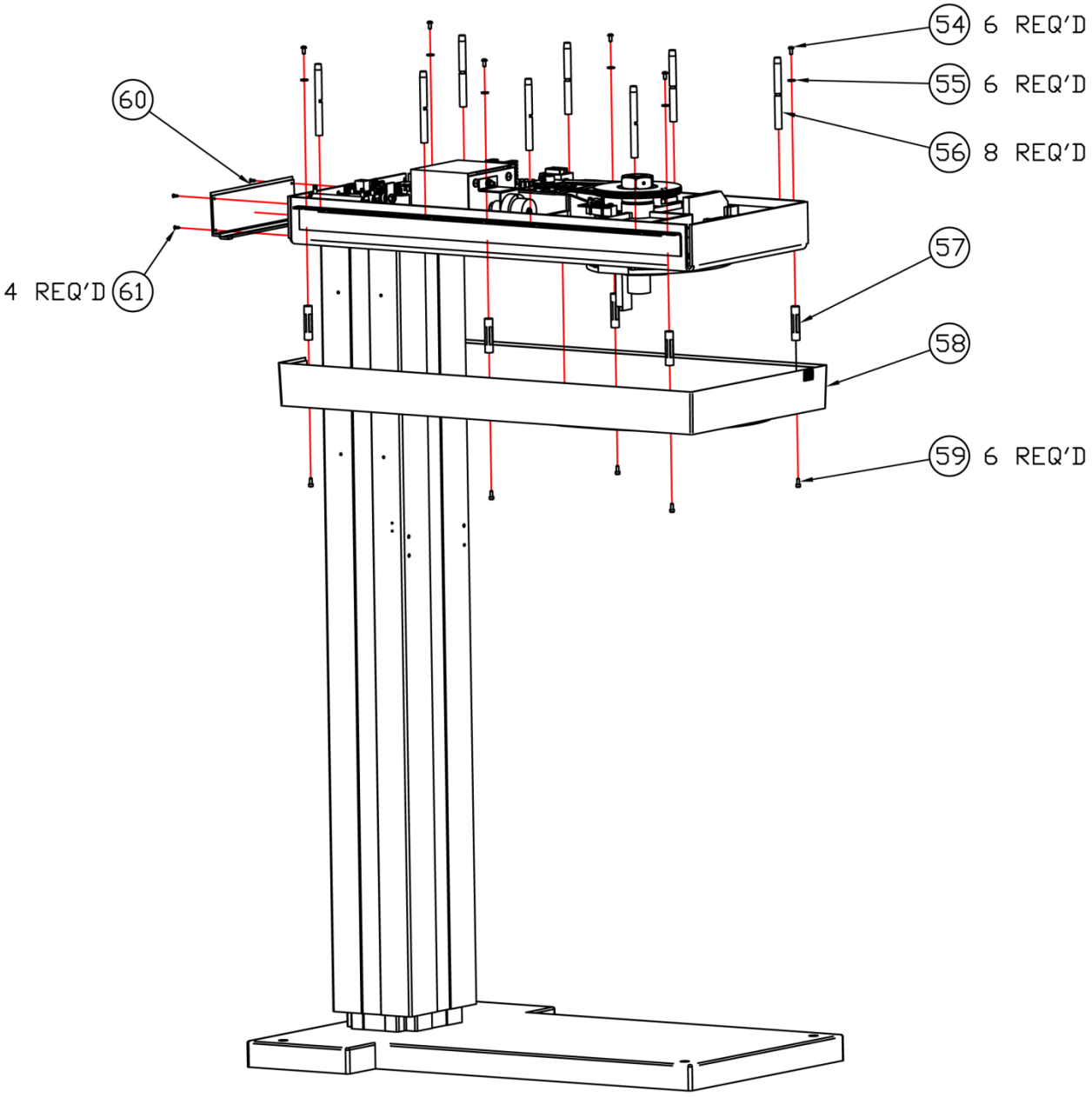
Item #	Part #	Description
34	300946-1	Retainer, Side Cover
35	550148-10	Lockwasher, Split, #10
36	550015-124	PHMS, #10-24 X 5/16, Zinc
37	801134-2	Rotating Arm Assembly, Digital
38	301187-1.001	Collar, Special, Finished
39	550033-75	Setscrew, 5/16-18 X 3/8, Plain
40	300753-1	Cover, Rotating Arm, Bottom
41	550053-13	Screw, Self-Tap, #6 X 1.0

Final Assembly



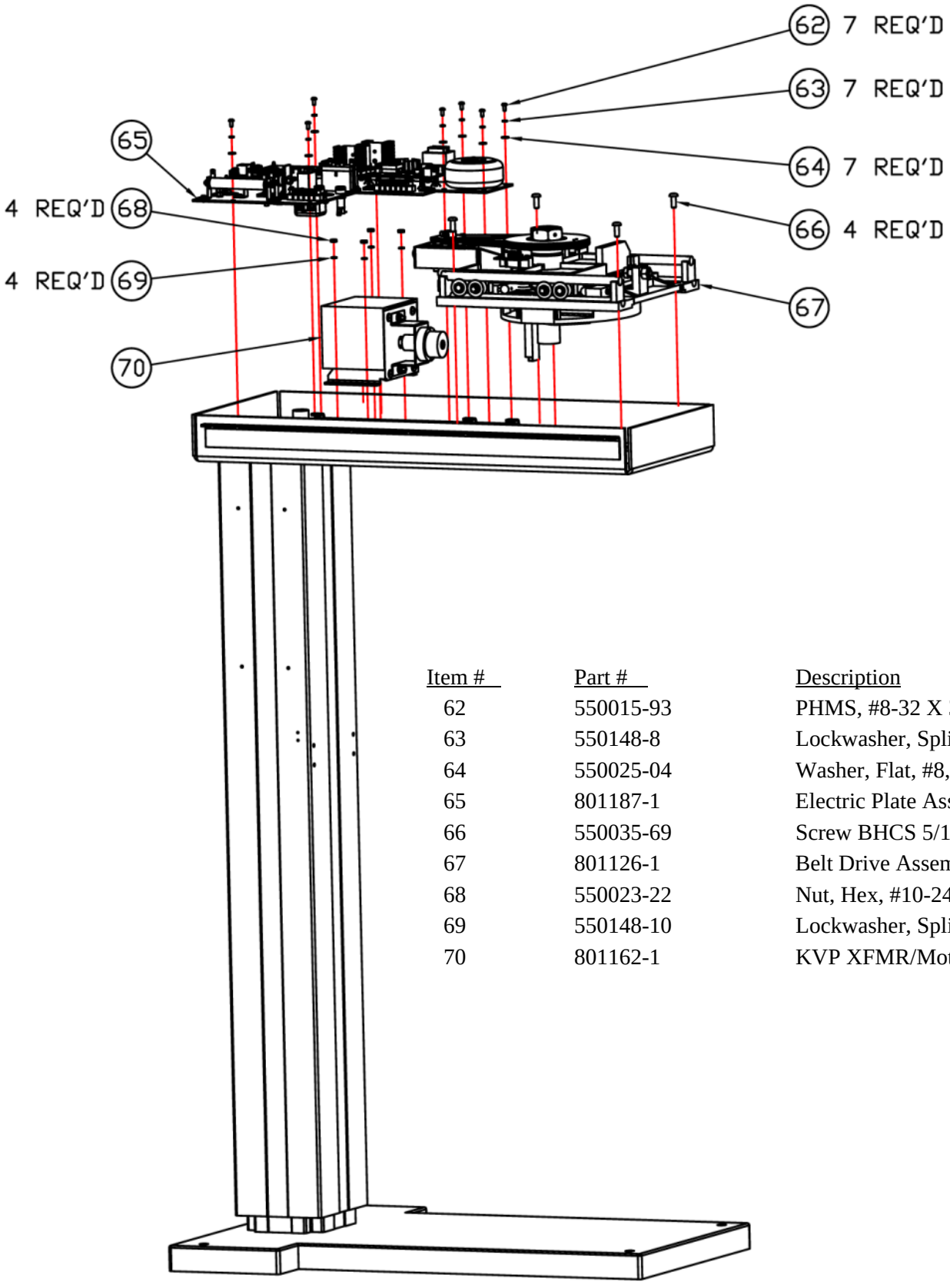
Item #	Part #	Description
41	301106-1.001	Mirror Mount
42	301157-1	Chin Spacer
43	801407-1	Chin Arm Top Cover Assembly
44	801319-1	Chin Arm Assembly
45	550148-13	Lockwasher, Split, 1/4
46	550052-050	SHCS, 1/4-20 X 1.0, Coarse, Blk
47	550015-93	PHMS, #8-32 X 3/8, Zinc
48	550035-50	BHCS, 1/4-20 X 1.00, Black
49	801320-1	Handle Assembly
50	301102-1	Cover, Chin Arm, Bottom
51	550015-93	PHMS, #8-32 X 3/8, Zinc
52	550015-60	PHMS, #6-32 X 1/2, Zinc
53	550015-58	PHMS, #6-32 X 5/16, Zinc

Final Assembly



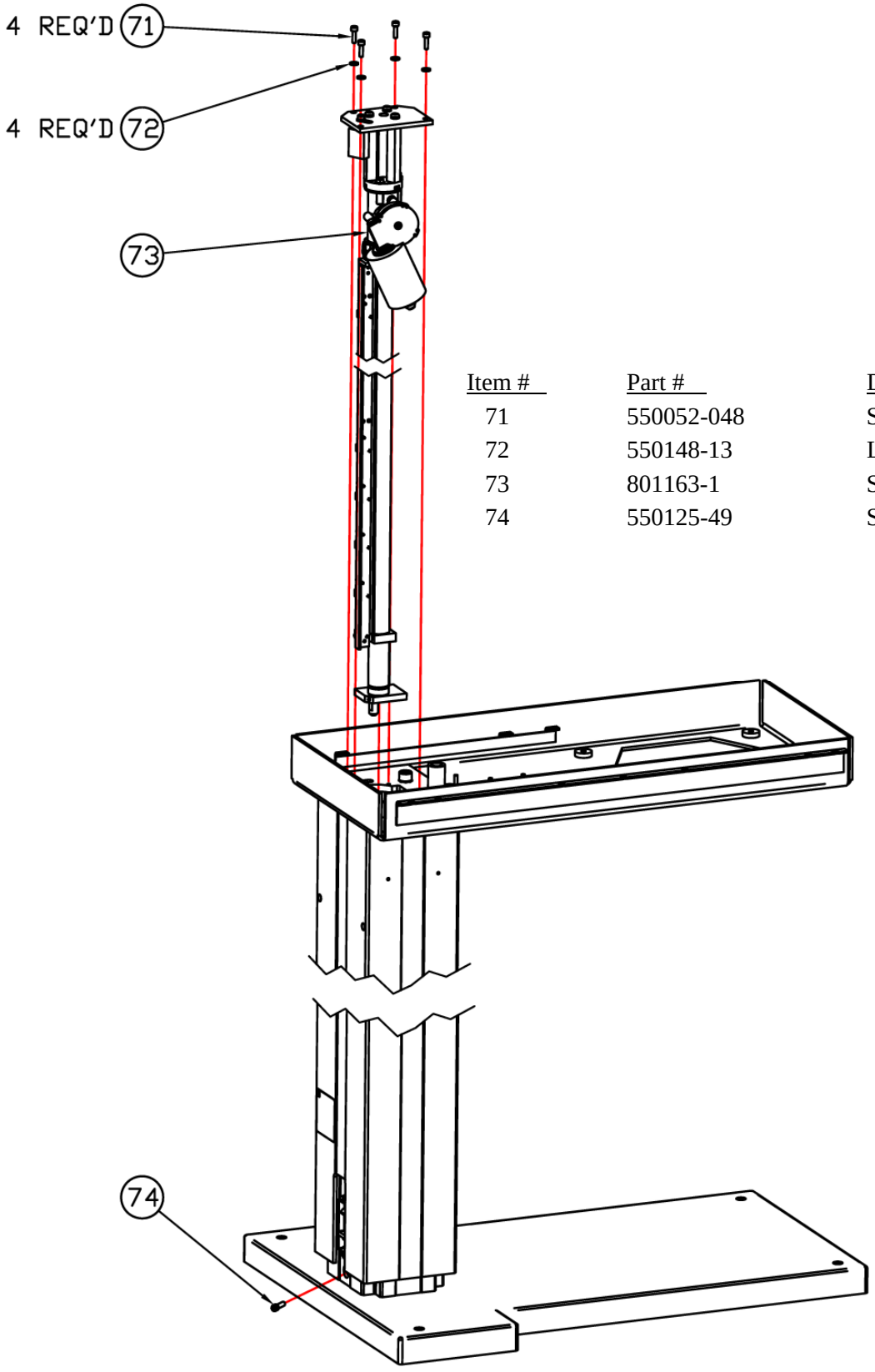
Item #	Part #	Description
54	550015-93	PHMS, #8-32 X 3/8, Zinc
55	550025-04	Washer, Flat, #8, Steel, ZP
56	301153-1	Stand Off Spacer, Long
57	301155-1	Stand Off Spacer, Short
58	300905-1	Cover, Chassis, Bottom
59	550052-021	SHCS, 8-32 X 3/8 Coarse, Blk
60	301158-1	Bottom Cover, Back
61	550181-1	#4-40 X 3/8 PHSMS

