



BLADDERSCAN PRIME PLUS

VERATHON SERVICE PARTNER MANUAL

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Effective: 6 November 2025

Caution: Federal (United States) law restricts this device to sale by or on the order of a physician.

CONTACT INFORMATION

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Information in this manual may change at any time without notice. For the most up-to-date information, see the documentation available at verathon.com/service-and-support.

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IMPORTANT INFORMATION

This document provides Verathon Service Partners with detailed instructions on how to troubleshoot, repair, and certify BladderScan Prime and Prime Plus devices.

SERVICE PARTNER PROGRAM OVERVIEW & BENEFITS

The BladderScan Prime Service Partner Program gives you the tools and training necessary to perform factory-recommended certifications and repairs at your own facility. This certification service is one of the ways Verathon ensures that your BladderScan systems perform to the highest standards.

IMPORTANT

For detailed information about the system and how to operate it, see the latest *BladderScan Prime Plus Operations & Maintenance Manual*, available at verathon.com/service-and-support. Before operating the system, ensure that you are familiar with the content in the Operations & Maintenance manual(s) and you have watched the onboard tutorial.

HOW TO USE THIS MANUAL

Note: To ensure that the figures and instructions are completely legible, this document must be printed in color. Do not use this document if it has been printed in black and white. Images of parts and labels are for representational purposes only and are subject to change without notice.

This manual is divided into the following chapters:

- **Important Information**—Includes an overview of how to use this manual and the required certifications, environment, and tools needed to service a device. Also contains warnings and cautions. Ensure that you read and understand this chapter before performing service.
- **Components & Features**—Provides a brief description of the system components, functions, and user interface. For more information, see the Operations and Maintenance Manual.
- **System Certification**—Contains procedures for confirming that the system is in good, working order.
- **Diagnostics & Troubleshooting**—Contains instructions for isolating the service issue to the probe or console and provides a general outline of troubleshooting and repairing known service issues.
- **Repair & Replacement**—Provides targeted procedures for replacing and repairing components and parts within the console, probe, or printer.
- **Reference Documentation**—Contains workmanship standards, reference procedures for general maintenance, and additional information that may be of assistance.

HOW TO SERVICE A SYSTEM

The primary service procedures are contained within three chapters: [System Certification](#), [Diagnostics & Troubleshooting](#), and [Repair & Replacement](#). The following figure illustrates the general order in which you should complete these procedures and advance through the manual.

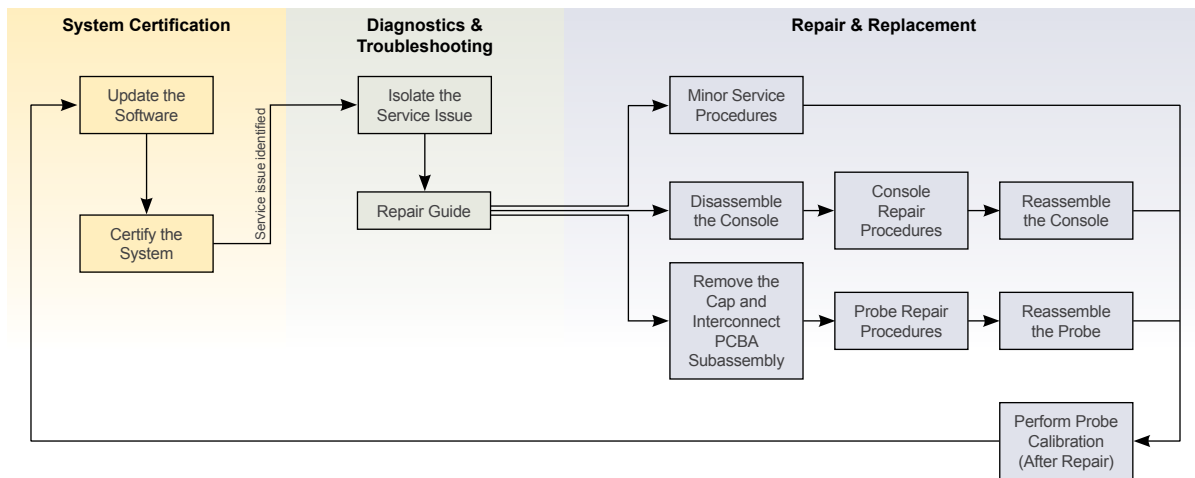


Figure 1. General Service Workflow for BladderScan Prime Systems

Note: Although BladderScan Prime Plus systems do not require regular calibration, full certification (including calibration) is recommended after disassembly and reassembly of the probe or the console.

Use the [System Certification](#) chapter to certify the system and confirm that it is in good working condition. If you encounter one or more service issues during certification, use the [Diagnostics & Troubleshooting](#) chapter to test the system and, if necessary, isolate the service issue to the console or the probe. Using the procedures [Test the Console](#) and [Test the Probe](#), identify the repair procedures to complete and the recommended order to follow. Completing the corrective procedures in the indicated order troubleshoots and eliminates possible sources of the issue.

Once you have isolated the issue and identified the likely repair procedures, continue to the [Repair & Replacement](#) chapter, which is divided into four sections: minor service procedures, console repair, probe repair, and printer repair. Use the disassembly procedure in each section before servicing the affected component, and then complete the repair or replacement procedures indicated during troubleshooting. Once the failure has been resolved, additional corrective procedures may not be required. Reassemble and complete service as detailed in each section.

As you complete repairs or test the working order of the device, visually inspect for damage and use the [Workmanship Standards](#) section on page 146 to determine if any components or parts require replacement.

REQUIREMENTS FOR SERVICE

TECHNICIAN CERTIFICATIONS

Only trained Verathon Service Partners, qualified to perform these activities, should perform the procedures contained within this manual. Verathon Service Partners agree to comply with the following:

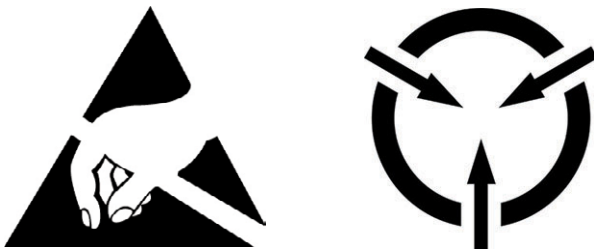
- All servicing will be conducted in accordance with the standards set forth in this manual.
- All repair parts, accessories, and product-specific calibration test equipment will be purchased directly from Verathon Inc.
- Only authorized Verathon Inc. parts will be used, and components will not be modified, changed, or substituted for any purpose, other than as authorized by Verathon.
- All soldering must comply with IPC/EIA J-STD-001C and IPC-A-610 standards.

Stop and seek assistance from Verathon Customer Care if, during the course of following a procedure, you notice something unsafe or beyond your training and experience.

ENVIRONMENT

To protect electrical and electronic parts (such as PCBAs), ensure that you are working in an environment with an electrostatic discharge (ESD) control program. Any parts that are sensitive to ESD or areas designated as ESD-safe are marked, either directly or on their packaging, with one of the following symbols.

Figure 2. ESD Symbols



ROHS COMPLIANCE

All BladderScan Prime consoles and probes are compliant with the Restriction of Hazardous Substances (RoHS) Directive, which restricts the use of certain hazardous substances in electrical and electronic equipment. When you are servicing one of these consoles or probes, ensure that you use RoHS-compliant materials and parts. For any questions about RoHS-compliant equipment, please contact Verathon Customer Care.

UDI COMPLIANCE

Depending on its date of manufacture, a Verathon product may or may not conform to the Unique Device Identification (UDI) standard. For items manufactured before the standard went into effect, the identity of the product line and the individual device are shown on the product's labels and packaging as plain text. For items manufactured to comply with the standard, the identity and specifications of the product line are shown as a registered code on the product's labels and packaging. The identity of the individual device, frequently a serial number, appears within the code.

When replacing a product label, be sure to use the appropriate replacement part (either UDI-compliant or non-UDI). For any questions about UDI-compliant equipment, contact Verathon Customer Care.

RECOMMENDED INSTRUMENTS & TOOLS

For information about the parts and components used when servicing a BladderScan Prime device, see [Part Numbers](#) on page 153. Servicing the system requires the following tools:

- Torque screwdriver calibrated to 0.28 ± 0.03 N-m (2.5 ± 0.3 in-lb)
- Torque screwdriver calibrated to 0.32 ± 0.03 N-m (2.8 ± 0.3 in-lb)
- Torque screwdriver calibrated to 0.37 ± 0.03 N-m (3.25 ± 0.25 in-lb)
- Torque screwdriver calibrated to 0.9 ± 0.06 N-m (8 ± 0.5 in-lb)
- Electric or manual screwdriver that accepts interchangeable bits
- Screwdriver bits
 - T10 star bit
 - T8 star bit
 - Phillips bit
 - 4.5 mm socket wrench bit
- 0.050-inch manual hex driver
- Flat screwdriver
- 4.5 mm open-end wrench
- 1/4-inch socket wrench
- 3/8-inch socket wrench
- Strap wrench (0610-0230)
- Tweezers
- Dental pick
- X-ACTO knife
- Single-edge razor blade (optional)
- Orange sticks
- Sandpaper
- Eraser
- Ionized air gun
- Isopropyl alcohol
- Heavy white USP mineral oil
- Kimtech wipes
- Cotton swabs (Q-tips)
- Fine-point permanent marker
- PC station with access to printer
- Scale loupe, 15× magnification (Peak Optics OPT-P2016-STD or equivalent)
- Feeler gauge set, including 0.254 mm (.010-inch) and 0.381 mm (.015-inch) sizes
- USB flash drive containing current BladderScan Prime software update (0901-0193)
- Certified adult bladder phantom (0620-0068)
- Ultrasound gel (0800-0005)
- BladderScan Prime Plus test console, known-good, with latest software (0570-0346 or 0570-0394)
- BladderScan Prime Plus test probe, known-good (0570-0347, 0570-0395, or E570-0395)
- BladderScan Prime Plus test printer, known-good (0800-0528)
- Calibration kit (0620-1083 or 0620-0739)
- Battery charger (0400-0157 or 0400-0130)
- Lithium-ion battery, 10.95 V, 77 Wh (0400-0164)
- Lithium-ion battery, 10.8 V, 70 Wh (0400-0155)
- Lithium-ion battery, 11.1 V, 51 Wh (0400-0126)
- Thermal printer paper (0800-0319)
- Adhesive foam tape, 1.3 cm (1/2-inch), roll
 - For USB/SD port cover (0136-0190; optional)
- Kapton tape
 - 0.6 cm (1/4-inch)
 - 1.3 cm (1/2-inch)
 - 2.5 cm (1-inch)
- Soldering station with soldering iron, solder, and flux
- Desoldering system or desoldering wick
- Latex or nitrile gloves
- Protective glasses

Note: If you have non-interchangeable screwdrivers and torque screwdrivers in the appropriate sizes, you can use them in place of the interchangeable tools listed here.

RECOMMENDED REPAIR STOCK

The spare parts listed in this section are likely to be needed as you repair the system. Verathon recommends keeping at least one of each part in stock.

PART	PART NUMBER
Console Parts (Recommended)	
Battery door	0122-1252 (replaces 0122-0743)
Battery door hinge	0122-1251 (replaces 0122-0741)
Touchscreen display assembly	0230-0142
Back panel	0122-1253 (replaces 0122-0744)
Lower housing	0122-1202 (replaces 0122-0811)
Upper housing	0122-1201 (replaces 0122-0800)
Console Parts (Optional)	
Main PCBA	0142-1070 or 0142-0820
Main chassis	0122-0749
Probe Parts (Recommended)	
LCD flex cable	0600-0720
Probe LCD overlay	0120-0737
Probe cap/LCD assembly	0142-0910
Probe cap and cable assembly (without LCD)	0600-0854
Power PCBA	0141-0756
MCU/FPGA PCBA	0141-0755
Probe Parts (Optional)	
ADC PCBA	0141-0757
AFE PCBA	0141-0760
DCM assembly	0142-1029 or 0142-1080

WARNINGS & CAUTIONS

Warnings indicate that injury, death, or other serious adverse reactions may result from use or misuse of the device. Please heed the following warnings.

Note: For additional warnings and cautions related to using the system on a patient, see the operations and maintenance manual, available at verathon.com/service-and-support.

WARNINGS



WARNING

To reduce the risk of leakage, explosion, fire, or serious injury, note the following when handling the lithium-ion battery included in the system:

- Do not store the battery in the console for an extended period of time.
- Never short-circuit the battery by bringing the battery terminals into contact with any other conductive object.
- Never expose the battery to abnormal shock, vibration, or pressure.
- Do not disassemble, heat above 60°C (140°F), or incinerate the battery.
- Keep battery out of reach of children and in original package until ready to use.
- Dispose of used batteries promptly according to local recycling or waste regulations.
- If the battery is leaking or its case is cracked, put on protective gloves to handle it, and discard it immediately.
- Put insulating tape, such as cellophane tape, on the electrodes during transportation.



WARNING

Some activities in this manual require modification of system parts by soldering. Failing to observe safety precautions while soldering can cause injury to the person performing service on the system. Soldering incorrectly can cause damage to the system.

Always wear protective glasses and latex or nitrile gloves when soldering. If you are not familiar enough with the technique necessary to complete the soldering tasks correctly, contact Verathon Customer Care.

COMPONENTS & FEATURES

SYSTEM PARTS & ASSEMBLIES

CONSOLE PARTS & ASSEMBLIES

The BladderScan Prime console's primary feature is a touchscreen display that allows you to control the system: completing scans, managing scan results, and customizing settings. A rechargeable battery is inserted into one side of the console, and the other side features a selection of ports for connecting system components and accessories, such as external, removable media storage devices. You may also customize your console by adding an optional printer, attaching the console stand, or mounting the console to a mobile cart.

Figure 3. Console Components



Table 1. Console Components

PART NAME	PURPOSE
Main display	Features touchscreen controls of the system user interface
Power control (Standby button)	Activates the unit or puts it in standby mode
Volume control	Adjusts volume up/down on start-up sound and “scan complete” tones
Brightness control	Adjusts display brightness dimmer/brighter
Battery door	Opens to allow insertion or removal of the rechargeable battery
Probe cable port	Connects the system probe and console
Micro USB port	Not functional in this version of BladderScan Prime
USB ports	Provides connection for external, removable storage media
SD card port	Provides connection for external, removable storage media

PROBE PARTS & ASSEMBLIES

The probe contacts the patient and transmits and receives ultrasound waves, automatically moving its internal transducer 360° to scan twelve planes to produce a three-dimensional image of the bladder. The probe is attached to the console by a cable. After a scan, the probe displays bladder volume and targeting.

Figure 4. Probe Components



Table 2. Probe Components

PART NAME	PURPOSE
Probe button	Starts aiming or scanning when pressed
Probe display	Displays aiming, scanning, and scan results information to the system operator
Probe cable	Connects the probe to the console
Probe dome	Contains the ultrasound transducer

SYSTEM ICONS

CONSOLE TOUCHSCREEN ICONS

The console touchscreen displays the interface that controls the BladderScan Prime system. The following icons may appear on the screen, and you can perform the associated tasks by tapping the icons directly.

Table 3. Touchscreen Icons

ICON	FUNCTION
	Saved Scans —View all scans that are saved to the console.
	Settings —Open the Settings screen.
	Scan —Start scanning the patient.
	B-Mode —View the ultrasound image as pairs of two-dimensional, orthogonal planes from the three-dimensional scan. The contours of detected features are overlaid on the image.
	C-Mode —View the ultrasound image as a cross-section view of the three-dimensional scan. The C-Mode image consists of a circular region with a crosshair overlay. This image displays the bladder shape and, if detected, the shadow of the pubic bone. The probe displays scan results in C-mode. The console displays scan results in C-mode by default, and B-mode may be selected for any scan.
	Clear —On the Results screen, clear all scan data within the current exam, but maintain patient information.
	Delete —On the Saved Exam screens, delete a saved exam that is currently being viewed.
	Delete —On the Saved Exam screens, delete a saved exam from the exam list.
	Help —Start the onboard tutorial or display screen-sensitive help text.
	Print —Print the scan, self-test, or savings calculation results. <i>Note: This function is only available if you have attached the optional printer.</i>
	Done —On the Results screen, save the scan result with the largest volume and return to the Home screen.
	Export Exams —On the Saved Scans screen, move exams from the system's internal storage to an external USB drive or SD card. This option is only available if external storage is connected.
	Configure Savings —Customize the values for calculating the cost savings that result from scanning rather than catheterizing patients.

ICON	FUNCTION
	Back —Return to the previous screen or the Home screen.
	Cancel —On the Results screen, cancel the scan without saving and return to the Home screen.
	Next —Advance to the next screen.
	Play —On the onboard tutorial, play the tutorial.
	Pause —On the onboard tutorial, pause the tutorial.
	Previous —On the onboard tutorial, move to the previous frame of the tutorial.
	Next —On the onboard tutorial, move to the next frame of the tutorial.

CONSOLE BATTERY LEVEL ICONS

The battery level icon is displayed in the Status bar at the top of the touch screen. The icon and the percentage value next to the icon indicate the remaining battery power.

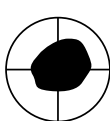
Table 4. Battery Level Icon

ICON	FUNCTION
	Battery approximately 100% charged.
	Battery approximately 80% charged.
	Battery approximately 60% charged.
	Battery approximately 40% charged.
	Battery approximately 20% charged.
	Battery discharged. Replace or recharge battery immediately.

PROBE ICONS

The following icons may appear on the probe display.

Table 5. Probe Icons

ICON	FUNCTION
	Patient Orientation Mode —When the system is ready to scan, the probe displays an icon indicating the currently selected patient orientation. The displayed patient orientation icon on the probe is updated when you change the patient orientation on the console Home screen.
	Scan in Progress Mode —When a scan is in progress, the probe displays the BladderScan logo.
	Results Mode —After a scan has been completed, the probe displays the position of the bladder in relation to the probe and the value of the largest volume acquired in the current exam. <i>Note: This display can be used to help position the probe. If the bladder is off-center on the probe display, move the probe in the direction of the bladder and scan again.</i>

SYSTEM CERTIFICATION

In this chapter, you perform maintenance service on your system and certify it. This chapter contains service and certification procedures for your system:

- **Update the Software**—You must ensure that the console is running the current software before testing it.
- **Certify the System**—This procedure ensures that the system is in good working order. Repeat this procedure and system repairs as needed to complete service. For facilities that require documentation of this procedure, this section includes a Calibration and Compliance Certificate.

If you discover during these procedures that the system requires repair, continue to the [Diagnostics & Troubleshooting](#) chapter on page 21.

Note: If it is necessary to clear the system's PIN codes and they have been lost or forgotten, contact Verathon Customer Care for a reset utility. (For contact information, visit verathon.com/service-and-support.) The reset utility is registered to the specific system for which it is generated, and it runs for only a limited time.

PROCEDURE 1. UPDATE THE SOFTWARE

QUANTITY	PART #	DESCRIPTION
Tools		
1	0901-0193	USB flash drive containing current BladderScan Prime Plus software update

If the system's software is not current, you must update it. You can determine the installed software versions by running a self-test (see [Run a Self-Test](#) on page 150). Information about the most recent software release, as well as a USB flash drive containing a software update package, is available from Verathon Customer Care.

Version 1.5 of the software introduced user interface and workflow changes. If you are updating a system to version 1.5 or later from a version prior to 1.5, you should also update the other BladderScan Prime systems in that facility so that all of them function consistently.

If you need to update a system with a console serial number of C1500001 or later to software version 1.6, it will be necessary to return the system to Verathon for the update. Later software updates on these systems, and all updates on other BladderScan Prime systems, can be performed according to the following steps.

Note: The system's battery should be at least 50% charged to perform an update.

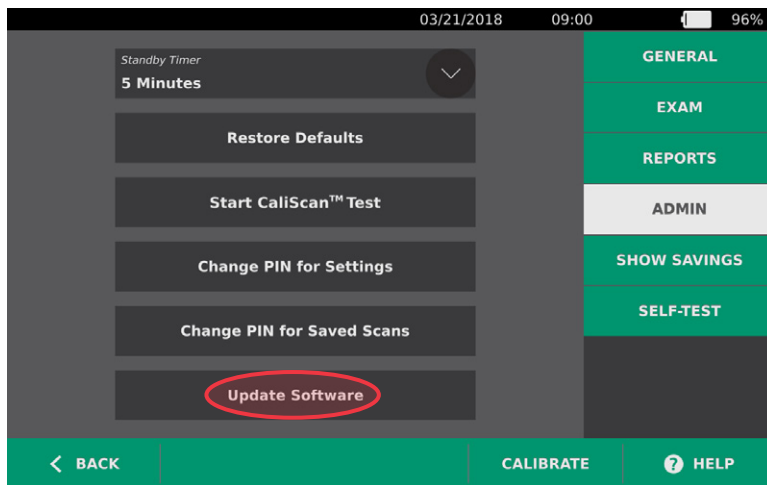
Software updates retain system settings and exam information.

1. Ensure that the probe is attached to the console and that the system is on.
2. If there are any USB drives or SD cards connected to the console, remove them.

3. Insert the USB drive or other device containing a valid software update package into the console.



4. On the Home screen, tap **Settings**.
5. Tap **Admin**, and then tap **Update Software**. The system begins updating and may restart during the update process. Do not remove the battery or the USB drive while the update is in process.



6. When instructed to do so, remove and reinsert the battery. The system restarts, and the software update is complete.

PROCEDURE 2. CERTIFY THE SYSTEM

The following certification procedure is used to test BladderScan Prime consoles and probes and ensure that the system is functioning properly after repairs. If the system passes the evaluations in the procedure, and the facility requires documentation that it passes, complete the Certificate of Calibration and Compliance. If the system fails, continue troubleshooting and perform any necessary additional repairs.

Often, the need for additional service may be discovered while performing these checks. This makes it beneficial to complete the entire procedure and check the system thoroughly.

QUANTITY	PART #	DESCRIPTION
Tools		
AR	0570-0346 or 0570-0394	Test console, known-good
AR	0620-0068	Certified adult bladder phantom
AR	0800-0005	Ultrasound gel
1	0400-0157 or 0400-0130	Battery charger
2	0400-0164, 0400-0155, or 0400-0126	Test battery, known-good
1	0800-0319	Thermal paper roll for the printer

Note: If you are certifying only one component of the BladderScan system (either a console or a probe), use a test console or probe to complete certification.



BLADDERSCAN PRIME PLUS

CERTIFICATE OF CALIBRATION & COMPLIANCE

Console S/N: _____ Asset Number: _____

Probe S/N: _____ Location: _____

The tests performed on the equipment listed above confirmed that it met all applicable product manufacturing and test specifications. Certification service is performed in compliance with Verathon manufacturing test specifications and equipment.

Today's Date: _____ Next Certification: _____

COMPLIANCE WITH "CERTIFY THE SYSTEM" PROCEDURE

- | | |
|---|--|
| ☐ Update system software | ☐ Controls and video function properly |
| ☐ Calibrate the probe (if necessary) | ☐ Scan results accurate (record in table below) |
| ☐ Cosmetic and physical inspection | ☐ Battery charger functions properly |
| ☐ System passes self-test | Replaced batteries? ☐ Yes ☐ No |
| ☐ Self-test printout is accurate and legible | |

SCAN RESULTS ON TISSUE -EQUIVALENT PHANTOM

Capture three scan results to ensure consistency. Confirm the results are within the accuracy range of the phantom's certified value.

PHANTOM VOLUME	SCAN #1	SCAN #2	SCAN #3	WITHIN RANGE?
				☐ Yes ☐ No

CERTIFIED ON BEHALF OF VERATHON, INC. BY:

Signature

Date

Global Headquarters

Verathon, Inc.
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Bothell, WA 98011 U.S.A.
Tel: 425.867.1348 / 800.331.2313 (US & Canada)
Fax: 425.883.2896

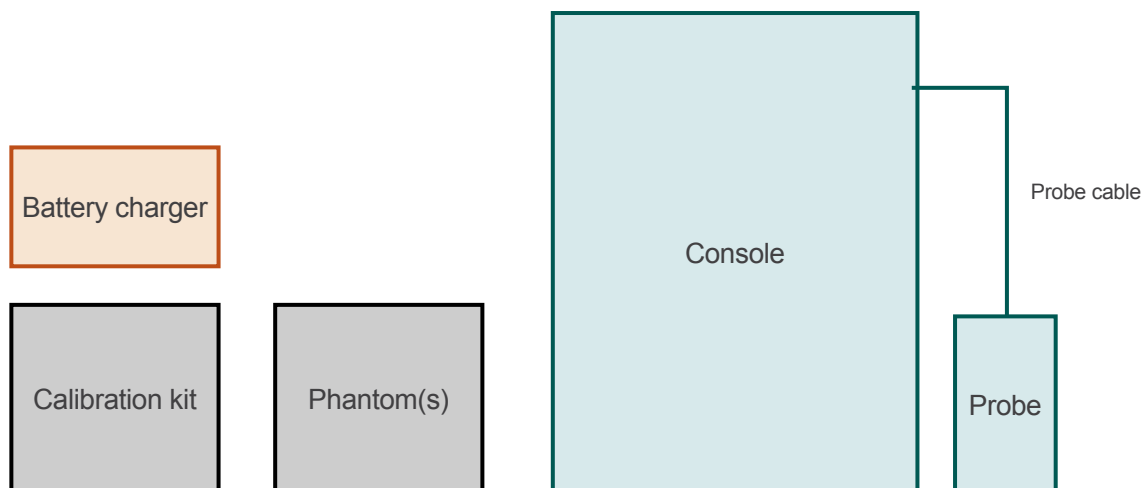
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Figure 5. Station Setup



STATION SETUP

1. Verify the following:
 - The station is set up with all equipment, as illustrated in [Figure 5](#).
 - The probe cable is plugged into the console.
 - Paper is inserted into the printer (if any) according to the procedure [Load Thermal Paper](#) on page 148.
2. Make a copy of the “Certificate of Calibration & Compliance” on page 16. As you progress through this procedure, complete the certificate.
3. If you have not done so already, update the system software in accordance with the procedure [Update the Software](#) on page 13.

CHECK THE COSMETIC APPEARANCE

4. Press the Standby button . The console goes into sleep mode.
5. Remove the battery from the console, and then unplug the probe.
6. Inspect the console and probe for cleanliness. For more information and guidance, refer to the section [Cleaning Standards](#) on page 146.
7. Inspect the console bottom label for orientation, condition, and compliance with service documentation.
8. Inspect for stress caused by inaccurate assembly, such as protruding screws or covers that are distorted or warped.

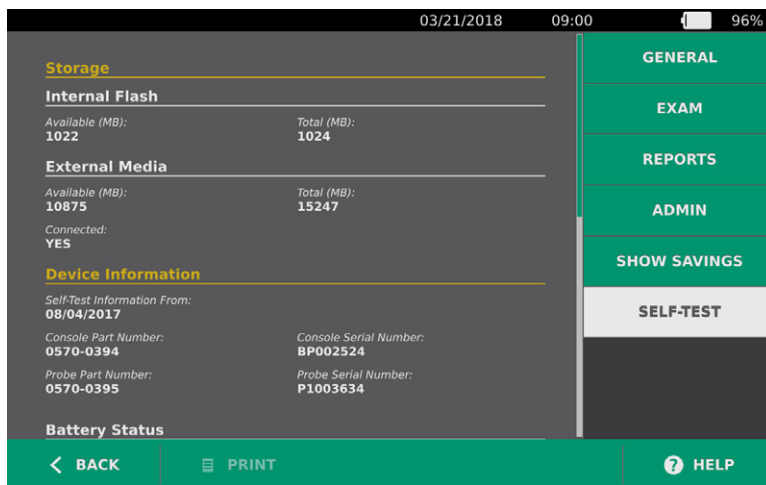
9. Inspect the console and probe to ensure that it meets the requirements outlined in the section [Component and Part Replacement Standards](#) on page 146.
10. Verify that all screws, feet, and surfaces are seated well.
11. Verify fit and alignment of all surfaces.
12. Ensure that the printer (if any) is securely attached and that its door is closed and latched, and then gently shake the console to ensure there are no loose parts.

TURN ON THE SYSTEM

13. Place a battery into the console, and then allow the device approximately 90 seconds to power up.
If the device does not start automatically, press the Standby button .

PERFORM A SELF-TEST

14. On the Home screen, tap the **Settings** icon, and then tap **Self-Test**. The Settings screen opens to the Self-Test tab, where the system completes the self-test and displays the results.



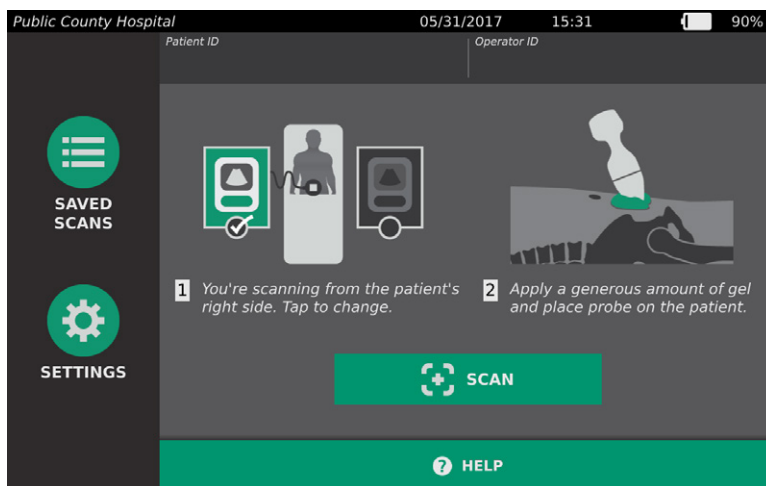
15. Scroll through the on-screen test results by vertically swiping with your finger on the touchscreen.
16. If the screen indicates any failed tests or abnormal results, continue troubleshooting the system.
17. If you want to print the self-test results, tap **Print**.
18. When you are finished viewing the test results, tap **Back**. The console returns to the Home screen.

TEST THE BUTTONS, TOUCHSCREEN CONTROL, AND VIDEO

19. Press the Brightness controls  and ensure that the screen brightens and dims.
20. On the Home screen, tap **Settings**.
21. On the Settings screen, tap different menu items on the left. Ensure the screen changes to show the status information and buttons for each item. Swipe up and down in the displayed information to verify scrolling.
22. Tap **Back** and verify that the Home screen reappears.

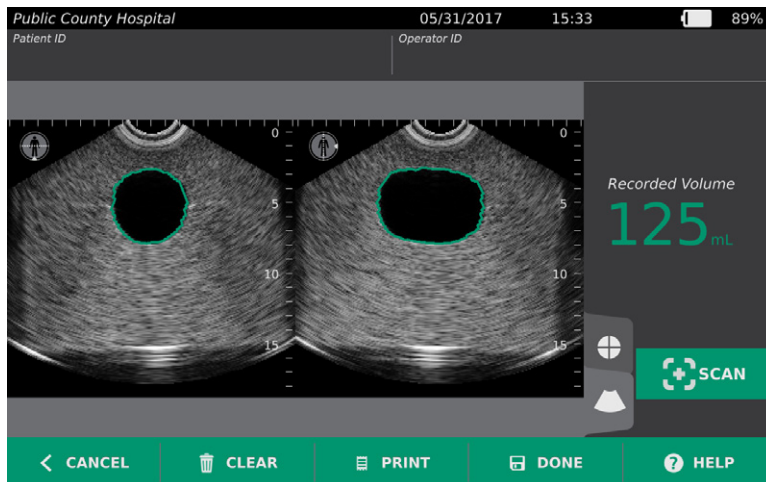
SCAN THE PHANTOMS

23. Apply ultrasound gel to the scan membrane of a certified adult bladder phantom, placing the gel in the center of the membrane.
24. Ensure that the Home screen appears on the console.



25. Place the dome of the probe onto the phantom scan membrane, and then press it gently against the top surface of the phantom.
26. On the probe, press the **Scan** button. The probe scans the phantom.
27. If Live Imaging Pre-Scan is on, maneuver the probe to position the bladder opening in the center of the B-mode ultrasound image.
28. After the scan is complete, verify on the console screen that the measurement is accurate to $\pm 7.5\%$.
29. Make note of the scan result on the Certificate of Calibration and Compliance.
30. Tap the B-mode tab  to view the test exam results as ultrasound images.

31. Verify that the ultrasound images are clear and resemble the following figure.



32. Swipe left and right to verify that the images are equally clear on all scan planes.

33. Tap **Clear** . The exam is deleted.

34. Repeat Step 23 through Step 33 to obtain and record the results of 3 scans.

TEST THE BATTERY CHARGER AND CUSTOMER-OWNED BATTERIES

35. Plug the battery charger into an outlet or power supply.

36. Insert test batteries into the battery charger.

37. Verify that the LED lights next to each battery bay turn green, confirming that the batteries are charging. The lights may turn orange at first, but they should then turn green within 10 seconds. If either of the lights remains orange while a known-good battery is inserted into the accompanying bay, remove and reinsert the battery. If the light still remains orange, the charger is malfunctioning and must be replaced.

38. If the system was returned for power-related issues, insert the customer-owned batteries into the battery charger. Verify that these batteries charge and function as the test batteries do. If a battery is being charged, and the light next to it on the charger flashes green immediately or stays orange for more than 10 seconds, the battery is malfunctioning and must be replaced.

39. Inspect the customer-owned batteries to identify any damage.

40. Replace the customer-owned batteries if they are damaged beyond use or do not function properly.

DIAGNOSTICS & TROUBLESHOOTING

PROCEDURE 3. ISOLATE THE SERVICE ISSUE

If the system is experiencing a performance or accuracy issue, it is necessary to determine if the source of the issue is located within the console, the probe, or the printer (if one is installed). Complete this procedure to determine the location of the issue.

QUANTITY	PART #	DESCRIPTION
Tools		
1	0400-0164, 0400-0155, or 0400-0126	Test battery, known-good
AR	0800-0528	Test printer, known-good
AR	0620-0068	Certified adult bladder phantom
AR	0570-0347, 0570-0395, or E570-0395	Test probe, known-good
AR	0570-0346 or 0570-0394	Test console, known-good, with latest software

1. On the system being serviced, ensure that the console and probe are fully connected.
2. If the console was returned without a printer, remove the console base (if necessary) and attach a test printer.
3. Place a charged battery into the console, and then allow the device approximately 30 seconds to power on.

If the device does not start automatically, press the Standby button .
4. If the device does not turn on, refer to the entry “System does not turn on” in [Table 6](#) on page 24.
5. Ensure there is a roll of thermal paper in the printer.
6. Run a self-test as described in the procedure [Run a Self-Test](#) on page 150.
7. Verify that all tests have passed and that the printout does not have any irregularities. If the self-test reports any failure messages, or if the printout is irregular, refer to [Table 6](#) on page 24 for instructions on correcting the issue.
8. Using the appropriate phantom, and referring to the information and materials provided with the system, confirm the reported service issue.
9. Disconnect the console and probe of the system being serviced.

10. If the equipment experienced a service issue during this procedure, continue to the following procedure, [Test the Console](#).

If no service issues were encountered, finish certifying the system as described in the section [System Certification](#) on page 13.

TEST THE CONSOLE

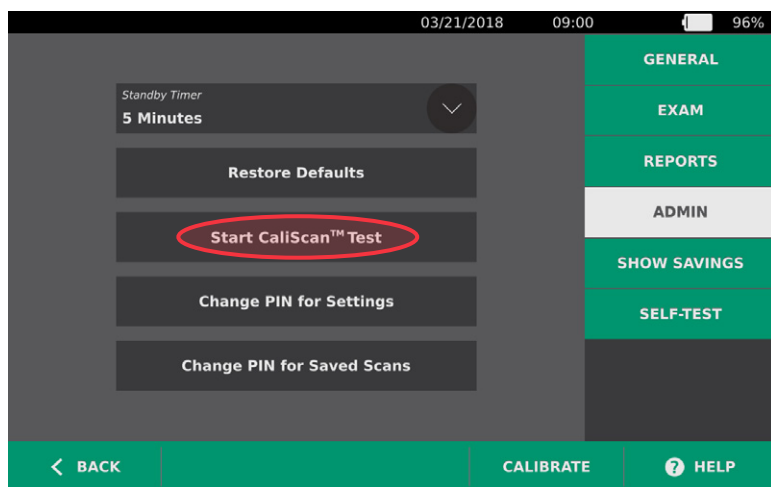
11. Connect a test probe to the console being serviced.
12. Turn on the system.
13. Observe the probe LCD. If any of the following occur, see [Table 6](#) on page 24:
 - The probe LCD does not turn off after the system has started
 - The graphics on the probe LCD are dim or missing while the system is starting or when a scan is taken
 - The console screen displays a missing probe error
14. Scan the certified phantom as described in [Scan the Phantoms](#) on page 19. If the scan returns inaccurate readings, see [Table 6](#) on page 24.
15. If a service issue occurs during this procedure, service is required on the console. Continue according to the instructions in the [Repair Guide](#).

If the scan is successful, continue to the next stage of the procedure.

TEST THE PROBE

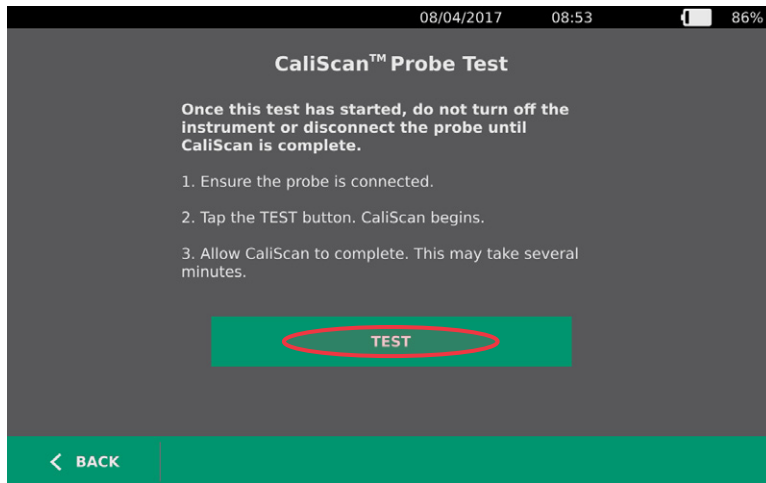
Note: The CaliScan test evaluates only the mechanical condition of the DCM. It does not calibrate the BladderScan system. For information on calibrating the system, refer to [Perform Probe Calibration](#) on page 143.

16. Connect the probe being serviced to the test console.
17. Turn on the system.
18. On the Home screen, tap the **Settings** icon.
19. Tap **Admin**, and then tap **Start CaliScan Test**.



20. Review the test instructions, and then tap **Test**. The system begins to test probe components. A message and process indicator appear while the test is in process.

Note: Once the test has started, do not press the Standby button or disconnect the probe from the console.



21. When the test is complete, make note of the results and then tap **Back**.
22. If the test completed normally, scan the phantom. (For more information, refer to [Scan the Phantoms](#) on page 19.) If not, continue to Step 23.
23. If a service issue has occurred during this procedure, follow the instructions in the section [Identify the Probe](#) to determine whether the probe is current in its construction. If it is, continue to Step 24. If not, replace the probe.
24. If the probe is current and is not functioning correctly, then it must be serviced. Continue according to the instructions in the [Repair Guide](#).

If no service issues were encountered when testing the console and probe, return to the procedure [Certify the System](#) on page 15 and complete certification.

IDENTIFY THE PROBE

Due to the unavailability of certain older parts, BladderScan Prime probes with serial numbers lower than P1500000 can not be serviced in the field. If the probe you have just tested demonstrates a service issue and has an earlier serial number, you must return it to Verathon for update to the current design.

Use one of the following methods to determine whether the probe can be serviced. The easiest methods are shown first.

- Examine the serial number label attached to the probe just above the data collection module (DCM).
- [Run a Self-Test](#) (page 150) and locate the probe's serial number in the test results.
- Measure the label recess on the probe body. If the recess measures 20 × 10 mm (0.78 × 0.38 inches), its serial number is lower than P1500000. If the recess measures 29 mm × 12 mm (1.16 × 0.47 inches), you must use a different method to identify the probe.

REPAIR GUIDE

Table 6 and Table 7 provide outlines of the known service issues for BladderScan Prime Plus consoles and probes. The tables list known corrective procedures for each issue in order of complexity. Once you have identified a service issue, complete the following actions until you have resolved it:

1. Disassemble the console or probe as needed.
2. Complete the first corrective procedure shown in the table.
3. Reassemble the console or probe as needed.
4. Test the correction.
5. If the issue persists, repeat these actions for the remaining corrective procedures shown in the table until you resolve the issue.

Table 6 provides an outline of known service issues and corrective procedures for BladderScan Prime Plus consoles. The following procedures provide disassembly and reassembly instructions:

- [Disassemble the Console](#) (page 39)
- [Reassemble the Console](#) (page 68)

Please note that console failures are not limited to those detailed in the following table. If you encounter a failure that is not documented in this manual, contact Verathon Customer Care (visit verathon.com/service-and-support for contact information).

