

# CX30 and CX50

## Service Manual

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CSIP Level I

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## About This Manual

### Audience

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This manual supports the field service maintenance and repair of the CX30 and CX50 ultrasound systems. The user of this document is a qualified ultrasound electronics technician who has completed training classes on the system and its peripherals.

This manual describes all the features and options available on the CX30 and CX50 ultrasound systems. Not all systems support all the features and options.

### New in This Revision

All previous revisions of this service manual are superseded by this revision, which adds or changes information as follows:

- Adds information on the following:
  - CX50 software versions 3.1.2 and 4.0
  - Patient data security on the CX50 system
  - S7-3t transducer
  - Sony UP-D898MD black-and-white printer

**Manual Format**

- Incorporates any change requests approved since the last release.
- This manual is in Portable Document Format (PDF), for viewing on a laptop computer with Acrobat Reader. A list of bookmarks functions as an additional table of contents. Those bookmarks, the table of contents, and cross-references use hypertext links to provide access to the referenced information.

**Conventions  
in This Manual**

The following conventions are used in this manual:

- Hypertext links are **blue**.
- All procedures are numbered, and all subprocedures are lettered. You must complete steps in the sequence they are presented to ensure reliable results.
- Bulleted lists indicate general information about a function or procedure. They do not imply a sequential procedure.
- Control names and menu items or titles are spelled as they are on the system, and they appear in **bold text**.
- Symbols appear as they appear on the system.
- An English system is assumed.
- When the term “system” is used alone, or no specific system distinction is made, it applies to all of the system configurations.

**Service Manual  
Questions  
or Comments**

If you have questions about the service manual, or you discover an error in the manual, contact Philips Ultrasound Technical Communications, MS 964, at the address below.

**Customer  
Assistance**

Various support locations around the world can provide customers technical assistance with the ultrasound system. Customers should contact the representative or sales office from which they purchased the system or the nearest Philips Ultrasound office.

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[www.healthcare.philips.com/ultrasound](http://www.healthcare.philips.com/ultrasound)

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# I General Information

## Introduction

This section describes the contents of the manual. It also provides a general overview and physical description of the system configurations, and a summary of application, feature, and regulatory information.

---

**NOTE** The information in this manual is based on the assumption that you are trained in the operation of this system and that you will operate it as intended. For user information and instructions, see the on-system Help feature (press **Help**) or the *User Manual*.

---

## Removal of Hazardous Substances (RoHS)

The RoHS standards provide country-specific environmental guidelines for toxic substances used in the manufacture of medical equipment. The standards apply primarily, but not exclusively, to countries in the European Union. Compliance is voluntary outside of Europe.

As of July 2014, new-build CX50 ultrasound systems became RoHS-compliant. All system components on new-build systems that previously contained hazardous substances specified in the RoHS standards have been replaced with components not containing those substances. The RoHS standards also apply to replacement parts used to repair medical equipment.

This manual adds RoHS-compliant parts information where applicable. If a RoHS-compliant part has been added to the manual, the RoHS status is indicated in the parts list for the old and new parts.

The CX30 Ultrasound System is not RoHS-compliant.

---

**NOTE** System RoHS status must be maintained. When you replace system parts, follow current repair practices for your region.

---

The system hardware version ([Table I-1](#)) identifies the system RoHS status. System hardware labels are located on the label on the rear panel.

**Table I-1**      **RoHS Status of System Hardware Versions**

Hardware Version	CX50	CX30	Operating System	RoHS Status	Notes
A	X	X	Windows XP	Non-RoHS	Parts are identified in <a href="#">Section 11, “Cabling”</a> , <a href="#">Section 14, “Parts”</a> and <a href="#">Section 15, “Transducers”</a>
B	X	X	Windows 7	Non-RoHS	
C	X	--	Windows 7	RoHS	

## More About This Manual

This manual is organized as follows:

- [Section 1, “General Information”](#): Provides a general overview of the system and this document.
- [Section 2, “Specifications”](#): Provides a summary of system specifications.
- [Section 3, “Safety”](#): Summarizes safety information. This is *required* reading for the service representative.
- [Section 4, “Theory of Operation”](#): Provides a basic functional description of the system: A breakdown of the system functional elements and a description of their relationships and simple principles of operation (how the system works).
- [Section 5, “Installation”](#): Provides step-by-step initial delivery pre-installation and installation instructions for the system. This section contains important information and is *required* reading for the service representative.

- [Section 6, “Performance Tests”](#): As applies, includes test procedures for ensuring that the system operates safely and as intended.
- [Section 7, “Adjustments”](#): Provides adjustment information for the system, as applies. Except as noted, there are no voltage, calibration, or alignment adjustments to make in the field for the system.
- [Section 8, “Preventive Maintenance”](#): Identifies activities supporting the quality assurance audit (QAA) concept that you should perform in accordance with Customer Field Service policy for this system.
- [Section 9, “Troubleshooting”](#): Provides troubleshooting information that will assist you in determining if a system is failing, and, if so, will help you isolate the cause.
- [Section 10, “Disassembly”](#): Provides specific information about system disassembly that may be required for the removal and installation of field-replaceable parts. If not covered by a detailed procedure, the means of removing a system part can be discerned from the illustrations in this section as well as from those in [Section 13, “Configuration”](#) and in [Section 14, “Parts”](#): Instructions for crating the system for shipment are also included.
- [Section 11, “Cabling”](#): Provides system signal and power interconnect information, cable part number information, and (sold-with-system) peripheral connection diagrams.
- [Section 12, “Change History”](#): A chronology of the system software and hardware releases.
- [Section 13, “Configuration”](#): Lists all the released software versions for the system, identifies the primary system PCBs, and shows where these PCBs are located in the system. When applicable, additional PCB reference information is provided. As applies, this section also contains configuration information such as the hard disk drive jumper positions, and the Philips-recommended settings for the optional peripherals sold with the system.

- [Section 14, “Parts”](#): Provides field-replaceable part numbers and information for parts that are not dependent upon system features and software versions (PCBs and certain hardware assemblies). Call your Philips representative for the core information you need to determine the compatibility of primary system PCBs and certain hardware assemblies with respect to the system software releases.
- [Section 15, “Transducers”](#): Summarizes general and part-number information for the transducers that can be purchased for the system.
- [Section 15, “Transducers”](#): Describes or references information, procedures, and service functions that are useful when supporting system administration or related service activities.

## System Overview

CX30 and CX50 systems are compact, fully-featured, diagnostic ultrasound systems. Each system includes one receptacle for imaging transducers and one receptacle for a pencil probe. When the system is connected to the optional cart configured with the Multiport adapter, the system uses the Multiport adapter’s three receptacles for imaging transducers.

CX30 and CX50 systems have multiple configurations. For a chronology of the system software and hardware releases, see [Section 12, “Change History”](#).

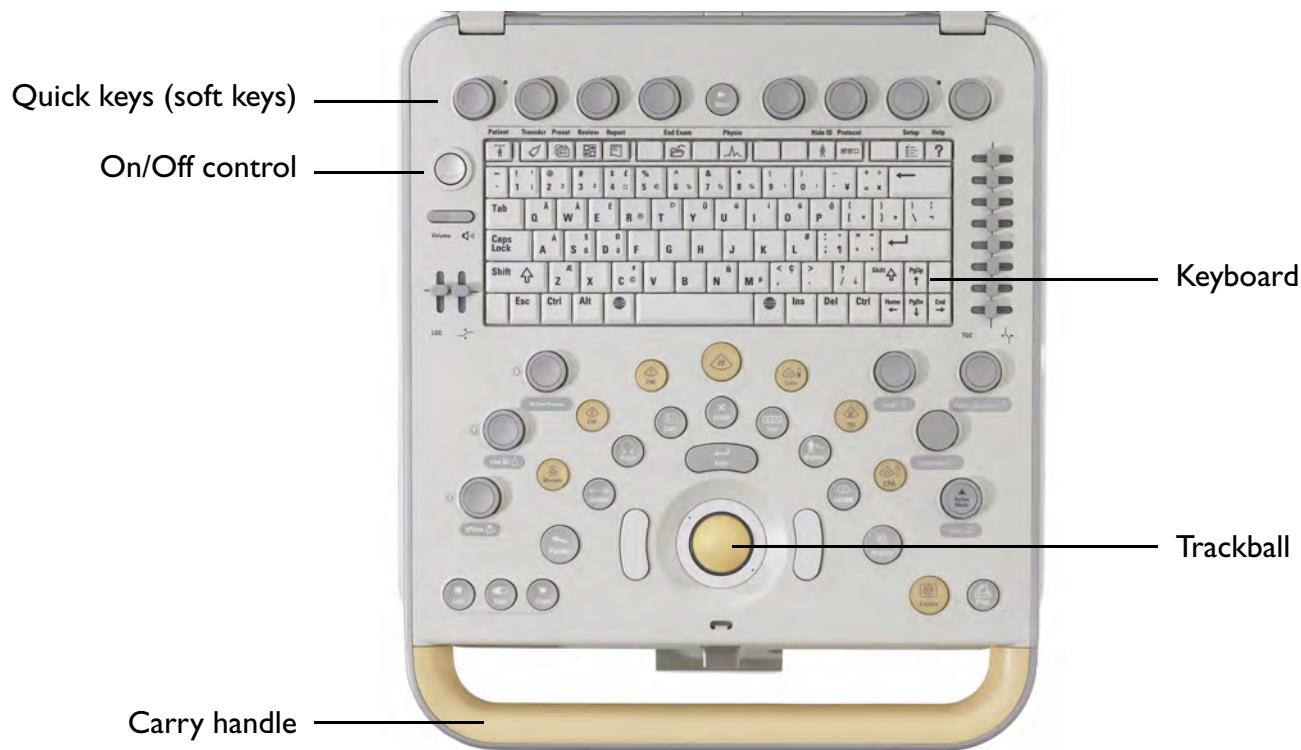
CX30 and CX50 systems are powered by an internal battery and can scan for up to 45 minutes on a full charge. An external AC line power adapter can be connected between the system and an AC power source, providing power to the system (with or without battery) for system operation exceeding 45 minutes. The system battery is recharged when the AC line power adapter is connected.

Figure I-1

**CX30 and CX50 Ultrasound Systems (Open Position)**

Figure 1-2

## User Interface Assembly (CX50 System Shown)



## Features

The following is an initial-release feature summary. For detailed feature information, see the *User Manual* or on-system *Help*. Features added in follow-on releases are summarized in [Section 12](#), “[Change History](#)”.

- Fully featured cardiovascular (CV) ultrasound system in laptop form weighing 7.3 kg (16 lb)
- Up to 45 minutes of scanning on battery power
- 38-cm (15-in) LCD display
- 128-channel beamformer supporting 4x multi-line
- Adult cardiac applications
- 2D, Color, PW Doppler, CW Doppler, and M-mode
- Contrast LVO and Harmonics
- Dedicated CV user interface
- Dynamic Stress Echo package
- Tissue Doppler Imaging package
- Image management
- QLAB Advanced Quantification Software
- Standard network connectivity
- Wired and wireless connectivity
- DICOM connectivity
- Internal DVD drive
- USB support (USB data storage devices, wireless network adapters, printers, foot switch)
- Optional cart
- Optional carrying case

**About  
Removable  
Media and USB  
Devices****DVD and CD Media**

DVD and CD media are available in many types. Some media types are not fully compatible with the system DVD drive. Media compatibility and capacity is addressed in detail in the most current CX30/CX50 *Media Compatibility* document.

**USB Data Storage Device Information****CAUTIONS**

- Take care when using USB memory devices that have been used on other computers. They can contain viruses.
  - Be certain that the writing process is complete before unplugging a USB device from the USB port. Depending on the tasks the system is performing, a delay may occur before the writing process starts and completes. Premature removal of the USB device can result in file damage.
- 
- USB data storage devices (hard drives and flash memory drives) can be used as removable media for the same purposes as DVDs or CDs. That includes the following:
    - Importing and exporting DICOM still images and loops
    - Importing and exporting OB trending documents
    - Importing and exporting studies
    - Exporting JPEG and AVI images and structured report documents.
    - Backing up system settings, presets
    - Downloading error logs
  - Philips does not recommend the use of USB hard drives that require external AC power.

- The system cannot differentiate one set of system files from another. Customers and FSEs should not back up more than one version of system settings, configurations, or presets to the same USB device.
- USB flash drives are not recommended for long term data archival.
- When you save images to USB flash drives, the system does not use the flash drive's "given" name when creating the file title. For example, a flash drive with the name "Kingston" will not have "Kingston" in the file name; the file name will be something such as "3\_074\_07\_05." This occurs every time an image is saved to the flash drive.
- USB drives, when inserted into a system USB port, are automatically assigned a drive letter; the drive letter varies by system configuration. You can connect multiple USB storage devices at one time, but you cannot export to or import from multiple drives or types of drives simultaneously. You must select the drive letter corresponding to the drive you want before performing the intended action.
- When using a USB cable from any USB port on the system to connect to a USB device, shorter cable lengths are preferred over longer cable lengths, for optimum performance.
- Many USB devices have an LED that indicates writing status. It is helpful to use a USB device that has a status indicator, verifying often that the indicator works, and to wait several seconds after the indicator light turns off before disconnecting the drive.
- USB connectors can malfunction if dirty or corroded. It is good practice to inspect the USB plug before inserting it in the USB port.

## Transducers

For transducer information, see [Section 15, "Transducers"](#).

## WARNING

Use only Philips-supplied transducers on these systems.

The system has two transducer connectors on the compact system case, a Tyco TC Ziff imaging transducer connector and a CW “pencil-probe” non-imaging transducer connector.

A Multiport adapter (part description: Multiple Transducer Module or MTM), which allows from one to three imaging transducers to be connected to the system via the cart at the same time, is available as an option.

## Languages

Besides English, the system software supports the following languages:

- Danish
- Dutch
- English
- French
- German
- Italian
- Norwegian
- Portuguese
- Spanish
- Japanese
- Russian
- Simplified Chinese
- Swedish

## Options

The system software contains all of the clinical and service options available for a specific configuration. A section of the software is “enabled” to allow its configuration options to operate in accordance with the customer's purchase.

## Peripherals

The system has commercial-off-the-shelf (COTS) driver software to support at least one of each of the following printers:

- A digital black-and-white medical printer ([Figure 1-3](#)). The COTS (DRIVERS) software supports the Sony BW UP-D897MD and the Sony BW UP-D898MD A6 medical printers. Each may be used in an “on-cart” or “off-cart” configuration.
- A digital color medical printer ([Figure 1-3](#)). The COTS (DRIVERS) software supports the Sony color UP-D23MD A6, UP-D25MD, and Mitsubishi color CP30DW medical printers. They may be used in an “on-cart” or “off-cart” configuration. (Color printer not available on cart with Multiport adapter).
- An InkJet report printer (not shown).The COTS (PRINTERS) software supports the report printers qualified for use on the system.
- Report printers supported by the system are provided by the customer and are not mounted on, or powered by, the system cart.

Figure 1-3

Optional System Peripherals



UP-D898MD Sony  
Digital Black-and-White Printer



UP-D25MD Sony  
Digital Color Printer



UP-D897MD Sony  
Digital B/W Printer



UP-D23MD Sony  
Digital Color Printer



CP30DW Mitsubishi  
Digital Color Printer

## Physical Description

### System User Interface

The system physical structure uses metal and plastic parts. The system ([Figure 1-1](#)) consists of a user interface (control panel), a visual display (video monitor), and the internal electronic components.

### System Monitor

The control panel ([Figure 1-2](#)) is the primary user interface. It is a replaceable, self-contained module integrated into the compact case. The control panel contains a backlit alphanumeric keyboard, slide controls, knobs, hard controls, soft keys called “quick keys,” and a trackball. For information about the control panel functions, see the *User Manual* or on-system Help.

### Internal Components

All of the system electronic components are inside the compact case. For interconnect information, see [Section 11, “Cabling”](#). For identification and location of the primary system PCBs, see [Section 13, “Configuration”](#).

### External Components

The compact system in stand-alone configuration does not provide any storage for additional transducers, cables, gel, or accessories. Without the optional cart or carrying case, the user must carry those items separately.

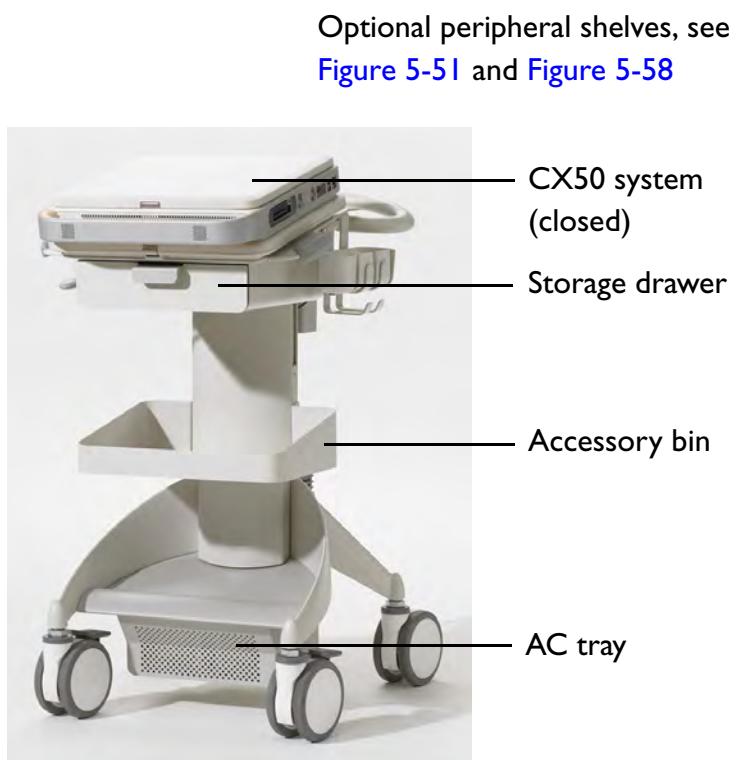
### Optional Cart

The optional cart ([Figure 1-4](#), [Figure 1-5](#), [Figure 1-6](#)) has a base and framework that provide a chassis on which you can mount the compact system and a peripheral. The cart provides storage for additional transducers, cables, gel, and accessories.

The cart can be configured with the optional Multiport adapter, which allows connection of multiple transducers. When the Multiport adapter is present, the imaging transducer receptacle on the system is unavailable and the imaging transducers can only be connected to the Multiport adapter.

The four casters of the cart are swivel mounted to provide maneuverability. Depending on the configuration of your cart, two casters have steering locks to aid in maneuvering the cart, two

casters have brakes to immobilize the cart, and two casters could have a combined brake and swivel lock (preventing the casters from rotating and swiveling).

**Figure I-4****Optional System Cart (A.0 or B.0 Cart)**

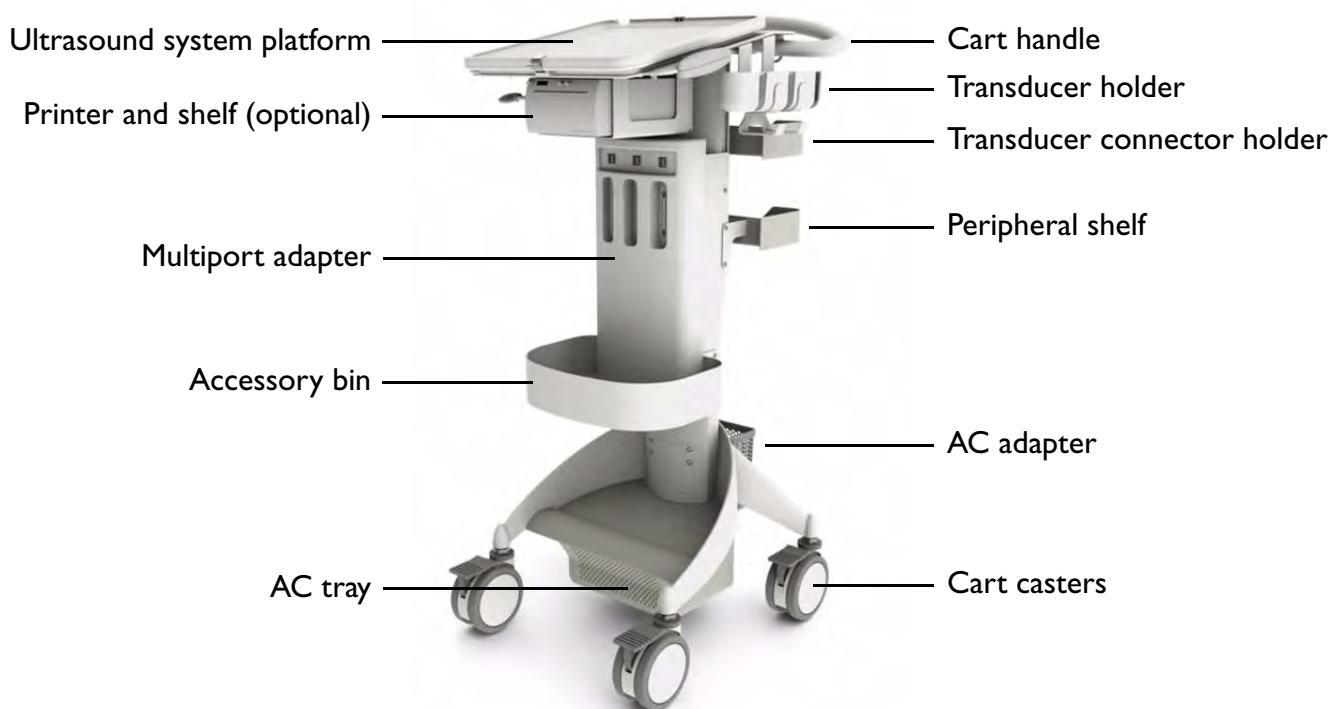
**Figure 1-5****Optional System Cart (C.0 Cart)**

Figure I-6

## Optional System Cart (D.0 Cart)



## Reference Information

Besides this service manual, system reference documentation includes the following for each system:

- *Uncrating Instructions* (also provided on the outside of the crate)
- On the User Information CD that comes with the system:
  - *User Manual* (also provided to the customer in hard copy)
  - *Help* (a copy of the user Help on the system)
  - *Acoustic Output Tables*
  - *AIUM Medical Ultrasound Safety booklet*
  - *Shared Roles for System and Data Security*
  - *Media Compatibility*
- Online Help (an on-system electronic guide, accessed by pressing the **Help** key, that assists system user with using the product software and hardware)

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**NOTE** For detailed information on Integrated Ultrasound, see the *CX50 Integrated Ultrasound User Manual* or the *Allura XPer FD Integrated Ultrasound Instructions for Use*, which accompany the CX50 system and Allura system user documents when Integrated Ultrasound is purchased. The primary CX50 system and Allura system user documents do not address Integrated Ultrasound.

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## Safety Requirements

The system complies with the requirements of IEC 60601-1, including all applicable collateral and particular standards, as well as all applicable national deviations.

## Supplies and Accessories

Ultrasound supplies and accessories, including transducer biopsy guides, kits, and covers or sheaths, are available from CIVCO Medical Solutions at the addresses and numbers below. Supplies and accessories are not available from Philips Ultrasound.

CIVCO Medical Solutions  
102 First Street South  
Kalona, IA 52247-9589

Telephone: 800-445-6741 (USA and Canada)  
+1 319-248-6757 (International)

Fax: 877-329-2482 (USA and Canada)  
+1 319-248-6660 (International)

E-mail: [info@civco.com](mailto:info@civco.com)

Internet: [www.civco.com](http://www.civco.com)

CIVCO no longer stocks ECG trunk cables, lead sets, and electrodes for Philips ultrasound systems. You can order lead sets from any supplier. Order only ECG trunk cables, lead sets, and electrodes with Type BF electrical isolation as specified in IEC 60601.

## System Shipping Information (Crating and Uncrating)

For ultrasound system crating procedures, see “[Disassembly Procedures](#)” on page 292.

For ultrasound system uncrating procedures, see “[Installation Procedures](#)” on page 122.

## 2 Specifications

### Introduction

This section summarizes the system specifications.

### Physical Specifications

Different physical system configurations are available. Each is different in terms of size, weight, mobility, and storage.

- Stand-alone, hand-carried system configuration
  - Width: 41.3 cm (16.25 in)
  - Height: 39.4 cm (15.5 in) with monitor fully open, 7.6 cm (3.0 in) with monitor closed
  - Depth: 35.6 cm (14 in)
  - Weight: 6.17 kg (13.6 lb)
- D.0 cart system configuration
  - Width: 51.2 cm (20.2 in)
  - Height: 144.8 cm (57.0 in) with monitor open and cart fully raised: 113.0 cm (44.5 in)
  - Depth: 60.0 cm (23.6 in)
  - Weight: 69 kg (152 lb) with printers, AC adapter, transducers, and all cables
- A.0, B.0, or C.0 cart: system configuration
  - Width: 53.3 cm (21 in)
  - Height: 152.4 cm (60 in) with monitor open; 120.7 cm (47.5 in) with monitor closed
  - Depth: 56.4 cm (22.2 in)
  - Weight: 69 kg (152 lb) with printers, AC adapter, transducers, and all cables

- AC adapter
  - Tectrol (gray color) adapter
    - Width: 12.4 cm (4.9 in)
    - Height: 6.7 cm (2.6 in)
    - Depth: 20.2 cm (8.0 in)
    - Weight: 1.6 kg (3.6 lb)
  - Emerson (mushroom color) adapter
    - Width: 13 cm (5.1 in)
    - Height: 7.4 cm (2.9 in)
    - Depth: 20.8 cm (8.2 in)
    - Weight: 2.1 kg (4.6 lb)

## Electrical Specifications

The system contains a power supply designed to work with a voltage range of 85-264 V~, 47-63 Hz at 750 VA. The system is powered by an internal battery. It can scan for up to 45 minutes on a full charge. An external AC line power adapter can be connected between the system and an AC power source, which provides power to the system (with or without) battery for system operations exceeding 45 minutes. The system battery is recharged when the AC line power adapter is connected.

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**NOTE** Maintaining the battery charge or ensuring the availability of AC power in a low-charge or absence-of-battery situation is important for proper system operation.

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## Environmental Specifications

### Operational

- Temperature range: 10°C to 40°C (50°F to 104°F)
- Relative humidity: 15% to 80% noncondensing
- Pressure limits: 525 mmHg to 795 mmHg (700 hPa to 1,060 hPa)

### Storage/Shipping

- Temperature range: -15°C to 65°C (-4°F to 149°F)
- Relative humidity: 93% at 32°C (89.6°F), noncondensing
- Pressure limits: 375 mmHg to 795 mmHg (500 hPa to 1,060 hPa)

## Monitor Specifications

The system monitor is a 38-cm (15-in) LCD monitor with an integrated microphone.

- Screen size: 39.1 cm (15.4 in) with 4:3 aspect ratio
- Screen area: 304.5 mm x 228 mm (12.0 in x 9.0 in)
- Resolution:
  - LG monitor: 1400 x 1050 (SXGA +)
  - Hydis monitor: 1600 x 1200
  - NLT monitor: 1024 x 768
- Pixel pitch: 0.2175 mm (0.0086 in), 116 PPI, vertical stripe
- 262K colors available
- Super in-plane switching (S-IPS) technology

## Scan Lines

Up to 1,024 scan lines, depending on transducer and mode

**Gray Shades** 255 in 2D, M-mode, and Doppler

**Input Signals**

- High- and low-level ECG
- Pencil probe receptacle
- Physio pulse, phono, auxiliary 1, and auxiliary 2
- Single transducer receptacle or three transducer receptacles, depending upon system

**Output Signals**

- External printer
- Physio analog signal
- USB serial data
- Video: DVI-I (depending on system configuration)
- Video: VGA color

---

**NOTE** DVI-I video is available in either analog or digital. DVI-I to VGA adapter is possible but all displays must support 1600 x 2100 and a 60-Hz format. Video scalers can often convert to this format, but they are not supplied by Philips.

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**Data Connections**

- Digital Navigation Link (DNL)
- Ethernet network (Gigabit, 10Base-T, and 100Base-T)
- USB 3.0 devices at USB 2.0 speeds
- Wireless network (IEEE 802.11 a/b/g/n)

**Physio**

- ECG amplitude range: 0.15 mV to 5.0 mV
- Duration of the QRS wave: 40 ms to 120 ms

## Peripherals

The black-and-white image printer can be mounted on the cart, depending upon cart configuration. The other peripherals cannot be mounted on the cart but can be connected to the system.

- Black-and-white video printer
- Color video printer
- External monitor
- Report printer

# 3 Safety

## Introduction

This section summarizes the safety information for the system and is required reading for anyone intending to service this system.

## About Safety Information

**Please read this and related information before using or servicing a Philips ultrasound system.** It applies to the ultrasound system, transducers, recording devices, and any optional equipment.

This system is intended for use by, or by the order of, and under the supervision of a licensed physician qualified to direct the use of the device.

In this manual, **WARNING** is used to indicate the presence of a hazard that can cause personal injury or death if the warning is ignored.

In this manual, **CAUTION** is used to indicate the presence of a hazard that can cause equipment damage if the caution is ignored. It can also indicate the potential for loss of patient or system data.

In this manual, **NOTE** is used when an additional comment or explanation is required about installation, operation, or maintenance information that is important but not necessarily hazard-related.

## General Operating Safety

Read the *User Manual* for detailed safety and standards information for the system. That manual includes critical information about the intended uses of the system, patient and operator safety, and device standards. Maintenance personnel should be aware of that information.

## Electrical Safety

### WARNINGS

This equipment has been verified by a recognized third-party testing agency as a Class I device with Type BF and Type CF isolated patient-applied parts and Type B non-isolated patient-applied parts. For maximum safety observe these warnings:

- Do not connect the ultrasound system to the same circuit used for life-support devices.
- Shock hazards may exist if this system (when mounted on its cart or plugged directly into an AC power source), including all externally mounted recording and monitoring devices, is not properly grounded. Protection against electrical shock is provided by grounding the cart or the AC power adapter with a three-wire cable and plug, which must be plugged into a grounded outlet. The grounding wire must not be removed or defeated. Never plug the system into a multi-connector AC power strip.
- To avoid risks of electrical shock and fire hazards, inspect the system power cord and plug on a regular basis. Ensure that they are not damaged in any way.
- Do not remove the protective covers on the system; hazardous voltages are present inside. System covers must be in place while the system is in use. All internal adjustments and replacements must be made by a qualified Philips Ultrasound field service engineer.
- Do not operate this system in the presence of flammable gases or anesthetics. Explosion can result from electrical ignition.
- To avoid risk of electrical shock hazards, always disconnect the system from the wall outlet before cleaning the system.
- To avoid risk of electrical shock hazards, always inspect transducers before use: Check the face, housing, and cable before use. Do not use if the face is cracked, chipped, or torn; the housing is damaged; or the cable is abraded.

**WARNINGS**

- To avoid risk of electrical shock, do not use any transducer that has been immersed beyond the specified cleaning or disinfection level.
- All patient-contact devices, such as transducers, pencil probes, and ECG leads must be removed from the patient contact prior to application of a high-voltage defibrillation pulse.
- Connection of optional devices not supplied by Philips Ultrasound could result in electrical shock. When such optional devices are connected to your ultrasound system, ensure that the total system earth leakage current does not exceed 300 µA.
- Avoid placing the system in an environment that may produce electrostatic discharges (ESD) that could affect the ultrasound system performance. (Electrostatic discharges can cause the ECG heart rate display to increase by 10% to 15% for a few seconds after the discharge, even though the ECG heart rate display returns to normal within a few seconds. See "[About Electrostatic Discharge](#)" on page 77.)
- Avoid placing the system in an environment that may produce electromagnetic interference (EMI) that could impact the diagnosis of a patient. (Only a physician can determine if an artifact caused by radiated interference has a negative impact on image quality and the subsequent diagnosis.)
- Using cables, transducers, and accessories other than those specified for use with the system may result in increased emissions from, or decreased immunity of, the system.

## Battery Safety

The battery is sealed in a hardened plastic case. Inside the case, the battery contains several chemical and electrical fail-safes that prevent the battery from being a hazard. As long as the integrity of the case is uncompromised, the battery is completely safe for normal use in a clinical, development, or testing environment.

## WARNINGS

- Never try to open or tamper with the battery casing; doing so could result in serious bodily harm.
- Do not dismantle, open, or shred secondary cells or batteries.
- Do not expose cells or batteries to heat or fire. Avoid storage in direct sunlight.
- Do not short-circuit a cell or a battery. Do not store cells or batteries haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects.
- Do not remove a cell or battery from its original packaging until required for use.
- Do not subject cells or batteries to mechanical shock.
- If a cell leaks, do not allow the liquid to come in contact with skin or eyes. If such contact occurs, wash the affected area with copious amounts of water and seek medical advice.
- Do not use any charger other than that specifically provided for use with the equipment.
- Observe the plus (+) and minus (-) marks on the cell, battery, and equipment; and ensure correct use.
- Do not use any cell or battery that is not designed for use with the equipment.
- Do not mix cells of different manufacture, capacity, size, or type within a device.

**WARNINGS**

- Keep cells and batteries out of the reach of children.
- Seek medical advice immediately if a cell or a battery has been swallowed.
- To avoid risk of electrical shock hazards, always turn off the system, disconnect it from the wall outlet, and remove the battery before cleaning the system.
- Wipe the cell or battery terminals with a clean dry cloth if they become dirty.
- Secondary cells and batteries need to be charged before use. Always use the correct charger and refer to the manufacturer's instructions or equipment manual for proper charging instructions.
- Do not leave a battery on prolonged charge when not in use.
- Use only the cell or battery in the application for which it was intended.
- When possible, remove the battery from the equipment when not in use.
- If a battery case has been cracked, punctured, or otherwise compromised, place the battery in a heavy-duty resealable plastic bag, and dispose of it as hazardous material, in accordance with local, state, or federal laws.
- If a battery leaks or emits a strong odor, remove it from the system and store it away from any ignition source. Avoid contact with the fluid. If you get fluid on your skin, wash the area with copious amounts of water and seek medical assistance.
- If a damaged battery must be shipped, place the battery in a heavy-duty resealable plastic bag and ship it by ground as Class 9 hazardous material. Do not ship damaged batteries by air.

## AC Power Adapter Safety

### WARNINGS

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- Do not place the AC adapter on the floor. You can place it on a table or chair. Only “sealed devices” are allowed to be placed on the floor in the patient care area per the safety standards.
  - When using the AC adapter, do not connect the ultrasound system to the same circuit used for life-support devices.
  - To avoid risks of electrical shock and fire hazards, inspect the AC adapter cord and plug regularly. Ensure that they are not damaged in any way.
  - When using the AC adapter, it must be plugged into a grounded outlet. The grounding wire must not be removed or defeated.
  - When disinfecting the AC adapter, it must not be sprayed with liquid, but it can be disinfected using a wipe method. Always unplug the adapter before disinfecting it.
- 

### CAUTION

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To avoid battery discharge, do not leave the AC adapter connected to the system when the cart or power cord is not plugged in.

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## Avoiding EMI and RF

Although the system has been manufactured in compliance with existing EMI/EMC requirements, use of this system in the presence of an electromagnetic field can cause momentary degradation of the ultrasound image. If this occurs often, review the environment in which the system is being used, to identify possible sources of radiated emissions. These emissions could be from other electrical devices used within the same room or an adjacent room. Communication devices such as cellular phones and pagers can cause these emissions. The existence of radio, TV, or microwave transmission equipment located nearby can cause emissions. In cases where EMI is causing disturbances, it may be necessary to relocate your system.

Electrosurgical units (ESUs) and other devices intentionally introduce radio frequency (RF) electromagnetic fields or currents into patients. Because imaging ultrasound frequencies are also in the RF range, ultrasound transducer circuits are susceptible to RF interference. While an ESU is in use, the noise generated can severely interfere with the black-and-white image and completely obliterate the color image.

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### CAUTION

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Avoid placing the system in an environment that may produce electrostatic discharges (ESD) that could damage the ultrasound system. (See “[About Electrostatic Discharge](#)” on page 77.)

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## Mechanical Safety

### WARNINGS.

Although the system is designed to be compact and mobile, you still must take precautions when moving it. The physical aspects of this system present a hazard that can cause injury, property damage, or equipment damage if the following information is ignored:

- Before moving the system, be sure to turn it off, disconnect the AC adapter cord, and disconnect all external devices. Move and secure external devices away from the system.
- Ensure the system is closed and locked. Unlock the cart caster locks before moving a system using an optional cart. Push with the handle at the rear of the cart. After the system is in position, engage the caster locks to immobilize the system.
- For systems using the optional cart, be aware of the casters as well as the extremities of the system when moving it. Improperly handled, the system, in any configuration, can cause injury to you or others. Use additional caution when going up or down inclines.
- When attempting to overcome an obstacle, do not push the system with enough force to cause it to tip over. Do not exceed 10 degrees of incline.
- Never park the system on an incline.
- For transport, ensure the system is closed and locked. Secure the system so that it cannot roll or tip. For systems using an optional cart, engage the caster locks and use wheel chocks and restraining straps. Do not attempt to hold the system in place manually during transport. Never strap or secure the system at any point on the control top or monitor.

**CAUTIONS**

- Ensure that the cables for all patient-applied parts are secure before moving the system. Use the cable management system to ensure that transducer cables are protected from damage.
- Do not roll the system over transducer cables or power cables.
- If the system behaves abnormally after moving or transporting, contact Philips Ultrasound Customer Service immediately. The components can withstand considerable shock, but excessive shock can cause a system failure.

**General  
Equipment  
Protection**

Follow these additional precautions to protect the system from damage:

**CAUTIONS**

- If systems, transducers, and peripherals have been in an environment below 10°C (50°F), allow them to reach room temperature before connecting or turning them on. Philips recommends allowing 24 hours for complete normalization. Otherwise, condensation inside the device could cause damage. If the device was only briefly exposed to temperatures below 10°C (50°F), then the time required for the device to return to room temperature could be significantly less than 24 hours.
- For optimal performance when using the AC adapter, the ultrasound system should be connected to a power circuit dedicated solely for the ultrasound system.
- Verify system and peripheral power sources are appropriate before connecting to them.
- Avoid placing the system in an environment that may produce electrostatic discharges (ESD) that could damage the ultrasound system. See “[About Electrostatic Discharge](#)” on page 77.

**CAUTIONS**

- Excessive bending or twisting of cables on patient-applied parts may cause failure or intermittent operation of the system. Do not run over cables with the system, which may damage them.
- In general, only the area of the transducer acoustic window is watertight. Except where specified in specific transducer cleaning instructions, do not immerse the remainder of a transducer in any liquid.
- Practice proper cleaning or sterilization of a patient-applied part to avoid damage.
- Do not submerge the cables of patient-applied parts in solution. The cables are not liquid-tight beyond the applied part/cable or cable/connector interfaces.
- Do not use solvents such as thinner or benzine or abrasive cleaners on the system, transducers, video monitor, touch screen, or any printer.

**About Electro-static Discharge**

Electrostatic discharge (ESD), commonly referred to as a static shock, is a naturally occurring phenomenon. ESD is most prevalent during conditions of low humidity, which can be caused by heating or air-conditioning. During low-humidity conditions, electrical charges naturally build up on individuals and can create static shocks.

An ESD condition occurs when an individual with an electrical energy buildup comes in contact with objects such as metal doorknobs, file cabinets, computer equipment, and even other individuals. The static shock or ESD is a discharge of the electrical energy buildup from a charged individual to a lesser or non-charged individual or object.

The level of electrical energy discharged from a system user or patient to the ultrasound system can be significant enough to cause damage to the system or transducers. The following precautions can help to reduce ESD: antistatic spray on carpets; antistatic spray on linoleum; antistatic mats; or a ground wire connection between the system and the patient table or bed.

## ESD Safeguards

Follow these general ESD guidelines to minimize deterioration or destruction of ESD-sensitive electronic components:

- Avoid working in carpeted areas.
- If you use a vacuum cleaner to clean the interior of any part of the system sensitive to static electricity, take the necessary ESD precautions to avoid static buildup and discharge.
- Use a properly grounded wrist strap.
- Use a grounding mat for assembly work on sensitive areas.

## Environmental Safety

Components and accessories removed from the system must be returned to Bothell or recycled or disposed of according to local, state, and federal laws.

## Symbols

The International Electrotechnical Commission (IEC) has established a set of symbols for medical electronic equipment that classify a connection or warn of potential hazards. Of those symbols, the following may be used on the system and its accessories and packaging.

<b>Rx only</b>	USA federal law restricts this device to sale by or on the order of a physician.
	Isolated patient connection (Type BF applied part).
	Defibrillation-proof patient connection (Type BF applied part).

	Non-isolated patient connection (Type B applied part).
	Isolated patient connection for applied part intended for intraoperative use, including direct cardiac application and contact with major vessels (Type CF applied part).
	Defibrillation-proof patient connection (Type CF applied part).
	Identifies ESD (electrostatic-discharge) sensitivity of a connector that is not tested as specified in IEC 60601-1-2. Do not touch exposed connector pins. Touching exposed pins can cause electrostatic discharge, which can damage the product.
	Identifies the On/Off control.
	On a two-position power switch, represents On (   ) and Off ( O ).
	Identifies a caution.
	Indicates that the user should see the instructions for use for safety information.
	Identifies equipotential ground.

	Identifies earth ground.
	Identifies protective earth ground.
	Nonionizing electromagnetic radiation. Indicates that interference may occur in the vicinity of equipment marked with this symbol.
	Indicates conformance with European Council Directive 93/42/EEC.
	The radio component contained in this device is compliant to Council Directive 1999/5/EC (Radio Equipment and Telecommunications Terminal Equipment Directive).
	Class 2 radio equipment identifier per Directive 1999/5/EC. European Union member states may apply restrictions on putting this device into service or placing it on the market. This device is intended to be connected to the Publicly Available Interfaces for use throughout the European Economic Area.
	Class 2 radio equipment identifier per Directive 1999/5/EC. European Union member states may apply restrictions on putting this device into service or placing it on the market. This device is intended to be connected to the Publicly Available Interfaces for use throughout the European Economic Area.
	Indicates that the device is protected against the effects of vertically falling water. This degree of protection can apply to transducers.

<b>IPX4</b>	Indicates that the device is protected against the effects of splashing liquids. This degree of protection can apply to foot-operated devices.
<b>IPX7</b>	Indicates that the device is protected against the effects of immersion. This degree of protection can apply to transducers and foot-operated devices.
<b>IPX8</b>	Indicates that the device is protected against the effects of immersion for up to 60 minutes. This degree of protection can apply to foot-operated devices or transducers.
	Indicates the need for separate collection for electrical and electronic equipment in compliance with the Waste Electrical and Electronic Equipment (WEEE) Directive. When accompanied by  or  , components of the device may contain lead or mercury, respectively, which must be recycled or disposed of in accordance with local, state, or federal laws. The backlight lamps in an LCD system monitor contain mercury.
	Do not throw away. Dispose of in accordance with local, state, or federal laws.
	Do not reuse.
	Use-by date.

GMDN	Global Medical Device Nomenclature Code.
	Indicates a possible crushing hazard to hands.
	Warns of system over-balance due to external force. (Do not push on the monitor or the transducer holders to move the system.)
	Warns that the system should not be used stacked with other equipment. If the system is used stacked with or adjacent to other equipment, verify normal operation before use.
	Indicates the temperature range (noncondensing) for transport and storage. (Does not apply to media.)
	Indicates the atmospheric pressure range for transport and storage.
	Indicates the relative humidity range (noncondensing) for transport and storage.
	Indicates that a connector receives alternating current.

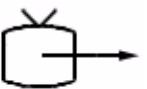
	Identifies fuse boxes or their locations. For continued protection from fire and shock, replace fuses only with fuses of the same type and rating.
	Identifies the date of manufacture.
	Identifies the legal manufacturer.
	This side up: Points toward the side of the shipping crate that should be kept facing up.
	Indicates that the device should be kept dry.
	Indicates that the device is fragile; handle with care.
	Do not use if damaged.
	Keep away from sunlight.

	Non-sterile.
	Sterilized using ethylene oxide.
	Catalog number.
	Batch code.
	Serial number.
	Universal part number.

The following symbols may also be used on the system and its accessories and packaging:

	Indicates a hazard to patients with pacemakers. Do not place field generator within 200 mm (8 in) of an installed pacemaker.
	Connection for a pencil probe.
	Connection for a pencil probe.
	Connection for a transducer.
	Connection for ECG and physio leads.
	Connection for ECG and physio leads.
	Print remote output.
	Input port for audio left/right, VHS/S-VHS, microphone, CD, or DVD.

	Output port for audio left/right, VHS/S-VHS, video patient monitor, black-and-white printer, or interlaced RGB output port.
	VGA or parallel output port.
	DVI video output receptacle.
	USB input/output port.
	FireWire (IEEE 1394) input/output port.
	Ethernet connection.
	RS-232 serial port.
	System microphone.

AUX POWER ISOLATE OUTPUT	Isolated auxiliary power provided for connection of Philips-approved remote accessories.
	Foot switch.
	SVGA, DVI-I, HDMI, or DisplayPort connection.
AUX 	SVGA connection.
	Video connection.
	S-Video connection.
	B/W composite video output connection.
	Color composite video output connection.

	Video print trigger connection.
	Identifies the port for the PercuNav field generator.
	Identifies the port for the PercuNav tool connection unit.
	Identifies the TCU port that is used to connect the TCU to the ultrasound system.
	China RoHS Hazardous Substances are not contained in the EIP (Electronic Information Products).
	Chinese Environmentally Friendly Use Period symbol.
	CSA (CSA International) classification symbol.

	EU Authorized Representative
	Russian approval (GOST)
	Customs Union Mark of Conformity (EurAsian Conformity Mark)
	UL (Underwriters Laboratories) classification symbol.
	Indicates a possible pinch hazard when positioning the monitor.

The following symbols are used inside the system:

	Dangerous voltages: Appears adjacent to high-voltage terminals, indicating the presence of voltages greater than 1,000 Vac (600 Vac in the United States).
	Indicates equipotential ground.

# 4 Theory of Operation

## Introduction

This section provides a basic functional description of the system: a breakdown of the system functional elements, a description of their relationships, and simple principles of operation (how the system works).

## System Architecture

The system is fundamentally a combination of the following functional elements:

- Physical assemblies comprising compact system components and the optional mobile cart
- Electrical power functions
- Ultrasound signal generation and control functions
- Echo acquisition and control functions
- Signal and image data processing and analysis functions
- Visual and audio presentation functions (image management and review)

The system uses Microsoft Windows XPe Embedded operating system (on A.x hardware versions) or Windows 7 operating system (on B.x and later hardware versions).

The system ultrasound hardware architecture consists of custom electronics circuits that perform many of the ultrasound imaging functions in the system, such as transducer identification, transmit generation, beamforming, demodulation, detection, and image processing. Those components also are inside the compact case.

The CPU acts as a central processing unit, performing further processing of the image data, including the generation of the image display. The CPU also serves as the main controller of the ultrasound (US) components and the system user interface, and the organizer of all of the image management functionality.

The system software architecture consists of four major executables: beam-processing control (US), signal-processing control (US), imaging modes (CPU), and image management and review (CPU). Those executables communicate with each other over a high-speed serial link by using a proprietary token-ring network.

## Functional Description

The location and identification of the physical parts of the system are described in [Section 1, “General Information”](#), [Section 11, “Cabling”](#), [Section 13, “Configuration”](#), and [Section 14, “Parts”](#). The functional nature of each is described in this section.

The system electronics and software combine to support the production of ultrasound images. The user interface allows system control and viewing of the results. The system produces ultrasound images through the use of transducers, digital beamforming, and Doppler processing.

The system stores the ultrasound images and patient data on the hard disk drive and can copy that data to the removable media for offline review. The system can send those images to a black-and-white printer or to a color printer. It also generates printable reports.

## Physical Functions

The system physical structure comprises metal and plastic parts, packaged similarly to a laptop computer. The compact system ([Figure 1-1](#)) consists of a control panel, a visual display (video monitor), and the internal electronic components. An optional mobile cart is available.

**System  
Operating  
Power**

The system is powered by an internal battery. An external AC line power adapter can be connected between the system and an AC power source, which then provides power to the system and the battery via the Power Board.

**Battery**

The system is typically powered by an internal battery. An external AC line power adapter can be connected between the system and an AC power source, which provides power to the system and the battery. The system battery is recharged when the AC adapter is connected. See "[AC Power Adapter Safety](#)" on page 73 for important, additional battery information.

The actual voltage output of the battery depends on its state of charge. You can determine the status of the battery by checking the power status icon in the icon area of the system display, just above the quick keys. Battery status icons represent the overall state of the system power ([Table 4-1](#)). Left-clicking the power status icon displays a dialog box with more details about system power.

**Table 4-1**      **Battery and AC Indicators**

1.x-3.x software	4.x and later software	Description
		The system is running on AC power, and the battery is fully charged.
		The system is running on AC power, and the battery is charging.
		The system is running on battery power, and the battery is fully charged. Each band represents 20% of full battery power.
  	  	The system is running on battery power, and the battery is partially charged. Each band represents 20% of full battery power.
		The system is running on battery power, and the battery is nearly depleted and should be charged.

The battery has three levels of protection:

- Software current limit that disconnects the battery from the load if it detects excessive current draw
- Fuse that blows if it detects excessive current draw and the software does not disconnect in less than 30 seconds
- Thermal cut-out that detects if the battery gets too warm (which a short would cause) and shuts off the system if the battery gets too warm

#### **NOTES**

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- The AC adapter can power the system without a battery.
  - Maintaining the battery charge or ensuring the availability of AC power in a low-charge or absence of battery situation is important for proper operation.
  - After extended periods of storage, it may be necessary to charge and discharge the cells or batteries several times to obtain maximum performance.
  - Secondary cells and batteries give their best performance when they are operated at normal room temperature ( $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ).
  - Retain the original product literature for future reference.
-

## AC Line Power Adapter

The AC line power adapter (AC adapter) has a status LED on its case ([Figure 4-1](#)) that indicates condition of the adapter and the system battery ([Table 4-2](#)).

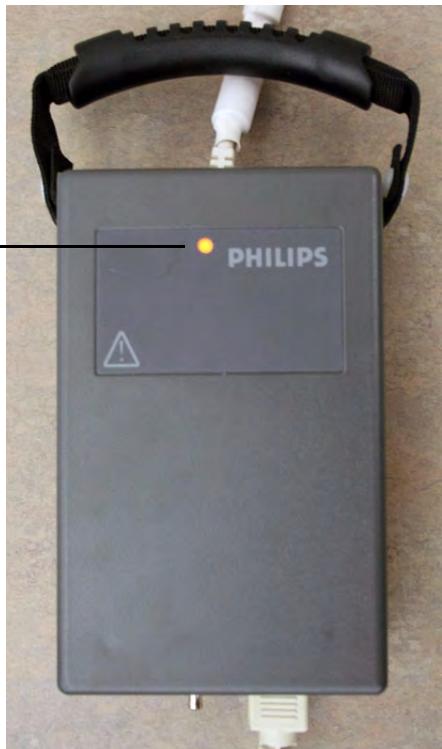
The AC adapter software monitors voltage and current. Because the battery looks like a short to the adapter when it is charging, the adapter maintains a constant-current mode of operation, limiting current to 13 A. In that mode, if the voltage drops below 11 V for 5 seconds, the adapter shuts down. Then you must unplug the adapter to reset the condition.

Due to its chemistry, the battery voltage should not drop below approximately 12 V. The only reason the adapter output might drop below 11 V is if a short circuit in the system causes the battery to disconnect; or possibly, the system is running without a battery and experiences a short.

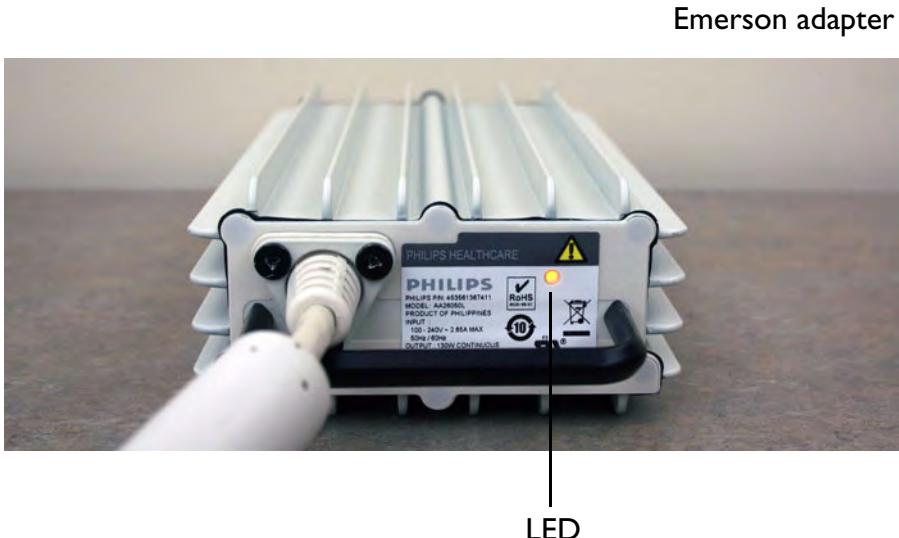
For important, additional AC adapter information, see “[AC Power Adapter Safety](#)” on page 73.

Figure 4-1

## AC Line Power Adapter LED Locations



Tectrol adapter



Emerson adapter

**Table 4-2****AC Line Power Adapter LED Indications**

LED State and Color	Status/Condition
Solid amber	AC adapter is connected to an AC power source, but is disconnected from the system.
Flashing green	AC adapter is connected to an AC power source and is connected to the system, without a working battery installed.
Solid green	AC adapter is connected to an AC power source and is connected to a system with a working battery installed.
Irregular flashing red <sup>1</sup> (flash, flash, flash, pause, repeat)	Adapter was reset.
Erratic flashing red	Error condition. See “ <a href="#">Miscellaneous</a> ” on page 254.
Regular, periodic flashing or solid red <sup>1</sup>	Error condition. See “ <a href="#">Miscellaneous</a> ” on page 254.

- I. When disconnecting and connecting the AC adapter or installing and removing a battery, the AC adapter LED may flash red momentarily. It is when the LED stays in a solid red state for more than a few seconds that you should consider the battery to be in an error condition.

## Operating System

The full-service, real-time Windows XPe operating system (A.x hardware) or Windows 7 operating system (B.0 and later hardware) resides on the hard disk drive (HDD) provides an integrated range of resources:

- Drivers and handlers for storage
- Video outputs
- Serial and parallel ports
- Support of file system services and graphical user interfaces

## Ultrasound Application Software

The ultrasound application software performs these tasks:

- Processes requests from the control panel.
- Sets up beam-forming parameters.
- Processes acquired ultrasound echoes into digital visual representations.
- Converts digital signals into analog signals.
- Performs measurements and calculations on acquired data.
- Stores acquired data (such as images and user-entered data) for subsequent retrieval.
- Performs all necessary functions to coordinate software tasks.
- Integrated Ultrasound: This is a software option that allows the CX50 system to integrate with the Allura Xper FD X-ray system. Specifically, the option allows the two systems to synchronize patient data, and for the ultrasound system to be controlled remotely from the X-ray system's "Xper module" touch screen.

## Imaging Functions

Electronics perform many of the ultrasound imaging functions in the system, such as transducer identification, transmit generation, beamforming, demodulation, detection, and image processing.

### Power, Signal, and Data Distribution

The power, signal, and data distribution functions are supported by the following hardware:

- Power Board
- Motherboard
- Side I/O Board

### Pulse Generation, Summation, Beamforming, Processing, Steering

The pulse generation, summation, beamforming, processing, and steering functions are supported by the following hardware:

- Two transducer connectors: One supports imaging transducers, and one supports CW non-imaging transducers (see [Section 15, “Transducers”](#)).
- Channel Boards: Two transmit-and-receive boards, Channel Board 0 (CB0) and Channel Board 1 (CB1). The two boards form the electronic beams for the transmit signals and process the receive signals. CB0 is the channel board closest to the Main Board (labeled on the MB connector).

## Central Processing Functions

Electronics, firmware, and software comprise the central-processing functions, performing further processing of the image data, including the generation of the image display to the screen.

### Main Board

The Main Board is responsible for beam processing and providing the functional interfaces.

## COM Express Module

The COM Express module is the central-processing unit (CPU).

## Hard Disk Drive (HDD)

The HDD contains the operating system, ultrasound application software, and COTS (DRIVER/PRINTER) software. The HDD stores acoustic power and intensity data and ultrasound images.

## CD-RW DVD Drive

The CD-RW DVD drive is a removable-media device used for archiving images and reports and upgrading the system.

## Physio Module

The Physio Module connects to the Main Board. The Physio Module provides circuitry for the acquisition and real-time display of physiological signals.

## User Interface

### Control Panel

The system control panel contains the circuitry to process control inputs from the system QWERTY keyboard, the knobs and slide controls, and the trackball.

### System Monitor

The system monitor is an RGB, 38-cm (15-in) LCD device that displays the ultrasound images and related data.

## I/O Interface

The system has various I/O (input/output) connections for external devices (see “[System Connector Information](#)” on page 411).

# 5 Installation

## Introduction

This section provides, but is not limited to, information supporting the installation tasks applicable to this system. It contains pre-installation and installation information for the system. Read this section completely before starting a system installation.

## Warnings and Cautions

Review [Section 3, “Safety”](#) before continuing. Also follow any additional warnings and cautions in this section.

## Inspecting the Installation Site

Inspect the site before system installation to ensure a trouble-free installation and help the customer provide an environment that supports reliable system performance.

## Checking Electrical and Environmental Requirements

Confirm that the system is to be installed and operated in a room or rooms that meet the electrical and environmental requirements given in [Section 2, “Specifications”](#).

## Image Management Network Requirements

The customer or their contractor shall install network cabling. If in-wall cabling is used, it is the customer's responsibility to install the correct type of cable, in accordance with all applicable building and fire codes. It is also the customer's responsibility to maintain the in-wall cabling for the life of the system.

► **To prepare to connect the system to a network and install the DICOM Connectivity option**

1. Identify the system administrator (and the administrator's backup person, if possible).
2. Obtain the following information from the system administrator:
  - List of all equipment that is part of the image-management network, including device type, model number, and software version applicable to each piece of equipment
  - Logical diagram of the network, showing topology, subnets, and such
  - Locations of equipment
  - Locations of all DICOM Connectivity LAN attachment points
  - Locations of power outlets and connector types
  - Locations of any dedicated analog phone lines
  - All necessary Internet Protocol (IP) addresses and subnet information
  - Application Entity (AE) titles for the ultrasound system and all connected devices
  - Port numbers for all connected devices
  - IP address, subnet mask, port number, and DICOM AE title for the system
  - IP address, port number, and AE title for each DICOM server

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**NOTE** Key network terms are defined in [Table 5-1](#).

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3. Determine the type of network cabling installed.
4. Check device compatibility before connecting new devices (such as printers or archive devices) to the network. See "[Configuring System Network Settings](#)" on page 112.

**Table 5-1****Key Network Configuration Terms Defined**

<b>Value</b>	<b>Description</b>
AE (Application Entity) title	(1) An arbitrary name, but a required field, for DICOM configuration. (2) In the DICOM setups, a field into which you enter the AE title.
Gateway	(1) A device or system that connects two networks together. (2) In the DICOM setups, a field into which you enter the gateway address of the ultrasound system. This field requires a four-byte IP address with each byte separated by a dot and in the range of 0 to 255.
IP address	(1) A four-byte IP address with each byte separated by a dot and in the range of 0 to 255. A required field for DICOM configuration of the ultrasound system or device. (2) In the DICOM setups, a field into which you enter the IP address.
Port number	(1) A number in the range of 0 to 65,535, found in the DICOM Conformance Specification for the ultrasound system or device. A required field for DICOM configuration of the ultrasound system or any device configured for DICOM operation. (2) In the DICOM setups, a field into which you enter the port number.
Subnet mask	(1) A four-byte IP address with each byte separated by a dot and in the range of 0 to 255. A required field for DICOM configuration of the ultrasound system. (2) In the DICOM setups, a field into which you enter the subnet mask of the ultrasound system.

## Unpacking the System

Inspect the shipping container and unpack the system as follows.

### Inspecting the Container

Inspect the shipping container before unpacking the system:

- Examine the shipping container for damage. Look for evidence that the container was opened.
- Report any damage or missing inventory to the carrier and to the Philips Ultrasound traffic department.

### Unpacking the System

Unpack the system by following the instructions in “[Unpacking the System](#)” on page 104.  
(Instructions for re-packing the system for shipment are in Section 10, “[Disassembly](#)”.)

### Inspecting the System

After the system is unpacked, conduct the following inspections. Report any damage or missing inventory to the carrier and to the Philips Ultrasound traffic department.

### WARNING

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Dangerous voltages are present inside the system. Do not install the system power cord or connect it to AC line voltage until correct line voltage has been verified, a thorough inspection of the system has been performed, and the system has been properly assembled.

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**► To inspect the system after unpacking**

1. Inventory the shipment against the packing list.
2. Inspect the outside surfaces of the system and peripherals for damage.
3. If an optional cart is purchased, verify that it rolls and turns smoothly on its casters.
4. Verify proper caster brake and swivel operation.
5. Remove any loose packing material, dust, or debris from the system.
6. Check that the vented covers are clean and free from obstructions.

Assemble the system as instructed in the “[Installation Procedures](#)” on page 122.

---

**NOTE** When instructed to secure hardware, tighten in accordance with the training you received on this product.

## Assembling the System

## Installing a Printer

If the system is ordered without the optional cart and with a printer, you must connect it as a remote peripheral in an appropriate work space near the system. If an optional cart is part of the order, the ordered printer arrives separately and needs to be installed on the cart (“[Installation Procedures](#)” on page 122).

---

**NOTE** CX50 systems with 4.x software and later are shipped with the UP-D898MD printer driver installed. If the printer driver is not installed on CX50 or CX30 systems, the UP-D898MD printer will have to be setup in UP-D897MD emulation mode. The printer is shipped with Field Installation Instructions for this task.

## Powering On the System

After the system has been unpacked and inspected, connect the AC adapter to the system and plug it into an appropriate AC outlet. Then switch the system power on. It is necessary and important to verify that the system is properly configured (“[Configuring the System](#)” on [page 106](#)).

## Configuring the System

Basic initial configuration is addressed in the following subsections. For detailed configuration and operation information, see the on-system user Help (press the **Help** key) after you boot the system.

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**NOTE** The Caps Lock defaults to “on” at boot, as indicated by an **(A)** on the bottom left of the display; no **(A)** indicates that Caps Lock is “off.” If Caps Lock is left on, password entries may be in error.

---

## Monitor Setup

For monitor settings, see “[Adjusting the Monitor](#)” on [page 241](#).

## Language Settings

The user interface language and the regional language settings must be set to the language that best matches the site location. The procedure to follow for setting the language depends on the language being set and the operating system of the ultrasound system.

### Setting the Language on Windows XP Systems (1.x to 3.x Software)

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**NOTE** The following procedures assume a system set to English that you want to change to a different language. On systems already set to another language, the language-specific text appears. It is assumed that you have working knowledge of both English and the language in which you are configuring the system.

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► **To select English or Russian on systems with Windows XP**

1. Press **Setup**.
2. Click the **System** tab.
3. Click **Locale** to open the **Regional and Languages Options** dialog box.
4. On the **Regional Options** tab, in the **Standards and Formats** list, select the language that best matches the site location.

---

**NOTES**

- If the number, currency, time, or date formats in the selected language do not match the site locale, click **Customize** to correct the settings.
  - Customizing the date format to one that is longer than any in the list may cause dates in the display to be truncated.
  - The language in which the on-system *Help* is displayed is determined by the locale selected under **Standards and Formats**, if that language is available. If the selected language is unavailable, Help is displayed in the same language as the rest of the system.
- 

5. In the **Location** list, select the location that best matches the site location.
6. Click the **Languages** tab.
7. In the **Language Used in Menus and Dialogs** list, select a language.
8. Click the **Advanced** tab.
9. In the **Language for Non-Unicode Programs** list, select the language that best matches the site language.
10. Click **OK**.

11. If the language settings were changed, the following dialog boxes appear:

- **Change Regional Options** (Click **OK**.)
- **Advanced** (Click **Yes**.)
- **Change Regional Options** (Click **Yes** to accept the change and reboot the system.)

► **To select languages other than English or Russian on systems with Windows XP**

1. Set the language for English or Russian “[To select English or Russian on systems with Windows XP](#)” on page 107.
2. Press **Setup**.
3. Click the **System** tab.
4. Click **Locale** to open the **Regional and Languages Options** dialog box.
5. In the **Regional Options** and **Languages** tabs, confirm that the language is set to the language you want.
6. Click the **Advanced** tab.
7. Under **Language for Non-Unicode Programs**, do one of the following:
  - If the language is set to a European language, select Chinese or Japanese.
  - If the language is set to Chinese or Japanese, select English.
8. Click **OK**.
9. The following dialog boxes appear:
  - **Advanced** (Click **Yes**.)
  - **Change Regional Options** (Click **Yes** to accept the change and reboot the system.)
10. Press **Setup**.
11. Click the **System** tab.

12. Click **Locale** to open the **Regional and Languages Options** dialog box.
13. In the **Regional Options** and **Languages** tabs, confirm that the language is set to the language you want.
14. Click the **Advanced** tab.
15. Under **Language for Non-Unicode Programs**, do one of the following:
  - If the language is set to a European language, select English.
  - If the language is set to Chinese, select Chinese.
  - If the language is set to Japanese, select Japanese.
16. Click **OK**.
17. The following dialog boxes appear:
  - **Advanced** (click **Yes**.)
  - **Change Regional Options** (Click **Yes** to accept the change and reboot the system.)

## **Setting the Language on Windows 7 Systems (3.x and Later Software)**

---

**NOTE** The following procedure assumes a system set to English that you want to change to a different language. On systems already set to another language, the language-specific text appears. It is assumed that you have working knowledge of both English and the language in which you are configuring the system.

---

### ► **To select a language on systems with Windows 7**

1. Press **Setup**.
2. Click the **System** tab.
3. Click **Locale** to open the **Region and Languages** dialog box.

4. Click the **Keyboards and Languages** tab.
5. Under **Choose a Display Language**, select the language that best matches the site location.
6. Click **Apply** and click **OK**.
7. Restart the system to show the new language interface.

## Setting the Institution Name

- **To check or set the institution name**
1. Press **Setup**.
  2. Click the **System** tab.
  3. Click **Border and Prompts**.
  4. Type the institution name, and click **OK**.

## Date, Time, and Network Time Protocol

The procedure to set the date and time varies by the operating system. CX50 systems with version 4.0 software and the Network Time Protocol (NTP) can be set to synchronize the date and time settings with a networked server. If you synchronize the time using NTP, you must still configure the proper time zone and whether to automatically adjust for daylight saving time.

### Setting the Date and Time

- **To set the date and time on Windows XP systems (1.x to 3.x software)**
1. Press **Setup**.
  2. Click **Date/Time**.
  3. Click the **Time Zone** tab.
  4. Select the local time zone.

5. Click the **Date & Time** tab.
6. Change the settings to the local date and time, and click **OK**.  
➤ **To set the date and time on Windows 7 systems (3.x and later software)**
  1. Press **Setup**.
  2. Click **System**.
  3. Click **Date/Time**.
  4. Click the **Date and Time** tab.
  5. Click **Change Date and Time**.
  6. Change the settings to the local date and time, and click **OK**.

## Setting Up Network Time Protocol

- **To set up Network Time Protocol**
  1. Press **Setup**.
  2. Click **System**.
  3. Click **Date/Time**.
  4. Click **Change Time Zone** and select the desired time zone.
  5. If the customer wants the system to adjust for daylight saving time, click **Automatically Adjust Clock for Daylight Saving Time**.
  6. Click the **Internet Time** tab.
  7. Click **Change Settings**.
  8. Click **Synchronize With an Internet Time Server**.
  9. Select a server from the list.

10. Click **Update Now**.
11. Click **OK**. The next synchronization time is displayed.
12. Click **OK**.

## Verifying the System Options

The system leaves the factory with all purchased options enabled. Verify that the options enabled are the options that the customer ordered. You must have the correct authorization code to enable system options in the field.

► **To verify or enable system software options**

1. Press **Setup**.
2. Click the **Options** tab.
3. Click **Options** to see the installed options.
4. Confirm that the enabled options match what the customer ordered.

---

**NOTE** The serial number, and model name and version are on the **Options** display. The serial number is required when you request an authorization code to enable an option.

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To install or remove an option, see “[Licensed Options](#)” on page 655.

## Configuring System Network Settings

The system supports standard wired and wireless network functions, which include printing to local printers and report printers, but it supports only one wired or wireless network connection at a time. If a wireless connection will be used, it needs to be configured after the network settings have been entered (“[Enabling a Wireless Network Connection](#)” on page 115).

Additional network capabilities are available in the DICOM Networking option. Before you can connect the system to a network or use the capabilities provided by the DICOM Networking option, it must be configured to communicate on the network. The system configuration information must contain the correct AE title, port number, IP address, and subnet mask for each

device on the network, including the system itself. Those network terms are defined in [Table 5-1](#).

Because configuring the system for connection to a network requires information from the customer network administrator ([“Image Management Network Requirements” on page 101](#)), Philips recommends that you work with the customer to configure the network settings.

### ► To enter the system network settings

- I. To avoid the possibility of conflicting IP addresses in static IP configurations, do not connect the LAN cable (if you are using a wired connection) or the wireless network adapter (if you are using a wireless connection) to the system. If it is already connected, disconnect it.
  - a. Press **Setup**.
  - b. On the **System** tab, click **DICOM**.
  - c. Click the **DICOM Preset** tab.
  - d. On the **Change DICOM Preset** menu, select the preset that you want to configure.
  - e. Click **Change Settings For Current Preset**.
  - f. Click the **This System** tab.
  - g. In the **System Name** area, enter the **PC Name** and **AE Title** specified by the customer network administrator.

---

**NOTES**

- The AE title for each device on the network must be unique.
- AE titles are case sensitive. (That is, PACSI is different from PacsI.)
- In many institutions, the AE title is derived from the PC name, which must be unique across the institution's network.

2. In the **System Port Number** area, type, or click the arrows to change, the port number specified by the network administrator.

---

**NOTES**

- The default port number, 104, is assigned to ultrasound systems at most institutions.
- If the site uses static IP addressing, the IP address, subnet mask, and default gateway must be entered in the **TCP/IP Properties**.
- If the network is configured for DHCP, then the network administrator may need to know the system's MAC address, which is displayed in the **Network Settings** area.
- If the site uses a DHCP-assigned address, ensure that the system is connected to the network, and select **Obtain DNS Server Address Automatically** to assign the address.

- 
3. To apply the same AE title and port number to all DICOM presets that you create, in the **Common Settings** area, click **Press To Apply the Same AE Title and Port Number to All DICOM Presets**.
  4. In the **Network Settings** area, click **TCP/IP Properties**.
  5. Select **IPv4** or **IPv6**. To specifically enable or disable IPv6, click **Enable IPV6**.

---

**NOTE** Selection of IPv6 is possible only on systems with 4.x software and later. Leave **Enable IPV6** unchecked if IPv6 is not in use.

- 
6. In the **Internet Protocol (TCP/IP) Properties** dialog box, enter the IP address, the subnet mask, and any other network parameters specified by the network administrator.
  7. Click **OK**.

**NOTE** If a wireless connection will be used in the following step, configure the system appropriately. See “[Enabling a Wireless Network Connection](#)” on page 115.

- 
8. Connect the LAN cable (if you are using a wired connection) or the wireless network adapter (if you are using a wireless connection) to the system. After about 10 to 20 seconds, click **Network Administration**, verify that the **TCP/IP Properties** that you entered are displayed in the **Information Window**, and verify that the **Network Status** is **Connected**.

---

#### NOTES

- To refresh the window, click **ipconfig** for summary information or **ipconfig/all** for detailed information.
- If DHCP is configured, you may need to release the connection and then renew the connection to obtain a DHCP lease. To do this, click **ipconfig/release** and then click **ipconfig/renew**.
- To verify that a particular server is on the network, in the **TCP/IP Ping a Networked Server** area, type the server's IP address or DNS name and click **Ping**. The system then performs a TCP/IP ping and displays the results in the **Information Window**.

- 
9. Click **Close**, and then click **Close** again.

## Enabling a Wireless Network Connection

The system supports wireless networking when the system network settings are configured accordingly.

Detailed instructions for enabling and configuring the system for wireless networking are contained in both the on-system *Help* (“System Administration”) and in the *User Manual* (“Preparing the System”)

Where it states, “If the **Philips Medical System Wireless Properties** dialog box appears...” the information is for an XP system.

Where it states, “If the **Manage Preferred Wireless Networks** dialog box appears...” the information is for a Windows 7 system.

When you enable a wireless network connection on the system, it appears on the network as **Philips Medical Systems Wireless**. Wireless networks appear in the **Wireless Properties** dialog box. The system automatically tries to connect to the network that is first in the list of preferred networks. If the first network is unavailable, the system tries to connect to the next network in the list.

## Configuring the DICOM Feature

If the system you are installing has the DICOM option enabled, you or the customer’s system administrator must configure the system DICOM feature.

Before you can use either the standard network support or the capabilities of the DICOM Networking option, the system must be configured to communicate on the network (“[Configuring System Network Settings](#)” on page 112).

Because configuring the system for DICOM operation requires information from the customer network administrator (“[Image Management Network Requirements](#)” on page 101), Philips recommends that you work with the customer to configure the DICOM feature.

Detailed instructions for enabling and configuring the system DICOM feature are in both the on-system Help (“System Administration”) and in the *User Manual* (“Preparing the System”).

This is a good time to verify that, in **DICOM Diagnostics**, under **System Log**, the system error logging level is set to **Error Level Logging**.

DICOM uses three identifiers for each system ([Table 5-1](#)):

- IP address or host name
- Listening port number

- Application entity title

In addition to the identifiers, identify the type of supported images, which affects the system settings. The site administrator typically provide that information.

The basic steps to configure the system for DICOM communications over a network are covered in the following topics.

### NOTES

---

- For detailed information about network and DICOM setups, see the on-system *Help*.
  - You must first enter the system network settings, date, time, and time zone *before* configuring the DICOM settings. If you enable the Modality Worklist Server and then change the system time, the patient list may not update properly.
- 

## Configuring the Keystroke Log

The system has a keystroke logging application that records control panel activity whenever the system is running. Keystroke logging always runs in the background and cannot be turned off, logging all keystrokes except those that contain patient information or passwords. However, you can set how long the Keystroke Log files remain in the system and the maximum number of Keystroke Log entries that can be stored in the files. If necessary, you can use the Keystroke Log as an aid to reproducing a system problem. The keystroke logging application also allows you to view and delete the Keystroke Log files and copy them to removable media. Access and configure the Keystroke Log as described in “[Servicing Features \(CX30 1.0 and CX50 1.x-2.5 Systems\)](#)” on page 266.

**NOTE** “Keystrokes” made on the Allura Xper module (instead of on the CX50 system user interface) are not logged in the CX50 system keystroke log.

---

## Configuring Other System Settings

If appropriate for this installation, work with the customer and follow the instructions in the on-system *Help* (“Customizing Your System”) to initially configure the system settings not yet set to the customer’s preference.

## Configuring Integrated Ultrasound Settings (CX50 3.x and Earlier Systems)

Only if the CX50 system has the Integration Mode ultrasound option enabled, follow these steps to configure the Integrated Ultrasound settings.

### ► To configure the Integrated Ultrasound settings

1. Press **Setup** and if necessary, select the **Service** tab.
2. In the **System Network Settings** area, click **Integration Settings**.
3. In the **Integration Settings** display, verify that **Create Unique Ultrasound Study ID** is set to the customer’s preference.

---

**NOTE** Creating a unique study ID causes ultrasound and X-ray images to be stored separately on the PACS. Many customers prefer this setting.

---

4. Click **X-ray Settings**.
5. In the **CWISHID Config** display, enter the **IP Address** for each X-ray system to be used in Integration Mode with the CX50 system. Repeat as needed to enter all of the corresponding **X-ray IP Addresses**. Enter the **Unique Device Name** of the CX50 system as it appears on the Xper control panel on the Allura X-ray system.

## Configuring Integration Mode (X-Ray) Settings (CX50 4.x and Later Systems)

Integration Mode ultrasound settings allow the CX50 system to be controlled by the Allura X-ray system's Xper module. They are not used for the DNL connection to the EchoNav computer.

**NOTE** On CX50 systems with 4.0 software and later, and the Integration Mode option, implementation of the Integration Mode is by using **X-Ray Settings** on the **System** tab of **Setup**. The configuration steps are the same as they were previously, with this exception.

Only if the CX50 system has the Integration Mode ultrasound option enabled, follow these steps to configure the Integrated Ultrasound settings.

► **To configure the Integration Mode ultrasound (X-Ray) settings on CX50 systems with 4.0 and later software**

1. Press **Setup**.
2. Click the **System** tab.
3. Click **X-Ray Settings**.
4. In the **X-Ray Settings** display, verify that **Create Unique Ultrasound Study ID** is set to the customer's preference.

**NOTE** Creating a unique study ID causes ultrasound and X-ray images to be stored separately on the PACS. Many customers prefer this setting.

5. Click **X-Ray Settings**.
6. In the **CWISHID Config** display, enter the **IP Address** for each X-ray system to be used in Integration Mode with the CX50 system. Repeat as needed to enter all of the correspond-

ing X-ray **IP Addresses**. Enter the **Unique Device Name** of the CX50 system as it appears on the Xper control panel on the Allura X-ray system.

7. Click **OK** to exit **CWISHID Config** display.
8. Click **OK** to exit **X-Ray Settings**.

## Preparing the Peripherals (Windows XP Systems)

Use this procedure to manually install software drivers on systems with the Windows XP operating system. The procedure is not used on systems with the Windows 7 operating system.

Correctly load paper and ribbon in the printer.

Follow the instructions in the on-system *Help* (press **Help**) to check or initially configure the system setups for the peripheral devices.

The system is configured at the factory for NTSC format. To reconfigure the system for PAL format, complete the following steps.

### ► **To configure the system for PAL format on 1.x to 3.x systems**

1. In the setups, click the **Peripherals** tab.
2. Click **Install Software Drivers**.
3. In the **Install Software Drivers** display, click **Video Installation**.
4. Click **OK**.
5. Select **PAL**.
6. Click **OK**. The driver is reinstalled with the correct configuration. This takes about 20 seconds.
7. Click **Close**. The new setting takes effect after the system is restarted.

## Checking System Functionality

Verify basic system functionality using the information in [Section 6, “Performance Tests”](#). If system testing reveals any problems, troubleshoot, repair, and retest the system before presenting it to the customer for use.

## Installation Procedures

**Figure 5-1**

### Uncrating/Unpacking Procedure List



- Uncrating the CX30 or CX50 System and Accessories
- Uncrating the System Cart (A.0, B.0 or C.0)
- Uncrating the System Cart and Top-Load Box (D.0)
- Unpacking and Setting Up the CX30 or CX50 System
- Installing the System Battery



**NOTE** The numbers in the installation illustrations correspond to the steps in the installation procedure.

**Figure 5-2**

### Installation Procedure List (CX50 System Only)



- Installing the CX50 System xMATRIX or PureWave Label (3.0 Systems Only)

**Next Page**

**Figure 5-3****Installation Procedure List  
for Systems with the A.0  
or B.0 Cart****CX30 or CX50 System and A.0 or B.0  
Cart Installation**

- Installing the Stand-alone CX30 or CX50 System
- Installing the CX30 or CX50 System with Optional A.0 or B.0 Cart
  
- Installing the USB Hub (A.0 or B.0 Cart)



**NOTE** The numbers in the installation illustrations correspond to the steps in the installation procedure.



- Installing the Color Printer and Printer Shelf (A.0 or B.0 Cart)
- Installing the Color Printer Shelf Stop Bracket (Shelf Already Installed), (A.0 or B.0 Cart)
- Installing the Black-and-White Printer (A.0 or B.0 Cart)
  
- Installing the AC Adapter and System Power Cord (A.0 or B.0 Cart)
- Installing the Foot Switch Assembly (A.0 or B.0 Cart)
  
- Installing the Antistatic Chain (A.0 or B.0 Cart)

**Figure 5-4****Installation Procedure List  
for Systems with the  
C.0 Cart****CX30 or CX50 System and C.0 Cart  
Installation**

- Installing the Stand-alone CX30 or CX50 System
- Installing the CX30 or CX50 System with Optional C.0 Cart
- Installing the USB Hub (C.0 Cart)



**NOTE** The numbers in the installation illustrations correspond to the steps in the installation procedure.



- Installing the AC Adapter and System Power Cord (C.0 Cart)



- Installing the Foot Switch Assembly (C.0 Cart)



- Installing the Antistatic Chain (C.0 Cart)



- Installing the Stand-alone Color Printer Option (C.0 Cart)

**Figure 5-5****Installation Procedure List  
for Systems with the  
D.0 Cart****CX30 or CX50 System and D.0 Cart  
Installation**

- Installing the Stand-alone CX30 or CX50 System
- Installing the CX30 or CX50 System with Optional D.0 Cart



- Installing the AC Adapter and System Power Cord (D.0 Cart)



- Installing the Foot Switch Assembly (D.0 Cart)



- Installing a User-Owned Peripheral Device (D.0 Cart)



- Installing the Stand-alone Color Printer Option (D.0 Cart)

**NOTE** The numbers in the installation illustrations correspond to the steps in the installation procedure.

**Previous Page**

## Uncrating the CX30 or CX50 System and Accessories

Figure 5-6

Inspecting the Crate and Plastic Banding



► To uncrate the CX30 or CX50 system and accessories

### NOTES

- Inspect the crate for damage before cutting the plastic banding. Three plastic bands (with Philips logo) secure the corrugate crate. Confirm that the original banding is in place.
- For instructions on re-crating the system for shipment, see “[Packaging the CX30 or CX50 Ultrasound System](#)” on page 327
- The estimated time to uncrate the system is 8 minutes.

Figure 5-7

## Removing the Plastic Banding, Corrugate Lid, and Plywood Insert



**WARNING** Use caution when removing the strapping bands securing the shipping container. The bands are under enough tension to cause injury if removed carelessly.

- I. Remove (cut) the three plastic strapping bands from around the crate.

**WARNING** Take care when lifting the corrugate lid off of the crate. The plywood insert can be stuck inside the lid and drop out when you lift the lid.

2. Remove the corrugate lid from the top of the crate.
3. Remove the plywood insert from the top of the crate.

Figure 5-8

## Removing the Corrugated Wrap



4. Grasp the corrugated wrap from both sides and lift it straight up and off the pallet.

Figure 5-9

## Removing the System, Peripheral, and Accessory Boxes from the Pallet



5. Remove the system, peripheral, and accessory boxes from the pallet.
6. Dispose of the crate and packing materials properly.

**NOTE** Do not return the crate or packing materials to Philips.

7. Do one of the following:
  - If the system arrived with a second crate containing the optional cart, go to "[Uncrating the System Cart \(A.0, B.0 or C.0\)](#)" on page 130 or "[Uncrating the System Cart and Top-Load Box \(D.0\)](#)" on page 140.
  - If the system was ordered without a cart, go to "[Unpacking and Setting Up the CX30 or CX50 System](#)" on page 150.

Return to [Uncrating/Unpacking Procedure List](#).

## Uncrating the System Cart (A.0, B.0 or C.0)

Figure 5-10

Inspecting the Crate and Plastic Banding



### ► To uncrate the system cart

#### NOTES

- Inspect the cart crate for damage before cutting the plastic banding. Three plastic bands (with Philips logo) secure the corrugate crate. Ensure that the original banding is in place.
- If the tilt monitors on the packaging are red, please report this and any damage you find, to the Philips transportation department.
- For instructions on re-crating the system cart for shipment, see "["Crating the System Cart \(A.0, B.0, and C.0 Carts\)" on page 342.](#)

**Figure 5-11****Removing the Plastic Banding, Corrugate Lid, and Plywood Insert**

**WARNING** Use caution when removing the strapping bands securing the shipping container. The bands are under enough tension to cause injury if removed carelessly.

1. Remove (cut) the three plastic strapping bands from around the crate.

**WARNING** Take care when lifting the corrugate lid off of the crate. The plywood insert can be stuck inside the lid and drop out when you lift the lid.

2. Remove the corrugate lid from the top of the crate.
3. Remove the plywood insert from the top of the crate.

**Figure 5-12****Removing the Upper Foam Support**

4. Remove the foam support from the top of the crate.

Figure 5-13

## Removing the Corrugated Wrap



5. Grasp the corrugated wrap from both sides and lift it straight up and off the pallet.

**Figure 5-14****Removing the Antistatic Bag**

6. Remove the antistatic bag from around the system cart.

Figure 5-15

## Removing the Front Foam Caster Blocks



**WARNING** The cart is heavy. Do not attempt to lift the cart off of the pallet. Personal injury or damage to the cart can occur.

7. Tilt the cart to the rear using the cart handle, and remove the two front foam caster blocks from the cart pallet.
8. Set the cart back onto its front casters.

**Figure 5-16****Removing the Rear Foam Caster Blocks**

9. Tilt the cart to the front using the cart handle, and remove the two rear foam caster blocks from the cart pallet.
10. Set the cart back onto its rear casters.

**Figure 5-17****Unlocking the Front Cart Casters**

11. Push up the lock levers on the two front casters to unlock the casters.
12. If the rear casters have brakes, repeat [step 11](#) on the rear casters.

**Figure 5-18****Removing the Cart from the Pallet (1 of 2)****13** ➡**14** ↓

13. Tilt the cart to the rear using the cart handle and roll the cart to the edge of the corrugate base of the pallet.
14. Lower the front of the cart to the floor.

Figure 5-19

## Removing the Cart from the Pallet (2 of 2)



15 ➤



16 ↓

15. Tilt the cart to the front using the cart handle, and roll the cart forward until the rear casters clear the pallet.
16. Lower the rear of the cart to the floor to complete the cart removal.
17. Dispose of the crate and packing materials properly.

**NOTE** Do not return the crate or packing materials to Philips.

18. Go to “Unpacking and Setting Up the CX30 or CX50 System” on page 150 and begin the installation of the system.

Return to [Uncrating/Unpacking Procedure List](#).

## Uncrating the System Cart and Top-Load Box (D.0)

Figure 5-20

Inspecting the Crate and Plastic Banding



### ► To uncrate the system and cart

#### NOTES

- Inspect the system cart box and the top-load box for damage before cutting the plastic banding. Three plastic bands (with Philips logo) secure the corrugate crate. Ensure that the original banding is in place.
- If the tilt monitors on the packaging are red, please report this and any damage you find, to the Philips transportation department.
- For instructions on re-crating the system cart for shipment, see "["Crating the System Cart \(D.0 Cart\)" on page 356.](#)
- For instructions on packing the system for return, see "["Packaging the CX30 or CX50 Ultrasound System" on page 327.](#)

Figure 5-21

## Removing the Plastic Banding and the Top-Load Box



**WARNING** Use caution when removing the strapping bands securing the shipping container. The bands are under enough tension to cause injury if removed carelessly.

1. Remove (cut) the three plastic strapping bands from around the crate.
2. Remove the top-load box (system box or carrying case box) from the top of the system cart box and set it aside.

**Figure 5-22****Removing the Corrugated Lid**

3. Remove the corrugated lid from the top of the cart crate.

Figure 5-23

## Removing the Corrugated Wrap



**CAUTION** The contents of the crate may shift during shipment. Take care when removing the outer wrap, as items could be loose within the crate.

4. Grasp the corrugated wrap from both ends and slowly lift it straight up and off the pallet.

Figure 5-24

## Removing the Cart Accessory and Transducer Box Sleeves



Transducer box sleeves  
(2 places)



Cart accessory sleeves  
(2 places)

**NOTE** Some packing sleeves may be empty. To support the contents of the crate, all four corrugated sleeves surrounding the system, are installed regardless of the amount of accessories ordered.

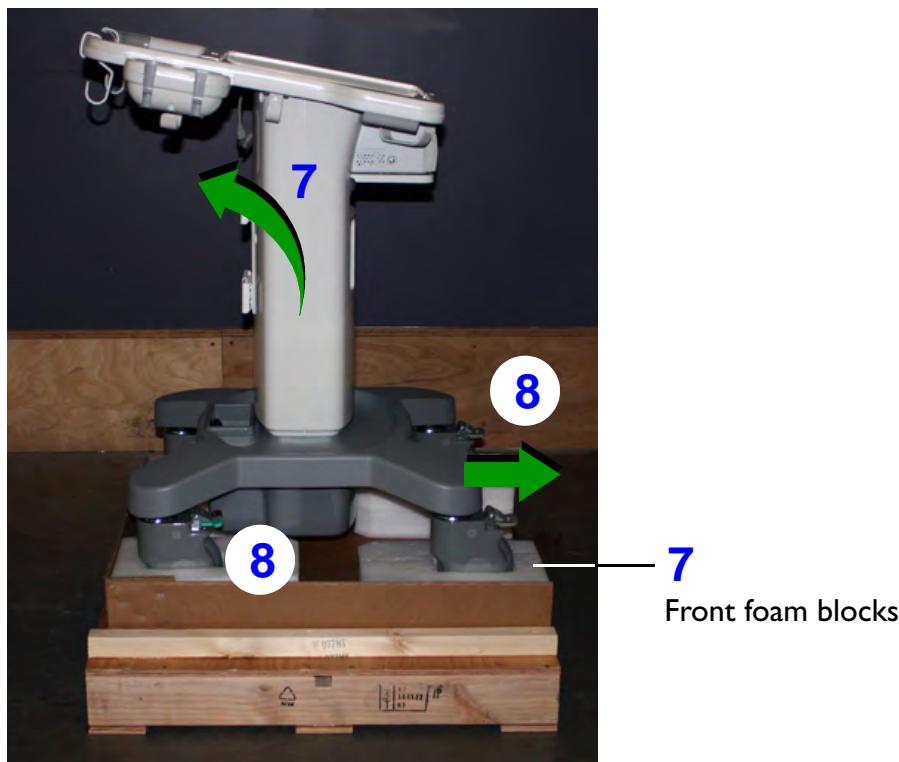
5. Remove the two cart accessory sleeves and the two transducer box sleeves that are packed around the system cart.

**Figure 5-25****Removing the Antistatic Bag**

6. Remove the antistatic bag from around the system cart.

Figure 5-26

## Removing the Front Foam Caster Blocks

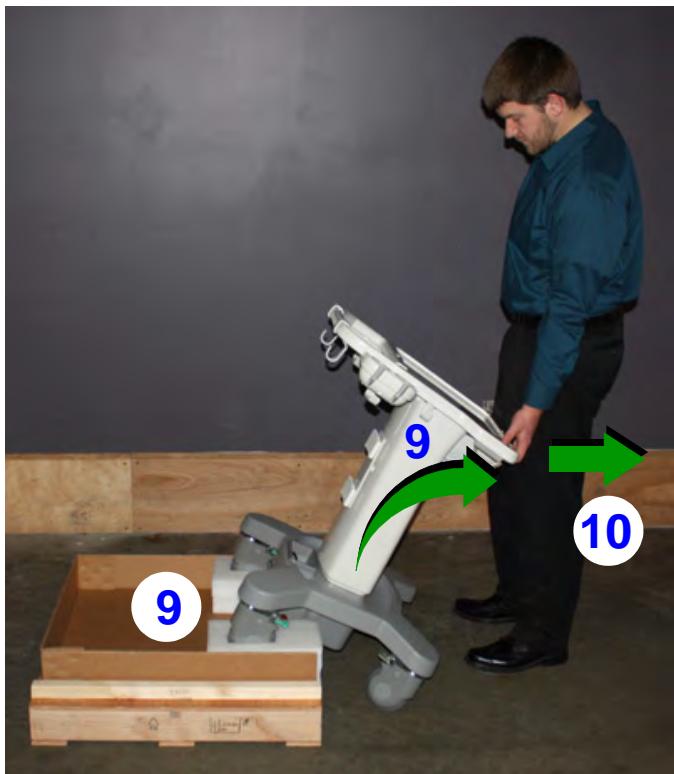


**WARNING** The cart is heavy. Do not attempt to lift the cart off of the pallet. Personal injury or damage to the cart can occur.

7. Tilt the cart to the rear using the cart handle, and remove the two front foam caster blocks from the cart pallet.
8. Slide the cart on its rear foam blocks, toward the front of the pallet until it stops, and then set the front casters on the floor.

Figure 5-27

## Removing the Rear Foam Caster Blocks



9. Tilt the cart to the front using the cart handle until the rear casters are clear of the rear foam blocks.
10. Roll the cart away from the crate and set the cart back down on its casters to complete the cart removal.

Figure 5-28

## Removing the Cart Foam Packing



11. Pull the Multiport adapter connector out of the front foam support.
12. Slide the two foam packing supports off of the cart docking platform.

**Figure 5-29****Unpacking the Corrugated Sleeves**

Corrugated accessory box sleeve (2 places) —————



Corrugated transducer box sleeve (2 places) —————



13. Remove all the accessory boxes and transducer boxes from the corrugated packing sleeves.

14. Dispose of the crate and packing materials properly. Ensure you check all packing material before discarding.

**NOTE** Do not return the crate or packing materials to Philips.

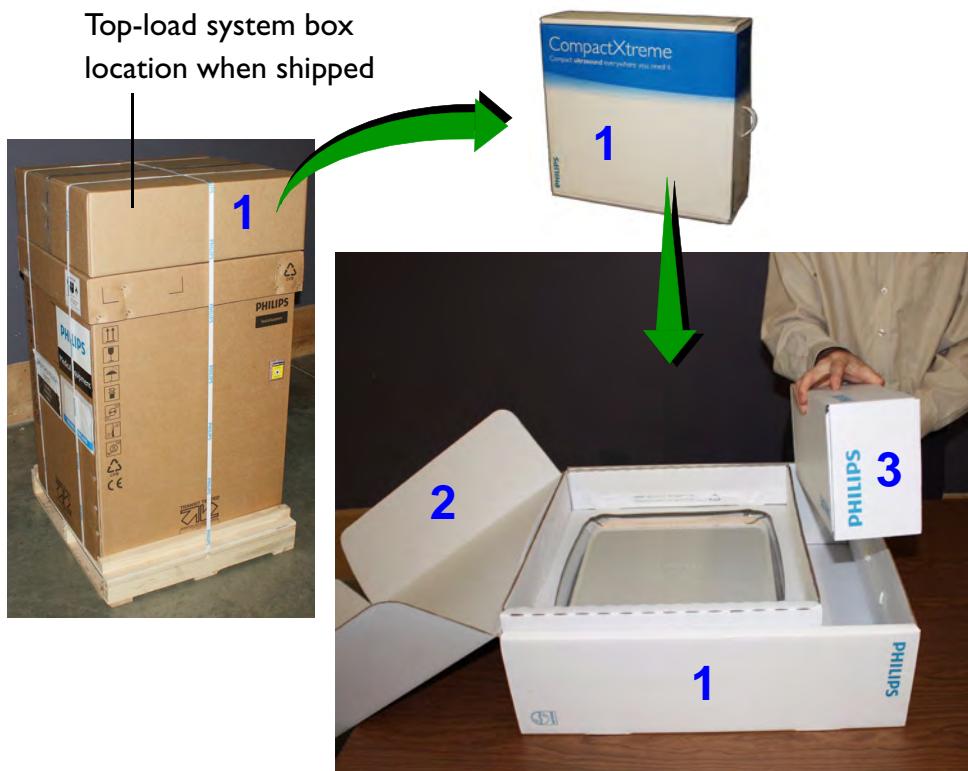
15. Go to “[Unpacking and Setting Up the CX30 or CX50 System](#)” on [page 150](#) and begin the installation of the system.

Return to [Uncrating/Unpacking Procedure List](#).

## Unpacking and Setting Up the CX30 or CX50 System

Figure 5-30

Opening the System Suitcase Box



► **To unpack the CX30 or CX50 system**

1. Locate the top-load system box and remove the “suitcase box” containing the system and place it on a flat surface.
2. Open the suitcase box.
3. Remove the system auxiliary pack from the suitcase box and set it aside.

**NOTE** Do not tear the plastic wrap on the battery-retention pack or the AC adapter-retention pack. Save the packing for return shipping, if the accessories were damaged or not functioning properly.

Figure 5-31

### Removing the Suspension Frame



4. Remove the top suspension frame from the top of the system.

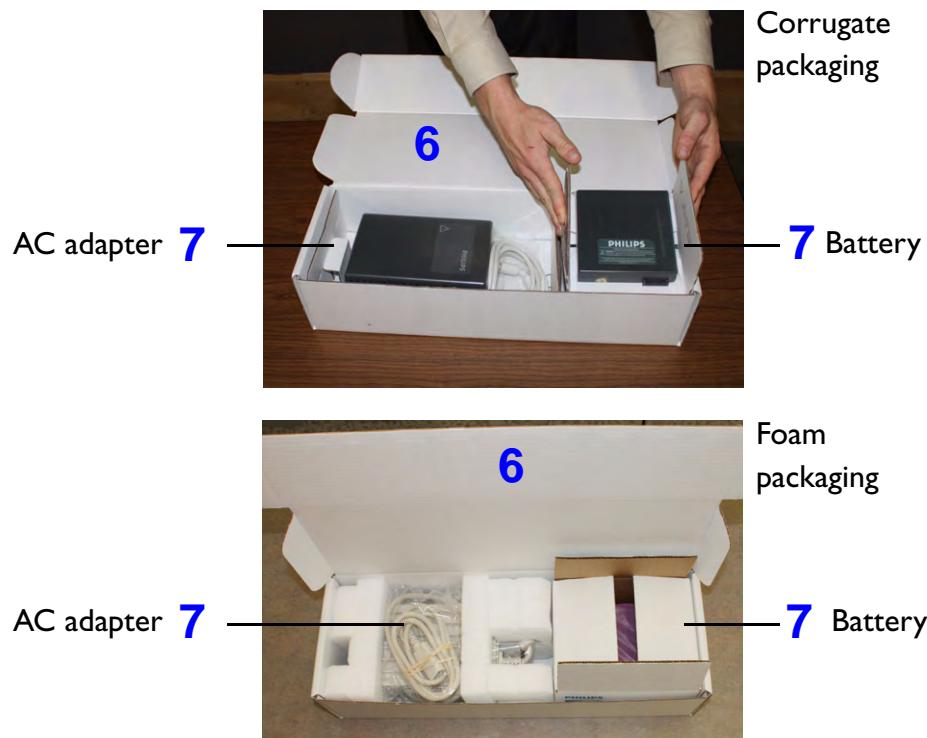
**Figure 5-32****Removing and Inspecting the System**

5. Remove the system from the suitcase box and set it aside.

**NOTE** Inspect the system to confirm that it was not damaged during shipment.

Figure 5-33

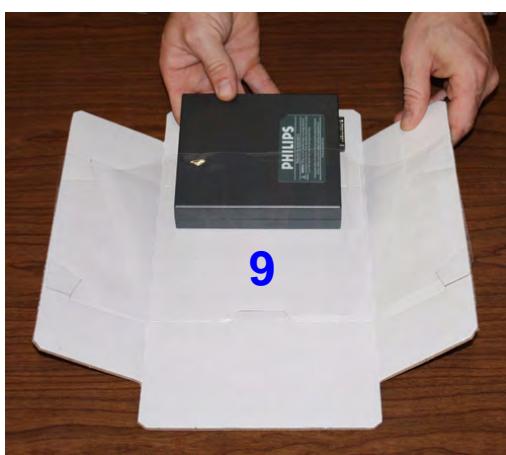
## Opening the System Auxiliary Pack



6. Open the system auxiliary pack.
7. Remove the system battery and AC adapter packaging from the auxiliary pack.

**Figure 5-34****Unpacking the System Battery (Corrugate Packaging)**

8. Unfold the battery retention pack and set it on a flat surface.
9. Slide the battery out from under the plastic wrapping and set it aside.



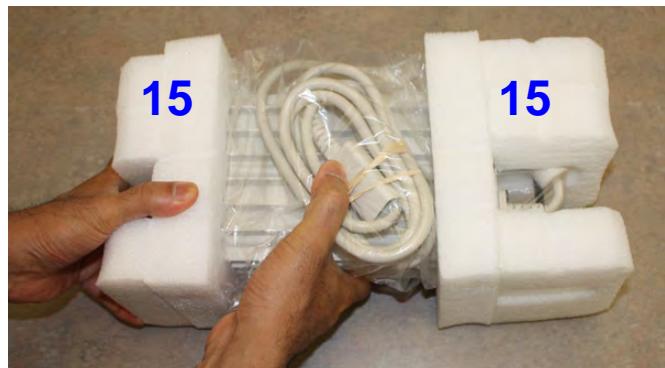
**Figure 5-35****Unpacking the System Battery (Foam Packaging)**

10. Open the battery box and set the battery pack on a flat surface.
11. Slide the foam end caps off the battery, remove the antistatic bag, and set the battery aside.

**Figure 5-36****Unpacking the AC Adapter (Corrugate Packaging)**

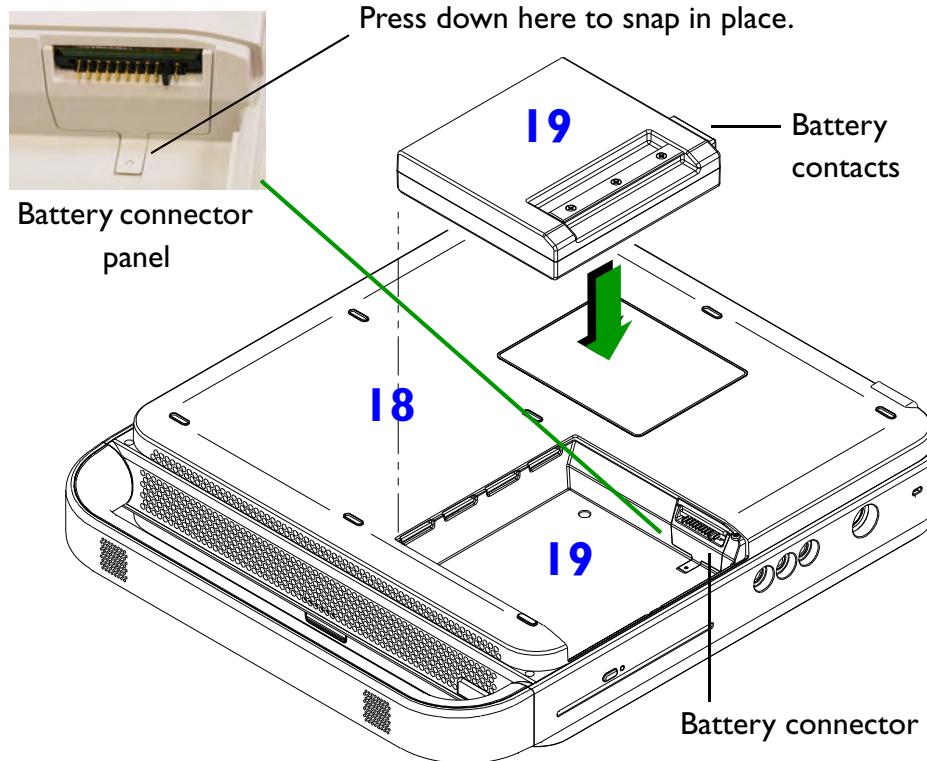
12. Unfold the AC-adapter retention pack and set it on a flat surface.
13. Slide the AC adapter out from under the plastic wrapping and set it aside.
14. Dispose of the packing materials properly.

**NOTE** Do not return the packing materials to Philips.

**Figure 5-37****Unpacking the AC Adapter (Foam Packaging)**

15. Slide the foam end caps off the AC adapter.
16. Remove the antistatic bag, and set the adapter aside.
17. Dispose of the packing materials properly.

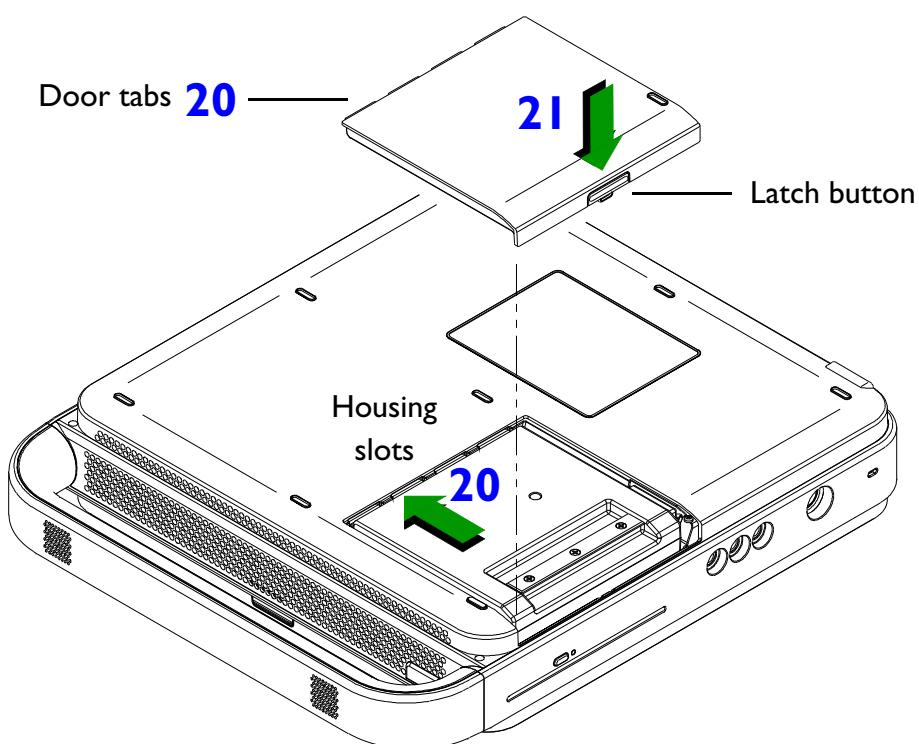
**NOTE** Do not return the packing materials to Philips.

**Figure 5-38****Installing the System Battery**

18. Ensure that the battery connector panel is snapped in place (so it does not fall out), turn the system over, and remove the battery-compartment access door.
19. Install the battery into the system battery compartment with the battery contacts aligned with the battery connector. (Lower the side opposite the connector in first; then push the connector side into the compartment.)

Figure 5-39

## Installing the Battery Access Door



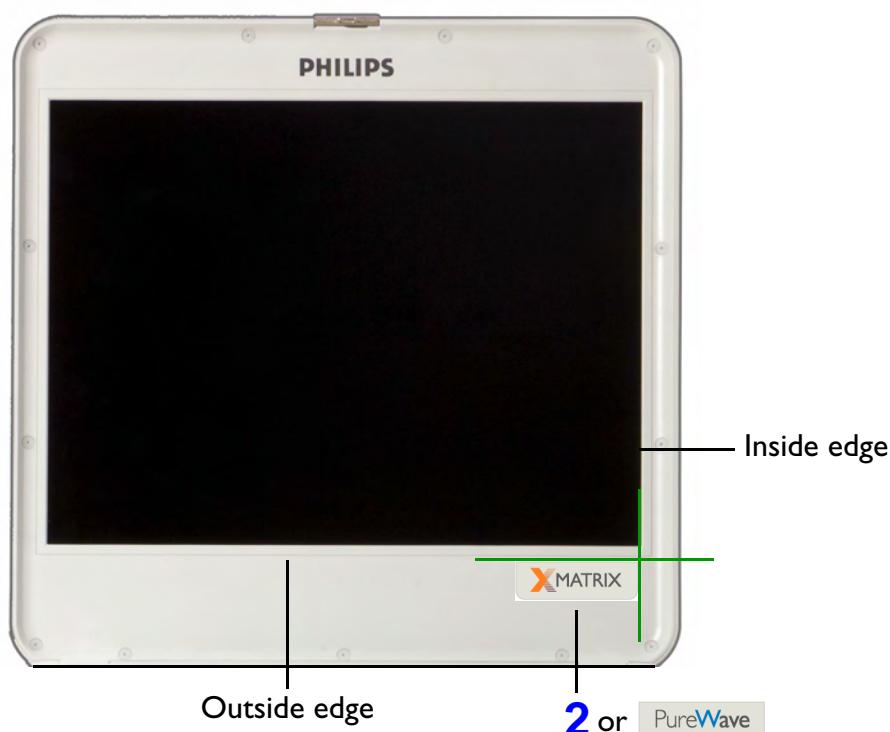
20. Replace the battery access door by sliding the door tabs into the housing slots.
21. Push the access door down to close (latch button side).
22. Do one of the following:
  - If the system was shipped without a cart, go to “[Installing the Stand-alone CX30 or CX50 System](#)” on page 161 or “[Installing the Stand-alone CX30 or CX50 System](#)” on page 188.
  - If the system was shipped with a cart, go to “[CX30 or CX50 System and A.0 or B.0 Cart Installation](#)” on page 161 or “[CX30 or CX50 System and C.0 Cart Installation](#)” on page 188.

Return to [Uncrating/Unpacking Procedure List](#).

## Installing the CX50 System xMATRIX or PureWave Label (3.0 Systems Only)

Figure 5-40

Label Alignment on the CX50 Monitor



- To install the CX50 system monitor label

**NOTE** New systems have this label, but labels are not included with replacement monitors. Order the correct label and install it. Monitors on the CX30 systems have no label.

1. Find the video display “xMATRIX” or “PureWave” label (technology badge) in the packaging and remove the adhesive backing from the label.
2. Affix the label, aligning the right edge of the label with the inside edge of the bezel and the top edge of the label with the outside edge of the LCD screen (see green alignment lines).

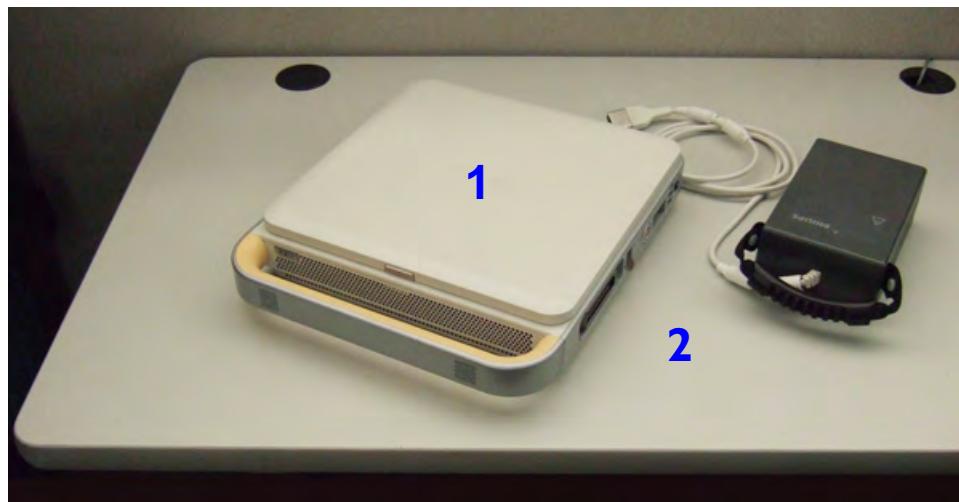
Return to [Installation Procedure List \(CX50 System Only\)](#).

## CX30 or CX50 System and A.0 or B.0 Cart Installation

### Installing the Stand-alone CX30 or CX50 System

Figure 5-41

Placing the System on a Suitable Surface

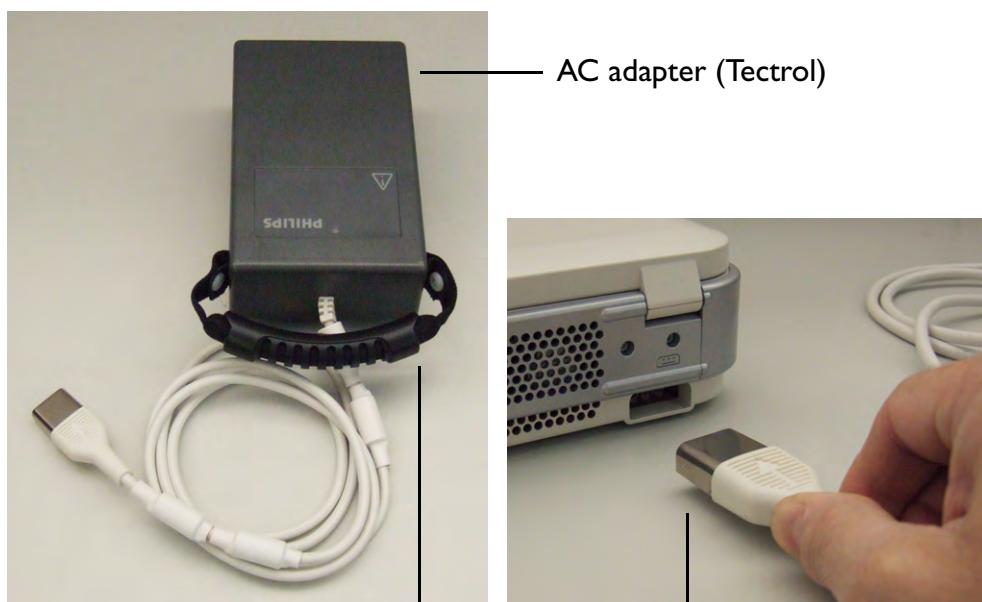


➤ To install the CX30 or CX50 system as a stand-alone

1. If system was ordered as a stand-alone system (without a cart), place it where the customer will first use it.
2. Ensure that the system and AC adapter are placed on an appropriate flat surface (not the floor or patient's bed) that provides access to a proper power source.

