ZT411/ZT421

Industrial Printer

User Guide

ZEBRA

P1106464-03EN Rev A

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About this Guide

This document is intended for use by any person who needs to perform routine maintenance, upgrade, or troubleshoot problems with the ZT411/ZT421 printer.

Notational Conventions

The following conventions are used in this document:

- **Bold** text is used to highlight the following:
  - Dialog box, window, and screen names
  - Drop-down list and list box names
  - Checkbox and radio button names
  - Icons on a screen
  - Key names on a keypad
  - Button names on a screen
- Bullets (•) indicate:
  - Action items
  - List of alternatives
  - Lists of required steps that are not necessarily sequential.
- Sequential lists (for example, those that describe step-by-step procedures) appear as numbered lists.

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 a minor or moderate injury.

[OTHER]: 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.

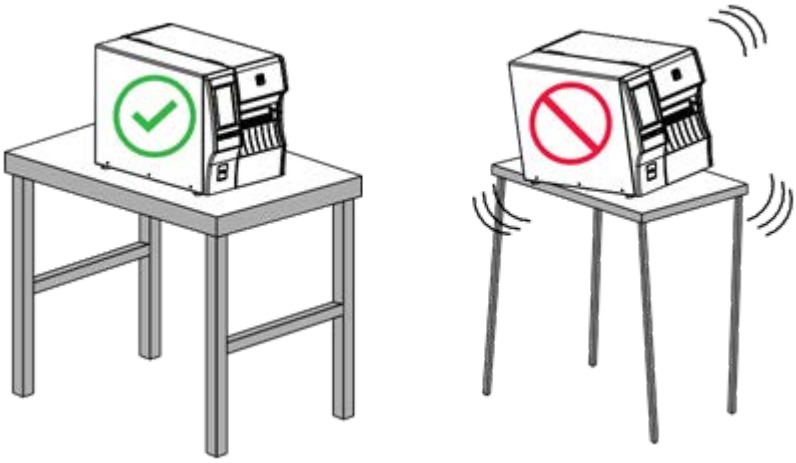
Printer Setup

This section assists a user with initial setup and operation of the printer.

Selecting a Location for the Printer

Select a location for the printer that meets these conditions:

- Surface—The surface where the printer will be located must be solid, level, and of sufficient size and strength to hold the printer.



- Space—The area where the printer will be located must include enough space for ventilation and for accessing the printer components and connectors. To allow for proper ventilation and cooling, leave open space on all sides of the printer.

CAUTION: Do not place any padding or cushioning material behind or under the printer because this restricts air flow and could cause the printer to overheat.

- Power—The printer should be within a short distance of an appropriate power outlet that is easily accessible.
- Data communication interfaces—The printer must be within range of your WLAN radio (if applicable) or within an acceptable range for other connectors to reach your data source (usually a computer). For

more information on maximum cable lengths and configuration, see General Specifications on page 182.

- Operating conditions—Your printer is designed to function in a wide range of environmental and electrical conditions, including a warehouse or factory floor. The following table shows the temperature and relative humidity requirements for the printer when it is operating.

Table 1 Operating Temperature and Humidity

Mode	Temperature	Relative Humidity
Thermal Transfer	40° to 104°F (5° to 40°C)	20 to 85% non-condensing
Direct Thermal	32° to 104°F (0° to 40°C)	

Ordering Supplies and Accessories

The following things that you will need do NOT come with the printer:

- Communication/network cables (such as USB, serial, parallel, wired Ethernet)
- Media
- Ribbon (if your printer has a thermal transfer option)

Media

For optimal printing quality and proper printer performance across our product line, Zebra strongly recommends the use of Zebra Certified Supplies as part of the total solution.

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 zebra.com/supplies.

The Glossary on page 194 includes terms associated with media, such as black mark media, gap/notch media, RFID media, fanfold media, and roll media. Use these terms to help determine which type of media will suit your needs.

Ribbon

Do I need to use ribbon?	The media itself determines if you will need to use ribbon. • Thermal Transfer media—Requires ribbon. • Direct Thermal media—Does NOT require ribbon.
How can I tell if media is Direct Thermal or Thermal Transfer? (See direct thermal on page 196 and thermal transfer on page 202 for definitions.)	The easiest way to find out is to scratch the surface of the media rapidly with your fingernail. If a black mark appears where you scratched, the media is Direct Thermal, so you do NOT need ribbon. (See Performing a Ribbon Scratch Test on page 61.)
What kind of ribbon can I use?	This printer can only use ribbon that is coated on the outside unless you purchase and install the optional spindle that allows ribbon that is coated on the inside. Contact your authorized Zebra reseller for ordering information.

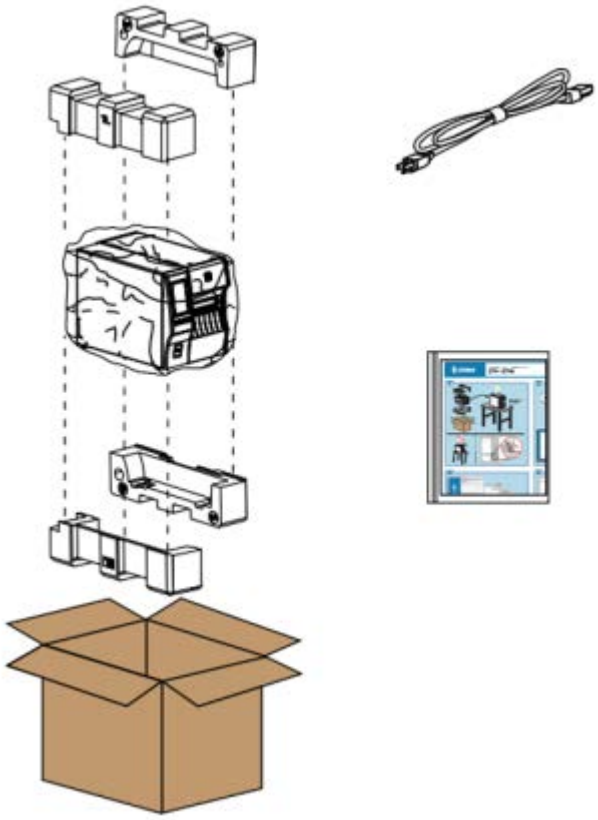
How can I tell which side of the ribbon is coated?	Use one of these two methods to identify the coated side: • Method 1: **1.** Press a corner of the sticky side of a label to the outer surface of the ribbon roll. **2.** Peel the label off the ribbon. If ink particles adhere to the label, the outer side of the roll is coated. Repeat this test with the inner surface if needed to confirm which side is coated. • Method 2: **1.** Unroll a short length of ribbon and place the outer surface against a piece of paper. **2.** Scratch the inner surface of the ribbon with your fingernail. **3.** Lift the ribbon and check for marks on the paper. If the ribbon left a mark, the outer side is coated. See Performing an Adhesive Test on page 61.

Inspecting the Contents of the Box

Ensure that the printer box contains all the items you need to set it up.

IMPORTANT: Zebra Technologies is not responsible for any damage incurred during the shipment of the equipment and will not repair this damage under warranty.

1. Verify that the following items are included in the box with the printer:



   Additional items may be included, depending on the options ordered with the printer.
2. If anything is missing, notify your authorized Zebra reseller.
3. Immediately unwrap the printer and inspect for shipping damage.
   - Save all packing materials.
   - Check all exterior surfaces for damage.
   - Raise the media door, and inspect the media compartment for damage to components.
4. If you discover shipping damage upon inspection:
   - Immediately notify the shipping company and file a damage report.
   - Keep all packaging material for shipping company inspection.
   - Notify your authorized Zebra reseller.
5. The printer shipped with several protective items for shipping, including a film of plastic over the transparent window on the media door. Before operating the printer, remove these protective items.

Connecting the Printer to a Device

After you have set up the printer, you are ready to connect the printer to your device (such as a computer, phone, or tablet).

Connect to a Phone or Tablet

Download the free Zebra Printer Setup Utility app for your device.

- Android devices
- Apple devices

The applications support the following types of connectivity:

- Bluetooth Classic
- Bluetooth Low Energy (Bluetooth LE)
- Wired/Ethernet
- Wireless
- USB On-The-Go

For the User Guides for these printer setup utilities, go to zebra.com/setup.

Installing Drivers and Connecting to a Windows® -Based Computer

To use your printer with a Microsoft Windows-based computer, you must install the correct drivers first.

IMPORTANT: You may connect your printer to your computer using any of the connections that you have available. However, do not connect any cables from your computer to the printer until you are instructed to do so. If you connect them at the wrong time, your printer will not install the correct printer drivers. To recover from incorrect driver installation, see What to Do If You Forget to Install Printer Drivers First on page 24.

Installing the Drivers

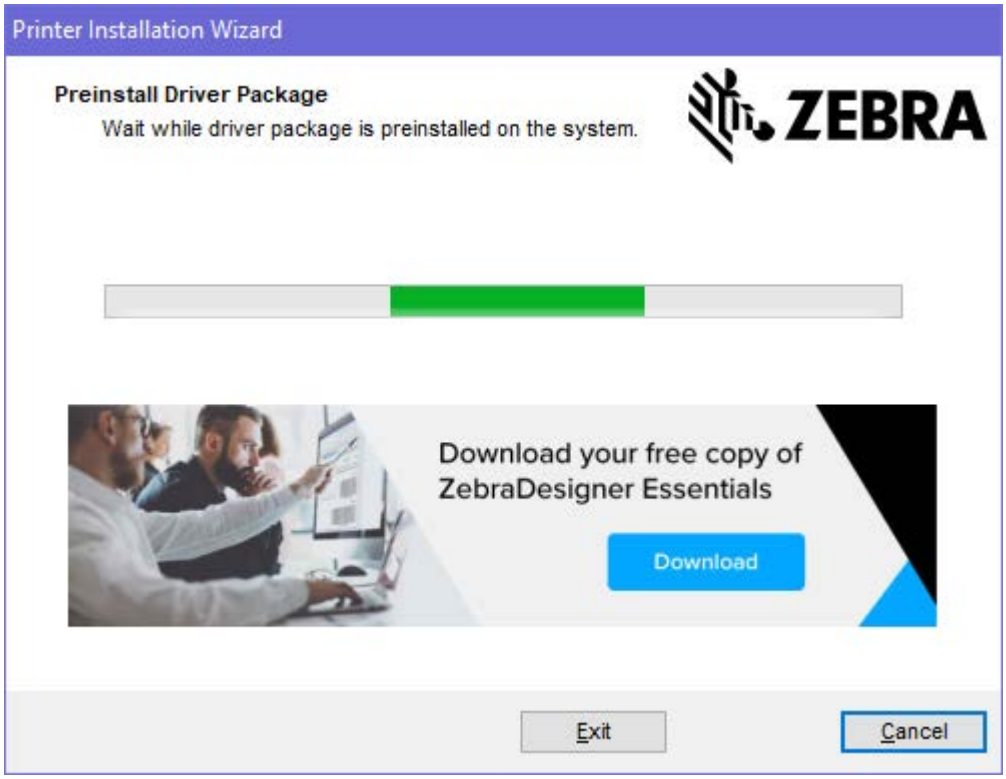
Follow these steps to install the correct drivers.

1. Navigate to zebra.com/drivers.
2. Click **Printers**.
3. Select your printer model.
4. On the printer product page, click **Drivers**.
5. Download the appropriate driver for Windows.

   The driver executable file (such as `zd86423827-certified.exe`) is added to your Download folder.

