

# **ZD621 and ZD421**

## **Link-OS® Desktop Printers**



**ZEBRA**

## **Service Manual**

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# About this Guide

This guide provides information about servicing the Zebra Link-OS ZD421 and ZD621 desktop printers. Use this guide to repair these printers.

## Related Documents and Software

Use these links to get to your Online printer support resources:

- ZD621 Thermal Transfer Printer — [zebra.com/ZD621t-info](http://zebra.com/ZD621t-info)
- ZD621 Direct Thermal Printer — [zebra.com/ZD621d-info](http://zebra.com/ZD621d-info)
- ZD421 Thermal Transfer Ribbon Cartridge Printer — [zebra.com/ZD421c-info](http://zebra.com/ZD421c-info)
- ZD421 Thermal Transfer Printer — [zebra.com/ZD421t-info](http://zebra.com/ZD421t-info)
- ZD421 Direct Thermal Printer — [zebra.com/ZD421d-info](http://zebra.com/ZD421d-info)
- ZD621R Thermal Transfer Printer — [zebra.com/ZD621r-info](http://zebra.com/ZD621r-info)

The printer resources to support this printer include:

- “How To” videos
- Printer accessory, supplies, parts, and software links
- Various setup and configuration guides
- Programmer’s manuals,
- Printer Drivers (Windows, Apple, OPOS, etc.)
- Printer Firmware
- Printer Fonts
- Utilities
- Knowledge base and support contacts
- Printer warranty and repair links

## Other Valuable Printer Resources

Zebra has a large suite of free and fee-based software, Apps (applications), and other technical resources for your Zebra Link-OS printer.

These are just some of the extensive software and resource areas available online at [Zebra.com](http://Zebra.com):

- Label Design software
- Printer Management tools
- Virtual Devices for legacy languages normally associated with other printer brands
- Cloud-based Enterprise printer management and printing
- XML and PDF format file printing
- Oracle and SAP support
- Zebra Savanna™ Data Intelligence platform - turns raw data from devices (IoT) and sensors into actionable intelligence for your business
- A suite of Link-OS Mobile Apps (applications for phones, tablets, etc.)
- Link-OS software development kit (SDK)
- Additional Operating Systems (OS) and Service platforms

See ZebraLink, Zebra Link-OS, and Zebra Savanna from this Online link: [zebra.com/software](http://zebra.com/software)

## Zebra OneCare Printer Service and Support

For maximum productivity, we can help your business ensure its Zebra printers are Online and ready for business. See the descriptions of the Zebra OneCare service and support options available for your printers Online at this link: [zebra.com/zebraonecare](http://zebra.com/zebraonecare)

## Icon Conventions

The documentation set is designed to give the reader more visual clues. The following graphic icons are used throughout the documentation set. These icons and their associated meanings are described below.



**NOTE:** The text here indicates information that is supplemental for the user to know and that is not required to complete a task.



**IMPORTANT:** The text here indicates information that is important for the user to know.



**CAUTION—EYE INJURY:** Wear protective eyewear when performing certain tasks.



**CAUTION—PRODUCT DAMAGE:** If the precaution is not taken, the product could be damaged.



**CAUTION:** If the precaution is not heeded, the user could receive minor or moderate injury.



**CAUTION—HOT SURFACE:** Touching this area could result in burns.



**CAUTION—ESD:** Observe proper electrostatic safety precautions.



**CAUTION—ELECTRIC SHOCK:** Disconnect the printer power before performing certain procedures to avoid the risk of electric shock.



**WARNING:** If danger is not avoided, the user CAN be seriously injured or killed.



**DANGER!** If danger is not avoided, the user WILL be seriously injured or killed.



**NOTE:** This is an icon for wired networking notes.



**NOTE:** This is an icon for wireless networking notes.

# Introduction

This manual provides ZD421 and ZD621 printer repair, maintenance, and troubleshooting procedures for field engineers or technicians.

Follow the part replacement procedures as closely as possible. If you are unsure of any procedure, please contact your service representative or call the products technical support group at Zebra Technologies Corporation.

Zebra Technologies stocks all replacement parts for the printer. Be sure your facility stocks sufficient parts for the printer so that scheduled maintenance can take place in a timely manner.

To simplify the documentation, the base printer model displayed on the printer has an added model type identifier in parentheses.

- ZD421(c) represents the ZD421 Thermal Transfer Cartridge Printer
- ZD421(d) represents the ZD421 Direct Thermal Printer
- ZD621(d) represents the ZD621 Direct Thermal Printer
- ZD421(t) represents the ZD421 and ZD421CN Thermal Transfer (Roll) Printer
- ZD621(t) represents the ZD621 Thermal Transfer (Roll) Printer
- ZD621R represents the ZD621R RFID Thermal Transfer (Roll) Printer

## How Repairs and Maintenance Procedures Are Documented

This manual is designed to provide training and instruction for repair and maintenance of your Zebra printer.

Each Link-OS 4 inch Desktop printer Spares Kit has one or more repair procedures that support it. The Replacing Parts section of this service manual includes a repair flow diagram. See a list of available Spare Parts Kits at:

[zebra.com/parts](http://zebra.com/parts)

## Thermal Printing



**CAUTION—HOT SURFACE:** The printhead becomes hot while printing. To protect from damaging the printhead and risk of personal injury, avoid touching the printhead. Only use the cleaning pen to perform printhead maintenance.

## Preparing a Static-Safe Work Area

Prepare a static-safe work area before opening the printer for repair. The area must include a properly grounded conductive cushioned mat to hold the printer and a conductive wrist strap for the technician. ESD protective devices are available from most electronic supply stores or by contacting 3M corporation at (800) 328-1368.



**CAUTION—ESD:** The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead and other electronic components used in this device. You must observe static-safe procedures when working with the printhead or the electronic components under the top cover.

## Packaging

Printers are carton shipped and wrapped inside a protective bag. Keep all packing materials in case you need to reship the printer later or store the printer for any length of time.

## Environmental and Shock Protection

Extreme temperature and humidity fluctuations or mishandling can damage the printer and power supply.

Allow 30 minutes or more before opening the printer's plastic bag. This time allows the printer to stabilize temperature especially after storage in a cool, dry location and then placed in a warmer, more humid location. Warm, humid air condenses on the cool components of the printer and this condensation may damage the components.

Move the printer carefully. Mechanical damage can certainly result from falls or rough handling.

## Long Term Printer Inactivity or Storage

Over time the printhead may stick to the platen (drive) roller. To prevent this, always store the printer with a piece of media (a label or paper) between the printhead and platen roller. Do not ship the printer with a roll of media installed or damage to the printer or media may result.

## Real Time Clock (RTC)

The Real Time Clock (RTC) is included with ZD621 and ZD421 printers.

The clock's battery is rated to provide approximately ten (10) years of service and is not user replaceable. See a Zebra authorized service technician to replace the battery. For more details on battery replacement, see the warranty for your printer on the Zebra Website at: [zebra.com/warranty](http://zebra.com/warranty).



**IMPORTANT:** Recycle batteries according to local your guidelines and regulations. Wrap the battery when disposing (or storing) to avoid a short circuit.



### CAUTION:

- Do not short circuit the battery. Short circuiting the battery may result in heat generation, fire or bursting.
- Do not heat, disassemble or dispose of battery in fire.
- The printer has a 3 V lithium battery. You can discern a low or flat battery if the printer provides a consistently delayed date stamp. Battery replacement must be performed by a qualified service technician. Only use a Zebra approved replacement battery.

## Fuses

There are no replaceable fuses in ZD-Series printers or power supplies.

# Cleaning and Maintenance

This section provides routine cleaning and maintenance procedures.

## Cleaning Supplies

The following printer cleaning supplies are recommended for use with your printer:

- Printhead Cleaning Pens for simple operator printhead cleaning
- 99.7% pure Isopropyl Alcohol (Never re-moisten cleaning materials used to clean the printer).
- Fiber-free Cleaning Swabs for media path, guides, and sensors.
- Cleaning Wipes (lint free) for media path and interior.
- Can of compressed air



### IMPORTANT:

- Using too much alcohol can result in contamination of the electronic components requiring a much longer drying time before the printer will function properly.
- Do Not Use an air compressor in place of the can of compressed air. Air compressors have micro contaminants and particles that get into the air system and damage your printer.



**CAUTION—EYE INJURY:** Use eye protection to protect your eyes from flying particles and objects when using compressed air.

## Get Zebra Supplies and Accessories for Cleaning Your Printer

See the Zebra web site at [zebra.com/accessories](http://zebra.com/accessories).

## Recommended Cleaning Schedule

### Printhead

**Interval:** Clean the printhead after every roll printed.

**Procedure:** [Cleaning the Printhead on page 18](#).

### Standard Platen (Drive) Roller

**Interval:** As needed to improve print quality. Platen rollers can slip causing print image distortion and in worst case scenarios not move the media (labels, receipts, tags, etc.).

**Procedure:** See [Platen Cleaning and Replacement on page 30](#).



**NOTE:** Standard platen rollers are identified by color: black (203 dpi) and gray (300 dpi).

### Linerless Platen (Drive) Roller

**Interval:** If there is observed build-up of particles on the platen roller, use this procedure. The linerless platen normally does not require cleaning. The adhesive side of the media picks up particles as you print.

If the linerless media is sticking and binding in the printer, the linerless platen normally needs to be replaced. The silicon non-stick coating has been used up.



#### IMPORTANT:

- Linerless platen rollers are identified by color: reddish-brown (203 dpi) and brown (300 dpi).
- Cleaning the roller with solutions or rubbing the delicate surface of this type of roller will permanently damage or shorten the usable life of the linerless platen.
- The platen roller can accumulate adhesive on the outer edges of the roller. After using many rolls of media, these 'rings' of adhesive can get dislodged when using the printer. These particle clumps can then get transferred to other areas in the printer, most importantly, the printhead.

**Procedure:** To remove adhesive particles, use the adhesive side of a piece of linerless media to gently press and remove the particles from the plater roller. Use the [Platen Cleaning and Replacement on page 30](#) procedure to get better access for particle removal.

### Media Path

**Interval:** Clean as needed.

**Method:** Clean it thoroughly with fiber-free cleaning swabs and cloths moistened with 99% isopropyl alcohol. Let alcohol evaporate completely.

**Procedure:** See [Media Path Cleaning on page 21](#).

### Interior

**Interval:** Clean the printer as needed.

**Method:** Use a soft cloth, brush or compressed air to wipe or blow dust and particles out of the printer. A 99.7% isopropyl alcohol and a fiber-free cleaning cloth can be used to dissolve contaminants like oils and grime.

### Exterior

**Interval:** Clean as needed.

**Method:** Use a soft cloth, brush or compressed air to wipe or blow dust and particles out of the printer. The exterior of the printer can be cleaned using plain soap and water solutions to moisten the cloth. Only use the minimum amount of cleaning to avoid getting solution in the printer or other areas. Do not clean connectors or interior of the printer. with this method.

**Healthcare Printer Models:** The latest models now include ultra-violet (UV) and disinfectant-safe plastics for hospital and other similar environments. The user interface is sealed so it can be cleaned with the rest of the printer's exterior. See the 'Guide To Disinfecting and Cleaning Zebra® Healthcare Printers' on the Zebra Web site for the latest information on tested and approved cleaning materials, and cleaning methods.

### Label Dispenser Option

**Interval:** As needed to improve label dispensing operations.

**Procedure:** See [Label Dispenser Option on page 17](#) cleaning.

### Cutter Option

**Interval:** Not an operator serviceable component. Do not clean inside the cutter opening or blade mechanism. You may use the exterior cleaning to clean the cutter bezel (housing).

**Method:** None at this time.

**Procedure:** None



**CAUTION:** Never attempt to insert objects or fingers in to the cutter mechanism. Never remove the cutter cover (bezel). There are no operator serviceable parts in the cutter unit.



#### IMPORTANT:

- The blade has a special coating to resist adhesives and wear. Cleaning it may ruin the blade.
- Using unapproved items such as tools, alcohol, solvents, or cotton swabs. They may damage or shorten the cutter's usable life or cause the cutter to bind.

## Cleaning the Printhead

Always use a new cleaning pen on the printhead (an old pen carries contaminants from its previous use that may damage the printhead).

When you load new media, you should clean the printhead for optimal print operations.



**CAUTION—HOT SURFACE:** The printhead becomes hot while printing. To protect from damaging the printhead and risk of personal injury, avoid touching the printhead. Only use the cleaning pen to perform printhead maintenance.



**CAUTION—ESD:** Observe proper electrostatic safety precautions when handling static-sensitive components such as circuit boards and printheads.

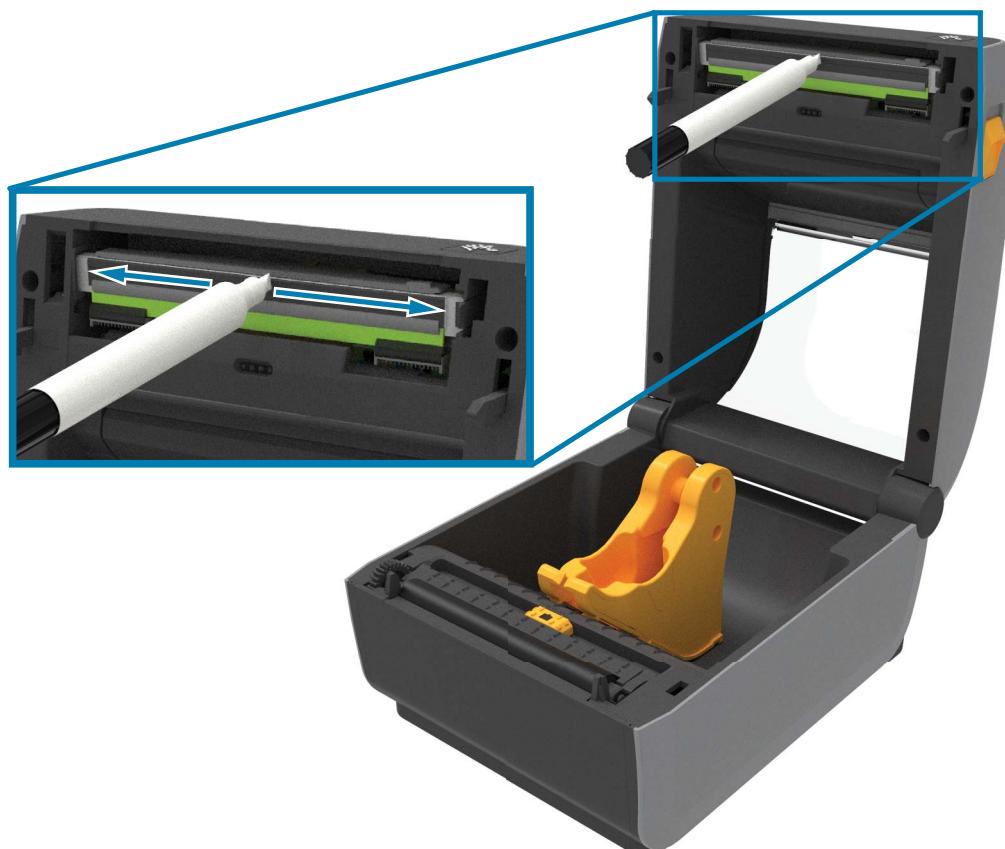


**CAUTION:** Do not use the cleaning pens or swabs on the platen (drive) roller or other parts of the printer to avoid cross contamination and damage to the printhead or printer operation.

## ZD621/ZD421 Direct Thermal Printers

When you load new media, you can also clean the printhead.

1. Rub the cleaning pen across the dark area of the printhead. Clean from the middle to the outside. This will move adhesive transferred from the edges of media to the outside of media path.
2. Wait one minute before closing the printer to allow the components to dry.



### ZD621/ZD421 Thermal Transfer Printers

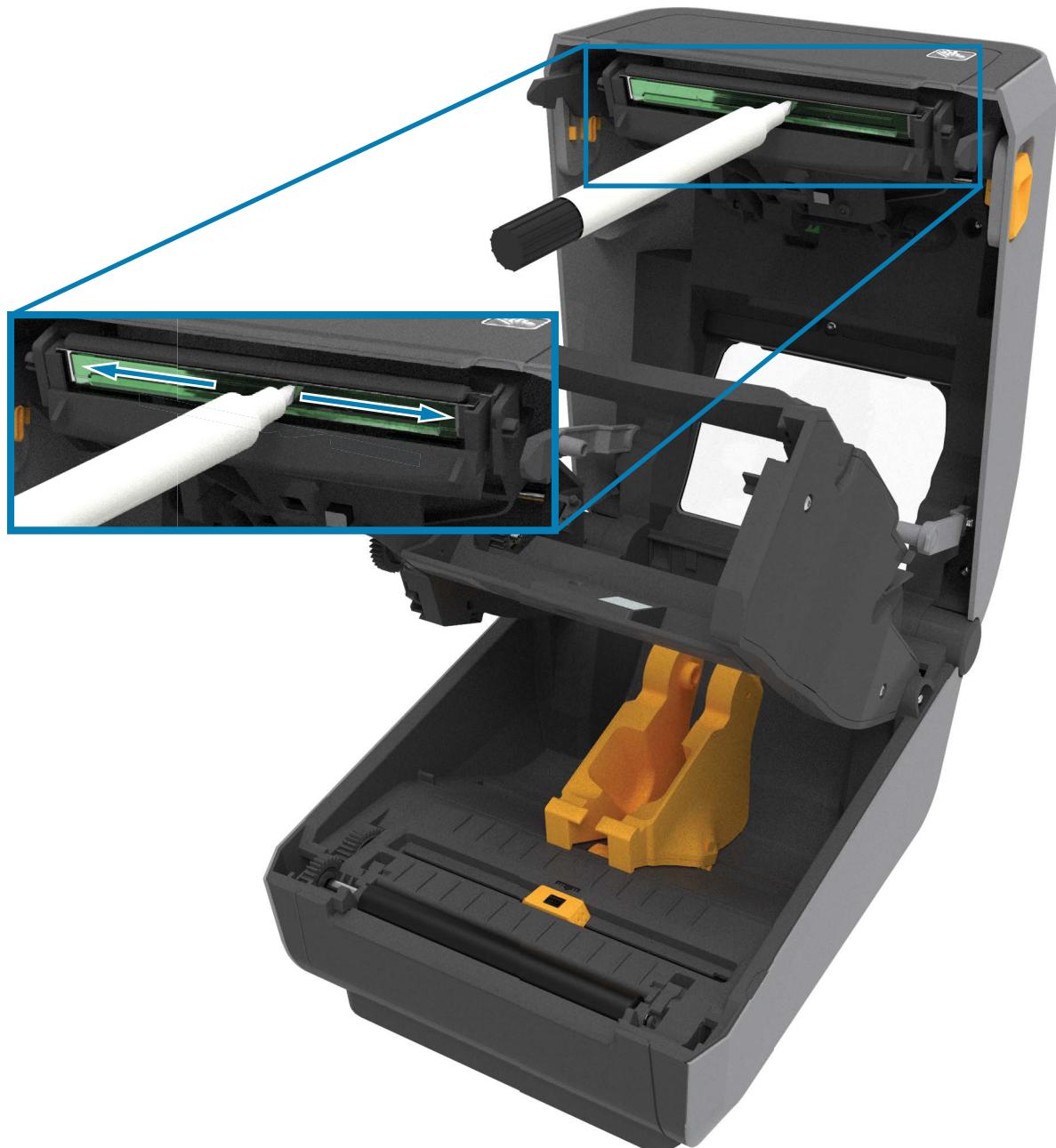
When you load new media or ribbon, you can also clean the printhead.

1. If transfer ribbon is installed, remove it before proceeding.
2. Rub the cleaning pen across the dark area of the printhead. Clean from the middle to the outside. This will move adhesive transferred from the edges of media to the outside of media path.
3. Wait one minute before closing the printer or loading ribbon to allow all components to dry.



## ZD421 Ribbon Cartridge Printers

1. Pull the two (2) release arms out to release the ribbon drive transport. See [ZD421 Ribbon Cartridge Printer - Accessing the Printhead on page 63](#) for more details.
2. Lift the printhead actuator arm up to gain access to the printhead. Rub the cleaning pen across the dark area of the printhead. Clean from the middle to the outside. This will move adhesive transferred from the outer edges of media to the area outside of media path.
3. Wait one minute before closing the printer.



4. Release the printhead actuator arm and then push the ribbon drive transport into the printhead actuator arm. The release arms will snap into place relinking the ribbon drive transport to the top cover and the printhead actuator arm.

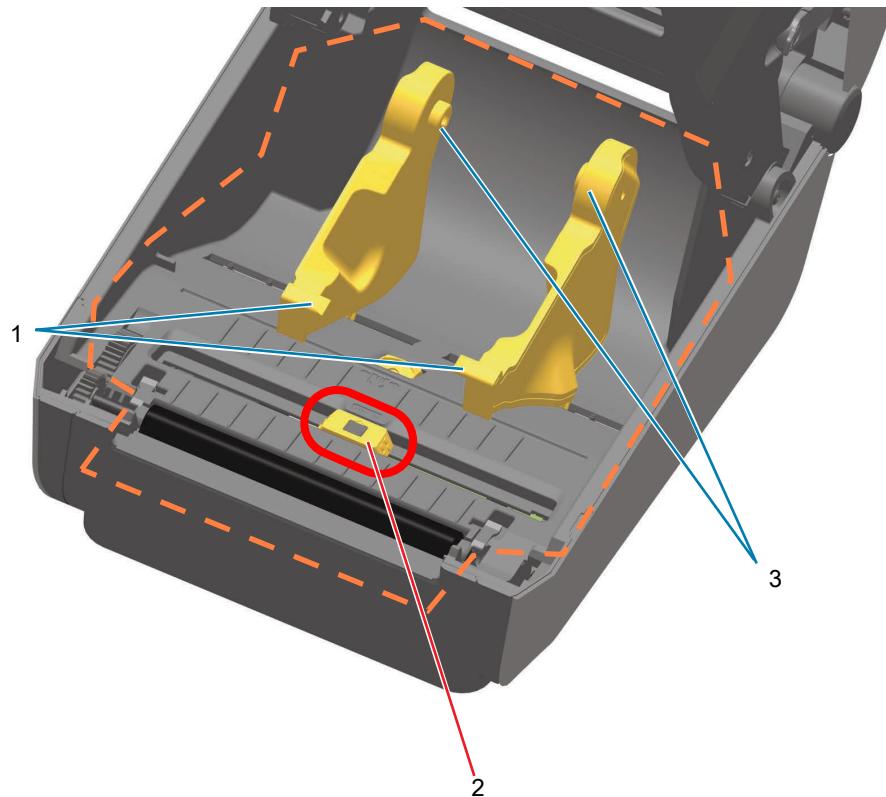
## Media Path Cleaning

Use a cleaning swab and/or a lint free cloth to remove debris, dust or crust that has built-up on the holders, guides and media path surfaces. Lightly moisten the swab or cloth with 99% solution medical-grade alcohol. For hard to clean areas, use extra alcohol on a cleaning swab to soak the debris to break up any adhesive that may have accumulated on surfaces in the media compartment.

Do not clean the printhead, sensors, or platen as part of this process.

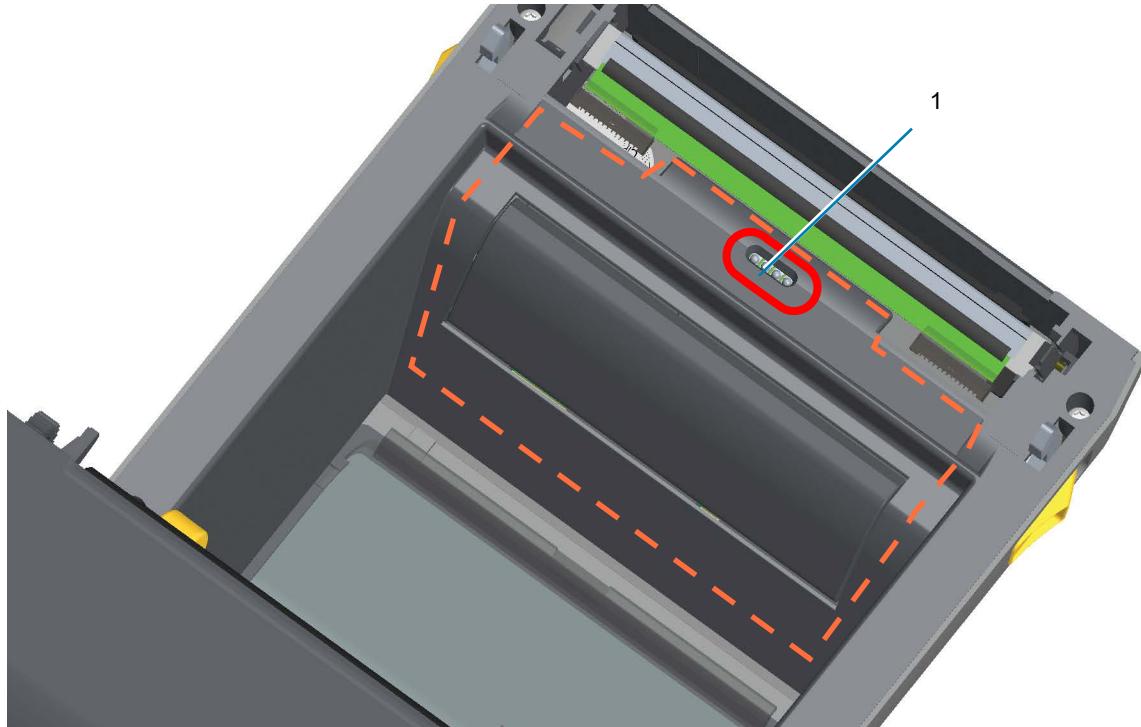
### Lower Half of ZD621/ZD421 Printers

1. Wipe the inside surfaces of the roll holders (3) and the underside of the media guides (1) with a cleaning swabs and wipes.
2. Wipe the movable sensor slide channel, but do not clean the sensor (2). Move the sensor to get to all areas.
3. Wait one minute before closing the printer.
4. Discard used cleaning supplies.



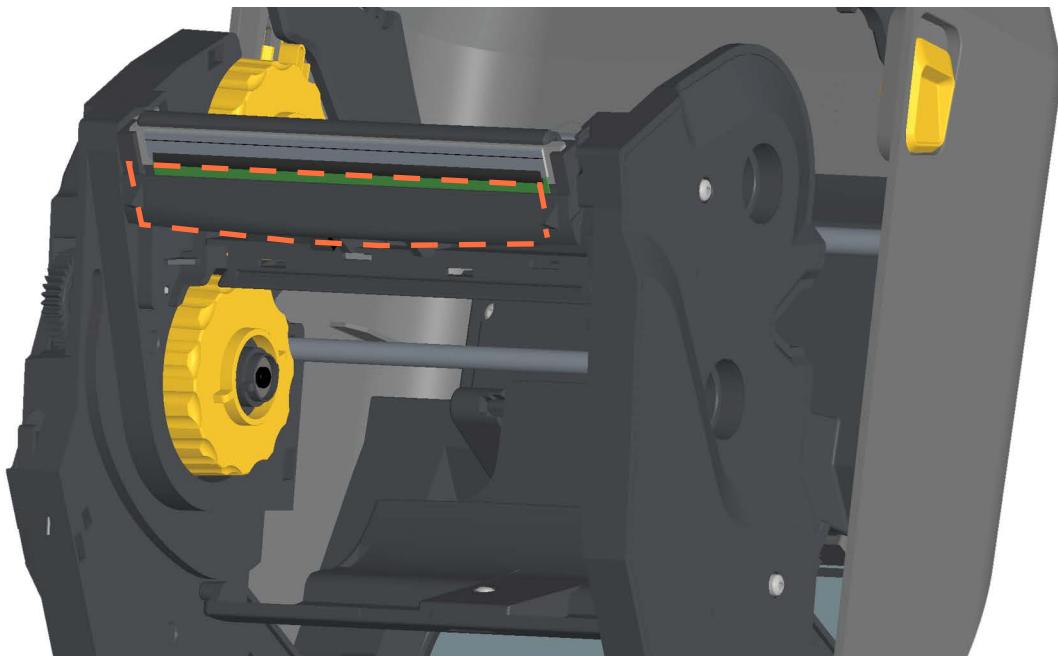
## Upper Half of ZD621/ZD421 Direct Thermal Printers

1. Wipe the areas (outlined in orange) to remove adhesive and other contaminants. Do not clean the sensor array (1).



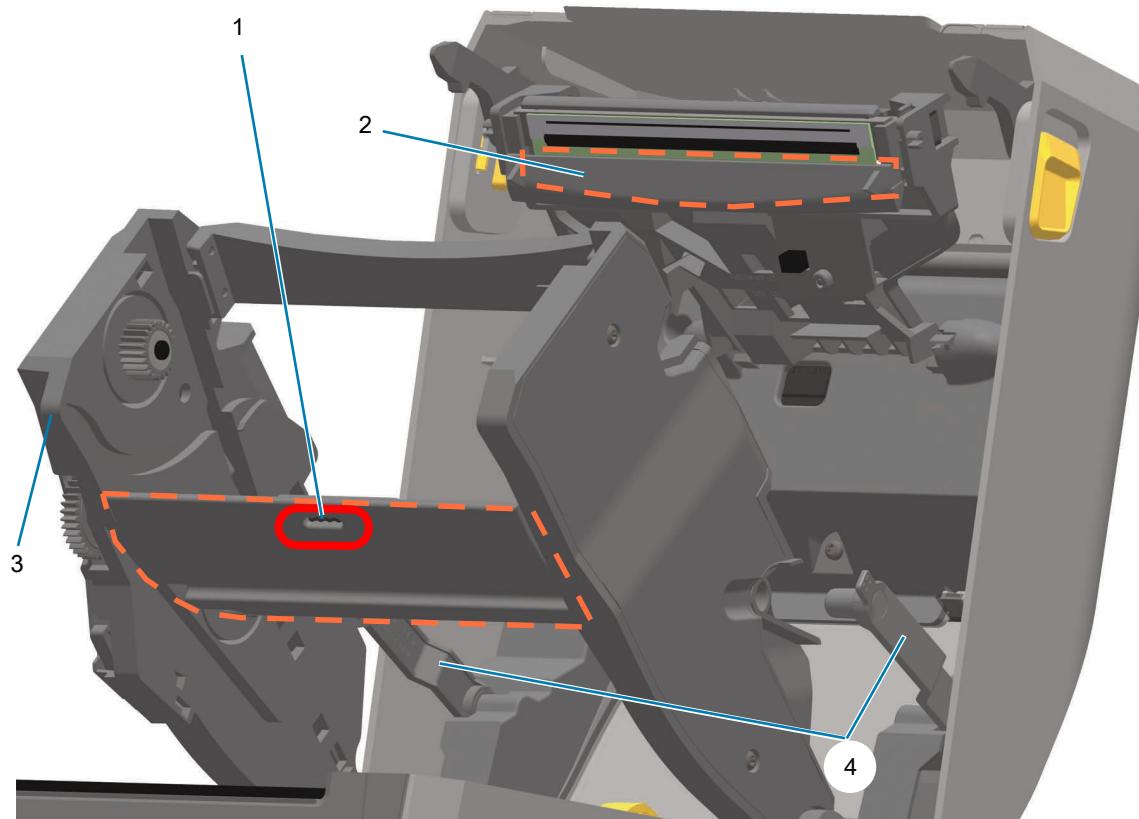
## Upper Half of ZD621/420 Thermal Transfer Printers

1. Wipe the area (outlined in orange) near the printhead on the front of the ribbon carriage.



## Upper Half of ZD421 Thermal Transfer Ribbon Cartridge Printers

1. Pull the two release arms (3) out to release the ribbon drive transport (3). See [ZD421 Ribbon Cartridge Printer - Accessing the Printhead on page 63](#) for more details.
2. Wipe the areas (outlined in orange) below the printhead actuator arm (2) and the ribbon drive transport. Do not clean the array sensor (1)



3. Release the printhead actuator arm (4) and then push the ribbon drive transport (3) into the printhead actuator arm. The release arms will snap into place relinking the ribbon drive transport to the top cover and the printhead actuator arm.

## Cleaning the Cutter and Label Dispenser Options

This is a continuation of cleaning the media path for either option, if installed.

### Cleaning the Cutter Option

The plastic media path surfaces can be cleaned but not the internal cutter blades or mechanism.

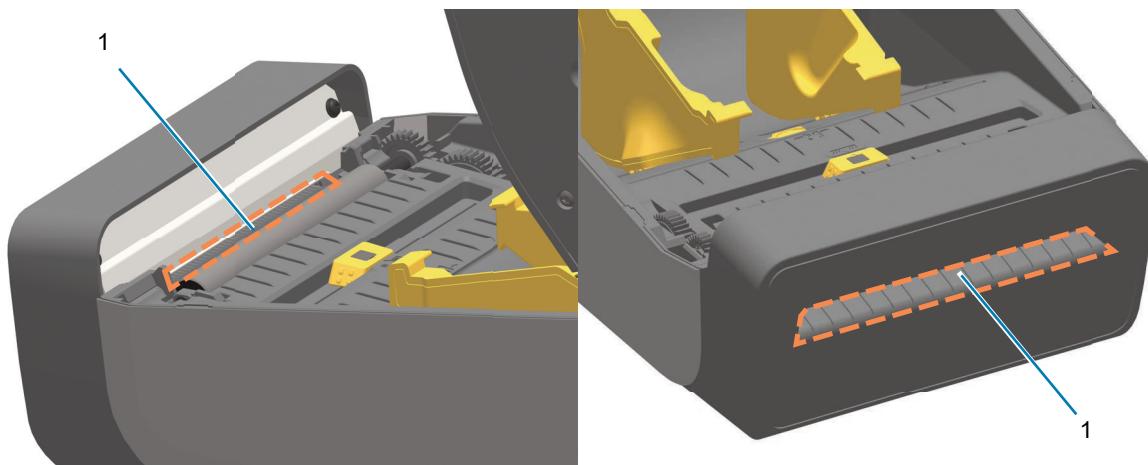


**IMPORTANT:** The cutter blade mechanism does not require maintenance cleaning. Do not clean the blade. This blade has a special coating to resist adhesives and wear. Using unapproved items such as tools, alcohol, solvents, or cotton swabs. They may damage or shorten the cutter's usable life or cause the cutter to bind.



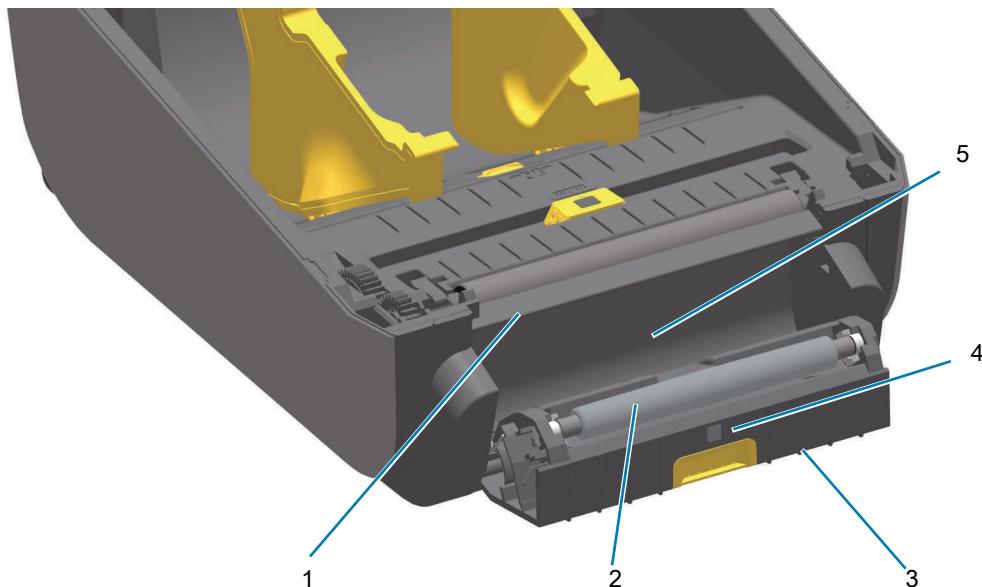
**CAUTION:** Never attempt to insert objects or fingers into the cutter mechanism. Never remove the cutter cover (bezel). There are no operator serviceable parts in the cutter unit.

1. Wipe the ridges and the plastic surfaces of the media entry (inside) and exit slot (outside) of the cutter. Clean (1) inside the areas outlined in orange.
2. Repeat as necessary to remove any adhesive or contaminate residue after it dries.



### Cleaning the Label Dispenser Option

1. Open the door and clean the peel bar (1), inner surfaces (5), and ridges (3) on the door.
2. Wipe the roller (2) while rotating it. Discard the swab or cloth.
3. Clean again with a new swab or cloth to remove diluted residue.
4. Clean the Label Taken sensor window (4). The window should be clear of streaks and residue.

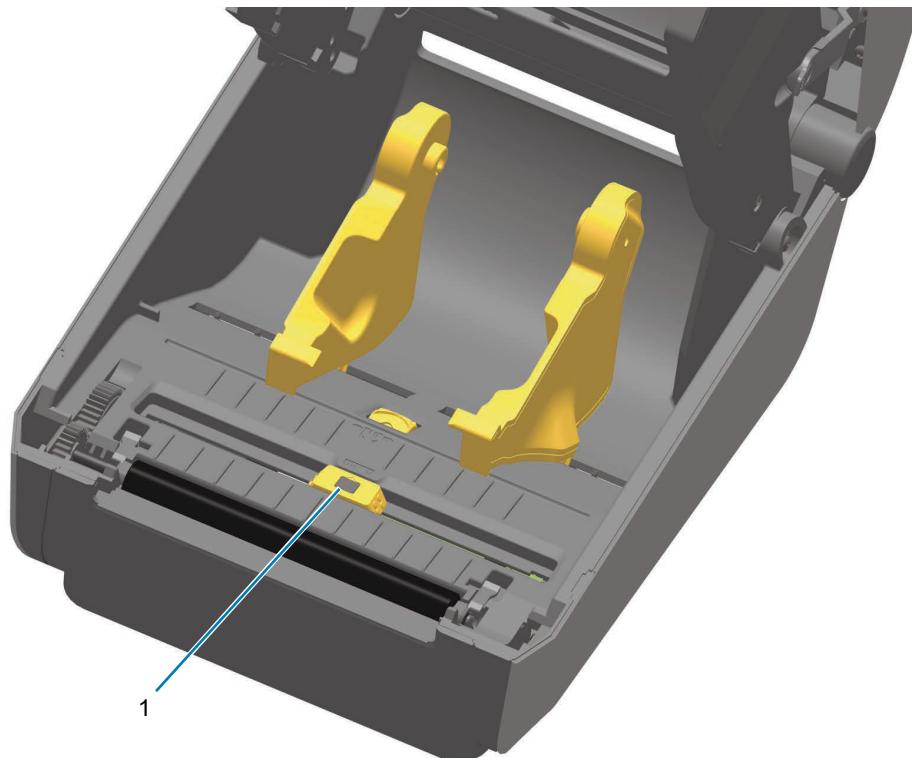


## Sensor Cleaning

Dust can accumulate on the media sensors. Do not use an air compressor to remove dust. Compressors add moisture, fine grit, and lubricant, which can contaminate your printer.

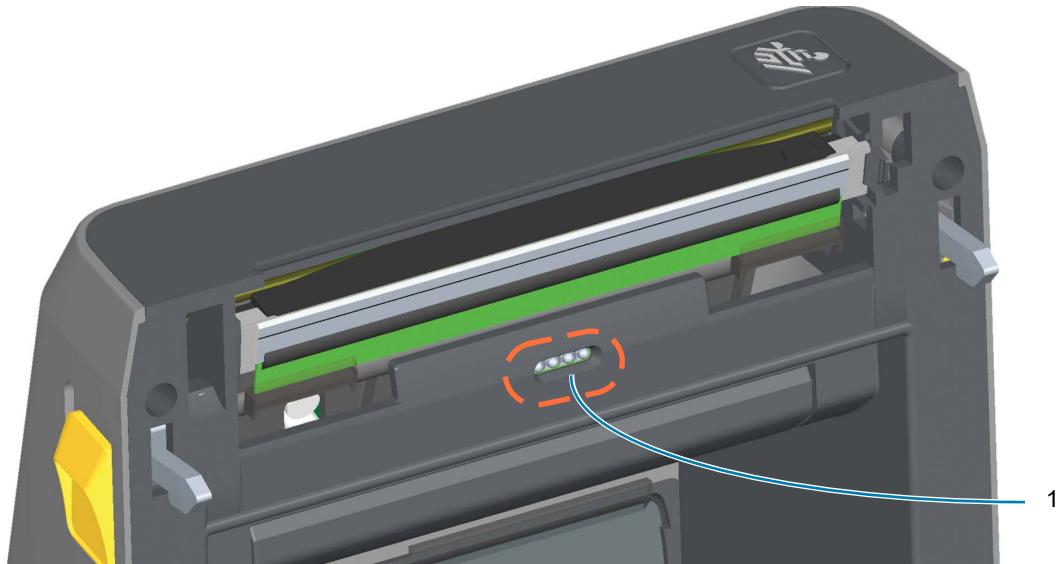
### Lower Half of ZD621/ZD421 Printers

1. Clean the movable sensor's window (1). Gently brush away dust or use a can of compressed air; if necessary, use a dry swab to brush away dust. If adhesives or other contaminants remain, use an alcohol moistened swab to break it up.
2. Use a dry swab to remove any residue that may be left from the first cleaning.
3. Repeat steps 1 and 2 as required until all residue and streaks are removed from the sensor.



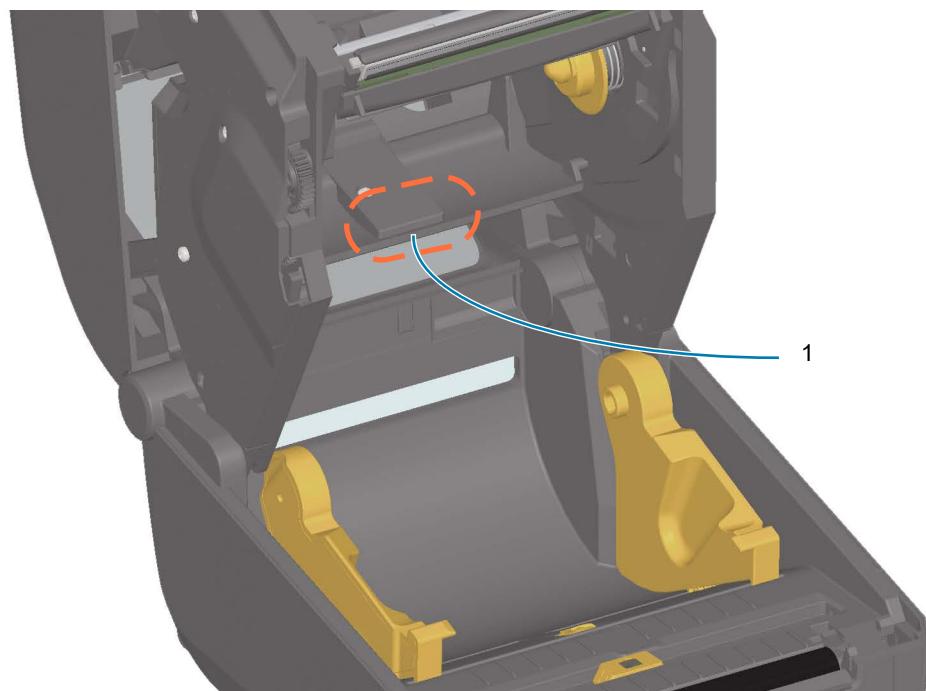
## Upper Half of ZD621/ZD421 Direct Thermal Printers

1. Spray the upper web (gap) array sensor (1) below the printhead with a can of compressed air. If necessary, use an alcohol moistened swab to break up adhesive or other non-dust contaminants. Use a dry swab to remove any residue that may be left from the first cleaning.



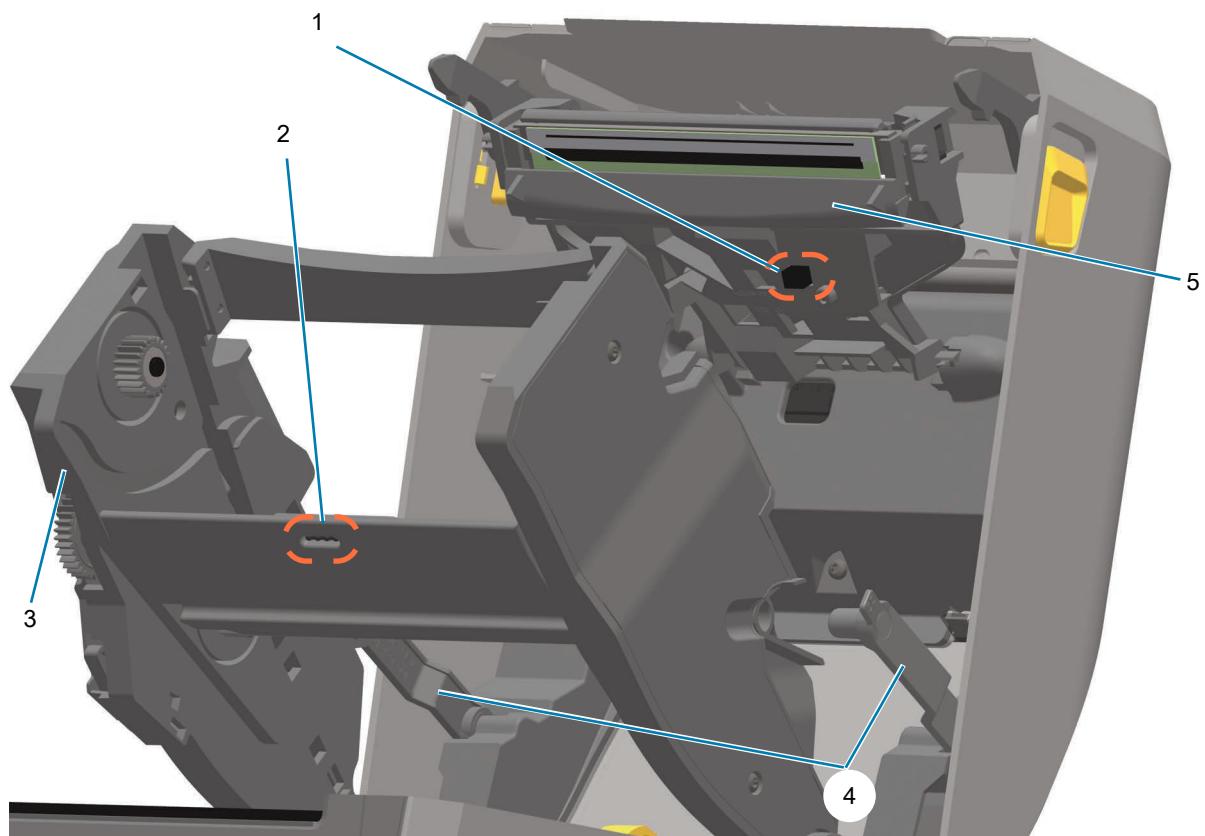
## Upper Half of ZD621/ZD421 Thermal Transfer Printers

1. Spray the upper web (gap) array sensor (1) below the printhead with a can of compressed air. Complete sensor cleaning (very rare) requires a service technician.



## Upper Half of ZD421 Ribbon Cartridge Printers

1. Pull the two release arms (4) out to release the ribbon drive transport (3). See [ZD421 Ribbon Cartridge Printer - Accessing the Printhead on page 63](#) for more details.
2. Swing the printhead actuator arm (5) up until it touches the printer's top cover. Hold the printhead actuator arm in this position for access to the area below the printhead, see the next graphic.
3. Spray the upper web (gap) array sensor (2) under the ribbon drive transport (5) and the ribbon out sensor (1) on the underside of the printhead actuator arm with a can of compressed air. If necessary, use an alcohol moistened swab to break it up. Use a dry swab to remove any residue that may be left from the first cleaning.



## Cleaning Ribbon Cartridge Sensor



**IMPORTANT:** Only clean the Ribbon Cartridge Sensor Pins when the cartridges are failing detection.

1. Clean the Ribbon Cartridge interface pins (1) with a gentle wiping from right to left. Up and down motions may damage the pins.



## Platen Cleaning and Replacement

The platen (drive roller) normally does not require cleaning. Normally, paper and liner dust can accumulate without affecting print operations.

Clean the platen (and media path) whenever the printer has significantly poorer performance, print quality or media handling. The platen is the print surface and drive roller for your media. If sticking or jamming continues even after cleaning, you must replace the platen.



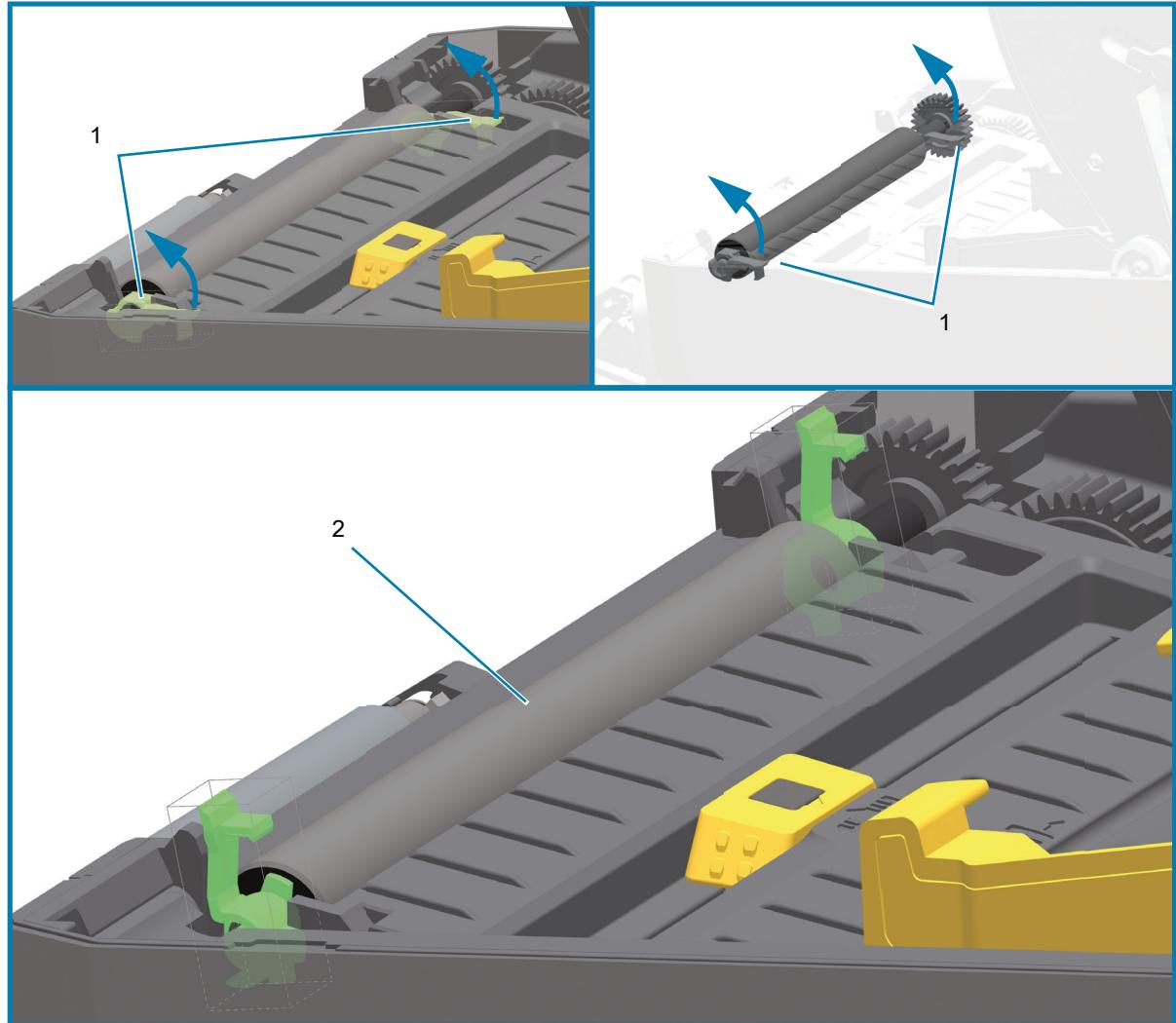
**IMPORTANT:**

- Contaminants on the platen roller can damage the printhead or cause the media to slip or stick when printing. Adhesive, dirt, general dust, oils and other contaminants should be cleaned immediately off the platen.
- Linerless Platens — Do not wash or scrub. Only remove adhesive particles by using the adhesive side of linerless media. Lightly touch the platen roller with a linerless label to lift particles off the exposed area of the platen roller and the media path areas.

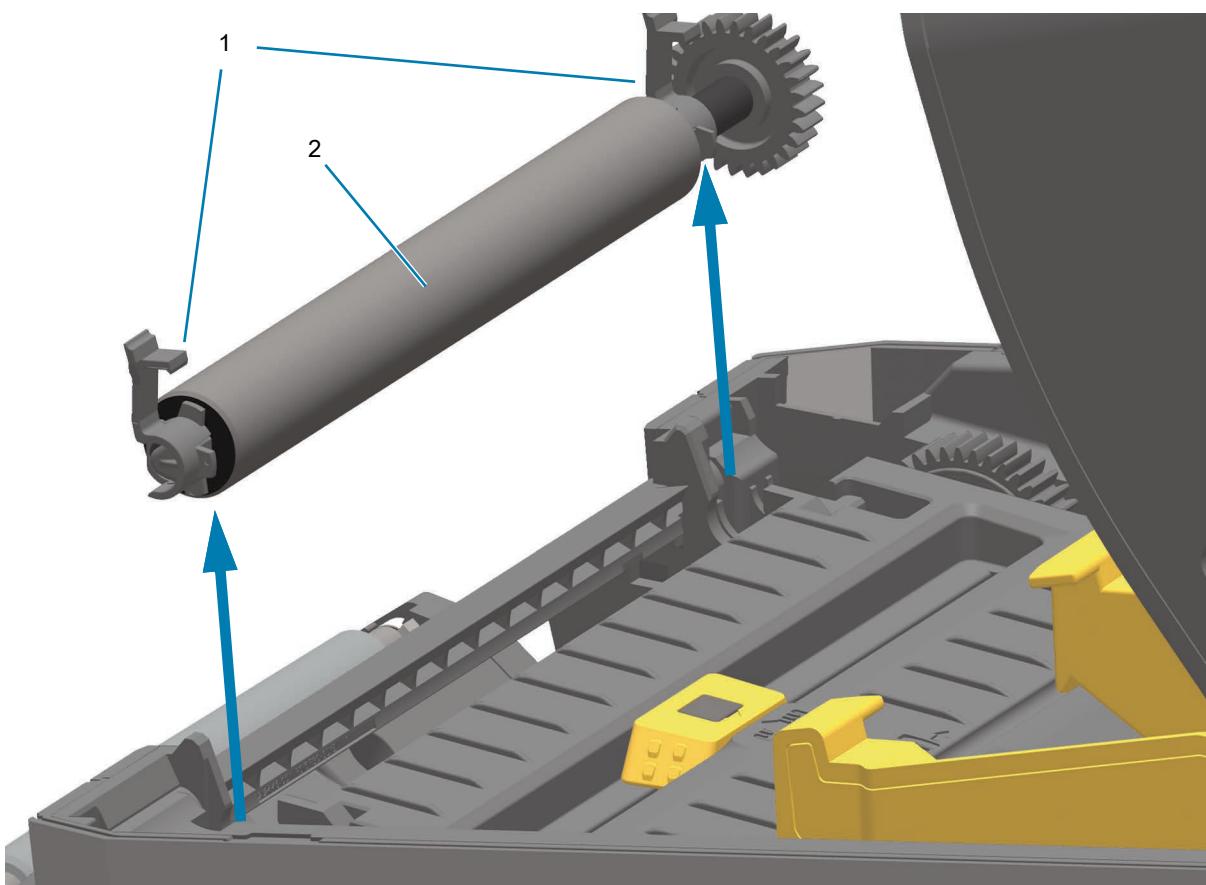
## Removing the Platen Roller

The platen can be cleaned with a fiber-free swab (such as a Texpad swab) or a lint free, clean, damp cloth very lightly moistened with medical grade alcohol (99.7% pure or better).

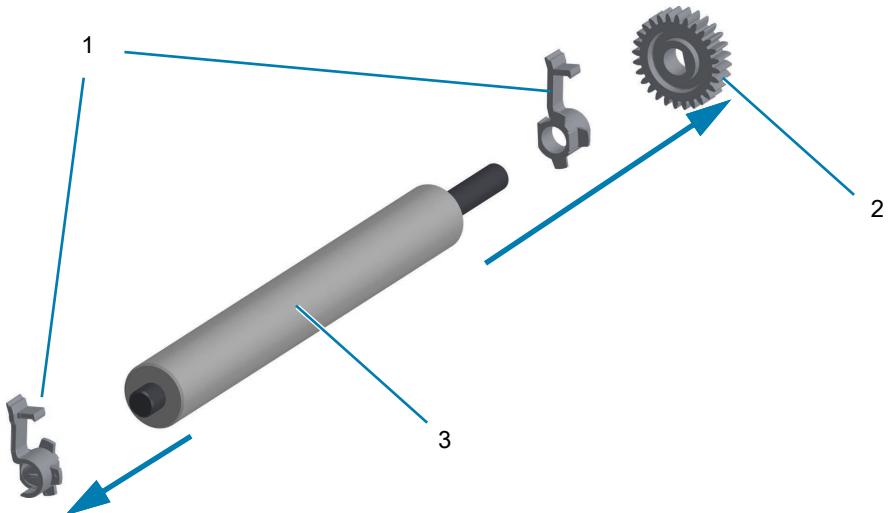
1. Open the cover (and dispenser door, if the dispenser is installed). Remove media from platen area.
2. Pull the platen bearing (1) latch release tabs on the right and left sides towards the front of the printer and rotate them up to release the platen (2).



- Lift the platen (2) out of the printer's bottom frame using the platen bearings (1).



- Slide the gear (2) and the two platen bearings (1) off the shaft of the platen roller (3).



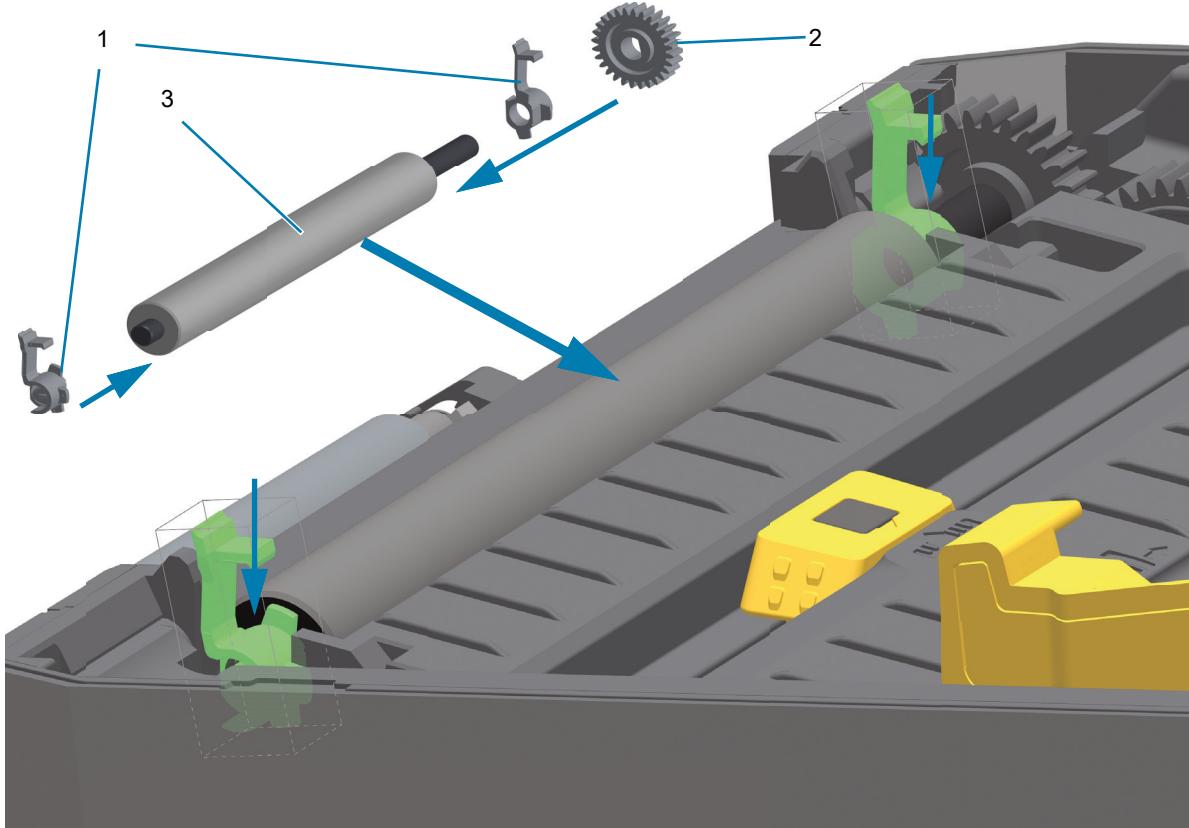
- Cleaning Only** — Clean the platen with the alcohol moistened swab. Clean from the center out. Repeat this process until all of the roller surface has been cleaned. If there has been heavy adhesive build-up or label jam, repeat with a new swab to remove residual contaminants. Adhesives and oils, for example, may be thinned by the initial cleaning but not completely removed.



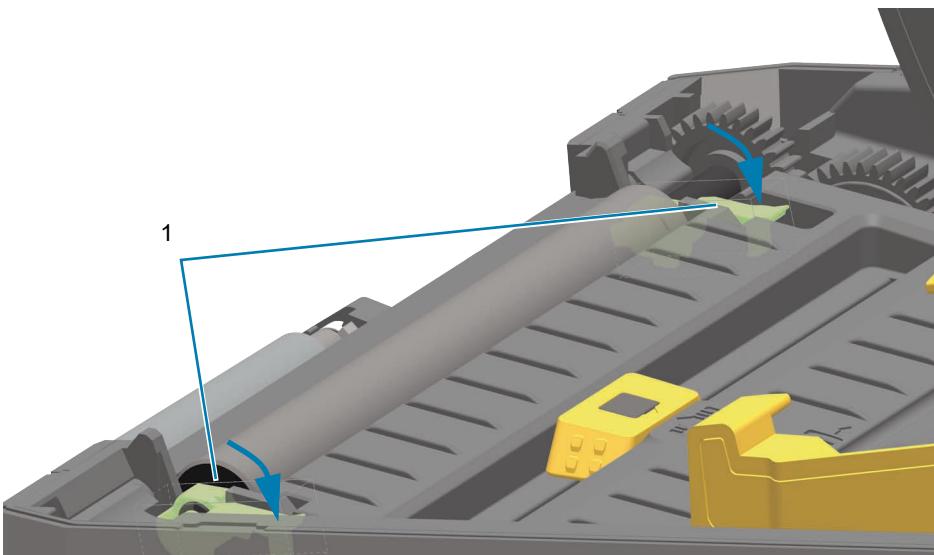
**IMPORTANT: LINERLESS PLATENS** — Only use the adhesive side of a piece of linerless media to gently lift the particles from the platen roller for cleaning.

## Replacing the Platen Roller

1. Discard the cleaning swabs after use - do not reuse.
2. Make sure the platen bearings (1) and drive gear (2) are on the shaft of the platen roller (3).



3. Align the platen (3) with the gear (2) to the left and lower it into the printer's bottom frame.
4. Rotate the platen bearing (1) latch release tabs down on the right and left sides towards the rear of the printer and snap them into place.



5. Allow the printer to dry for one minute before closing the dispenser door, media cover or loading labels.

## Updating Printer Firmware

The printer's firmware may need to be updated periodically to get new features, improvements, and printer upgrades for media handling and communications.

Use Zebra Setup Utilities (ZSU) to load new firmware.

1. Open Zebra Setup Utilities.
2. Select your installed ZD621/ZD421 printer.
3. Click on the **Open Printer Tools** button and a **Tools** window will open.
4. Click on the **Action** tab.
5. Load the printer with media.
6. Click on the text line - **Send file**. The lower half of the window will present a filename and path with a **Browse (...)** button to select the latest firmware file you have downloaded from the Zebra Web site.
7. Observe the user interface and wait.

If the firmware version is different than the version installed on the printer, the firmware will be downloaded to the printer. Otherwise, the printer waits with the **STATUS** on green for the next command or print job. The data indicator will flash green while the new firmware is downloading.

The printer will restart with all indicators flashing. When the firmware update has completed, the **STATUS** indicator will display solid Green. The firmware is validated and installation is complete.

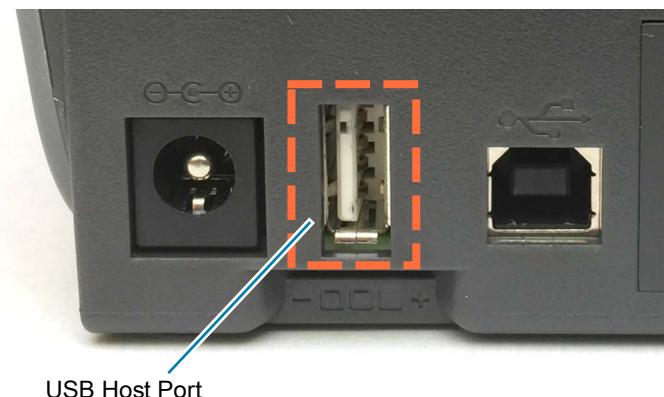
A printer configuration report is automatically printed to verify new firmware versions.

## USB Host for File Transfers

The USB host port allows you to connect USB devices—such as a keyboard, scanner, or USB Flash (memory) drive—to the printer.

### USB Host Port Uses

- Firmware updates
- File transfers and management
- A port for low power USB data entry devices (keyboards, scales, scanners, and other wedge devices)



**IMPORTANT:** The USB Flash drive must be formatted with the FAT file system. Filenames may be 1 to 16 alphanumeric characters (A, a, B, b, C, c, ..., 0, 1, 2, 3, ...) only. Only use ASCII characters. Do not use Asian characters, Cyrillic characters, or accented characters in file names. Some functions may not work properly if there are underscores in a file name. Use periods instead.



## Using USB Host for Firmware Updates

The USB host port allows you to connect an USB Flash drive to the printer to perform firmware updates.

This is an example of using the powerful printer management, Zebra Mirror functions. See the Zebra Programming Manual for more information about mirroring, and the `usb.mirror` Set-Get-Do commands.



**NOTE:** See the [About this Guide on page 9](#) section for information and support links for your specific printer model.



**IMPORTANT:** Supports USB Flash drives (or “thumb drive” or “memory stick”) up to 1 Terabyte (TB). The printer will not recognize drives larger than 1 TB.

### Flash Drive Preparation and Firmware Update

1. On your USB Flash Drive, create the following:
  - a folder called Zebra
  - in that folder, create three sub-directories:
    - appl
    - commands
    - files
2. In the `/appl` folder, place a copy of the latest firmware for your printer.
3. Load the printer with media.
4. Insert the USB Flash drive into the USB host port on your printer.
5. Observe the user interface and wait.

If the firmware version is different than the version installed on the printer, the firmware will be downloaded to the printer. The data indicator will flash green while the firmware is downloading.

The printer will restart with all indicators flashing. When the firmware update has completed, the STATUS indicator will display solid Green. The firmware is validated and installation is complete.

A printer configuration report is automatically printed to verify new firmware versions.

6. Remove the USB Flash drive from the printer.

## Run a SmartCal Media Calibration after Repairs

The printer needs to set the media parameters for prior to printing optimal operation. The printer will automatically determine media type (web/gap, black mark/notch, or continuous) and measure media characteristics.



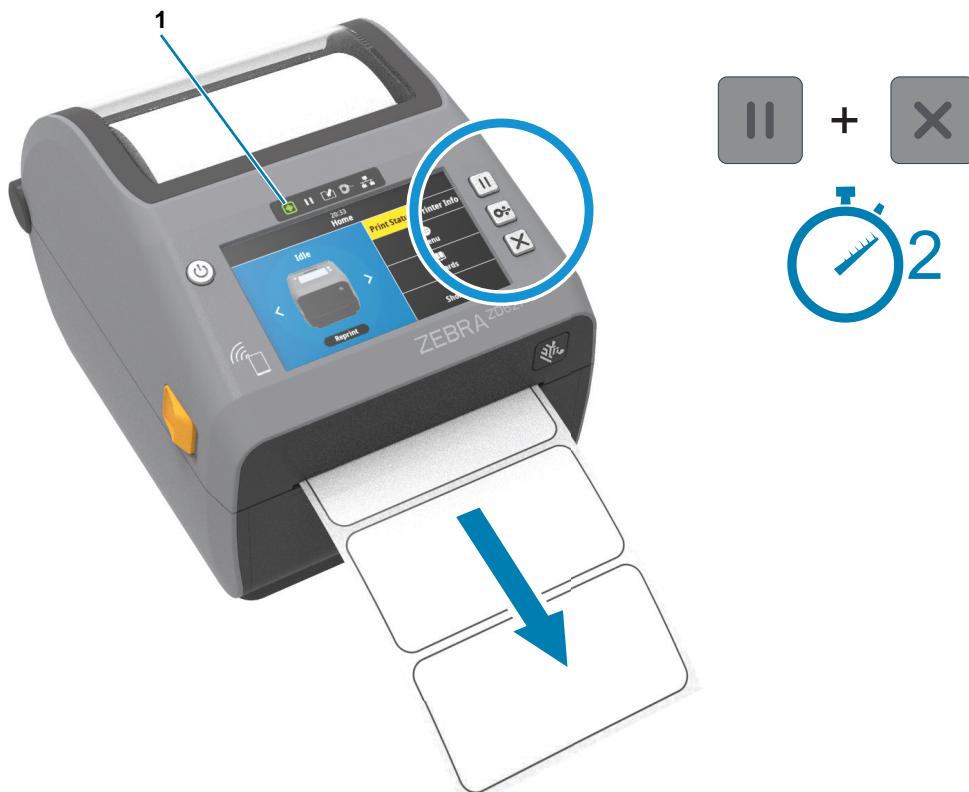
**IMPORTANT:** After the initial calibration to a specific media is completed, it is not required to perform additional calibrations each time the media is replaced. The printer automatically measures the media to adjust for small changes in the media characteristics while printing. Pressing the **FEED** (Advance) once or twice after a new roll of media (same batch) has been installed will synchronize the labels. It is then ready to continue printing.

### SmartCal Procedure

1. Make sure the media and ribbon cartridge (if you are thermal transfer printing) are loaded properly in the printer and the top cover of the printer is closed.
2. Press the **POWER** button to turn the printer on.
3. Once the printer is in the ready state with the **STATUS** (1) indicator solid green, then press and hold the **PAUSE** and **CANCEL** button for 2 seconds and release.

The printer will measure a few labels and adjust media sensing levels.

When the printer stops, the Status (1) indicator will turn solid green.



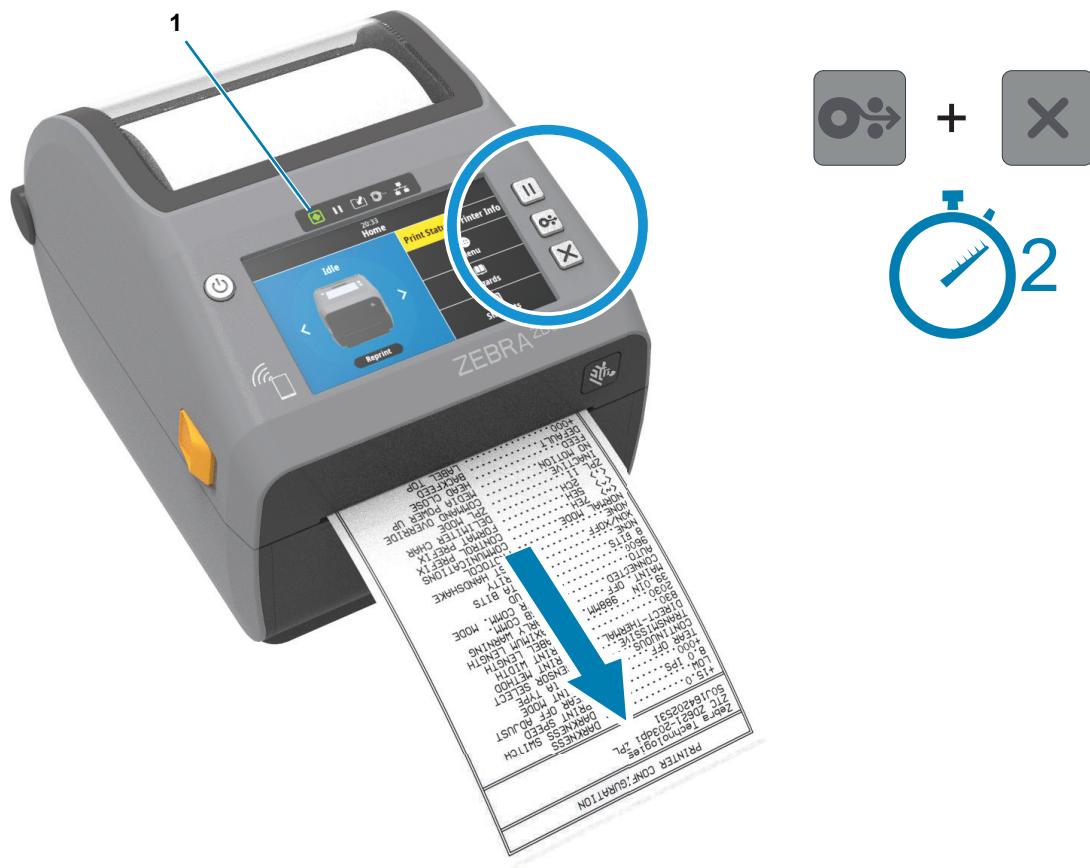
## Test Printing with the Configuration Report

Before you connect the printer to a computer, make sure that the printer is in proper working order. You can do this by printing a configuration report. The information on the configuration report may be helpful with printer installation and troubleshooting.

1. Make sure the media and ribbon cartridge (if you are thermal transfer printing) are loaded properly in the printer and the top cover of the printer is closed.
2. Turn the printer ON.
3. Once the printer is in the ready state with the **STATUS** (1) indicator solid green, then press and hold the **FEED** and **CANCEL** buttons for 2 seconds and release.

The Printer and Network Configuration Reports (shown below) will be printed.

When the printer stops, the Status indicator will turn solid green.



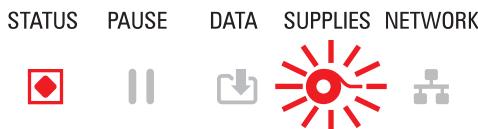
If you cannot get these reports to print, go to [Troubleshooting on page 38](#).

# Troubleshooting

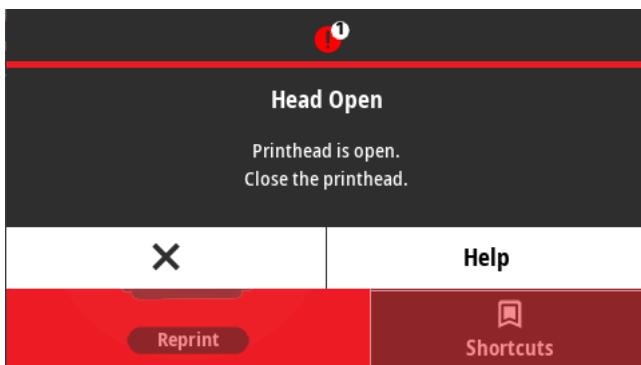
This section provides troubleshooting procedures and information.

## Resolving Alerts and Errors

### Alert: Printhead Open



A print command or a **FEED** button has been pressed and the printer has detected that the printhead (cover) is not closed.



#### Possible Cause - 1

The cover is open or has not been closed properly.

#### Resolution

Close the cover/printhead. Push down on the front top corners of the printer's cover. You should normally hear and feel the cover latches snap in place to lock the cover closed for printing.

#### Possible Cause - 2

The printer's Head-up switch needs service.

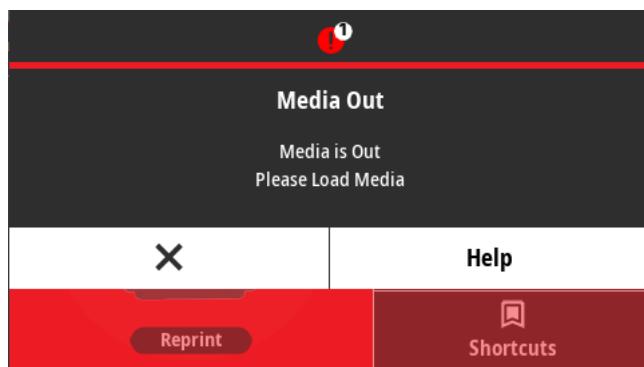
**Resolution**

Replace the Head-Up switch.

- [ZD421\(t\) and ZD621\(t\) - Replacing the Head-Up Sensor on page 103](#)
- [Accessing ZD621\(d\) and ZD421\(d\) Head-up and Movable Sensors on page 116](#)
- [Accessing the ZD621R Head-up and Movable Sensors on page 122](#)

**Alert: Media Out**

A print command, a **FEED** button has been pressed, or you are printing; and the printer can not detect media in the print path.

**Possible Cause - 1**

There is no media (roll) in the printer.

**Resolution**

Load your chosen media in the printer and close the printer. You may need to press the **FEED** button once or the **PAUSE** button to get the printer to resume your print operation.

**Possible Cause - 2**

Open the printer: If there is a missing label on the roll between two labels at the end of a roll of labels, then this is a method used by the label roll manufacturer to identify the end of the roll.

**Resolution**

Replace the empty media roll and continue printing. Do not power the printer off or you will lose your print job.

**Possible Cause - 3**

Misaligned media sensor.

### Resolution

Check the position of the media sensor. The printer may need to be calibrated for the media after the adjusting the sensor location.

### Possible Cause - 4

The printer is set for noncontinuous (labels or black mark) media, but continuous media is loaded.

### Resolution

1. Check the position of the media sensor is in the center default location.
2. The printer may need to be calibrated for the media after the adjusting the sensor location.

### Possible Cause - 5

The media sensor is dirty.

### Resolution

1. Clean the upper web (gap) sensor array and the lower movable media sensors. See [Sensor Cleaning on page 26](#).
2. Reload your media, adjust the movable media sensor's position for your media, and recalibrate the printer for the media.

### Possible Cause - 6

The media sensing is not working. Possible data corruption of memory or faulty components.

### Resolution

1. Reload the printer's firmware. See [Updating Printer Firmware on page 34](#).
2. Replace the upper gap array or lower movable (blackmark) sensors. See the following:
  - [Accessing the ZD421\(c\) Movable Sensor on page 113](#)
  - [Accessing ZD621\(d\) and ZD421\(d\) Head-up and Movable Sensors on page 116](#)
  - [Accessing the ZD621\(t\) Movable Sensor on page 119](#)
  - [Accessing the ZD621R Head-up and Movable Sensors on page 122](#)
  - [Replacing the Movable Lower Media \(Blackmark\) Sensor on page 126](#)
  - [Replacing the Upper Media \(Gap/Web\) Sensor \(ZD421C\) on page 168](#)

### Alert: Ribbon In (ZD421 Cartridge Printer only)

A print command has been sent to the printer and it is in direct thermal mode with ribbon installed.



**NOTE:** The printer has two different heat settings - one for direct thermal and one for thermal transfer. They are designed to have equivalent print density/darkness at the same setting level.

STATUS PAUSE DATA SUPPLIES NETWORK



## Possible Cause - 1

There is a ribbon cartridge in the printer while the printer is set to direct thermal mode (and printing on direct thermal media).

### Resolution

Remove the ribbon cartridge from the printer without turning the printer OFF. Close the printer. You may need to press the **FEED** button once or the **PAUSE** button to resume your printing.

## Possible Cause - 2

The printer is incorrectly set to Direct Thermal Mode when you are trying to print using Transfer Media and Ribbon Cartridge to print.

### Resolution

1. Change the PRINT METHOD to THERMAL TRANS (Thermal Transfer) mode. The print format/form send for this print job may have direct thermal mode set with a ^MTD set instead of ^MTT.

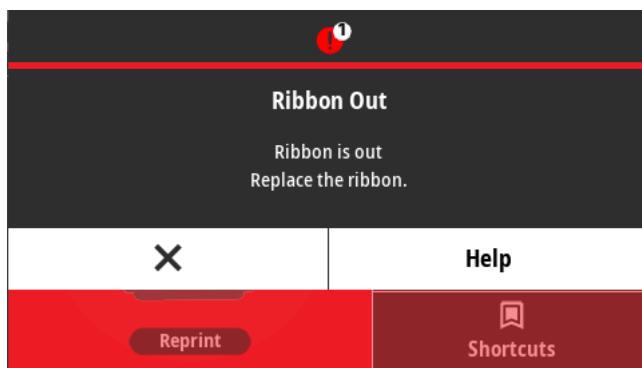
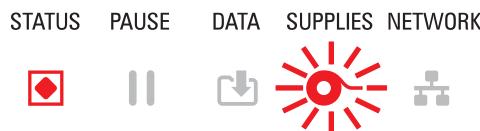
See the ZPL Programmer's Manual for details. For printer links to manuals, see the section [About this Guide on page 9](#).

To change this setting:

- Use the printer's color touch display user interface (if present) to change the setting.
- Use an Ethernet (LAN or WLAN) printer's Print Server Web page to access and set the PRINT METHOD to THERMAL TRANS (Thermal Transfer) mode.

## Alert: Ribbon Out

1. The printer is printing and stops while printing.
2. A print job has been sent to the printer and the printer immediately reports this Alert.



## Possible Cause - 1

The printer has detected the end of the ribbon. The end of the ribbon has a reflective trailer on the end of Genuine Zebra Transfer Ribbon that the printer 'sees' as end of ribbon condition.

### Resolution

Remove the ribbon and replace the ribbon rolls or ribbon cartridge in the printer without turning the printer OFF. Close the printer. You may need to press the **FEED** button once or the **PAUSE** button to get the printer to resume your print operation.

### Possible Cause - 2 (ZD421 Cartridge Printer only)

A ribbon cartridge needs to be loaded in the printer. The printer is set for Thermal Transfer Mode.

### Possible Cause - 3 (ZD421 Cartridge Printer only)

The media sensing is not working. There is a possible dirty ribbon cartridge data chip or cartridge sensor contacts; data corruption of memory; or faulty cartridge or printer components.

### Resolution

1. Try another working ribbon cartridge, if available.
2. Clean the ribbon cartridge chip with an alcohol moistened swab.
3. Clean the ribbon cartridge sensor's contact pins. See [Upper Half of ZD421 Thermal Transfer Ribbon Cartridge Printers on page 23](#) for cleaning instructions.
4. Reload the printer's firmware. See [Updating Printer Firmware on page 34](#).
5. Replace the ribbon cartridge sensor. See [Replacing the Cartridge Printer Ribbon Sensor PCBA on page 160](#).

### Possible Cause - 4 (Standard Roll - Thermal Transfer Printers)

The media sensing is not working.

### Resolution

1. Reload the printer's firmware. See [Updating Printer Firmware on page 34](#).
2. Replace the Ribbon Trailer Sensor. See [Replacing the Ribbon Roll Printer's Ribbon Trailer Sensor PCBA on page 158](#).

### Alert: Ribbon Low (ZD421 Cartridge Printer only)

The printer reports this Alert.



### Possible Cause - 1

The printer has calculated that the ribbon cartridge has only 10% of the ribbon left in the cartridge. The ribbon low value can be changed by programming.