Figure 5-42

## Connecting the AC Adapter



AC adapter handle

3

3. Plug the AC adapter into an AC outlet and then into the rear of the system.

**WARNING** The AC adapter may become hot. Do not touch the surface of the adapter; touch only the AC adapter handle.

4. Go to [Figure 11-23](#) to connect the printers and the optional isolation transformer.

Return to [Installation Procedure List for Systems with the A.0 or B.0 Cart](#).

## Installing the CX30 or CX50 System with Optional A.0 or B.0 Cart

Figure 5-43

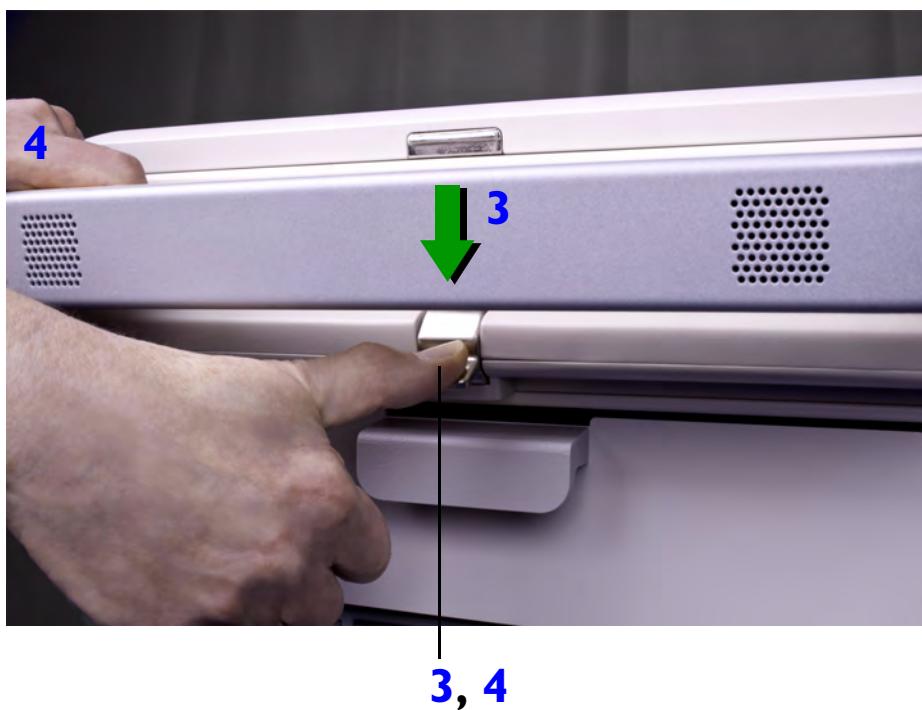
### Installing the CX30 or CX50 System on the Cart



- To install the CX30 or CX50 system on the optional A.0 or B.0 cart

**NOTE** If the system was shipped with a color printer, first install the color printer on the cart. See [Figure 5-47](#) and then go to “[Installing the Color Printer and Printer Shelf \(A.0 or B.0 Cart\)](#)” on [page 169](#).

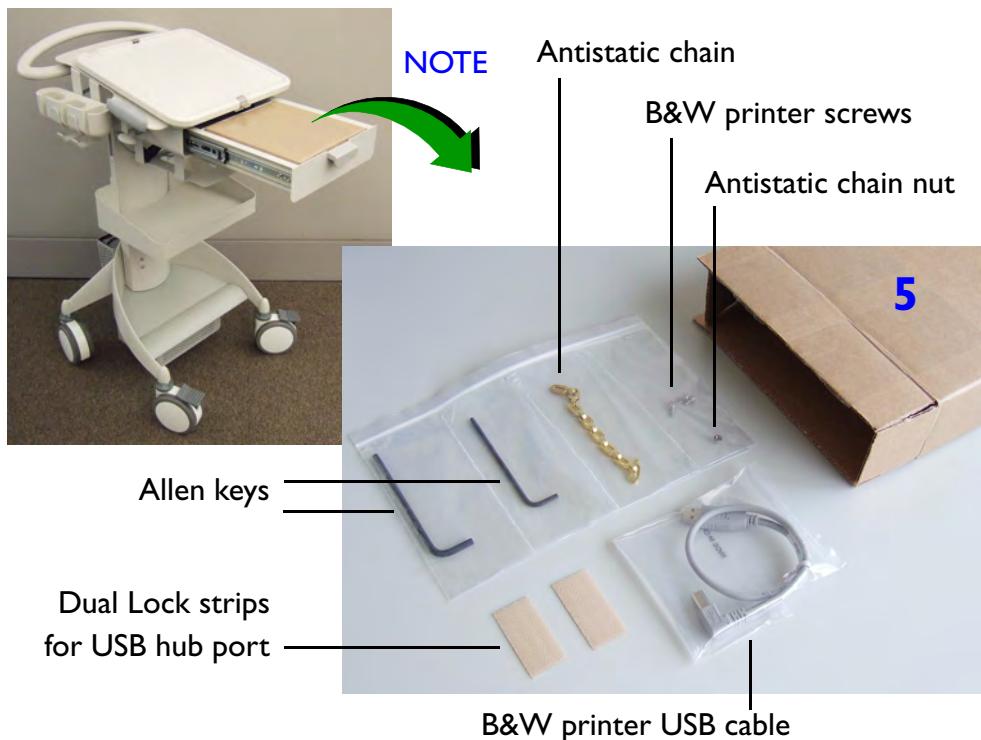
1. Facing the front of the cart, set the bottom rear of the system onto the latch assembly platform, and slide it toward the cart handle.
2. Slide the system back until the pegs on the rear latch lever fit into the holes in the rear system case.

**Figure 5-44****Locking the System onto the Cart Latch Assembly**

3. Press the front latch lever down and set the front of the system down on the latch assembly platform.
4. Release the latch lever to set the pegs of the front latch lever into the front system case holes. The system is now secured to the system cart.

Figure 5-45

### Opening the Cart Accessory Box (A.0 or B.0 Carts)

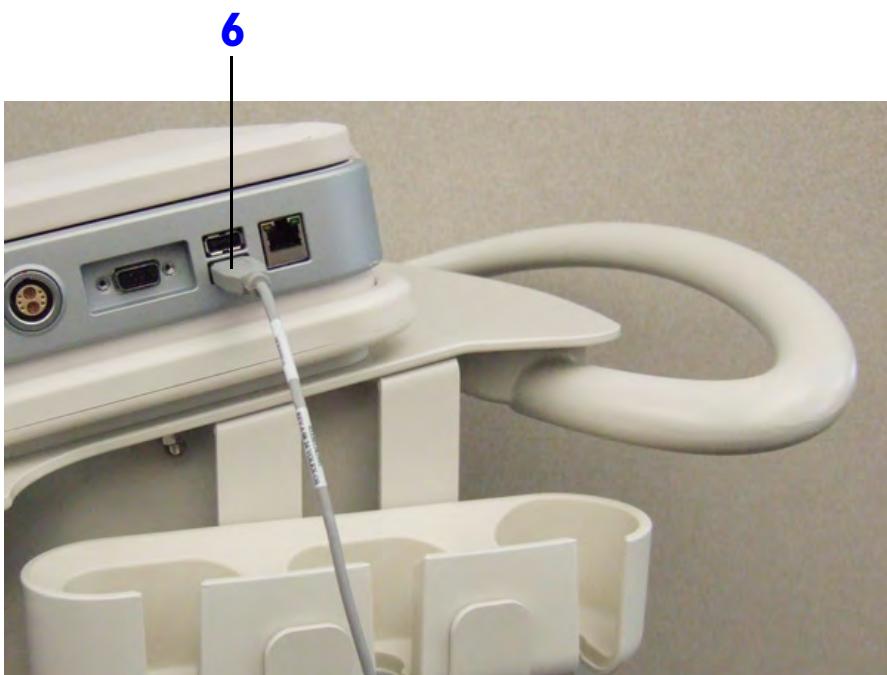


**NOTE** The cable hose strain relief used in the interventional suite to connect video, Ethernet, and AC power to the Allura system for Integrated Ultrasound is shown in [Figure 11-2](#).

**NOTE** Slide open the cart drawer, and remove the accessory box supplied with the cart.

5. Check that the contents of the box matches that shown in [Figure 5-45](#).

**NOTE** If the system has the optional probe holder accessory ([Figure 14-83](#)) for the D2cwc or D5cwc transducer, it has a self-adhesive mount. This holder can be applied anywhere behind the system on the flat part at the top of the cart. The recommended location is shown in [Figure 14-83](#).

**Figure 5-46****Connecting the CX30 or CX50 System USB Cable**

6. Unwrap the system USB cable and plug it into the lower USB port on the right side of the system.

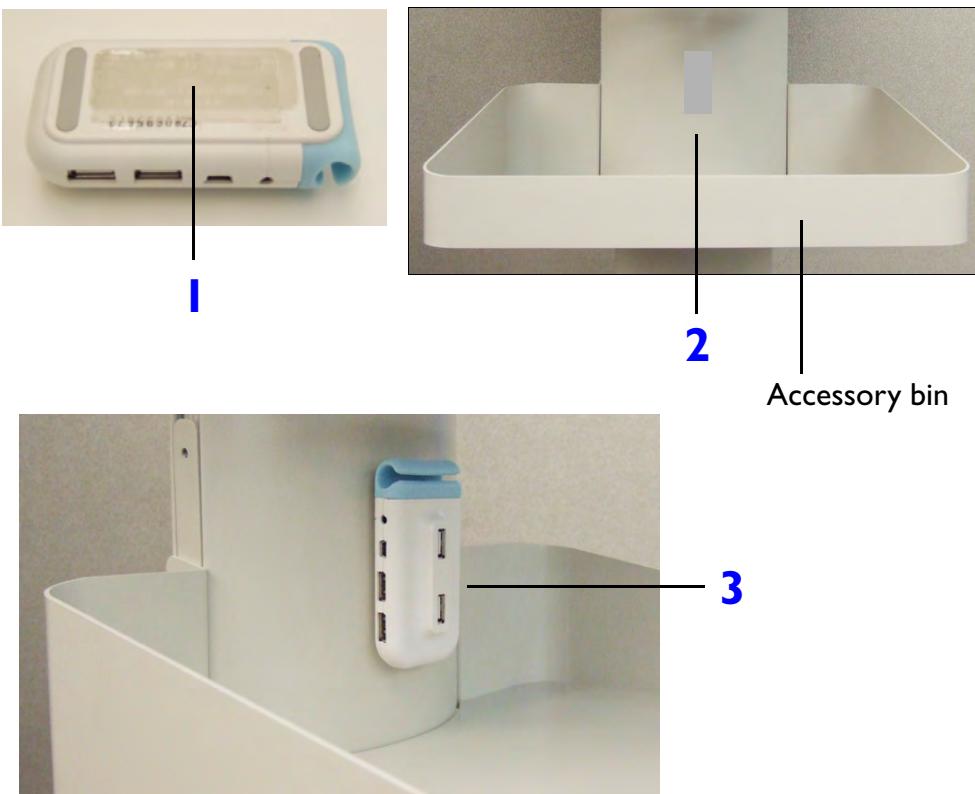
**NOTE** Connecting the system USB cable to the lower USB port is recommended. It allows easy access to the upper port for other USB devices.

Return to [Installation Procedure List for Systems with the A.0 or B.0 Cart](#).

## Installing the USB Hub (A.0 or B.0 Cart)

Figure 5-47

Installing the USB Hub (Cart Installations)



### ► To install the USB hub

#### NOTES

- If the USB hub was previously installed, go to [“Installing the Color Printer and Printer Shelf \(A.0 or B.0 Cart\)” on page 169](#) to install the color printer on the system cart.
- For USB hub connector designations, see [Figure 11-20](#).

1. Peel the adhesive backing off one of the Dual Lock strips and adhere it to the back of the USB hub.
2. Peel the backing off the other adhesive strip and adhere it to the cart column above the accessory bin.
3. Place the USB hub over the Dual Lock strip on the column and press to secure it in place. You should hear a snap when it locks.

Figure 5-48

## Connecting the Cables to the USB Hub

B&W printer cable (short) **5****7** System cableColor printer  
cable (long) **6****CAUTION**

Current over-draw. Do not connect a wireless device to the USB hub.

4. Remove the wrapping from around the three cables below the cart drawer.
5. Unpack the B&W printer USB cable (short gray cable) from the cart accessory box and connect it to any of the USB hub ports. Using the port shown in [Figure 5-48](#) is recommended.
6. If the system was shipped with a color printer, connect the color printer USB cable (long gray cable, installed at the factory) to any of the USB hub ports. Using the port shown in [Figure 5-48](#) is recommended.
7. Connect the small system USB cable into the hub port, as shown in [Figure 5-48](#).

Return to [Installation Procedure List for Systems with the A.0 or B.0 Cart](#).

## Installing the Color Printer and Printer Shelf (A.0 or B.0 Cart)

Figure 5-49

Printer on Printer Shelf



Sony UP-D23MD or UP-D25MD



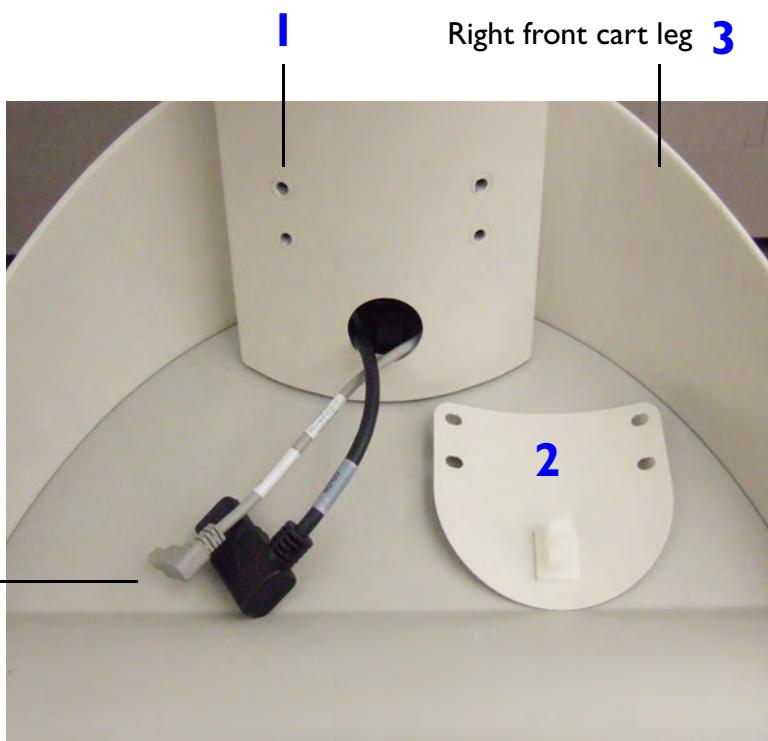
Mitsubishi CP30DW



- To install the color printer and printer shelf

### NOTES

- Some carts may be shipped with the color printer shelf already installed.
- The color printer and printer shelf are a system option. If the system is ordered without the optional cart, connect the printer as a remote peripheral on an appropriate work space near the system ([Figure 11-23](#)).
- Although this procedure shows the Sony UP-D23MD Color Printer as an example, the procedure also applies to the Sony UP-D25MD Color Printer and the Mitsubishi CP30DW Color Printer.

**Figure 5-50****Removing the Cable Access Cover**

3. Pull the two printer cables out of the access hole and drape them over the right front cart leg.

1. Remove the four screws and four washers that secure the color printer cable access cover.
2. Set aside the cover and attaching hardware.

Figure 5-51

## Shelf Placement and Cart Preparation

Front of cart

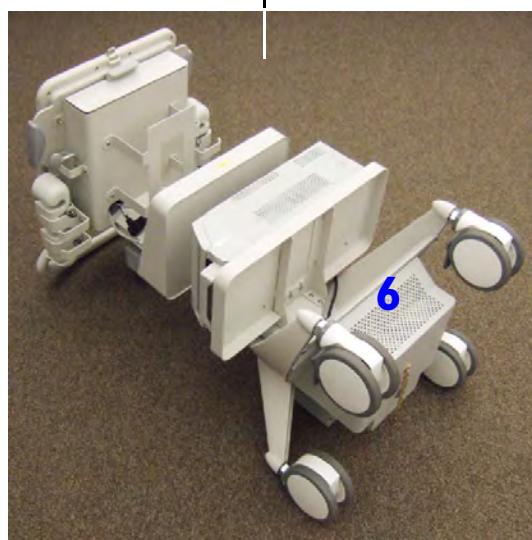


Orient the color printer as shown (facing left), for correct installation of the power cable.

**NOTE** Printer and shelf shown installed for purpose of correct orientation.

**CAUTION**

The cart easily scratches.  
Tilt the cart over on a soft protective surface.



**NOTE** The color printer must be oriented on the printer shelf as shown (Figure 5-51) to correctly install the right-angle plug on the power cable.

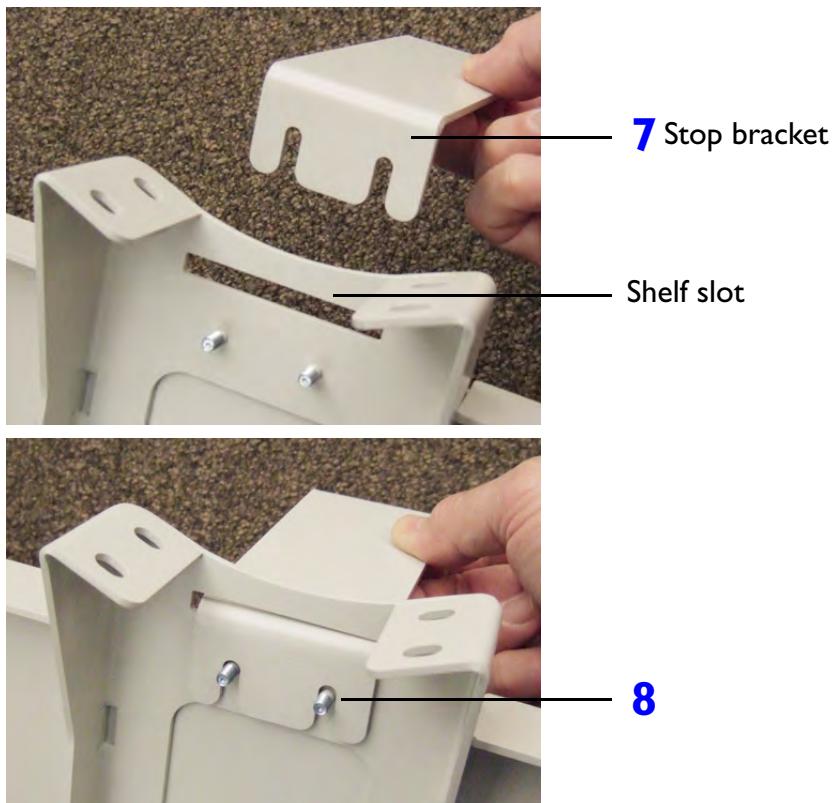
4. Remove the color printer shelf components from the packaging.
5. Unpack the printer and remove the four rubber feet, if installed.

**NOTES**

- It is easier to install the printer shelf if the cart is tilted back on the floor.
  - Remove all small parts from the cart drawer to prevent them from falling inside the cart column.
  - If the color printer faces the right-hand side of the cart, you cannot mount it with screws.
6. Carefully rotate the system cart over onto the cart handle.

Figure 5-52

## Attaching the Stop Bracket

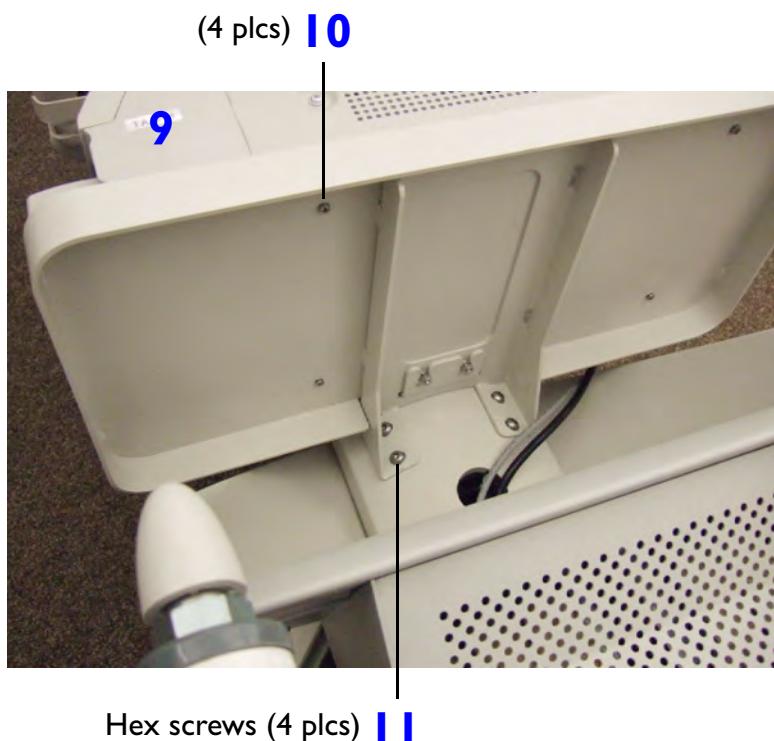


7. Install the stop bracket through the printer shelf slot. (The screw-slot end of the bracket fits through the slot in the printer shelf.)
8. Secure the bracket to the bottom of the shelf with two lock nuts.

**NOTE** When instructed to secure hardware, tighten in accordance with the training you received on this product.

Figure 5-53

## Attaching the Shelf to the Cart



9. Place the color printer on the shelf and check the orientation against [Figure 5-51](#).

10. Secure the printer to the shelf from underneath with four screws.

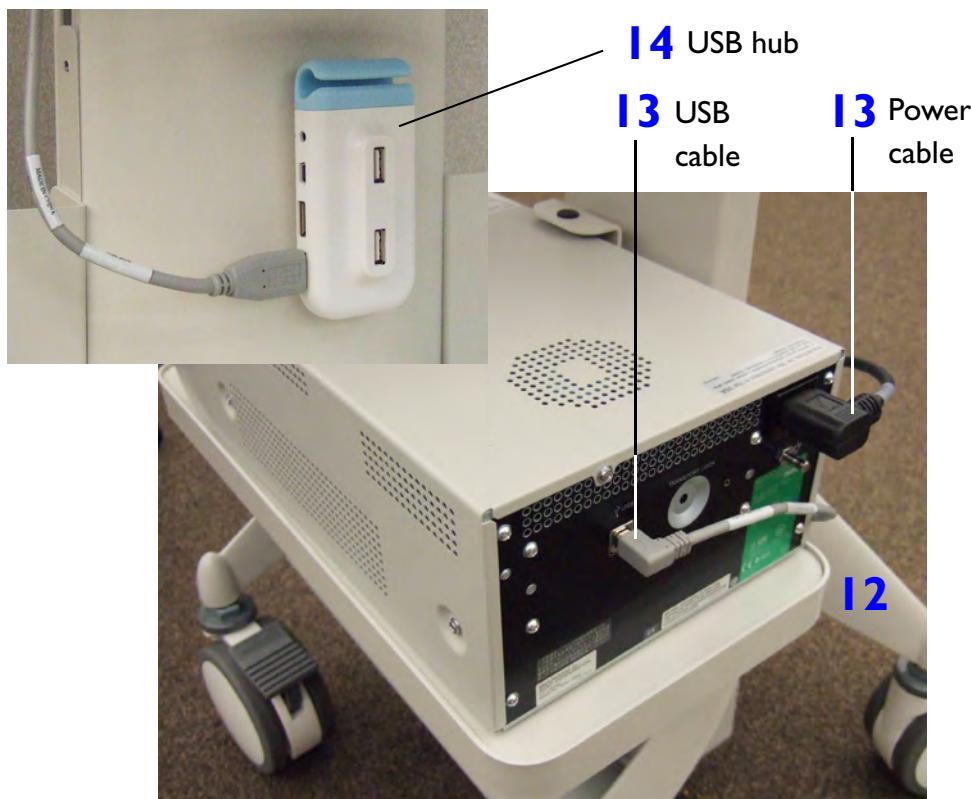
**NOTE** If you have a B.0 shelf with rear slotted holes, install the two rear screws to the bottom of the printer (about half way), set the printer on the shelf and then align/install the front two screws and tighten.

11. Attach the shelf/color printer assembly, flush to the cart column, with four screws. Verify that the four screws are fully seated and secure on the shelf flange.

**NOTE** Tighten according to the training that you received on this product.

Figure 5-54

## Connecting the Color Printer Cables



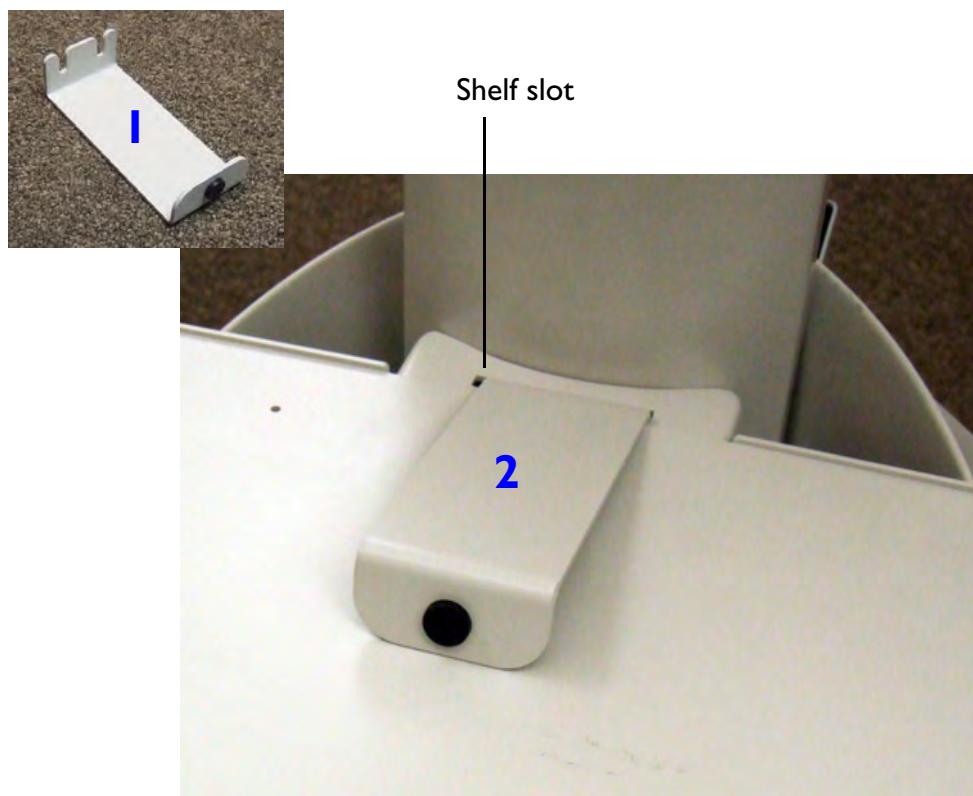
12. Rotate the system cart back up onto the cart casters.
13. Connect the cables as shown. For cabling diagrams, see [Figure 11-29](#) for the Sony UP-D23MD or the Sony UP-D25MD, or [Figure 11-30](#) for the Mitsubishi CP30DW.
14. Connect the other end of the color printer USB cable to any of the USB hub ports. (The lower port is recommended).
15. Go to “[Installing the CX30 or CX50 System with Optional A.0 or B.0 Cart](#)” on page 163 to install the system on the cart.

Return to [Installation Procedure List for Systems with the A.0 or B.0 Cart](#).

## Installing the Color Printer Shelf Stop Bracket (Shelf Already Installed), (A.0 or B.0 Cart)

Figure 5-55

Placing the Stop Bracket



- To install the color printer shelf stop bracket

**NOTE** The system cart is shipped without the color printer shelf stop bracket installed, due to cart height restrictions for crating. The stop bracket is shipped in the accessories box that comes with the cart.

1. Locate the color printer shelf stop bracket that came with the cart accessories.
2. Install the stop bracket through the printer shelf slot. (The screw-slot end of the bracket fits through the slot in the printer shelf.)

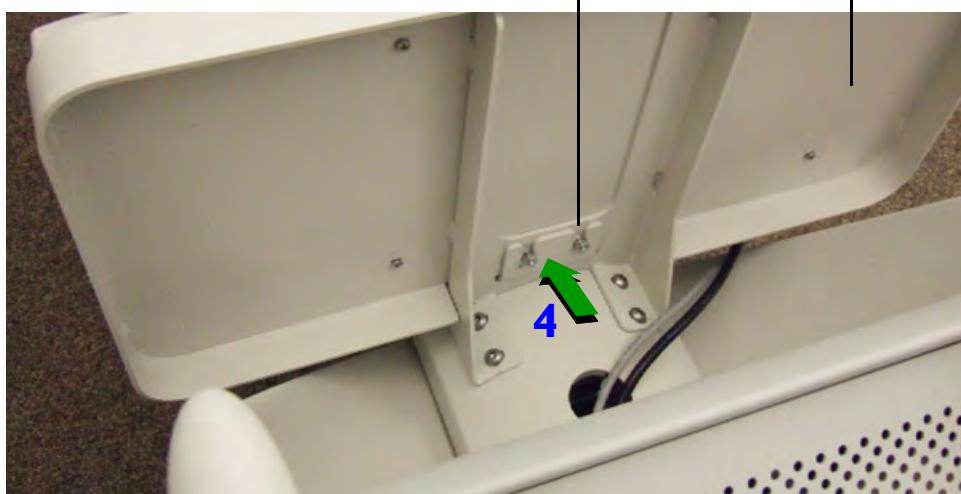
Figure 5-56

## Securing the Stop Bracket



5

Bottom of shelf



3. Rotate the stop bracket up to the vertical position.
4. Push the stop bracket up against the bottom of the color printer shelf so that the two screw studs fit into the stop bracket slots.
5. Secure the bracket to the bottom of the shelf with two lock nuts.

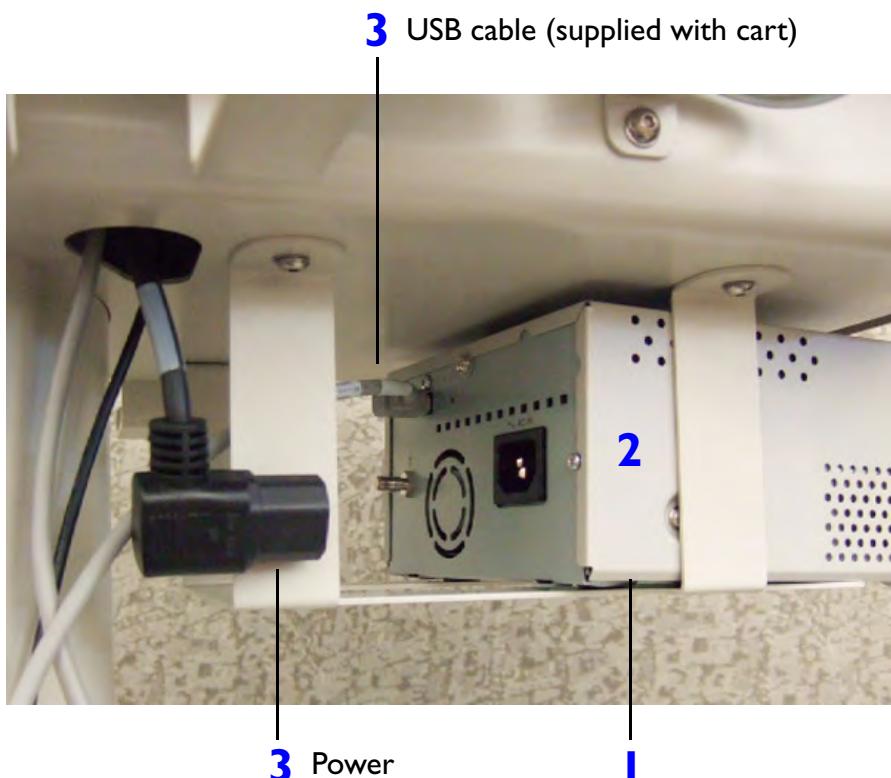
**NOTE** When instructed to secure hardware, tighten in accordance with the training you received on this product.

Return to [Installation Procedure List for Systems with the A.0 or B.0 Cart](#).

## Installing the Black-and-White Printer (A.0 or B.0 Cart)

Figure 5-57

Placing and Cabling the B&W Printer



### ► To install the B&W printer

**NOTE** If the system is ordered without the optional cart, connect the printer as a remote peripheral on an appropriate work space near the system ([Figure 11-23](#)).

1. Unpack the printer and remove the four rubber feet (if installed) from the bottom of the printer.
2. Slide the printer about halfway into the B&W printer support shelf.
3. Route the two printer cables between the two rear legs of the support shelf. Connect the power cord and B&W printer USB cable to the rear of the B&W printer.

Figure 5-58

## Securing the B&amp;W Printer, A.0 Cart



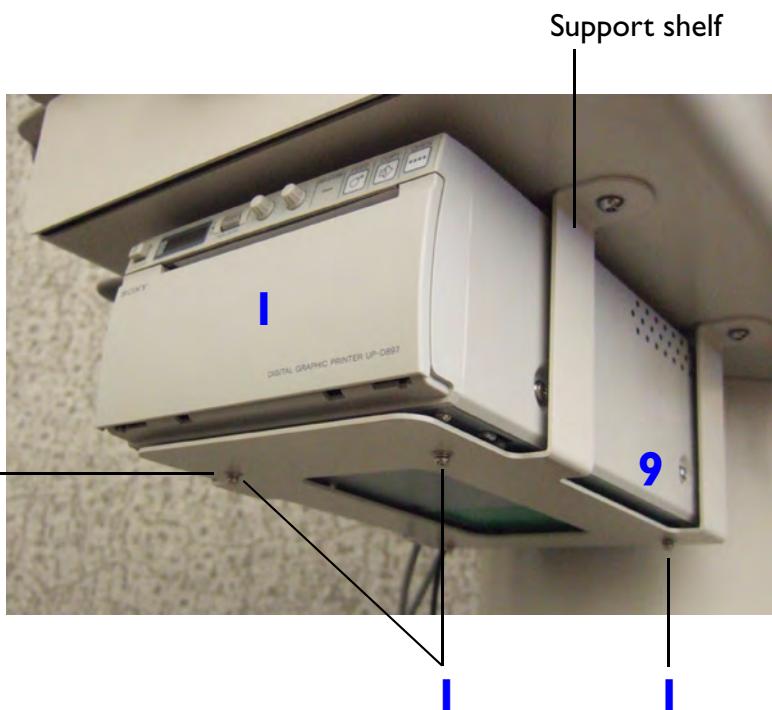
Sony UP-D897MD printer shown

4. For A.0 system carts, go to [step 6](#).
5. For B.0 system carts, go to [step 8](#).
6. Remove the four screws from the bottom of the printer support shelf.
7. Align and secure the printer to the shelf from underneath with four screws.

**NOTE** When instructed to secure hardware, tighten according to the training that you received on this product.

Figure 5-59

## Securing the B&amp;W Printer, B.0 Cart

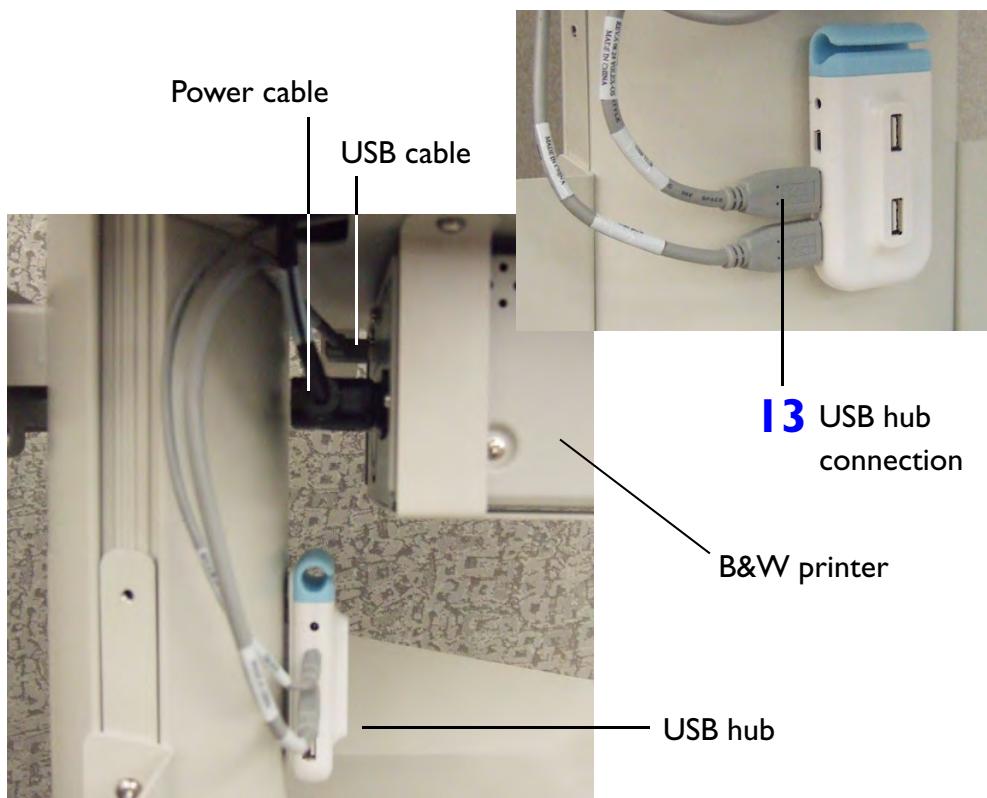


Sony UP-D897MD printer shown

8. Remove the four screws from the bottom of the printer support shelf.
9. Install the two rear screws to the bottom of the printer (about half way).
10. Slide the printer into the support shelf, placing the printer rear mounting screws into the slotted holes of the support shelf.
11. Align and install the two front printer mounting screws.
12. Secure the printer to the shelf from underneath, tightening all four screws.

**NOTE** When instructed to secure hardware, tighten according to the training that you received on this product.

Figure 5-60

**B&W Printer Cabled and Installed**

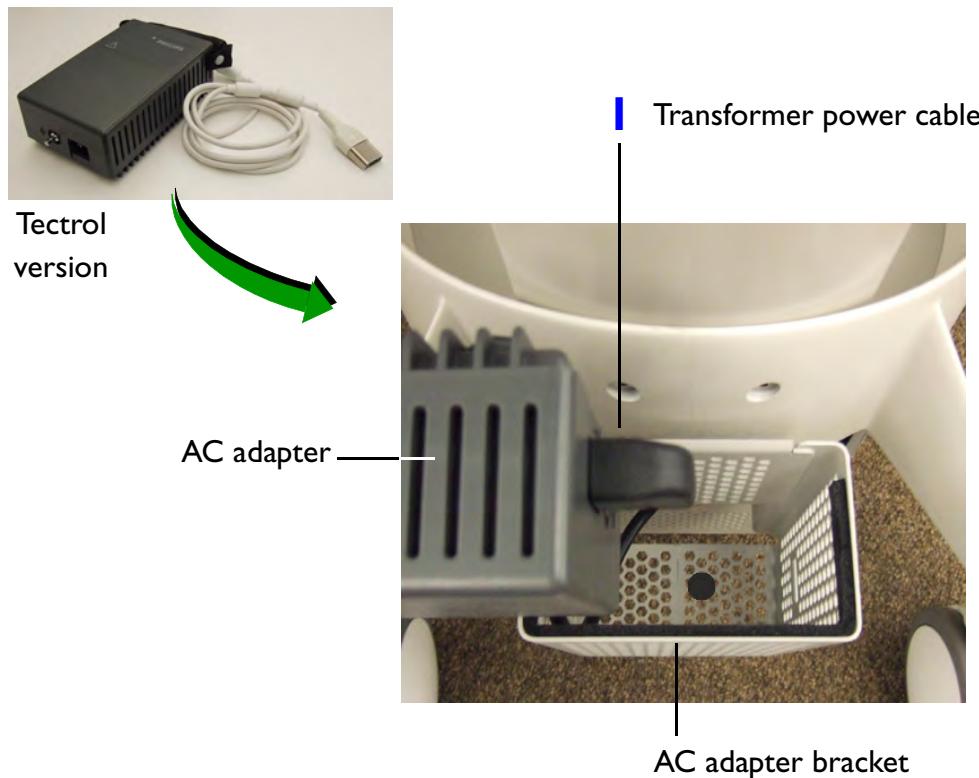
13. Connect the other end of the B&W printer USB cable to any of the USB hub ports. (The center port is recommended.) For the cabling diagram, see [Figure 11-28](#).

Return to [Installation Procedure List for Systems with the A.0 or B.0 Cart](#).

## Installing the AC Adapter and System Power Cord (A.0 or B.0 Cart)

Figure 5-61

Connecting the Transformer Power Cable to  
the AC Adapter

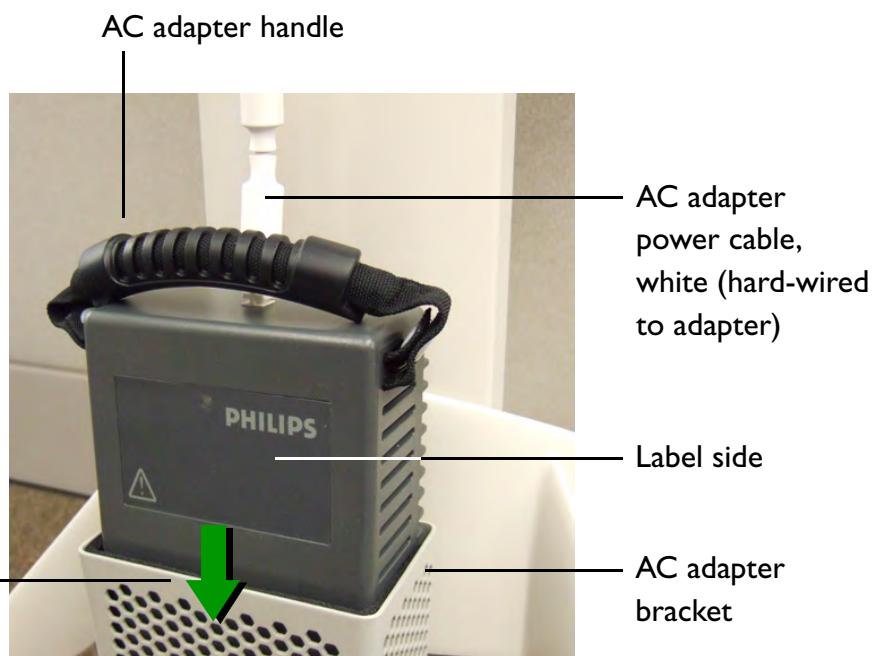


➤ To install the AC adapter and system power cord (optional cart application)

- I. Reach inside the AC adapter bracket, pull the transformer power cable up, and plug it into the receptacle on the AC adapter. For the cabling diagram, see [Figure 11-24](#).

Figure 5-62

## Placing the AC Adapter into the Bracket

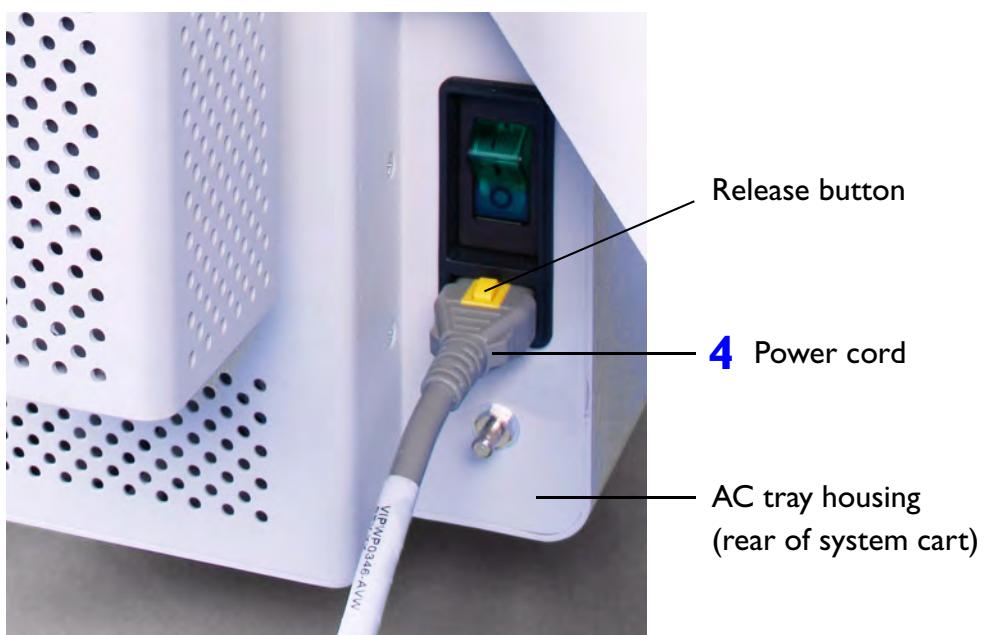


**NOTE** The correct orientation for the AC adapter is label side facing out, away from the cart.

2. Feed the transformer power cable (black cable) down inside the AC adapter bracket as you slide the adapter into the bracket.

**Figure 5-63****Connecting the AC Adapter Power Cable to the CX30 or CX50 System****Rear of cart**Power receptacle **3**

3. Connect the AC adapter power cable to the system power receptacle on the rear of the system.

**Figure 5-64****Installing the System Cart Power Cord**

4. Push the system cart power cord into the receptacle at the rear of the AC tray housing until it snaps in place. For the cabling diagram, see [Figure 11-22](#).

**CAUTION** Do not drape the power cord over any of the cable hooks or the handle on the system cart. Damage to the cord or power receptacle unit can occur when raising the cart.

**NOTE** To remove the power cord, press the yellow release button with your thumb and pull the cord out of the receptacle.

Return to [Installation Procedure List for Systems with the A.0 or B.0 Cart](#).

## Installing the Foot Switch Assembly (A.0 or B.0 Cart)

Figure 5-65

Placing the Foot Switch



► **To install the foot switch**

- I. Unpack the foot switch and place it on the floor between the system cart front casters.

Figure 5-66

## Connecting the Foot Switch Cable

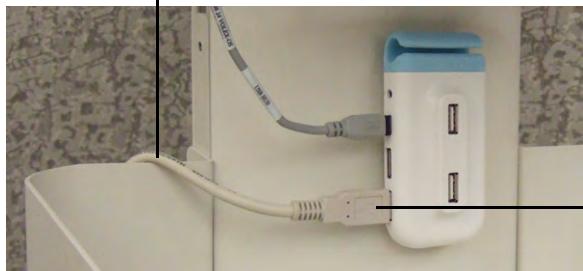


Preferred option:  
system connection

2

3

Or



Alternate option:  
cart USB-hub connection

2 (Use any port)

2. Connect the foot switch USB cable to the spare port on the system or to one of the ports on the USB hub. For the cabling diagram, see [Figure 11-27](#).

**NOTE** For best reliability, connect the foot switch directly to the system, if possible.

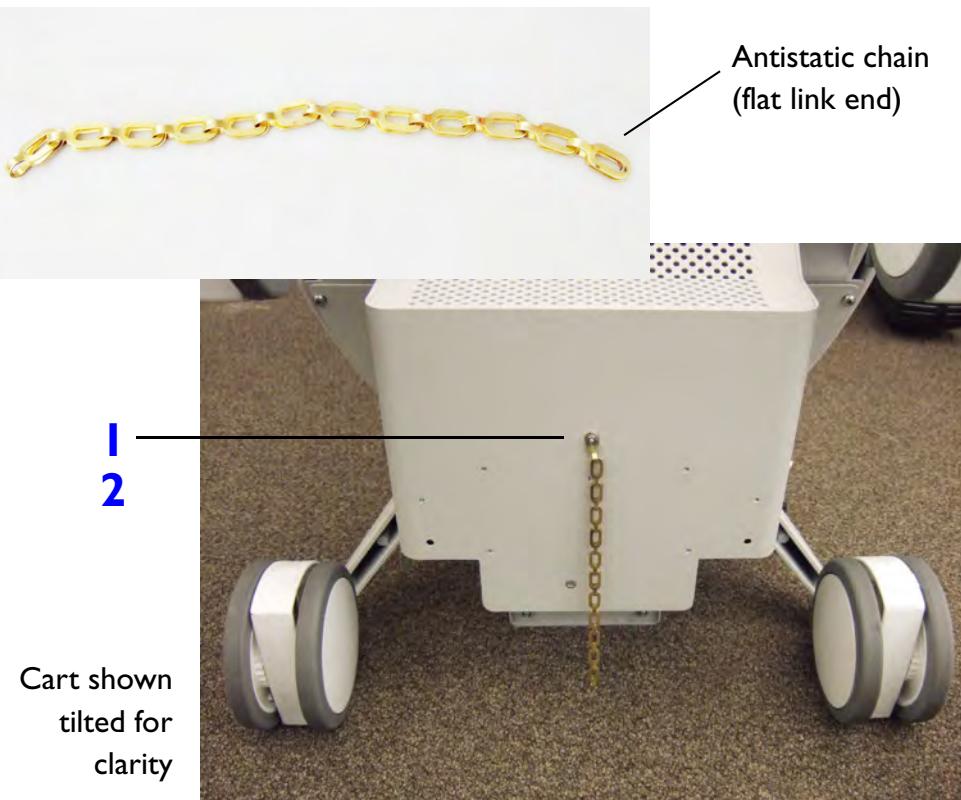
3. Bundle the excess cable or drape it over the cart cable hooks to keep the work area clear.

Return to [Installation Procedure List for Systems with the A.0 or B.0 Cart](#).

## Installing the Antistatic Chain (A.0 or B.0 Cart)

Figure 5-67

Installing the Antistatic Chain



### ► To install the antistatic chain

#### NOTES

- An antistatic chain is shipped with the system cart. Install it only if the customer wants it.
- Some carts may ship with the anti-static chain already installed.

1. Place the flat link end of the chain over the screw stud on the bottom of the AC tray housing.
2. Secure the chain with the supplied lock nut (hand-tighten).

Return to [Installation Procedure List for Systems with the A.0 or B.0 Cart](#).

## CX30 or CX50 System and C.0 Cart Installation

### Installing the Stand-alone CX30 or CX50 System

Figure 5-68

Placing the System on a Suitable Surface

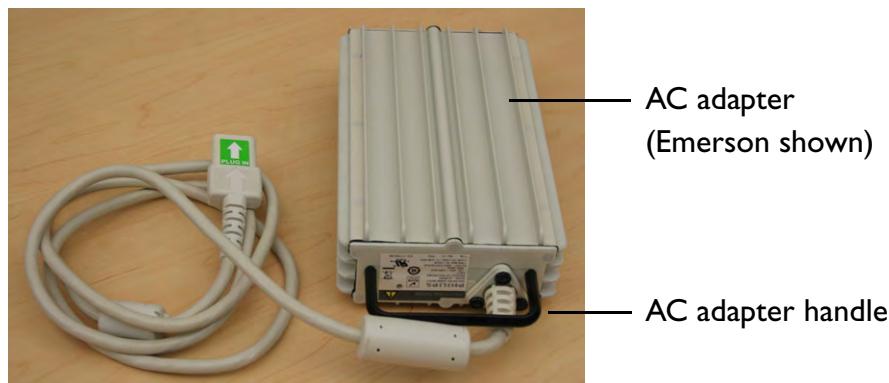


► **To install the CX30 or CX50 system as a stand-alone**

1. If system was ordered as a stand-alone system (without a cart), place it where the customer will first use it.
2. Ensure that the system and AC adapter are placed on an appropriate flat surface (not the floor or patient's bed) that provides access to a proper power source.

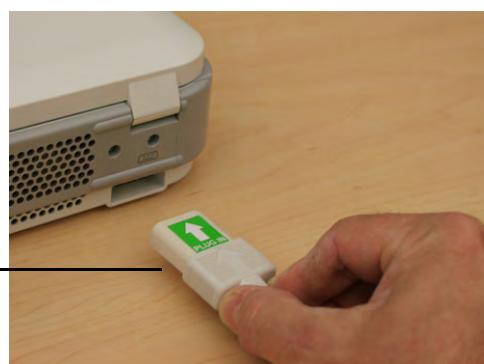
Figure 5-69

## Connecting the AC Adapter



AC adapter  
(Emerson shown)

AC adapter handle



3. Plug the AC adapter into an AC outlet and then into the rear of the system.

**WARNING** The AC adapter may become hot. Do not touch the surface of the adapter; touch only the AC adapter handle.

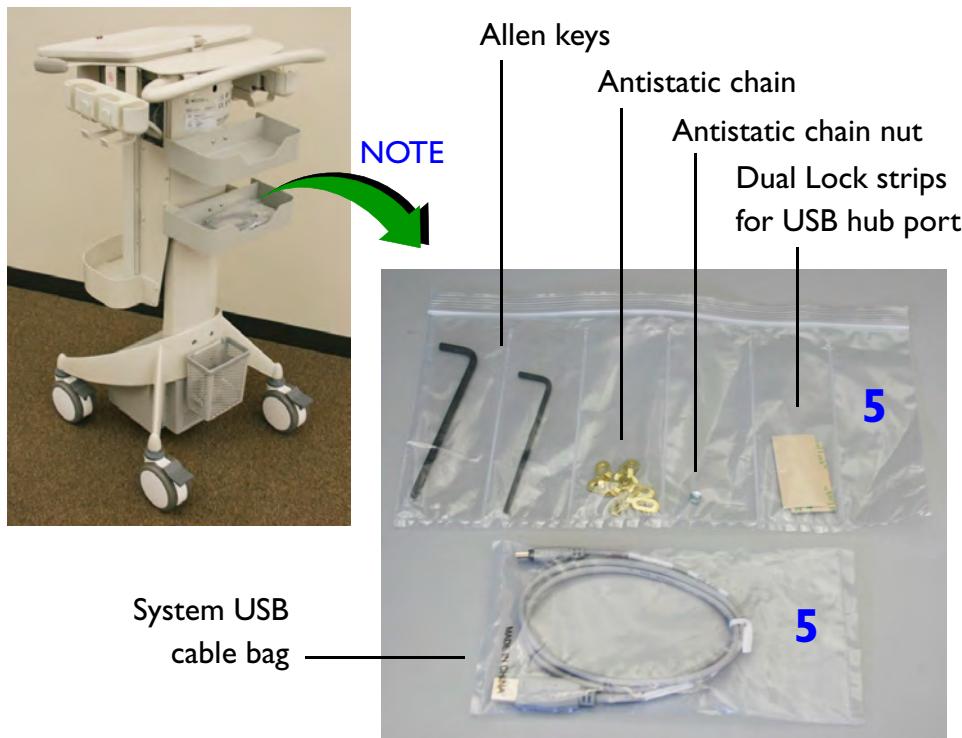
4. Go to [Figure 11-23](#) to connect the printers and the optional isolation transformer.

Return to [Installation Procedure List for Systems with the C.0 Cart](#).

## Installing the USB Hub (C.0 Cart)

Figure 5-70

Locating the Cart Accessory Bags



**NOTE** The cable hose strain relief used in the interventional suite to connect video, Ethernet, and AC power to the Allura system for Integrated Ultrasound is shown in [Figure 11-2](#).

### ► To install the USB hub

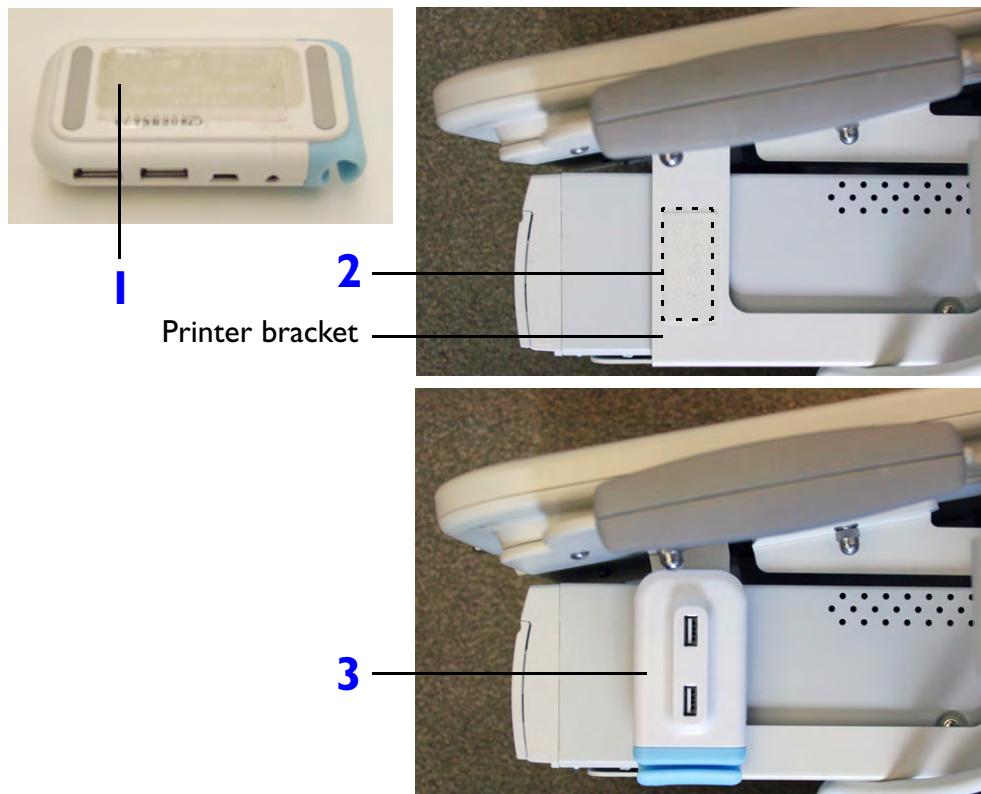
**NOTE** Two accessory bags ship with the system cart, in one of the rear storage shelves.

5. Check that the contents of the bags match those shown in [Figure 5-70](#).

**NOTE** If the system has the optional probe holder accessory for the D2cwc or D5cwc transducer, it has a self-adhesive mount. This holder can be applied anywhere behind the system on the flat part at the top of the cart. The recommended location is shown in [Figure 14-83](#).

Figure 5-71

## Installing the USB Hub (Cart Installations)

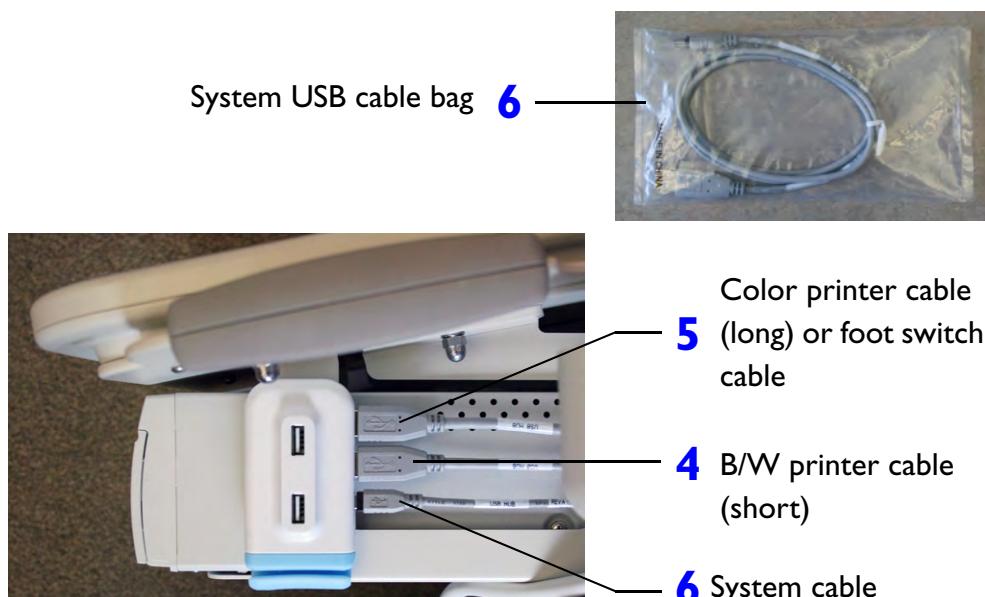


**NOTE** For USB hub connector designations, see [Figure 11-20](#).

1. Peel the adhesive backing off one of the Dual Lock strips and adhere it to the back of the USB hub.
2. Peel the backing off the other adhesive strip and adhere it to the right-side, on the B/W printer bracket.
3. Place the USB hub over the Dual Lock strip on the printer bracket and press to secure it in place. You should hear a snap when it locks.

Figure 5-72

## Connecting the Cables to the USB Hub

**CAUTION**

Current over-draw. Do not connect a wireless device to the USB hub.

**NOTE** The black-and-white printer is installed at the factory.

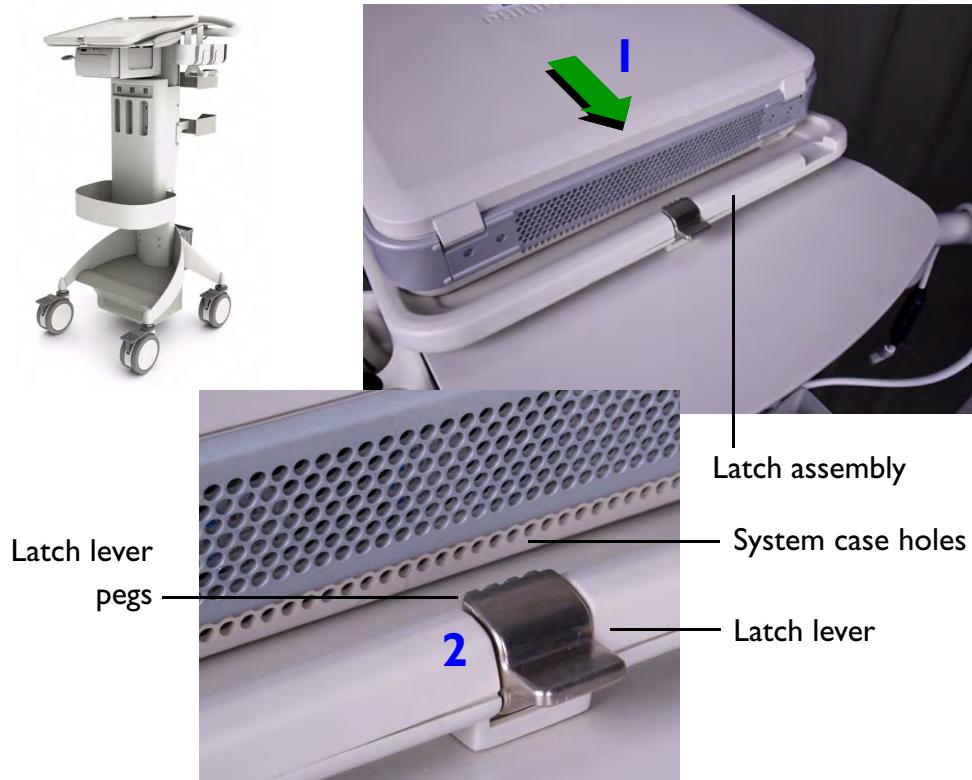
4. Take the pre-installed B&W printer USB cable (short gray cable) and connect it to any of the USB hub ports. Using the port shown in [Figure 5-72](#) is recommended.
5. Take the other pre-installed color printer USB cable (long gray cable) and connect it to any of the USB hub ports until used.
6. Remove the system USB cable from the bag (small connector cable, supplied with cart) and connect it into the hub port shown in [Figure 5-72](#).

Return to [Installation Procedure List for Systems with the C.0 Cart](#).

## Installing the CX30 or CX50 System with Optional C.0 Cart

Figure 5-73

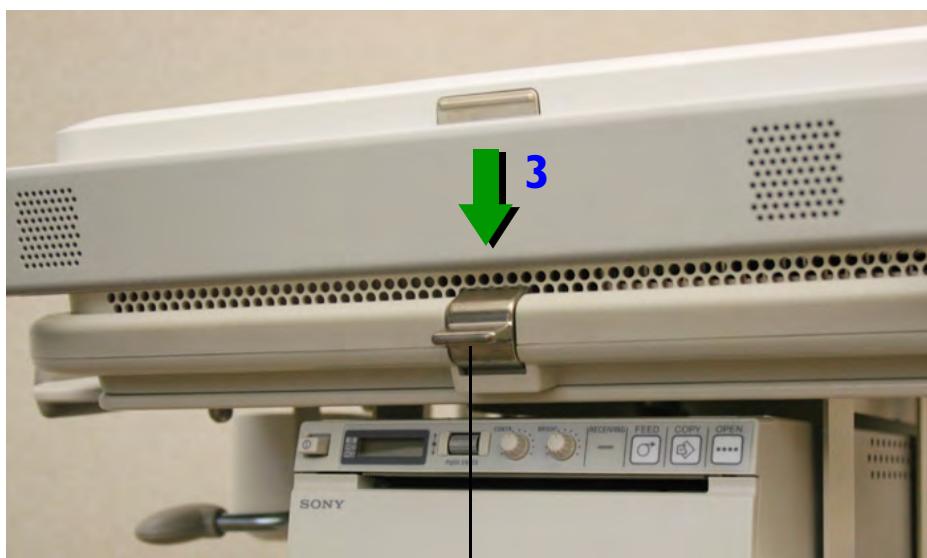
### Installing the CX30 or CX50 System on the Cart



- To install the CX30 or CX50 system on the optional C.0 cart

#### NOTES

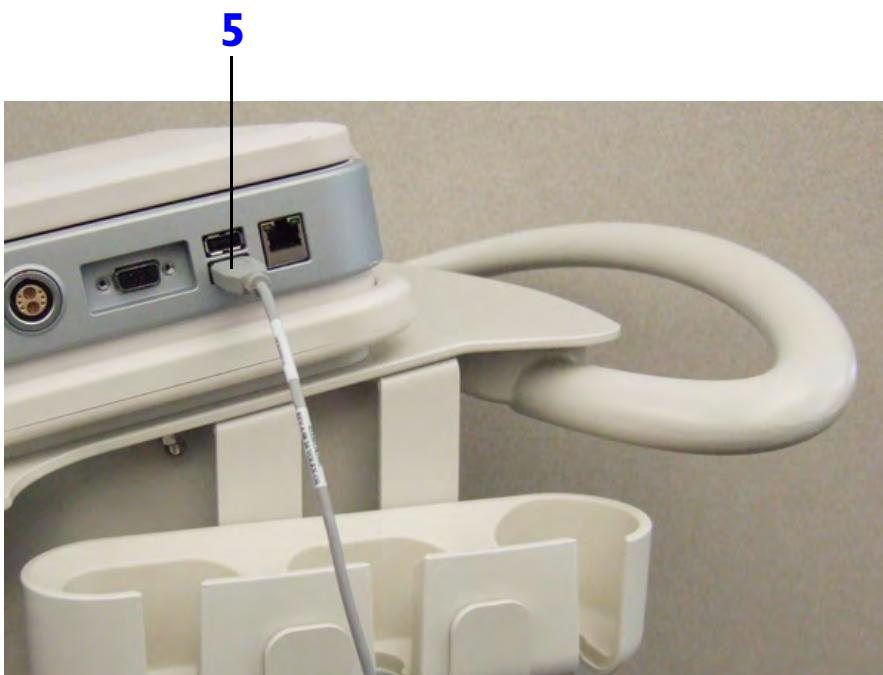
- The USB hub must be installed before completing this procedure. To install the USB hub, go to “[Installing the USB Hub \(C.0 Cart\)](#)” on page 190.
  - The B&W printer is installed at the factory.
1. Facing the front of the cart, set the bottom rear of the system onto the latch assembly platform, and slide it toward the cart handle.
  2. Slide the system back until the pegs on the rear latch lever fit into the holes in the rear system case.

**Figure 5-74****Locking the System onto the Cart Latch Assembly**

3. Press the front latch lever down and set the front of the system down on the latch assembly platform.
4. Release the latch lever to set the pegs of the front latch lever into the front system case holes. The system is now secured to the system cart.

Figure 5-75

### Connecting the CX30 or CX50 System USB Cable



5. Plug the system USB cable into the right side of the system.

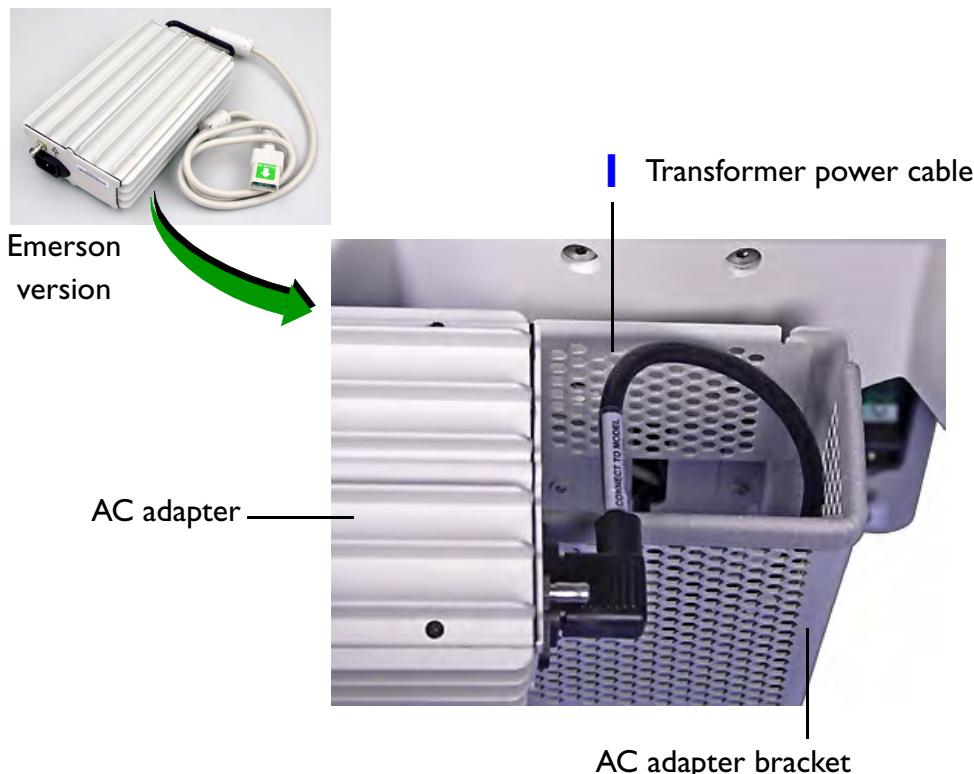
**NOTE** Connecting the system USB cable to the lower USB port is recommended. It allows easy access to the upper port for other USB devices.

Return to [Installation Procedure List for Systems with the C.0 Cart](#).

## Installing the AC Adapter and System Power Cord (C.0 Cart)

Figure 5-76

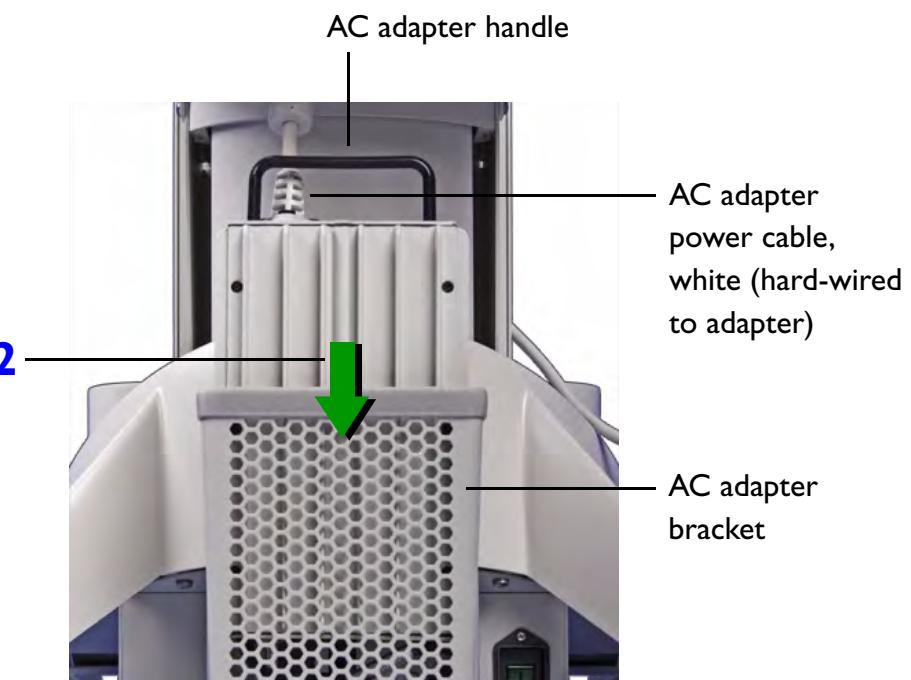
### Connecting the Transformer Power Cable to the AC Adapter



- To install the AC adapter and system power cord (optional cart application)
  - I. Reach inside the AC adapter bracket, pull the transformer power cable up, and plug it into the receptacle on the AC adapter. For the cabling diagram, see [Figure 11-24](#).

Figure 5-77

## Placing the AC Adapter into the Bracket



2. Feed the transformer power cable (black cable) down inside the AC adapter bracket as you slide the adapter into the bracket.

Figure 5-78

**Connecting the AC Adapter Power Cable to the CX30 or CX50 System**

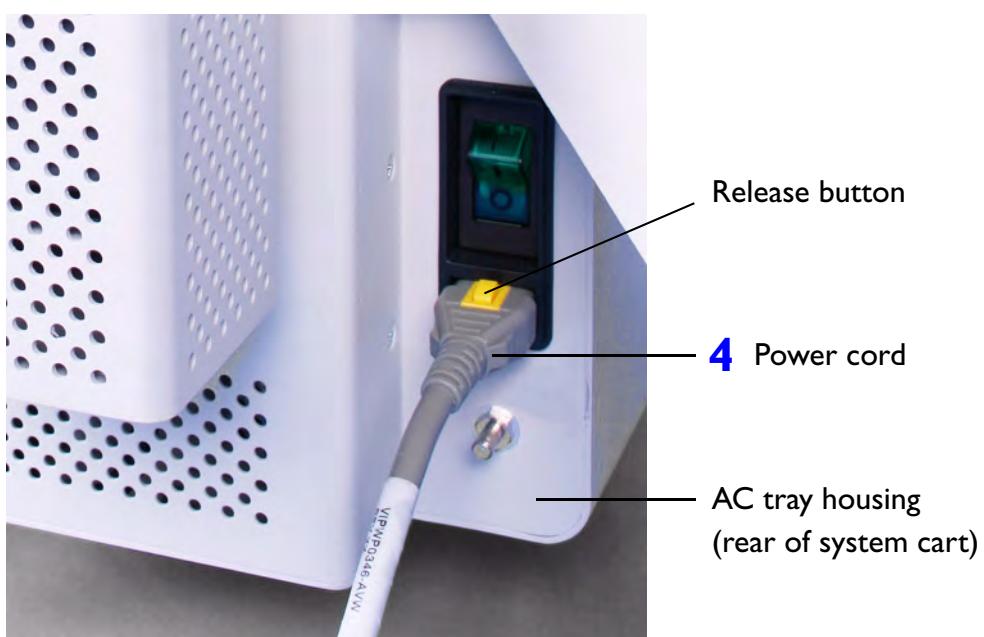
Rear of cart

Power receptacle **3**

3. Connect the AC adapter power cable to the system power receptacle on the rear of the system.

Figure 5-79

## Installing the System Cart Power Cord



4. Push the system cart power cord into the receptacle at the rear of the AC tray housing, until it snaps in place. For the cabling diagram, see [Figure 11-22](#).

**CAUTION** Do not drape the power cord over any of the cable hooks or the handle on the system cart. Damage to the cord or power receptacle unit can occur when raising the cart.

**NOTE** To remove the power cord, press the yellow release button with your thumb and pull the cord out of the receptacle.

Return to [Installation Procedure List for Systems with the C.0 Cart](#).

## Installing the Foot Switch Assembly (C.0 Cart)

Figure 5-80

Placing the Foot Switch



► **To install the foot switch**

- I. Unpack the foot switch and place it on the floor between the system cart front casters.

Figure 5-81

## Connecting the Foot Switch Cable



First choice, preferred  
(system connection)

2

Alternate option  
(cart USB hub connection)

Or



2

(Use any port)

3

2. Connect the foot switch USB cable to the spare port on the system or to one of the ports on the USB hub. For the cabling diagram, see [Figure 11-27](#).

**NOTE** For best reliability, connect the foot switch directly to the system, if possible.

3. Bundle the excess cable or drape it over the cart cable hooks to keep the work area clear.

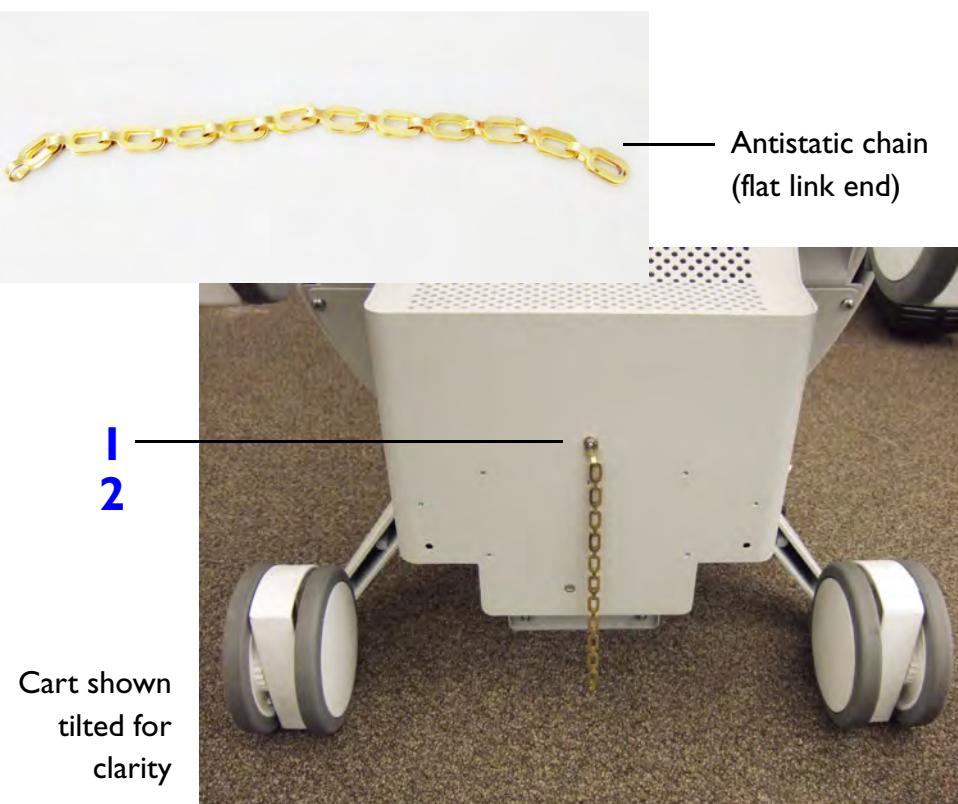
**NOTE** When moving the system, the foot switch assembly can be placed in the front cable catch or the rear storage shelf.

Return to [Installation Procedure List for Systems with the C.0 Cart](#).

## Installing the Antistatic Chain (C.0 Cart)

Figure 5-82

Installing the Antistatic Chain



Cart shown  
tilted for  
clarity

### ► To install the antistatic chain

#### NOTES

- An antistatic chain ships with the system cart. Install it only if the customer wants it.
- Some carts may ship with the anti-static chain already installed.

1. Place the flat link end of the chain over the screw stud on the bottom of the AC tray housing.
2. Secure the chain with the supplied lock nut (hand-tighten).

Return to [Installation Procedure List for Systems with the C.0 Cart](#).

## Installing the Stand-alone Color Printer Option (C.0 Cart)

Figure 5-83

Placing the Printer on a Suitable Surface



Sony UP-D23MD



Sony UP-D25MD



Mitsubishi CP30DW

- To install the color printer as a remote stand-alone unit

### NOTES

- Color printers cannot be installed on C.0 carts.
- The color printer is a system option.
- The color printer is connected as a remote peripheral on an appropriate work space near the system.

For cabling an optional stand-alone color printer, see [Figure 11-33](#).

Return to [Installation Procedure List for Systems with the C.0 Cart](#).

## CX30 or CX50 System and D.0 Cart Installation

### Installing the Stand-alone CX30 or CX50 System

Figure 5-84

Placing the System on a Suitable Surface

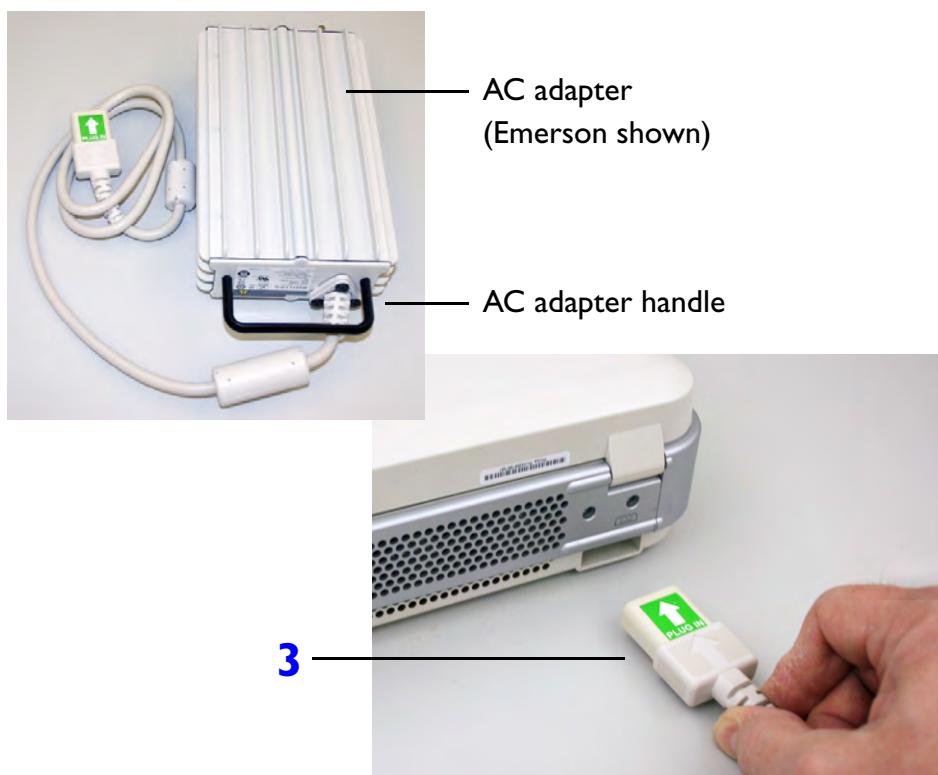


► **To install the CX30 or CX50 system as a stand-alone**

1. If system was ordered as a stand-alone system (without a cart), place it where the customer will first use it.
2. Ensure that the system and AC adapter are placed on an appropriate flat surface (not the floor or patient's bed) that provides access to a proper power source.

Figure 5-85

## Connecting the AC Adapter



3. Plug the AC adapter into an AC outlet and then into the rear of the system.

**WARNING** The AC adapter may become hot. Do not touch the surface of the adapter; touch only the AC adapter handle.

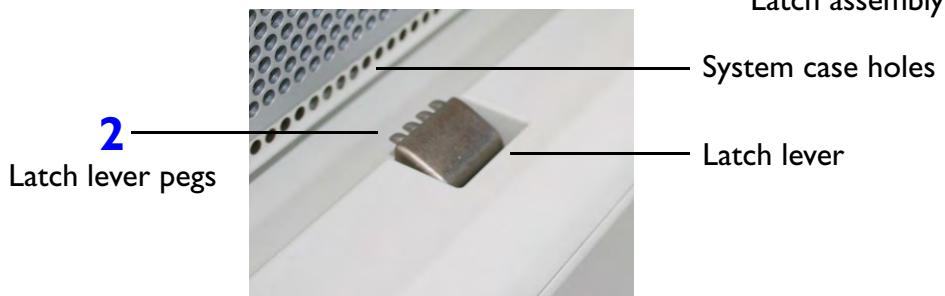
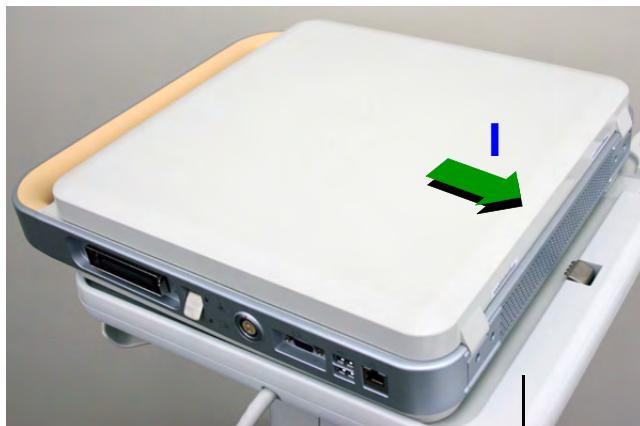
4. Connect the printers and the optional isolation transformer (Figure 11-23).

Return to [Installation Procedure List for Systems with the D.0 Cart](#).

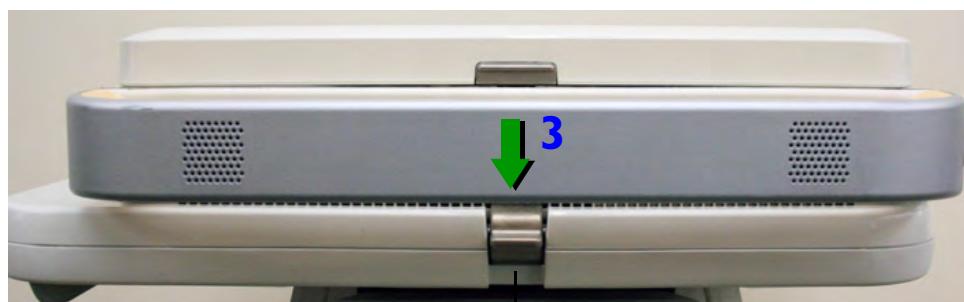
## Installing the CX30 or CX50 System with Optional D.0 Cart

Figure 5-86

### Installing the CX30 or CX50 System on the Cart

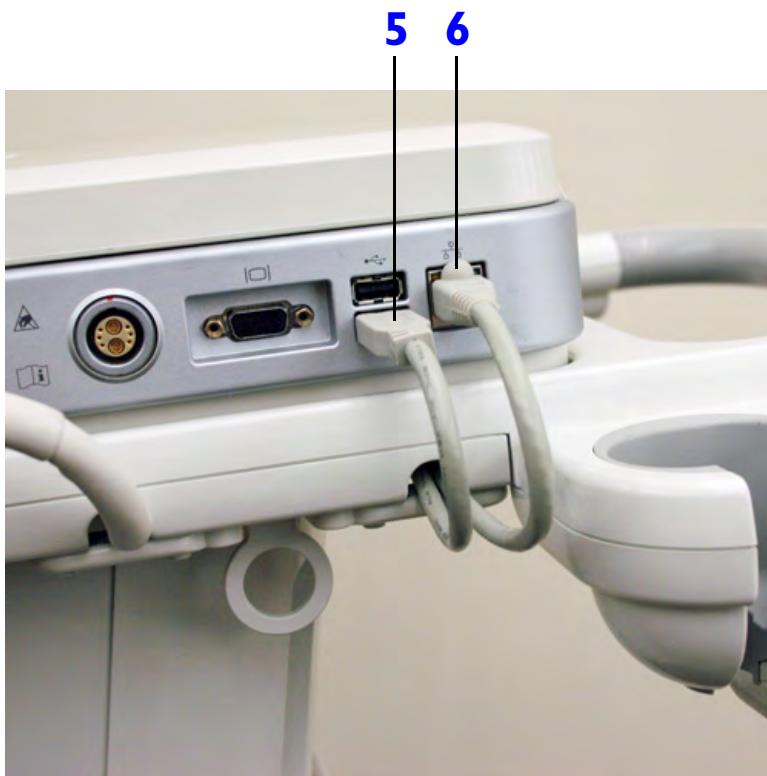


- To install the CX30 or CX50 system on the optional D.0 cart
1. Facing the front of the cart, set the bottom rear of the system onto the latch assembly platform, and slide it toward the cart handle.
  2. Slide the system back until the pegs on the rear latch lever fit into the holes in the rear system case.

**Figure 5-87****Locking the System onto the Cart  
Latch Assembly**

Front of cart

3. Press the front latch lever down and set the front of the system down on the latch assembly platform.
4. Release the latch lever to set the pegs of the front latch lever into the front system case holes. The system is now secured to the system cart.

**Figure 5-88****Connecting the CX30 or CX50 System  
USB Cable**

5. Plug the cart-to-system USB cable into the lower USB port on the right side of the system.
6. Plug the cart-to-LAN cable into the LAN connector on the right side of the system.

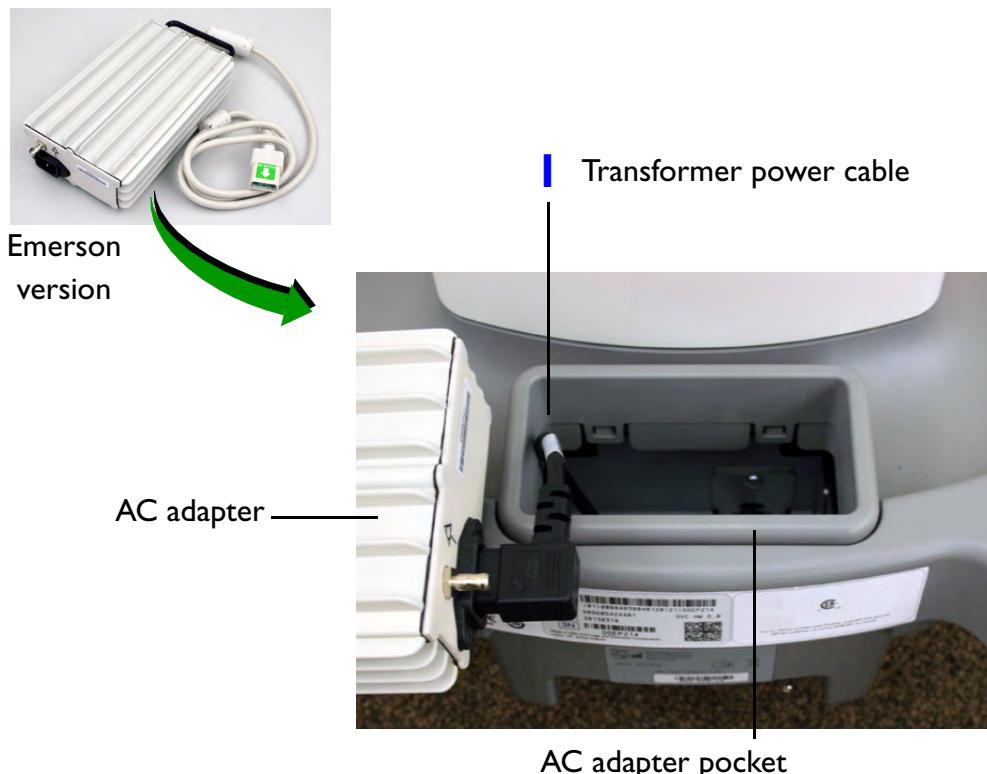
**NOTE** Connecting the system USB cable to the lower USB port is recommended. It allows easy access to the upper port for other USB devices.

Return to [Installation Procedure List for Systems with the D.0 Cart](#).

## Installing the AC Adapter and System Power Cord (D.0 Cart)

Figure 5-89

### Connecting the Transformer Power Cable to the AC Adapter

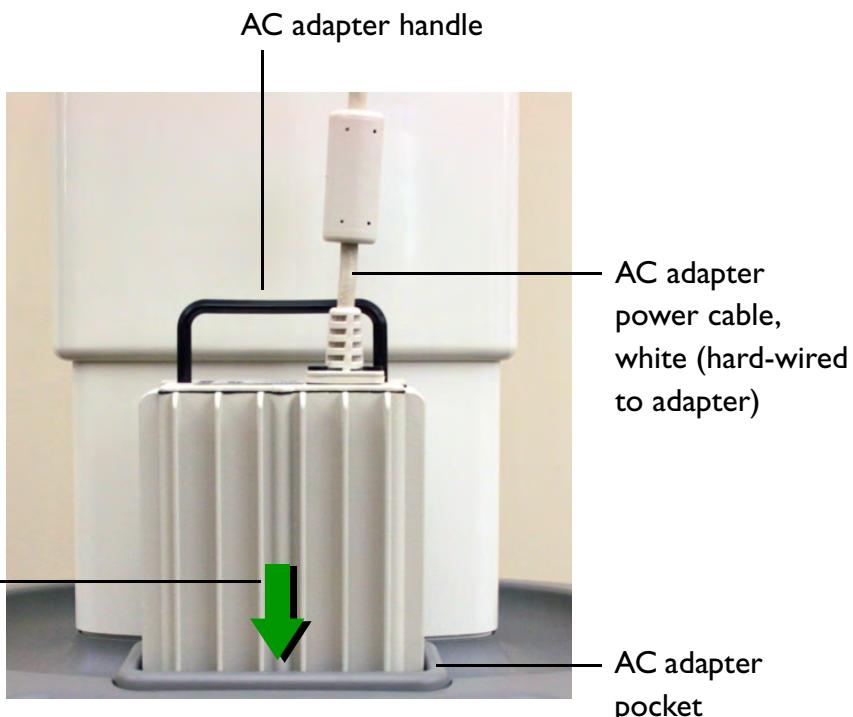


➤ To install the AC adapter and system power cord (optional cart application)

- I. Reach inside the AC adapter pocket, pull the transformer power cable up, and plug it into the receptacle on the AC adapter. For the cabling diagram, see [Figure 11-25](#).

Figure 5-90

## Placing the AC Adapter into the Bracket



- Feed the transformer power cable (black cable) down inside the AC adapter opening while sliding the adapter into the cart pocket.

**Figure 5-91****Connecting the AC Adapter Power Cable to the CX30 or CX50 System**

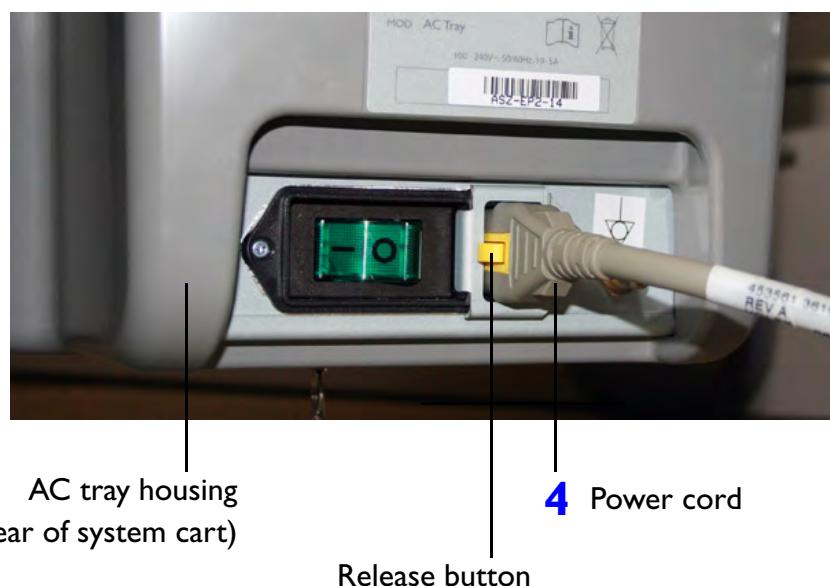
Rear of cart

Power receptacle **3**

3. Connect the AC adapter power cable to the system power receptacle on the rear of the system. For the cabling diagram, see [Figure 11-25](#).

Figure 5-92

## Installing the System Cart Power Cord



- Push the system cart power cord into the receptacle at the rear of the AC tray housing, until it snaps in place. For the cabling diagram, see [Figure 11-22](#).

**CAUTION** Do not drape the power cord over any of the cable hooks or the handle on the system cart. Damage to the cord or power receptacle unit can occur when raising the cart.

**NOTE** To remove the power cord, press the yellow release button with your thumb and pull the cord out of the receptacle.

Return to [Installation Procedure List for Systems with the D.0 Cart](#).

## Installing the Foot Switch Assembly (D.0 Cart)

Figure 5-93

Placing the Foot Switch

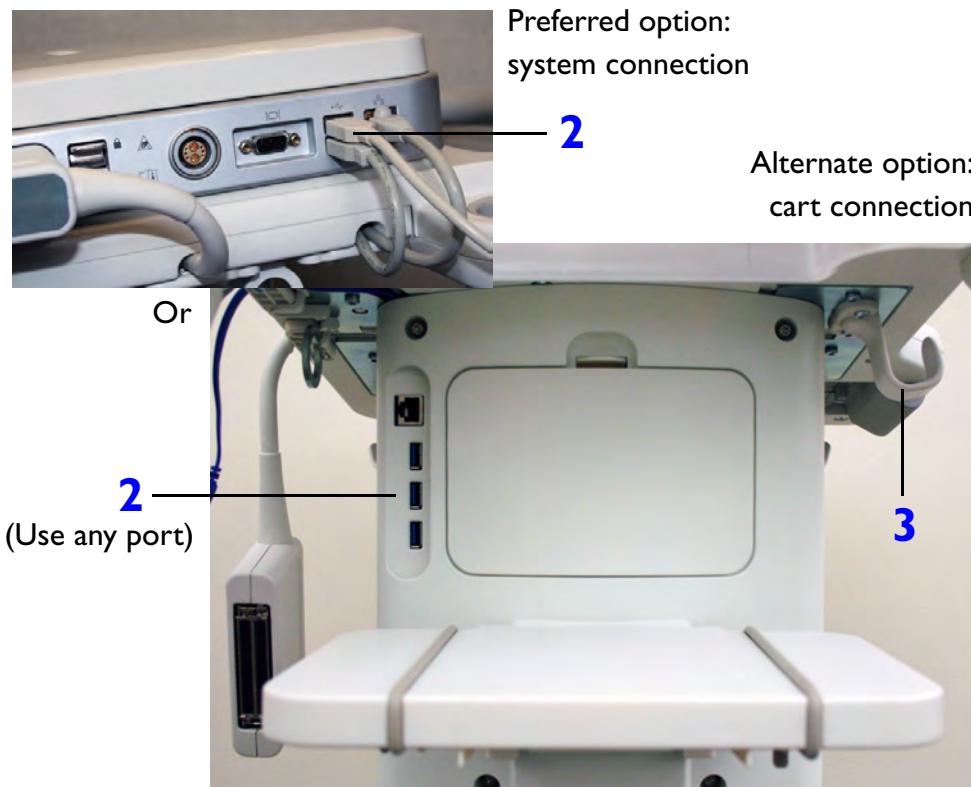


► **To install the foot switch**

- I. Unpack the foot switch and place it on the floor between the system cart front casters.

Figure 5-94

## Connecting the Foot Switch Cable



2. Connect the foot switch USB cable to the spare port on the system (preferred) or to one of the ports at the rear of the cart. For the cabling diagram, see [Figure 11-34](#).

**NOTE** For best reliability, connect the foot switch directly to the system, if possible.

3. Bundle the excess cable, or drape it over the cart cable hooks, to keep the work area clear.

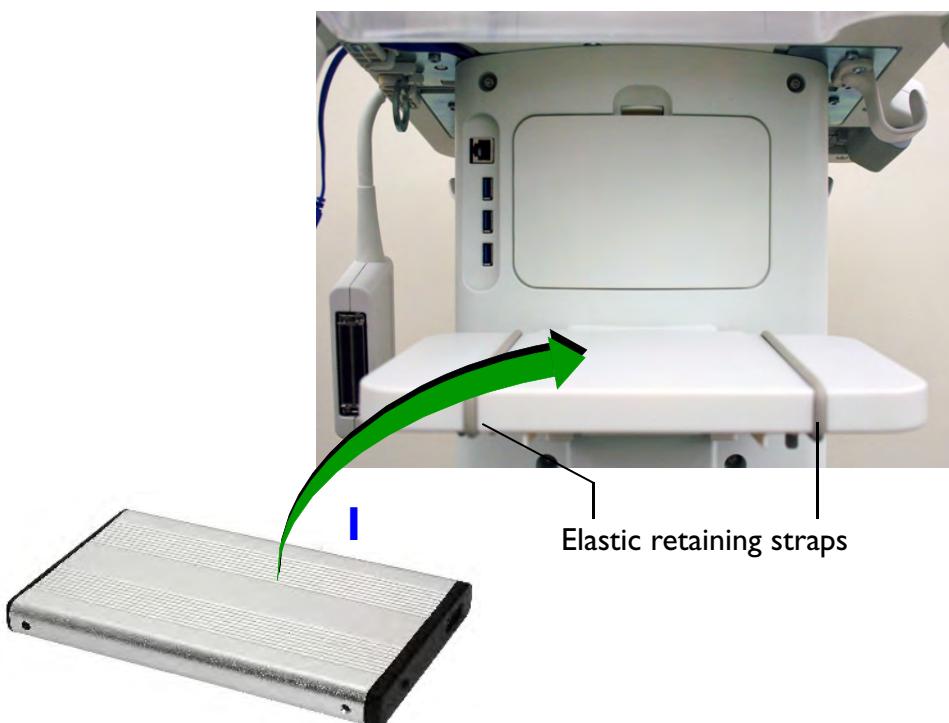
**NOTE** When moving the system, the foot switch assembly can be placed in the front cable catch or the rear storage shelf.

Return to [Installation Procedure List for Systems with the D.0 Cart](#).

## Installing a User-Owned Peripheral Device (D.0 Cart)

Figure 5-95

Placing the Unit on the Cart Shelf



- To install user-owned peripherals on the system cart

### NOTES

- The DVD shelf is not designed to support the weight of printers or DVR recorders. It is intended for USB hard drive and DVD drive devices only. Maximum allowable weight is 2 kg (4.4 lb).
- Optional external DVD drives and hard drives are not supplied by Philips.

- I. Place the device on the DVD shelf and secure it using the two elastic retainer straps.

For cabling an on-cart peripheral, see [Figure 11-37](#).

Return to [Installation Procedure List for Systems with the D.0 Cart](#).

## Installing the Stand-alone Color Printer Option (D.0 Cart)

Figure 5-96

Placing the Printer on a Suitable Surface



Sony UP-D23MD



Sony UP-D25MD



Mitsubishi CP30DW

- To install the color printer as a remote stand-alone unit

### NOTES

- Color printers cannot be installed on D.0 carts.
- The color printer is a system option.
- The color printer is connected as a remote peripheral on an appropriate work space near the system.

For cabling an optional stand-alone color printer, see [Figure 11-36](#).

Return to [Installation Procedure List for Systems with the D.0 Cart](#).

# 6 Performance Tests

## Introduction

This section explains the tests that determine functional confidence and ensure that the system is operating as intended at initial installation and after upgrades or repairs.

The goal is to verify correct system functionality. If testing reveals any problems, troubleshoot, repair, and retest the system before presenting it to the customer for use.

## Warnings and Cautions

Review [Section 3, “Safety”](#) before continuing. Also follow any additional warnings and cautions contained in this section.

## Visual Inspection for Mechanical Integrity

At initial installation and after upgrades or repairs, inspect controls, cables, connectors, transducers, and if applicable, the system cart, for outward signs of wear or physical damage that would suggest the system may be unable to function correctly and safely:

- Check for abnormalities or conditions that do not meet as-manufactured specifications.
- Ensure mechanical moving parts are functional and operate correctly:
  - On the optional cart, check that wheels all roll smoothly and both wheel brakes lock.
  - Control panel movable controls operate smoothly.
  - Video monitor can be adjusted as designed and holds position when the desired adjustment is achieved.

## System Functionality

Operate the system as Philips intended (see the *User Manual* as necessary) while observing and verifying that the following are true when checking system modes and basic operations.

### Ongoing Observations

- The image is correctly positioned on the video display.
- The indicators and backlighting associated with the controls on the control panel indicate correctly.
- The system responds correctly to all controls.

### System Modes and Basic Operations

- Every transducer purchased for the system can be connected and initialized in all corresponding transducer ports and operated in all its functional modes.
- Peripherals
  - The image printer, if installed, makes a print of the system display: Print images are correctly positioned horizontally and vertically and contain all the displayed information. The grayscale distinction or color of the printed image is accurate.
  - The report printer, if installed, prints and all report information is present and legible.
- Image and patient data transfer to removable media.
- DICOM print and export.

## Resident Self Tests

The Resident Self Tests (RST) suite of diagnostics requires no external instrumentation. RST is used to test the system hardware and software and includes tests for the individual subsystems (display processing and beam processing), specific modules, and submodules.

RST also provides system-specific hardware, software, service, and RST-log information. With RST, you can view, save, and print system information, RST-log contents, test pass/fail results, and errors.

RST is installed on all CX30 and CX50 systems, but CX30 systems with 2.0 and later software and CX50 systems with 3.0 and later software have the Integrated Service Platform (ISP), which provides consolidated access to the service functions that you can use for system troubleshooting, scheduled service, and system administration.

Some of the service functions, such as **System Test**, **Hardware Utilities**, and **Hardware Tests**, are sub-elements of the RST suite. Except for the customer-facing sub-elements of RST, only authorized users can access RST.

Philips service representatives can enable RST access for customers with a First Responder or Co-op contract that allows the customer's service engineer to use all of the RST tools and utilities and provide the results to the Philips service representative or the Philips call center. For CX30 1.0 systems and CX50 systems with versions 1.x through 2.5 software, the Philips service representative can enable customer access to RST for up to 14 months. After that option is enabled, a **Resident Self Test** control appears in the **Service** setups.

For CX30 2.0 and CX50 3.0 and later systems, the Philips service representative can enable the First Responder service option. When that option is enabled, First Responder user names and passwords can be created. When first responders log on, the **Hardware Tests** control becomes available (["Tests & Utilities Tab" on page 280](#)).

RST and ISP access is enabled when the system is booting or when the ultrasound application is running.

With version 1.1 and later software, an icon (a capital U) appears on the lower-right corner of the splash screen when you can use service keyboard shortcuts (that is, when **Ctrl + Alt + R** is available).

---

**NOTE** When you run a DIB test in bright ambient light, some of the tests fail. Philips recommends that you avoid running the DIB tests in brightly lit conditions.

---

## Logging On

Access to RST and advanced service features of ISP are available only to authorized users using the Integrated Security Tool (IST) or a key-generated password.

Non-Philips personnel (such as hospital biomedical engineers) can access RST only when the customer purchases a First Responder or Co-op service contract.

## Starting and Closing the RST Application (CX30 1.0 and CX50 1.x-2.5)

You can start the RST application after the system boots. If the ultrasound application is running, it closes when the RST application is started.

---

## CAUTION

Allow the system to boot to the imaging screen and allow the Active Box icon (square box at the bottom) to be displayed for at least ten seconds before starting the RST application. Failure to do so could cause the system to hang during RST startup or shut-down.

---

---

**NOTE** You cannot start the RST application while any dialog boxes are displayed.

---

► **To start the RST application**

1. Press **Ctrl+Alt+R**.
2. Enter a valid IST password or a key-generated password.

► **To close the RST Application**

1. Click the **X** button in the upper right corner of the RST window.
2. When the RST application closes, a dialog box asks if you want to reboot. To reboot the system, click **OK**.

---

**NOTE** Standard good practice is to reboot the system after closing RST.

---

## **Starting and Closing the RST Application (CX30 2.x and CX50 3.x-4.x)**

► **To start RST while the system boots**

Press **Ctrl+Alt+R**.

► **To start RST while the ultrasound application is running**

1. Press **Setup** and click **Service** to access the common service application.
2. Log on and click the **Test & Utilities** tab.

When the RST application closes, a message indicates that the system will reboot. Click **OK** (your only option) to respond to the message.

## RST User Interface

You control the RST software by using the system control panel and trackball. The buttons on each side of the trackball perform the functions of mouse buttons. The left trackball button functions like a left mouse button, and the right trackball button functions like a right mouse button.

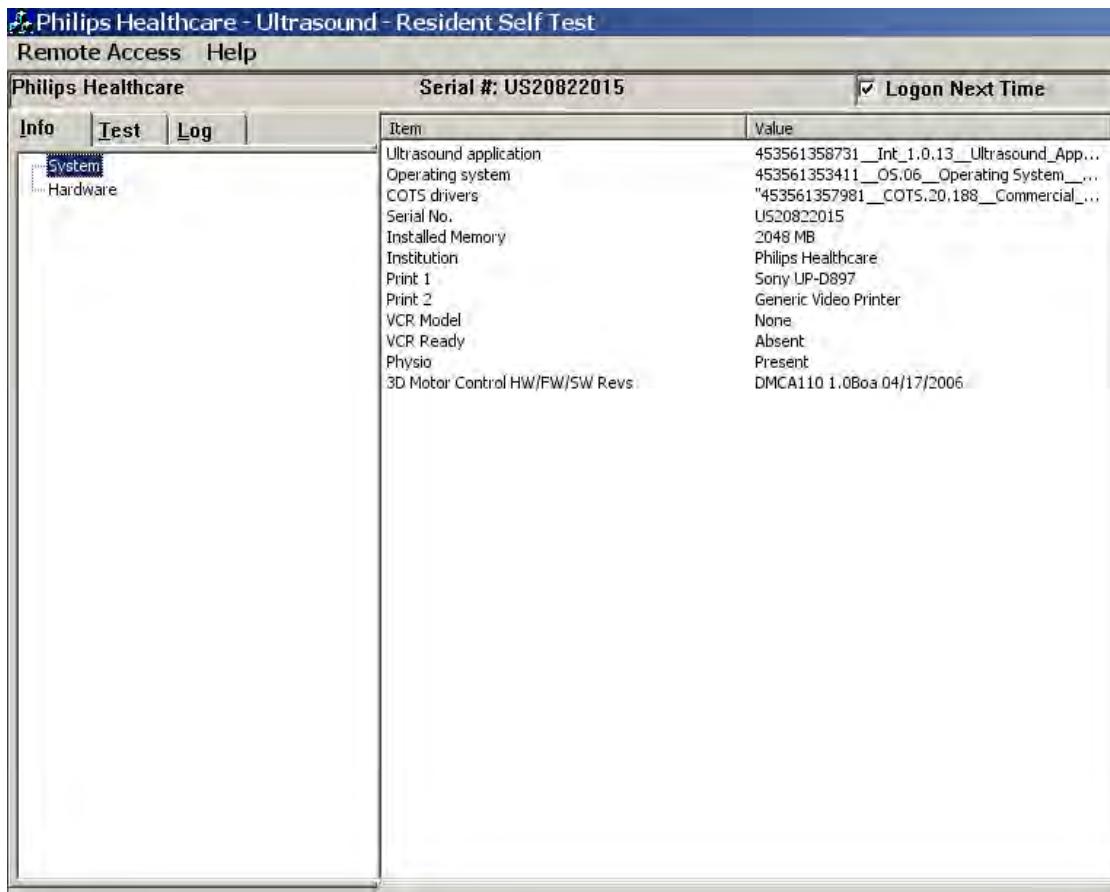
Three tabs are in the left pane ([Figure 6-1](#)), and each tab contains a directory of the supported functions.

- **Info** shows the system and hardware information.
- **Test** shows the available tests, enables you to invoke the tests, and displays the test status and results.
- **Log** displays errors and test-parameter data in the event viewer and displays service log entries in the service log.

The right pane shows information related to the items you select in the directory. The window header includes the institution name and the system serial number.

Figure 6-1

Example of an RST Window



## Info

The left pane of the **Info** window shows the System and Hardware items. Clicking an item shows the details for that item in the right pane of the window.

- The **System** item shows the system information:
  - Ultrasound application (application software)
  - Operating system
  - COTS (DRIVERS and PRINTERS) software
  - System serial number
  - Amount of installed memory
  - Institution name
  - Available (installed) peripherals
  - Status of the Physio Module (present or absent)
- The **Hardware** item shows the status of the available hardware:
  - Main Board
  - Channel Boards, CB0 and CBI (CB0 is the channel board closest to the Main Board, labeled on the Main Board connector.)
  - Transducer Connector Module (The non-imaging transducer connector is not tested.)
  - Physio Module

---

**NOTE** If the Physio Module is not on the system you are testing, “not installed” is displayed.

## Test

The **Test** window ([Figure 6-2](#)) shows the available tests, enables you to invoke the tests, and displays the test status and results. The left pane of the **Test** window shows the directory of the available tests, which are listed in tiers. The tests can be invoked from any tier.

- **Extended Test** is a comprehensive test of the system hardware. The tests in this tier do not require your participation after they are started. The tests verify detailed system operation with fault isolation to the board level. These tests report only failures that adversely impact system performance. Listed under **Extended Test** are the available subsystems, submodules, and the specific submodule tests. For instructions on running extended tests, see [“Running an Extended Test” on page 227](#).