Table 6. Console Troubleshooting—Observed Failures

OBSERVED CONSOLE FAILURE	ORDER	CORRECTIVE PROCEDURE	PAGE
System does not turn on	1	Ensure that a charged battery is installed	—
	2	Check flex cable connections in Reassemble the Console	68
	3	Replace the Main PCBA	57
Display backlight activates, but the system does not initialize completely	1	Check flex cable connections in Reassemble the Console	68
	2	Replace the Main PCBA	57
Display does not respond correctly to touch	1	Check flex cable connections in Reassemble the Console	68
	2	Replace the touchscreen display assembly in Disassemble the Console	39
	3	Replace the Main PCBA	57
Scan does not begin when selected on the console screen	1	Check flex cable connections in Reassemble the Console	68
	2	Replace the touchscreen display assembly in Disassemble the Console	39
	3	Replace the Main PCBA	57
Main display is too bright or too dark	1	Check whether the user's brightness setting is responsible	—
	2	Replace the touchscreen display assembly in Disassemble the Console	39

OBSERVED CONSOLE FAILURE	ORDER	CORRECTIVE PROCEDURE	PAGE
Sound missing or distorted	1	Replace the Speakers	52
	2	Replace the Main PCBA	57
Printout is irregular	1	Verify paper is loaded correctly in Load Thermal Paper	148
	2	Clean the Printer Contacts	30
	3	Clean the Print Head	29
	4	Replace the Printer Door	104
	5	Update the Printer Controller PCBA	108
		Replace the Printer Controller PCBA	116
	6	Replace the Main PCBA	57
Printer begins printing in self-test mode when system is turned on and continues to do so, even though the user has not run or printed a self-test	1	Verify that the two captive screws securing the printer to the console are tightened with no more than 0.9 N-m (8 in-lb) of torque	—
	2	Reposition the Accessory Interface PCBA	31
System does not start properly, and printer prints random text continuously	—	Replace the Main PCBA	57
Printer does not function	1	Verify that the two captive screws securing the printer to the console are tightened with no more than 0.9 N-m (8 in-lb) of torque	—
	2	Reposition the Accessory Interface PCBA	31
	3	Clean the Printer Contacts	30
	4	Replace the Accessory Interface PCBA	53
	5	Update the Printer Controller PCBA	108
		Replace the Printer Controller PCBA	116
	6	Replace the Printer Mechanism	122
Reset switch has no effect	1	Check wire connections on reset switch assembly	—
	2	Replace the Reset Switch	56
	3	Replace the Main PCBA	57
USB or SD card errors	1	Check USB and SD connectors for obstructions or damage	—
	2	Replace the USB/SD PCBA	55
	3	Replace the Main PCBA	57
Console does not respond to probe	1	Check probe cable connections	—
	2	Replace the Main PCBA	57

OBSERVED CONSOLE FAILURE	ORDER	CORRECTIVE PROCEDURE	PAGE
Probe vibrates without completing a successful scan; console displays a “loss of ultrasound data” message	1	Complete all troubleshooting steps listed for this failure condition in Table 7	27
	2	Replace the Main PCBA	57
Calibration fails consistently	—	Replace the Main PCBA	57
Glass overlay on touchscreen display is becoming loose or separating from the console	—	Replace the touchscreen display assembly in Disassemble the Console	39
Other failure(s) during self-test	—	Replace the Main PCBA	57

Table 7 provides an outline of known service issues and corrective procedures for BladderScan Prime Plus probes. The following procedures provide disassembly and reassembly instructions:

- [Remove the Cap and Interconnect PCBA Subassembly](#) (page 80)
- [Reassemble the Probe](#) (page 92)

Please note that probe failures are not limited to those detailed in the following table. If you encounter a failure that is not documented in this manual, contact Verathon Customer Care (visit verathon.com/service-and-support for contact information).

Table 7. Probe Troubleshooting—Observed Failures

OBSERVED PROBE FAILURE	ORDER	CORRECTIVE PROCEDURE	PAGE
Inaccurate scan result (Example: zero bladder volume or irregular bladder shape on results screen)	1	Replace the ADC PCBA in Remove the DCM Assembly	88
	2	Replace the AFE PCBA in Remove the DCM Assembly	88
	3	Replace the data collection module (DCM) assembly in Remove the DCM Assembly	88
Scan doesn't initiate	1	Visually inspect all probe PCBAs for damage. If any are damaged or faulty, replace them in Reassemble the Probe .	92
	2	Replace the probe cap assembly in Remove the Cap and Interconnect PCBA Subassembly	80
	3	Replace the probe body in Remove the DCM Assembly	88
Probe vibrates without completing a successful scan; console displays a "loss of ultrasound data" message	1	Visually inspect the probe cable port on the console. Clear any debris.	—
	2	Visually inspect all cable connections within the probe. If any cables are disconnected or not connected securely, replace them in Reassemble the Probe .	92
	3	Visually inspect the connection between the AFE PCBA and the DCM assembly. If the connectors are not aligned correctly or any pins are not making contact, correct the connection in Reassemble the Probe .	92
	4	Replace the DCM assembly and power PCBA in Remove the DCM Assembly	88
	5	Continue with the troubleshooting steps for this failure condition in Table 6	24
Probe fails CaliScan test	1	Replace the LCD flex cable in Remove the Cap and Interconnect PCBA Subassembly	80
	2	Replace the probe power PCBA in Remove the Cap and Interconnect PCBA Subassembly	80
	3	Replace the DCM assembly in Remove the DCM Assembly	88

OBSERVED PROBE FAILURE	ORDER	CORRECTIVE PROCEDURE	PAGE
Probe test produces “valid probe not connected” message	1	Remove the battery, remove and reconnect the probe, and then reinsert the battery.	—
	2	Replace the LCD flex cable in Remove the Cap and Interconnect PCBA Subassembly	80
	3	Replace the DCM assembly in Remove the DCM Assembly	88
	4	Replace the interconnect PCBA subassembly in Remove the Cap and Interconnect PCBA Subassembly	80
	5	Replace the probe cap assembly in Remove the Cap and Interconnect PCBA Subassembly	80
Probe becomes hot near its cap	1	Replace the DCM assembly in Remove the DCM Assembly	88
	2	Replace the probe power PCBA in Remove the Cap and Interconnect PCBA Subassembly	80
	3	Replace the probe cap assembly in Remove the Cap and Interconnect PCBA Subassembly	80
Calibration fails consistently	1	Replace the probe cap assembly in Remove the Cap and Interconnect PCBA Subassembly	80
	2	Visually inspect all probe PCBAs for damage. If any are damaged or faulty, replace them in Reassemble the Probe .	92
Probe LCD is blank	1	Replace the probe power PCBA in Remove the Cap and Interconnect PCBA Subassembly	80
	2	Replace the probe cap assembly in Remove the Cap and Interconnect PCBA Subassembly	80
	3	Replace the interconnect PCBA subassembly in Remove the Cap and Interconnect PCBA Subassembly	80
Probe scan button feels loose	—	Replace the probe body in Remove the DCM Assembly	88
Probe is leaking oil	—	Replace the DCM assembly in Remove the DCM Assembly	88

REPAIR & REPLACEMENT

MINOR SERVICE PROCEDURES

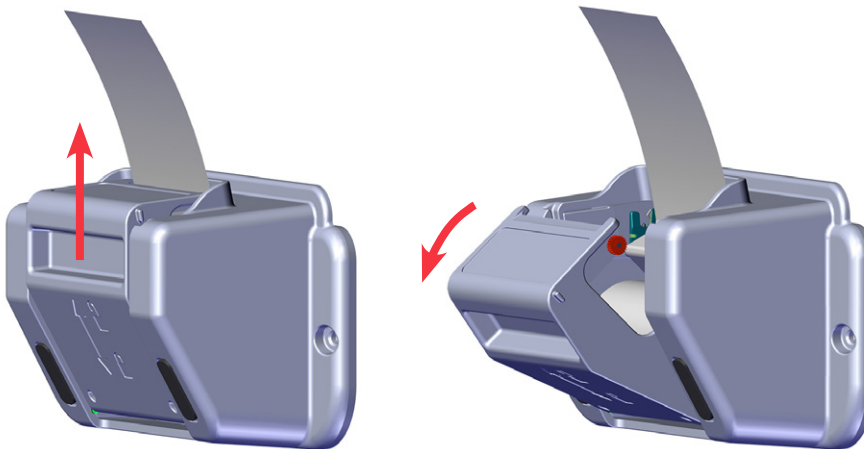
This section consists of minor service produces that do not require significant disassembly of system components.

PROCEDURE 4. CLEAN THE PRINT HEAD

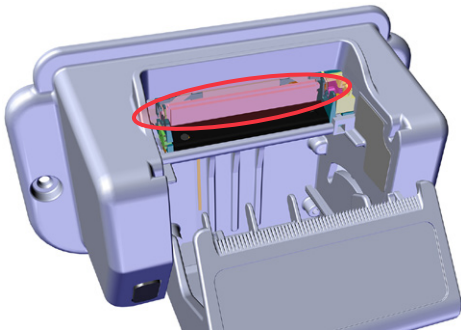
If the printer is producing irregular printouts, attempt to clean the print head and contacts before replacing any parts. If cleaning the print head does not solve the service issue, then continue to [Clean the Printer Contacts](#) on page 30.

QUANTITY	PART #	DESCRIPTION
Tools		
AR	—	Cotton swab
AR	—	Isopropyl alcohol

1. Open the printer door and remove any installed thermal paper.



2. Using a cotton swab and isopropyl alcohol, wipe along the print head contact area.



PROCEDURE 5. CLEAN THE PRINTER CONTACTS

Complete the following steps to clean the electrical contacts between the console and the printer.

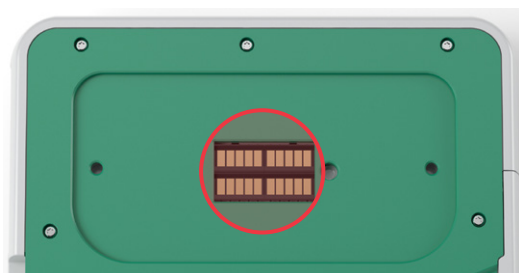
QUANTITY	PART #	DESCRIPTION
Tools		
1	—	Electric or manual interchangeable-bit screwdriver
1	—	Phillips bit
AR	—	Cotton swab (Q-tip)
AR	—	Isopropyl alcohol
AR	—	Eraser

1. Using a screwdriver with a Phillips bit, loosen the (2) captive screws securing the printer to the back of the console. Remove the printer from the back of the console.

Note: If a cart mounting bracket is installed over the printer, remove the (3) screws securing the bracket to the back of the console and the spacer between the bracket and the mounting plate. Set the bracket, the spacer, and the screws aside.



2. Examine the contact pads on the printer and on the back of the console for oxidation and contamination.



3. If the contact pads are heavily oxidized or extremely dirty, polish them using an eraser.
4. Using a cotton swab and isopropyl alcohol, wipe the contact pads on the printer and on the back of the console to remove any remaining contamination.
5. After the alcohol has dried, seat the printer on the back of the console so that the contacts between the two assemblies are correctly aligned.
6. If the console was not received with a cart mounting bracket, insert or seat the (2) screws in the screw holes in the lower printer housing, and then use a screwdriver with a Phillips bit to tighten them securely. After tightening the screws, skip to Step 12.

If the console was received with a cart mounting bracket, continue to the following step.
7. Place the spacer over the hole in the mounting plate.
8. Position the bracket over the printer.
9. Insert the (2) upper cart mounting bracket screws through the two upper branches of the mounting bracket and into the holes on either side of the printer.
10. Insert the lower mounting bracket screw through the lower branch of the mounting bracket and the spacer, and then into the hole in the mounting plate.
11. Using a screwdriver with a Phillips bit, tighten the screws securely.
12. Test the printer. If the reported service issue persists, then continue to [Printer Repair Procedures \(Optional\)](#) on page 103.

PROCEDURE 6. REPOSITION THE ACCESSORY INTERFACE PCBA

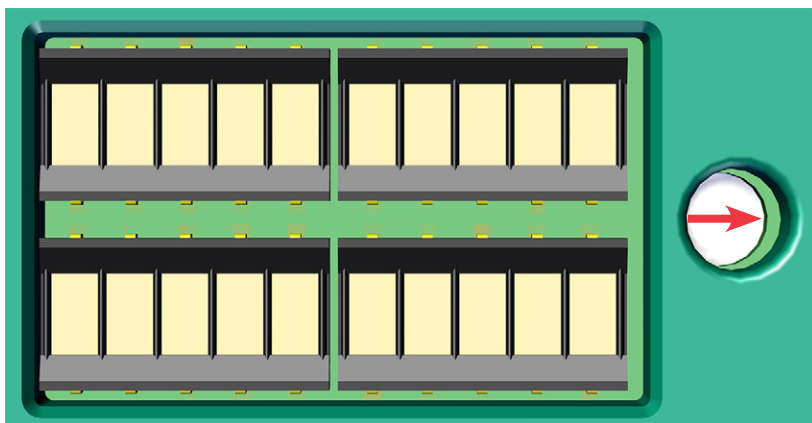
The accessory interface PCBA cannot move much within the console. However, occasional small shifts can cause printing problems.

To verify that the accessory interface PCBA is out of alignment, examine the printer alignment hole on the back of the console. If you see a small, crescent-shaped section of circuit board material, follow this procedure to realign the PCBA.

QUANTITY	PART #	DESCRIPTION
Tools		
1	—	Flat screwdriver

1. Insert a flat screwdriver into the printer alignment hole.

2. Using the screwdriver, press against the edge of the circuit board where it extends into the alignment hole.



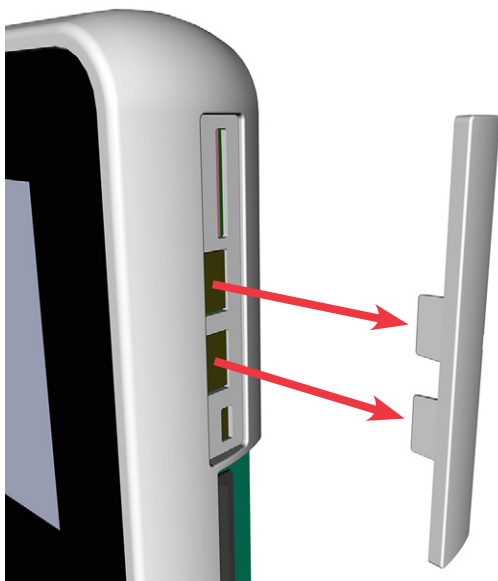
3. Repeat the previous step as needed until the circuit board is properly aligned.

PROCEDURE 7. REMOVE AND REPLACE THE PORT COVER (OPTIONAL)

Facilities that do not use external media with their BladderScan Prime Plus systems may install an optional port cover over the USB and SD ports. Before you update the software on such systems, you must remove the cover.

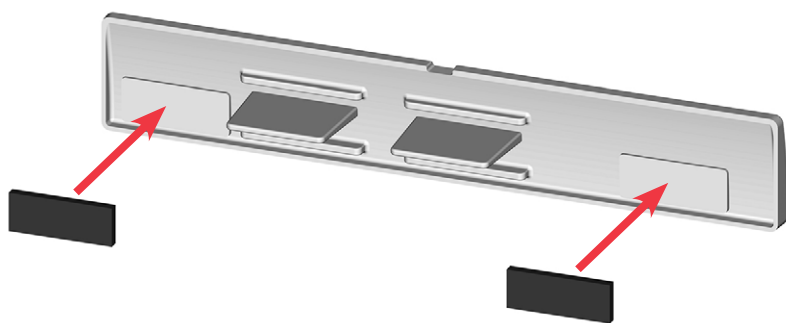
QUANTITY	PART #	DESCRIPTION
Parts		
AR	0122-0814	Port cover
AR	0136-0190	Adhesive foam tape, 1.3 cm (½-in), roll
Tools		
AR	—	Isopropyl alcohol

1. Insert a dental pick into the gap between the edge of the cover and the upper housing of the console. Carefully separate the two adhesive foam pads from the upper housing.
2. Pull the cover away from the console as shown in the following figure.

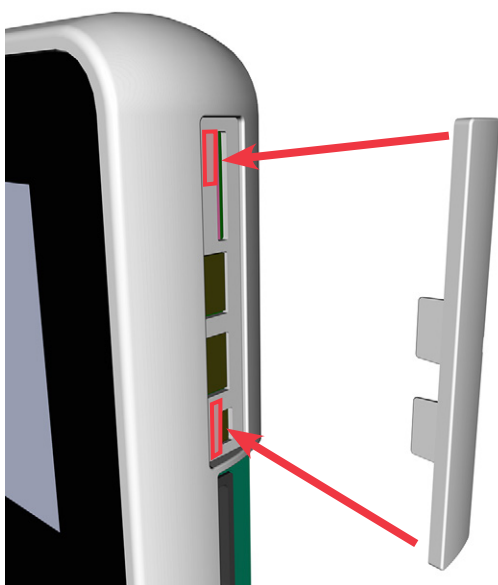


3. Using isopropyl alcohol, remove any adhesive residue from the area around the USB and SD ports on the console.
4. Examine the two adhesive pads to determine whether they can be reused. If not, separate them from the cover. Using isopropyl alcohol, remove any adhesive residue from the recesses where the pads were previously attached to the cover.
5. Install the update described in the section [Update the Software](#) on page 13, or perform other service as needed.
6. If you removed the adhesive pads when you removed the cover, cut two 0.5 cm (3/16-inch) lengths of adhesive foam tape (0136-0190) to create two new pads.

7. Remove the backing from each pad, and then apply the pad to one of the two recesses on the inside surface of the cover as shown in the following figure.



8. Position the cover so that the pads will contact the upper housing just in front of the SD and micro USB ports, as shown in the following figure.



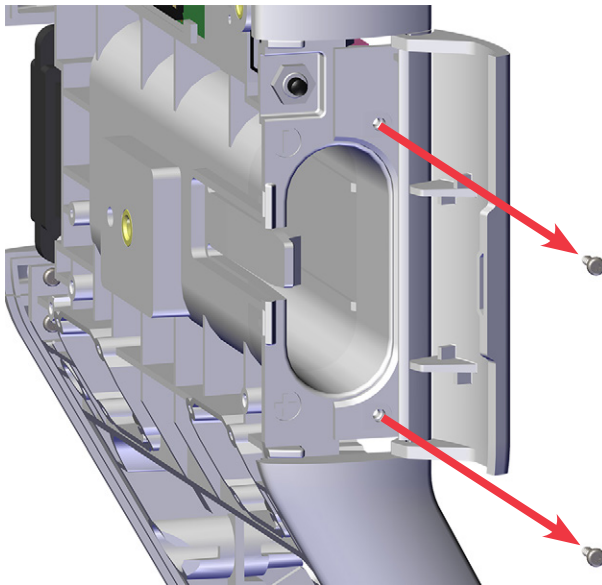
9. Insert the two tabs on the cover into the two standard USB ports on the upper housing and press the cover firmly into place.
10. Press down on the corners of the cover to ensure that the pads are securely attached to both the cover and the upper housing.

PROCEDURE 8. REPLACE THE BATTERY DOOR

The battery door assembly consists of the battery door, its retaining bracket, and the hinge between the two. Inspect the battery door assembly for damage and replace it if necessary.

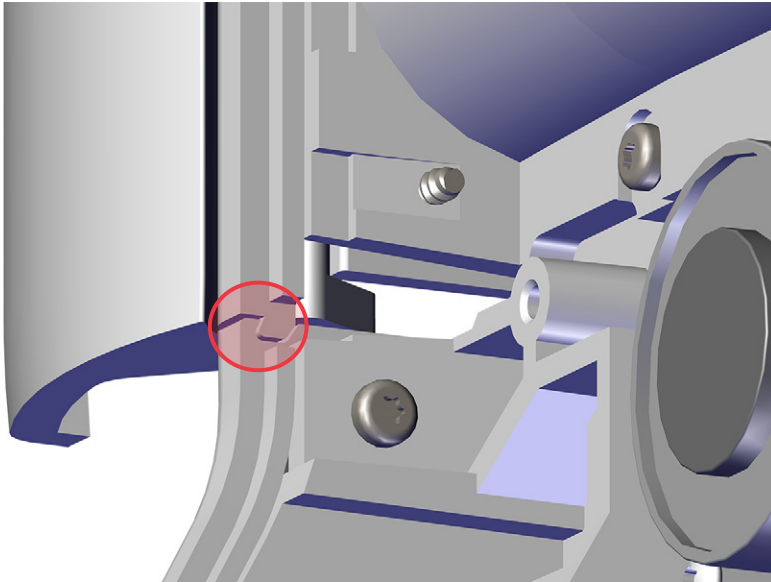
QUANTITY	PART #	DESCRIPTION
Parts		
1	0122-1252 (replaces 0122-0743)	Battery door
1	0122-1251 (replaces 0122-0741)	Battery door hinge
2	0261-0255	Battery door screw, M2.5, 8 mm, self-tapping, T8 drive
Tools		
1	—	Electric or manual interchangeable-bit screwdriver
1	—	T8 star bit
AR	—	Cotton swab
AR	—	Isopropyl alcohol

1. While holding the battery door open, use a screwdriver with a T8 star bit to remove the (2) battery door screws (0261-0255). Carefully remove the battery door assembly from the chassis.



2. Place the new battery door assembly over the battery opening in the chassis, making sure that the locking tabs fit correctly into the corresponding notches on the chassis.

Note: in the following figure, the back panel is omitted for clarity.



3. Using a screwdriver with a T8 star bit, install (2) battery door screws (0261-0255) to secure the door hinge.

CONSOLE REPAIR PROCEDURES

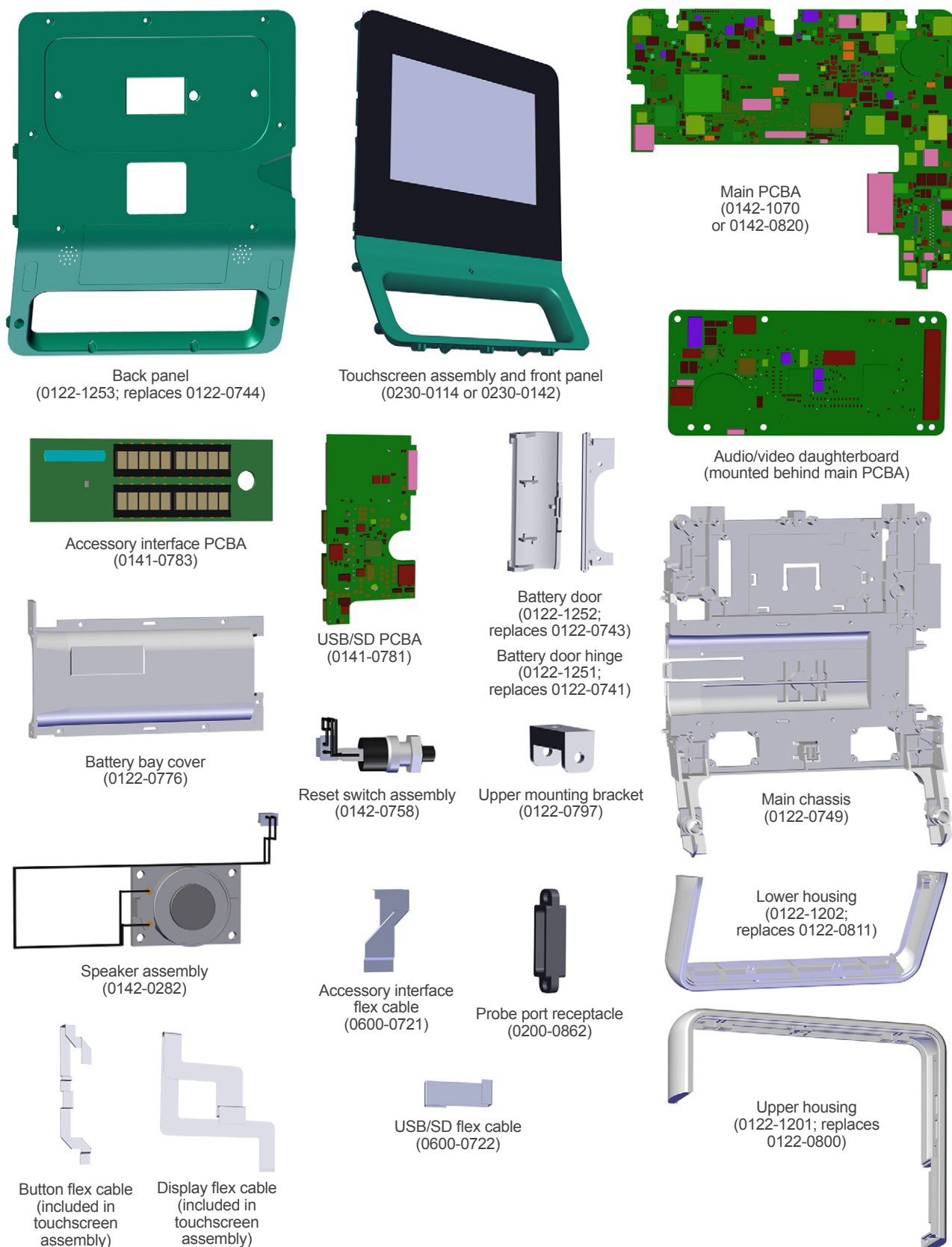
This section contains service instructions for the BladderScan Prime Plus console. It consists of the following procedures:

- [Disassemble the Console](#)
- [Replace the Lower Housing](#)
- [Replace the Upper Housing](#)
- [Replace the Speakers](#)
- [Replace the Accessory Interface PCBA](#)
- [Replace the USB/SD PCBA](#)
- [Replace the Reset Switch](#)
- [Replace the Main PCBA](#)
- [Reassemble the Console](#)

As you remove body components from the console, inspect each component to ensure that it is intact and suitable for reinstallation. For information on how to determine whether a console body component needs to be replaced, refer to the section [Component and Part Replacement Standards](#) on page 146.

After replacing any damaged or non-functioning parts according to the procedures in this section, you may skip additional replacement procedures and go directly to the reassembly procedure.

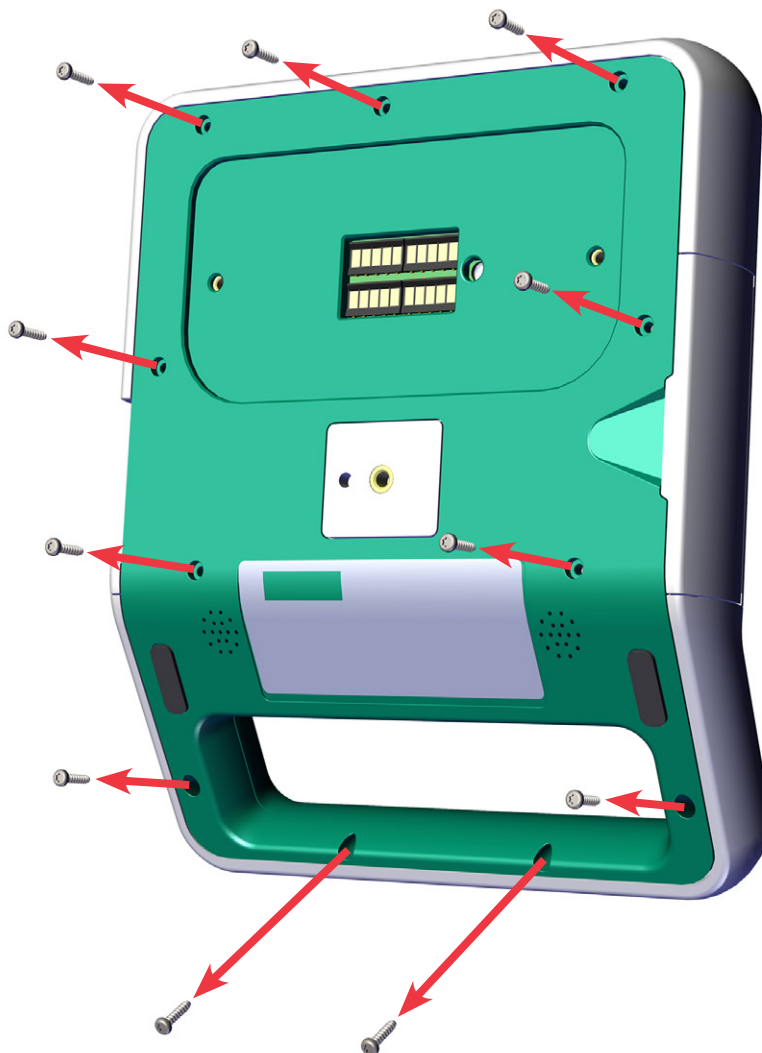
Figure 6. Components of the BladderScan Prime Plus Console



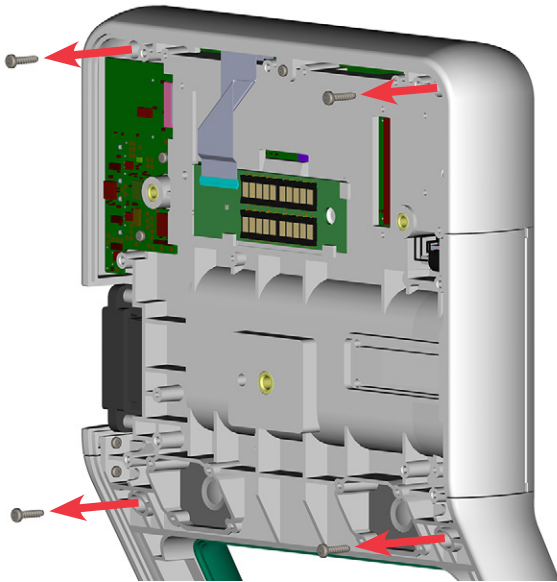
PROCEDURE 9. DISASSEMBLE THE CONSOLE

QUANTITY	PART #	DESCRIPTION
Parts		
11	0261-0256	Back panel screw, 4-20, ½-in, self-tapping, T10 drive
AR	0261-0256	Front panel screw, 4-20, ½-in, self-tapping, T10 drive
AR	0261-0499	Front panel screw, 4-20, ⅞-in, self-tapping, T10 drive
5	0261-0255	Battery bay screw, M2.5, 8 mm, self-tapping, T8 drive
Tools		
1	—	Electric or manual interchangeable-bit screwdriver
1	—	T10 star bit
1	—	T8 star bit

1. If a stand or printer is attached to the console, remove it.
2. Using a screwdriver with a T10 star bit, remove the (11) back panel screws (0261-0256). Set the screws aside for later use.

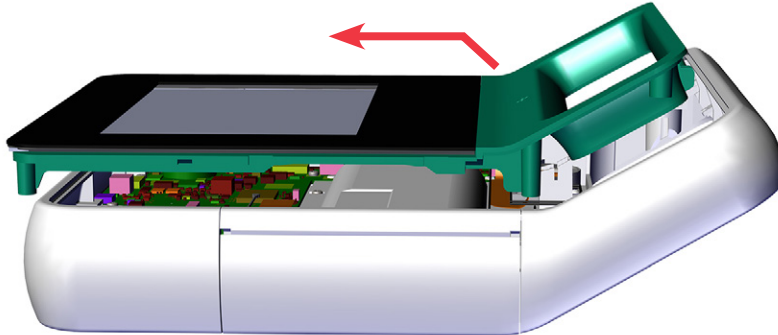


3. Remove the back panel, opening the battery door to make removal easier if necessary.
4. Using a screwdriver with a T10 star bit, remove the (4) front panel screws (0261-0256 or 0261-0499).

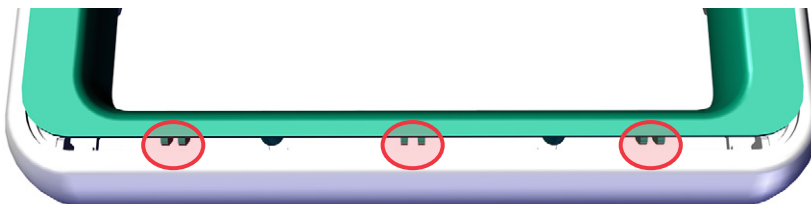


Note: In the following step, take care not to separate the glass overlay from the other components of the touchscreen display assembly.

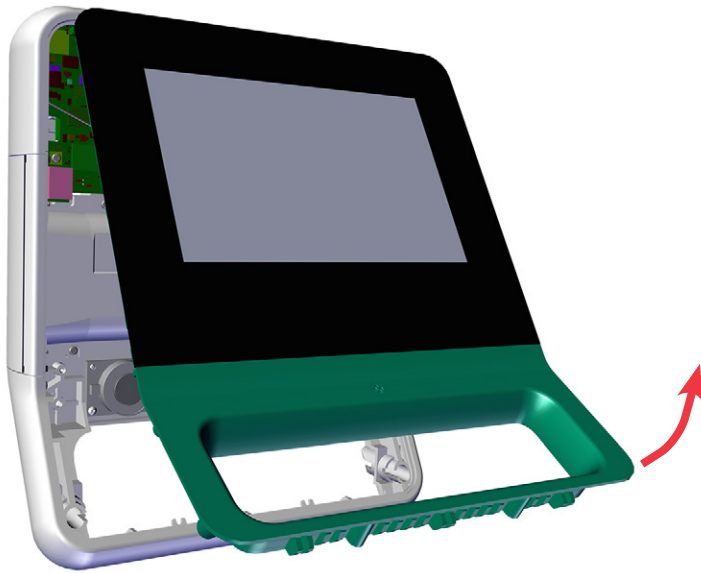
5. Carefully loosen the touchscreen display assembly and the front panel. Lift the combined assembly slightly away from the chassis and toward the top of the console.



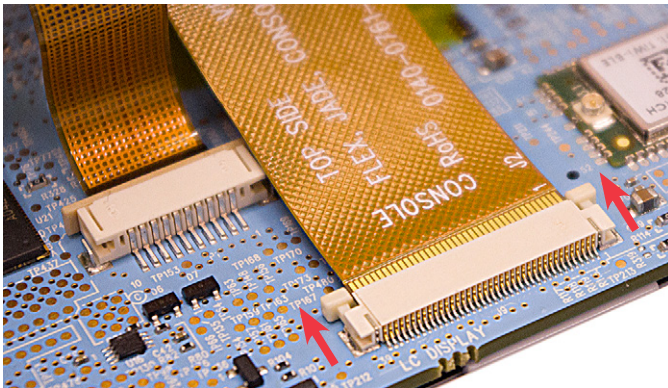
6. Carefully slide the touchscreen display assembly and the front panel upward until the tabs at the bottom edge are fully disengaged from the handle.



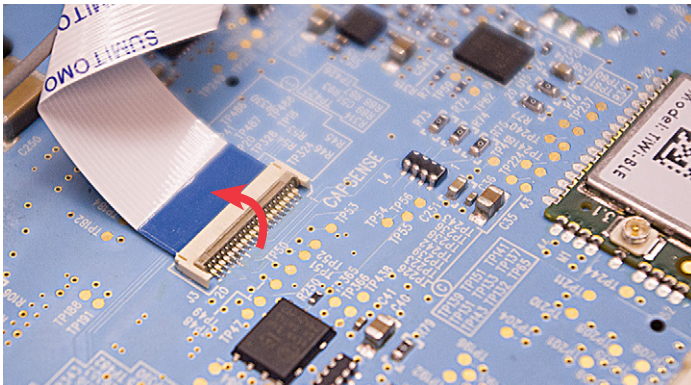
7. Tilt the display assembly upward to avoid damaging the three flex cables connecting it to the main PCBA.



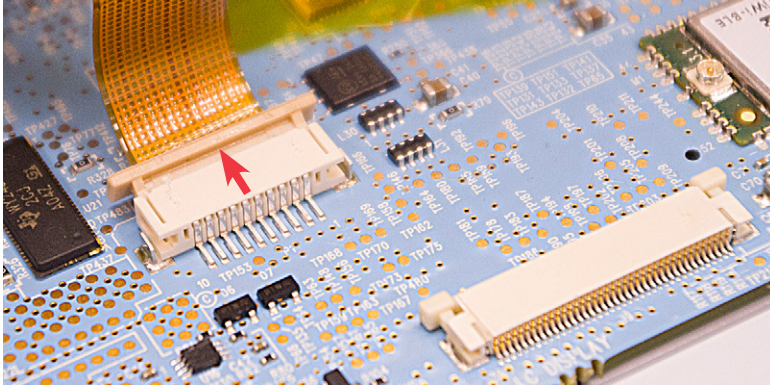
8. Remove the Kapton tape securing the flex cables to the main PCBA and the chassis.
9. On the main PCBA, disconnect the display flex cable.



10. On the main PCBA, disconnect the capacitive button flex cable.

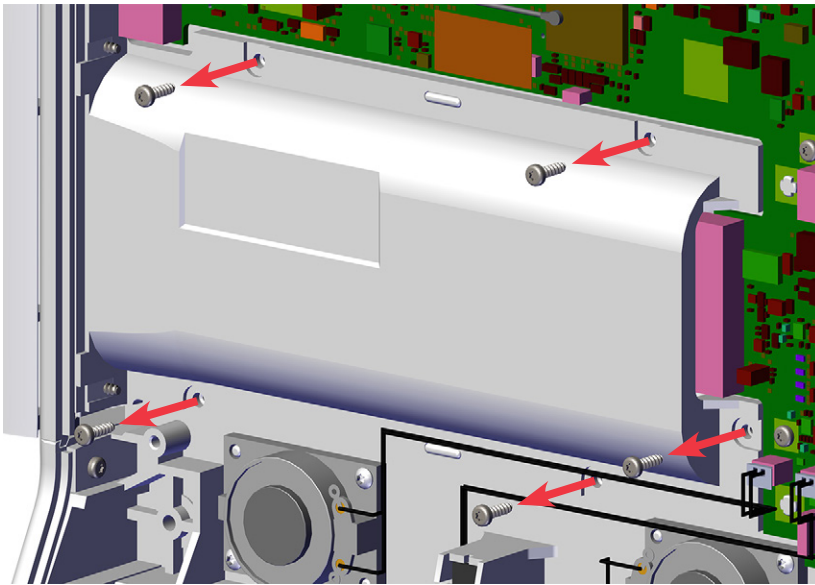


11. On the main PCBA, disconnect the touch interface flex cable.

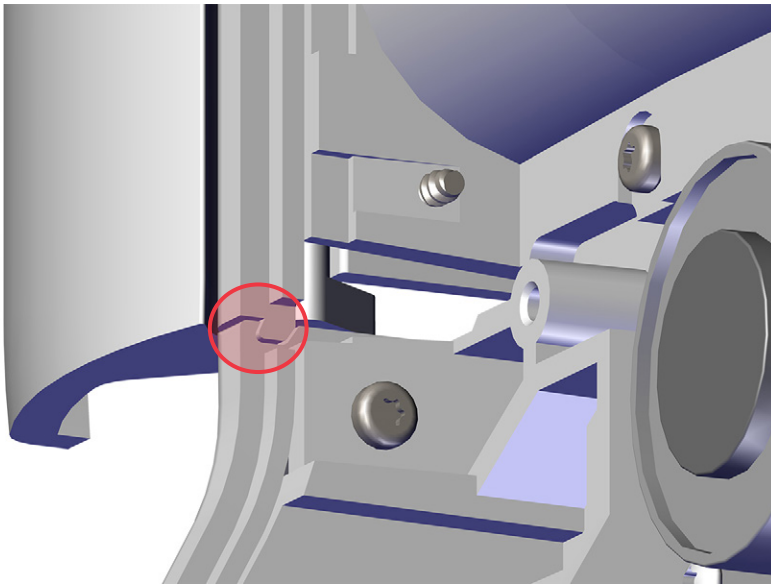


12. Remove the touchscreen display assembly and set it aside. If a reported issue requires you to replace the touchscreen display assembly, be sure to use the replacement during the procedure [Reassemble the Console](#) on page 68.
13. Using a screwdriver with a T8 star bit, remove the (5) battery bay screws (0261-0255).

Note: If the speakers are currently installed, you will need to move their cables in order to reach all of the battery bay screws.



14. Lift the battery bay cover out of the unit, taking care to disengage the two locking tabs if the battery door assembly is still attached. Set the cover aside for reinstallation later.

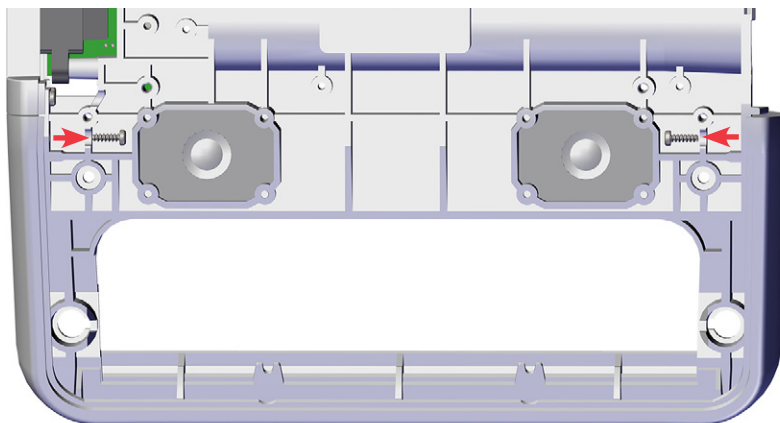
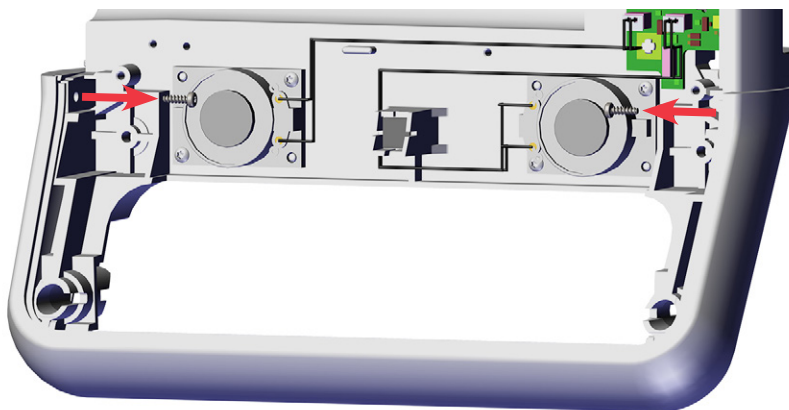


Note: At this point, the common portion of console disassembly is complete. The following part-replacement procedures can be followed as needed, except for the procedures that require removal of the main PCBA.