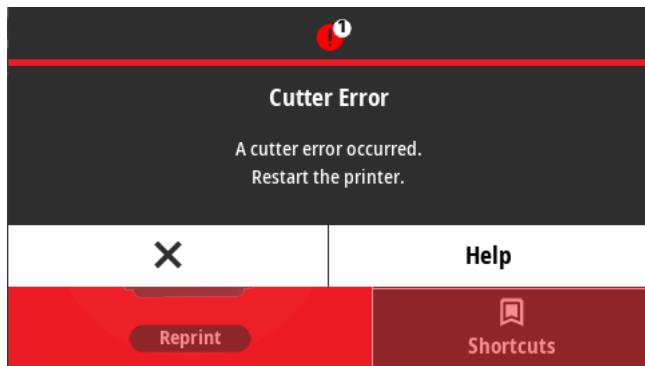
### Resolution

Check for the availability of ribbon cartridges. To change the ribbon low warning point. See the ZPL Programmer's Manual for details on printer programming. For printer links to manuals, the section [Related Documents and Software on page 9](#).

## Alert: CUT ERROR

The cutter blade is bound and is not moving properly.

STATUS PAUSE DATA SUPPLIES NETWORK



**CAUTION:** Never attempt to insert objects or fingers in to the cutter mechanism. Never remove the cutter cover (bezel). There are no operator serviceable parts in the cutter unit.



**IMPORTANT:** Using unapproved items such as tools, alcohol, solvents, cotton swabs, etc.; all may damage or shorten the cutter's usable life or cause the cutter to bind.

### Possible Cause - 1

Media, adhesive, or external object has stopped the cutter blade from operating.

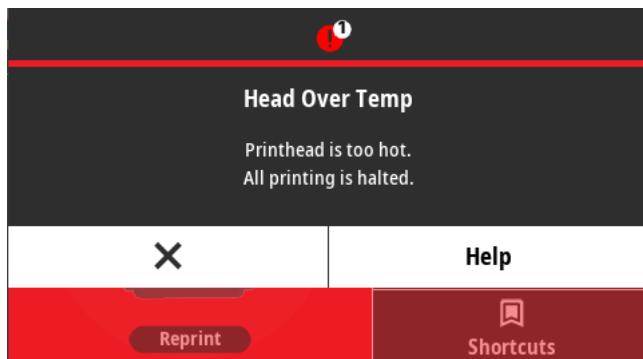
#### Resolution

1. Turn the printer off by holding the power button down for 5 seconds. Wait for the printer to shutdown completely. Turn the printer on.
2. If the printer does not recover from this error, call a service technician. This is not a operator serviceable item.

## Alert: PRINthead OVER TEMP

The printhead is over temperature and paused to allow the printhead to cool.

STATUS PAUSE DATA SUPPLIES NETWORK

### Possible Cause - 1

The printer is printing a large batch job, typically with large amounts of print.

#### Resolution

The print operation will resume after the printhead has cooled.

### Possible Cause - 2

The ambient temperature at the printers location exceeds the specified operating range. Sometimes, ambient temperatures in the printer can be higher if it is in direct sunlight.

#### Resolution

Move the printer location or cool ambient temperature where the printer is operating.

### Possible Cause - 1

Printhead has had a critical current or power failure.

STATUS PAUSE DATA SUPPLIES NETWORK



#### Resolution

1. Turn the printer off by holding the power using the **POWER** button down for 5 seconds. Wait for the printer to shutdown completely.

Turn the printer on.

2. Replace the printhead. See [Replacing the Printhead on page 66](#).

## Alert: PRINthead SHUTDOWN

The printhead is below operating temperature for proper printing.

STATUS PAUSE DATA SUPPLIES NETWORK



### Possible Cause - 1

Printhead has had a critical current or power failure.

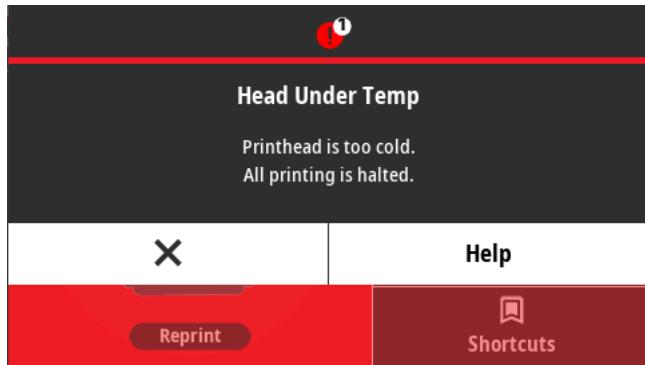
#### Resolution

1. Turn the printer off by holding the power using the **POWER** button down for 5 seconds. Wait for the printer to shutdown completely.  
Turn the printer on.
2. Replace the printhead. See [Replacing the Printhead on page 66](#).

## Alert: PRINthead UNDER TEMP

1. The printhead is below operating temperature for proper printing.

STATUS PAUSE DATA SUPPLIES NETWORK



### Possible Cause - 1

The ambient temperature at the printers location is below the specified operating range.

#### Resolution

Turn the printer off. Move the printer location and wait for it to warm naturally. Moisture may condense in and on the printer if the temperature changes too quickly.

### Possible Cause - 2

The printhead thermistor has failed.

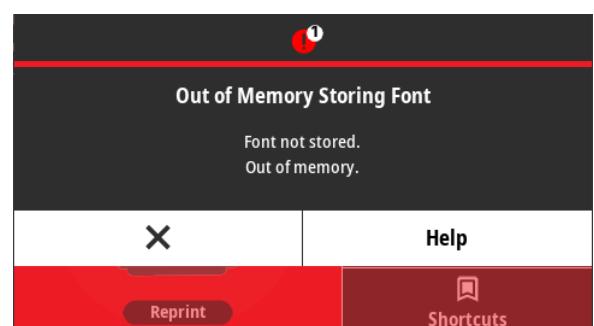
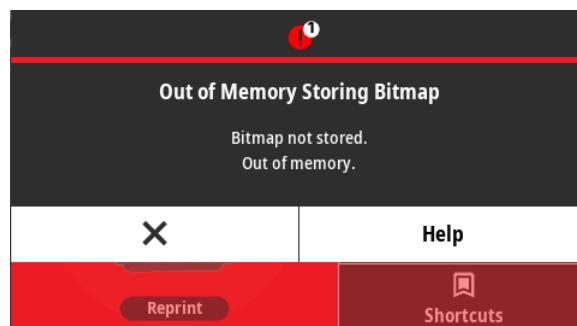
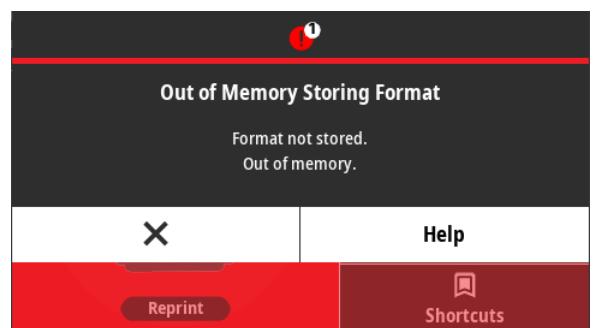
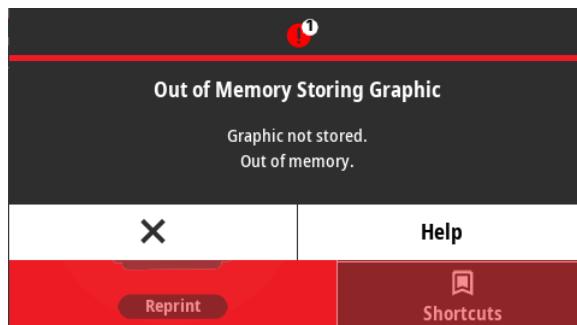
### Resolution

1. Turn the printer off by holding the power button down for 5 seconds. Wait for the printer to shutdown completely. Turn the printer on.
2. Replace the printhead.

## Alert: OUT OF MEMORY

Data can not be stored in the specified memory location. There are four types of storage memory: Graphic, Format, Bitmap and Font. There is not enough memory to perform the function specified on the second line of the error message.

STATUS PAUSE DATA SUPPLIES NETWORK



### Possible Cause - 1

There is not enough memory to perform the function specified on the second line of the error message.

### Resolution

1. Free up some of the printer's memory by adjusting the label format or printer parameters to make the print area smaller.
2. Remove unused graphics, fonts, or formats.
3. Ensure that the data is not directed to a device that is not installed or is unavailable.

## Resolving Print Issues

This section helps you identify issues with printing or print quality, the possible causes, and solutions.

### Issue: General Print Quality Issues

The printed image does not look right.

#### Possible Cause - 1

The printer is set at an incorrect darkness level and/or print speed.

##### Resolution

Perform the Print Quality Report (**FEED** self test) to determine the ideal darkness and speed settings for your application. Do not set print speeds above the manufacturer's maximum rated speed for your media.

#### Possible Cause - 2

The printhead is dirty.

##### Resolution

Clean the printhead. See [Cleaning the Printhead on page 18](#).

#### Possible Cause - 3

The platen roller is dirty or damaged.

##### Resolution

Clean or replace the platen. Platens can wear out or get damaged. See [Platen Cleaning and Replacement on page 30](#).

#### Possible Cause - 4

The printhead has worn out.

##### Resolution

Replace the printhead. The printhead can wear out and be damaged. See [Replacing the Printhead on page 66](#).

#### Possible Cause - 5

Thermal Transfer printing - Printing looks fuzzy, has smudge marks, or has voids or holes in print with no particular pattern.

##### Resolution

The print material (wax, wax-resin, or resin) may not match the material (paper, media coating, or synthetics) in use. Set the printer for no higher than the maximum recommended print speed of the ribbon.

#### Possible Cause - 6

You may be using the wrong power supply.

### Resolution

Verify you are using the power supply that came with this printer.

## Issue: No Print on the Label

The printed image does not look right.

### Possible Cause - 1

The media may not be direct thermal media (and is thermal media made for thermal transfer printers).

### Resolution

See the test procedure, [Determining Thermal Media Types on page 221](#).

### Possible Cause - 2

Media has been loaded incorrectly.

### Resolution

The media printable surface must face up towards the printhead.

## Issue: Labels Are Distorted in Size or Print Area Start Position Varies

Includes printed image that skips between labels (mis-registration).

### Possible Cause - 1

Media has been loaded incorrectly or the movable media sensor is not set properly.

### Resolution

Verify that the sensor is set and positioned correctly for your media type and sensing location.

### Possible Cause - 2

The media sensors are not calibrated for your media length, physical properties, or sensing type (gap/notch, continuous, or mark).

### Resolution

1. Run a SmartCal media calibration, see [SmartCal Procedure on page 36](#).
2. If it still skips labels after step 1, try a manual media calibration. See the printers user guide.

### Possible Cause - 3

The platen (drive) roller is slipping or damaged.

### Resolution

Clean or replace the platen. Platens can wear out or get damaged. See [Platen Cleaning and Replacement on page 30](#).

### Possible Cause - 4

The printer has communication issues with cables or communication settings.

#### Resolution

See [Communication Issues on page 49](#).

## Communication Issues

This section identifies problems with communications, the possible causes, and the recommended solutions.

### Issue: Label Job Sent, No Data Transfer

A label format was sent to the printer but was not recognized. The DATA light does not flash.

#### Possible Cause

The communication parameters are incorrect.

#### Resolution - 1

Check the printer driver or software communications settings (if applicable).

#### Resolution - 2

Serial Port Only - Check the printer's handshake protocol and serial port settings. The setting used must match the one being used by the host computer.

#### Resolution - 3

The serial cable you are trying to use may not be a standard DTE or DCE type cable, is damaged, or is too long per the RS-232 Serial ports specifications.

### Issue: Label Job Sent, Skips Labels or Prints Bad Content

A label format was sent to the printer. Several labels print, then the printer skips, misplaces, misses, or distorts the image on the label.

#### Possible Cause

The serial communication settings are incorrect.

#### Resolution - 1

Check the printer driver or software communications settings (if applicable). Ensure that the flow control settings and other serial port handshake setting match the host system.

### Issue: Label Job Sent, Data Transfers, But No Print

A label format was sent to the printer but was not recognized. The DATA light flashes but no printing occurs.

#### Possible Cause - 1

The prefix and delimiter characters set in the printer do not match the ones in the label format.

##### Resolution

Verify the ZPL command prefix (COMMAND CHAR) and delimiter (DELIM./CHAR) characters.

#### Possible Cause - 2

Incorrect data is being sent to the printer.

##### Resolution

Check the communication settings on the computer. Ensure that they match the printer settings.

#### Possible Cause - 3

Incorrect data is being sent to the printer.

##### Resolution

Check the label format. See the ZPL Programming Guide for details on printer programming. For printer links to manuals, the section [Related Documents and Software on page 9](#).

## Miscellaneous Issues

This section identifies miscellaneous issues with the printer, the possible causes, and the recommended solutions.

### Issue: Settings are Lost or Ignored

Some parameters are set incorrectly.

#### Possible Cause - 1

Printer settings were changed without saving them.

##### Resolution

The ZPL ^JU command was not used to save your configuration before turning the printer off. Cycle the printer OFF and then back ON to verify settings have been saved.

#### Possible Cause - 2

The label format/form commands or commands sent directly to the printer have syntax errors or have been used incorrectly.

- A firmware command turned off the ability to change the parameter.
- A firmware command changed the parameter back to default setting.

### Resolution

See the ZPL programmer's guide to verify command usage and syntax. See the section [About this Guide on page 9](#) for support links to view the ZPL Programming Guide for your printer model.

### Possible Cause - 3

The prefix and delimiter characters set in the printer do not match the ones in the label format.

### Resolution

Verify the ZPL programming settings of the Control, Command and Delimiter settings are correct for your system software environment. Print a Configuration Report or use the display Language Menu (if present) for these three (3) menu items and compare it the commands in label format/form you are trying to print.

### Possible Cause - 4

The Main Logic board may not be working properly. Firmware is corrupted or the printer needs service.

### Resolution

1. Reset the printer to factory defaults. See **System > Settings > Restore Defaults** or use the Zebra Setup Utility and [Open Printer Tools > Action > Load printer defaults](#).
2. Reload printer firmware. See [Updating Printer Firmware on page 34](#).
3. Replace the Main PCBA.

## Issue: Non-continuous labels act as Continuous labels.

A non-continuous label format with matching media loaded in the printer, was sent to the printer but prints like it is continuous media.

### Possible Cause - 1

The printer was not calibrated for the media being used.

### Resolution

Set the movable media for the media in use and run a SmartCal media calibration, see [SmartCal Procedure on page 36](#).

### Possible Cause - 2

The printer is configured for continuous media.

### Resolution

Set the printer for the correct media type (gap/notch, continuous, or mark) and calibrate the printer using Run a [SmartCal Procedure on page 36](#) and if necessary use [Manual Media Calibration](#) for hard to calibrate media types. See [Print > Print Quality > Label Type](#) for ZD621 printers with the display to check and set media type.

### Issue: Printer Locks-Up

All indicator lights are on and the printer locks up or the printer locks up while restarting.

#### Possible Cause - 1

The printer memory has been corrupted by an unknown event.

#### Resolution - 1

1. Reset the printer to factory defaults. See **System > Settings > Restore Defaults** or use the Zebra Setup Utility and **Open Printer Tools > Action > Load printer defaults**.
2. Reload printer firmware. See [Updating Printer Firmware on page 34](#).
3. Replace the Main PCBA.

### Issue: Erroneous Ribbon Cartridge Faults

The printer is not detecting the ribbon cartridge properly.

- The printer has a Ribbon Out warning, but a ribbon cartridge is installed.
- Or the printer has as Ribbon Cartridge Authentication error, but a Genuine Zebra Ribbon Cartridge is installed and has not been refurbished or altered.

#### Possible Cause

The ribbon cartridge sensor contact pins or the ribbon cartridge's smart chip's contacts may be dirty or the chip may be damaged.

#### Resolution

1. Clean the ribbon cartridge's smart chip contact with alcohol and a lightly moistened cotton swab if they look contaminated.
2. Try a different cartridge.
3. Clean the ribbon cartridge sensor contact pins - see [Cleaning Ribbon Cartridge Sensor on page 29](#).
4. Reload printer firmware. See [Updating Printer Firmware on page 34](#).
5. Replace the ribbon cartridge sensor.

### **Issue: Battery Has a Red Indicator**

Battery has a fault.

#### **Possible Cause - 1**

The battery has reached its usable life or has a general component failure.

#### **Possible Cause - 2**

Battery is too hot or too cold

#### **Resolution**

1. Remove the battery from the printer and check charge status by charging the battery.
2. Let the battery cool down or warm up to ambient temperature and recheck the battery charge.
3. Replace the battery.

# Required Tools



**TOOLS:** Make use of the following tools while performing replacement procedures:

- #10 hexalobular (T10) driver (magnetized)  
Torque value range:  $0.53 \pm 0.11 \text{ NM} = 4.7 \text{ inch}\cdot\text{lb}$
- #6 hexalobular (T6) driver (magnetized)  
Torque value range:  $0.53 \pm 0.11 \text{ NM} = 4.7 \text{ inch}\cdot\text{lb}$
- Small flat-blade (slot-head) screwdriver
- Small pliers
- Printhead cleaning pen
- Fiber free swabs
- Lint free wipes
- Isopropyl Alcohol – 99.7% pure solution

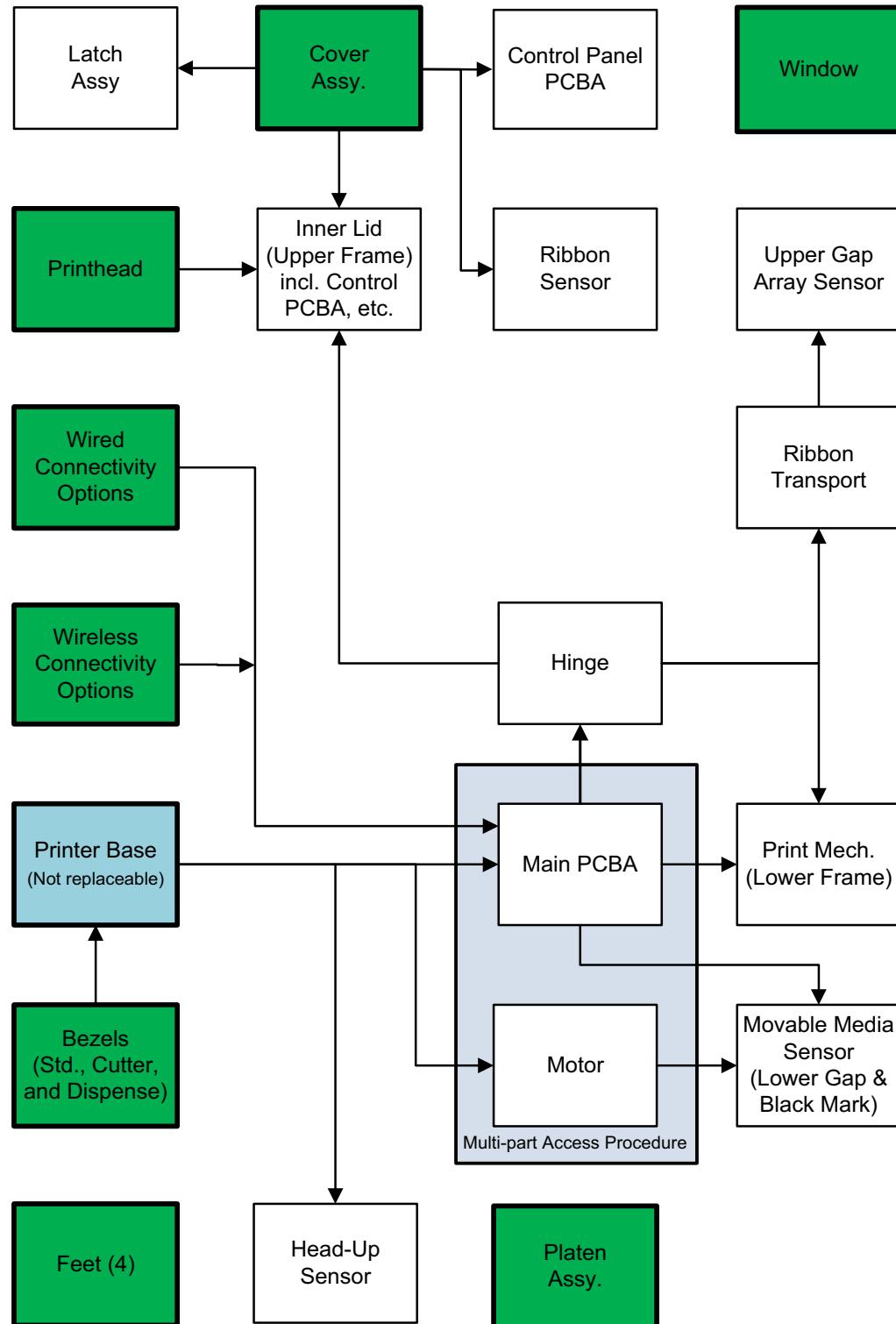
# Replacing Parts

The part replacement procedures in this manual have been broken down into common procedures and sub-procedures with most aligning to spare parts. Each procedure lists which procedures and actions must precede it in order to perform the procedure. A “Repair Path” flow diagram is on the following page.

In the event you must replace a part, review the repair path flow diagram to see which procedures to perform. Read the part’s procedure to identify procedures and steps required to remove the old part and install the new part. Many repair sequences include simple functionality tests, cleaning or other operations after the spare has been replaced to verify the repair and printer state.

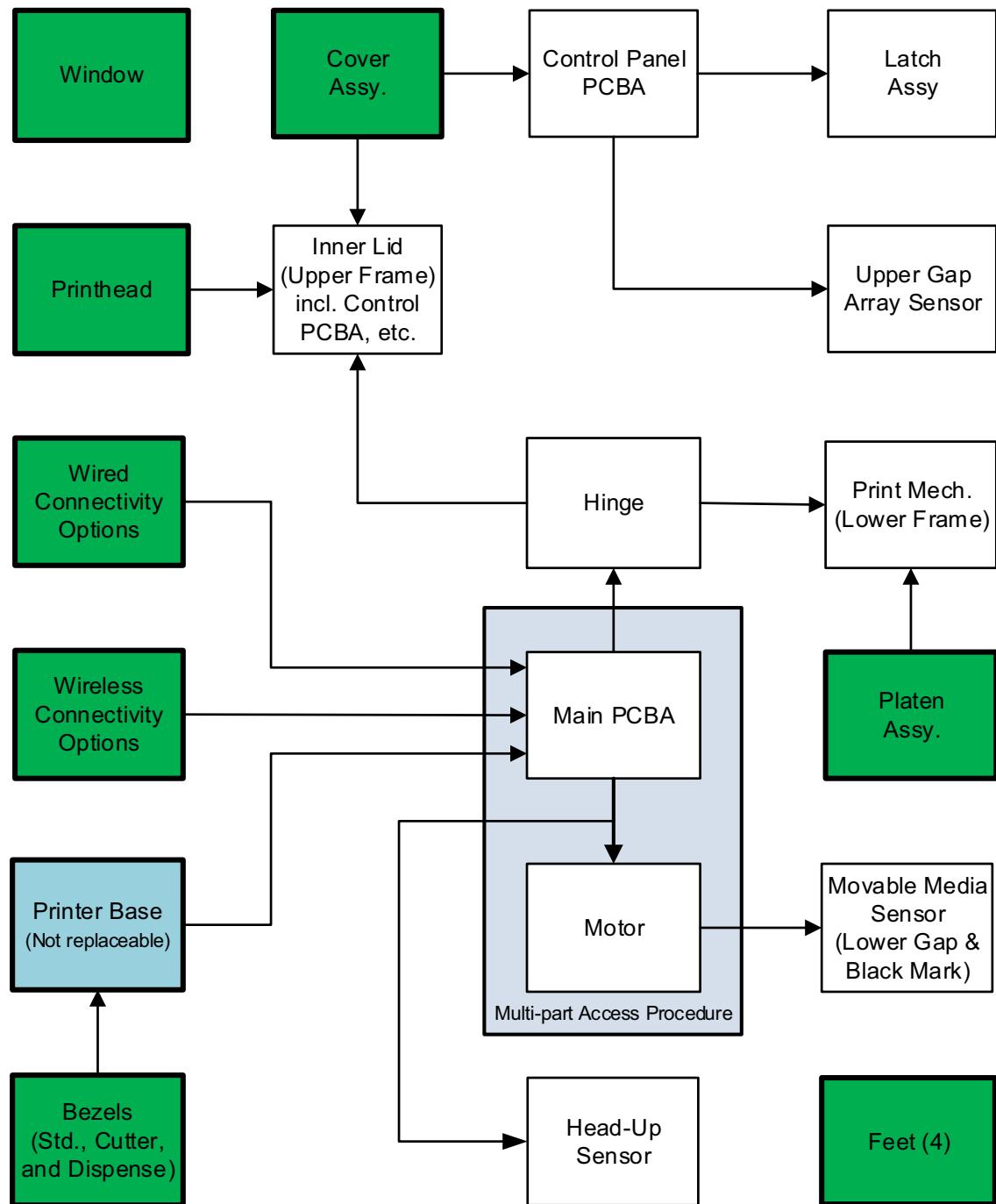
## Repair Procedure Sequence for ZD421(c) Cartridge Printers

The Repair Path flow diagram shows the starting point (green blocks) to the endpoint – the replacement procedure for your spare part. The diagram does not include any general repair preparation or post repair operations that may be recommended for the printer.



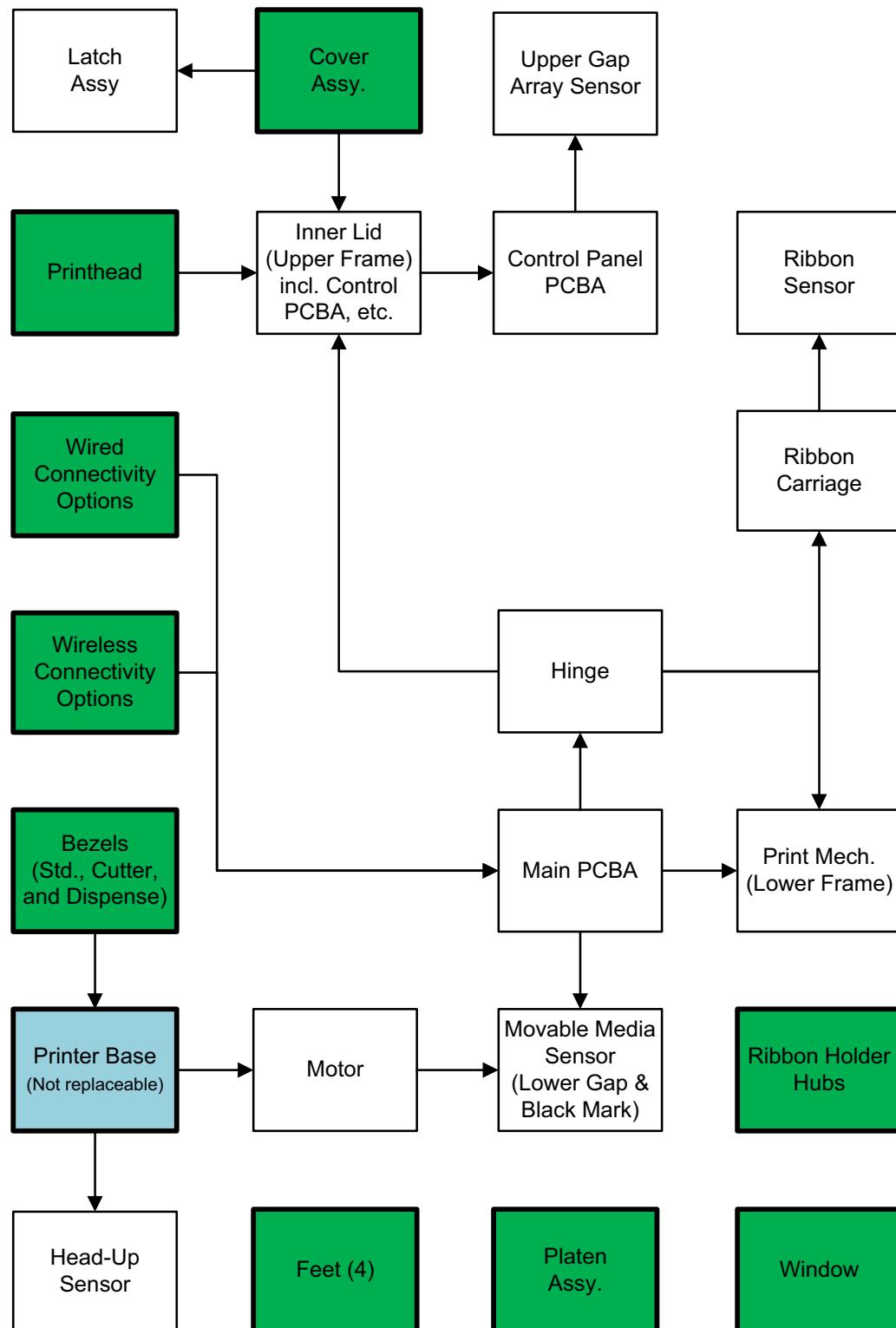
## Repair Paths for ZD421(d) and ZD621(d) Direct Thermal Printers

The Repair Path flow diagram shows the starting point (green blocks) to the endpoint – the replacement procedure for your spare part. The diagram does not include any general repair preparation or post repair operations that may be recommended for the printer.



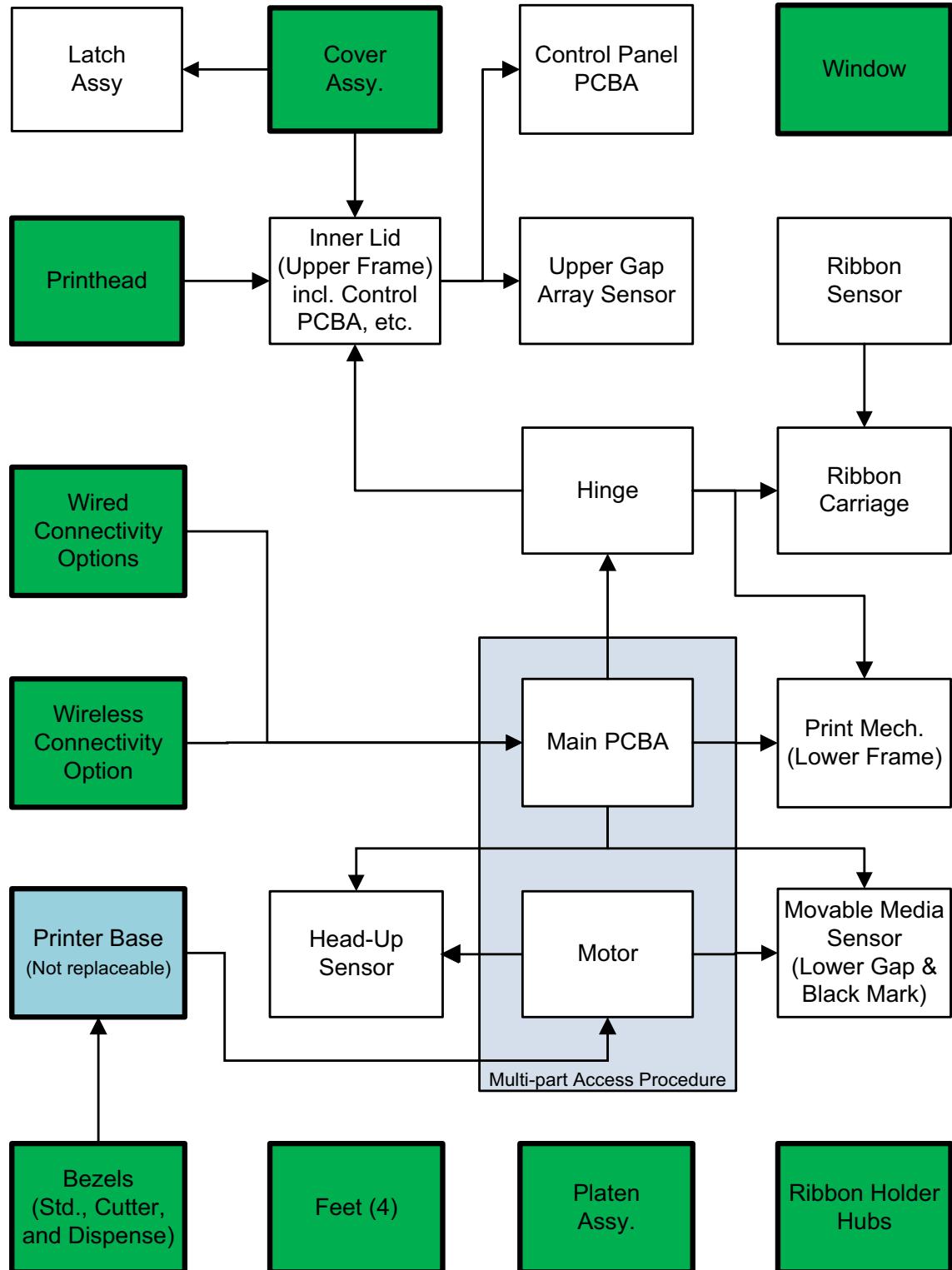
# Repair Paths for ZD421(t) Thermal Transfer Printers

The Repair Path flow diagram shows the starting point (green blocks) to the endpoint – the replacement procedure for your spare part. The diagram does not include any general repair preparation or post repair operations that may be recommended for the printer.



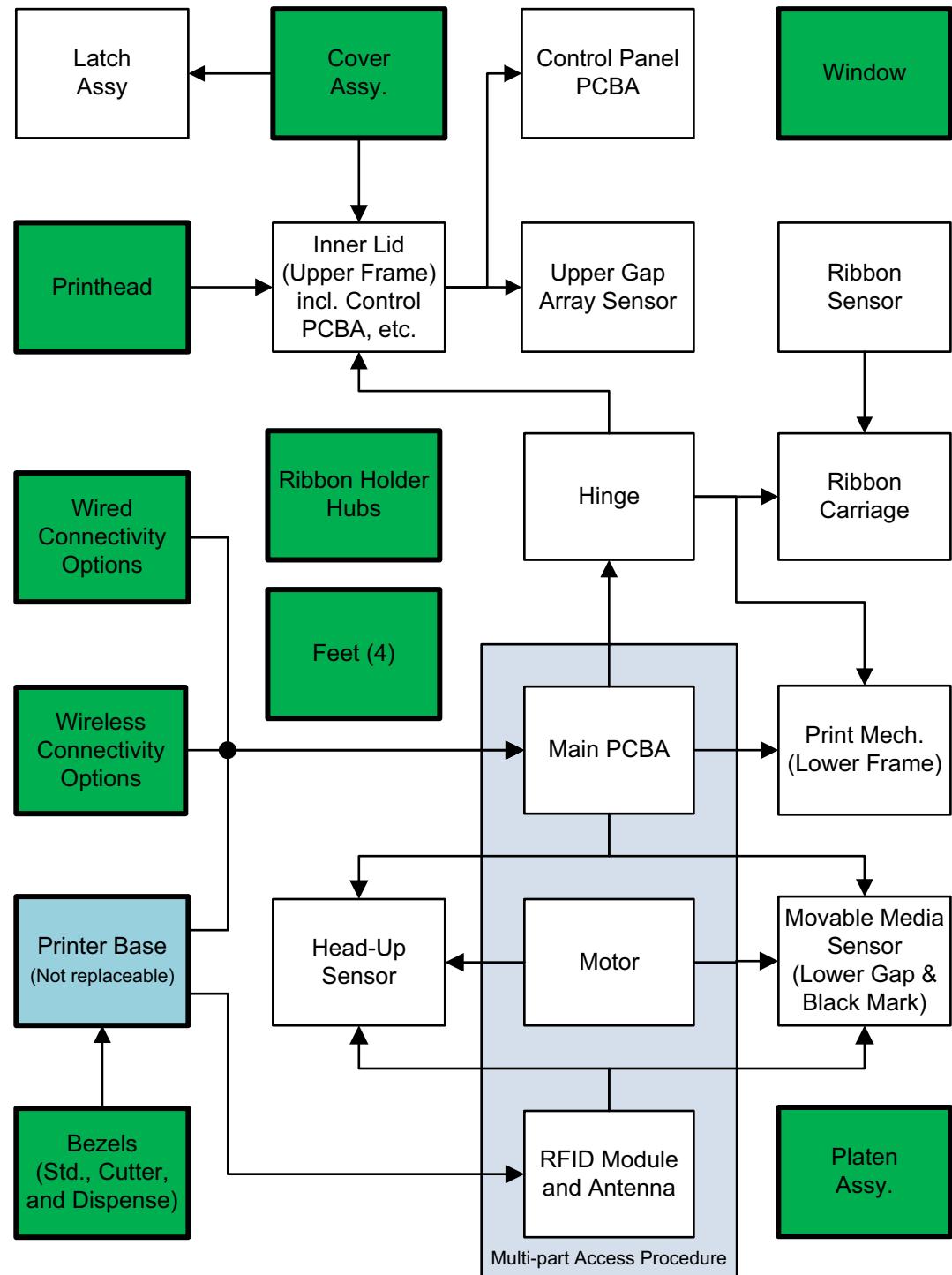
## Repair Paths for ZD621(t) Thermal Transfer Printers

The Repair Path flow diagram shows the starting point (green blocks) to the endpoint – the replacement procedure for your spare part. The diagram does not include any general repair preparation or post repair operations that may be recommended for the printer.



# Repair Paths for ZD621R RFID Thermal Transfer Printers

The Repair Path flow diagram shows the starting point (green blocks) to the endpoint – the replacement procedure for your spare part. The diagram does not include any general repair preparation or post repair operations that may be recommended for the printer.



## How to Determine a Repair Sequence for your Part

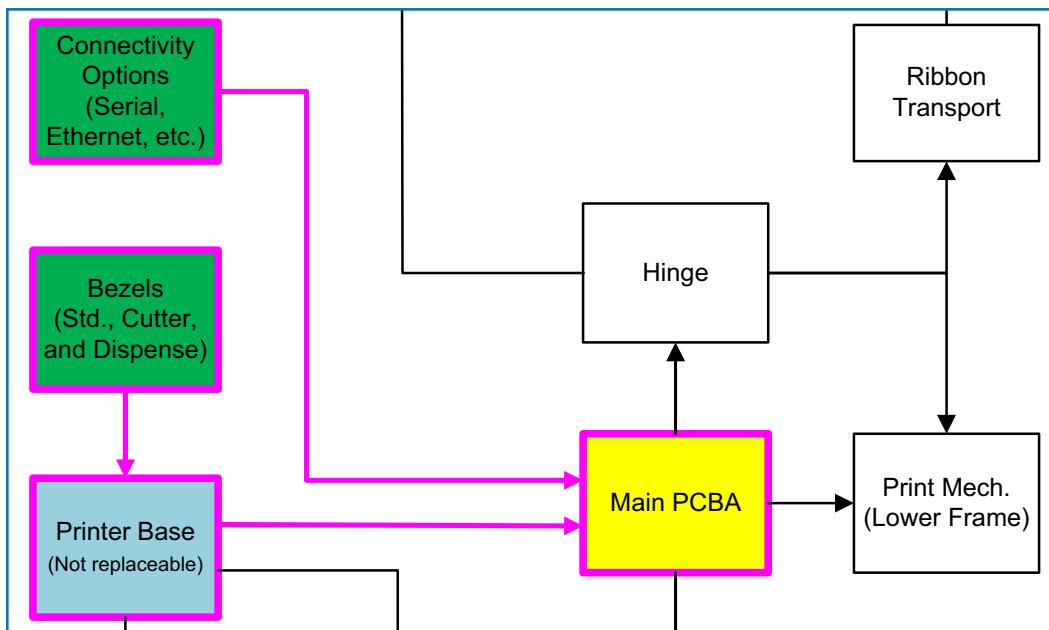
Repair procedures are broken down into sub-procedures that mainly align to spare parts. Many procedures require you to remove other parts to gain access to the part needing replacement. The green blocks represent stand alone or starting procedures needing to be performed to access other parts. Use the connecting arrow lines (going backwards and forward) to determine procedure order for your repair item. One or more starting procedure paths may be needed to access a given part being replaced. Individual repair procedures include references to prerequisite procedures for each procedure in repair order.

After you have diagnosed and identified the part that needs replacing in your printer, you can use the repair flow charts to identify the prerequisite repair procedures needed to complete your repair.

### Repair Path Example

For this example, we have chosen the main PCBA. It requires multiple paths to complete the repair.

During the troubleshooting process (for the purposes of this example), we have determined that the printer has a problem with the main PCBA (yellow square below). By following the arrows leading into the main PCBA repair square, we can see the connectivity options and the printer base precede the main PCBA. The connectivity options procedure square is green to denote a starting procedure. It has no arrows leading into it, therefore no prerequisite procedures. The printer base has an arrow coming from the bezel procedure square and it is a prerequisite for both the printer base and main PCBA repair procedures by following all the arrows to the Main PCBA.



## Repair Preparation and Post Repair Basic Operational Tests

To prevent additional damage or injury, the printer and its repair area needs to be prepared prior to repairing the printer.

### Preparation



**CAUTION—ESD:** Observe proper electrostatic safety precautions when handling static-sensitive components such as circuit boards and printheads.

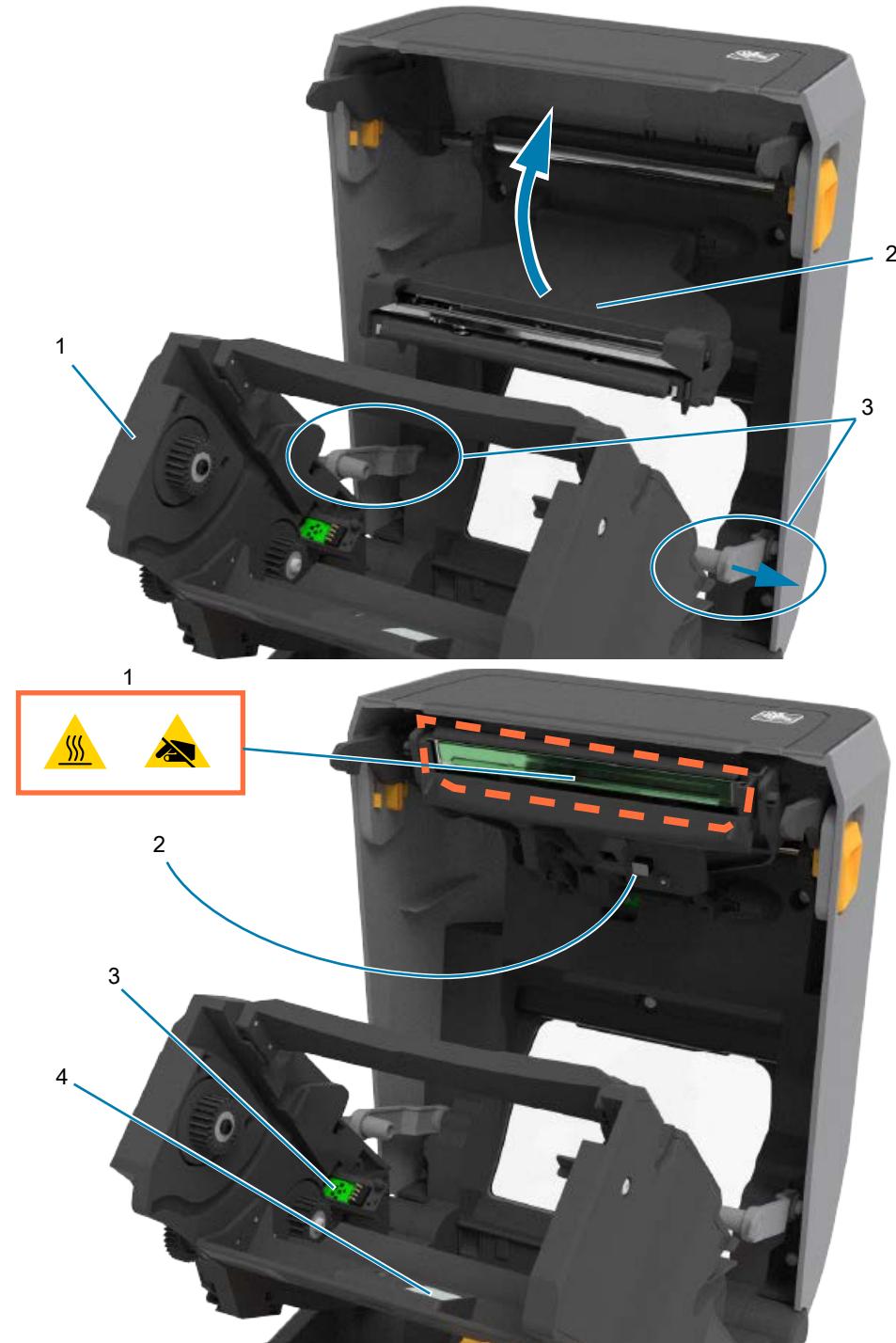
- The repair surface and area should be clean.
- Use electrostatic protection (grounded mats, ground straps, etc.).
- Remove all media and ribbon cartridges from the printer.
- Disconnect all cables and power from the printer.

### Post Repair Cleaning and Basic Testing

1. Clean the printer. This will leave the printer in a optimal state and provide assurance the contamination has not migrated or been added during handling and repair.
  - [Cleaning the Printhead on page 18](#)
  - [Sensor Cleaning on page 26](#)
  - [Media Path Cleaning on page 21](#)
  - [Platen Cleaning and Replacement on page 30](#)
2. Load a full width roll of labels and a ribbon cartridge into the printer; see the printers user's guide for details.
3. Connect the printer to power and turn ON the printer. The printer runs self tests and configures itself for the options installed.
4. Set the print width to full width printing, if needed after troubleshooting and repair.
5. Calibrate the media (see [Run a SmartCal Media Calibration after Repairs on page 36](#)).
6. Print a configuration report to test printing and provide information on the status and configuration of the printer and it's option (see [Test Printing with the Configuration Report on page 37](#)).

## ZD421 Ribbon Cartridge Printer - Accessing the Printhead

1. Pull both release arms (3) out (lighter gray parts).
2. Ribbon (drive) transport (1) drops down.
3. Lift printhead actuator arm (2) up to access the printhead.



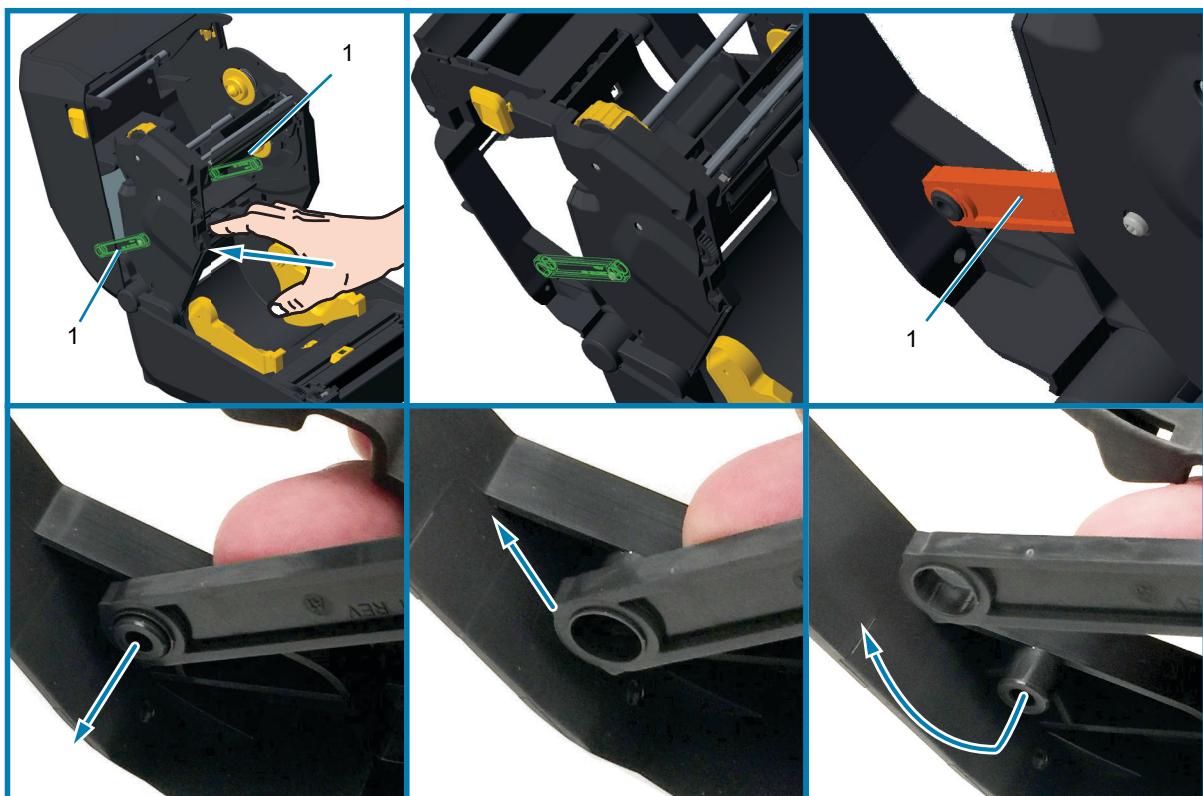
1 - Printhead	2 - Ribbon Sensor
3 - Ribbon Cartridge Authentication and Status Interface	4 - Ribbon Sensor's Reflector

## Transfer Ribbon Roll Printers: Accessing Inside the Cover

Disconnecting the thermal transfer printer's inner cover top cover for the ribbon carriage makes it easier to access for repairs. It's a simple tool-less process to disconnect the two link arms holding them together.

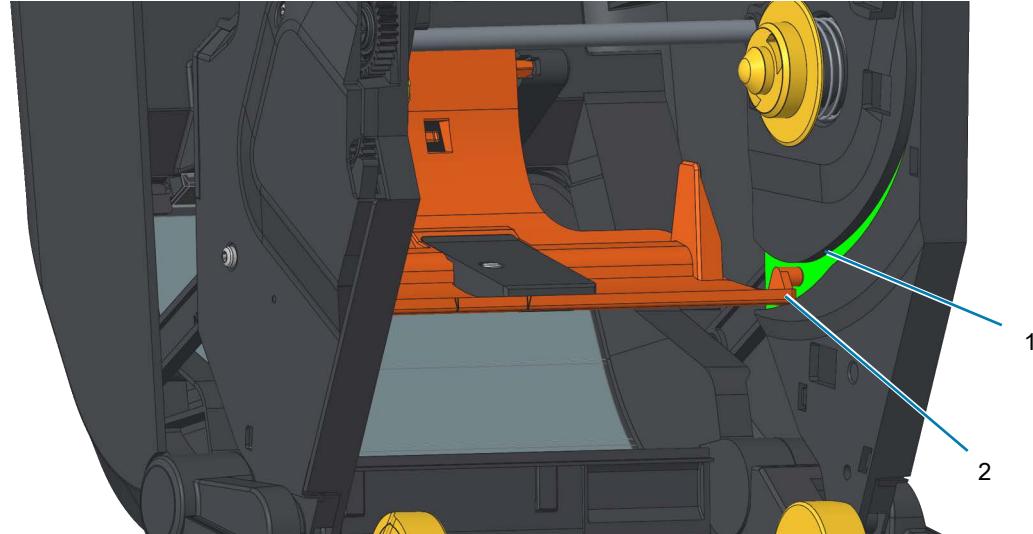
### Disconnecting the Cover from the Ribbon Carriage

1. With the printer's cover open, slide your hand under the flapper arm (curved part) that slides into the ribbon carriage and is connected to the inner frame of the cover. Use your index finger to touch the left link arm (1) where it contacts the inner frame.
2. Push the link arm (1) towards the outside of the printer until it just clears the top of the post. Slide it up and off the post.
3. Repeat steps 1 and 2 to disconnect the right side link arm.
4. Pull the ribbon carriage down and towards the front of the printer while holding the cover in the full open position. The flapper arm will come loose and swing down into the inner cover.



### Re-connecting the Ribbon Carriage

1. Swing the flapper arm (2 -orange in drawing below) up and the ribbon carriage up so the two side posts slide into the curved channels (1- green surface highlight channel) on the inside of the ribbon carriage.



2. The free ends of the links on the ribbon carriage go back on the posts on the inner frame of the top cover. Move the link arm and ribbon carriage to get the hole at the end of the link arm close to alignment and push the link arm up and over the post and release when centered. The link arm on the other side is now aligned and it is easy to push it over and on the post.
3. Verify that the top cover now opens and closes with the carriage moving with the cover.

# Replacing the Printhead

If you need to replace the printhead, read the procedure and review the removal and installation steps before actually replacing the printhead.

## Preparation



**CAUTION—ESD:** Observe proper electrostatic safety precautions when handling static-sensitive components such as circuit boards and printheads.



**CAUTION:** Unplug the printer from the power supply and allow the printer to cool to prevent injuries or damage to printer circuitry.

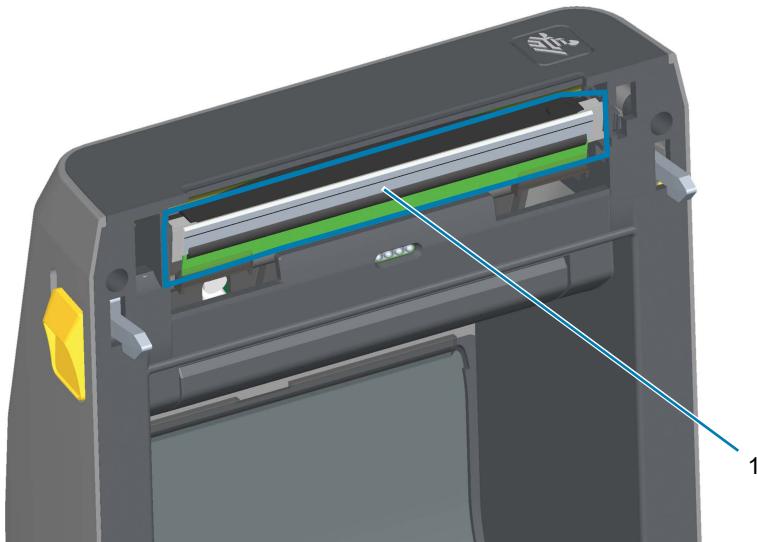
**Use one of the following model-specific procedures to replace the printhead.**

- [ZD621 and ZD421 Direct Thermal Printhead on page 67](#)
- [ZD621 and ZD421 Thermal Transfer Ribbon Roll Printhead on page 71](#)
- [ZD421 Thermal Transfer Ribbon Cartridge Printhead on page 76](#)

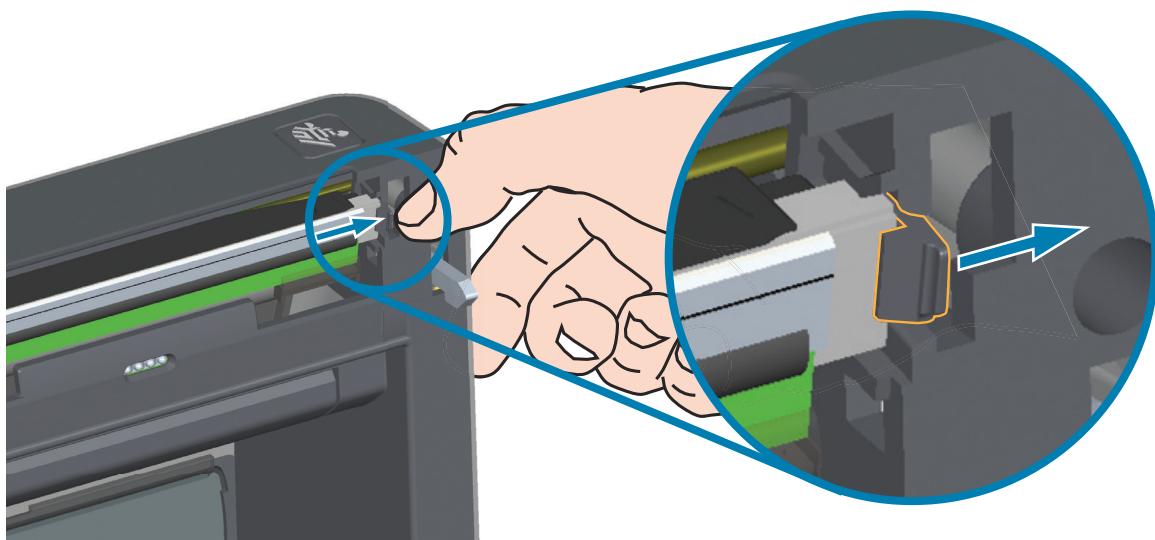
### ZD621 and ZD421 Direct Thermal Printhead

#### Removing the Printhead

1. Turn the printer OFF.
2. Open the printer to access the printhead (1).

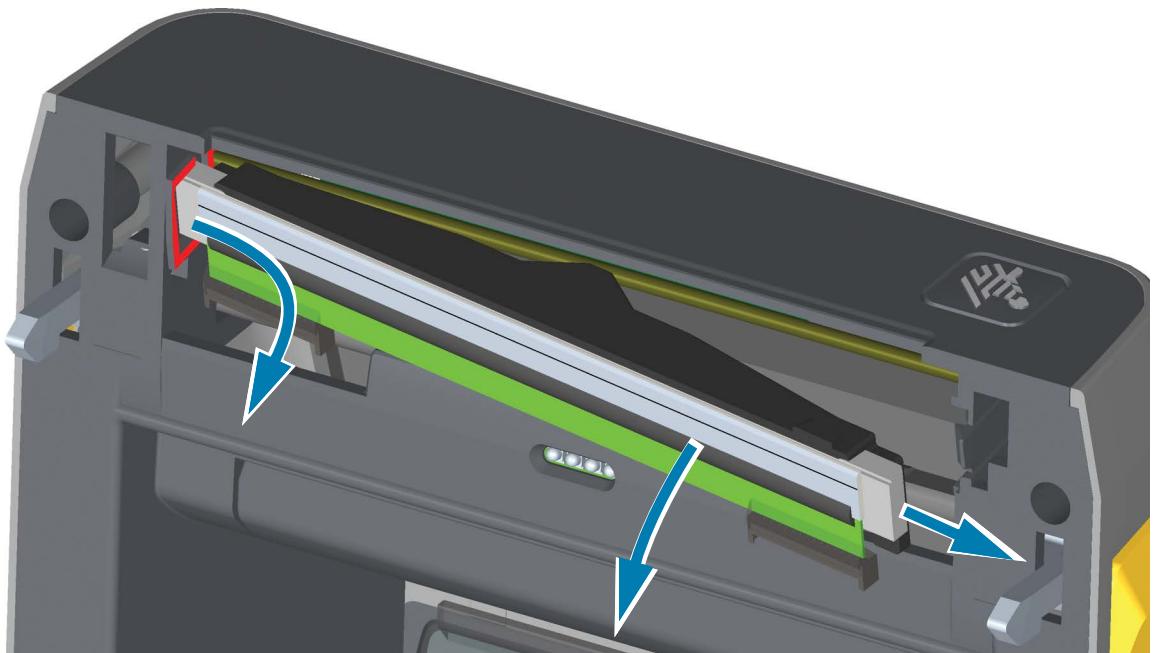


3. Push the printhead release latch away from the printhead. The right side of printhead releases.

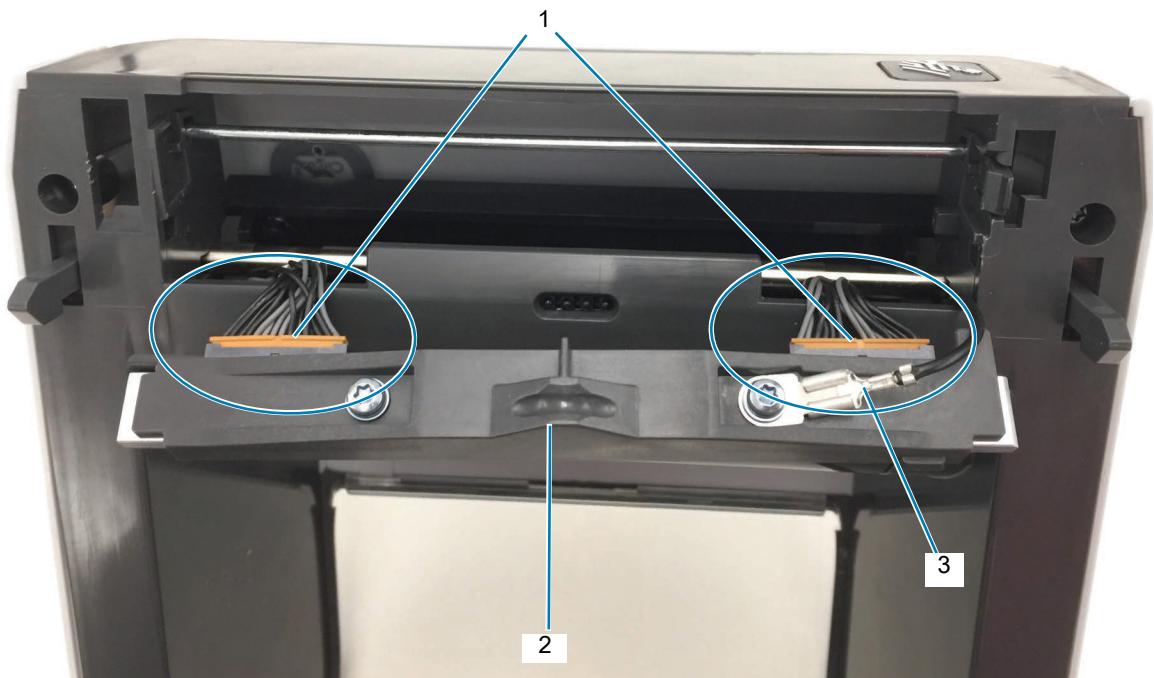


## Replacing Parts

4. Swing the loose right side of the printhead out of the printer. Pull it out and to the right a little to get the left side of the printhead clear. Pull the printhead out and free of the top cover to gain access to its attached cables on the backside of the printhead. Note, the red highlights of the left side printhead retainer slot location.

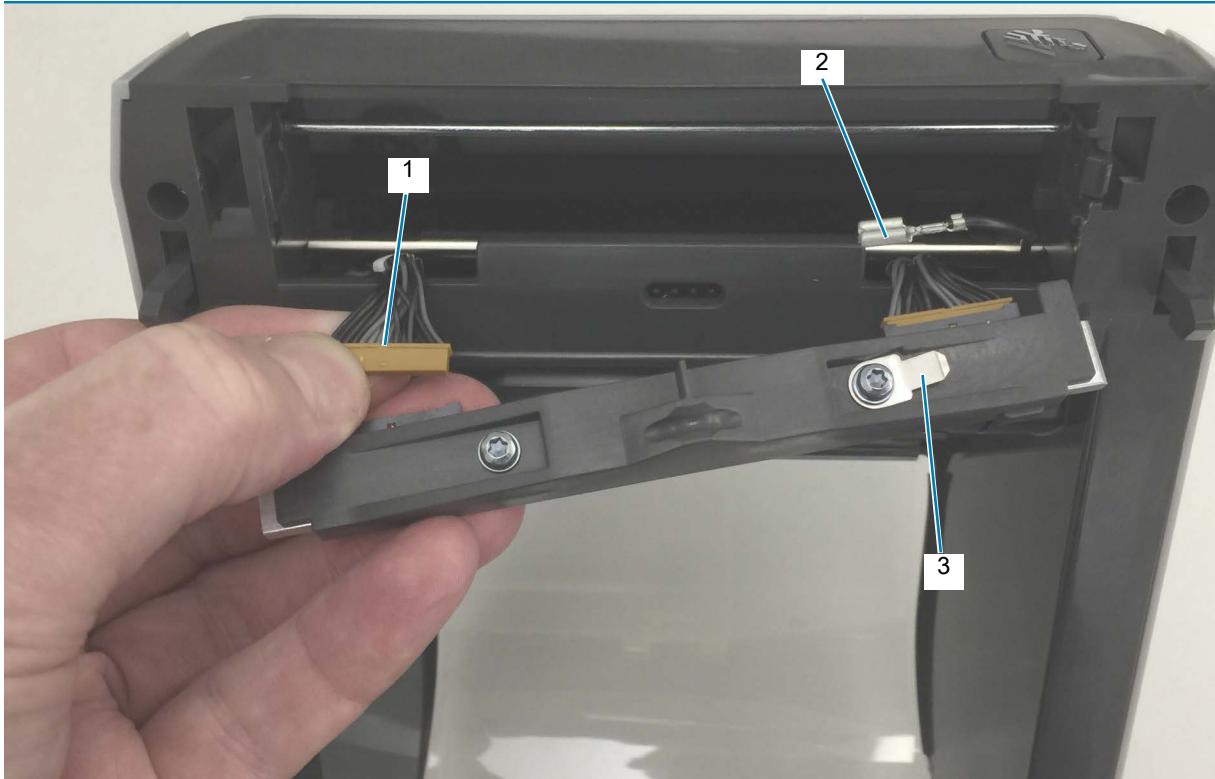


5. Gently but firmly pull the two printhead cable bundle connectors (1) off of the printhead (2). Pull the ground wire (3) off the printhead (2).

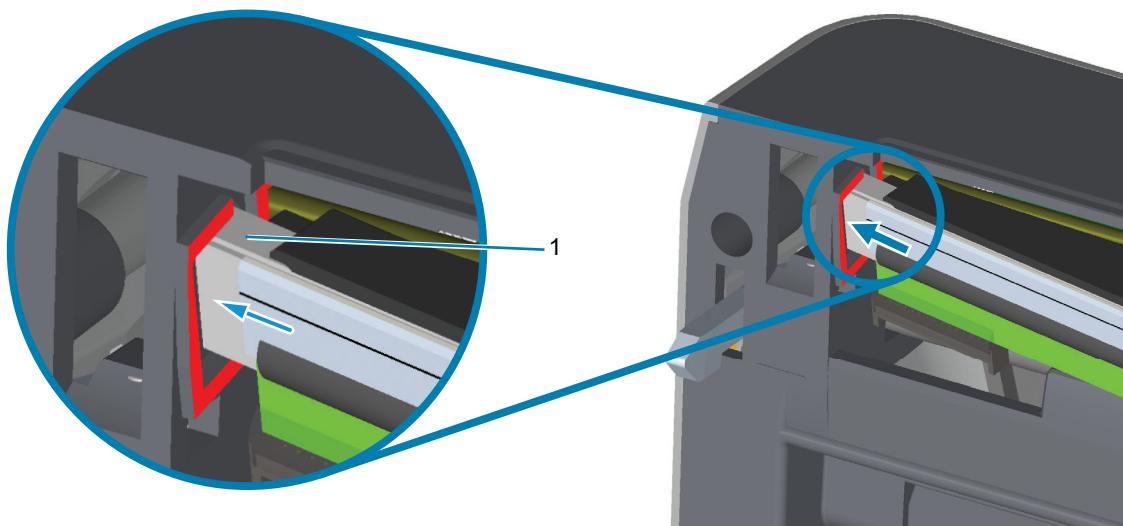


### Replacing the Printhead

1. Push the right side printhead cable connector (1) into the printhead. The connector is keyed to only insert one way.
2. Attach the ground wire (2)to the printhead's ground tab (3).

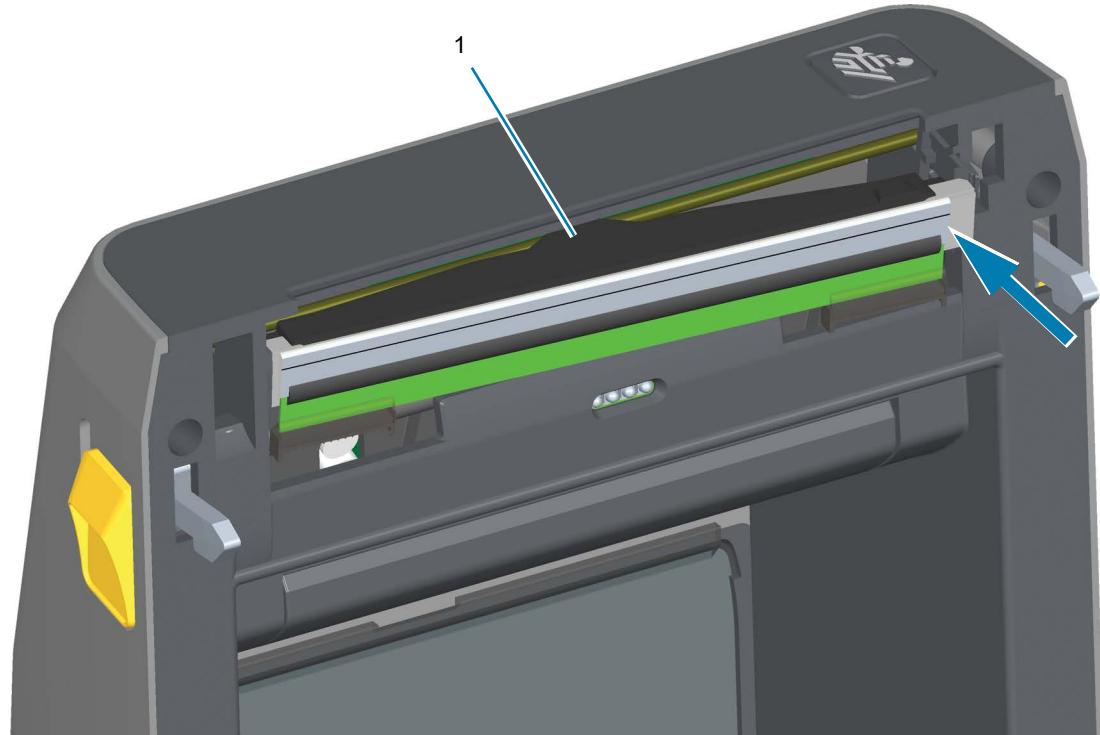


3. Push the left side printhead cable connector onto the printhead.
4. Insert the left side of the printhead assembly into the recessed slot (1 - highlighted in red) on the left side of the printer.

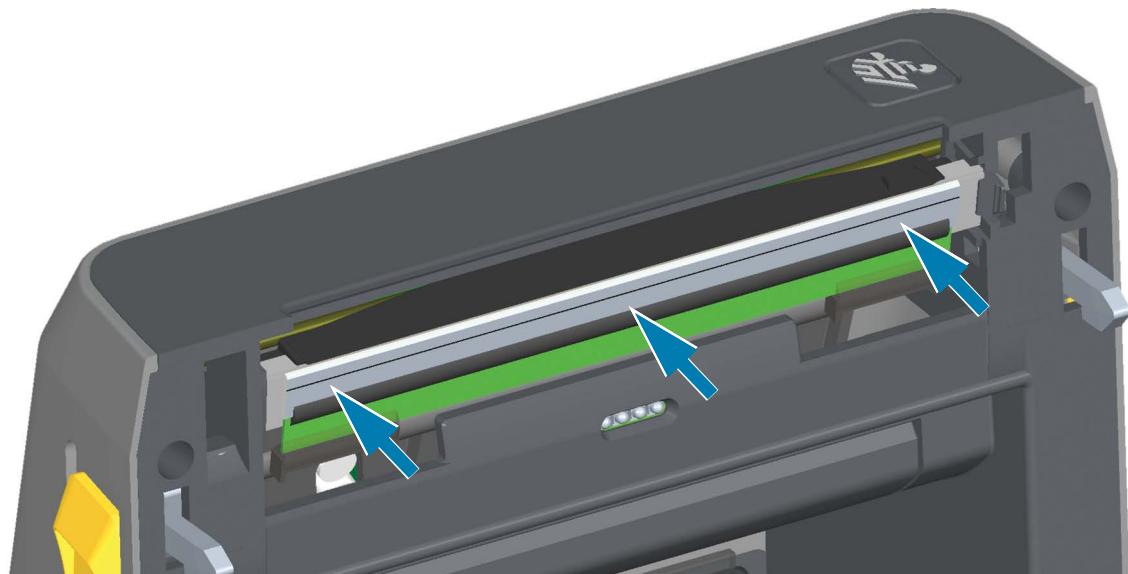


## Replacing Parts

5. Align the Spring Wire Notch (1) on the backside of the printhead to the Spring Wire. Push the right side of the printhead into the printer until the latch locks the right side of the printhead into the printer.



6. Verify that the printhead moves up and down freely when pressure is applied and remains locked when released.

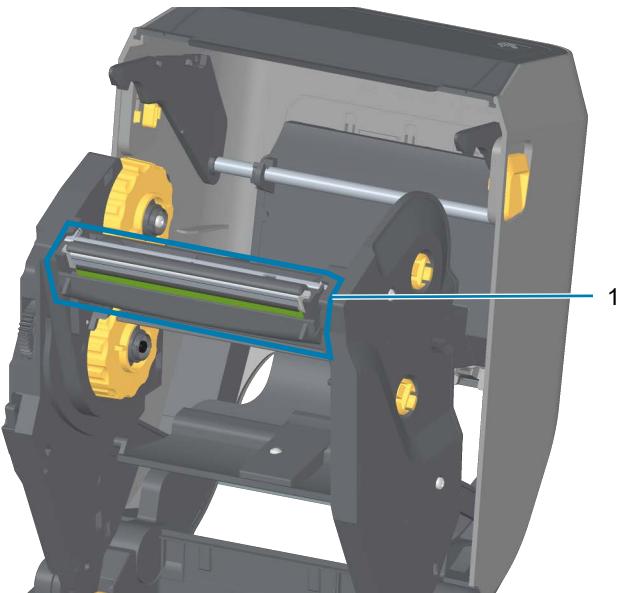


7. Clean the printhead. Use a new pen to wipe body oils (fingerprints) and debris of the printhead. Clean from the center of the printhead to the outside. See [Cleaning the Printhead on page 18](#).
8. Reload media. Plug in the power cord, turn on the printer and print a status report to ensure proper function. See [Test Printing with the Configuration Report on page 37](#).

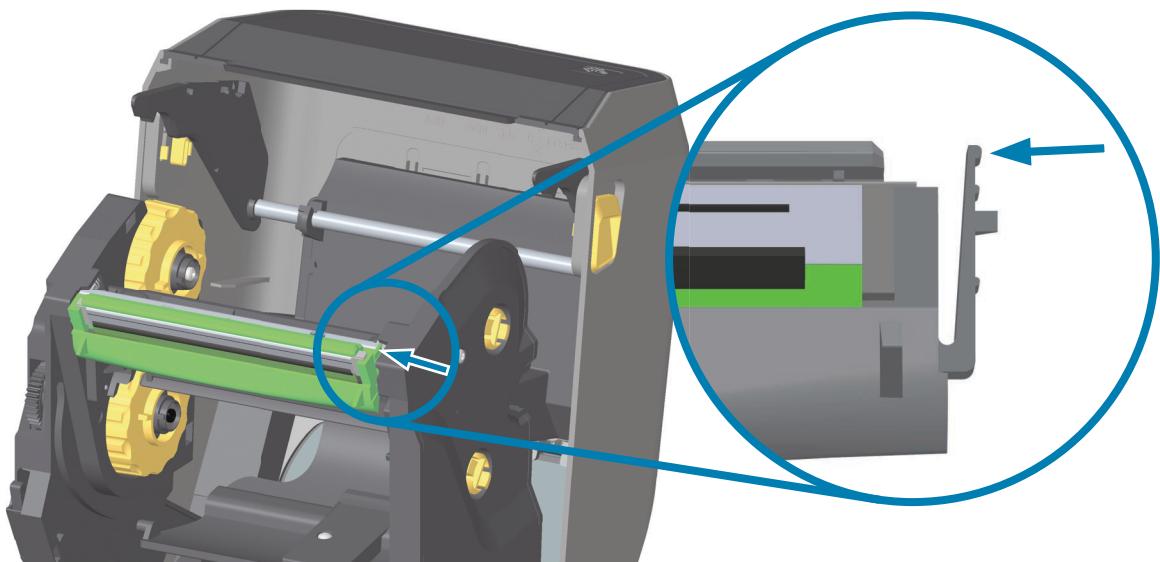
### ZD621 and ZD421 Thermal Transfer Ribbon Roll Printhead

#### Removing the Printhead

1. Turn the printer OFF.
2. Open the printer to gain access to the printhead (1).

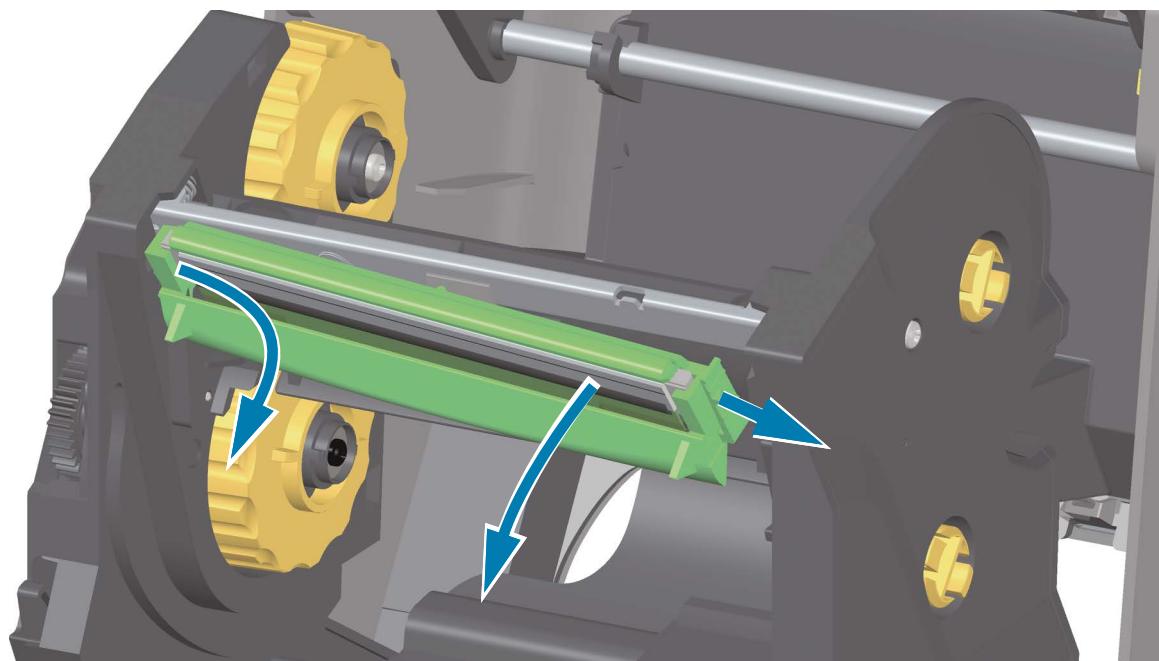


3. Push the printhead release latch toward the printhead (shown as green for visibility). The right side printhead releases down and away from the Printhead Actuator Arm.

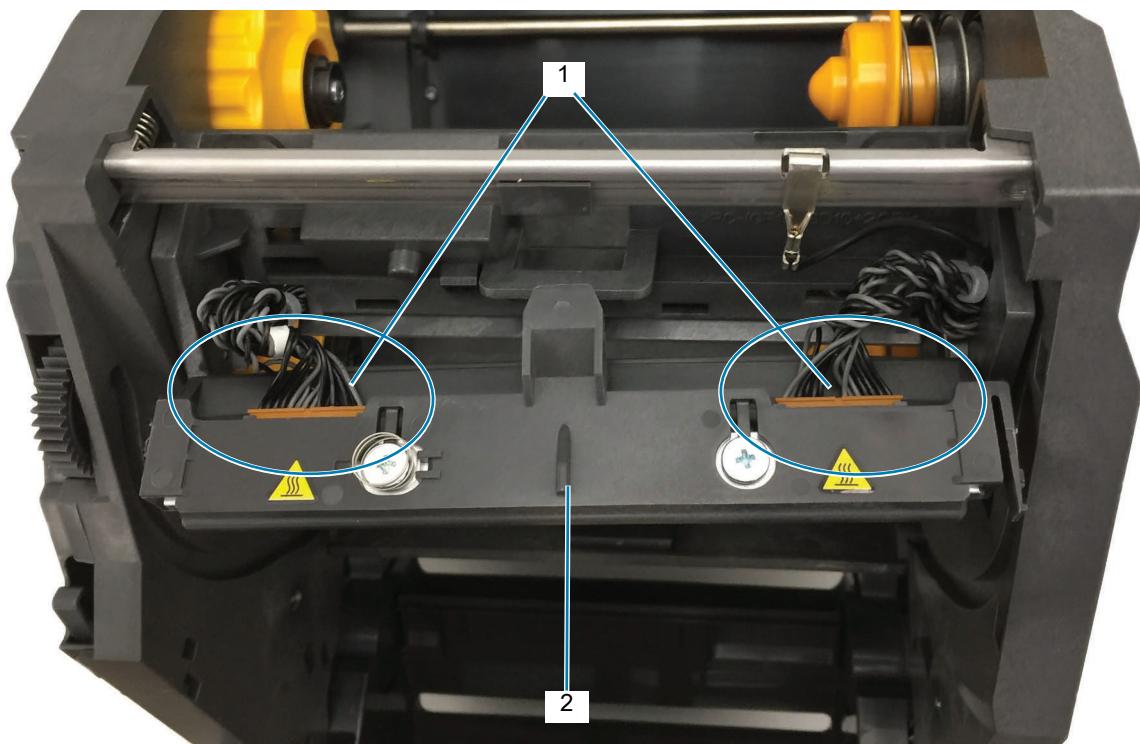


## Replacing Parts

4. Swing the loose right side of the printhead out of the printer. Pull it to the right a little to get the left side of the printhead clear. Pull the printhead down and free of the ribbon carriage to gain access to its attached cables.



5. Gently but firmly pull the two printhead cable bundle connectors (1) off of the printhead (2).

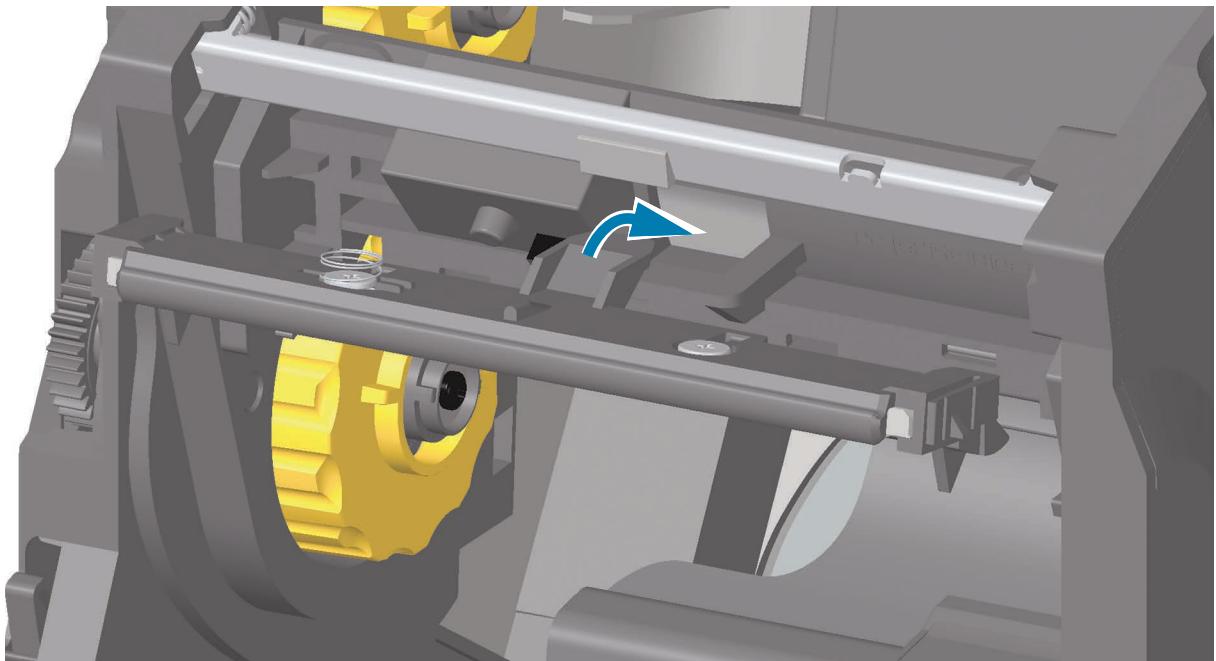


### Replacing the Printhead

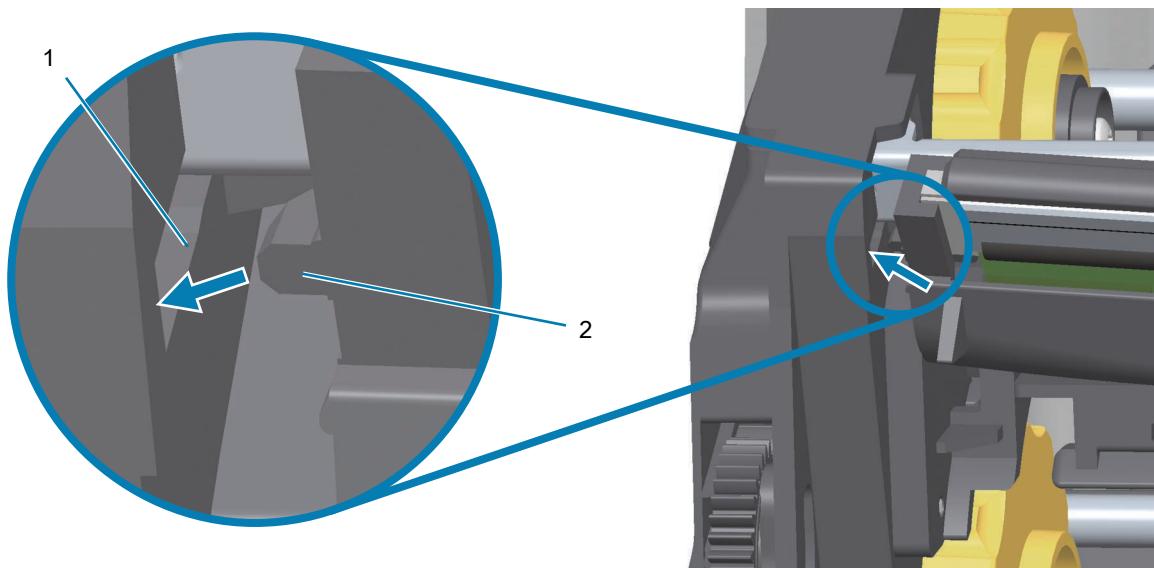
1. Push the right side printhead cable connector into the printhead. The connector is keyed to only insert one way.
2. Push the left side printhead cable connector onto the printhead.