Final Assembly



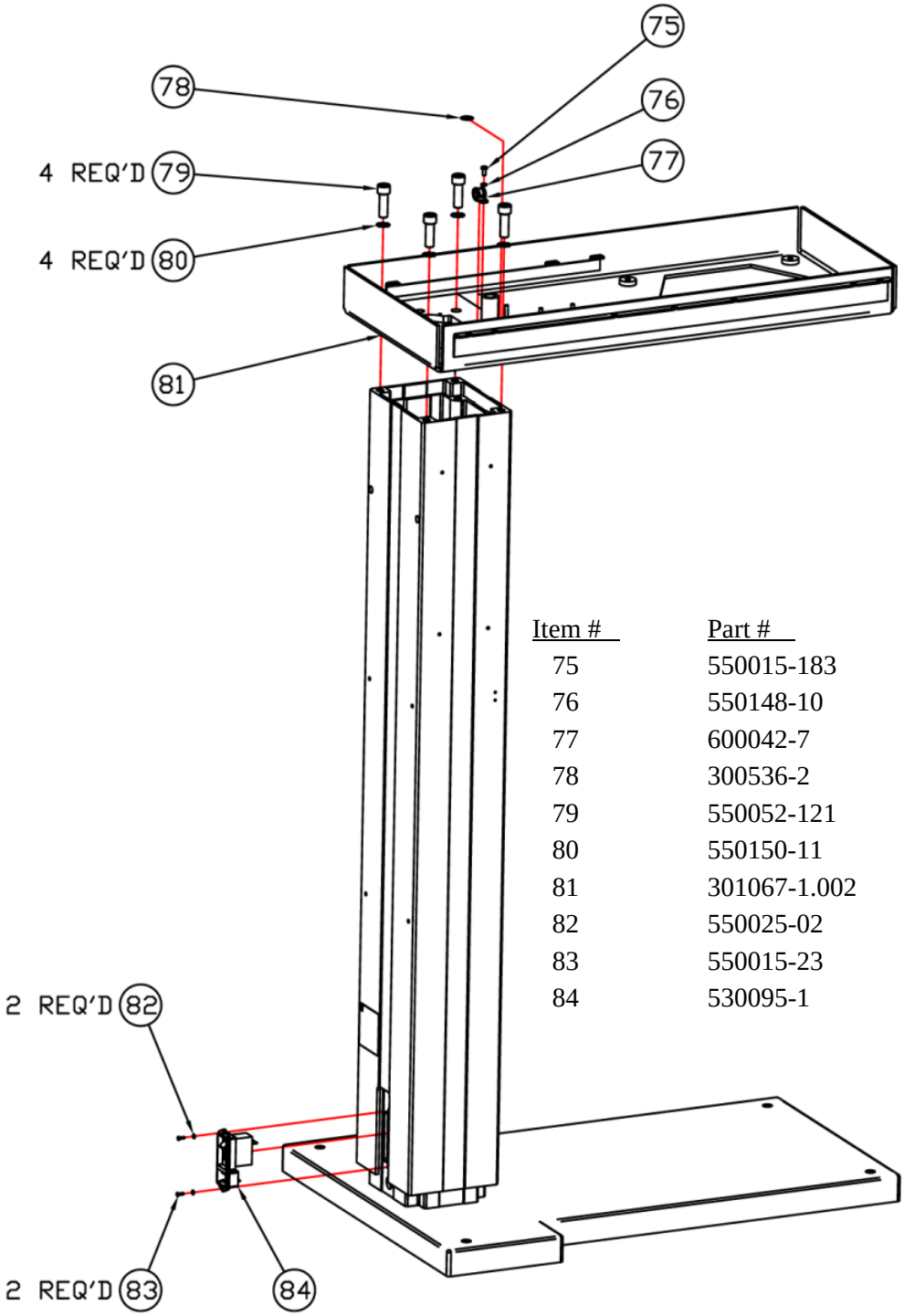
Item #	Part #	Description
62	550015-93	PHMS, #8-32 X 3/8, Zinc
63	550148-8	Lockwasher, Split, #8
64	550025-04	Washer, Flat, #8, Steel, ZP
65	801187-1	Electric Plate Assembly
66	550035-69	Screw BHCS 5/16-24
67	801126-1	Belt Drive Assembly
68	550023-22	Nut, Hex, #10-24, Steel
69	550148-10	Lockwasher, Split, #10
70	801162-1	KVP XFMR/Motor Assembly

Final Assembly

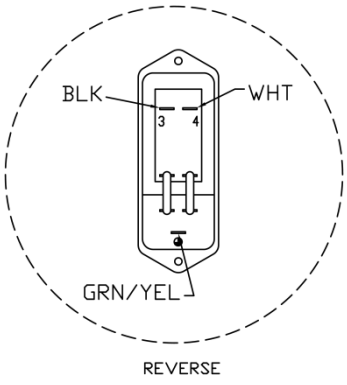


Item #	Part #	Description
71	550052-048	SHCS, 1/4-20 X 3/4, Coarse, Blk
72	550148-13	Lockwasher, Split, ¼
73	801163-1	Screw Drive Assembly
74	550125-49	SHCS, 1/4-20 X 7/8 SS

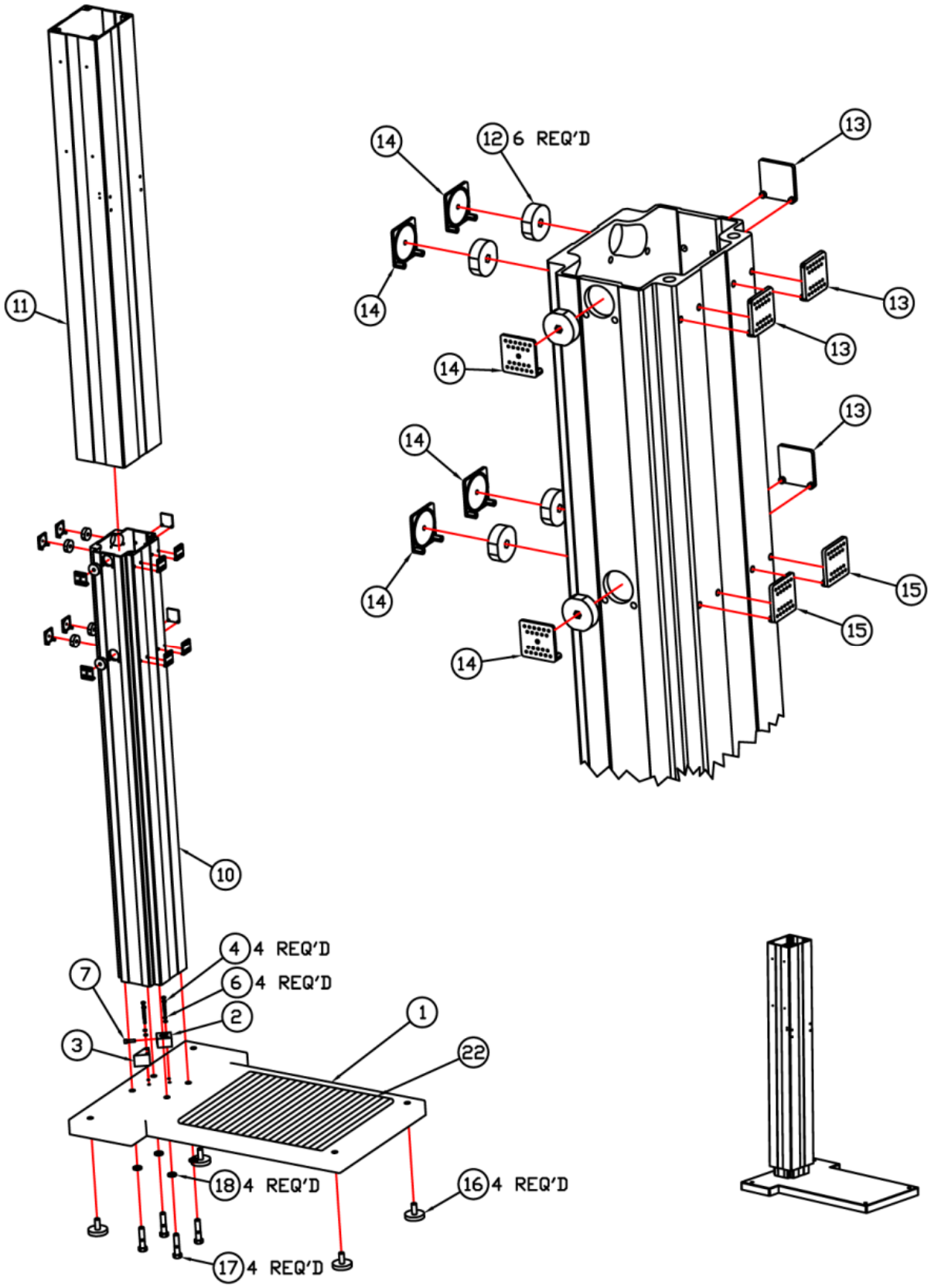
Final Assembly



Item #	Part #	Description
75	550015-183	PHMS, #10-32 X 7/16, Zinc
76	550148-10	Lockwasher, Split, #10
77	600042-7	Clamp, Santoprene, #7, 7/16
78	300536-2	Decal, GND W/Blk Circle
79	550052-121	SHCS, ½-13 X 1 ½, Coarse
80	550150-11	Lockwasher, Ext, 1/2
81	301067-1.002	Chassis Weldment, Finished
82	550025-02	Washer, Flat, #4, Steel, ZP
83	550015-23	PHMS, #4-40 X 3/8, Zinc
84	530095-1	Module, Power, 2 Pole, 10A

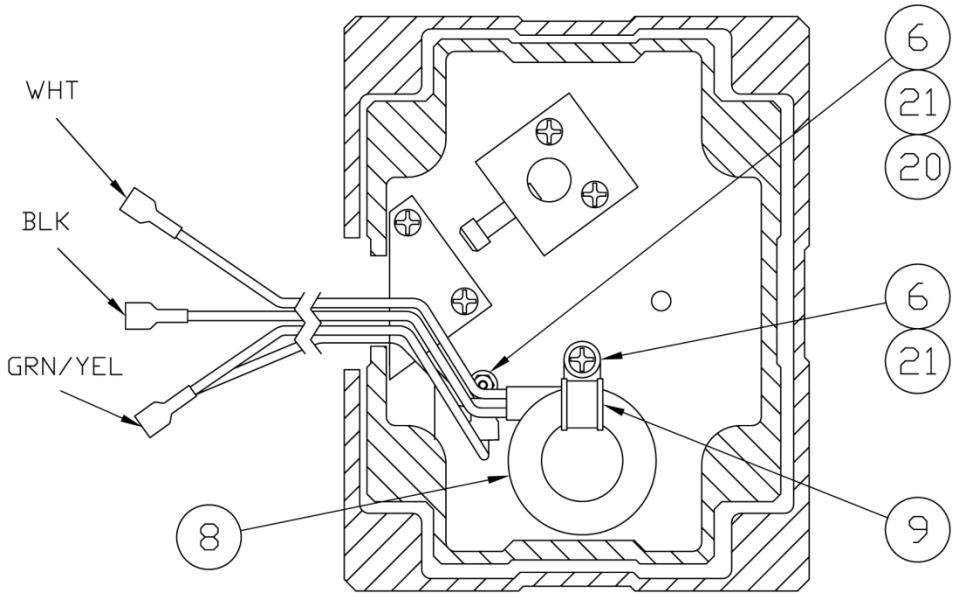


X-Ray Machine Base Assembly

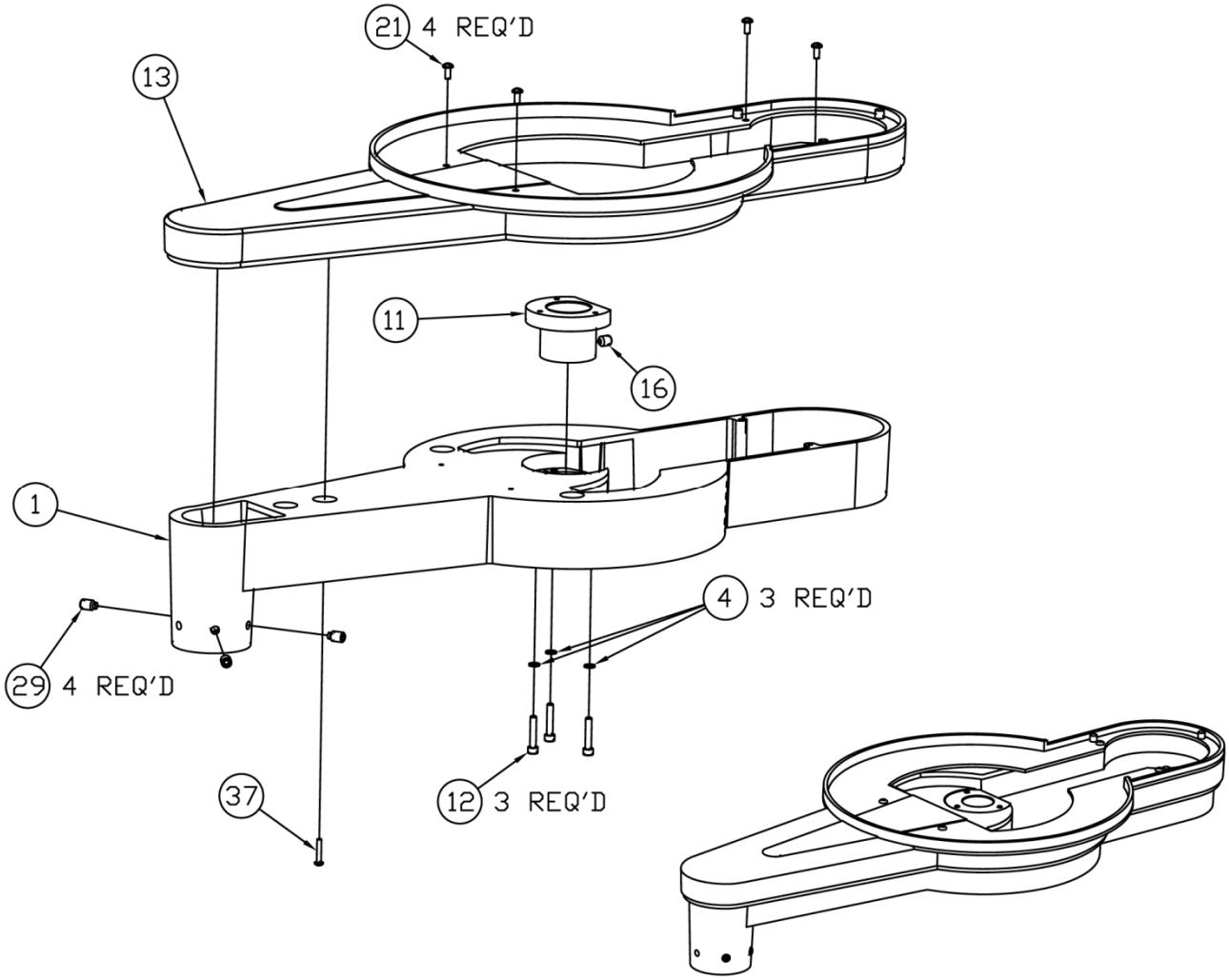


X-Ray Machine Base Assembly

Item #	Part #	Description
1	300775-1.002	Base, Weldment, Finished
2	301013-1.001	Block, Drive, Finished
3	300947-1.001	Guide, Finished
4	550015-117	PHMS, #10-32 X 1 3/4, Zinc
6	550148-10	Lockwasher, Split, #10
7	550125-49	SHCS, 1/4-20 X 7/8, SS
8	801145-1	Cable Assembly, Spiral
9	600042-1	Clamp, Santoprene, #7, 7/16
10	801241-1.002	Column, Inner, Finished
11	300916-1.002	Column, Outer, Finished
12	801147-1	Adjustment Plug w/ Nylock
13	660026-1	Bearing Pad
14	660026-2	Bearing Pad
15	660026-3	Bearing Pad
16	229847-2	Assembly Leveling Foot
17	550151-132	HHCS, 1/2-13 X 2 1/4, Zinc
18	550148-17	Lockwasher, Split, 1/2
20	550150-05	Lockwasher, Ext, #10
21	550015-110	PHMS, #10-32 X 1/2, Zinc
22	318555-2	Tread, Foot