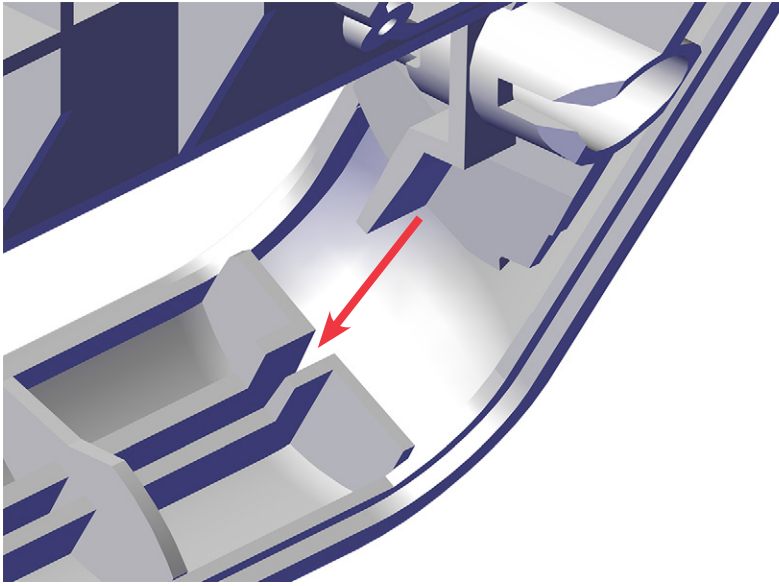
PROCEDURE 10. REPLACE THE LOWER HOUSING

QUANTITY	PART #	DESCRIPTION
Parts		
1	0122-1202 (replaces 0122-0811)	Lower housing
4	0261-0255	Lower housing screw, M2.5, 8 mm, self-tapping, T8 drive
Tools		
1	—	Electric or manual interchangeable-bit screwdriver
1	—	T8 star bit

1. Before beginning this procedure, ensure you have completed the procedure [Disassemble the Console](#) on page 39.
2. Using a screwdriver with a T8 star bit, remove the (4) lower housing screws (0261-0255). Remove the housing from the chassis.



3. Slide the new lower housing onto the chassis so that the projections on the chassis engage properly with the lower housing and the screw holes in both components line up correctly.

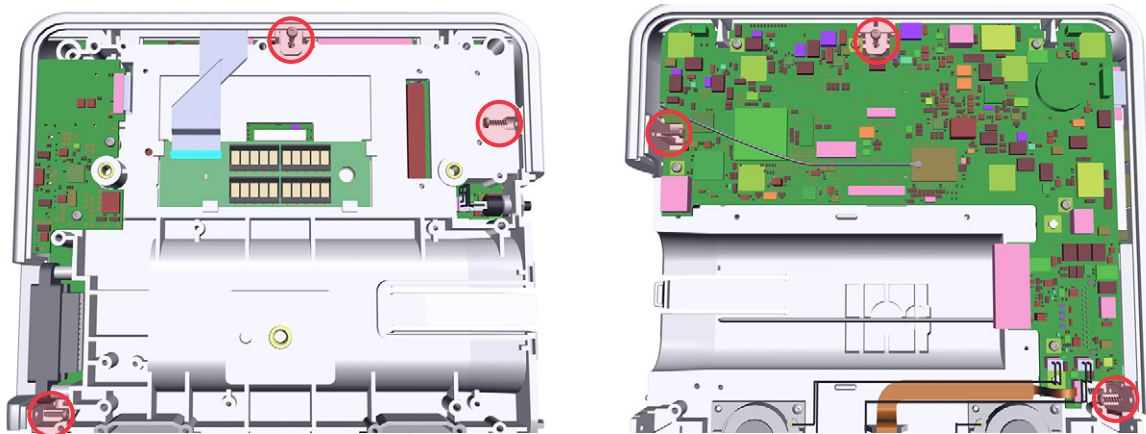


4. Using a screwdriver with a T8 star bit, attach (4) lower housing screws (0261-0255) to secure the lower housing to the chassis.
5. If no additional components need to be replaced, continue to [Reassemble the Console](#) on page 68.

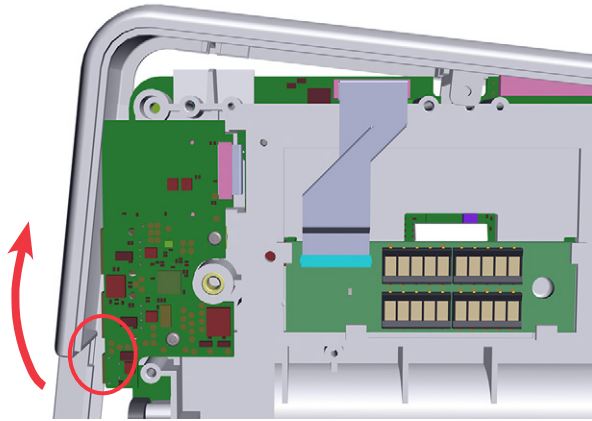
PROCEDURE 11. REPLACE THE UPPER HOUSING

QUANTITY	PART #	DESCRIPTION
Parts		
1	0122-1201 (replaces 0122-0800)	Upper housing
1	0122-0797	Upper mounting bracket
7	0261-0255	Upper housing screw, M2.5, 8 mm, self-tapping, T8 drive
1	0125-2514	USB/SD port label
2	0261-0255	Receptacle screw, M2.5, 8 mm, self-tapping, T8 drive
Tools		
1	—	Electric or manual interchangeable-bit screwdriver
1	—	T10 star bit
1	—	T8 star bit
1	0570-0347, 0570-0395, or E570-0395	BladderScan Prime / Prime Plus test probe, known-good

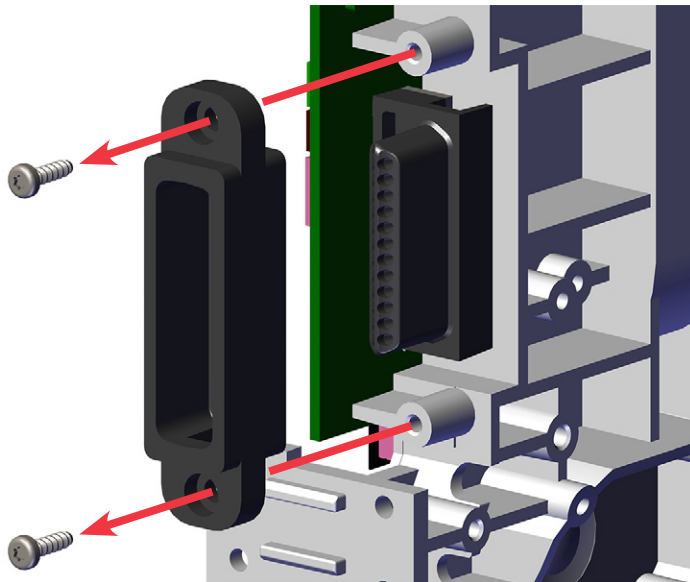
1. Before beginning this procedure, ensure you have completed the procedure [Disassemble the Console](#) on page 39. If a port cover was installed, ensure you have removed it as described in the procedure [Remove and Replace the Port Cover \(Optional\)](#) on page 33.
2. Using a screwdriver with a T8 star bit, remove the (6) upper housing screws (0261-0255) securing the upper housing and the upper mounting bracket to the chassis.



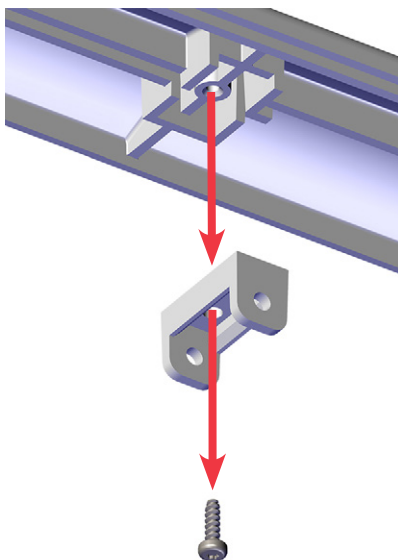
3. Orient the console so that the main PCBA faces away from you. Flex the upper housing so that the ridge inside its left arm clears the USB/SD PCBA as shown in the following figure.



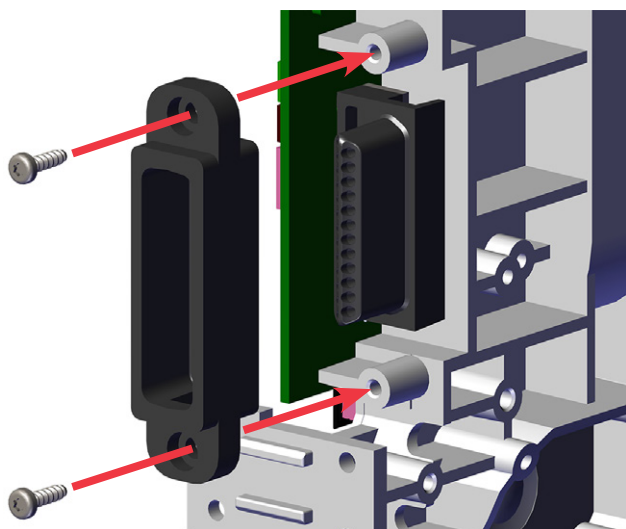
4. Disengage the upper housing and the upper mounting bracket from the top of the chassis.
5. Using a screwdriver with a T8 bit, remove the (2) receptacle screws (0261-0255), and then remove the probe cable port receptacle from the chassis.



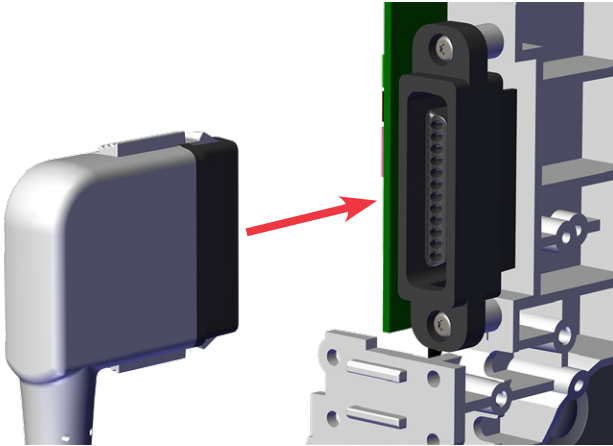
6. If necessary, using a screwdriver with a T8 star bit, remove the upper housing screw (0261-0255) securing the upper mounting bracket to the upper housing, and then remove the bracket.



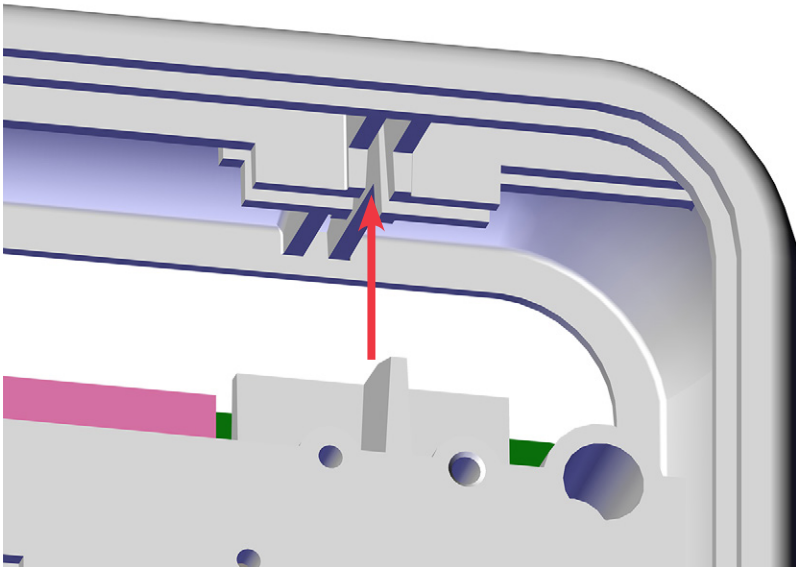
7. Insert the upper mounting bracket into its recess on the new upper housing. Using a screwdriver with a T8 star bit, attach an upper housing screw (0261-0255) to hold the two components together.
8. Attach (2) receptacle screws (0261-0255) to hold the receptacle loosely in place over the probe cable port, but **do not** tighten the screws.



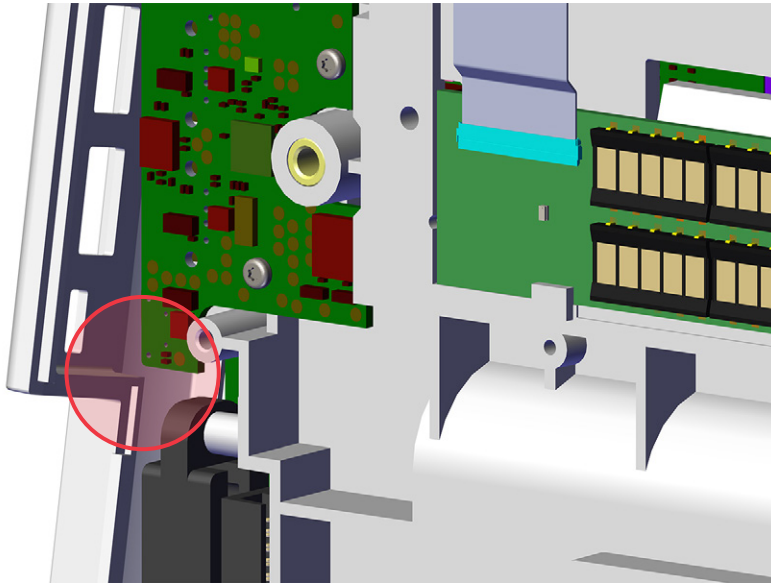
9. Insert the connector of a test probe (0570-0347, 0570-0395, or E570-0395) into the receptacle and over the probe cable port, making sure the locking tabs are both properly engaged.



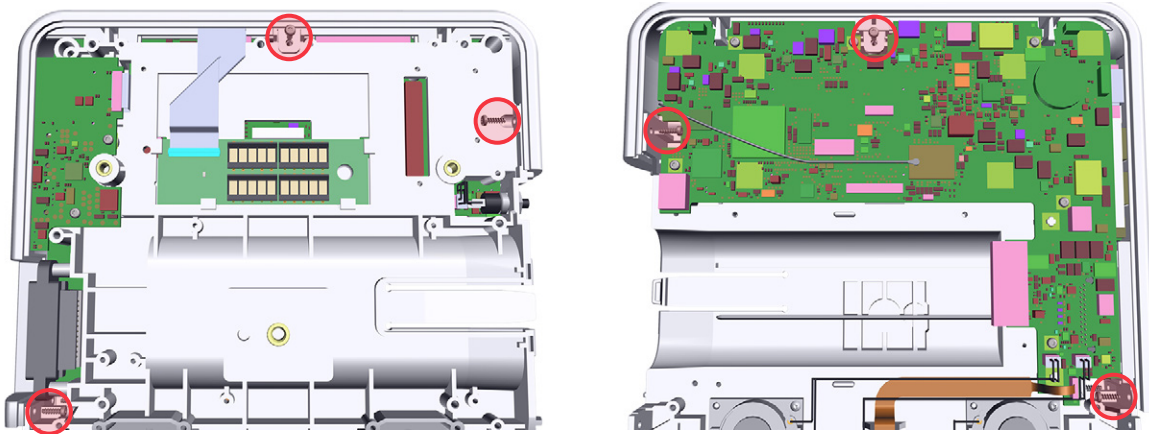
10. Using a screwdriver with a T8 star bit, tighten the screws to secure the receptacle in position and in its proper alignment. After you have tightened the screws, remove the probe connector.
11. Orient the chassis with the main PCBA facing downward (away from you). Position the new upper housing over the upper edge of the chassis.
12. Align the tabs at the top of the chassis with the central slot in the new upper housing so that the tabs on the chassis fit between the tabs on the housing. The upper mounting bracket should also straddle the chassis.



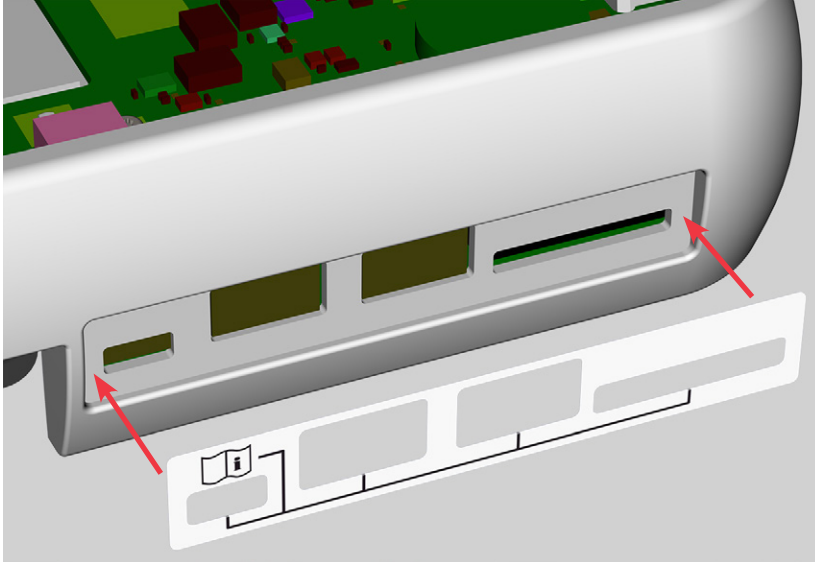
13. Move the new upper housing downwards until the ridge inside its left arm can clear the corner of the USB/SD PCBA, as shown earlier in this procedure. When the ridge has cleared the PCBA, allow the housing to settle into place.



14. Seat the new upper housing and the upper mounting bracket on the chassis so that the screw holes in the mounting bracket line up correctly with the corresponding holes on the chassis.
15. Using a screwdriver with a T8 star bit, attach (6) upper housing screws (0261-0255) to secure the new upper housing and the upper mounting bracket to the chassis.



16. Remove the protective backing from a USB/SD port label (0125-2514). Apply the label to the USB/SD port panel on the upper housing, ensuring that the openings in the label line up with the ports in the panel.

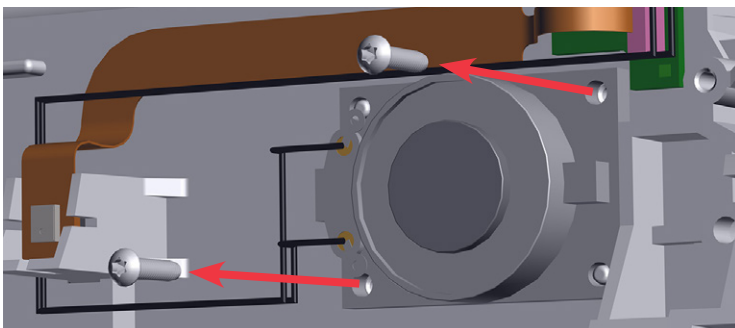


17. If no additional components need to be replaced, continue to [Reassemble the Console](#) on page 68.

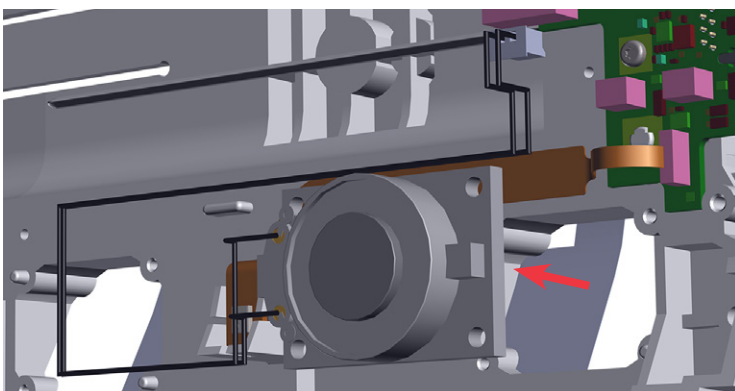
PROCEDURE 12. REPLACE THE SPEAKERS

QUANTITY	PART #	DESCRIPTION
Parts		
1	0142-0282	Speaker assembly
2	0261-0336	Speaker mounting screw, M2.63, 10 mm, self-tapping, T8 drive
Tools		
1	—	Electric or manual interchangeable-bit screwdriver
1	—	T8 star bit

1. Before beginning this procedure, ensure you have completed the procedure [Disassemble the Console](#) on page 39.
2. Disconnect the speaker cable connectors from the main PCBA.
3. Using a screwdriver with a T8 star bit, remove the (2) speaker mounting screws (0261-0336) securing each speaker to the chassis. Set the screws aside for use later in this procedure.



4. Remove each speaker from the chassis.

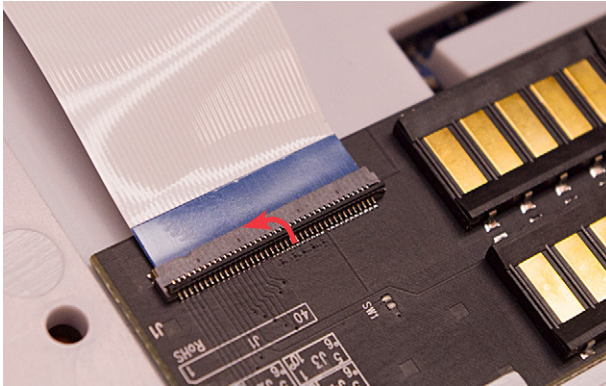


5. Seat one replacement speaker over the right-hand speaker opening in the chassis.
6. Using a screwdriver with a T8 star bit, attach (2) speaker mounting screws (0261-0336) through the mounting holes in the speaker and into the corresponding holes in the chassis. Tighten the screws securely.
7. Attach the speaker cable connector of the new speaker to the right-hand speaker connector on the main PCBA.
8. If no additional components need to be replaced, continue to [Reassemble the Console](#) on page 68.

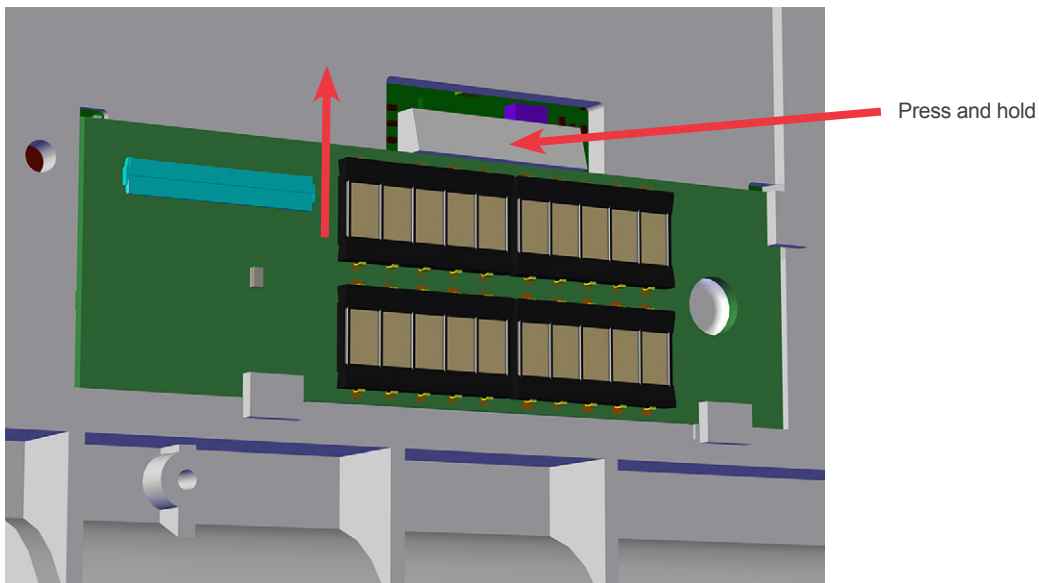
PROCEDURE 13. REPLACE THE ACCESSORY INTERFACE PCBA

QUANTITY	PART #	DESCRIPTION
Parts		
1	0141-0783	Accessory interface PCBA

1. Before beginning this procedure, ensure you have completed the procedure [Disassemble the Console](#) on page 39.
2. Lift the locking tab of the flex cable connector on the accessory interface PCBA, and then remove the flex cable from the connector.

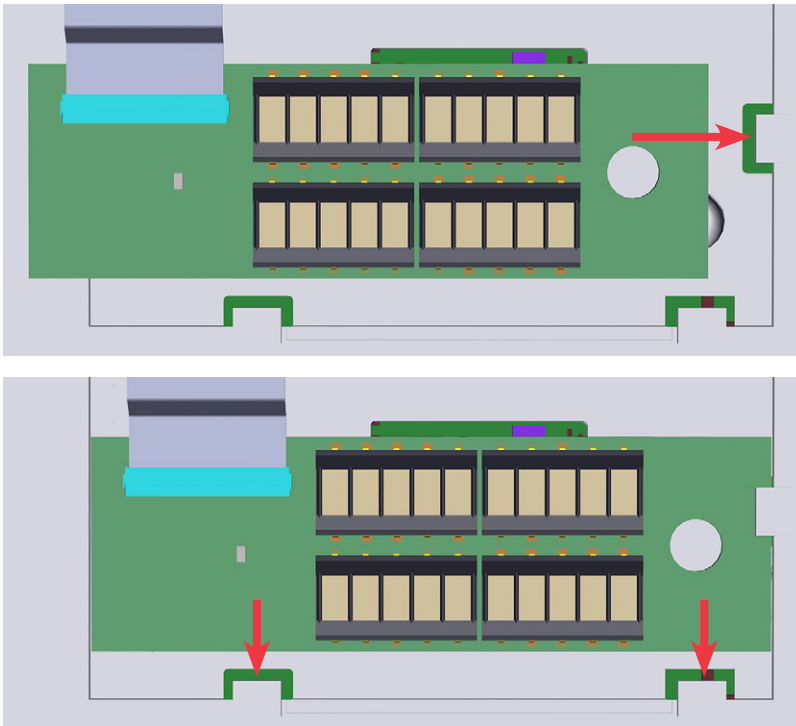


3. Press the latch into the chassis. While holding the latch in, slide the accessory interface PCBA upward and out of its bracket.



4. If you need to replace the accessory interface flex cable, continue to Step 5. If not, skip to Step 9.

5. On the main PCBA, lift the locking tab from the accessory interface flex cable connector, and then remove the flex cable from the connector.
6. Attach the new accessory interface flex cable to its connector at the upper edge of the main PCBA. Push the locking tab of the connector into place to secure the flex cable in the connector.
7. Orient the new accessory interface PCBA with its flex cable connector at the upper left.
8. Slide the new accessory interface PCBA sideways into the arm on the right edge of the bracket. When the PCBA engages all three arms of the bracket, press its upper edge against the latch and slide it downward into the bracket until it fits into the two lower arms and the latch snaps into place.

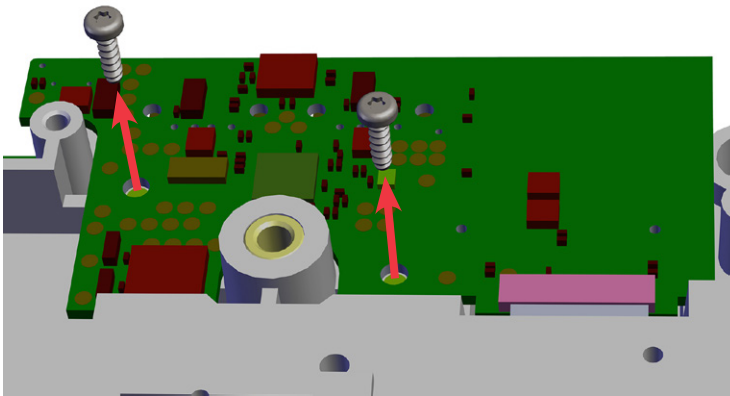


9. Insert the flex cable into the connector on the new accessory interface PCBA, and then push the locking tab into place.
10. If no additional components need to be replaced, continue to [Reassemble the Console](#) on page 68.

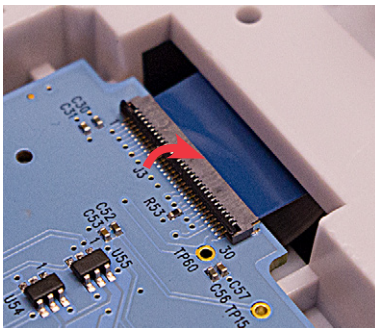
PROCEDURE 14. REPLACE THE USB/SD PCBA

QUANTITY	PART #	DESCRIPTION
Parts		
1	0141-0781	USB/SD PCBA
2	0261-0255	USB/SD PCBA screw, M2.5, 8 mm, self-tapping, T8 drive
Tools		
1	—	Electric or manual interchangeable-bit screwdriver
1	—	T8 star bit

1. Before beginning this procedure, ensure you have completed the procedure [Disassemble the Console](#) on page 39.
2. Using a screwdriver with a T8 star bit, remove the (2) USB/SD PCBA screws (0261-0255). Remove the existing USB/SD PCBA from the chassis.



3. Lift the locking tab of the flex cable connector on the USB/SD PCBA, and then remove the flex cable from the connector.



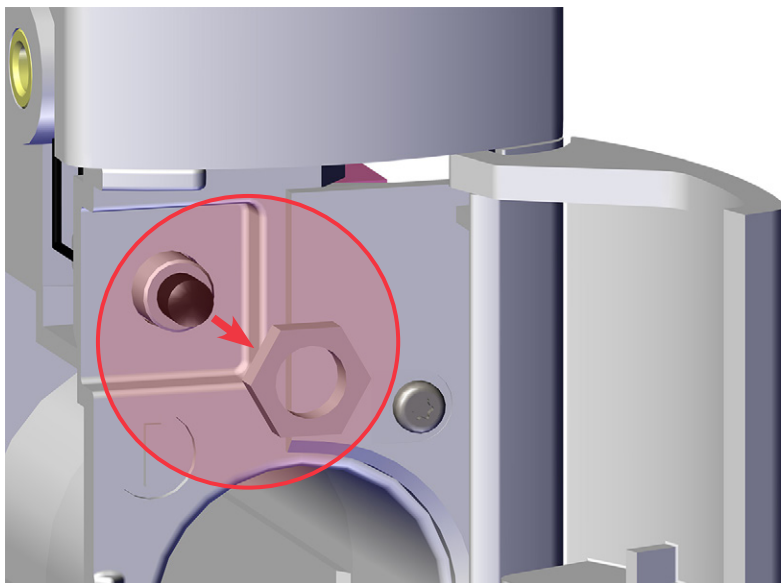
4. Insert the flex cable into the connector on the new USB/SD PCBA, and then press down the locking tab on the connector to secure the cable.
5. Set the new USB/SD PCBA on the chassis so that the screw holes on the PCBA and the chassis line up.
6. Secure the new USB/SD PCBA to the chassis using (2) USB/SD PCBA screws (0261-0255). Tighten the screws using a screwdriver with a T8 star bit.
7. If no additional components need to be replaced, continue to [Reassemble the Console](#) on page 68.

PROCEDURE 15. REPLACE THE RESET SWITCH

QUANTITY	PART #	DESCRIPTION
Parts		
1	0142-0758	Reset switch assembly, including mounting nut
Tools		
1	—	$\frac{3}{8}$ -in socket wrench

Note: If you need to replace the main PCBA or the audio/video PCBA, do not reinstall the reset switch until after you have reinstalled the main PCBA on the chassis.

1. Before beginning this procedure, ensure you have completed the procedure [Disassemble the Console](#) on page 39.
2. While holding the battery door open, using a $\frac{3}{8}$ -inch socket wrench, remove the mounting nut holding the reset switch in place.



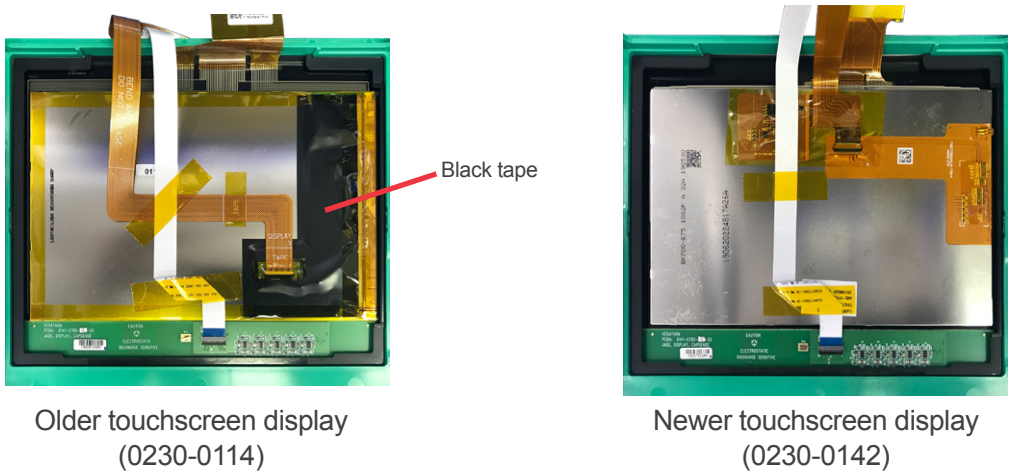
3. Pull the reset switch out of its mounting location on the chassis, and then disconnect the reset switch cable from its connector on the main PCBA.
4. Attach the cable of the new reset switch to its connector on the main PCBA.
5. Place the new reset switch into the chassis opening where the previous reset switch had been installed. Attach the mounting nut and tighten it using a $\frac{3}{8}$ -inch socket wrench.
6. If no additional components need to be replaced, continue to [Reassemble the Console](#) on page 68.

PROCEDURE 16. REPLACE THE MAIN PCBA

The USB/SD flex cable connector is located between the main PCBA and the chassis. If you need to service this component, you must remove the main PCBA first.

If you need to replace the main PCBA itself, the part you should order depends on which model of touchscreen display assembly is installed in the system. To identify the touchscreen display assembly, examine its back surface. Black tape is present on older assemblies (0230-0114), but absent from newer ones (0230-0142).

If it is necessary to install a newer touchscreen display assembly with an older main PCBA, you must remove a set of five small resistors from the PCBA. This modification is described in the procedure [Reassemble the Console](#) on page 68.



TOUCHSCREEN DISPLAY ASSEMBLY	MAIN PCBA	
	0142-1070	0142-0820
0230-0114 (old model)	Not compatible	Required
0230-0142 (new model)	Recommended	Compatible if modified

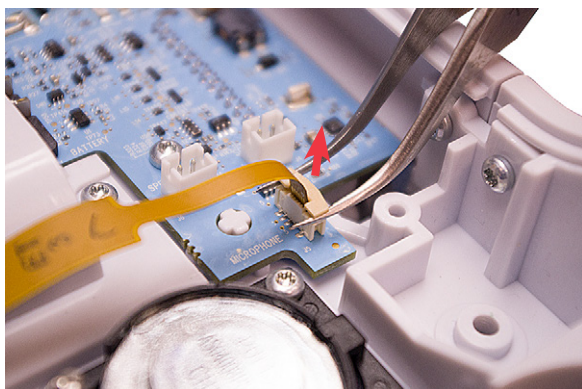
IMPORTANT

After this procedure is complete, no console serial number will appear in the self-test or on any exam printout. For more information, contact Verathon Customer Care.

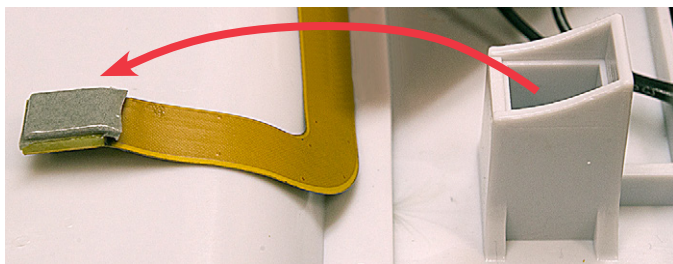
Note: A daughterboard containing the DM3730 audio/video processor is attached to the main PCBA by two press-fit connectors. When replacing the main PCBA, be careful not to disconnect or dislodge the audio/video PCBA. Note also that when you replace a system's main board, the system's settings must be configured after the system is reassembled.

QUANTITY	PART #	DESCRIPTION
Parts		
1	0142-1070 or 0142-0820	Main PCBA
6	0261-0255	Main PCBA screw, M2.5, 8 mm, self-tapping, T8 drive
4	0261-0255	Audio/video PCBA screw, M2.5, 8 mm, self-tapping, T8 drive
Tools		
1	—	Electric or manual interchangeable-bit screwdriver
1	—	T8 star bit

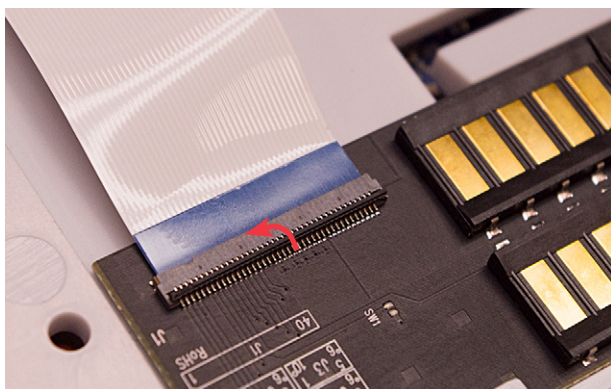
1. Before beginning this procedure, ensure you have completed the procedure [Disassemble the Console](#) on page 39.
2. If necessary, remove the reset switch as described in [Replace the Reset Switch](#) on page 56.
3. Remove the upper housing according to the instructions in [Replace the Upper Housing](#) on page 22.
4. If a microphone is still connected to the main PCBA, continue to Step 5. Otherwise, skip to Step 7.
5. Lift the locking tab securing the microphone flex cable in its connector and then remove the cable from the connector.



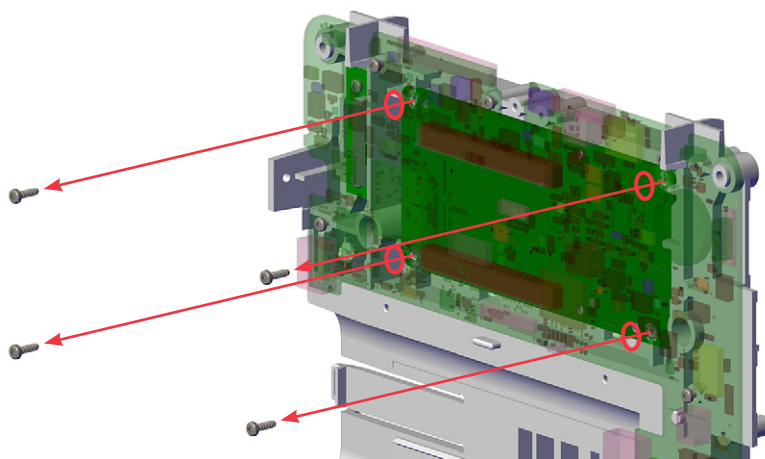
6. Separate the adhesive pad attached to the existing microphone from its bracket on the chassis. Remove and discard the microphone and its flex cable.



7. If the flex cable is still connected to the accessory interface PCBA, disconnect it there. Lift the locking tab of the flex cable connector, and then remove the flex cable from the connector.



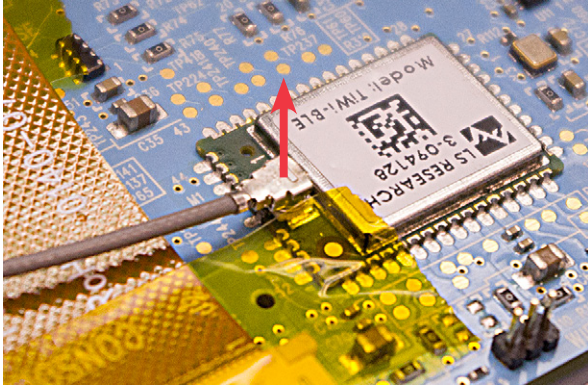
8. Using a screwdriver with a T8 bit, reach through the four openings in the main PCBA and remove the (4) audio/video PCBA screws (0261-0255).



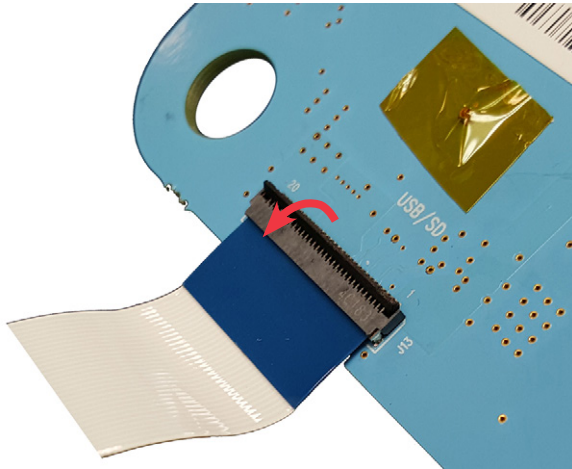
9. Using a screwdriver with a T8 bit, remove the (6) main PCBA screws (0261-0255).



10. If an antenna lead is connected to the Wi-Fi terminal on the main PCBA, disconnect it.

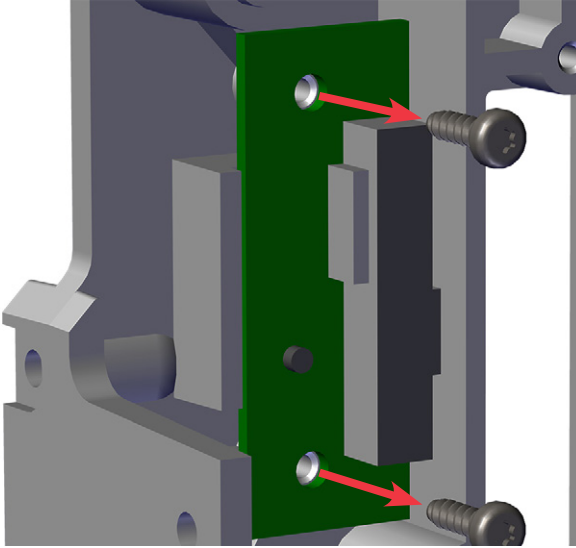


11. Rotate the main PCBA upward to expose the USB/SD flex cable and its connector.
12. Lift the locking tab of the USB/SD flex cable connector on the main PCBA, and then remove the flex cable from the connector.

