Service Manual

Model: 801125-1/801125-2

Panoramic Corporation
4321 Goshen Road, Fort Wayne, Indiana 46818
800•654•2027 www.pancorp.com

SMF20000

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Introduction

Purpose

Panoramic Corporation provides this printed manual as a guide for the installation of the PC-3000 dental panoramic X-ray machine.

The PC-3000 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-3000 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-3000 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

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

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 acheived 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 accesory 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

I On (power: connection to the mains)

O 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-3000 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

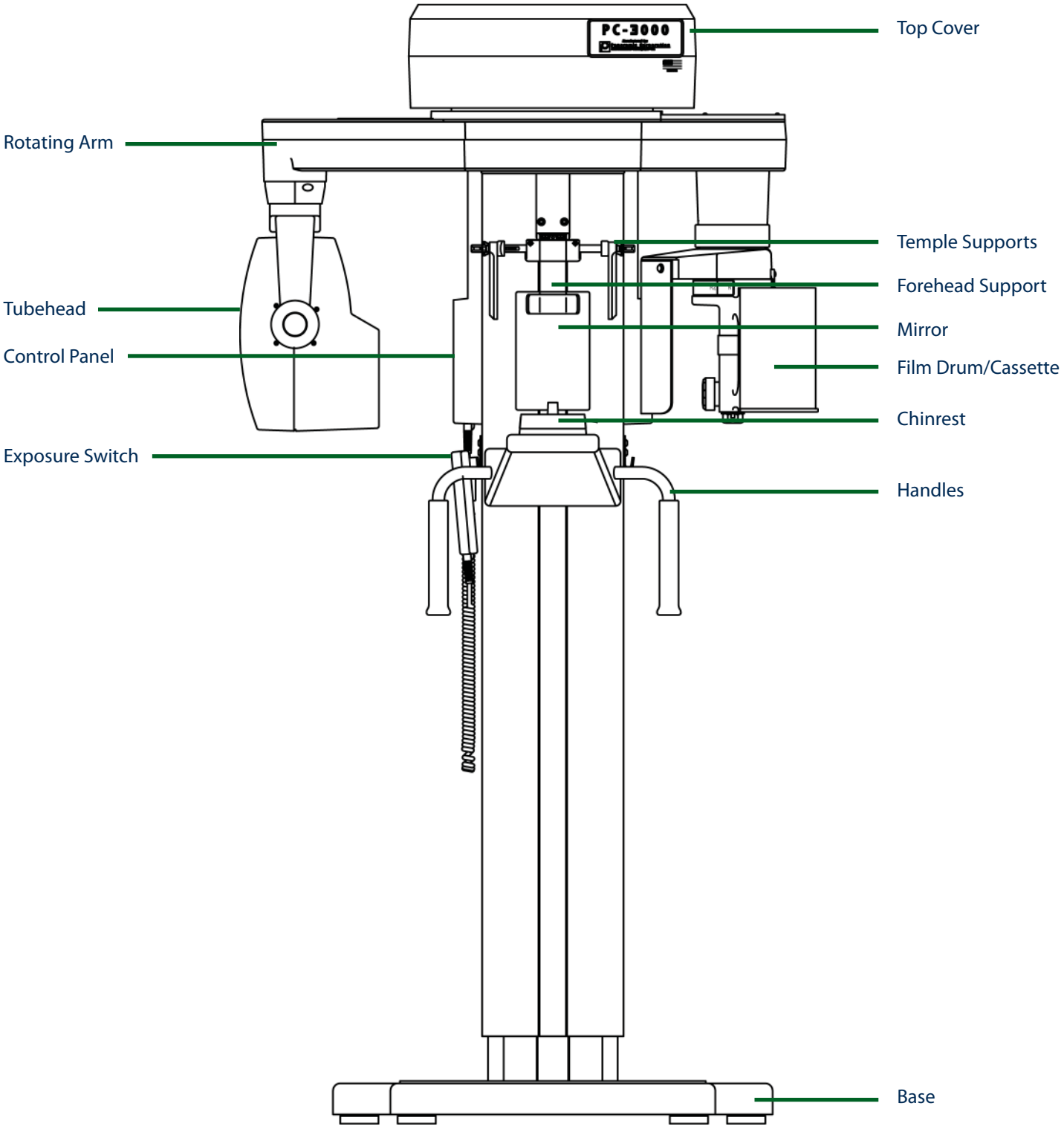
Continuous operation with short time loading.

Electrical Safety

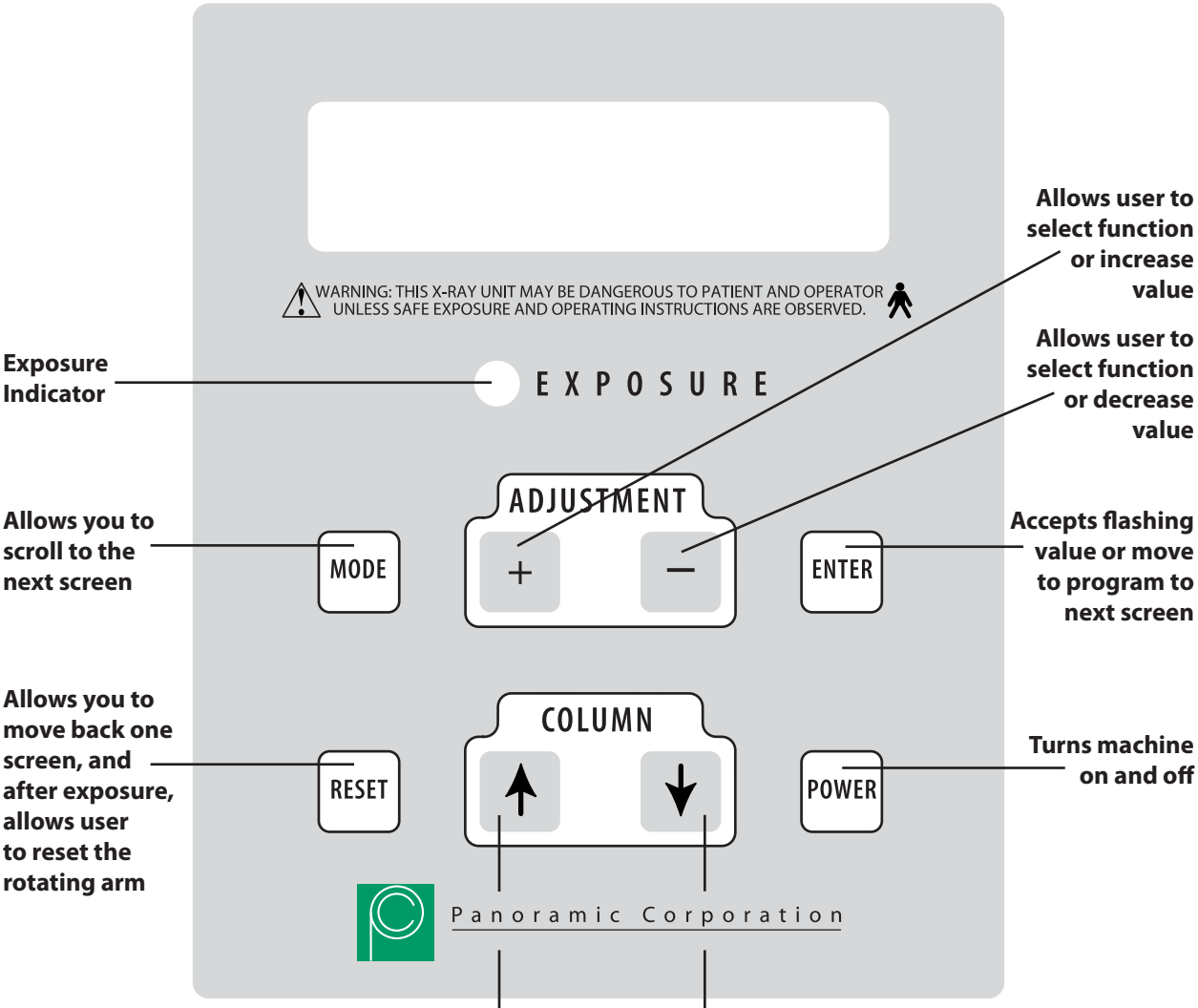
Class I, Type B Applied Parts
Equipment is classified as ordinary equipment (enclosed equipment without protection against ingress of water).

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

PC-3000 Components



PC-3000 Control Panel



Pre-Installation Check

Electrical Requirements

Optimally, the PC-3000 (801125-1) should have a dedicated 105-125 VAC (available 100, or 220 to 240 VAC model 801125-2), 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 Appendix A for detailed procedures.

Darkroom Requirements

Proper darkroom facilities MUST be present BEFORE installing the PC-3000. The darkroom will be used to process test films at the time of installation to verify proper calibration. Refer to Appendix L for darkroom requirements and processing procedures.

PC-3000 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 801125-2)

Remove Packaging and Shipping Restraints

1. Carefully remove packaging material from the PC-3000.
3. 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.
4. Remove the 3/4" hex head shipping bolt and washer located in the overhead near the Control Board at the back of the machine.
5. Install the four (4) leveling feet provided in the accessory box with the machine.

Control Panel Installation

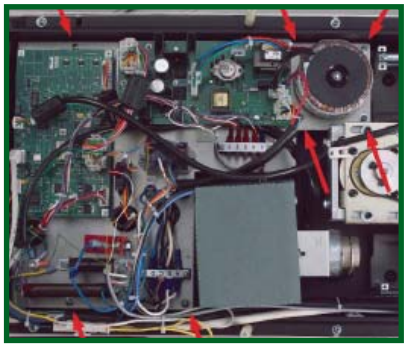
Verify with the doctor, on which side the control panel needs to be located. The machine comes from the factory with the display cable routed on the left side.

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 in near J6 plug.

To move the display cable routing to the right side:

1. Remove the seven (7) 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 (7) phillips screws from step 1.

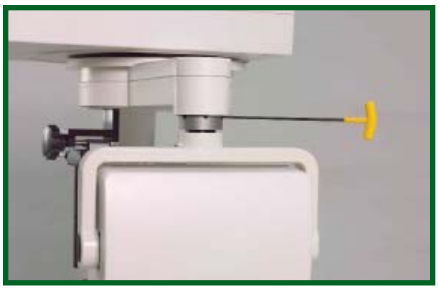


To Finish Display Panel Installation:

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) each 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, then back each out slightly to allow alignment of the tubehead in a later procedure.



Install Film Drum Assembly

1. Remove the three (3) Allen head screws from the plastic cover of the end of the rotating arm.
2. Remove the set screw, crown nut, and washer from the film drum spindle.
3. Insert the film drum spindle down through the rotating arm.
4. Install the film drum with the knob closest to the floor. Slide the film drum onto the spindle up as far as possible and tighten the film drum knob to temporarily hold the film drum in place.
5. Slide the flat washer up on the film drum spindle.
6. Install the crown nut on the film drum spindle with the slots in the crown nut facing up.
7. Thread the crown nut until the lower edge of the threaded hole in the film drum spindle is aligned to the lower edge of a slot in the crown nut.
8. Insert the set screw in the threaded hole in the film drum spindle and tighten the screw.
9. While supporting the film drum, loosen the film drum knob to allow the film drum to rest on the washer and crown nut.
10. Place the plastic cover back over the rotating arm, and install the three (3) Allen head screws.

NOTE: The film drum will rotate with increased friction after the film drum knob is tightened. Manual rotation, while the knob is tight, should be avoided to prevent abnormal wear.

Install Temple Supports

1. Install the two (2) temple supports using the existing screws and washers in the head suppor assembly. (The red lines on the temple supports should face out)

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.

Check KVP Calibration

1. Plug the Power Cord into the Power Bus at the bottom of the column, and the wall and flip the Main Power Button to ON at the base of the unit.
2. Power on the machine at the Control Panel.
3. Verify that screen displays:
   PANORAMIC
   CORPORATION
4. Press MODE once. Verify the **SELECT OPERATION** says:
   PAN L or **PAN R**
5. Press the MODE button (1) one time to get the **ARM POSITIONED** or **ARM NOT POSITIONED** screen. If needed, press ENTER so that the arm rotates into position
6. Press the MODE button once to get the **PAN KVP** screen. The default KVP setting will be flashing. Adjust the KVP to 70.0 and then press Enter.
   Screen will display: **ADJUSTING KVP**

   If machine fails to adjust to the desired KVP, screen will display error message: **KVP FAILED** and machine will beep once. Machine will then require re-calibration. Skip to Appendix H for KVP calibration instructions.
7. Test the KVP Calibration by increments of 5.0 KVP from 70.0 up to 90.0 and back to 70.0.
8. Calibration check is complete.

Check mA Calibration

1. Press the POWER button to power off the machine.
2. Disconnect the yellow wire, 1-pin molex connector in the overhead chassis located near the variac.
3. Connect a DC multimeter in series with the molex connectors, positive lead to the male connector, negative lead to the female connector.
4. Power on the machine at the Control Panel and simultaneously press the MODE and ENTER buttons.
   Enter Passcode 2703 by using +/- buttons. Press enter to toggle between digits.
5. Press MODE button four (4) times. Screen should read: **6mA CURRENT CAL**. If it does not:
6. Press and hold EXPOSURE button.
7. Verify meter reading of 6.0 mA +/- .1. If it does not:
   A. Use the Adjustment +/- buttons to increase/decrease the number. Each number represents approximately .2 mA.
   B. Take another exposure to verify your meter is reading 6.0mA.
   C. Repeat this procedure until you achieve the correct reading. (Be sure to hit ENTER to save settings)
   NOTE: Contact Panoramic Corporation if the mA cannot be set to 6.0 mA +/- .1 mA.
8. Disconnect the multimeter.
9. Reconnect the yellow wire, 1-pin molex connector.

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. 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 * 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 stop watch 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.
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.

Is this a Rental Unit?

If this is a rental unit, follow these steps while still in the Service Mode.

1. Press MODE button until you read **RENTAL UNIT** on the screen.
2. Use the Adjustment +/- buttons to select **ON** or **OFF**. If this is a Rental Unit then make sure the screen says **ON** and press ENTER.
3. If this is **NOT** a Rental Unit, then leave the setting in the default setting.

Perform Panoramic X-ray Beam Alignment

1. Press Mode until you see:
   BEAM ALIGNMENT
   85.0 KVP 6mA

2. Temporarily affix a fluorescent screen behind the film drum mask (slotted plate in front of the film drum).

3. Darken the room and depress the exposure switch.

   The fluorescent screen should glow, denoting the presence of X-rays. Adjust the tubehead so that the X-ray beam is centered horizontally in the film mask slot, and that the top edge of the X-ray beam is aligned to the top edge of the film drum mask slot.

4. After you have verified the beam of radiation is aligned to the spindle of the film drum, tighten the horizontal tubehead knob/set screw, locking the tubehead into position.

5. Remove the fluorescent screen.

6. Beam alignment is now complete.

Perform PIN Test

1. Press MODE until you see: **PIN TEST**

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

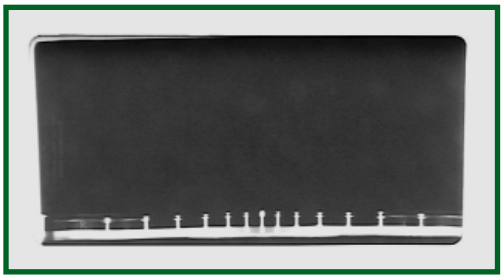
3. Load a film cassette and place this on the film drum. Align the clear tab with the Black Line to the Decal on the film drum corresponding to the L or R side, L1 or R1.

4. 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.

5. When exposure is complete, release the exposure button.

6. Loosen the film drum knob, and remove the cassette/film.

7. Process the film to verify proper alignment.



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. Make sure to just snug up the top cover because over tightening of these screws with damage the plastic.

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

Post-Installation Steps

Training of the office staff

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

2. Please reference the User Manual and train the staff thoroughly.

3. Complete the Panoramic Corporation Installation Report and the FDA 2579 paperwork and distribute accordingly.

Appendix

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 regulation require.

Prior to the installation of a PC-3000, an electrician will need to install the following:

- A 2" x 4" electrical box at standard outlet height on the wall directly behind the PC-3000.
- A 2" x 4" electrical box at the necessary location and height for the remote switch.
- A 2-conductor, low voltage (24 VAC) wire routed between the 2 boxes with sufficient access 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 Switch Installation

1. Wire the RJ-45 wall jack according to the supplied instructions making sure to denote which wire is attached to position 1 and which 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 plated provided in the kit.

3. Wire the lighted pushbutton switch according to the supplied instruction 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 the PC-3000 off.

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

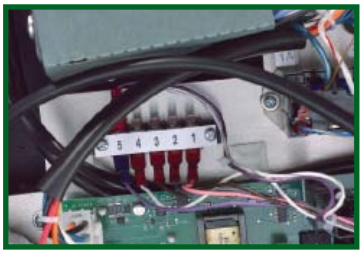
7. Plug the CAT5 cord from the display panel on the machine into the RJ-45 wall plate located near the machine.

8. Power the PC-3000 on and verify that the remote switch functions properly.

Screw Motor Assembly Height Limit

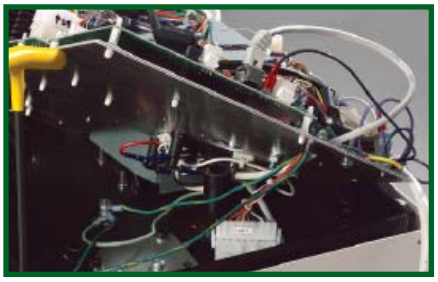
The PC-3000 incorporates a height adjustment limit switch that will stop the machine from raising past a predetermined height. This limit height, factory set at approximately 92", can be adjusted for low ceilings in 3" increments down to approximately 83".

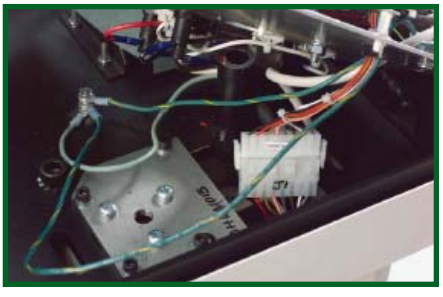
1. Power the PC-3000 OFF.
2. Remove the 8 screws holding the top cover.
3. At the back of the machine, you will see terminal strip marked 1-5.
4. The factory setting is on terminal 5.
5. You can move the single white wire to any other terminal lowering the machine height 3" for each terminal marking. Marking #1 is the lowest.
6. Power the PC-3000 ON.
7. Using the Up/Down switch on the display panel, raise the machine and verify the height adjustment is automatically terminated.



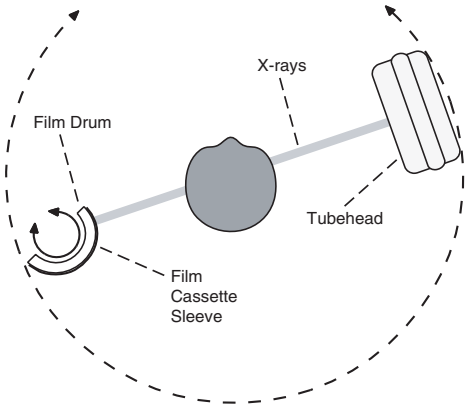
Screw Motor Exchange

1. Power the PC-3000 ON.
2. Lower the machine to the lowest position.
3. Power the PC-3000 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. Loosen the 4 bolts from the top of the screwmotor.
9. Loosen the bottom mount of the screwmotor.
10. Lift screw motor assembly out of the inner/outer column.
11. Lower replacement motor down into the column.
12. Align bottom mount and tighten.
13. Tighten 4 upper bolts.
14. Connect wire harness.
15. Lower aluminum chassis and tighten corner screws.
16. Power the PC-3000 ON.
17. Test lift mechanism by pressing column up/down.
18. Reinstall top cover.





Panoramic Radiography has been in use for over 30 years. In panoramic radiography, the X-ray source and film rotate around the patient's head at the same speed. Simultaneously, the film rotates about its own axis.



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 film cassette sleeve. Intensifying screens are used inside the film cassette sleeve. The intensifying screens glow whenever X-rays strike them, the more X-rays striking the screen, the brighter the glow. Film, which is sensitive to light, is placed between the intensifying screens. The more light that is exposed to film, the darker the film is. 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 film when striking the teeth, causing them to appear on the film as lighter areas. More X-rays reach the film when striking tissue, causing it to appear on the film 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 film rotate around the patient, the film is gradually exposed by a narrow vertical band. It is imperative that the film is aligned to start at the correct position and that nothing stops the film drum or tubehead from moving while the exposure is being taken.

The following is a preventative maintenance guide. Refer to your state and local regulations to determine how often to check the following items.

Please contact the Service Department of Panoramic Corporation(800) 654-2027 and ask about our Preventative Maintenance Program.

1. Visual Inspection
    a. certification and identification labels in place
    b. check plastics, cords, accessories for excessive wear

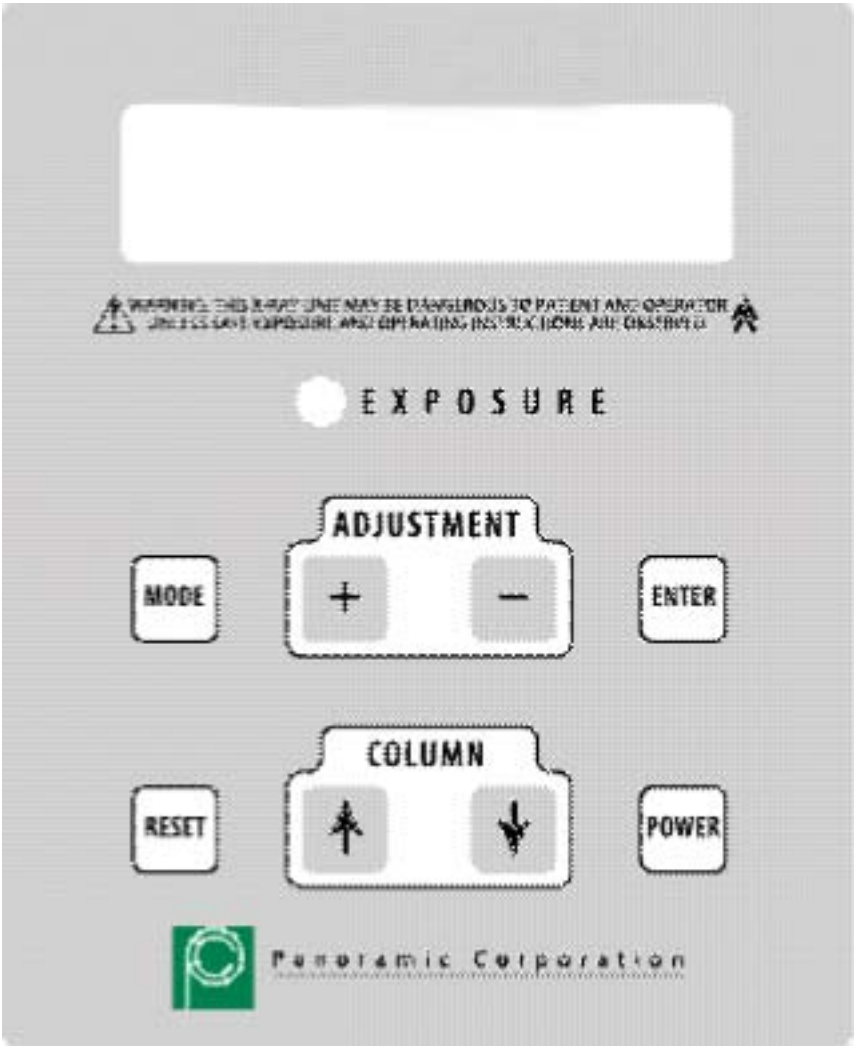
2. Inspect Indicator Lights and Beeper
    a. LED display is working properly
    b. exposure indicator light illuminates during exposure
    c. audible beeper sounds during exposure

3. Inspect Filters/Intensifying Screens
    a. clean with cleaning/antistatic solution or nonabrasive soap and water
    b. no scratches or marks
    c. black cassette free of rips or holes
    d. verify correct film and screen combination

4. Inspect Machine
    a. forehead support assembly is working properly
    b. machine is level and secured
    c. column up/down assembly is well lubricated and working properly
    d. arm and film drum rotation is free of friction and well lubricated
    e. tubehead is free of oil leaks

5. Calibration and Beam Alignment
    a. verify tubehead is properly calibrated as required by FDA
    b. arm is rotating at factory specified speed
    c. beam is properly aligned with film drum

6. Darkroom
    a. light-tight
    b. no light sources other than GBX-2 or equivalent (radios, clocks, etc.)
    c. timer/thermometer working properly



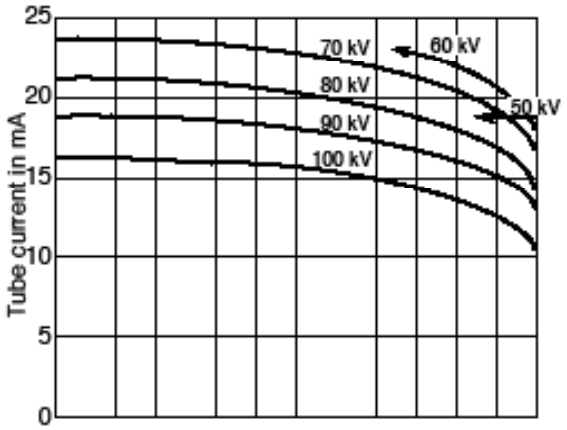
Control Panel

Tube Housing Thermal Characteristics

Time in hours

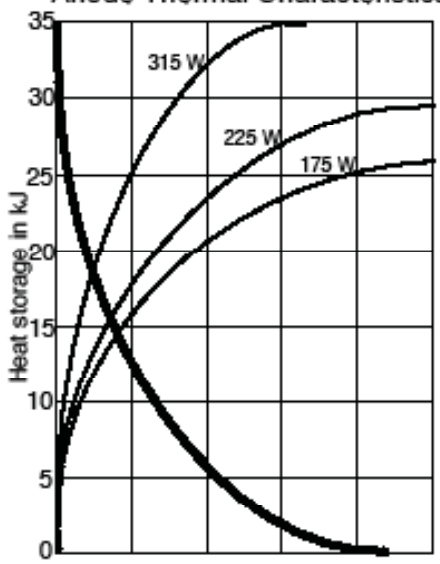
1 kJ=1400 H.U. 1 Watt=1.4 H.U./sec

Tube Maximum Current



Time in seconds

Anode Thermal Characteristics

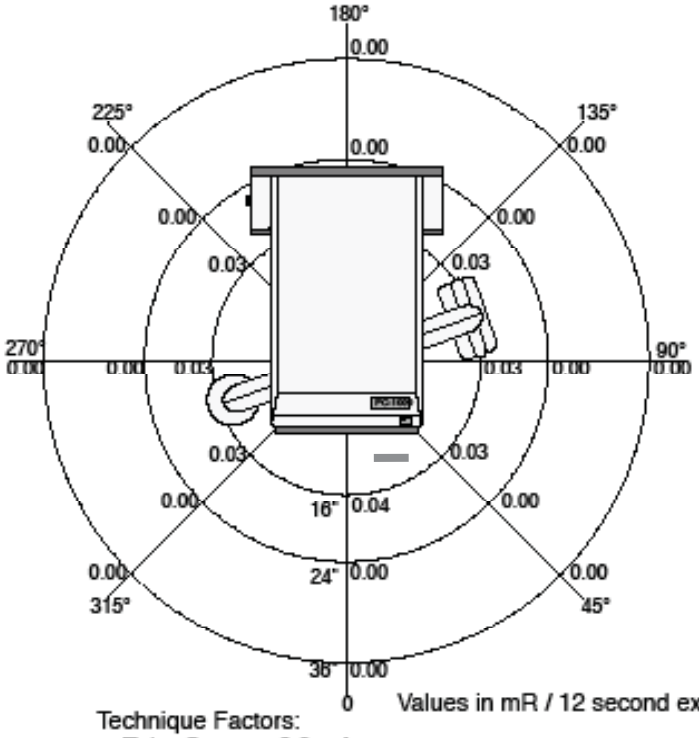


Time in minutes

— Heating
▬ Cooling

Self-rectified Focal spot: 0.5 mm

Radiation Scatter Survey



Values in mR / 12 second exposure

Technique Factors:
Tube Current: 6.0 mA
Tube Voltage: 90 kVp
Exposure Duration: 12 seconds

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

Power Ratings

Model 801125-1: 105-125 VAC, 50/60 Hz, 10A
Model 801125-2: 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