---

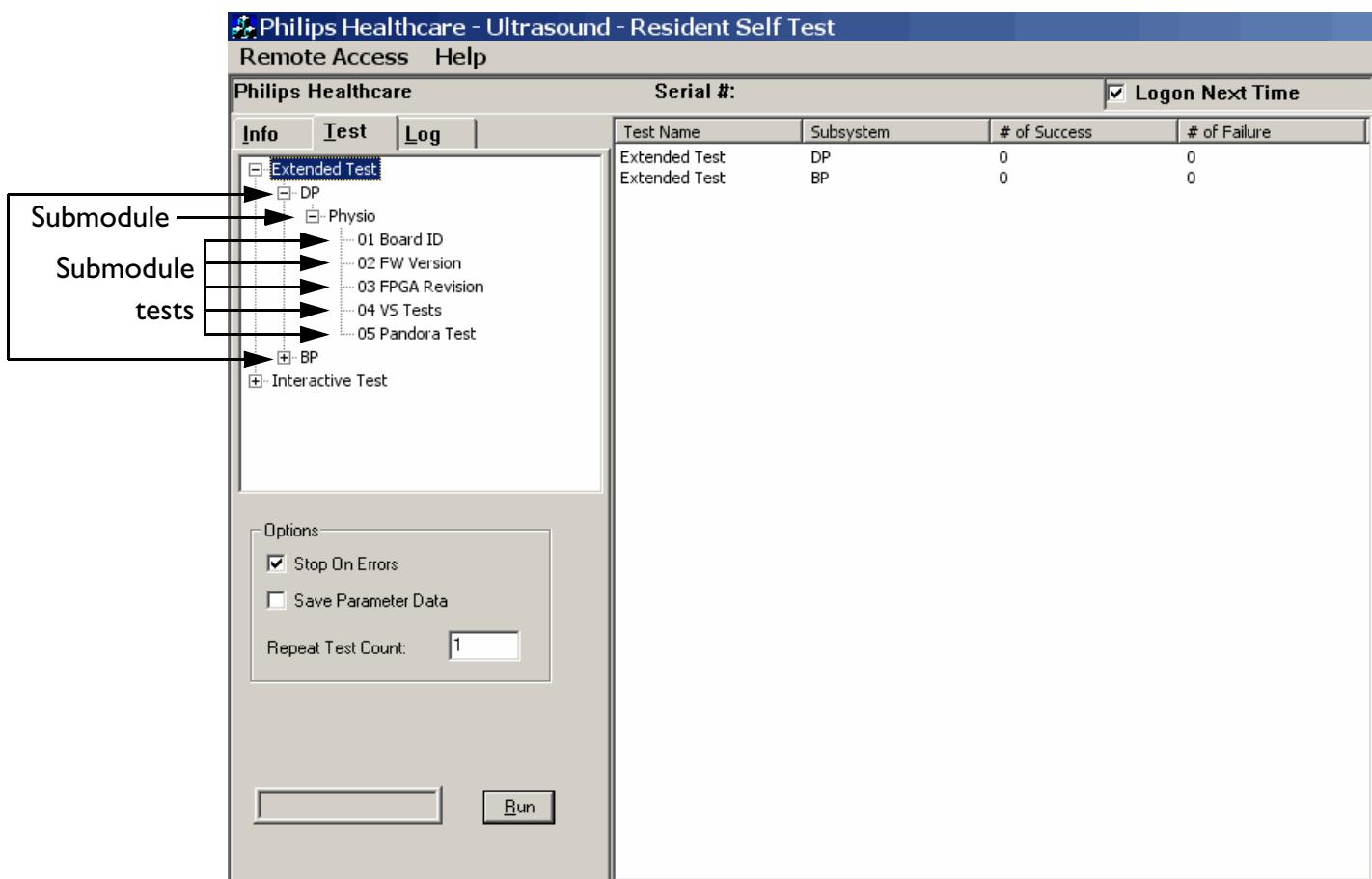
**NOTE** When you run a DIB test in bright ambient light, some of the tests fail. Philips recommends that you avoid running the DIB tests in brightly lit conditions.

---

- **Interactive Tests** verify operation of the system controls and display, and they require your active participation. Included are tests of the control panel (user interface) and display. For instructions on running interactive tests, see [“Running an Interactive Test” on page 233](#).

Figure 6-2

Example of an RST Test Window



## Test Options

The lower section of the left pane shows the three test options and **Run**, which is used to begin a selected test. **Run** dims when the test begins.

- **Stop On Errors** stops all tests when an error occurs. If this option is disabled, the selected tests run until completed. Any errors encountered are recorded in the error log.
- **Save Parameter Data** saves the measured test parameters.
- **Repeat Test Count** defines the number of times tests are repeated. The default is **1**. A value of **0** runs the tests continuously.

---

### NOTES

- The RST tests do not execute properly when a transducer is connected to the system. Disconnect all transducers before beginning any RST testing. If transducers are connected, RST displays a message to remind you to remove the transducers.
  - The PCIO Board supplies the RST programming; therefore, if RST is running, that section of the PCIO Board is functioning correctly.
- 

## Running an Extended Test

The extended tests check the system's hardware to the board level and do not require your participation after they are started. When you select a test in the left pane, the right pane shows the name of each test (**Test Name**), the components tested (**Subsystem**), the number of times the component passed the test (**# of Success**), and the number of times the component failed the test (**# of Failure**).

► **To run an extended test**

1. Click **Extended Test** in the directory to show the available tests.
2. If you want to run all the available tests, leave **Extended Test** selected. If you want to run a specific test, see “[Running a Subsystem or a Submodule Test](#)” on page 228.)
3. To run the test a specific number of times, enter the number in the **Repeat Test Count** field. To run the test continuously, enter 0 in the field.
4. Click **Run** to start the test.
5. When the test is complete, click **OK** in the dialog box.

## **Running a Subsystem or a Submodule Test**

Each subsystem contains submodules, which contain the submodule tests. You can test the subsystem or the submodule, or run a specific submodule test. Each test runs separately from the other tests in its tier.

► **To run a subsystem test or a submodule test**

1. Click **Extended Test** in the directory to show the available tests.
2. Do one of the following:
  - To run all of the extended tests, see “[Running an Extended Test](#)” on page 227.
  - To run all the submodule tests, click the submodule name.
  - To run a specific submodule test, click the submodule test name.
3. To run the test a specific number of times, enter the number of times in the **Repeat Test Count** field. To run the test continuously, enter 0 in the field.
4. Click **Run** to start the test.
5. When the test is complete, click **OK** in the dialog box.

---

**NOTE** The two-digit codes that precede the submodule test names are used in the **Application Test Log** display, in its **Category** column, and in the **Status** area at the lower left of the window.

---

## Specific Test Information

### 01 Main (Main Board) Test Submodules

- Main Board Configuration: Initializes the State machines on Gozer, Keymaster FPGAs to a known state. If failed, can be Main Board.
- Voltage Monitor Test: Measures voltages and make sure they are within limits (+12 V, +5 V, +3.3 V, +2.5 V, +1.8 V, +1.2 V). If failed, can be Main Board, Power Supply or Side I/O.
- PCIe Lock Test: Checks if the PCIe link is established between Gozer and the COM Express (Host). If failed, can be Main Board COM Express assembly.
- PROM Config Done Test: Checks if the external PROM has configured Gozer successfully. If failed, can be Main Board.
- DAS Reference Test: measures the 2.5V Reference to the DAS A2D Converter circuit in the Main Board. If failed, can be Main Board.
- DAS A2D Converter Test: Tests the DAS A2D Converter Circuit on the Main Board. If failed, can be Main Board, Power Board or Side I/O.
- Gozer Basic Memory Test: Performs a basic 55's, AA's, address offset pattern test on the two BP DDRII Memories. If failed, can be Main Board.

---

**NOTE** Gozer and Keymaster FPGAs were combined on a single FPGA called Zuul on some systems. The functionality is the same as for systems with the dual FPGAs.

---

- Gozer Memory March Test: Performs an extensive March-C test on the two BP DDRII Memories. If failed, can be Main Board.

- MainBd-ChBd 0 MGT Test: Tests the 3.2-GB MGT (Multi Gigabit Transceiver) Interface between the Main Board and Channel Board 0. If failed, either Main Board, Channel Board 0, or Motherboard. CB0/Channel board 0 is the one closest to the Main Board (labeled on the MB connector).
- MainBd-ChBd 1 MGT Test: Tests the 3.2-GB MGT Interface between the Main Board and Channel Board 1. If failed, either Main Board or Channel Board 0 or Motherboard.
- Keymaster Control Bus Test: Checks the 8-bit write/4-bit read Control Bus between Gozer and Keymaster with a loopback test and walking-1's test. If failed, can be Main Board.
- Gozer Keymaster Sum-Est Bus Test: Checks the 10 physical Sum Bus and Estimate Bus from Gozer to Keymaster. If failed, can be Main Board.
- Keymaster RLDRAM Test: Performs AA, 55, ramp test and pseudorandom data test on the 16Mx18 RLDRAM connected to Keymaster. If failed, can be Main Board.
- MTGC MVREF Test: Test that uses the Main Board Diagnostic Processor to monitor the Matrix TGC and Matrix VREF 1-bit DAC circuit in the Main Board. If failed, can be Main Board.
- CB RST HW Test: Test that verifies the RST circuit put in the Main Board to test Channel Boards. If failed, can be Main Board.
- Temperature Sensor Test:

## 02 Pwr Sup (Power Board) Test Submodules

- 2.5V RefVoltage Monitor: Measures the 2.5 V Ref Voltage.
- Digital Volt Monitor: Measures the digital voltages, +1.2 VD, +1.8 VD, +2.5 VD, +3.3 VD, +5 VD, +12 VD, -5 VD.

- Analog Volt Monitor: Measures the analog voltages, +1.8 VA, +11 VA, +3.3 VA, +3.3 VA\_CB, +5 VA, -5 VA.
- 5V ECG and 5V STBY Monitor: Measures the 5 V ECG and 5 V Standby voltage.
- Switching Supplies Monitor: Measures the 2.1 V, 3.6 V, 5.3 V, -5.3 V, and -12 V switching supplies.
- XHVP Monitor: Monitors the transducer high-voltage positive supply.
- XHVN Monitor: Monitors the transducer high-voltage negative supply.
- CBHVP Monitor: Monitors the Channel Board high-voltage positive supply.
- CBHVN Monitor: Monitors the Channel Board high-voltage negative supply.
- Fan Monitor: Monitors the programmable fan supply to see if it is out of tolerance.
- PIC Monitor: Uses the Power Supply PIC to monitor the 1.8 VA, 3.3 VA, 5 VA, 3.3 VD, 11 VA, -5 VA, -11 VA supplies.
- Transducer LV Monitor: Monitors the Transducer Low Voltage supplies.

## Channel Board 0 and 1 (Channel Board) Test Submodules

- Ch Voltage Test: Measures the 14 voltages on the Channel Board using the PIC.
- Ch Write/Read Test: Writes As and 5s to each Shepard and reads back for stuck bits on data bus.
- Ch Digital Test: Tests Shepard RF Bus by transferring A's and 5's through each Shepard in the chain.
- Receive Test: Uses the Main Board test clock to produce a square wave to find bad receive channels. If failed, can be Channel Board, Main Board, or Motherboard.
- A/D Test: Tests the Maxim A-D Device by using an internal test feature that outputs a value of 0x0BD.

- TGC Amplifier Gain Test: Tests the gain of the Nipper devices using two TGC values to amplify test clock.
- Transmit Test: Finds bad transmitters by transmitting pulses on each channel and sampling it with an A-D converter on the Main Board through a relay on the Motherboard. If failed, Channel Board, Main Board, or Motherboard.

## Physio Test

The Physio Module is a USB device, so for Physio RST to operate, the USB communications must be functioning properly. The module's FW and FPGA code are downloaded upon boot of the PC, so Modules 2 and 3 check that those downloads have been successful. Module 4 checks a couple of supplies plus the Aux ADC used for the 2 Aux inputs. Module 5 checks each channel used for the ECG plus respiration. To fully test the Physio functionality, you may need to use an ECG simulator.

- Board ID: Checks the 2 bit Board ID.
- FW version: Checks the Firmware version returned by the Cypress FX7.
- FPGA revision: Checks FPGA version of Spartan 3E FPGA.
- VS Test: Checks the +3.3 V and +1.2 V supplies as read on Channels 2 and 3 of the Aux ADC.
- Pandora Test: Checks the Pandora ASIC, which is a custom 11-channel AD.

---

**NOTE** If all of the above Physio tests fail with error code 0x63, then it is a USB communication problem between the Main Board and Physio Board.

## Running an Interactive Test

The interactive tests check the operation of the system controls. The test requires you to make selections and operate controls during the test.

For other useful test functions, see “[Tests & Utilities Tab](#)” on page 280.

### ► To run an interactive test

1. Click **Interactive Test** in the directory to show the available tests ([Figure 6-3](#)). Expand the list as required.
2. Select the test you want to run; only one interactive test can run at a time.
3. Click **Run**. Testing begins.

---

**NOTE** When you run the Keyboard test, a separate display appears. It shows a picture of the control panel and actively shows the actions taken on the controls. As each control is activated, the picture uses colors to show the status of the control. Green indicates that the LEDs were tested; yellow and white indicate that the buttons are switching (only the controls with LEDs cycle to green). The display shows any actions reported from the control panel. If the test fails, it does not show the action.

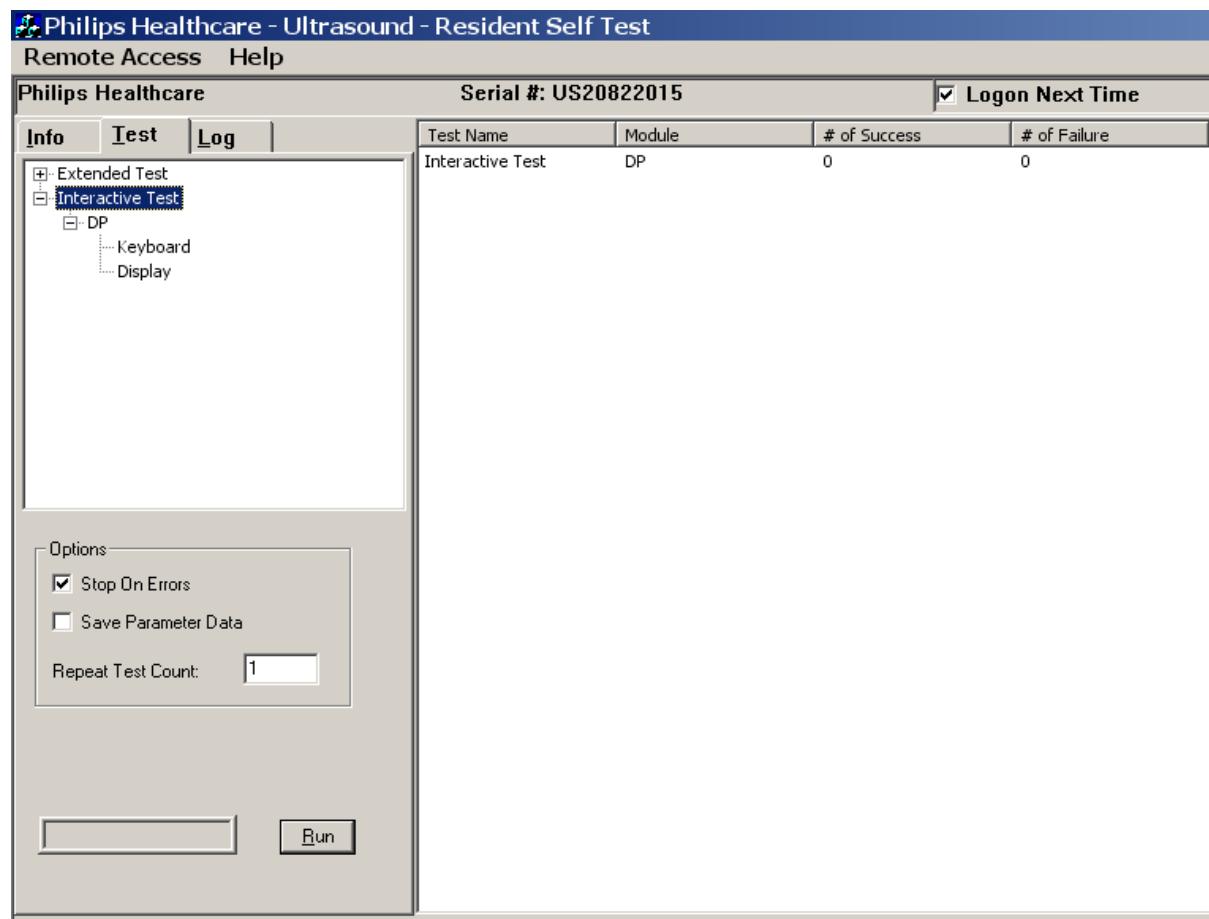
---

4. Follow the displayed instructions.
5. To end a test, do the following:
  - To end a display test: press **THI**.
  - To end a keyboard test: right-click the test name and click **Stop** on the shortcut menu.

---

**NOTE** The factory default settings are restored after the system reboots.

---

**Figure 6-3** Example of an Interactive Test Display

## Log

The **Log** tab shows the system log information. The left pane shows a directory of the available information.

### CAUTION

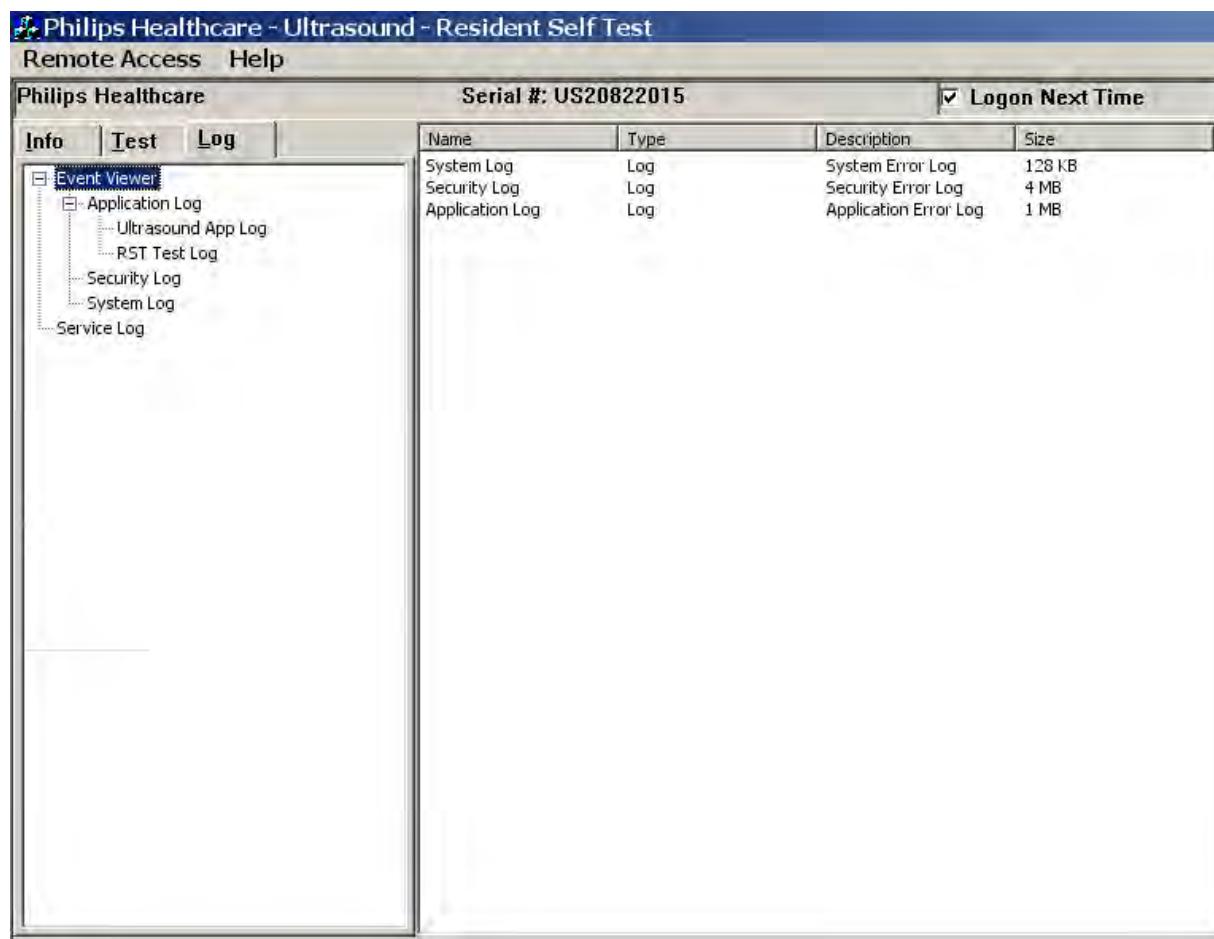
Reboot the system after downloading any log to prevent system problems.

- **Event Viewer** displays errors and test parameter data.
- **Service Log** displays service log information and allows you to record information about the system.

The right pane of the **Log** window shows the specific information for the selected item ([Figure 6-4](#)).

Figure 6-4

Example of a Log Display



## Event Viewer

The **Event Viewer** shows information for the **Application Log**, **Security Log**, and **System Log**. The **Application Log** includes information for the **Ultrasound App Log** and the **RST Test Log**. Making a selection in the left pane shows the applicable log information for that selection.

### ► To view error logs

1. Click the log you want to see. The log lists the errors in the right pane, in chronological order, with the most recent error at the top of the list.
2. To view more detail of an error, double-click the error. The details may provide clues for diagnosing system problems.

## Application Log

This log includes run-time errors encountered by both the ultrasound application and the RST application. The log lists the date and time the error occurred, the name of the error, the applications and subsystems affected, and other information.

## Clearing the Application Log

Clearing the **Application Log** clears the information in the **Ultrasound App Log** and the **RST Test Log**.

### ► To clear the Application Log

1. Right-click **Application Log**.
2. Click **Clear Log** on the shortcut menu.
3. When a dialog box asks if you want save the log, click **Yes** or **No**.

## Ultrasound App Log

This log shows the errors generated by the ultrasound application.

## RST Test Log

This log shows the results of the RST tests, including errors encountered while running the tests.

## Log Codes

The right pane shows coded information, which relates to the specific test performed, in the Category column. The code is in the following format:

SSmmNN

Where:

- SS is the subsystem tested. (BP is the beam processor subsystem, and DP is the display processor subsystem.)
- mm is the module number.
- NN is the submodule number.

For example, code DP0102 indicates:

- Display processor subsystem
- Module 01 (Acquisition)
- Submodule 02 (A/D Converter)

The example indicates that the A/D converter Submodule 02 of Module 01) of the display processor was tested. To find the meaning of the numeric codes, use the directory in the left pane, under the **Test** tab.

## Clearing the RST Test Log

See “[Clearing the Application Log](#)” on page 237.

## System Log

The **System Log** includes hardware errors filtered from the application run-time error log and the RST test log.

## Clearing the System Log

### ► To clear the system log

1. Right-click **System Log**.
2. Click **Clear Log** on the shortcut menu.
3. When a dialog box asks if you want save the log, click **Yes** or **No**.

## Using the Service Log

## Service Log

In the **Service Log**, you can enter notes and record service procedures that you perform or problems that you encounter.

### ► To make a new entry in the Service Log

1. Right-click **Service Log**.
2. Click **Add Service Entry** on the shortcut menu.
3. Type your name in the top two fields, and the service information in the **Comments:** field.
4. Click **OK**. Your entry appears in the service log.

### ► To view details for an entry in the Service Log

Double-click the entry in the right pane.

► **To print the Service Log**

1. Right-click **Service Log**.
2. Click **Print Log**.
3. Select a printer.
4. Click **Print**.

## **Modifying an Entry in the Service Log**

If you are logged on to RST, you can change the information in an existing service log entry.

► **To modify a service log entry**

1. Click **Service Log**.
2. Double-click the log entry you want to modify.
3. Click in the entry field and modify the text.
4. Click **OK**.

# 7 Adjustments

## Introduction

This section contains information for adjusting the system monitor display. Except for the monitor, there are no other calibration or alignment adjustments to make in the field for this system. There are no voltage adjustments to make in the field for this system.

---

**NOTE** The procedures in this section should be performed only by qualified technicians who have been trained by Philips to maintain the system.

---

## Warnings and Cautions

Review [Section 3, “Safety”](#) before continuing. Also follow any additional warnings and cautions contained in this section.

## Adjusting the Monitor

You can change the default brightness and the default tint of the monitor image by using the system setups or by using keyboard shortcuts.

---

**NOTE** Pay attention to the subtle differences in the monitor adjustments as you toggle between each setting. It requires a few seconds for the display to react to each setting.

---

## Setting the LCD Monitor Brightness

The system uses the selected default value to set monitor brightness each time the system is powered on. You can also change the monitor brightness to adjust for ambient light conditions. Use the lowest setting (**1**) for very dark rooms and the highest setting (**5**) for bright conditions, such as operating rooms. Philips recommends setting **2** for normal scan-room lighting conditions. For more information, see the on-system *Help*.

► **To set and save the default monitor brightness**

1. Press **Setup**.
2. Do one of the following:
  - On systems with 3.0 software and earlier, click the **System** tab.
  - On systems with 3.1 software and later, click the **Panel and Monitor** tab.
3. Select a setting for **Monitor Brightness**.
4. Click **Save**.
5. Click **Apply**.

► **To temporarily adjust the brightness for ambient light as needed**

1. Press **Setup**.
2. Do one of the following:
  - On systems with 3.0 software and earlier, click the **System** tab.
  - On systems with 3.1 software and later, click the **Panel and Monitor** tab.
3. Press **Ctrl+M** to cycle through the brightness settings.
4. Click **Close**.

## Setting the LCD Monitor Tint Control

You can change the default tint of the monitor image in the setups. The system uses the default value to set monitor tint each time the system is turned on. You can also change the monitor tint as needed.

Philips recommends the **sRGB** setting for routine use.

► **To set and save the default monitor tint**

1. Press **Setup**.
2. Do one of the following:
  - On systems with 3.0 software and earlier, click the **System** tab.
  - On systems with 3.1 software and later, click the **Panel and Monitor** tab.
3. Select a setting for **Monitor Tint**.
4. Click **Save**.
5. Click **Apply**.

► **To temporarily adjust the tint as needed**

1. Press **Setup**.
2. Do one of the following:
  - On systems with 3.0 software and earlier, click the **System** tab.
  - On systems with 3.1 software and later, click the **Panel and Monitor** tab.
3. Press **Ctrl+T** to cycle through the tint settings.
4. Click **Close**.

# 8 Preventive Maintenance

## Introduction

This section provides information to support preventive-maintenance activities.

## Warnings and Cautions

Review [Section 3, “Safety”](#) before continuing. Also follow any additional warnings and cautions contained in this section.

## PM Equipment and Supplies

Any tools, parts, and supplies needed for these preventive maintenance activities are identified as part of the described or referenced procedures.

## Inspecting and Cleaning the System

Inspect and clean the system as needed.

Ensure that all system hardware is in the correct place and is properly secured. Check the system for abnormalities or conditions that do not meet the system specifications. Inspect the monitor, wheel locks, cables, power cords, transducers, transducer connectors, fans, shields, ground straps, PCBs, fasteners, and controls and indicators to ensure that they are in good physical condition.

General cleaning of the system is as follows.

## WARNING

---

To avoid risk of electrical shock hazards, always turn off the system and disconnect it and all system devices from AC power before cleaning.

---

**NOTE** The user is told to clean and maintain the system regularly as needed. For detailed cleaning and disinfection information, see the *User Manual*.

## Cleaning Exterior Surfaces

### CAUTIONS

- Use adequate ESD safeguards when performing service and maintenance procedures. See [“About Electrostatic Discharge” on page 77](#). To avoid damaging the system, do not use acetone, methyl ethyl ketone (MEK), paint thinner, or other strong solvents to clean exterior plastic surfaces.
- When cleaning the system keyboard and monitor, take care not to get any solution inside the housings. Also, take care not to scratch the or otherwise damage the LCD face of the monitor while cleaning it.

Use a rag with mild soap and water to clean exterior surfaces, including those on the system, monitor, and peripherals. Also clean the User Interface and knobs. Ink or stubborn stains should be removed with rubbing alcohol or a stronger detergent and immediately washed with mild, soapy water.

### Cleaning Air Vents

Because there are no fan filters on the system, ensure that the front and rear case vents are clean and that all five fans are operating properly. You can clean the vent holes with a can of compressed air designed for use on computers.

### Cleaning the Battery and AC Adapter

The battery and AC adapter can be safely cleaned using isopropyl alcohol (70% solution in water), mild soap and water, or Sporicidin disinfectant solution.

## Cleaning the LCD Monitor

### CAUTIONS

- To avoid damage to the monitor screen, do not touch it with any sharp objects, such as pencils or calipers.
- Repeated use of common cleaners such as glass cleaner or products containing alcohol may damage the screen surface and should not be used. Use cleaners specifically designed for cleaning LCDs.
- Do not use paper towels to clean LCD surfaces; they may scratch the surfaces. Use only a micro-fiber or other lint-free cloth.

The LCD monitor has a plastic front surface. The surface is resistant to fluids normally found in clinical environments, such as ultrasound gel, alcohol, and disinfectants, but fluids spilled on the screen should be wiped off with a soft cloth to avoid forming spots on the display surface.

For routine cleaning, use only cleaners specifically designated for LCD screens. Disinfectants may be used when necessary, but they are not recommended for routine screen cleaning.

## Cleaning the Trackball

Clean the trackball as its condition warrants.

### ► To clean the trackball

1. Unscrew (half rotation counter-clockwise) and remove the trackball bezel.
2. Remove the trackball from the User Interface.

**NOTE** Use a business card or other stiff paper to scoop out the trackball.

3. Clean the trackball with an alcohol-dampened pad.

4. Clean the trackball race (the depression in the User Interface where the trackball rides) by removing any dust or lint and wiping with an alcohol-dampened pad.
5. Reinstall the trackball and bezel.

## Cleaning Transducers

For information on the general care, handling, cleaning, and storing of Philips transducers, see the *User Manual*.

## Performance

For information about system performance tests, see [Section 6, “Performance Tests”](#).

Information about system logs is provided in more than one section. To find the specific information you want, look in the bookmarks, table of contents, or do a “Search PDF” (click the binocular Search icon) for “log.”

## Battery Inspection

After extended storage, it may be necessary to charge and discharge the cells or batteries several times to obtain maximum performance.

Battery information is provided in [Section 3, “Safety”](#), [Section 4, “Theory of Operation”](#), and [Section 10, “Disassembly”](#).

Most lithium-ion batteries swell from five to ten percent during their normal lifetime. During this time, battery function fades, and customers often request battery replacement. If battery replacement is not requested, continued and repeated charging increases battery swelling and internal pressure. Battery cells may vent (as designed to relieve pressure) and release battery chemicals (liquid or vapor).

If the battery has not been replaced, use the following procedure to inspect the battery.

The recommended interval for battery inspection is every 12 months or as needed.

► **To inspect the battery**

1. Turn on the system and verify proper battery function.
2. Turn off the system and remove the power cord.
3. Open the battery door. Verify that the battery door opens and closes freely and that the battery does not interfere with door closure.
4. Visually check for other mechanical displacement issues.
5. Remove the battery. See [Figure 10-4](#).
6. Visually inspect the battery for evidence of swelling or discharge.
7. Place the battery flat-side down on a flat surface and attempt to spin. If the battery spins freely or does not lay flat, replace it.
8. Reinstall or replace the battery as needed.

# 9 Troubleshooting

## Introduction

The troubleshooting information provided in this section and tests from [Section 6, “Performance Tests”](#) can help you determine if a system is failing, and it may help you isolate the cause of the failure.

For basic troubleshooting methodology see [“All Troubleshooting Starts Here” on page 250](#).

For descriptions of troubleshooting tools (tests and utilities) and functions supporting system administration available on CX30 1.0 systems and CX50 systems with versions 1.x through 2.5 software see [“Servicing Features \(CX30 1.0 and CX50 1.x-2.5 Systems\)” on page 266](#)

For descriptions of troubleshooting tools (tests and utilities) and functions supporting system administration available on CX30 systems with version 2.x software and CX50 systems with version 3.0 and later software see [“Servicing Features \(CX30 2.x and CX50 3.x and Later Systems\)” on page 273](#).

## About Philips Remote Services

CX30 and CX50 systems have remote service capability. This capability allows a Philips service agent to access the system from a remote location to do the following:

- Run tests
- Record system behavior
- Conduct analysis
- Monitor the system
- Download necessary software
- Upload log files
- Remote patch upgrades

Remote services enable service personnel and call-center application specialists to view, in real time, what is happening on the system display or to have limited control of the system from a remote location via a service computer. That ability is a useful tool for troubleshooting.

## Warnings and Cautions

Review [Section 3, “Safety”](#) before continuing. Also follow any additional warnings and cautions contained in this section. Before taking any action that might cause data to be lost, back up data [“Backing Up and Restoring System Data” on page 658](#).

## All Troubleshooting Starts Here

Reviewing and applying the following basic guidelines can produce effective troubleshooting and responsible call resolution. Even an experienced and successful troubleshooter who can solve problems without stepping through the following troubleshooting basics might find it beneficial to review the basics at the onset of a troubleshooting activity. Always make notes as you troubleshoot; if properly communicated, some or all of the information you discover can help you or others in the future.

### Troubleshooting Basics

1. Identify the symptom.
2. Re-create the problem.
3. Isolate the cause by investigating and testing.
4. Develop a solution.
5. Perform a corrective action.
6. Verify that the system works.
7. Return the system to the customer and close the call.

## Checking for Obvious Causes

- Check system status indicators.
- Check for correct voltage at electrical outlets, “tripped” circuit breakers, disconnected or damaged wires or cables, and so on. Always check that power cords are plugged in, and inspect them for wear.
- Consider the situation: Was there a system option or hardware change recently? When was the last time the system was working correctly and what, if any, influencing circumstances have occurred since?
- Check if the symptom and probable cause may already be recorded somewhere for quick reference and resolution. [Table 9-1](#) and [Table 9-2](#) list some symptoms, possible causes, and solutions.

### CAUTION

Consider the value against the difficulties of swapping suspect hardware components with good ones. Do *not* cause additional problems or confuse your search. Never swap parts if it might damage a known good item.

## Returning the System to Service

When the reported problem is fixed and the system tests are successful, return the system to the customer and close the call:

- Formally document the problem and the solution: Write down exactly what problems you discovered and what corrections you made.
- Provide feedback: Communicate to all affected parties what problems you discovered, how you arrived at that conclusion, and what corrections you made. Include this information with parts that are returned for repair and, if appropriate, send e-mail with this information to ISS personnel who could find it useful.

## Quick Reference to Symptoms, Causes, and Corrective Actions

[Table 9-1](#) is a quick reference to some past symptoms, possible causes, and solutions that might help you quickly resolve similar problems. [Table 9-2](#) is a quick reference to some symptoms, possible causes, and solutions that might help you quickly resolve problems with systems in Integration Mode.

**Table 9-1****Trouble Symptoms, Possible Causes and Actions**

<b>Category</b>	<b>Symptom</b>	<b>Possible Cause/Action</b>
Access	Password problems occur.	See “Passwords Do Not Work” on page 259.
Battery (Low battery warning message)	When you turn on the system under battery power, during system initialization, a message appears that says the system will shut down in 28009 minutes and recommends that you connect the AC power adapter.	This is a software defect usually. Inform the user that this is an errant message and they can click OK and begin scanning. There is no effect on imaging.
Boot	System is inoperative or takes longer than usual to boot.	If a charged battery is not installed in the system, and the AC adapter is unplugged from the wall outlet before the system is completely off (before the shutdown message appears), the system takes longer than usual to be ready for use the next time it is powered on.  This can also corrupt files, which can result in an inoperative system or the loss of patient data.
Data	Loss of patient data.	If a charged battery is not installed, and the AC adapter is unplugged from the wall outlet before the system is completely off (before the shutdown message appears), files can be corrupted, which can result in loss of patient data.
DICOM	Cannot print or export to DICOM devices (or other DICOM failures).	Search for “DICOM” in this section.

**Table 9-1****Trouble Symptoms, Possible Causes and Actions (Continued)**

<b>Category</b>	<b>Symptom</b>	<b>Possible Cause/Action</b>
Miscellaneous	Miscellaneous.	<ul style="list-style-type: none"><li>• Battery charge is too low.</li><li>• AC adapter is unplugged or faulty: The adapter has a status LED on top of its case that indicates conditions involving the adapter and the system battery. <a href="#">Table 4-2</a> lists the LED states and the status that each indicates. For any of the following conditions, power down and restart the system to see if the condition is cleared, before replacing a part:<ul style="list-style-type: none"><li>• An erratically flashing red LED may be caused by a short circuit in the AC adapter.</li><li>• A steadily flashing red LED may be caused by a faulty battery or a faulty AC adapter or cable.</li><li>• A persistent solid red LED may be caused by a faulty battery.</li></ul></li><li>• Power Board is failing.</li><li>• Power distribution is faulty.</li><li>• Troubleshoot boards that contain power regulation.</li></ul>
	System displays a warning message and then shuts off 30 minutes later.	When the system reaches a certain internal temperature, the system displays a warning message and then shuts off automatically 30 minutes later. Increased internal temperature can be caused by obstructed vents on the front and back of the system.

Table 9-1

## Trouble Symptoms, Possible Causes and Actions (Continued)

Category	Symptom	Possible Cause/Action
Monitor	System monitor has a “shuddering” display or noise in the image.	Consider the possibility of EMI or RFI as described in <a href="#">“Checking for EMI and RFI” on page 260</a> . Check print quality for similar noise. If it is on the printout, it is probably an internal system failure. Troubleshoot the PCBs.
	No external video on the external monitor.	In the setups, verify that the external display feature is enabled.  <b>NOTE</b> This step is needed only if the external video monitor is connected after the system is powered on. If the monitor is connected when the system is powered on, the external video is automatically enabled. The <b>External Monitor Enabled</b> setting is on the <b>System</b> tab in the setups.
Network	No network connection.	See <a href="#">“DICOM/Network Failures” on page 262</a> , <a href="#">“To check for LAN activity” on page 262</a> , <a href="#">“Troubleshooting Wireless Network Connections” on page 264</a> , and <a href="#">“Network Settings Tab” on page 279</a>

**Table 9-1****Trouble Symptoms, Possible Causes and Actions (Continued)**

<b>Category</b>	<b>Symptom</b>	<b>Possible Cause/Action</b>
Power	No system power.	<ul style="list-style-type: none"><li>• System is actually in 'sleep' mode.</li><li>• Power switch was not pressed on.</li><li>• Battery charge is too low. Check the power status icon in the icon area just above the quick key labels. Battery status icons represent the overall state of the system power (<a href="#">Table 4-1</a>).</li><li>• AC adapter is unplugged or faulty.</li><li>• AC adapter senses current or voltage problem and shuts down. See "<a href="#">AC Line Power Adapter</a>" on page 95. If it has shut down and is still operable, the adapter needs to be unplugged to reset the condition.</li><li>• Power Board is failing.</li><li>• Power distribution is faulty.</li></ul> <p>Troubleshoot boards that support power regulation.</p>
System crashes	System hangs or crashes.	<a href="#">See "System Hangs or Crashes" on page 261.</a>
USB	USB device failures.	<a href="#">See "USB Device Failures" on page 261.</a>

**Table 9-2****Integration Mode Trouble Symptoms, Possible Causes and Actions**

Category	Symptom	Possible Cause/Action
Integration	<p>No Icon displayed when one should be (see <a href="#">Table 9-3</a> for icon status definitions).</p> <p> </p> <p>Integration icon appears with red <b>X</b>: Integration Mode is enabled on the CX50 system, but there is no connection with the Allura Xper FD system (see <a href="#">Table 9-3</a> for icon status definitions).</p>	<p>Integration Mode is disabled.</p> <ul style="list-style-type: none"><li>• Ethernet cable is disconnected.</li><li>• Incorrect or missing integration settings (“<a href="#">Configuring Integrated Ultrasound Settings (CX50 3.x and Earlier Systems)</a>” on page 118).</li><li>• Incorrect CX50 system IP address.</li><li>• IPSec settings not coordinated with Allura IPSec settings (the problem might be that the Allura has its IPSec disabled)</li></ul>

**Table 9-2 Integration Mode Trouble Symptoms, Possible Causes and Actions (Continued)**

<b>Category</b>	<b>Symptom</b>	<b>Possible Cause/Action</b>
Imaging	Live imaging freezes on external monitor when CX50 system monitor is closed.	Portability mode is enabled in the setups/power management. To disable, deselect Portability mode.
DICOM	Ultrasound images do not appear in same PACs folder as X-ray images.	<ul style="list-style-type: none"> <li>• <b>Create Unique Ultrasound Study ID</b> checkbox is checked under Integration Settings (“<a href="#">Configuring Integrated Ultrasound Settings (CX50 3.x and Earlier Systems)</a>” on page 118).</li> <li>• PACs system does not use SUID (Study Unique ID) to associate images with folders.</li> <li>• For other DICOM issues, see DICOM in <a href="#">Table 9-1</a>.</li> </ul>

**Table 9-3****Integration Mode Status Icons**

Systems with 3.x software and earlier	Systems with 4.x software and later	Description
		Indicates the status of Integrated Ultrasound: the CX50 ultrasound system and the Allura Xper FD system are integrated and patient ID is synchronized.
		Indicates the status of Integrated Ultrasound: the CX50 ultrasound system and the Allura Xper FD system are integrated, but there is no patient ID synchronization.
		Indicates the status of Integrated Ultrasound: Integration Mode is enabled on the CX50 system, but there is no connection with the Allura Xper FD system.

## Passwords Do Not Work

The system boots with the Caps Lock on as the default, which is indicated by the **(A)** at the bottom left of the display. Disable the Caps Lock by pressing the Caps Lock key.

**NOTE** The results of changing the Caps Lock setting does not update on display until you return to the ultrasound application.

## Unable to Access the Service Features

The availability of certain functions, and therefore the visibility and content of some service menus, depends on the access privileges of the user.

## Checking for EMI and RFI

Electromagnetic interference (EMI) and radio frequency interference (RFI) can degrade the performance of the system. For example, a transducer placed close to an ECG cable can increase interference. Moving the ECG cable or other medical equipment away from the transducer can reduce interference. EMI and RFI can conceivably cause image noise or monitor distortion if the system EMI shielding has been compromised. EMI and RFI can be generated by a variety of electrical devices. The interference can be transmitted over power lines or radiated through the air. Answering the following questions can help locate the source of interference and help determine whether the problem is with the system or with the scanning environment.

- Is the interference intermittent or constant?
- Does the interference appear with only one transducer or with several transducers?
- Do two different transducers operating at the same frequency have the same problem?
- Is the interference present if the system is moved to a different location in the facility?
- Can the EMC coupling path be attenuated?
- Does operating an AM radio tuned between stations around 1,600 Hz (using it as an EMI/RFI source tester) identify interference, which would be noticeable as audible static noise on the radio while walking it around the room. Sometimes EMI/RFI sources are not constant, but are temporary or surge situations that may only occur at certain times.
- Locating the source or cause is important, but regardless of the source, since the system is shielded against EMI and RFI, troubleshoot the system to determine if the EMI/RFI shielding has been compromised. One place to start is to verify that all the system panels are appropriately secured with all of the factory-approved fasteners.

## System Hangs or Crashes

Often the terms “hang” and “crash” are used interchangeably to describe the same symptom. However, with the CX30 and CX50 systems, those two terms describe two different behaviors. It is important to understand the difference between those terms, because the causes, the troubleshooting techniques, and the information available to you are all different.

A “hang” is when the system stops responding to the keyboard. A normal image is on the monitor, and the system may continue to work (updated data in the image area, and clock is correct and continues changing), but the system does not respond to hard keys, quick keys, or the track-ball.

A “crash” occurs when the system detects an abnormal condition in either the hardware or the software.

No specific data is associated with a “hang” (because from the software point of view, everything is behaving normally).

## USB Device Failures

Consider the following if you suspect a USB device failure. Also review the information in [“About Removable Media and USB Devices” on page 52](#), in case it leads you to the cause of a USB-related failure.

- Only use drives that use less than 500 mA: The power consumption of USB hard drives is related to the type of motor that is used, and this varies by manufacturer. Disk drives from one manufacturer may have twice the storage capacity as another drive, yet require only half the current. All the drives use less than 500 mA when the motor is running, but starting the motor requires additional current, and this is what will vary by manufacturer and model.
- A USB device can malfunction if its connector is dirty or corroded.

---

**NOTE** Many USB hard drives do not fully comply with the USB 2.0 specification and require more power than the USB 2.0 specification allows from a single USB connector. Philips does not recommend using USB hard drives or hubs that require an external AC power source, as it may compromise the electrical safety characteristics of the system. Many of these drives are supplied with, or offer separately a special USB cable that has two USB-A plugs. Plugging both plugs into the two USB receptacles on the system increases the power available to the drive to potentially overcome this limitation.

---

## DICOM/ Network Failures

Verify that the DICOM option is enabled (see “[Verifying the System Options](#)” on page 112). If the DICOM option is enabled, verify that it has been configured correctly (“[Configuring the DICOM Feature](#)” on page 116).

Verify that the system is connected to the specified IP address and that it can connect to the specified DICOM server. Ensure that the IP address, port number, and AE title specified for the system and for the DICOM server are correct. The AE title is case-sensitive; ensure it has been entered correctly.

Check for network/LAN activity.

► **To check for LAN activity**

Observe the Ethernet activity LEDs (top corners of the LAN connector). The green LED, when lit, indicates that the system is connected to a network. The yellow LED flickers to indicate network activity.

If the DICOM server is using high-security settings, you may need to add the system AE title and IP address to the server’s list of systems that are authorized to access it.

## Repairing Network Connections

**NOTE** The appearance of displayed icons varies by software version. Both possible versions are shown in this manual.

---

If the system's network connection is not functioning, as indicated by the  or  (Network Disconnected),  or  (Wireless Network Disconnected) icon on the display, you can attempt to repair the network connection.

When you repair the network connection, the system locates and selects the network adapter, renews the IP address, refreshes all DHCP leases, and reregisters DNS names. If the DICOM Networking option is installed, the system also updates the current DICOM preset with the TCP/IP settings.

**NOTE** If no wireless network adapter is connected, the system prompts you to retry the repair. If you cancel the repair, the system disables the network connection.

---

1. Press **Pointer**.
2. Click  or  (Network Disconnected)  or  (Wireless Network Disconnected) icon.
3. Click the **Diagnostics** tab in the **DICOM Setup** dialog box.
4. In the **Repair Network Connection** area, click **Repairs**.
5. In the **Repair Network Connection** dialog box, click **Repair**. The system displays information about the repair.
6. Click **Close**.

## Trouble-shooting Wireless Network Connections

If the system's wireless network connection is not functioning, as indicated by the icon on the display (see “[Troubleshooting Wireless Network Connections](#)” on page 264), troubleshoot the network connection. Do any of the following:

- Disconnect and then reconnect the wireless network adapter.
- Ensure that only one wireless network adapter is connected to the system.
- Use the **Repair Network Connection** feature to locate and select the wireless network adapter.
- If the wireless network adapter is connected to a USB hub or extender, connect the adapter directly to the system.
- Always connect the wireless adapter to the same USB port. The physical size and shape of the wireless adapter may limit its use to certain USB connectors.
- Use the Wi-Fi monitor to verify network availability and signal strength. See “[Wi-Fi Monitor](#)” on page 264.
- Disconnect the wireless network adapter and configure the system for wired network use. Test the system in the wired mode to determine if the problem is the system or the network connection.

---

**NOTE** The wireless network setup in ISP may not work until you set it up under DICOM.

### Wi-Fi Monitor

Signal strength lower than 35% can cause interruptions in the transfer of studies to a PACS. The Wi-Fi monitor verifies the availability and strength of a wireless network signal. The Wi-Fi monitor enables you to compare the strength of a Wi-Fi signal received by the ultrasound system with the strength of a signal from a laptop at the same location. If the ultrasound system receives

a signal strength lower than expected, you may want to confirm that the signal strength is low in other locations at the facility.

► **To open the Wi-Fi monitor**

1. Press **Setup**.
2. Click **Service**.
3. Click **DICOM**.
4. On the **DICOM Preset** tab, select a preset from the **Change DICOM Preset** menu, and click **Change Settings for Current Preset**.
5. Click **Wireless Properties** to display the Wi-Fi monitor.

---

**NOTE** The Wi-Fi monitor is also accessible from the **Diagnostics** tab in **DICOM Setup**, or by typing **Ctrl+W**.

---

6. Select a network from the list of available networks. A list of the access points for the selected network appears, including the signal strength and other details.
7. Repeat **step 1** through **step 6** for your laptop or another PC. Evaluate the changes in performance to help you troubleshoot the wireless network connection.

## Servicing Features (CX30 1.0 and CX50 1.x-2.5 Systems)

The following topics explain the service diagnostic and utility tool features for CX30 version 1.0 and CX50 versions 1.x through 2.5 that can be used for system troubleshooting, scheduled service, and system administration.

**NOTE** Pay attention to the version and configuration of the system you are servicing. While some of the service tools may be the same or similar, the means of accessing and using them can depend on the version and configuration of the system. See also, “[Servicing Features \(CX30 2.x and CX50 3.x and Later Systems\)](#)” on page 273

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## Service Tools (CX30 1.0 and CX50 1.x-2.5 Systems)

Service tools on the system support troubleshooting.

- **Keystroke Log**, to configure or view the keystroke log. For more information, see “[Keystroke Log Tools](#)” on page 267.

**NOTE** “Keystrokes” made on the Allura Xper module (instead of on the CX50 system control panel) are not logged in the CX50 system keystroke log.

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- **Maintenance Tools**, to access additional service tools or repair the patient review database. For more information, see “[Maintenance Tools](#)” on page 268.
- **System Network Settings**, to configure the network and TCP/IP properties. For more information, see “[System Network Settings Tools](#)” on page 269.
- **Remote Service**, to enable remote service via a network connection go to “[Remote Service Tools](#)” on page 269. For more information, see “[About Philips Remote Services](#)” on page 249.

**NOTE** The RST tool for service testing is not listed on the **Service** tab. For more information, see “[Resident Self Tests](#)” on page 219.

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► **To view the Service tools**

1. Press **Setup**.
2. If necessary, click the **Service** tab to see the available service tools.

## Keystroke Log Tools

The **Keystroke Log** tools are:

- **Start new log**, for starting a new keystroke log. See “[To start a new keystroke log](#)” on [page 267](#).
- **Keystroke log settings** (see “[To configure the Keystroke Log Settings](#)” on [page 267](#)):
  - **Delete keystroke log files after** (in days), for deleting log files after a set number of days.
  - **Maximum log files entries** (in thousands), for setting the maximum number of entries to store.
- **View selected files**, for viewing details of the selected files. See “[To view selected files](#)” on [page 268](#).
- **Copy selected files**, for copying selected files. See “[To copy selected files](#)” on [page 268](#).
- **Delete selected files**, for deleting selected files. See “[To delete selected files](#)” on [page 268](#).

► **To start a new keystroke log**

1. Click **Start new log** to start a new keystroke log.
2. Click **OK** to return to the **Service** tab.

► **To configure the Keystroke Log Settings**

1. Enter a number for the **Delete keystroke log files after** setting.
2. Enter a number for the **Maximum log files entries** setting.
3. Click **OK** to return to the **Service** tab.

► **To view selected files**

1. Click a file name (you can click multiple files) in the lower left window.
2. Click **View selected files** to see the details for that file.
3. Click **Close** to close the detail window.
4. Click **OK** to return to the **Service** tab.

► **To copy selected files**

1. Click a file name (you can click multiple files) in the lower left window.
2. Click a location in the **Copy To** field.
3. Click **Copy selected files** to copy the files.
4. Click **OK** to return to the **Service** tab.

► **To delete selected files**

1. Click a file name (you can click multiple files).
2. Click **Delete selected files** and follow the prompts to delete the file.
3. Click **OK** to return to the **Service** tab.

## Maintenance Tools

The **Maintenance Tools** are Service system (**Service**) and Database Recovery (**Database Repair**):

- **Service:** The system provides access to service functions that can be used for system troubleshooting, scheduled service, and system administration. Access to these tools is restricted to authorized users. On systems with 3.x software and earlier, the **Service** tab in the **Setup** window provides access to functions. On CX50 systems with 4.x software and later, there is no **Service** tab. Access is by clicking **Service** in the lower left corner of the **Setup** display.

- The Database Recovery tools should be used only when you suspect a database error. To access the tools, click **Database Repair** and click **Attempt Repair**, to have the system attempt to repair the patient (Review) database or **Restore**, to revert to a saved (older) copy of the database.

#### NOTES

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- It is sometimes necessary to click a tool button twice.
  - Always reboot the system after using any of the **Maintenance Tools**.
- 

### System Network Settings Tools

The **System Network Settings** tools are:

- **Select network adapter**, for designating the network connection type as **Wired** or **Wireless**
- **Network Administration**, for viewing or editing the network connectivity settings.
- **Integration Settings**, for viewing or editing the integration settings
- **Wireless Properties**, for viewing or editing the wireless properties settings
- **TCP/IP Properties**, for viewing or editing the TCP/IP settings.

### Remote Service Tools

The remote service tools are:

- **Enable Remote Session**, which is the means for the customer (or on-site FSE) to enable a remote access session on a registered system.
- **Allow Open Studies**, which allows viewing of patient studies (customer's decision) during a remote access session.

## DICOM Diagnostics Tools

The system includes diagnostic tools for DICOM. These tools include:

- **Job Queue**, to view, control, and delete DICOM jobs. Jobs must be cleared before any other changes can be made.
- **Log Settings**, to copy log files and configure DICOM logging activities, including:
  - Log directory maximum size
  - Number of days to retain log files
  - Log file maximum size
  - Logging level for the system log
- **Repairs**, to reset the job queue or reset the database.
- **Repair Network Connection**, to repair a DICOM-specific network connection.

### ► To view the available diagnostic tools

1. Press **Setup**.
2. Click the **System** tab.
3. Click the **DICOM** button.
4. Click the **Diagnostics** tab.
5. Click the button for the desired tool:

## Jobs Tools

The **Jobs** tools are:

**NOTE** Jobs can be retried or deleted only if they are displayed in the upper left section of the Job Manager window.

---

- **Retry Job**, for retrying a job; select the job ID of a failed job (an error state) and click **Retry Job**.
- **Delete Job**, for deleting a selected job.
- **Delete All Jobs**, for deleting all the jobs in the job manager.
- **Clear Log Entries**, for clearing the **Recent Log Entries** section of the display. The system provides a method for saving the logs before clearing them from the system.

## Logging Tools

The **Logging** tools are:

- **Log Directory Maximum Size (MBytes)**, for setting the maximum size of the log directory.
- **Delete Archived Log Files After**, for setting the number of days to keep archived files before deleting.
- **Log File Maximum Size (KBytes)**, for setting the maximum size of the log file.
- **Copy log Files**, for copying the log files to a designated location.
- Logging level **Details**, for displaying the detailed logging level information.

**NOTE** Always set the Logging level to Less, which is Error Level Logging. This setting provides useful diagnostics information.

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## Repairs Tools

The **Repairs** tools are:

- **Reset Job Queue**, for resetting the job queue and deleting all jobs.
- **Reset Database**, to reset the DICOM database to its factory-installed state. This operation deletes all job history, many DICOM setting, and reboots the system. A better operation to perform is the Database Repair in the main Service menu.

## Repair Network Connection Tools

The **Repair Network Connection (Repairs)** tools list any duplicate DICOM addresses. The network administrator would need to fix each duplicate address.

## Servicing Features (CX30 2.x and CX50 3.x and Later Systems)

The following topics explain the service diagnostic and utility tool features for CX30 versions 2.x and CX50 version 3.x through 4.x that can be used for system troubleshooting, scheduled service, and system administration.

### NOTES

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- Pay attention to the version and configuration of the system you are servicing. While some of the service tools may be the same or similar, the means of accessing and using them can depend on the version and configuration of the system. See also, “[Servicing Features \(CX30 1.0 and CX50 1.x-2.5 Systems\)](#)” on page 266.
  - CX30 version 2.x and CX50 version 3.x and later systems have the Integrated Service Platform (ISP). ISP supports consolidated access to system administration, scheduled maintenance, and troubleshooting features. See “[Integrated Service Platform](#)” on page 275.
- 

## System Diagnostics

CX30 version 2.x and CX50 version 3.x and later systems contain the stand-alone Resident Self Test (RST) application. For information about running RST, see “[Resident Self Tests](#)” on page 219.

## Remote Servicing Support

CX30 version 2.x and CX50 version 3.x and later systems support the following service features by means of a connection to an authorized Philips representative’s computer or to the Philips Customer Care Center server. For more information, see “[About Philips Remote Services](#)” on page 249.

## Remote Desktop

**NOTE** Remote access will not be functional on CX50 systems with 4.x and later software and purchase of Government Security.

The Remote Desktop licensed option allows the Philips service representative or call center specialist to do the following using a Philips laptop that can be located any place that has an Internet connection:

- View, in real time, what is happening on the customer's ultrasound system display including images, reports and setup displays.
- Diagnose problems and make some repairs at times that are convenient for the customer.
- Access and change system settings and configurations, including presets, system settings, and DICOM settings.
- Demonstrate features.
- Troubleshoot the system by doing the following:
  - Running system diagnostics (RST) and viewing test results
  - Viewing and modifying setup displays
  - Viewing and exporting system log files

You may temporarily disable or enable Remote Desktop (and other options) or permanently remove it. After an option is removed, you must obtain an access code to re-install it.

## Monitoring

The monitoring service option monitors key system parameters, such as PC temperatures and number of abnormal shutdowns. When parameters are out of the acceptable range, the system sends an alert automatically to the Philips call center (not available in all countries).

## Online Support Request

The online support request service option allows the customer to enter a request for support (either technical or clinical support) using system software. The system sends the request to the Philips call center (not available in all countries).

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**NOTE** To use any of the service options, you must purchase the appropriate service or service contract from Philips. For more information, contact your Philips Service Representative.

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## Integrated Service Platform

ISP provides a modernized, standard service-user interface. This interface accesses the functions that enable the service provider to configure, test, diagnose, and verify the functionality of the system on site or, if configured, from a remote location by Philips service personnel. Those functions were identified as “Service Tools” in previous system releases (“[Service Tools \(CX30 1.0 and CX50 1.x-2.5 Systems\)](#)” on page 266).

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**NOTE** The availability of certain functions, and therefore the visibility and content of the **Service** menus of the service user interface, depends on the access privileges of the user.

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## Accessing the Service Interface

In system setups **Service** tab, the **Maintenance Tools** area is a portal to the service tools and utilities. When you click **Service**, the ISP display appears with tabbed menus that present the system service functions.

## Conventions of the Service Interface

Across the top of the display, tabs name the major functional tool and utility categories. Selecting a tab displays a service function menu. Some functions, appearing dimmed, are only fully active after an authorized agent is logged on. The content of some of the service menus varies, depending upon the access-level privileges of the user.

- When you select a tab, it appears dimmed.
- On the left side of the display, the menus have side tabs that name sub-functions within the major category.
- The center area of the display shows the information and tools for the selected function.
- Controls at bottom of the display are *always available* functions that are not affected by tab selection.

### System Management Tab

The **System Management** tab is the default selection when the ISP application is launched. When selected, this tab displays a menu that provides the **System Information**, **System Logs**, and **First Responder Management** sub-tabs.

The **System Management** tab displays system software and hardware information and system logs. It also allows system settings to be copied from the ultrasound system to removable media (CD, DVD, or USB storage devices). The settings may then be copied to another ultrasound system or reloaded onto the current ultrasound system after an upgrade procedure. The **System Management** capabilities are available to all users.

### System Information Sub-tab

The **System Information** sub-tab displays data needed when contacting Philips support, including system model name, serial number, and current hardware revision. In many regions, an equipment number is assigned at installation. If the FSE enters one, it is displayed here.

- The **Software Information** area shows the same software version information as shown on the **Options** tab in the setups.
- The **Hardware Information** area shows the same hardware version information as shown on the **Options** tab in the setups and includes a **Field Modifications** area that lists hardware changes.

## System Logs Sub-tab

In the **System Logs** sub-tab, the DICOM, Keystroke, Security, and Service logs can be sorted, searched, and filtered. All of the log files can be exported to removable media, or sent to the remote Philips M2M server. Log files that are exported to media are encrypted, except the Service log. The following logs are available for First Responder use.

- **DICOM**
- **Keystroke**
- **Security**
- **Service**

## Remote Services Tab

The **Remote Services** tab displays a menu listing the **Access/Status**, **Correction Settings**, and **Software Downloads** sub-tabs.

The **Remote Services** tab provides settings that allow a Philips service agent to access the system from a remote location to run tests, to record system behavior, to conduct analysis, to monitor the system, and to download necessary software. For more information, see “[Remote Servicing Support](#)” on page 273.

## Access/Status Sub-tab

The **Access/Status** sub-tab reports the status of, and provides controls for, the remote service access functions:

- **Remote Connection** area: Shows the system ID of the system. The Remote Services area also contains the remote connection **Enable Monitoring** control (see the Monitoring information on [page 274](#)). An indicator displays the status of the Remote Connection service feature ([Table 9-6](#)).
- **Remote Desktop** area: Provides means for enabling the Remote Desktop ([page 274](#))
- **Software Downloads** area: Contains controls for allowing software downloads from a network to the ultrasound system. Selecting **Enable Download** allows upgrade software to be downloaded to a directory on the hard drive for future installation into the system software. Selecting **Install Automatically** allows upgrade software to automatically load into the system software (immediately after the files are stored to the hard drive).

## Connection Settings Sub-tab

Remote Services connection settings are used to enable the remote connection (typically configured at installation).

- **Connection Settings** area
- **Proxy Settings** area
- **Test Connection** control
- **Trace Route** control
- **Material Number**: Visible but can only be edited by a Philips service agent.
- **Save** control: Saves and locks configuration entries and changes made from this sub-tab.

## Software Downloads Sub-tab

- This area displays a list of software downloaded to this system.
- You can use **Search** to search through multiple downloaded line items.

## Network Settings Tab

**Network Settings** displays sub-tabs of common networking tools used by network administrators. On systems with 3.x software and earlier, **Network Settings** and **Network Diagnostics** functionality is available. On CX50 systems with 4.x software and later, **Network Settings** is on the **DICOM** page of the **System** setups.

### Network Settings Sub-tab

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**NOTE** On CX50 systems with 4.0 software and later, the network settings were moved to the DICOM setups. All other systems have the functions listed below on the **Network Settings** tab.

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The **Network Settings** sub-tab displays current (if any) network settings and is the means to enter or change network settings.

- **Select Network Card:** Allows you to configure the network settings.
- **Disable** control
- **TCP/IP Properties** control
- Information window
- **Ethernet Properties** control
- Network Status: connection status (connected or not connected)
- IP address: displays system IP address
- MAC address: displays system MAC address

- Show configuration information: **ipconfig**
- Show detailed configuration information: **ipconfig/All**
- Release connection: **ipconfig/Release**
- Renew connection: **ipconfig/Renew**
- Ping a networked device area: IP address, **Connection Test**

## Network Diagnostics Sub-tab

The **Network Diagnostics** sub-tab provides the ability to check connection status to each network server.

► **To check the connection status of a configured network server**

1. Select the devices to test from the structured list.
2. Click **Test** to start the test. Test results appear under **Device Details**. Green check marks indicate successful communication with the device.

## Tests & Utilities Tab

The **Test & Utilities** tab provides these sub-tabs:

**NOTE** Some functions are visible only when an authorized agent is logged on. The content of some of the service menus varies, depending on the access-level privileges of the user.

- **System Test** sub-tab is accessible by all users and runs a system confidence test. The System Test is run without any transducers connected and normally requires approximately 2 to 4 minutes to complete. When finished, a system reboot is forced no later than when exiting the **Service** tab. The result is displayed as **Passed** or **Failed (Contact your Philips Service representative for further assistance.)** without details.
  - **Run:** Starts the system confidence test.

- **Export Logs:** Initiates the export of system test results and other logs.
- **Software Maintenance** sub-tab allows:

## NOTES

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- Use the following utilities to repair system software without losing patient data.
  - For utilities to reset and restore patient data, see **Disk Maintenance**.
- 
- **Reinstall Application** reinstalls all system software (except the operating system) without impacting system configuration and data.
  - **Reinstall All** reinstalls all system software (including the operating system) without impacting system configuration and data.
  - **Reset Configuration** deletes custom configurations and resets to the factory-default settings.
- **Disk Maintenance** sub-tab allows managing the system hard drive. It presents the Patient data management features and hard disk tools:
    - Patient data management
      - **Study Management** sets how the system deletes studies (prompt user, or automatically delete the oldest). Same as **Disk Full Strategy** in the **Acquisition** setups.
      - **Repair Patient Database** opens **Database Repair**, which lets you attempt to repair the database to fix defective entries. The system backs up a copy of the database at least once daily. If the database cannot be repaired, you can switch to an earlier database version, or you can use **Restore** to revert to an earlier copy of the database. But you must first try to repair the database before you can use **Restore**.
      - **Restore Patient Database:** Reverts to a previous copy of the database. The system makes a copy each day and keeps the two most recent. Studies performed after

the restore point are lost. The system guides the user to the most-benign repair first: You must try **Repair** before you can attempt to use **Restore**; a restore must be done before **Delete** is available. **Delete** deletes the patient database and replaces it with a “blank” database. All studies are lost, but the user can now start a new study.

- **Delete Patient Data:** Deletes all patient data, images, and the entire patient database.

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## CAUTION

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Restoring the database results in the loss of patient information. All studies acquired after the time of the backup are no longer be available.

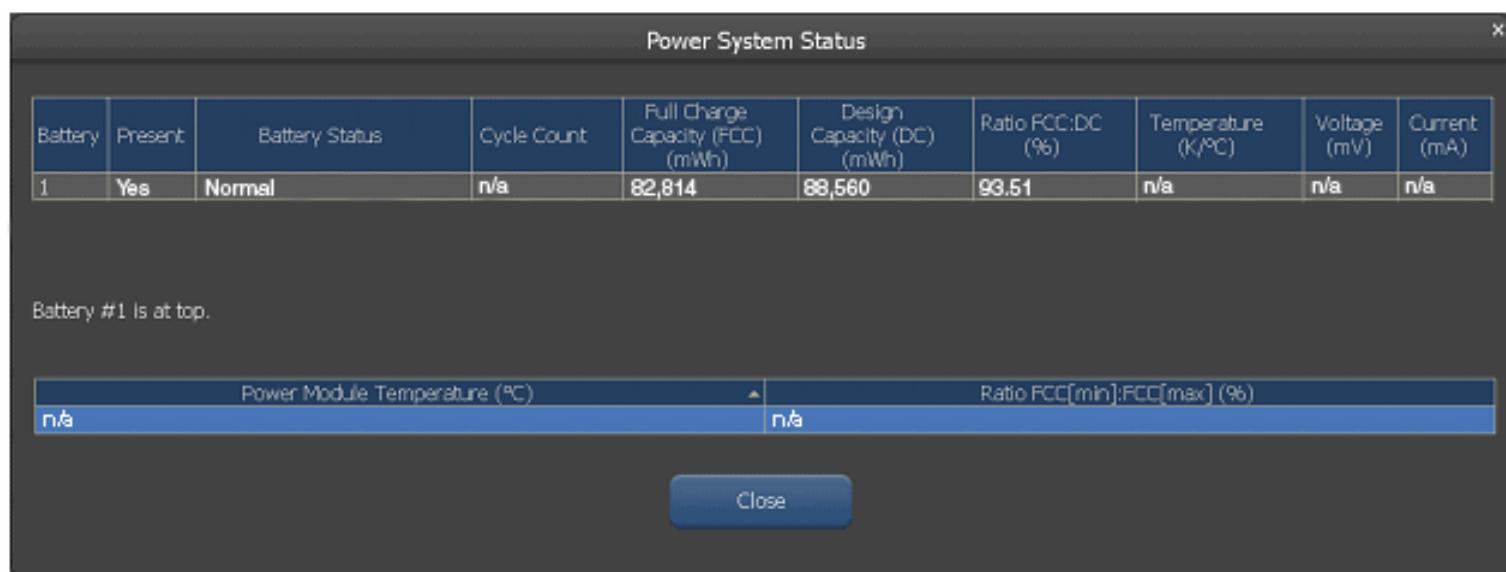
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- Hard disk tools
  - **Disk Optimizer** allows defragmentation of any of the drives in use on the system. Opens the **Windows Disk Defragmenter**, which can rearrange files and unused space on the hard disk, to make the software run faster, and to increase the speed of access and retrieval.
  - **Check Disk** runs the operating system **chkdsk.exe** application, a tool used to check and verify the file system against disk errors
  - **Repair Disk** runs the operating system Scandisk function with **Automatically fix file system errors** and **Scan for and attempt recovery of bad sectors** selected. If there is an error, portions of the stored information may be deleted without generating a report.
  - **System Logs** sub-tab provides access to view and manage log files, which can be exported to removable media, or sent to the remote Philips M2M server. Log files that are exported to media are encrypted, except the audit log.

- **Hardware Utilities** sub-tab:
  - **Interactive Tests:** Select the test you want to run; only one interactive test can run at a time. Click **Run** to begin the test and follow the displayed instructions.
    - Control Panel: When you run this test, a separate display appears. It shows a picture of the control panel and actively shows the actions taken on the controls. As each control is activated, the picture uses colors to show the status of the control. Green indicates that the LEDs were tested; yellow and white indicate that the buttons are switching (only the controls with LEDs cycle to green). The display shows any actions reported from the control panel. If the test fails, it does not show the action.
    - Display: Displays test patterns on the monitor to help troubleshoot display issues.
    - Bezel Controls: Electronically exercises the control panel controls on the monitor using the mouse. Results of each control activation are located to the left of the controls.
    - Audio: Allows audible sounds to play, to ensure the audio and speakers are working properly.
  - **Run Test:** Starts the selected test.
  - **Power System Status:** The system is typically powered by an internal battery (“[System Operating Power](#)” on page 92). In addition to the power status indicator in the icon area of the system display ([Table 4-1](#)), other battery status can be observed by clicking **Power System Status** to open the **Power System Status** display ([Figure 9-1](#)). The data categories and status definitions of the **Power System Status** display are described in [Table 9-5](#) and [Table 9-6](#).

Figure 9-1

## Power System Status Display



**Table 9-4****Power System Status Display Column Definitions**

<b>Column Name</b>	<b>Definition</b>	<b>Comments</b>
Battery	Battery identifier	There is only one battery.
Battery status	Indicates some key battery states	See <a href="#">Table 9-5</a>
Cycle count	Number of full charge and full discharge cycles	Currently no applicable use in this system
Full Charge Capacity (FCC)	Amount of power the battery can store when fully charged	When the battery is new, the FCC is approximately equal to the design capacity (may even display as slightly greater). As the battery ages, the FCC decreases.
Design Capacity (DC)	Amount of power the battery is designed to store when fully charged	--
Ratio FCC:DC	Indicates battery "strength"	For example, if the battery is designed to provide 2 hours of operation, and if the FCC is 50% of the DC, the running time will be about 1 hour.
Temperature	Batteries normally run hotter when discharging than when charging.	Currently no applicable use in this system
Voltage	Battery voltage reported in mV.	Currently no applicable use in this system
Current	Battery current in mA.	Currently no applicable use in this system

**Table 9-4****Power System Status Display Column Definitions (Continued)**

<b>Column Name</b>	<b>Definition</b>	<b>Comments</b>
Power Module Temperature	Temperature as measured on the charging circuit in the power supply	Currently no applicable use in this system
Ratio FCC(min)/FCC(max)	Smallest FCC divided by the largest FCC. A measure of “relative strength” of the batteries and how they share the load.	Not applicable, because there is only one battery in the system

**Table 9-5****Battery Status Definitions**

<b>Battery Status</b>	<b>Definition</b>	<b>Comments</b>
Terminate Discharge	Battery has self-disconnected	May be due to an error condition (such as excessive discharge current).
Initialized	Error in the “time remaining” indicator is greater than 10%	Battery needs to be “calibrated.” Leave the system plugged in, and allow the battery to charge fully. Then unplug the system, and let the battery discharge fully. You may need to repeat this cycle.
Fully Discharged	Reports that the battery is fully discharged	Unlikely status, because the system should shut down before the battery reaches this state.
Fully Charged	Reports that the battery is fully charged	Appears when the system is plugged in, and the battery is allowed to charge fully.
Normal	None of the previously defined status conditions exist	A status of “normal” appears if the battery is not in one of the other conditions listed in this table.

- **Hardware Tests** sub-tab
  - The hardware tests are used to determine functionality of each major hardware component on the system.
  - Use **View Hardware Test Log** if you want to view the test log
- **Service Messaging** Sub-tab: Service messaging allows service personnel to create pop-up messages and to enter notes on the system. Messages can be created and displayed to the end user when the system boots. These messages can be configured to be repeatable or one-time only messages. The user must reply to these messages when they are displayed.

## Service Options

The service options are customer-purchased options to assist with system utilization and troubleshooting. The options are found on the **Options** tab of the service interface and include:

- On-line Support Request ([“Online Support Request Service Option” on page 287](#))
- Utilization Reports ([“Utilization Reports Service Option” on page 288](#))
- First Responder ([“First Responder Service Option” on page 288](#))
- Monitoring ([“Monitoring Service Option” on page 288](#))
- Service Demo ([“Service Demo Service Option” on page 289](#))
- Software Update ([“Software Update Service Option” on page 289](#))

The options are enabled by entering an access code that is related to the system serial number. With the exception of the Service Demo option, the service options are customer-purchasable and have an expiration date. Not all service options are available on all software versions, or in all geographies.

## Online Support Request Service Option

Once setup, the online support request service option enables the user to automatically request assistance from the Philips service organization or the authorized service provider. The request is sent over a network connection. Responses from the service organizations are by telephone,

e-mail, or remote desktop, as selected by the customer. This feature is not available in all countries.

The features of the request support service option are always available to FSEs, and if the service option is enabled, those features are available to First Responders. It is unavailable to end-users.

## Utilization Reports Service Option

The Utilization service option provides asset-managing data. This feature provides data on system usage, transducer usage, and the type and duration of exams. The customer can use this data to identify underperforming assets, to justify additional equipment purchases, or to optimize the daily workflow. The utilization reports can be viewed on the system or exported in PDF format for printing or archiving.

The features of the utilization report service option are available to FSEs, and if the service option is enabled, those features are available to First Responders and end-users. (The utilization log is unavailable to end-users.)

## First Responder Service Option

The First Responder service option enables second-level access to service diagnostic tools and capabilities.

## Monitoring Service Option

When purchased, the monitoring service option enables FSEs to remotely monitor system temperature, voltage, hard drive space, abnormal shutdowns, battery cycle counts, battery ratios, and error conditions. If a network connection has been established, the monitoring results are sent automatically to Philips. Deviations from normal settings are detectable and may result in maintenance before a system is actually broken. FSEs can configure whether an alert message is displayed when a parameter is violated and can change the settings at which an alert occurs.

The features of the monitoring service option are always available to FSEs, and if the service option is enable, those features are available to First Responders, except for **Configure**, which is available only to FSEs. The monitoring service option is unavailable to end-users.

<b>Service Demo Service Option</b>	<p>The Service Demo service option is a tool for FSEs and sales personnel to temporarily activate all of the service options simultaneously on a Sales Demo system. If Service Demo is enabled, all service options are available for demonstration to customers. This service option is not sold to customers and must never be enabled on a customer system.</p> <p>If Service Demo is enabled and the patient data security features are presented to a customer, reset all data security settings using <b>Demo Reset</b>. See “<a href="#">Resetting Data Security on Demo Systems</a>” on page <a href="#">667</a> to reset temporary data security settings that were used during sales and service demonstration.</p>
<b>Software Update Service Option</b>	<p>The Software Update service option enables FSEs and first responders to upgrade system software from a USB flash drive. The software installation may include updates for drivers, the ultrasound application, or the operating system. Patient data and images are preserved during the installation process.</p>
<b>Remote Connection Status Indicator</b>	<p>A single indicator in the upper-left corner of the <b>Remote Connection</b> area of the <b>Access/Status</b> sub-tab (under the <b>Remote Services</b> tab) shows the status of the remote connection service feature (<a href="#">Table 9-6</a>).</p>

**Table 9-6****Remote Connection Status Indicator**

<b>Indicator Condition</b>	<b>Status Definition</b>
	Not running
	Not ready
	Ready
	Unexpected error
	Disconnected
	Starting
	Stopping
	Call help desk

# I 0 Disassembly

## Introduction

This section provides specific information about system disassembly that may be required for the removal and installation of field-replaceable parts. If not covered by a detailed procedure, the means of removing a system part can be discerned from the illustrations in this section as well as from those in [Section 13, “Configuration”](#), and [Section 14, “Parts”](#). Instructions for crating the system for shipment are also included.

For links to disassembly procedures by specific part, see [Figure 10-1](#).

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**NOTE** When instructed to secure hardware, tighten in accordance with the training you received on this product.

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## Warnings and Cautions

Review [Section 3, “Safety”](#), before continuing. Also follow any additional warnings and cautions contained in this section.

### WARNING

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Always turn the power off, disconnect the AC adapter from the wall outlet, remove the battery, and wait at least 30 seconds before removing or installing any PCB, module, or component.

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### CAUTION

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Always use correct ESD procedures. ESD damage is cumulative and may be unnoticeable at first. ESD symptoms may be first exhibited as a slight degradation of performance or image quality.

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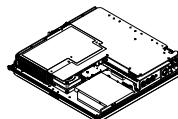
**NOTE** The video monitor contains mercury and must be recycled or disposed of according to local, state, and federal laws. Return products with mercury to Bothell for disposal.

---

# Disassembly Procedures

**Figure 10-1****Disassembly Procedure List**

- CX30 and CX50 System Enclosures
- Removing the System Battery
- CX30 and CX50 System LCD Assembly



- Internal System Components
- User Interface (UI) Assembly



- Packaging the CX30 or CX50 Ultrasound System



- Replacing the System Audio Cable (CX30 2.0 and CX50 3.0 Systems)

**NOTE** The numbers in the installation illustrations correspond to the steps in the installation procedure.



- Crating the System Cart (A.0, B.0, and C.0 Carts)
- Crating the System Cart (D.0 Cart)



- Using the Crate Banding Kit



- Disassembling the System Cart (D.0 Version)

## Required Common Tools for the System and Cart

Table 10-1 lists some of the common tools required to disassemble the system and the system cart.

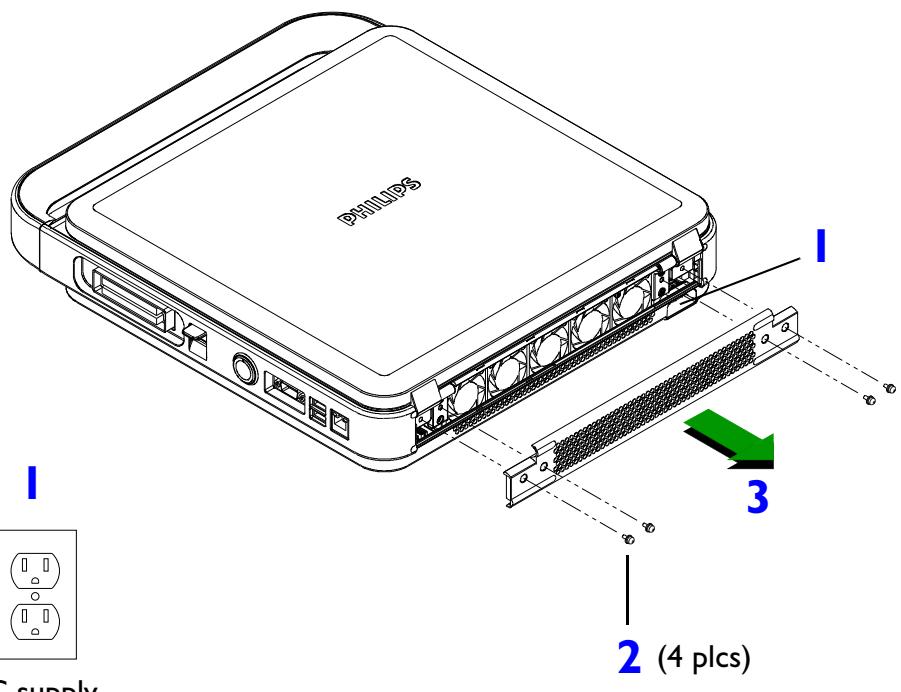
**Table 10-1 Required Common Tools**

Part Number	Description
<b>System</b>	
453561436541	Screwdriver, Phillips, ESD, Precision, #1
453561436591	Screwdriver, Slotted, ESD, Precision, 2.5 mm
453561436601	Screwdriver, Torx, ESD, Precision, T5
453561437031	Screwdriver, Torx, ESD, Precision, T6
453561437061	Tweezer, SS, ESD, 5-Inch, Universal, Fine
<b>Cart</b>	
N/A	3-mm Allen Wrench
N/A	4-mm Allen Wrench
N/A	10-mm Socket or Wrench

## CX30 and CX50 System Enclosures

Figure 10-2

Removing the System Rear Bezel



### ► To remove system enclosures

#### NOTES

- Keep mounting hardware with the part or stored in trays during disassembly.
- Due to the various screw types, note their locations and sizes.

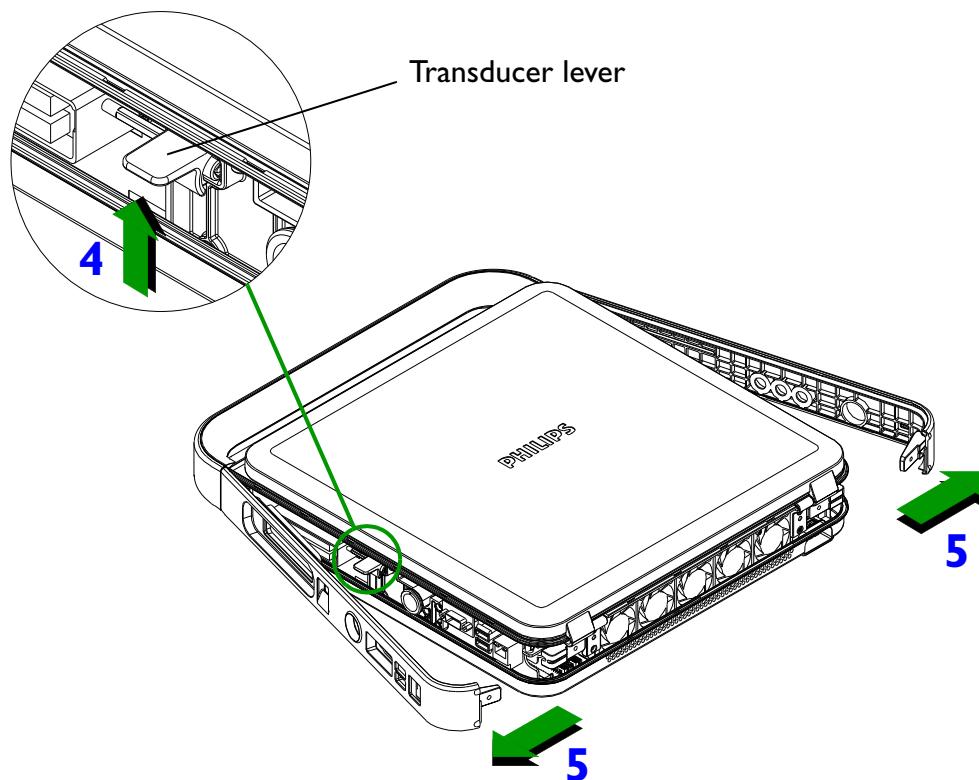
1. Disconnect the system power cord from the main AC supply and the ultrasound system.
2. Use a #1 Phillips driver to remove the four screws that secure the rear bezel to the frame.

**NOTE** When instructed to secure hardware, tighten in accordance with the training you received on this product.

3. Use a small slotted screwdriver to carefully pry the bezel from the case.

Figure 10-3

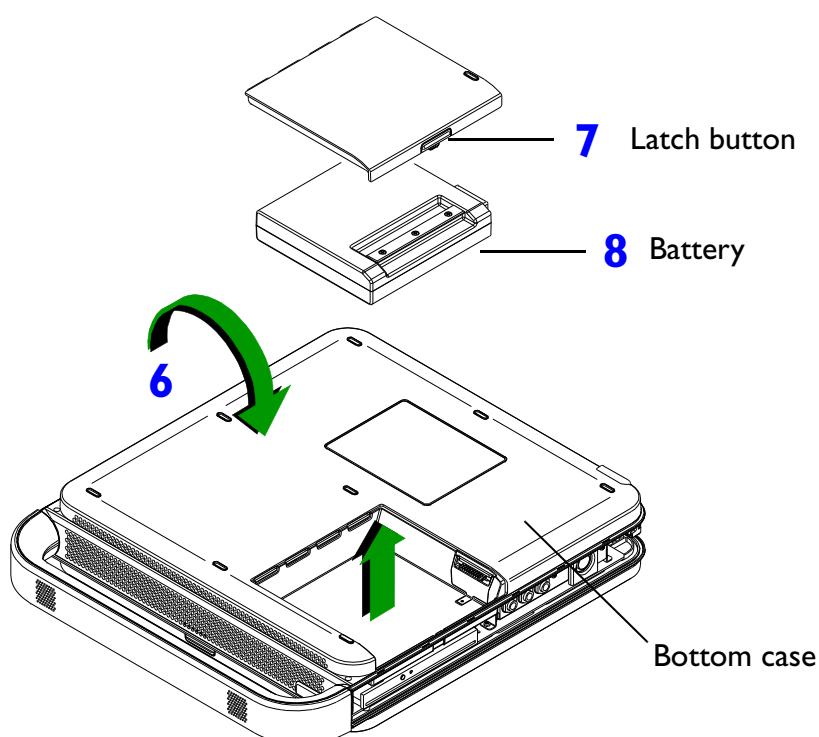
## Removing the System Side Bezels



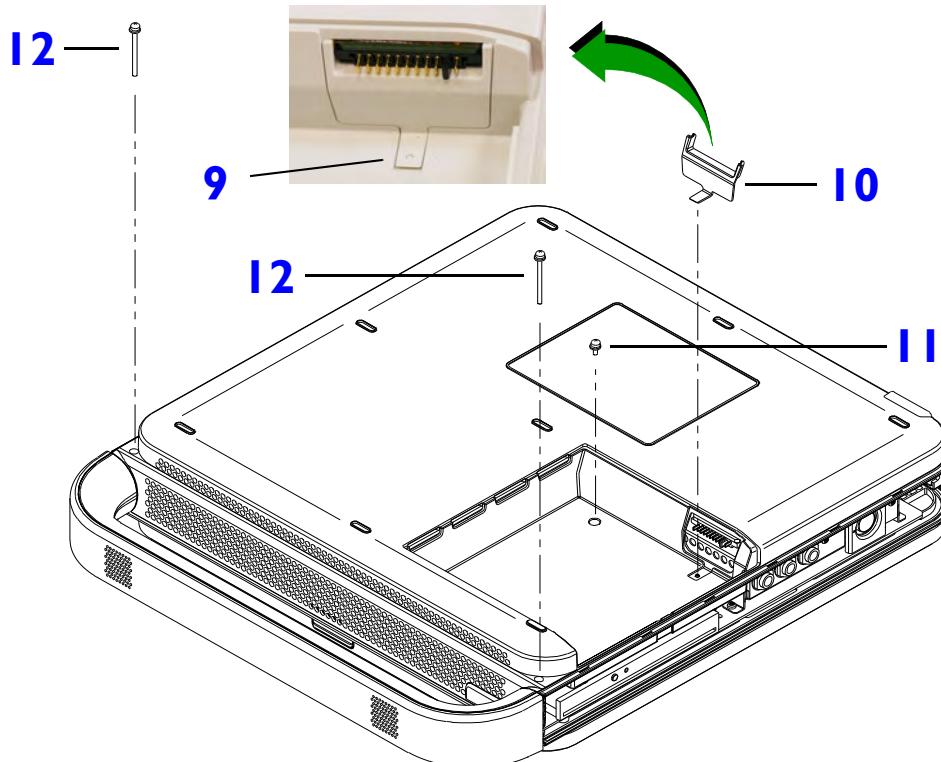
4. Push the transducer lever in the locked (up) position.
5. From the rear of the system, use a small slotted screwdriver to carefully pry each side bezel away from the case. Pull out about 45 degrees until they slide off of the external system connectors.

Figure 10-4

## Removing the System Battery



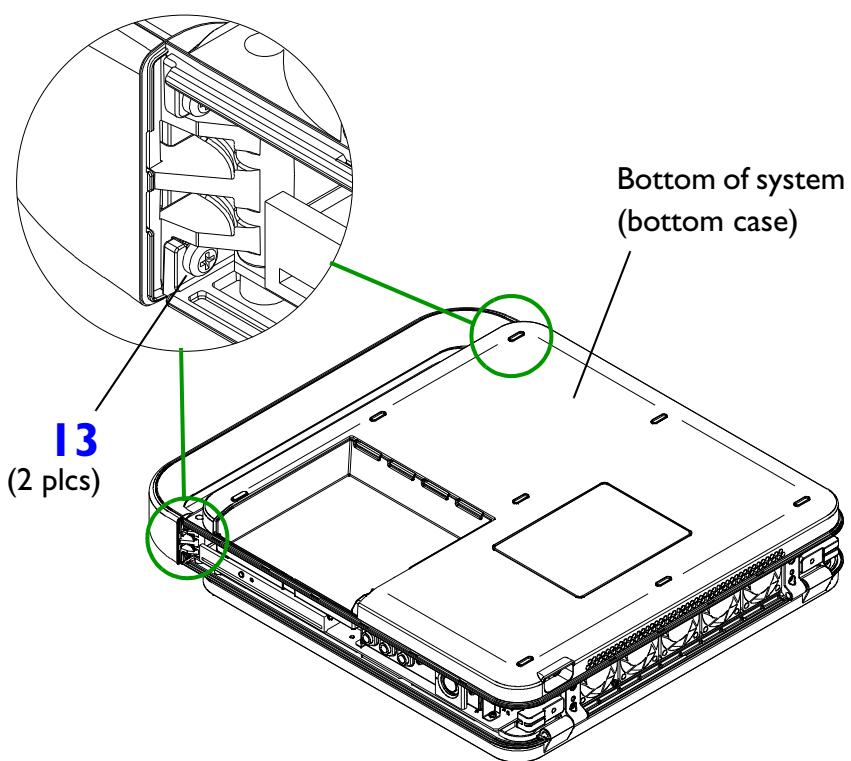
6. Using an ESD mat, turn the ultrasound system over, so that the system rests on the LCD side.
7. Press the latch button on the battery access door and lift the door up and off the system.
8. Remove the system battery and set it aside.

**Figure 10-5****Removing the Battery Connector Cover and Bottom Case Screws**

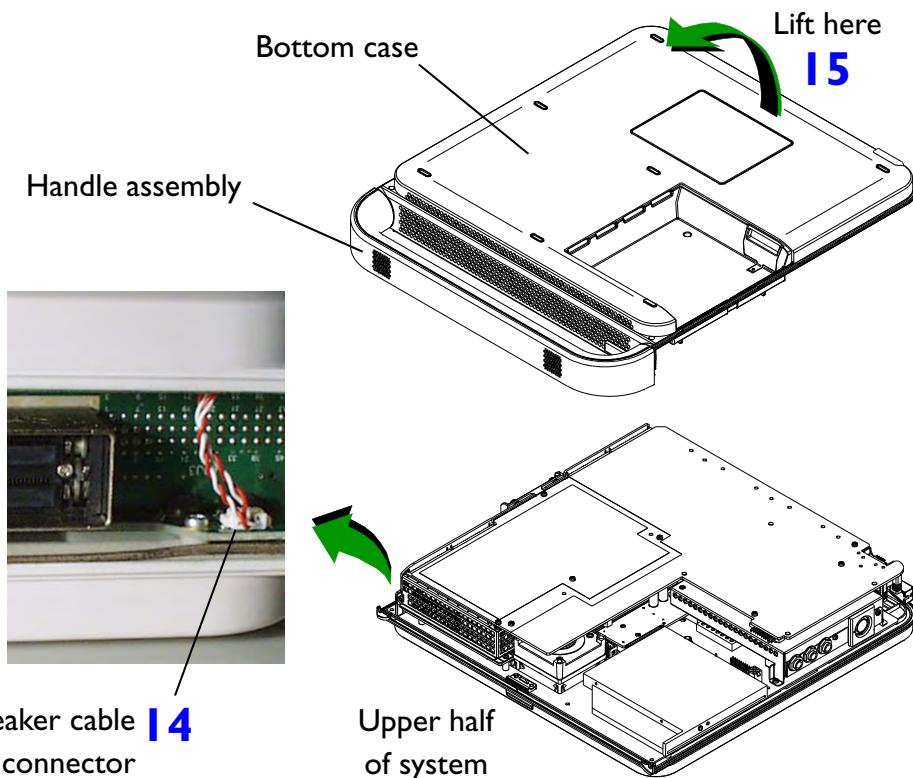
9. With a small slotted screwdriver, gently pry the battery connector cover tab up until the cover disengages from around the connector.
10. Lift the connector cover out of the battery compartment and set it aside.
11. Remove the one short screw from the battery compartment. This is one of the three screws that secure the bottom case to the system.
12. Remove the two front long screws that secure the bottom case to the system assembly.

Figure 10-6

## Loosening the Handle Screws



13. Loosen the two screws that secure the handle assembly to the upper case. There is one on each end of the handle assembly. Loosen only those two screws.

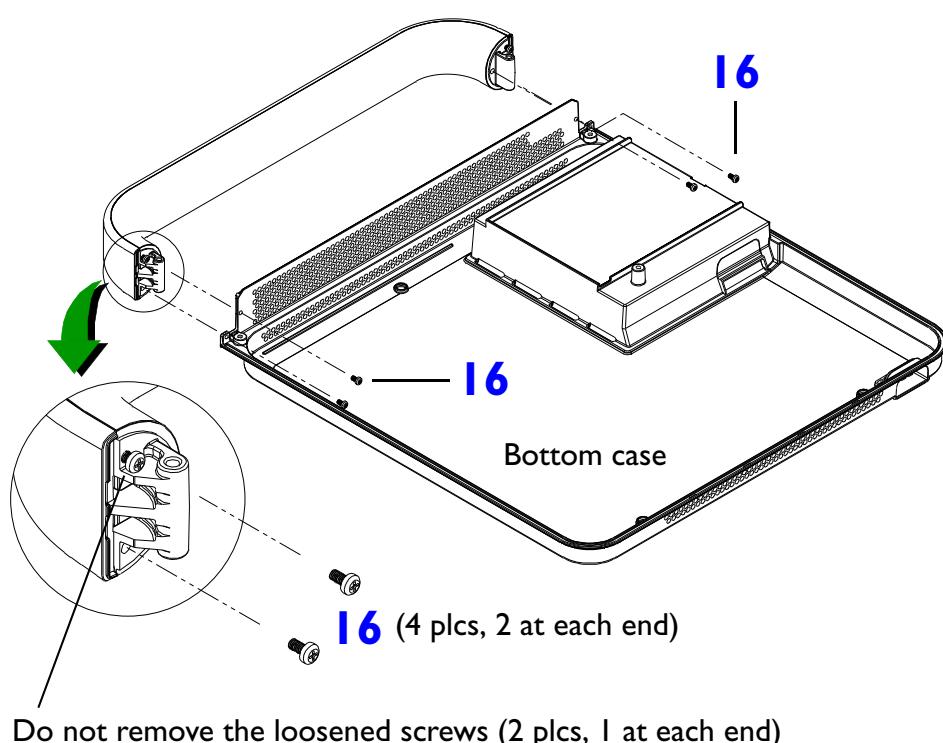
**Figure 10-7****Removing the Bottom Case with Handle Assembly****NOTES**

- Four other screws secure the handle assembly to the bottom case. The bottom case and handle assembly are removed as one assembly and can be separated after removal.
- The speakers are in the handle assembly and are cabled to the UI assembly on the upper half of the system.

14. Disconnect the speaker cable from the system UI speaker connector.
15. Carefully lift and rotate the bottom case and handle assembly off the upper half of the system.

Figure 10-8

## Removing the Handle Assembly

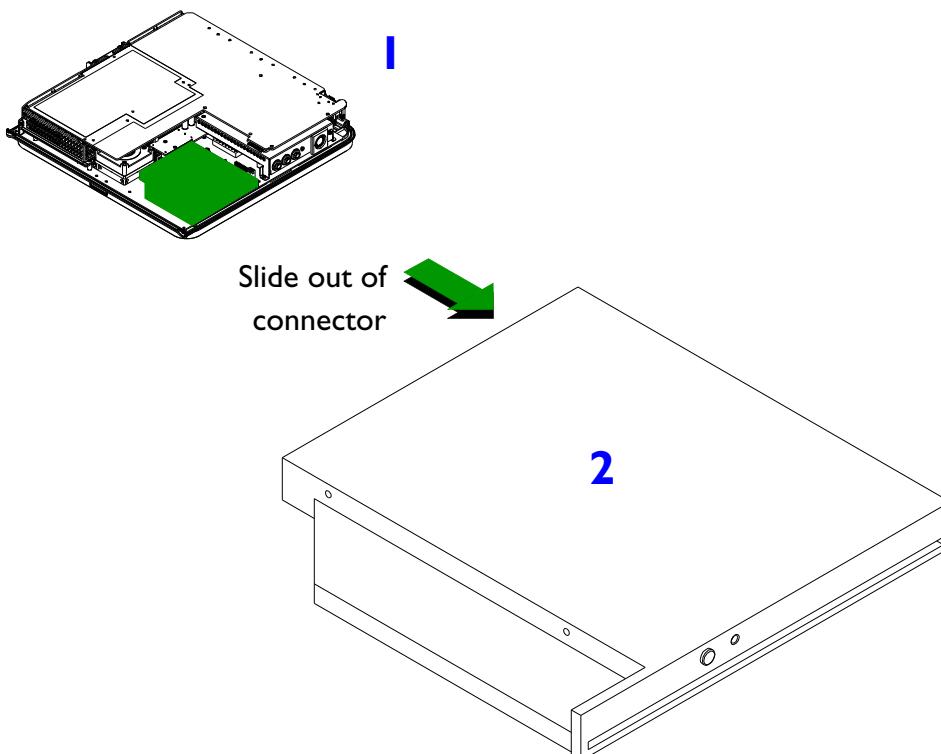


**NOTE** You do not need to remove the handle assembly from the bottom case, unless the speakers are bad. This illustration is provided for those cases only, where the handle assembly needs replacing.

16. Remove the four screws that secure the handle assembly to the bottom case. Do not remove the two screws that were loosened in step 13.

Return to [Disassembly Procedure List](#).

## Internal System Components

**Figure 10-9****Removing the DVD Drive Assembly**

- **To remove the internal system components**

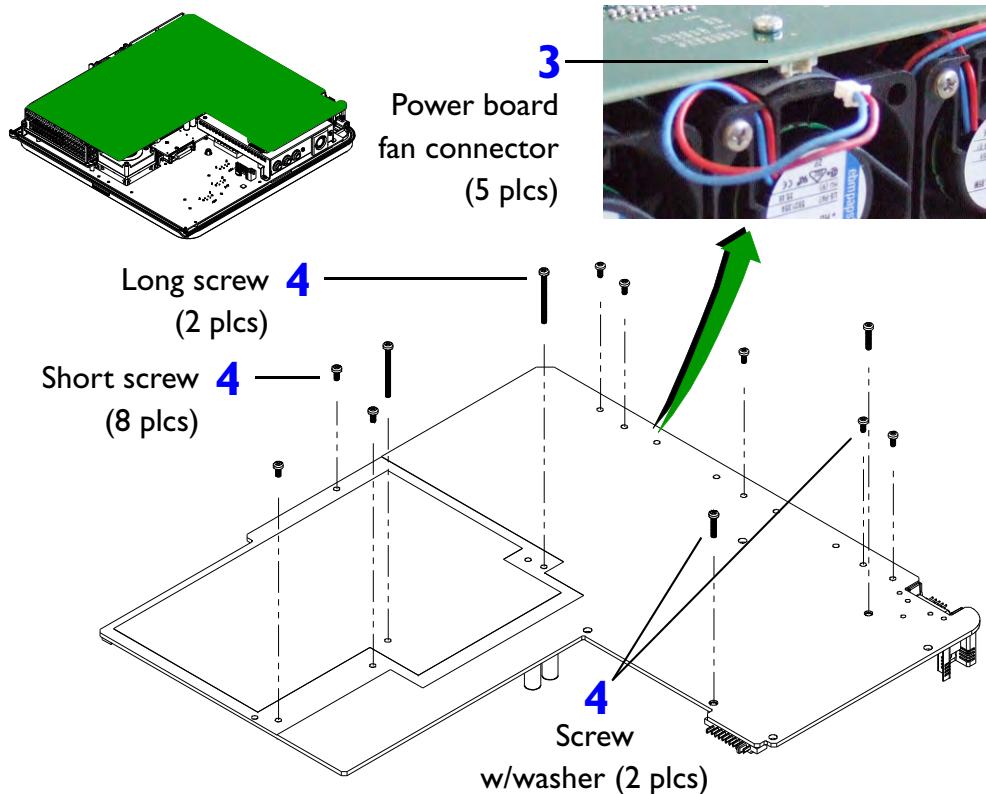
**NOTES**

- The internal components must be removed in the order shown here.
- The trackball and cooling fans do not need to be removed to access the other system components. They are both part of the UI assembly.
- A small magnetic screwdriver is recommended for disassembly and reassembly of the internal system components.

1. Remove the system enclosures ([“To remove system enclosures” on page 294](#)).
2. Slide and lift the DVD drive out of the system and set it aside. No screws secure this assembly.

Figure 10-10

## Removing the Power Board Screws



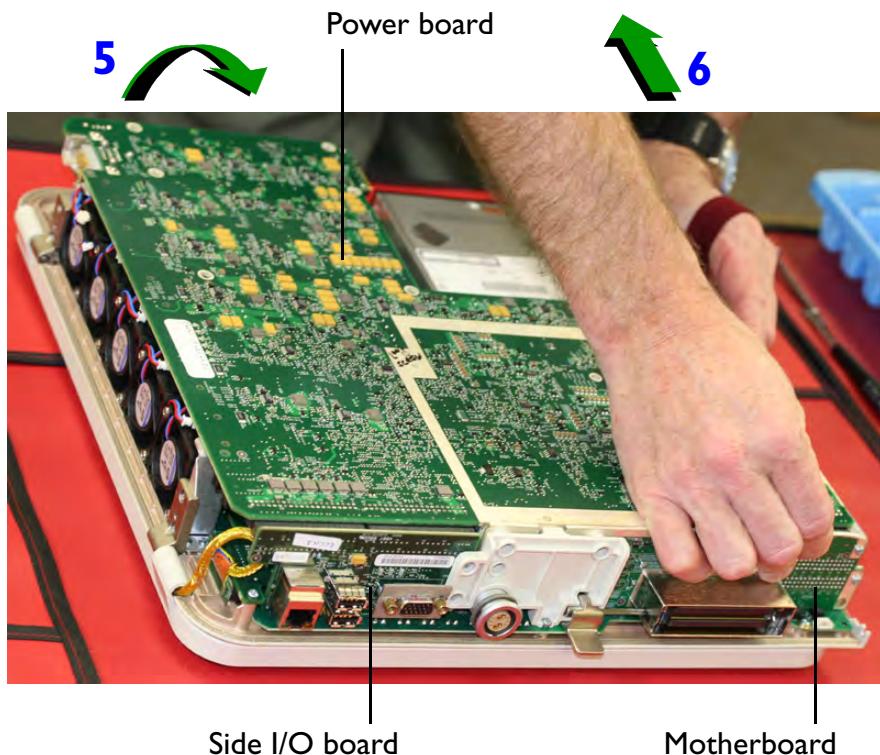
**CAUTION** Carefully disconnect the fan cables from the Power Board connectors. The connectors can break away from their solder points on the board.

3. With a small slotted screwdriver, carefully pry the fan cable end connector away from the Power Board connector. Repeat for the other four fan cables.

**NOTES**

- Screw sizes vary. Make note of their locations.
- Now you may remove the fans if necessary ([step 9](#)).

4. Remove the 12 screws from the locations shown in the illustration.

**Figure 10-11****Removing the Power Board**

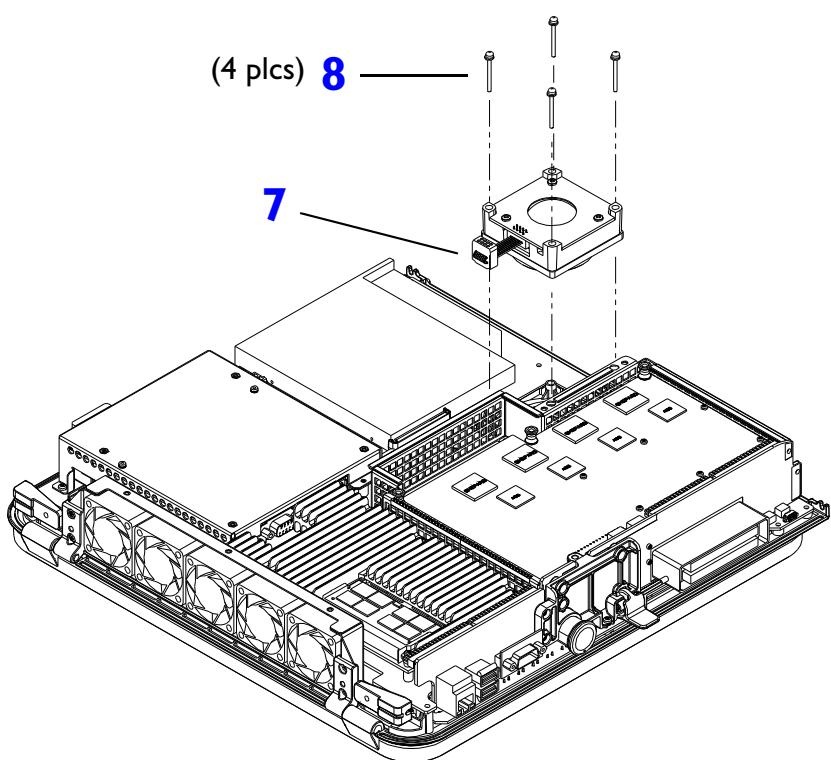
**NOTE** When removing or replacing the Power Board it is important to support the Motherboard and the Side I/O Board.

5. Slightly tilt up the back of the Power Board.
6. Carefully pull the Power Board until it disengages from the Motherboard and Side I/O Board assemblies.

**NOTE** Now you can remove the trackball assembly if necessary.

Figure 10-12

## Removing the Trackball

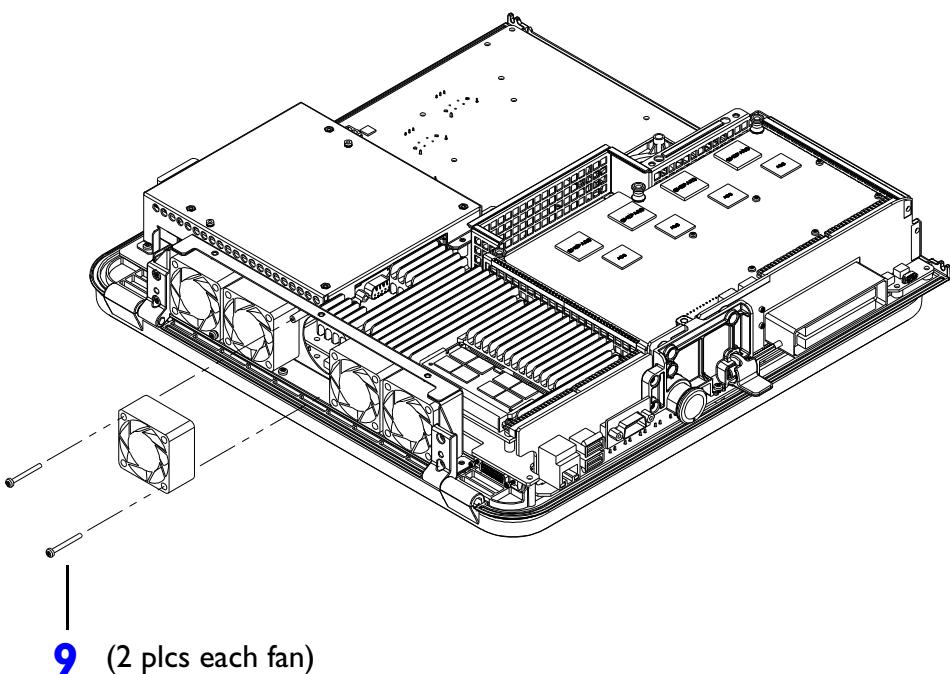


7. Disconnect the trackball cable from the UI assembly.
8. Remove the four screws that secure the trackball assembly and remove it.

**NOTE** When instructed to secure hardware, tighten in accordance with the training you received on this product.

Figure 10-13

## Removing the Fans

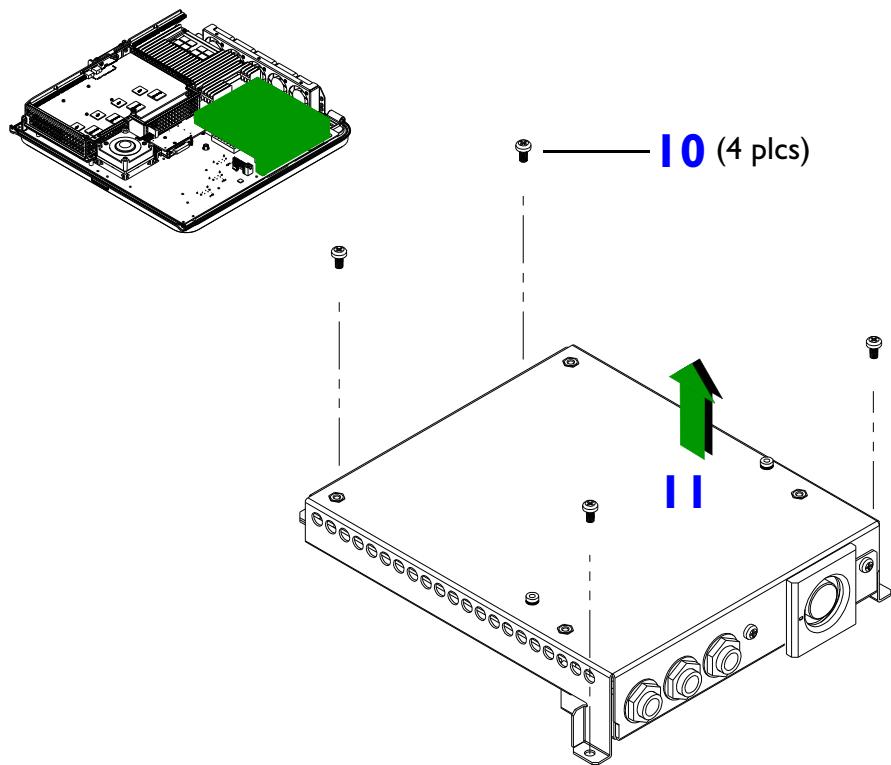


9. Remove the two screws that secure the fan to the fan bracket. Repeat for each fan replacement.

**NOTE** For installation, ensure that the cable of each fan is tucked between the fans so that the covers fit properly and the cables are not pinched.