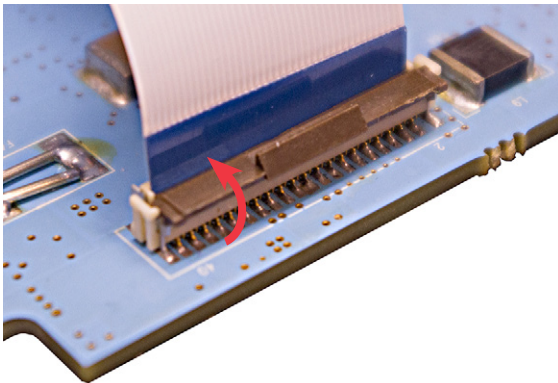


13. Remove the existing main PCBA.
14. If a Wi-Fi antenna PCBA is installed, continue to Step 15. Otherwise, skip to Step 17.

15. Using a screwdriver with a T8 bit, remove the (2) Wi-Fi antenna PCBA screws from the chassis.

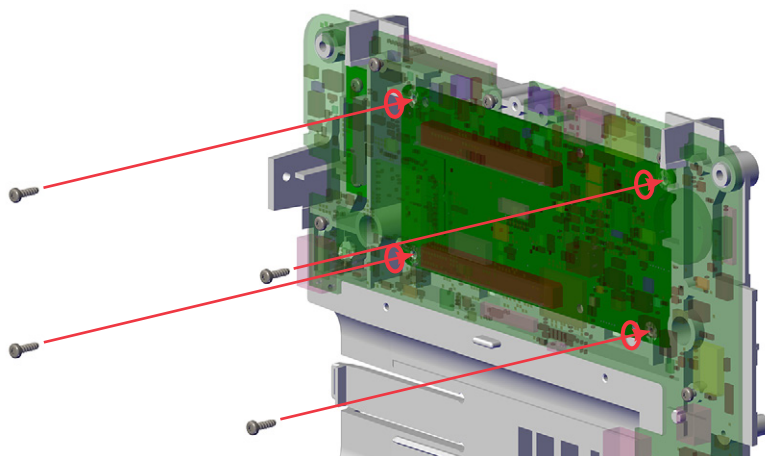


16. Remove and discard the Wi-Fi antenna PCBA and its antenna lead.
17. Lift the locking tab of the accessory interface flex cable connector on the existing main PCBA, and then remove the flex cable from the connector.



18. Insert the flex cable into the USB/SD flex cable connector on the new main PCBA, and then press the connector's locking tab into place.
19. Rotate the new PCBA down into position over the chassis.
20. Using a screwdriver with a T8 bit, secure the new main PCBA by attaching (6) main PCBA screws (0261-0255).

21. Using a screwdriver with a T8 bit, insert (4) audio/video PCBA screws (0261-0255) through the openings in the main PCBA and into the holes securing the audio/video daughterboard to the chassis. Carefully tighten the screws while ensuring that the daughterboard is not disconnected or detached from the main PCBA.



22. Insert the accessory interface flex cable into its connector on the main PCBA, and then press the locking tab down to secure the cable.
23. Install the upper housing according to the instructions in [Replace the Upper Housing](#) on page 46.
24. If no additional components need to be replaced, continue to [Reassemble the Console](#) on page 68.

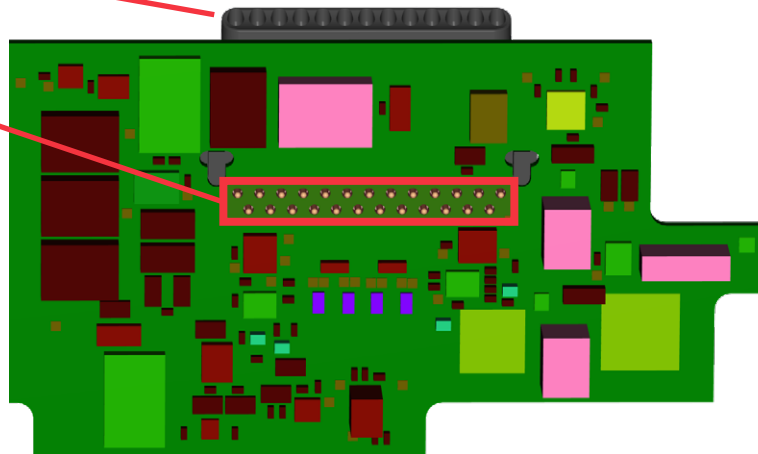
PROCEDURE 17. REPLACE THE PROBE CABLE PORT CONNECTOR

QUANTITY	PART #	DESCRIPTION
Parts		
1	0200-0863	Probe cable port connector
Tools		
—	—	Soldering station with soldering iron, solder, and flux
—	—	Desoldering system or desoldering wick

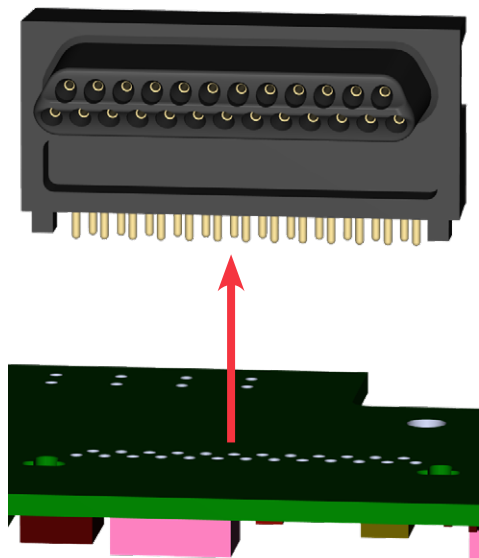
1. Before beginning this procedure, ensure you have completed the procedure [Disassemble the Console](#) on page 39.
2. If necessary, remove the reset switch according to the instructions in [Replace the Reset Switch](#) on page 56.
3. Remove the upper housing according to the instructions in [Replace the Upper Housing](#) on page 46.
4. Before beginning this procedure, remove the main PCBA from the chassis according to Step 4 through Step 13 in [Replace the Main PCBA](#) on page 57.
5. At a soldering station, remove the solder from each of the pins connecting the probe cable port connector to the main PCBA.

Probe cable port connector

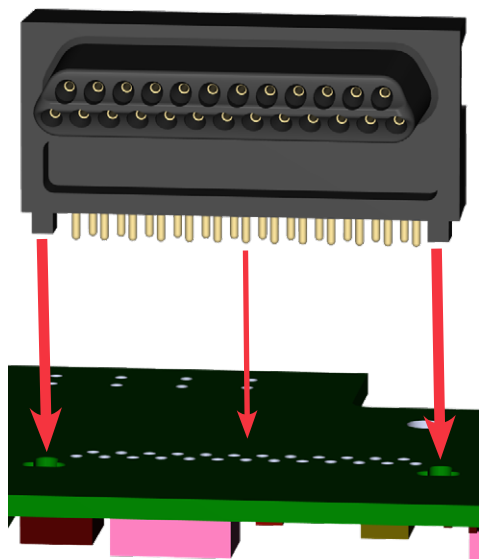
Pins



6. Lift the probe cable port connector off of the main PCBA and discard it.



7. Position a new probe cable port connector (0200-0863) over the main PCBA so that the positioning pegs and the connector pins line up with the corresponding holes in the board. Insert the pegs and pins into the holes, and press down on the connector until it is flush against the surface of the board.



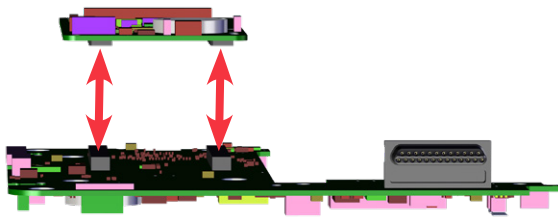
8. Solder each of the pins securely in place.
9. Reattach the main PCBA to the chassis according to Step 18 through Step 22 in [Replace the Main PCBA](#).
10. Install the upper housing according to the instructions in [Replace the Upper Housing](#) on page 46.
11. If no additional components need to be replaced, continue to [Reassemble the Console](#) on page 68.

PROCEDURE 18. REPLACE THE COIN CELL

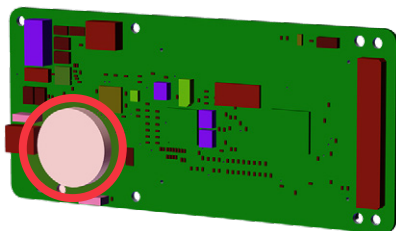
Replace the coin cell if the system does not retain its software settings.

QUANTITY	PART #	DESCRIPTION
Parts		
1	0400-0131	Coin cell, BR2330, PCB mount
Tools		
—	—	Soldering station with soldering iron, solder, and flux
—	—	Desoldering system or desoldering wick
AR	—	Kapton tape, 2.5 cm (1-in)

1. Before beginning this procedure, ensure you have completed the procedure [Disassemble the Console](#) on page 39.
2. If necessary, remove the reset switch according to the instructions in [Replace the Reset Switch](#) on page 56.
3. Remove the upper housing according to the instructions in [Replace the Upper Housing](#) on page 46.
4. Before beginning this procedure, remove the main PCBA from the chassis according to Step 4 through Step 13 in [Replace the Main PCBA](#) on page 57.
5. Carefully separate the two strips of connectors between the main PCBA and the audio/video daughterboard.

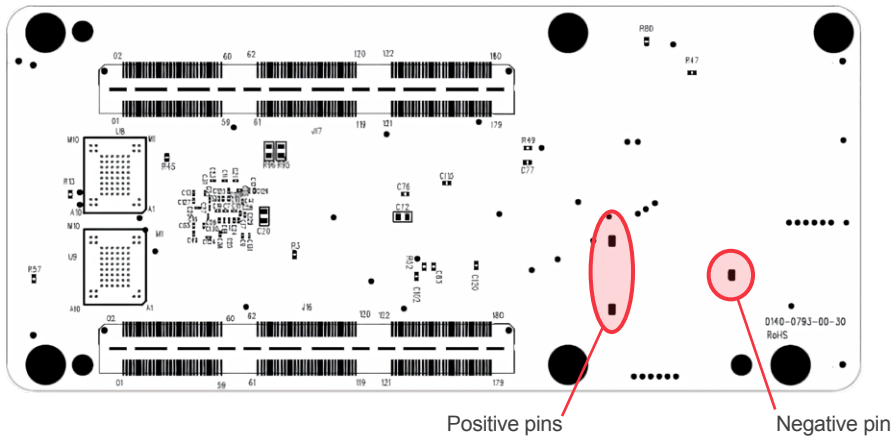


6. On the audio/video daughterboard, locate the coin cell as shown in the following figure.

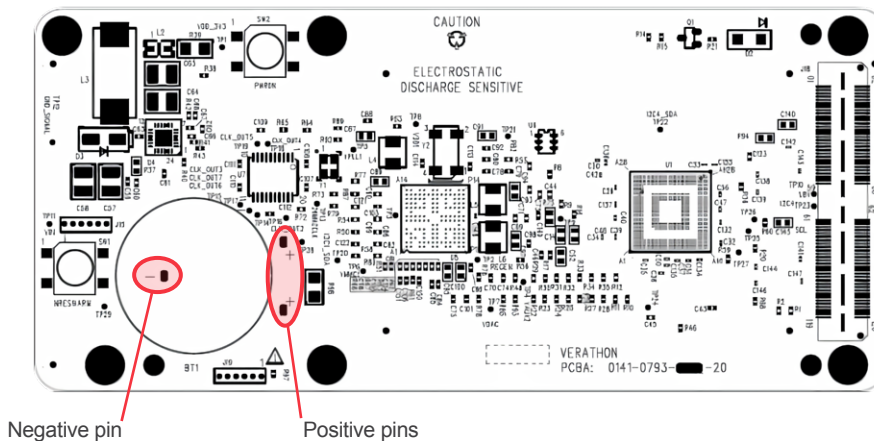


7. Remove the Kapton tape from the coin cell.

8. Turn the daughterboard over and locate the three connecting pins for the coin cell as shown in the following figure.

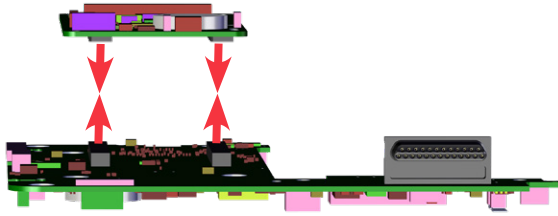


9. Remove the Kapton tape covering the three connecting pins.
10. Carefully desolder all three connecting pins, and then lift the coin cell off of the audio/video daughterboard.
11. Insert the new coin cell (0400-0131) into the daughterboard so that the two positive pins (the pins extending from the upper side of the coin cell over its edge) are in the holes at the edge of the circle on the daughterboard, and the negative pin (the pin mounted on the underside of the coin cell) is in the hole near the middle of the circle. The three holes are also marked with plus and minus signs, as shown in the following figure.



12. Carefully solder all three pins into their holes.
13. Place a strip of 2.5 cm (1-inch) Kapton tape over the three pins.
14. Place a square of 2.5 cm (1-inch) Kapton tape over the top of the battery, making sure to cover the metallic surface, the bracket, and the two positive pins.

15. Line up the two sets of connectors on the main PCBA and the audio/video daughterboard, making sure that the battery is on the side closest to the probe cable port and the USB ports. Carefully press the connectors together.



16. Reattach the main PCBA to the chassis according to Step 18 through Step 22 in [Replace the Main PCBA](#).
17. Install the upper housing according to the instructions in [Replace the Upper Housing](#) on page 46.
18. If no additional components need to be replaced, continue to [Reassemble the Console](#) on page 68.

PROCEDURE 19. REASSEMBLE THE CONSOLE

Prior to reassembling the console, review the section [Component and Part Replacement Standards](#) on page 146. If any of the console components require replacement according to the guidance in that section, then be sure to use the replacement components during this reassembly procedure.

QUANTITY	PART #	DESCRIPTION
Parts		
1	0200-0862	Probe cable port receptacle
1	0122-0776	Battery bay cover
1	0122-1251 (replaces 0122-0741)	Battery door hinge (attached to battery bay cover)
1	0122-1252 (replaces 0122-0743)	Battery door (attached to battery bay cover)
AR	0230-0142	Touchscreen display assembly (newer model)
AR	0230-0114	Touchscreen display assembly (older model)
1	0122-1253 (replaces 0122-0744)	Back panel
2	0120-0761	Rubber foot
11	0261-0256	Back panel screw, 4-20, 1/2-in, self-tapping, T10 drive
2	0261-0256	Front panel screw, 4-20, 1/2-in, self-tapping, T10 drive
2	0261-0499	Front panel screw, 4-20, 7/8-in, self-tapping, T10 drive
2	0260-0757	Front panel spacer, M5, 16 mm
5	0261-0255	Battery bay screw, M2.5, 8 mm, self-tapping, T8 drive
Tools		
1	—	Electric or manual interchangeable-bit screwdriver
1	—	T10 star bit
1	—	T8 star bit
AR	—	0.6 cm (1/4-in) Kapton tape
AR	—	1.3 cm (1/2-in) Kapton tape
1	—	Soldering station with soldering iron, solder, and flux
1	—	Desoldering system or desoldering wick
AR	—	Latex or nitrile gloves
AR	—	Protective glasses



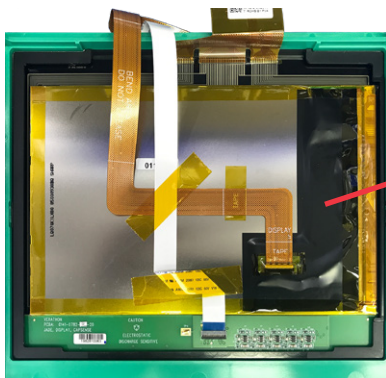
WARNING

Some activities in this manual require modification of system parts by soldering. Failing to observe safety precautions while soldering can cause injury to the person performing service on the system. Soldering incorrectly can cause damage to the system.

Always wear protective glasses and latex or nitrile gloves when soldering. If you are not familiar enough with the technique necessary to complete the soldering tasks correctly, contact Verathon Customer Care.

Note: Before you begin reassembly, check to see whether the (2) 7/8-inch front panel screws (0261-0499) and the (2) front panel spacers (0260-0757) have been included with the touchscreen display (0230-0142). If not, they must be ordered separately.

1. Examine the back of the touchscreen display assembly to determine which model it is. Black tape is present on older assemblies (0230-0114), but absent from newer ones (0230-0142).



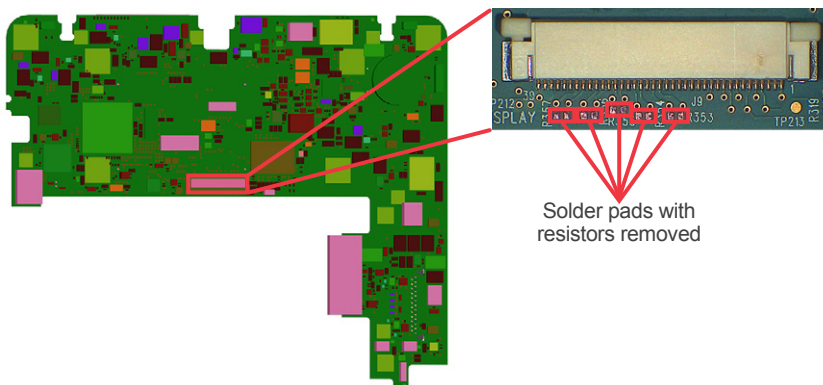
Older touchscreen display
(0230-0114)



Newer touchscreen display
(0230-0142)

<i>If the touchscreen assembly is ...</i>	<i>Then ...</i>
Older (0230-0114)	Skip to Step 4.
Newer (0230-0142)	Continue to Step 2.

2. Check the main PCBA to determine whether resistors R353, R354, R355, R356, and R357 are present just below the connector for the display flex cable.

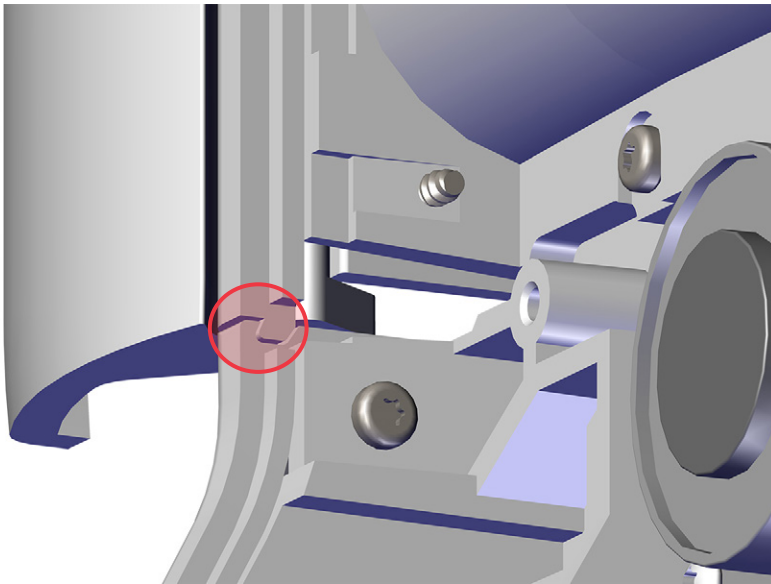


Solder pads with
resistors removed

3. Using a soldering station and a desoldering station or wick, disconnect resistors R353, R354, R355, R356, and R357 from the main PCBA, making sure the solder pads on the PCBA are as free of solder buildup as possible. Discard the resistors.
4. Position the probe cable port receptacle over the probe cable port so that its screw holes line up with the corresponding holes on the chassis.
5. Position the battery bay cover on the chassis so that the screw holes on the cover and the chassis line up.

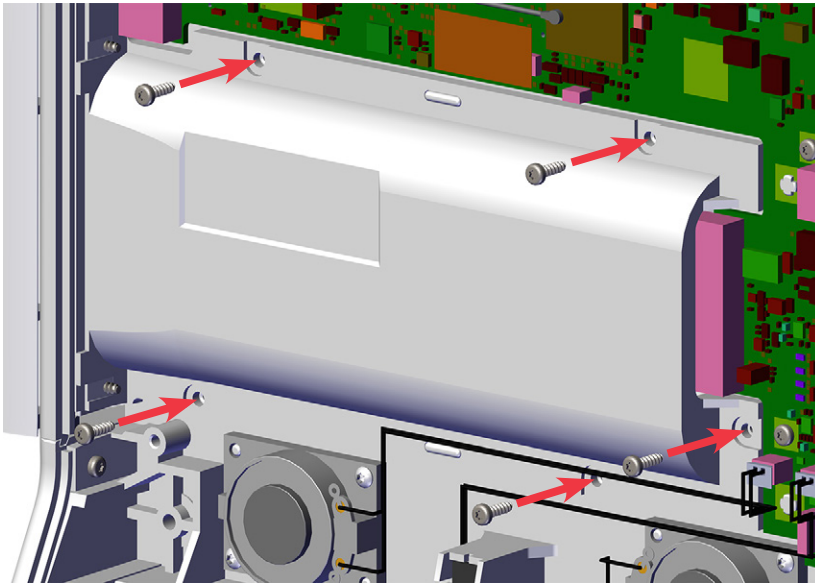
Note: When replacing the battery bay cover, do not pinch the speaker cables. Also, take care not to damage the HDMI connector mounted on the main PCBA just inside the battery bay.

6. Insert the two locking tabs of the battery cover hinge into their notches on the chassis.

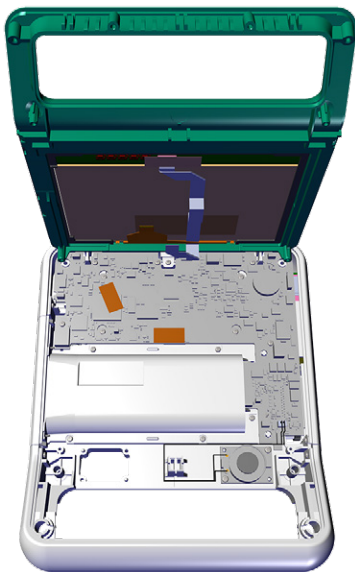


7. Using a screwdriver with a T8 star bit, attach (5) battery bay screws (0261-0255) to secure the battery bay cover.

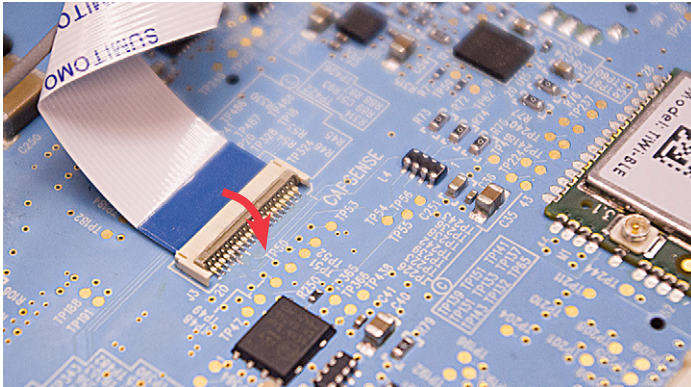
Note: If the speakers are currently installed, you will need to move their cables in order to install all of the battery bay screws.



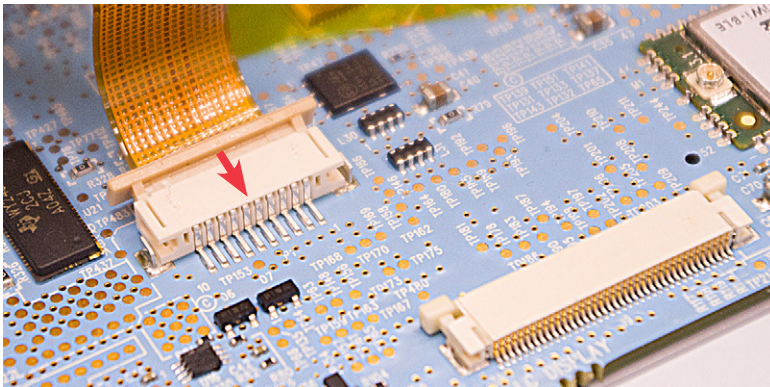
8. Position the touchscreen display assembly so that it is rotated about 90° upward and its upper edge is next to the top of the console.



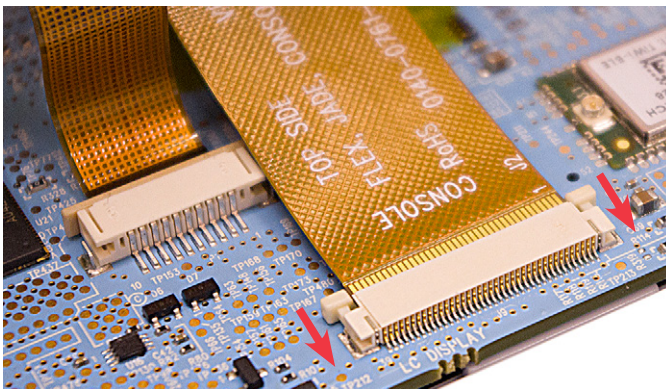
9. On the main PCBA, reconnect the capacitive button flex cable.



10. On the main PCBA, reconnect the touch interface flex cable.

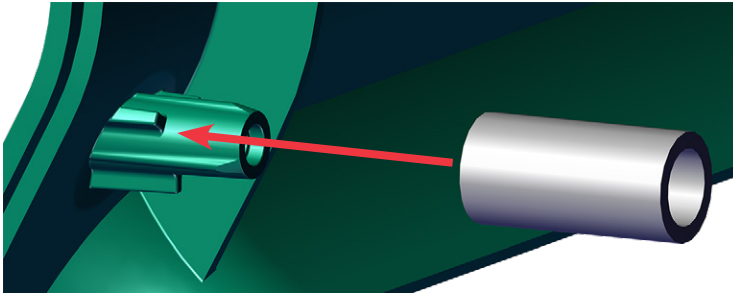


11. On the main PCBA, reconnect the display flex cable.

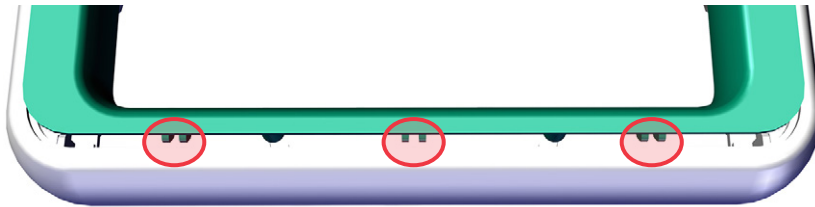


12. Place a length of 0.6 cm (1/4-inch) Kapton tape over the display flex cable connector on the main PCBA to secure it in place.
13. Carefully rotate the touchscreen display until it is in position over the chassis but slightly away from the handle.

14. Slide (1) front panel spacer (0260-0757) onto each of the two lower bosses on the touchscreen display assembly. Press each spacer firmly into place.

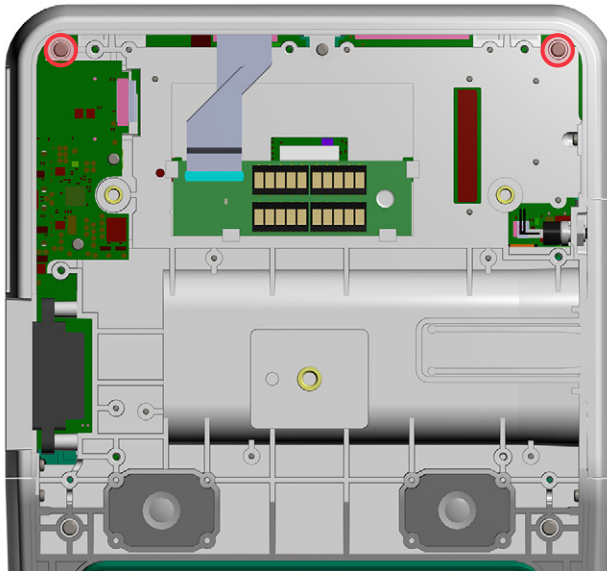


15. Slide the tabs at the bottom of the touchscreen display into the corresponding recesses on the handle.

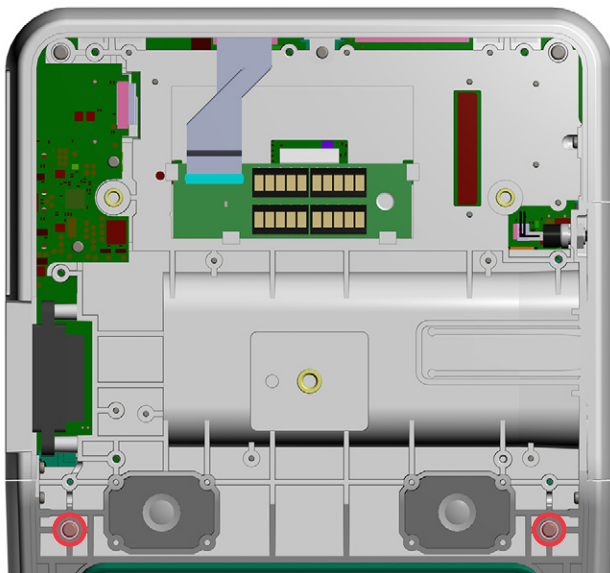


16. Press the touchscreen display assembly into place, and then carefully turn the console over.

17. Using a screwdriver with a T10 star bit, attach (2) ½-inch front panel screws (0261-0256) to secure the top of the touchscreen display assembly to the chassis.



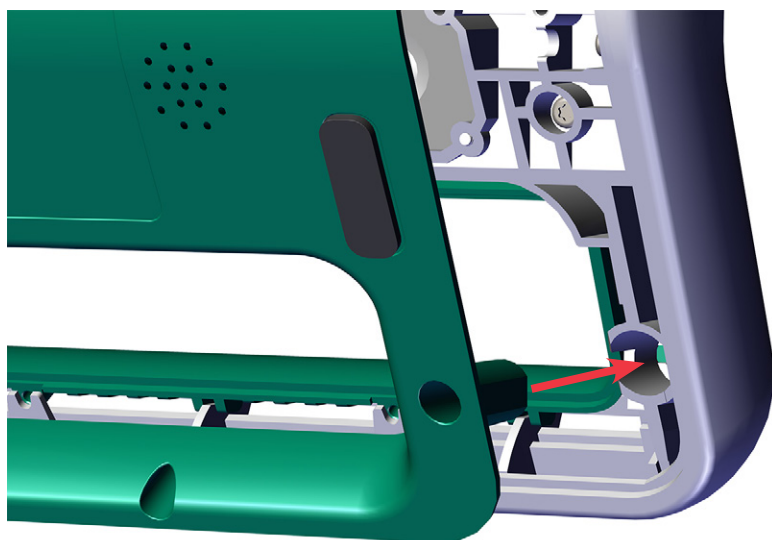
18. Using a screwdriver with a T10 star bit, attach (2) $\frac{7}{8}$ -inch front panel screws (0261-0499) to secure the bottom of the touchscreen display assembly to the chassis.



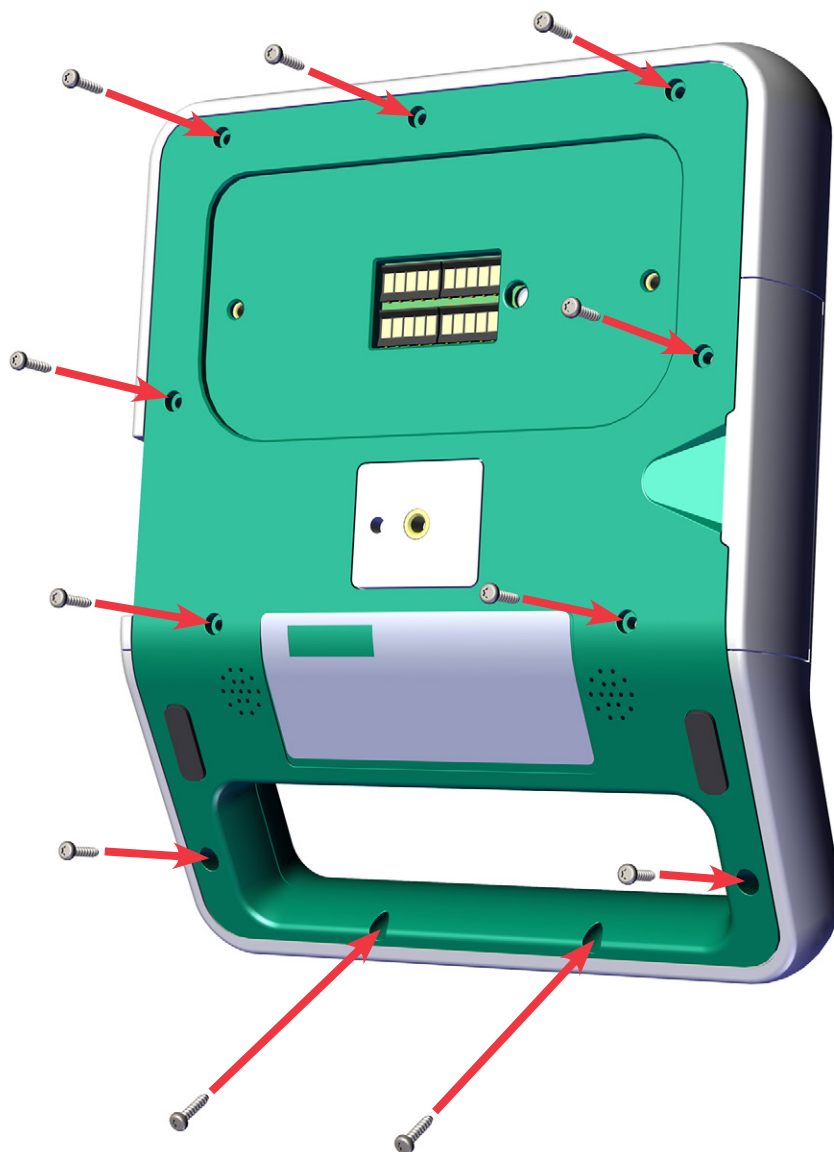
19. If necessary, install two new rubber feet into the small, oval recesses on the back panel. Remove the paper backing from each foot and press it into place.



20. Position the back panel over the console so that the bosses on the panel's inside edges line up with the sleeves on the chassis.



21. Carefully press the back panel into place, opening the battery door to position the back panel more easily if necessary.
22. Using a screwdriver with a T10 star bit, secure the back panel to the chassis using (11) back panel screws (0261-0256), as shown in the following figure.



PROCEDURE 20. REPLACE THE INSTRUMENT LABEL

Complete this procedure if the instrument label is damaged or if you have replaced the back panel. Examine the existing instrument label and compare it to the following two figures to determine whether or not the system is UDI-compliant and to verify the console's part number. Once you have that information, order the appropriate label kit and follow the accompanying steps to replace the label.

To confirm that a unit is UDI-compliant, look for the following items of information on the label:

- The unit's date of manufacture
- A DataMatrix code  containing the unit's ID and date of manufacture in machine-readable form

Figure 7. UDI-compliant instrument label

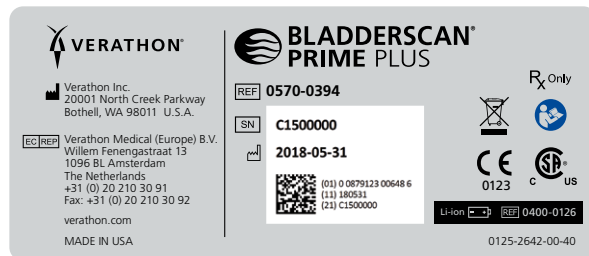
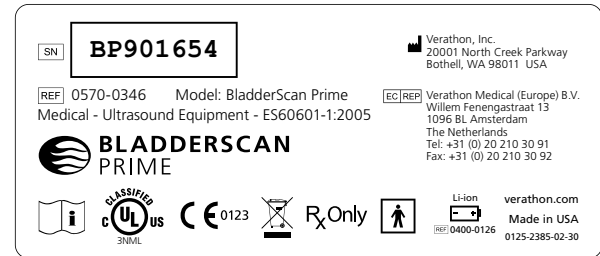


Figure 8. Non-UDI instrument label



OPTION 1. UDI-COMPLIANT SYSTEMS

QUANTITY	CONSOLE PART #	ITEM PART #	DESCRIPTION
Parts			
1	0570-0346	0800-0547	Instrument label kit, individually customized (UDI-compliant systems)
	0570-0394	0800-0613	
Tools			
1	—	—	X-ACTO knife
—	—	—	Isopropyl alcohol

1. If the back panel of the console has an existing label, carefully use an X-ACTO knife to peel off the original label. Otherwise, skip to Step 3.
2. Using isopropyl alcohol, remove any label residue from the back panel.
3. Peel the protective backing off the new instrument label, being careful not to disturb the attached underlabel.
4. Carefully apply the instrument label to the recess in the back panel, ensuring that the orientation is correct.
5. Finish certifying the system as described in the section [System Certification](#) on page 13.

OPTION 2. NON-UDI SYSTEMS

QUANTITY	PART #	DESCRIPTION
Parts		
1	0125-2385	Instrument label
Tools		
1	—	PC station with access to printer
1	—	X-ACTO knife
—	—	Isopropyl alcohol

1. If the back panel of the console has an existing label, carefully use an X-ACTO knife to peel off the original label. Otherwise, skip to Step 3.
2. Using isopropyl alcohol, remove any label residue from the back panel.
3. At a PC station with access to a printer, prepare a serial number insert for the new instrument label. The insert must be at least 0.6 cm (¼ inch) high by 3.2 cm (1¼ inch) wide.
4. Type the system's serial number onto the insert, ensuring that it matches the original and uses the following formatting:
 - Typeface: Courier New
 - Font Size: 14 point
 - Font Style: Bold
 - Alignment: Centered (horizontally and vertically)

The completed insert should look like the following figure.

BP901654

5. Print the serial number insert and trim it to size if necessary.
6. Peel the protective backing off the new instrument label.
7. Line up the serial number insert in the window of the instrument label, and then carefully apply it.
8. Carefully apply the instrument label to the recess in the back panel, ensuring that the orientation is correct.
9. Finish certifying the system as described in the section [System Certification](#) on page 13.

PROBE REPAIR PROCEDURES

This section contains instructions for completing service on BladderScan Prime Plus probes. It consists of the following procedures:

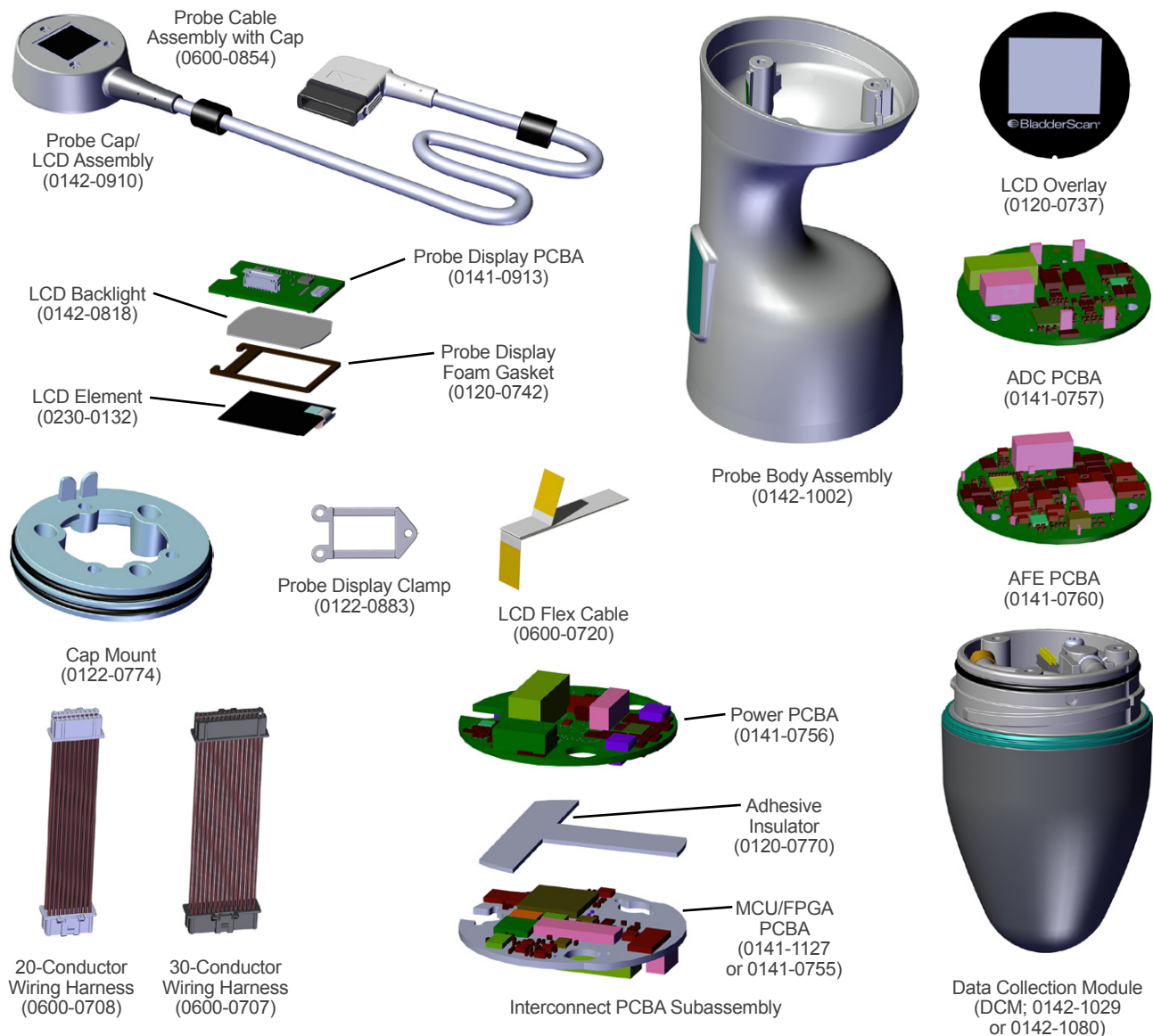
- [Remove the Cap and Interconnect PCBA Subassembly](#)
- [Replace the Probe Cap and Probe Cable](#)
- [Remove the DCM Assembly](#)
- [Reassemble the Probe](#)

After replacing any damaged or non-functioning parts per the procedures in this section, you may skip additional replacement procedures and proceed directly to the reassembly procedure.