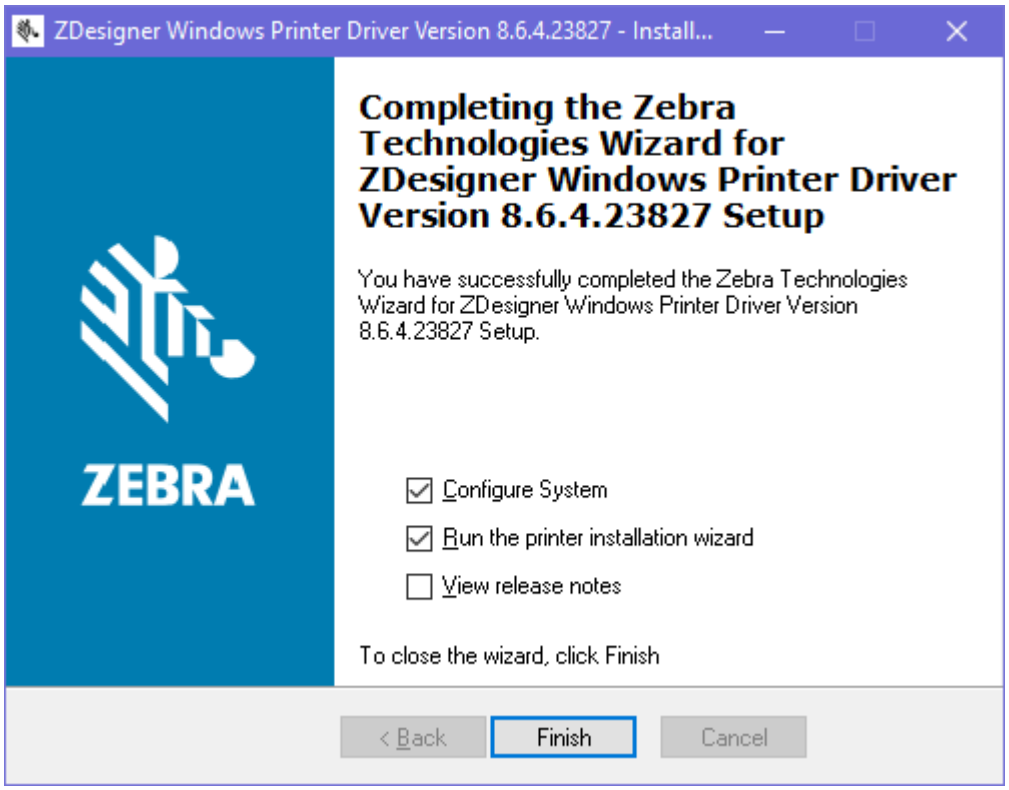
6. Run the executable file and follow the prompts.

   When setup is complete, you may select to add all of the drivers to your system (**Configure System**) or to add/configure specific printers (see Running the Printer Installation Wizard on page 16).



7. Select **Configure System**, and then click **Finish**.

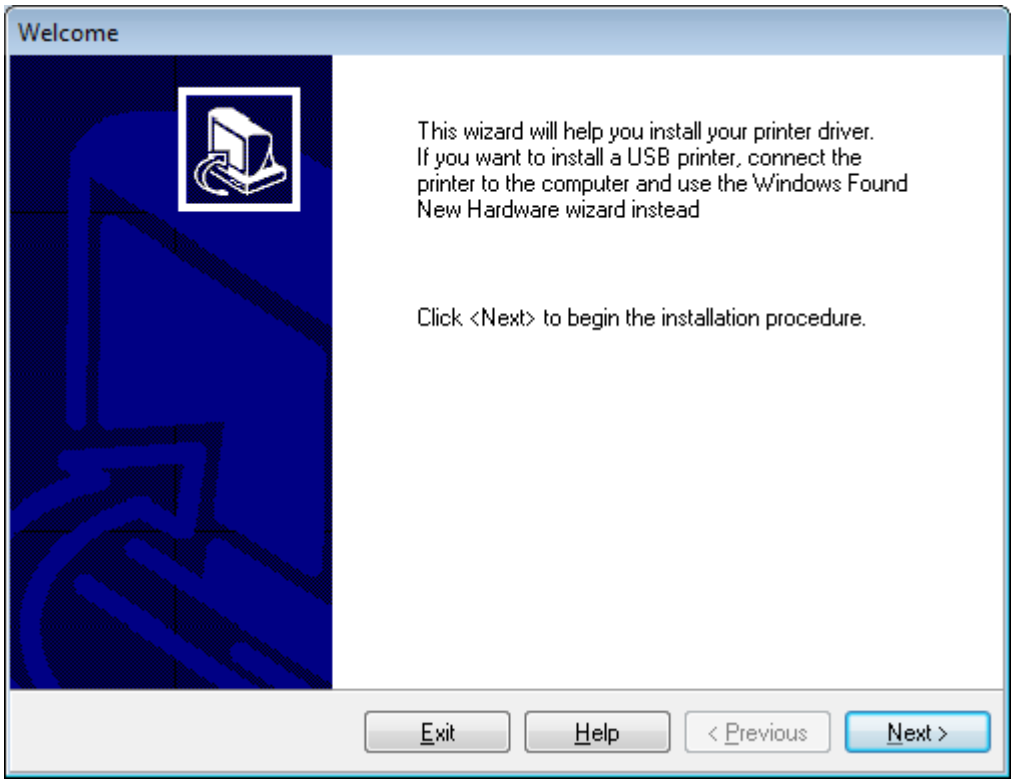
   The Printer Installation Wizard installs the drivers.



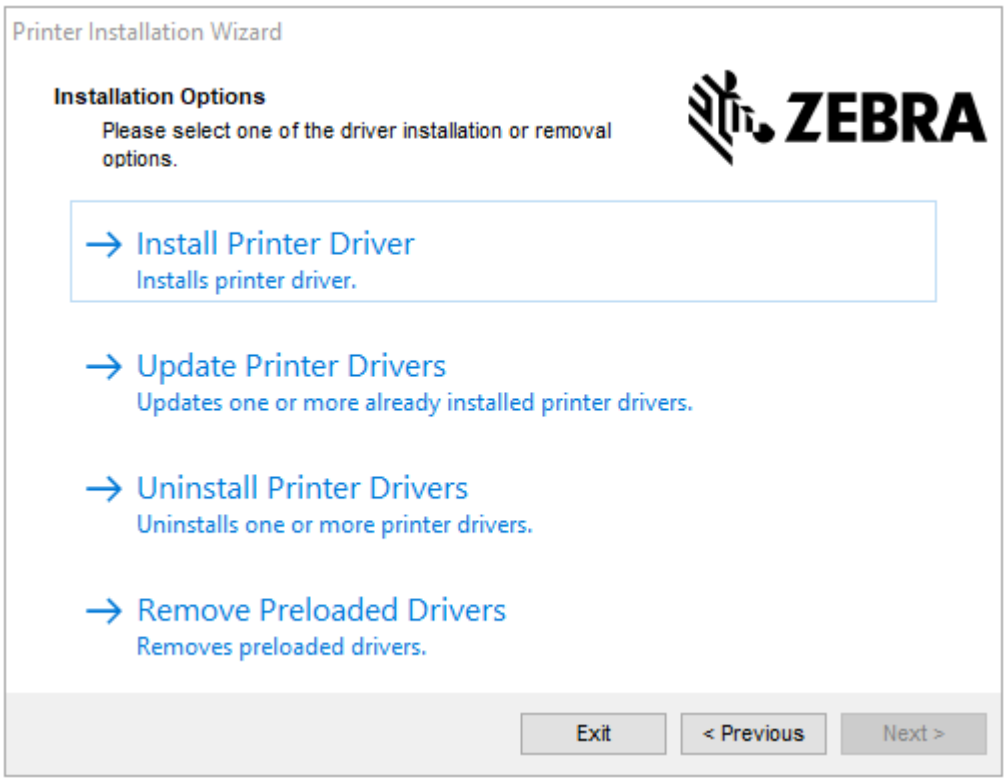
Running the Printer Installation Wizard

1. On the last screen of the driver installer, leave **Run the Printer Installation Wizard** checked, and then click **Finish**.

   The Printer Installation wizard displays.



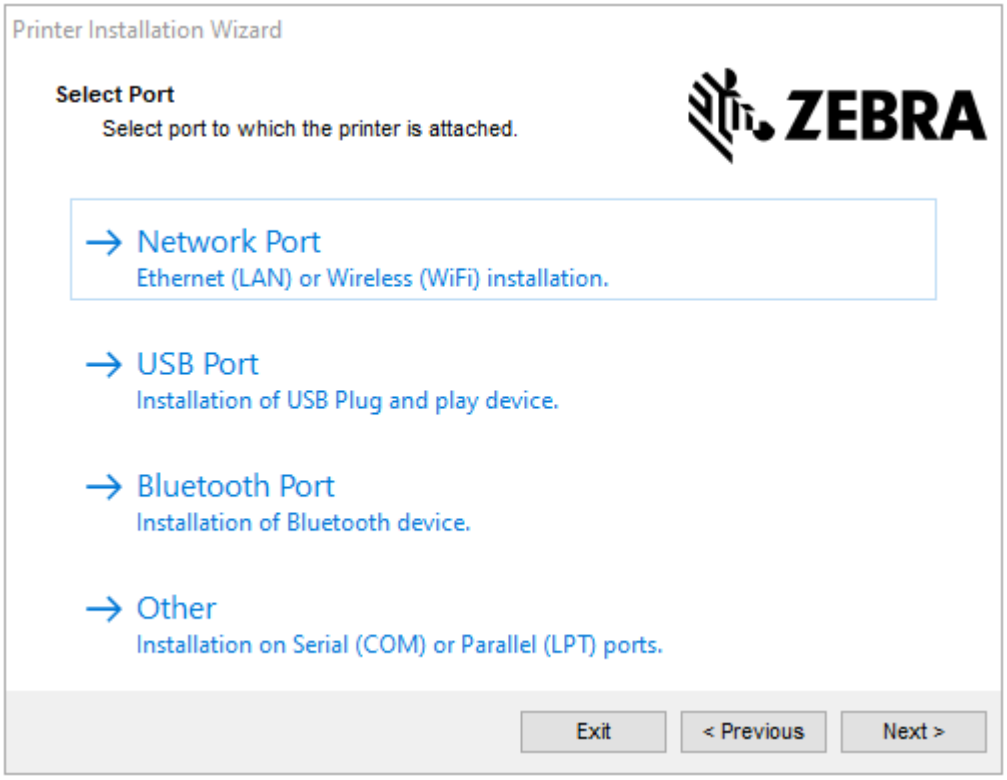
2. Click **Next**.


Printer Installation Wizard
Installation Options
Please select one of the driver installation or removal options.
ZEBRA
Install Printer Driver
Installs printer driver.
Update Printer Drivers
Updates one or more already installed printer drivers.
Uninstall Printer Drivers
Uninstalls one or more printer drivers.
Remove Preloaded Drivers
Removes preloaded drivers.
Exit
< Previous
Next >

3. Click **Install Printer Driver**.

   The license agreement displays.

4. Read and accept the terms of the license agreement, and then click **Next**.



5. Select the communication option that you want to configure for your printer:
   - Network Port—or installing printers with an Ethernet (LAN) or wireless (Wi-Fi) network connection. Wait for the driver to scan your local network for devices and follow the prompts. If necessary, set the values as directed in Connecting to Your Network through the Printer's Ethernet Port on page 22 or in Connecting the Printer to Your Wireless Network on page 24.
   - USB Port—For installing printers connected with the USB cable. Connect the printer to the computer as shown in Connecting to a Computer Using the Printer's USB Port on page 20. If the printer is already connected and powered on, you may need to remove the USB cable and install it again. The driver will automatically search for the model of the connected printer.
   - Bluetooth Port—For installing printers with a Bluetooth connection. Not applicable to this printer.
   - Other—For installation using another type of cable, such as Parallel (LPT) and Serial (COM). No additional configuration is necessary.
6. If prompted, select your printer model and resolution.