Figure 10-14

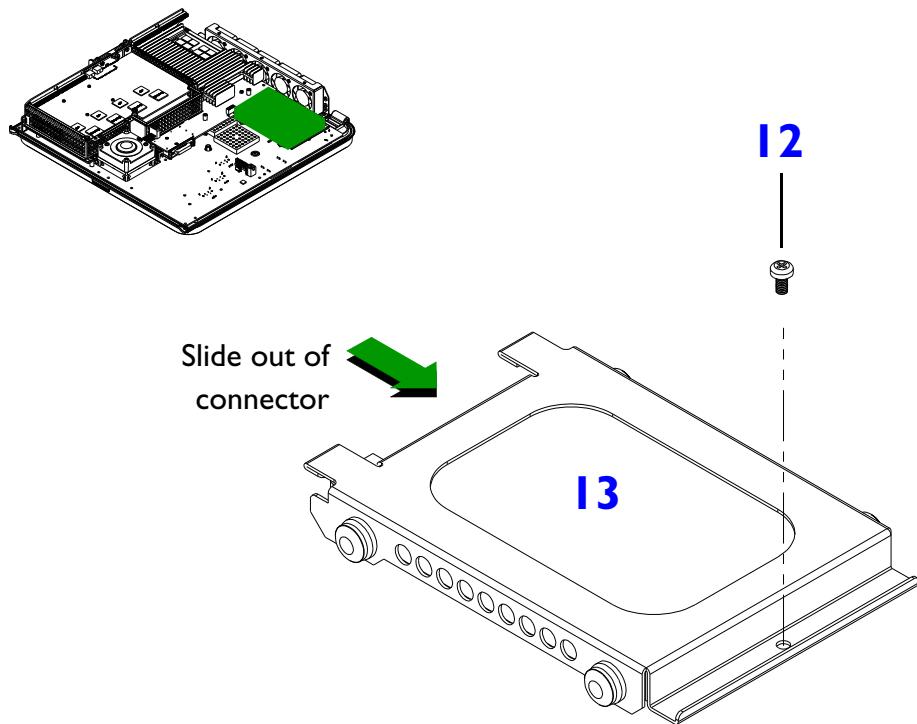
## Removing the Physio Module Assembly



10. Remove the four screws that secure the Physio Module.
11. Lift the Physio Module off the system.

Figure 10-15

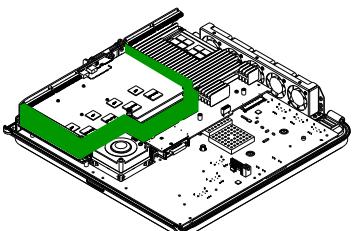
## Removing the Hard Drive Assembly



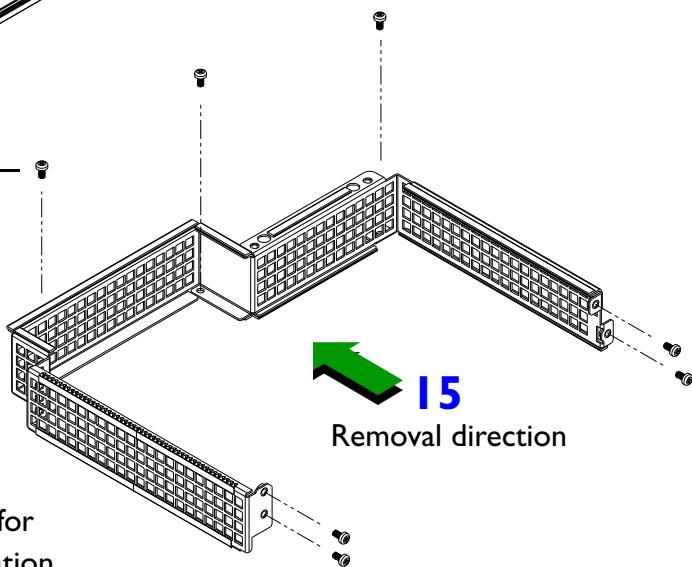
12. Remove the screw that secures the hard drive.
13. Slide the hard drive out of the connector and lift it off the system.

Figure 10-16

## Removing the EMI Fence



(7 plcs) 14

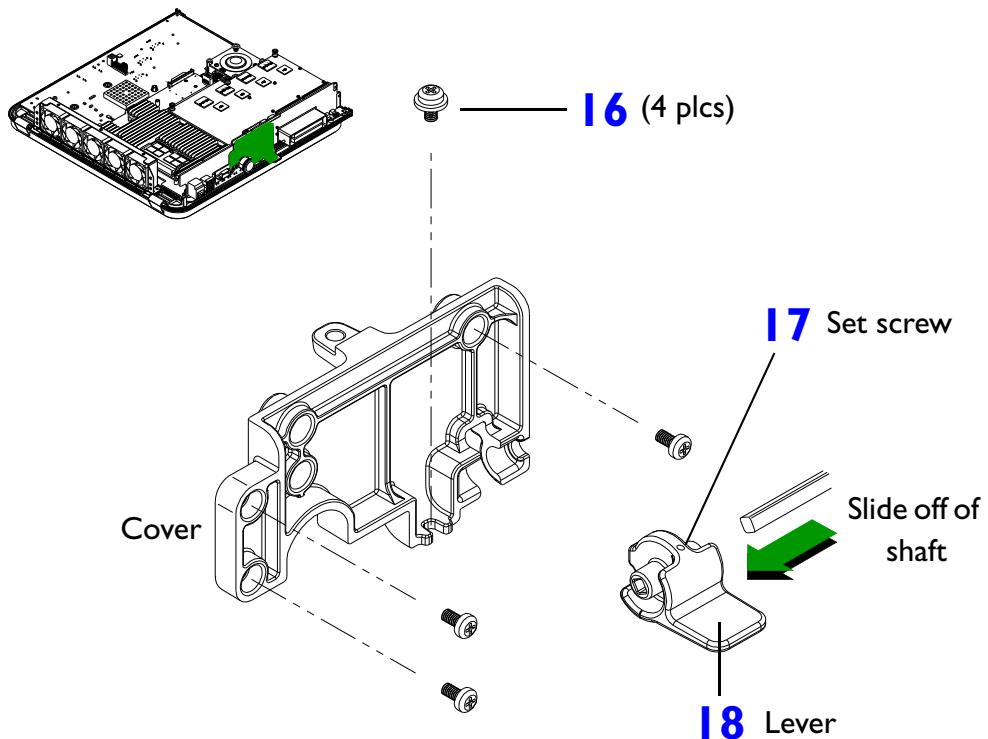


**CAUTION** The EMI fence is installed in a very tight area. Carefully remove the EMI fence, so that the Channel Boards and surrounding components are not damaged.

14. Remove the seven screws that secure the EMI fence.
15. Carefully slide and gently lift the fence out from around the Channel Boards. Do not force, twist, or bend the EMI fence.

Figure 10-17

## Removing the Transducer Lever and Cover



16. Remove the four screws that secure the transducer lever cover to the Motherboard.

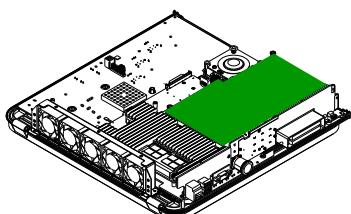
17. Loosen the allen head set screw that secures the lever to the transducer lever shaft.

**CAUTION** The lever is very close to the Motherboard, especially the U601 board component. Very carefully slide the lever off the shaft.

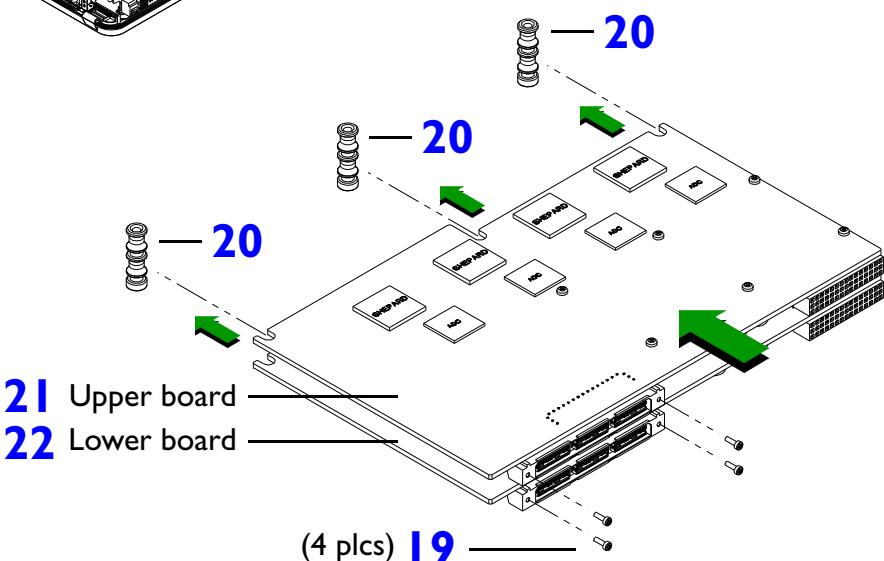
18. Remove the transducer lever by sliding it off the metal shaft.

Figure 10-18

## Removing the Channel Boards



**NOTE** CB0/Channel board 0 is the one closest to the Main Board (labeled on the MB connector).



**CAUTION** Be aware of surrounding board components that may be damaged during removal.

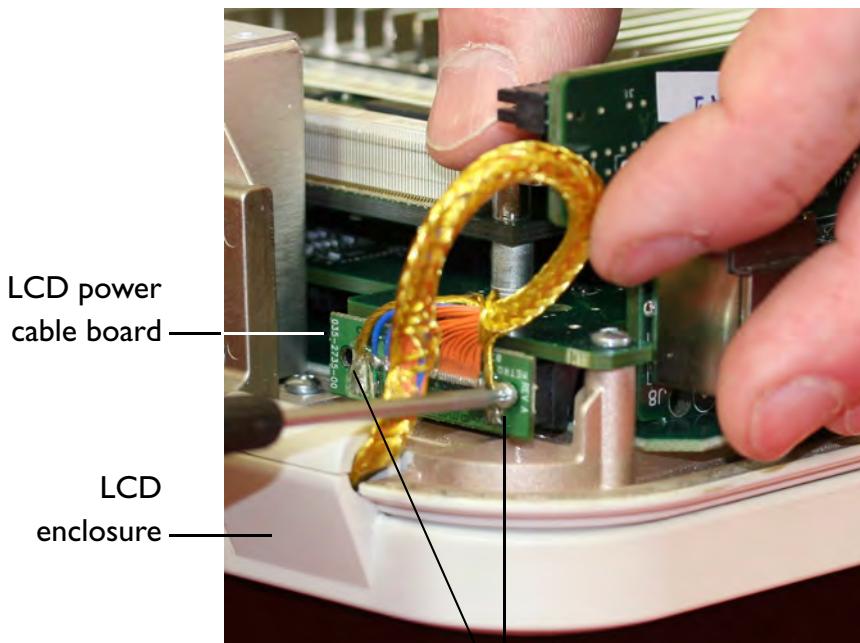
19. Use a Phillips or T5 Torx driver to remove the four screws (Phillips or T5 Torx) that secure the Channel Boards.
20. Remove the three Channel Board standoffs.

**NOTE** Apply gentle force against the Motherboard when removing or installing the Channel Boards.

21. Supporting the Motherboard, gently wiggle and slide the upper Channel Board out of the connectors.
22. Supporting the Motherboard, gently wiggle and slide the lower Channel Board out of the connectors.

Figure 10-19

## Disconnecting the LCD Power Cable

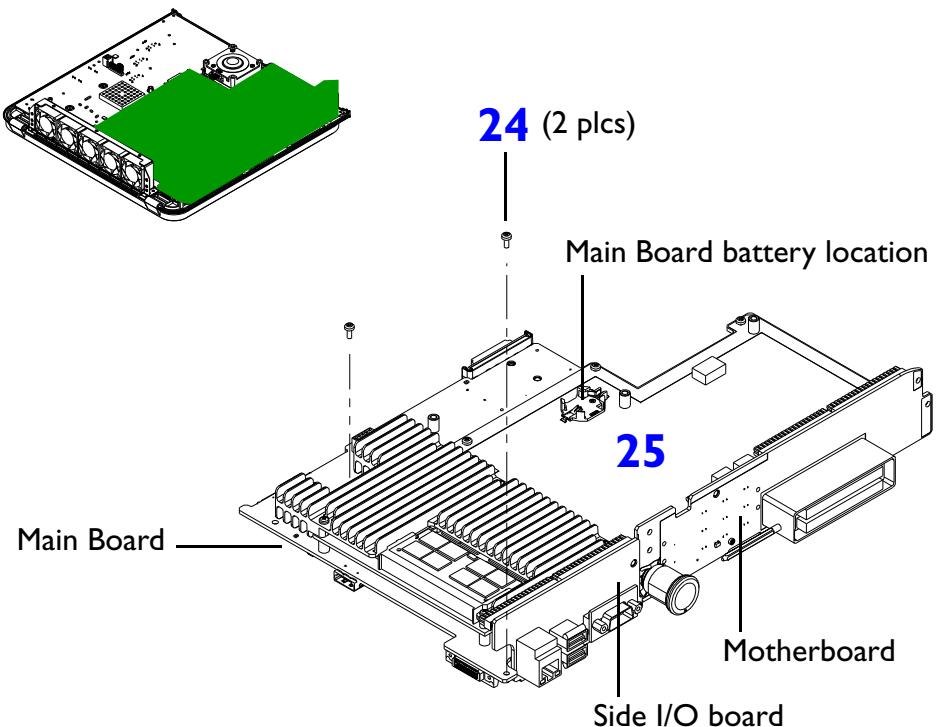


23

23. Use a Phillips or T5 Torx driver to disconnect the LCD video connector from the Main Board by removing the two screws (Phillips or T5 Torx).

Figure 10-20

## Removing the Main Board Assembly

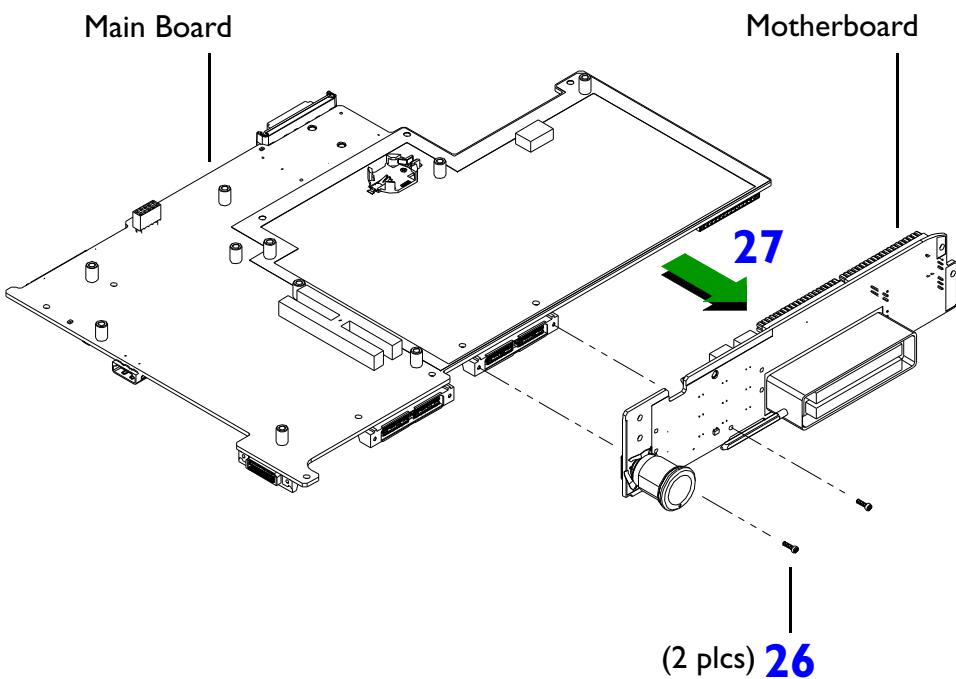
**NOTES**

- The Main Board, Side I/O Board, and Motherboard are removed as one assembly.
- To remove Main Board battery, channel-board removal is unnecessary.
- On B.0 hardware, you must remove the audio cable from the Main board.
- When re-installing, tighten the Main Board screws to a snug fit only, and on B.0 hardware, re-install the audio cable ([“Replacing the System Audio Cable \(CX30 2.0 and CX50 3.0 Systems\)” on page 339](#)).

24. Remove the two screws that secure the Main Board.
25. Lift the Main Board off the system with the Side I/O Board and Motherboard still attached.

Figure 10-21

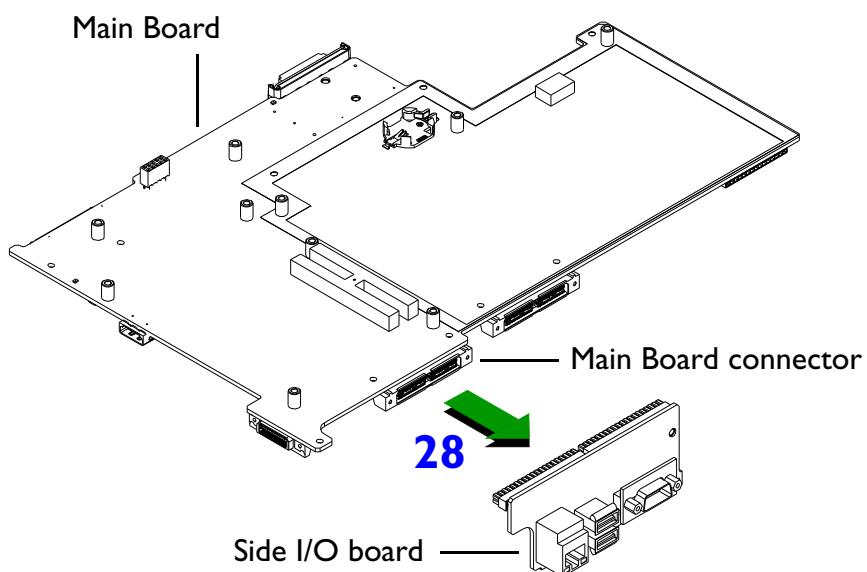
## Removing the Motherboard



26. Use a Phillips or T5 Torx driver to remove the two screws (Phillips or T5 Torx) that secure the Motherboard to the Main Board.
27. Gently slide the Motherboard out of the board connectors.

Figure 10-22

## Removing the Side I/O Board



**NOTE** After you remove the transducer-lever cover (Figure 10-17), only the Main Board holds the Side I/O board in place.

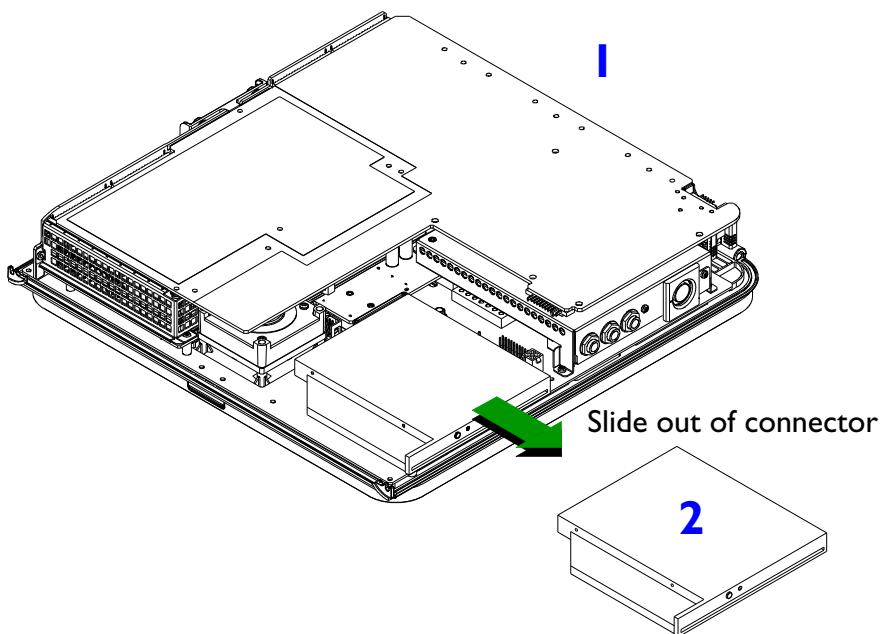
28. Gently slide the Side I/O Board off the Main Board connector.

Return to [Disassembly Procedure List](#).

## User Interface (UI) Assembly

Figure 10-23

Removing the DVD Drive Assembly

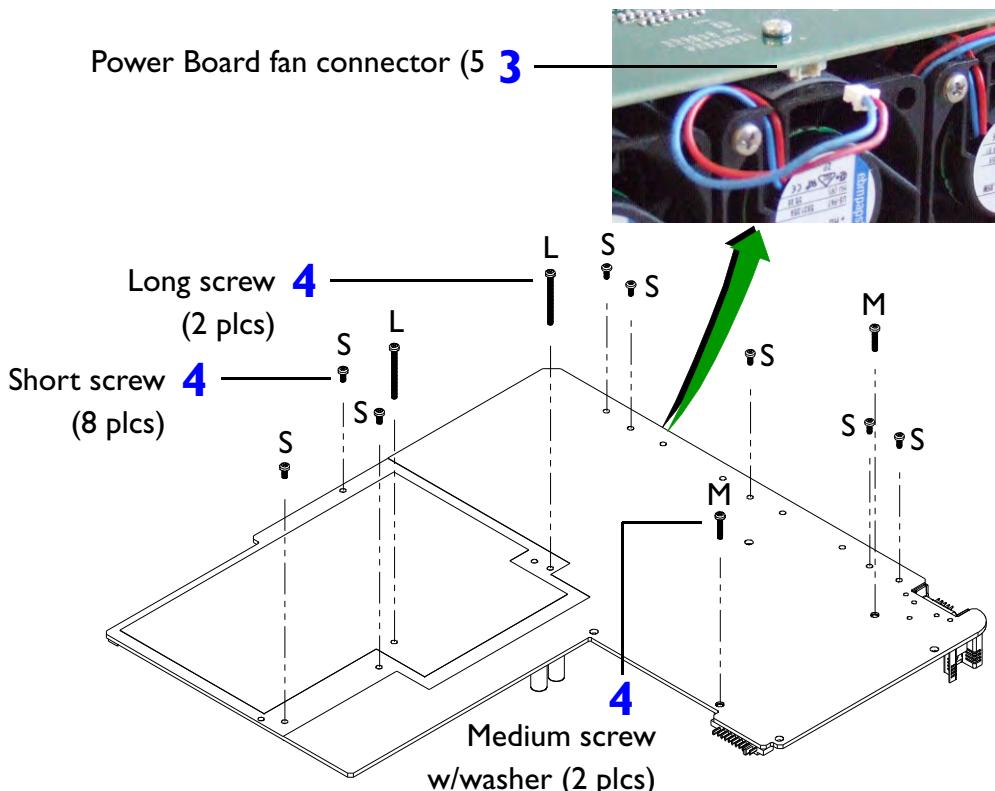


### ► To remove the UI assembly

1. Remove the system enclosures ("To remove system enclosures" on page 294).
2. Slide and lift the DVD drive out of the system and set it aside. No screws secure this assembly.

Figure 10-24

## Removing the Power Board Screws



**CAUTION** Carefully disconnect the fan cables from the Power Board connectors. The connectors may break away from their solder points on the Power Board.

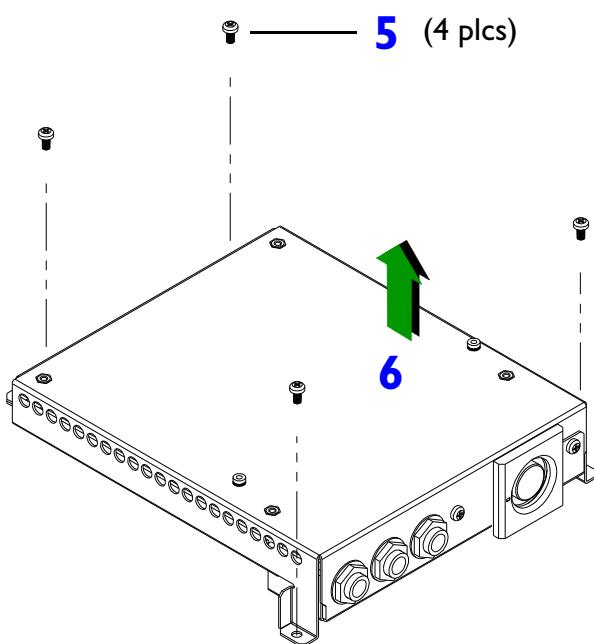
3. With a small slotted screwdriver, carefully pry the fan cable end connector away from the Power Board connector. Repeat for the other four fan cables.

**NOTE** Screw sizes vary. Make note of their locations.

4. Remove the 12 screws from the locations shown in the illustration.

Figure 10-25

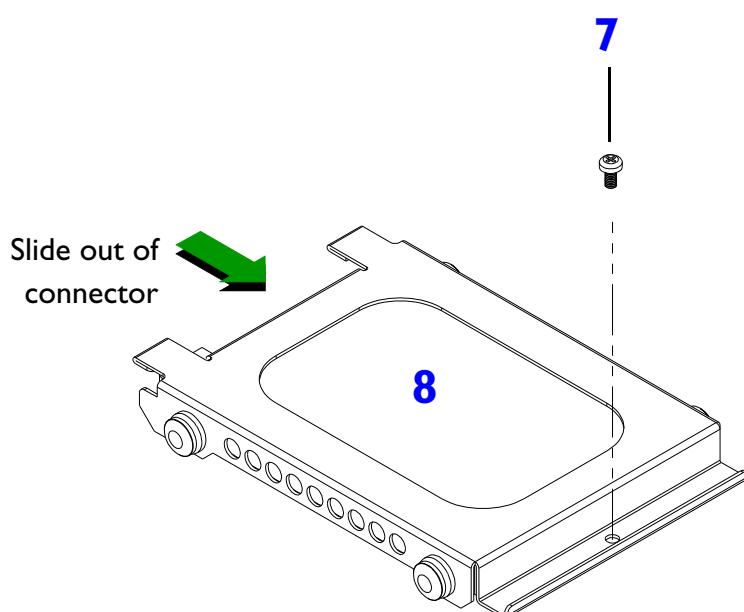
## Removing the Physio Module Assembly



5. Remove the four screws that secure the Physio Module assembly.
6. Lift the Physio Module off the system.

Figure 10-26

## Removing the Hard Drive Assembly

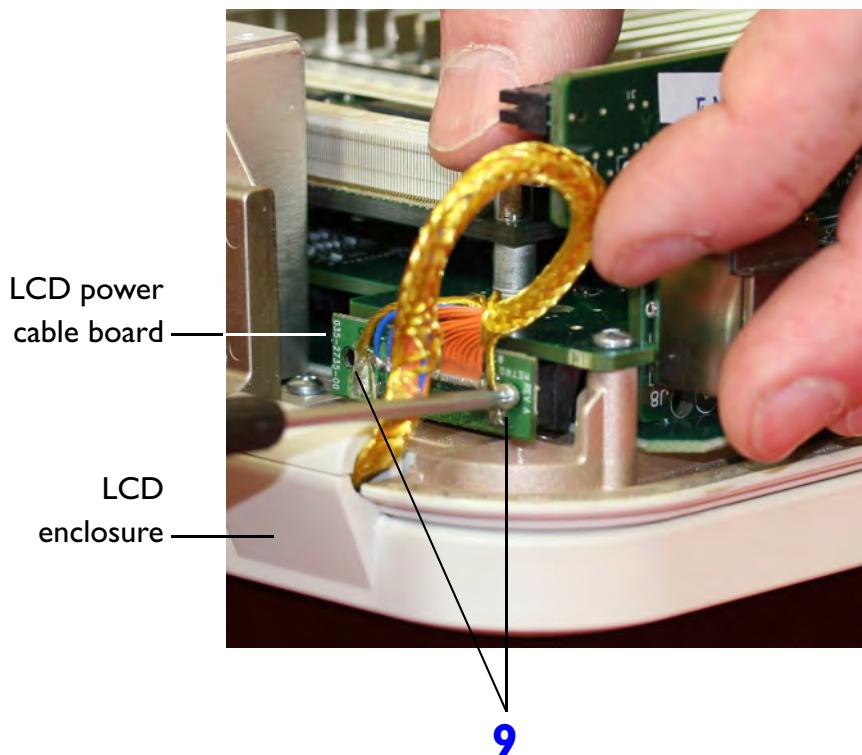


7. Remove the screw that secures the hard drive.
8. Slide the hard drive out of the connector and lift it off of the system.

**NOTE** When instructed to secure hardware, tighten in accordance with the training you received on this product.

Figure 10-27

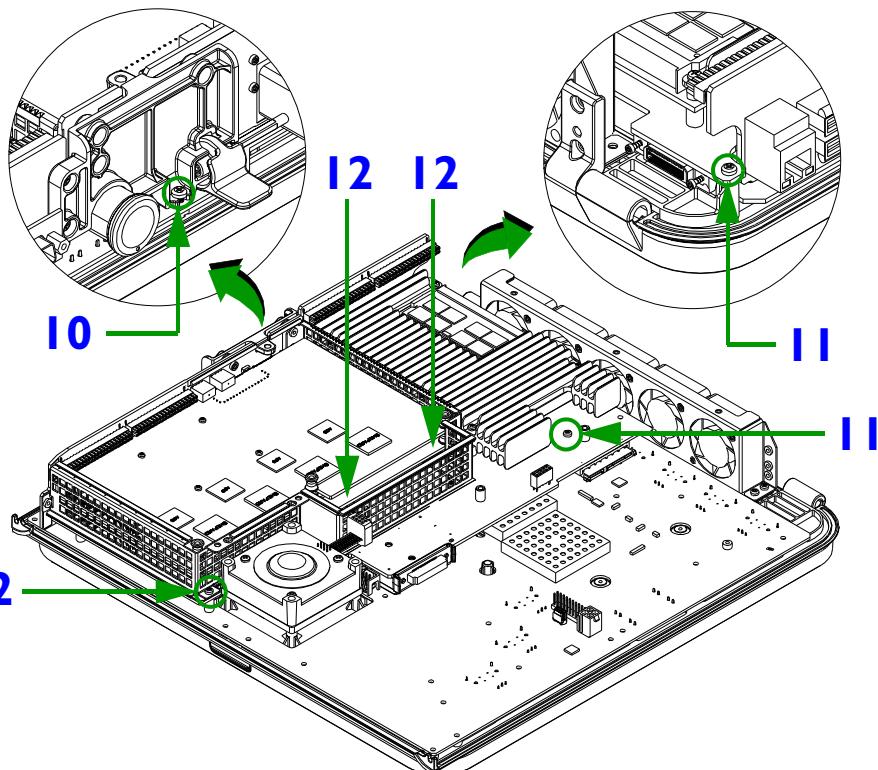
## Disconnecting the LCD Power Cable



9. Use a Phillips or T5 Torx driver to disconnect the LCD video connector from the Main Board by removing the two screws (Phillips or T5 Torx).

Figure 10-28

## Removing the Main Board Screws

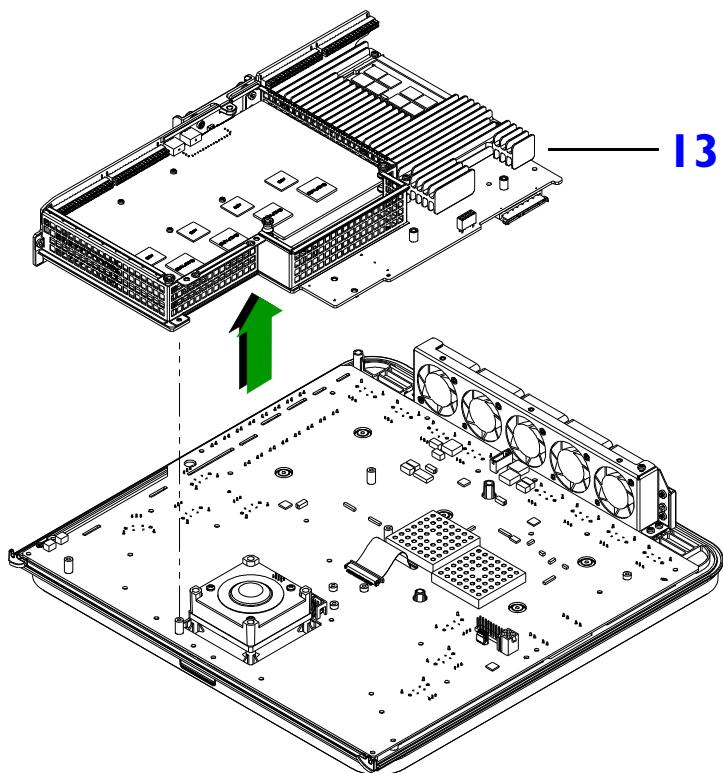


**NOTE** The screw locations indicated with a green arrow are the only screws that must be removed to remove the rest of the components from the UI assembly.

10. Remove the screw that secures the transducer lock cover screw to the Main Board.
11. Remove the two screws that secure the Main Board to the UI standoffs.
12. Remove the three EMI fence screws that secure the Main Board to the UI assembly.

Figure 10-29

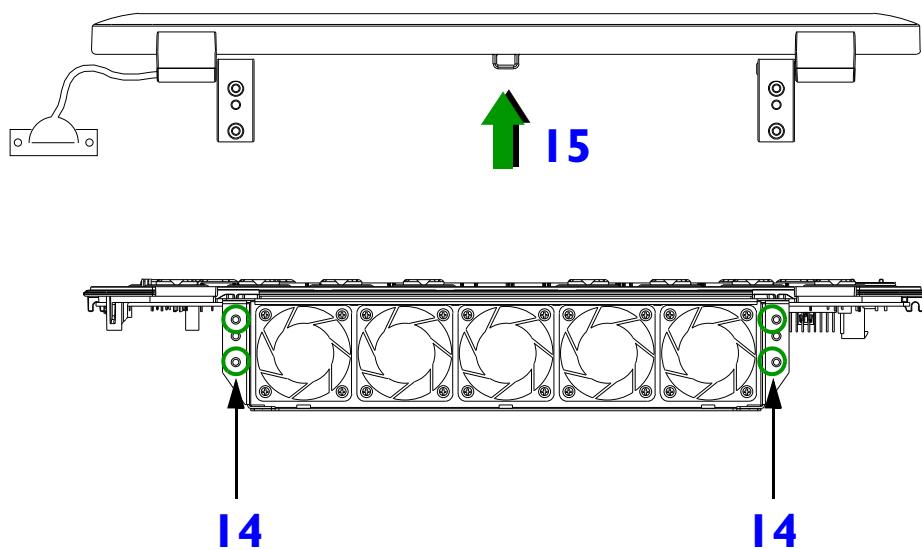
## Removing the Whole Main Board Assembly



13. Gently lift the whole, assembled Main Board and components off the UI assembly.

Figure 10-30

## Removing the LCD Assembly

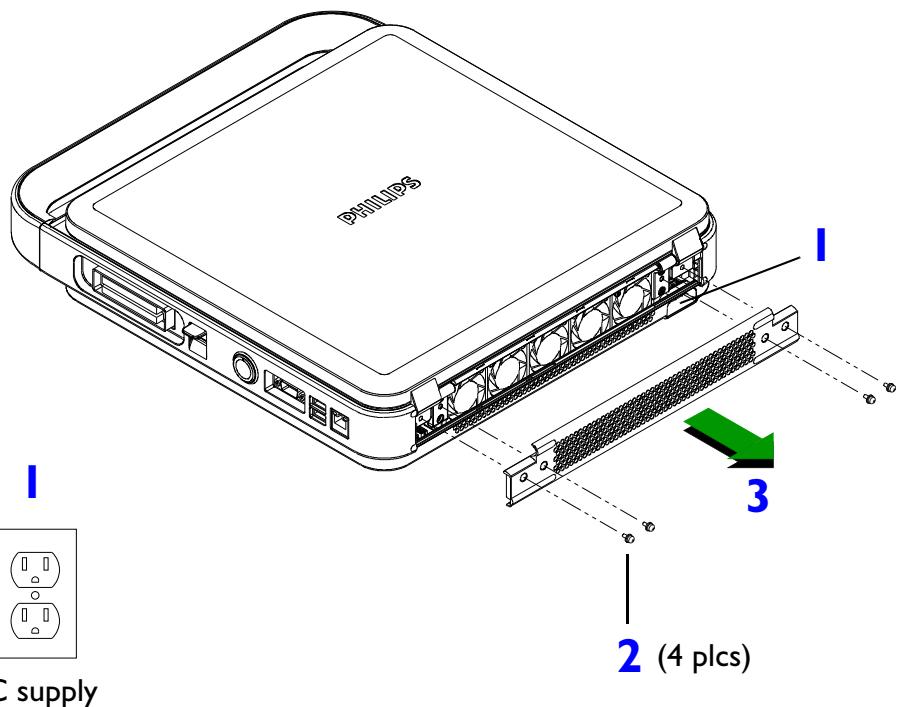


14. Turn the UI assembly over and remove the four screws (green circled areas) that secure the two LCD hinges to the fan bracket.
15. Lift the LCD assembly off the system case.

Return to [Disassembly Procedure List](#).

## CX30 and CX50 System LCD Assembly

Figure 10-31 Removing the System Rear Bezel



► **To remove the LCD assembly**

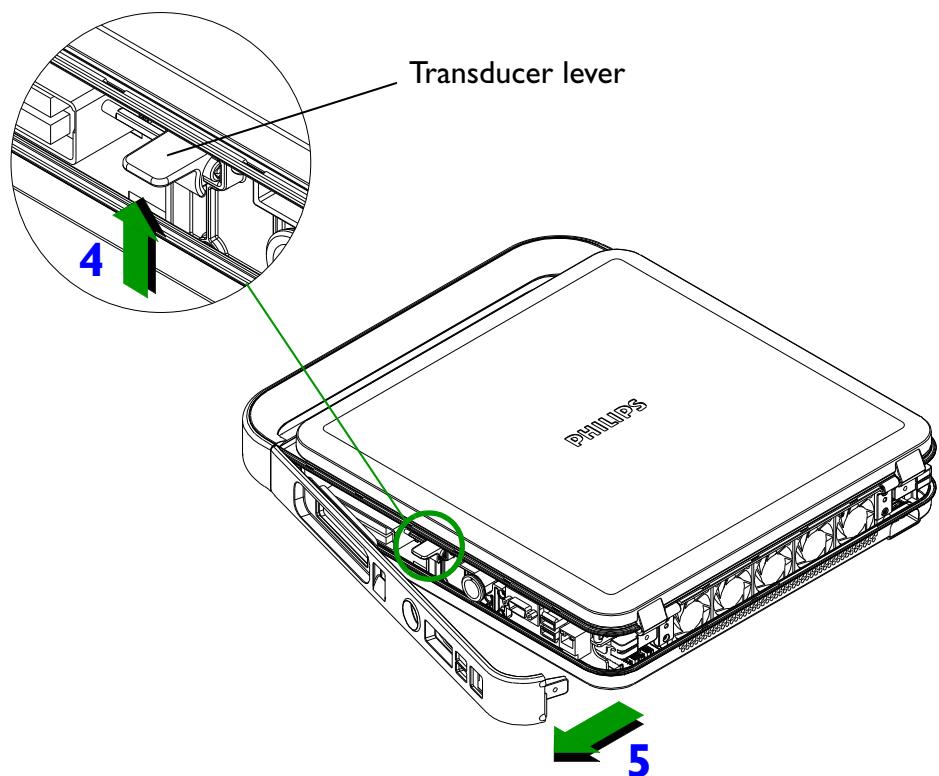
1. Disconnect the system power cord from the main AC supply and the ultrasound system.
2. Use a #1 Phillips driver to remove the four screws that secure the rear bezel to the system frame.

**NOTE** When instructed to secure hardware, tighten in accordance with the training you received on this product.

3. With a small slotted screwdriver, carefully pry the bezel away from the case and remove the rear bezel.

Figure 10-32

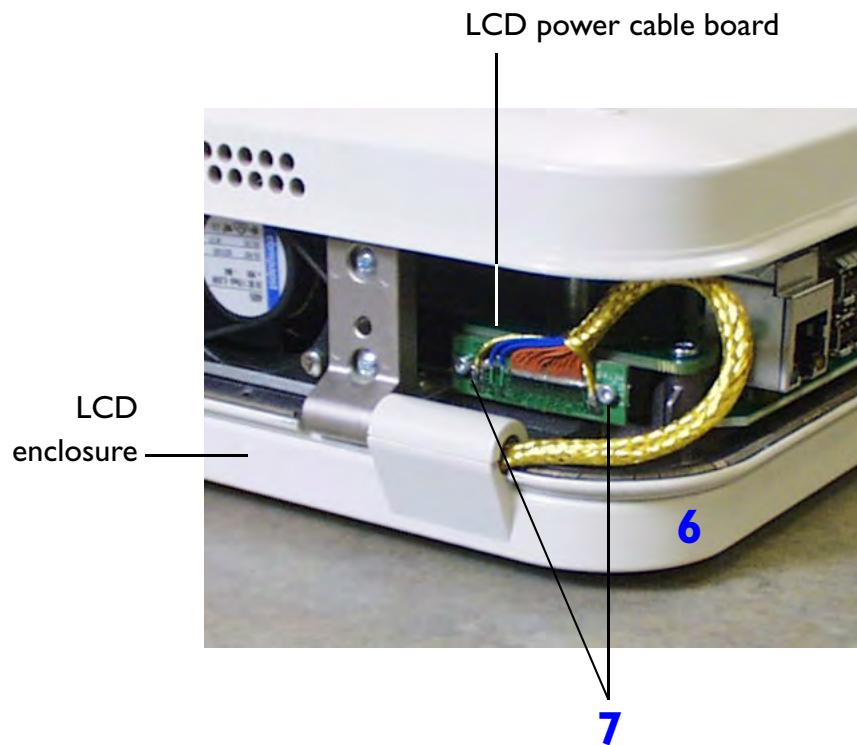
## Removing the System Right Side Bezel



4. Push the transducer lever in the locked (up) position.
5. From the rear of the system, use a small slotted screwdriver to carefully pry the right-side bezel away from the case. Pull out about 45 degrees until it slides off of the external system connectors and transducer lever.

Figure 10-33

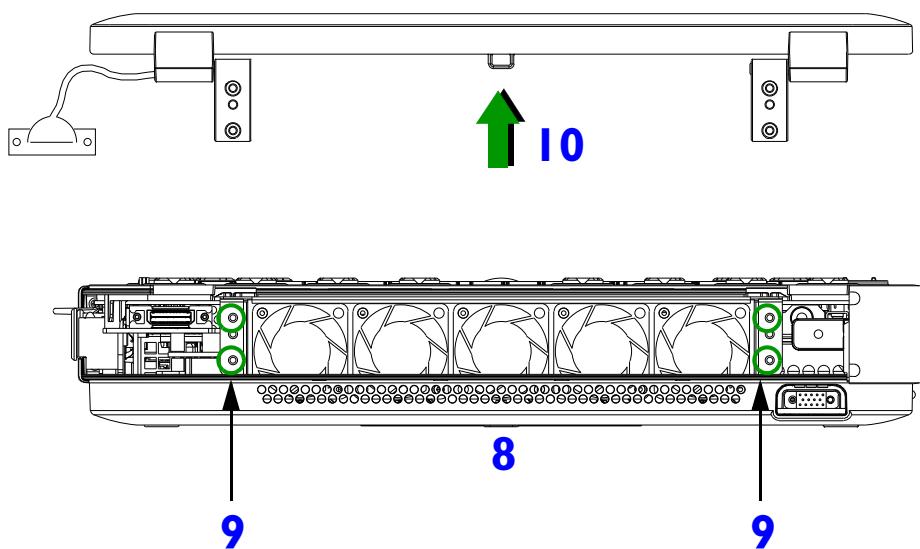
## Disconnecting the LCD Power Cable



6. Turn the system over so that the system rests on the LCD side.
7. Use a Phillips or T5 Torx driver to remove the two (Phillips or T5 Torx) screws that secure the LCD power cable and board to the Main Board.

Figure 10-34

## Removing the LCD Assembly



8. Turn the system back over so that the system is rests on the bottom case side.
9. Remove the four screws (green circled areas) that secure the two LCD hinges to the fan bracket assembly.
10. Lift the LCD assembly off the system case.

[Return to Disassembly Procedure List.](#)

## Packaging the CX30 or CX50 Ultrasound System

Figure 10-35

System Packaging Components



CX30 and CX50 system suitcase box



Auxiliary pack



Overpack system box



White battery box



Battery card and sleeve



Antistatic battery bag  
Antistatic adapter bag



Suspension frame (2)



AC adapter end cap set



Battery end caps (2)

Table 10-2 System Packaging Parts

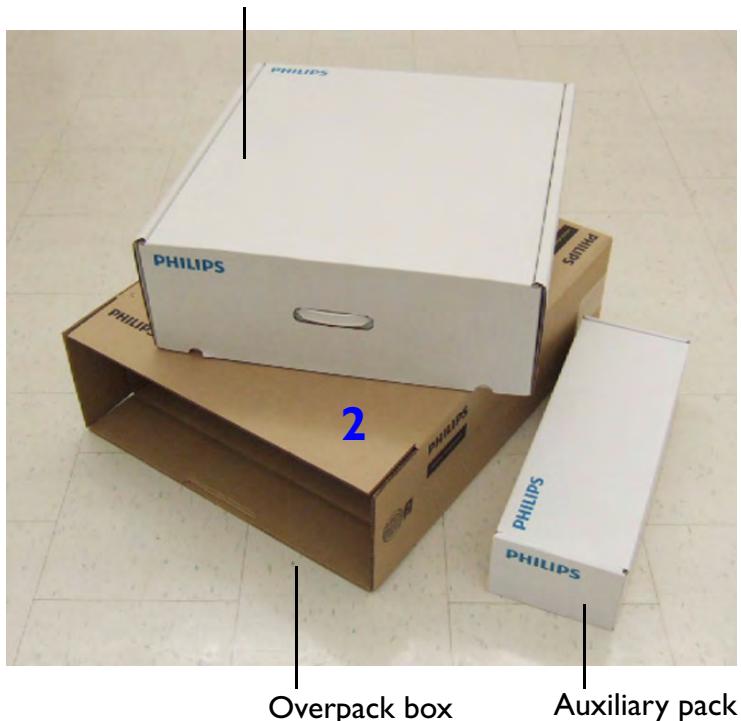
Part No.	Component
453561610121	CX Core Packaging Kit (Includes items below)
453561607961	Auxiliary Pack
453561607981	Overpack System Box
453561607991	CX Series Suitcase Box
453561607971	Suspension Frame (2)
453561605521	AC Adapter End Cap Set (2 pieces)
453561605541	Battery End Cap Set (2)
453561605411	White Battery Box
453561611171	Antistatic Battery Bag
453561611181	Antistatic Adapter Bag
453561778271	Battery Card
453561782471	Battery Card Sleeve

**NOTE** To order the entire packaging kit, order the CX Core Packaging Kit, [453561610121](#).

Figure 10-36

### Separating the Packing Materials (CX30 or CX50 System Core Packaging Kit)

Suitcase box (contains the foam end caps, suspension frames, static bags, and battery box packing materials)



► **To package the CX30 or CX50 ultrasound system**

1. Order the shipping materials ([Figure 10-1](#)) from the Bothell shipping department. The packing components are shipped pre-assembled inside an overpack box.
2. Open the overpack box, slide out the "suitcase box," and remove all the packing material.

**NOTE** The battery packing in this procedure is for system returns only.

**WARNING** Do not return damaged or defective batteries to Philips. Defective batteries cannot be transported. Recycle batteries according to local regulations.

Figure 10-37

## Placing the Lower Suspension Frame



3. Place one of the suspension frames into the suitcase box with the film side facing up.
4. Place the system on the suspension frame.

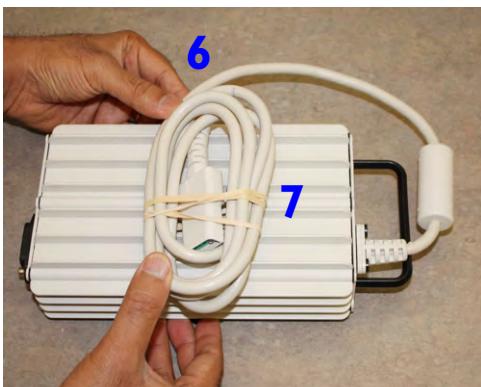
CX50 system shown

**Figure 10-38****Placing the Upper Suspension Frame**

5. Place the other suspension frame over the system with the film side facing down.

Figure 10-39

## Packing the AC Adapter (Antistatic Bag)



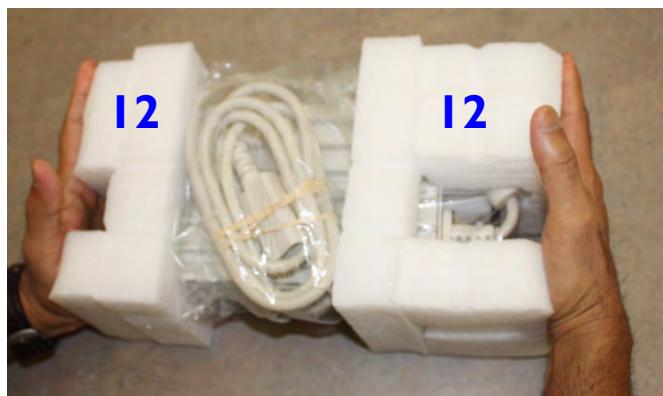
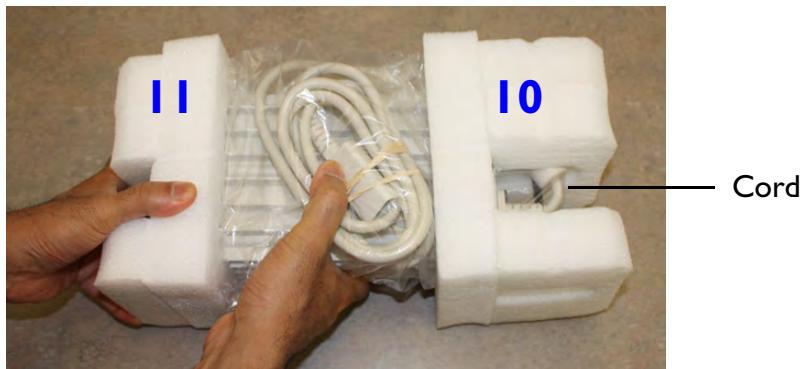
6. Coil the AC adapter power cord and secure it with a rubber band or cable tie.
7. Place the cord centered on top of the adapter. Note the coil length in photo (approximately 5 in).

**NOTE** The antistatic bag in the kit is pink. The clear bag in the photo is being used for clarity.

8. Place the adapter antistatic bag over the AC adapter and tuck the excess material under the adapter.
9. Seat the power cord between the fins on either side of the adapter housing.

Figure 10-40

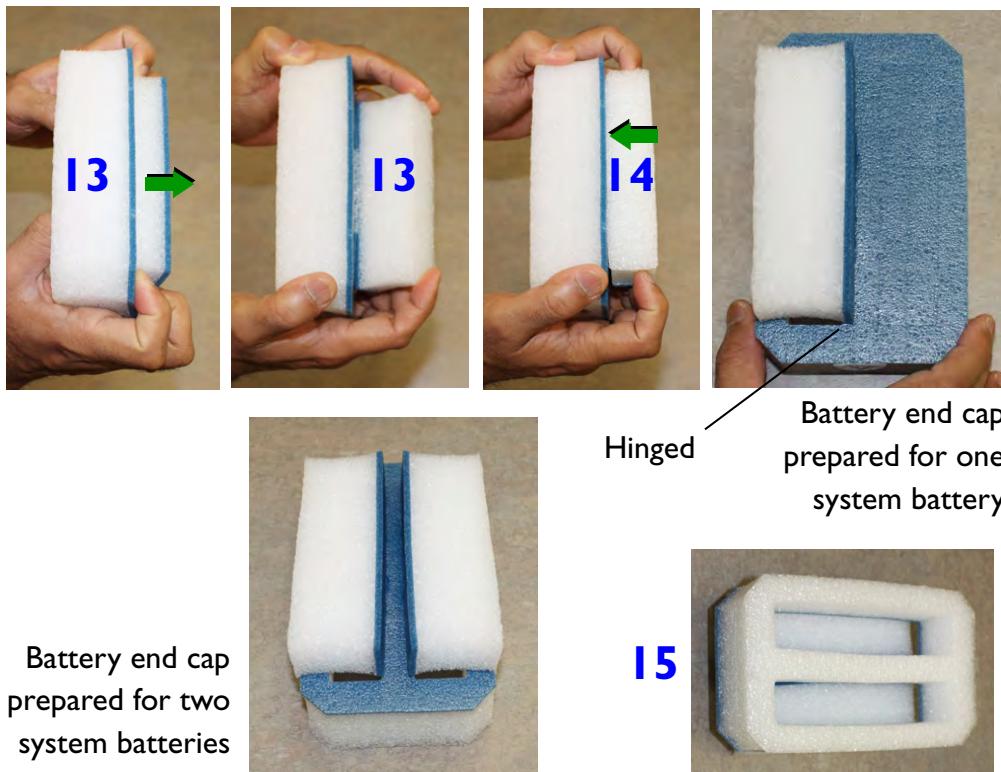
## Packing the AC Adapter (Foam End Caps)



10. Locate the two AC adapter foam end caps and slide the large cap onto the cord end of the adapter.
11. Slide the small cap onto the other end of the adapter.
12. Press the two adapter end caps toward each other to ensure that both end caps are completely seated around the adapter.

Figure 10-41

## Preparing the Battery Foam End Caps



13. Take one of the battery foam end caps and push out the pre-cut foam section through the other side, by using your two thumbs, as shown in the illustration. The blue side is hinged.

**NOTES**

- Do not tear off the push-out sections of the foam end caps.
- For shipment of one battery, only one of the push-out sections needs to be prepared on each end cap.

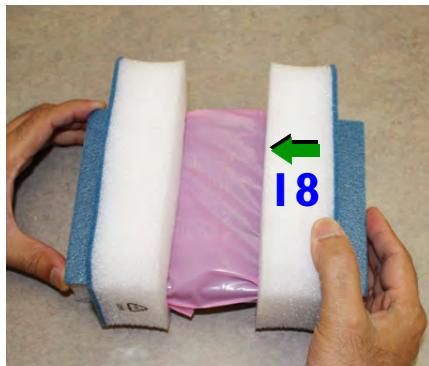
14. Fold down the push-out foam section back onto the back of the end cap.

15. Inside view of prepared end cap.

Repeat step 13 and step 14 for the second battery end cap.

Figure 10-42

## Packing the Battery (Foam End Caps)



16. Place an antistatic bag over the system battery.
17. Slide the battery into the slot of one of the battery end caps until it is fully seated.
18. Slide the other battery end cap onto the battery until it is fully seated.
19. Place the packed system battery into the white corrugated battery box.

Figure 10-43

## Packing the Auxiliary Pack



**WARNING** Do not return damaged or defective batteries to Philips. Defective batteries cannot be transported. Recycle batteries according to local regulations.

**NOTES**

- The AC adapter does not have to be returned with the system for repair, unless the adapter is not functioning.
  - If the AC adapter or battery do not need to be returned, put the empty auxiliary pack in the suitcase box as a filler.
- 
20. Place the packed AC adapter into the auxiliary pack.
  21. Place the system battery box into the auxiliary pack.

Figure 10-44

## Placing the Auxiliary Pack



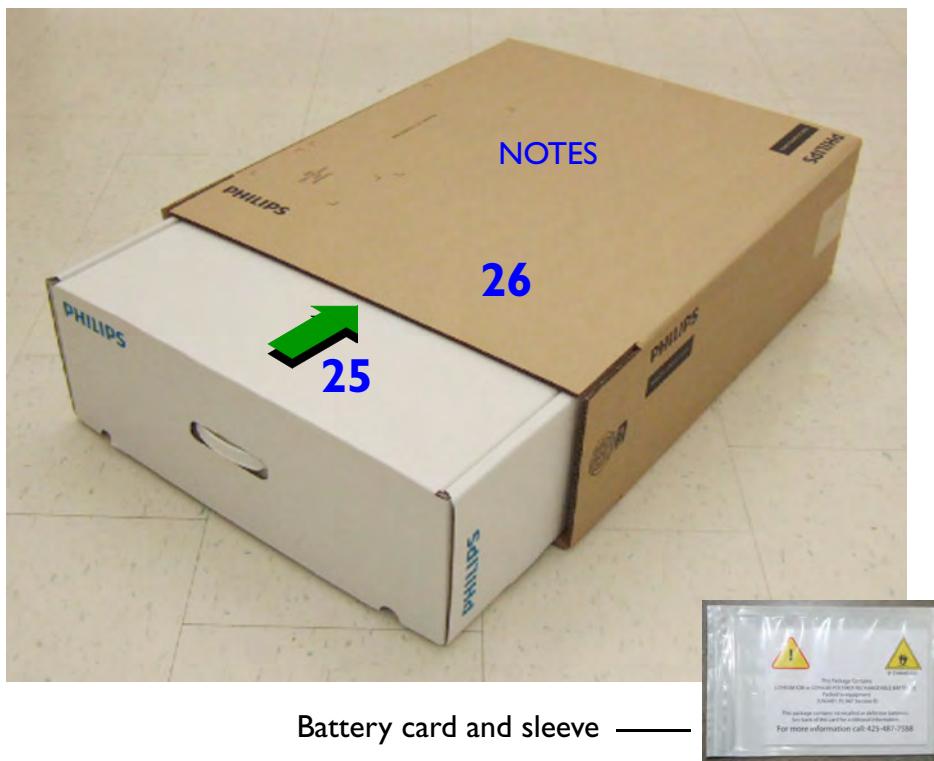
22. Close the auxiliary pack by folding the tabs into the front of the box.
23. Place the auxiliary pack into the front of the suitcase box.

**Figure 10-45****Closing the Packed System Suitcase Box**

24. Close the suitcase box by folding the tabs into the front of the box.

Figure 10-46

## Placing the Suitcase Box Inside the Overpack Box

**NOTES**

- The overpack box is used only when the system alone is shipped/returned to Philips.
- Ensure that the battery card and sleeve are attached properly to the outside of the overpack box.

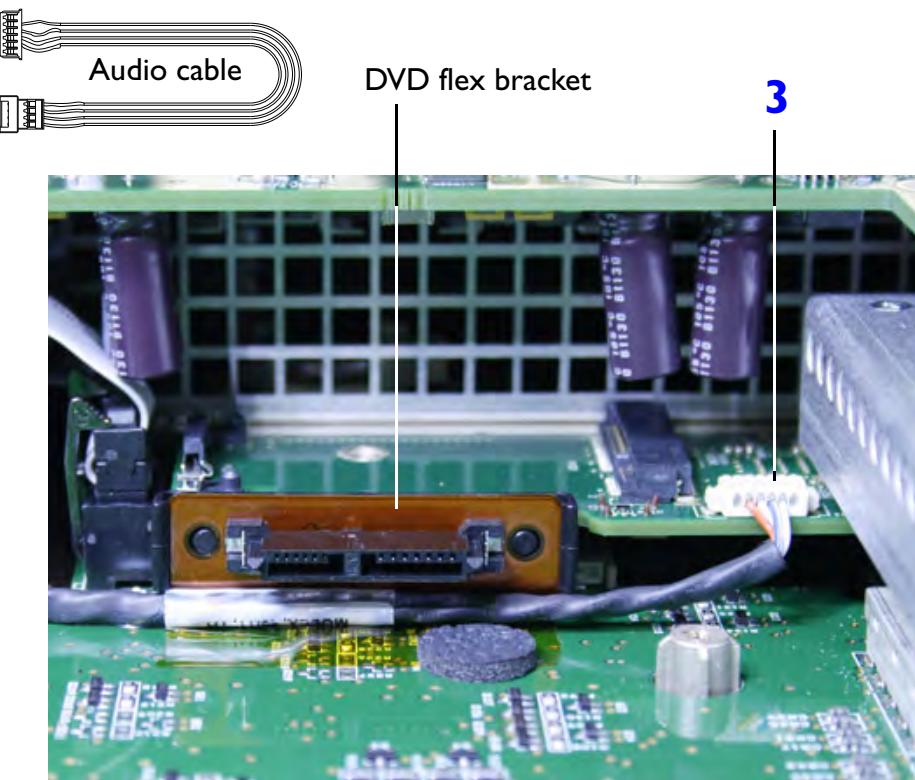
- Slide the system suitcase box into the overpack box.
- Fold the end flaps in on the overpack box and seal it tightly with shipping tape.

[Return to Disassembly Procedure List.](#)

## Replacing the System Audio Cable (CX30 2.0 and CX50 3.0 Systems)

Figure 10-47

Connecting the Audio Cable to the Main Board



- **To install the system audio cable**

**NOTE** The audio cable is installed at the factory. If the cable or Main Board needs replacement, use these instructions for correct installation.

1. Remove the system enclosures ("To remove system enclosures" on page 294).
2. Disassemble the internal system components as necessary to access to the Main Board and audio cable connector. See "Internal System Components" on page 301.
3. Before installing the Physio Module and DVD drive, connect the audio cable to the connector on the Main Board.

Figure 10-48

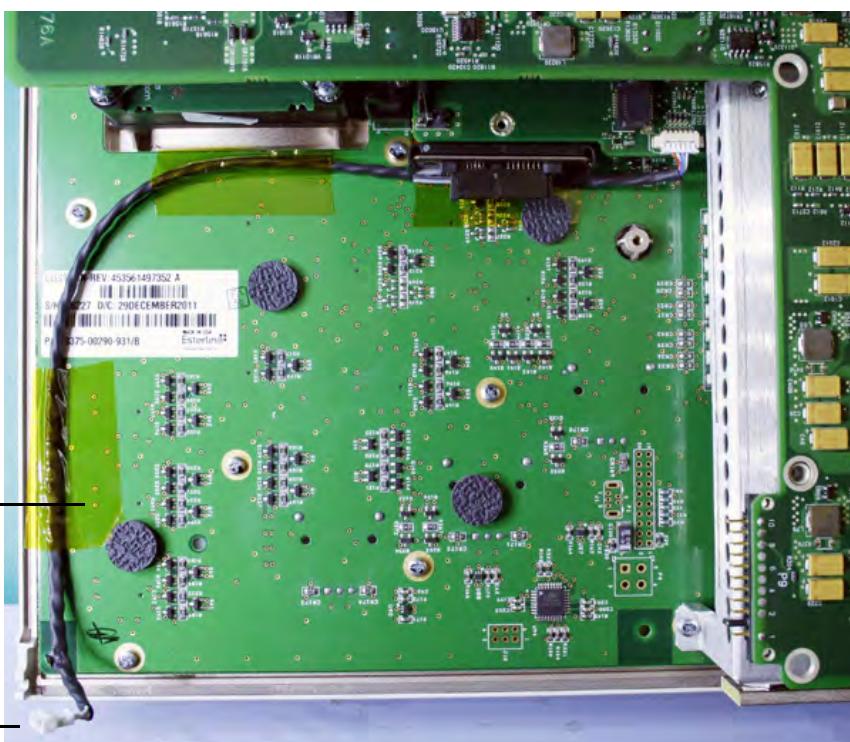
## Routing the Audio Cable Under the DVD Flex Bracket

**CAUTIONS**

- After the audio cable is connected to the Main Board, do not pull the audio cable tightly, which could damage the connector.
  - When you apply the Kapton tape, avoid covering the control-panel button vent holes and the button labels. Covering the holes prevents the controls from functioning properly.
4. Tuck the audio cable under the DVD flex bracket and use Kapton tape to secure the cable to the UI PCB. Ensure that the cable is taut, with no excess play in the cable.

Figure 10-49

## Securing the Rest of the Audio Cable



**CAUTION** When you apply the Kapton tape, avoid covering the control-panel button vent holes and the button labels. Covering the holes prevents the controls from functioning properly

5. Further secure the cable to the UI PCB with a second piece of Kapton tape.
6. Connect the audio cable to the speaker cable that extends from the system handle. For the cabling diagram, see [Figure 11-14](#).

[Return to Disassembly Procedure List.](#)

## Crating the System Cart (A.0, B.0, and C.0 Carts)

Figure 10-50

System Cart Crate Components



Top foam set



Pallet, corrugate base, caster foam set



Corrugate wrap



ShockWatch



Plywood top plate



Poly system bag (antistatic)



Corrugate lid



Banding strap



TiltWatch

### ► To crate the system cart

Table 10-3 Cart Crate Parts

Part No.	Component
453561611531	CX50 Corrugate Wrap
453561605431	CX30 Corrugate Wrap
453561605441	Corrugate Lid
453561605451	Corrugate Base
453561605461	User Kit Box
453561605471	Pallet Base
453561605481	Front/Rear Caster Foam Set
453561605491	Plywood Top Plate
453561605501	Top Foam Set
453561605511	Antistatic Bag
453561607101	Indicator, TiltWatch
453561607111	Indicator, ShockWatch

- I. Order and receive a shipping crate (Figure 10-3). To order, contact the Bothell shipping department and specify the cart version.

Figure 10-51

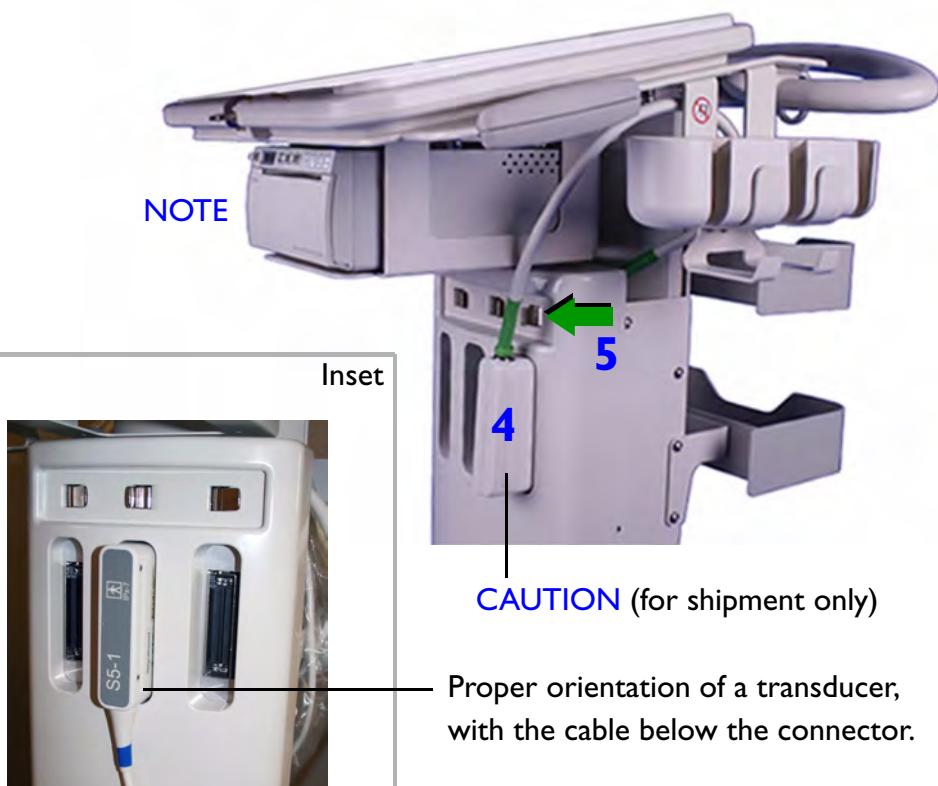
## Lowering the Cart



**NOTE** This procedure is the same for the A.0, B.0, or C.0 system carts. The A.0/B.0 cart is illustrated throughout, unless otherwise noted.

2. Pull up on the height adjustment lever (left side of upper cart).
3. Hold the lever in the up position and push down on the cart (with your hand directly over the cart column) until the cart is lowered to its lowest point.

Figure 10-52

Securing the Multiport Adapter Cable  
(C.0 Cart)

**NOTE** The C.0 system cart is shipped with the B&W printer installed.

**CAUTION** The orientation of the connection shown (step 4), is for securing the Multiport adapter cable during shipment. When connecting a transducer to the Multiport adapter, the cable must be in the down position (cable below connector), see inset.

4. Plug the Multiport adapter cable connector into the right-side port of the adapter, to secure it for shipping.
5. Lock the transducer lever by pushing the lever to the left to secure the cable connector.

Figure 10-53

## Loading the Cart onto the Pallet (1 of 2)



6  
↑



**WARNING** The cart is heavy. Do not attempt to lift the cart onto the pallet. Possible injury or damage to the cart may occur.

6. Roll the cart (back side to pallet) up to the pallet and tilt the cart up on the front casters using the cart handle.
7. Roll the cart back until the rear casters clear the corrugate base, and set the rear casters down on the pallet.

Figure 10-54

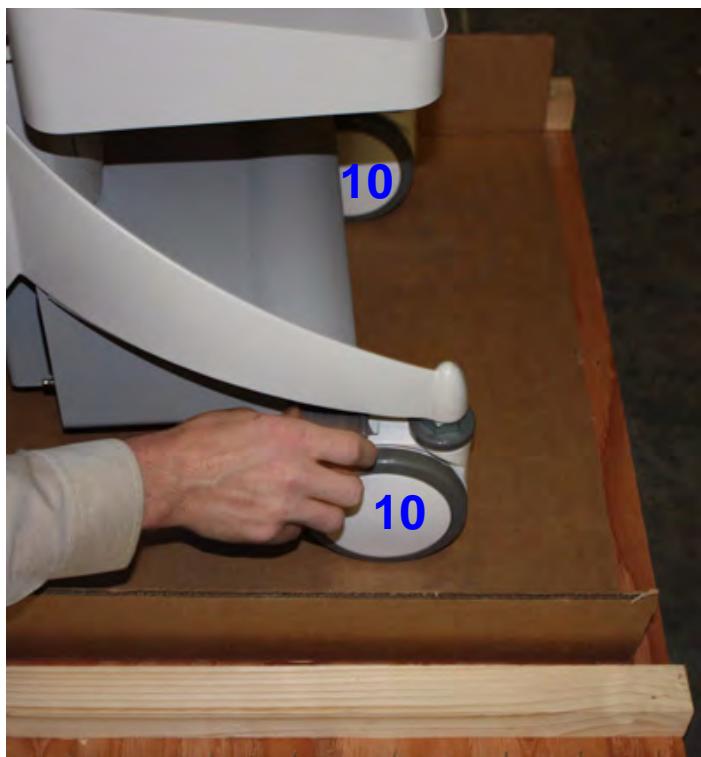
## Loading the Cart onto the Pallet (2 of 2)



8. Tilt the cart to the rear using the cart handle and roll the cart back until the front casters clear the corrugate base.
9. Lower the front of the cart until the entire cart rests on the pallet.

Figure 10-55

## Locking the Front Cart Casters



10. To prevent the cart from rolling, press the two front caster lock levers down to lock the casters. On newer carts with four brake-style casters, lock all four.

Figure 10-56

## Placing the Rear Foam Caster Blocks



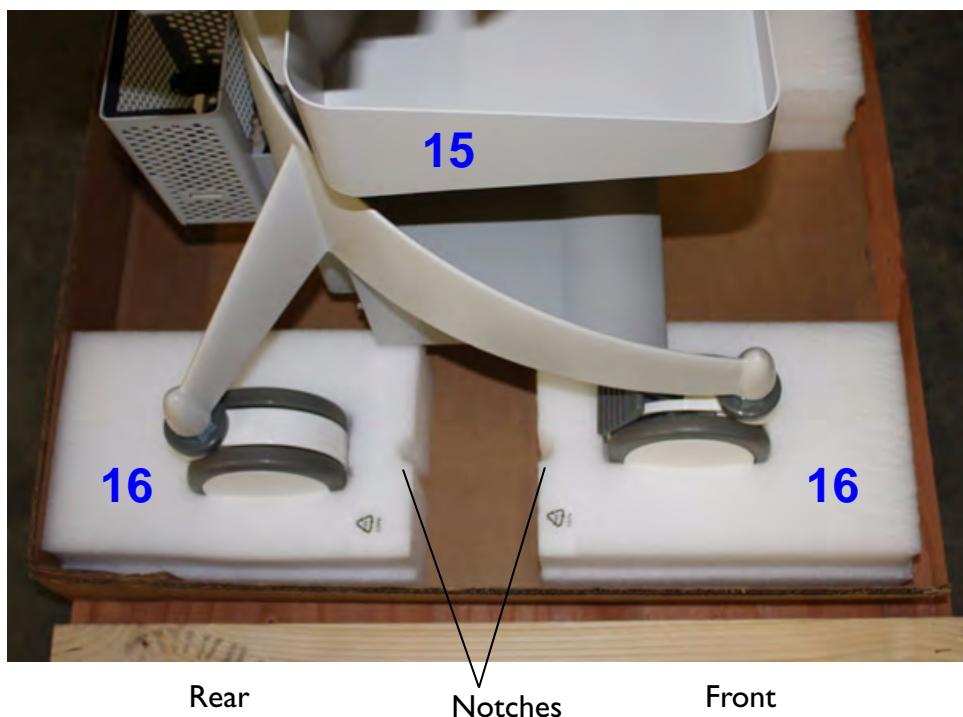
11. Tilt the cart to the front using the cart handle and place the two rear foam caster blocks on the pallet positioned under the rear casters (notch on foam facing front casters).
12. Tilt the cart back onto its rear casters so that the casters fit inside the foam block cutouts.

Figure 10-57

## Placing the Front Foam Caster Blocks



13. Tilt the cart to the rear using the cart handle and place the two front foam caster blocks on the pallet positioned under the front casters (notch on foam facing rear casters).
14. Tilt the cart back onto its front casters so that the casters fit inside the foam block cutouts.

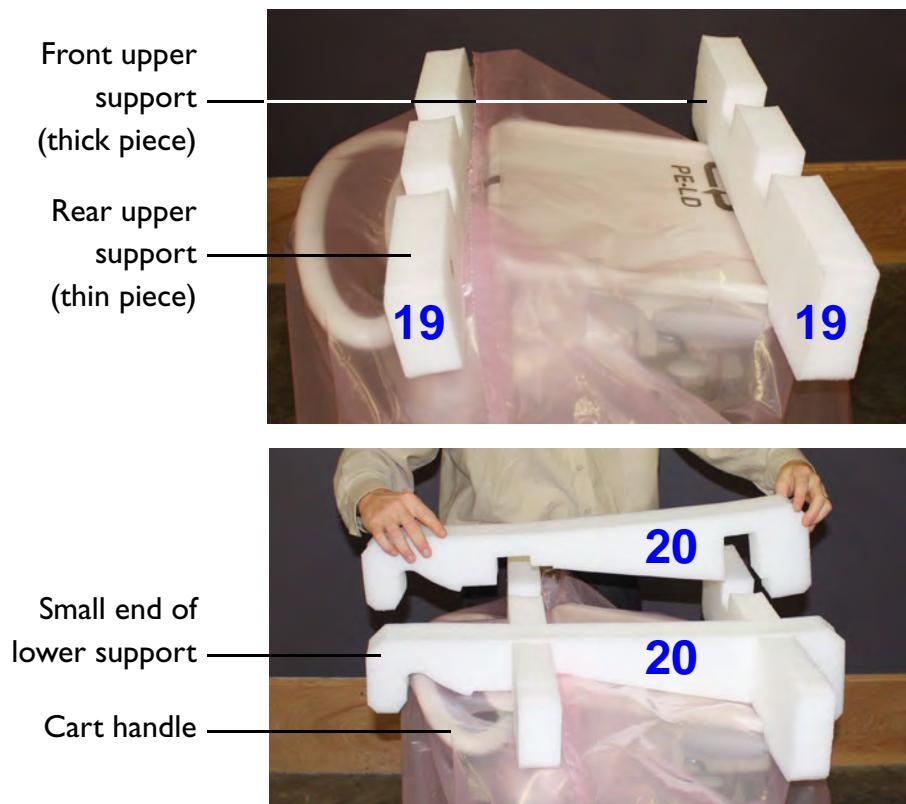
**Figure 10-58****Cart Loaded on Pallet Showing Foam Block Placement**

15. Cart shown loaded on the pallet.

16. Placement of the front and rear foam blocks should be oriented notch to notch as shown.

**Figure 10-59****Covering the System with an Antistatic Bag**

17. Place the antistatic bag over the entire cart.
18. Tuck the bag in between the corrugate base and the foam caster blocks.

**Figure 10-60****Placing the Top Foam Supports**

19. Place the two lower foam supports where shown in the illustration. The thicker of the two foam pieces goes on the front of the cart.
20. Place the two upper foam supports inside the lower support notches with the small end of the support draped over the cart handle.

**Figure 10-61****Placing the Corrugate Wrap**

21. Place the corrugate wrap over the cart and onto the cart pallet.

Figure 10-62

## Placing the Plywood Insert and Corrugate Lid



22. Place the plywood top plate on the top of the crate.
23. Place the corrugate lid over the top of the crate and push down all four corners to set it in place.

Figure 10-63

## Banding the Cart Crate



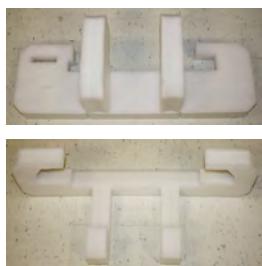
24. Peel the self-adhesive backing off of the ShockWatch device and adhere it to the crate where shown.
25. Peel the self-adhesive backing off two of the TiltWatch devices and adhere them to the side of the crate. Place them on two different sides, near the edge of the corrugated wrap.
26. To band the crate, go to “Using the Crate Banding Kit” on page 368.

Return to [Disassembly Procedure List](#).

## Crating the System Cart (D.0 Cart)

Figure 10-64

System Cart Crate Components



Top foam set



Pallet, corrugate base, caster foam set



Corrugate wrap



ShockWatch



Plywood top plate



Poly system bag (antistatic)



TiltWatch



Corrugate lid



Banding strap

### ► To crate the system D.0 cart

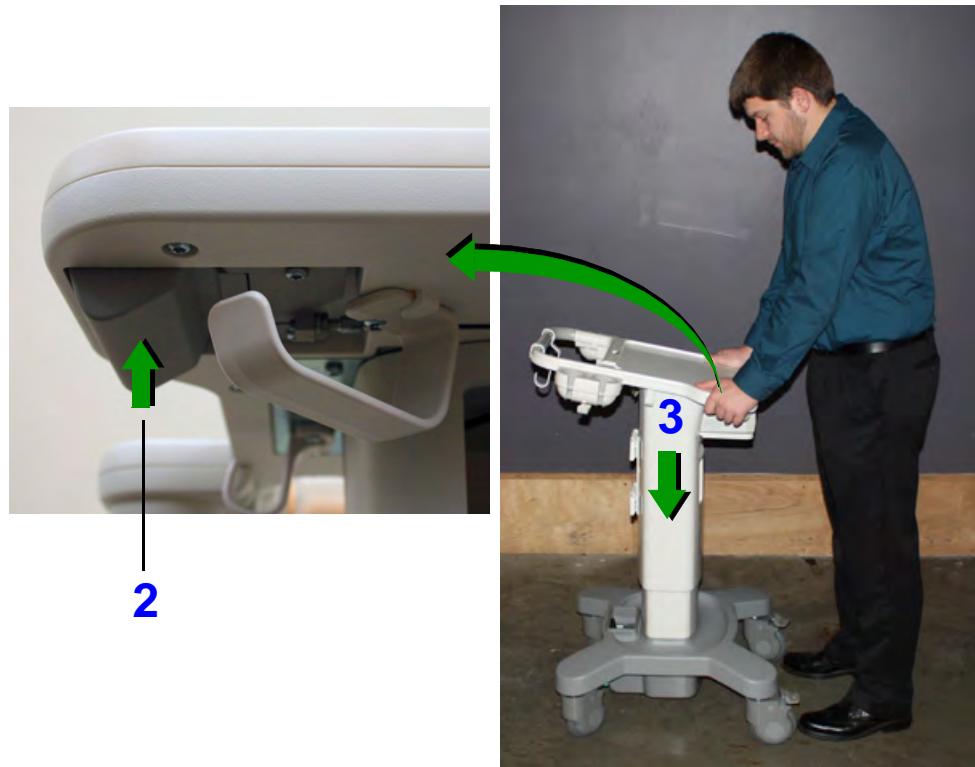
Table 10-4 Crate Parts for D.0 Crates

Part No.	Component
453561605431	CX30 Corrugate Wrap
453561611531	CX50 Corrugate Wrap
453561605441	Corrugate Lid
453561605451	Corrugate Base
453561605472	Pallet Base
453561691811	Front/Rear Caster Foam Set
453561605491	Plywood Top Plate
453561691821	Top Foam Set
453561605511	Antistatic Bag
453561607101	Indicator, TiltWatch
453561607111	Indicator, ShockWatch

- I. Order and receive a shipping crate (Figure 10-4). To order, contact the Bothell shipping department and specify the cart version.

Figure 10-65

## Lowering the Cart



2. Press up on the height adjustment lever (left side of upper cart).
3. Hold the lever in the up position and push down on the cart (with your hand directly over the cart column) until the cart is lowered to its lowest point.

Figure 10-66

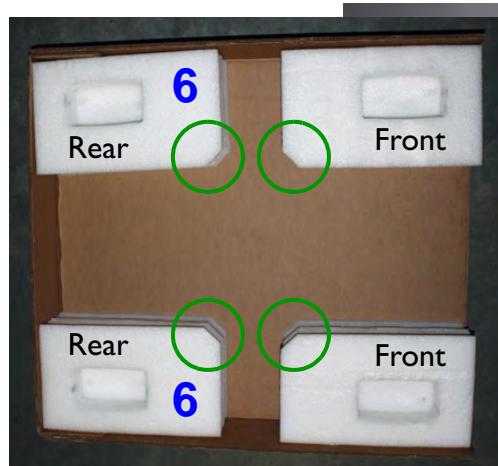
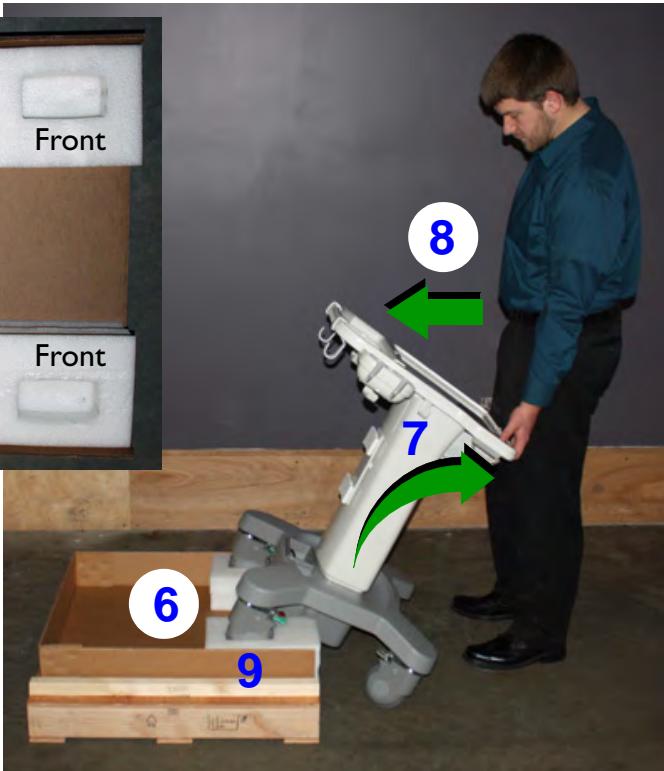
## Preparing the Pallet and Corrugate Base



4. Place the wood pallet flat on the floor with the three wood skids toward the floor.
5. Place the corrugate base on top of the pallet, with the open end of the corrugate base facing toward you as shown. The open end is the front-side of the crate.

Figure 10-67

## Installing the Rear Foam Caster Blocks

Foam block orientation  
after cart installation

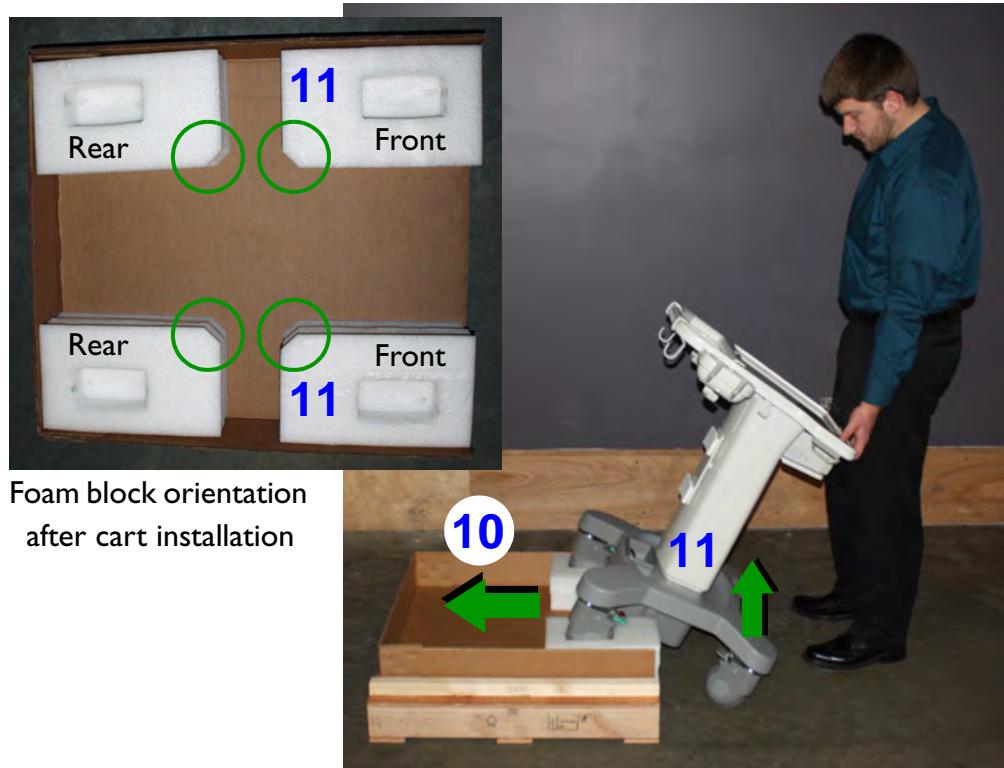
**WARNING** The cart is heavy. Do not attempt to lift the cart onto the pallet. Personal injury or damage to the cart can occur.

**NOTE** Ensure that the chamfer cuts on the foam caster blocks are oriented within the corrugate base as shown (green circles).

6. Place the first two foam blocks (rear blocks) at the open end of the crate.
7. Tilt the cart to the front, using the cart handle.
8. Roll the cart toward the crate until the rear casters are over the rear foam block slots.
9. Raise the front of the cart until the rear casters are resting inside the rear foam blocks.

Figure 10-68

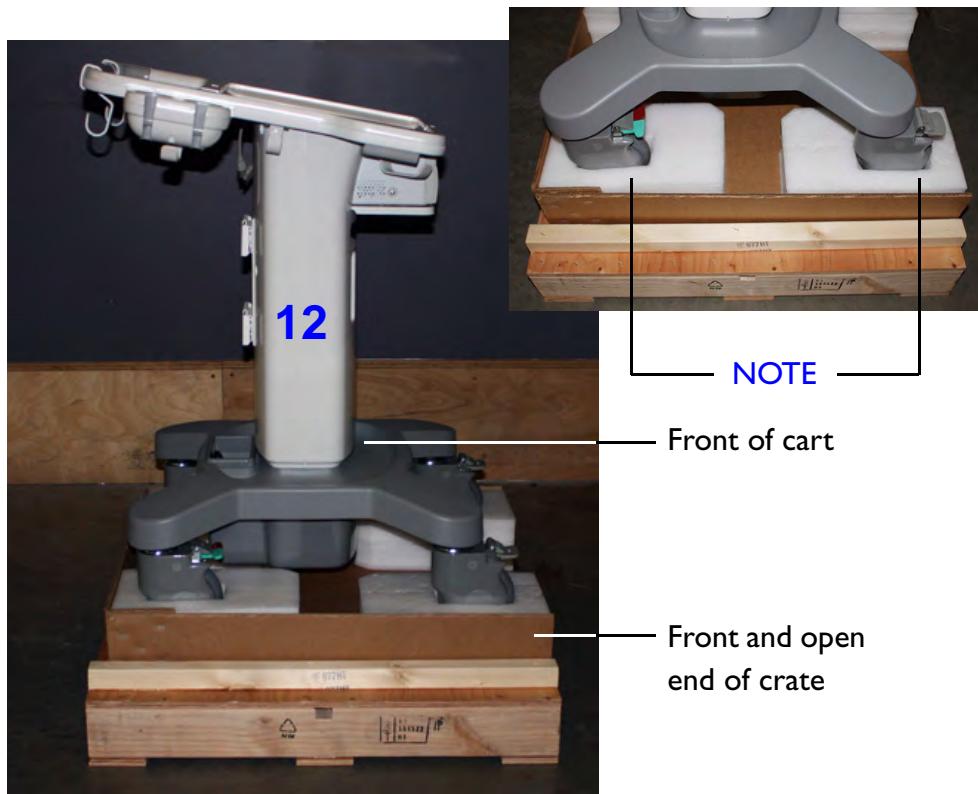
## Installing the Front Foam Caster Blocks



10. Slide the cart on its rear foam blocks, toward the rear of the pallet until it stops.
11. Raise the front of the cart and place the other two foam blocks (front blocks) at the open end of the crate, under the front casters. Lower the cart.

Figure 10-69

## Cart Loaded Correctly on the Pallet



**NOTE** All four casters should be oriented with the caster locks facing toward the front of the crate.

12. The cart is correctly loaded onto the cart pallet.

Figure 10-70

## Installing the Foam Packing Supports



**NOTE** The D.0 system cart is shipped with the B&W printer installed.

13. Slide the two foam packing supports onto the cart docking platform as shown. The foam support with the slot for the Multiport adapter connector fits on the lower end of the docking platform.

Figure 10-71

## Securing the Multiport Adapter Connector

Multiport adapter  
connector slot

**CAUTION** The Multiport adapter connector must be secured during shipment. Ensure that the connector is securely placed within the foam support.

14. Fully insert the Multiport adapter connector into the foam support slot as shown.

**Figure 10-72****Covering the System with an Antistatic Bag**

15. Place the antistatic bag over the entire cart.
16. Tuck the bag between the corrugate base and the foam caster blocks.

Figure 10-73

## Placing the Corrugate Wrap



17. Place the corrugate wrap over the cart and onto the cart pallet.

Figure 10-74

## Placing the Plywood Insert and Corrugate Lid



18. Place the plywood top plate on the top of the crate.
19. Place the corrugate lid over the top of the crate and push down all four corners to set it in place.

Figure 10-75

## Banding the Cart Crate



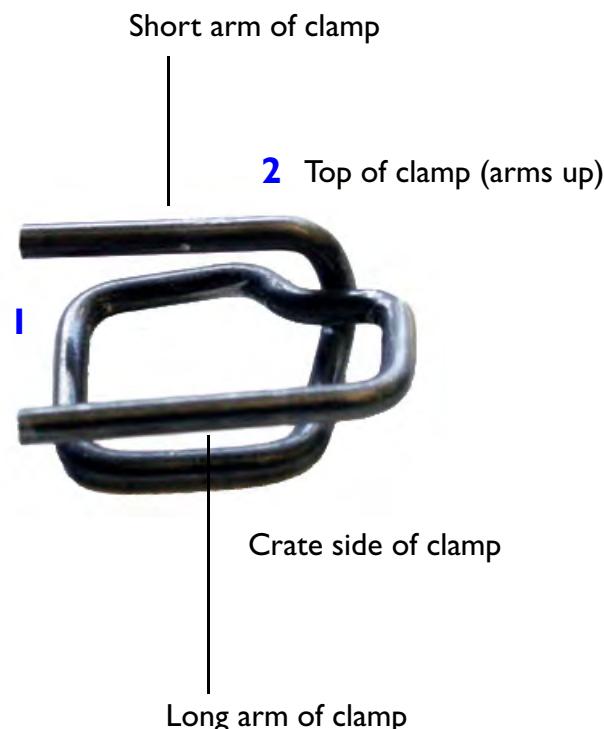
20. Peel the self-adhesive backing off of the ShockWatch indicator and adhere it to the crate where shown.
21. Peel the self-adhesive backing off of the TiltWatch indicator and adhere it to the crate where shown.
22. Band the crate, as described in "Using the Crate Banding Kit" on page 368.

Return to [Disassembly Procedure List](#).

## Using the Crate Banding Kit

Figure 10-76

Banding Clamp

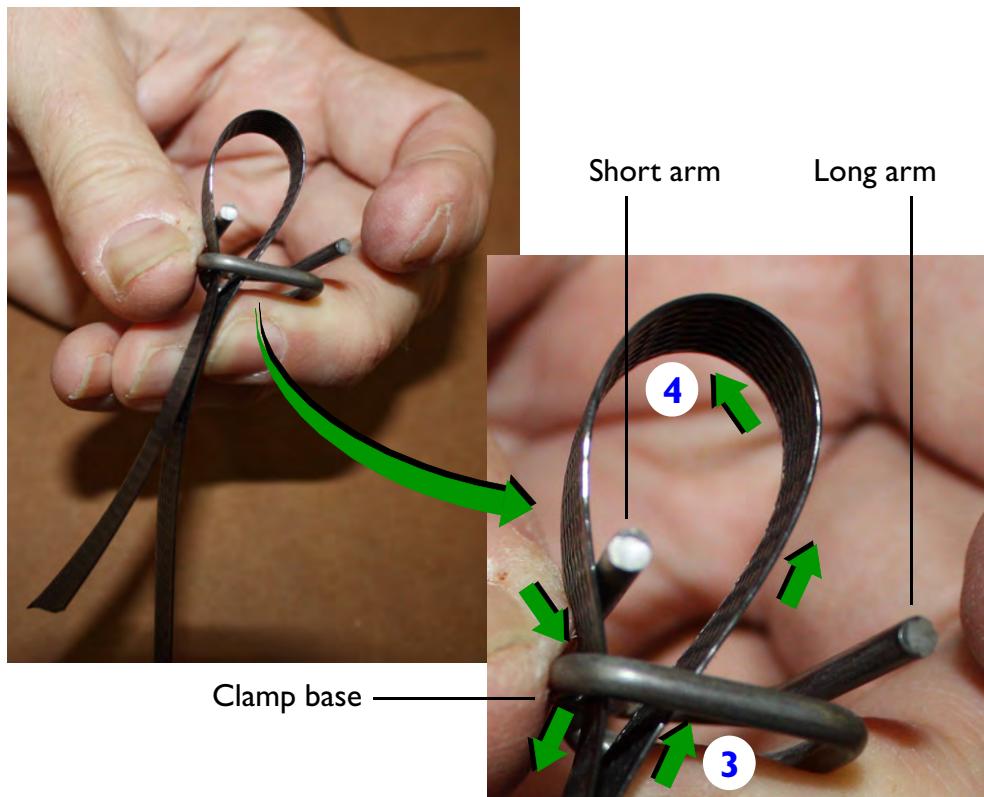


► **To use the crate banding kit**

1. Locate the banding clamp in the banding kit supplied with the crate.
2. Familiarize yourself with the clamp orientation to the crate surface.

Figure 10-77

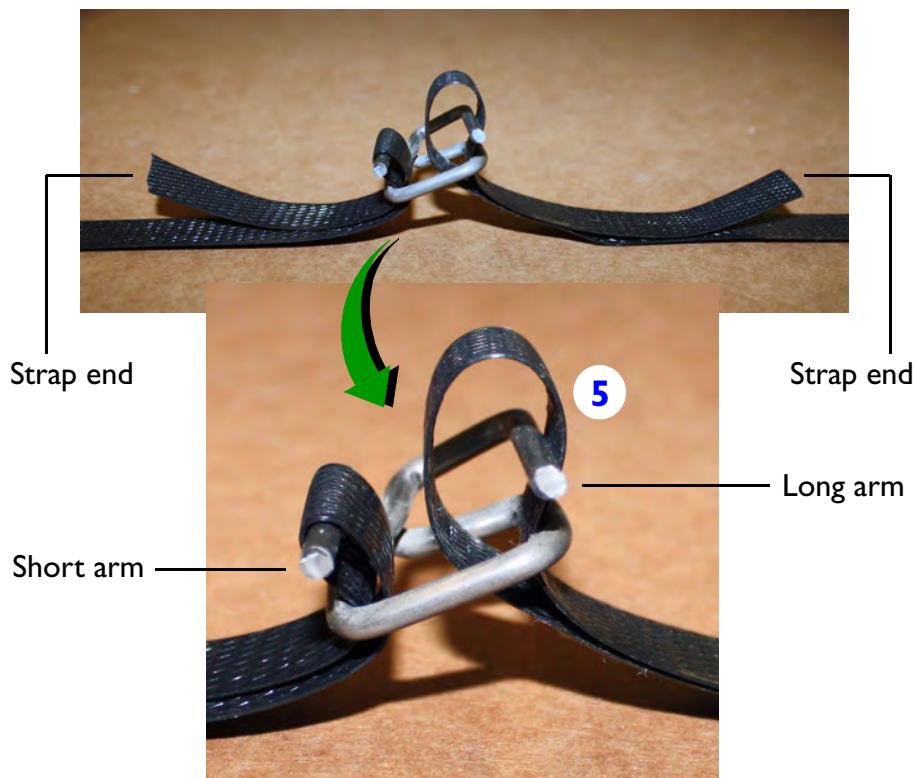
## Threading the First End of the Banding Strap



3. Thread the banding strap up through the base of the clamp. Ensure that the two clamp arms are facing up.
4. Make a loop in the strap and thread the end of the strap around the short arm and back down through the clamp base.

Figure 10-78

## Threading the Other End of the Banding Strap



5. Thread the other end of the strap (around the long arm) so that it mirrors the threading shown in [step 3](#) and [step 4](#). The strap ends should both be dressed on top of the main body of the banding strap, as shown.

Figure 10-79

## Tighten the Banding Strap Around the Crate



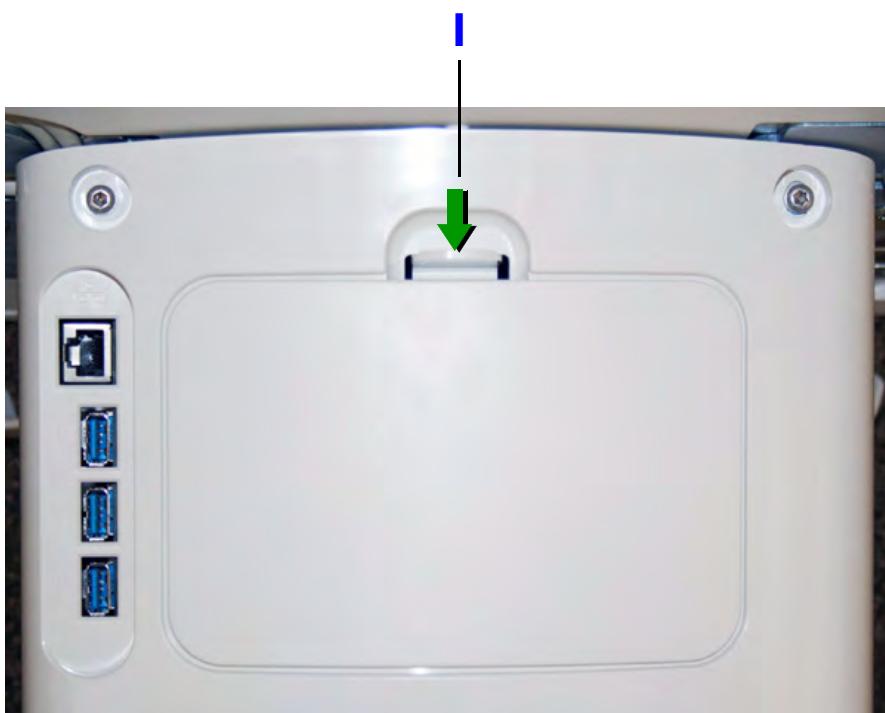
6. Place your foot over the banding strap at the base of the crate.
7. From the “long arm” side of the clamp, grasp the banding strap firmly with both hands and pull the strap to cinch it down tight against the crate.
8. Repeat this entire procedure for the other two banding straps. Three straps are required: two straps around one side of the box and one strap centered around the other side.

[Return to Disassembly Procedure List.](#)

## Disassembling the System Cart (D.0 Version)

Figure 10-80

Removing the B/W Printer Access Panel



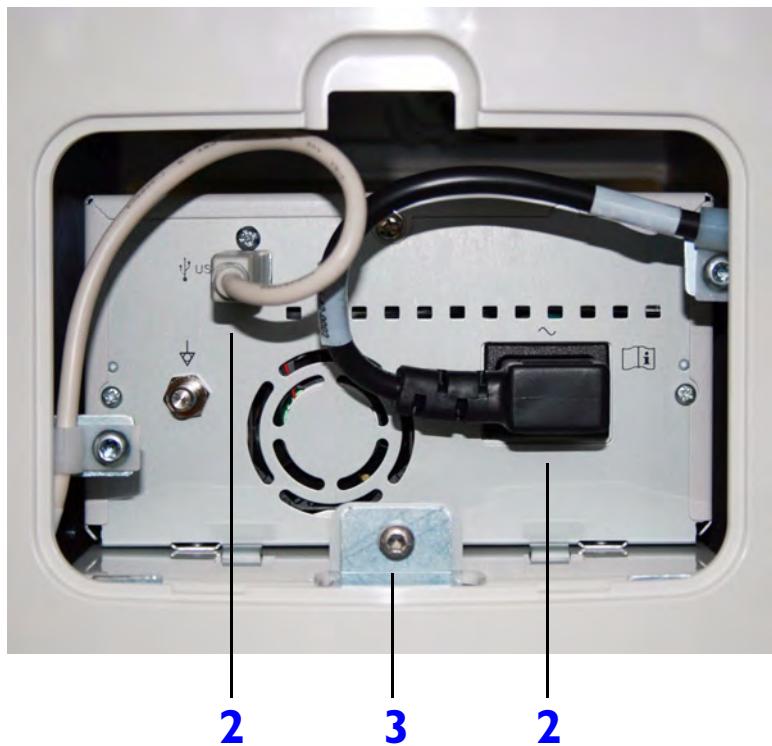
### ► To remove the B/W printer

#### NOTES

- For these procedures, use a TX20 TORX screwdriver to remove all parts, unless otherwise noted in the procedure.
  - To prevent losing screws during removal, place them in the cable catch basin at the base of the cart.
- 
- I. Press down on the B/W printer access panel lock tab and remove the panel.

Figure 10-81

## Disconnecting the B/W Printer Cables



2. Disconnect the USB cable and power cable from the rear of the B/W printer.
3. Remove the screw that secures the printer/shelf assembly to the cart frame.

Figure 10-82

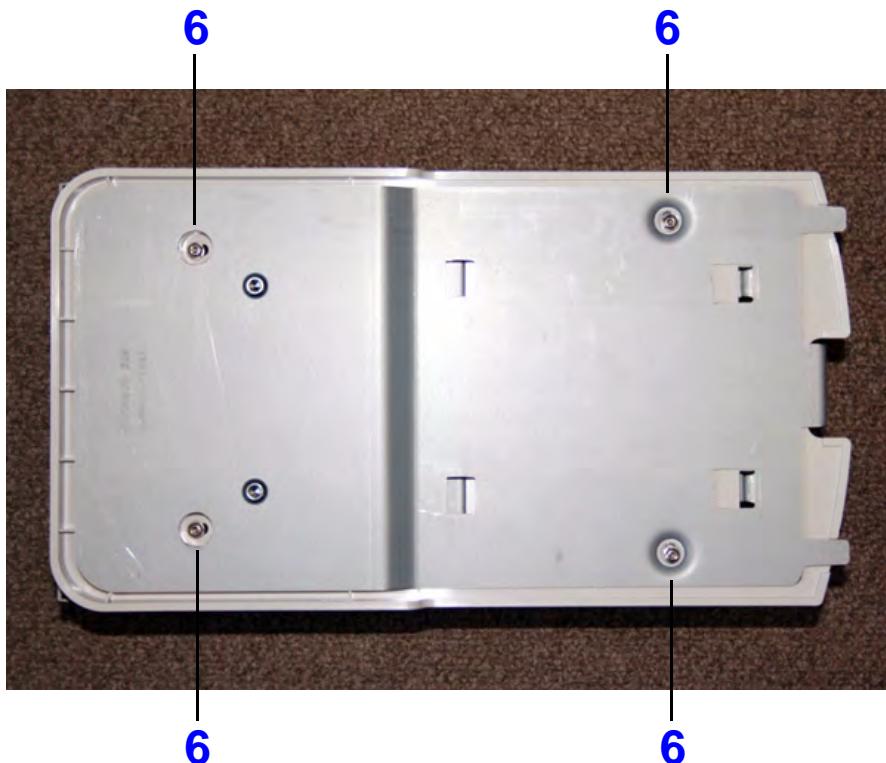
## Removing the B/W Printer/Shelf Assembly



4. Grasp the bottom of the B/W printer/shelf assembly and pull it forward until it stops.
5. Tilt the front of the shelf down and slide the assembly out of the cart frame.

Figure 10-83

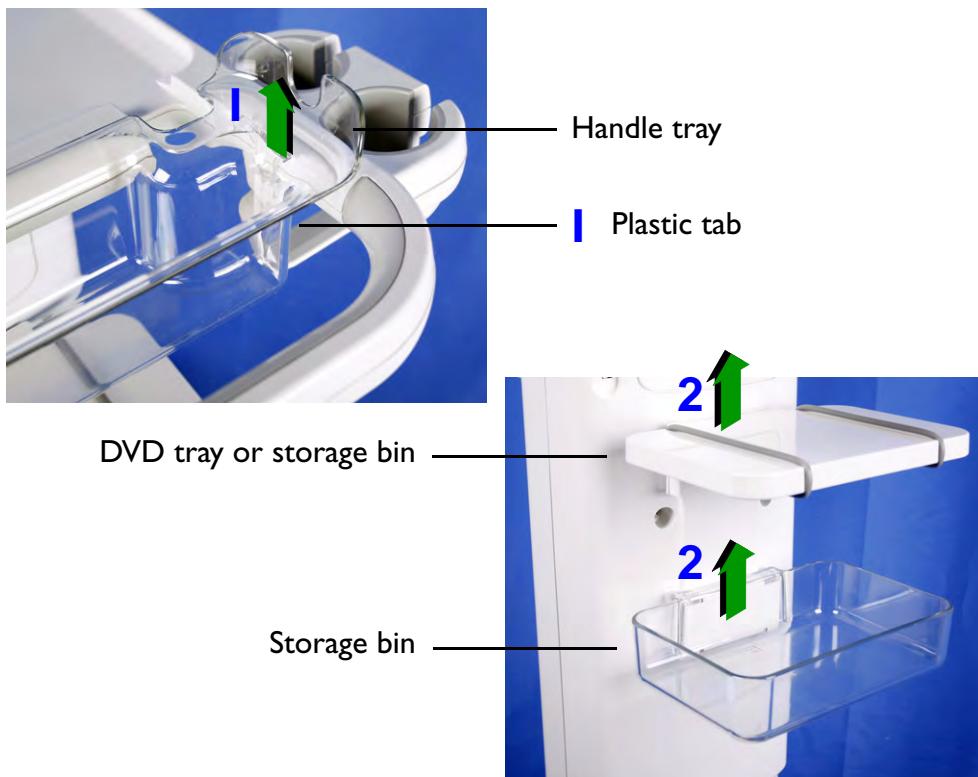
## Removing the B/W Printer from the Shelf



6. Using a T10 TORX screwdriver, remove the four screws that secure the B/W printer shelf to the bottom of the printer.

Figure 10-84

## Removing the Handle Tray, DVD Shelf, and Storage Bins



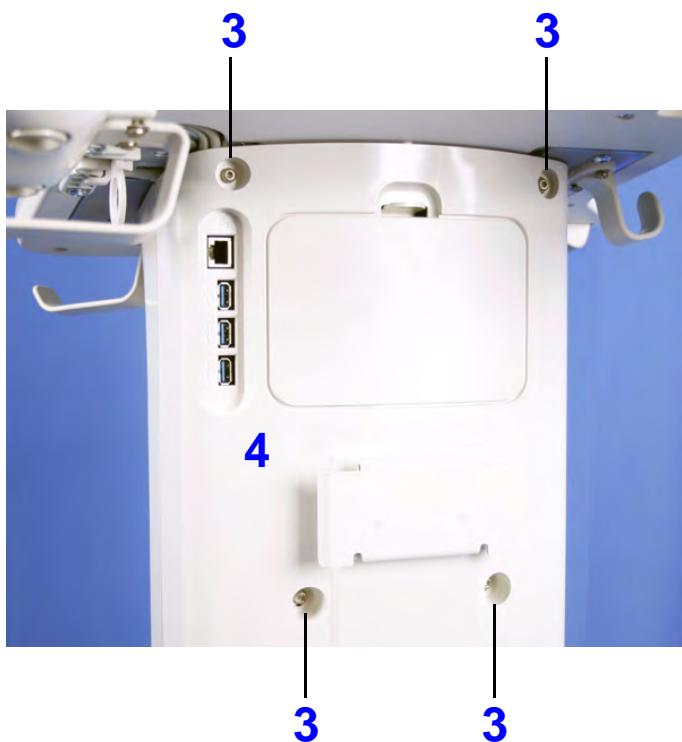
## ► To remove the cart enclosures

**NOTE** Remove the parts in the order shown.

1. To remove the handle tray, simultaneously press in on the plastic tab (toward the tray), while tilting the tray upward. Lift the tray out of the handle frame. To install the handle tray see, “To install the plastic handle tray” on page 380.
2. To remove the DVD shelf or one of the storage bins, lift it straight up and off the cart mounting bracket.

Figure 10-85

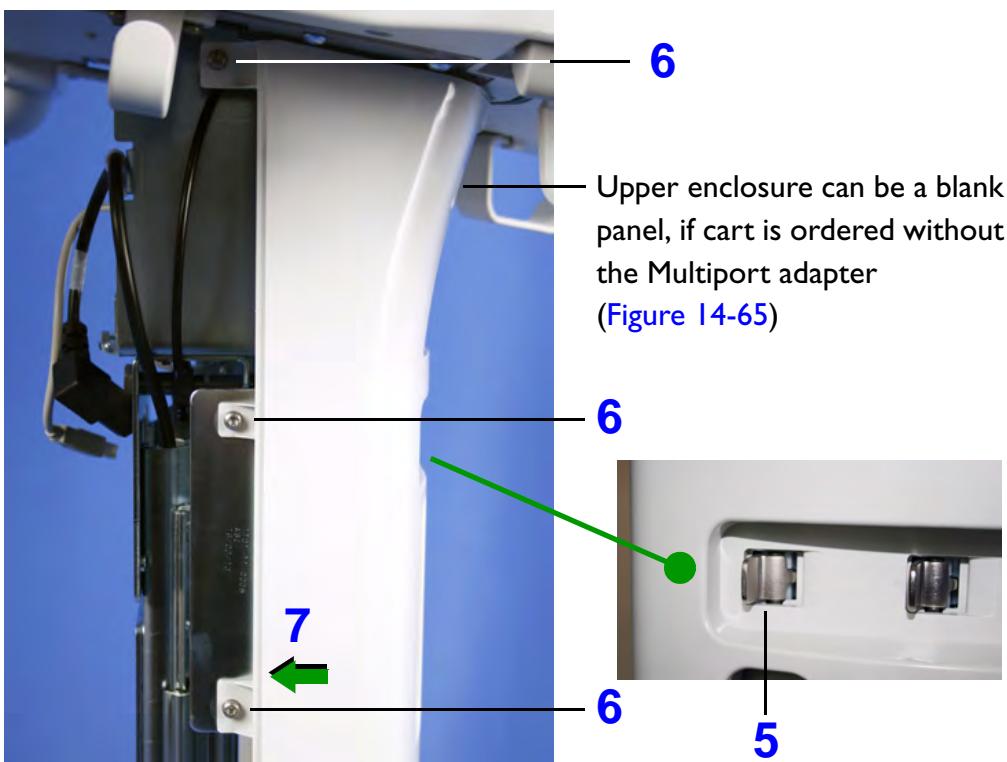
## Removing the Upper Rear Enclosure



3. Remove the four screws that secure the upper rear enclosure to the cart frame.
4. Lift the enclosure off the rear of the cart.

Figure 10-86

## Removing the Upper Front Enclosure



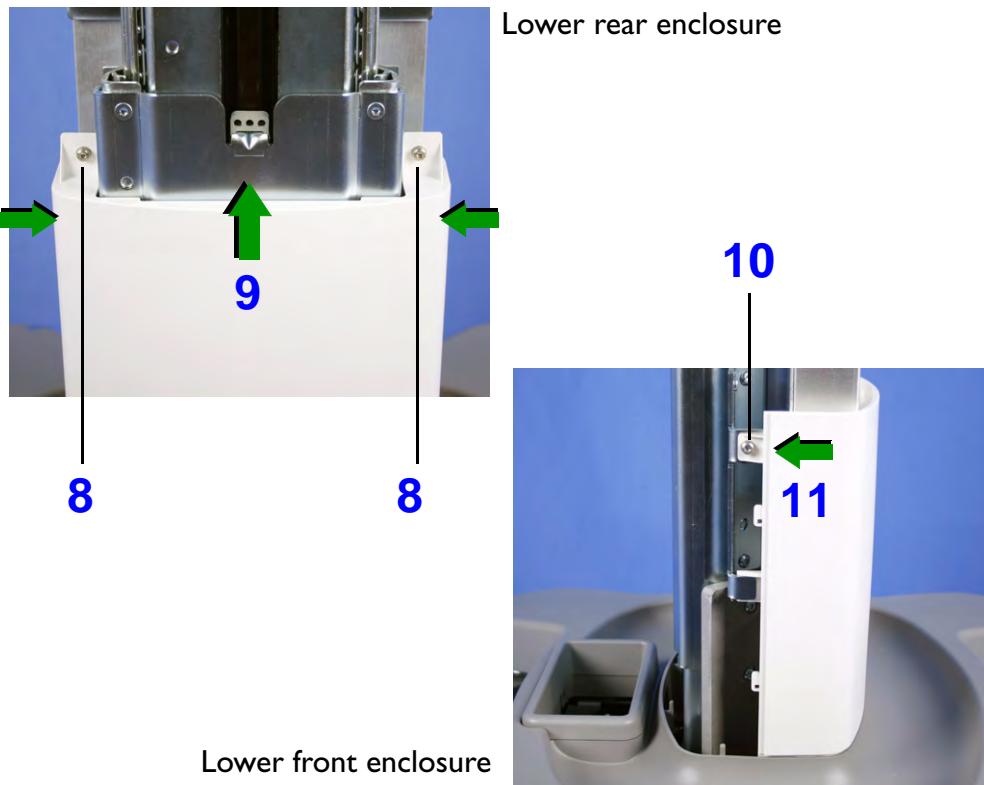
Upper enclosure can be a blank panel, if cart is ordered without the Multiport adapter (Figure 14-65)

**NOTE** The B/W printer/shelf assembly must be removed before the upper front enclosure can be removed. See “To remove the B/W printer” on page 372, step 2 through step 5.