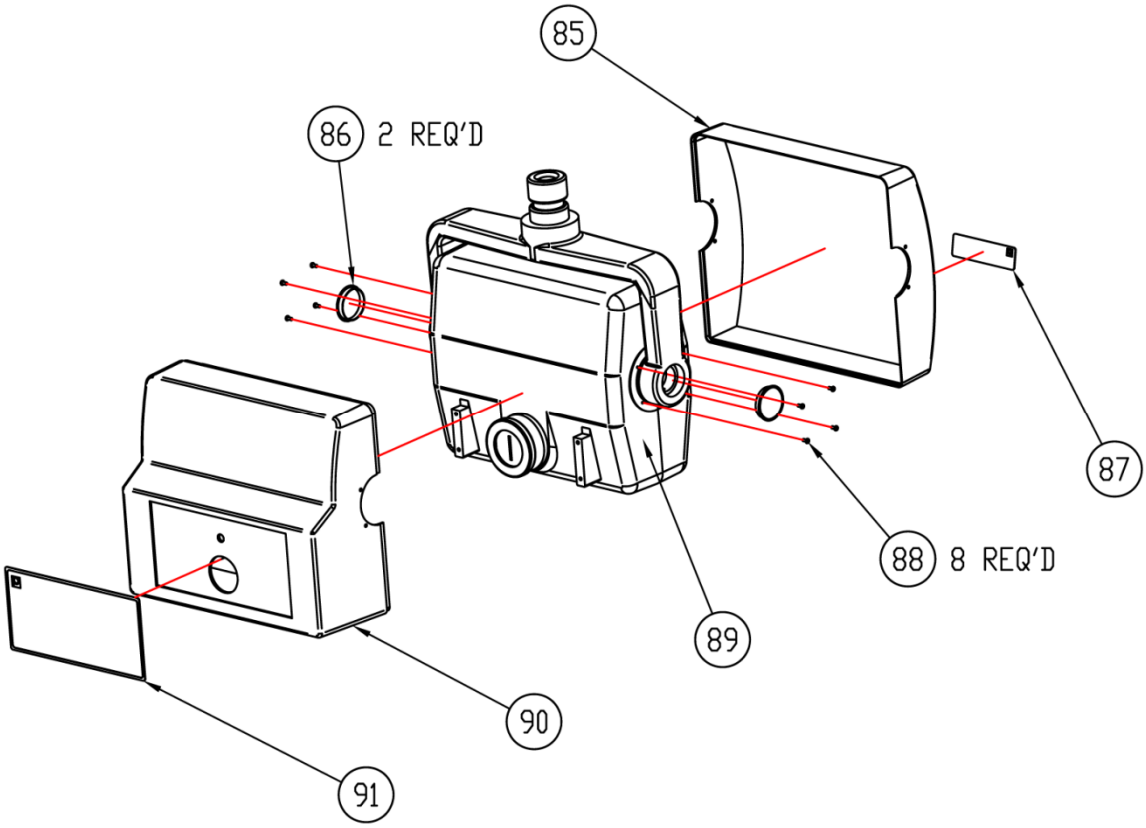


Digital Rotating Arm Assembly



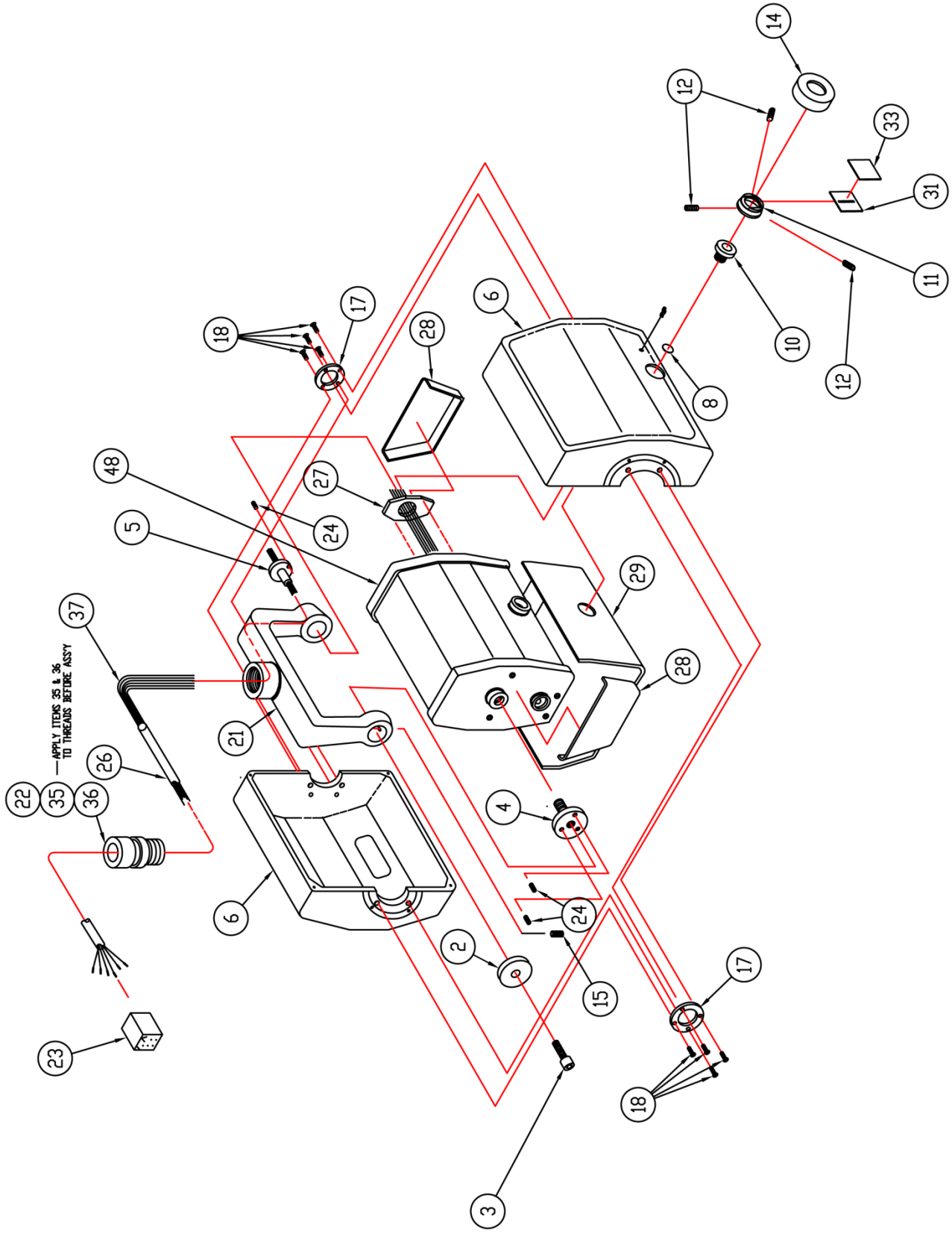
Item #	Part #	Description
1	801121-1	Rotating Arm Assembly
4	550148-10	Lockwasher, Split, #10
11	317927-2.001	Collar, Cam Shaft, Digital, Finished
12	550052-037	SHCS, 10-24 X 1.0, Coarse, Blk
13	300752-1	Top Cover, Rotating Arm
16	550033-75	Setscrew, 5/16-18 X 3/8, Plain
21	550015-93	PHMS, #8-32 X 3/8, Zinc
29	550033-523	Setscrew, 5/16-18 X 1/2, HFDOG
37	550015-63	PHMS, #6-32 X 7/8, Zinc

Tubehead



Item #	Part #	Description
85	301051-1	Cover, Tube, Rear
86	680008-18	Button, Plug
87	674074-1	Decal, X-Ray Tubehead
88	550035-7	BHCS, #4-40 X .25, Black
89	801119-1	X-Ray Tube & Yoke Assembly
90	301050-1	Cover Tube, Front
91	300958-1	Decal, Tubehead Aperture, PC-4000

