ZEBRA ZD500 Series™

Service Manual

Thermal Transfer Printer

Proprietary Statement   This manual contains proprietary information of Zebra Technologies Corporation and its subsidiaries ("Zebra Technologies"). It is intended solely for the information and use of parties operating and maintaining the equipment described herein. Such proprietary information may not be used, reproduced, or disclosed to any other parties for any other purpose without the express, written permission of Zebra Technologies.

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Compliance and Regulatory Statements

FCC Compliance Statement (USA)

This device complies with Part 15 rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and

2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for Class B Digital Devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the product manuals, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, the user is encouraged to do one or more of the following measures:

• Reorient or relocate the receiving antenna.

• Increase the separation between the equipment and receiver.

• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced RF service technician for help.

Important •

1. The radio must be installed with a minimum 20 cm separation between the user and the antenna.

2. The radio must not be co-located or used in simultaneous transmitting condition with another radio.

3. The host system shall have a label to indicate that the system contains a certified module. An example is "Contains FCC ID : I28MD-EXLAN11N , IC ID: 3798B-EXLAN11N".

4. The radio is for indoor use only in the 5150-5250 GHz frequency range.

The user is cautioned that any changes or modifications not expressly approved by Zebra Technologies could void the user's authority to operate the equipment. To ensure compliance, this printer must be used with fully shielded communication cables.

Mexico — NOM-121-SCT1-2009

Este equipo ha sido diseñado para operar con las antenas que enseguida se enlistan y para una ganancia máxima de antena de [x] dB. El uso con este equipo de antenas no incluidas en esta lista o que tengan una ganancia mayor que [x] dB quedan prohibidas. La impedancia requerida de la antena es de [y] ohms.

auden - p/n 220370-09

• Gain = 2.77dbi @ 2.4 GHz
• Gain = 2.69 - 3.19dBi @ 5 GHz
• Impedance = 50 ohms

Canadian DOC Compliance Statement

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
This Class B digital apparatus complies with Canadian ICES-003.

Industry Canada (IC) Warning

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: 1) This device may not cause interference., 2) This device must accept any interference, including interference that may cause undesired operation of the device.

Brasil — Aviso da Anatel

Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário.

"Este produto está homologado pela ANATEL, de acordo com os procedimentos regulamentados pela Resolução 242/2000, e atende aos requisitos técnicos aplicados"

Para maiores informações, consulte o site da ANATEL www.anatel.gov.br

This equipment's operation is of a secondary character; that is, it doesn't have the right to protection against damaging interference, even from stations of the same type, nor can it cause interference to systems with a primary operating character.

Japan Restricted Frequencies

この周波数帯は 5.725 5.825 GHz の日本で利用できるされません。
For 5.725 - 5.825 GHz, this frequency band will not be available in Japan.

Taiwan Restricted Frequencies

5.15-5.25 GHz, 該頻段將在臺灣不可用。
For 5.15 - 5.25 GHz, this frequency band will not be available in Taiwan.

Korean Compliance Statement

이 기기는 가정용 (B 급) 전자파 적합기기 로서 주로 가정에서 사용하는 것을 목적으로 하며 , 모든 지역에서 사용할 수 있습니다 .
The equipment is for home use (Class B) and has acquired electromagnetic conformity registration, so it can be used not only in residential area but other areas as well.
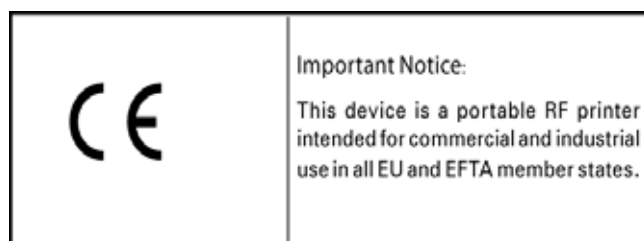해당 무선설비기기는 운용 중 전파혼신 가능성이 있으므로 인명 안전과 관련된 서비스는 할 수 없습니다 .
This radio device is not allowed to be used for human safety since it has possibility of radio interference during operation.

European Regulatory Information

AT	BE	BG	HR	CY	CZ	DK	EE
FI	FR	DE	GR	HU	IS	IE	IT
LV	LI	LT	LU	MT	NL	NO	PL
PT	RO	SK	SI	ES	SE	CH	GB

Note • Member states in the EU with restrictive use for this device are crossed out. This device is also authorized for use in all EFTA member states (CH, IS, LI, NO).

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Important Notice:

This device is a portable RF printer intended for commercial and industrial use in all EU and EFTA member states.

NCC

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

According to "Administrative Regulations on Low Power Radio Waves Radiated Devices" Without permission granted by the NCC, any company, enterprise, or user is not allowed to change frequency, enhance transmitting power or alter original characteristic as well as performance to an approved low power radio-frequency devices. The low power radio-frequency devices shall not influence aircraft security and interfere legal communications; If found, the user shall cease operating immediately until no interference is achieved. The said legal communications means radio communications is operated in compliance with the Telecommunications Act.

The low power radio-frequency devices must be susceptible with the interference from legal communications or ISM radio wave radiated devices.

WLAN Radio Specification

802.11 b

- 2.4 GHz
- DSSS (DBPSK, DQPSK and CCK)
- RF power 63 mW (ZebraNet n Print Server)

802.11 g

- 2.4 GHz
- OFDM (16-QAM and 64-QAM with BPSK and QPSK)
- RF power 63 mW (ZebraNet n Print Server)

802.11 n

- 2.4 GHz
- OFDM (16-QAM and 64-QAM with BPSK and QPSK)
- RF power 63 mW (ZebraNet n Print Server)

802.11 a/n

- 5.15-5.25 GHz, 5.25-5.35 GHz, 5.47-5.725 GHz, 5.725-5.825 GHz
- OFDM (16-QAM and 64-QAM with BPSK and QPSK)
- RF power 50 mW (ZebraNet n Print Server)

Bluetooth 2.1 + EDR

- 2.4 GHz
- FHSS
- RF power 0.4 mW

RFID Radio Specification

- 902 - 928 MHz (US); 865 - 868 MHz (EU)
- ISO-18000 - 6B; ISO 18000-6C
- RF power <30 dBm ERP

Environmental Management

Do not dispose of this product in unsorted municipal waste. This product is recyclable, and should be recycled according to your local standards.

For more information, please see our website at:

Web address: www.zebra.com/environment

Document Conventions

Table 1 • Document Conventions

Alternate Color

If you are viewing this guide on-line, you can click the blue text used for cross-references or hyper-links to jump directly to other sections in the guide or to web sites on the Internet.

Command Line Examples, File Names, and Directories

Command line examples, file names, and directories appear in a `Typewriter style (Courier) mono-spaced` font. For example:

Type `ZTools` to get to the Post-Install scripts in the `/bin` directory.

Open the `Zebra<version number>.tar` file in the `/root` directory.

Icons and Advisory Words

The following icons and advisory words are used to draw your attention to certain areas of text.

Caution • Warns you of the potential for electrostatic discharge.

Caution • Warns you of a potential electric shock situation.

Caution • Warns you of a situation where excessive heat could cause a burn.

Caution • Advises you that failure to take or avoid a specific action could result in physical harm to **you**.

(No icon) **Caution •** Advises you that failure to take or avoid a specific action could result in physical harm to the **hardware**.

Important • Advises you of information that is essential to complete a task.

Note • Indicates neutral or positive information that emphasizes or supplements important points of the main text.

Tools • Tells you what tools you need to complete a given task.

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1

Introduction

If you are a field engineer or technician, this manual helps you with routine maintenance, troubleshooting and procedures for replacing parts for repair.

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.

How Repairs and Maintenance Procedures are Documented

This manual is a part of a multi-media service CD-ROM. It is designed to provide training and instruction for repair and maintenance of your Zebra printer.

Each ZD500 Series™ printer Spares Kit has one or more repair procedures that support it. Most procedures include videos of the actual repair. The Replacing Parts section of this service manual includes a repair flow diagram. A list of Spare Kits available for your Zebra printer (supported by this manual) have been included on this service CD-ROM.

Most maintenance procedures have written procedures with corresponding videos detailing the service procedure.

The videos are accessed via links in the electronic version of this manual with Adobe Reader version 9 or higher (PDF files). They consist of compressed movies in MP4 video format. Most of the videos do not have an audio track. The simplest procedures do not have video. The service videos are complemented by step by step instructions and additional information, such as cautions and warnings for your safety or to protect the printer from damage during service.

How to share access to the contents of this CD-ROM

This service CD-ROM has been designed to be copied to a PC or network server for sharing access. FOR YOUR INTERNAL USE ONLY! DO NOT COPY! DO NOT REDISTRIBUTE OR PLACE ON THE INTERNET!

Copy all the files in the root directory of this CD (i.e. D:\) including all the sub-directories, intact to a directory on your PC or network server. RunCD.exe file opens the service CD's user interface screen.

Do not change any file or sub-directory names or their locations relative to the location of the RunCD.exe file.

Thermal Printing

Caution • 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 • The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead or 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

Overtime 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.

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Cleaning and Maintenance

The printers are manufactured and tested under a strict quality management program. Zebra Technologies uses only high quality components and materials in its printers. Although only minimal routine maintenance is required, following these simple maintenance guidelines will ensure longer life with quality printing performance.

Cleaning

When you clean the printer, use one of the following supplies that best suits your needs:

Cleaning Supplies	Order Quantity	Intended Purpose
Cleaning pens (105950-035)	Set of 12	Clean printhead
Cleaning swabs (105909-057)	Set of 25	Clean media path, guides and sensors

You can obtain cleaning supplies at www.zipzebra.com.

The cleaning process takes just a couple of minutes using the steps outlined below.

Printer Part	Method	Interval
Printhead	Let the printhead to cool for a minute, then use a new cleaning pen to swab the dark line on the printhead cleaning from the center to the outside edges of the printhead. See *Cleaning the Printhead on page 7*	After every roll of media using direct thermal printing. When using ribbon: after every roll of ribbon; when using direct thermal: after every roll of media.
Platen roller	Remove the platen roller to clean. Clean the roller thoroughly with 90% medical-grade alcohol and a cleaning swab or lint-free cloth. See *Platen Cleaning on page 10*	As needed.
Peel bar	Clean it thoroughly with 90% medical-grade alcohol and a fiber-free cleaning swab. Let alcohol dissipate and the printer dry completely.	
Media path		
Exterior	Water-dampened cloth.	
Interior	Gently brush out printer.	

Caution • Adhesives and coatings from the media can over time transfer onto the printer components along the media path including the platen and printhead. This build-up can accumulate dust and debris. Failure to clean the printhead, media path and platen roller could result in inadvertent loss of labels, label jams and possible damage to the printer.

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.
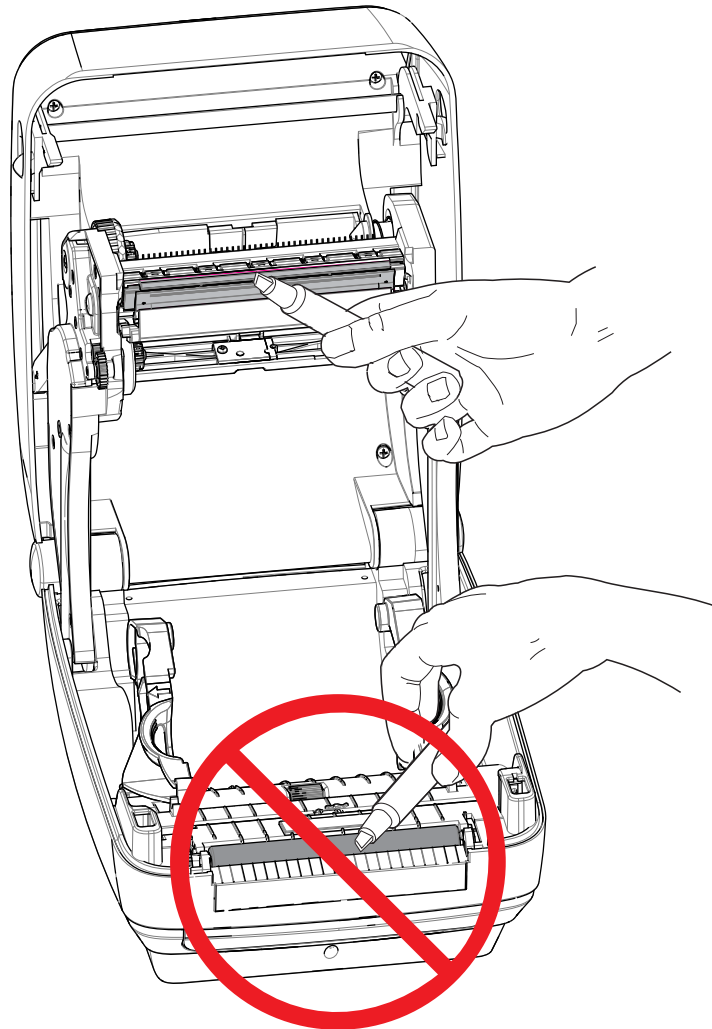
Cleaning the Printhead

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

Caution • The printhead becomes hot while printing. To protect from damaging the printhead and risk of personal injury, avoid touching the printhead. Use only the cleaning pen to perform maintenance.

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 printhead outside of media path.

2. Wait one minute before closing the printer.

Cleaning the Media Path

Use a cleaning swab to remove debris, dust or crust that has built-up on the holders, guides and media path surfaces.

1. Use the alcohol in the cleaning swab to soak the debris to break up the adhesive.

2. Wipe the ridges to remove accumulated debris.

3. Wipe the inside edges of both edge guides to remove any built-up residue.

4. Wait one minute before closing the printer.

Discard the cleaning swab after use.
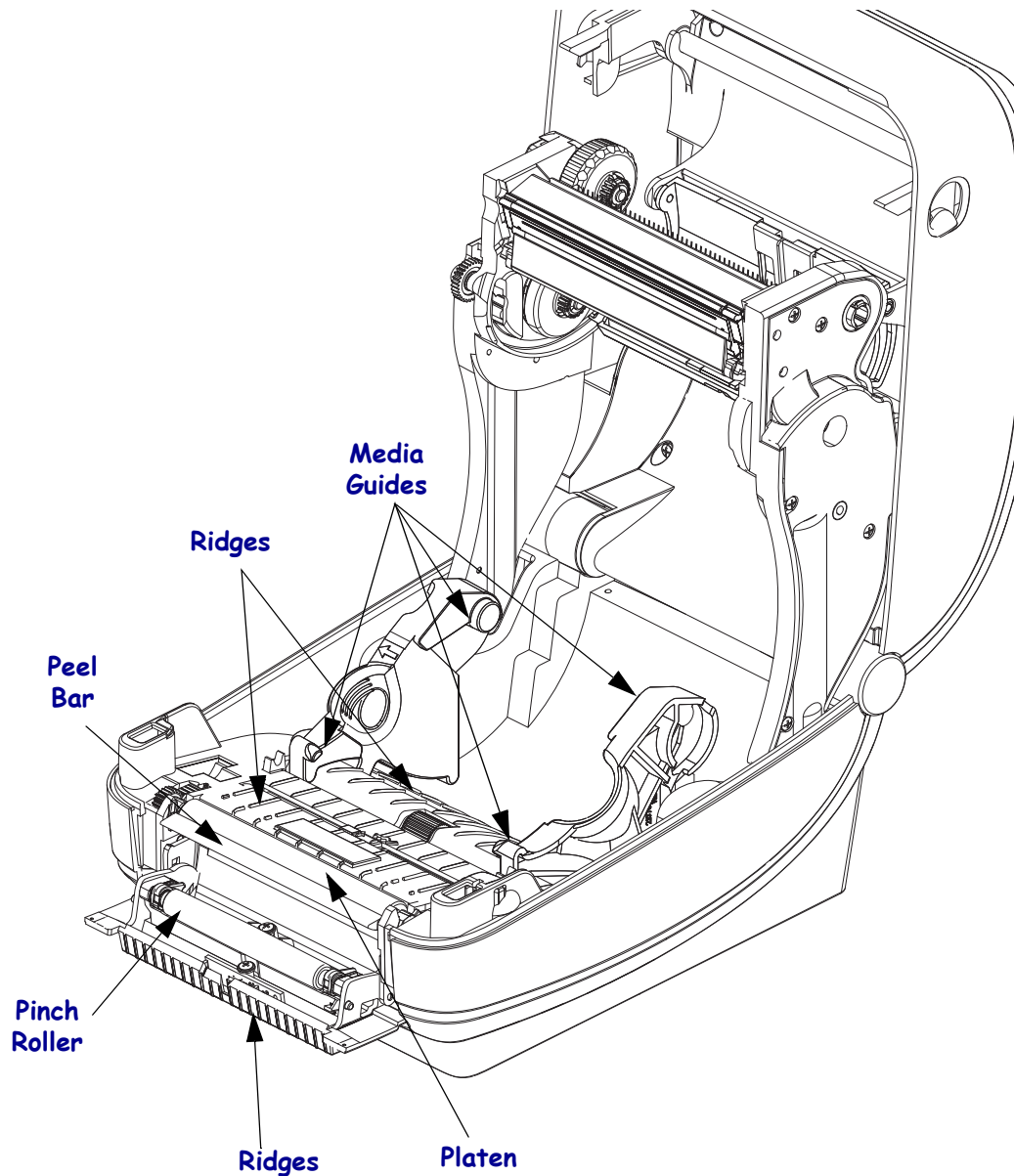
Sensor Cleaning

Dust can accumulate on the media sensors.