5. Flip all three transducer latches to the unlock position. They should point straight out from the cart.
6. Remove the six screws that secure the upper front enclosure to the cart frame. There are three screws on each side of the cart.
7. Slightly pull both sides of the enclosure outward where shown (green arrow) and then lift the enclosure off the cart.

Figure 10-87

## Removing the Lower Front and Rear Enclosures

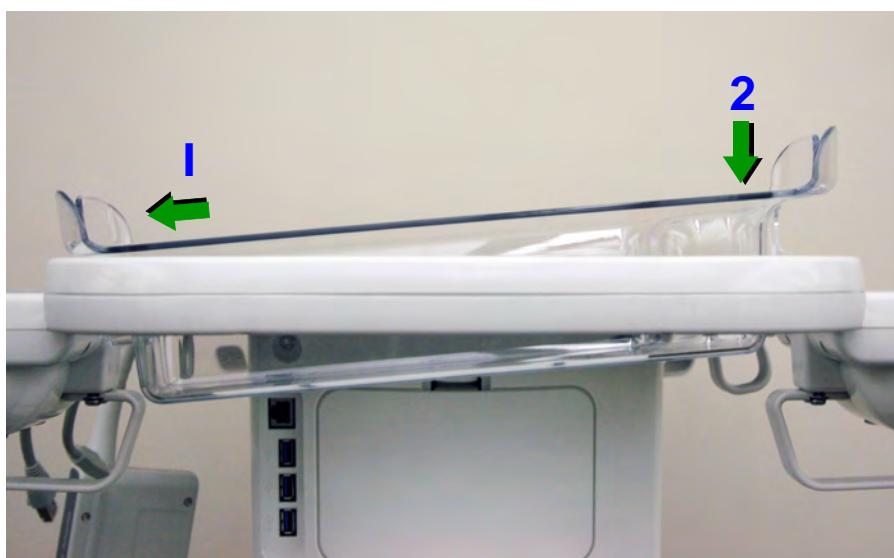


8. Remove the two screws that secure the lower rear enclosure to the cart frame.
9. Grasp the enclosure at both sides (green arrows) and slide it straight up until it clears the cart base.
10. Remove the two screws that secure the lower front enclosure to the cart frame (one screw on each side of the cart).
11. Slightly pull both sides of the enclosure outward where shown (green arrow), then tilt the enclosure forward and lift it off the cart.

The enclosures are installed in reverse of the order in which they are removed.

Figure 10-88

## Installing the Plastic Handle Tray

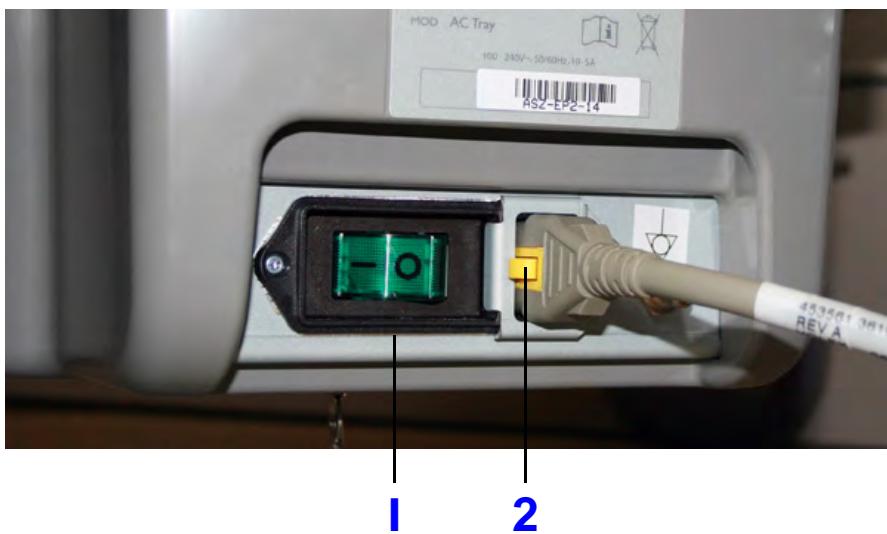


## ► To install the plastic handle tray

1. From the rear of the cart, hold the handle tray diagonally and slide it inside the handle, toward the left.
2. Gently push down on the right side of the tray and it will snap into place.

Figure 10-89

## Disconnecting the Power to the System Cart



► **To remove the Multiport adapter (MPA)**

1. Shut off the circuit breaker switch at the rear of the cart.
2. Press in on the yellow power cord button as you pull the cord plug, to disconnect the power cord from the AC receptacle on the AC tray.
3. Remove the cart enclosures as described in “[To remove the cart enclosures](#)” on page 376.

Figure 10-90

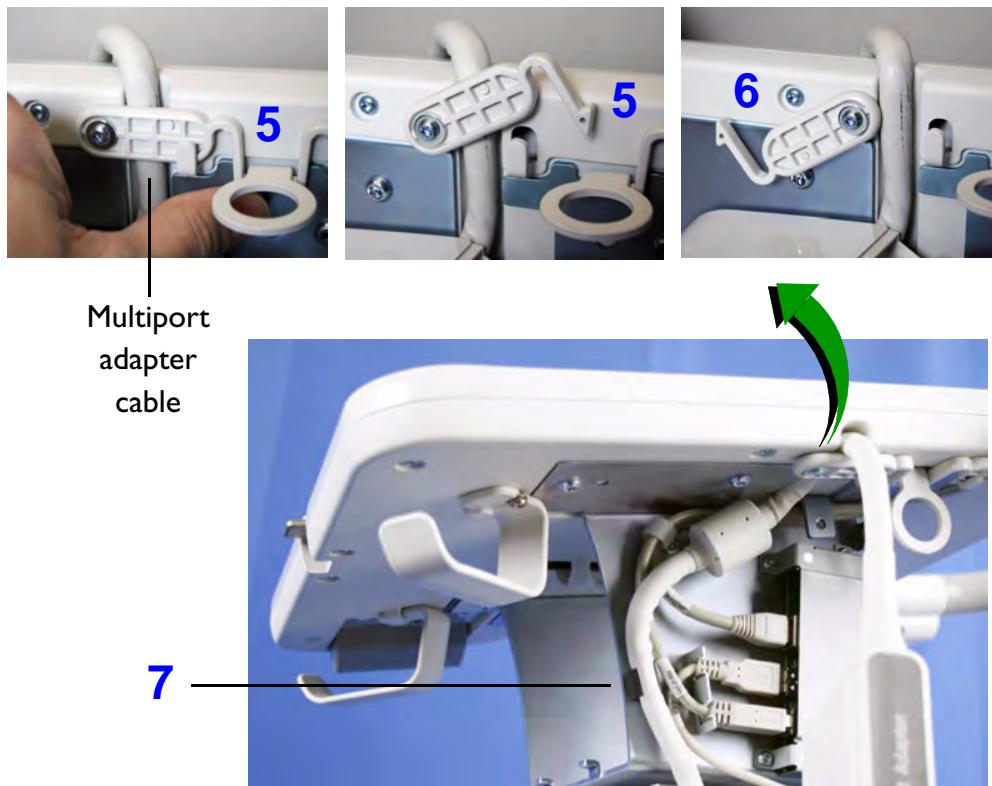
## Removing the Multiport Adapter Screws



4. Remove the two screws that secure the Multiport adapter to the cart frame.

Figure 10-91

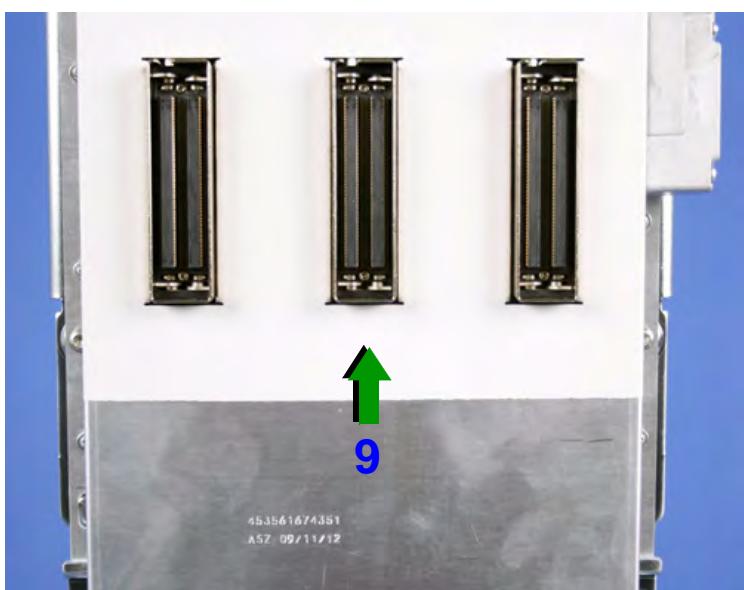
## Unclamping the Multiport Adapter Cable



5. Locate the retainer clip for the multiport cable and pull the plastic lever on the retainer clip away from the metal loop. It will snap free when it clears the metal loop.
6. Rotate the retainer clip over, until it no longer covers the cable.
7. Pull the cable out of the metal spring retainer.

Figure 10-92

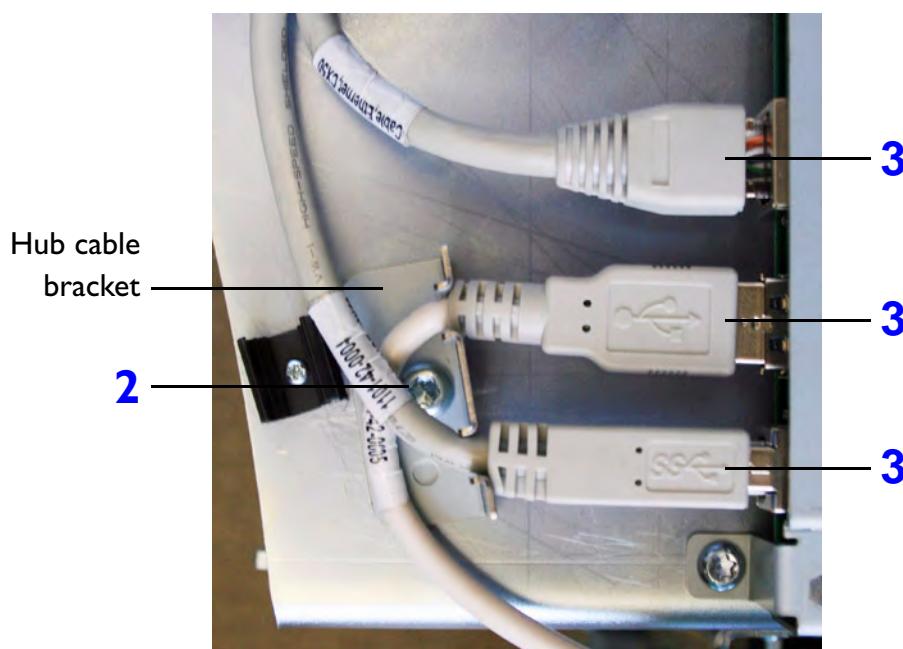
## Removing the Multiport Adapter



8. Place one hand at the bottom of the adapter assembly.
9. Slide the assembly straight up until it stops, then lift the assembly off the front of the cart.

Figure 10-93

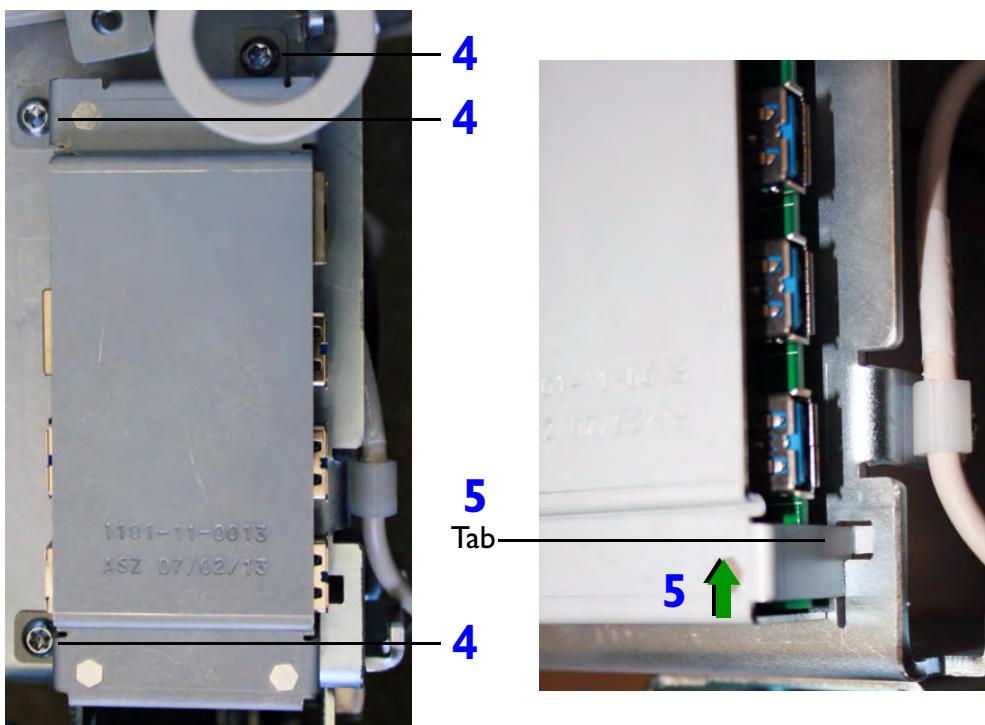
## Removing the Hub Cable Retainer Bracket



- To remove the cart hub assembly
1. Perform step 1 through step 7 of “To remove the cart enclosures” on page 376.
  2. Remove the screw that secures the hub cable bracket, and remove the bracket from around the two USB cables.
  3. Disconnect the three cables from the cart hub assembly.

Figure 10-94

## Removing the Cart Hub Assembly



4. Remove the three screws that secure the cart hub assembly to the cart frame.
5. Slide the hub assembly up until it stops (align the hub tab with the slot in the cart frame). Pull the assembly straight out from the cart.

Figure 10-95

## Disconnecting the Power to the System Cart



► **To remove the AC tray assembly**

1. Turn off the circuit breaker switch at the rear of the cart.
2. Press in on the yellow power cord button as you pull the cord plug, to disconnect the power cord from the AC receptacle on the AC tray.

Figure 10-96

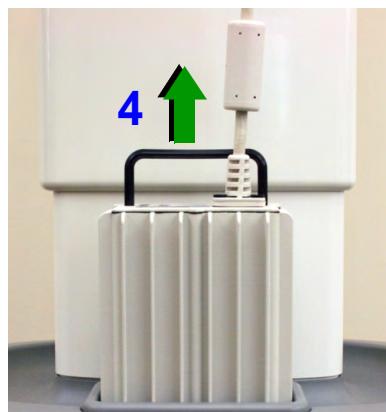
## Removing the AC Adapter



5



3



4



6

3. Disconnect the AC adapter power cable from the system.
4. Using the handle, lift the AC adapter out of the cart AC tray.
5. Disconnect the AC tray power cable from the AC adapter.
6. Tuck the AC tray cable back down into the AC tray so that it lays flat on the bottom of the tray.

Figure 10-97

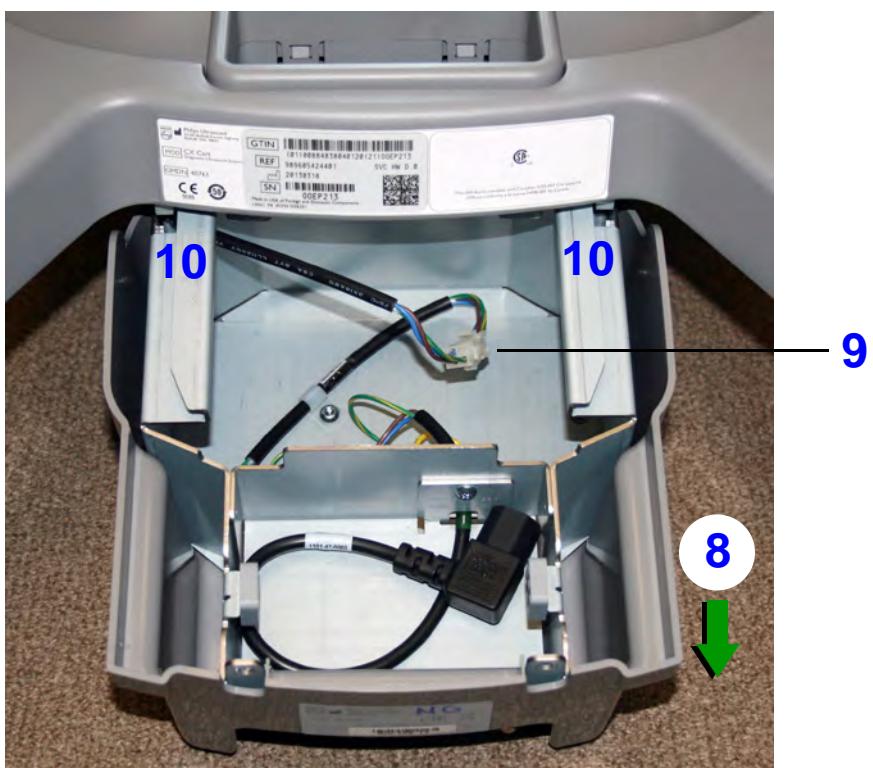
## Removing the AC Tray Screws



7. Remove the two screws that secure the AC tray assembly to the cart frame.

Figure 10-98

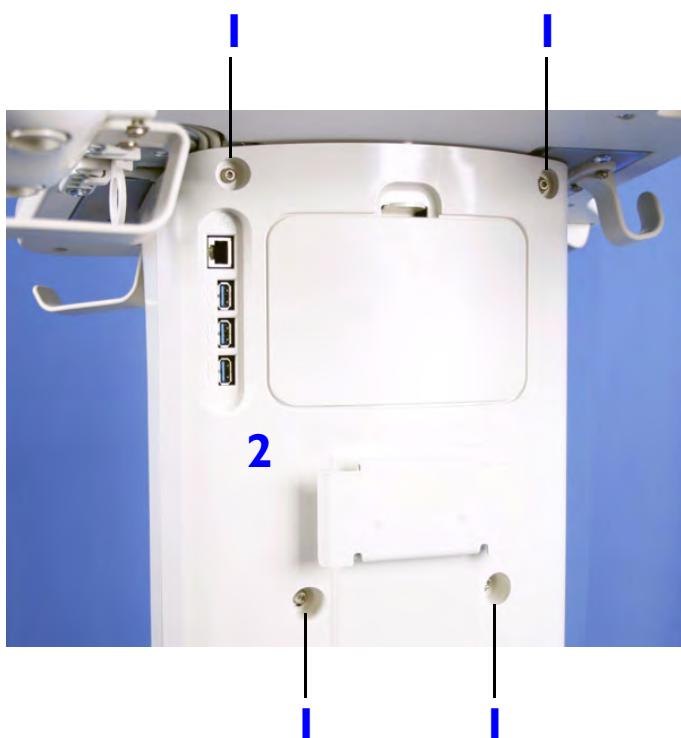
## Removing the AC Tray Assembly



8. Pull the AC tray straight out of the base of the cart until it stops and rest the AC tray on the floor.
9. Disconnect the printer power cable from the AC tray power connector.
10. Lift the back side of the AC tray up and toward you to remove the assembly from the cart.

Figure 10-99

## Removing the Upper Rear Enclosure

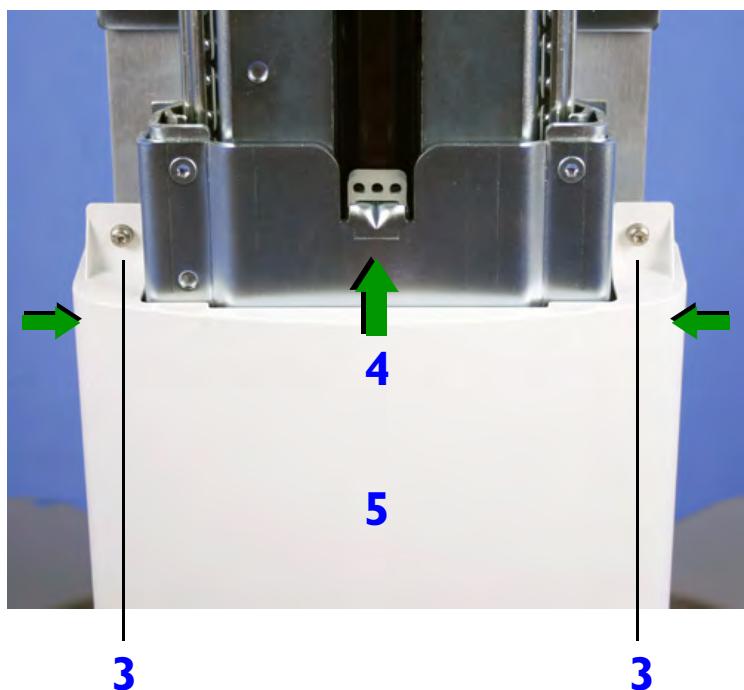


➤ **To remove the gas strut or replace the column bumper**

1. Remove the four screws that secure the upper rear enclosure to the cart frame.
2. Lift the enclosure off the rear of the cart.

Figure 10-100

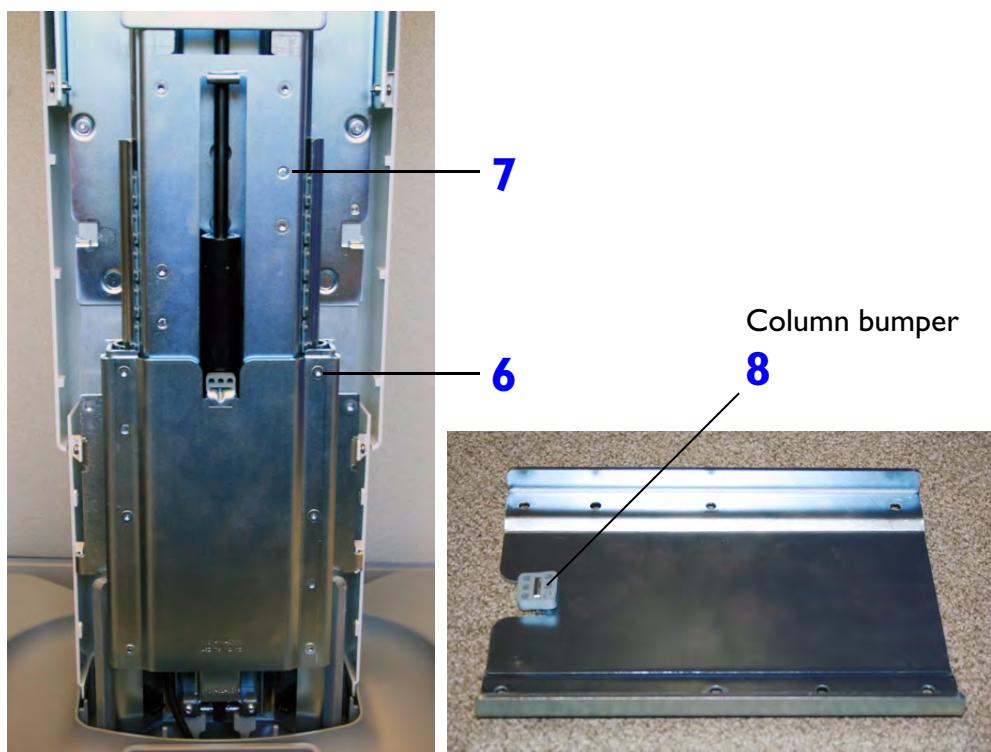
## Removing the Lower Rear Enclosure



3. Remove the two screws that secure the lower rear enclosure to the cart frame.
4. Grasp the enclosure at both sides (green arrows) and slide it straight up until it clears the cart base.
5. Lift the enclosure off the rear of the cart.

Figure 10-101

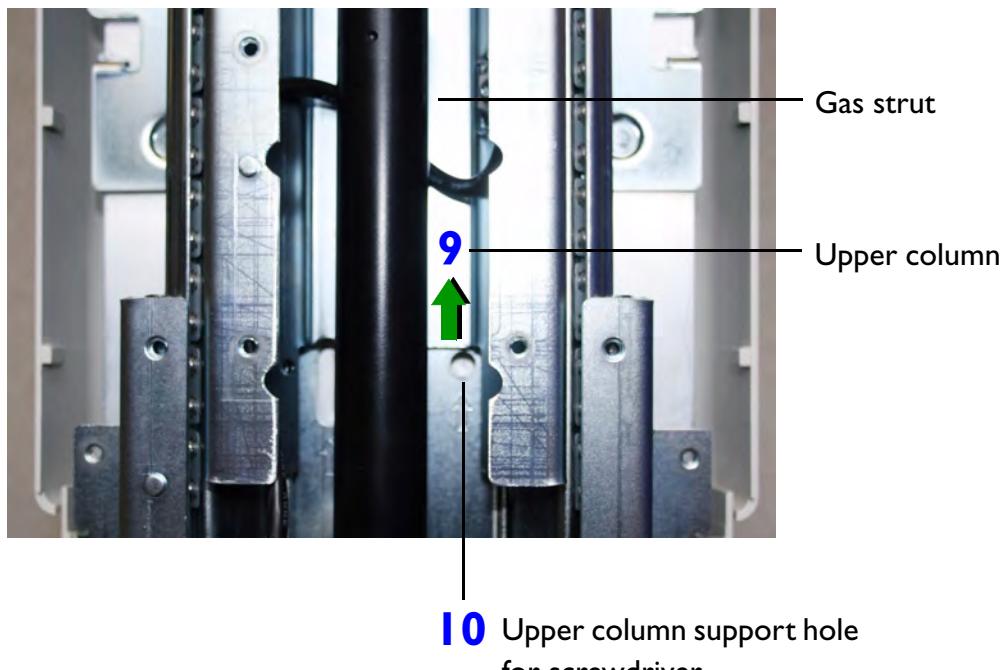
## Removing the Column Metal Plates



6. Remove the six screws that secure the outer lower metal plate to the cart frame.
7. Remove the six screws that secure the inner upper metal plate to the cart frame.
8. To replace the column bumper, pull the bumper off of the sheet-metal prong. Press on the replacement bumper.

Figure 10-102

## Supporting the Upper Cart Column

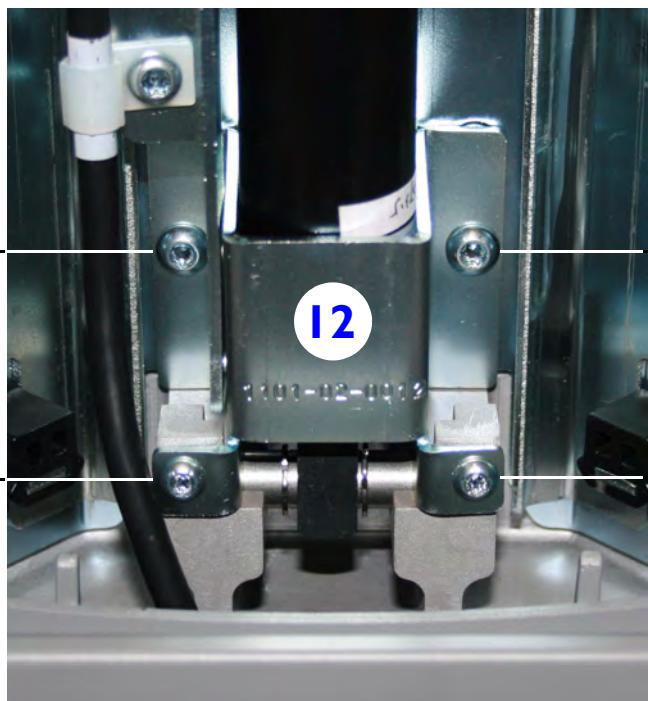


**WARNING** When you remove the gas strut, nothing supports the upper cart. To prevent injury or damage to the cart, insert a screwdriver to hold the upper section of the cart in place while removing the gas strut.

9. Using the cart lift trigger, raise the column to its highest position.
10. Pull the top of the cart up an inch further to expose the column-support hole. Insert a screwdriver, from the rear of the cart, into the hole. An arrow is embossed in the sheet metal, just below the hole.

Figure 10-103

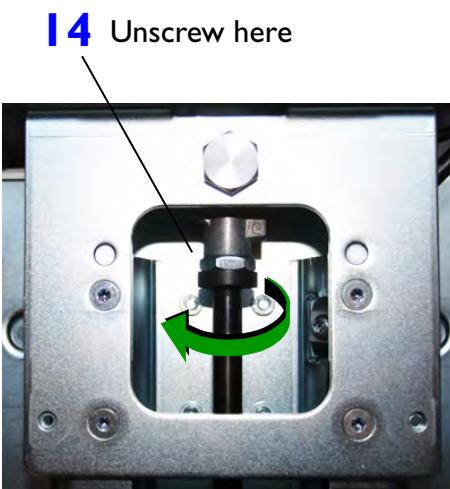
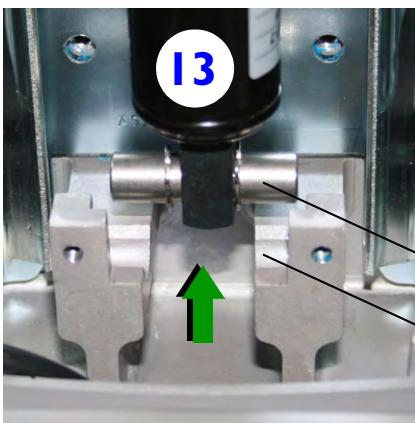
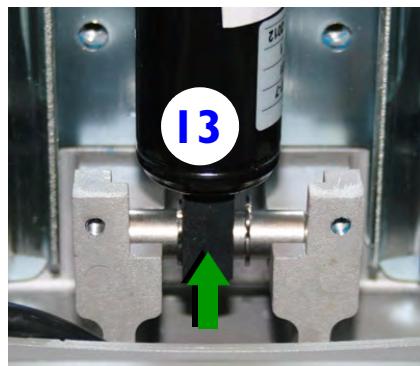
## Removing the Release Cable Guide



11. Remove the four screws that secure the release cable metal guide.
12. Position the metal guide out of the way to access the bottom of the gas strut.

Figure 10-104

## Removing the Gas Strut



13. Slide the bottom of the gas strut forward and out of the retaining bracket. You may need to use a lever to press the strut from the bottom, so that the strut clears the retaining bracket it rests on.

14. From the bottom end of the strut, turn it counter-clockwise to unscrew it from the mounting bolt at the top end of the strut. Remove the strut.

Figure 10-105

**Shortening the Gas Strut (Depressing the Lock Pin)**

Lock pin extended



Lock pin pushed in

**► Installing the gas strut**

**NOTE** When you install the gas strut, you must shorten its length slightly, to allow you to screw the strut into place. Otherwise, you could cause a cross-thread between the mounting bolt and the strut's screw head.

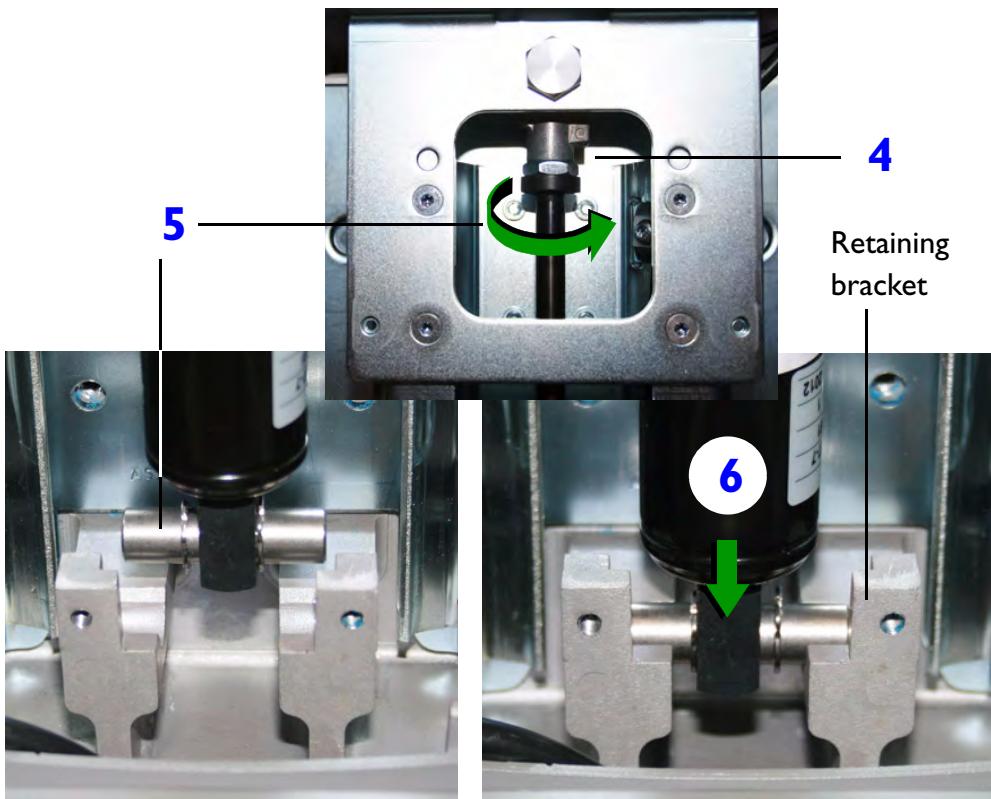
- I. To shorten the strut, hold it vertically upside down, and push the top into the floor to push in the lock pin.

**Figure 10-106****Shortening the Gas Strut (Releasing the Lock Pin)**

2. Hold the strut in the pushed-in lock-pin position, and slowly tilt the strut to a 45-degree angle while applying pressure to retain the strut's shorter length.
3. As you tilt the gas strut, the release pin moves outward, locking the strut in the desired position. You are now be able to position the strut into the threads in the top bolt and screw it into place.

Figure 10-107

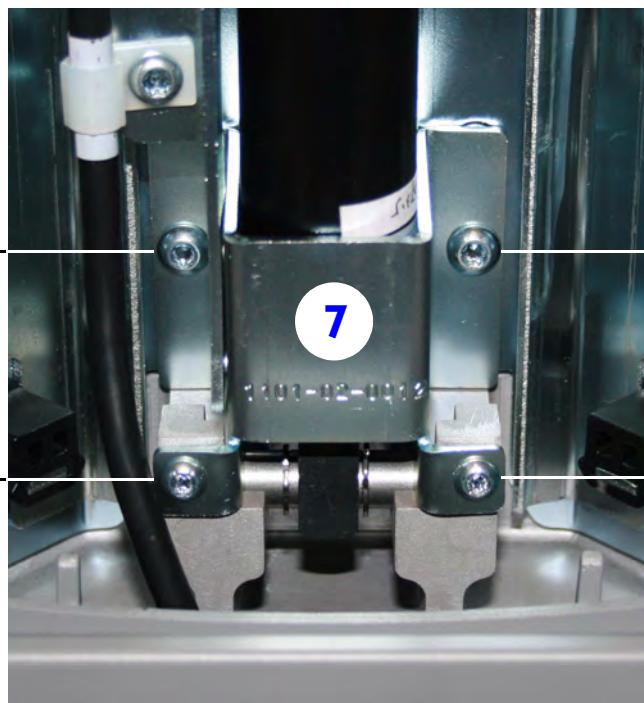
## Installing the Gas Strut



4. Slide the gas strut up and into the mounting bolt. Ensure that the mounting bolt is aligned with the strut's screw head.
5. From the bottom end of the strut, turn the gas strut clockwise to screw it into the mounting bolt.
6. When the strut is fully screwed in, the locking pin pushes in and releases the strut, which allows the strut to seat into the retaining bracket. You may have to move it slightly to seat it fully.

Figure 10-108

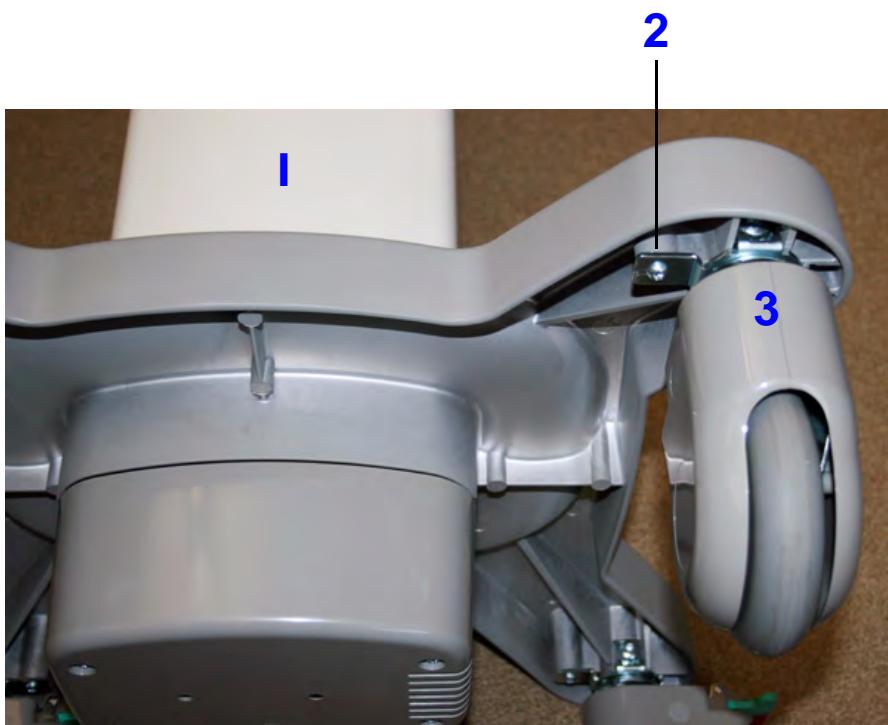
## Installing the Release Cable Guide



7. Position the metal cable guide so that the four holes are aligned with the holes on the cart frame.
8. Install the four screws to secure the cable guide to the cart frame.

Figure 10-109

## Removing a Cart Caster



## ► To remove the cart casters

**CAUTIONS**

- Turn off the circuit breaker switch at the rear of the cart.
- Disconnect the main power cord from the AC receptacle on the AC tray.
- Disconnect all cables from the system and remove the system from the cart platform.

1. Carefully tilt the cart over onto the floor.
2. Using a TX30 TORX screwdriver, remove the screw that secures the caster bracket to the base assembly.
3. Wiggle the caster and slide it out of the mounting recess in the cart base.

[Return to Disassembly Procedure List.](#)

# II Cabling

## Introduction

This section contains system cabling and connector information. Use the illustrations (figures) and parts tables in this section to locate and identify system cables and their part numbers. Part numbers are shown on the system cabling diagrams and are listed and described in the corresponding tables.

**NOTE** Cable part numbers are located on at least one end of the cables.

## Cable Part Numbers

[Table 11-1](#) is a parts list of the system cables.

[Table 11-2](#) is a parts list of the peripheral cables.

[Table 11-3](#) is a parts list of the D.0 system cart cables.

[Table 14-62](#) contains additional information on peripherals and applicable cables.

## System Cable and System Connector Information

[Figure 11-1](#) through [Figure 11-21](#) are illustrations of system cable and system connector information.

## System Cabling Diagrams

For reference, system and OEM cabling diagrams are provided in [Figure 11-22](#) through [Figure 11-37](#).

## About the Cable Tables

For part-number information, see [Figure 14-1](#).

Cable names are alphabetized in the “Cable Description” column.

The “Notes/Reference” column in [Table 11-1](#) and [Table 11-2](#) contains added notes and provides cross-reference links to additional cabling resources.

## Cable Parts List

**Table 11-1** System Cables

Index No.	Part Number	Cable Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	453561496621	Cable Assy, Audio, MI3	RoHS. Not backward compatible with previous hardware. Cable Illustration: <a href="#">Figure 11-14</a>	x	x			x
2	453561299101	Cable Assy, DVD	Non-RoHS. Flex cable System DVD Diagram: <a href="#">Figure 11-10</a> Parts Info: <a href="#">Figure 14-11</a>	x		x		
3	453561478352	Cable Assy, DVD Flex, SATA	RoHS. Not backward compatible with previous hardware. System DVD Diagram: <a href="#">Figure 11-10</a> See “ <a href="#">About Compatibility and Part Numbers</a> ” on page 459.	x		x		

**Table 11-1** System Cables (Continued)

Index No.	Part Number	Cable Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
4	453561363992	Cable Assy, Mini USB B to USB A, 1128mm L	Non-RoHS. Used for system-to-USB hub  System USB Diagram: <a href="#">Figure 11-27</a> USB Hub Parts Info: <a href="#">Figure 14-82</a>	x	x	x	x	x
5	453561362141	Cable Assy, Power, 1250mm, L, Printer	RoHS. Y cable, routes within the cart column, printers-to-transformer  B/W Printer Diagram: <a href="#">Figure 11-28</a> UP-23MD Color Printer Diagram: <a href="#">Figure 11-29</a> UP-25MD Color Printer Diagram: <a href="#">Figure 11-29</a> CP30DW Color Printer Diagram: <a href="#">Figure 11-30</a>	x	x	x	x	x

Table 11-1 System Cables (Continued)

Index No.	Part Number	Cable Description	Notes/Reference				
			CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
6	453561361901	Cable Assy, Power, 4572mm L, North America				x	x
7	453561361861	Cable Assy, Power, 4572mm L, Argentina				x	x
8	453561361871	Cable Assy, Power, 4572mm L, China				x	x
9	453561361881	Cable Assy, Power, 4572mm L, South Africa				x	x
10	453561361891	Cable Assy, Power, 4572mm L, Danish				x	x
11	453561361921	Cable Assy, Power, 4572mm L, British				x	x
12	453561361941	Cable Assy, Power, 4572mm L, Australia/New Zealand				x	x
13	453561361951	Cable Assy, Power, 4572mm L, Europe				x	x
14	453561361961	Cable Assy, Power, 4572mm L, Switzerland				x	x
15	453561361971	Cable Assy, Power, 4572mm L, Israel				x	x
16	453561364002	Cable Assy, USB Hub to Printer, 400mm L	Non-RoHS. Used for B&W printer B/W Printer Diagram: <a href="#">Figure 11-28</a> USB Hub Parts Info: <a href="#">Figure 14-82</a>			x	x

**Table 11-1** System Cables (Continued)

Index No.	Part Number	Cable Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
17	453561364012	Cable Assy, USB Hub to Printer, 2000mm L	Non-RoHS. Used for color printer UP-23MD Color Printer Diagram: <a href="#">Figure 11-29</a> CP30DW Color Printer Diagram: <a href="#">Figure 11-30</a> USB Hub Parts Info: <a href="#">Figure 14-82</a>	x	x	x	x	x
18	453561716461	Cable Kit, Physio, RoHS		x	x	x	x	x

**Table 11-2** Peripheral Cables

<b>Index No.</b>	<b>Part Number</b>	<b>Cable Description</b>	<b>Notes/Reference</b>	<b>CX50 A.x</b>	<b>CX50 B.x</b>	<b>CX50 C.x</b>	<b>CX30 A.x</b>	<b>CX30 B.x</b>
1	453561232851	Cable Assy, Adapter, USB to DB9, Serial, 13-In	RoHS. Serial to USB adapter  Cable Illustration: <a href="#">Figure 11-1</a>	x	x	x	x	x
2	453561378301	Cable Assy, Power, Univ Jumper, 2M	RoHS. Used for stand-alone isolation transformer  Used for stand-alone printers connected to the isolation transformer  CX50 System Stand-alone Diagram: <a href="#">Figure 11-23</a>	x	x	x	x	x
3	453561814921	Cable Assy, European Jumper	Complies with new cable standards	x	x	x	x	x
4	453561814931	Cable Assy, North America Jumper	(UL62) for use in Europe and North America. Replaces 453561378301	x	x	x	x	x
5	453561153453	Cable Assy, USB, AVIO-OEM	RoHS. Used for stand-alone B&W or color printer  CX30 and CX50 System Stand-alone Diagram: <a href="#">Figure 11-23</a>  UP-D25MD Diagram: <a href="#">Figure 11-29</a> (On-cart) <a href="#">Figure 11-33</a> (External)	x	x	x	x	x

**Table 11-3** System Cart Cables (D.0 Cart)

Index No.	Part Number	Cable Description	Notes/Reference	A.0	B.0	C.0	D.0
1	453561672601	Cable Assy, Ethernet	RoHS. Cables route within the cart			x	
2	453561672571	Cable Assy, Power, Adapter	Cart Internal Cabling Diagram: <a href="#">Figure 11-26</a>			x	
3	453561672561	Cable Assy, Power Printer	B/W Printer Cabling Diagram: <a href="#">Figure 11-35</a>			x	
4	453561672581	Cable Assy, USB (System)				x	
5	453561672591	Cable Assy, USB, Printer				x	

**Figure 11-1** USB to DB-9 Serial Adapter Cable Assembly

Figure 11-2

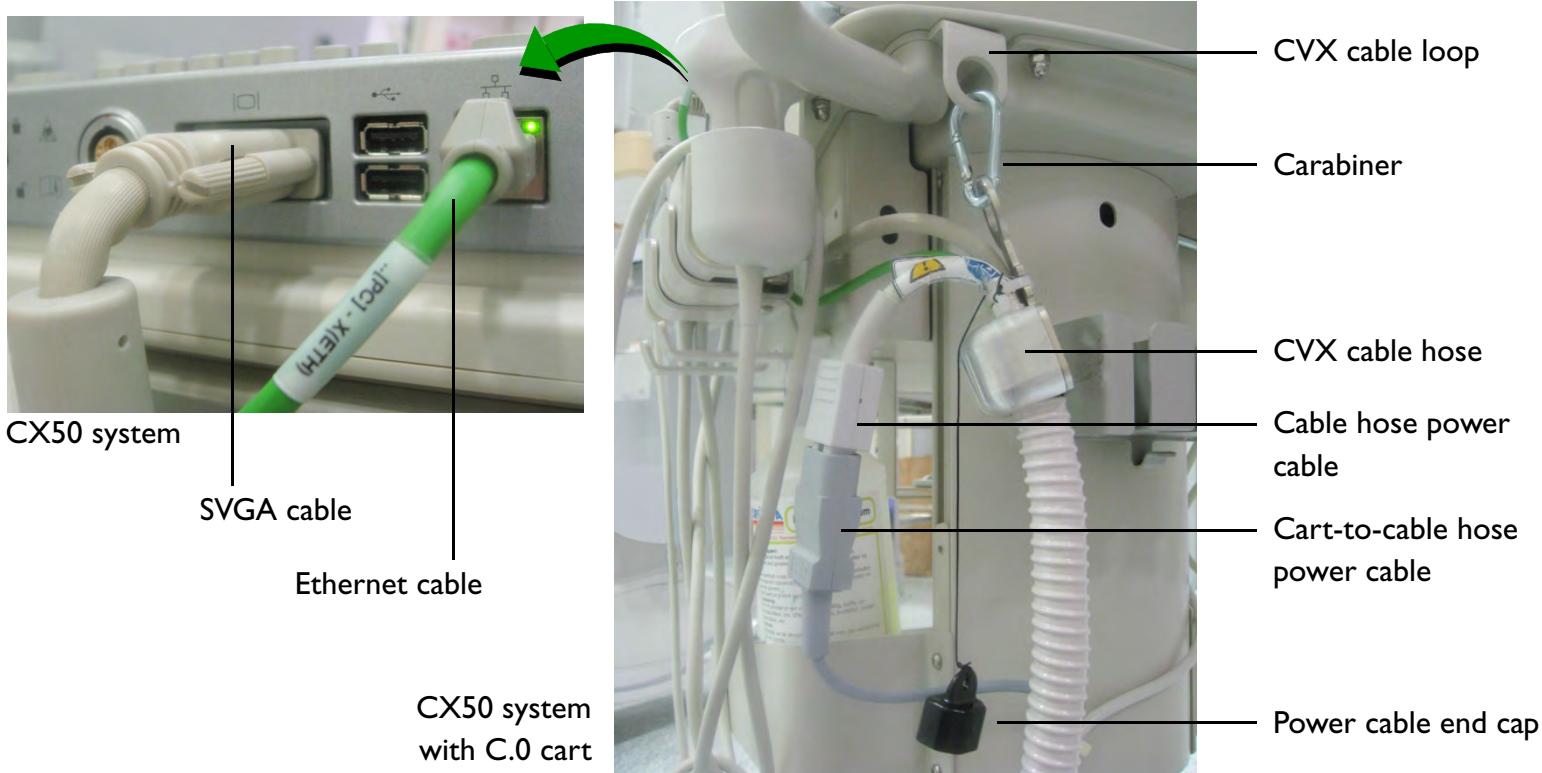
**CVX Cable Hose and Strain Relief Detail (CX50 2.x System with C.0 Cart)**

Figure 11-3

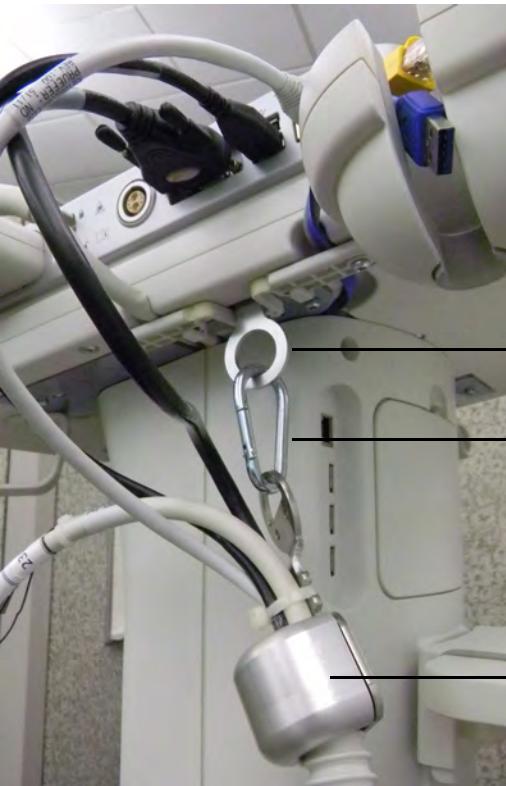
**CVX Cable Hose and Strain Relief Detail (CX50 3.x System with D.0 Cart)**



CX50 system

SVGA cable

Ethernet cable



CVX cable loop

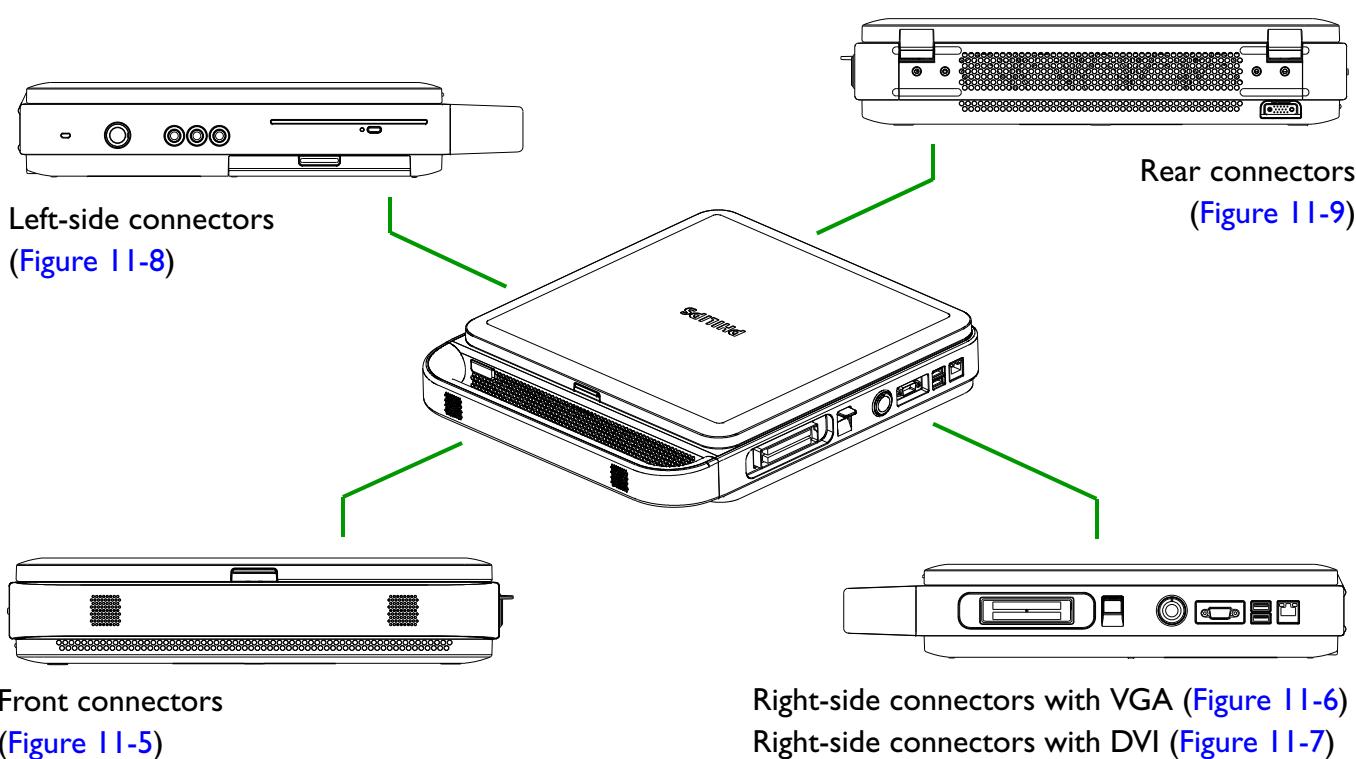
Carabiner

CVX cable hose

# System Connector Information

Figure 11-4

System Connector Locations



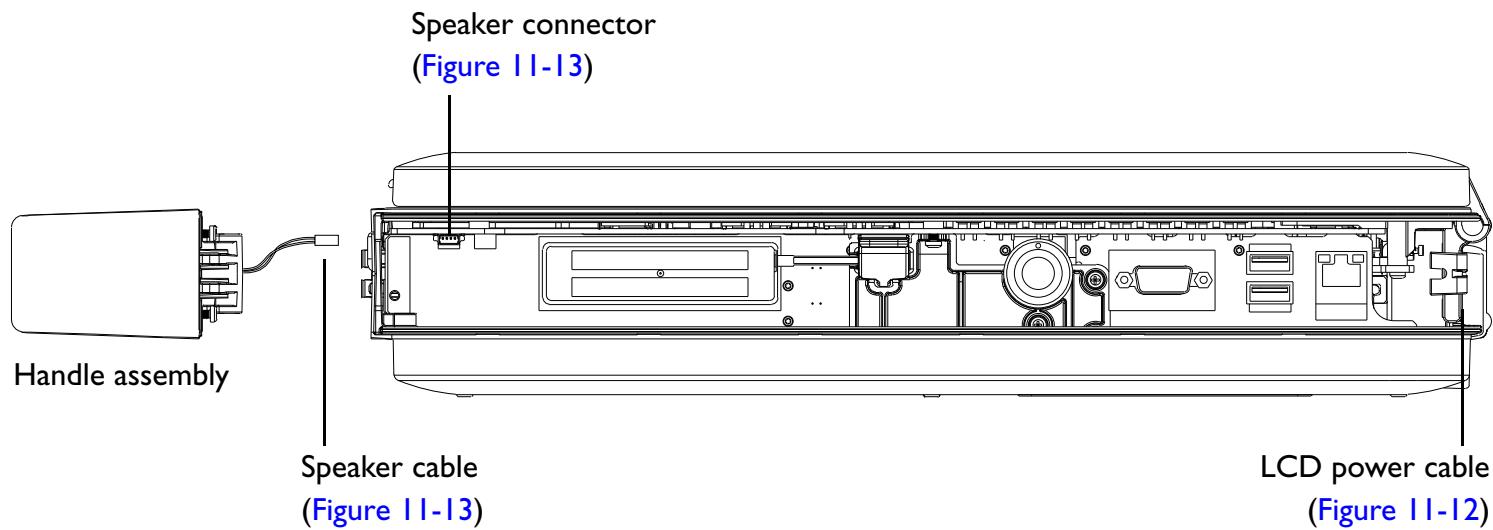
**Figure 11-5****Front System Connectors (Front Detail with Right Side Open)**System connector locations: [Figure 11-4](#)

Figure 11-6

## Right-Side System Connectors (with VGA Connector)

System connector locations: [Figure 11-4](#)

CX50 Effectivity		
A.x	B.x	C.x
x		

CX30 Effectivity		
A.x	B.x	
x		

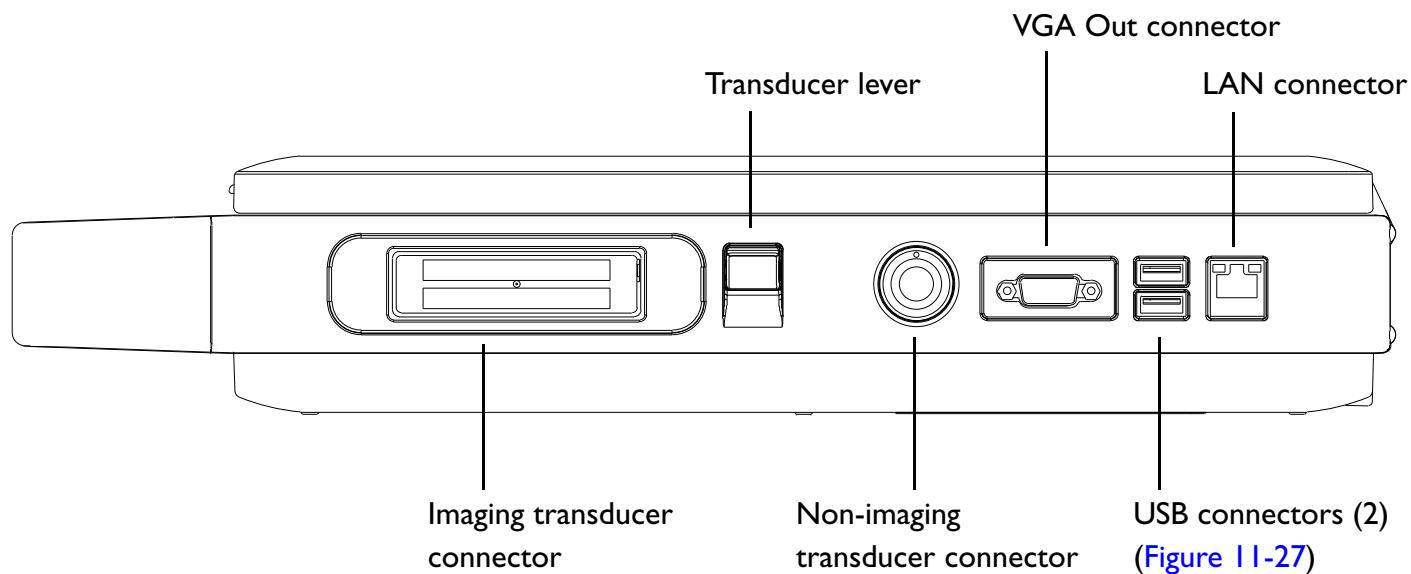
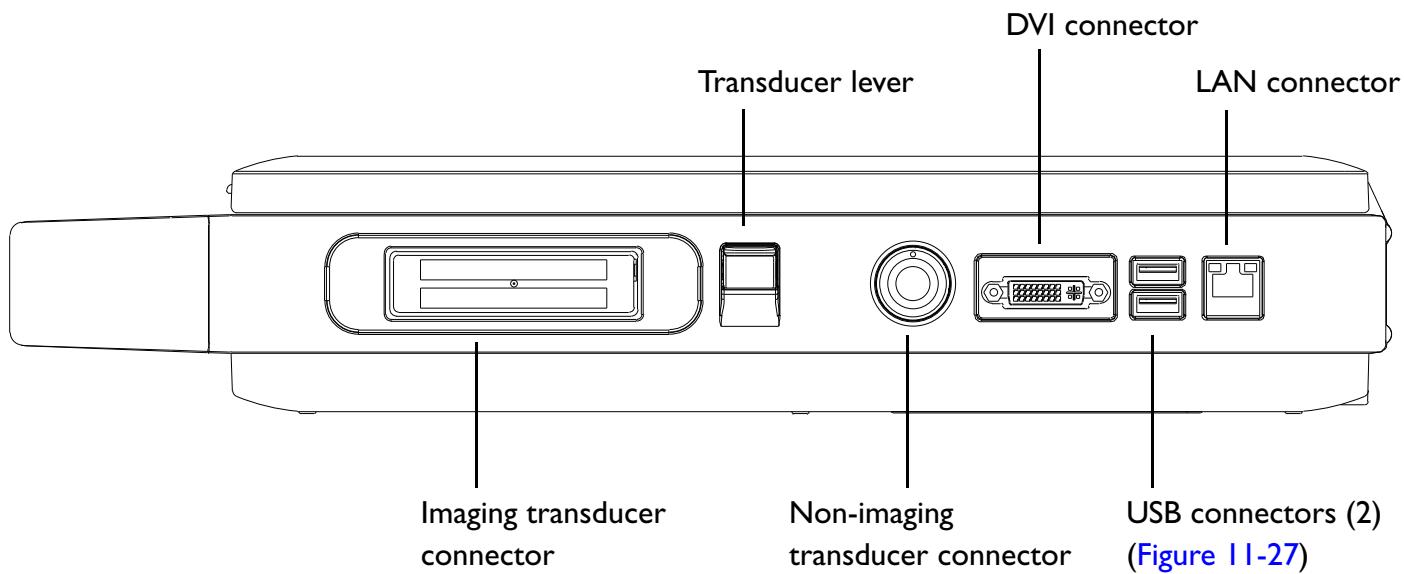
USB connectors (2)  
[\(Figure 11-27\)](#)

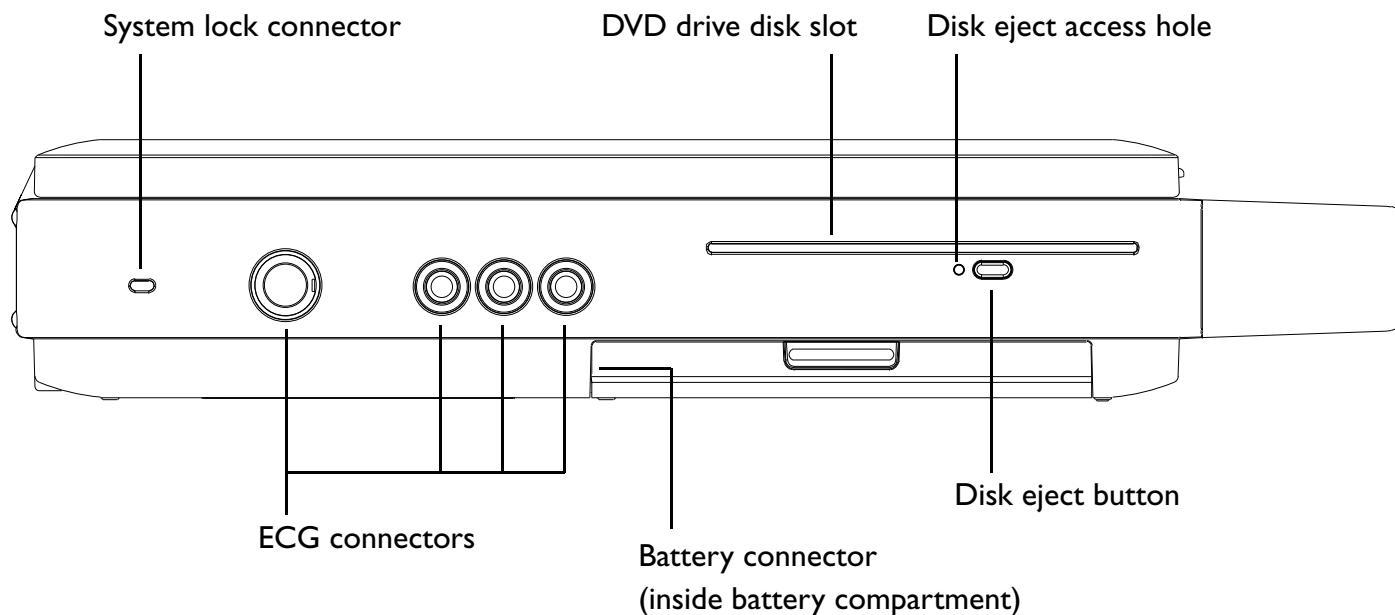
Figure 11-7

## Right-Side System Connectors (with DVI Connector)

System connector locations: [Figure 11-4](#)

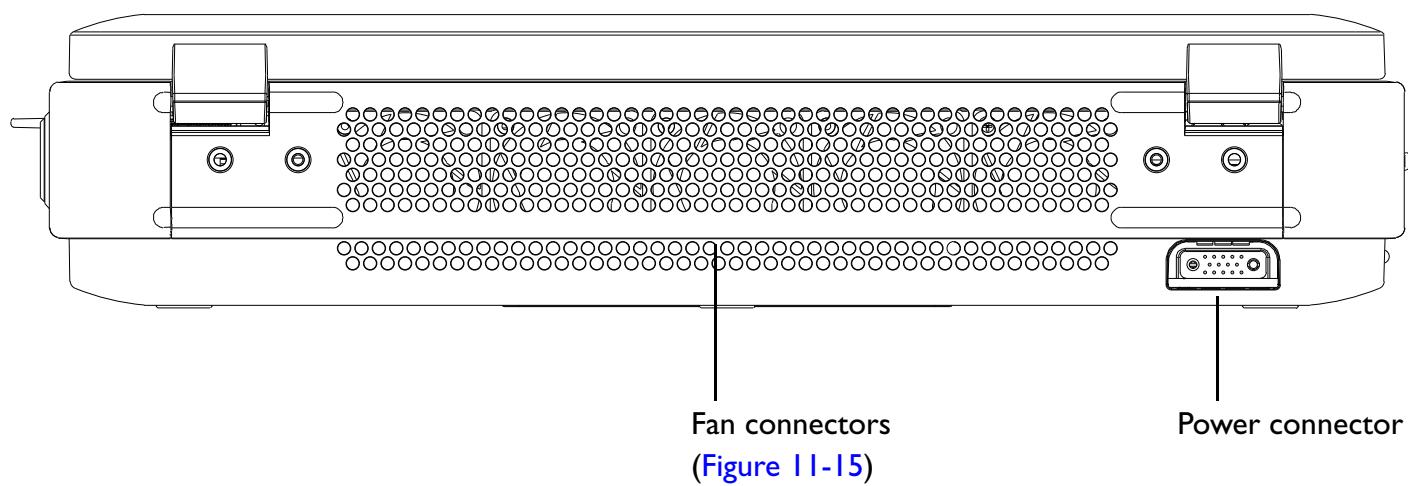
CX50 Effectivity			CX30 Effectivity
A.x	B.x	C.x	A.x
	x	x	x



**Figure 11-8** Left-Side System ConnectorsSystem connector locations: [Figure 11-4](#)

**Figure 11-9**      **Rear System Connectors**

System connector locations: [Figure 11-4](#)



## CX30/CX50 System Internal Cable Illustrations

Figure 11-10

The system internal cable illustrations are shown on [Figure 11-10](#) through [Figure 11-15](#).

DVD Drive Cabling Diagram



Top view



DVD assembly



Bottom view

- COM Express/Main Board Assembly -

[453561299101](#)

or

[453561478352](#)



Figure 11-11

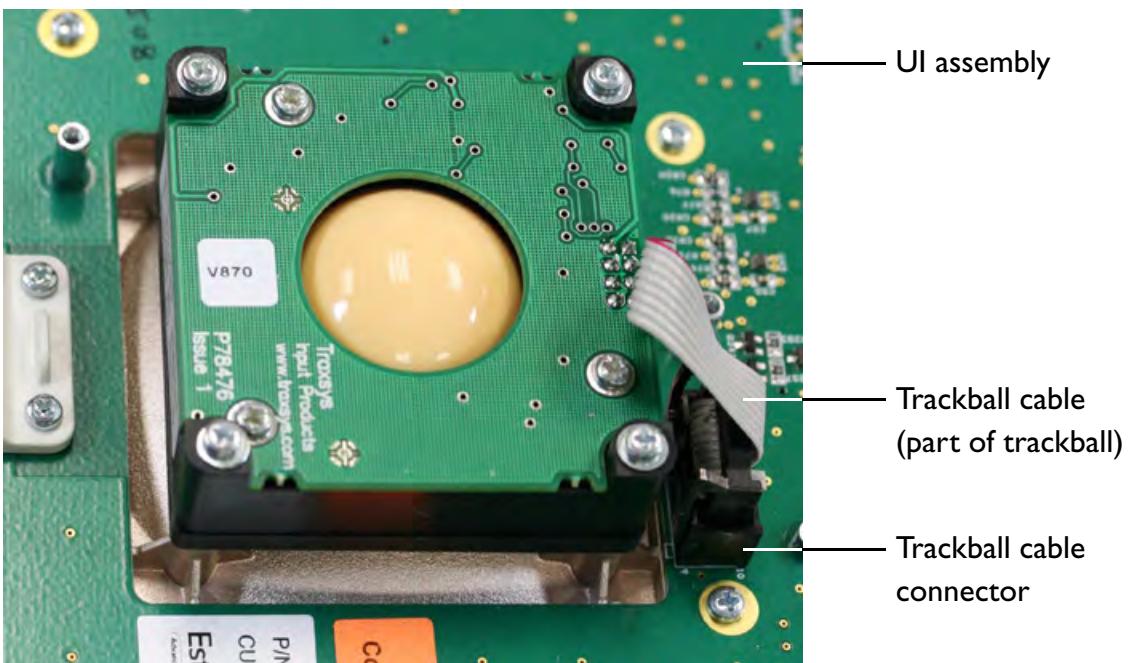
**CX30 and CX50 System Trackball Cabling Diagram**

Figure 11-12

## CX30 and CX50 System LCD Power Cabling Diagram

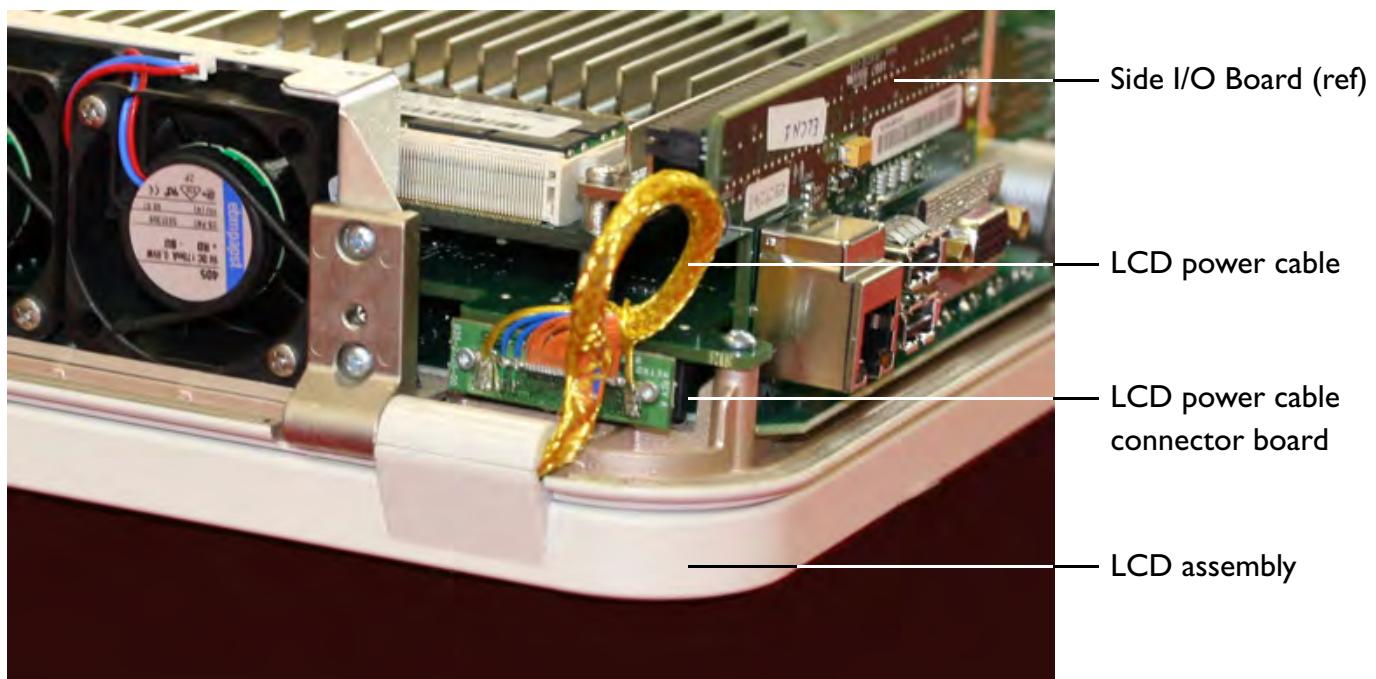
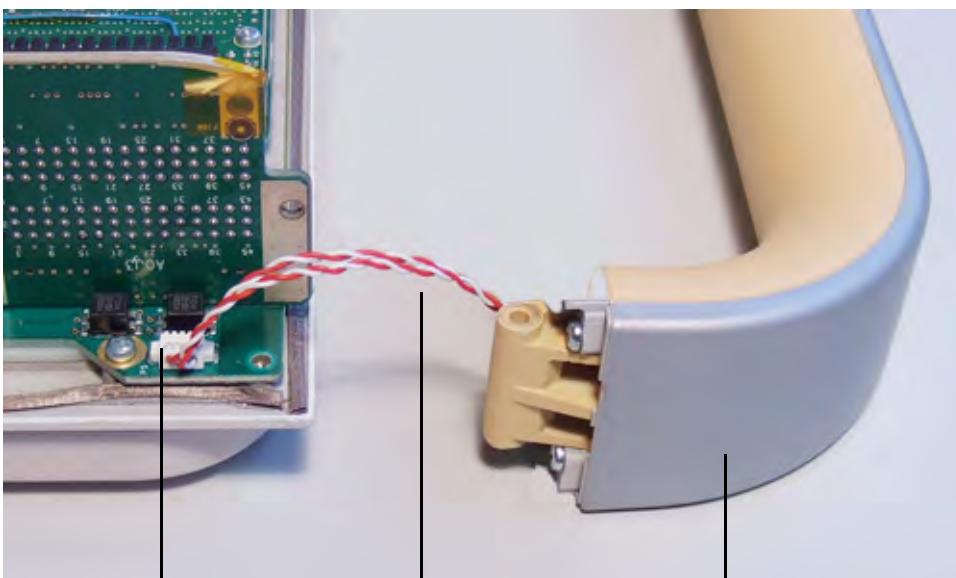
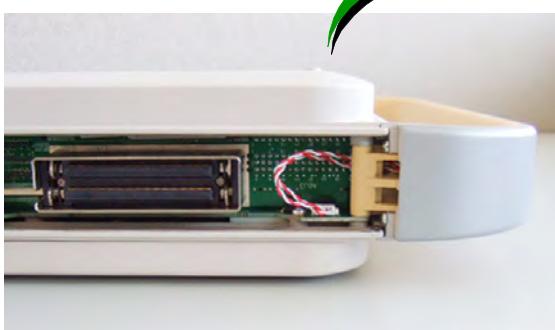


Figure 11-13

**CX30 and CX50 System Speaker Cable Cabling Diagram**

CX50 Effectivity		
A.x	B.x	C.x
x		

CX30 Effectivity	
A.x	B.x
x	



Speaker connector  
on UI assembly

Speaker cables  
(part of speakers)

Handle assembly

Figure 11-14

## CX30 and CX50 System Audio Cable Cabling Diagram (453561496621)

CX50 Effectivity		
A.x	B.x	C.x
x	x	

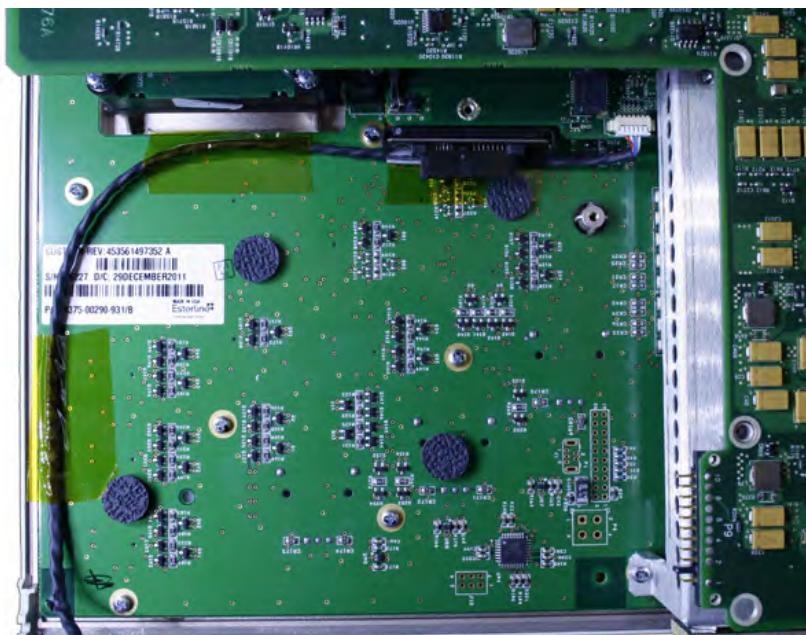
CX30 Effectivity		
A.x	B.x	
x		



Speaker cable  
connector  
(system handle)

Disassembly

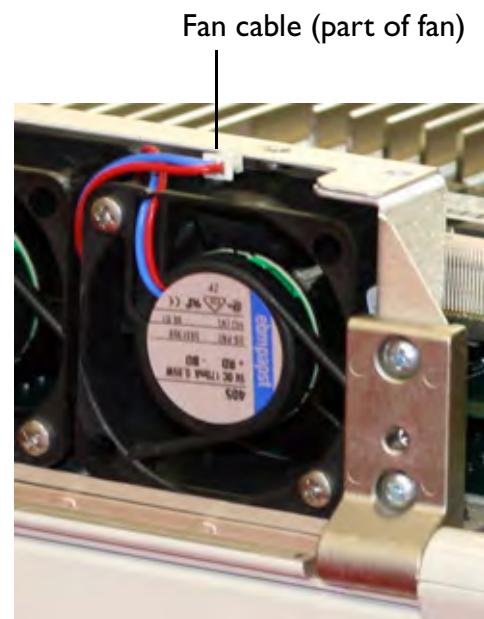
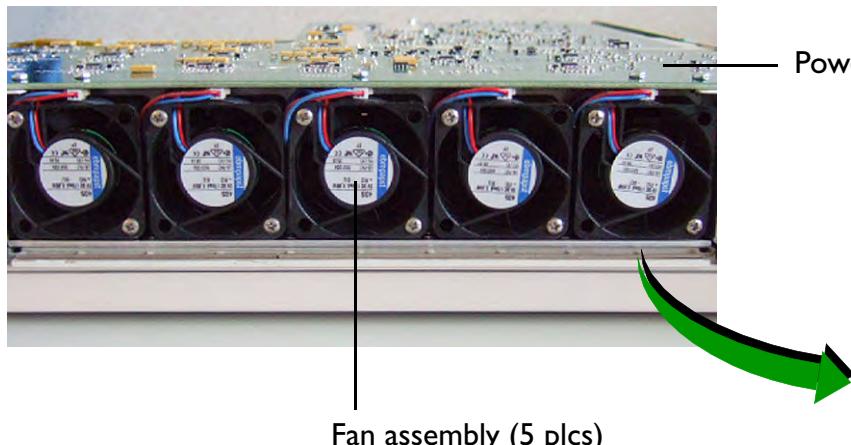
Bottom of system case



System user interface

Audio cable connector

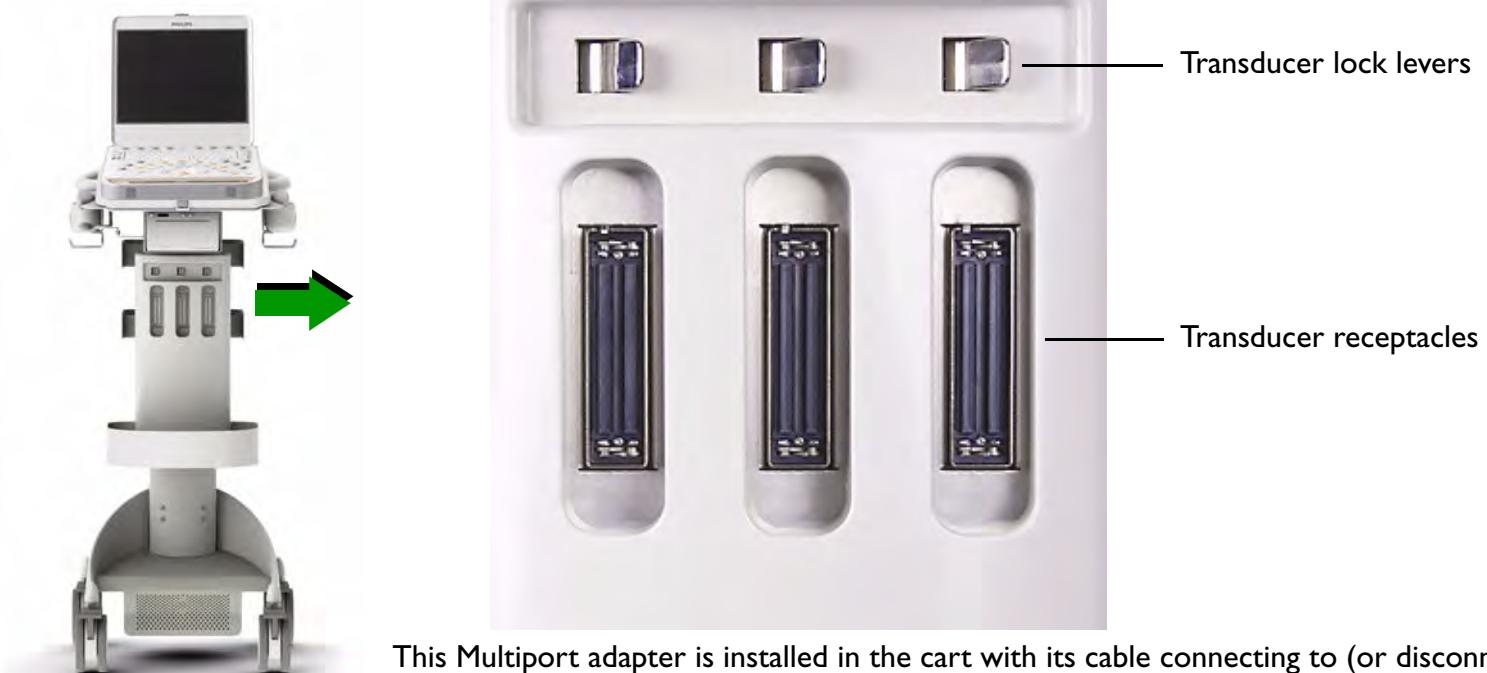
Figure 11-15

**CX30 and CX50 System Cooling Fans Cabling Diagram**

# Cart Connector Information

Figure 11-16

Cart Connector Designations, Multiport Adapter (C.0 Cart)



This Multiport adapter is installed in the cart with its cable connecting to (or disconnecting from) the Tyco TC Ziff connector on the side of the compact system ([Figure 11-18](#)).

Figure 11-17

## Cart Connector Designations, Multiport Adapter (D.0 Cart)



This Multiport adapter is installed in the cart with its cable connecting to (or disconnecting from) the Tyco TC Ziff connector on the side of the compact system ([Figure 11-18](#)).

Figure 11-18

**Multiport Adapter Cable Connected to System**

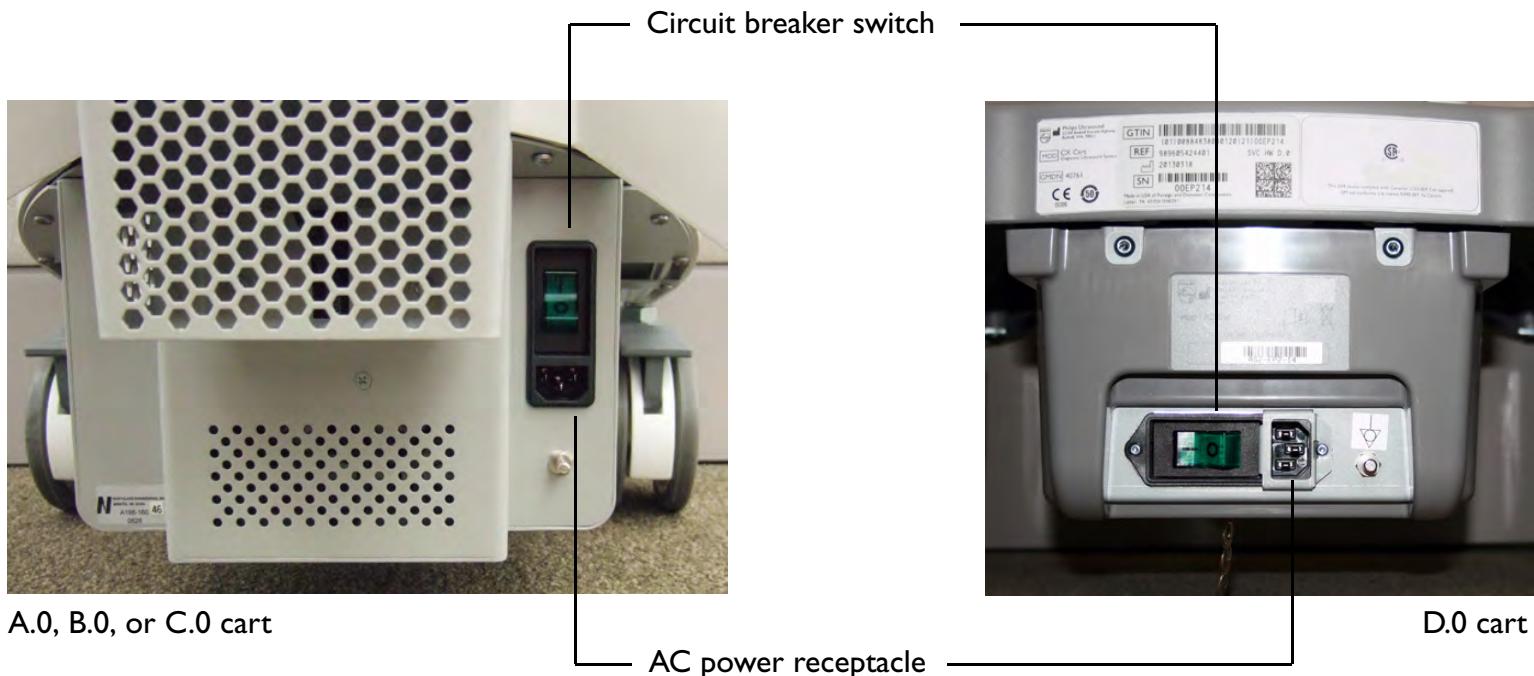
Multiport adapter connector



D.0 cart shown

Figure 11-19

## Cart Connector Designations, Circuit Breaker/AC Receptacle



## Cart USB Hub Connector Information

Figure 11-20

USB Hub (Velcro-Mount) Connector Designations (A.0, B.0 or C.0 Cart)

**CAUTION** Current over-draw. Do not connect a wireless device to the USB hub.

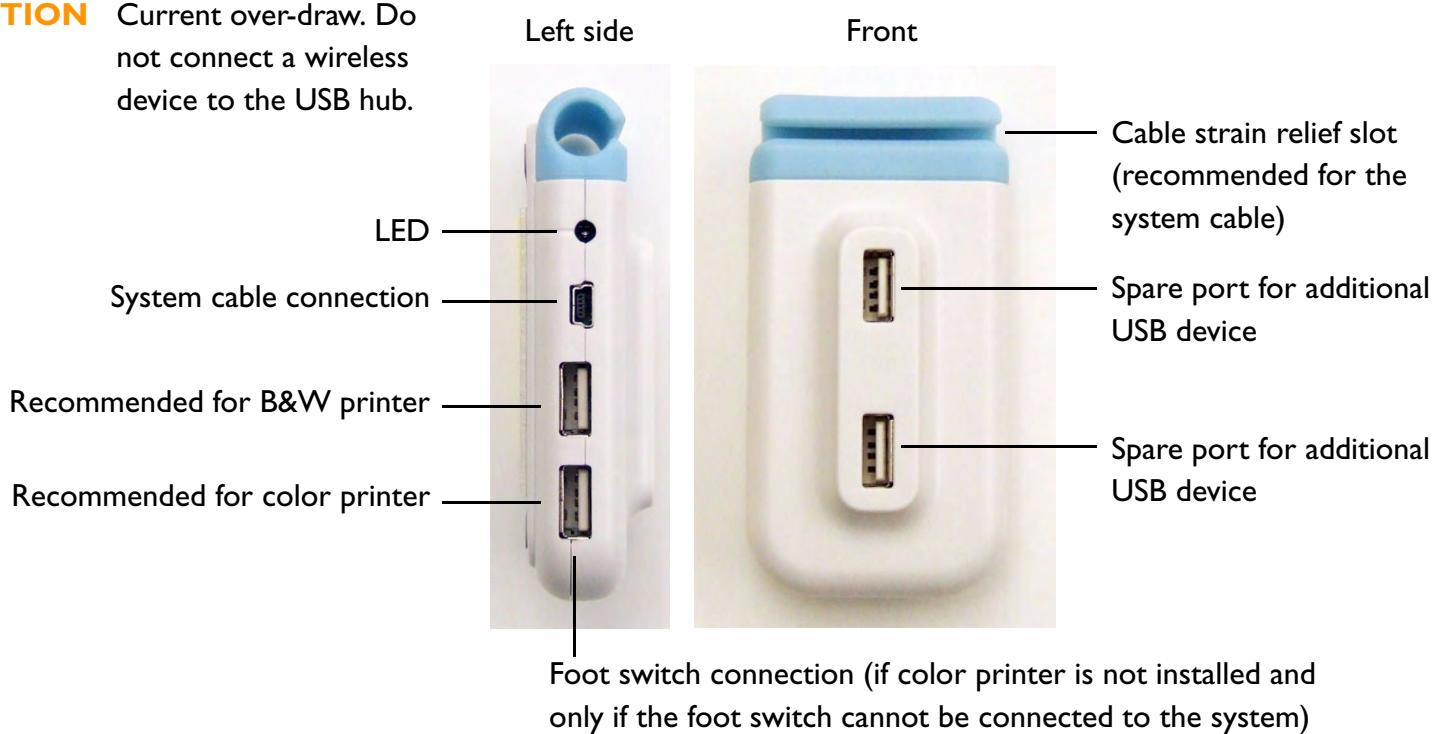
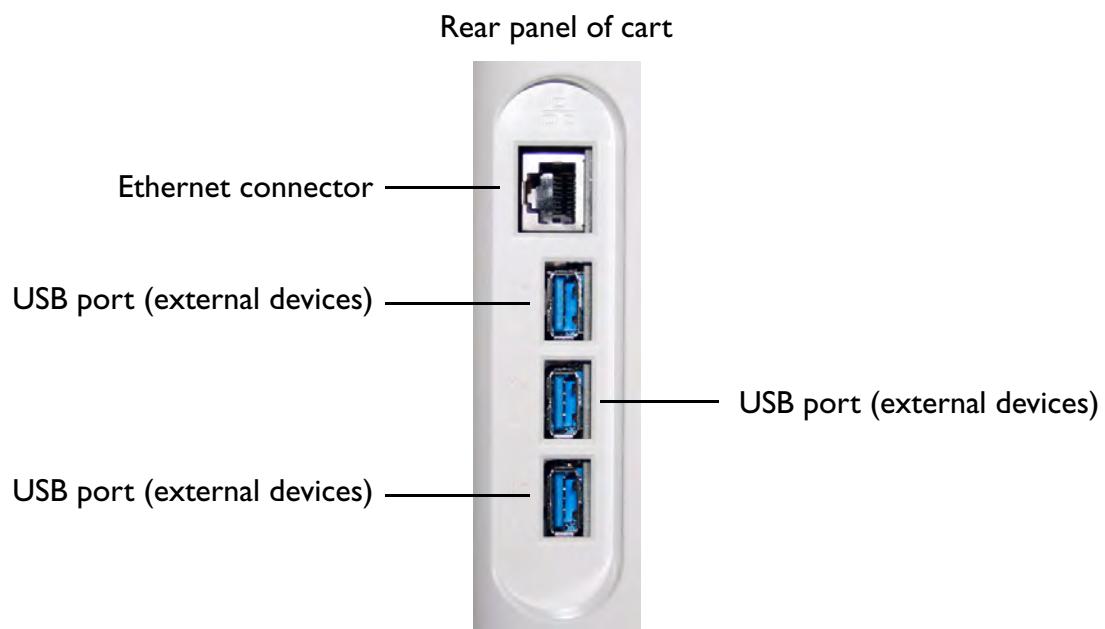


Figure 11-21

**USB Hub (Integrated) Connector Designations (D.0 Cart)**

## CX30/CX50 System and Cart Cabling Diagrams

### WARNING

The system cabling diagrams are illustrated on [Figure 11-22](#) through [Figure 11-26](#).

The OEM cabling diagrams are illustrated on [Figure 11-27](#) through [Figure 11-37](#).

**NOTE** An isolation transformer is an option offered for the non-cart configurations.

Figure 11-22

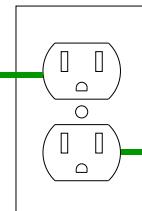
System Cart Power Cord Cabling Diagram



Rear of AC tray housing  
(A.0, B.0 or C.0 cart)

See [Table 11-1](#) for all power cable numbers

453561361901



AC power source

453561361901

Switch plate  
([Figure 11-26](#))

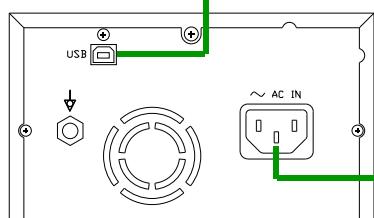


Rear of AC tray housing  
(D.0 cart)

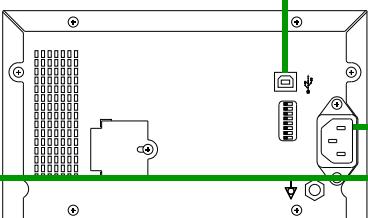
Figure 11-23

**CX30 or CX50 System and OEM Power Cabling Diagram (Stand-Alone Configuration)**

System and AC adapter  
453561153453



UP-D897MD (shown),  
UP-D898MD



CP30DW (shown),  
UP-D23MD, or UP-D25MD

453561361901

Without isolation transformer

With isolation  
transformer

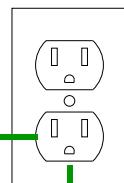
453561378301

453561378301

453561378301

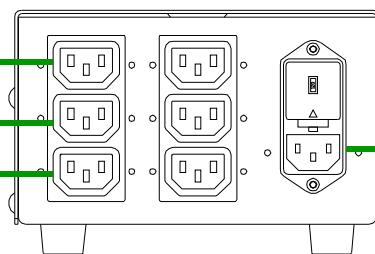
Transformer  
(optional)

Power



453561361901

With isolation  
transformer



453561361901

Figure 11-24

## CX30 or CX50 System Cabling Diagram (On-Cart Configuration, A.0, B.0 or C.0)



Rear side of system



AC adapter

To B/W  
printer



USB hub

Right side  
of system

453561363992

System USB cable

To color printer

Part of AC Tray



Figure 11-25

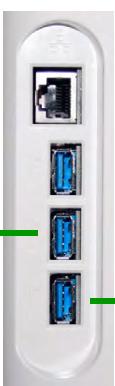
**CX30 or CX50 System Cabling Diagram (On-Cart Configuration, D.0)**

Rear side of system



AC adapter

To foot switch



USB ports (rear cart)

Right side  
of system

Ethernet cable

System cable



Cart cabling diagram

Figure 11-26

To external  
devices

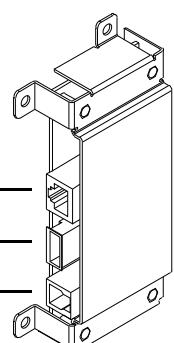
Part of AC Tray



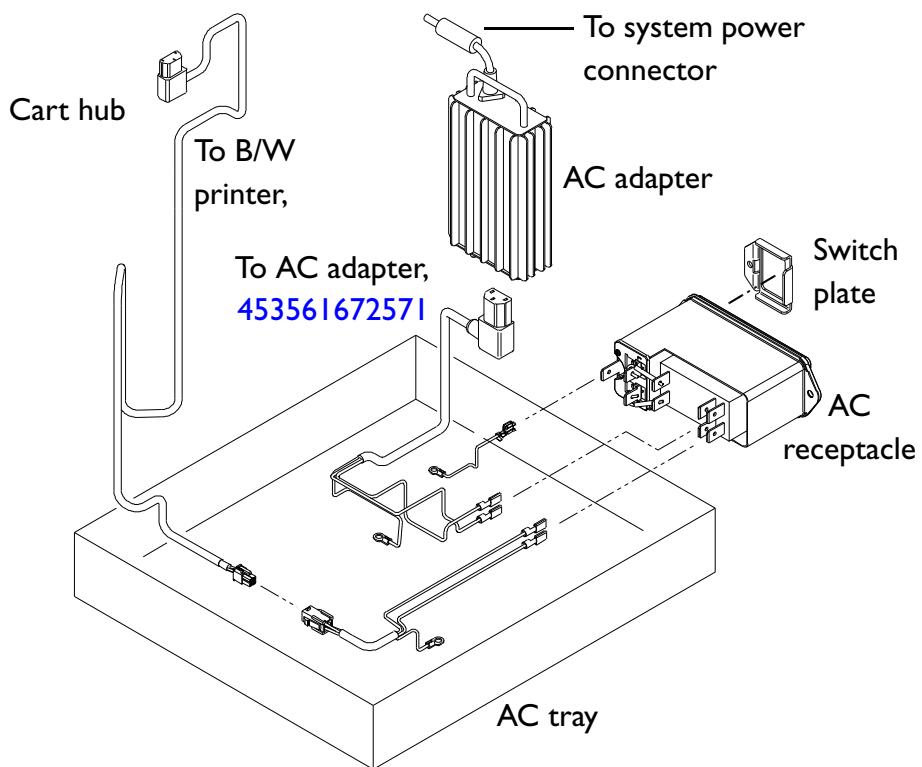
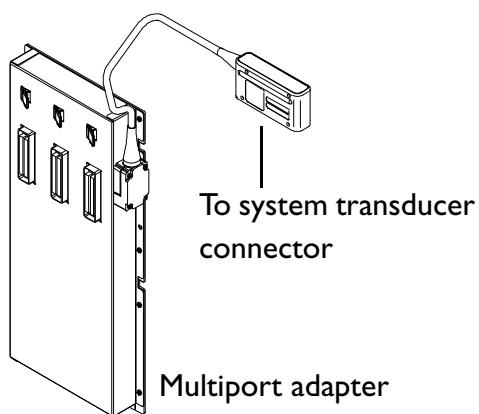
Figure 11-26

## Cart Internal Cabling Diagram (D.0)

System cabling diagram  
Figure 11-25



Ethernet, 453561672601  
Printer USB, 453561672591  
System USB, 453561672581



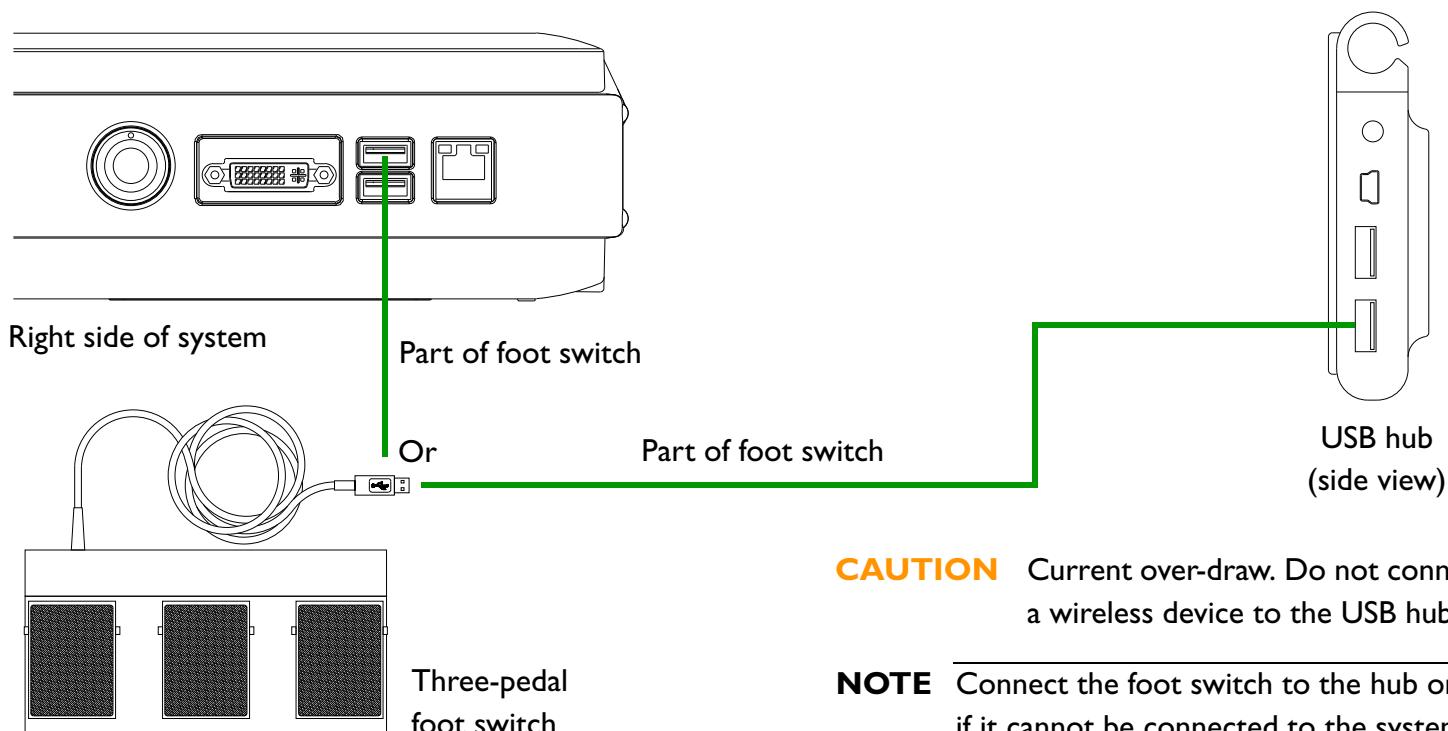
## OEM Cabling Diagrams

**Figure 11-27**

The following diagrams show the connectivity between the peripherals and the system cart.

The B&W printer is pre-installed at the factory on C.0 and D.0 carts.

### Foot Switch Cabling Diagram (A.0, B.0 or C.0 Cart)



## A.0 and B.0 Cart

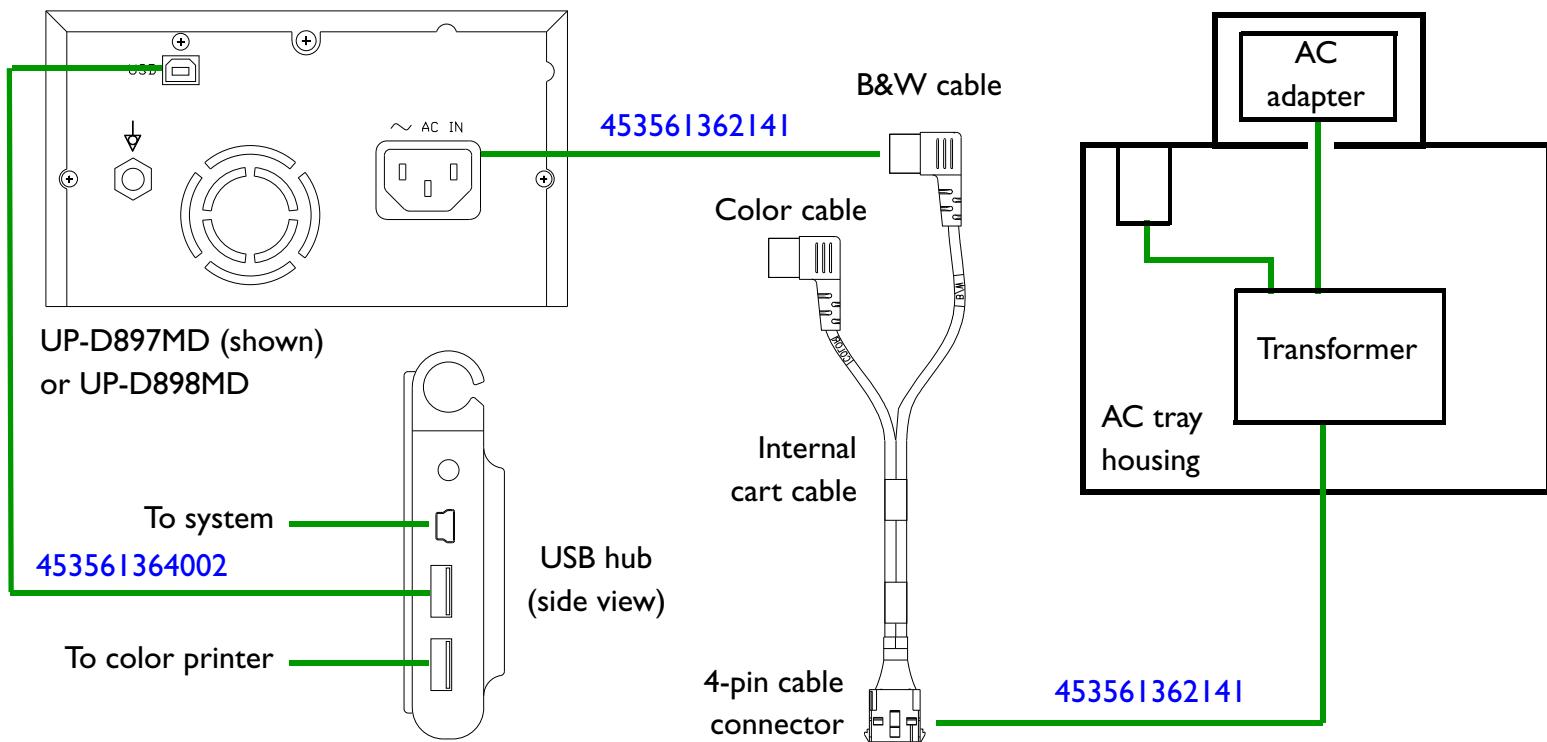
**Figure 11-28****UP-D897MD or UP-D898MD Sony Digital B&W Printer Cabling Diagram (On-Cart, A.0 or B.0)**

Figure 11-29

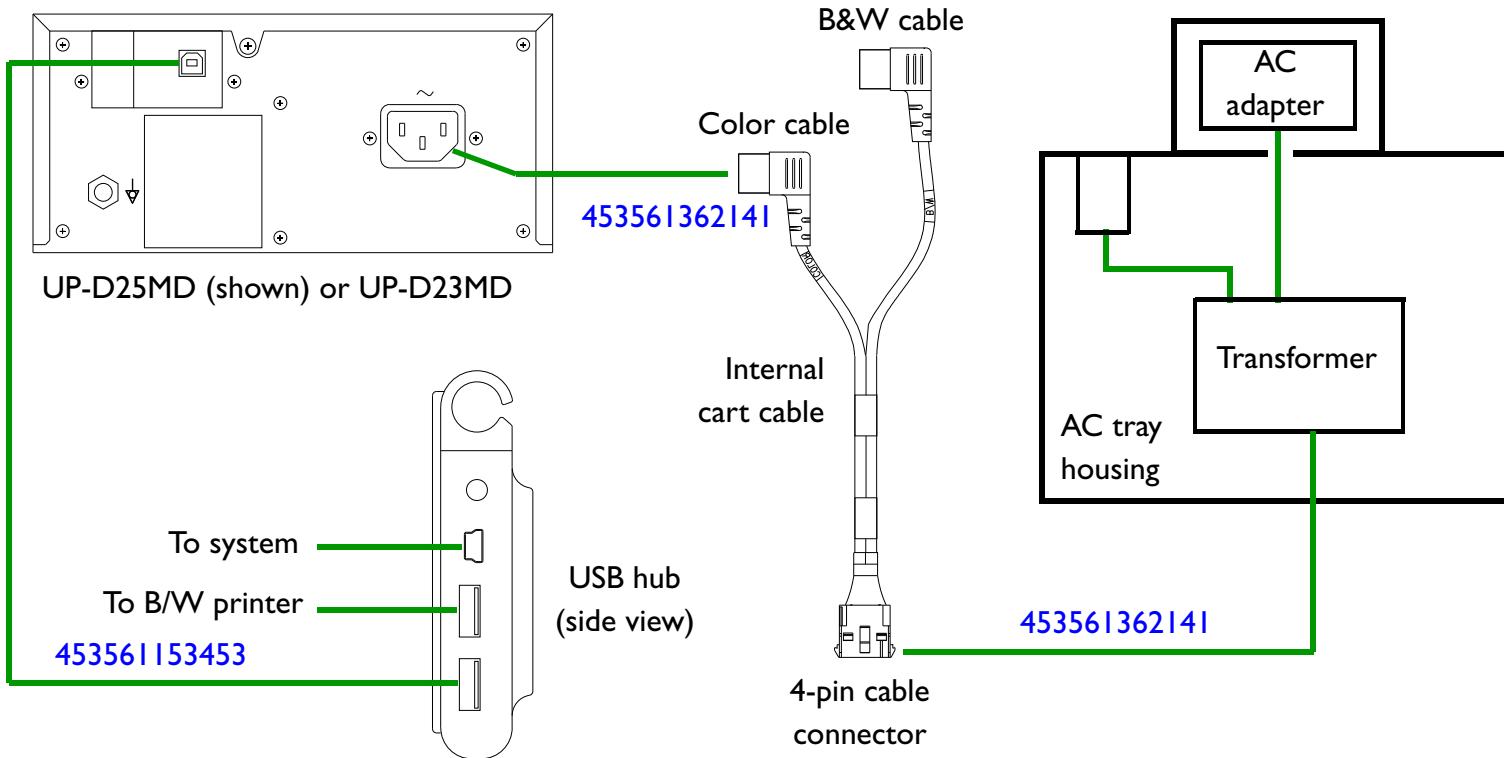
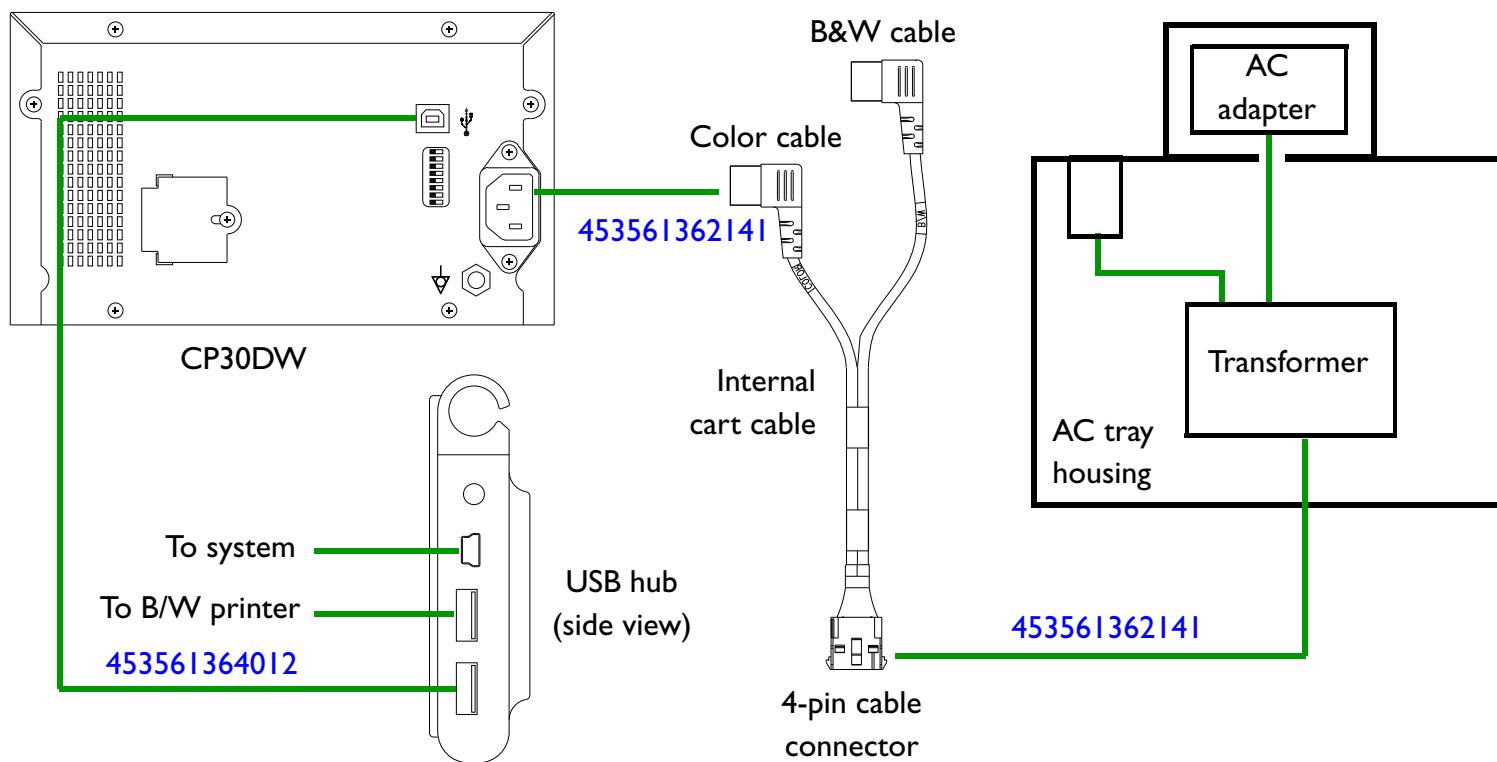
**UP-D23MD or UP-D25MD Sony Digital Color Printer Cabling Diagram (On-Cart, A.0 or B.0)**

Figure 11-30

## CP30DW Mitsubishi Digital Color Printer Cabling Diagram (On-Cart, A.0 or B.0)



**C.0 Cart**

Color printers cannot be installed on the C.0 cart. See [Figure 11-33](#) for external configuration.