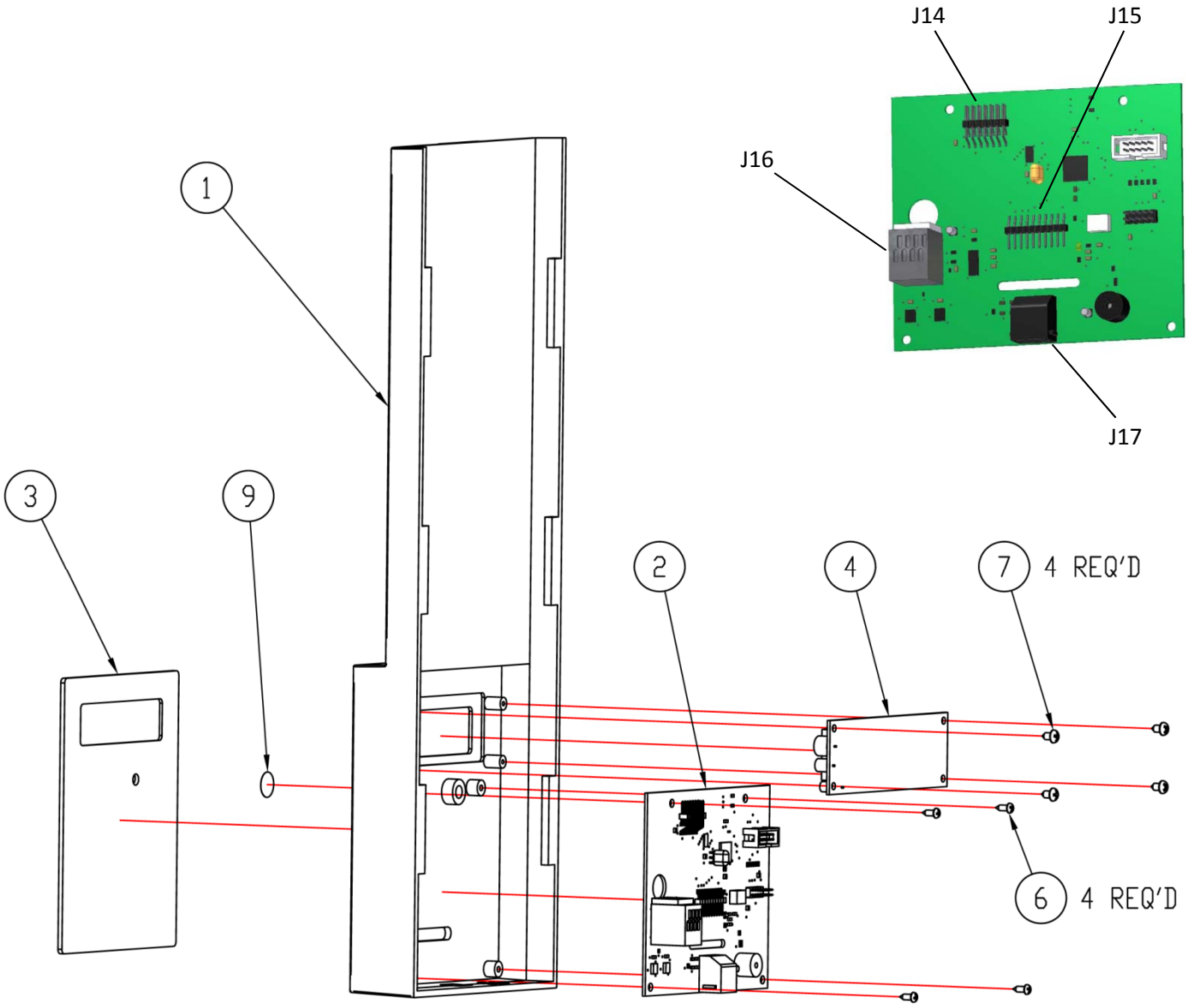
X-Ray Tube & Yoke Assembly



X-Ray Tube & Yoke Assembly

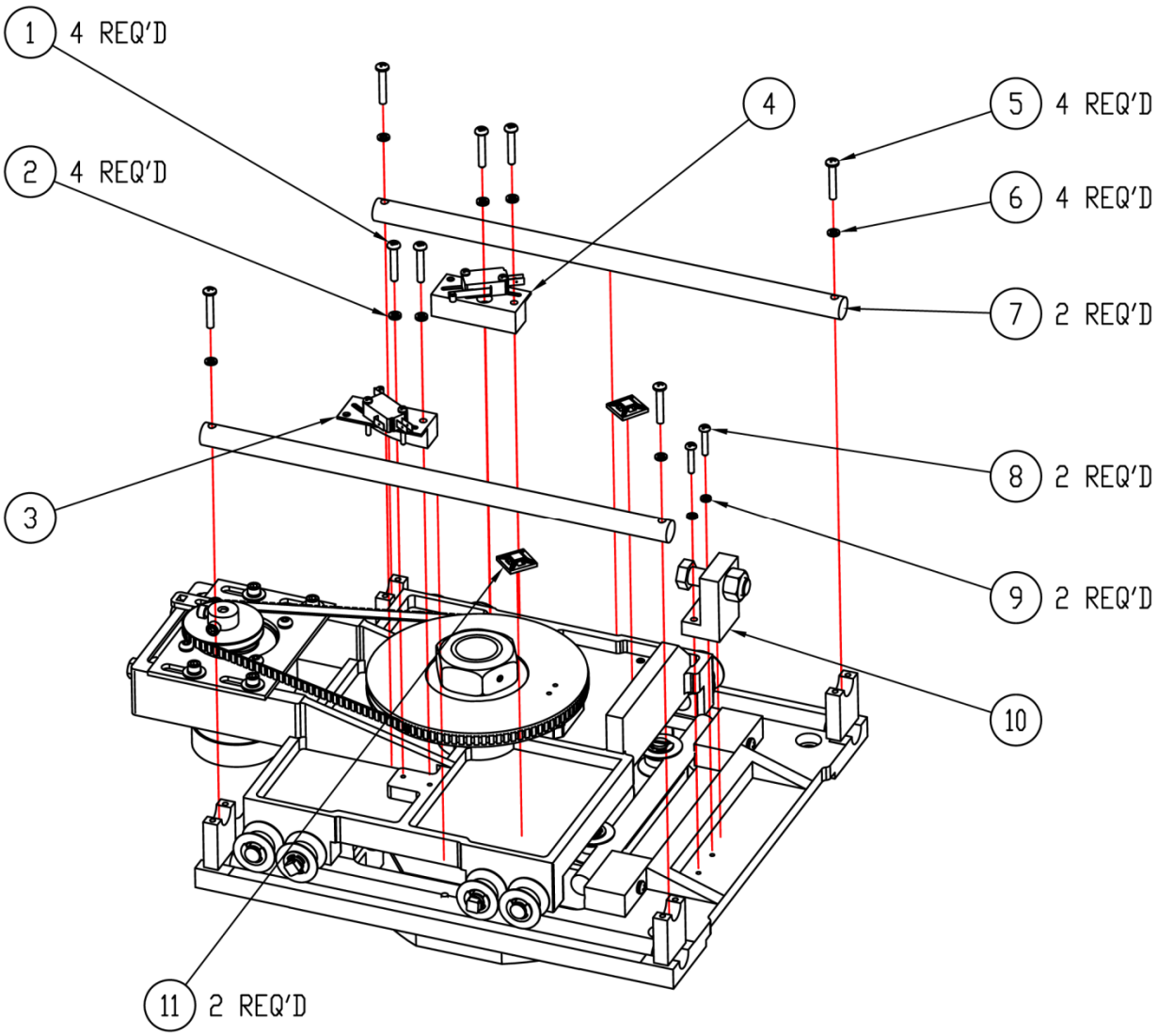
Item #	Part #	Description
2	301070-1.001	Washer, Special, Finished
3	550002-49	SHCS, UFT, 5/16-24 X 3/4
4	131718-1.001	Sleeve, RH Adjust
5	131719-1.001	Sleeve X-Ray Tube Housing
6	801118-1	Assembly, Tube Halves, Machined
8	131798-1	Shield, Radiation
10	229161-2.001	Collar, Col. Sup., Blk Oxide
11	317929-1	Collimator Support
14	229101-2.001	Collimator Ring
15	550033-242	Setscrew, 5/16-18 X 1/2, Flat
17	131717-1	Plate, Mounting
18	550036-28	PHMS-82D HD, #8-32 X .38
21	301059-1.002	Yoke, Machined, Finished
22	229114-1.001	Yoke Shaft
23	530117-6	Conn, Plug, .093, 6 Pos.
24	550149-14	Setscrew, #6-32 X 5/16, Cone
26	229564-3	PVC Tubing - 16
27	229552-1	Shield, Fish Paper
28	229551-1	Lead Wrap Ends
29	318024-1	Lead Wrap Face
31	131720-2	Collimator
33	133582-2	Decal, Collimator
35	640010-3	Primer, Loctite, 747, Yellow
36	640009-2	Threadlocker, 242, Blue
37	801338-1	Wiring Assembly, X-Ray Tube, UL
38	624035-8	Term, QD, .25 X .032, 16-14AWG
48	419321-1	Inner Tube Hsg. Assembly

Display Panel Assembly



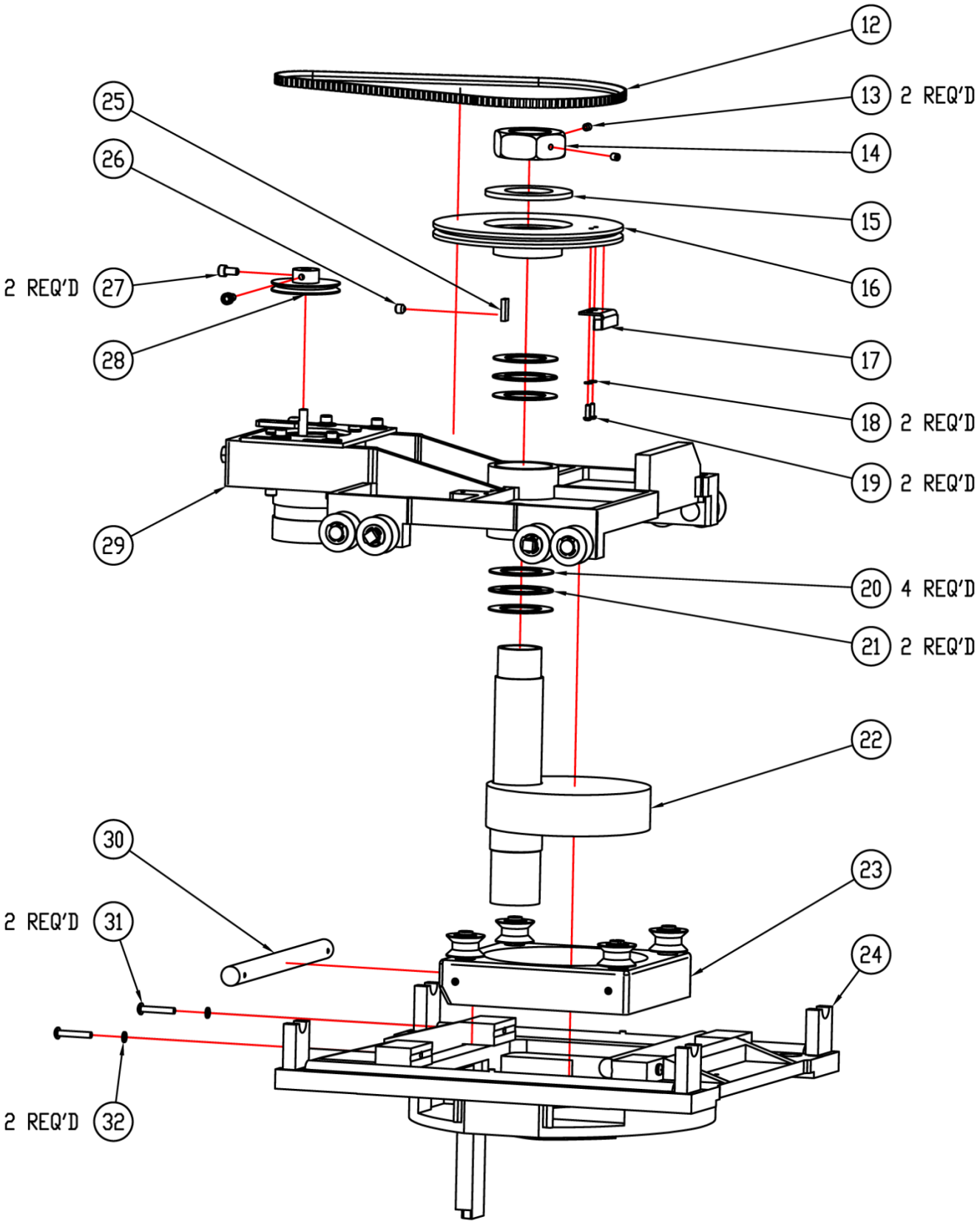
Item #	Part #	Description
1	301130-1	Cover, Modified, Display
2	801253-1	PCB Assembly, Prog, Display
3	674035-1	Keypad, Display
4	801345-1	Display & Connector Assembly
6	550053-7	Screw, Self-Tap, #6 X .25
7	550053-2	Screw, Self-Tap, #4 X .31
9	674050-1	Decal, Clear, Matte, 1/2" Dia.

Belt Drive Assembly



Item #	Part #	Description
1	550015-98	PHMS, #8-32 X 1, Zinc
2	550148-8	Lockwasher, Split, #8
3	801203-2	Switch and Bracket Assembly
4	801203-1	Switch and Bracket Assembly
5	550015-98	PHMS, #8-32 X 1, Zinc
6	550148-8	Lockwasher, Split, #8
7	229305-1.004	Rod, Guide Top, Plated
8	550015-62	PHMS, #6-32 X 3/4, Zinc
9	550148-6	Lockwasher, Split, #6
10	801252-1	Stop Block Assembly
11	133455-1	Cable Tie Mount