IMPORTANT

Due to the unavailability of certain older parts, BladderScan Prime probes with serial numbers lower than P1500000 can not be serviced in the field. If the probe ID label is damaged or missing, refer to [Identify the Probe](#) on page 23 for additional ways to determine the probe's serial number. Always order the replacement probe ID label before you remove or replace the DCM, because the existing label no longer adheres properly after it is removed. This label is provided free of charge with any order for probe repair parts.

Figure 9. Components of the BladderScan Prime Plus Probe

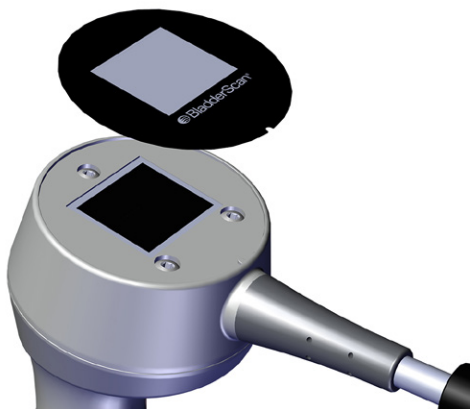


PROCEDURE 21. REMOVE THE CAP AND INTERCONNECT PCBA SUBASSEMBLY

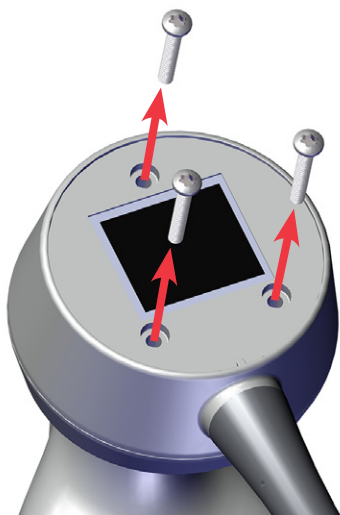
QUANTITY	PART #	DESCRIPTION
Parts		
3	0261-0398	Probe cap screw, 4-40, 3/4-in, T10 drive
3	0261-0445	Cap mount screw, panhead, M2.5 × 0.45, 8 mm, SS, Nylok, T8 drive
Tools		
1	—	Interchangeable-bit screwdriver
1	—	T10 star bit
1	—	T8 star bit
AR	—	Dental pick
AR	—	X-ACTO knife

1. Using an X-ACTO knife or dental pick, lift one edge of the adhesive overlay covering the LCD on the probe cap. Peel the overlay off of the cap.

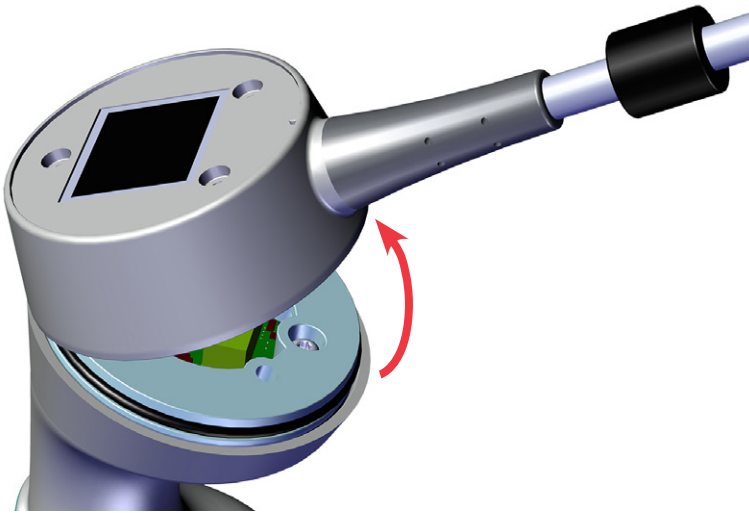
Note: Take care not to damage the cap or the LCD.



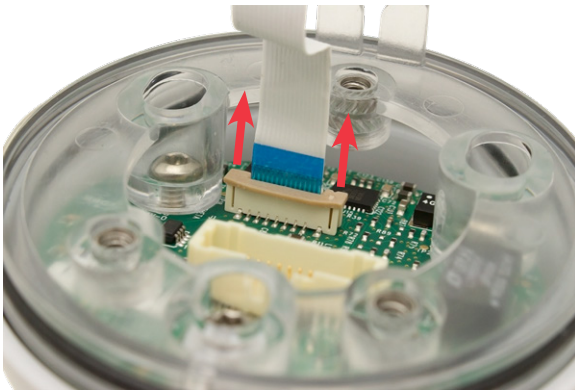
2. Using an interchangeable-bit screwdriver with a T10 star bit, remove the (3) probe cap screws.



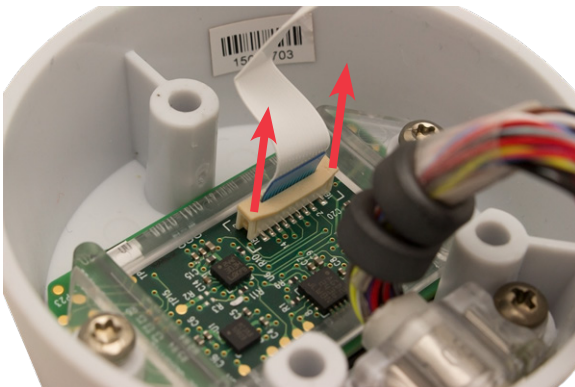
3. Tilt the cap toward the upper side of the probe (the side with the scan button), taking care not to damage the LCD flex cable or the probe cable wiring harness.



4. On the interconnect PCBA subassembly, pull out the locking tab of the connector securing the LCD flex cable. Remove the end of the flex cable from the connector.

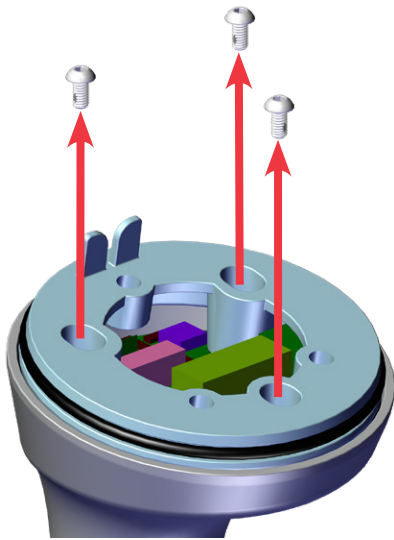


5. In the probe cap, pull out the locking tab of the connector securing the LCD flex cable. Remove the end of the flex cable from the connector.

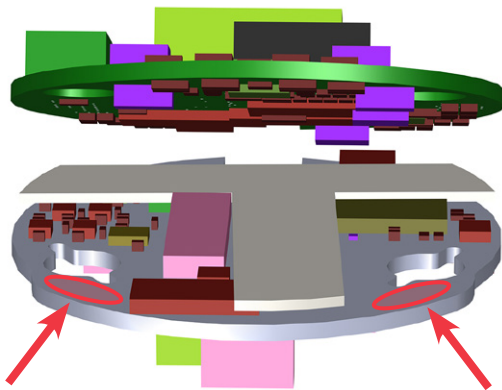


6. On the probe cable wiring harness connector, press the locking tab inward (toward the wires) and disconnect the wiring harness.

7. Using an interchangeable-bit screwdriver with a T8 star bit, remove the (3) cap mount screws (0261-0445 or 0261-0341), and then remove the cap mount.



8. Carefully lift the interconnect PCBA subassembly away from the three screw bosses that surround it.
9. On the underside of the interconnect PCBA subassembly, pull out the locking tab of the connector securing the flex cable for the scan button, and then disconnect the flex cable.
10. On each of the two wiring harness connectors on the underside of the interconnect PCBA subassembly, press the locking tab inward (toward the wires), and then disconnect the wiring harness.
11. If you need to replace the power PCBA or the MCU/FPGA PCBA, continue to Step 12. Otherwise, skip to the procedure [Remove the DCM Assembly](#) on page 88.
12. Insert an orange stick between the MCU/FPGA PCBA and the power PCBA, which together make up the interconnect PCBA subassembly. When determining where to insert the orange stick, as shown in the following figure, avoid locations where the stick could put pressure on delicate electronic components.



13. Continue to separate the two PCBAs, carefully applying pressure at various points around their edges while avoiding the components mounted on them, until the press-fit connector between them disengages.
14. Pull the two PCBAs apart and separate the adhesive insulator from both of them. Inspect the adhesive insulator and the adjacent components to make sure the components are not damaged.
15. Set the power PCBA and the MCU/FPGA PCBA aside.

PROCEDURE 22. REPLACE THE PROBE CAP AND PROBE CABLE

This procedure describes how to disassemble and reassemble the probe cap assembly in case the cap housing and probe cable must be replaced.

During the production lifetime of the probe, it has been necessary to change the LCD element used in the probe cap. In probe caps with the older LCD element, the probe display clamp is held in place by (2) screws; in caps with the new element, the probe display clamp has (3) screws.

Figure 10. Probe cap with newer LCD element

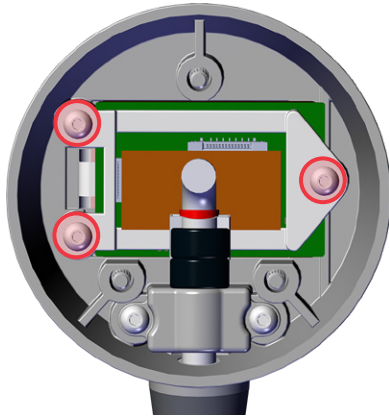
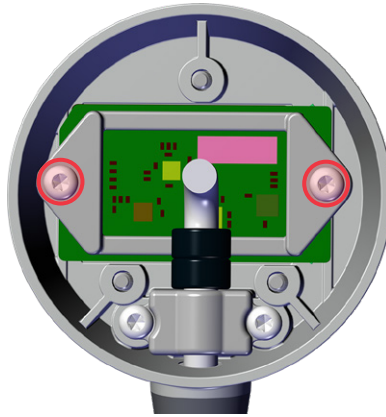


Figure 11. Probe cap with older LCD element



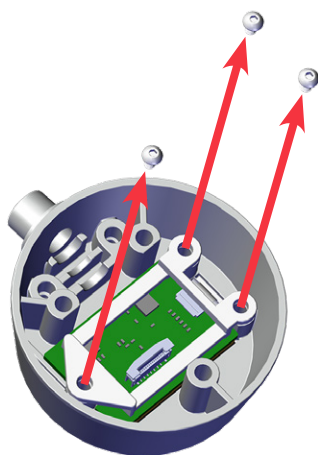
If you have a probe with the older LCD element, proceed with one of the following two options:

- Order a newer probe cable and cap assembly (0142-0910) and a new MCU/FPGA PCBA (0141-1127 or 0141-0755), and then install them in the procedure [Reassemble the Probe](#) on page 92.
- Return the probe to Verathon to be updated.

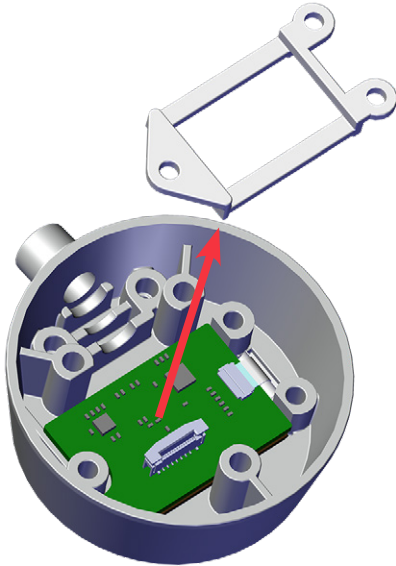
Note: In the figures in this procedure, the probe cable is omitted for visibility purposes, as are the adhesive foam insulator and Kapton tape covering part of the probe display PCBA. During this procedure, do not remove or disturb the foam insulator or the Kapton tape.

QUANTITY	PART #	DESCRIPTION
Parts		
1	0600-0854	Probe cap and cable assembly (without LCD)
1	0122-0883	Probe display clamp
1	0141-0913	Probe display PCBA
1	0230-0132	LCD element
1	0142-0818	LCD backlight
1	0120-0742	Adhesive foam gasket
3	0261-0445	Probe display assembly screw, M2.5 × 0.45, 8 mm, T8 drive
Tools		
1	—	Torque screwdriver calibrated to 0.28 ± 0.03 N-m (2.5 ± 0.3 in-lb)
1	—	Interchangeable-bit screwdriver
1	—	T8 star bit
AR	—	Tweezers
AR	—	Dental pick

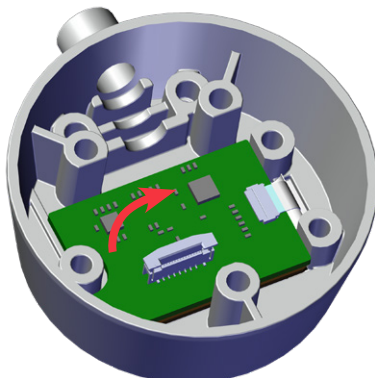
1. Using an interchangeable-bit screwdriver with a T8 star bit, remove the (3) probe display assembly screws (0261-0445).



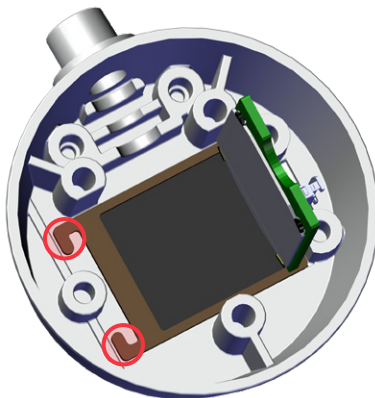
2. Lift out the plastic clamp.



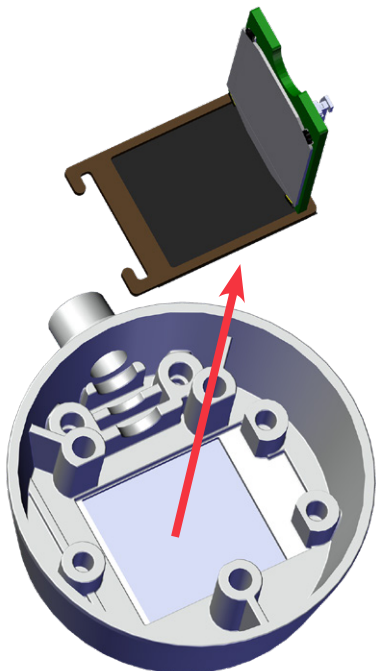
3. Lift the free end of the probe display PCBA (the end without the flex cable connection). Without straining the flex cable, rotate the probe display PCBA upward and to one side.



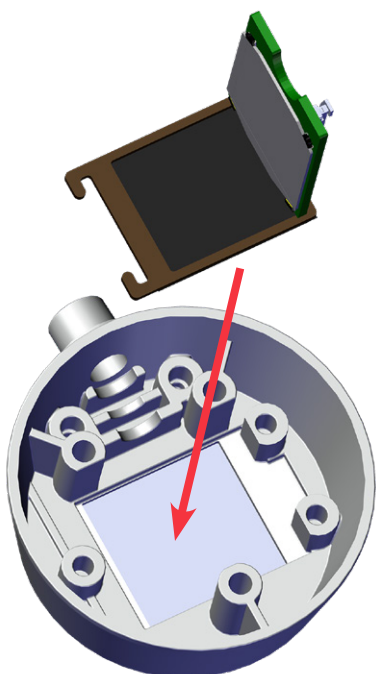
4. Using tweezers, lift the tabs at the corners of one end of the LCD assembly. Carefully detach the gasket from the old probe cap if needed.



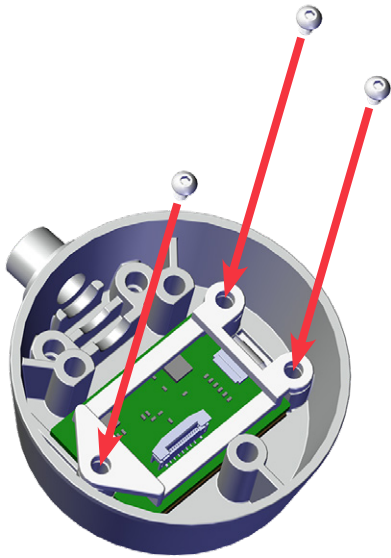
5. Lift the LCD assembly up and out of the cap. The assembly consists of the probe PCBA (0141-0913), the LCD backlight (0142-0818), the LCD element (0230-0132), and the foam gasket (0120-0742); remove all three parts together.



6. Using a dental pick, carefully peel the serial number label off of the inside of the old probe cap. Transfer the label to the inside of the new cap (0600-0854) and press it securely into place.
7. If you are installing a new LCD assembly, remove the strips of protective film from the top and bottom of the LCD element.
8. Insert the LCD assembly into the recess in the top of the new cap, ensuring that the LCD element is positioned correctly inside the deepest level of the recess.



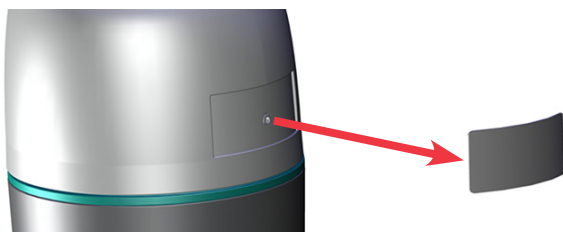
9. Lower the probe display PCBA into place, taking care not to strain the flex cable.
10. Position the probe display clamp so that it holds the LCD assembly and the display PCBA in place. Using a torque screwdriver with a T8 bit, attach the (3) probe display assembly screws (0261-0445) to secure the clamp. Tighten the screws to 0.28 N-m (2.5 in-lb).



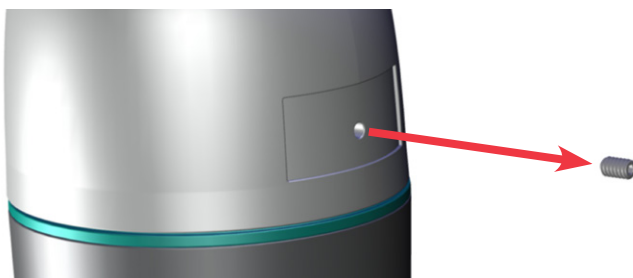
PROCEDURE 23. REMOVE THE DCM ASSEMBLY

QUANTITY	PART #	DESCRIPTION
Parts		
3	0261-0341	Probe PCBA screw, M2.5 × 0.45, 5 mm, T8 drive
2	0264-0120	Probe PCBA standoff, M2.5 × 0.45, 6.5 mm
Tools		
1	—	Interchangeable-bit screwdriver
1	—	T8 star bit
1	—	4.5 mm socket wrench bit
1	—	4.5 mm open-end wrench
AR	—	Flat screwdriver
AR	—	0.050-in manual hex driver
1	0610-0230	Strap wrench
AR	—	Tweezers

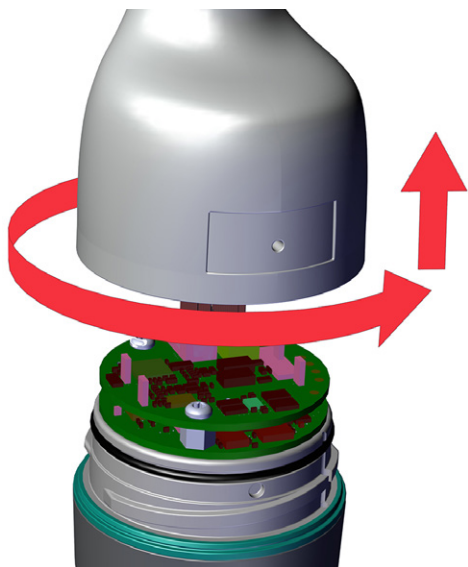
1. Using tweezers, peel off the label from the underside of the probe (the side opposite the scan button).



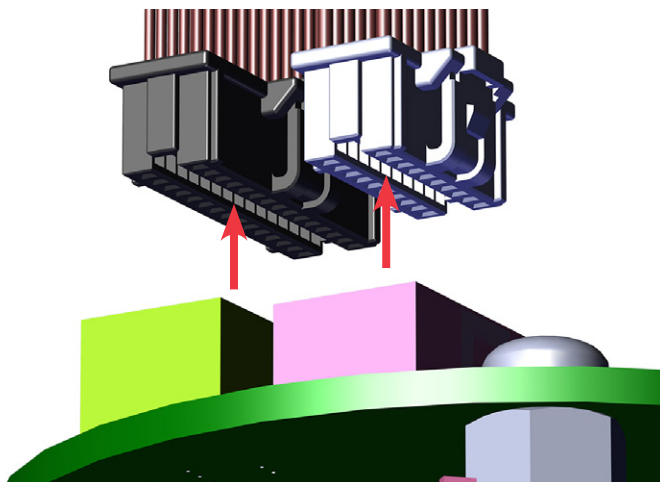
2. Using a flat screwdriver or a 0.050-inch manual hex driver, loosen and remove the set screw that was previously covered by the label.



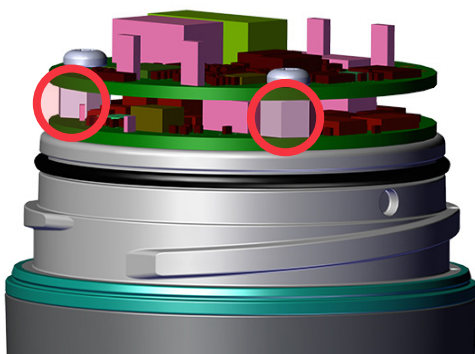
3. Turn the body of the probe counterclockwise and then lift it off of the data collection module (DCM).



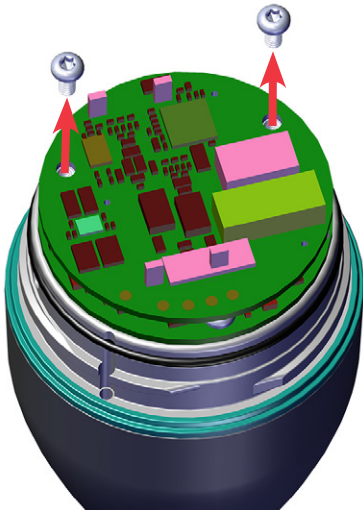
4. If either of the two wiring harnesses attached to the ADC PCBA must be replaced, press the locking tab on that connector inward (toward the wires), and then disconnect the wiring harness. Repeat this step for the other wiring harness if necessary.



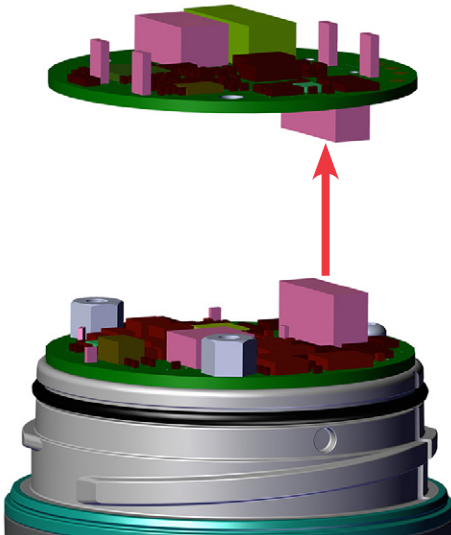
5. Using a 4.5 mm open-end wrench, restrain one of the two standoffs (0264-0120) between the AFE PCBA and the ADC PCBA.



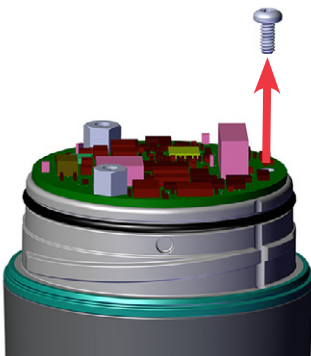
6. Using an interchangeable-bit screwdriver with a T8 star bit, remove the probe PCBA screw (0261-0341) attached to the standoff that you are currently restraining.



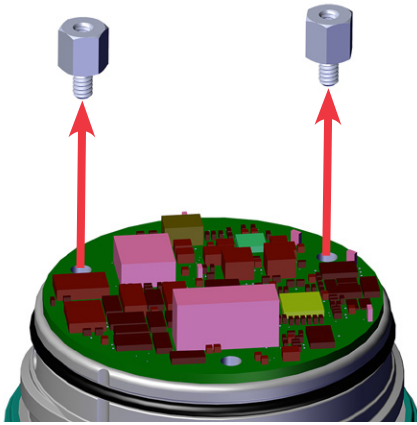
7. Repeat the previous two steps to remove the other probe PCBA screw (0261-0341).
8. Carefully loosen the press-fit connector between the two PCBAs, and then disconnect and remove the ADC PCBA.



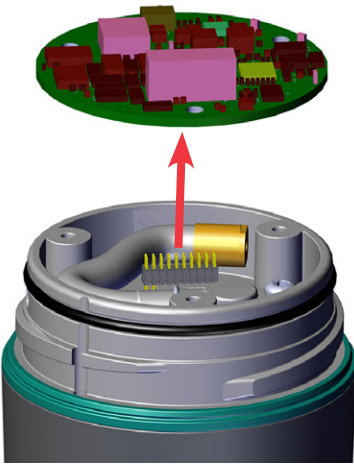
9. Using an interchangeable-bit screwdriver with a T8 star bit, remove the probe PCBA screw (0261-0341) from the AFE PCBA.



10. Using an interchangeable-bit screwdriver with a 4.5 mm socket wrench bit, remove the two standoffs (0264-0120) securing the AFE PCBA to the DCM.



11. Carefully lift the edges of the PCBA to loosen the 20-pin connector between the PCBA and the DCM, and then disconnect and remove the PCBA.



PROCEDURE 24. REASSEMBLE THE PROBE

Prior to reassembling the probe, review the section [Component and Part Replacement Standards](#) on page 146. If any of the probe components require replacement according to the guidance in that section, then replace those components during this reassembly procedure.

If you are replacing either the DCM assembly or the MCU/FPGA PCBA, you may need to order and replace the other component as well during this procedure. The current model of MCU/FPGA PCBA only supports current DCM assembly models, so you **must** replace both components if the DCM assembly is an older model. On the other hand, if you are replacing the MCU/FPGA PCBA, you may also install a new DCM assembly. The following table provides a summary of what you should order in each case.

<i>If you are replacing ...</i>	<i>And your DCM assembly has ...</i>	<i>Then order ...</i>
The DCM assembly	An older part number: • 0142-0666 • 0142-0841 • 0142-0812 • 0142-0999	(1) MCU/FPGA PCBA (0141-0755) and (1) current DCM assembly (0142-1029 or 0142-1080)
The DCM assembly	A current part number: • 0142-1029 • 0142-1080	(1) current DCM assembly (0142-1029 or 0142-1080)
The MCU/FPGA PCBA	An older part number: • 0142-0666 • 0142-0841 • 0142-0812 • 0142-0999	(1) MCU/FPGA PCBA (0141-0755) and (1) current DCM assembly (0142-1029 or 0142-1080)

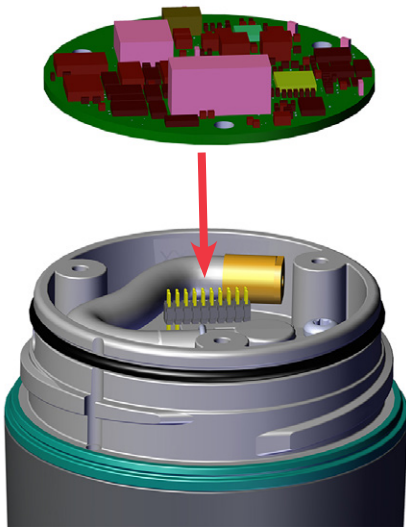
Note: If the power PCBA needs to be replaced, contact Verathon Customer Care to obtain a replacement probe.

QUANTITY	PART #	DESCRIPTION
Parts		
1	0142-0910	Probe cap/LCD assembly
1	0600-0720	LCD flex cable
1	0122-0774	Cap mount
1	0141-0756	Power PCBA
1	0120-0770	Adhesive insulator
1	0141-1127 or 0141-0755	MCU/FPGA PCBA
1	0142-1002	Probe body assembly
1	0600-0707	Probe wiring harness, 30-conductor
1	0600-0708	Probe wiring harness, 20-conductor
1	0141-0757	ADC PCBA
1	0141-0760	AFE PCBA
AR	0142-1029 or 0142-1080	DCM assembly
1	0120-0737	Probe LCD overlay
AR	0120-1061	O-ring
3	0261-0398	Probe cap screw, 4-40, 3/4-in, T10 drive
1	0261-0426	Set screw, 4-40, 3/16-in, 0.050-in hex drive, stainless steel
3	0261-0445	Cap mount screw, panhead, M2.5 × 0.45, 8 mm, SS, Nylok, T8 drive
3	0261-0341	Probe PCBA screw, M2.5 × 0.45, 5 mm, T8 drive
2	0264-0120	Probe PCBA standoff, M2.5 × 0.45, 6.5 mm
Tools		
AR	—	Tweezers
AR	—	Dental pick
1	—	Fine-point permanent marker
AR	—	Cotton swab
AR	—	Isopropyl alcohol
AR	—	Heavy white USP mineral oil
1	—	Torque screwdriver calibrated to 0.28 ± 0.03 N-m (2.5 ± 0.3 in-lb)
1	—	Torque screwdriver calibrated to 0.37 ± 0.03 N-m (3.25 ± 0.25 in-lb)
1	—	T8 star bit
1	—	4.5 mm socket wrench bit
1	—	4.5 mm open-end wrench
1	—	0.050-in manual hex driver
1	—	Flat screwdriver
1	0610-0230	Strap wrench
AR	—	Scale loupe, 15× magnification (Peak Optics OPT-P2016-STD or equivalent)
AR	—	Feeler gauges, 0.254 mm (.010-in) and 0.381 mm (.015-in)

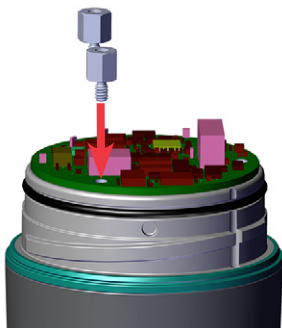
IMPORTANT

After this procedure is complete, no probe serial number will appear in the self-test or on any exam printout. For more information, contact Verathon Customer Care.

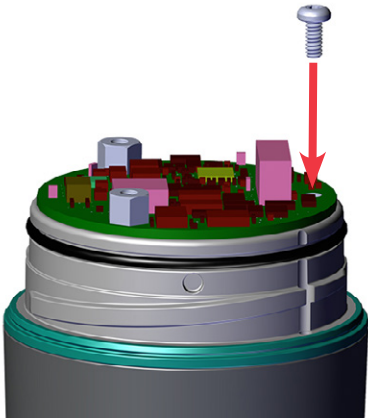
1. Inspect the O-rings on the DCM assembly for wear or damage. If an O-ring is worn, damaged, or missing, continue to Step 2. If not, skip to Step 4.
2. Remove the O-ring if it is still in place. Using a cotton swab moistened with isopropyl alcohol, clean the O-ring groove on the DCM assembly.
3. Coat an O-ring (0120-1061) with mineral oil, and then install it into the groove on the DCM assembly.
4. Carefully line up the AFE PCBA so that its 20-pin connector lines up with the two rows of pins on the DCM assembly and the screw holes on both components align properly. Press down on the PCBA to seat the connectors.



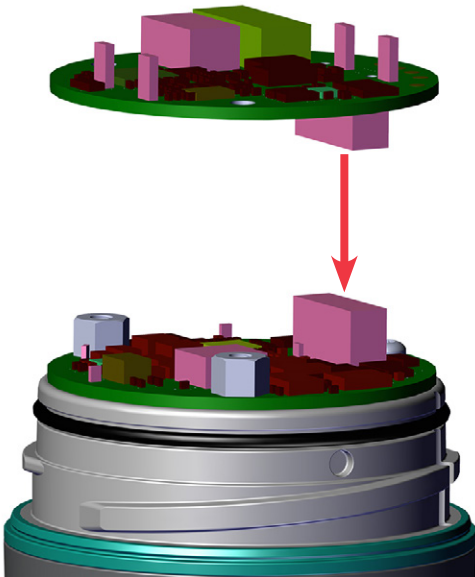
5. Orient the DCM assembly so that the set screw opening faces you.
6. Insert the two probe PCBA standoffs (0264-0120) into the two screw holes on the left. Using a torque screwdriver with a 4.5 mm socket wrench bit, tighten the standoffs to 0.37 N-m (3.25 in-lb).



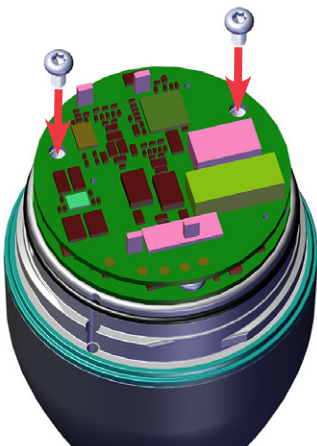
7. Insert a probe PCBA screw (0261-0341) into the screw hole opposite the standoffs. Using a torque screwdriver with a T8 star bit, tighten the screw to 0.28 N-m (2.5 in-lb).



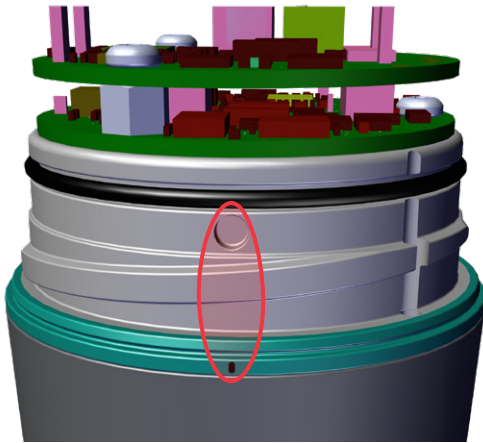
8. Carefully line up the press-fit connector on the ADC PCBA with the corresponding connector on the top of the AFE PCBA. Press the connectors together to seat them.



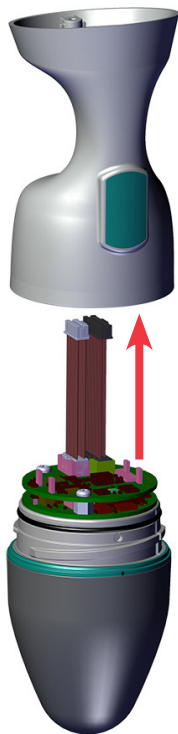
9. Insert (2) probe PCBA screws (0261-0341) into the screw holes on the ADC PCBA. Using a torque screwdriver with a T8 star bit, tighten the screws to 0.28 N-m (2.5 in-lb).



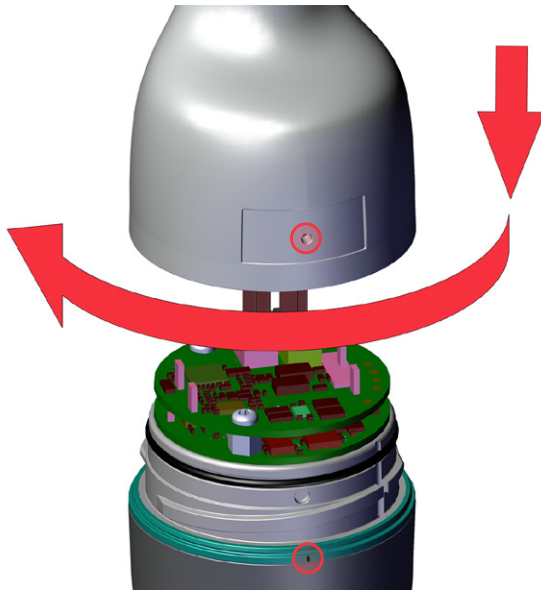
10. If necessary, attach the two wiring harnesses to the connectors on the ADC PCBA. Push the connector on each of the wiring harnesses into the corresponding connector on the PCBA until it locks into place.
11. Using a fine-point permanent marker, apply a small alignment mark to the outside edge of the green molding, directly below the set screw hole.



12. Lower the probe body (0142-1002) over the DCM with its set screw hole at the bottom and facing away from you.
13. As you continue to lower the probe body into place, pass the two wiring harnesses through it so that they extend upward through it without twisting. If the flex cable from the scan button does not extend upward through the probe body, pass it through as well.



14. Turn the probe body clockwise until its threads engage the threads on the DCM. Using a strap wrench, tighten the probe body until the set screw hole on the probe body lines up with the alignment mark on the DCM.

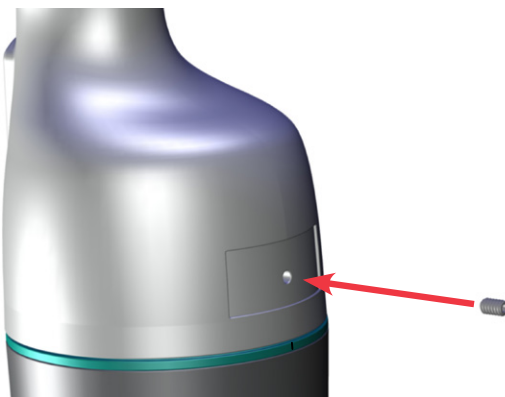


15. Using a scale loupe or a feeler gauge, verify the width of the gap between the edge of the probe body and the plastic molding on the base.

If the gap is 0.381 mm (.015 inch) or less, continue to Step 16.

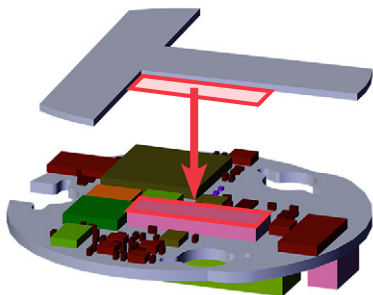
If the gap is more than 0.381 mm (.015 inch) wide, remove the probe body and repeat Step 12 through this step.
16. If the gap between the probe body and the base is still more than 0.381 mm (.015 inch) wide, inspect both components. Repeat assembly using a replacement for the part that appears to be out of specifications.
17. Insert the set screw (0261-0426) into the aligned holes in the probe body and the DCM. Using a 0.050-inch manual hex driver, drive the set screw gently until it is flush with the surface of the probe body.

*Note: **Do not** drive the set screw any further than necessary to prevent it from protruding from the surface of the probe body. **Do not** attempt to tighten the screw if you feel resistance.*

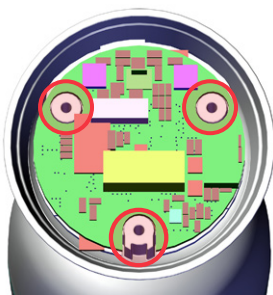


18. Using a cotton swab moistened with isopropyl alcohol, remove the alignment mark from the green molding on the probe.
19. If you disassembled the interconnect PCBA assembly earlier, continue to Step 20. If not, skip to Step 22.

20. Hold the MCU/FPGA PCBA with its press-fit connector facing you. Place the adhesive insulator over the PCBA so that the connector fits snugly into the left corner of the insulator, as shown in the following figure. Press down on the insulator to ensure that it adheres to the components on the PCBA.

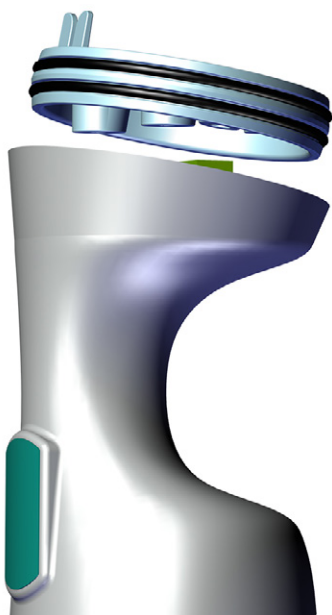


21. Place the power PCBA over the MCU/FPGA PCBA so that their press-fit connectors line up. Press the connectors together until they are securely seated in order to assemble a new interconnect PCBA subassembly. Press lightly around the edges of the subassembly to ensure that the adhesive insulator adheres securely on both sides.
22. Connect each of the two wiring harnesses to the interconnect PCBA subassembly by inserting its connector into the corresponding connector on the subassembly. Press the connectors together until they lock into place.
23. Orient the end of the scan button flex cable over its connector on the interconnect PCBA subassembly, making sure the metallic connectors face away from the edge of the PCBA. Insert the end of the cable into the connector, and then push the tab down on the connector to secure the cable.
24. Position the interconnect PCBA subassembly over the probe so that the three notches in its edges line up with the three screw bosses inside the probe body.
25. While carefully guiding the flex cables into the probe body so that they are not kinked, pinched, or strained, fit the interconnect PCBA subassembly into place between the screw bosses on the probe body.

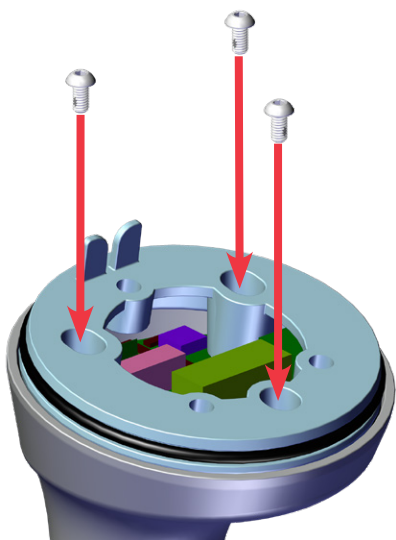


26. Inspect the O-rings on the cap mount for wear or damage. If an O-ring is worn, damaged, or missing, continue to Step 27. If not, skip to Step 29.
27. Remove any worn or damaged O-rings. Using a cotton swab moistened with isopropyl alcohol, clean the empty O-ring grooves on the cap mount.
28. Lightly coat a replacement O-ring with mineral oil, and then install it into an empty O-ring groove on the cap mount. Repeat if necessary to install a second O-ring.