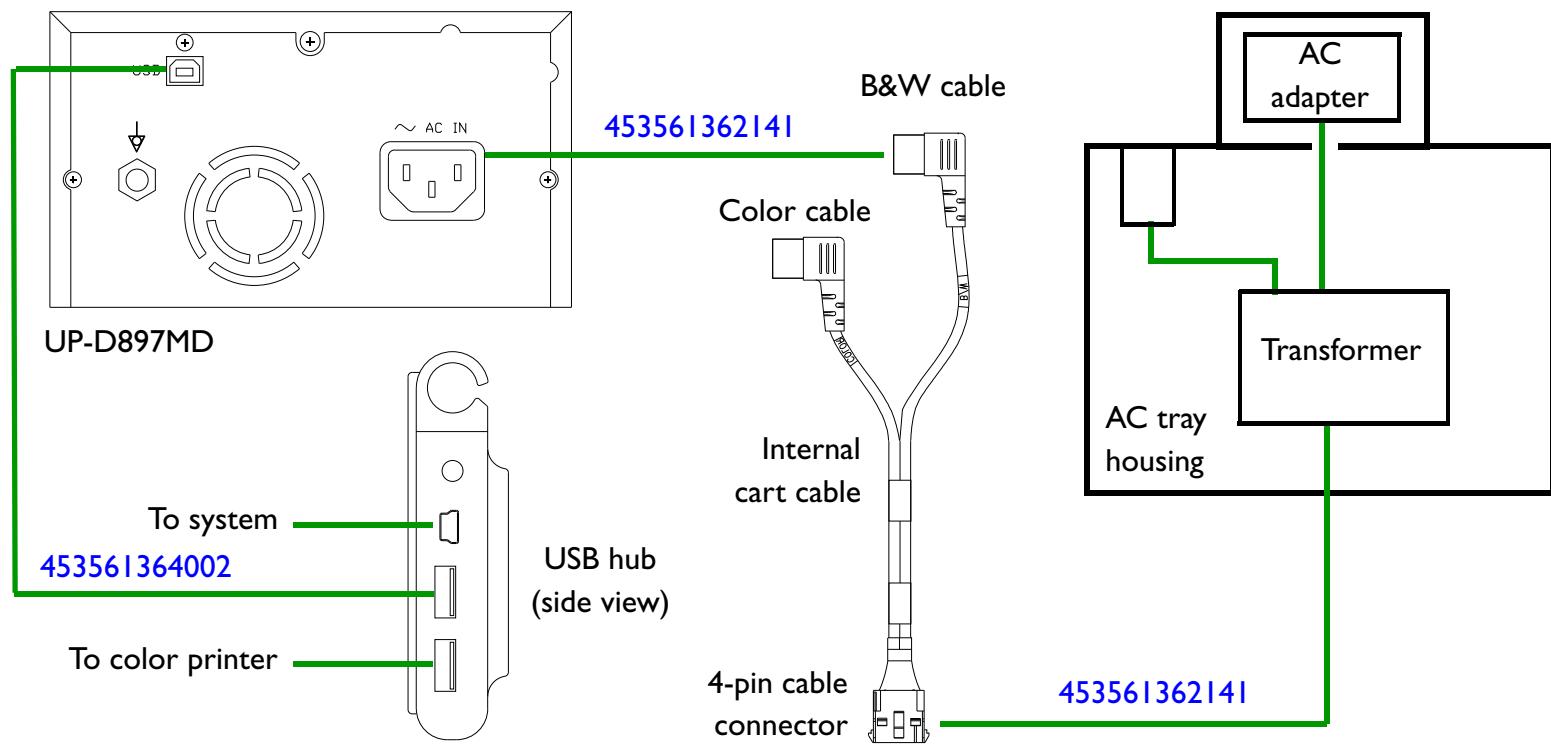
**Figure 11-31****UP-D897MD Sony Digital B&W Printer Cabling Diagram (On-Cart, C.0)**

Figure 11-32

## UP-D898MD Sony Digital B&amp;W Printer Cabling Diagram (On-Cart, C.0)

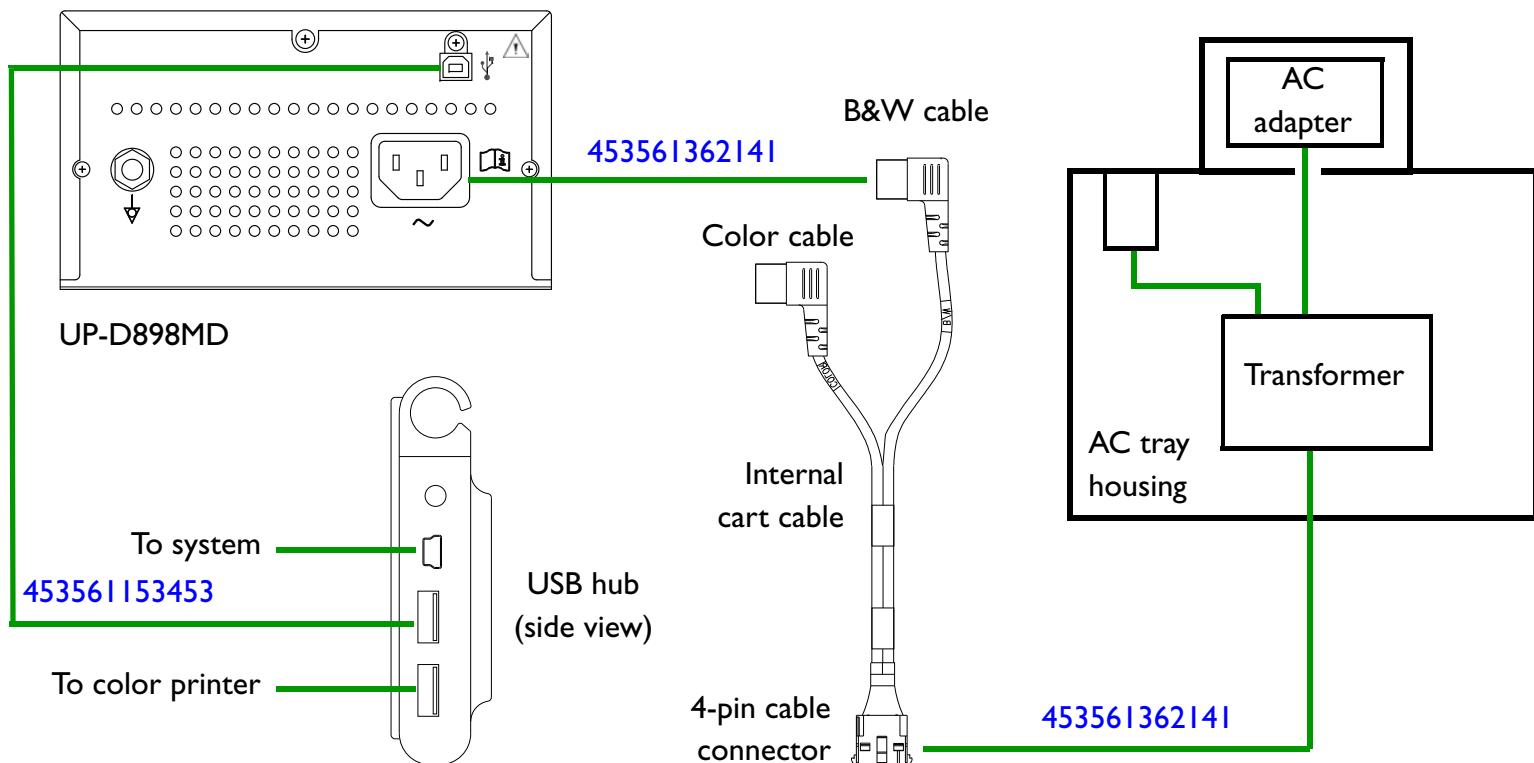
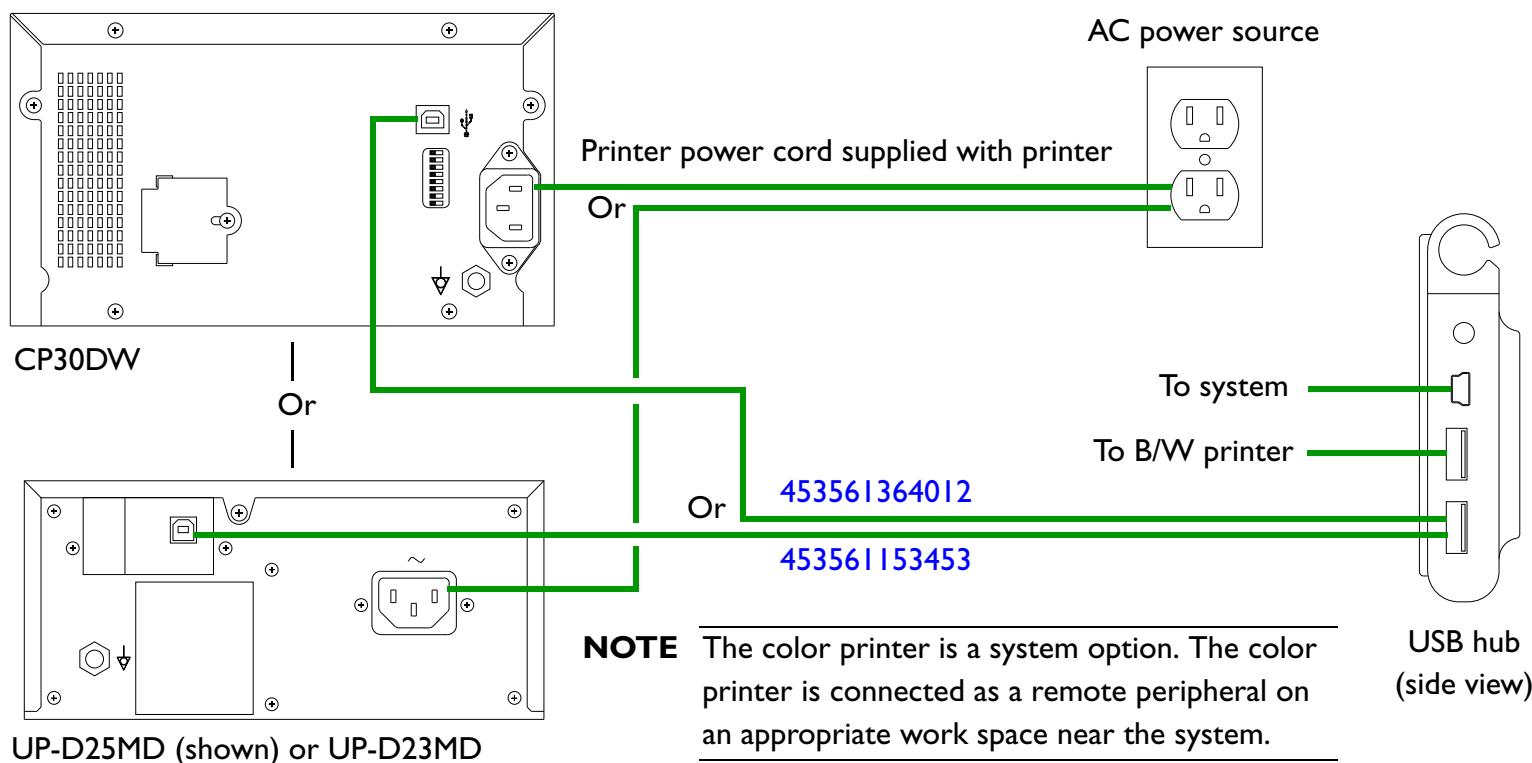


Figure 11-33

## External Color Printer Cabling Diagram (Stand-Alone Configuration, C.0)



**D.0 Cart**

Color printers cannot be installed on the D.0 cart. See [Figure 11-36](#) for external configuration.

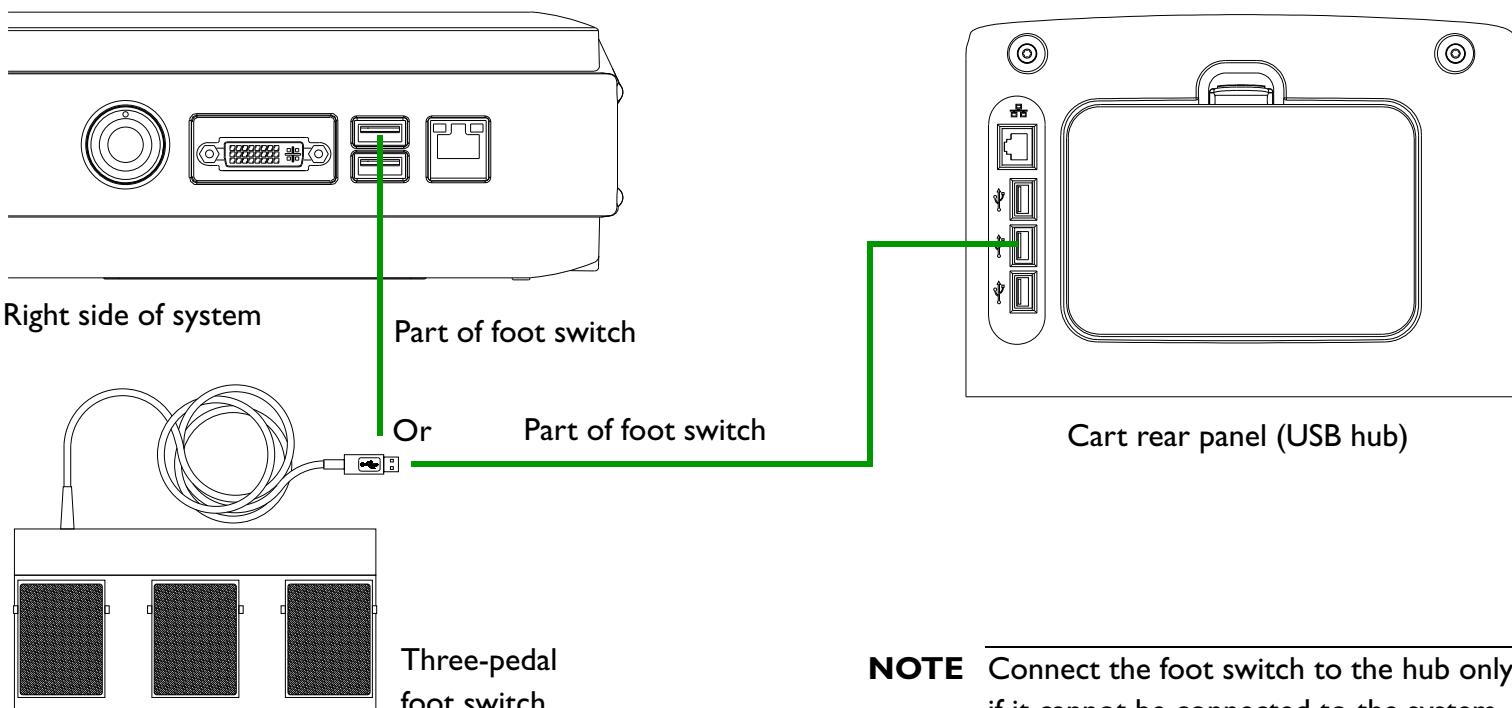
**Figure 11-34****Foot Switch Cabling Diagram (D.0 Cart)**

Figure 11-35

## UP-D897MD or UP-D898MD Sony Digital B&amp;W Printer Cabling Diagram (On-Cart, D.0)

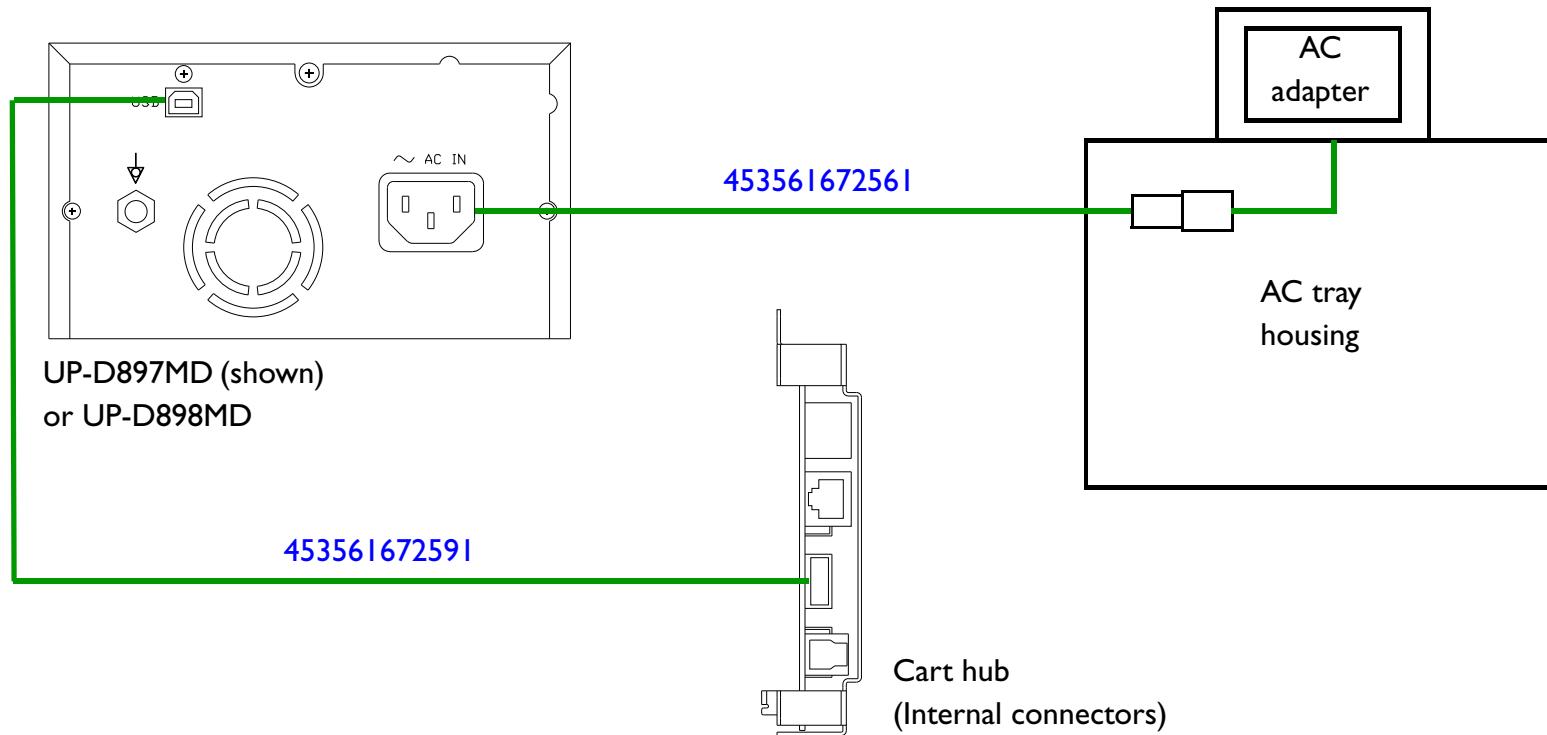


Figure 11-36

## External Color Printer Cabling Diagram (Stand-Alone Configuration, D.0)

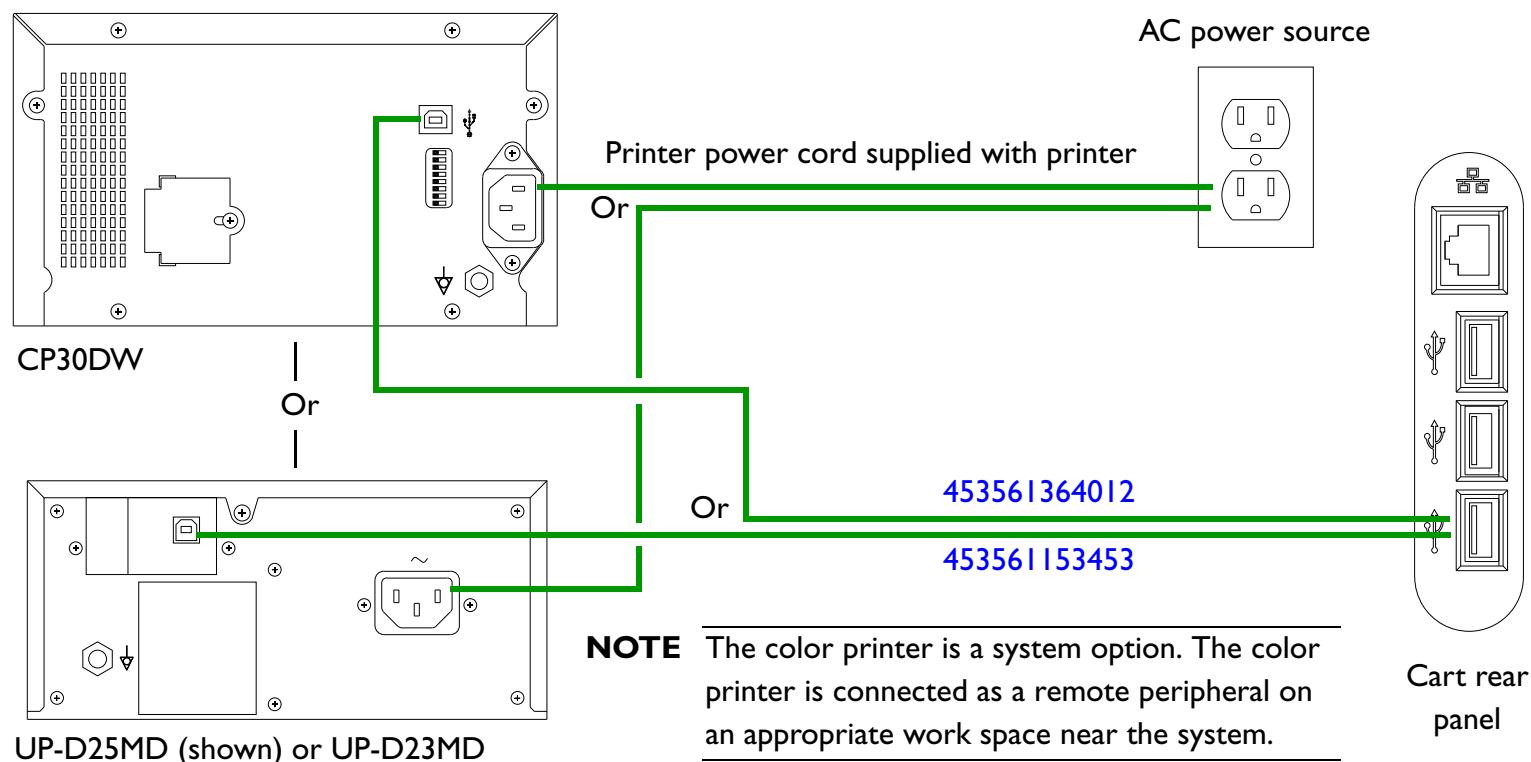
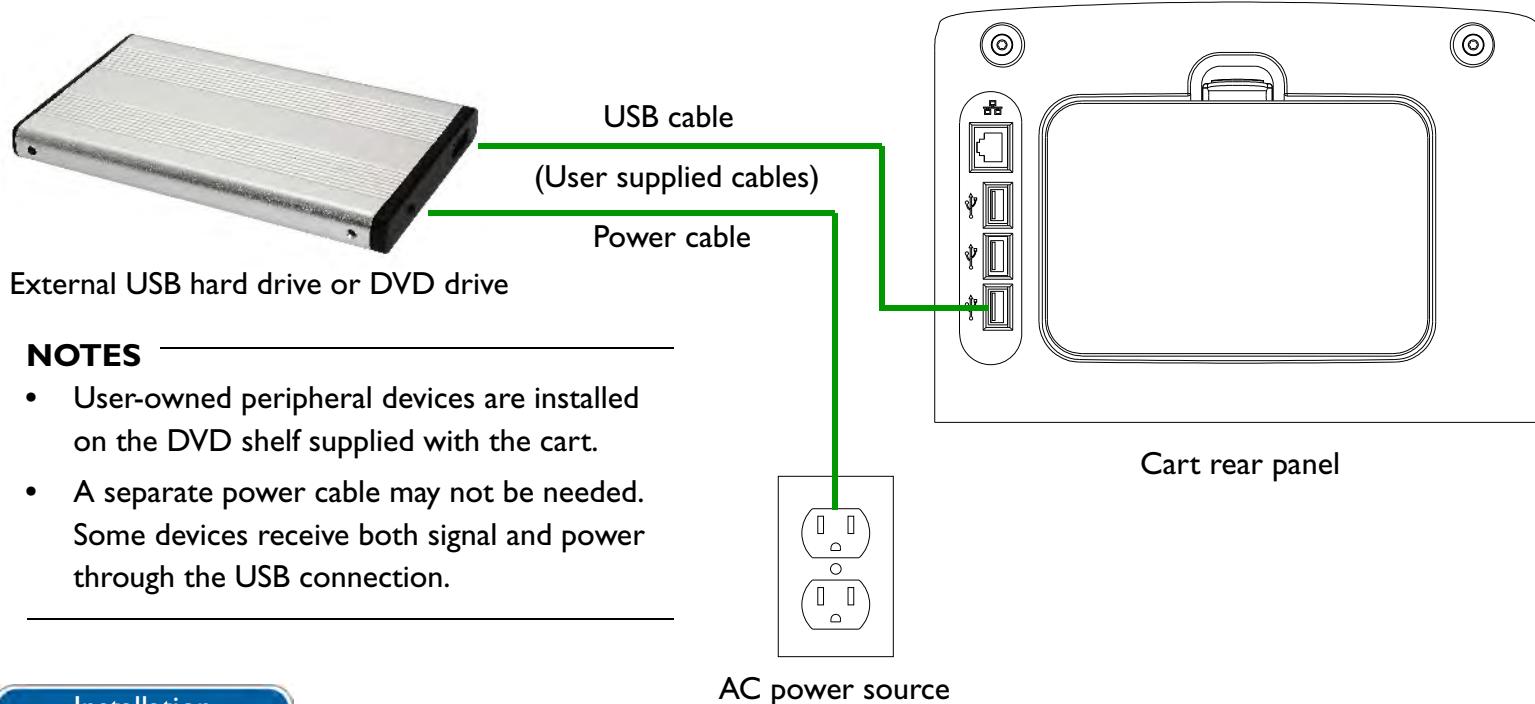


Figure 11-37

## User-Owned Peripheral Device Cabling Diagram (On-Cart, D.0)



# I2 Change History

## Introduction

This section summarizes the changes associated with specific program releases. Any hardware part number additions or changes not dependent on software compatibility that accompany these releases are incorporated into the appropriate sections of this manual.

## CX50 System Releases

Table I2-1 shows the CX50 system releases and corresponding hardware releases.

**Table I2-1 CX50 System Releases and hardware Releases**

System Revision	Hardware Revision	Notes
1.0 through 2.5	A.x	
3.0 and 3.1	B.0	
3.1.1 and later	C.0	RoHS hardware

## Initial CX50 System Release (Version 1.0)

Philips Ultrasound released the CX50 Ultrasound System with version 1.0 software for customer orders in October 2008.

Transducers supported at initial release:

- D2cwc
- S5-1
- X7-2t

Operating Notes (English part number 453561311841) apply to this release.

**CX50 Version  
1.0.2 Release**

Philips Ultrasound released the CX50 Ultrasound System with version 1.0.2 software for customer orders in October 2008.

This release incorporates a production software change associated with color flow in international locales with customized presets. Operating Notes (English part number 453561311842) apply to this release.

**CX50 Version  
1.1 Release**

Philips Ultrasound released the CX50 Ultrasound System with version 1.1 software for customer orders in October 2008. Operating Notes (English part number 453561386301) apply to this release.

## Software

This release incorporated the following changes, still supporting all features in the previous software version:

- Added Color M-mode for the X7-2t transducer.
- Added full-cycle acquisition to the Stress Echo package. The configured stress loop type (full cycle or systole) is saved with the application preset.
- Added 3COM Wireless 2870 to COTS.21A.
- Modified GSDF monitor curves to increase monitor brightness.
- Improved Color velocity scales on X7-2t transducer.
- Added an RST test for the LCD backlight module.
- Added visibility into USB device state.
- Power Board Test improvements:
  - Shorten\_Psup\_TestTime
  - Psup\_Breakout\_HVTest

- Replaced Nero CD/DVD drivers with MS IMAPI drivers.
- Added a unique splash screen at startup when RST/Service Hot Keys can be invoked.
- Added an RST test for the LCD backlight module.
- Added visibility into USB device state.

## Hardware

Hardware part number changes were implemented parallel to this release for the following:

- Case Bottom Assy
- Fence Assy
- Battery Door Assy
- Left Side Case Assy
- Right Side Case Assy
- User Interface Assy, Morpheus
- Assembly, COM Express/Mainboard
- Fan Bracket Kapton

## CX50 Version 2.0 Release

Philips Ultrasound released the CX50 Ultrasound System with version 2.0 software for customer orders in June 2009. Operating Notes (English part number 453561395911) apply to this release.

## New Clinical Features

- Fully featured GI/Shared Service ultrasound system
- Abdominal, OB, GYN, Vascular (including TCD), Small Parts, Musculoskeletal, Contrast (General & Superficial), Acute Care, and Regional Anesthesia

- SonoCT Real-time Compound Imaging
- Color Power Angio (CPA)
- Triplex Doppler
- Freehand 3D Imaging
- SmartExam
- QLAB 7.1
- Integrated Ultrasound

---

**NOTE** Integrated Ultrasound allows the CX50 system to integrate with the Allura Xper FD cardiovascular X-ray system. For more information, see the CX50 information related to this feature in the relevant sections of this manual.

---

- Additional transducer support:
  - C5-1 (with compact connector)
  - C9-3v (with compact connector)
  - D5cwc
  - L12-3 (with compact connector)

## Hardware Changes

- User Interface Assembly (control panel)
- Optional cart

**CX50 Version  
2.0.3 Release**

Philips Ultrasound released the CX50 Ultrasound System with version 2.0.3 software for customer orders in October 2010. Operating Notes (English part number 453561466901) apply to this release.

**Software**

This release supported all features supported in the previous software version and added no new features.

**Hardware**

Hardware changes were implemented parallel to this release for the following:

- Mitsubishi CP30DW Digital Color Printer
- Locking mechanism on all four casters

**CX50 Version  
2.1 Release**

Philips Ultrasound released version 2.1 of the CX50 Ultrasound System for customer orders in October 2011.

This sustaining release addressed the replacement of parts reaching end-of-life, improved software reliability, and improved remote service capability. Operating Notes (English part number 453561474071) apply to this release.

**Software**

This release supported all features supported in the previous software version and added no new features.

**Ultrasound Application**

The new Hydis monitor performs at a higher native resolution than the end-of-life LG monitor that the Hydis replaces. A software infrastructure change, the Display Toolkit (DTK), is implemented to manage higher resolution.

Version 2.1 also releases the Internet Secure Socket Layer (iSSL) feature, permitting a remote service connection using a standard, encrypted Internet connection through the customer-site firewall.

### **Operating System (OS.09)**

A new version of the operating system (OS.09) is also released to add the Microsoft fixes and security updates provided in Microsoft Service Pack 3 (SP3).

### **Drivers.29**

A new version of the drivers software, also released, added the following support:

- EDIDs to support the new Hydis monitor
- Driver support for the new Belkin wireless adapter (F7D2101 “Surf & Share”)
- Hydis LCD Gamma/Brightness GI (defaults) settings
- Hydis LCD Gamma/Brightness non-GI settings

### **Hardware**

The CX50 2.1 program released the Hydis LCD monitor (required a redesigned DIB and new plastics for the panel, which are part of the assembly).

**CX50 Version  
2.1.1 Release**

Philips Ultrasound released version 2.1.1 software for the CX50 Ultrasound System in November 2011. Version 2.1.1 was an upgrade only and was not released to the manufacturing line.

Operating Notes (English part number 453561634871) apply to this release.

**Software**

This version extends the top blue border to the right edge of the monitor screen and fixed a TI reporting inaccuracy. This release supports all features supported in the previous software version and added no new features.

**Hardware**

No hardware changes accompanied this release.

**CX50 Version  
2.5 Release**

Philips Ultrasound released version 2.5 of the CX50 Ultrasound System for customer orders in November 2011. Operating Notes (English part number 453561492501) apply to this release.

**Software**

This release supports all features of the previous version and accomplished the following:

- Product market position improved
  - GI/Shared Service compact
  - Multiport adapter on the cart
  - New transducers
  - QLAB 8.1
- Service iSSL added to simplify remote connectivity
- Basic CX50 base hardware unchanged; cart added the optional Multiport adapter

- Additional transducer support:
  - C8-5
  - S8-3
  - S12-4

**CX50 Version  
2.5.1 Release**

Philips Ultrasound released version 2.5.1 of the CX50 Ultrasound System for customer orders in August 2012. Operating Notes (English part number 453561669041) apply to this release.

**CX50 Version  
3.0 Release**

Philips Ultrasound released version 3.0 of the CX50 Ultrasound System for customer orders in August 2012. Operating Notes (English part number 453561655001) apply to this release.

## Software

This release incorporated the following changes, still supporting all features in the previous software version:

- Live 3D
- New DNL link to interventional X-ray: Allows for a Live 3D ultrasound image to be displayed on same display as an X-ray image. The ultrasound 3D image rotates automatically to provide same viewing angle as the X-ray image.
- System supports new intracardiac echo ICE catheter (ViewFlex Xtra) from St. Jude Medical.
- Additional transducer support:
  - C9-3io
  - C10-3v
  - L10-4lap
  - L12-5 50
  - L15-7io

- Workflow improvements
- Service features

## Hardware

The CX50 3.0 program releases these items:

- Monitor with new Display Interface Board (DIB) for improved reliability
- Updated control panel labels for 3D functions
- DVI-Digital output for better display on auxiliary monitors
- Hardware changes to several boards in E-box to support Live 3D feature
- New Multiport adapter supports the X7-2t TEE transducer. A direct connection to the system is no longer required. Customers can connect the X7-2t to the Multiport adapter or directly to the system.

### CX50 Version 3.0.1 Release

Philips Ultrasound released version 3.0.1 of the CX50 Ultrasound System for customer orders in February 2013. Operating Notes (English part number 453561655031) apply to this release.

### CX50 Version 3.1 Release

Philips Ultrasound released version 3.1 of the CX50 Ultrasound System for customer orders in May 2013. Operating Notes (English part number 453561707961) apply to this release.

This program released a new LCD assembly that requires the new software for correct operation.

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**NOTE** The resolution of the new monitor differs from the resolution of the previous monitors. Therefore, the appearance of the user interface may also differ.

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**CX50 Version****3.1.1 Release**

Philips Ultrasound released version 3.1.1 of the CX50 Ultrasound System for customer orders in November 2013. Operating Notes (English part number 453561707961) apply to this release.

**CX50 Version****3.1.2 Release**

Philips Ultrasound released version 3.1.2 of the CX50 Ultrasound System for customer orders in December 2015. Operating Notes (English part number 453561707961) apply to this release.

**CX50 Version****4.0 Release**

Philips Ultrasound released version 4.0 of the CX50 Ultrasound System for customer orders in May 2016. Operating Notes (English part number 453561828161) apply to this release.

**Software**

This release incorporated the following changes, still supporting all features in the previous software version:

- S7-3t TEE transducer
- Security features, including:
  - De-identification of patient data from patient data exported in DICOM format
  - Local and remote user management (remote using LDAP to allow for centralized accounts)
  - Secure DICOM
  - Hard drive encryption
  - Audit Logs and Service Log separation
  - Syslog server support
  - Network Time Protocol (NTP)
  - Wireless Enterprise
  - IPV6 Internet protocol version
  - Patient-based Modality Worklist enhancements

- WhiteListing licensed option (SafeGuard)
- Government Security purchasable option
- Security settings can be backed up to, or restored from, CX50, CX30, Sparq, EPIQ, and Affinti ultrasound systems.
- Print workflow improvements
- Telexy QPath Remote Reporting (North American systems only)
- QLAB 10.5.1 Advanced Quantification Software
- Software Update service option (end-user software installations via USB flash drive)
- Several changes to service functions
- MPEG PC export of images or image loops

## **Hardware**

- Releases a COM Express Main board with a new version of the operating system BIOS. Access to the BIOS requires password authentication.
- Removes the DVD drive as a standard feature. Backup and restoration of system settings and data are accomplished with a USB flash drive.

## CX30 System Releases

Table 12-2 shows the CX30 system releases and corresponding hardware releases.

**Table 12-2 CX30 System Releases and Hardware Releases**

System Revision	Hardware Revision	Notes
1.0	A.x	Non-RoHS (CX30 systems are not RoHS-compliant)
2.0	B.0	

### CX30 Version 1.0 Release

Philips Ultrasound released the version 1.0 CX30 Ultrasound System for customer orders in July 2012. Operating Notes (English part number 453561605891) apply to this release.

Transducers supported at initial release:

- C6-2
- C9-4v
- D2cwc
- D5cwc
- L12-4
- S4-2

### CX30 Version 2.0 Release

Philips Ultrasound released the version 2.0 CX30 Ultrasound System for customer orders in August 2012. Operating Notes (English part number 453561641851) apply to this release.

### Software

This release incorporated the following changes, still supporting all features in the previous software version:

- Additional transducer support:
  - C8-5
  - S8-3
  - L15-7io
- Additional point-of-care presets
- Workflow improvements
- Service features

## Hardware

The CX30 2.0 system program releases these items:

- Monitor with new Display Interface Board (DIB) for improved reliability
- Hardware changes to several boards in E-box (same as CX50 3.0 systems)
- DVI-Digital output for better display on auxiliary monitors
- New Multiport adapter (same as used on CX50 systems)

## CX30 Version 2.0.1 Release

Philips Ultrasound released version 2.0.1 of the CX30 Ultrasound System for customer orders in February 2013. Operating Notes (English part number 453561641851) apply to this release.

**CX30 Version  
2.1 Release**

Philips Ultrasound released version 2.1 of the CX30 Ultrasound System for customer orders in May 2013. Operating Notes (English part number 453561707951) apply to this release.

This program released a new LCD assembly that requires the new software for correct operation.

---

**NOTE** The resolution of the new monitor differs from the resolution of the previous monitors. Therefore, the appearance of the user interface may also differ.

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# I3 Configuration

## Introduction

This section lists all of the released software versions for the system, identifies the primary system PCBs, and shows where these PCBs are located in the system. When applicable, additional PCB reference information is provided.

## About Compatibility and Part Numbers

Call your Philips service representative to determine the software part numbers and to determine the part numbers and compatibility of primary system PCBs and certain hardware assemblies to ensure proper system operation.

## System Software

Software releases are listed in [Table 13-1](#) (CX50) and [Table 13-2](#) (CX30).

**Table 13-I** CX50 System Software

<b>Version</b>	<b>Description</b>	<b>Notes</b>
1.0	I.0, SW, System Application Files	
	OS.07, SW	
	COTS.2I, SW	
	PRINTERS.04, SW	
1.0.2	I.0.2, SW, System Application Files	
	OS.07, SW	
	COTS.2I, SW	
	PRINTERS.04, SW	
1.1	I.1, SW, System Application Files	
	OS.07, SW	
	COTS.2IA, SW	
	PRINTERS.04, SW	
2.0	2.0, SW, System Application Files	
	OS.08, SW	
	DRIVERS.23, SW	
	PRINTERS.05, SW	

**Table 13-1 CX50 System Software (Continued)**

<b>Version</b>	<b>Description</b>	<b>Notes</b>
2.0.3	2.0.3, SW, System Application Files	Requires DRIVERS.25, PRINTERS.06
	OS.08, SW	
	DRIVERS.25, SW	Required for Mitsubishi CP30DW Color Printer
	PRINTERS.06, SW	Required for Epson plain-paper printers
2.1	2.1, SW, System Application Files	
	OS.09, SW	
	DRIVERS.29, SW	
	PRINTERS.06, SW	
2.1.1	2.1.1, SW, System Application Files	Version 2.1.1 was an upgrade only and not released to the manufacturing line.
	OS.09, SW	
	DRIVERS.29, SW	
	PRINTERS.06, SW	

Table 13-1

CX50 System Software (Continued)

Version	Description	Notes
2.5	2.5, SW, System Application Files	
	OS.09, SW	
	DRIVERS.29, SW	
	PRINTERS.06, SW	
2.5.1	2.5.1, SW, CX50, Application CD	
	OS.09, SW	
	DRIVERS.29, SW, CX50	
	PRINTERS.07A, SW, CX50	
3.0	3.0, SW, System Ultrasound Application	A.x hardware systems use Microsoft Windows XP OS. XP is a multiple-disc set.
	OS.11	
	DRIVERS.41, CX50	
	PRINTERS.07A, SW, CX50	
3.0	3.0, SW, System Application Files	B.0 and later hardware systems use Microsoft Windows 7 OS. One disc with all software on it (OS, drivers, and ultrasound application).

**Table 13-1 CX50 System Software (Continued)**

<b>Version</b>	<b>Description</b>	<b>Notes</b>
3.0.1	3.0.1, SW, CX50 Application	For Windows XP systems
	OS.11, SW	
	DRIVERS.41, SW, CX50	
	PRINTERS.07A, SW, CX50	
	3.0.1, SW, CX50 Application	
3.1	3.1,SW,CX50,Application (HW A.x)	For Windows XP systems
	OS.11, SW	
	DRIVERS.41, SW, CX50, or	
	DRIVERS.51, SW, CX50	
	PRINTERS.07A, SW, CX50	
	3.1, SW,CX50,OS,APP,DRV,PTR (HW B.x)	
3.1.1	3.1.1,SW,CX50,Application (HW A.x)	For Windows XP systems
	OS.12, SW	
	DRIVERS.45, SW, CX50 (HW A.x), or	
	DRIVERS.51, SW, CX50	
	PRINTERS.08, SW, CX50 (HW A.x)	
	3.1.1, SW,CX50,OS,APP,DRV,PTR (HW B.x)	

**Table 13-1 CX50 System Software (Continued)**

<b>Version</b>	<b>Description</b>	<b>Notes</b>
3.1.2	3.I.2,SW,CX50,Application (HW A.x)	For Windows XP systems
	OS.I2, SW	
	DRIVERS.5I, SW, CX50	
	PRINTERS.II, SW, CX50 (HW A.x)	
4.0	3.I.2, SW,CX50,OS,APP,DRVr,PTR (HW B, C)	For Windows 7 systems
	4.0, SW,CX50,OS,APP,DRVr,PTR (HW B, C)	For Windows 7 systems

**Table 13-2 CX30 System Software**

<b>Version</b>	<b>Description</b>	<b>Notes</b>
1.0	I.0, SW, System Application Files	
	OS.09, SW	
	DRIVERS.29, SW	
	PRINTERS.06, SW	
1.0.1	I.0.1, SW, System Application Files	
	OS.09, SW	
	DRIVERS.33, SW	
	PRINTERS.06, SW	

**Table 13-2 CX30 System Software (Continued)**

<b>Version</b>	<b>Description</b>	<b>Notes</b>
2.0	2.0, SW, System, Ultrasound Application	A.x hardware systems use Microsoft Windows XP OS. XP is a multiple-disc set.
	OS.11	
	DRIVERS.41	
	PRINTERS.07	
2.0	2.0, SW, System Application Files	B.0 and later hardware systems use Microsoft Windows 7 OS. One disc with all software on it (OS, drivers, and ultrasound application).
2.0.1	2.0.1, SW, CX30, Application	For Windows XP systems
	OS.11, SW	
	DRIVERS.41, SW, CX30	
	PRINTERS.07A, SW, CX30	
	2.0.1, SW, CX30, Application	For Windows 7 systems

Table 13-2

CX30 System Software (Continued)

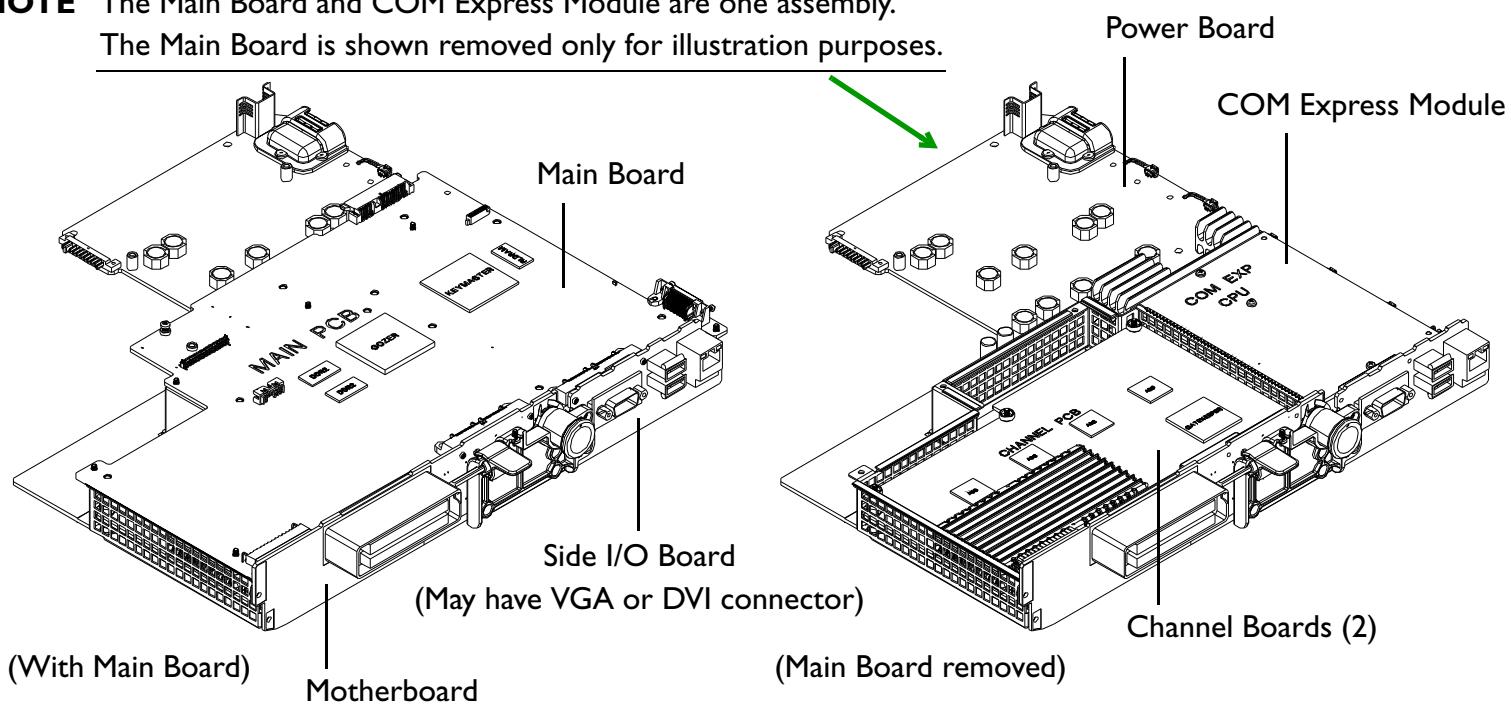
Version	Description	Notes
2.1	2.1, SW, CX30, Application (HW A.x)	For Windows XP systems
	OS.11, SW	
	DRIVERS.45, SW, CX30, or DRIVERS.51, SW, CX30	
	PRINTERS.07A, SW, CX30	
	2.1, SW, CX30, OS, APP, DRVR, PTR (HW B.x)	For Windows 7 systems

## Primary PCB Information

The system primary PCB locations are shown in [Figure 13-1](#). There are no PCB PROMs or PCB jumpers that must be configured in the field.

**Figure 13-I Primary System PCB Names and Locations**

**NOTE** The Main Board and COM Express Module are one assembly.  
The Main Board is shown removed only for illustration purposes.



**NOTE** CB0/Channel board 0 is the one closest to the Main Board (labeled on the MB connector).

**About Compatibility and Part Numbers**

**Disk Drive  
Settings**

There are no jumpers or settings for the hard disk drive or the DVD drive in this system.

**Peripheral  
Settings**

The initial Philips-recommended peripheral settings for use with the system are provided here.

**B&W Printer**

The Sony UP-D897MD and the Sony UP-D898MD have no field-accessible settings.

**Color Printer**

There are no field-accessible settings on the Sony UP-D23MD and UP-D25MD.

The Mitsubishi CP30DW has DIP switches on the back of the printer. The Philips-recommended DIP switch settings for use with the system are for all switches to be in the off position.

# I4 Parts

## Finding a Part Number

This section contains general and specific parts information for the system. System field-replaceable parts and cables are shown in the illustrations and are listed in tables.

Use the parts and cable illustrations to visually locate and identify the part you are looking for. An index number is included in the figure and is linked to the corresponding parts table where part numbers and part descriptions are provided.

### Using the Figures and Tables

#### ► To use the figures and tables in this section

- Start your parts search with the “Configuration Locator” ([Figure 14-1](#)).
- Click one of the configuration buttons to go to the “System Parts Locator” for that configuration.
- If you need a part number, find the drawing of the part in the appropriate figure. The index number, or reference to a detail figure where the index number appears, points to the part. If you need the part description, clicking the blue index number takes you to the corresponding item in the parts table where the description is provided.
- If you have the part number and want to look up the description in the table, use the Acrobat Reader **Find** function to locate the part number, either in the table or in the figure, from which you can click the index number to go to the corresponding item in the parts table.

## Parts Figure and Table Conventions

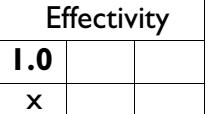
**Table 14-1**

### Parts Figure Conventions

Conventions	Definition
7	The index number for each part or subassembly shown in an illustration is a cross-reference that links to the parts/cable tables containing parts descriptions and additional information.
See <a href="#">Figure 14-X</a>	“See Figure” is a cross-reference link to a detail (subassembly) figure. In the subassembly figure you will find either the part number, a reference to another detail figure, or a reference to the table containing parts descriptions and additional information.
<b>SYSTEM VIEW</b>  1.0 Configuration	The “SYSTEM VIEW” (Configuration Locator), contains configuration buttons that are cross-reference links to the “System Parts Locator” illustrations. The “System Parts Locator” provides cross-reference links to the major system parts assemblies.
<b>PARENT VIEW</b> 	The “PARENT VIEW” indicates an illustration that provides links to additional parts breakdown, indicated with a “See Figure” reference.
 System View	The “System View” button is a cross-reference link to the “SYSTEM VIEW” (Configuration Locator). You can return to the “System Parts Locator” by clicking the “System View” button in the lower left corner of any figure in this section and it will return you to the “Configuration Locator” illustration.

Table 14-1

## Parts Figure Conventions (Continued)

Conventions	Definition
	The “Parent View” button is a cross-reference link to the parent-part or “PARENT VIEW” illustration.
	The “Installation” button is a cross-reference link to a figure’s corresponding installation/removal procedure.
	The “Disassembly” button is a cross-reference link to a figure’s corresponding disassembly/assembly procedure.
	The “Cabling Diagram” button is a cross-reference link to a peripheral cabling diagram.
	The green arrows found throughout the parts illustrations are used to indicate movement (direction, rotation), or to point to details.
	The green pointer lines found throughout the parts illustrations are used to indicate the location of the detail it is pointing to.
	The effectivity box located in the right corner of each figure, denotes the compatible configuration for that figure. An “x” is shown below the effective configuration heading.

**Table 14-2****Parts Table Definitions**

Column	Definition
Index No.	This column lists the index numbers that correspond to the numbers in the parts illustrations.
Part Number	This column lists the 12NC part number (if any), for an item. If a table is referenced in this column, the part number is on that table. Cable part numbers are in Section 11, "Cabling."
Part Description	The name or common description of the item is listed here. Where appropriate, the description column also includes size, tolerance, type or model, and material data for the part. Attaching parts must be ordered separately. They are not provided with the assembly, the subassembly, or the component being attached.
Notes/Reference	Manufacturer's part numbers, sometimes alternate part numbers, special applications, and other information pertaining to a specific part are listed in the Notes/Reference column. For top assemblies containing many replaceable parts, the applicable figure or table for further breakdown of parts is listed here.
Parts Effectivity	Parts effectivity is indicated in the columns on the right side of each parts table. An "x" in a particular column indicates the part is used for that system hardware configuration. An empty cell indicates the part is not compatible. The blue "x" in the effectivity columns are links to the corresponding parts illustrations.

# Parts Ordering Information

## Field Service Engineers

For parts ordering procedures, FSEs should use their standard operating procedures.

## Customers

Customers can order parts through an FSE or directly from the Customer Service Order Processing Department. Customers ordering parts through an FSE need to provide the following information:

- Shipping address
- Purchase order number of equipment
- Part numbers or sales order numbers
- Part descriptions and quantity needed

## Figures and Parts Lists

Figure 14-1

CX30 and CX50 System Configuration Locator

### SYSTEM VIEW



CX30/CX50 System

Uncrating

Packaging

CX30/CX50 Cart

Uncrating

Crating

CX50 system  
(with A.0 or B.0 cart)



CX30 or CX50 system  
(with C.0 cart)



CX30 or CX50 system  
(with D.0 cart)

Parts Locator

Figure 14-2

**CX30 and CX50 Ultrasound System and Optional Cart Parts Locator****PARENT VIEW**

Peripherals

Accessories

System Fasteners

System Video Display

System User Interface

CX30 Labeling

CX50 Labeling

CX30 Enclosures

CX50 Enclosures

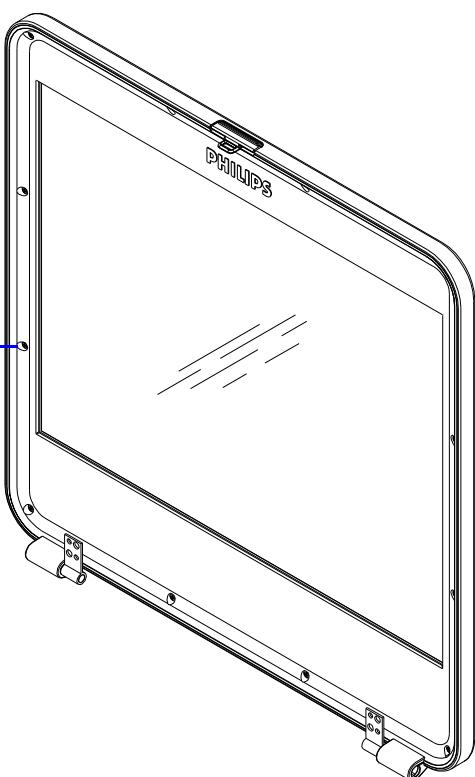
System

CX30 or CX50  
ultrasound systemD.0 cart  
shown

System Cart (Option)

Figure 14-3

## System Video Display Assembly

**PARENT VIEW**

CX50 Effectivity		
A.x	B.x	C.x
X	X	X

CX30 Effectivity	
A.x	B.x
X	X

**Disassembly****Parent View****System**

Table 14-3 System Video Display Assembly

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	See "About Compatibility and Part Numbers" on page 459	CX50 NLT LCD Sub-assembly	Order label when replacing the CX50 video display (Figure 14-21).	x	x	x	x	x
2		CX30 NLT LCD Sub-assembly		x	x	x	x	x
3	453561689611	Screw Caps, CX50	RoHS. For NLT displays 9 places per system	x	x	x		
4	453561689711	Screw Caps, CX30	RoHS. For NLT displays 9 places per system				x	x
5	453561340881	Screw Plug, Bezel (Mushroom)	Non-RoHS. For LG and Hydis displays (CX50) 13 places per system	x	x	x		
6	453561489071	Screw Plug, Bezel, Light Mushroom	RoHS. For Hydis Displays (CX30) 13 places per system				x	x

Figure 14-4

## CX30 System Enclosures

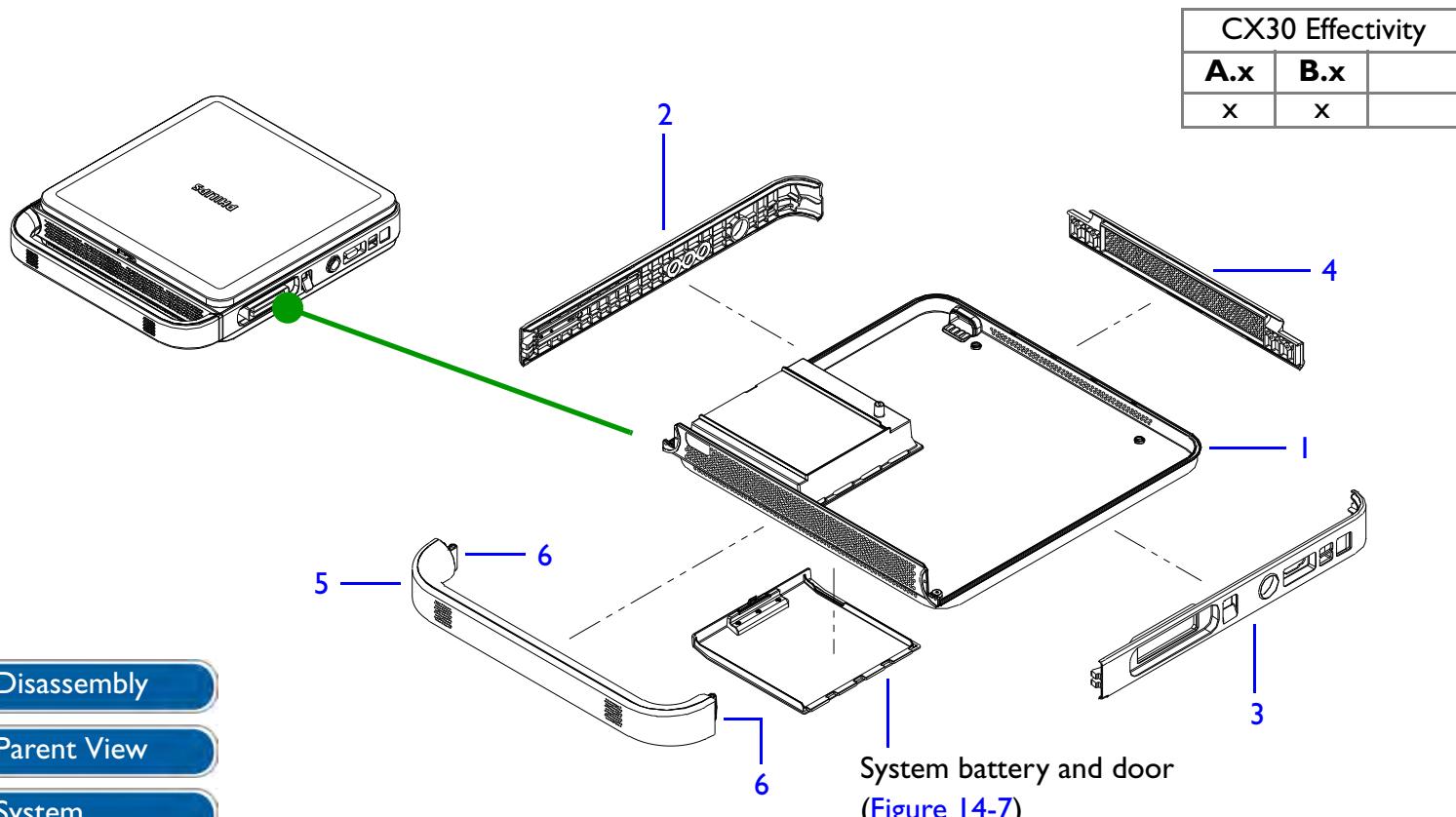


Table 14-4 CX30 System Enclosures

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	453561614461	Case, Bottom Assembly, CX30	Non-RoHS. Includes insulator, pad, and gasketing				x	x
2	453561614481	Case Side Left/Corner Bracket Assembly	Non-RoHS. Includes mounting bracket, DVD button, and DVD arm button				x	
3	453561614491	Case Side Right/Corner Bracket Assembly, CX30	Non-RoHS. Used with Side I/O PCB with VGA connector				x	
4	453561478521	Case Rear, Light Gray	Non-RoHS.				x	x
5	453561614451	Handle Assembly, CX30	Non-RoHS. Includes handle cap, handle grip, ball stud, ball stud receiver, and speakers				x	x
6	453561388371	Screw, M2.5x32mm, Panhead, Phillips Drive, Steel, Zinc Plated (Black), Custom Blue Patchlock	Non-RoHS. 2 places, 1 each side				x	x

Figure 14-5

## CX50 System Enclosures

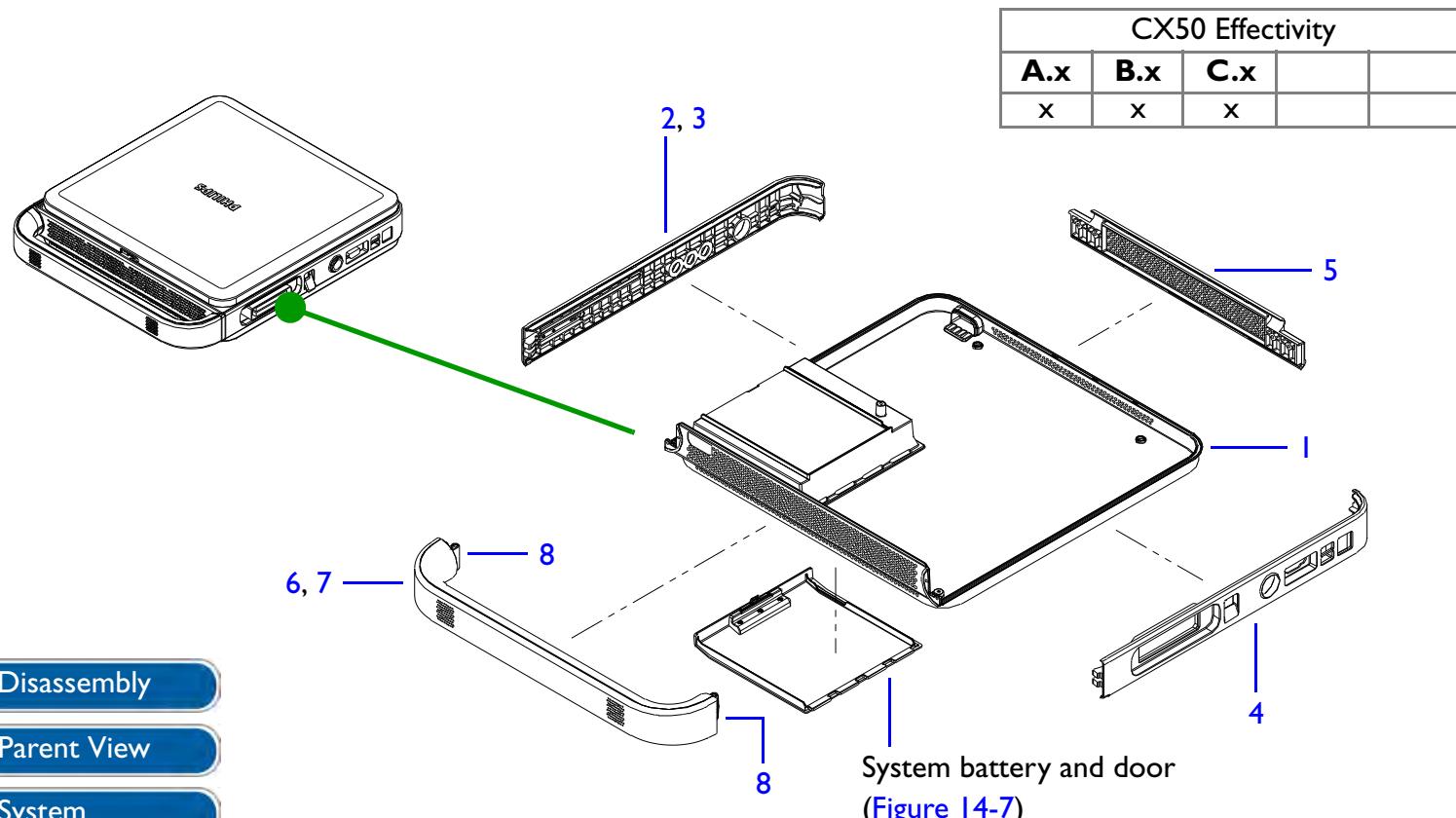


Table 14-5 CX50 System Enclosures

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	453561627381	Case, Bottom Assembly, CX50	Non-RoHS. Includes insulator, pad, and gasketing	x	x	x		
	453561390754	Case, Bottom Assembly, CX50, RoHS	Includes insulator, pad, and gasketing	x	x	x		
2	453561390781	Case Side Left/Corner Bracket	Non-RoHS. Includes mounting bracket, DVD button, and DVD arm (button extension)	x	x			
3	453561699482	Kit, Case Side Left w/Bkt, CX50, C.0, DVD	RoHS. Includes mounting bracket, DVD button, and DVD arm (button extension)	x	x			
4	453561390791	Case Side Right/Corner Bracket	Non-RoHS. Used with Side I/O PCB with VGA connector	x	x			
5	453561290711	Case, Rear	RoHS.	x	x	x		
6	453561601071	Handle Assembly	Non-RoHS. Includes handle cap, handle grip, ball stud, ball stud receiver, and speakers	x	x			

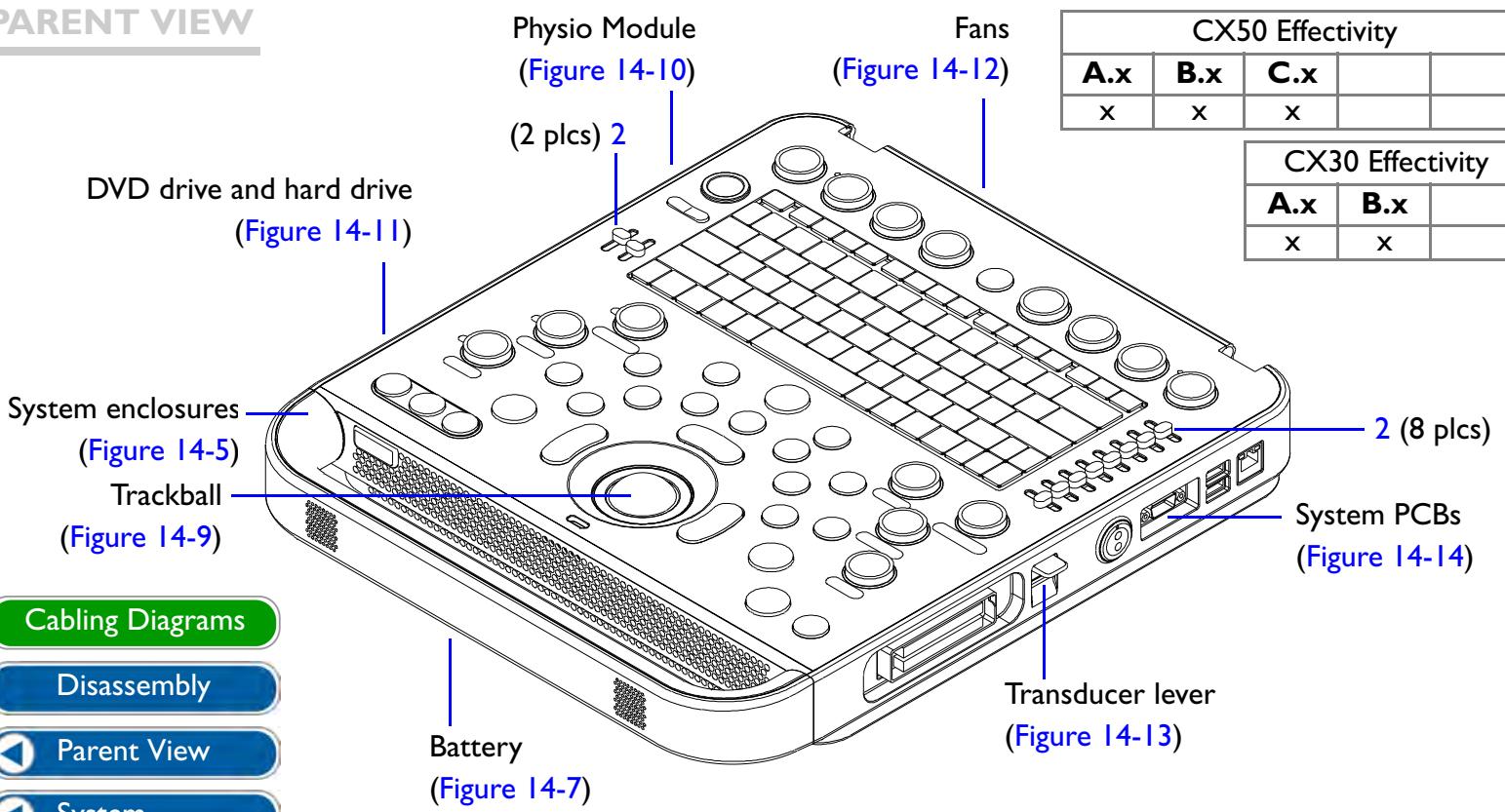
**Table 14-5** CX50 System Enclosures (Continued)

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>CX50 A.x</b>	<b>CX50 B.x</b>	<b>CX50 C.x</b>	<b>CX30 A.x</b>	<b>CX30 B.x</b>
7	453561601072	FRU Assembly, Handle, CX50, RoHS	Includes handle cap, handle grip, ball stud, ball stud receiver, and speakers	x	x	x		
8	453561388371	Screw, M2.5x32mm, Panhead, Phillips Drive, Steel, Zinc Plated (Black), Custom Blue Patchlock	RoHS. 2 places, 1 each side	x	x	x		

Figure 14-6

## System User Interface Assembly and Components

## PARENT VIEW



User Interface Assembly

**Table 14-6** System User Interface Assembly and Components

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	See "About Compatibility and Part Numbers" on page 459	User Interface Assembly, CX30 and CX50	Includes trackball	x	x	x	x	x
2	453561364362	Knobs, Slide Pot, CX30 and CX50	RoHS, 10 places	x	x	x	x	x

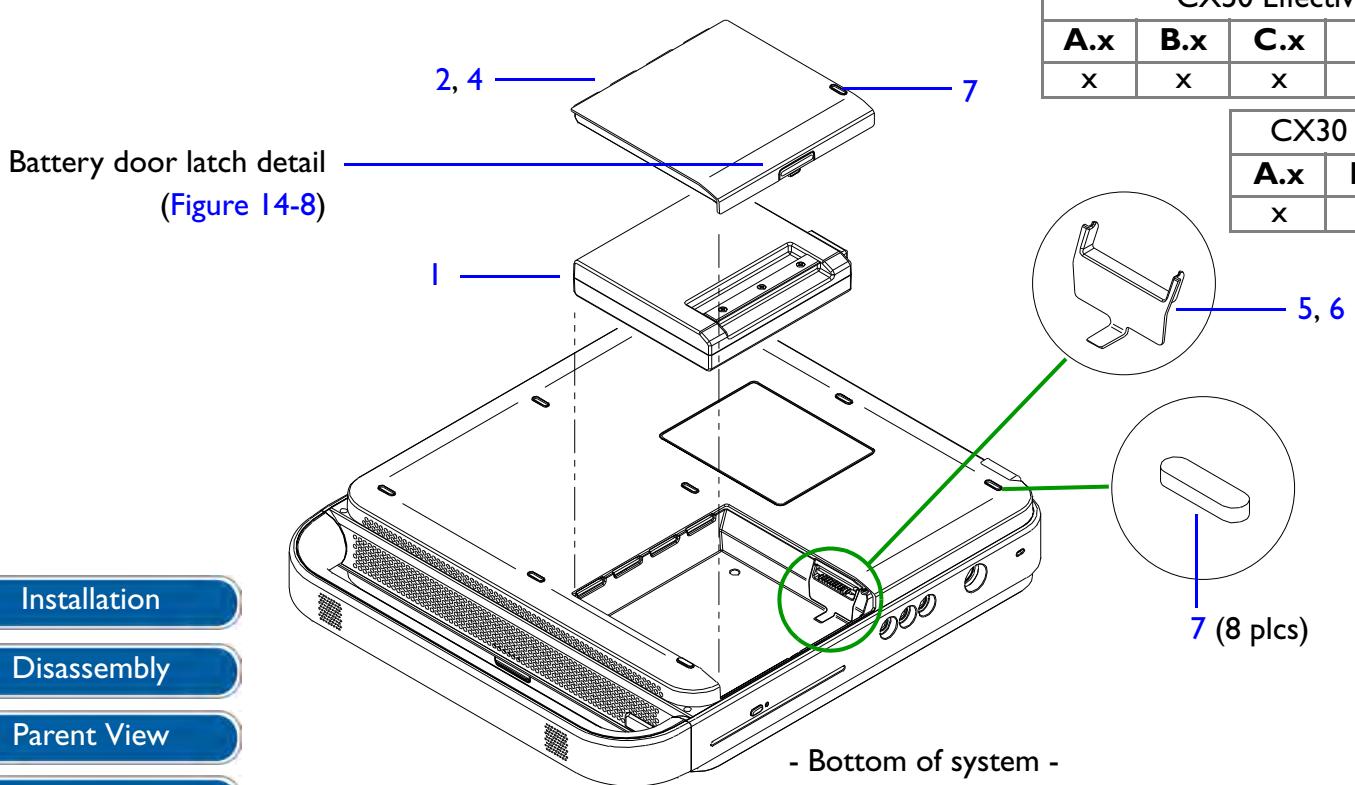
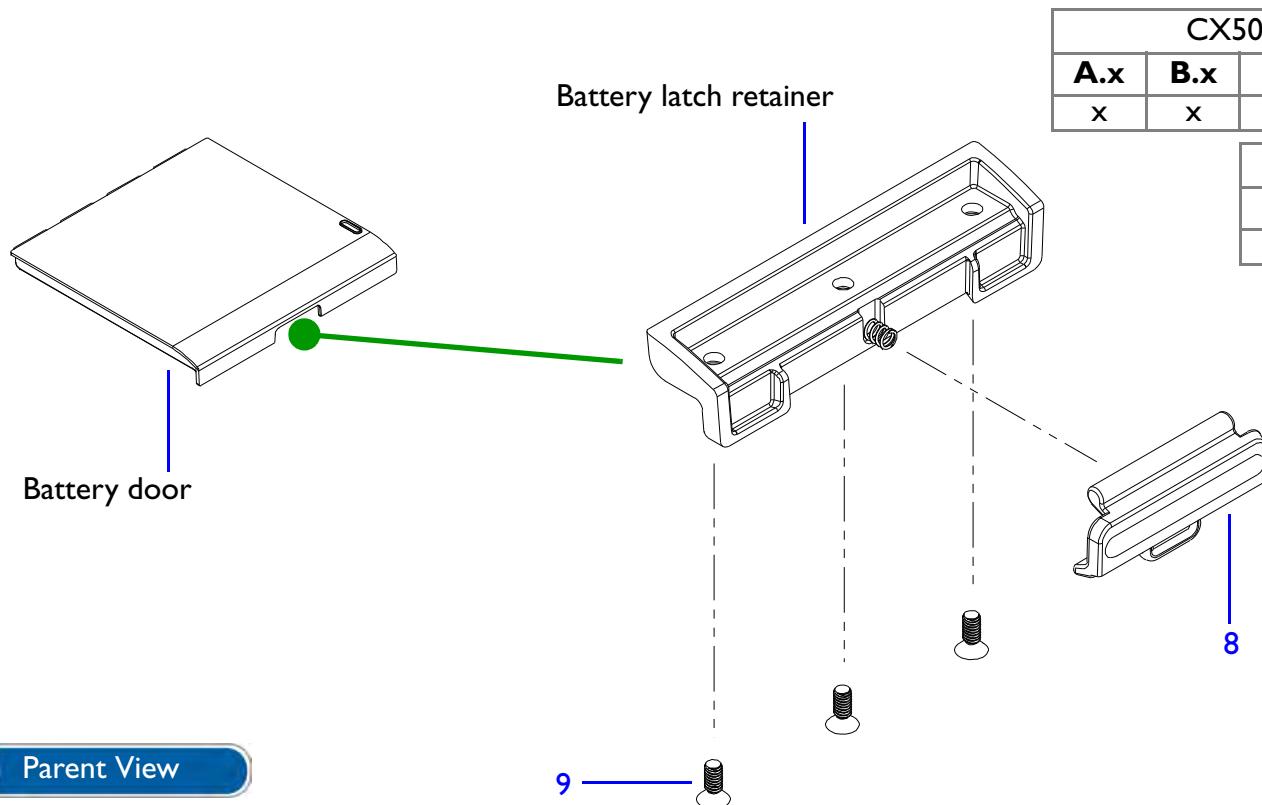
**Figure 14-7** System Battery and Door

Figure 14-8

## Battery Door Latch Detail



CX50 Effectivity		
A.x	B.x	C.x
x	x	x

CX30 Effectivity	
A.x	B.x
x	x

Parent View

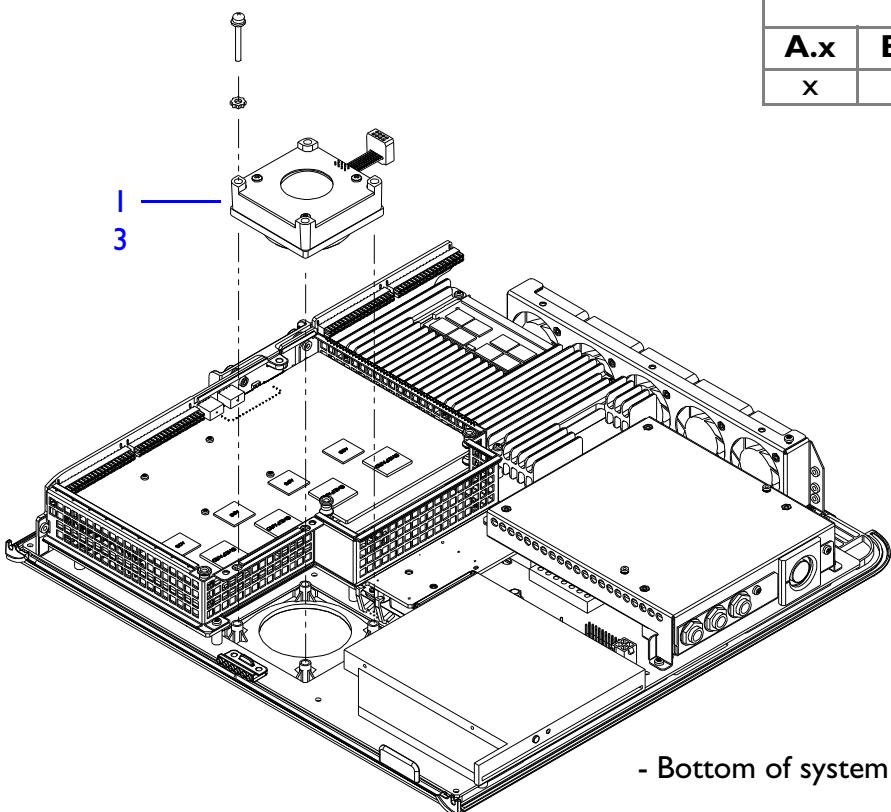
System

**Table 14-7** System Battery and Door

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	453561446191	Battery, CX50 System, 16.8V, 91.02WH, Li-Ion	Batteries are RoHS-exempt. Sanyo	X	X	X	X	X
2	453561390771	Battery Door Assembly, CX50, Non-RoHS	Includes latch, screws, spring, and pads	X	X			
3	453561390772	Battery Door Assembly, CX50, RoHS	RoHS. Includes latch, screws, spring, and pads	X	X	X		
4	453561614471	Battery Door Assembly, CX30	RoHS status not pertinent to CX30. Includes latch, screws, spring, and pads				X	X
5	453561338751	Panel, Battery Connector (CX50)	RoHS, for both, but, RoHS status not pertinent to CX30. Battery connector cover	X	X	X		
6	453561478551	Panel, Battery Connector (CX30)					X	X
7	453561303091	Pad, Case, Bottom	RoHS. Rubber feet, 9 places (8 on case bottom and 1 on battery door)	X	X	X	X	X
8	453561324911	Latch, Door, Battery	RoHS	X	X	X	X	X
9	453561388311	• Screw, M2.5x5mm, Flathead, Phillips Drive, Steel, Zinc Plated, Custom Blue Patchlock	RoHS. 3 places	X	X	X	X	X

Figure 14-9

## System Trackball



CX50 Effectivity		
A.x	B.x	C.x
X	X	X

CX30 Effectivity	
A.x	B.x
X	X

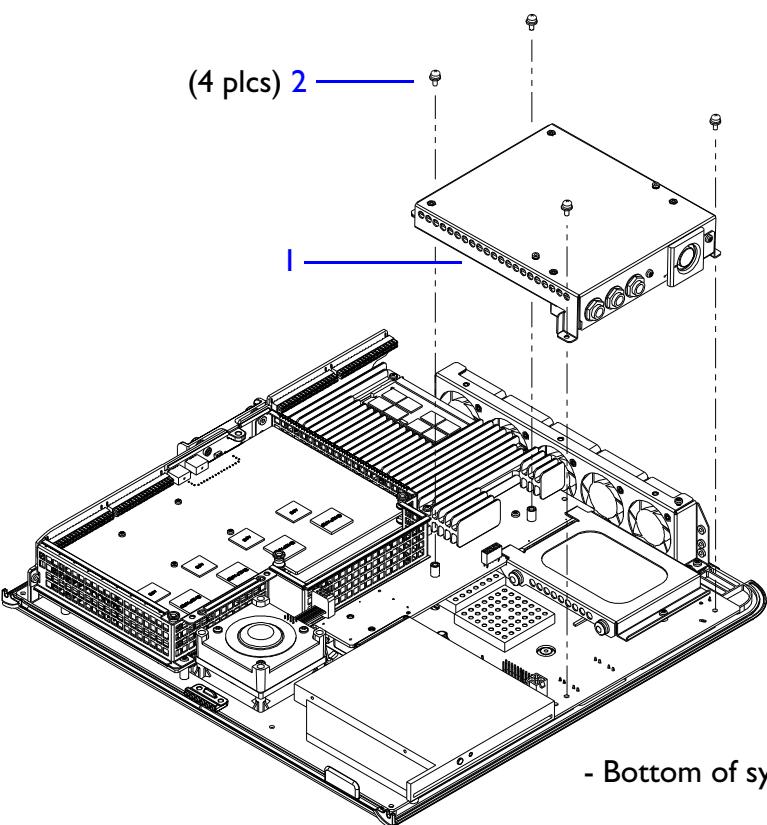
**Disassembly****Parent View****System****- Bottom of system -**

**Table 14-8** System Trackball

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	See "About Compatibility and Part Numbers" on page 459	Trackball Assembly	The ball part of the trackball assembly, is orange for CX50 systems and gray for CX30 systems.	x	x	x	x	x
2	453561489481	Trackball Ring	Non-RoHS. Scraper ring. Available only for original trackball	x	x	x	x	x
3	453561489482	Trackball Ring	RoHS. Scraper ring.	x	x	x	x	x

Figure 14-10

## System Physio Module



- Bottom of system -

Disassembly

Parent View

System

CX50 Effectivity		
A.x	B.x	C.x
x	x	x

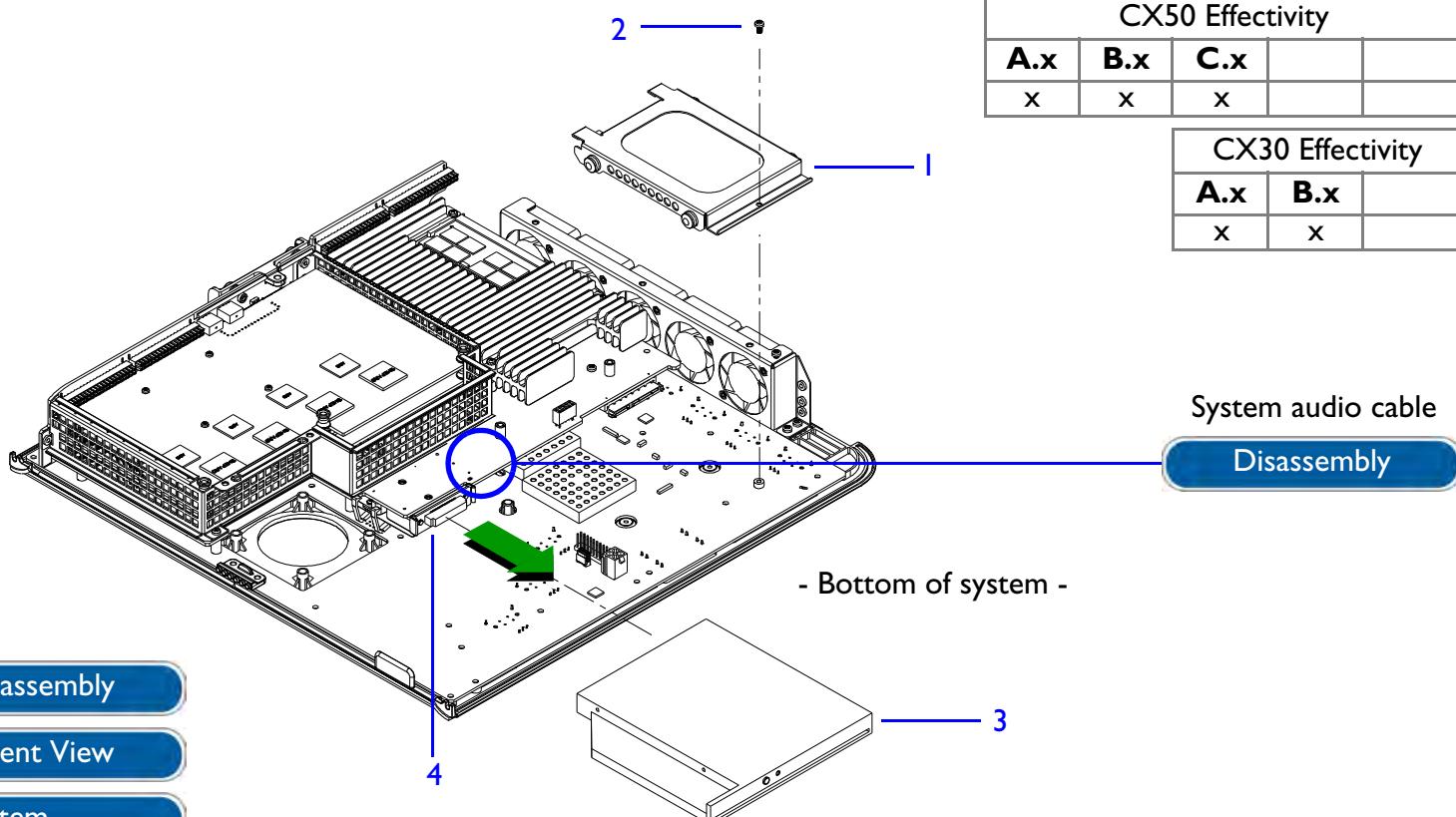
CX30 Effectivity	
A.x	B.x
x	x

**Table 14-9** System Physio Module

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	See "About Compatibility and Part Numbers" on page 459	PCB Assy, Physio Module, Non-RoHS M13 Physio Module Assy, RoHS	Includes sheet metal enclosure	x	x	x	x	x
2	45356138831	• Screw, M2.5x5mm, Panhead, Phillips Drive, Steel, Zinc Plated, Custom Yellow Patchlock	RoHS. 4 places, secures Physio Module	x	x	x	x	x

Figure 14-11

## System DVD Drive and Hard Drive

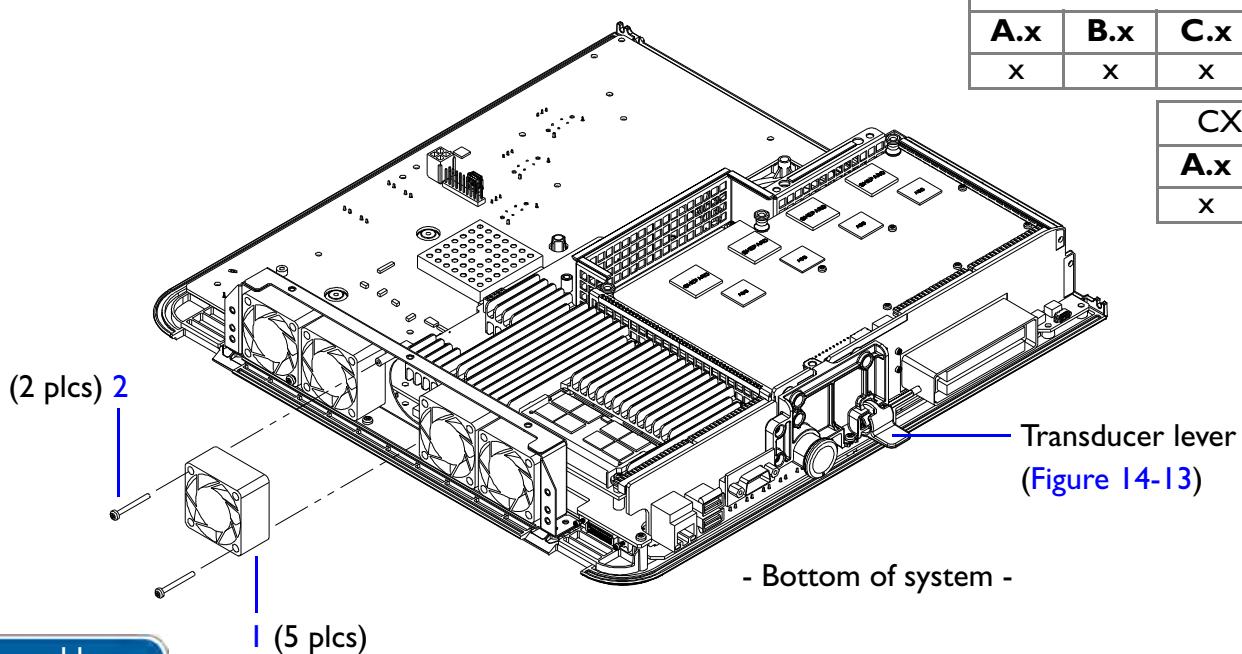


**Table 14-10** System DVD Drive and Hard Drive

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	See "About Compatibility and Part Numbers" on page 459	Drive, HDD	Storage device, hard drive	x	x	x	x	x
2	45356138831	• Screw, M2.5x5mm, Panhead, Phillips Drive, Steel, Zinc Plated, Custom Yellow Patchlock	RoHS. 1 place, secures hard drive	x	x	x	x	x
3	See "About Compatibility and Part Numbers" on page 459	Drive, DVD, SATA Slimline	Storage device, disk drive Slides out of connector	x	x	x	x	x
4	453561299101	Cable Assy, DVD	Non-RoHS. Flex cable	x	x	x	x	x

Figure 14-12

## System Cooling Fans



CX50 Effectivity		
A.x	B.x	C.x
X	X	X

CX30 Effectivity	
A.x	B.x
X	X

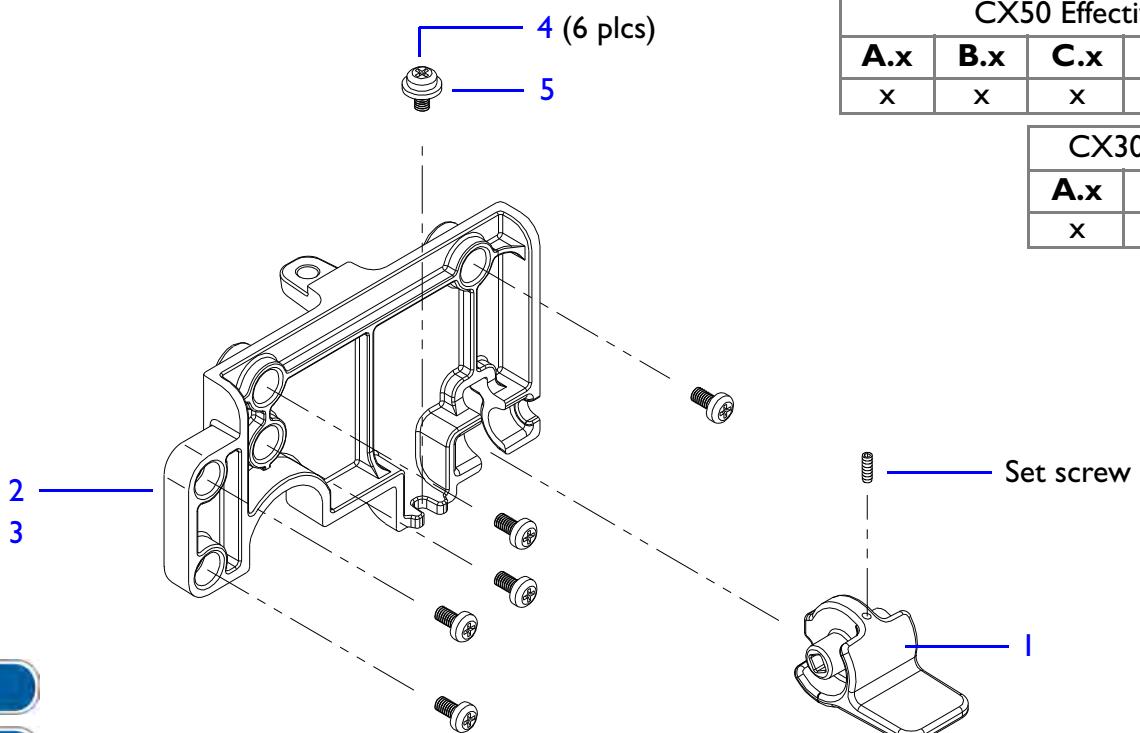
**Disassembly****Parent View****System**

**Table 14-II** System Cooling Fans

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>CX50 A.x</b>	<b>CX50 B.x</b>	<b>CX50 C.x</b>	<b>CX30 A.x</b>	<b>CX30 B.x</b>
1	453561317791	Fan Assembly	RoHS. 5 fans required	x	x	x	x	x
2	453561388351	<ul style="list-style-type: none"><li>Screw, M2.5x14mm, Panhead, Phillips Drive, Stainless Steel, Custom Green Patchlock</li></ul>	RoHS. 10 places (2 places each fan), secures fan	x	x	x	x	x

Figure 14-13

## Transducer Lever Detail

**Disassembly****Parent View****System**

CX50 Effectivity		
A.x	B.x	C.x
x	x	x

CX30 Effectivity	
A.x	B.x
x	x

Table 14-12 Transducer Lever Detail

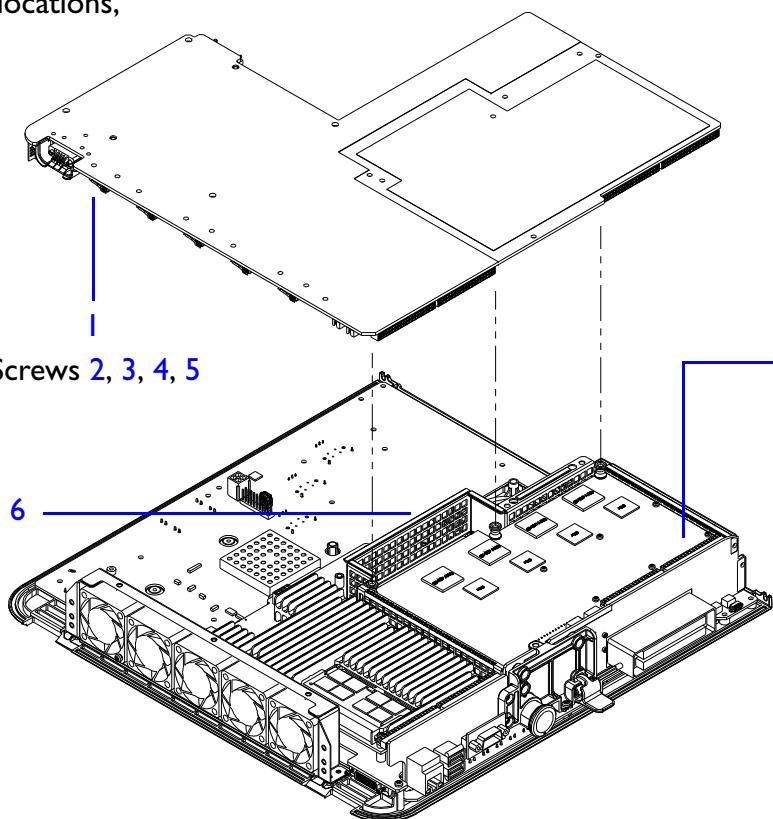
Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	See "About Compatibility and Part Numbers" on page 459	Transducer Lever Assembly, W/Magnet and Set Screw	Transducer locking latch Lever attaches to shaft on Motherboard ( <a href="#">Figure 10-21</a> )	x	x	x	x	x
2	453561289261	Bracket, Side, Right	RoHS. Transducer lever cover Used with Side I/O PCB with VGA connector	x			x	
3	453561495721	Right Side Bracket, MI3	RoHS. Transducer lever cover Used with Side I/O PCB with DVI connector. Not backward compatible with previous hardware versions.	x	x			x
4	453561388341	Screw, M2.5x8mm, Panhead, Phillips Drive, Steel, Zinc Plated, Custom Red Patchlock	RoHS. 6 places	x	x	x	x	x
5	453561364492	Washer, Fl, 2.7mmID, 8.0mmOD, 0.8mmTHK, Ss	RoHS 1 place	x	x	x	x	x

Figure 14-14

## Power Board (System PCB)

System PCB names and locations,

(Figure 13-1)



CX50 Effectivity		
A.x	B.x	C.x
x	x	x

CX30 Effectivity	
A.x	B.x
x	x

Disassembly

Parent View

System

Main Board, Motherboard,  
I/O Side Board, Channel  
Boards (Figure 14-15)

**NOTE** CB0/Channel  
Board 0 is the  
one closest to  
the Main Board  
(labeled on the  
MB connector).

Figure 14-15

## Main Board, Motherboard, I/O Side Board, and Channel Boards (System PCBs)

System PCB names and locations,

(Figure 13-1)

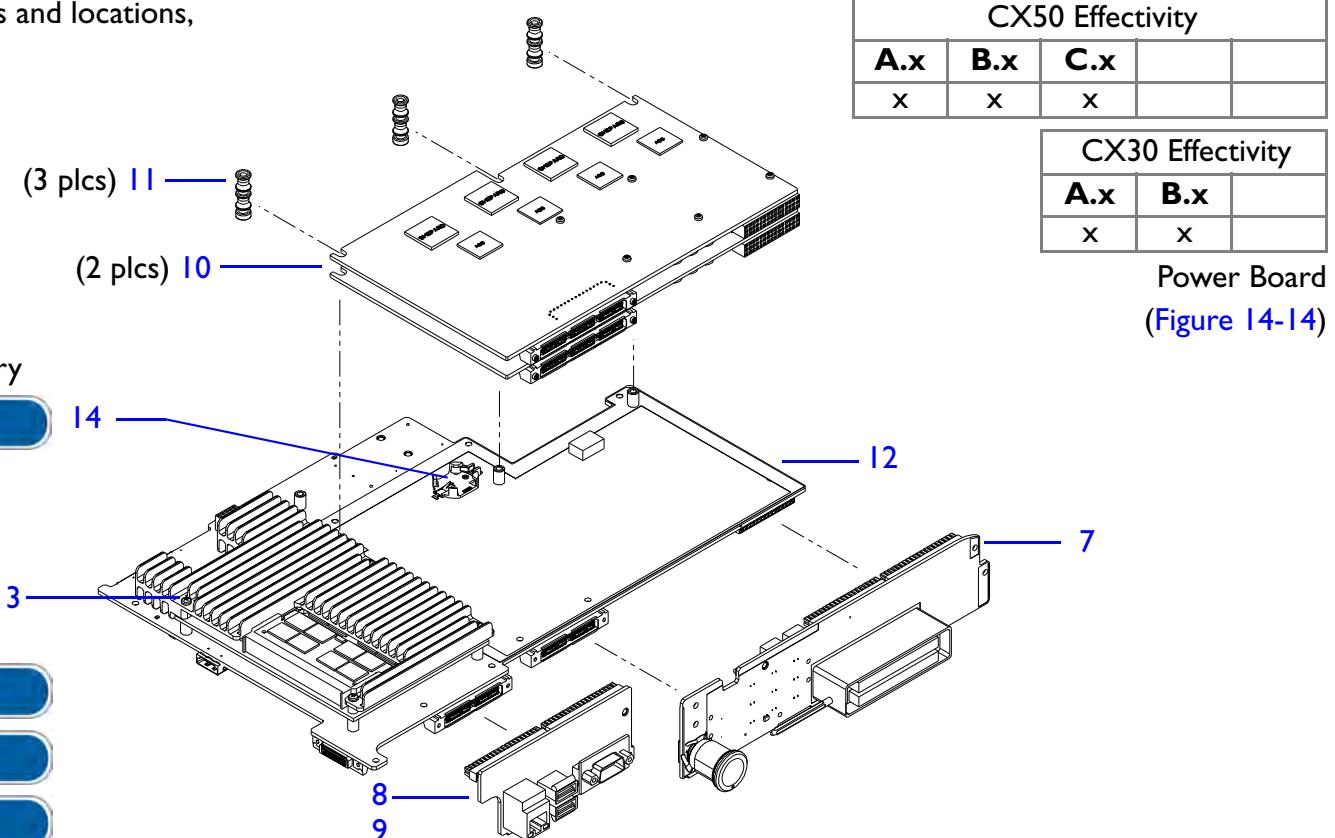


Table 14-13 System PCBs

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	See "About Compatibility and Part Numbers" on page 459	PCB Assy, CX50 Power Board		x	x	x	x	x
2	45356138831	• Screw, M2.5x5mm, Panhead, Phillips Drive, Steel, Zinc Plated, Custom Yellow Patchlock	RoHS. 8 places (short screws), secures Power Board ( <a href="#">Figure 10-10</a> )	x	x	x	x	x
3	453561388351	• Screw, M2.5x14mm, Panhead, Phillips Drive, Stainless Steel, Custom Green Patchlock	RoHS. 2 places (screws with washers), secures Power Board ( <a href="#">Figure 10-10</a> )	x	x	x	x	x
4	453561388361	• Screw, M2.5x30mm, Panhead, Phillips Drive, Steel, Zinc Plated, Custom Yellow Patchlock	RoHS. 2 places (long screws), secures Power Board ( <a href="#">Figure 10-10</a> )	x	x	x	x	x
5	453561364492	• Washer, Fl, 2.7mmID, 8.0mmOD, 0.8mmThk, Ss	RoHS. 2 places, secures Power Board ( <a href="#">Figure 10-10</a> )	x	x	x	x	x
6	453561390762	Fence Assembly	RoHS.	x	x	x	x	x

Table 14-13 System PCBs (Continued)

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
7	See "About Compatibility and Part Numbers" on page 459	PCB Assy, Motherboard		x	x	x	x	x
8		PCB Assy, CX50 Side I/O	With VGA connector For systems with XP	x			x	
9		PCB Assy, MI3 Side I/O, DVI	With DVI connector For systems with Win7	x	x			x
10		PCB Assy, CX50 Channel Board	2 required	x	x	x	x	x
11	453561290691	Spacer, PCB	RoHS. Channel boards spacer	x	x	x	x	x
12	See "About Compatibility and Part Numbers" on page 459	COM Express/Main Board Assembly	Includes Main Board and DVD cable	x	x	x	x	x
13	453561388351	• Screw, M2.5x14mm, Panhead, Phillips Drive, Stainless Steel, Custom Green Patchlock	RoHS. 5 places, secures COM Express/Main Board Assembly (Figure 10-10)	x	x	x	x	x
14	Purchase locally	Battery, Lithium Coin Cell, CR2032	Used on Main Board	x	x	x	x	x

## System Fasteners

Screws are listed numerically by size.

See “[Required Common Tools for the System and Cart](#)” on page 293.

Table 14-14

System Fasteners Parts List

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	453561388331	Screw, M2.5x5mm, Panhead, Phillips Drive, Steel, Zinc Plated, Custom Yellow Patchlock	RoHS. Used on Physio Module, hard drive, and Power Board to fan assembly	x	x	x	x	x
2	453561388341	Screw, M2.5x8mm, Panhead, Phillips Drive, Steel, Zinc Plated, Custom Red Patchlock	RoHS. Used on Channel Board shield, Main Board, and plastic back panel	x	x	x	x	x
3	453561388351	Screw, M2.5x14mm, Panhead, Phillips Drive, Stainless Steel, Custom Green Patchlock	RoHS. Used on Power Board and Main Board assemblies	x	x	x	x	x
4	453561388361	Screw, M2.5x30mm, Panhead, Phillips Drive, Steel, Zinc Plated, Custom Yellow Patchlock	RoHS. 2 long screws that secure Power Board	x	x	x	x	x
5	453561388371	Screw, M2.5x32mm, Panhead, Phillips Drive, Steel, Zinc Plated (Black), Custom Blue Patchlock	RoHS. Used to secure system handle, 2 places, 1 on each side of handle	x	x	x	x	x

Table 14-14

## System Fasteners Parts List (Continued)

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
6	453561400991	Screw, Plastite, M2 x 8 mm, Pan Head, Phillips Drive, Steel, Zinc Plated	RoHS. Used to secure Motherboard to Channel Board and COM Express/Main Board Assembly; used to secure LCD display connector to COM Express/Main Board Assembly.	x	x	x	x	x
7	453561400981	Screw, Plastite, M2x4mm, Pan Head, Phillips Drive, Steel, Zinc Plated	RoHS. Used to secure speakers in the system handle.	x	x	x	x	x

## CX30 and CX50 System Labeling

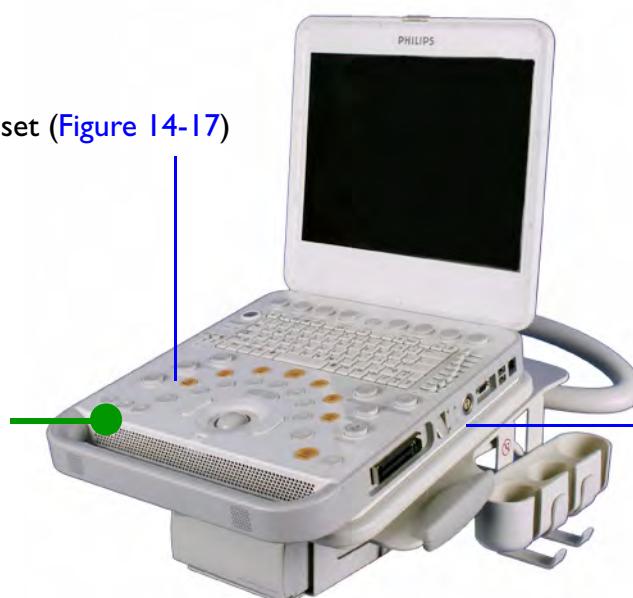
**Figure 14-16**For CX30 system labeling, see [Figure 14-16](#).For CX50 system labeling, see [Figure 14-20](#).