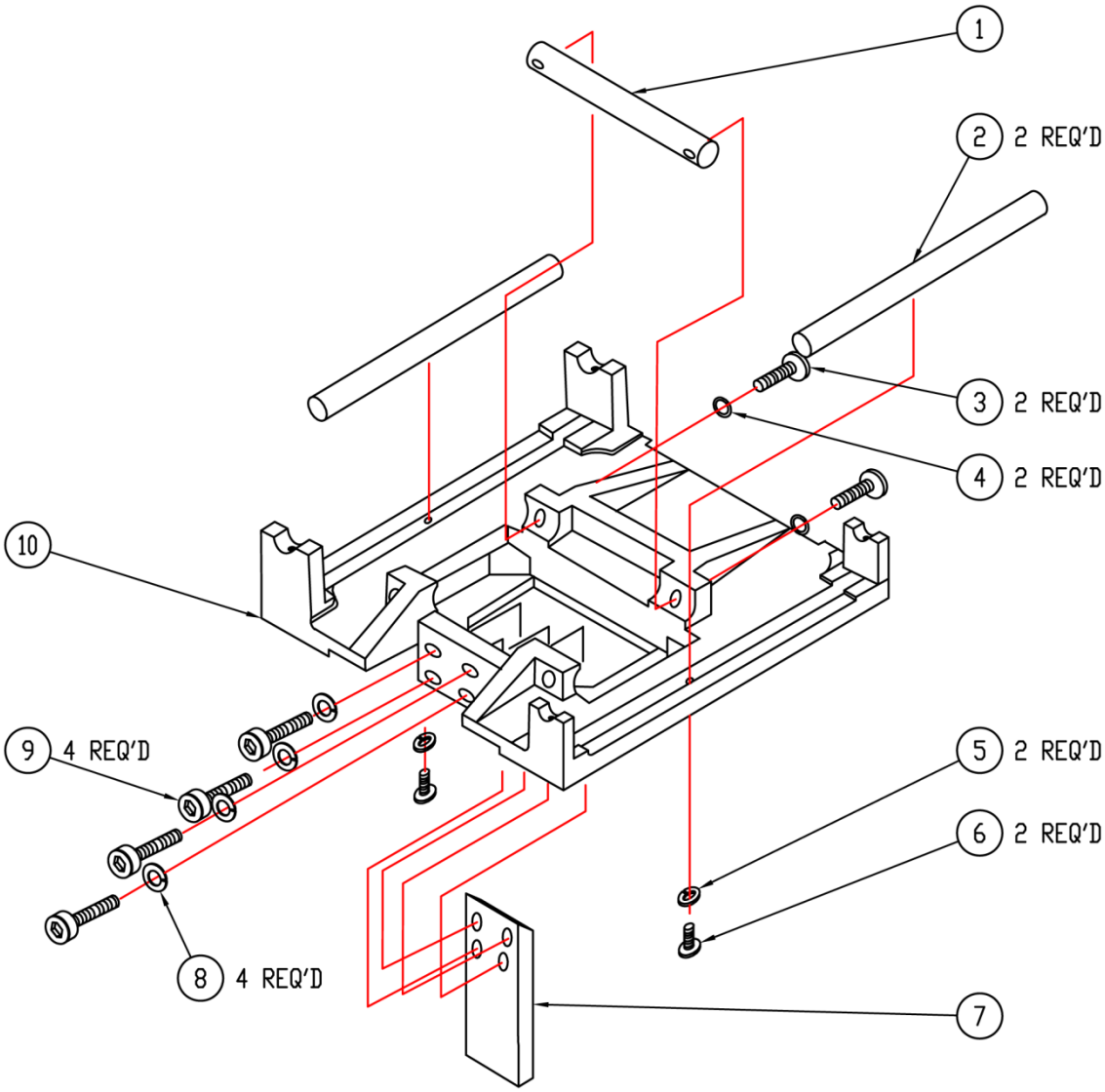
Belt Drive Assembly



Belt Drive Assembly

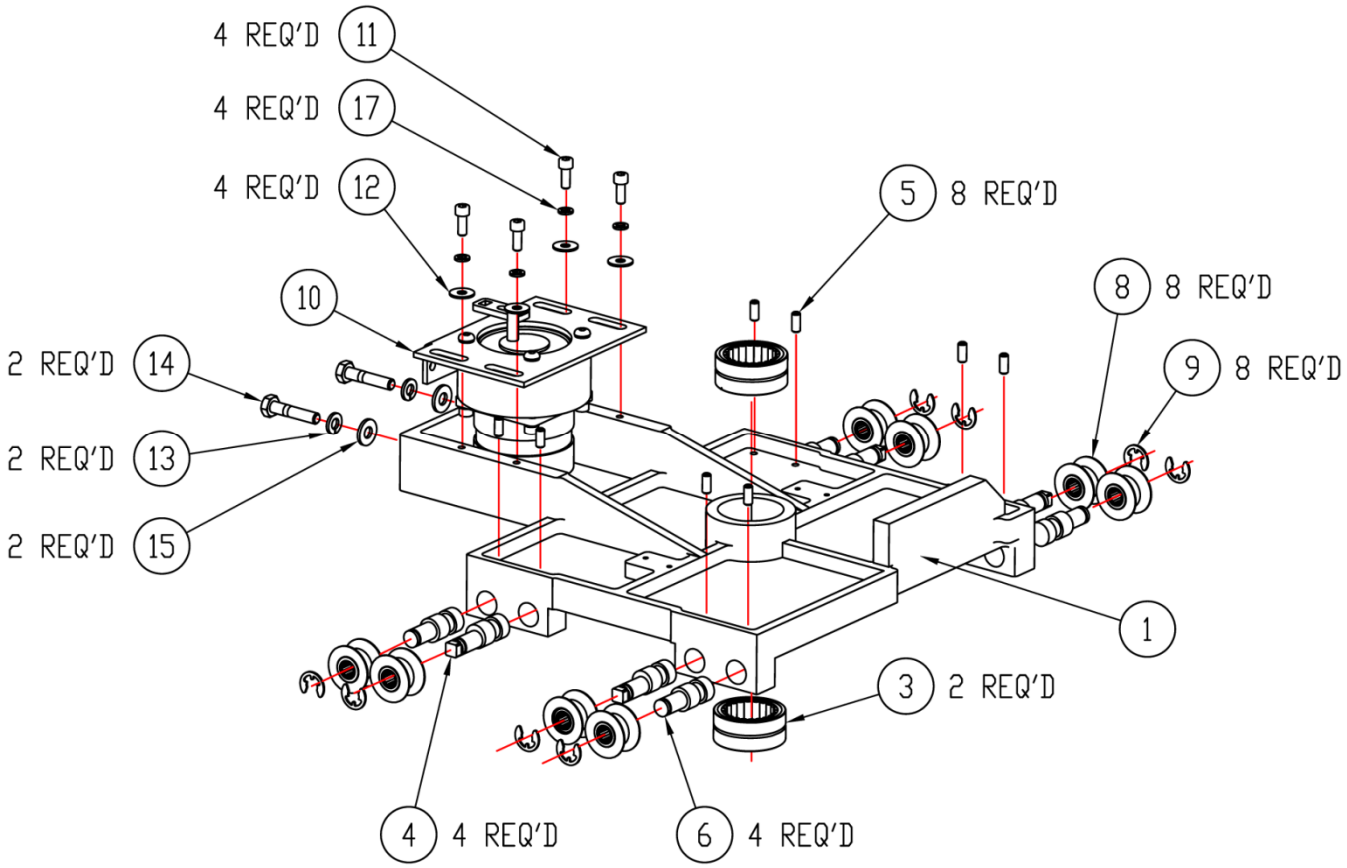
Item #	Part #	Description
12	300331-2	Facelift Drive Belt
13	550149-243	Setscrew, #10-24 X 1/4, Cup
14	131708-2	Nut, Hex, Spc, 1 1/4-12, Mach
15	550025-23	Washer, Flat, 1-1/4, Steel
16	300771-1.001	Pulley, Driven, Finished
17	301025-1	Actuator, Switch
18	550148-4	Lockwasher, Split, #4
19	550015-23	PHMS, #4-40 X 3/8, Zinc
20	229171-3	Washer, Thrust, Facelift
21	229066-3	Thrust, Needle Bearing, Facelift
22	801129-1	Cam/Shaft Subassembly
23	317947-2	Cam Holder Assembly, Facelift
24	317909-5	Lower Drive Assembly
25	131773-2	Key, Upper Drive-Shaft Facelift
26	550149-253	Setscrew, 1/4-20 X 1/4, Cup
27	550002-22	SHCS, UFT, 10-32 X 3/8, BL OX
28	300957-1.001	Pulley, Motor Drive, Finish
29	801127-1	Upper Belt Drive Assembly
30	317940-2.004	Rod, Guide Center, Plated
31	550015-98	PHMS, #8-32 X 1, Zinc
32	550148-8	Lockwasher, Split, #8

Lower Drive Assembly



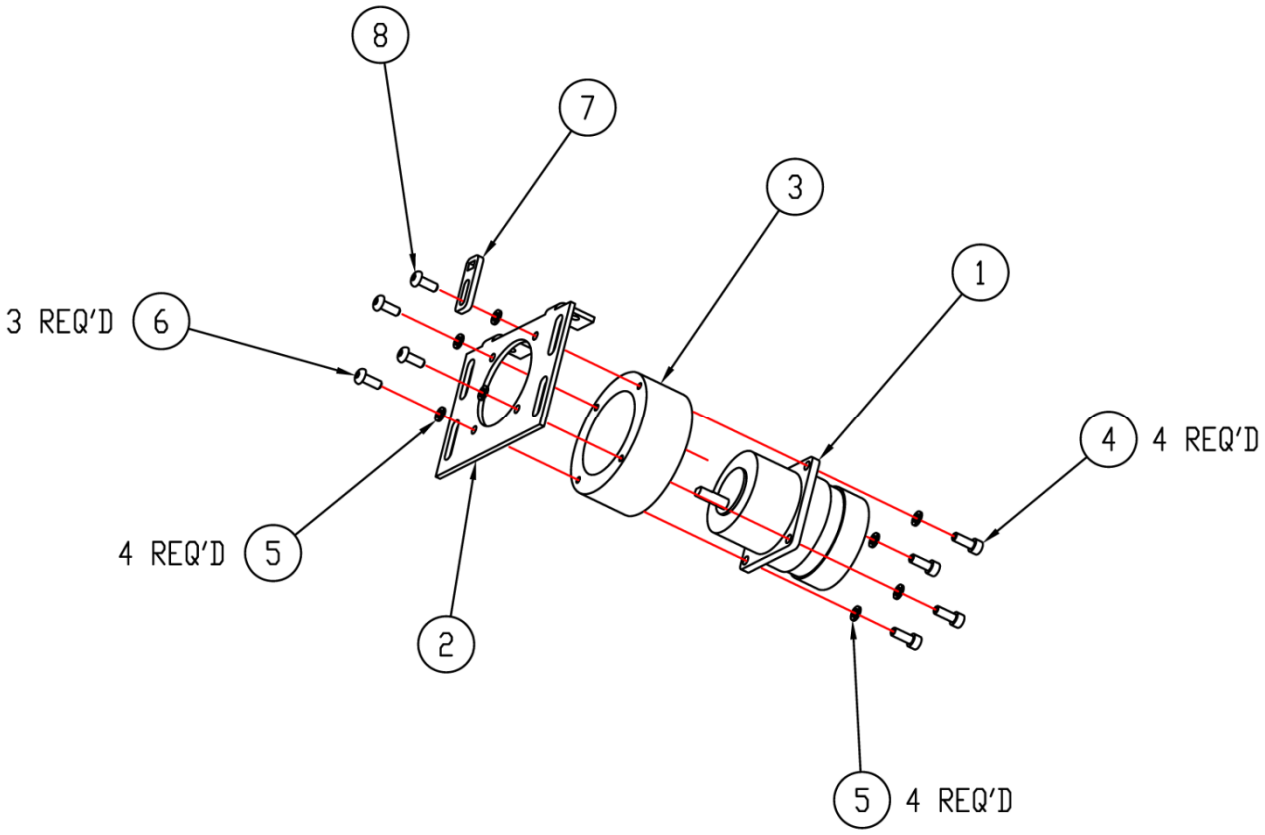
Item #	Part #	Description
1	317940-2.004	Rod, Guide Center, Plated
2	317940-1.004	Rod, Guide, Plated
3	550015-98	PHMS, #8-32 X 1, Zinc
4	550148-8	Lockwasher, Split, #8
5	550148-8	Lockwasher, Split, #8
6	550015-95	PHMS, #8-32 X 5/8, Zinc
7	301109-1.001	Mount, Head Support Finished
8	550148-8	Lockwasher, Split, #8
9	550052-026	SHCS, 8-32 X 1.0 Coarse, Blk
10	419530-2.001	Lower Drive Body Coated

Upper Belt Drive Assembly



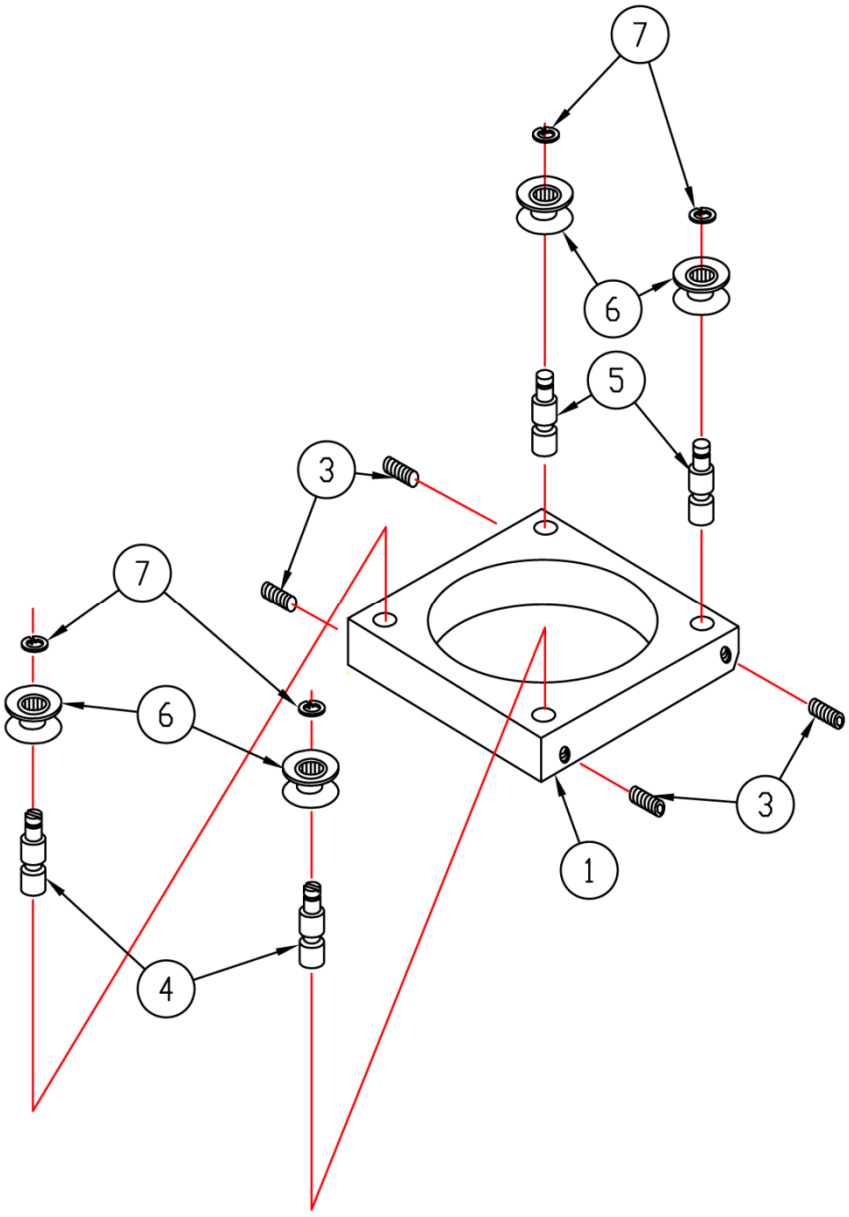
Item #	Part #	Description
1	300773-1	Mount, Upper Belt Dr, Mach
3	229063-4	Bearing, Needle Roller
4	317910-1	Shaft, Wheel, Square Head
5	550149-245	Setscrew, #10-24 X 3/8, Cup
6	317911-1	Shaft, Wheel, Plain Head
8	229576-1	Roller Assembly
9	52482-7	Ring, Retaining
10	801128-1	Drive Motor Assembly
11	550052-033	SHCS, 10-24 X 1/2, Coarse, Blk
12	550041-1	Washer, Flat, #10, Enlarge OD
13	550148-13	Lockwasher, Split, 1/4
14	550151-06	HHCS, 1/4-20 X 1 1/4, Zinc
15	550025-07	Washer, Flat, 1/4, Steel, ZP
17	550148-10	Lockwasher, Split, #10

Drive Motor Assembly



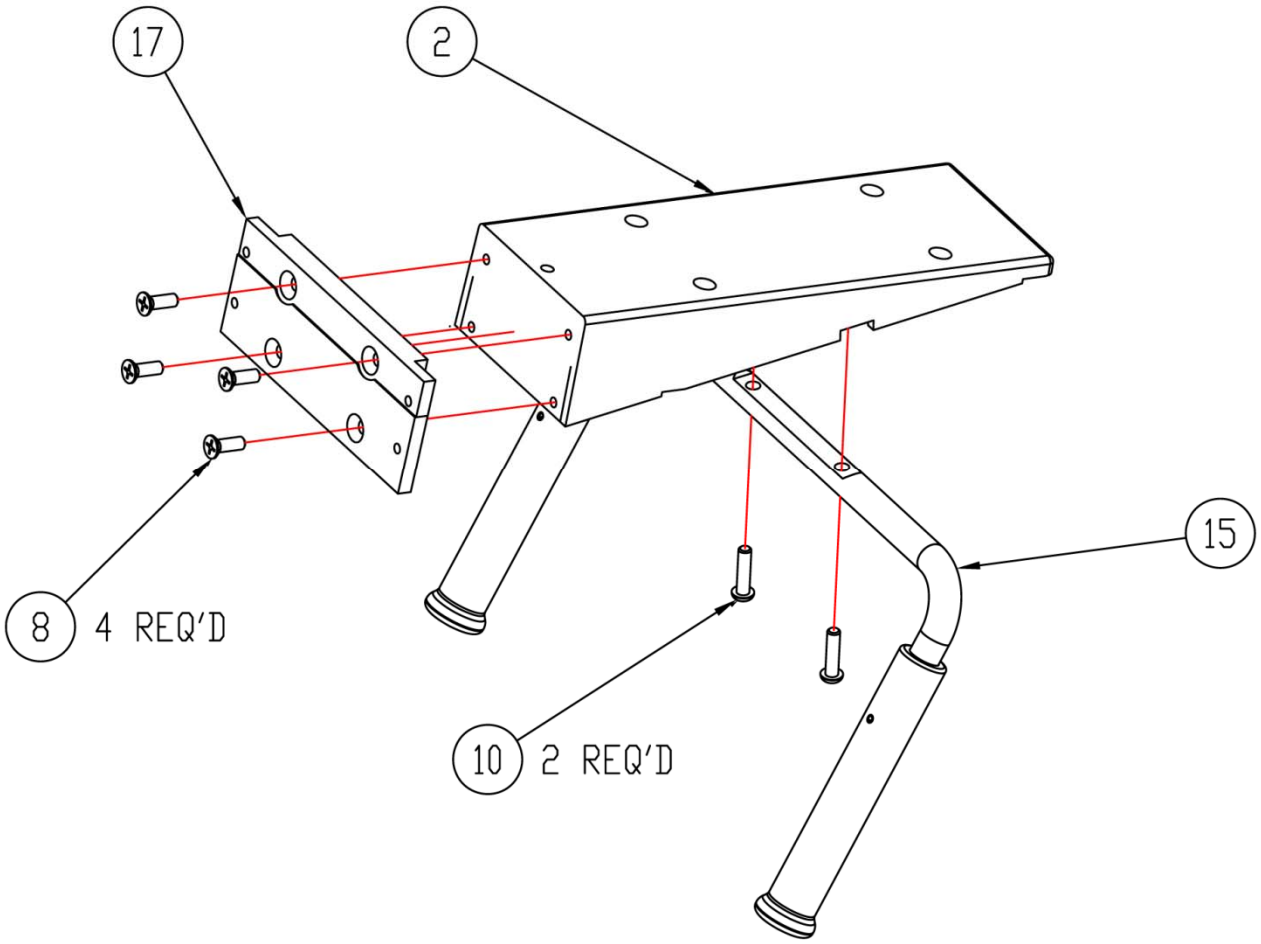
Item #	Part #	Description
1	801195-1	Motor/Gearbox Assembly
2	300774-1	Plate, Motor Mount
3	300968-1.001	Spacer, Motor Mount, Finish
4	550052-033	SHCS, 10-24 X 1/2 Coarse, Blk
5	550148-10	Lockwasher, Split, #10
6	550035-30	BHCS, #10-24 X .50, Black
7	600026-1	Anchor Plate, Cable Tie
8	550035-31	BHCS, #10-24 X .60, Black