29. Position the cap mount so that the two tabs line up with the scan button and face upward, and then place the cap mount onto the probe body.

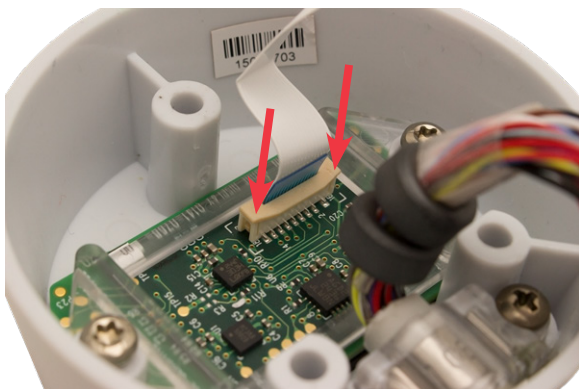


30. Insert (3) cap mount screws (0261-0445) through the holes in the cap mount and into the screw bosses on the probe body. Using a torque screwdriver with a T8 star bit, tighten the screws to 0.28 N-m (2.5 in-lb).

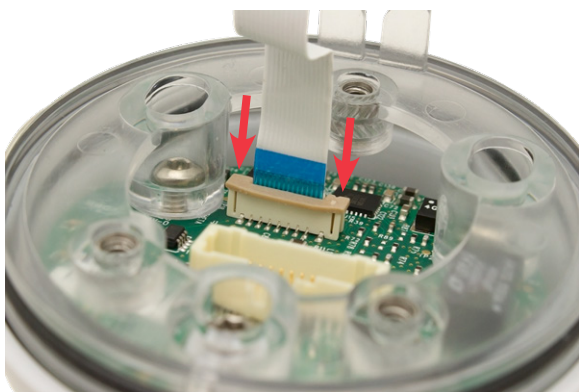


31. Position the probe cap over the cap mount so that the probe cable extends toward you.

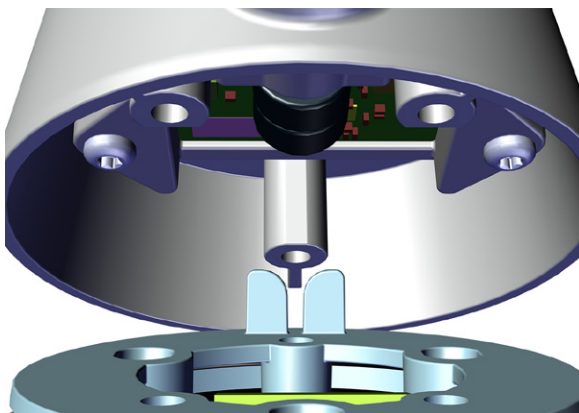
32. Insert one end of the LCD flex cable into the flex cable connector in the probe cap, making sure the exposed contacts face away from the locking tab. Lock the cable in place by pressing the tab downward.



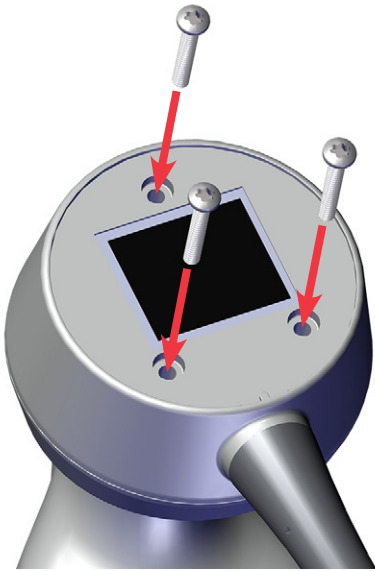
33. Insert one end of the LCD flex cable (0600-0720) into the flex cable connector on the interconnect PCBA assembly, making sure the exposed contacts face away from the locking tab. Lock the cable in place by pressing the tab downward.



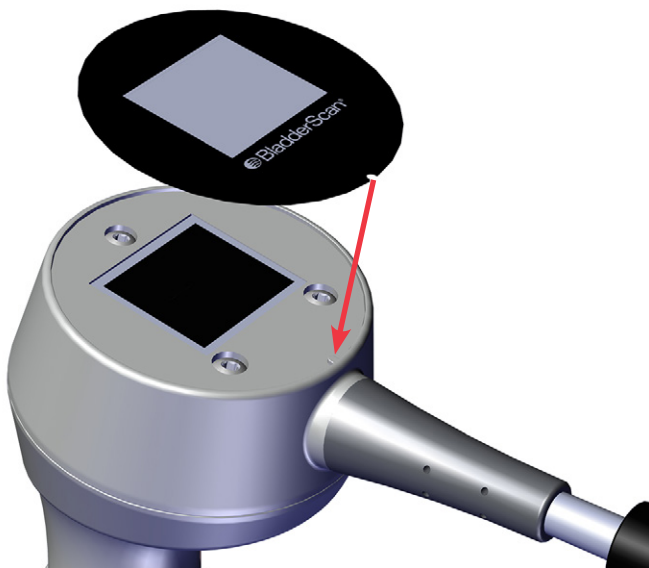
34. Insert the connector of the probe cable wiring harness into the corresponding connector on the power PCBA. Press the connectors together until they lock into place.
35. Seat the cap on the probe body so that the ridge inside the cap fits between the two tabs on the cap mount.



36. Insert (3) probe cap screws (0261-0398) through the screw holes in the cap and into the probe. Using a torque screwdriver with a T8 star bit, tighten the screws to 0.28 N-m (2.5 in-lb).



37. Using a scale loupe or a feeler gauge, verify that the gap between the edge of the probe cap and the probe handle is 0.254 mm (.010 inch) or less. If the gap is wider than 0.254 mm (.010 inch), repeat Step 35 and Step 36 to narrow the gap.
38. Remove the backing from a new adhesive overlay. Carefully position it over the top of the probe cap so that its notch lines up with the ridge on the cap and its window lines up with the LCD. Press the overlay into place, applying pressure between the window and the edges so that the adhesive bonds securely.



PROCEDURE 25. REPLACE THE PROBE ID LABEL

Complete this procedure if the ID label from the probe has been damaged or removed.

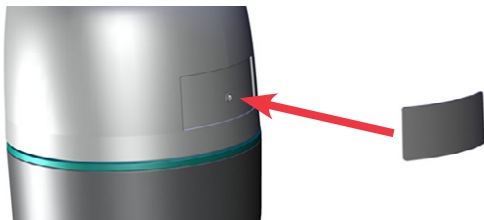
Before ordering the replacement labels, check the part number and serial number of the probe. Order the appropriate label kit for the part number and serial number of the probe you are servicing.

IMPORTANT

Due to the unavailability of certain older parts, BladderScan Prime probes with serial numbers lower than P1500000 can not be serviced in the field. If the probe ID label is damaged or missing, refer to [Identify the Probe](#) on page 23 for additional ways to determine the probe's serial number. Always order the replacement probe ID label before you remove or replace the DCM, because the existing label no longer adheres properly after it is removed. The replacement probe ID label is provided free of charge with any order for probe repair parts.

QUANTITY	PROBE PART #	PROBE SERIAL #	ITEM PART #	DESCRIPTION
Parts				
AR	0570-0347	Beginning in P10	0800-0545	BladderScan Prime Plus SPP Probe Label Replacement Kit
		Beginning in P15		
	0570-0395	Beginning in P15	0800-0555	
	E570-0395	Beginning in P15	0800-0672	BladderScan Prime Plus Probe Exchange SPP Label Kit
Tools				
AR	—	—	—	Tweezers
AR	—	—	—	Isopropyl alcohol

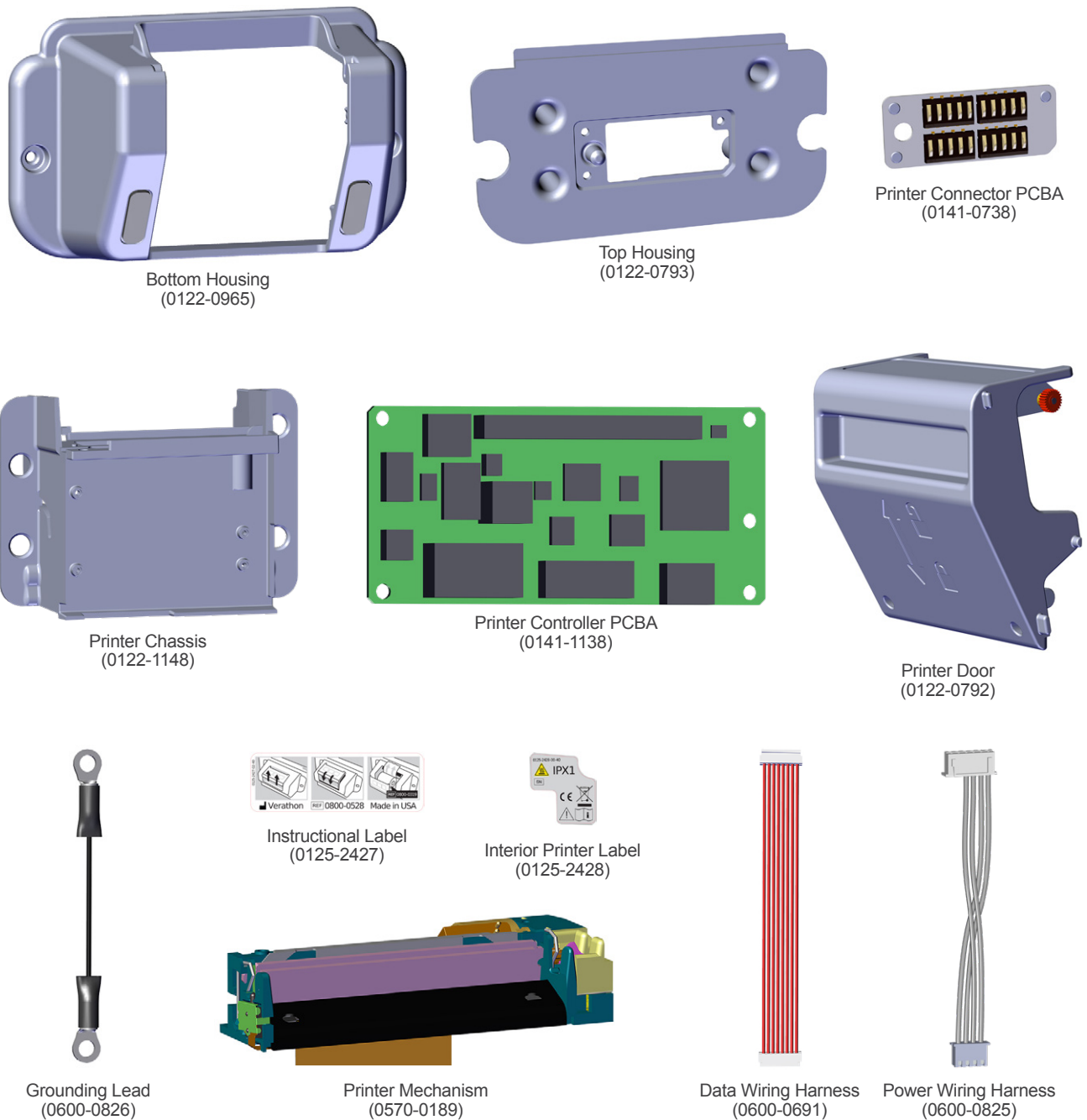
1. If necessary, use tweezers to peel off the label from the underside of the probe (the side opposite the scan button).
2. Using isopropyl alcohol, clean any remaining residue from the label recess.
3. Remove the new probe ID label from its envelope.
4. Remove the backing from the label.
5. Apply the new label to the recess around the set screw hole on the probe body.



PRINTER REPAIR PROCEDURES (OPTIONAL)

The following procedures apply only to consoles with printer modules installed.

Figure 12. Components of the BladderScan Prime Plus Printer Module



PROCEDURE 26. REPLACE THE PRINTER DOOR

Aside from correcting functional issues, you may need to replace the printer door if it is damaged.

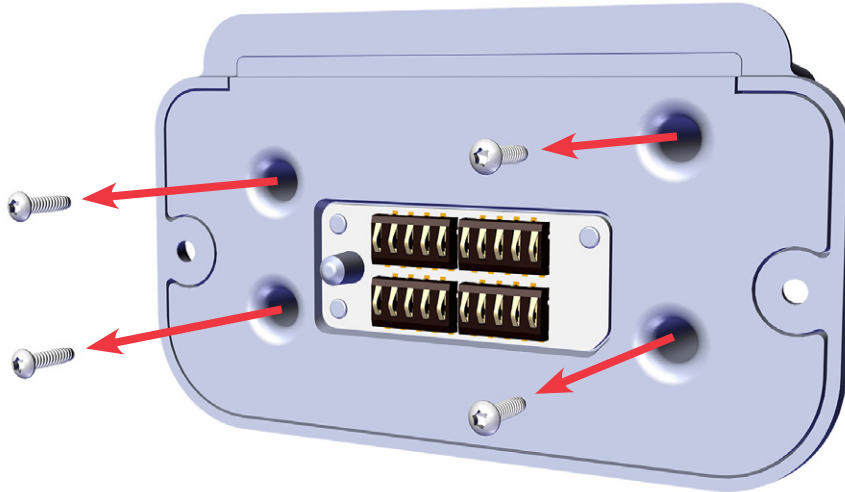
QUANTITY	PART #	DESCRIPTION
Parts		
1	0122-0792	Replacement door for printer
1	0125-2427	Instructional label
4	0261-0091	Top housing screw, M3, 12 mm, T10 drive
AR	0800-0576	Cart mount kit
1	0130-0774	Cart mounting bracket
2	0260-0588	Upper bracket screw, 10-32, ¾-in, Phillips
1	0260-0589	Lower bracket screw, ¼-20, 0.625-in, Phillips (optional)
1	0263-0149	Bracket washer, 0.252-in internal diameter (optional)
Tools		
1	—	Torque screwdriver calibrated to 0.9 ± 0.06 N-m (8 ± 0.5 in-lb)
1	—	Electric or manual interchangeable-bit screwdriver
1	—	Phillips bit
1	—	T10 star bit

- Using a screwdriver with a Phillips bit, loosen the (2) screws securing the printer to the back of the console. Remove the printer from the back of the console and set the screws aside if necessary.

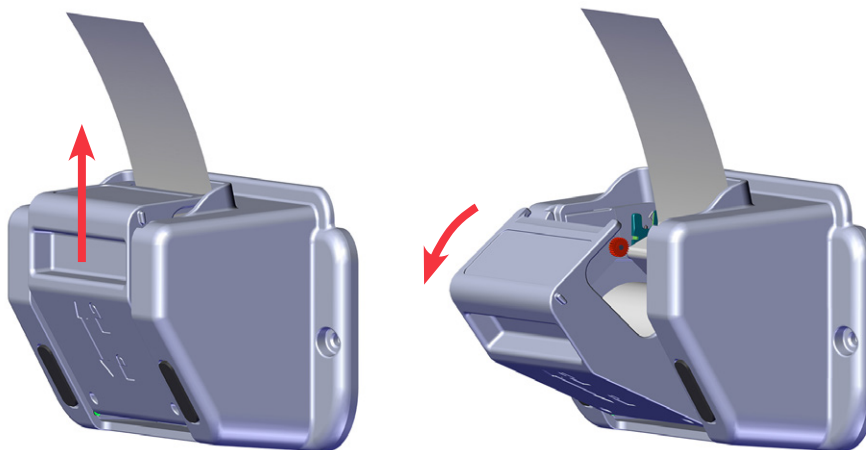
Note: If a cart mounting bracket is installed over the printer, remove the (3) screws securing the bracket to the back of the console and the washer between the bracket and the mounting plate. Set the bracket, the washer, and the screws aside.



2. Using a torque screwdriver with a T10 star bit, remove the (4) top housing screws (0261-0091).

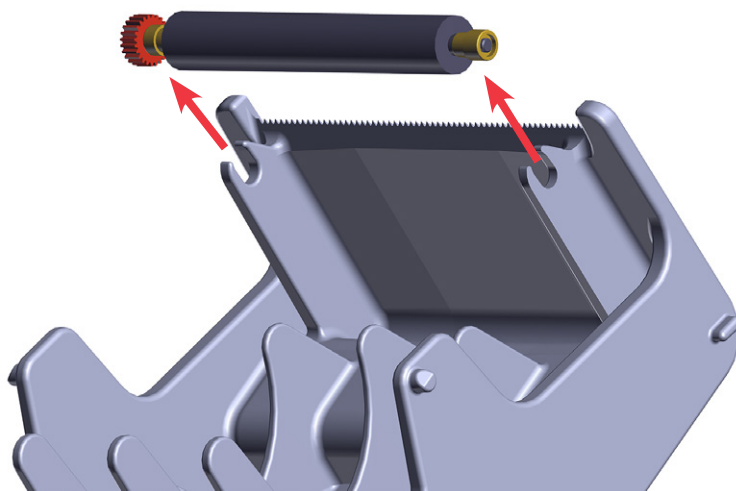


3. Turn the printer so that the printer door faces you.
4. Lift the top housing off of the printer, and then disconnect the two wiring harnesses. Set the top housing aside.
5. Slide the printer door upward to unlatch it, and then open it.

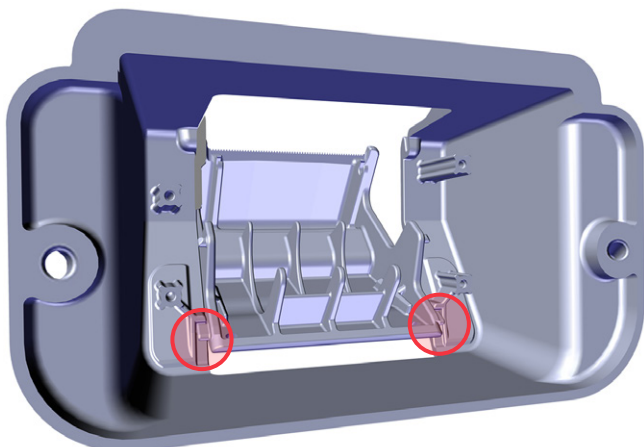


6. Lift the printer assembly out of the bottom housing, moving the guide pins on the printer door out of their grooves if necessary.
7. Lift the printer door out of the bottom housing.

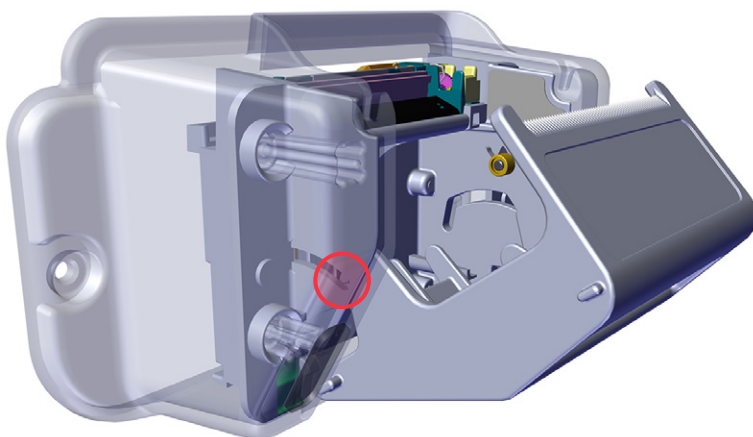
8. Detach the drive roller from the old printer door and snap it into the new printer door in the same position.



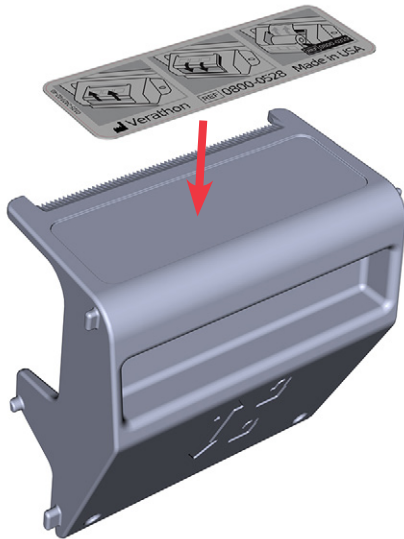
9. Place the new printer door into the bottom housing so that its hinge pins fit into the recesses on the housing.



10. Insert the printer assembly into the bottom housing, pushing the guide pins on the printer door into the grooves on the printer assembly.



11. Close the printer door, and then slide it down into its locked position. This holds the printer assembly in place during the following two steps.
12. Attach the power and data wiring harnesses to the top housing.
13. Replace the top housing, taking care to keep all power and data wires away from the pinch points between the housing and the printer assembly. Using a torque screwdriver with a T10 star bit, attach (4) top housing screws (0261-0091). Tighten the screws to 0.9 N-m (8 in-lb).
14. If necessary, install an instructional label into the recess on the top of the printer door. Remove the backing strip from the label, and then apply the label within the recess as shown in the following figure.



15. Gently shake the printer and ensure no parts are loose.
16. Install a roll of thermal printer paper as described in [Load Thermal Paper](#) on page 148.
17. If the console was not received with a cart mounting bracket, insert or seat the (2) screws in the screw holes in the lower printer housing, and then use a screwdriver with a Phillips bit to tighten them securely. The procedure is complete.

If the console was received with a cart mounting bracket, skip to the following step.
18. Place the bracket washer (0263-0149) over the hole in the mounting plate.
19. Position the cart mounting bracket (0130-0774) over the printer.
20. Insert the (2) upper bracket screws (0260-0588) through the two upper branches of the mounting bracket and into the holes on either side of the printer.
21. Insert the lower bracket screw (0260-0589) through the lower branch of the mounting bracket and the spacer, and then into the hole in the mounting plate.
22. Using a screwdriver with a Phillips bit, tighten the screws securely.

PROCEDURE 27. UPDATE THE PRINTER CONTROLLER PCBA

If you are servicing an older edition of the printer, it may contain the previous version of the printer controller PCBA (0141-0739). If so, you will need to install the current printer controller PCBA (0141-1138) in its place. The current version of the PCBA is shorter than the previous one, although both are the same width; also, the current version has five screw holes instead of four.

Updating the printer controller PCBA from the old version to the current version follows the same steps as replacing the PCBA with an identical new part, except that you must also replace the chassis and transfer the printer mechanism from the old chassis to the new one.

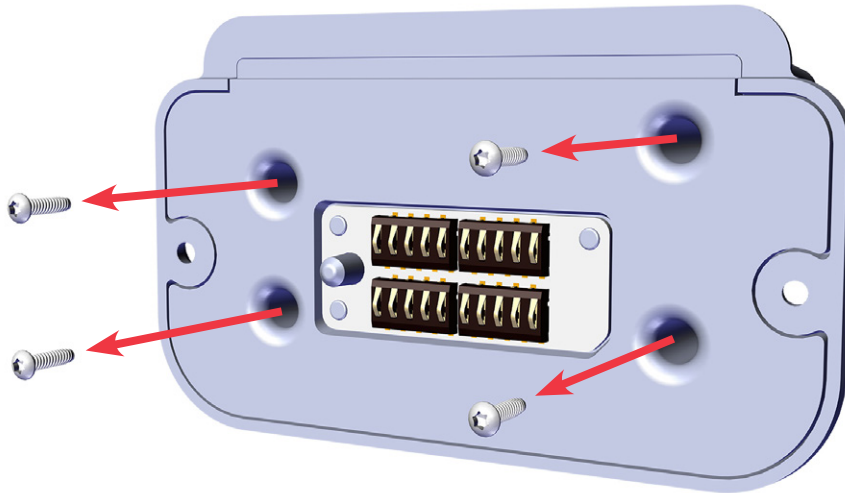
QUANTITY	PART #	DESCRIPTION
Parts		
1	0141-1138	Printer controller PCBA
1	0122-1148	Printer chassis
1	0125-2428	Interior printer label
1	0600-0825	Power wiring harness
1	0600-0826	Grounding lead
4	0261-0091	Top housing screw, M3, 12 mm, T10 drive
2	0261-0091	Printer mechanism screw, M3, 12 mm, T10 drive
3	0261-0416	Printer controller PCBA screw, M2.2 × 0.85, 6 mm, T6 drive
AR	0800-0576	Cart mount kit
1	0130-0774	Cart mounting bracket
2	0260-0588	Upper bracket screw, 10-32, ¾-in, Phillips
1	0260-0589	Lower bracket screw, ¼-20, 0.625-in, Phillips (optional)
1	0263-0149	Bracket washer, 0.252-in internal diameter (optional)
Tools		
1	—	Torque screwdriver calibrated to 0.32 ± 0.03 N-m (2.8 ± 0.3 in-lb)
1	—	Torque screwdriver calibrated to 0.9 ± 0.06 N-m (8 ± 0.5 in-lb)
1	—	Electric or manual interchangeable-bit screwdriver
1	—	Phillips bit
1	—	T10 star bit
1	—	T6 star bit

1. Using a screwdriver with a Phillips bit, loosen the (2) screws securing the printer to the back of the console. Remove the printer from the back of the console and set the screws aside if necessary.

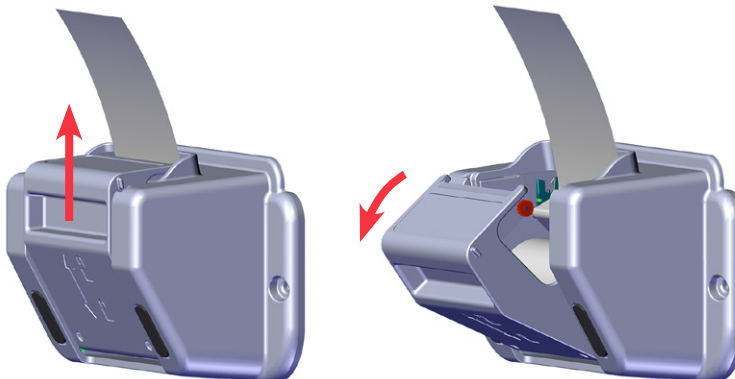
Note: If a cart mounting bracket is installed over the printer, remove the (3) screws securing the bracket to the back of the console and the washer between the bracket and the mounting plate. Set the bracket, the washer, and the screws aside.



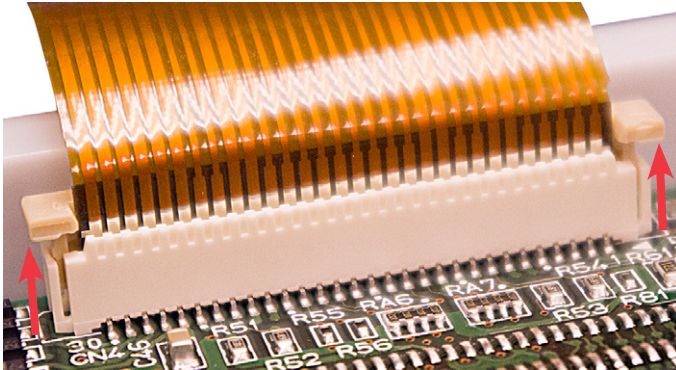
2. Using a torque screwdriver with a T10 star bit, remove the (4) top housing screws (0261-0091).



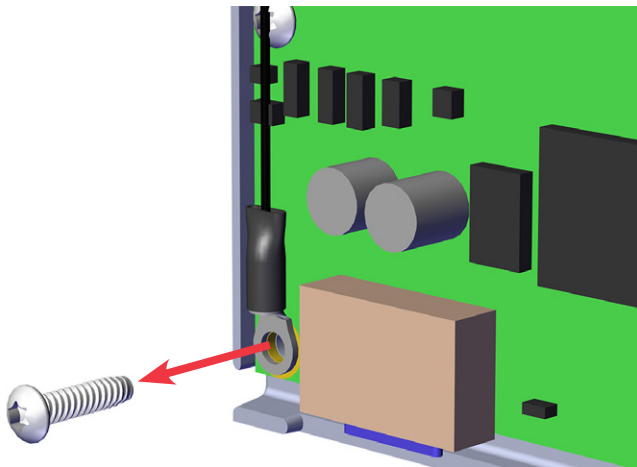
3. Turn the printer so that the printer door faces you.
4. Lift the top housing off of the printer, and then disconnect the two wiring harnesses. Set the top housing aside.
5. Slide the printer door upward to unlatch it, and then open it.



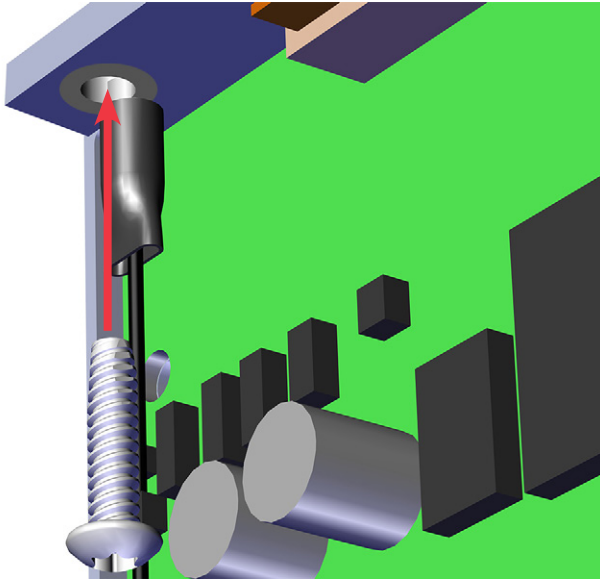
6. Lift the printer assembly out of the bottom housing, moving the guide pins on the printer door out of their grooves if necessary.
7. On the existing printer controller PCBA, slide the locking tab on the flex cable connector upward (away from the PCBA). Remove the end of the flex cable from the connector.



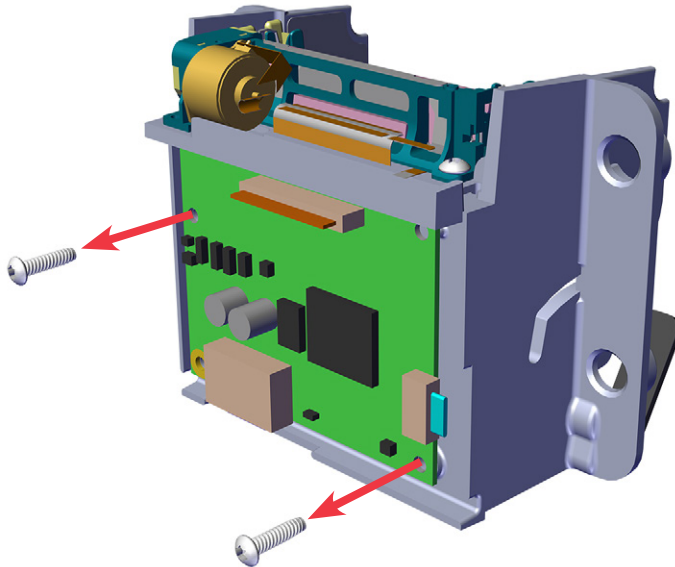
8. Disconnect the existing power wiring harness and the data wiring harness from their connectors on the printer controller PCBA. Discard the existing power wiring harness.
9. Using a torque screwdriver with a T10 star bit, remove the screw (0261-0091) securing the grounding lead to the existing printer controller PCBA.



10. Using a torque screwdriver with a T10 star bit, remove the screw securing the existing grounding lead to the printer mechanism. Remove the grounding lead and discard it.

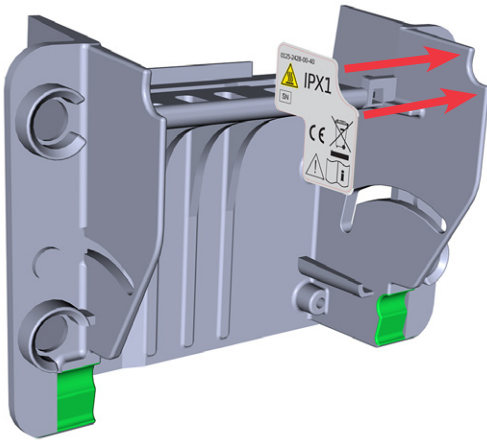


11. Using a torque screwdriver with a T10 star bit, remove the (3) screws (0261-0091) securing the existing printer controller PCBA to the printer chassis. Remove the printer controller PCBA and discard it.

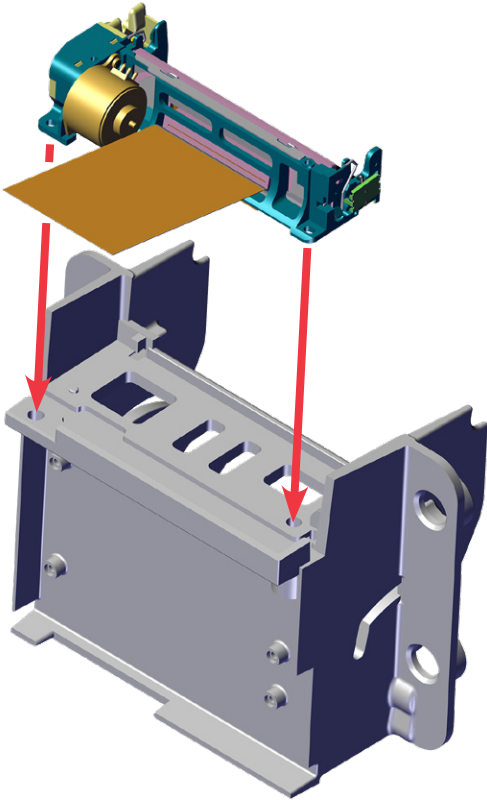


12. Using a torque screwdriver with a T10 star bit, remove the (2) printer mechanism screws (0261-0091), and then remove the printer mechanism from the printer chassis. Discard the printer chassis.

13. Apply an interior printer label to a new printer chassis (0122-1148) as shown in the following figure. Remove the backing from the label, align it with the corner of the chassis, and then press it into place.

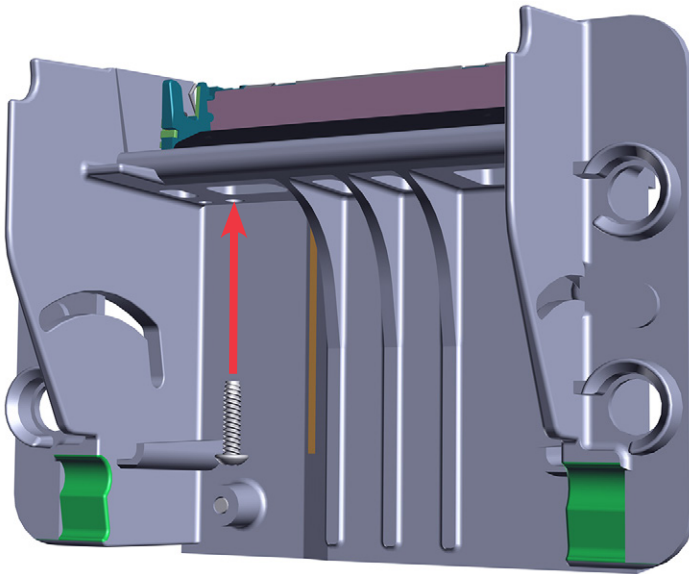


14. Position the new printer mechanism onto a new printer chassis (0122-1148) so that its mounting holes line up with the screw holes on the chassis.

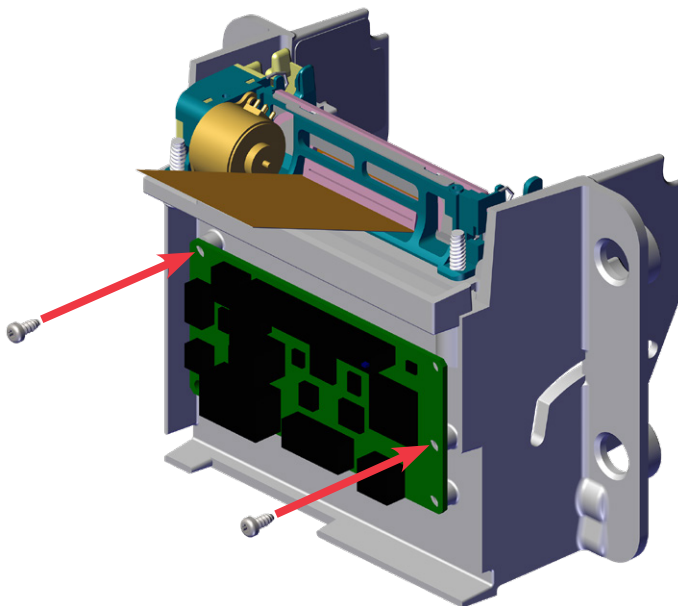


15. Insert a second printer mechanism screw (0261-0091) through the printer chassis and into the mounting hole on the right side of the printer mechanism. Using a torque screwdriver with a T10 star bit, tighten the screw to 0.9 N-m (8 in-lb).

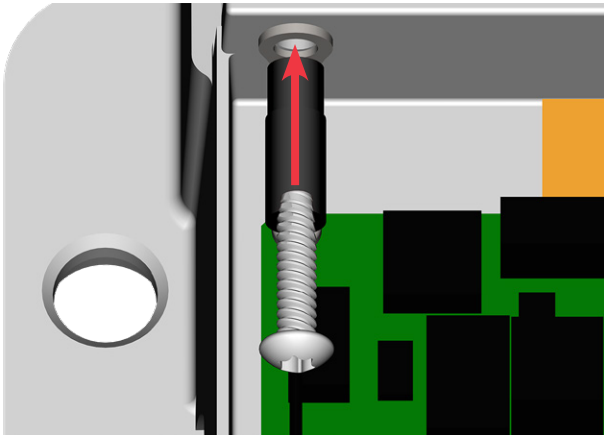
Note: You must insert this screw from the opposite side of the printer chassis.



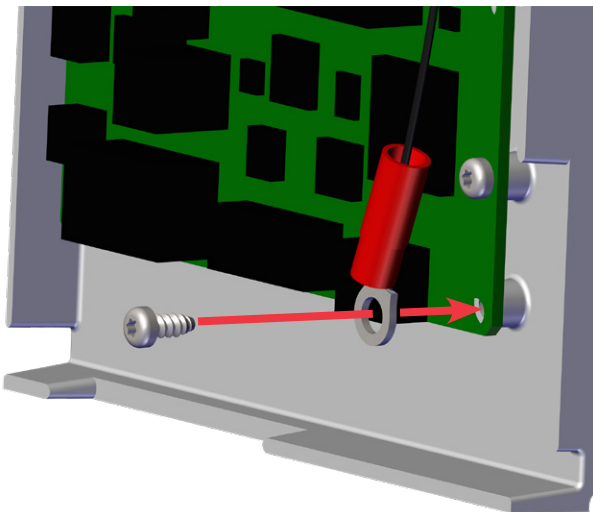
16. Position the new printer controller PCBA on the printer chassis so that the screw holes on the PCBA line up with the holes in the chassis. Using a torque screwdriver with a T6 star bit, attach (2) screws (0261-0416) as shown to secure the PCBA to the chassis. Tighten the screws to 0.32 N-m (2.8 in-lb).



17. Insert (1) printer mechanism screw (0261-0091) through one end of a new grounding lead (0600-0826), then through the printer chassis, and finally into the mounting hole on the left side of the printer mechanism. Using a torque screwdriver with a T10 star bit, tighten the screw to 0.9 N-m (8 in-lb).

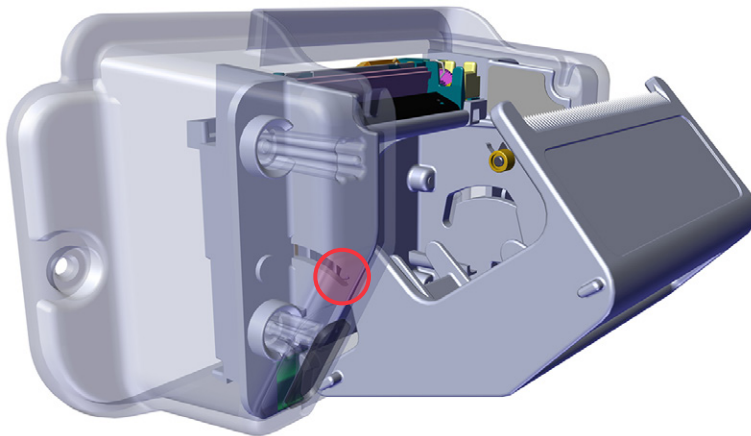


18. Insert (1) screw (0261-0416) through the loose end of the new grounding lead (0600-0826) and the hole at the lower left corner of the new printer controller PCBA. Using a torque screwdriver with a T6 star bit, tighten the screw to 0.32 N-m (2.8 in-lb). As you tighten the screw, make sure to avoid contact between the connector of the lead and any components on the PCBA.



19. Connect the new power wiring harness (0600-0825) to connector CN1 on the printer controller PCBA. The wiring harness and the connector are keyed, so they can fit together in only one way.
20. Connect the serial wiring harness to connector CN2 on the new printer controller PCBA. The wiring harness and connector are keyed in the same way as the power wiring harness and its connector.
21. Insert the end of the flex cable from the printer mechanism into the connector on the printer controller PCBA. Press the locking tabs on the connector down to secure the flex cable.

22. Insert the printer assembly into the bottom housing, pushing the guide pins on the printer door into the grooves on the printer assembly.



23. Close the printer door, and then slide it down into its locked position. This holds the printer assembly in place during the following two steps.
24. Attach the power and data wiring harnesses to the top housing.
25. Reinstall the top housing, taking care to keep all power and data wires away from the pinch points between the housing and the printer assembly. Using a torque screwdriver with a T10 star bit, attach (4) top housing screws (0261-0091). Tighten the screws to 0.9 N-m (8 in-lb).
26. Gently shake the printer and ensure no parts are loose.
27. Install a roll of thermal printer paper as described in [Load Thermal Paper](#) on page 148.
28. If the console was not received with a cart mounting bracket, insert or seat the (2) screws in the screw holes in the lower printer housing, and then use a screwdriver with a Phillips bit to tighten them securely. The procedure is complete.
- If the console was received with a cart mounting bracket, skip to the following step.
29. Place the bracket washer (0263-0149) over the hole in the mounting plate.
30. Position the cart mounting bracket (0130-0774) over the printer.
31. Insert the (2) upper bracket screws (0260-0588) through the two upper branches of the mounting bracket and into the holes on either side of the printer.
32. Insert the lower bracket screw (0260-0589) through the lower branch of the mounting bracket and the spacer, and then into the hole in the mounting plate.
33. Using a screwdriver with a Phillips bit, tighten the screws securely.