### CX30 Ultrasound System Nameplate

#### PARENT VIEW

CX30 Effectivity		
A.x	B.x	
x	x	

Overlay label set ([Figure 14-17](#))



Regulatory label location  
([Figure 14-18](#))  
Hardware label template  
([Figure 14-19](#))

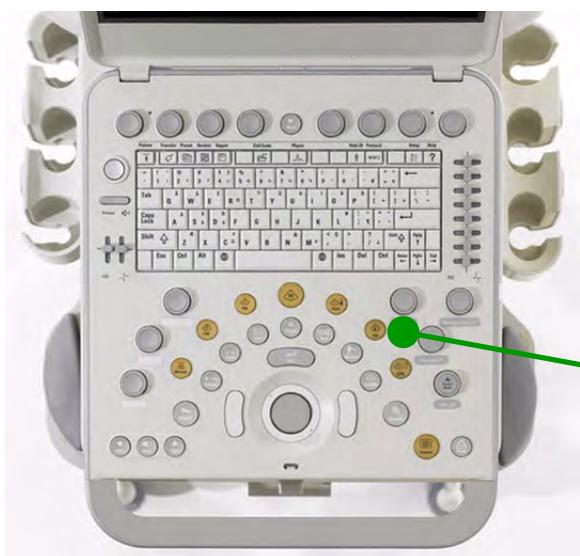
Parent View

System

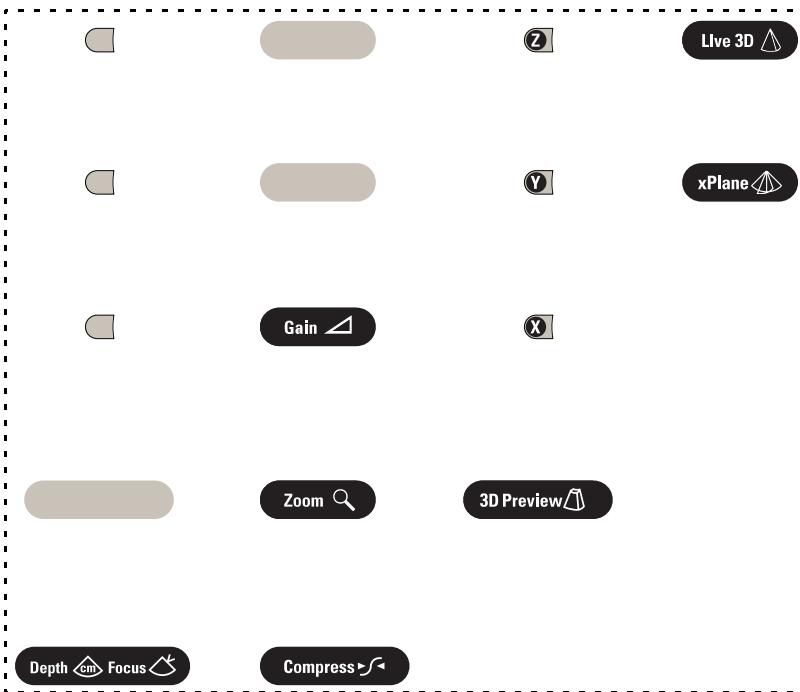
Figure 14-17

## CX30 Overlay Label Set

## PARENT VIEW



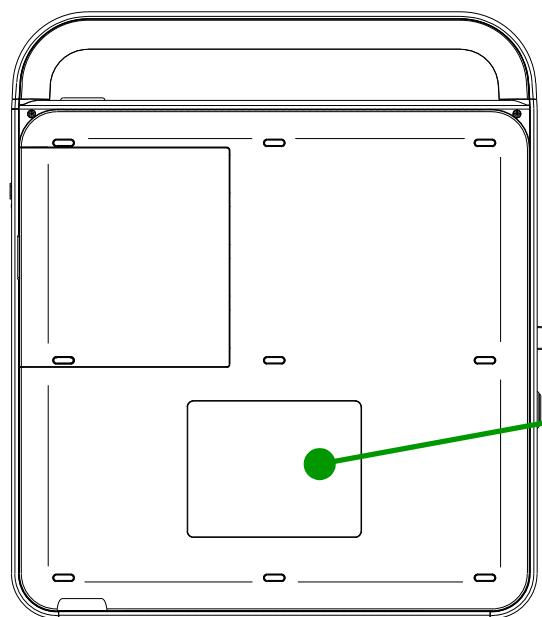
2 —————



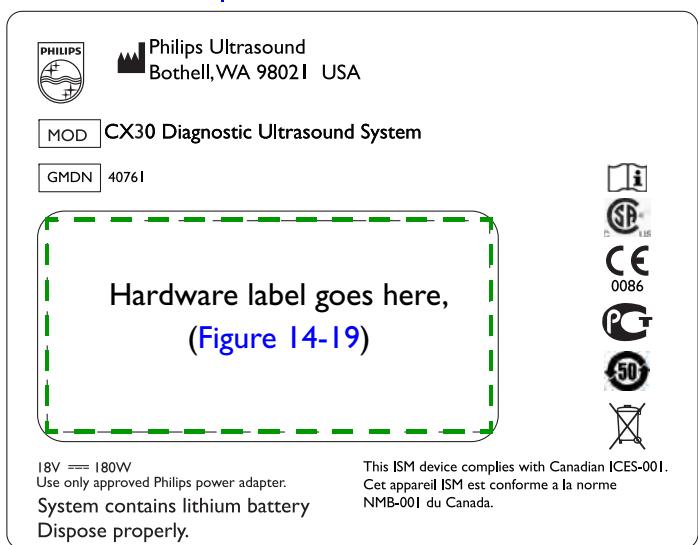
CX30 Effectivity		
A.x	B.x	
x	x	

Figure 14-18

## CX30 Regulatory Label



3



Parent View

System

Figure 14-19

## GTIN SN ID/Hardware Template

Adheres over Regulatory label, (Figure 14-18)

CX30 Effectivity		
A.x	B.x	
x	x	



**NOTE** Sample of label shown. Label information may vary on each system.



**Table 14-15** CX30 System Labeling

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>CX30 A.x</b>	<b>CX30 B.x</b>
1	453561487021	Label, Nameplate, System, CX30	RoHS status not pertinent to CX30. System badge	X	X
2	453561489451	Label, Overlay, CX30	RoHS status not pertinent to CX30. Includes all individual CP UIF labels and labels for systems with 3D and without 3D	X	X
3	453561479701	Label, Regulatory, CX30	RoHS status not pertinent to CX30. Regulatory label is placed under hardware/serial label	X	X
4	453561494501	GTIN SN ID Label Template	RoHS status not pertinent to CX30. Hardware and serial number label  Adheres over the Regulatory label, located on the underside of the system	X	X

Figure 14-20

**CX50 Ultrasound System Nameplate****PARENT VIEW****Parent View****System**

CX50 Effectivity			
A.x	B.x	C.x	
X	X	X	

Figure 14-21

**CX50 xMATRIX and PureWave Technology Badge**

CX50 Effectivity			
A.x	B.x	C.x	
	x	x	



— 2

or

Installation

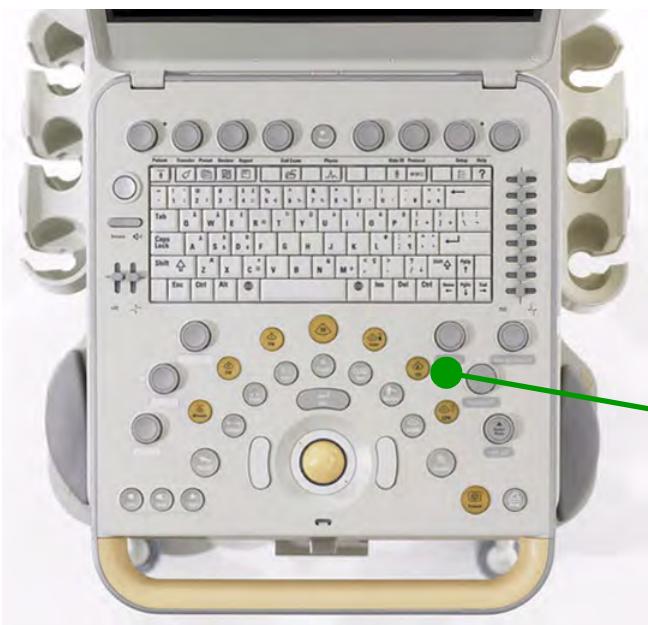


— 3



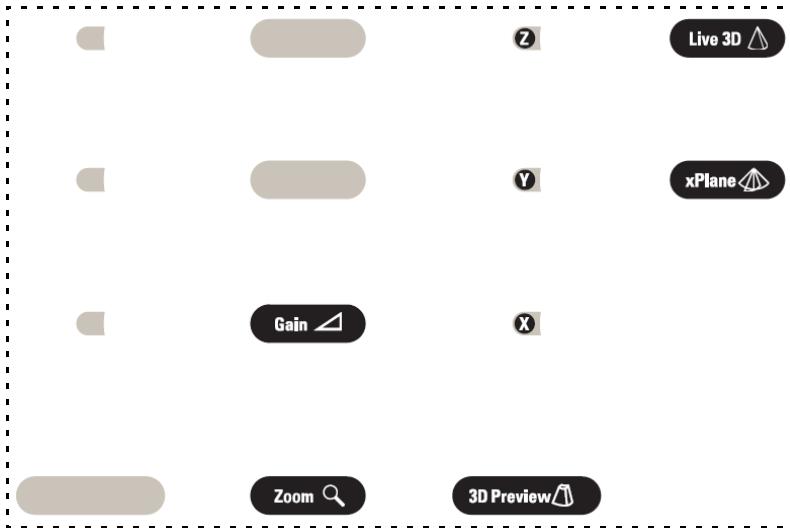
Figure 14-22

## CX50 Overlay Label Set



4

CX50 Effectivity			
A.x	B.x	C.x	
X	X	X	

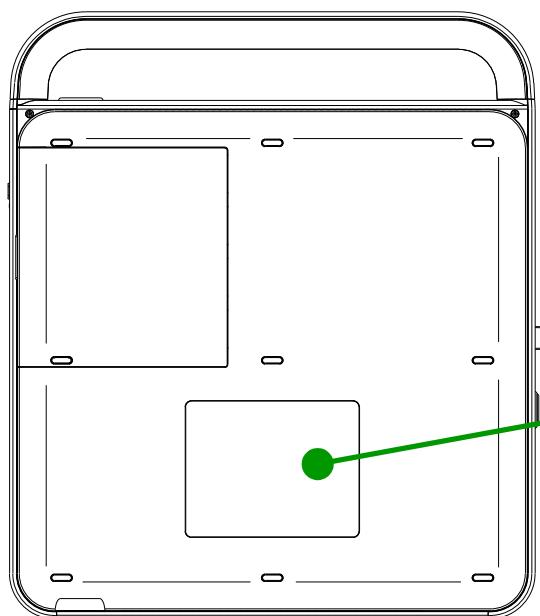


Parent View

System

Figure 14-23

## CX50 Regulatory Label



5

CX50 Effectivity			
A.x	B.x	C.x	
X	X	X	

**Philips Ultrasound**  
22100 Bothell Everett Highway  
Bothell, WA. 98021

**MOD** CX50 Diagnostic Ultrasound System

**GMDN** 40761

**Hardware label goes here**  
**(Figure 14-24)**

18V = 180W  
Use only approved  
Philips power adapter.

This ISM device complies with Canadian ICES-001.  
Cet appareil ISM est conforme à la norme NMB-001 du Canada.

System Display May Contain Mercury. Dispose Properly.  
System Contains Lithium Battery. Dispose Properly.

**CE** 0086  
**PC** VM24  
**50**  
**X**

Parent View

System

Figure 14-24

## GTIN SN ID/Hardware Template

Adheres to regulatory label (Figure 14-23)

CX50 Effectivity			
A.x	B.x	C.x	
x	x	x	



**NOTE** Sample of label shown. Label information may vary on each system.



Table 14-16

## CX50 System Labeling

Index No.	Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	
1	453561348691	Label, Nameplate, System Badge	RoHS.	x x x			
2	453561647891	Label, CX50, xMATRIX	RoHS. xMATRIX technology badge Order label as needed when replacing the video display.	x x			
3	453561647901	Label, CX50, PureWave	RoHS. PureWave technology badge Order label as needed when replacing the video display.	x x			
4	453561392481	Label, Overlay, CX50	RoHS. Includes all individual CP UIF labels and labels for systems with 3D and without 3D.	x x x			
5	453561669454	Label, Regulatory	RoHS Placed under hardware/serial label.	x x x			
6	453561494501	GTIN SN ID Label Template	RoHS. Hardware and serial number label Adheres over the Regulatory label, located on the underside of the system	x x x			

## CX30 and CX50 System Cart Option

Optional system carts that are ordered with a Multiport adapter are C.0 version carts. If the C.0 version cart is ordered without a Multiport adapter installed, it is classed as a B.1 version cart. D.0 carts may also be ordered with or without the Multiport adapter.

Cart hardware versions A.x, B.x, and C.x are no longer available, due to end-of-life (EOL) stocking issues. Replacement cart hardware is listed in the manual in the appropriate locations.

Figure 14-25

**CX30 and CX50 System Cart Locator****PARENT VIEW**

Cart Effectivity			
A.0	B.0	C.0	D.0
x	x	x	x



A.0/B.0 System Cart



C.0 System Cart



D.0 System Cart

Parent View

System

**Figure 14-26**

## **Optional System Cart Parts Locator (Front), A.0 and B.0 Carts**

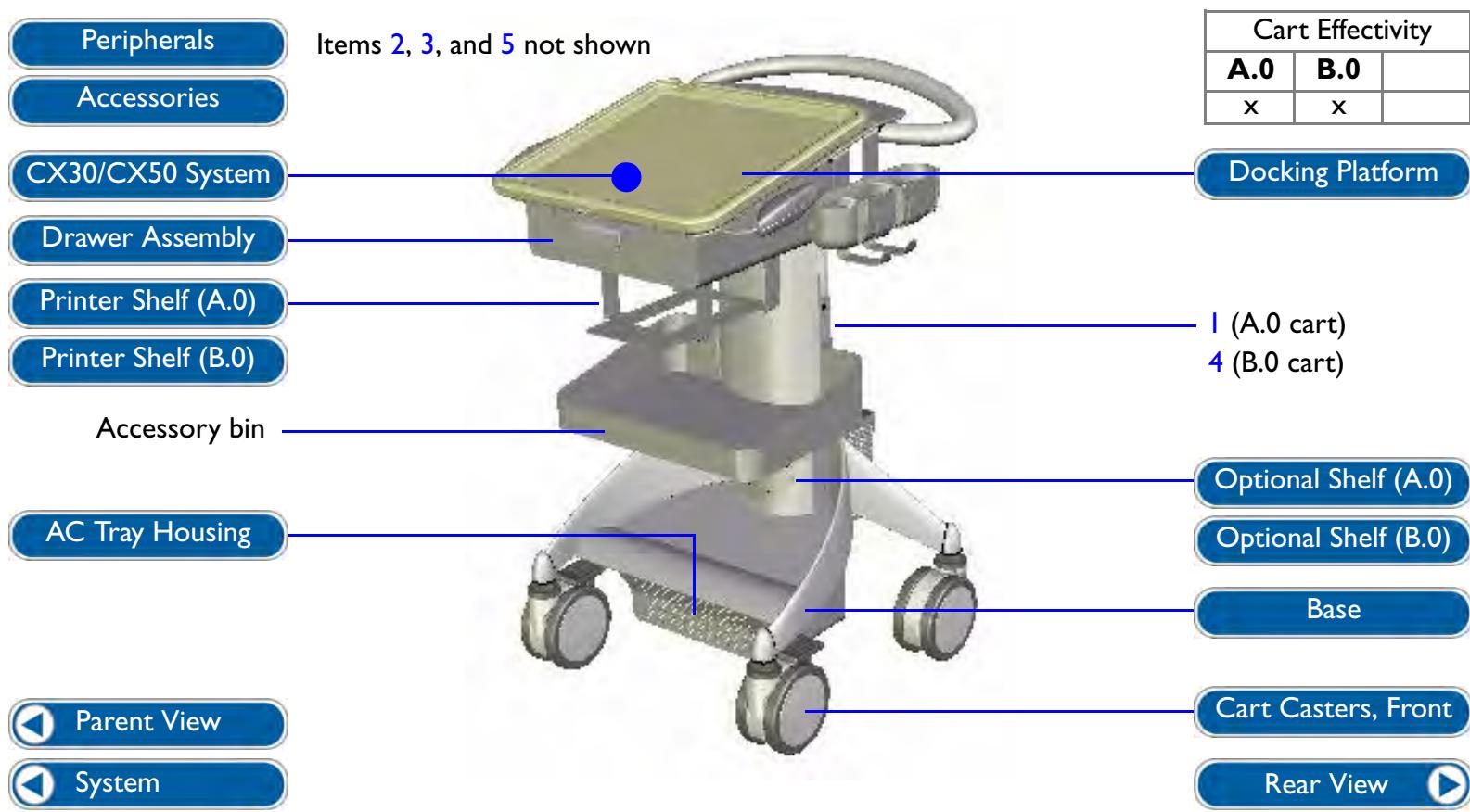
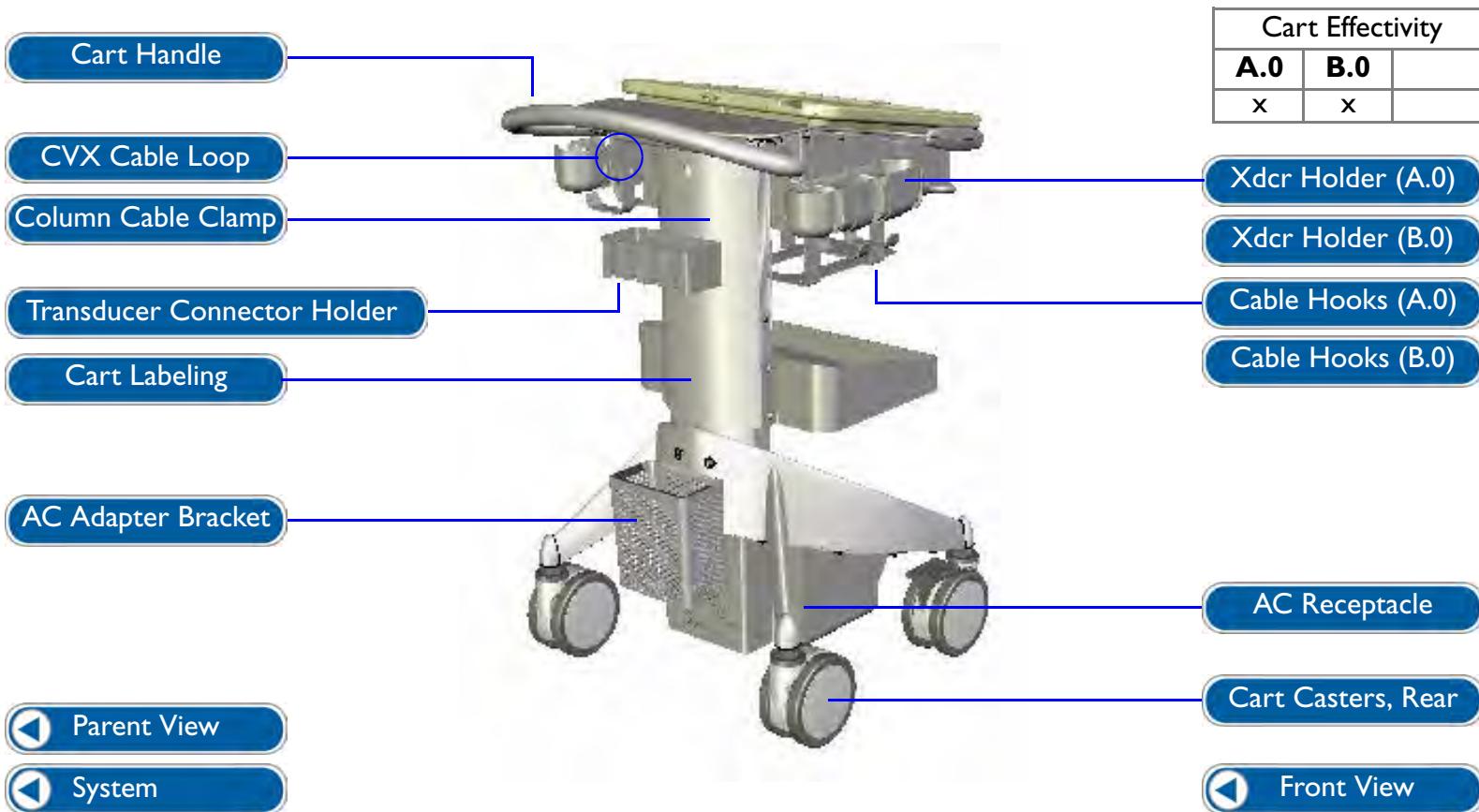


Figure 14-27

## Optional System Cart Parts Locator (Rear), A.0 and B.0 Carts

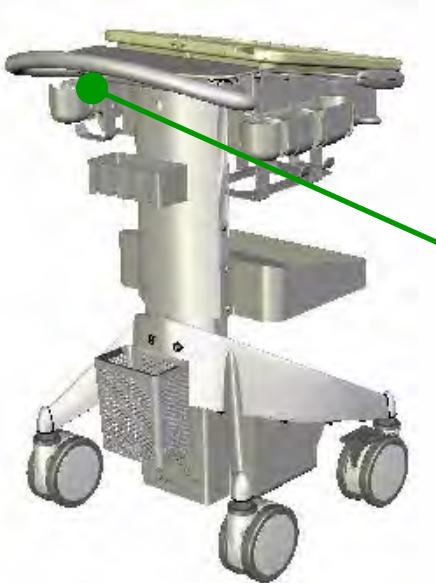


**Table 14-17      System Cart (Option), A.0 and B.0 Carts**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>A.0</b>	<b>B.0</b>
1	453561345004	Mechanical Cart, 1.0	Non-RoHS. A.0 version Entire cart	x	
2	453561835661	CX50/CX30 Cart Kit, w/o MPA/MTM, FRU	Not illustrated. Replaces A.0 version hardware without MPA/MTM	x	
3	453561844601	• CX50/30 Cart, w/o MPA/MTM, Sub-assy, Svc	Not illustrated		
4**	453561446331	Cart, CX50, 2.0	Non-RoHS. B.0 version Entire cart with CVX cable loop, see <a href="#">Figure 14-28</a>	x	
5	453561835661	CX50/CX30 Cart Kit, w/o MPA/MTM, FRU	Not illustrated. Replaces B.x version hardware without MPA/MTM	x	

Figure 14-28

## CVX Cable Loop (B.0 Cart)



Cart Effectivity		
A.0	B.0	
	X	

CVX cable loop  
(carabiner bracket)

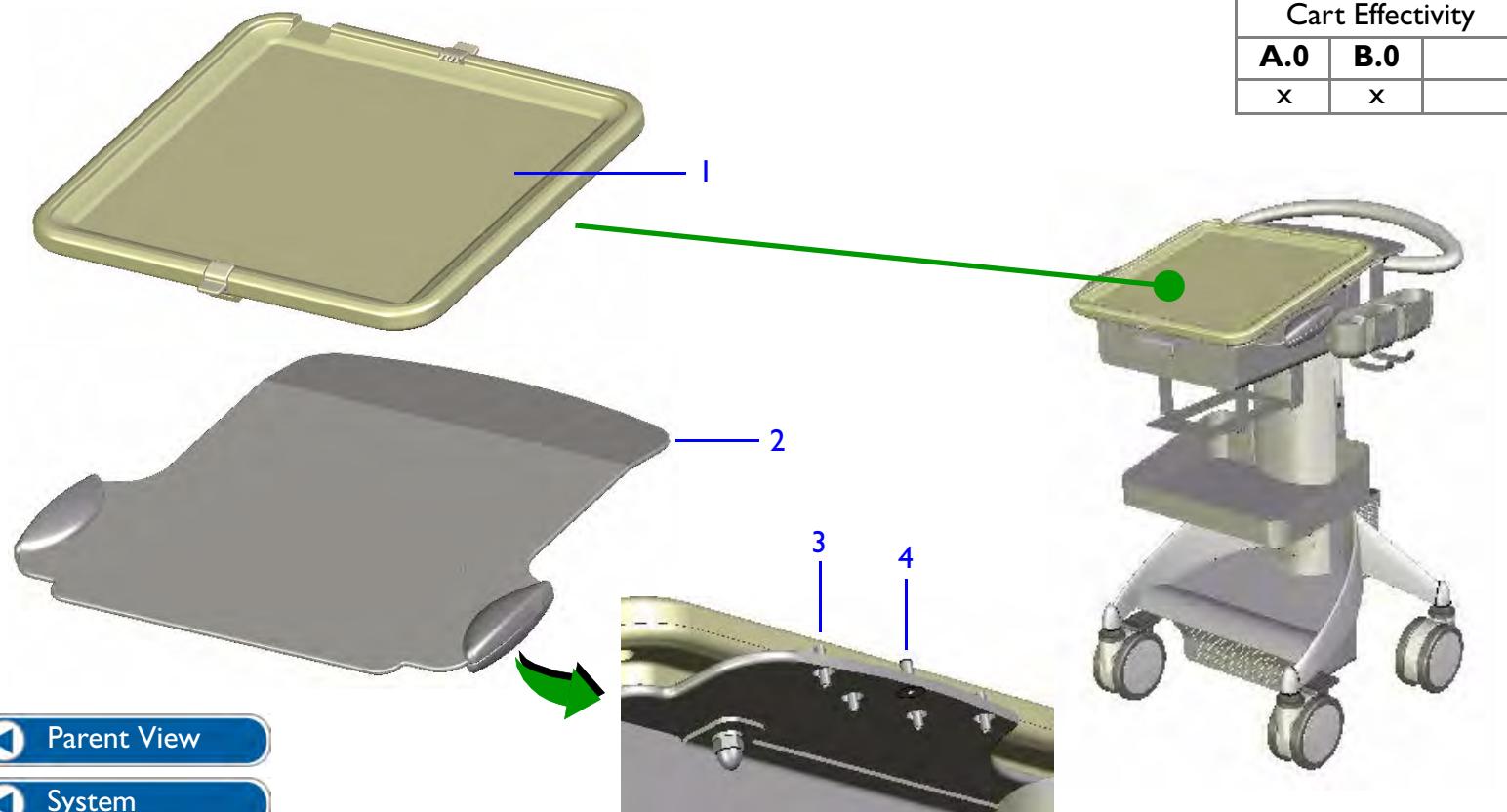
Cabling Diagram

Parent View

System

Figure 14-29

Docking Platform and Microposition Pad



Parent View

System

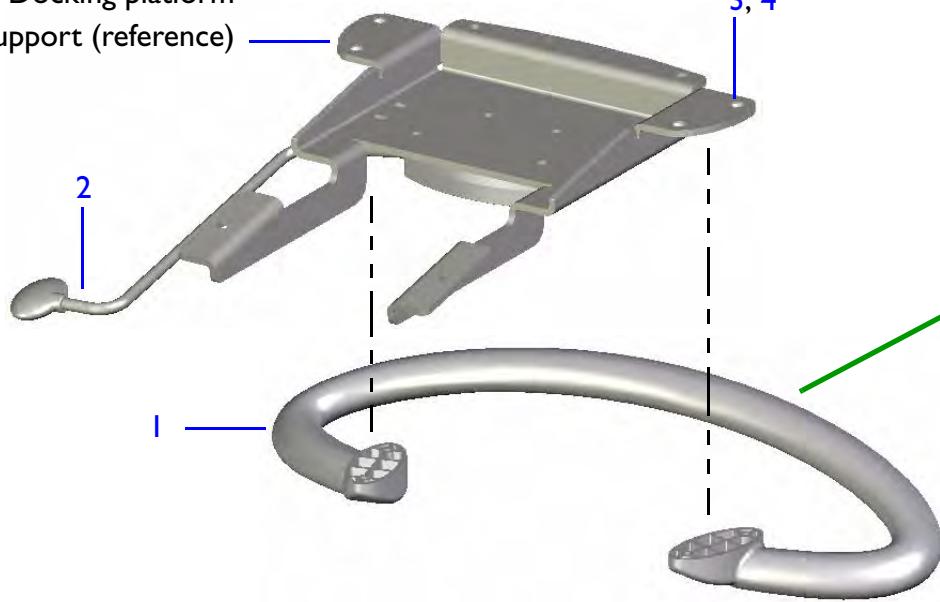
**Table 14-18 Docking Platform and Microposition Pad**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>A.O</b>	<b>B.O</b>
1	453561378341	Docking Assembly	RoHS. CX30 and CX50 system docking platform Includes latches	X	X
2	453561375911	Pad, Microposition	RoHS. Includes hand grip	X	X
3	453561378321	• Pin, Spring, 0.156 OD	RoHS, 4 places each grip set	X	X
4	453561377771	• Screw, #10-16x1/2-In, Fh, Type B, Phillips, Ss	RoHS, 1 place each grip set	X	X

Figure 14-30

## Handle and Docking Platform Support

Docking platform support (reference)



3, 4



Cart Effectivity	
A.0	B.0
x	x

Parent View

System

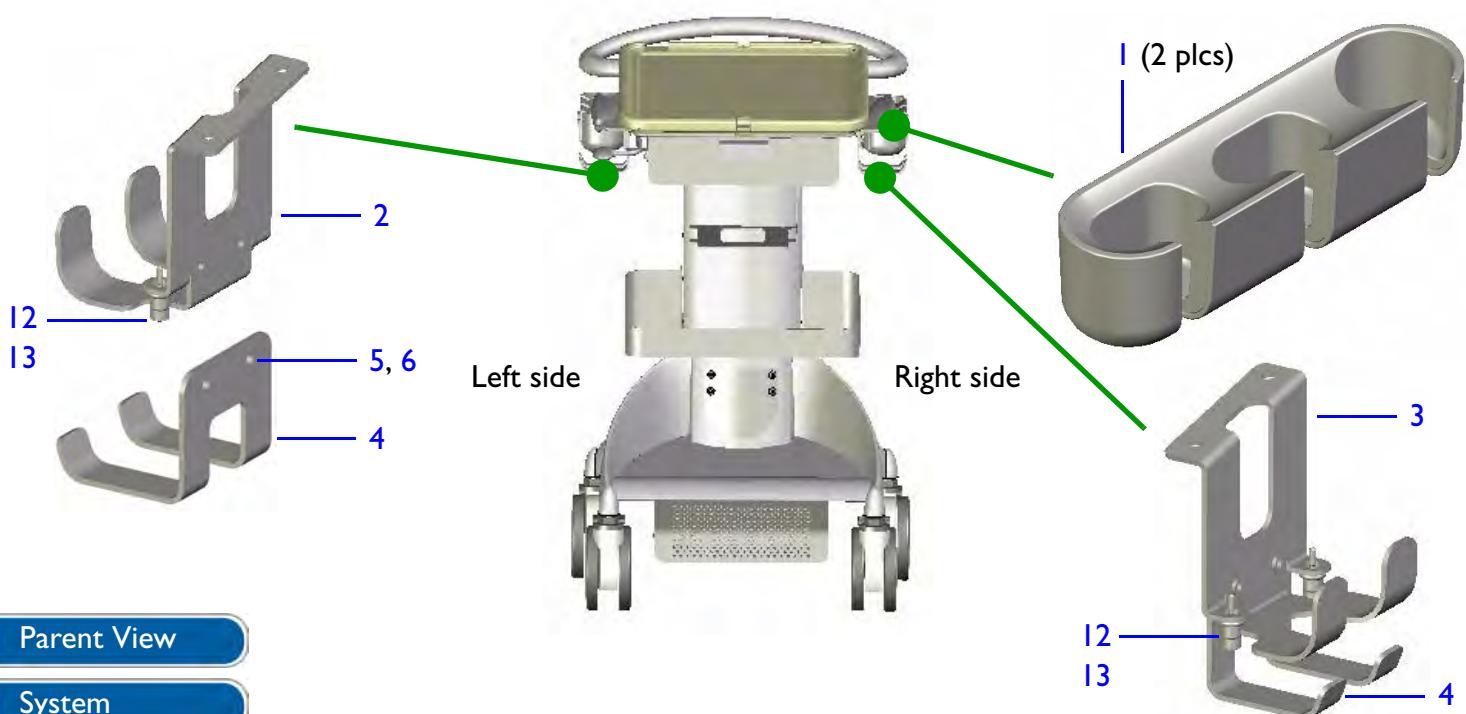
**Table 14-19 Handle and Docking Platform Support**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>A.O</b>	<b>B.O</b>
1	453561375901	Handle, Cart	RoHS	X	X
2	453561466721	Release Lever Assembly	RoHS. Lift handle that raises and lowers system cart	X	X
3	453561377781	• Screw, #10-32x1/2, FHCS, Ss	RoHS, 4 places	X	X
4	453561377791	• Washer, Lock, C'Sink, #10	RoHS, 4 places	X	X

Figure 14-31

## Transducer Cable Hooks (A.0 Cart)

Cart Effectivity	
A.0	B.0
x	



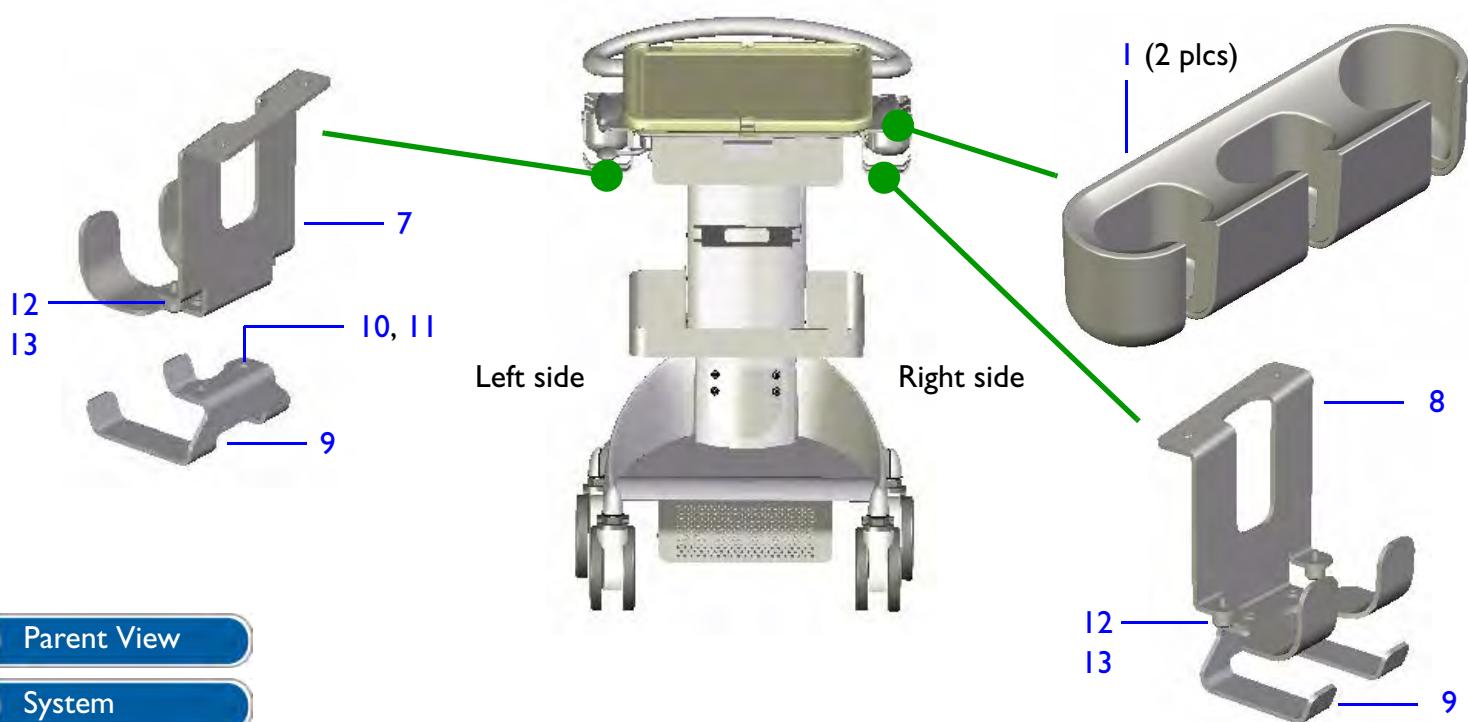
Parent View

System

Figure 14-32

Transducer Cable Hooks (B.0 Cart)

Cart Effectivity		
A.0	B.0	
	x	



Parent View

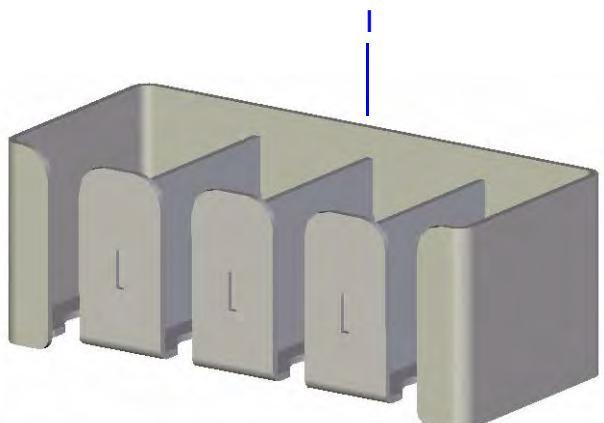
System

Table 14-20 Transducer Cable Hooks

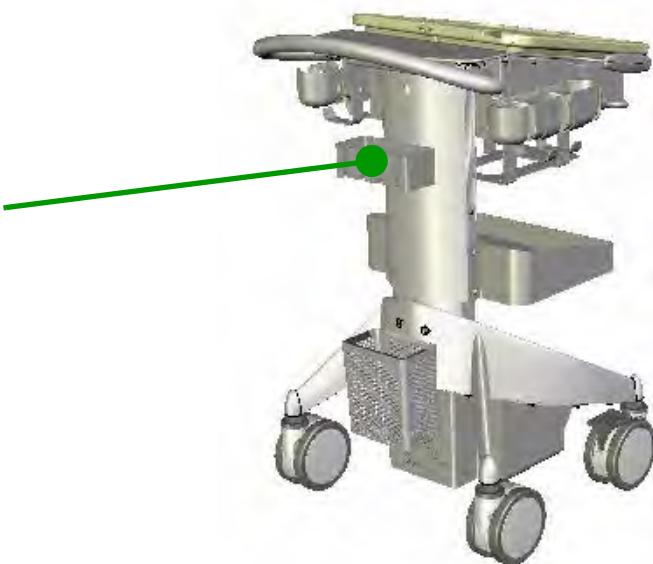
Index No.	Part Number	Part Description	Notes/Reference	A.0	B.0
1	453561155531	Transducer Holder, Right (Over-Mold Assembly)	RoHS. 2 places, holders are reversible to both sides of cart	X	X
2	453561375871	Bracket, Probe Holder, Left	A.0 cart, Non-RoHS	X	
3	453561375881	Bracket, Probe Holder, Right		X	
4	453561375891	Hook, Probe, Cable	A.0 cart, 2 places, Non-RoHS	X	
5	453561377661	• Screw, M5x10, BHCS, Ss	RoHS, 4 places (2 places each hook)	X	
6	453561377292	• Washer, Lock, IT, M5, Ss		X	
7	453561396352	Bracket, Probe Holder, Left	RoHS. B.0 cart		X
8	453561396362	Bracket, Probe Holder, Right			X
9	453561396371	Hook, Probe, Cable	RoHS. B.0 cart, 2 places		X
10	453561377661	• Screw, M5x10, BHCS, Ss	RoHS, 4 places (2 places each hook)	X	
11	453561377292	• Washer, Lock, IT, M5, Ss			X
12	453561377671	Nut, Acorn, M6, Ss	RoHS, used on A.0 and B.0 carts, 2 places each probe holder bracket	X	X
13	453561377691	Washer, Split Lock, M6, Ss		X	X

Figure 14-33

## Transducer Connector Holder



Cart Effectivity		
A.0	B.0	
x	x	

 Parent View System

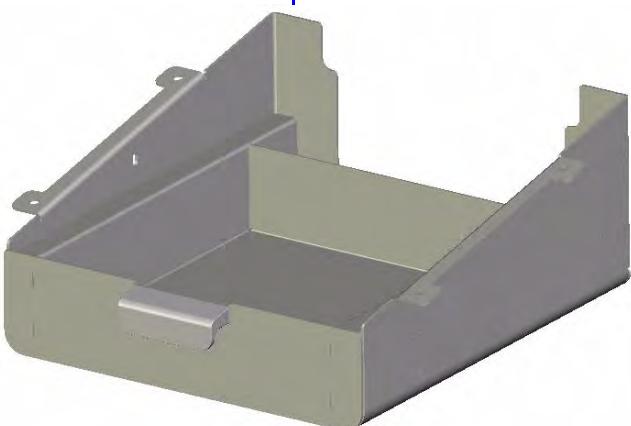
**Table 14-21 Transducer Connector Holder**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>A.O</b>	<b>B.O</b>
I	Not Available	Connector Holder Bracket, Transducer		X	X

Figure 14-34

## Drawer Assembly

Drawer assembly detail  
(Figure 14-35)



Cart Effectivity		
A.0	B.0	
x	x	



 Parent View

 System

Figure 14-35

## Drawer Assembly Detail

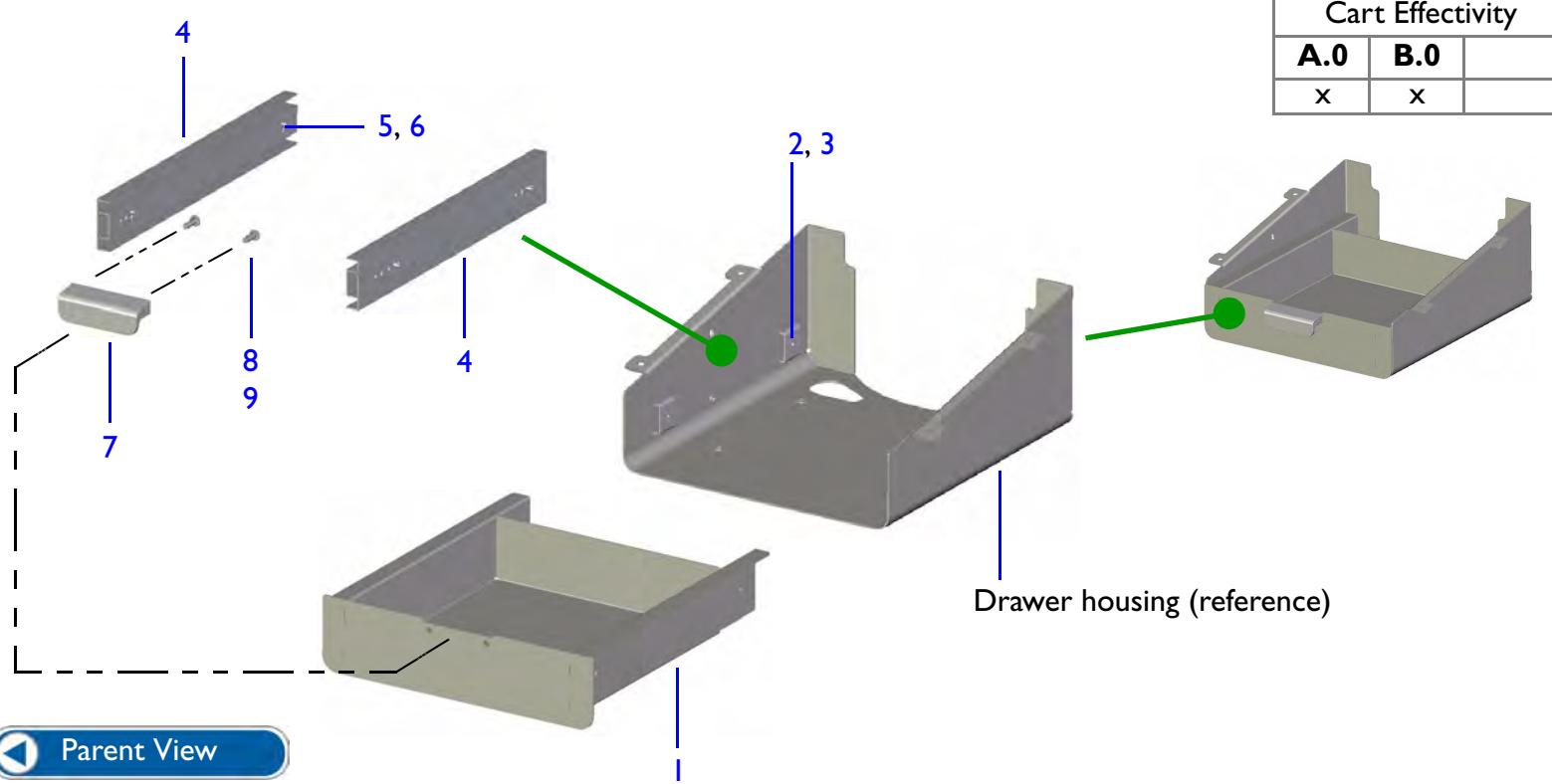
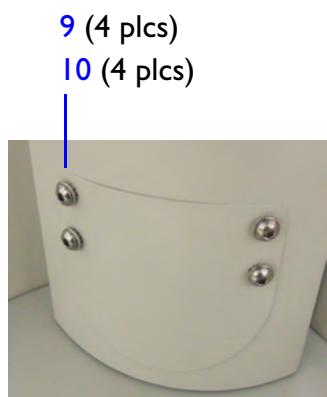
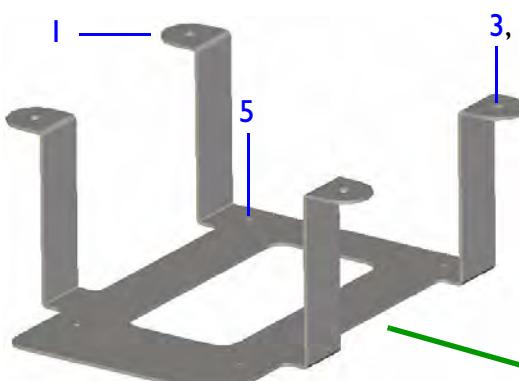


Table 14-22 Drawer Assembly

Index No.	Part Number	Part Description	Notes/Reference	A.O	B.O
1	453561375951	Drawer with Rails	RoHS. Includes slides and drawer pull	X	X
2	453561377711	<ul style="list-style-type: none"><li>Screw, M4x6, BHCS, Ss</li></ul>	Non-RoHS, 4 places  Secures drawer assembly to drawer housing	X	X
3	453561377721	<ul style="list-style-type: none"><li>Washer, Lock, IT, M4, Ss</li></ul>	RoHS, 4 places  Secures drawer assembly to drawer housing	X	X
4	453561381261	Slide, Med Duty, 12-Inch L, 100Lb	RoHS. 2 assemblies	X	X
5	453561377711	<ul style="list-style-type: none"><li>Screw, M4x6, BHCS, Ss</li></ul>	Non-RoHS, 4 places	X	X
6	453561377721	<ul style="list-style-type: none"><li>Washer, Lock, IT, M4, Ss</li></ul>	Secures slide to drawer weldment	X	X
7	453561375971	Handle, Drawer	RoHS. Drawer pull	X	X
8	453561377661	<ul style="list-style-type: none"><li>Screw, M5x10, BHCS, Ss</li></ul>	RoHS, 2 places	X	X
9	453561377292	<ul style="list-style-type: none"><li>Washer, Lock, IT, M5, Ss</li></ul>	Secures drawer pull	X	X

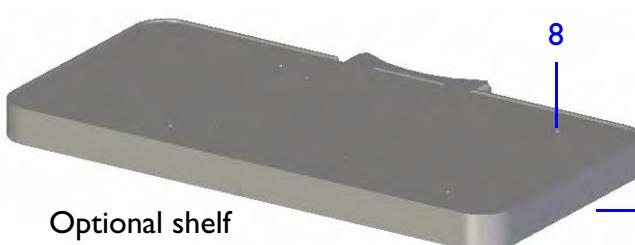
Figure 14-36

## Black and White Printer Shelf and Optional Printer Shelf (A.0 Cart)

Cable access hole cover  
(part of cart)

3, 4

Cart Effectivity	
A.0	B.0
x	



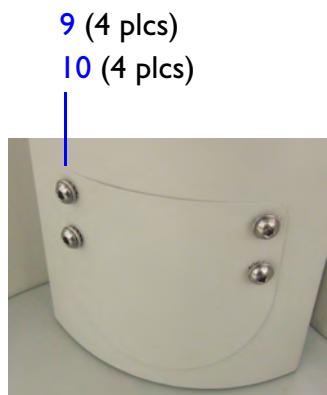
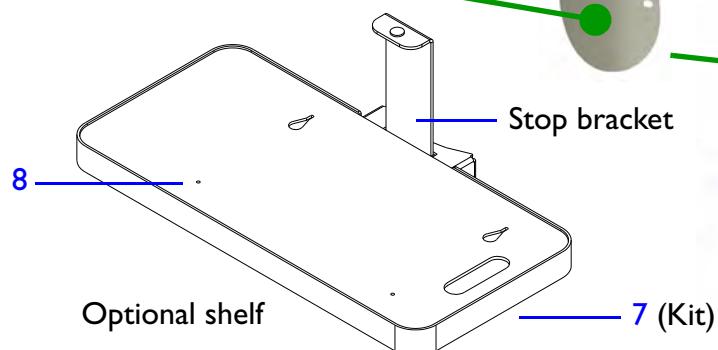
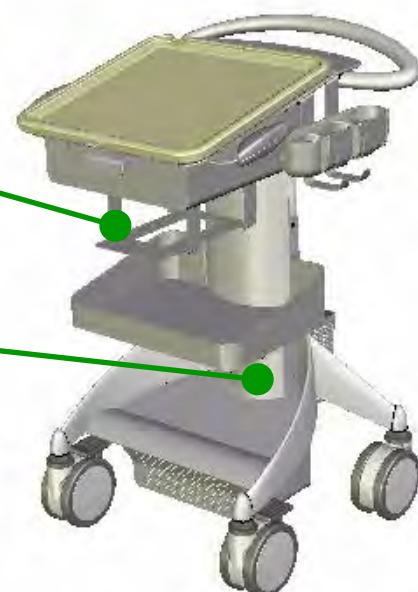
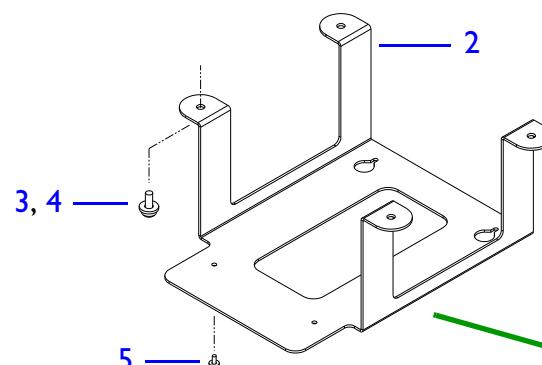
8

6 (Kit)

[Cabling Diagrams](#)[B&W Installation](#)[Color Installation](#)[Parent View](#)[System](#)

Figure 14-37

## Black and White Printer Shelf and Optional Printer Shelf (B.0 Cart)

Cable access hole cover  
(part of cart)

Optional shelf

Cart Effectivity		
A.0	B.0	
	x	

[Cabling Diagrams](#)[B&W Installation](#)[Color Installation](#)[Parent View](#)[System](#)

**Table 14-23 Black and White Printer Shelf and Optional Printer Shelf**

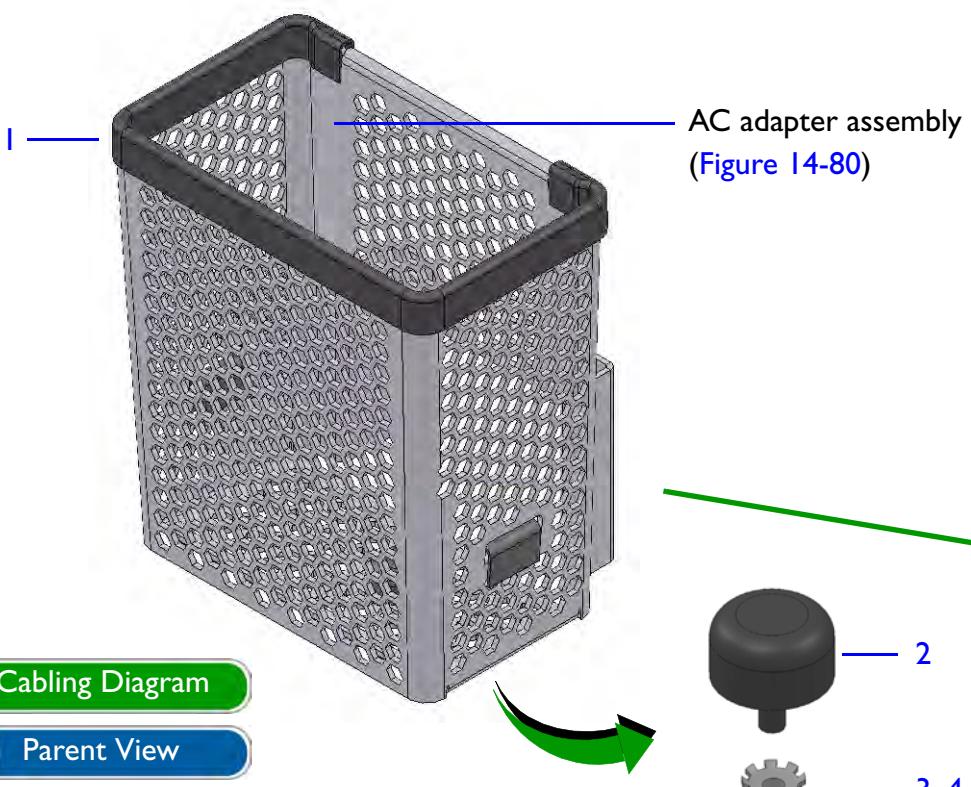
<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>A.0</b>	<b>B.0</b>
1	453561375981	B&W Printer Shelf, Accessory Kit	Non-RoHS. Mounting bracket, A.0 cart	x	
2	453561375982	B&W Printer Shelf, Accessory Kit	RoHS. Mounting bracket, B.0 cart		x
3	453561377282	• Screw, M5x8, BHCS, Ss	RoHS. 4 places	x	x
4	453561377292	• Washer, Lock, IT, M5, Ss	Secures B&W printer shelf to cart	x	x
5	Screws are part of boxed kit supplied with optional cart	• Screw, Locking, M3x8, Ss	4 places Secures B&W printer to B&W printer shelf	x	x
6	453561363561	Color Printer Shelf, Accessory Kit	RoHS Mounting shelf (optional), A.0 cart, used with color printer Includes shelf, stop bracket, and hardware for mounting	x	
7	453561363562	Color Printer Shelf, Accessory Kit	RoHS Mounting shelf (optional), B.0 cart, used with color printer Includes shelf, stop bracket, and hardware for mounting		x

**Table 14-23 Black and White Printer Shelf and Optional Printer Shelf (Continued)**

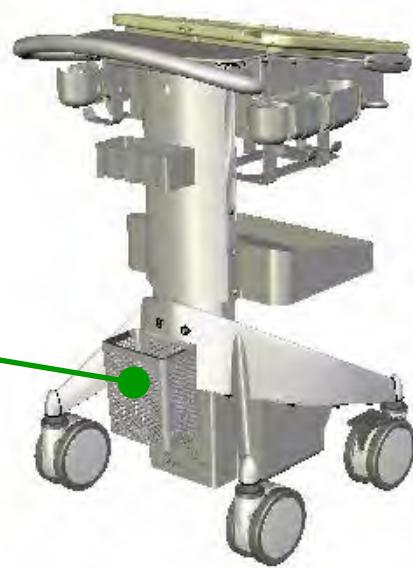
<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>A.O</b>	<b>B.O</b>
8	Screws are part of optional color printer kit	<ul style="list-style-type: none"><li>• Screw, Locking, M3x8, Ss</li></ul>	4 places, secures color printer to color printer shelf	X	X
9	453561384681	Screw, M6x12, Bhcs, Ss, Threadlock	Non-RoHS. 4 places, secures color	X	X
10	453561385891	Washer, Ext Lk Serrated, M6, Ss	printer cable access cover to cart frame	X	X

Figure 14-38

## AC Adapter Bracket



Cart Effectivity	
A.0	B.0
x	x



Cabling Diagram

Parent View

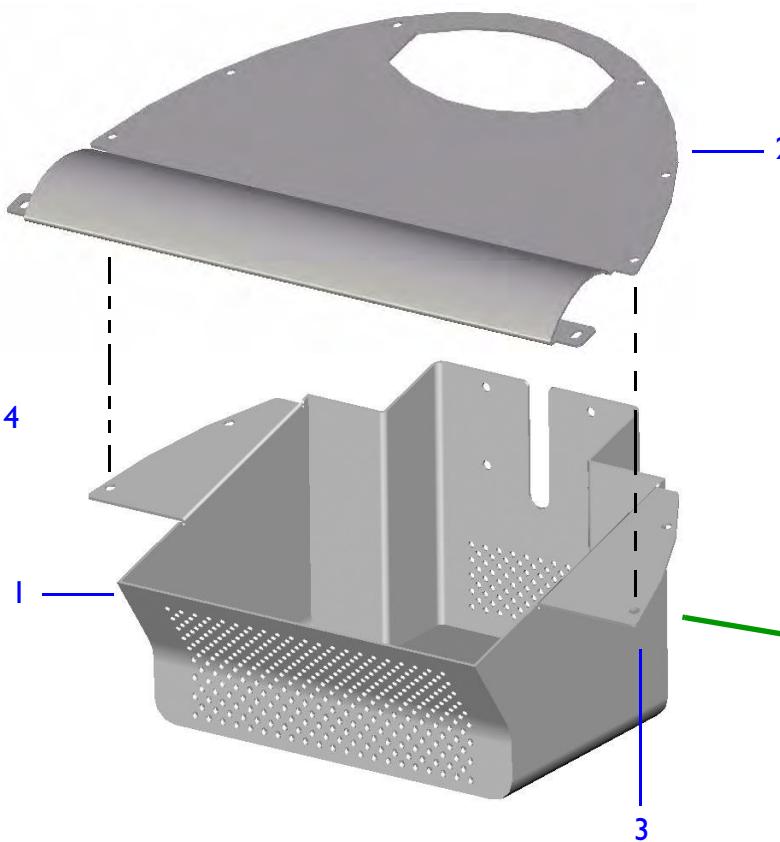
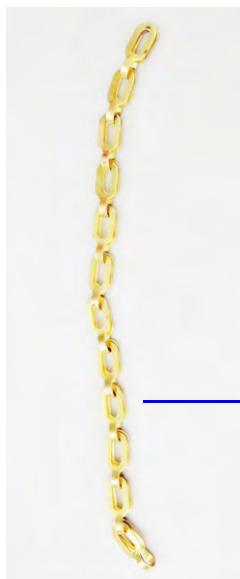
System

**Table 14-24 AC Adapter Bracket**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>A.O</b>	<b>B.O</b>
1	453561396381	Bracket, A/C Adapter, with Trim-Lok gasketing	RoHS. Trim-Lok gasketing is a gray color	X	X
2	453561386071	Bumper, 3/4 Dia, 7/16 H, 8-32 Thd, Hard Rubber	Non-RoHS.	X	X
3	453561386061	Washer, Fl, #8, .375OD, .45Thk, St, Zn	Non-RoHS. Used with rubber bumper	X	X
4	453561386081	Nut, 8-32, Ext Keps, St, Zn		X	X

Figure 14-39

## AC Tray Housing and Base Plate



Cart Effectivity		
A.0	B.0	
x	x	

Antistatic chain

Installation

Parent View

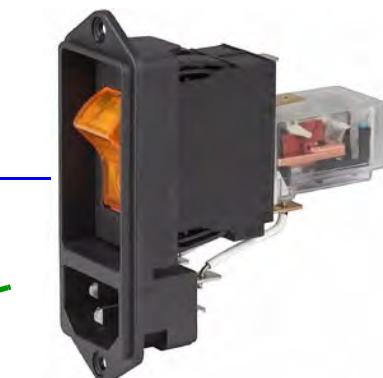
System

Table 14-25 AC Tray Housing and Base Plate

Index No.	Part Number	Part Description	Notes/Reference	A.O	B.O
1	See "About Compatibility and Part Numbers" on page 459	AC Tray, CX50		x	x
2	Part of cart	Base Plate		x	x
3	453561384721	<ul style="list-style-type: none"><li>Screw, 10-32x1/2, Pnh, Intsem, Pd, Ss, Thdlk</li></ul>	Non-RoHS. 4 places (part of cart)	x	x
4	453561486811	Kit, Antistatic Chain	RoHS. Attaches to bottom of AC tray housing. Includes 3mm and 4mm hex keys, M3x8 screws (4), nut, ESD chain, lock strip, and chain hardware	x	x

Figure 14-40

## AC Receptacle and Circuit Breaker Switch



Cart Effectivity		
A.0	B.0	
x	x	

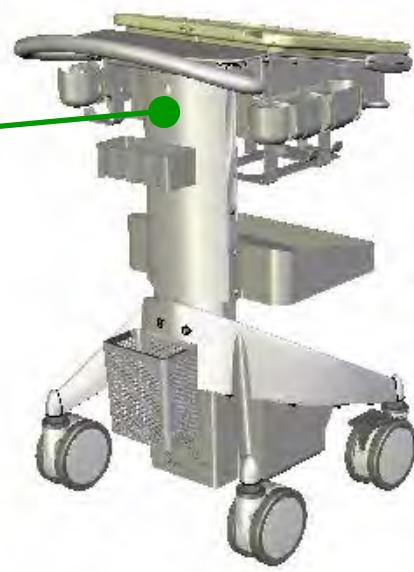
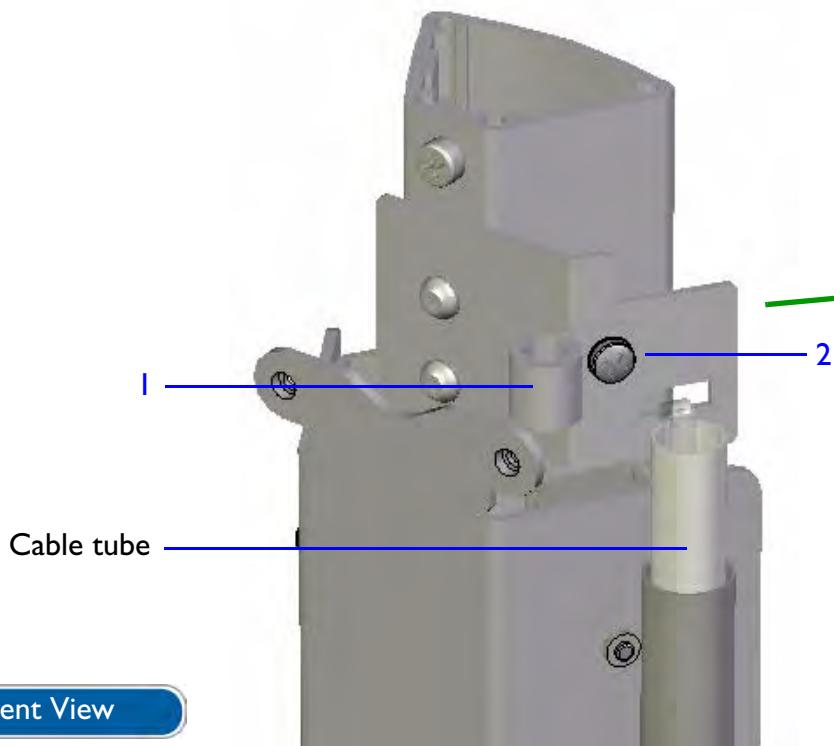
[Cabling Diagram](#)[Parent View](#)[System](#)

**Table 14-26 AC Receptacle and Circuit Breaker Switch**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>A.O</b>	<b>B.O</b>
I	453561472891	Power Entry, W/Circuit Breaker, 10A	RoHS.	X	X

Figure 14-41

## Column Cable Clamp (Internal Column)



Cart Effectivity		
A.0	B.0	
x	x	

Parent View

System

**Table 14-27 Column Cable Clamp (Internal Column)**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>A.O</b>	<b>B.O</b>
1	453561377892	Cable Clamp, Rubber Cushioned, 3/8-In OD	RoHS. Clamp secures AC power cable and color printer USB cable	X	X
2	453561377272	• Screw, Locking, #10-32x1/2-In, Phillips, Ss	RoHS.	X	X

Figure 14-42

Base



Cart Effectivity		
A.0	B.0	
x	x	

Parent View

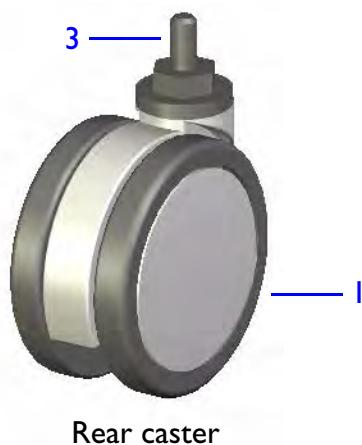
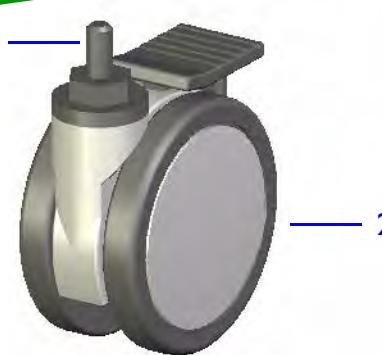
System

**Table 14-28****Base**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>A.O</b>	<b>B.O</b>
I	45356146673I	Base	RoHS. Cart base support with caster mounts	X	X

Figure 14-43

## Cart Casters



Rear caster

Front or rear caster

Parent View

System

**Table 14-29** **Cart Casters**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>A.0</b>	<b>B.0</b>
1	453561362341	Caster, 5-Inch, Dual, Non-Locking	Non-RoHS, 2 places (rear) on A.0 carts	x	
2	453561362352	Caster, 5-Inch, Dual, with Brake, Locking	RoHS, 2 places (front or rear) on A.0 carts. 4 places on B.0 carts	x	x
3	453561377261	• Washer, Split, 1/2-In, Ss	Non-RoHS	x	x

Figure 14-44

## Optional System Cart Parts Locator (Front), C.0 Cart

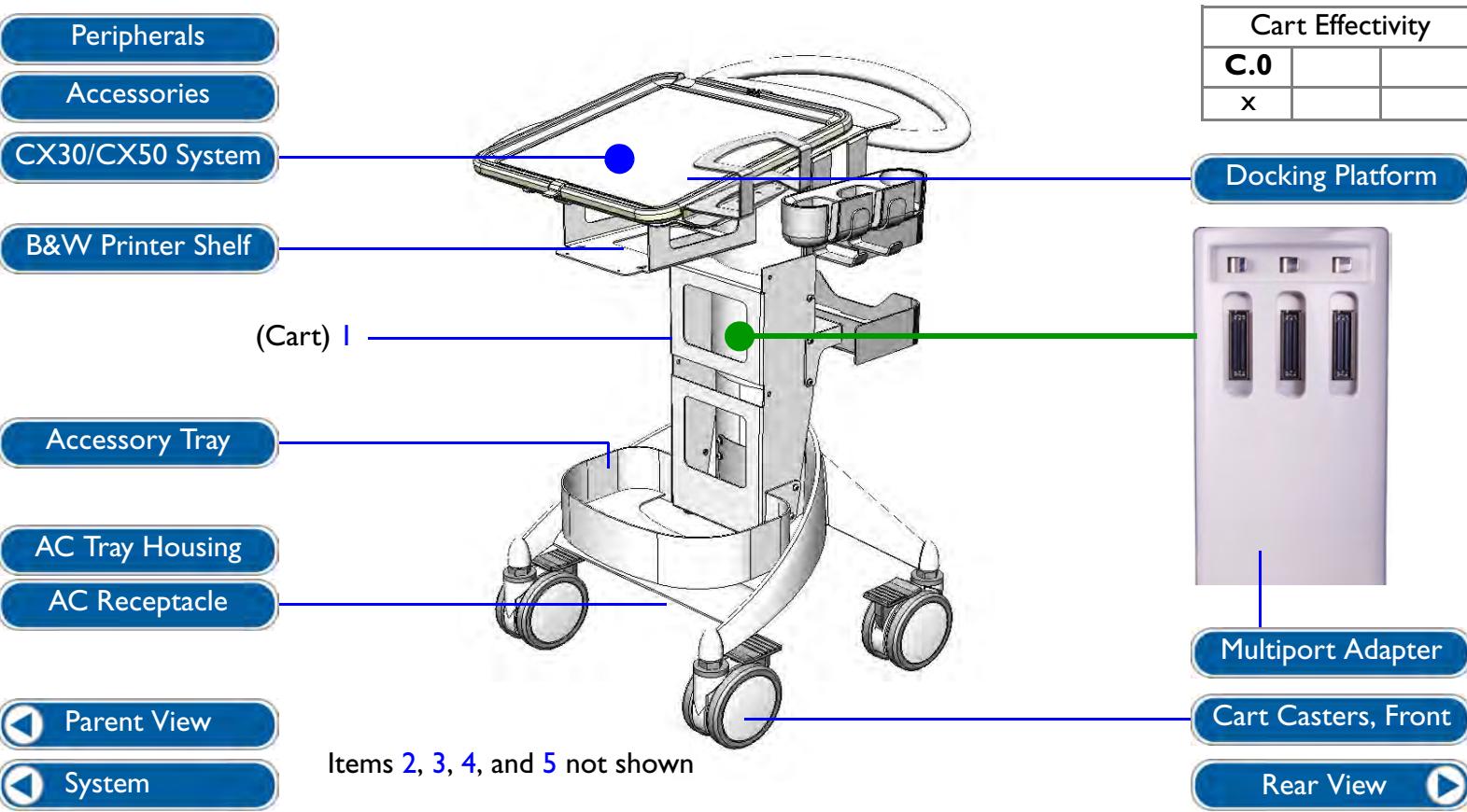
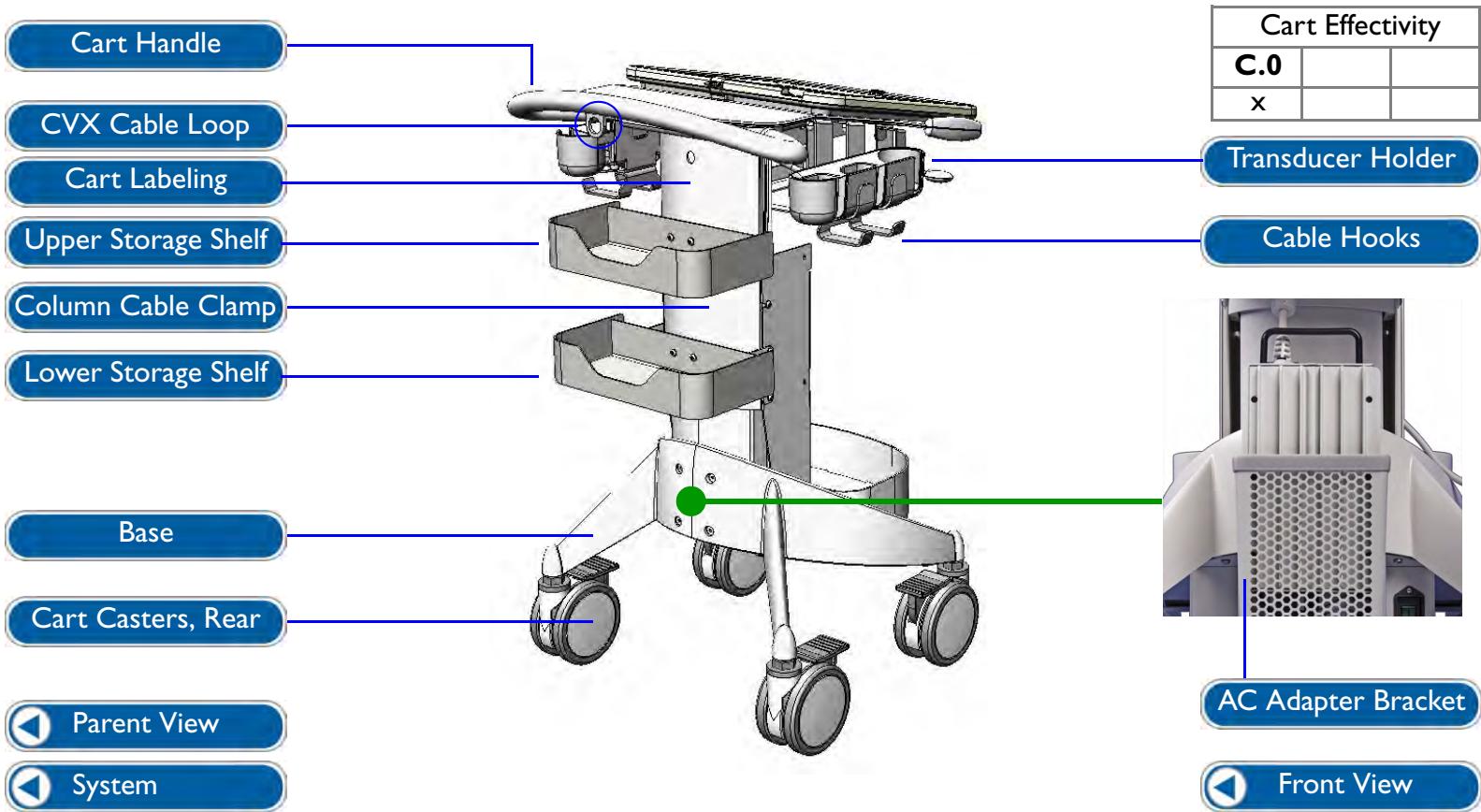


Figure 14-45

## Optional System Cart Parts Locator (Rear), C.0 Cart

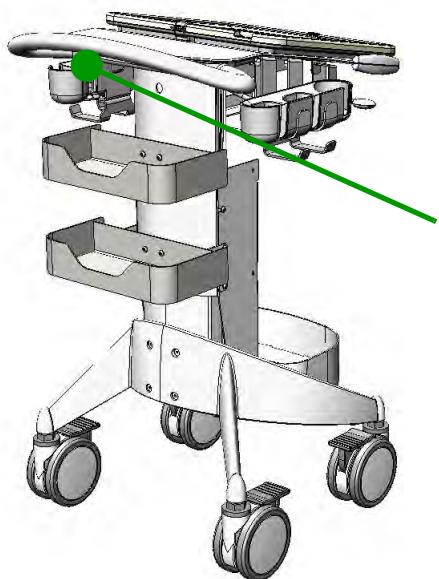


**Table 14-30 System Cart (Option), C.0 Cart**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>C.0</b>	<b>U</b>
1	453561466881	Mechanical Cart Assembly	Non-RoHS. Entire cart Used for CX50 and CX30 systems	x	
2	453561835671	CX50 Cart Kit, w/MPA, FRU	Not illustrated. Replaces CX50 C.0 version hardware with MPA/MTM or CX30 C.0 version hardware with MPA	x	
3	453561844591	• CX50 Cart w/MPA Sub-assy, Svc	Not illustrated		
4	453561835681	CX30 Cart Kit, w/MTM, FRU	Not illustrated. Replaces CX30/CX50 B.x version hardware or CX30 C.0 version hardware with MTM	x	
5	453561835581	• CX30 Cart w/MTM Sub-assy, Svc	Not illustrated		

Figure 14-46

## CVX Cable Loop



Cart Effectivity		
<b>C.0</b>		
X		

CVX cable loop  
(carabiner bracket)

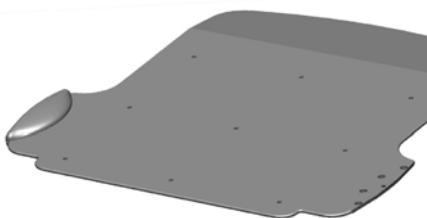
**Cabling Diagram**

**Parent View**

**System**

Figure 14-47

## Docking Platform and Microposition Pad



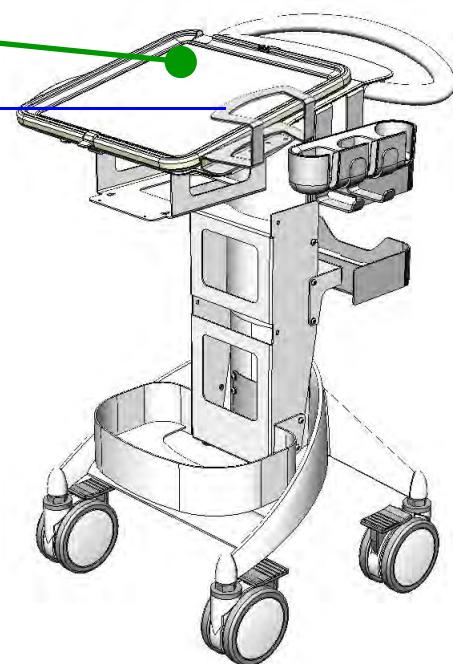
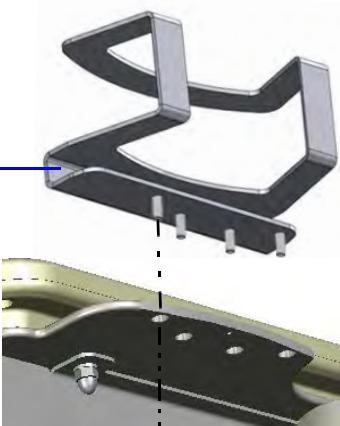
1

2

4

3

5, 6 (4 plcs each)



**NOTE** The right hand grip of the micro-position pad is replaced by the Connector Bumper Bracket Kit.

Parent View

System

Cart Effectivity	
C.0	
x	

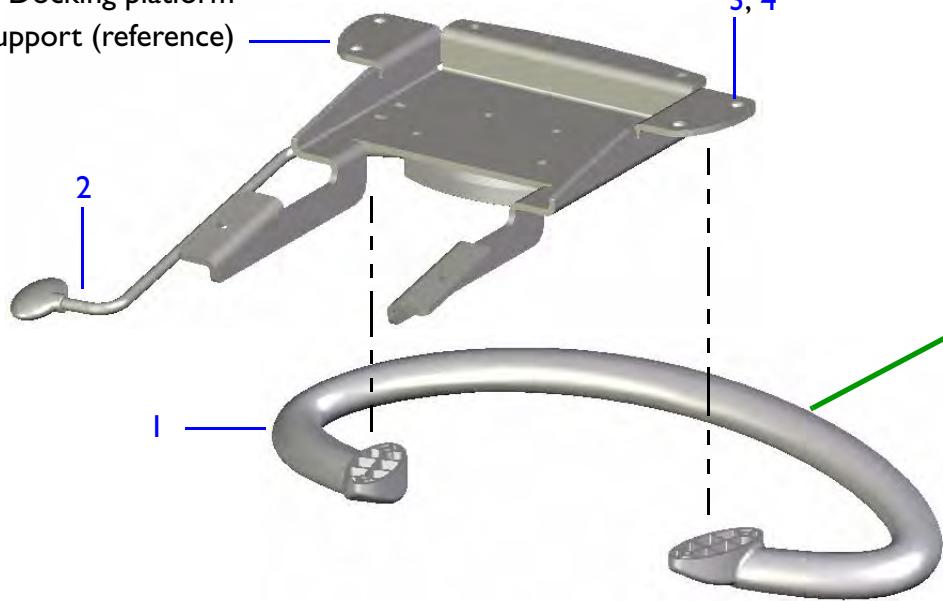
**Table 14-31 Docking Platform and Microposition Pad**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	C O U L D
1	453561378341	Docking Assembly	RoHS CX30 and CX50 system docking platform, includes latches	X
2	453561375911	Pad, Microposition	RoHS Includes hand grip	X
3	453561843011	Connector Bumper Bracket Kit		X
4	453561807711	• Bracket, XDCR Connector Bumper	Includes 4 Studs	X
5	453561377691	• WSHRS/R LK,M6,SS	RoHS 4 places	X
6	453561377671	• NUT,ACORN,M6,SS	RoHS 4 places	X

Figure 14-48

## Handle and Docking Platform Support

Docking platform support (reference)

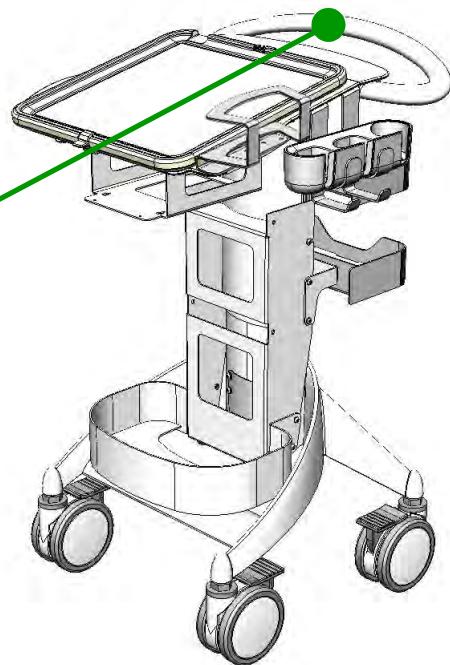


3, 4

Cart Effectivity

C.0

x



Parent View

System

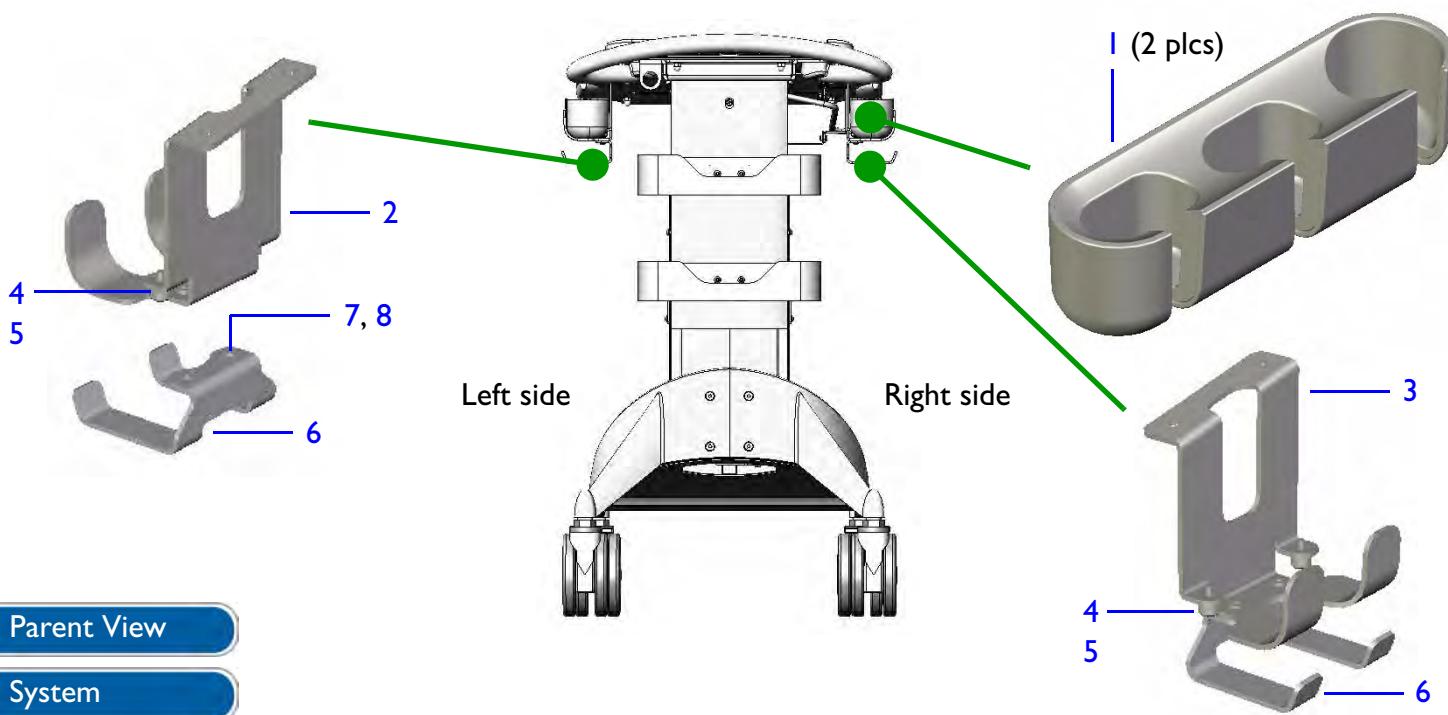
**Table 14-32 Handle and Docking Platform Support**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	C O U L D	
1	453561375901	Handle, Cart	RoHS	X	
2	453561466721	Release Lever Assembly	RoHS. Lift handle that raises and lowers system cart	X	
3	453561377781	• Screw, #10-32x1/2, FHCS, Ss	RoHS, 4 places	X	
4	453561377791	• Washer, Lock, C'Sink, #10	RoHS, 4 places	X	

Figure 14-49

## Transducer Cable Hooks

Cart Effectivity	
C.0	
x	



Parent View

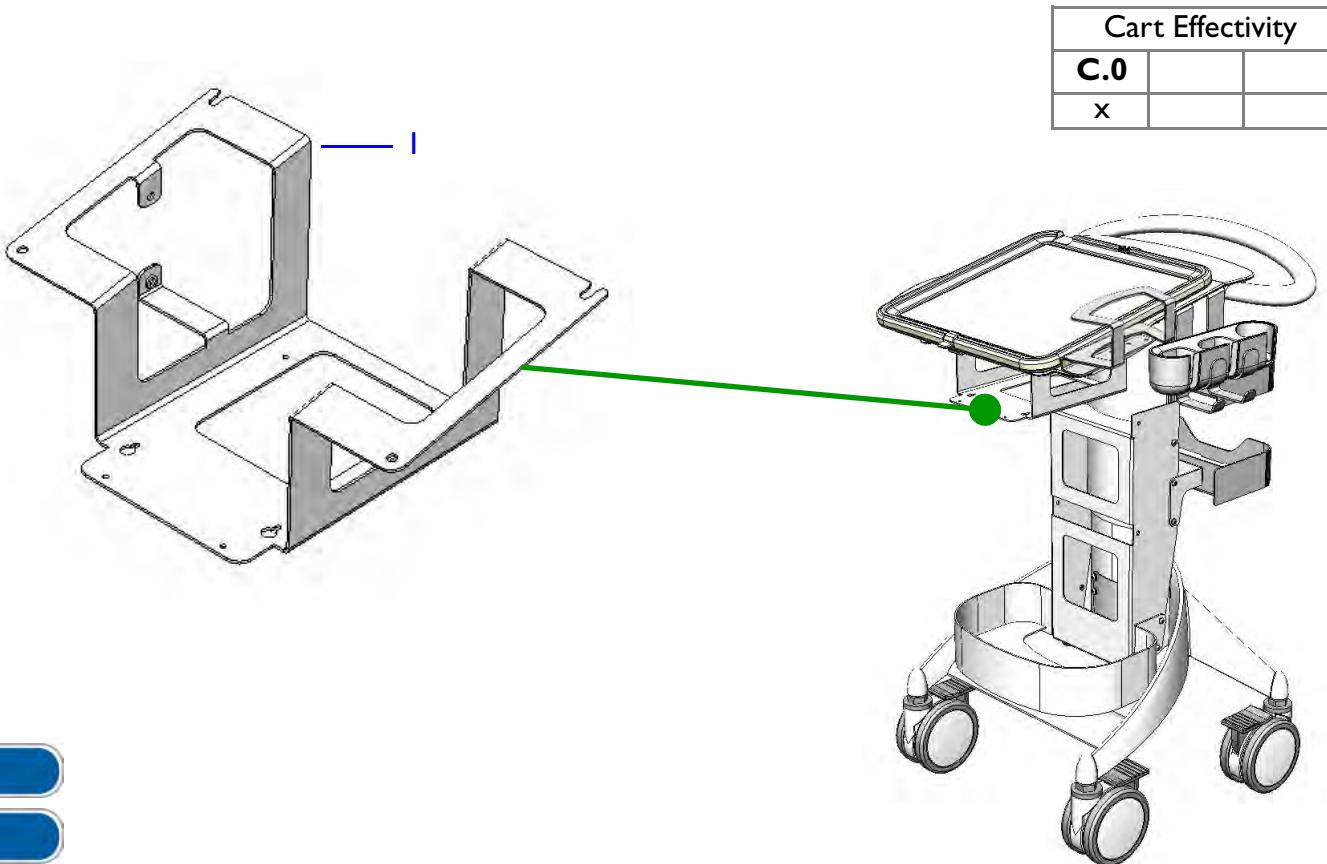
System

**Table 14-33 Transducer Cable Hooks**

Index No.	Part Number	Part Description	Notes/Reference	C	O
1	453561155531	Transducer Holder, Right (Over-Mold Assembly)	RoHS. 2 places, holders are reversible to both sides of cart	X	
2	453561396352	Bracket, Probe Holder, Left	RoHS.	X	
3	453561396362	Bracket, Probe Holder, Right	RoHS.	X	
4	453561377671	• Nut, Acorn, M6, Ss	RoHS, 2 places each probe holder bracket	X	
5	453561377691	• Washer, Split Lock, M6, Ss		X	
6	453561396371	Hook, Probe, Cable	RoHS. 2 places	X	
7	453561377661	• Screw, M5x10, BHCS, Ss	RoHS, 4 places (2 places each hook)	X	
8	453561377291	• Washer, Lock, IT, M5, Ss		X	

Figure 14-50

## Black and White Printer Shelf



Cart Effectivity	
C.0	
X	

Parent View

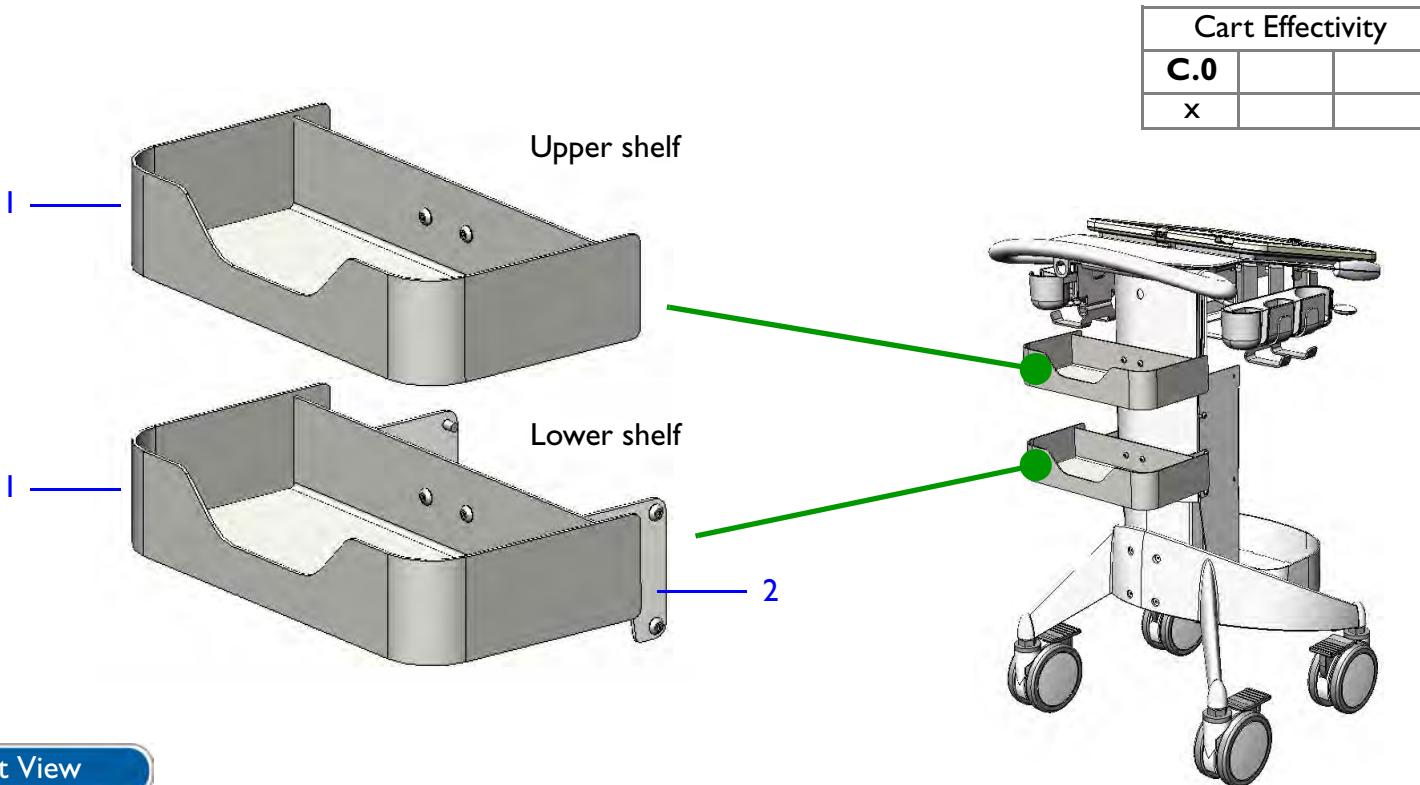
System

**Table 14-34 Black and White Printer Shelf**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>C.O.</b>	
I	453561496211	Bracket, Black and White Printer	RoHS. Mounting bracket The B&W printer is installed at the factory Part of Multiport adapter (MPA) kit <a href="#">453561624623</a>	X	

Figure 14-51

## Rear Storage Shelves



Cart Effectivity	
C.0	
X	

Parent View

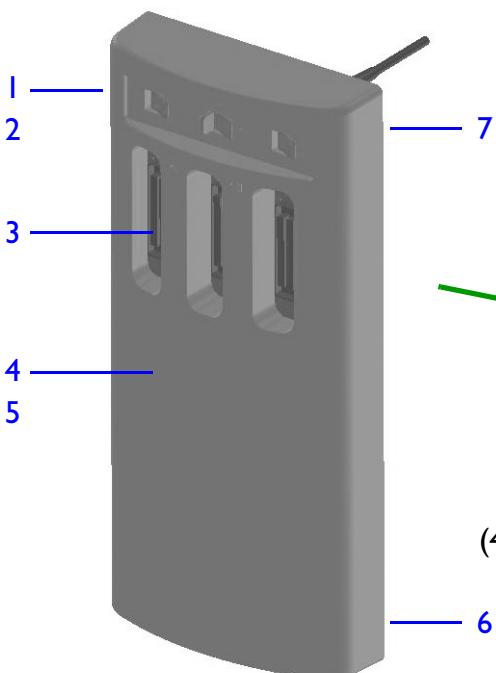
System

**Table 14-35** Rear Storage Shelves

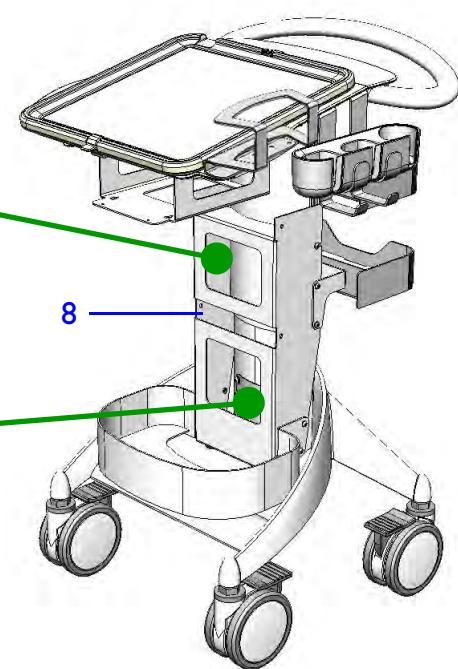
Index No.	Part Number	Part Description	Notes/Reference	C.O.	
1	453561496201	Storage Shelf	RoHS. 2 places Part of Multiport adapter (MPA) kit <a href="#">453561624623</a>	X	
2	453561496921	Bracket, Storage Shelf	RoHS. Lower rear shelf bracket Part of Multiport adapter (MPA) kit <a href="#">453561624623</a>	X	

Figure 14-52

## Multiport Adapter Assembly (Option)



(4 plcs) 9  
(4 plcs) 10  
6



Cart Effectivity	
C.0	
x	

Parent View

System

Table 14-36 Multiport Adapter Assembly (Option)

Index No.	Part Number	Part Description	Notes/Reference	C O U L D
1	453561624623	MPA Final Assembly	RoHS Cart option, includes MPA cable, covers, and mounting brackets Backward compatible	x
2	453561606181	Kit, MTM (Multiport adapter) Cart Upgrade	Non-RoHS Cart option, includes mounting frame, cable catch, storage shelf, B/W printer bracket, and attaching hardware	x
3	See "About Compatibility and Part Numbers" on page 459	PCB Assy, MPA		x
4	453561472821	Cover, MTM	RoHS.	x
5	453561627051	MTM Enclosure Front Cover with Gaskets	RoHS.	x
6	453561477811	Mounting Bracket, MTM, Lower	RoHS.	x
7	453561601041	Mounting Bracket, MTM, Upper	RoHS.	x
8	453561496181	Mounting Frame, MTM	RoHS.	x

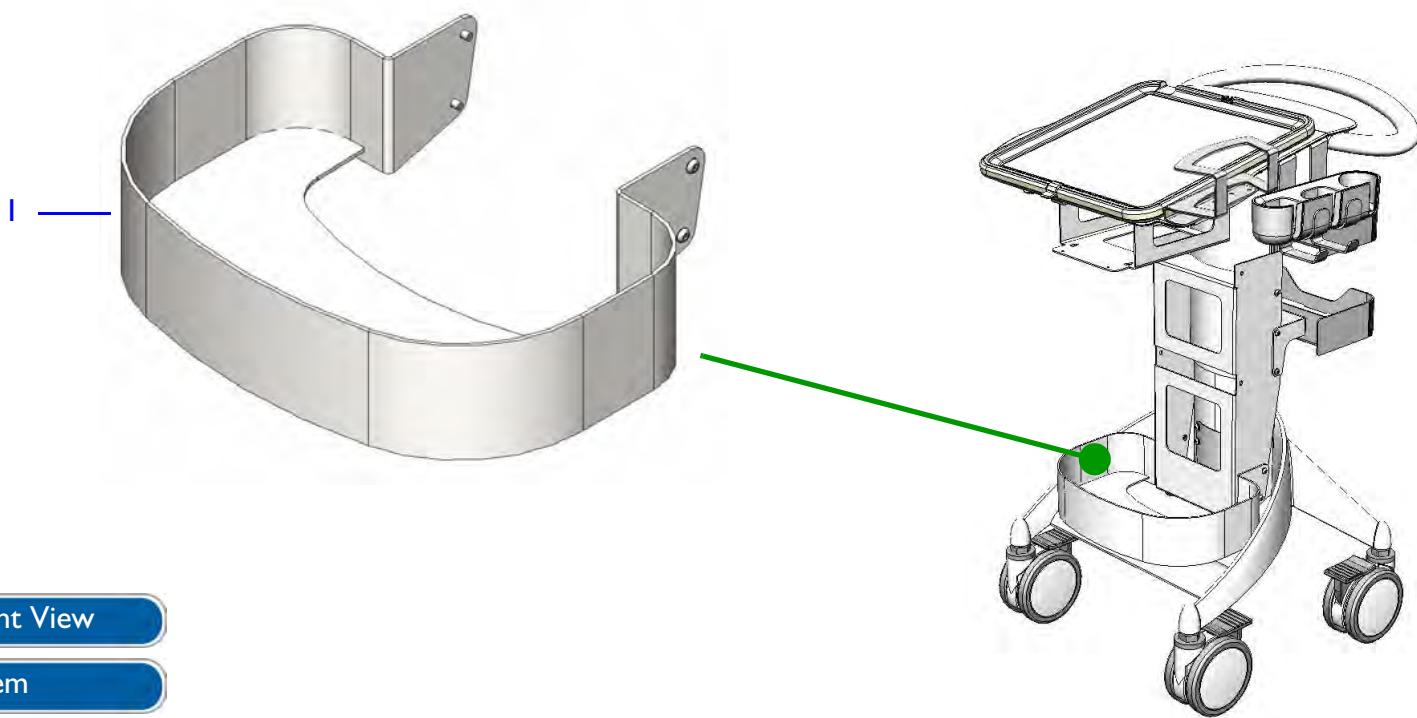
**Table 14-36 Multiport Adapter Assembly (Option) (Continued)**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>C.O.C.</b>	
9	453561384681	Screw, M6x12, Bhcs, Ss, Threadlock	Non-RoHS. 4 places, secures color-printer cable-access cover to cart frame	X	
10	453561385891	Washer, Ext Lk Serrated, M6, Ss		X	

Figure 14-53

**Cable Catch Bin**

Cart Effectivity	
<b>C.0</b>	
X	

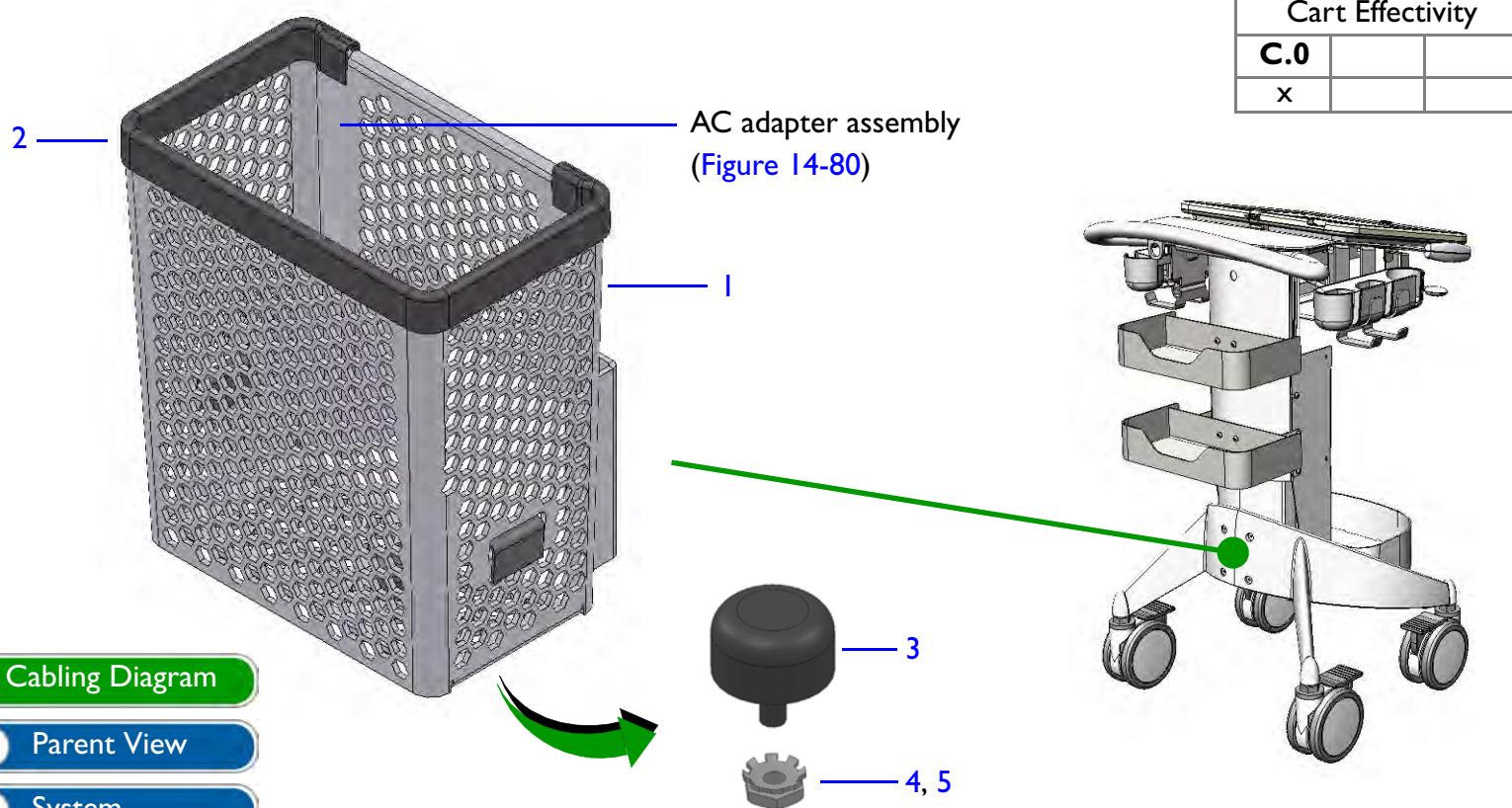
**Parent View****System**

**Table 14-37** **Cable Catch Bin**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>Q.C.</b>	
I	453561496191	Bin, Cable Catch, MTM	RoHS. Cable bin for transducers connected to the multiport adapter Part of Multiport adapter (MPA) kit <a href="#">453561624623</a>	X	

Figure 14-54

## AC Adapter Bracket

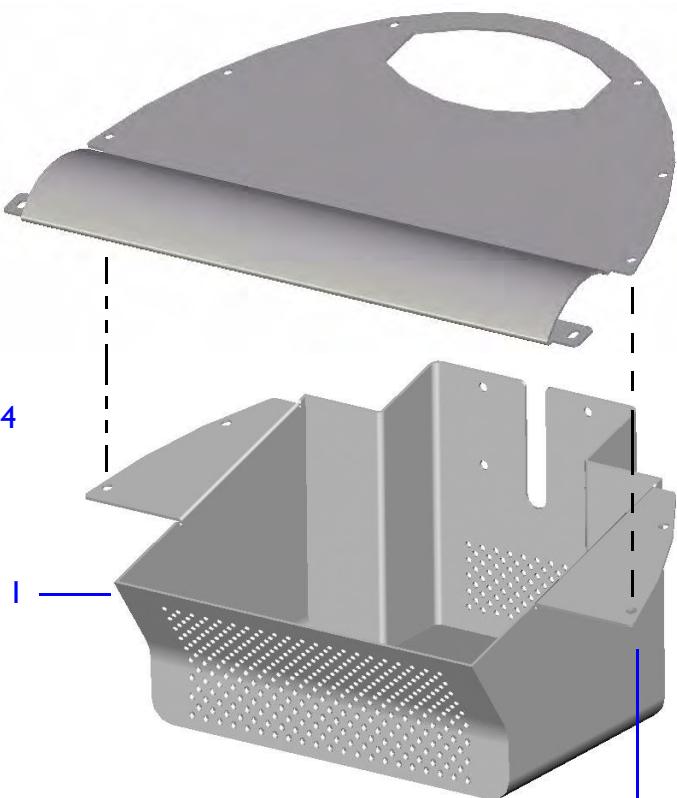
[Cabling Diagram](#)[Parent View](#)[System](#)

**Table 14-38 AC Adapter Bracket**

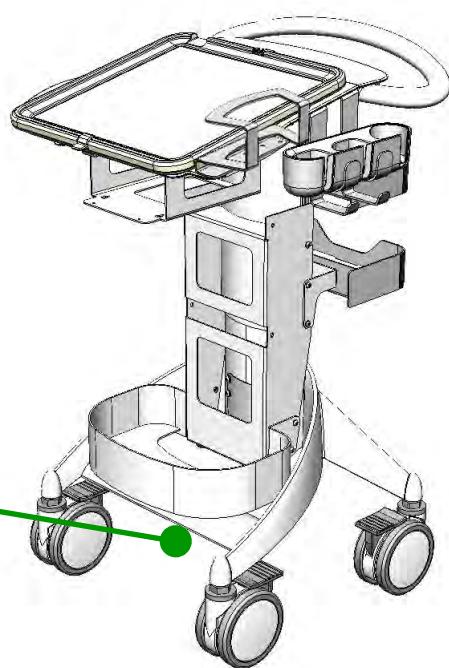
<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	C O U L D	
1	453561606911	Bracket, A/C Adapter, with Trim-Lok gasketing	RoHS Trim-Lok gasketing is a gray color	X	
2	453561410711	Edge Trim, AC Adapter Bin	RoHS. Trim-Lok gasket	X	
3	453561386071	Bumper, 3/4 Dia, 7/16 H, 8-32 Thd, Hard Rubber	Non-RoHS.	X	
4	453561386061	Washer, Fl, #8, .375OD, .45Thk, St, Zn	Non-RoHS. Used with rubber bumper	X	
5	453561386081	Nut, 8-32, Ext Keps, St, Zn		X	

Figure 14-55

## AC Tray Housing and Base Plate



— 2



Cart Effectivity	
C.0	
x	

Antistatic chain

Installation

Parent View

System

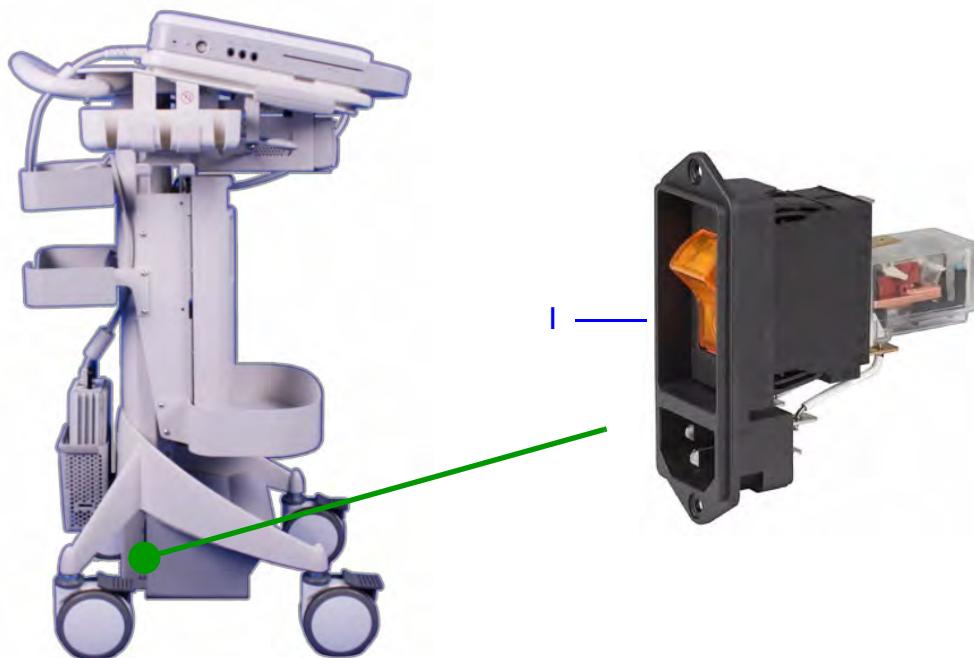
**Table 14-39 AC Tray Housing and Base Plate**

Index No.	Part Number	Part Description	Notes/Reference	C.O.C.	
1	See "About Compatibility and Part Numbers" on page 459	AC Tray, CX50		X	
2	Part of cart	Base Plate		X	
3	453561384721	<ul style="list-style-type: none"><li>Screw, 10-32x1/2, Pnh, Intsem, Pd, Ss, Thdlk</li></ul>	Non-RoHS. 4 places (part of cart)	X	
4	453561486811	Kit, Antistatic Chain	RoHS. Attaches to bottom of AC tray housing. Includes 3mm and 4mm hex keys, M3x8 screws (4), nut, ESD chain, lock strip, and chain hardware.	X	

Figure 14-56

## AC Receptacle and Circuit Breaker Switch

Cart Effectivity		
C.0		
X		

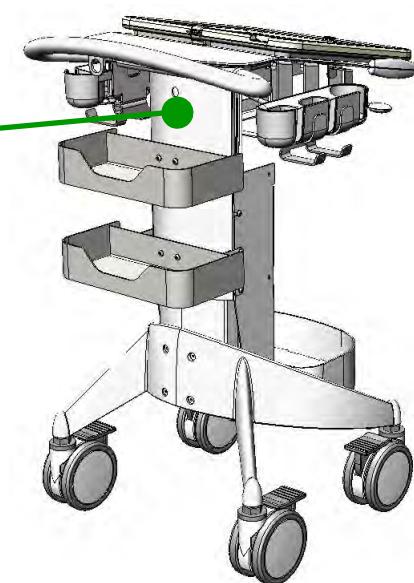
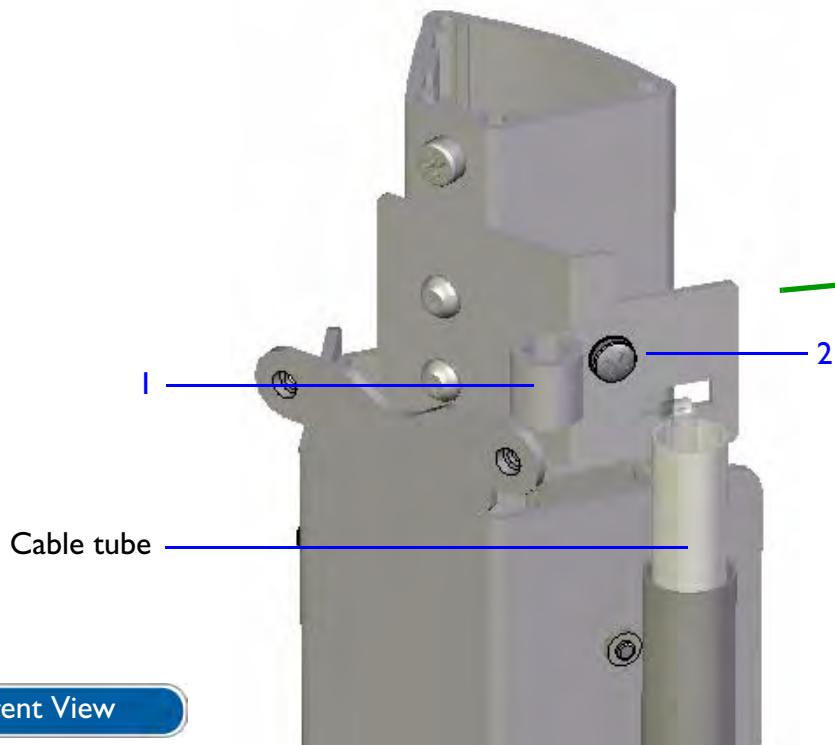
[Cabling Diagram](#)[Parent View](#)[System](#)

**Table 14-40 AC Receptacle and Circuit Breaker Switch**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	C0	C1	C2
I	453561472891	Power Entry, W/Circuit Breaker, 10A	RoHS.	X		

Figure 14-57

## Column Cable Clamp (Internal Column)



Cart Effectivity	
C.0	
X	

Parent View

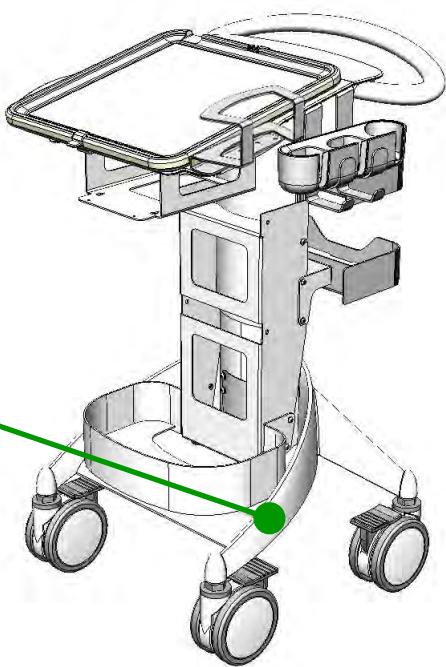
System

**Table 14-41 Column Cable Clamp (Internal Column)**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	C O U L D	
1	453561377892	Cable Clamp, Rubber Cushioned, 3/8-In OD	RoHS. Clamp secures AC power cable and color printer USB cable	X	
2	453561377272	• Screw, Locking, #10-32x1/2-In, Phillips, Ss	RoHS.	X	

Figure 14-58

Base



Cart Effectivity	
C.0	
X	

Parent View

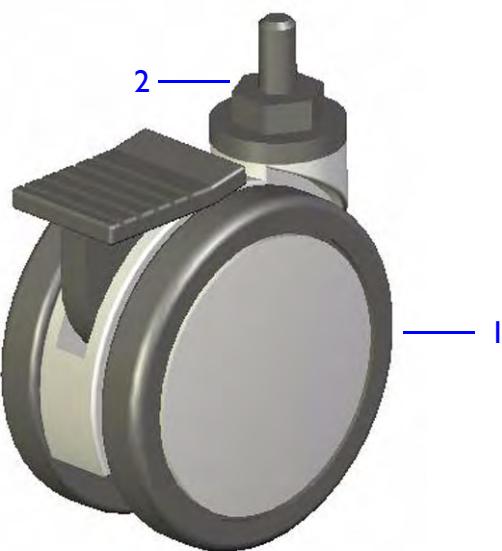
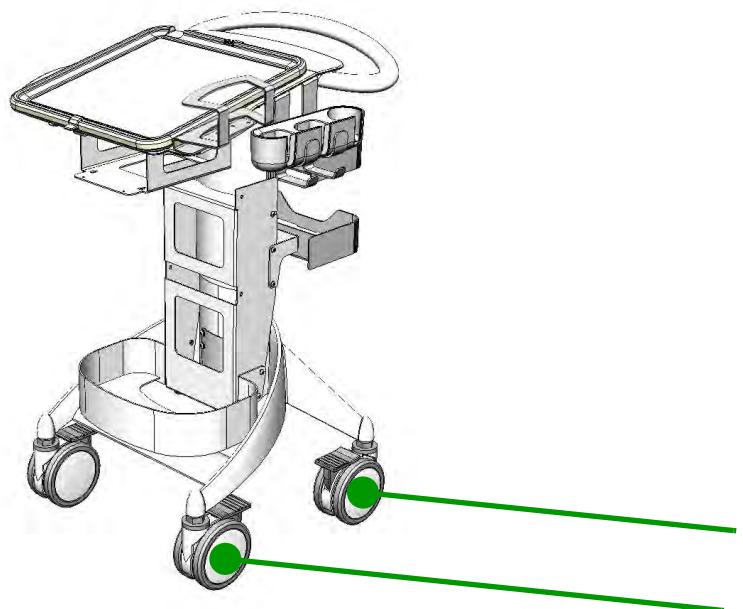
System

**Table 14-42**      **Base**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	C <sup>0</sup> C <sup>1</sup>	
I	45356146673I	Base	RoHS. Cart base support with caster mounts	X	

Figure 14-59

## Cart Casters



Cart Effectivity		
C.0		
X		

Parent View

System

**Table 14-43** **Cart Casters**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	C.0	C.U	
1	453561362352	Caster, 5-Inch, Dual, with Brake, Locking	RoHS, 4 places	X		
2	453561377261	• Washer, Split, 1/2-In, Ss	Non-RoHS	X		

**Figure 14-60**

## **Optional System Cart Parts Locator (Front), D.0 Cart**

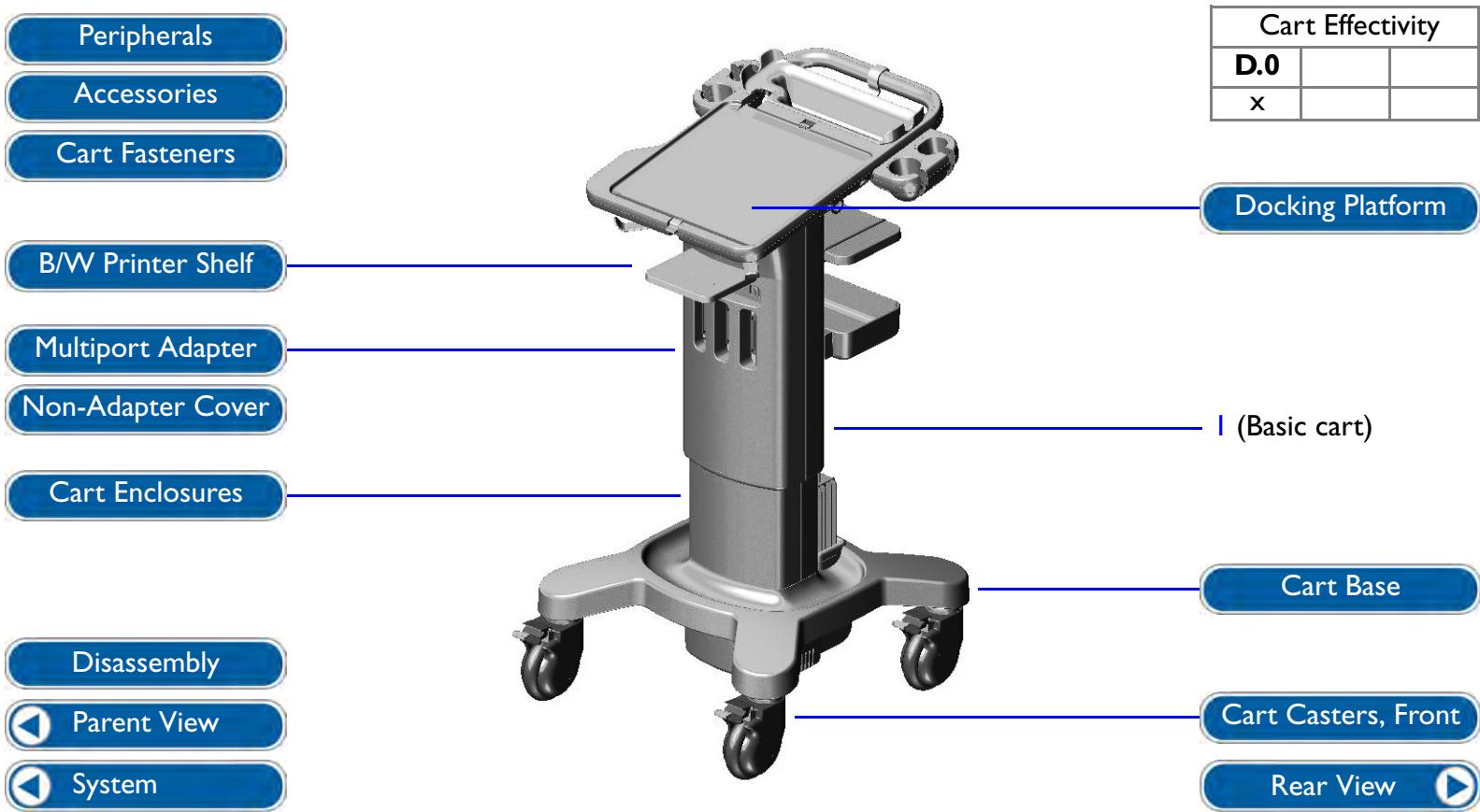


Figure 14-61

## Optional System Cart Parts Locator (Rear), D.0 Cart

Peripherals

Accessories

Cart Fasteners

Cable Hooks

Optional Shelf

Storage Tray

AC Adapter Ring

Cart Labeling

Disassembly

Parent View

System



Cart Effectivity

D.0

x

Specialty Transducer Tray

Transducer Holders

(Basic cart)

Lift Mechanism

AC Housing

Cart Casters, Rear

Front View

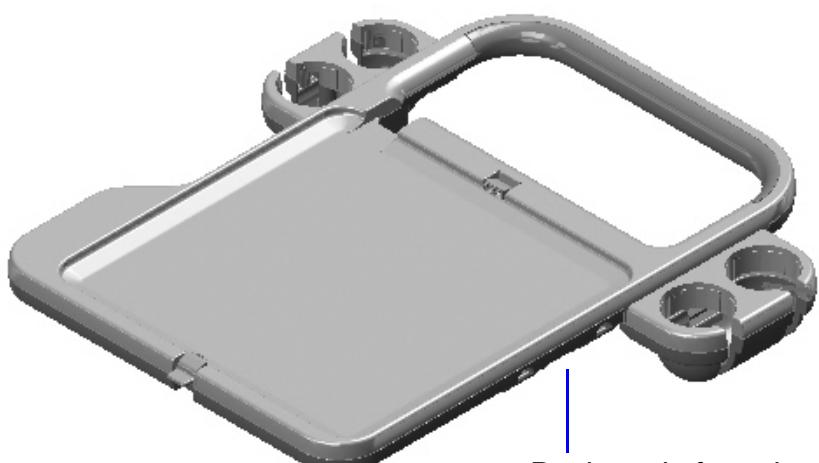
**Table 14-44**      **System Cart (Option), D.0 Cart**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>D.0</b>	
1	453561672043	Cart, CX Basic	RoHS  Not included: Plastic column enclosures, printer option, MPA option, or storage trays.  Used for CX50 and CX30 systems	X	

Figure 14-62

## Docking Platform, CX30 or CX50 System

Cart Effectivity	
D.0	
X	



Parent View

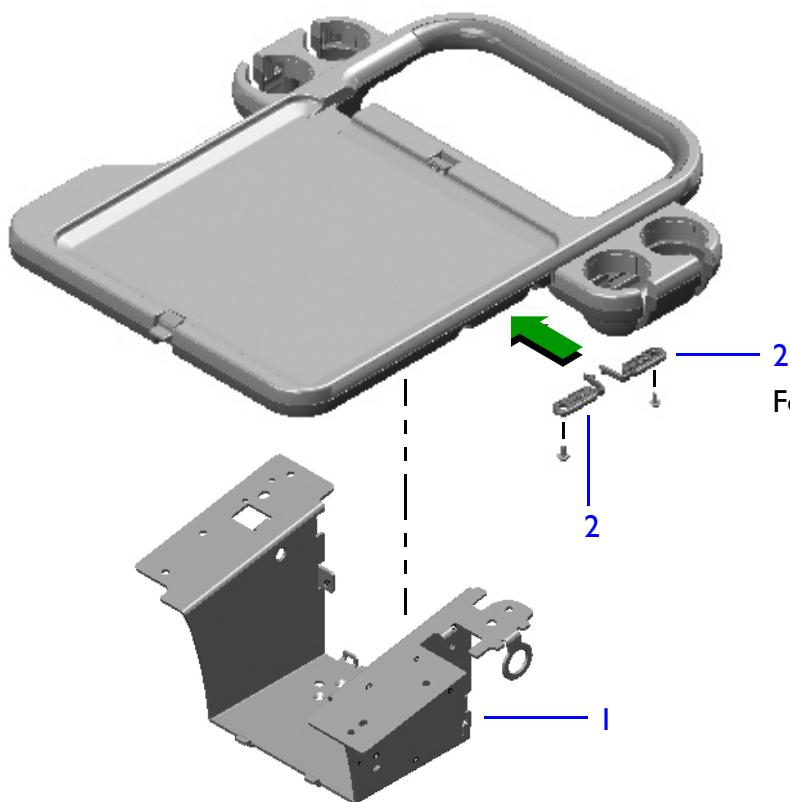
System

**Table 14-45 Docking Platform, CX30 or CX50 System**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>D.O.</b>	
I	453561673451	Top Assembly	RoHS CX system docking platform, includes retention latches, rear handle, and transducer holder covers	X	

Figure 14-63

## Docking Platform Detail

For cart cables, see [Table 11-3](#)

Cart Effectivity	
D.0	
x	

Parent View

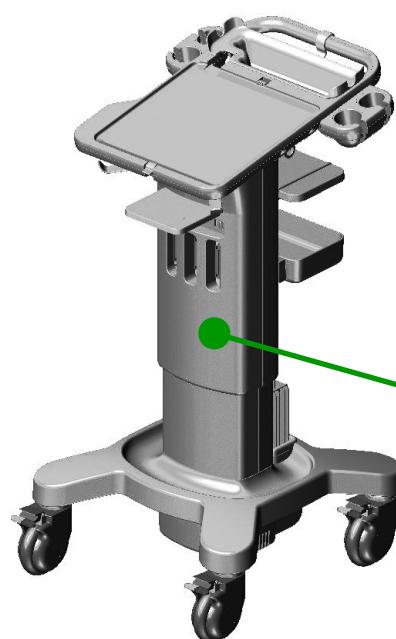
System

**Table 14-46 Docking Platform Detail**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>D.O.</b>		
1	453561672941	Bracket, U Support	RoHS	X		
2	453561674141	Retainer, Cable Lever	RoHS, 2 places	X		

Figure 14-64

## Cart Enclosures

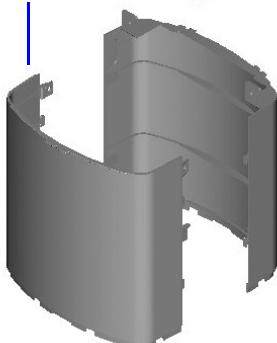
Multiport adapter assembly  
(option) (Figure 14-65)

Cart Effectivity

D.0		
x		

Upper rear panel  
detail (Figure 14-66)

3



4

Disassembly

Parent View

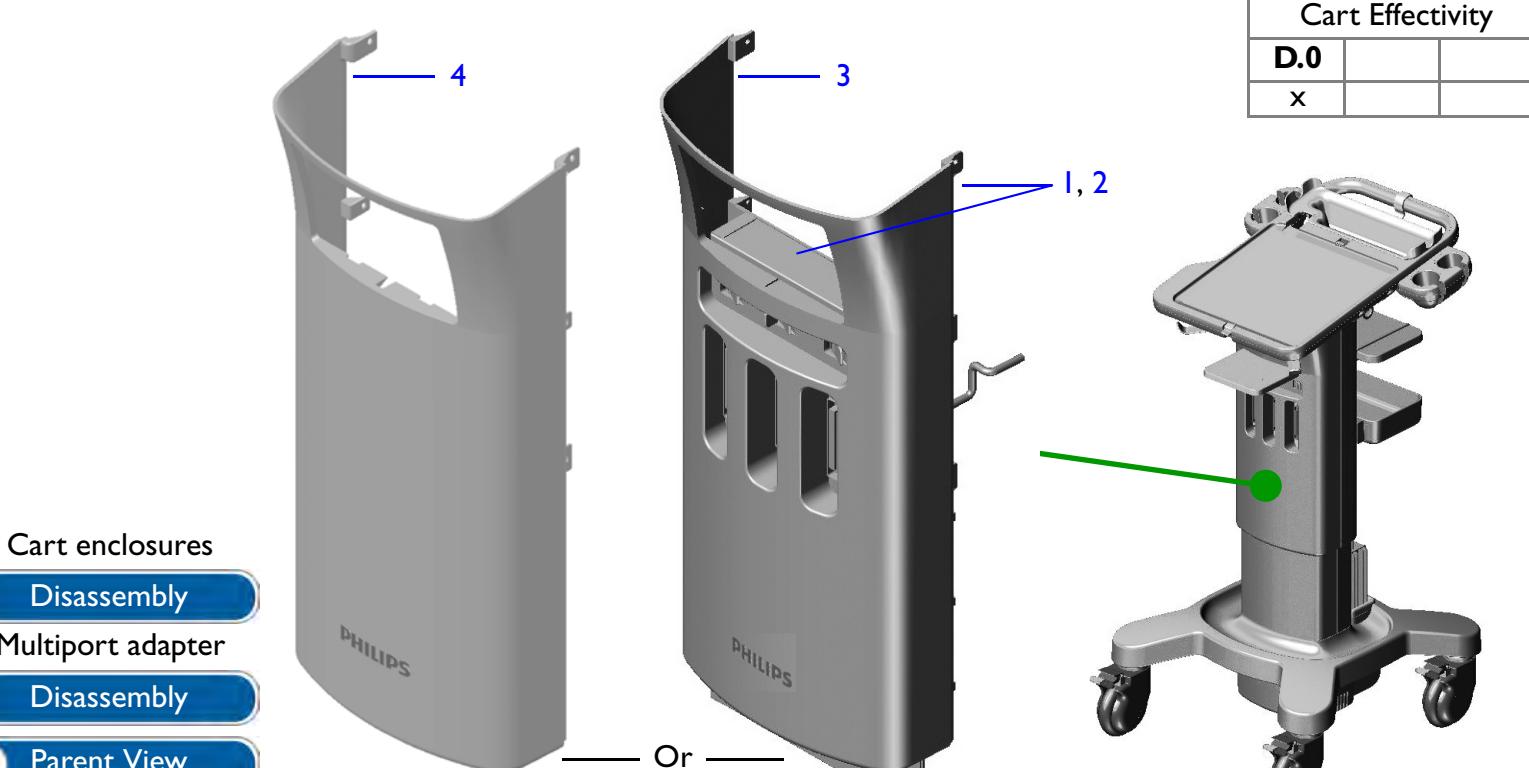
System

**Table 14-47** Cart Enclosures

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>D.O.</b>		
3	453561674181	Cover, Lower, Front	RoHS	X		
4	453561674191	Cover, Lower, Rear	RoHS	X		

Figure 14-65

## Multiport Adapter Assembly (Option)



Cart enclosures

Disassembly

Multiport adapter

Disassembly

Parent View

System

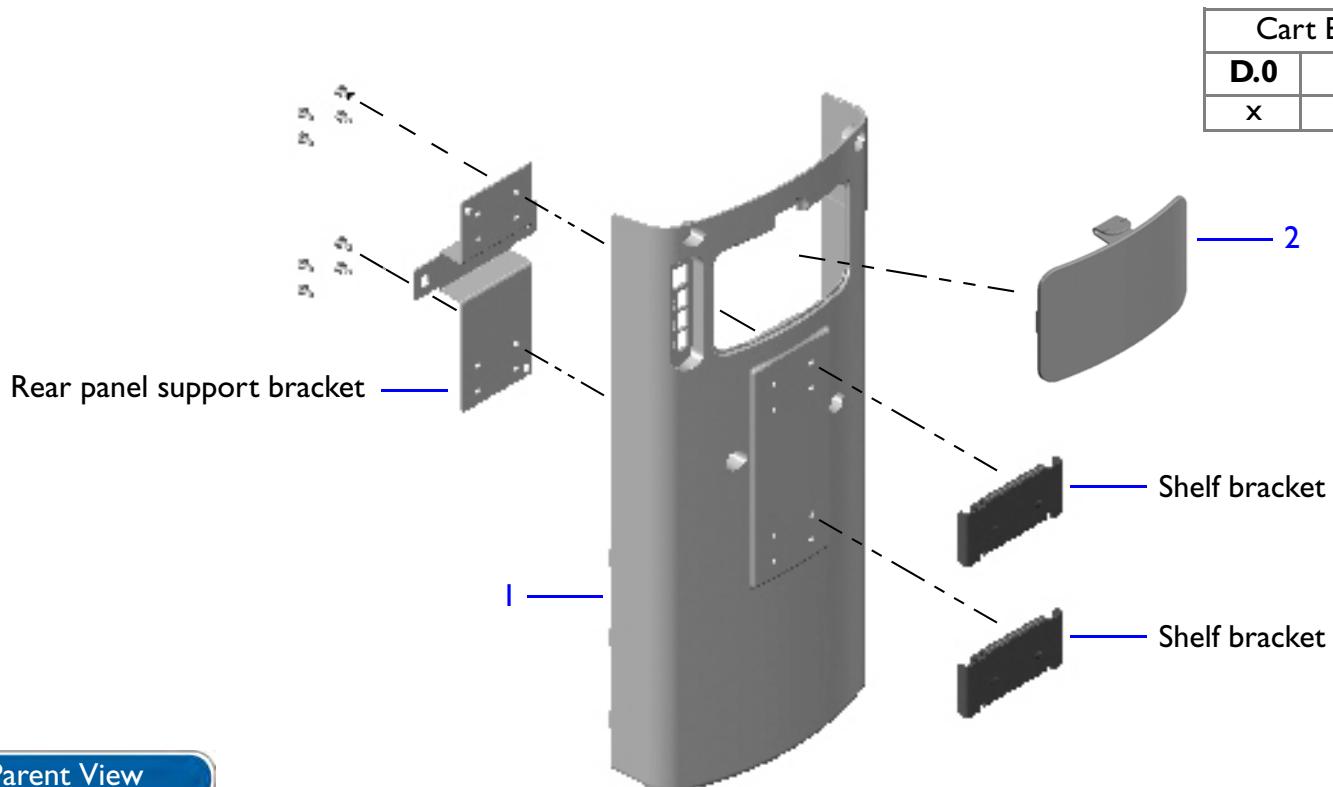
Cart Effectivity	
D.0	
x	

Table 14-48 Multiport Adapter Assembly (Option)

Index No.	Part Number	Part Description	Notes/Reference	D	O
1	453561687451	MPA Final Assembly, CX50	RoHS Multiport Adapter (MPA), supports use of the X7-2t TEE transducer	X	
2	453561687461	MTM Final Assembly, CX30	Non-RoHS Multiport Adapter (MPA) Does not support use of the TEE transducers in MPA	X	
3	453561674332	Cover, Upper Front, MPA	RoHS Cover only, used when MPA is installed	X	
4	453561681322	Kit, Blank Panel	RoHS Used when no MPA is installed	X	
5	453561674322	• Cover, Upper Front, Blank		X	
6	453561693472	• Plate, Blank Panel		X	
7	453561493281	• Screw, M4-0.7x12mm, Pnh, T20, w/CCW, Ss		X	

Figure 14-66

Upper Rear Panel Detail



Cart Effectivity		
D.0		
x		

Parent View

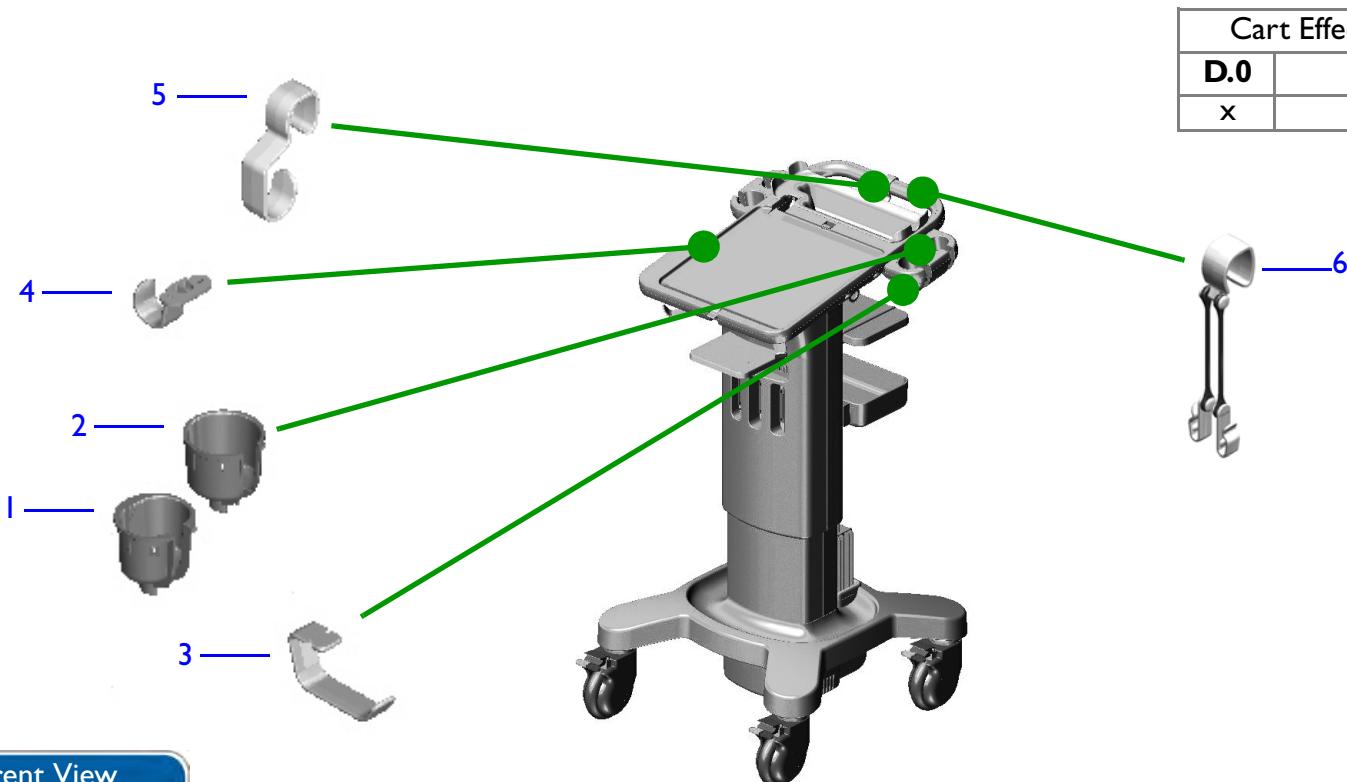
System

**Table 14-49**      **Upper Rear Panel Detail**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>D.O.</b>		
1	453561674201	Panel, Upper Rear	RoHS Includes rear panel support bracket and two shelf brackets	X		
2	453561674231	Cover, Access Hatch	RoHS	X		

Figure 14-67

## Transducer Cable Hooks



Cart Effectivity		
D.0		
x		

Parent View

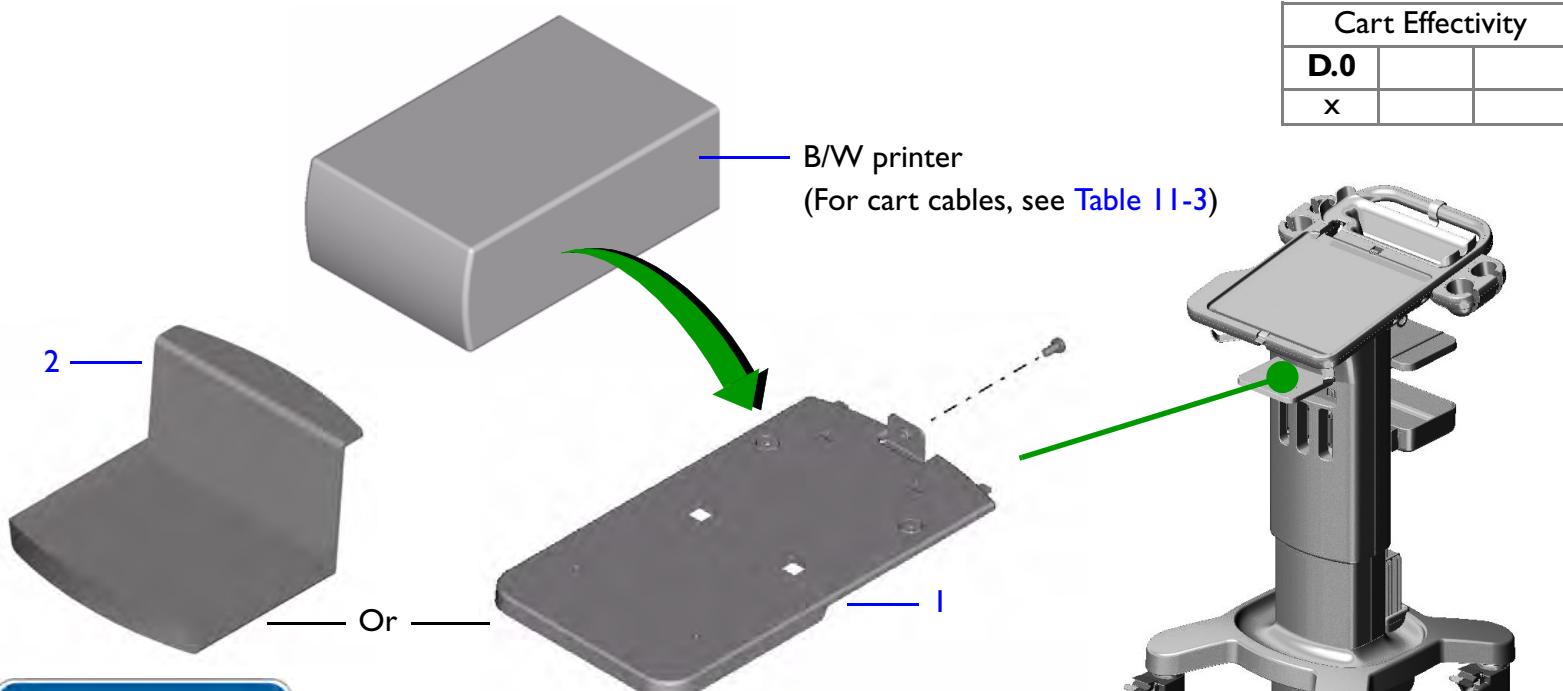
System

**Table 14-50** Transducer Holders and Cable Hooks

Index No.	Part Number	Part Description	Notes/Reference	D	O
1	453561674091	Holder, Probe Insert	RoHS, 2 places, oval	X	
2	453561674101	Holder, Gel Insert	RoHS, 2 places, round	X	
3	453563470421 (M2540-40690)	Transducer Cable Hook, Mushroom	RoHS, 4 places	X	
4	453561168711	Hook, Transducer Cable	RoHS. 1 place	X	
5	453561498721	Hook, Cable Handle	RoHS. Power cord hook, moveable	X	
6	453561759491	Cable Management Module Assy, Easy-Clip	Quantity 2 "bungee" cable hangers and clips. Attaches to handle.	X	

Figure 14-68

## Black-and-White Printer Shelf



Cart Effectivity	
D.0	
x	

[Disassembly](#)[Parent View](#)[System](#)

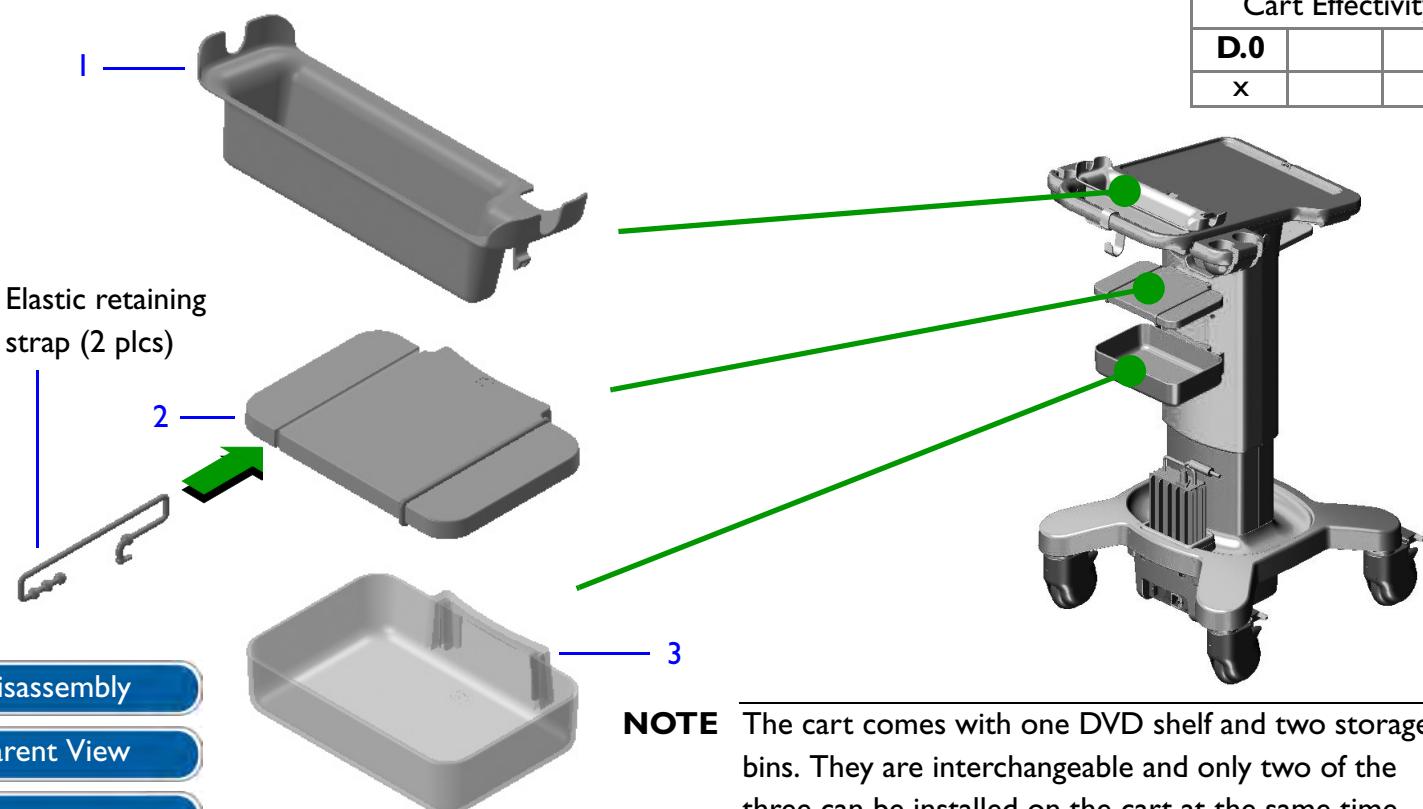
**Table 14-51** Black-and-White Printer Shelf

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>D.O.</b>	
1	453561674301	Shelf Assembly, Printer	RoHS Internal shelf for B/W printer	X	
2	453561674311	Tray, Column, Storage	RoHS Used if no B/W printer is installed	X	

Figure 14-69

## Peripheral Rear Shelf and Storage Trays

Cart Effectivity	
D.0	
x	



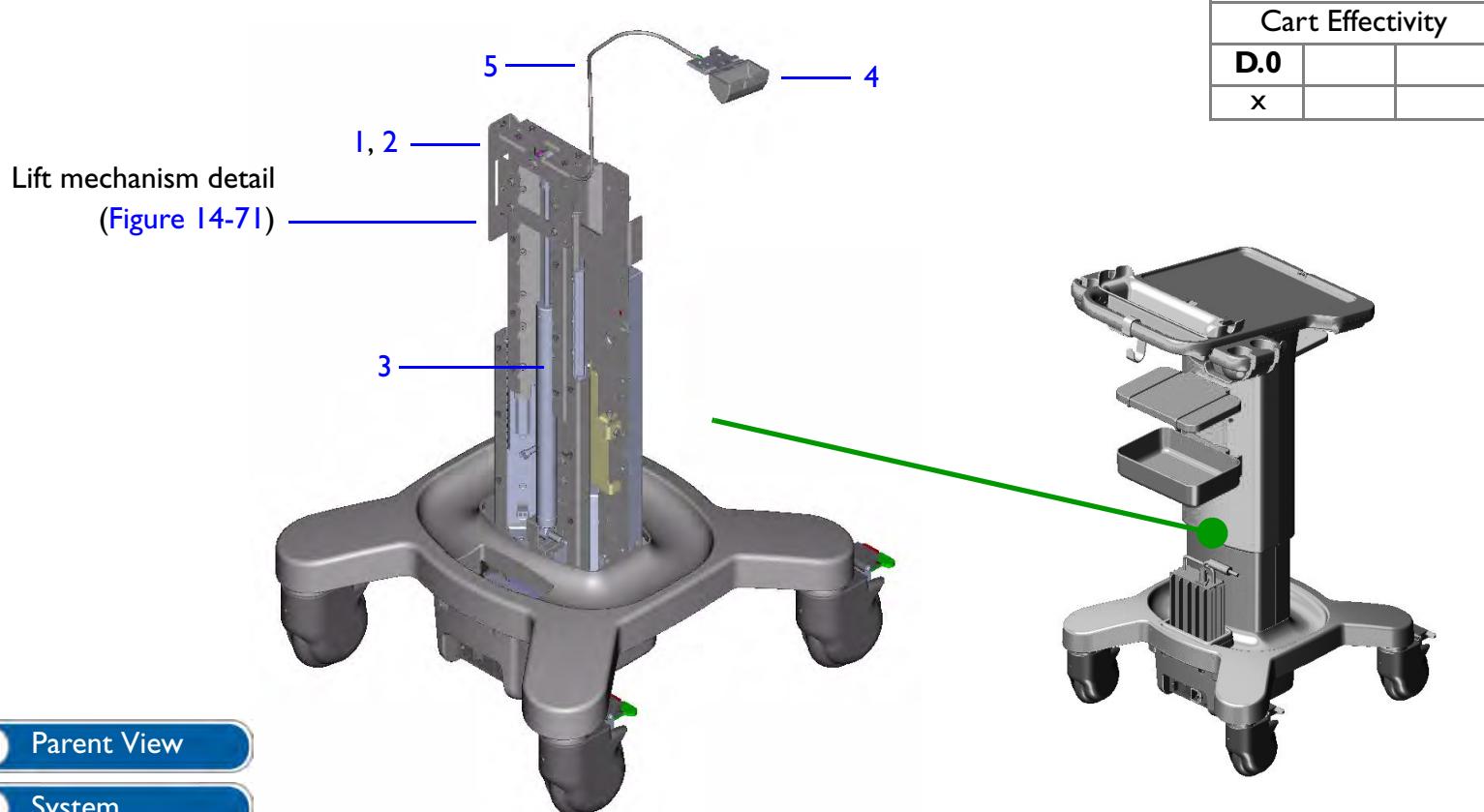
**NOTE** The cart comes with one DVD shelf and two storage bins. They are interchangeable and only two of the three can be installed on the cart at the same time.

**Table 14-52 Peripheral Rear Shelf and Storage Trays**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>D</b>	<b>O</b>
1	453561674251	Storage Bin, Handle	RoHS  Clear plastic. May be used to store the intraoperative or endocavity transducers.	X	
2	453561687491	DVD Shelf Assembly	RoHS  One supplied with cart.  Includes two elastic retaining straps. Shelf is designed for small user-owned peripherals, such as external USB DVD drive or USB hard drive only.  Not to be used for printers.	X	
3	453561674261	Storage Bin, Rear Column	RoHS  Clear plastic.  2 supplied with cart. One may be used as an alternate to the DVD shelf.	X	

Figure 14-70

## Lift Mechanism and Gas Strut



Cart Effectivity		
D.0		
x		

Parent View

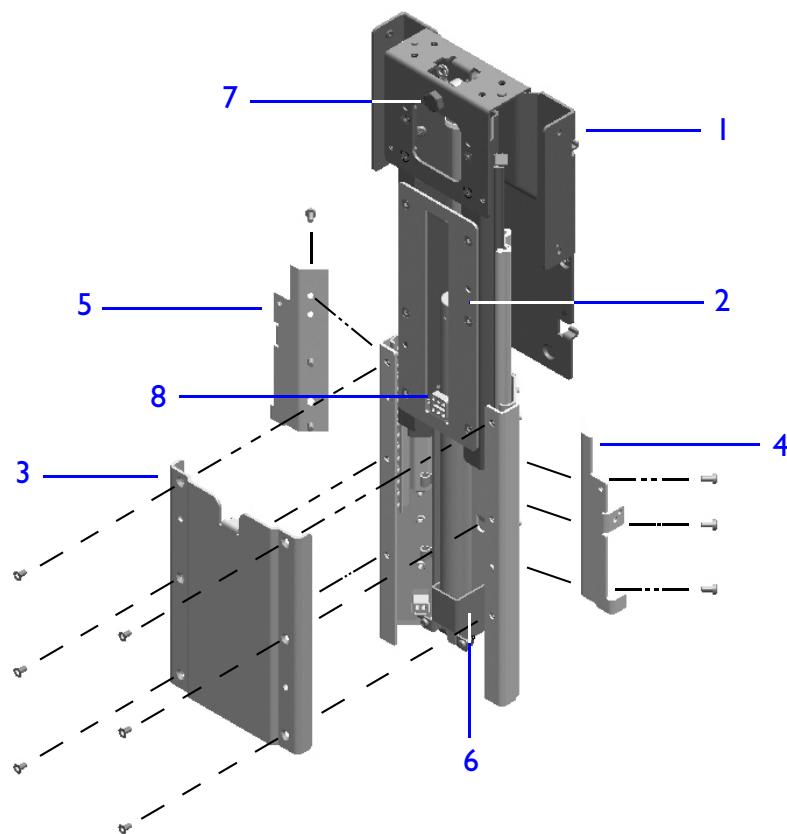
System

**Table 14-53** Lift Mechanism and Gas Strut

Index No.	Part Number	Part Description	Notes/Reference	D	O
1	453561691602	Articulation Assembly	RoHS Entire lift assembly Includes: Gas strut, bowden wire, inner member cover, MPA bracket, and release head shaft	X	
2	453561673391	Lift Mechanism Assembly	RoHS Includes: MPA mount bracket, inner and outer column members (U-brackets) Does not include gas strut	X	
3	453561672681	Spring, Gas	RoHS Gas strut Includes: Individual unit, with release head and lower pin	X	
4	453561672691	Lift Trigger Mechanism Assembly	RoHS Includes: Lever, adjustment nut, and bracket Does not include trigger release cable	X	
5	453561693391	Bowden Wire	RoHS Lift mechanism trigger release cable	X	

Figure 14-71

Lift Mechanism Detail



Cart Effectivity		
D.0		
x		

Parent View

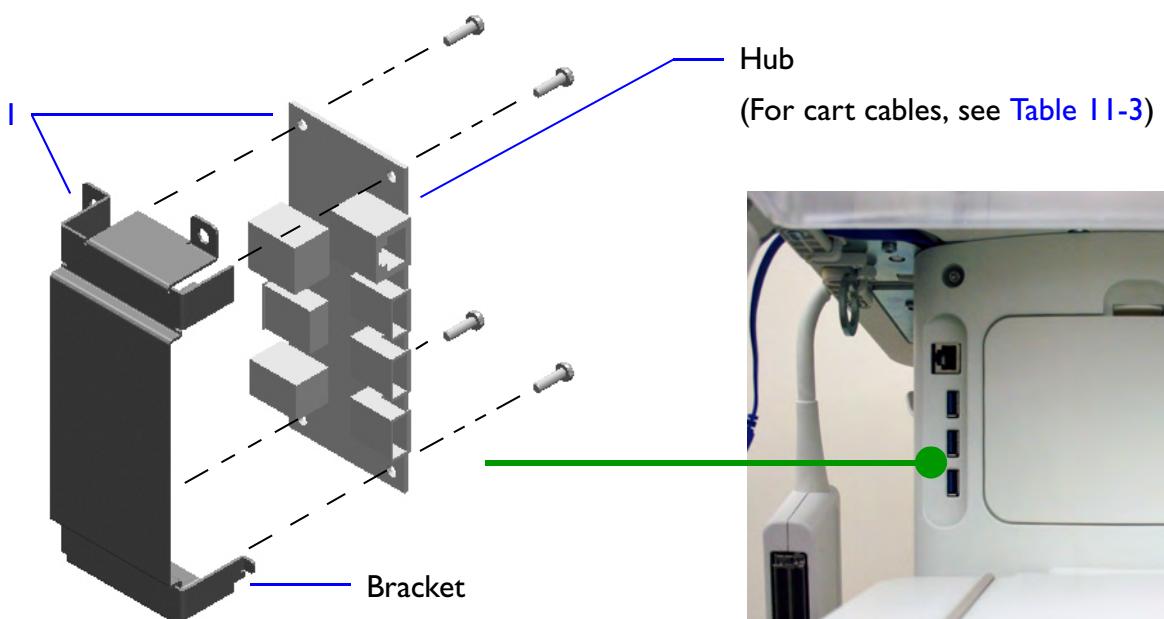
System

Table 14-54 Lift Mechanism Detail

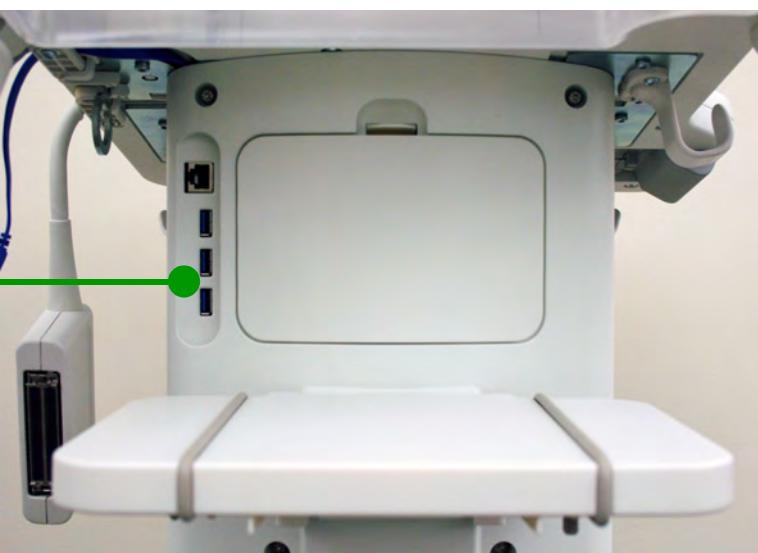
Index No.	Part Number	Part Description	Notes/Reference	D.O.	
1	453561672981	Bracket, MTM	RoHS, MPA assembly mount	X	
2	453561673521	Cover, Inner Member	RoHS, overs gas strut and lift	X	
3	453561673531	Cover, Outer Member	mechanism	X	
4	453561672961	Bracket, Base Cover, Left	RoHS	X	
5	453561672971	Bracket, Base Cover, Right	RoHS	X	
6	453561692871	Bracket, Gas Spring	RoHS	X	
7	453561673381	Shaft, Release Head	RoHS	X	
8	453561686222	Stopper, Lift Mechanism	RoHS, rubber	X	

Figure 14-72

## USB Hub and Bracket



Cart Effectivity		
D.0		
X		



Disassembly

Parent View

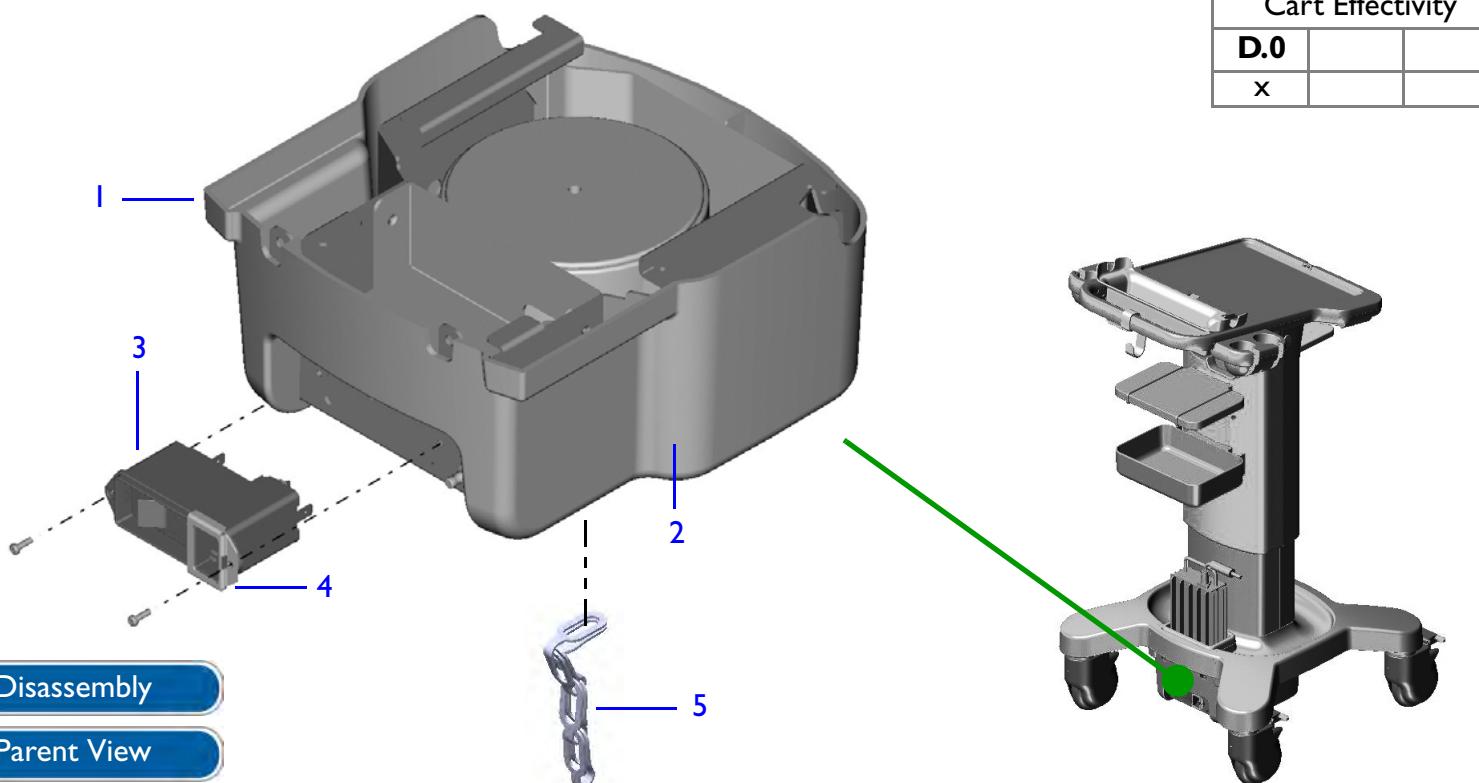
System

**Table 14-55** USB Hub and Bracket

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>D.O.</b>		
I	453561673461	USB Hub Assembly, Bracket	RoHS USB hub with bracket	X		

Figure 14-73

## AC Tray Housing

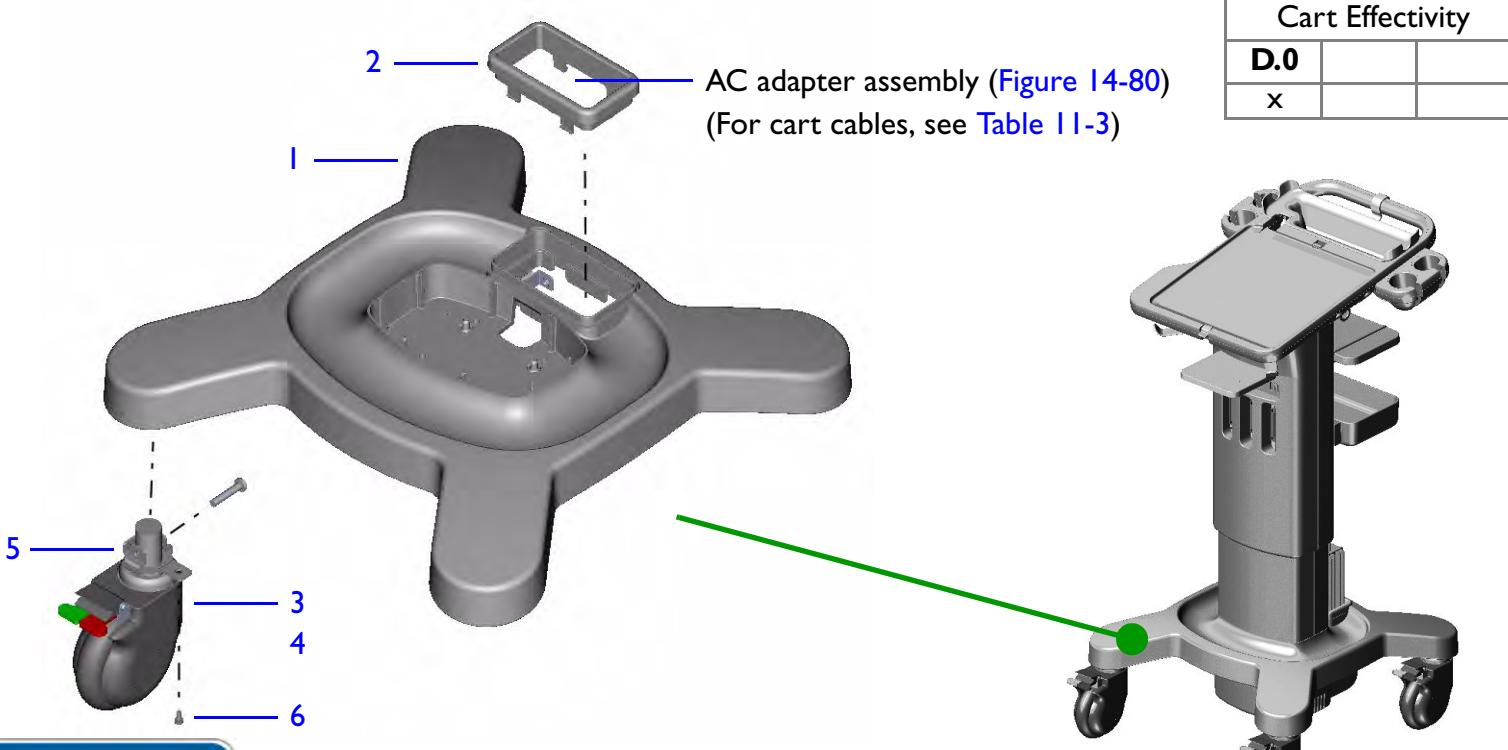
[Disassembly](#)[Parent View](#)[System](#)

**Table 14-56** AC Tray Housing

Index No.	Part Number	Part Description	Notes/Reference	D.O.	
1	453561673403	AC Tray Assembly	RoHS Includes transformer, circuit board, wiring, and breaker (complete unit)	X	
2	453561674061	Cover, AC Tray	RoHS	X	
3	453561712001	Switch, Power Inlet Breaker	RoHS Cart power switch	X	
4	453561768811	Plate, Switch	Non-RoHS Cabling Diagram: <a href="#">Figure 11-26</a>	X	
5	453561673481	Chain, ESD, Static, with Screw	RoHS Attaches to underside of AC tray	X	

Figure 14-74

## Base Enclosure and Cart Casters



Parent View

System

**Table 14-57** Base Enclosure and Cart Casters

Index No.	Part Number	Part Description	Notes/Reference	D	O
1	453561672141	Base, Cart	RoHS Structural base with caster mounts	x	
2	453561674081	Cover, Lid Base	RoHS AC adapter ring	x	
3	453561653051	Caster, Swivel and Total Lock	Rear caster, RoHS 2 places	x	
4	453561701021	Caster, Swivel and Brake Only	Front caster, RoHS 2 places	x	
5	453561681961	Bracket, Caster Wheel	RoHS, 2 places	x	
6	453561672121	Screw, M8x1.25x40, Pnh, Torx, Tlock	RoHS, 4 places each caster	x	

## D.0 Cart Fasteners

Screws are listed numerically by size.

Table 14-58

D.0 Cart Fasteners Parts List

Index No.	Part Number	Part Description	Notes/Reference	A.0	B.0	C.0	D.0
1	453561694661	Screw, M2x0.4x5, Pd, Ph	RoHS			x	
2	453561493311	Screw, M3x0.5x6mm, Pnh, T10, w/CCW, Ss	RoHS			x	
3	453561671991	Screw, M3x0.5x8, Pnh, TORX, Tlock	RoHS, AC tray and USB hub			x	
4	453561672011	Screw, M4x0.7x5, Pnh, TORX, Tlock	RoHS, Common cart fastener			x	
5	453561712141	Screw, M4x0.7x10, Pnh, TORX, Tlock	RoHS			x	
6	453561493281	Screw, M4x0.7x12mm, Pnh, T20, w/CCW, Ss	RoHS			x	
7	453561672001	Screw, M4x0.7x12, Pnh, TORX, Tlock	RoHS, Articulation assembly			x	
8	453561672071	Screw, M5x0.8x6, Pnh, TORX, Tlock	RoHS, Common cart fastener			x	
9	453561672081	Screw, M5x0.8x8, Pnh, TORX, Tlock	RoHS, AC tray and printer shelf			x	
10	453561672061	Screw, M5x0.8x10, TORX, Cntrsnk, Tlock	RoHS, Common cart fastener			x	
11	453561672021	Screw, M5x0.8x10, Pnh, TORX, Tlock	RoHS, Common cart fastener			x	
12	453561672031	Screw, M5x0.8x16, Pnh, TORX, Tlock	RoHS, Articulation assembly			x	
13	453561693441	Screw, M6x1x10, Pnh, TORX, Tlock	RoHS			x	
14	453561672091	Screw, M6x1x12, Pnh, TORX, Tlock	RoHS, Common cart fastener			x	
15	453561672101	Screw, M6x1x16, Pnh, TORX, Tlock	RoHS, Common cart fastener			x	

Table 14-58

## D.0 Cart Fasteners Parts List (Continued)

Index No.	Part Number	Part Description	Notes/Reference	A.O	B.O	C.O	D.O
16	453561672121	Screw, M8x1.25x49, Pnh, TORX, Tlock	RoHS. Bolts for casters, 4 places each caster				x
17	453561693461	Nut, Hex, M8	RoHS. Nut for casters, 4 places each caster				x
18	453561693431	Clamp, Open, Cable, 6.4mm	RoHS				x
19	453561693421	Clamp, Open, Cable, 9.5mm	RoHS				x
20	453561712011	Clamp, Closed, Cable	RoHS				x

## System Cart Labeling

For A.0 and B.0 cart labeling, see [Figure 14-75](#).

For C.0 cart labeling, see [Figure 14-76](#).

For D.0 cart labeling, see [Figure 14-78](#).

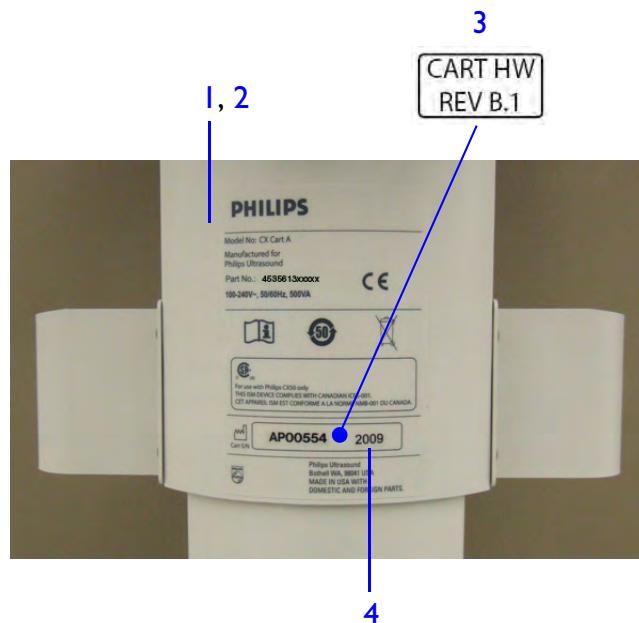
### A.0 and B.0 Cart

**Figure 14-75**

**System Cart Labeling, A.0 and B.0 Cart (Main Label)**

**NOTE** Sample of cart label and its location. Cart label information may be different.

Cart Effectivity	
A.0	B.0
x	x



Parent View

System

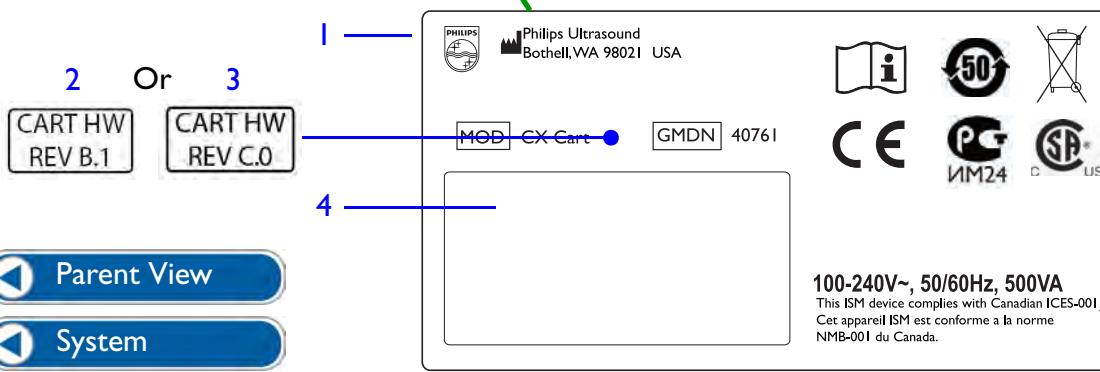
**Table 14-59****System Cart Labeling, A.0 and B.0 Cart**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>A.0</b>	<b>B.0</b>
1	453561352262	Label, Main System, MI Cart	Non-RoHS. Attaches to rear of cart column	x	
2	453561394881	Label, Main System, CX50 Cart	RoHS.		x
3	453561453231	Label, Cart Hardware	Non-RoHS. B.I hardware label.		x
4	453561380371	Label, Year of Manufacture, MI Cart	RoHS. Attaches to cart Main label	x	x

## C.0 Cart

**Figure 14-76****System Cart Labeling, C.0 Cart (Main Label)**

Cart Effectivity		
C.0		
X		



"No Pushing" label  
(Figure 14-77)

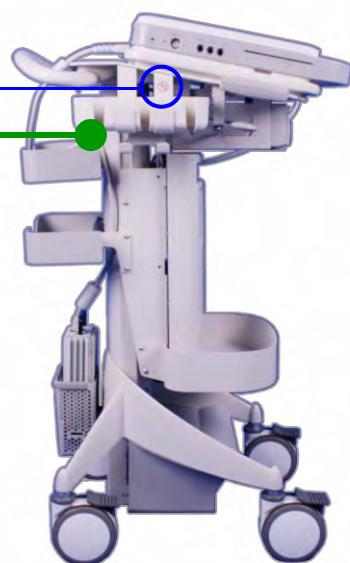
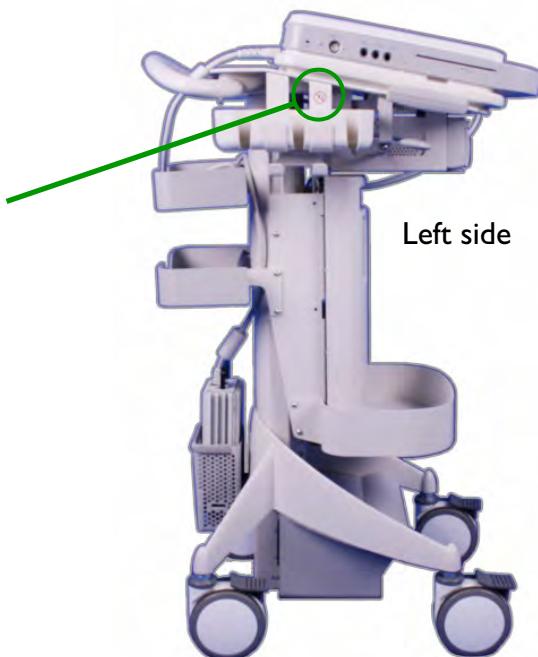


Figure 14-77

## System Cart Labeling, C.0 Cart (No Pushing Label)



Right side



Left side

Cart Effectivity	
C.0	
X	

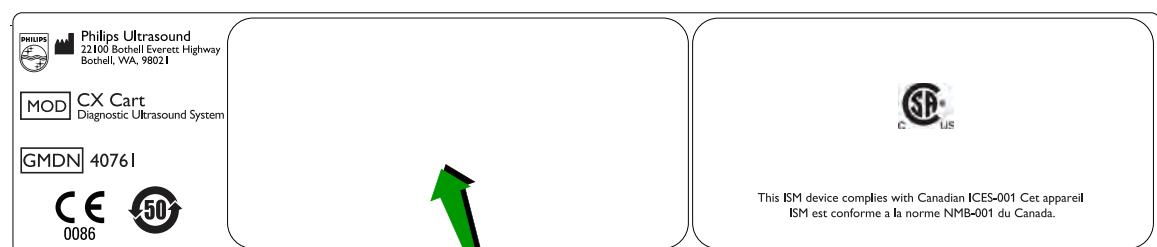
Parent View

System

**Table 14-60**      **System Cart Labeling, C.0 Cart**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>U</b>	<b>U</b>	<b>U</b>
1	453561486181	Label, Main System, Cart	RoHS. Attaches to rear of cart column	X		
2	453561453231	Label, Cart Hardware	Non-RoHS. B.I hardware label for C.0 carts without a Multiport adapter installed.	X		
3	453561614401	Label, Cart Hardware	RoHS. C.0 hardware label.	X		
4	Not available	Label, Year of Manufacture, MI Cart	Attaches to cart Main label	X		
5	453561452191	Label, Cart, No Pushing	RoHS. 2 places; one on each side of system.	X		

## D.0 Cart

**Figure 14-78****System Cart Labeling, D.0 Cart (Main Label)**

— 2

**NOTE** Sample of label shown.  
Label information may vary on each system cart.

**Parent View****System**

**Table 14-6I**      **System Cart Labeling, D.0 Cart**

<b>Index No.</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Notes/Reference</b>	<b>D.0</b>			
1	453561674241	Label, System, CX Cart	RoHS Main cart label	X			
2	453561698291	Label, GTIN/SN ID, CX Cart	RoHS	X			

## System Peripherals

**NOTE** For cable RoHS status, see [Section 11, “Cabling”](#).

**Table 14-62****CX30 and CX50 System Peripheral Options and Applicable Cables**

Peripheral	Part Description	Configuration Kit	Part Number	Notes/Reference
		Kit Number		
	Printer, Black-and-White, UP-D897MD, Syn, Digital, USB, Sony	Cart B&W printer: 989605377821 (RoHS)  External B&W printer: 989605375142 (RoHS)	Printer: 453561243911  <b>Signal cable:</b> <a href="#">453561364002</a> (On-cart)  <a href="#">453561153453</a> (Stand-alone)  <b>Power cable:</b> <a href="#">453561362141</a> (On-cart)  <a href="#">453561378301</a> (Stand-alone)	Small B&W printer  Photo: <a href="#">Figure 1-3</a> CX30 and CX50 System Stand-alone Cabling Diagram: <a href="#">Figure 11-23</a> On-cart Cabling Diagram: <a href="#">Figure 11-28</a>
	• Paper, Sony UP-895, UPPI10HG		453561131301 (2100-1856-01)	Print media (RoHS exempt)

Table 14-62

CX30 and CX50 System Peripheral Options and Applicable Cables (Continued)

Peripheral	Part Description	Configuration Kit	Part Number	Notes/Reference
		Kit Number		
	Printer, Sony UP-D898MD/ SYN, B&W, Digital	989605407332	Printer: <b>453561778121</b> <b>Signal cable:</b> <b>453561364002</b> (On-cart) <b>453561153453</b> (Stand-alone) <b>Power cable:</b> <b>453561362141</b> (On-cart) <b>453561378301</b> (Stand-alone)	Small B&W printer Photo: <a href="#">Figure 1-3</a> CX30 and CX50 System Stand-alone Cabling Diagram: <a href="#">Figure 11-23</a> On-cart Cabling Diagram: <a href="#">Figure 11-32</a>
	• Paper, Sony UP-895, UPPI10HG		453561131301 (2100-1856-01)	Print media (RoHS exempt)

Table 14-62

CX30 and CX50 System Peripheral Options and Applicable Cables (Continued)

Peripheral	Part Description	Configuration Kit	Part Number	Notes/Reference
		Kit Number		
	Printer, Color, Digital, UP-D23MD, Sony	Cart color printer: <b>989605377831</b> (Non-RoHS)  External color printer: <b>989605375131</b> (Non-RoHS)	Printer: <b>453561121361</b> (2100-1941-01)  Signal cable: <b>453561364012</b> (On-cart)  <b>453561153453</b> (Stand-alone)  Power cable: <b>453561362141</b> (On-cart)  <b>453561378301</b> (Stand-alone)	Color medical printer (this option is unavailable if the cart has a multiport adapter installed).  Photo: <a href="#">Figure 1-3</a> CX30 and CX50 System Stand-alone Cabling Diagram: <a href="#">Figure 11-23</a> On-cart Cabling Diagram: <a href="#">Figure 11-29</a>
	Paper/Ribbon Pack, Sony UP-21, UPC-21L		<b>453561131311</b> (2100-1857-01)	Print media (RoHS exempt)

Table 14-62

CX30 and CX50 System Peripheral Options and Applicable Cables (Continued)

Peripheral	Part Description	Configuration Kit	Part Number	Notes/Reference
		Kit Number		
	Printer, Color, Digital, UP-D25MD, Sony	989605416171 (RoHS)	Printer:  453561646171  Signal cable:  <a href="#">453561153453</a>  Power cable:  <a href="#">453561362141</a> (On-cart)  <a href="#">453561378301</a> (Stand-alone)	Color medical printer (this option is unavailable if the cart has a multiport adapter installed).  Photo: <a href="#">Figure 1-3</a>  CX30 and CX50 System Stand-alone Cabling Diagram: <a href="#">Figure 11-23</a>  On-cart Cabling Diagram: <a href="#">Figure 11-29</a>
	Paper/Ribbon Pack, Sony UP-21, UPC-21L		453561131311 (2100-1857-01)	Print media (RoHS exempt)

Table 14-62

CX30 and CX50 System Peripheral Options and Applicable Cables (Continued)

Peripheral	Part Description	Configuration Kit	Part Number	Notes/Reference
		Kit Number		
	Printer, Color, Mitsubishi, CP30DW	Cart color printer: 989605399911 (RoHS)  External color printer: 989605399841 (RoHS)  Config kits include: Mitsubishi printer kit (printer and paper) 453561436641 (RoHS)	Printer: 453561420751  Signal cable: <a href="#">453561364012</a> (On-cart)  <a href="#">453561153453</a> (Stand-alone)  Power cable: <a href="#">453561362141</a> (On-cart)  <a href="#">453561378301</a> (Stand-alone)	Color medical printer (this option is unavailable if the cart has a multiport adapter installed).  NOTE: Drivers are unavailable for this printer when used with Windows 7 operating systems.  Photo: <a href="#">Figure 1-3</a> CX30 and CX50 System Stand-alone Cabling Diagram: <a href="#">Figure 11-23</a> On-cart Cabling Diagram: <a href="#">Figure 11-30</a>
	• Paper/Ribbon Pack, Mitsubishi		453561435001	Paper media (RoHS exempt)

Table 14-62

CX30 and CX50 System Peripheral Options and Applicable Cables (Continued)

Peripheral	Part Description	Configuration Kit	Part Number	Notes/Reference
		Kit Number		
	Configuration Kit, Isolation Transformer <ul style="list-style-type: none"><li>• Xfmr, Iso, Med Hosp Grd, 600VA</li></ul>	989605377421 (RoHS)	Transformer: 453561353331 (RoHS) Power cable: <a href="#">453561378301</a>	System stand-alone option CX30 and CX50 System Stand-alone Cabling Diagram: <a href="#">Figure 11-23</a>

## Supplies and Accessories

### System Accessories

Figure 14-79

System Accessories, Travel Cases



CX50 Effectivity		
A.x	B.x	C.x
x	x	x

CX30 Effectivity	
A.x	B.x
x	x

System

| Travel case

**Figure 14-80 System Accessory, AC Adapter**

Items 1 through 3 are not shown.

See [Table 14-63](#) for all part numbers.

CX50 Effectivity		
A.x	B.x	C.x
X	X	X

CX30 Effectivity		
A.x	B.x	
X	X	



A.0 or B.0 Cart

Installation

C.0 Cart

Installation

Cabling Diagram

System

[4 AC adapter](#)

Figure 14-81

## System Accessory, Foot Switch Assembly, Three-Pedal (USB)

Items 1 through 4 are not shown.

See [Table 14-63](#) for all part numbers.

CX50 Effectivity			
A.x	B.x	C.x	
X	X	X	

CX30 Effectivity		
A.x	B.x	
X	X	



A.0 or B.0 Cart

Installation

C.0 Cart

Installation

◀ System

5 Foot switch assembly

Table 14-63

## CX30 and CX50 System Accessories

Index No.	I2NC Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
1	453561349901	Case, Travel, Soft-sided, Wheeled	CX30 and CX50 system carry case, <a href="#">Figure 14-79</a> Non-attached accessories are RoHS exempt.	x	x	x	x	x
2	453561350161	Travel Case, CX30 and CX50, without Transducer Bag		x	x	x	x	x
3	453561349911	Transducer bag, CX30 and CX50		x	x	x	x	x
4	453561367414	AC Adapter: Medical Power Supply with Lithium Ion Battery Charger (Emerson Version)	Included in auxiliary box shipped with system, <a href="#">Figure 14-80</a> . AC adapter cable connects to rear side of CX30 and CX50 system. CX30 and CX50 Stand-alone Cabling Diagram, <a href="#">Figure 11-23</a> On-cart Cabling Diagram, <a href="#">Figure 11-24</a> Non-attached accessories are RoHS exempt.	x	x	x	x	x

Table 14-63

## CX30 and CX50 System Accessories (Continued)

Index No.	I2NC Part Number	Part Description	Notes/Reference	CX50 A.x	CX50 B.x	CX50 C.x	CX30 A.x	CX30 B.x
5	453561347203	Switch, Foot, Triple, USB	RoHS. Included in accessory box shipped with system cart, <a href="#">Figure 14-81</a> USB cable connects to USB hub or right side panel USB port on CX30 and CX50 system OEM Cabling Diagram, <a href="#">Figure 11-27</a>	x	x	x	x	x
6	Purchase locally	Battery, Lithium Coin Cell, CR2032	Used on Main Board. Not illustrated (RoHS exempt)	x	x	x	x	x

## System Cart Accessories

Figure 14-82

System Cart Accessories, Optional USB Devices



1



2, 4



3

Cart Effectivity			
A.0	B.0	C.0	D.0
X	X	X	X

**CAUTION:** Current over-draw. Do not connect a wireless device to the USB hub.

(For USB hub connector designations, see [Figure 11-20](#))



5

A.0 or B.0 Cart

Installation

C.0 Cart

Installation

Cabling Diagrams

A blue button with a left arrow icon and the word "System".

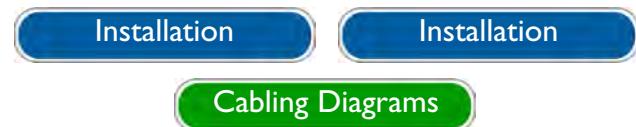


Figure 14-83

## System Cart Accessory, CW Probe Holder Clip (Optional Kit)

Items 1 through 5 are not shown.

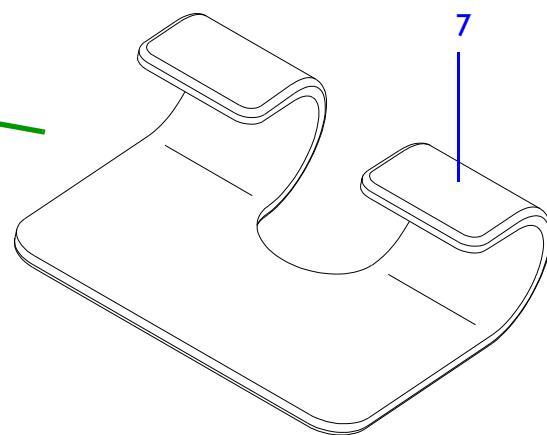
See [Table 14-64](#) for all part numbers.

Cart Effectivity			
A.0	B.0	C.0	D.0
X	X	X	



Recommended  
mounting location

Probe holder clip



**6** Probe holder clip kit



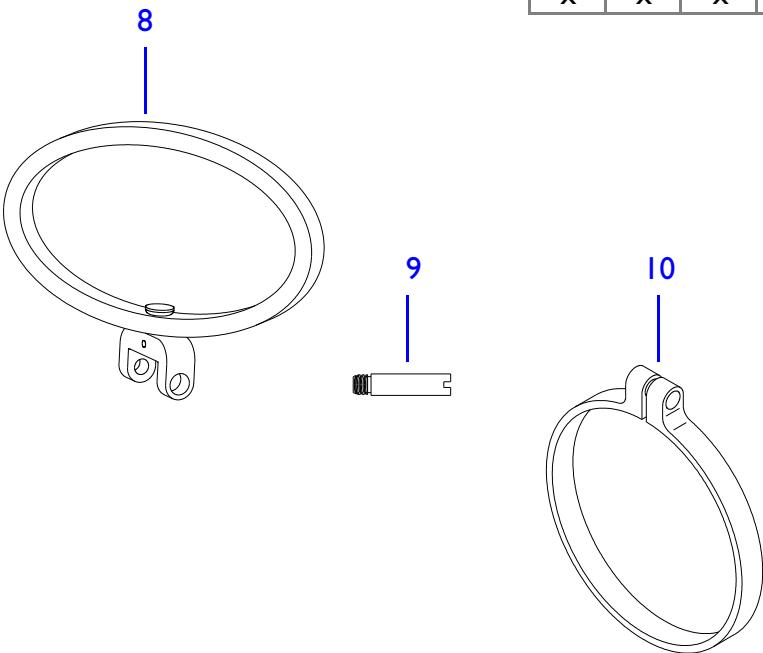
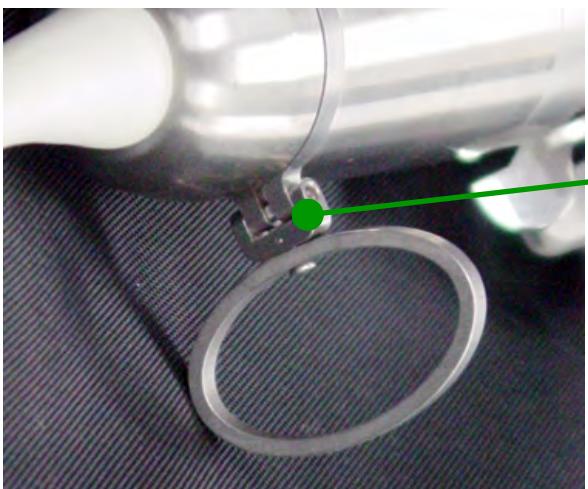
Figure 14-84

## System Cart Accessory, Hanger Ring for X7-2t Transducer

Items 1 through 7 are not shown.

See [Table 14-64](#) for all part numbers.

Cart Effectivity			
A.0	B.0	C.0	D.0
x	x	x	x



System

Table 14-64 CX30 and CX50 System Cart Accessories

Index No.	I2NC Part Number	Part Description	Notes/Reference	A.0	B.0	C.0	D.0
1	453561356281	Adapter, USB, Wireless, 300Mbps, 11G Std	Non-RoHS. Belkin, model F5D8053, Win XP only, requires CX50 1.0 software or higher. Not used on CX30	x	x		
2	453561487381	Adapter, USB Wireless, Surf and Share	RoHS. Belkin. Model F7D2101, Win XP or Win 7, requires CX50 2.1 to 3.x or CX30 1.0 or later software	x	x	x	x
3	453561487611	Adapter, USB Dual Band, 802.11N	RoHS. 3Com or HP, model 3CRUSBN275, Win XP or Win 7, requires CX50 3.0 or CX30 2.0 or later software	x	x	x	x
4	453561711811	Adapter, USB Wireless	RoHS. Belkin, model F9L1002, Win XP or Win 7, requires CX50 3.0 or CX30 2.0 or later software	x	x	x	x

Table 14-64

## CX30 and CX50 System Cart Accessories (Continued)

Index No.	I2NC Part Number	Part Description	Notes/Reference	A.0	B.0	C.0	D.0
5	453561374821	Hub, USB, 4 Port, CX30 and CX50	RoHS. Belkin USB Hub Cabling Information, <a href="#">Figure 11-20</a> OEM Cabling Diagrams: UP-D897MD, <a href="#">Figure 11-28</a> UP-D23MD, <a href="#">Figure 11-29</a> UP-D25MD, <a href="#">Figure 11-29</a> CP30DW, <a href="#">Figure 11-30</a> External Printer, <a href="#">Figure 11-33</a> Foot switch, <a href="#">Figure 11-27</a>	x	x	x	
6	989605385141	Kit, Probe Holder Clip	RoHS. Configuration kit Optional cart accessory	x	x	x	
7	453561238951	• Clip, Probe Holder	RoHS. CW probe holder Mounts on system cart (recommended location shown in <a href="#">Figure 14-83</a> ) with self-adhesive strip on clip bottom Part of <a href="#">989605385141</a> config kit	x	x	x	

Table 14-64 CX30 and CX50 System Cart Accessories (Continued)

Index No.	I2NC Part Number	Part Description	Notes/Reference			
			A.0	B.0	C.0	D.0
8	453561209772	Ellipse Ring Assembly				
9	453561191632	Hinge Pin (Threaded)				
10	453561191602	Handle Ring	Hanger ring for X7-2t transducer. RoHS.	X	X	X

# I5 Transducers

## Introduction

This section summarizes general and parts information for the transducers that can be used with the system. Historical information about when the transducers were released is available in [Section 12, “Change History”](#).

## About System Transducers

The system has two transducer connectors on the compact system case, a Tyco TC Ziff imaging transducer connector and a CW “pencil-probe” non-imaging transducer connector.

A Multiport adapter (part description: Multiple Transducer Module or MTM), which allows from one to three imaging transducers to be connected to the system via the cart at the same time, is available as an option.

## WARNING

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Use only Philips-supplied transducers on these systems.

---

## CAUTION

If systems, transducers, and peripherals have been in an environment below 10°C (50°F), allow them to reach room temperature before connecting or turning them on. Philips recommends allowing 24 hours for complete normalization. Otherwise, condensation inside the devices could cause damage. If the device was only briefly exposed to temperatures below 10°C (50°F), then the time required for the device to return to room temperature could be significantly less than 24 hours.

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**NOTE** The intracardiac echo (ICE) imaging catheter probe is developed, sold, supplied, and supported by St. Jude Medical and interfaces with an isolation module, which is also developed, sold, supplied, and supported by St. Jude Medical. The isolation module attaches to the system like a transducer. There are no Philips part numbers associated with these components.

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## Transducer Information

[Table 15-1](#) provides transducer compatibility information. [Table 15-2](#) through [Table 15-21](#) provide specifications and part numbers for each transducer.

**Table 15-1** **Transducer Compatibility Information** <sup>1</sup>

Transducer	CX30	CX50	Reference
C5-1	--	x	<a href="#">Table 15-2</a>
C6-2	x	--	<a href="#">Table 15-3</a>
C8-5	x	x	<a href="#">Table 15-4</a>
C9-3io	--	x	<a href="#">Table 15-5</a>
C9-3v	--	x	<a href="#">Table 15-6</a>
C9-4	x	--	<a href="#">Table 15-7</a>
C10-3v	--	x	<a href="#">Table 15-8</a>
D2cwc	x	x	<a href="#">Table 15-9</a>
D5cwc	x	x	<a href="#">Table 15-10</a>
L10-4lap	--	x	<a href="#">Table 15-11</a>
L12-3	--	x	<a href="#">Table 15-12</a>
L12-4	x	--	<a href="#">Table 15-13</a>

**Table 15-1** Transducer Compatibility Information (Continued)<sup>1</sup>

Transducer	CX30	CX50	Reference
L12-5 50	--	x	<a href="#">Table 15-14</a>
L15-7io	x	x	<a href="#">Table 15-15</a>
S4-2	x	--	<a href="#">Table 15-16</a>
S5-1	--	x	<a href="#">Table 15-17</a>
S7-3t	--	x	<a href="#">Table 15-18</a>
S8-3	x	x	<a href="#">Table 15-19</a>
S12-4	--	x	<a href="#">Table 15-20</a>
X7-2t	--	x	<a href="#">Table 15-21</a>

- I. To ensure RoHS compliance, CX50-compatible transducers must be RoHS-compliant. However, CX30-exclusive transducers may or may not be RoHS-compliant. RoHS information is listed in each of the transducer tables that follow.

**Table 15-2 C5-I Transducer**

Parameter	Specification
Part number	989605366331 and 453561301481 (Non-RoHS) 989605412041 and 453561616293 (RoHS)
Clinical options	Abdominal, Abdominal Vascular, Acute Care, Contrast General, OB/GYN, Peripheral Vascular, Regional Anesthesia, Small Parts
Frequency range	1–5 MHz
SW version	CX50 2.0 and later

**Table 15-3 C6-2 Transducer**

Parameter	Specification
Part number	989605387072 and 453561381402 (Non-RoHS) 989605418981 and 453561652563 (RoHS)
Clinical options	Abdominal, OB/GYN, Vascular, Small Parts
Frequency range	2–6 MHz
SW version	CX30 1.0 and later

**Table 15-4 C8-5 Transducer**

Parameter	Specification
Part number	989605391921 and 453561411261 (Non-RoHS) 989605391921 and 453561411262 (RoHS)
Clinical options	Acute Care, Cerebrovascular, Pediatric Radiology, Peripheral Vascular
Frequency range	5–8 MHz
Released on SW version	CX50 2.5 and later; CX30 2.0 and later

**Table 15-5****C9-3io Transducer**

<b>Parameter</b>	<b>Specification</b>
Part number	989605395611 and 453561440551 (Non-RoHS) 989605395611 and 453561440552 (RoHS)
Clinical options	Abdominal, Contrast General
Frequency range	3–9 MHz
Released on SW version	CX50 3.0 and later

**Table 15-6****C9-3v Transducer**

<b>Parameter</b>	<b>Specification</b>
Part number	989605366341 and 453561299701 (Non-RoHS) C9-3v is no longer being manufactured. Replaced by the RoHS-compliant C10-3v.
Clinical options	Acute Care, OB/GYN
Frequency range	3–9 MHz
Released on SW version	CX50 2.0 and later

**Table 15-7****C9-4v Transducer**

Parameter	Specification
Part number	989605387092 and 453561381412 (Non-RoHS) 989605418971 and 453561652573 (RoHS)
Clinical options	OB/GYN
Frequency range	4–9 MHz
Released on SW version	CX30 1.0 and later

**Table 15-8****C10-3v Transducer**

Parameter	Specification
Part number	989605414531 and 453561632421 (Non-RoHS) 989605409561 and 453561605802 (RoHS)
Clinical options	Acute Care, OB/GYN
Frequency range	3–10 MHz
Released on SW version	CX50 3.0 and later

**Table 15-9****D2cwc Transducer**

<b>Parameter</b>	<b>Specification</b>
Part number	989605440841 and 453561172792 (Non-RoHS) 989605412051 and 453561616302 (RoHS)
Clinical options	Acute Care, Adult Echo, Regional Anesthesia
Frequency range	2.0 MHz
Released on SW version	CX50 1.0 and later

**Table 15-10****D5cwc Transducer**

<b>Parameter</b>	<b>Specification</b>
Part number	989605440851 and 4000-0990-01(Non-RoHS) 989605412061 and 453561616312 (RoHS)
Clinical options	Acute Care, Peripheral Vascular, Regional Anesthesia
Frequency range	5.0 MHz
Released on SW version	CX50 2.0 and later

**Table 15-11****L10-4lap Transducer**

<b>Parameter</b>	<b>Specification</b>
Part number	989605395601 and 453561440521 (Non-RoHS) 989605395601 and 453561440522 (RoHS)
Clinical options	Abdominal, Contrast General
Frequency range	4–10 MHz
Released on SW version	CX50 3.0 and later

**Table 15-12****L12-3 Transducer**

Parameter	Specification
Part number	989605366211 and 453561291102 (Non-RoHS) 989605412071 and 453561616352 (RoHS)
Clinical options	Abdominal, Acute Care, Cerebrovascular, Contrast Superficial, Musculoskeletal, Peripheral Vascular, Regional Anesthesia, Small Parts
Frequency range	3–12 MHz
Released on SW version	CX50 2.0 and later

**Table 15-13****L12-4 Transducer**

Parameter	Specification
Part number	989605387081 and 453561381392 (Non-RoHS) 989605418961 and 453561652583 (RoHS)
Clinical options	Abdominal, Musculoskeletal, Small Parts, Vascular
Frequency range	4–12 MHz
Released on SW version	CX30 1.0 and later

**Table 15-14****L12-5 50 mm Transducer**

<b>Parameter</b>	<b>Specification</b>
Part number	989605396001 and 453561441951 (RoHS) 989605396001 and 453561441952 (RoHS, compact connector) 989605418551 and 453561645092 (Apex-made, RoHS, compact connector)
Clinical options	Abdominal, Acute Care, Cerebrovascular, Musculoskeletal, Peripheral Vascular, Small Parts
Frequency range	5–12 MHz
Released on SW version	CX50 3.0 and later

**Table 15-15****L15-7io Transducer**

Parameter	Specification
Part number	989605387851 and 453561399351 (Non-RoHS) 989605387851 and 453561399353 (RoHS)
Clinical options	Acute Care, Adult Echo, Cerebrovascular, Musculoskeletal, Peripheral Vascular, Small Parts
Frequency range	7–15 MHz
Released on SW version	CX50 3.0 and later; CX30 2.0 and later

**Table 15-16****S4-2 Transducer**

Parameter	Specification
Part number	989605381212 and 453561381383 (Non-RoHS) 989605414692 and 453561636603 (RoHS)
Clinical options	Abdominal, Access, Adult Echo, Cerebrovascular, OB/GYN, Trauma
Frequency range	2–4 MHz
Released on SW version	CX30 1.0 and later

**Table 15-17****S5-1 Transducer**

<b>Parameter</b>	<b>Specification</b>
Part number	989605361871 and 453561265582 (Non-RoHS) 989605412081 and 453561616363 (RoHS)
Clinical options	Abdominal, Acute Care, Adult Echo, Cerebrovascular, Regional Anesthesia
Frequency range	1–5 MHz
Released on SW version	CX50 1.0 and later

**Table 15-18****S7-3t Transducer**

<b>Parameter</b>	<b>Specification</b>
Part number	989605406771 and 453561490013 (RoHS)
Clinical options	Acute Care, Adult Echo, Pediatric Echo
Frequency range	3.0–7.0 MHz
Released on SW version	CX50 4.0 and later

**Table 15-19****S8-3 Transducer**

Parameter	Specification
Part number	989605361881 and 453561265611 (RoHS) 989605361881 and 453561265612 (Apex-made, RoHS)
Clinical options	Adult Echo, Pediatric Echo, Pediatric Radiology, Regional Anesthesia
Frequency range	3-8 MHz
Released on SW version	CX50 2.5 and later; CX30 2.0 and later

**Table 15-20****S12-4 Transducer**

Parameter	Specification
Part number	989605361891 and 453561265621 (Non-RoHS) 989605361891 and 453561265622 (RoHS)
Clinical options	Acute Care, Adult Echo, Pediatric Echo, Pediatric Radiology, Regional Anesthesia
Frequency range	4-12 MHz
Released on SW version	CX50 2.5 and later

**Table 15-21****X7-2t TEE Transducer**

<b>Parameter</b>	<b>Specification</b>
Part number	989605361911 and 453561265641 (Non-RoHS) 989605414121 and 453561627102 (RoHS)
Clinical options	Acute Care, Adult Echo
Frequency range	2–7 MHz
Released on SW version	CX50 1.0 and later

# I6 System Administration

## Introduction

The system has several operating features that can help customers manage their system installations. Field service engineers (FSEs) can use these same features when supporting system administration and, in some circumstances, when performing service.

System administration features are well documented in the user information, such as printer setup (add and configure local and networked printers), standard networking functions (export images and other study data to removable media), and DICOM networking functions (if the option is installed, select, add, or delete servers to be used by the system, such as commit, storage, worklist, performed-procedure-step, and structured report servers).

This section describes or references information, procedures, and service functions that are useful when supporting system administration or service activities.

## Locating System Information

### System Serial Number

The following topics explain where you can find various types of system information.

The system serial number can be found here:

- External: located on the system label at the bottom of the system (“[System Cart Labeling](#)” on [page 611](#)).
- Internal (in software):
  - Shown on the title bar of the **Options** display. (Press **Setup**, click the **Options** tab, and then click **Options**.)
  - Shown on the initial RST system information window (the header in the window includes the institution name and the system serial number).
  - **Info** in the RST window accesses a directory with **System** and **Hardware** information categories. **System** information includes the system serial number.

### System Remote ID

The System ID (US\_xxxxxx\_Clxxxxxxxx) is the ID that the system uses to identify itself to the M2M server, part of which is the KMAT material number.

## System Software Information

### ► To find software information on CX30 1.0 and CX50 1.x through 2.5 systems

Do one of the following

- Press **Setup**, click **Options**, and look under **Software Info**.
- In the RST window, click **Info** to access a directory with **System** and **Hardware** information categories. **System** information includes the system software information.

### ► To find software information on CX30 2.0 and CX50 3.0 and later systems

1. Press **Setup**.
2. Click **Service**.
3. Click the **System Management** tab.
4. Look under **Software Information**.

### ► To find hardware information on CX30 1.0 and CX50 1.x through 2.5 systems

- External: See the high-level descriptor on the system label on the bottom of the system (“[System Cart Labeling](#)” on page 611).
- Internal (in software):
  - On systems with 2.0 software, press **Setup**, click **Options**, and see **Hardware Info**.
  - In the RST window, click **Info** to access a directory with **System** and **Hardware** information categories. **Hardware** information includes the system hardware information.

### ► To find hardware information on CX30 2.0 and CX50 3.0 and later systems

1. Press **Setup**.
2. Click **Service**.
3. Click **System Management** and **System Information**.
4. See **Hardware Information**.

**Factory  
Configured PC  
Name****► To find the system factory-configured PC name**

1. Press **Setup**.
2. Click the **System** tab.
3. Click **DICOM**.

**Options  
Information****► To find the system options information**

1. Press **Setup**
2. Click the **Options** tab
3. Click **Options**.

Also see “[Licensed Options](#)” on page 655 and “[Service Options](#)” on page 287.

## Codes, Keys, Passwords

This manual does not provide any codes, keys or passwords. Contact your Philips representative for any codes, keys or passwords that you need to know, create, or generate for access to service features, system administration (such as option management), and network-connectivity administration.

---

**NOTE** The Caps Lock defaults to “on” at bootup, as indicated by an **(A)** on the bottom right of the display; no **(A)** indicates that Caps Lock is “off.”

---

## Licensed Options

Besides the standard features available in the system, other features are available as purchasable licensed options. The types of system options available include clinical options, imaging capabilities, and connectivity capabilities.

System option information is found in the system **Options** setups (“[Options Information](#)” on [page 654](#)). A description of each option available for the system is in the system user information.

System options are installed when a new option is purchased, after system software is upgraded, after hard drive replacement, and for pre-sale trial options.

---

**NOTE** The serial number, and model name, and version are in the title bar of the **Options** setups. The serial number is required when you request an authorization code to enable an option. You must have the correct authorization code to enable system options in the field.

---

You may temporarily disable or enable an option or permanently remove it. After an option is removed, you must obtain an access code to re-install it.

If a system hard drive needs to be replaced, and the options were not backed up, the FSE must download the access codes from the ISS OnLine website to enable the options.

Service options are also available to support service functions. See “[Service Options](#)” on page 287.

## Installing and Removing Licensed Options

When you install a system, the purchased options are installed and enabled. Sometimes you may need to install a new option or remove an option. If you remove an option using the following procedure, you must obtain a code to reinstall it.

See to “[To enable or disable a licensed option](#)” on page 657 to temporarily disable an option.

### ► To install or remove a licensed option

1. Press **Setup**.
2. Click the **Options** tab.
3. Click **Options**.
4. Select the option, click **Install or Remove**, and respond to the prompt.
5. Do one of the following:
  - To install an option, insert the media containing the licensed option, and enter the appropriate code for that option.
  - To remove an option, type in the password (the name of the option).

### NOTES

---

- In the **Application** column, the check boxes to the left of the options indicate if the option is enabled (checked) or disabled (unchecked). An option can be temporarily disabled by unchecking the box and re-enabled by checking the box.
  - The **Status** column indicates whether the option is permanent or temporary. A temporary status results from a temporary option key that is generated and installed.
- 

6. Exit setups.

7. Verify that the option is functional or has been removed.

---

**NOTE** On systems with software versions 2.0 to 3.x, there is a **Load From File** utility available on the **Options** display. Installation of licensed options by means of an options file on removable media can be accomplished by navigating to the utility, placing the media (either CD or USB) containing the file in the system and clicking **Install from File**. The system will automatically locate the file and prompt you for installation. After the file installs, reboot the system. **Load From File** has been removed from CX50 systems with 4.x software and later.

---

## Enabling and Disabling Licensed Options

Use this procedure to temporarily enable or disable an option. To install or remove an option, see “[To install or remove a licensed option](#)” on page 656.

► **To enable or disable a licensed option**

1. Press **Setup**.
2. Click the **Options** tab.
3. Click **Options**.
4. Click in the box to the left of the option, to enable or disable that option. Each click toggles the setting to the opposite state.
5. Click **Apply**.
6. Click **OK**.
7. Verify that the box to the left of the option appears in the opposite state from which you started.
8. Click **Close** to exit the Options.

<b>Media Compatibility</b>	For information about media compatibility with the system, see the <i>CX50 User Manual</i> or the <i>CX30/CX50 Media Compatibility</i> document on the <i>User Information CD</i> .
<b>USB Devices</b>	USB data storage devices can be used as removable media for the same purposes as DVDs or CDs. For important information about USB devices see “ <a href="#">USB Data Storage Device Information</a> ” on page 52 and the system <i>Media Compatibility</i> document on the <i>User Information CD</i>
<b>Backing Up and Restoring System Data</b>	The system has features that can be used to back up and restore critical data.
<b>Settings and Presets</b>	<p>The system allows settings and presets to be copied to, and restored from, removable media. You can use this feature to create safety backup copies, to set up multiple systems from removable media, or to quickly implement changes in settings to those systems.</p> <p>Settings that can be transferred to and from removable media include presets, image and measurement data, system options, measurement configuration and tables, AutoText data, security settings, and general system settings, including DICOM settings. Every time you back up presets, system settings, custom calculations and measurements, printer settings, and options, settings are automatically backed up.</p> <p>On CX50 systems with 4.0 software and later, site administrators can back up and restore security settings to and from EPIQ, Affiniti, and Sparq ultrasound systems using <b>Backup/Restore</b> on the <b>Security Policies</b> tab of <b>Security</b>. This feature is particularly useful when configuring an LDAP server.</p> <p>Also on CX50 systems with 4.0 software and later, FSEs can back up and restore security settings to and from a system with the same serial number using the regular backup and restore</p>

procedure. This enables FSEs to restore all settings required during software installations, hard drive installations, or other service events. However, only a site administrator can copy and restore security settings to and from different systems.

---

**NOTE** Integrated Ultrasound settings are not automatically backed up or restored. Those settings (IP addresses) must be manually backed up and restored.

---

To back up system settings, follow the instructions in the on-system *Help* for backing up presets and settings. To restore system settings, follow the instructions in the *Help* for restoring presets, system settings, printer and VCR settings, or options settings from removable media.

## Patient Studies

The data in system memory is temporary storage. The customer should save any important patient data and images to removable media or to a network server. If the system memory fails and there is no backup of the patient folders, all patient information and images will be lost.

To back up or restore patient studies, follow the instructions in the on-system *Help* for importing and exporting.

## Viewing Log Files

For information about viewing log files, see “[Event Viewer](#)” on page 237.

---

**NOTE** Exported log data is encrypted and can be viewed only by a Philips representative.

---

## Hard Drive Maintenance

Field maintenance of the installed hard drive consists of defragmenting the drive after the customer removes patient studies (usually backed-up studies).

## Patient Study Removal

The number of studies the system can store varies depending on the content of each study, and the size of the hard drive. Philips strongly recommends that, to prevent data loss, customers perform patient-data backup ([“Backing Up and Restoring System Data” on page 658](#)) and cleanup at regular intervals, before the system hard drive capacity is exceeded.

### CAUTIONS

- Philips recommends not using the system during backup and deletion of patient studies.
- Back up all patient studies before deleting them. Deleted studies cannot be restored.

Perform hard drive maintenance only after all study data is backed up and only when the system will not be needed during the backup process.

Use the **Disk Defrag** utility ([“Maintenance Tools” on page 268](#)) to defragment the hard drive.

## Loading Software

Install system software by loading the software from the discs onto the system hard drive. Windows XP systems are a five-disc set, and Windows 7 systems are a single disc. On Windows 7 systems with 4.0 software and later, system software may be installed or upgraded from a USB flash drive.

### NOTES

- Maintaining the battery charge or ensuring the availability of AC power in a low-charge or no-battery situation is important during this operation.
- The wireless adapter must be disconnected before starting the procedure.

Generally, the activities of a software installation include:

1. Verifying the installation requirements
2. Preparing the system for the installation
3. Backing up the system information
4. Installing the software
5. Restoring the user presets and the network settings
6. Verifying that the system is operational

► **To update or upgrade system software on systems with 4.0 software and later**

---

**NOTE** On systems with the WhiteListing licensed option installed, the WhiteListing application is automatically disabled when you install system software and automatically re-enabled when the installation is done.

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1. If the software is to be installed by the end-user, verify that the Software Update service option is installed.
2. Use the Field Installation Instructions to confirm that the Software Update feature can be used to install the upgrade. Some upgrades (such as the 3.1-to-4.0 upgrade) require a full software installation.
3. Press **Setup**.
4. Click **Service**.
5. Log on using IST or a key-based logon.
6. Click **Test/Utilities**.
7. Click **Software Maintenance**.
8. Insert USB storage device containing the software you wish to install.
9. Click **Install Software**.

10. Select the source drive.
11. Click **Upgrade Software**.

## CX50 System Security

[Table 16-1](#) lists the system security options and the compatible software versions. If purchased and enabled, these options limit system functionality to increase system security. The security options are available on new-build systems or as part of an upgrade.

**Table 16-1      System Security Option Availability**

<b>Security Option</b>	<b>Software Version</b>		<b>References</b>
	<b>1.0–3.x.x</b>	<b>4.0 and later</b>	
WhiteListing (SafeGuard)	--	X	<a href="#">“WhiteListing Licensed Option” on page 662</a>
Government Security	--	X	<a href="#">“Government Security Purchasable Option” on page 664</a>

### WhiteListing Licensed Option

The WhiteListing licensed option is listed as SafeGuard in the Philips commercial catalog. If the customer purchases SafeGuard, the WhiteListing licensed option is enabled.

The WhiteListing licensed option prevents malware (non-Philips-authorized software or an attempt to change software installed on the system) from running on the ultrasound system.

After the option is enabled and solidified, WhiteListing runs in the background. If malware is detected,  appears in the tools and icons area on the display. Clicking  displays a service message. Entries are also logged in the Audit and Service logs.

WhiteListing is automatically disabled during system upgrades. After the upgrade, the system prompts you to re-enable WhiteListing, after which you can continue to use the system.

---

**NOTE** After WhiteListing is enabled, you cannot run any third-party software on the ultrasound system, even from a USB drive. This includes drive-fitness or screen-capture programs.

---

## Enabling WhiteListing

If the customer buys WhiteListing for a new system, the system ships with the option installed and enabled.

If the customer buys WhiteListing for an existing system, or if system software is reinstalled in the field, you must install the licensed option file to enable this feature. To install the WhiteListing licensed option file, call your local field service representative.

If you are installing WhiteListing in the field, after the first system start, a dialog box prompts you to select one of the following:

- **Enable Now** begins the enabling process immediately. The solidifying process, where WhiteListing checks the installed software to make sure it is allowed and up-to-date, may take an hour to complete and requires a system restart.
- **Enable Later** delays the enabling process until the next system restart, when the dialog box prompts you again to select **Enable Now** or **Enable Later**. The prompt appears after every system restart, until WhiteListing is enabled.

**Government Security Purchasable Option**

Government Security is the purchasable option that prevents remote access to the ultrasound system by disabling the Remote Desktop licensed option. Government Security is not a licensed option.

All systems with 4.0 and later software are shipped from the factory with the Remote Desktop licensed option enabled, unless the customer purchases Government Security from the Philips commercial catalog. You cannot enable remote access on systems with the Government Security option.

On systems upgraded to version 4.0 software in the field, the Remote Desktop feature is automatically enabled when the software is installed. If the customer also purchases Government Security, and it is field-installed, the Remote Desktop feature must be disabled, which automatically enables Government Security.

To disable Remote Desktop and enable Government Security, call your local field service representative.

Government Security does not affect the following connectivity features:

- Uploading system logs to a Philips server
- Online Support Request
- Monitoring

---

**NOTE** You must configure remote connectivity for customers who purchase the Online Support Request and Monitoring service options.

---

**Patient Data Security**

Patient data security limits access to previously stored patient data and images. To gain access to such data, users (not FSEs) must first log on to the system using a password. When they are finished using the system, they can log off manually or shut down the system, which logs them off automatically. The system stores a record of each user logon.

The data security feature is used to help meet the requirements of the U.S. Health Insurance Portability and Accountability Act (HIPAA), which became effective in April 2003.

Systems with 4.0 and later software have enhanced data security capabilities.

Philips employees are encouraged to answer customer security questions but are prohibited from making security policy decisions or setting up patient data security. You can reference the security procedures in the system *Help*.

## CAUTIONS

- Due to liability issues associated with potential loss of customer data, FSEs and other Philips personnel are *not to* implement version 4.0 security features. It is acceptable to inform the customer about each feature or how to configure it, but do not to perform any hands-on setup procedures or to make any setup decisions.
- Regardless of whether the customer has implemented patient data security procedures, do not back up, copy, or print any files containing patient data. If the customer wants to perform those tasks, procedures are available in the system *Help*.

## Setting Up Patient Data Security (4.0 and Later Software)

Systems with 4.0 and later software have a suite of features to enhance patient data security. Systems are shipped from the factory with the **Access Level** set to **No Restrictions**. If data security is not set up using the procedures in this section, there is no data security. The site administrator sets the system level security according to the site's security policies. Each security setting increases or decreases patient data security.

**NOTE** The security features come standard on systems with 4.0 software and later. (No licensed option file is necessary to enable the security features.)

This section contains FSE-specific data security information. See the system Help for site-admin data security procedures.

FSEs are responsible for the following data-security setup tasks:

- Recreating the site administrator default account if the password is lost or forgotten.
- Resetting data security settings on demo systems
- Reinstalling application software

### **Creating a Site Administrator Account**

The site administrator is required to create a site administrator account upon logging in with the default site administrator account. The default user name is **SiteAdmin** and the default password is the system serial number. After the new site administrator account is created, the default account is deleted and can no longer be used.

If the site administrator password is lost or forgotten, an FSE can create a new site administrator default account. Creation of a new account allows the site administrator to establish new logon credentials and restore access to patient data. The site administrator default account cannot be reset or changed (because it is deleted when the new credentials are established), but a new default account can be created without loss of previously set data security settings.

---

**NOTE** The temporary user name for the site administrator default account is **SiteAdmin** (with no spaces), and the password is the system serial number. The site administrator can configure additional password complexity. For more information, see the system *Help*.

---

## Resetting Data Security on Demo Systems

FSEs or sales personnel may be required to use **Demo Reset** to reset temporary data security settings that were used during sales and service demonstration (only when the Service Demo Service Option is enabled). **Demo Reset** does the following:

- Removes all local and remote accounts
- Removes all LDAP configuration
- Enables media export
- Eliminates restrictions to system or patient data access.
- Resets the system to the default user name and password.
- Restores settings for security policies, user management, and audit logs to their factory default values.
- Recreates the site admin default account and sets the default password to the system serial number.

### ► To reset data security settings on demo systems

---

**NOTE** Resetting the data security settings does not delete the security certificates that were added during the demo. The certificates must be removed manually.

---

#### I. Verify the following:

- Sales Demo licensed option or Service Demo Service Option is enabled.
- Data security access level is set to **Complete System is Locked** or **Only Patient Data is Locked**.
- System security settings are set to non-factory default values.

#### 2. Press **Setup**.

3. Click **Security**.
4. On the **Data Security Login** dialog box, click **Demo Reset**.
5. Click **OK**.

## Site Administrator Responsibilities

Site administrators are responsible for the following:

- Working with the local field service representative to reset the default password to a secure password of their choice.

### CAUTION

To ensure patient data security, the site administrator must create a new site administrator account the first time **Security** is selected. Failure to do so could allow unauthorized access to the system.

- Working with the field service representative to restore the site administrator password, if the password is lost or forgotten.
- Local and remote user management. See “[User Management](#)” on page 670.
- Managing the Audit Log. See “[Audit Logs](#)” on page 673.
- Encrypting patient data. See “[Hard Drive Encryption](#)” on page 673.
- Backing up and restoring data security settings. See “[Backup and Restoration of Data Security Settings](#)” on page 672.
- Setting up Secure DICOM. See “[Secure DICOM](#)” on page 674.
- Enabling or disabling media export. See “[Enabling or Disabling Media Export](#)” on page 676.

## Patient Data Security Features (4.0 and Later Software)

Patient data security is enhanced with a suite of security tools implemented on version 4.0 software. When appropriately set up, each tool adds a layer of security to configure the site's data security policies.

A site security policy can range from not restricting access to patient data to completely locking system controls and patient data.

New-build systems with version 4.0 and later software arrive from the factory with the access level set to **No Restriction**. The site administrator decides and sets the level of patient data security. If the site administrator does not configure the security settings, the system has no patient data security. Configurable security features include:

- “[User Management](#)” on page 670
- “[Backup and Restoration of Data Security Settings](#)” on page 672
- “[Audit Logs](#)” on page 673
- “[Hard Drive Encryption](#)” on page 673

Patient data security setups are accessed by pressing **Setup**, clicking **Security** and entering the appropriate user credentials. Be mindful that the available security settings vary depending on the selected access level and user management policy. Be aware that this may be a source of confusion for users who do not often access the settings.

### CAUTION

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The site administrator is solely responsible for all security aspects of the system. Due to liability issues associated with potential loss of customer data, FSEs and other Philips personnel are *not* to set up or change any security settings for their customers.

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## User Management

Site administrators can restrict system access to registered users who must provide a user name and a password. Access can be restricted to stored patient data, or to both stored patient data and imaging functions. Site administrators can manage user names and passwords in these ways:

- Locally, on the ultrasound system
- Remotely, with an LDAP (Lightweight Directory Access Protocol) server

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**NOTE** LDAP is an internet protocol that allows clients to query a server for information. The ultrasound system queries the LDAP server to confirm user-authorization credentials.

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Local and remote users have the same access privileges, with the exception that user passwords cannot be changed during remote access. With a combination of locally and remotely defined users (preferred for emergency system access), site administrators can manage multiple CX systems with the same users and passwords by backing up the data security settings from one system and restoring the settings to another system or multiple systems.

The site administrator is solely responsible for user management, which includes the following:

- Setting user management policy
- Configuring password policies
- Creating, changing, and deleting and data security user logons
- Configuring logon messages
- Configuring account lockout policies
- Enabling remote user management.
- Enabling or disabling write to media
- Configuring the auto-logoff policy

Site administrators can also create additional site administrators. For information on local and remote user management, see the system *Help*.

## Setting the Data Security Access Level

**Restricted Access** allows guest user access to system imaging capabilities and patient data. Registered users who are logged in have unrestricted access.

- **Complete System is Locked (Both Imaging and Patient Data Require Login)** prevents guest users (including FSEs) from using the system. If an FSE is on-site, access to all system menus is not restricted, but access to imaging capabilities or the setups is restricted. (If an FSE is accessing the system remotely, a registered user must be available to press **Setup**. This access level is indicated by  in the bottom-left of the image display.)
- **Only Patient Data is Locked (Imaging is Available Without a Login)** prevents guest users (including FSEs) from accessing patient data. FSEs can troubleshoot as usual, but if they perform a test-scan, they are unable to view images after the exam has ended. This access level is indicated by  in the bottom-left of the image display.
- **No Restrictions (Imaging and Patient Data are Available Without Login)** allows guest users access to all system functionality and patient data. New-build systems are delivered from the factory without access restrictions. With this access level, no icon appears on the bottom-left of the image display.

The site administrator is solely responsible for the configuration and management of the system access level. For information on data security management, see the system *Help*.

## Auto Log Off Time Setting

The system automatically logs off the current user after the system has been inactive (no controls used) for the length of time shown in **Automatically Log Users Out After** list in the **Access** page of the **Security Policies**. When the user is automatically logged off, the patient exam is terminated, although it may be restarted within 24 hours of the automatic termination.

The access level must be set to **Complete System is Locked** or **Only Patient Data is Locked** before **Lockout Duration** can be set. If you are unable to access the system, the system access level may be set to either of those settings, and the auto log off time may have expired.

The site administrator is solely responsible for the configuration, security, and management of automatic log outs. For more information, see the system *Help*.

## System Logons

When data security is enabled, a registered user must log on to the system before being able to view or load patient files, if the access level is set to **Complete System is Locked** or **Only Patient Data is Locked**. A logon dialog box appears when you attempt to use the system.

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**NOTE** On systems with 4.0 and later software, the site administrator can set the number of unsuccessful logon attempts using **Account Lockout Policy** in the security settings.

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## Backup and Restoration of Data Security Settings

Site administrators can back up and restore data security settings to and from the same system, from one CX system to other CX systems, or to and from a CX system to an EPIQ, Affiniti, or Sparq system. Data security settings are backed up to removable media, such as a DVD or a USB storage device. Security policy settings are backed up and restored from the **Security Policies** tab of the security setups.

The data security settings include a list of full user names, logon user IDs, and passwords for registered users and site administrators. The backed up data security settings also include the security policies set by the site administrator.

For backup and restoration procedures, see the system *Help*.

## Audit Logs

The Audit Log contains patient health information and records all patient data transactions. The Audit Log may be exported to media by site administrators and is not merged with other log data during the export process. Audit Log data is retained for a minimum of 90 days. The Audit Log is not available to FSEs.

Audit Log data can be stored and managed by a remote Syslog server. See “[Syslog Server Support](#)” on page [674](#).

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**NOTE** Patient data transactions use DICOM standard encoding to enable audit logging with servers from multiple vendors.

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## Hard Drive Encryption

Site administrators can encrypt all of the hard drive partitions that contain electronic patient health information (ePHI). After the encryption process has been initiated, the level of encryption cannot be changed. The system cannot be used while encryption is in progress.

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### CAUTION

After data encryption has been enabled, it cannot be disabled.

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**NOTE** Encryption is typically performed during system installation (when the hard drive does not have any data). Encrypting a drive with data on it will likely take a long time to complete.

If a hard drive is encrypted and the customer wants to return it to an un-encrypted state, system software must be re-installed. All patient data will be deleted and cannot be recovered.

The site administrator is solely responsible for the configuration, security, and management of patient data encryption. For information on encrypting patient data, see the system *Help*.

► **To restore an encrypted drive to a non-encrypted state**

1. Advise the customer that all patient data will be lost permanently.
2. Ask the customer to back up patient data, if the system is capable of doing so.
3. Perform a full software installation to restore the hard drive to the non-encrypted state.

## Syslog Server Support

Software version 4.0 added support for a remote Syslog server to manage audit logging. The customer must provide the Syslog server, which must be configured and controlled by the customer's security officer. The server is considered safe for storage of patient health information. Syslog server configuration is implemented using **Export** on the **Security Policies** tab in the security settings.

## Secure DICOM

Secure DICOM enables the site administrator to encrypt patient data during network transfer to DICOM devices. It also enables the customer to manage the certificates needed for Secure DICOM.

The ultrasound system may be configured to operate on a wireless network using certificates to authenticate devices and for data encryption and decryption.

The ultrasound system requirements include:

- DICOM option enabled
- Transport Layer Security configured
- Certificate entered in correct trusted store (same certificate used on the PACS archive device: Personal, Trusted Root Certificate, or Enterprise Trust Store)
- DICOM device properly configured on the ultrasound system

The PACS archive device requirements include:

- Secure DICOM capability
- Correct security configuration
- Accepts connection to the ultrasound system
- Certificate entered in correct trusted store (same certificate used on the ultrasound system: Personal, Trusted Root Certificate, or Enterprise Trust Store)

The site administrator is solely responsible for DICOM security and management of certificates. For more information, see the system *Help*.

## Network Time Protocol

CX50 systems with version 4.0 and later software support Network Time Protocol (NTP), which is used to synchronize the time and date stamp on ultrasound data associated with data processing or storage at multiple hospital or clinic locations.

NTP requires that the site administrator create a connection to an NTP server. It also requires the system to be configured for the correct time zone and, if requested by the customer, to be set up to automatically adjust the clock for Daylight Saving Time. See “[To set up Network Time Protocol](#)” on page 111 for more information.

## Enabling or Disabling Media Export

**Media Export Security** controls whether patient data can be stored to external media (such as a USB storage device or a DVD). **Media Export Security** configuration is implemented using the **Export** sub-tab of the **Security Policies** tab in the security settings. The customer is solely responsible for the management of media exports. For more information, see the system *Help*.