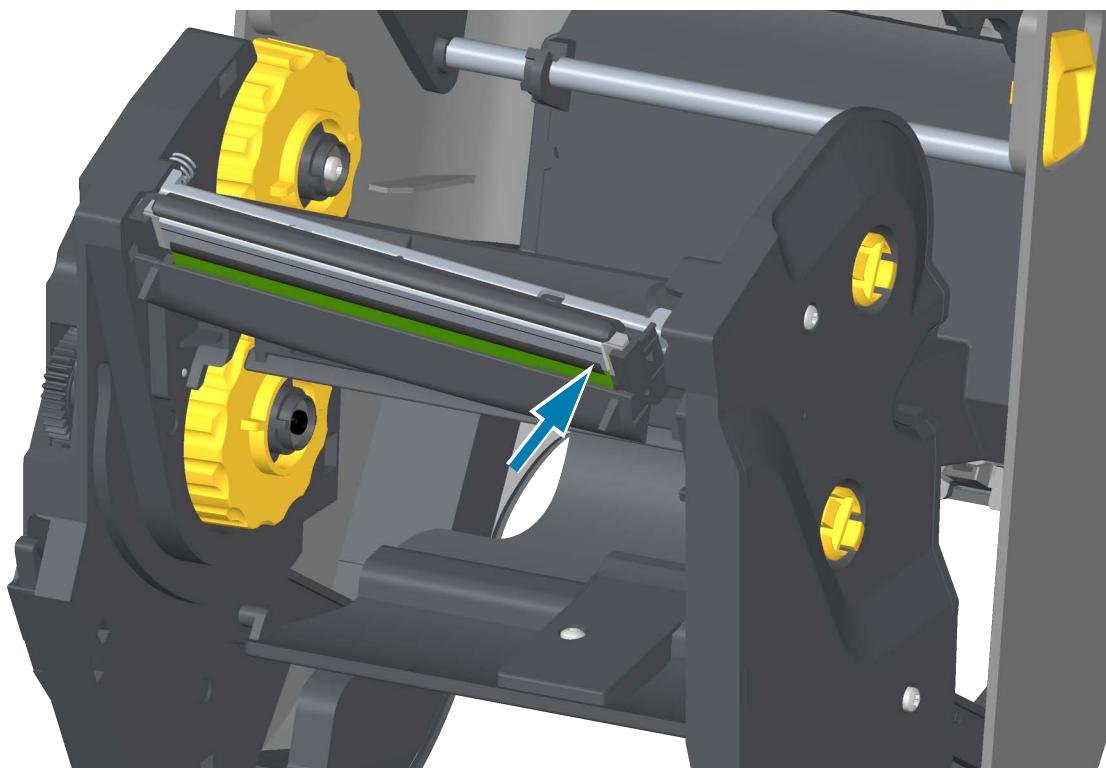
3. Insert the center tab on the printhead assembly into the center slot on the Printhead Actuator Arm.



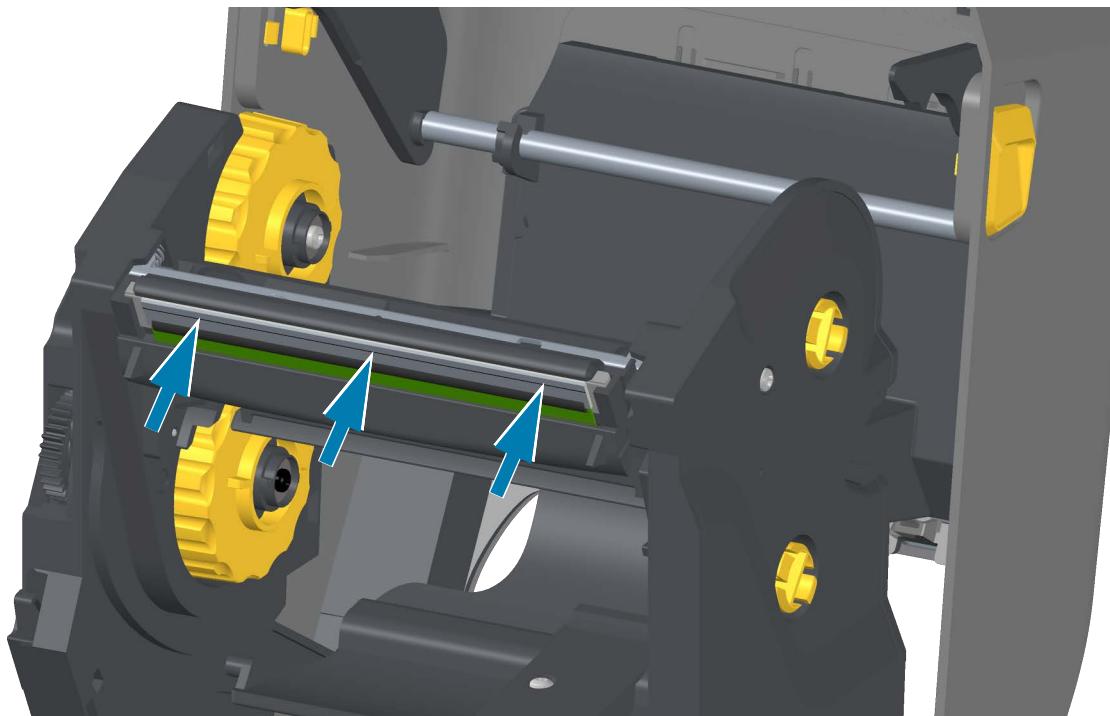
4. Insert the left side tab of the printhead assembly into the recessed slot (1) on the left side of the printhead's actuator arm (2).



5. Push the right side of the printhead into the printer until the latch locks the right side of the printhead into the printer.



6. Verify that the printhead moves up and down freely when pressure is applied and remains locked when released.

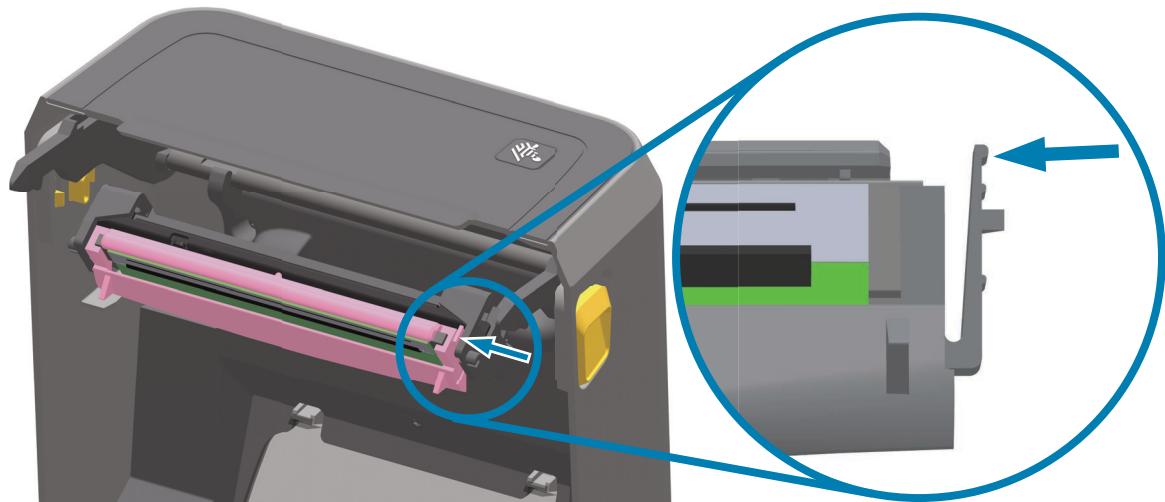


7. Clean the printhead. Use a new pen to wipe body oils (fingerprints) and debris of the printhead. Clean from the center of the printhead to the outside. See [Cleaning the Printhead on page 18](#).
8. Reload media. Plug in the power cord, turn on the printer and print a status report to ensure proper function. See [Test Printing with the Configuration Report on page 37](#).

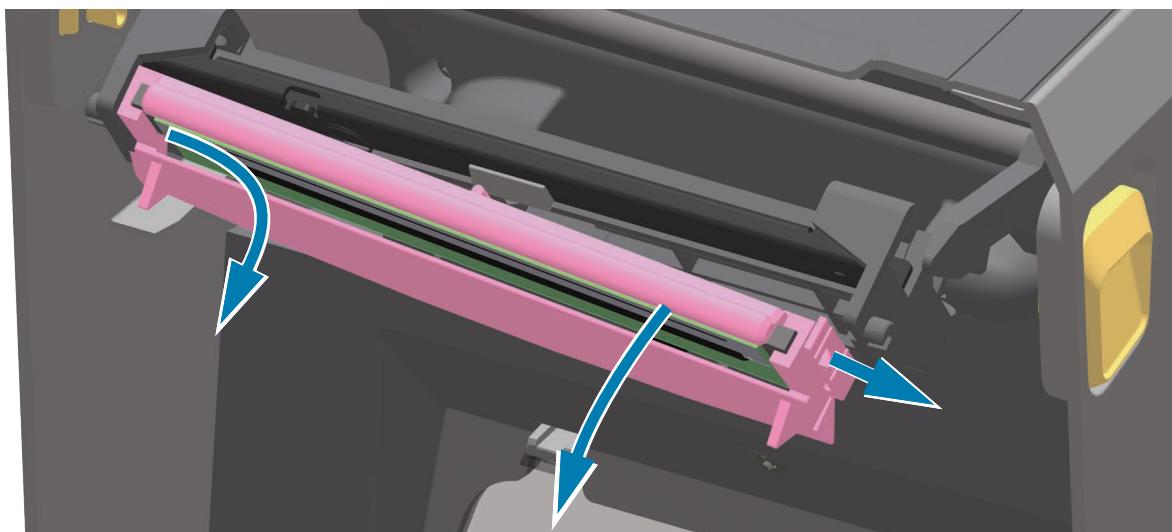
## ZD421 Thermal Transfer Ribbon Cartridge Printhead

### Printhead Removal

1. Turn the printer OFF. Open the printer.
2. Pull the two (2) release arms out to release the ribbon drive transport. See [ZD421 Ribbon Cartridge Printer - Accessing the Printhead on page 63](#) for more details.
3. Swing the printhead actuator arm up until it touches the printer's top cover. Hold the printhead actuator arm in this position for access to the printhead. Push the printhead release latch toward the printhead (shown as pink for visibility). The right side printhead releases down and away from the printhead actuator arm.

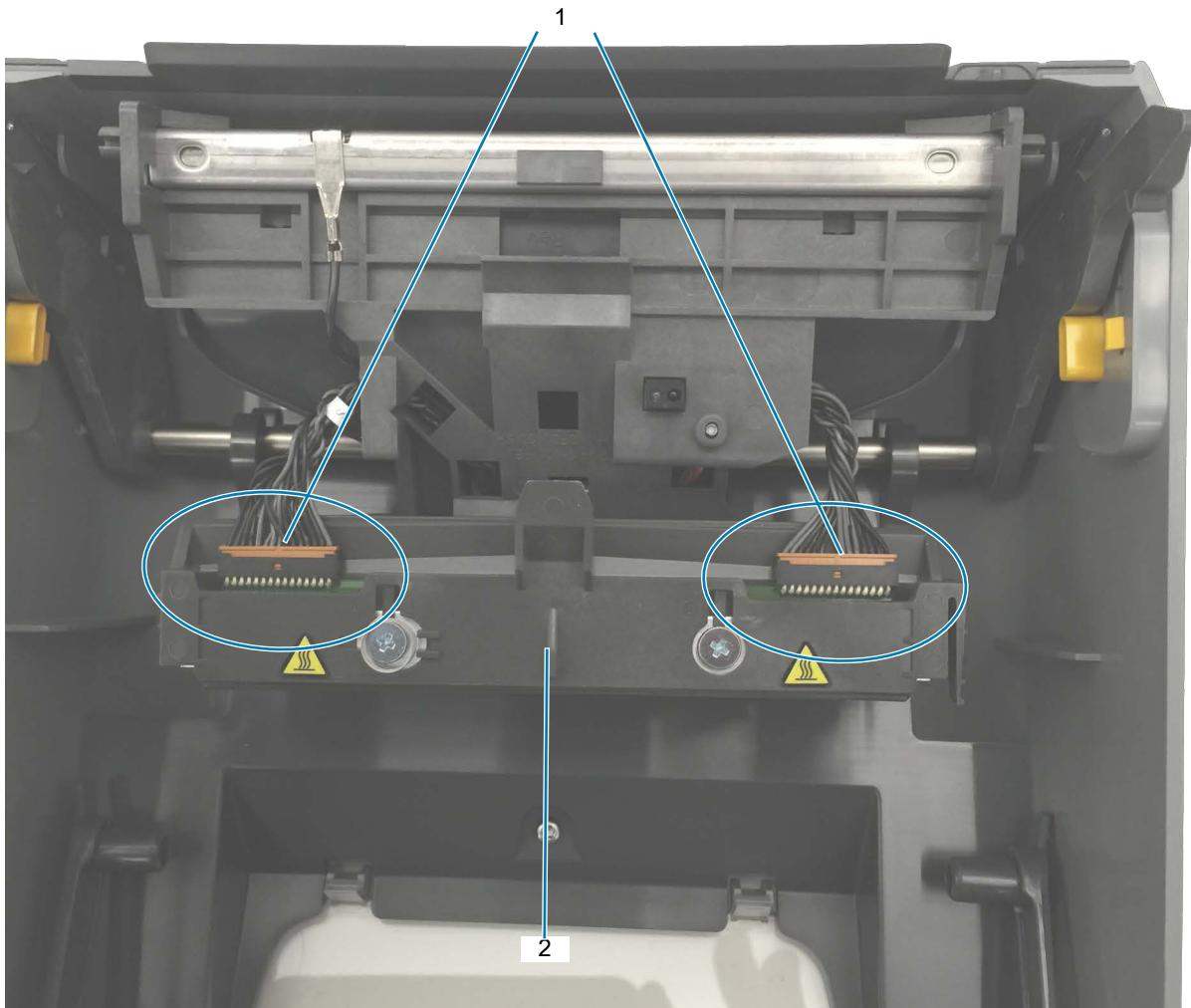


4. Swing the loose right side of the printhead out of the printer. Pull it to the right a little to get the left side of the printhead clear. Pull the printhead down and free of the printhead actuator arm to gain access to its attached cables.



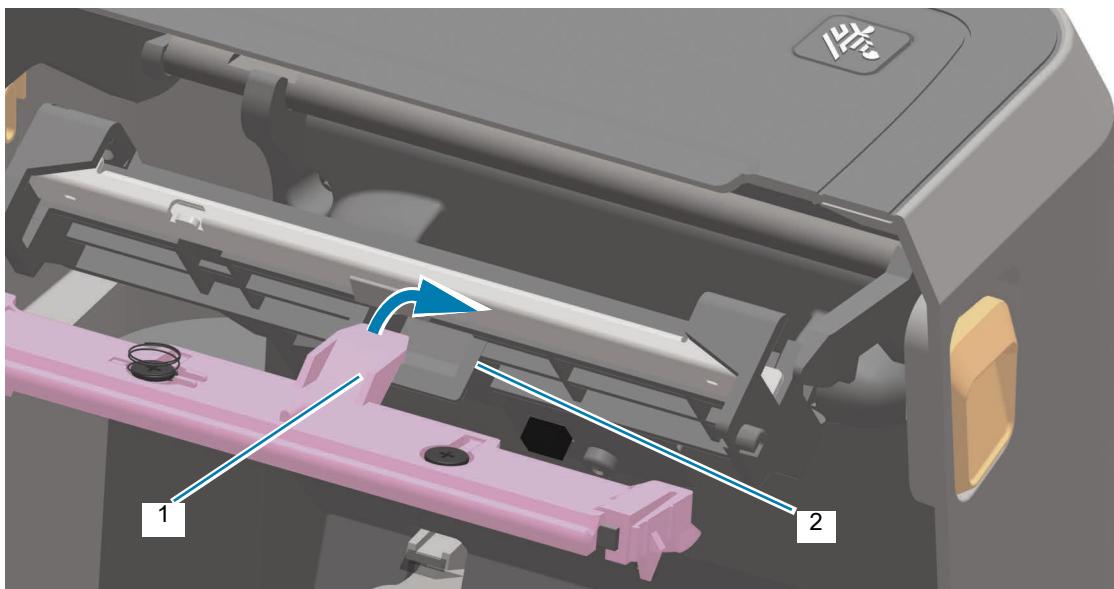
## Replacing Parts

5. Gently but firmly pull the two printhead cable bundle connectors (1) off of the printhead assembly (2).

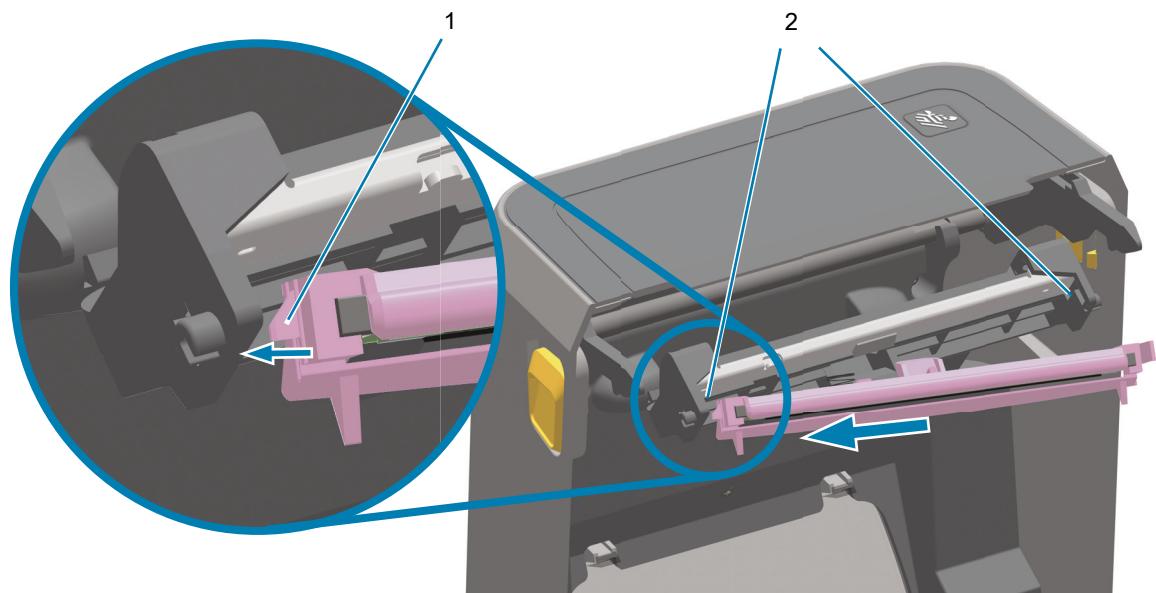


### Replacing the Printhead

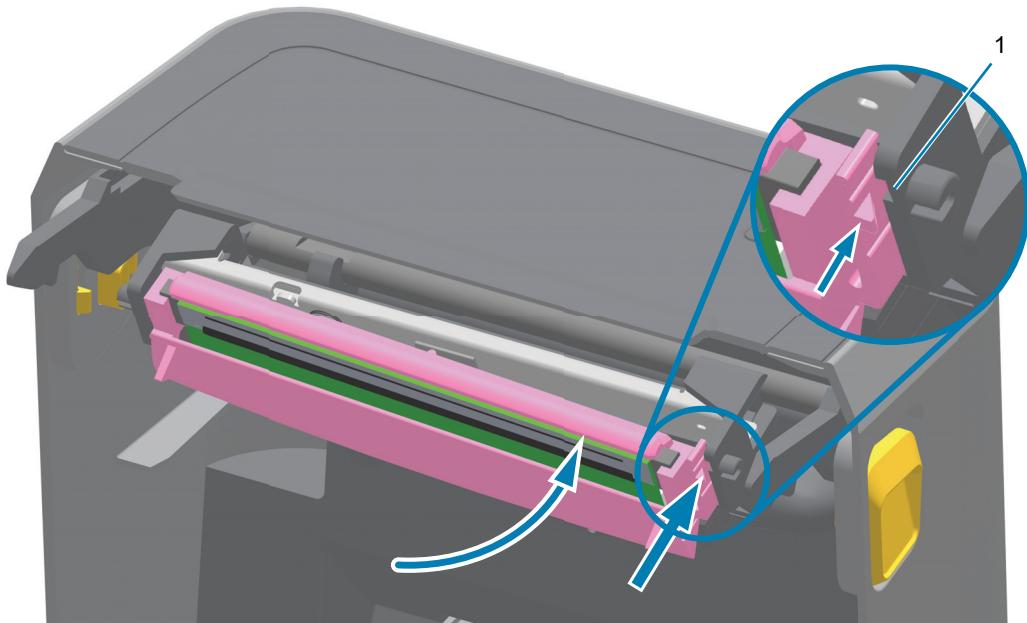
1. Push the right side printhead cable connector into the printhead. The connector is keyed to only insert one way.
2. Push the left side printhead cable connector onto the printhead.
3. Insert the center tab (1) on the printhead assembly into the center slot (2) on the printhead actuator arm.



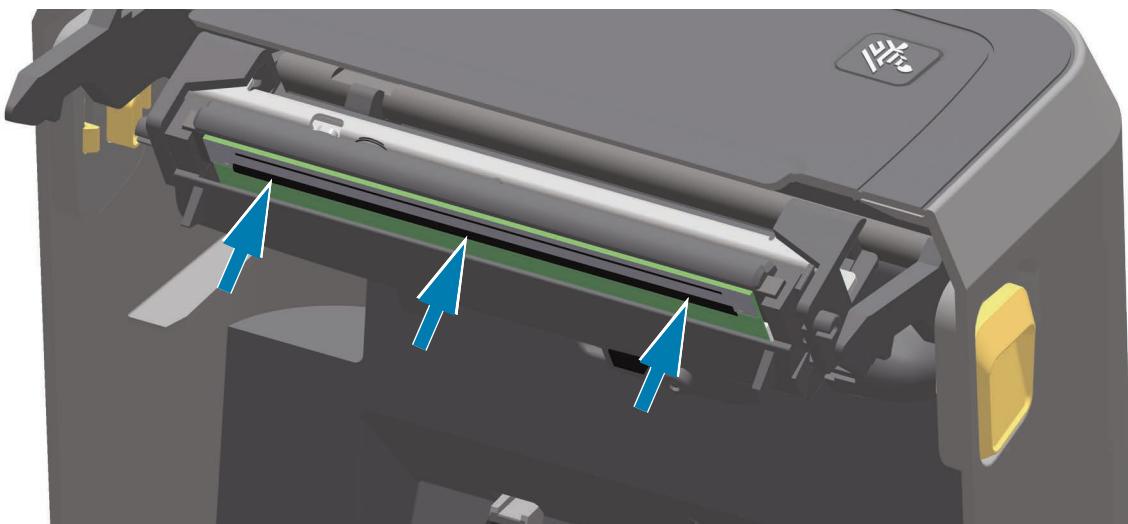
4. Insert the left side tab of the printhead assembly into the recessed slot (2) on the left side of the printhead actuator arm.



5. Push the right side of the printhead into the slot (1) until the latch locks the right side of the printhead into the printer.



6. Verify that the printhead moves freely into the printer when pressure is applied (see arrow) and remains locked when pressure is released.



7. Clean the printhead by using a new cleaning pen to wipe body oils (fingerprints) and debris off the printhead. See [Cleaning the Printhead on page 18](#).
8. Reload media. Turn on the printer and print a Configuration Status report to ensure proper function. See [Test Printing with the Configuration Report on page 37](#).

## Replacing the Platen (Drive) Roller

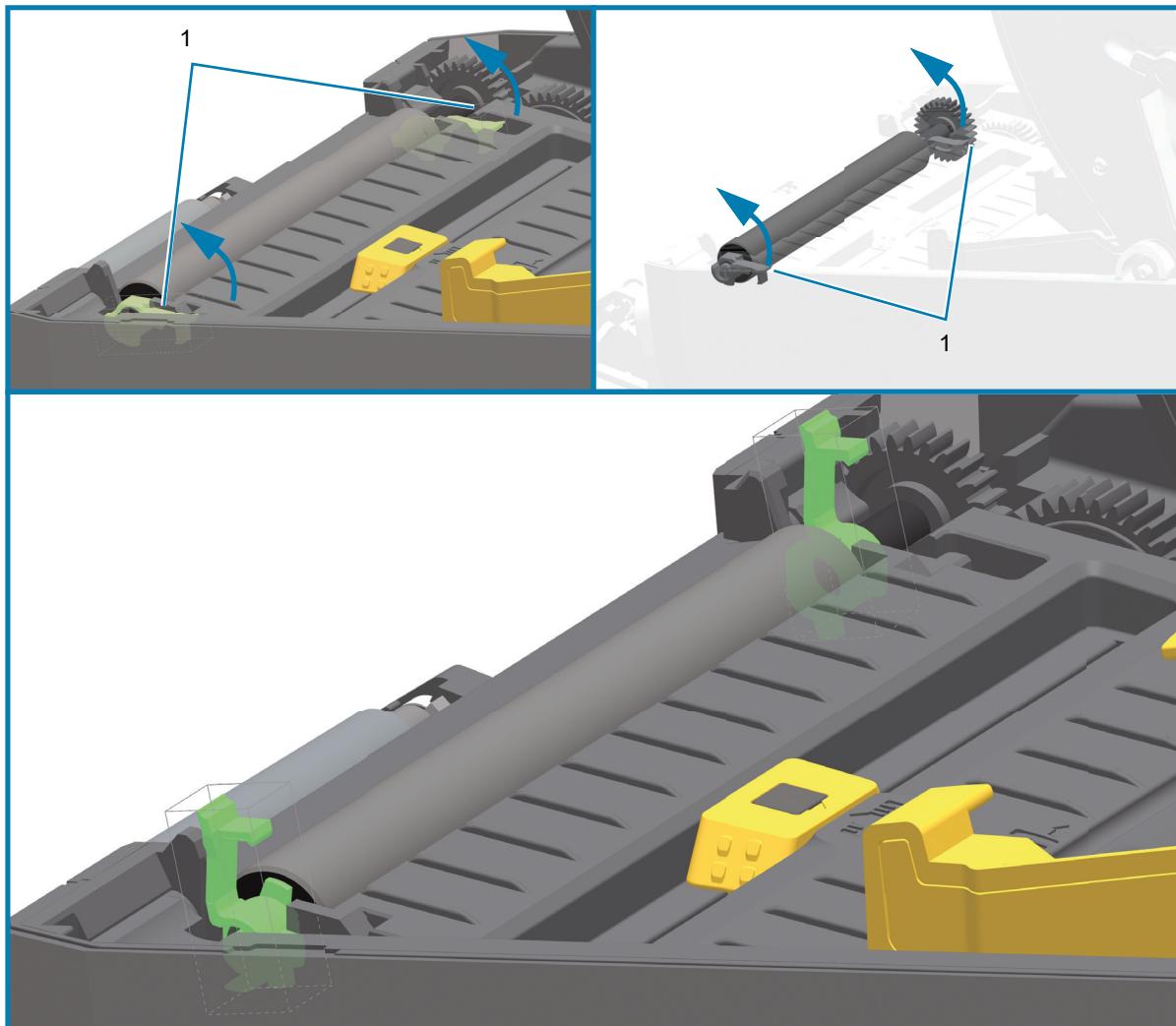
If you need to replace the platen drive roller assembly, read the procedure and review the removal and installation steps before actually replacing the platen.



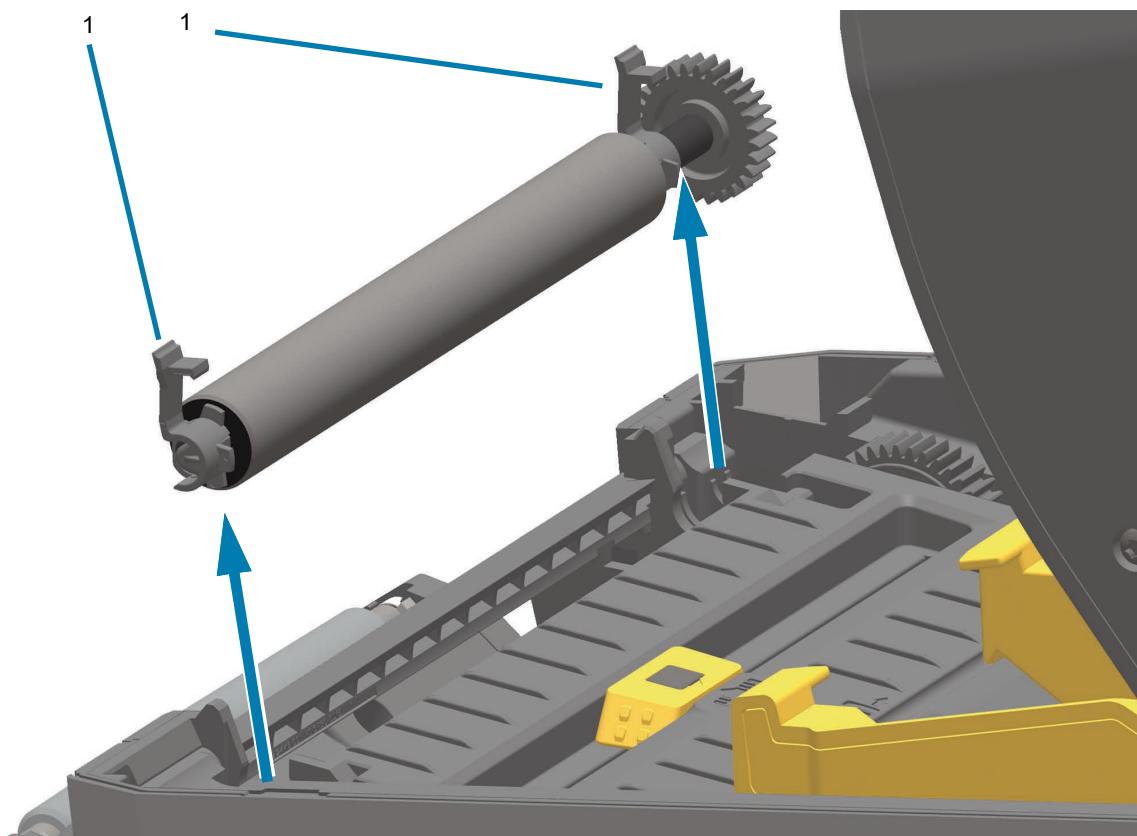
**CAUTION—ESD:** Observe proper electrostatic safety precautions when handling static-sensitive components such as circuit boards and printheads.

### Removal

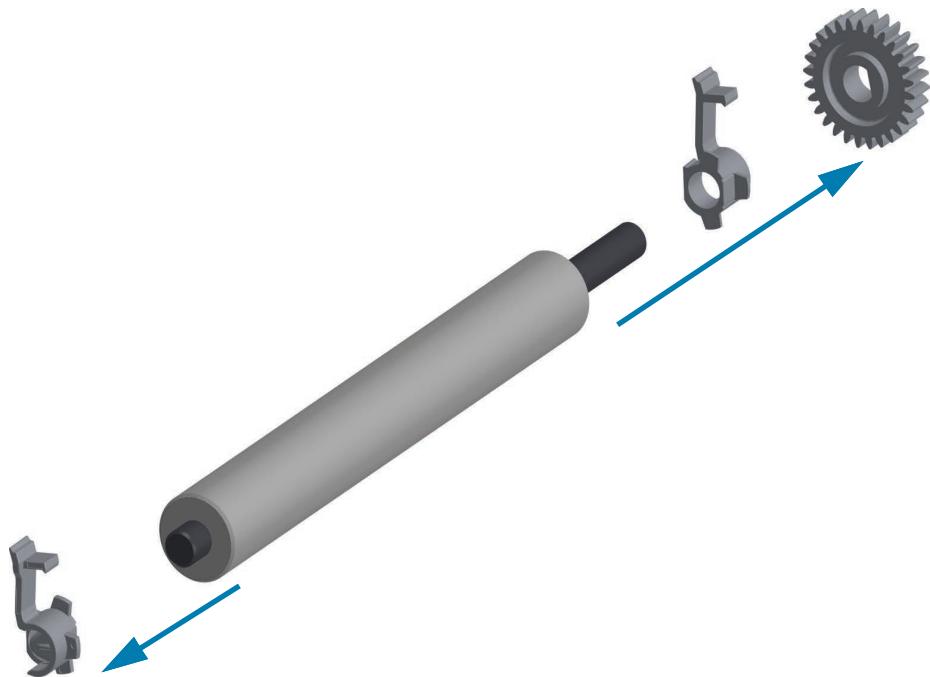
1. Open the cover (and dispenser door if the dispenser is installed).
2. Remove media from platen area.
3. Pull the platen bearing latch release tabs (1) on the right and left sides towards the front of the printer and rotate them up.



4. Lift the platen out of the printer's bottom frame by the platen bearing arms (1).



5. Slide the gear and the two (2) bearings off the shaft of the platen roller.

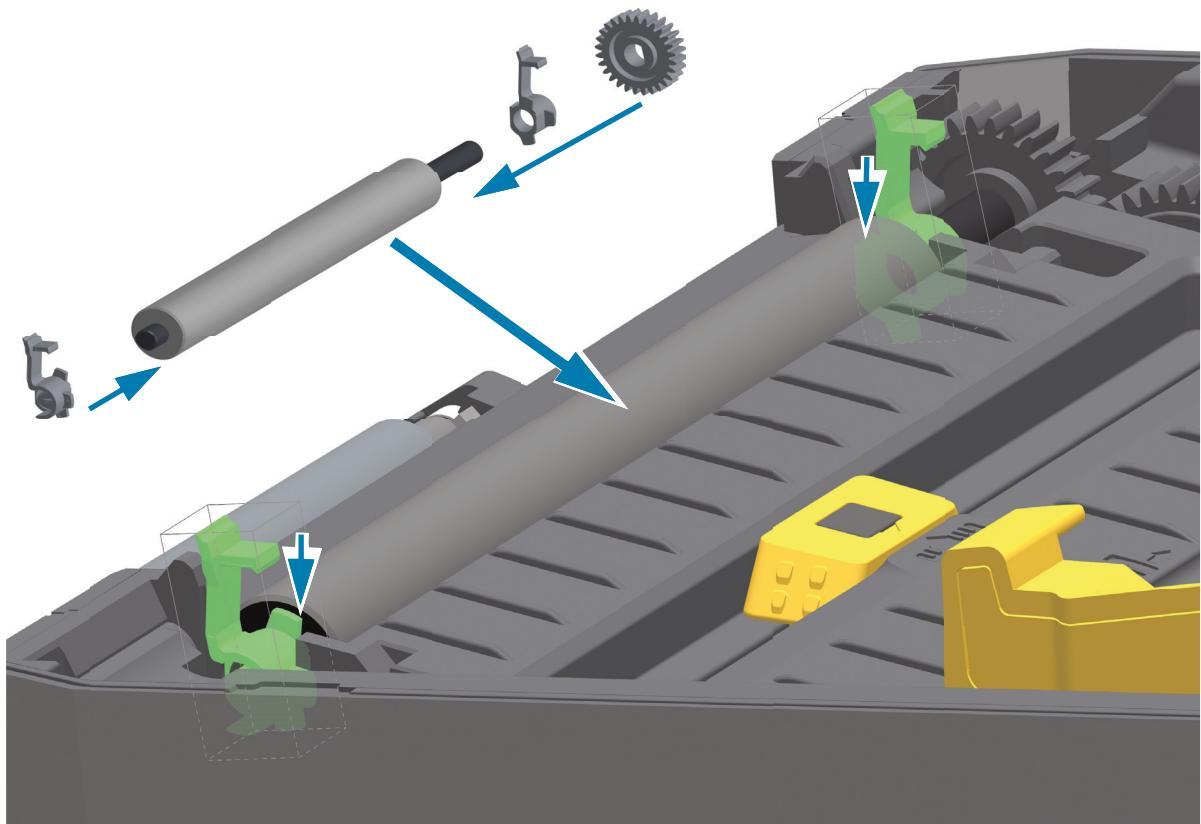


### Installation

Your new platen may be dirty from shipping and handling. Inspect the platen for dirt and other contaminates. Clean if necessary.

Clean the platen with a 99.7% pure isopropyl alcohol moistened swab or fiber free cloth. Clean from the center out. Repeat this process until all of the roller surface has been cleaned.

1. Make sure the bearings and drive gear are on the shaft of the platen roller.



2. Align the platen with the gear to the left and lower it into the printer's bottom frame.
3. Rotate the platen bearing latch release tabs down on the right and left sides towards the rear of the printer and snap them into place.
4. If you cleaned the platen roller, allow the printer to dry for one minute before closing the dispenser door, media cover or loading labels.

## Replacing Wired Connectivity Modules

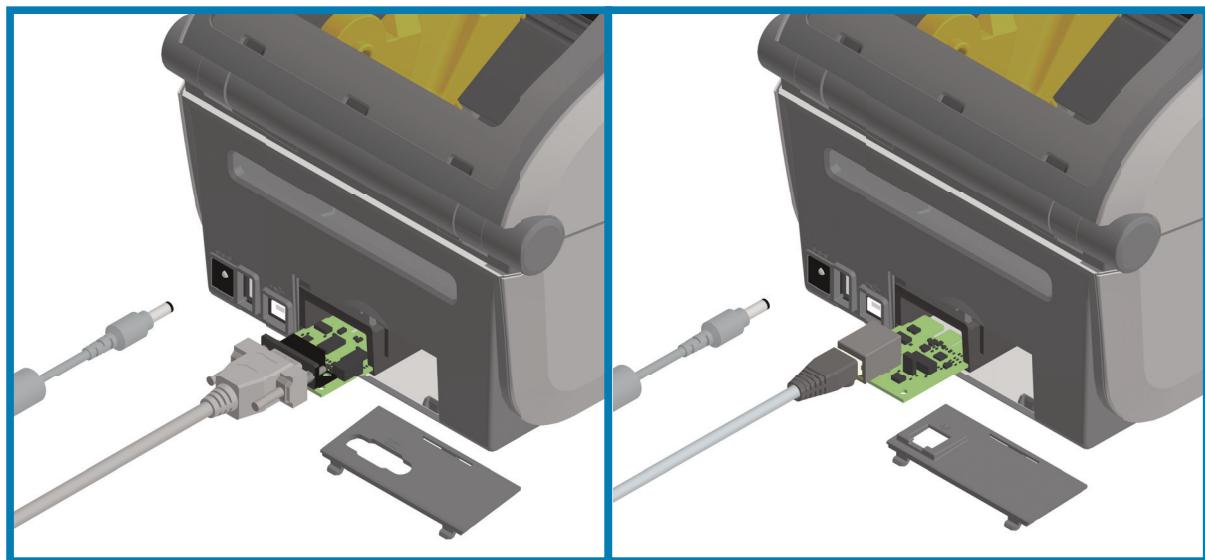


**CAUTION—ESD:** Observe proper electrostatic safety precautions when handling static-sensitive components such as circuit boards and printheads.

Connectivity modules can easily be removed for the purpose of reconfiguring a printer or repair. You should not remove and replace connectivity modules as a general practice. The connector and PCBA's have not been designed for this use.

### Removal

1. Turn power off and disconnect the power cable.
2. Remove the interface cables.
3. Remove the module access door. Push down on the top of the door with your finger tip. This releases the latch. Pull the door away and down to remove.
4. Reattach an interface cable to the connectivity module and secure the cable.
5. Gently pull on the interface cable that is secured to the connectivity module. Slowly pull the module out of the printer.



### Installation

1. With the module's access door removed, slide the connectivity module into the printer. Push the circuit card in slowly but firmly until the card is just past the inside lip of the access door.
2. Align the bottom of the connectivity module door cover to the bottom lip of the module access opening. Swing the door up and snap the cover closed.
3. Reconnect power. Turn power on and update the printer firmware which includes connectivity module updates to synchronize versions.

## Replacing the Wireless Connectivity Module

Use this procedure to install the Wireless Connectivity Module.



**CAUTION—ESD:** Observe proper electrostatic safety precautions when handling static-sensitive components such as circuit boards and printheads.



**NOTE:** If you are removing the base of the printer to repair other parts, it is easier to lift the Wireless Module off the Main PCBA after the base is removed.

### Removal

1. Remove any media from the printer and close the cover.
2. Turn power off and disconnect the power cable.
3. Remove the interface cables, if any.
4. Turn the printer over to access the wireless connectivity door.
5. Open the module access door by pushing the latch at the top of the door with your fingertip. The printer base has a recessed area for your fingertip. This releases the latch. Lift and swing the door up to remove it.



### Installation

1. Align the antenna arm (1) of the wireless module into the well. Lower and align the module (2) to the printer's Wi-Fi connector (3). Push the module (2) in gently but firmly until fully seated.



2. Align the shortest side of the wireless connectivity door (1) to the shortest side of the opening. Swing the door on the tab (1) in the middle of the door printer and swing the door closed. Push the door to lock the latch.



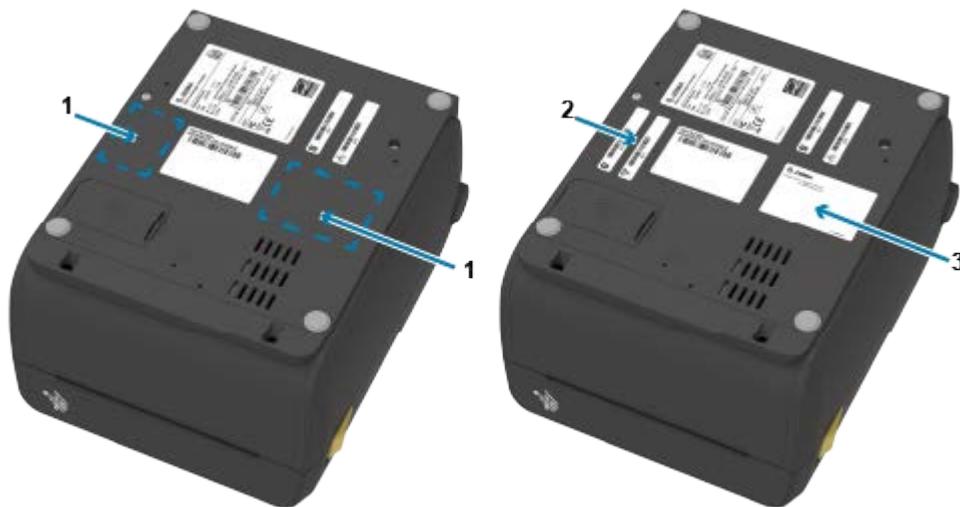
**NOTE:** The wireless connectivity door will not close correctly if the module has not been fully seated. This is a good test to verify complete insertion.

3. Place the three (3) Wi-Fi identification labels included on the bottom of the printer. These assist with printer configuration (and later reconfiguration) of your printer. Mobile apps, use of scanners, and printer support are aided by these printer configuration labels.

### Label Locations for Thermal Transfer Printers



### Label Locations for Direct Thermal Printers



## Replacing the Wireless Connectivity Module Antenna

Use this procedure to remove or install the wireless connectivity module antenna.

**CAUTION—ESD:** Observe proper electrostatic safety precautions when handling static-sensitive components such as circuit boards and printheads.



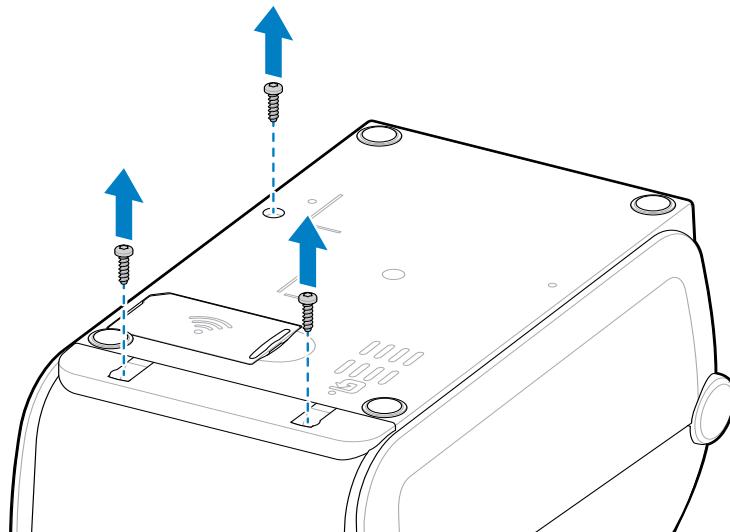
**NOTE:** If you are removing the base of the printer to repair other parts, it is easier to lift the Wireless Module off the Main PCBA after the base is removed.

## Prerequisites

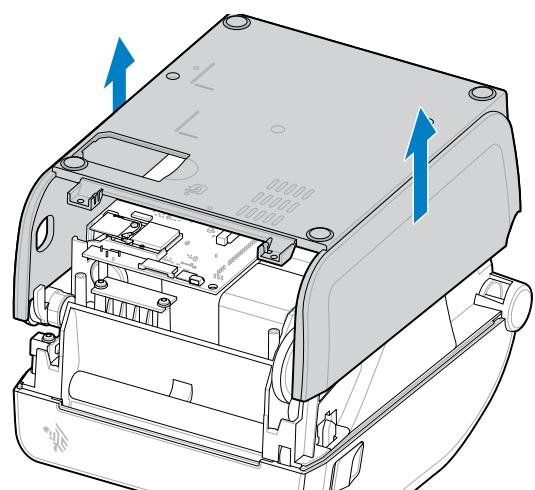
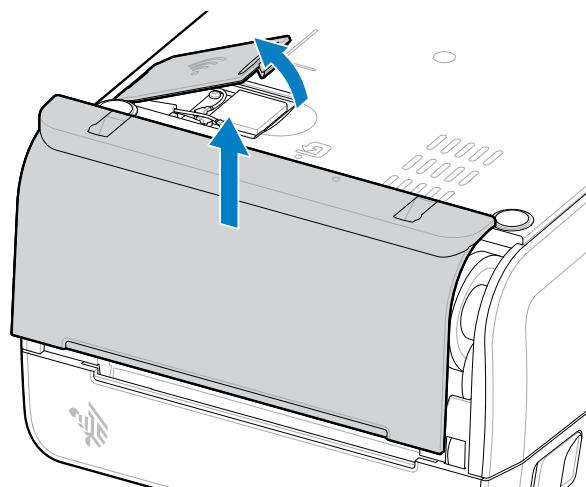
1. Remove any media from the printer and close the cover.
2. Turn power off and disconnect the power cable.
3. Remove any interface cables.
4. This procedure requires Kapton tape.

## Removal

1. Turn the printer over to access the wireless connectivity door.
2. Remove all three screws securing the front bezel or option and bottom cover to the printer.

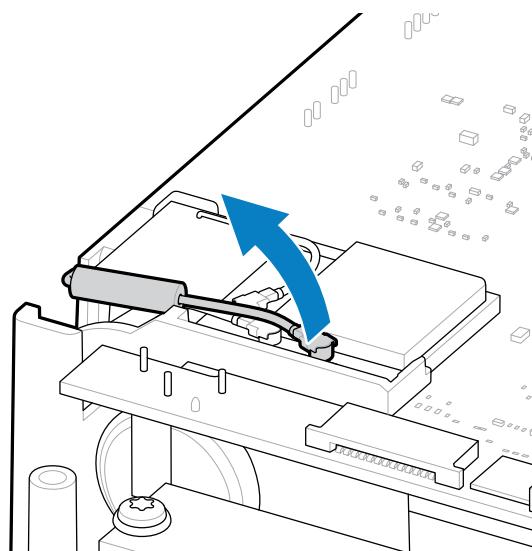


3. Remove all covers from the printer.

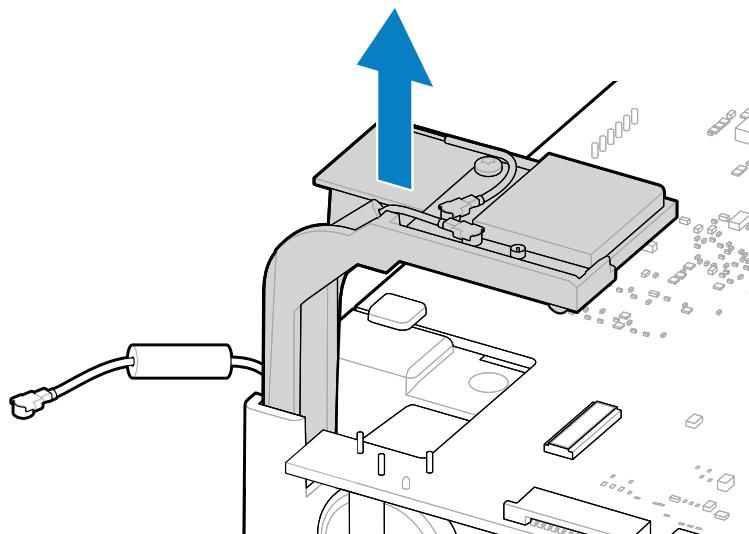


## Replacing Parts

4. Disconnect the antenna from the wireless module.

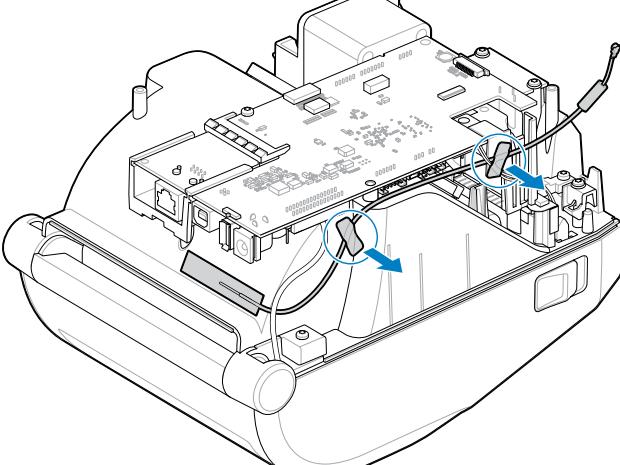
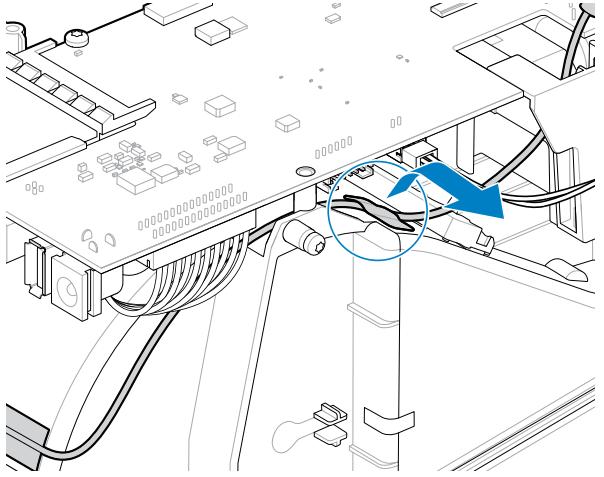


5. Remove the wireless module from the printer.

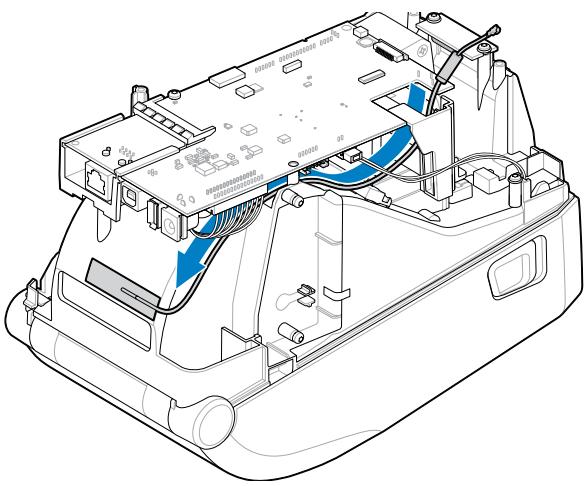


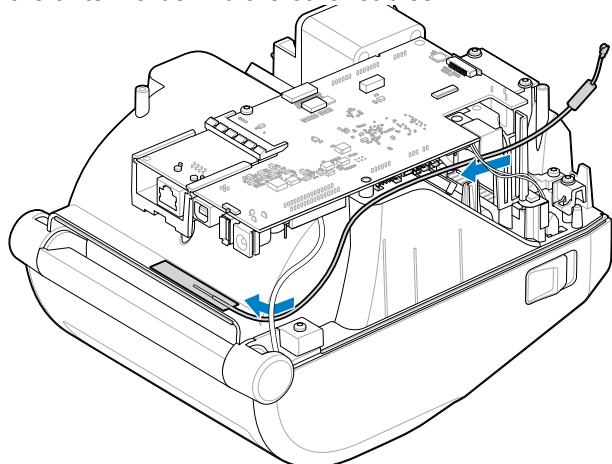
## Replacing Parts

6. Remove the tape from the printer body.

If you have the...	Then...
ZD411D ZD611D	
ZD411T ZD611T ZD611R	

7. Route the antenna behind the other cables.

If you have the...	Then...
ZD411D/ZD611D	

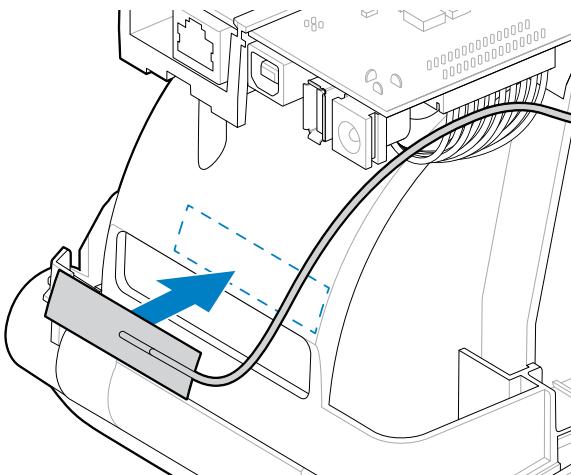
If you have the...	Then...
ZD411T/ZD611T/ ZD611R	Route the antenna behind the other cables.. 

8. Remove the antenna adhesive.

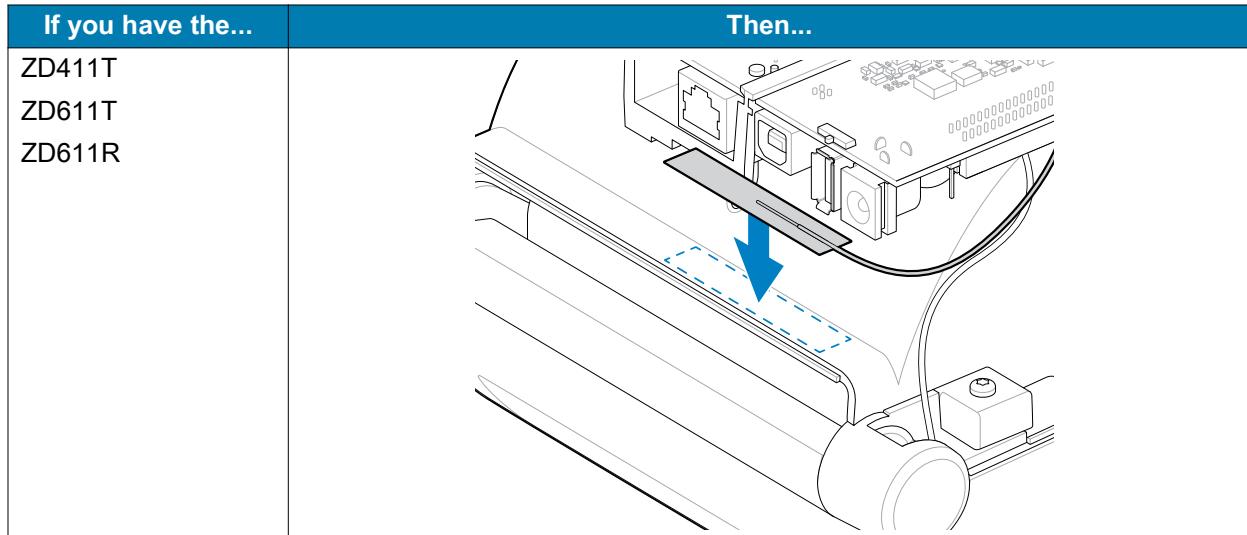
## Installation

Follow these steps to install the P1110774-05 Wi-Fi 6 MIMO antenna.

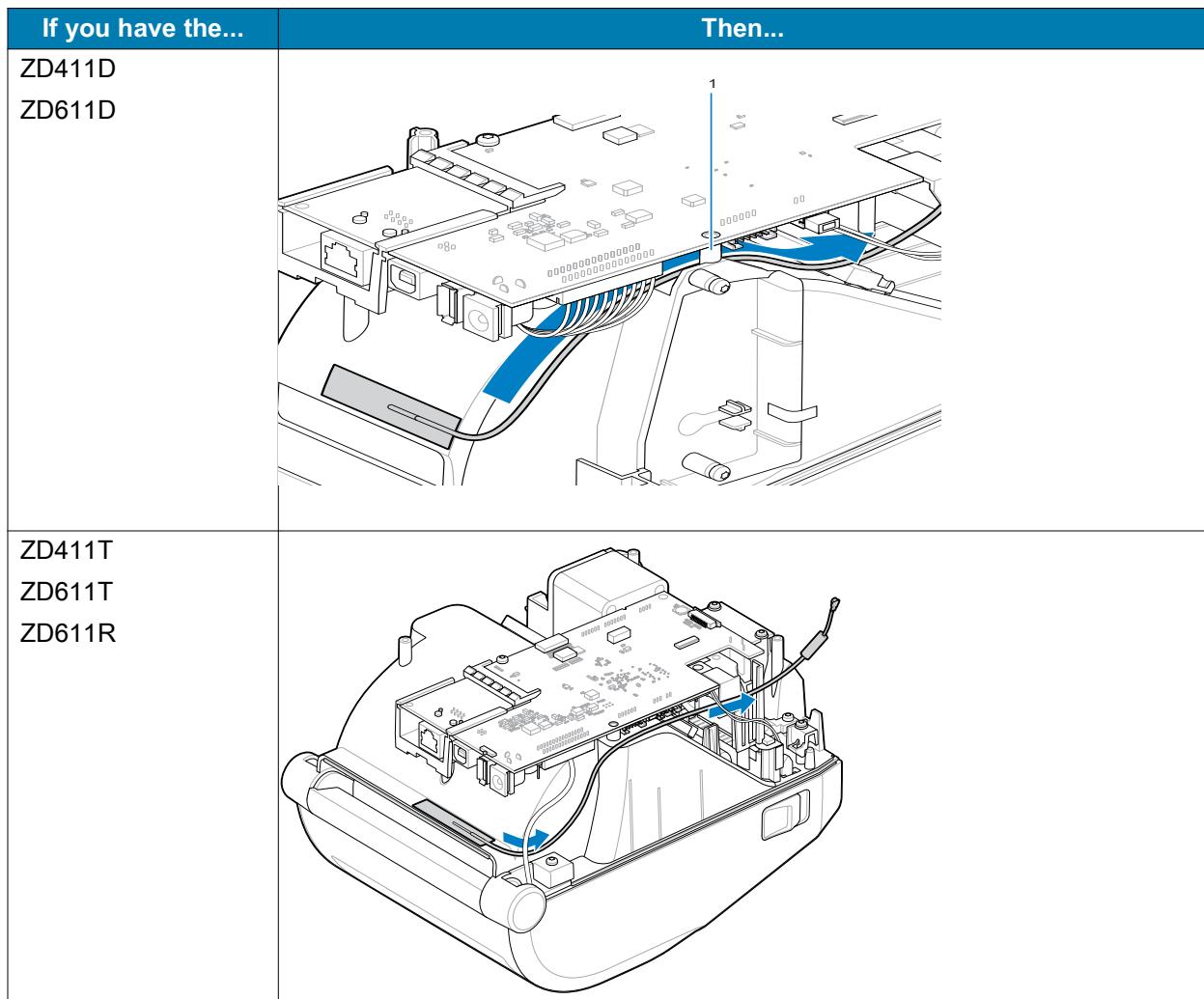
1. Place the adhesive of the antenna on the back of the printer body.
  - Ensure the long edge of the adhesive is parallel to the edge of the printer.

If you have the...	Then...
ZD411D ZD611D	

## Replacing Parts



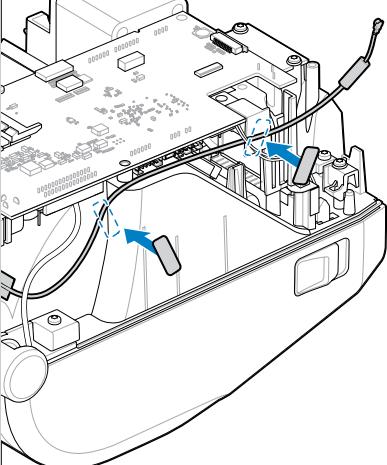
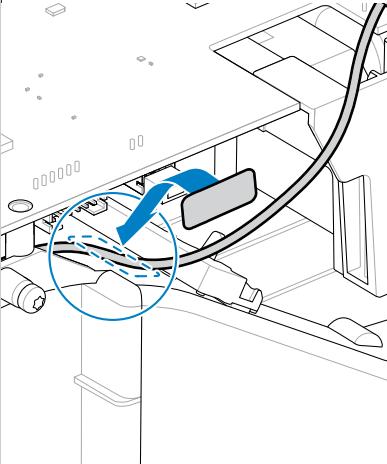
2. Route the antenna through the frame post.



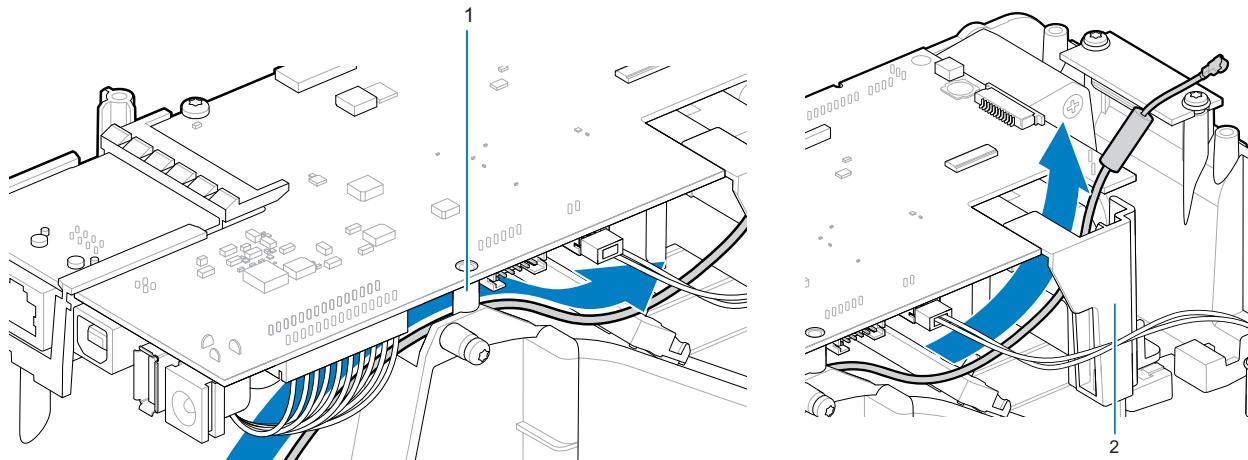
3. Tape the antenna to the printer body with Kapton tape.

## Replacing Parts

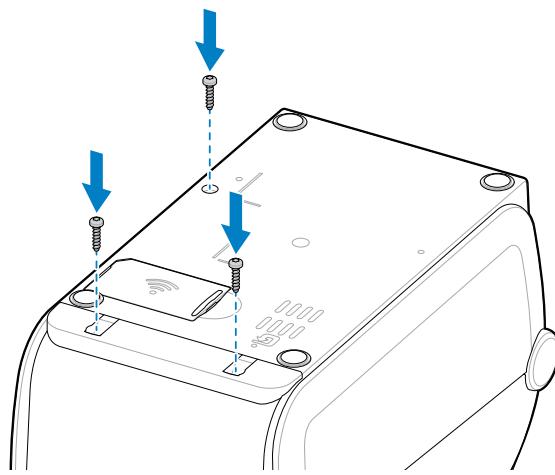
- Use a tape length of 35 +/- 5 mm.

If you have the...	Then...
ZD411D ZD611D	
ZD411T ZD611T ZD611R	

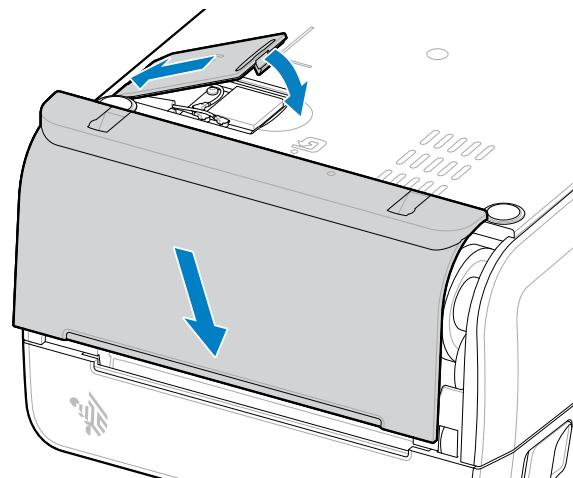
### 4. Route the antenna through the antenna frame.



5. Replace the bottom cover and secure it with the screws.

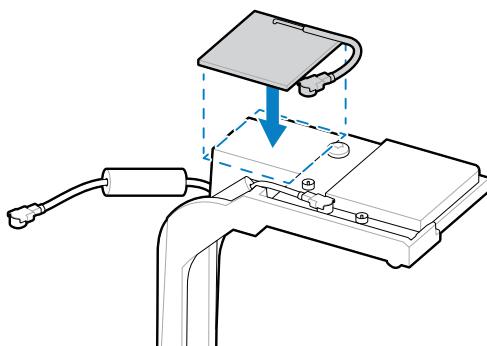


6. Replace the front bezel and Wi-Fi door.

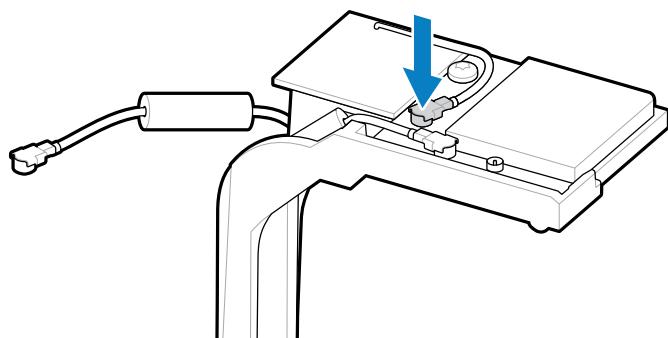


### Connecting the Antenna to the Wi-Fi module

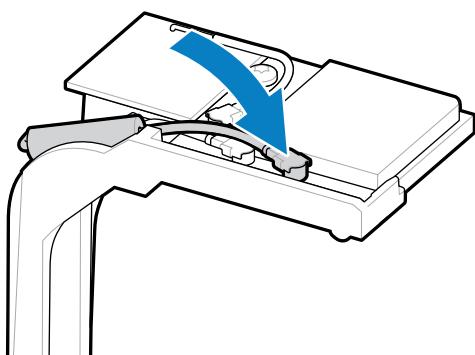
1. Place the adhesive of the P1110774-04 BT antenna board straight. Ensure it is parallel to the radio board's top and left edge.



2. Connect the Bluetooth antenna to the Wi-Fi module.



3. Connect the antenna (P111074-02) to the top of the module.



## Replacing a Front Bezel Option (Tear-off, Dispense, Cut)

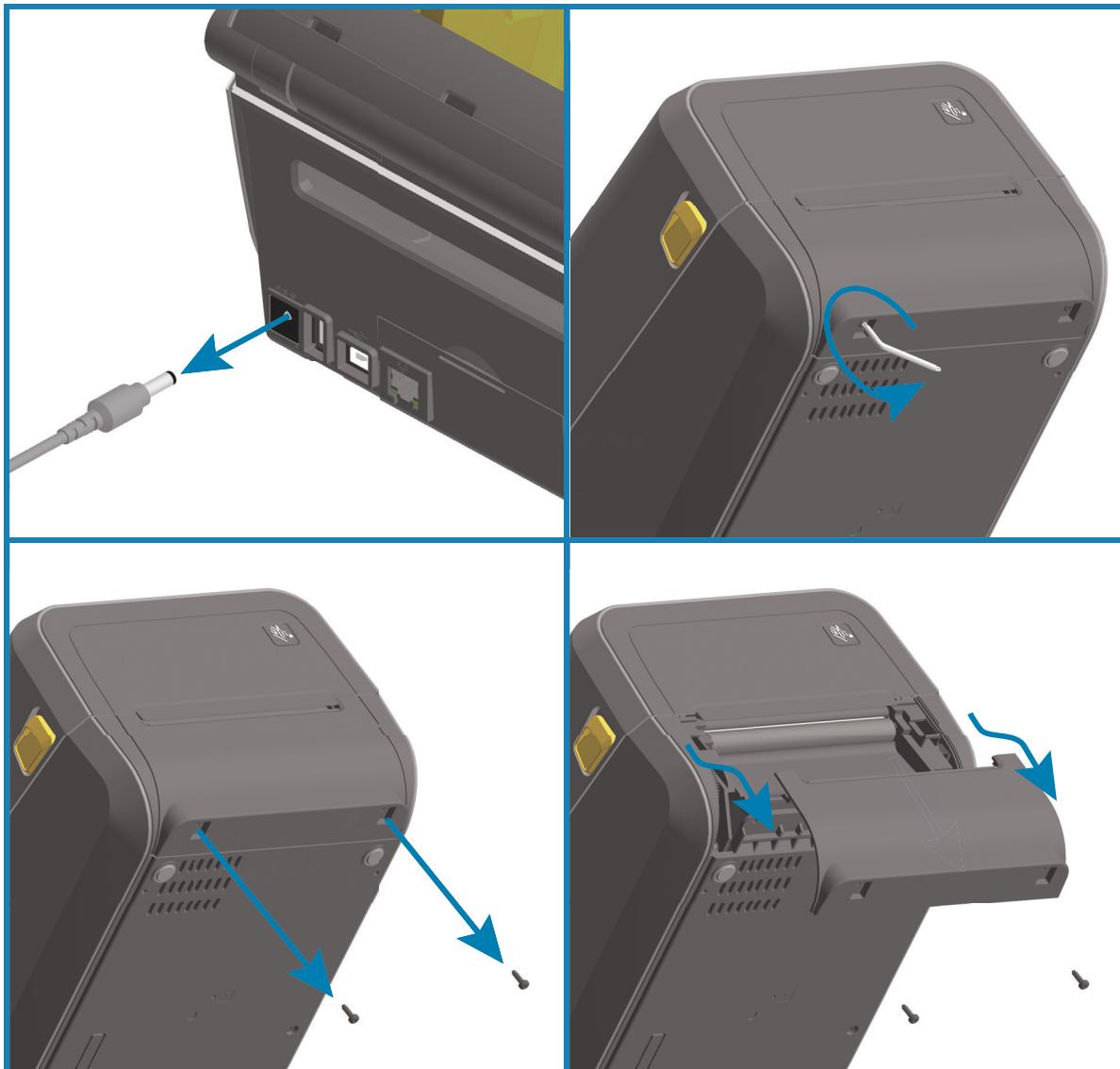


**CAUTION—ESD:** Observe proper electrostatic safety precautions when handling static-sensitive components such as circuit boards and printheads.

All three (3) of the front bezel options (standard tear-off bezel, the dispenser module, and cutter module) mount in the same way

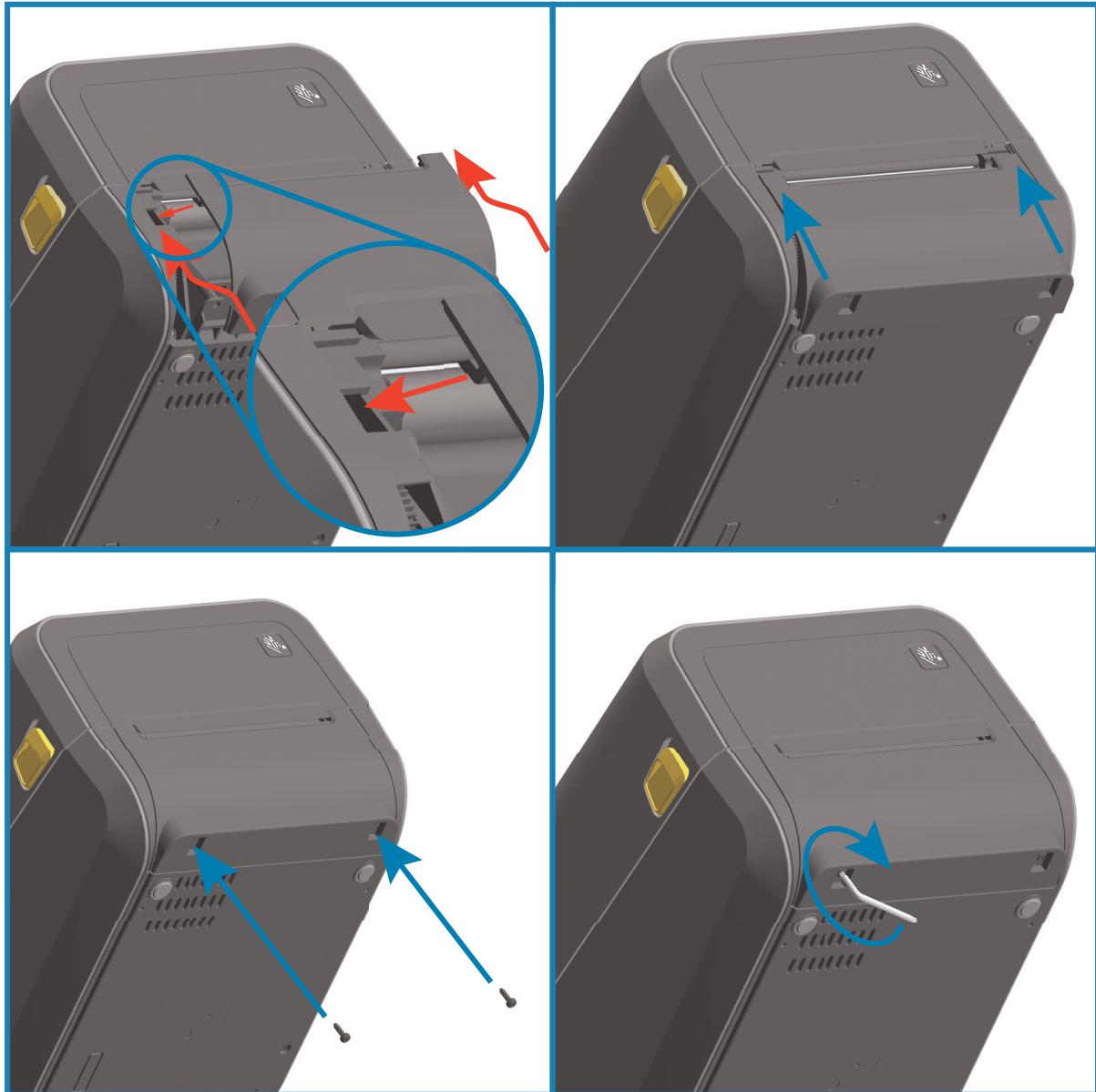
### Removal

1. Remove any media from the printer and close the cover.
2. Turn power off and disconnect the power cable.
3. Remove the interface cables, if any.
4. Turn the printer upside down. Remove the two (2) mounting screws securing the bezel. Save the screws.
5. Slide the bezel down the front and pull the loose bezel out.



### Installation

1. Place the front bezel option and printer right side up with the top of the module even with the bottom of the top cover. Center and push the module into the front of the printer and slide it up until it stops.
2. Turn the printer upside down and attach the media exit option to the printer with the two screws to 4.7 +/- 1 in lbs.



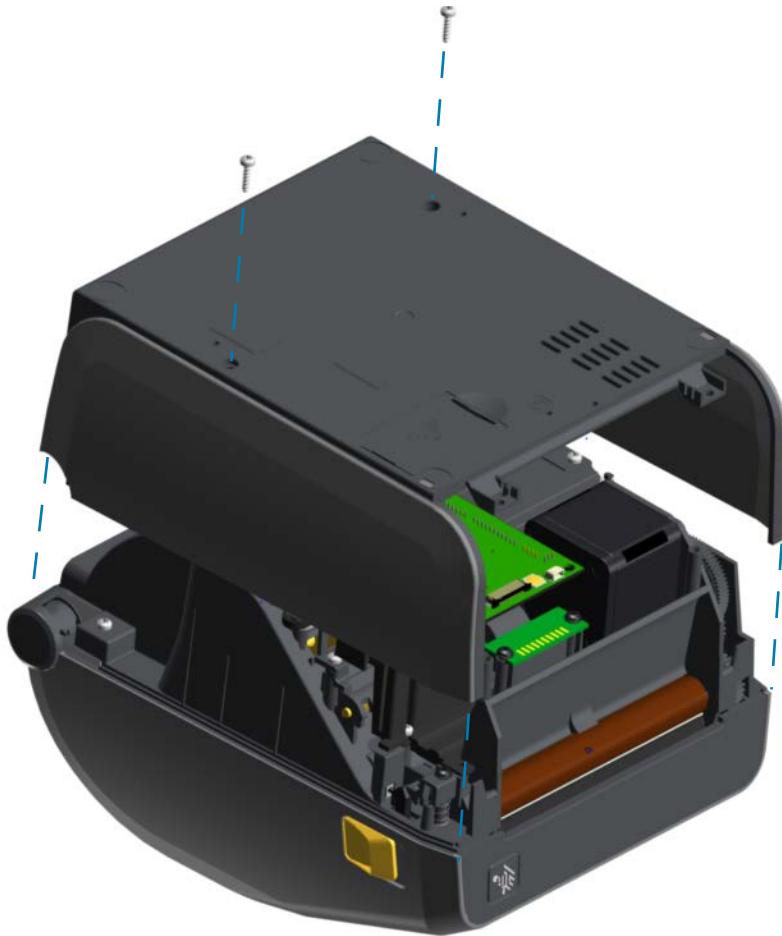
3. Reconnect power. Turn power on and update the printer firmware which includes connectivity module updates to synchronize versions.

## Removing the Printer Base for Repair Access

The printer base (bottom cover) is not a spare part and must be replaced at a Zebra repair center.

### Repair Prerequisites

You must remove the bezels using the [Replacing a Front Bezel Option \(Tear-off, Dispense, Cut\) on page 95](#) before you can remove the printer base. No need to remove connectivity option PCBA's and doors to remove the base.



### Removal

1. Remove the two (2) screws.
2. Lift the base off the printer.

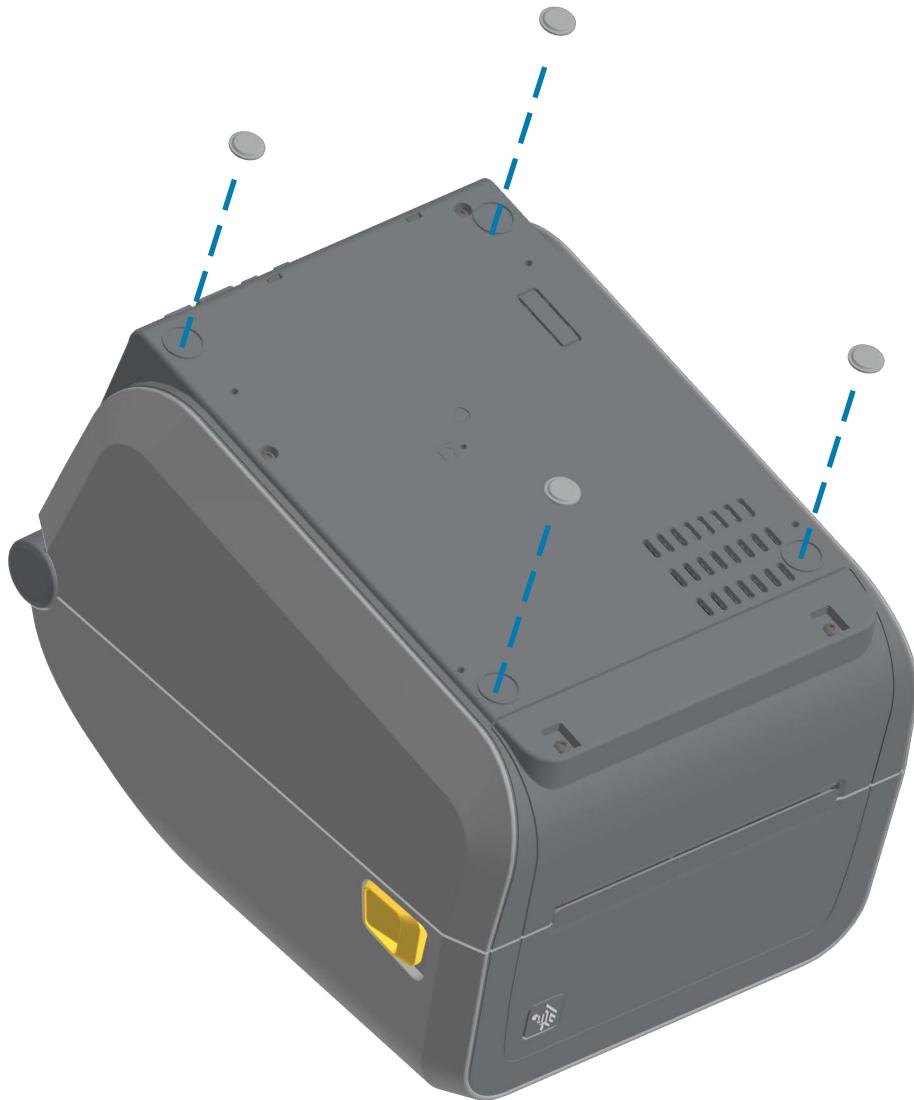
### Installation

1. Place the base on the lower printer's frame.
2. Secure the base with the two (2) screws to 4.7 +/- 1 in lbs.
3. See the [Replacing the Wireless Connectivity Module on page 84](#) or [Replacing Wired Connectivity Modules on page 83](#) for replacing the connectivity access doors.