PROCEDURE 28. REPLACE THE PRINTER CONTROLLER PCBA

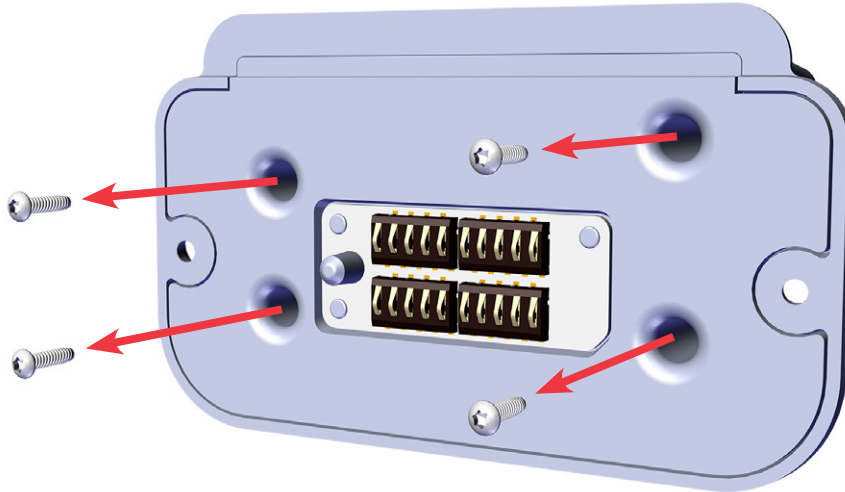
QUANTITY	PART #	DESCRIPTION
Parts		
1	0141-1138	Printer controller PCBA
4	0261-0091	Top housing screw, M3, 12 mm, T10 drive
3	0261-0416	Printer controller PCBA screw, M2.2 × 0.85, 6 mm, T6 drive
AR	0800-0576	Cart mount kit
1	0130-0774	Cart mounting bracket
2	0260-0588	Upper bracket screw, 10-32, ¾-in, Phillips
1	0260-0589	Lower bracket screw, ¼-20, 0.625-in, Phillips (optional)
1	0263-0149	Bracket washer, 0.252-in internal diameter (optional)
Tools		
1	—	Torque screwdriver calibrated to 0.32 ± 0.03 N-m (2.8 ± 0.3 in-lb)
1	—	Torque screwdriver calibrated to 0.9 ± 0.06 N-m (8 ± 0.5 in-lb)
1	—	Electric or manual interchangeable-bit screwdriver
1	—	Phillips bit
1	—	T10 star bit
1	—	T6 star bit

- Using a screwdriver with a Phillips bit, loosen the (2) screws securing the printer to the back of the console. Remove the printer from the back of the console and set the screws aside if necessary.

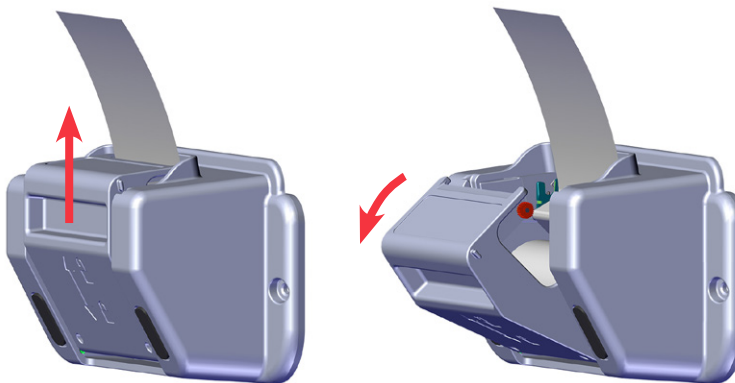
Note: If a cart mounting bracket is installed over the printer, remove the (3) screws securing the bracket to the back of the console and the washer between the bracket and the mounting plate. Set the bracket, the washer, and the screws aside.



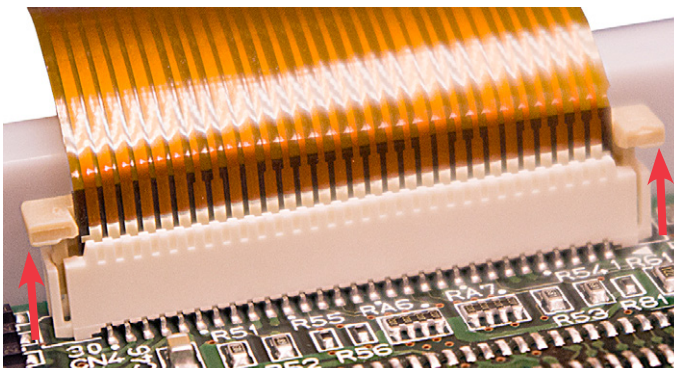
2. Using a torque screwdriver with a T10 star bit, remove the (4) top housing screws (0261-0091).



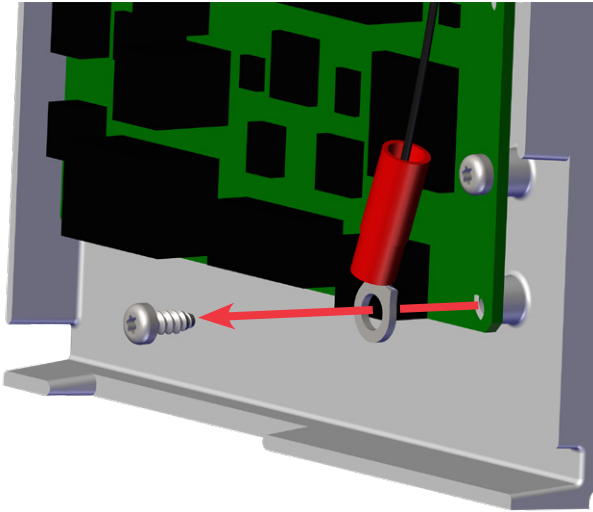
3. Turn the printer so that the printer door faces you.
4. Lift the top housing off of the printer, and then disconnect the two wiring harnesses. Set the top housing aside.
5. Slide the printer door upward to unlatch it, and then open it.



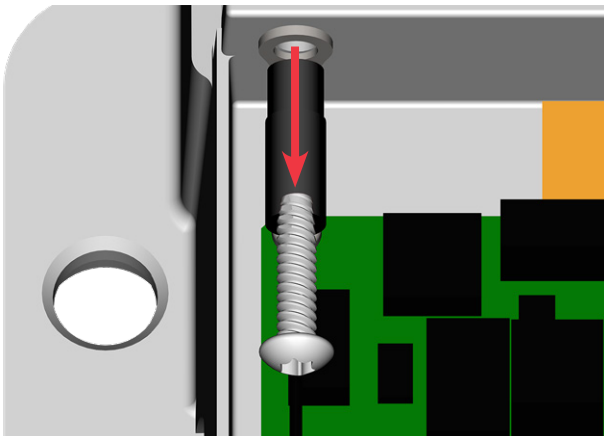
6. Lift the printer assembly out of the bottom housing, moving the guide pins on the printer door out of their grooves if necessary.
7. On the existing printer controller PCBA, slide the locking tab on the flex cable connector upward (away from the PCBA). Remove the end of the flex cable from the connector.



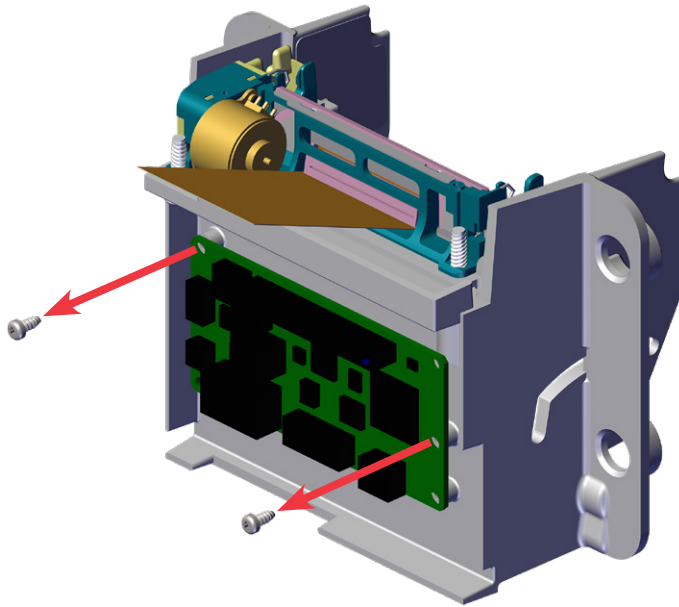
8. Disconnect the power wiring harness and the data wiring harness from their connectors on the printer controller PCBA.
9. Using a torque screwdriver with a T10 star bit, remove the screw securing the grounding lead to the existing printer controller PCBA.



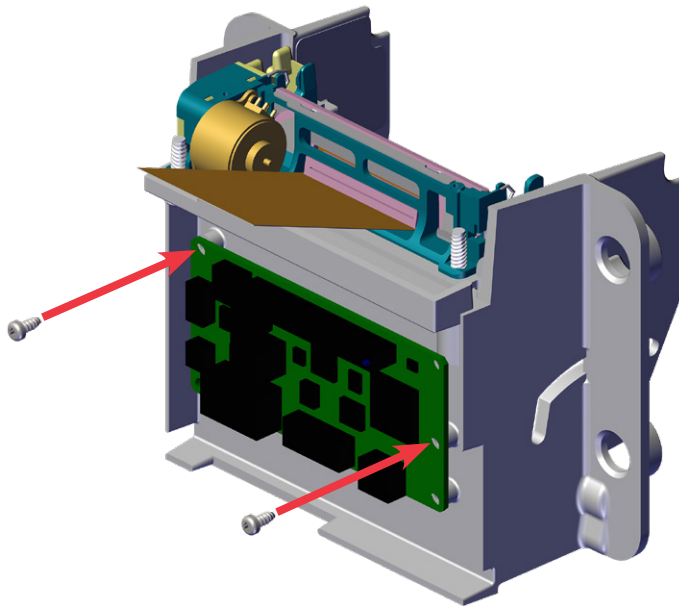
10. Using a torque screwdriver with a T10 star bit, remove the screw securing the existing grounding lead to the printer mechanism. Remove the grounding lead.



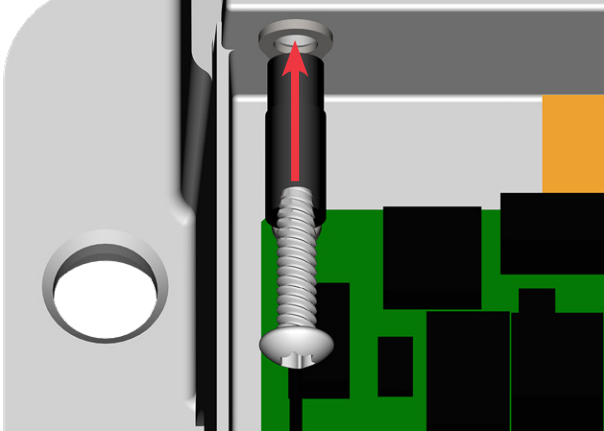
11. Using a torque screwdriver with a T10 star bit, remove the (2) screws securing the existing printer controller PCBA to the printer chassis. Remove the printer controller PCBA and discard it.



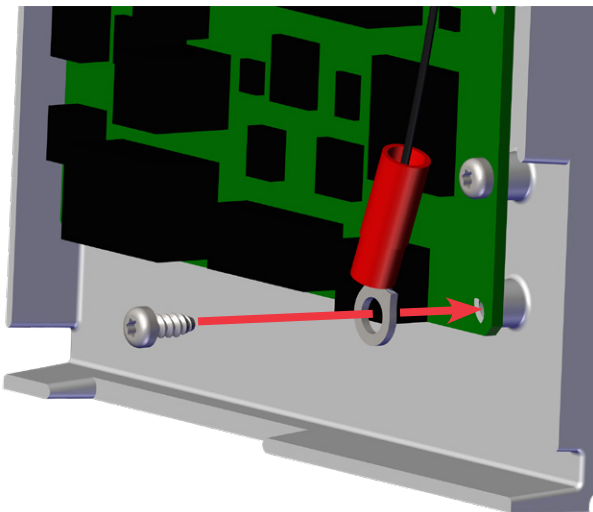
12. Position the new printer controller PCBA on the printer chassis so that the screw holes on the PCBA line up with the holes in the chassis. Using a torque screwdriver with a T6 star bit, attach (2) screws (0261-0416) as shown to secure the PCBA to the chassis. Tighten the screws to 0.32 N-m (2.8 in-lb).



13. Insert (1) printer mechanism screw (0261-0091) through one end of a new grounding lead (0600-0826), then through the printer chassis, and finally into the mounting hole on the left side of the printer mechanism. Using a torque screwdriver with a T10 star bit, tighten the screw to 0.9 N-m (8 in-lb).

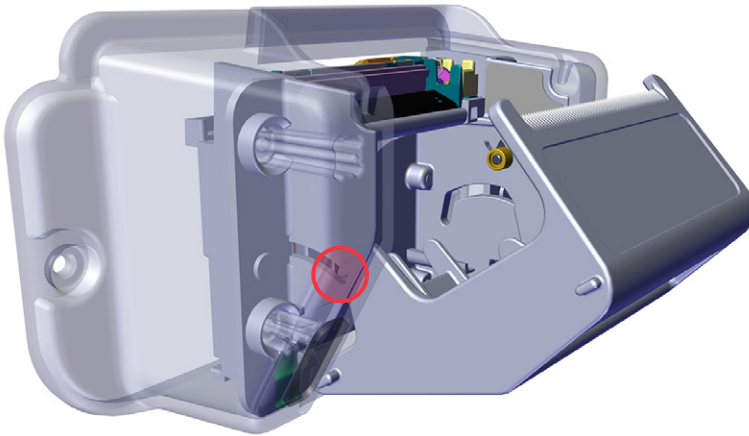


14. Insert (1) screw (0261-0416) through the loose end of the new grounding lead (0600-0826) and the hole at the lower left corner of the new printer controller PCBA. Using a torque screwdriver with a T6 star bit, tighten the screw to 0.32 N-m (2.8 in-lb). As you tighten the screw, make sure to avoid contact between the connector of the lead and any components on the PCBA.



15. Connect the power wiring harness to the printer controller PCBA.
16. Connect the data wiring harness to the printer controller PCBA.
17. Insert the end of the flex cable from the printer mechanism into the connector on the printer controller PCBA. Press the locking tabs on the connector down to secure the flex cable.

18. Insert the printer assembly into the bottom housing, pushing the guide pins on the printer door into the grooves on the printer assembly.



19. Close the printer door, and then slide it down into its locked position. This holds the printer assembly in place during the following two steps.
20. Attach the power and data wiring harnesses to the top housing.
21. Reinstall the top housing, taking care to keep all power and data wires away from the pinch points between the housing and the printer assembly. Using a torque screwdriver with a T10 star bit, attach (4) top housing screws (0261-0091). Tighten the screws to 0.9 N-m (8 in-lb).
22. Gently shake the printer and make sure no parts are loose.
23. Install a roll of thermal printer paper as described in [Load Thermal Paper](#) on page 148.
24. If the console was not received with a cart mounting bracket, insert or seat the (2) screws in the screw holes in the lower printer housing, and then use a screwdriver with a Phillips bit to tighten them securely. The procedure is complete.

If the console was received with a cart mounting bracket, skip to the following step.
25. Place the bracket washer (0263-0149) over the hole in the mounting plate.
26. Position the cart mounting bracket (0130-0774) over the printer.
27. Insert the (2) upper bracket screws (0260-0588) through the two upper branches of the mounting bracket and into the holes on either side of the printer.
28. Insert the lower bracket screw (0260-0589) through the lower branch of the mounting bracket and the spacer, and then into the hole in the mounting plate.
29. Using a screwdriver with a Phillips bit, tighten the screws securely.

PROCEDURE 29. REPLACE THE PRINTER MECHANISM

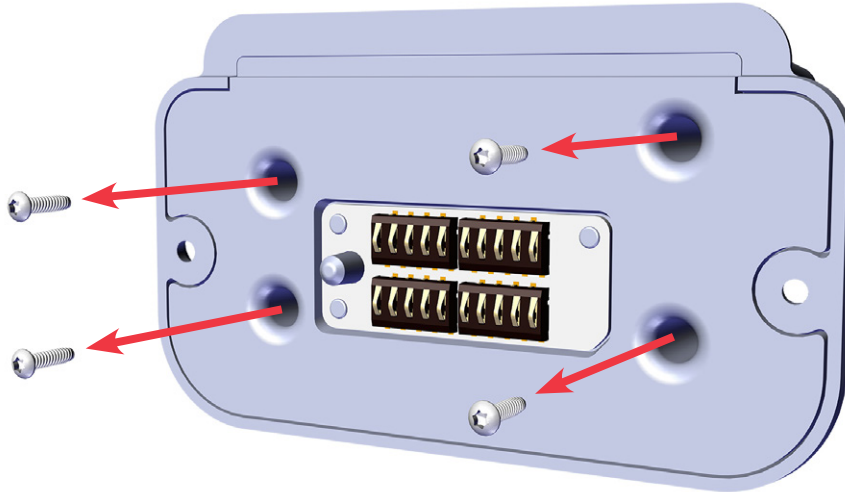
QUANTITY	PART #	DESCRIPTION
Parts		
1	0570-0189	Printer mechanism with flex cable
4	0261-0091	Top housing screw, M3, 12 mm, T10 drive
2	0261-0091	Printer mechanism screw, M3, 12 mm, T10 drive
AR	0800-0576	Cart mount kit
1	0130-0774	Cart mounting bracket
2	0260-0588	Upper bracket screw, 10-32, ¾-in, Phillips
1	0260-0589	Lower bracket screw, ¼-20, 0.625-in, Phillips (optional)
1	0263-0149	Bracket washer, 0.252-in internal diameter (optional)
Tools		
1	—	Torque screwdriver calibrated to 0.9 ± 0.06 N-m (8 ± 0.5 in-lb)
1	—	Electric or manual interchangeable-bit screwdriver
1	—	Phillips bit
1	—	T10 star bit

- Using a screwdriver with a Phillips bit, loosen the (2) screws securing the printer to the back of the console. Remove the printer from the back of the console and set the screws aside if necessary.

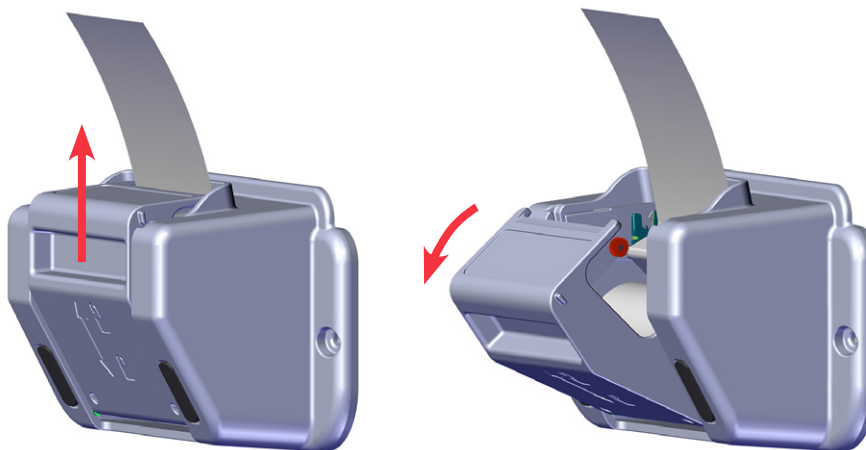
Note: If a cart mounting bracket is installed over the printer, remove the (3) screws securing the bracket to the back of the console and the washer between the bracket and the mounting plate. Set the bracket, the washer, and the screws aside.



2. Using a torque screwdriver with a T10 star bit, remove the (4) top housing screws (0261-0091).

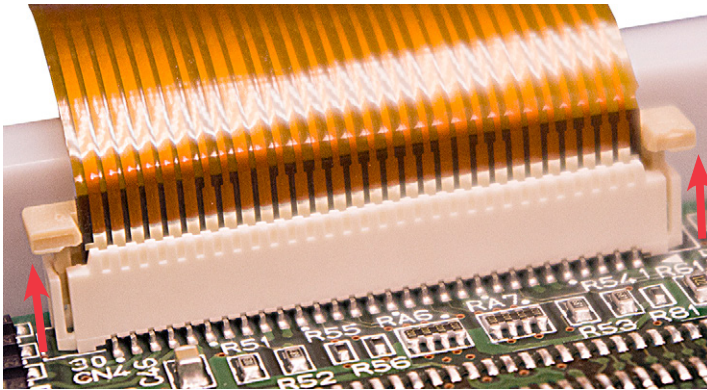


3. Turn the printer so that the printer door faces you.
4. Lift the top housing off of the printer, and then disconnect the two wiring harnesses. Set the top housing aside.
5. Slide the printer door upward to unlatch it, and then open it.

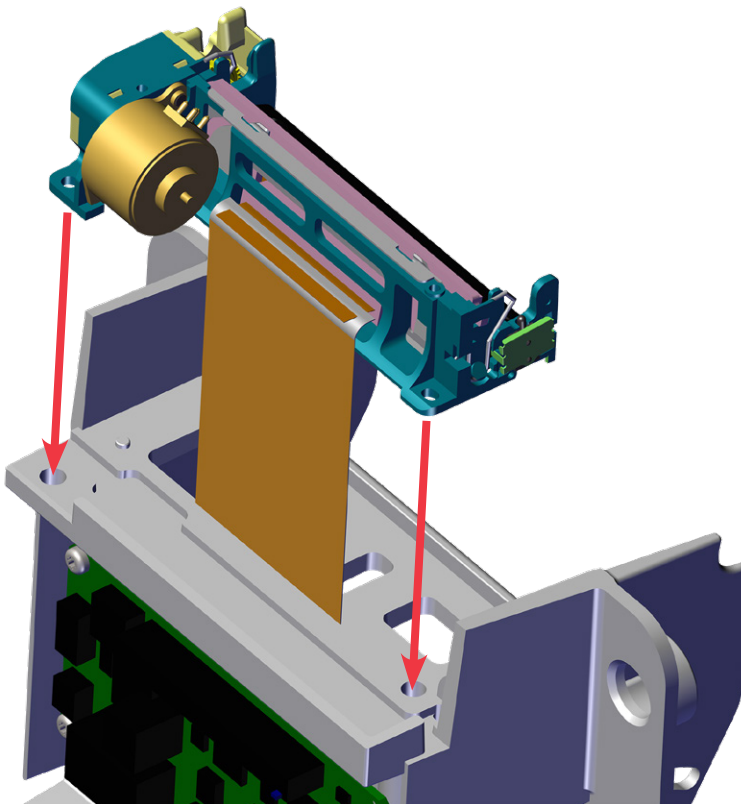


6. Lift the printer assembly out of the bottom housing, moving the guide pins on the printer door out of their grooves if necessary.

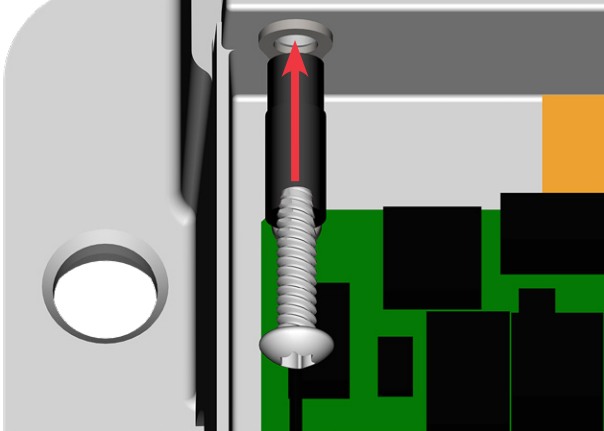
- On the existing printer controller PCBA, slide the locking tab on the flex cable connector upward (away from the PCBA). Remove the end of the flex cable from the connector.



8. Using a torque screwdriver with a T10 star bit, remove the (2) printer mechanism screws (0261-0991), and then remove the printer mechanism from the printer chassis.
9. Position the new printer mechanism on the printer chassis so that its mounting holes line up with the screw holes on the chassis.

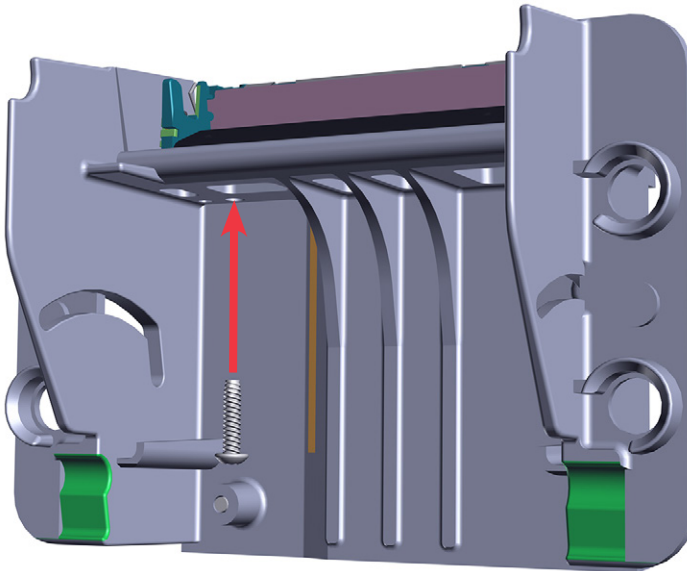


10. Insert (1) printer mechanism screw (0261-0091) through the loose end of the grounding lead, then through the printer chassis, and finally into the mounting hole on the left side of the printer mechanism. Using a torque screwdriver with a T10 star bit, tighten the screw to 0.9 N-m (8 in-lb).



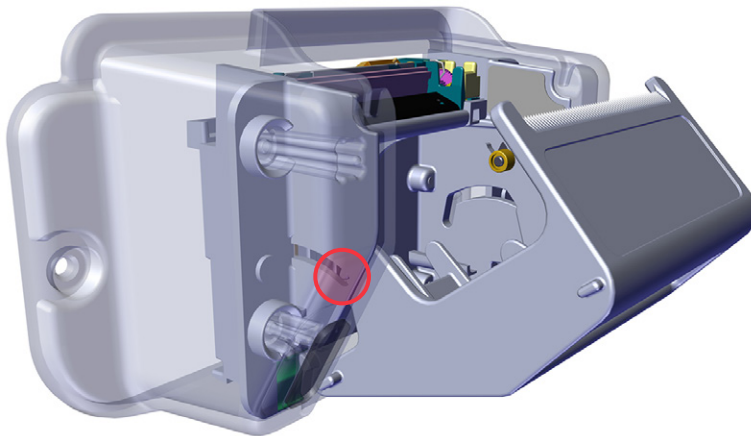
11. Insert a second printer mechanism screw (0261-0091) through the printer chassis and into the mounting hole on the right side of the printer mechanism. Using a torque screwdriver with a T10 star bit, tighten the screw to 0.9 N-m (8 in-lb).

Note: You must insert this screw from the opposite side of the printer chassis.



12. Insert the end of the flex cable from the printer mechanism into the connector on the printer controller PCBA. Press the locking tabs on the connector down to secure the flex cable.

13. Insert the printer assembly into the bottom housing, pushing the guide pins on the printer door into the grooves on the printer assembly.



14. Close the printer door, and then slide it down into its locked position. This holds the printer assembly in place during the following two steps.
15. Attach the power and data wiring harnesses to the top housing.
16. Replace the top housing, taking care to keep all power and data wires away from the pinch points between the housing and the printer assembly. Using a torque screwdriver with a T10 star bit, attach (4) top housing screws (0261-0091). Tighten the screws to 0.9 N-m (8 in-lb).
17. Gently shake the printer and ensure no parts are loose.
18. Install a roll of thermal printer paper as described in [Load Thermal Paper](#) on page 148.
19. If the console was not received with a cart mounting bracket, insert or seat the (2) screws in the screw holes in the lower printer housing, and then use a screwdriver with a Phillips bit to tighten them securely. The procedure is complete.

If the console was received with a cart mounting bracket, skip to the following step.
20. Place the bracket washer (0263-0149) over the hole in the mounting plate.
21. Position the cart mounting bracket (0130-0774) over the printer.
22. Insert the (2) upper bracket screws (0260-0588) through the two upper branches of the mounting bracket and into the holes on either side of the printer.
23. Insert the lower bracket screw (0260-0589) through the lower branch of the mounting bracket and the spacer, and then into the hole in the mounting plate.
24. Using a screwdriver with a Phillips bit, tighten the screws securely.

PROCEDURE 30. REPLACE THE PRINTER CHASSIS

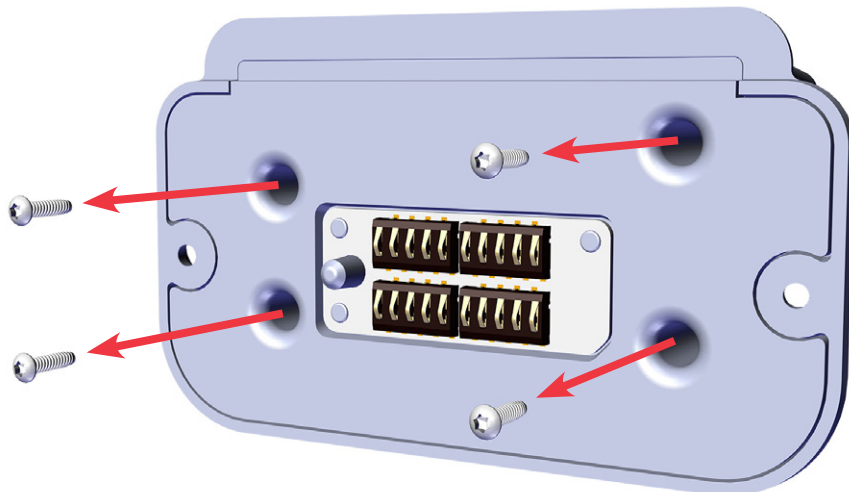
QUANTITY	PART #	DESCRIPTION
Parts		
1	0122-1148	Printer chassis
1	0125-2428	Interior printer label
4	0261-0091	Top housing screw, M3, 12 mm, T10 drive
3	0261-0091	Printer controller PCBA screw, M3, 12 mm, T10 drive
AR	0800-0576	Cart mount kit
1	0130-0774	Cart mounting bracket
2	0260-0588	Upper bracket screw, 10-32, 3/4-in, Phillips
1	0260-0589	Lower bracket screw, 1/4-20, 0.625-in, Phillips (optional)
1	0263-0149	Bracket washer, 0.252-in internal diameter (optional)
Tools		
1	—	Torque screwdriver calibrated to 0.9 ± 0.06 N-m (8 ± 0.5 in-lb)
1	—	Electric or manual interchangeable-bit screwdriver
1	—	Phillips bit
1	—	T10 star bit

- Using a screwdriver with a Phillips bit, loosen the (2) screws securing the printer to the back of the console. Remove the printer from the back of the console and set the screws aside if necessary.

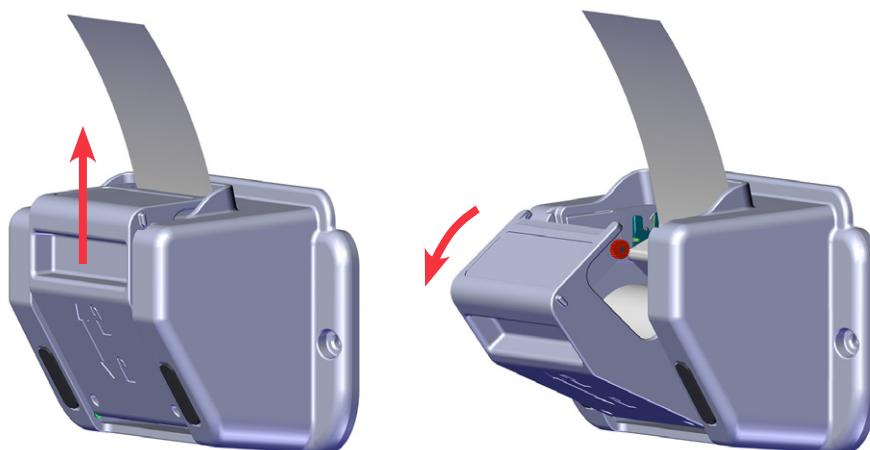
Note: If a cart mounting bracket is installed over the printer, remove the (3) screws securing the bracket to the back of the console and the washer between the bracket and the mounting plate. Set the bracket, the washer, and the screws aside.



2. Using a torque screwdriver with a T10 star bit, remove the (4) top housing screws (0261-0091).

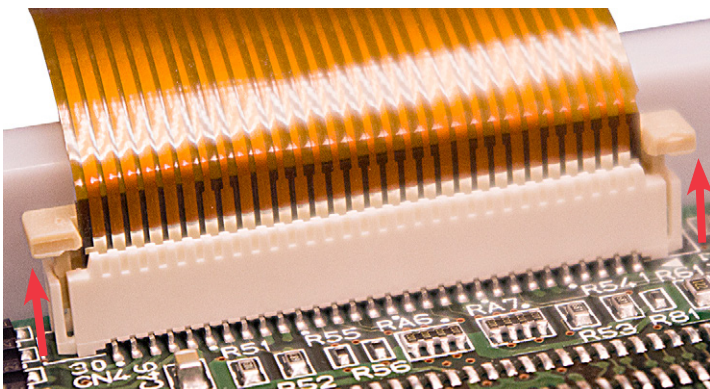


3. Turn the printer so that the printer door faces you.
4. Lift the top housing off of the printer, and then disconnect the two wiring harnesses. Set the top housing aside.
5. Slide the printer door upward to unlatch it, and then open it.

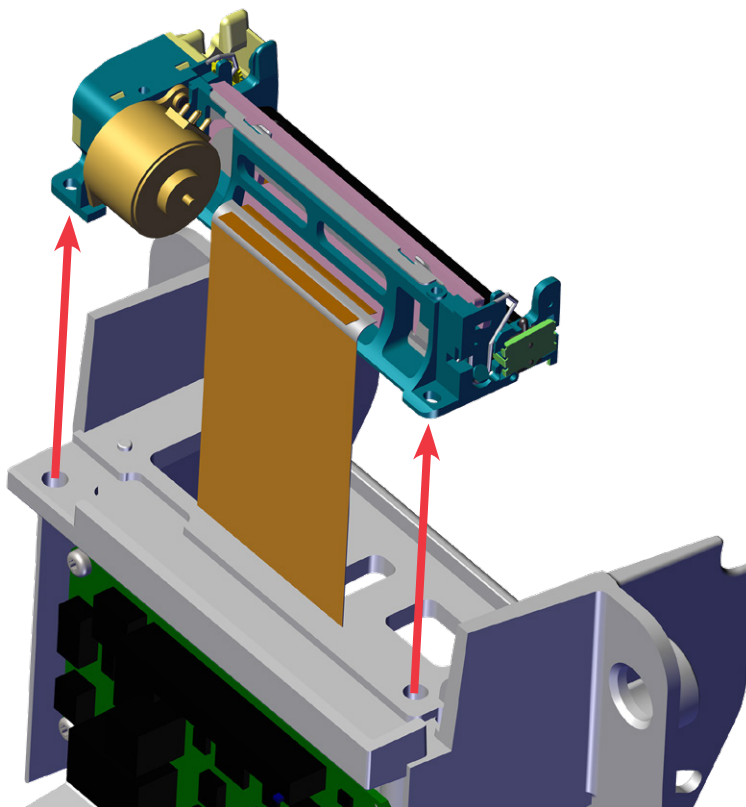


6. Lift the printer assembly out of the bottom housing, moving the guide pins on the printer door out of their grooves if necessary.

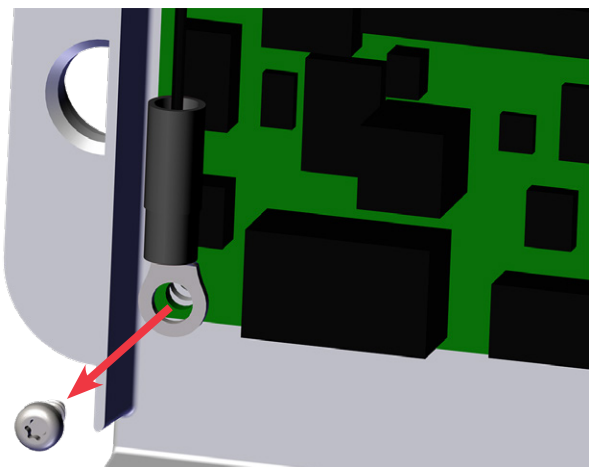
- On the existing printer controller PCBA, slide the locking tab on the flex cable connector upward (away from the PCBA). Remove the end of the flex cable from the connector.



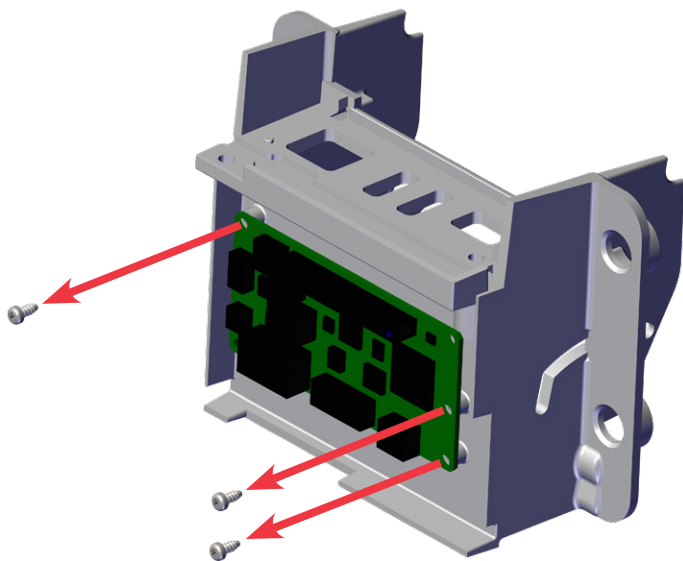
8. Using a torque screwdriver with a T10 star bit, remove the (2) printer mechanism screws (0261-0991), and then remove the printer mechanism from the printer chassis.



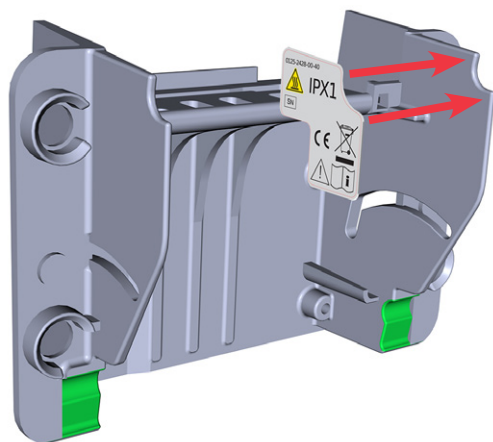
9. Using a torque screwdriver with a T10 star bit, remove the screw (0261-0091) securing the grounding lead to the printer controller PCBA. Remove the grounding lead and set it aside.



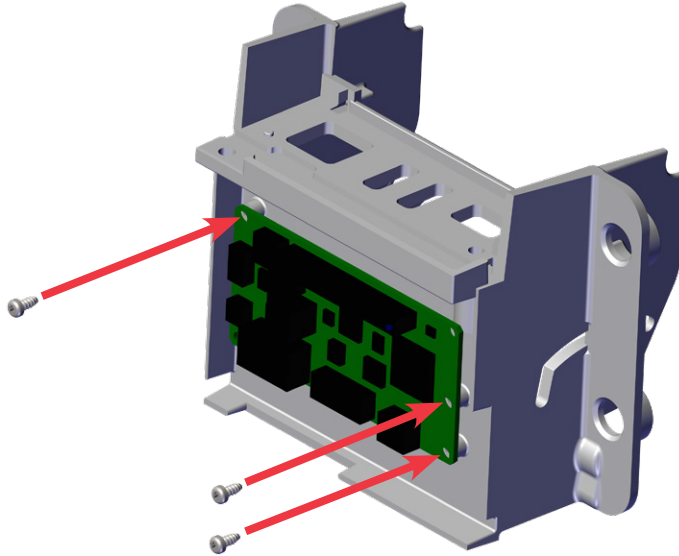
10. Using a torque screwdriver with a T10 star bit, remove the (2) screws (0261-0091) securing the printer controller PCBA to the printer chassis. Remove the printer controller PCBA and set it aside.



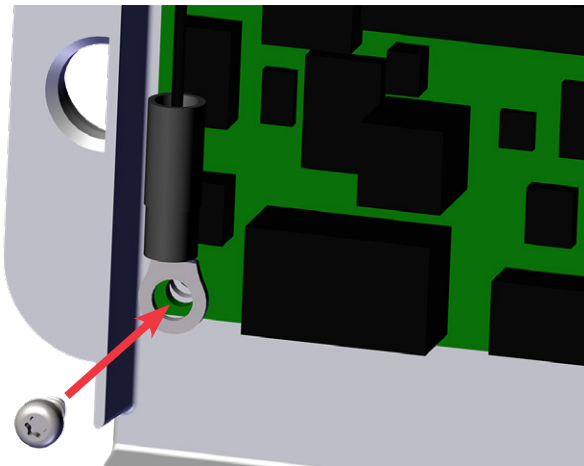
11. Apply an interior printer label to the printer chassis as shown in the following figure. Remove the backing from the label, align it with the corner of the chassis, and then press it into place.