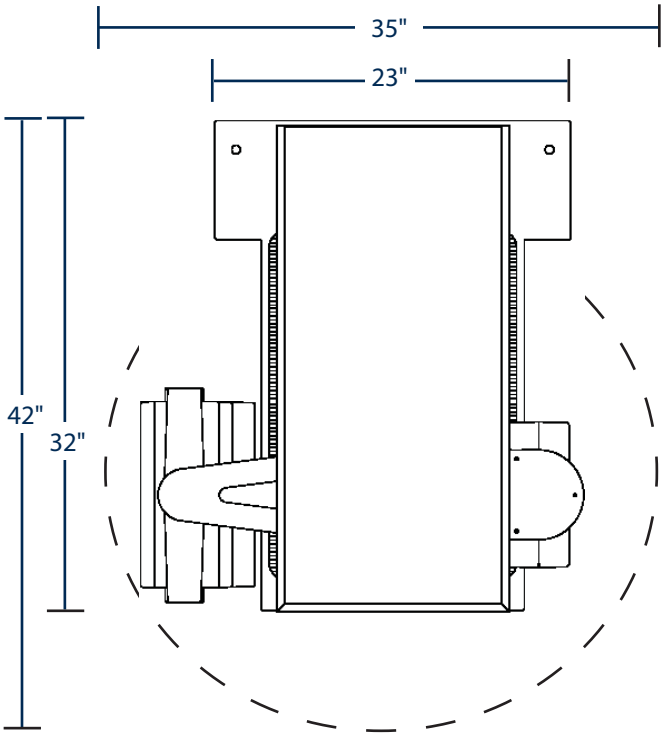
Measurement Techniques

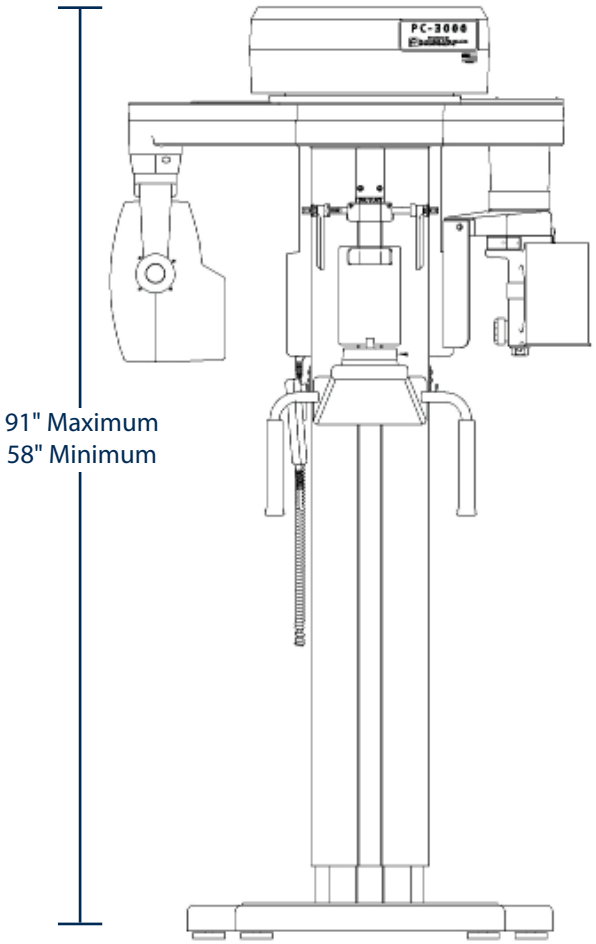
Exposure Time	Measured with Engineered Systems & Design Model XR201MS pulse counter.
Tube Current	Measured directly with a DC mA meter having a basic accuracy of no less than ± 3%.
Peak Tube Potential	Measured using a computerized kVp measurement system NeroMax Victoreen. System accuracy is ± 3% exclusive of waveform, inherent filtration, and reproducibility.
Maximum Line Current	Machine set at 90 kVp/6 mA

PC-3000 Space Requirements

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

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



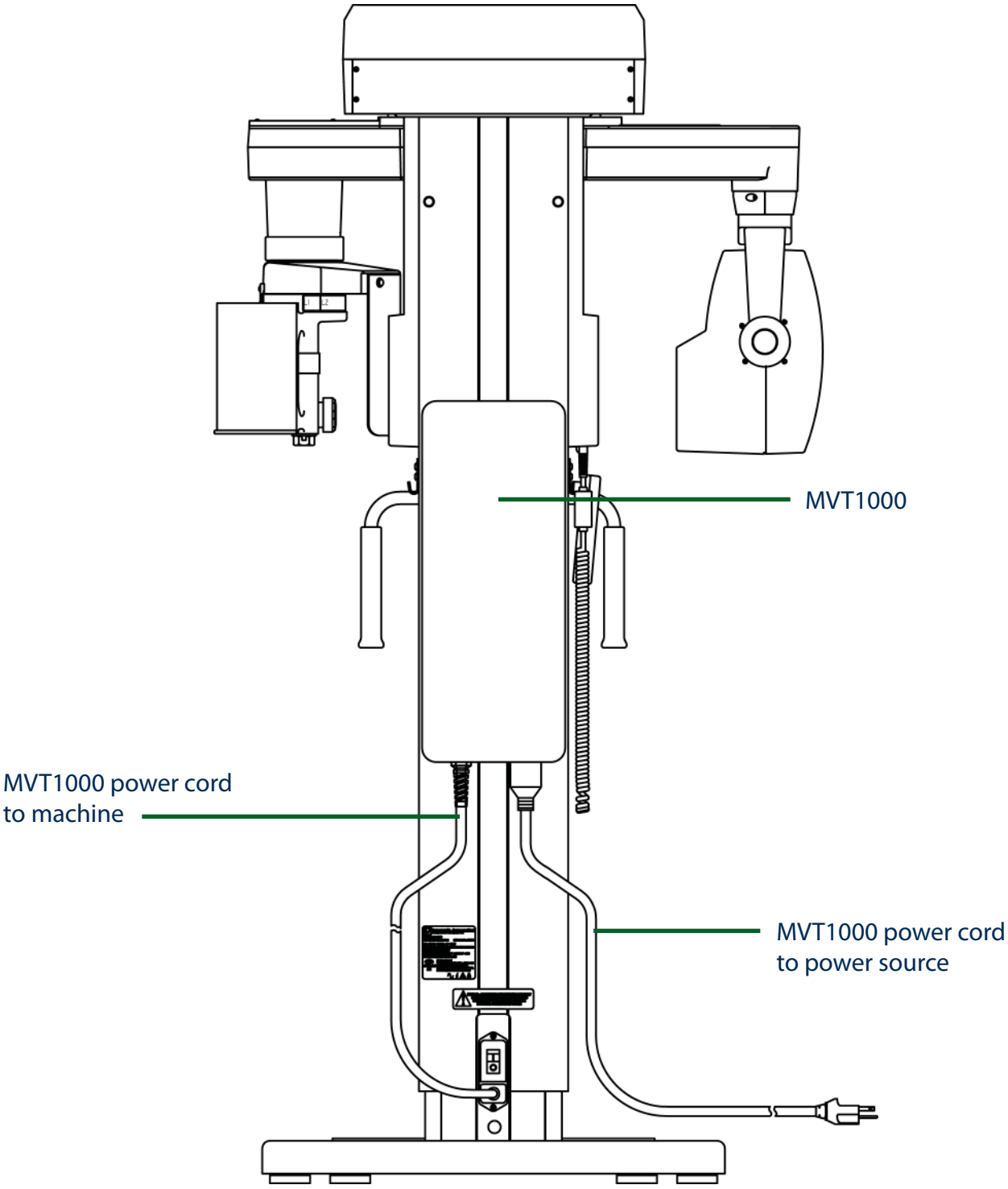


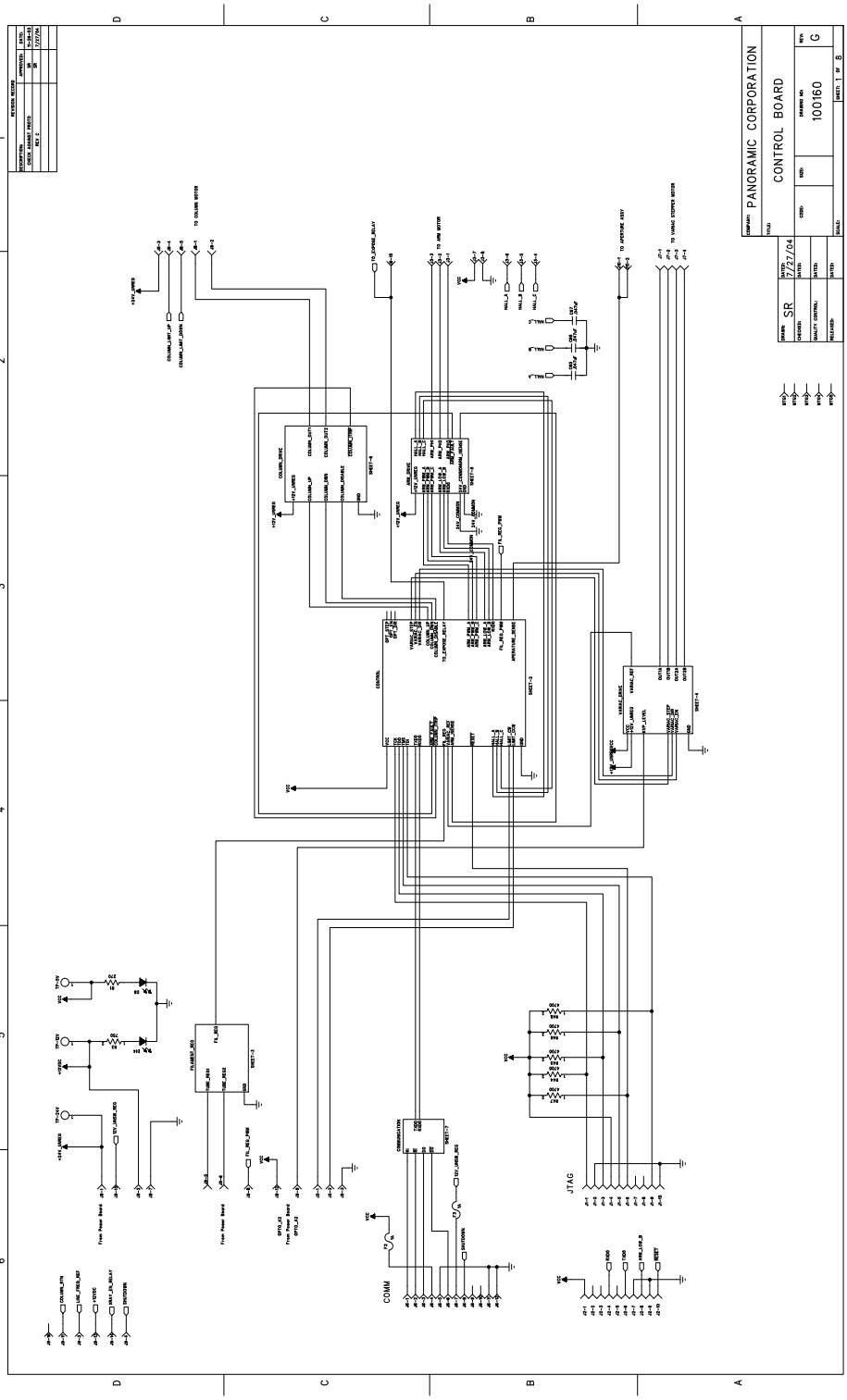
The PC-3000 weighs approximately 415 pounds and is freestanding, requiring no extra support in the wall or floor.

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.

Model 801125-2 includes MVT1000 attached to the rear of the machine. MVT1000 power cords must be connected as shown.

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CONTROL BOARD
100160
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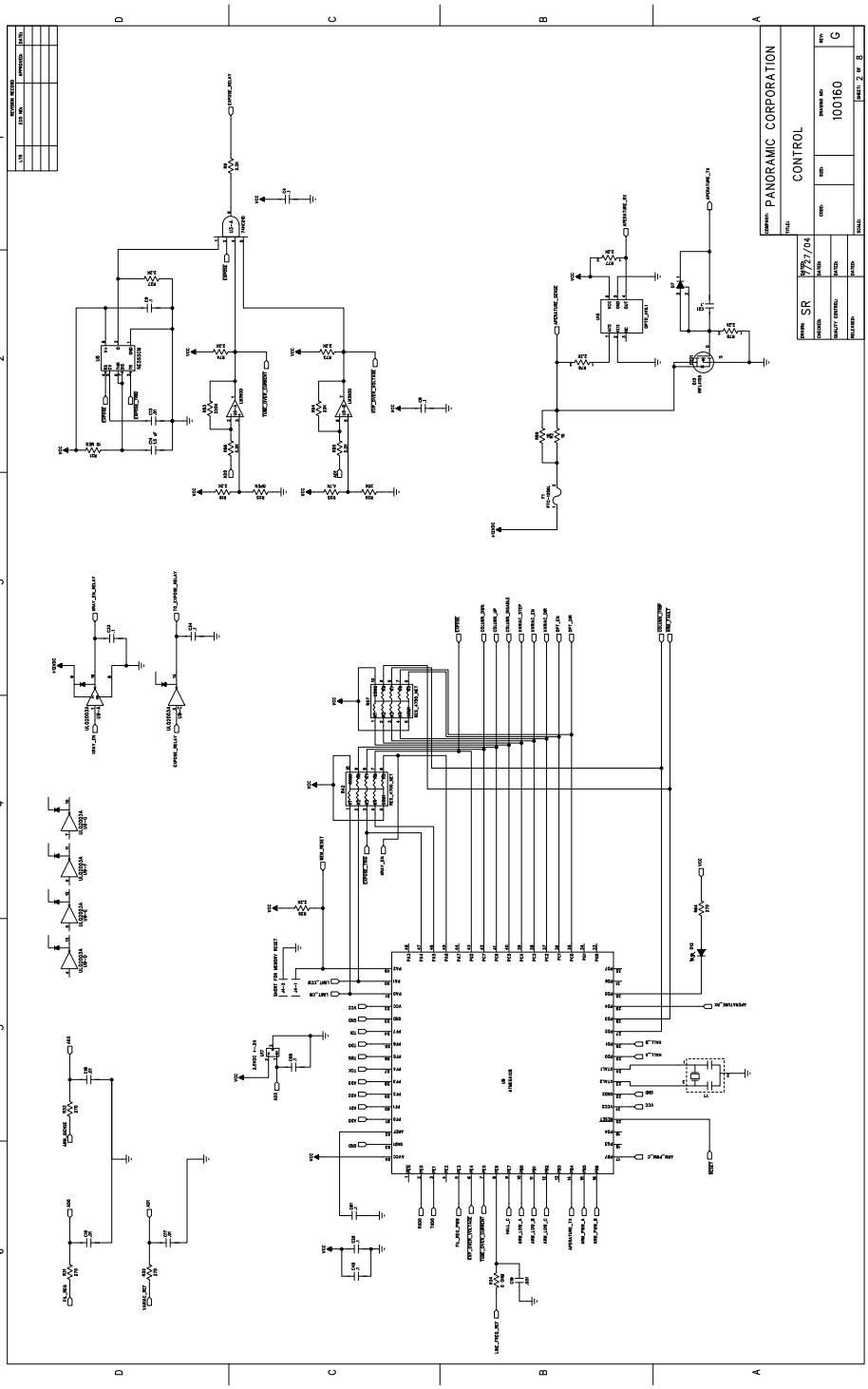
7/27/04
JTAG
COMM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CONTROL
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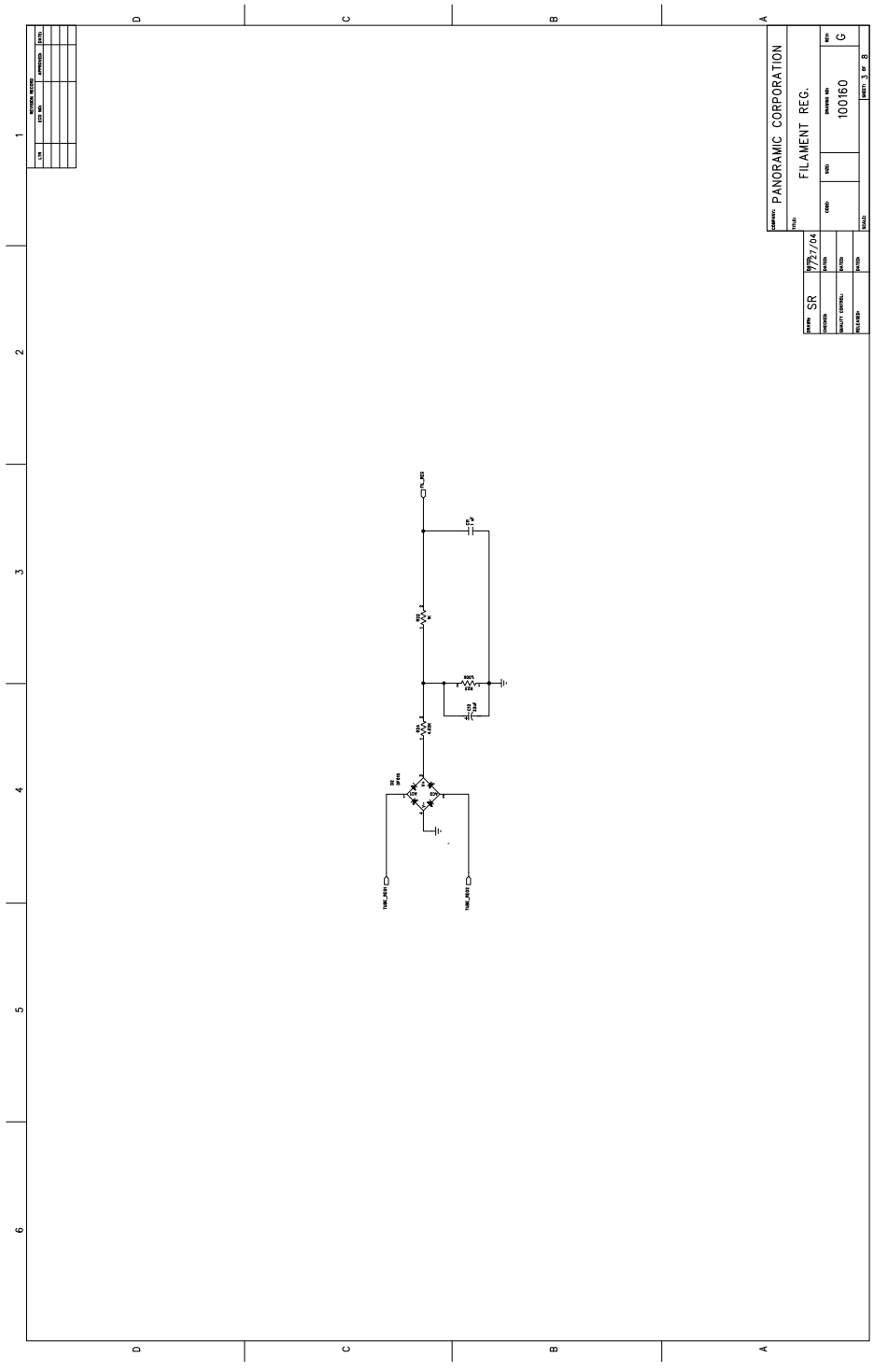
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FILAMENT REG.
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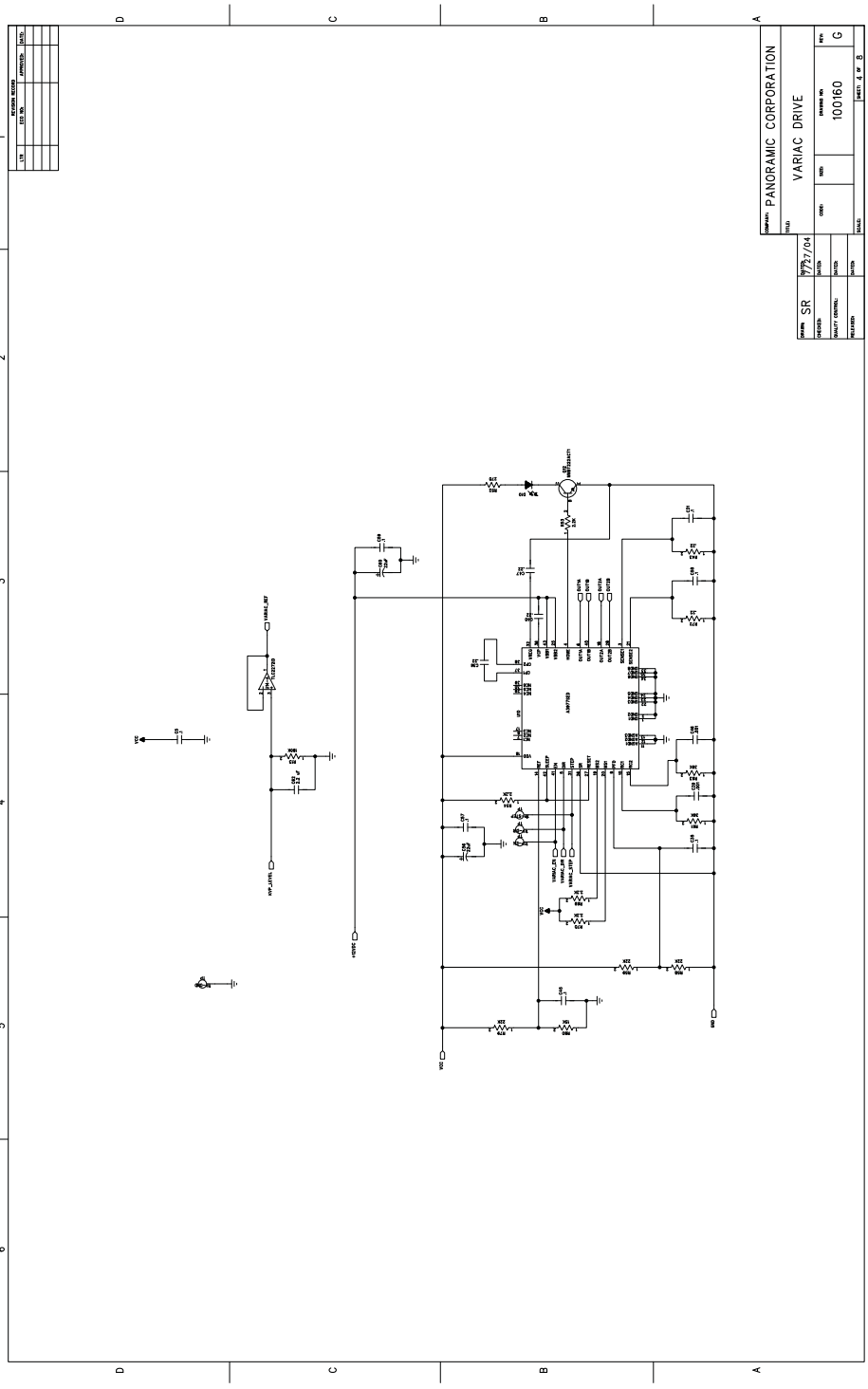
7/7/04
SHEET 1 OF 8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VARIAC DRIVE
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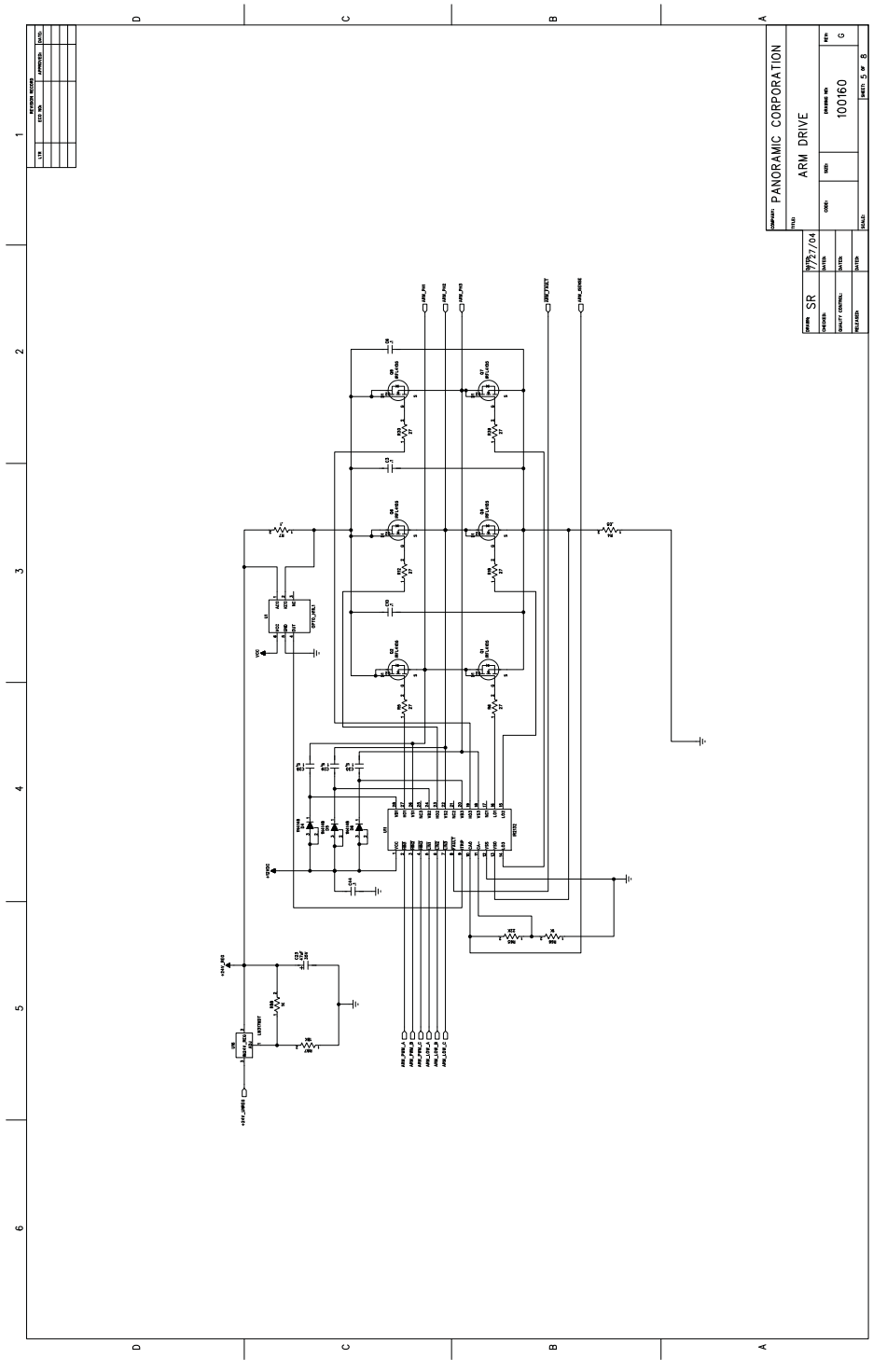
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ARM DRIVE
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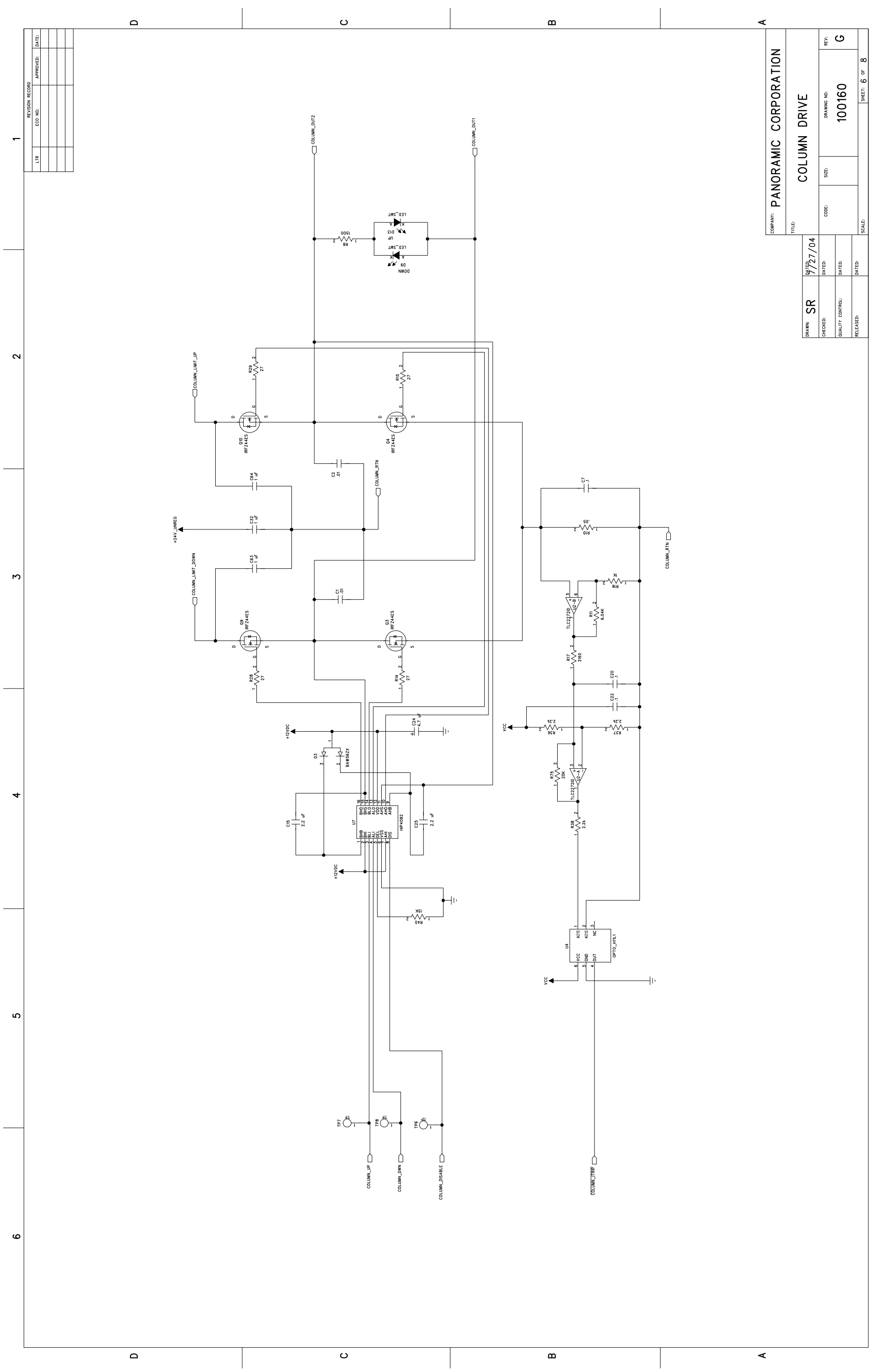
SR
7/7/04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COLUMN DRIVE
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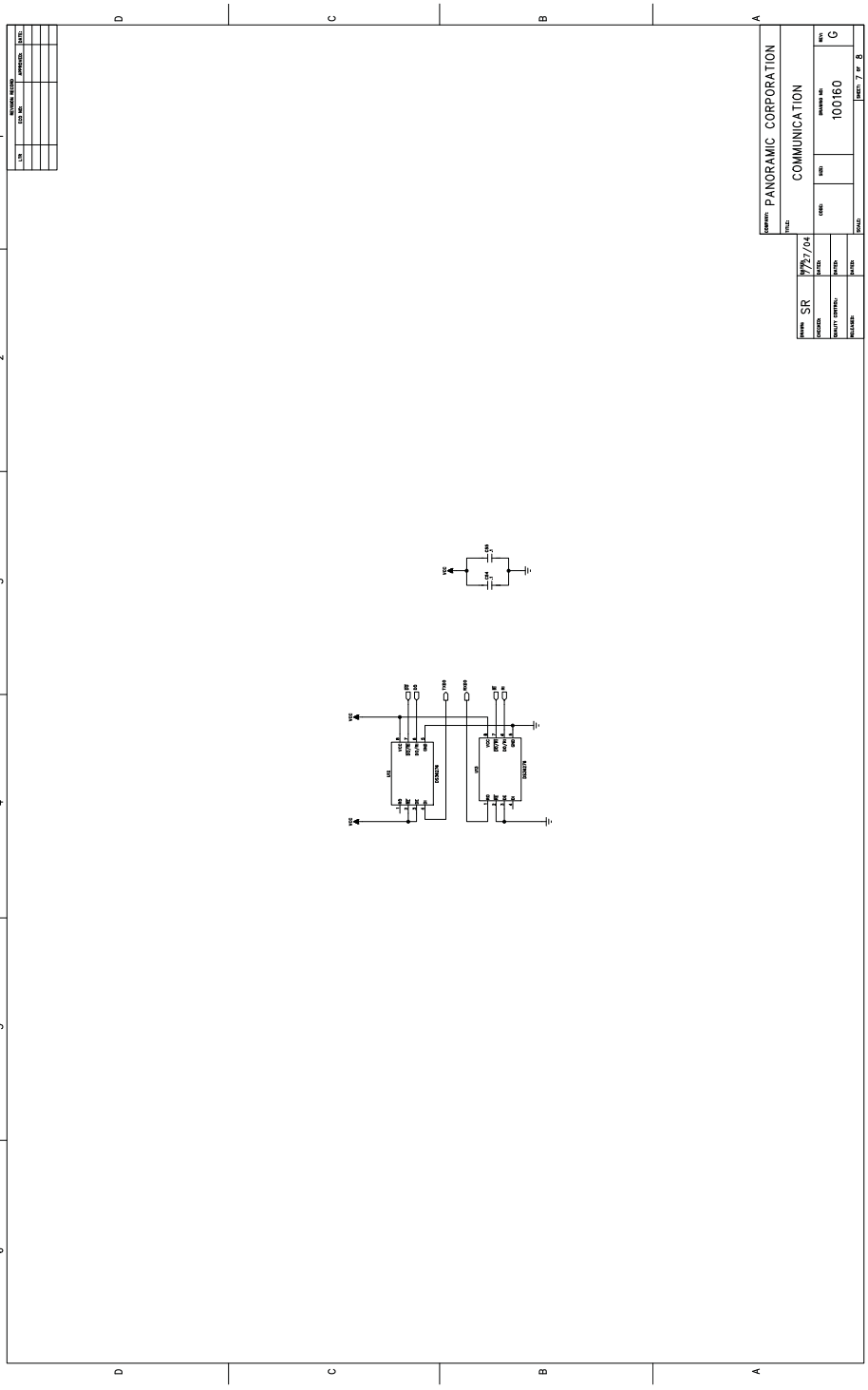
6 of 8