# Replacing the Printer's Feet

### Installation

1. Turn the printer over with the bottom facing up.
2. Replace any missing feet as needed. Insert the adhesive backed rubber foot into the round foot holder (see below).



# Replacing the Window

## Repair Prerequisites

Open the printer to gain access to the window release tabs on the inside of the printer. For better access to the window, use the following:

- [ZD421 Ribbon Cartridge Printer - Accessing the Printhead on page 63](#)
- [Transfer Ribbon Roll Printers: Accessing Inside the Cover on page 64](#)

## Thermal Transfer Roll and Cartridge Printers

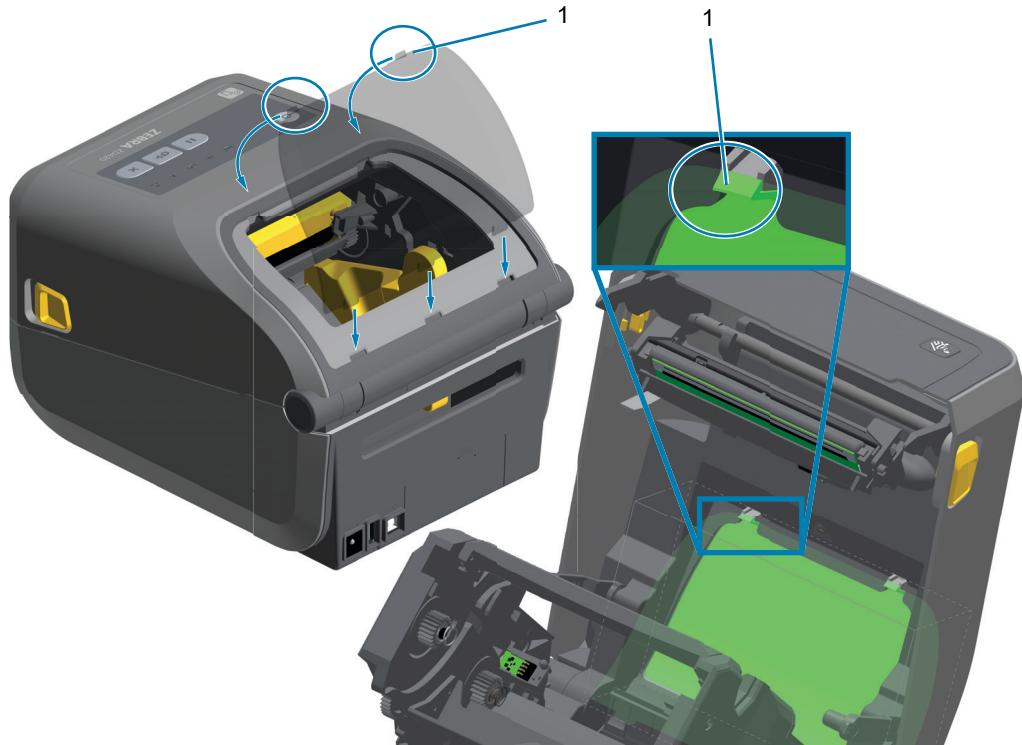
For direct thermal printers see: [Direct Thermal Printer Window Replacement on page 100](#).

### Removal

1. Use your finger to push the window's release tabs towards the middle area of the window.

### Installation

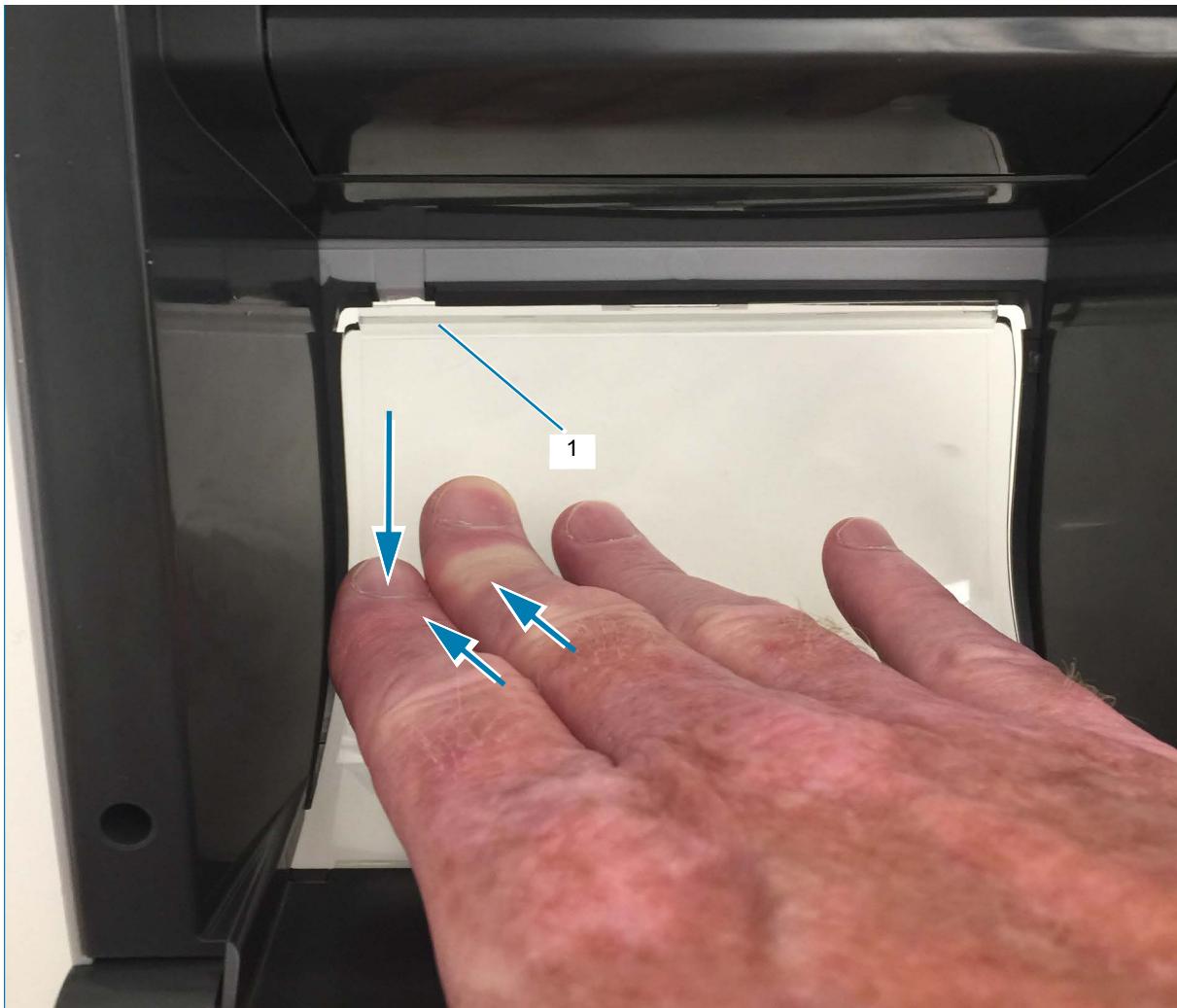
1. Slide the three (3) tabs on the window part into the three (3) slots in the top cover at the rear of the printer.
2. Swing the window down into the front of the window recess area. The window has 2 latching tabs (1). Press them into the cover to latch. You may want to leave the window's protective cover on until the printer is installed for use.



### Direct Thermal Printer Window Replacement

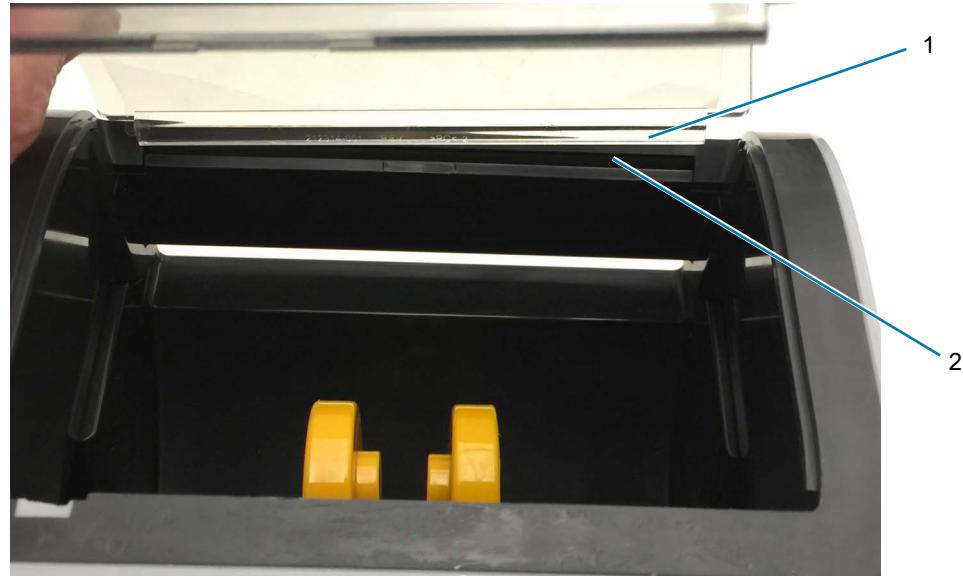
#### Removal

1. Open the printer to gain access to the window release tabs on the inside of the printer.
2. Use push the window out of the top cover. Press the middle of the window on the left side. Push it out and towards the cover hinge until you can see a gap (1) between the window and cover. Continue to push while shifting your fingers to the right to side to release the window.



### Installation

1. Slide the window's tab (1 - window wide) into the slot (2) on the back of the top cover at the rear of the printer.



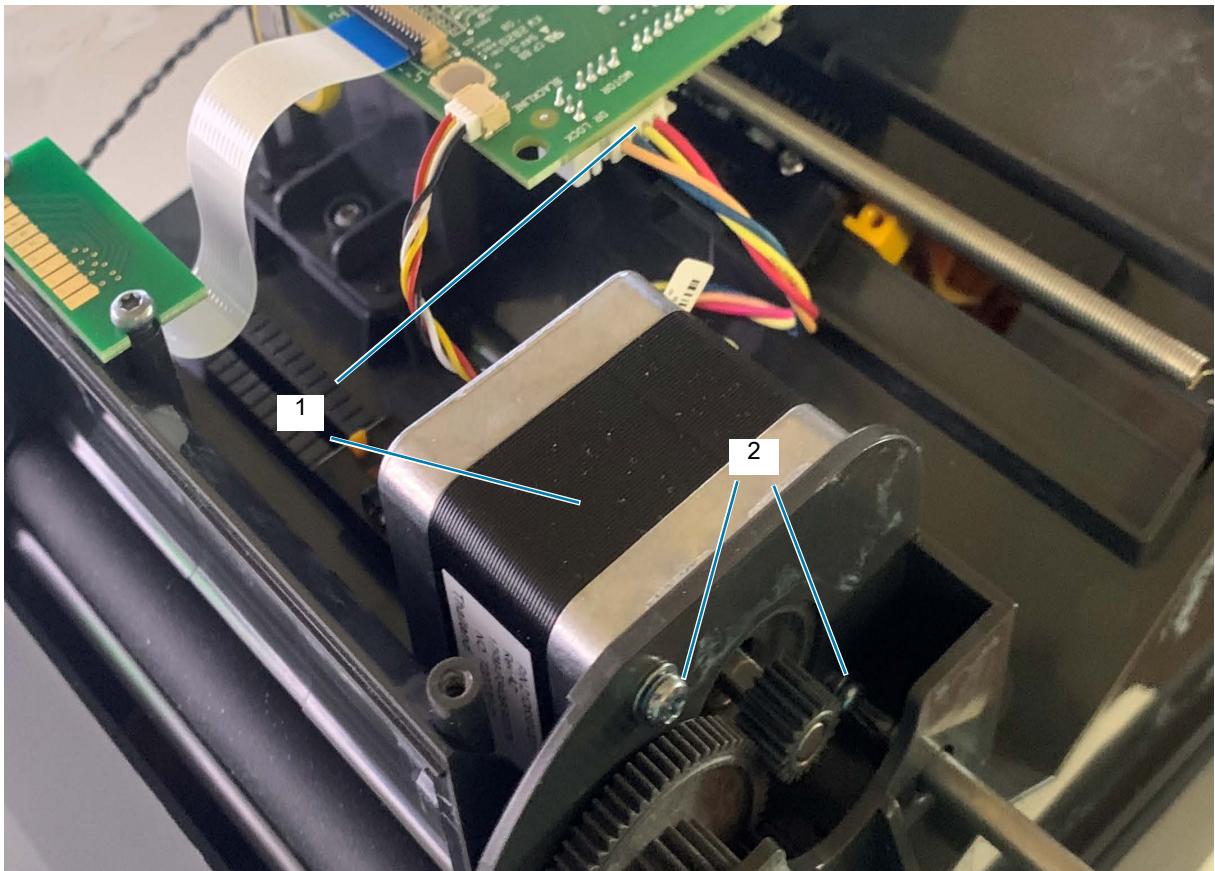
2. Swing the window down into the front of the window recess area. Push the lip of the window (1) under the front edge of the window recess. The window lip will slide down and into place.



## Replacing the Motor

### Repair Prerequisites

You must remove the main pcba, (direct thermal only) front bezel option (tear-off, dispenser, or cutter) and printer base before you can remove the motor.



### Removal

1. Remove the two screws (2) holding the motor (1) to the inner frame. Pull the motor out of the gears and inner frame. Note the location of the connector motor.
2. Disconnect the cable from the motor or from the main PCBA on thermal transfer printers.

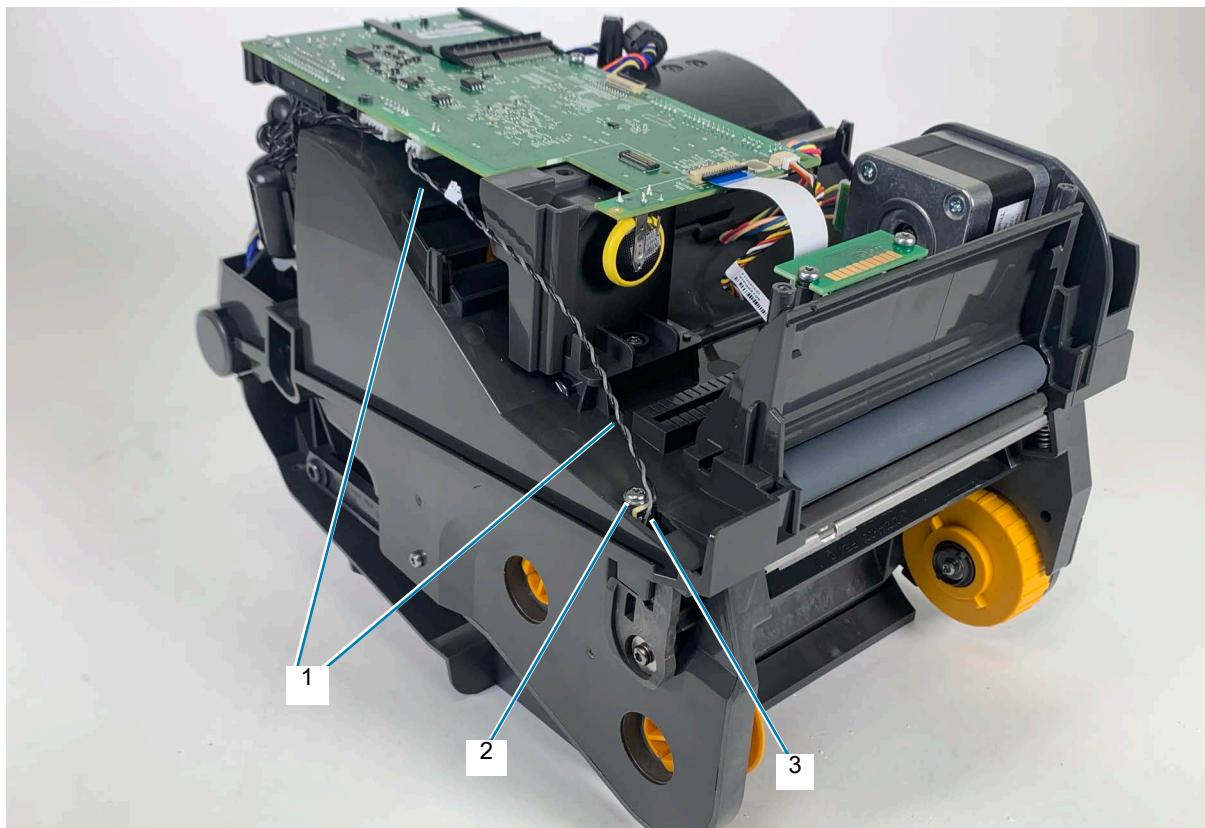
### Installation

1. Connect the cable to the motor on thermal transfer printers.
2. Orient the motor with the cable connector:
  - ZD421(t) - connector is positioned towards the rear of the printer.
  - ZD421(d) and ZD621(d) - connector is positioned away from the bottom, towards the inner frame.
  - ZD421(c), ZD621(t), and ZD621R - connector is positioned to the front of the printer.Correct motor cable positioning is important to keep the media sensor's cabling loose.
3. Secure the motor to the inner frame with the two (2) screws to 7.5 +/- 1 in lbs.

### ZD421(t) and ZD621(t) - Replacing the Head-Up Sensor

#### Repair Prerequisites

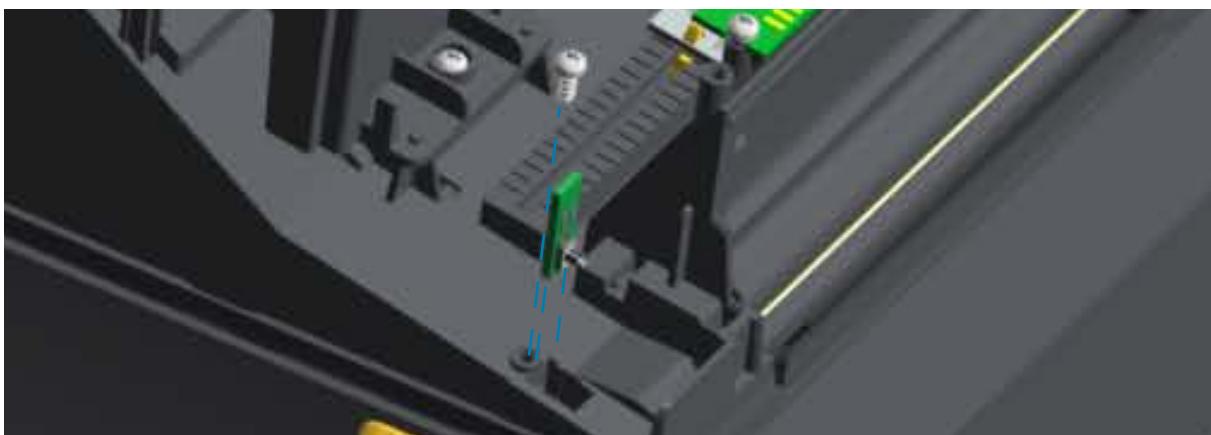
You must remove the front bezel option (tear-off, dispenser, or cutter) and printer base before you can remove this head-up sensor.



#### Removal

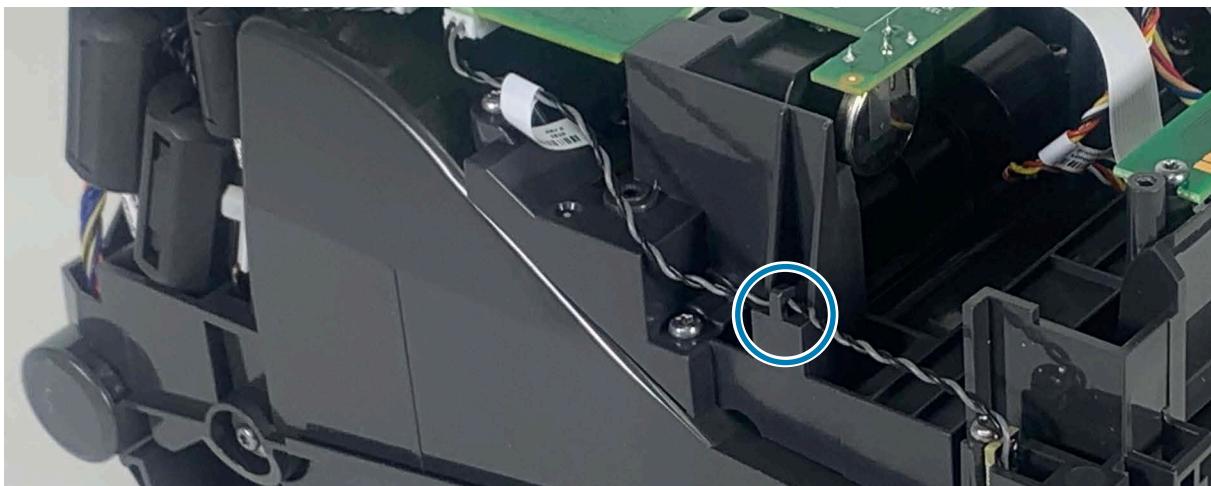
1. Disconnect the head-up sensor cable (1) from the main PCBA.
2. Remove the screw (2) holding the head-up sensor (3) in the inner frame. Pull the sensor out of the inner frame.

3. Disconnect the cable from the main PCBA. The ZD621(t) has a cable hook



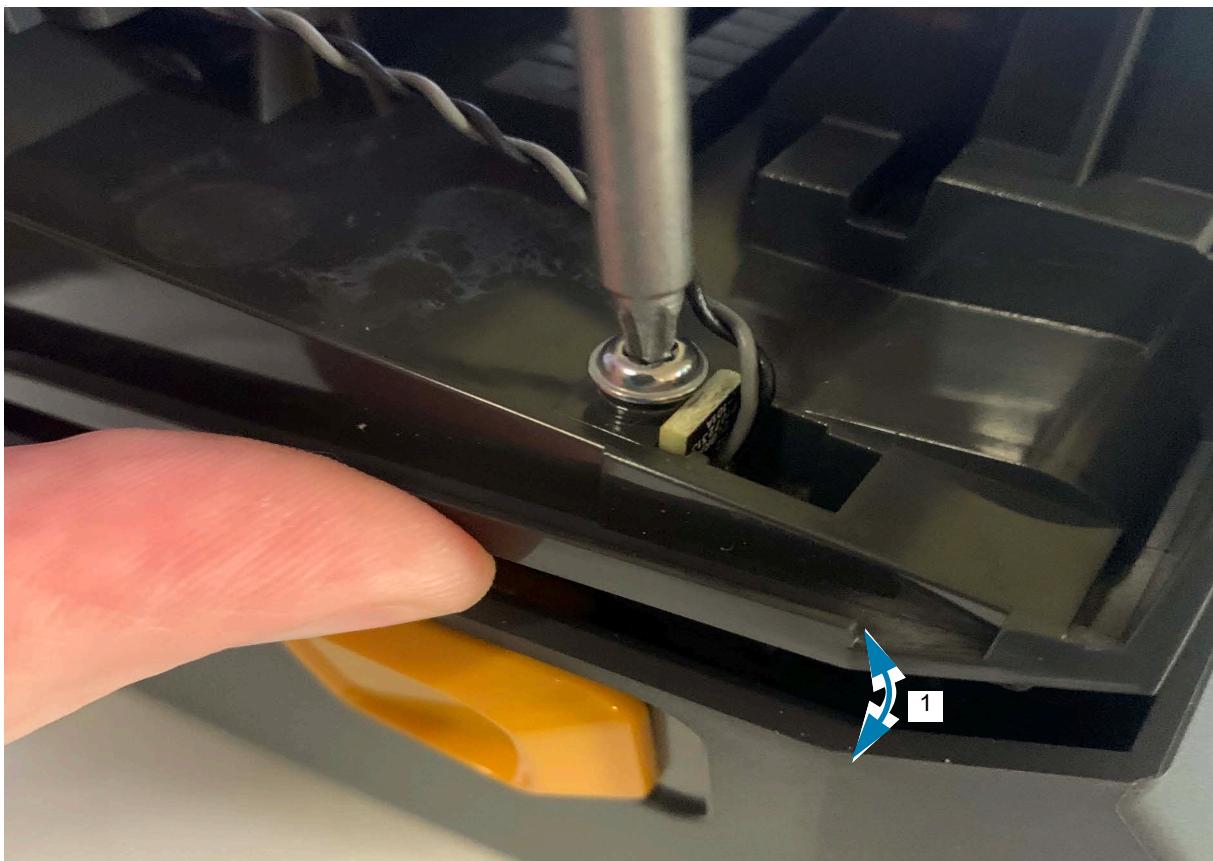
### Installation

1. Connect the cable to the Main PCBA.
2. ZD621(t) - attach the cable to the cable hook on the side of the Wi-Fi mounting tower.



## Replacing Parts

3. Slide the head-up sensor PCBA into the slot in the inner frame. The PCBA's switch will slide in easier if the top cover is not latched to the inner frame (3). The switch on the PCBA faces the front of the printer with the cable oriented towards the printer bottom. Secure it with the screw.



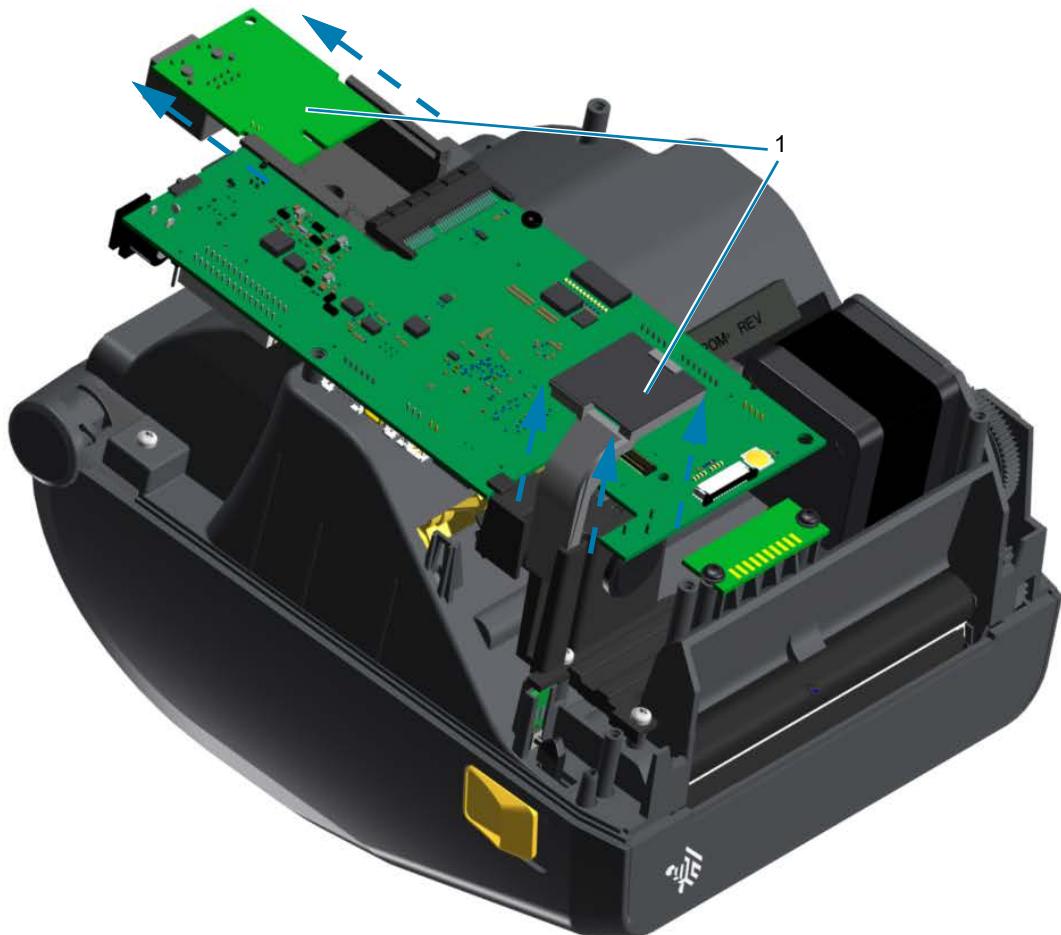
## Replacing the Main PCBA

### Repair Prerequisites

You must remove the Front bezel option (tear-off, dispenser, or cutter) and printer base before you can remove the main PCBA. The Connectivity option modules can be removed during or prior to this procedure.

### Removal

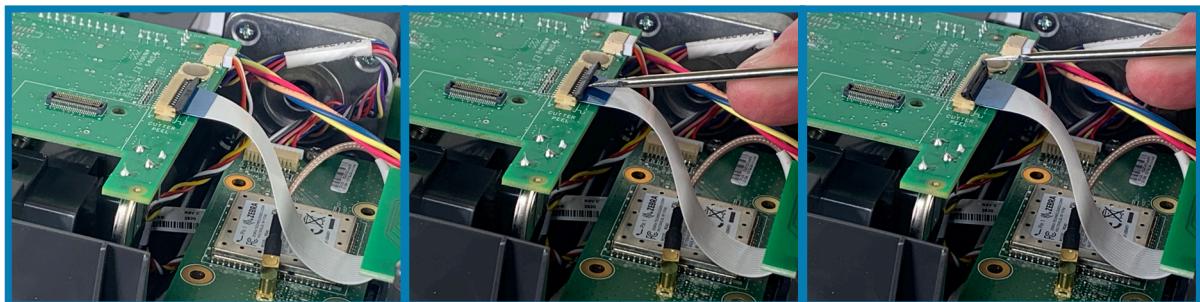
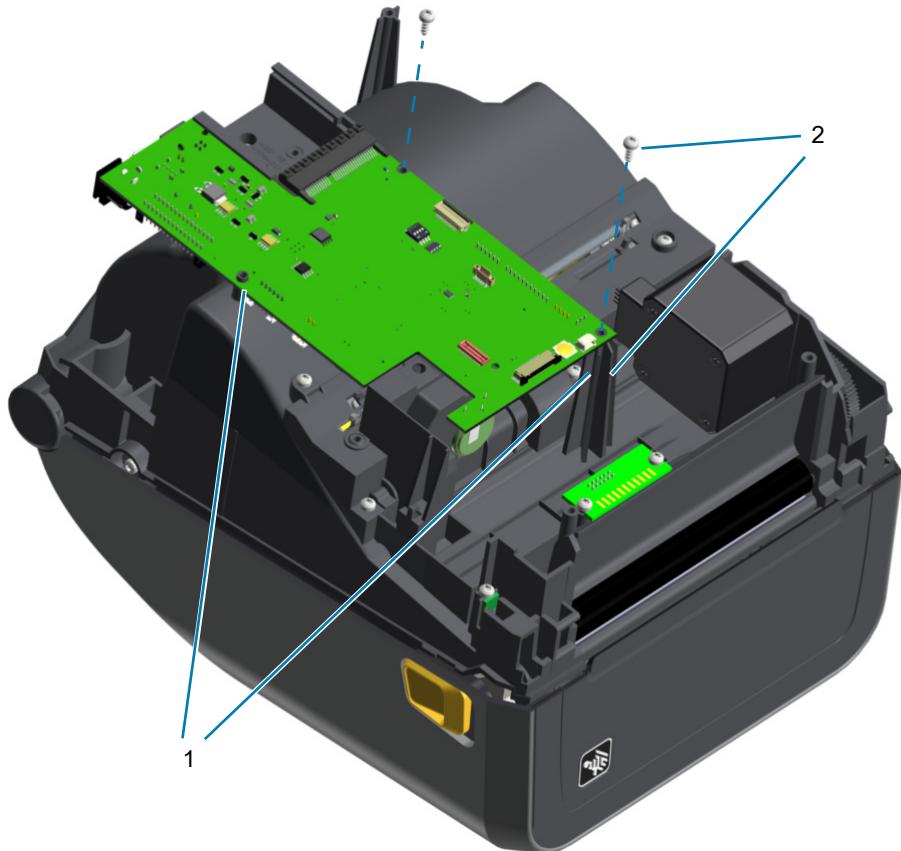
1. Remove any wired and wireless connectivity modules (1) that may be installed.



2. Remove the one or two screws used to retain the Main PCBA.

## Replacing Parts

3. Lift the PCBA off the one or 2 mounting posts (1). The second screw (2) and mounting post (2) are only with ZD621(t) and ZD421(c) models. Slide the main PCBA side ways, away from the connectivity module's mounting bracket. Carefully lift the main PCBA away from the printer to disconnect the wires from the board.



4. Carefully remove each connector from the Main PCBA. See [Main PCBA Layout on page 164](#) for illustrated connector for both side of the Main PCBA.
  - a. Disconnect the CUT/PEEL (media handling option) cable J25 on the backside of the PCBA.
  - b. ZD621 printers with color touch display - Disconnect the LCD cable J23 on the backside of the PCBA.
  - c. Disconnect the BLACKLINE (movable media) sensor cable from J17 on the backside of the PCBA.
  - d. Disconnect the USER INTERFACE (control panel) cable from J4.
  - e. Disconnect the CARTRIDGE (reader) sensor cable from J3.
  - f. Disconnect the RFID (reader/programming module) cable from J2.
  - g. Disconnect the MOTOR cable (number hidden).
  - h. Disconnect the LOCK (lock switch) cable from J15.
  - i. Disconnect the HEAD UP (switch) sensor cable from J14.
  - j. Disconnect the RIBBON sensor cable from J16.
  - k. Disconnect the two PRINthead cables at J20 and the single ground wire at J11 next to the printhead connectors.

## Installation

1. Reconnect the cables to the main board in reverse order for easiest access.
2. Slide the main PCBA into the slot on the outside of the Connectivity PCBA mounting bracket and between the mounting post and loosened screw.
3. Align the main PCBA to the other mounting posts and tighten the loosened screw to secure the main board to the printer.
4. ZD421(c) and ZD621(t) - Finish securing the main PCBA to print mechanism with a screw to the mounting post near the motor.

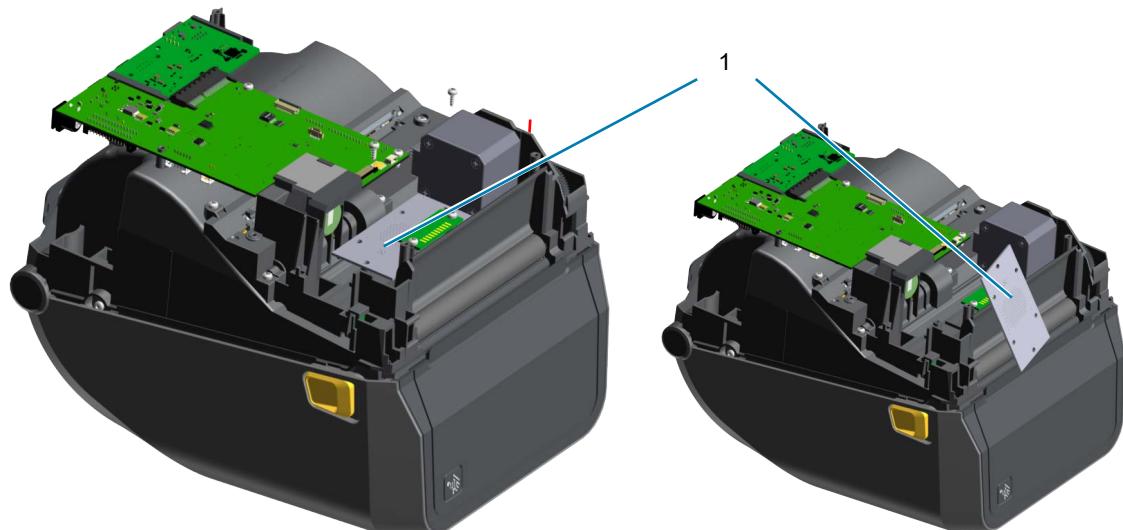
# ZD621R - Replacing the RFID Programming and Antenna PCBA's

## Repair Prerequisites

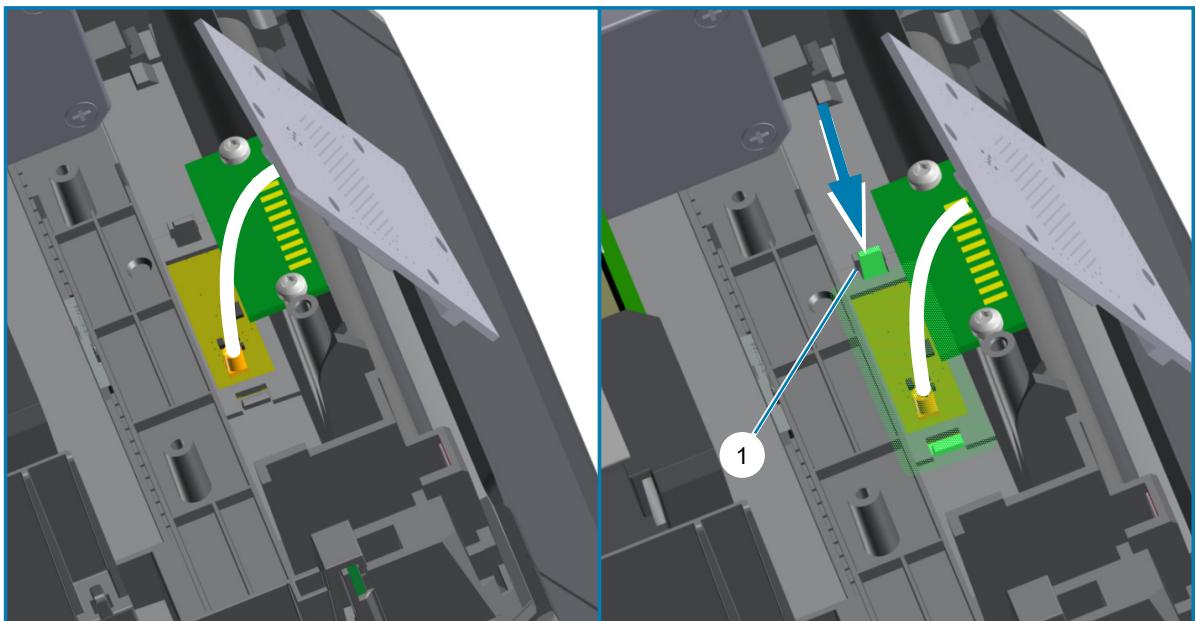
You must remove the front bezel option (tear-off, dispenser, or cutter) and printer base before you can remove this RFID programming PCBA.

## Removal

1. Disconnect the RFID cable from the Main PCBA.
2. Remove the two (2) screws holding the RFID programming PCBA (1). Lift the PCBA out and let it hang off the front of the printer by the antenna's coupling cable. Do not disconnect the cable.

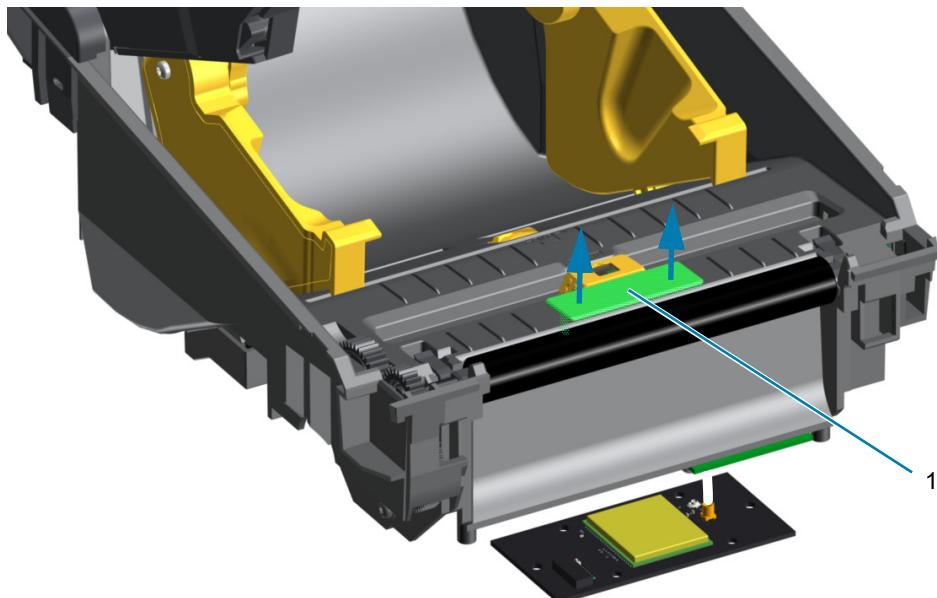


3. Push the release tab on the antenna cover (1).

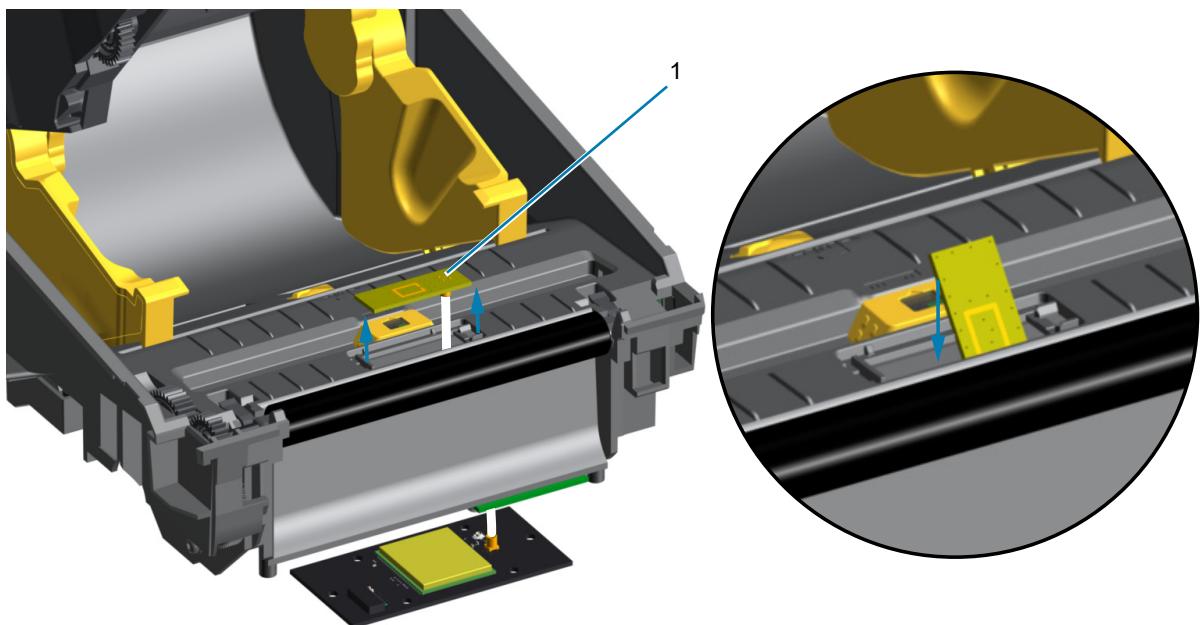


## Replacing Parts

4. Flip the printer over and gently set it down. Open the media compartment. Lift the loose antenna cover off the inside of the printer.

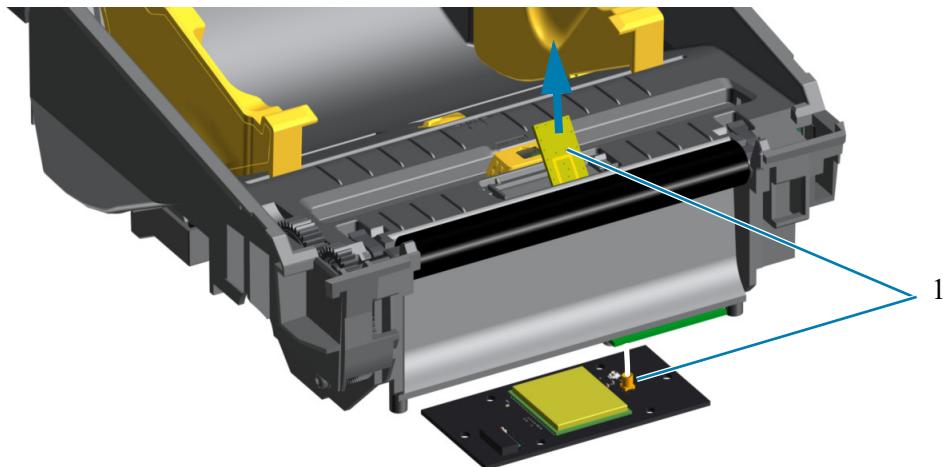


5. Lift the Antenna PCBA (1) up. Turn it sideways and slide it through the antenna access hole.

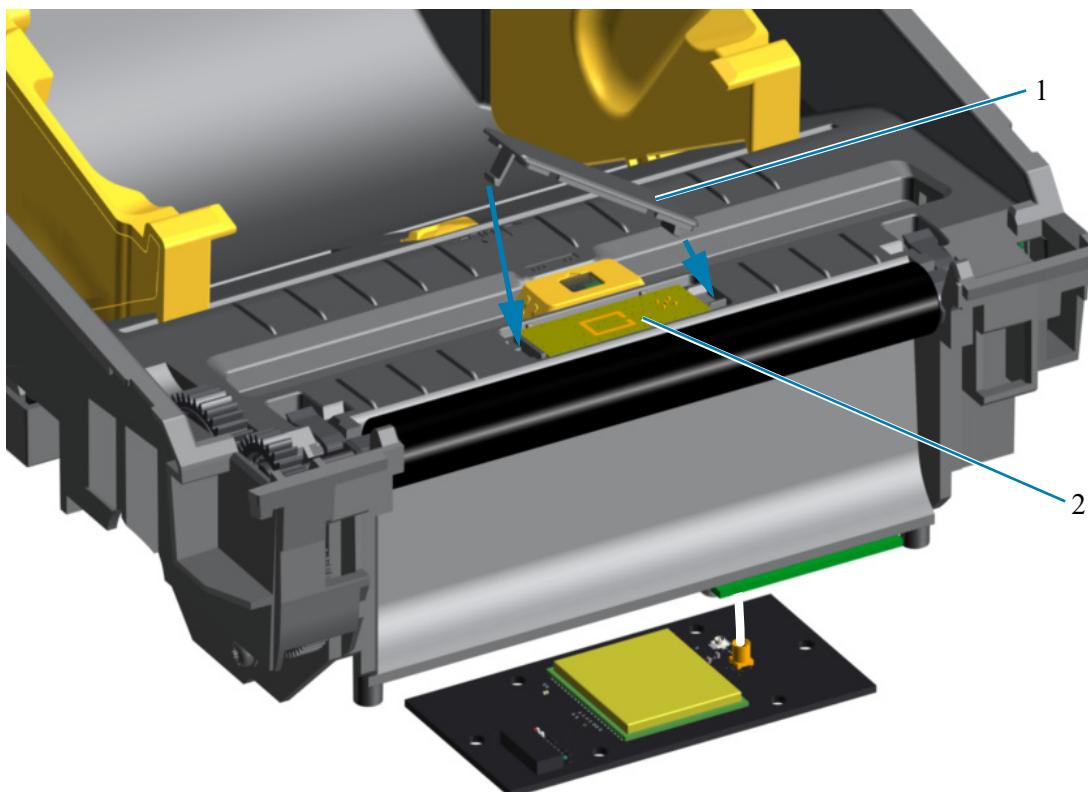


### Installation

- With the RFID antenna and programming model PCBA's connected with the antenna coupling cable, slide the Antenna PCBA up from the bottom and through the antenna access hole.



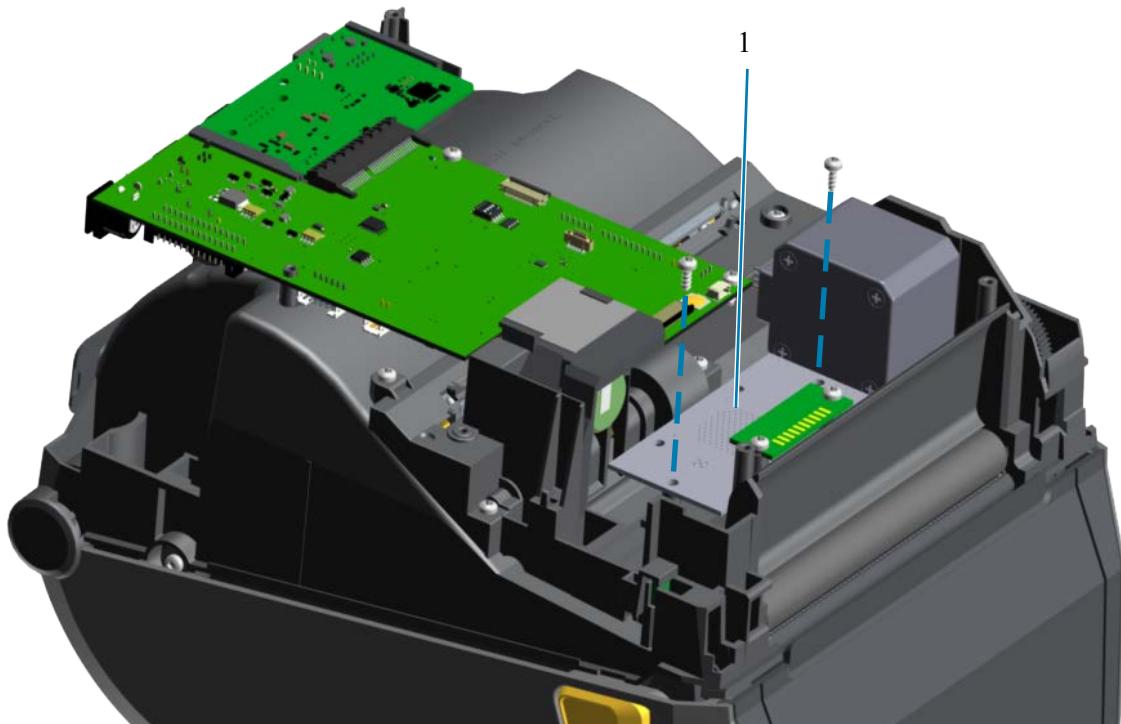
- Set the loose Antenna PCBA (2) into the inner frame. Snap the Antenna Cover (1) into the inner frame to lock it in place.



- Flip the printer over and close the cover.

## Replacing Parts

4. Attach the RFID programming module (1) to the media sensor's cover with 2 screws to 1.5 +/- .05 in. lbs.



5. Connect the RFID cable from the RFID programming to the main PCBA.

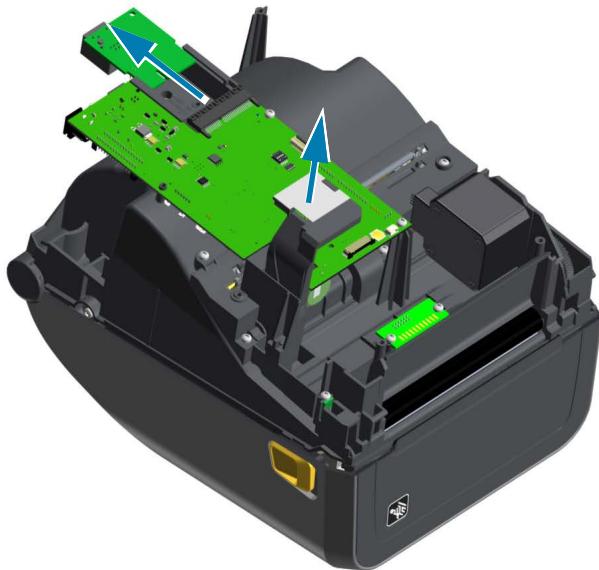
# Accessing the ZD421(c) Movable Sensor

### Repair Prerequisites

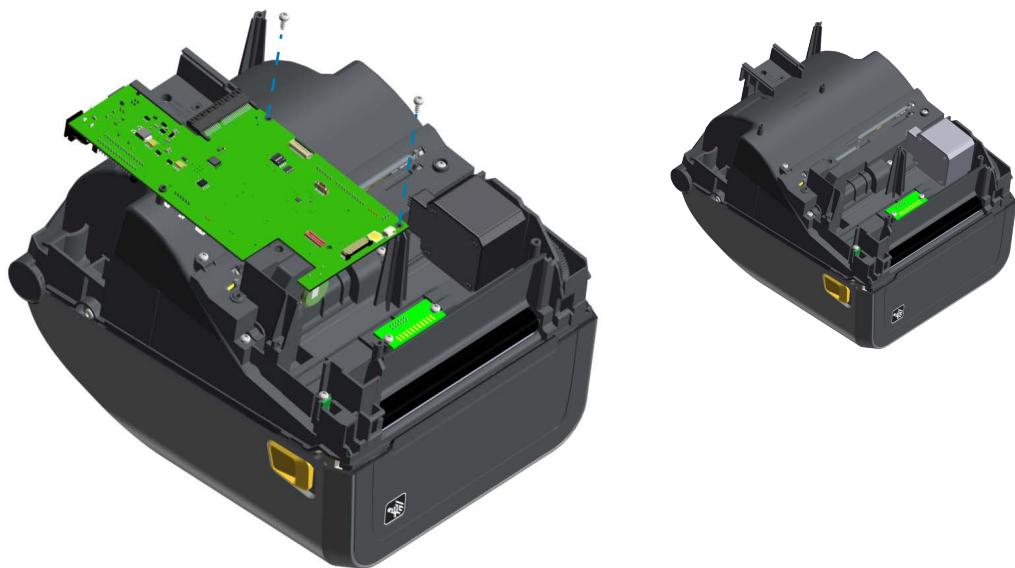
You must remove the front bezel option (tear-off, dispenser, or cutter) and printer base before proceeding.

### Removal for Access

1. Remove the wired and wireless connectivity options installed.



2. Remove the two screws holding the main PCBA to the inner frame. Disconnect the cables from the main PCBA.

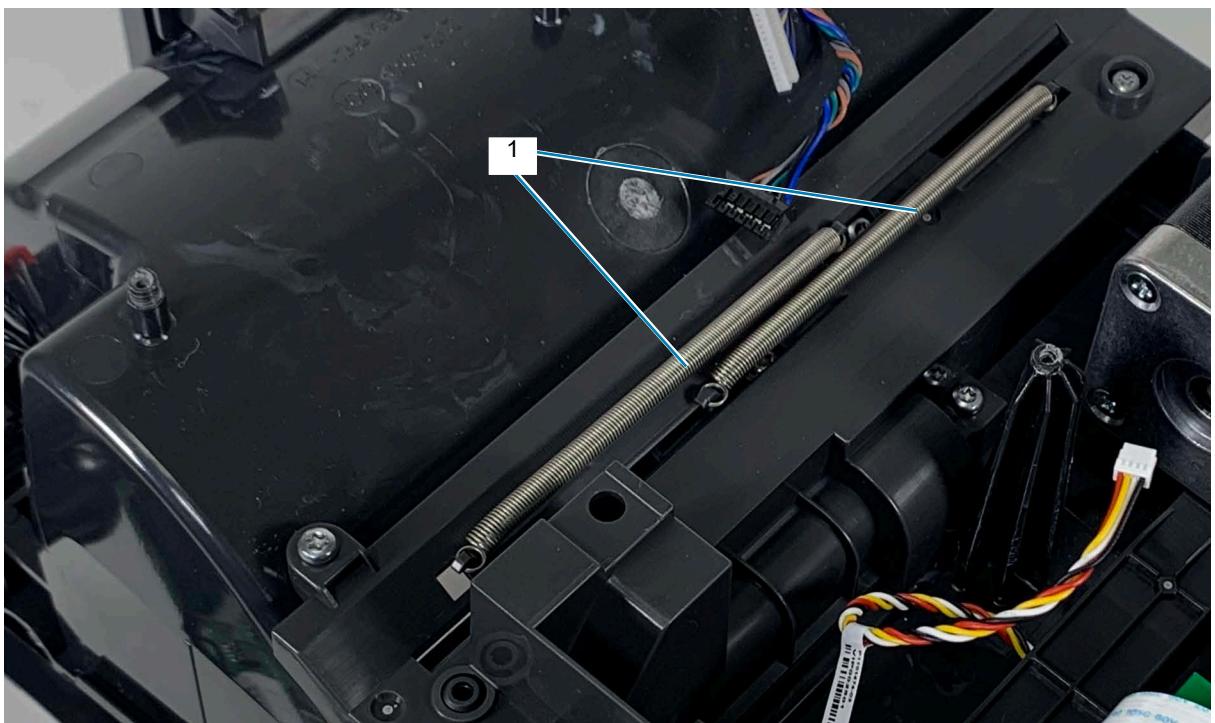


## Replacing Parts

3. Remove the two screws holding the motor (2) to the inner frame. Pull the motor out. Note the location of the of the motors cable connector.

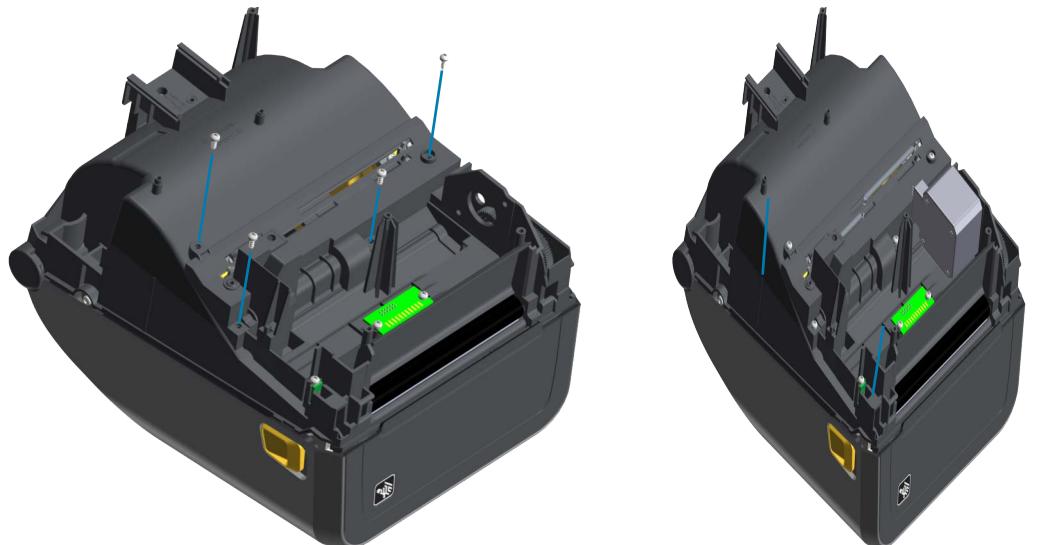


4. Remove the two media roller tensioning springs (1).

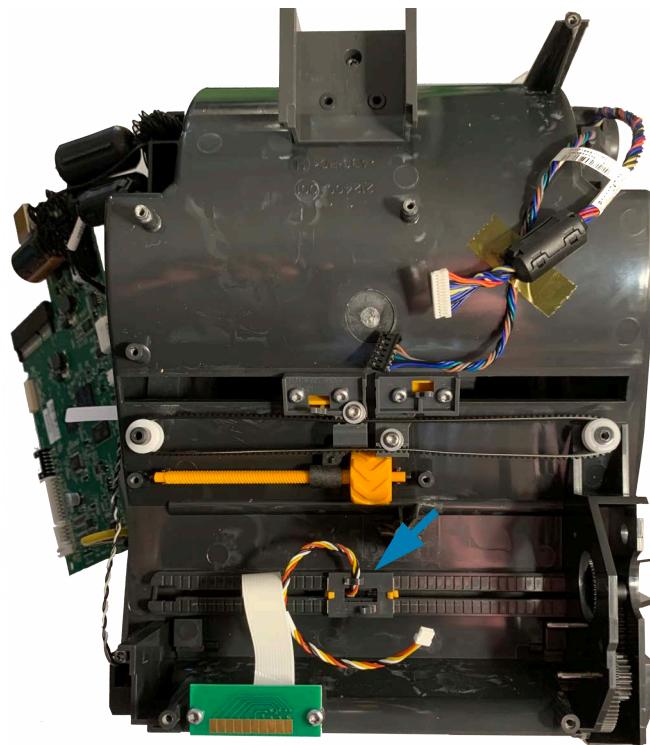


## Replacing Parts

1. Remove the four screws securing the roll holder cover that retains the roll holder parts and covers the movable media sensor. Many roll holder parts are loose and will fall out if you are not careful.



2. The movable media sensor is now accessible. Note the sensor's cable exits toward the inside of the printer for ZD421(c) printer model.



### Re-assemble

1. Reverse the 'Removal for Access' sequence. Remember to replace any connectivity options that were installed.

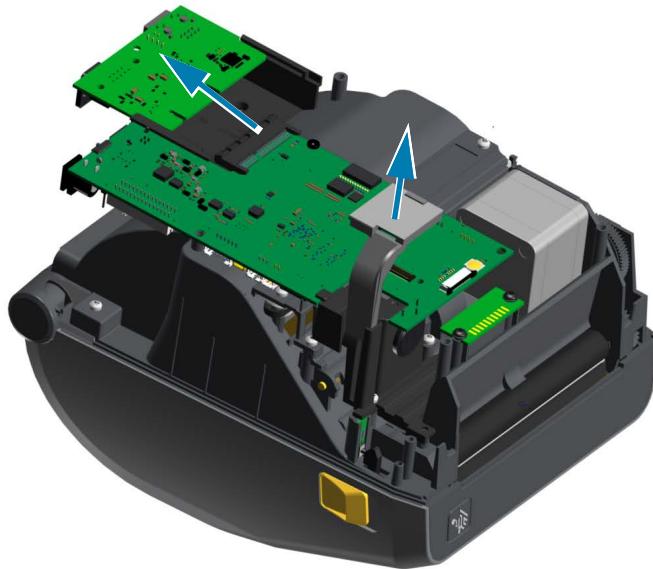
# Accessing ZD621(d) and ZD421(d) Head-up and Movable Sensors

## Repair Prerequisites

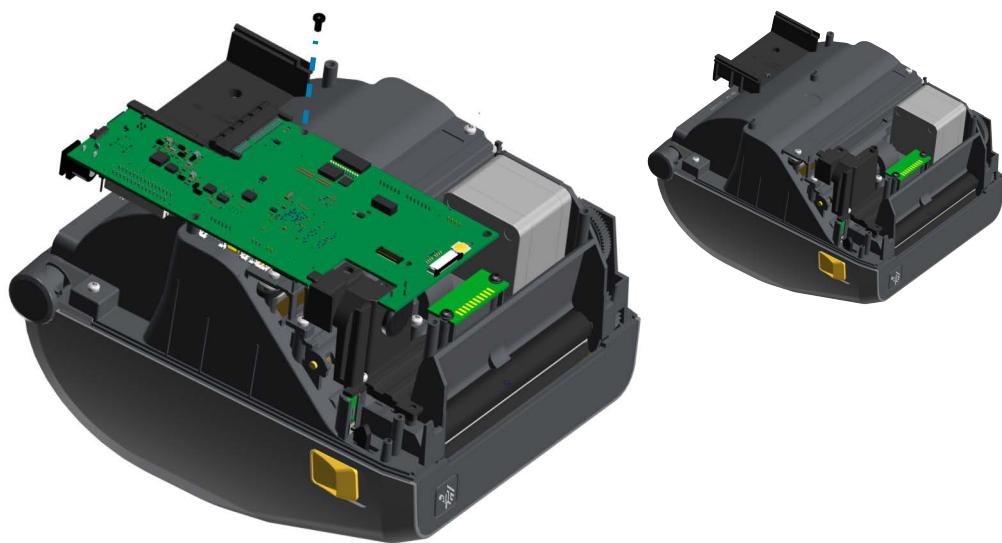
You must remove the front bezel option (tear-off, dispenser, or cutter) and printer base before proceeding.

## Removal for Access

1. Remove the wired and wireless connectivity options installed.

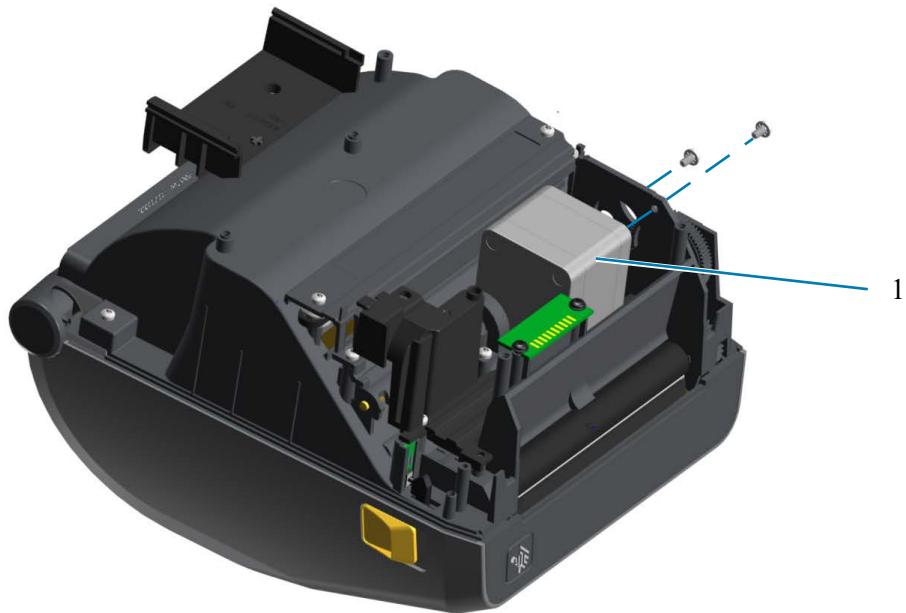


2. Remove the screw holding the main PCBA to the inner frame. Disconnect the cables from the main PCBA.

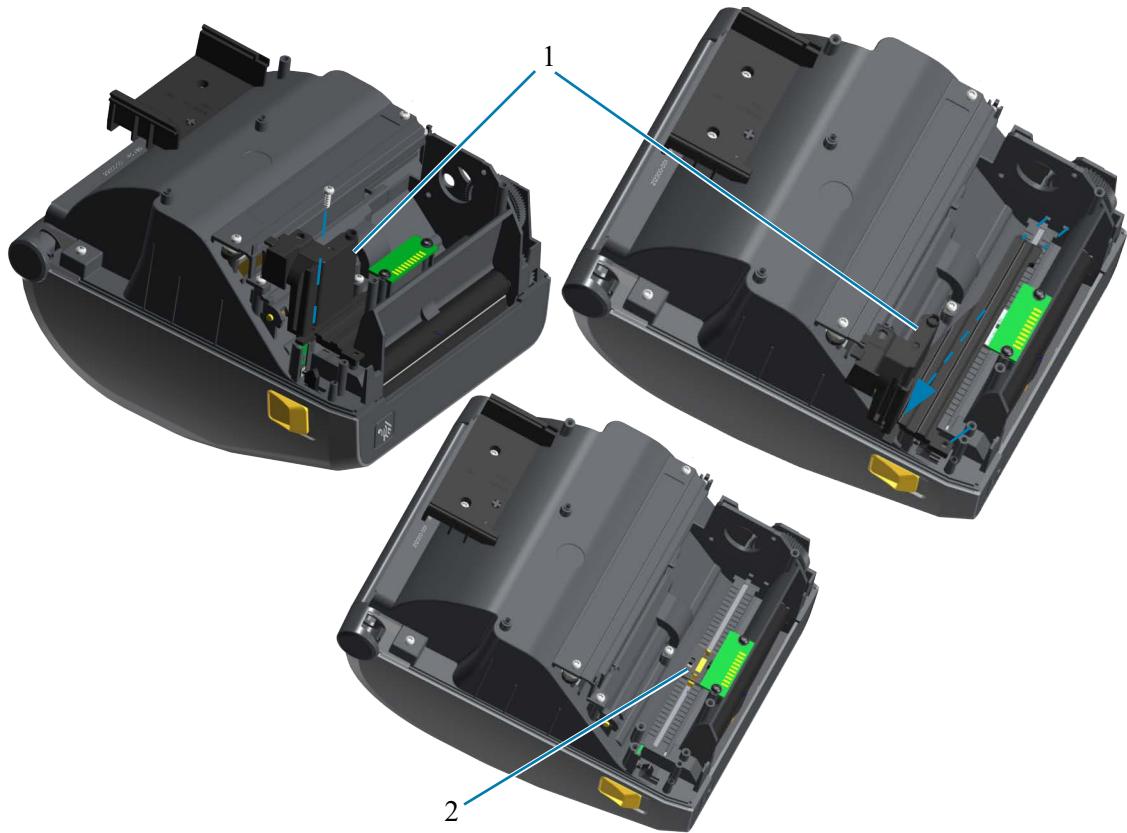


## Replacing Parts

3. Remove the two screws holding the motor (1) to the inner frame. Pull the motor out. Note the location of the of the motors cable connector.

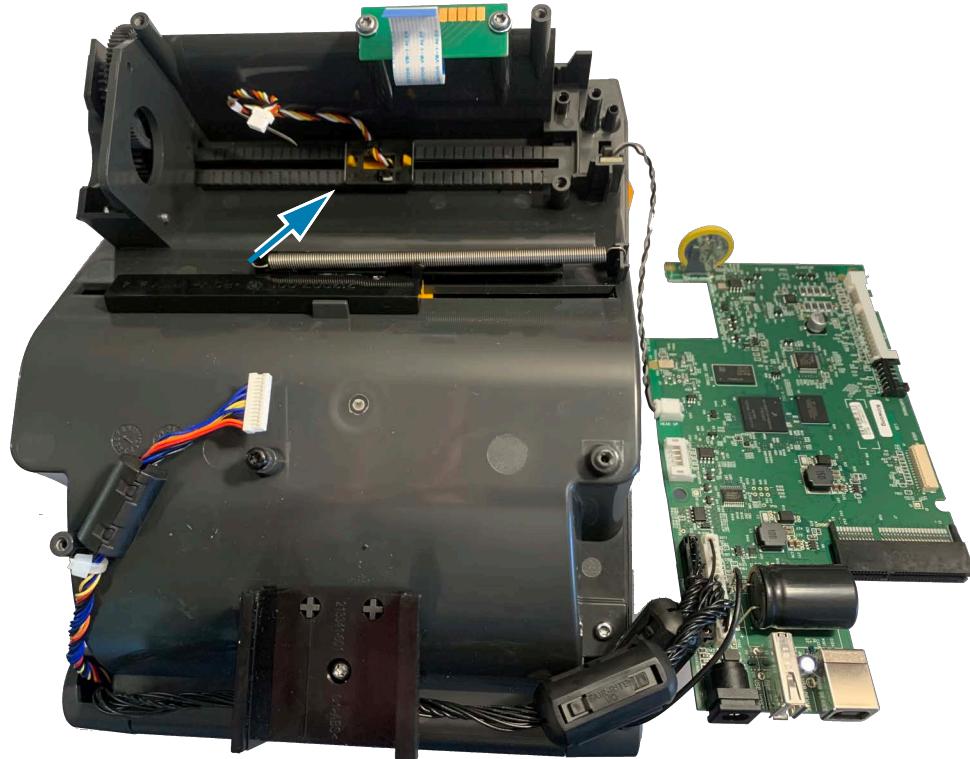


4. Remove the screw securing the media sensor cover (1) that covers the movable of sensor (2) and holds the main PCBA. Pull the media cover out of the motor mount wall on the inner frame of the printer.



5. The movable media sensor is now accessible. Note the sensor's cable exits toward the front of the ZD621(d) and ZD421(d) printer models.

The head-up sensor can be lifted out of the inner frame now that the media sensor cover is removed. See [Accessing ZD621\(d\) and ZD421\(d\) Head-up and Movable Sensors on page 116](#) for reference.



### Re-assemble

1. Reverse the 'Removal for Access' sequence. Remember to replace any connectivity options that were installed.

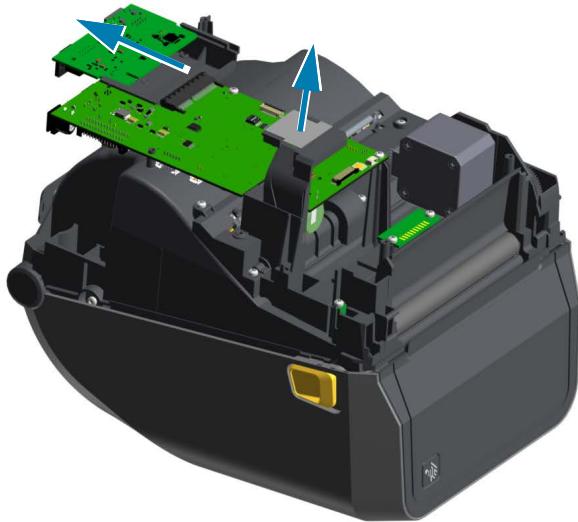
## Accessing the ZD621(t) Movable Sensor

### Repair Prerequisites

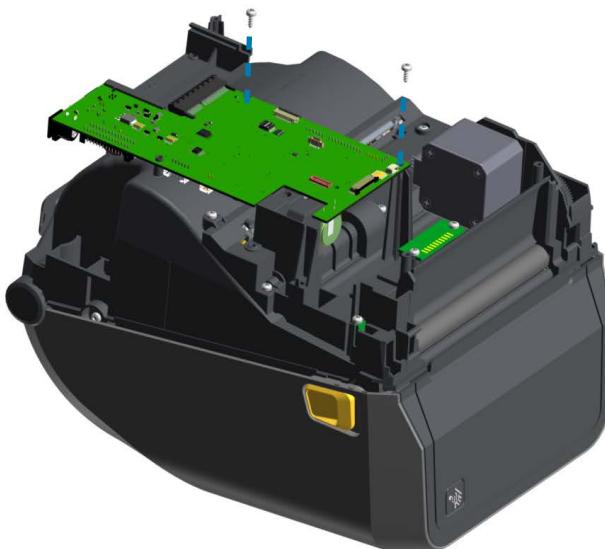
You must remove the Front Bezel Option (tear-off, dispenser, or cutter) and printer base before proceeding.

### Removal for Access

1. Remove the wired and wireless connectivity options installed.

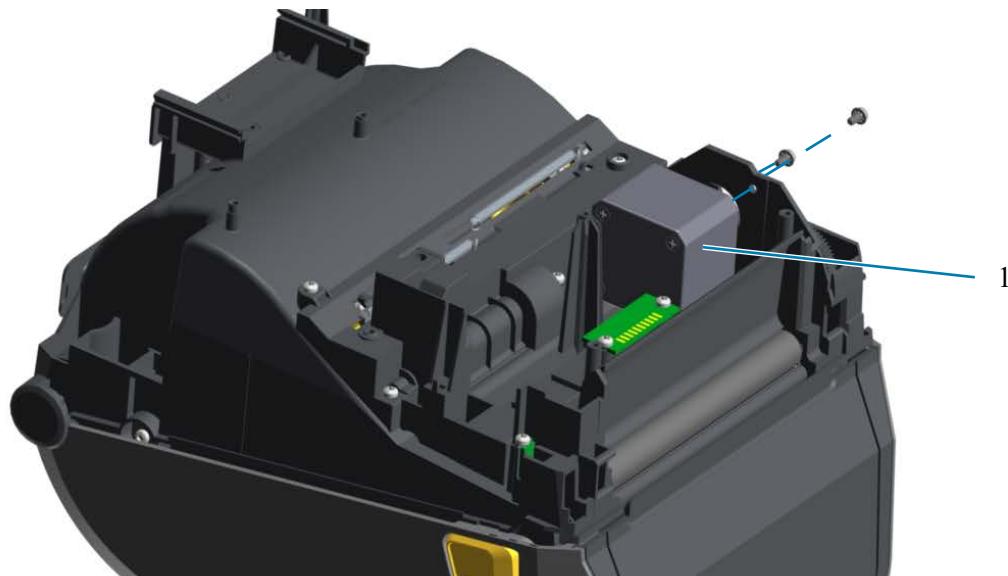


2. Remove the two screws holding the main PCBA to the inner frame. Disconnect the cables from the main PCBA.

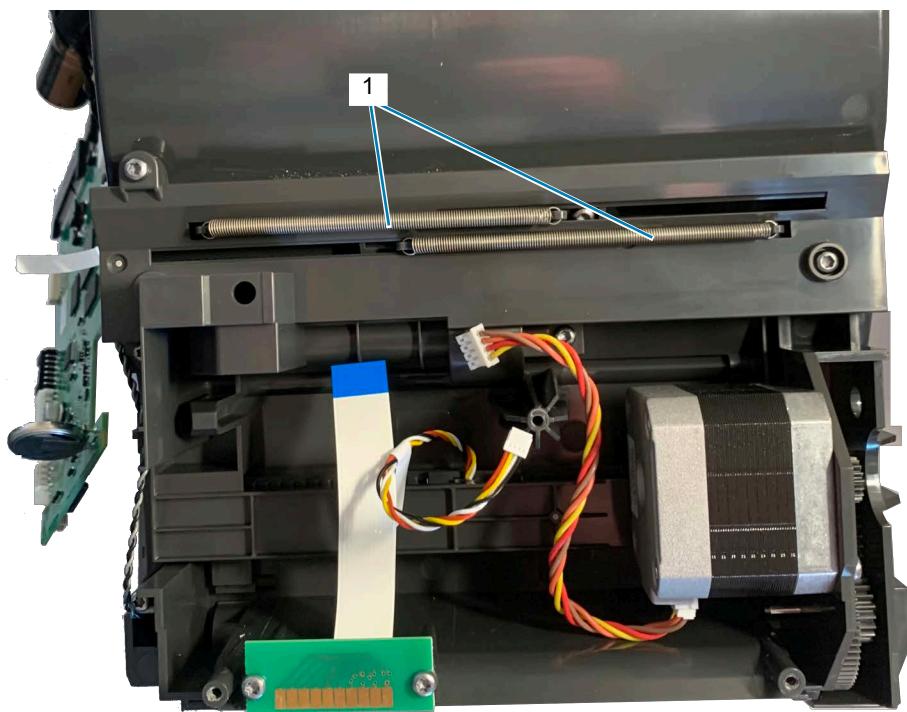


## Replacing Parts

3. Remove the two screws holding the motor (1) to the inner frame. Pull the motor out. Note the location of the motors cable connector.

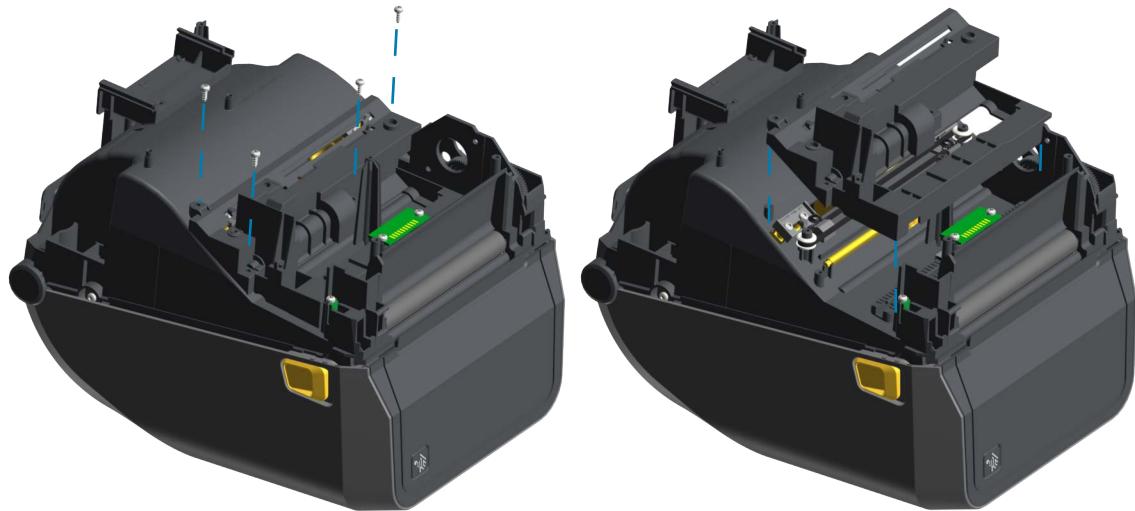


4. Remove the two media roller tensioning springs (1).

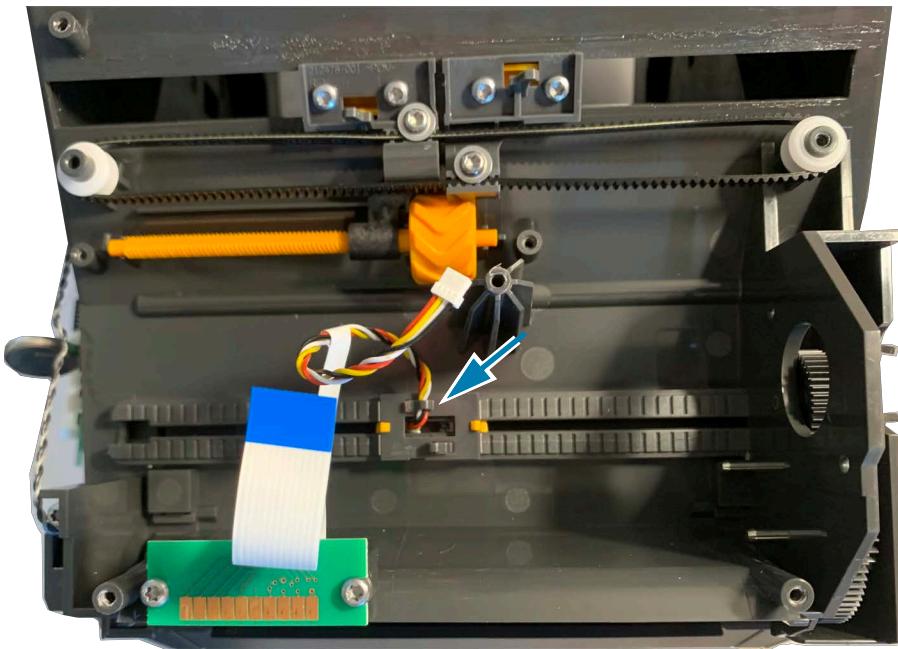


## Replacing Parts

5. Remove the four screws securing the roll holder cover that retains the roll holder parts and covers the movable media sensor. Many roll holder parts are loose and will fall out if you are not careful.



6. The movable media sensor is now accessible. Note the sensor's cable exits toward the inside of the printer for ZD621(t) printer model.



### Re-assemble

1. Reverse the 'Removal for Access' sequence. Remember to replace any connectivity options that were installed.

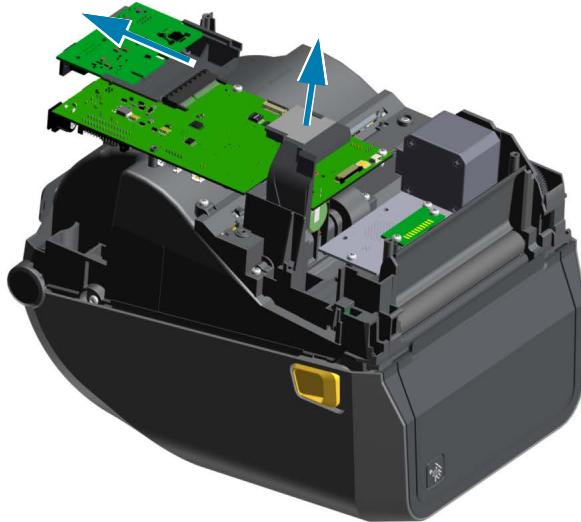
# Accessing the ZD621R Head-up and Movable Sensors

## Repair Prerequisites

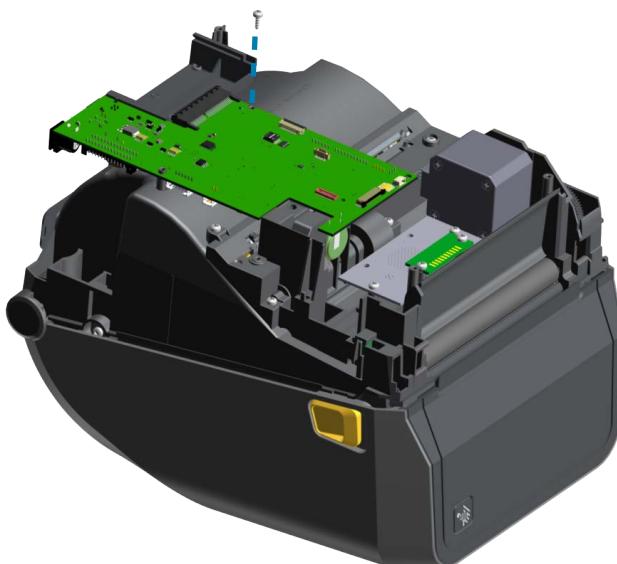
You must remove the Front Bezel Option (tear-off, dispenser, or cutter) and printer base before proceeding.