Cam Holder Assembly



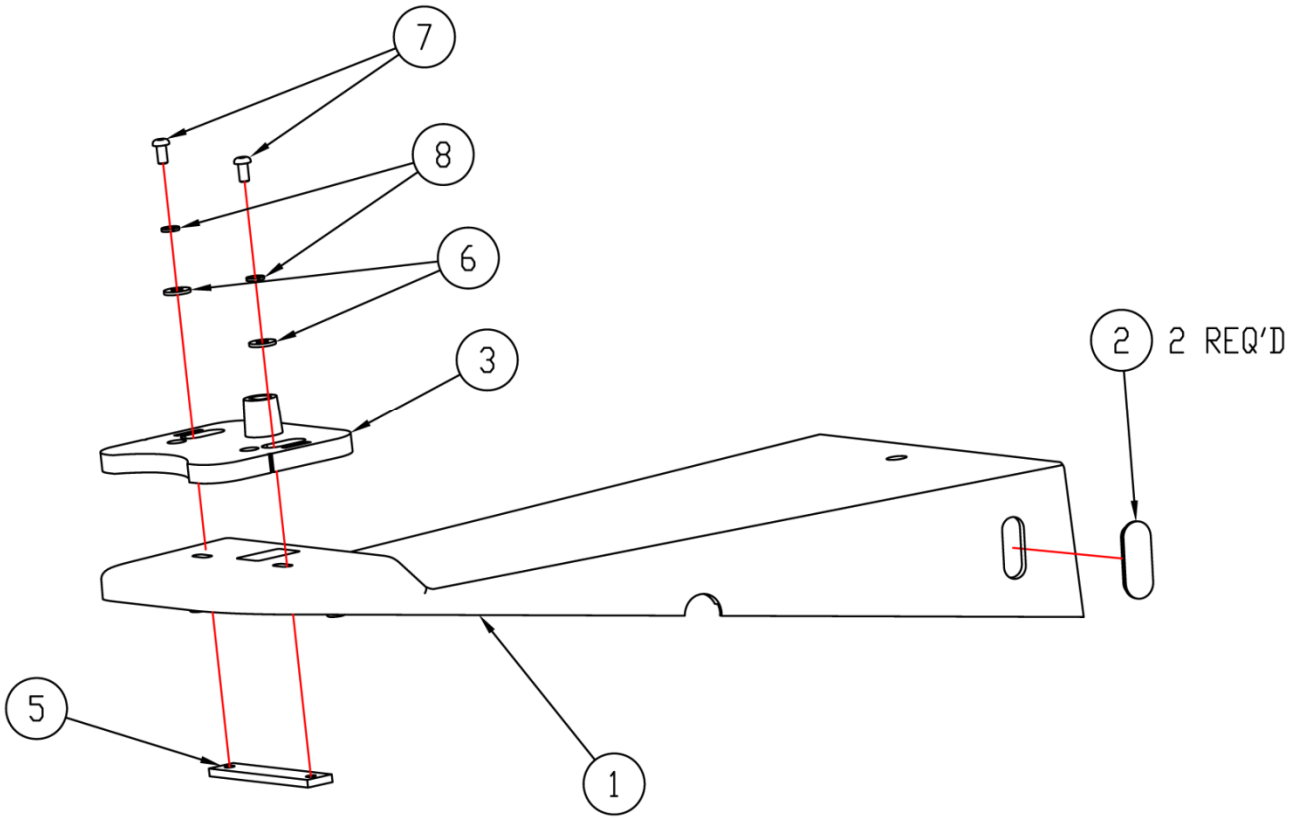
Item #	Part #	Description
1	300543-2.005	Holder, Cam, Machined Facelift
3	550149-245	Setscrew, #10-24 X 3/8, Cup
4	229166-1	Shaft, Wheel, Cam, Slotted Head
5	229167-1	Shaft, Wheel, Cam, Plain Head
6	229576-1	Roller Assembly
7	52482-7	Ring, Retaining

Chin Arm Assembly



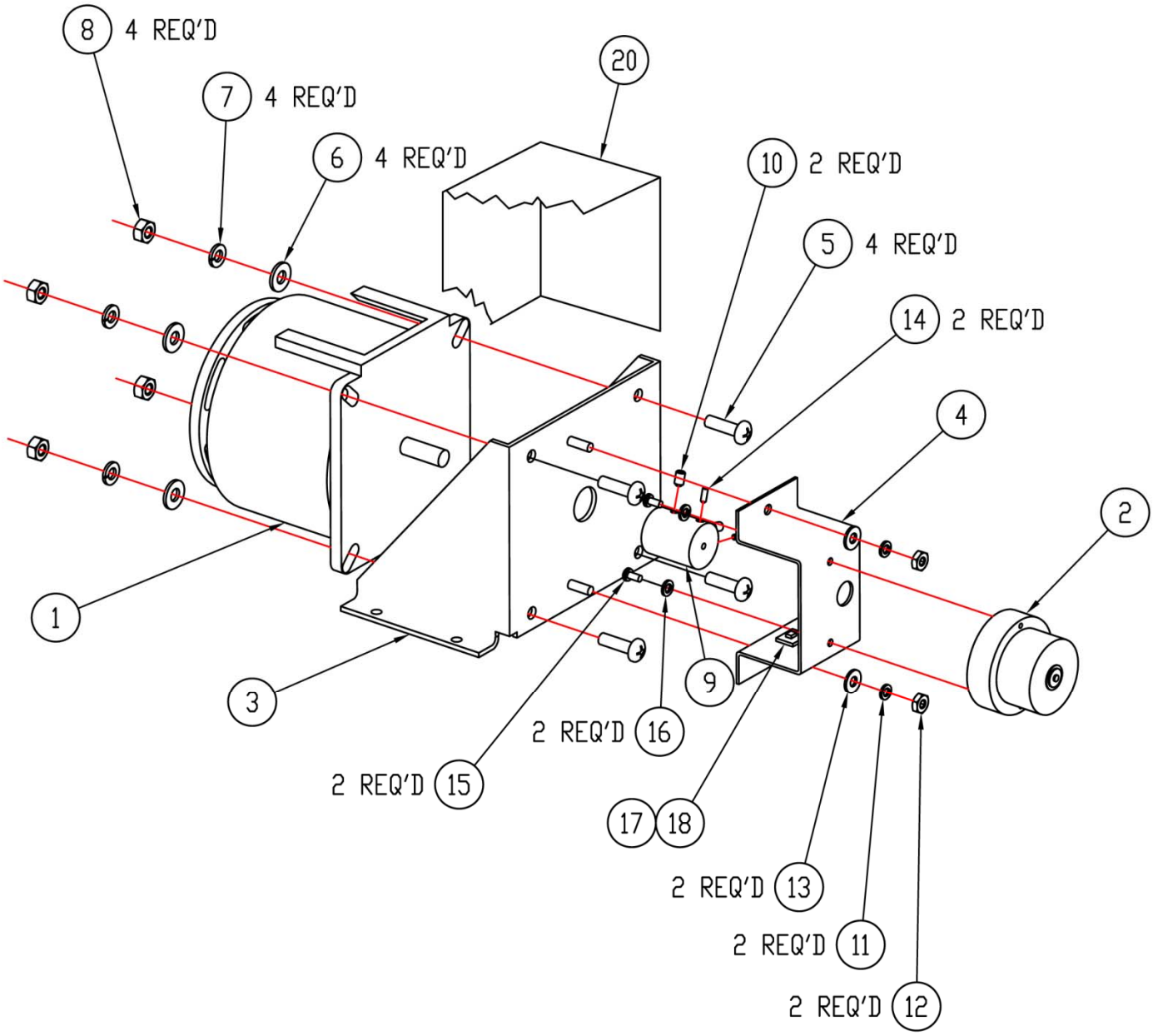
Item #	Part #	Description
2	301101-1	Chinrest Arm
8	318028-157	FHMS, 1/4-20 X 7/8, SS, Phil
10	550035-50	BHCS, 1/4-20 X 1.00, Black
15	801320-1	Handle Assembly
17	301198-1	Chin Arm Mounting Block

Chin Arm Top Cover Assembly



Item #	Part #	Description
1	301103-1	Cover, Chin Arm, Top
2	301154-1	Plug, Chin Arm
3	301156-1	Chin Base
5	300451-1.001	Nut Plate, Black Oxide
6	550029-7	Washer, Flat, #8 X .304 OD
7	550035-25	BHCS, #8-32 X .63, Black
8	550148-8	Lockwasher, Split, #8