PANORAMIC CORPORATION
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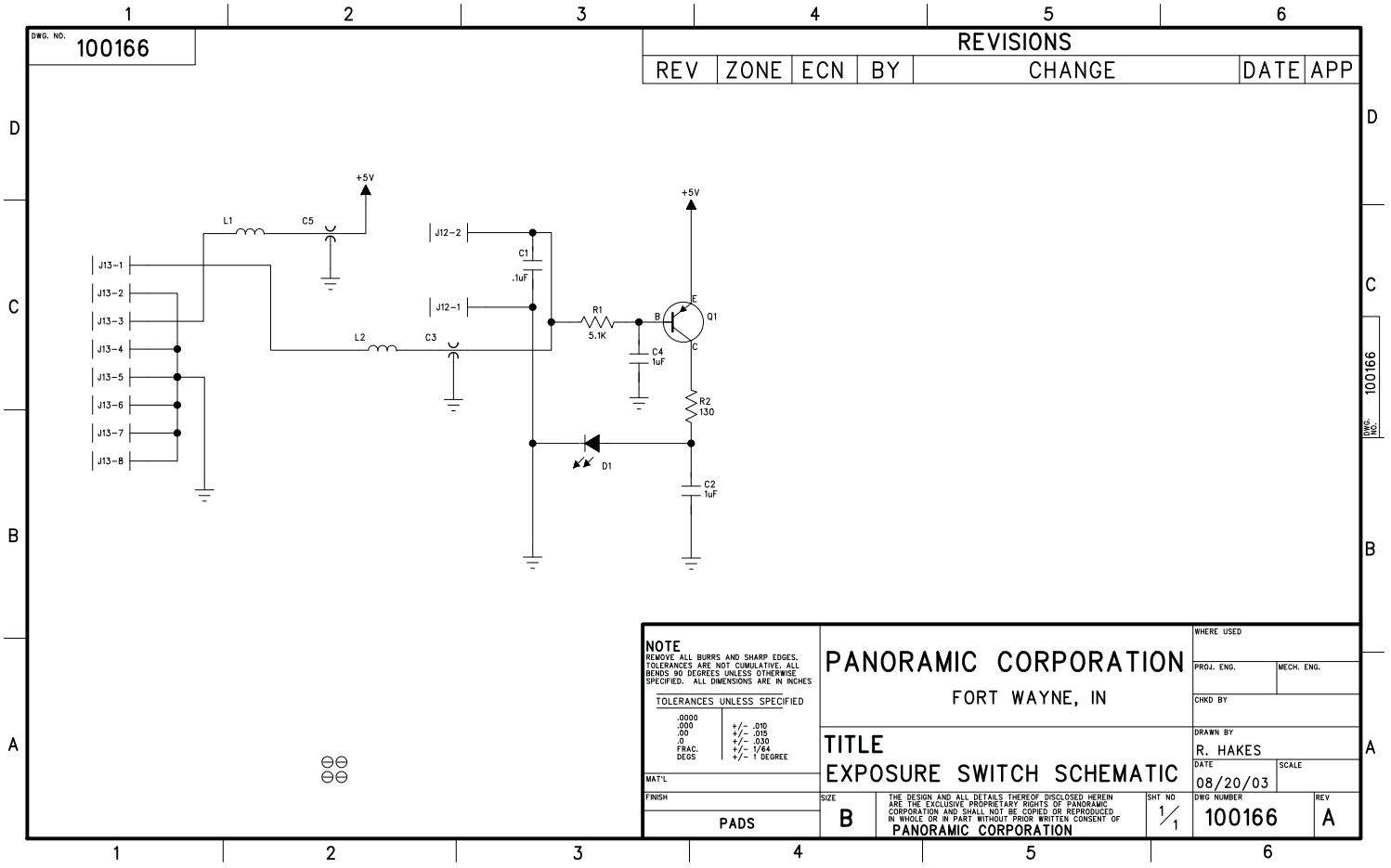
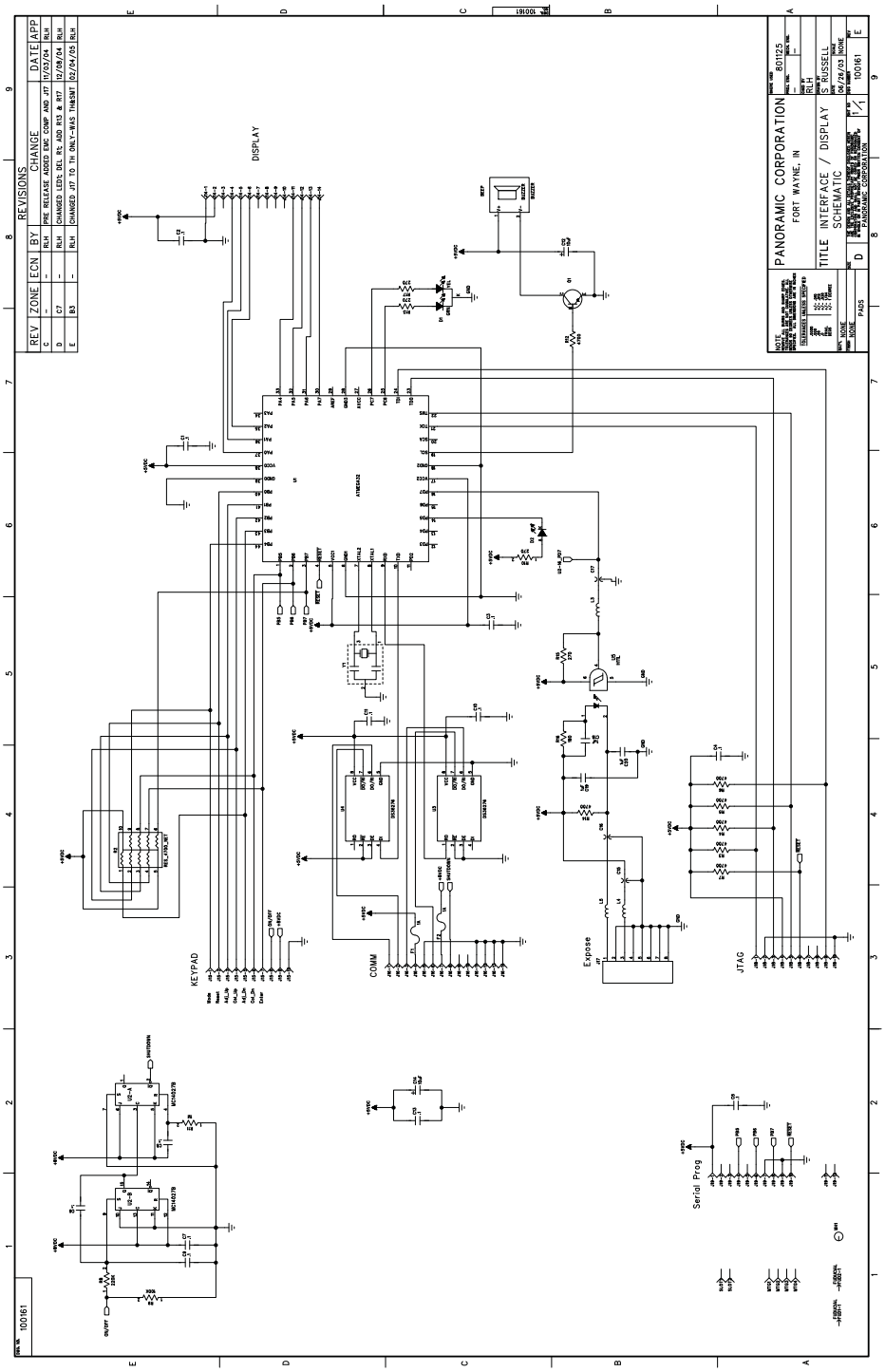
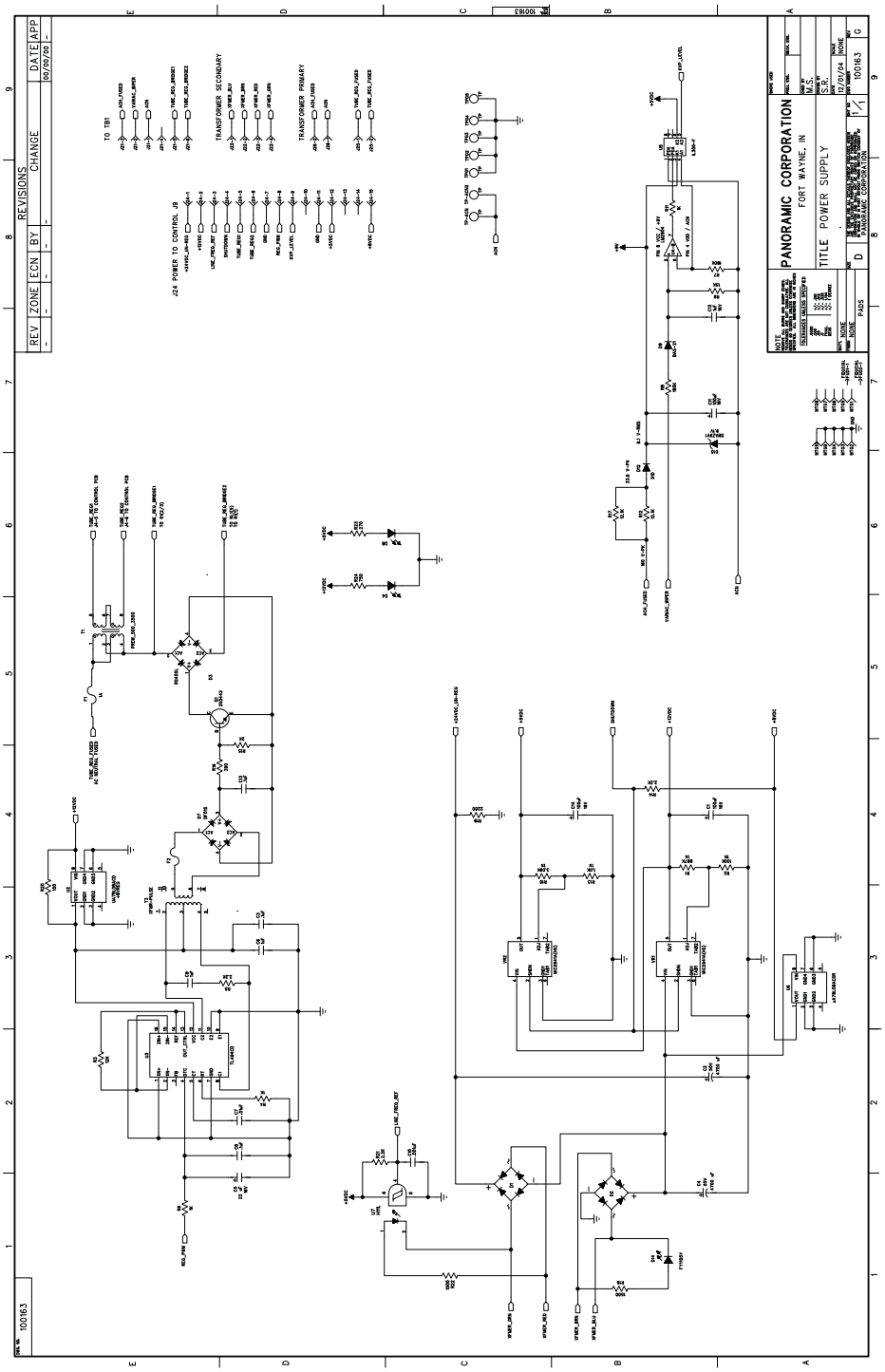
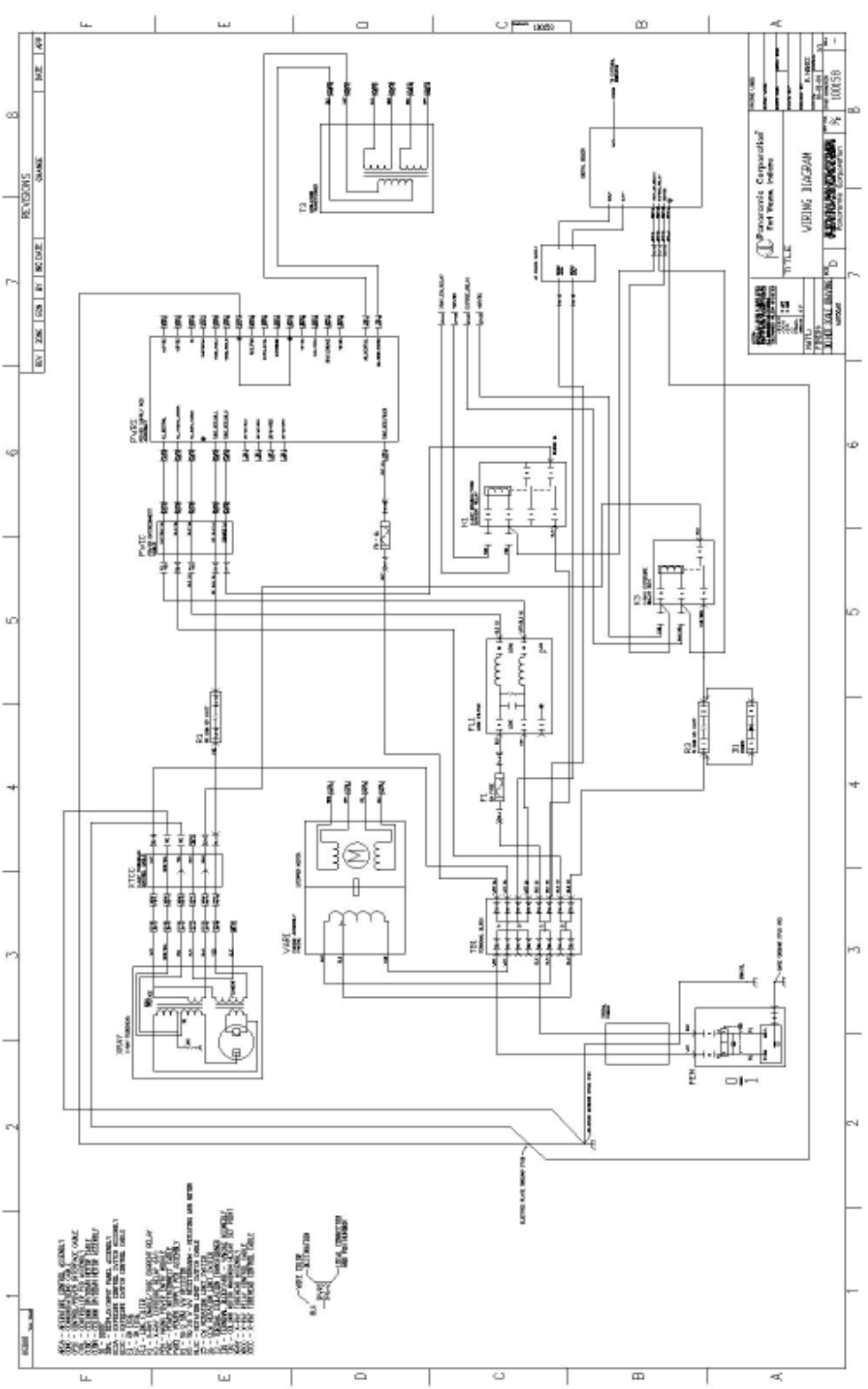
SHEET: 7 OF 8

800-654-2027 www.pancorp.com




REVISIONS
REV | ZONE | ECN | BY | CHANGE | DATE | APP
C | - | - | RLH | PRE RELEASE ADDED EMC COMP AND J17 | 11/03/04 | RLH
D | C7 | - | RLH | CHANGED LEDS DEL R5 ADD R13 & R17 | 12/08/04 | RLH
E | B3 | - | RLH | CHANGED J17 TO TH ONLY-WAS THMOUNT | 02/04/05 | RLH
PANORAMIC CORPORATION
FORT WAYNE, IN
TITLE INTERFACE / DISPLAY SCHEMATIC
DISPLAY
KEYPAD
COMM
Expose
JTAG
Serial Prog


REVISIONS
REV | ZONE | ECN | BY | CHANGE | DATE | APP
PANORAMIC CORPORATION
FORT WAYNE, IN
TITLE POWER SUPPLY
100163


WIRING DIAGRAM

Perform KVP Calibration

1. Plug the Power Cord into the Power Bus at the bottom of the column, and 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 you have about 1 second to hold simultaneously the MODE and ENTER buttons.
     - The screen will display:
       ENTER PASSWORD
       2703
       To enter the password you will press the Adjust +/- 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.
5. Press and hold exposure switch to get reading on multimeter.
6. Adjust voltage by using +/- buttons until 89v +/- .1 is achieved. Press ENTER.
7. Press MODE once to advance to:
   KVP CAL104 VAC
8. Repeat steps 4-6 to achieve 104v +/- .1.
9. 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 +/- .1 mA.

6. Press ENTER once 6.0 mA +/- .1 is achieved
7. Power off the machine, remove multimeters, and reconnect wires. Current Calibration is complete.

The darkroom must be lighttight. Extraoral (panoramic/cephalometric) film is more sensitive than intraoral (bite-wings) film to light, and processing time and temperature.

Manual Processing

- Lighttight darkroom
- Dip tanks
- Timer
- Thermometer
- Developer and fixer solutions
- Film Hanger
- Water supply and drain
- Safelight (GBX-2 filter or equivalent, 15 W bulb or less and at least 4' from film)

1. Prepare developer and fixer solutions according to the solution's directions.
2. Verify developer temperature.
3. Under safelight conditions, remove the exposed film from the cassette sleeve and attach it to a film hanger.
4. Set the timer based on the developer temperature and the processing chart.
5. Immerse the film quickly into the developer and agitate it vigorously for only 5 seconds to dislodge any air bubbles.
6. When the timer sounds, remove the film from the developer and immediately rinse it with water for 30 seconds while agitating it. Do not allow the excess developer to drain back into the developer tank.
7. Immerse the film into the fixer and agitate it for 5 seconds every 30 seconds. Allow the excess fixer to drain back into the fixer tank.
8. Immerse the film in the water wash tank and rinse it thoroughly.
9. Dry the film at room temperature or in a drying cabinet.

Automatic Processing

A thermometer should be present to periodically verify the temperature. It is imperative that the processor's maintenance schedule is followed thoroughly.

Manual Processing					Automatic Processing
Film Type	Developer Temperature Time	Rinse	Fixer	Wash	
T-MAT (for use with Lanex screens)	68° F 20.0° C 8 min 72° F 22.0° C 7 min 76° F 24.5° C 5 min 80° F 26.5° C 4 min	30 sec 60° F 15.5° C to 85° F 29.5° C	2-4 min 60° F 15.5° C to 85° F 29.5° C	5 min 60° F 15.5° C to 85° F 29.5° C	82° F 28.0° C 5.5 min 83° F 28.5° C 4.5 min 85° F 29.5° C 4 min

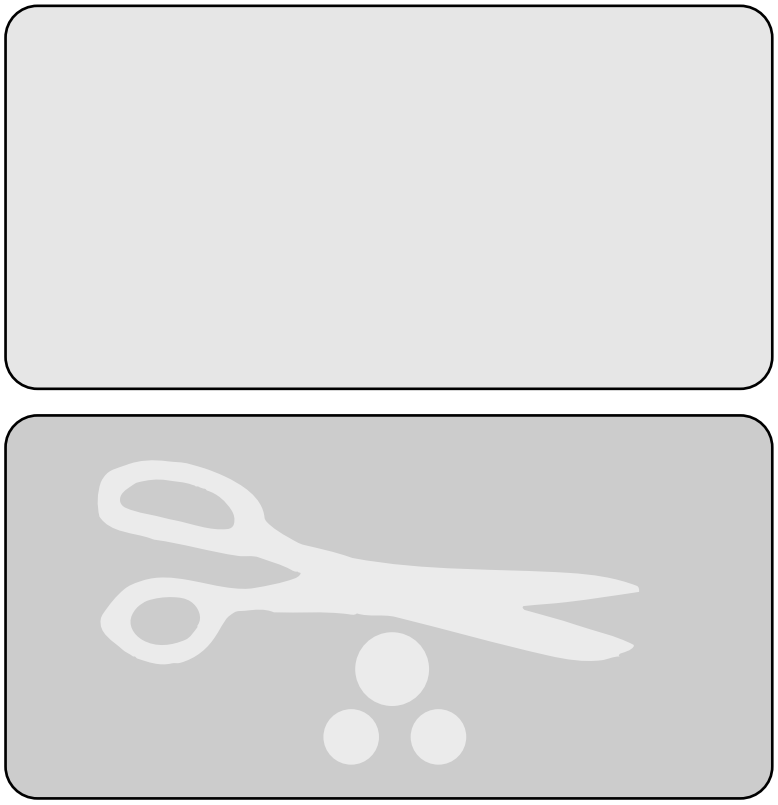
Note: Extraoral film requires more frequent solution replenishment than intraoral film. One ounce of chemicals are typically required for replenishment for every 75 intraoral, 3 panoramic, or 2 cephalometric films.

Darkroom Light Leak Test

Extraoral film is more sensitive to light than intraoral film. The purpose of the intensifying screens inside of the cassette sleeve is to convert the X-ray energy into light, thus exposing the film. While the light sensitivity of the film allows a very small amount of radiation to expose the film, it also can pose a problem if the darkroom is not completely lighttight. Small light leaks can cause fogging of the film while handling and processing the film in the darkroom.

The following test should be performed in the darkroom under safelight conditions to ensure it is lighttight:

1. Remove one sheet of extraoral film from the box.
2. Lay it on the counter in the darkroom under normal darkroom conditions.
3. Place a couple of coins, a pair of scissors, or any other opaque object on top of the film.
4. Wait for two minutes.
5. Process the film as usual.



The processed film should be clear. None of the objects should be visible on the film.

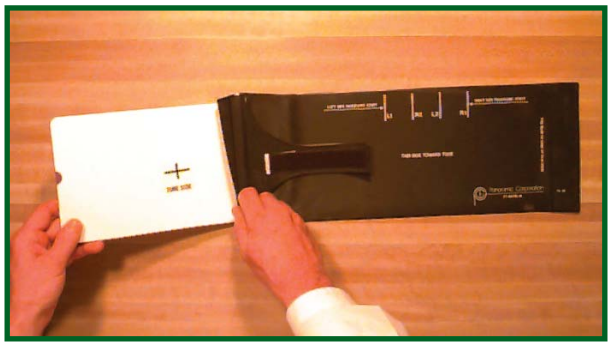
If any of the objects can be seen on the processed film, there is a light leak or other light source in the darkroom. The light leak fogs the test film, everywhere except where the opaque objects are blocking the light. To find the light leak, turn all of the lights off in the darkroom and inspect the darkroom for cracks around the door and ceiling tiles. Indicator lights on equipment, such as stereos, and improper safelights can also cause fogging. Turn off all unnecessary equipment and the safelight and try this test again.

It is recommended that the panoramic and cephalometric cassettes be loaded with film just prior to use. Do not leave a film loaded in the cassettes for an extended period of time. This will prevent background radiation from prematurely exposing the film. The film should be stored in a cool and dark place.