## Removal for Access

1. Remove the wired and wireless connectivity options installed.

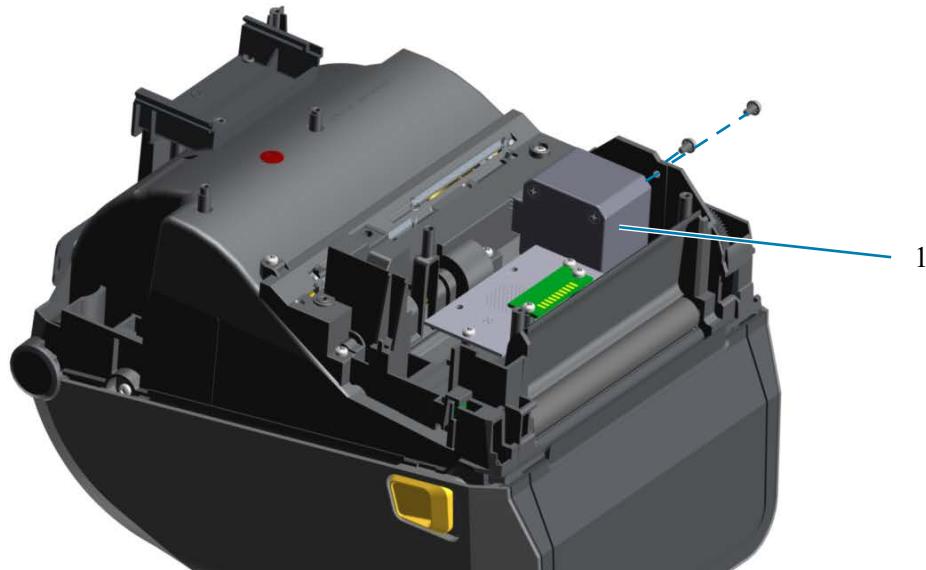


2. Remove the screw holding the main PCBA to the inner frame. Disconnect the cables from the main PCBA.

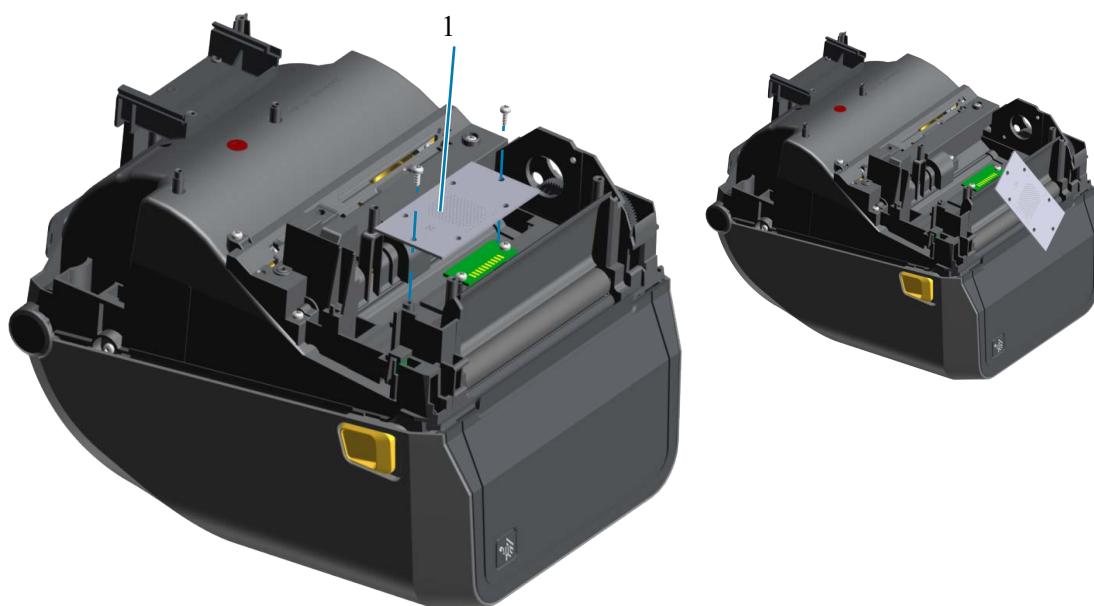


## Replacing Parts

3. Remove the two screws holding the motor (1) to the inner frame. Pull the motor out. Note the location of the motors cable connector.

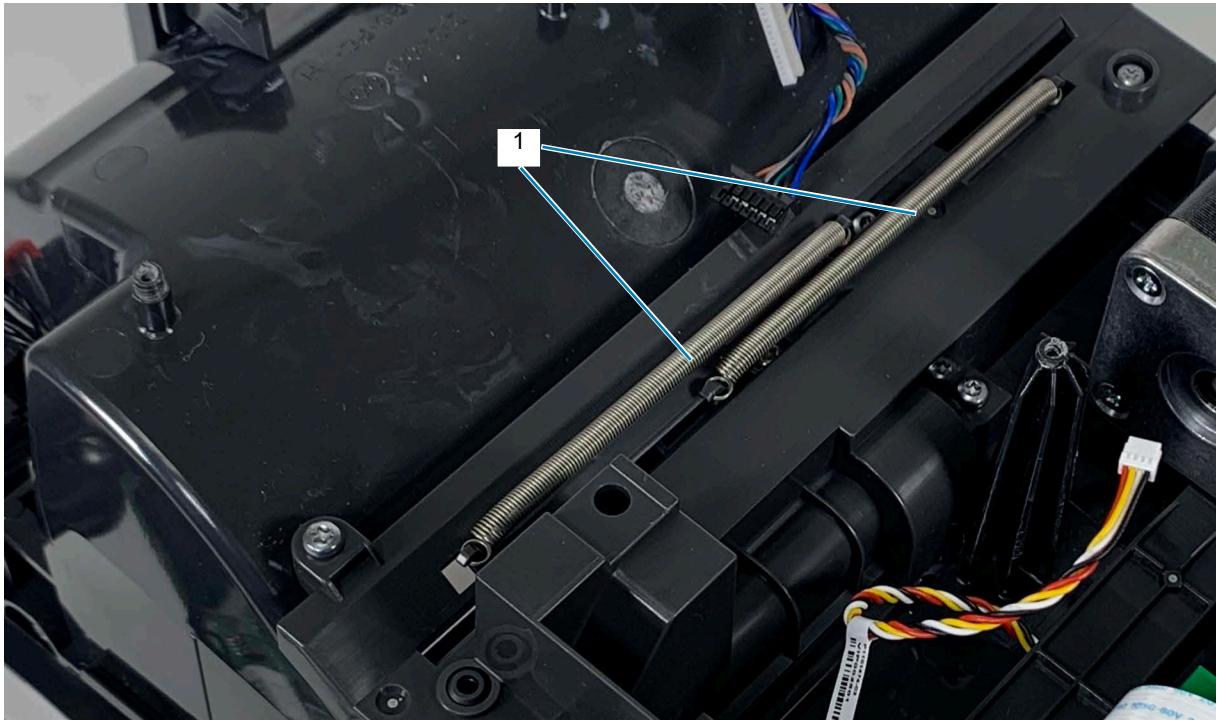


4. Remove the two screws holding the RFID programming PCBA (1). Lift the PCBA out and let it hang off the front of the printer by the antenna's coupling cable. Do not disconnect the cable.



## Replacing Parts

5. Remove the two media roller tensioning springs (1).

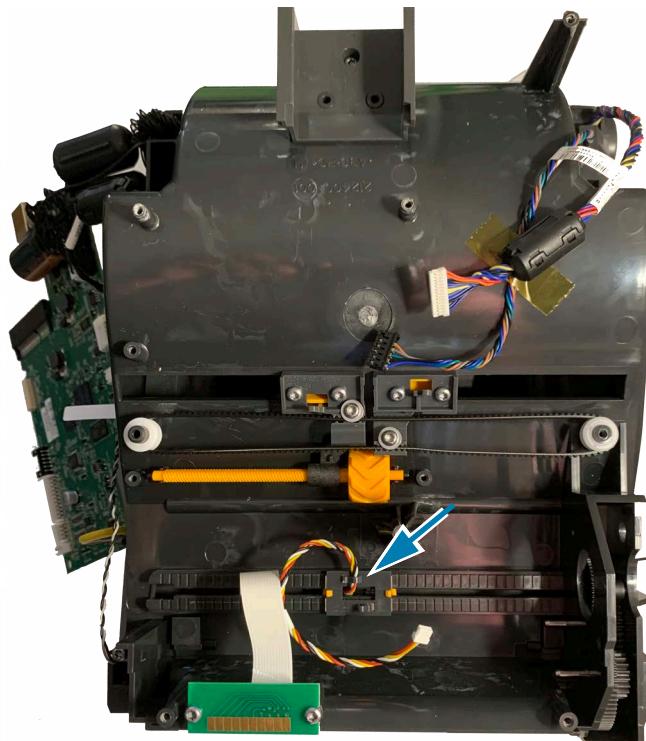


6. Remove the four screws securing the roll holder cover (1) that retains the roll holder parts and covers the movable of sensor. Many roll holder parts are loose and will fall out if you are not careful.



## Replacing Parts

7. The movable media sensor is now accessible. Note the sensor's cable exits toward the inside of the printer for ZD421(c) printer model.



### Re-assemble

1. Reverse the 'Removal for Access' sequence. Remember to replace any connectivity options that were installed.

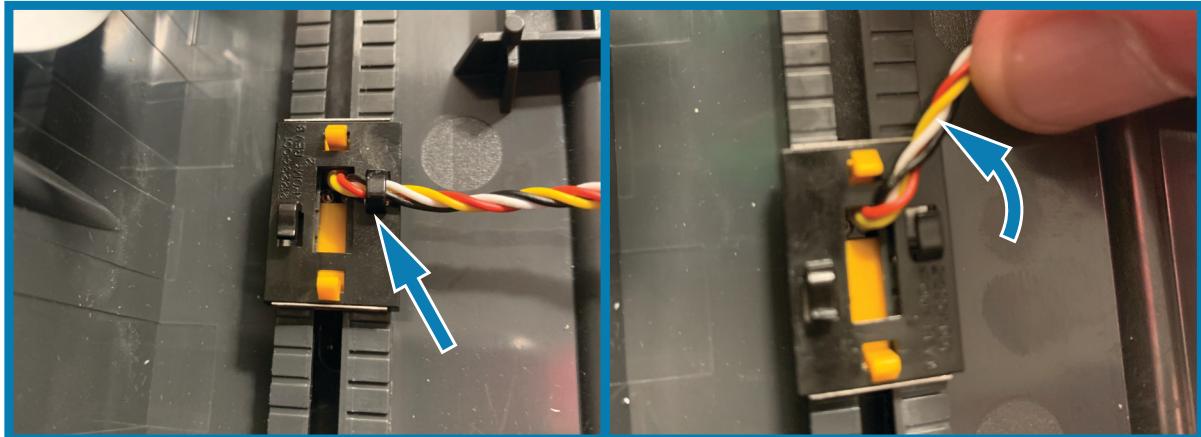
# Replacing the Movable Lower Media (Blackmark) Sensor

## Repair Prerequisites

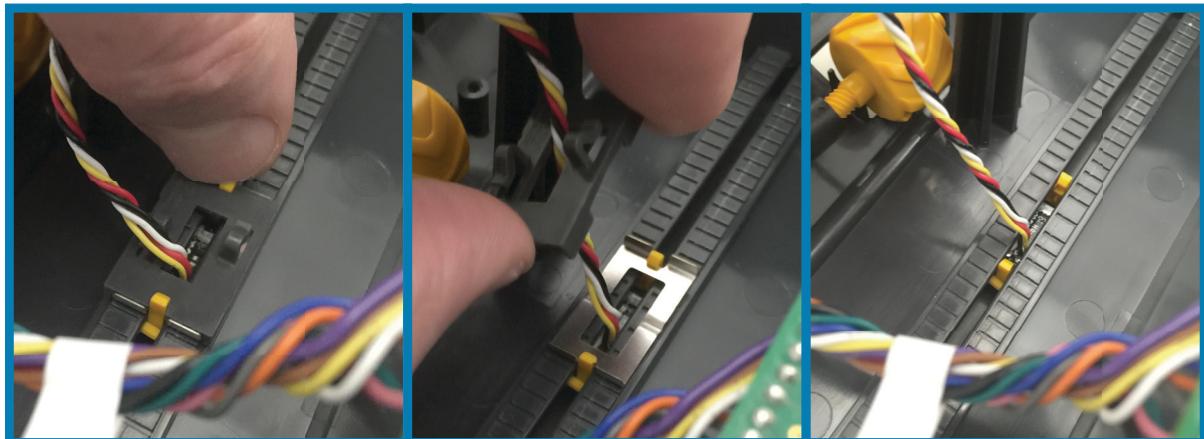
You must remove the front bezel option (tear-off, dispenser, or cutter), printer base, motor, and the main PCBA before you can remove the movable sensor.

## Removal

1. Unhook the sensor's cable from the backside of the movable sensor.

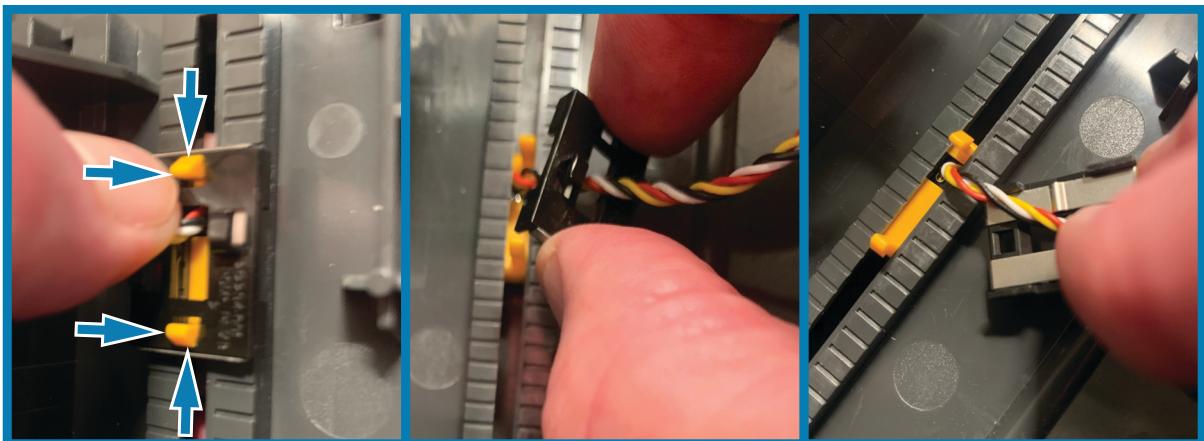


2. **ZD421(c), ZD621(t), ZD621R:** Release the two gold prongs holding the movable sensor. Pinch them toward the center of the movable sensor. Push down into the bracket when the prongs release at holding the black plastic bracket.



## Replacing Parts

**ZD421(d), ZD621(d), ZD621(t):** Release the two gold prongs holding the movable sensor. Push them away the center of the movable sensor. Push down on the prongs into the bracket and lift the black plastic bracket and metal spring-lock up.

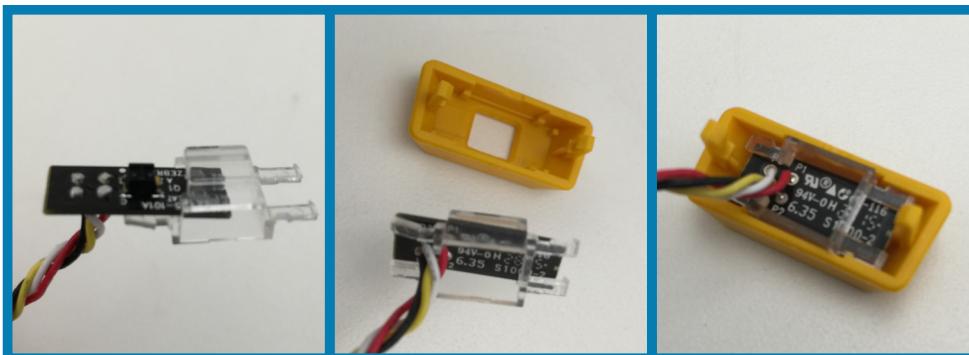


3. Pull the metal spring-lock and black plastic bracket out of the frame and clear of the sensor's cable.
4. Open the printer. The golden sensor body, it's PCBA, and cable can now be pulled out of the printer's inner cavity and movable sensor's recessed slide track.

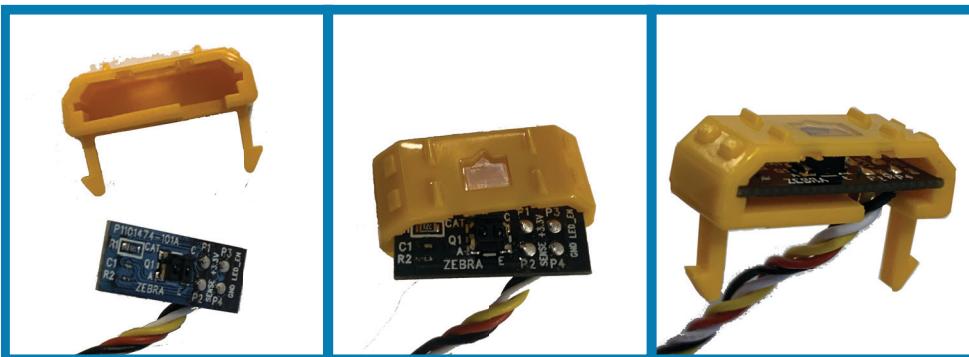
### Installation

1. Slide the new sensor's PCBA and cable into the lens bracket for the PCBA. The cable is on the open end of the golden sensor body and hangs below the bracket.

Models: ZD421(c), ZD621(t), ZD621R

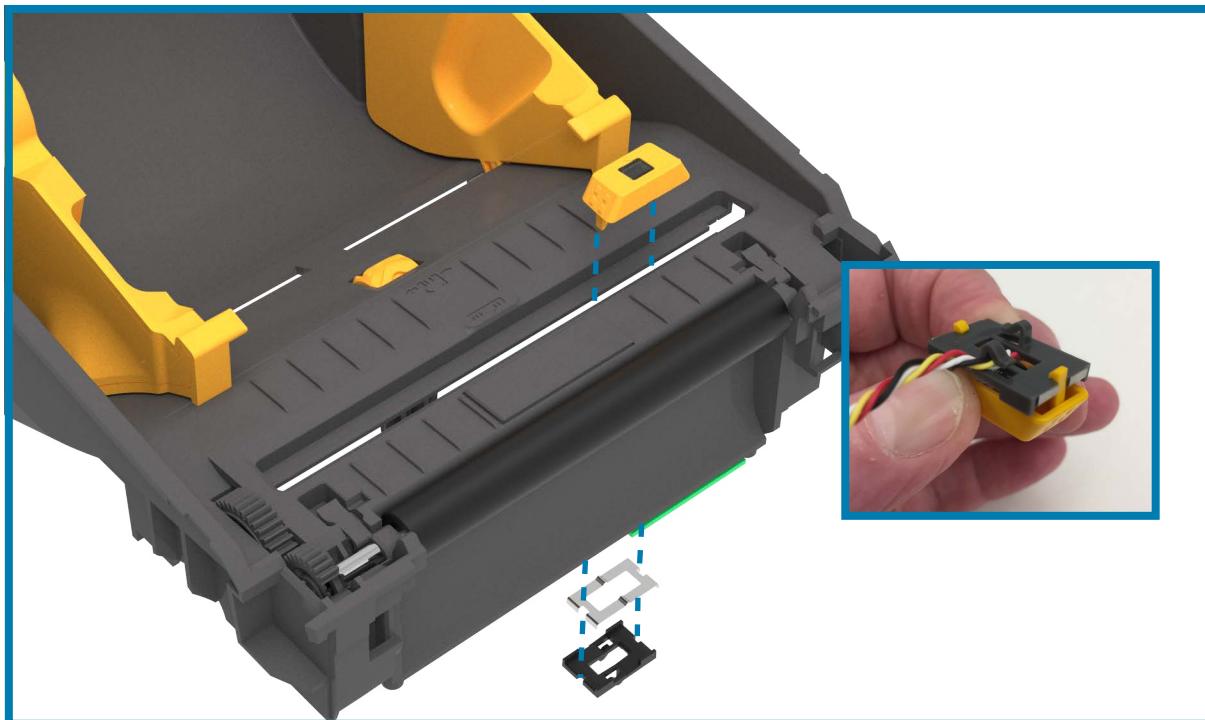


Models: ZD421(d), ZD621(d), ZD621(t)

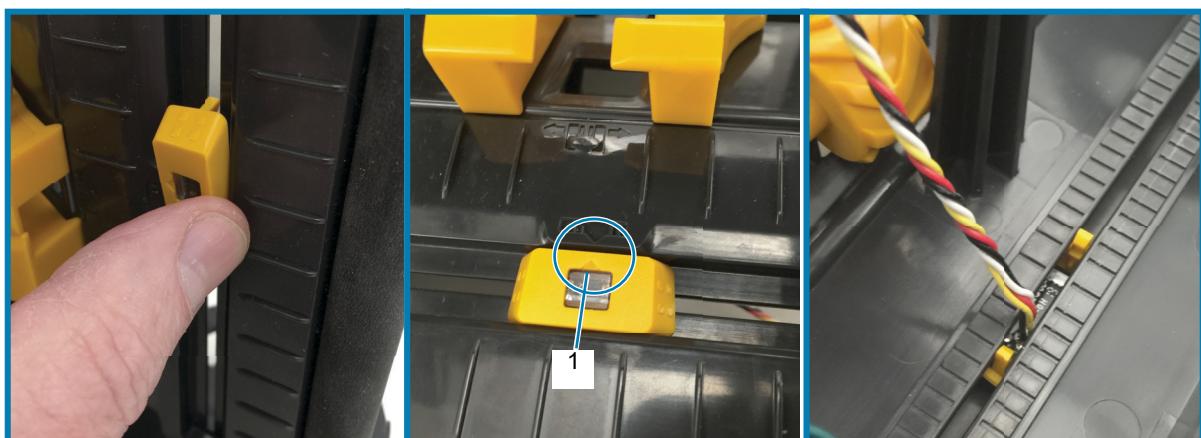


## Replacing Parts

1. Snap the PCBA and bracket into the movable sensor body. The lens bracket should be flush with the top surface of the sensor body. The arrow on the sensor body points toward the rear of the printer.



2. Place the sensor's cable and connector into sensor guide channel and cable slot. There is a wider opening on one end to allow the connector to slip through the slot.
3. Align the (gold plastic) sensor body (with the sensor PCBA inside) to the movable sensor channel on the inside of the printer. The prongs go into the cable channel. The arrow point (1) on the sensor body points to the rear of the printer.

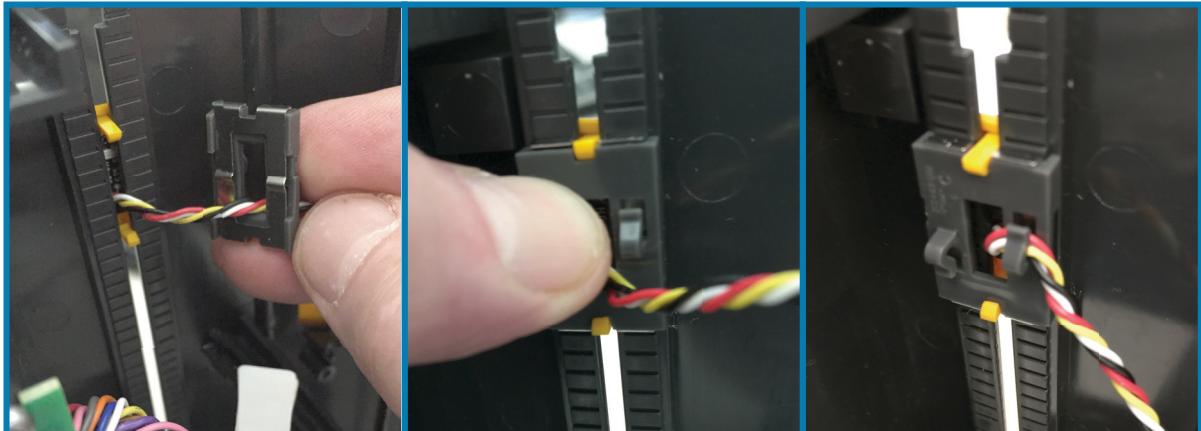


4. Put the sensor's cable into the center of the metal spring-lock with the metal spring-lock's notch facing the inner frame. Put the sensor's cable into the center of the black plastic bracket with the black plastic bracket's cable retainer (hooks) facing away from the inner frame.

## Replacing Parts

5. Align the black plastic bracket to the metal spring-lock and lock them to the movable sensor. The prong's tabs will lock the bracket and spring in place.

Slide the movable sensor from end to end to verify that the bracket is locked properly.



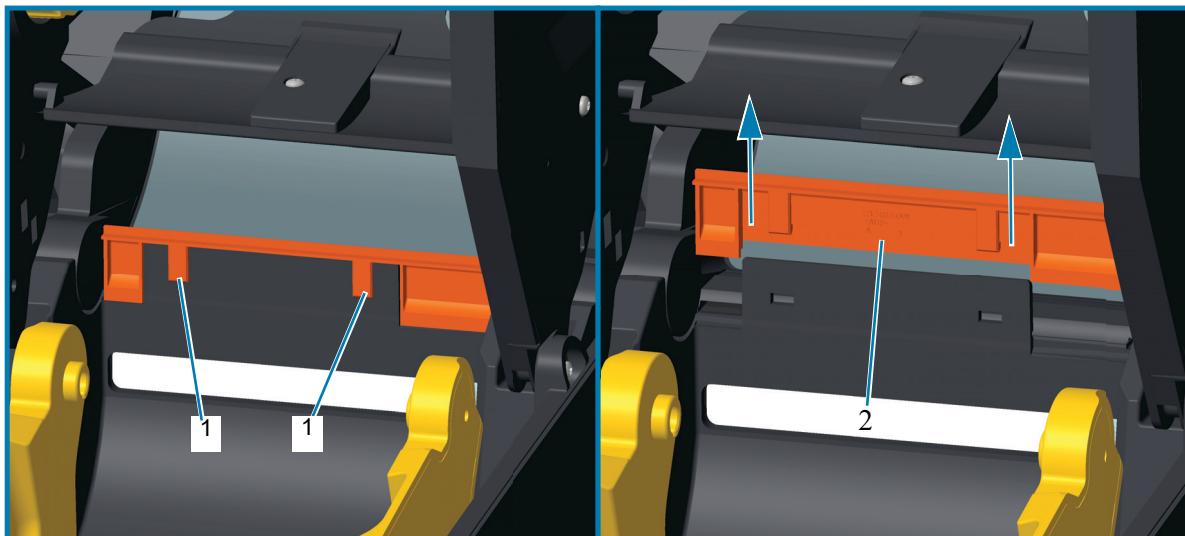
# Replacing the Hinge in Thermal Transfer Printers

## Repair Prerequisites

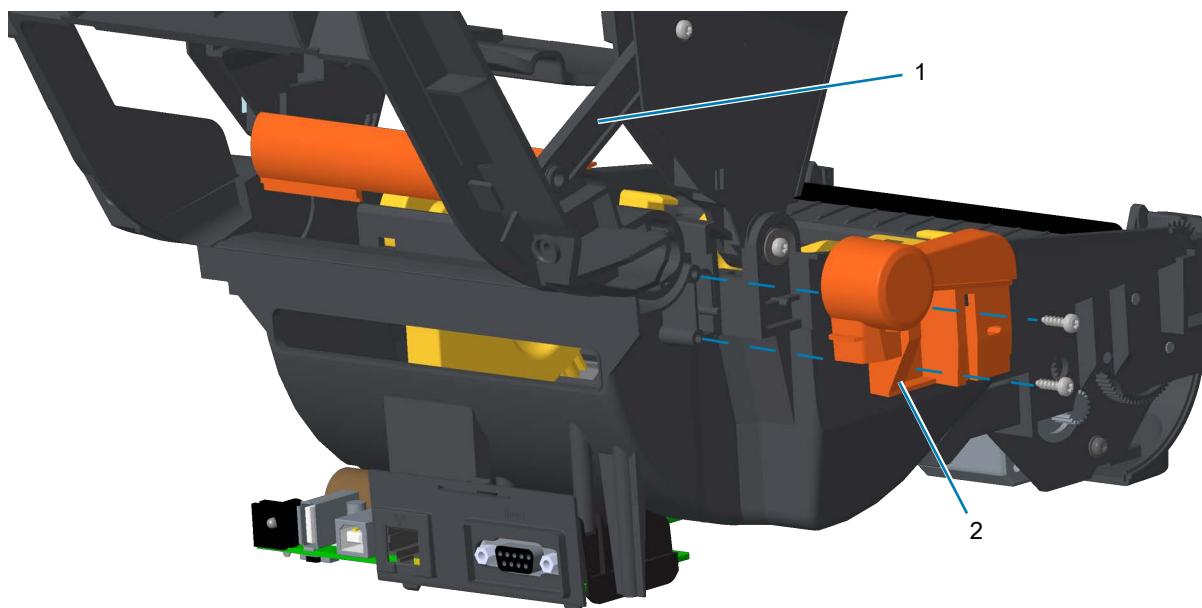
You must remove the front bezel option (tear-off, dispenser, or cutter) and printer base before you can remove the hinge. The main PCBA can be removed to gain better access to cable connectors on the main PCBA.

## Removal

1. Open the printer (with bezel and printer base removed).
2. Disconnect the link arms if you are replacing the cover assembly or the print mechanism (the lower frame). See [Disconnecting the Cover from the Ribbon Carriage on page 64](#).
3. Lift the hinge lock bracket (2) off to free the right hinge mechanism. Use a small flat bladed screwdriver to pry the two tab locks (1) on the hinge lock bracket on the inside of the printer.



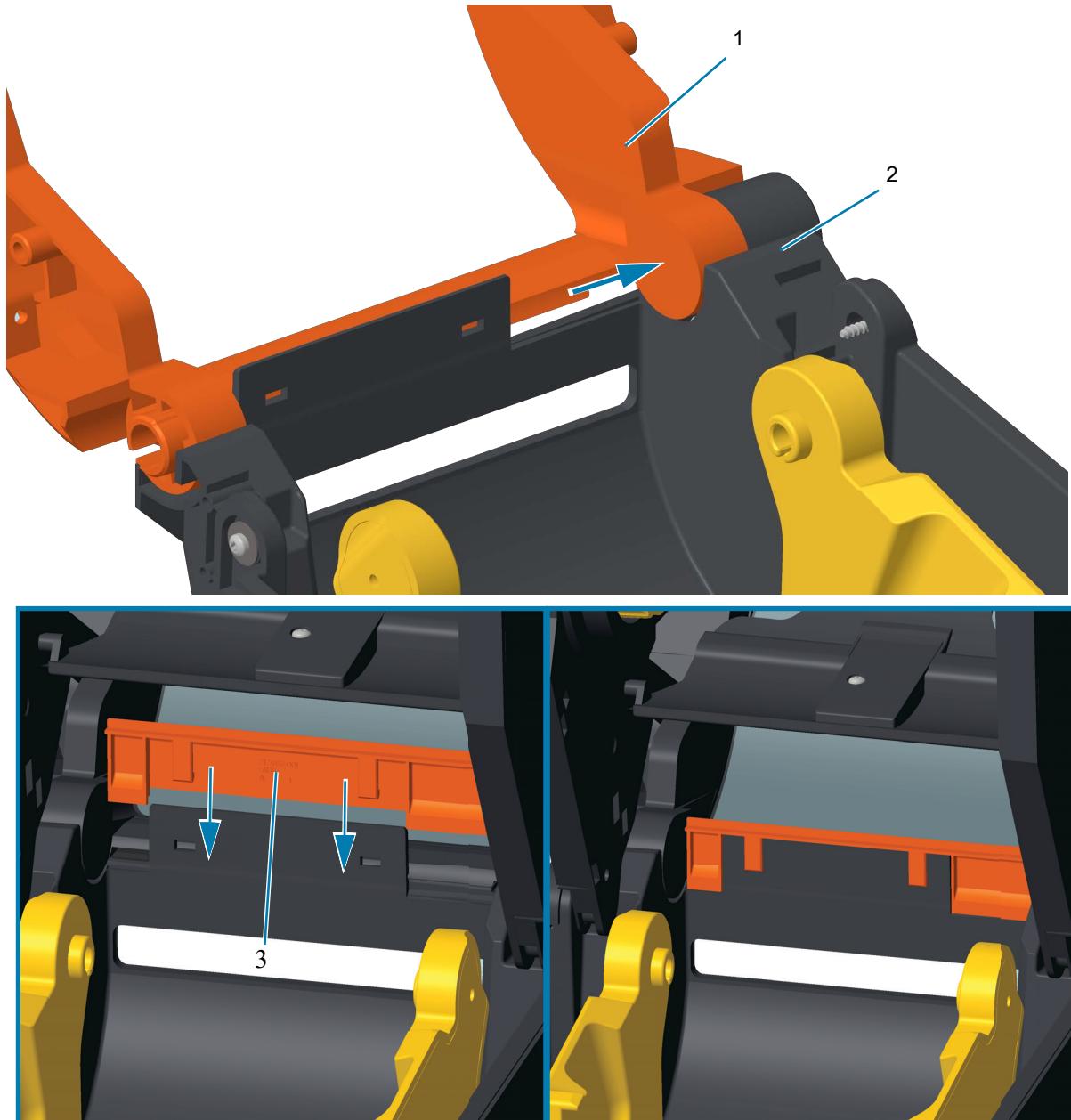
4. Remove the two screws securing the hinge cap (2) to the print mechanism (lower frame).



5. Remove the loose hinge cap (2) and disconnect the 2 links (1) connecting the upper inner frame to the ribbon carriage.

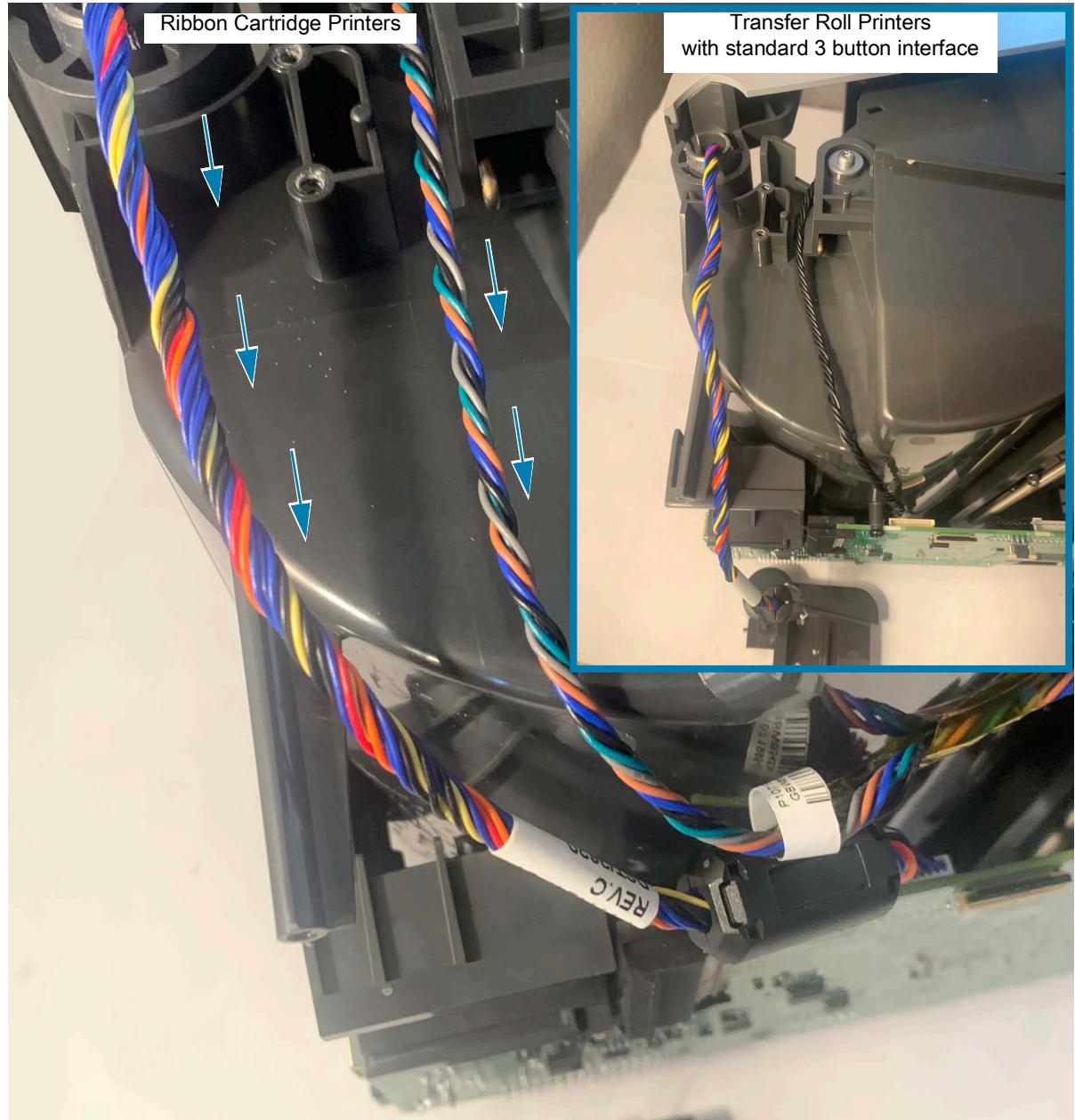
## Installation

1. Insert the right side of the upper inner frame hinge (1) in the right lower frame's hinge (2). Push the hinge lock bracket (3) down onto the rear wall of the lower inner frame. Many parts are hidden in the illustration to help you identify the primary parts.



## Replacing Parts

2. Align the cables exiting the center of the inner frames hinge joint and pull them straight down towards the bottom of the printer.
3. Align the sensor cable exiting the ribbon transport or ribbon carriage where it joins the print mechanism (lower inner frame) and put the cable straight down into the channel in the print mechanism (lower inner frame) towards the bottom of the printer.



## Replacing Parts

4. Place the Hinge on the printer and verify that the cables are not pinched between the inner frames.



5. Secure the hinge to the frame with the two screws to  $4.7 \pm 1$  in. lbs.

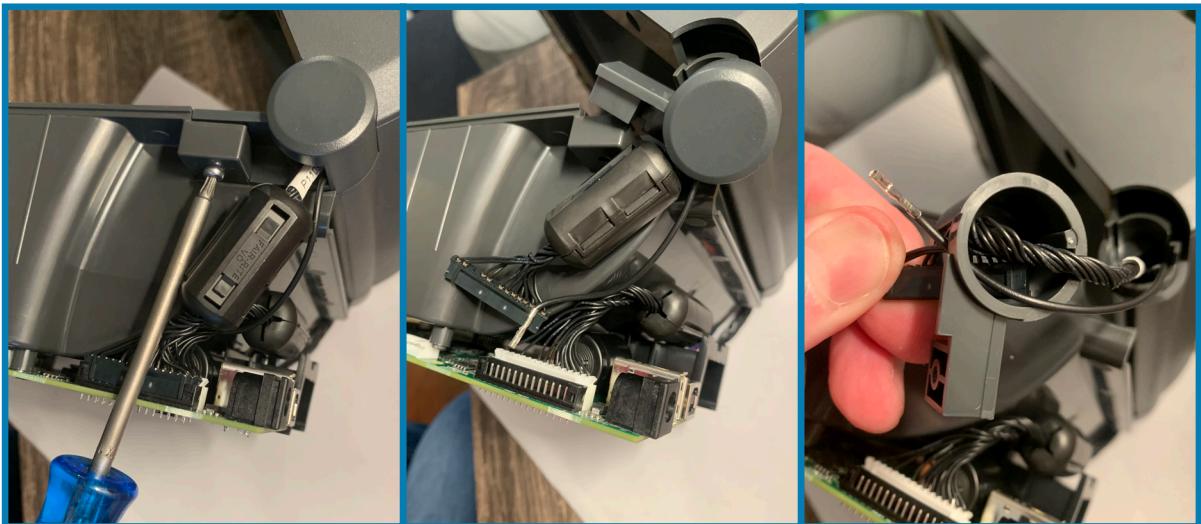
# Replacing the Hinge in Direct Thermal Printers

## Repair Prerequisites

You must remove the front bezel option (tear-off, dispenser, or cutter) and printer base before you can remove the hinge. The main PCBA can be removed to gain better access to cable connector on the main PCBA.

## Removal

1. Open the printer (with bezel and printer base removed).
2. Remove the screw securing the hinge cap to the print mechanism (lower frame). Rotate the loose hinge cap and pull it out of the hinge
3. Disconnect the outside printhead cable with the black wires and the ground wire from the Main PCBA.



4. Remove the ferrite clamp. Push the printhead connector and cable out of the hinge.

## Replacement

5. Put the printhead cable in the new hinge.
6. Put the hinge on the top cover and pull the printhead through the hinge to remove slack in the cable.
7. Align the hinge with the lower frame and swing the square end into the matching square on the lower frame.
8. Secure the hinge to the frame with the screw.
9. Re-attach the printhead cable to the main PCBA.

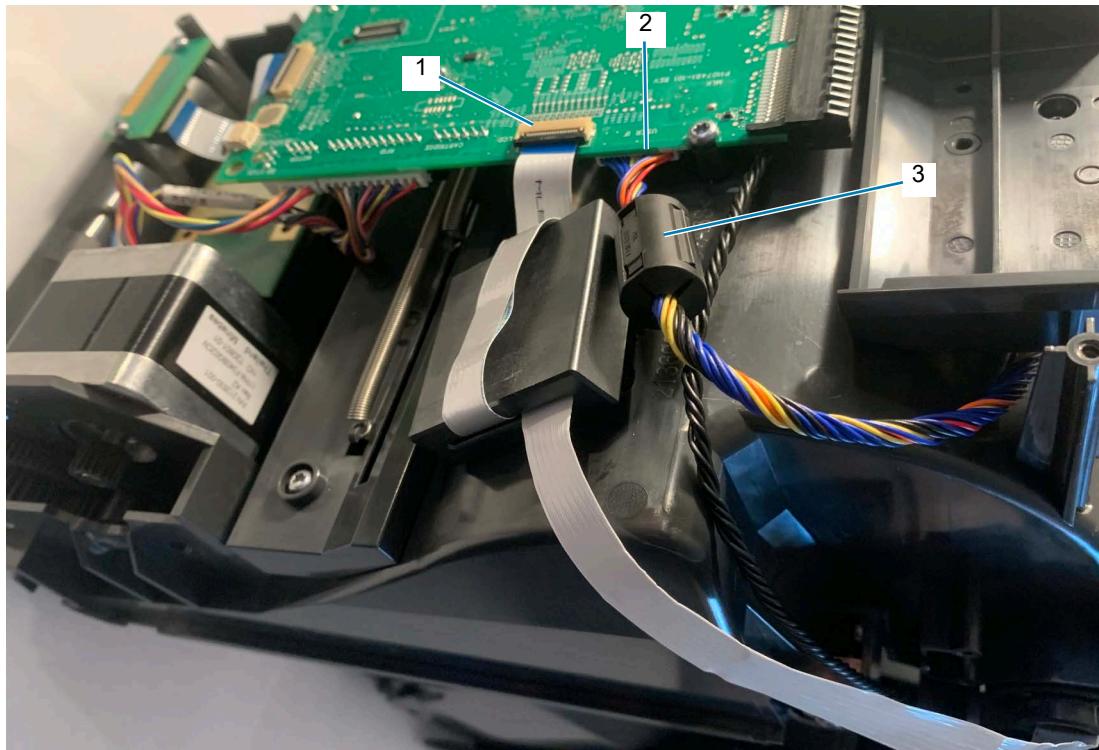
# Replacing the Cover Assembly on Thermal Transfer (Roll) Printers

## Repair Prerequisites

You must remove the front bezel option (tear-off, dispenser, or cutter), printer base, the main PCBA, and the hinge before you can remove the cover assembly.

## Removal

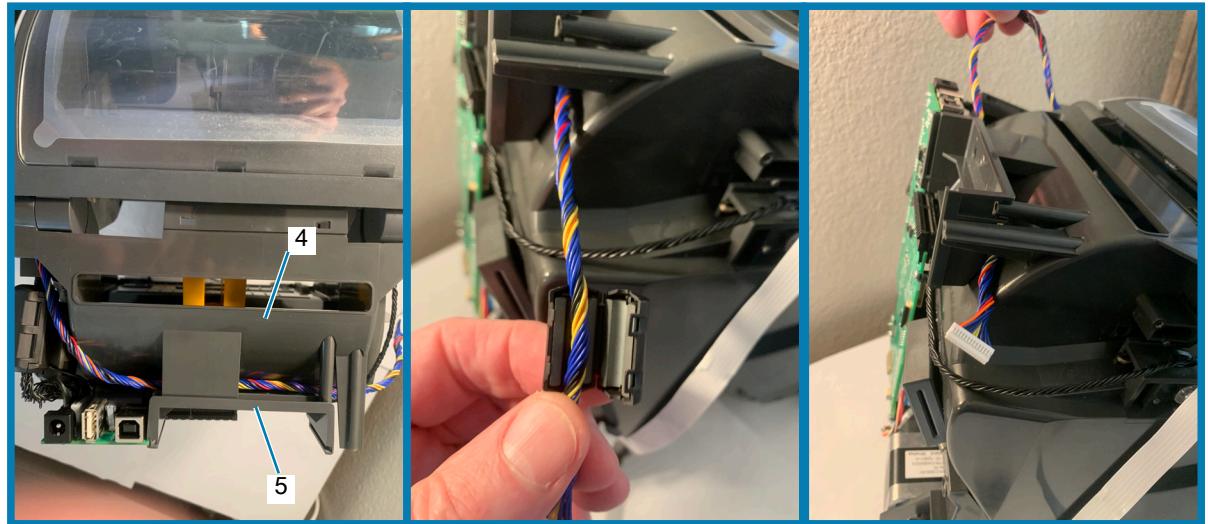
1. Disconnect the link arms connecting the cover to the ribbon carriage assembly. See [Disconnecting the Cover from the Ribbon Carriage on page 64](#).



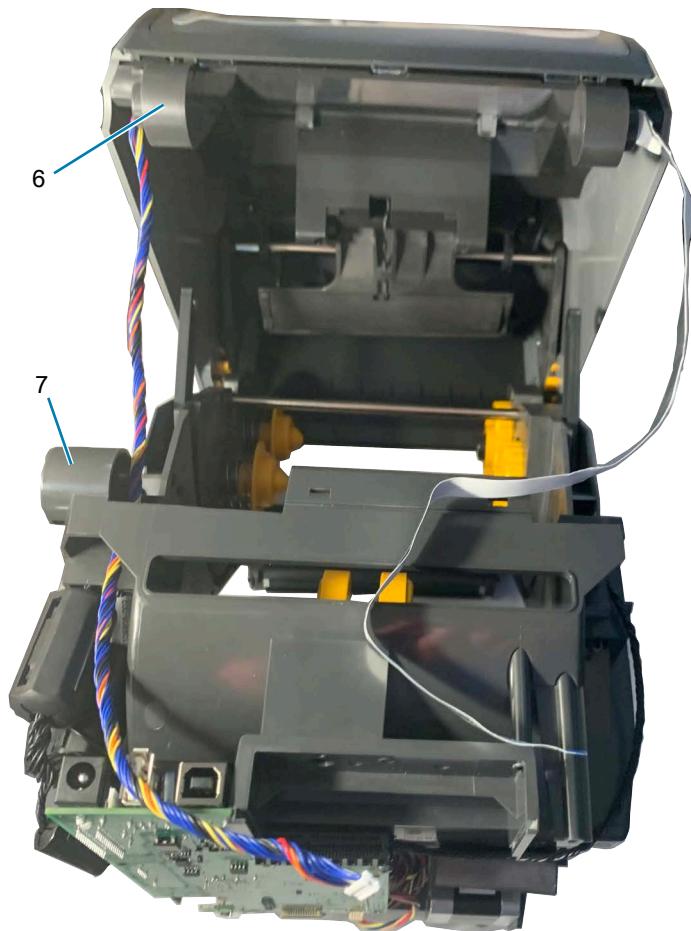
2. Release the LDC (CTD - Color Touch Display) flexible circuit cable (1) from the main PCBA. Unwind the flex cable from the toroid block.
3. Disconnect the control panel (USER IF) cable (2) from the main PCBA and remove its ferrite clamp (3). Use a small flat bladed screw driver or a fingernail to release the latches on the side of the clamp body.

## Replacing Parts

4. Pull the control panel (USER IF) cable (2) out from between the inner frame (4) and connectivity module bracket (5).



5. Pull the cover assembly (6) out of the left side hinge cap (7) on the lower frame.



### Replacement

1. Reverse the removal process to install the new cover.

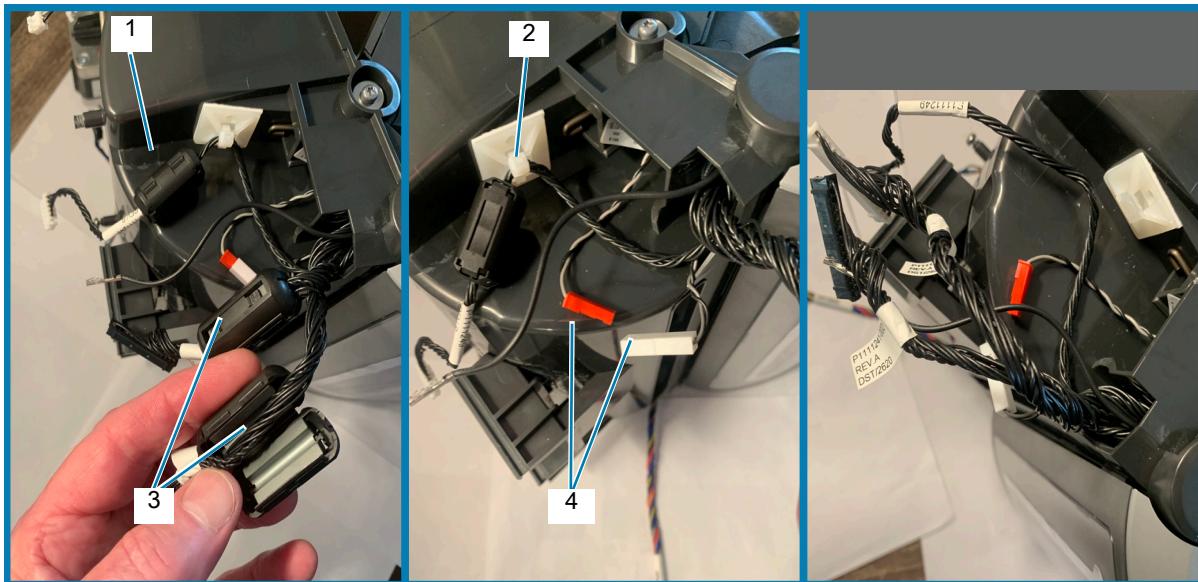
# Replacing the Cover Assembly on Cartridge Printers

## Repair Prerequisites

You must remove the front bezel option (tear-off, dispenser, or cutter), printer base, the, main PCBA, and the hinge before you can remove the cover assembly.

## Removal

1. Remove the two ferrite clamps (3) attached to the printhead cables by gently prying the clamp's lock open.



2. Disconnect the two wire connector (3)near the right hinge.
3. Cut the cable tie (2) securing the ribbon sensor cable onto the inner frame.
4. Remove the ferrite clamp (1) on the ribbon sensor cable (placed next to the tie).
5. Slide the right side of the cover out of the hinge on the printer.

## Replacement

1. Reverse the removal process to install the new cover.

# Replacing the Cover Assembly on Direct Thermal Printers

## Repair Prerequisites

You must remove the front bezel option (tear-off, dispenser, or cutter), printer base, main PCBA, and the hinge before you can remove the cover Assembly.

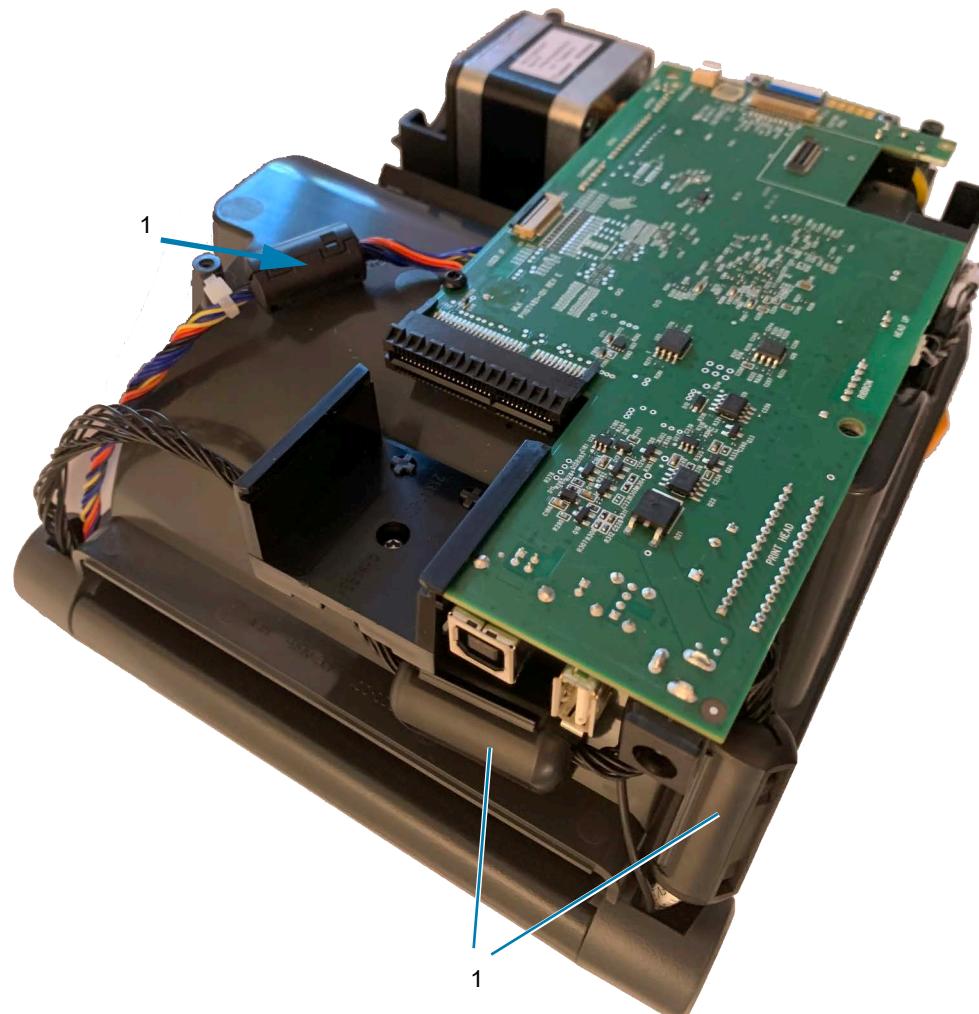
Does not include the ZD621 direct thermal printer with a color touch display.

## Removal

1. With the hinge and the main PCBA removed, the slide the cover assembly out of the left side hinge cap.

## Replacement

1. Reverse the removal process to install the new cover. Note the ferrite (1) locations below to verify placement after the new cover assembly, hinge, and main PCBA have been reinstalled.



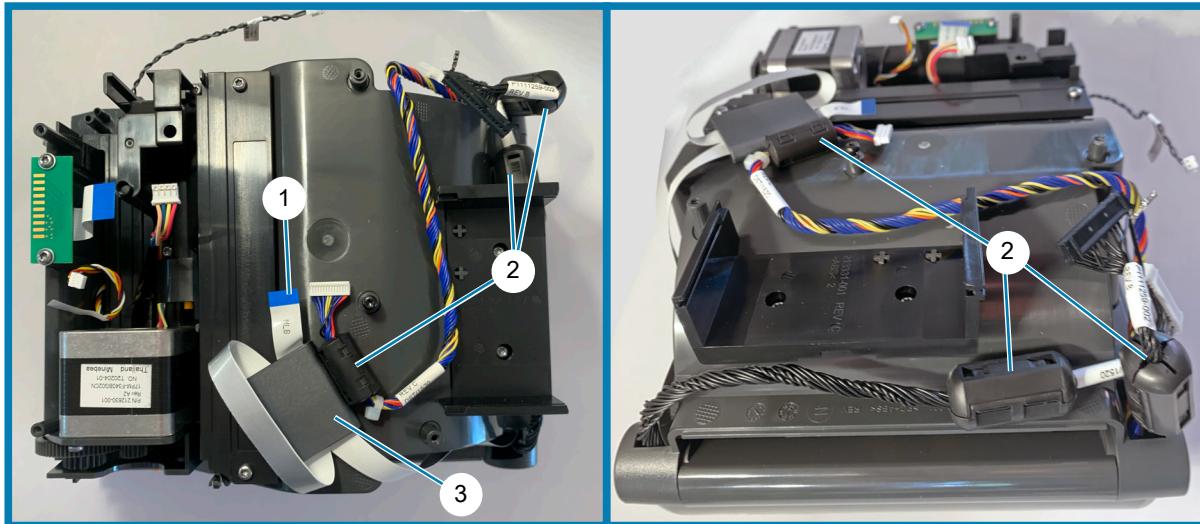
# Replacing the CTD Cover Assembly on ZD621(d)

## Repair Prerequisites

You must remove the front bezel option (tear-off, dispenser, or cutter), printer base, main PCBA, and the hinge before you can remove the cover assembly.

## Removal

1. Unwind the LDC (Color Touch Display) flexible circuit cable (1) out of the toroid block(3).



2. Remove the ferrites clamps (2) from the printhead and control panel cables.
3. Gently pull the flex circuit off the side of the inner frame.



4. Slide the cover out of the left side hinge cap.

## Replacement

1. Reverse the removal process to install the new cover.

## Accessing under the Cover - Thermal Transfer Printers

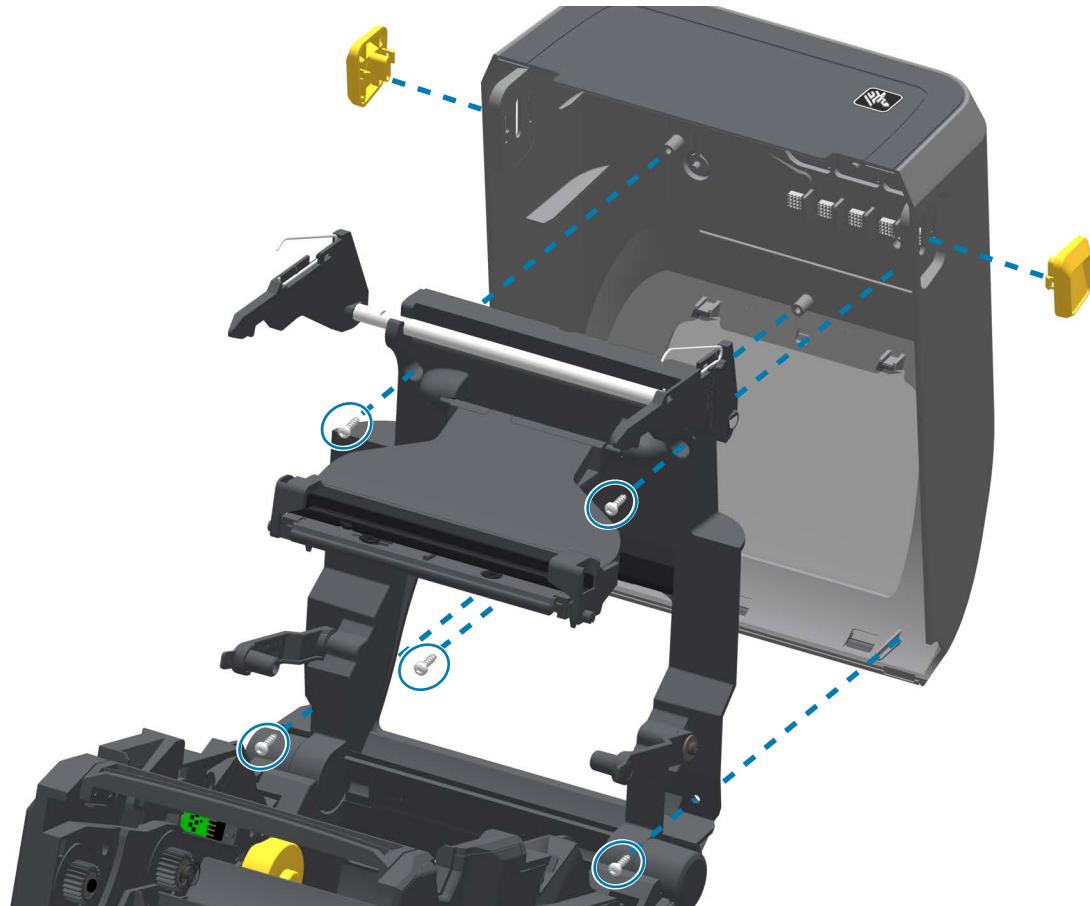


**CAUTION—ESD:** Prepare your work area by protecting against static discharge. Your work area must be static-safe and include a properly grounded conductive cushioned mat to hold the printer and a conductive wrist strap for yourself.

### Repair Prerequisites

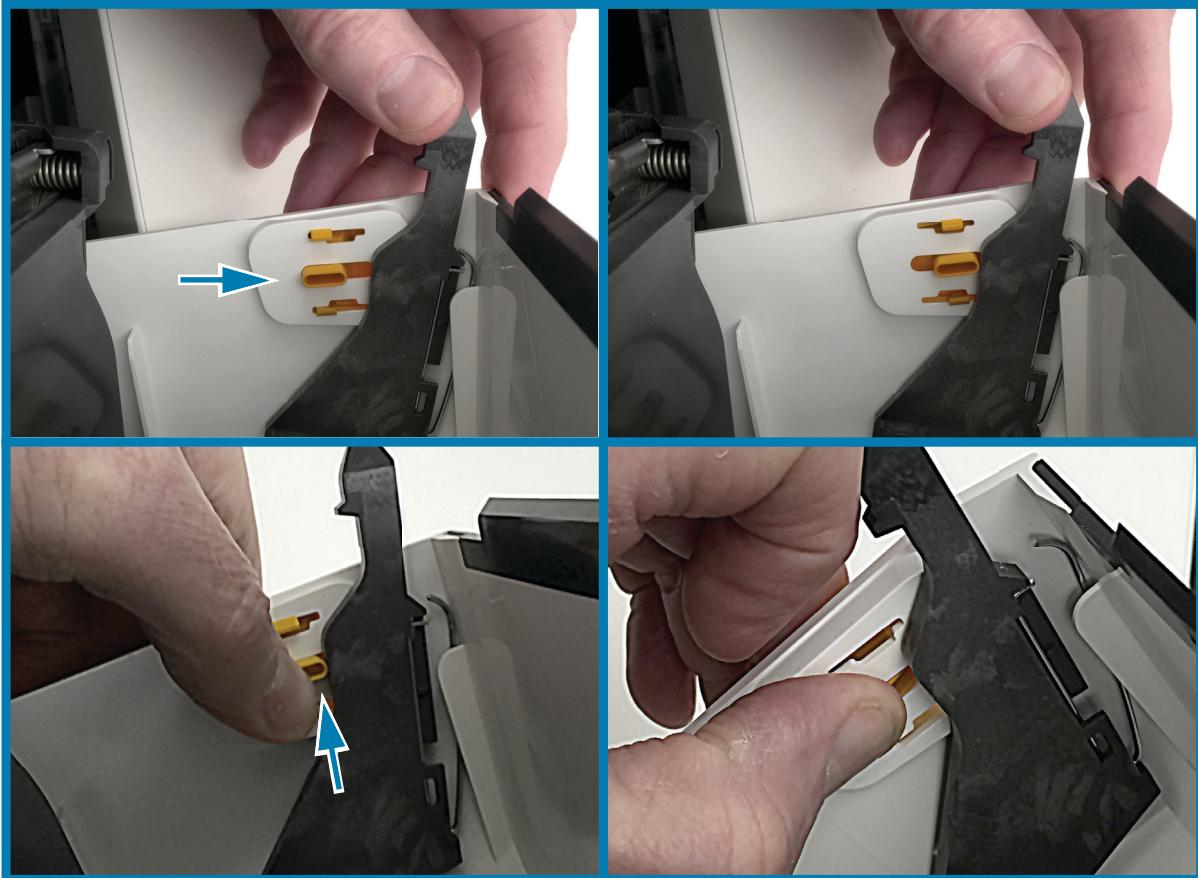
Before you begin this procedure, turn the printer OFF, open the printer, and remove media or ribbon.

**Exploded View Thermal Transfer Printer:** Cartridge and Roll Printers are similar

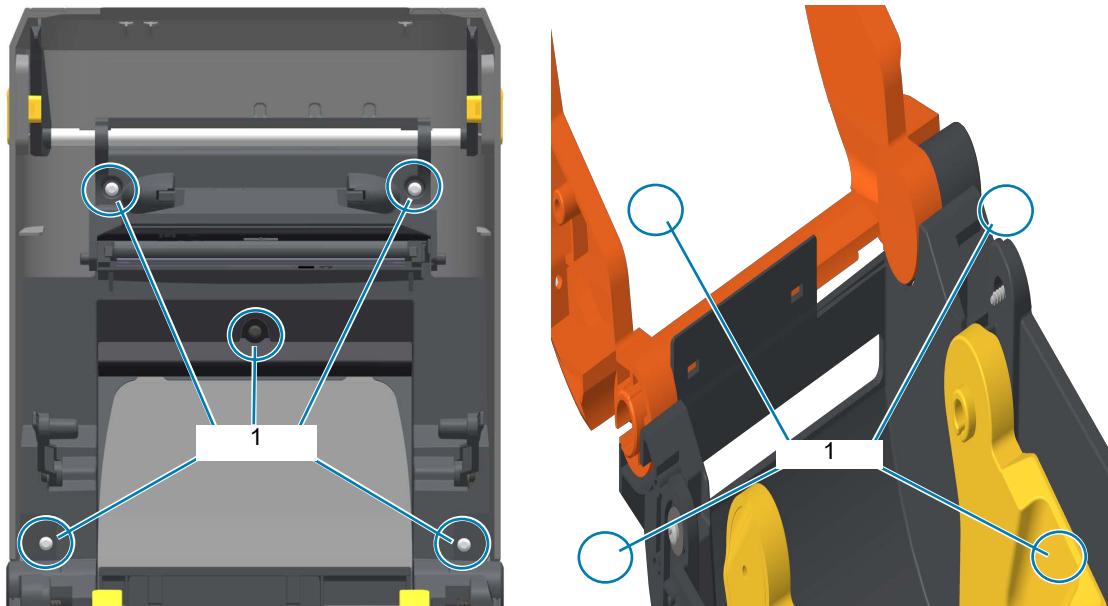


### Removal

1. Slide both of the gold latch release slider buttons towards the front of the top cover. Stop sliding the gold buttons when they are slightly past the mid point in the slide channel. Push the button out of the slide channel (and cover) from the inside of the cover. Note the ZD421(t) printer has a different latch and is mounted on the ribbon carriage instead.



2. Remove the screws (1) securing the top cover to the inner lid. Remove the top cover.



### Installation

1. Place the new cover on the top inner frame. Align the cover to the mounting holes.
2. Use the mounting screws to secure the cover to the frame 4.7 +/- 1 in. lbs.
3. Swing the latch arms up until it touches the front of the cover. Snap the gold latch release slider buttons into the right and left sides of the cover. Verify they slide freely and release the latch arm.
4. Close the cover and verify the printer latches closed. Open and close the cover a few times to verify mechanism and latch function.

## Accessing under the Cover - Direct Thermal Printers



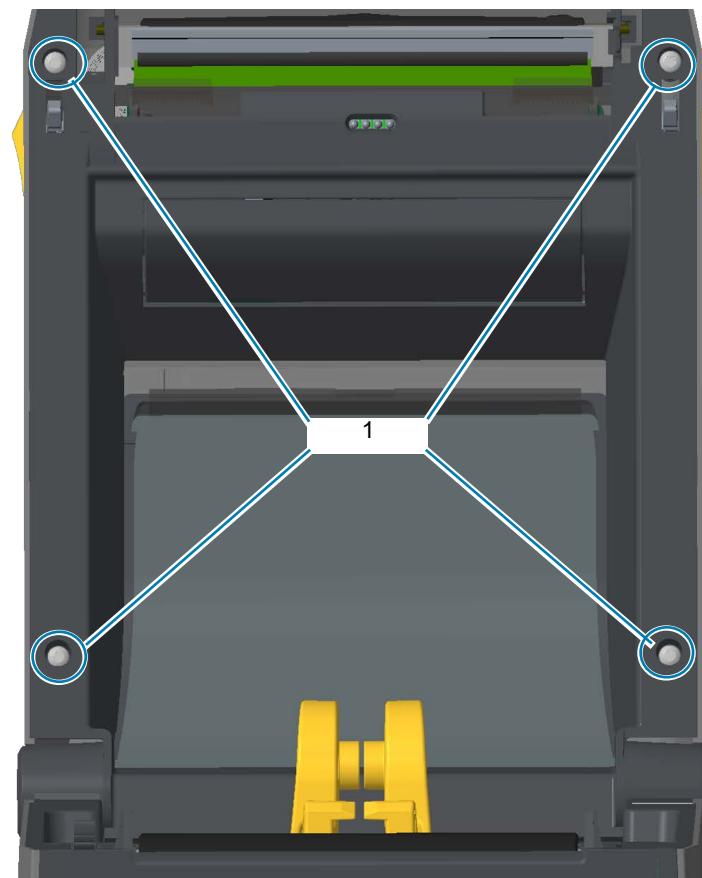
**CAUTION—ESD:** Prepare your work area by protecting against static discharge. Your work area must be static-safe and include a properly grounded conductive cushioned mat to hold the printer and a conductive wrist strap for yourself.

### Repair Prerequisites

Before you begin this procedure, turn the printer OFF, open the printer, and remove media.

### Removal

1. Remove the four screws (1) securing the top cover to the inner lid.
2. Pull the cover off the upper inner frame.



3. ZD621(d) with a Color Touch Display - The power and printer control buttons are now loose.

### Installation

1. ZD621(d) with a Color Touch Display - Place the power and printer control buttons on the control panel. Use the alignment pins.



2. Place the new cover on the top inner frame. Align the cover to the mounting holes.
3. Use the mounting screws to secure the cover to the frame 4.7 +/- 1 in. lbs.
4. Close the cover and verify the printer latches closed. Open and close the cover a few times to verify mechanism and latch function.

# Replacing a 3-Button Control Panel PCBA

## Repair Prerequisites

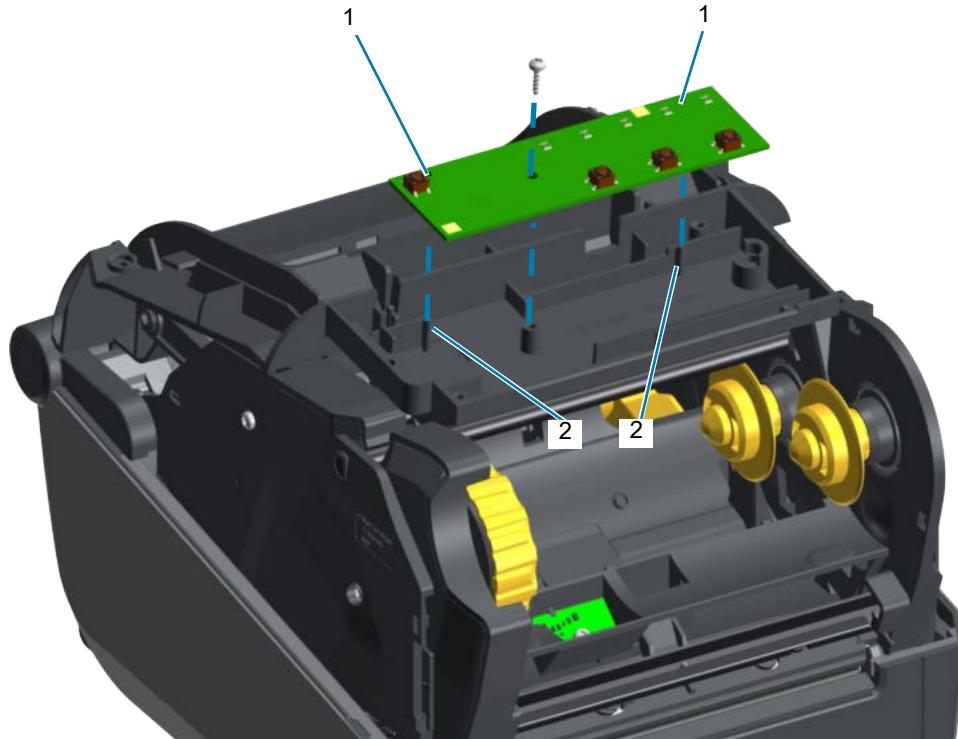
You must remove the cover before performing this procedure.

## Removal

1. With the cover removed, remove the screw holding the control panel PCBA to the inner frame.
2. Lift the PCBA off the inner frame and disconnect the cable(s) from the backside of the PCBA.

## Installation

1. Reconnect the cable(s) to the new control panel PCBA.
2. Place the PCBA with the connector/cable side facing down with the two small guide holes (1) to guide pins (2) molded into the top of the inner frame.



3. Secure the PCBA to the inner frame with the screw.

# Replacing a Color Touch Display Control Panel

## Repair Prerequisites

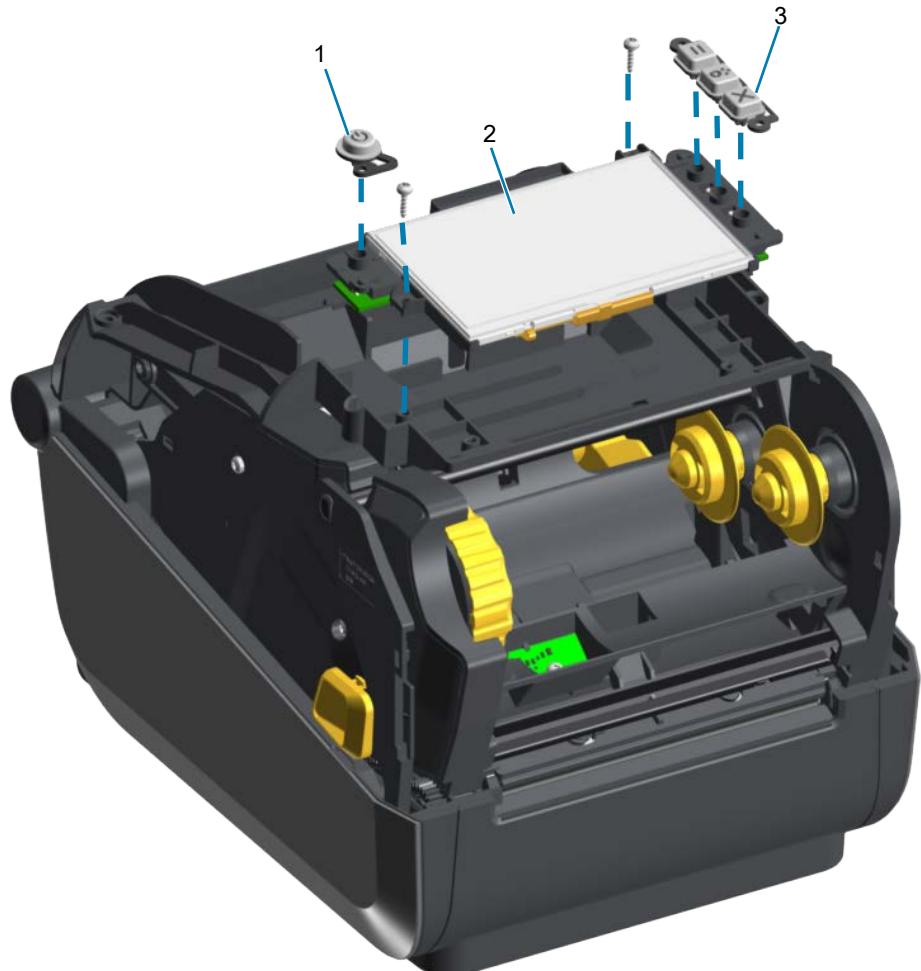
You must remove the cover assembly before performing this procedure.

## Removal

1. With the cover removed, lift the power (1) and printer control (3) buttons
2. Remove the 2 screws holding the CTD control panel PCBA and bracket (2) to the inner frame.
3. Lift the PCBA off the inner frame and disconnect the cables from the backside of the PCBA.

## Installation

1. Reconnect the cables to the new CDT control panel PCBA.
2. Place the PCBA with the connector/cable side facing down onto the top of the inner frame.



3. Secure the PCBA to the inner frame with the 2 screws 1.5 +/- 0.5 in. lbs.
4. Place the power and printer control buttons on the control panel. Use the alignment pins.

# Replacing the Latch Assembly - ZD421(c), ZD621(t), and Zd621R

## Repair Prerequisites

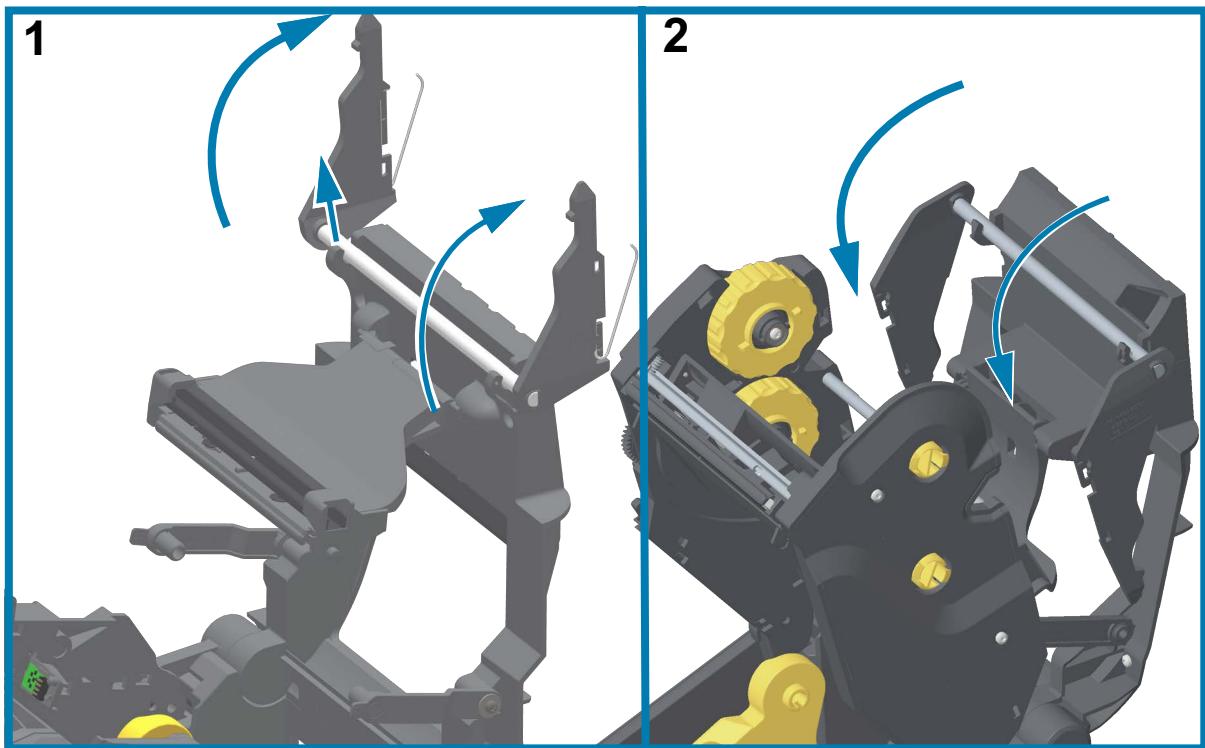
You must remove the cover assembly on thermal transfer printers before performing this procedure.

## Removal

1. **Cartridge Printer** - With the cover removed and inner frame in the full open position, rotate the latch assembly up and lift it out of the inner frame.  
**Ribbon Roll Printer** - With the cover removed and inner frame in the full open position, rotate the latch assembly down and lift it out of the inner frame.

## Installation

1. With the inner frame in the full open position, slide the flat surface on the latch assembly's pivot bar into the two (2) molded 'C' shaped latch bar bearings at the top of the inner frame. Orient the latch arm assembly to lift and remove.
  - 1 - Ribbon Cartridge Printers
  - 2 - Ribbon Roll Printers



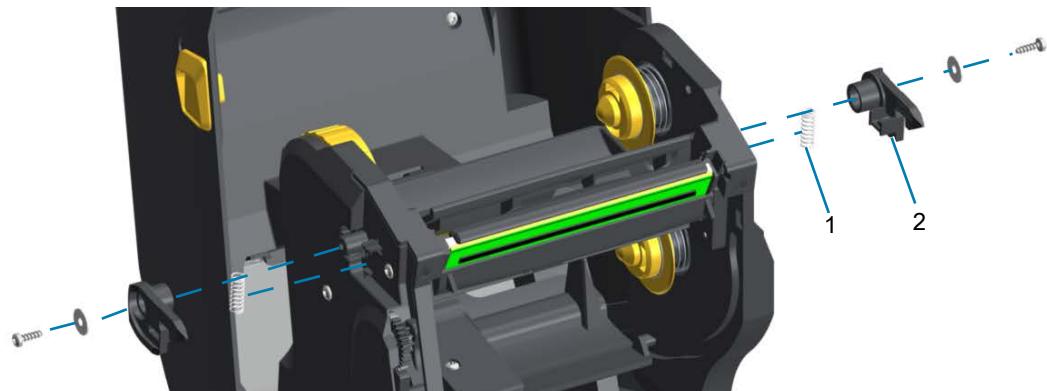
# Replacing the Latch Assembly - ZD421(t)

## Repair Prerequisites

None

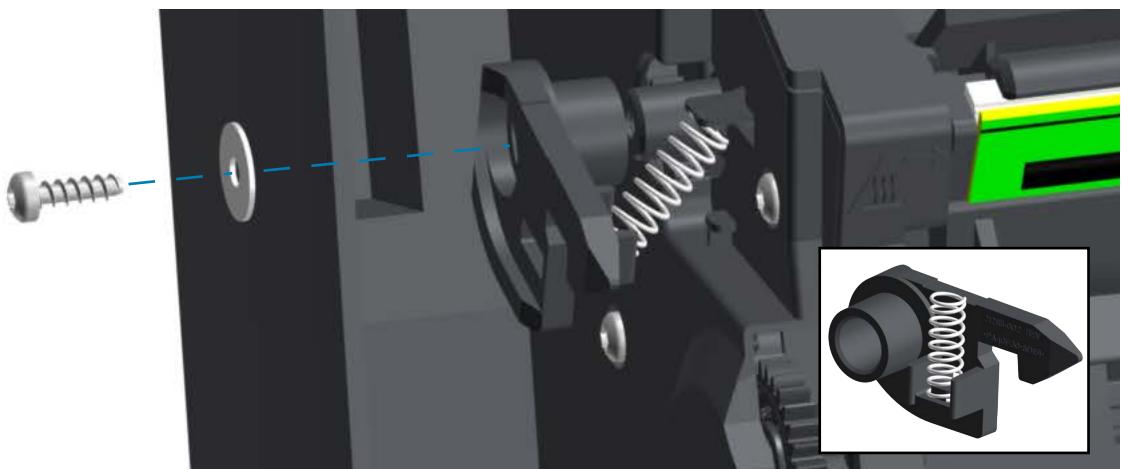
## Removal

1. Open the printer. Locate the latches on the side of the ribbon carriage. Remove the screw holding the latch arm (1), washer, and spring (1) on both sides of the printer. Pull it off the post. The spring is loose now.



## Installation

2. Place the spring on the spring post of the latch.



3. Align the latch with the latch post on the ribbon carriage. As the latch and spring near the post align the top of the spring with spring post on the side of the ribbon carriage.
4. Push the latch on the post while rotating the latch counterclockwise to get the latch to clear the latch stop feature. Let the latch rest on the stop.
5. Use the washer and screw to finish securing the latches to the ribbon carriage.

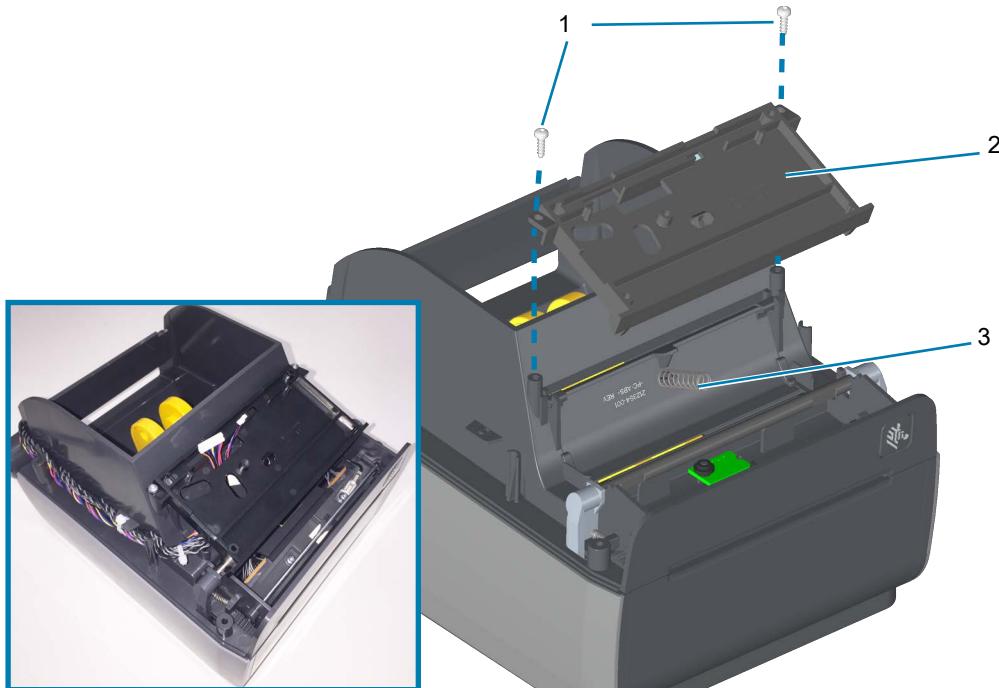
# Replacing the Latch Arm Assembly - Direct Thermal Printers

## Repair Prerequisites

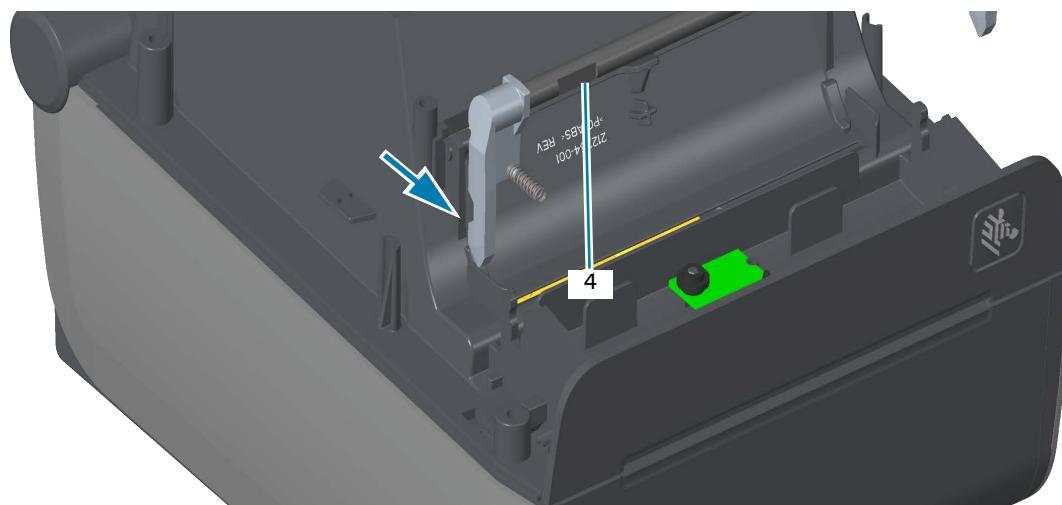
You must remove the cover and the control panel PCBA before performing this procedure. The latch on ZD421(d) models is all plastic version.

## Removal

1. Remove the control panel mounting plate (2). It is attached to the inner frame by two screws (1). ZD621 models have a media dancer spring that may come loose (3).

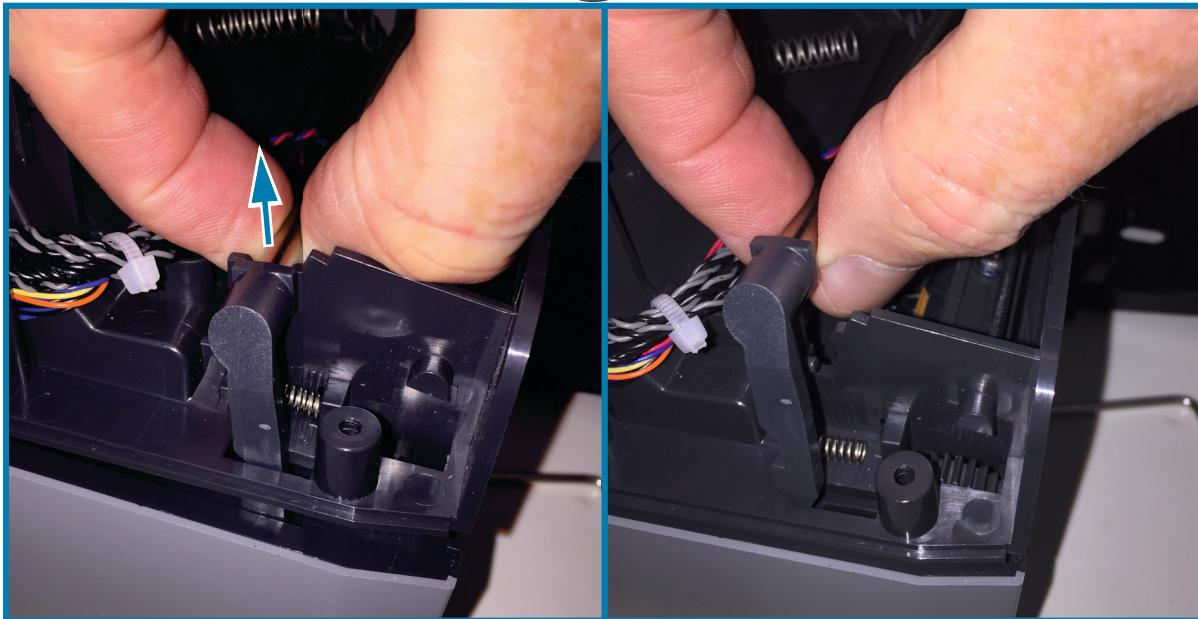
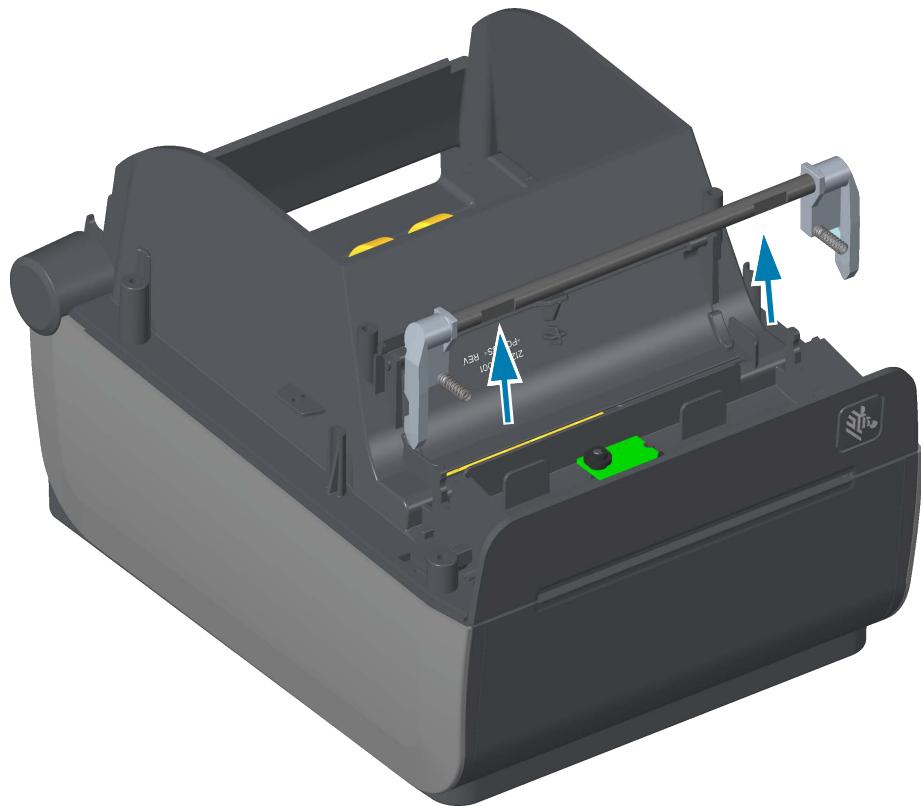


2. The inner frame may be latched into the inner frame. To release the latch arm assembly (4), pull the latch forward and lift the inner frame up.



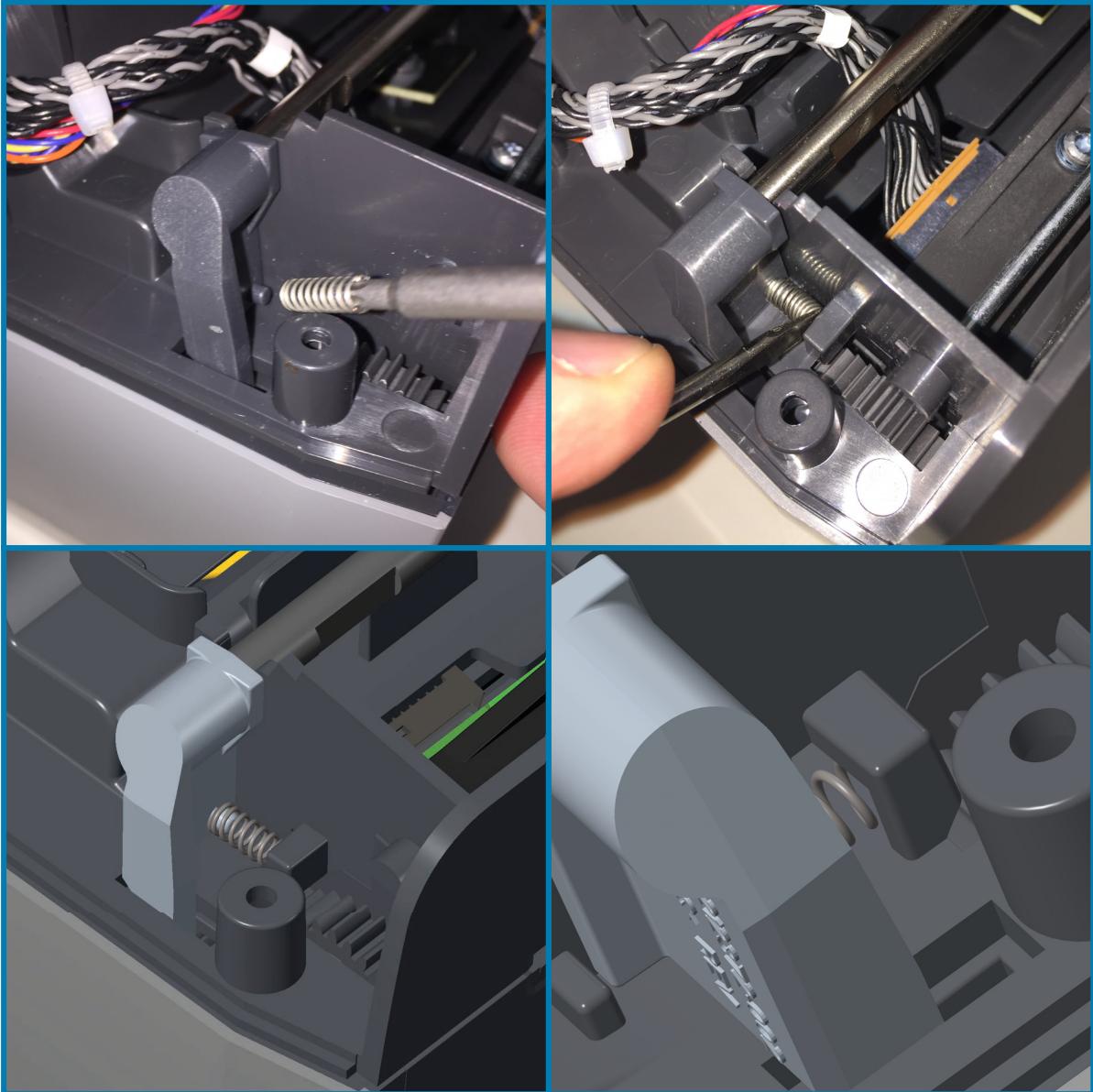
## Replacing Parts

3. Lift one side of the latch assembly out of the inner frame with steady firm pressure. The spring may pop or fall out. Repeat on the other side of the latch to completely remove the assembly (latch bar and springs).



### Installation

1. Align and insert the new latch assembly and press it into the inner frame.
2. Insert a latch spring on the small, short post on the front side of each latch arm. Slide the other end of the spring into the square recesses immediately across from the latch arms.



3. ZD621 Printers only: Place the media dancer's spring on the post (plus sign shape) in the middle of the inner frame.

## Replacing Parts

4. Take the control panel mounting plate and insert the upper array sensor and control panel interface cables (3) into the largest opening.
5. ZD621 printers: Align the media dancer spring (1) to the cup (2) on the back of the mounting plate. Put a small tool in the cup's hole to guide the spring into the cup.

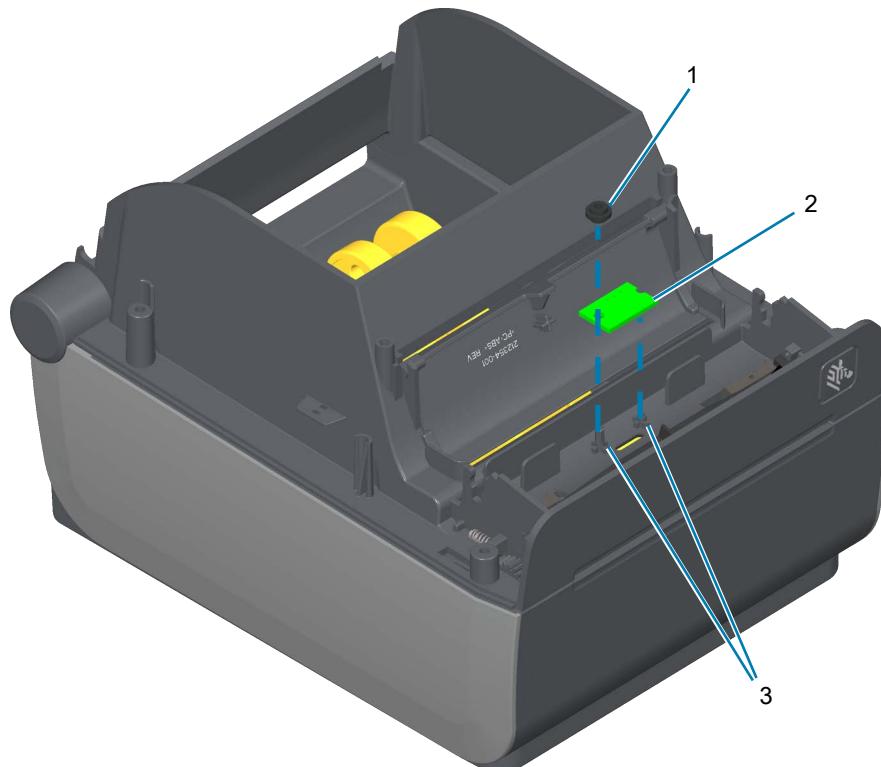


6. Place the mounting bracket on the two mounting posts (4) on the inner frame and secure it to the inner frame with two screws to  $4.7 \pm 1$  in. lbs.

# Replacing the Upper Array Sensor - Thermal Transfer Printer

## Repair Prerequisites

You must remove the cover assembly, control panel PCBA (3-button or LCD version) and latch assembly before performing this procedure. The upper array sensor is unplugged control panel PCBA.



## Removal

1. Using a pliers or special tool lift the press-on fitting (1) securing the upper array sensor PCBA (2) to the inner frame. Pull the PCBA off the sensor mounting posts (3).

## Installation

2. Put the upper array sensor PCBA on the two guide pins with the row of LEDs in the slot and wires on top facing out and on the inside of the printer. Hold the PCBA on the posts while pressing the fitting on the long post to secure the PCBA to the inner frame.

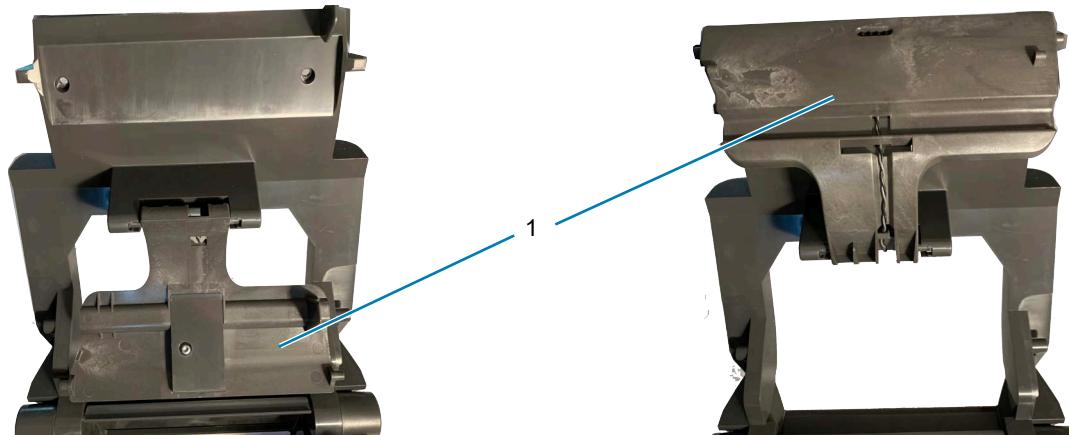
# Replacing the Upper Array Sensor - Thermal Transfer Printer

## Repair Prerequisites

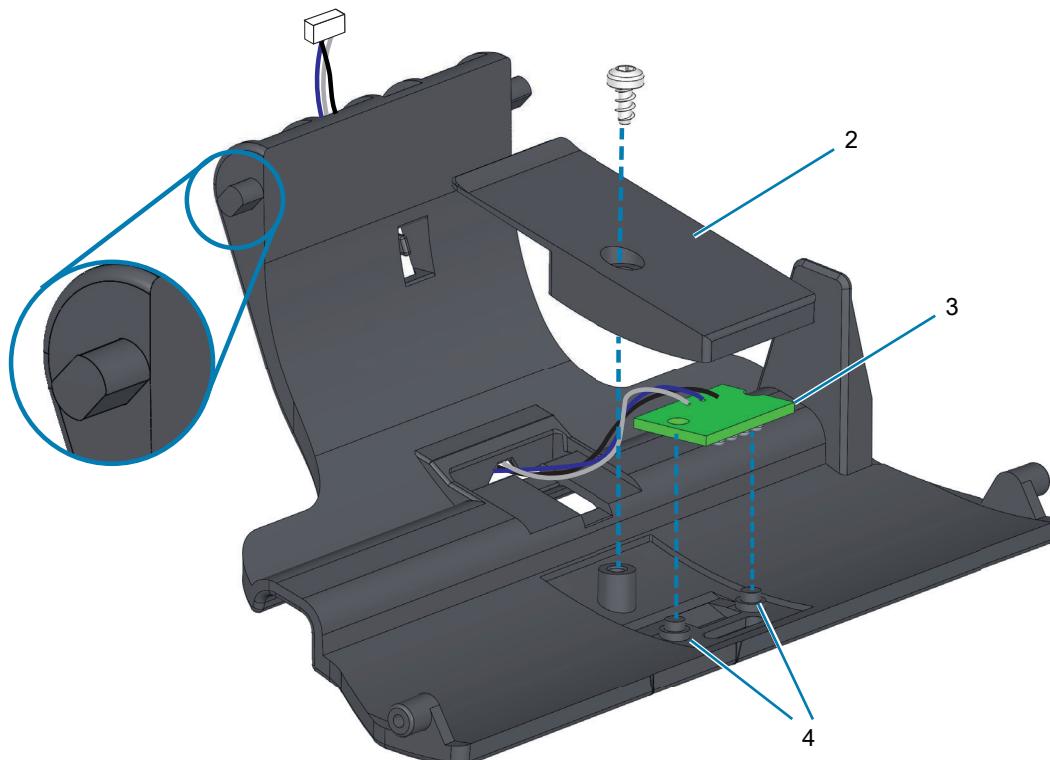
You must remove the cover assembly and the control panel PCBA (3-button or LCD version) before performing this procedure. The upper array sensor is unplugged control panel PCBA.

## Removal

1. Swing the flapper arm up. This aligns the flat surfaces on the on the arm's pivot posts. The narrower width can slide out of the two slots in the arm's pivot bracket. Slide the flapper arm out of the bracket.



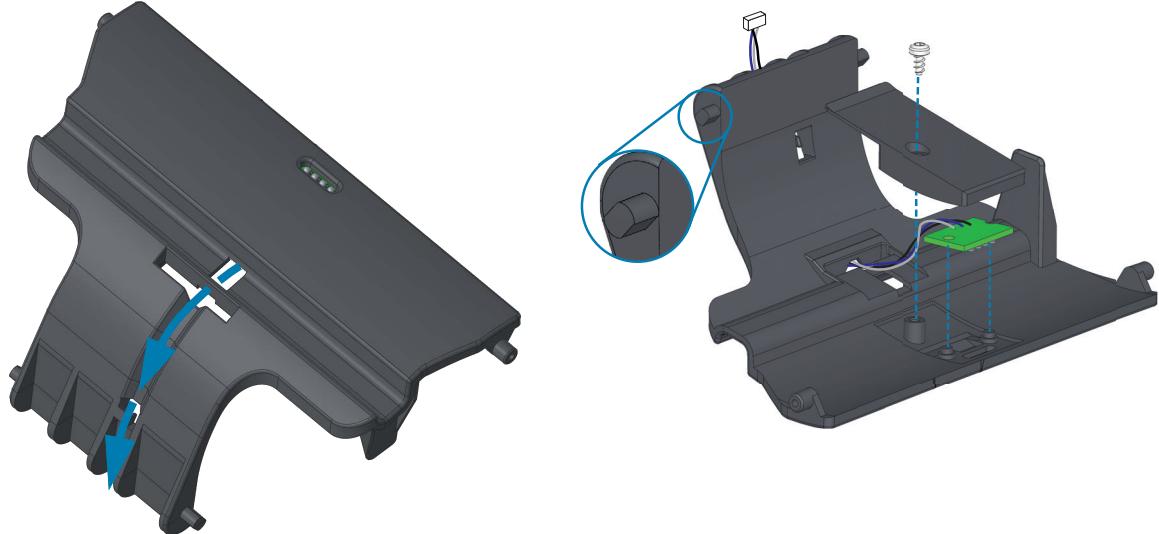
2. Pull the sensor cable out of the backside of the flapper arm (1).



3. Remove the screw securing the sensor cover (2) from the top side of the flapper arm (1). Set the cover aside. Remove the sensor array PCBA and cable.

### Installation

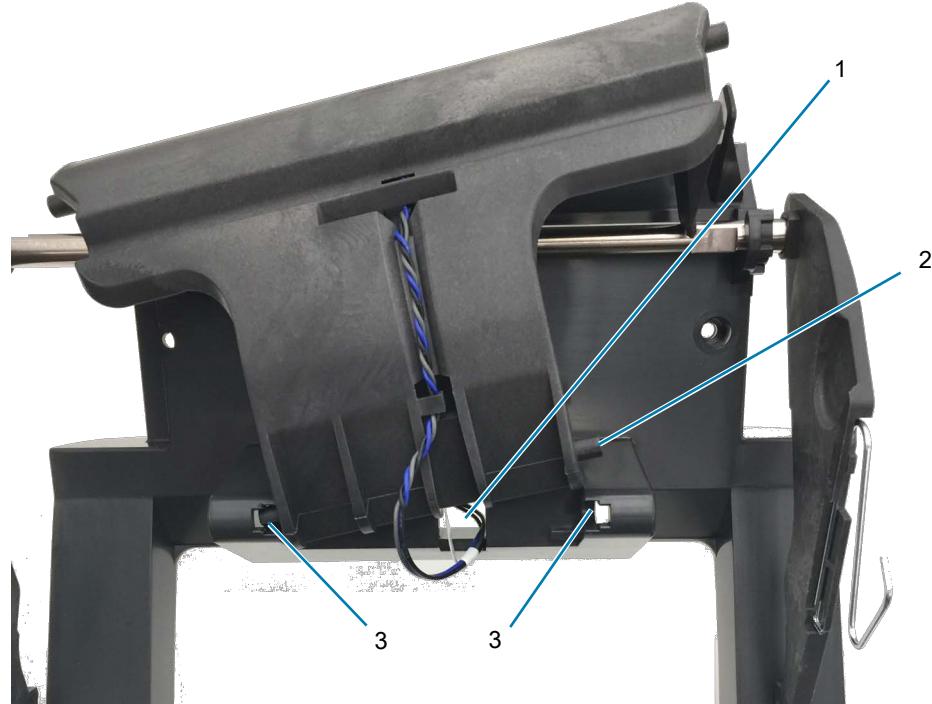
1. Insert the new PCBA's cable and connector into the hole in the center of the flapper and route it through the cable channel on the backside of the flapper arm.



2. Put the upper array sensor PCBA on the two guide pins with the row of LEDs in the slot and wires on top facing out. Hold the PCBA on the posts while pulling the wires and cable connector to remove slack (out the back of the flapper arm to the top).
3. Place the sensor cover on top of the senor PCBA and secure it with the screw. Verify that the wires are not pinched and the PCBA is still in place.

## Replacing Parts

4. Insert the cable and connector through the hole (1) in the inner frame's flapper arm pivot bracket.
5. Insert the two flapper arm pivot posts (2) into the bracket (3). Swing the flapper arm down away from the top of the printer. This will lock the flapper arm in the bracket.
6. Replace the control panel PCBA and cover to complete reassembly.



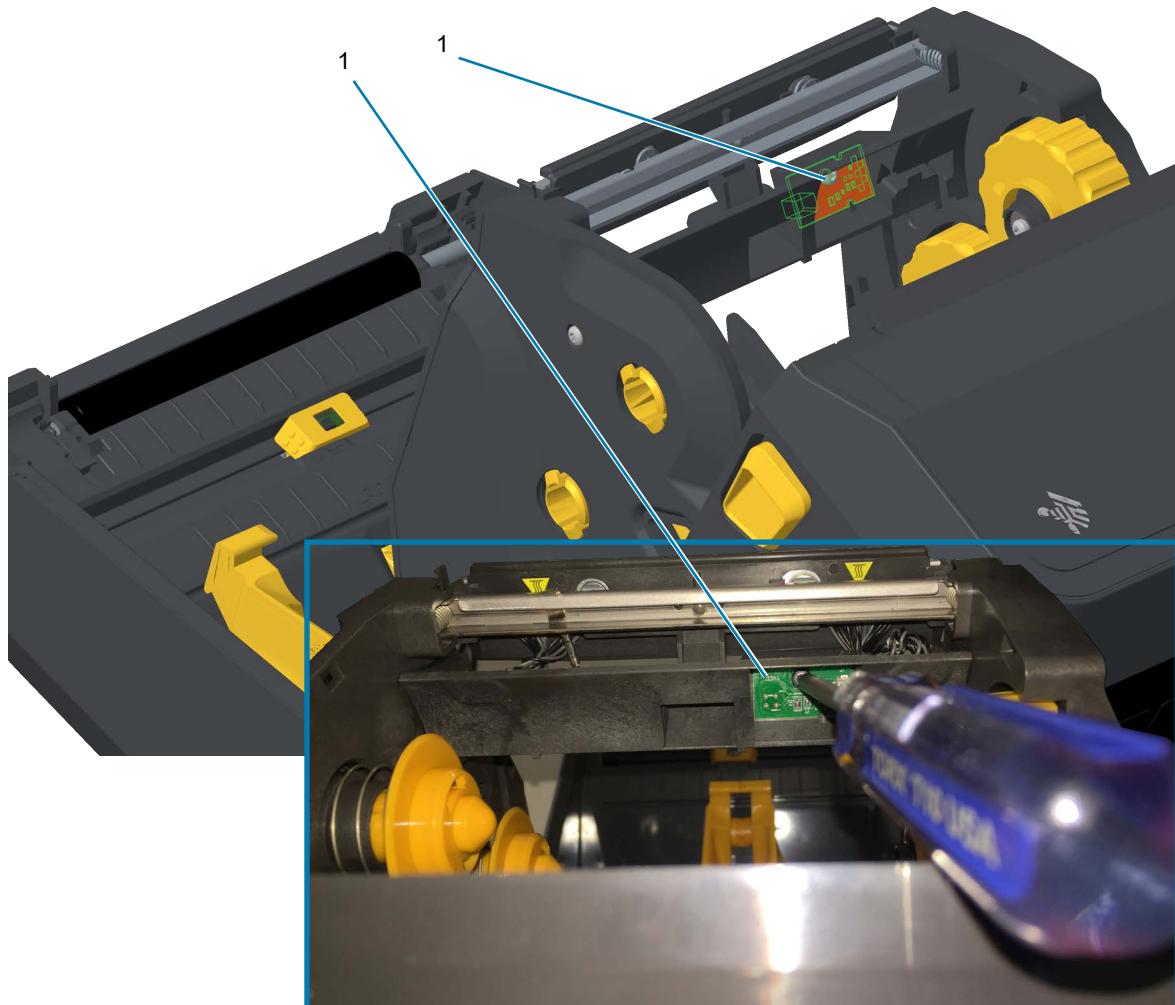
## Replacing the Ribbon Roll Printer's Ribbon Trailer Sensor PCBA



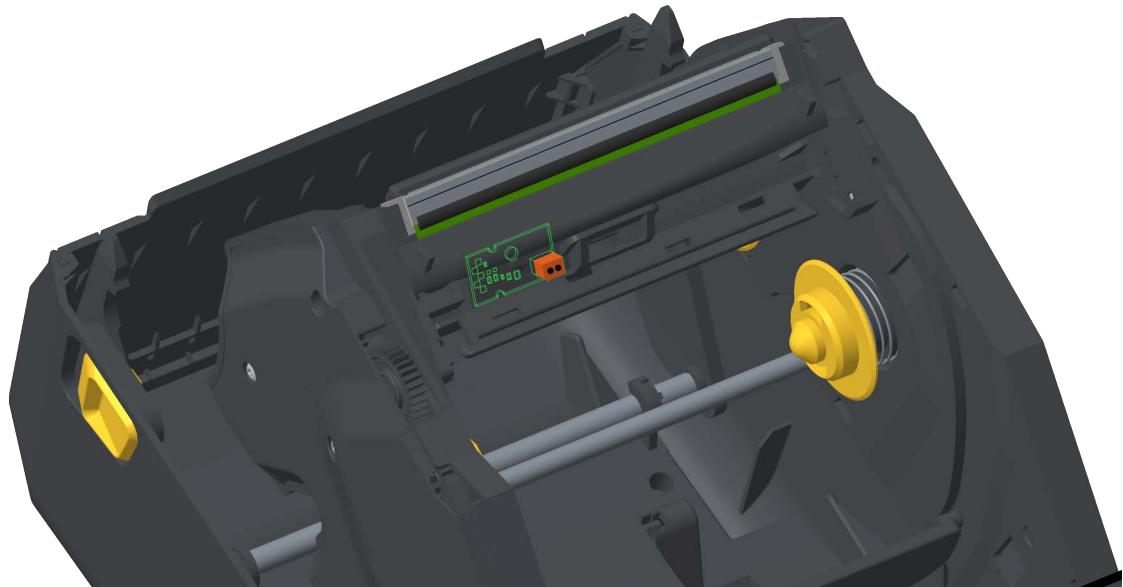
**CAUTION—ESD:** Prepare your work area by protecting against static discharge. Your work area must be static-safe and include a properly grounded conductive cushioned mat to hold the printer and a conductive wrist strap for yourself.

### Removal

1. Open the printer. Remove the ribbon rolls. Note the sensor is in slightly different spots on each model type.
2. Turn the printer around. Look down into the top of the ribbon carriage.
3. Remove the screw securing the Ribbon Sensor PCBA (1) to the ribbon chassis's front cross member.

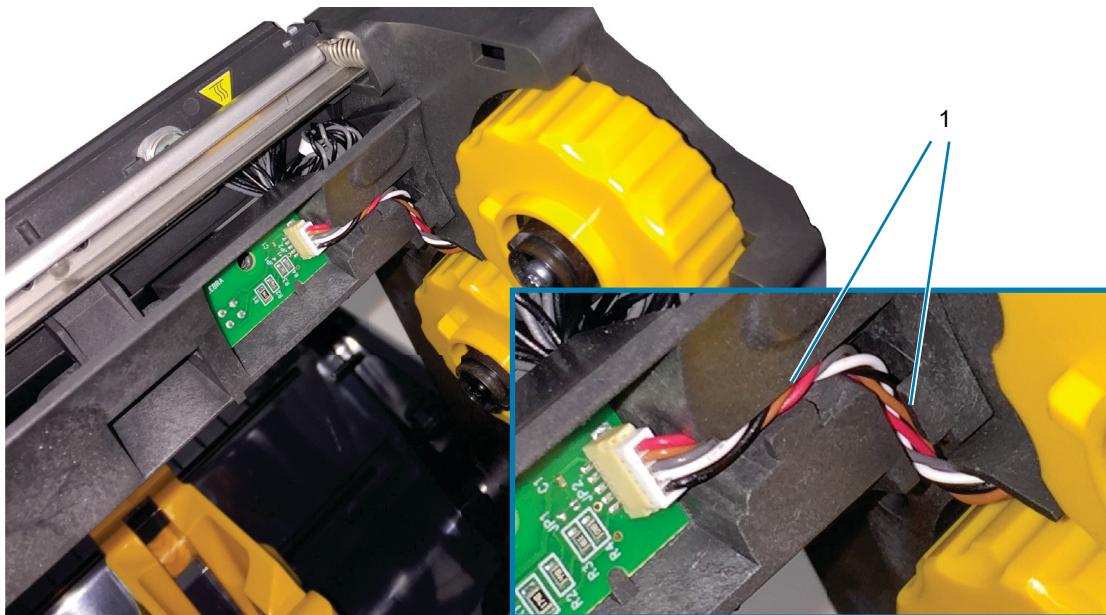


4. Push the PCBA out of the ribbon carriage cross member from the bottom and lift it up. Note the wire routing. Disconnect the cable's connector from the PCBA. The black sensor extending through the cross member is colored orange in this illustration.



### Installation

1. Connect the cable (1)to the to the new PCBA.
2. Place the sensor on the PCBA into the square hole in the cross member and secure it to the cross member with the screw.

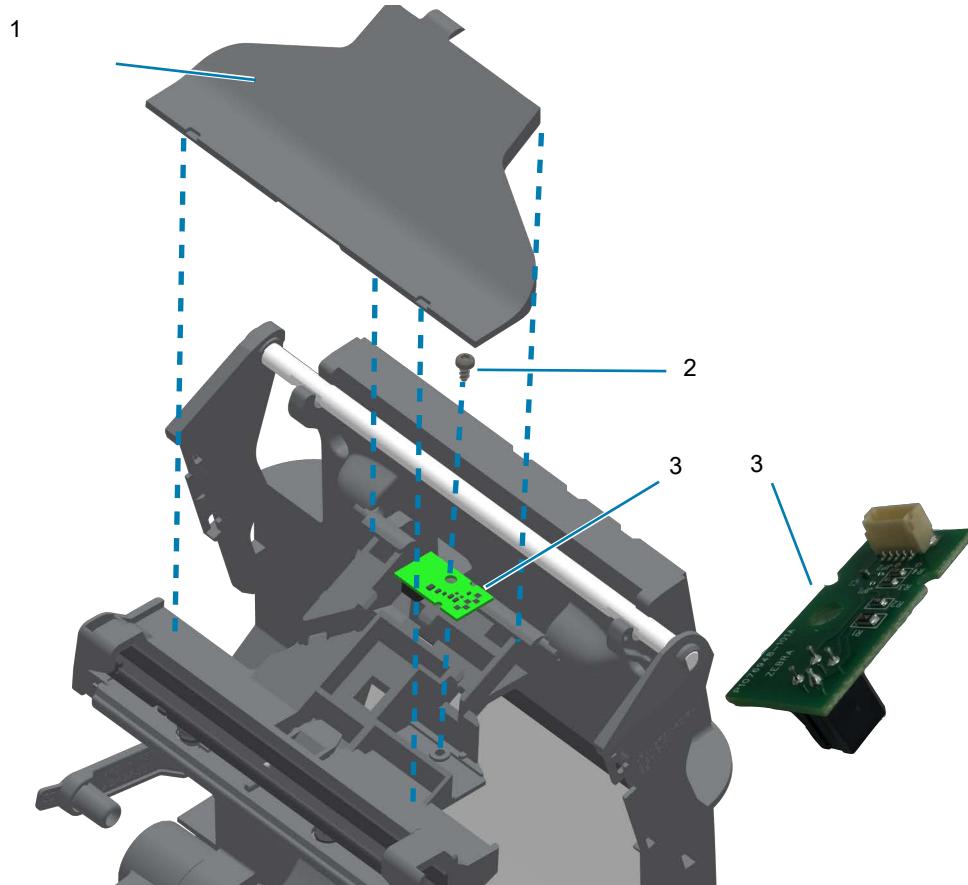


3. Verify the cable's wiring is routed in the channel (under the tabs).

# Replacing the Cartridge Printer Ribbon Sensor PCBA

## Repair Prerequisites

You must remove the cover assembly before performing this procedure.

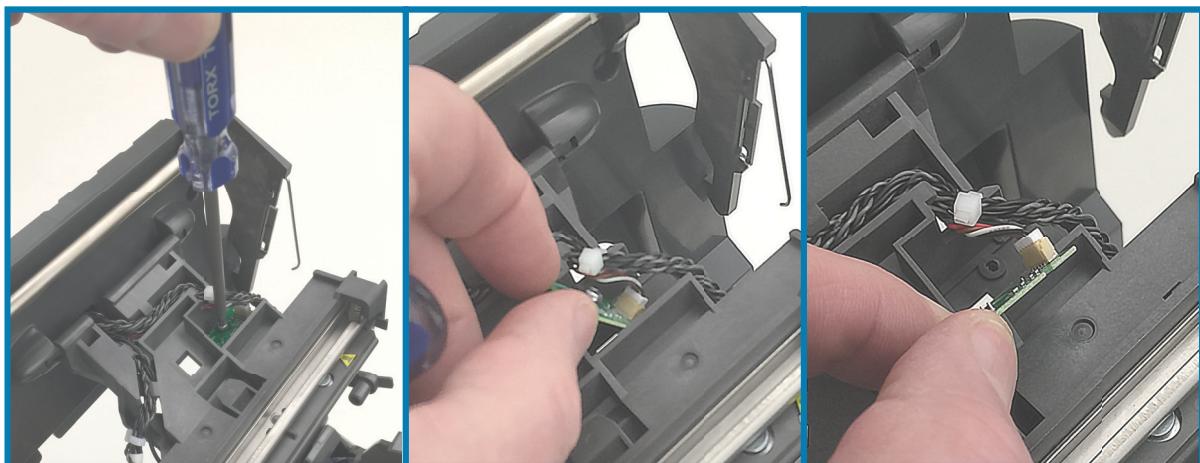


## Removal

1. Pry the cover (1) off the printhead actuator arm with your hand. Grab the sides of the cover (close to actuators arm's hinge) and lift up. Swing it up and lift the cover out.



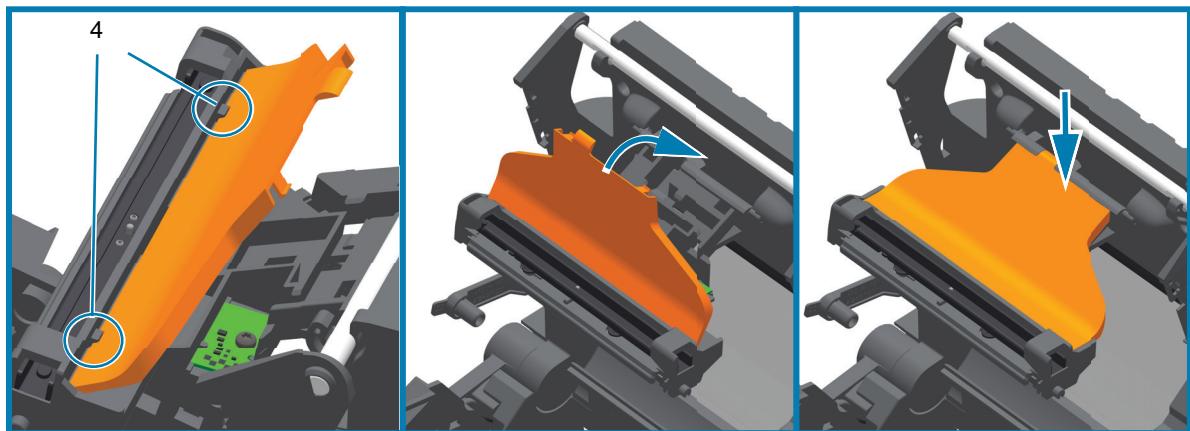
2. Remove the screw (2) securing the ribbon sensor PCBA (3) to the printhead actuator arm. Lift the PCBA out. The printhead may be unlatched from the printhead actuator arm if necessary to gain more clearance from the printhead cable, see [Removing the Printhead on page 71](#).



3. Disconnect the cable from the PCBA.

## Installation

1. Connect the cable to the ribbon sensor PCBA (3).
2. Place the ribbon sensor PCBA (3) with the black sensor body down into the actuator arm body. The connector/cable side is on the outer edge of the actuator arm body. Align the PCBA with the two notches and the screw hole in the actuator arm body.
3. Secure the PCBA to the actuator arm body with screw.
4. Place the actuator arm's cover back onto the actuator arm body. Slide the notches on the cover under the tabs (4) on the actuator arm body. Swing the narrow end down into the arm's hinge. Press the cover into the actuator arm body to lock it in place.



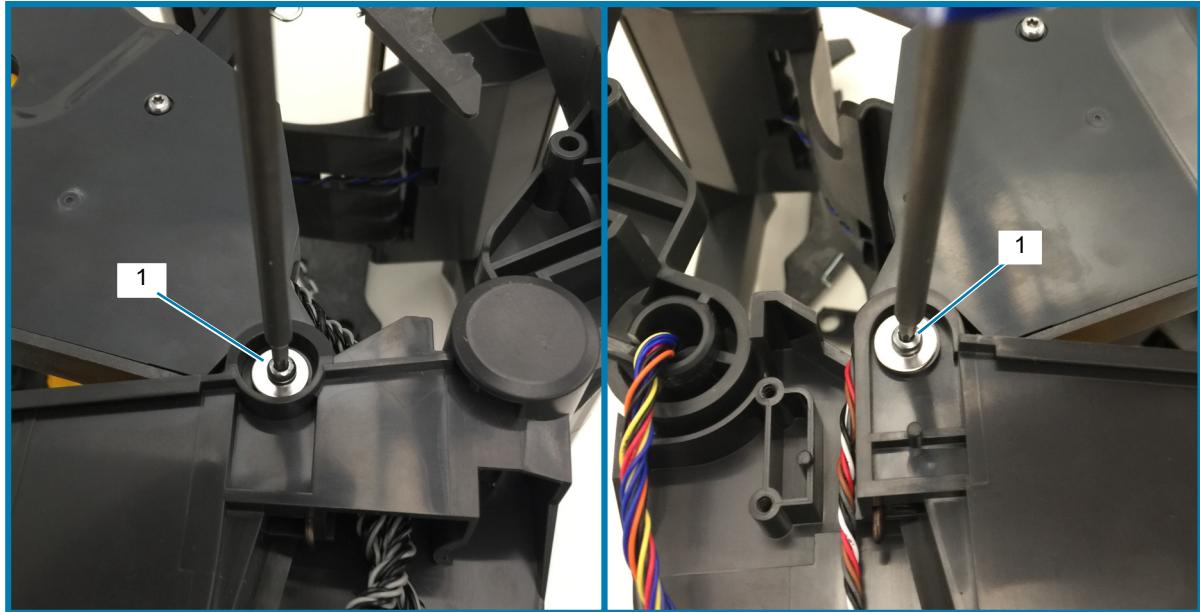
# Replacing the Ribbon Carriage in Thermal Transfer (Roll) Printers

## Repair Prerequisites

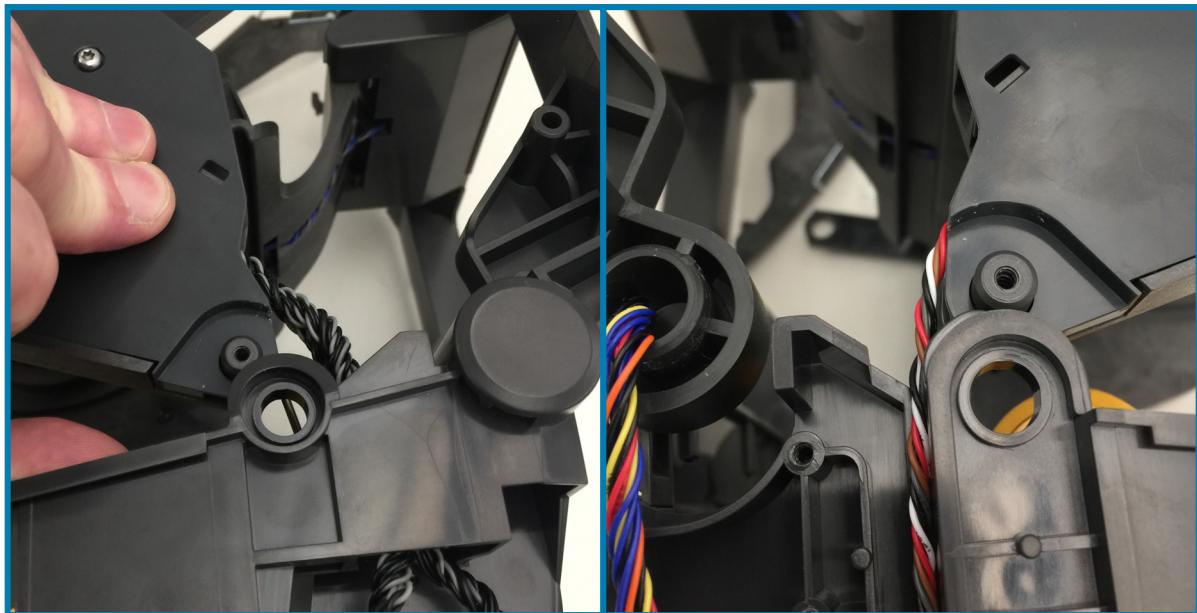
You must remove the front bezel option (tear-off, dispenser, or cutter), printer base, main PCBA, and hinge before you can remove the ribbon carriage.

## Removal

1. Remove the screw and washer (1) on each side of the print mechanism at the ribbon carriage's hinges.



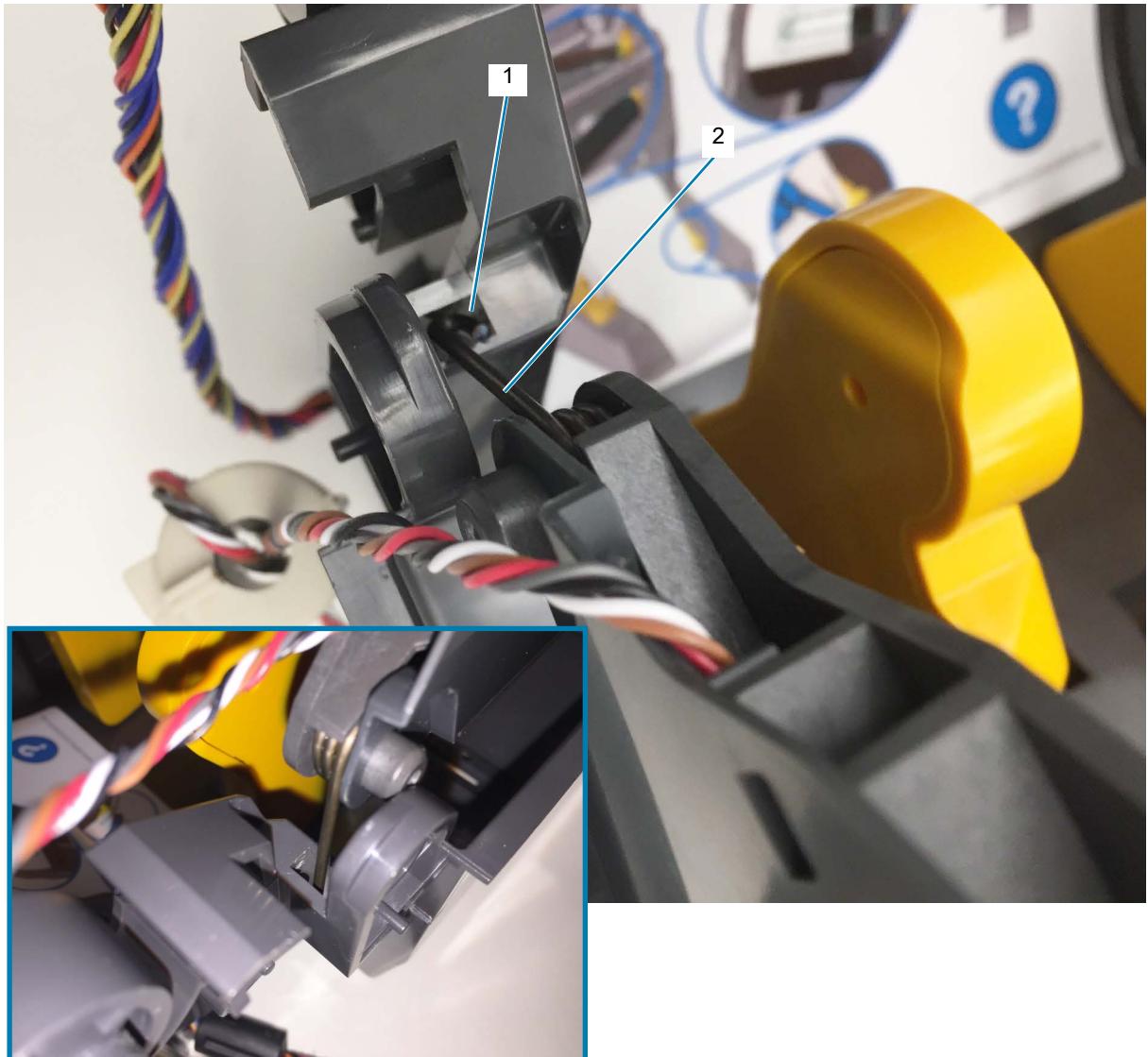
2. Push the ribbon carriage's hinge pin out of the hinge bracket molded into the print mechanism (lower frame) on the left side. The inner frame and transport both bend to allow you to get the pin out of the bracket.



3. Pull the ribbon carriage up and way from the printer. Gently pull the printhead cables (and connectors) out of the well in the top of the lower frame.

### Installation

1. Insert the printhead cable (and connector) into the opening between the right cover hinge and right ribbon carriage hinges.
2. Align the ribbon carriage with the two hinge springs (2) with the two hinge spring wells (1) in the top of the lower inner frame. Lower the springs into the wells until the carriages hinge pins and hinge brackets are close.



3. Push the right side transport hinge pin into the right side bracket on the inner frame. Repeat for the left side.
4. Pull the printhead cable completely through the lower frame to remove slack at the carriage hinge. Re-attach the two oroid clamps to the two branches of printhead cables below the hinge area.
5. Secure the ribbon carriage hinges to the print mechanism with a screw and washer on each side of the printer.

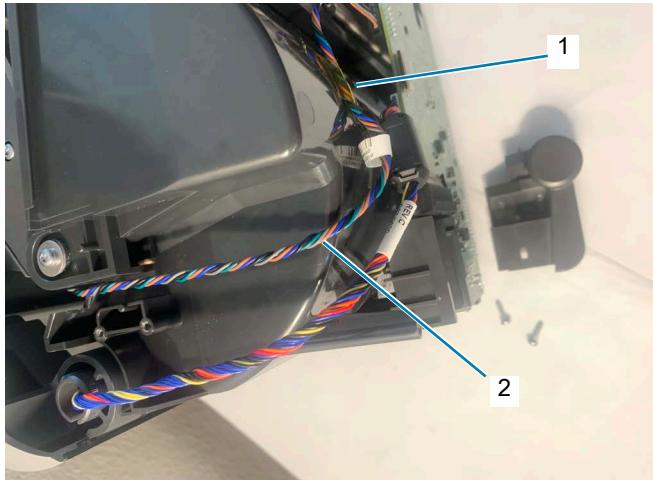
## Replacing the Ribbon Transport

### Repair Prerequisites

You must remove the front bezel option (tear-off, dispenser, or cutter), printer base, main PCBA and hinge before you can remove the ribbon transport.

### Removal

1. Loosen the tape (1) holding the cartridge sensor cable (2) to free the cable.

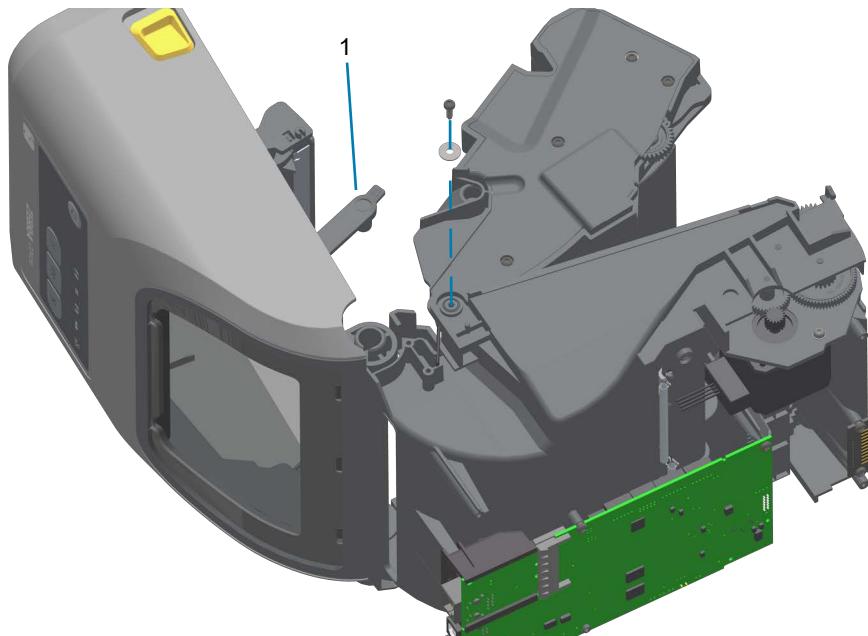


2. Disconnect the upper (gap/web) media sensor cable (3) in the right hinge area. The printhead cables with ferrite's are just out of this picture.

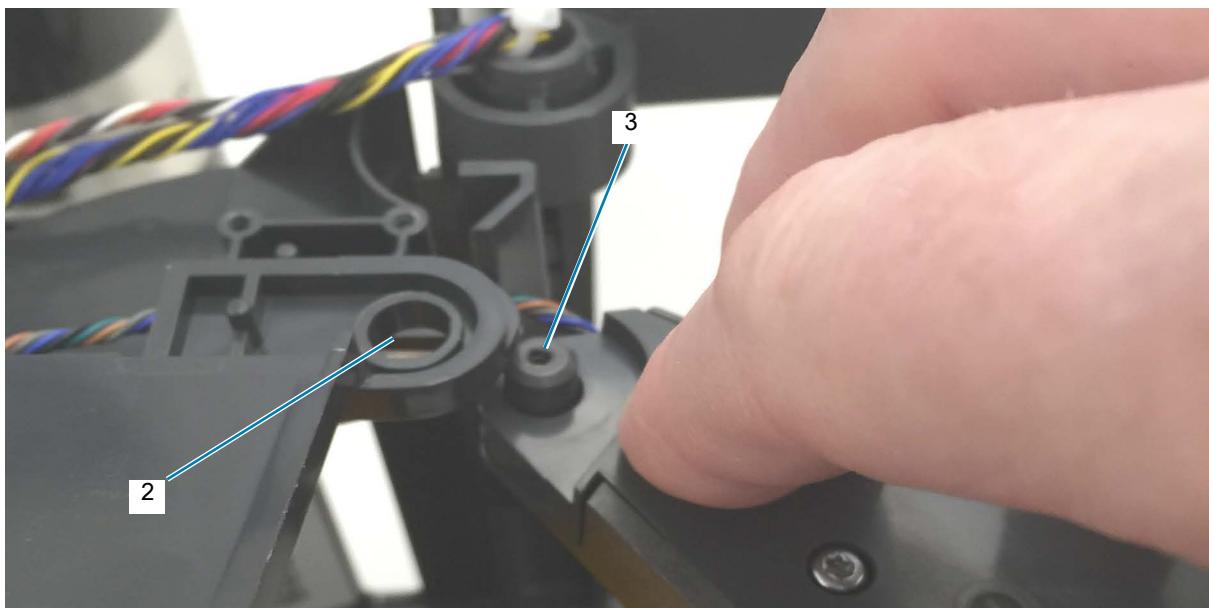


## Replacing Parts

3. Disconnect the two link arms (1) that connect the ribbon transport to the top cover (and upper frame).



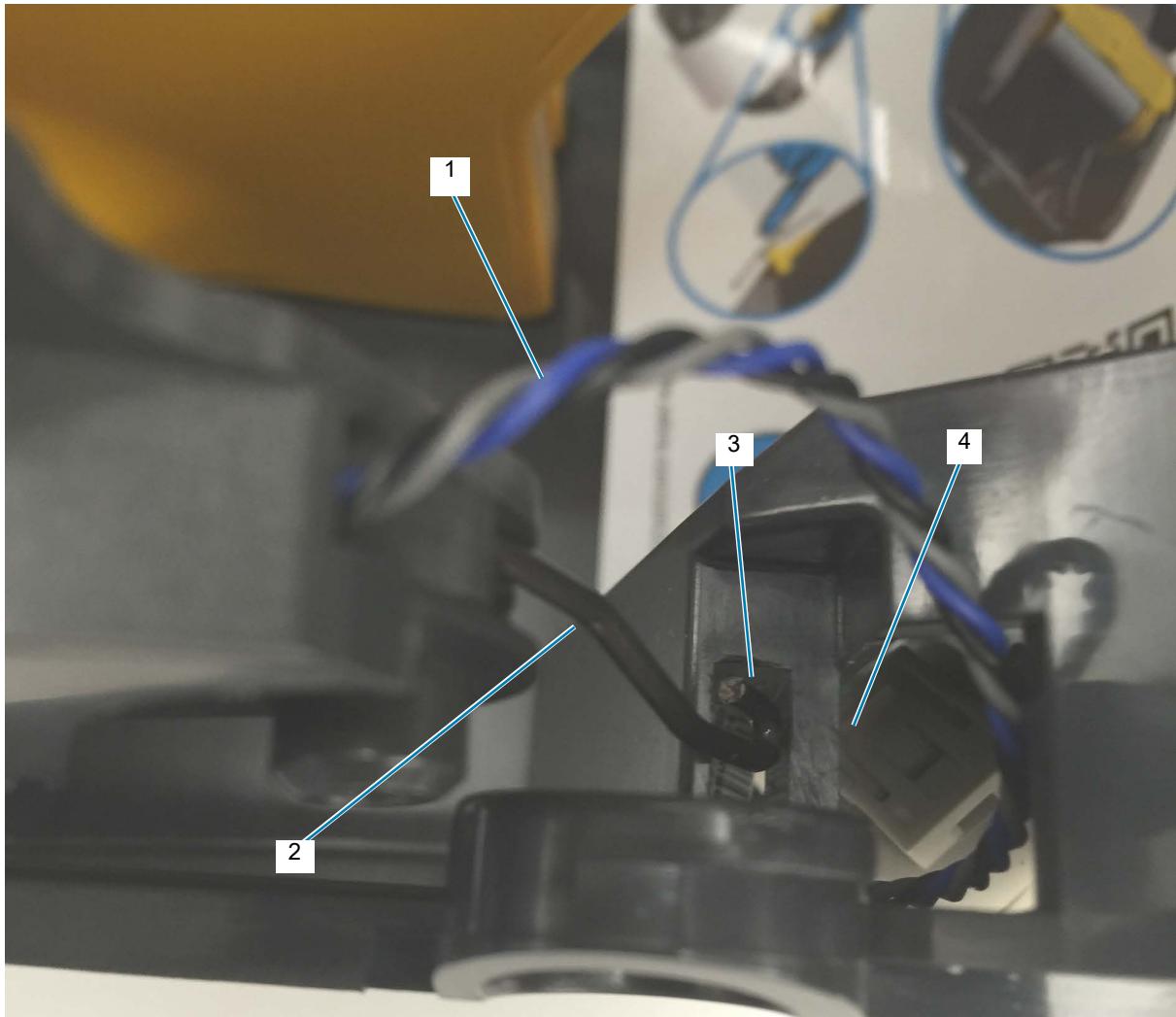
4. Remove the screw and washer on each side of the print mechanism at the ribbon transport's hinge.
5. Push the ribbon transport's hinge pin out (3) of the hinge bracket (2) molded into the print mechanism (lower frame) on the left side. The inner frame and transport both bend to allow you to get the pin out of the bracket.



6. Pull the ribbon transport up and out of the printer. Gently pull the upper media sensor's cable (and connector) out of the well in the top of the lower frame.

### Installation

1. Align the ribbon transport with the two hinge springs with the two hinge spring wells in the top of the lower inner frame. Lower the springs (2) into the spring wells (3) until the transports hinge pins and hinge brackets are close.

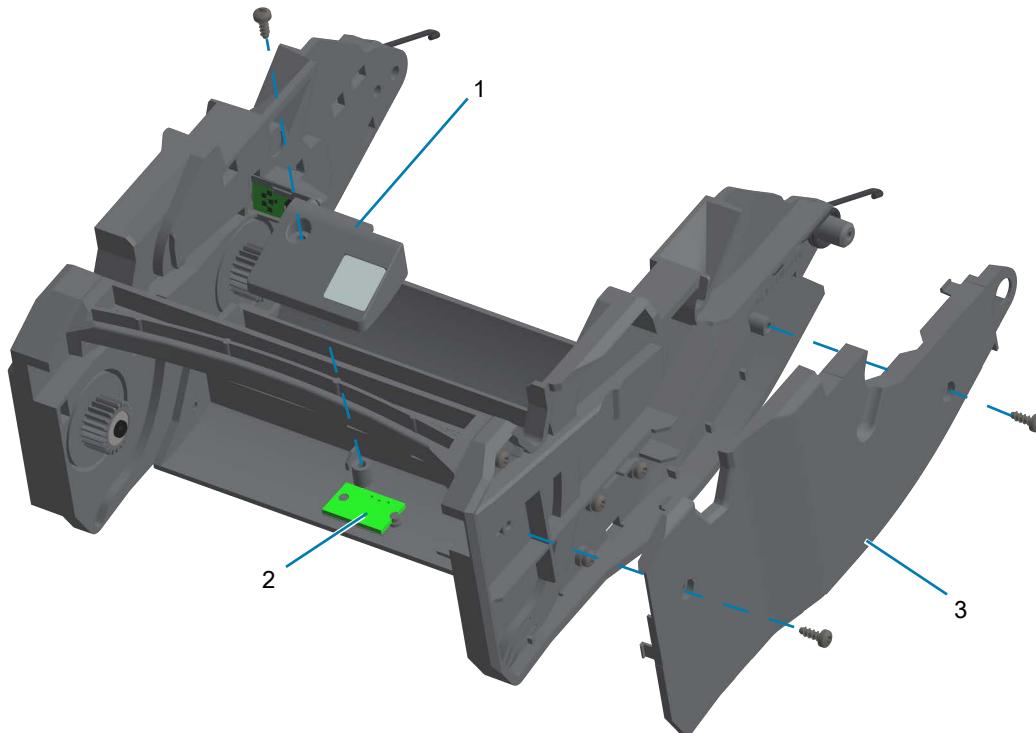


2. Push the right side transport hinge pin into the right side bracket on the inner frame. Repeat for the left side.
3. Insert the upper media sensor cable and connector (1) into the larger well (4) on the top of the inner frame on the left side of the printer.
4. Plug the cartridge sensor and upper media sensor cables into the main PCBA.
5. Re-secure the cartridge sensor and ribbon sensor cables to the bottom of the print mechanism with tape.
6. Secure the ribbon transport hinge to the print mechanism with a screw and washer on each side of the printer.

# Replacing the Upper Media (Gap/Web) Sensor (ZD421C)

## Repair Prerequisites

You must remove the front bezel option (tear-off, dispenser, or cutter), printer base, hinge, and ribbon transport before you can remove the upper media Sensor. The main PCBA can be removed to gain better access to cable connectors on the main PCBA.

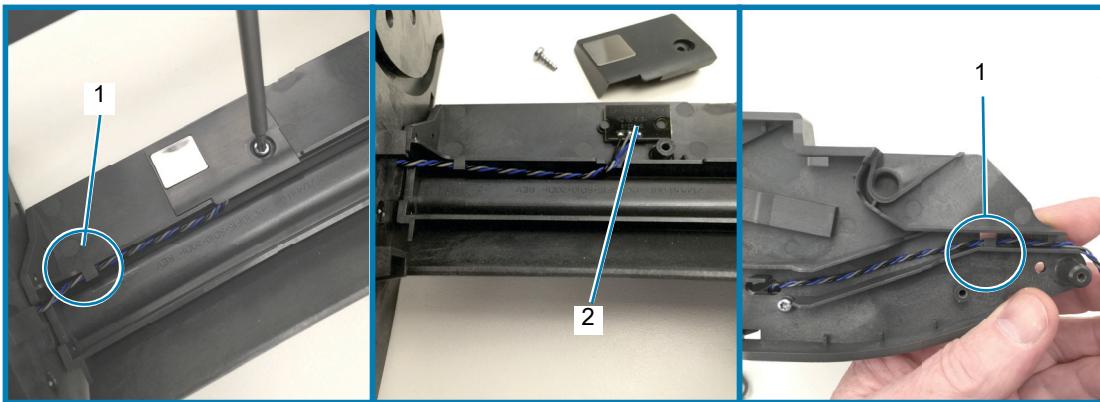


## Removal

1. With the ribbon transport removed from the printer, remove the two screws securing the lift side panel (3) to the transport.
2. At the ribbon transport's hinge pin, lift the side panel off the transport. The side panel has snap to lock features that are holding the panel lightly in place. Continue lifting all the way around the side panel to release the latches and pull it away from the transport frame.

## Replacing Parts

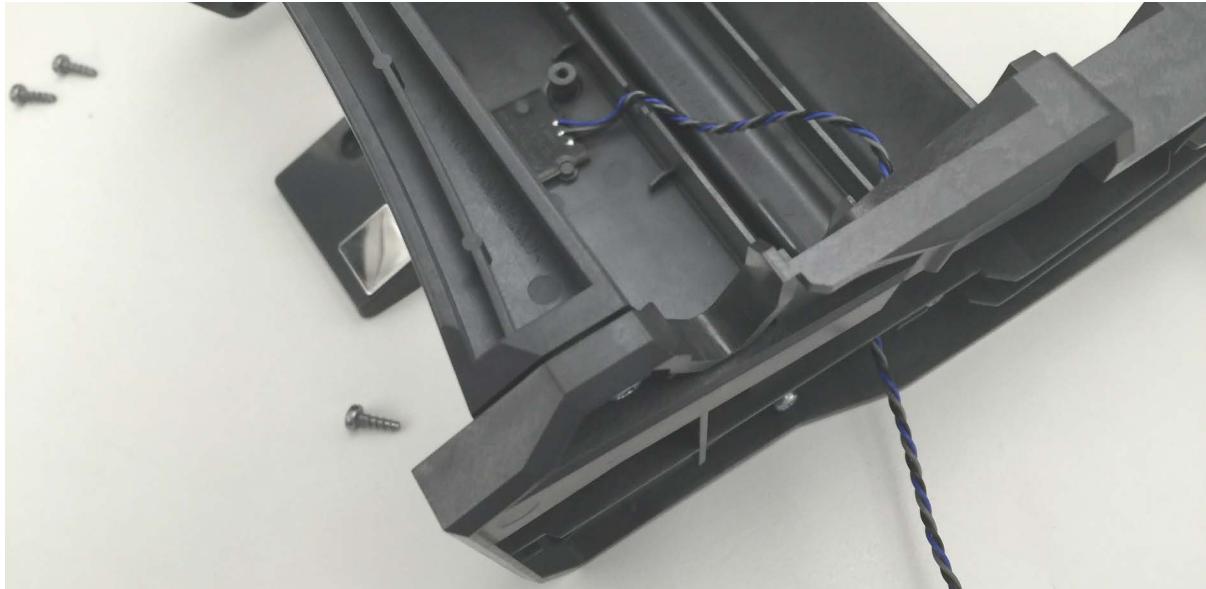
3. Remove the screw securing the sensor cover and remove the cover.



4. Locate the cable on side of the transport frame and pull it out. The cable channels include cable capture features (1) to hold the cable in place during assembly. Pull the cable around them and then out of the transport frame through the inside of the transport's side frame to release the upper sensor PCBA (2).

### Installation

1. Place the new upper media sensor PCBA on the two guide posts with the four LEDs in the hole in the transport frame's cross member. The cable from the sensor PCBA exits toward the back of the transport (hinges in the back) and the cable sits in a notch in the cross member.



2. Place the sensor cover over the upper media sensor PCBA and secure it and the PCBA to the frame with a screw. Verify that the cable is not pinched between the frame and the cover.
3. Put the cable's loose end with the connector through the transport's right inside wall and route the cable through the channel and under the cable capture feature.
4. From the outside of the transport frame's right side, gently pull the cable tight and route it through the cable channel and out over the hinge pin. Push the cable in the channel and under the cable capture feature. Pull the cable gently tight again to remove any slack.
5. Align and press the left side transport frame's cover pack onto the transport. Secure it to the frame with two (2) screws to 4.7 +/- 1 in. lbs.

# Replacing the Print Mechanism

## Repair Prerequisites

You must remove the front bezel option (tear-off, dispenser, or cutter), printer base, main PCBA, hinge, and cover assembly (cover and inner upper frame) before you can remove the print mechanism.

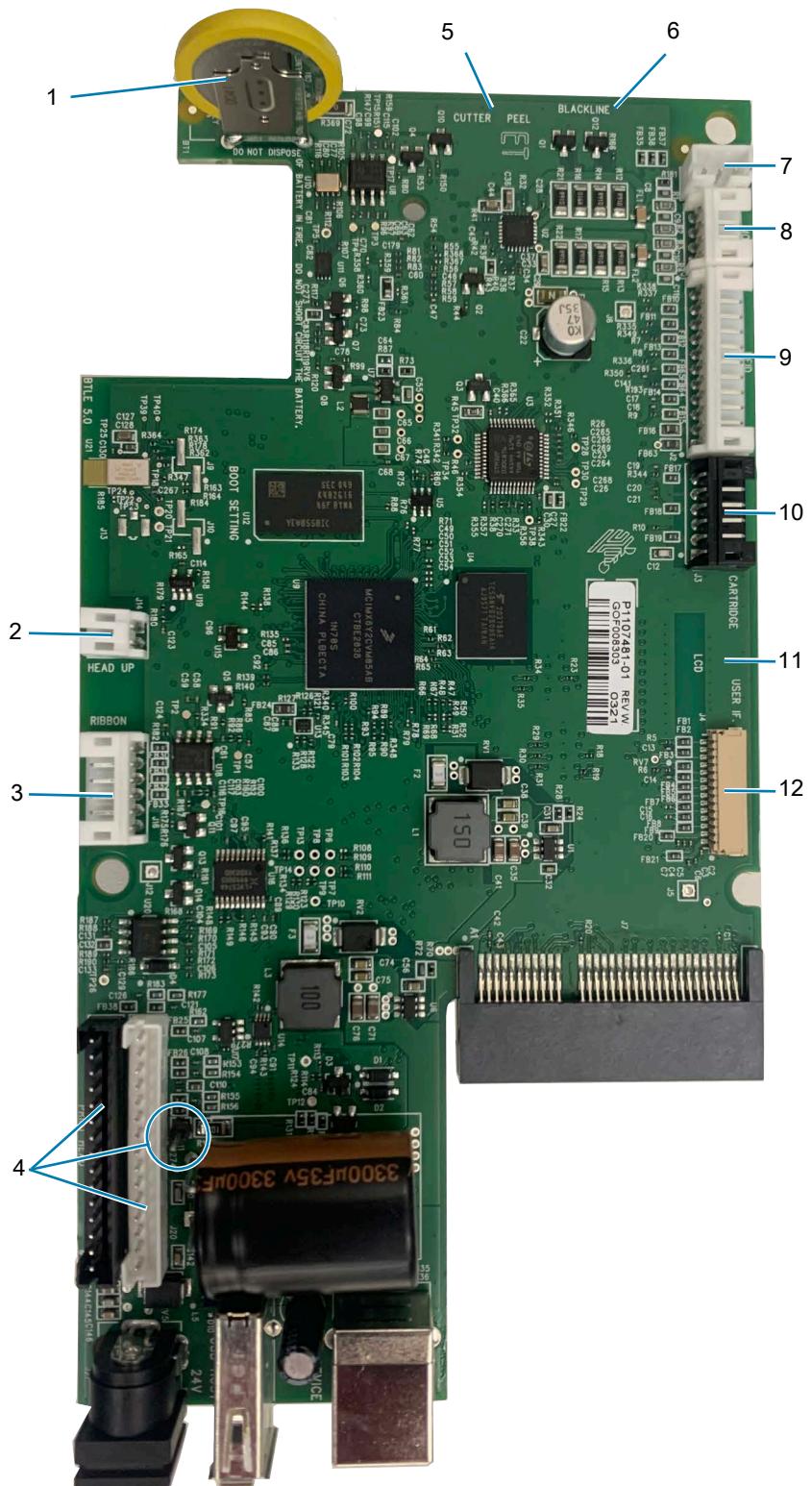
## Removal and Installation

1. **ZD421(d) and ZD621(d):** Cover assembly (cover and inner upper frame) releases the print mechanism for replacement.
2. **ZD421(t), ZD621(t), and ZD621R:** Cover assembly (cover and inner upper frame) releases the print mechanism. See [Replacing the Ribbon Carriage in Thermal Transfer \(Roll\) Printers on page 162](#) to remove and connect it to the new print mechanism.
3. **ZD421(c):** Cover assembly (cover and inner upper frame) releases the print mechanism with the ribbon transport. See [Replacing the Ribbon Transport on page 165](#) to remove and connect it to the new print mechanism.

# Main PCBA Layout

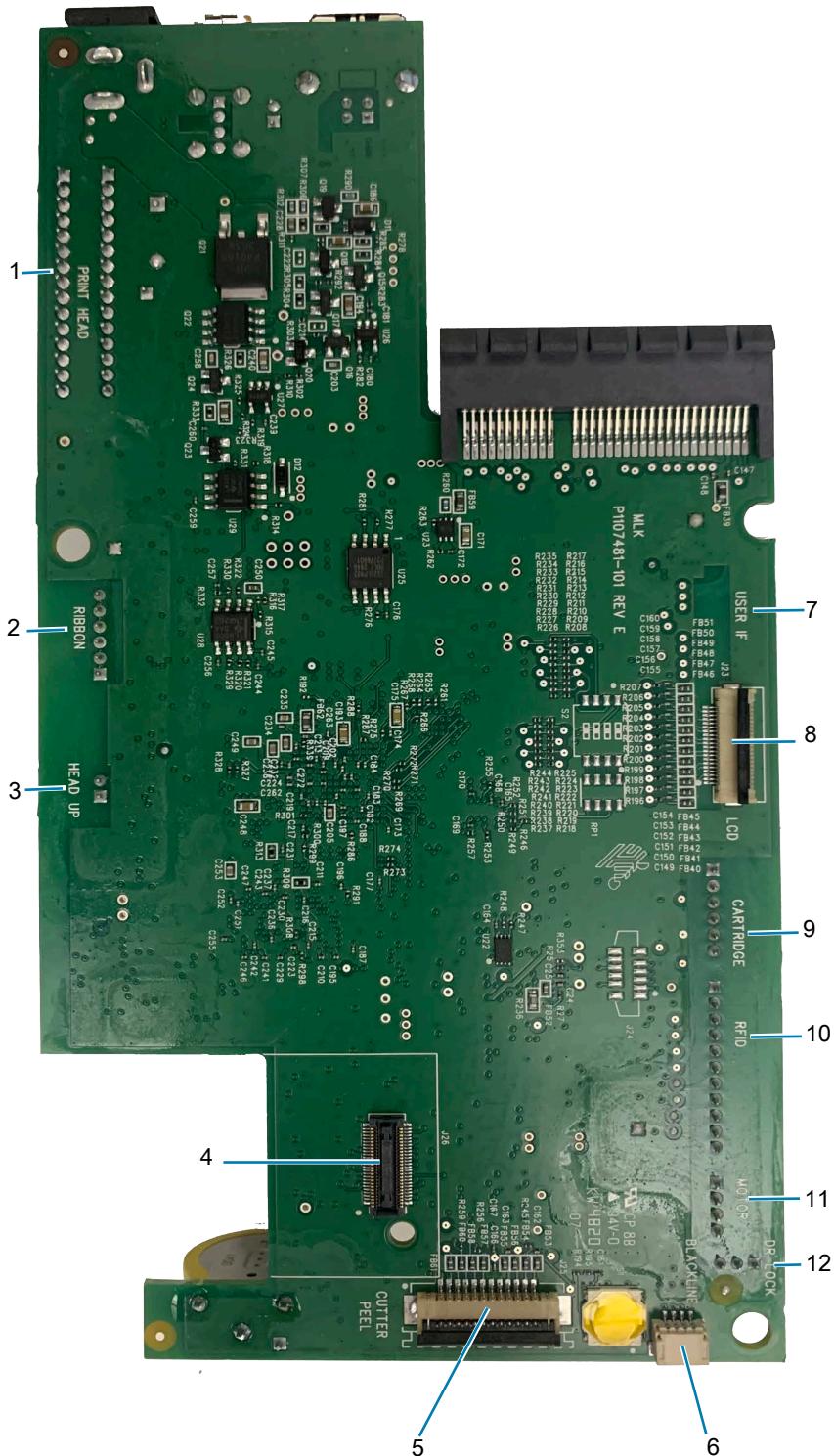
This section shows the Main PCBA and its connector locations from the top and bottom sides of the circuit board assembly.

## Main Printed Circuit Board Assembly (Top View)



- |  |
|--|
| 1 - Lithium Battery Not Replaceable          |
| 2 - Head-up Sensor                           |
| 3 - Ribbon Sensor                            |
| 4 - Printhead has 2 cables and a ground wire |
| 5 - Media Option Interface (back)            |
| 6 - Movable (Blackline) Sensor (back)        |
| 7 - Lock                                     |
| 8 - Motor                                    |
| 9 - RFID                                     |
| 10 - Cartridge Sensor                        |
| 11 - LCD (back)                              |
| 12 - Control Panel (User IF)                 |

## Main Printed Circuit Board Assembly (Back View)

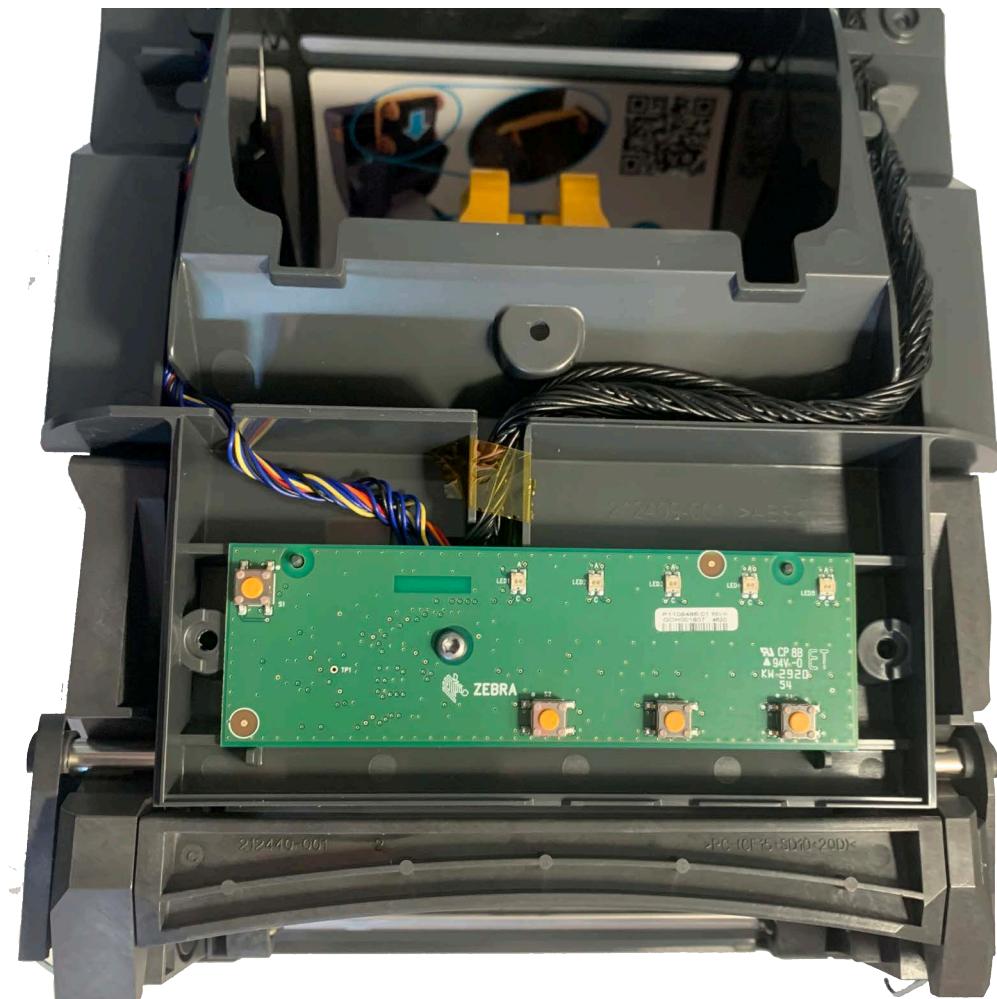


1 - Printhead and ground
2 - Ribbon Sensor
3 - Head-Up
4 - Wireless Connectivity Connector
5 - Hardware Option Connector (Cutter-Peeler-Tear)
6 - Movable Media Sensor (Blackline)
7 - Control Panel (USER IF)
8 - LCD (back)
9 - Cartridge Sensor
10 - RFID
11 - Motor
12 - Lock

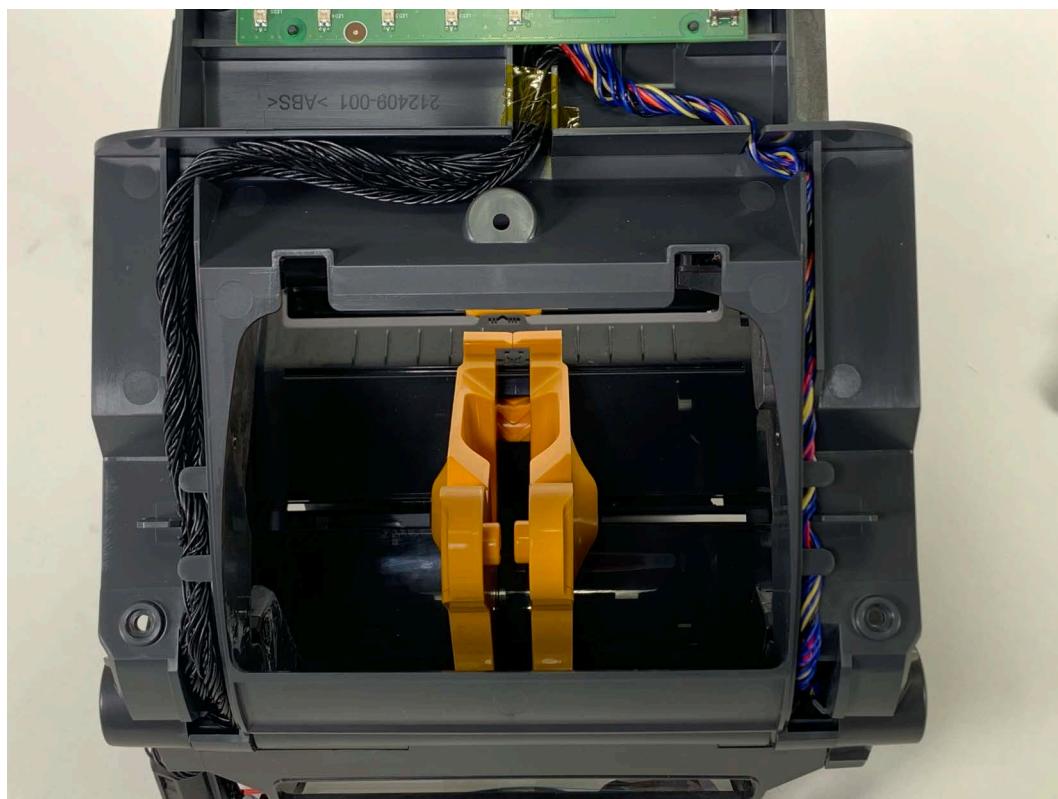
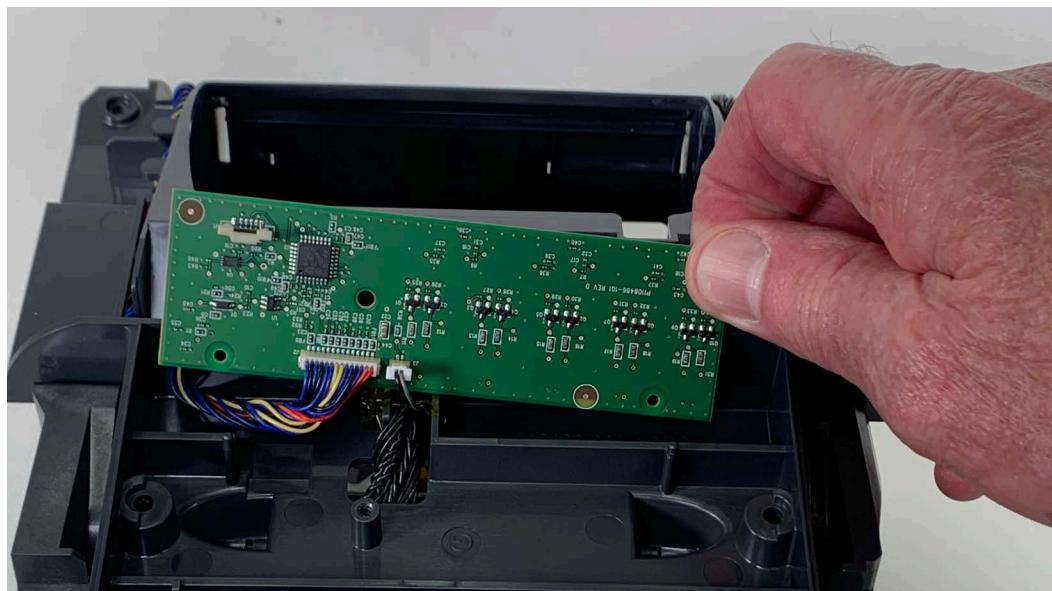
# Cable Routing for ZD421c

This section provides a visual printer reference for service personnel if wiring and components have shifted or come loose during repairs. The printer is shown with the cover and base removed.

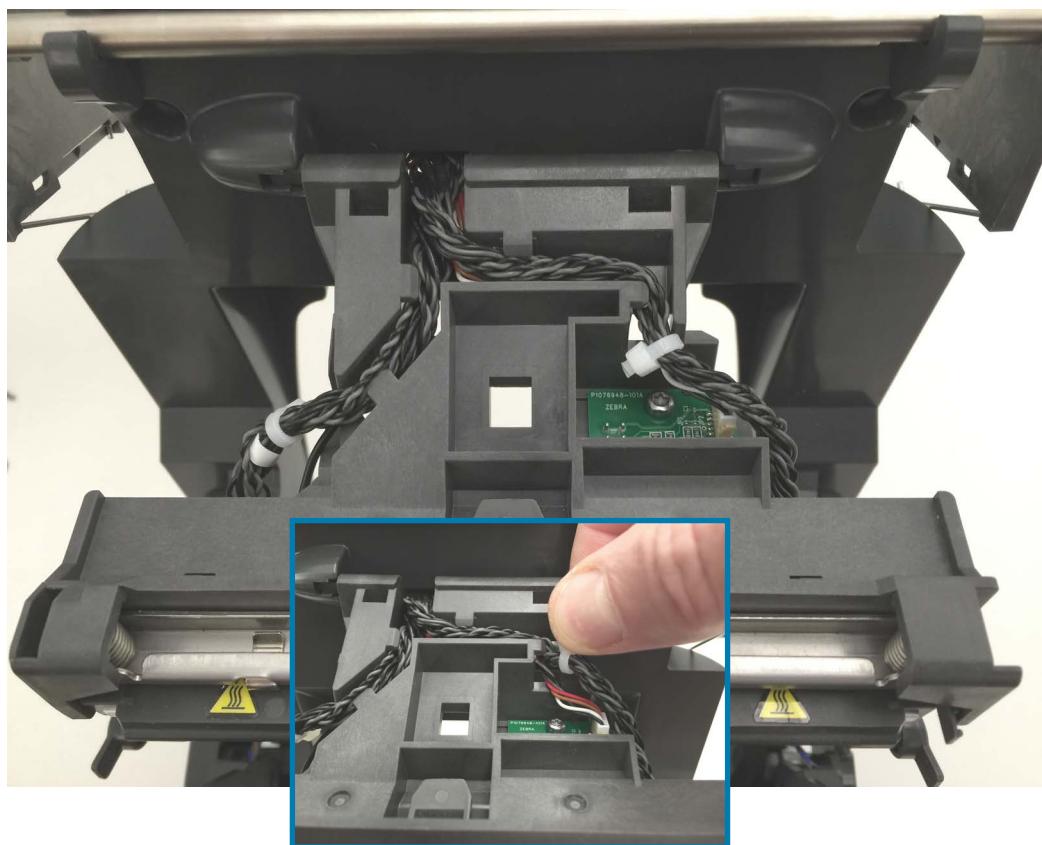
## ZD421c - Ribbon Cartridge printers



## Cable Routing for ZD421c



## Cable Routing for ZD421c



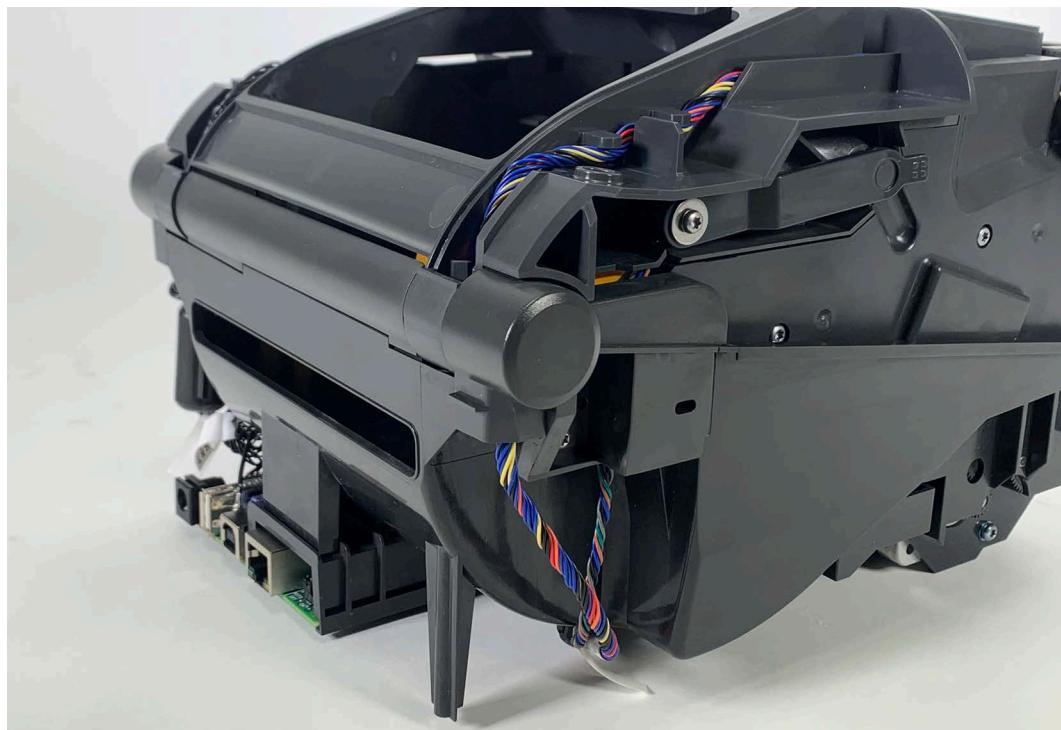
## Cable Routing for ZD421c



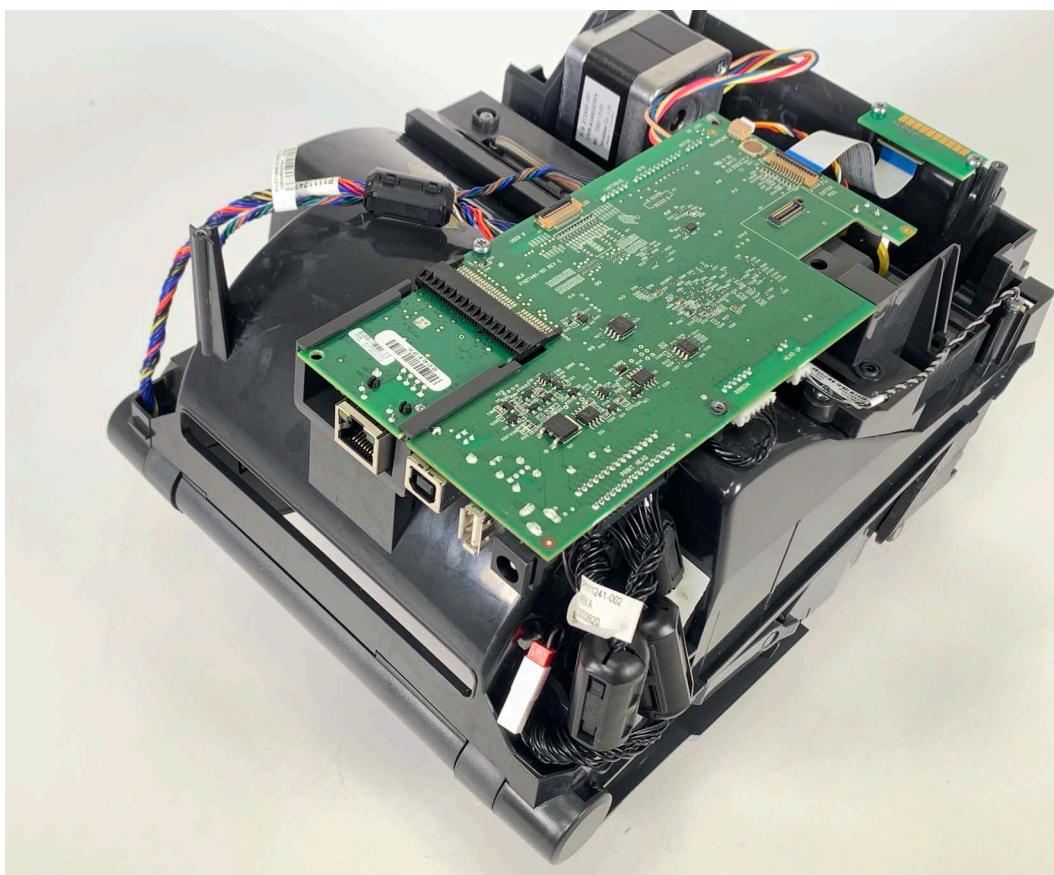
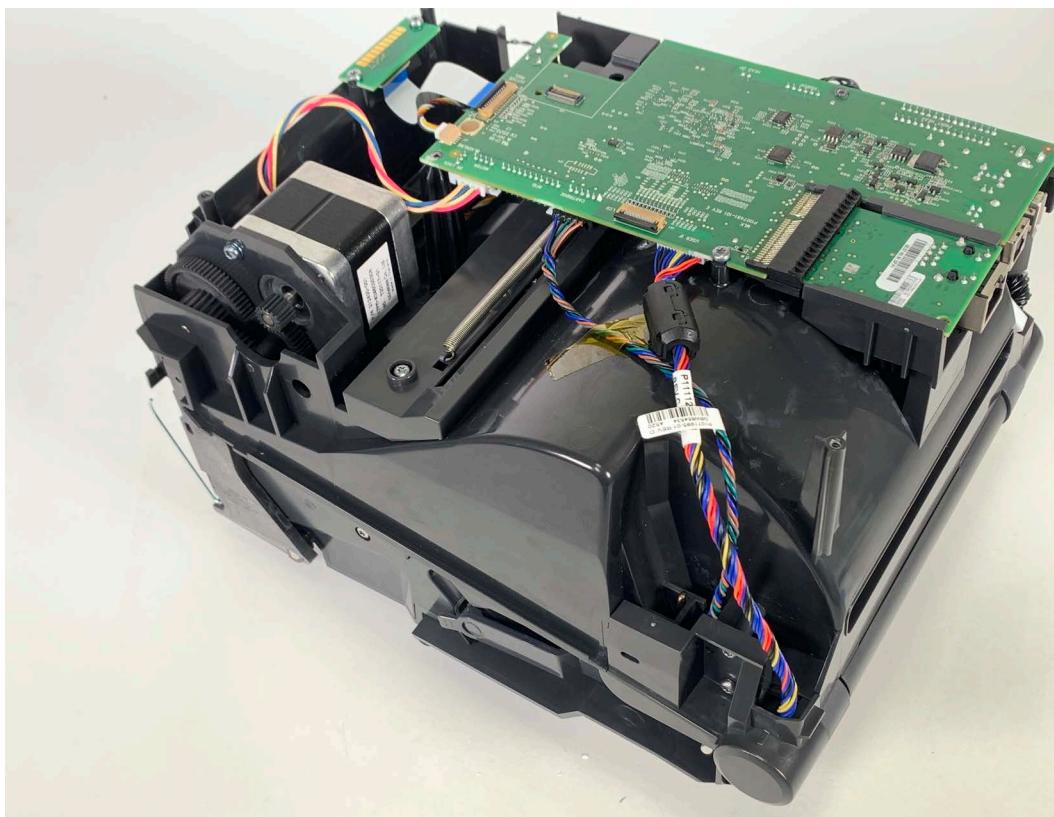
## Cable Routing for ZD421c



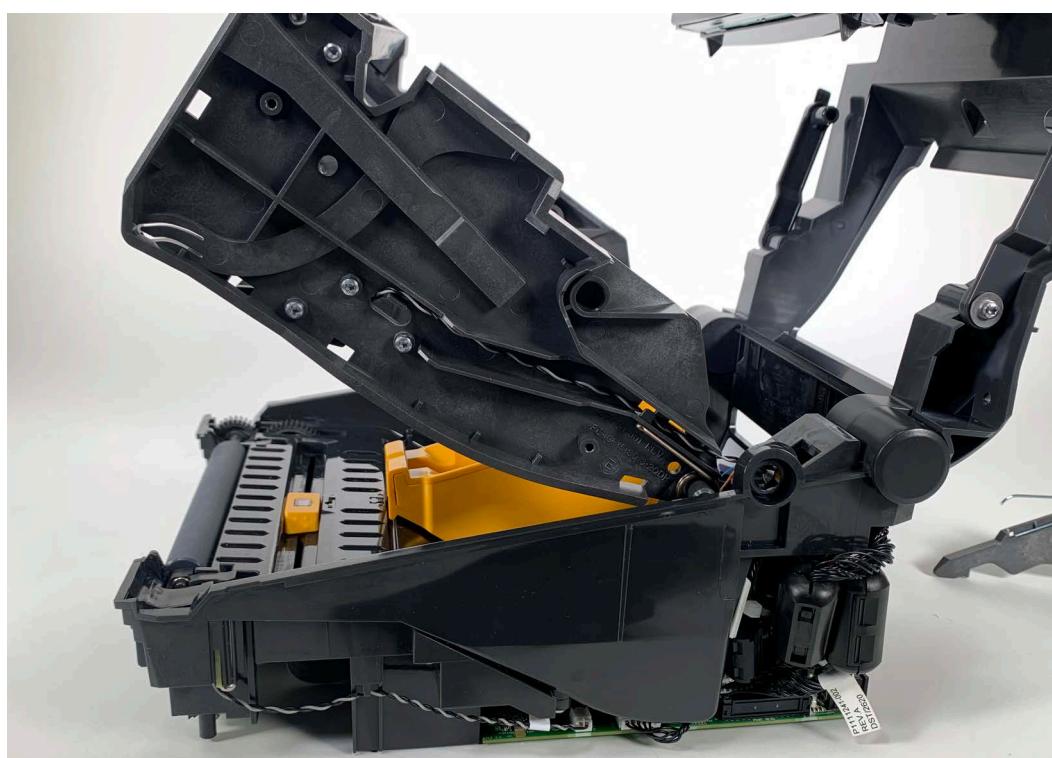
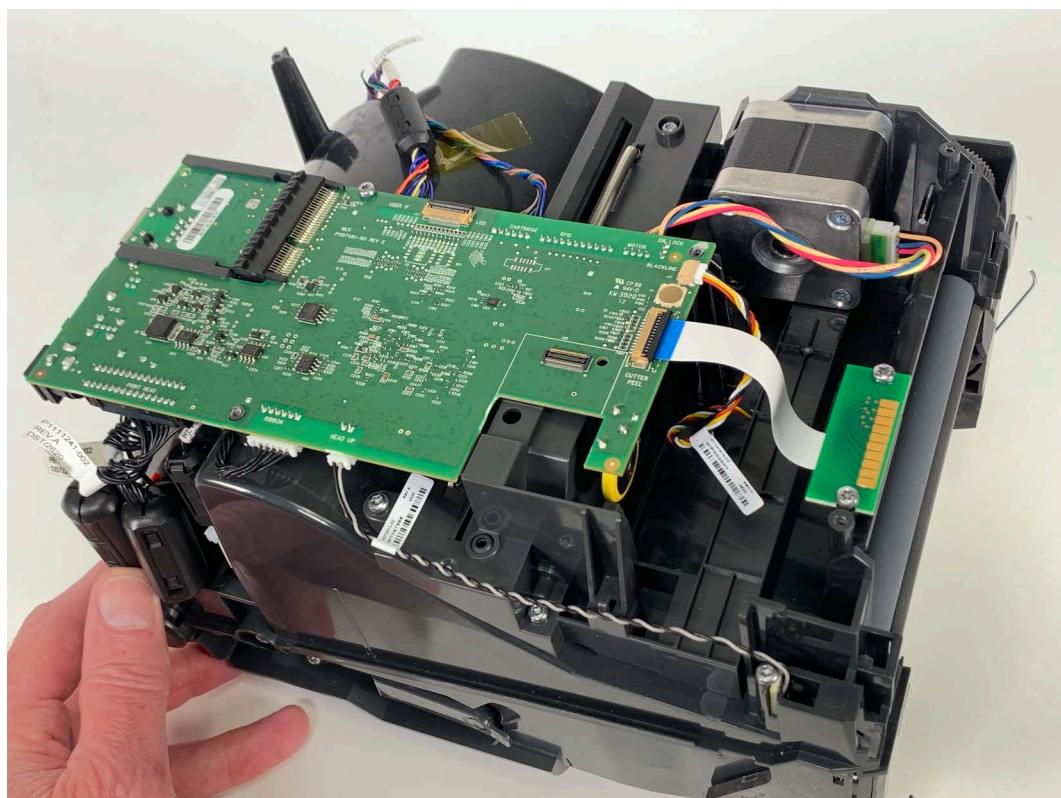
## Cable Routing for ZD421c



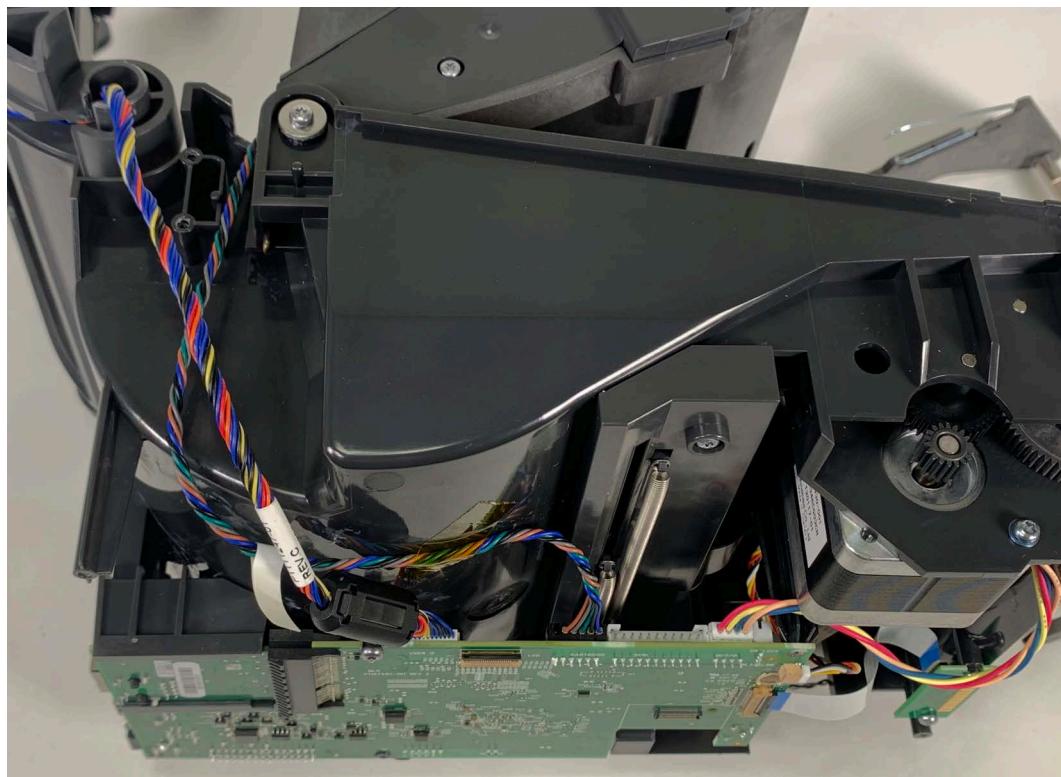
## Cable Routing for ZD421c



## Cable Routing for ZD421c



## Cable Routing for ZD421c



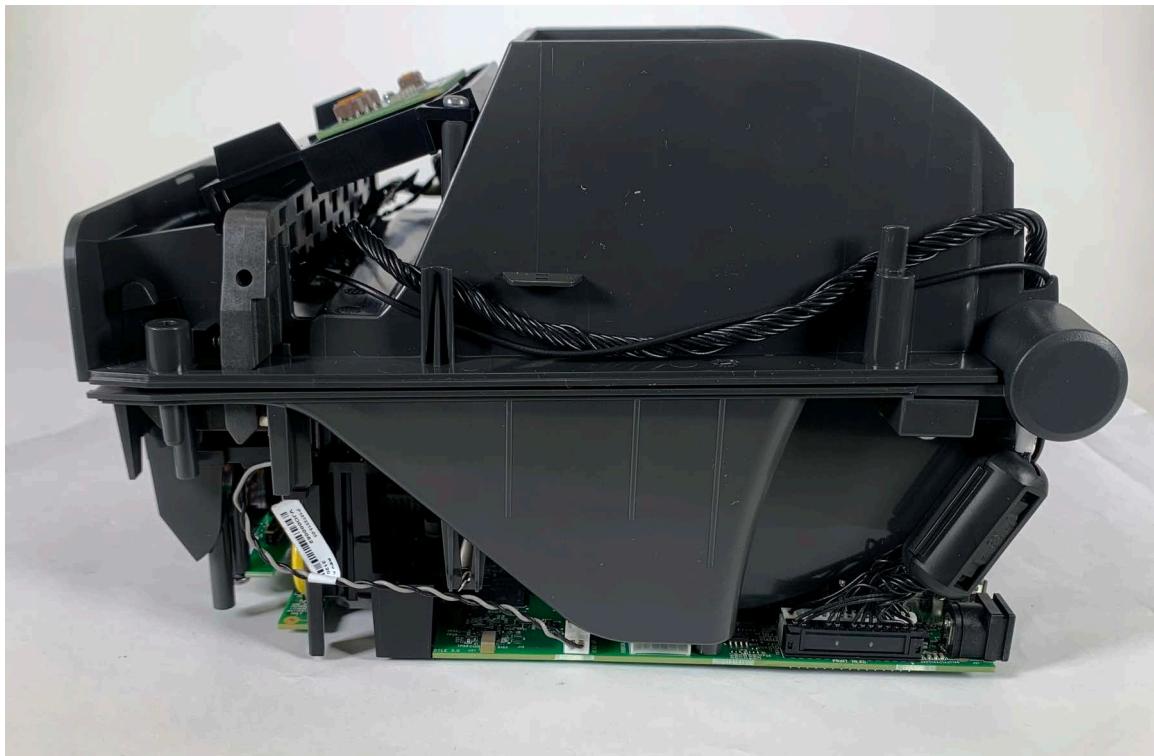
## Cable Routing for ZD421c



# Cable Routing for ZD421d

This section provides a visual printer reference for service personnel if wiring and components have shifted or come loose during repairs. The printer is shown with the cover and base removed.

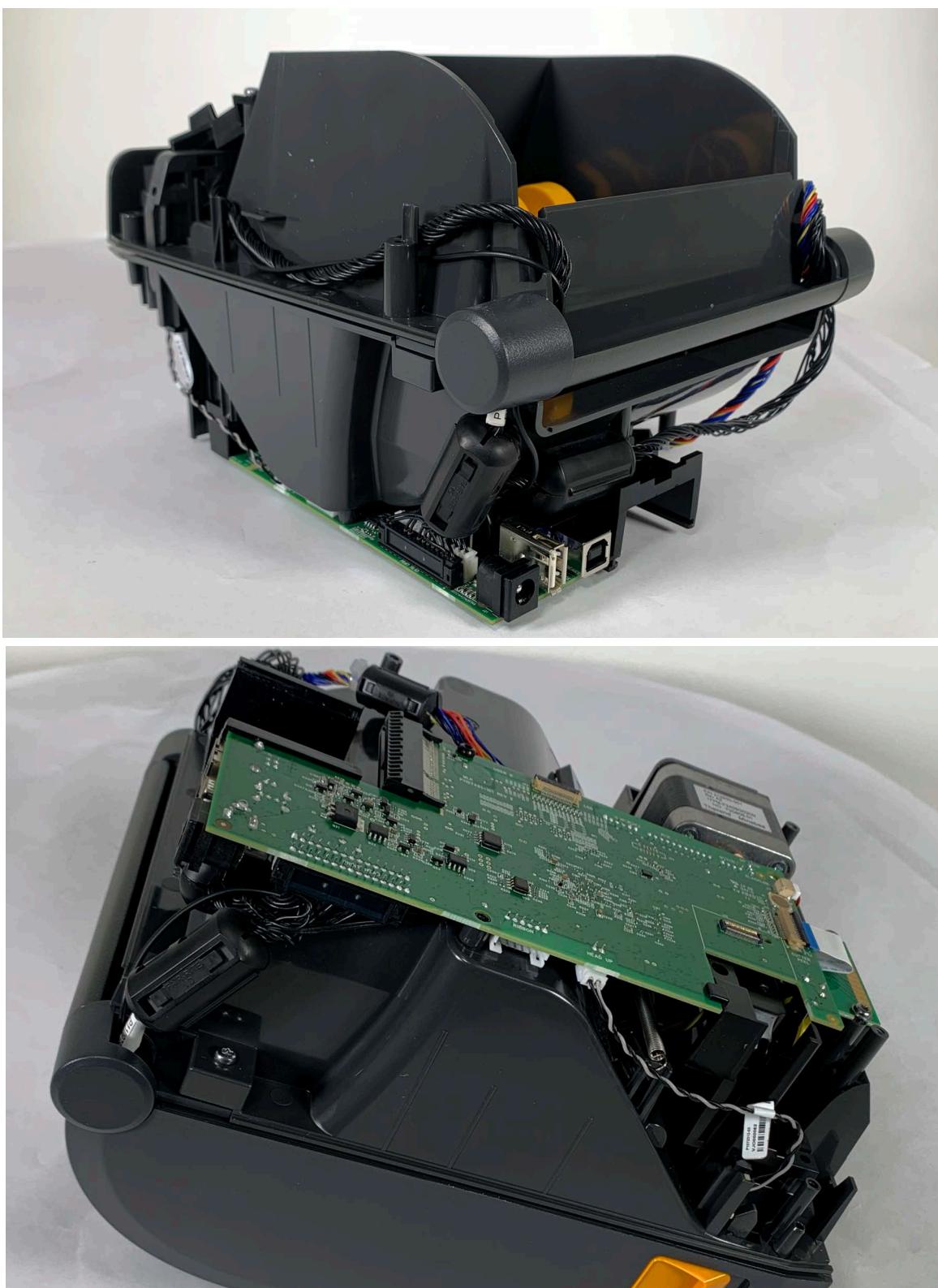
## ZD421d - Direct Thermal printers



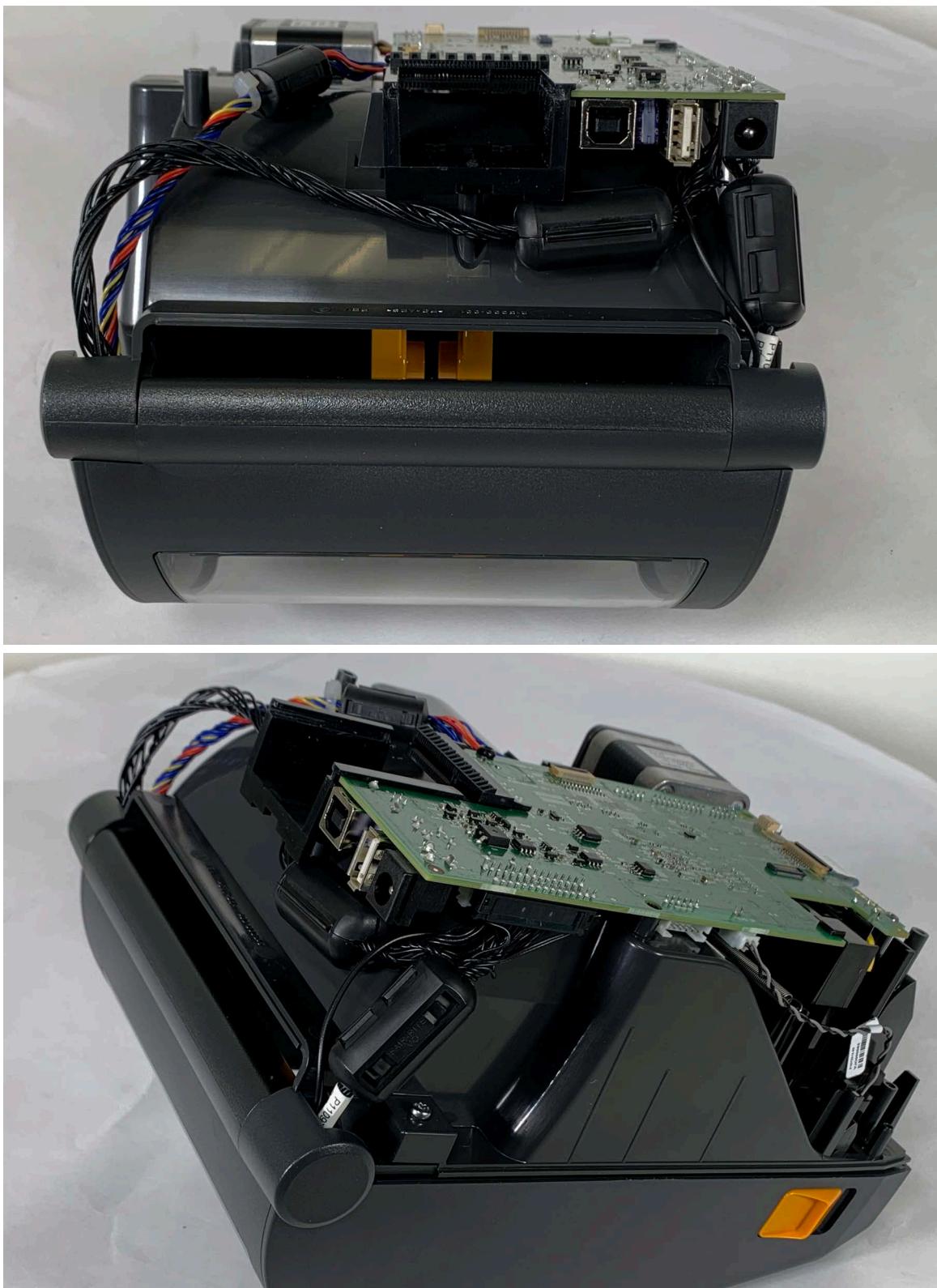
## Cable Routing for ZD421d



## Cable Routing for ZD421d



## Cable Routing for ZD421d



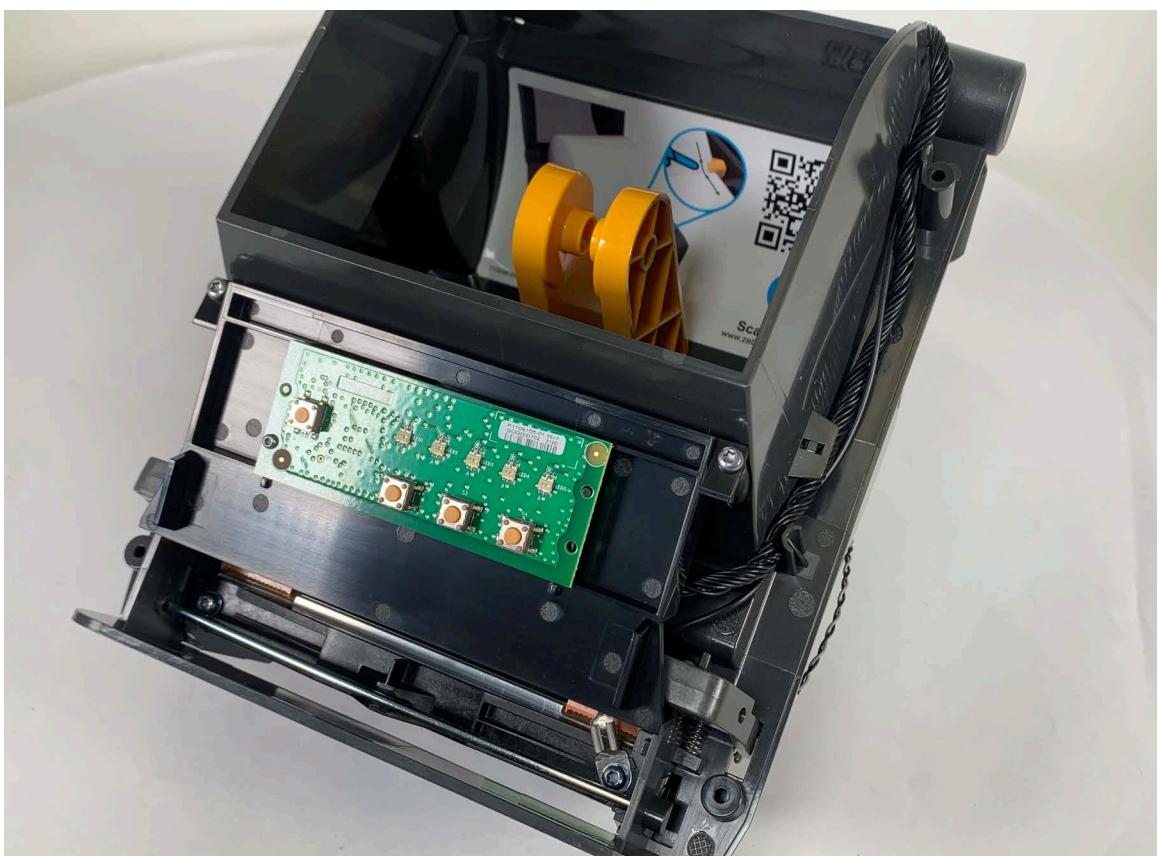
## Cable Routing for ZD421d



## Cable Routing for ZD421d



## Cable Routing for ZD421d

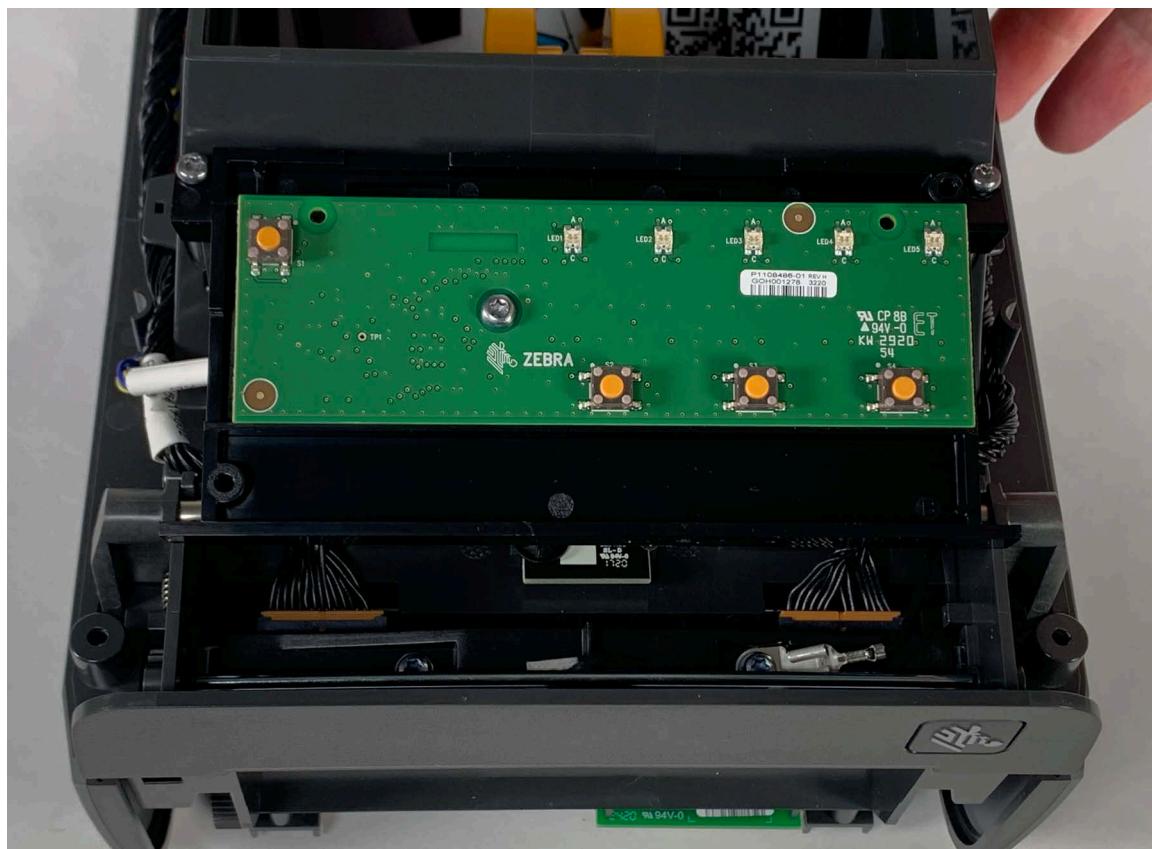


# Cable Routing for ZD621d

This section provides a visual printer reference for service personnel if wiring and components have shifted or come loose during repairs. The printer is shown with the cover and base removed.

## ZD621d - Direct Thermal printers

### Basic 3 Button UI

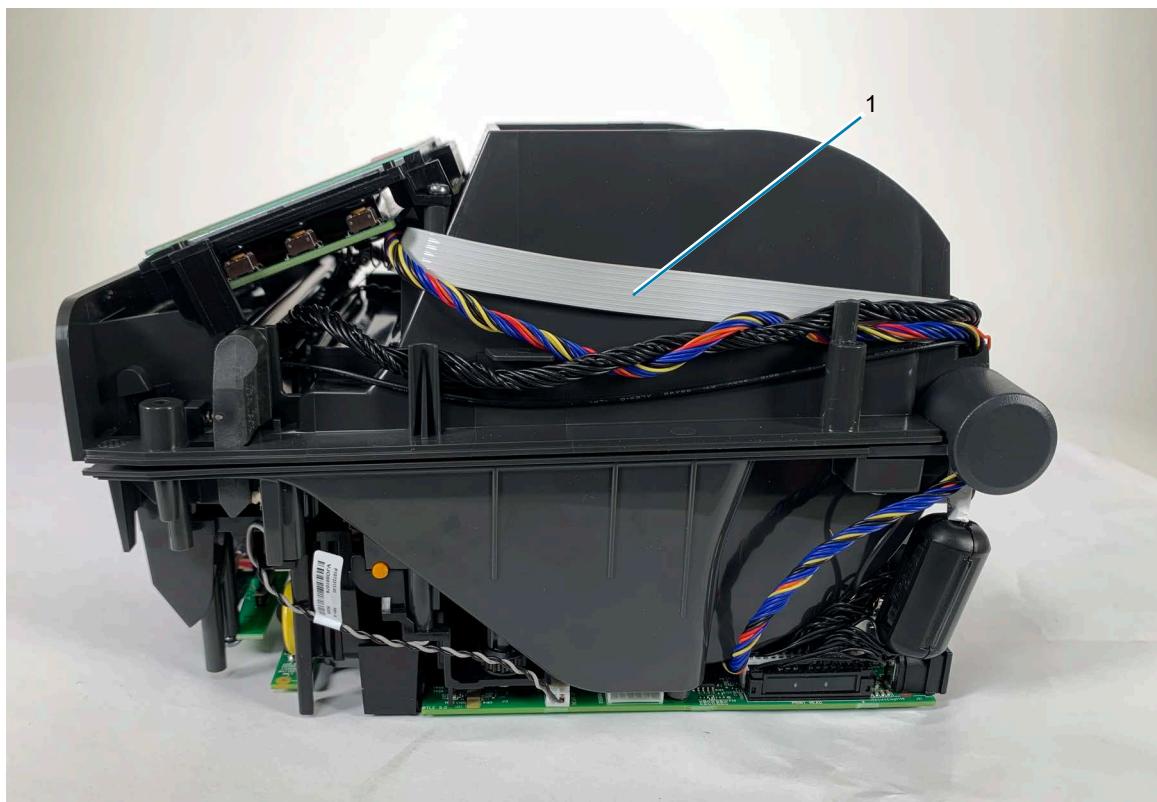




### Color Touch Display UI

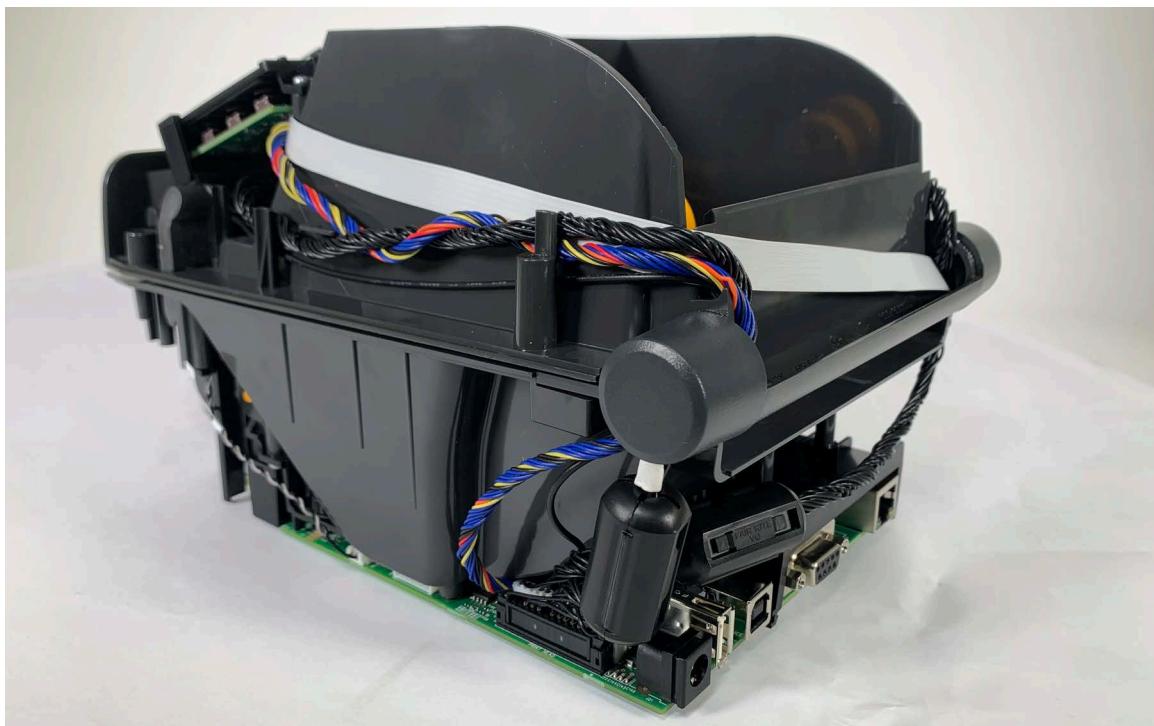


## Cable Routing for ZD621d

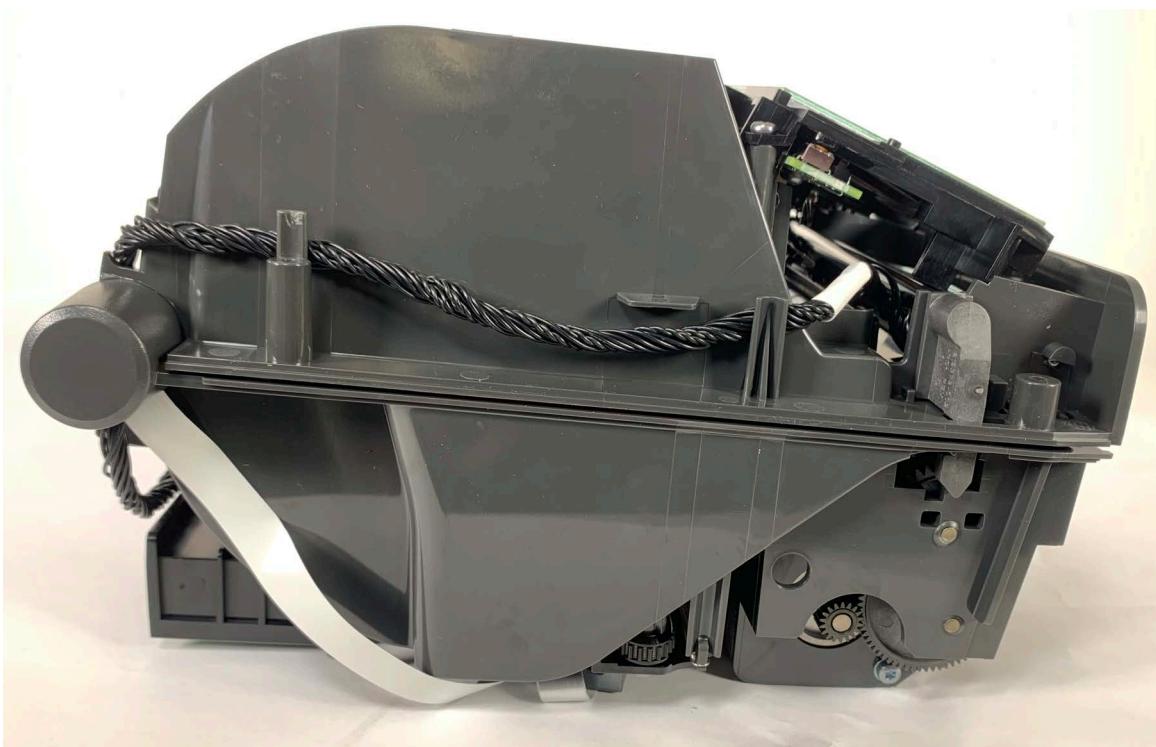


1 - Color Touch Display Cable

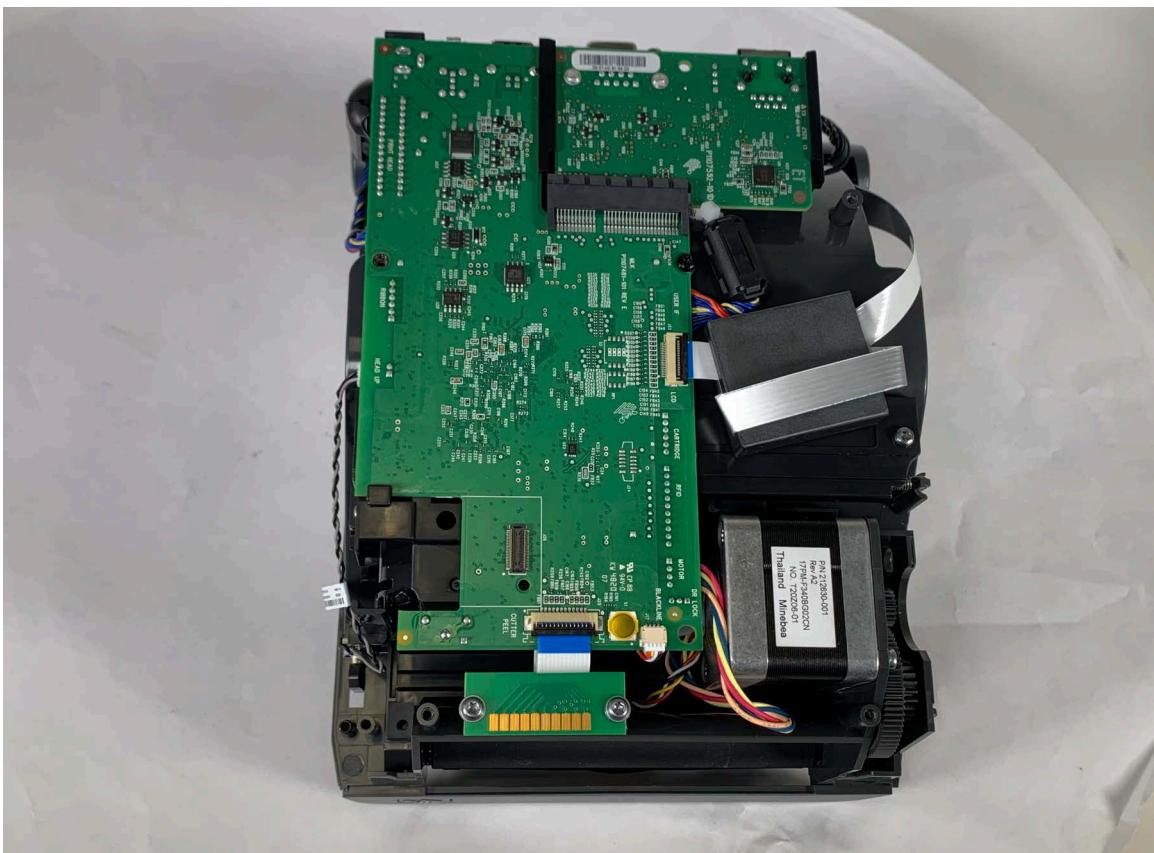
## Cable Routing for ZD621d



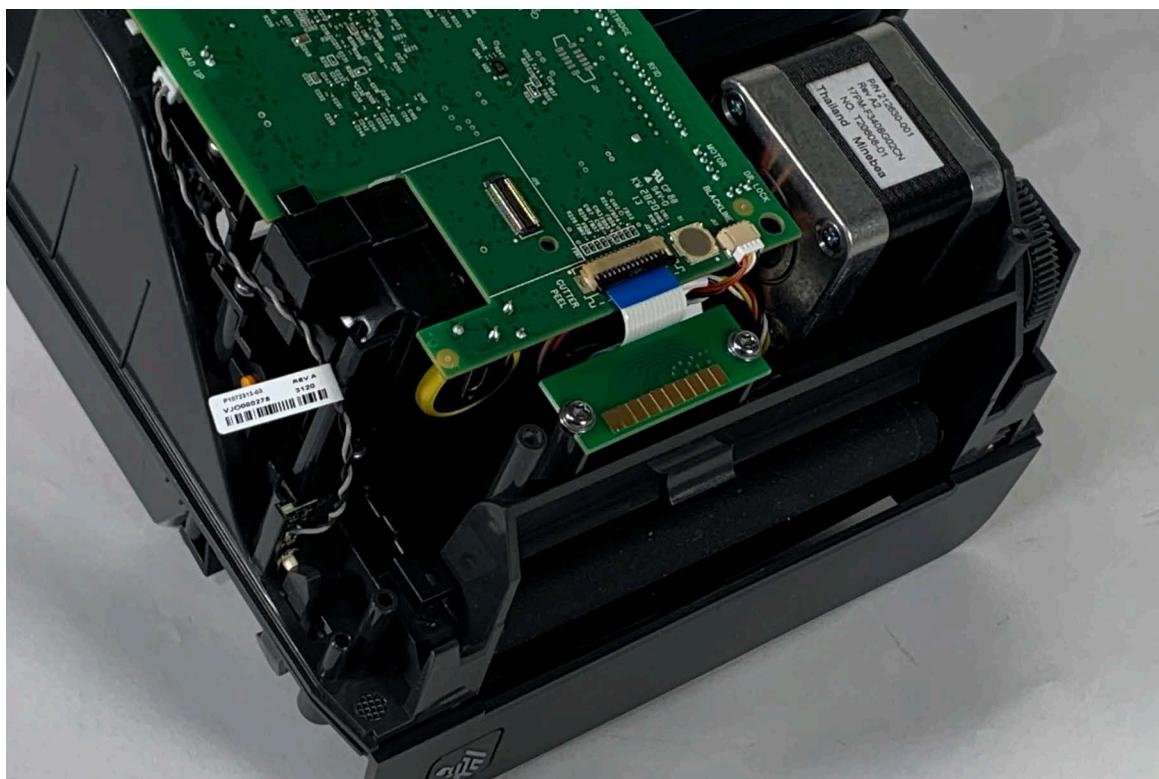
## Cable Routing for ZD621d



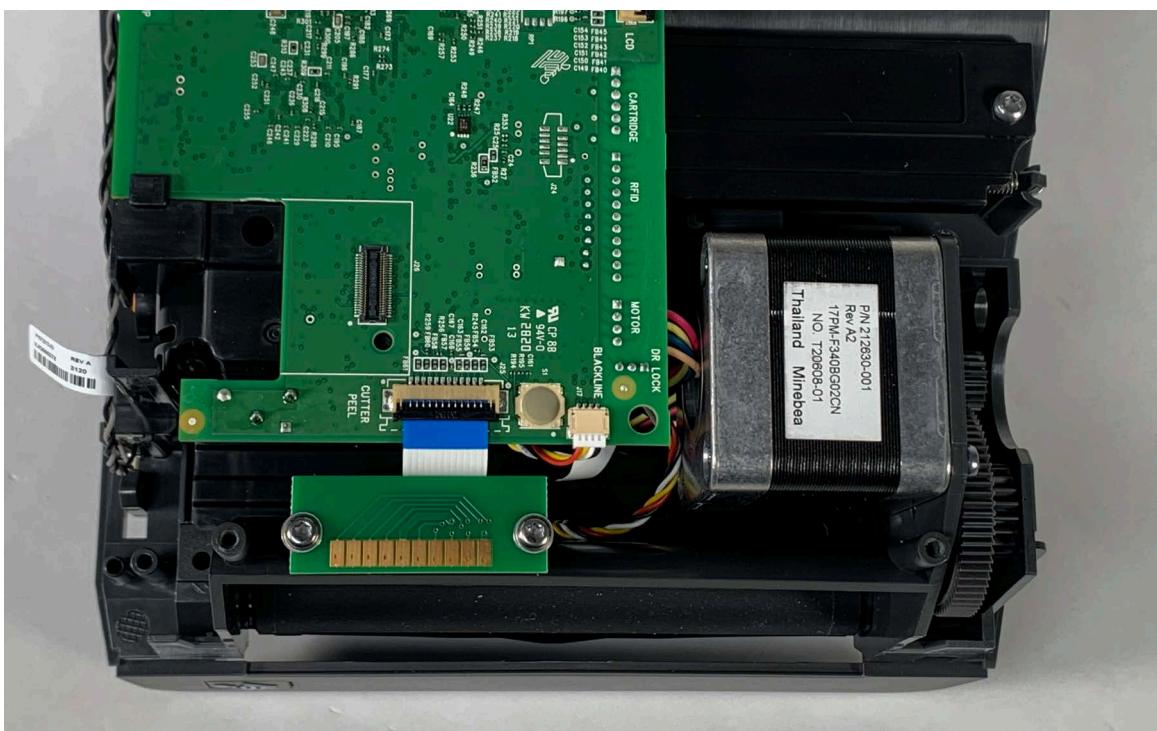
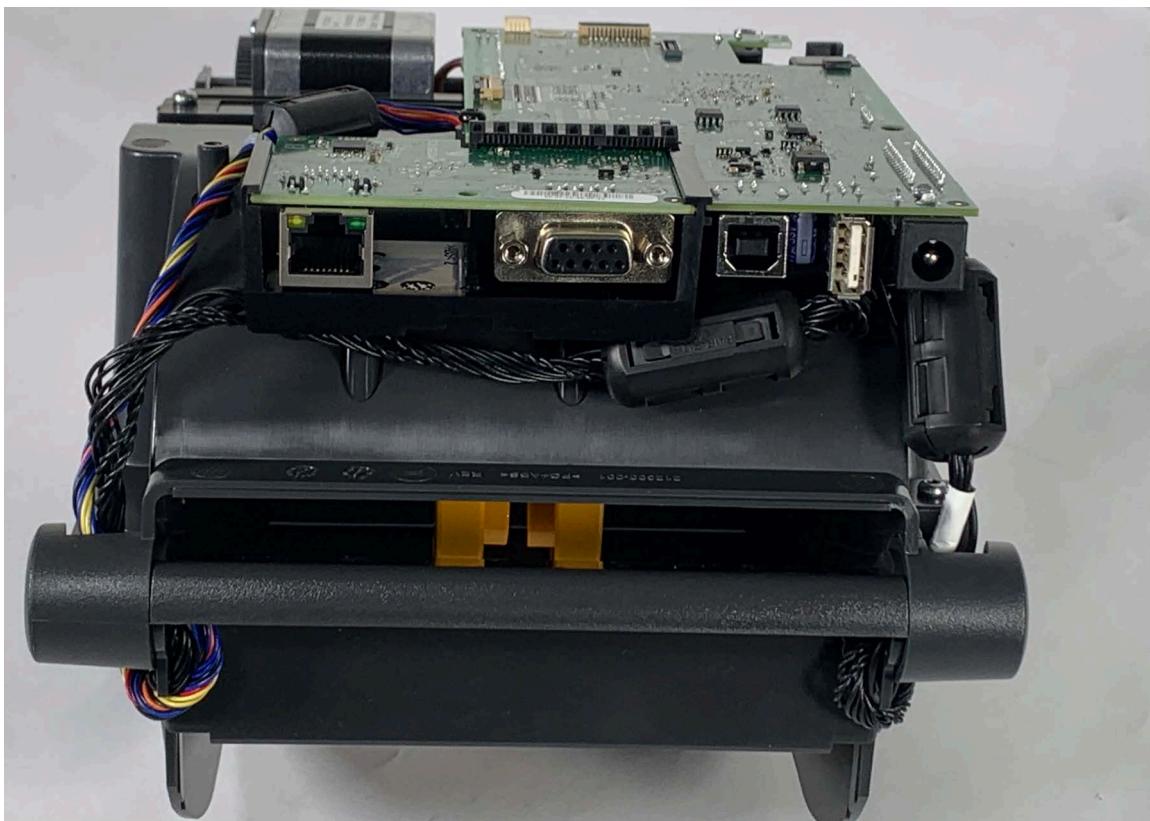
## Cable Routing for ZD621d



### 3 Button UI



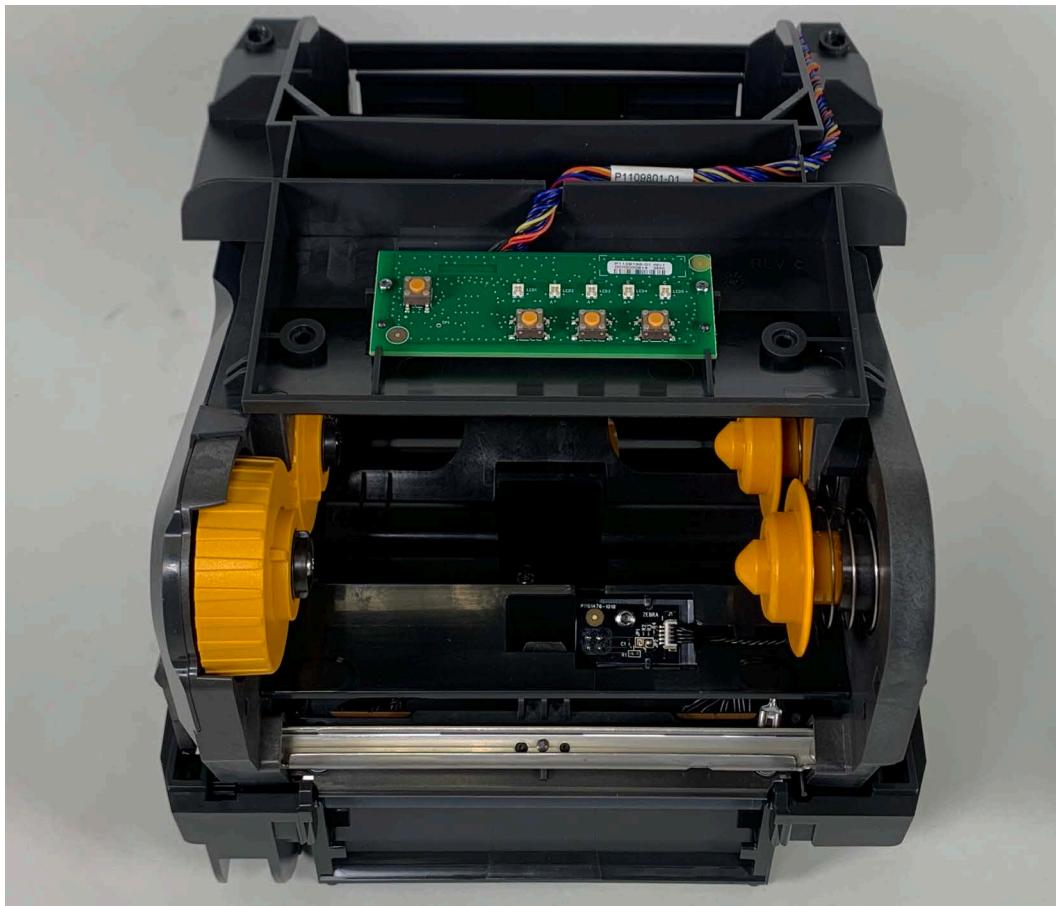
## Cable Routing for ZD621d



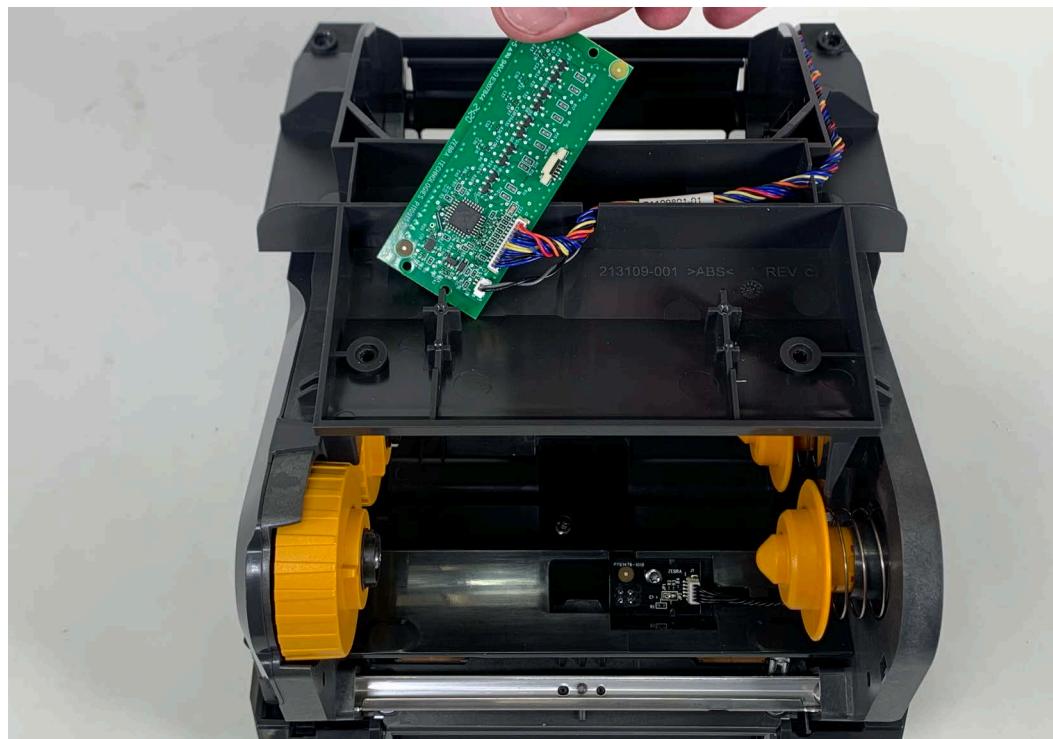
# Cable Routing for ZD421t

This section provides a visual printer reference for service personnel if wiring and components have shifted or come loose during repairs. The printer is shown with the cover and base removed.

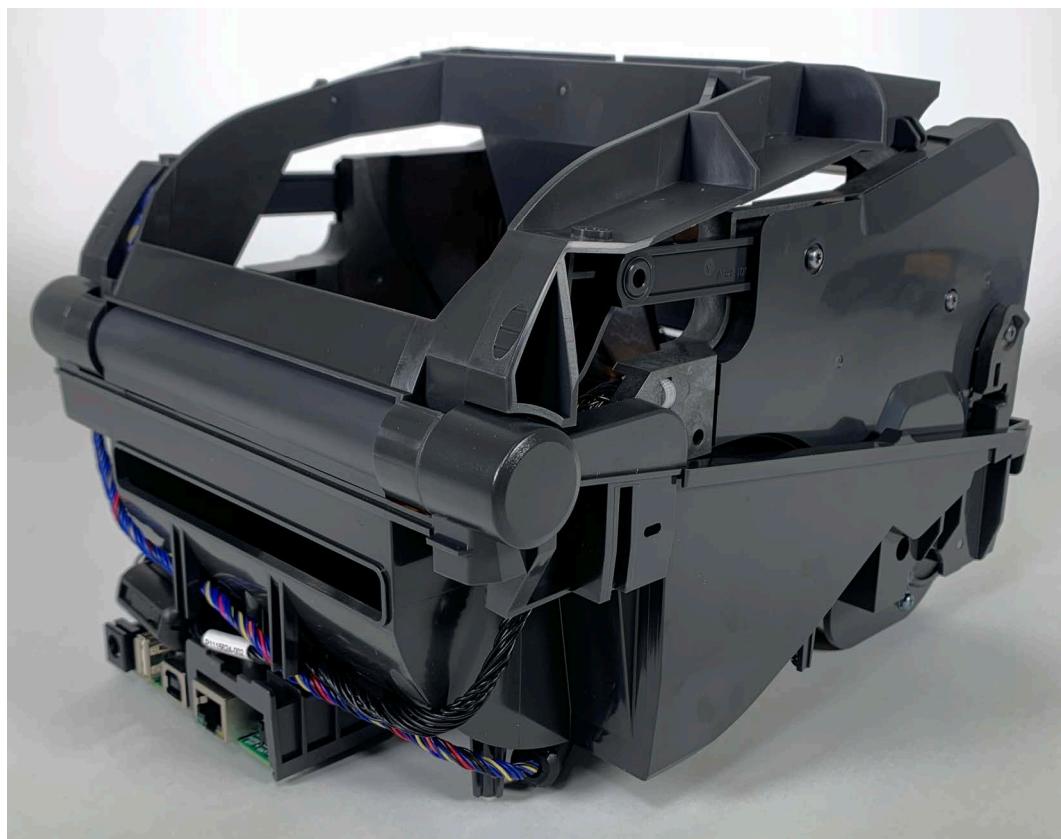
## ZD421t Ribbon Roll Thermal Transfer Printers



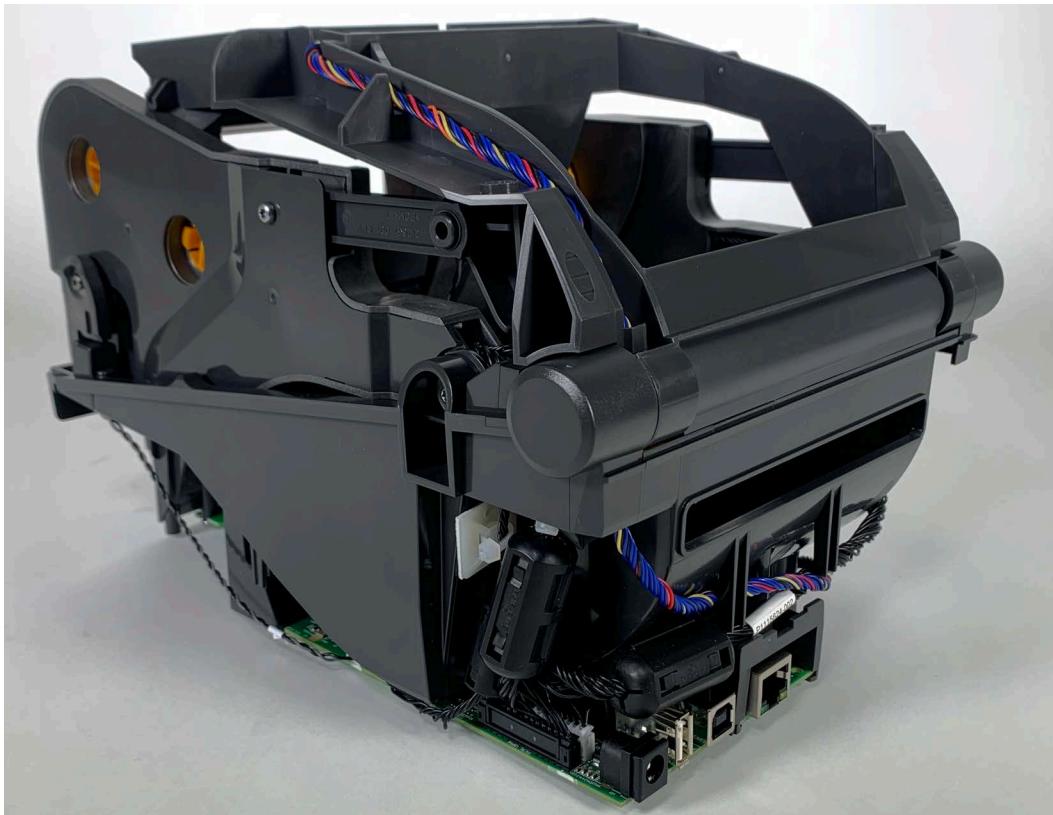
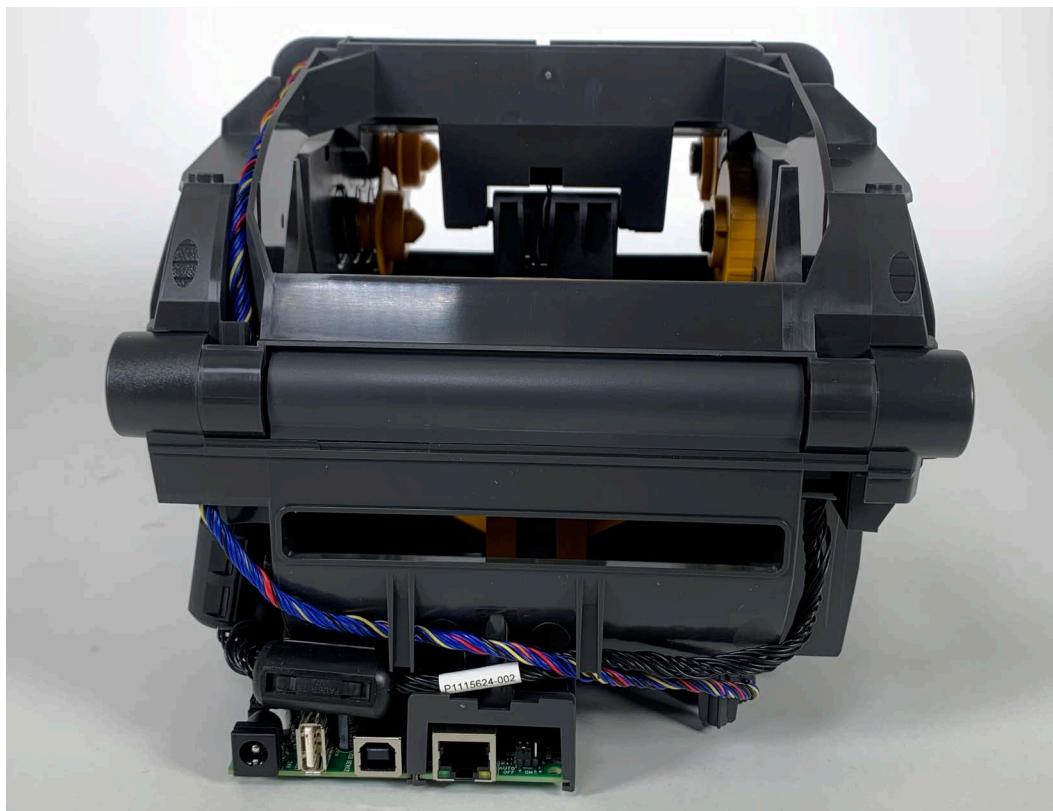
## Cable Routing for ZD421t



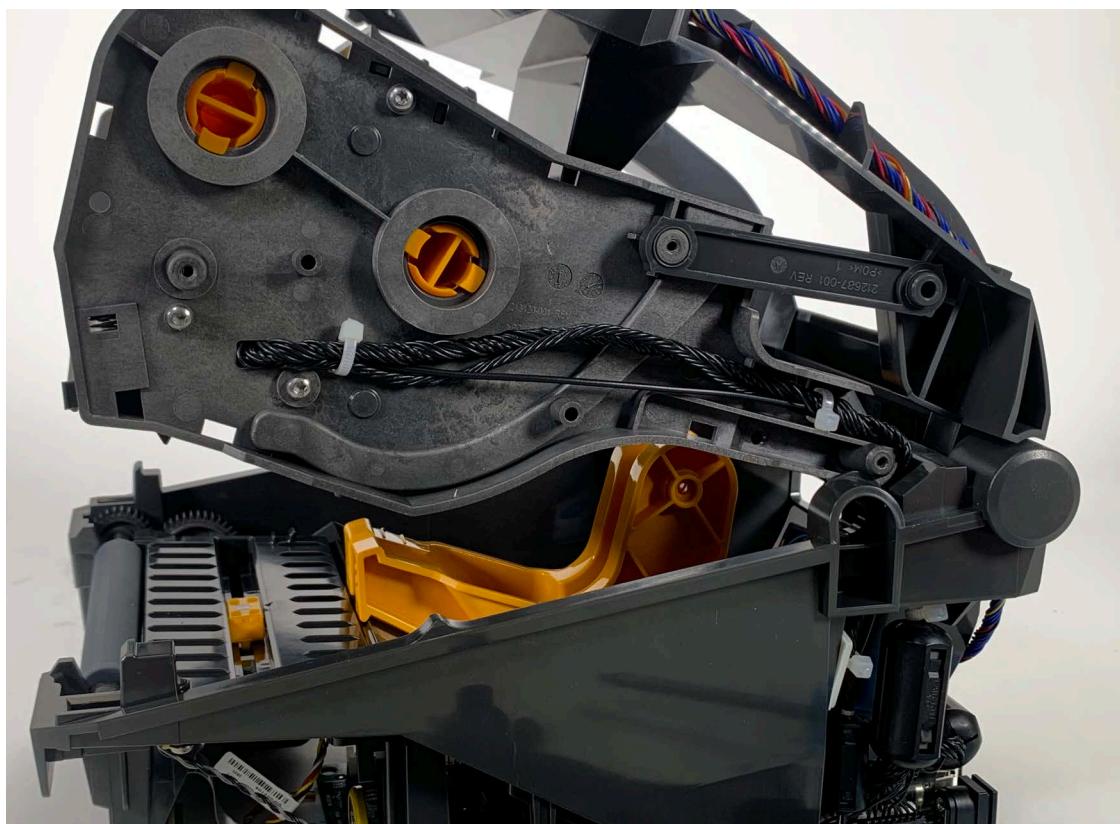
## Cable Routing for ZD421t



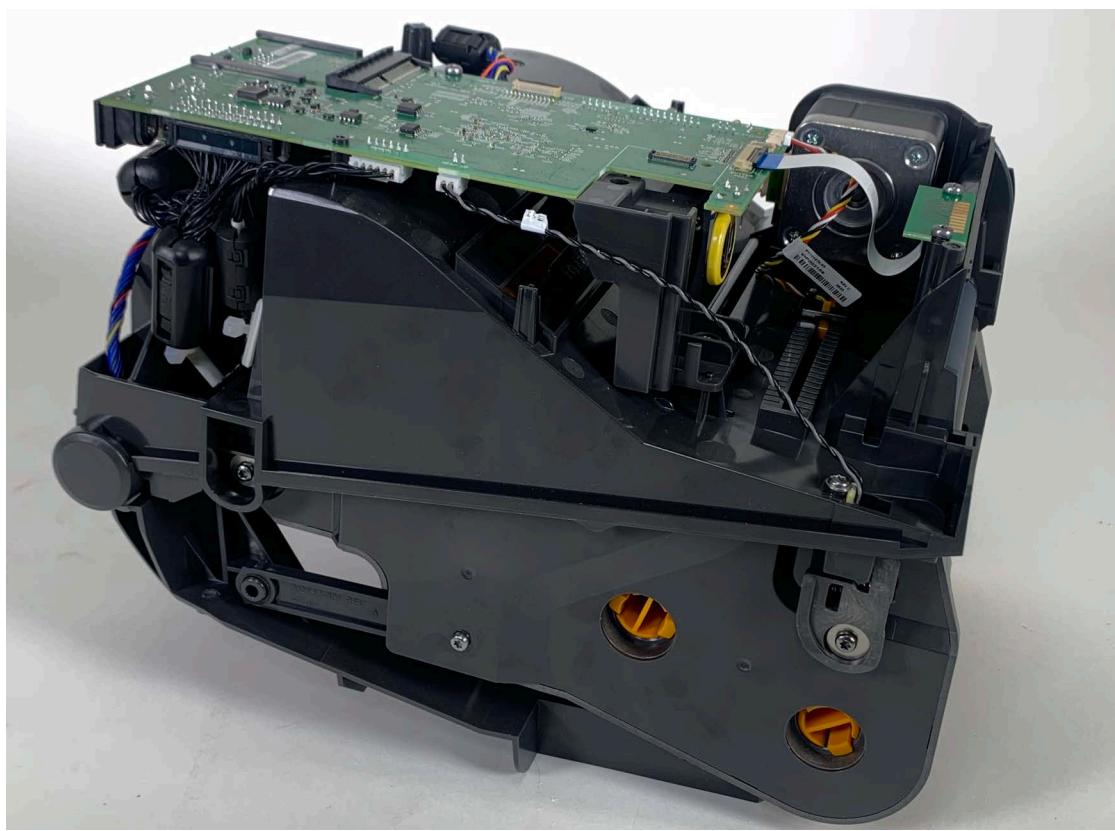
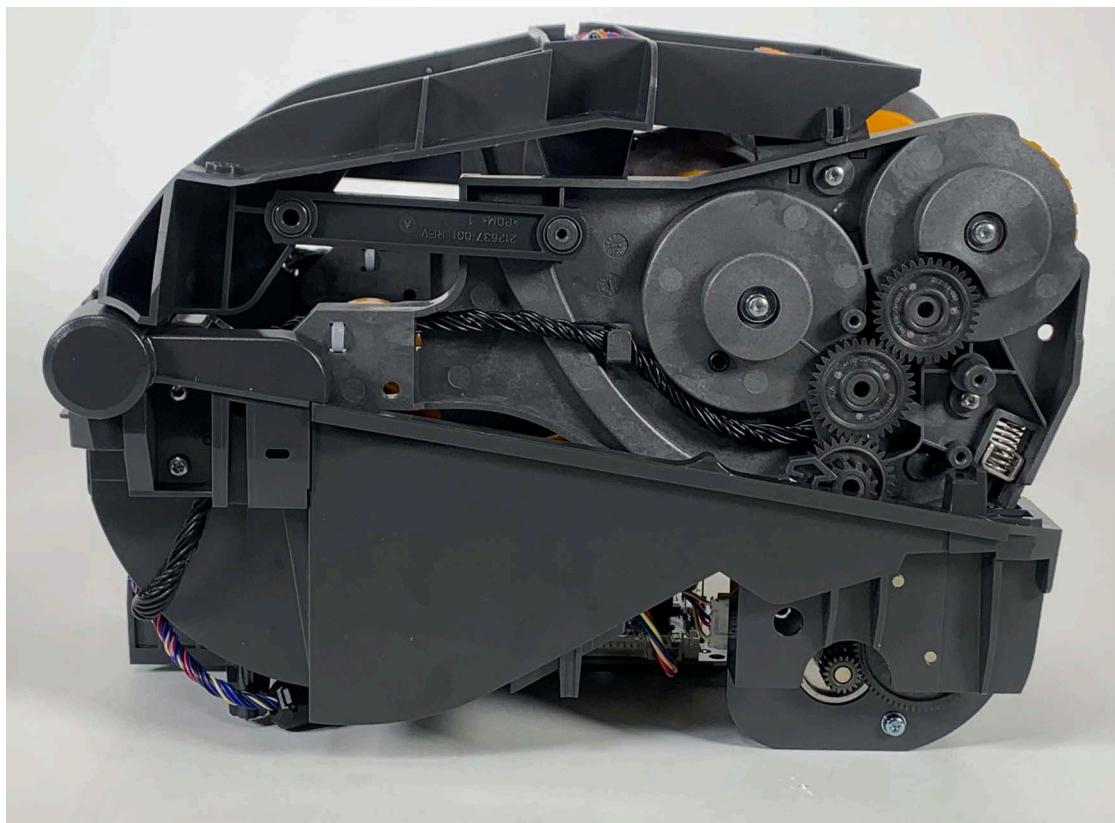
## Cable Routing for ZD421t



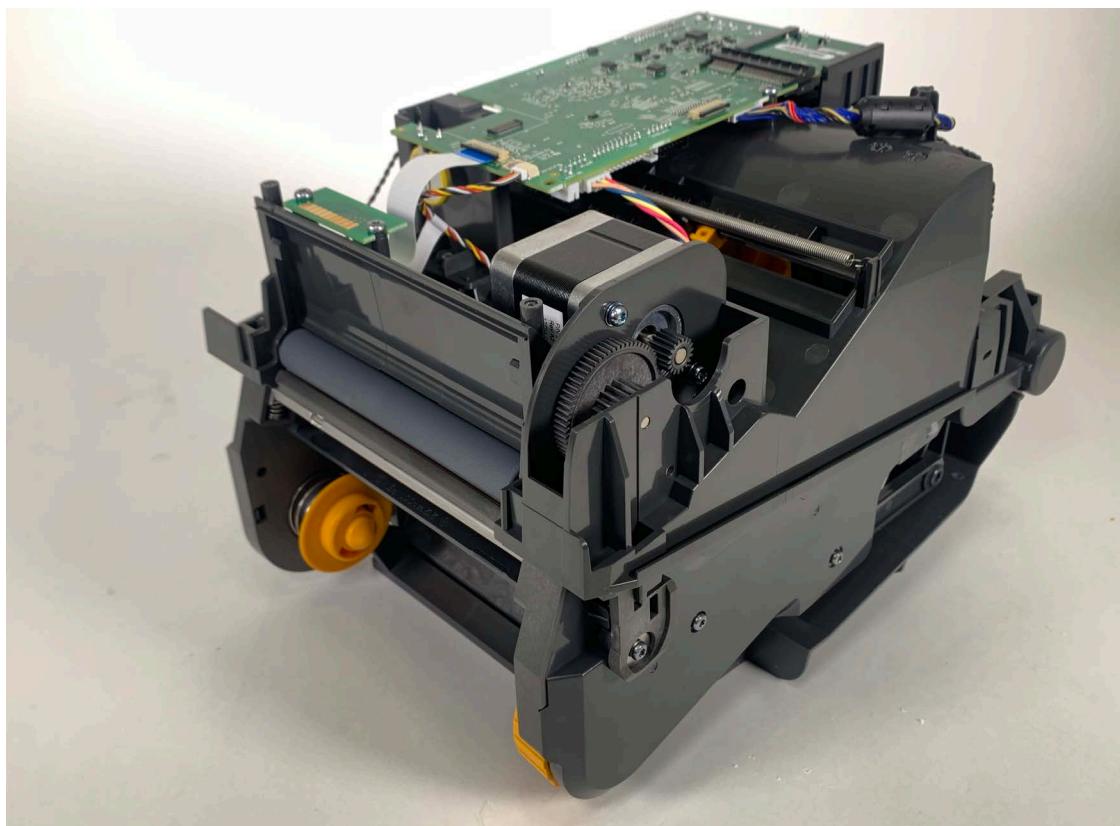
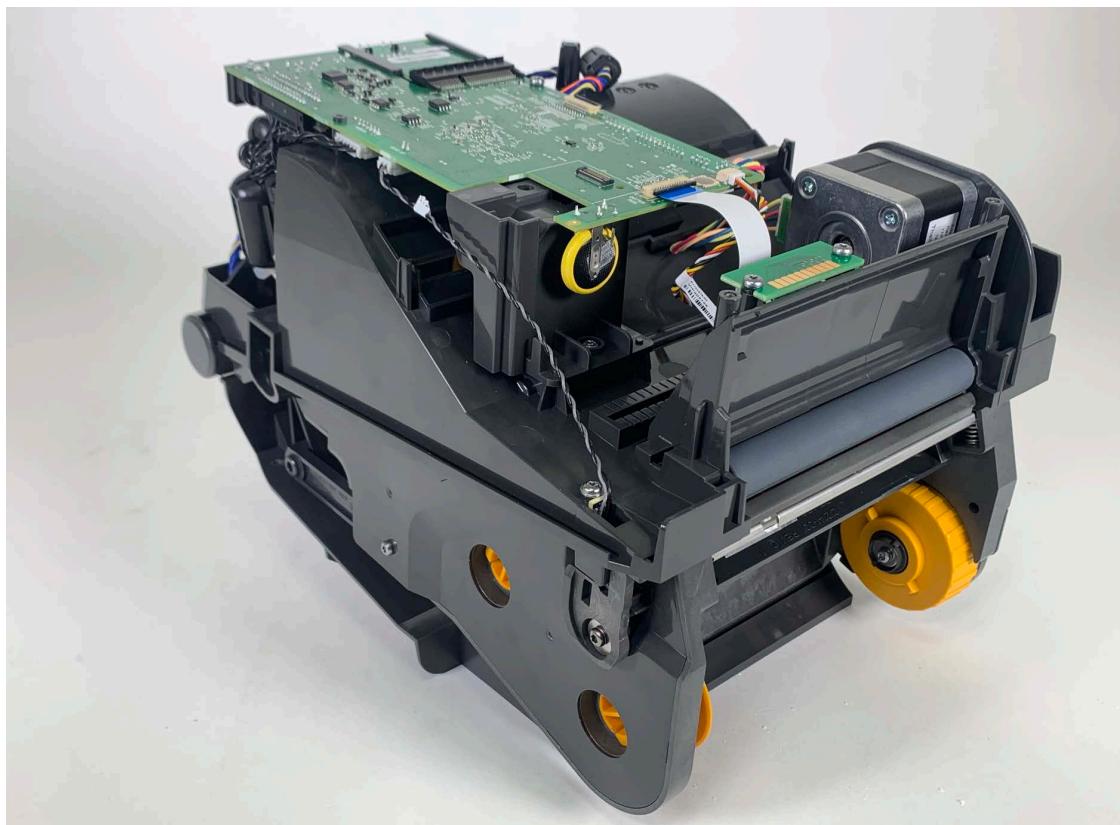
## Cable Routing for ZD421t



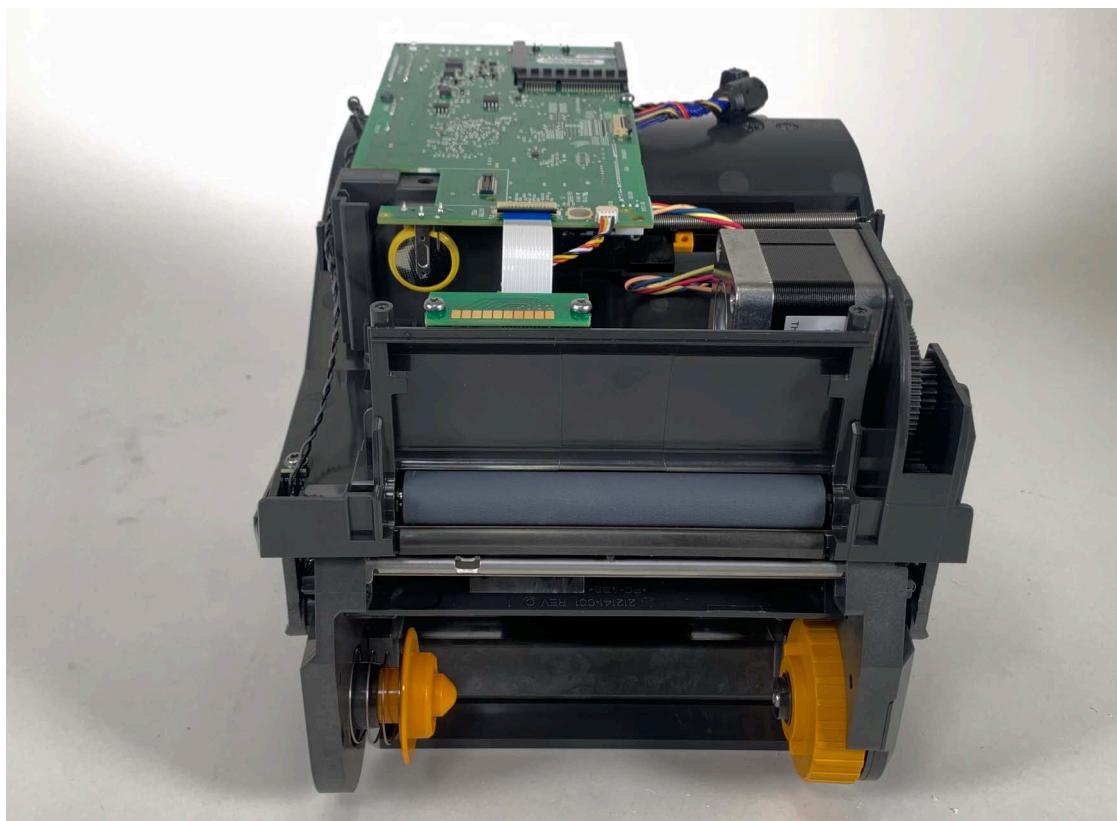
## Cable Routing for ZD421t



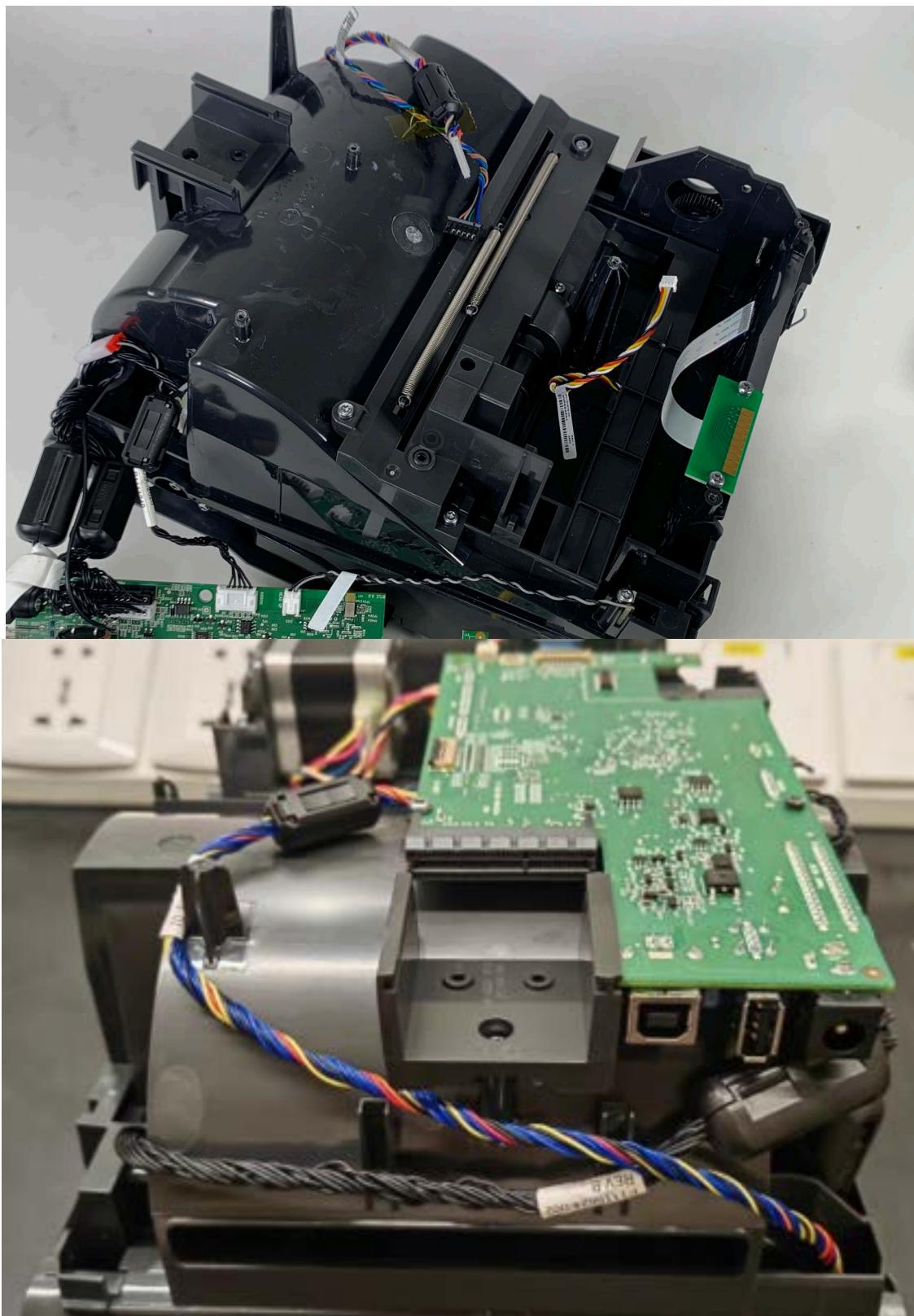
## Cable Routing for ZD421t



## Cable Routing for ZD421t

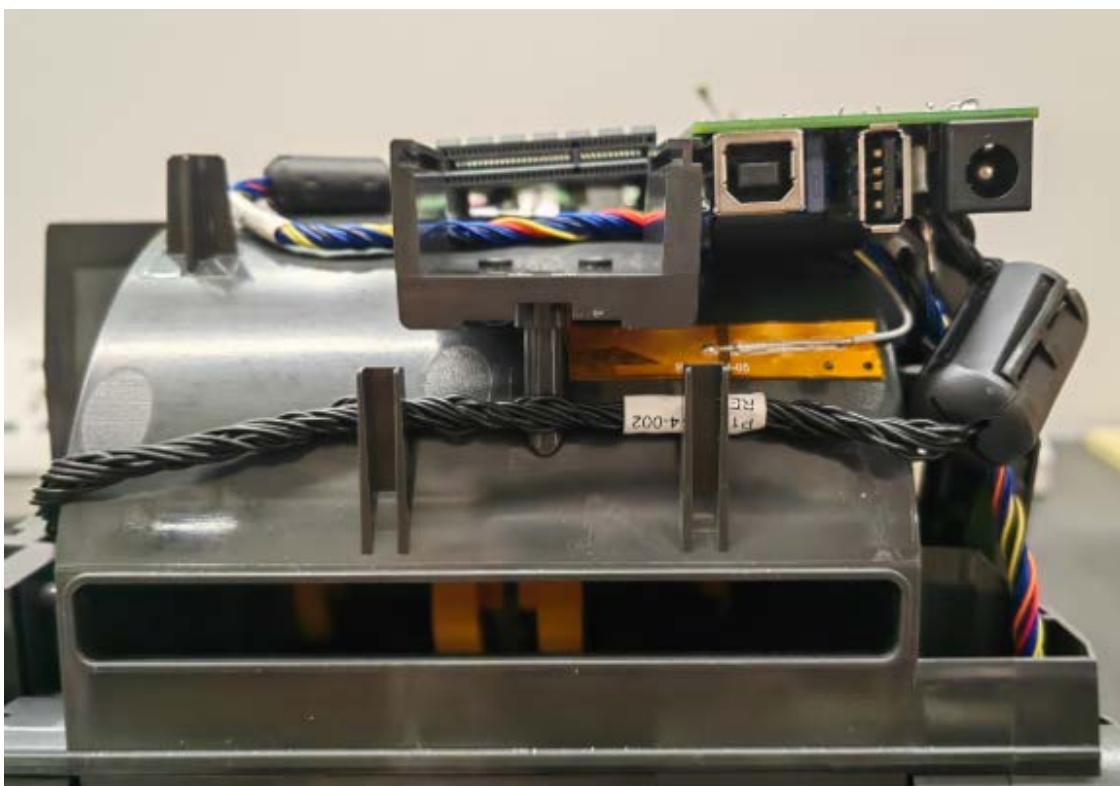


## Cable Routing for ZD421t



## Cable Routing for ZD421t

Route cable to avoid contact with the Wi-Fi antenna.

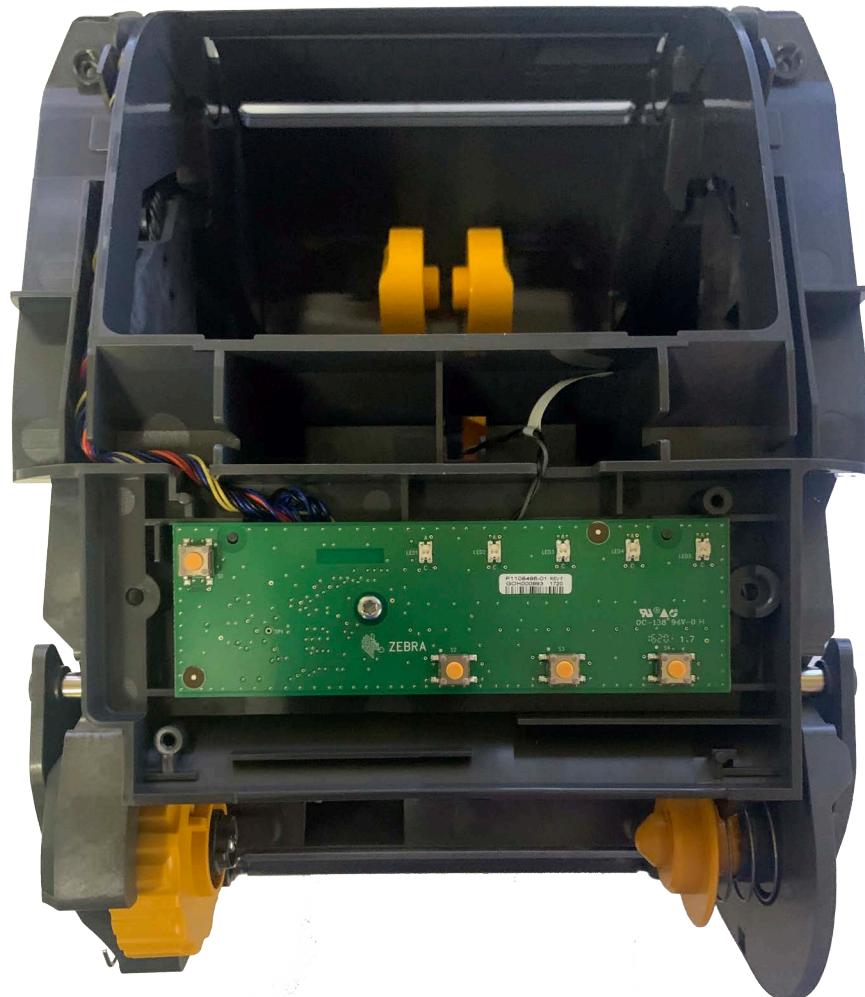


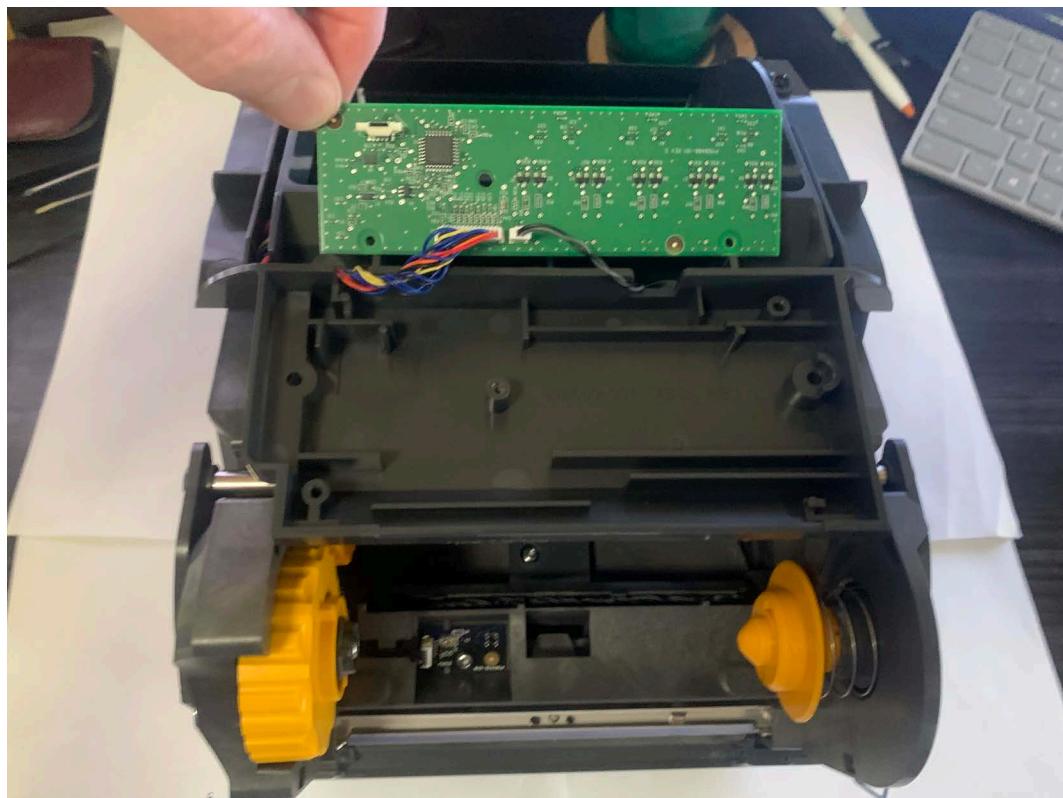
# Cable Routing for ZD621t

This section provides a visual printer reference for service personnel if wiring and components have shifted or come loose during repairs. The printer is shown with the cover and base removed.

## ZD621 Ribbon Roll Thermal Transfer Printers

### Basic 3 Button UI

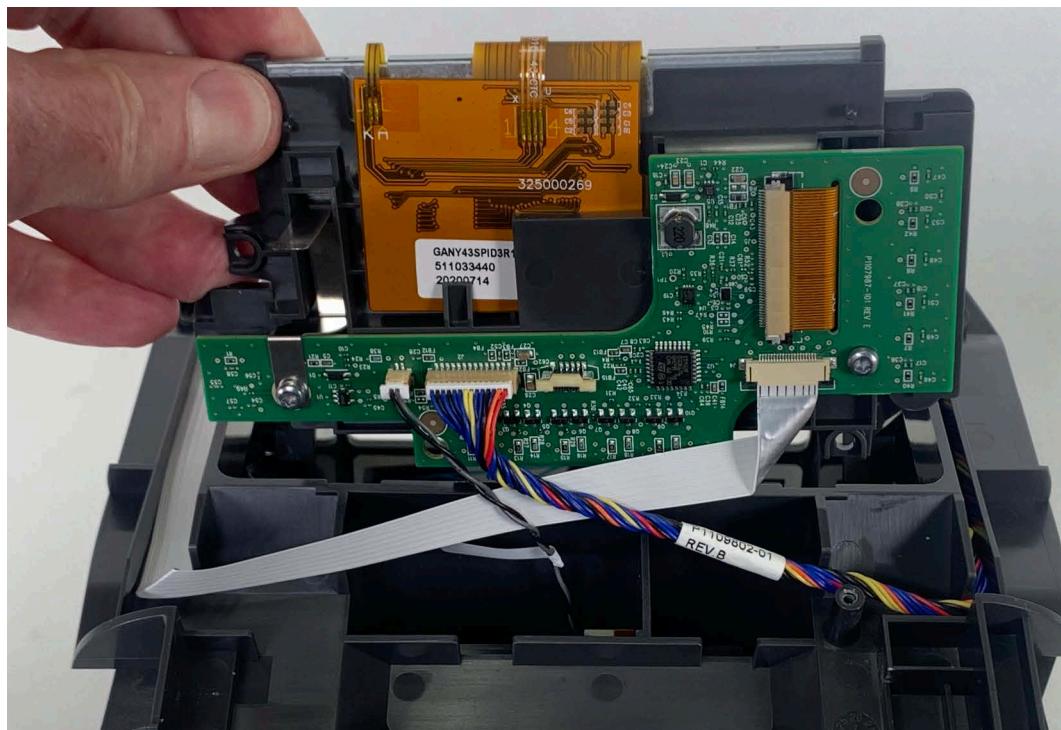




### Color Touch Display UI



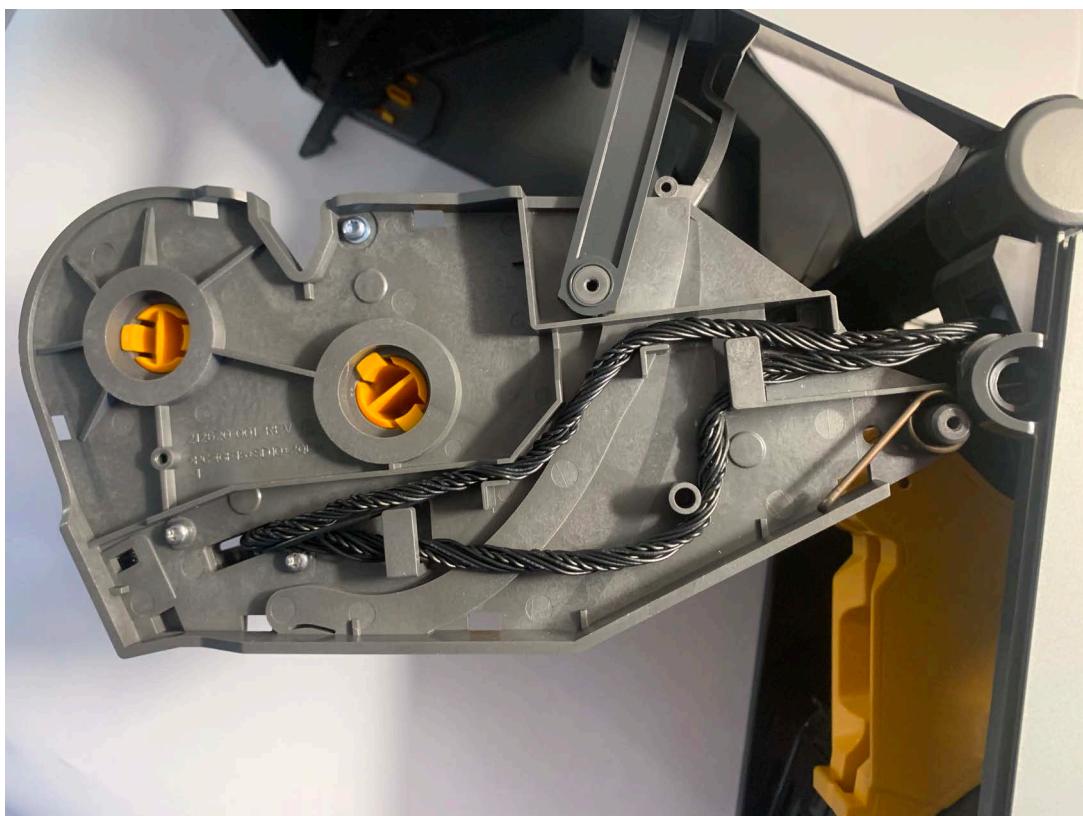
## Cable Routing for ZD621t



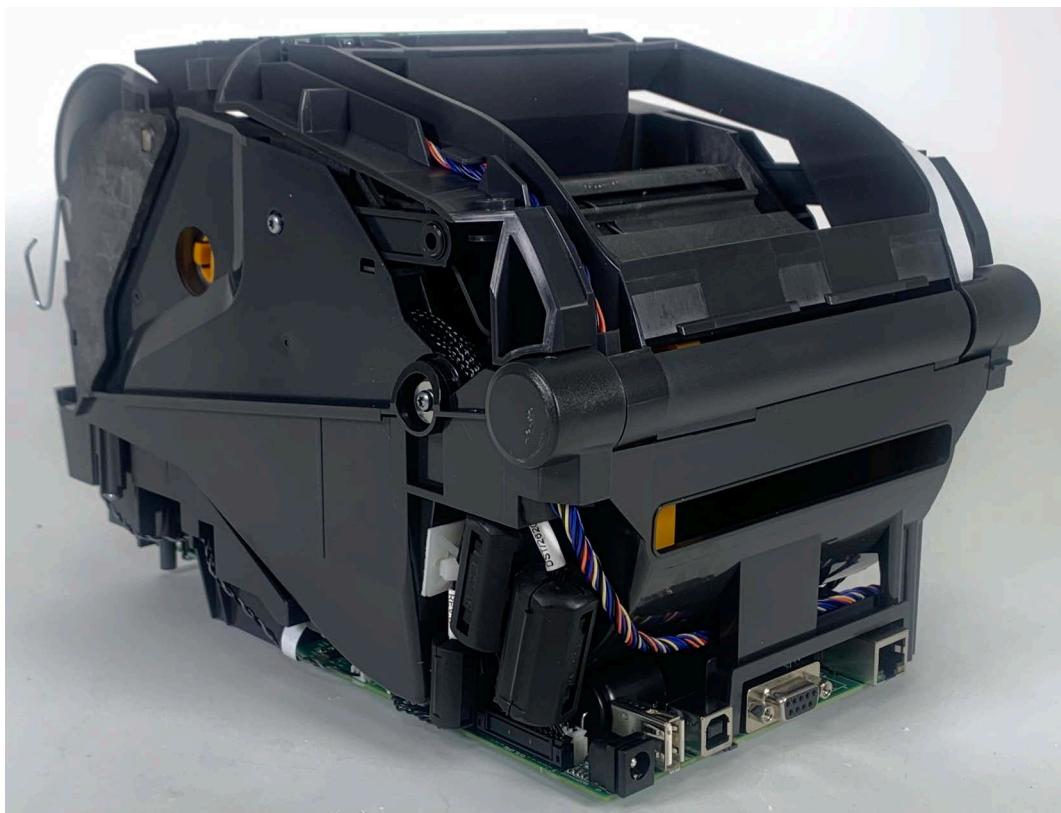
## Cable Routing for ZD621t



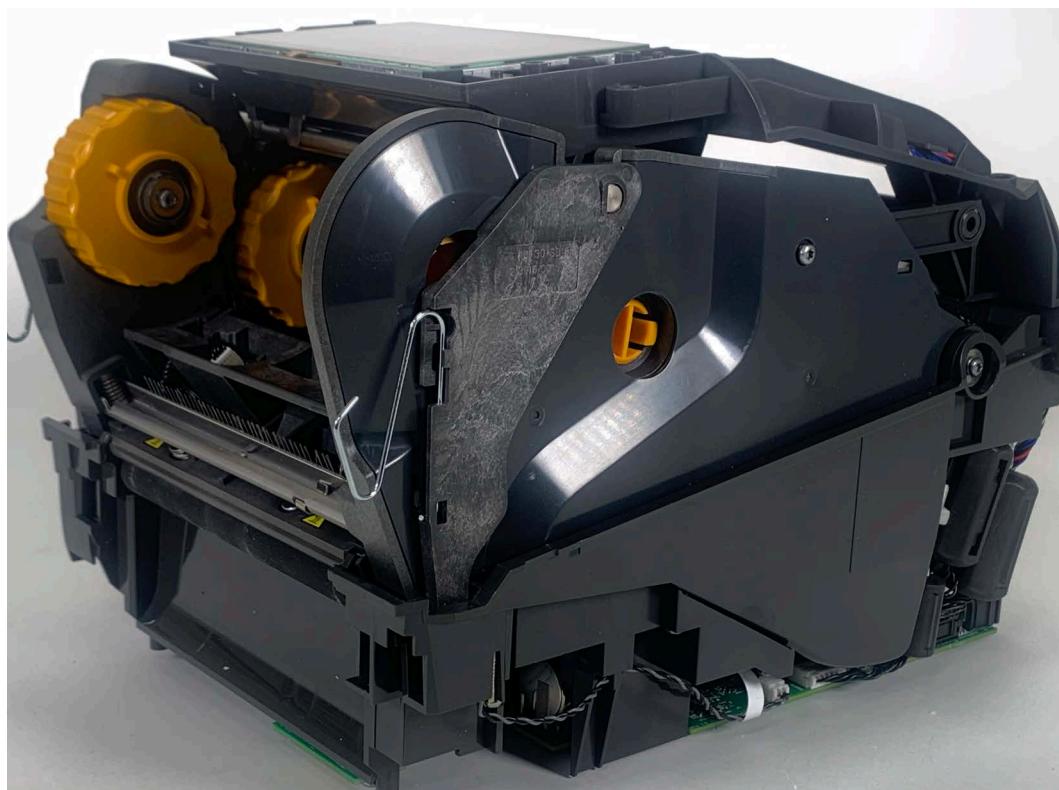
## Cable Routing for ZD621t



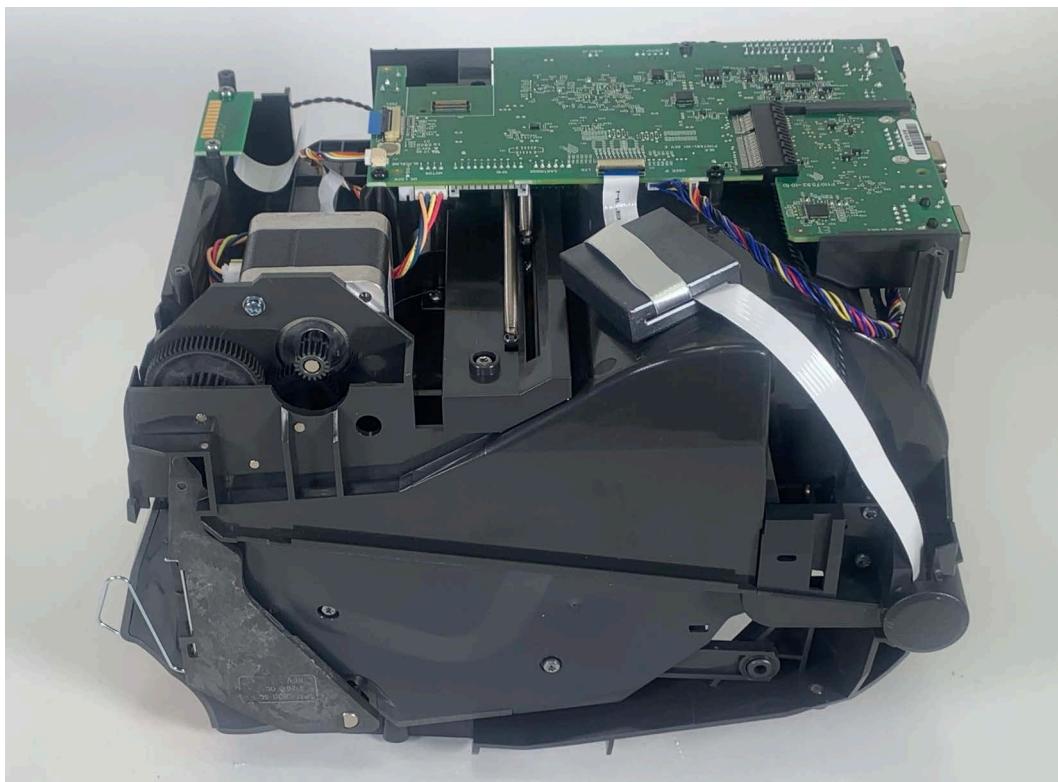
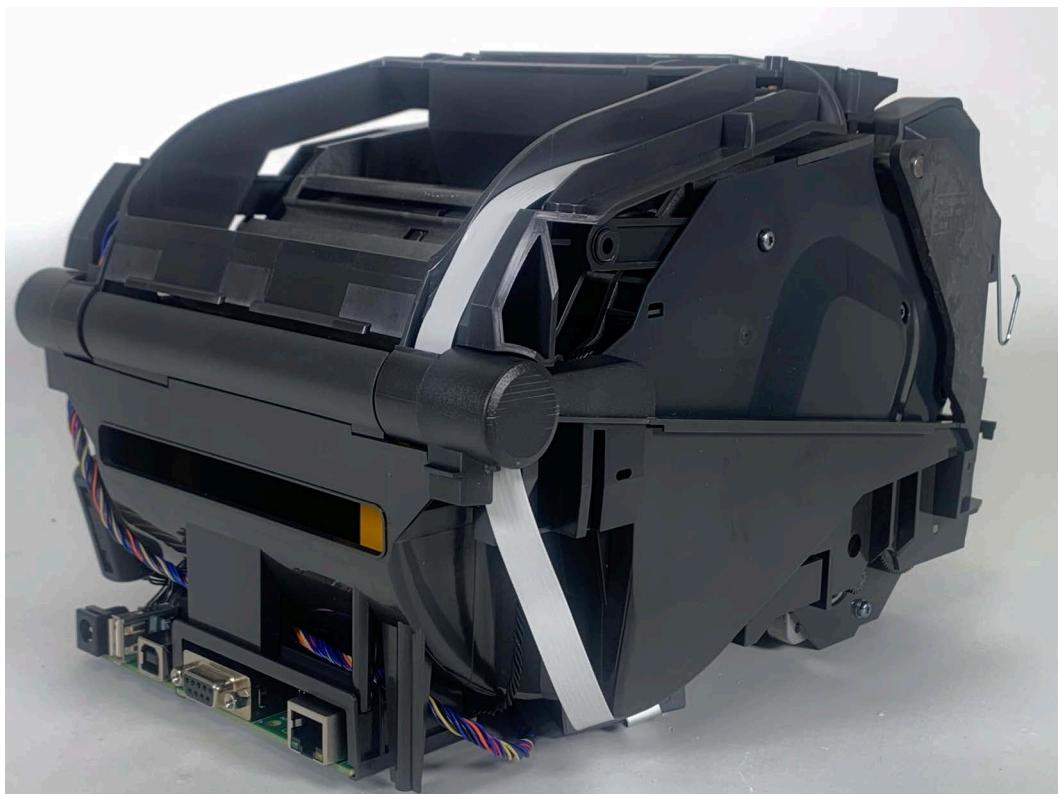
## Cable Routing for ZD621t



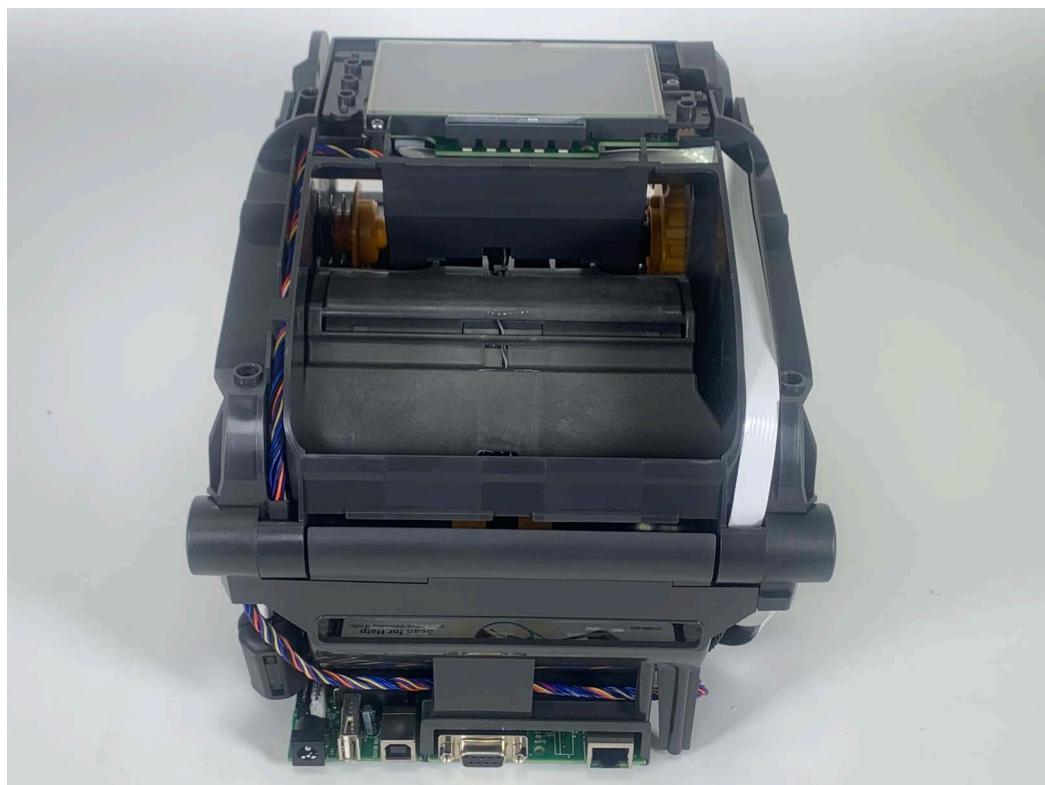
## Cable Routing for ZD621t



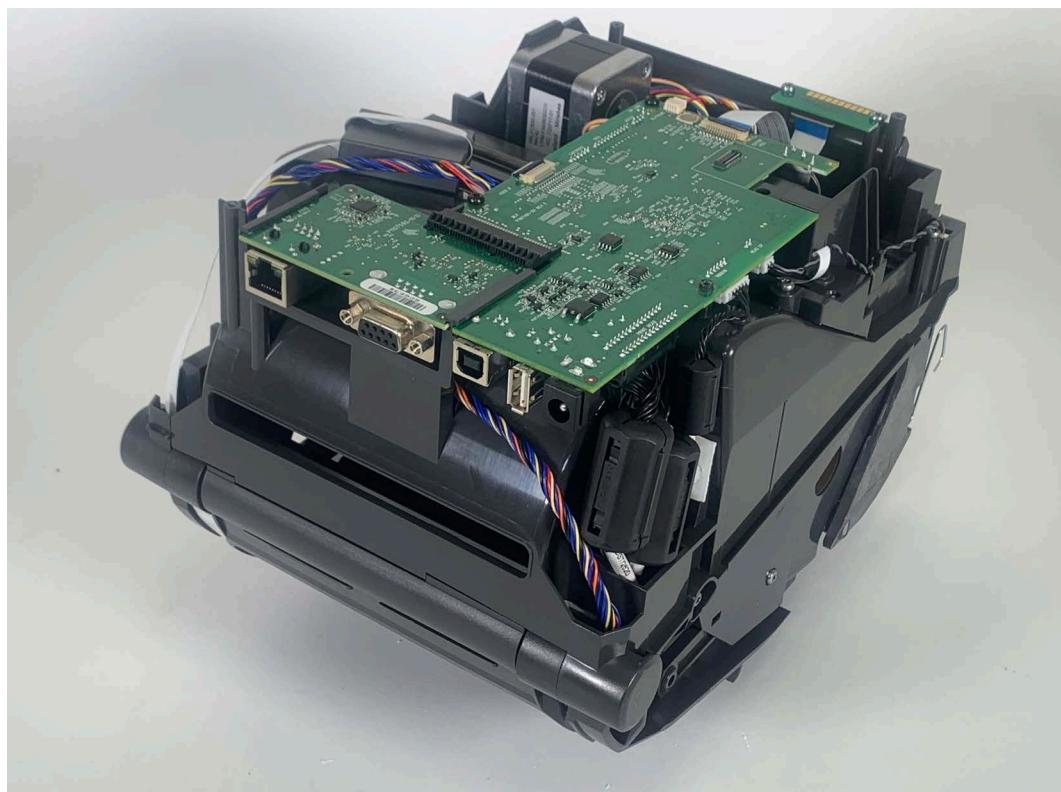
## Cable Routing for ZD621t



## Cable Routing for ZD621t



## Cable Routing for ZD621t

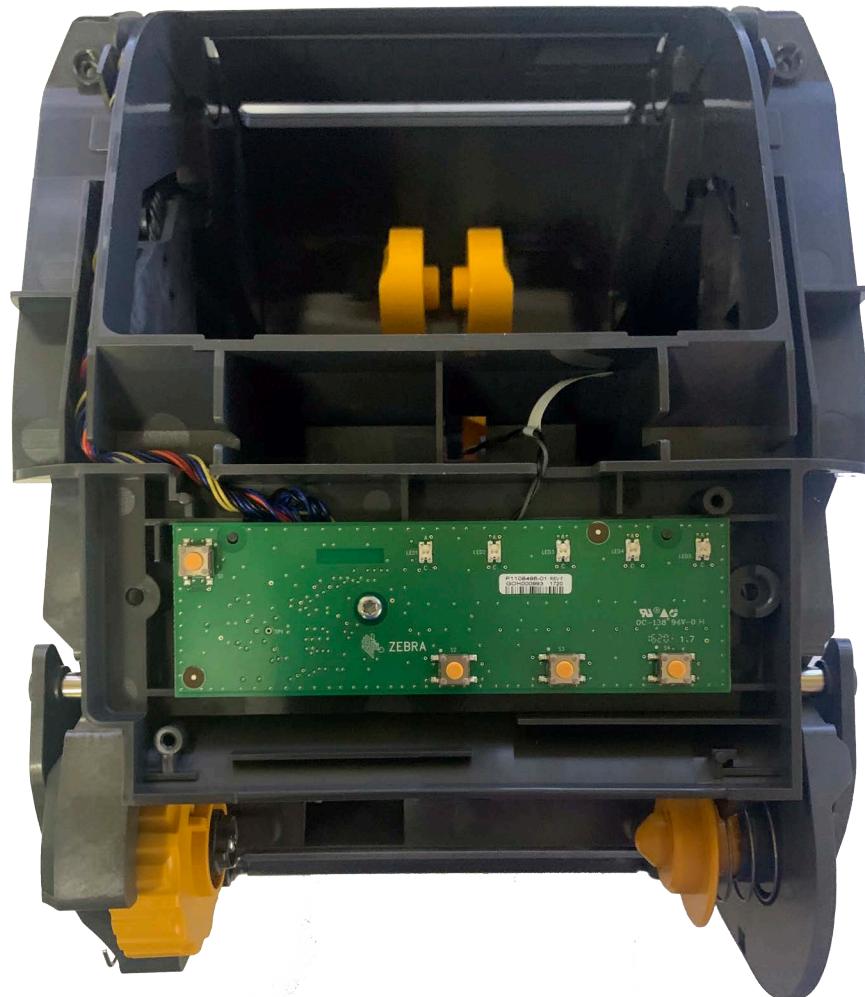


# Cable Routing for ZD621R

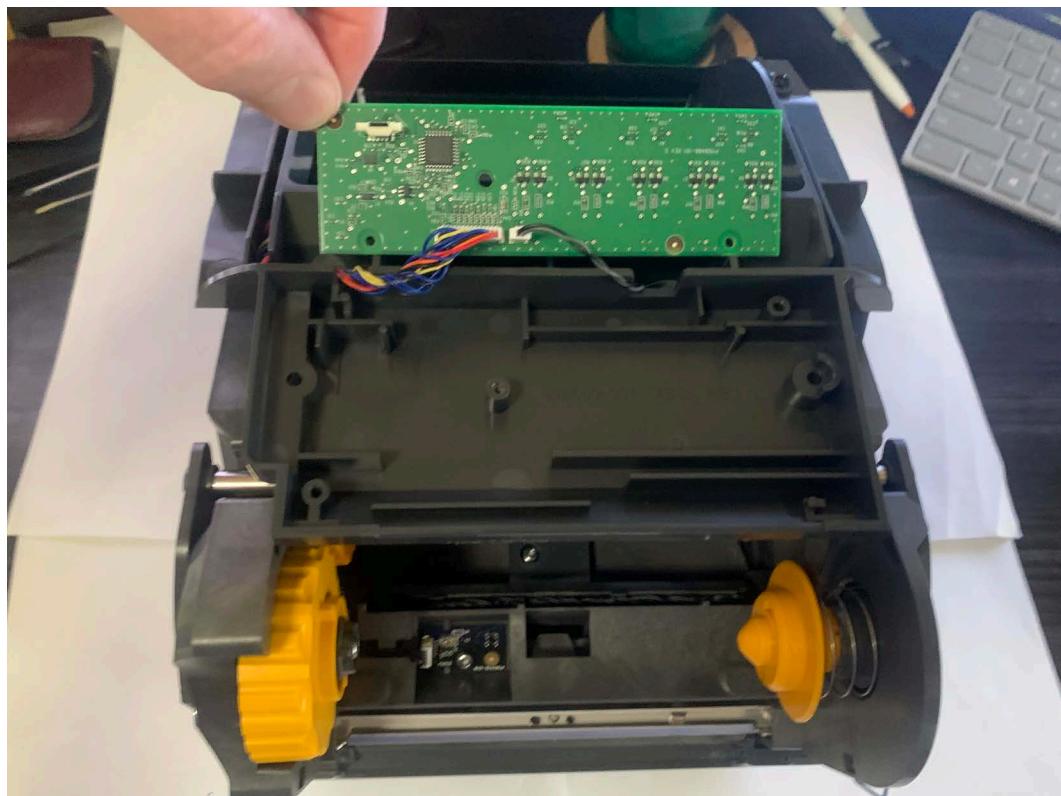
This section provides a visual printer reference for service personnel if wiring and components have shifted or come loose during repairs. The printer is shown with the cover and base removed.

## ZD621RFID Thermal Transfer Printers

### Basic 3 Button UI



## Cable Routing for ZD621R



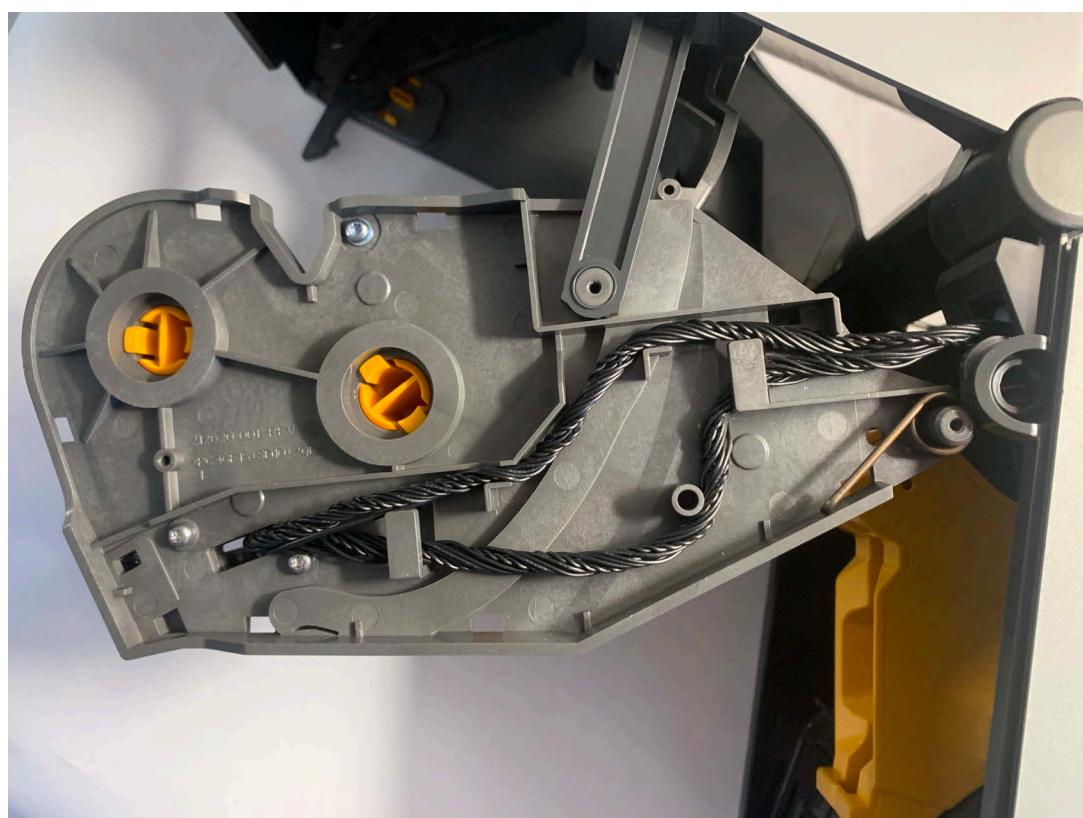
## Cable Routing for ZD621R



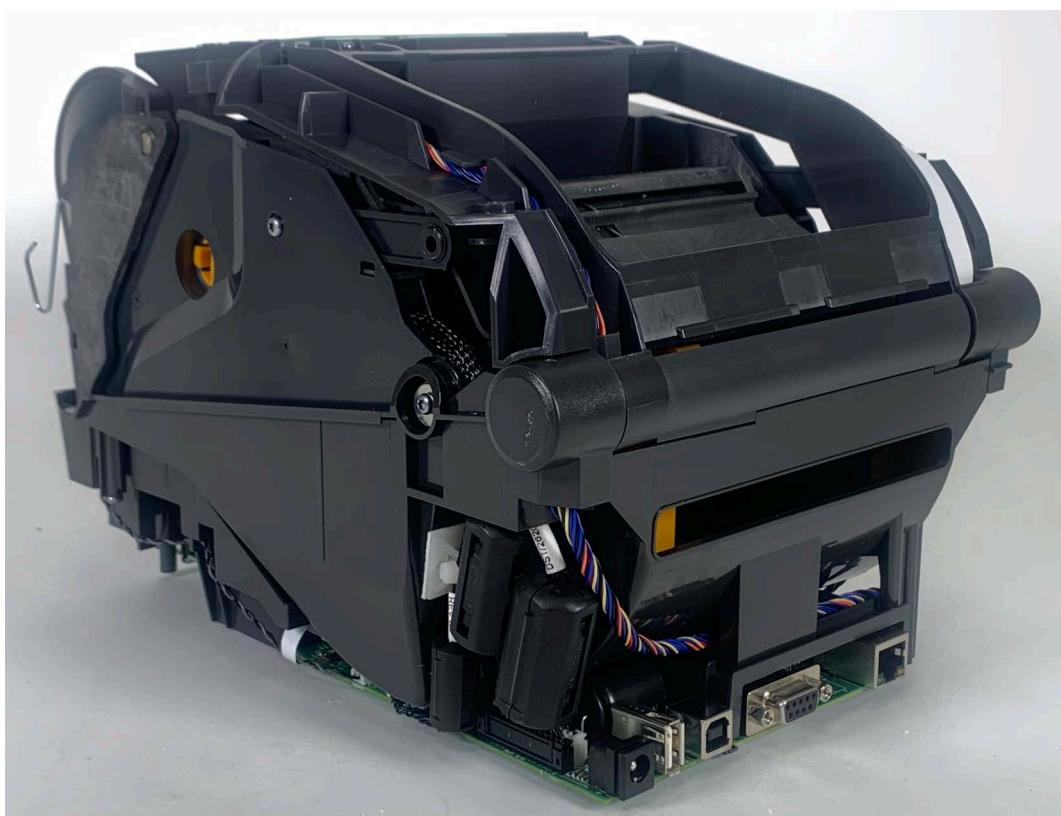
## Cable Routing for ZD621R



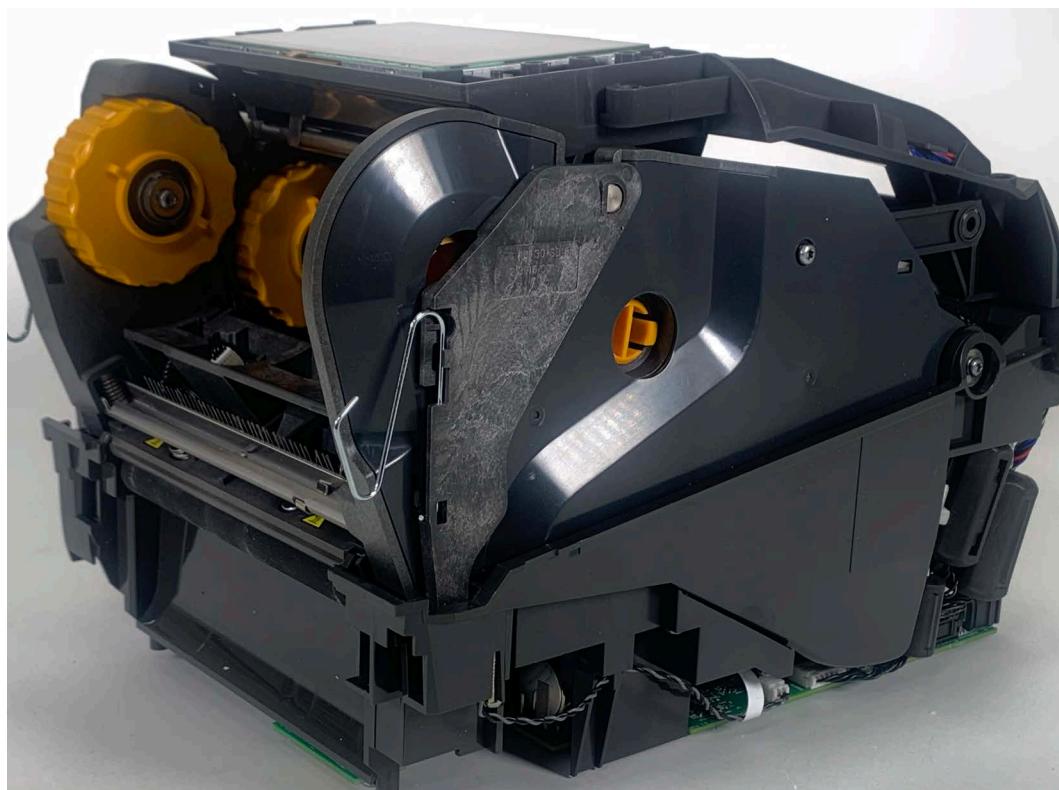
## Cable Routing for ZD621R



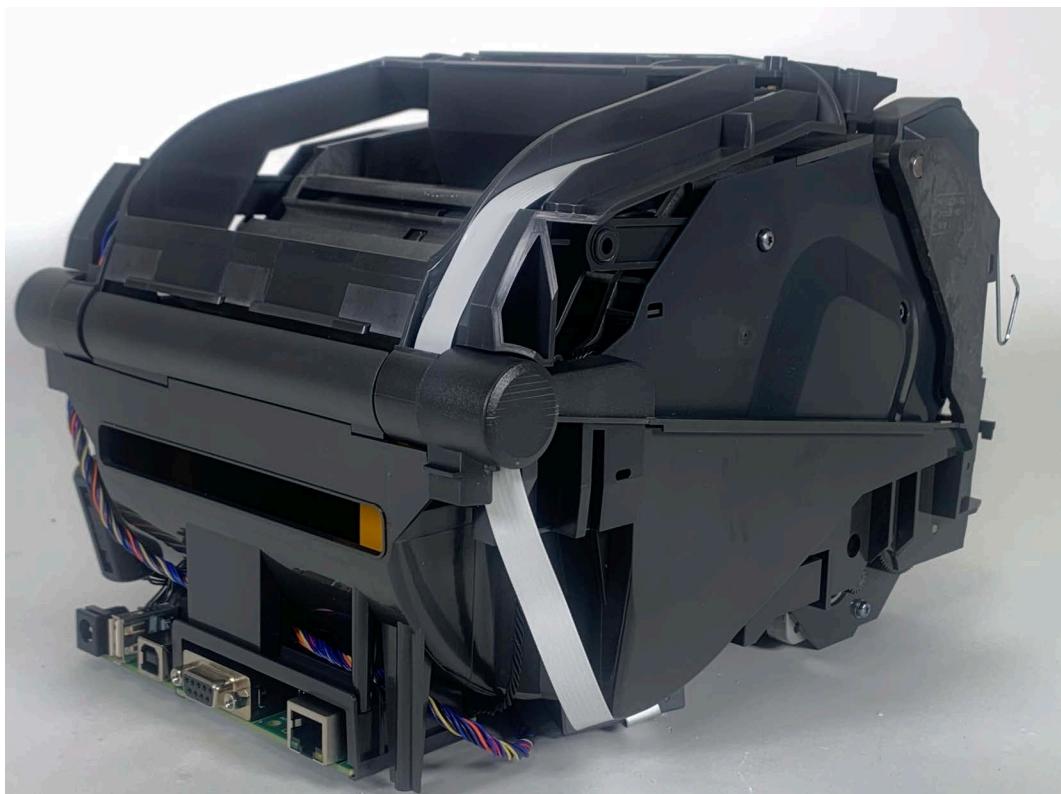
## Cable Routing for ZD621R



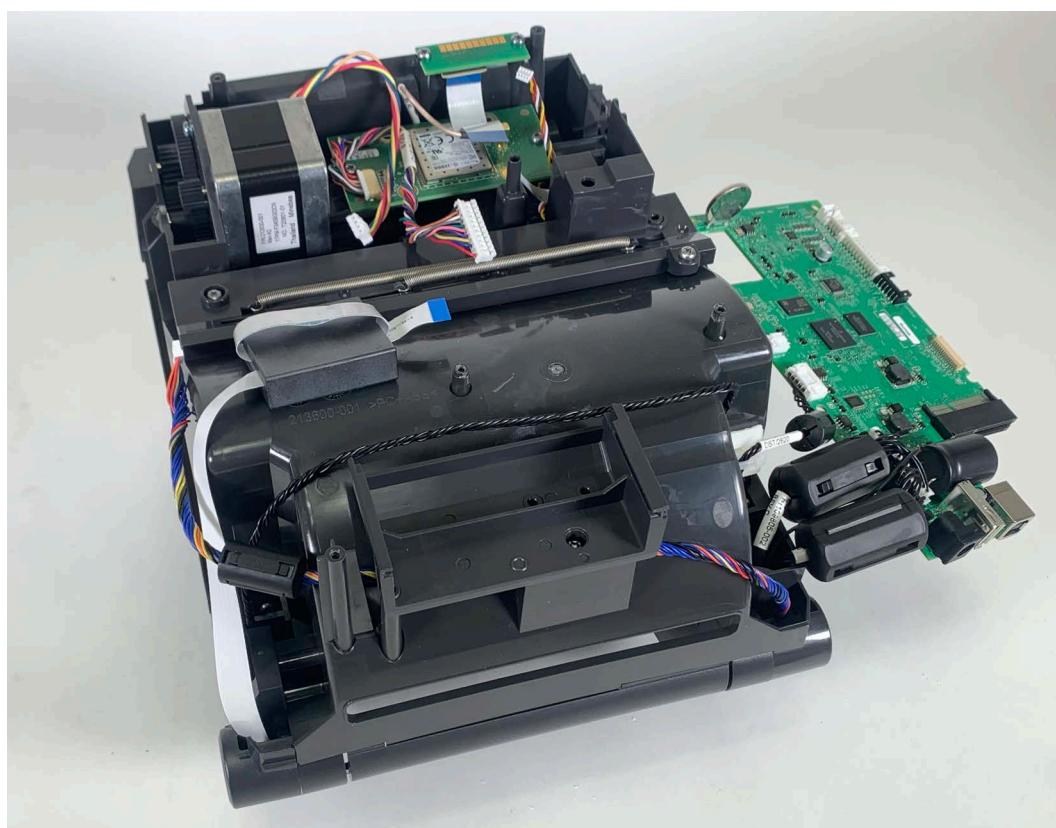
## Cable Routing for ZD621R



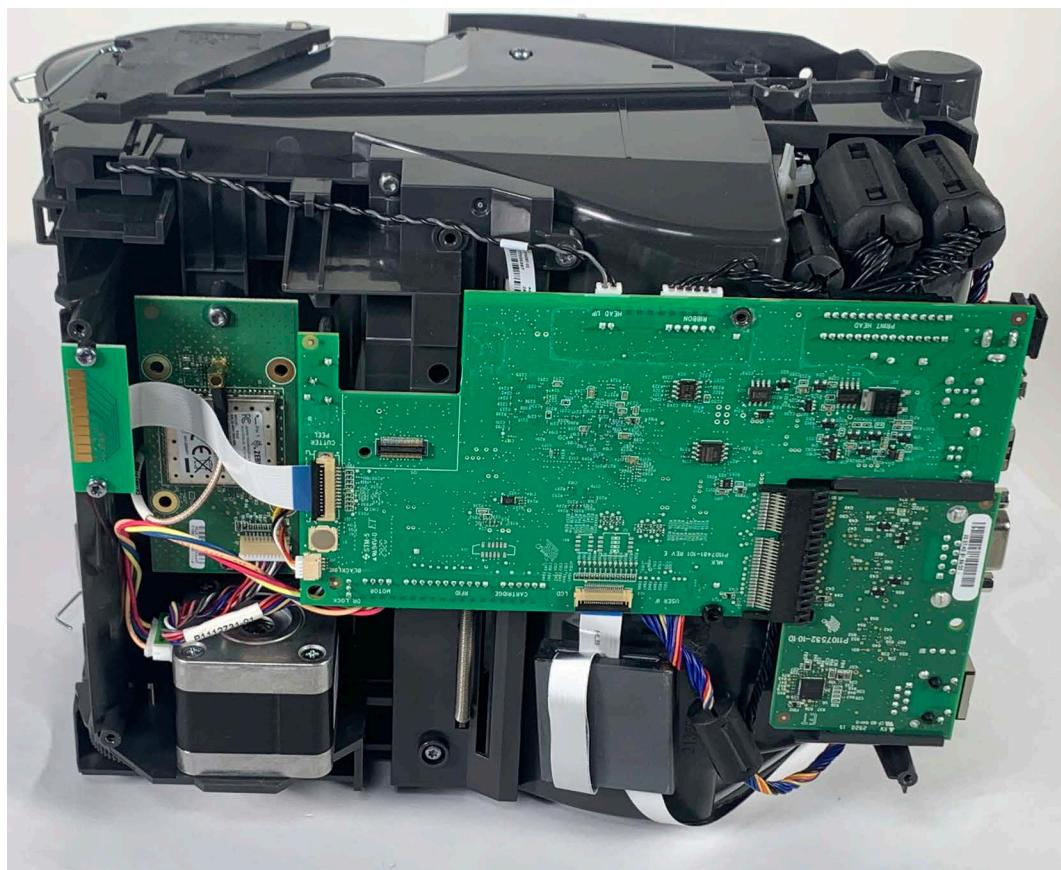
## Cable Routing for ZD621R



## Cable Routing for ZD621R



## Cable Routing for ZD621R



# Media

This section provides a simple media overview for your printer.

## Types of Thermal Media



**IMPORTANT:** strongly recommends the use of Zebra-brand supplies in order to ensure consistent high-quality printing. A wide range of paper, polypropylene, polyester, and vinyl stock has been specifically engineered to enhance the printing capabilities of the printer and to prevent premature printhead wear.

To purchase supplies, go to <http://www.zebra.com/howtobuy>.

- Your printer can use various types of media:
- **Standard media**—Most standard (non-continuous) media uses an adhesive backing that sticks individual labels or a continuous length of labels to a liner.
- **Continuous roll media**—Most continuous roll media is direct thermal media (similar to FAX paper) and is used for receipt or ticket style printing.
- **Tag stock**—Tags are usually made from a heavy paper (up to 0.0075in./0.19mm thick). Tag stock does not have adhesive or a liner, and it is typically perforated between tags.

The printer typically uses roll media, but you can use fan-fold or other continuous media too.

## Determining Thermal Media Types

Thermal transfer media requires ribbon for printing while direct thermal media does not. To determine if ribbon must be used with a particular media, perform a media scratch test.

### To perform a media scratch test, complete these steps:

1. Scratch the print surface of the media with a fingernail or pen cap. Press firmly and quickly while dragging it across the media surface. Direct thermal media is chemically treated to print (expose) when heat is applied. This test method uses friction heat to expose the media.
2. Did a black mark appear on the media?

If a black mark...	Then the media is...
Appears on the media	<b>Direct thermal.</b> No ribbon is required.
Does not appear on the media	<b>Thermal transfer.</b> A ribbon is required. Not supported by direct thermal printers.

## General Media and Print Specifications

- Direct Thermal — Max. Media width: 108mm (4.25 inches)
- Thermal Transfer — Max. Media width: 118mm (4.65 inch)
- All Printers — Min. Media width: 15mm (0.585 inch)
- Media length:
  - 990mm (39 inches) max.
  - 6.35mm (0.25 inches) min. – Tear Off or Label
  - 12.7mm(0.50 inches) min. – Peel
  - 25.4mm (1.0 inch) min. - Cutter
- Media thickness:
  - 0.06mm (0.0024 inches) min. – all requirements
  - 0.1905mm (0.0075 inches) max. – all requirements
- Media Roll Outer Diameter (O.D.) max.: 127mm (5.0 inches)
- Media Roll Core Inner Diameter (I.D.):
  - 12.7mm (0.5 inch) I.D. - Standard roll configuration
  - 25.4mm (1 inch) I.D. - Standard roll configuration
  - 38.1mm (1.5 inches) I.D. - with optional media roll adapter
  - 50.8mm (2.0 inches) I.D. - with optional media roll adapter
  - 76.2mm (3.0 inches) I.D. - with optional media roll adapter
- Ribbon Rolls - 74 meter
  - Ribbon Length - 74 m (243 feet)
  - Ribbon Width Max. - 110 mm (4.33 inches)
  - Ribbon Width Min. - 33 mm (1.3 inches) ‡
  - Ribbon Core I.D. - 12.7mm (0.5 inches)
  - Wax, Wax/Resin, and Resin transfer materials
- Ribbon Rolls - 300 meter
  - Ribbon Length - 300 m (984 feet)
  - Ribbon Width Max. - 110 mm (4.33 inches)
  - Ribbon Width Min. - 33 mm (1.3 inches) ‡
  - Wax, Wax/Resin, and Resin transfer materials

‡ - Transfer ribbon should always cover the entire width of the media (and liner) to prevent damaging the printhead.

- ZD421 Ribbon Cartridges
  - Ribbon Length - 74 m (243 feet)
  - Ribbon Width Max. - 110 mm (4.33 inches)
  - Ribbon Width Min. - 33 mm (1.3 inches) ‡
  - Colors available in Black - Wax, Wax Resin, and Resin transfer materials
- Dot pitch:
  - 203 dpi: 0.125mm (0.0049 inches)
  - 300 dpi: 0.085mm (0.0033 inches)
- Barcode modulus x-dim:
  - 203 dpi: 0.005-0.050 inches
  - 300 dpi: 0.00327 - 0.03267 inches

## Label Dispenser (Peeler)

The printer supports a field installed label dispense option with label taken sensor for batch processing of labels.

- Paper Thickness:
  - Min. 0.06 mm (0.0024 inches)
  - Max. 0.1905 mm (0.0075 inches)
- Media Width:
  - Min.15 mm (0.585 inches)
  - Thermal Transfer Printers Max. 118 mm (4.65 inches)
  - Direct Thermal Printers Max. 108 mm (4.25 inches)
- Label Length:
  - All Printers Max. (theoretical): 990mm (39 inches)
  - Thermal Transfer Printers Max. (tested): 279.4mm (11 inches)
  - Direct Thermal Printers Max. (tested): 330mm (13 inches).
  - All Printers Min.: 12.7mm (0.5 inches).

## Standard (Media) Cutter

The printer supports a field installed media cutter option for full width cutting of label liner, tag or receipt media.

- A medium duty cutter for cutting label liner and light tag media (LINER/TAG). Do not cut through labels, adhesive or embedded circuitry.
- Paper Thickness:
  - Min. 0.06 mm (0.0024 inches)
  - Max. 0.1905 mm (0.0075 inches)
- Cut Width:
  - Min. 15 mm (0.585 inches)
  - Thermal Transfer Printers Max. 118 mm (4.65 inches)
  - Direct Thermal Printers Max. 109 mm (4.29 inches)
- Minimum distance between cuts (label length): 25.4 mm (1 inch). Cutting shorter media lengths between the cuts may cause the cutter to jam or error.
- By design, the cutter is self cleaning and does not require preventive maintenance of the internal cutter mechanism.

## Linerless (Media) Cutter - Direct Thermal only

The printer supports a field installed media cutter option for full width cutting of linerless media.

- A full width linerless media cutter (LINERLESS CUT).
- Paper Thickness:
  - Min. 0.06 mm (0.0024 inches)
  - Max. 0.1905 mm (0.0075 inches)
- Cut Width:
  - Min. 15 mm (0.585 inches)
  - Max. 118 mm (4.65 inches)
- Minimum distance between cuts (label length): 25.4 mm (1 inch). Cutting shorter media lengths between the cuts may cause the cutter to jam or error.
- By design, the cutter is self cleaning and does not require preventive maintenance of the internal cutter mechanism. See [Linerless Platen \(Drive\) Roller on page 16](#) cleaning and [Media Path Cleaning on page 21](#) to maintain optimal linerless media cut operation.

# ZPL Configuration

This section provides an overview of managing printer configuration, the configuring status report, and printer and memory printouts.

## Managing the ZPL Printer Configuration

The ZPL printer is designed to allow you to change printer settings dynamically for fast first label out printing. Printer parameters that are persistent will be retained for future formats to use. Those settings will remain in effect until they are changed by subsequent commands, the printer is reset, power is cycled, or when you restore a parameter that has a factory default by resetting the printer to factory defaults. The ZPL Configuration Update command (^JU) saves and restores printer configurations to initialize (or re-initialize) the printer with pre-configured settings.

- To keep settings after a power cycle or printer reset, a ^JUS can be sent to the printer to save all current persistent settings.
- The values are recalled with a ^JUR command to restore the last saved values to the printer.

ZPL stores all parameters at once with a single command mentioned above. The legacy EPL programming language (supported by this printer) changes and saves individual commands immediately. Most printer settings are shared between ZPL and EPL. For example, changing the speed setting with EPL will also change the speed set for ZPL operations. The changed EPL setting will persist even after a power cycle or reset issued by either printer language.

A printer configuration report is available to assist the developer. The configuration report lists operating parameters, sensor settings, and printer status. It can be accessed by using the procedure in [Test Printing with the Configuration Report on page 37](#). The Zebra Setup Utility and the ZebraDesigner™ Windows driver also print this report and other printer reports to help you manage your printer.

## ZPL Printer Configuration Format

Managing more than one printer can be done by creating a printer configuration programming file to send to one or more printers or ZebraNet™ Bridge can be used to clone a printer's setup. Figure 1 below shows the basic structure of a ZPL programming configuration file.

Refer to the ZPL programmer's guide and the [Configuration Setting to Command Cross-reference on page 227](#) to create a programming file. The Zebra Setup Utility (ZSU) can be used to send programming files to the printer. Windows Notepad (text editor) can be used to create programming files.

**Figure 1** Configuration Parameter Format Structure

**^XA** — Start Format Command

Format Commands are order sensitive

- a) General Print and command settings
- b) Media handling and behaviors
- c) Media print size

**^JUS** command to save

**^XZ** — End Format Command

## Configuration Setting to Command Cross-reference

The printer configuration report, shown below, provides a listing of a majority of the configurations settings that can be set by ZPL command.

**Figure 2** Configuration Report Printout

PRINTER CONFIGURATION	
<b>Zebra Technologies</b> ZTC ZD620-203dpi ZPL 50J164202531	
+15.0.....	DARKNESS
LOW.....	DARKNESS SWITCH
8.0 IPS..	PRINT SPEED
+000.....	TEAR OFF ADJUST
TEAR OFF.....	PRINT MODE
CONTINUOUS.....	MEDIA TYPE
TRANSMISSIVE.....	SENSOR SELECT
DIRECT-THERMAL.....	PRINT METHOD
830.....	PRINT WIDTH
2030.....	LABEL LENGTH
39.0IN . 988MM.....	MAXIMUM LENGTH
MAINT. OFF.....	EARLY WARNING
CONNECTED.....	USB COMM.
AUTO.....	SER COMM. MODE
9600.....	BAUD
8 BITS.....	DATA BITS
NONE.....	PARITY
XON/XOFF.....	HOST HANDSHAKE
NONE.....	PROTOCOL
NORMAL_MODE.....	COMMUNICATIONS
<~> 7EH.....	CONTROL PREFIX
<> 5EH.....	FORMAT PREFIX
<,> 2CH.....	DELIMITER CHAR
ZPL II.....	ZPL MODE
INACTIVE.....	COMMAND OVERRIDE
NO MOTION.....	MEDIA POWER UP
FEED.....	HEAD CLOSE
DEFAULT.....	BACKFEED
+000.....	LABEL TOP
+0000.....	LEFT POSITION
DISABLED.....	REPRINT MODE
045.....	WEB SENSOR
096.....	MEDIA SENSOR
128.....	TAKE LABEL
062.....	MARK SENSOR
004.....	MARK MED SENSOR
046.....	TRANS GAIN
034.....	TRANS LED
049.....	MARK GAIN
100.....	MARK LED
DPCSWFXM.....	MODES ENABLED
.....	MODES DISABLED
832 8/MM FULL.....	RESOLUTION
4.0.....	LINK-OS VERSION
V84.20.07ZP37536 <-	FIRMWARE
1.3.....	XML SCHEMA
6.5.0 0.770.....	HARDWARE ID
8192K..... R	RAM
65536K..... E	ONBOARD FLASH
NONE.....	FORMAT CONVERT
FW VERSION.....	IDLE DISPLAY
06/08/17.....	RTC DATE
07:07.....	RTC TIME
DISABLED.....	ZBI
2.1.....	ZBI VERSION
READY.....	ZBI STATUS
178 LABELS.....	NONRESET CNTR
178 LABELS.....	RESET CNTR1
178 LABELS.....	RESET CNTR2
1,290 IN.....	NONRESET CNTR
1,290 IN.....	RESET CNTR1
1,290 IN.....	RESET CNTR2
3,277 CM.....	NONRESET CNTR
3,277 CM.....	RESET CNTR1
3,277 CM.....	RESET CNTR2
002 WIRED,SERIAL.....	SLOT 1
0.....	MASS STORAGE COUNT
0.....	HID COUNT
OFF.....	USB HOST LOCK OUT
FIRMWARE IN THIS PRINTER IS COPYRIGHTED	

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1 - Sensor Settings used for Service Purposes

**Table 1** ZPL Commands and Configuration Report Listing Cross-Reference

Command	Listing Name	Description
~SD	DARKNESS	Default: 10.0
-	DARKNESS SWITCH	LOW (Default), MEDIUM, or HIGH
^PR	PRINT SPEED	Default: 152.4 mm/s / 6 IPS (max.) - 203 dpi 101.6 mm/s / 4 IPS (max.) - 300 dpi
~TA	TEAR OFF	Default: +000
^MN	MEDIA TYPE	Default: GAP/NOTCH
	SENSOR SELECT	Default: AUTO (^MNA - Auto-Detect)
^MT	PRINT METHOD	THERMAL-TRANS or DIRECT-THERMAL
^PW	PRINT WIDTH	Default: 448 (dots for 203 dpi) or 640(dots for 300 dpi)
^LL	LABEL LENGTH	Default: 1225 (dots) (dynamically updated while printing)
^ML	MAXIMUM LENGTH	Default: 39.0IN 989MM
-	USB COMM.	Connection Status: Connected / Not Connected
^SCa	BAUD	Default: 9600
^SC,b	DATA BITS	Default: 8 BITS
^SC,,c	PARITY	Default: NONE
^SC,,,e	HOST HANDSHAKE	Default: AUTO
^SC,,,,f	PROTOCOL	Default: NONE
- SGD -**	COMMUNICATIONS	Default: NORMAL MODE
	SER COMM. MODE	Default: AUTO
^CT / ~CT	CONTROL CHAR	Default: <~> 7EH
^CC / ~CC	COMMAND CHAR	Default: <^> 5EH
^CD / ~CD	DELIM./CHAR	Default: <,> 2CH
^SZ	ZPL MODE	Default: ZPL II
- SGD -**	COMMAND OVERRIDE	Default: INACTIVE
^MFa	MEDIA POWER UP	Default: NO MOTION
^MF,b	HEAD CLOSE	Default: FEED
~JS	BACKFEED	Default: DEFAULT
^LT	LABEL TOP	Default: +000
^LS	LEFT POSITION	Default: +0000
~JD / ~JE	HEXDUMP	Default: NO (~JE)
	REPRINT MODE	Default: DISABLED

From this point in the configuration report listing, the printout has sensor settings and values displayed to troubleshoot sensor and media operations. These are typically used by Zebra Tech Support to diagnose printer problems.

\*\* - Not supported with a ZPL command, uses the Set Get Do command in the ZPL manual. Refer to `device.command_override.xxxxx` in the ZPL Programmer's manual.

## ZPL Configuration

The configuration settings listed here resume after the **TAKE LABEL** sensor value. These listings contain printer features seldom changed from default or provide status information.

**Table 2** ZPL Commands and Configuration Report Listing Cross-Reference

Command	Listing Name	Description
^MP	MODES ENABLED	Default: CWF (refer to ^MP Command)
	MODES DISABLED	Default: (nothing set)
^JM	RESOLUTION	Default: 448 8/mm (203 dpi); 640 8/mm (300 dpi)
-	FIRMWARE	Lists ZPL Firmware Version
-	XML SCHEMA	1.3
-	HARDWARE ID	Lists Firmware Boot-block Version
-	LINK-OS VERSION	
-	CONFIGURATION	CUSTOMIZED (after first use)
-	RAM	2104k..... R:
-	ONBOARD FLASH	6144k..... E:
^MU	FORMAT CONVERT	NONE
	RTC DATE	Date Displayed
	RTC TIME	Time Displayed
^JI / ~JI	ZBI	DISABLED (Requires key to enable)
	ZBI VERSION	2.1 (Displayed if installed)
-	ZBI STATUS	READY
^JH ^MA ~RO	LAST CLEANED	X,XXX IN
	HEAD USAGE	X,XXX IN
	TOTAL USAGE	X,XXX IN
	RESET CNTR1	X,XXX IN
	RESET CNTR2	X,XXX IN
	NONRESET CNTR0 (1, 2)	X,XXX IN
	RESET CNTR1	X,XXX IN
	RESET CNTR2	X,XXX IN
	SLOT1	EMPTY / SERIAL / WIRED
	MASS STORAGE COUNT	0
	HID COUNT	0
	USB HOST LOCK OUT	OFF /ON
	SERIAL NUMBER	XXXXXXXXXXXX
^JH	EARLY WARNING	MAINT. OFF

The printer has the ability to set a command or a group of commands once for all reports (receipts or labels) that follow. Those settings will remain in effect until they are changed by subsequent commands, the printer is reset, or you restore factory defaults.

## Printer Memory Management and Related Status Reports

To help you manage printer resources, the printer supports a variety of format commands to manage memory, transfer objects (between memory areas, import and export), object naming, and provide various printer operating status reports. They are very similar to the old DOS commands like DIR (directory listing) and DEL (delete file). The most common reports are also part of the Zebra Setup Utility and ZebraDesigner™ Windows driver.

It is recommended that a single command be processed within this type of format (form). A single command is easily reused as a maintenance and development tool.

### **`^XA`** — Start Format Command

A Single Format Command is recommended for purposes of reuse

### **`^XZ`** — End Format Command

Many of the commands that transfer objects, manage and report on memory are control (~) commands. They do not need to be within a format (form). They will be processed immediately upon receipt by the printer whether in a format (form) or not.

## ZPL Programming for Memory Management

ZPL has various printer memory locations that are used to run the printer, assemble the print image, store formats (forms), graphics, fonts and configuration settings.

- ZPL treats Formats (Forms), Fonts, and Graphics like files; and memory locations like disk drives in the DOS operating system environment:
  - Memory Object Naming: Up to sixteen (16) alphanumeric characters followed by a three (3) alphanumeric character file extension, for example: **123456789ABCDEF.TTF**  
Legacy ZPL printers with V60.13 firmware and earlier can only use the 8.3 file name format versus today's 16.3 file name format.
  - Allows moving objects between memory locations and deleting objects.
  - Supports DOS directory style file list reports as printouts or status to the host.
  - Allows use of 'wild cards' (\*) in file access

**Table 3** Object Management and Status Report Commands

Command	Name	Description
<b>^WD</b>	Print Directory Label	Prints a list of objects and resident barcodes and fonts in all addressable memory locations
<b>~WC</b>	Print Configuration Label	Prints a configuration status report (label) Same as <b>FEED</b> Button mode one flash routine
<b>^ID</b>	Object Delete	Deletes objects from printer memory
<b>^TO</b>	Transfer Object	Used to copy an object or group of objects from one memory area to another.
<b>^CM</b>	Change Memory Letter Designation	Reassigns a letter designation to a printer memory area.
<b>^JB</b>	Initialize Flash memory	Similar to formatting a disk - erases all objects from the specified memory locations B: or E:.
<b>~JB</b>	Reset Optional Memory	Similar to formatting a disk - erases all objects from the B: memory (factory option).
<b>~DY</b>	Download Objects	Downloads and installs wide variety of printer usable programming objects: fonts (OpenType and TrueType), graphics, and other object data types. Recommendation: Use ZebraNet™ Bridge for downloading graphics and fonts in the printer.
<b>~DG</b>	Download Graphic	Downloads an ASCII Hex representation of a graphic image. This is used by ZebraDesigner™ (label creation application) for graphics.
<b>^FL</b>	Font Linking	Appends secondary TrueType font or fonts to the primary TrueType font to add glyphs (characters).
<b>^LF</b>	List Font Links	Prints a list of the linked fonts
<b>^CW</b>	Font Identifier	Assigns a single alphanumeric character as an alias to a font stored in memory.



**IMPORTANT:** Some factory installed ZPL fonts in your printer cannot be copied, cloned or restored to your printer by reloading or updating firmware. If these license restricted ZPL fonts are removed by an explicit ZPL object delete command, they must be repurchased and reinstalled via a font activation and installation utility. EPL fonts do not have this restriction.