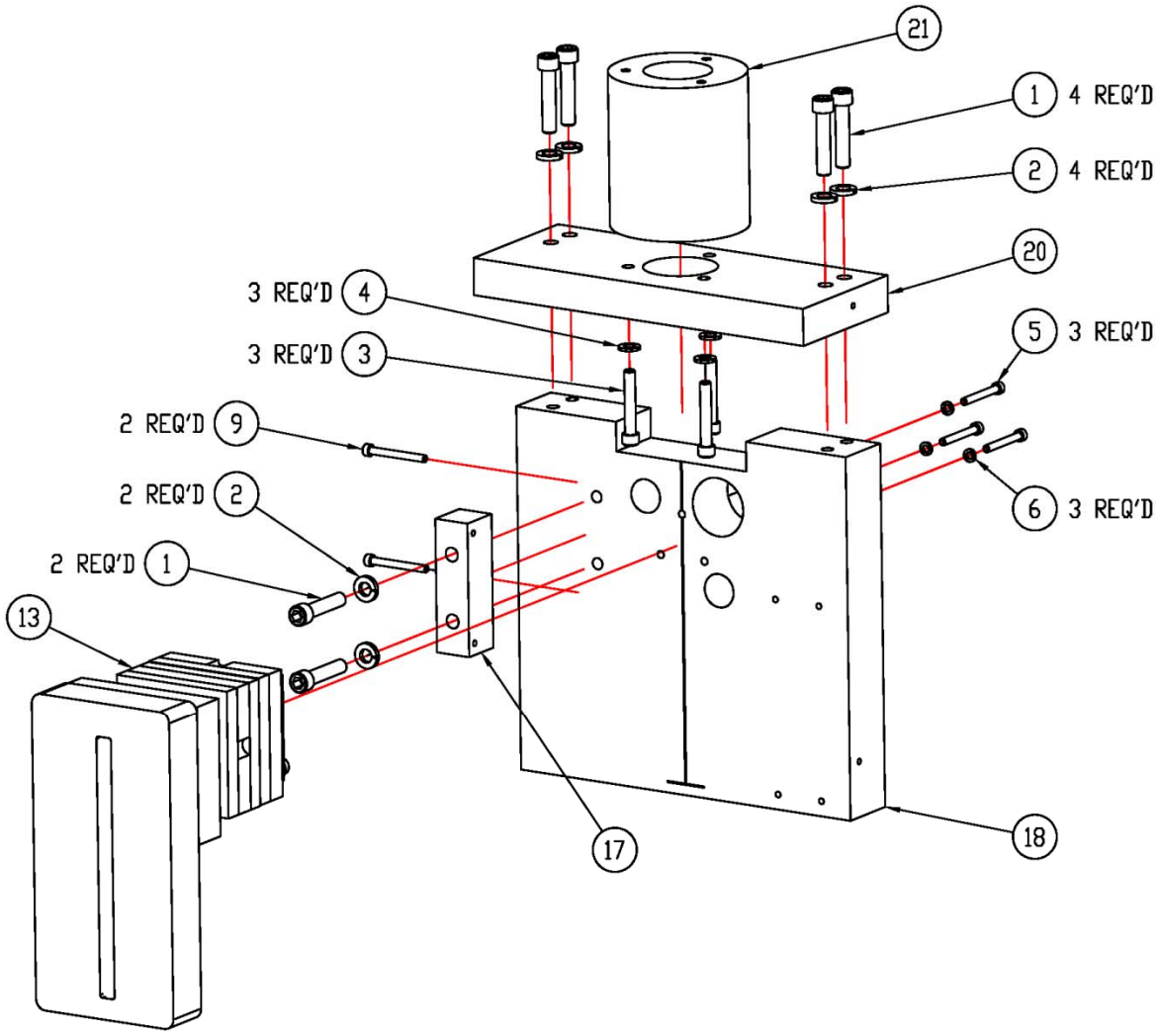
KVP XFMR/Motor Assembly



KVP XFMR/Motor Assembly

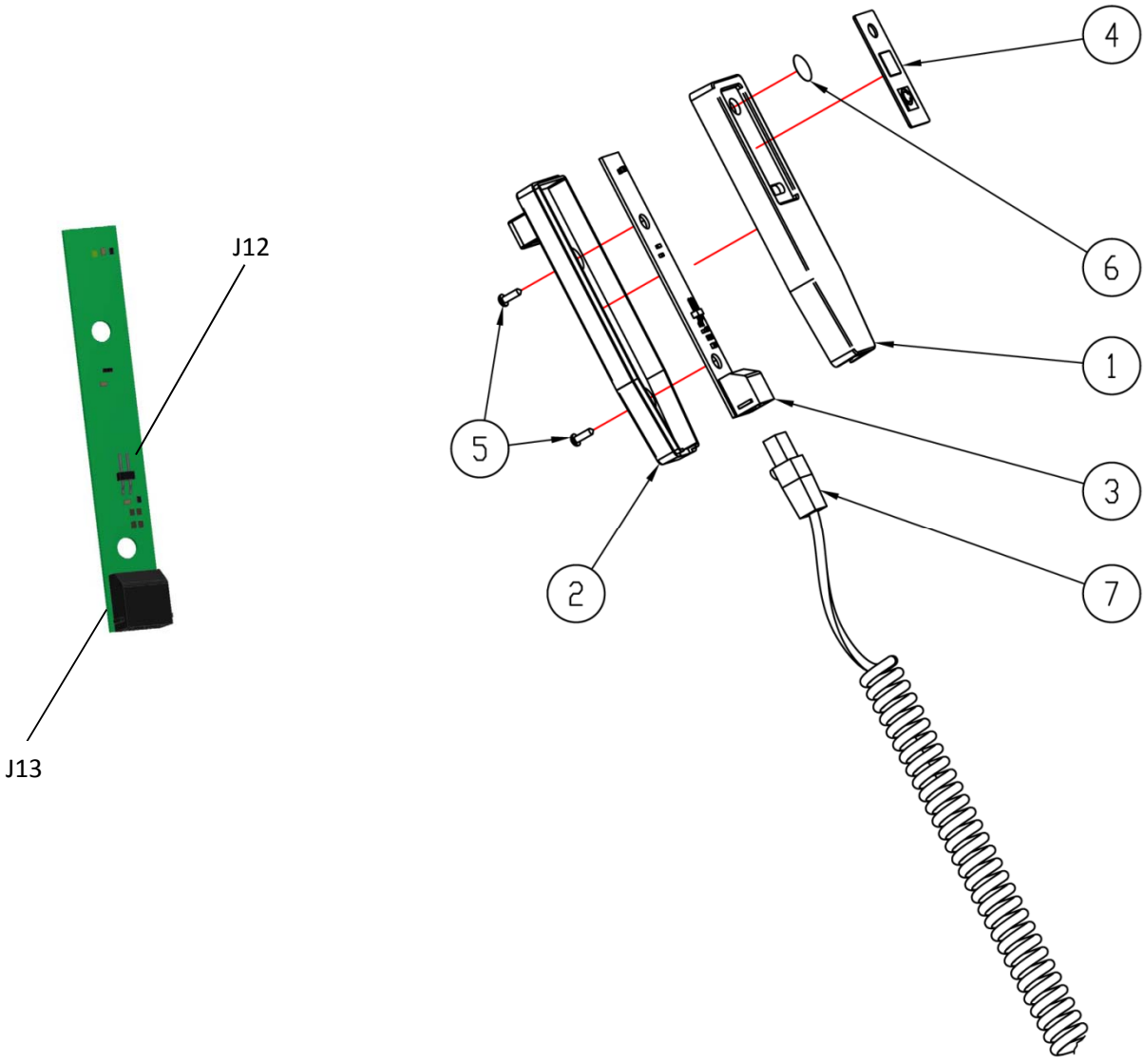
Item #	Part #	Description
1	800768-2	Variac Transformer Assembly
2	801184-1	Motor Assembly, KVP/XFMR
3	300934-1	Mounting Bracket, XFMR
4	300935-1	Mount, Stepper Motor
5	550015-157	PHMS, 1/4-20 X 7/8, Zinc
6	550025-07	Washer, Flat, 1/4, Steel, ZP
7	550148-13	Lockwasher, Split, 1/4
8	550023-09	Nut, Hex, 1/4-20, Steel
9	300936-1.001	Coupling, Finished
10	550149-244	Setscrew, #10-24 X 5/16, Cup
11	550148-10	Lockwasher, Split, #10
12	550023-22	Nut, Hex, #10-24, Steel
13	550025-05	Washer, Flat, #10, Steel, ZP
14	550149-214	Setscrew, #4-40 X 5/16, Cup
15	550015-58	PHMS, #6-32 X 5/16, Zinc
16	550148-6	Lockwasher, Split, #6
17	660000-1	Cable Tie, Natural, 4.0 X 0.1
18	133455-1	Cable Tie Mount
20	801296-1	Insulator Assy, KVP/XFMR

Camera Holder Assembly



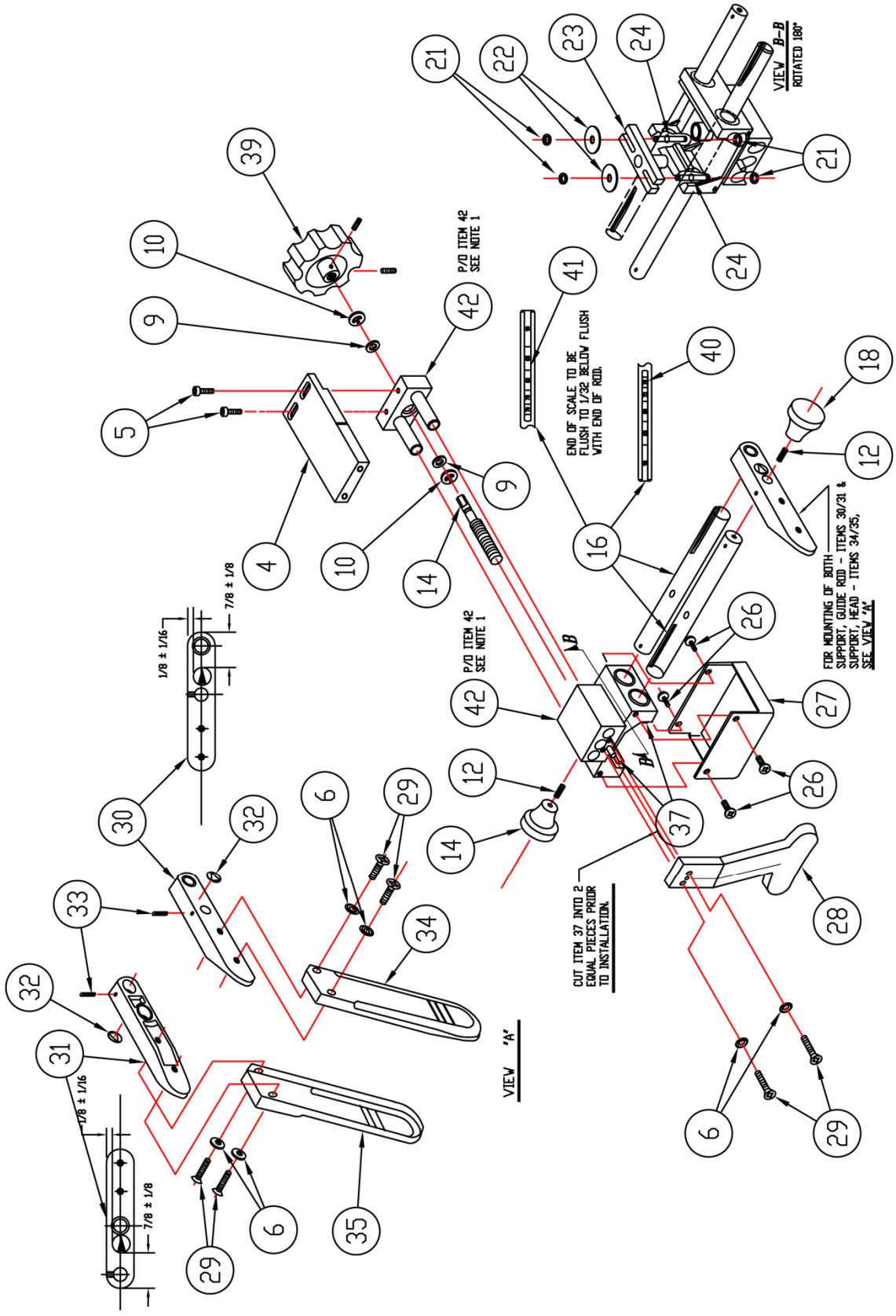
Item #	Part #	Description
1	550002-53	SHCS, UFT, 5/16-24 X 1 1/2
2	550148-14	Lockwasher, Split, 5/16
3	550052-052	SHCS 1/4-20 X 1 1/2
4	550148-13	Lockwasher, Split, 1/4
5	550052-0275	SHCS, 8-32 X 1 3/8, Coarse, Blk
6	550148-8	Lockwasher, Split, #8
9	550173-1	#8-36 X 1 1/2 SHCS
11	550174-1	M3 X 12 PHMS
13	801412-4	SNAP150 Sensor Kit, PC-4000
17	301169-1.001	Adjustment, Phi Finished
18	301163-1.001	Plate Counter, Finished
20	301166-1.001	Plate, Mounting Finished
21	301165-1.001	Cylinder, Counter Weight, Finished

Exposure Switch Assembly



Item #	Part #	Description
1	300964-1	Cover, Front, Exposure SW
2	301131-1	Cover, Rear, Exp, SW, Modified
3	801364-1	PCB Assembly, Leaded, Exp SW
4	674036-1	Switch, Membrane, Exposure
5	550053-3	Screw, Self-Tap, #4 X .38
6	674050-1	Decal, Clear, Matte, 1/2" Dia.
7	656024-1	Cable, Exposure Switch

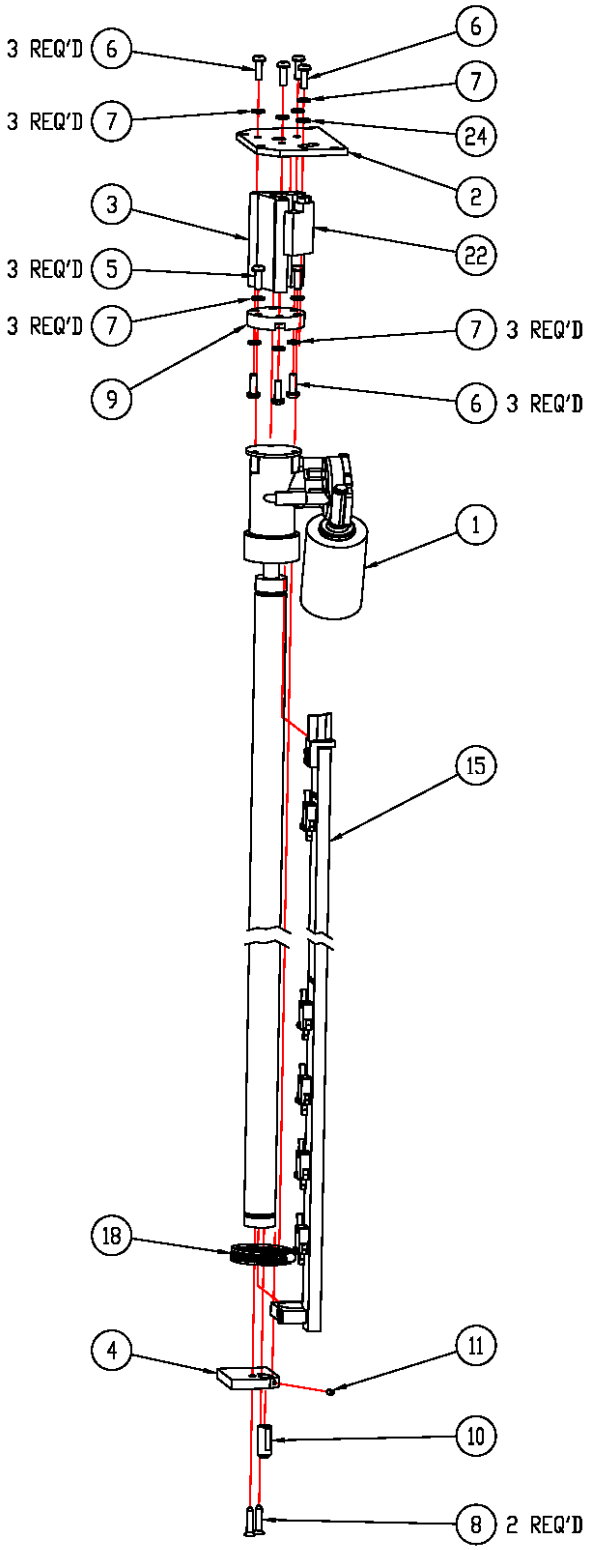
Head Support Assembly



Head Support Assembly

Item #	Part #	Description
4	301117-1.001	Plate, Head Sup, Coated (UL)
5	550052-021	SHCS, 8-32 X 3/8, Coarse, Blk
6	133223-1	Washer, Special, Head Supp.
9	229098-2	Washer, Nylon, Special
10	52482-12	Ring, Retaining, Zinc, 5/16
12	550149-237	Setscrew, #8-32 X 1/2, Cup
14	229075-1	Rod, Threaded
16	230098-1	Shaft, Head Cal
18	131739-1	Knob, Shaft Adjuster
21	52482-5	Ring, Retaining, Zinc, 3/16
22	229098-6	Washer, Special
23	230096-1	Guide Bar Assembly
24	229085-1	Pin, Guide Rod
26	550015-21	PHMS, #4-40 X 1/4, Zinc
27	229054-1	Cover, Head Support
28	317902-1	Forehead Support
29	318028-96	FHMS, 8-32 X 3/4, SS, Phil
30	229055-1	Support, Guide Rod, Right
31	229056-1	Support, Guide Rod, Left
32	229543-8	Decal, Yoke, Red Arrow
33	550149-223	Setscrew, #6-32 X 1/4, Cup
34	229052-1	Support Head Right
35	229053-1	Support Head Left
37	638001	Tape, Foam, 3/16 X 3/8
39	676005-1	Knob, Head Support
40	674008-2	Decal, KVP, Left Side
41	674008-1	Decal, KVP, Right Side
42	800770-1	Head Support Block Assembly