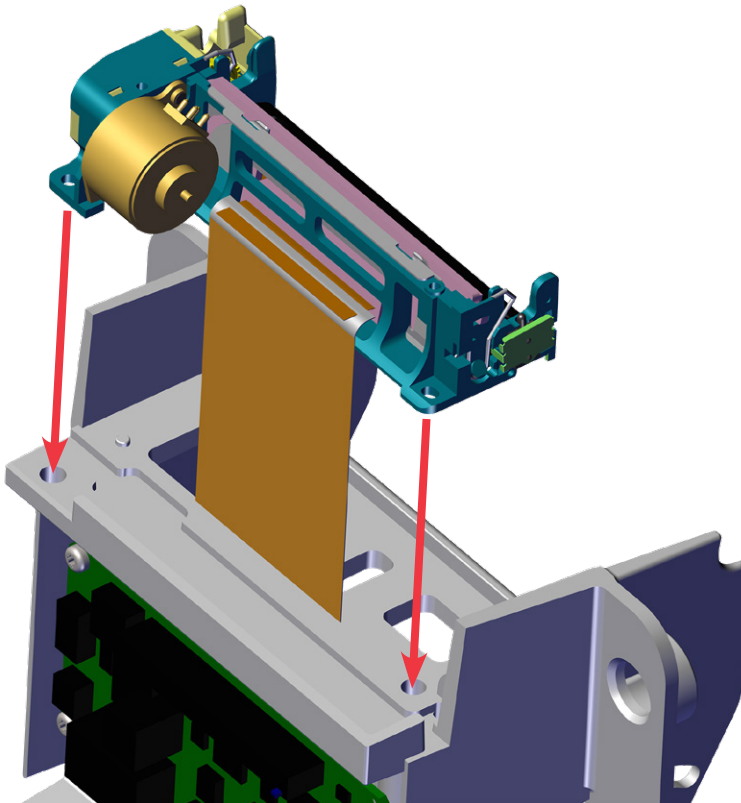
12. Position the printer controller PCBA on the new printer chassis so that the screw holes on the PCBA line up with the holes in the chassis. Using a torque screwdriver with a T10 star bit, attach (2) screws (0261-0091) to secure the PCBA to the chassis. Tighten the screws to 0.9 N-m (8 in-lb).



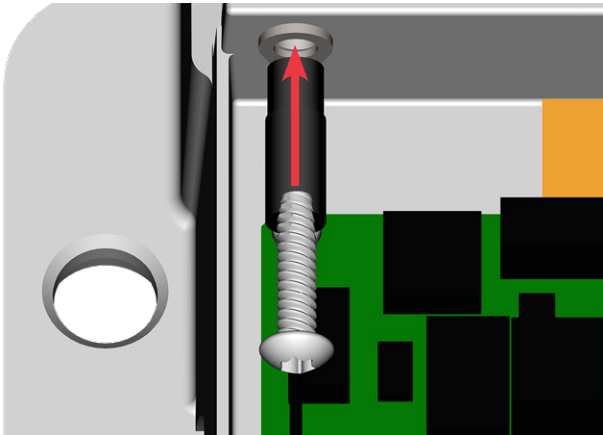
13. Insert (1) screw (0261-0091) through the loose end of the grounding lead and the hole at the lower left corner of the printer controller PCBA. Using a torque screwdriver with a T10 star bit, tighten the screw to 0.9 N-m (8 in-lb).



14. Position the printer mechanism on the new printer chassis so that its mounting holes line up with the screw holes on the chassis.

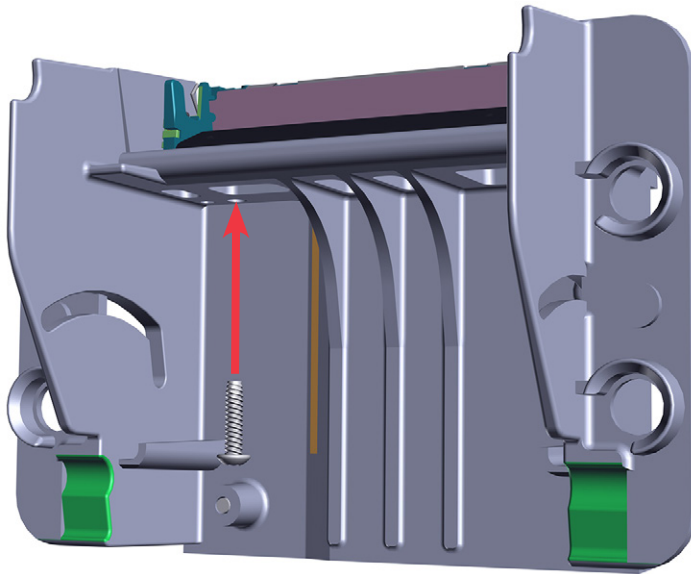


15. Insert (1) printer mechanism screw (0261-0091) through the loose end of the grounding lead, then through the printer chassis, and finally into the mounting hole on the left side of the printer mechanism. Using a torque screwdriver with a T10 star bit, tighten the screw to 0.9 N-m (8 in-lb).

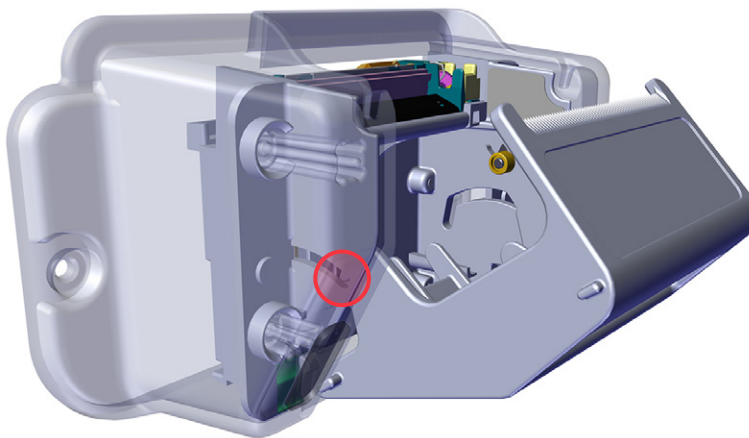


16. Insert a second printer mechanism screw (0261-0091) through the printer chassis and into the mounting hole on the right side of the printer mechanism. Using a torque screwdriver with a T10 star bit, tighten the screw to 0.9 N-m (8 in-lb).

Note: You must insert this screw from the opposite side of the printer chassis.



17. Insert the end of the flex cable from the printer mechanism into the connector on the printer controller PCBA. Press the locking tabs on the connector down to secure the flex cable.
18. Insert the printer assembly into the bottom housing, pushing the guide pins on the printer door into the grooves on the printer assembly.



19. Close the printer door, and then slide it down into its locked position. This holds the printer assembly in place during the following two steps.
20. Attach the power and data wiring harnesses to the top housing.
21. Replace the top housing, taking care to keep all power and data wires away from the pinch points between the housing and the printer assembly. Using a torque screwdriver with a T10 star bit, attach (4) top housing screws (0261-0091). Tighten the screws to 0.9 N-m (8 in-lb).
22. Gently shake the printer and ensure no parts are loose.
23. Install a roll of thermal printer paper as described in [Load Thermal Paper](#) on page 148.
24. If the console was not received with a cart mounting bracket, insert or seat the (2) screws in the screw holes in the lower printer housing, and then use a screwdriver with a Phillips bit to tighten them securely. The procedure is complete.

If the console was received with a cart mounting bracket, skip to the following step.
25. Place the bracket washer (0263-0149) over the hole in the mounting plate.
26. Position the cart mounting bracket (0130-0774) over the printer.
27. Insert the (2) upper bracket screws (0260-0588) through the two upper branches of the mounting bracket and into the holes on either side of the printer.
28. Insert the lower bracket screw (0260-0589) through the lower branch of the mounting bracket and the spacer, and then into the hole in the mounting plate.
29. Using a screwdriver with a Phillips bit, tighten the screws securely.

PROCEDURE 31. REPLACE THE LOWER PRINTER HOUSING

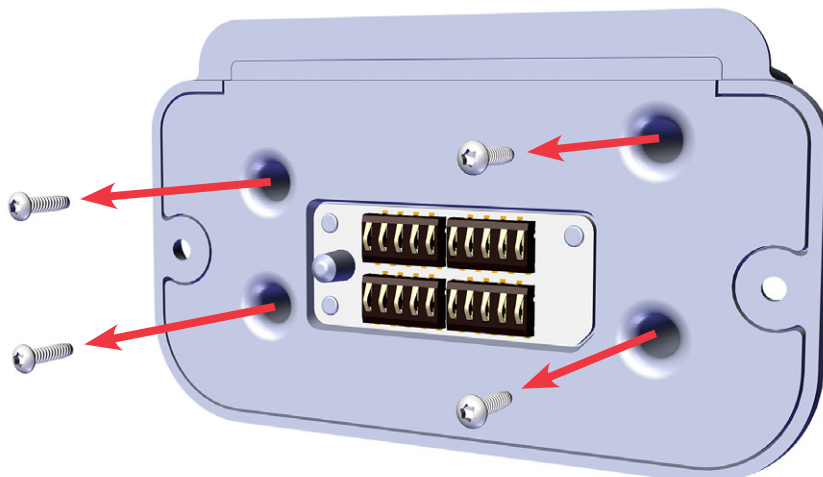
QUANTITY	PART #	DESCRIPTION
Parts		
1	0122-0965	Lower printer housing
2	0120-0761	Rubber foot
4	0261-0091	Top housing screw, M3, 12 mm, T10 drive
3	0261-0091	Printer controller PCBA screw, M3, 12 mm, T10 drive
AR	0800-0576	Cart mount kit
1	0130-0774	Cart mounting bracket
2	0260-0588	Upper bracket screw, 10-32, 3/4-in, Phillips
1	0260-0589	Lower bracket screw, 1/4-20, 0.625-in, Phillips (optional)
1	0263-0149	Bracket washer, 0.252-in internal diameter (optional)
Tools		
1	—	Torque screwdriver calibrated to 0.9 ± 0.06 N-m (8 ± 0.5 in-lb)
1	—	Electric or manual interchangeable-bit screwdriver
1	—	Phillips bit
1	—	T10 star bit

- Using a screwdriver with a Phillips bit, loosen the (2) screws securing the printer to the back of the console. Remove the printer from the back of the console and set the screws aside if necessary.

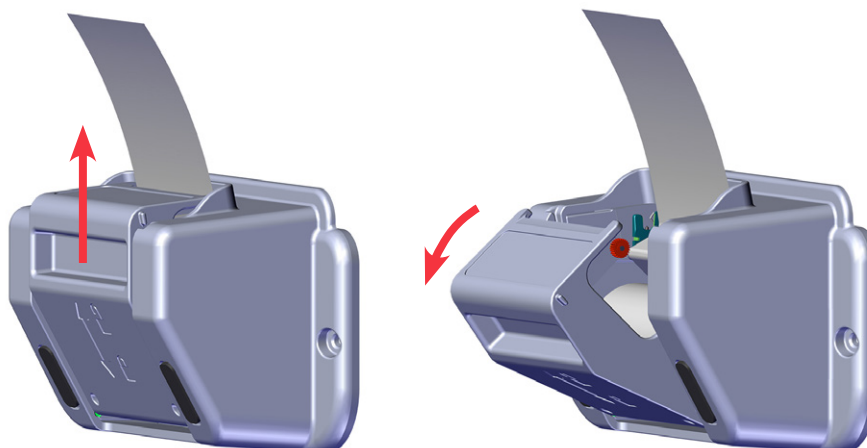
Note: If a cart mounting bracket is installed over the printer, remove the (3) screws securing the bracket to the back of the console and the washer between the bracket and the mounting plate. Set the bracket, the washer, and the screws aside.



2. Using a torque screwdriver with a T10 star bit, remove the (4) top housing screws (0261-0091).

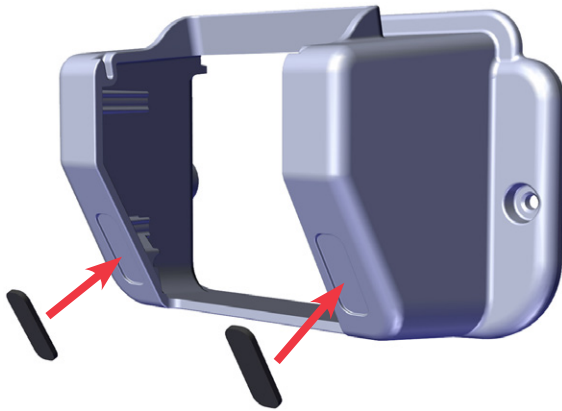


3. Turn the printer so that the printer door faces you.
4. Lift the top housing off of the printer, and then disconnect the two wiring harnesses. Set the top housing aside.
5. Slide the printer door upward to unlatch it, and then open it.

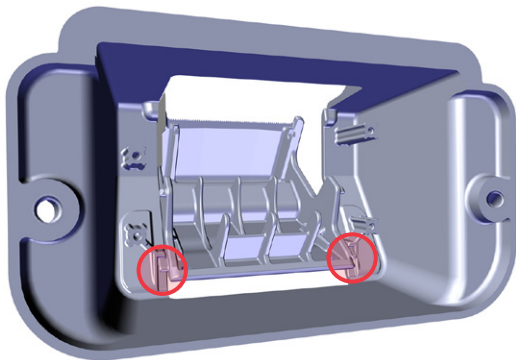


6. Lift the printer assembly out of the bottom housing, moving the guide pins on the printer door out of their grooves if necessary.
7. Lift the printer door out of the bottom housing.

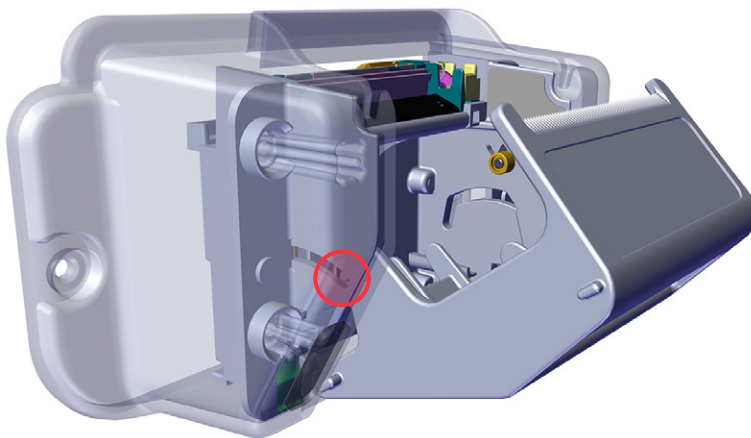
8. Apply two rubber feet to the oval recesses on the new bottom housing (0122-0965). Remove the backing from each rubber foot, and then press the foot into place within the oval recess.



9. Place the new printer door into the bottom housing so that its hinge pins fit into the recesses on the housing.



10. Insert the printer assembly into the bottom housing, pushing the guide pins on the printer door into the grooves on the printer assembly.



11. Close the printer door, and then slide it down into its locked position. This holds the printer assembly in place during the following two steps.
12. Attach the power and data wiring harnesses to the top housing.

13. Replace the top housing, taking care to keep all power and data wires away from the pinch points between the housing and the printer assembly. Using a torque screwdriver with a T10 star bit, attach (4) top housing screws (0261-0091). Tighten the screws to 0.9 N-m (8 in-lb).
14. Gently shake the printer and ensure no parts are loose.
15. Install a roll of thermal printer paper as described in [Load Thermal Paper](#) on page 148.
16. If the console was not received with a cart mounting bracket, insert or seat the (2) screws in the screw holes in the lower printer housing, and then use a screwdriver with a Phillips bit to tighten them securely. The procedure is complete.

If the console was received with a cart mounting bracket, skip to the following step.
17. Place the bracket washer (0263-0149) over the hole in the mounting plate.
18. Position the cart mounting bracket (0130-0774) over the printer.
19. Insert the (2) upper bracket screws (0260-0588) through the two upper branches of the mounting bracket and into the holes on either side of the printer.
20. Insert the lower bracket screw (0260-0589) through the lower branch of the mounting bracket and the spacer, and then into the hole in the mounting plate.
21. Using a screwdriver with a Phillips bit, tighten the screws securely.

PROCEDURE 32. REPLACE THE TOP PRINTER HOUSING

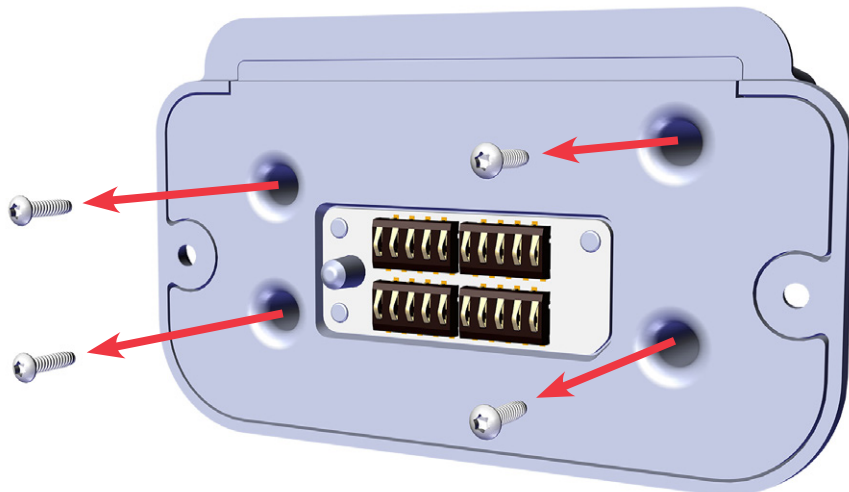
QUANTITY	PART #	DESCRIPTION
Parts		
1	0122-0793	Top printer housing
1	0141-0738	Printer connector PCBA
4	0261-0091	Top housing screw, M3, 12 mm, T10 drive
3	0262-0113	Printer connector nylon lock nut, 4-40
AR	0800-0576	Cart mount kit
1	0130-0774	Cart mounting bracket
2	0260-0588	Upper bracket screw, 10-32, 3/4-in, Phillips
1	0260-0589	Lower bracket screw, 1/4-20, 0.625-in, Phillips (optional)
1	0263-0149	Bracket washer, 0.252-in internal diameter (optional)
Tools		
1	—	Torque screwdriver calibrated to 0.9 ± 0.06 N-m (8 ± 0.5 in-lb)
1	—	Electric or manual interchangeable-bit screwdriver
1	—	Phillips bit
1	—	T10 star bit
1	—	1/4-inch socket wrench

1. Using a screwdriver with a Phillips bit, loosen the (2) screws securing the printer to the back of the console. Remove the printer from the back of the console and set the screws aside if necessary.

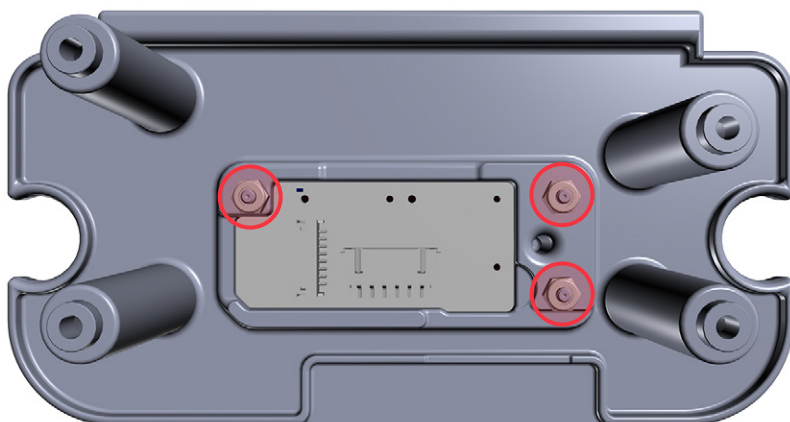
Note: If a cart mounting bracket is installed over the printer, remove the (3) screws securing the bracket to the back of the console and the washer between the bracket and the mounting plate. Set the bracket, the washer, and the screws aside.



2. Using a torque screwdriver with a T10 star bit, remove the (4) top housing screws (0261-0091).

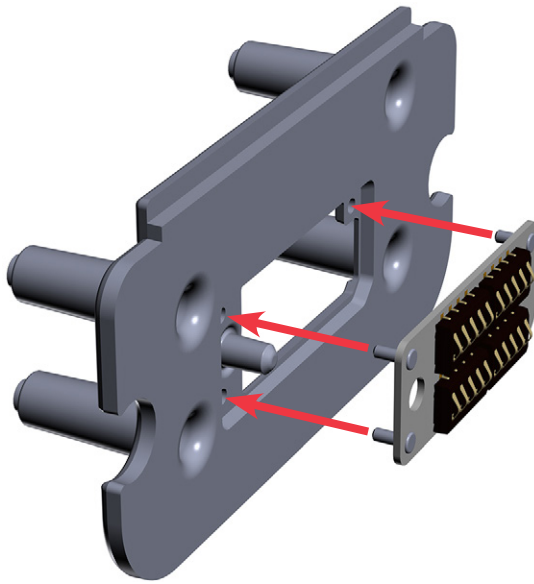


3. Lift the top housing off of the printer, and then disconnect the two wiring harnesses. Set the printer aside.
4. Using a 1/4-inch socket wrench, remove the (3) nylon lock nuts (0262-0113) from the inside of the top housing.

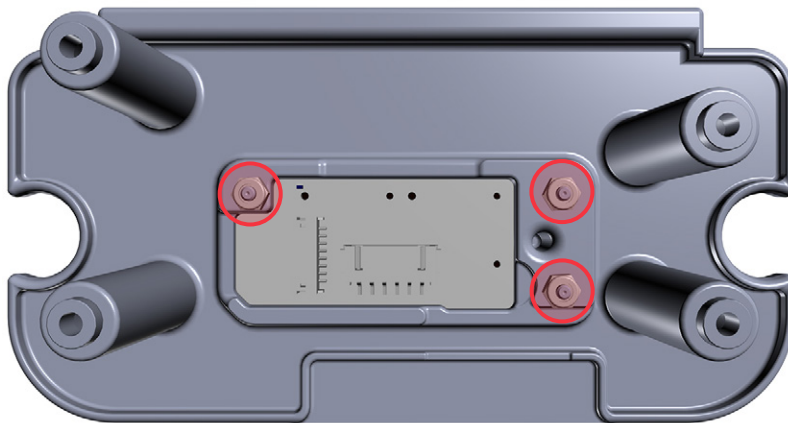


5. Remove the printer connector PCBA from the top housing.

6. Insert the printer connector PCBA (new or existing) into the new top housing so that the embedded screws on the PCBA extend through the screw holes in the housing, as shown in the following figure.



7. Using a ¼-inch socket wrench, attach (3) nylon lock nuts (0262-0113) to the embedded screws on the printer connector PCBA. Tighten the lock nuts until they are snug.



8. Attach the power and data wiring harnesses to the printer connector PCBA.
9. Replace the top housing, taking care to keep all power and data wires away from the pinch points between the housing and the printer assembly. Using a torque screwdriver with a T10 star bit, attach (4) top housing screws (0261-0091). Tighten the screws to 0.9 N-m (8 in-lb).
10. Gently shake the printer and ensure no parts are loose.
11. Install a roll of thermal printer paper as described in [Load Thermal Paper](#) on page 148.

12. If the console was not received with a cart mounting bracket, insert or seat the (2) screws in the screw holes in the lower printer housing, and then use a screwdriver with a Phillips bit to tighten them securely. The procedure is complete.

If the console was received with a cart mounting bracket, skip to the following step.

13. Place the bracket washer (0263-0149) over the hole in the mounting plate.
14. Position the cart mounting bracket (0130-0774) over the printer.
15. Insert the (2) upper bracket screws (0260-0588) through the two upper branches of the mounting bracket and into the holes on either side of the printer.
16. Insert the lower bracket screw (0260-0589) through the lower branch of the mounting bracket and the spacer, and then into the hole in the mounting plate.
17. Using a screwdriver with a Phillips bit, tighten the screws securely.

CALIBRATION PROCEDURE (OPTIONAL)

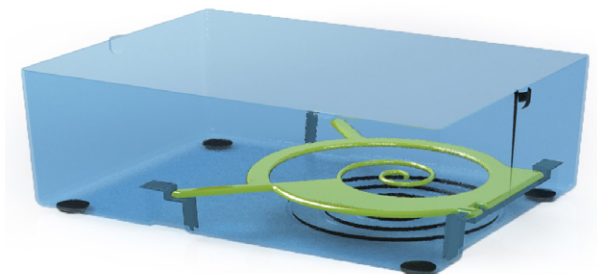
Although BladderScan Prime Plus systems do not require it, calibration is recommended after disassembly and reassembly of the probe or the console.

PROCEDURE 33. PERFORM PROBE CALIBRATION

QUANTITY	PART #	DESCRIPTION
Tools		
1	0620-1083 or 0620-0739	Calibration kit (includes calibration tank and target)
1	—	Clean, soft cloth

Note: Once the calibration process has started, do not press the Standby button or disconnect the probe from the console.

1. Place the calibration tank on a flat, non-reflective surface, and then remove the lid.
2. Using the notches to position the spiral shaped target correctly, place the target in the tank base.
3. Pour clean, room-temperature water into the container, filling to the top of the textured section.
4. Minimize the amount of air bubbles in the water and on the target.



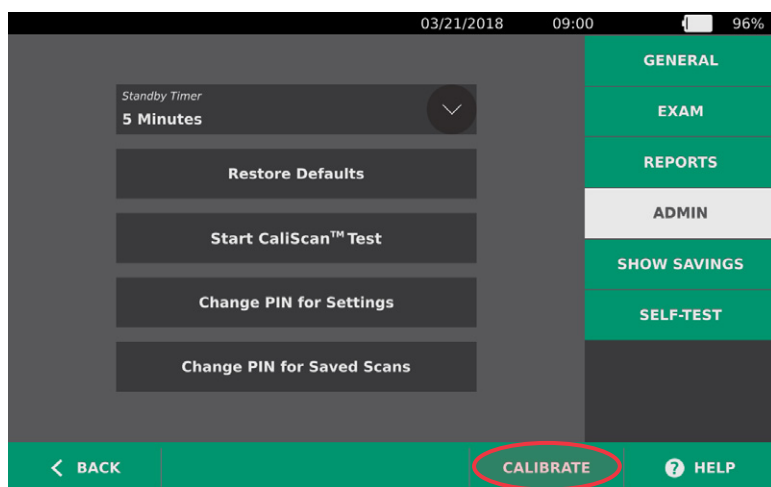
5. Replace the tank lid onto the base.

6. Place the probe into the adapter in the tank lid. Align the probe button with the notch exactly as shown, and ensure that the tip of the probe is submerged in the water.

Note: Align the probe button with the notch in the adapter exactly as shown—installation in another orientation may result in failure to calibrate.



7. Ensure that the probe is attached to the console and that the system is on.
8. On the Home screen, tap **Settings**.
9. Tap **Admin**, and then at the bottom of the screen, tap **Calibrate**.



10. Review the instructions that appear on the screen, and then tap the **Calibrate** button above them. A waiting indicator appears on the screen while the calibration is in progress.

Note: Once the calibration process has started, do not press the Standby button or disconnect the probe from the console.

- If calibration is successful, a message on the console indicates that the probe has passed.
- If calibration fails, a message on the console indicates calibration failure.

11. If a calibration failure occurs:
 - Ensure that the calibration tank has sufficient water.
 - Minimize the amount of air bubbles in the water and on the target.
 - Verify that the probe is seated properly in the tank lid.
12. Tap **Calibrate** to begin recalibration. If repeat calibration failures occur, skip to [Diagnostics & Troubleshooting](#) on page 21 to diagnose the system.
13. When you are finished, tap **Back**.
14. Remove the probe from the tank lid, and then dry the probe with a clean, soft cloth.

REFERENCE DOCUMENTATION

WORKMANSHIP STANDARDS

When performing repairs or inspections, this chapter ensures that all technicians are performing the highest quality services while maintaining uniform standards. When assessing whether a part needs to be replaced for cosmetic reasons, refer to the guidance in this chapter.

CLEANING STANDARDS

Ensure the console and probe are clean, as follows:

- Ensure no cleaner residue is present.
- Clean the touch screen.
- Ensure there is no external dust or lint on the device.
- Clean dried ultrasound gel from the probe.
- Remove residue from tape, stickers, or labels.
- Clean surfaces with isopropyl alcohol to prepare them for new labels.
- Clean the probe LCD of oil marks, smudges, or chemical buildup.
- Wipe down the probe cable, ensuring that it is free of buildup or grime.
- If possible, remove any pen marks.

COMPONENT AND PART REPLACEMENT STANDARDS

CONSOLE COMPONENTS & PARTS

Refer to the following guidance when assessing whether to replace a console component:

- Replace a cracked component if:
 - The crack is sharp or could cause harm.
 - The crack is 5.1 cm (2 inches) or more in length.
- Replace any applicable part if its bosses are broken or stripped. A *boss* is a channel or void in an extrusion that accepts a certain diameter screw.
- Replace the touchscreen display assembly if any cracks are present in the glass covering the screen and buttons.
- Replace the touchscreen display assembly or the back panel if only the colored portion of the handle is cracked.

PROBE COMPONENTS AND PARTS

Refer to the following guidance when assessing whether to replace a probe component:

- Replace a cracked component if:
 - The crack is sharp or could cause harm.
 - The crack is 1.3 cm (½ inch) or longer.
 - Two or more cracks are present (per component).
 - Shallow cracking or *crazing* (a network of fine cracks on the surface of the material) is present on the DCM dome.
- Replace the probe cap assembly if:
 - The probe cable has excessive damage, such as deep nicks or cuts that expose wires or shielding, or damaged connectors. Do not replace the probe cap assembly if the only damage is kinks in the cable.
 - The probe LCD is cracked.
 - The status icons are not visible on the probe.
- Replace the DCM if significant pieces have been cut or torn away from its green rubber molding. If the surface of the molding is roughened, it is still acceptable. Deep gate marks in the molding are also acceptable.

Acceptable Wear



Gate mark (acceptable)

Unacceptable Damage



REFERENCE PROCEDURES

PROCEDURE 34. LOAD THERMAL PAPER



WARNING

To avoid the risk of injury, when the printer door is open:

- Do not touch the printer mechanism or print head, which may be hot from recent printing.
- Do not touch the surface of the paper cutter.

The BladderScan Prime Plus system senses the presence of paper and automatically displays a message when the printer is out of paper.

QUANTITY	PART #	DESCRIPTION
Parts		
1	0800-0319	Thermal paper roll

1. Slide the printer door toward you. Placing your thumb on the outside of the printer and squeezing can facilitate easy opening.
2. Rotate the door down to open.



3. Place a roll of Verathon thermal paper (part 0800-0319) inside the door as shown so that the loose end of the paper exits on the top of the roll as shown (on the side closest to the console).



4. While centering the paper, rotate the door up, and lock it closed by squeezing the label toward the back of the printer. Ensure that the door clicks into place.



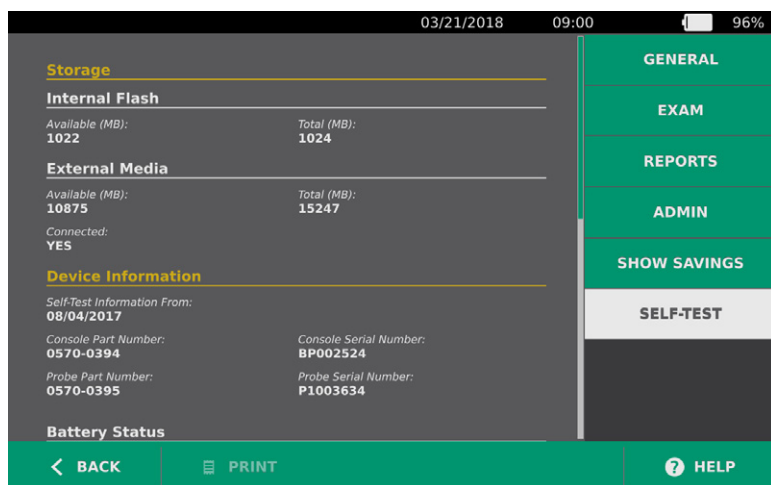
5. Tear off any excess paper protruding from the printer. For best results, pull the paper diagonally, starting the cut on one side of the paper, and finishing on the other.

PROCEDURE 35. RUN A SELF-TEST

The BladderScan Prime Plus self-test function completes self-diagnostic testing on the following:

- Internal memory (and external devices, if any)
- Hardware components, including the console, installed battery, probe, and printer, if attached
- BladderScan Prime Plus software

1. On the Home screen, tap the **Settings** icon, and then tap **Self-Test**. The Settings screen opens to the Self-Test tab, where the system completes the self-test and displays the results.



2. Scroll through the on-screen test results by vertically swiping with your finger on the touchscreen.
3. If the screen indicates any failed tests or abnormal results, continue troubleshooting the system.
4. If you want to print the self-test results, tap **Print**.
5. When you are finished viewing the test results, tap **Back**. The console returns to the Home screen.

ACCURACY SPECIFICATIONS

The following accuracy specifications assume usage per instructions, compliance with operating and storage conditions, and scanning a tissue-equivalent phantom.

BLADDER VOLUME

In order to ensure that the highest standards of quality are being met, the range of accuracy used by all service technicians when scanning a tissue-equivalent bladder phantom is $\pm 7.5\%$ for volumes greater than 100 mL and ± 7.5 mL for volumes of 100 mL or less. The following examples show how these ranges may affect reported volume measurements.

- If the measurement is greater than 100 mL, the accuracy range is $\pm 7.5\%$ and is calculated as follows:
 $240 \text{ mL} \times 7.5\% = 18 \text{ mL}$
 $240 \pm 18 \text{ mL} = \mathbf{222\text{--}258 \text{ mL}}$
- If the measurement is 0–100 mL, the accuracy range is ± 7.5 mL and is calculated as follows:
 $80 \text{ mL} \pm 7.5 \text{ mL} = \mathbf{73\text{--}88 \text{ mL}}$ (rounded to the nearest whole number)

While the upper threshold of the accuracy range is 999 mL, the system is capable of detecting and displaying bladder volumes above 999 mL. Verathon cannot guarantee the accuracy of measurements outside of the stated specifications.

PHANTOM SPECIFICATIONS

Record the accuracy range of your tissue-equivalent phantom below. Accuracy is compromised if the user does not obtain an optimal, repeatable image within the accuracy range.

Our **adult bladder** tissue-equivalent phantom is _____ mL; its range is _____ to _____ mL.

GLOSSARY

TERM	DEFINITION
A	Ampere (also known as <i>amp</i>)
AR	As required
Boss	A channel or void in an extrusion that accepts a certain diameter screw
BSP	Binary source package
CFR	Code of Federal Regulations
Crazing	A network of fine cracks on the surface of a material
DataMatrix	A standard type of two-dimensional matrix barcode
DCM	Data collection module
ESD	Electrostatic discharge
FPGA	Field-programmable gate array (the component on which the probe's firmware is stored)
g	Gram
in-lb	Inch-pound, a unit of torque
LCD	Liquid-crystal display
N-m	Newton-meter, a unit of torque
Ohm	The SI unit of electrical resistance, expressing the resistance in a circuit transmitting a current of one ampere when subjected to a potential difference of one volt
PCBA	Printed circuit board assembly
RA	Return authorization
RoHS	Restriction of Hazardous Substances
SD	Secure Digital, a data storage card format
SI	International System of Units
UDI	Unique Device Identification, a service of the U.S. Food and Drug Administration (FDA) that tracks individual medical devices using standardized identification codes
Underlabel	A custom-printed element inserted behind the transparent window of a device label
USB	Universal Serial Bus, a common hardware interface standard for flash drives and other devices
V	Volt

PART NUMBERS

PART	PART NUMBER
Console Components	
Touchscreen display assembly with flex cables (newer model)	0230-0142
Touchscreen display assembly with flex cables (older model)	0230-0114
Back panel	0122-1253 (replaces 0122-0744)
Rubber foot	0120-0761
Battery bay cover	0122-0776
Battery door	0122-1252 (replaces 0122-0743)
Battery door hinge	0122-1251 (replaces 0122-0741)
Probe cable port receptacle	0200-0862
Probe cable port connector	0200-0863
Main chassis	0122-0749
Lower housing	0122-1202 (replaces 0122-0811)
Upper housing	0122-1201 (replaces 0122-0800)
Upper mounting bracket	0122-0797
Speaker with cables and connector	0142-0282
Accessory interface PCBA	0141-0783
USB/SD PCBA	0141-0781
Reset switch assembly	0142-0758
Main PCBA	0142-1070 or 0142-0820
Coin cell, BR2330, PCB mount	0400-0131
Lithium-ion battery pack, 11.1 V, 51 Wh	0400-0126
10.8 V, 6400 mAh, 70 Wh lithium-ion rechargeable battery	0400-0155
10.95 V, 7000 mAh, 77 Wh lithium-ion rechargeable battery	0400-0164
Instrument label kit, individually customized (UDI-compliant systems, console part number 0570-0346)	0800-0547
Instrument label kit, individually customized (UDI-compliant systems, console part number 0570-0394)	0800-0613
Instrument label (non-UDI systems)	0125-2385
USB/SD port label	0125-2514
USB/SD port cover (optional)	0122-0814
Adhesive foam tape for USB/SD port cover, 1.3 cm (½-in), roll (optional)	0136-0190
Console stand (optional)	0122-0818
Cart mount kit	0800-0576
Cart mounting bracket (optional)	0130-0774

PART		PART NUMBER
Console Fasteners		
Screw, 10-32, 3/4-in, Phillips	Upper bracket screw (optional)	0260-0588
Screw, 1/4-20, 0.625-in, Phillips	Lower bracket screw (optional)	0260-0589
Screw, M2.5, 8 mm, self-tapping, T8 drive	Battery bay screw	0261-0255
	Battery door screw	
	Receptacle screw	
	Lower housing screw	
	Upper housing screw	
	USB/SD PCBA screw	
	Main PCBA screw	
	Audio/video PCBA screw	
Screw, 4-20, 1/2-in, self-tapping, T10 drive	Front panel screw	0261-0256
	Back panel screw	
Screw, 4-20, 7/8-in, self-tapping, T10 drive	Front panel screw	0261-0499
Screw, 10-32, 1/2-in, machine	Console stand screw (optional)	0261-0332
Screw, M2.63, 10 mm, self-tapping, T8 drive	Speaker mounting screw	0261-0336
Washer, 0.252-in internal diameter	Bracket washer (optional)	0263-0149
Spacer, M5, 16 mm	Front panel spacer	0260-0757
Printer Components (Optional)		
Printer door		0122-0792
Instructional label		0125-2427
Interior label		0125-2428
Printer mechanism with flex cable		0570-0189
Printer controller PCBA		0141-1138
Top housing		0122-0793
Printer connector PCBA		0141-0738
Bottom housing		0122-0965
Rubber foot		0120-0761
Printer chassis		0122-1148
Grounding lead		0600-0826
Power wiring harness		0600-0825
Data wiring harness		0600-0691
Paper roll for thermal printer		0800-0319
Printer Fasteners (Optional)		
Screw, M3, 12 mm, T10 drive	Printer mechanism screw	0261-0091
	Top housing screw	
Screw, M2.2 x 0.85, 6 mm, T6 drive	Printer controller PCBA screw	0261-0416
Printer connector nylon lock nut, 4-40		0262-0113

PART		PART NUMBER
Probe Components		
Probe cap/LCD assembly		0142-0910
Probe cap and cable assembly (without LCD)		0600-0854
Probe LCD overlay		0120-0737
LCD flex cable		0600-0720
Probe display clamp		0122-0883
Probe display PCBA		0141-0913
LCD element		0230-0132
LCD backlight		0142-0818
Probe display foam gasket		0120-0742
Cap mount		0122-0774
Interconnect PCBA Subassembly	Power PCBA	0141-0756
	Adhesive insulator	0120-0770
	MCU/FPGA PCBA	0141-1127 or 0141-0755
Probe body assembly with scan button flex cable		0142-1002
Probe wiring harness, 30-conductor		0600-0707
Probe wiring harness, 20-conductor		0600-0708
ADC PCBA		0141-0757
AFE PCBA		0141-0760
Data collection module (DCM) assembly		0142-1029 or 0142-1080
O-ring		0120-1061
BladderScan Prime Plus SPP Probe Label Replacement Kit (probes with part number 0570-0347 and serial numbers beginning with P10)		0800-0545
BladderScan Prime Plus SPP Probe Label Replacement Kit (probes with part number 0570-0347 or 0570-0395 and serial numbers beginning with P15)		0800-0555
BladderScan Prime Plus Probe Exchange SPP Label Kit (probes with part number E570-0395)		0800-0672
Probe Fasteners		
Screw, 4-40, 3/4-in, T10 drive	Probe cap screw	0261-0398
Screw, panhead, M2.5 × 0.45, 8 mm, SS, Nylok, T8 drive	Cap mount screw	0261-0445
	Probe display assembly screw (probe caps with new LCD element)	
Screw, M2.5 × 0.45, 5 mm, T8 drive	Probe PCBA screw	0261-0341
Screw, 4-40, 1/4-in, T10 drive	Probe display assembly screw (probe caps with old LCD element)	0261-0328
Standoff, M2.5 × 0.45, 6.5 mm	Probe PCBA standoff	0264-0120
Set screw, 4-40, 3/16-in, 0.050-in hex drive, stainless steel		0261-0426

PART	PART NUMBER
Tools & Test Fixtures	
Certified adult bladder phantom	0620-0068
Test console, known-good, with latest software	0570-0346 or 0570-0394
Test probe, known-good	0570-0347, 0570-0395, or E570-0395
Test printer, known-good	0800-0528
Calibration kit	0620-1083 or 0620-0739
Battery charger	0400-0157 or 0400-0130
Lithium-ion battery pack, 11.1 V, 51 Wh	0400-0126
10.8 V, 6400 mAh, 70 Wh lithium-ion rechargeable battery	0400-0155
10.95 V, 7000 mAh, 77 Wh lithium-ion rechargeable battery	0400-0164