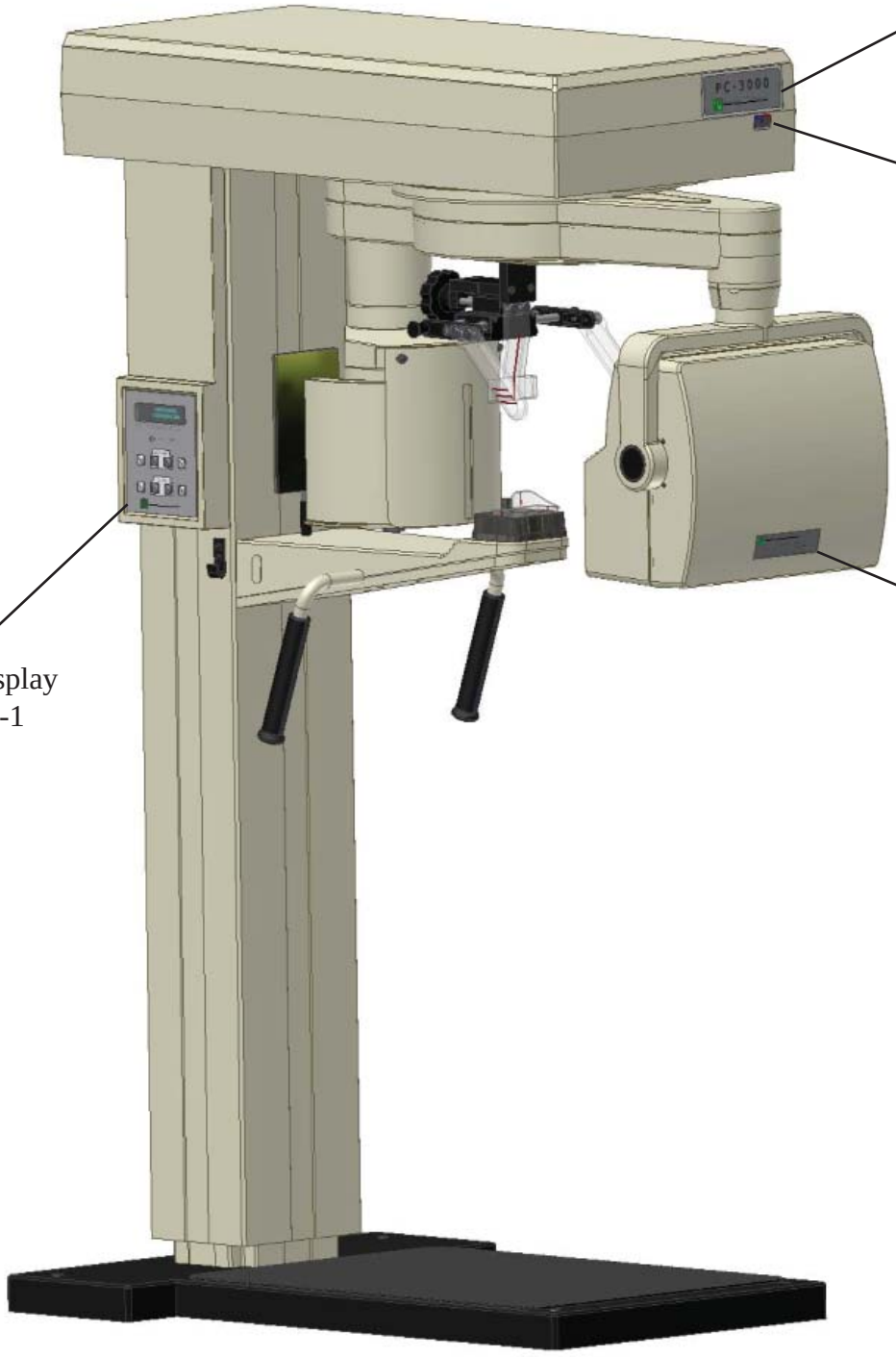
Loading The Panoramic Cassette

In a lighttight darkroom, open the flexible, panoramic cassette sleeve and slowly remove the intensifying screens. Open the screens on the counter and place a sheet of panoramic film on top of one of the screens. Close the screens and slowly slide them back into the cassette sleeve. Ensure that the hinged end of the screens is placed into the cassette sleeve first and the "TUBESIDE" decal is facing the same direction as the writing on the outside of the cassette sleeve. Ensure that all excess air is expelled from the cassette sleeve.

Note: Remove and discard the protective sheet from between new intensifying screens before their first use.



Labeling



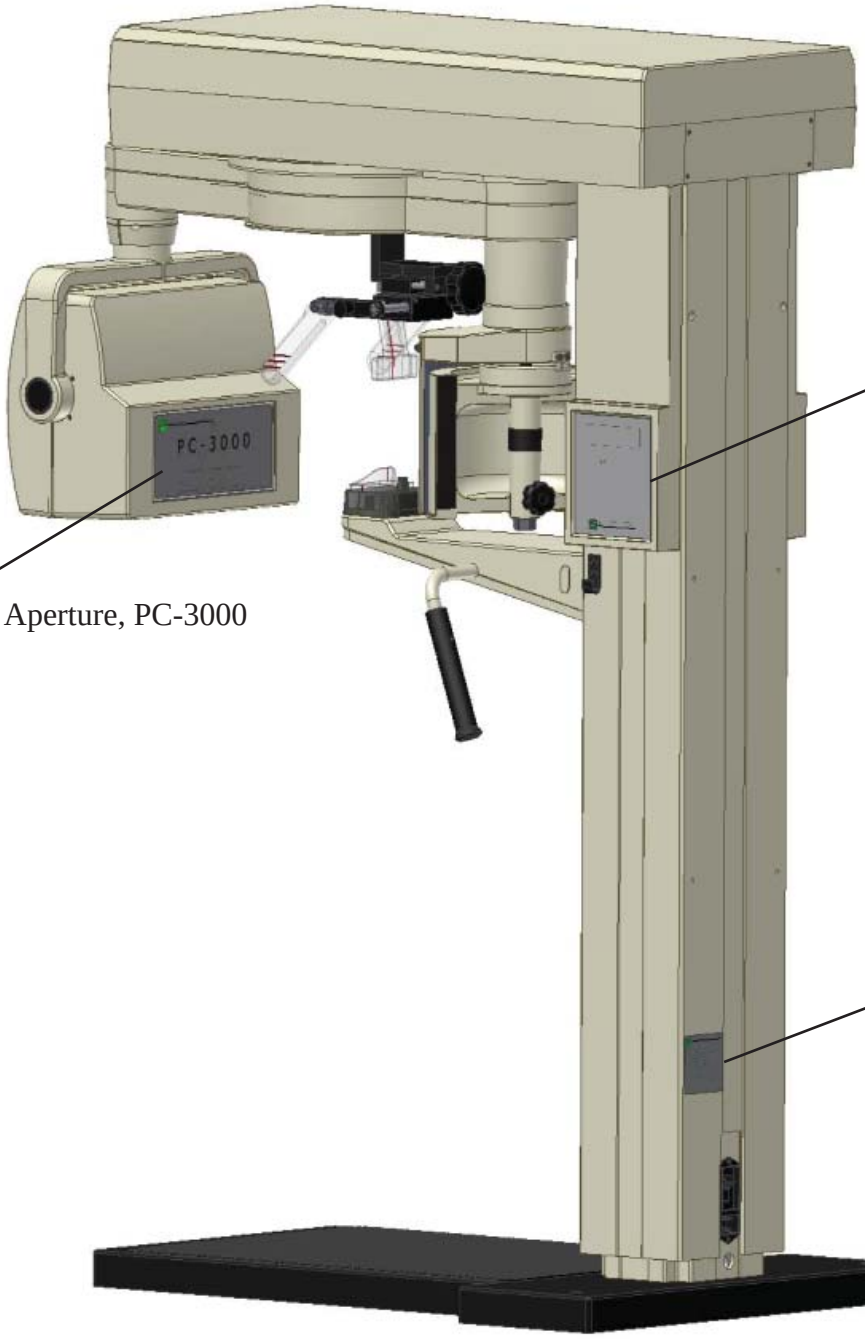
Decal, Model, PC-3000
P/N 674075-2

USA Decal
P/N 229548-1

Keypad, Display
P/N 674035-1

Decal, X-Ray Tubehead
P/N 674074-1

Labeling

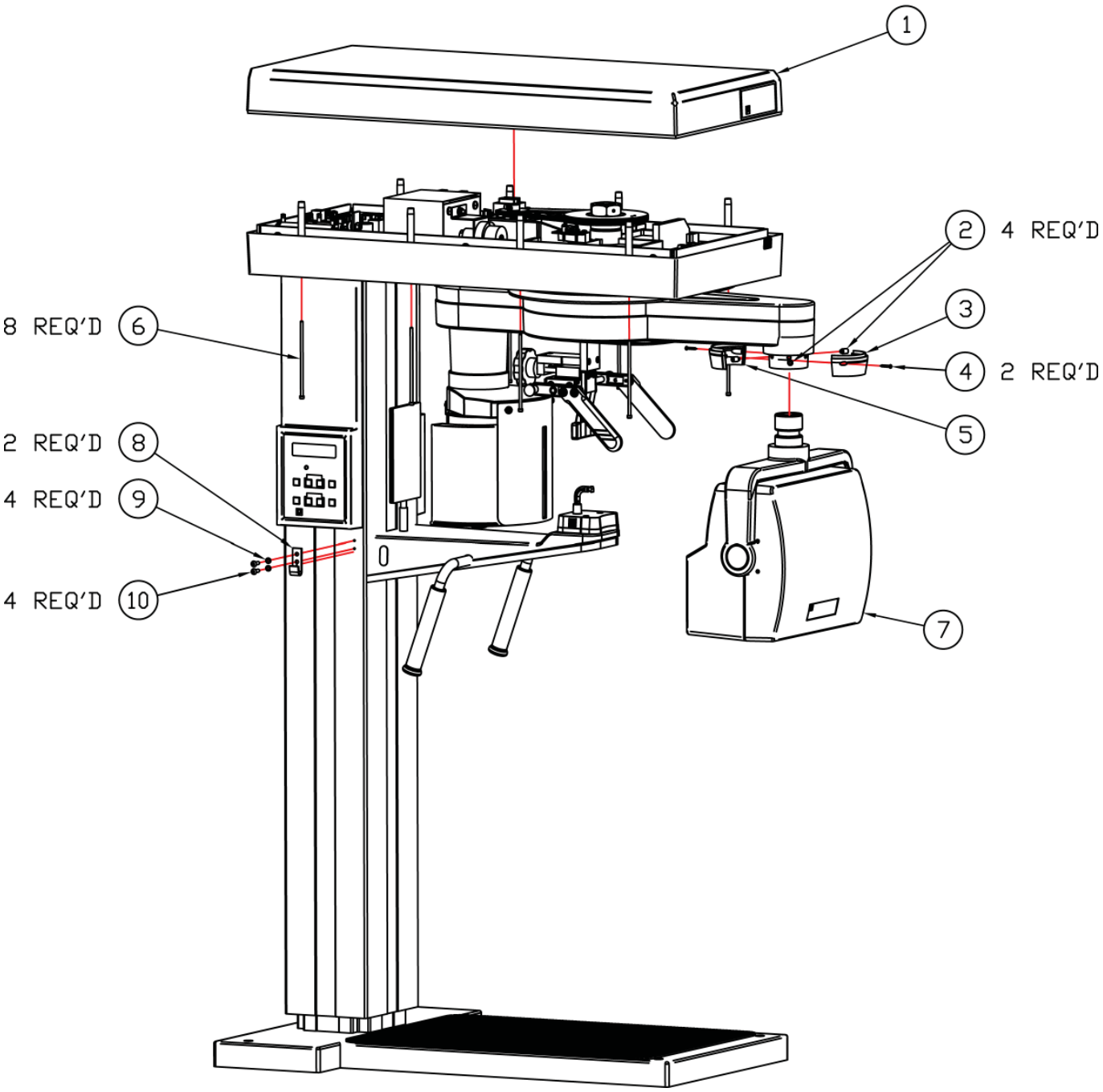


Decal, Plain
P/N 674046-1

Decal, Tubehead Aperture, PC-3000
P/N 300958-3

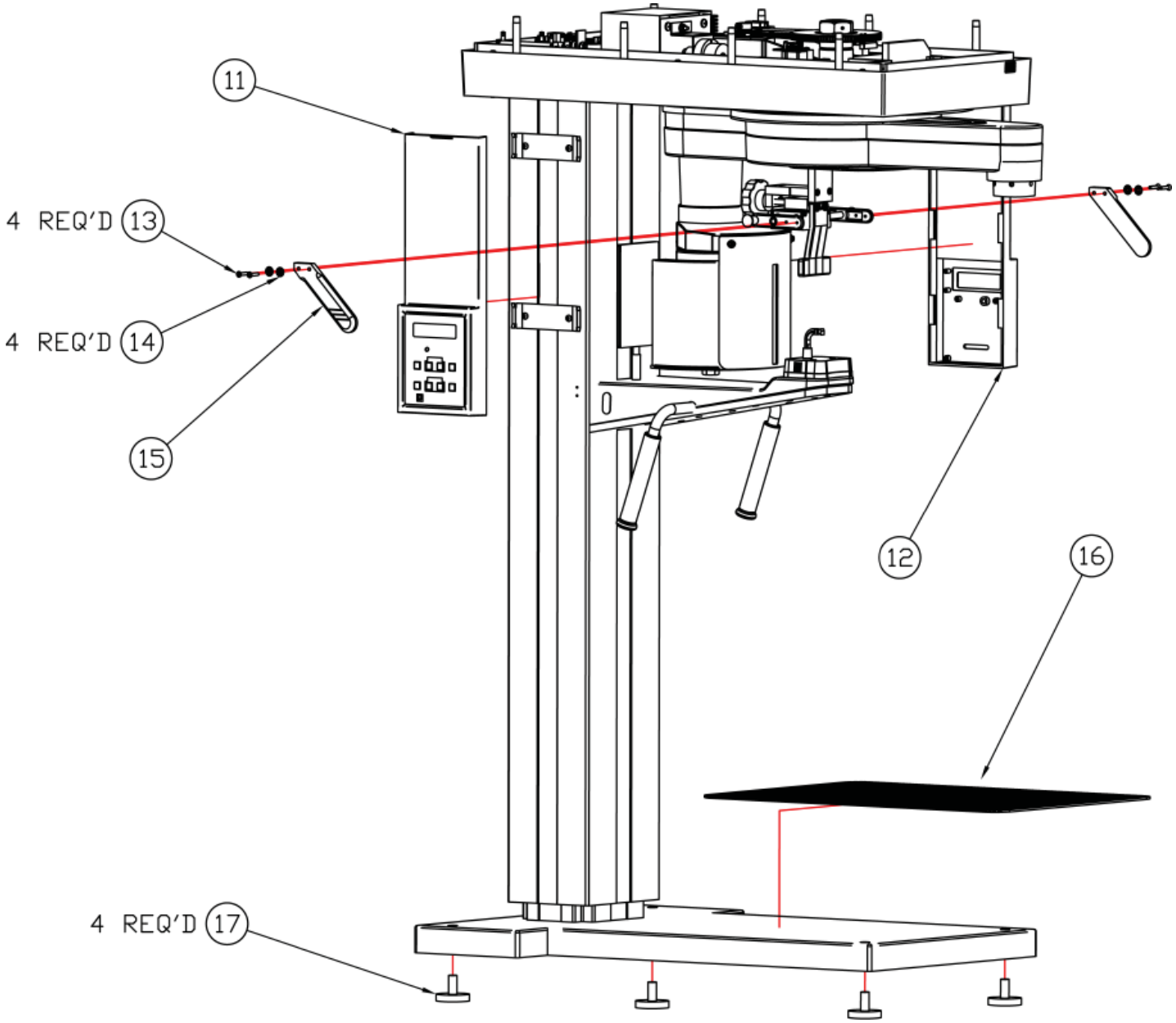
Label, Mains
P/N 674071-1

Final Assembly



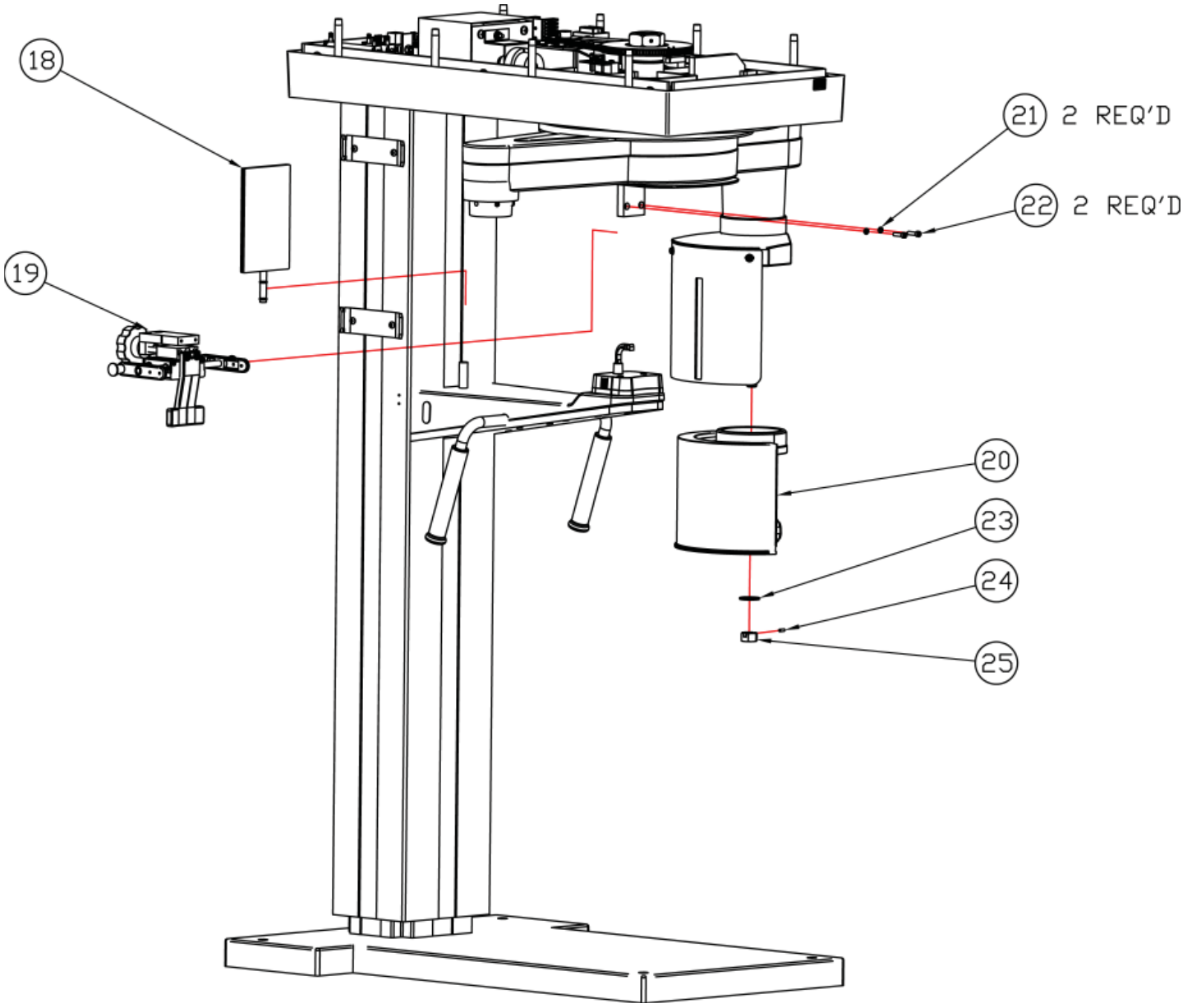
Item #	Part #	Description
1	301202-1	Cover, Chassis, Top, Modified
2	550033-523	Setscrew, 5/16-18, HFDOG
3	301054-2	Cover, Yoke Collar, Modified
4	550179-1	PHSMS, #4 X 3/4
5	301054-1	Cover, Yoke Collar
6	550168-1	SHCS 8-32 Special
7		Tubehead
8	301010-1	Hook, Exposure Switch
9	550148-10	Lockwasher, Split, #10
10	550035-31	BHCS, #10-24 X .63, Black

Final Assembly



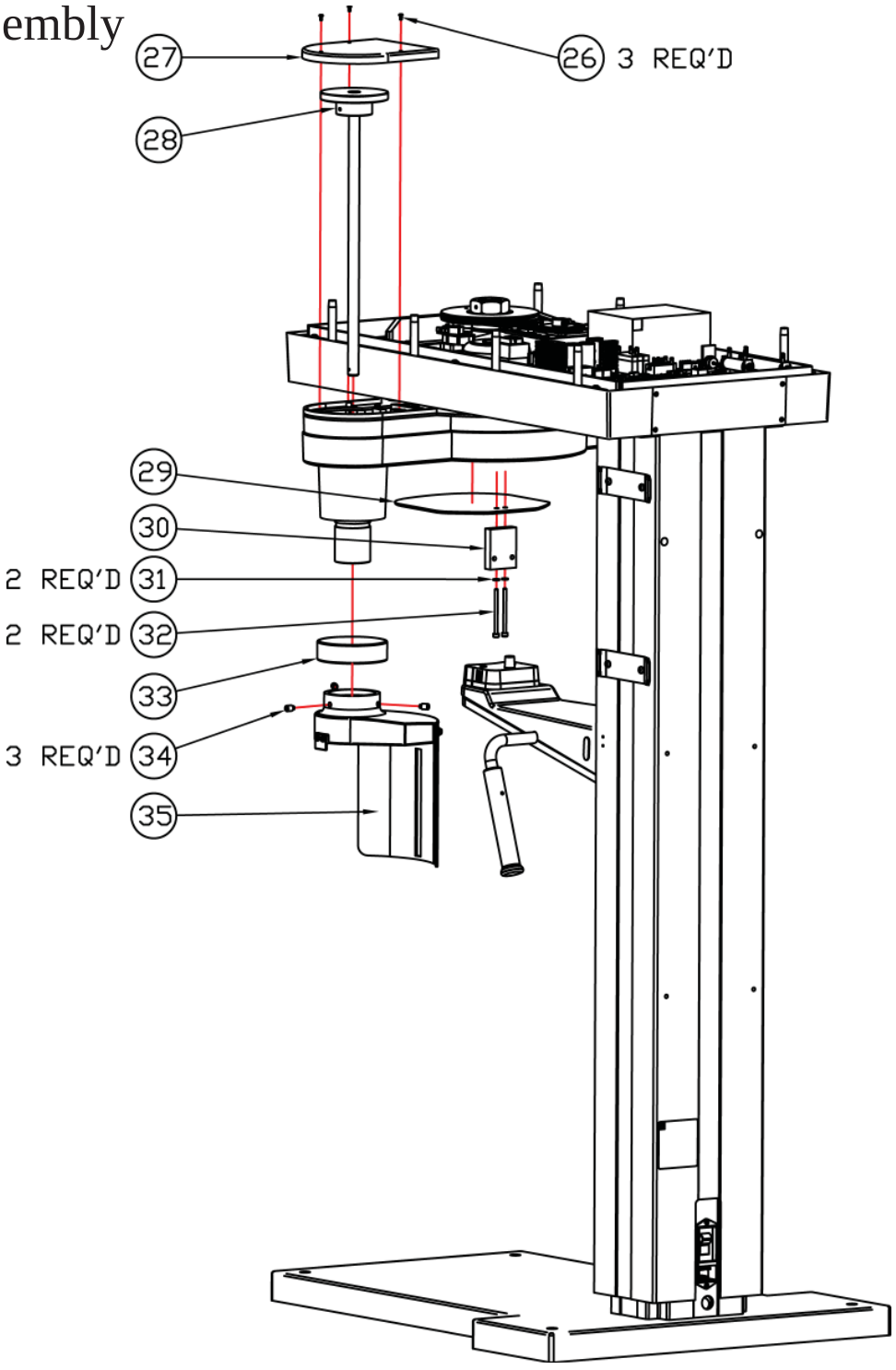
Item #	Part #	Description
11	801165-1	Display Panel Assembly
12	801192-1	Panel Assembly, Plain
13	318028-96	FHMS, 8-32 X 3/4, SS, PHIL
14	133223-1	Washer, Special, Head Support
15	229053-1	Support Head Left
15	229052-1	Support Head Right
16	318555-2	Tread, Foot
17	229847-2	Assembly, Leveling Foot

Final Assembly



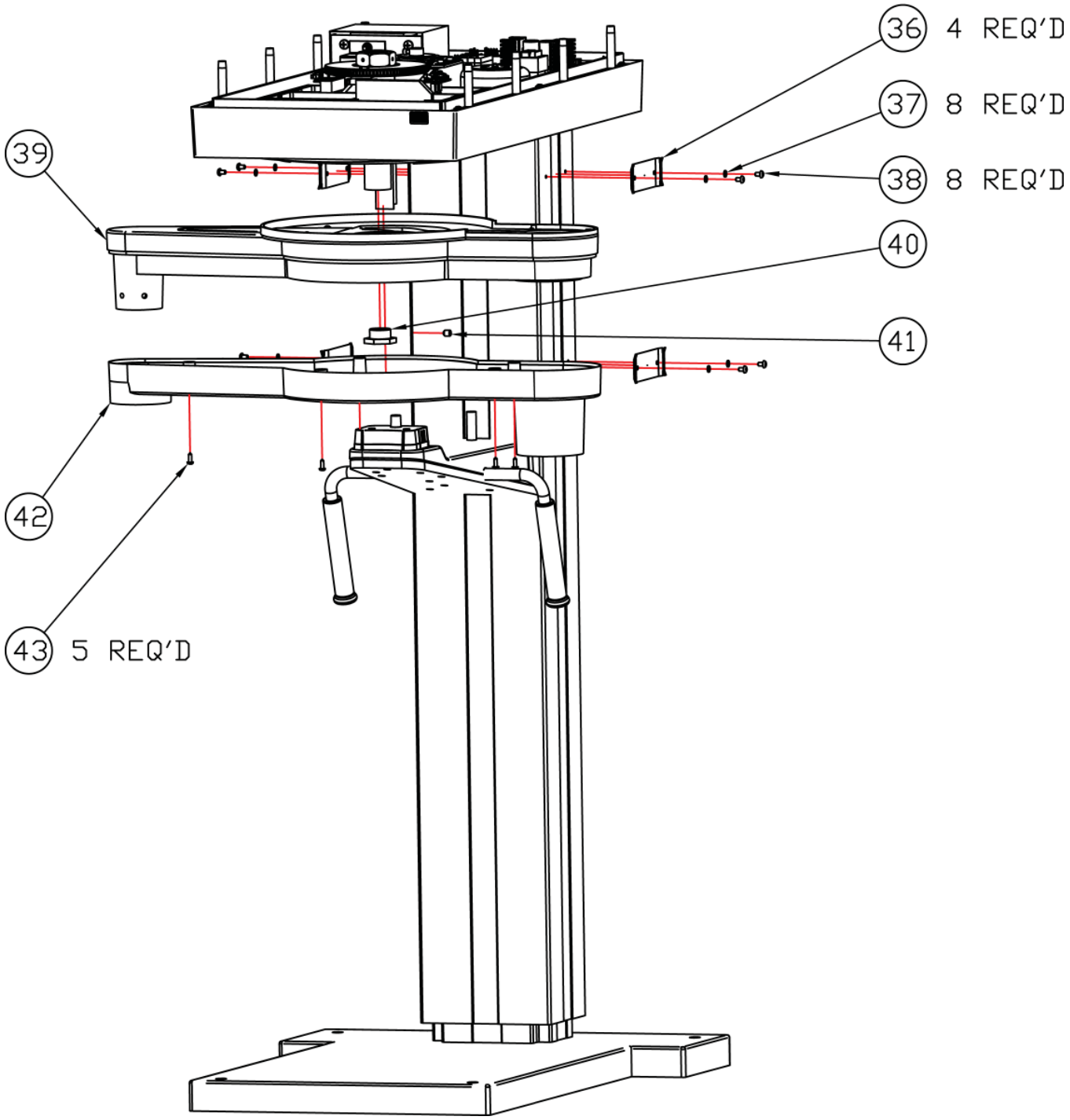
Item #	Part #	Description
18	801321-1	Mirror Assembly
19	419340-4	Head Support Assembly
20	800733-1	Film Holder Assebmly
21	550148-10	Lockwasher, Split, #10
22	550052-035	SHCS, 10-24 X 3/4, Coarse, Blk
23	300653-1	Washer, Special
24	550149-226	Setscrew, #6-32 X 7/16, Cup
25	229117-1	Nut, Special

Final Assembly



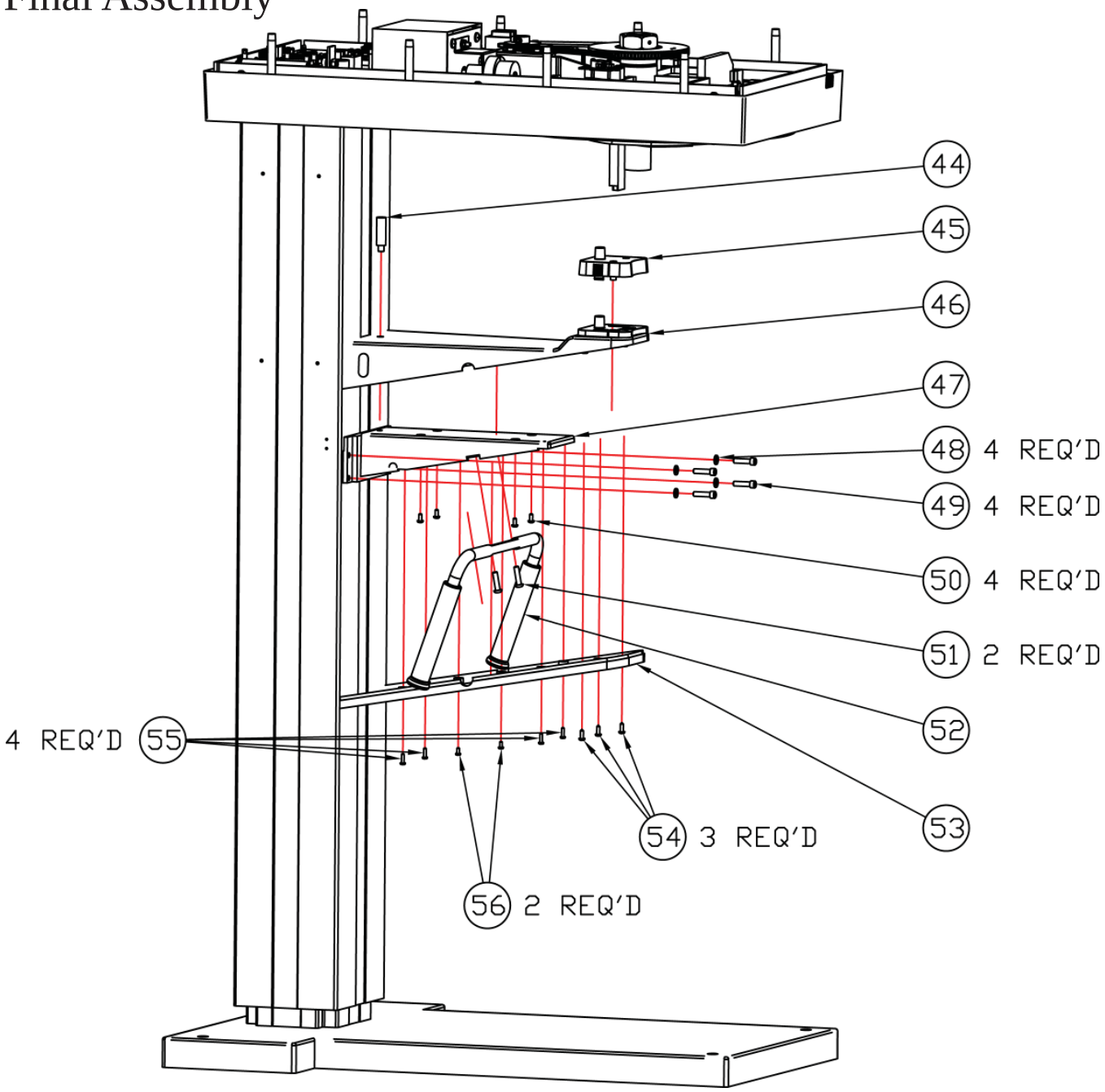
Item #	Part #	Description
26	550035-7	BHCS, #4-40 X .25, Black
27	300754-1	Cover, Wheel
28	800897-2	Inertia Wheel Assembly Facelift
29	301107-1.002	Fixed Cover, Finished
30	301116-2.001	Sliding Plate Support
31	550148-10	Lockwasher, Split, #10
32	550052-043	SHCS, 10-24 X 1/2, Coarse
33	300778-2	Trim
34	550149-337	Setscrew, 5/16-18 X 1/2, HFDG
35	800732-1	Film Shield Assembly

Final Assembly



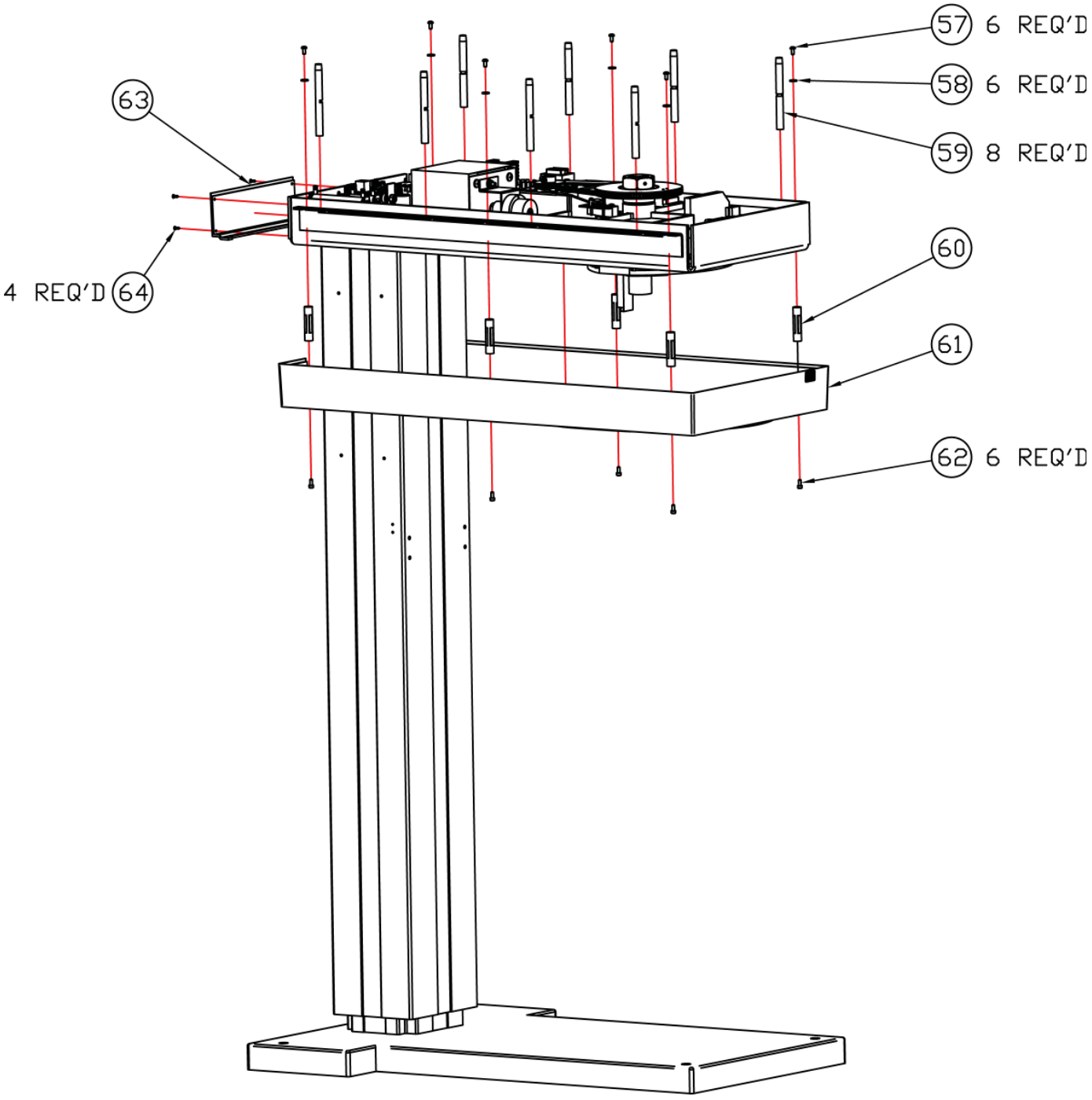
Item #	Part #	Description
36	300946-1	Retainer, Side Cover
37	550148-10	Lockwasher, Split, #10
38	550015-124	PHMS, #10-24 X 5/16, Zinc
39	801134-1	Rotating Arm Assembly
40	301187-1.001	Collar, Special, Finished
41	550033-75	Setscrew, 5/16-18 X 3/8, Plain
42	300753-1	Cover, Rotating Arm, Bottom
43	550053-13	Screw, Self-Tap, #6 X 1.0

Final Assembly



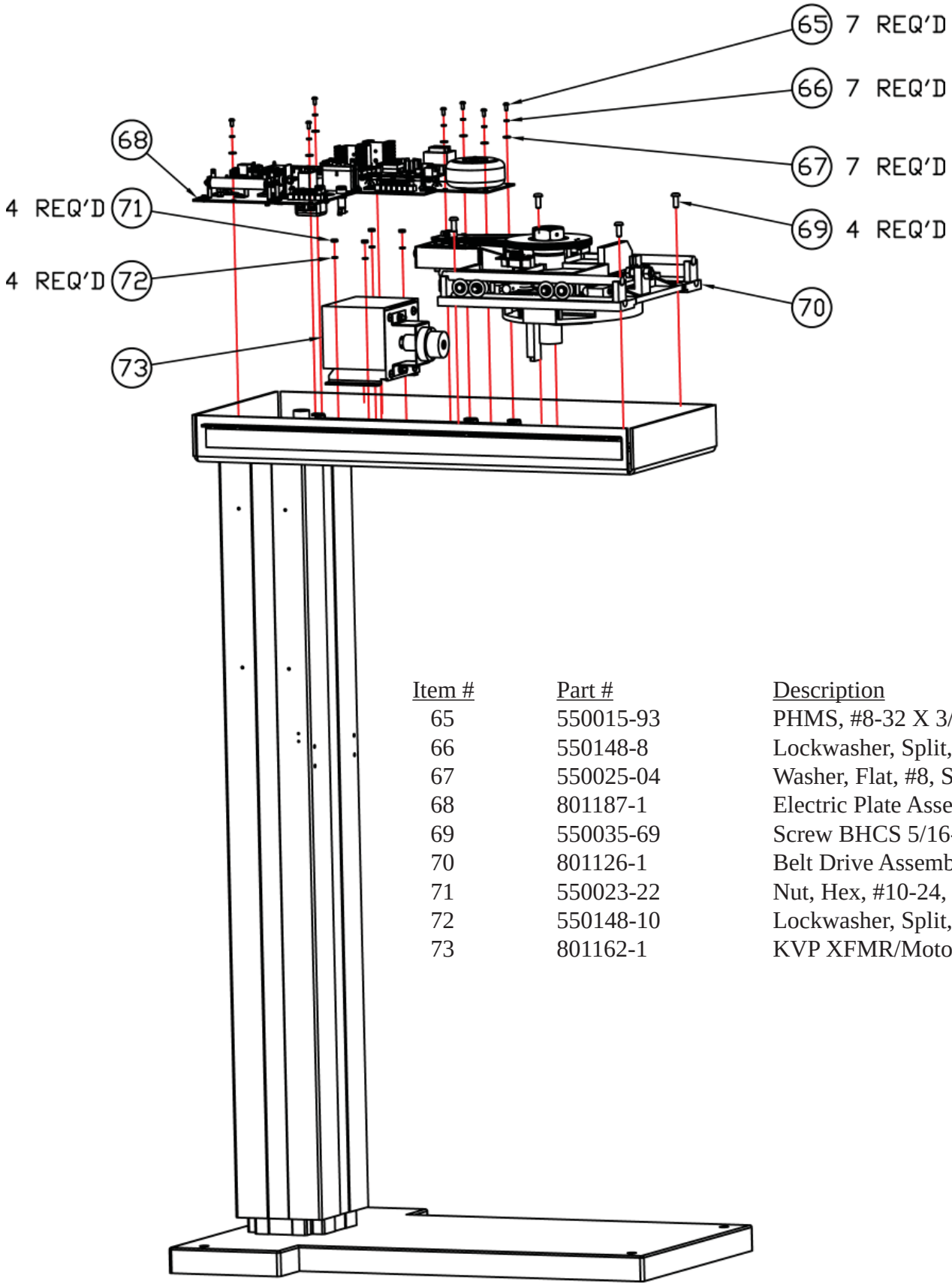
Item #	Part #	Description
44	301106-1.001	Mirror Mount
45	301157-1	Chin Spacer
46	801407-1	Chin Arm Top Cover Assembly
47	801319-1	Chin Arm Assembly
48	550148-13	Lockwasher, Split, 1/4
49	550052-050	SHCS, 1/4-20 X 1.0, Coarse, Blk
50	550015-93	PHMS, #8-32 X 3/8, Zinc
51	550035-50	BHCS, 1/4-20 X 1.00, Black
52	801320-1	Handle Assembly
53	301102-1	Cover, Chin Arm, Bottom
54	550015-93	PHMS, #8-32 X 3/8, Zinc
55	550015-60	PHMS, #6-32 X 1/2, Zinc
56	550015-58	PHMS, #6-32 X 5/16, Zinc

Final Assembly



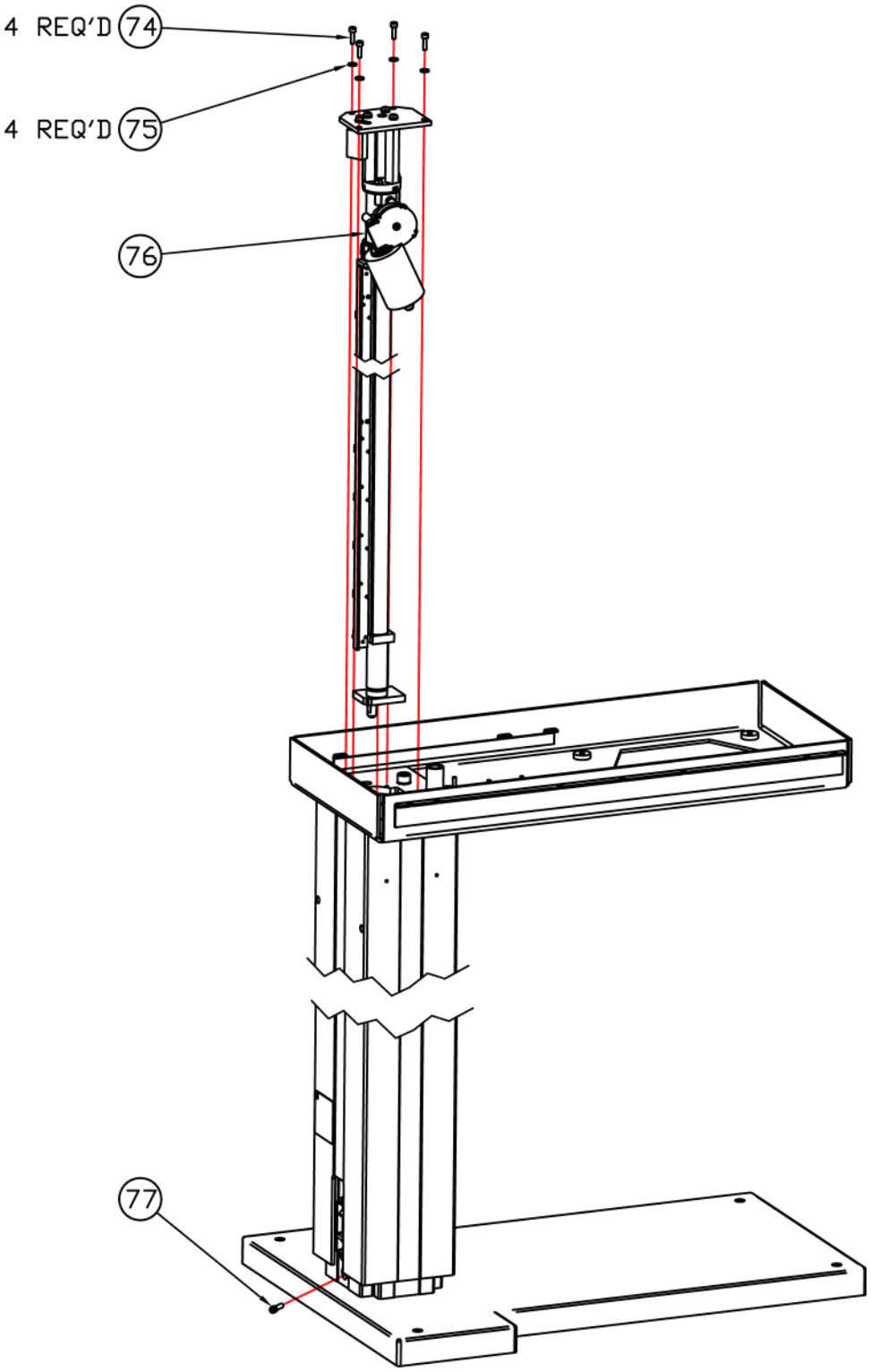
Item #	Part #	Description
57	550015-93	PHMS, #8-32 X 3/8, Zinc
58	550025-04	Washer, Flat, #8, Steel, ZP
59	301153-1	Stand Off Spacer, Long
60	301155-1	Stand Off Spacer, Short
61	300905-1	Cover, Chassis, Bottom
62	550052-021	SHCS, 8-32 X 3/8 Coarse, Blk
63	301158-1	Bottom Cover, Back
64	550181-1	#4-40 X 3/8 PHSMS

Final Assembly



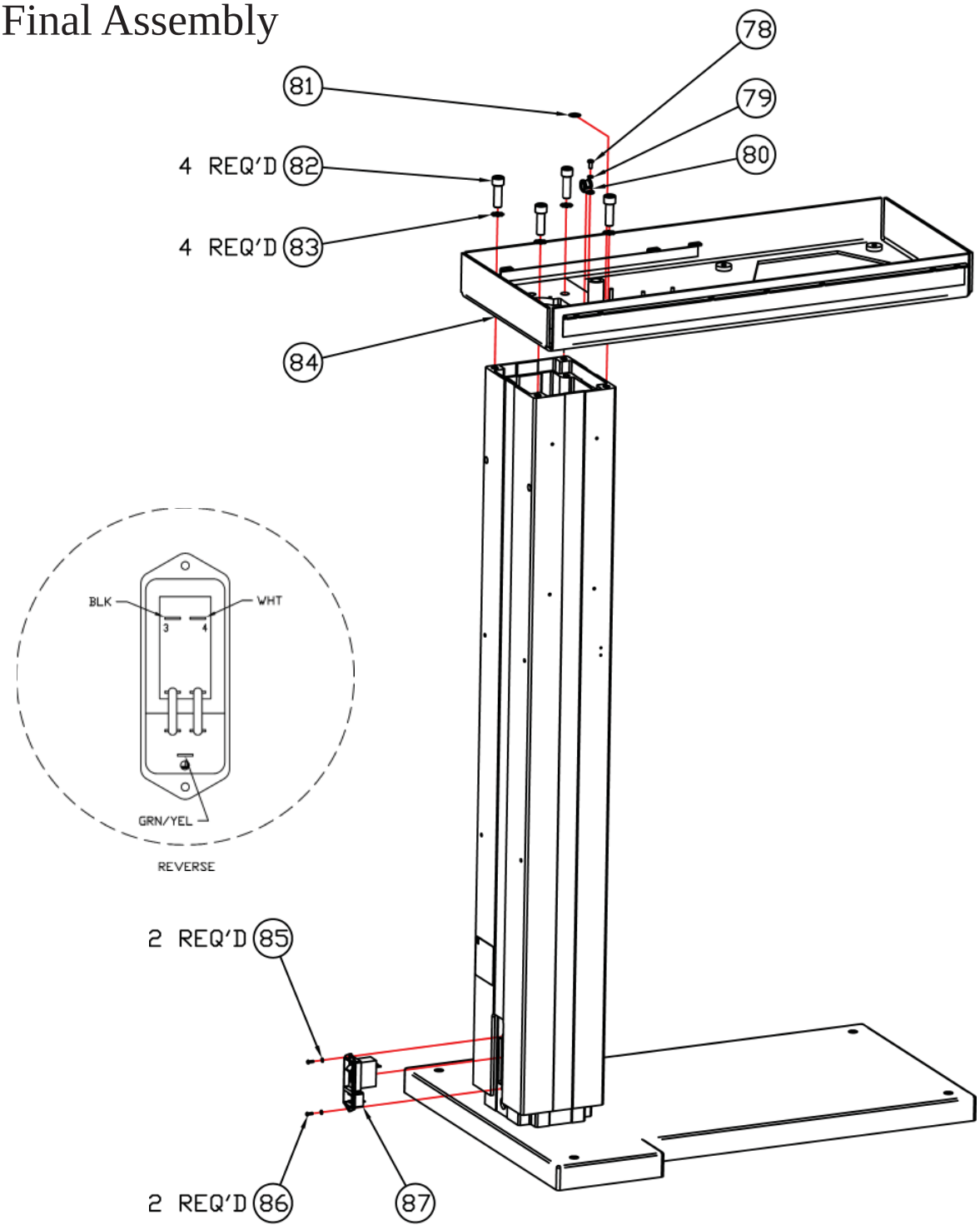
Item #	Part #	Description
65	550015-93	PHMS, #8-32 X 3/8, Zinc
66	550148-8	Lockwasher, Split, #8
67	550025-04	Washer, Flat, #8, Steel, ZP
68	801187-1	Electric Plate Assembly
69	550035-69	Screw BHCS 5/16-24
70	801126-1	Belt Drive Assembly
71	550023-22	Nut, Hex, #10-24, Steel
72	550148-10	Lockwasher, Split, #10
73	801162-1	KVP XFMR/Motor Assembly

Final Assembly



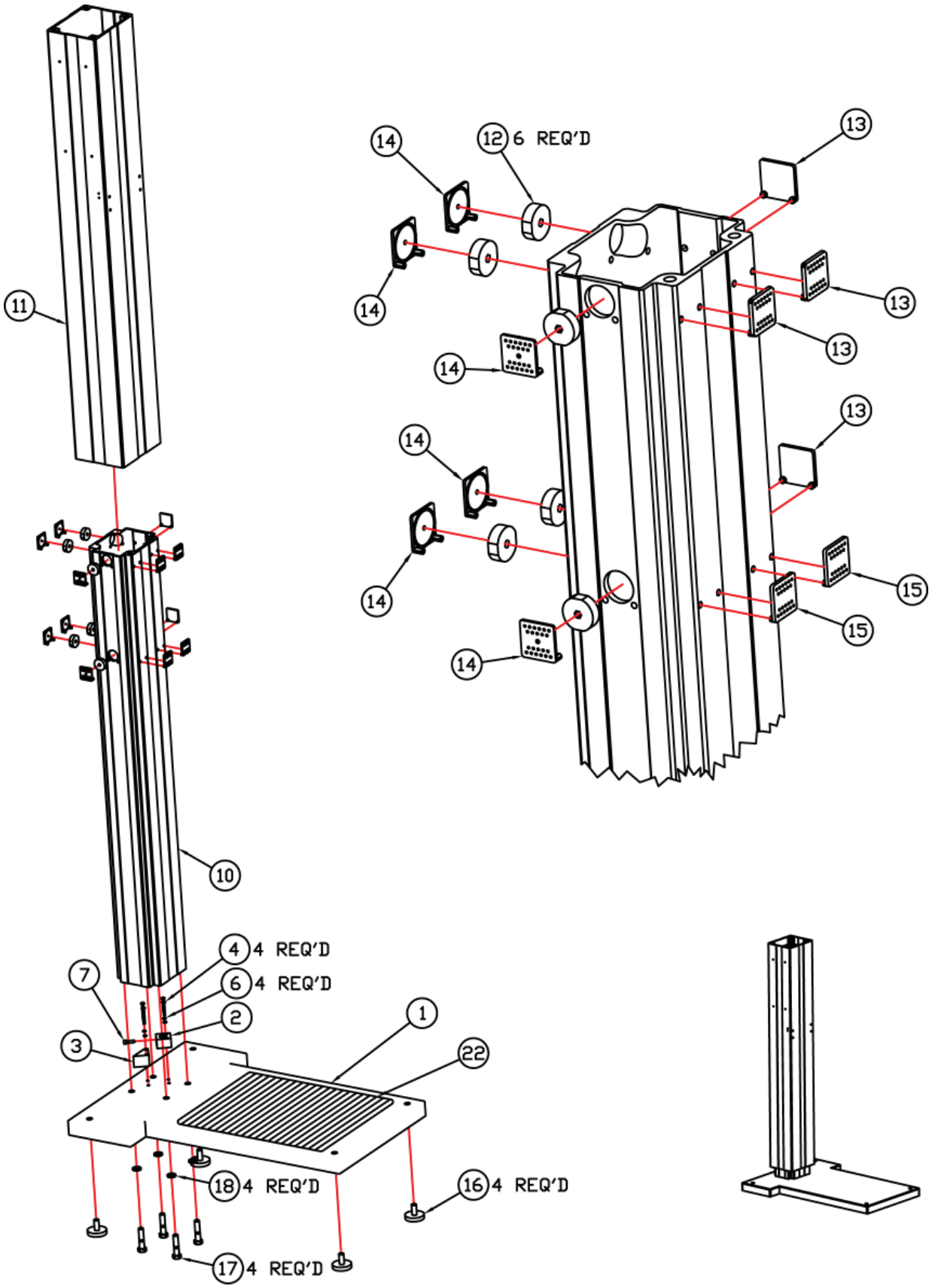
Item #	Part #	Description
74	550052-048	SHCS, 1/4-20 X 3/4, Coarse, Blk
75	550148-13	Lockwasher, Split, 1/4
76	801163-1	Screw Drive Assembly
77	550125-49	SHCS, 1/4-20 X 7/8 SS

Final Assembly



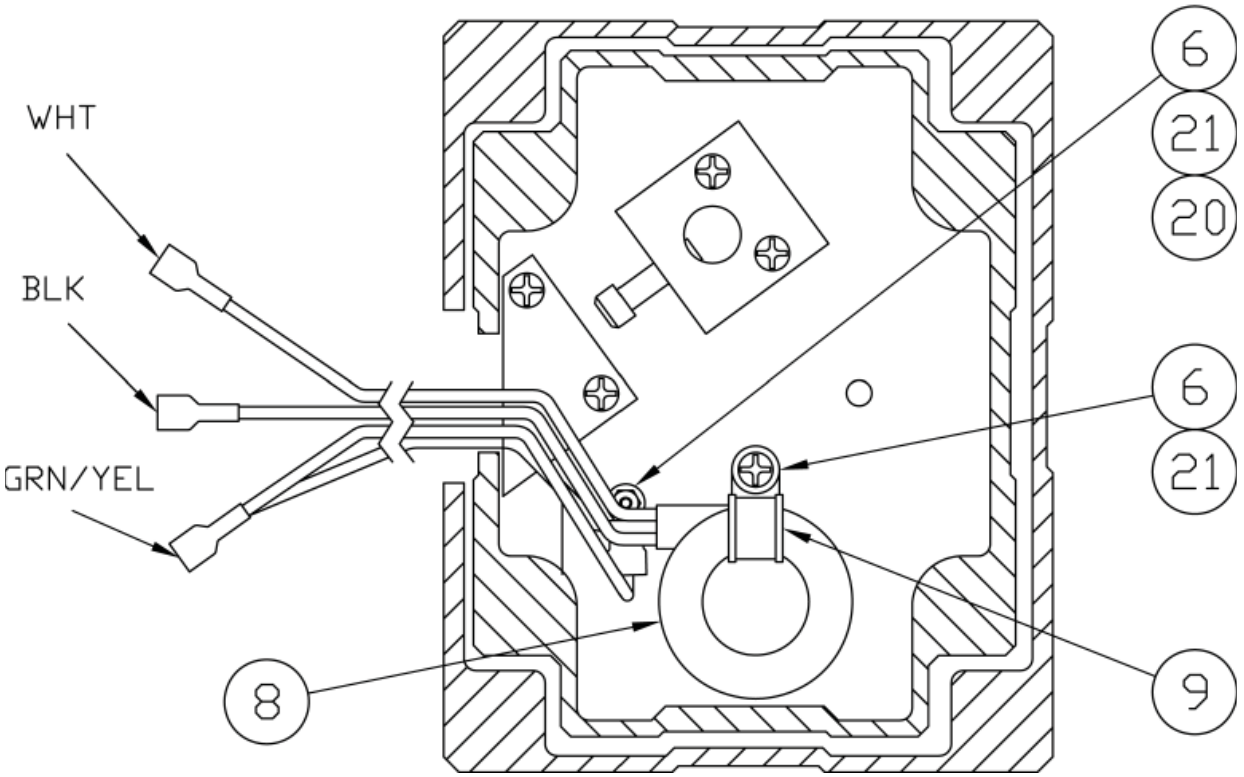
Item #	Part #	Description
78	550015-183	PHMS, #10-32 X 7/16, Zinc
79	550148-10	Lockwasher, Split, #10
80	600042-7	Clamp, Santoprene, #7, 7/16
81	300536-2	Decal, GND W/Blk Circle
82	550052-121	SHCS, 1/2-13 X 1 1/2, Coarse
83	550150-11	Lockwasher, Ext, 1/2
84	301067-1.002	Chassis Weldment, Finished
85	550025-02	Washer, Flat, #4, Steel, ZP
86	550015-23	PHMS, #4-40 X 3/8, Zinc
87	530095-1	Module, Power, 2 Pole, 10A

X-Ray Machine Base Assembly

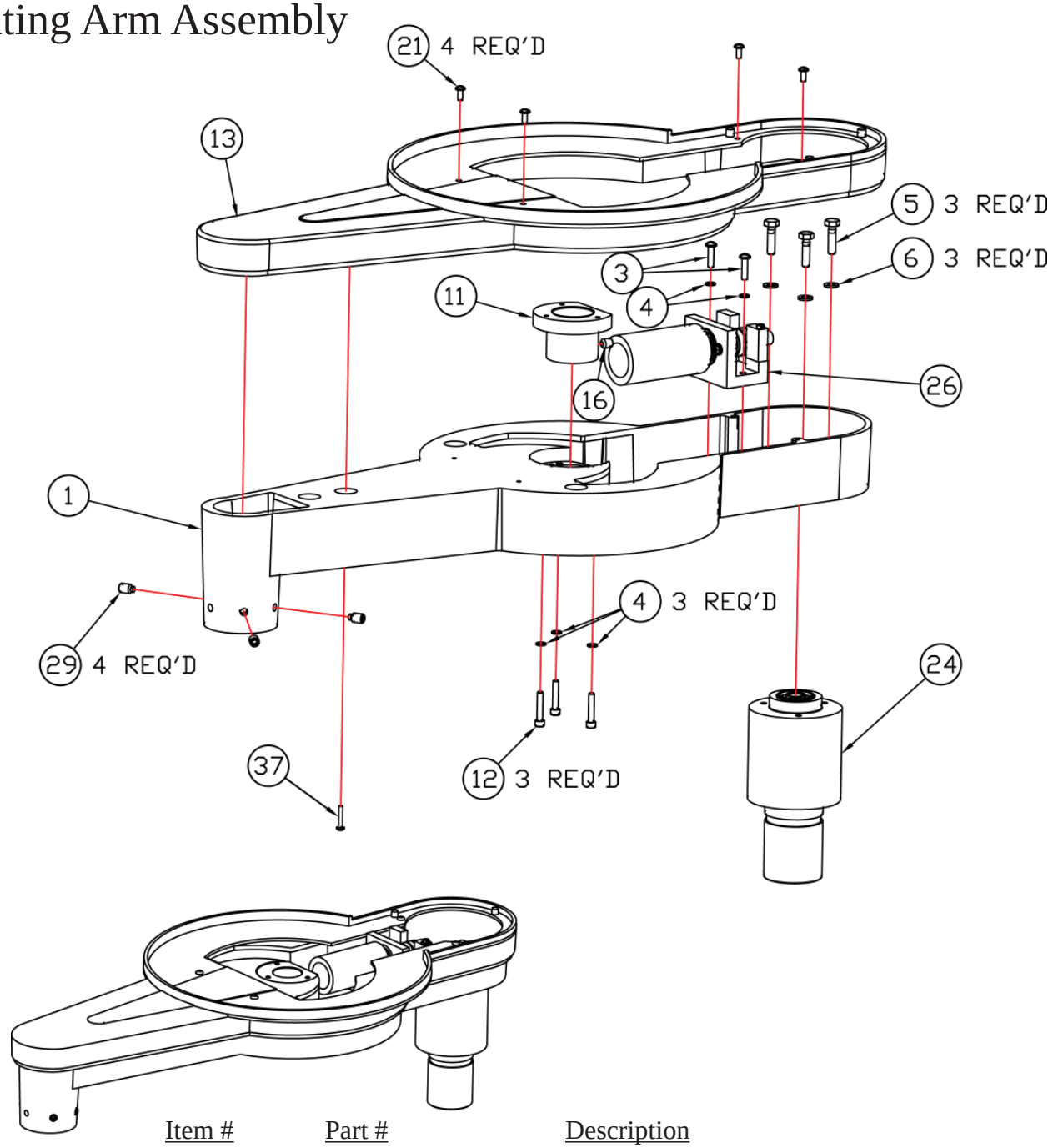


X-Ray Machine Base Assembly

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

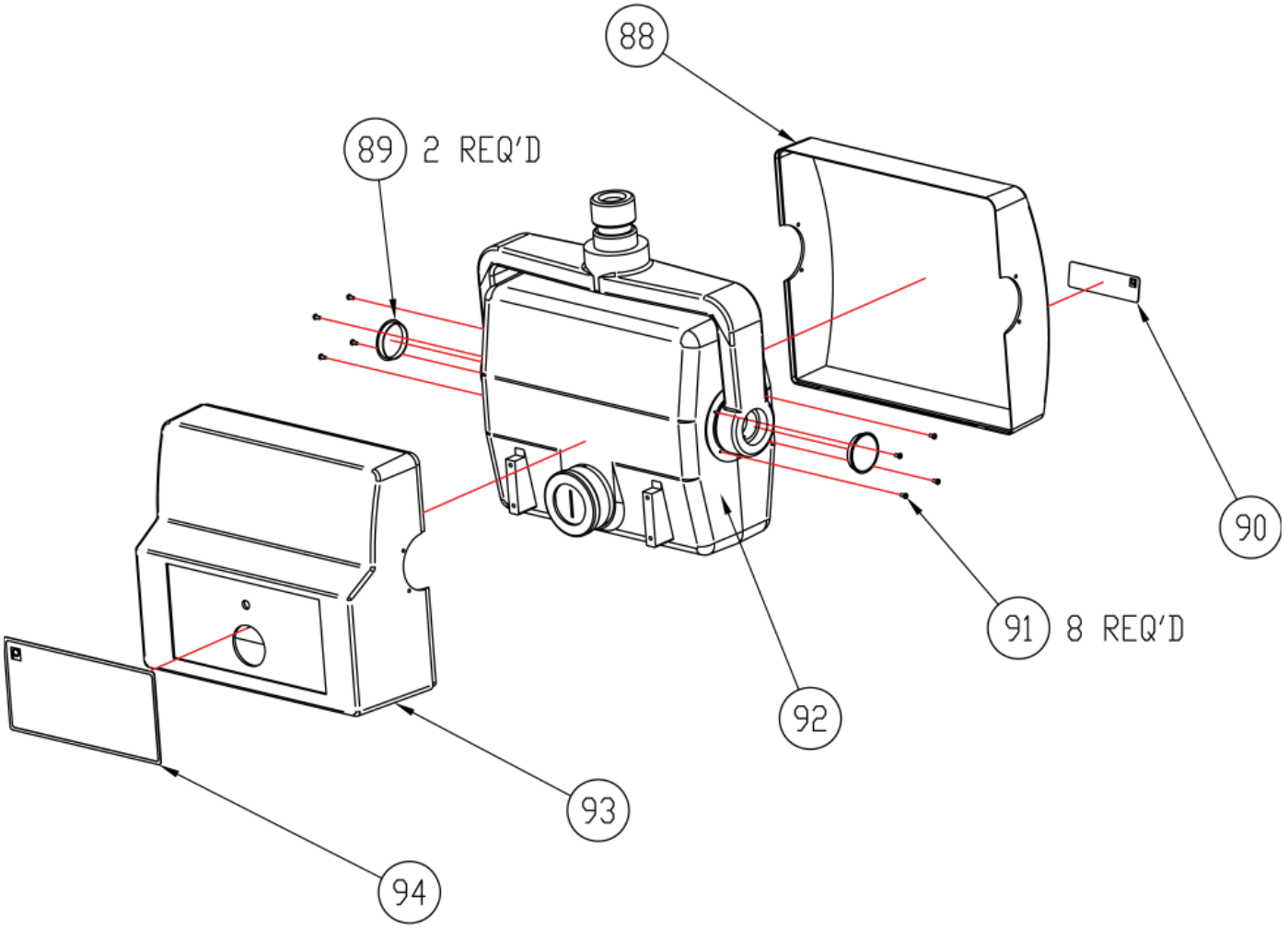


Rotating Arm Assembly



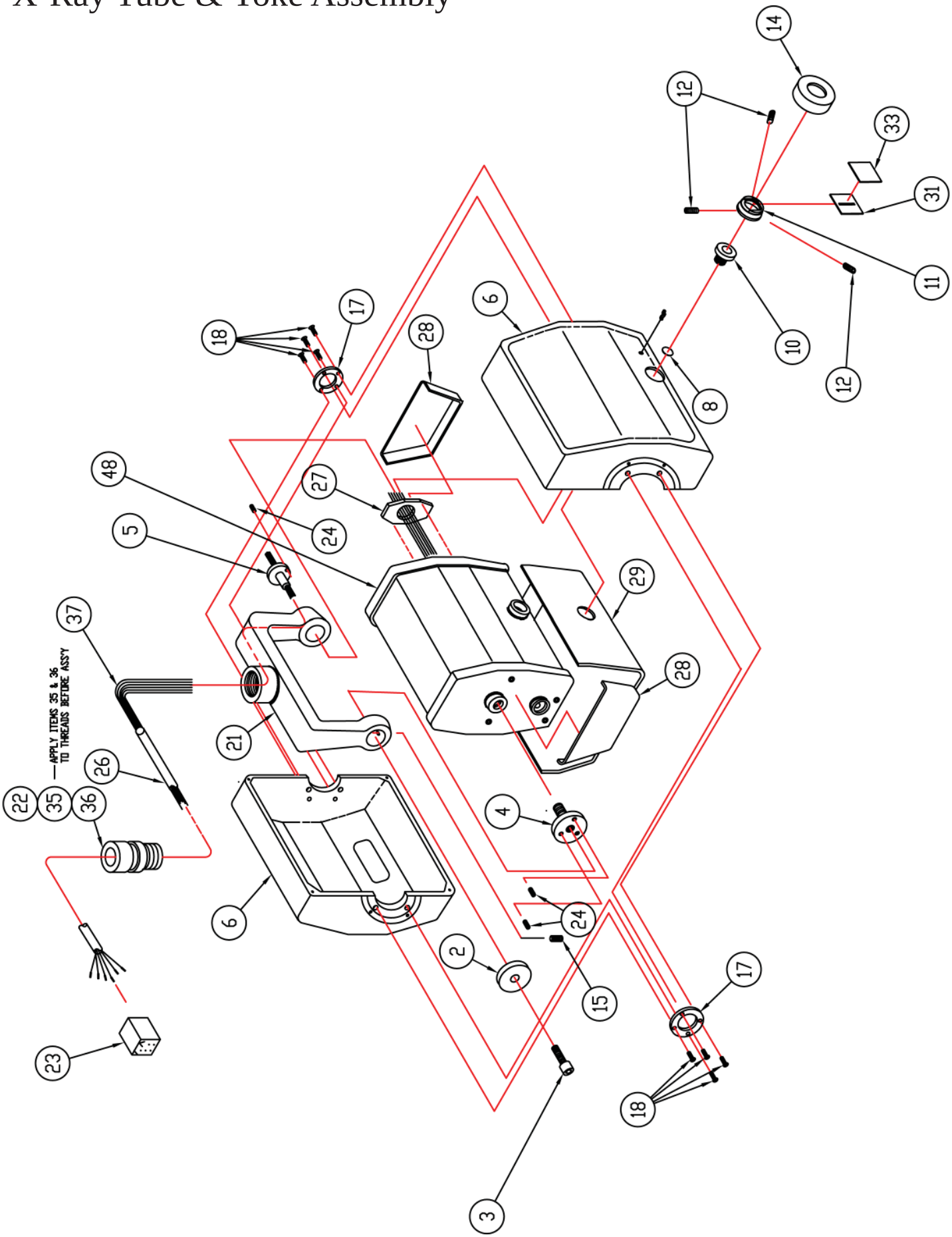
Item #	Part #	Description
1	801121-1	Rotating Arm Assembly
3	550015-128	PHMS, #10-24 X 3/4, Zinc
4	550148-10	Lockwasher, Split, #10
5	550151-05	HHCS, 1/4-20 X 1, Zinc
6	550148-13	Lockwasher, Split, #10
11	317927-2.001	Collar, Cam Shaft, Digital, Finished
12	550052-037	SHCS, 10-24 X 1.0, Coarse, Blk
13	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
24	801133-1	Bearing Housing Assembly
26	801171-1	Roller-Orbit Drive Assembly
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
88	301051-1	Cover, Tube, Rear
89	680008-18	Button, Plug
90	674074-1	Decal, X-Ray Tubehead
91	550035-7	BHCS, #4-40 X .25, Black
92	801119-1	X-Ray Tube & Yoke Assembly
93	301050-1	Cover Tube, Front
94	300958-3	Decal, Tubehead Aperture, PC-3000

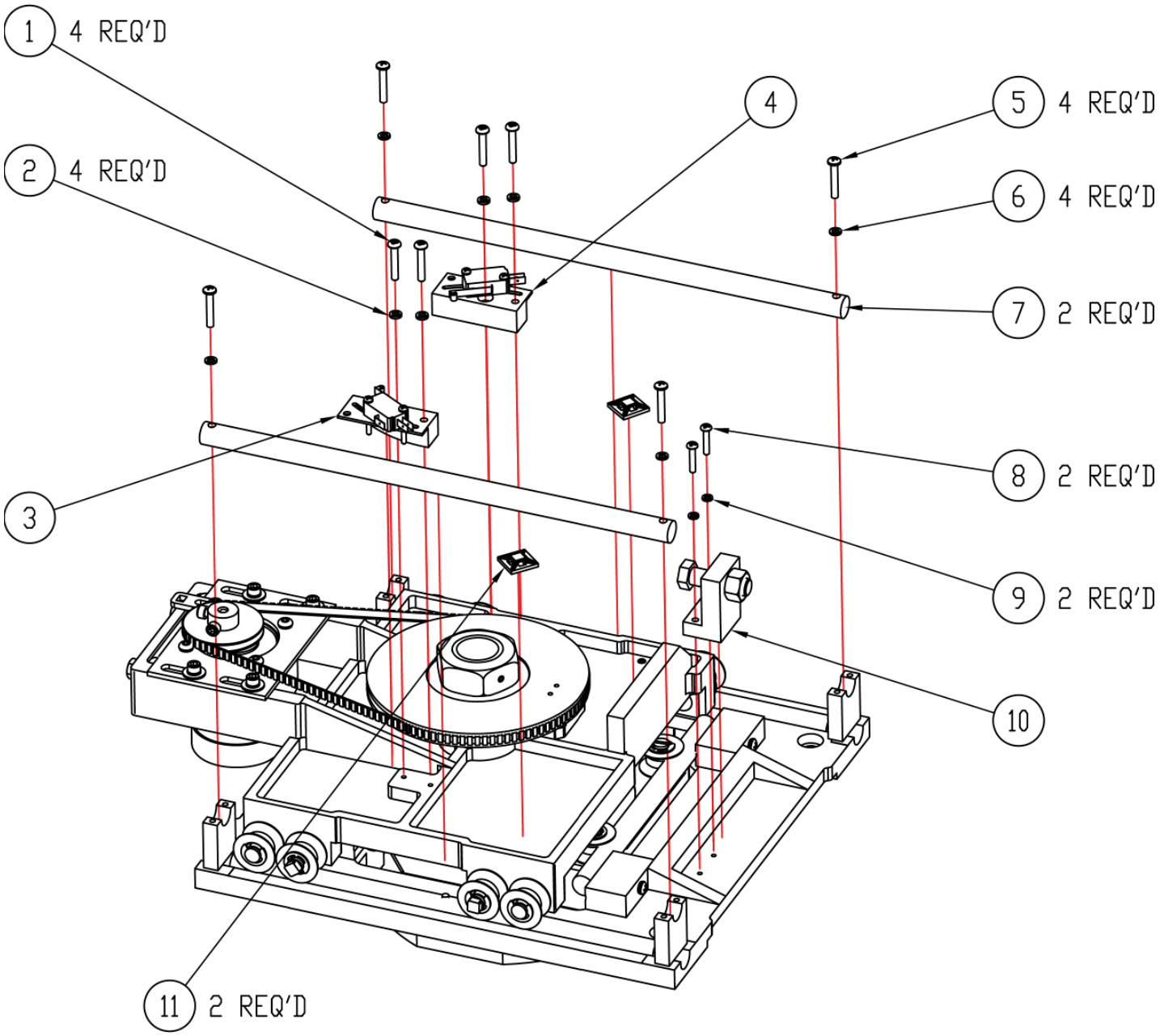
X-Ray Tube & Yoke Assembly



X-Ray Tube & Yoke Assembly

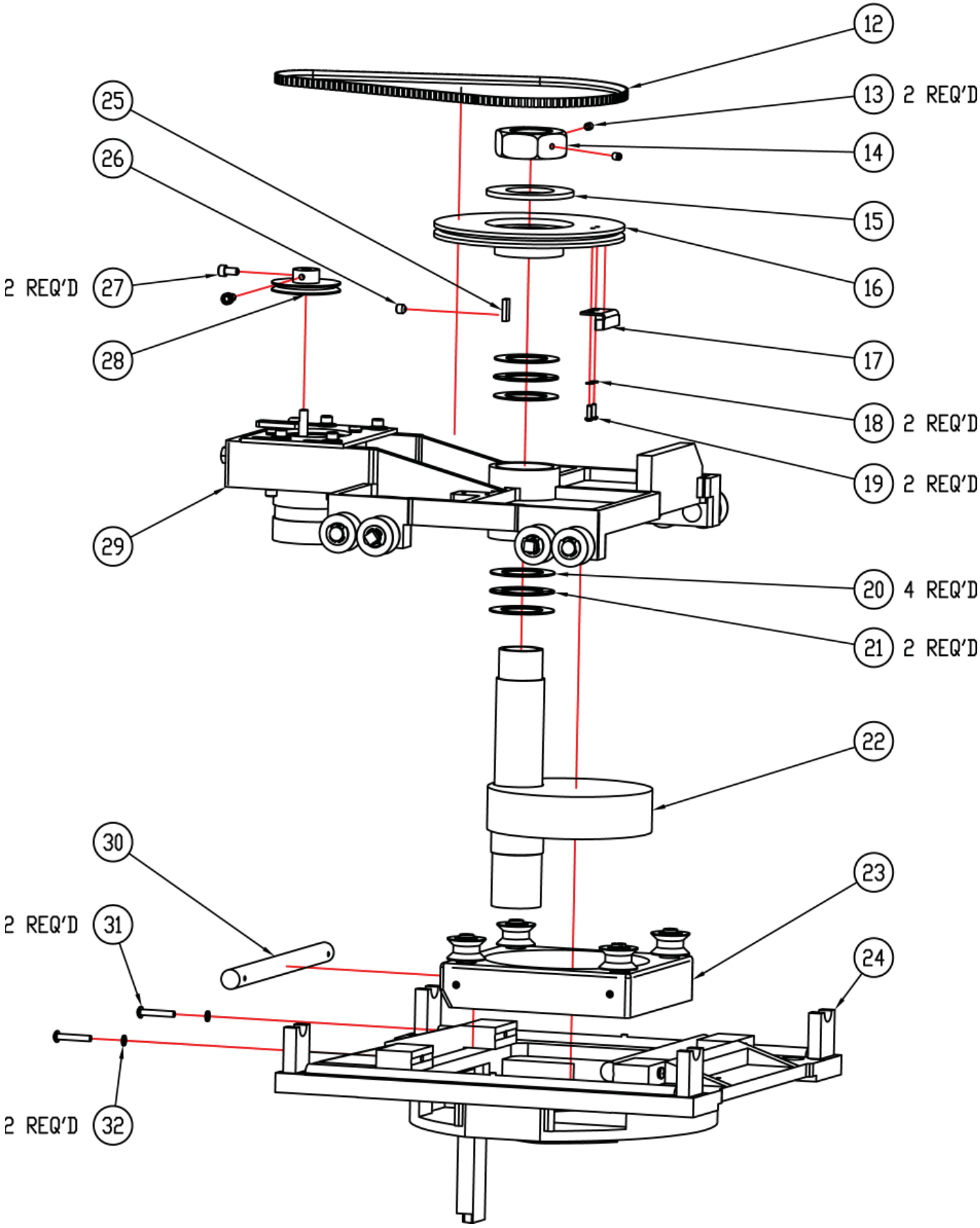
Item #	Part #	Description
2	301070-1.001	Washer, Special, Finished
3	550002-49	SHCS, UFT, 5/16-24 X 3/4
4	131718-1.001	Sleeve, RH Adjust
5	131719-1.001	Sleeve X-Ray Tube Housing
6	801118-1	Assembly, Tube Halves, Machined
8	131798-1	Shield, Radiation
10	229161-2.001	Collar, Col. Sup., Blk Oxide
11	317929-1	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

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

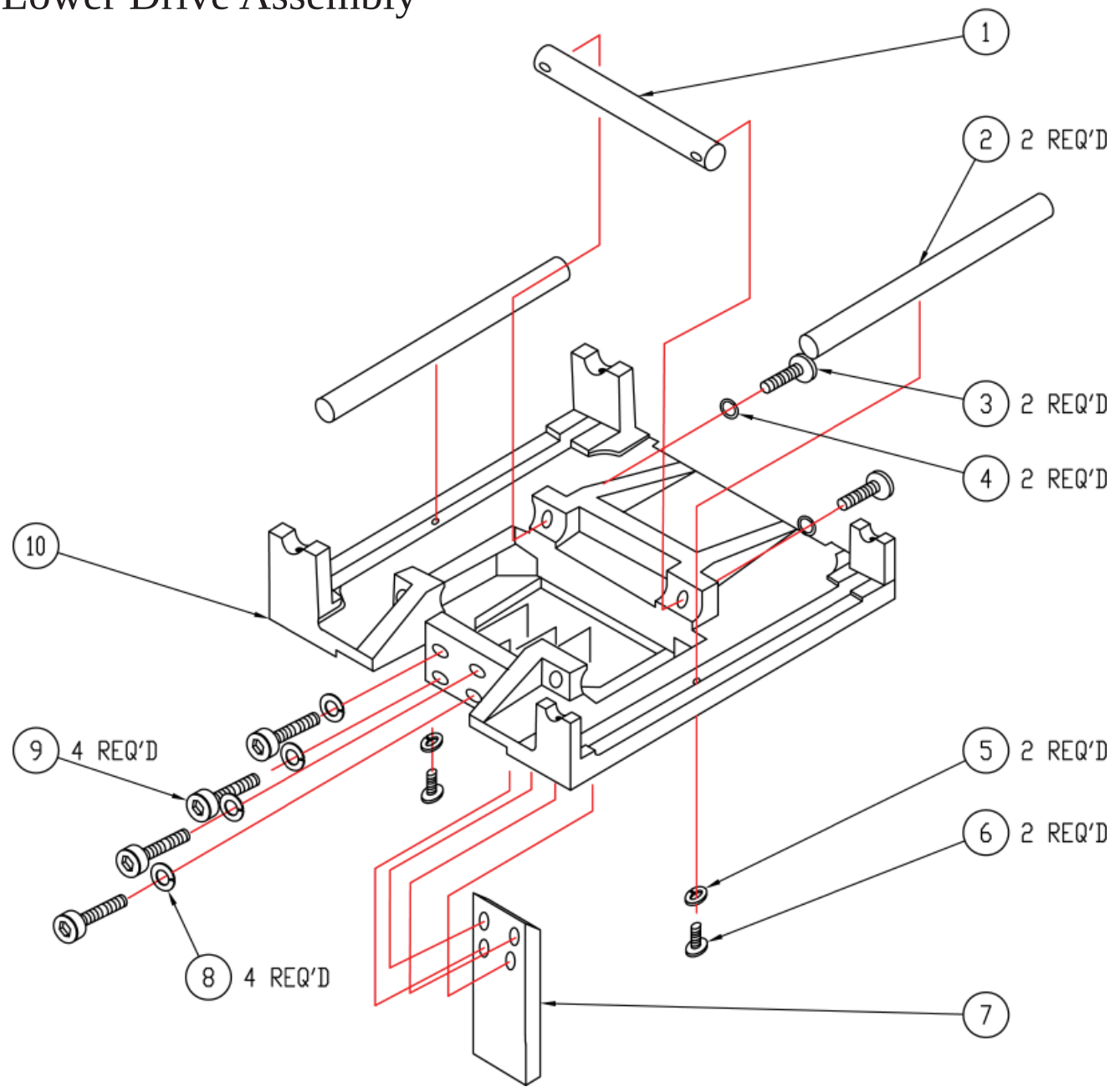
Belt Drive Assembly



Belt Drive Assembly

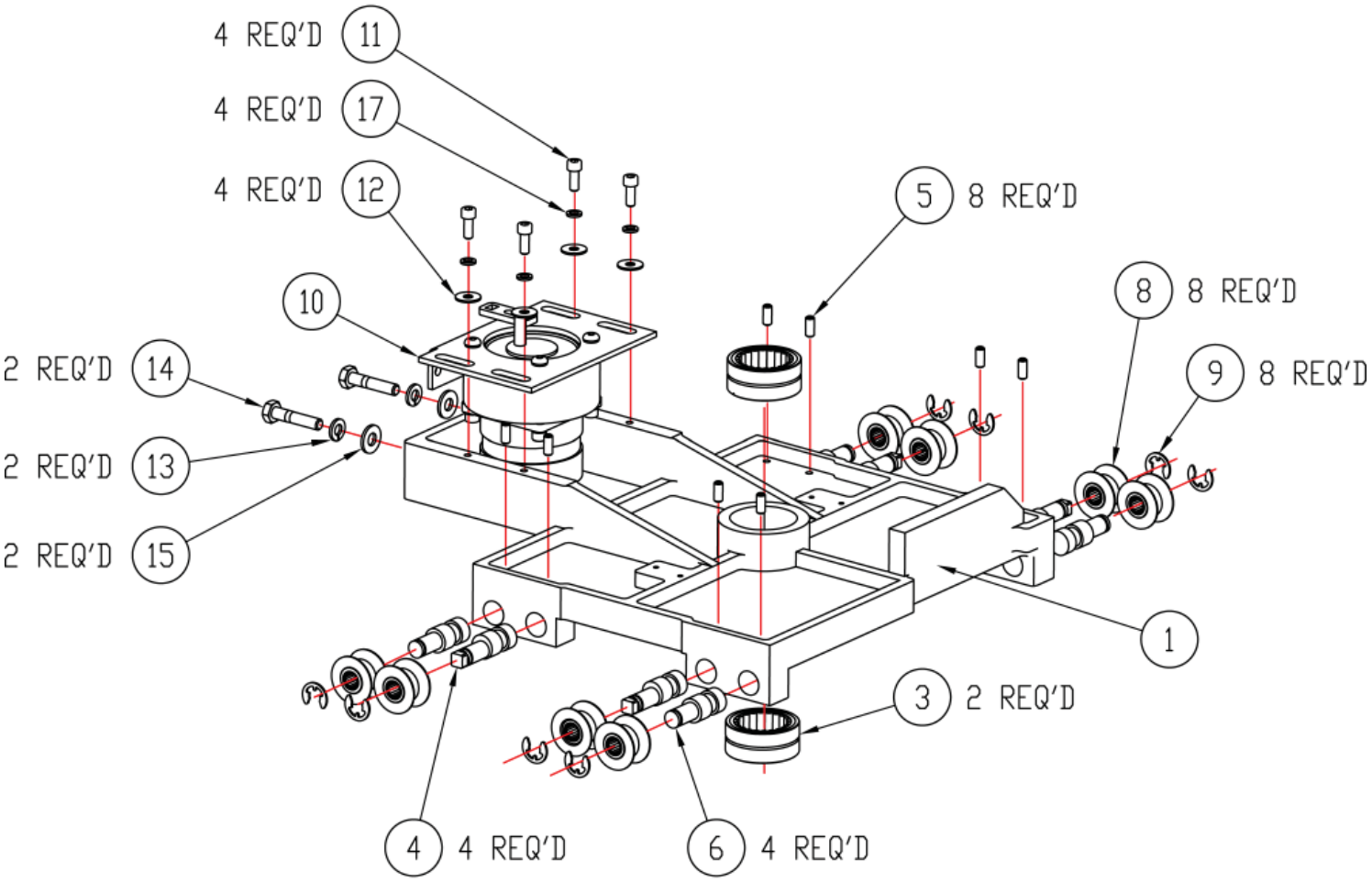
Item #	Part #	Description
12	300331-2	Facelift Drive Belt
13	550149-243	Setscrew, #10-24 X 1/4, Cup
14	131708-2	Nut, Hex, Spc, 1 1/4-12, Mach
15	550025-23	Washer, Flat, 1-1/4, Steel
16	300771-1.001	Pulley, Driven, Finished
17	301025-1	Actuator, Switch
18	550148-4	Lockwasher, Split, #4
19	550015-23	PHMS, #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



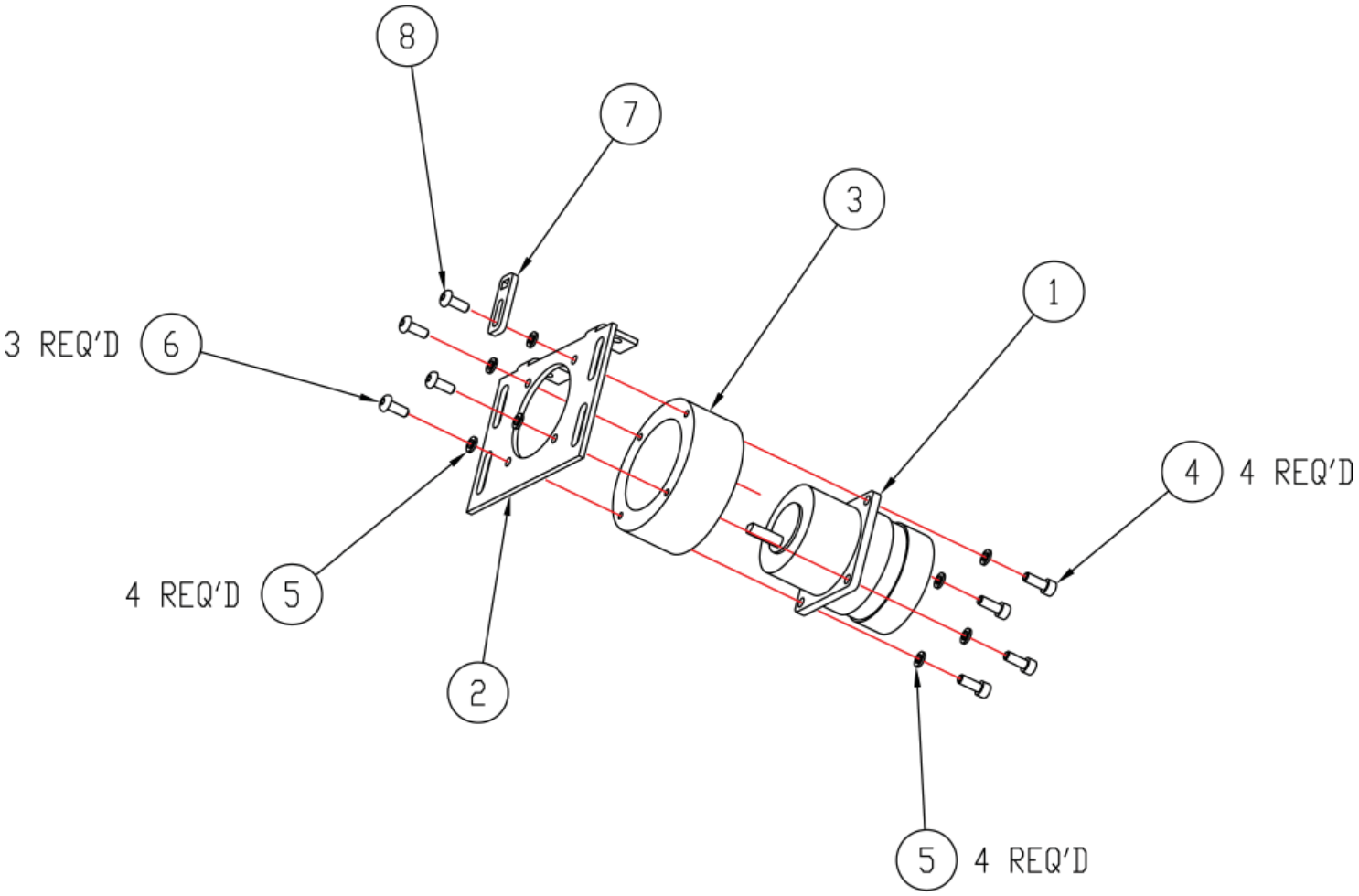
Item #	Part #	Description
1	317940-2.004	Rod, Guide Center, Plated
2	317940-1.004	Rod, Guide, Plated
3	550015-98	PHMS, #8-32 X 1, Zinc
4	550148-8	Lockwasher, Split, #8
5	550148-8	Lockwasher, Split, #8
6	550015-95	PHMS, #8-32 X 5/8, Zinc
7	301109-1.001	Mount, Head Support Finished
8	550148-8	Lockwasher, 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



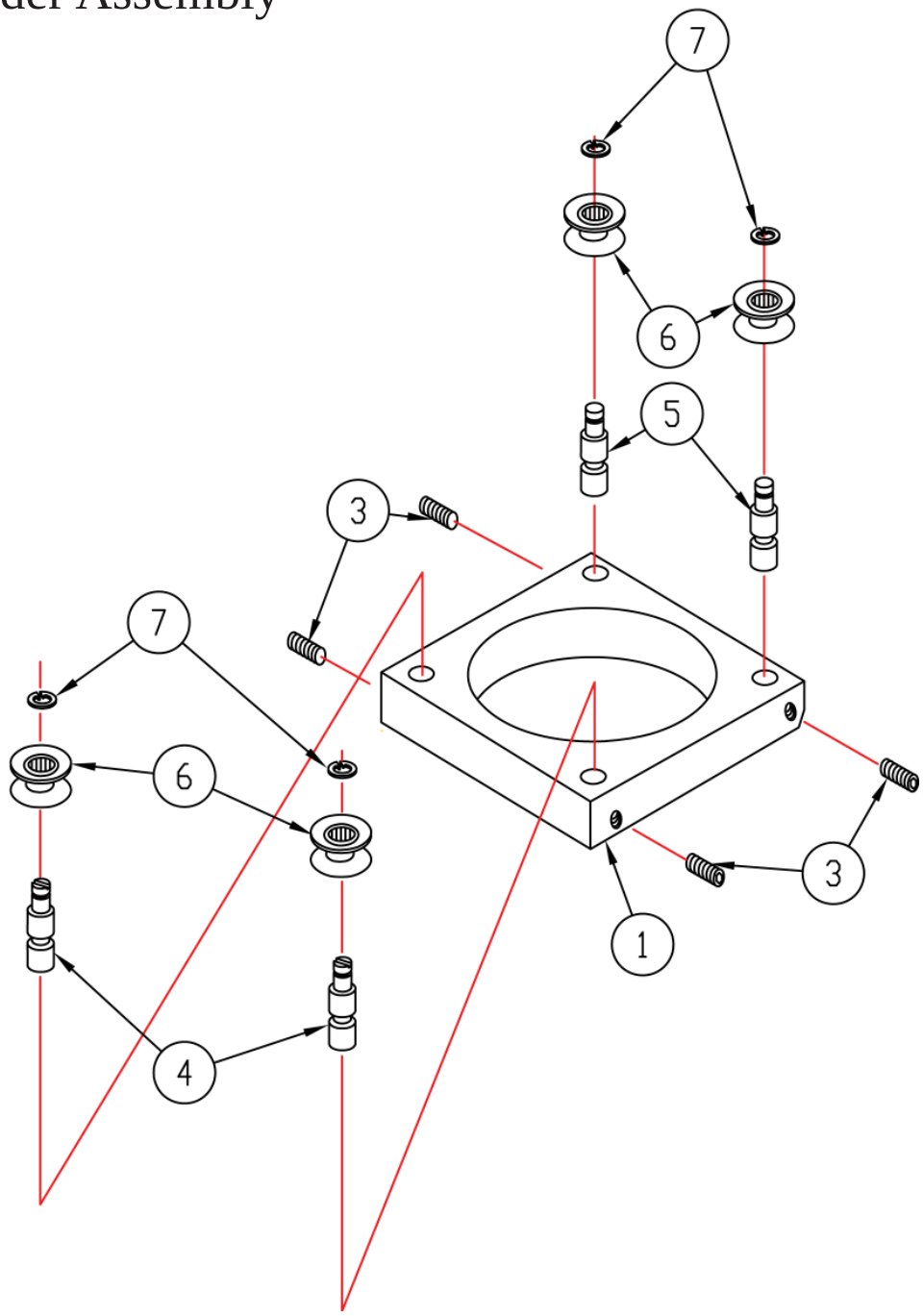
Item #	Part #	Description
1	300773-1	Mount, Upper Belt Dr, Mach
3	229063-4	Bearing, Needle Roller
4	317910-1	Shaft, Wheel, Square Head
5	550149-245	Setscrew, #10-24 X 3/8, Cup
6	317911-1	Shaft, Wheel, Plain Head
8	229576-1	Roller Assembly
9	52482-7	Ring, Retaining
10	801128-1	Drive Motor Assembly
11	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



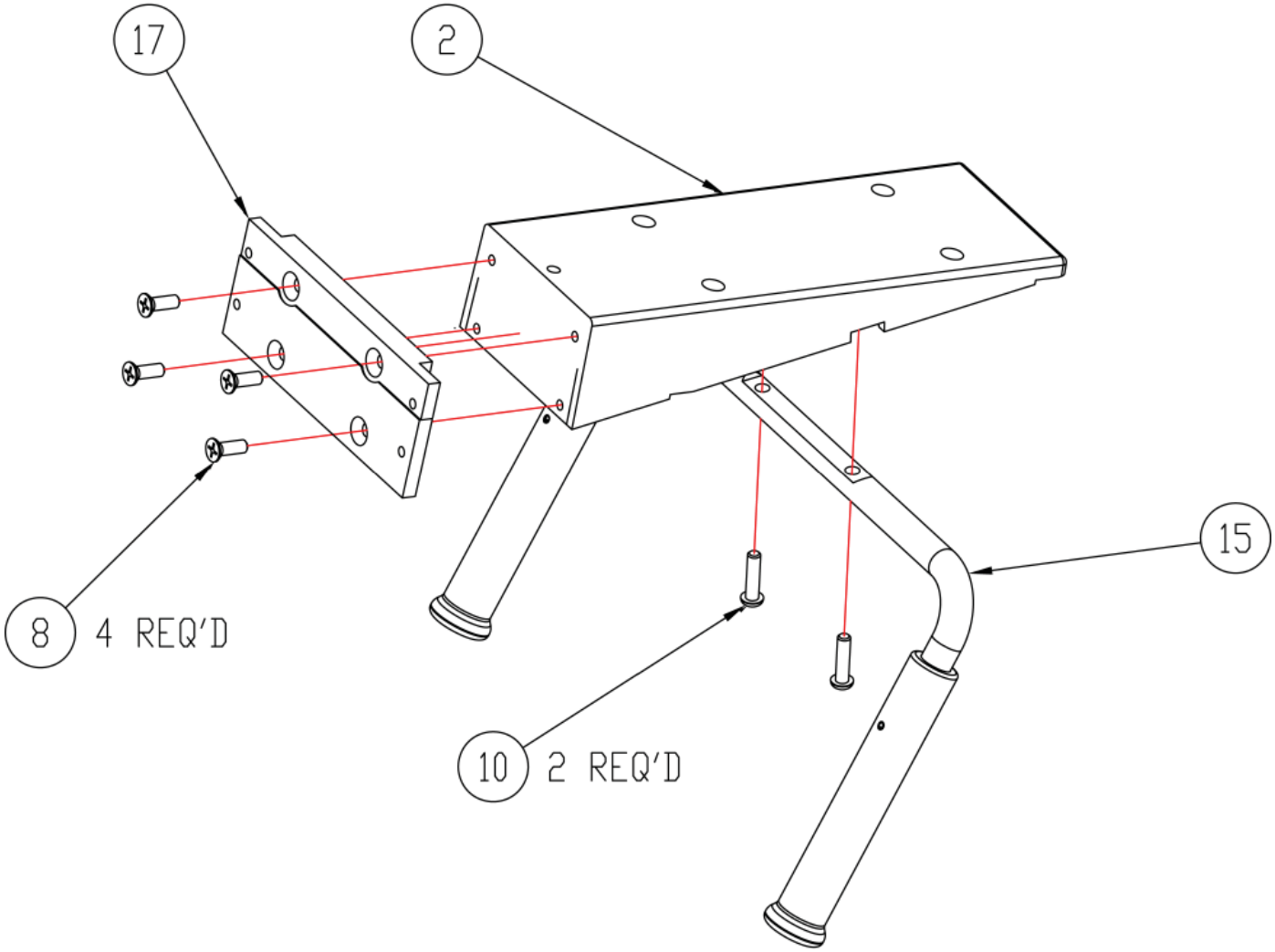
Item #	Part #	Description
1	801195-1	Motor/Gearbox Assembly
2	300774-1	Plate, Motor Mount
3	300968-1.001	Spacer, Motor Mount, Finish
4	550052-033	SHCS, 10-24 X 1/2 Coarse, Blk
5	550148-10	Lockwasher, Split, #10
6	550035-30	BHCS, #10-24 X .50, Black
7	600026-1	Anchor Plate, Cable Tie
8	550035-31	BHCS,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

Cam Holder Assembly



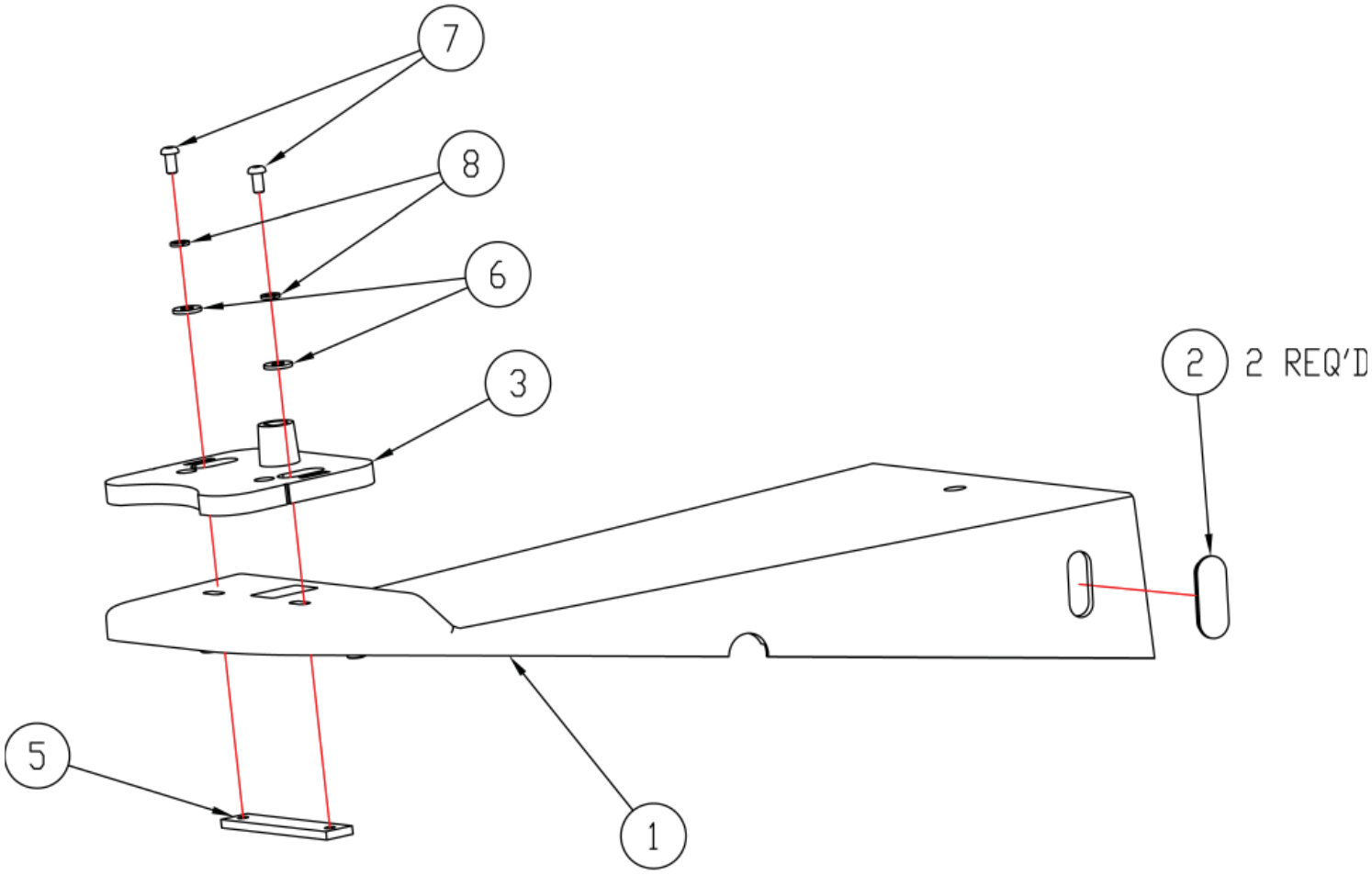
Item #	Part #	Description
1	300543-2.005	Holder, Cam, Machined Facelift
3	550149-245	Setscrew, #10-24 X 3/8, Cup
4	229166-1	Shaft, Wheel, Cam, Slotted Head
5	229167-1	Shaft, Wheel, Cam, Plain Head
6	229576-1	Roller Assembly
7	52482-7	Ring, Retaining

Chin Arm Assembly



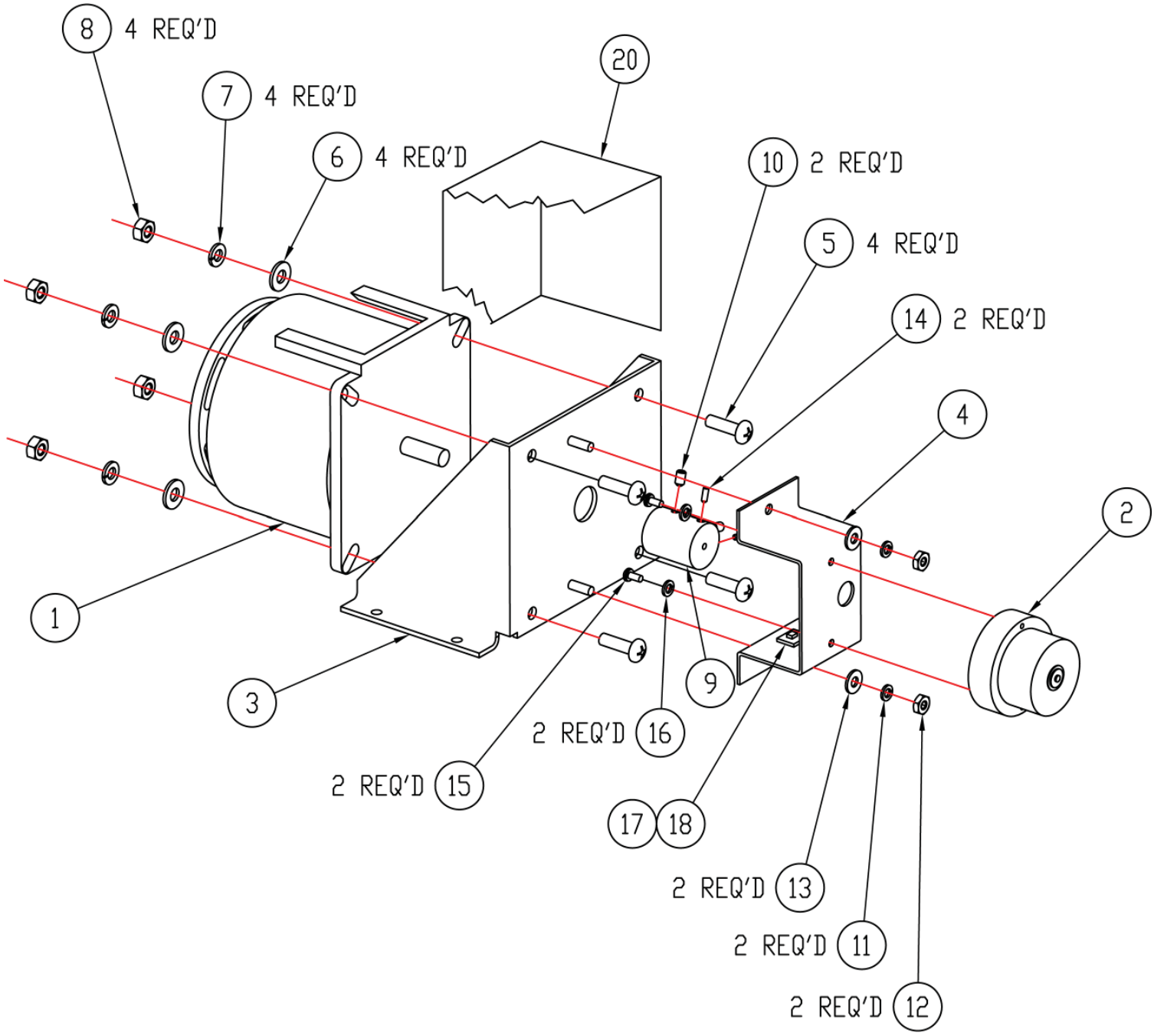
Item #	Part #	Description
2	301101-1	Chinrest Arm
8	318028-157	FHMS, 1/4-20 X 7/8, SS, Phil
10	550035-50	BHCS, 1/4-20 X 1.00, Black
15	801320-1	Handle Assembly
17	301198-1	Chin Arm Mounting Block

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

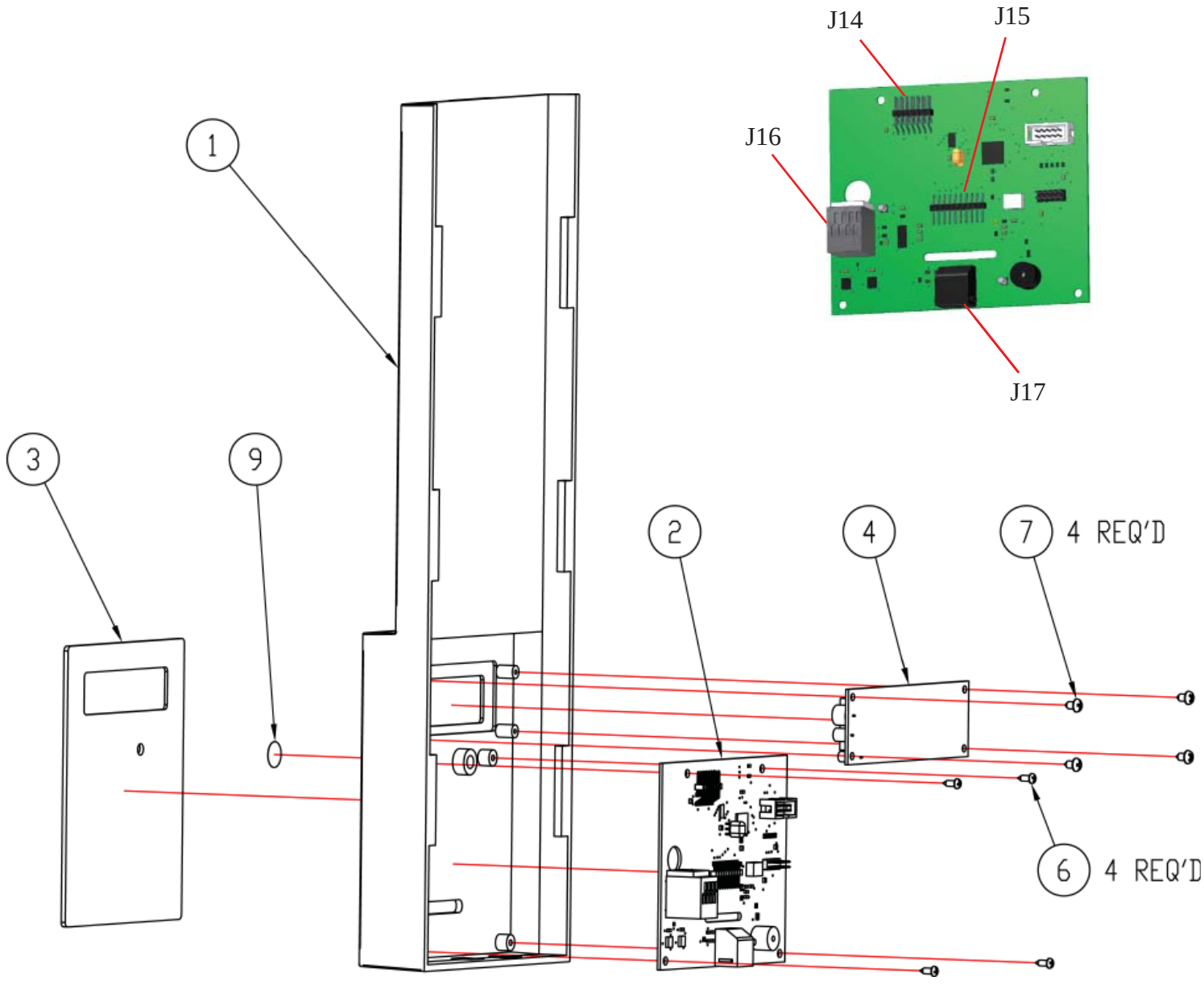
KVP XFMR/Motor Assembly



KVP XFMR/Motor Assembly

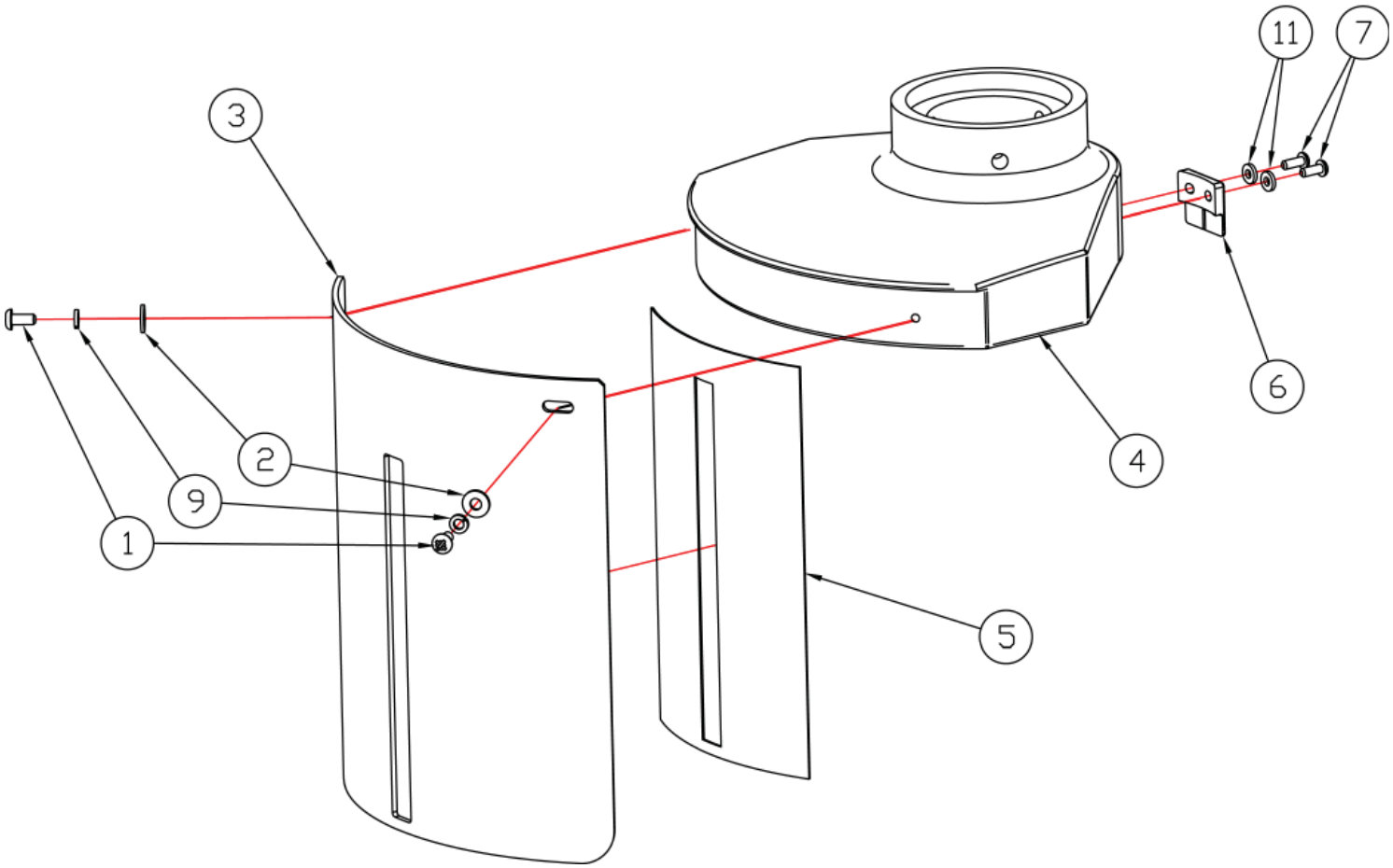
Item #	Part #	Description
1	800768-2	Variac Transformer Assembly
2	801184-1	Motor Assembly, KVP/XFMR
3	300934-1	Mounting Bracket, XFMR
4	300935-1	Mount, Stepper Motor
5	550015-157	PHMS, 1/4-20 X 7/8, Zinc
6	550025-07	Washer, Flat, 1/4, Steel, ZP
7	550148-13	Lockwasher, Split, 1/4
8	550023-09	Nut, Hex, 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, Zinc
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

Display Panel Assembly



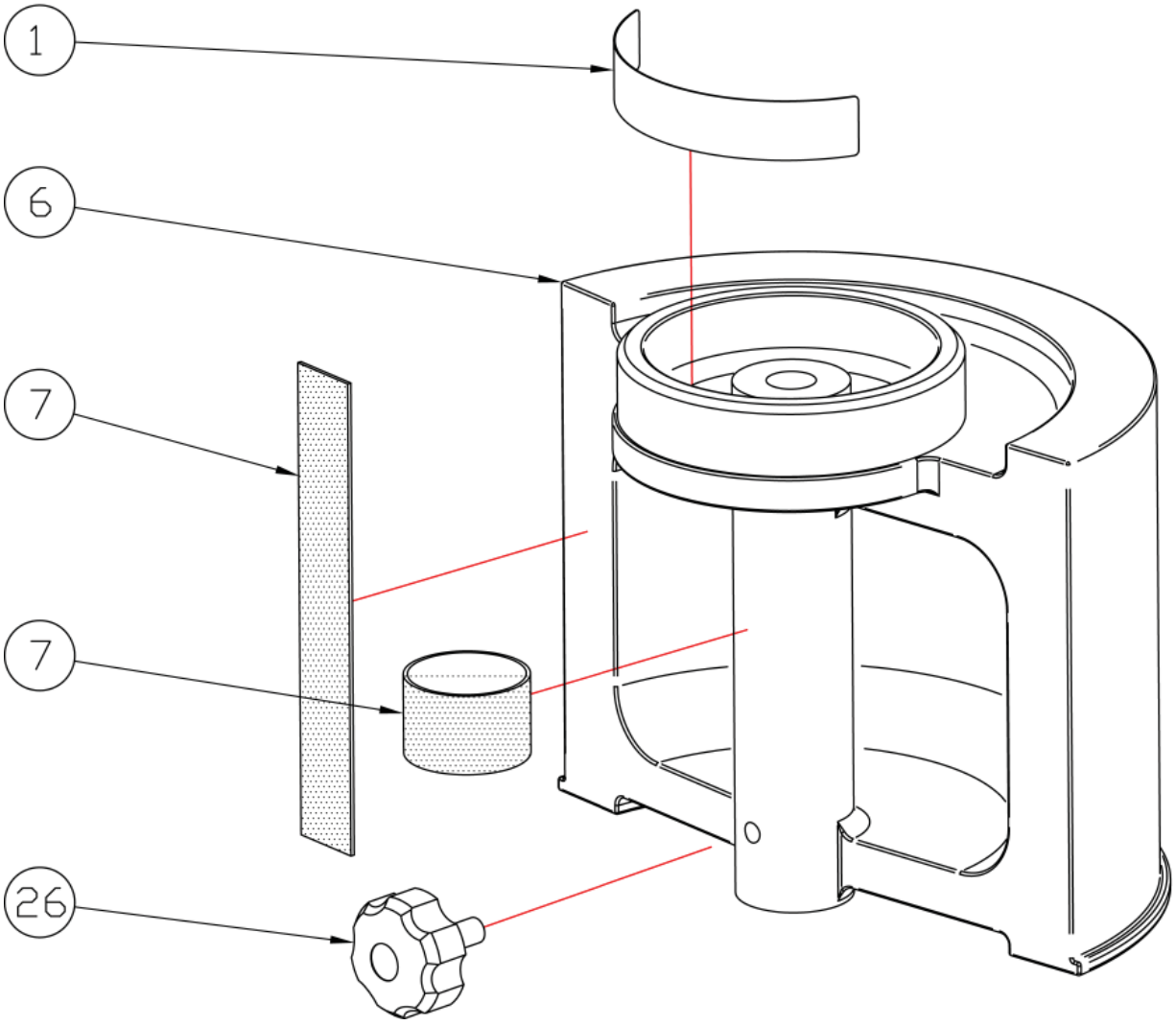
Item #	Part #	Description
1	301130-1	Cover, Modified, Display
2	801253-1	PCB Assembly, Prog, Display
3	674035-1	Keypad, Display
4	801345-1	Display & Connector Assembly
6	550053-7	Screw, Self-Tap, #6 X .25
7	550053-2	Screw, Self-Tap, #4 X .31
9	674050-1	Decal, Clear, Matte, 1/2" Dia.

Film Shield Assembly



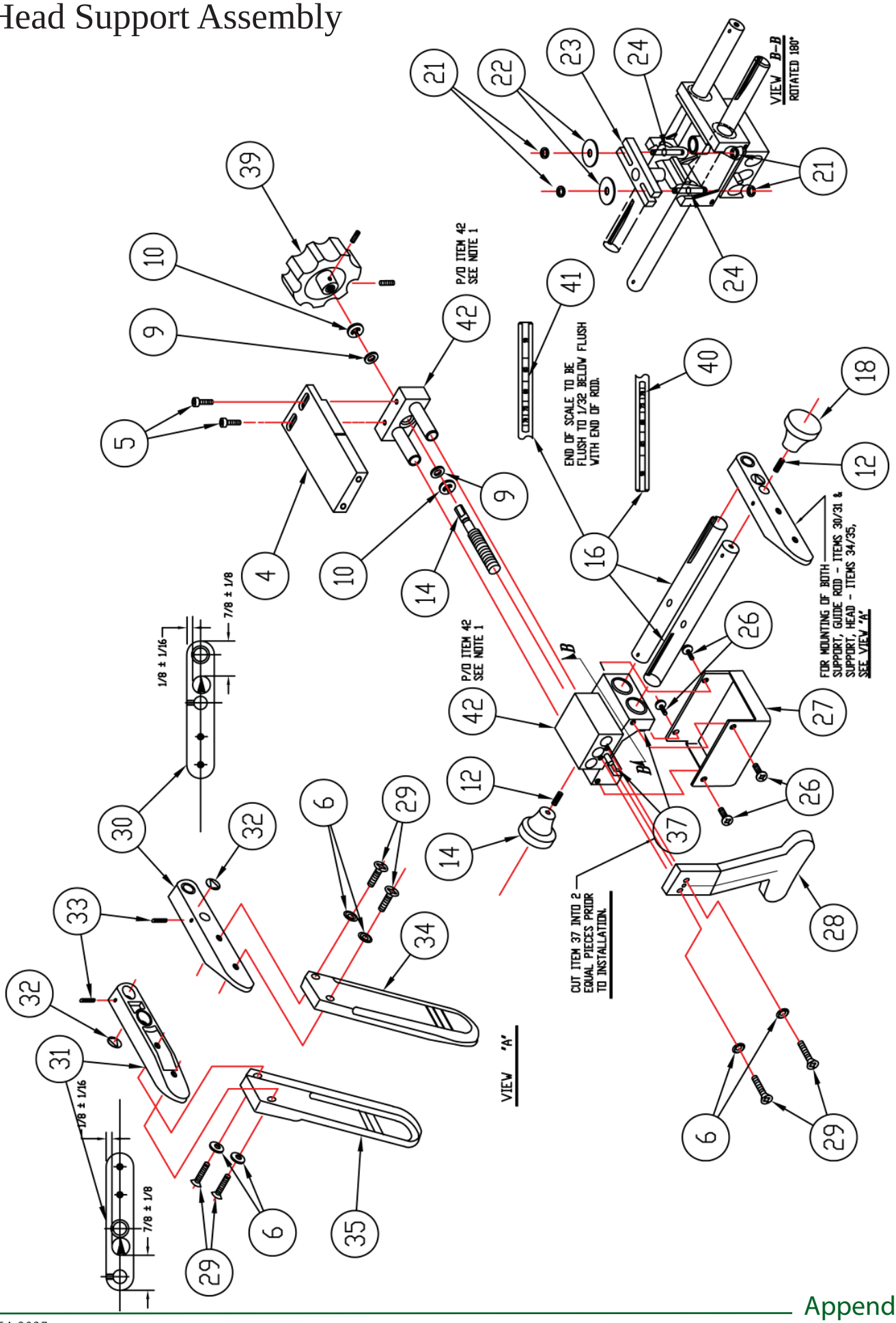
Item #	Part #	Description
1	550015-93	PHMS, #8-32 X 3/8, Zinc
2	550025-04	Washer, Flat, #8, Steel, ZP
3	317942-1	Film Holder Plate Assy
4	317900-2.002	Slot Plate Support, Paint
5	229306-1	Lead Plate
6	300455-1.006	Pointer, Drum, Hot-Stamped
7	550035-17	BHCS, #6-32 X .38, Black
9	550148-8	Lockwasher, Split, #8
11	550178-1	Washer, Nylon

Film Holder Assembly



Item #	Part #	Description
1	300461-1	Film Drum Alignment Decal
6	300454-1.002	Film Holder, Painted
7	600070-1	Velcro, Hookside, 1 X 30 FT
26	676007-1	Knob, Film Drum

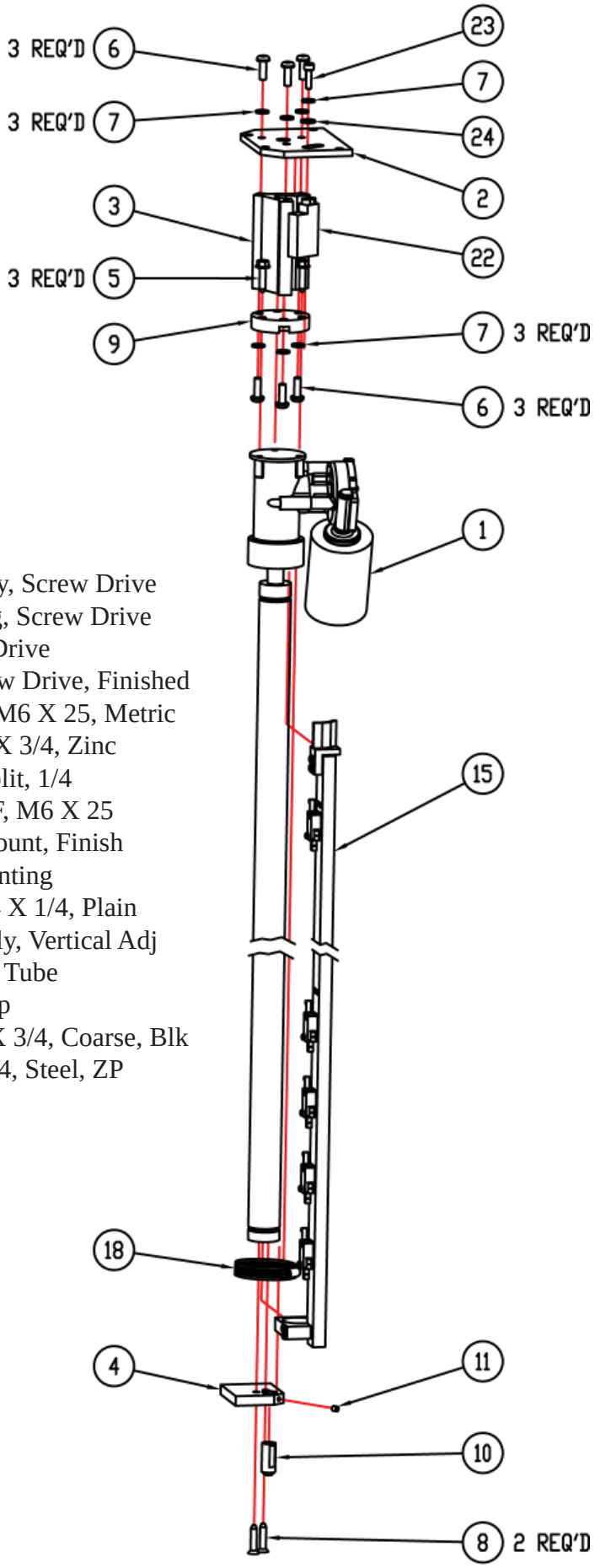
Head Support Assembly



Head Support Assembly

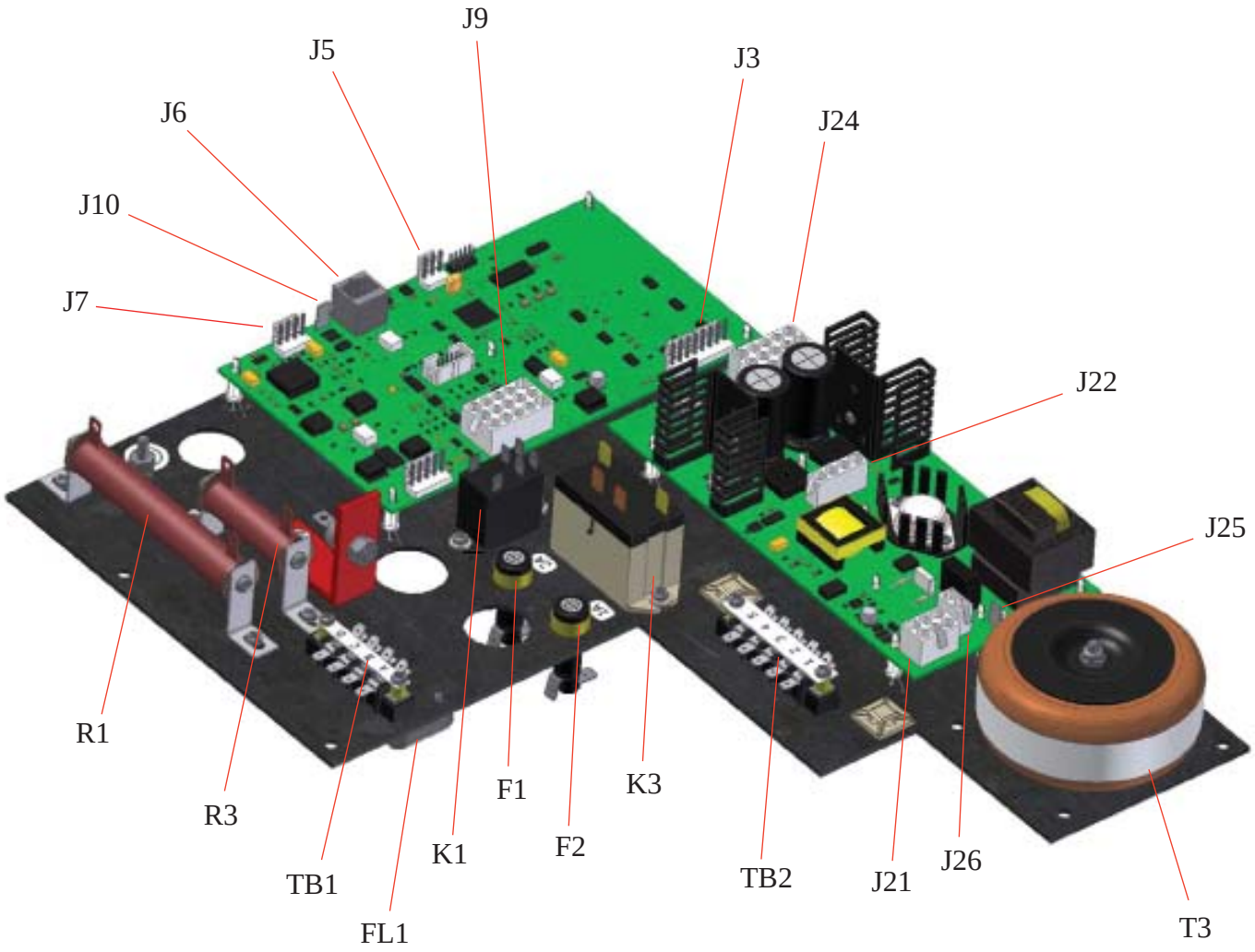
Item #	Part #	Description
4	301117-1.001	Plate, Head Sup, Coated
5	550052-021	SHCS, 8-32 X 3/8, Coarse, Blk
6	133223-1	Washer, Special, Head Supp.
9	229098-2	Washer, Nylon, Special
10	52482-12	Ring, Retaining, Zinc, 5/16
12	550149-237	Setscrew, #8-32 X 1/2, Cup
14	229075-1	Rod, Threaded
16	230098-1	Shaft, 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

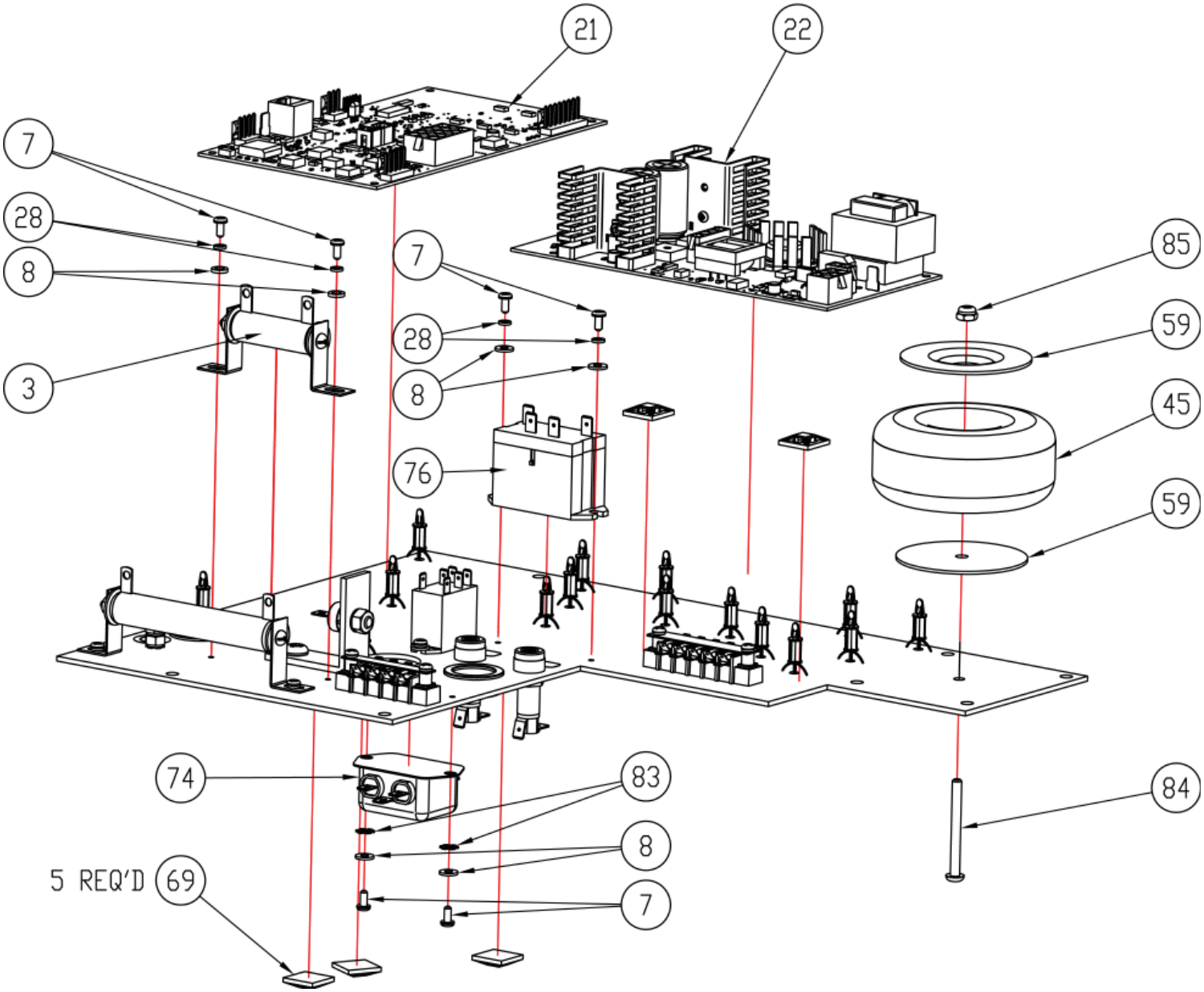


Item #	Part #	Description
1	801186-1	Motor Assembly, Screw Drive
2	300937-1	Plate, Mounting, Screw Drive
3	300938-1	Spacer, Screw Drive
4	301011-1.001	Plate, Lwr Screw Drive, Finished
5	550137-17	SOC HD TFS, M6 X 25, Metric
6	550015-156	PHMS, 1/4-20 X 3/4, Zinc
7	550148-13	Lockwasher, Split, 1/4
8	550127-20	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

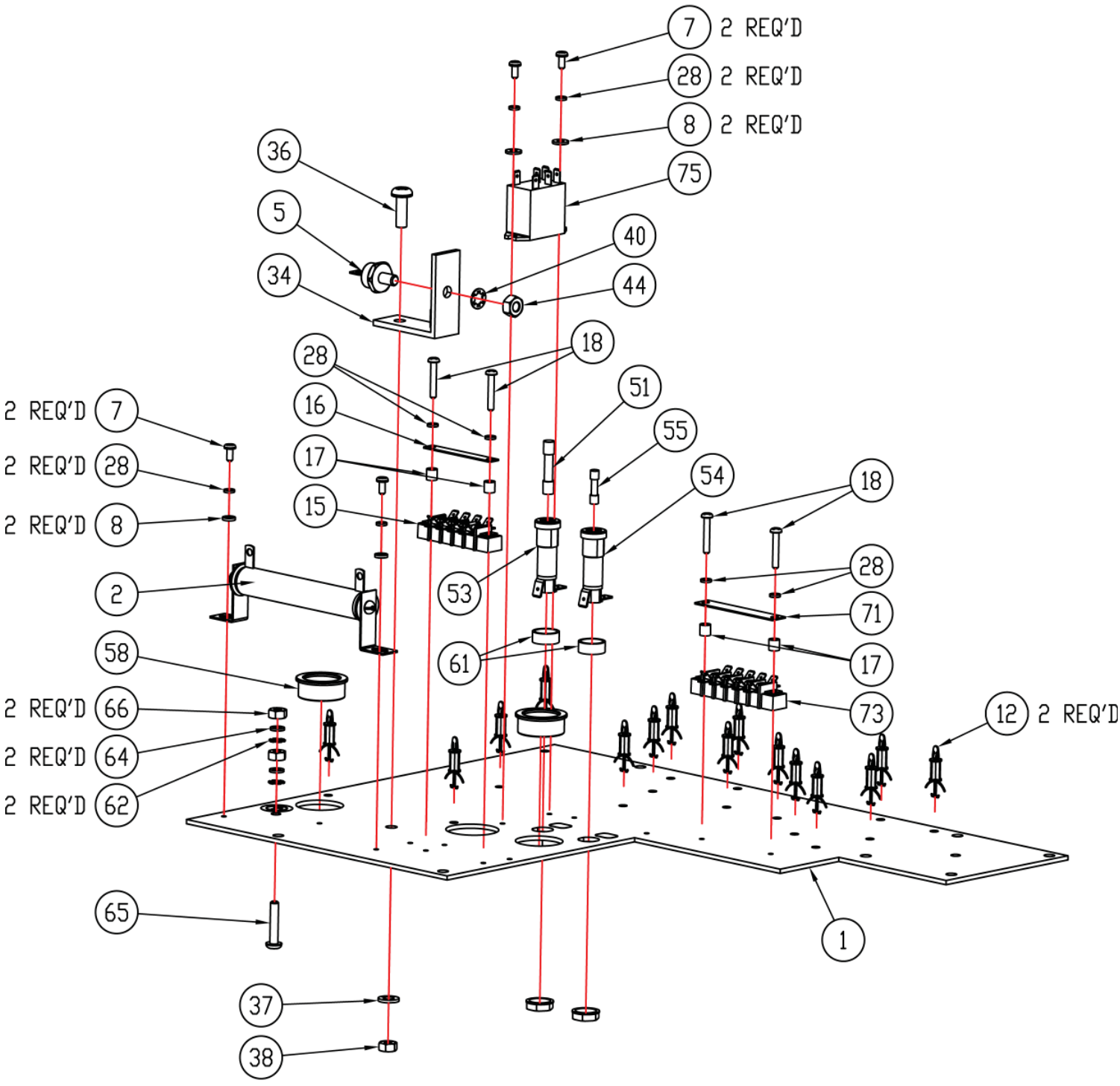
Electric Plate Assembly



Electric Plate Assembly



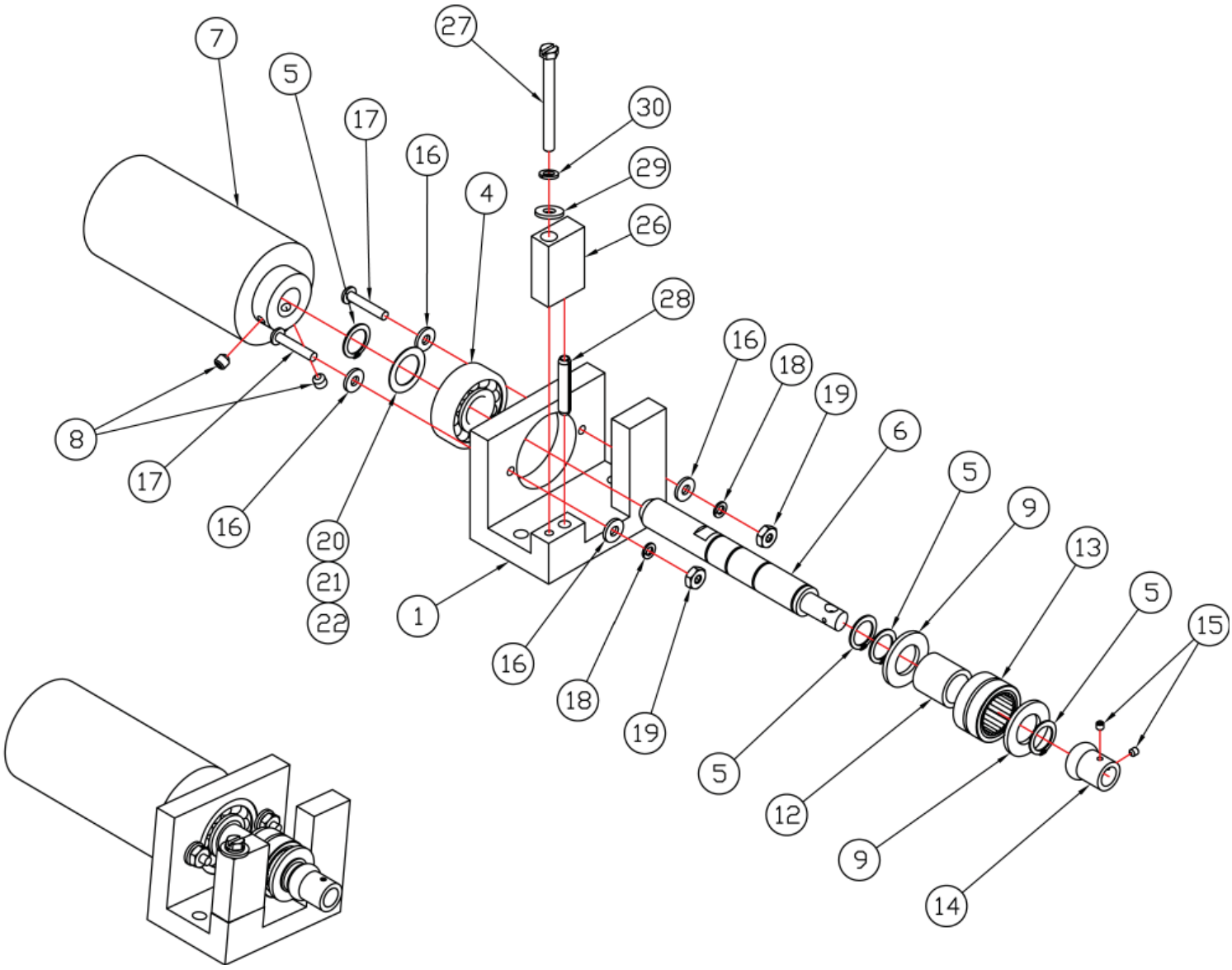
Electric Plate Assembly



Electric Plate Assembly

Item #	Part #	Description
1	300996-1	Plate, Electric, Facelift
2	801020-5	Res Assembly, 50 OHM, 50W, FXD
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

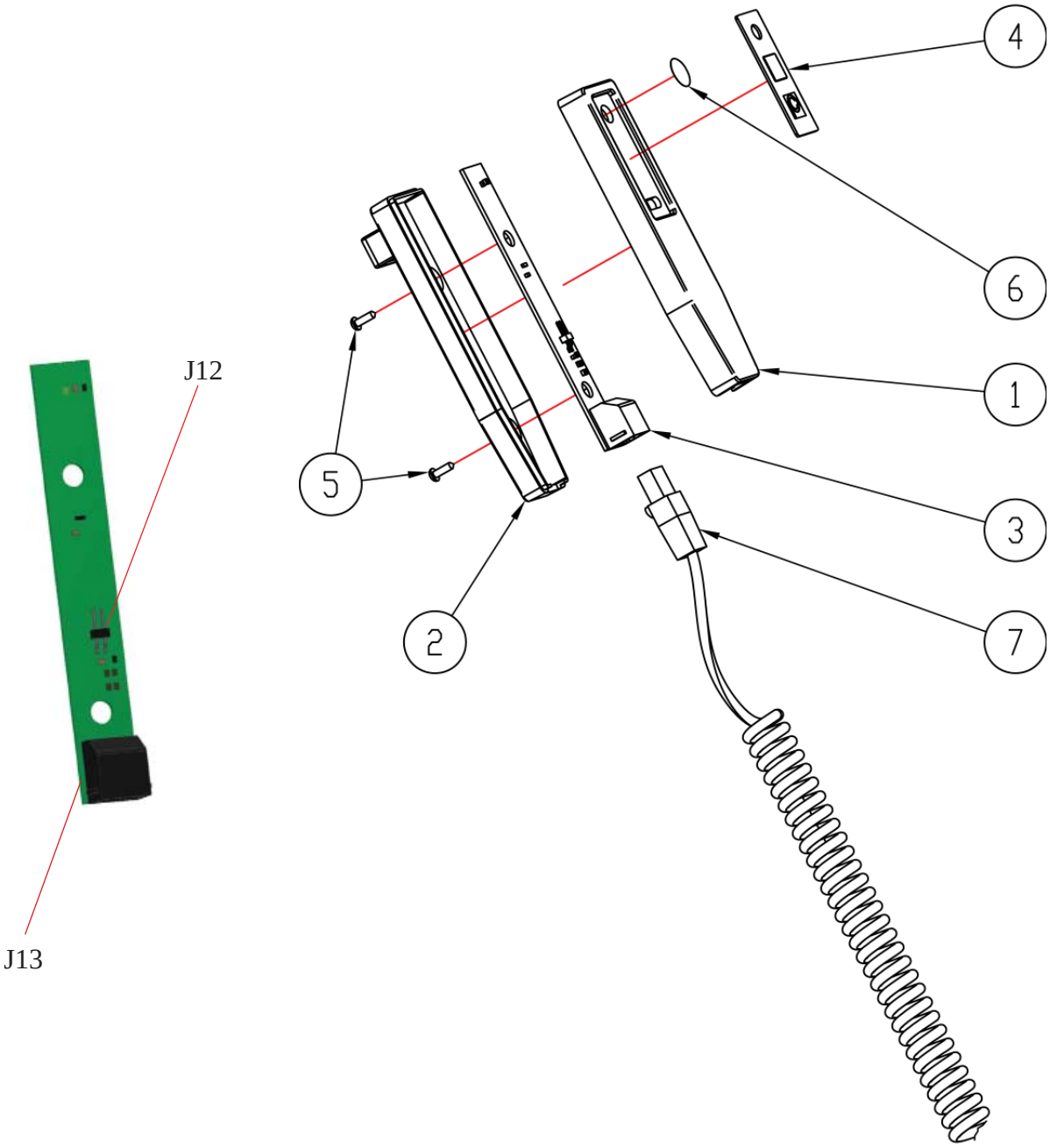
Roller-Orbit Drive Assembly



Roller-Orbit Drive Assembly

Item #	Part #	Description
1	300951-1.001	Mounting Block, Orbit Drive
4	229065-1	Bearing, Self Aligning
5	550155-17	Retaining, Truarc, 15/32
6	229083-1	Shaft, Wheel Drive
7	229082-1.001	Roller, Orbit-Driving, Finished
8	550149-242	Setscrew, #10-24 X 3/16, Cup
9	229098-1	Washer, Special, Plastic
12	229097-1	Inner Race, Needle Rl Brg
13	229063-3	Bearing, Roller
14	131704-3.001	Roller Wheel Dr-Blk, Facelift
15	550149-211	Setscrew, #4-40 X 1/8, Cup
16	550025-03	Washer, Flat, #6, Steel, ZP
17	550015-62	PHMS, #6-32 X 3/4, Zinc
18	550148-6	Lockwasher, Split, #6
19	550023-20	Nut, Hex, #6-32, Steel
20	542004-0209	Shim, .010 Thk, .5 ID, .75 OD
21	542004-0211	Shim, .015 Thk, .5 ID, .75 OD
22	542004-0212	Shim, .020 Thk, .5 ID, .75 OD
26	301068-1.001	Block, Adjustment, Finished
27	550141-1	Hex HD MS 8-32 X 1.5 SLT ZI
28	550154-87	Roll Pin, .187 X 1.000, CS
29	550025-04	Washer, Flat, #8, Steel, ZP
30	550148-8	Lockwasher, Split, #8

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