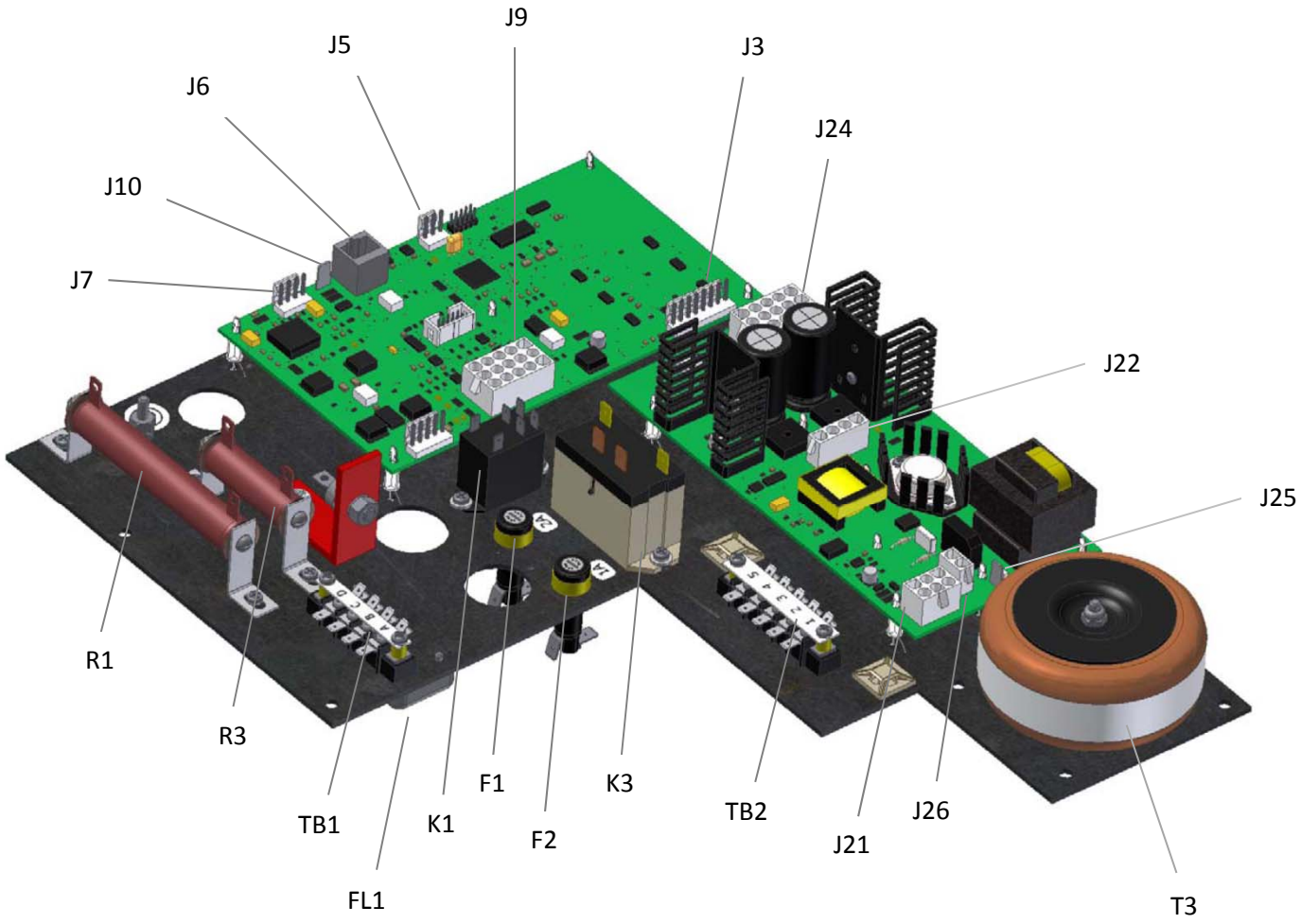
Screw Drive Motor Assembly



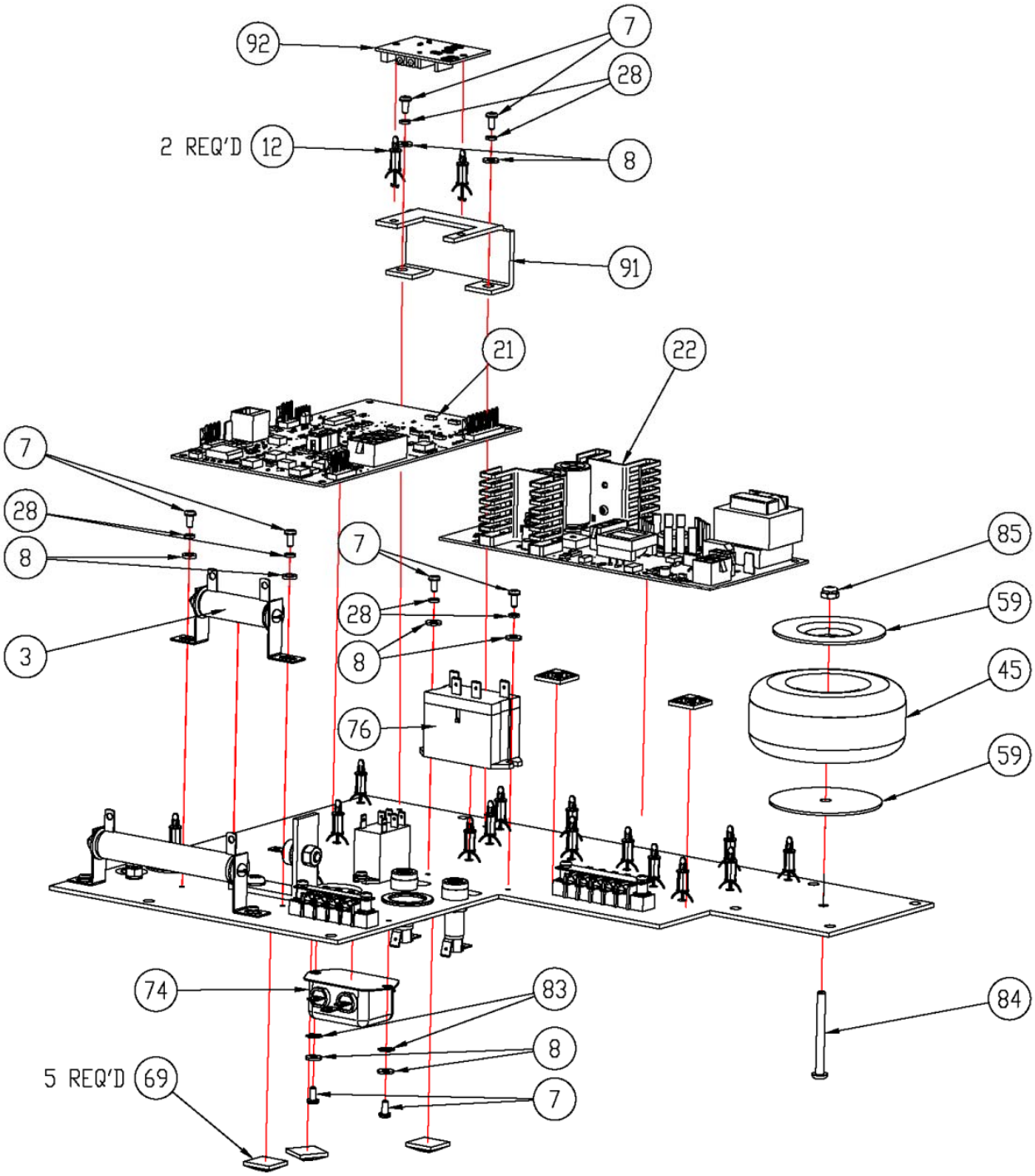
Screw Drive Motor Assembly

Item #	Part #	Description
1	801186-1	Motor Assembly, Screw Drive
2	300937-1	Plate, Mounting, Screw Drive
3	300938-1	Spacer, Screw Drive
4	301011-1.001	Plate, Lwr Screw Drive, Finished
5	550137-17	SOC HD TFS, M6 X 25, Metric
6	550015-156	PHMS, 1/4-20 X 3/4, Zinc
7	550148-13	Lockwasher, Split, 1/4
8	550127-20	Screw, CSK, TF, M6 X 25
9	301004-1.001	Plate, Motor Mount, Finish
10	301012-1	Pin, Drive Mounting
11	550033-35	Setscrew, 10-24 X 1/4, Plain
15	801288-1	Switch Assembly, Vertical Adj
18	600080-1	Clamp, Hose & Tube
22	301138-1	Mechanical Stop
23	550052-048	SHCS, 1/4-20 X 3/4, Coarse, Blk
24	550025-07	Washer, Flat, 1/4, Steel, ZP

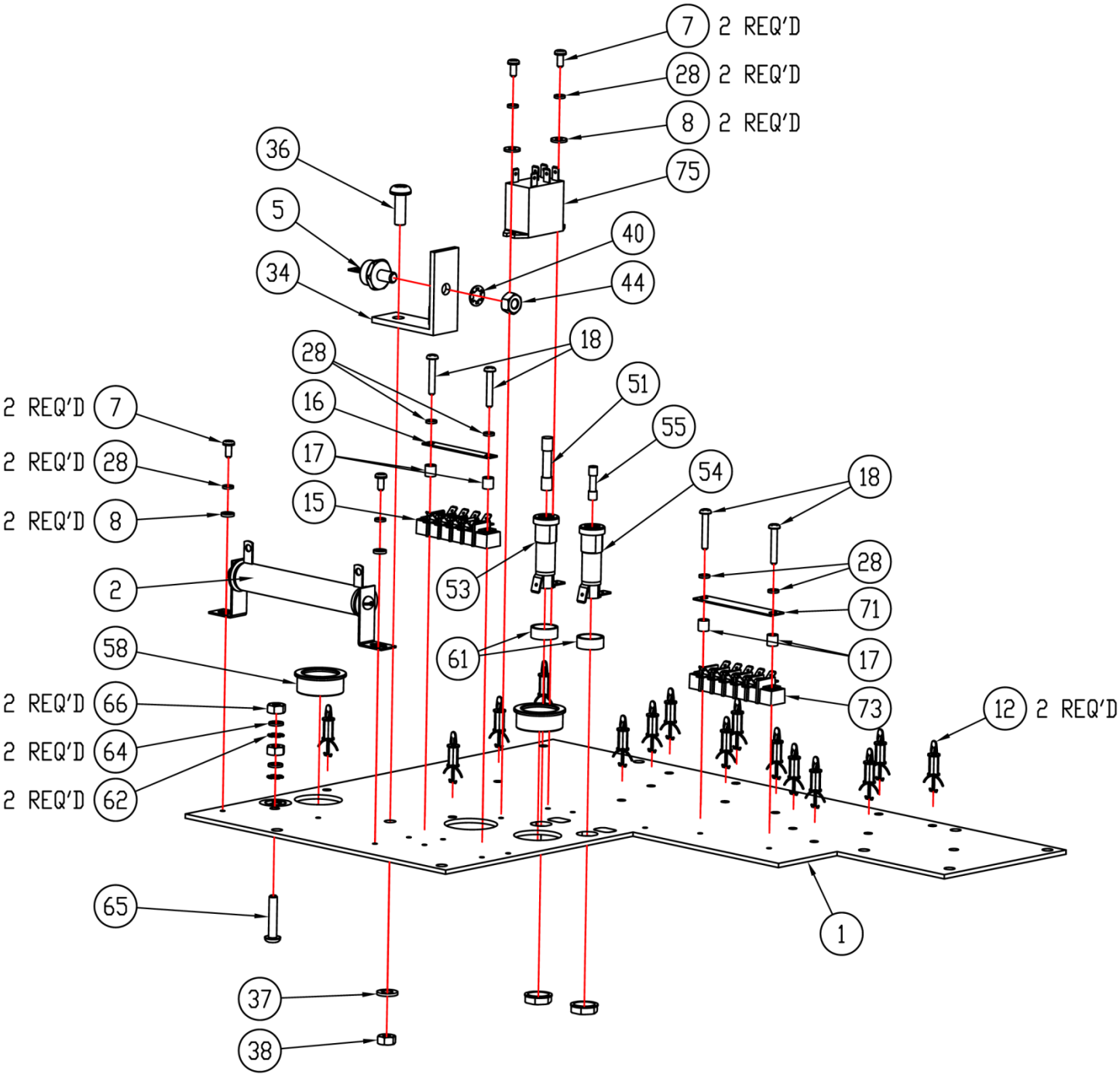
Electric Plate Assembly



Electric Plate Assembly



Electric Plate Assembly



Screw Drive Motor Assembly

Item #	Part #	Description
1	300996-1	Plate, Electric, Facelift
2	801020-5	Res Assembly, 50 OHM, 50W, FX
3	801020-2	Res Assembly, 5 OHM, 25W, FXD
5	226396-6	Diode, 40HF40, 400V, 40A
7	550015-58	PHMS, #6-32 X 5/16, Zinc
8	550025-03	Washer, Flat, #6, Steel, ZP
9	550150-21	Lockwasher, INT, #6
12	225470-2	Support, PCB, Nylon
15	530093-2	Strip, Barrier, 1 Short, 4P
16	229502-3	Label, Barrier Strip, ABCD
17	542006-12	Spacer, .140 ID, #6 X .05
18	550015-63	PHMS, #6-32 X 7/8, Zinc
19	550023-20	Nut, Hex, #6-32, Steel
21	801190-1	PCB Assembly, Prog, Control Brd
22	801200-1	PCB Assembly, Leaded, Power
28	550148-6	Lockwasher, Split, #6
34	300544-1	Diode Bracket
36	550015-156	PHMS, 1/4-20 X 3/4, Zinc
37	550148-13	Lockwasher, Split, 1/4
38	550023-09	Nut, Hex, 1/4-20, Steel
40	550150-25	Lockwasher, INT, 1/4
44	550023-1-2	Nut, Hex, 1/4-28, Zinc
45	801202-1	XFMR, Power, Modified
51	634016-22C	Fuse, Fast-Act, 3AG, 2A, CART
53	634013-3	Fuseholder, PNL MT, 3AG
54	634013-2	Fuseholder, PNL MT, 5 X 20 mm
55	634012-1	Fuse, Fast-Act, 5 X 20 mm, 1A
58	680007-37	Bushing, Insulator, Black
59	584018-1	Kit MTG XFMR - 1 Wash / 2 Pad
61	301055-1.001	Spacer, Fuse, Finished
62	550150-05	Lockwasher, EXT, #10
64	550148-10	Lockwasher, Split, #10
65	550015-114	PHMS, #10-32 X 1, Zinc
66	550023-17	Nut, Hex, #10-32, Steel
69	133455-1	Cable Tie Mount
71	674061-2	Label, Barrier Strip, 54321
73	530114-1	Strip, Barrier, 5 POS
74	584021-3	Filter, In-Line, Med Grade
75	594016-1	Relay, Power, DPST-NO, 12VDC
76	594002-1	Relay, 12VDC, 25-30A, SPST
83	550150-03	Lockwasher, EXT, #6
84	550015-118	PHMS, #10-32 X 2, Zinc
85	550075-4	Nut, Self-Lock, #10-32 Std
91	301219-1	Mount, ISO Board
92	SUB054	SNAP150 Isolation Board

Tubehead

Item #	Part #	Description
1	801327-1	Control Cable, X-Ray Tube, UL

Overhead

Item #	Part #	Description
2	801290-1	Cable Assy., Limit Switch/Rotating Arm

Electric Plate

Item #	Part #	Description
3	801216-1	Harness, Electric Plate
4	801243-1	Cable Assy., Power/Control
5	801289-1	Cable Assy., Motor Drive
6	801408-1	AJAT Signal Wire Assembly

Notes: