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Service Manual

MAN-04198 Revision 003

HOLOGIC®



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Digital Tomosynthesis System

Service Manual

For Software Version 1.8

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Chapter 1 Introduction

1.1 System Capabilities

The system provides the user interfaces for the performance of screening and diagnostic mammograms:

- Conventional mammography with a digital image receptor equivalent in size to large mammography film.
- Tomosynthesis scan with a digital image receptor equivalent in size to large mammography film (Tomosynthesis option).
- Conventional digital mammogram and tomosynthesis scan during one compression (Tomosynthesis option).

1.2 Skills Needed for System Use

You must know how to do the following:

- Perform the trackball operations, like click, drag, and/or select
- Perform the touch screen operations
- Select from menus
- Type information in text fields
- Select the options in the screens
- Select the entries from drop-down lists
- Use scroll bars

1.3 User Training

Hologic® does not accept the responsibility for injury or damage caused by incorrect system operation. Hologic can arrange for training by a clinical application specialist. See the *User Guide* for directions on how to use the system.

The Service Engineers must complete Hologic training programs before they operate or service a system.

1.4 Quality Control Requirements

The facilities in the United States must use the Quality Control Manual to create a Quality Assurance and Quality Control program. The facility must create the program to meet the requirements of the Mammography Quality Standards Act or to be accredited by ACR or another accreditation body.

The facilities outside the United States can use the Quality Control Manual as a guide to create a program to meet the local standards and regulations.

1.5 Product Complaints

Report any complaints or problems in the quality, reliability, safety, or performance of this product to Hologic. If the device has caused or added to patient injury, immediately report the incident to Hologic. (See the title page for contact information.)

1.6 Hologic Cybersecurity Statement

Hologic continuously tests the current state of computer and network security to examine possible security problems. When necessary, Hologic provides the updates to the product.

For Cybersecurity Best Practices documents for Hologic products, refer to the Hologic Internet site.

1.7 Descriptions of Warnings, Cautions, and Notes

Descriptions of Warnings, Cautions, and Notes used in this manual:



WARNING!

The procedures that you must follow accurately to prevent possible dangerous or fatal injury.



Warning:

The procedures that you must follow accurately to prevent injury.



Caution:

The procedures that you must follow accurately to prevent damage to equipment, loss of data, or damage to files in software applications.



Note

Notes show additional information.

1.8 Terms and Definitions

ACR	American College of Radiology
AE	Application Entity
AEC	Automatic Exposure Control
Annotations	Graphic or text marks on an image to indicate an area of interest.
BTO	Hologic's abbreviation for the DICOM Breast Tomosynthesis Image SOP Class, for interoperable exchange of tomosynthesis reconstructed slices.
CAD	Computer Assisted Detection and Diagnosis
CAN Bus	Controller Area Network bus
CC	Cranio-caudal (mammography view)
CDI	Compression Device Interface
CEDM	Contrast Enhanced Digital Mammography
CE2D	Hologic® term for CEDM
Collimator	Device at the x-ray tube to control the area of the receptor that is exposed.
Conventional Mammography	Single projection x-ray images of views for screening and diagnostic purposes.
DICOM	Digital Imaging and Communications in Medicine
DRC	Hologic's Direct Radiography Corp.
EMC	Electromagnetic Compatibility
Gantry	A part of the Selenia® Dimensions® system that has the Detector, Generator and X-ray Source, Positioning/Compression, Power Distribution, and Accessories Subsystems.
Grid	Element within the Digital Image Receptor that reduces scatter radiation during the exposure.
Hall Effect Sensor	A transducer that varies its output voltage in response to changes in magnetic field.
HIS	Hospital Information System
HTC™	High Transmission Cellular Grid
I-View™	A licensed feature for 2D Contrast Enhanced Digital Mammography
Image Receptor	Assembly of x-ray detector, x-ray scatter reduction grid, and carbon fiber cover.
MLO	Medio Lateral Oblique (mammography view)
MQSA	Mammography Quality Standards Act
MPPS	Modality Performed Procedure Step
MWL	Modality Worklist

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Chapter 1: Introduction

Node	A start or stop for a CAN message. More than one node can exist within a Selenia Dimensions subsystem.
Notice	Annotations and comments per image communicated between Diagnostic Review Workstations, Technologist Workstations, and Acquisition Workstations.
NPT	Non-Patient Test—Service Mode only
PACS	Picture Archiving and Communications System. A computer and network system for the transfer and archive of digital medical images.
PCI	Peripheral Component Interconnect
Pend	The action taken on an image to mark the image if the Technologist is not positive about the image quality. Pended images must be Accepted or Rejected before the procedure is closed.
Projection Images	The group of x-ray images for tomosynthesis (option) taken at different projection angles through the breast.
QR	Query/Retrieve
RF	Radio Frequency
RIS	Radiology Information System
ROI	Region of Interest
SCO	Hologic's abbreviation for the proprietary use of the DICOM Secondary Capture Image SOP Class to store tomosynthesis projection images and reconstructed slices.
SID	Source to Image Distance
SIM	Subscriber Identity Module
Tomosynthesis (option)	An imaging procedure which combines a number of projections taken at different angles. The tomosynthesis images can be reconstructed to show focal planes (slices) within the object (Tomosynthesis option).
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus

1.9 Symbols

This section describes the Symbols on this system.

Symbol	Description
	Type B Applied Part
	Potential Equalization terminal
	Protective Earth terminal
	"OFF" (power)
	"ON" (power)
	"OFF" for part of the equipment
	"ON" for part of the equipment
	Discard electrical and electronic equipment separately from standard waste. Send decommissioned material to Hologic or contact your service representative.
	Dangerous Voltage
	Manufacturer
	Date of Manufacture
	This system transmits radio frequency (RF) energy (non-ionizing radiation)
	Caution—Radiation
	Follow operating instructions
	Follow the <i>User Guide</i>
	Caution

1.10 Document Conventions

When prompted to add text, enter the text written in **monospaced font** exactly as shown.

Chapter 2 General Information

2.1 System Description

2.1.1 Tubestand

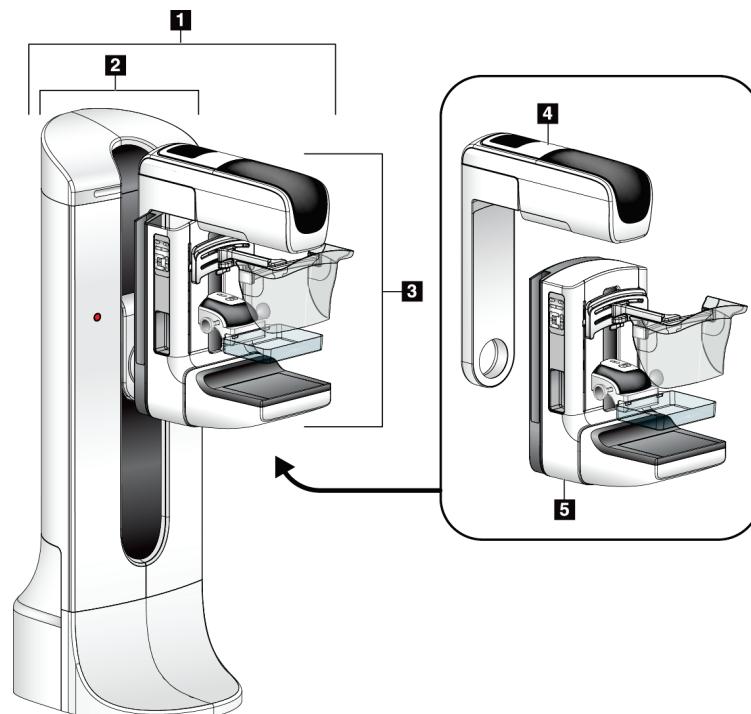


Figure 1: Selenia® Dimensions® System Tubestand

Figure Legend

1. Tubestand (Gantry and C-arm)
2. Gantry
3. C-arm (Tube Arm and Compression Arm)
4. Tube Arm
5. Compression Arm

2.1.2 Acquisition Workstation

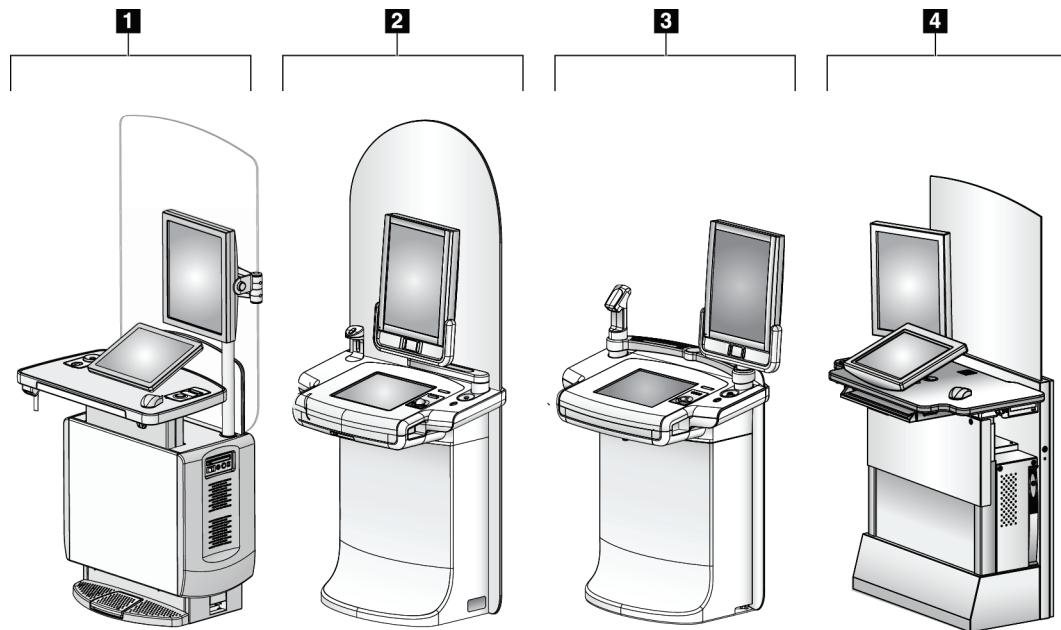


Figure 2: Acquisition Workstation

Figure Legend

1. Universal Acquisition Workstation
2. Premium Acquisition Workstation
3. Mobile Acquisition Workstation
4. Standard Acquisition Workstation

2.2 Safety Information

Read and understand this manual before you use the system.

The Selenia Dimensions system has protective devices, but the Service Engineer must understand how to safely use the system. The Service Engineer must remember the health hazards of x rays.

2.3 Warnings and Precautions



This system is classified as CLASS I, TYPE B APPLIED PART, IPX0, permanently connected equipment, continuous operation with short term loading per IEC 60601-1. There are no special provisions to protect the system from flammable anesthetics or ingress of liquids.

**WARNING!**

Risk of electric shock. Only connect this equipment to supply mains with Protective Earth.

**WARNING!**

For North American electrical safety requirements, use a Hospital Grade receptacle to supply a correct Ground.

**WARNING!**

Electrical equipment used near flammable anesthetics can cause an explosion.

**WARNING!**

To correctly isolate the system, attach only approved accessories or options to the system. Only approved personnel can change the connections.

**WARNING!**

Keep a 1.5 meter safe distance between the patient and any non-patient devices.

Do not install non-patient system components (like the Workflow Manager, a diagnostic review workstation, or a hard copy printer) in the Patient Area.

**WARNING!**

This system contains lethal voltages.

**Warning:**

This device contains dangerous material. Send decommissioned material to Hologic or contact your service representative.

Selenia Dimensions System Service Manual

Chapter 2: General Information



Warning:

C-arm movement is motorized.



Warning:

You increase the patient dose to high levels when you increase the AEC exposure adjustment. You increase the image noise or decrease image quality when you decrease the AEC exposure adjustment.



Warning:

Control the access to the equipment according to local regulations for radiation protection.



Warning:

The disk drives installed in this system are a Class I Laser Product. Prevent direct exposure to the beam. Hidden laser radiation exists if the case to a disk drive is open.



Warning:

The bar code scanner installed in this system is a Class II Laser Product. Prevent direct exposure to the beam. Hidden laser radiation exists if the cover is opened.



Warning:

Keep your full body behind the radiation shield during the exposure.



Warning:

Do not move the C-arm while the system retrieves the image.



Warning:

The user or a Service Engineer must correct problems before the system is used.



Warning:

Always follow the safety precautions for x-ray exposures.



Caution:

The system is a medical device and not a normal computer. Only make approved changes to the hardware or software. Install this device behind a firewall for network security. The computer virus protection or network security for this medical device is not supplied (for example, a computer firewall). The network security and anti-virus provisions are the responsibility of the user.



Caution:

Do not turn off the Acquisition Workstation circuit breaker except in emergency. The circuit breaker can turn off the Uninterruptible Power Supply (UPS) and risk data loss.



Caution:

Risk of data loss. Do not put any magnetic media near or on devices that create any magnetic fields.



Caution:

Do not use any heat source (like a heating pad) on the image receptor.



Caution:

To prevent possible damage from thermal shock to the Digital Image Receptor, follow the recommended procedure to turn off the equipment.



Caution:

The display is calibrated for compliance to DICOM standards. Do not make any brightness or contrast adjustments to the display.



Caution:

Use the least possible amount of cleaning fluids. The fluids must not flow or run.



Caution:

To prevent damage to the electronic components, do not use disinfectant sprays on the system.

2.4 Emergency Off Switches

The Emergency Off switches remove the power from the Gantry and the Standard Acquisition Workstation Lift Mechanism. Do not normally use the Emergency Off switches to turn off the system. See the Selenia Dimensions System *User Guide* to learn about the Emergency Off switches.

2.5 Interlocks

The Selenia Dimensions system has safety interlocks:

- C-arm vertical movement and rotation are disabled when compression force is applied. A Service Engineer can configure the lockout force from 22 Newtons (5 pounds) to 45 Newtons (10 pounds).
- If the x-ray button and/or footswitch* is released before the end of the exposure, the exposure stops and an alarm message is displayed.
* (The footswitch option is available only on the Universal Acquisition Workstation console.)
- When in Tomo mode, the system does not allow an exposure if the Grid is in the x-ray field (Tomosynthesis option).
- Mirror and Filter position flags also prevent x rays when the Light Field Mirror or the Filter Assembly is not correctly positioned.

2.6 Compliance

This section describes the mammography system compliance requirements and the responsibilities of the manufacturer.

2.6.1 Compliance Requirements

The manufacturer has the responsibility for the safety, reliability, and performance of this equipment with the following provisions:

- The electrical installation of the room meets all requirements.
- The equipment is used according to the *User Guide*.
- The assembly operations, extensions, adjustments, changes, or repairs are performed only by authorized persons.
- The network and communication equipment is installed to meet IEC Standards. The complete system (network and communications equipment and Selenia Dimensions Mammography System) must be in compliance with IEC 60601-1 and IEC 60601-1-1.



Caution:

Medical Electrical Equipment needs special precautions about EMC and must be installed, put into service and used according to the EMC information provided.



Caution:

Portable and mobile RF communications can affect medical electrical equipment.



Caution:

The use of unauthorized accessories and cables can result in increased emissions or decreased immunity. To keep the isolation quality for the system, attach only approved Hologic accessories or options to the system.



Caution:

The Medical Electrical (ME) Equipment or ME System should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, make sure that the ME Equipment or ME System operates correctly in this configuration.



Caution:

This system is intended for use by healthcare professionals only. This system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the equipment or shielding the location.



Caution:

Changes or modifications not expressly approved by Hologic could void your authority to operate the equipment.



Caution:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2.6.2 Compliance Statements

The manufacturer states this device is made to meet the following requirements:

- CAN/CSA - ISO 13485-03 Medical Devices – Quality Management Systems – Requirements for Regulatory Purposes (Adopted ISO 13485:2003 second edition, 2003-07-15)
- CAN/CSA C22.2 NO. 60601-1-08 Medical Electrical Equipment – Part 1: General Requirements for Basic Safety and Essential Performance (Adopted IEC 60601-1:2005, third edition, 2005-12), includes Corrigendum 1:2011; also CAN/CSA C22.2 NO. 601.1-M90 (R2005) Medical Electrical Equipment Part 1: General Requirements for Safety
- EN 60601-1:2006 Medical Electrical Equipment. General Requirements for Basic Safety and Essential Performance; also EN 60601-1:1990 +A1+A11+A12+A2+A13 Medical Electrical Equipment—General Requirements for Safety
- ETSI EN 300 330-1: V1.3.1, and ETSI EN 300 330-2: V1.5.1: 2006—Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz
- ETSI EN 301 489-1: V1.6.1, and ETSI EN 301 489-3: V1.8.1: 2008—Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services
- FCC, 47 CFR Part 15, Subpart C, Section 15.225: 2009
- FDA, 21 CFR [Parts 820, 900 and 1020]
- IEC 60601-1 Ed. 3.0:2005 Medical Electrical Equipment – Part 1: General Requirements for Basic Safety and Essential Performance; also IEC 60601-1 Ed. 2.0:1988 +A1+A2:1995 Medical Electrical Equipment—General Requirements for Safety
- IEC 60601-1-1Ed. 2.0:2000 Medical Electrical Equipment - Part 1-1: General Requirements for Safety - Collateral Standard: Safety Requirements for Medical Electrical Systems
- IEC 60601-1-2 Ed. 3.0:2007 Medical Electrical Equipment – Part 1-2: General Requirements for Basic Safety and Essential Performance - Collateral Standard: Electromagnetic Compatibility – Requirements and Tests
- IEC 60601-1-3 Ed. 2.0:2008 Medical Electrical Equipment – Part 1-3: General Requirements for Basic Safety and Essential Performance –Collateral Standard: Radiation Protection in Diagnostic X-Ray Equipment; also IEC 60601-1-3 Ed. 1.0:1994 Medical Electrical Equipment – Part 1: General Requirement for Safety -3. Collateral Standard: Requirements for Radiation Protection in Diagnostic X-ray Equipment
- IEC 60601-1-4 Ed. 1.1:2000 Medical Electrical Equipment – Part 1-4: General Requirements for Safety - Collateral Standard: Programmable Electrical Medical Systems

- IEC 60601-2-28 Ed. 2.0:2010 Medical Electrical Equipment - Part 2-28: Particular Requirements for the Basic Safety and Essential Performance of X-ray Tube Assemblies for Medical Devices; also IEC 60601-2-28 Ed. 1.0:1993 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 Ed. 1.0:1994 Medical Electrical Equipment – Part 2: Particular Requirements for the Safety of Associated Equipment of X-ray Equipment
- IEC 60601-2-45 Ed. 3.0:2011 Medical Electrical Equipment – Part 2-45: Particular Requirements for Basic Safety and Essential Performance of Mammographic X-Ray Equipment and Mammographic Stereotactic Devices; also IEC 60601-2-45 Ed. 2.0:2001 Medical Electrical Equipment Part 2-45: Particular Requirements for the Safety of Mammographic X-ray Equipment and Mammographic Stereotactic Devices
- RSS-210: Issue 7, 2007 Radio Standards Specification Low-power License-exempt Radiocommunication Devices: Category I Equipment
- ANSI/AAMI ES60601-1:2005 (IEC 60601-1:2005, MOD) Medical Electrical Equipment, Part 1: General Requirements for Basic Safety and Essential Performance, includes amendment (2010); also UL 60601-1 1st Edition: Medical Electrical Equipment, Part 1—General Requirements for Safety

2.7 Label Locations

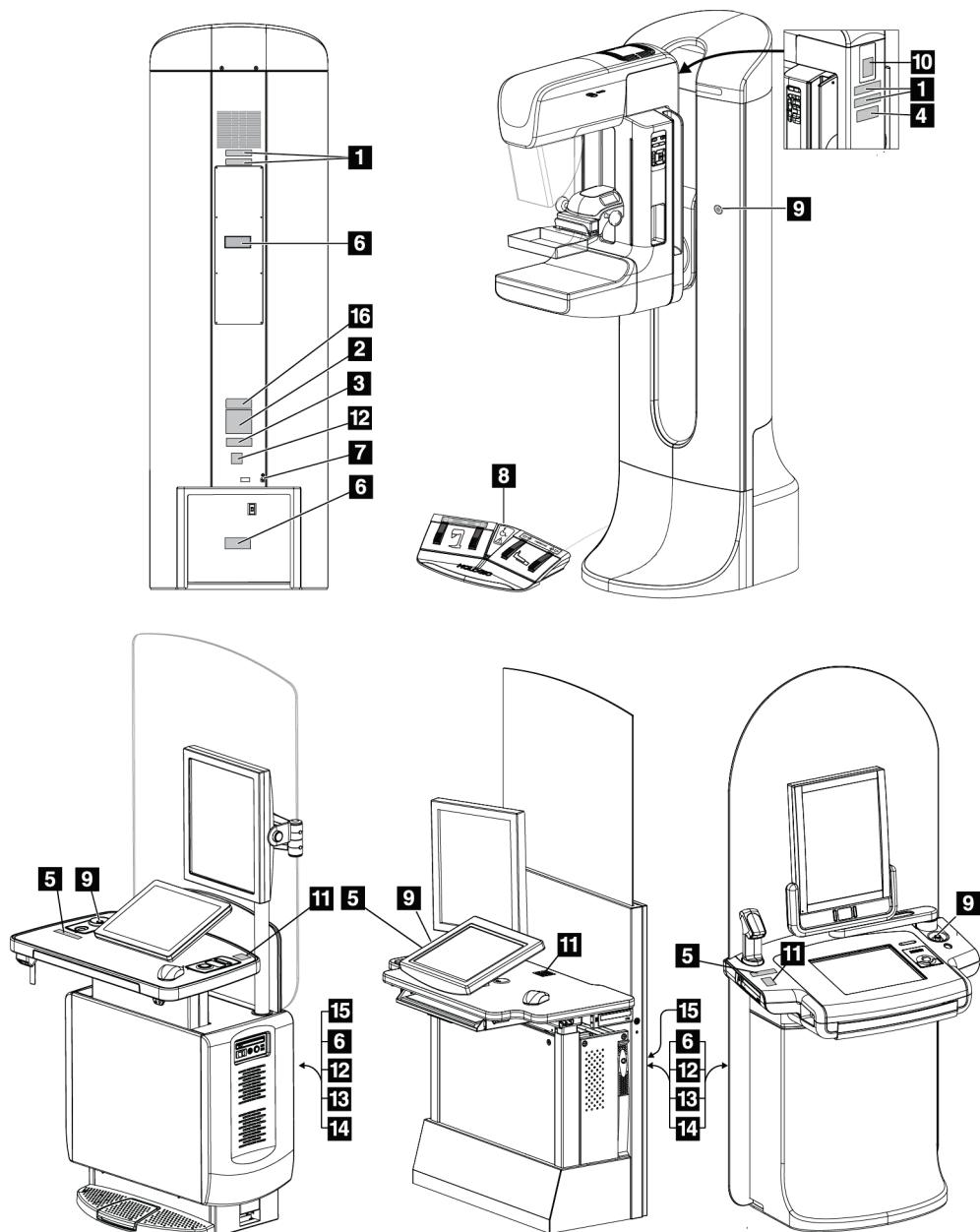
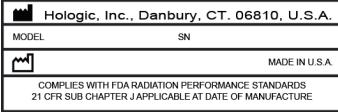
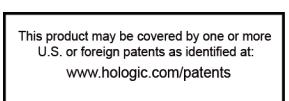
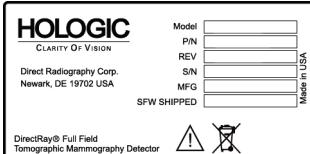
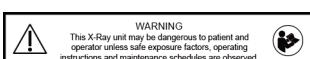


Figure 3: Label Locations

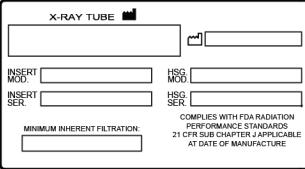
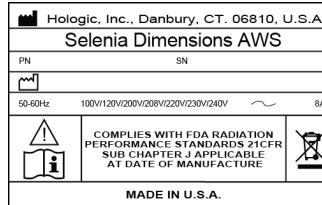
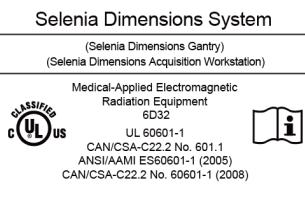
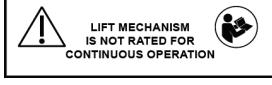
Table 1: List of Labels

Label Identification	Description
1 	Serialized Device Label
2 	System Nameplate Label
3 	Patent Label
4 	Tomographic Mammography Detector Label
5 	X-ray Device Warning
6 	Electrical Shock Warning
7 	Potential Equalization Terminal
8 	Wheelchair Warning for Footswitch
9 	Emergency Stop Switch

Selenia Dimensions System Service Manual

Chapter 2: General Information

Table 1: List of Labels

Label Identification		Description
10		X-ray Tube Serial Number
11		Technical Support Contact Label
12		CE Marking
13		Acquisition Workstation Nameplate Label
14		Gantry and Acquisition Workstation Certification
15		Acquisition Workstation Lift Limit Label *This label and the associated lift mechanism are not available on some Acquisition Workstation models.
16		UDI Label

Chapter 3 Installation and Configuration

3.1 Receive Shipment and Unpack

Required Tools:

- Box cutter
- Electric screw gun with #2 Phillips screw head driver
- Small crowbar or claw hammer
- Set of 3/8" socket wrenches
- Hand truck with drop-down wheels

3.1.1 Receiving Instructions

The Selenia® Dimensions® system is shipped in containers that hold the:

- Gantry
- Acquisition Workstation (Universal, Premium, or Standard)
- Radiation Shield (not included with the Mobile configuration)
- Image Receptor (IR)—The IR usually does not arrive until the second day.
- Accessories and additional or optional equipment

Note

 A Hologic representative must be present at the time of delivery and is responsible for unpacking the product.

Note

 If there is a discrepancy between the contents and the packing list or sales order, contact Hologic immediately. If it is necessary to repack any items for future installation, use the original packaging materials.

Note

 If shipping damage is concealed, contact the carrier immediately after discovery.

At the time of receipt, perform the following steps before opening the containers:

1. Inspect each container for damage.
2. Note any damage on the shipping manifest.
3. Notify Hologic of any external shipping damage that has occurred.

3.1.2 Unpacking the Gantry

The Selenia Dimensions Gantry is crated and shipped in a prone position. The C-arm is rotated 180°, and a foam block is wedged between the C-arm and the Gantry.



Warning:

Be sure to have the necessary machinery and personnel available to move heavy medical equipment safely.



Warning:

To prevent injury to personnel and/or damage to equipment, care must be taken when uncrating the equipment.

To unpack the Gantry from the shipping container:

1. While still in the loading area, cut the retaining straps that secure the cardboard carton to the wooden crate.
2. Remove the nails holding the carton to the wooden crate along the bottom edge of the cardboard.
3. Remove the side screws and washers that hold the carton to the internal wooden support piece.
4. Lift the carton off the wooden crate.
5. Carefully remove all shipping materials (foam padding, tie-downs, straps, shipping wrap, and so on) from around the Gantry and wooden crate. Remove any accessory boxes. Do NOT remove the foam block wedged between the C-arm and Gantry.
6. Open all boxes removed from the Gantry shipping container, and check their contents against the packing list and sales order.
7. Inspect each item for damage, then safely store them near the exam site.
8. Carefully move the Gantry and wooden crate into an upright position.



Warning:

The unit is top-heavy when in the upright position.



Caution:

Do not attempt to lift or move the Gantry by the C-arm or damage may occur.

9. Remove the top support bolts from the top of the Gantry. (See the following figure.)



Caution:

Do not insert eyebolts and do not lift the Gantry from the top or damage can occur.

10. Carefully slide the Gantry from the crate. (See the following figure.)

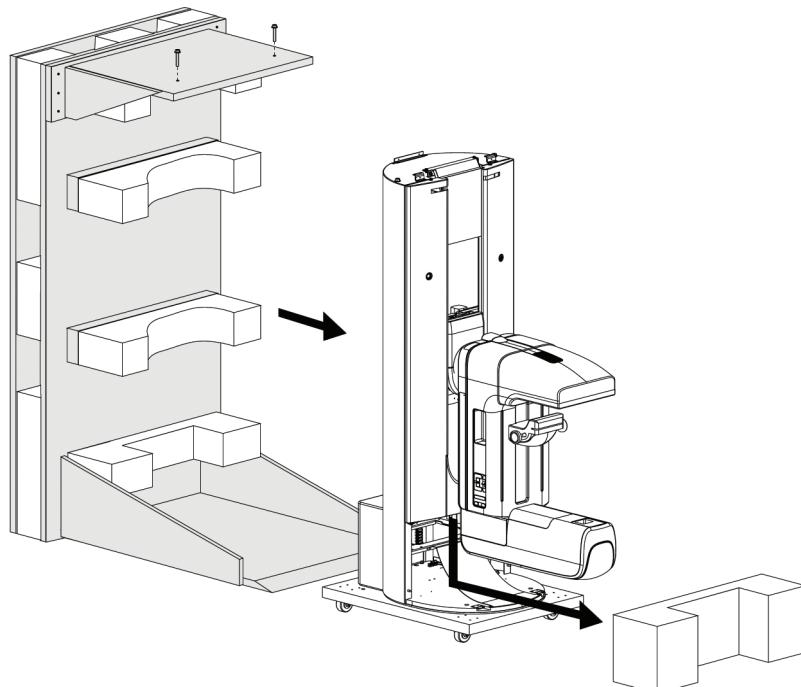


Figure 4: Unpacking the Gantry

11. Transport the Gantry from the loading area to the exam area for installation.
12. Remove the four bolts securing the Gantry to the dolly.
13. Use a rigging service to maneuver the Gantry off the dolly and to position the Gantry in the area of installation. Do not attempt to move the Gantry alone.
14. Remove the foam block securing the C-arm. (See the previous figure.)
15. The Service Engineer returns the dolly to Hologic. Refer to the return shipment Bill of Lading (attached to either the dolly or the Gantry). If this documentation is unavailable, contact Hologic Technical Support to acquire a Return Authorization number. Be prepared to identify the site/customer and the Selenia Dimensions Gantry serial number. Coordinate with the Installation Coordinator as needed.

3.1.3 Unpacking the Acquisition Workstation

Unpacking the Universal Acquisition Workstation

The Universal Acquisition Workstation is crated and shipped upright. Most options and accessories are not preinstalled on the workstation. Items such as the preview display monitor, display monitor swing arm, x-ray shield, fingerprint scanner, and bar code reader are packed separately. These packages may be included in the workstation shipping container, such as the control/operator monitor.



Warning:

Be sure to have the necessary machinery and personnel available to move heavy medical equipment safely.



Warning:

The Radiation Shield is tempered glass and may shatter if dropped or overstressed.



Warning:

The Universal Acquisition Workstation is front-heavy. Until the unit is bolted down, be careful when you move or work on the unit. Make sure that the front edge is supported.

To unpack the Universal Acquisition Workstation from the shipping container:

1. While still in the loading area, cut the retaining straps that secure the cardboard carton to the wooden pallet.
2. Lift the carton off the wooden pallet.
3. Carefully remove all shipping materials (foam padding, tie-downs, straps, shipping wrap, and so on) from around the workstation and wooden pallet. Remove any accessory boxes.
4. Open all boxes removed from the workstation shipping container, and check their contents against the packing list and sales order.
5. Inspect each item for damage, then safely store them near the exam site.
6. Carefully maneuver the Universal Acquisition Workstation off the wooden pallet, and transport it from the loading area to the exam area.

Unpacking the Premium Acquisition Workstation

The Selenia Dimensions Premium Acquisition Workstation is crated and shipped upright. The preview display is not attached and is shipped in its own carton. The radiation shields are not attached and are packaged inside the Acquisition Workstation shipping container.

**Warning:**

Be sure to have the necessary machinery and personnel available to move heavy medical equipment safely.

**Warning:**

The Radiation Shield is tempered glass and may shatter if dropped or overstressed.

**Warning:**

Do not handle or position the Radiation Shield alone. Two people are required to handle and position the tempered glass shield to minimize stress to the shield.

To unpack the Premium Acquisition Workstation from the shipping container:

1. While still in the loading area, cut the retaining straps that secure the cardboard carton to the wooden pallet.
2. Lift the carton off the wooden pallet.
3. Carefully remove all shipping materials (foam padding, tie-downs, straps, shipping wrap, and so on) from around the workstation and wooden pallet. Remove any accessory boxes.
4. Open all boxes removed from the workstation shipping container, and check their contents against the packing list and sales order.
5. Inspect each item for damage, then safely store them near the exam site.
6. Remove the Premium Acquisition Workstation front cover.
7. Remove the bolts, washers, and nuts that secure the Premium Acquisition Workstation to the wooden pallet.
8. Carefully maneuver the Premium Acquisition Workstation off the pallet, and transport it from the loading area to the exam area.

Unpacking the Standard Acquisition Workstation

The Selenia Dimensions Standard Acquisition Workstation is crated and shipped upright. The preview display is not attached and is shipped in its own carton. The radiation shield is not attached and is packaged inside the Gantry carton.



Warning:

Be sure to have the necessary machinery and personnel available to move heavy medical equipment safely.



Warning:

The Radiation Shield is tempered glass and may shatter if dropped or overstressed.



Warning:

Do not handle or position the Radiation Shield alone. Two people are required to handle and position the tempered glass shield to minimize stress to the shield.

To unpack the Standard Acquisition Workstation from the shipping container:

1. While still in the loading area, cut the retaining straps that secure the cardboard carton to the wooden pallet.
2. Lift the carton off the wooden pallet.
3. Carefully remove all shipping materials (foam padding, tie-downs, straps, shipping wrap, and so on) from around the workstation and wooden pallet. Remove any accessory boxes.



Caution:

Take special care to make sure that no stress is placed on the monitor mounted to the counter. Doing so can damage the mounting hardware for the bracket and counter surface.

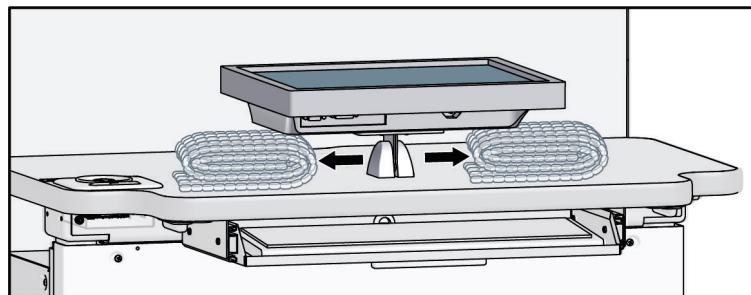


Figure 5: Unpacking the Standard Acquisition Workstation and Control Display Monitor

4. Open all boxes removed from the workstation shipping container, and check their contents against the packing list and sales order.

5. Inspect each item for damage, then safely store them near the exam site.
6. The workstation is held in position by a 2 x 4 in front of it, screwed to the pallet. Remove the 2 x 4.
7. Carefully maneuver the Standard Acquisition Workstation off the wooden pallet, and transport it from the loading area to the exam area.

All Selenia Dimensions Standard Acquisition Workstations are shipped with a shield mounting kit. Verify that the shield mounting kit is supplied. The mobile Acquisition Workstation has a Selenia Dimensions Mobile Shield Fillers Kit, as x-ray shields are not supplied with the mobile configuration.

3.1.4 Unpacking the Image Receptor

**Caution:**

Move the Detector to a controlled area prior to unpacking.

**Caution:**

Extreme care should be taken during unpacking and handling to prevent damage.

**Note**

The detector shipping container is specially designed to minimize shipping damage and to facilitate storage. A temperature monitoring device is included in the shipping container.

**Note**

If shipping damage is concealed, contact the carrier immediately after discovery.

At the time of receipt, move the Image Receptor to a controlled area which meets these environmental requirements:

<i>Temperature Range</i>	<i>10 °C (50 °F) to 30 °C (86°F) indefinitely</i>
<i>Maximum rate of temperature change</i>	<i>10 °C (50 °F) to 35°C (95 °F) for a maximum of 12 hours</i>
<i>Relative Humidity Range</i>	<i>Less than 10 °C (50 °F) per hour</i>

(Put in a package for storage in a building.)

To unpack the Image Receptor from the shipping container:

1. Open the shipping carton and carefully remove all shipping materials (foam padding, shipping wrap, and so on) from around the Image Receptor.
2. Open all boxes removed from the shipping carton, and check their contents against the packing list and sales order.
3. Inspect the Image Receptor for damage.
4. Press the button on the temperature monitor. The LED should be green. If not, contact Hologic Technical Support.

3.2 Overview of the Installation Process

This section details setting up, positioning, and installing the Selenia Dimensions system in the exam room.



Caution:

Do not power up the system until you remove the Grid Assembly shipping bracket or grid damage may occur.



Caution:

Make sure that there is an installed circuit breaker at the Mains that meets the following requirements:

40A Breaker, UL 489, or UL HACR listed



Note

The network and communication equipment must be installed to meet IEC Standards. The complete system (network and communications equipment and Selenia Dimensions Mammography System) must be installed to meet IEC 60601-1 and IEC 60601-1-1.



Note

Thoroughly read all procedures before starting the installation.

3.3 Required Tools and Equipment

- Standard Tool Kit
- Selenia Dimensions Tool Kit—ASY-02442
- Power hammer drill
- Drill bits and masonry bits
- Anchors (Red Head or equivalent)
- Bolts, washers, shim stock for leveling
- Hacksaw
- Claw hammer
- Center punch
- 3/8 inch or larger ratchet set
- Heavy duty shop vacuum cleaner
- Installation Checklist—see [Installation Checklist](#) on page 373.

3.4 Exam Room Layout

Follow the exam room layout shown below for proper clearance zones.

Note

The dimensions referenced in the following figure are the minimum for general purposes. We recommend that the customer ensure all installations meet local regulations.

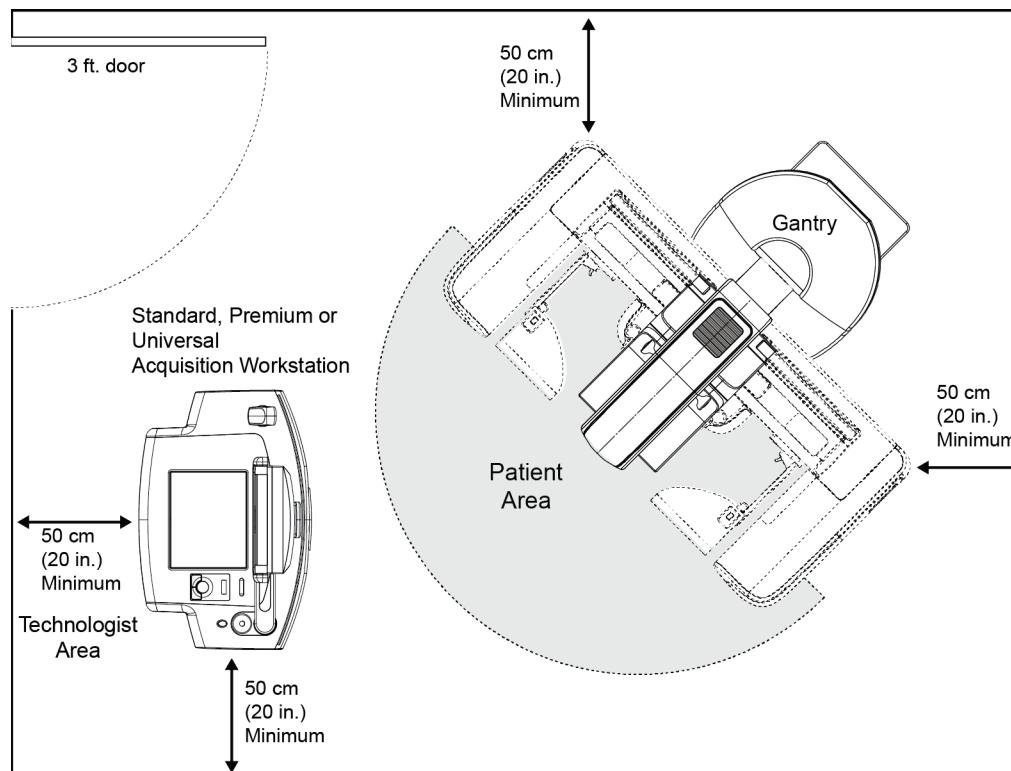


Figure 6: Exam room clearance zones

3.5 Gantry Installation

3.5.1 Fasten the Gantry



Note

If seismic events are a consideration, see the figure [Center of Gravity Reference](#) on page 360.



Caution:

Do not attempt to lift or move the Gantry by the C-arm or damage may occur.

1. Position the Gantry in the exam room in a location satisfactory to the technicians and the doctors. Ensure that the circuit breaker and rear panels are accessible.
2. Remove the Gantry top cover, side covers, and the front and rear Gantry covers to access the bolt holes. See the adjacent figure and the figure [Fasten the Gantry](#) on page 29.
 - a. Remove the two screws that fasten the Gantry top cover.
 - b. Remove the bolts located at the top of each Gantry side cover.
 - c. Slide the covers up, and use the inside hooks on the covers, and outer slots on the frame to support the covers while performing the next step.
 - d. Remove the screws that fasten the front cover, and remove the front cover by sliding it down from the retaining pins and forward.
 - e. Remove the four screws from the lower rear cover.
 - f. Remove the rear cover.

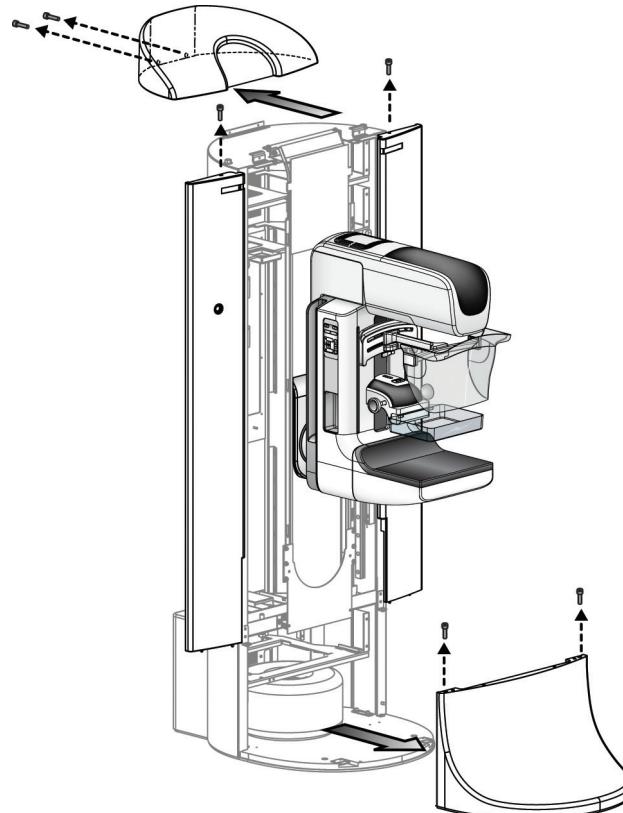


Figure 7: Removing the Front Cover

3. On the exam room floor, mark the four holes for the Gantry bolts.
4. Move the Gantry to allow access to the marks for hole drilling.
5. Drill the anchor holes and set the inserts.
6. Position the Gantry over the inserts and bolt it in place with 5/8 inch hardware in accordance with site specification drawings and/or local building codes.

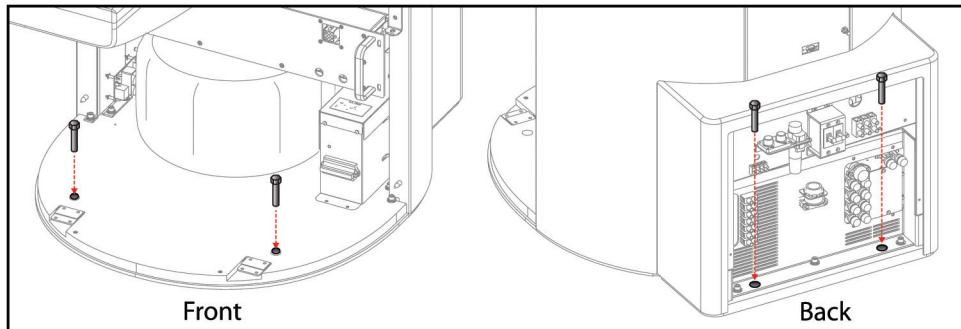


Figure 8: Fasten the Gantry

Note

You install the rear Gantry covers further in this chapter.

3.5.2 Configure the Isolation Transformer

The system ships configured for 240 VAC. You must configure the isolation transformer in the Gantry to match the power source at the site.

1. Before connecting the Gantry to a mains disconnect, verify the source voltage as follows:
 - a. Measure voltage at the terminal.
 - b. Ask about voltage fluctuations or voltage-related problems that have occurred in other equipment at the site.
2. After determining the input voltage range, verify that the isolation transformer is correctly set. See figure [Isolation Transformer Taps](#) on page 30.
 - a. Set the circuit breaker at the rear of the Gantry to Off.
 - b. Remove the Gantry's lower rear panel to access the input power terminal block.
 - c. Verify that the isolation transformer taps are wired to match the source voltage; if they don't match, configure the isolation transformer input wiring and taps.

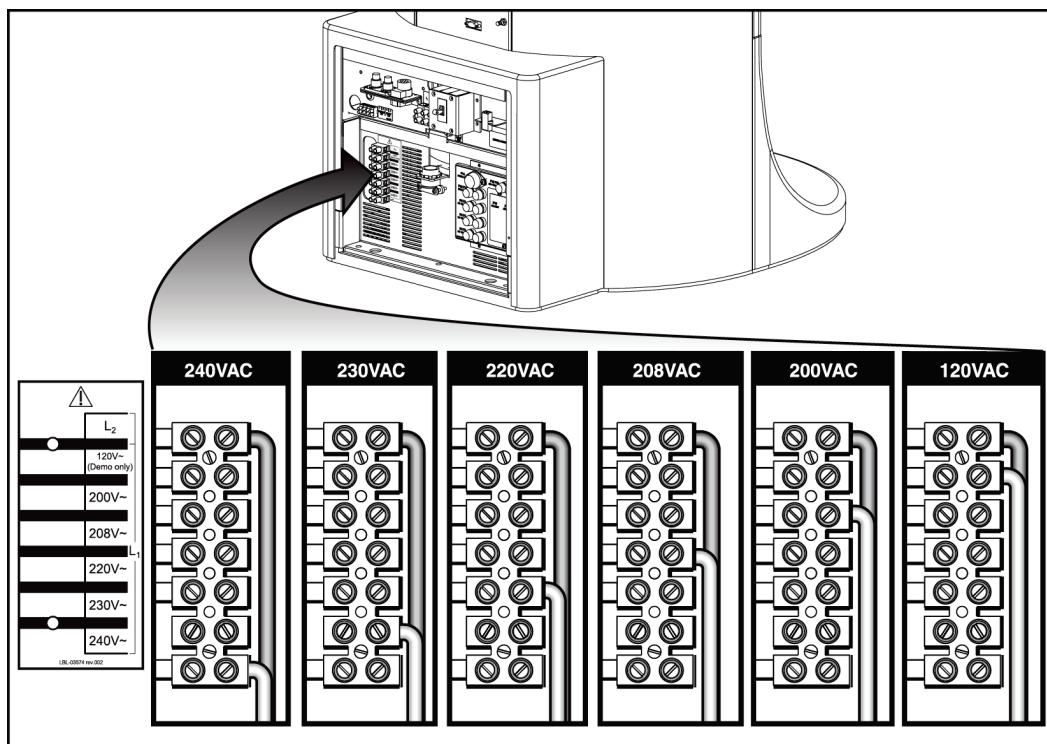


Figure 9: Isolation Transformer Taps



Caution:

120V Demo only is not for clinical use.

3.5.3 Input Power Configuration

Gantry to Acquisition Workstation Cable Connection

The Acquisition Workstation interconnect (item 4) and fiber optic cables (item 7) are connected to the Gantry connectors as shown in the figure [Gantry Connections](#) on page 32.

Gantry Power Cable Connection

1. Ensure that the circuit breaker is Off.
2. Remove the lower rear Gantry cover if not already removed. See the following figure.

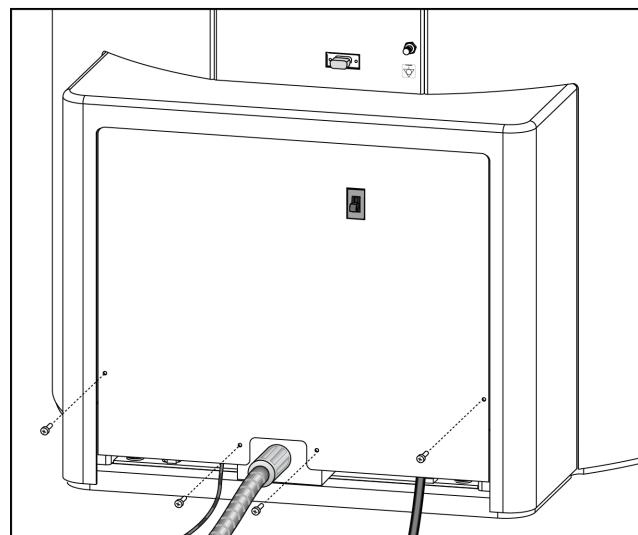


Figure 10: Remove Lower Rear Cover

3. Remove the hole plug from the input power cable bracket, and fasten the input power conduit to the bracket.
4. Route the conduit wires through the nylon cable clamp, and connect to the input power terminal block, as shown in the following figure.
5. Tighten the nylon clamp cap to secure the wires.
6. Have a certified electrician hard wire the opposite end of the input power conduit into the power source via a disconnect panel.

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Chapter 3: Installation and Configuration

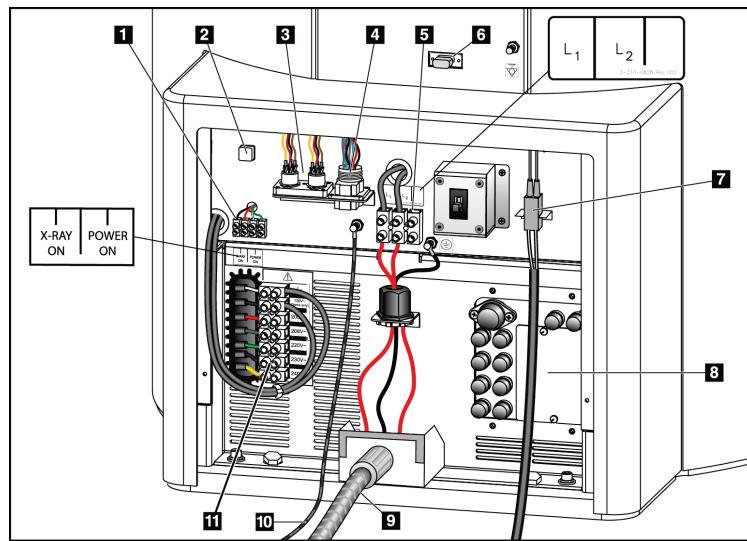


Figure 11: Gantry Connections

Figure Legend

1. Power On/X-ray On Terminal Block
2. On/Off Button (service use only)
3. Footswitch Connectors
4. Acquisition Workstation Interconnect
5. Input Power Terminal Block
6. Gantry Service Port (service use only)
7. Fiber Optic Connection
8. Fuse Panel
9. Input Power Conduit
10. Acquisition Workstation safety ground cable
11. Isolation Transformer Taps

3.5.4 Remote X-ray On/Power On Lamp Connection

The Selenia Dimensions system gives the user the ability to operate remote lights which indicate when the system is On and when x rays are being taken. These lights are normally installed outside the exam room, above the door. Installation should be done by a certified electrician. The relay contacts are rated:

- 10 A 250 VAC (normally open)
 - 10 A 30 VDC (normally open)
1. The connection points are available through the access panel at the rear of the Gantry, as shown in figure [Fasten the Gantry](#) on page 29 , item 1. Connections are made on the Power On/X-ray On terminal block.
 2. Install the remote Power On/X-ray On lights following local guidelines.
 3. Route the remote cables from the lights to the Gantry and connect each cable to the appropriate location on the Power On/X-ray On terminal block.

The Selenia Dimensions system also supports the option of turning on the X-ray On light during Boost and x ray, or just during x ray.

To turn on X-ray On light during Boost and x ray:

1. Go to CalTool
2. Click on 'Advanced'
3. Click on 'Virtual Switch'
4. Click on 'GCB'
5. Locate Soft switch number 18 and set to 1. (The default from the factory is 0.)

3.5.5 Install the Gantry Footswitch

The system permits attachment of two dual-function footswitches that plug into receptacles on the Gantry connector panel. See figure [Fasten the Gantry](#) on page 29, item 3.

1. Connect the footswitch to one of the footswitch receptacles by aligning the key to the keyhole and pushing the connector straight in.

Note

Either footswitch can be connected to either footswitch receptacle.

2. Position the footswitch in the desired location on the floor below the C-arm.
3. Repeat Steps 1 and 2 for the second footswitch.

Warning:

Position the footswitches to prevent accidental operation by a patient or wheelchair.

3.5.6 Remove the Grid Assembly Shipping Bracket

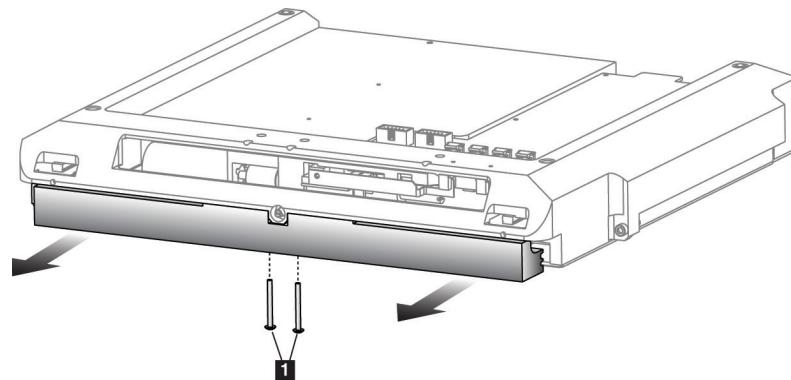


Figure 12: Remove the Grid Assembly Shipping Bracket

1. Remove the two screws—item 1.
2. Remove the bracket.

3.5.7 Install the Image Receptor and Breast Platform

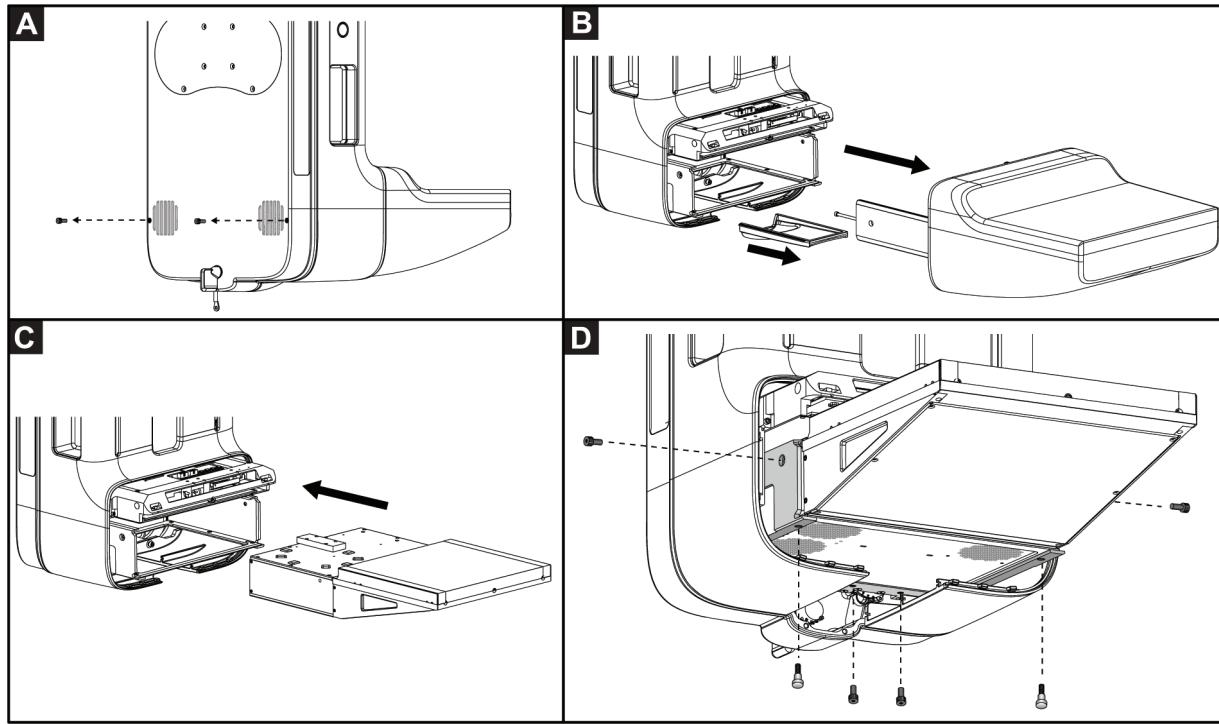


Figure 13: Install the Image Receptor

A and B—Remove the Breast Platform from the C-arm:

1. Remove the two hex-head screws located at the rear of the C-arm that fasten the Breast Platform. Save the hardware.
2. Slide the Breast Platform forward.
3. Slide the bottom detail insert located at the rear of the C-arm forward.

C—Install the Image Receptor:

1. Carefully remove the Image Receptor from its shipping carton.
2. Remove the protective cover from the mylar surface.
3. Remove the rubber cap at the rear.
4. Slide the Image Receptor into the Platform Mount Brackets until it is seated at the rear (do not force).

D—Fasten the Image Receptor (use the hardware shipped with the Image Receptor):

1. Use two hex-head screws in each side of the Platform Mount Brackets.
2. Use two hex-head screws at the bottom rear of the Image Receptor.
3. Use two shoulder-bolts at the bottom front of the Image Receptor.
4. Install the detail insert.
5. Slide the Breast Platform into the C-arm.
6. Fasten the Breast Platform with the previously removed hex-head screws (A).

3.5.8 Install and Adjust the Mag Stand

The Mag Stand must be adjusted for minimum lateral movement before installing:

1. Put the hooks of the Mag Stand into the C-arm slots, and check for lateral play.
2. Remove the Mag Stand, and adjust the Mag Stand right-side hex screw (at the bottom of the C-arm Interface hook) 1/4 to 1/8 turn at a time until there is minimum lateral movement in the mounted Mag Stand
3. Remove the Mag Stand, and repeat the adjustment as necessary.

3.6 Acquisition Workstation Installation

3.6.1 Universal Acquisition Workstation Installation

Mount the Workstation in Position

This section details setting up, positioning, and installing the Universal Acquisition Workstation in the exam room.



Warning:

The Universal Acquisition Workstation is front-heavy. Until the unit is bolted down, be careful when you move or work on the unit. Make sure that the front edge is supported.

1. Position the workstation in the exam room in the specified location.
2. Remove the front, back, and side covers. Remove the top cover (refer to [Remove the Covers and Panels](#) on page 210).
3. Remove the lower rear panel (kick plate) from its location behind the (removed) back cover. This provides access to the anchor bolt locations behind the kick plate. (See following figure.) We recommend that you use the two outer holes for the anchor bolts, if possible.

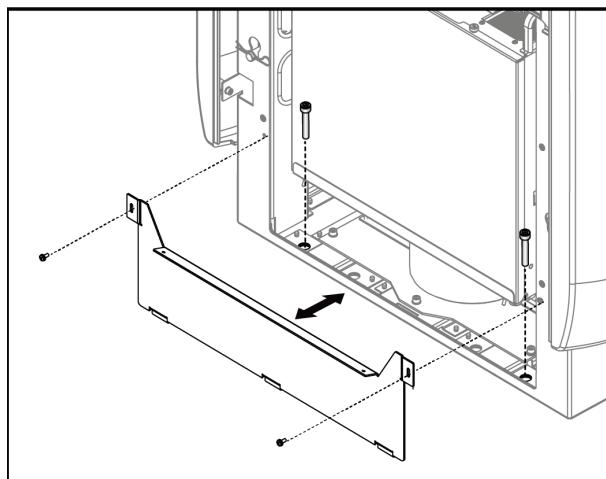


Figure 14: Removing the kick plate and accessing the anchor bolt locations

4. Mark the four anchor holes for the workstation, then move the workstation to access the marks.
5. Drill the anchor holes and set the inserts.
6. Position the workstation over the inserts and bolt it in place in accordance with site specification drawings and/or local building codes.



Note

You install the workstation covers further in this chapter.

Install the Control Monitor

The shipping box for the control/operator monitor is included inside the Universal Acquisition Workstation shipping container.

Note

 For easier access to the mounting plate or cable panel, tilt the monitor mount plate all the way back until it is resting at about a 45° angle, top-down, bottom-up. When finished, restore the mounted monitor to its proper position. You may have to loosen the nut on the side of the LCD pivot mount in order to tilt the monitor. If so, remember to re-tighten the nut after you restore the monitor to its proper position.

Tip

 If you are installing a monitor with a touch screen: The power cable-to-adapter cable connection can be made above or below the workstation tabletop (as allowed by cable slack through wireways). If below, use the motorized height adjust feature to lift the tabletop about eight inches or more to gain better working access underneath.

To install the control monitor:

1. Power OFF and unplug the UAWS system.
2. Attach the LCD pivot mount (see the following figure, item 1) to the top of the workstation tabletop using four screws.
3. Attach the monitor mounting plate (item 2) to the LCD pivot mount (item 1) using four screws.
4. Attach the control monitor (item 3) to the monitor mounting plate (item 2), using the four hand-tightened thumbnail screws.

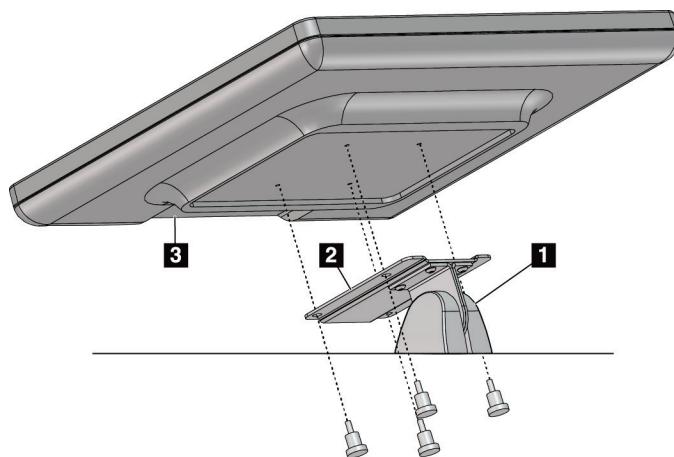


Figure 15: Attaching mount to tabletop, plate to mount, and monitor to plate



Note

- The control monitor is shipped with its VGA cable already threaded throughout its routing path inside the workstation by Manufacturing. Merely connect the VGA cable to the monitor. (Refer to step 5.)
- The control monitor is shipped with its 6.0 ft. power cable already threaded throughout its routing path inside the workstation by Manufacturing.
 - If the monitor being installed is a touch screen model, the field representative also installs an adapter cable (supplied in the kit), by connecting power cable to adapter cable and adapter cable to monitor. (Refer to step 6.)
 - If the monitor being installed is a non-touch screen model, no adapter cable is required. Merely connect the 6.0 ft. power cable directly to the monitor.

-
5. Connect the monitor-end of the VGA cable to the monitor.
 6. Connect the monitor-end of the power cable or adapter cable to the monitor as follows:

If the monitor being installed is a touch screen model:

- a. Connect the power cable (see the following figure, item 4) to the adapter cable (item 2). (See the connection at item 3.) Recall that the power cable is already threaded from the Uninterruptible Power Supply (UPS) up to the workstation tabletop by Manufacturing.
- b. Connect the adapter cable to the monitor. (See this connection at item 1.)

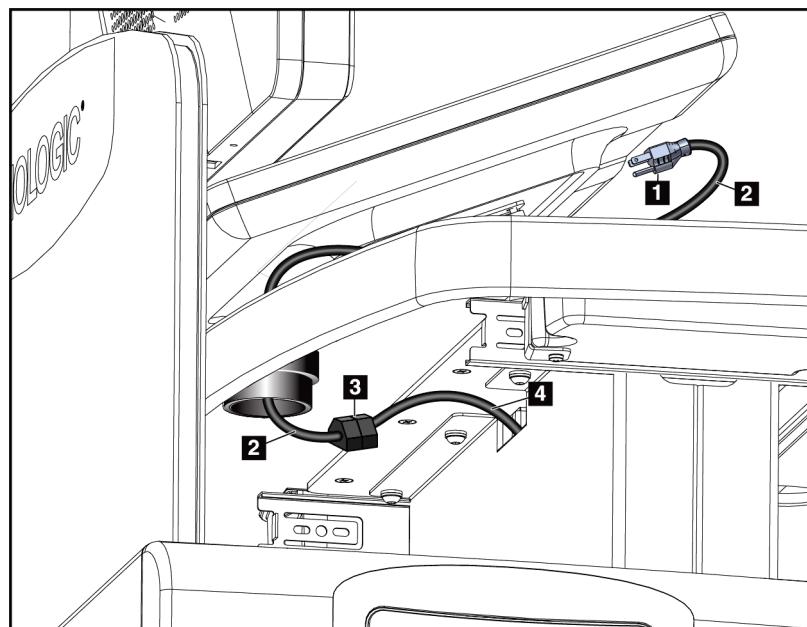


Figure 16: Connecting power cable to adapter cable, and adapter cable to monitor

If the monitor being installed is a non-touch screen model:

- Connect the power cable directly to the monitor. No adapter cable is required. (See the following figure.) Recall that the power cable is already threaded from the Uninterruptible Power Supply (UPS) up to the workstation tabletop by Manufacturing.

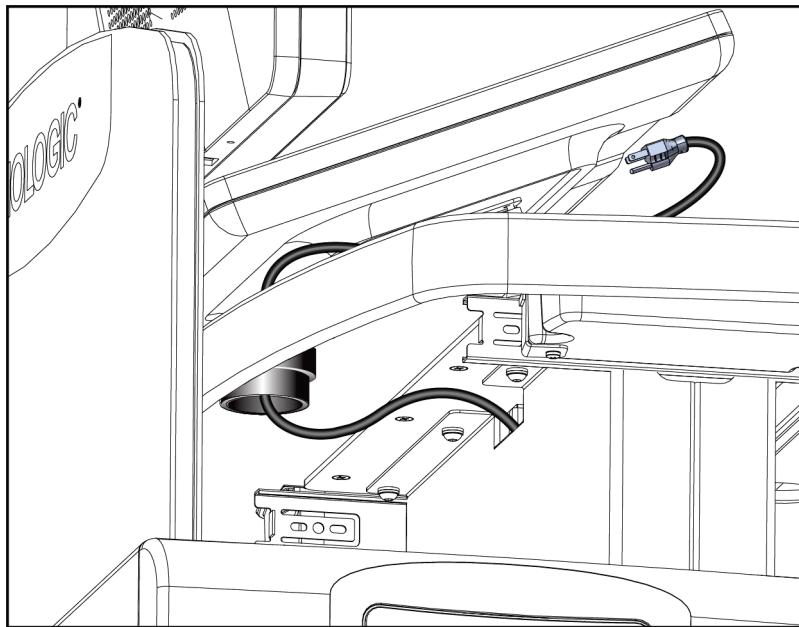


Figure 17: Connecting power cable directly to control monitor without need for adapter

7. If the control monitor being installed is a touch screen model, you must install the USB cable that was shipped with the monitor (otherwise, skip to the next numeric step):
 - a. Remove the covers (in the following order) to gain access inside the workstation. (Refer to Chapter 10: *Universal Acquisition Workstation Maintenance*—for illustrations and more information.)
 - front and rear covers
 - side covers
 - top cover
 - chassis support bracket (in front of front shroud)
 - front shroud
 - b. Plug in the USB cable to the monitor.
 - c. Route the USB cable down through the tabletop wireways.

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- d. Route the USB cable laterally underneath the tabletop through the rear shroud-to-front shroud wireways. (See the following figure.)
- e. Connect the USB cable to an available port on the USB hub. (See the following figure.)
- f. Reinstall the removed covers to the workstation.

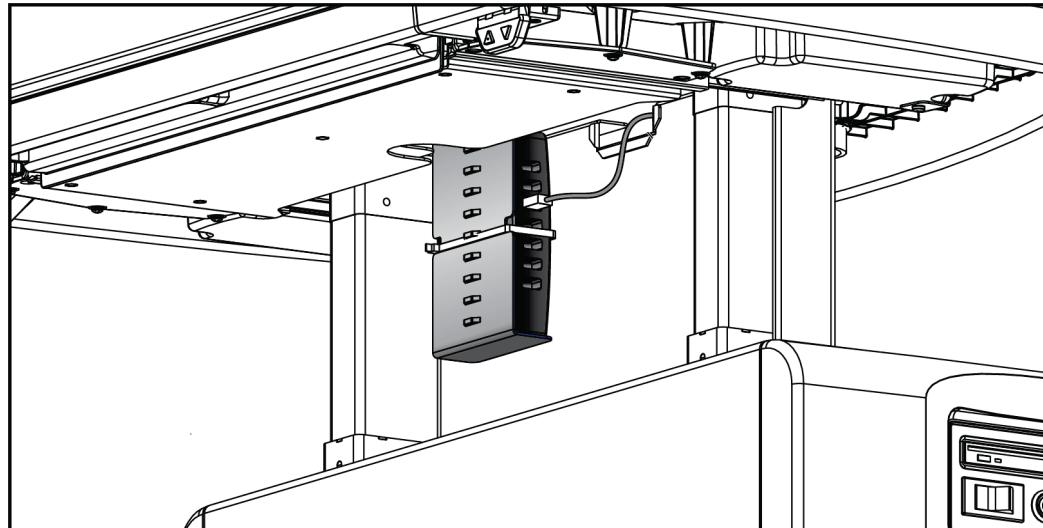


Figure 18: Connecting USB cable of control monitor to USB hub of workstation

8. Plug in and power ON the UAWS system.
9. If you are installing a touch screen monitor, calibrate the monitor by using the software utility built into the monitor drivers (otherwise, skip to the next numeric step):
 - a. From the desktop, navigate to the Windows Control Panel.
 - b. In the Control Panel, click the **elo Touchscreen** icon.
 - c. From the General tab, select **Align**.
 - d. Follow the on-screen prompts to calibrate the monitor
10. Verify proper operation of the control monitor.

Install the Preview Display Monitor

You can install the preview display monitor on either the left or right side of the Universal Acquisition Workstation.



Note

This procedure discusses the installation of the standard mount on the preview monitor. For other monitor mounts, refer to the kit instructions supplied with those mounts.

1. Make sure that the power is OFF and the system is unplugged. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. If not done already, remove the front, back, side, and top covers. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. Install the monitor post to the appropriate side (left or right) of the workstation. (See following figure.)

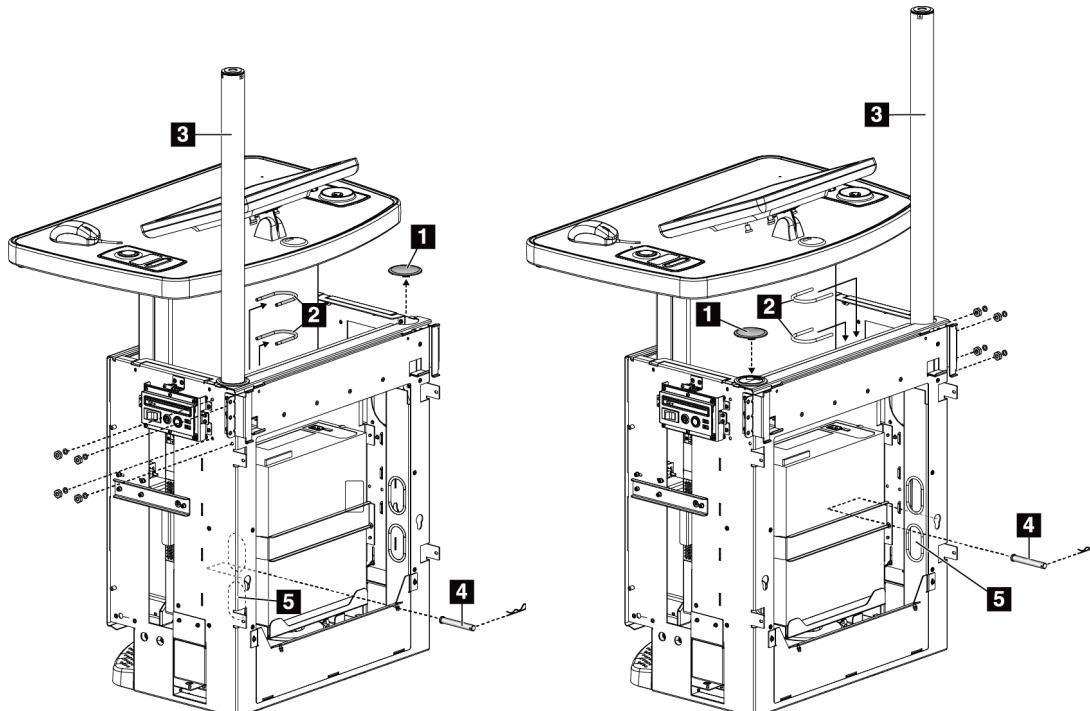


Figure 19: Installing the Preview Monitor Post on Either Side of Workstation

- a. Remove cap (item 1) from top cover on the side you are installing.
- b. Remove the pin bolt (item 4).
- c. Loosen the two U-bolts (item 2, using four screws) located near the top of the monitor post shaft.
- d. Slide the monitor post (item 3) out and move to proper side of workstation.
- e. Slide shaft and align slot in post with pin bolt hole in chassis. Insert pin bolt (item 4) to hold shaft in place.

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Chapter 3: Installation and Configuration

4. Rotate the monitor post so the notch on top (see following figure, item 1) is facing the operator side of the workstation. Tighten the two U-bolts to secure the monitor post.

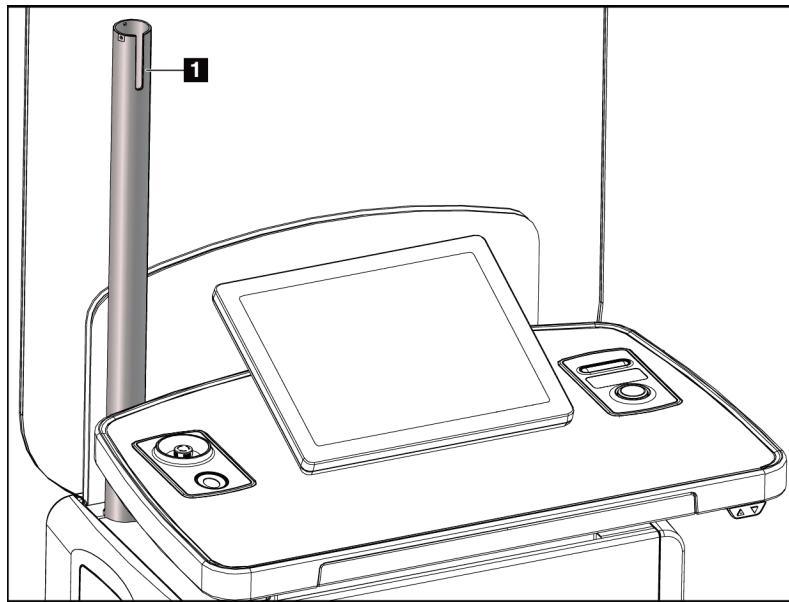


Figure 20: Notch on Monitor Post Facing the Operator

5. Thread the power and DVI cables through top of monitor post.
6. Pull the power and DVI cables out of the access opening of the monitor post (item 1 in following figure).

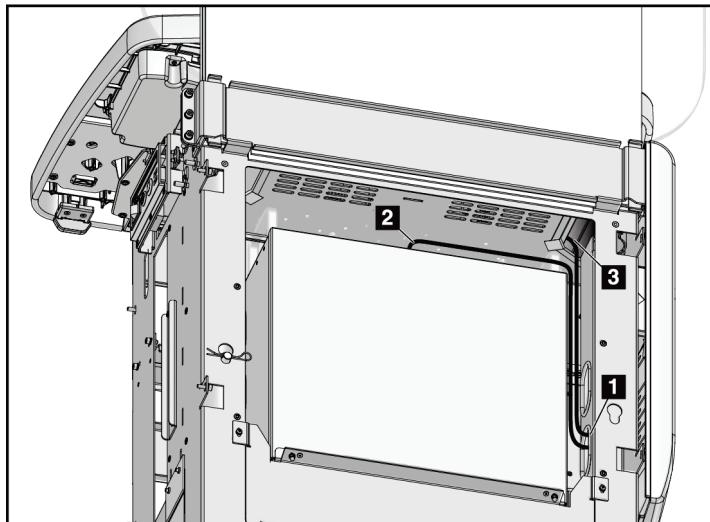


Figure 21: Routing of DVI and Power Cables for Preview Monitor
(left side mounting of post shown)

7. Route the DVI cable up the inside of the workstation and over the rear panel of the computer. (See the previous figure, item 2 that shows left side routing.) Connect to proper video output on computer rear panel. Use wire ties a necessary for proper cable management.
8. Route the monitor power cable up the inside of the workstation and through the access opening to the platform above the computer. (See the previous figure, item 3 that shows the left side access opening.)
9. Attach the monitor power supply to the platform above the computer, based on the type of monitor you are installing.
 - *3MP LED Display* - Mount the power supply on its bracket and use the strap (FAB-13242) supplied in the kit to hold down the power supply.
 - *Color monitor* - Mount the power supply on its bracket using power supply spacer (FAB-13362) and strap (FAB-13242) (supplied in the kit) to hold down the power supply.
10. Route the AC cable coming from the power supply through the access hole in the platform above the computer to the UPS underneath. Connect the AC cord to the appropriate outlet on the UPS. Use wire ties a necessary for proper cable management.
11. Place the standard mounting arm on the monitor post and tighten with three setscrews on post.
12. Attach new monitor to the monitor bracket (item 2 in following figure).

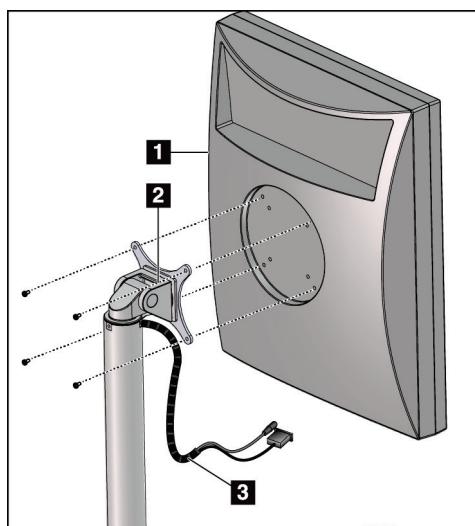


Figure 22: Installing Display Monitor on Standard Arm

13. Connect the DVI and power cables (item 3 in previous figure) to the preview monitor.
14. After the workstation installation is complete, configure the preview monitor using the appropriate programs from the control monitor. If you are installing the Barco Color Monitor MDNC-3321 (Hologic CMP-01404), verify the setup settings for the new monitor. Refer to the following section in this manual Verify Settings of Barco MDNC-3321 Preview Display Monitor.

Input Power Configuration

The isolation transformer within the workstation must be configured to 100, 120, 200, 208, 220, 230, or 240 VAC. After determining the correct VAC for the site, verify that the isolation transformer of the workstation is correctly set. Reconfigure the taps to match site power requirements as required.

1. Verify that the isolation transformer taps are wired to the site voltage requirements. If they are not, configure the isolation transformer input wiring and taps whose location is shown in the following figure (item 1).

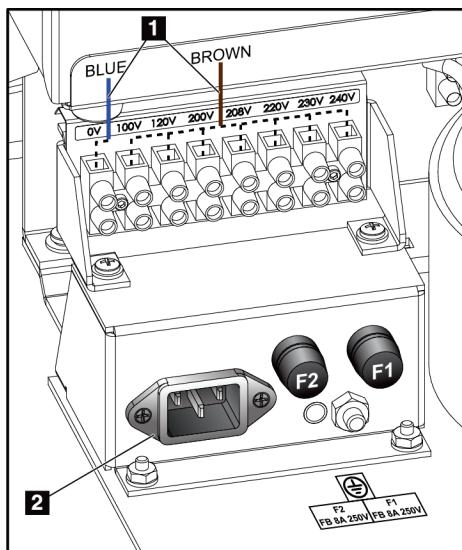


Figure 23: AC Input Power Configuration (example only)

2. Verify that the circuit breaker CB1 rating is as follows: CB1 = 8.0 A 120/240V
3. Verify fuse F1 and F2 ratings: F1 = 8.0 A 250V, F2 = 8.0 A 250V
4. Connect the appropriate workstation power cord to the AC input (see previous figure, item 2).

Install the Radiation Shield



Warning:

Use gloves and eye protection when handling the X-ray Shield.



Warning:

Do not handle or position the Radiation Shield alone. Two people are required to handle and position the tempered glass shield to minimize stress to the shield.



Caution:

The X-Ray Shield is made of tempered glass and is fragile. Use extreme care when handling and installing the shield.



Caution:

Inspect the X-ray Shield before and after installation. Small imperfections embedded in the glass are acceptable. Do not install the shield if cracks or chips are visible.



Caution:

Use care when cleaning the X-ray Shield to avoid excessive force and movement of the shield.

Refer to the following figure to install the radiation shield:

1. Lift the radiation shield (item A) carefully and place it on the shield supports behind the right and left slots (item B) of the metal bracket.
2. Place the shield reinforcement plates (item C) on either side of the radiation shield (item A) and tighten screws (item D) on both sides of metal bracket.

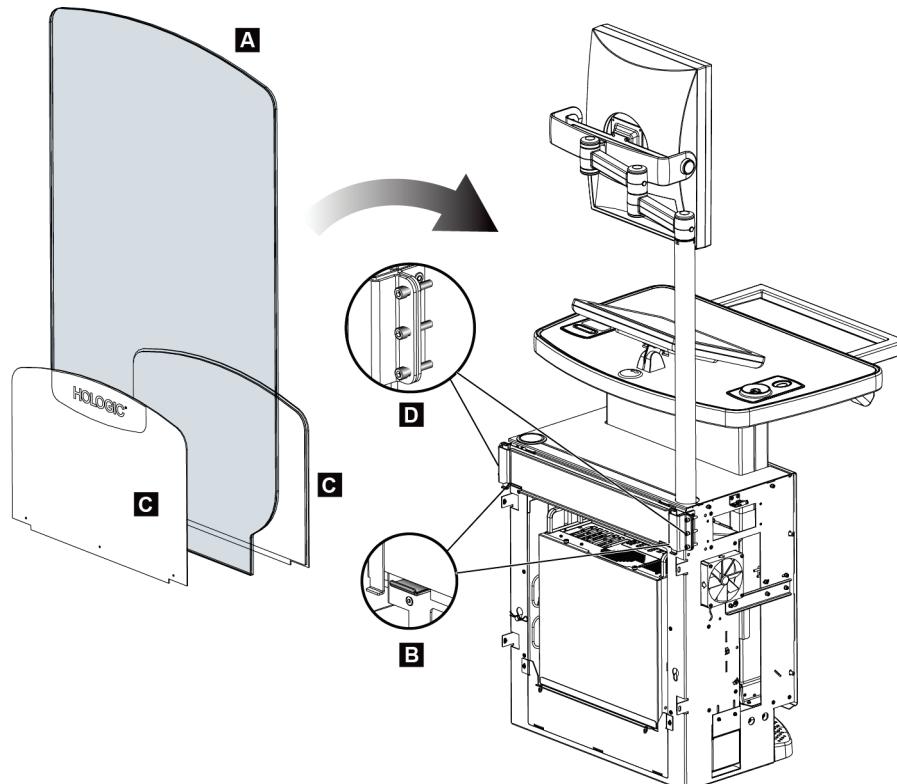


Figure 24: Radiation Shield Installation

Install the Acquisition Workstation Cables

A straight-through cable is used for the Universal Acquisition Workstation interconnect. Either end is connected to the workstation or the Gantry.

To install the Universal Acquisition Workstation cables:

1. Make sure the power is OFF and the system is unplugged. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. If not done already, remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. Route the cables from the Gantry to the workstation through either the right or left bottom slots found on the sides of the workstation frame.
4. Loosen the screws of the covers in their slots.
5. Lift the covers and route the cables through the related slot.
6. Put the covers on the wires and tighten the screws.
7. Route the cables to the front of the workstation.
8. Connect the cables to the Gantry cable interface on the power distribution assembly on bottom of the chassis. (See the following figure.)

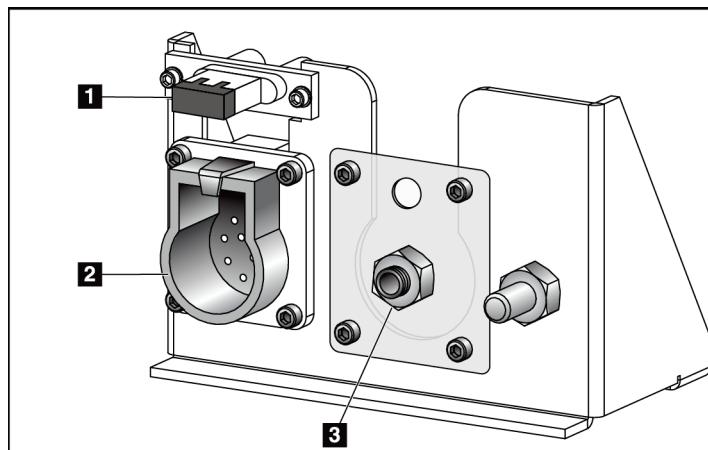


Figure 25: Gantry Cable Interface

Figure Legend

1. Fiber optic cable pair to Gantry
2. Interconnect cable to Gantry
3. Remote X-ray Button (optional)

Install X-ray Activation Footswitch Assembly

To install the X-Ray Activation Footswitch Assembly for the Universal Acquisition Workstation:

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. If not done already, remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. Unfasten the four screws (two at each end) of the lower front panel (kick plate) and remove the panel. Retain the screws. (See the following figure.)

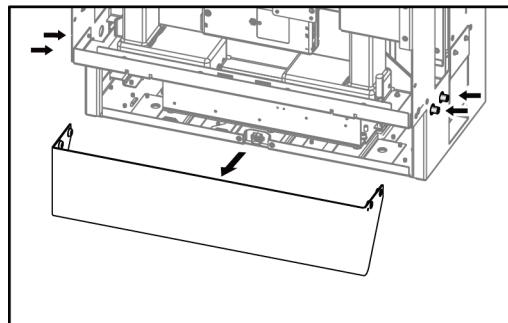


Figure 26: Removing original factory-installed Lower Front Panel (kick plate)

4. Install the x-ray activation footswitch assembly:
 - a. Attach the new lower front panel kick plate (which is part of the x-ray activation footswitch assembly) by sliding it into place. (See the following figure.)
 - b. With the assembly now attached to the base of the workstation, secure it by tightening the same screws loosened in the previous step.

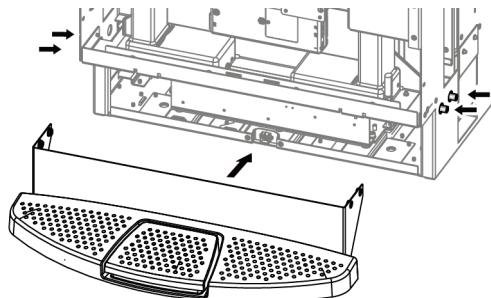


Figure 27: Installing x-ray footswitch assembly
(which includes new lower front panel kick plate)



Note

The wiring connection is made via bulkhead connectors between the footswitch and the workstation with no separate cabling/harnesses used.

See the previous figure. The center arrow points to where the footswitch connector connects with the workstation mating connector.



Tip

If there is not enough space to slide the x-ray footswitch assembly into place, loosen the Universal Acquisition Workstation mounting bolts from the floor. If necessary, tilt the front of the workstation up slightly to slide the x-ray footswitch assembly into place.

5. Verify that the footswitch is installed and connected properly:
 - a. On the I/O Interface Board, locate JP5. (See the following figure.)
 - b. Using a digital multimeter (DMM), measure resistance between JP5 Pin-2 and JP5 Pin-4 on the I/O Interface Board.
 - c. If the footswitch is installed and connected properly:
 - When the footswitch is depressed, your resistance measurement indicates a closed connection.
 - When the footswitch is NOT depressed, your resistance measurement indicates an open connection.
6. Set the jumpers for the proper footswitch operation (parallel or series) that the customer requires. (Refer to the following figure and legend.)

Figure Legend

A - For parallel operation (the operator uses *either* the footswitch or the x-ray button on the tabletop to activate an x-ray image):

- Put jumpers on pins 1-2 and 3-4. (See the adjacent figure, item A.)

B - For series operation (the operator uses *both* the footswitch *and* the x-ray button on the tabletop to activate an x-ray image):

- Verify (or put) jumpers on pins 5-6 and 2-3. (See the adjacent figure, item B.)

NOTE:

- Parallel operation is the default setting for all shipped UAWS systems.
- Series operation is the default setting for AWS.

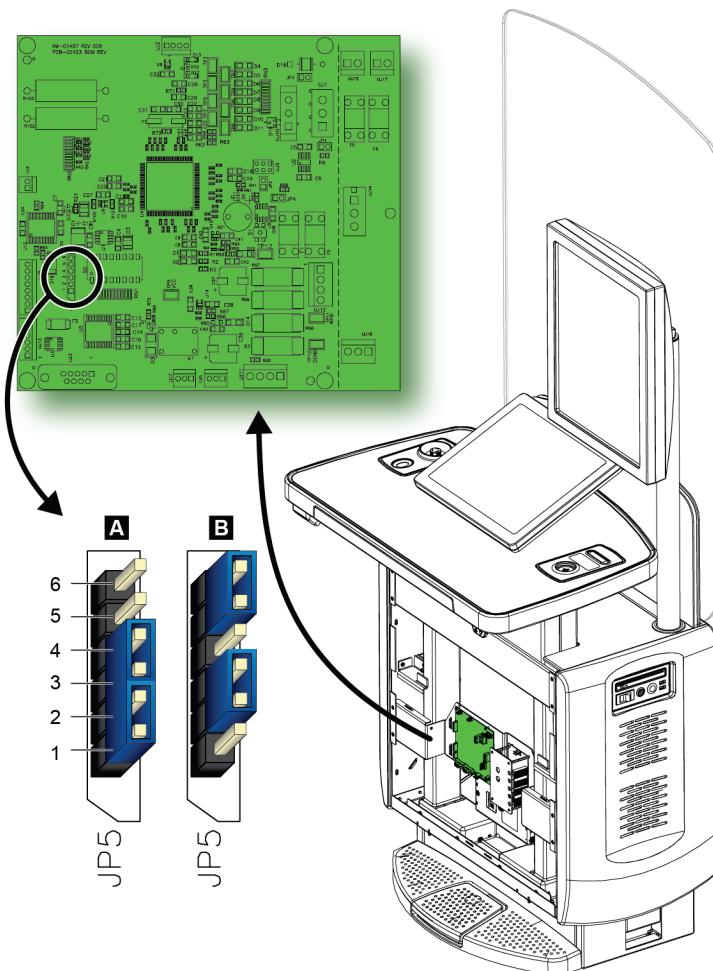


Figure 28: Setting the jumpers on the UAWS I/O Board

7. Reinstall the side, rear, and front covers.
8. Plug in and power ON the system.
9. Verify proper operation of the x-ray activation footswitch and the x-ray activation button on the tabletop.
10. Reinstall the side, rear, and front covers.
11. Plug in and power ON the system.
12. Verify proper operation of the x-ray activation footswitch and the x-ray activation button on the tabletop.

3.6.2 Premium Acquisition Workstation Installation

Mount the Premium Acquisition Workstation in Position

This Section details setting up, positioning, and installing the Premium Acquisition Workstation in the exam room.

1. Position the Acquisition Workstation in the exam room in the specified location.
2. Remove the two socket head screws and flat washers on the rear cover.
3. Slide the front cover off.
4. From the front, remove the four 3/16 inch socket head screws located at the inside corners of the frame. See the following figure.

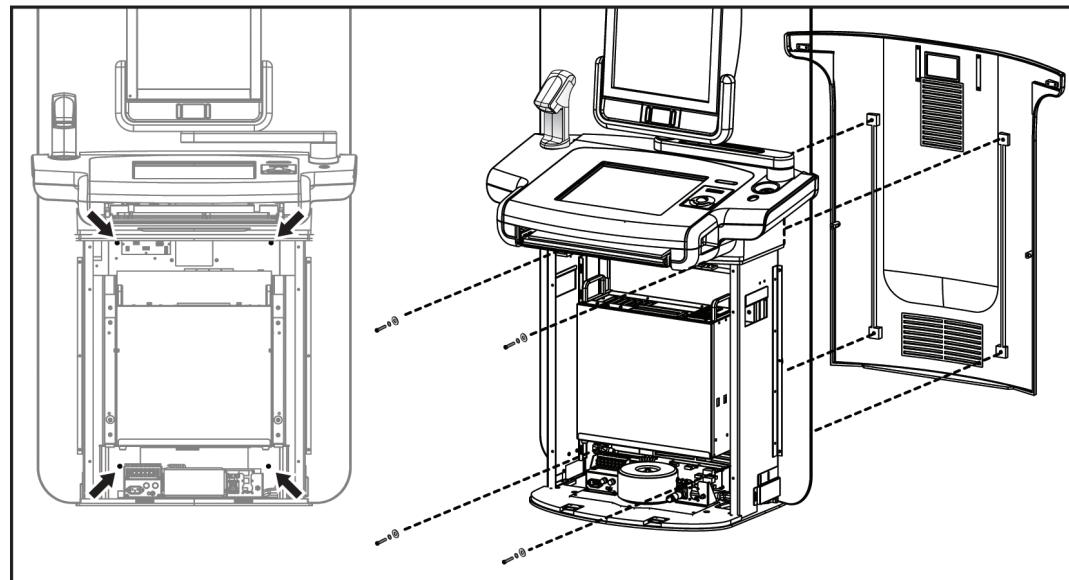


Figure 29: Remove the Rear Cover

5. Gently pull the top of the rear cover away from the nylon rotary catches at the top of the Acquisition Workstation, and remove rear cover.
6. Mark the four anchor holes for the Acquisition Workstation, then move the workstation to access the marks. See the following figure.
7. Drill the anchor holes and set the inserts.

8. Position the Acquisition Workstation over the inserts and bolt it in place with 3/8 inch hardware in accordance with site specification drawings and/or local building codes.

**Note**

You install the Acquisition Workstation covers further in this chapter

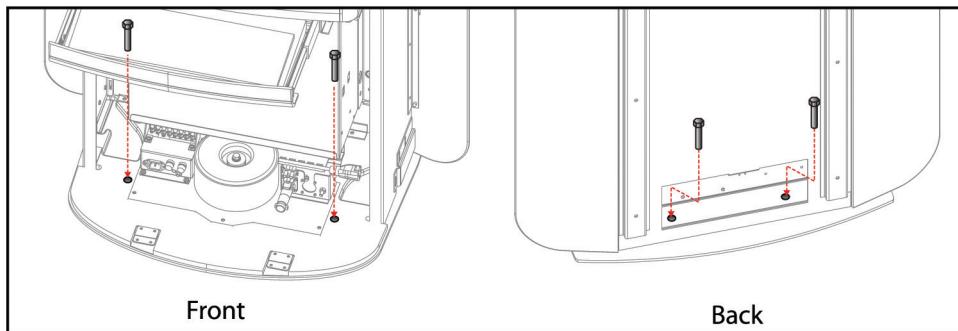


Figure 30: Fasten the Premium Acquisition Workstation

Install the Preview Display—Standard Configuration

In the standard configuration, the Display Arm is installed on the right side and the Bar Code Scanner is installed on the left side of the Acquisition Workstation. Optionally, the Display Arm is installed on the left side, and the Bar Code Scanner is installed on the right side.

Refer to [*Install the Preview Display—Optional Configuration*](#) on page 53.

1. Insert the display mount post into the post mount on the Display Arm and tighten the set-screw. See the inset in the following figure.
2. Remove the access panel at the rear of the display, and attach the DVI and power cables.
3. Fasten the cables under the cable retainer.
4. Connect the Touchpad cable from the Display Arm to the Touchpad cable from the Preview Display, and fasten with a cable tie.
5. If you are installing the Barco Color Monitor MDNC-3321 (Hologic CMP-01404), verify the setup settings for the new monitor. Refer to the following section in this manual Barco Monitor Setup and Installation.

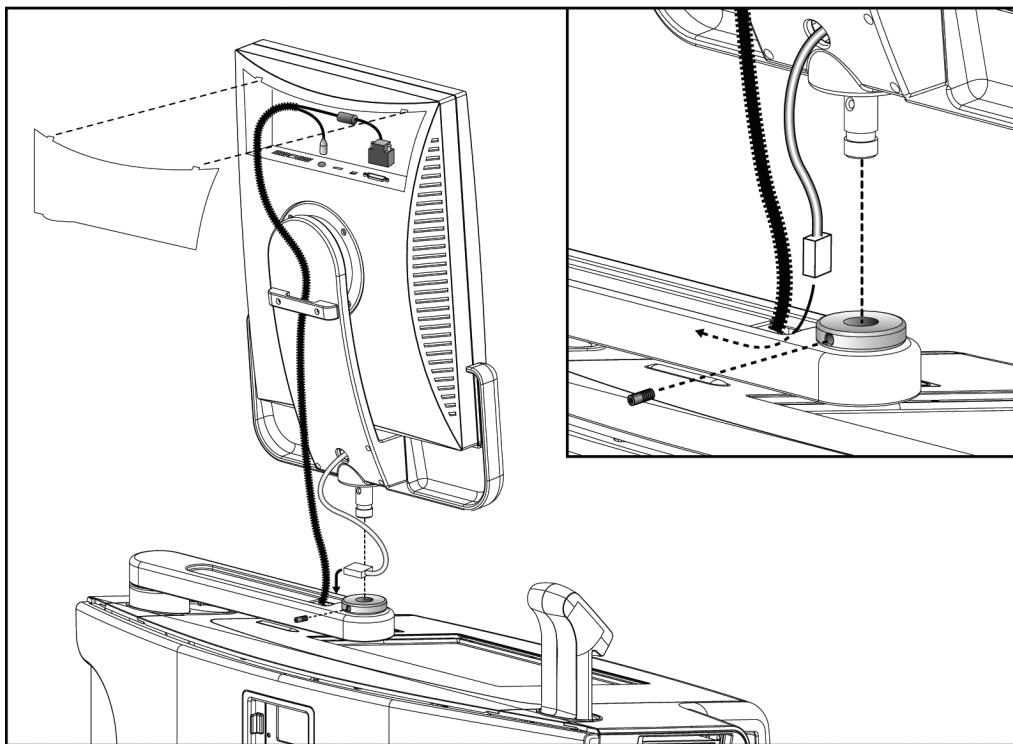


Figure 31: *Install the Preview Display—Standard Configuration*

Install the Preview Display—Optional Configuration

1. Remove the Bar Code Scanner. See [Bar Code Scanner \(Optional\)](#) on page 63.
2. Cut the associated Preview Display cable ties leading to the computer. *Do not remove the cable ties at the bottom of the Display Arm.*
3. Note the cable locations and remove the Preview Display cables at the computer and the Preview Display Power Module.
4. Remove the six hex screws fastening the Display Arm to the chassis.
5. Route the Preview Display cables through the access hole at the left side of the chassis.
6. Reattach the Display Arm on the left side of the Acquisition Workstation being sure the arm rotation stopper screw is facing to the right. See the following figure.

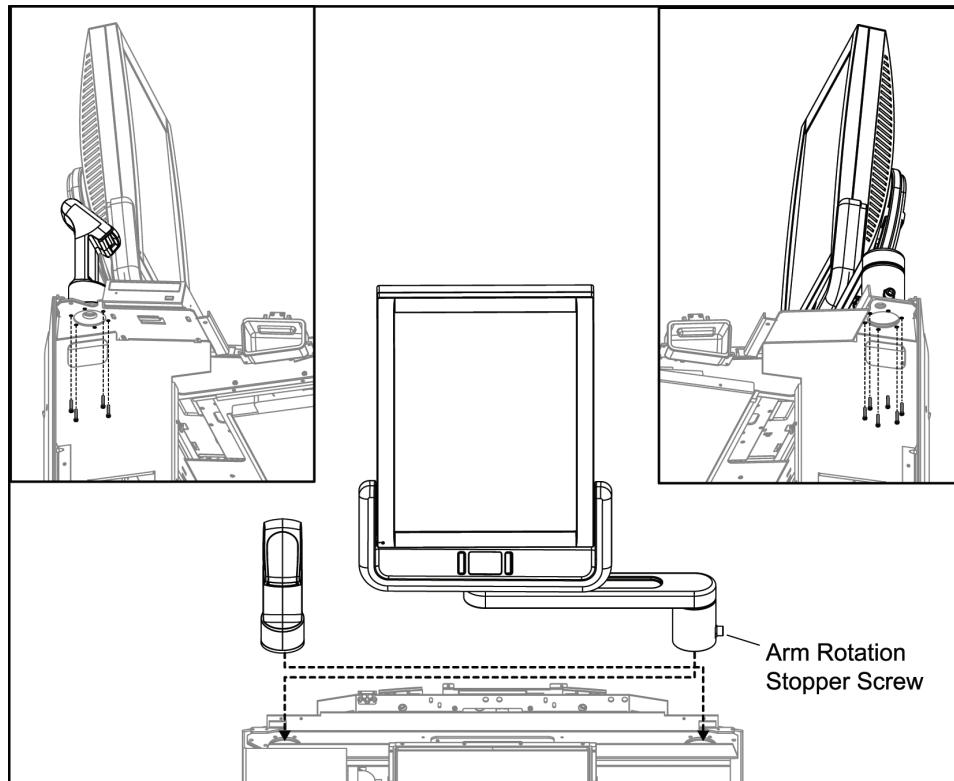


Figure 32: Install the Preview Display—Optional Configuration

7. Connect the Preview Display cables to the computer and to the Preview Display Power Module.
8. Route and cable tie as necessary.
9. Attach the Bar Code Scanner to the right side of the Acquisition Workstation and connect the cable to the computer.
10. Route and cable tie as necessary.
11. Install the Preview Display.

Input Power Configuration

The isolation transformer within the Acquisition Workstation must be configured to 100, 120, 200, 208, 220, 230, or 240 VAC. After determining the correct VAC for the site, verify the Acquisition Workstation's isolation transformer is correctly set. Reconfigure the taps to match site power requirements as required.

1. Verify the isolation transformer taps are wired to the site voltage requirements. If they are not, configure the isolation transformer input wiring and taps as shown in the following figure.
2. Verify circuit breaker CB1 ratings is as follows:
CB1 = 8.0 A 120/240V
3. Verify fuse F1 and F2 ratings: F1 = 8.0 A 250V, F2 = 8.0 A 250V

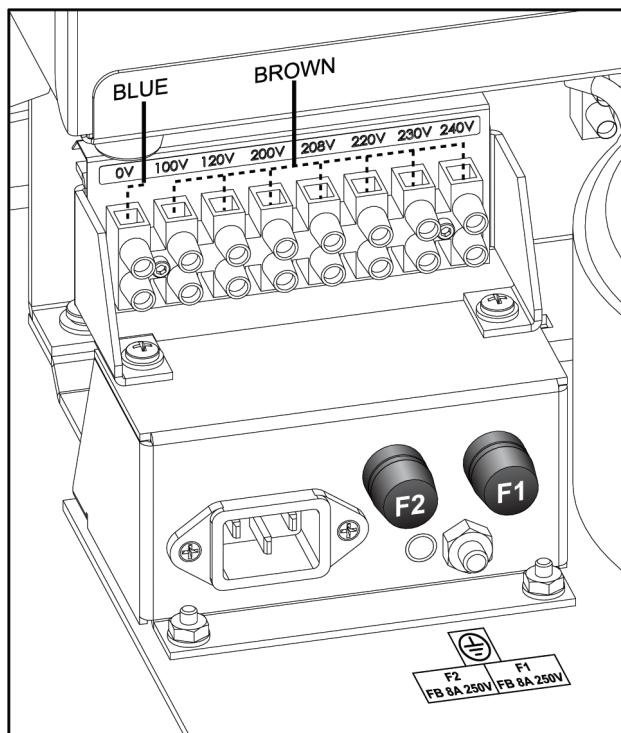


Figure 33: Input Power Configuration—Acquisition Workstation

Install the Radiation Shields

**Warning:**

Use gloves and eye protection when handling the X-ray Shield.

**Warning:**

Do not handle or position the Radiation Shield alone. Two people are required to handle and position the tempered glass shield to minimize stress to the shield.

**Caution:**

The X-Ray Shield is made of tempered glass and is fragile. Use extreme care when handling and installing the shield.

**Caution:**

Inspect the X-ray Shield before and after installation. Small imperfections embedded in the glass are acceptable. Do not install the shield if cracks or chips are visible.

**Caution:**

Use care when cleaning the X-ray Shield to avoid excessive force and movement of the shield.

1. Lift the upper radiation shield and place it on the support shelf on top of the right and left cork shield supports (item 1 in the following figure). The remaining steps refer to items in that same figure.

Old Style Upper Shield Install

- a. Slide the supplied shield bushings into the holes of the glass.
- b. Place the shield mounting plates (item 2A) on each side of the shield as shown in the exploded view.
- c. Align the holes in the shield and plates with the threaded holes in the Acquisition Workstation rear frame.
- d. Use the four supplied shield screws (thumbscrews) and wave spring washers to fasten the shield to the frame. Use minimum force.

New Style Upper Shield Install

- a. Place the shield mounting plates (item 2B) on each side of the shield as shown in the exploded view.
- b. Align the holes in the shield and plates with the threaded holes in the Acquisition Workstation rear frame.
- c. Use the four supplied shield shoulder screws to fasten the shield to the frame. Screw in all the way.

Position a lower radiation shield on the lower shield protector (item 3) and against the three (on each side of the frame) round glass protectors (item 4).

Slide the supplied shield bushings into the holes of the glass.

Use the supplied round glass protectors, shield screws, and wave spring washers to fasten the shield to the frame. Use minimum force.

Repeat for the other side.

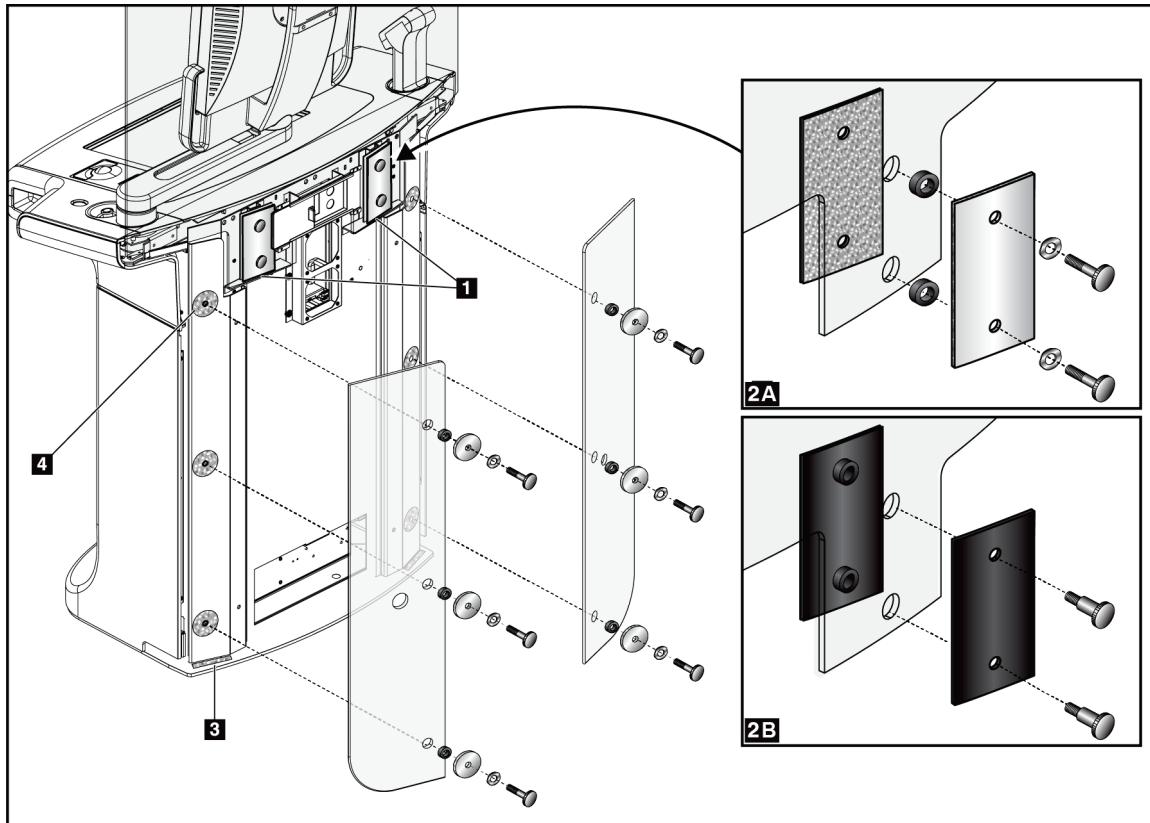


Figure 34: Radiation Shield Installation

Install the Acquisition Workstation Cables

A straight-through cable is used for the Acquisition Workstation interconnect. Either end is connected to the Acquisition Workstation or the Gantry. The cables to the Acquisition Workstation are routed from the Gantry through either the right or left bottom slots found on the sides of the Acquisition Workstation frame—*the screws on the covers are loosened in their slots, the covers are lifted, and the cables routed through the related slot. The covers are put on the wires and the screws tightened.* The cables are then routed to the front of the Acquisition Workstation and connected. See the following figure.

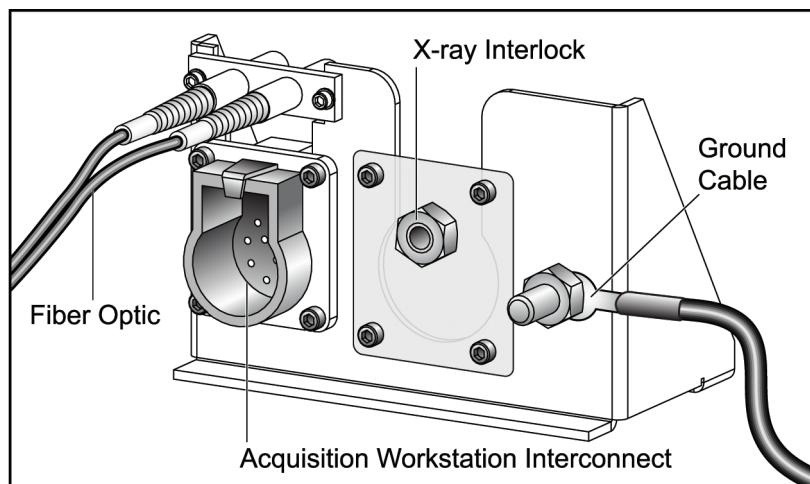


Figure 35: Acquisition Workstation Cable Connections

The ground cable is connected to the stud at the Gantry as shown in figure [Gantry Connections](#) on page 32, and then to the Acquisition Workstation as shown in the previous figure.

The X-ray Interlock connector at the rear of the Gantry provides a normally closed (NC) contact (5V 10mA) for the Acquisition Workstation. When an external interlock is used (for example a door or shield switch), a contact opens and an exposure cannot take place. A switch closure on the contact must occur for an exposure to occur.

Note

If the X-ray Interlock is utilized, the state of the interlock contacts should be displayed by visual means to the operator per IEC 60601-2-45:2011 (3rd Edition), Clause 203.6.2.1.101.



3.6.3 Standard Acquisition Workstation Installation

Mount the Standard Acquisition Workstation in Position

This section details setting up, positioning, and installing the Standard Acquisition Workstation in the exam room.

1. Position the Acquisition Workstation in the exam room in the specified location.
2. Loosen the two bottom screws securing the rear cover to the rear of the Acquisition Workstation.
3. Slide the rear cover up to free the hooks from the slots in the rear of the frame.
4. Set the cover aside.
5. Mark the four holes of the Acquisition Workstation with a marker and move the unit back to access the marks. See the following figure.
6. Drill the anchor holes and set the inserts.
7. Fasten the Acquisition Workstation to the floor using the required anchor bolts and washers in accordance with site specification drawings and/or local building codes.

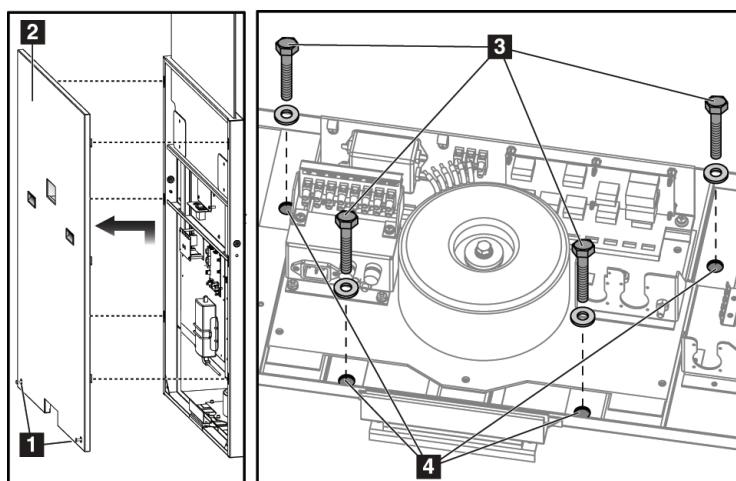


Figure 36: Rear Cover Removal/Mounting the Standard Acquisition Workstation

Figure Legend

1. Rear Cover Screws
2. Rear Cover
3. Anchor Bolts and Washers
4. Mounting Holes

Install the Components

The following items are installed in the Acquisition Workstation:

- Computer
- UPS (optional)
- Control Display
- Keyboard
- Mouse

The following items are shipped in cartons, then installed on the Acquisition Workstation:

- Preview (Image) Display with pedestal/base.
- Bar Code Scanner (optional)
- X-ray Shield

Install the Preview Display



Note

Your Preview Display may appear different from the Preview Displays shown in this manual, but the function is identical.

1. Remove the display with attached pedestal from the shipping carton.
2. Position the display at the right or left-hand side of the Acquisition Workstation.
3. Remove the rear cover from the top of the display to provide access to the connectors. See the following figure.
4. Remove the display's pedestal cover by pressing the two bottom latches and lifting the cover up and off.
5. Route the DVI cable from the computer through the pedestal, to the DVI port of the display.
6. Route the display power supply output cable through the pedestal to the power supply input connector of the display.
7. Position the cables in the pedestal, and secure them in the pedestal clips.
8. Remove the red pin (item 1), set the height of the pedestal, then insert the pin.
9. Install the pedestal and rear cover.

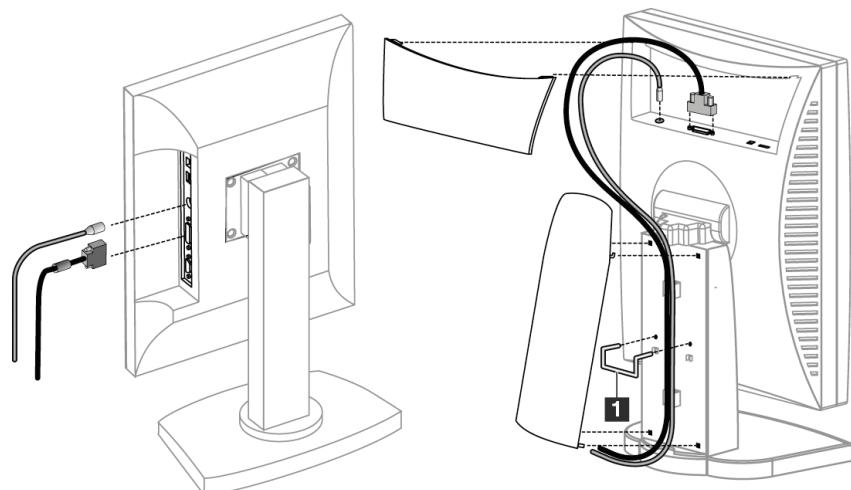


Figure 37: Preview Display Cable Routing

Install the Radiation Shield



Warning:

Use gloves and eye protection when handling the X-ray Shield.



Warning:

Do not handle or position the Radiation Shield alone. Two people are required to handle and position the tempered glass shield to minimize stress to the shield.



Caution:

The X-Ray Shield is made of tempered glass and is fragile. Use extreme care when handling and installing the shield.



Caution:

Inspect the X-ray Shield before and after installation. Small imperfections embedded in the glass are acceptable. Do not install the shield if cracks or chips are visible.



Caution:

Use care when cleaning the X-ray Shield to avoid excessive force and movement of the shield.

1. Lift the radiation shield and place it on the support shelf.
2. Attach the shield to the front shield support, with the logo facing the front of the Acquisition Workstation.
3. Align the holes in the shield with the threaded holes in the Acquisition Workstation rear frame.
4. Position the two protective plates over the shield mounting holes.
5. Fasten the plates and the shield to the Acquisition Workstation rear frame using the four supplied bolts and lock washers.
6. Tighten the bolts just enough to compress the lock washers.

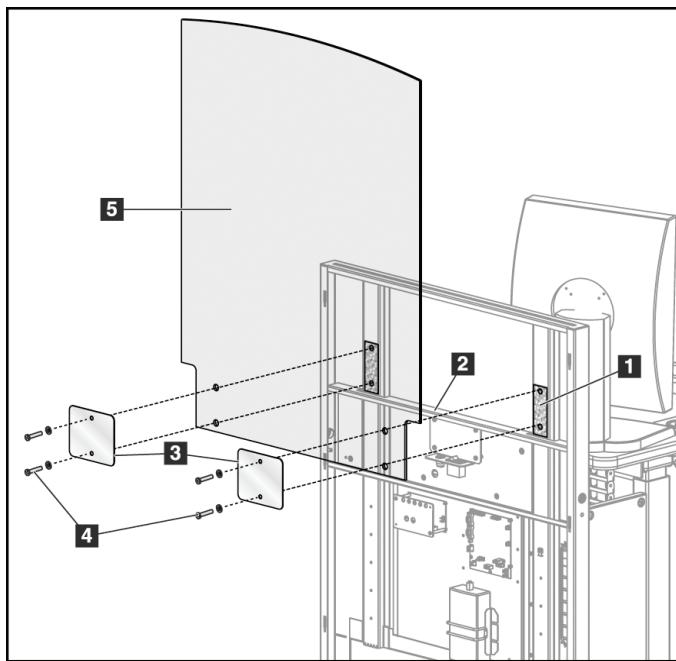


Figure 38: Install the Radiation Shield

Figure Legend

1. Front Shield Support (2) (part of the Standard Acquisition Workstation frame)
2. Support Shelf
3. Protective Plate (2)
4. Bolts and Lock Washers (4)
5. Radiation Shield

Install the Acquisition Workstation/Gantry Cables

See figure [Gantry Connections](#) on page 32 and figure [Input Power Configuration – Acquisition Workstation](#) on page 54 for power connections between the Acquisition Workstation and the Gantry.

Install the Fiber Optic/Network Cables

The fiber optic cable (item 1 in the following figure) is connected between the Gantry and the Acquisition Workstation computer. The network cable (item 2 in the following figure) is connected between the site network and the Acquisition Workstation computer.

1. Route the cables to the network and fiber optic connectors on the Acquisition Workstation Power Distribution Assembly as shown in the following figure.
2. All Acquisition Workstation cabling exits from the cutouts on the bottom of either side covers.

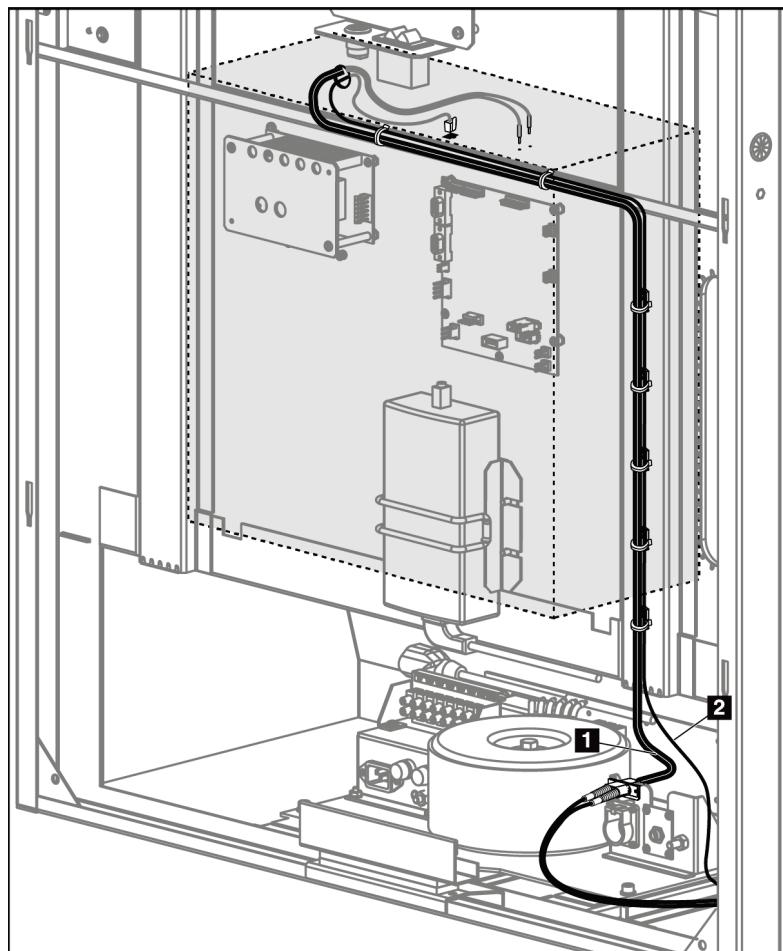


Figure 39: Fiber Optic (1) and Network (2) Cabling, Standard Acquisition Workstation

3.6.4 Bar Code Scanner (Optional)

Install the Bar Code Scanner Holder and Bracket

1. Locate the bar code scanner holder and two piece bracket in the accessory carton.
2. Determine left or right side mounting, and adjust the two piece bracket and holder as shown in the following figure.
3. Attach the bracket to the bottom of the table using three screws.
4. Attach the holder to the bracket using the two supplied screws.

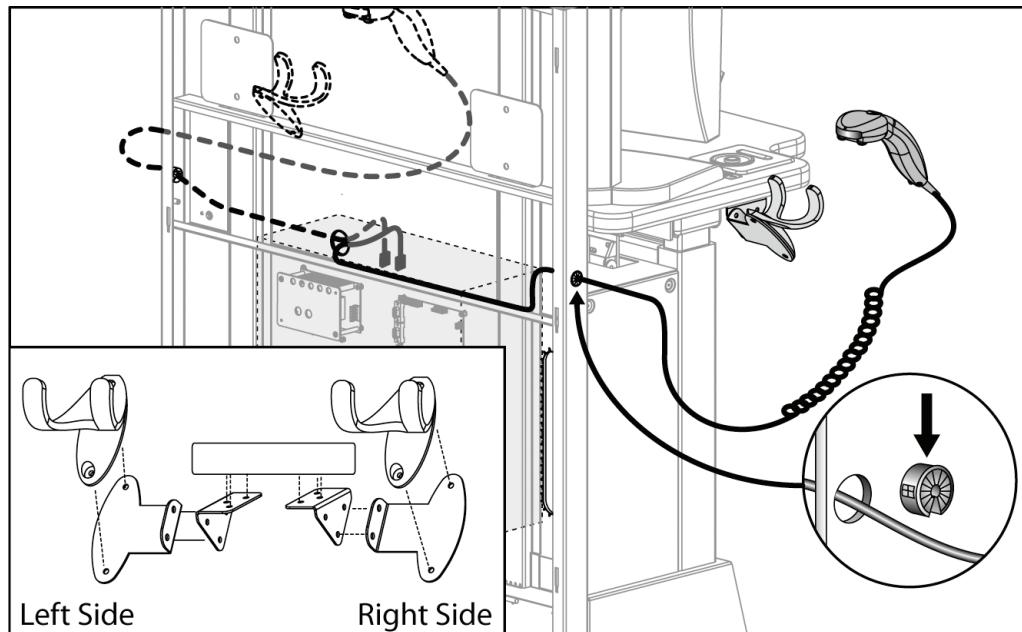


Figure 40: Bar Code Scanner Cable Routing

Install the Bar Code Scanner

Bar Code Scanner mounted on left side:

1. Pass the bar code scanner cable through the hole in the frame.
2. Install the slotted plastic grommet as shown in the previous figure.
3. Pass the cable to the computer.

Bar Code Scanner mounted on right side:

1. Pass the bar code scanner cable through the hole in the frame.
2. Install the slotted plastic grommet as shown.
3. Pass the cable through the hole at the rear of the Acquisition Workstation to the computer as shown.

3.6.5 Connect Power

The Selenia Dimensions system ships with two Acquisition Station power cords:

- 1-056-0046 (POWER CORD, INTL 3.0 METERS 10AMP 250V C13)
- 1-056-0047 (POWER CORD, 10FT LG HOSPITAL GRADE 125V 10 AMP SJT GRAY)

Use the power cord to match the application at the site, and then discard the unused cord.

Connect one end of the power cable to the Acquisition Workstation Power Distribution Assembly outlet, see figure [Input Power Configuration—Acquisition Workstation](#) on page 54, and the other end to the power source from the facility.

3.7 Install the Covers

Install the Gantry covers. Refer to the figure [Gantry Covers Removal](#) on page 106.

3.8 Return the Shipping Container to Hologic

Return the array shipping container and the temperature monitoring device to Hologic as per the instructions in the container.

Chapter 4 System Controls and Indicators

4.1 System Power Controls

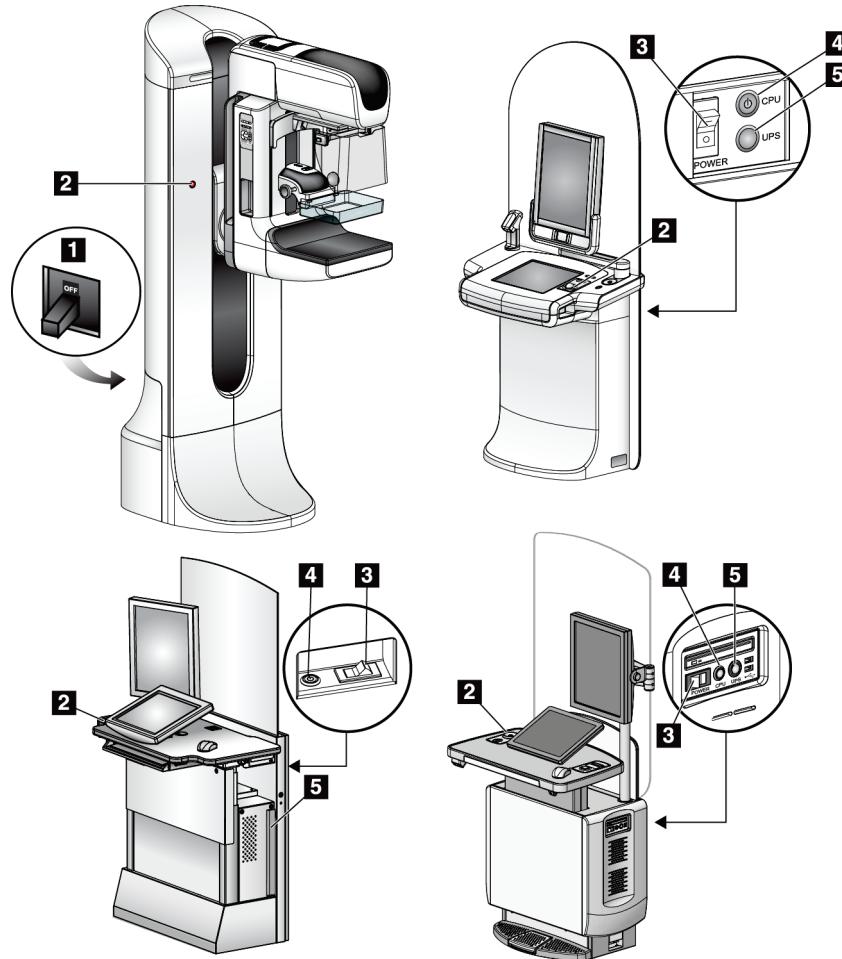


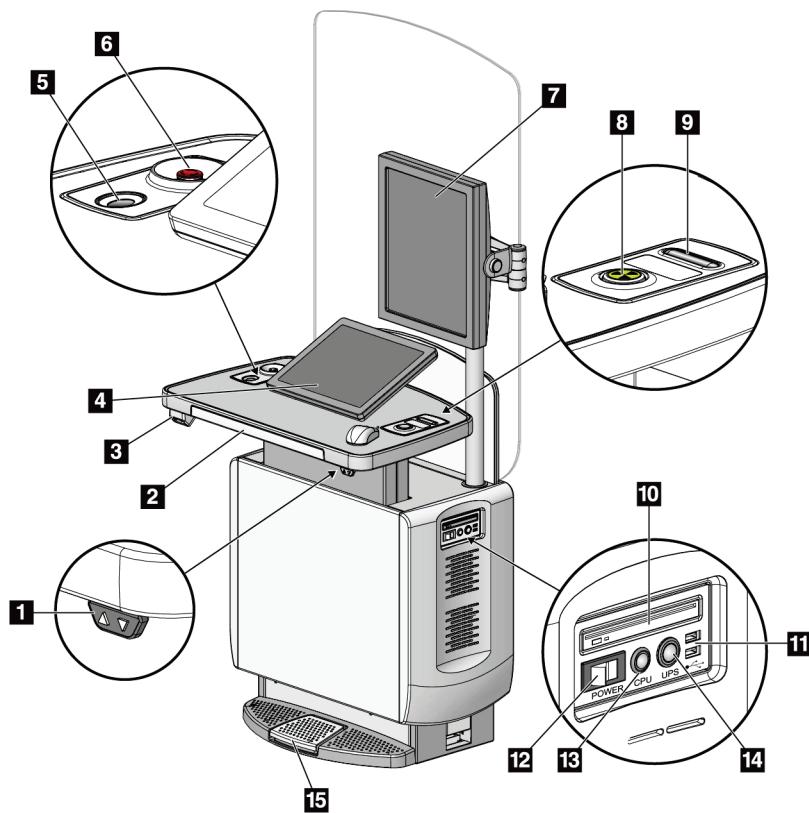
Figure 41: System Power Controls

Figure Legend

1. Gantry Power Circuit Breaker
2. Emergency Off Switch (two on the Gantry, one on the Acquisition Workstation)
3. Acquisition Workstation Power Switch
4. CPU Power On/Reset Button
5. UPS Power Button, if equipped

4.2 Acquisition Workstation Controls and Displays

4.2.1 Universal Acquisition Workstation Controls and Displays

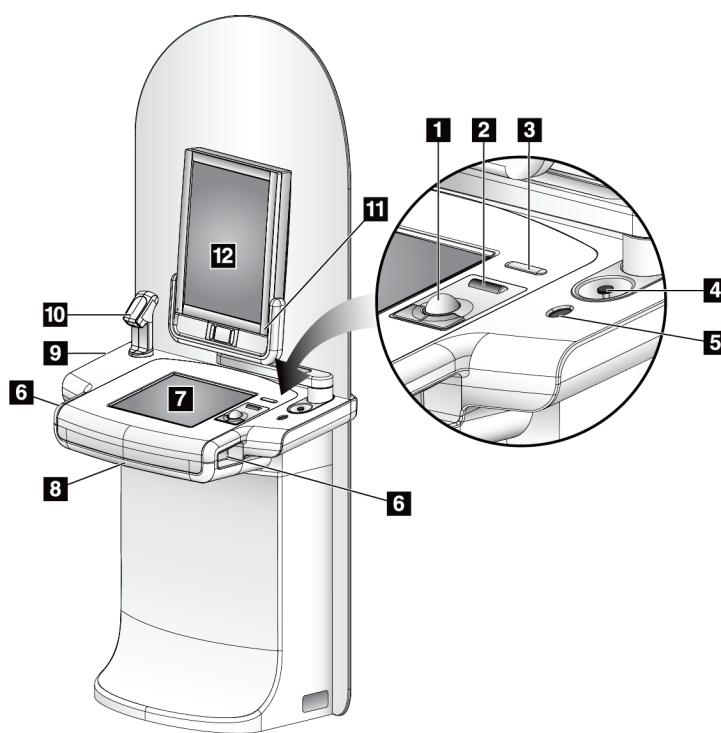
**Figure Legend**

1. Height Adjustment Switch (optional)
2. Keyboard (in drawer)
3. Bar Code Scanner (optional)
4. Control Display Monitor
5. Fingerprint Scanner (optional)
6. Emergency Off Switch
7. Preview Display Monitor
8. X-ray Activation Button
9. Compression Release
10. CD/DVD Drive
11. USB Ports
12. Workstation Power Switch
13. CPU Power On/Reset Button
14. UPS (optional) Power Button
15. X-ray Footswitch (optional)

Figure 42: Universal Acquisition Workstation Controls and Displays**Note**

The controls for the Universal Acquisition Workstation installed in a mobile environment are the same as the controls for the Universal Acquisition Workstation.

4.2.2 Premium Acquisition Workstation Controls and Displays

**Figure Legend**

1. Trackball
2. Scroll Wheel
3. Compression Release
4. Emergency Off Switch
5. Fingerprint Scanner
6. X-ray Button (one on each side)
7. Touch Screen Display
8. Keyboard (in drawer)
9. CD/DVD Drive
10. Bar Code Scanner
11. LED for Preview Display Power
(Light Turns Off After Initial Start)
12. Preview Display

*Figure 43: Premium Acquisition Workstation Controls and Displays***Note**

The controls for the Acquisition Workstation installed in a mobile environment are the same as the controls for the Premium Acquisition Workstation.

4.2.3 Standard Acquisition Workstation Controls and Displays

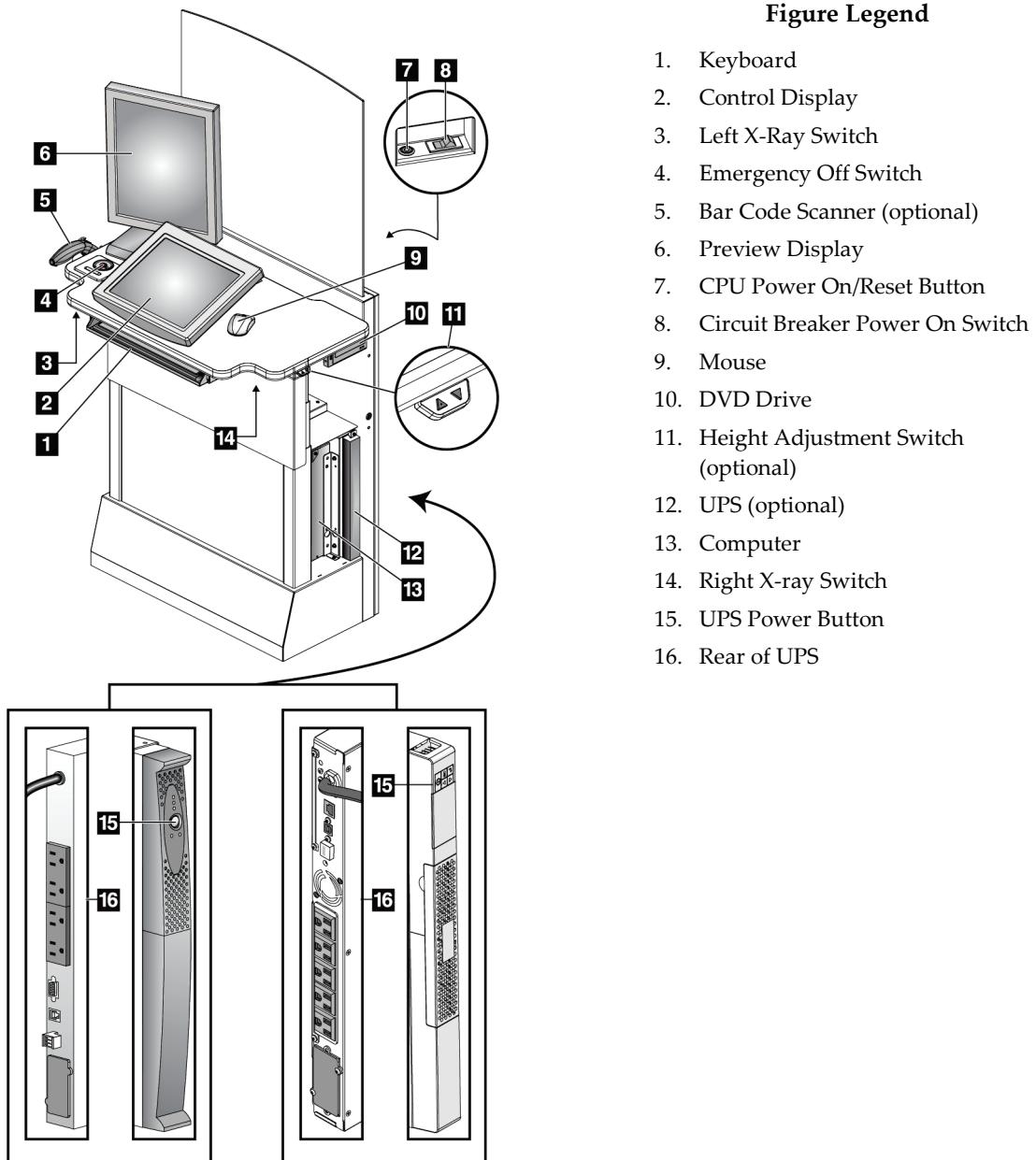
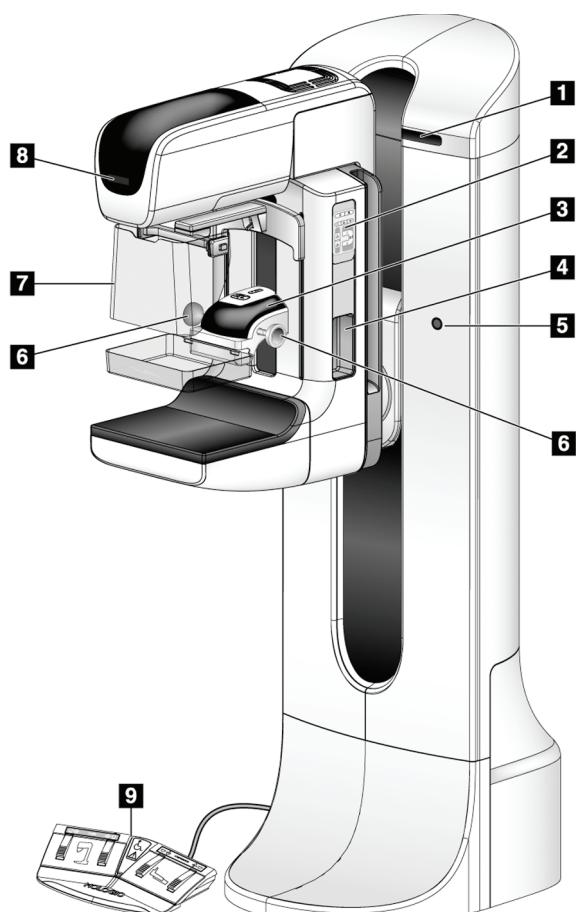


Figure 44: Standard Acquisition Workstation Controls and Displays

4.3 Tubestand Controls and Indicators

**Figure Legend**

1. Rotation Angle Displays (each side)
2. C-arm Controls (each side)
3. Compression Device
4. Patient Handles (each side)
5. Emergency Off Switches (each side)
6. Compression Handwheels
7. Patient Face Shield
8. Tubehead Display
9. Footswitches

Figure 45: Tubestand Controls and Indicators

4.3.1 C-Arm Controls

C-arm controls provide the Collimator and C-arm functions. See the Selenia Dimensions System *User Guide* for details.

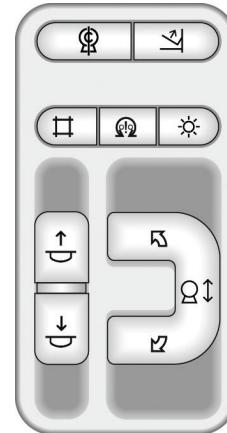


Figure 46: C-Arm Controls

4.3.2 Compression Device Controls and Displays

Figure Legend

1. Manual Compression Handwheels
2. Paddle Shift Buttons
3. AEC Sensor Buttons
4. Compression Device Display
5. The FAST Compression Mode Slide
6. Paddle Clamp

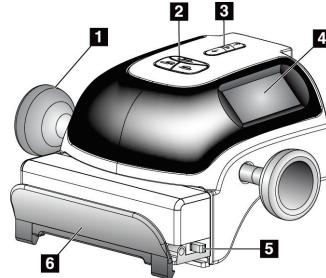


Figure 47: Compression Device

The Display on the compression device shows:

- AEC Sensor Position
- Compression Force (displays 0.0 when force is less than 4 pounds)
- Compression Thickness
- Angle of C-arm after rotation (for 5 seconds)



Figure 48: Compression Display

4.3.3 Tubehead Display

The Tubehead Display shows:

- SID
- Filter Type
- Collimator Setting
- Paddle Position

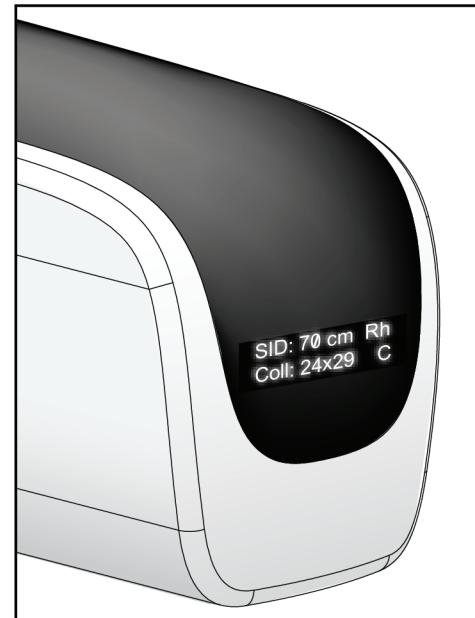


Figure 49: Tubehead Display

4.3.4 Dual Function Footswitches



Warning:

Place each footswitch in a position where, when used, they remain in reach of the Emergency Off Switches.



Warning:

Position the footswitches to prevent accidental operation by a patient or wheelchair.

To use the footswitches:

1. Press the footswitch to actuate.
2. Release the switch to stop the movement.

Figure Legend

1. C-arm Down
2. C-arm Up
3. Compression Down
4. Compression Up

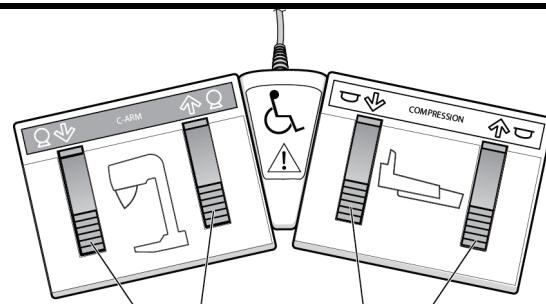


Figure 50: Dual Function Footswitches

4.4 How to Turn On the Selenia Dimensions System



Note

If the system remains on overnight, restart the system daily to guarantee best performance.

4.4.1 Preparation

1. Reset all three Emergency Off switches by turning each switch about one-quarter turn clockwise until it springs back up.

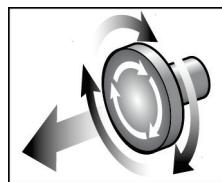


Figure 51: Reset the Emergency Off Switches

2. Make sure that both system circuit breakers are in the On position.
3. Remove blockages to the C-arm movement and to the view of the Operator.

4.4.2 Startup

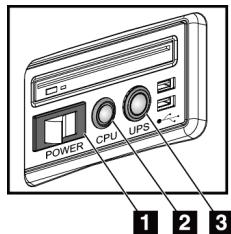


Figure 52: Universal Acquisition Workstation Power Buttons

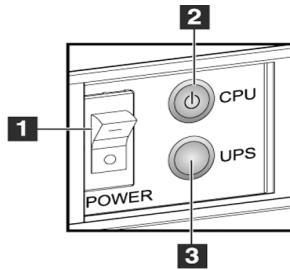


Figure 53: Premium Acquisition Workstation Power Buttons

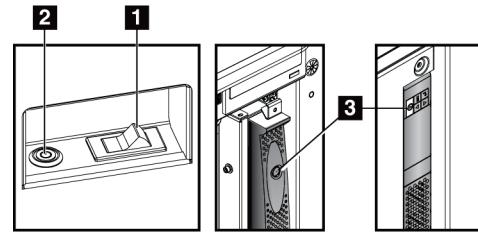


Figure 54: Standard Acquisition Workstation Power Buttons

Figure Legend

1. Acquisition Workstation Power Switch
2. CPU Power On/Reset Button
3. UPS (optional) Power Button

To start up the Acquisition Workstation (Standard, Premium, or Universal):

1. Make sure the workstation power switch is set to ON.
2. If the UPS was shut down, press the UPS power button (see the previous figure).
3. Wait for the green light of the CPU power on/reset button to turn on, then press the CPU power button (see the previous figure).
4. Select the **Log In** button on the control display user interface (see the following figure).

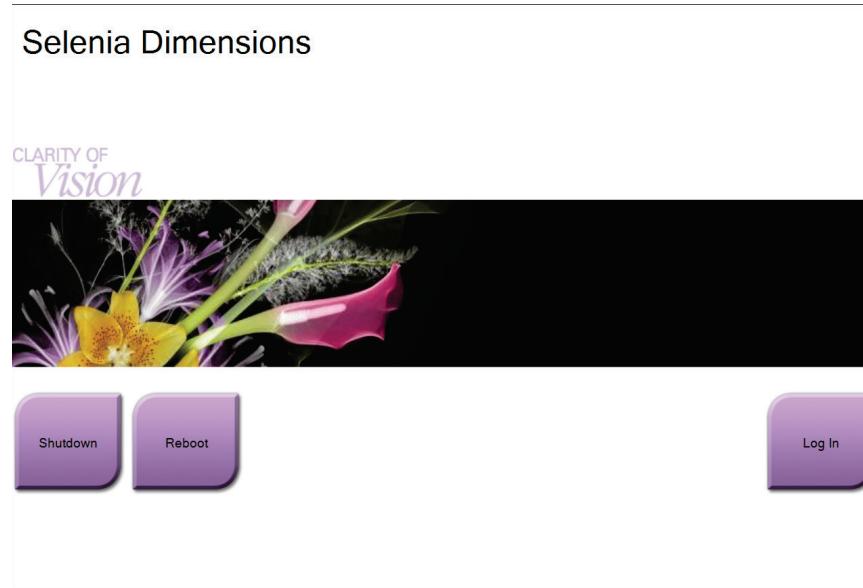


Figure 55: Startup Screen

Note

The Startup screen includes a **Shutdown** button that turns off the system, and a **Reboot** button that restarts the system.

Note

The system may require between five minutes and fifteen minutes to prepare for image acquisition. The wait time depends on the detector power configuration. A timer in the Taskbar displays the wait time before the system is ready. Do not acquire clinical or QC images unless the System Status Icon indicates the system is Ready.

4.4.3 Log In

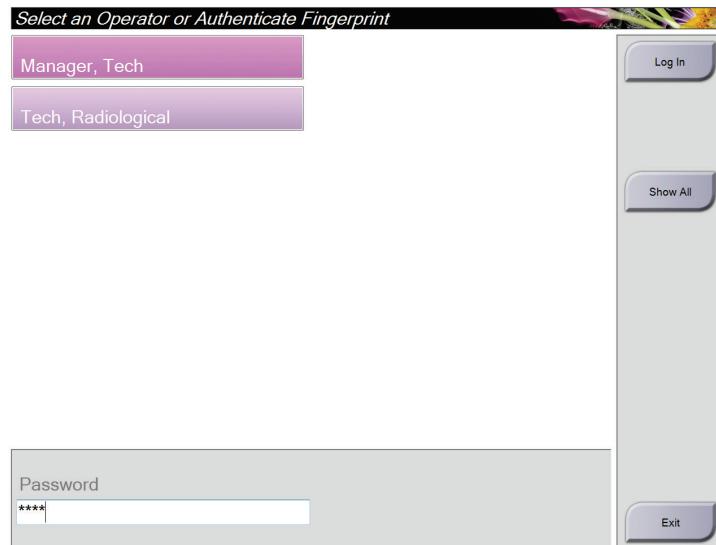


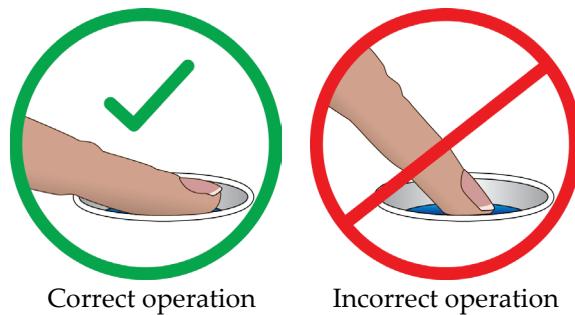
Figure 56: Log In Screen

When the user Log In screen displays, all Managers and Technologists show in the list of Operators.

1. To display the Service, Applications, and Physicists user names, select the **Show All** button.
2. Select your user name, type your password, and select the **Log In** button.

Or

Validate your fingerprint by pressing your finger in the fingerprint reader. Most of the unique, repeatable fingerprint information is from the pad of the finger, not the fingertip. Flat finger placement as shown on the left image results in fast and accurate fingerprint identification.



Correct operation

Incorrect operation

Note



If Quality Control tasks are due, the Select Function to Perform screen appears. You can perform quality tasks or you can select **Skip**.

4.5 Confirm Licensing

The Field Engineer confirms the customer's licensing of features and options by accessing System Tools. If any additional information is required, contact 3D@hologic.com to confirm the licenses for this system. You should have access to the system at the time of the call, and must be able to provide the unit Sales Order number.

4.6 How to Turn Off the System

1. Close any open patient procedures.
2. From the Select Patient screen, select the **Log Out** button.
3. From the Select an Operator screen, select the **Exit** button.
4. From the Startup screen, select the **Shutdown** button.
5. Select the **Yes** button in the confirmation screen.

4.7 How to Remove All Power from the Acquisition Workstation

See the following figure for illustrations of the buttons and switches referenced in the following procedures.

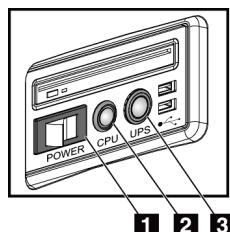


Figure 57: Universal Acquisition Workstation Power Buttons

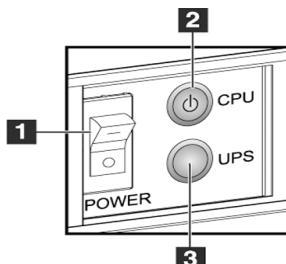


Figure 58: Premium Acquisition Workstation Power Buttons

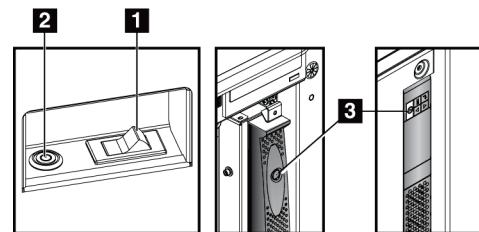


Figure 59: Standard Acquisition Workstation Power Buttons

Figure Legend

1. Acquisition Workstation Power Switch
2. CPU Power On/Reset Button
3. UPS (optional) Power Button

To remove all power from the workstation (Universal, Premium, and Standard):

1. Shut down the computer including all software applications.
2. If your system includes the optional UPS, press the UPS button (item 3).
3. Power OFF the workstation power switch (item 1).
4. Unplug the workstation power cable from the AC outlet.

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Chapter 4: System Controls and Indicators

To restart the system:

1. Plug in the workstation power cable to the AC outlet.
2. Power ON the workstation power switch.
3. If your system includes the optional UPS, press the UPS button.
4. Wait for the green light of the CPU power on/reset button to turn on, then press the CPU power button.

Chapter 5 Connectivity, Setup, and Functional Testing

5.1 Introduction to the Service Tools



Note

If the Acquisition Workstation software is not in operation, you can start the Service Tools from the shortcut on the desktop.

At the Acquisition Workstation, log in to the application as Service.

1. Proceed to the Select Patient Screen.
2. Select **Admin**.
3. On the Admin screen, select **System Tools**.

The screenshot shows the 'System Tools' interface for HOLOGIC. The top navigation bar includes 'Search' and 'Logout' buttons. The left sidebar lists 'Welcome (Hologic Service)' with sub-options: Getting Started, AWS, Peripherals, Hardware, Service Tools Settings, Notes From Hologic Service, and Troubleshooting. The main content area displays a 'Welcome' message with a floral background image. A table provides system information: Site Name (Your Hospital Name), IP Address (10.36.9.14), Host Name (GEMINIA-SVCP34G), and Software Version (1.6.0). Below the table, links to 'Getting Started', 'AWS', 'Peripherals', 'Hardware', 'Service Tools Settings', 'Notes From Hologic Service', and 'Troubleshooting' are listed. The bottom status bar shows the service name 'Service, Hologic (Hologic Service)', various system icons, and the time '1:50:00 PM'.

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Chapter 5: Connectivity, Setup, and Functional Testing

Table 2: Service Tool

Item	Topic	Description
Getting Started	About	Introduction to using the service tool
	FAQ	List of frequently asked questions
	Glossary	List of terms and definitions
	Platform	List of directories, software version numbers, and system software statistics
	Index	Alphabetical list of topics
	Shortcuts	List of Windows® shortcuts
AWS (Acquisition Workstation)	Connectivity	List of Installed Devices; install a device; configure MPPS and Store SCP.
	Film and Image Information	Set image-processing defaults; configure image and text display.
	Licensing	List, add, remove, and backup license.
	Notices	Configure import/export settings
	Import	Configure Code/Field mappings and DB Filters.
	JSS	Configure job default settings.
	Hanging Protocol	Configure Hanging Protocol.
	Reclaimer	Configure Reclamation defaults.
	Procedures	Configure Procedure parameters.
	DICOM	Configure DICOM settings.
	User Interface	Configure UI defaults.
	Simulation	
	Internationalization	Configure language and culture.
	Global	Configure system, repository, Institution settings.
	QC	Procedure, periodicity, calibrations, phantom thickness
	AWM	Configuration for AWM Cluster

Table 2: Service Tool

Item	Topic	Description
Peripherals	Bar Code	Configure Bar Code.
	Biometrics	Fingerprint reader enable
	Removable Media	Configure removable media, DICOM default tags.
Hardware	Paddles	Configure Paddle ID and cropping size.
	Calibration	Configure calibration parameters.
	Subsystem (Global)	Acquisition Workstation Settings, Mag settings, Gantry distances, temperature limits
	Biopsy Device List	Device list
	Biopsy Config	Biopsy, QAS configuration parameters
	Monitors	Heartbeat, exposure count, monitors
	Detector Configuration	Detector information
	Tube Filter Outputs	Filter Tube Output and HVL tables
Service Tools Settings		Idle Timeout
Notes from Hologic Service		Service notes page
Troubleshooting	Acquisition Workstation	Self tests, Database Viewer/Setup, Mappings, Role Permissions, Tagged Images, DICOM dump, Get Images/Quality files.
	Computer	Windows Services/Processes, System Management, Network information.
	Log	Log: downloader, Flags, Config, Management, Viewer, Audit Viewer. Screenshot download.
	Backups	Backup: Create, Restore, Management, Parameters

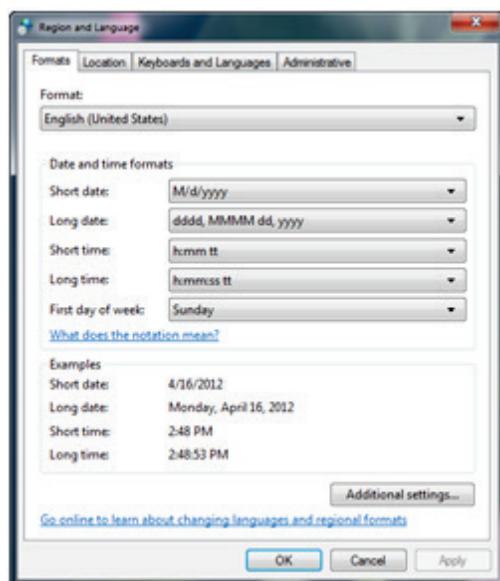
5.2 How to Adjust the Time and Date Presentation

The Dimensions Time and Date formats default to 12-hour Eastern Standard Time in the USA. The Time or Date format is changed through the Windows Control Panel. Follow these instructions to change Time or Date presentation for regional or international installations.

1. Close the Dimensions Application software.

Open the Control Panel—**Start > Control Panel**.

Select Regional and Language Options



2. Change the time format from the drop-down list. For example, select HH.mm.ss (24 hour time) for Europe.
3. Click **Apply**.
4. Select the Date tab.
5. Change the date format from the drop-down list. For example, select Long Date format dddd.MMMM.dd.YYYY for Europe.
6. Click **Apply**.
7. Restart the Dimensions Application.

5.3 Configure the Output Devices

5.3.1 Install a New Device

**Note**

Edit the types of files that are being sent.

1. Log in to System Tools.
2. Browse to Acquisition Workstation > Connectivity > Install a device.
3. Click the down arrow and select a category and model to install. The choices are:
 - Archive
 - CAD: Cenova CAD (Only Choice)
 - MPPS: Generic MPPS (Only)
 - MWL: Default Query and Sectra
 - Printer: Agfa, CareStream, Fuji, Konica, Sony, and Generic Printer
 - QR: SecurXchange, Query and Retrieve
 - Workstation: Generic, Generic with BTO, SecurView® Conv & Tomo BTO/SCO
4. Click **Install this device**. Archive is the displayed category.
5. Mouse over **Basic**, then click **Basic Store**.
6. Enter the following information:
 - Name (This is the name used in the Output Group to identify this device)
 - Manufacturer (Identifies the manufacturer of the Archive. For example, GE, Siemens, Stentor, McKesson)
 - Model (Identifies the Model and Software version. For example, Impax 5.2)
 - Host
 - Port
 - Called AE Title (This is the AE Title of the Archive)
7. If System AE Title is being used, check the Use System Calling AE Title checkbox. The system AE Title displays on the bottom of the window.
8. If the System AE Title is not being used, enter the Dimensions AE Title to use in the Calling AE Title text box.
9. Click **Update**.
10. Repeat for other Archive store devices.

5.3.2 Test Installed Devices

1. Browse to Welcome > AWS > Connectivity > List Installed Devices.
2. Select the device to be tested.
3. Make sure the device to be tested is highlighted in the List Installed Devices window.
4. Mouse over **Ping**, click **Ping Store**. The system indicates if the ping was successful or failed. If the ping failed, check the IP that was entered for that device.
5. Mouse over **Dicom Ping**, click **Dicom Ping Store**. The system indicates if the DICOM ping was successful or failed. If the DICOM ping failed, check the Called AE Title, Calling AE Title and/or Port.

5.3.3 Change the System AE Title

1. Browse to Welcome > AWS > Connectivity > Connectivity (Global).
2. Enter the new System AE Title in the System AE Title parameter under the Connectivity section.
3. Scroll down to the bottom of the window and click **Update**.

Note

It may be necessary to log off the application and log in for the change to take place.

5.3.4 Set Up Query/Retrieve

Note

These changes may require restarting the application.

1. Log in to Service Tools.
2. Browse to **Welcome > AWS > Connectivity > Install a device**.
3. Click the down arrow and select a category and model to install. The category choices are: QR: SecurXchange model. The SecurXchange model is based on the Relational query model.
4. Click the **Install this device** button.
5. From the Install a Device window, select the QR device installed.
6. Mouse over **Basic**, then click **Basic Query**.

7. Enter/change the following information:
 - Name (The name used to identify this Q/R device)
 - Manufacturer (Identifies the manufacturer of the Q/R device. For example, GE, Siemens, Stentor, McKesson)
 - Model (Identifies the Model and Software version. For example, Impax 5.2)
 - Host: IP Address of the SecurXchange or PACS.
 - Port: Port of the SecurXchange and 104
 - Called AE Title: Default AE_Title (SXCAET)of the SecurXchange
 - Check use System Calling AE Title
8. Click **Update**. Notice the global AE_Title in red being used at the bottom.
9. Click **<< Back** (at the upper left side of the window).
10. Mouse over **Basic**, then click **Basic Retrieve**.
11. Enter the following information:
 - Name
 - Host
 - Port
 - Called AE Title: Same as above
12. Check **Use System Calling AE Title**. Ensure the Calling AE_Title at the bottom is the global_AE_Title entered above.
13. Click **Update**.
14. Click **Back**
15. Mouse over **Advanced**, then click **Advanced Retrieve**.
16. Enter the global AE_Title, or the System Calling AE Title in the Move Destination field.
17. Click **Update**.
18. Browse to **AWS > Connectivity > SCP > Server**.
19. Enter the following information:
 - Port: Should be 104
20. Click **Update**.

5.3.5 Set Up MWL to Query MWL Provider

1. Log in to Service Tools.
2. Browse to **Welcome > AWS > Connectivity > Modality Worklist**.
3. Click **Basic worklist configuration**.
4. In the Name field add a human readable name assigned to the worklist. This identifies the worklist provider such as IDX.
5. In the Host field, enter the IP Address of the MWL provider.
6. In the Port field, enter the port used by the MWL provider.

7. In the AE Title field, enter the AE Title used by the MWL provider.
8. If System AE Title is not being used:
 - a. Uncheck **Use System Calling AE Title**.
 - b. Enter an AE Title to be used.
9. Click **Update**.
10. Click **Back**.
11. Click **Advanced Worklist configuration**.
12. Check the box next to Activated.
13. Change the study code from SPS Seq, Sched Prot Code Seq Code Val to Req Proc Code Seq, Code Meaning.
14. Click **Update**.
15. Click **Back**.
16. Click **Ping** (An indication is presented if the test was successful or failed).
17. Click **DICOM Ping** to test. (An indication is presented if the test was successful or failed).
18. Click **Query On Demand** and use the right scrollbar to scroll until the query is visible.
19. Click **Query**.
20. In the Results window, the C-FIND-RQ sent to the MWL provider is displayed. If the MWL Provider returned any scheduled patients, the C-FIND-RSP's is displayed in the Results window also.
21. Reboot the system.

5.4 Perform Functional Tests

Perform the functional tests as described in the Selenia Dimensions System *User Guide*.

Note



To stop the C-Arm automatic rotation movement, press any button or the Emergency Stop switch.

Warning:



Risk of entrapment. Make sure that the C-arm has 50 cm (20 inches) of clearance to any object during C-arm rotation. Do not use Auto Rotation when C-arm clearance is less than 50 cm (20 inches).

Chapter 6 System Calibration and Performance Tests

This chapter outlines the Selenia Dimensions system Preventive Maintenance Schedule, calibration procedures, and performance tests. Most system calibrations use a software-based Calibration Tool; some adjustments use other software tools from the Acquisition Station, and some refer you to use the Quality Control Manual for instructions.

Note

The procedures in this chapter are written for conventional (invasive) testing equipment. To use non-invasive testing equipment and techniques, follow the instructions provided by the manufacturer of the test equipment.

6.1 Preventive Maintenance Schedule

**Note**

The Preventive Maintenance Schedule for the User is in the Selenia Dimensions System *User Guide*.

Refer to [Universal Acquisition Workstation Maintenance](#) on page 207, [Premium Acquisition Workstation Maintenance](#) on page 167 and [Standard Acquisition Workstation Maintenance](#) on page 195 for detailed cleaning and inspection procedures.

Table 3: Service Engineer Preventive Maintenance

Maintenance Task Description	Recommended Frequency	
	Semiannually	Annually
Clean and Inspect the Gantry and Acquisition Workstation	x	
Inspect the radiation shield for chips, cracks, breaks, and for tight attachments.	x	
Check all primary power connections	x	
Check interlocks, safety and limit switches	x	
Inspect/Lubricate C-arm	x	
C-arm / Verify all C-arm buttons	x	
Verify C-arm and Rotational Calibration	x	
Replace Breast Platform Filter	x	
Verify Compression Force Calibration	x	
Verify Compression Thickness Calibration	x	
Inspect LED Collimator Lamp for dust and dirt	x	
Clean & lubricate collimator, and worm screws	x	
Perform Rotational Brake verification	x	
Verify X-ray Field / Light Field Calibration	x	
Verify kV Calibration and Tube Current Calibration	x	
Perform and Verify Linearity	x	
Check HVL Evaluation	x	
Verify Target Dose Verification	x	
Verify AEC Exposure Compensation 2D	x	
Perform System Resolution Test *	x	
Perform Phantom Image Quality Evaluation *	x	
Perform Image Artifact Evaluation *	x	
Backup Acquisition Workstation files	x	
Empty Reject Bin	x	
Evaluate UPS Performance Status/ Batteries Status	x	
Backup all Calibration Data	x	
* Refer to Quality Control Manual		

6.2 System Calibration

Note

 For dose calibration, refer to MAN-02461 Selenia Dimensions Dose Calibrations, CalTool 2.x.

The primary software tool is the Calibration Tool. This software application is resident on the Acquisition Workstation.

Note

 Contact Hologic Technical Support for assistance using this tool if required.

6.2.1 Configure the Vertical Height Adjustment

If you install the system in a room or a coach (mobile installation) where a low ceiling height is a consideration, in addition to the standard Calibration Tool parameters, you can perform the optional Vertical Height Adjustment. For additional information about the Calibration Tool, refer to the topic [*Overview of the Functions in the Calibration Tool*](#) on page 88.

Refer to [*Gantry Vertical Height Upper Limit Adjust*](#) on page 335.

6.2.2 Overview of the Functions in the Calibration Tool

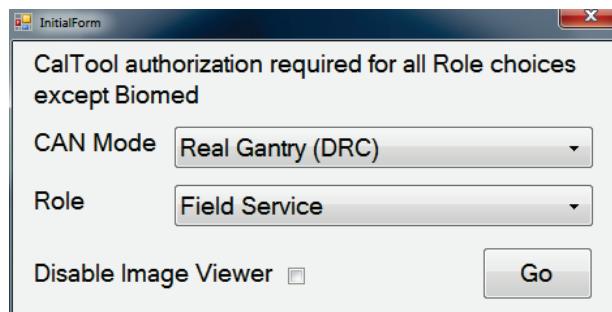
With software version 1.7 or greater, a dongle needs to be connected to start the Calibration Tool (CalTool). If you do not have a dongle, contact 3D@hologic.com and request a code for a temporary license.

1. Select the CAN Mode **Real Gantry**, then select the **Field Service** role.

Role options:

- Biomed
- Manufacturing
- Field Service
- Upgrade
- Array Test
- Developer

The Field Service role is used for all Hologic service calibrations.



2. Select **Go** to open CalTool.
3. Click the **TASK BAR** to view tasks.
4. Select a task.
5. Perform the task.

Click **Help** for more information.



Figure 60: Cal Tool Taskbar

Note



Depending on Licensing (2D or 3D), CalTool notifies availability of selected calibrations.

6.2.3 Inverter Drawer Calibration

Calibrating the Replacement Generator Inverter Drawer (ASY-05788)

Two Generator configurations are currently in use:

- Inverter (ASY-05788) and Multiplier (ASY-05340) pair.
- Inverter (ASY-01272) and Multiplier (ASY-01273) pair.

This procedure describes the calibration of the Generator Assembly Inverter Drawer (ASY-05788).

Note

The Inverter (ASY-05788) and Multiplier (ASY-05340) Drawer pair require adjustments to ensure proper waveform flatness. If the Drawers are not replaced as a pair, kV waveform edge adjustments are required.

1. For access to adjustments, remove the plastic cover on the front panel of the Inverter.
2. kV leading waveform edge (Multiplier trim pot adjust).
 - a. Use a Divider Tank to monitor kV waveforms with an Oscilloscope.
 - b. Using CalTool, take 35kV, 100mA, 200mAs, Manual, Grid Out, LFS exposures and monitor the waveform.
 - c. Adjust the feedback trim pot located on the Multiplier Drawer above the mAs plug to obtain a square leading edge waveform. (See the following figures.)

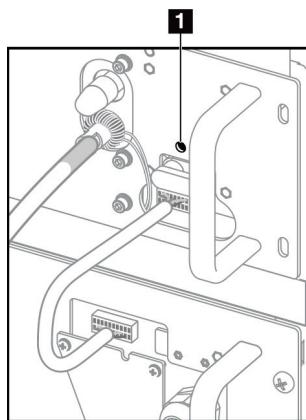


Figure 61: Adjusting the Multiplier Feedback Trim Pot (item 1)

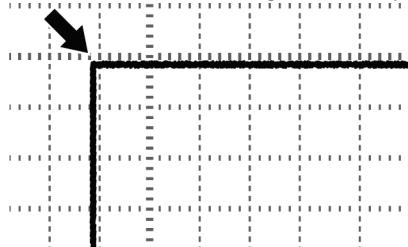


Figure 62: Correct Square Edge

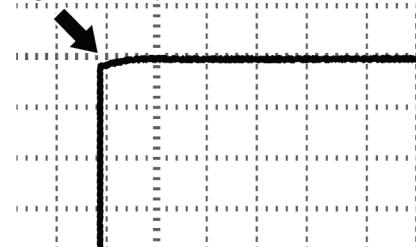


Figure 63: Undershoot, Adjustment Required

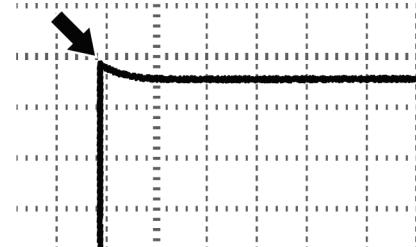


Figure 64: Overshoot, Adjustment Required

Selenia Dimensions System Service Manual

Chapter 6: System Calibration and Performance Tests

3. Standby voltage (Inverter): Filament idle current (standby voltage) is factory set to 2.5 amps. Verify the following:
 - a. Monitor Filament idle current sense at TSTH1 pins 1-2 with voltmeter = 0.25 v (0.1 v = 1 amp)
 - b. Acceptable range is 2.48 - 2.52 amps. Adjustment is done with FIL ADJ R14. If necessary, adjust before performing filament calibration.

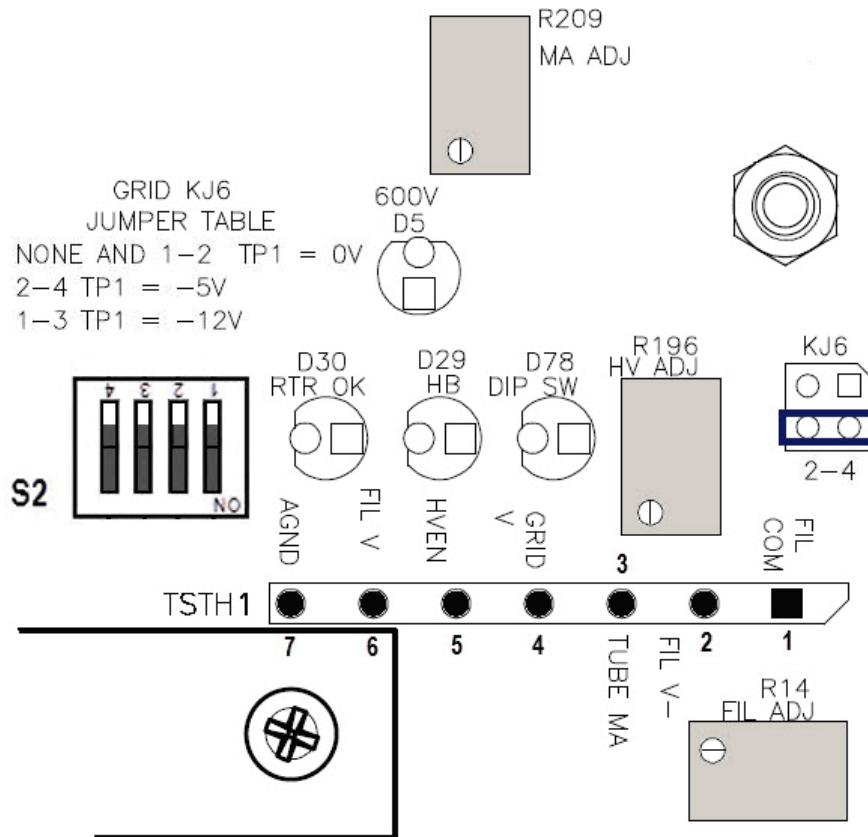


Figure 65: Front Panel Inverter Drawer (ASY-05788)

4. kV voltage (Inverter):
 - a. "kV" output voltage adjustment is done with potentiometer R196 HV ADJ.
 - b. Monitor the waveform levels using a tank and oscilloscope or measure voltage with a DVM.
 - c. Use CalTool to verify Generator kV.
5. Tube current (Inverter):
 - a. Tube current adjustment is done with MA ADJ R209. This potentiometer is factory set; adjust only if the measured mA is not correct.
 - b. Use CalTool to verify Generator mA.

6. Grid voltage (Inverter):

- a. Grid voltage is a legacy parameter and is not used. The voltage is factory set to -5 (± 3) volts by jumper on KJ6 pins 2 and 4.
- b. Verify with voltmeter (+) to TSTH1 pin 4, voltmeter (-) to TSTH1 pin 7.

Calibrating the Generator Inverter Drawer (ASY-01272)

Two Generator configurations are currently in use:

- Inverter (ASY-05788) and Multiplier (ASY-05340) pair.
- Inverter (ASY-01272) and Multiplier (ASY-01273) pair.

This procedure describes the calibration of Generator Inverter Drawer (ASY-01272).

1. Standby Voltage:

- No external adjustment is available.

2. kV voltage (Inverter):

- a. kV output voltage adjustment is done with kV ADJ located on the front of the Inverter Drawer.
- b. Use CalTool to verify Generator kV.

3. Tube current (Inverter):

- a. Tube current adjustment is done with rnA ADJ located on the front of the Inverter Drawer.
- b. Use CalTool to verify Generator rnA.

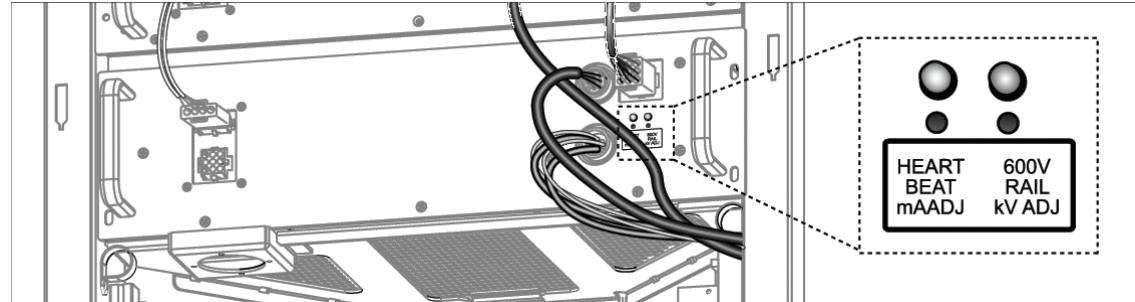


Figure 66: Using CalTool to Verify Generator mA

4. Grid Voltage

- No external adjustment is available.

6.2.4 Acquisition Workstation Calibrations

When you need to perform Detector Gain Calibration and Geometry Calibration, start each procedure from the Acquisition Workstation. Log in to the system as Service. Then go to **Admin > Quality Control**. Follow the on-screen instructions.

6.2.5 Quality Control Manual Calibrations

When you need to perform Geometry Calibration (Tomosynthesis or Biopsy option), follow the instructions in the Quality Control Manual.

6.3 System Performance Tests

This section contains the procedures for testing the system performance. Use the following table to locate a specific procedure and form.

Test Name	Page	Appendix E Form
Tube Current/Exposure Time Product	Tube Current/Exposure Time Product on page 92	Tube Current/Exposure Time Product Forms on page 377
Peak Tube Potential	Peak Tube Potential on page 95	Peak Tube Potential Form on page 378
X-ray Field Size Determination	X-ray Field Size Determination on page 97	X-ray Field Size Determination Forms on page 378
Alignment of Visually Defined X-ray Fields	Alignment of Visually Defined X-ray Fields on page 98	Alignment of Visually Defined X-ray Fields Form on page 380
Beam Quality Half Value Layer	Beam Quality Half Value Layer on page 99	Beam Quality Half Value Layer Form on page 380
Linearity	Linearity on page 100	Linearity Form on page 381
Reproducibility	Reproducibility on page 101	Reproducibility Form on page 382

6.3.1 Tube Current/Exposure Time Product

**Warning:**

Always follow the safety precautions for x-ray exposures.

Equipment Required:

- mAs Meter (invasive mAs meter or equivalent)
- Tube Current Exposure Time Product Form—see [Tube Current/Exposure Time Product Forms](#) on page 377.

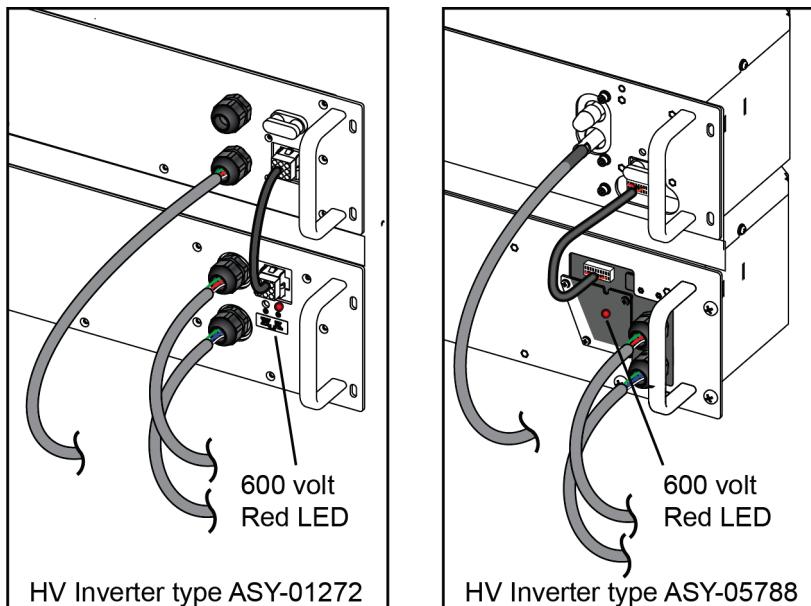
Setup

1. Turn the Gantry Power Off.

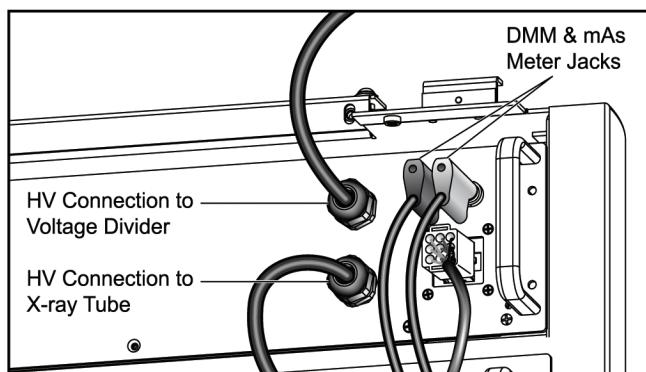


WARNING!

To reduce the risk of hazardous electrical shock, do not attempt service until the Red LED on the HV Inverter is extinguished (this takes approximately 5 minutes). Once the Red LED is extinguished, do not proceed until an additional 1 minute has elapsed.



2. Remove the mA shorting jumper and insert the mAs meter probes as shown in the following figure.



3. If an image receptor is present, cover it with a lead apron.

Test

1. Turn the Gantry power on.
2. Configure the Exposure Techniques:

Modality	Mode	Filter	Grid	FS
Screen	MAN	Rh	In or Out	Large

3. Refer to the Large Focal Spot Form. Configure the mAs and kV as shown in the first row and column—10 mAs, 25 kV.
4. Take an exposure and record the mAs output measured in the Form.
5. Reset the mAs meter for the next measurement.
6. Repeat the exposure sequence above for each of the remaining mAs and kV combinations. Do not take an exposure for any of the cells which are highlighted in **bold**.
7. Configure the Exposure Techniques:

Modality	Mode	Filter	Grid	FS
Screen	MAN	Rh	In or Out	Small

Note



The small focal spot is not available on the Selenia Dimensions 2D Screening system.

8. Refer to the Small Focal Spot Form. Configure the mAs and kV as indicated in the first row and column—10mAs, 25kV.
9. Take an exposure and record the mAs output measured on the Form.
10. Reset the mAs meter for the next measurement.
11. Repeat the exposure sequence above for each of the remaining mAs and kV combinations.
12. Turn the Gantry Power Off.



WARNING!

To reduce the risk of hazardous electrical shock, do not attempt service until the Red LED on the HV Inverter is extinguished (this takes approximately 5 minutes). Once the Red LED is extinguished, do not proceed until an additional 1 minute has elapsed.

13. Remove the mAs meter probes from the HV Multiplier Drawer and replace the mAs shorting jumper.

6.3.2 Peak Tube Potential

**Warning:**

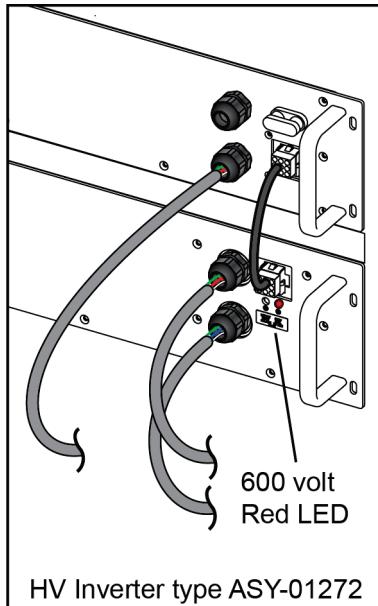
Always follow the safety precautions for x-ray exposures.

Equipment Required:

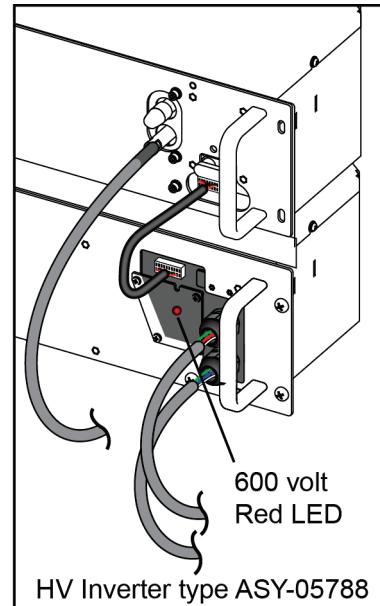
- Invasive high voltage divider or a non-invasive system
 - Digital voltmeter
 - Coaxial cable and BNC to banana plug
 - Adapter cable to connect the divider to the test receptacle on the HV Generator
 - Peak Tube Potential Form—see [Peak Tube Potential Form](#) on page 378.
-

**WARNING!**

To reduce the risk of hazardous electrical shock, do not attempt service until the Red LED on the HV Inverter is extinguished (this takes approximately 5 minutes). Once the Red LED is extinguished, do not proceed until an additional 1 minute has elapsed.



HV Inverter type ASY-01272



HV Inverter type ASY-05788

Setup

1. Shut down the system.
2. Connect a voltmeter:
 - Connect a DC voltmeter to the **low voltage terminals** of a **1,000:1 Voltage Divider**.

Or

 - Use a coaxial cable and a BNC to banana plug splitter to connect a digital voltmeter to the anode terminal of the voltage divider.
3. Position the meter where it can be read from behind the radiation shield.

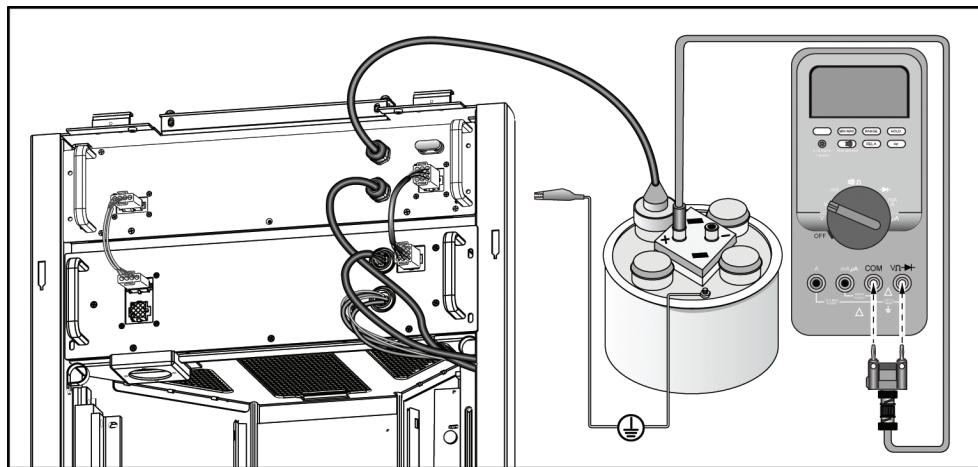


Figure 67: Tube Voltage Calibration

4. Connect the ground lug of the high voltage divider to a chassis ground point located on the HV Multiplier Assembly.
5. Loosen the locking collar from the HV test jack located on the HV Multiplier Assembly.
6. Connect one end of the high voltage adapter cable into the voltage divider receptacle and the opposite end into the HV Multiplier Assembly test jack. Ensure the adapter cable is firmly seated and tighten the locking collar.

Test

1. Boot up the computer, close out all applications, and open Caltools.
2. Click **Advanced Form**, then click the **Technique** tab.
3. Set up the manual mode KV's and mA's accordingly. Click the **Arm** button.
4. Using the Peak Tube Potential (kV) Form make an exposure at the first kV, mAs setting in the table, and record the meter reading.
5. Confirm that the meter reading falls into the range shown on the Form.
6. Repeat steps 4 and 5 for each of the remaining exposures.
7. Shut down the system.
8. Remove the test equipment.

6.3.3 X-ray Field Size Determination

**Warning:**

Always follow the safety precautions for x-ray exposures.

- X-Ray Field Size Test Fixture, TLS-01063
- X-Ray Field Size Determination Form—see [X-ray Field Size Determination Forms](#) on page 378.

Setup

1. Adjust the Collimator and set the aperture size to 15 x 15 prior to performing this test.
2. Install intensifying screen on top of breast tray.
3. Set the exposure techniques:

Modality	Mode	Filter	kV	mA	mAs	Grid	FS
Screen	MAN	Rh	35	80	160	out	Large

Test

1. View the Intensifying screen and take an x-ray exposure.
2. Verify that the x-ray field as evidenced by the glowing phosphorescent image lies within the corresponding set of field alignment lines.
3. If the x-ray field is not aligned repeat the calibration sequence.
4. Repeat the exposure and viewing sequence for each of the remaining aperture positions.
5. Visually verify that each x ray edge lies within the corresponding field lines. Record all observations on the Form.

6.3.4 Alignment of Visually Defined X-ray Fields



Warning:

Always follow the safety precautions for x-ray exposures.

Equipment Required:

- X-ray Field Size Test Fixture, TLS-01063

Setup

1. Install the intensifying screen on the Breast Platform.
2. Open Caltools and go to **Task Bar > X-Ray and Light Field > Light Field Alignment**.
3. Follow the procedure outlined in Caltools.

Test

1. Install the intensifying screen on the X-ray platform.
2. Use the Aperture Select Switch to cycle the Collimator to the setting that is to be verified. Verify that the correct aperture size is displayed on the collimator display.
3. Verify that the light field lies within the corresponding set of field alignment lines.
4. If the light field requires adjustment, repeat the adjustment procedure found in **Caltools > Task Bar > X-Ray and Light Field > Light Field Alignment**.

6.3.5 Beam Quality Half Value Layer

**Warning:**

Always follow the safety precautions for x-ray exposures.

Equipment Required:

- 24 x 29 cm screening paddle
- A non-invasive system, or a Calibrated mammography ionization chamber and electrometer per the *1999 ACR Mammography Quality Control Manual*, "Beam Quality Assessment" section
- Aluminum 1145 or 1100 alloy sheets per the *1999 ACR Mammography Quality Control Manual*, "Beam Quality Assessment" section (eight sheets of 0.1 mm thickness and six sheets of 0.5 mm thickness)
- 0.5 mm or thicker lead block, wide enough to cover entire surface of the digital receptor
- Beam Quality Half Value Layer Form—see [Beam Quality Half Value Layer Form](#) on page 380.

Setup

1. Cover the Image Receptor with a lead blocker found in the HVL test kit TLS-02407, and install a 24 x 29 Full Field compression paddle.
2. Setup the meter for a radiation measurement.
3. Place the radiation probe 2.5 cm above the breast tray. A probe holder or BR12 may be used to attain proper probe height of 4.2 cm above the breast tray.
4. The center of the sensor should be 4.0 cm from the chest-wall and positioned so it lies directly above the vertical centerline of the array.
5. Verify the probe position by lowering the paddle a few inches from the top surface of the probe. If the probe is positioned properly, the sensor is located directly under AEC position 2 when viewed from above the paddle.
6. Move the compression paddle to its highest position (closest to the tube).
7. Measure the distance from the breast tray to the red volume centerline of the sensor probe. (4.2 cm). Note that the lead apron width is approximately 0.2 cm.
8. Enter the measured height, in mm, on the spreadsheet as the **distance above breast platform**.

Note

As an additional check of probe alignment, the probe should appear to be centered within the illuminated region.

Test

Follow the "Beam Quality Half Value Layer test in the QC manual. Rh and Ag filters should be checked, each at one kVp only.

6.3.6 Linearity



Warning:

Always follow the safety precautions for x-ray exposures.

Equipment Required:

- Radiation Meter (for example, Rad Cal 2026C Series, Unfors, or equivalent)
- Linearity Form—see [Linearity Form](#) on page 381.

Setup

1. Connect the radiation probe per product manufacturer's instructions.
2. Place the readout/logic module where it can be easily read.
3. Select exposure in milliroentgen on the function switch.
4. If an image receptor is present, cover it with lead supplied with TLS-02407.
5. Position the x-ray meter probe on the breast tray centered along the chest wall and 1 cm from the edge of the receptor. The plane of the probe surface must be aligned so that it is perpendicular to the x-ray beam axis.

Test

Large Focal Spot

1. Configure the Exposure Techniques:

Modality	Mode	Filter	kV	mA	Grid	FS
Screen	MAN	Rh	35	200	out	Large

2. Set the mAs to 10 and take an exposure.
3. Record the milliroentgen output on the Form.
4. Reset the meter.
5. Repeat the exposure sequence for each of the remaining mAs settings.
6. Remove the meter from the breast tray.

Small Focal Spot



Note

The small focal spot is not available on the Selenia Dimensions 2D Screening system.

1. Configure the Exposure Techniques:

Modality	Mode	Filter	kV	mA	Grid	FS
Screen	MAN	Rh	35	50	out	Small

2. Set the mAs to 10 and take an exposure.
3. Record the milliroentgen output on the Form.

4. Reset the meter.
5. Repeat the exposure sequence for each of the remaining mAs settings.
6. Remove the meter from the breast tray.

6.3.7 Reproducibility

**Warning:**

Always follow the safety precautions for x-ray exposures.

Equipment Required:

- Radiation Meter (for example, Rad Cal 2026C Series, Unfors, or equivalent)
- Rad Cal 20x6-6 mm Probe (or equivalent)
- Reproducibility Form—see [Reproducibility Form](#) on page 382.

Setup

1. Connect the radiation probe per product manufacturers instructions.
2. Place the readout/logic module where it can be easily read.
3. Select exposure in milliroentgen on the function switch.
4. If an image receptor is present, cover it with lead supplied with TLS-02407.
5. Position the x-ray meter probe on the breast tray centered along the chest wall and 1 cm from the edge of the receptor. The plane of the probe surface must be aligned so that it is perpendicular to the x-ray beam axis.
6. Configure the Exposure Techniques:

Modality	Mode	Filter	kV	mA	Grid	FS
Screen	MAN	Rh	25	60	out	Large

Test

1. Take an exposure and record the milliroentgen output measured on the Form.
2. Reset the Meter.
3. Reset the kV and mAs settings to values different than those listed in the table, and then return them to their original values.
4. Repeat the exposure sequence as indicated above until 10 complete exposures have been taken.
5. Calculate the Coefficient of Variation for all 10 readings:
Coefficient of Variation = (Standard Deviation/Mean)
6. Remove the meter from the breast tray.

6.3.8 Artifact Evaluation

Follow the "Artifact Evaluation" test in the Quality Control Manual.

6.3.9 AEC Function Performance Test

Follow the "AEC Function Performance" test in the Quality Control Manual. If it fails, perform the AEC calibration in the Calibration Tool ('Detector' calibration).

6.3.10 Breast Entrance Exposure, AEC Reproducibility, and Average Glandular Dose

Follow the "Breast Entrance Exposure, AEC Reproducibility, and Average Glandular Dose" test in the Quality Control Manual.

6.3.11 Signal to Noise Ratio

Follow the "SNR/CNR Measurement" test in the Quality Control Manual.

6.3.12 Compression Force Test

Follow the "Compression Test" test in the Quality Control Manual.

6.3.13 Compression Thickness Accuracy Test (Standard Mode)

Equipment Required:

- BR-12 phantom blocks of 2, 4, 6, and 8 cm thickness
- 18 x 24 cm Compression Paddle
- 24 x 29 cm Compression Paddle
- 7.5 cm Spot Contact Compression Paddle

Setup

1. Center 2 cm of BR-12 laterally on the image receptor and position it so the chest-wall edge of the block is aligned with the chest wall side of the image receptor.
2. Install the 18 x 24 cm screening paddle in the Compression Device.

Test

1. Apply Full Automatic Compression of approximately 30 pounds to the phantom.
2. Note the thickness indicated on the compression device. The compression thickness indicator shall always be within ± 0.5 cm of the actual thickness.
3. If the indicator is not within ± 0.5 cm, perform the thickness calibration in the Calibration Tool, and then repeat this test.
4. Repeat steps 1 to 3 for thicknesses of 4 cm, 6 cm, and 8 cm.
5. Install the 24 x 29 cm paddle.
6. Repeat steps 1 to 3 for 2 cm through 8 cm of BR-12.
7. Install the 7.5 cm Spot Contact Compression Paddle.
8. Repeat steps 1 to 3 for 2 cm through 8 cm of BR-12.

6.3.14 Compression Thickness Accuracy Test (FAST Mode)

Equipment Required:

- BR-12 phantom blocks of 2, 4, 6, and 8 cm thickness
- 18 x 24 cm Compression Paddle
- 24 x 29 cm Compression Paddle

Setup

1. Place 2 cm of BR-12 laterally on the image receptor and position it 2 cm in front of the chest wall.
2. Install the 18 x 24 cm screening paddle in the Compression Device.

Test

1. Activate FAST Paddle™ mode (FAST Paddle™ tilting paddle system) by pushing the purple bar to the left or right.
2. Apply Full Automatic Compression of approximately 30 pounds to the phantom.
3. Note the thickness indicated on the compression device. The compression thickness indicator shall always be within ± 0.5 cm of the actual thickness.
4. If the indicator is not within ± 0.5 cm, perform the thickness FAST calibration in the Calibration Tool, and then repeat this test.
5. Repeat steps 2 to 4 for thicknesses of 4 cm, 6 cm, and 8 cm.
6. Install the 24 x 29 cm paddle.
7. Repeat steps 2 to 4 for 2 cm through 8 cm of BR-12.

Chapter 7 Gantry Maintenance

7.1 Introduction

This chapter describes maintenance information and instructions for the Gantry, including:

- Removing covers and panels
- Component identification
- Component replacement procedures

Component replacement procedures are sub-divided by topics:

- X-ray and Imaging components
- Circuit boards, firmware, and circuit components
- Mechanical components and related assemblies
- Electrical power components and assemblies
- Preventive maintenance procedures



WARNING!

Disconnect system power before removing components!



Warning:

Always follow the safety precautions for x-ray exposures.



Caution:

Always obey Electrostatic Discharge (ESD) precautions when working with electronics and electronic components.



Note

If a procedure instructs you to remove any covers or panels, do not install the covers until all required procedures are completed.

Only Hologic-authorized, trained service engineers can service this system. The system is designed for module-level repair.

7.2 Remove Gantry Covers and Bellows

Maintenance procedures in this chapter require removal of Gantry or C-arm covers, panels and bellows to gain access to the interior.

Do not install any covers or panels until all required procedures are completed.

7.2.1 Gantry Cover Removal

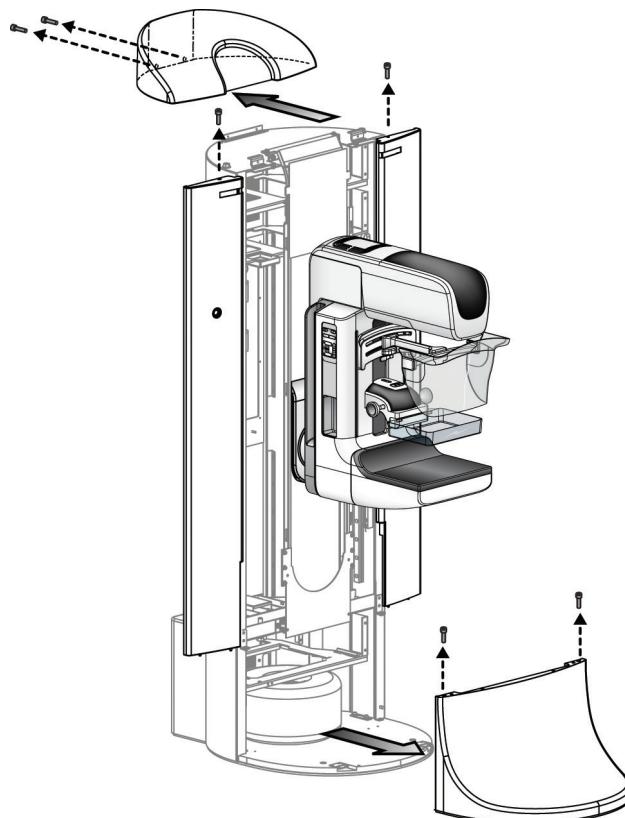


Figure 68: Gantry Covers Removal

Top, Side, and Bottom Covers Removal

1. Remove the two screws that fasten the Gantry top cover and remove the cover.
2. Remove the bolts located at the top of each Gantry side cover
3. Slide the covers up, and use the inside hooks on the covers, and outer slots on the frame to support the covers while performing the next step.
4. Remove the screws that fasten the bottom cover, and remove it by sliding the cover down from the retaining pins and forward.

Upper Rear Access Panel Removal

1. Remove the screws that fasten the Upper Rear Access Panel to the Gantry.
2. Lift the panel off.

Lower Rear Access Panel

1. Remove the screws that fasten the Lower Rear Access Panel to the Gantry.
2. Lift the panel off.

Lower Gantry Bellows Removal

1. Remove the Top, Sides, and Bottom covers—see figure [Gantry Cover Removal](#) on page 106.
2. Remove the four socket head screws from the right and left side of the bellows frame. See item 1 in the following figure.
3. Remove the three hex-head flat screws from each side of the lower housing. See item 2.
4. Remove the two socket head screws from the front of the lower bellows frame. See item 3.
5. Slide the lower frame and lower bellows out from the bottom.

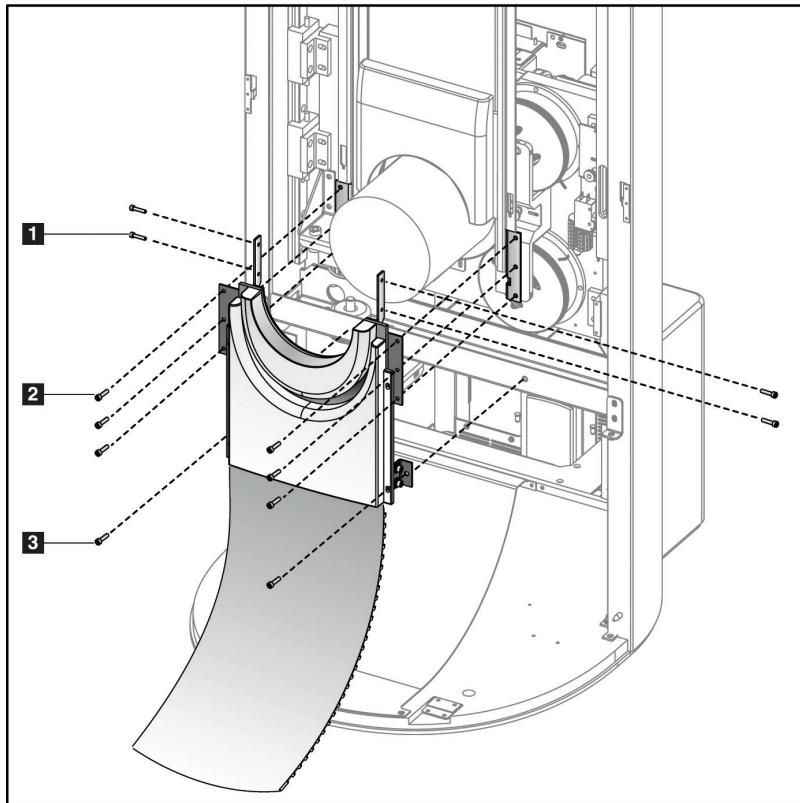


Figure 69: Lower Bellows Removal

Upper Gantry Bellows Removal

1. Remove the lower frame and bellows—See figure [Lower Gantry Bellows Removal](#) on page 107.
2. Remove the two socket head screws from the top of the upper bellow frame. See item 1 in the following figure.
3. Tilt the upper frame with attached upper bellows to the side and out.

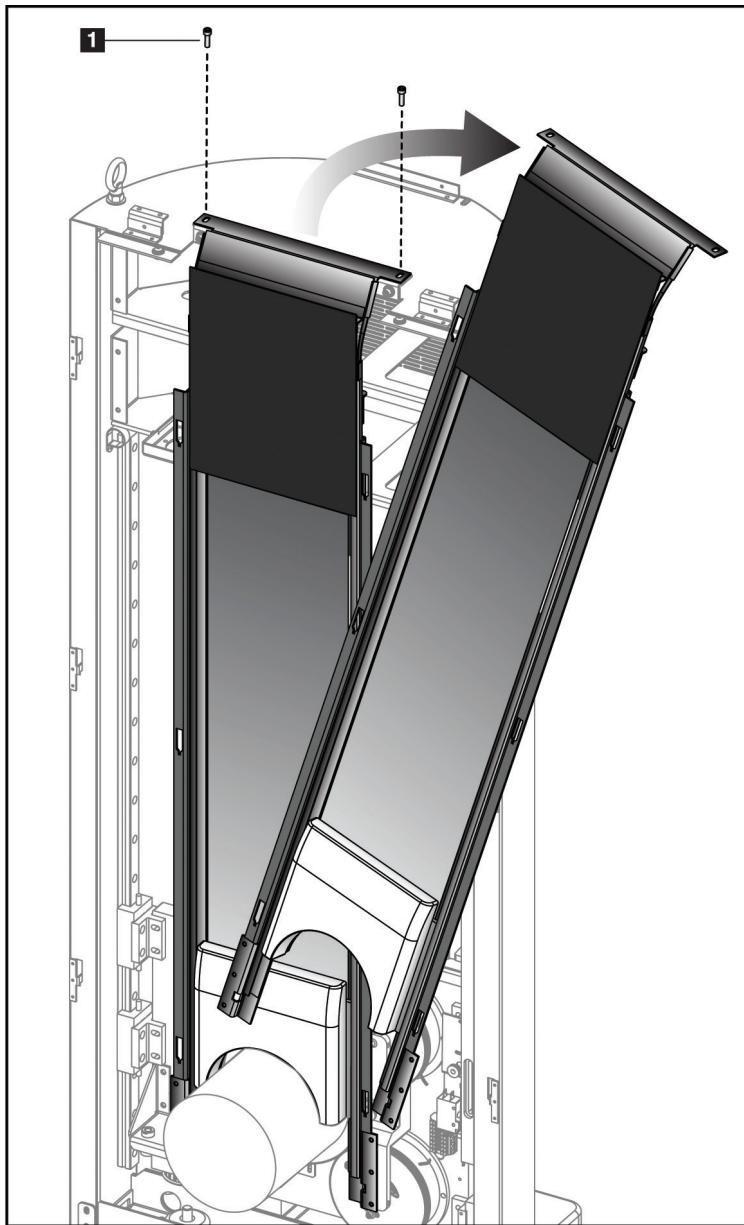


Figure 70: Upper Bellows Removal

7.2.2 C-Arm Cover Removal

Access to the serviceable components and assemblies of the C-arm are through:

- X-ray Tube Arm (Tubehead) Covers
- C-Arm Housing
- Compression Device Covers
- Compression Bellows Assembly

Top X-ray Tube Arm (Tubehead) Cover Removal

Remove the Top X-ray Tube Arm (Tubehead) Cover. See the following figure.

1. Lower the C-arm, and tilt in either direction to access rear mounting screws.
2. Remove the rear mounting screws.
3. Return the C-arm to the vertical position.
4. Remove the front (inner) mounting screws.
5. Lift the rear of the cover, to release the integral snaps on the cover.
6. Slide the cover forward and off.

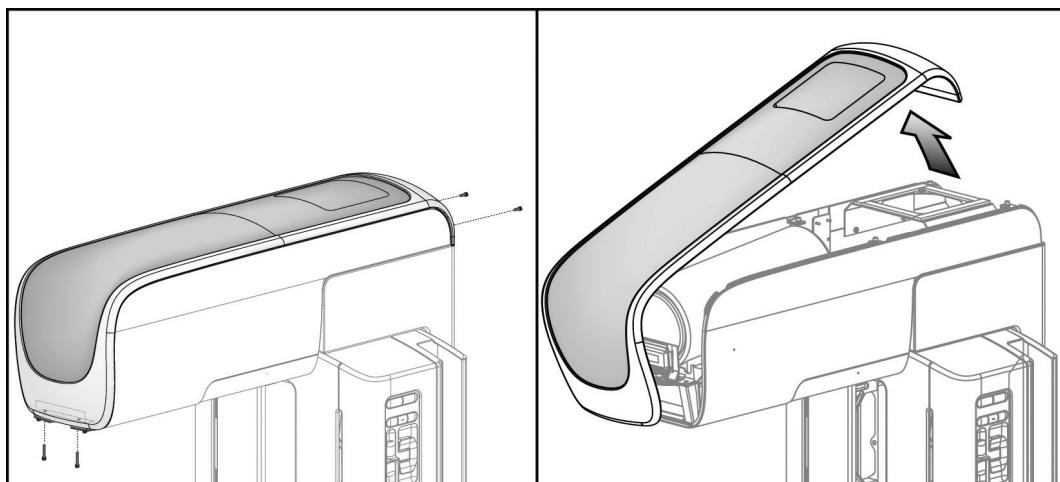


Figure 71: Top X-ray Tube Arm (Tubehead) Cover Removal

Bottom Tubehead Cover Removal

To remove the Bottom X-ray Tube Arm (Tubehead) Cover, see the following figure.

1. Remove the Top Cover.
2. Loosen the six hex-head screws in the fastening brackets. See exploded view.
3. Position the brackets *inward toward the tubehead* to release the tabs that fasten the top cover.
4. Remove the two screws (outer) at the front of the Bottom Cover.
5. Remove the cover.
6. Remove the lower tubehead cover bracket.

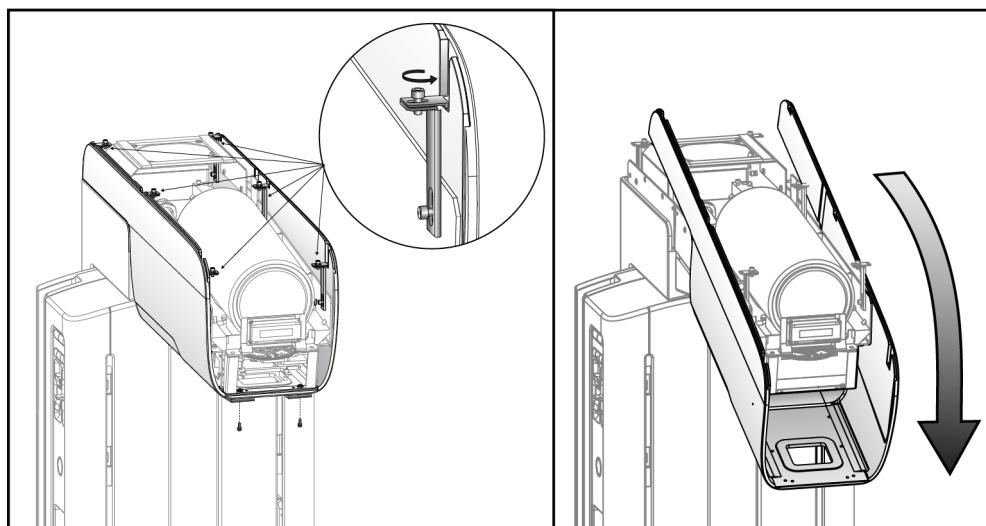


Figure 72: Bottom Tubehead Cover Removal

C-Arm Housing Removal



Note

An 8-inch 5/32 inch T-handle hex wrench with ball head is required for removing the inner cover of the C-Arm Housing.

1. Remove the X-ray Tube Arm (Tubehead) covers—refer to the [Top X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 109, and [Bottom Tubehead Cover Removal](#) on page 110.
2. Remove the Breast Platform—refer to [Remove the Breast Platform and Image Receptor](#) on page 122.
3. Remove the Detector (IRSD)—refer to [Remove the Breast Platform and Image Receptor](#) on page 122.
4. Remove the Grid Assembly—refer to the topic [Remove the Breast Platform and Image Receptor](#) on page 122 .

5. Remove the upper and lower Compression Device covers—refer to the topic [Compression Device Covers](#) on page 112. (The Device is not shown for clarity.)
6. Using an 8-inch 5/32 inch T-handle hex wrench, loosen the two retaining screws from the inner cover—see the following figure.
7. Manually lower the Compression Device, and tilt the inner cover up and out being careful not to scrape the cover against the Compression Device displays.
8. Remove the six C-Arm Housing screws that fasten the housing to the C-arm frame. Be careful not to drop the screws. A magnetic bit would be helpful here.
9. Slide out the detail filler cover at the bottom of the C-Arm Housing.
10. Retract the C-Arm Housing approximately 2 inches, and disconnect the switch panel cables and ground connections.
11. Slide the C-Arm Housing forward gently to remove.
12. Reverse the above steps to install the C-Arm Housing. Be careful not to pinch the cables.

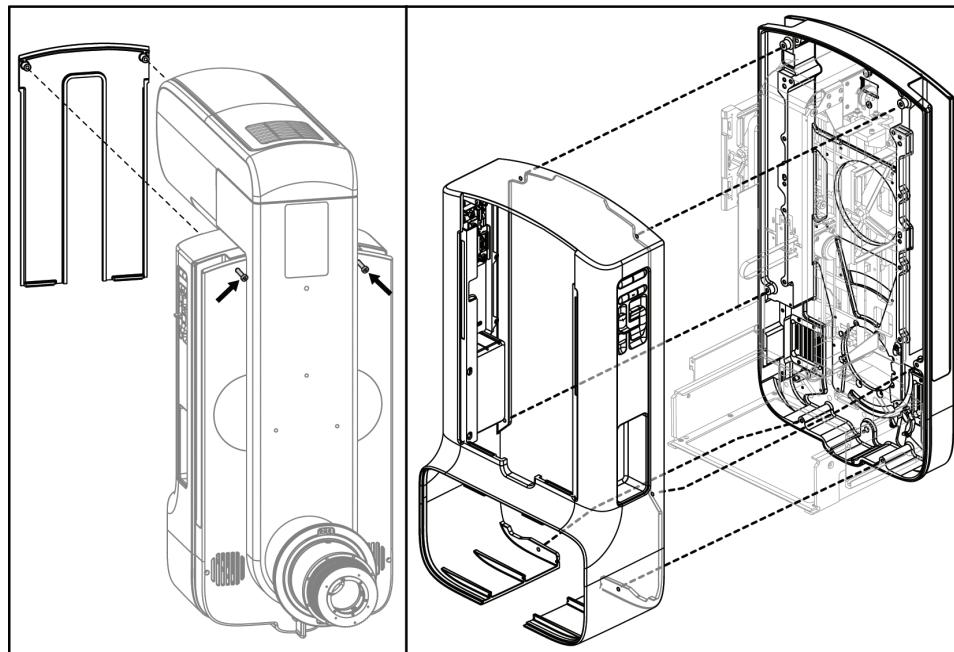


Figure 73: C-Arm Housing Removal

Compression Device Covers

Access to the serviceable components are through the Upper and Lower Compression Device Covers (see the following figure).

To remove the upper and lower covers:

1. Manually raise the Compression Device to access the bottom cover.
 2. Remove the two screws that fasten the bottom cover and remove (item 1).
 3. Loosen, but do not remove, the two set screws (from the bottom) in each compression knob, and slide the knobs off the shaft (item 2).
 4. Remove the four screws that fasten the top cover at the bottom of the Compression Device Interface Board mounting plate (item 3).
-



Note

When reassembling the Compression Device Knobs to the shafts ensure that the key on the knob fits into the key of the compression device.

5. Place a small amount of Loctite 222 (2-580-0525) to the (4) 8-32 x 1/4 inch set screws. Align the set screws holes in the knobs to the dimples on the shafts. Assemble and tighten the set screws.

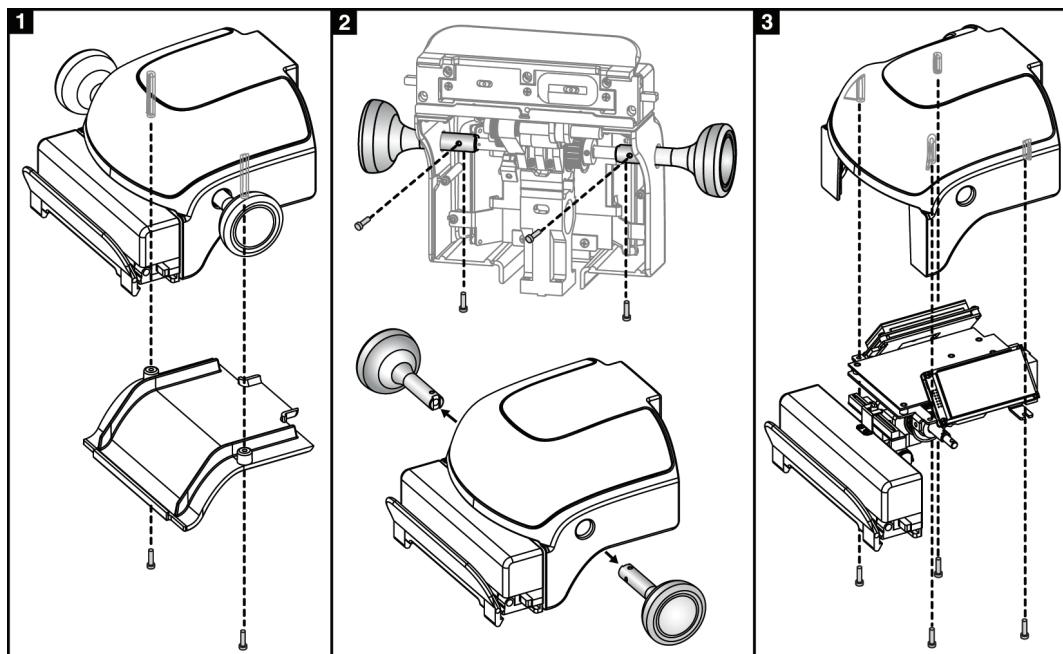


Figure 74: Compression Device Covers

C-Arm Compression Bellows Assembly—Removal

1. Remove the top X-ray Tube Arm (Tubehead) cover—see [Top X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 109.
2. Remove the bottom tubehead cover—see [Top, Side, and Bottom Covers Removal](#) on page 106.
3. Remove the C-arm housings, breast platform, and grid assembly—see [C-Arm Housing Removal](#) on page 110.
4. Remove the external compression device—see [Remove the External Compression Device](#) on page 153.
5. Release the bellows metal straps from the top and bottom drive pins that fasten the bellows to the compression device front plate. See the following figure.
6. Remove the 3 upper (item 3) and 4 lower (item 2) screws from the bellows assembly.

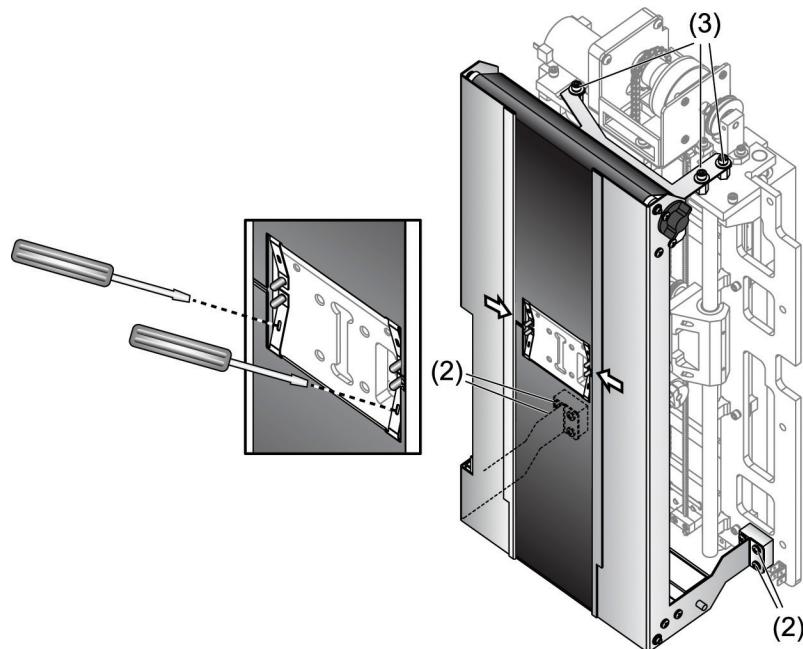


Figure 75: C-Arm Bellows Removal

C-Arm Compression Bellows Assembly—Install

1. Attach the lower bellows assembly with two screws in each block.
 2. Attach the upper bellows assembly with three screws in the upper standoffs.
 3. Attach the bellows metal straps to the top and bottom pins on the mounting block.
-

Note



Use two small 1/8-inch blade screwdrivers in the slots of the straps to install. DO NOT over extend the straps.

4. Make sure you can access the circuit harness and the gear belt at the front.
5. Verify clearance from the carriage components to the bellows track.
6. Replace the compression device.
7. Reverse the procedures described in [C-Arm Cover Removal](#) on page 109, and [C-arm](#) on page 116 to install the previously removed covers, the breast platform, and grid assembly.
8. Verify the Compression Force, and Compression Thickness from the Calibration Tool.

7.3 Component Identification

7.3.1 Gantry

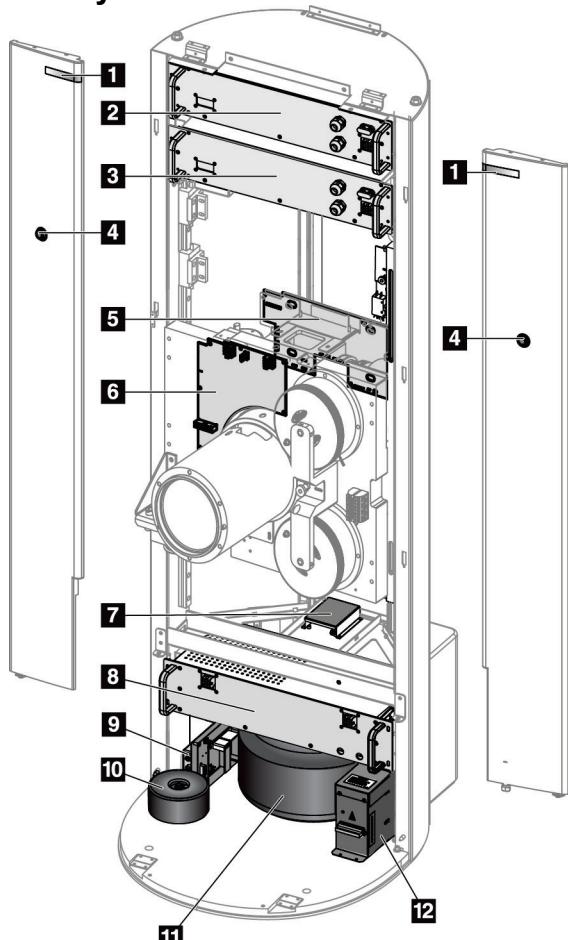


Figure 76: Gantry Component Location

Item	Section
1. Rotation Angle Display (2)	Rotation Angle Display Board(s) on page 138
2. HV Multiplier Drawer	Remove the HV Multiplier Drawer on page 124
3. HV Inverter Drawer	Remove the HV Multiplier and HV Inverter Drawers on page 124
4. Emergency Off Switch (2)	Emergency Off Switch on page 146
5. VTA Control Board	VTA Control Board on page 139
6. VTA Drive Board	VTA Drive Board on page 139
7. Gantry Service Port Board	Gantry Service Port Board on page 138
8. Power Distribution Drawer	Power Distribution Drawer on page 147
9. 24 V Power Supply and External User Indicator Boards	24 V Power Supply and External User Indicator Board on page 149
10. Detector Isolation Transformer	Detector Isolation Transformer on page 148
11. Isolation Transformer	Isolation Transformer on page 147
12. Capacitor and Bridge	Capacitor and Bridge Assembly on page 149

7.3.2 C-Arm

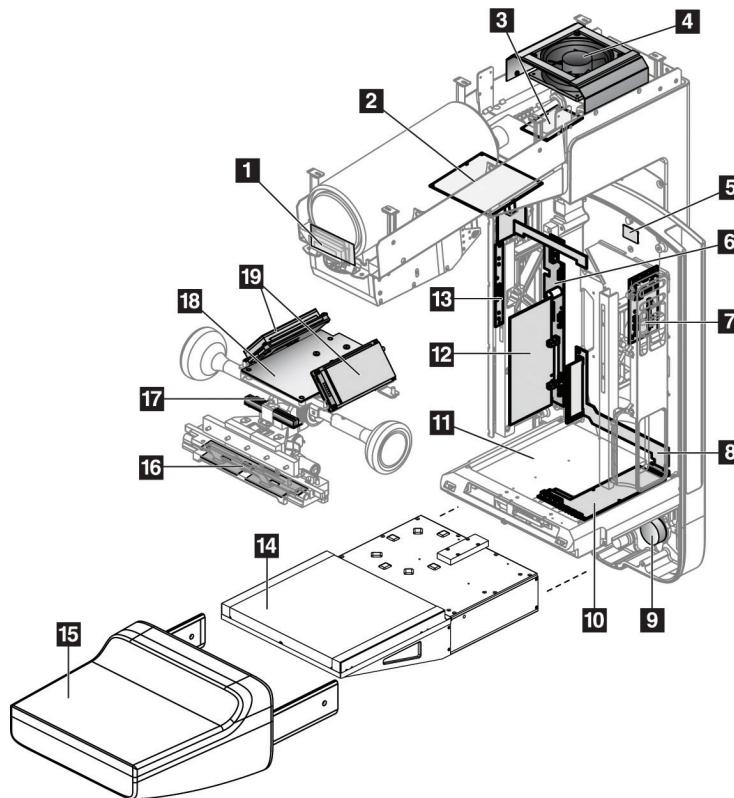


Figure 77: C-Arm Component Location

Item	Section
1. C-arm Angle Display Board	C-Arm Angle Display Board on page 133
2. Tubehead Microprocessor Board	Tubehead Microprocessor Board on page 133
3. Filament Protect Board	Filament Protect Board on page 134
4. Tubehead Cooling Fan	Tubehead Cooling Fan on page 143
5. Zero Position Board (not visible)	Zero Position Board on page 140
6. C-arm Transition Board	C-Arm Transition Board on page 134
7. C-arm Switch Board (2)	C-Arm Switch Boards on page 135
8. Grid Transition Board	Grid Transition Board on page 135
9. Tomo Angle Pot (Tomosynthesis option)	Tomo Angle Potentiometer (Tomosynthesis Option) on page 141
10. Grid Interface Board	Grid Interface Board on page 135
11. Grid Assembly	Install the Grid Assembly on page 123
12. C-arm Board	C-Arm Board on page 135
13. Mag Sense Board	Mag Sense Board on page 136
14. Image Receptor	Remove the Breast Platform and Image Receptor on page 122
15. Breast Platform	Remove the Breast Platform and Image Receptor on page 122
16. RFID Board	RFID (Radio Frequency Identification) Board on page 137
17. Paddle Position Sensor Board	Grid Transition Board on page 135
18. Compression Device Interface Board	Compression Device Interface Board on page 136
19. Compression Displays	Compression Device Display Boards on page 136

7.3.3 Compression

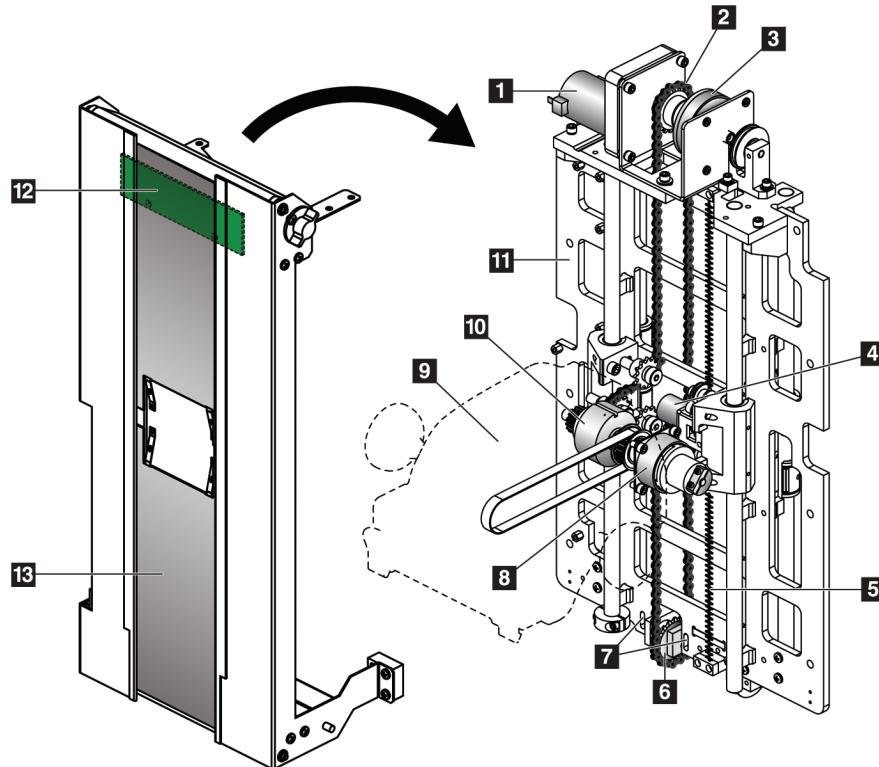


Figure 78: Compression System Components

Item	Section
1. Compression Motor	Compression Motor and Brake on page 158
2. Compression Chain	Compression Chain Adjustment on page 160
3. Compression Motor Brake	Compression Motor and Brake on page 158
4. Compression Thickness Potentiometer	Compression Thickness Potentiometer on page 156
5. Compression Thickness Timing Belt	Compression Timing Belt on page 159
6. Chain Idler Gear	Compression Chain Adjustment on page 160
7. Chain Adjustment Points	Compression Chain Adjustment on page 160
8. Slip Clutch/Brake Magnet and Armature	Remove Slip Clutch, Brake and Armature, and Bi-Directional Brake on page 155
9. External Compression Device	Remove the External Compression Device on page 153
10. Bi Directional Brake	Remove Slip Clutch, Brake and Armature, and Bi-Directional Brake on page 155
11. Internal Compression Device	Remove the Internal Compression Device on page 154
12. Face Shield Sense Board	Face Shield Sense Board on page 140
13. C-arm Bellows	C-Arm Compression Bellows Assembly—Removal on page 113

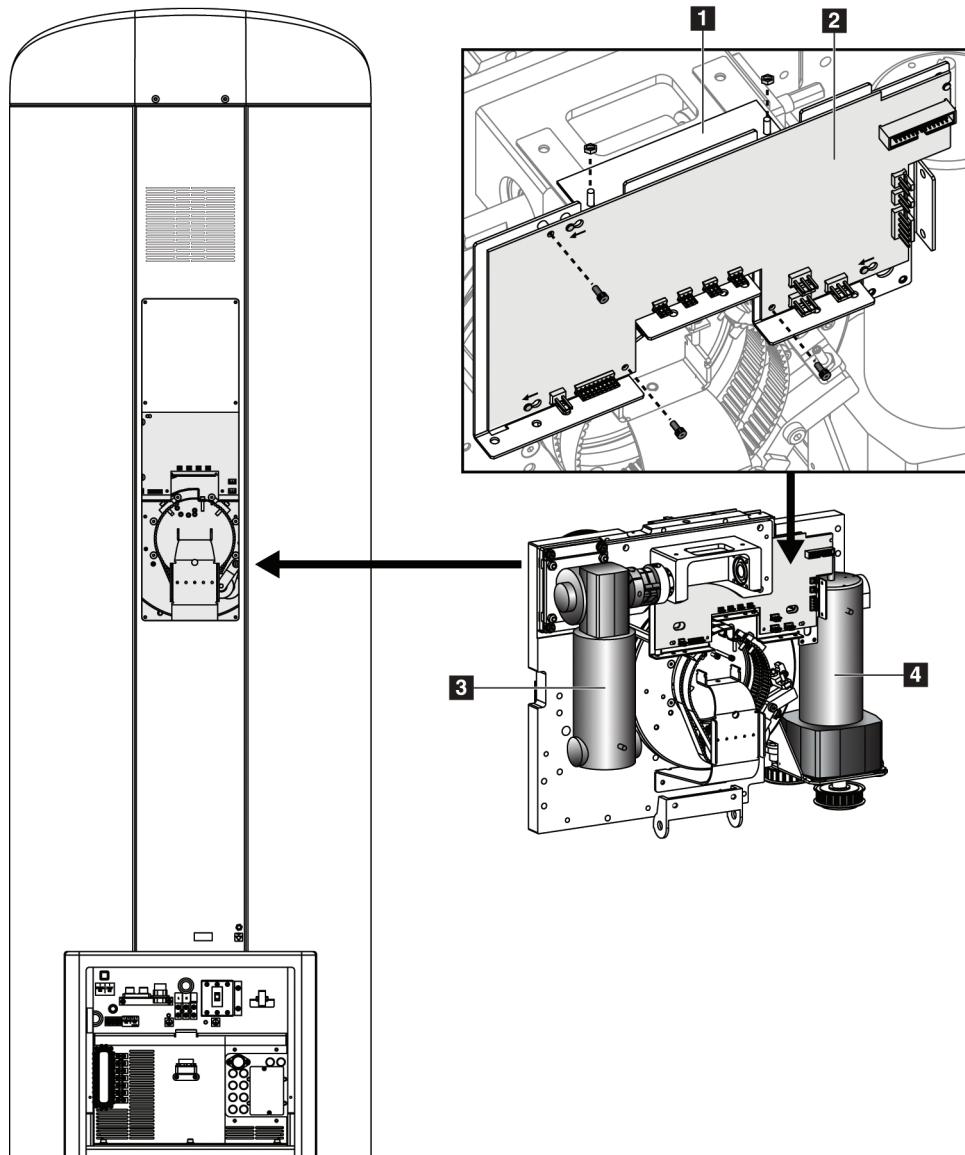
7.3.4 VTA and Rotation

Figure 79: C-Arm Rotation and Vertical Travel Components

Item	Section
1. VTA Power Filter Board (not shown)	VTA Power Filter Board on page 139
2. VTA Control Board	VTA Control Board on page 139
3. C-Arm Rotation Drive Motor and Gearbox	C-Arm Rotation Drive Motor and Gear Box on page 150
4. C-Arm Vertical Drive Motor and Gearbox	C-Arm Vertical Drive Motor on page 152

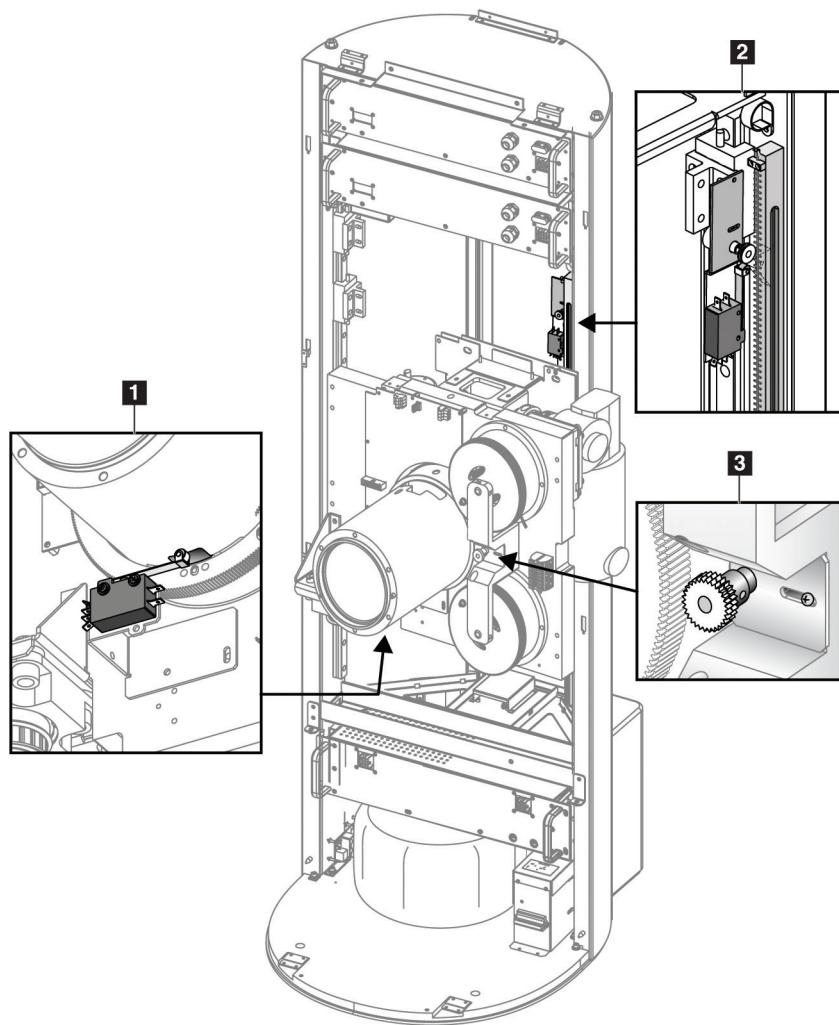
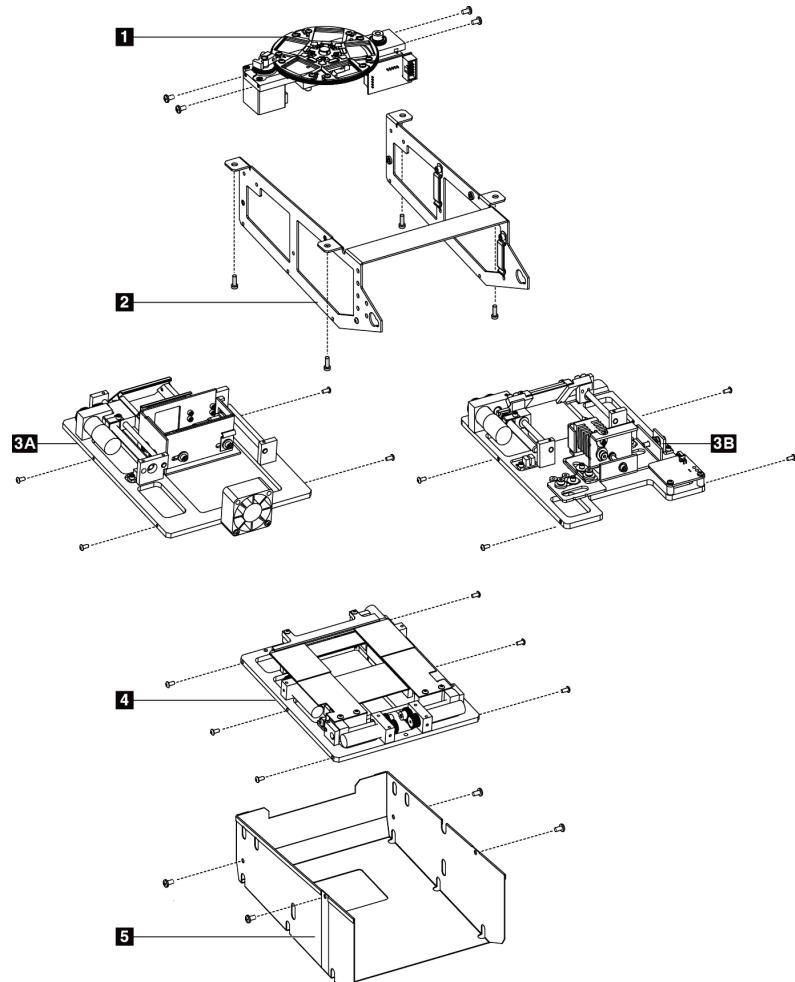


Figure 80: C-Arm Rotation and Vertical Travel Adjustments

Item	Section
1. C-Arm Rotation Limit Switch	C-Arm Rotation Limit Switch on page 140
2. C-Arm Vertical Travel Limit Switch	C-Arm Vertical Travel Limit Switch on page 140
3. C-Arm Rotation Limit Potentiometer	C-Arm Rotation Potentiometer on page 141

7.3.5 Beam Limiting Assembly

**Figure Legend**

1. Filter Wheel
2. Beam Limit Bracket
- 3A. Mirror Assembly
- 3B. LED Mirror Assembly
4. Collimator Assembly
5. Assembly Cover

7.4 Replace X-ray and Imaging Components

This section describes the replacement of x-ray and imaging components:

- Fiber Optic Cabling
- Image Receptor
- HV Multiplier Assembly
- HV Inverter Assembly
- Beam Limiting Assembly
- X-ray Tube

7.4.1 Fiber Optic Cabling

The Fiber Optic cable that connects the Gantry to the Acquisition Workstation goes to the bottom of the connector. The Fiber Optic cable from the Detector attaches to the top of the connector. At initial installation, remove the plastic protective covers from the connector.

Remove the Fiber Optic Cables

1. Remove the lower rear Gantry panel.
2. Remove the Acquisition Workstation (or Detector) Fiber Optic cable from the connector. See the following figure.

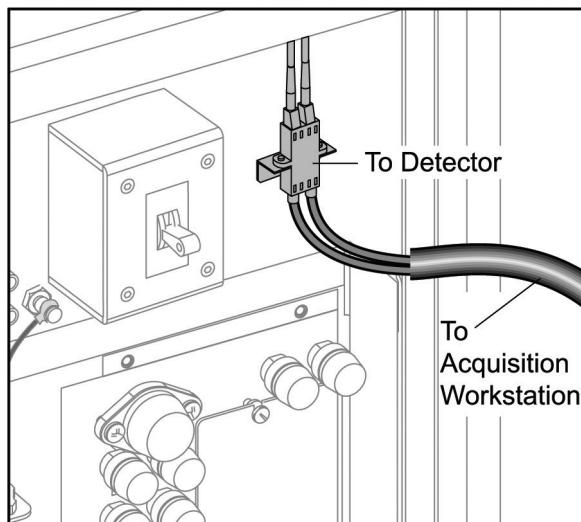


Figure 82: Fiber Optic Cable

7.4.2 Remove the Breast Platform and Image Receptor

See the following figure.

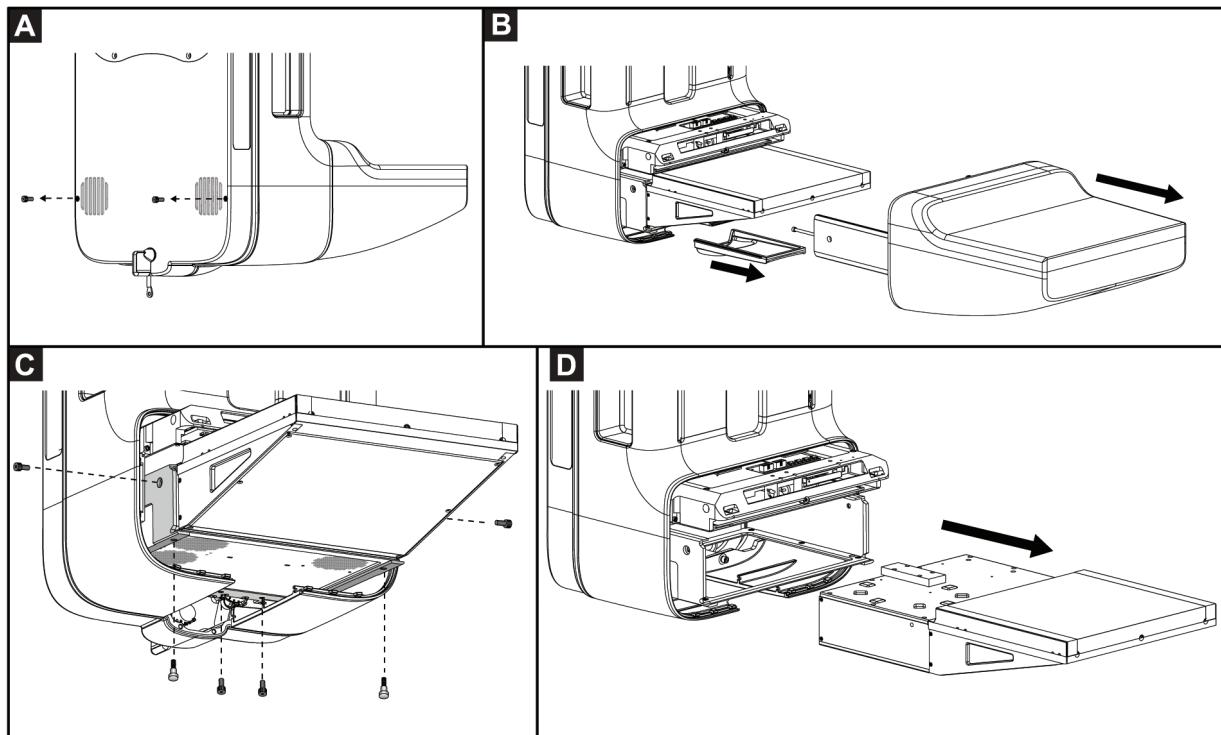


Figure 83: Breast Platform and Image Receptor

1. Remove the two hex-head screws at the rear of the C-arm that fasten the Breast Platform. Retain the hardware—A.
2. Slide the Breast Platform forward—B.
3. Slide the bottom detail insert at the rear of the C-arm forward—B.
4. Remove the two hex-head screws in each side of the Platform Mount Brackets—C.
5. Remove the two hex-head screws at the bottom rear of the Image Receptor—C.
6. Remove the two shoulder-bolts at the bottom front of the Image Receptor—C.
7. Remove the Image Receptor from the Platform Mount Brackets—D.

7.4.3 Replace the Grid Assembly

Remove the Grid Assembly

1. Remove the Breast Platform; refer to [Remove the Breast Platform and Image Receptor](#) on page 122.
2. Remove the Image Receptor.
3. Loosen the two captive screws located at the lower front of the Grid Assembly. Refer to [Install the Grid Assembly](#) on page 123 item 1.
4. Slide the Grid Assembly forward and out.

Install the Grid Assembly

1. Slide the Grid Assembly into the frame until the Grid Assembly engages the ball plungers and connector at the rear.
2. Apply downward thumb pressure at the vertical arrows in the following figure, and tighten each captive screw on the Grid Assembly—item 1.
3. Install the Image Receptor.
4. Install the Breast Platform.

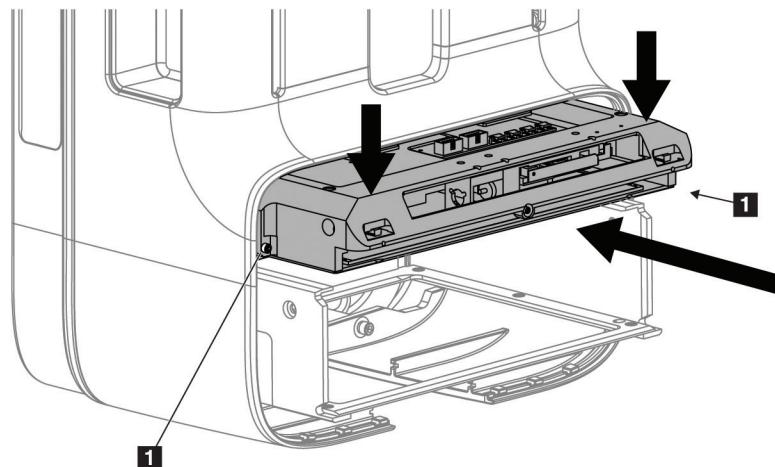


Figure 84: Install the Grid Assembly

7.4.4 Remove the HV Multiplier and HV Inverter Drawers

To access the HV Multiplier and Inverter Drawers, remove the Gantry covers and Bellows—refer to [Gantry Cover Removal](#) on page 106.

Remove the HV Multiplier Drawer

1. Apply power, lower and rotate the C-arm to expose the two drawers.
2. After the C-arm is in a good spot to access the multiplier, turn off power to the gantry.

Note



Wait at least 5 minutes after turning off power to the Gantry before disconnecting the cables from the front of the drawer.

3. Disconnect the cables from the front of the drawer.
4. Remove the screws from the corners of the drawer.
5. Slide the drawer out.

Remove the HV Inverter Drawer

Follow the procedure for removal of the HV Multiplier Drawer.

7.4.5 Remove the Image Receptor Cooling Fans

1. Remove the Image Receptor—see [Remove the Breast Platform and Image Receptor](#) on page 122.
2. Remove the grid tray:
 - Remove the six hex-head screws in the center of the frame
 - Pull out the grid tray
3. Unplug the fan(s), and remove the four screws that fasten the fan(s).

7.4.6 Beam Limiting Assembly - Replacement

See [Beam Limiting Assembly](#) on page 120 for reference.



Warning:

The Beam Limiting Assembly contains lead. Return the replaced assembly to Hologic for proper disposal.

The following procedures explain removal of the Beam Limiting Assembly.

1. Remove the top and bottom tubehead covers. See figure [Top X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 109, and figure [Bottom X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 110.
2. Remove the four screws that fasten the Beam Limit Bracket to the X-ray Tube Arm (Tubehead) frame.

3. Tilt the Beam Limit Bracket downward for servicing.
-

Note

To remove the assembly for complete servicing, continue with the following steps:

- 
4. Noting each cable position and orientation, disconnect all cables from the Beam Limiting Device.
 5. Move the Beam Limit assembly slightly backward to disengage the assembly from the holding studs and gently remove the assembly from the X-ray Tube Arm (Tubehead) cradle.
 6. Remove the Beam Limit Assembly cover.
 7. Remove the two screws on each side of the filter wheel frame.
 8. Carefully remove filter wheel assembly and set aside.
 9. Remove the four small hex screws that fasten the Mirror Assembly to the Beam Limit Bracket.
 10. Carefully remove the Mirror Assembly and set aside.
 11. Remove the hardware that fastens the Collimator Assembly to the Beam Limit Bracket.
 12. Carefully remove the Collimator Assembly and set it aside. Use care not to damage the lead on the collimator blades.
 13. Reverse the steps to install the replacements, noting the following: When mounting the Mirror Assembly to the Beam Limit Bracket, it must be parallel to the bracket to avoid binding or interference. Preload the mirror assembly up and then tighten the four screws. During this process, use care not to damage the lead on the collimator blades.
 14. Using the Calibration Tool, perform the X-Ray and Light Field Alignment.
If the correct calibration instructions are not appearing, reset the THD module:
 - a. Go to the Advanced Form in CalTool.
 - b. Click the "THD" link in the "Nodes" list on the left side of the screen.
 - c. Click the "Module Reset" button in the pop-up window that appears.
 - d. Close the pop-up window.When the module is finished resetting, the THD Status and State in the Nodes list displays "Ready".

7.4.7 X-ray Tube Maintenance

Equipment Required

Table 4: Equipment Required for X-ray Tube Maintenance

No.	Name	Part Number	Notes
1	Tube Alignment, Upper	TLS-00804	
2	Tube Alignment, Lower	TLS-00803	
3	Acrylic Block (Gain Calibration)	3-605-1876	Block and Case ASY-01621

Note

This procedure requires that the array be mounted to the Gantry, and that the appropriate defect map files are present. The C-arm and Tomo arm angle must also be calibrated. The detector cradle must be aligned with the C-arm using the alignment dowel if it has not been aligned.

Preparation

1. Rotate the C-arm to zero degrees if it is not already at that position.
 2. Lower the c-arm to a workable height so you will be able to work on the upper portion of the tube head where the x-ray tube is installed and the lower portion where the beam limiting assembly resides.
-

**WARNING!**

Ensure that system power is Off and the Gantry circuit breaker is in the Off position.

3. Remove the upper and lower tube head covers; see figure [Top X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 109 and figure [Bottom X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 110 so you can gain access to the x-ray tube and the beam limiting assembly.
4. Remove the lower cover mounting bracket located in front of the beam limiting assembly by removing the two cap head Allen screws. (See item 1 in the following figure.)

5. Next, unplug the tube head display and remove the display assembly (See item 2 in the following figure.)

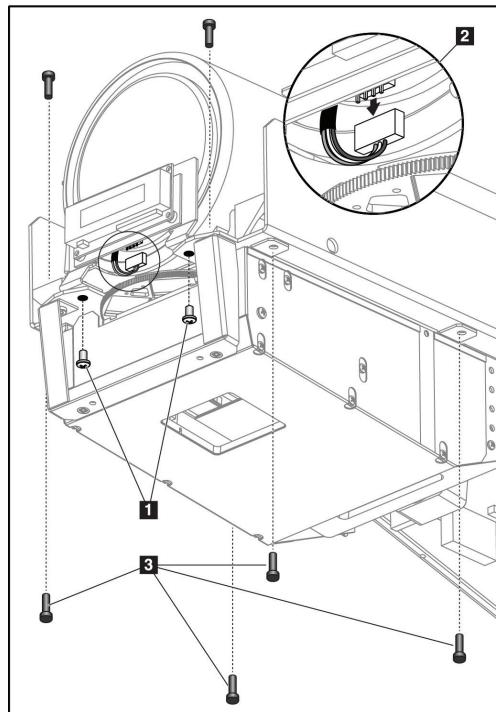


Figure 85: Lower Cover Mounting Bracket Removal and Display Connection

6. Mark the location of the beam limiting assembly against the tube head cradle assembly using a pencil (This will aid in alignment when reinstalling the beam limiting assembly). Remove the 4 cap head Allen screws that retain the beam limiting assembly to the tube head (See item 3 in the previous figure).
7. Lower the Collimator and allow it to hang vertically as shown in item 1 in the following figure.

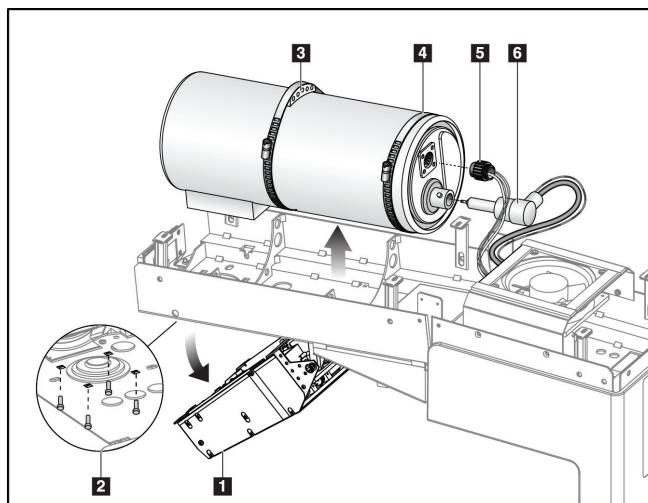


Figure 86: X-ray Tube, Beam Limiting Assembly

Removal and Replacement of the X-ray Tube

1. Disconnect the connections from the back of the x-ray tube. (See item 5 and item 6 in the previous figure.)
2. Remove the x-ray tube thermal sensor and the clamp from the x-ray tube so it can be installed on the replacement x-ray tube. (See item 3 in the previous figure.)
3. Remove the 4 tube mounting screws; item 2 and tube retention strap item 4 in the previous figure.
4. Remove the old X-ray tube from the unit and install the replacement x-ray tube.
 - a. Transfer the adjustment bracket from the old x-ray tube to the new x-ray tube.
 - b. Reinstall the rear 2 cap head Allen screws previously removed from around the x-ray port. **DO NOT TIGHTEN** the screws; leave them loose for adjusting the x-ray tube. Do not install the front 2 front cap head Allen screws or damage may occur to the filter wheel assembly.
 - c. Reconnect the connections to the rear of the x-ray tube. Be sure that there is sufficient HV grease applied to the HV connection so arcing will not occur.
 - d. Install the thermal temperature sensor and retention strap onto the replacement x-ray tube.
5. Reposition the beam limiting assembly and secure it in place to the tube cradle with the 4 screws previously removed. Leave the tube head cover mounting bracket and display unplugged. The beam limiting assembly is removed again after final adjustments have been made.
6. Move the tube to full forward position and all the way to the left position using the side and front adjustment screws. (See the following figure.)

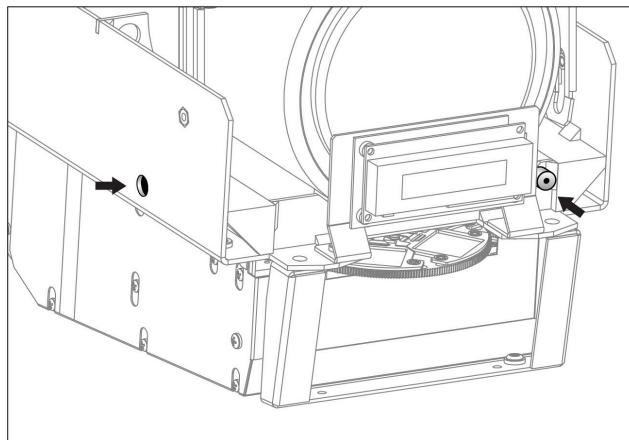


Figure 87: Alignment Adjustment Screws

Installation of the Alignment Templates (TLS-00804 and TLS-00803)

1. Place the Gantry circuit breaker in the On position, and the system power On.
2. Place the TLS-00804 (Upper alignment template) on the breast platform and Install the TLS-00803 (Lower alignment template) into the compression device as shown in the following figure.

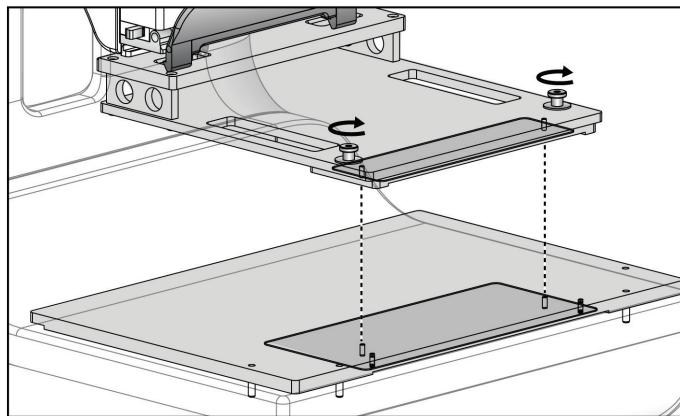


Figure 88: X-ray Alignment Templates and Pin Alignment

3. Loosen the two thumb screws on the upper alignment template.
4. Assure that the locator pins (two at the front , one on the left, and one on the right) associated with the lower alignment template are all mounted squarely to their respective edges of the breast platform.
5. Lower the upper alignment template onto the lower alignment template, aligning the two dowel pins of the upper template into the holes of the lower template.
6. Tighten the two thumb screws once the alignment is complete.
7. Raise the compression device and temporarily remove the lower template from the breast platform.
8. Raise compression device so that the height measured from the surface of the breast platform to the lower most portion of upper template measures 13.25 inches.

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9. Replace the lower template (TLS-00803) onto the breast platform and assure that the locator pins (two on the front, one on the left, one on the right) associated with the lower template are all mounted squarely to their respective edges of the breast platform. Place the acrylic block (item 1 in the following figure) on top of the lower alignment template.

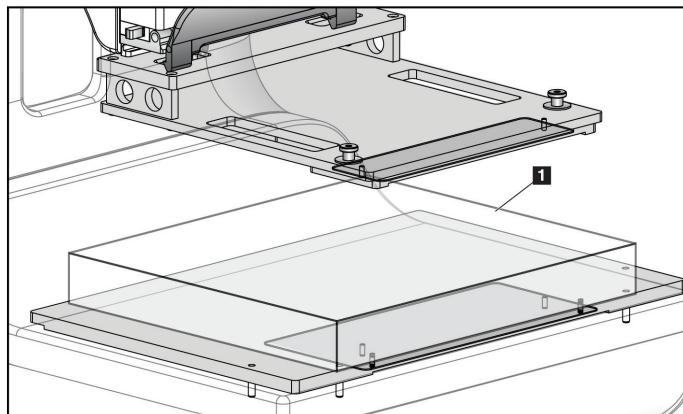


Figure 89: Acrylic Block on Top of the Lower Template

Adjusting the X-ray Tube

1. Launch Caltool and click on the "Advanced" menu and select the "Technique" tab. Configure the Exposure Techniques as indicated in the table below:

Modality	Mode	Filter	Kv	mA	mAs	Grid	FS
Conventional	MAN	1	30	140	160	Out	Large

2. In the "Image tools" tab, click on the "Click to Arm" button and take an exposure by pressing the x-ray switches.

3. Once the exposure has been acquired it should be visible on the monitor. The image is oriented with the chest wall at the right hand side. An example of indications from Vernier scales and direction is shown in the following figure (the image has been rotated in the example). **You will be not be able to rotate the image in Caltool.**

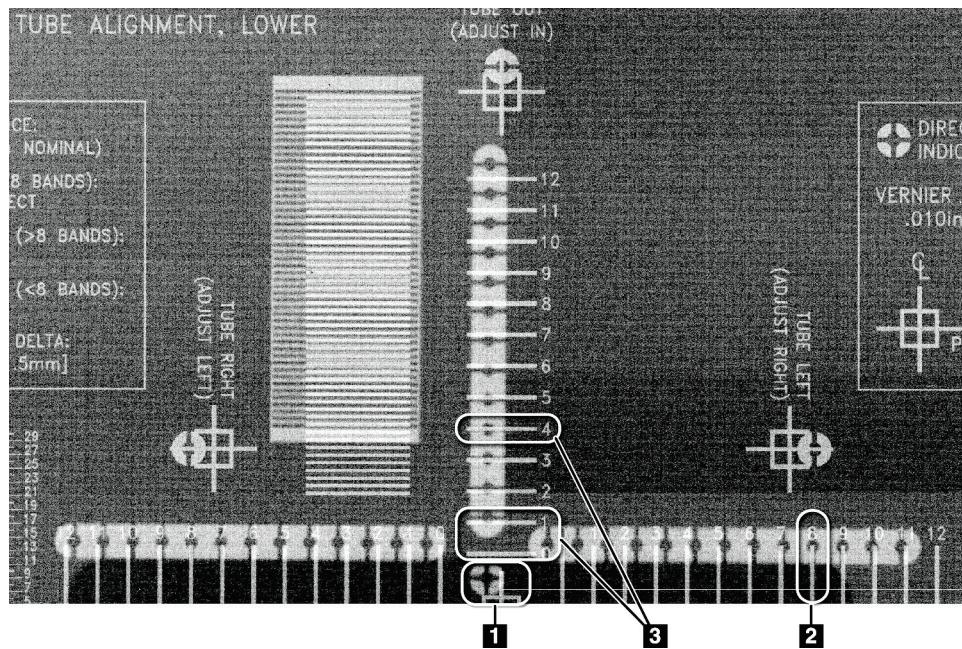


Figure 90: Exposure Example Showing the Vernier Scale

- The direction indicator shows the tube is out or forward and to the right (#1 in the previous figure).
 - The direction indicator also shows the tube X axis is off by .08 to the right by less than .11 (marker aligns between 7 and 9) —item 2 in the image above.
 - The Y axis is out greater than .11 Y adjustment would be $.04 + .10 = .14$ inches (marker between 0 and 1 is off the scale and marker aligns between 3 and 5) — item 3 in the previous figure.
4. Make adjustments to the tube alignment using the X and Y (refer to figure [Alignment Adjustment Screws](#) on page 128) axis adjustment screws so the tube alignment is less than .11 inches and take new exposures to confirm tube locations. Readjust and perform exposures as needed to get the markers to align at zero.
 5. Once the Tube has been aligned, power off the gantry and lower the beam limiting assembly by removing the 4 Allen head screws.
 6. Install the 2 front cap head screws and carefully tighten the tube head mounting bolts, being careful not to move the tube.
 7. Once the tube mounting bolts have been tightened, tighten the rear mounting strap.
 8. Reposition the beam limiting assembly and secure it in place to the tube cradle.
 9. Secure the bottom cover mounting bracket and plug the tube head display back in.

10. Power on the system and perform one last exposure to verify that the tube is aligned properly after tightening the retention bolts and strap. The alignment should be less than .11 inches in both the x and y direction, .11 inches is the maximum allowed and calibration should exceed this specification and be aligned as best as possible to get the markers to align at zero.
11. Remove the acrylic block from the breast platform and the upper and lower alignment templates.
12. Reattach and secure the upper and lower tube head covers.

Calibration



Note

The small focal spot is not available on the Selenia Dimensions 2D Screening system.

1. Perform the following calibrations and adjustments:
 - a. Reset the exposure counter by launching Caltool, and clicking on the "Advanced" menu.
 - b. Click on the "GEN" tab. Then click the "CLR" button next to "Exposure Count"—Caltool.
 - c. Tube Warm-up —Caltool (If your Caltool version does not have the procedure acquire several 28kV, 200mAs, Rhodium filter, Large focal spot exposures)
 - d. Generator kV—Caltool.
 - e. mA Calibration—Caltool.
 - f. Filament Calibration Large and Small Focal spot—Caltool.
 - g. X-ray Field Large Focal Spot and Small Focal Spot—Caltool.
 - h. Light Field Alignment—Caltool.
 - i. Half Value Layer (HVL) adjustment—Caltool or spreadsheet.
 - j. Gain Calibration in the Acquisition Workstation application
 - k. Dark offset—Caltool.
 - l. Goaltab Generation—Caltool.
 - m. Goaltab Scale—Caltool.
 - n. Goaltab Scale mag—Caltool.
 - o. If the Unit is equipped with an Affirm™ breast biopsy guidance system, the Geometry calibration and STX calibration will need to be re-performed in the Acquisition Workstation application.
2. Evaluate the systems operation, AEC performance, Dosage, Exposure index of the system and schedule for physicist review.

7.5 Replacing Circuit Boards and Circuit Components

Note

The correct CAN software should be installed on the boards for the version of software installed on the computer.

7.5.1 Introduction

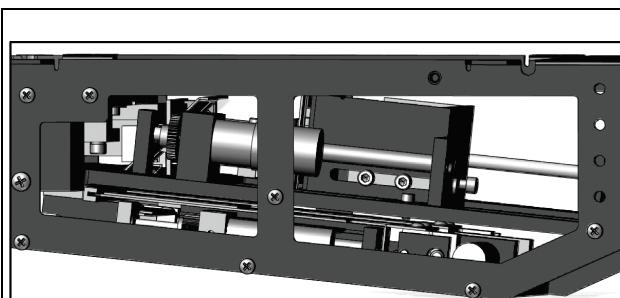
The procedures in this Section require removal of covers or panels to gain access to circuit boards.

7.5.2 C-Arm Angle Display Board

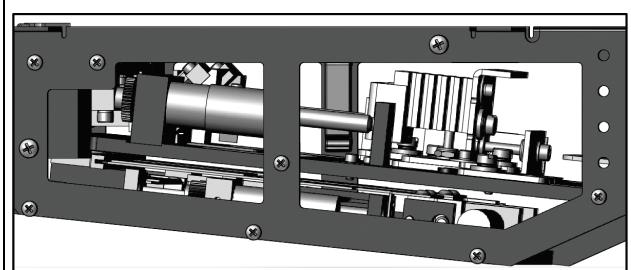
1. Remove the cable.
2. Remove the screws.
3. Remove the board.
4. Reverse the procedure to install the replacement board.
5. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide*.

7.5.3 Tubehead Microprocessor Board

1. Apply power and raise the C-arm to access the Tubehead Microprocessor Board.
2. Remove power.
3. Note the cable locations and remove all cables.
4. Remove the screws that fasten the board to the x-ray tube assembly frame.
5. Remove the board.
6. Reverse the procedure to install the replacement board.
7. Look inside beam limit assembly and determine which version of the mirror assembly is installed. (See the following figure.)



Halogen Bulb Mirror Assembly



LED Mirror Assembly

Figure 91: Beam Limit Assembly Side View

8. If the Halogen Bulb Mirror Assembly is installed, ensure that dip switch S1-4 on new board is switched OFF. (See the following figure, left.) If LED Mirror Assembly is installed, ensure that dip switch S1-4 on new board is switched ON. (See the following figure, right.)

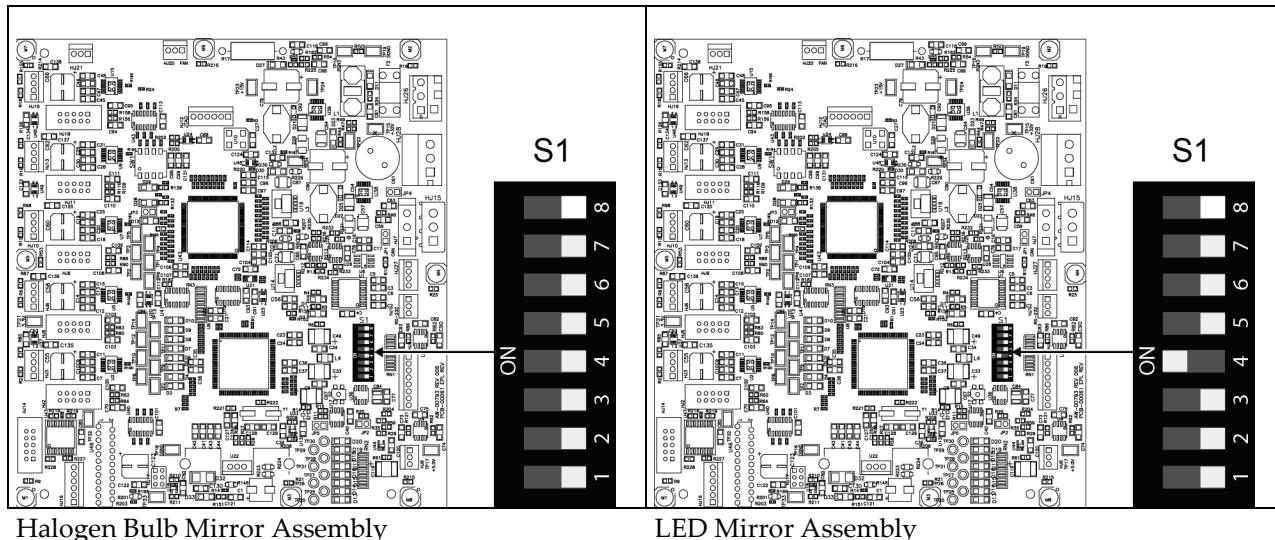


Figure 92: PCB-00061 Dip Switch S1-4 Configuration

9. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide*.

7.5.4 Filament Protect Board

1. Lower the C-arm to access the board.
2. Remove the fan and bracket assembly to access board.
3. Note the cable locations and remove all cables.
4. Remove the screws that fasten the board.
5. Remove the board.
6. Reverse the procedure to install the replacement board.
7. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide*.

7.5.5 C-Arm Transition Board

1. Note the cable locations and remove them.
2. Remove the screws that fasten the board to the frame.
3. Remove the board.
4. Reverse the procedure to install the replacement board.
5. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide* before returning the system to service.

7.5.6 C-Arm Switch Boards

1. Remove the Breast Platform and detector—see [Remove the Breast Platform and Image Receptor](#) on page 122.
2. Remove the Tubehead covers—see figure [Top X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 109, and figure [Bottom X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 110.
3. Remove the C-Arm Compression covers—see [Compression Device Covers](#) on page 112.
4. Remove the C-Arm Housing—see [C-Arm Housing Removal](#) on page 110.
5. Note the cable locations and ground wires, and remove them.
6. Carefully slide the C-Arm Housing forward.
7. Place the Housing, switch panel down on a soft cloth.
8. Remove the screws that fasten the circuit board. Be careful to make sure that the switch springs do not eject.
9. Remove the board.
10. Reverse the procedure to install the replacement board(s).
11. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide* before returning the system to service.

7.5.7 Grid Transition Board

1. Remove the External and Internal Compression Device—see [Remove the External Compression Device](#) on page 153 and [Remove the Internal Compression Device](#) on page 154.
2. Note the connector locations and remove them.
3. Remove the screws that fasten the board.

7.5.8 Grid Interface Board

1. Remove the Breast Platform—see [Remove the Breast Platform and Image Receptor](#) on page 122.
2. Remove the Image Receptor—see [Remove the Breast Platform and Image Receptor](#) on page 122.
3. Note the cable locations and remove them.
4. Remove the Grid Assembly—see [Replace the Grid Assembly](#) on page 123.
5. Remove the screws that fasten the Grid Interface Board to the Grid Assembly.

7.5.9 C-Arm Board

1. Remove the screws that fasten the board to the C-Arm Transition Board connector.
2. Pull board from the C-Arm Transition Board connector.
3. Reverse the procedure to install the replacement board(s).
4. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide* before returning the system to service.

7.5.10 Mag Sense Board

1. Remove the cable.
2. Remove the screws.
3. Remove the board.
4. Reverse the procedure to install the replacement board.
5. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide*.

7.5.11 Compression Device Display Boards

1. Remove the Compression Device Covers—see figure [*Compression Device Covers*](#) on page 112.
2. Cut the cable tie, and unplug the harness to the display board.
3. Remove the four screws at the corners of the display(s).
4. Reverse the procedure to install the replacement board(s).
5. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide* before returning the system to service.

7.5.12 Compression Device Interface Board

1. Remove the Compression Device Covers—see figure [*Compression Device Covers*](#) on page 112 .
2. Note the cable locations and remove them.
3. Remove the three screws at the top of the board. Remove the bracket and attached board.
4. Remove the bracket.
5. Remove the screws and the integral washers from the underside of the bracket.
6. Remove the board.
7. Reverse the procedure to install the replacement board.
8. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide* before returning the system to service.

7.5.13 Paddle Position Sensor Board

1. Remove the Compression Device covers. See figure [*Compression Device Covers*](#) on page 112.
2. Remove the cable from the Paddle Position Sensor Board.
3. Remove the two socket head screws that fasten the board.
4. Slide the board out through the optical interrupter switches.
5. Reverse the procedure to install the replacement board.
6. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide*.

7.5.14 RFID (Radio Frequency Identification) Board

The first part of the procedure describes the removal of the FAST Paddle Assembly; the second part describes the removal of the RFID Board. See the following figure and the figure [FAST Paddle Assembly](#) on page 138 .

FAST Paddle Assembly Removal

1. Cut the cable ties and unplug all cables from the Compression Device Interface Board.
2. Remove two socket head screws that fasten the motor mount to the drive block. See the following figure, item 1.
3. Remove five socket head screws from bottom of FAST Paddle Assembly, item 2.
4. Remove the FAST Paddle Assembly.

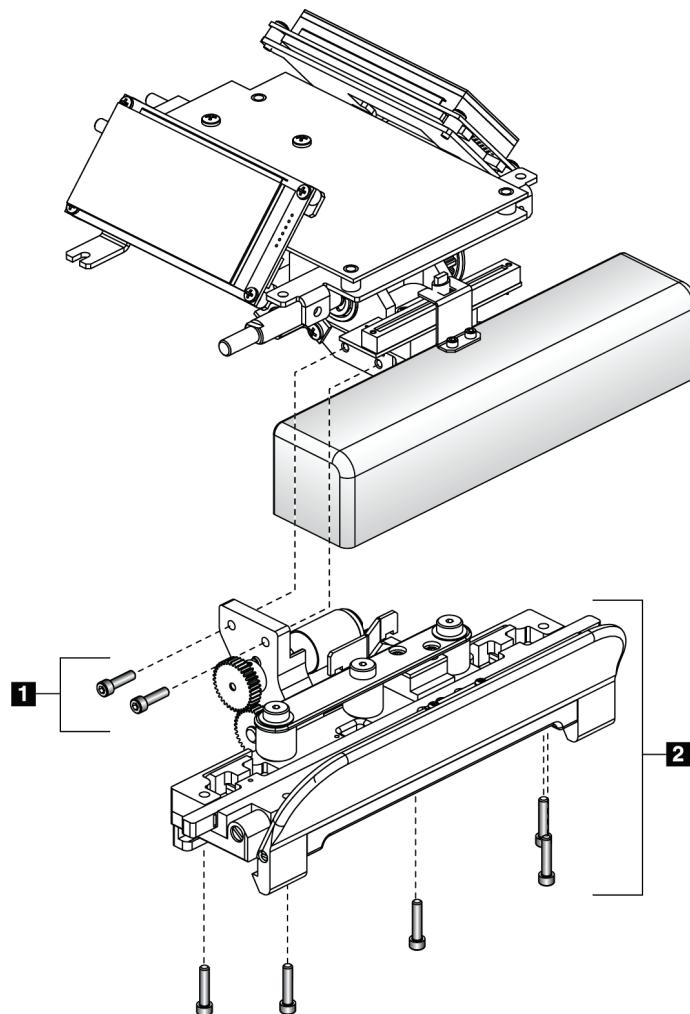


Figure 93: FAST Paddle Assembly

RFID Board Removal

1. From the bottom of the FAST Paddle Assembly, remove the three flat-head screws that fasten the RFID Board.
2. Remove the cable ties that fasten the RFID from the wire retainer bracket.
3. Remove the slide release bar (purple bar) by sliding out either side.
4. Remove the board and cable through the opening of the mount.
5. Reverse the procedure to install the replacement board(s).
6. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide*.

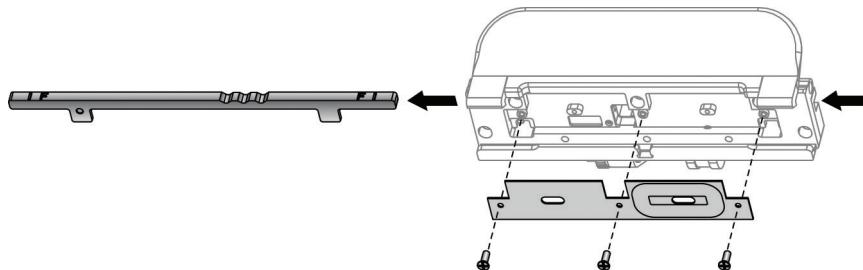


Figure 94: RFID Board

7.5.15 Rotation Angle Display Board(s)

1. Remove the Gantry side covers—see [Remove Gantry Covers and Bellows](#) on page 106.
2. Note the cable locations and remove them.
3. Remove the screws that fasten the board(s).
4. Remove the board(s).
5. Reverse the procedure to install the replacement board(s).
6. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide*.

7.5.16 Gantry Service Port Board

Allows Service Engineers to set up and troubleshoot the system through the 9-pin serial jack attached to the board and located at the rear of the Gantry.

1. Raise the C-arm.
2. Remove power.
3. Remove the four screws and connectors from the Gantry Service Port Board.
4. Remove the board from the front.
5. Reverse the procedure to install the replacement board.
6. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide*.

7.5.17 VTA Power Filter Board

1. Note the cable locations and remove them.
2. Remove the two nuts that fasten the board.
3. Remove the board.
4. Reverse the procedure to install the replacement board(s).
5. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide*.

7.5.18 VTA Control Board

See figure [C-Arm Rotation and Vertical Travel Components](#) on page 118 .

1. Remove the rear panel.
2. Manually raise the C-arm to access the VTA Control Board.
3. Remove the power.
4. Note the cable locations and remove them.
5. Remove the three screws from the board.
6. Remove the board:
 - a. Slide the board to the left along the elongated holes in the board, and remove.
 - b. Record the DIP switch positions on the board to transfer to the replacement board.
7. Install the replacement board:
 - a. Reverse the procedure to install the replacement board.
 - b. Set the DIP switches to the positions recorded in step 6b.
8. Turn Gantry power on and adjust circuit board voltage.
 - a. Use a DVM to measure and adjust voltage on TP29 (ref TP4 gnd).
 - b. Adjust potentiometer R3 for a voltage of +21.7 vdc.
9. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide* before returning the system to service.

7.5.19 VTA Drive Board

See figure [C-Arm Rotation and Vertical Travel Components](#) on page 118.

1. Note the cable locations and remove them.
2. Remove the screws that fasten the board to the frame.
3. Remove the board.
4. Reverse the procedure to install the replacement board.
5. Complete "Perform the Functional Tests", in the Selenia Dimensions System *User Guide* before returning the system to service.

7.5.20 Zero Position Board

1. Remove the External and Internal Compression Device—see [Remove the External Compression Device](#) on page 153, and [Remove the Internal Compression Device](#) on page 154.
2. Move the black plastic protective guard to expose the board.
3. Remove the connector on the board.
4. Loosen the clamp screw.
5. Remove board.

7.5.21 Face Shield Sense Board

See figure [Compression System Components](#) on page 117 for location of the board.

1. Remove the C-Arm Housing—see [C-Arm Housing Removal](#) on page 110.
2. Remove the two screws that fasten the board to the frame.
3. Unplug the board harness from the Face Shield Sense Board.

7.5.22 C-Arm Vertical Travel Limit Switch

1. Locate the Vertical Travel Limit Switch in figure [C-Arm Vertical Travel Limit Switch](#) on page 119 item 2.
2. Remove the three screws holding the switch to its bracket.
3. Noting their location, remove the wires from the switch.
4. Mount the new switch to the bracket.
5. Verify operation of the C-arm.

7.5.23 C-Arm Rotation Limit Switch

1. Locate the C-Arm Rotation Limit Switch in figure [C-Arm Rotation Limit Switch](#) on page 119 item 1.
2. Remove the two screws holding the switch to its bracket.
3. Note the wires from the switch and remove them.
4. Mount the new switch to the bracket; do not tighten.
5. Adjust the C-Arm Rotation Limit Switch.

7.5.24 Auxiliary C-Arm Switch Assembly

1. Remove the bottom C-arm housing—see [C-Arm Housing Removal](#) on page 110.
2. Remove the set screw that fastens the switch lever to the switch shaft.
3. Disconnect the harness.
4. Replace the switch assembly.
5. Replace the bottom cover.
6. Attach the lever to the switch shaft.
7. Verify operation of the C-arm.

7.5.25 C-Arm Rotation Potentiometer

See figure [C-Arm Rotation Limit Switch](#) on page 119 item 3 for the location of the C-Arm Rotation Potentiometer.

1. Raise the C-arm.
2. Remove power.
3. Remove the Gantry side covers—see [Remove Gantry Covers and Bellows](#) on page 106.
4. Remove the screw that fastens the potentiometer mounting bracket to the VTA.
5. Disconnect the harness.
6. Remove the bracket with the attached potentiometer/harness and sprocket.
7. Note alignment of the potentiometer on the mounting bracket—mark with felt pen.
8. Loosen the hex set screw on the end of the potentiometer shaft, and remove the sprocket.
9. Remove the hex nut and washer that fastens the potentiometer to the mounting bracket, and remove the potentiometer.
10. Unsolder the potentiometer wires.
11. Reverse steps 4 to 9 to install the replacement potentiometer.
12. Perform the procedure in the C-arm adjustments section of the Calibration Tool.
13. Replace the Gantry covers.

7.5.26 Tomo Angle Potentiometer (Tomosynthesis Option)

See the following figure.

1. Remove power.
2. Remove the Breast Platform—see [Remove the Breast Platform and Image Receptor](#) on page 122.
3. Remove the Image Receptor.
4. Remove the Grid Assembly—see [Replace the Grid Assembly](#) on page 123.
5. Remove the grid tray—six counterbored hex-head screws.
6. Remove the pot connector.
7. Remove the three hex-head screws that fasten the pot to the frame.
8. Remove the pot anti-backlash gear.

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9. Place the anti-backlash tool TLS-00922 against the replacement pot shaft in line with the pot pins.

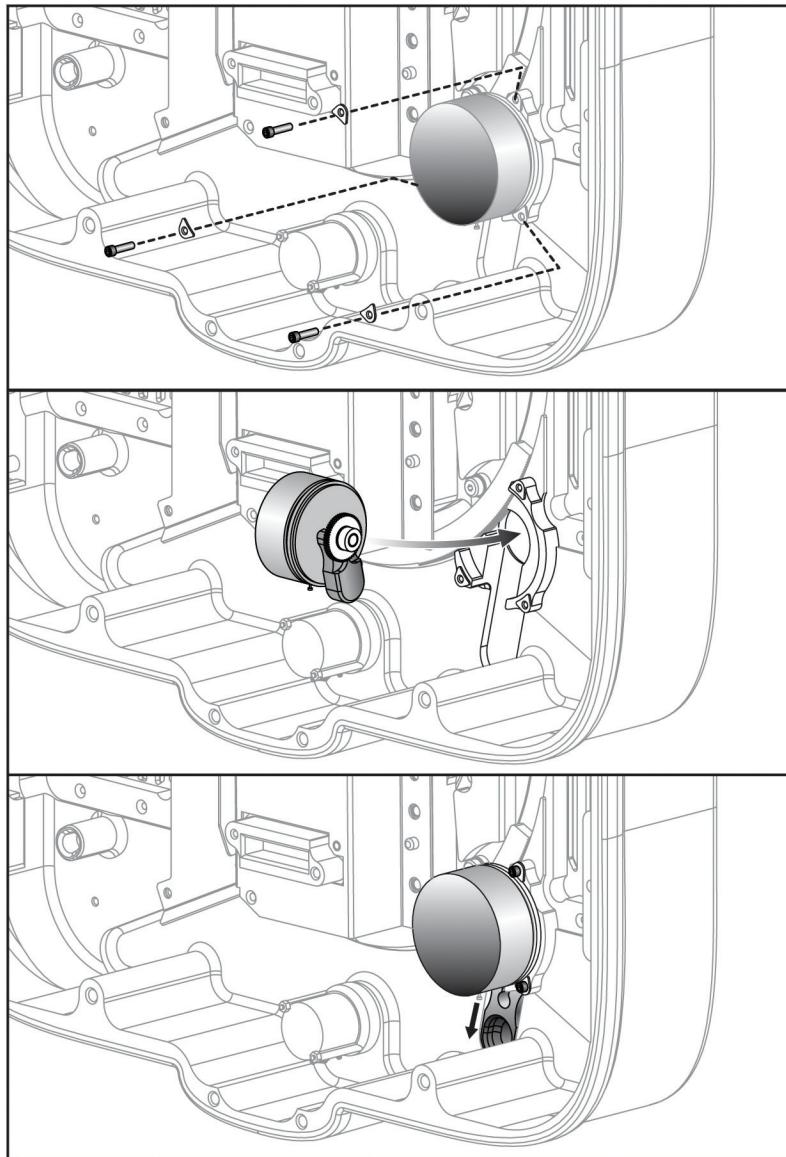


Figure 95: Tomo Angle Potentiometer (Tomosynthesis Option)

10. Attach the anti-backlash gear to the new pot shaft.
11. With an ohmmeter, center the pot at 5K.
12. Rotate the movable section of the anti-backlash gear (while holding the non-moving section) until it stops, then return it one or two teeth.
13. Holding the gear in this position, push the anti-backlash tool into the gears that fasten them in place.

14. With the adjustment tool in the recessed area of the frame, mesh the anti-backlash gear to the gear segment and fasten the pot to the frame with the previously removed screws.
15. When the pot is installed, remove the anti-backlash tool.
16. Recheck the 5k center adjustment.
17. Replace the connector.

7.5.27 Tubehead Cooling Fan

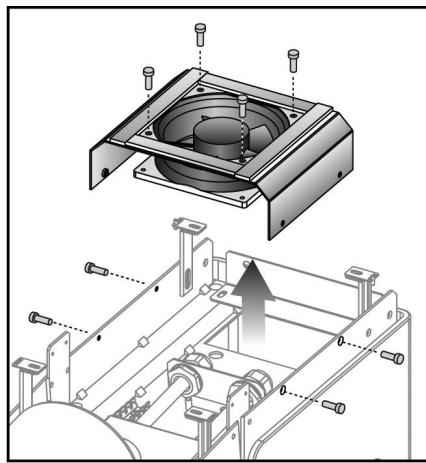


Figure 96: Tubehead Cooling Fan

1. Remove the X-ray Tube Arm (Tubehead) top cover. See [Top X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 109.
2. Disconnect the fan power cable.
3. Remove all cable ties from the power cable.
4. Remove the four screws that fasten the cooling fan mounting bracket to the X-ray Tube Arm (Tubehead) frame.
5. Lift out the fan and bracket assembly.
6. Remove the hardware that fastens the cooling fan to the mounting bracket.
7. Reverse these steps to install the replacement cooling fan. Position for proper air flow (out).
8. Verify fan is operating before returning to service.

7.6 Replace Electrical Components and Assemblies

The procedures in this Section require removal of covers or panels to gain access to the components.

7.6.1 Fuse Panel



WARNING!

Ensure that system power is Off and the Gantry circuit breaker is in the Off position.



WARNING!

Make sure that the wall circuit breaker is in the Off position.

See figure [Circuit Breaker and Fuse Panel](#) on page 145.

1. Remove the Gantry lower rear panel (four screws).
2. Remove the screws that fasten the Fuse Panel to the frame.
3. Pull the Fuse Panel out.
4. Unplug the wires from the fuse holder to be replaced.
5. Replace the fuse holder, and attach the wires.
6. Fasten the Fuse Panel to Gantry.

7.6.2 Circuit Breaker

**WARNING!**

Ensure that system power is Off and the Gantry circuit breaker is in the Off position.

**WARNING!**

Make sure that the wall circuit breaker is in the Off position.

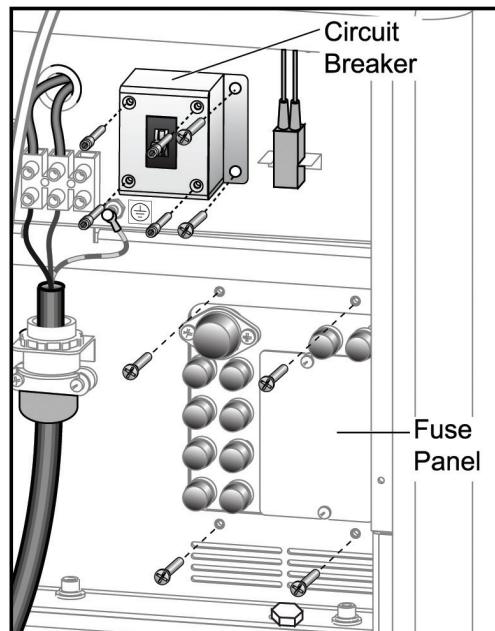


Figure 97: Circuit Breaker and Fuse Panel

1. Remove the Gantry lower rear panel.
2. Remove the two screws from the Circuit Breaker Bracket.
3. Remove the six hex flat-head screws that fasten the circuit breaker to the bracket.
4. Noting their location, remove the wires to the circuit breaker.
5. Replace the circuit breaker, and attach the wires.

7.6.3 Emergency Off Switch



WARNING!

Make sure that the wall circuit breaker is in the Off position.

See the following figure.

1. Remove the applicable Gantry side cover.
2. Remove the cable tie that fastens the switch harness to the cover harness, and remove the connector.
3. Loosen the ring nut and back the ring nut and the lock washer off the switch assembly.
4. From the front of the Gantry cover, pull the switch and connector through the cover.
5. Reverse steps to install the new switch assembly.
6. Test switch for functionality.

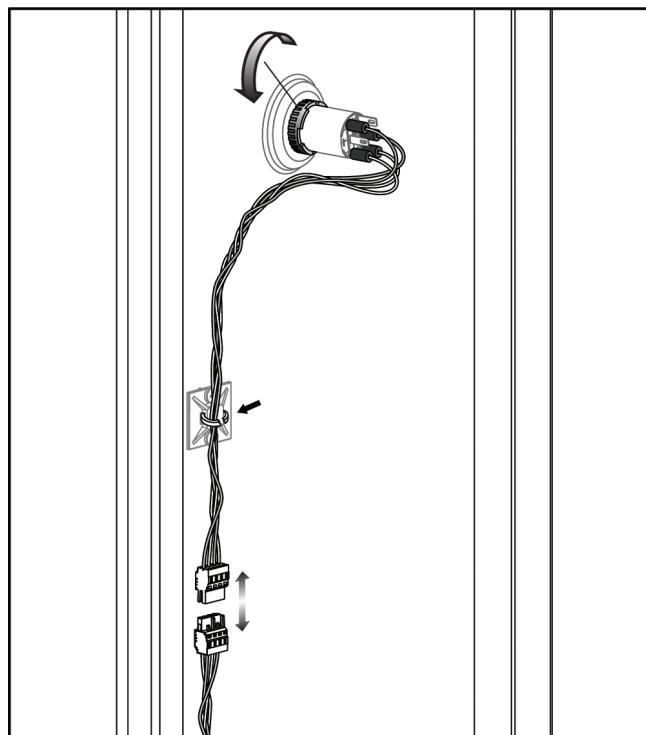


Figure 98: Emergency Off Switch

7.6.4 Power Distribution Drawer

**WARNING!**

Make sure that the wall circuit breaker is in the Off position.

To access the Power Distribution Drawer, remove the Gantry covers and Bellows—see [Remove Gantry Covers and Bellows](#) on page 106.

1. Remove the screws from the corners of the drawer.
2. Remove the cables from the front of the drawer.
3. Slide the drawer out.
4. Remove the cables from the rear of the drawer.

**WARNING!**

To reduce the risk of hazardous electrical shock, do not attempt service until the Red LED on the HV Inverter is extinguished (this takes approximately 5 minutes). Once the Red LED is extinguished, do not proceed until an additional 1 minute has elapsed.

7.6.5 Isolation Transformer

**WARNING!**

Ensure that system power is Off and the Gantry circuit breaker is in the Off position.

**WARNING!**

Make sure that the wall circuit breaker is in the Off position.

1. Remove the Power Distribution Drawer—see [Power Distribution Drawer](#) on page 147.
2. Note the cable locations and remove the fuse panel and cables going to the Isolation Transformer—see [Isolation Transformer](#) on page 147.
3. Remove the connector from the Capacitor and Bridge Assembly, then remove.
4. Remove the two seven-inch bolts at the top center of the Isolation Transformer.
5. Slide the transformer forward.

7.6.6 Detector Isolation Transformer



WARNING!

Ensure that system power is Off and the Gantry circuit breaker is in the Off position.



WARNING!

Make sure that the wall circuit breaker is in the Off position.

See the following figure.

1. Remove the Power Distribution Drawer—see [Power Distribution Drawer](#) on page 147.
2. Note the cable locations and remove the cables going to the Detector Isolation Transformer.
3. Remove the bolt at the top center of the Detector Isolation Transformer.
4. Remove the transformer.

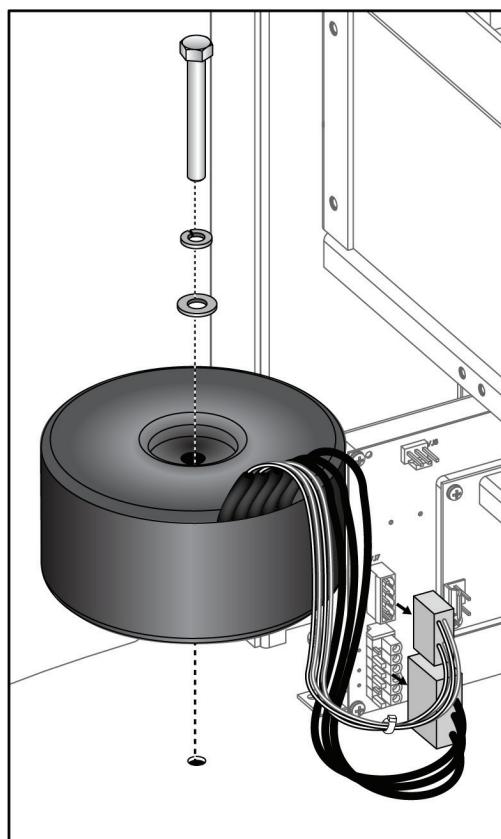


Figure 99: Detector Isolation Transformer

7.6.7 24 V Power Supply and External User Indicator Board

**WARNING!**

Make sure that the wall circuit breaker is in the Off position.

To access these boards, remove the Gantry covers; see figure [Gantry Covers Removal](#) on page 106.

1. Remove cable ties as needed.
2. Note the wires from the boards and capacitor and remove them.
3. Remove the rear screw from the bracket—this is a ‘blind’ screw, remove by feel. A short screwdriver with magnetic bit eases removal.
4. Remove the front screw.
5. Remove the bracket with boards attached.

7.6.8 Capacitor and Bridge Assembly

**WARNING!**

Make sure that the wall circuit breaker is in the Off position.

To access the Capacitor and Bridge Assembly, remove the Gantry covers; see figure [Gantry Covers Removal](#) on page 106 .

1. Note the wire locations and remove them.
2. Remove the two screws from the front of the assembly.
3. Slide the assembly out from the rear hold-down bracket.

7.7 Replace Mechanical Components and Assemblies

Removal and replacement procedures in this Section require removal of covers and/or panels to gain access to the components.

7.7.1 C-Arm Rotation Drive Motor and Gear Box

Remove the Rotation Drive Motor and Gear Box Assembly

1. Remove the rear panel.
2. Raise the C-arm to expose the Rotation Drive Motor and Gear Box Assembly.
3. Turn off power to the Gantry.
4. Cut the cable ties and remove the drive motor cable.
5. Note the VTA cable locations and remove them
6. Remove the four socket head screws through the elongated holes in the VTA board that fastens the Rotation Drive Motor and Gear Box Assembly to the mounting plate—see the following figure.
7. Remove the mounting plate with the attached Rotation Drive Motor and Gear Box from the rear.
8. To remove the subassemblies see [Remove the Rotation Drive Motor](#) on page 151, and [Remove the Gear Box](#) on page 152.

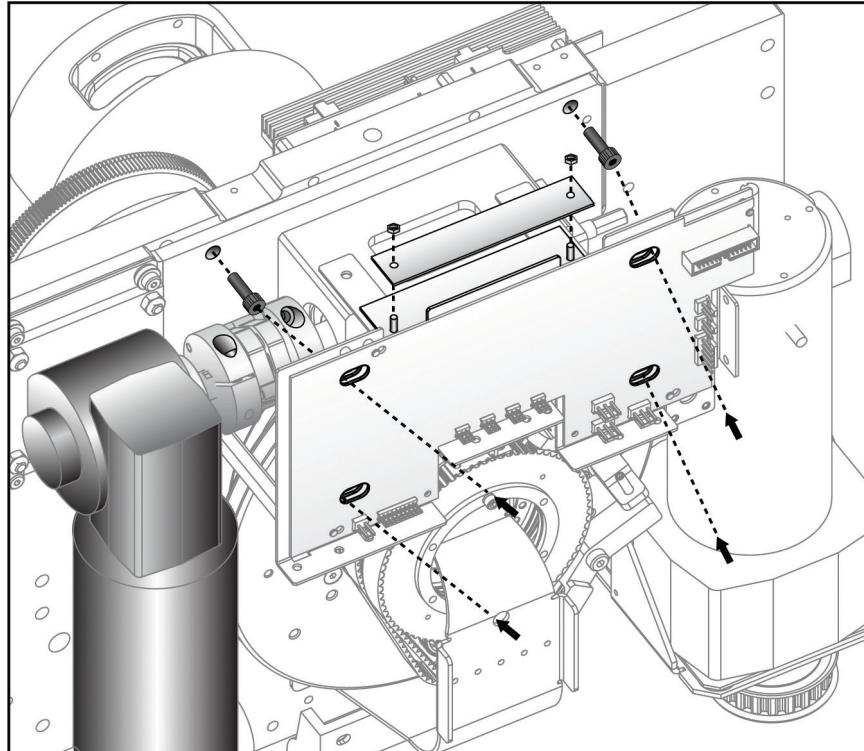


Figure 100: Rotation Drive Motor/Gear Box Assembly

Remove the Rotation Drive Motor

1. Remove the four shoulder socket head screws that fasten the drive motor plate to the mounting plate.
2. Loosen the coupler from the motor shaft.
3. Remove the motor and plate.
4. Remove the four captive nuts that fasten the motor.
5. Remove the motor.
6. Reverse the procedure to replace the motor.

Remove the Rotational Drag Clutch

1. The drag clutch is mounted on the worm mount assembly shaft end, opposite the rotational gear motor.
2. Loosen the top and bottom set screws located on the end of the drag clutch sleeve. Remove the clutch.
3. Reverse the procedure to replace the drag clutch.
 - a. Install the drag clutch over the exposed shaft and ensure that the shim spacer is in place between the clutch and mount. The shim provides a 0.020 in. gap between the drag clutch and worm shaft mount.
 - b. Tighten the upper set screw on the clutch, snug against the flat of the shaft, then fully tighten the bottom set screw. Complete installation by fully tightening the upper set screw.

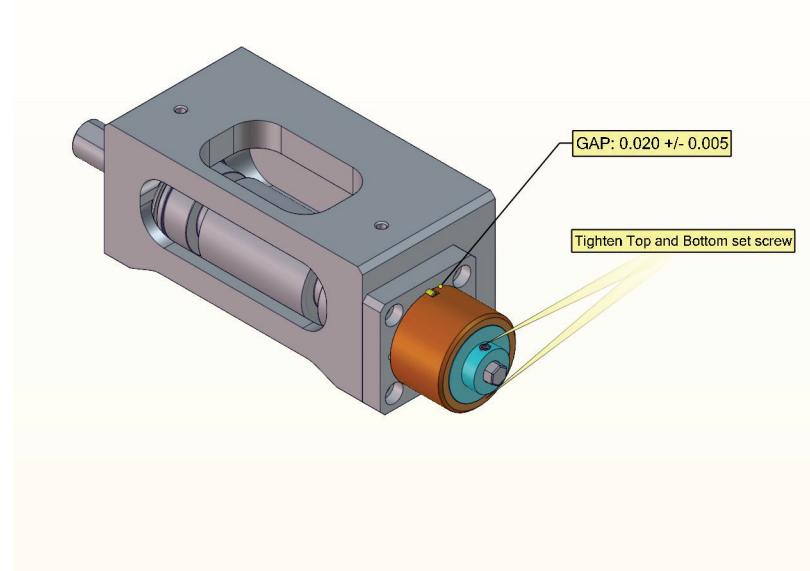


Figure 101: Installing the Drag Clutch with Proper Gap on Shaft

Remove the Gear Box

1. Remove the four flat socket head screws on the rear of the mounting plate. (The mounting plate must be removed to view the screws.)
2. Loosen the two coupler cap screws that fasten the coupler to the motor shaft and the gear box shaft.
3. Remove the gear box assembly.
4. Reverse the procedure to replace the gear box.

7.7.2 C-Arm Vertical Drive Motor

1. Remove the front left Gantry cover—see [Remove Gantry Covers and Bellows](#) on page 106.
2. Raise the Rotation Drive Motor and Gear Box Assembly to access the bottom of the Vertical Drive Motor and drive pulley.
3. Turn off power to the Gantry.
4. Remove the cable ties and the motor cable.
5. Remove the two 5/16 inch (black) bolts from the taper-lock fitting.
6. Replace the bolts you just removed and place them in the other pair of threaded holes in the taper-lock (this arrangement is used to remove the drive pulley from the motor shaft).
7. Using a ratchet with 5/16 inch socket, alternately thread these two bolts upwards into the drive pulley to remove the pulley.
8. Remove the four 5/16 inch bolts that fasten the motor to the bracket.
9. Remove the motor.

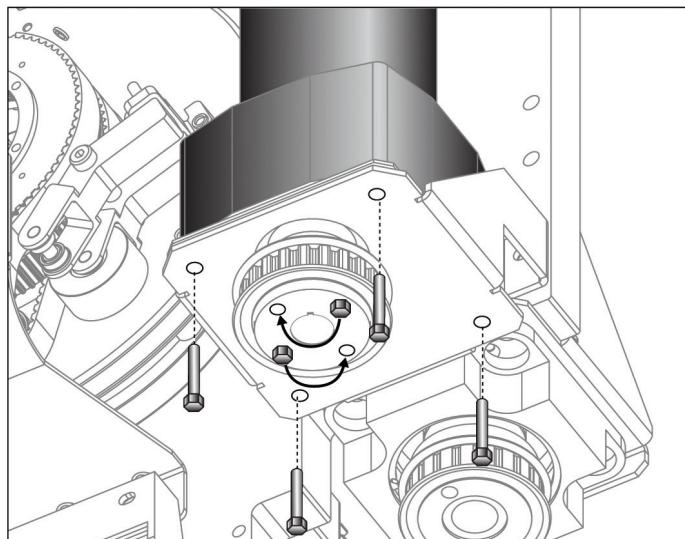


Figure 102: Vertical Drive Motor

7.7.3 Remove the External Compression Device

1. Remove the Compression Device Covers. See the figure [Compression Device Covers](#) on page 112.
2. Note the location of the connectors (not shown) and remove the Compression Device Interface Board, Displays, and attached bracket by removing the three screws at the top of the board. See the figure [External Compression Device](#) on page 153.
3. Locate the four 10-32 socket head screws at the rear of the External Compression Device.
4. Loosen these screws with a hex key, then remove with a long-handled ball end hex wrench.
5. Swing the External Compression Device to the right to free the gear belt, and remove.

7.7.4 Compression Force Load Cell

The Compression Force Load Cell is an integral part of the CDA Drive Block. The block and Force Load Cell are replaced as an assembly.

1. Remove the FAST Paddle Assembly. See [FAST Paddle Assembly Removal](#) on page 137.
2. Remove the Paddle Position Sensor Board—see the following figure.
3. Remove the Compression shaft and pulley:
 - Remove the e-ring from the left-side of the shaft
 - Remove the shaft and shim from the right-side
4. Reverse the procedure to install a new CDA Drive Block with Force Load Cell.

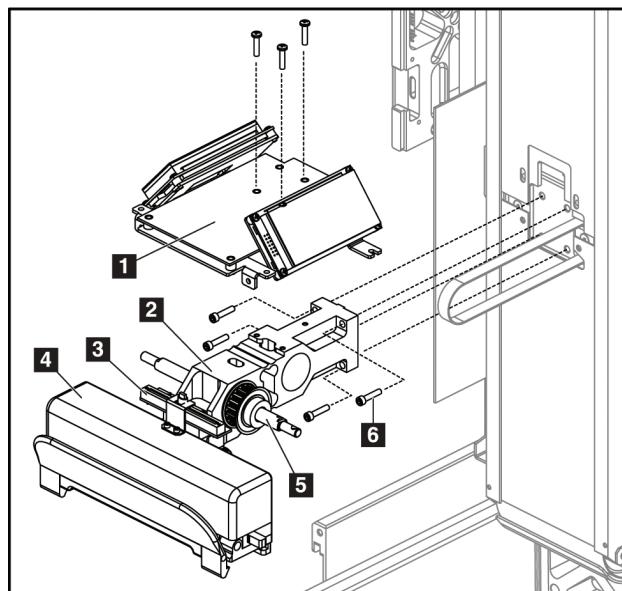


Figure Legend

1. Compression Device Interface Board and Displays.
2. CDA Drive Block and Load Cell
3. Paddle Position Board.
4. Fast Paddle Assembly
5. Compression Knob Shaft
6. CDA Drive Block Screws

Figure 103: External Compression Device

7.7.5 Remove the Internal Compression Device

1. Remove the External Compression Device—see [Remove the External Compression Device](#) on page 153.
2. Note the cable locations on the C-Arm Transition Board and remove them.
3. Remove the black mounting brackets on both sides of the Internal Compression Device.
4. Remove the six hex-head socket head screws and the two nuts that fasten the Internal Compression Device—see the figure [C-Arm Component Location](#) on page 116.
5. Carefully remove the Internal Compression Device assembly.

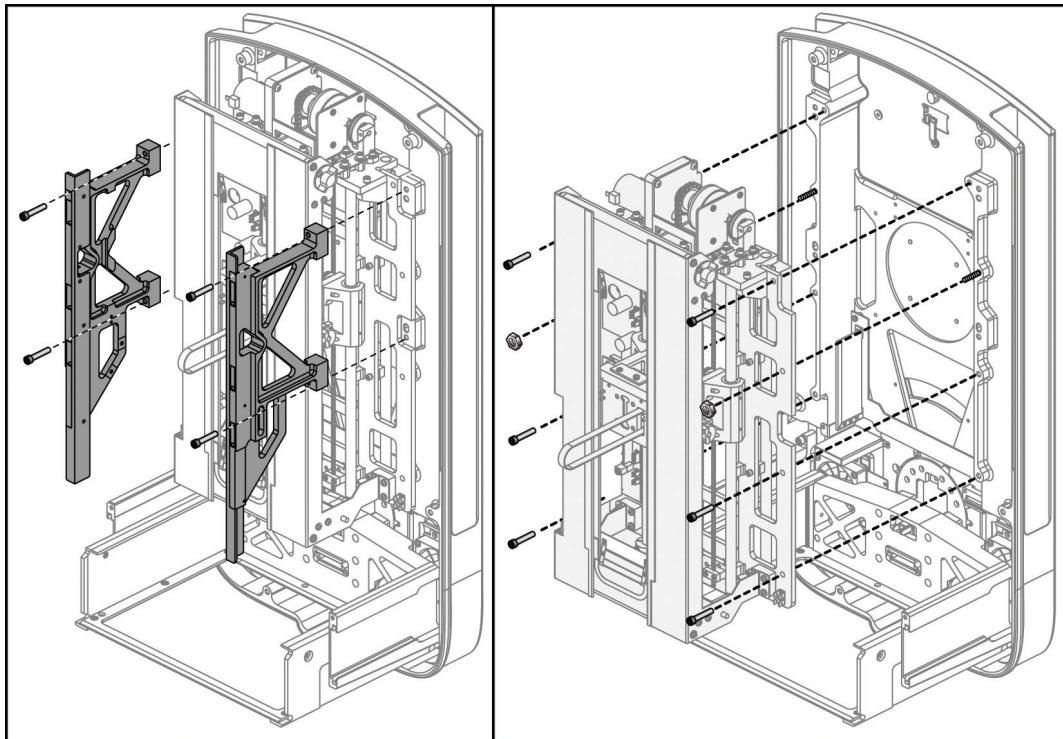


Figure 104: Internal Compression Device

7.8 Compression Device Drive Assembly

The Compression Device Drive Assembly houses a slip clutch/brake, and a bi-directional brake assembly.

7.8.1 Remove Slip Clutch, Brake and Armature, and Bi-Directional Brake

Slip Clutch:

1. Remove the C-Arm Housing—see [C-Arm Housing Removal](#) on page 110.
2. Remove the External Compression Device—see [Remove the External Compression Device](#) on page 153.
3. Loosen the two slip clutch shaft clamp screws.
4. Slide the slip clutch off the shaft.
5. If necessary, continue the disassembly.

Brake and Armature:

1. Cut the cable tie on the bi-directional brake bracket.
2. Unplug the brake wire connector.
3. Remove the four socket head cap screws that fasten the brake/armature to the housing.
4. Remove the brake and armature.
5. Refer to [Adjust the Assembly](#) on page 156 for adjustment.

Bi-Directional Brake:

1. Remove the two screws that fasten the bi-directional brake bracket.
2. Loosen the two sprocket hub set screws.
3. Loosen the two bi-directional brake clamp screws.
4. Slide the shaft out.

5. Remove the bi-directional brake.

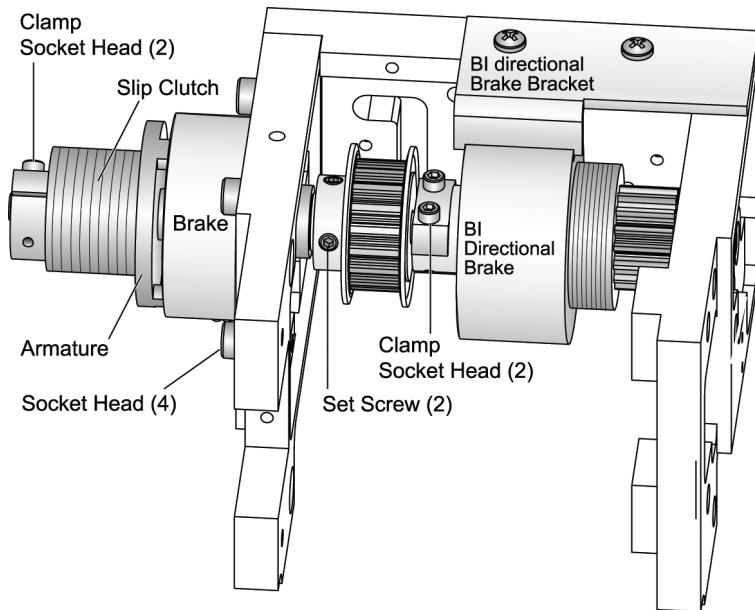


Figure 105: Slip Clutch, Brake/Armature and Bi-Directional Brake

7.8.2 Adjust the Assembly

1. Place a 0.015 inch feeler gauge (or shim stock) between the armature and brake, and press the armature against the feeler gauge.
2. Tighten the brake clamp screws.
3. Remove the feeler gauge, and verify a 0.010 to 0.020 inch gap, with no left-to-right play in the brake/armature assembly.

7.8.3 Compression Thickness Potentiometer

1. Remove the top and bottom Compression Device covers—see the figure [Compression Device Covers](#) on page 112 .
2. Remove the Compression Bellows—see [C-Arm Compression Bellows Assembly—Removal](#) on page 113.
3. Loosen the two hex screws that fasten the Compression Timing Belt item 2 to the bottom clamp item 1. See the following figure.
4. Remove the timing belt from the bottom clamp.
5. Carefully thread the timing belt up and out of the sprockets.
6. Inspect the timing belt. If damaged, replace the belt—see [Compression Timing Belt](#) on page 159.
7. Remove the top hex socket shoulder screw, and then remove the sprocket and screw to access the potentiometer clamp.

8. Loosen the clamp screw on the end of the potentiometer shaft, and slide clamp and sprocket off the potentiometer shaft.
9. Remove the hex nut (using a small open-end wrench) that fastens the potentiometer to the mounting bracket. Slide the potentiometer off the bracket.
10. Noting the color of the wire for each pin, unsolder the three wires from the potentiometer.
11. Reverse the steps to install the replacement potentiometer, and the timing belt.

Note

Loosen the timing belt, and with the Compression Device against the bottom stop, verify that the compression pot is 550 to 590 ohms measured on the brown and black wires of the pot. Adjust as necessary. Tighten the belt.

12. Start up the system.
13. Before returning the system to service, perform the Compression Thickness procedure in the Calibration Tool.
14. Install the Compression Bellows.
15. Install the Compression Device covers.

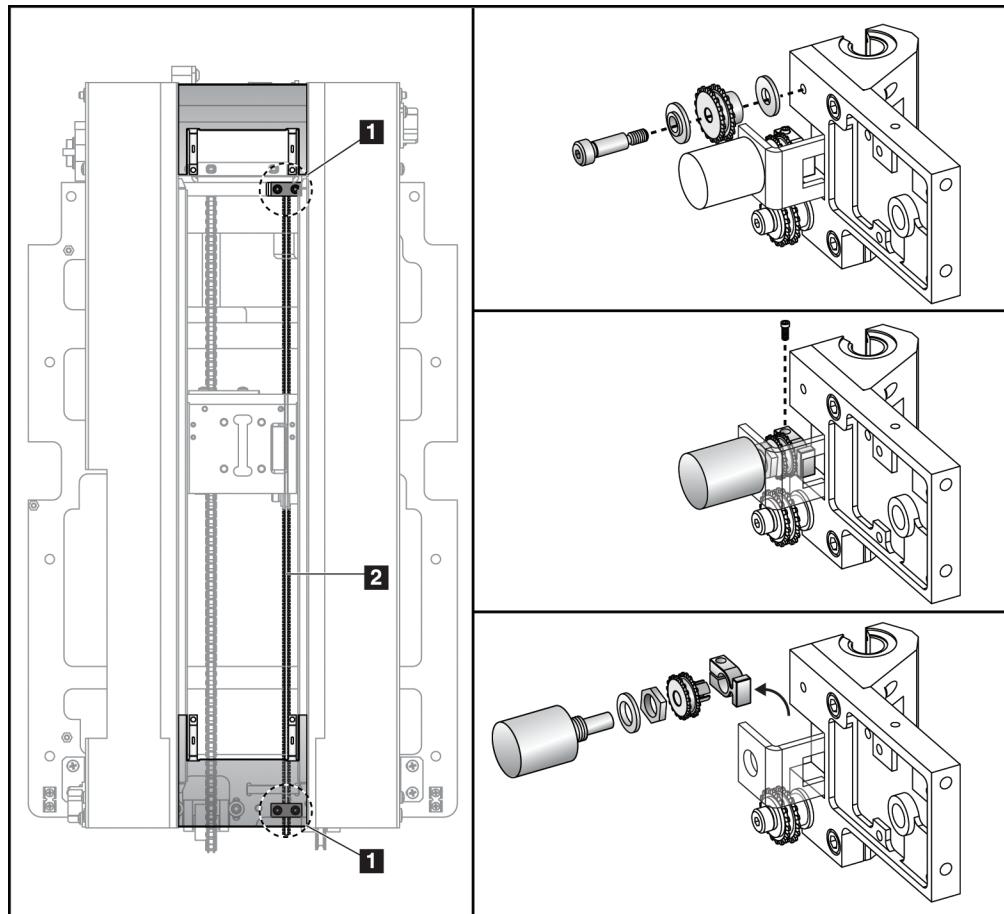


Figure 106: Compression Thickness Potentiometer and Timing Belt

7.9 Compression Motor and Brake

The Compression Motor drives the compression chain through a series of gears to move the Compression Device up or down. The Compression Motor Brake prevents compression back-drive.

7.9.1 Remove the Compression Motor and Brake Assembly

1. Remove the C-Arm Housing—see [C-Arm Housing Removal](#) on page 110.
2. Remove the External and Internal Compression Device. See [Remove the External Compression Device](#) on page 153, and [Remove the Internal Compression Device](#) on page 154.
3. Cut the cable ties that fasten the motor/brake wires.
4. Remove the motor/brake connectors on the C-Arm Transition board.
5. Disconnect the master link on the drive chain, and remove the chain from the sprocket.
6. Remove the two socket head screws that fasten the motor/brake bracket to the frame—see the following figure.
7. Remove the motor and brake assembly.

Remove the Compression Motor/Brake:

1. Loosen the set screws that fasten the motor shaft to the motor sprocket.
2. Remove the screws that fasten the compression motor to the mounting bracket
3. Remove the motor.
4. Remove the screws that fasten the brake to the mounting bracket.
5. Remove the brake.
6. Reverse the procedure to replace the motor or brake.
7. After replacing the assembly and master link, align the mounting bracket (sprocket) with the chain utilizing the elongated holes in the mounting bracket.

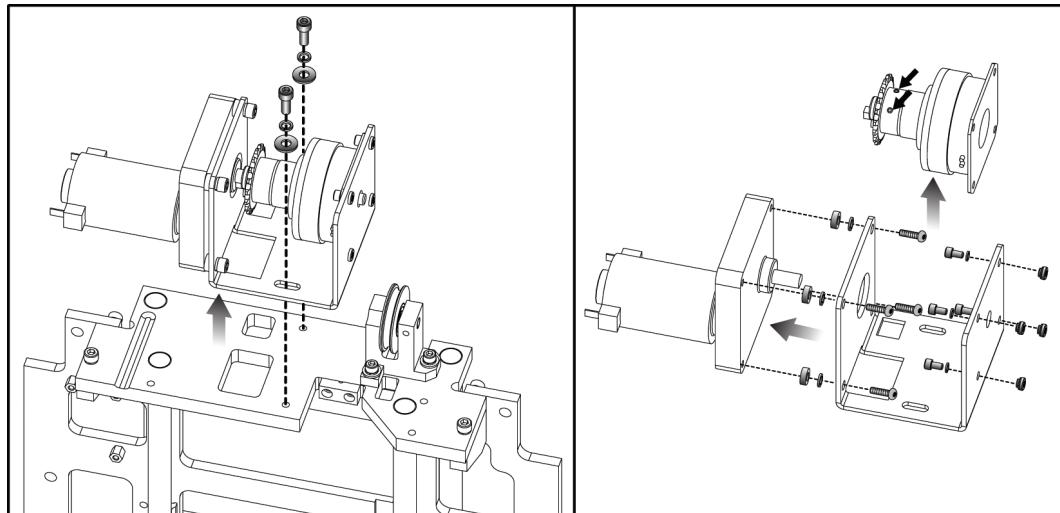


Figure 107: Compression Motor and Brake Assembly

7.9.2 Compression Timing Belt

1. Remove the Compression Device covers and compression bellows—refer to [Compression Device Covers](#) on page 112.
2. Manually center the Compression Device on the C-arm.
3. Loosen the screws that fasten the Compression Timing Belt item 2 to the bottom clamp item 1—see the figure [Compression Thickness Potentiometer and Timing Belt](#) on page 157.
4. Remove the timing belt from the bottom clamp.
5. Thread the timing belt up and out of the sprockets.
6. Loosen the two hex screws that fasten the timing belt in the upper clamp block item 1.
7. Remove the belt and discard it.
8. Insert the new timing belt through the upper clamp.
9. Thread the timing belt through the sprockets to the bottom clamp.
10. Apply Blue Loctite 242 and retighten the hex screws.

7.9.3 Compression Chain Adjustment

1. Remove the Compression Device covers and compression bellows—see [Compression Device Covers](#) on page 112 and [C-Arm Compression Bellows Assembly—Removal](#) on page 113.
2. Manually center the Compression Device on the C-arm.
3. Loosen the socket head screws on the sprocket mount—see the following figure.
4. Install the Compression Chain Tension Tool—TLS-01361as shown in the following figure.
5. Attach an ammeter in series with the compression motor.
6. With the ammeter on the DC range, turn on the power, and increase the tension on the chain (counter-clockwise of tool knob) until the motor is drawing between 350 - 400 mA. Run for a complete cycle.
7. Tighten the right socket head screw on the sprocket mount, then the left screw.
8. Loosen and remove TLS-01361.

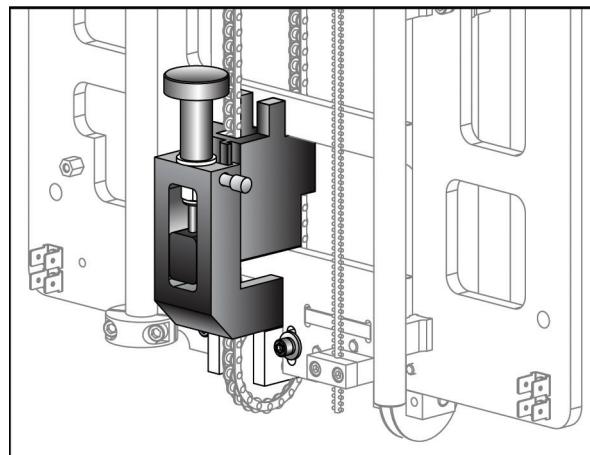


Figure 108: Compression Chain Adjustment

7.10 Preventive Maintenance Procedures

Note

Refer to [Preventive Maintenance Schedule](#) on page 86 for the Service Engineer Preventive Maintenance Schedule.

Tools and materials required to perform cleaning and inspection:

- Lint Free Cloths
- Brush
- Synthetic Lubricant PN 2-580-0207
- Small Vacuum Cleaner
- CRT Wipes

7.10.1 Gantry - Clean and Inspect

When the system is down for service:

1. Inspect the Gantry for:
 - Cleanliness
 - Loose or missing panels or covers, and loose or worn wires or cables
2. Vacuum around the light field window and image receptor fans.
3. Clean the Face Shield and displays with a CRT wipe. Clean any fingerprints and stains from the painted surfaces.

Replace the Breast Platform Filter

- Required equipment, FAB-10761 (Filter with three Velcro strips)

Refer to the following text and figure.

1. Remove power from the system.
2. Remove the Breast Platform from the C-arm. See [Remove the Breast Platform and Image Receptor](#) on page 122.
3. Vacuum any accumulated debris from the bottom of the detector, and from the inside of the breast platform.
4. Slide the slotted vent forward from the bottom of the breast platform.
5. Place the inside of the vent facing upwards on a work surface.
6. Remove the three Velcro strips from the filter material in FAB-10761.
7. Remove the protective backing from the adhesive on the Velcro strips and place onto the inside of the vent as shown in the following figure.
8. Align the filter material with the vent and firmly press the filter onto the Velcro strips making sure that it is firmly attached to the Velcro.
9. Slide the vent back into the breast platform.

10. Reinstall the breast platform:
 - a. Slide the Breast Platform into the C-arm.
 - b. Fasten the Breast Platform with the previously removed hex-head screws.

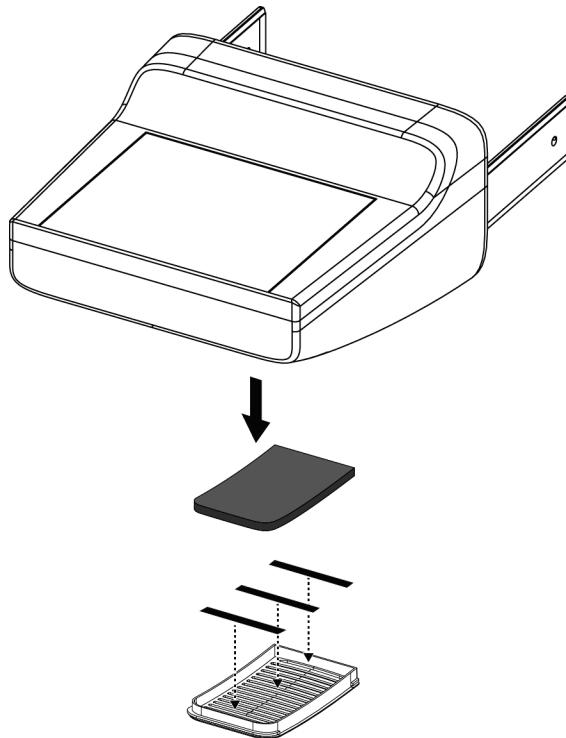


Figure 109: Breast Platform Filter

7.10.2 C-Arm Rotation Gear Assembly Inspection and Lubrication

See [Compression](#) on page 117, and perform this procedure annually or as required. If the upper rear access panel is off the Gantry for service, inspect the rotation gear assembly.

1. Turn the system off.
2. Remove the Gantry upper rear access panel—see [Gantry Cover Removal](#) on page 106.
3. Locate and inspect the gear assembly for loose hardware.
4. Inspect harnesses for proper dress and clearances.
5. Clean and lightly lubricate (if required) the C-arm rotation gear assembly, using approximately one tablespoon of synthetic lubricant (PN 2-580-0207). Apply with a brush. Make sure the gear teeth and worm gear are evenly coated.
6. Turn the system on.
7. Rotate the C-arm through full operational travel.
8. Remove any excess lubricant.
9. Replace upper rear access panel.

7.10.3 Cleaning the Gantry C-arm Rotational Brakes

This section provides the procedure for cleaning the Gantry C-arm rotational brakes. We suggest you complete this procedure during the annual Preventive Maintenance Survey for all Hologic Dimensions Systems.

Note

 Ensure that you have the brake power supply TLC-01064 available before starting this maintenance procedure.

Before You Begin

1. Ensure that the C-arm is at the zero degree position.
2. Turn OFF the power to the Gantry.
3. Turn OFF the rear circuit breaker on the rear of the unit.
4. Remove the Gantry front covers (see [Gantry Cover Removal](#) on page 106) to gain access to the right side of the unit VTA assembly.

Procedure

1. Loosen the screw holding the C-arm rotation potentiometer and slide the bracket back away from the pivot tube gear. (See item 1 in the following figure.) This step allows the anti-backlash gear on the C-arm potentiometer to disengage from the pivot tube gear.

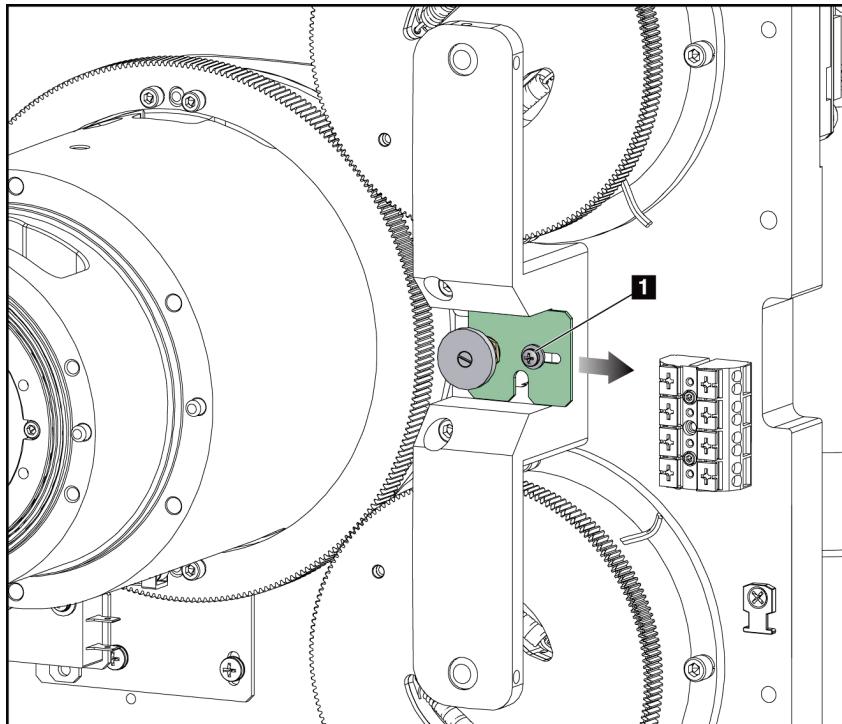


Figure 110: Loosening the Screw, Sliding the Bracket

2. Unplug the C-arm rotation potentiometer from the VTA harness connection. This step allows you to remove the gear mount bracket assembly and set it aside.
3. Remove the gear mount bracket (see the following figure, item 1):
 - a. Loosen the four set screws.
 - b. Remove the two 1/4-20 screws that hold the gear mount bracket assembly.
 - c. Remove the gear mount bracket.

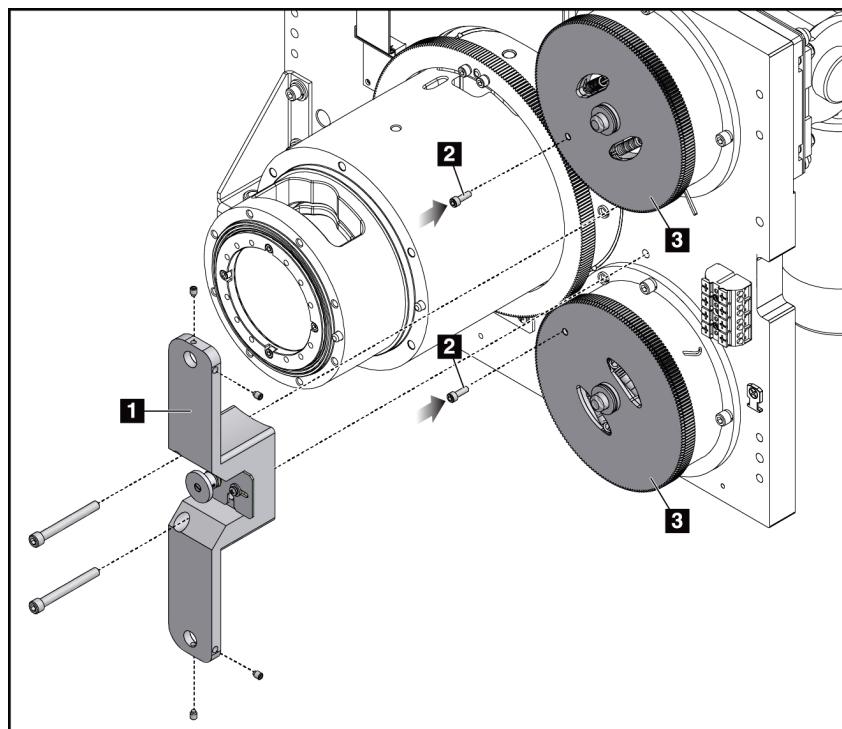


Figure 111: Gear Mount Bracket and Anti-Backlash Gears

4. Remove the flat washers and spring washers from the upper brake assembly. (See the previous figure.)
5. Insert an 8-32 socket head screw (item 2 in the previous figure) into the anti-backlash gear plates (item 3 in the previous figure) to hold them together.

Note



Ensure the screws used for this purpose are not more than 1.25 cm (0.5 inch) long.

6. Connect the brake power supply TLS-01064 and energize the rotation brakes. This step releases the upper anti-backlash gear (see the previous figure, item 3, upper) from the upper brake.
7. Pull the anti-backlash gear off the upper brake, then de-energize the brakes.

8. Clean and inspect the brake:
 - a. Clean the brake with a clean cloth and alcohol.
 - b. Inspect the surface for wear.
 - c. Verify that there are no particles or foreign matter attached to the surface of the magnet.
9. Clean the anti-backlash gear with alcohol in a similar manner and ensure that there is no residue.
10. Apply a small amount of lead screw lubricant (2-50-0216) to the shaft (see item 2 in the following figure) and the inner diameter of the anti-backlash gear (see item 1 in the following figure).

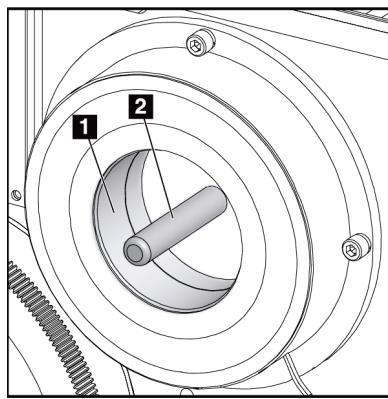


Figure 112: Lubricating the Shaft and Inner Anti-Backlash Gear

11. Repeat step 7 through step 10 for the lower anti-backlash gear.
12. For the anti-backlash gear of the UPPER brake assembly:
 - a. Energize the upper brake assembly to disable the magnet.
 - b. Test with a screwdriver to ensure that the magnet is OFF.



Warning:

Make sure that the magnet is OFF before proceeding with either the upper or lower brake assembly. If left on, the magnet is strong enough to cause the anti-backlash gear to move which could result in pinched or injured fingers.

- c. Take the upper anti-backlash gear and slowly place it over the shaft of the upper brake.
- d. When you are over the shaft, be careful to align the teeth of the gear with the teeth of the VTA wheel.
- e. Place the spring washer, then the flat washer over the shaft of the upper brake assembly.
- f. De-energize the brake to pull in the anti-backlash gear and remove the #8 socket head screw previously installed.

13. For the anti-backlash gear of the LOWER brake assembly, repeat all of step 12.
14. Replace the gear mount bracket assembly using the two 1/4-20 x 2-1/4 inch socket head cap screws and two 1/4-20 high collar lock washers removed in step 3.
15. Tighten the four set screws loosened in step 3.
16. Reposition the rotation potentiometer and bracket, ensuring that the potentiometer is in the middle of its range (five turns counter-clockwise from its mechanical stop).
17. Engage the potentiometer:
 - a. Holding the potentiometer shaft in position, twist the backlash gear in the opposite direction against the anti-backlash spring until they are offset by three teeth.
 - b. Holding the gears in this position, slide potentiometer bracket to engage with the VTA gear and tighten the potentiometer bracket.

Note

This adjustment is sufficient to ensure proper reliable engagement. Do NOT push up the C-arm potentiometer assembly tight against the pivot tube gear.

18. With power ON to the Gantry, verify that the rotation indicator display reads zero degrees. If not, perform the C-arm zero calibration. Refer to the C-arm Adjustment section of the on-screen CalTool.

7.10.4 VTA Lead Screw Inspection and Lubrication

Perform this procedure annually or as required. If the left front cover is off the Gantry for service, inspect the VTA lead screw.

1. Turn the system off.
2. Remove the Gantry left front cover—[Fasten the Gantry](#) on page 28.
3. Locate and inspect the VTA lead screw for loose hardware.
4. Inspect harnesses for proper dress and clearances.
5. Clean and lightly lubricate (if required) the VTA lead screw, using approximately two tablespoon of synthetic lubricant (PN 2-580-0207). Apply lubricant with brush. Ensure all metal surfaces are evenly coated.
6. Turn the system on.
7. Raise the C-arm to the top of its vertical travel, then lower the C-arm to the bottom of its vertical travel.
8. Remove any excess lubricant.
9. Replace the Gantry left front cover.

Chapter 8 Premium Acquisition Workstation Maintenance

8.1 Introduction

This chapter describes maintenance information and instructions for the Premium Acquisition Workstation, including:

- Removing covers and panels
- Component identification
- Component replacement procedures
- Preventive maintenance procedures



WARNING!

Disconnect system power before removing components!



Warning:

Always follow the safety precautions for x-ray exposures.



Note

If a procedure instructs you to remove any covers or panels, do not install the covers until all required procedures are completed.

8.2 How to Remove All Power from the Acquisition Workstation

Perform the procedures in [How to Remove All Power from the Acquisition Workstation](#) on page 75.

8.3 Remove the Covers and Panels

8.3.1 Front Cover

1. Remove the two socket head screws and flat washers located at the middle of the sides of the rear cover.
2. Slide the front cover off.

8.3.2 Rear Cover

1. Remove the front cover.
2. Remove the four inch socket head screws located at the inside corners of the frame.
3. Gently pull the top of the rear cover away from the nylon rotary catches located at the top of the Acquisition Workstation.
4. Remove the rear cover.

8.3.3 Top Cover

1. Remove the two screws on each side of the top cover.
2. Slide the keyboard forward to access the slide release levers.
3. Push one lever up and the other down while moving the tray forward to access the three screws on the bottom of the bracket.
4. Remove the screws.
5. Gently lift the front of the cover.
6. Disconnect the fingerprint cable connector.
7. Disconnect the trackball connector.
8. Remove the ground strap.
9. Release the cover from the nylon rotary catches at the rear.
10. Remove the top cover.

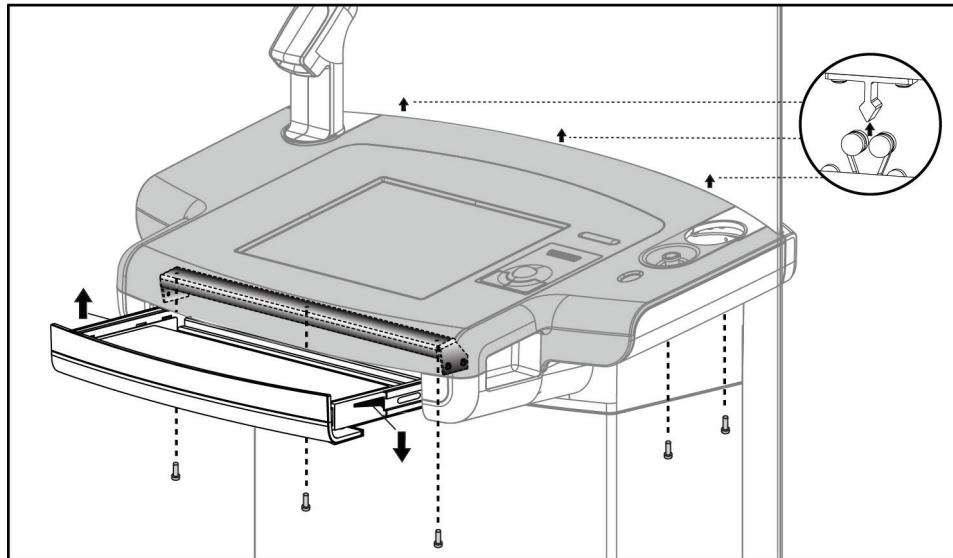


Figure 113: Remove the Top Cover

8.3.4 Bottom Cover

1. Remove the front cover—see [Front Cover](#) on page 167.
2. Remove the rear cover—see [Rear Cover](#) on page 167.
3. Remove the top cover—see [Top Cover](#) on page 168.
4. Remove the wires from the x-ray switches—item 1.
5. Remove the USB port—item 6.
6. Loosen the two screws on the DVD drive bracket and slide it back to clear the edge of the DVD drive slot—item 2.
7. Remove two 10-32 upper rear screws (solid lines—item 3 leaving the two lower 10-32 screws (dotted lines) to support the cover—item 3.
8. Remove the four lower screws (8-32)—item 4.
9. Remove the two socket head screws from the bottom rear of the cover—item 5.
10. While supporting the cover with one hand, remove the remaining front screws (dotted lines)—item 3.
11. Lower the bottom cover approximately six inches, and slide forward.

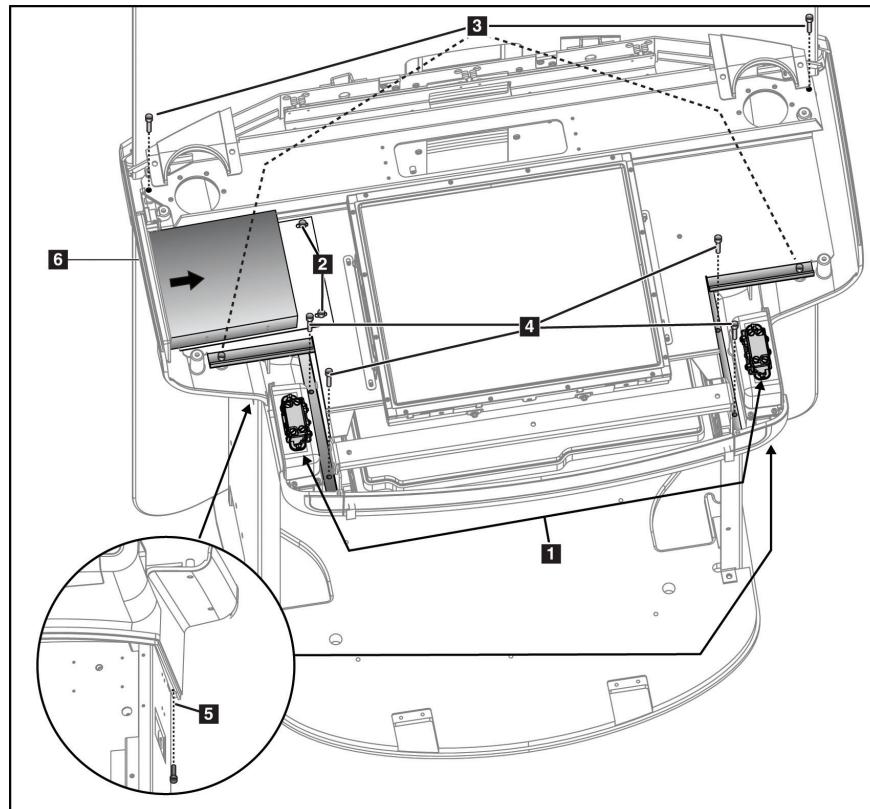


Figure 114: Remove the Bottom Cover

8.4 Component Identification

8.4.1 Acquisition Workstation—Front and Top View

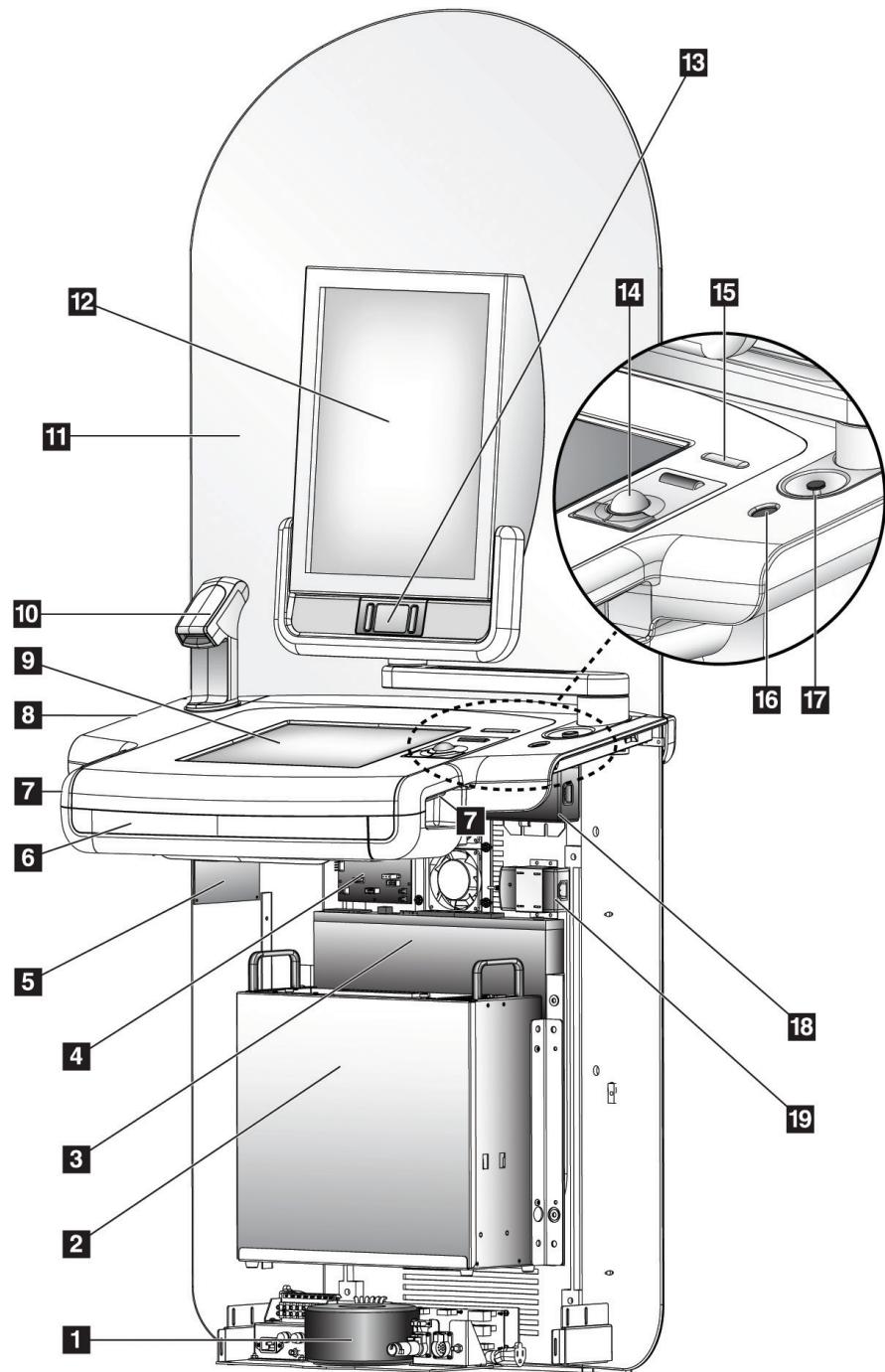


Figure 115: Premium Acquisition Workstation Components—Front and Top View

Item	Section
1. Power Distribution Assembly	Power Distribution Assembly on page 188
2. Computer	Computer on page 173
3. UPS	Uninterruptible Power Supply (UPS) on page 189
4. Acquisition Workstation I/O Board	Acquisition Workstation I/O (Input/Output) Board on page 187
5. Dual Output Power Supply Board—5 V, 12 V	Dual Output Power Supply Board—5 V, 12 V on page 187
6. Keyboard	Keyboard on page 181
7. Right/Left X-ray Switches	Right or Left X-ray Switch on page 179
8. DVD/USB Port	DVD Drive on page 180
9. Touch screen Display	Touch screen Display on page 178
10. Bar Code Scanner	Bar Code Scanner on page 181
11. Radiation Shield	Install the Radiation Shield on page 60
12. Preview Display	Preview Display on page 173
13. Touchpad	Touchpad Assembly on page 177
14. Trackball	Trackball Assembly on page 179
15. Compression Release Switch	Compression Release Switch on page 179
16. Fingerprint Scanner	Fingerprint Scanner on page 180
17. Emergency Off Switch	Emergency OFF Switch on page 179
18. Preview Display Power Module	Preview Display Power Module on page 187
19. Touch screen Display Power Module	Touch screen Display Power Module on page 187

8.4.2 Acquisition Workstation—Rear View

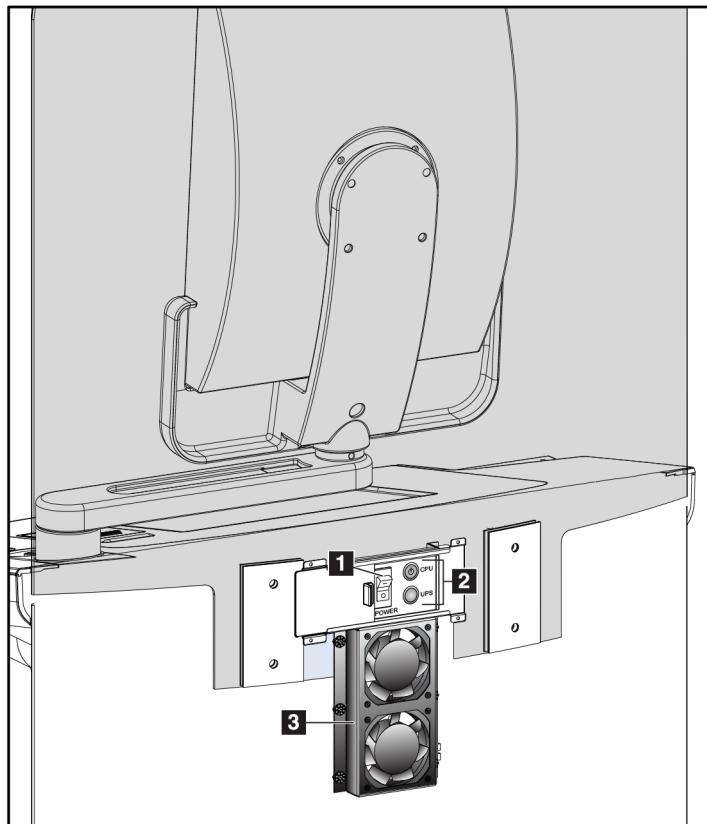


Figure 116: Premium Acquisition Workstation Components—Rear View

Item and Section

1. [Power ON/OFF Switch](#) on page 190
2. [CPU and UPS Reset Buttons](#) on page 190
3. [Cooling Fans](#) on page 191

8.5 Remove the Computer, Display, and Data Components



WARNING!

Power must be completely removed before servicing the Acquisition Workstation.

8.5.1 Back Up the Computer

Follow the on-screen procedures in the Service Tool: *Hologic Service> Troubleshooting>Backups*.

8.5.2 Computer

1. Remove the front cover—see [Front Cover](#) on page 167.
2. Note their location and remove all connectors from the computer.
3. Remove the four socket head screws from the computer's side brackets.
4. Remove the computer with brackets attached.
5. Reverse the procedure to install.

Note

Place the bottom of the computer bracket on the bottom ledge of the UPS bracket for support, then move it in place and fasten.

6. Install the backup files. Follow the on-screen procedures in the Service Tool: *Hologic Service>Troubleshooting>Restore From Backup*.
7. Verify system operation.

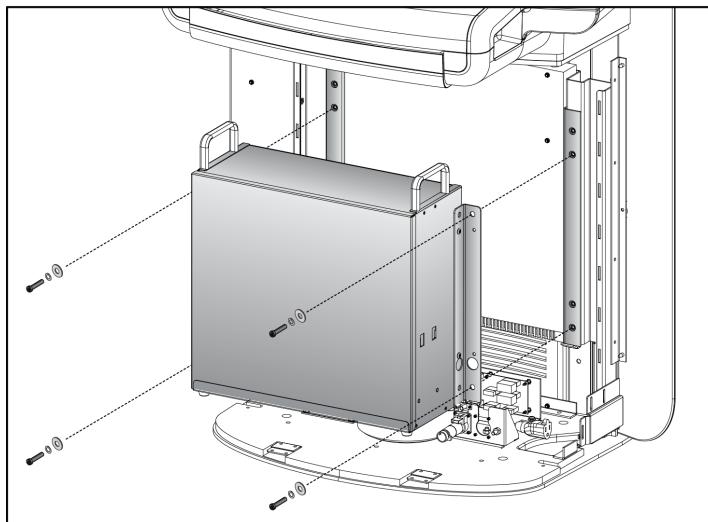


Figure 117: Remove the Computer

8.5.3 Displays

Preview Display

1. Remove the access panel at the rear of the display—see the following figure.
2. Remove the cables.
3. Remove the two socket head screws that fasten the wire retainer on the display mount frame.
4. Have one person hold the display while another removes the four screws that fasten the display to the LCD mounting plate.

5. Remove the preview display.

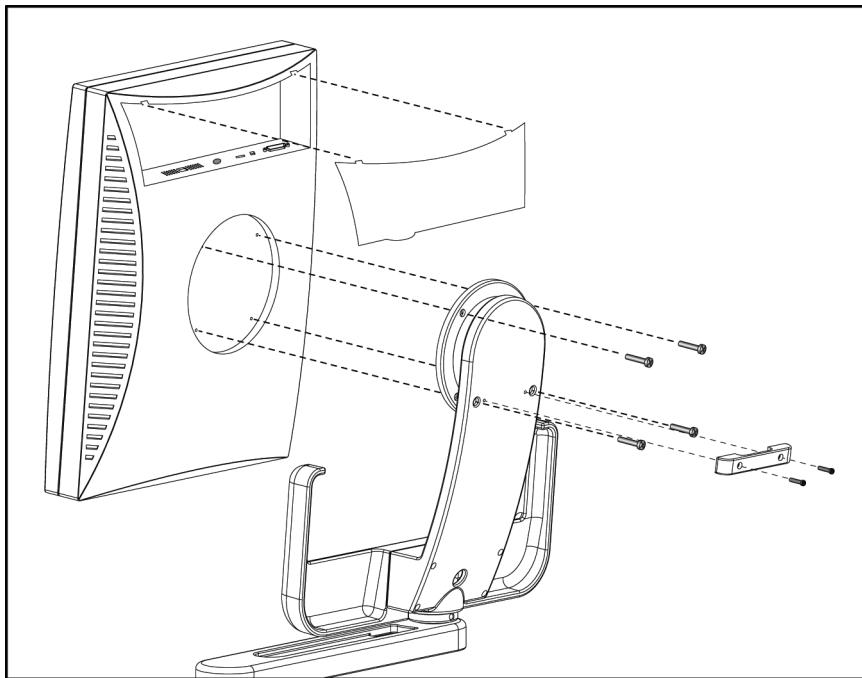


Figure 118: Remove the Preview Display

Replacement of Preview Display Monitor (Barco MDNC-3321) of Premium AWS

Removal of Existing Preview Display Monitor:

1. Remove all power from the workstation.
2. Remove covers and panels, as needed.
3. Remove the existing preview display monitor:
 - a. Remove the access panel at the rear of the preview display monitor.
 - b. Disconnect and remove the cables from the preview display monitor.
 - c. Remove the two socket head screws that fasten the wire retainer on the display mount frame.
 - d. Remove the cables from the arm.
 - e. Have one person hold the preview display monitor while another person completes the following two steps.
 - f. Unfasten the four mounting screws that secure the monitor to the monitor mount.
 - g. Remove the preview display monitor from the existing monitor mount.

4. Remove the existing cables from the workstation:
 - a. Remove the monitor arm from the monitor post.
 - b. Disconnect the cables from their endpoint connections in the workstation. Note the locations of these endpoint connections and their cable routing. This information is helpful for the installation procedure that follows.
 - c. Route the cables from their endpoints, up through the workstation, then up and out of the monitor mounting post. The existing cables are not required for the replacement monitor. New cables are provided in the kit.

Installation of Replacement Preview Display Monitor Barco MDNC-3321:

1. Remove the new preview display monitor from its shipping box and packing material.
2. Install the new preview display monitor (see the following figure):
 - a. Have one person hold the preview display monitor (item 1) while another person completes the following two steps.
 - b. Attach the round side of the new mounting plate (item 3) to the inside of the vertical mounting arm (item 4). Use the screws supplied in the kit.
 - c. Attach the square side of the new mounting plate (item 3) to the rear panel of the new preview display monitor. Use the screws supplied in the kit.

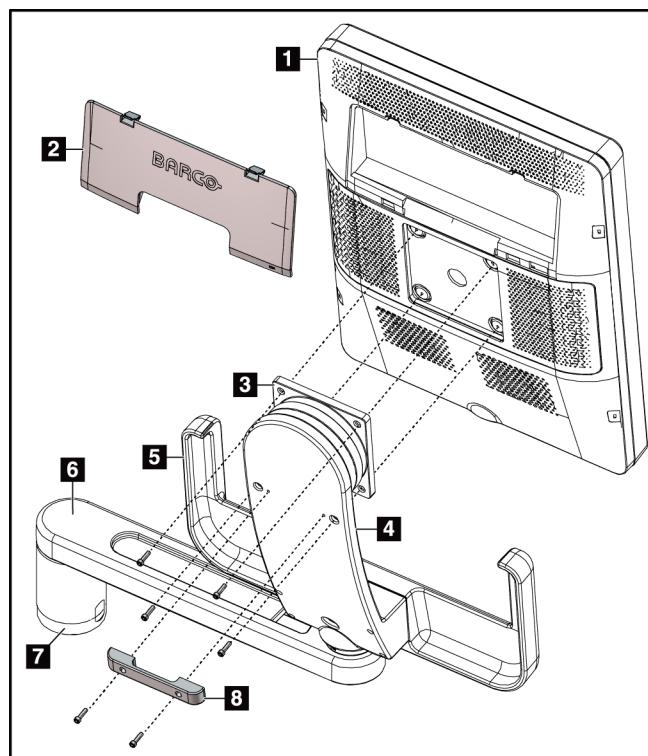


Figure Legend

1. Preview display monitor
2. Access panel
3. Square side of new mounting plate
4. Vertical mounting arm
5. Bevel bracket
6. Swing arm
7. Top of monitor post
8. Wire retainer

Figure 119: Installation of new preview display monitor

3. Connect the new cables to the new preview display monitor.
4. Attach the access panel at the rear of the preview display monitor.
5. Fasten the wire retainer to the display mount frame (two socket head screws).
6. Install and connect the new cables to the workstation:
 - a. Route and thread the new cables through the swing arm (see previous figure, item 6), down through the top of the monitor post (item 7).
 - b. Connect the cables to their endpoint connections in the workstation.
 - c. Locate and remove the existing monitor power supply bracket inside the workstation and replace it with the new bracket included in the kit.
 - d. Secure the monitor power supply to the new bracket, using the hook and loop strap provided with the kit.
7. Plug in and power ON the system.
8. Verify the setup settings of the monitor. Refer to the section Verify Settings of Barco MDNC-3321 Preview Display Monitor in Chapter 10.

Touchpad Assembly

1. Access the bottom of the display arm—see the following figure.
2. Disconnect the Touchpad power connector.
3. Remove the four socket head screws through the rear of the display mount frame.
4. Remove the display mount frame bezel, and place it on a work surface.
5. Remove the four screws at the corners of the Touchpad assembly.
6. Disconnect the cable on the Touchpad, and remove the Touchpad.
7. Reverse the procedure to replace the assembly.

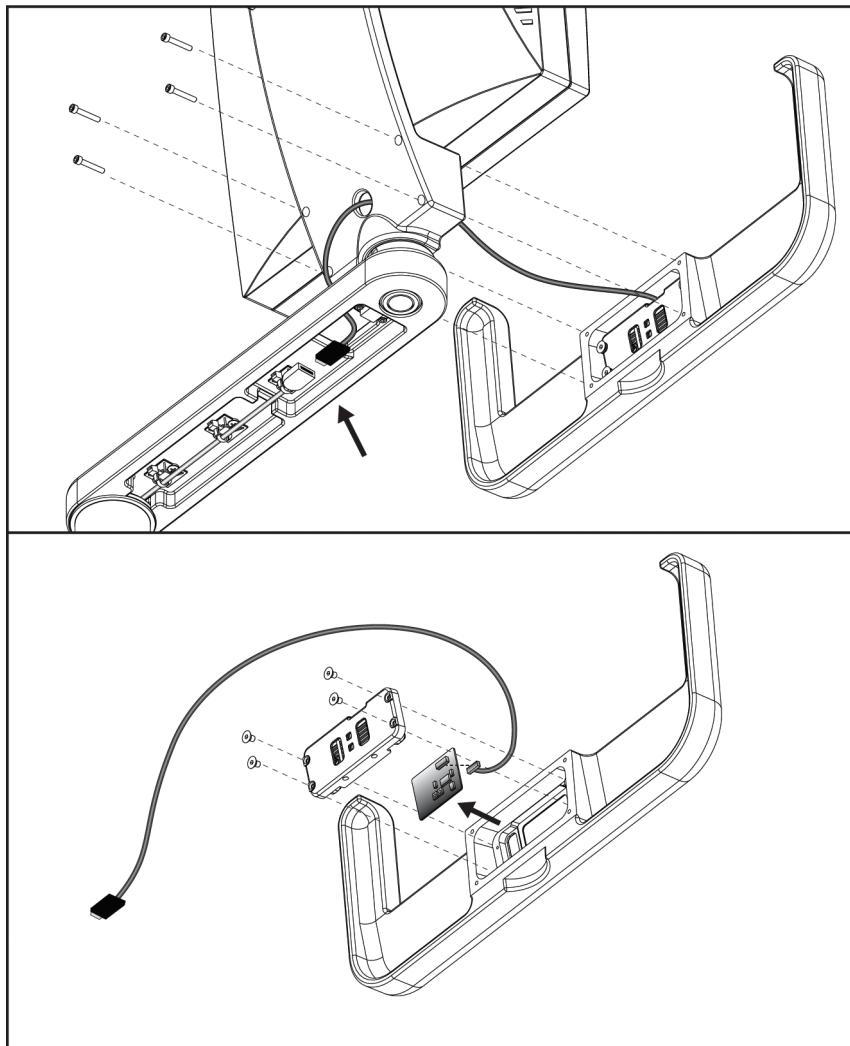


Figure 120: Remove the Touchpad

Touch Screen Display

1. Remove the top cover—see [Top Cover](#) on page 168.
2. Remove the four screws and ground strap on the Touch Screen Display bracket—see the following figure.
3. Note cable locations, lift the Touch Monitor, and remove all connectors.



Tip:

Tape the connector wires to the frame so they don't fall into the Acquisition Workstation. Otherwise removal of the front cover is necessary.

4. Remove the Touch Screen Display from the frame.
5. Reverse the procedure to install.
6. Slide the keyboard tray forward.
7. Power the Acquisition Workstation and position an inspection mirror to view the bottom front of the Touch Screen Display.
8. Press the power reset button shown in the following figure.

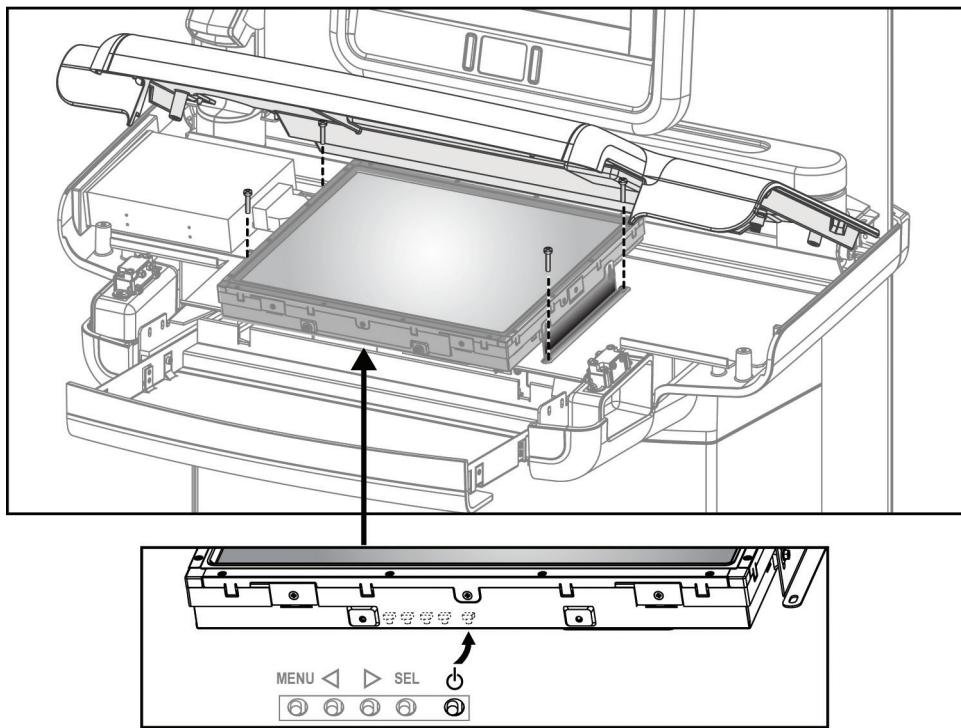


Figure 121: Remove the Touch Screen Display

8.5.4 Right or Left X-ray Switch

1. Remove the top cover—see [Top Cover](#) on page 168.
2. Remove the two hooked forked terminals on the switch—see the figure [Remove the Bottom Cover](#) on page 169, item 1.
3. Remove the two socket head screws and captive nuts from the sides of the switch.
4. Remove the switch.

8.5.5 Compression Release Switch

1. Remove the top cover—see [Top Cover](#) on page 168.
2. Remove the two connectors on the compression release board.
3. Remove the four screws that fasten the board—see the figure [Remove the Compression Switch, Trackball, and Fingerprint Scanner](#) on page 180, item 4.
4. Remove the board from the frame.

8.5.6 Trackball Assembly

1. Remove the top cover—see [Top Cover](#) on page 168.
2. Remove the four screws that fasten the trackball assembly to the frame—figure [Remove the Compression Switch, Trackball, and Fingerprint Scanner](#) on page 180, item 1.
3. Remove the trackball assembly.

8.5.7 Emergency OFF Switch

1. Remove the top cover—see [Top Cover](#) on page 168.
2. Remove the connector attached to the emergency off switch wires.
3. Remove the nut and washer from the switch—figure [Remove the Compression Switch, Trackball, and Fingerprint Scanner](#) on page 180, item 3.

8.5.8 Fingerprint Scanner

1. Remove the top cover—see [Top Cover](#) on page 168.
2. Remove the four screws that fasten the Fingerprint Scanner to the frame—see the following figure, item 2.

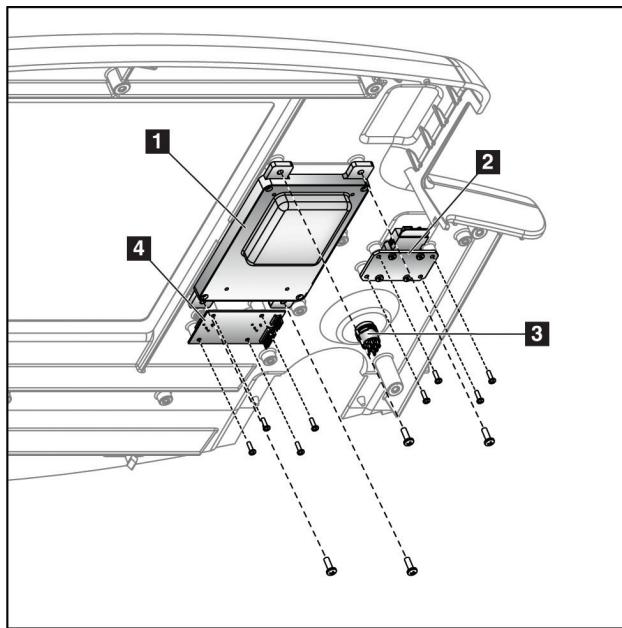


Figure 122: Remove the Compression Switch, Trackball, and Fingerprint Scanner

8.5.9 DVD Drive

1. Remove the top cover—see [Top Cover](#) on page 168.
2. Remove the USB and power connectors on the IDE/USB board at the rear of the DVD drive.
3. Remove the two screws that fasten the DVD drive bracket—figure [View of Premium workstation with bottom cover removed](#) on page 169, item 2.
4. Remove the DVD drive.
5. When installing, use the elongated holes in the DVD drive bracket to align the DVD with the edge of the bottom cover.



Note

An additional USB User Port is located to the left of the DVD drive.

8.5.10 Keyboard

1. Remove the front cover—see [Front Cover](#) on page 167.
2. Cut the cable ties along the harness, and remove the keyboard cable from the computer.
3. Slide out the keyboard tray, and remove the keyboard from the hook-and-loop material on the tray.

8.5.11 Bar Code Scanner

1. Remove the front cover—see [Front Cover](#) on page 167.
2. Locate and remove the Bar Code Scanner cable at the computer.
3. Remove the top cover—see [Top Cover](#) on page 168.
4. Remove the bottom cover —see [Bottom Cover](#) on page 169.
5. Remove the four socket head screws at the bottom of the Bar Code Scanner—see the figure to the right.
6. Remove the Bar Code Scanner with attached cable through the top of the Acquisition Workstation.

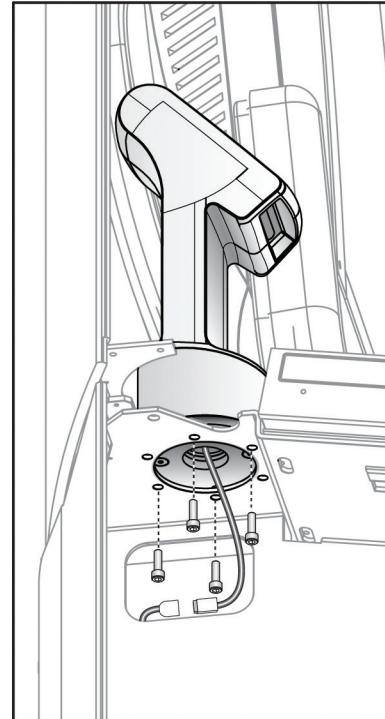


Figure 123: Remove the Bar Code Scanner

Verify the Bar Code Scanner

1. Click the Windows **Start** Button.
2. Click **All Programs**.
3. Click **MetrOPOS**.
4. Click **MetrOPOS Administrator**.
5. If the OPOS Configuration Wizard Welcome window opens, click the *Do not show at startup* check box. Close the window.
6. When the form is displayed, select **Device Information** tab.

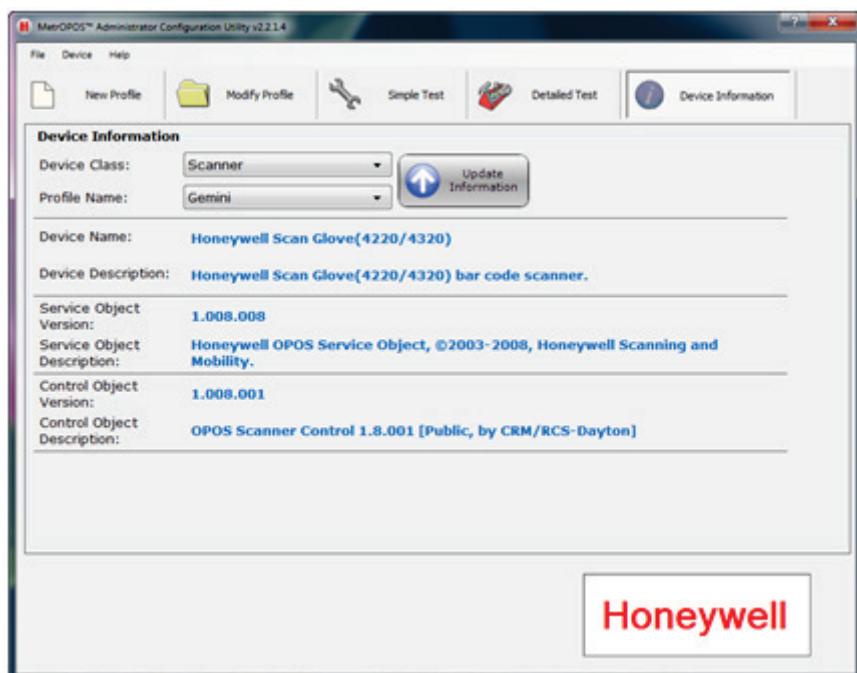


Figure 124: MetrOPOS Administrator Screen

7. Click the **Update Information** button. The Device Name and Description information should be displayed as in the previous figure.
 - a. If the Device Name shows *Unable to open device (107)*, scan the [Enable Barcode Scanner USB Serial Emulation Mode](#) on page 245 barcode below and reboot the computer.



Figure 125: Enable Barcode Scanner USB Serial Emulation Mode

7. Click the **Update Information** button. The Device Name and Description information should be displayed as shown above.

8. Click the **Simple Test** tab.
9. Click the **Begin Test** button.
 - a. Scan a test barcode shown below.
 - b. The *Scan data:* should display the barcode information.



10. If the **End Scanner Test** button is not enabled, the scanner is not configured properly.
11. If the scan failed, see [Configure the Bar Code Scanner](#) on page 184 to configure the bar code scanner. If your system has the Standard Acquisition Workstation, see [Configure the Bar Code Scanner](#) on page 199.
12. Click the **End Test** button.
13. Close the **MetrOPOS Administrator** window by clicking on the red X in the upper right corner of the window.

Test Bar Codes



Configure the Bar Code Scanner

The following procedure has the bar codes that must be scanned one at a time in numerical order to configure the bar code scanner. The individual bar codes are printed on the page to be properly scanned by the bar code scanner when in its permanent mounted position on the Acquisition Workstation.

1. Scan the item 1 bar code.
2. After the beep(s), move the page away from you until the next bar code is underneath the scanner.
3. Repeat the process until all bar codes on the page have been scanned.
4. After scanning the last bar code on a page, move the page to the side, being careful not to inadvertently scan a code.
5. Proceed to the next page.
6. Repeat the process for the remaining pages.

1	Enable Factory Defaults	 3 8 4 6 6 0 0
2	Recall Defaults	 3 9 9 9 9 9 8
3	Enable Uni-Directional USB Serial Emulation	 3 3 1 6 4 7 0
4	Enter Program Mode	 3 9 9 9 9 9 9
5	Internal Low Speed	 3 9 9 9 9 4 1
6	Transmit Leading Zero on UPC-E	 3 1 0 7 5 1 3

7	Transmit UPC-E Check Digit	 3 1 0 7 5 1 6
8	Enable Transmit of LRC Calculation	 3 1 0 7 8 1 1
9	Enable Nixdorf ID Characters	 3 1 0 7 9 1 7
10	Enable Un-Directional USB Serial Emulation (POS)	 3 3 1 6 4 7 0
11	Disable Line Feed Suffix	 3 1 1 6 6 0 2
12	Disable Carriage Return Suffix	 3 1 1 6 6 0 3
13	Enable ETX Suffix	 3 1 1 6 6 1 4
14	Enable STX Prefix	 3 1 1 6 6 1 5
15	Enable Communication Timeout	 3 1 1 8 4 1 2
16	Beep After Transmit	 3 1 1 8 4 0 3

17	Exit Program Mode	 3 9 9 9 9 9 9 9
18	Optional Tone 5	 3 3 1 8 5 2 5
19	CodeGate Active Out Of Stand	 3 1 1 8 7 1 3
20	Short Range In Stand	 3 1 1 8 7 1 5

8.6 Remove Circuit Boards and Circuit Components



WARNING!

Power must be completely removed before servicing the Acquisition Workstation.

Note

For the following procedures, be careful not to drop the screws as you remove them. Otherwise, the computer and UPS may have to be removed. See the figure [Premium Acquisition Workstation Components—Front and Top View](#) on page 170 for component location.

8.6.1 Acquisition Workstation I/O (Input/Output) Board

1. Remove the front cover—see [Remove the Covers and Panels](#) on page 167.
2. Note their location and remove all connectors (and power cord to the UPS) from the board.
3. Remove the five screws that fasten the board to the frame.

8.6.2 Dual Output Power Supply Board—5 V, 12 V

1. Remove the front cover—see [Front Cover](#) on page 167.
2. Note their location and remove all connectors from the board.
3. Remove the four screws that fasten the board to the frame.

8.6.3 Touch Screen Display Power Module

1. Remove the front cover—see [Front Cover](#) on page 167.
2. Remove the Touch Screen Display module power cord from the UPS.
3. Remove the Touch Screen Display module power cable to the Touch Screen Display.
4. Remove the four nuts that fasten the bracket.
5. Remove the module.

8.6.4 Preview Display Power Module

1. Remove the front cover—see [Front Cover](#) on page 167.
2. Remove preview display module power cord from the UPS.
3. Remove the preview display module power cable to the preview display.
4. Remove the strap that fastens the module to the bracket.
5. Remove the module.

8.7 Remove Electrical Components and Assemblies



WARNING!

Power must be completely removed before servicing the Acquisition Workstation.

8.7.1 Power Distribution Assembly

1. Remove the front cover—see [Front Cover](#) on page 167.
2. Note their location and remove all connectors from the Power Distribution Assembly.
 - UPS power leads.
 - Filter capacitor wires.
 - X-ray interlock phone jack at connector.
 - Acquisition Workstation to Gantry interconnect—Remove the four socket head screws from the plate where the connector is mounted.
 - Fiber optic connector.
 - Ground wire.
3. Remove the five socket head screws that fasten the Power Distribution Assembly to the frame—see the following figure.
4. Remove the assembly from the frame.

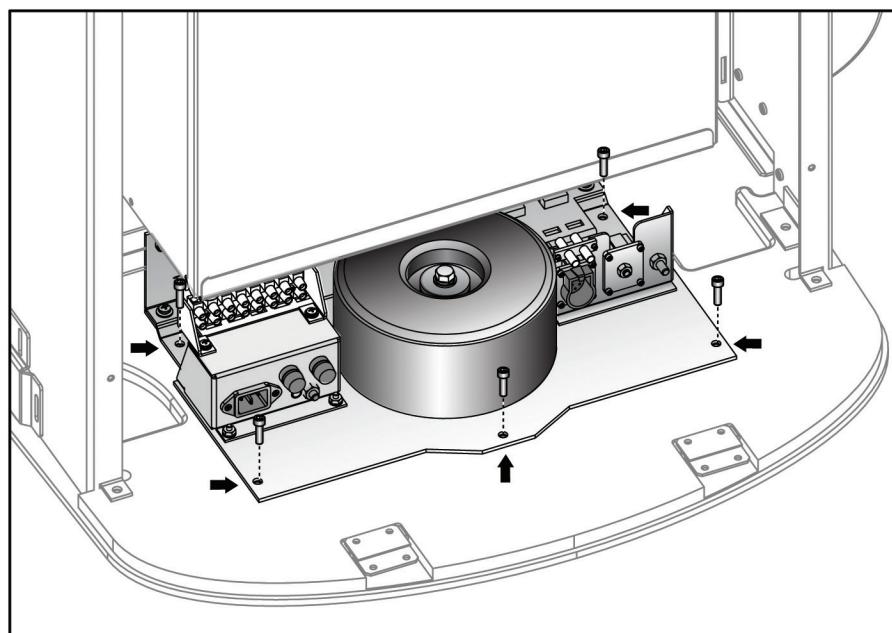


Figure 126: Remove the Power Distribution Assembly

8.7.2 Uninterruptible Power Supply (UPS)

1. Remove the computer—see [Computer](#) on page 173.
2. Cut the cable ties that fasten the UPS power cord to the frame.
3. On an earlier Acquisition Workstation, remove the UPS power cord leads from the L/N/G terminal block at the rear of the PDA (see the following figure):
 - a. Remove the center bolt from the PDA transformer.
 - b. Move the transformer to gain access to the terminal block.
 - c. Loosen the terminal block screws to remove the UPS power cord leads.

Note

 Later UPS power terminal blocks have a short AC power cord extension that mates with the UPS power cord.

4. Remove the four socket head screws on the sides of the UPS bracket.
5. Tilt the UPS slightly to show the connectors at the top of the UPS.
6. Note their location and remove all connectors from the UPS.
7. Remove the UPS from the frame.

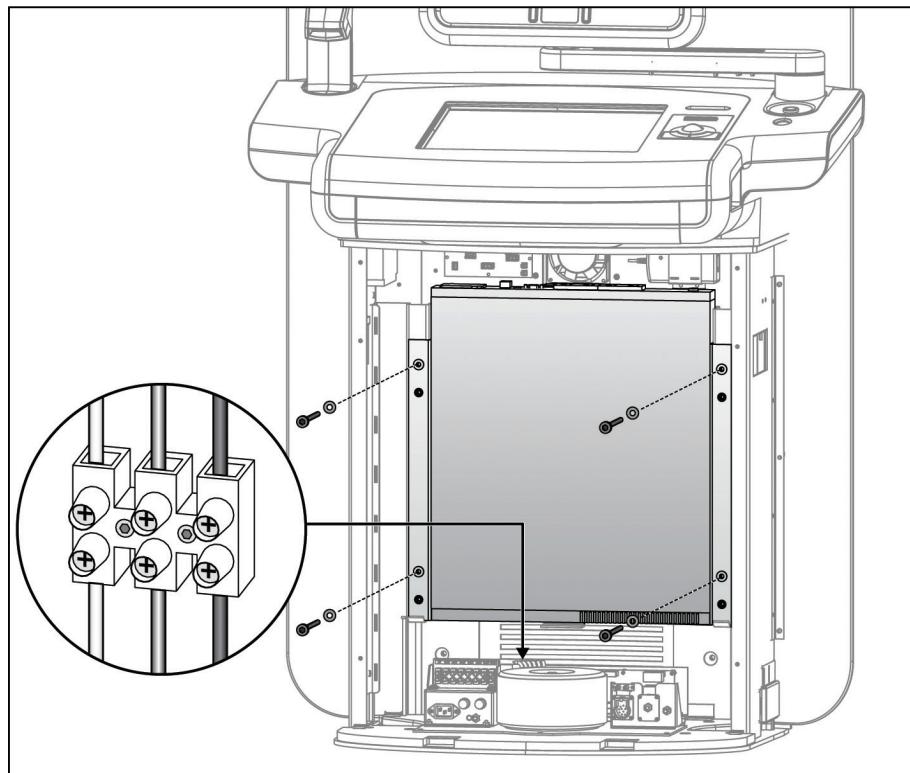
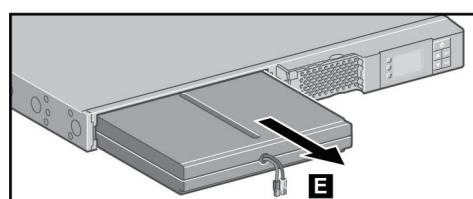
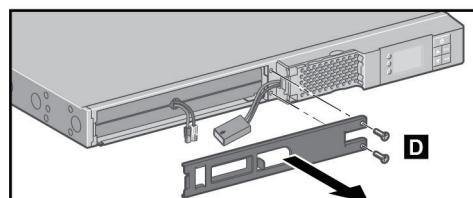
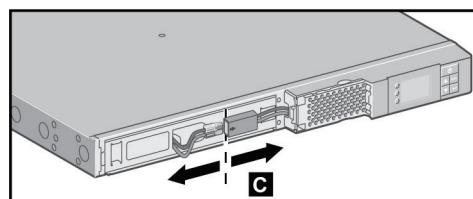
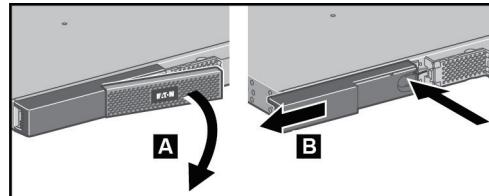


Figure 127: Remove the UPS

8.7.3 UPS Battery (ASY-07497) Replacement

To replace the UPS battery (ASY-07497):

1. Remove the UPS from the AWS—see [Uninterruptible Power Supply \(UPS\)](#) on page 189.
2. Lay the UPS flat in a position where you can access the front panel.
3. Remove the middle panel, item A.
4. Remove the left-hand side of the front panel by pushing the button, and then by sliding the part, item B.
5. Disconnect the battery-module by separating the connectors (never pull on the wires), item C.
6. Remove the metal protection cover in front of the battery (two screws), item D.
7. Pull the plastic tab to remove the battery block and replace it, item E.
8. Reverse the previous steps to install the new battery.



8.7.4 Power ON/OFF Switch

1. Remove the rear cover—see [Rear Cover](#) on page 167, and the figure [Premium Acquisition Workstation Components—Rear View](#) on page 172.
2. Remove the four screws that fasten the switch bracket to the frame.
3. Remove the quick-connects at the rear of the switch.
4. Press the mounting tabs at the rear of the switch to remove the switch.

8.7.5 CPU and UPS Reset Buttons

1. Remove the rear cover—see [Rear Cover](#) on page 167.
2. Remove the front cover—see [Front Cover](#) on page 167.
3. Remove the four screws that fasten the switch bracket to the frame.
4. Cut the cable ties along the harness.
5. Disconnect the CPU reset button cable from the computer.
6. Disconnect the UPS reset button cable and ground from UPS.
7. Remove the nuts and washers that fasten the buttons to the bracket.

8.7.6 Cooling Fans

1. Remove the rear cover—see [Rear Cover](#) on page 167, and the figure [Premium Acquisition Workstation Components—Rear View](#) on page 172.
2. Remove the six screws that fasten the fan bracket, and remove the bracket and fans.
3. Disconnect the fan connectors from the Acquisition Workstation I/O board.

8.8 Preventive Maintenance Procedures



Note

Refer to the [Preventive Maintenance Schedule](#) on page 86.

The tools and materials required for performing preventive maintenance:

- Standard hand tools
- Lint free cloths
- CRT wipes
- Small vacuum cleaner
- Brush

8.8.1 Acquisition Workstation—Clean and Inspect

1. Turn the system off.
2. Remove the front cover; see [Front Cover](#) on page 167.
3. Remove the rear cover; see [Rear Cover](#) on page 167.
4. Inspect the chassis for loose or missing hardware.
5. Inspect the cables for signs of wear such as crimps, breaks, and frays.
6. Use the vacuum cleaner to remove dust from inside the chassis, cooling fans, and air intakes on the computer.

8.8.2 Clean the Preview Display and Touch Screen Display

Avoid touching the display area.

Always use care when cleaning the outer surface of the display area. Always use a clean, soft, lint-free cloth. Microfiber cloths, are highly recommended.

- Never spray or pour a liquid directly onto the display area.
- Never apply excessive pressure to the display area.
- Never use detergents with fluorides, ammonia, alcohol, or abrasives.
- Never use bleach.
- Never use steel wool, or cloth woven with metal.
- Never use a sponge with abrasives.

To clean the display:

Clean the display using a sponge, cleaning cloth, or soft tissue, lightly moistened with a recognized cleaning product for medical equipment. Read and follow all label instructions on the cleaning product. In case of doubt about a screen cleaning product, use plain water.

Do NOT use the following products:

- Alcohol/solvents at higher concentration > 5%
- Strong alkalis lye, strong solvents
- Acid
- Detergents with fluoride
- Detergents with ammonia
- Detergents with abrasives
- Steel wool
- Sponge with abrasives
- Steel blades
- Cloth with steel thread

8.8.3 Clean the Trackball

External:

Clean the trackball assembly surfaces using a standard CRT wipe.

Internal:

1. Remove the power.
2. Remove the Acquisition Workstation top cover; see [Top Cover](#) on page 168.
3. Remove the trackball assembly; see [Trackball Assembly](#) on page 179.
4. Remove the four screws on the back of the trackball assembly, and remove the cover; see the following figure—item 1.
5. Unplug the connectors.
6. Remove the four screws that hold the scroll bar—item 2.
7. Remove the screws from the circuit board that holds the trackball—item 3.
8. Remove the trackball from the optic lens—item 4.
9. Flush the inside of the optic lens with isopropanol, and dry with a microfiber cloth.
10. Install the trackball in the reverse order, and check for full range of motion.
11. Install the trackball assembly to the Acquisition Workstation top cover.

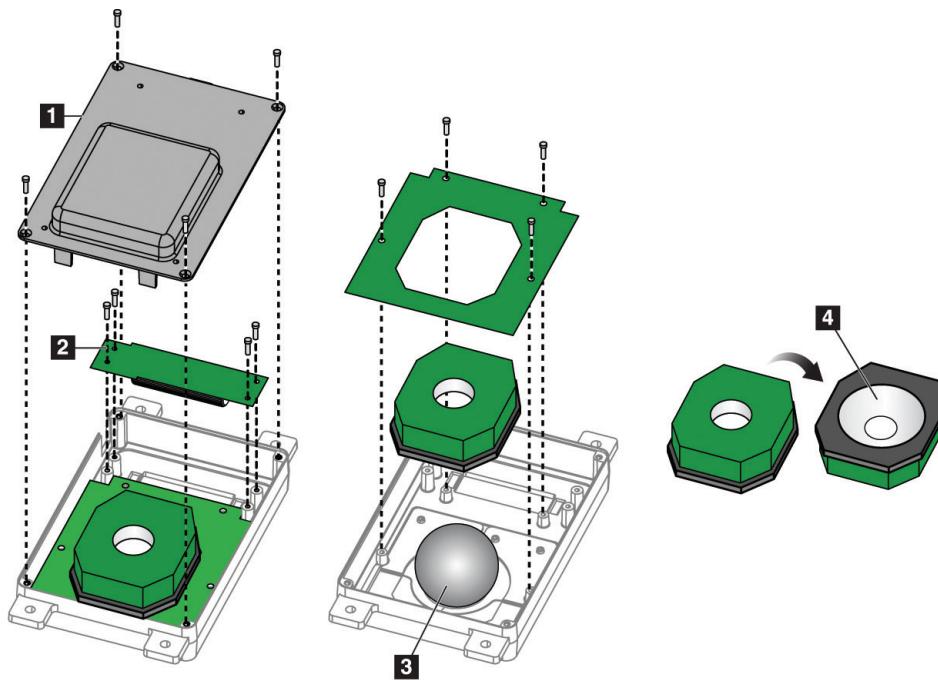


Figure 128: Clean the Trackball

Chapter 9 Standard Acquisition Workstation Maintenance

9.1 Component Identification

9.1.1 Standard Acquisition Workstation—Rear

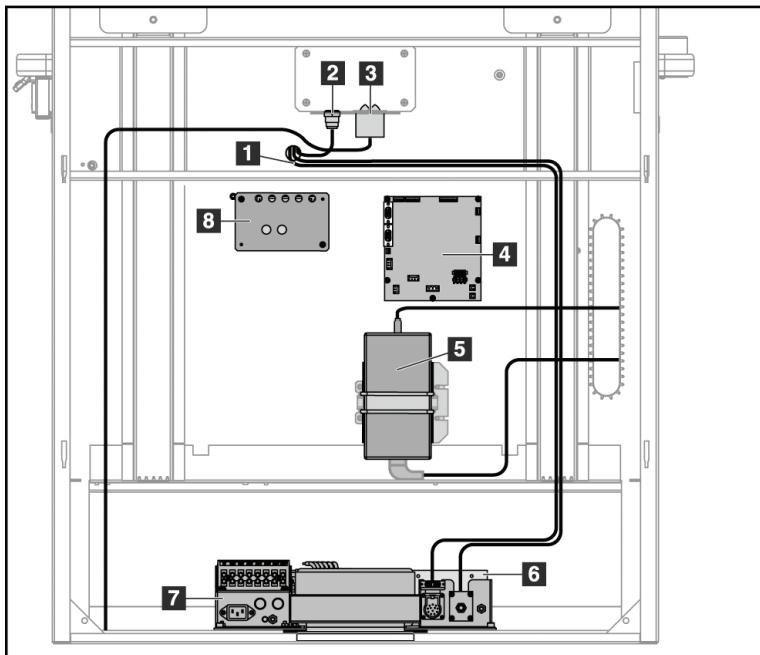


Figure Legend

1. Network/Fiber Optic Cables
2. CPU Reset Switch
3. Circuit Breaker Power ON Switch
4. Standard Acquisition Workstation Power Control Board
5. Preview Display Power Supply (Secured with Strap FAB-13242)
6. AC Power Distribution Board
7. Power Distribution Assembly (PDA)
8. Low Voltage Power Supply

Figure 129: Standard Acquisition Workstation Components—Rear View

9.2 Access Internal Components

9.2.1 Remove the Covers

Front Cover

1. Remove the two screws at the top of the cover.
2. Pull the cover up from the slots at the bottom of the Acquisition Workstation.

Rear Cover

1. Loosen the two screws located at the bottom of the rear cover.
2. Grasp the handles on each side of the cover.
3. Slide the cover up and off.

Side Covers

1. Remove the two screws at the top of the cover.
2. Pull the cover up from the slots at the bottom of the Acquisition Workstation.

9.3 Remove the Computer, Display, and Data Components



WARNING!

Power must be completely removed before servicing the Acquisition Workstation.

9.3.1 Back Up the Computer

Follow the on-screen procedures in the Service Tool: Hologic Service > Troubleshooting > Backups.

9.3.2 Computer

1. Remove the side cover.
2. Remove the front cover.
3. Note their location and remove all connectors from the computer.
4. Remove the four socket head screws that are holding the computer brackets to the frame.
5. Remove the computer with attached brackets.
6. Reverse the procedure to install.
7. Install the backup files. Follow the on-screen procedures in the Service Tool: *Hologic Service>Troubleshooting>Restore From Backup*.

To confirm licensing, see [Confirm Licensing](#) on page 75.

8. Verify system operation.

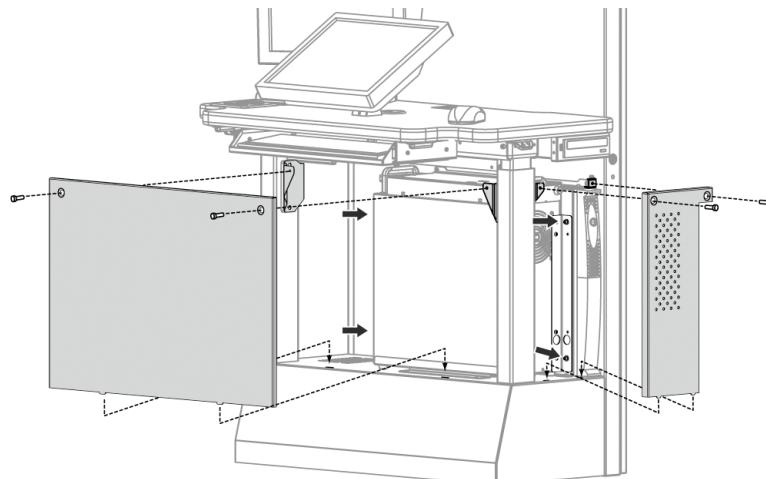


Figure 130: Remove the Computer

9.3.3 Displays

Preview Display

1. Remove the display cable cover.
2. Remove the DVI and power supply cables.
3. Remove the pedestal/base cover, then remove the cables.
4. Remove the preview display.

Preview Display Power Supply

1. Open the display cable cover, and remove the power supply connector.
2. Remove the Acquisition Workstation rear cover.
3. Disconnect the display power supply AC input power plug to the UPS, if equipped.
4. Remove the strap that fastens the power supply to the bracket.
5. Remove the power supply and cable through the frame.
6. Reverse the steps to install the preview display power supply. Dress and cable tie as required.

Control Display

1. Remove the AC cord and VGA cable to the control display.
2. Remove the four plastic knobs securing the display to the bracket.
3. Remove the control display.

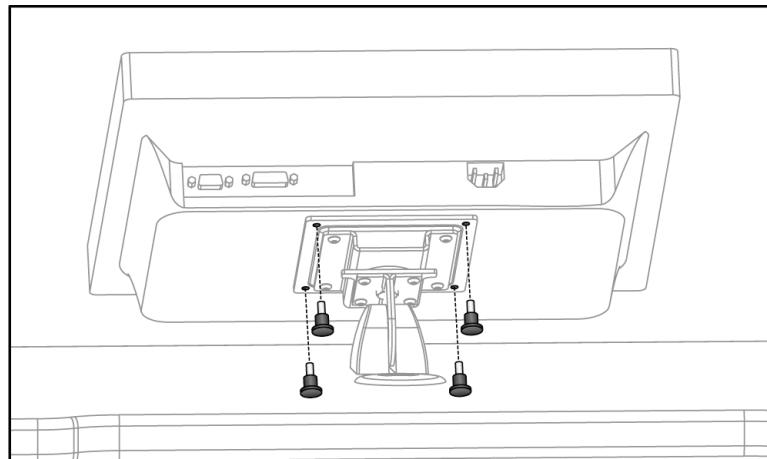


Figure 131: Remove the Control Display

9.3.4 Right or Left X-ray Switch

1. Remove the front cover.
2. Remove the two screws that fasten the switch assembly to the bottom of the table.
3. Remove the two small screws that secure the switch cover, and remove cover.
4. Note the position of the cables and remove the wires from the switch.

9.3.5 Compression Release Switch/Emergency Off Switch

1. Remove the front cover.
2. Remove the two screws that fasten the switch assembly to the bottom of the table.
3. Remove the cable from the compression release/emergency off switch circuit boards.
4. Turn the emergency off cap CCW to remove from the switch button.
5. Unscrew the nut holding the switch
6. Remove assembly from the bottom of the table.
7. Replace the compression release switch or the emergency off switch (with attached PCB).
8. To install emergency off cap, turn CW on body of switch.

9.3.6 DVD Drive

1. Remove the front and side cover.
2. Remove the USB and power connectors on the IDE/USB board at the rear of the DVD drive.
3. Remove the two screws that fasten the DVD housing to the bottom of the table.
4. Slide the DVD and housing forward and out.
5. Remove the DVD drive by removing the four screws at the bottom of the housing.

9.3.7 Keyboard

1. Remove the front cover.
2. Disconnect the keyboard cable from the computer.
3. Pull the keyboard cable out through the hole at the rear of the sliding tray.
4. Remove the keyboard (attached with Velcro®) from the sliding tray.

9.3.8 Mouse

1. Remove the front cover.
2. Disconnect the mouse cable from the computer.
3. Pull the mouse and cable through the hole in the table top.

9.3.9 Bar Code Scanner (Optional)

Replace the Bar Code Scanner:

1. Remove the Acquisition Workstation front cover.
2. Disconnect the Bar Code Scanner cable from the USB connector on the computer.
3. If the Bar Code Scanner is installed on the left side, remove the Bar Code Scanner cable through the hole on the side of the frame after you remove the slotted plastic grommet from the side of the frame.
4. If the Bar Code Scanner is installed on the right side, remove the Bar Code Scanner cable through the hole at the rear wall of the Acquisition Workstation after you remove the slotted plastic grommet from the side of the frame.

Configure the Bar Code Scanner

The following procedure has the bar codes that must be scanned one at a time in numerical order to configure the bar code scanner. The individual bar codes are printed on the page to be properly scanned by the bar code scanner when in its permanent mounted position on the Acquisition Workstation.

1. Scan the item 1 bar code.
2. After the beep(s), move the page away from you until the next bar code is underneath the scanner.
3. Repeat the process until all bar codes on the page have been scanned.
4. After scanning the last bar code on a page, move the page to the side, being careful not to inadvertently scan a code.
5. Proceed to the next page.
6. Repeat the process for the remaining pages.

1	Enable Factory Defaults	 3 8 4 6 6 0 0
2	Recall Defaults	 3 9 9 9 9 9 9 8
3	Enable Manual Activation	 3 4 1 8 3 5 4

4	0.5 Second Timeout	 3 1 2 0 0 1 0
5	Enable Uni-Directional USB	 3 3 1 6 4 7 0
6	Transmit Leading Zero	 3 1 0 7 5 1 3
7	Transmit UPC-E Check Digit	 3 1 0 7 5 1 6
8	Transmit LRC	 3 1 0 7 8 1 1
9	Enable NIXDORF ID	 3 1 0 7 9 1 7
10	Disable Line Feed	 3 1 1 6 6 0 2
11	Disable Carriage Return	 3 1 1 6 6 0 3
12	Enable ETX suffix	 3 1 1 6 6 1 4
13	Enable STX prefix	 3 1 1 6 6 1 5

14	Enable Comm Time Out	 3 1 1 8 4 1 2
15	Beep After Transmit	 3 1 1 8 4 0 3
16	Optional Tone 5	 3 3 1 8 5 2 5

9.4 Replace the Radiation Shield



Warning:

The Radiation Shield is tempered glass and may shatter if dropped or overstressed.



Warning:

Use gloves and eye protection when handling the X-ray Shield.



Warning:

Do not handle or position the Radiation Shield alone. Two people are required to handle and position the tempered glass shield to minimize stress to the shield.



Caution:

The X-Ray Shield is made of tempered glass and is fragile. Use extreme care when handling and installing the shield.



Caution:

Inspect the X-ray Shield before and after installation. Small imperfections embedded in the glass are acceptable. Do not install the shield if cracks or chips are visible.



Caution:

Use care when cleaning the X-ray Shield to avoid excessive force and movement of the shield.

1. Remove the rear cover.
2. Remove the four bolts that secure the two protective plates and the radiation shield to the Acquisition Workstation rear frame.
3. Lift the radiation shield up off the support shelf.
4. Reverse the steps to install the radiation shield. Ensure the logo faces to the front of the Acquisition Workstation. Do not overtighten the bolts.

9.5 Remove the Circuit Boards



WARNING!

Power must be completely removed before servicing the Acquisition Workstation.

9.5.1 Standard Acquisition Workstation I/O (Input/Output) Board

1. Remove the rear cover.
2. Note their location and remove all connectors (and power cord to the UPS, if equipped) from the board.
3. Remove the five screws that fasten the board to the frame.

9.5.2 Dual Output Power Supply Board—5 V, 12 V

1. Remove the rear cover.
2. Note their location and remove all connectors from the board.
3. Remove the four screws that fasten the board to the frame.

9.6 Remove Electrical Components and Assemblies

9.6.1 Power Distribution Assembly

See [Power Distribution Assembly](#) on page 188.

9.6.2 Uninterruptible Power Supply (UPS)



Note

The Uninterruptible Power Supply (UPS) is optional on the Selenia Dimensions Standard Acquisition Workstation.

1. Remove the front, rear, and side covers.
2. Cut the cable ties that fasten the UPS power cord to the frame.
3. Remove the AC power cord from the extension that goes to the PDA terminal block.
4. From the front, remove the four screws from the top of the UPS mounting bracket.
5. Remove the two UPS mounting screws from the bottom rear of the frame.
6. Note their location and remove all power cords and connectors from the UPS.
7. Slide the UPS from the UPS Mounting bracket.

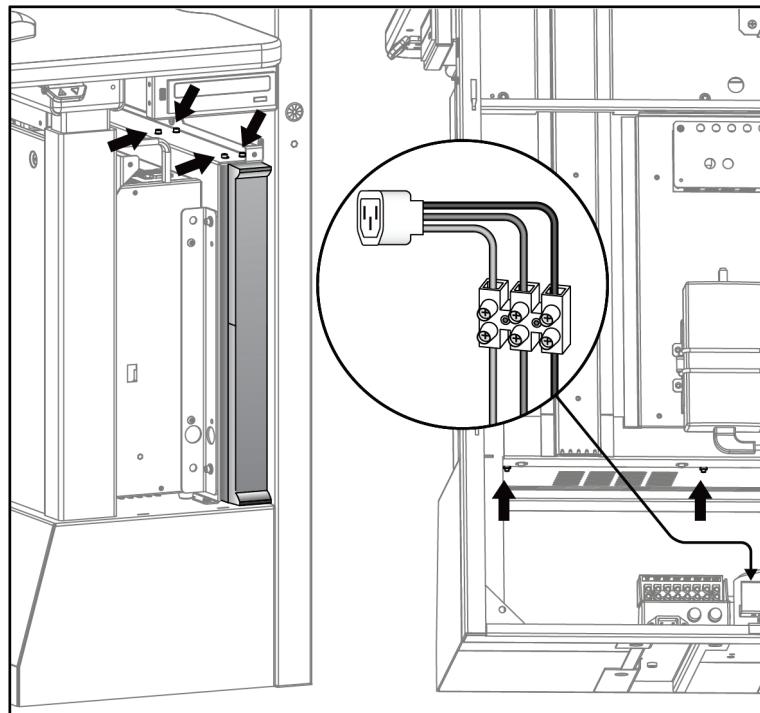


Figure 132: Remove the UPS

9.6.3 UPS Battery Replacement

See [UPS Battery \(ASY-07497\) Replacement](#) on page 190.

9.6.4 Power ON/OFF Switch

1. Remove the rear cover.
2. Remove the quick-connects at the rear of the switch.
3. Press the mounting tabs at the rear of the switch to remove the switch.

9.6.5 CPU Reset Button

1. Remove the front and rear covers.
2. Disconnect the CPU reset button cable from the computer.
3. Pull the cable through the hole in the frame.
4. Remove the nuts and washers that fasten the button to the bracket.

9.6.6 Table Height Assembly Replacement



Note

The table height is not adjustable on the Selenia Dimensions 2D Screening system.

When the table is lifted to its maximum height, and the front and side covers removed, the components under the table are accessed. To replace the lifting columns, remove the table.



Warning:

Have the necessary personnel available to help when you remove the top of the table.

Remove the Table

See the following figure.

1. Remove the front and side covers.
2. Remove the cables from the Preview Display and remove the display.
3. Remove the cables from the Control Display and remove the display. See figure [Remove the Control Display](#) on page 197 .
4. Remove the mouse and keyboard cable from the computer.
5. Remove the cables from the DVD drive.
6. Remove the cables from the Compression/Emergency Off, and Right/Left X-ray switches.
7. Remove the E-chain cable carrier.
8. Loosen but don't remove two screws at one end of the Control Box

9. Remove the two screws at the other end of the Control Box.
10. Remove the Control Box cables.
11. Slide the Control Box from the remaining screws. (Use the remaining screws to aid in installing the Control Box).
12. Remove the table.

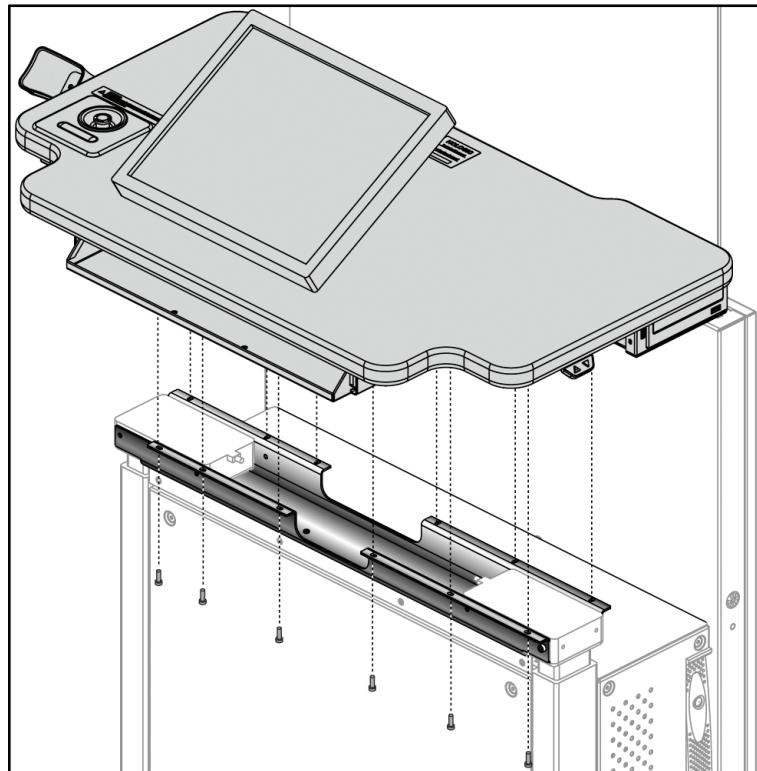


Figure 133: Remove the Table Top

Remove the Lifting Columns

1. Remove the table top.
2. Remove the rear cover.
3. Remove the 4 bolts at the bottom of each leg.
4. Remove the column bracket (4 cap screws two for each leg) at the top of the lifting columns.
5. Remove the lifting columns.

Note

 Use the height adjustment switch to initialize the replacement lifting columns by first completely lowering the columns.

Chapter 10 Universal Acquisition Workstation Maintenance

10.1 Introduction

This chapter describes maintenance information and instructions for the Universal Acquisition Workstation, including:

- Component identification
- Removing covers and panels
- Component replacement procedures
- Preventive maintenance procedures



WARNING!

Disconnect system power before removing components!



Warning:

Always follow the safety precautions for x-ray exposures.



Caution:

Always obey Electrostatic Discharge (ESD) precautions when working with electronics and electronic components.



Note

If a procedure instructs you to remove any covers or panels, do not install the covers until all required procedures are completed.

10.2 Universal Acquisition Workstation Controls and Displays

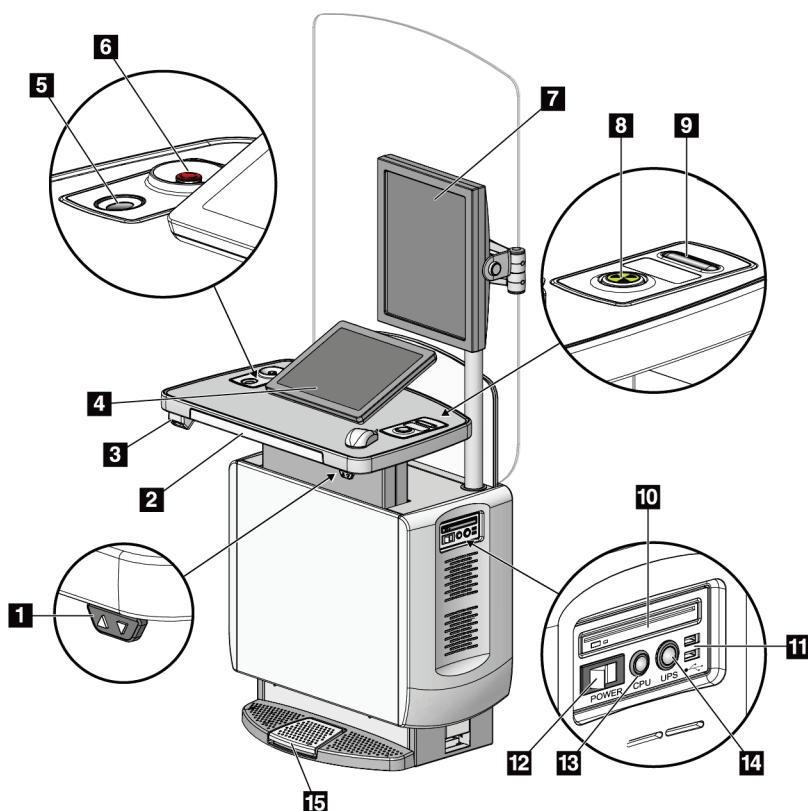


Figure Legend

1. Height Adjustment Switch (optional)
2. Keyboard (in drawer)
3. Bar Code Scanner (optional)
4. Control Display Monitor
5. Fingerprint Scanner (optional)
6. Emergency Off Switch
7. Preview Display Monitor
8. X-ray Activation Button
9. Compression Release
10. CD/DVD Drive
11. USB Ports
12. Workstation Power Switch
13. CPU Power On/Reset Button
14. UPS (optional) Power Button
15. X-ray Footswitch (optional)

Figure 134: Universal Acquisition Workstation Controls and Displays



Note

The controls for the Universal Acquisition Workstation installed in a mobile environment are the same as the controls for the Universal Acquisition Workstation.

10.3 How to Remove All Power to Universal Acquisition Workstation



WARNING!

Power must be completely removed before servicing the Acquisition Workstation.

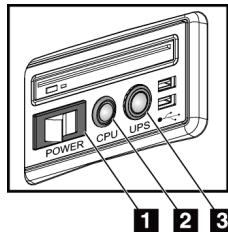


Figure Legend

1. Workstation Power Switch
2. CPU Power On/Reset Button
3. UPS (optional) Power Button

Figure 135: Universal Acquisition Workstation power buttons

To remove all power from the workstation (see previous figure and legend):

1. Shut down the computer including all software applications.
2. If your system includes the optional UPS, press the UPS button (item 3).
3. Power OFF the workstation power switch (item 1).
4. Unplug the workstation power cable from the AC outlet.

To restart the system:

1. Plug in the workstation power cable to the AC outlet.
2. Power ON the workstation power switch.
3. If your system includes the optional UPS, press the UPS button.
4. Wait for the green light of the CPU power on/reset button to turn on, then press the CPU power button.

10.4 Remove the Covers and Panels



WARNING!

Power must be completely removed before servicing the Acquisition Workstation.

See the following figures, which illustrate the removal of covers and panels. Keep in mind the following:

- To remove the side covers, first remove the front and rear covers.
- To remove the top cover, first remove the front, rear, and both side covers.
- To remove the front shroud, first remove the front cover, then remove the chassis support bracket.
- To remove the lower front panel (kick plate), first remove the front, rear, and both side covers.
- To remove the lower rear panel (kick plate), first remove the rear cover.

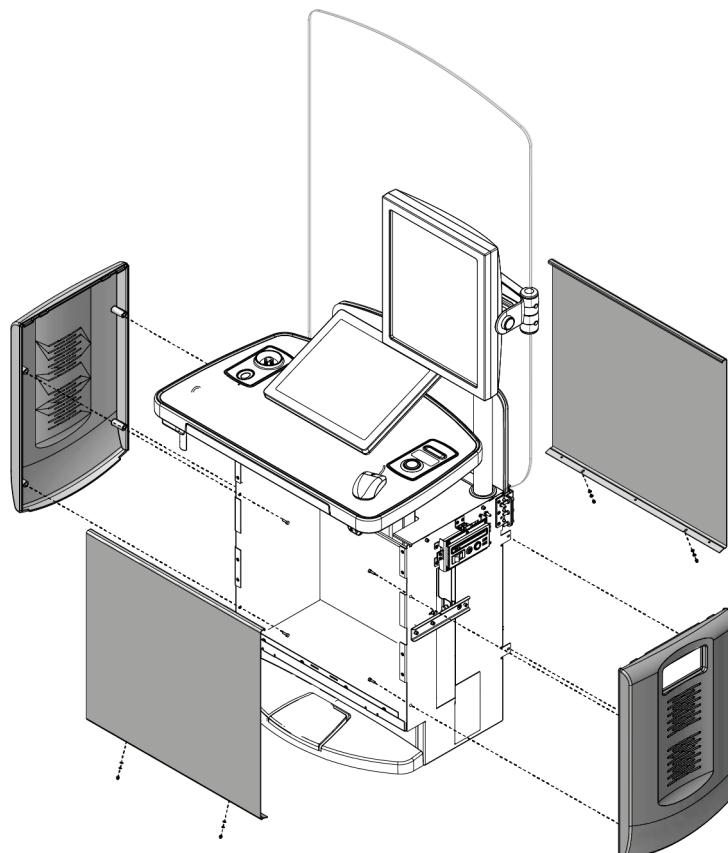


Figure 136: Removing front, rear, and side covers

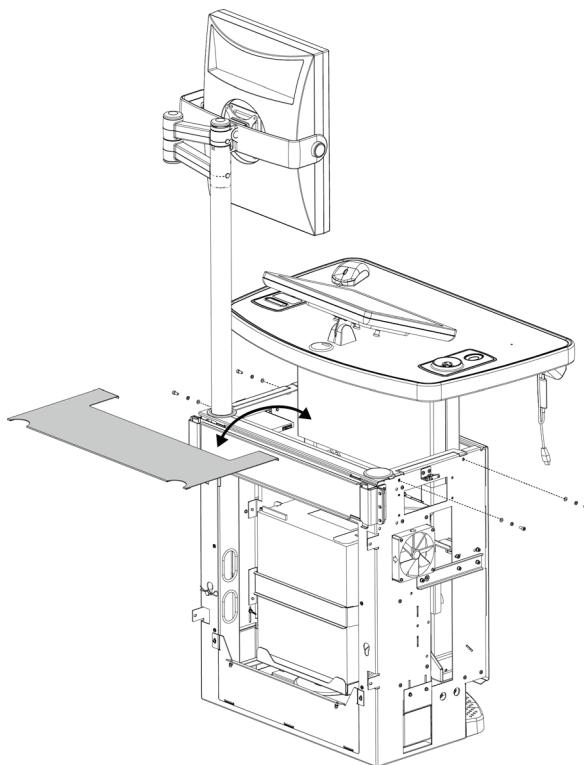


Figure 137: Removing top cover

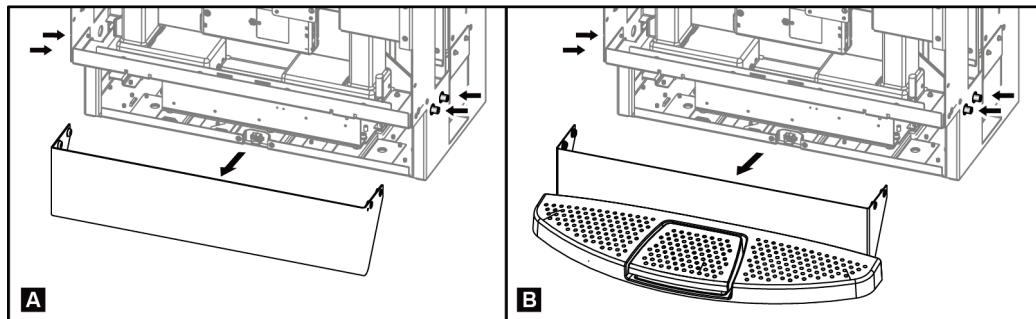


Figure 138: [A] Standard front panel kick plate [B] x-ray activation footswitch kick plate

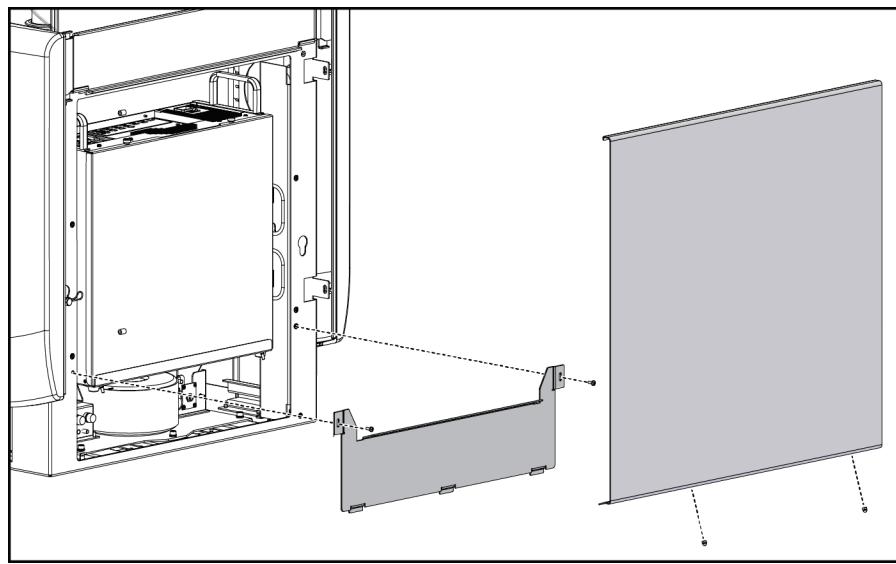


Figure 139: Removing rear cover (right) in order to remove lower rear panel kick plate (center)

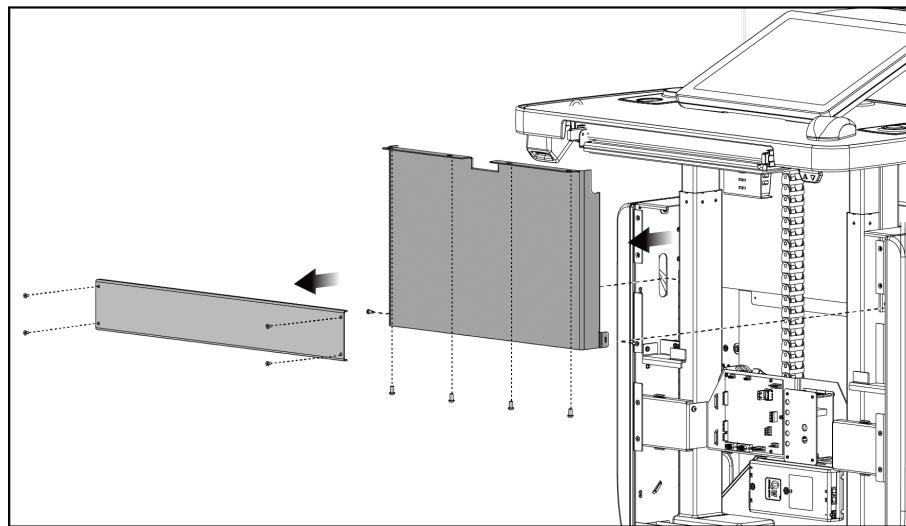


Figure 140: Remove chassis support bracket (left) in order to remove front shroud (center)

10.5 Replacement Procedures for the Workstation

10.5.1 Replace the Computer

Back Up the Computer

Follow the on-screen procedures in the Service Tool: Hologic Service > Troubleshooting > Backups.

Replace the Computer

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 210.) You can optionally remove the lower rear panel if necessary.
3. Approach the computer from the rear of the workstation.
4. Note the orientation of the computer. The power input and other rear panel connections of the computer are on the TOP LEFT, with the rear panel connections facing UP.
5. Note all cable interconnections to and from the computer, then disconnect the cables.
6. Remove the computer brackets:
 - *Standard Base Configuration* - Remove the computer adapter bracket and CPU retention strap. (See the following figure, left.)
 - *Upgraded Configuration* - Remove the side brackets. (See the following figure, right.)

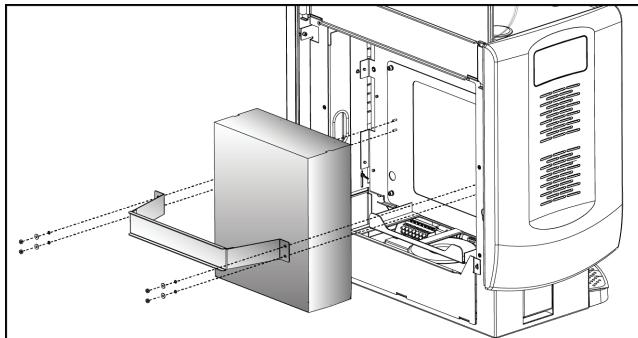


Figure 141: Removing/replacing the computer (Standard Configuration)

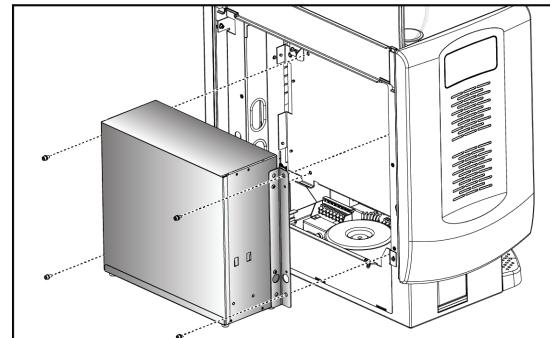


Figure 142: Removing/replacing the computer (Upgraded Configuration)

Replacement

1. Install the new computer using the applicable supporting hardware:
 - *Standard Base Configuration* - Use the computer adapter bracket and CPU retention strap. (See the previous figure, left.)
 - *Upgraded Configuration* - Use the side brackets as shown. (See the previous figure, right.)



Note

Install the computer in the proper orientation. The power input and other connections rear panel connections of the computer MUST be on the TOP LEFT, with the rear panel connections facing UP.



Note

If your replacement kit does not include new brackets or straps (as shown in the previous figures), use the old brackets and straps for the installation.



Note

Depending on the configuration of the replacement kit for the Standard Base computer, the kit may include:

- Replacement tape for the computer adapter bracket.
- Replacement strap-foam for the CPU assembly and tape for the CPU retention strap.

If the existing tape or strap foam is worn, replace with those items provided in the kit:

- Cut and install three 5.5-inch (14 cm) long pieces of tape to the base of the computer adapter bracket, in similar fashion to the old pieces of tape.
- Cut and install two 15-inch (38 cm) long pieces of tape to the CPU retention strap in similar fashion to the old pieces of tape.

-
2. Reconnect all cable interconnections to and from the computer.
 3. Reinstall the front, back, and side covers (and lower rear panel if previously removed).
 4. Plug in and power ON the system. Verify proper system operation.

10.5.2 Replace the Uninterruptible Power Supply (UPS)



WARNING!

Do NOT ship or transport a new or used UPS until you have disconnected or removed its internal battery.

Leaving this lead-acid battery connected or installed inside a UPS during shipment or transport presents a potential FIRE HAZARD with the risk of serious injury or death.

Before you ship or personally transport a UPS, make sure that you disconnect or remove its internal battery. Reconnect or reinstall the battery before installing the UPS onto the UAWS workstation.

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the front, back, and side covers. Remove the lower rear panel (kick plate). (Refer to [Remove the Covers and Panels](#) on page 210.)
3. From the rear of the chassis, locate and disconnect the power strip AC cord connected to the female AC outlet cord on the power distribution assembly. Unfasten any wire ties along the cable path. Make a note of the cable path.

4. On the right side of the workstation chassis, locate the right stiffener bracket (see following figure, item 1). Unfasten two of the three screws securing the bracket to the chassis and let the bracket hang by the remaining screw.

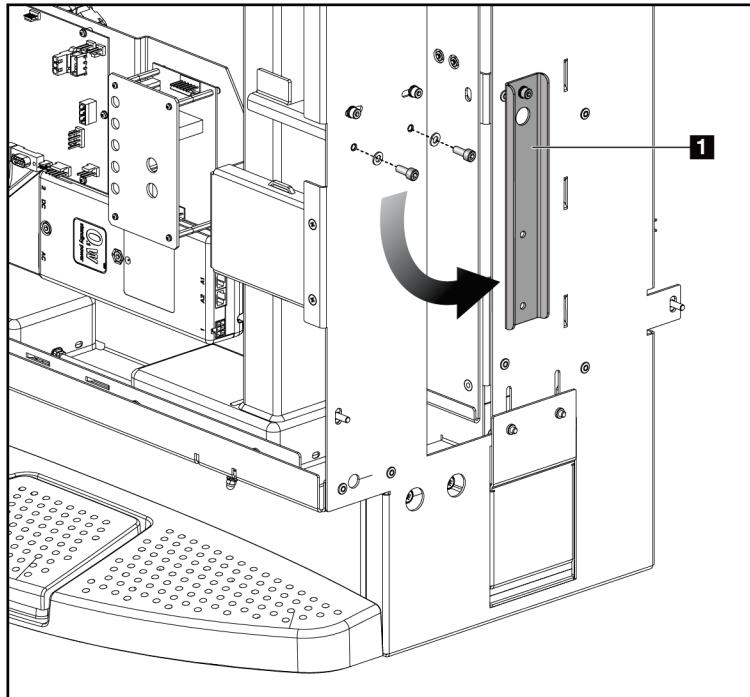


Figure 143: Unfastening the stiffener bracket

5. On left side of workstation, unfasten two of the three screws securing the left stiffener bracket to the chassis and let the bracket hang by the remaining screw.

6. From the left side of the workstation (and rear of the UPS), disconnect all AC plugs from power strip. Make a note of what device each plug is for. Disconnect the USB cable. Use the following figure and legend as a guide.

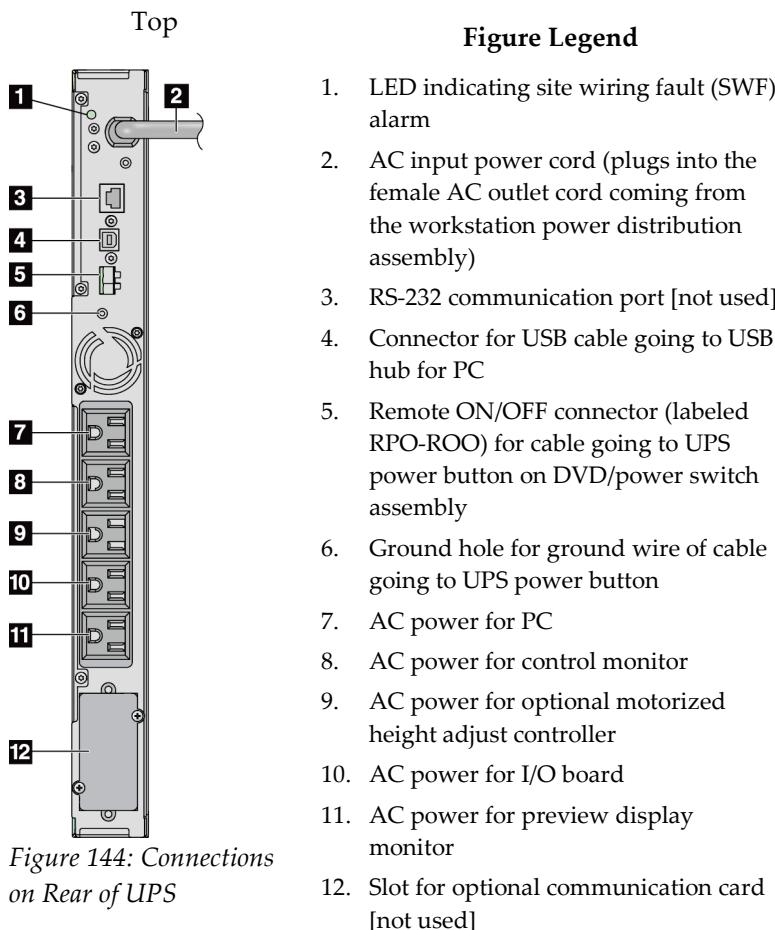


Figure 144: Connections on Rear of UPS

7. On the back of the UPS, disconnect the green terminal of the UPS remote power cable from RPO-ROO (item 1 in following figure). Disconnect the UPS cable ground ring from the threaded screw hole (item 2).

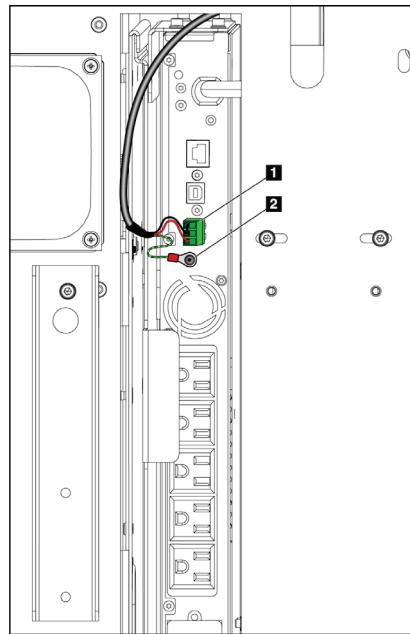


Figure 145: Connections for the Remote UPS Power Cable on Rear of UPS

8. Slide out and remove the UPS (with the UPS AC cable) from the workstation chassis.

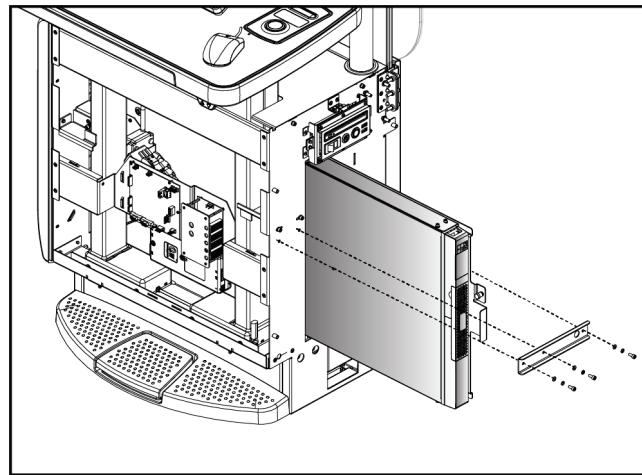


Figure 146: Sliding the UPS out of workstation

Disconnecting, Removing, and Optionally Replacing the UPS Battery

You MUST disconnect the UPS battery whenever the UPS is removed for shipment back or if the battery on the UPS is being replaced.

1. Lay the UPS flat in a position where you can access the front panel.
2. Remove the middle panel of the front panel. (See the following figure, item B.)
3. Remove the left side of the front panel by pushing the PUSH button and then sliding the panel. (See the following figure, item A.)

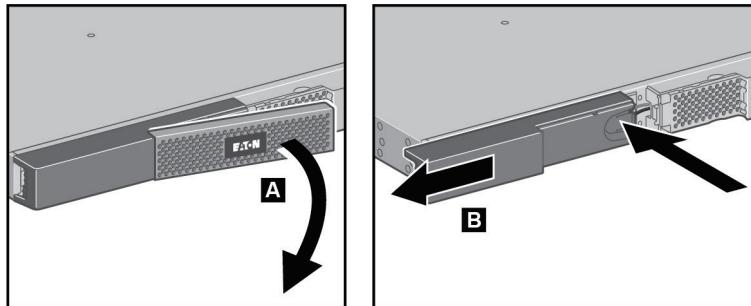


Figure 147: (A) Removing middle panel and (B) removing left-hand side of front panel

4. Disconnect the battery module by separating the two connectors. Never pull on the wires. (See the following figure.)

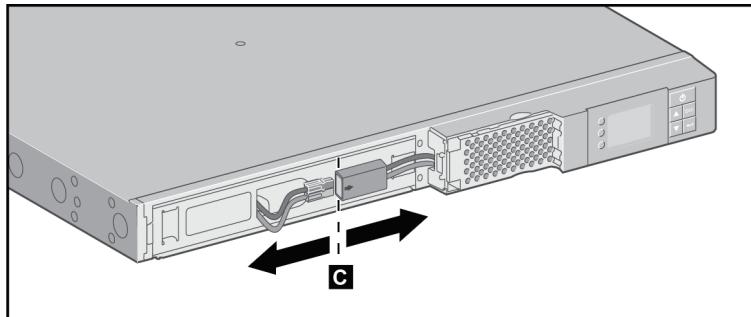


Figure 148: Disconnecting the battery module

5. Remove the metal protection cover in front of the battery (two screws). (See the following figure.)

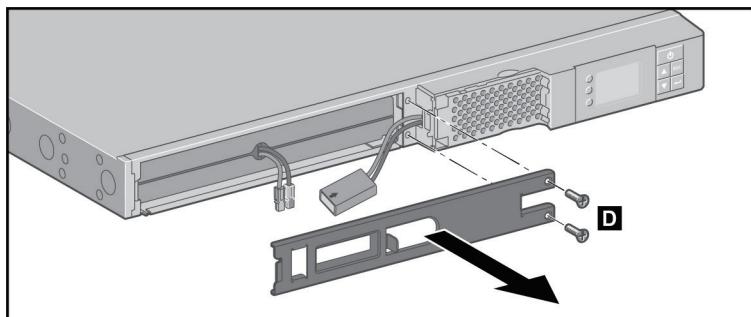


Figure 149: Removing the metal protection cover on battery

6. Pull the plastic tab to move the battery block.
7. (Optional) If replacing the battery, pull out the old battery and replace with new one. Reassemble the battery module by doing the following:
 - a. Reattach the metal protection cover.
 - b. Reconnect the battery module with the two connectors.
 - c. Reattach the left side of the front panel.
 - d. Reattach the middle panel.

Replacement

1. If for some reason the new UPS does not come pre-installed with the UPS sled bracket, remove the sled bracket from the old UPS. Mount sled bracket on new UPS. (See following figure).



Note

Make sure that the plunger pin locks into the chassis. (See the following figure—smaller arrow is pointing to plunger.)

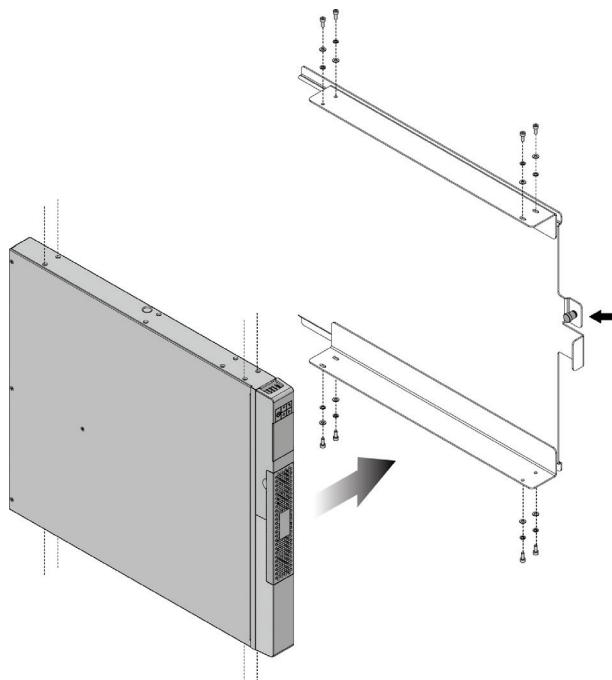


Figure 150: Mounting the UPS to the UPS sled bracket

2. Install the new UPS (see following figure):
 - a. On the right side of the chassis, push the UPS AC line cord ahead of the UPS before you slide the UPS into the UPS chassis slot. Leave enough cable slack to be able to slide the UPS assembly onto the chassis slide rails without any interference or binding.
 - b. Route and connect the UPS AC cable to the female AC outlet cord coming from the workstation power distribution assembly. Use wire ties as necessary for proper cable management.
 - c. Ensure that the UPS assembly is fully seated in the proper position.
 - d. Fasten the right stiffener to the chassis with the remaining two screws.

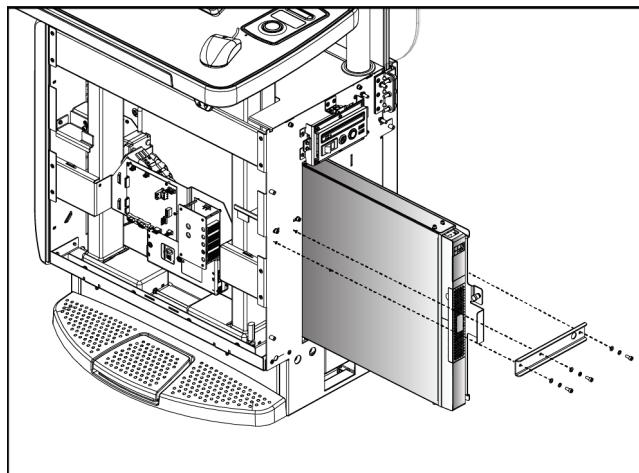


Figure 151: Sliding the UPS into workstation and reattaching stiffener

3. At the rear of the UPS (see the figure [Connections for the Remote UPS Power Cable on Rear of UPS](#) on page 217):
 - a. Connect the remote UPS power cable (green terminal) into RPO-ROO.
 - b. Connect the UPS cable ground ring to the threaded screw hole using the pan head screw supplied in the kit.
 - c. Plug the USB cable (disconnected earlier) into the USB port.
 - d. Plug back in all the AC plugs from the workstation devices.
4. Fasten the left stiffener to the chassis with the remaining two screws.
5. Reinstall the front, back, side covers, and lower rear panel (kick plate) that were removed previously.
6. Plug in and power ON the system. Verify proper operation.

10.5.3 Replace Control Monitor with Same Model

This procedure provides instructions for a field replacement of a control monitor (touch screen or non-touch screen) for a new one of the same model.



Note

For easier access to the mounting plate or cable panel, tilt the monitor mount plate all the way back until it is resting at about a 45° angle, top-down, bottom-up. When finished, restore the mounted monitor to its proper position, top-up, bottom-down. You may have to loosen the nut on the side of the LCD pivot mount in order to tilt the monitor. If so, remember to re-tighten the nut after you restore the monitor to its proper position.



Tip

If you are installing a monitor with a touch screen: The power cable-to-adapter cable connection can be made above or below the workstation tabletop (as allowed by cable slack through wireways). If below, use the motorized height adjust feature to lift the tabletop about eight inches or more to gain better working access underneath.

Remove Existing Monitor

1. Power OFF and unplug the system.
2. Disconnect the VGA cable, power cable, and USB cable (touch screen model only) from the existing control monitor.
3. Remove the monitor (see the following figure, item 3) from the monitor mounting plate (item 2) by removing the four (hand-tightened) thumbnail screws.
4. Remove the monitor mounting plate (item 2) from the LCD pivot mount (item 1).

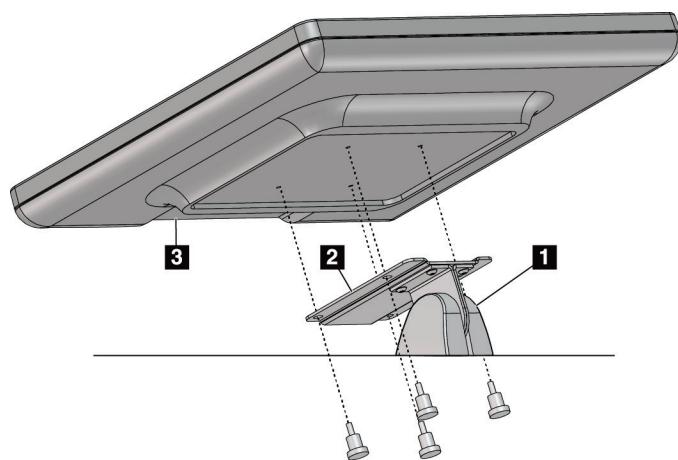


Figure 152: Removing/replacing control monitor

Install New Monitor

1. Attach the new mounting plate to the LCD pivot mount.
2. Attach the new monitor to the mounting plate with the four hand-tightened thumbnail screws.
3. (Optional) If necessary, replace the existing VGA cable, power cable, adapter cable, or USB cable, as described in the following sub-steps. Otherwise, skip to the next numeric step.
 - a. Remove the Universal Acquisition Workstation (UAWS) covers as needed.
 - If you are replacing the VGA cable, disconnect it from the rear panel of the computer. Route the cable in reverse direction of its installation path, through and out of the workstation.
 - If you are replacing the power cable and/or adapter cable, disconnect it from the rear panel of the UPS. Route the cable in reverse direction of its installation path, through and out of the workstation.
 - If you are replacing the USB cable, disconnect it from the USB hub. Route the cable in reverse direction of its installation path, through and out of the workstation.
 - b. Route the new cable into and through the workstation, secure it with cable ties as needed, and connect the VGA cable to the computer or the power cable to the UPS.
4. Connect the monitor-end of the VGA cable, 6.0-ft. power cable, 1.5-ft. adapter cable, and/or USB cable to the monitor.
5. Plug in and power ON the system.
6. If you are installing a monitor with a touch screen, calibrate the monitor by using the software utility built into the monitor drivers (otherwise, skip to the next numeric step):
 - a. From the desktop, navigate to the Windows Control Panel.
 - b. In the Control Panel, click the **elo Touchscreen** icon.
 - c. From the General tab, select **Align**.
 - d. Follow the on-screen prompts to calibrate the monitor.
7. Verify proper operation of the monitor.

10.5.4 Upgrade from Non-Touch Screen to Touch Screen Monitor

Overview

Upgrading from a non-touch screen to a touch screen control monitor includes:

- Installing and connecting the 1.5-ft. adapter cable (supplied in the kit), connecting the 6.0-ft. power cable to the adapter cable and adapter cable to monitor.
- Routing and connecting the USB cable (supplied with the touch screen monitor) from the monitor to the USB hub located at the top center of the front shroud of the workstation.

Preparation

1. Power OFF and unplug the workstation.
2. Remove these covers (in this order) to gain access inside the workstation. (Refer to the Selenia Dimensions System *Service Manual*—Chapter 10: Universal Acquisition Workstation Maintenance—for illustrations and more information.)
 - front and rear covers
 - side covers
 - top cover
 - chassis support bracket (in front of front shroud)
 - front shroud
3. To gain better access to the installation screws and cable connections, tilt the monitor all the way back until it is resting at about a 45° angle, top-down, bottom-up.

Remove the Existing Monitor

1. Disconnect the VGA cable and power cable from the existing monitor.
2. Remove the monitor (see the following figure, item 3) from the monitor mounting plate (item 2) by removing the four (hand-tightened) thumbnail screws.
3. Remove the mounting plate from the LCD pivot mount (see following figure, item 1) using the four hex screws.

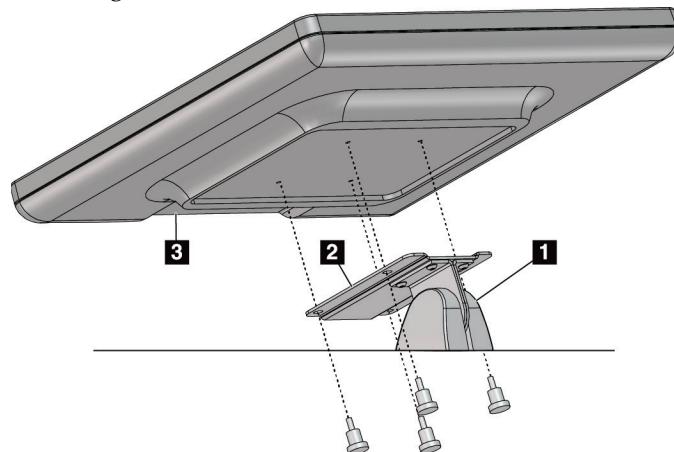


Figure 153: Removing/replacing control monitor

Install the Touch Screen Monitor

1. Install the new mounting plate to the LCD pivot mount.
2. Install the new monitor to the mounting plate with the four hand-tightened thumbnail screws.
3. Connect the 1.5-ft. power adapter cable supplied in the kit (see the following figure, item 2) to the existing power cable for the monitor (item 4). (See their connection at item 3.)
4. Connect the other end of the adapter cable to the monitor (at item 1).

Tip

The power cable-to-adapter cable connection can be made above or below the workstation tabletop (as allowed by cable slack through wireways). If below, use the motorized height adjust feature to lift the tabletop about eight inches or more to gain better working access underneath.

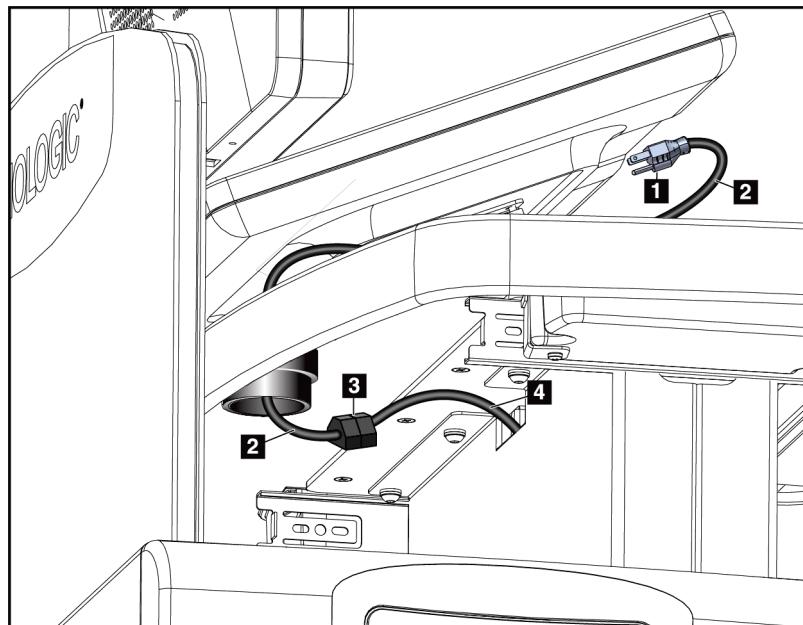


Figure 154: Connecting power cable to adapter cable and adapter cable to monitor

5. Connect the USB cable to the monitor.
6. Route the USB cable down through the tabletop wireways.
7. Route the USB cable laterally underneath the tabletop through the rear shroud-to-front shroud wireways.

8. Connect the USB cable to an available port on the USB hub. (See the following figure.)

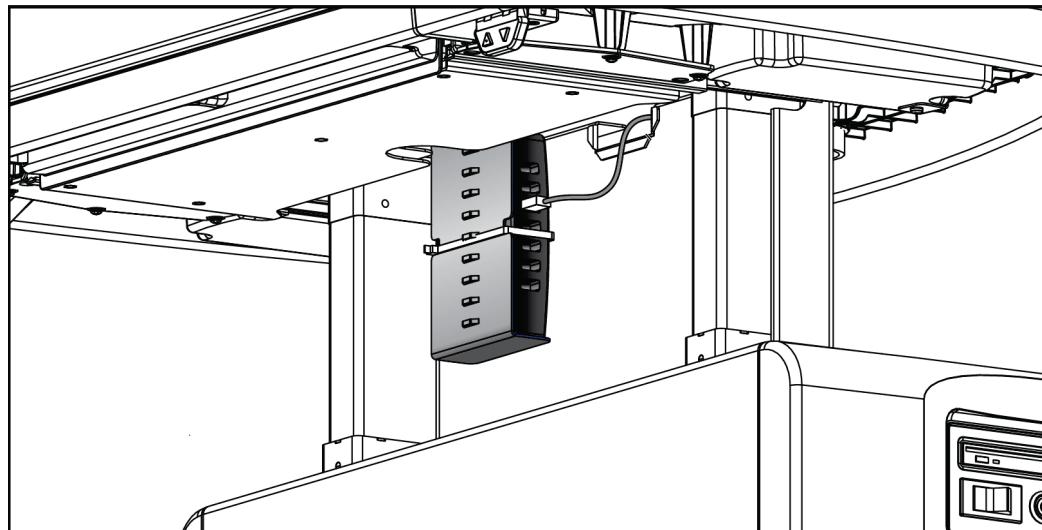


Figure 155: Connecting USB cable of control monitor to USB hub of workstation

9. Connect the existing VGA cable to the new monitor.
10. Reattach all covers previously removed.
11. Plug in and power ON the workstation.
12. Calibrate the touch screen monitor by using the software utility built into the monitor drivers:
 - a. From the desktop, navigate to the Windows Control Panel.
 - b. In the Control Panel, click the **elo Touchscreen** icon.
 - c. From the **General** tab, select **Align**.
 - d. Follow the on-screen prompts to calibrate the monitor.
13. Verify proper operation of the monitor.

10.5.5 Replace Preview Display Monitor Barco MDNC-3321 (Standard Arm) - UAWS

Removal of Existing Monitor

1. Remove all power from the workstation. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove covers and panels, as needed. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. Remove the existing preview display monitor:
 - a. Remove the access panel at the rear of the preview display monitor.
 - b. Disconnect and remove the cables (see the following figure, item 3) from the preview display monitor.
 - c. Have one person hold the preview display monitor while another person completes the following two steps.
 - d. Unfasten the four mounting screws that secure the monitor to the monitor mount (item 2).
 - e. Remove the preview display monitor from the existing monitor mount (item 2).
4. Remove the existing cables from the workstation:
 - a. Disconnect the cables from their endpoint connections in the workstation. Note the locations of these endpoint connections and their cable routing. This information is helpful for the installation procedure that follows.
 - b. Route the cables from their endpoint connections, through the monitor mounting post access openings, then up and out of the monitor mounting post. The existing cables are not required for the replacement monitor. New cables are provided in the kit.

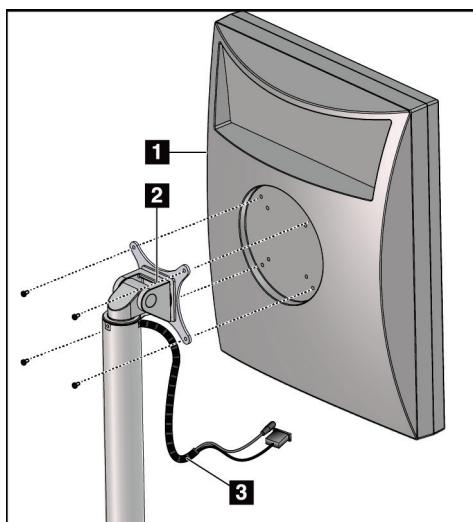


Figure Legend

1. Preview display monitor
2. Monitor mount
3. Cables

Figure 156: Removing legacy preview display monitor equipped with standard arm of UAWS

Installation of Replacement Monitor

1. Install the new preview display monitor (see the following figure):
 - a. Have one person hold the new preview display monitor (item 1) while another person completes the following step.
 - b. Attach the rear panel of the new preview display monitor (item 1) to the monitor mount (item 2).
 - c. Connect the new cables (item 3) to the new preview display monitor.

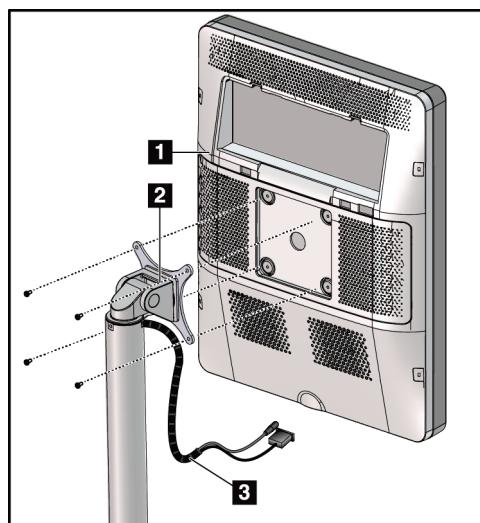


Figure Legend

1. Preview display monitor
2. Monitor mount
3. Cables

Figure 157: Installing replacement preview display monitor with standard arm for UAWS

2. Install and connect the new cables to the workstation:
 - a. Route and thread the new cables through the standard arm, down through the monitor post, and into the workstation.
 - b. Connect the cables to their endpoint connections in the workstation.
 - c. Locate and remove the existing monitor power supply bracket inside the workstation and replace it with the new bracket included in the kit.
 - d. Secure the power supply to the new bracket, using the hook and loop strap provided with the kit.
3. Plug in and power ON the system.
4. Verify the setup settings of the monitor. Go to the next section, [Verify Settings of Barco MDNC-3321 Preview Display Monitor](#) on page 233 for the procedure.

10.5.6 Replace Double Articulated Arm of Preview Display Monitor - UAWS

Note

The double articulating arm is available in two versions:

- a deeper mounted bracket for the gray scale monitor
- a shallow mounted bracket for the color monitor

Make sure you have the correct version for your monitor.

If you are replacing a legacy CMP-00121-C monitor with a CMP-01404 (Barco MDNC-3321), that is mounted on a double articulating arm, replace the double articulating arm with the new one supplied in kit ASY-09505. This replacement is necessary because the CMP-01404 requires a more shallow monitor bracket. (See the following figure, which provides an overhead view of the two monitor brackets and their difference in depth.)

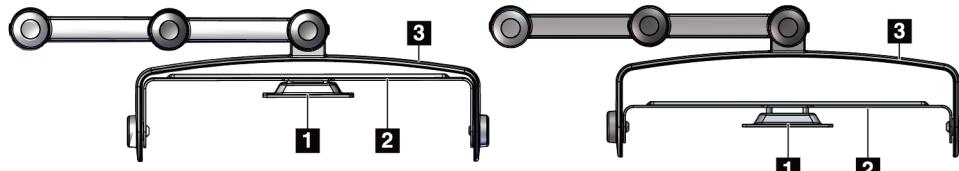


Figure 158: Old monitor bracket (item 2, left)

New monitor bracket (item 2, right)

Figure Legend

1. Monitor mount
2. Monitor bracket (Old bracket is deeper in depth
new bracket is more shallow.)
3. Articulated monitor mount

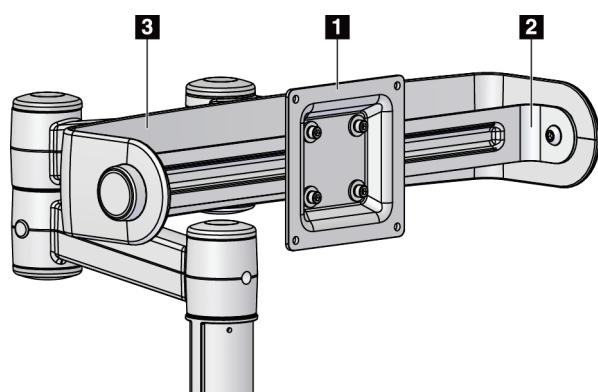


Figure Legend

1. Monitor mount
2. Monitor bracket
3. Articulated monitor mount

Figure 159: Mounting hardware of articulated arm assembly

Procedure for Removal of Existing Double Articulating Arm Assembly

Perform the steps in the following procedure to remove and replace the double articulating arm of the preview display monitor.

1. Power OFF and unplug the system.
2. Remove covers and panels of the workstation, as needed.
3. Remove the preview display monitor from the monitor mount. (Refer to the previous procedure *Removal of Existing Preview Display Monitor of Universal Acquisition Workstation (UAWS)* elsewhere in this document.)
4. Remove the articulating arm from the workstation:
 - a. Ensure that the cables are disconnected from the preview display monitor. (Refer to step 3 in this section.)
 - b. Ensure that the preview display monitor is removed from the monitor mount. (Refer to step 3 in this section.) (See also the previous figure.)
 - c. Loosen the three set screws at the top of the monitor post. (See the following figure, item 5.)
 - d. Lift and remove the articulating arm assembly from the monitor post and set it down near the workstation.
5. Remove the cables from the workstation:
 - a. Disconnect the cables from their endpoint connections inside the workstation. Note the locations of these connections. Note the routing path of each cable through the workstation. This information is helpful for the installation procedure that follows.
 - b. Route the cables from their endpoint connections, through the workstation, through the monitor post access openings, then up and out of the post.

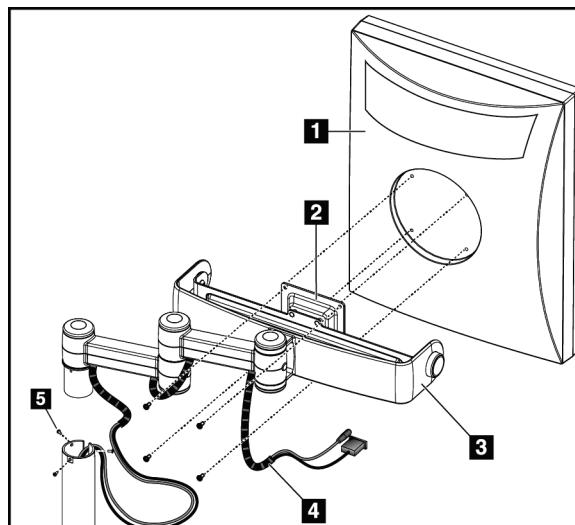


Figure Legend

1. Preview display monitor
2. Monitor mount
3. Articulated monitor mount
4. Cables being removed from installation path within arm
5. Top of monitor post

Figure 160: Removing legacy monitor, cables, and articulating arm assembly

Installation of Replacement Double Articulating Arm Assembly

1. Install the new preview display monitor to the monitor mount of the double articulating arm assembly. (Refer to the section *Installation of Replacement Preview Display Monitor for Universal Acquisition Workstation (UAWS)* elsewhere in this document.)
2. Connect the cables to the new monitor. (Refer to the section *Installation of Replacement Preview Display Monitor for Universal Acquisition Workstation (UAWS)* elsewhere in this document.)
3. Route the cables through the double articulating arm:
 - a. Temporarily remove the cable retainers that cover the cable-threading tracks under the double articulating arm sections. (See the following figure.)
 - b. Route the cables through the entire double articulating arm assembly, threading them through the tracks of each section of the arm.
 - c. Reinstall the cable retainers to the underside of the arm sections.

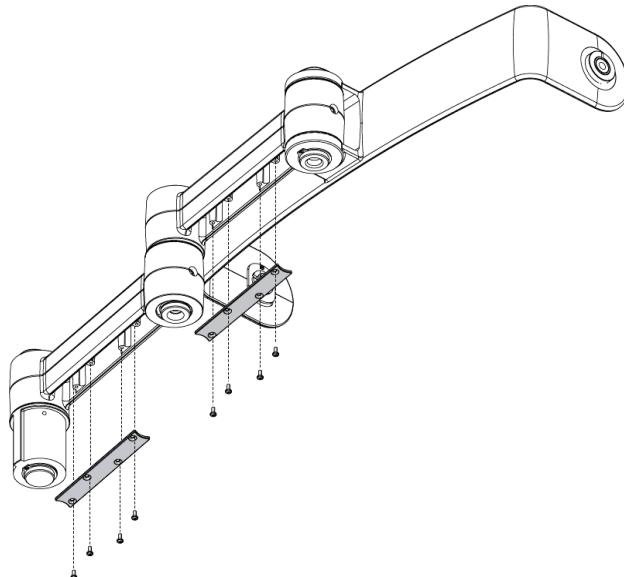


Figure 161: Temporarily removing cable retainers from tracks under double articulating arm sections

- d. Leave the spiral tubing wrapped around portions of cable that are exposed between sections of the double articulating arm. (See the following figure, item 4.)

4. Route the cables through the workstation and connect:
 - a. Route the cables down the monitor post (see the following figure, item 5) and out through one of the access openings near the bottom of the post.
 - b. Connect the DVI cable to the appropriate port on the computer.
 - c. Connect the power cable to the monitor power supply.
 - d. Secure the monitor power supply with the new power supply bracket and hook-and-loop strap supplied in the kit.
 - e. Make sure that there is sufficient slack for both cables before you finalize your cable routing from monitor (starting point) to computer and power supply (endpoints).
5. Place the new articulating arm and monitor onto the monitor post. Secure the arm to the post using the three setscrews. (See the following figure, item 5.)
6. Thread the cables (item 4) through the articulating arm track. For those portions of cable that remain outside the arm, ensure that the spiral tubing is outside the arm track.

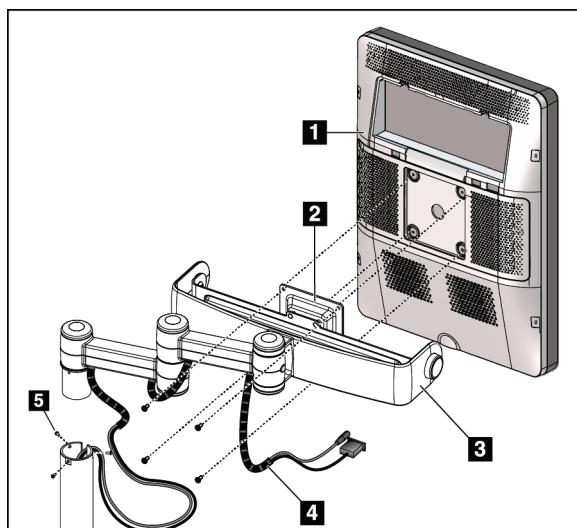


Figure 162: Routing and threading cables through articulating arm

Figure Legend

1. New preview display monitor
2. Monitor mount
3. Articulated monitor mount
4. Cables being threaded through sections of arm
5. Top of monitor post

10.5.7 Verify Settings of Barco MDNC-3321 Preview Display Monitor



Note

This post-installation setup verification procedure pertains only to the Barco MDNC-3321 (Hologic CMP-01404).

After you install the new Barco preview display monitor, perform these steps verify the monitor settings values for the correct Display Function, Luminance Target, and other settings.

1. Power ON the monitor. A single LED lights up in the lower right corner of the monitor frame. (See the following figure.)
2. Wait for the LED light to go out (approximately 50 seconds after power ON).



Figure 163: Waiting for single LED to turn OFF after power ON

3. Touch the monitor frame (not the screen), along the bottom near its lower right corner until four LED touch keys (embedded in the frame) light up. (See the following figure.)



Note

The operator of the workstation touches these LED keys to navigate and select the various screens, menus, and settings on the monitor.

4. Touch the LED under the menu symbol (second from right). (See the following figure.)

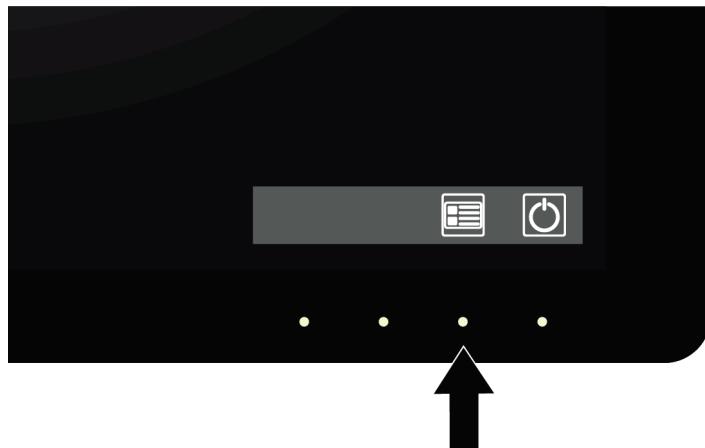


Figure 164: Touching LED under menu symbol (second from right LED) to display Main Menu

The Main Menu is displayed. (See the following figure.)

5. Using the touch-sensitive LEDs, navigate and select Configuration > Image Source.

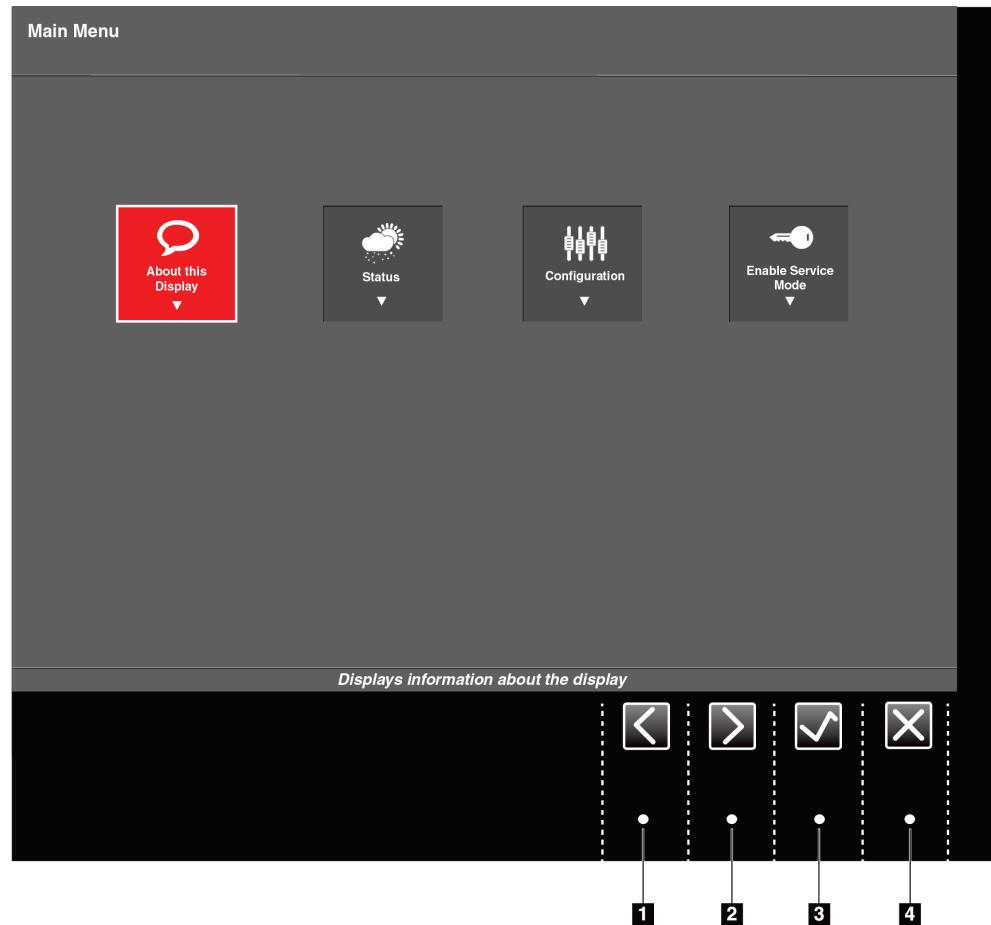


Figure 165: Main menu of Barco MDNC-3321 (Hologic CMP-01404)

Figure Legend

1. Left key
2. Right key
3. Enter key (navigate into submenu)
4. Cancel key (exit out of submenu)



Note

The key icons (on-screen) are displayed above the LED keys (embedded in monitor frame). (See the previous figure.) Each icon is adapted to the function for which it is used (menu dependent).

6. Confirm all settings in the **Configuration > Image Source** screen, as shown in the following figure.

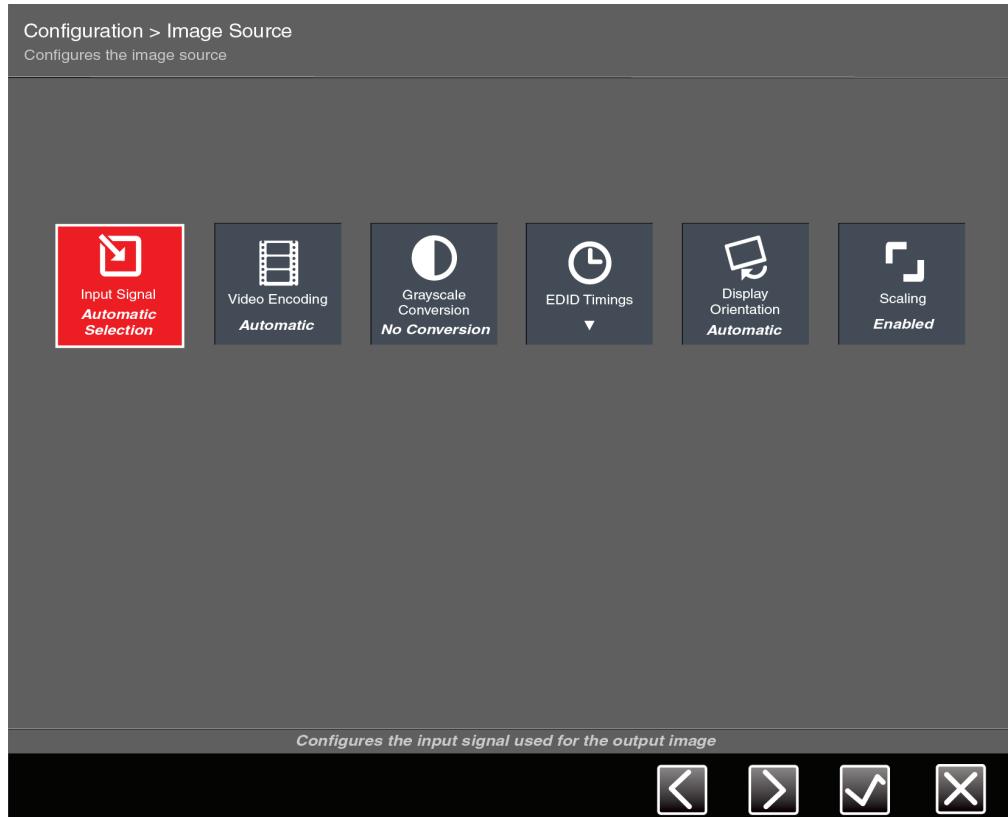


Figure 166: Confirmation of settings in Configuration > Image Source screen

7. Return to the main menu.
8. Navigate and select **Configuration > Calibration**.

9. Confirm all settings in the Configuration > Calibration screen, as shown in the following figure.

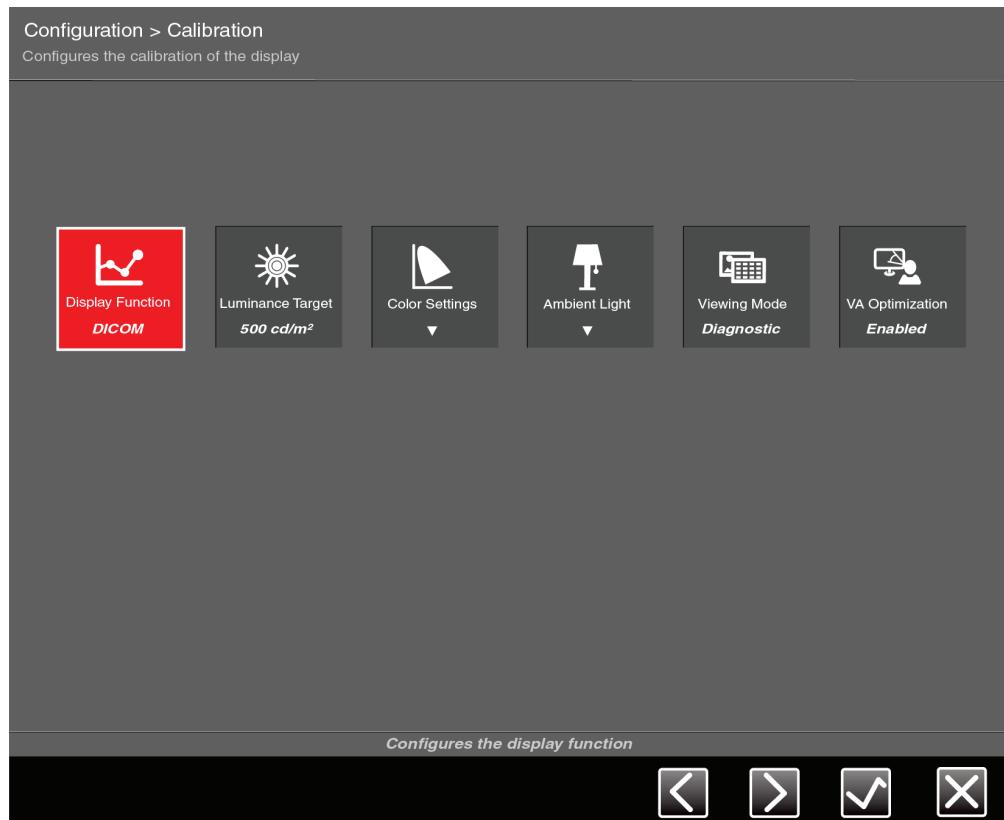


Figure 167: Confirmation of settings in Configuration > Calibration screen.

10. Return to the Main Menu.
11. Navigate and select **Status > Calibration**.

12. Confirm all settings in the Status > Calibration screen, as shown in the following figure.

The screenshot shows a mobile application interface titled "Status > Calibration". A sub-header below it reads "Displays information about status of the calibration". The main content is a table with a red header row labeled "Calibration". The table lists various calibration parameters and their values:

Display Function	DICOM
Current Luminance	500 cd/m ²
Luminance Target	500 cd/m ²
Backlight	2,359
Stabilizer	Enabled
ULT	Enabled
Reading Room	Emergency Room
Ambient Light Compensation	Enabled
Ambient Light Compensation Operational	Enabled
Maximum Ambient Light	300 lx
Preset Ambient Light	275 lx
Dark Luminance	0.363 cd/m ²
Ambient Correction	1.497 cd/m ²

At the bottom of the screen are four navigation icons: a left arrow, a right arrow, a checkmark, and an X.

Figure 168: Verification of settings for new and replacement installs

13. In the Status > Calibration screen:

- Confirm *all* settings for a *replacement* installation, as shown in the previous figure.
- Confirm *only* the first three settings for a *new* installation, as shown in the previous figure.

Make sure that:

- Display Function = DICOM
- Current Luminance = 500 cd/m²
- Luminance Target = 500 cd/m²

10.5.8 Major Internal Components

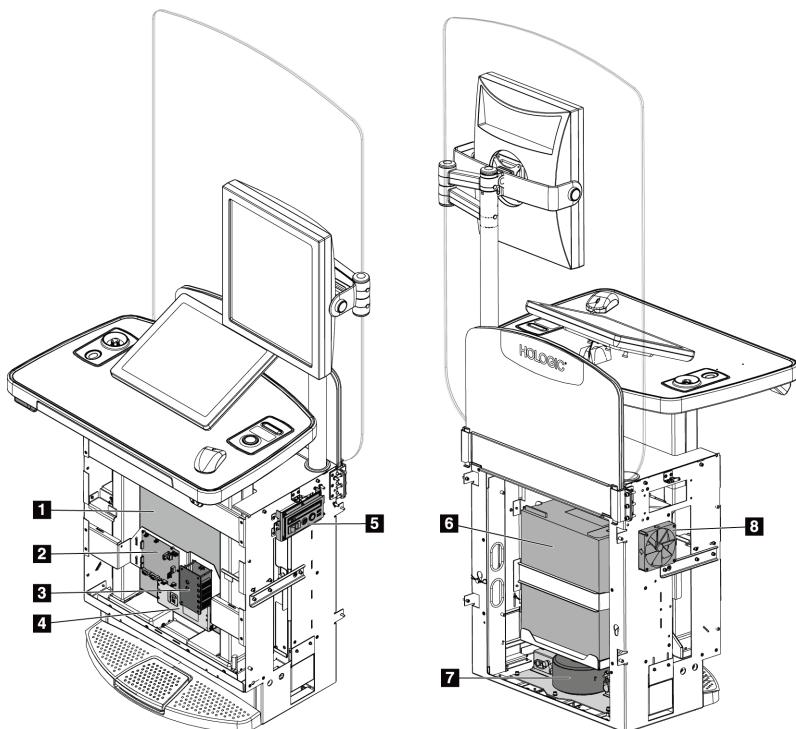


Figure Legend

1. UPS
2. AWS I/O Interface
3. DC Power Supply, Dual Output (5 V, 12 V)
4. Motorized Height Adjust Controller
5. Internal connections for CD/DVD Drive, Circuit Breaker Power On Switch, CPU Power/Reset Button, UPS (Optional) Power Button, USB Ports
6. Computer
7. Power Distribution Assembly
8. Fan

Figure 169: Universal Acquisition Workstation Major Internal Components

10.5.9 Replace the Keyboard

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the front, back, and side covers to provide access to the rear panel of the computer. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. If applicable, cut and remove the cable ties that secure the keyboard USB cable along its installation path to the rear panel of the computer.
4. Remove the existing keyboard and cable.

Replacement

1. Place the keyboard on the pull-out drawer.
2. Route and connect the USB cable of the keyboard to an available port on the rear panel of the computer. Bundle any excess length of USB cable and secure it with the cable ties provided in the kit.
3. Reinstall the front, back, and side covers.
4. Plug in and power ON the system. Verify proper operation of the keyboard.

10.5.10 Replace the Mouse

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the front, back, and side covers to provide access to the rear panel of the computer. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. If applicable, cut and remove the cable ties that secure the mouse USB cable along its installation path to the rear panel of the computer.
4. Remove the mouse and cable.

Replacement

1. Place mouse on the keyboard pull-out drawer.
2. Route and connect the USB cable of the new mouse to an available port on the rear panel of the computer. Bundle any excess length of USB cable and secure it with the cable ties provided in the kit.
3. Reinstall the front, back, and side covers.
4. Plug in and power ON the system. Verify proper operation of the mouse.

10.5.11 Replace/Verify/Configure the Bar Code Scanner

Replace the Bar Code Scanner

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the front, back, side covers, chassis support bracket, and the front shroud to provide access to the USB hub. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. Remove the bar code scanner:
 - a. At the USB hub, disconnect the USB cable of the bar code scanner. (See the following figure, item 3.)

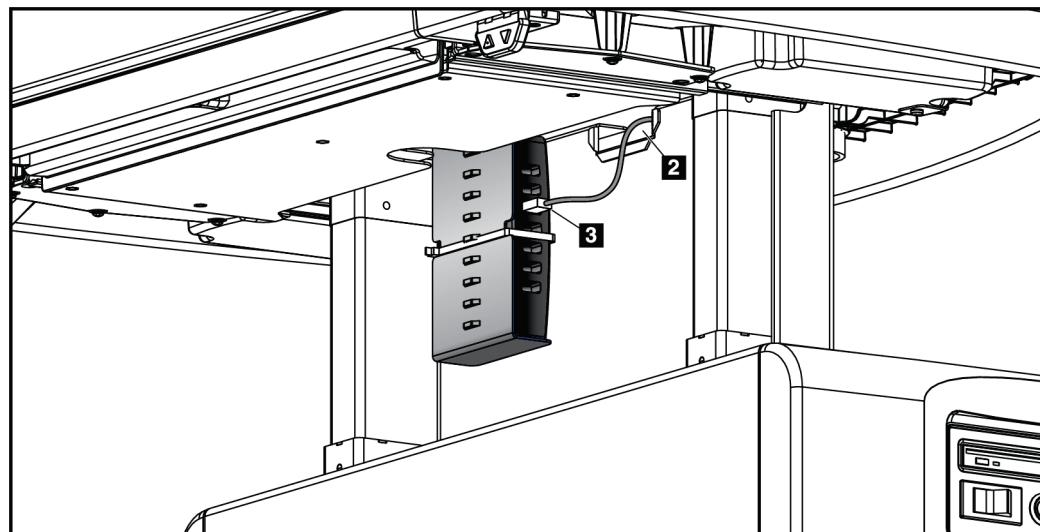


Figure 170: Disconnecting bar code scanner USB cable from USB hub

- b. Pull the USB cable through the access opening at the top center of the rear shroud. (See the previous figure, item 2.)

- c. Detach the USB cable from the p-clips on the underside of the workstation tabletop (see the following figure, item 2) back to the bar code scanner (item 1).

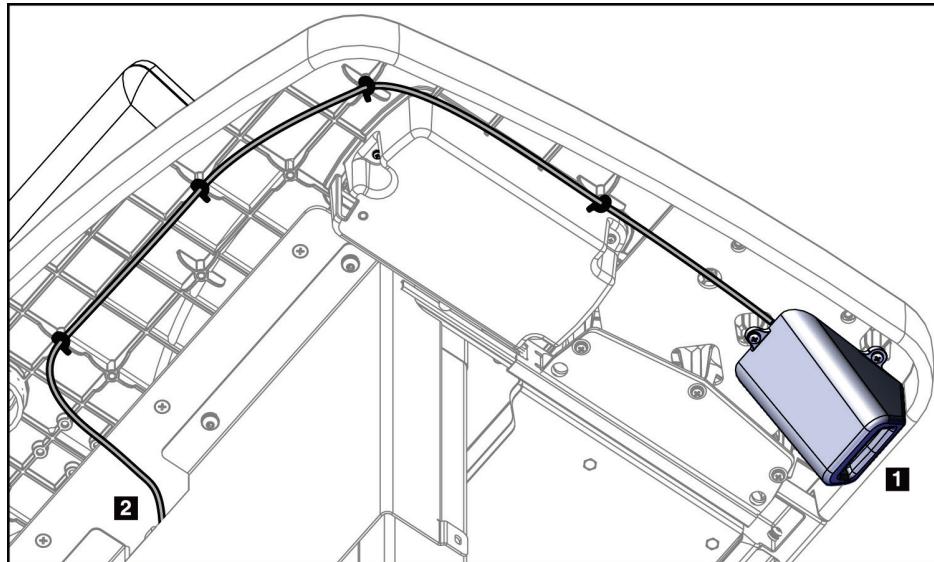


Figure 171: Removing USB cable from access opening (2) to bar code scanner cover (1)

- d. Remove the bar code scanner and cover (item 2 in following figure) from the underside of the tabletop (three screws, item 1 in following figure).

Make sure that the rubber stop (item 3 in following figure) is intact and still attached to the underside of the tabletop. The rubber stop holds the scanner captive when mounted. If the rubber stop is not salvageable or usable, make sure a new one is available when installing the new scanner.

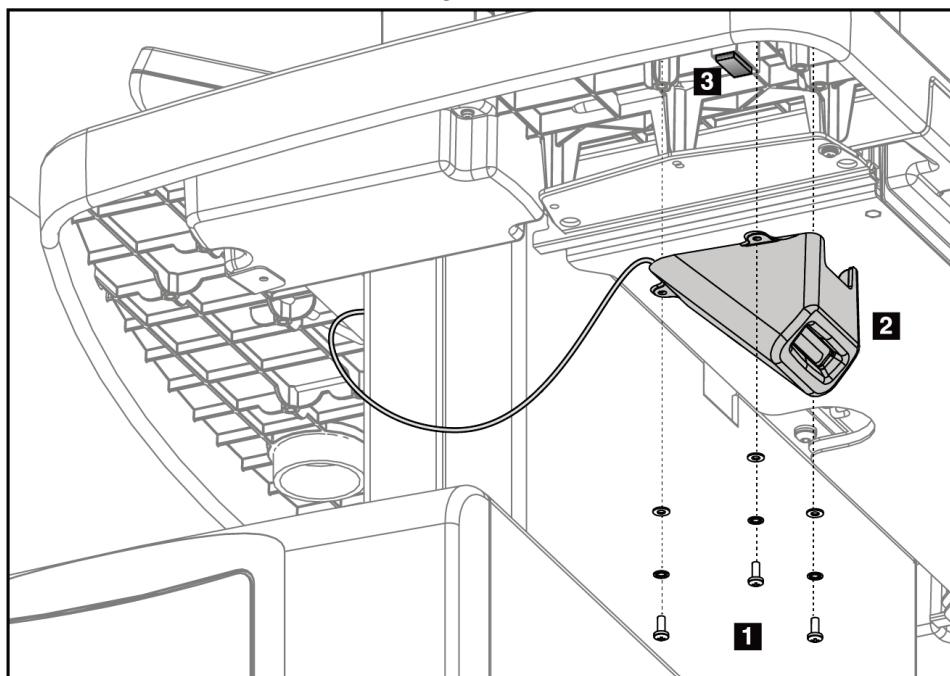


Figure 172: Removing the bar code scanner

Replacement

1. Install the new bar code scanner (see following figure):

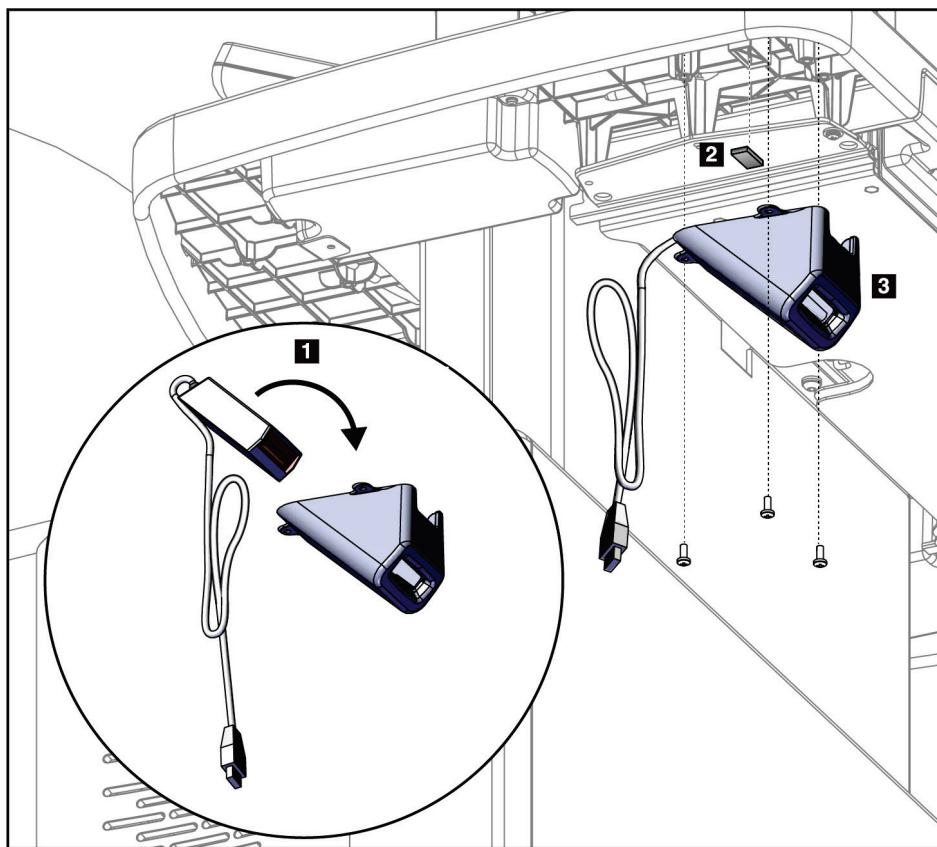


Figure 173: Replacing the bar code scanner

- a. If necessary, insert the bar code scanner (item 1) into the scanner cover (item 3).
- b. If you are replacing the rubber stop (item 2) due to its condition, remove the old one. Peel off the cover of the adhesive backing of the new rubber stop and insert it where the old one was positioned.
- c. Fasten the scanner cover (with bar code scanner) to the underside of the tabletop (three screws, item 3). As you fasten the cover, make sure that the USB cable protrudes freely through the gap between the cover and the underside of the tabletop.

Note

Be careful not to damage the cable when mounting the cover.



2. Route and connect the USB cable:
 - a. Route the USB cable along the underside of the tabletop, using the p-clips (already installed) or the wire ties provided in the kit to secure the cable.
 - b. Pull the USB cable through the access opening forward to the front side of the rear shroud and plug into an available port on the USB hub.
 - c. Secure any excess cable slack with wire ties.
3. Reattach components:
 - a. Reattach the front shroud.
 - b. Reattach the chassis support bracket.
 - c. Reattach the front, rear, and side covers.
4. Plug in and power ON the system. Continue with the section [Verify the Bar Code Scanner](#) on page 244.

Verify the Bar Code Scanner

1. Click the Windows **Start** Button.
2. Click **All Programs**.
3. Click **MetrOPOS**.
4. Click **MetrOPOS Administrator**.
5. If the OPOS Configuration Wizard Welcome window opens:
 - a. Click the **Do not show at startup** check box.
 - b. Close the window.
6. When the MetrOPOS Administrator screen is displayed, select the **Device Information** tab. (See the following figure.)

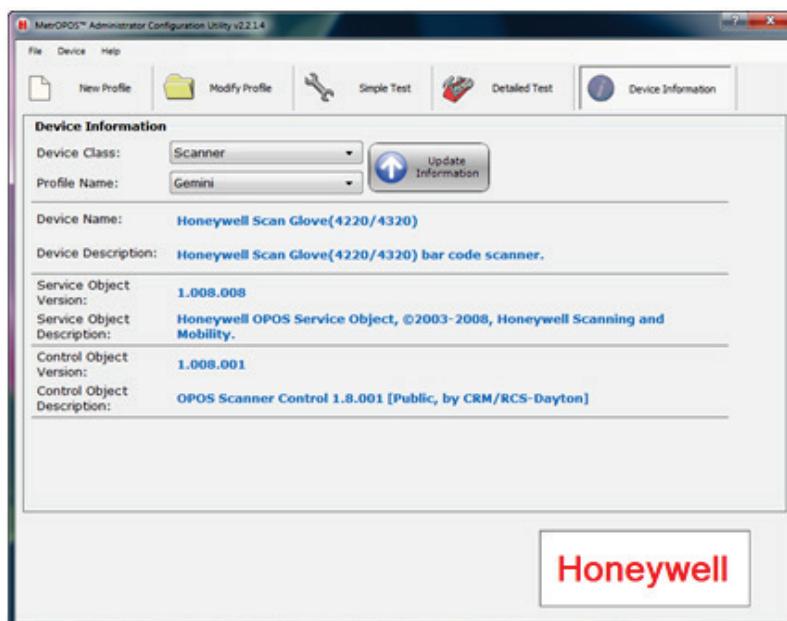


Figure 174: MetrOPOS Administrator screen

7. In the Device Information section of the screen:
 - a. Click the **Update Information** button.
 - If the Device Name and Description information is displayed correctly (as shown in the previous figure), go to step 8.
 - If the Device Name and Description information is NOT displayed correctly, go to step 7b.
 - b. If the Device Name indicates *Unable to open device (107)*, scan the Enable Bar Code Scanner USB Serial Emulation Mode bar code (see the following figure) and reboot the computer.
 - c. Click the **Update Information** button. The Device Name and Description information is displayed as shown in the previous figure.



Figure 175: Enable Bar Code Scanner USB Serial Emulation Mode

8. Click the **Simple Test** tab.
9. Click the **Begin Test** button.
10. Scan a test bar code shown in the following figure.



Figure 176: Test bar codes

The *Scan data* and *Scan data type* readings in the MetrOPOS Administrator screen displays the correct bar code information. (See the following figure.)



11. After you have scanned a test bar code:
 - If the **End Scanner Test** button is enabled, the scan has passed the test. Go to step 13.
 - If the **End Scanner Test** button is NOT enabled, the scan has failed. The scanner is not configured properly. Go to the next section [Configure the Bar Code Scanner on page 246](#).
12. When you have configured the Bar Code Scanner, return to this section (*Verify the Bar Code Scanner*). Retry steps 8 through 10 until you successfully scan a test bar code.
13. Click the **End Test** button.
14. Close the **MetrOPOS Administrator** window by clicking the red X in the upper right corner of the window.

Note

When your scanner tests successfully in this section, the installation is complete.

Configure the Bar Code Scanner

The following procedure allows you to configure the bar code scanner by scanning bar codes one at a time in numerical order. Use this procedure if your test scan fails during the previous procedure, [Verify the Bar Code Scanner](#) on page 244.

1. Scan the first bar code. (Refer to item 1 in the following table.)
2. After the beep, move the page until the next bar code in the table is underneath the scanner.
3. Repeat the process until you have scanned all 16 configuration bar codes in the table.
4. When you are finished scanning all 16 configuration bar codes, return to the previous section, [Verify the Bar Code Scanner](#) on page 244. Perform steps 8 through 14 to complete the verification.

Note

Scan all of the following bar codes in order. After scanning the last bar code on a page, move the page to the side, being careful not to scan a code unintentionally. Proceed to the next page of bar codes.

Table 5: Configuration Bar Codes

Table 5: Configuration Bar Codes

Item	Bar Code Name	Bar Code
1	Enable Factory Defaults	 3 8 4 6 6 0 0
2	Recall Defaults	 3 9 9 9 9 9 8
3	Enable Manual Activation	 3 4 1 8 3 5 4
4	0.5 Second Timeout	 3 1 2 0 0 1 0
5	Enable Uni-Directional USB	 3 3 1 6 4 7 0
6	Transmit Leading Zero	 3 1 0 7 5 1 3
7	Transmit UPC-E Check Digit	 3 1 0 7 5 1 6
8	Transmit LRC	 3 1 0 7 8 1 1
9	Enable NIXDORF ID	 3 1 0 7 9 1 7
10	Disable Line Feed	 3 1 1 6 6 0 2

Table 5: Configuration Bar Codes

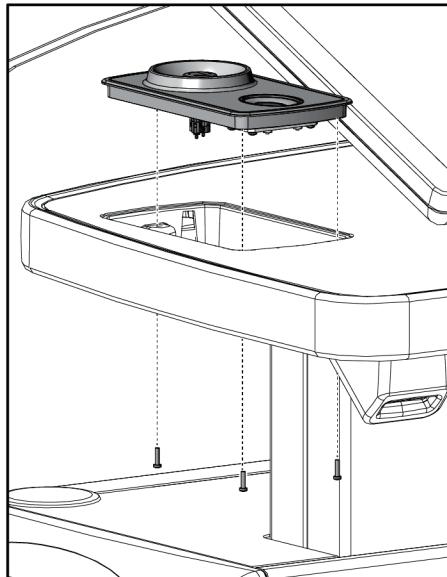
Item	Bar Code Name	Bar Code
11	Disable Carriage Return	 3 1 1 6 6 0 3
12	Enable ETX suffix	 3 1 1 6 6 1 4
13	Enable STX prefix	 3 1 1 6 6 1 5
14	Enable Comm Time Out	 3 1 1 8 4 1 2
15	Beep After Transmit	 3 1 1 8 4 0 3
16	Optional Tone 5	 3 1 8 5 2 5

10.5.12 Replace and Configure the E-Stop/Fingerprint Scanner Assembly

Replace the E-Stop and/or Fingerprint Scanner

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Unfasten the E-Stop/fingerprint scanner assembly from its housing by removing the three screws underneath the workstation table top. (See the following figure.)



*Figure 177: Removing the assembly from its housing
(shows all cables already disconnected)*

3. Pry up carefully the assembly out of its housing. Disconnect the "y" junction cable from E-Stop wire harness and disconnect the cable from the fingerprint scanner.
4. The next step depends on the level of removal needed.
 - If you are replacing the entire assembly with a new assembly that is pre-installed with the E-Stop button and the fingerprint scanner, you are done as far as removal. Proceed to the following Replacement procedure.
 - If you are replacing the E-Stop button as a separate unit, continue with step 5.
 - If you are replacing the fingerprint scanner as a separate unit, continue with step 6.

5. Removal of E-Stop button:
 - a. Disconnect the "y" junction cable on E-Stop to E-Stop wire harness.
 - b. Make a note of the pin connections on the two termination connectors of the "y" junction cable going to the E-Stop. Pull out (intact if possible) the pins from each termination connection.



Note

You need to remove the two termination connectors at the ends of the "y" junction cable on the E-Stop so you can slide the fastening hardware off the E-Stop wiring.

- c. Unfasten the E-Stop by loosening the collar nut and metal reinforcement collar and slide both off the wiring.
- d. Pull out E-Stop button with dangling wires through the E-Stop mounting hole (see following figure).

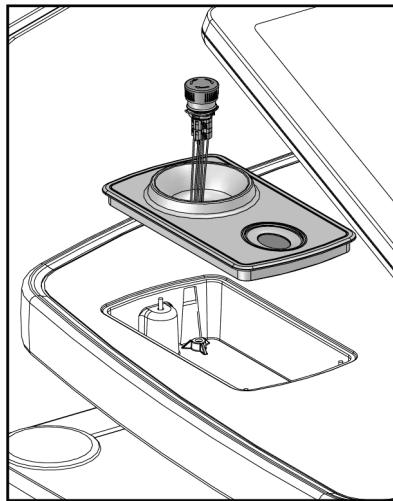


Figure 178: Removing/replacing the E-Stop button

6. Remove the fingerprint scanner (see following figure):

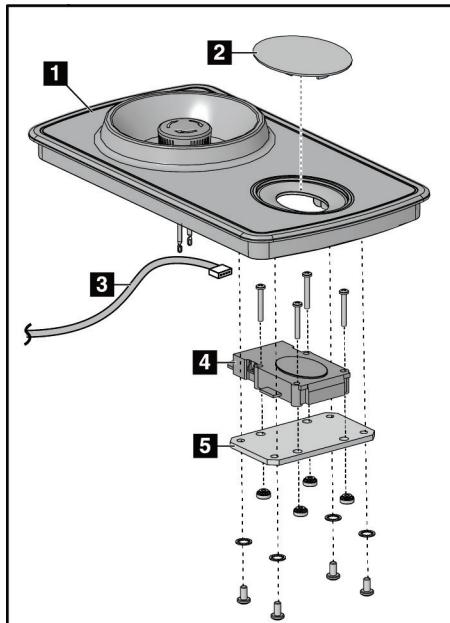


Figure 179: Removing fingerprint scanner

- a. Unfasten the fingerprint scanner mounting bracket (four screws, item 5) from inside the assembly.
- b. Unfasten the fingerprint scanner module (item 4) from its mounting bracket (four screws).
- c. If not already done, disconnect the device cable (item 3) from the fingerprint scanner.

Replacement

1. If you replaced the entire assembly with a new assembly pre-installed with the E-Stop button and the fingerprint scanner, go to step 4.
2. Replace the E-Stop:
 - a. Insert the new E-Stop button into E-Stop mounting hole.
 - b. Slide the metal reinforcement collar and then slide the collar nut over the wiring dangling from the bottom of the new E-Stop. Tighten collar nut against the reinforcement collar.
 - c. Based on your previous notes, insert the pin connections of the dangling crimped wires into each "y" junction cable connector termination. If you damage a pin, cut it off and crimp a new pin for that wire.
 - d. Connect the "y" junction cable on E-Stop to E-Stop wire harness.
3. Replace the fingerprint scanner:
 - a. Attach the device cable to the fingerprint scanner module.
 - b. Fasten the fingerprint scanner module to its mounting bracket (four screws).
 - c. Fasten the fingerprint scanner mounting bracket (four screws) to the underside of the E-Stop/fingerprint scanner assembly.
4. If not done already:
 - a. Connect the "y" junction cable on E-Stop to E-Stop wire harness.
 - b. Attach the device cable to the fingerprint scanner module.
5. Reattach the assembly to its housing (three screws).
6. Plug in and power ON the system. Test the E-Stop button for proper operation. Configure the fingerprint scanner (refer to [Configure the Fingerprint Scanner](#) on page 252).

Configure the Fingerprint Scanner

1. Start up the system and log in as the operator that you want to set up for fingerprint scanning.
2. On the touch screen of the user interface, go to **Admin > Manage Operators**.
3. Select the operator, then select **Edit**.
4. At the bottom of the user screen, select **Finger 1**, then select **Capture**.
5. At the prompt (see the following figure, left), place the desired finger of the operator on the fingerprint scanner.
6. Remove the finger when the Data screen indicates *Fingerprint Capture Succeeded*. (See the following figure, right.)
7. Repeat the previous step three more times or until the operator obtains a total of four thorough, successful scans.
8. When you have captured four successful scans of the fingerprint, select **OK**.

9. Select **Save > OK > Back > Log Out**.
10. If necessary, repeat steps 5a to 5i to acquire another set of fingerprint images, either for the same finger or another. Acquiring another set is optional and is useful for the following reasons:
 - For the same finger: The operator can scan additional data for a finger (for example, for more accurate recognition under less than ideal conditions for fingerprint scanning).
 - For another finger: The operator can scan a backup fingerprint (for example, if the first finger is injured and the operator cannot use it to log in).
11. Log off the system. Advise the operator to log back on using the Fingerprint Scanner to verify proper operation.

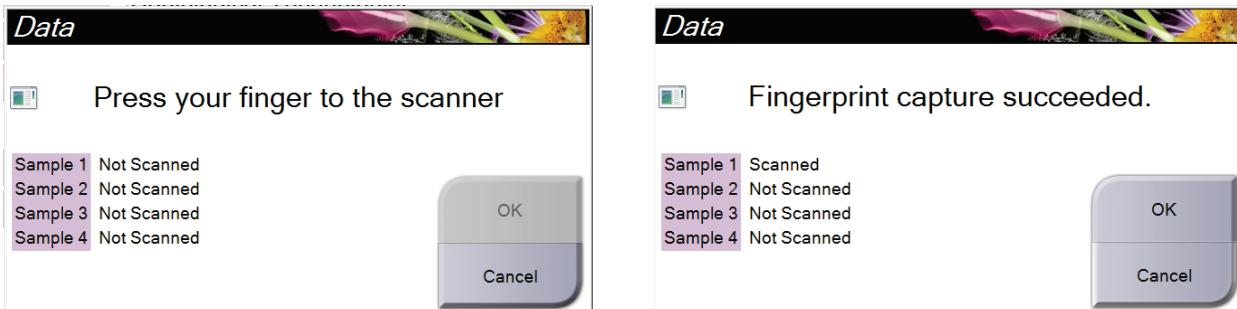


Figure 180: Data screen before (left) and after (right) a successful scan

10.5.13 Replace the X-ray Activation Button and/or Compression Release Button

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Unfasten the x-ray activation button/compression release button assembly from its housing by three screws underneath the workstation table top. (See the following figure.)

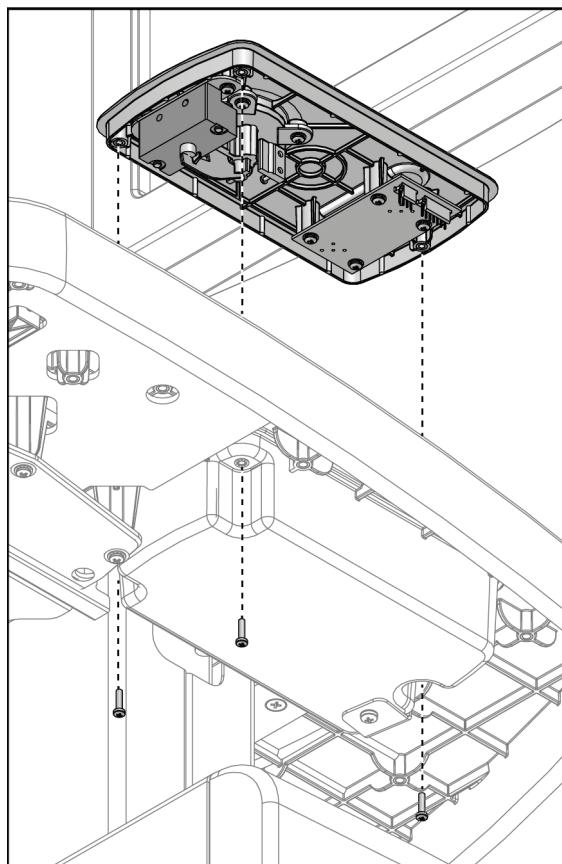


Figure 181: Removing the assembly from its housing (shows all cables already disconnected)

3. Pry up carefully the assembly out of its housing. Disconnect the cable (AEJ12) going to the x-ray activation button.
4. The next step depends on the level of removal needed.
 - If you are replacing the entire assembly with a new assembly that is pre-installed with the compression release button and the x-ray activation button, you are done as far as removal. Proceed to the following Replacement procedure.
 - If you are replacing the x-ray button as a separate unit, continue with step 5.
 - If you are replacing the compression release button as a separate unit, continue with step 6.

5. Remove the x-ray activation button:
 - a. Make a note of the spade connections (the lower two when looking at the assembly upside down) at the x-ray button side of the jumper cable (AEJ11), then disconnect the jumper cable.
 - b. Disassemble the x-ray button components. (See following figure.)

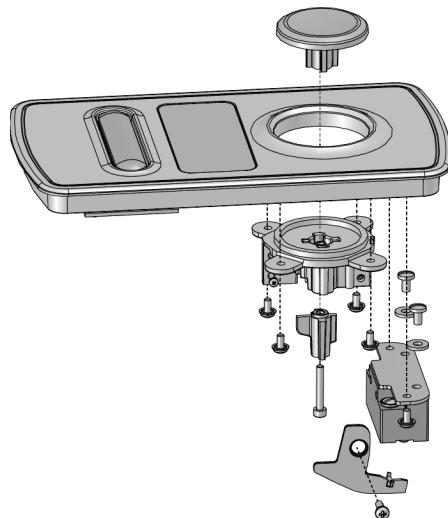


Figure 182: Disassembling the x-ray activation button

- c. Detach the x-ray activation button from the top.
6. Remove the compression release button:
 - a. Disconnect the jumper cable (AEJ11) to the compression release button board.
 - b. Unfasten the compression release button board (four screws). (See following figure.)

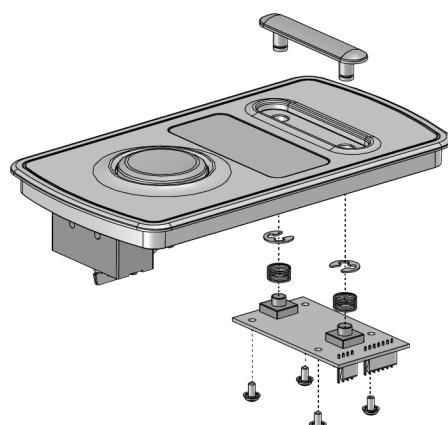


Figure 183: Disassembling the compression release button

- c. Remove the two springs, then the two e-clips. (See previous figure).
- d. Detach the compression release button "bar" from the top.

Replacement

1. If you replaced the entire assembly with a new assembly pre-installed with the x-ray button and the compression release button, go to step 4.
2. Replace the x-ray button:
 - a. Assemble the x-ray button components under the assembly.
 - b. Attach the x-ray activation button from the top.
 - c. Connect the spade connections (the lower two when looking at the assembly upside down) at the x-ray button side of the jumper cable (AEJ11).
3. Replace the compression release button:
 - a. Insert the compression release button "bar" on top.
 - b. Attach the two e-clips to hold the button "bar" in place.
 - c. Insert two springs while assembling the compression release button board (four screws) to the inside of the assembly.
 - d. Connect jumper cable (AEJ11) to the compression release board.
4. Connect cable (AEJ12) to the x-ray activation button.
5. Reattach the assembly to its housing by three screws underneath the workstation table top.
6. Plug in and power ON the system. Test the x-ray activation button and compression release button for proper operation.

10.5.14 Replace the Height Adjust Motor Controller



Warning:

For the following procedures, be careful not to drop the screws as you remove them. If you do, locate and retrieve the lost screws from the bottom of the machine. Not retrieving the screws may cause a shorting hazard in the power distribution assembly after system startup.

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the front, back, side covers, the chassis support bracket, and the front shroud. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. Disconnect all cords and cables going to the controller (see following figures and legend):

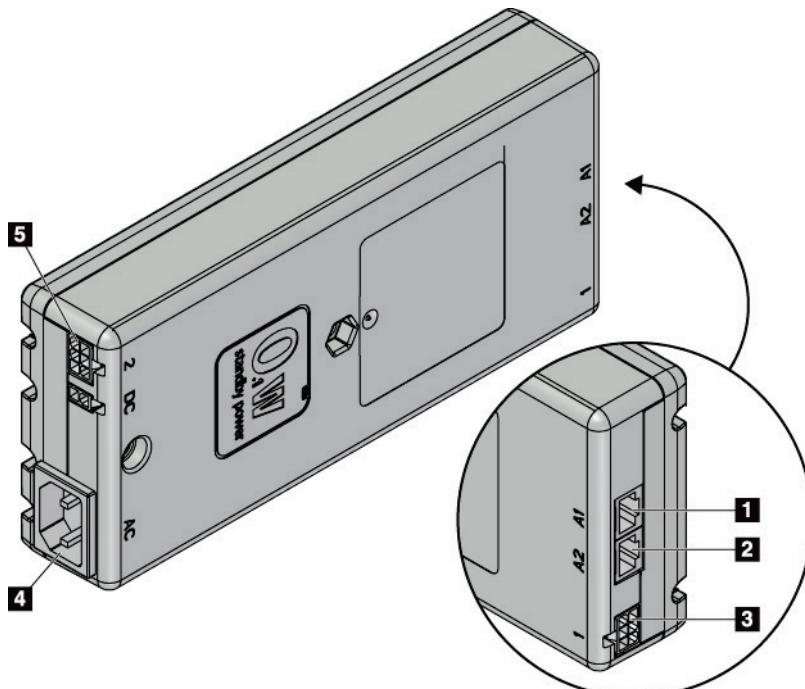


Figure 184: Connections to the motorized height adjust controller

Figure Legend

1. Port A1: USB Signal Converter Cable (optional, may not be present)
2. Port A2: Operator Desk Control Panel Cable
3. Port 1: Motor 1 Controller Cable
4. Port AC: AC input from UPS
5. Port 2: Motor 2 Controller Cable

4. Remove the controller from the tabletop pillar mounting bracket (item 1 in following figure).

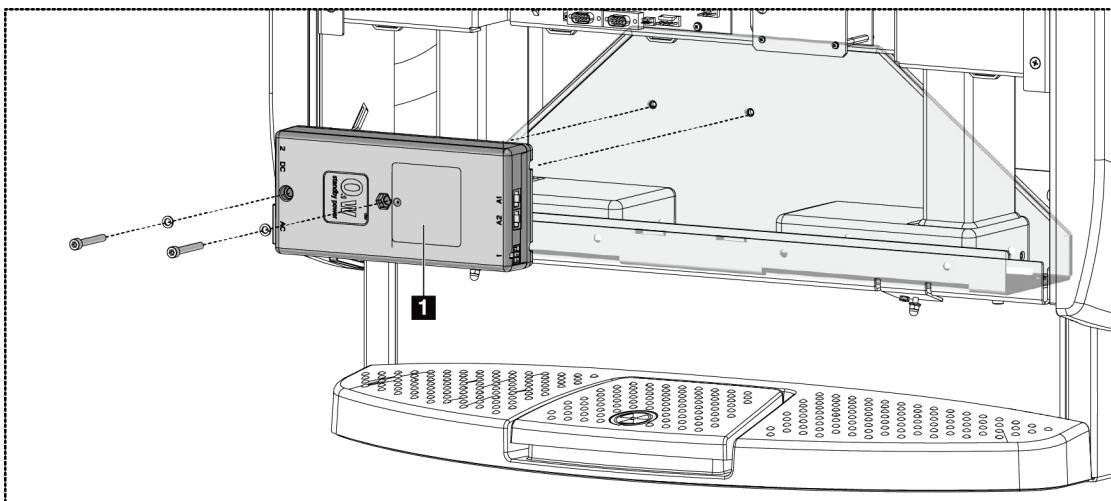


Figure 185: Replacing the motorized height adjust controller

Replacement

1. Install the new controller to the mounting bracket using two screws, flat washers, and lock washers (see previous figure).
2. Reconnect all cords and cables to the controller (see figure [Connections to the Motorized Height Adjust Controller](#) on page 257):
 - a. Female AC power input (item 4)
 - b. Motor 2 controller cable (item 5)
 - c. Motor 1 controller cable (item 3)
 - d. Operator desk control panel cable at A2 (item 2)
 - e. (If originally present) Cable to USB signal converter at A1 (item 1)
3. Reattach components:
 - a. Reattach the front shroud.
 - b. Reattach the chassis support bracket.
 - c. Reattach the front, rear, and side covers.
4. Plug in and power ON the system.

5. Program/calibrate the Controller:
 - a. At the Up/Down button module of the workstation, press the **Down** button.
 - b. Lower the tabletop all the way down.
 - c. Release the **Down** button.
 - d. Depress and hold the **Down** button for about 10 seconds.
 - e. Release the **Down** button.

The tabletop of the workstation is now programmed and calibrated to move fully up and down by using the Up/Down buttons.
6. Verify proper operation of the motorized height adjust control for the tabletop.

10.5.15 Replace the Signal Converter

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. Locate the signal converter (item 1 in following figure) near the bottom front of the workstation next to the motorized height adjust controller (item 2). The signal converter consists of a rectangular device with a USB cable coming out one side and a network cable coming out the other side. It is not mounted to any structure.

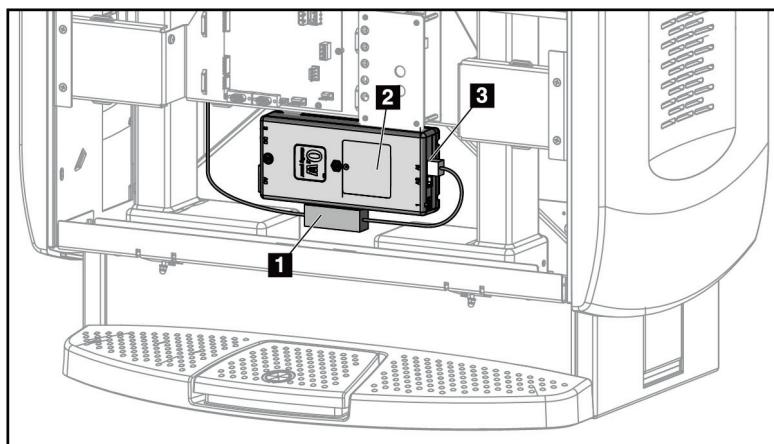


Figure 186: Location of signal converter (item 1)

4. Disconnect the network cable of the signal converter from port A1 of the motorized height adjust controller (item 3 from previous figure).
5. Disconnect the USB cable of the signal converter from the USB port on the workstation computer.
6. Remove the signal converter with its cables.

Replacement

1. Connect the network cable into port A1 of the motorized height adjust controller (item 3 from previous figure).
2. Route the USB cable end up inside the workstation and connect it to an available port on the computer. Use cable ties to manage and bundle any slack at that end as necessary to hold the signal converter in place under the motorized height adjust controller.
3. Attach the front, back, and side covers.
4. Plug in and power ON the system. Test the motorized height adjust controller for proper operation.

10.5.16 Replace the Remote X-ray Activation Switch

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the rear cover and the lower rear panel (kick plate) behind the rear cover. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. At the Gantry cable interface, disconnect the existing remote x-ray switch cable. (See the following figure.)

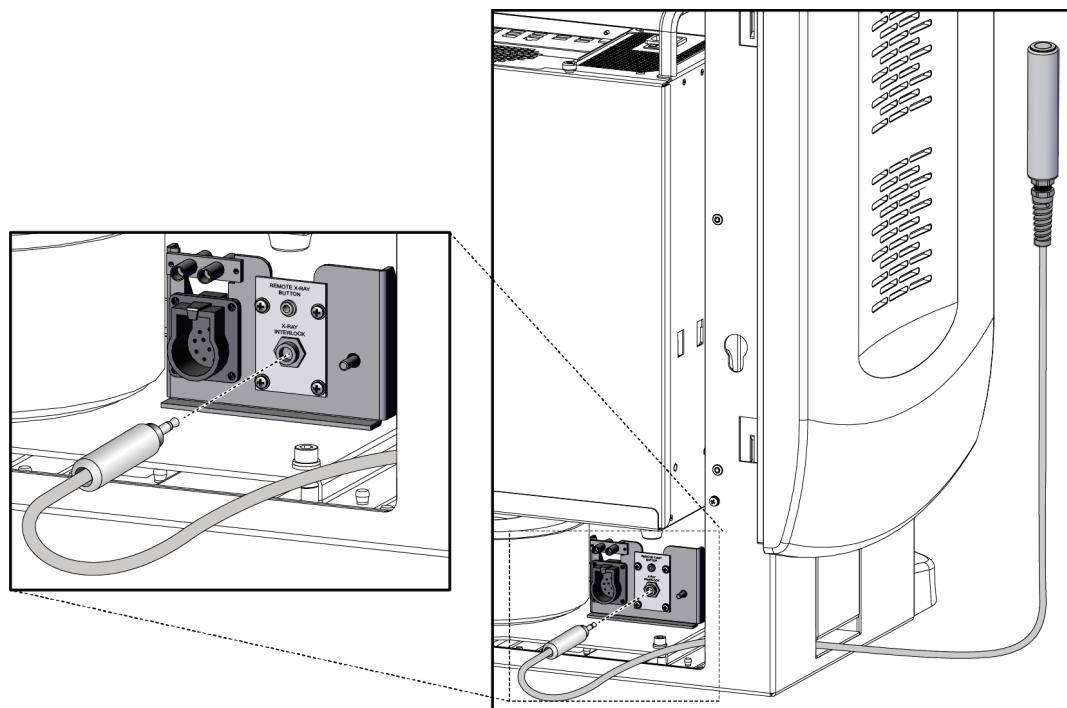


Figure 187: Removal/replacement of remote x-ray switch cable (shows left side access)

4. Pull out the remote x-ray switch cable through the access opening at the bottom left or right side of the workstation. (See the previous figure.)
5. Insert the new remote x-ray switch cable through this same access opening.
6. At the Gantry cable interface, insert the remote x-ray switch cable into the phone jack that is labeled *X-ray Interlock*.
7. Place the remote x-ray switch in the desired location.
8. Reinstall the lower rear panel (kick plate) and rear cover.
9. Plug in and power ON the system. Verify proper operation of the remote x-ray switch.

10.5.17 Replace the DVD Drive and Switch Assembly

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the front, back, and right side covers. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. Remove the CD/DVD drive and switch panel assembly from the right side of the workstation chassis (four screws).

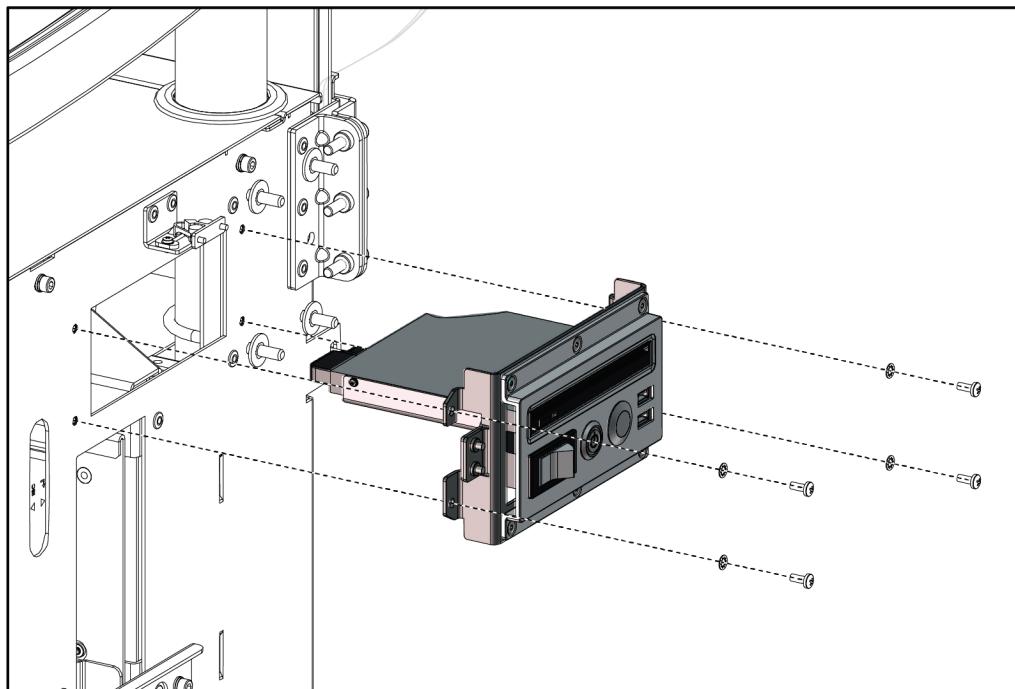


Figure 188: Removing the CD/DVD drive and switch panel assembly

4. Disconnect the cables to the CD/DVD drive, Power On/Off switch, CPU reset button, UPS reset button, and the two USB ports.

5. If necessary, remove the CD/DVD drive (item 1) from the drive mounting bracket (item 2) with four screws.

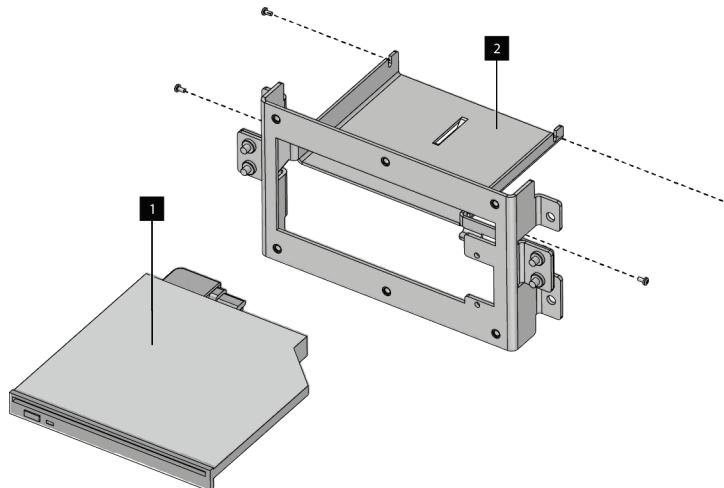


Figure 189: Removing the CD/DVD drive from the drive mounting bracket

Replacement

1. If necessary, install the new CD/DVD drive to the drive mounting bracket.
2. Connect the cables to the CD/DVD drive, CPU reset button, UPS reset button, and Power On/Off switch.
3. Reinstall the CD/DVD drive and switch panel assembly to the chassis.
4. Reinstall the front, back, and right side covers.
5. Plug in and power ON the system. Test the CD/DVD drive and front panel switches.

10.5.18 Replace the X-ray Activation Footswitch Assembly

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. If not done already, remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. Unfasten the four screws (two at each end) of the lower front panel (kick plate) and remove the panel. Retain the screws.

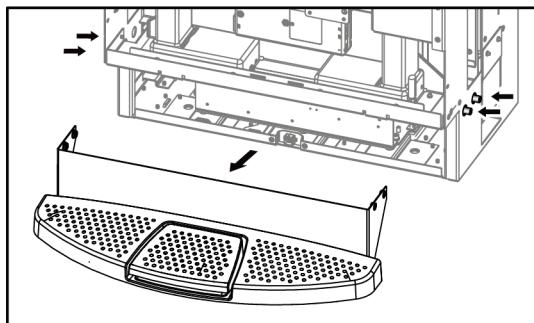


Figure 190: Removing the existing x-ray footswitch assembly

Replacement

1. Install the x-ray activation footswitch assembly:
 - a. Attach the new lower front panel kick plate (which is part of the x-ray activation footswitch assembly) by sliding it into place. (See the following figure.)
 - b. With the assembly now attached to the base of the workstation, secure it by tightening the same screws loosened in the previous step.

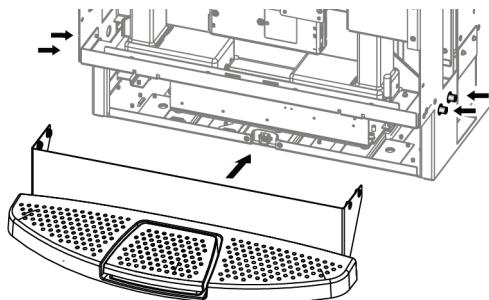


Figure 191: Installing x-ray footswitch assembly (which includes new lower front panel kick plate)



Note

The wiring connection is made via bulkhead connectors between the footswitch and the workstation with no separate cabling/harnesses used.

See the previous figure. The center arrow points to where the footswitch connector connects with the workstation mating connector.



Tip

If there is not enough space to slide the x-ray footswitch assembly into place, loosen the Universal Acquisition Workstation mounting bolts from the floor. If necessary, tilt the front of the workstation up slightly to slide the x-ray footswitch assembly into place.

2. Verify that the footswitch is installed and connected properly:
 - a. On the I/O Interface Board, locate JP5. (See the following figure.)
 - b. Using a digital multimeter (DMM), measure resistance between JP5 Pin-2 and JP5 Pin-4 on the I/O Interface Board.
 - c. If the footswitch is installed and connected properly:
 - When the footswitch is depressed, your resistance measurement indicates a closed connection.
 - When the footswitch is NOT depressed, your resistance measurement indicates an open connection.
3. Set the jumpers for the proper footswitch operation (parallel or series) that the customer requires. (Refer to the following figure and legend.)

Figure Legend

A - For parallel operation
(the operator uses *either* the footswitch *or* the x-ray button on the tabletop to activate an x-ray image):

- Put jumpers on pins 1-2 and 3-4. (See the adjacent figure, item A.)

B - For series operation
(the operator uses *both* the footswitch *and* the x-ray button on the tabletop to activate an x-ray image):

- Verify (or put) jumpers on pins 5-6 and 2-3. (See the adjacent figure, item B.)

NOTE:

- Parallel operation is the default setting for all shipped UAWS systems.
- Series operation is the default setting for AWS.

4. Reinstall the side, rear, and front covers.
5. Plug in and power ON the system.
6. Verify proper operation of the x-ray activation footswitch and the x-ray activation button on the tabletop.

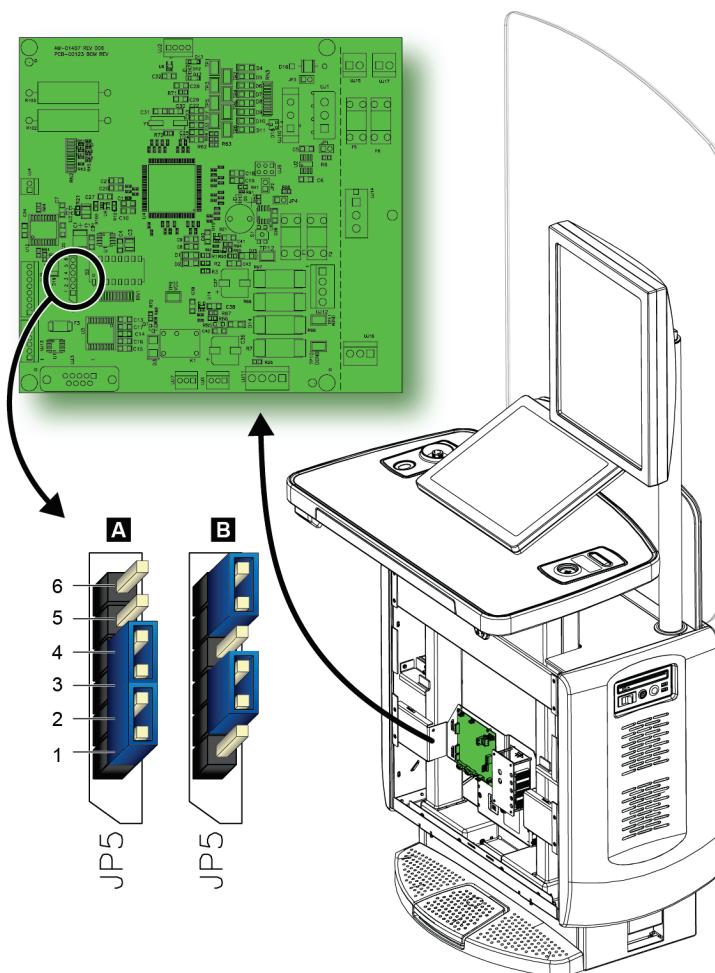


Figure 192: Setting the jumpers on the UAWS I/O Board

10.5.19 Replace the Radiation Shield



Warning:

Use gloves and eye protection when handling the X-ray Shield.



Warning:

Do not handle or position the Radiation Shield alone. Two people are required to handle and position the tempered glass shield to minimize stress to the shield.



Caution:

The X-Ray Shield is made of tempered glass and is fragile. Use extreme care when handling and installing the shield.



Caution:

Inspect the X-ray Shield before and after installation. Small imperfections embedded in the glass are acceptable. Do not install the shield if cracks or chips are visible.



Caution:

Use care when cleaning the X-ray Shield to avoid excessive force and movement of the shield.

Removal and Replacement

(Refer to the following figure.)

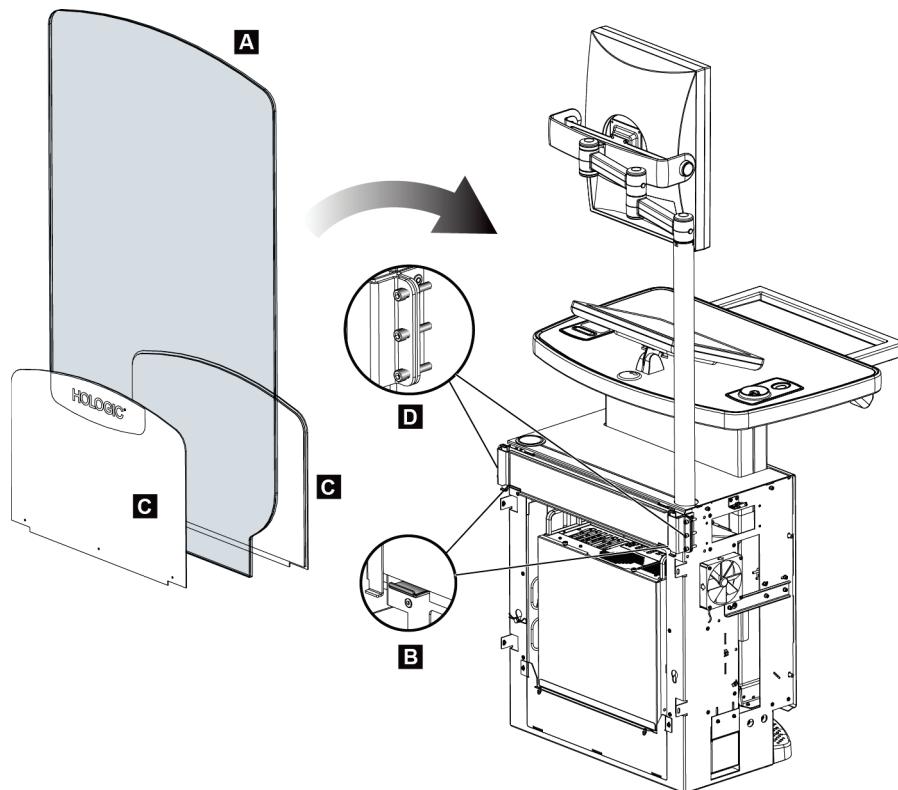


Figure 193: Radiation shield installation

1. Loosen screws (item D) on both sides of metal bracket.
2. Carefully remove the shield reinforcement plates (item C) on either side of the radiation shield (item A).
3. Carefully lift and remove the radiation shield (item A) from the shield supports behind the right and left slots (item B) of the metal bracket.
4. Lift the new radiation shield (item A) carefully and place it on the shield supports behind the right and left slots (item B) of the metal bracket.
5. Place the shield reinforcement plates (item C) on either side of the radiation shield (item A) and tighten screws (item D) on both sides of metal bracket.

10.5.20 Replace the AWS I/O Interface Assembly



Warning:

For the following procedures, be careful not to drop the screws as you remove them. If you do, locate and retrieve the lost screws from the bottom of the machine. Not retrieving the screws may cause a shorting hazard in the power distribution assembly after system startup.

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. From the front of the machine, locate the I/O interface board (item 1).

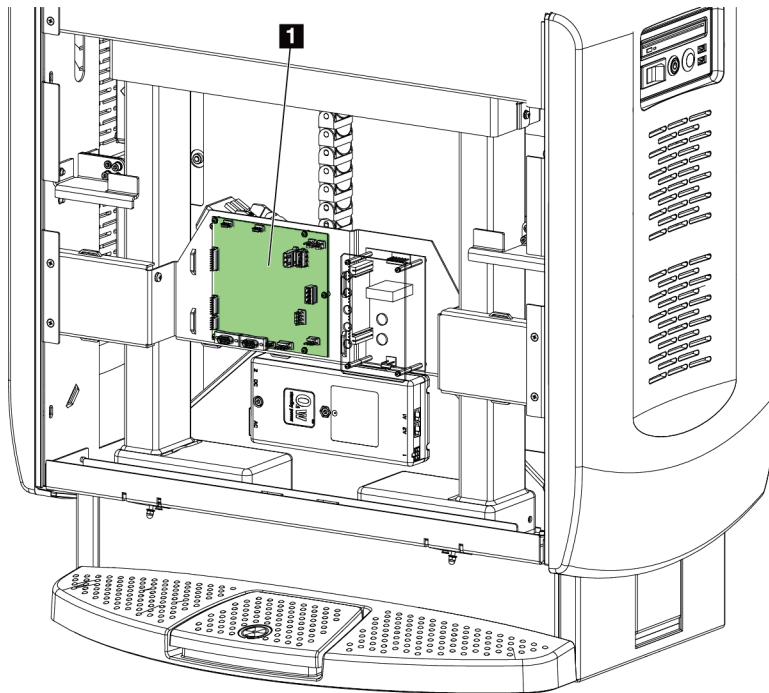


Figure 194: AWS I/O interface board

4. Disconnect all cables from the interface board (see following figure).

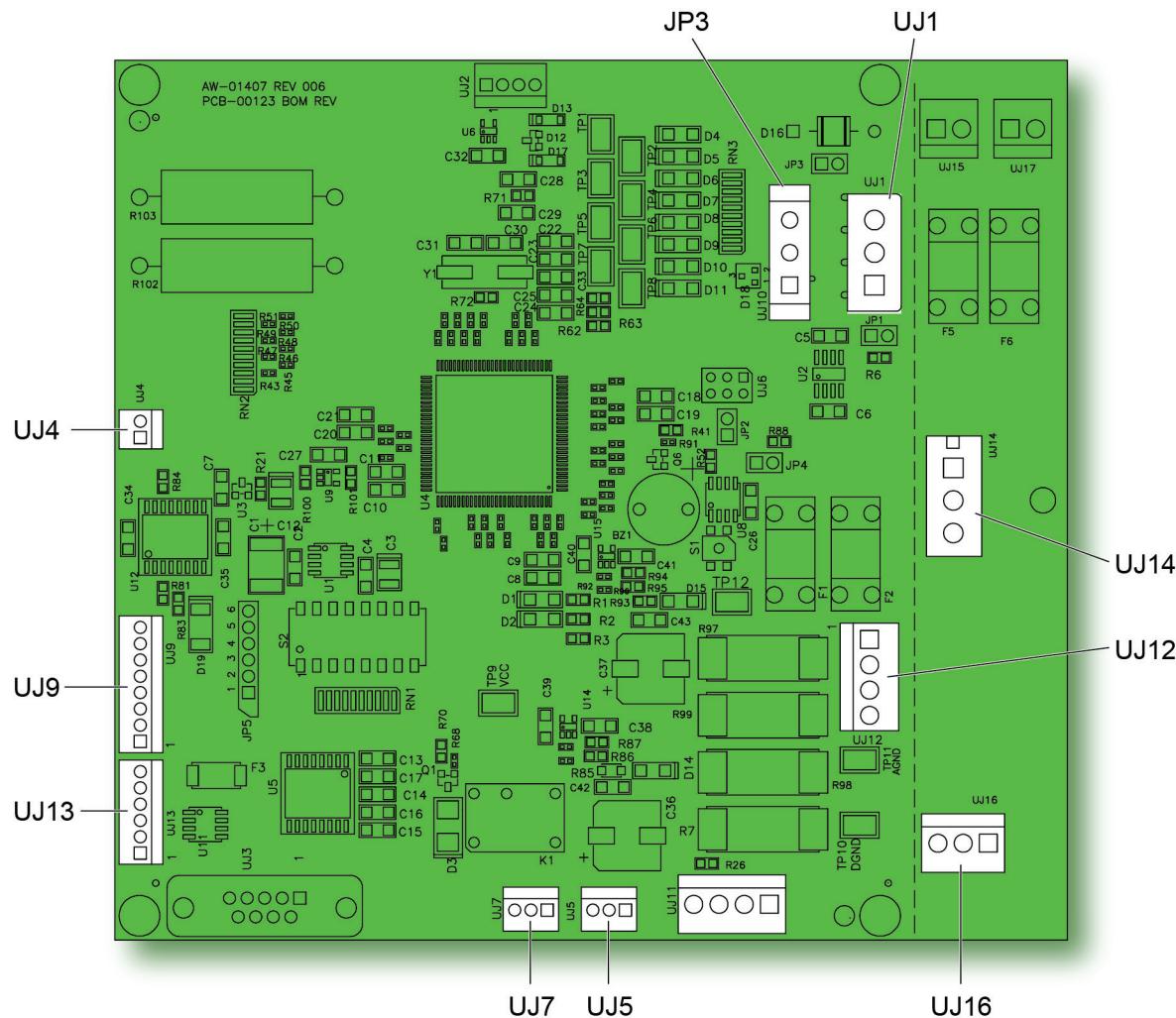


Figure 195: Connections on AWS I/O interface board

5. Remove the interface board from the control board mounting bracket (four screws).

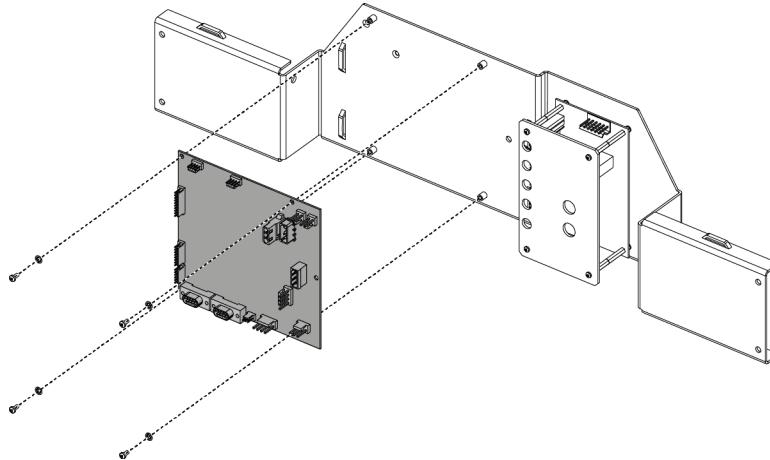


Figure 196: Removing AWS I/O interface board

6. Make a note of all jumper positions on the existing interface board.

Replacement

1. Check the jumpers on new board (and change if necessary) to match the same jumper positions on the old board.
2. Install the new interface board to the control board mounting bracket (see the previous figure).
3. Reconnect all cables to the interface board.
4. Reinstall the front, back, and side covers.
5. Plug in and power ON the system. Verify proper system operation.

10.5.21 Replace the Low Voltage DC Power Supply



Warning:

For the following procedures, be careful not to drop the screws as you remove them. If you do, locate and retrieve the lost screws from the bottom of the machine. Not retrieving the screws may cause a shorting hazard in the power distribution assembly after system startup.

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209).
2. Remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. From the front of the machine, locate the powers supply (item 1).

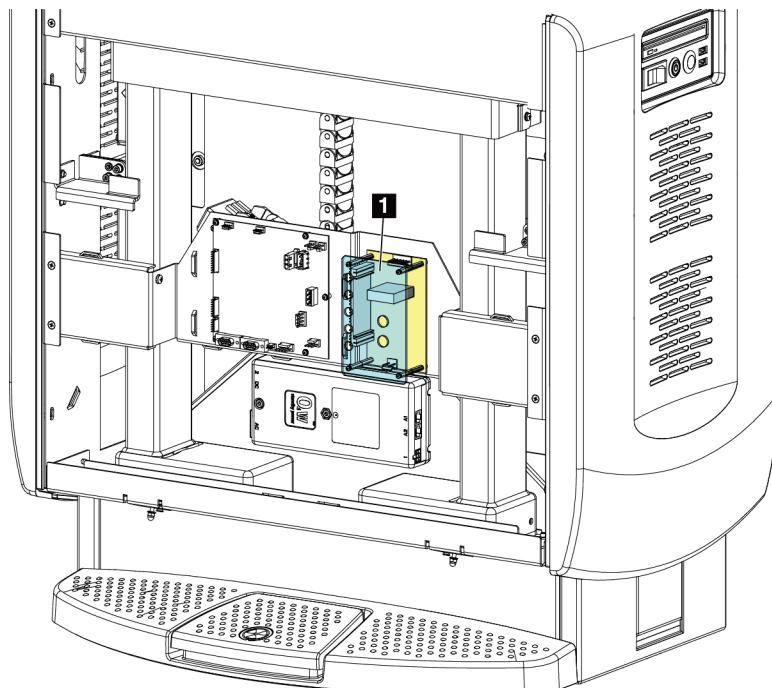


Figure 197: DC Power supply (dual output)

4. Disconnect from the power supply the AC input harness (at JP1, item 4, and at CN1, item 5) and the DC output harness (at CN2, item 7) as shown on following figure.

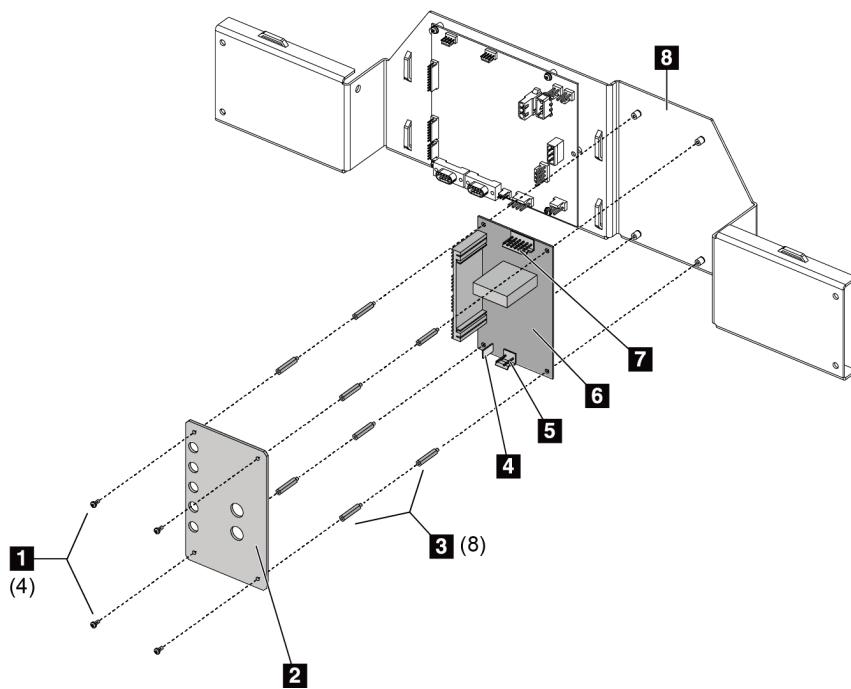


Figure 198: Removal/Disconnection of the power supply

5. Remove the power supply shield (item 2) with four screws (item 1) as shown on previous figure.
6. Remove the stand-off posts (item 3) from the power supply (item 6) as shown on previous figure. If possible, try to keep each pair of stand-offs (one on top of the other) as one item when removing.
7. Remove the power supply (item 6) from the control board mounting bracket (item 8) as shown on previous figure.

Replacement

1. Attach the power supply to the control board mounting bracket (see the previous figure) using the stand-off posts.
2. Attach the power supply shield to the stand-offs on the power supply.
3. Connect the AC input harness (at CN1 and JP1) and the DC output harness (at CN2) on the power supply.
4. Reinstall the front, back, and side covers.
5. Plug in and power ON the system. Verify proper system operation.

10.5.22 Replace the Fan

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the front, back, and left side covers. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. Unfasten fan from chassis (see following figure, four screws) and remove front and back screens on fan.

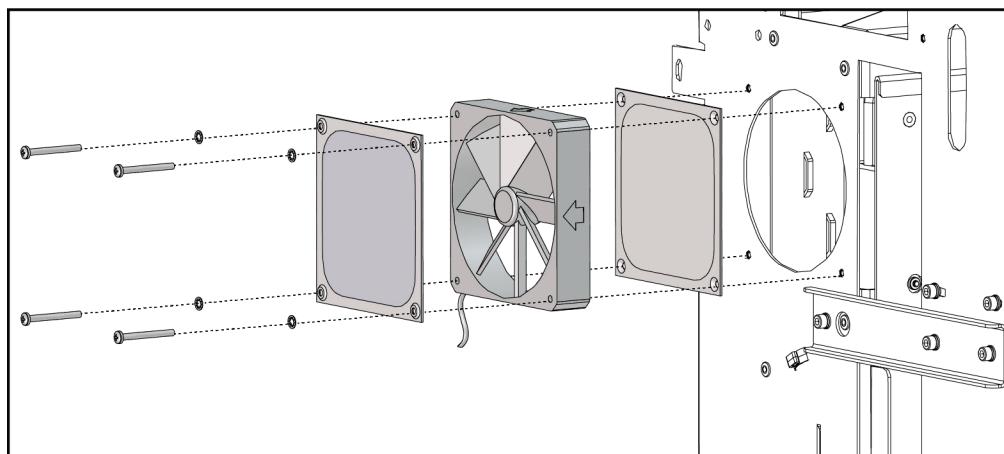


Figure 199: Removal/disassembly of fan

4. Disconnect power cable to fan and remove fan.

Replacement

1. Connect power cable to fan.
2. Assemble screens on front and back of fan and attach fan to chassis (four screws).
3. Reinstall the front, back, and left side covers.
4. Plug in and power ON the system. Verify proper system operation.

10.5.23 Replace the Power Distribution Assembly

Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the front, back, and side covers. Remove the lower front panel (kick plate) and lower rear panel (kick plate). (Refer to [Remove the Covers and Panels](#) on page 210.)
3. Note all cable connections and their locations to the power distribution assembly, then disconnect:
 - UPS AC power cable from AC extension outlet on power assembly.
 - AC power cord from AC input terminal block (on the left side if viewing from the rear of the workstation). (See following figure, item 2.)
 - blue and brown wires going to AC input terminal block (see following figure, item 1)

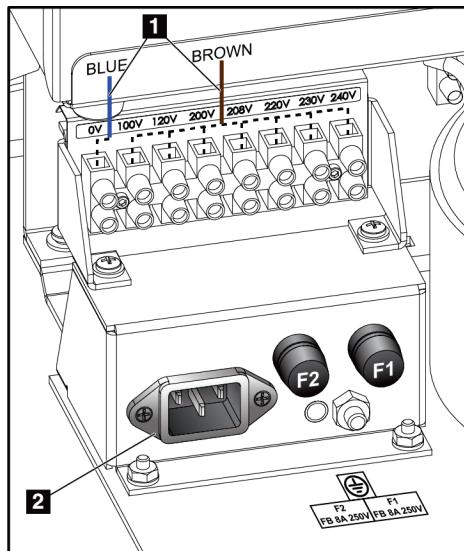


Figure 200: AC input power terminal block on left side of power distribution assembly

- Cables going to the Gantry cable interface (on the right side if viewing from the rear of the workstation). (See following figure). The cable interface acts merely as a mounting plate for the Gantry cables and does not interact directly with the power distribution assembly.
 - Unplug the Gantry fiber optic cable pair from the front of interface and remove the mounting plate (two screws) with the rear cables still attached as one unit.
 - Unplug the Gantry interconnect cable from the front of interface and remove the mounting plate (four screws) with the rear cables still attached as one unit.
 - Unplug the remote x-ray activation button cable from the front of interface (if used) and remove the mounting plate (four screws) with the rear cables still attached as one unit.

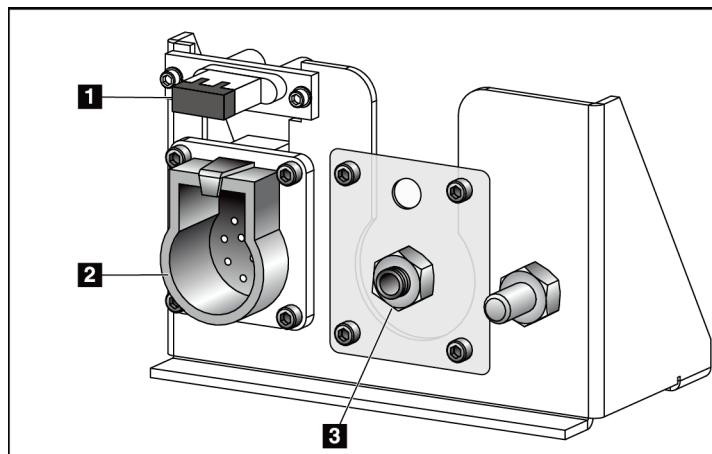


Figure 201: Gantry cable interface on right side of power distribution assembly

Figure Legend

1. Gantry fiber optic cable (pair)
2. Interconnect cable to Gantry
3. Remote x-ray activation button jack

4. Unfasten the power distribution assembly (five mounting bolts) from the base of the workstation and slide it out the rear of the chassis. (See the following figure.)

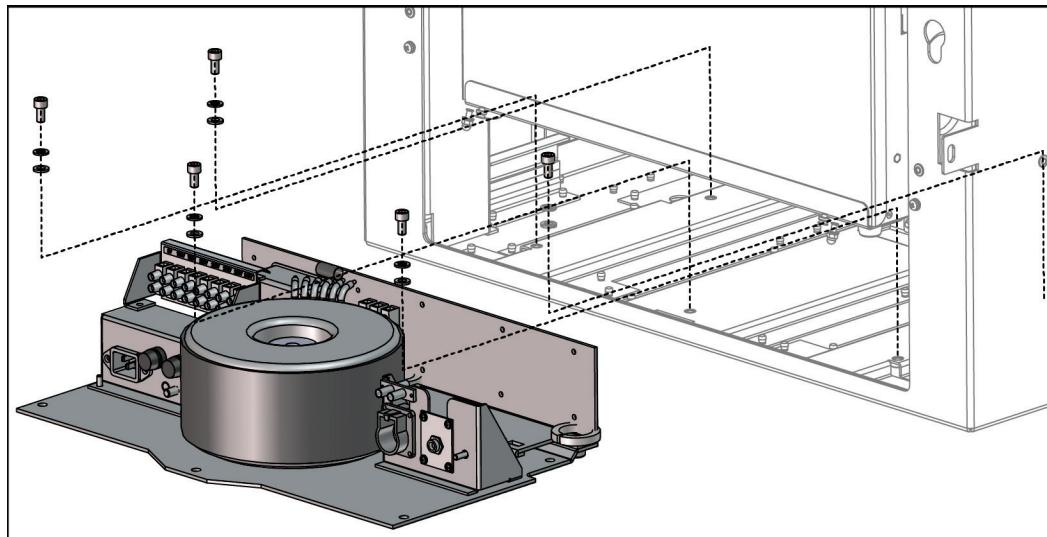


Figure 202: Unfastening mounting bolts and sliding power distribution assembly out of rear of chassis

Replacement

1. Slide the assembly into place at the base of the workstation chassis and fasten using five screws and washers.
2. Reconnect all the cables/harnesses to the assembly (see step 3 in previous procedure), including those cables and hardware removed at the Gantry cable interface. Use wire ties as necessary for proper cable management.
3. Attach workstation AC input cord (not plugged in to AC outlet yet) to the left terminal block of the power assembly.
4. Reinstall the lower front panel (kick plate), lower rear panel, front, back, and side covers.
5. Plug in and power ON the system. Verify proper system operation.

10.6 Relocating Assemblies to Opposite Side of Workstation

10.6.1 Relocating the Preview Display Monitor

You can change the location of the preview display monitor post and monitor to the opposite side of the workstation tabletop if necessary or per customer request.

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the front, back, side, and top covers. (Refer to [Remove the Covers and Panels](#) on page 210.)
3. Disconnect the DVI cable and the power cable (item 3, see following figures) from the preview display monitor (item 1). Remove the preview monitor from the monitor bracket (item 2).

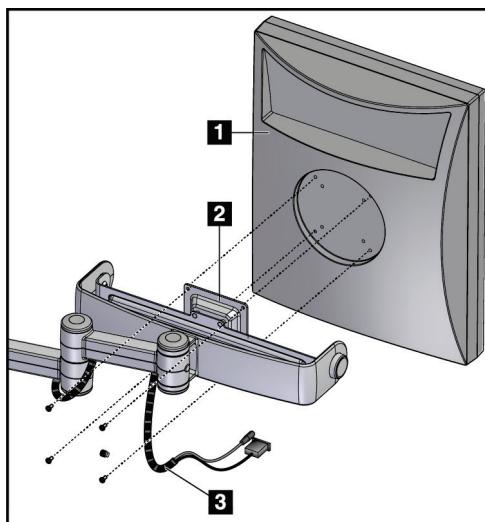


Figure 203: Removing display monitor from on articulated arm

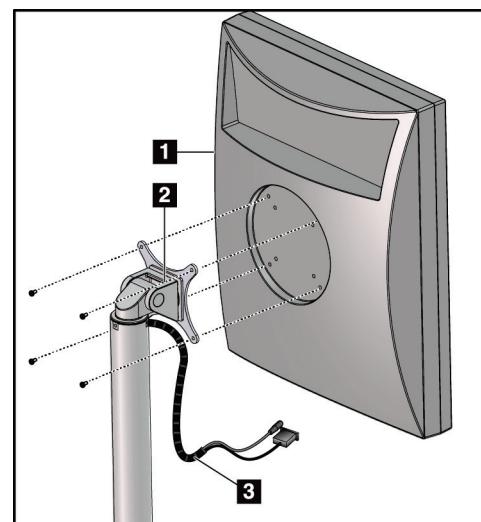


Figure 204: Removing display monitor from a standard arm

4. Loosen three setscrews (item 5 in figure [Routing preview monitor cables through articulating arm](#) on page 283) from the monitor post.
 - *Standard Arm* - Remove the mounting arm from the post.
 - *Articulating Arm* - Support the arm while cables are still threaded inside arm and remove arm from post. From the underside of the double articulated arm, unfasten the cable retainers (see following figure). Remove the DVI cable and power cable out of the double articulated arm assembly. Leave the spiral tubing over those sections of cable that were not inside the arm.

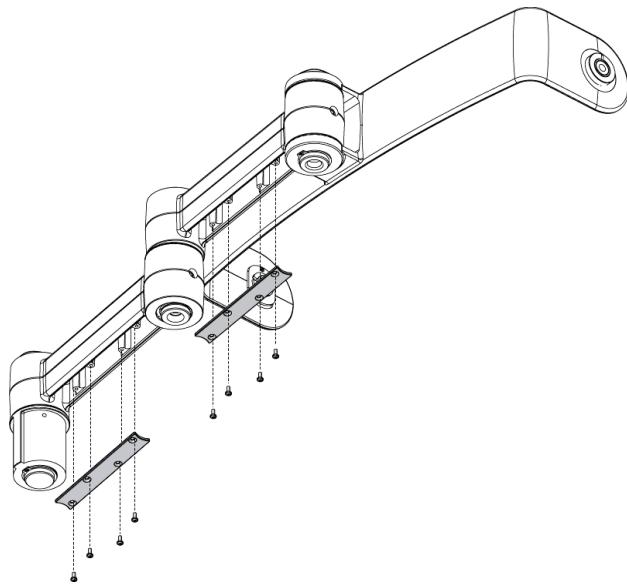
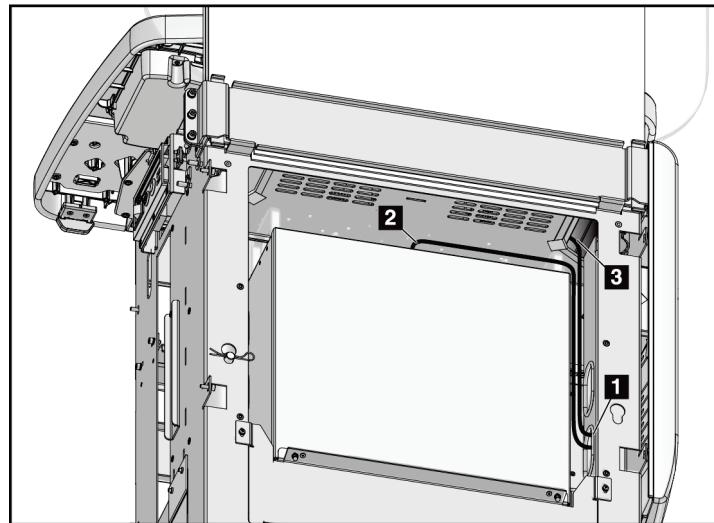


Figure 205: Removing cable retainers on underside of articulated arm

5. Inside the workstation:
 - a. Disconnect the DVI cable from the computer. (See the following figure, item 2.)
 - b. Disconnect monitor power cable (item 3) from power supply on platform above the computer.



*Figure 206: Routing of DVI and power cables for preview monitor
(Shows left side mounting of post)*

6. Unfasten wire ties from DVI and monitor power cables. Gather up slack for both cables and insert into monitor post through access opening (item 1 in previous figure).
7. Move monitor post to the appropriate side (left or right) of the workstation. (See following figure.)

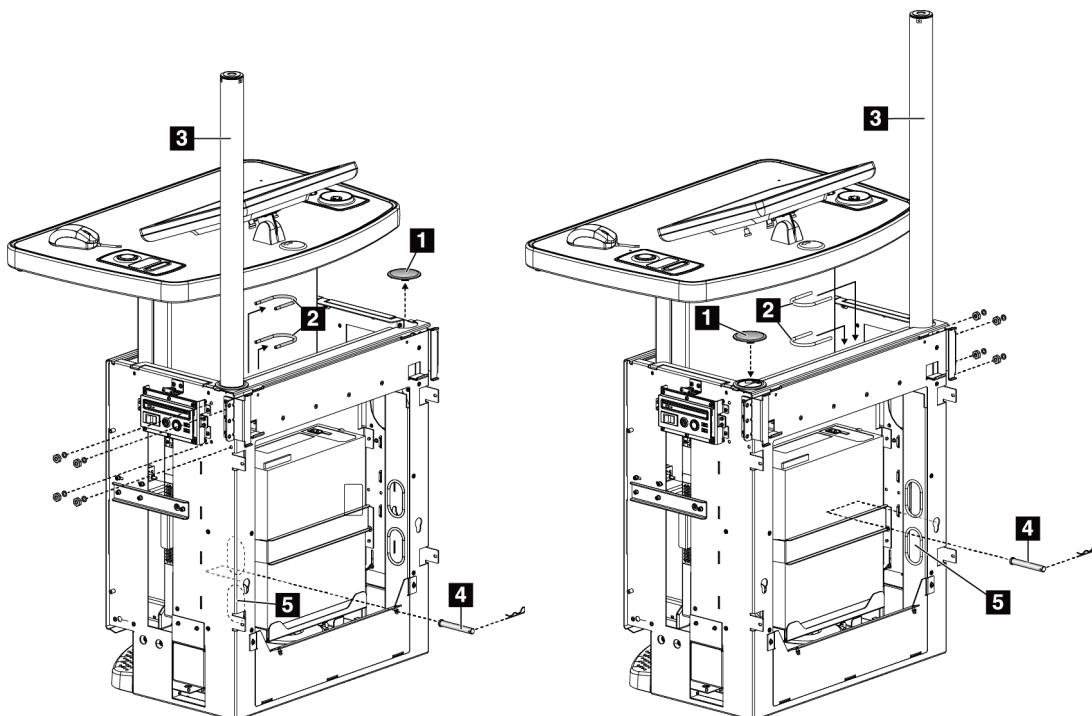


Figure 207: Installing the preview monitor post on either side of workstation

- a. Remove cap (item 1) from top cover on the side you are installing.
- b. For monitor posts having the standard arm, remove the pin bolt (item 4).
- c. Loosen the two U-bolts (item 2, using four screws) located near the top of the monitor post shaft.
- d. Slide the monitor post (item 3) out with cables inside and move to other side of workstation.
- e. Slide post down the shaft on the other side of workstation.
 - *Standard Arm* - Slide shaft and align slot in post with pin bolt hole in chassis. Insert pin bolt (item 4) to hold shaft in place.
 - *Articulating Arm* - Slide shaft until it can go no further.

- f. Rotate the monitor post so the notch on top (see following figure, item 1) is facing the operator side of the workstation.

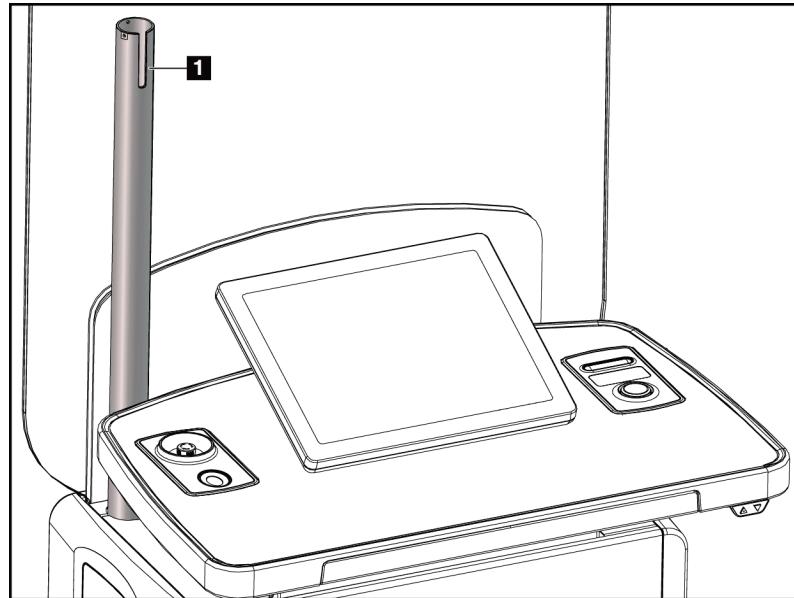
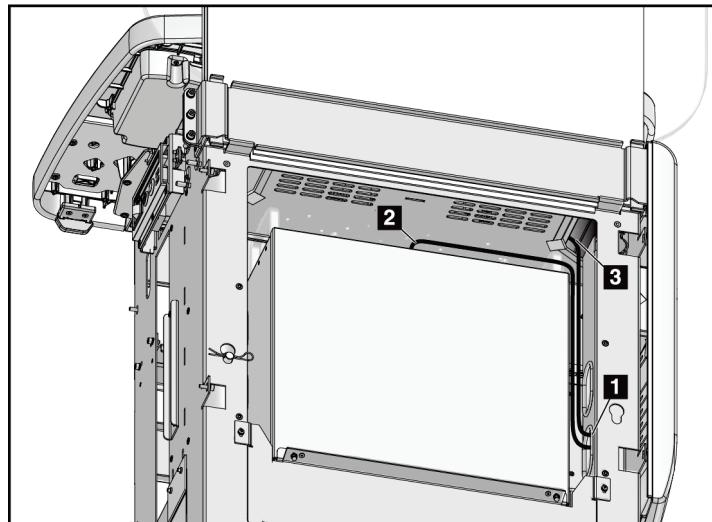


Figure 208: Notch on monitor post facing the operator

- g. Tighten the two U-bolts to secure the monitor post.
8. Untie the power and DVI cables that you bundled up previously and pull them out of the access opening of the monitor post (item 1 in following figure).



*Figure 209: Routing of DVI and power cables for preview monitor
(Shows left side mounting of post)*

9. Route the DVI cable up the inside of the workstation and over the rear panel of the computer. (See the previous figure, item 2 that shows left side routing.) Connect to proper video output on computer rear panel. Use wire ties a necessary for proper cable management.
10. Route the monitor power cable up the inside of the workstation and through the access opening to the platform above the computer. (See the previous figure, item 3 that shows the left side access opening.) Connect monitor power cable to power supply on platform above the computer. Use wire ties a necessary for proper cable management.
11. The next step depends on the type of mounting arm:
 - *Standard Arm* - Thread the DVI and power cables up and out through the notch on top of the monitor post. Place the standard arm on the monitor post and tighten three setscrews on post. Attach the preview monitor to the monitor bracket (item 2 in following figures). Connect the DVI cable and the power cable (item 3) to the preview display monitor (item 1). Continue at step 13.

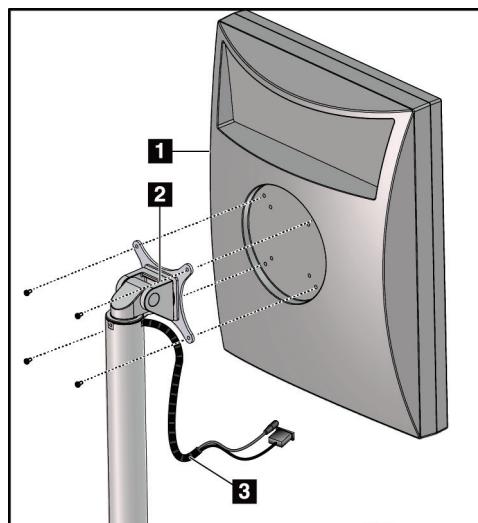


Figure 210: Connecting display monitor to a standard arm

- *Articulating Arm* - If you are moving the monitor post from the left side to the right side, go to following topic [Change the Left/Right Orientation of the Double Articulated Arm](#) on page 284. Continue at step 12 in any case.

12. *Articulating Arm* - Do these substeps and refer to the following figure:
 - a. Thread the DVI and power cables up and out through the notch on top of the monitor post (item 5).
 - b. Attach the preview display monitor (item 1) to the mounting plate (item 2) on the new arm.
 - c. Place the new articulating arm and monitor onto the monitor post. Secure the articulating arm to the monitor post using three setscrews (item 5.)
 - d. Thread the power and DVI cables through the articulating arm track. For those sections of cable that are not inside the arm (such as the gap between the articulating arms), ensure that the spiral tubing is outside the arm track. Fasten the cable retainers under the articulating arm.
 - e. Connect the DVI cable and the power cable (item 4) to the preview display monitor (item 1).

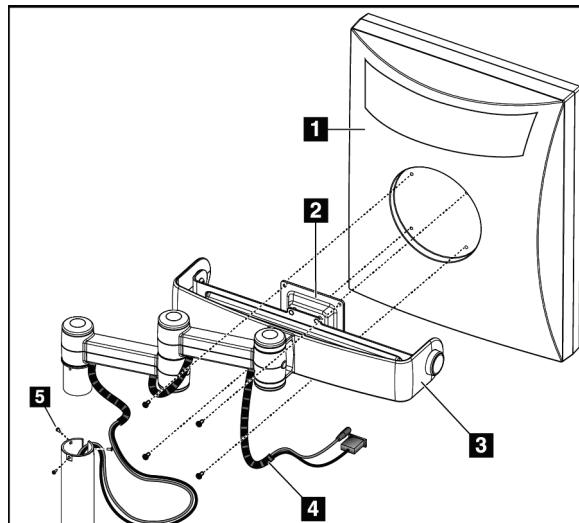


Figure 211: Routing preview monitor cables through articulating arm

13. Install the top, front, back, side, and top covers.
14. Plug in and power ON the system. Configure the preview monitor using the appropriate programs from the control monitor.

Change the Left/Right Orientation of the Double Articulated Arm

The double articulation of the arm ensures a full 360° combined radius of horizontal monitor movement. The pivot joints of the arm are shipped configured in a left orientation. (See the following figure.)

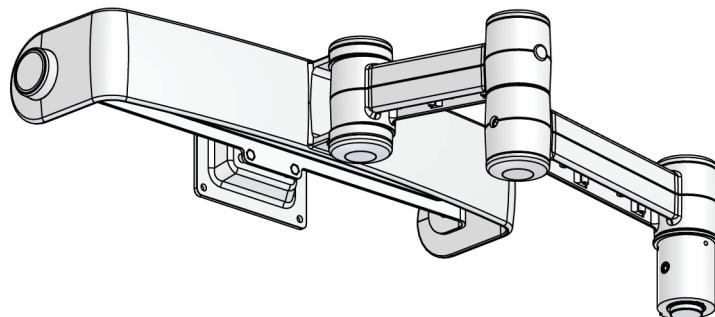


Figure 212: Double articulated arm in left (default) orientation

- If you install the monitor on the left side of the tabletop, you do not have to adjust the orientation of the double articulated arm.
- If you are install the monitor on the right side of the tabletop, you need to change the orientation of the double articulated arm from left to right by doing the following procedure.

To change the double articulated arm assembly from left to right orientation:

1. Rotate the arm leftward to its fullest extent. (See the following figure.) By leftward, we mean to your left *as you are facing the front of the monitor mounting bracket*.

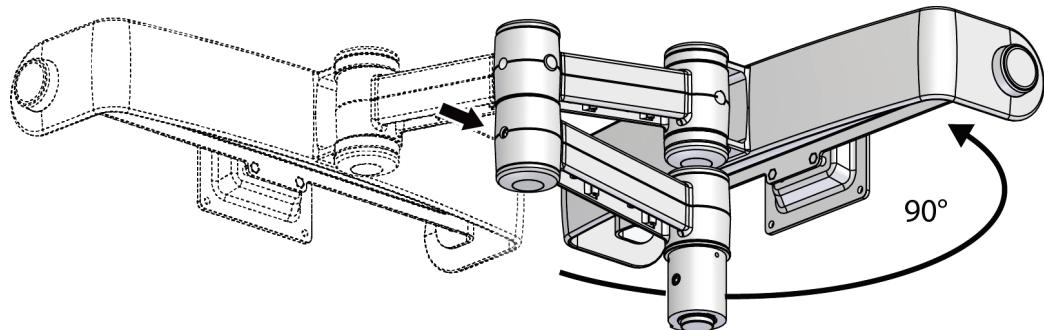


Figure 213: Double articulated arm assembly rotated to its fullest extent before adjustment

2. Adjust the lower of two middle hex screws as follows:
 - a. Loosen—but do not remove—the hex screw (5 mm) of the lower of the two pivot joints at the center of the arm assembly. (See the previous figure.)
 - b. Continue to loosen the screw until the top of it is at least flush with or protruding slightly outside the screw hole. This action frees the connection for the next step.
 - c. Rotate the arm to its fullest extent.
 - d. Tighten the same lower screw that you loosened in steps 2a and 2b. This action secures the set screw.
3. Adjust the pivot joint that is attached to the monitor post plug (see the following figure):

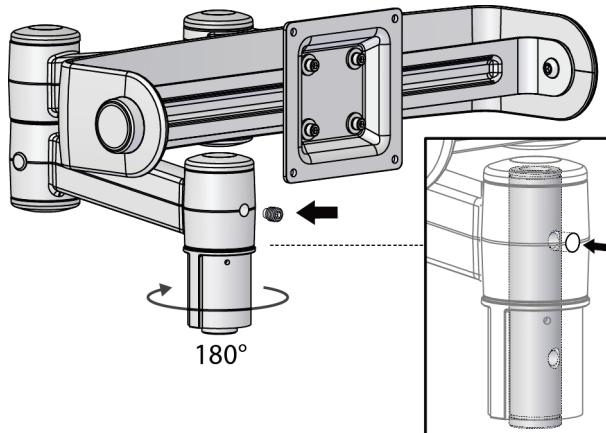


Figure 214: Rotating and aligning for proper screw reinsertion

- a. Remove the hex screw from the pivot joint.
- b. Insert your hex wrench into the screw hole and use the wrench as a lever to loosen and rotate the plug 180°. (See the previous figure.)
- c. Before you reinstall the screw, apply Loctite 242 to it.
- d. Reinstall the screw to the pivot joint. Take care to align the pivot joint and monitor post plug so that the screw hole allows the full insertion of the screw. (See the previous figure.)
- e. When reinserting the screw, make sure that the screw is fully recessed inside the screw hole. If it is not, the screw chambers are not aligned properly. If this situation occurs, remove the screw, realign the pivot joint, and monitor post plug, then retry reinstall the screw until properly aligned. (See the previous figure.)

10.6.2 Relocate Bar Code Scanner and/or Motorized Height Adjust Buttons

You can change the location of the bar code scanner and/or motorized height adjust control panel to the opposite side of the workstation tabletop if necessary or per customer request.



Note

If you are moving a bar code scanner, make sure that you have a new rubber stop or can salvage/reuse the old rubber stop from the original install. The rubber stop holds the scanner captive when mounted underneath the workstation tabletop.

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Remove the bar code scanner (if installed).
 - a. Remove the cable (item 2, see following figure) for the bar code scanner (item 1) by detaching it from the p-clips on the underside of the workstation tabletop.

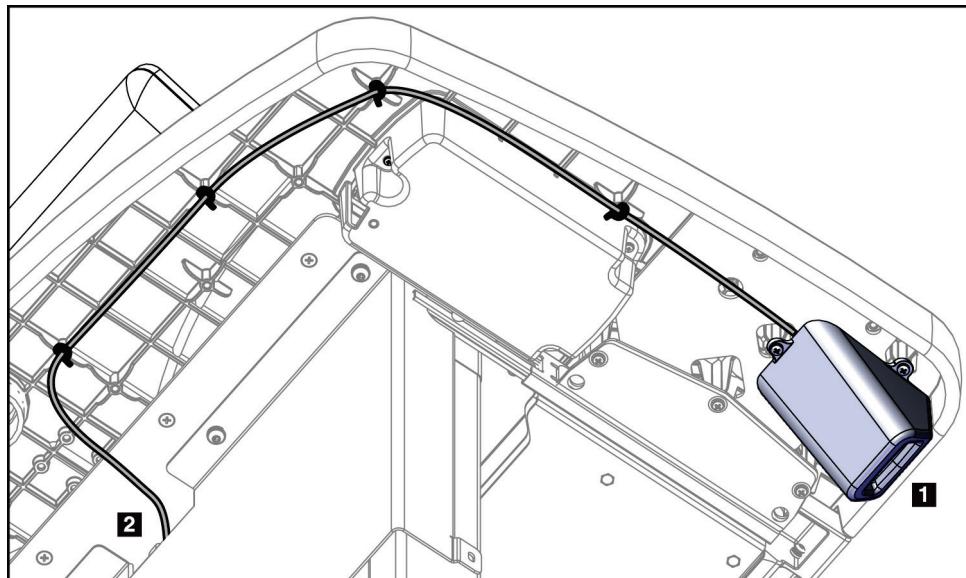


Figure 215: Bar code scanner and cabling (shown on left side of workstation)

- b. Remove the bar code scanner assembly from the underside of the tabletop (three screws, item 1 in following figure). If you do not have a new rubber stop (item 3), try to salvage the old rubber stop. The rubber stop holds the scanner captive when mounted underneath the workstation tabletop.

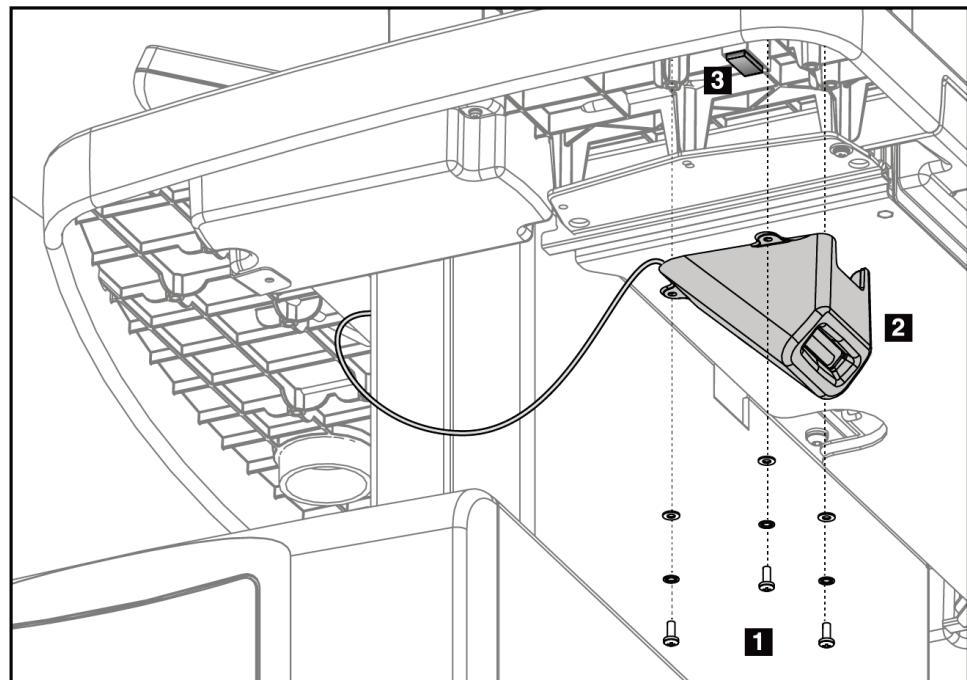


Figure 216: Removing/replacing the bar code scanner

3. Remove the height adjust control panel (if installed). (See following figure.)

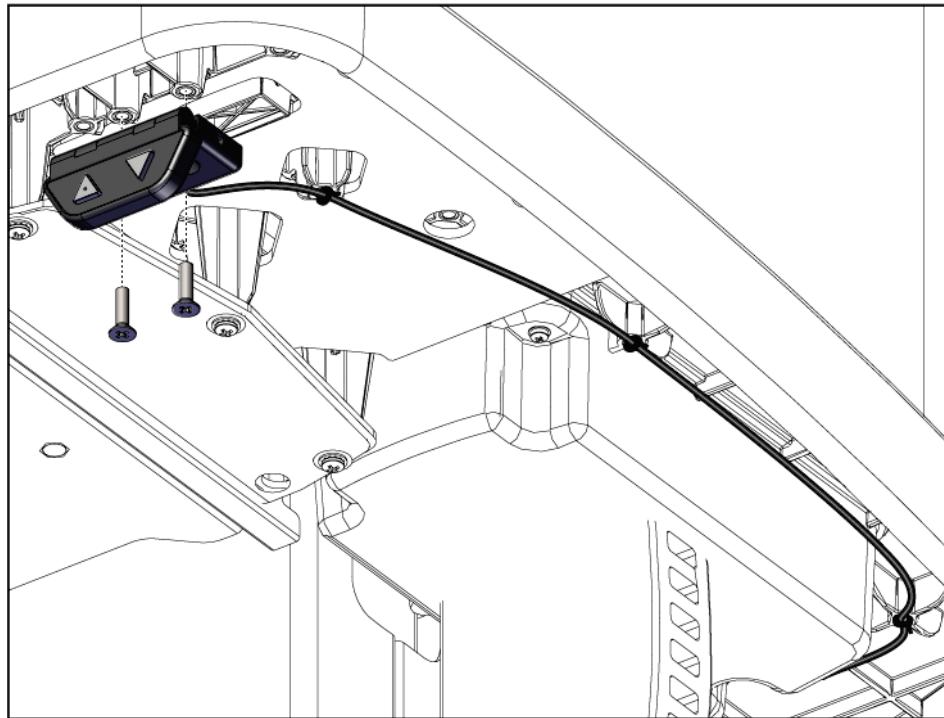


Figure 217: Replacing the height adjust control panel and routing the cable

- a. Unfasten the control panel from the underside of the workstation tabletop (two hex screws).
- b. Remove the cable for the module by detaching it from the p-clips on the underside of the workstation tabletop.
4. Reroute each assembly with its cable to the opposite sides of the workstation tabletop using the p-clips or wire ties as necessary.
5. Install the bar code scanner:
 - a. Insert the rubber stop into the rectangular cavity under the tabletop where you are installing the bar code scanner. The rubber stop helps hold the scanner captive when mounted underneath the workstation tabletop.
 - b. Fasten the assembly to the underside of the tabletop (three screws).
6. Fasten the desk control panel button module to the underside of the workstation tabletop using two hex screws (see previous figure).
7. Plug in and power ON the system. Verify proper operation of the bar code scanner and height adjust control panel. If necessary for the bar code, continue with the section [Verify the Bar Code Scanner](#) on page 244.

10.6.3 Relocate E-Stop/Fingerprint Scanner and X-ray Act/Compression Rel Button - UAWS

You can change the location of the E-Stop/fingerprint scanner assembly and the x-ray activation button/compression release button assembly to the opposite side of the workstation tabletop if necessary or per customer request.

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
2. Unfasten the E-Stop/fingerprint scanner assembly and the x-ray activation button/compression release button assemblies from respective their housings by removing the three screws underneath the workstation tabletop. (See the following figures.)

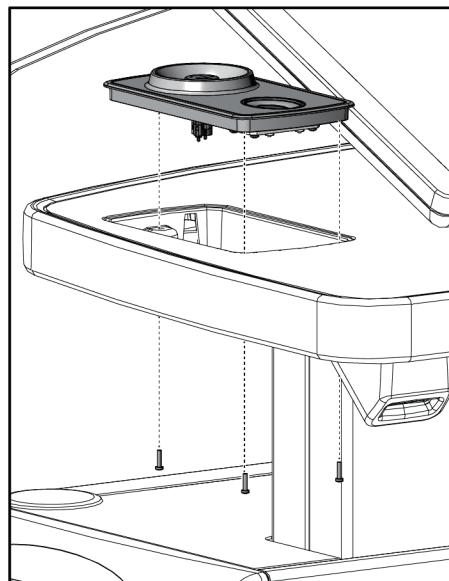


Figure 218: Removing the E-Stop/fingerprint assembly

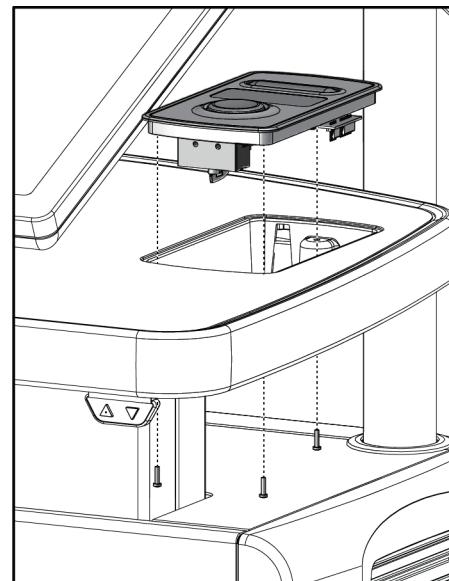


Figure 219: Removing the x-ray activation button/compression release button assembly

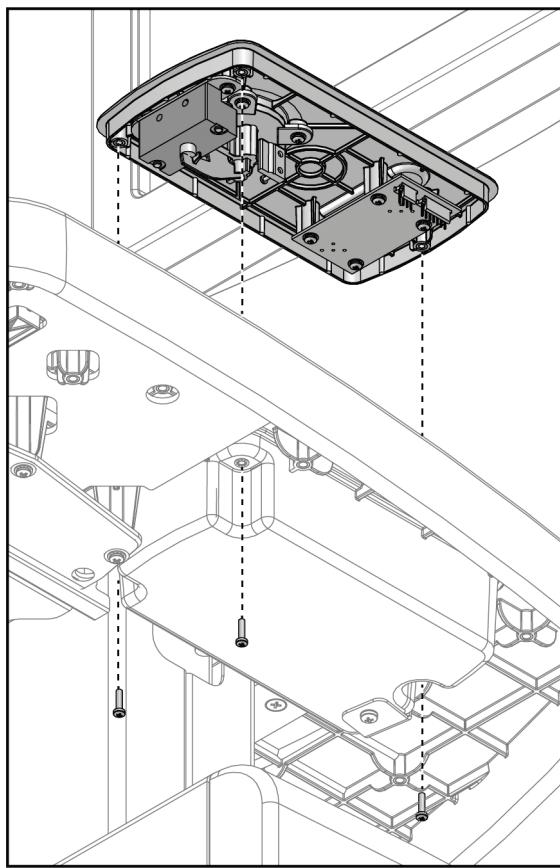


Figure 220: Underside of an assembly housing

3. Pry up carefully each assembly out of its housing.
4. Disconnect the cables for each assembly:
 - For the E-Stop/fingerprint scanner assembly, disconnect the "y" junction cable from E-Stop wire harness and disconnect the cable going to the fingerprint scanner.
 - For the x-ray activation button/compression release button assembly, disconnect the cable (AEJ12) going to the x-ray activation button.
5. Move each assembly to the opposite side of the workstation tabletop.

6. Remove the wire harness bracket (one screw, see the following figure, item 2) that covers the cable access opening (item 3) in each assembly housing. Remove the cables through the access opening.

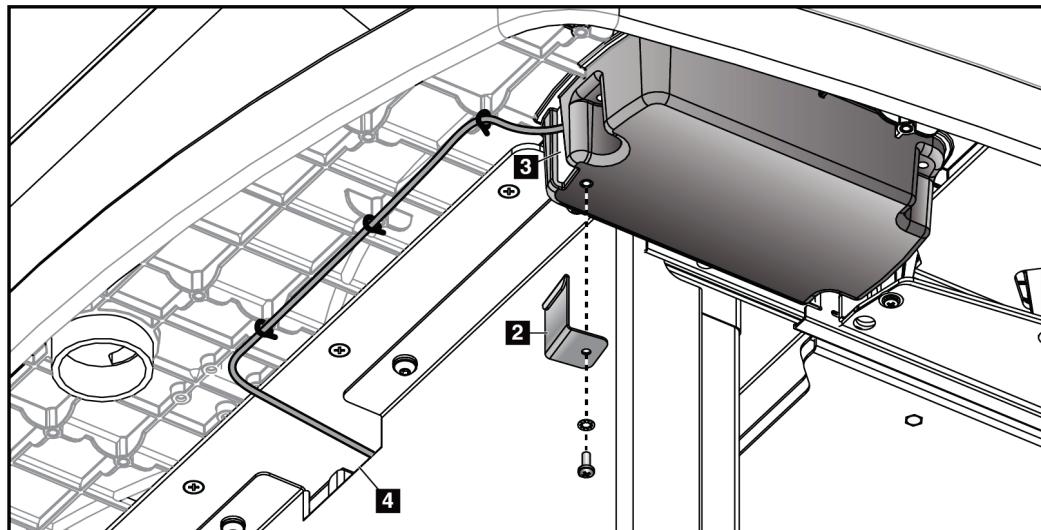


Figure 221: Routing/Removing cables of assembly housing under the workstation tabletop

7. Unclip the existing cables for each assembly under the workstation tabletop (see previous figure) and reroute to the other side. Use new wire ties as necessary.
8. Route the cables through the access opening in each new assembly housing. Tighten the wire harness bracket (one screw, see the previous figure, item 2) that covers the cable access opening (item 3).
9. Connect the cables for each assembly:
 - For the E-Stop/fingerprint scanner assembly, connect the "y" junction cable from E-Stop wire harness and connect the cable going to the fingerprint scanner.
 - For the x-ray activation button/compression release button assembly, connect the cable (AEJ12) going to the x-ray activation button.
10. Reattach each assembly to its housing (three screws).
11. Plug in and power ON the system.
 - a. Test the E-Stop button for proper operation.
 - b. Configure the fingerprint scanner (see [Configure the Fingerprint Scanner](#) on page 252).
 - c. Test the x-ray activation button for proper operation.
 - d. Test the compression release button for proper operation.

10.6.4 Relocate DVD Drive/Switch Panel Assembly

You can change the location of the DVD Drive/Switch Panel Assembly to the opposite side of the workstation if necessary or per customer request.

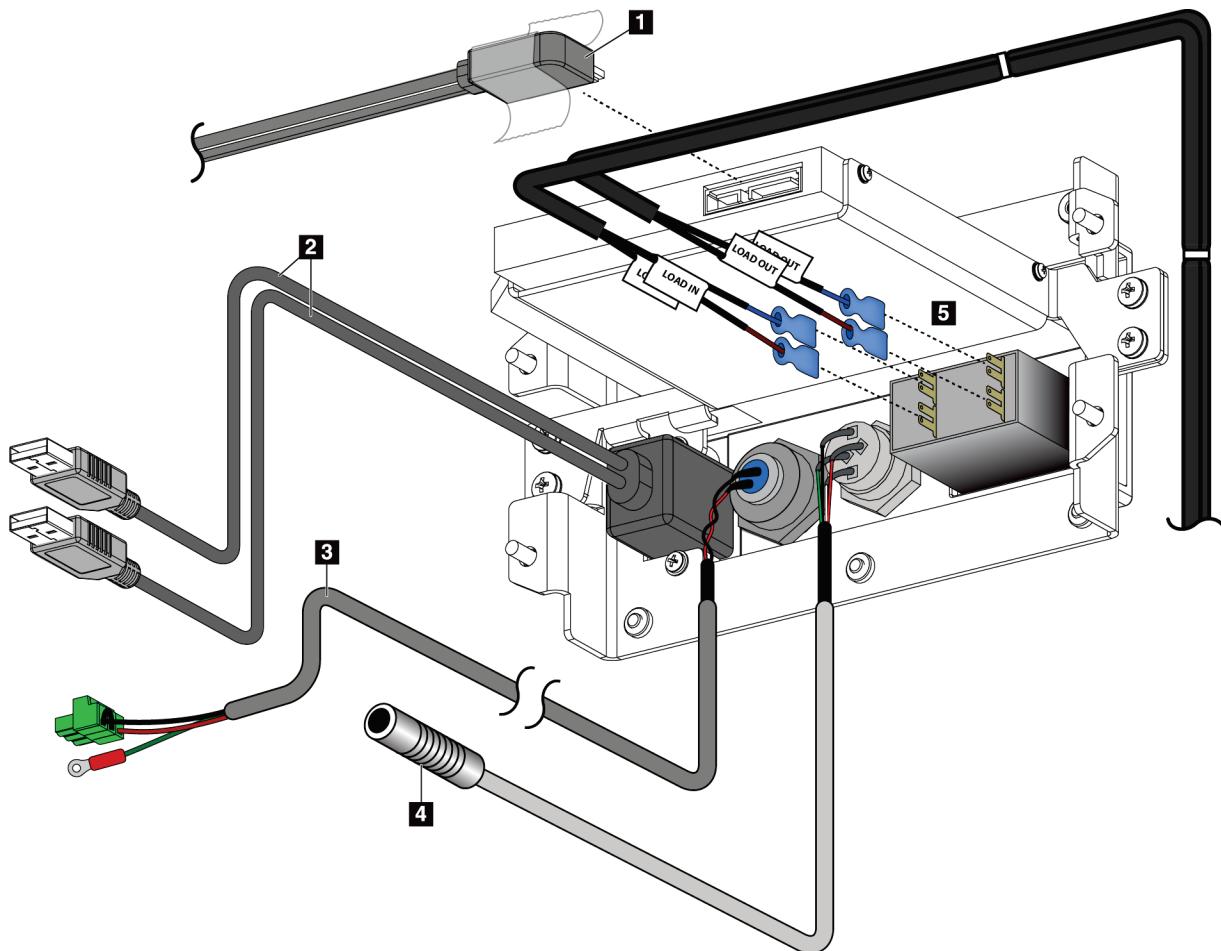
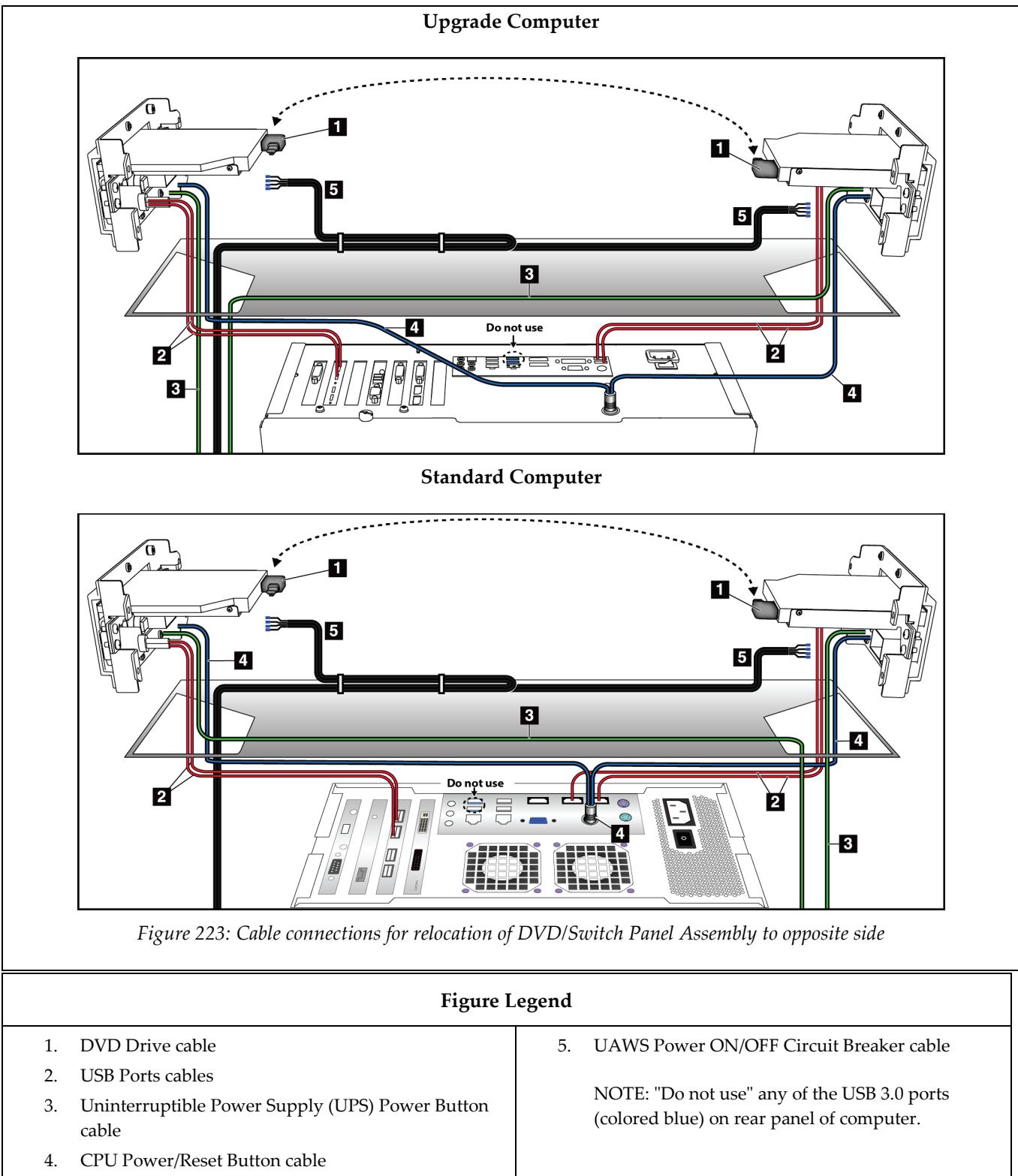


Figure 222: Rear view of cable connections to/from DVD Drive/Switch Panel Assembly

Figure Legend

1. DVD Drive cable
2. USB Ports cables
3. Uninterruptible Power Supply (UPS) Power Button cable
4. CPU Power/Reset Button cable
5. UAWS Power ON/OFF Circuit Breaker cable



Overview of Relocation Procedure

The following steps provide a high level overview of the procedure for relocate the DVD Drive/Switch Panel Assembly to the opposite side of the workstation. For more details, refer to the tables at the end of this section.



Note

Before you disconnect the cables and reroute them to the opposite side, note how each cable has been routed or bundled and where the wire ties are installed. Use the current cable management arrangement as a guide to rerouting the cables to the opposite side. In most cases, your new rearrangement of cable routing and wire ties will mirror the old arrangement.

To relocate the DVD Drive/Switch Panel Assembly to the opposite side of the workstation:

1. Raise the height of the tabletop (to the extent permitted by this system's configuration) to provide easier access to the rear of the DVD/Switch Panel Assembly.
2. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 209.)
3. Remove the front, back, top, and side covers. (Refer to [Remove the Covers and Panels](#) on page 210.)
4. Remove the DVD Drive/Switch Panel Assembly from its present location on the frame/chassis as follows:
 - a. Disconnect the cable(s) from each component of the assembly:
 - For the DVD Drive and the Power ON/OFF Circuit Breaker Switch connections, make the disconnections at the assembly end of each cable. (See the previous two figures in this section, items 1 and 5.)
 - For the CPU Power/Reset Button, optional UPS Power Button, and two USB ports, we recommend that you make the disconnections at the routing endpoint of each cable. (See the previous two figures in this section, items 4, 3, and 2.)
 - Refer to the table at the end of this section for more information about disconnecting, rerouting, and reconnecting each cable of the assembly.
 - b. Cut and remove wire ties as necessary along the routing paths of the cables/harnesses to ensure there is enough slack to re-route the cables to the opposite side of the workstation.
 - c. Remove the assembly (keeping it attached to its Mounting Bracket) from its present location on the frame/chassis (four Mounting Bracket screws).
5. Relocate the assembly to the opposite side. (See previous figure.)
6. Reroute the cables. (See previous figure.)

7. Re-install the assembly (with Mounting Bracket) to the opposite side of the frame/chassis:
 - a. Reconnect the cable(s) to each component of the assembly:
 - For the DVD Drive and the Power ON/OFF Circuit Breaker Switch, reconnect at the assembly end of each cable. (See the previous two figures in this section, items 1 and 5.)
 - For the CPU Power/Reset Button, optional UPS Power Button, and two USB ports, reconnect at the endpoint of each cable. (See the previous two figures in this section, items 4, 3, and 2.)
 - Refer to the following table in this section for more information about disconnecting, rerouting, and reconnecting each cable of the assembly.
 - b. Use new wire ties as necessary to take up any loose slack along the routing paths in the cables/harnesses to the opposite side of the workstation.
 - c. Install the DVD Drive/Switch Panel Assembly (attached to its Mounting Bracket) to its new location on the opposite side of the frame/chassis (four Mounting Bracket screws).
8. Swap the side covers so that the DVD/Switch Panel Assembly cut-out is on the side cover where the assembly is now installed.
9. Reinstall the top, front, back, and side covers.
10. Plug in and power ON the system. Test the DVD Drive/Switch Panel Assembly switches/buttons/ports for proper operation.

Details of Relocation Procedure by Specific Component

Table 6: Relocate the DVD Drive		
Disconnect	Remove/Reroute/Relocate	Reconnect
<ul style="list-style-type: none">• Remove piece of tape (2-580-1118) affixed to connector plug at rear of DVD drive assembly. Save tape for reuse. (See previous two figures, item 1.)• Disconnect connector plug from socket at rear of DVD drive assembly. (See previous figure, item 1.)	<ul style="list-style-type: none">• Remove DVD Drive/Switch Panel assembly (keep attached to mounting bracket) by pulling outward (not inward) from cut-out in frame/chassis.• Relocate assembly to opposite side.• Reroute connector plug with its cables across chassis platform to opposite side.• Remove/replace wire ties as needed, as you reroute cables.	<ul style="list-style-type: none">• Plug connector into socket of DVD drive.• Re-affix tape (2-580-1118) to help secure plug.
NOTES: <ul style="list-style-type: none">• During relocation, if you need to unplug and relocate flat black/red cable from its endpoint (on rear panel of computer), reconnect to an available USB port.• Do NOT use either of two USB 3.0 ports, which are easily recognized by their blue color.• There is sufficient slack to reroute this component to opposite side without needing to make substantial modifications.• TIP: When disconnecting/reconnecting this cable from its component on the DVD Drive/Switch Panel Assembly, you may find it easier to temporarily pull assembly partially forward and outward from its opening in cut-out of frame/chassis. There is sufficient slack to reroute this component to opposite side without needing to make substantial modifications.		

<i>Table 7: Relocate the UAWS Power ON/OFF Circuit Breaker Switch</i>		
Disconnect	Remove/Reroute/Relocate	Reconnect
Remove four-prong connector from terminal block at rear of assembly. (See first figure in this section, item 5.)	Remove wire ties that secure wire harness to chassis platform about midway across.	Plug four-prong connector into socket.
NOTES:		
<ul style="list-style-type: none"> • Cables for this component are encased in and routed through wire harness. • Wire harness length is about twice that of chassis platform, so is folded in half and secured midway with two wire ties about an inch or two apart. (See previous figure, item 5.) • Plenty of slack to reroute to opposite side. • Insert pair of cable plugs labeled LOAD IN into leftmost vertical pair of prongs on rear side of switch. (See first figure in this section, item 5.) • Insert pair of cable plugs labeled LOAD OUT into rightmost vertical pair of prongs on rear side of switch. (See first figure in this section, item 5.) • Regarding color of wires—in horizontal pairs—keep blue with blue, brown with brown. For example: <ul style="list-style-type: none"> • Blue and blue on two upper prongs (horizontal pair), brown and brown on two lower prongs (horizontal pair). (As shown in first figure in this section, item 5). - OR - • Brown and brown on two upper prongs, blue and blue on two lower prongs. (Not shown.) • TIP: When disconnecting/reconnecting this cable from its component on the DVD Drive/Switch Panel Assembly, you may find it easier if you temporarily pull assembly partially outward from its opening in cut-out of frame/chassis. 		

<i>Table 8: Relocate the UAWS Computer Remote Power/ Reset Button</i>		
Disconnect	Remove/Reroute/Relocate	Reconnect
Disconnect LEMO® connector plug from its socket on rear panel of computer.	Allow cable to remain attached to assembly as you relocate assembly to opposite side.	Plug LEMO® connector plug into its socket on rear panel of computer.
NOTES		
<ul style="list-style-type: none">• CPU button cannot be easily or quickly removed from rear of assembly.• Make disconnection at endpoint of CPU remote power cable. (See item 4 in previous figure.) That is, at round socket for LEMO® connector plug. Socket is located on rear panel of computer.• Computer remote power/reset cable cannot be disconnected at DVD Drive / Switch Panel Assembly. Must be disconnected at cable endpoint (item 4 in previous figure) at rear panel of computer.• There is sufficient slack to reroute to opposite side without modifications.		

Table 9: Relocate the UPS Remote Power Button

Disconnect	Remove/Reroute/Relocate	Reconnect
<ul style="list-style-type: none"> • Disconnect UPS cable and ground ring at endpoint of routing path at rear panel of UPS. (See following figure in this table.) • Socket for green connector and screw for ground ring of UPS remote power cable are located at RPO-ROO on rear panel of UPS. (See items 1 and 2 in following figure in this table.) 	<ul style="list-style-type: none"> • At publication time of this manual, workstation manufacturing process routes UPS cable across platform in frame/chassis, to ease routing of cable to opposite side. Older units have UPS cable routed down shaft and through access openings, so you must pull cable up through its routing path to/from rear panel of UPS. • Allow cable and ground ring to remain attached to assembly as you relocate assembly to opposite side. 	<ul style="list-style-type: none"> • Route cable back to rear panel of UPS. • Connect UPS cable and attach ground ring to rear panel of UPS.

NOTES:

- UPS remote power cable splits at its endpoint into terminal connector and ground ring, which connect to rear panel of UPS.
- UPS remote power cable cannot be disconnected at DVD Drive/Switch Panel Assembly. (See first figure in this section, item 3.) Must be disconnected at cable endpoint, at rear panel of UPS. (See following figure in this table.)
- For older units, as you disconnect cable from UPS and retract it up to frame/chassis platform, make note of cable routing path and cable management (wire ties). You will need this information when reinstalling cable.
- It may be necessary for you to temporarily pull UPS out to gain sufficient access to its rear panel in order to make disconnections.

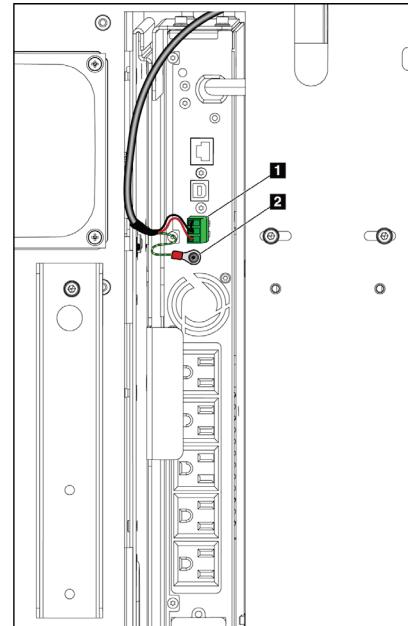


Figure 224: Connections for Remote UPS Power Cable on rear of UPS

Table 10: Relocate the USB Port		
Disconnect	Remove/Reroute/Relocate	Reconnect
Disconnect both cables from their USB ports on rear panel of computer.	Allow cables and to remain attached to assembly as you relocate assembly to opposite side.	<ul style="list-style-type: none">Reconnect to unused pair of USB ports on rear panel of computer so that both USB cables reach DVD Drive/Switch Panel Assembly's new location on opposite side.Do NOT use either of two USB 3.0 ports (colored blue).

NOTES:
For workstations equipped with upgrade (larger) computer:

- Both USB port cables on DVD Drive/Switch Panel Assembly are too short to reach assembly's new location on opposite side of workstation.
- Therefore, disconnect both cables from their original two USB ports on rear panel of computer. Reconnect both cables to two other USB ports that are closer to relocated assembly.

For workstations equipped with standard (smaller) computer:

- We recommend that you disconnect both cables from their original two USB ports on rear panel of computer. Reconnect both cables to two other USB ports that are closer to relocated assembly.

10.7 Workstation Preventive Maintenance

10.7.1 Universal Acquisition Workstation Preventive Maintenance Checklist

Use the following table for a workstation preventive maintenance checklist. The tools and materials required for workstation preventive maintenance include:

- Standard hand tools
- Lint free cloths
- CRT wipes
- Small vacuum cleaner
- Brush

For preventive maintenance procedures on the *entire* system, refer to [Preventive Maintenance Schedule](#) on page 86.

Note



- The following preventive maintenance checklist is for guidance only - it is not a representation of the approved Preventive Maintenance document for the Dimensions system located in Agile.
- Refer to the appropriate sections of the Service Manual as necessary.

Table 11: Preventive Maintenance Checklist for Universal Acquisition Workstation

	Maintenance Task Description	Recommended Frequency	
		Semi-Annually	Annually
1	Review with customer any concerns or unreported issues before starting the PM.	x	x
2	Inspect all outer cosmetics, panels, desk top, foot switch, monitor column and mounting for damage or wear, electrical connections for security.		x
3	Remove all covers, and check x-ray shield integrity and ensure that mounting hardware is secure (non-Mobile only).	x	x
4	Check the console tabletop up/down drive mechanism and controls for proper operation and ensure that movement is smooth with no interference.	x	x
5	Perform all functional tests and component checks for proper operation of workstation. Ensure that monitors, controls, and all features are performing to factory specifications after reassembly.	x	
6	Ensure that cooling fans and internal components are free of debris and dust. Clean as necessary to ensure proper operation.	x	
7	Clean panel interiors as necessary and inspect for any mounting hardware that is damaged or missing. Correct as necessary and reinstall all panels.	x	
8	Visually inspect reassembled console for cosmetics; clean and align panels after service if necessary.	x	
9	Perform a full functional check of the monitors and controls of the workstation and insure all features and controls are performing to factory specification after reassembly.	x	x

10.7.2 Clean the Preview Display and Touch Screen Display

Avoid touching the display area.

Always use care when cleaning the outer surface of the display area. Always use a clean, soft, lint-free cloth. Microfiber cloths, are highly recommended.

- Never spray or pour a liquid directly onto the display area.
- Never apply excessive pressure to the display area.
- Never use detergents with fluorides, ammonia, alcohol, or abrasives.
- Never use bleach.
- Never use steel wool, or cloth woven with metal.
- Never use a sponge with abrasives.

To clean the display:

Clean the display using a sponge, cleaning cloth, or soft tissue, lightly moistened with a recognized cleaning product for medical equipment. Read and follow all label instructions on the cleaning product. In case of doubt about a screen cleaning product, use plain water.

Do NOT use the following products:

- Alcohol/solvents at higher concentration > 5%
- Strong alkalis lye, strong solvents
- Acid
- Detergents with fluoride
- Detergents with ammonia
- Detergents with abrasives
- Steel wool
- Sponge with abrasives
- Steel blades
- Cloth with steel thread

Appendix A Specifications

A.1 Product Measurements

A.1.1 Tubestand (Gantry with C-Arm)

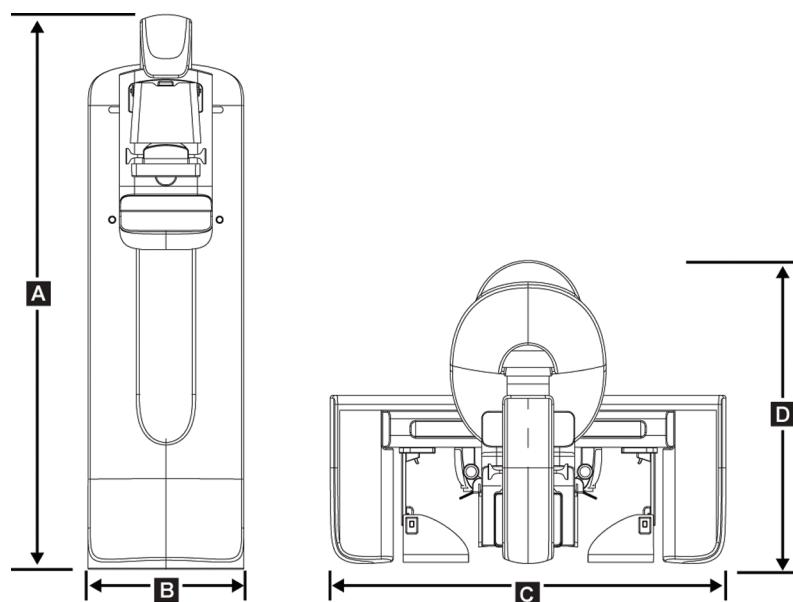


Figure 225: Tubestand (Gantry with C-arm Dimensions)

A.	<i>Height</i>	223 cm (87.8 inches)
B.	<i>Width</i>	66 cm (26 inches)
C.	<i>Width</i>	173 cm (68 inches)
D.	<i>Depth</i>	138 cm (54.25 inches)
	<i>Weight</i>	Maximum of 400 kg (882 pounds)

A.1.2 Acquisition Workstations

Universal Acquisition Workstation

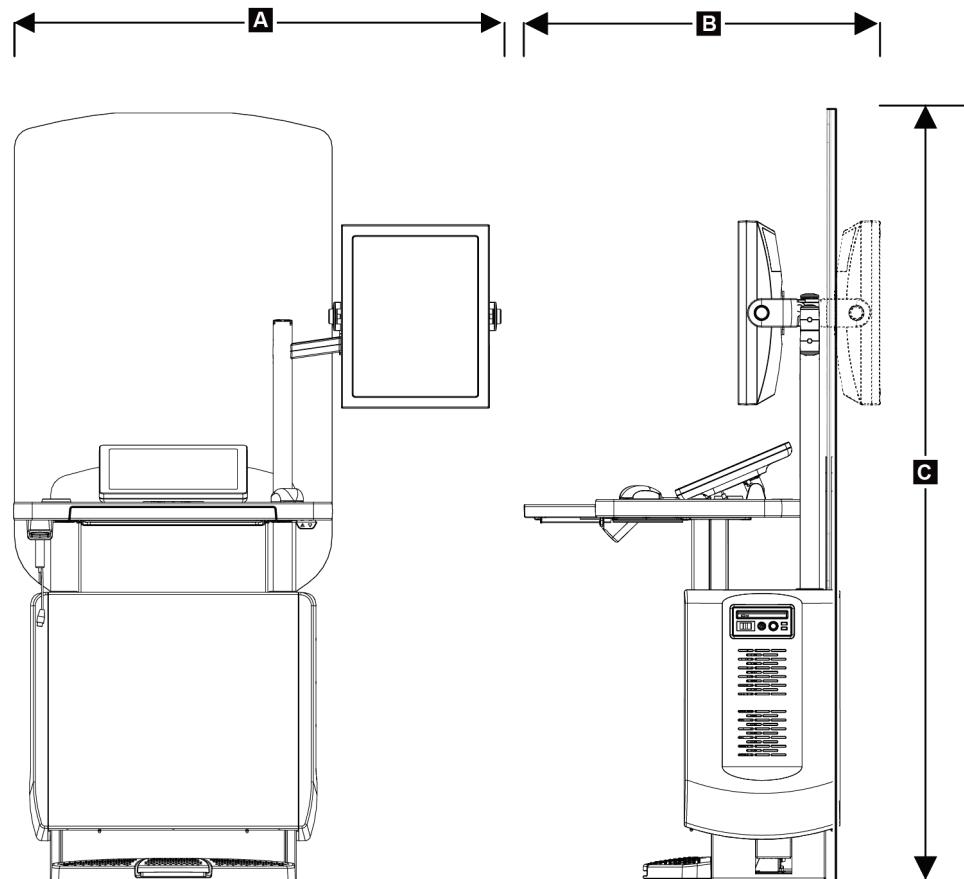
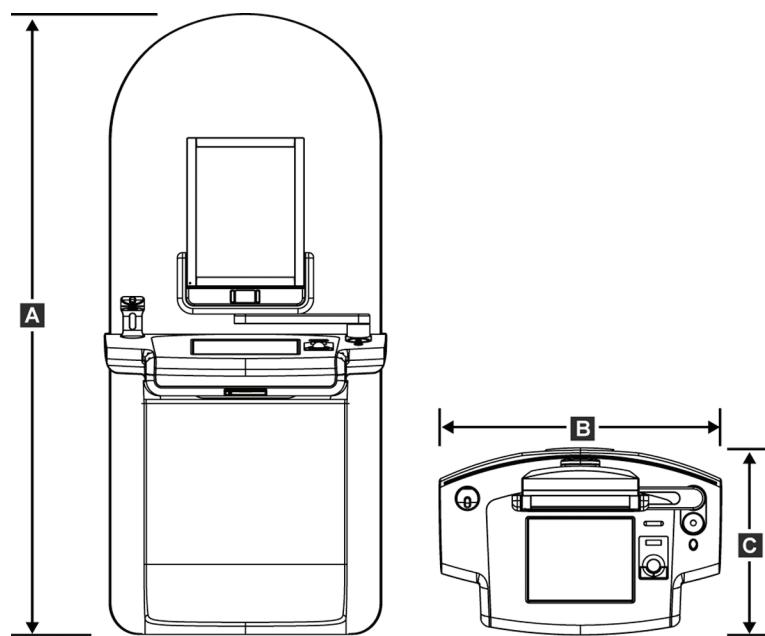


Figure 226: Universal Acquisition Workstation Dimensions System

A.	Width (max.) with optional display arm extended	135.6 cm (53.4 inches)
	Width (max.) with standard display arm	93.8 cm (36.9 inches)
B.	Depth (max) with keyboard tray extended and optional display monitor arm rotated to rear	122.0 cm (48.4 inches)
C.	Height (max)	204 cm (80.3 inches)
	Weight (max)	209 kg (460 pounds)

Premium Acquisition Workstation*Figure 227: Premium Acquisition Workstation Dimensions System*

A.	<i>Height</i>	202.1 cm (79.75 inches)
B.	<i>Width</i>	92.7 cm (36.5 inches)
C.	<i>Depth</i>	58.5 cm (23 inches)
	<i>Weight</i>	154 kg (340 pounds)

Selenia Dimensions System Service Manual

Appendix A: Specifications

Standard Acquisition Workstation

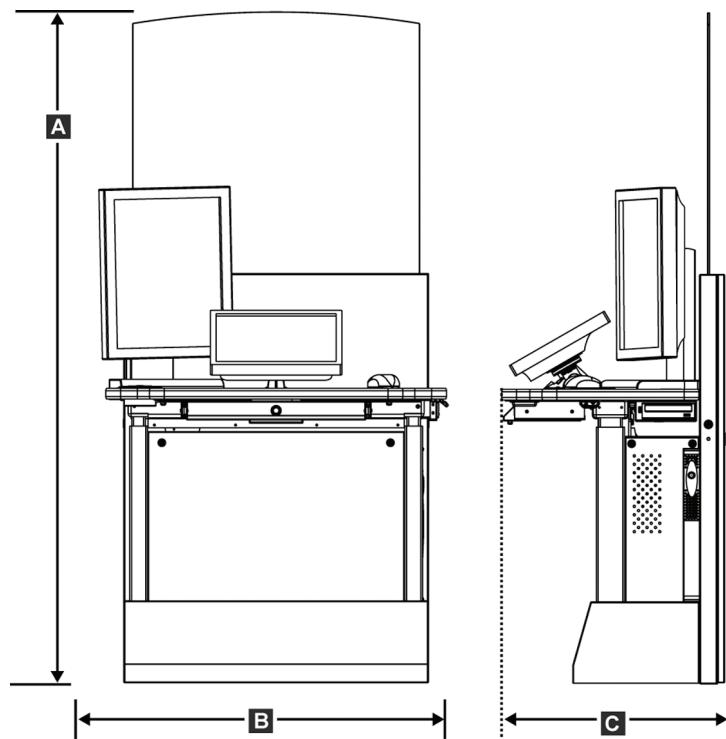


Figure 228: Standard Acquisition Workstation Dimensions System

A.	<i>Height</i>	191.3 cm (75.32 inches)
B.	<i>Width</i>	107 cm (42 inches)
C.	<i>Depth</i>	76 cm (30 inches)
	<i>Weight</i>	219 kg (462 pounds)

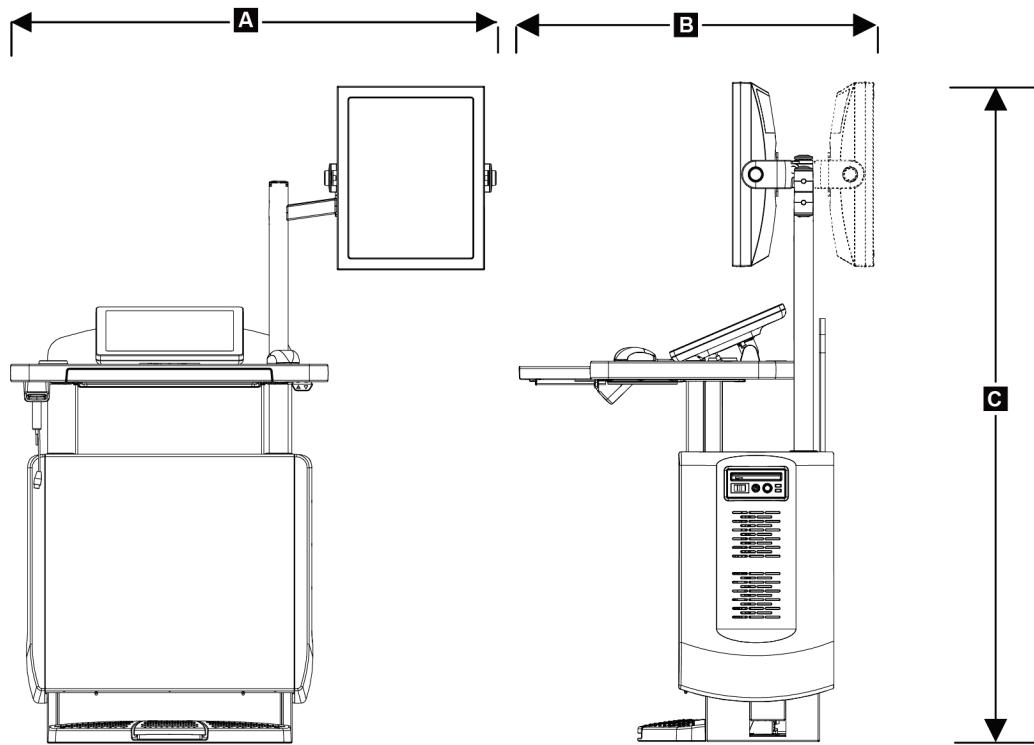
Acquisition Workstations for Mobile Use

Figure 229: Mobile Universal Acquisition Workstation Dimensions System

A.	<i>Width (max.) with optional display arm extended</i>	128 cm (50.5 inches)
	<i>Width (max.) with standard display arm</i>	100 cm (39.5 inches)
B.	<i>Depth (max)</i>	85 cm (33.5 inches)
C.	<i>Height (max)</i>	180 cm (71 inches)
	<i>Weight (max)</i>	179 kg (395 pounds)

Selenia Dimensions System Service Manual

Appendix A: Specifications

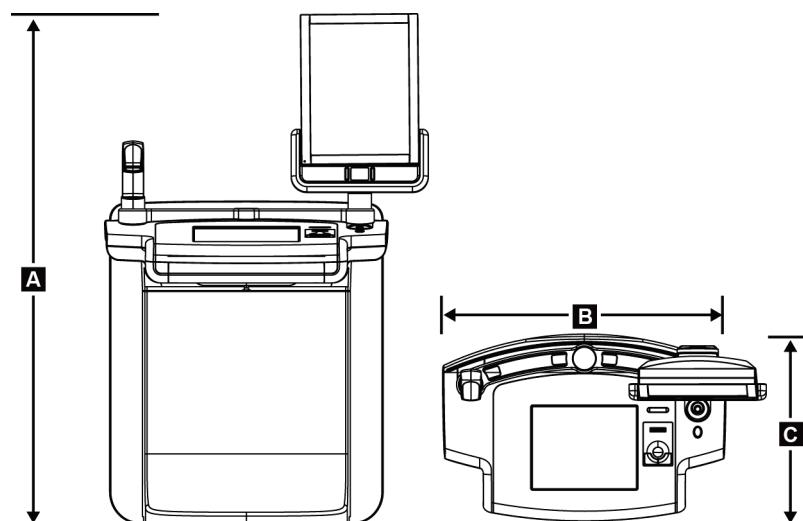


Figure 230: Mobile (non-Universal) Acquisition Workstation Dimensions System

A.	<i>Height</i>	167.6 cm (66.0 inches)
B.	<i>Width</i>	105.5 cm (41.5 inches)
C.	<i>Depth</i>	58.5 cm (23 inches)
	<i>Weight</i>	154 kg (340 pounds)

A.2 Operation and Storage Environment

A.2.1 General Conditions for Operation

<i>Temperature Range</i>	20 °C (68 °F) to 30 °C (86 °F)
<i>Relative Humidity Range</i>	20% to 80% without condensing moisture

A.2.2 Storage Environment

Gantry

<i>Temperature Range</i>	-10 °C (14 °F) to 40 °C (104 °F)
<i>Relative Humidity Range</i>	0% to 95% without condensing moisture

(Put in a package for storage in a building.)

X-ray Detector

<i>Temperature Range</i>	10 °C (50 °F) to 30 °C (86 °F) indefinitely
	10 °C (50 °F) to 35°C (95 °F) for a maximum of 12 hours
<i>Maximum rate of temperature change</i>	Less than 10 °C (50 °F) per hour
<i>Relative Humidity Range</i>	10% to 80% without condensing moisture

(Put in a package for storage in a building.)

Acquisition Workstation

<i>Temperature Range</i>	-10 °C (14 °F) to 40 °C (104 °F)
<i>Relative Humidity Range</i>	0% to 95% without condensing moisture

(Put in a package for storage in a building.)

A.3 Radiation Shield

<i>Radiation Shield Lead (Pb) equivalent</i>	0.5 mm lead for x ray energy to 35 kV
--	---------------------------------------

A.4 Electrical Input

A.4.1 Tubestand

<i>Mains Voltage</i>	200/208/220/230/ 240 VAC ±10%
<i>Mains Impedance</i>	Maximum line impedance not to exceed 0.20 ohms for 208/220/230/240 VAC, 0.16 ohms for 200 VAC
<i>Mains Frequency</i>	50/60 Hz ±5%
<i>Average Current over 24 Hours</i>	< 5 A
<i>Peak Line Current</i>	4 A (65 A maximum for ≤ 5 seconds)

A.4.2 Acquisition Workstation

<i>Mains Voltage</i>	100/120/200/208/220/230/240 VAC $\pm 10\%$
<i>Mains Frequency</i>	50/60 Hz $\pm 5\%$
<i>Power Consumption</i>	< 1000 watts
<i>Duty Cycle (Standard Acquisition Workstation)</i>	10% ~ 6 minutes per hour or 2 minutes on, 18 minutes off
<i>Overcurrent Protection</i>	8A

A.5 Tubestand Technical Information

A.5.1 C-Arm

<i>Rotation Range</i>	<i>Conventional Mammography:</i> +195° +3°/-0.5° to 0° $\pm 0.5\%$ to -155° +0.5°/-3°
<i>Absolute Angular Position</i>	<i>Tomosynthesis option:</i> +180° $\pm 0.5\%$ to 0° $\pm 0.5\%$ to -140° $\pm 0.5\%$ <i>accurate to $\pm 0.5\%$</i>
<i>Rotation Acceleration</i>	18°/s ² +18/-9%
<i>Rotation Deceleration</i>	18°/s ² +18/-9%
<i>Rotational Positioning Angular Velocity</i>	18°/s $\pm 25\%$

Note

The angular velocity is the average of the velocity of the tube arm rotating clockwise between 0° and 90° or rotating counterclockwise between 90° and 0°. The angular velocity does not include the time to accelerate from zero velocity and decelerate to zero velocity.

<i>Source-to-Image Distance (SID)</i>	70.0 cm ± 1.0 cm (27.6 inches ± 0.4 inches) (Focus position deviation is ± 5 mm)
<i>Patient Support (non-magnification)</i>	
<i>Vertical Position Lower Limit</i>	70.5 cm +5.1/-0 cm (27.75 inches +2.0/-0 inches)
<i>Vertical Position Upper Limit</i>	141 cm +0/-17.8 cm (55.5 inches +0/-7.0 inches)

A.5.2 Compression

<i>Manual Compression Force</i>	<i>Maximum of 300 N (67.4 pounds)</i>
<i>Motorized Compression</i>	<i>Functions in three operating modes: Pre-compression, Full-Range, Dual Compression. User selectable through software.</i>
<i>Pre-Compression Force</i>	<i>15 pounds to 30 pounds (67 to 134 N), motorized</i>
<i>Full Range Compression Force</i>	<i>20 pounds to 40 pounds (89 to 178 N), motorized</i>
<i>Dual Mode Compression</i>	<i>Provides Pre-Compression force upon first activation of compression switch; then, if switch is activated within 2 seconds, the force is increased incrementally for each additional switch activation, up to the user selected full compression force.</i>
<i>Compression Controls</i>	<i>Up/Down controls on both sides of C-arm and on 2-position footswitch (Motorized). Handwheel on both sides of Compression Device (Manual).</i>
<i>Compression Release</i>	<i>Manual or Automatic. Motorized Release mode controlled by push-buttons on both sides of the C-arm.</i>
<i>Automatic Compression Release</i>	<i>User selectable automatic release mode raises Compression Device upon exposure termination.</i>
<i>Down Motion Variable Speed</i>	<i>4.2 cm/s ±15% (1.66 inches/s ±15%)</i>
<i>Compression Force Display</i>	<i>Two LCDs on the Compression Device show the compression force through the range of 18 N to 300 N in 1 N increments (4 pounds to 67 pounds in 1 pound increments).</i>
<i>Compression Force Display Accuracy</i>	<i>±20 N (±4.5 pounds)</i>
<i>Compression Thickness Display</i>	<i>Two LCDs on the Compression Device measure between 0 and 15 cm above image receptor in 0.1 cm increments. The display is visible from both sides of the patient.</i>
<i>Compression Thickness Accuracy</i>	<i>±0.5 cm (±0.2 inches) for thicknesses between 0.5 cm and 15 cm (5.9 inches)</i>
<i>Compression Paddles</i>	<i>Compression Paddles are transparent. The paddles are composed of polycarbonate resin or the equivalent. With compression applied, paddle deflection from a plane parallel to the patient support surface shall be less than or equal to 1.0 cm.</i>

A.5.3 X-ray Tube

<i>Focal Spot</i>	<i>Large (0.3 mm) Nominal Small (0.1 mm) Nominal</i>
<i>Tube Voltage</i>	<i>20 kV to 49 kV</i>
<i>Anode Material</i>	<i>Tungsten</i>
<i>X-Ray Window</i>	<i>Beryllium 0.63 mm</i>
<i>Tube leakage test conditions</i>	<i>49 kVp, 2.0 mA</i>

A.5.4 X-ray Beam Filtration and Output

Filtration*Five-position filter wheel:**Position 1: Rhodium, 0.050 mm ±10%**Position 2: Aluminum, 0.70 mm (nominal) (Tomosynthesis option)**Position 3: Silver, 0.050 mm ±10%**Position 4: Copper, 0.3mm**Position 5: Lead (provided for servicing)***kV/mA Range***Table 12: Maximum mA Setting as a Function of kV*

kV	LFS mA	SFS mA
20	100	30
21	110	30
22	110	30
23	120	30
24	130	30
25	130	40
26	140	40
27	150	40
28	160	40
29	160	40
30	170	50
31	180	50
32	190	50
33	200	50
34	200	50
35	200	50
36	190	50
37	180	50
38	180	50
39	180	50
40	170	
41	170	
42	160	
43	160	
44	150	
45	150	
46	150	
47	140	
48	140	
49	140	

<i>mAs Steps (Table 1, default)</i>	4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 22, 25, 30, 32.5, 35, 37.5, 40, 42.5, 45, 47.5, 50, 52.5, 55, 57.5, 60, 62.5, 65, 67.5, 70, 75, 80, 85, 90, 95, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400, 420, 440, 460, 480, 500
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Attenuation of Carbon Fiber

<i>Image Receptor</i>	< 0.3 mm Al
<i>Magnification Platform</i>	< 0.3 mm Al

A.5.5 X-ray Collimation

<i>Collimation Fields</i>	7.0 cm x 8.5 cm
	10 cm x 10 cm
	15 cm x 15 cm
	18 cm x 24 cm
	18 cm x 29 cm ((Tomosynthesis option))
	24 cm x 29 cm

A.5.6 Light Field Indication

<i>Light Field to X Ray Congruency</i>	Within 2% of SID
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A.5.7 X-ray Generator

<i>Type</i>	<i>Constant Potential High Frequency Inverter</i>
<i>Rating</i>	7.0 kW, maximum (isowatt), 200 mA at 35 kV
<i>Electrical Power Capacity</i>	9.0 kW maximum
<i>kV Range</i>	20 kV to 49 kV in 1 kV increments
<i>kV accuracy</i>	±2%, over range 20-49 kVp
<i>mAs Range</i>	3.0 mAs to 500 mAs in Manual Mode mAs (8 mAs minimum in AEC Mode)
<i>mAs Accuracy</i>	±(10% + 0.2 mAs)
<i>mA Range</i>	10 mA to 200 mA, Large Focal Spot 10 mA to 50 mA, Small Focal Spot

A.6 Imaging System Technical Information

A.6.1 Image Receptor

<i>Fluid Ingress</i>	<i>No fluid from accidental spillage on the Image Receptor may seep inside.</i>
<i>Deflection</i>	<i>Does not exceed 1.0 mm at maximum compression.</i>
<i>Active Imaging Area</i>	<i>Not less than 23.3 cm by 28.5 cm (9.2 inches x 11.2 inches)</i>
<i>DQE Conventional Mammography</i>	<i>Not less than 50% at 0.2 lp/mm Not less than 15% at the Nyquist limit</i>
<i>DQE (Tomosynthesis option)</i>	<i>Not less than 30% at 0.2 lp/mm Not less than 15% at the Nyquist limit</i>
<i>Dynamic Range and Linearity</i>	<i>Detector Subsystem response is linear with linearity of 0.999 over a dynamic range of 400:1 in x-ray exposure.</i>
<i>Uniformity</i>	<i>Detector Subsystem can correct pixel-to-pixel gain variations. For conventional mammography procedures, the uniformity of flat field image response of the detector shall be no greater than 2% after gain calibration is applied over an exposure range of 0.5 mR to 200 mR.</i>

Appendix B The System Messages and Alert Messages

B.1 Error Recovery and Troubleshooting

Most faults and alert messages are cleared without result to your workflow. Follow the instructions on the screen or fix the condition then clear the status from the Taskbar.

Some conditions require a system restart or indicate that more action is necessary (for example, to call Hologic Technical Support). This appendix describes the message categories and your actions to return the system to normal operation. If errors repeat, contact Hologic Technical Support.

B.2 Types of Messages

B.2.1 Fault Levels

Each Message has a particular set of the following characteristics:

- Aborts an exposure in progress (yes/no)
- Prevents an exposure from starting (yes/no)
- Displays a message to the user on the Acquisition Workstation (yes/no)
- May be reset by the user (yes/no)
- May be reset automatically by the system. (yes/no)

Displayed Messages

All displayed messages will be shown in the user's selected language.

Any message which aborts an exposure or prevents an exposure from starting will always display a message directing the user's actions required to proceed.

Additional Message Information

Technical information about the message is available in the log file.

Some messages always show as a critical fault (a system restart is necessary). These messages result from a condition which prevents an exposure, and which cannot be reset by the user or the system.

B.2.2 System Messages

When the following system messages show, do the step shown in the User Action column to clear the message and allow the next exposure.

Table 13: System Messages

Icon	Message	User Action
	Paddle is moving	No action needed.
	Sending notice	No action needed.
	Invalid use of Magnification Stand	You selected a tomographic view with the Magnification Stand installed. Select a non-tomographic view. (Tomosynthesis option)
	Face shield is not secured	Fully extend or fully retract the Face Shield. (Tomosynthesis option)
	Invalid use of compression paddle	Remove the Magnification Stand or install the Magnification Paddle.
	Paddle position does not match selected view	Shift the Paddle to the correct location for the selected view.
	Compression is less than 4.5 cm during calibration	Move the Compression Paddle higher than 4.5 cm to complete the calibration procedure.
	FAST compression is engaged	Disengage FAST compression and install a paddle designated for this mode.
	License is missing	A license is necessary to use this feature or function. (This message is for your information only. There are no user actions.)
	Invalid detector calibration	Install the Magnification Stand for Small Focal Spot calibration. Remove the Magnification Stand to do Large Focal Spot calibration.
	Invalid geometry calibration	Repeat the geometry calibration before you try to take an exposure. (Tomosynthesis option)
	Configuration file is missing	Applies to Service Personnel.

Table 13: System Messages

Icon	Message	User Action
	Waiting for Detector	No action needed.
	System in Test Mode	Applies to Service Personnel.
	Affirm cable is not connected	Connect the Affirm system cable to the side of the Gantry.
	Affirm is not locked	Lock each side of the Affirm system.
	BCM cable is not connected	Connect the Biopsy Control Module cable to the side of the Affirm system.
	View requires Affirm to be installed OR View cannot be completed with Affirm installed	Install the Affirm system to acquire this view. OR Remove the Affirm system to acquire this view.
	Tube needs to be manually positioned (move to 0 degrees)	Rotate the C-arm to 0 degrees.
	Tube needs to be manually positioned (move to -15 degrees)	Rotate the C-arm to -15 degrees.
	Tube needs to be manually positioned (move to 15 degrees)	Rotate the C-arm to +15 degrees.
	The Emergency Stop switch has been deactivated.	Turn the Emergency Off switch one-quarter turn to reset the switch.
	The needle needs to be moved to the correct location.	Move the needle to the correct location for Biopsy QAS.
	Compression too low for tomo reconstructions.	Move the Compression Paddle higher than 0.5 cm to take tomography exposures.

B.3 UPS Operation

Selenia Dimensions System Service Manual

Appendix B: The System Messages and Alert Messages



Note

The User Guide for the UPS is supplied with the system. Refer to the *UPS User's Guide* for complete instructions.

The LCD in the UPS shows the power status.

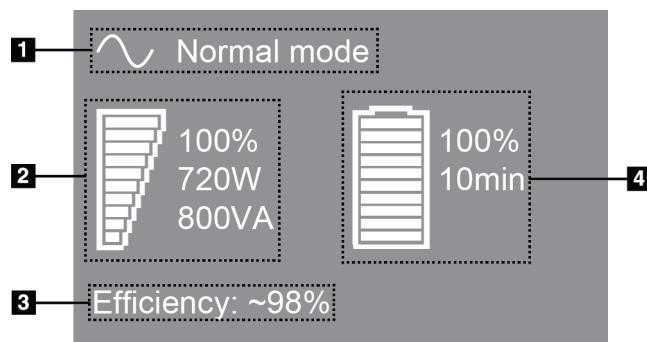


Figure 231: UPS LCD Display

If the UPS battery expires, the Mode icon changes as shown. Contact your service representative to replace the battery.



Figure Legend

1. UPS Mode
2. UPS Load
3. UPS Efficiency
4. UPS Battery level

Appendix C Field Replaceable Units

C.1 Replacement Parts List for Field Replaceable Units (FRUs)

The Parts Lists are located in the tables below.

The replacement parts lists are divided into four parts:

- **Part Number:** This is the order number for the Field Replaceable Unit/part. The Hologic Service Department requires this number when placing an order.
- **Description:** Identifies the Field Replaceable Unit/part by name.
- **Refer To:** Identifies the Chapter and Section in this manual to go to for installation or remove and replace procedures for that Field Replaceable Unit/part.
- **Comments:** Contains additional information. Also identifies components which make up the Field Replaceable Unit. If any of these components fail, replace the Field Replaceable Unit.

Table 14: Gantry Power Distribution Functions Parts List

Part Number	Description	Refer To	Comments
ASY-01612	Power Distribution Drawer	Power Distribution Drawer on page 147	
ASY-01546	Fixed Power Distribution Assembly	Power Distribution Drawer on page 147	At rear of Power Distribution Drawer
ASY-01711	Capacitor and Bridge Assembly	Capacitor and Bridge Assembly on page 149	To right of Isolation Transformer
ASY-02522	Detector Isolation Transformer 120VAC Assembly	Detector Isolation Transformer on page 148	To left of Isolation Transformer
ASY-01385	Power Supply and Switching Assembly	24 V Power Supply and External User Indicator Board on page 149	To left of Isolation Transformer
1-700-0107	Emergency Off Switch	Emergency Off Switch on page 146	
CKB-00030	Circuit Breaker	Circuit Breaker on page 145	
PCB-00070	Power Distribution Board Assembly	Power Distribution Drawer on page 147	In Power Distribution Drawer
PCB-00044	Gantry Control Board Assembly	Power Distribution Drawer on page 147	
PCB-00166	Rail Indicator Board Assembly	Capacitor and Bridge Assembly on page 149	On Capacitor and Bridge Assembly

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Appendix C: Field Replaceable Units

Table 15: System Control and X-ray Functions Parts List

Part Number	Description	Refer To	Comments
OSC-00007	X-ray Tube, Varian M-113T	X-ray Tube Maintenance on page 126	Varian M-113T
PCB-00061	Tubehead Microprocessor Board	Tubehead Microprocessor Board on page 133	
ASY-01381	Tube Arm Fan Bracket Assembly	Tubehead Cooling Fan on page 143	
ASY-01273 ASY-05340	HV Multiplier Drawer Assembly	Remove the HV Multiplier Drawer on page 124	
PCB-00179	High Voltage Adjust Board Assembly	Peak Tube Potential on page 95	Located in the Inverter Drawer for ASY-01272. (Note: The HV Adj. function is integral to PCB-00179 located in the Inverter Drawer for ASY-05788).
ASY-01272 ASY-05788	Inverter Drawer	Remove the HV Inverter Drawer on page 124	
1-003-0289	Filament Protect Board	Filament Protect Board on page 134	
ASY-01309	Collimator Assembly	Beam Limiting Assembly on page 120	
ASY-01307	Beam Limiting Assembly	Beam Limiting Assembly on page 120	
PCB-00117	Filter Wheel Board	Beam Limiting Assembly on page 120	

Table 16: C-Arm Functions Parts List

Part Number	Description	Refer To
PCB-00092	C-Arm Switch Board	C-Arm Switch Boards on page 135
PCB-00134	Mag Sense Board	Mag Sense Board on page 136
PCB-00086	C-Arm Angle Display Board	C-Arm Angle Display Board on page 133
PCB-00155	VTA Drive Board	VTA Drive Board on page 139
PCB-00154	VTA Control Board	VTA Control Board on page 139
PCB-00064	C-Arm Board	C-Arm Board on page 135
PCB-00095	Compression Device Interface Board	Compression Device Interface Board on page 136
PCB-00150	Grid Interface Board	Grid Interface Board on page 135
PCB-00152	Grid Transition Board	Grid Transition Board on page 135
PCB-00197	C-Arm Transition Board	C-Arm Transition Board on page 134
PCB-00116	RFID Interface Board	RFID (Radio Frequency Identification) Board on page 137
PCB-00186	Paddle Position Sensor Board	Paddle Position Sensor Board on page 136
PCB-00163	Power Filter Board	VTA Power Filter Board on page 139
PCB-00136	C-Arm Zero Position Sense Board	Zero Position Board on page 140
ASY-01503	C-Arm Rotation Switch	C-Arm Rotation Limit Switch on page 140
1-195-3058	C-Arm Rotation Potentiometer	C-Arm Rotation Potentiometer on page 141
ASY-01216	C-Arm Rotation Drive Motor/Gear Box	C-Arm Rotation Drive Motor and Gear Box on page 150
1-195-3058	Compression Thickness Potentiometer	Compression Thickness Potentiometer on page 156
RES-00015	Tomo Potentiometer (Tomosynthesis option)	Tomo Angle Potentiometer (Tomosynthesis Option) on page 141
ASY-01588	Compression Device Clutch	Compression Device Drive Assembly on page 155
ASY-01589	Compression Device Brake Assembly	Compression Motor and Brake on page 158
ASY-01589	Compression Motor/Brake Assembly	Remove the Compression Motor and Brake Assembly on page 158
MME-00400	Timing Belt	Compression Timing Belt on page 159
ASY-04242 (replaces ASY-01196)	Grid Device	Replace the Grid Assembly on page 123
PRD-00455	Image Receptor	Remove the Breast Platform and Image Receptor on page 122

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Appendix C: Field Replaceable Units

Table 17: Universal Acquisition Workstation Parts List

Part Number	Description	Refer To	Comments
ASY-07468	UPS, Universal AWS, Assembly	Replace the Uninterruptible Power Supply (UPS) on page 215	
CMP-01065	AWS Computer, WIN7, with CTX780	Replace the Computer on page 213	
ASY-01947	AWS Power Distribution Assembly	Replace the Power Distribution Assembly on page 275	
PWR-00066	Low Voltage DC Power Supply, Dual Output 5V,5.5A/12V,2.8A	Replace the Low Voltage DC Power Supply on page 272	
PCB-00123	AWS I/O Interface Assembly	Replace the AWS I/O Interface Assembly on page 269	
ASY-07463	X-Ray Activation Footswitch Assembly	Replace the X-ray Activation Footswitch Assembly on page 264	
ASY-07474	CD/DVD Drive and Switch Panel Assembly	Replace the DVD Drive and Switch Assembly on page 262	
ASY-07911	X-Ray Switch and Compression Release Assembly	Replace the X-ray Activation Button and/or Compression Release Button on page 254	
ASY-07914	E-STOP and Fingerprint Scanner Assembly	Replace the E-Stop and/or Fingerprint Scanner on page 249	
CMP-01261	Height Adjust Controller, Programmed for Travel 0-200MM, 120V 220-240VAC	Replace the Height Adjust Motor Controller on page 257	
CMP-01259	Control Monitor, 17" Flat Panel Color TFT LCD Touch screen with LED Backlight	Replace the Control Display Monitor	
CMP-00447	Keyboard, Spill Safe, USB & PS/2 104 Key	Replace the Keyboard on page 240	
CMP-00819	Mouse, USB & PS/2 3 Button Optical w/Scroll Wheel w/cord 6FT	Replace the Mouse on page 240	
CMP-01307	Converter, Signal	Replace the Signal Converter on page 260	

Table 17: Universal Acquisition Workstation Parts List

Part Number	Description	Refer To	Comments
ASY-08447	Barcode Scanner, Universal Acquisition	Replace the Bar Code Scanner on page 241	
CMP-01270	Color Preview Display Monitor	Replace the Preview Display Monitor	
CMP-01404 (BARCO MDNC-3321)	Monitor, 21.3" 3MP 2048X1538 Barco NIO Color, TFT AM Color LCD IPS, LED Backlights, DVID Dual Link, DisplayPort	Replace the Preview Display Monitor	
CMP-00637	Display, BARCO NIO MDNG-2121, 2MP, 21", Unpainted, Gray, with Stand	Replace the Preview Display Monitor	
FAB-10880	Radiation Shield	Replace the Radiation Shield on page 267	
FAN-00084	Fan	Replace the Fan on page 274	

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Appendix C: Field Replaceable Units

Table 18: Premium Acquisition Workstation Parts List

Part Number	Description	Refer To	Comments
PCB-00123	Acquisition Workstation I/O Interface Board	Acquisition Workstation I/O (Input/Output) Board on page 187	
ASY-01947	Acquisition Workstation Power Distribution Assembly	Power Distribution Assembly on page 188	
PWR-00066	Dual Output Power Supplies 5 V, 12 V Board	Dual Output Power Supply Board—5 V, 12 V on page 187	On upper left wall of Acquisition Workstation.
CBL-00714	Emergency Off Switch	Emergency OFF Switch on page 179	
CBK-00023	Power ON/OFF Switch	Power ON/OFF Switch on page 190	
PCB-00199	Compression Release Switch Board	Compression Release Switch on page 179	
ASY-01967	Cooling Fans	Cooling Fans on page 191	
PWR-00074 (old) ASY-07497 (new)	UPS	Uninterruptible Power Supply (UPS) on page 189	
CBL-00685	UPS Switch/Cable	CPU and UPS Reset Buttons on page 190	
ASY-01942 (R) ASY-01943 (L)	Right X-ray Switch Left X-ray Switch	Right or Left X-ray Switch on page 179	
ASY-01973	Barcode Scanner	Bar Code Scanner on page 181	
CMP-01404	Preview Display	Preview Display on page 173	
CMP-00443	Touch screen Display	Touch screen Display on page 178	
CMP-01040	Dimensions Acquisition Workstation Computer, WIN 7, X64 Embedded	Computer on page 173	
CMP-01064	Dimensions Acquisition Workstation Computer, WIN 7, with GTX680	Computer on page 173	
CMP-00810	DVD Drive	DVD Drive on page 180	
CMP-00447	Keyboard	Keyboard on page 181	
CMP-00532	Trackball	Trackball Assembly on page 179	
CMP-00542	Fingerprint Scanner	Fingerprint Scanner on page 180	

Table 19: Standard Acquisition Workstation Parts List

Part Number	Description	Refer To	Comments
PCB-00123	Acquisition Workstation I/O Interface Board	Standard Acquisition Workstation I/O (Input/Output) Board on page 202	
ASY-01947	Acquisition Workstation Power Distribution Assembly	Power Distribution Assembly on page 203	
PWR-00066	Dual Output Power Supplies V, 12 V Board	Dual Output Power Supply Board—5 V, 12 V on page 202	
CBL-00714	Emergency Off Switch	Compression Release Switch/Emergency Off Switch on page 198	
CBK-00023	Power ON/OFF Switch	Power ON/OFF Switch on page 204	
PCB-00199	Compression Release Switch Board	Compression Release Switch/Emergency Off Switch on page 198	
PWR-00074 (old) ASY-07497 (new)	UPS	Uninterruptible Power Supply (UPS) on page 203	
ASY-01942 (R) ASY-01943 (L)	Right X-ray Switch Left X-ray Switch	Right or Left X-ray Switch on page 198	
CMP-00820	Scanner	Bar Code Scanner (Optional) on page 199	
CMP-00637	Preview Display	Preview Display on page 197	
CMP-00811	Control Display	Control Display on page 197	
CMP-00418	Computer	Computer on page 196	
CMP-00810	DVD Drive	DVD Drive on page 198	
CMP-00447	Keyboard	Keyboard on page 198	
CMP-00819	Mouse	Mouse on page 198	
MME-01233	Pillar Assembly	Table Height Assembly Replacement on page 204	
CMP-00818	Pillar Controller	Table Height Assembly Replacement on page 204	

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Appendix C: Field Replaceable Units

Table 20: Miscellaneous Gantry Parts List

Part Number	Description	Refer To	Comments
PCB-00174	Gantry Service Port Board	Gantry Service Port Board on page 138	
PCB-00165	Face Shield Sense Board	Face Shield Sense Board on page 140	
PCB-00124	External User Indicator Board	24 V Power Supply and External User Indicator Board on page 149	On ASY-01385 bracket to left of isolation transformer.
PWR-00049	24 V Power Supply	24 V Power Supply and External User Indicator Board on page 149	
ASY-02385	Standard Crosshair	User Guide	
ASY-02258	Magnification Crosshair	User Guide	
ASY-02202	Magnification Stand	User Guide	

Table 21: Selenia Dimensions Paddle Parts List

Part Number	Description
ASY-01945	24 cmx29 cm Screening Paddle
ASY-01946	18 cmx24 cm Screening Paddle
ASY-01950	Spot Contact Paddle
ASY-01940	Small Breast Paddle
ASY-01986	7.5 cm Spot Contact Paddle
ASY-01993	Localization Rectangular Opening Paddle
ASY-01994	10 cm Localization Perforated Paddle
ASY-02028	15 cm Contact Paddle
ASY-02036	15 cm Localization Rectangular Opening Paddle
ASY-02037	15 cm Localization Perforated Paddle
ASY-05469	15 cm LG Ultrasound Paddle

Table 22: Selenia Dimensions Cables Parts List

Part Number	Description	Max. Length
CBL-00326	Network Cable Assembly	10 feet
CBL-00465	Fiber Optic Cable	43 feet
CBL-00585	Workstation/Gantry Interconnect Cable	40 feet
CBL-02349	Network Cable Assembly	25 feet
1-040-0719	Ground Cable Assy	40 feet
1-040-0777	Power Cable Assy	25 feet
1-056-0046	International Power Cord	10 feet
1-056-0047	Domestic Power Cord	10 feet

C.2 Universal Acquisition Workstation Visual Reference for FRUs

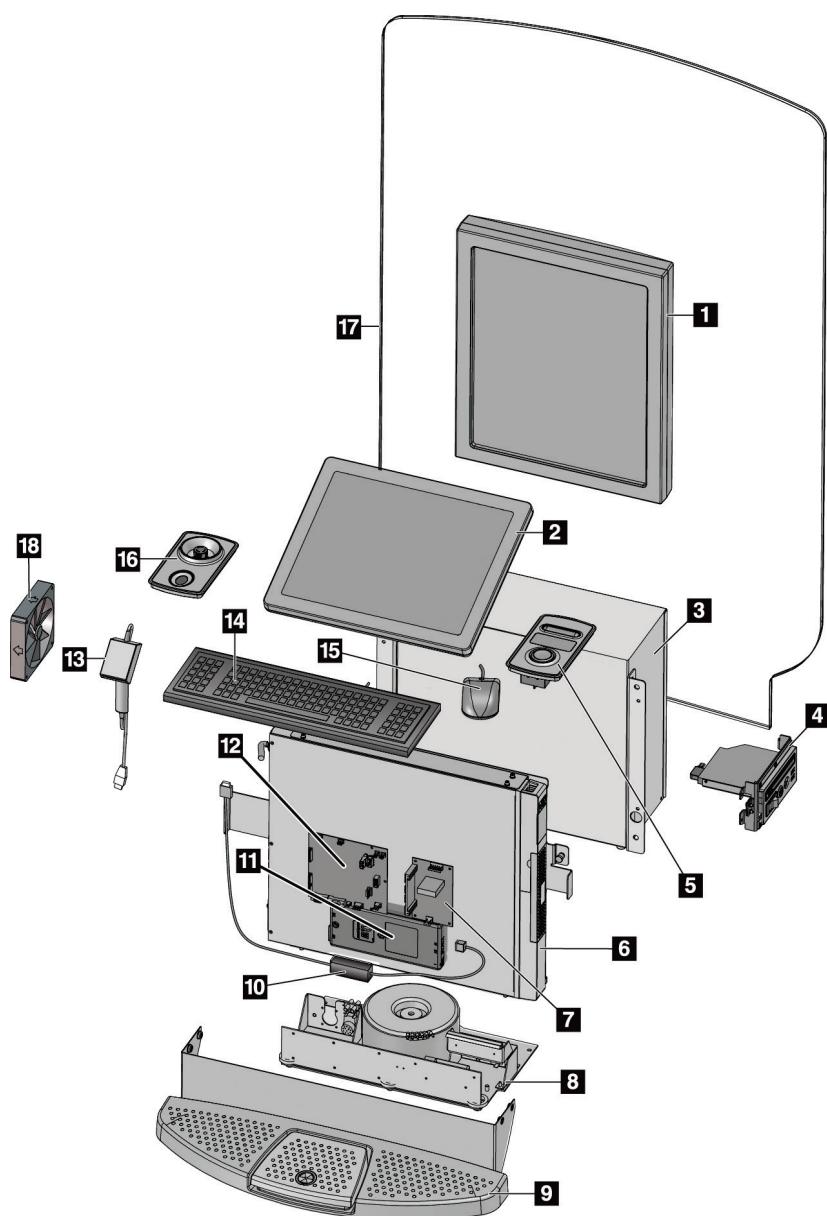


Figure 232: Field Replaceable Units (FRUs)

Figure Legend

1. Preview Display Monitor
2. Control Monitor
3. Computer
4. CD/DVD Drive and Switch Panel Assembly
5. X-ray Button/Compression Release Button Assembly
6. UPS with Battery
7. Low Voltage DC Power Supply
8. Power Distribution Assembly
9. X-ray Activation Footswitch Assembly
10. Signal Converter for Motorized Height Adjust Controller
11. Motorized Height Adjust Controller
12. I/O Interface Board
13. Bar Code Scanner
14. Computer Keyboard
15. Computer Mouse
16. E-Stop/Fingerprint Scanner Assembly
17. Radiation Shield
18. Fan

Appendix D Dimensions Mobile System

D.1 General Information

This appendix describes the Selenia Dimensions system installed in a mobile environment.

Note

This appendix covers the Mobile (non-Universal) Acquisition Workstation and the Mobile Universal Acquisition Workstation. Make sure you are referencing the proper instructions for your model where noted.

D.2 Conditions for Safety and Other Precautions

An acceptable, stable, clean VAC power source is required to make sure that the system meets all its performance specifications. Where available, shore power correctly supplied to the Selenia® Dimensions® digital mammography system provides the best performance. If a mobile power generator is used, you must keep the specifications for input power during all load conditions.

Warning:

The radiation shield is not approved for mobile use and is not provided. The coach manufacturer must provide adequate shielding.

Caution:

When shore power is unavailable, mobile power sources that provide equivalent performance may be employed. (See [Mobile Specifications](#) on page 330.) Proper system function and performance can only be ensured if continuous true sinusoidal VAC power is supplied per the system power input specifications and loading characteristics. Intermittently, the power source must provide 65 Amps at 208 VAC for minimum of 5 seconds, and 4 Amps maximum continuous otherwise. This load must be supported once every 30 seconds. In the event of shore or mobile power service interruption, the UPS must be capable of providing the operational power described above for a minimum of 4 minutes. Acquisition Workstation and Gantry power must be fed on separate dedicated circuits. The use of an uninterruptible power supply with active line conditioner is recommended on each power circuit. Accordingly, all ancillary mobile coach power should be distributed by other circuits. The electrical installation must be verified to meet system power input specifications and IEC 60601-1 safety requirements after initial installation and upon each relocation of the mobile coach.

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Appendix D: Dimensions Mobile System



Caution:

The temperature and humidity inside the vehicle must be maintained at all times. Do not allow environmental conditions to exceed stated specifications when the unit is not in use.



Caution:

Voltages cannot change by more than $\pm 10\%$ when the x-ray unit or other equipment, (for example heating or air conditioning) is operated.



Note

If a mobile power generator is used, make sure that it is at least 3 meters (10 feet) from the system. If this distance requirement cannot be met, additional EMI or RF shielding can be required.

D.3 Mobile Specifications

D.3.1 Shock and Vibration Limits

Vibration Limit	Maximum of 0.30 G (2 Hz to 200 Hz), measured at the point where the system mounts to the coach.
Shock Limit	Maximum of 1.0 G (1/2 sine pulse), measured at the point where the system mounts to the coach. An "air ride" coach suspension is recommended.

D.3.2 Coach Environment

Operation Environment

Temperature Range	20 °C (68 °F) to 30 °C (86 °F)
Relative Humidity Range	20% to 80% without condensing moisture

Non-operating/Transit Environment

Temperature Range	10 °C (50 °F) to 35 °C (95 °F) for a maximum of 12 hours 10 °C (50 °F) to 30 °C (86 °F) indefinitely
Maximum Rate of Temperature Change	<10 °C/hr.
Relative Humidity Range	10% to 80% without condensing moisture

D.4 Electrical Input

D.4.1 Gantry

<i>Mains Voltage</i>	200/209/220/230/ 240 VAC $\pm 10\%$
<i>Mains Impedance</i>	<i>Maximum line impedance not to exceed</i> 0.20 ohms for 208/220/230/240 VAC, 0.16 ohms for 200 VAC
<i>Mains Frequency</i>	50/60 Hz $\pm 5\%$
<i>Average Current over 24 Hours</i>	< 5 A
<i>Peak Line Current</i>	4 A (65 A maximum for 3 seconds)

D.4.2 Acquisition Workstation

<i>Mains Voltage</i>	100/120/200/ 208/220/230/ 240 VAC $\pm 10\%$
<i>Mains Frequency</i>	50/60 Hz $\pm 5\%$
<i>Power Consumption</i>	< 1000 watts

D.4.3 Coach UPS Recommendations

- Dedicated UPS for only the Gantry and Acquisition Workstation
- Dual Conversion UPS (Uninterruptible Power Supply and Power Conditioner)
- Single Phase
- Hardwired (Multi) Input 208/220/230/240
- Hardwired (Multi) Output 120/208/240
- IGBT Technology (refer to note below)
- Output Current >55Amps @ 240 VAC
- Internal Isolation Transformer (separate module not preferred)
- Power Factor Correction Technology Input Power Factor >.95 / Output Power Factor $\geq .85$
- Output Voltage Regulation not to exceed $\pm 3\%$ (1% typical)
- Minimum Battery Back-up time at Full charge ≥ 7 minutes

Note

 If the UPS does not use IGBT Technology the UPS specification must be for a minimum 2X the systems kW rating.

Placement of the UPS relative to the detector must be a minimum of 3.05 meters (10 feet) line-of-sight.

D.5 Changes to the Installation Procedures

This section discusses changes to the Selenia Dimensions System *Service Manual* for the mobile installation procedures.

Mobile (non-Universal) Acquisition Workstation-Specific Changes

- Install the preview display (see the following topic [Preview Display—Standard Configuration](#) on page 333)
- Changing the side of the workstation that the preview display and bar code scanner are mounted (see the following topic [Preview Display and Bar Code Scanner—Optional Configuration](#) on page 333)

Mobile Universal Acquisition Workstation-Specific Changes

- None required. However, you have the option of mounting the following items on either side of the workstation based on customer preference or site conditions:
 - preview display (see [Relocating the Preview Display Monitor](#) on page 278)
 - bar code scanner (see [Relocate Bar Code Scanner and/or Motorized Height Adjust Buttons](#) on page 286)
 - motorized height adjust control panel (see [Relocate Bar Code Scanner and/or Motorized Height Adjust Buttons](#) on page 286)
 - E-Stop/fingerprint scanner assembly (see [Relocate E-Stop/Fingerprint Scanner and X-ray Act/Compression Rel Button - UAWS](#) on page 289)
 - compression release button/x-ray activation button assembly (see [Relocate E-Stop/Fingerprint Scanner and X-ray Act/Compression Rel Button - UAWS](#) on page 289)
 - CD/DVD drive and power switch assembly (see [Relocate DVD Drive/Switch Panel Assembly](#) on page 292)

Gantry Changes

- setting vertical height upper limit (see [Gantry Vertical Height Upper Limit Adjust](#) on page 335)
- install the mobile brake kit (see *Install Brake Kit for Gantry Mobile* under [Gantry Install Changes](#) on page 335)
- additional support (if necessary) for the Gantry (see [Gantry Support](#) on page 335)

D.5.1 Mobile (non-Universal) Acquisition Workstation-Specific Install Changes

Preview Display—Standard Configuration

The Preview Display is installed on the right side and the Bar Code Scanner is installed on the left side of the Acquisition Workstation. The optional configuration has the Preview Display installed on the left side, and the Bar Code Scanner installed on the right side. Refer to the next section.

1. Put the display mount post into the post mount on the display crossbar and tighten the set-screw. See item 1 in figure [Install the Preview Display—Optional Configuration](#) on page 334 . Do not tighten completely - the display must rotate freely.
2. Remove the access panel at the rear of the display, and attach the DVI power cables.
3. Fasten the cables under the cable retainer.

Preview Display and Bar Code Scanner—Optional Configuration

To move the display, refer to the following sections.

The following describes how to move the display from the right side to the left side. The Bar Code Scanner is moved from the left side to the right side.

How to Remove the Preview Display and Bar Code Scanner

1. Remove the power from the system.
2. Disconnect the display cables from the display.
3. Remove the front cover of the Acquisition Workstation.
4. Press and hold the display crossbar collar down, and loosen the setscrew Item 1—see the following figure.
5. Remove the display, and the collar.
6. Remove the four screws that fasten the display mounting flange, and remove the flange Item 2.
7. Remove the setscrew at the rear that fastens the Bar Code Scanner Item 3.
8. Remove the Bar Code Scanner cable from the computer, and remove the Bar Code Scanner.
9. Remove the eight (four on each side) socket screws that fasten the display crossbar, and remove the display crossbar Item 4.
10. From the front, cut the cable tie that fastens the display cables to the frame rail Item 5.

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11. Pull the display cables through the right-side slot in the frame and guide to the left-side slot. The display cables are prepared and cable fastened when the installation is complete.

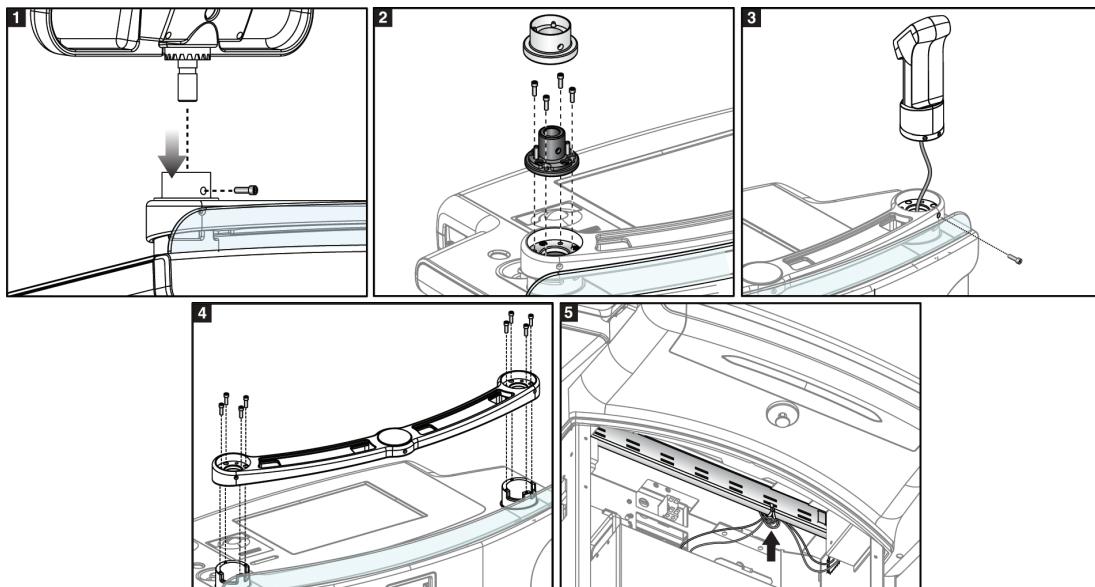


Figure 233: Install the Preview Display—Optional Configuration

How to Install the Preview Display and Bar Code Scanner

1. Install the display crossbar, and route the display cables through the square hole in the display crossbar.
2. Install the display mounting flange on the left side, so that the setscrew faces the rear.
3. Replace the display collar, and position the hole for the setscrew toward the rear. Test that the collar moves freely.
4. Install the display, and fasten the setscrew—*Do not tighten completely, the display must rotate freely.*
5. Connect the display cables to the display.
6. Replace the Bar Code Scanner on the right side, and attach the cable to the computer.
7. Prepare and fasten the cables to the inside of the frame.
8. Replace the front cover.

D.5.2 Gantry Install Changes

Gantry Support

This section adds a procedure to the Gantry Installation section in the Service Manual.

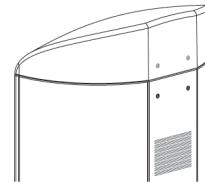
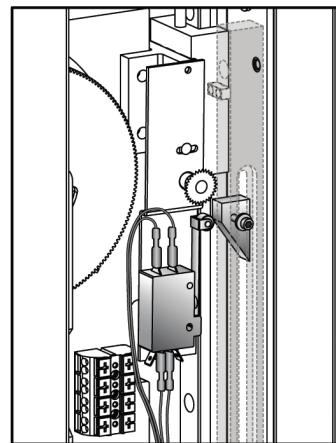


Figure 234: Additional Gantry support mounting holes

If additional support is needed, two holes that have threads are provided at the top rear of the Gantry. (These holes are 3/8 x 1/2 inch deep.) Use this option with the four standard base mounting holes.

Gantry Vertical Height Upper Limit Adjust



The C-arm upper travel is adjusted for ceiling limits.

1. Move the Gantry tube head to approximately 1 inch from the ceiling.
2. Open the VTA Vertical Height Limits Menu from the Calibration Tool.
3. Click **Next**. This action resets the vertical height limits to their original values.
4. Adjust the limit switch ramp until the ramp actuates the switch, (this action stops the Gantry).
5. Reverse the switch until the switch releases 1/4-inch higher, and lock the ramp in this position.
6. Press the Advanced button from the Advanced Form to turn the Gantry on.
7. Click **Next** (sets the upper limit).
8. Follow the instructions in the Calibration Tool to set the lower limit.
9. Click **Next** (sets the lower limit).
10. Verify the upper and lower mechanical switch settings.

Install Brake Kit for Gantry Mobile



WARNING!

Ensure that system power is Off and the Gantry circuit breaker is in the Off position.

1. Power DOWN the system.
2. Remove the eight screws holding the rear cover to the Gantry (see following figure) and remove cover to expose the lift motor (item 1).

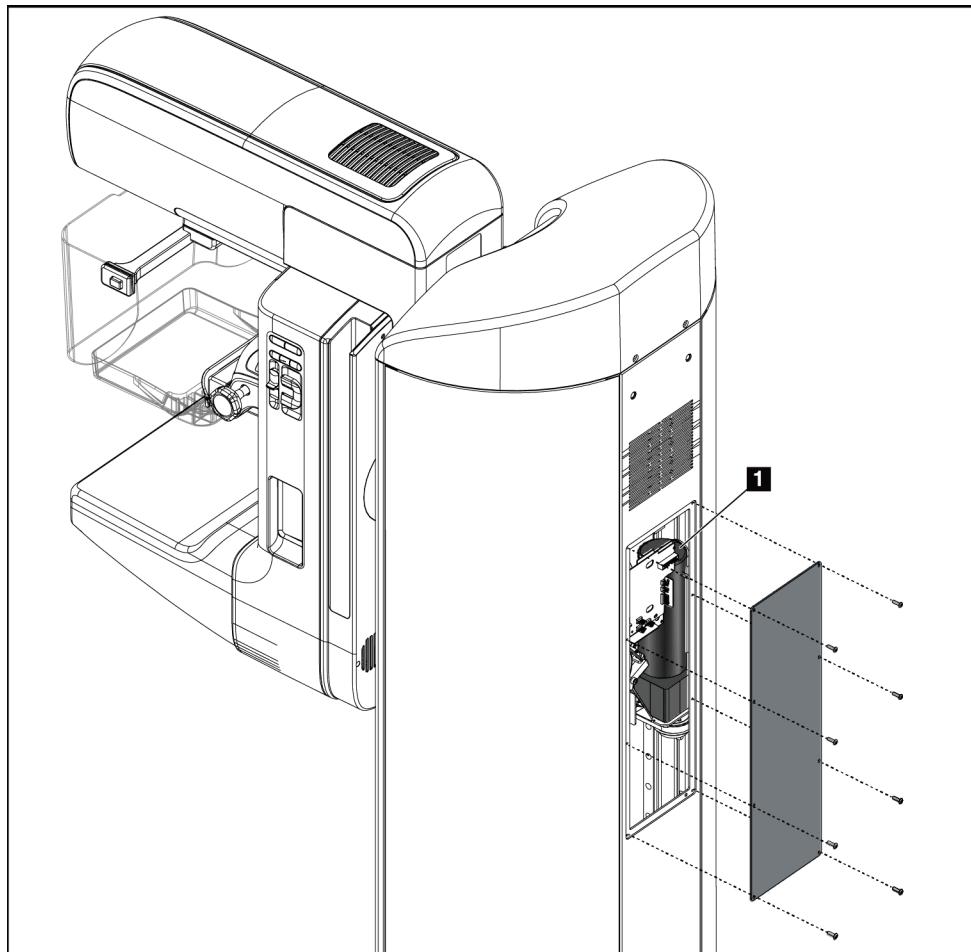


Figure 235: Removing rear cover of Gantry to expose the lift motor (item 1)

3. Locate the lift motor (item 1 from previous figure). Secure the nut supplied with the kit over the motor shaft:
 - d. Place the nut (item 1 on following figure) over the shaft and make sure that the slotted part of the nut is on top and the setscrew is on the bottom.
 - e. Align the set screw (item 2) to the flat on the motor shaft (item 3).
 - f. Use a 0.015" shim (item 4) to set the gap between the nut and motor housing, then tighten the two set screws on the nut with 1/16" Allen wrench. Remove the shim.

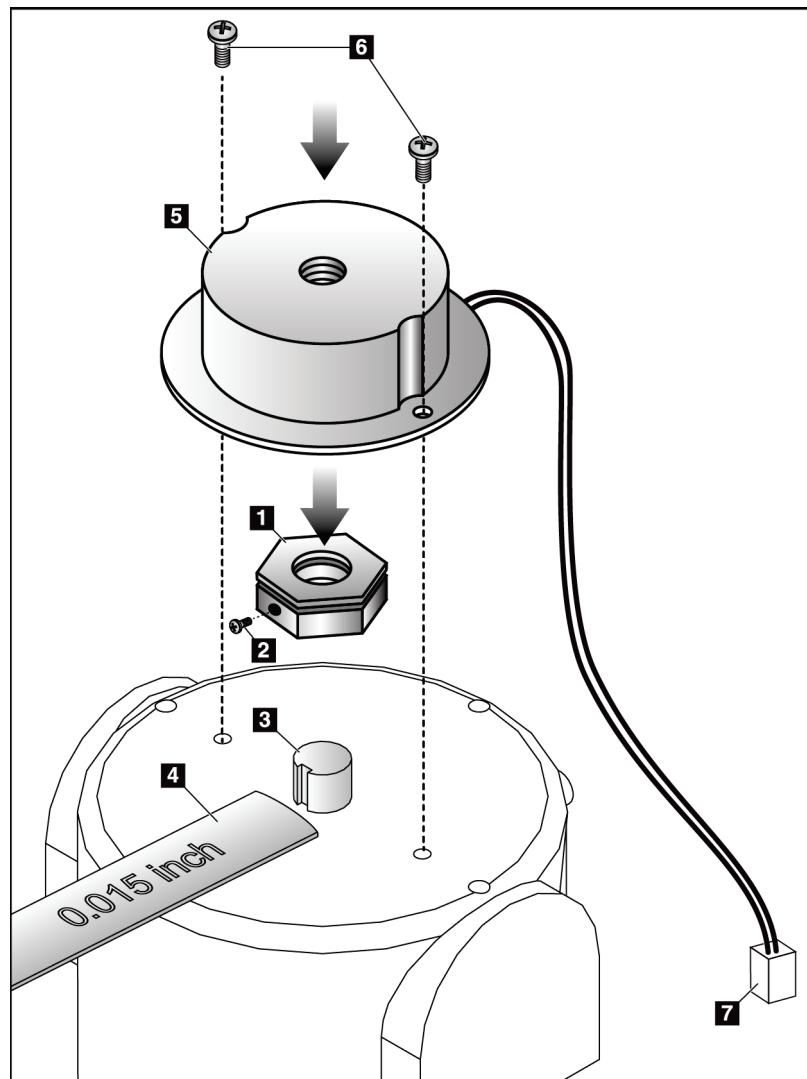


Figure 236: Securing brake assembly to motor and motor shaft

4. Place the 24 VDC Power Off Brake assembly (item 5 on previous figure) on top of the motor shaft with nut. Secure with two screws (item 6).

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5. Route the brake cable (item 7 on previous figure) to the VTA Control board and plug the connector into WCJ15 (see following figure). Make a service loop in the brake cable and secure it to the gray wire harness nearby with a cable tie.

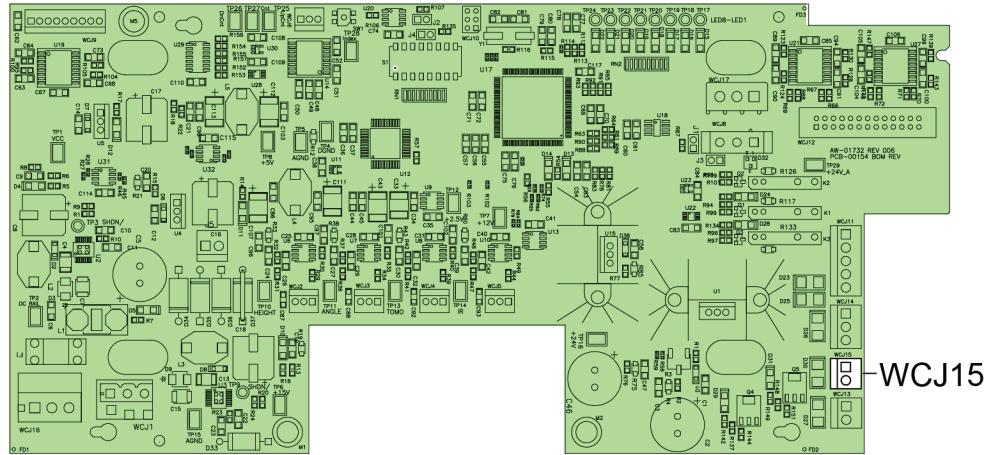


Figure 237: WCJ15 on VTA board for brake cable

6. Reinstall rear cover to Gantry.
7. Power up the system and verify proper operation.

D.6 Changes to the Maintenance Procedures

This section discusses changes to the Selenia Dimensions System *Service Manual* for the mobile maintenance procedures.

Mobile (non-Universal) Acquisition Workstation-Specific Changes

The mobile version has filler panels installed instead of the standard radiation shields. The filler panels use the same hardware and support points, and are installed by the same method as the radiation shields.

Mobile Universal Acquisition Workstation-Specific Changes

- None required.

Gantry Changes

- replace the VTA motor brake (see [Replace the VTA Motor Brake \(Mobile\)](#) on page 339)

D.6.1 Replace the VTA Motor Brake (Mobile)

This section adds a new procedure to the Gantry Maintenance section.

1. Remove the upper rear Gantry panel.
2. Lift the VTA Motor Assembly to expose the top of the Vertical Drive Motor.
3. Remove the brake cable from the VTA circuit board.
4. Remove the two screws on the top of the brake.
5. Remove the brake.
6. To replace the coupler (if necessary), loosen the two hex screws on the coupler, and remove the coupler from the motor shaft. Energize the brake to line up the mounting holes.

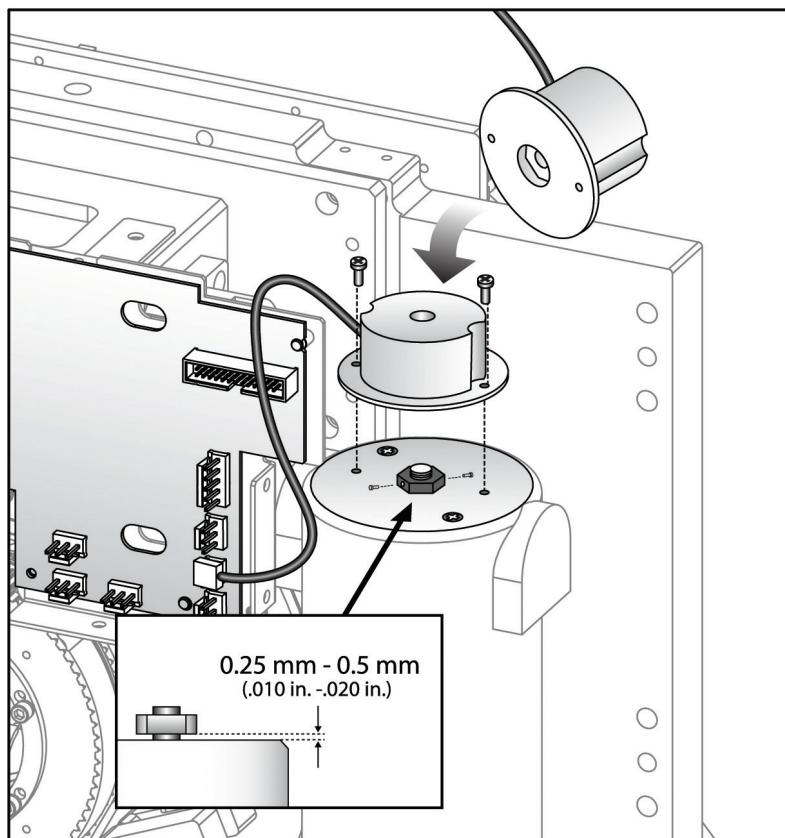


Figure 238: VTA Motor Brake

Note

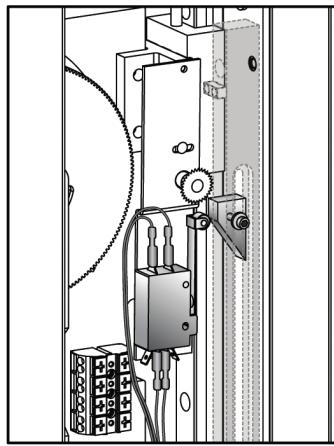
The coupler should be set above the motor housing as shown in the drawing detail.



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Gantry Vertical Height Upper Limit Adjust



The C-arm upper travel is adjusted for ceiling limits.

1. Move the Gantry tube head to approximately 1 inch from the ceiling.
2. Open the VTA Vertical Height Limits Menu from the Calibration Tool.
3. Click **Next**. This action resets the vertical height limits to their original values.
4. Adjust the limit switch ramp until the ramp actuates the switch, (this action stops the Gantry).
5. Reverse the switch until the switch releases 1/4-inch higher, and lock the ramp in this position.
6. Press the Advanced button from the Advanced Form to turn the Gantry on.
7. Click **Next** (sets the upper limit).
8. Follow the instructions in the Calibration Tool to set the lower limit.
9. Click **Next** (sets the lower limit).
10. Verify the upper and lower mechanical switch settings.

D.7 Prepare the System for Travel

Before travel, perform these steps:

1. Rotate the C-arm to 0 degrees (CC position).
2. Lower the C-arm to its lowest position.
3. Turn off the system through the user interface.
4. Place the mouse in the keyboard tray.
5. Lock the keyboard tray (see the following figures):
 - a. Close the tray.
 - b. Find the knob under the tray.
 - c. Turn the knob 90° until the knob fits into the lock. Position A in the following figure shows the locked position.

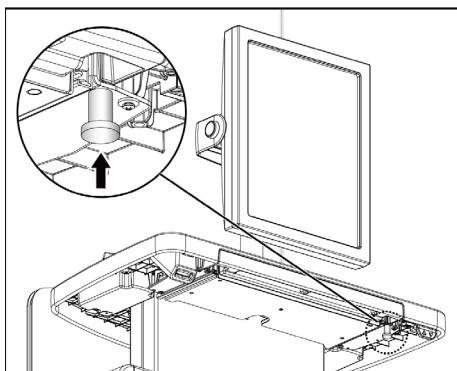


Figure 239: Keyboard Tray Lock Knob

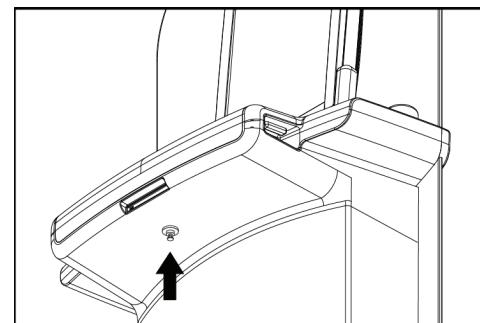


Figure 240: Keyboard Tray Lock Knob

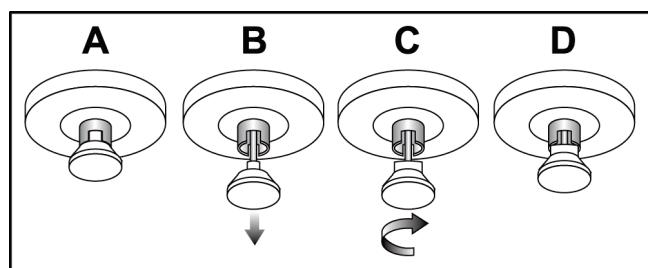


Figure 241: Tray Lock Release from Locked (A) to Unlocked (D)

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6. If using the mobile Universal Acquisition Workstation, lock the swivel display using the knobs provided (see the following figure).

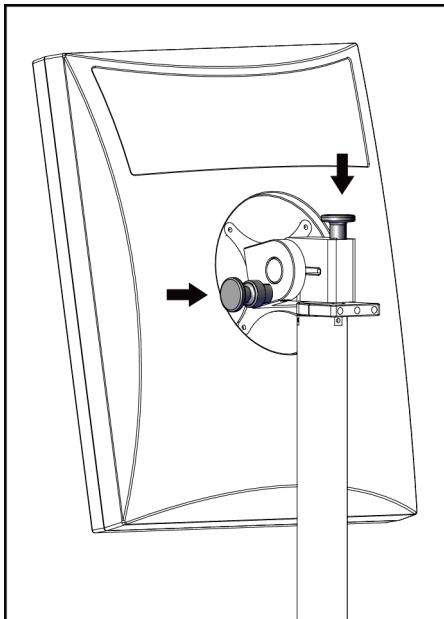


Figure 242: Swivel Lock Knobs for Preview Display on Mobile Universal Acquisition Workstation

7. Lower the work surface to the minimum height.
8. Remove all system accessories.
9. Put all accessories in a safe storage area.

D.8 Prepare the System for Use

1. Unlock the keyboard tray:
 - a. Find the knob under the tray.
 - b. Pull the knob down.
 - c. Turn the knob 90°. This position keeps the latch open. Position D (in the following figure) shows the unlocked position.

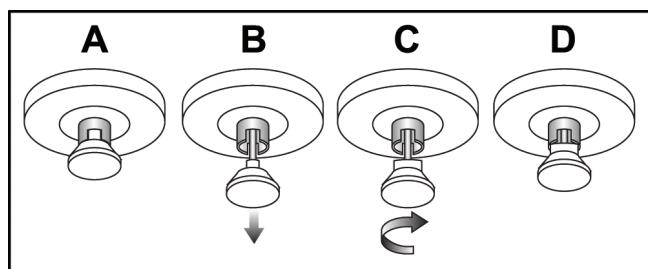


Figure 243: Tray Lock Release from Locked (A) to Unlocked (D)

2. Pull the tray out, if needed.
3. If using the mobile Universal Acquisition Workstation, unlock the swivel display (see the following figure).

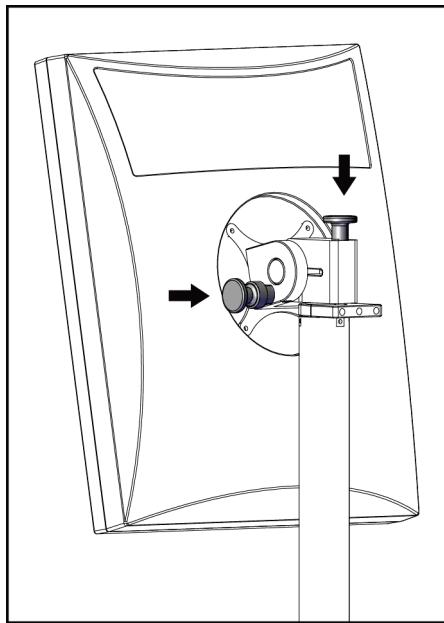


Figure 244: Swivel Lock Knobs for Preview Display on
Mobile Universal Acquisition Workstation

D.9 Test the System after Travel

D.9.1 Selenia Dimensions System Controls and Functional Tests

Perform the Controls and Functional Tests. Refer to the Selenia Dimensions System *User Guide*.

- Compression Up/Down
- Compression Release
- C-arm Rotation
- C-arm Up/down
- Collimator Override
- Light Field Lamp
- Shifting Paddle System
- Emergency Off Switches

D.10 Quality Control Tests

Refer to your quality control manual for quality system checks.

Appendix E Technical References

E.1 System Overview

E.1.1 Gantry Subsystem

The Gantry subsystem consists of an x-ray source, a digital x-ray image detector, mechanisms for positioning and compressing the patient, mechanisms for rotating the C-arm, and mechanisms for rotating the tube head to obtain tomosynthesis (Tomosynthesis option) projection images. The following sections describe each Gantry subsystem in more detail.

E.1.2 X-ray Source

The x-ray source consists of a high-voltage generator, a rotating-anode x-ray tube, and an x-ray filter mechanism. The generator supplies high voltage to the x-ray tube, and is capable of the fast rise times and quick cycle times needed for tomosynthesis imaging. Filters can be selected from three materials to optimize x-ray beam quality for breast thickness and composition, and for the type of exam being performed, conventional or tomosynthesis. The x-ray filter materials for conventional imaging are rhodium and silver. An aluminum filter is added for use in tomosynthesis. The Selenia Dimensions system uses a filter wheel to house the filters.

E.1.3 Digital X-ray Image Detector

The Selenia Dimensions digital x-ray image detector is based on technology identical to that in the Selenia digital x-ray image detector and incorporates the dielectric structure.

The Selenia Dimensions x-ray image detector is responsible for capturing and digitizing x-ray images, correcting the images for known detector defects and non-uniformities, and presenting digitized images to the host Acquisition Workstation.

The interface between the detector and host Acquisition Workstation on the Selenia Dimensions system was redesigned to support a higher data rate over an error-correcting fiber optic link. The host board in the Acquisition Workstation has sufficient memory to buffer a full combination image (conventional plus maximum size tomosynthesis projection set).

E.1.4 Positioning and Compression

The Selenia Dimensions system gives the technologist the capability to position and compress the patient for all standard mammography procedures. Positioning and compression are performed identically for conventional and tomosynthesis imaging. The C-arm can be rotated to allow positioning for all standard views, and both conventional and tomosynthesis imaging can be performed at any C-arm rotation angle.

Compression paddles are available to cover all standard mammography examinations. Paddles on the Selenia Dimensions system that are smaller than 24 cm x 29 cm shift center, left, and right automatically to match the selected view.

E.1.5 Tube Head Rotation (Tomosynthesis Option)

Capturing tomosynthesis projection images is achieved by rotating the tube head through a maximum specified angle about the stationary, compressed breast while the x-ray tube emits a controlled sequence of short, evenly spaced x-ray pulses. The tube head motion is actuated by a DC servo motor while the tube head angle is measured by a rotary sensor. The tube head rotation is controlled by a servo feedback loop from the sensor to achieve precise, smooth, reproducible rotary motion during the tomosynthesis sweep.

Tube head rotation is uncoupled from C-arm rotation so that tomosynthesis sweeps can be carried out at any C-arm angle.

E.1.6 Acquisition Workstation Subsystem

The Acquisition Workstation enables the technologist to enter patient demographic data automatically or manually, set up examination procedures for each patient, set up operating parameters and techniques for studies, initiate exposures, review x-ray images for quality control purposes, and transmit and store images to connected peripherals. The Acquisition Workstation performs image processing on captured images to optimize them for soft copy and hardcopy display. The Acquisition Workstation carries out the filtered back projection operation to reconstruct the Tomosynthesis projections into 3D image slices.

E.2 Principles of Operation

The Selenia Dimensions system uses digital imaging technology to acquire and store x-ray images of the breast. The system acquires conventional mammography images in an identical fashion as the Selenia product. The Selenia Dimensions system also captures tomosynthesis (Tomosynthesis option) images by rotating the tube head about the stationary breast and capturing x-ray projection images at several angles relative to the breast. Image capture during a tomosynthesis sweep is the same as during a conventional image, but the individual x-ray exposures during the tomosynthesis sweep are shorter and occur more rapidly. The projection images are mathematically reconstructed to generate three-dimensional breast images that enhance the radiologist's ability to discern pathology and structures within the breast.

E.2.1 Conventional Image Acquisition

Conventional imaging on Selenia Dimensions system is identical to imaging performed on the Selenia system.

During the x-ray exposure, the image acquisition system uses the direct conversion of x-ray energy into charge to produce a digital x-ray image. X rays of a selected energy are generated by a rotating-anode tungsten tube and are filtered by selectable x-ray filters. rhodium, and silver. The x rays penetrate the breast, pass through a carbon-fiber breast tray, and then through an HTC™ high transmission cellular grid.

The Selenia Dimensions digital x-ray imaging detector converts the absorbed energy to charge-in an x-ray photoconductive layer. The photoconductor is biased with an electric field supplied by a high-voltage power supply. The converted charge is collected with spatial resolution by a two-dimensional array of pixels. Each pixel consists of a charge-storage capacitor and a TFT (thin-film transistor) switch. The gates of the TFTs are connected together in rows, with each gate being connected to the output of a digital driver. The sources of the TFTs are connected in columns, with each column being connected to the input of a low-noise charge amplifier. Following the x-ray exposure, the gate lines are turned on sequentially and the charge from the storage capacitors are read out through the low-noise charge amplifiers.

The outputs of the low-noise amplifiers are filtered, further amplified, and digitized. Parallelism is used in the readout and digitization electronics to increase panel readout speed. The digitized signal is transmitted over a serial optical link from the detector to a PCI card installed in a host computer where the image is buffered in PCI card memory. Image data on the PCI card is transferred to host computer memory by DMA where it can be stored, viewed, or otherwise manipulated.

E.2.2 Tomosynthesis Image Acquisition (Tomosynthesis Option)

The process used in the Selenia Dimensions system for Tomosynthesis imaging is identical to that used for conventional imaging described above, except that the tube head is moved at a constant angular velocity about the stationary breast and a number of short, low-dose exposures are performed during the sweep.

The Tomosynthesis images are made by first acquiring projection images and then performing reconstruction. For each standard view, for example RCC, a series of projection images are acquired. Once the images are acquired the projections are reconstructed into a series of images spanning the entire breast thickness.

The following figures explain the acquisition geometry graphically. During acquisition the x-ray tube moves over an arc, acquiring projection images. Following the acquisition, these are reconstructed into cross-sectional slices parallel to the breast platform, labeled as 'Reconstructed planes' in the following figure.

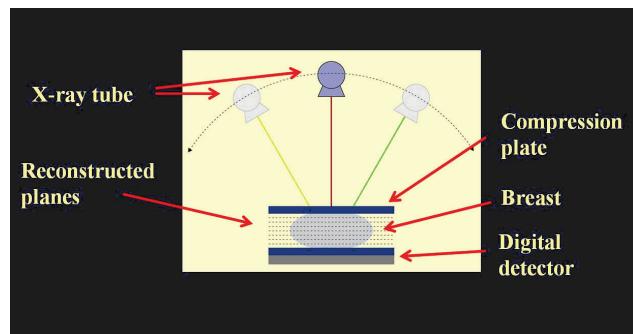


Figure 245: Tube Movement During Projection Image Acquisition

The acquisition geometry is shown again for an MLO view—see the figure [Acquisition Geometrical View](#) on page 348. During acquisition, the x-ray tube moves, acquiring projection images. Each projection image is a low dose mammogram, viewing the breast from the differing angles.

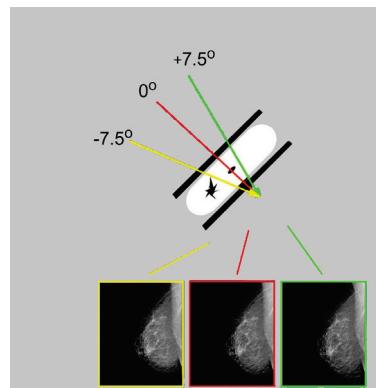


Figure 246: Acquisition Geometrical View

E.2.3 Image Correction

The Selenia Dimensions system performs several operations on acquired images to optimize image quality. The Selenia Dimensions system performs identical image-correction processes as the Selenia system.

First, a dark image frame (no x-ray exposure) is subtracted from the exposure image frame pixel by pixel. This step removes any common-mode noise from the image. Common-mode noise is noise that does not change with signal level, such as offset differences between charge amplifiers.

Next, defective pixels are corrected. Defective pixels are cataloged at the time of manufacture of the detector and are updated periodically during preventive maintenance performed by Hologic. A pixel is defective if its digital value differs by more than a specified amount from the average of its neighbors. If a pixel is in the defective pixel map, its digital value is replaced by a weighted average of its nearest neighbors at this stage of the imaging process. To ensure the quality of x-ray images, there are limits imposed on the number and density of defective pixels allowed in a detector. With the exception of the maximum number of allowable pixel clusters, the defective pixel specification for the Selenia Dimensions system is the same as the specification for the Selenia system. These pixel clusters have eight or fewer defective pixels, and are smaller in area than the smallest microcalcification detectable on a mammogram.

Finally, system gain variations are corrected. Gain variations are noise sources that change in proportion to x ray signal level. The largest source of gain variation is the chip-to-chip differences in gain between charge amplifiers. A gain map is created during system calibration that represents the response of the detector to a flat field. At the time of imaging, the acquired image is effectively mathematically divided pixel-by-pixel by the values in the gain map. Creation of the gain map is a function that is carried out during production and periodically by the system user.

E.2.4 Image Processing and Reconstruction

Once image corrections have been applied, all conventional and Tomosynthesis are processed to improve their appearance. Two forms of images processing are used, multilevel contrast enhancement (MCE) and peripheral contrast enhancement (PCE).

The MCE image processing performs the following steps on the image. The breast image area is determined using a breast boundary detection algorithm. The breast image is logarithmically converted to enhance contrast in the area of the uniformly compressed breast. A multilevel contrast enhancement method is then applied to smooth the image. An adaptive un sharp mask image processing technique is applied to enhance image contrast. Finally, the processed data set is passed through a sigmoid data conversion process and the bit depth is adjusted to meet the requirements of the display device. PCE image processing applies a small amount of dynamic range compression to the digital values in a breast image so that the skin line can be visualized simultaneously with dense breast tissue when the image is viewed on a soft copy display or film.

In the case of tomosynthesis imaging, once the projection images are captured and corrected, the Acquisition Workstation processes and reconstructs them using a filtered back projection algorithm to obtain slice images. Both the processed projection images and the reconstructed slices are retained.

The following figure shows the reconstructed image geometry. The reconstructed slices are slices at different heights in the breast, and parallel to the breast platform. The number of reconstructed slices varies with the compressed breast size; the thicker the compressed breast, the more reconstructed slices. These reconstructed slices are the images that are viewed by the radiologist.

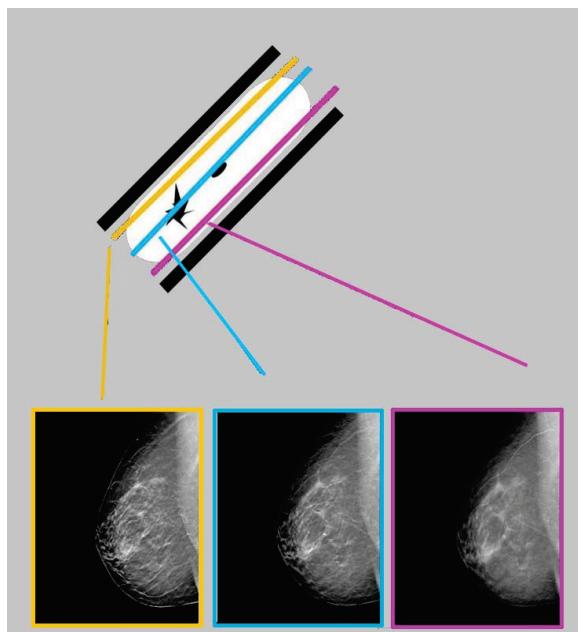


Figure 247: Reconstructed Image Geometry

E.3 Scatter Radiation

All important x ray safety features meet 21 CFR, Chapter I, 1020.31, IEC 60601-1-3, and IEC 60601-2-45.

Typical values of x ray leakage shown are at a distance of 1 meter from the tube focal spot, at maximum kVp, and adjusted for a maximum in use duty cycle of 0.027.

Duty cycle comes from a maximum throughput of 12 patients per hour x 4 exposures, or 48 exposures per hour with a maximum exposure time of 2 seconds.

$48 \times 2 = 96$ exposure seconds per hour, or $96 \text{ exposure seconds} / 3600 \text{ seconds per hour} = 0.027$.

The meter measures x ray leakage in units of mR/Hour.

The meter reading is multiplied by the duty cycle to get the correct leakage value ($N \times 0.027$) and this is compared with the maximum allowed criteria 90 mR/Hour.

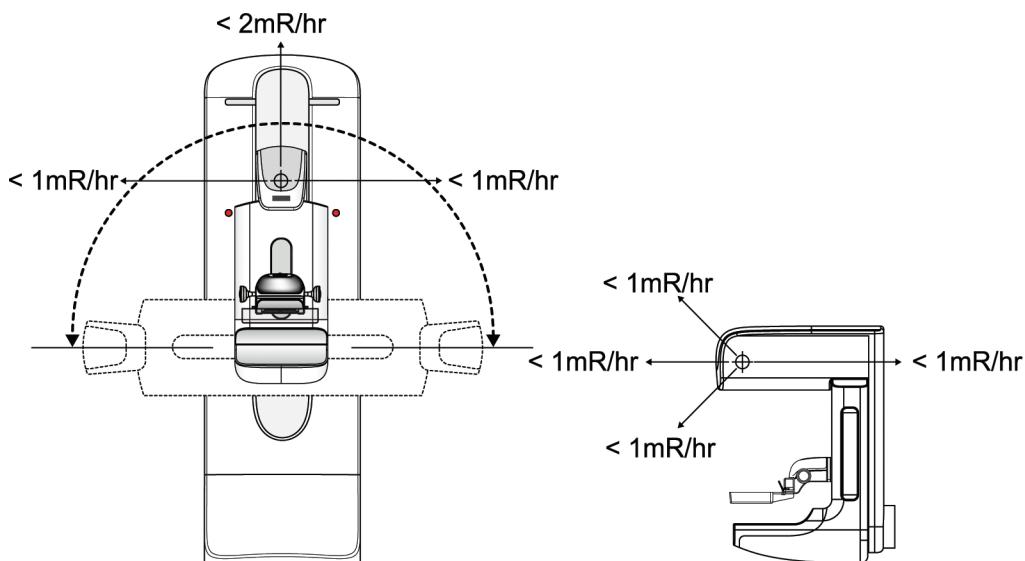


Figure 248: Scatter Radiation

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Appendix E: Technical References

E.4 Electromagnetic Compatibility

This section provides information about the electromagnetic compatibility of the Selenia Dimensions system per IEC 60601-1-2.

Table 23: Electronic Emissions

Electromagnetic Emissions		
The Selenia Dimensions system is intended for use in the electromagnetic environment specified below. The customer or the user of the Selenia Dimensions system should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment – guidance
RF emissions CISPR 11	Group 1	The Selenia Dimensions system uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	Meets Class A compliance.
Harmonic emissions IEC 61000-3-2	Class A	The Selenia Dimensions system is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

Table 24: Electromagnetic Immunity Part 1

Electromagnetic Immunity – Part 1			
The Selenia Dimensions system is intended for use in the electromagnetic environment specified below. The customer or the user of the Selenia Dimensions system should assure that it is used in such an environment.			
IMMUNITY test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 s	<5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 s	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Selenia Dimensions System requires continued operation during power mains interruptions, it is recommended that the Selenia Dimensions System be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_T is the a.c. mains voltage prior to application of the test level.			

Table 25: Electromagnetic Immunity Part 2

Electromagnetic Immunity – Part 2			
The Selenia Dimensions System is intended for use in the electromagnetic environment specified below. The customer or the user of the Selenia Dimensions system should assure that it is used in such an environment.			
IMMUNITY test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	[V1] = 3 V	Portable and mobile RF communications equipment should be used no closer to any part of the Selenia Dimensions system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = \left[\frac{3,5}{V_1} \right] \sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2,5 GHz	[E1] = 3V/m	$d = \left[\frac{3,5}{E_1} \right] \sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}$ $d = \left[\frac{7}{E_1} \right] \sqrt{P} \quad 800 \text{ MHz to } 2,5 \text{ GHz}$ where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, ^a should be less than the compliance level in each frequency range. ^b Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.			
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
^a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Selenia Dimensions system is used exceeds the applicable RF compliance level above, the Selenia Dimensions system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Selenia Dimensions system.			
^b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [V1] = 3 V/m.			

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Appendix E: Technical References

Table 26: Separation Distances for RF Equipment

Recommended Separation Distances for Portable and Mobile RF Communications Equipment and the Selenia Dimensions System			
Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = \left[\frac{3,5}{V_1} \right] \sqrt{P}$	80 MHz to 800 MHz $d = \left[\frac{3,5}{E_1} \right] \sqrt{P}$	800 MHz to 2,5 GHz $d = \left[\frac{7}{E_1} \right] \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.7	3.7	7.38
100	11.7	11.7	23.3

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people

E.5 List of Test Points

Use the following test point tables as an aid in troubleshooting the Selenia Dimensions system.

Table 27: Gantry Control Board Test Points

Test Point	Voltage/Signal
TP2	+32Vdc
TP3	GND
TP5	+3.3Vdc
TP6	+5Vdc
TP4	Temp.

Table 28: X-ray Tube Arm (Tubehead) Control Board Test Points

Test Point	Voltage/Signal
TP15	+32Vdc
TP16	GND
TP21	+3.3Vdc
TP17	+5Vdc
TP34	+1.8Vdc

Table 29: C-Arm Control Board Test Points

Test Point	Voltage/Signal
TP10	+32Vdc
TP14	GND
TP9	+5Vdc
TP12	+12Vdc

Table 30: Compression Device Interface Board Test Points

Test Point	Voltage/Signal
TP3	+32Vdc
TP4	GND
TP6	+5Vdc
TP7	+15Vdc
TP1	Comp. Force
TP2	Comp. Thick.

Table 31: Grid Interface Board Test Points

Test Point	Voltage/Signal
TP26	+32V
TP30	GND
TP27	+3.3Vdc
TP25	+5Vdc
TP31	+15Vdc

Table 32: VTA Control Board Test Points

Test Point	Voltage/Signal
TP4	GND
TP1	+5Vdc
TP8	+5Vdc
TP7	+12Vdc
TP6	+15Vdc
TP29	+24Vdc
TP12	+2.5V ref
TP10	C-Arm Height
TP11	C-Arm Angle
TP13	Tomo Angle (Tomosynthesis option)

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Table 33: Power Distribution Board Test Points

Test Point	Voltage/Signal	Test Point	Voltage/Signal
TP29	+5Vdc	TP1	+2.5Vdc ref
TP17	+15Vdc	TP2	+90Vdc
TP22	On Latch	TP3	+90V ref
TP23	On Hold	TP4	+32Vdc
TP24	On	TP5	+32Vdc
TP18	Comp. Up	TP6	20Vac_A
TP19	Comp.Dn	TP7	20Vac_B
TP20	Arm Up	TP25	120Vac_A
TP21	Arm Dn	TP26	120Vac_B

E.6 LED Indicators

Use the following LED Indicator tables as an aid for troubleshooting the Selenia Dimensions system. Covers must be removed to view LED Indicators.

Table 34: Gantry Control Board LEDs

LED	LED "ON" Indication
D26	+3.3Vdc
D3	+5Vdc

Table 35: Tubehead Control Board LEDs

LED	LED "ON" Indication
D30	+1.8Vdc
D24	+3.3Vdc
D23	+5Vdc
D27	+15Vdc
D33	+24Vdc
D11	+32Vdc

Table 36: Compression Device Interface Board LEDs

LED	LED "ON" Indication
D13	+5Vdc
D16	+15Vdc
D14	+32Vdc

Table 37: C-Arm Control Board LEDs

LED	LED "ON" Indication
D13	+5Vdc
D16	+12Vdc
D4	+5Vdc
D12	+5Vdc
D11	+12Vdc

Table 38: VTA Control Board LEDs

LED	LED "ON" Indication
D4	+5Vdc
D12	+5Vdc
D11	+12Vdc
D10	+15Vdc
D5	+32Vdc
D24	C-Arm Lock
D28	Tomo Lock (Tomosynthesis option)

Table 39: Power Distribution Board LEDs

LED	LED "ON" Indication
D32	+5Vdc
D30	+15Vdc
D31	+24Vdc
D6	Trip Coil Fail

E.7 List of Fuses

These fuses are located on the Gantry, in the individual boards in the Gantry, and in the Acquisition Workstation.

Table 40: Fuses

Description	Fuse	Rating	Circuit	Part No.
Gantry Fuse Panel				
Rear Fuse Panel	F14	FB 30A 600V	600 VDC Rail	1-070-1119
	F10, F11	SB 3A 250V	Sec 120 VAC	1-070-1076
	F8, F9	SB 12A 250V	Sec 65 VAC	1-070-1327
	F6, F7	SB 10A 250V	Sec 24 VAC	1-070-1275
	F4, F5	SB 10A 250V	Sec 24 VAC	1-070-1275
	F12, F13	SB 1.5A 250V 3AG	Line (PRI)	1-070-1263
	F15	40A 600V	Sec 380 VAC	CKB-00027
	F16	40A 600V	Sec 380 VAC	CKB-00027

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Table 40: Fuses

Description	Fuse	Rating	Circuit	Part No.
Gantry Board Fuses				
PCB-00061	F2	1.5A SB 2AG	X-ray Tube Arm (Tubehead) Microprocessor Board	1-070-1245
PCB-00070	F2	10A SB 250V 3AG	Power Distribution Board	1-070-1275
	F3	10A SB 250V 3AG		1-070-1275
	F4	0.125A 250V 2AG		1-070-1220
PCB-00123	F1	3A SB 2AG	Acquisition Workstation Interface Board	1-070-1248
	F2	2A SB 2AG		1-070-1246
	F5	3A SB 2AG		1-070-1248
	F6	3A SB 2AG		1-070-1248
PCB-00150	F1	1.5A SB 2AG	Grid Interface Board	1-070-1245
PCB-00154	F1	4A SB 2AG	VTA Control Board	1-070-1250
PCB-00197	F1	3A SB 2AG	C-Arm Transition Board	1-070-1248
	F3	3A SB 2AG		1-070-1248
PCB-00110	F1	FB 25A 600V	HV Inverter Drawer HV Inverter Drawer - Rotor	1-070-1118
	F2	FB 8A 600V		1-070-1112
PCB-00158	F1	0.1A 600V Fast Acting Cartridge	Fast Bleed - Capacitor and Bridge Assembly	CKB-00025
Acquisition Workstation Fuses				
	F1	8A 250V Fast Blo 3AG 1/4X1-1/4	AWS Power Distribution	CKB-00031
	F2	8A 250V Fast Blo 3AG 1/4X1-1/4		

E.8 Jumper Configuration

Table 41: Jumper Configuration

PCB Assembly	Jumpers Installed	Jumpers not Installed
PCB-00044	J2 (1 and 2), J6	JP1, JP2, JP3, JP4
PCB-00061	JP2	JP1, JP3, JP4
PCB-00064	JP1	
PCB-00070	J3, J4	J1, J5
PCB-00095	J1, J2	
PCB-00123	JP2	JP1, JP3
PCB-00150	JP3	JP1, JP2
PCB-00154	J2	J1, J3
PCB-00197		JP1, JP2

E.9 LED Status

Table 42: LED Status

PCB Assembly	Run LED		Fault LED	
	CPU	CPLD	CPU	CPLD
PCB-00044	D1	n/a	n/a	n/a
PCB-00061	D2	n/a	D1	D29
PCB-00064	D2	n/a	D1	n/a
PCB-00070	D2	n/a	D1	n/a
PCB-00095	D2	n/a	D1	n/a
PCB-00123	D2	n/a	D1	n/a
PCB-00150	D21	D10	D20	D3
PCB-00154	D14	n/a	D13	n/a

E.10 Center of Gravity Reference

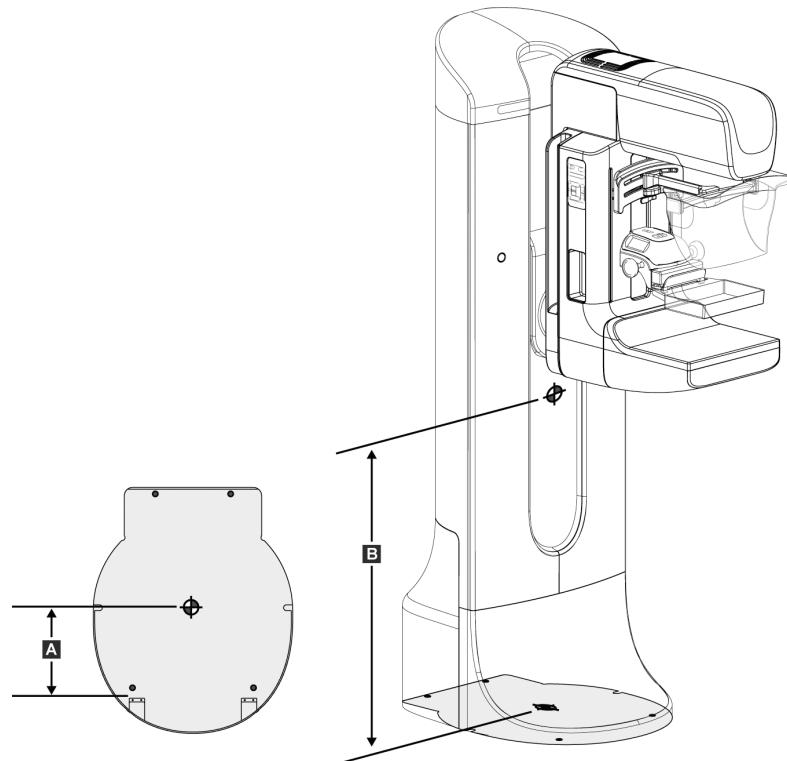


Figure 249: Gantry Center-of-Gravity Reference

- A. 31.8 cm (12.521 inches)
- B. 95.5 cm (37.60 inches)

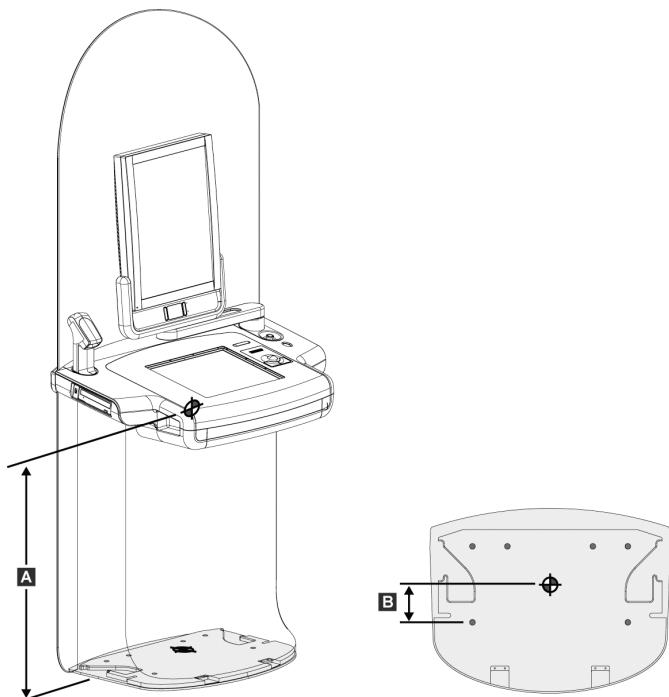


Figure 250: Premium Acquisition Workstation Center-of-Gravity Reference

- A. 62.87 cm (24.75 inches)
- B. 10.48 cm (4.125 inches)

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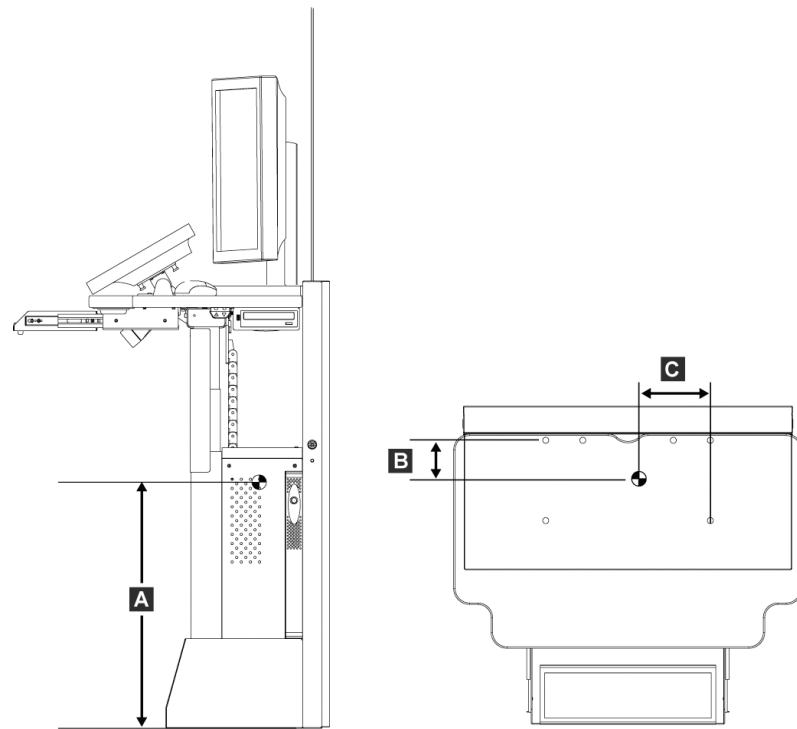


Figure 251: Standard Acquisition Workstation Center-of-Gravity Reference

- A. 64.3 cm (25.30 inches)
- B. 11.43 cm (4.5 inches)
- C. 18.8 cm (7.4 inches)

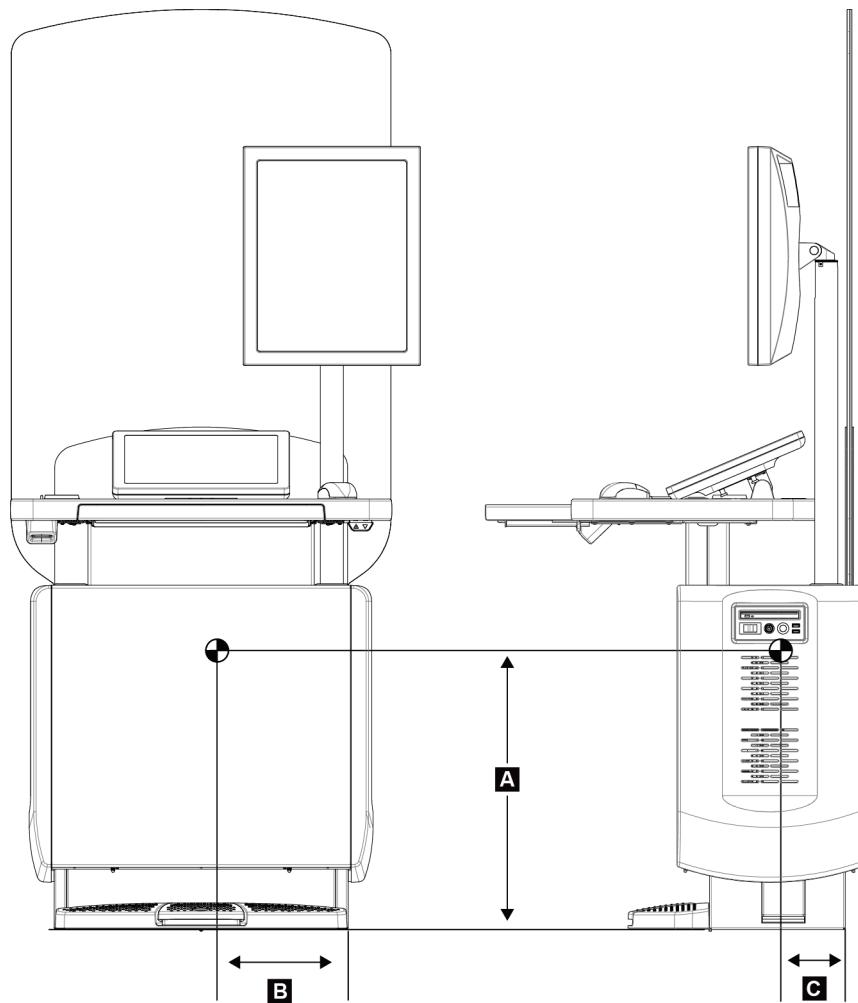


Figure 252: Universal Acquisition Workstation Center-of-Gravity Reference

- A. 61.7 cm (24.30 inches)
- B. 28.95 cm (11.4 inches)
- C. 14.2 cm (5.6 inches)

E.11 Hologic Connect Configuration

The following procedure explains the steps to configure a Selenia Dimension system to use Hologic Connect™ software.

E.11.1 Procedure

1. From any Applications screen, go to the Windows Desktop:
 - a. Press the Windows key.



Figure 253: Windows Key

- b. Right-click on the clock displayed in the tool bar in the lower right-hand side of the screen and select **Show the Desktop**.

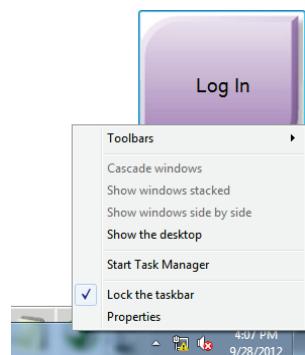


Figure 254: Show the Desktop

2. Test the internet connection.
 - a. Click the Windows **Start** button.



Figure 255: Start Button

- b. Type **iexplore** into the search box and select **OK**.

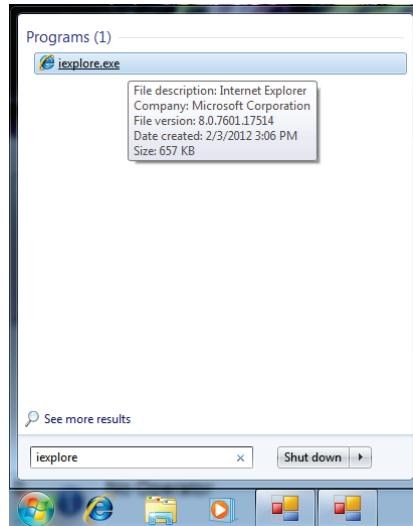


Figure 256: iexplore Screen

- c. The web browser should open. Go to <http://www.hologic.com>.
 - d. If the website does not appear, there is no connection to the internet. Proceed to [Troubleshooting](#) on page 368.
3. Find the Hologic Connect icon on the desktop and double-click it.



Figure 257: Hologic Connect Icon

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4. Choose Selenia Dimensions from the drop-down box.

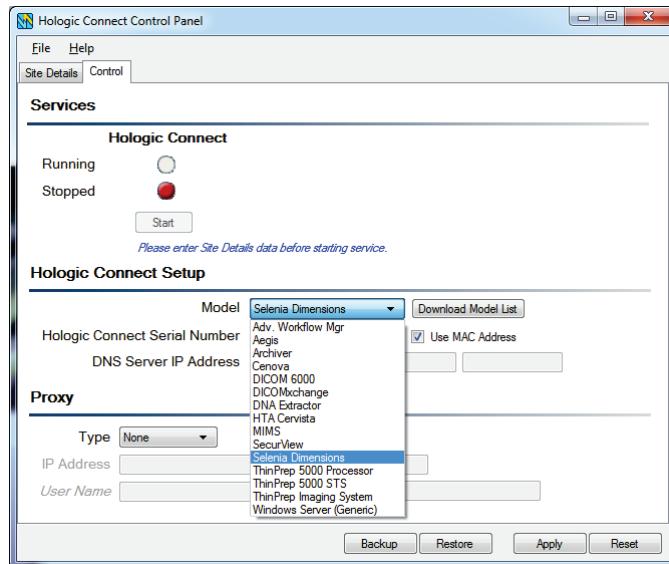


Figure 258: Hologic Connect Control Panel - Drop-Down Box

5. Select the Site Details tab at the top of the box and enter the site information. When entering details be specific and consistent. For example, don't use St. at one location and Saint at another. Always use the standard two letter abbreviation for the state, for example, use TX instead of Texas.

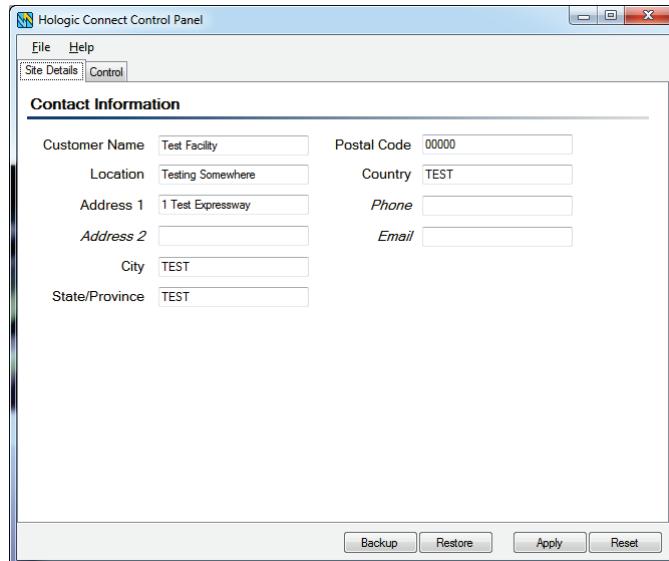


Figure 259: Hologic Connect Control Panel - Site Details

6. Select the Control tab at the top of the box.

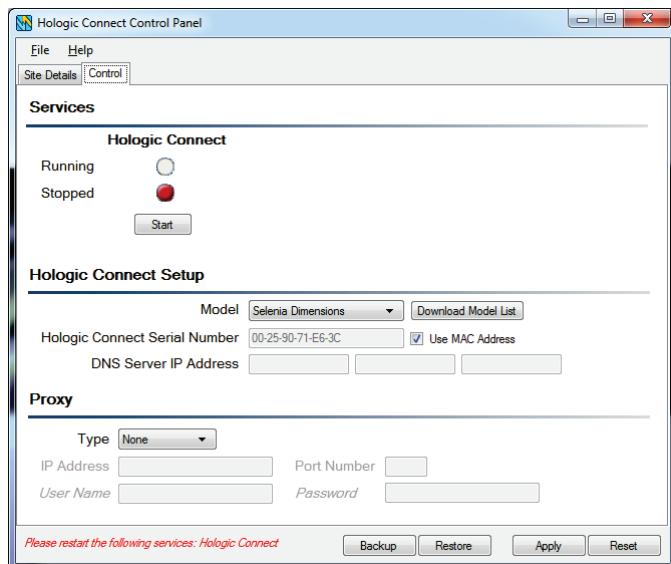


Figure 260: Hologic Connect Control Panel - Control Tab

7. Restart the system to complete the Hologic Connect configuration.
8. For verification of connection on the Hologic Connect server, email "seleniasupport@hologic.com". Please include:
 - customer name
 - system serial number
 - MAC address for each system
9. For Hologic Technical Support use the following methods: by phone, +1.800.760.8342, or by email, imgsupport@hologic.com.
10. Configuration is complete.

E.11.2 Troubleshooting

If the external website does not appear, configure a proxy server. Consult with the site Information Technology (IT) personnel to determine how they manage network security.

Entering the Network Identifiers

The application derives network identification parameters from entries you make using the *Network and Sharing Center* in Windows Control Panel. Use this procedure to enter the server host name, DNS server, IP address, subnet mask, and default gateway. Consult with the site IT administrator.

1. Enter the site IP address, subnet mask, default gateway, and DNS server.
 - a. Select **Start > Control Panel > Network and Sharing Center**. (Tip: Right click the Desktop Network icon and select properties.)

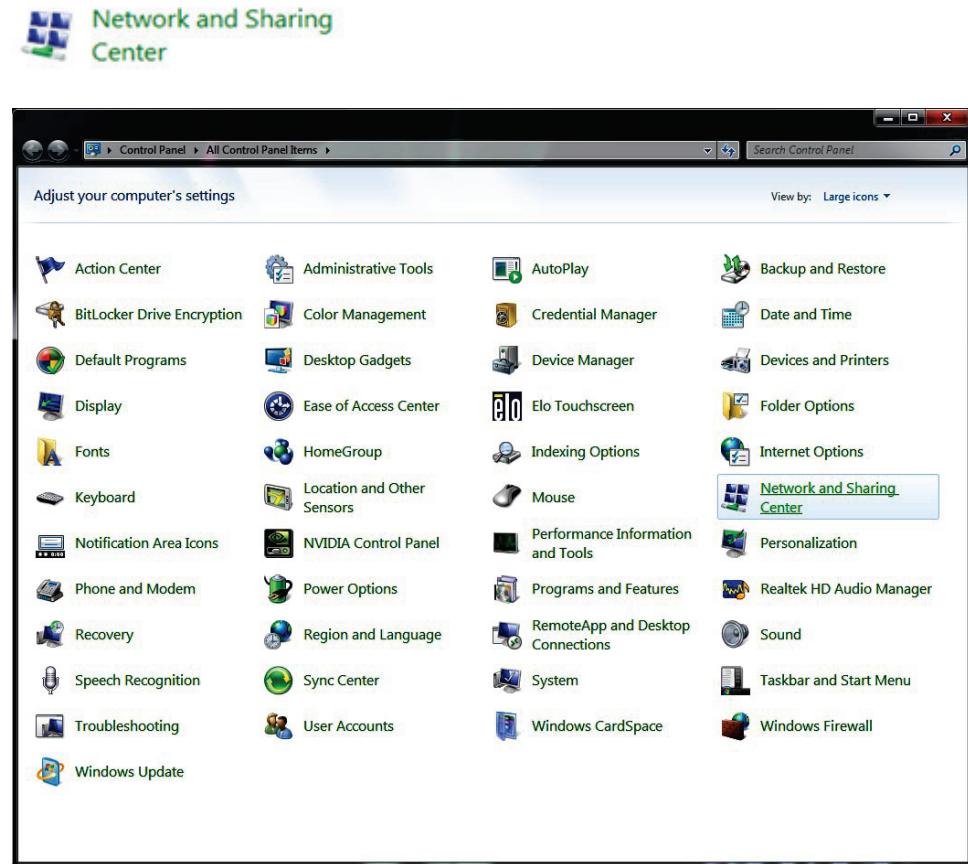
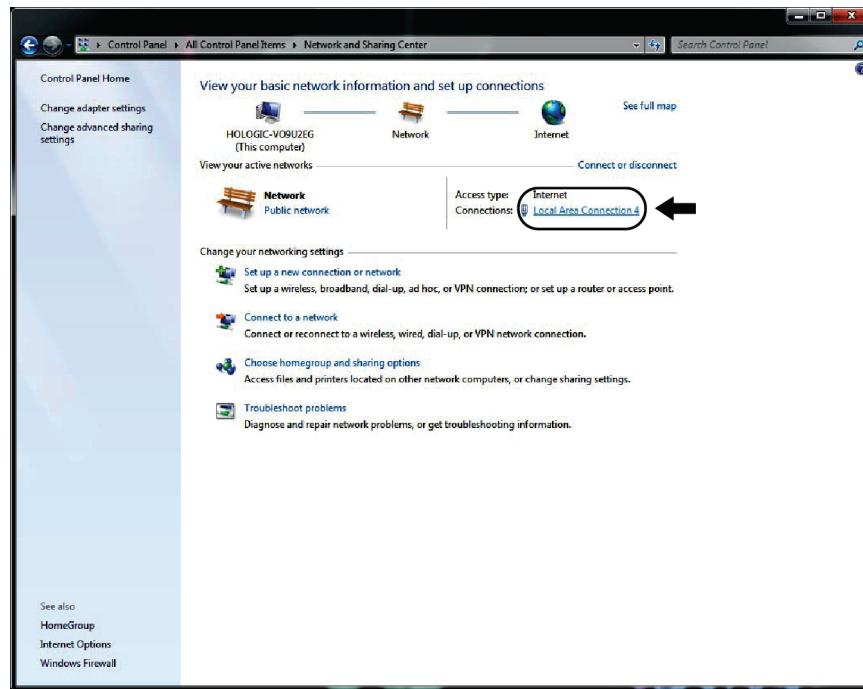


Figure 261: Control Panel - Network Connections

b. Click Local Area Connection.



c. Select Properties.

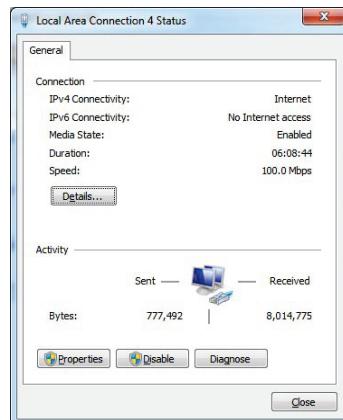


Figure 262: Local Area Connection

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- d. Select **Internet Protocol Version 4(TCP/IPv4)** and click the **Properties** button.
The Internet Protocol Version 4 (TCP/IPv4) Properties window appears.

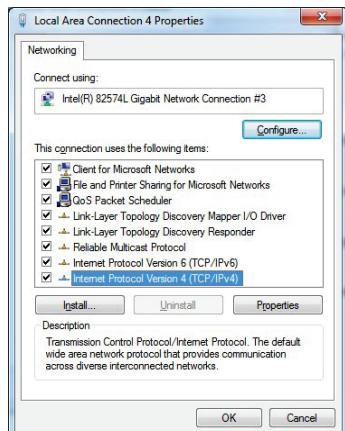


Figure 263: Internet Protocol

- e. Select the "**Use the following IP address**" option, and then enter the site IP address, Subnet mask, Default gateway, and DNS server address.
- f. Click **OK**, and then click **Close**.
2. Change the system host name if necessary. Consult with the site IT administrator before changing the server host name.
 - a. Right click **Computer** and select **Properties** to display the System Properties window. (Tip: Desktop Computer icon can also be used.)

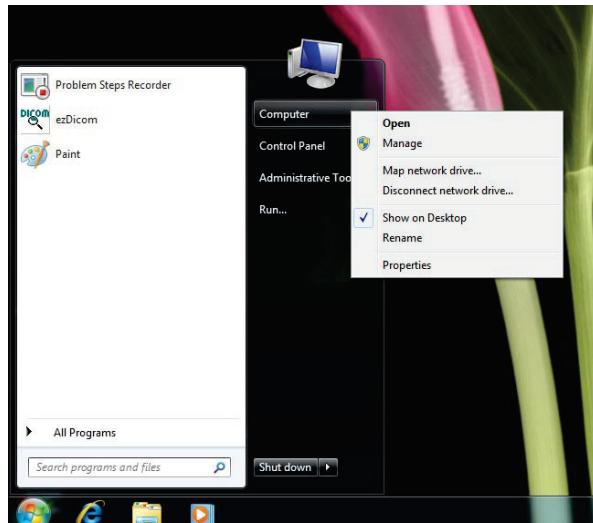


Figure 264: My Computer

- b. Click **Advanced System Settings** and then click the **Computer Name** tab.

- c. Click **Change**.

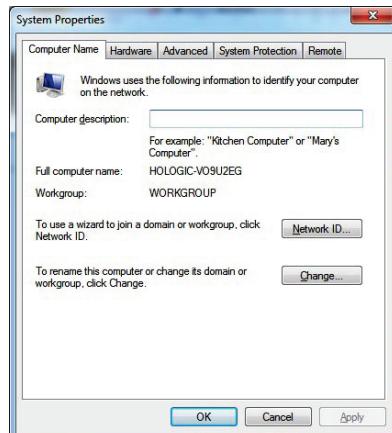


Figure 265: System Properties - Computer Name

The system displays:



Figure 266: Computer Name Changes

- d. Enter the host name in the Computer name field.
- e. Click **OK** (twice) to return the System Properties window.
- f. Click **Close**. When the System Settings Change window appears, click **Restart now** to restart the system.

Configure a Proxy Server

A proxy server sits between a client and the Internet. It serves as an intermediary gateway to pass acceptable requests from clients, then forwards those requests to other servers.

1. Select a proxy type. Select the Control tab from the Hologic Connect Control Panel and select the drop-down list next to Proxy Type.

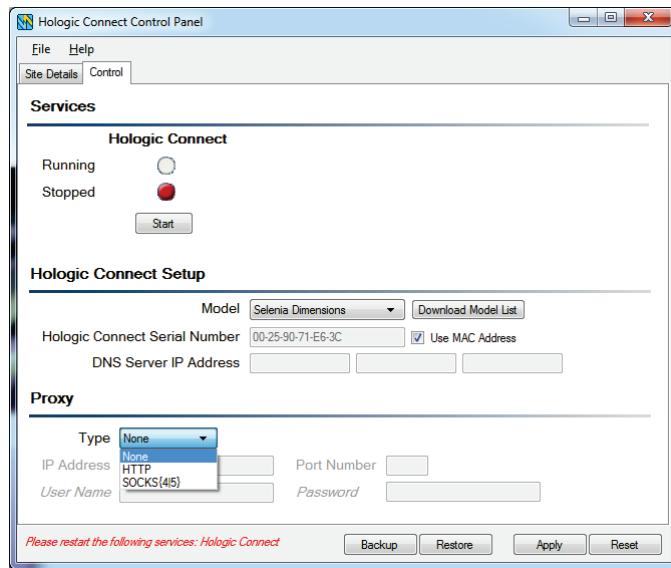


Figure 267: Hologic Connect Control Panel - Proxy Type

- **None**—No Proxy Server
 - **HTTP**—The session connects through a Hypertext Transfer Protocol (HTTP) proxy server. HTTP is a communications protocol used to transfer information on intranet and the World Wide Web.
 - **SOCKS{4|5}**—The session connects through SOCKS version 4 or 5 proxy server. SOCKS is an abbreviation for SOCKetS, and is an Internet protocol that allows client-server applications to transparently use network firewall services.
2. Enter proxy server settings. Enter the appropriate IP Address, Port, User Name, and Password for the customer's proxy server.
 3. Click Apply to save the settings. The server displays "**Please restart the following service: Hologic Connect**".
 4. Restart Hologic Connect service as explained in step 8 of the Hologic Connect Configuration instructions shown earlier in this appendix.
 5. Verify the Internet connection as explained in Step 2 of the Hologic Connect Configuration instructions shown earlier in this appendix.

E.11.3 Technical Support Information

Call Hologic Technical Support if there are any questions.

Appendix F Forms

F.1 Installation Checklist

Instructions: Photocopy this form for your use during installation.

F.1.1 Gantry Installation

- Configure the Isolation Transformer—see [Configure the Isolation Transformer](#) on page 30.
- Input Power Configuration—see [Input Power Configuration](#) on page 31.
- Remote X-ray On/Power On Lamp Connection—see [Remote X-ray On/Power On Lamp Connection](#) on page 33.
- Remove the Grid Assembly Shipping Bracket—see [Remove the Grid Assembly Shipping Bracket](#) on page 34.
- Installing the Image Receptor—see [Install the Image Receptor and Breast Platform](#) on page 34.

F.1.2 Acquisition Workstation Installation

Fasten the Acquisition Workstation in Position

- For Universal Acquisition Workstation, see [Mount the Workstation in Position](#) on page 36
- For Premium Acquisition Workstation, see [Mount the Premium Acquisition Workstation in Position](#) on page 50
- For Standard Acquisition Workstation, see [Mount the Standard Acquisition Workstation in Position](#) on page 58

Installing the Preview Display Monitor

- For Universal Acquisition Workstation, see [Install the Preview Display Monitor](#) on page 41
- For Premium Acquisition Workstation, see [Install the Preview Display—Standard Configuration](#) on page 52 or see [Install the Preview Display—Optional Configuration](#) on page 53
- For Standard Acquisition Workstation, see [Install the Preview Display](#) on page 59

Installing the Radiation Shield

- For Universal Acquisition Workstation, see [Install the Radiation Shield](#) on page 44
- For Premium Acquisition Workstation, see [Install the Radiation Shield](#) on page 60
- For Standard Acquisition Workstation, see [Install the Radiation Shield](#) on page 60

Input Power Configuration

- For Universal Acquisition Workstation, see [Input Power Configuration - UAWS "Input Power Configuration"](#) on page 44
- For Premium Acquisition Workstation and Standard Acquisition Workstation, see [Input Power Configuration](#) on page 54

Install the Acquisition Workstation Network Cables

- For Universal Acquisition Workstation, see [Install the Acquisition Workstation Cables](#) on page 46
- For Premium Acquisition Workstation, see [Install the Acquisition Workstation Cables](#) on page 57
- For Standard Acquisition Workstation, see [Install the Fiber Optic/Network Cables](#) on page 62

F.1.3 Configure the Output Devices

- Install a New Device on Dimensions system—[Install a New Device](#) on page 81.
- Test Installed Devices—[Test Installed Devices](#) on page 82.
- Change the System AE Title—[Change the System AE Title](#) on page 82.
- Set Up Query/Retrieve on Dimensions system—[Set Up Query/Retrieve](#) on page 82.
- Set Up MWL to Query MWL Provider—[Set Up MWL to Query MWL Provider](#)

F.1.4 Perform the Vertical Height Adjustment (optional)

- If you are installing the system in a room or a coach (mobile installation) where low ceiling height is a consideration, perform the Vertical Height Adjustment.

F.1.5 Perform the Functional Tests

(See the Selenia Dimensions System *User Guide*)

- Install each accessory provided with the system (Face Shields, Paddles, Crosshairs, Magnification Stands) to check the correct fit and correct system recognition.
- Compression Functions (Up, Down, Release)
- C-Arm Functions (Up, Down, CW Rotation, CCW Rotation)
- Collimator Lamp and Override
- Shifting Paddle System
- Emergency Off Switches
- Check operation of FAST paddle actuator from Calibration Tool

F.1.6 Bar Code Scanner

- [Verify the Bar Code Scanner](#) on page 182

F.1.7 HV Generator Calibrations

- kV Calibration—Calibration Tool; form on [Peak Tube Potential Form](#) on page 378
- Filament Calibration—Calibration Tool; form on [Tube Current/Exposure Time Product Forms](#) on page 377
- Save Calibration Files—Cal Tools; **Diagnostics > Transfer From Node**. Select Node to transfer from "GEN". Follow the on-screen instructions.

F.1.8 X-ray Field Alignment

- Calibration Tool; form on [X-ray Field Size Determination Forms](#) on page 378

F.1.9 Light Field Alignment

- Calibration Tool; form on [Alignment of Visually Defined X-ray Fields Form](#) on page 380

F.1.10 Image Receptor Calibrations

- Detector Gain Calibrations—Service Tools; **Admin>Service Tools**; then select **Hardware> Calibration**. Follow the on-screen instructions.
- Defect Mapping—Service Tools; **Admin>Service Tools**; then select **Hardware> Calibration**. Follow the on-screen instructions.
- Detector (AEC Calibration)—Calibration Tool.

F.1.11 Geometry Calibration

- Quality Control Manual

F.1.12 Compression System Calibration

- Compression Force Calibration—Calibration Tool
 Compression Thickness Calibration—Calibration Tool

F.1.13 Beam Quality Half Value Layer

- [Beam Quality Half Value Layer](#) on page 99; form on [Beam Quality Half Value Layer Form](#) on page 380

F.1.14 Linearity

- [Linearity](#) on page 100; form on [Linearity Form](#) on page 381

F.1.15 Reproducibility

- [Reproducibility](#) on page 101; form on [Reproducibility Form](#) on page 382

F.1.16 Artifact Evaluation

(See the Selenia Dimensions System *Quality Control Manual*)

- Meets criteria

F.1.17 Phantom Image Quality Evaluation

(See the Selenia Dimensions System *Quality Control Manual*)

- Meets criteria

F.2 Compliance Forms

F.2.1 Tube Current/Exposure Time Product Forms

LARGE FOCAL-SPOT

Tube Current Exposure Time Product Expected Results – Large Focal Spot									
mA Setting	mAs Setting	mAs Reading at 25kV	mAs Reading at 30kV	mAs Reading at 35kV	mAs Reading at 40kV	mAs Reading at 45kV	mAs Reading at 49kV	Minimum Permitted mAs	Maximum Permitted mAs
50	10							8.0	12.0
100	100							96	104
150	200							196	204
140	200							196	204
200	400							384	416

SMALL FOCAL-SPOT

Tube Current Exposure Time Product Expected Results – Small Focal Spot									
mA Setting	mAs Setting	mAs Reading at 20kV	mAs Reading at 25kV	mAs Reading at 30kV	mAs Reading at 35kV	mAs Reading at 39kV	mAs Reading at 41.6kV	Minimum Permitted mAs	Maximum Permitted mAs
20	10							8.0	12.0
30	40							38.4	41.6
40	40							38.4	41.6

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Appendix F: Forms

F.2.2 Peak Tube Potential Form

LARGE FOCAL-SPOT:

kVp	mA Setting	mAs Setting	Tube Voltage (kV)	Minimum Permitted kV	Maximum Permitted kV
20	100	100		19.60	20.40
25	130	120		24.50	25.50
30	170	200		29.40	30.60
35	200	200		34.30	35.70
40	170	200		39.20	40.80
45	150	200		44.10	45.90
49	140	200		48.02	49.98

F.2.3 X-ray Field Size Determination Forms

Collimation / FS / Shift	Measurement Location	Specification (cm)	Actual (cm)
24x29/Large/Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
18x24/Large/Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
15x15 / Large / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	

Collimation / FS / Shift	Measurement Location	Specification (cm)	Actual (cm)
10x10 / Large / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
7x8.5 / Large / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
18x24 / Small / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
15x15 / Small / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
10x10 / Small / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
7x8.5 / Small / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	

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Appendix F: Forms

F.2.4 Alignment of Visually Defined X-ray Fields Form

Collimation / Focal Spot	18 x 29cm / LARGE	18 x 24cm / LARGE	24 x 29cm / LARGE	Max. Dev.
Front Edge (chest wall)				
Rear Edge				The sum of the Front plus the Rear edge disregarding the sign must be less than or equal to 10mm.
Sum of Front plus Rear disregarding the sign				
Left Edge				The sum of the Left plus the Right edge disregarding the sign must be less than or equal to 10mm.
Right Edge				
Sum of Left plus Right				

F.2.5 Beam Quality Half Value Layer Form

Beam Quality Half Value Layer – Expected Results				
Target / Filter Combination	W / Rh	W / Ag	W / Rh	W / Ag
Filter Position	1	3	1	3
Nominal kVP Setting	30	30	35	39
mA setting	100	100	100	100
Time or mAs setting	80	80	80	80
Added Thickness of Aluminum	Exposure Measurements (mR)			
0.0mm				
0.4mm				
0.7mm				
	Expected			
	0.4 < HVL <0.7	0.4 < HVL <0.7	0.5 < HVL <0.8	0.58 < HVL < 0.88
Calculated HVL				

F.2.6 Linearity Form

Large Focal Spot Linearity Expected Test Results						
mAs Setting	mAs	Meter Reading mR	Quotient mR / mAs	Difference [ABS] (Previous Quotient - This Quotient)	Sum (Previous Quotient + This Quotient)	Difference / Sum
10						
12						
16						
20						
32.5						
50						
100						
200						
320						
400						

Small Focal Spot Linearity Expected Test Results						
mAs Setting	mAs	Meter Reading mR	Quotient mR / mAs	Difference [ABS] (Previous Quotient - This Quotient)	Sum (Previous Quotient + This Quotient)	Difference / Sum
10						
12						
16						
20						
32.5						
45						
50						
80						
100						

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Appendix F: Forms

F.2.7 Reproducibility Form

	Meter Reading mR	$\frac{(mR - \text{Mean } mR)^2}{9}$	Test Results:
1			Standard Deviation (/(Sum of Quotients))
2			
3			
4			
5			
6			
7			
8			
9			
10			
	Sum (mR readings)	Mean mR (Sum/10)	Sum of Quotients

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