   The model and resolution are on a part number sticker on the printer, usually located below the media hanger. The information will be in the following format:

```
Part Number: XXXXXxY – xxxxxxxx
```

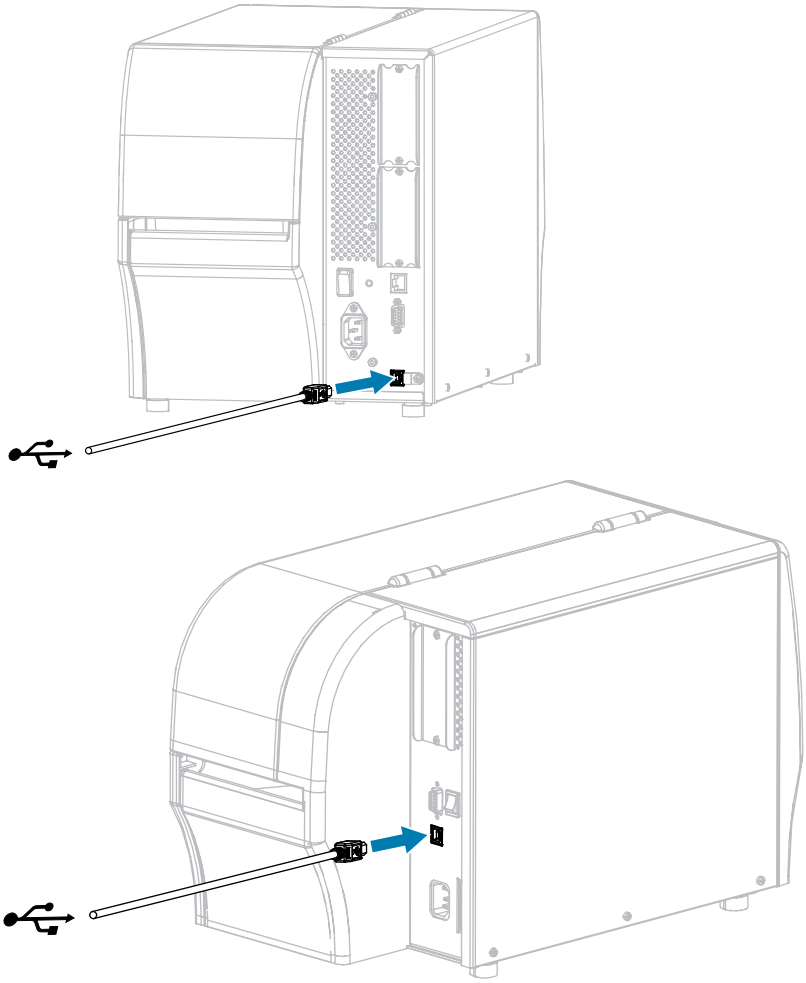
   where

   XXXXX = the printer model, and Y = the printer resolution (2 = 203 dpi, 3 = 300 dpi, 6 = 600 dpi).

   For example, in the part number ZT411x3 – xxxxxxxx, ZT411 indicates that the printer is a ZT411 model, and 3 indicates that the printhead resolution is 300 dpi.

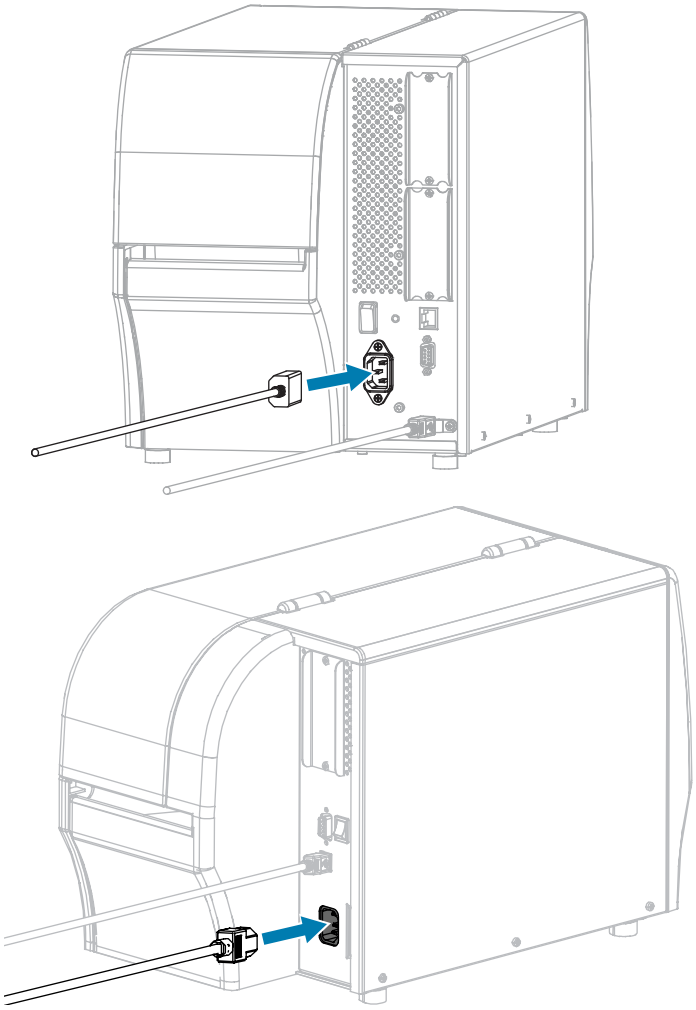
Connecting to a Computer Using the Printer's USB Port

1. After you install the drivers, connect the USB cord to the USB port on your printer.

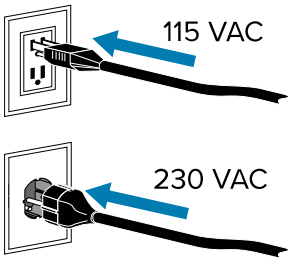


2. Connect the other end of the USB cord to your computer.

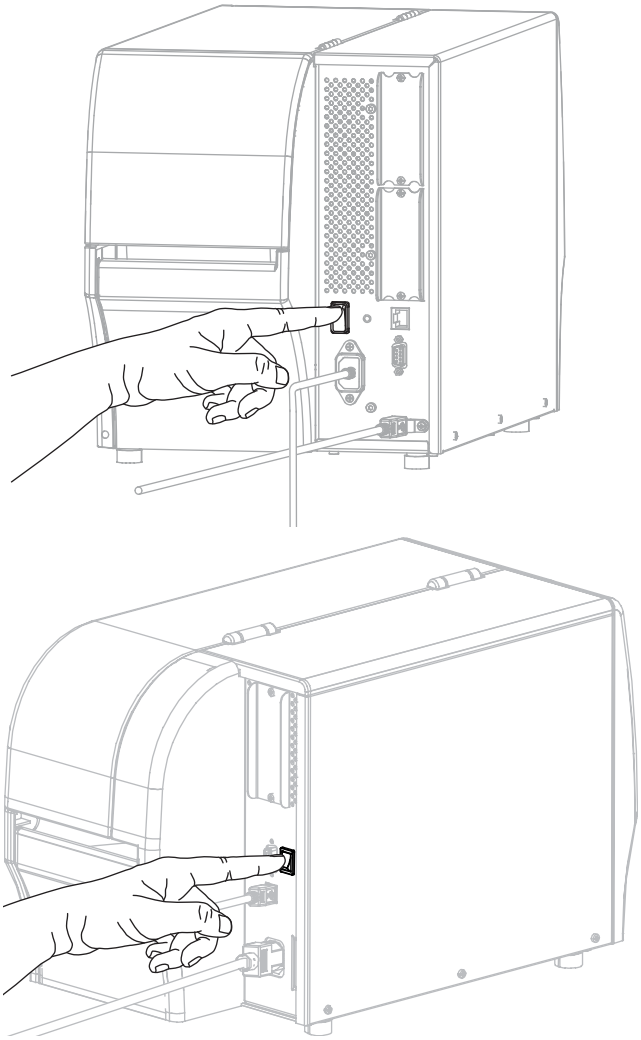
3. Plug the A/C power cord into the A/C power connector on the back of the printer.



4. Plug the A/C power cord into an appropriate power outlet.



5. Turn on (**I**) the printer.



As the printer boots up, your computer completes the driver installation and recognizes your printer.

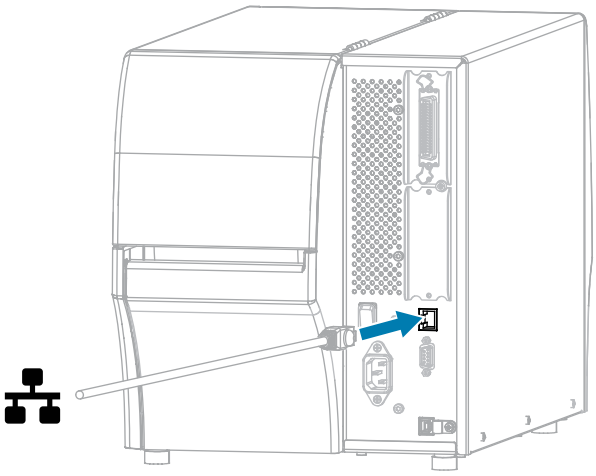
If you did not install the drivers first, see What to Do If You Forget to Install Printer Drivers First on page 24.

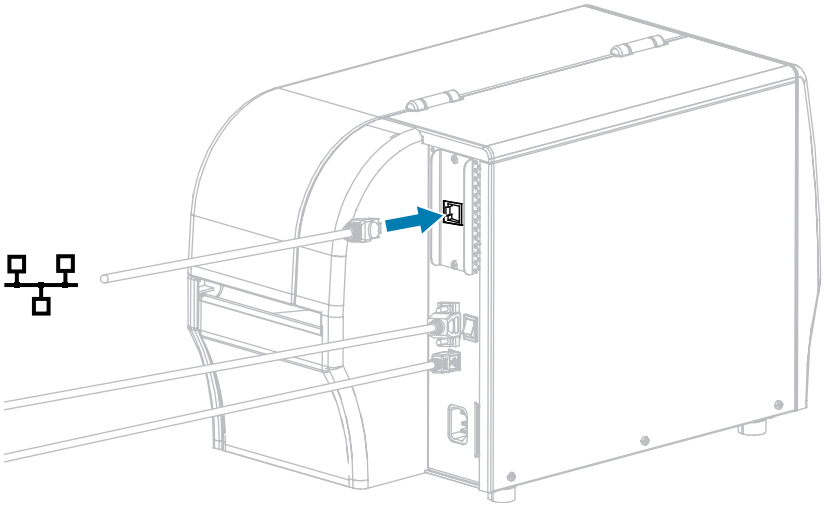
Connecting to Your Network through the Printer's Ethernet Port

If you wish to use a wired print server (Ethernet) connection, you may need to configure the printer to communicate with your Local Area Network (LAN).

For additional information about Zebra print servers, refer to the ZebraNet Wired and Wireless Print Server User Guide. To download the latest version of this guide, go to zebra.com/manuals.

1. After you install the drivers, connect the printer to an Ethernet cable that is connected to your network.





The printer attempts to communicate with your network. If it is successful, it fills in your LAN's gateway and subnet values and gets an IP address. The printer display then alternates between the printer's firmware version and its IP address.

2. Check the display to see if an IP address was assigned to the printer. See Connection > Wired > Wired IP Address for ways to view the IP address

If the printer's IP address is...	Then...

`0.0.0.0`
or
`000.000.000.000`
	Configure the following printer settings. Contact your network administrator for the proper values for your network.
	• Connection > Wired > Wired IP Protocol (change the value from ALL to PERMANENT)
	• Connection > Wired > Wired Gateway (match the gateway value of your LAN)
	• Connection > Wired > Wired Subnet (match the subnet value of your LAN)
	• Connection > Wired > Wired IP Address (assign a unique IP address to the printer)

any other value	The connection was successful.

3. Reset the network (see Connection > Networks > Reset Network) to allow changes to the network settings to take effect.

Connecting the Printer to Your Wireless Network

If you wish to use the printer's optional wireless print server, you must configure the printer to communicate with your Wireless Local Area Network (WLAN) through the wireless print server.

For additional information about Zebra print servers, refer to the ZebraNet Wired and Wireless Print Server User Guide. To download the latest version of this guide, go to zebra.com/manuals.

1. Install the drivers as instructed in Installing Drivers and Connecting to a Windows®-Based Computer on page 13.
2. Configure the following printer settings. Contact your network administrator for the proper values for your network.
   - Connection > WLAN > WLAN IP Protocol (change the value from ALL to PERMANENT.)
   - Connection > WLAN > WLAN Gateway (match the gateway value of your WLAN)
   - Connection > WLAN > WLAN Subnet (match the subnet value of your WLAN)
   - Connection > WLAN > WLAN IP Address (assign a unique IP address to the printer)
3. Reset the network (see Connection > Networks > Reset Network) to allow changes to the network settings to take effect.

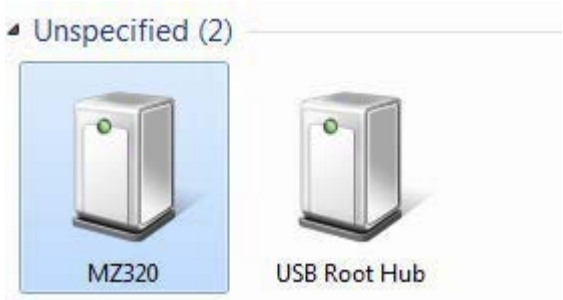
What to Do If You Forget to Install Printer Drivers First

If you plug in your Zebra printer before installing the drivers, the printer displays as an Unspecified device.

1. Follow the instructions in Installing Drivers and Connecting to a Windows®-Based Computer on page 13 to download and install the drivers.
2. From the Windows menu, open the Control Panel.

3. Click **Devices and Printers**.

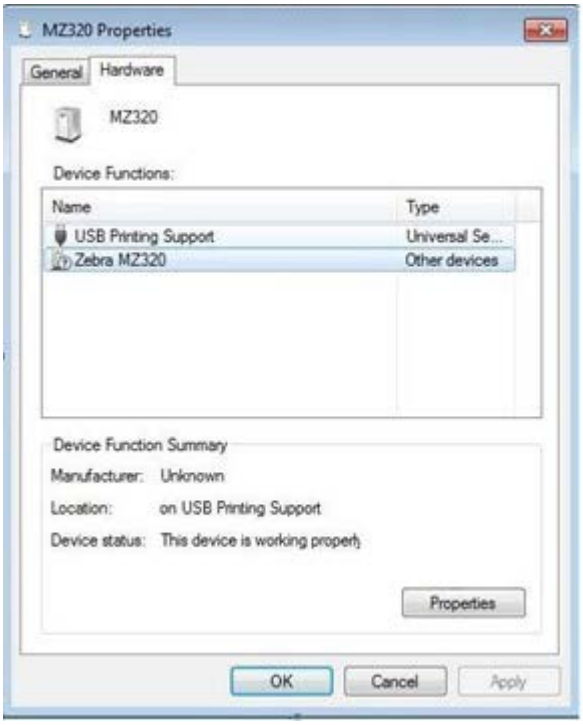
   In this example, the MZ320 is an incorrectly installed Zebra printer.



4. Right-click on the device, and select **Properties**.

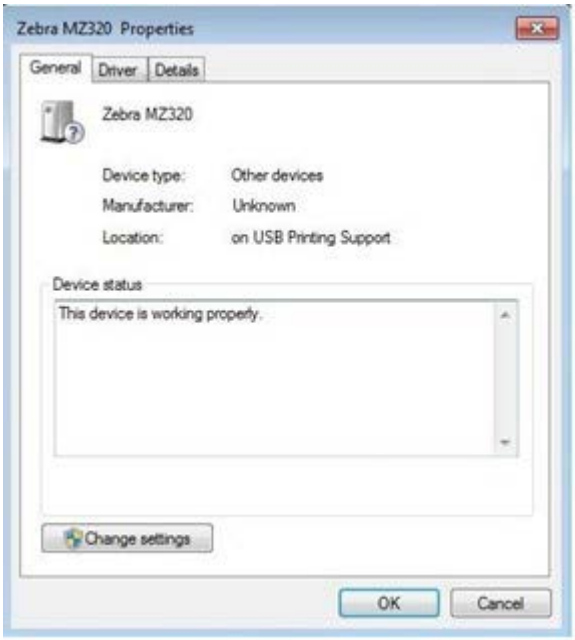
   The properties for the device display.

5. Click the **Hardware** tab.



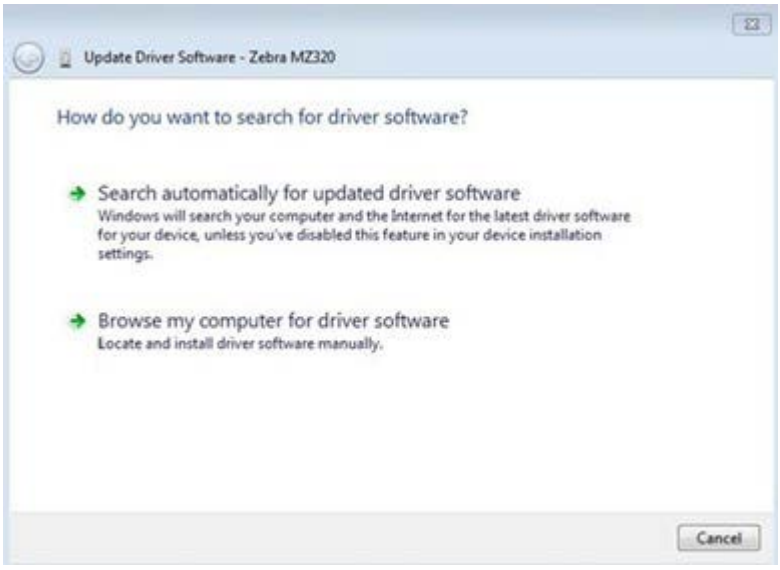
6. Select the Zebra printer in the **Device Functions** list, and then click **Properties**.

   The properties display.



7. Click **Change settings** and then click the **Driver** tab.

8. Click **Update Driver**.



9. Click **Browse my computer for driver software**.
10. Click **Browse...** and navigate to the Downloads folder.

11. Click **OK** to select the folder.

12. Click **Next**.

The device is updated with the correct drivers.

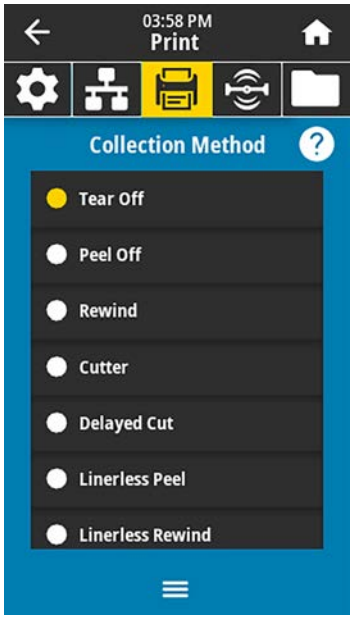
Determining the Label Collection Method

Use a label collection method that matches the media being used and the printer options available using the table and figures at the end of this section.

The media path is the same for roll and fanfold media.

1. On the Home screen, touch **Menu** > **Print** > **Label Position** > **Collection Method**.

   The Collection Method options display.



2. Select a collection method that is compatible with the options available on your printer.
3. Touch the **Home** icon to return to the Home screen.

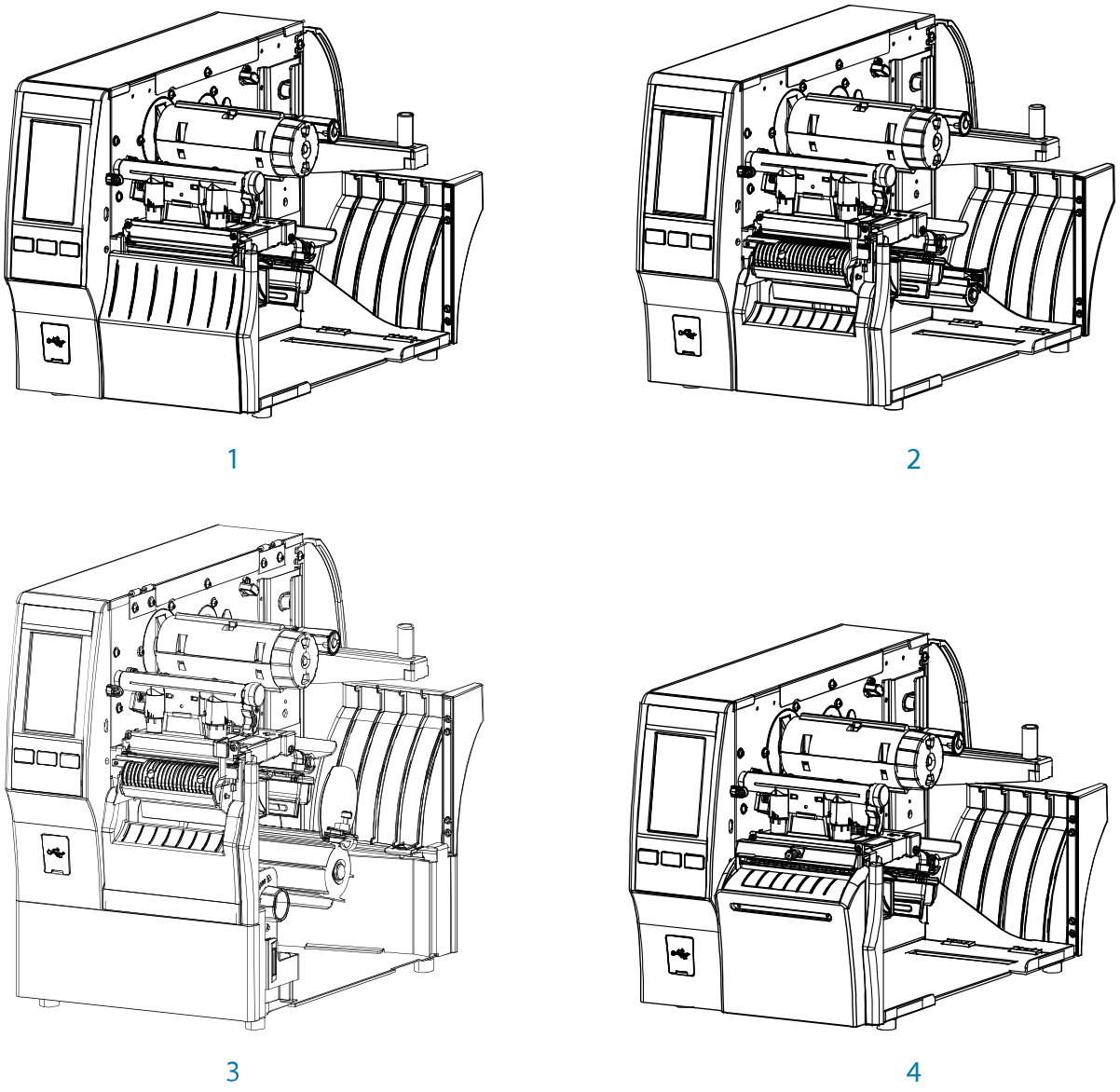
Table 2 Collection Methods and Printer Options

Collection Method	Required Printer Option	Description
Tear Off	Can be used with any printer option and most media types.	The printer prints label formats as it receives them. The printer operator can tear off the printed labels when the printer stops.
Peel Off	Liner Take-Up option or Rewind option	The printer peels the label from the backing during printing and then pauses until the label is removed. The empty backing may be allowed to exit the front of the printer, or it may be wound onto the liner take-up spindle or rewind spindle.
Rewind	Rewind option	The printer prints without pausing between labels. The media is wound onto a core after printing. The rewind plate is used to keep the labels from separating from the backing.
Cutter	Cutter option	The printer cuts between labels after each one is printed.
Delayed Cut	Cutter option	The printer waits for a delayed cut ZPL command (~JK) before it cuts the last printed label.
Applicator	This mode is for use with a machine that applies labels.	The printer prints when it receives a signal from the applicator. Authorized Service Technicians should refer to the Advanced User Information section of the Maintenance Manual for additional information about the applicator interface.

Table 2 Collection Methods and Printer Options (Continued)

Collection Method	Required Printer Option	Description
	NOTE: Linerless Peel, Linerless Rewind, Linerless Tear, Linerless Cut, and Linerless Delayed Cut are options reserved for future use.	

Figure 1 Printer Options



1	Tear-Off (standard)	2	Peel with Liner Take-Up option
3	Rewind option	4	Cutter option

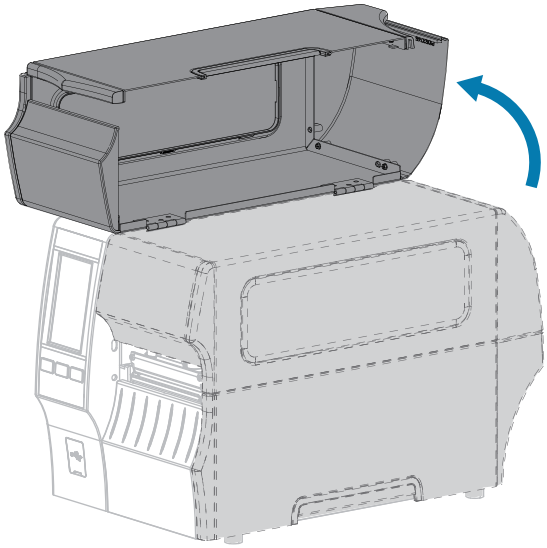
Loading the Media

Use the instructions in this section for loading roll or fanfold media in the appropriate label collection method for your needs.

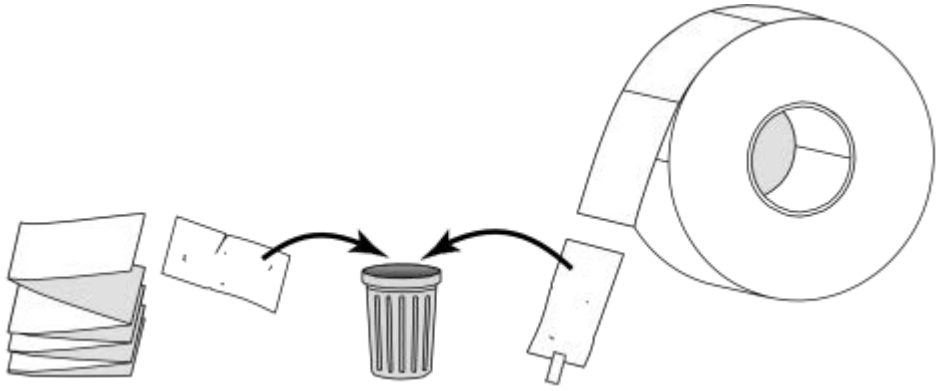
IMPORTANT: You are not required to turn off the printer power when working near an open printhead, but Zebra recommends it as a precaution. If you turn off the power, you will lose all temporary settings, such as label formats, and you must reload them before you resume printing.

Inserting the Media into the Printer

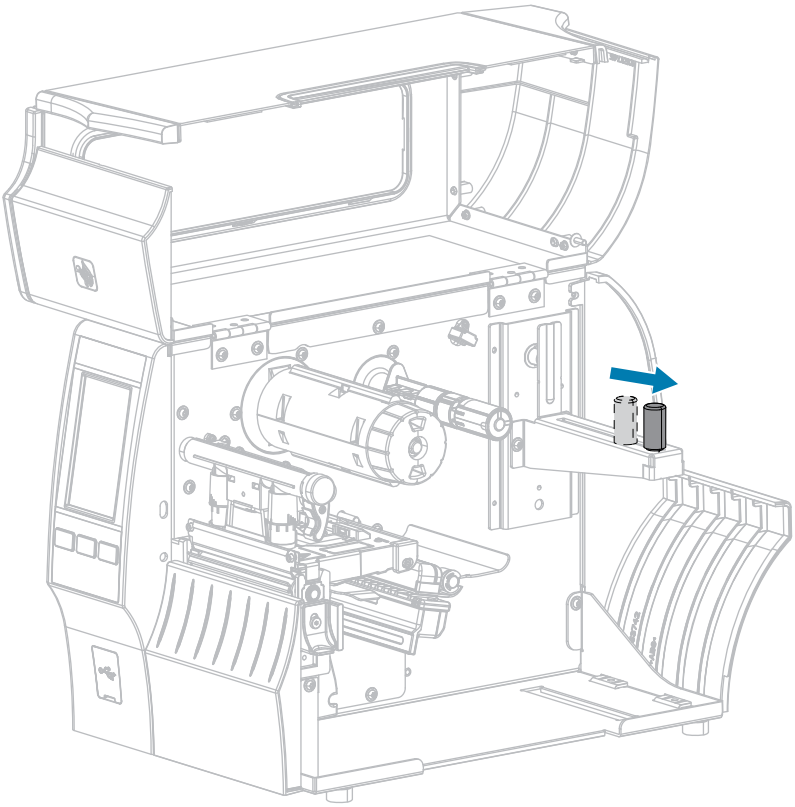
1. Raise the media door.



2. Remove and discard any tags or labels that are torn or dirty or that are held by adhesives or tape.

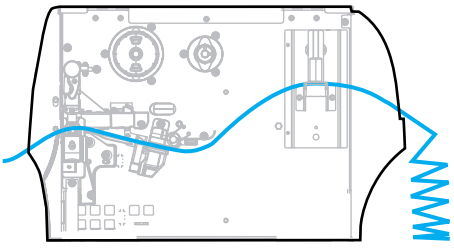
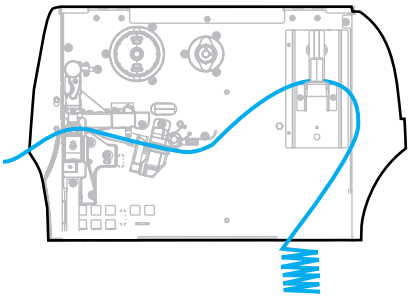


3. Pull out the media supply guide as far as it goes.

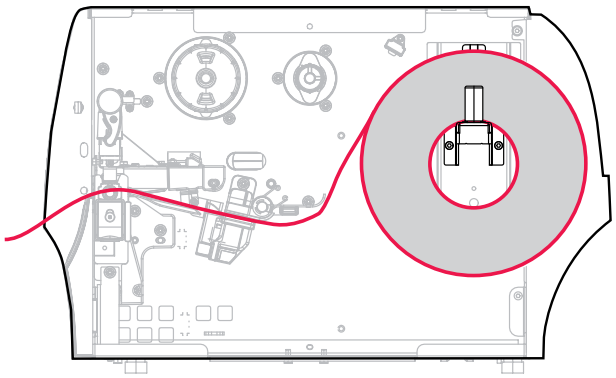
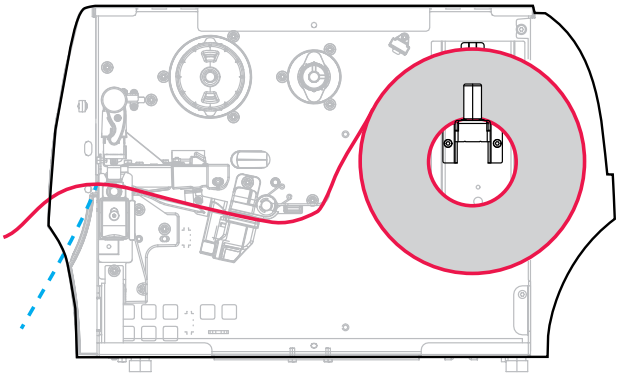
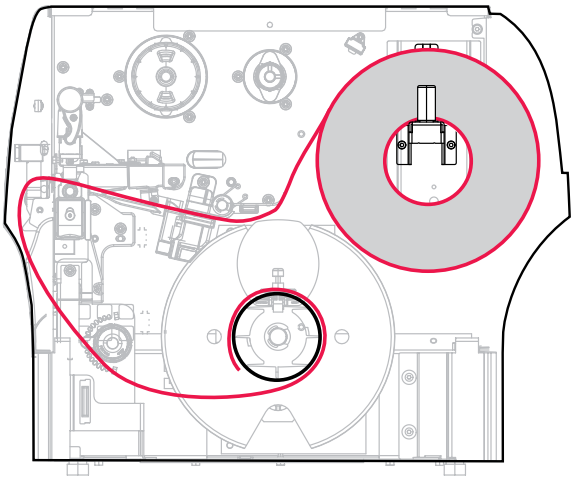


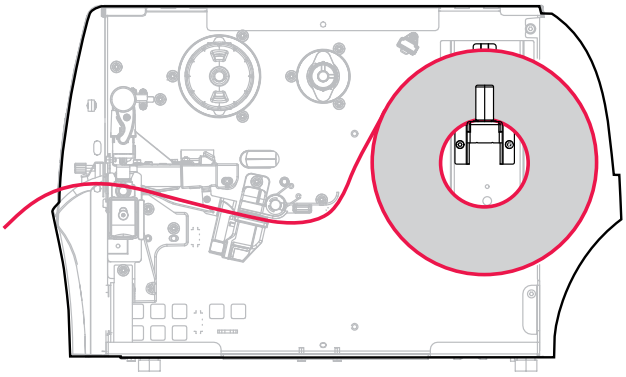
4. Insert roll or fanfold media into the printer. The media loading path is the same for both roll and fanfold media, so this is the only step that will be different.

Type of media	Instructions
Roll media	Place the roll of media on the media supply hanger. Push the roll as far back as it will go.
Fanfold media	Fanfold media can be stored behind or under the printer. Depending on where the media is stored, feed the media either from behind or through the bottom access slot, then drape it over the media supply hanger.

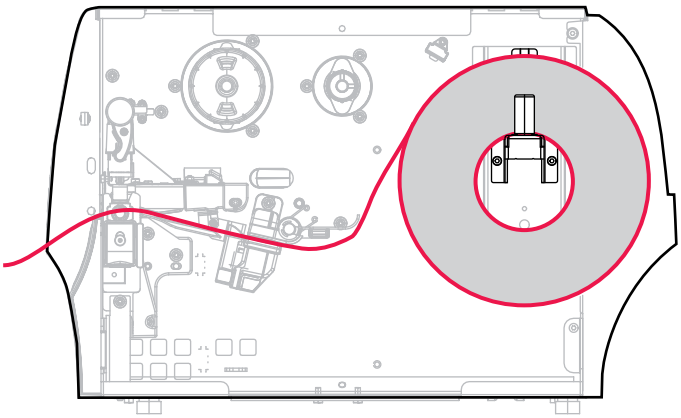
Rear Feed	Bottom Feed
	

5. Which collection method are you using? (See Determining the Label Collection Method on page 28.)

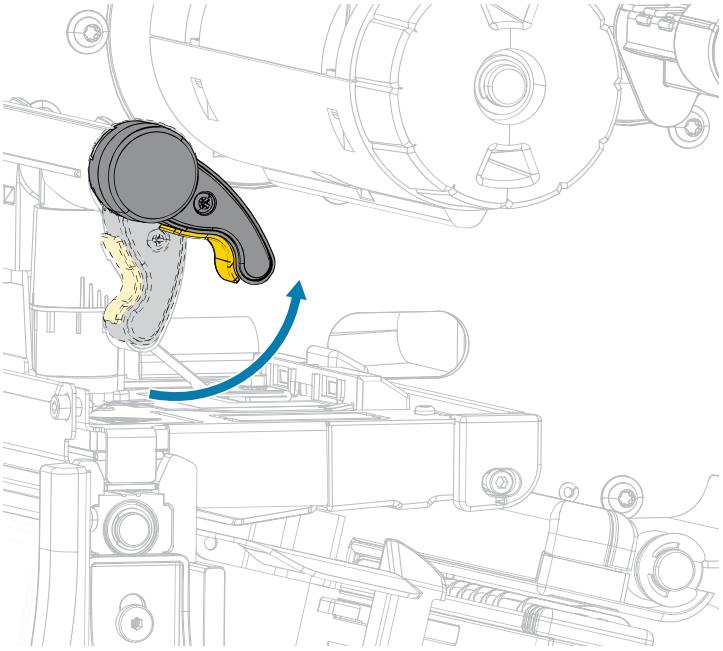
If using...	Then...
Tear Off 	Continue with Using Tear-Off Mode on page 35.
Peel Off (with or without liner take-up) 	Continue with Using Peel-Off Mode (with or without Liner Take-Up) on page 39.
Rewind 	Continue with Using Rewind Mode on page 49.

If using...	Then...
Cutter or Delayed Cut 	Continue with Using Cutter Mode or Delayed Cut Mode on page 57.

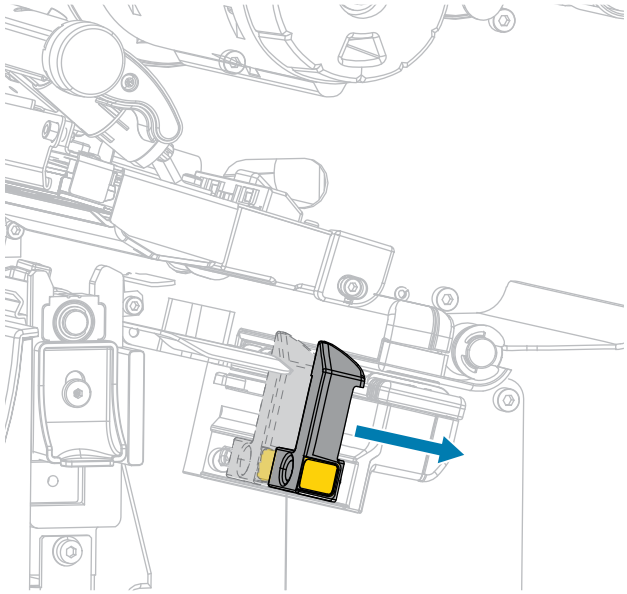
Using Tear-Off Mode



1. If you have not already done so, follow the instructions in the section Inserting the Media into the Printer on page 31.
2. Open the printhead assembly by rotating the printhead-open lever upward.

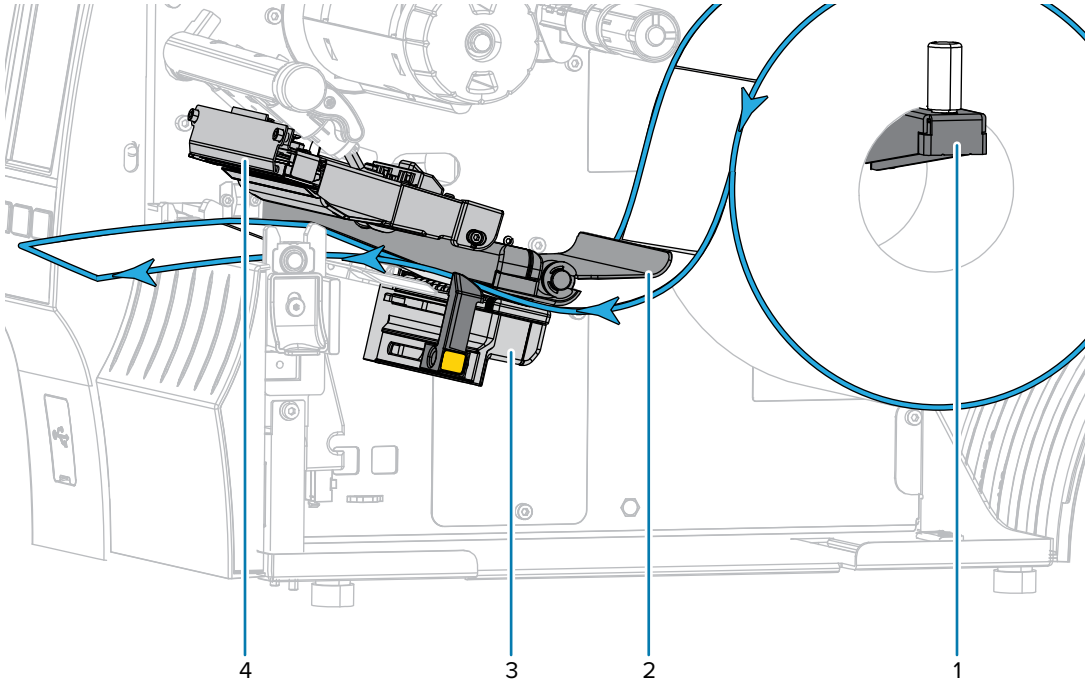


3. Slide the media guide all the way out.

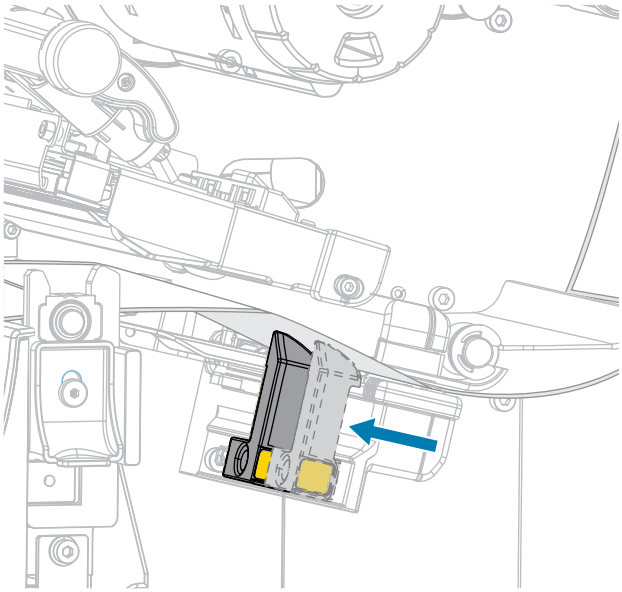


CAUTION: HOT SURFACE: The printhead may be hot and could cause severe burns. Allow the printhead to cool.

4. From the media hanger (1), feed the media under the dancer assembly (2), through the media sensor (3), and under the printhead assembly (4). Slide the media back until it touches the inside back wall of the media sensor.



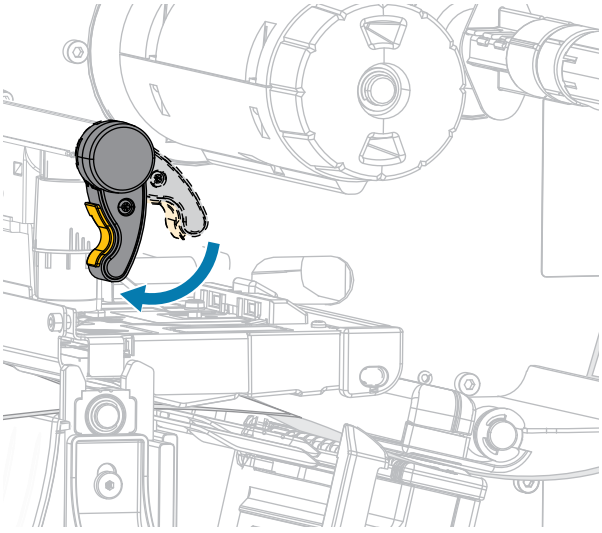
5. Slide in the media guide until it just touches the edge of the media.



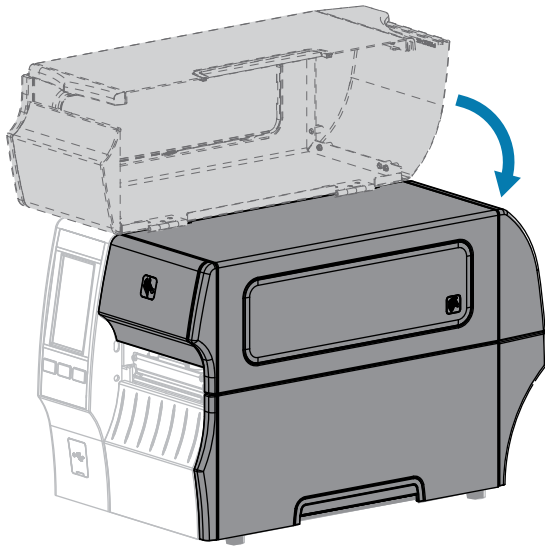
6. Does the media that you are using require ribbon for printing? If you are not sure, see Ribbon on page 10.

If using...	Then...
Direct Thermal media (no ribbon needed)	Continue with step 7 on page 37.
Thermal Transfer media (ribbon needed)	If you have not already done so, load ribbon in the printer using the instructions in Loading the Ribbon on page 62, then continue on to step 7 on page 37.

7. Rotate the printhead-open lever downward until it locks the printhead in place.



8. Close the media door.

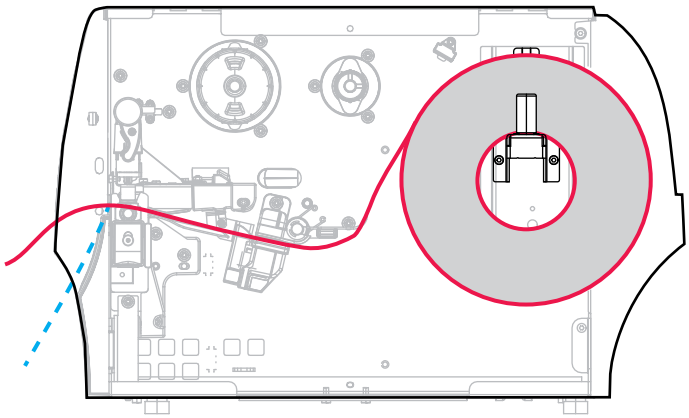


9. Set the printer to the appropriate collection method that is compatible with your printer (see Print Menu > Label Position > Collection Method).
10. Press **PAUSE** to exit pause mode and enable printing.

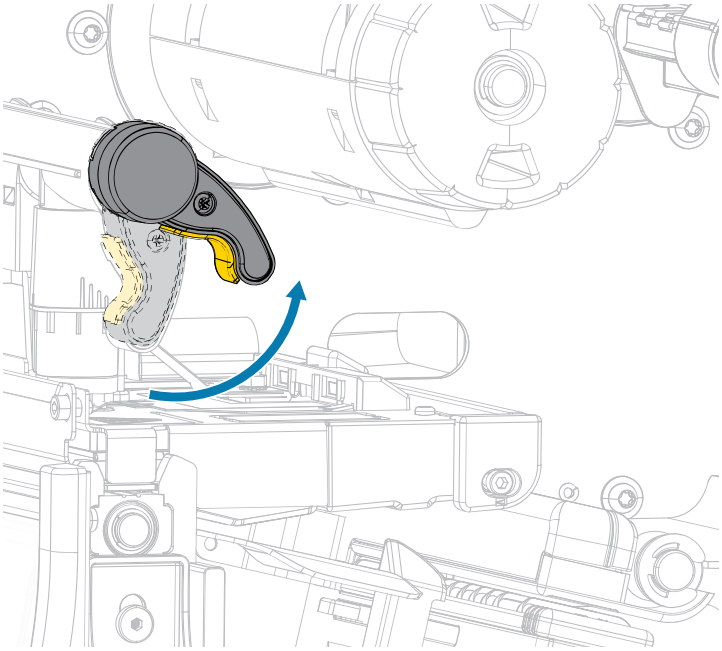
    The printer may perform a label calibration or feed a label, depending on your settings.
11. For optimal results, calibrate the printer (see Calibrating the Ribbon and Media Sensors on page 118).
12. Verify that your printer is able to print a configuration label by holding both the **FEED** and **CANCEL** keys for 2 seconds.

Media loading in Tear-Off mode is complete.

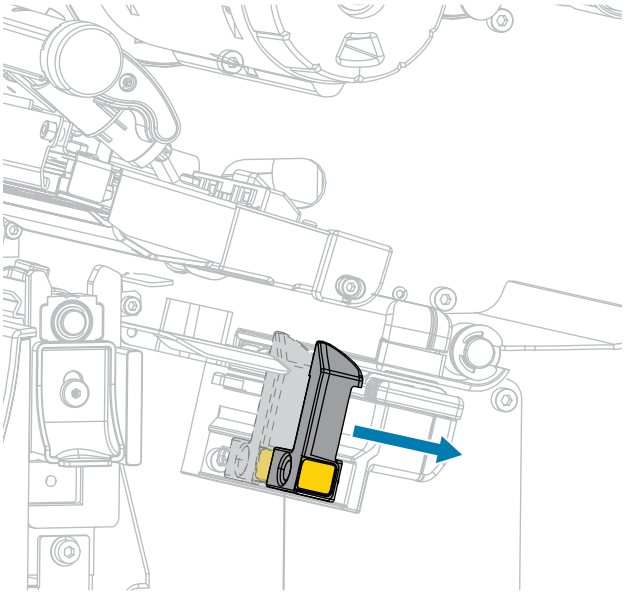
Using Peel-Off Mode (with or without Liner Take-Up)



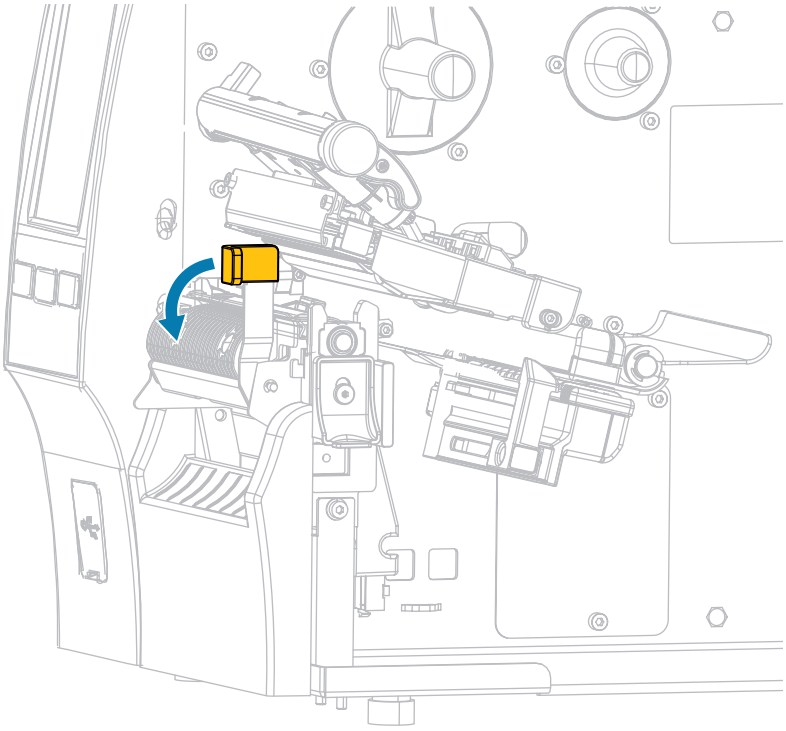
1. If you have not already done so, follow the instructions in the section Inserting the Media into the Printer on page 31.
2. Open the printhead assembly by rotating the printhead-open lever upward.



3. Slide the media guide all the way out.

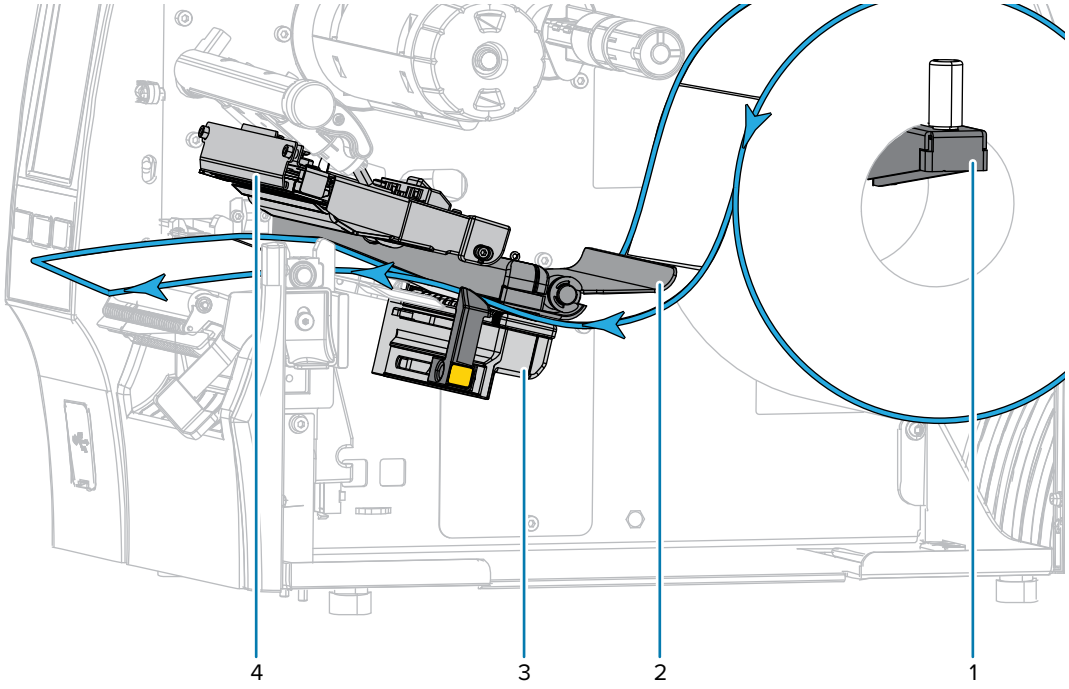


4. Push down the peel-off mechanism release lever to open the peel assembly.

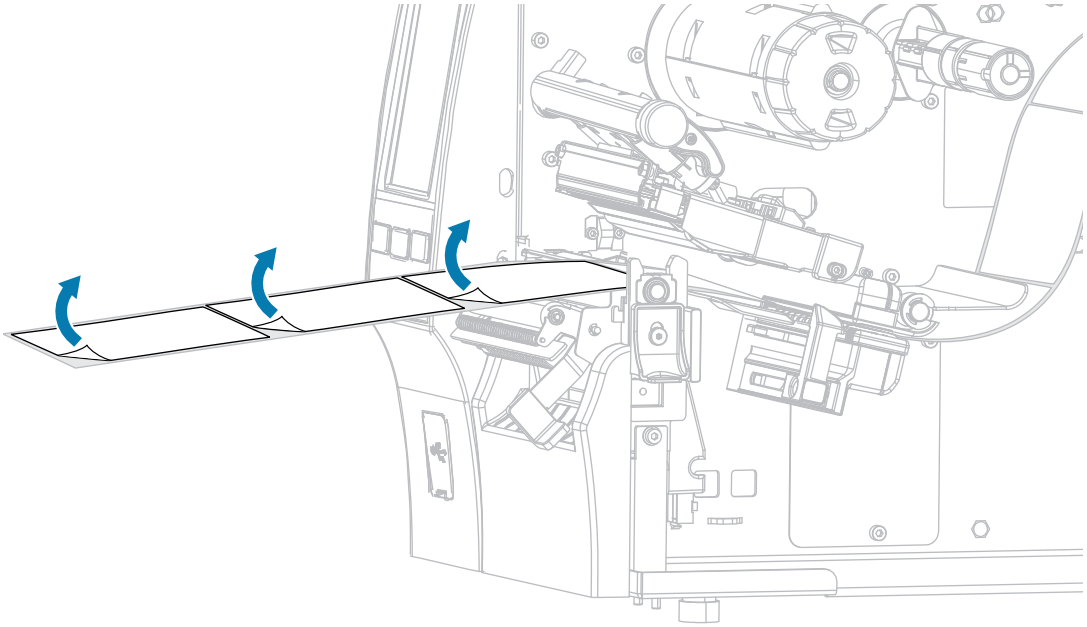


CAUTION: HOT SURFACE: The printhead may be hot and could cause severe burns. Allow the printhead to cool.

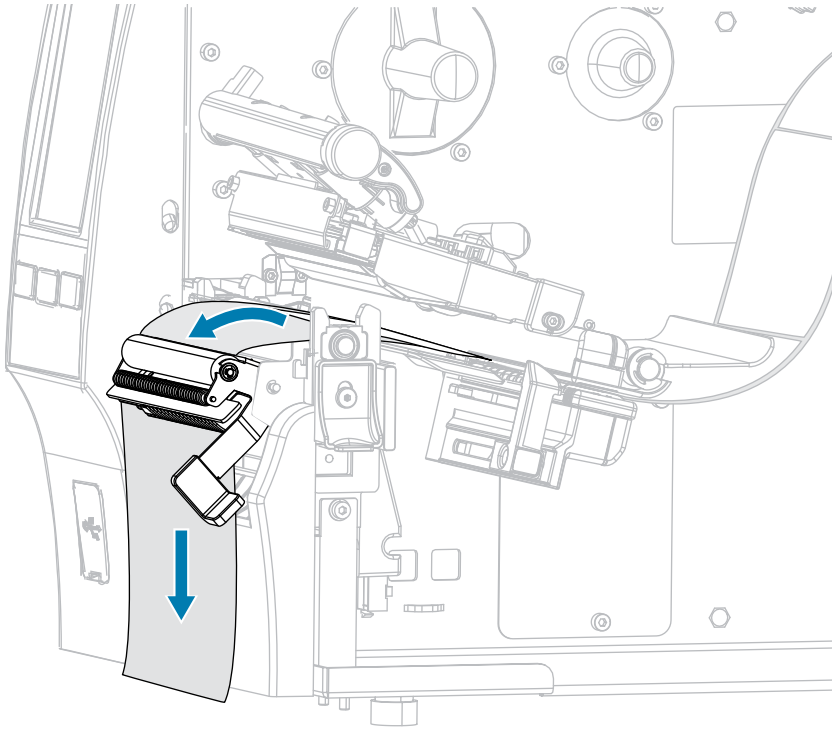
5. From the media hanger (1), feed the media under the dancer assembly (2), through the media sensor (3), and under the printhead assembly (4). Slide the media back until it touches the inside back wall of the media sensor.



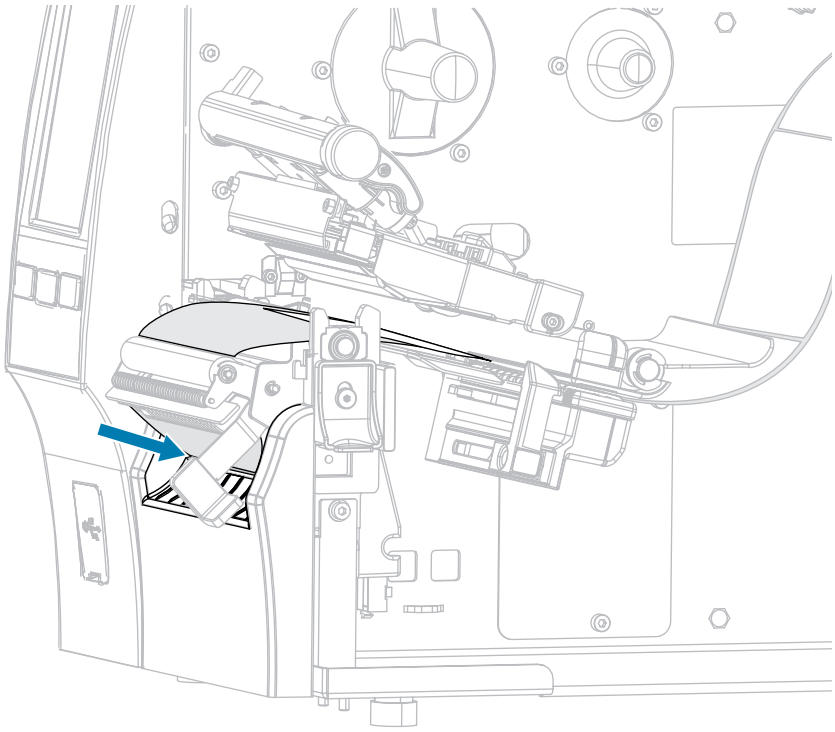
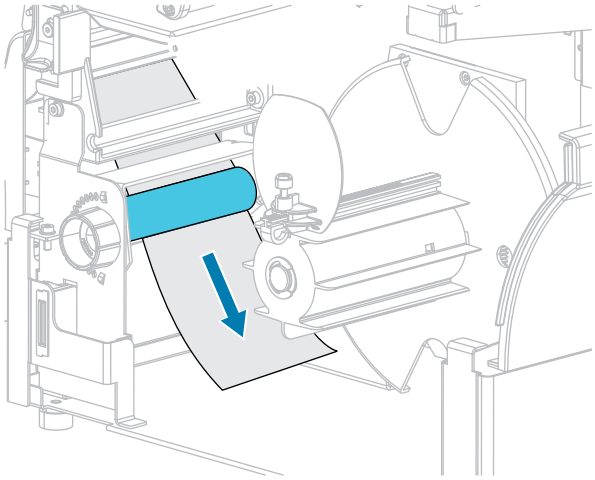
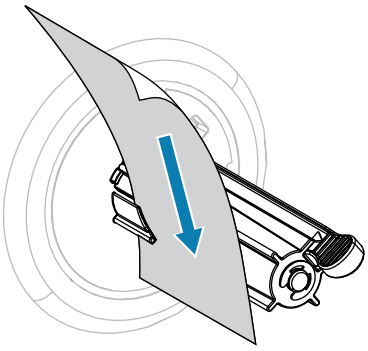
6. Extend approximately 18 in. (500 mm) of media out of the printer. Remove and discard the labels from this exposed media, leaving just the liner.

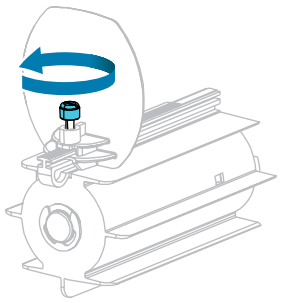
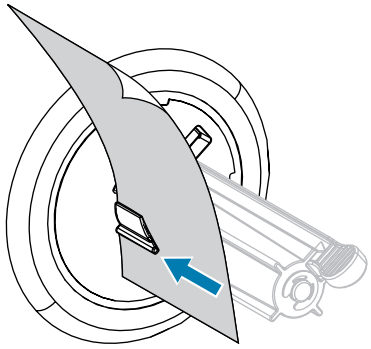
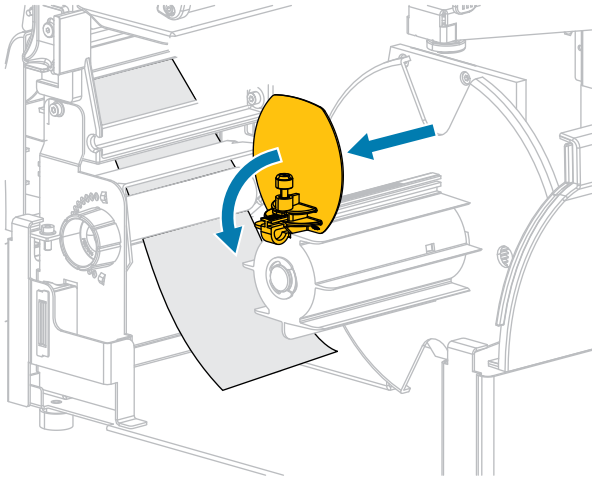
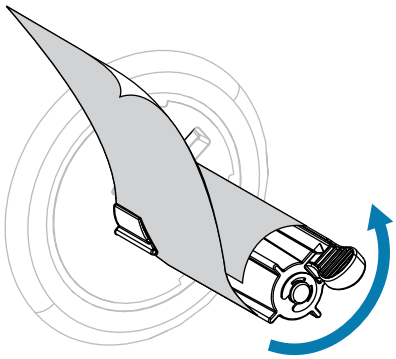
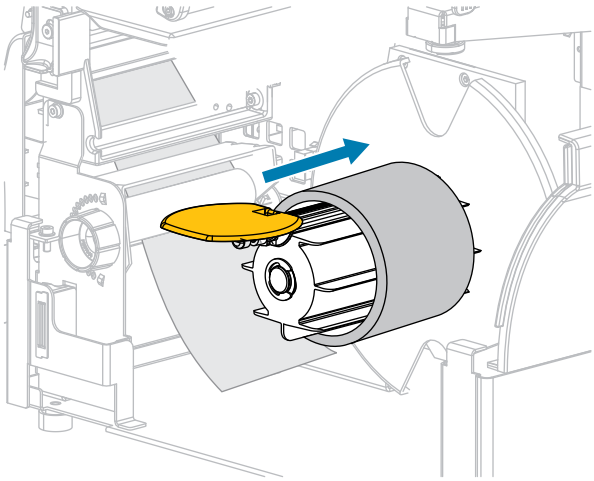


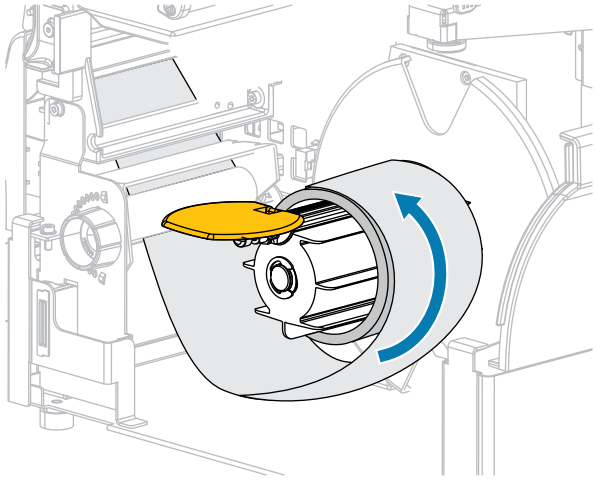
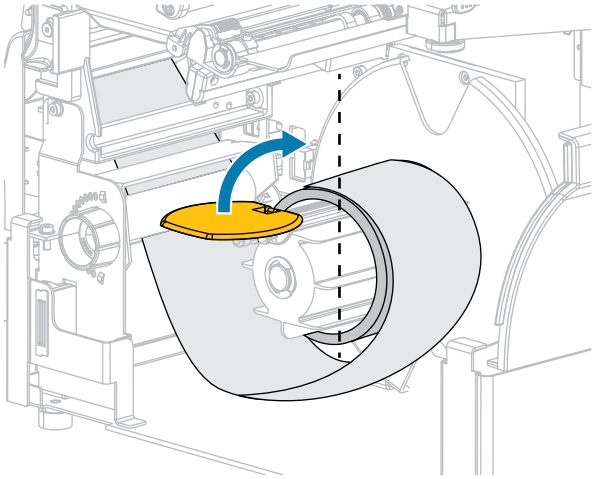
7. Feed the liner behind the peel assembly. Make sure that the end of the liner falls outside of the printer.

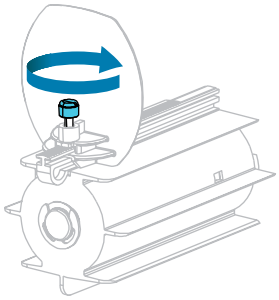


8. Complete this step only if you want to use Peel-Off mode with Liner Take-Up. Your printer must have the Liner Take-Up option or the Rewind option installed. Follow the instructions for your printer option. (If you are not using Liner Take-Up, skip this step and proceed to step 9 on page 46.)

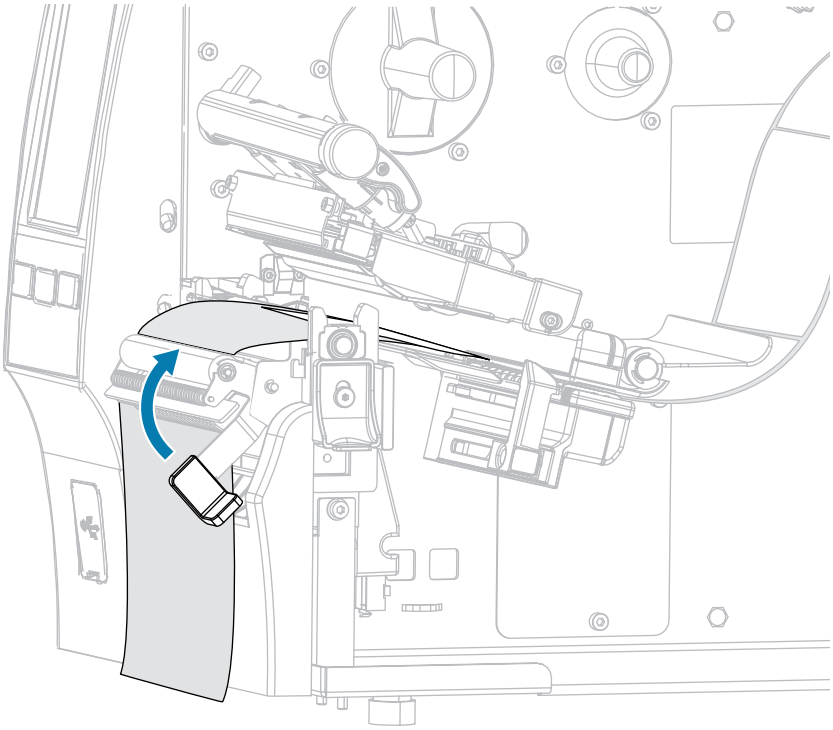
<table>
<tr><th>Rewind Option</th><th>Liner Take-Up Option</th></tr>
<tr><td colspan="2">a. For both the Rewind option and the Liner Take-Up option: Thread the liner into the slot below the peel assembly.
  </td></tr>
<tr><td>b. Feed the liner under the media alignment roller.
  </td><td>b. Slide the liner into the slot in the liner take-up spindle.
  </td></tr>
</table>

Rewind Option	Liner Take-Up Option
c. Loosen the thumbscrew on the rewind media guide. 	c. Push the liner back until it touches the back plate of the liner take-up spindle assembly. 
d. Slide the rewind media guide all the way out, and then fold it down. 	d. Wrap the liner around the liner take-up spindle and turn the spindle counterclockwise to tighten the liner.  For the Liner Take-Up option, loading of the liner is complete. Continue on to step 9 on page 46.
e. Slide an empty core onto the rewind spindle. 	

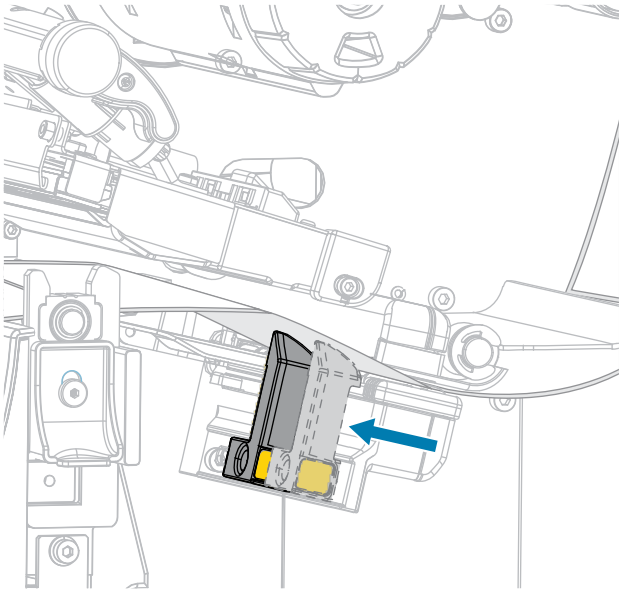
Rewind Option	Liner Take-Up Option
f. Wrap the liner around the core as shown, and then turn the rewind spindle to tighten the media. Ensure that the edge of the media is flush against the backplate of the rewind spindle. 	
g. Fold up the rewind media guide, and then slide it in until it touches the liner. 	

Rewind Option	Liner Take-Up Option
h. Tighten the thumbscrew on the rewind media guide.  Loading of the liner is complete. Continue with step 9 on page 46.	

9. Close the peel assembly using the peel-off mechanism release lever.



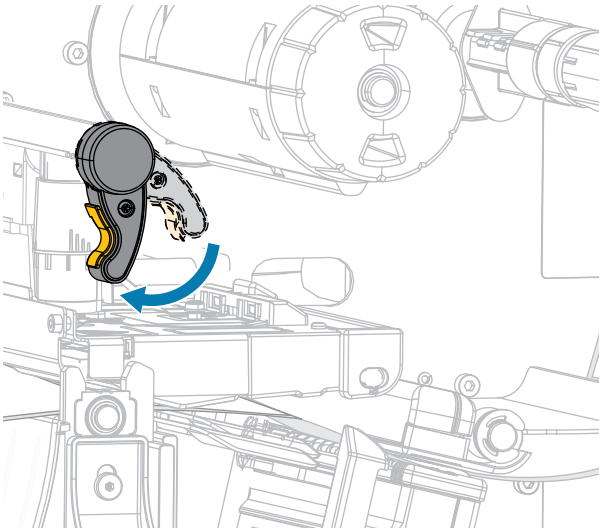
10. Slide in the media guide until it just touches the edge of the media.



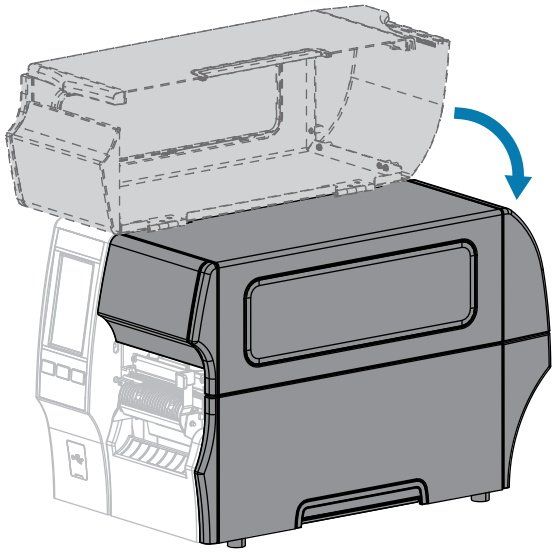
11. Does the media that you are using require ribbon for printing? If you are not sure, see Ribbon on page 10.

If using...	Then...
Direct Thermal media (no ribbon needed)	Continue with step 12 on page 47.
Thermal Transfer media (ribbon needed)	**a.** If you have not already done so, load ribbon in the printer. (See Loading the Ribbon on page 62.) **b.** Continue with step 12 on page 47.

12. Rotate the printhead-open lever downward until it locks the printhead in place.



13. Close the media door.



14. Set the printer to the appropriate collection method (see Print > Label Position > Collection Method).
15. Press **PAUSE** to exit pause mode and enable printing.

    The printer may perform a label calibration or feed a label, depending on your settings.
16. For optimal results, calibrate the printer (see Calibrating the Ribbon and Media Sensors on page 118).
17. Verify that your printer is able to print a configuration label by holding both the **FEED** and **CANCEL** keys for 2 seconds.

Media loading in Peel-Off mode is complete.