1. Gently brush away dust; if necessary, use a dry swab to brush away dust. If adhesives or other contaminates 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.
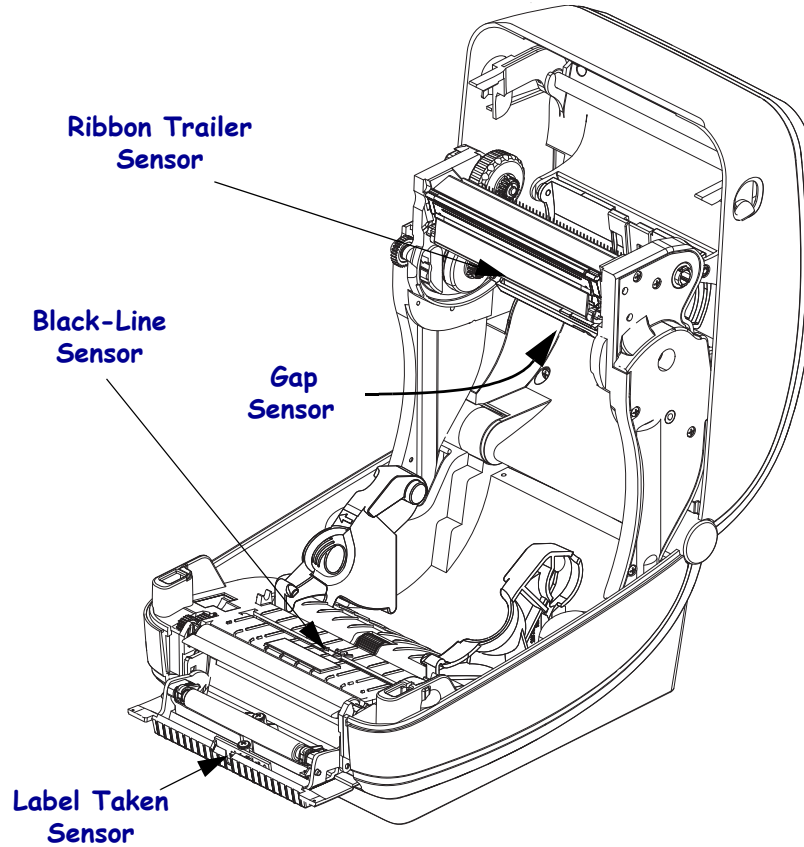
Platen Cleaning

The standard platen (drive roller) normally does not require cleaning. Paper and liner dust can accumulate without effecting print operations. Contaminates 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 contaminates should be cleaned immediately off the platen.

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.

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 (90% pure or better).

See "Replacing the Platen (drive roller) Assembly" on page 47 for more details on removing the platen.

1. Open the cover (and dispenser door). Remove media from platen area.

2. Push small platen bearing latch tabs, sticking up from the platen bearing well on the right and left sides, out slightly and then rotate them up.

3. Lift the platen out of the printer's bottom frame.

4. Clean the platen with the alcohol moistened swab. Clean from the center out. Repeat this process until the all of the roller surface has been cleaned. Don't scrub or scrape the platen or use tools. Dry the platen and repeat a second time with a new swab. If there has been heavy adhesive build-up or label jam, repeating this process with a new swab helps to remove residual contaminates. Adhesives and oils, for example, may be thinned by the initial cleaning but not completely removed. Discard the cleaning swabs after use - do not reuse.

5. Install the platen in the printer. Make sure the bearings and gear are on the platen shaft.

6. Align the platen with the gear to the left and lower it into the printer's bottom frame.

7. 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.

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

Cleaning the Cutter

The Zebra desktop printer cutters are designed to require little to no maintenance under normal use.

Caution • Never operate the printer with the cutter bezel removed.

Warning • There are no operator serviceable parts in the cutter unit. Only Zebra authorized service personel should remove the cutter cover (bezel).

Never attempt to insert objects or fingers in to the cutter mechanism.

Important • Tools, cotton swabs, solvents (including alcohol), etc. all may damage or shorten the cutter's usable life or cause the cutter to jam.

Cutter Facts

- The printer's cutter mechanisms are rated for up to a million cuts at rated paper weight (density/hardness). Higher paper weights than the rated weight can cause the cutter blade to dramatically wear out quicker. The rated paper weights versus cutters designed function (full – standard option, partial – custom option, etc.) will also affect the cutter's rated paper weight and cutter life at those weights.

- The cutter is not designed to cut adhesive backed media, only label liners. Cutting through adhesive backed media normally will jam the cutter blade over time by leaving adhesive deposits. Common adhesives such as acrylic and gum will build up on the fixed blade of the cutter. With the cutter's tight design tolerances required to deliver an accurate clean cut every time, the cutter can not tolerate the balls of gum or fine layers of hardened adhesives like the acrylic, building up on the fixed cutting blade. These materials can push the moving blade at an angle to the fixed blade causing the blade to bind.

- The printer uses a cutter jam detection algorithm to reverse a jammed cutter and flag a media error condition (with a red printer status LED and via printer interface communication). Cutting adhesive backed media, unapproved non-paper media or paper weights exceeding the rated paper range of the cutter are typically the cause of cutter jams.

Cutter Cleaning

Caution • Keep all tools out of the three access holes (used at the factory to adjust potentiometers on the cutter mechanism). *These are not field-serviceable points*.

Caution • 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.

1. Turn the printer over. Use a #1 Phillips screwdriver to remove the two screws securing the cutter bezel to the printer's cutter mechanism. Lift the cutter bezel off the top of the cutter.

2. Clean the upper fixed blade with a cleaning swab lightly moistened alcohol. It is recommend that cleaning of only the fixed blade. Completely dry the fixed blade with a dry swab.

3. You may clean the movable blade if there are visible contaminates on the top of the moving blade. Use the cutter blade's actuator thumb screw on the cutter body to move the blade up and down. Raise and lower the blade by turning the actuator screw counter-clockwise. Always leave the blade in the lowered, ready to cut position.

Thumb Screw
(moves blade in very
small amounts)

4. Replace the cutter bezel and secure it with the two screws.

Troubleshooting

This section provides troubleshoots procedures.

Error Messages

The control panel displays messages when there is an error. See Table 1 for errors, the possible causes, and the recommended solutions.

Table 1 • Error Messages (Continued)

Display/ Indicator Lights	Possible Cause	Recommended Solution
HEAD OPEN **CLOSE HEAD** STATUS light steady red	The printhead is not fully closed.	Close the printhead completely.
	The printhead open sensor is not working properly.	Replace the Head-Up sensor.
MEDIA OUT **LOAD MEDIA** STATUS light steady red	The media is not loaded or is loaded incorrectly.	Load media correctly.
	Misaligned media sensor.	Check the position of the media sensor.
	The printer is set for noncontinuous media, but continuous media is loaded.	**1.** Install the proper media type, or reset printer for the current media type. **2.** Calibrate the printer. See Manual Calibration in the User's Guide.
ALERT **RIBBON OUT** STATUS light steady red	In thermal transfer mode: • the end of the ribbon roll has been detected.	Replace the empty ribbon with a new roll.
PH NOT AUTHENTICATED **REPLACE PRINTHEAD** STATUS light flashing red	The printhead damaged, replaced incorrectly, or was replaced with one that is not a genuine Zebra™ printhead.	Install a genuine Zebra™ printhead.

Table 1 • Error Messages (Continued)

Display/ Indicator Lights	Possible Cause	Recommended Solution
PRINT HEAD OVERTEMP **PRINTING HALTED** STATUS light steady yellow	**Caution •** The printhead may be hot enough to cause severe burns. Allow the printhead to cool.	
	The printhead is over temperature.	Allow the printer to cool. Printing automatically resumes when the printhead elements cool to an acceptable operating temperature. If this error persists, consider changing where the printer is located (air flow, heat soucres, direct sun, high ambient temperature) or using a slower print speed. Replace the printhead if the environmental conditions have been addressed.
HEAD COLD **PRINTING HALTED** **THERMISTOR** **REPLACE PRINTHEAD** STATUS light steady yellow The printer shows one of these messages or cycles between them.	**Caution •** An improperly connected printhead data or power cable can cause these error messages. The printhead may be hot enough to cause severe burns. Allow the printhead to cool.	
	The printhead data cable is not properly connected.	Verify cable connections and cable integrity, then replace the printhead if the cable is intact.
	The printhead has a faulty thermistor.	Call a service technician to replace the printhead.
	The printhead temperature is approaching its lower operating limit.	Continue printing while the printhead reaches the correct operating temperature. If the error remains, the environment may be too cold for proper printing. Relocate the printer to a warmer area.
CUT ERROR STATUS light steady red	**Caution •** The cutter blade is sharp. Do not touch or rub the blade with your fingers.	
	The cutter blade is in the media path. Cutter maybe obstructed (jammed).	The cutting blade is stopped. Needs cleaning or replacement.

Table 1 • Error Messages (Continued)

Display/ Indicator Lights	Possible Cause	Recommended Solution
OUT OF MEMORY STORING GRAPHIC OUT OF MEMORY STORING FORMAT OUT OF MEMORY STORING BITMAP OUT OF MEMORY STORING FONT	There is not enough memory to perform the function specified on the second line of the error message.	Free up some of the printer's memory by deleting unneeded Forms, Graphics, or Fonts. Get more RAM memory for imaging by adjusting the label format or printer parameters. One way to free up memory is to adjust the print width to the actual width of the label instead of leaving the print width set to the default. See Settings Menu - PRINT WIDTH.
		Ensure that the data is not directed to a printer virtual device (memory area) that is not installed or is unavailable.
		Cycle printer power to allow the printer to do a POST (power on system test). Main PCBA may have bad memory.

Printing Issues

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

Table 2 • Printing Issues (Continued)

Issue	Possible Cause	Recommended Solution
General print quality issues - The printed image does not look right.	The printhead is dirty.	Clean the printhead. See *Cleaning the Printhead on page 4* and *Platen Cleaning on page 7*
	The printer is set at an incorrect darkness level and/or print speed.	For optimal print quality, set the darkness to the lowest possible setting for your for bar codes and balance that with graphic and text quality in your application. Don not set print speeds above the manufacture maximum rated speed for your media or ribbon. You may want to perform the *Print Quality Report on page 22* to determine the ideal darkness and speed settings for your application. See the User's Guide for information on setting print speed and darkness.
	You are using an incorrect combination of labels and ribbon for your application.	1. Switch to a different type of media or ribbon to try to find a compatible combination. 1. If necessary, consult your authorized Zebra reseller or distributor for information and advice.
	You maybe using the wrong power supply.	Verify the printer has the correct 100 Watt power supply that came with this printer.
	The printhead has worn out.	Replace the printhead. The printhead is a consumable item and will wear out due to friction between the media and printhead. Using unapproved media may shorten life or damage your printhead.
	The platen may need cleaning or replacement.	Clean or replace the platen (drive) roller.
No print on the label.	The media may not be direct thermal media when printing without ribbon (i.e. thermal transfer).	See the test procedure Determining Media Types in the User's Guide.
	The ribbon may not have the 'ink' outside wound or approved for this printer.	See the Ribbon Test with Adhesive and Ribbon Scratch Test in the User's Guide.
	Media or ribbon has been loaded incorrectly.	The media printable surface must face up towards the prinhead. See the Media and Ribbon loading in the User's Guide.

Table 2 • Printing Issues (Continued)

Issue	Possible Cause	Recommended Solution
Loss of printing registration on labels. Excessive vertical drift in top-of-form registration.	The platen roller is dirty.	Clean the printhead and platen roller. *Cleaning the Printhead* on page 4 and *Platen Cleaning* on page 7
	The media type is set incorrectly.	Set the printer for the correct media type (gap/notch, continuous, or mark). See Settings the User's Guide to start.
	The media is loaded incorrectly.	Load media correctly. See the Media Loading in the User's Guide.
Long tracks of missing print on several labels	Print element damaged or very dirty.	Clean the printhead: *Cleaning the Printhead* on page 4.Replace the printhead if cleaning does not correct.
Printing too light or too dark over the entire label	The media or ribbon is not designed for high-speed operation.	Replace supplies with those recommended for high-speed operation.
	You are using an incorrect combination of media and ribbon for your application.	1. Switch to a different type of media or ribbon to try to find a compatible combination. 2. If necessary, consult your authorized Zebra reseller or distributor for information and advice.
	You are using ribbon with direct thermal media.	Direct thermal media does not require ribbon. To determine if you are using direct thermal media, perform the label scratch test in the User' Guide.
Smudge marks on labels	The media or ribbon is not designed for high-speed operation.	Replace supplies with those recommended for high-speed operation.
Misregistration/skips labels	The printer is not calibrated.	Calibrate the printer. See the User's Guide-Manual Calibration.
	Improper label format.	Check your label format and correct it as necessary.
Vertical drift in top-of-form position	The printer is out of calibration.	Calibrate the printer. See the User's Guide-Manual Calibration.
	The platen roller is dirty.	Clean the printhead and platen roller. See *Cleaning the Printhead* on page 4 and *Platen Cleaning* on page 7.

Table 2 • Printing Issues (Continued)

Issue	Possible Cause	Recommended Solution
Vertical image or label drift	The printer is using non-continuous labels but is configured in continuous mode.	Set the printer for the correct media type (gap/notch, continuous, or mark—see the User's Guide *SETTINGS Menu.*- MEDIA TYPE and calibrate the printer, if necessary. See the User's Guide- Manual Calibration.
	The media sensor is calibrated improperly.	Calibrate the printer. See the User's Guide- Manual Calibration.
	The platen roller is dirty.	Clean the printhead and platen roller. *Cleaning the Printhead* on page 4 and *Platen Cleaning* on page 7.
	The media or ribbon is loaded incorrectly.	Ensure that the media and ribbon are loaded correctly. See the Media and Ribbon loading in the User's Guide.
	Incompatible media.	You must use media that meets the printer specifications. Ensure that the inter-label gaps or notches are 2 to 4 mm and consistently placed.
The bar code printed on a label does not scan.	The bar code is not within specifications because the print is too light or too dark.	Perform the *Print Quality Report* on page 26. Adjust the darkness or print speed settings as necessary.
	There is not enough blank space around the bar code.	Leave at least 1/8 in. (3.2 mm) between the bar code and other printed areas on the label and between the bar code and the edge of the label.

Ribbon Problems

Table 3 identifies problems that may occur with ribbon, the possible causes, and the recommended solutions.

Table 3 • Ribbon Problems

Problem	Possible Cause	Recommended Solution
Broken or melted ribbon	Darkness setting too high.	1. Reduce the darkness setting. See *SETTINGS Menu* - DARKNESS for how to change the darkness setting in the User's Guide. 2. Clean the printhead thoroughly. See *Cleaning the Printhead* on page 4 and *Platen Cleaning* on page 7
	The ribbon is coated on the wrong side and cannot be used in this printer.	Replace the ribbon with one coated on the correct side. For more information, see *Coated Side of Ribbon on the User's Guide.*
Wrinkled ribbon	Ribbon was loaded incorrectly.	Load the ribbon correctly. See Ribbon Loading in the User's Guide.
	The printhead, ribbon guide or platen roller may be installed incorrectly.	Inspect the printer.
The printer does not detect when the ribbon runs out.	You maybe using non-approved media.	Get Zebra approved ribbon with a reflective ribbon trailer. The sensor may need cleaning or replacement.

RFID Troubleshooting

Many RFID hardware problems can be corrected or diagnosed by performing a 'Manual Calibration - Media' on the printer (*Manual Calibration - Media* on page 26) followed by a 'RFID Calibration' (*RFID Calibration* on page 27) on your chosen RFID media. These two operations are the first place to troubleshoot problems with RFID operations. Does the printer sense basic media characteristics (length, gap, etc.) and can the RFID module recognize, read and write to your chosen RFID media without error?

Many other problems can be caused by the location of the printer (proximity to other UHF radio sources or other RFID reader, printers, tags and devices) or the media itself may not be compatible with the printer.

Information for troubleshooting the RFID operations and related media issues is found in the 'RFID Programming Guide 3' which can be found on the Zebra Web site at:

www.zebra.com/support

Look up the ZD500R or ZD500 Series printers. Go to the 'Manuals' tab and browse for the 'RFID Programming Guide 3'.

Printer firmware updates may improve or expand printer operation for some RFID media and other general operations. Firmware is available on the printer support web page also.

Communications Problems

Table 4 identifies problems with communications, the possible causes, and the recommended solutions.

Table 4 • Communications Problems

Problem	Possible Cause	Recommended Solution
A label format was sent to the printer but was not recognized. The DATA light does not flash.	The communication parameters are incorrect.	Check the printer driver or software communications settings (if applicable).
		If you are using serial communication, check the serial port settings. See the User's Guide.
		If you are using serial communication, make sure that you are using a null modem cable or using a null modem adapter.
		Check the printer's handshake protocol setting. The setting used must match the one being used by the host computer. See PORTS Menu for the Host Handshake setting.
		If a driver is used, check the driver communication settings for your connection.
A label format was sent to the printer. Several labels print, then the printer skips, misplaces, misses, or distorts the image on the label.	The serial communication settings are incorrect.	Ensure that the flow control settings match the host system.
		Check the communication cable length.
		Check the printer driver or software communications settings (if applicable).
A label format was sent to the printer but was not recognized. The DATA light flashes but no printing occurs.	The prefix and delimiter characters set in the printer do not match the ones in the label format.	Verify the prefix and delimiter characters. See *LANGUAGE Menu* - COMMAND CHAR and DELIMITER CHAR.
	Incorrect data is being sent to the printer.	Check the communication settings on the computer. Ensure that they match the printer settings.
		If the problem continues, check the label format.

Miscellaneous Issues

Table 3 identifies miscellaneous issues with the printer, the possible causes, and the recommended solutions.

Table 5 • Miscellaneous Printer Problems

Problem	Possible Cause	Recommended Solution
The control panel display shows a language that I cannot read	The language parameter was changed through the control panel or a firmware command.	1. On the control panel display, scroll to LANGUAGE Menu. 2. Press **OK** to access the items in this menu. 3. Use the **UP ARROW** or **DOWN ARROW** to scroll through the language selections. The selections for this parameter are displayed in the actual languages to make it easier for you to find one that you are able to read. 4. Select the language that you want to display.
The display is missing characters or parts of characters	The display may need replacing.	Replace the control panel.
Changes in parameter settings did not take effect	Some parameters are set incorrectly.	1. Check the parameters and change or reset if necessary. 2. Turn the printer off (**O**) and then on (**I**).
	A firmware command turned off the ability to change the parameter.	Refer to the *Programming Guide for ZPL, ZBI, Set-Get-Do, Mirror, and WML*
	A firmware command changed the parameter back to the previous setting.	
	If the problem persists, there may be a problem with the Main PCBA.	Replace the Main PCBA.
Non-continuous labels are being treated as continuous labels.	The printer was not calibrated for the media being used.	Calibrate the printer. See the User's Guide- Manual Calibration.
	The printer is configured for continuous media.	Set the printer for the correct media type (gap/notch, continuous, or mark). See *SETTINGS Menu on page 52*.- MEDIA TYPE.
All indicator lights are on, nothing is on the display and the printer locks up. - or- The printer locks up while running the Power-On Self Test.	Internal electronic or firmware failure.	Reload the printer firmware, then if the printer does not respond, replace the Main PCBA.

Printer Diagnostics

Diagnostic reports, calibrations procedures, restoring factory defaults and other diagnostics provide specific information about the condition of the printer. The procedures sample printouts and provide specific information that helps determine the operating conditions for the printer.

Important • Use full-width media when performing self tests. If your media is not wide enough, the test labels may print on the platen roller. To prevent this from happening, check the print width, and ensure that the width is correct for the media that you are using.

Each self test is enabled by pressing a specific control panel key or combination of keys while turning on (**I**) the printer power. Keep the key(s) pressed until the first indicator light turns off. The selected self test automatically starts at the end of the Power-On Self Test.

Note •

*   When performing these self tests, do not send data to the printer from the host.
*   If your media is shorter than the label to be printed, the test label continues on the next label.
*   When canceling a self test prior to its actual completion, always reset the printer by turning it off (**O**) and then on (**I**).
*   If the printer is in dispense mode and the liner is being taken up by the applicator, the operator must manually remove the labels as they become available.

Power-On Self Test

A Power-On Self Test (POST) is performed each time the printer is turned on (**I**). During this test, the control panel lights (LEDs) turn on and off to ensure proper operation. At the end of this self test, only the STATUS LED remains lit. When the Power-On Self Test is complete, the media is advanced to the proper position.

To initiate the Power-On Self Test, complete these steps:

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

The POWER LED illuminates. The other control panel LEDs and the LCD monitor the progress and indicate the results of the individual tests. All messages during the POST display in English; however, if the test fails, the resulting messages cycle through the international languages as well.

Configuration Report

The Configuration Report (CANCEL self test) prints a set of printer and network configuration reports.

To perform the configuration, complete these steps:

1. Make sure the media is properly loaded and the top cover of the printer is closed.

2. Press and hold **CANCEL button while setting the printer power switch to** on (**l**).

3. Hold **CANCEL button down until the printer status light turns green for the first time and release.**

4. The Printer and Network Configuration Reports (below) will be printed a couple of seconds after printer's display reports 'PRINTER READY'.

```
          PRINTER CONFIGURATION

Zebra Technologies
ZTC ZD500R-203dpi ZPL
40J133000272

+10.0................... DARKNESS
6.0 IPS............... PRINT SPEED
+000.................. TEAR OFF
TEAR OFF.............. PRINT MODE
GAP/NOTCH............. MEDIA TYPE
TRANSMISSIVE.......... SENSOR SELECT
THERMAL-TRANS......... PRINT METHOD
832................... PRINT WIDTH
1232.................. LABEL LENGTH
39.0IN   988MM...... MAXIMUM LENGTH
NOT CONNECTED......... USB COMM.
BIDIRECTIONAL......... PARALLEL COMM.
RS232................. SERIAL COMM.
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
NO MOTION............. MEDIA POWER UP
FEED.................. HEAD CLOSE
DEFAULT............... BACKFEED
+000.................. LABEL TOP
+0000................. LEFT POSITION
DISABLED.............. REPRINT MODE
008................... WEB SENSOR
058................... MEDIA SENSOR
065................... RIBBON SENSOR
128................... TAKE LABEL
074................... MARK SENSOR
021................... MARK MED SENSOR
001................... TRANS GAIN
100................... TRANS LED
040................... RIBBON GAIN
020................... MARK GAIN
100................... MARK LED
DPCSWFXM.............. MODES ENABLED
..................... MODES DISABLED
 832 8/MM FULL...... RESOLUTION
2.0................... LINK-OS VERSION
V74.19.62 <-........ FIRMWARE
1.3................... XML SCHEMA
6.5.0 57005......... HARDWARE ID
NONE.................. OPTION BOARD
4096k............R: RAM
57344k...........E: ONBOARD FLASH
NONE.................. FORMAT CONVERT
FW VERSION............ IDLE DISPLAY
04/25/13.............. RTC DATE
00:01................. RTC TIME
DISABLED.............. ZBI
2.1................... ZBI VERSION
READY................. ZBI STATUS
TM:MBE MICRO........ RFID READER
20.00.00.01......... RFID HW VERSION
01.01.01.02......... RFID FW VERSION
USA/CANADA........... RFID REGION CODE
USA/CANADA........... RFID COUNTRY CODE
RFID OK............... RFID ERR STATUS
16.................... RFID READ PWR
16.................... RFID WRITE PWR
F0.................... PROG. POSITION
F0.................... RFID VALID CTR
0..................... RFID VOID CTR
991 IN............... NONRESET CNTR
991 IN............... RESET CNTR1
991 IN............... RESET CNTR2
2.517 CM............. NONRESET CNTR
2.517 CM............. RESET CNTR1
2.517 CM............. RESET CNTR2
FIRMWARE IN THIS PRINTER IS COPYRIGHTED
```

```
         Network Configuration

Zebra Technologies
ZTC ZD500R-203dpi ZPL
40J133000272

PrintServer........ LOAD LAN FROM?
WIRELESS........... ACTIVE PRINTSRVR

Wired
ALL.................. IP PROTOCOL
000.000.000.000..... IP ADDRESS
255.255.255.000..... SUBNET
000.000.000.000..... GATEWAY
000.000.000.000..... WINS SERVER IP
YES................. TIMEOUT CHECKING
300................. TIMEOUT VALUE
000................. ARP INTERVAL
9100................ BASE RAW PORT
9200................ JSON CONFIG PORT

Wireless*
ALL.................. IP PROTOCOL
172.029.016.073..... IP ADDRESS
255.255.255.000..... SUBNET
172.029.016.001..... GATEWAY
172.029.001.003..... WINS SERVER IP
YES................. TIMEOUT CHECKING
300................. TIMEOUT VALUE
000................. ARP INTERVAL
9100................ BASE RAW PORT
9200................ JSON CONFIG PORT
INSERTED............ CARD INSERTED
02dFH............... CARD MFG ID
9118H............... CARD PRODUCT ID
ac:3f:a4:07:fe:b4.. MAC ADDRESS
YES................. DRIVER INSTALLED
INFRASTRUCTURE...... OPERATING MODE
125................. ESSID
100................. TX POWER
ALL................. CURRENT TX RATE
OPEN................ WEP TYPE
NONE................ WLAN SECURITY
1................... WEP INDEX
000................. POOR SIGNAL
LONG................ PREAMBLE
YES................. ASSOCIATED
ON.................. PULSE ENABLED
15.................. PULSE RATE
OFF................. INTL MODE
usa/canada.......... REGION CODE
usa/canada.......... COUNTRY CODE
0x3FFFFFFFFFFF...... CHANNEL MASK

Bluetooth
4.2.0............... FIRMWARE
04/20/2012.......... DATE
on.................. DISCOVERABLE
3.0................. RADIO VERSION
on.................. ENABLED
AC:3F:A4:07:FE:B5.. MAC ADDRESS
40J133000272....... FRIENDLY NAME
No.................. CONNECTED
1................... MIN SECURITY MODE
nc.................. CONN SECURITY MODE

FIRMWARE IN THIS PRINTER IS COPYRIGHTED
```

Using ZSU and ZPL Programming as a Repair Tool

The Zebra Setup Utilities (ZSU) used in combination with ZPL programming can provide you most of the information ad control needed to test, update and communicate with the printer.

Use the Zebra Setup Utilities to run common activities, get status, send commands, download firmware, etc. Many of these functions are found in the printer driver or Zebranet Bridge (which includes other tools to aid multi-printer management and roll-out) which has a three (3) maximum with the free version. Purchasing the ZebraNet Bridge activates printer coping (cloning), one among several useful features for repairing Zebra printers.

The ZPL programming language includes Host Query (`~HQ` in general and `~HQES` in particular) command that allows a service engineer or technician to resolve failure and test operation. Many of the other ~H commands can provide additional testing and information to help diagnosing printer issues. Use the 'Open Communication With Printer' in the ZSU to use this bi-directional command and response.

Use the 'Open Printer Tools' - 'Print' and 'Actions' tabs to do common service and functional testing of the printer. These include:

- Print configuration label (good to test printing and get status info)
- Feed one label (good to test motor, cutter, dispense, etc. function)
- Print object list (doing inventory of user content loaded into the printer)
- Calibrate media
- Load factory defaults
- Reset printer
- Enter and exit diagnostics mode (good for checking communications, marginal for testing)
- Send command
- Send a file (good for sending label forms (formats) and downloading firmware)

The ZSU does not let you activate ZBI used for customizing printer operations and non-Zebra printer emulation. Use the ZBI Key Manager software program to re-activate ZBI operation. You will need the purchased key to enable custom ZBI programming sent to the printer.

Example - Using the ~HQES command to the Test Ribbon Trailer Sensor

Connect the printer to a PC and run the ZSU. Select the printer and 'Open Communication With Printer'.

1. Remove media and ribbon from the printer. Leave the printer open.

2. Send the ~HQES to the printer. Use the ZPL manual in the ~HQ command and note the 'Ribbon Out' flag in Nibble 1.

3. Take a reflective surface (flat blade screwdriver, mirror, etc.) and place it in front of the Ribbon Trailer sensor (located under the ribbon guide and printhead). See the *Replacing the Ribbon Trailer Sensor* on page 77 for its location.

4. Re-send the ~HQES command and note the change in Nibble 1.

Manual Calibration - Media

The printer may need to have the sensors and the label length adjusted for a new media. Small variations in media from manufacture to manufacture and even from batch to batch of media may necessitate recalibrating the printer for the media being used.

Use the Manual Calibration procedure when you change media unless to it media from the same batch you have been using.

The primary method used to set the printer for media in use is the control panels SENSORS menu to access the MANUAL CALIBRATION procedure. Use the following procedure to set your printer's language when the printer is turned on and in the 'Ready' state.

Procedure for calibration of label media with liner and inter-label 'GAP' between labels.

1. Load the printer with your chosen label media. Verify the media sensor is in the center position for label gap (transmissive) sensing, see below.
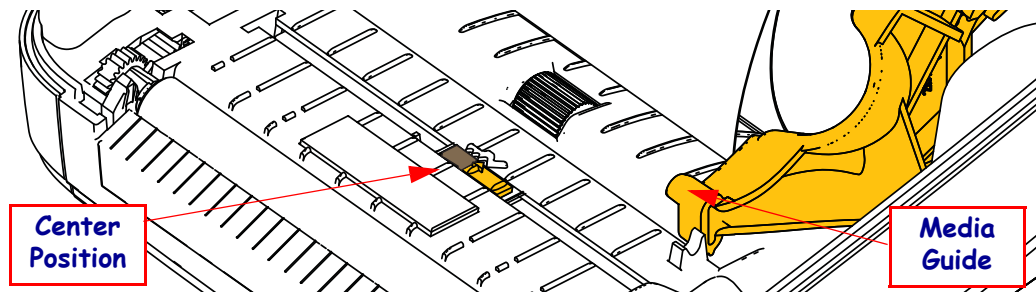
2. Remove the first 3 inches or 80 mm of labels from the liner. Place the label-less liner over the platen (driver roller) and the leading edge of the first label under the media guides.

3. Close the printer. Turn the printer power ON. Press the menus 'Home' (🏠) button.

4. Navigate to the 'SENSORS' (🖼) menu button and press the 'Select' (✔) button.

5. Use the 'Left' (◀) and 'Right' (▶) navigation arrows to browse to the 'MANUAL CALIBRATION' procedure.

6. Press the select button (—) below the **START** on the lower right hand of the display.

7. The display will have a message:
LOAD BACKING
PRINTER PAUSED

8. Press the Pause button once to start the calibration procedure.

9. When it has finished the first part of the calibration, the display will read:
RELOAD ALL
CONTINUE.

10. Press the Pause button once again to continue the calibration procedure. The printer will begin feeding several labels and then it will stop with the display message reading:
READY

Remove excess media. Media calibration has finished and you are ready to print.

RFID Calibration

RFID calibration sets communication parameters for your tag type. This procedure should be done after the printer has been calibrated for the media (length and gap settings), typically a Manual Media Calibration. During the RFID calibration process, the printer moves the media, calibrates the RFID tag position, and determines the optimal settings for the RFID media being used.

These settings include the programming position, the read/write power level to use, and reads the tag's TID to determine the chip type (or choose F0 from the front panel RFID menu).

To restore the printer's default programming position at any time, use the "restore" option in the rfid.tag.calibrate SGD command.

Do not remove any labels or tag from the liner (label backing or 'web'). This allows the printer to determine RFID settings which do not encode adjacent tags. Allow a portion of media to extend out the front of the printer to allow for backfeed during the tag calibration procedure.

Always do a Manual Media Calibration and RFID Calibration when you change media type. It should not be necessary when simply replacing an empty roll of the same media.

Before beginning, load RFID media into the printer and perform the manual media calibration.

1. Press the Feed button once to feed (advance) one label.

2. Press the menus 'Home' (🏠) button. Navigate to the 'RFID' (📇) menu button and press the 'Select' (✔) button.

3. Use the 'Left' (◀) and 'Right' (▶) navigation arrows to browse to the 'RFID CALIBRATE' procedure. Press the select button (—) below the **START** on the lower right hand of the display.

4. The printer will slowly feed a label while adjusting the location and RFID read/write communication settings for your chosen RFID tag/label.

   The printer will feed an additional label in some cases when calibration has completed successfully with the display message reading: READY

5. Remove excess media. Media calibration has finished and you are ready to print.

Print Quality Report

Different types of media may require different darkness settings. This section contains a simple but effective method for determining the ideal darkness for printing bar codes that are within specifications.

During the Print Quality Report (FEED self test), a series of labels are printed at different darkness settings at two different print speeds. The relative darkness and the print speed are printed on each label. The bar codes on these labels may be ANSI-graded to check print quality.

During this test, one set of labels is printed at 2 ips, and another set is printed at 6 ips. The darkness value starts at three settings lower than the printer's current darkness value (relative darkness of –3) and increase until the darkness is three settings higher than the current darkness value (relative darkness of +3).

The speed at which labels are printed during this print quality test depends on the dot density of the printhead.

- 300 dpi printers: 7 labels are printed at the 2 ips and 6 ips print speeds.
- 203 dpi printers: 7 labels are printed at the 2 ips and 6 ips print speeds.

To perform a Print Quality Report, complete these steps:

1. Print a configuration label to show the printer's current settings.

2. Turn off (**O**) the printer.

3. Press and hold **FEED** while turning on (**I**) the printer. Hold **FEED** until the first control panel light turns off.

    The printer prints a series of labels (Figure 1) at various speeds and at darkness settings higher and lower than the darkness value shown on the configuration label.

Figure 1 • Print Quality Report

4. See Figure 2 and Table 6. Inspect the test labels and determine which one has the best print quality for your application. If you have a bar code verifier, use it to measure bars/spaces and calculate the print contrast. If you do not have a bar code verifier, use your eyes or the system scanner to choose the optimal darkness setting based on the labels printed in this self test.

Figure 2 • Bar Code Darkness Comparison

Table 6 • Judging Bar Code Quality

Print Quality	Description
Too dark	Labels that are too dark are fairly obvious. They may be readable but not "in-spec." • The normal bar code bars increase in size. • The openings in small alphanumeric characters may fill in with ink. • Rotated bar code bars and spaces run together.
Slightly dark	Slightly dark labels are not as obvious. • The normal bar code will be "in-spec." • Small character alpha numerics will be bold and could be slightly filled in. • The rotated bar code spaces are small when compared to the "in-spec" code, possibly making the code unreadable.

Table 6 • Judging Bar Code Quality

Print Quality	Description
"In-spec"	The "in-spec" bar code can only be confirmed by a verifier, but it should exhibit some visible characteristics. • The normal bar code will have complete, even bars and clear, distinct spaces. • The rotated bar code will have complete, even bars and clear, distinct spaces. Although it may not look as good as a slightly dark bar code, the bar code will be "in-spec." • In both normal and rotated styles, small alphanumeric characters look complete.
Slightly light	Slightly light labels are, in some cases, preferred to slightly dark ones for "in-spec" bar codes. • Both normal and rotated bar codes will be in spec, but small alphanumeric characters may not be complete.
Too light	Labels that are too light are obvious. • Both normal and rotated bar codes have incomplete bars and spaces. • Small alphanumeric characters are unreadable.

5. Note the relative darkness value and the print speed printed on the best test label.

6. Add or subtract the relative darkness value from the darkness value specified on the configuration label. The resulting numeric value is the best darkness value for that specific label/ribbon combination and print speed.

7. If necessary, change the darkness value to the darkness value on the best test label.

8. If necessary, change the print speed to the same speed as on the best test label.

Reset Printer Factory Defaults

Performing this resets the printer configuration to the factory default values for the non-network printer settings. Perform a sensor calibration after this procedure. (See *Manual Calibration - Media on page 75*.)

To perform a Reset Printer Factory Defaults procedure (FEED + PAUSE Self Test), complete these steps:

1. Turn off (**O**) the printer.

2. Press and hold **FEED** + **PAUSE** while turning on (**I**) the printer.

3. Hold **FEED** + **PAUSE** until the first control panel light turns off.

   The printer configuration is reset to the factory default values. No labels print at the end of this test.

Reset Network Factory Defaults

Performing this procedure resets the network configuration settings only to the factory default values.

To perform a Reset Network Factory Defaults procedure (CANCEL + PAUSE Self Test), complete these steps:

1. Turn off (**O**) the printer.

2. Press and hold **CANCEL** + **PAUSE** while turning on (**I**) the printer.

3. Hold **CANCEL** + **PAUSE** until the first control panel light turns off.

   The printer's network configuration is reset to the factory default values. No labels print at the end of this test.

Communication Diagnostics Test

The communication diagnostics test is a troubleshooting tool for checking the interconnection between the printer and the host computer. When the printer is in diagnostics mode, it prints all data received from the host computer as straight ASCII characters with the hex values below the ASCII text. The printer prints all characters received, including control codes such as CR (carriage return). Figure 3 shows a typical test label from this test.

Note • The test label prints upside-down.

Figure 3 • Communications Diagnostics Test Label
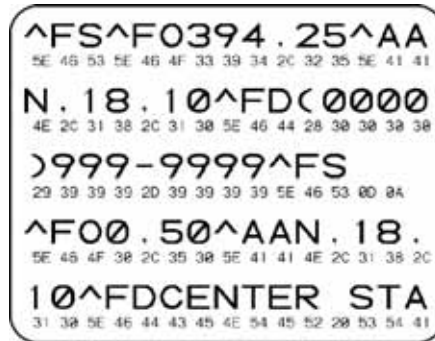
To use communications diagnostics mode, complete these steps:

1. Set the print width equal to or less than the label width being used for the test.

2. Set the DIAGNOSTICS MODE option to ENABLED. See the *User Guide* for methods for changing this setting.

   The printer enters diagnostics mode and prints any data received from the host computer on a test label

3. Check the test label for error codes. For any errors, check that your communication parameters are correct.

   Errors show on the test label as follows:

   • FE indicates a framing error.

   • OE indicates an overrun error.

   • PE indicates a parity error.

   • NE indicates noise.

4. Turn the printer off (**O**) and then back on (**I**) to exit this self test and return to normal operation.

Sensor Profile

Use the sensor profile image (which will extend across several actual labels or tags) to troubleshoot the following situations:

- The printer experiences difficulty in determining gaps (web) between labels.

- The printer incorrectly identifies preprinted areas on a label as gaps (web).

- The printer cannot detect ribbon.

With the printer in the Ready state, print a sensor profile in one of these ways:

Using the buttons on the control panel	**a.** Turn off (**O**) the printer. **b.** Press and hold **FEED** + **CANCEL** while turning on (**l**) the printer. **c.** Hold **FEED** + **CANCEL** until the first control panel light turns off.
Using ZPL	**a.** Send the ~JG command to the printer. See the *Zebra Programming Guide* for more information about this command.
Using the printer's control panel. See *TOOLS Menu on page 56* - PRINT INFORMATION	**a.** On the control panel display, navigate to the following item under the SENSORS menu. See the *User Guide* for information about using the control panel and accessing the menus. ▼ **PRINT INFORMATION** **SENSOR PROFILE** ▲ 🏠 **PRINT** **b.** Press **RIGHT SELECT** to select PRINT.

Compare your results to the examples shown in this section. If the sensitivity of the sensors must be adjusted, calibrate the printer (see *Manual Calibration - Media on page 75*).

Media Sensor Profile (Figure 4) The line labeled MEDIA (**1**) on the sensor profile indicates the media sensor readings. The media sensor threshold settings is indicated by WEB (**2**). The media out threshold is indicated by OUT (**3**).The upward spikes (**4**) indicate gaps between labels (the web), the lines between the spikes (**5**) indicate where labels are located, and the numbered line at the top (**6**) provides measurement in dots from the start of the printout.

If you compare the sensor profile printout to a length of your media, the spikes should be the same distance apart as the gaps on the media. If the distances are not the same, the printer may be having difficulty determining where the gaps are located.

Figure 4 • Sensor Profile (Media Section)

4
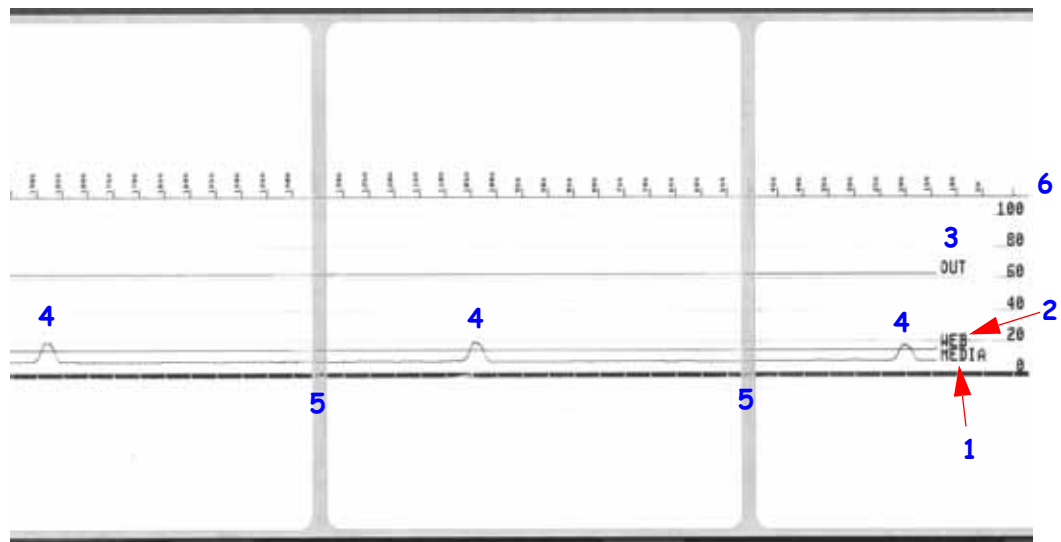
Required Tools

Tools • Make use of the following tools while performing replacement procedures:

- Phillips driver #0
- Phillips driver #1
- Small slot-head screwdriver
- Small diagonal pliers (aka. Dikes or Cutter)
- Printhead Cleaning Pen
- Fiber free swabs
- Lint free wipes, such as Kim-Wipes

Notes • _____

_____

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5

Replacing Parts

In the event you must replace a spare part, review the repair path decision tree to see which procedures to perform. Read the steps in the required procedures to remove the old part and install the new part. Other required procedures may include cleaning or other maintenance after the spare is replaced.

Repair Path for Transfer Ribbon Printers

Before performing any procedure, make sure you remove both media and ribbon from the printer and disconnect all printer power and interface cabling.
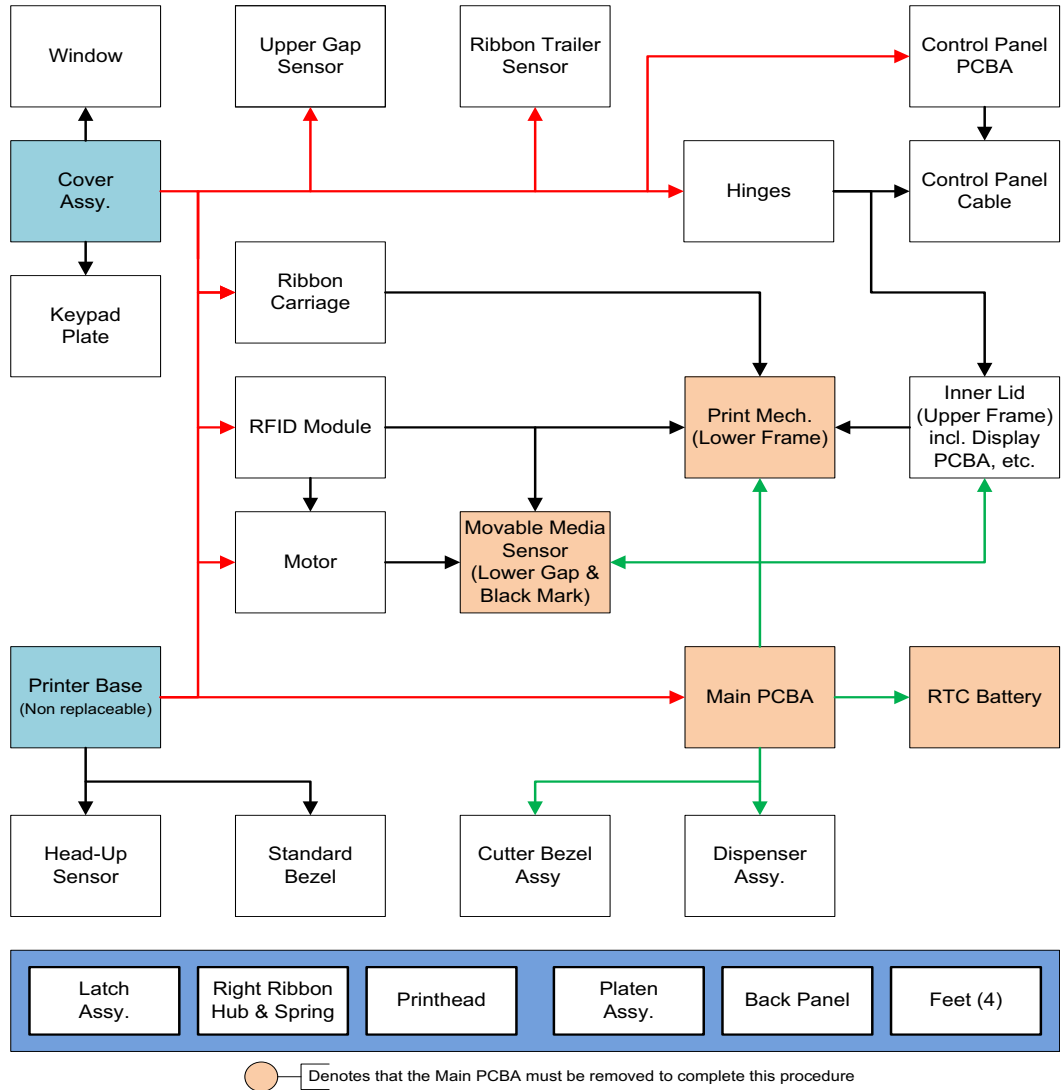
Figure 5 • Repair Path

Replacing the Latch

Removal

1. With cover open, push the latch's bar toward the front face of the upper cover on each side of the bar. The bar will pop out.

2. Pull the colored latch arms out of both side of the upper cover's side walls and then out of the cover once clear of the wall.
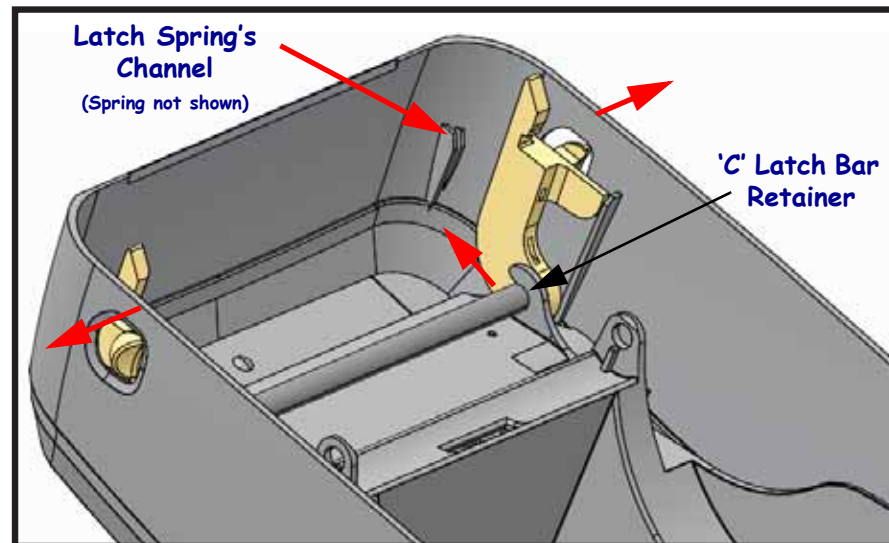
Installation

1. Reverse the process - Push the latch arm down into the cover assembly with each arm sliding into the holes in the side of the cover.

2. Align the springs (not shown above) into the latch spring channel.

3. Snap the bar into the two 'C' retainers.

4. Actuate the latch from the outside of the cover and verify that the springs and latch bar are secured and operating properly.

Replacing a Right Ribbon Hub and Spring

Removal

1. Open the printer.

2. Use a blunt tipped object (like a small Phillips head screwdriver) to push the two tabs on the ribbon (spindle) hub while pulling the hub towards the inside of the printer. The hub and spring will slide out of the ribbon carriage.

Ribbon Hub's
Release Tabs
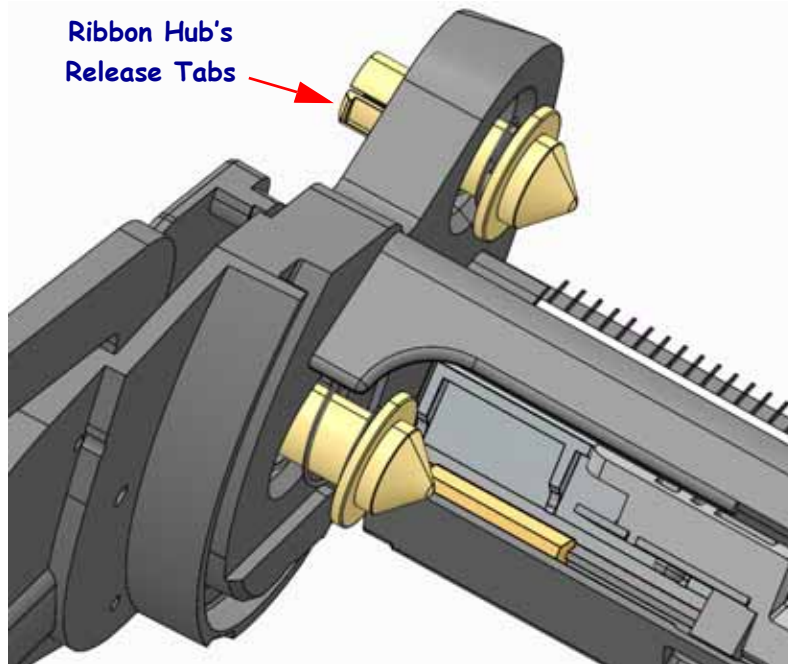
Installation

1. Place spring on the shaft of the hub — narrow end first.

2. Slide the shaft into the ribbon carriage until it extends out of the side and release.

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.

Caution • 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.

Caution • Turn the printer power off and unplug the power cord before replacing the printhead.

Before following the steps in this procedure, open the printer by pulling the release latches forward then lifting the top cover.

Printhead Removal

1. Open the printer. Remove any transfer ribbon from the printer.

2. Use a small flat bladed screwdriver to remove the ribbon guide. Gently pry the guide right-side tab from the ribbon frame. Pull the left side of the ribbon guide out.

Ribbon Guide
(and printhead cover)
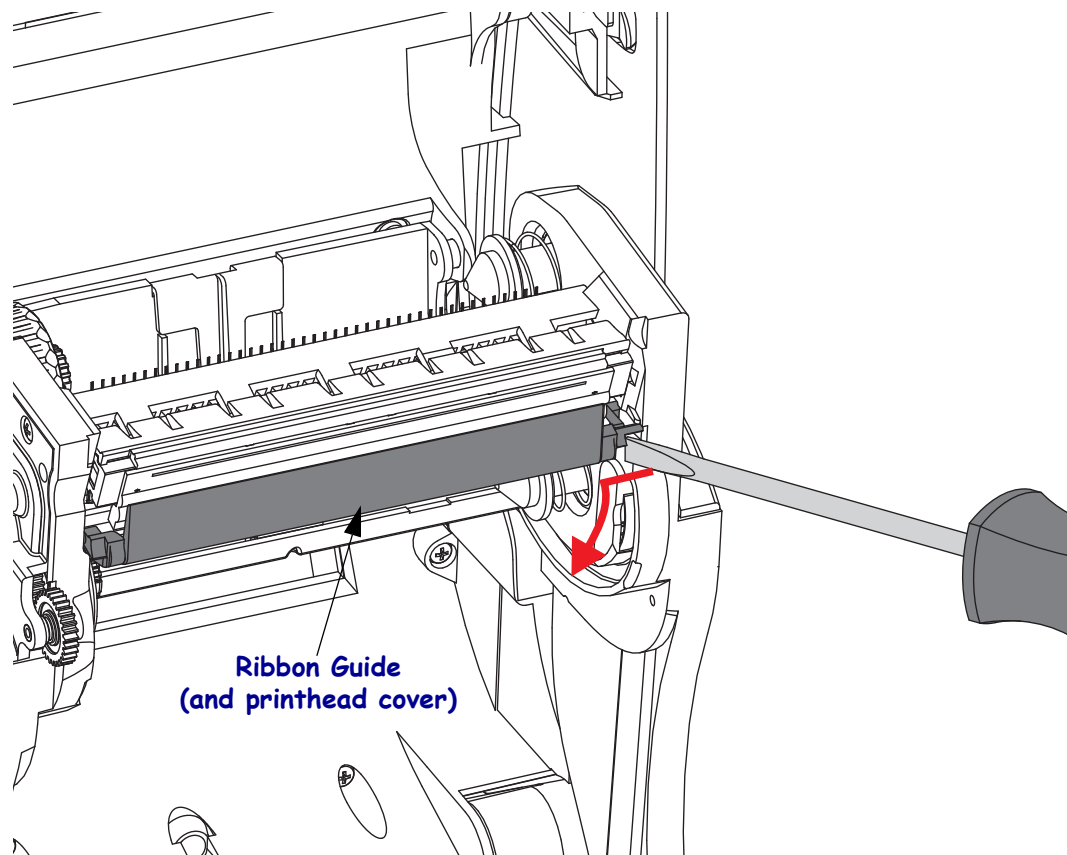
3. Use a blunt tipped tool to press the release tab on the right side and then the left side of the printhead. The tool diameter can be from 0.10 to 0.15 inches (2.5 to 3.8 mm).

Insert the tool into the ribbon frame's printhead release access (the round) opening. Push the release tab and gently pull the printhead bracket down.
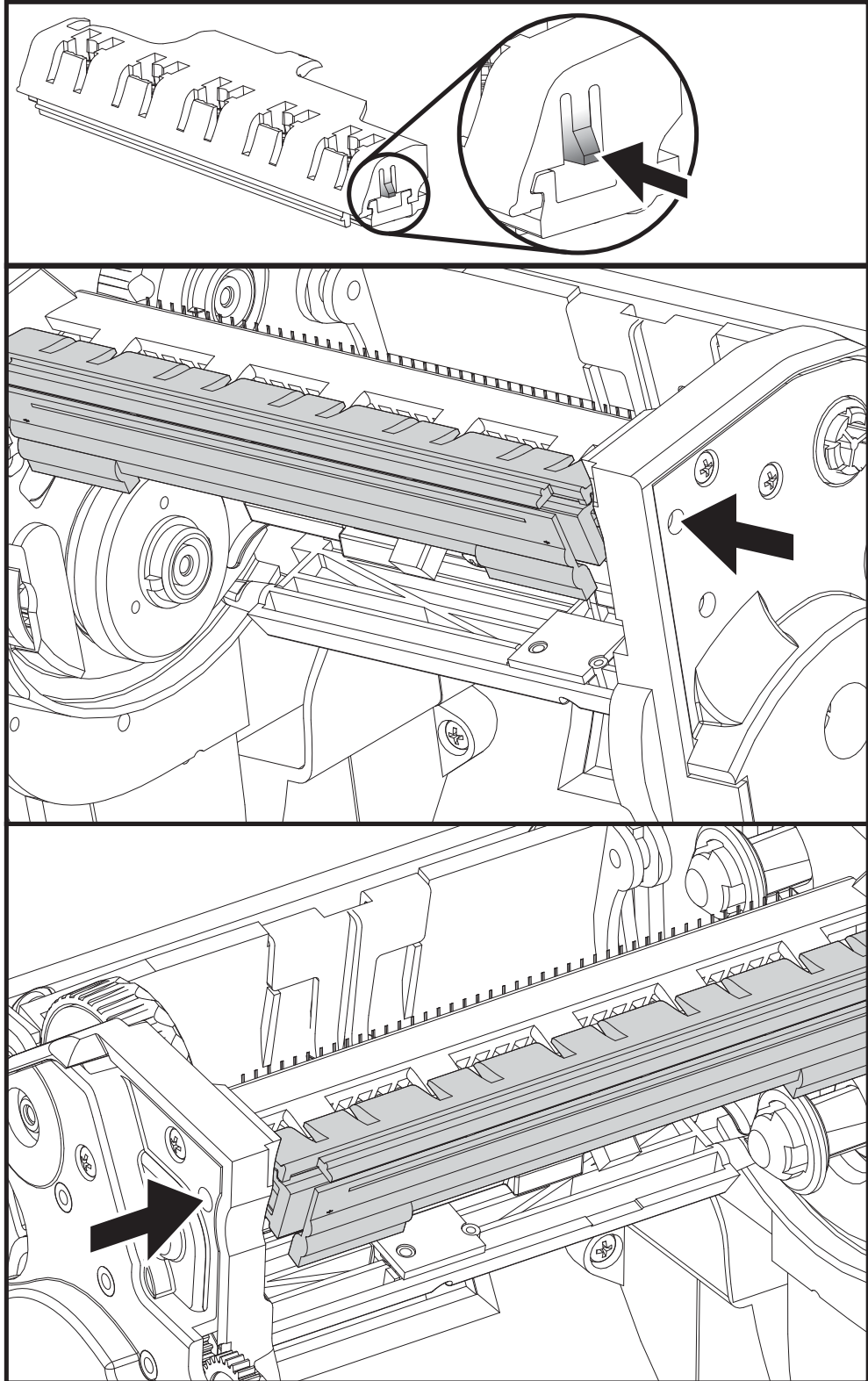
4. Gently but firmly pull the two printhead cable bundles' connectors off of the printhead.
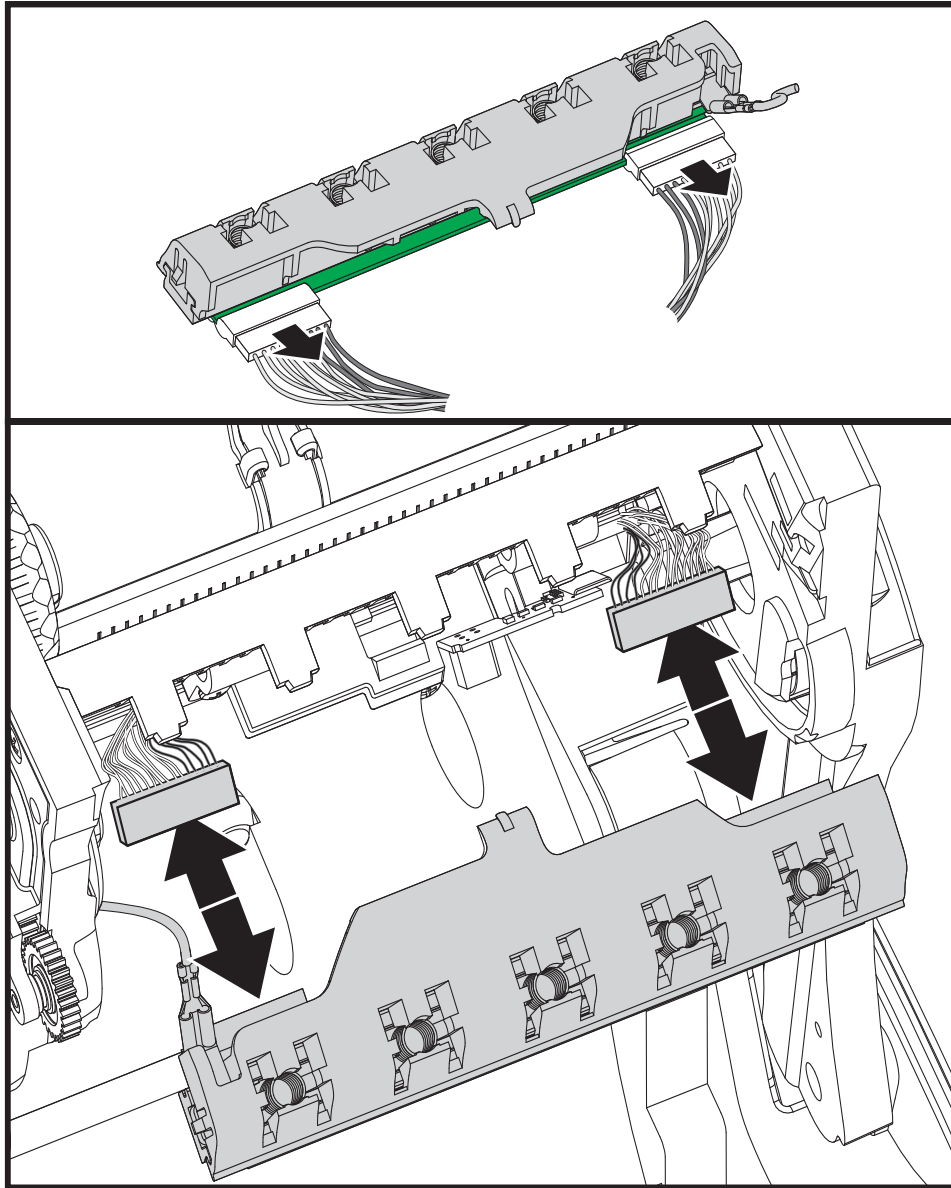
5. Gently but firmly pull the green ground wire off the printhead.
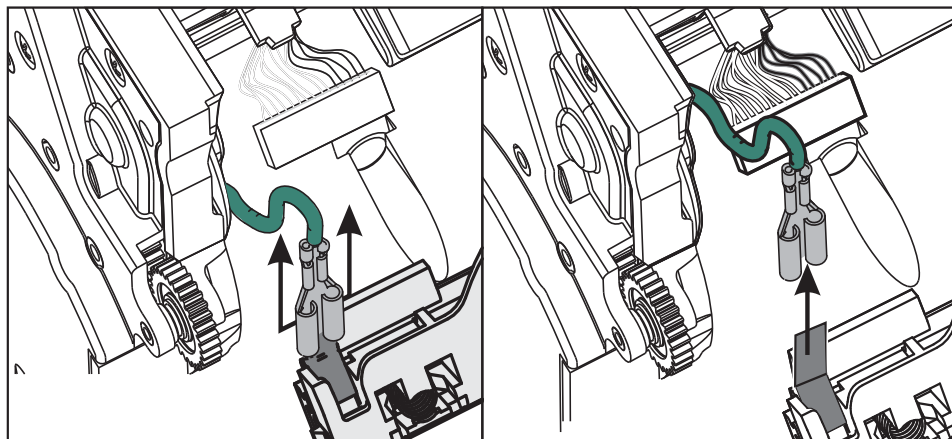
Replacing the Printhead

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

2. Connect the green ground wire to the printhead.

3. Push the right side printhead wire connector onto the printhead.

4. Check that the ground wire and wire bundles are still connected to the printhead.
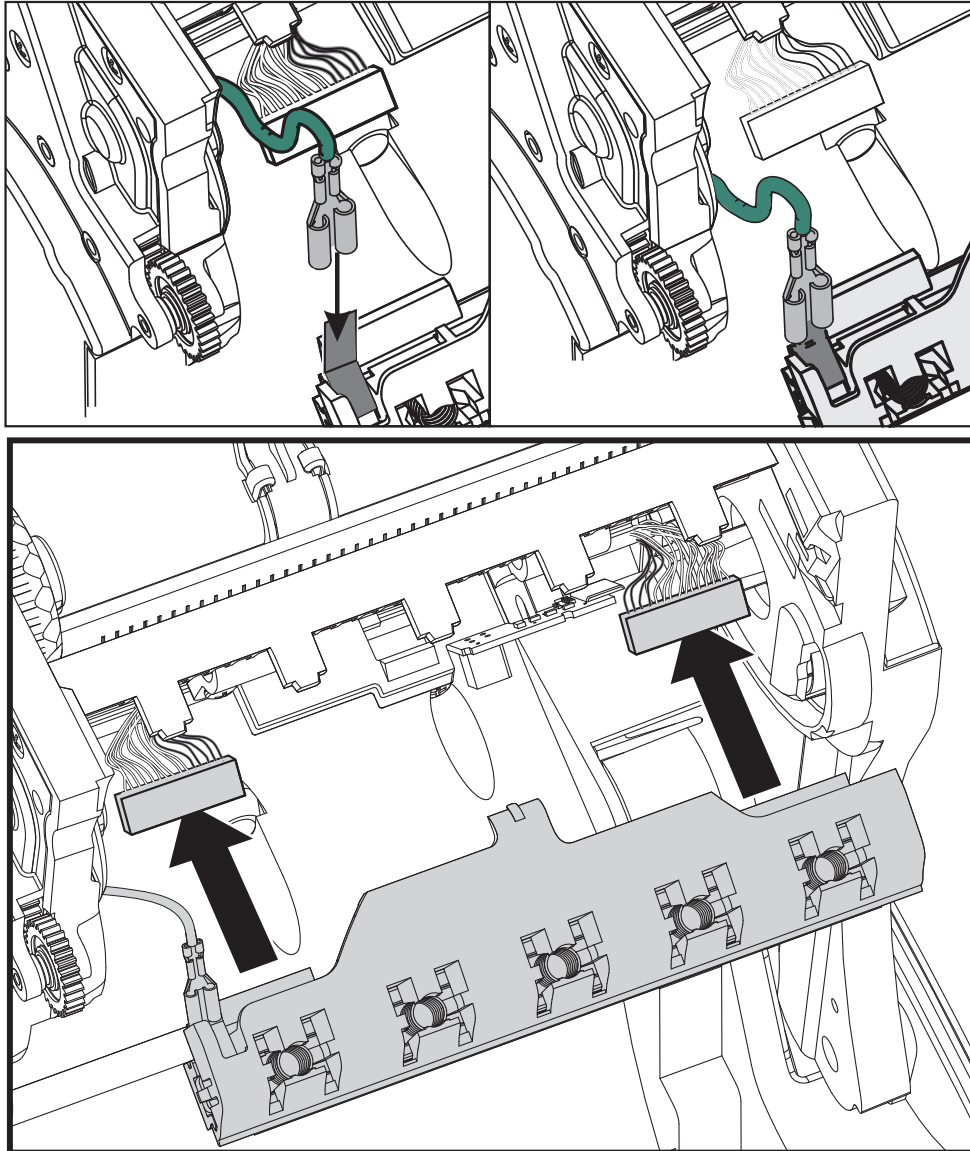
5. Insert the printhead bracket's the tab into slot in the ribbon frame assembly. Align the printhead spring slots to the five posts and snap the printhead into the ribbon frame.
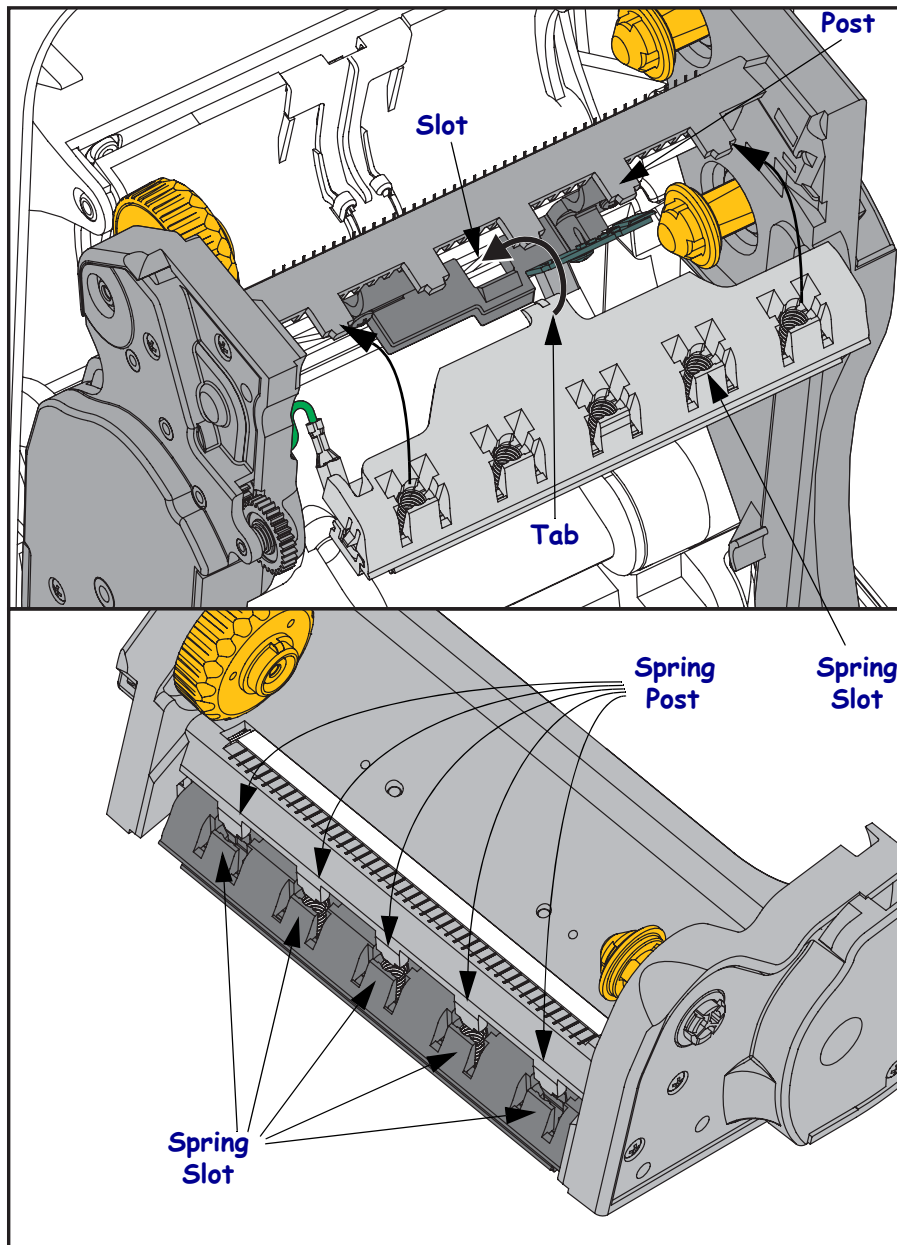
6. Place the left hand side of the ribbon guide into the ribbon frame. Swing the right side of the ribbon guide into the slot and snap it into position.
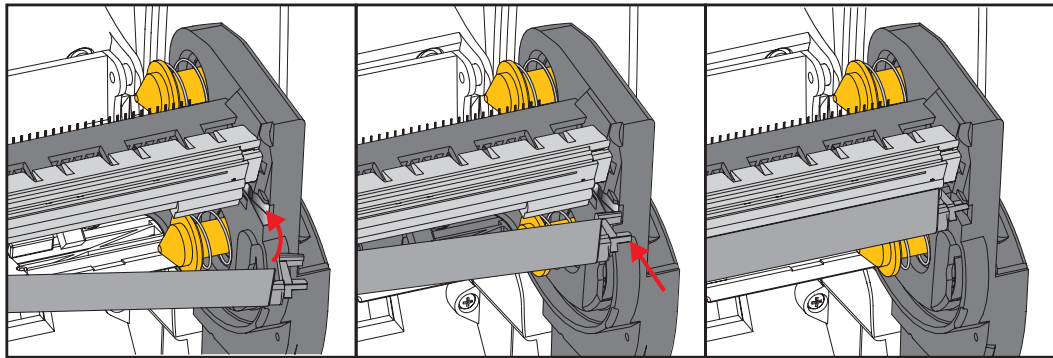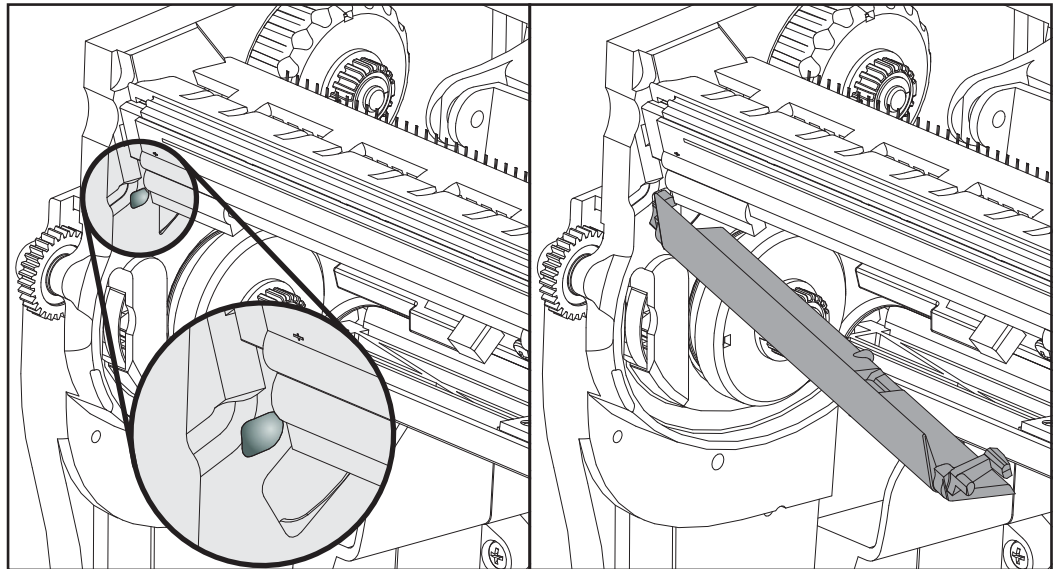
7. Verify that the printhead moves up and down freely when pressure is applied and remains locked when released.

8. Clean the printhead. Use a new pen to wipe body oils (finger prints) and debris of the printhead. Clean from the center of the printhead to the outside. See *Cleaning the Printhead on page 7*.

9. Reload media. Plug in the power cord, turn on the printer and print a status report to ensure proper function.

Replacing the Platen (drive roller) Assembly

Removing the Platen

1. Open the cover (and dispenser door). Remove media from platen area.

2. Pull the platen bearing latch release tabs on the right and left sides towards the front of the printer and rotate them up.
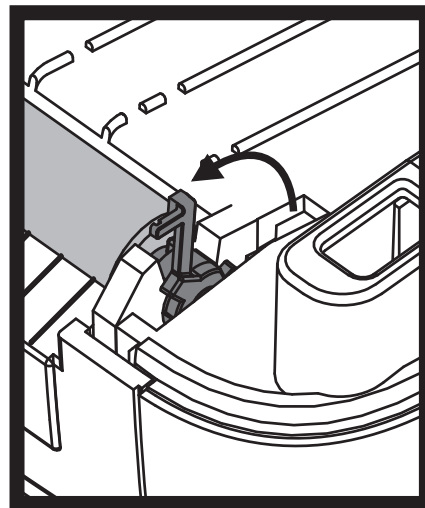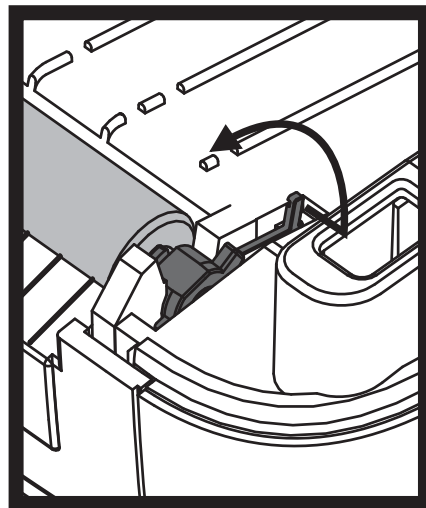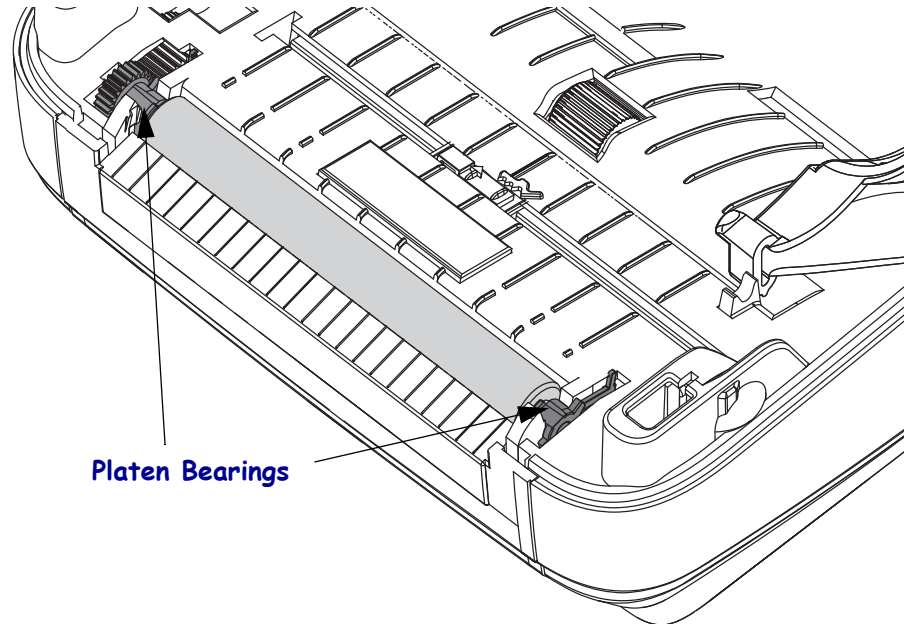
Platen Bearings

3. Lift the platen out of the printer's bottom frame.
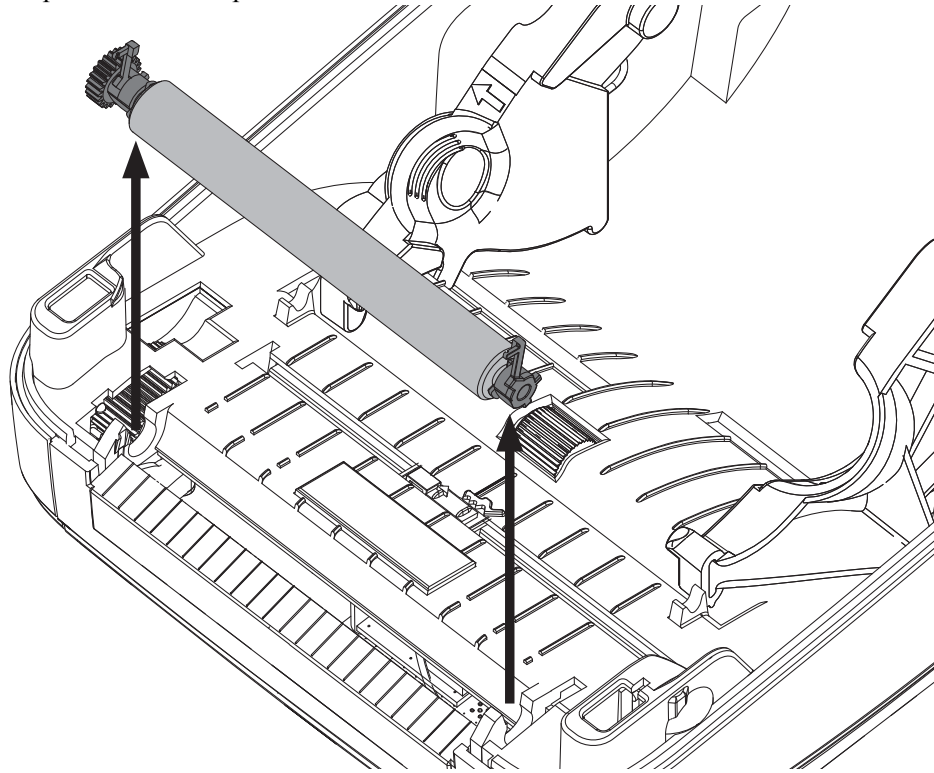
Installing the platen

1. Make sure the bearings and drive gear are on the shaft of the platen.
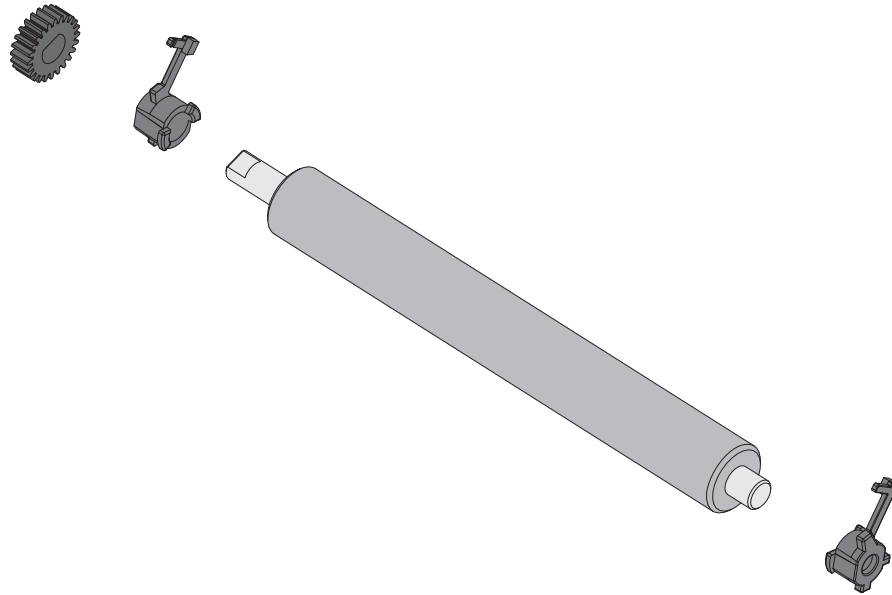
2. Align the platen with the gear to the left and lower it into the printer's bottom frame.

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.
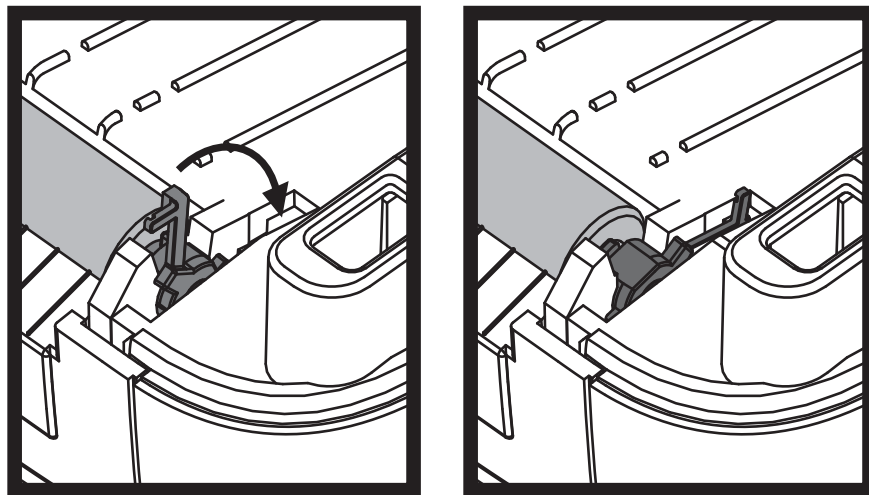
Replacing the Back Panel

⚠️ **Caution •** 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. Turn the printer over.

2. Gently release the two tabs securing the back panel to the bottom case with a small flat bladed screwdriver or a fingernail. Pull loosened panel out the rear of the printer.

Locking Tabs
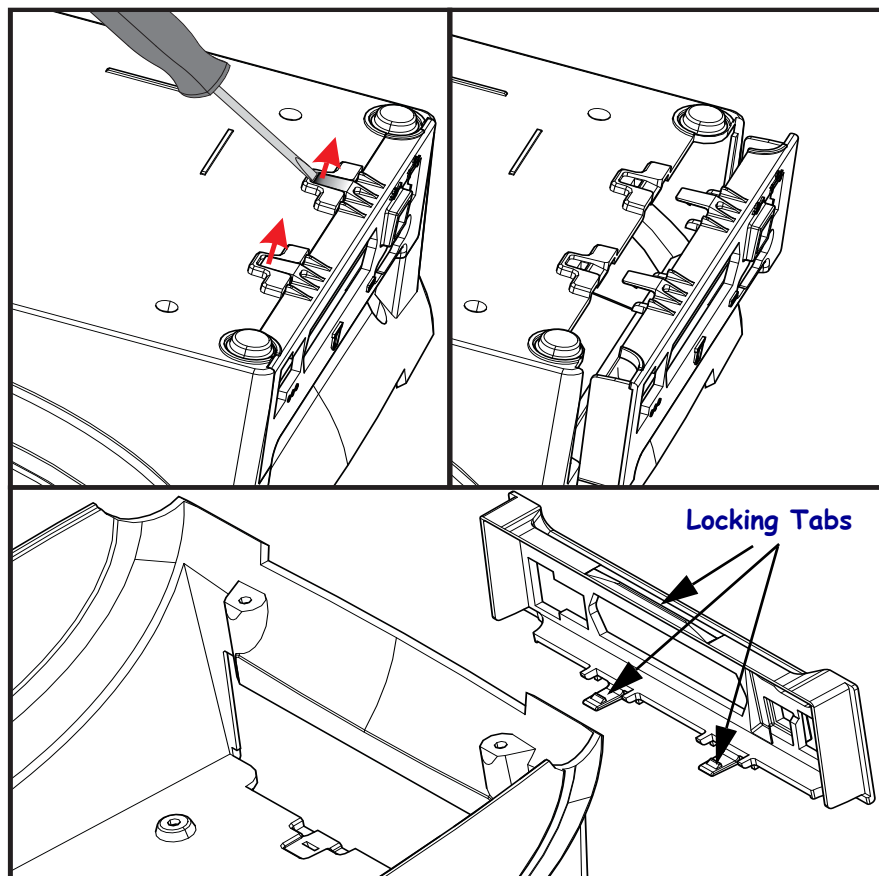
Installation

1. Reverse the removal process. Flip the parallel port 'bale-lock' latches toward the rear of the printer to slide the back panel into place

2. Verify the back panel's top edge's tab is inside of the printer's base. Verify that all of the connectors, plugs and power switch go through the access holes.

Replacing the Printer's Feet

> ⚠️ **Caution** • 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.

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.
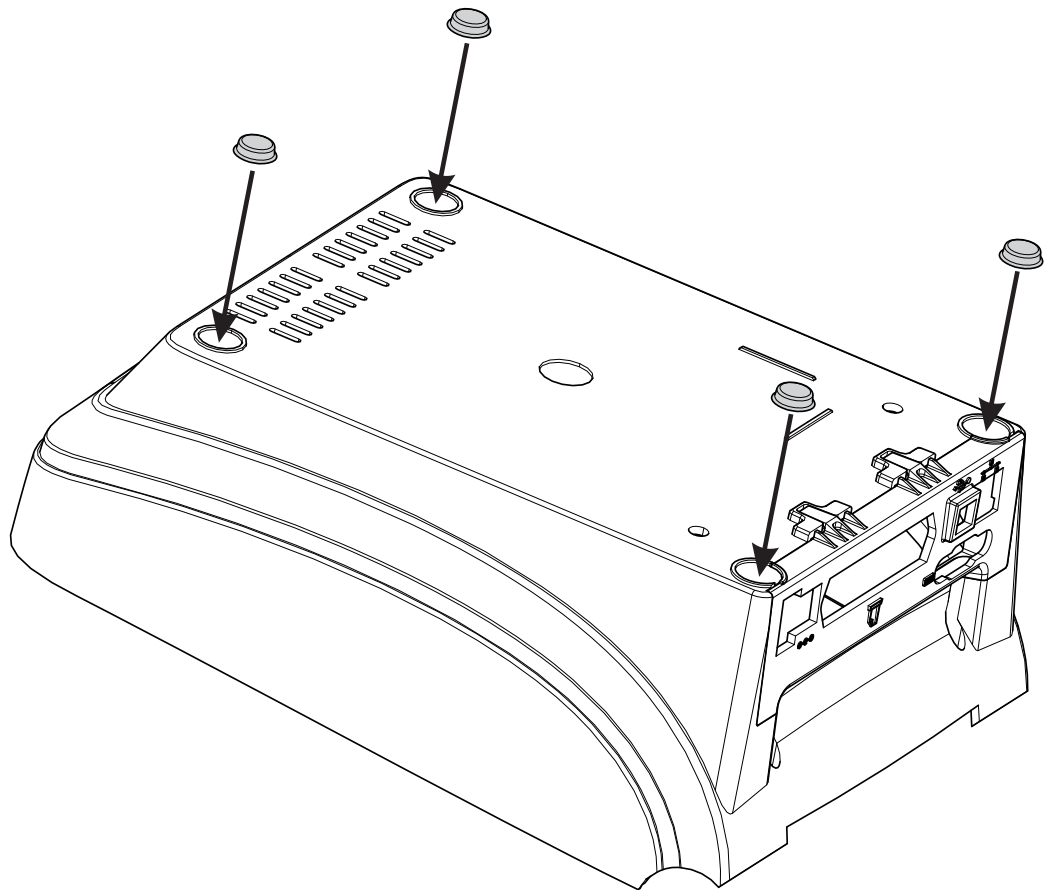
Replacing the Cover Assembly

⚠️ **Caution •** 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 and lean it back to gain access to the top of the media compartment.

2. Use a #1 Phillips screwdriver to remove the four (4) screws holding the top cover to the inner, upper frame.

3. Lift the cover off the printer. Take care to slip the sides of the top cover around the latches on the left and right sides. Close the printer

Installation

1. Lower the top cover onto the inner, upper frame.

2. Open the printer and make sure to align the latch arms in their access holes on the sides of the cover.

3. Put the latch springs in their guide channels.

4. Replace the screws that hold the top cover.

Screw Locations
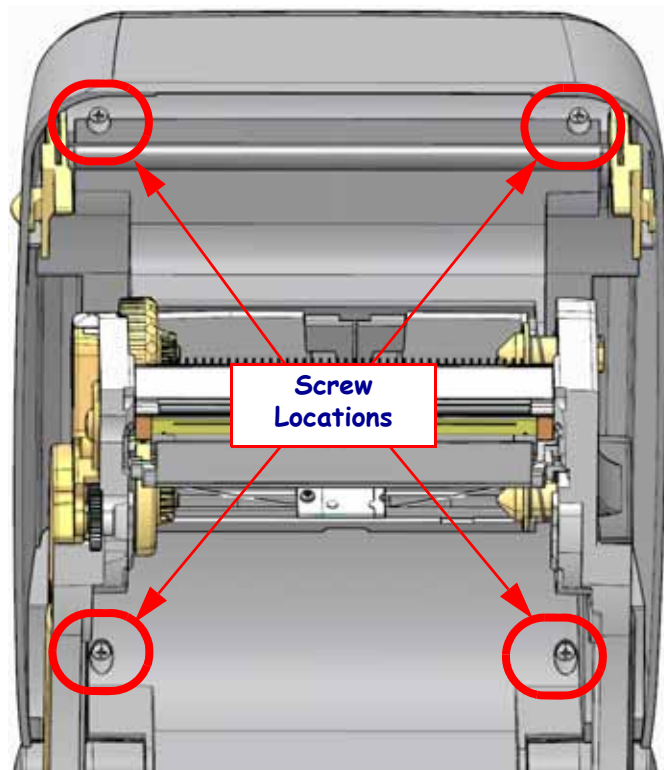
Replacing the Window

Remove the Cover Assembly to gain access to the window release tabs

Removal

1. Use your finger (or a blunt tipped object) to push the windows release tab towards the rear of the cover release the window. Lift the window out of the two tabs in the rear of window out of the cover.

Installation

1. Slide the two (2) tabs at the rear of the window into the cover.

2. Swing the front of the window into the cover and press it into the cover to latch.

   You may want to leave the window's protective cover on until the printer is installed for use.
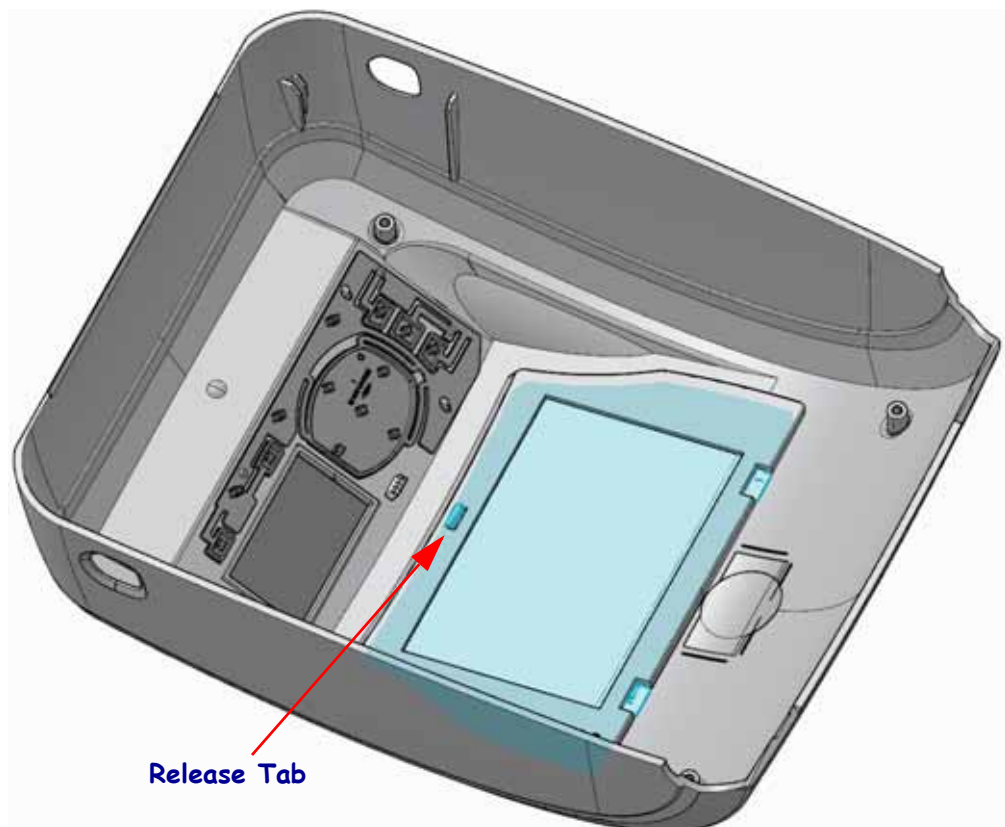
Release Tab

Replacing the Keypad Plate

Remove the Cover Assembly to gain access to the window release tabs

Removal

1. Use your finger tip or small flat bladed screwdriver to lift the top center edge of the keypad plate and the keypad will pop off.

Installation

1. Orient the keypad as shown and push the keypad on mounting Pin #1 then Pin#2 to snap the keypad to the cover.
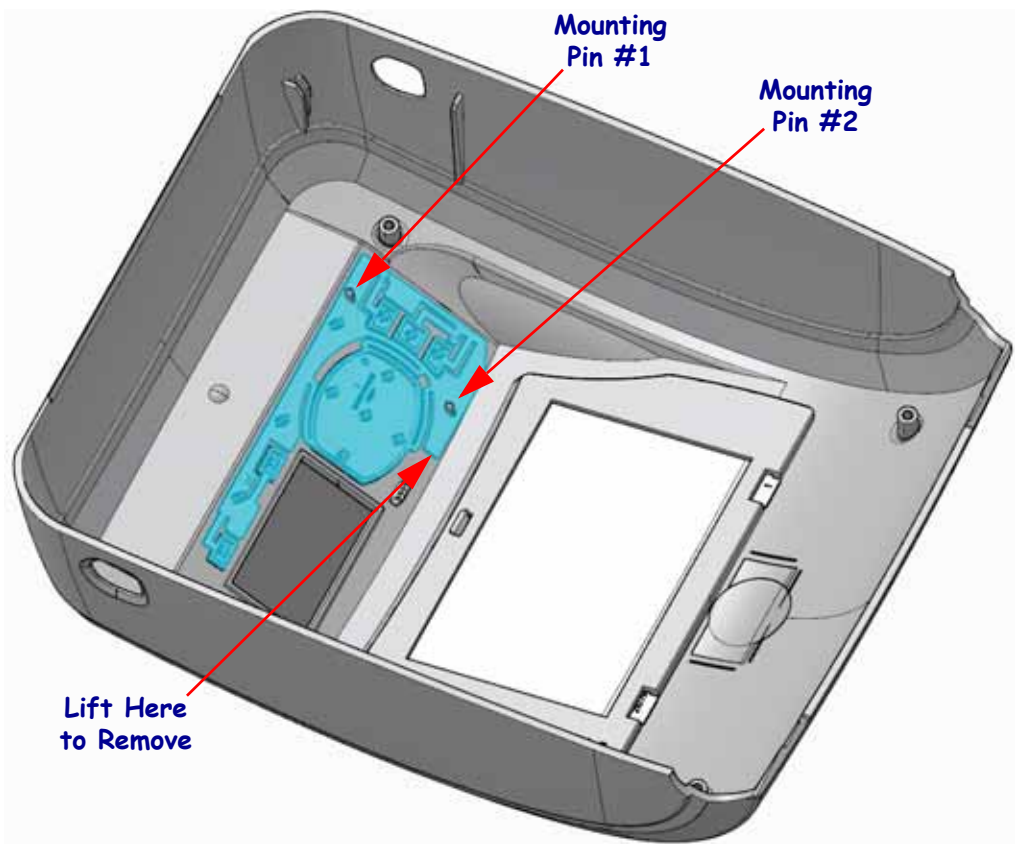
Replacing the Control Panel PCBA

⚠️ **Caution** • 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.

You must remove the Cover Assembly before performing this procedure.

Removal

1. Use a #1 Phillips screwdriver to remove the two screws securing the Control Panel PCBA to the top of the inner lid frame.

Screw Locations
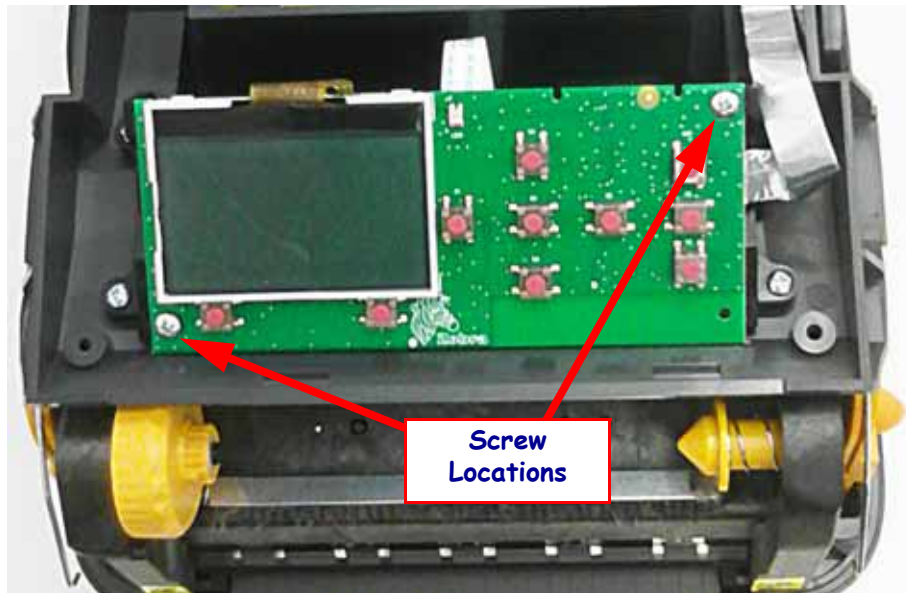
2. Release the locks on the two (2) flex circuit cables and pull the cables free of the circuit board. Note the location of the circuit contact fingers of the flex circuit cables end.

Release Tabs

Release Tabs
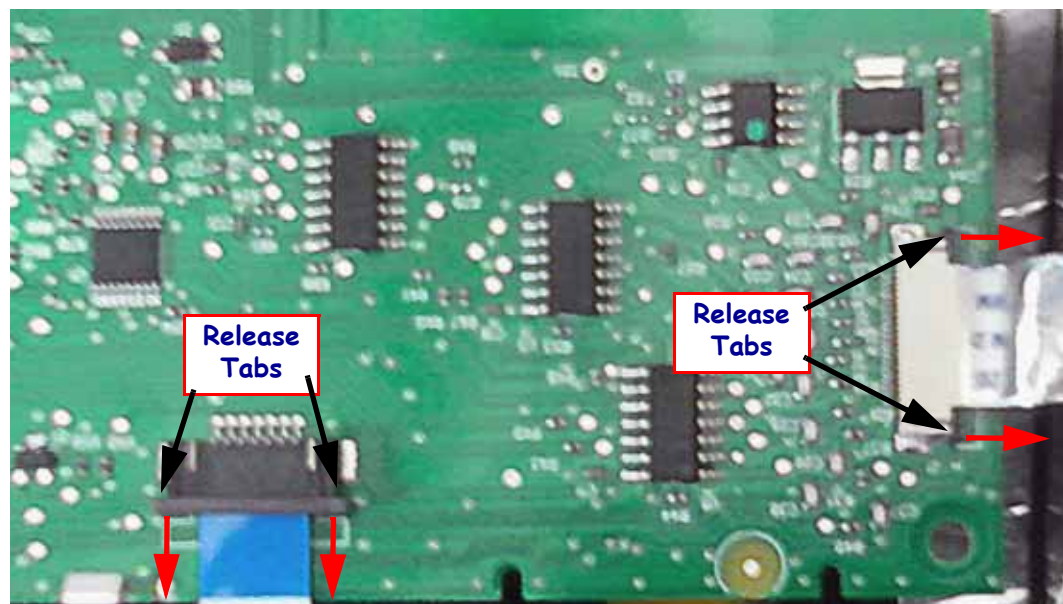
Installation

1. Open the two (2) cable connector's cable locks. Insert the flex cables into the connectors. The flex cable on the side has the 'blue' side facing the PCBA. The flex cable in the center has the 'blue' side facing away from the PCBA. Lock the connectors.

Release Tabs Open
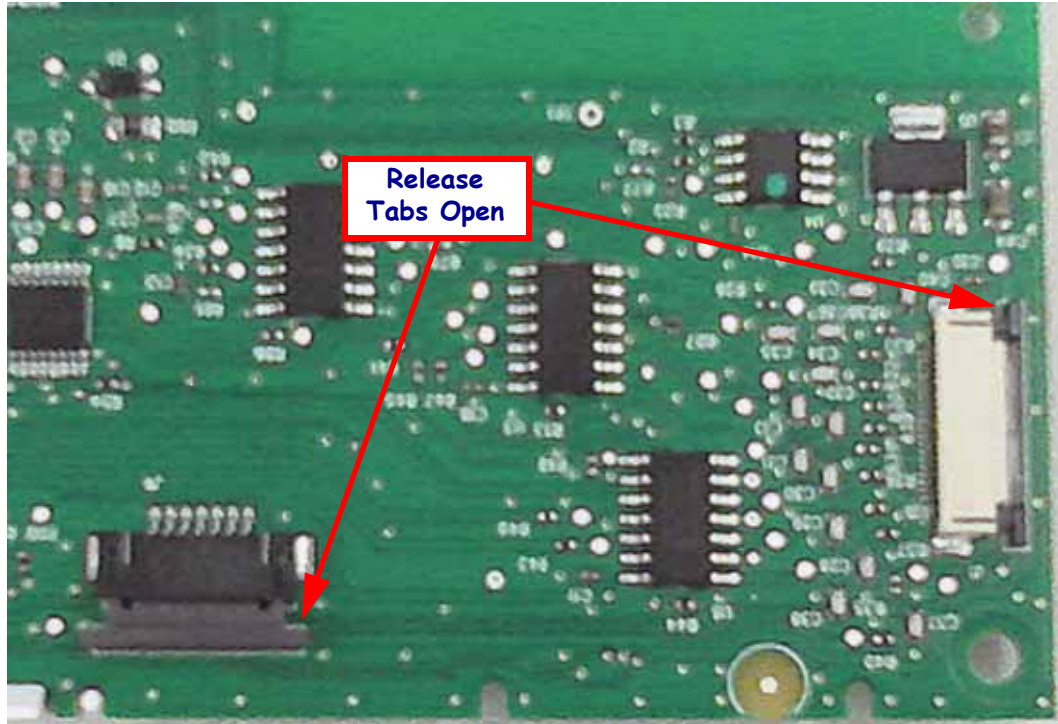
2. Verify the flex cables are inserted straight in the connectors and are not pulled out.

3. Flip the circuit board over and mount to the printer chassis. Secure it with the two screws.

Replace the top cover. Reload media. Plug in power, turn on the printer and print a status report to ensure proper function.

Replacing the Upper Gap Sensor

> **Caution •** 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.

You must remove the Cover Assembly and loosen the Control Panel PCBA before performing this procedure.

Removal

1. Unlock the Upper Gap Sensor flex circuit cable from the backside of the loose Control Panel PCBA.

2. Detach the links from both the left and right sides of the top, inner frame. Pull the two links until they clear the plus sign shaped post to release the links.
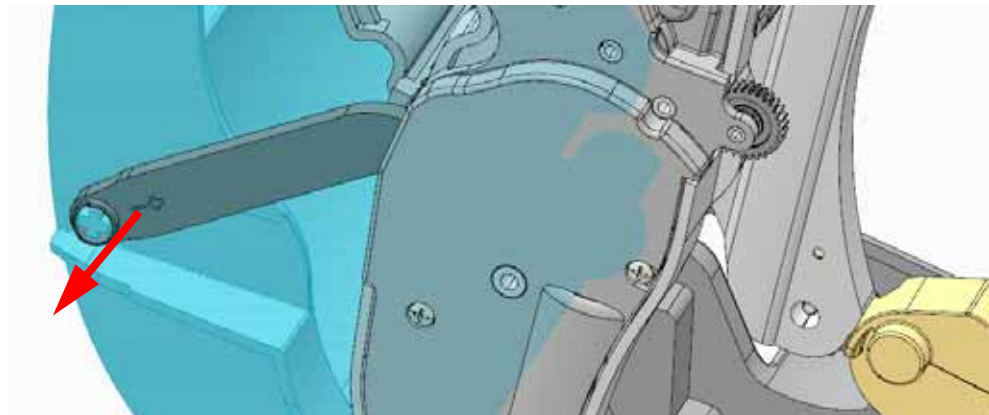
3. Lift top inner frame away from the ribbon carriage. The flapper (the curved scoop) will swing free of the ribbon carriage.

4. Remove the curved cover from the flapper (curved scoop) to expose the sensor's cable. There are two (2) locking tabs. Pinch
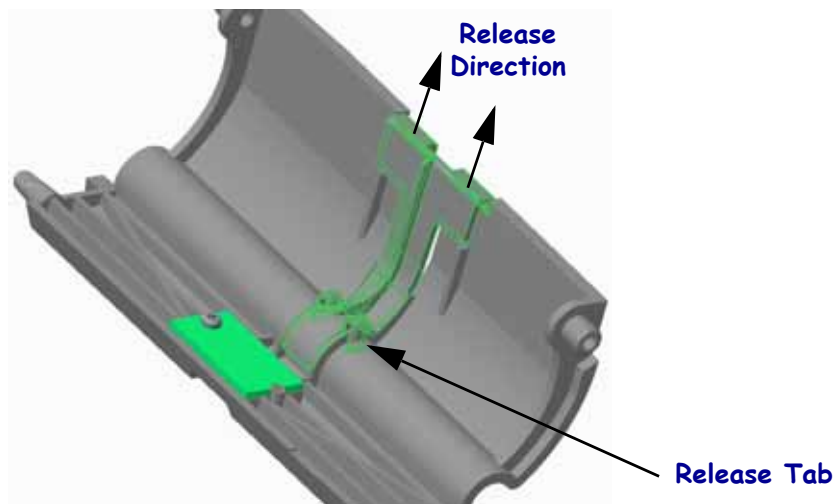
5. Use a #1 Phillips screwdriver to detach the sensors circuit board.

Installation

1. Using the old sensor as template, duplicate the fold on the end of the cable.

2. Insert the sensor's cable through the slot in the flapper and attach the sensor circuit board to flapper with the sensor facing down into the flapper.

3. Align the cable flat in the channel and snap the curved cover over the sensors cable.

4. Reconnect the sensor's PCBA to the flapper with the screw.

5. Lift the top frame and swing the flapper to align with the two curved slots in the ribbon carriage. Lower the top cover to insert the flapper.

6. Reattach the right and left ribbon carriage links to the cross shaped extrusions the sides of the top inner frame.

7. Insert the folded end of the sensor cable through hole on the center of the top inner frame.

8. Attach the end of the sensor cable's folded end to the Control Panel PCBA at the connector at the top center of the PCBA.

Re-attach the Control Panel PCBA and Cover Assembly. Reload media. Plug in power, turn on the printer, navigate the menus, and then print a status report to ensure proper function.

Removing the Printer Base (Bottom Cover)

> ⚠️ **Caution** • 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.

The Printer Base does not have a Spare Part Kit.

Removal

1. Turn the printer over.

2. *Cutter Option: Use a #1 Phillips screwdriver to remove the cutter bezel by removing the two (2) screws on the bottom of the cutter. Slip the bezel off the top of the cutter mech.*

3. Use a #1 Phillips screwdriver to loosen the five (5) screws holding the bottom case to the inner mechanism. The two (2) screws in the rear are recessed and on the back side below the hinges and above the interface and power connectors. Lift the front of the printer base away from the printer them off the rear interface connectors.

Screw Locations

Cutter Bezel Screw Locations
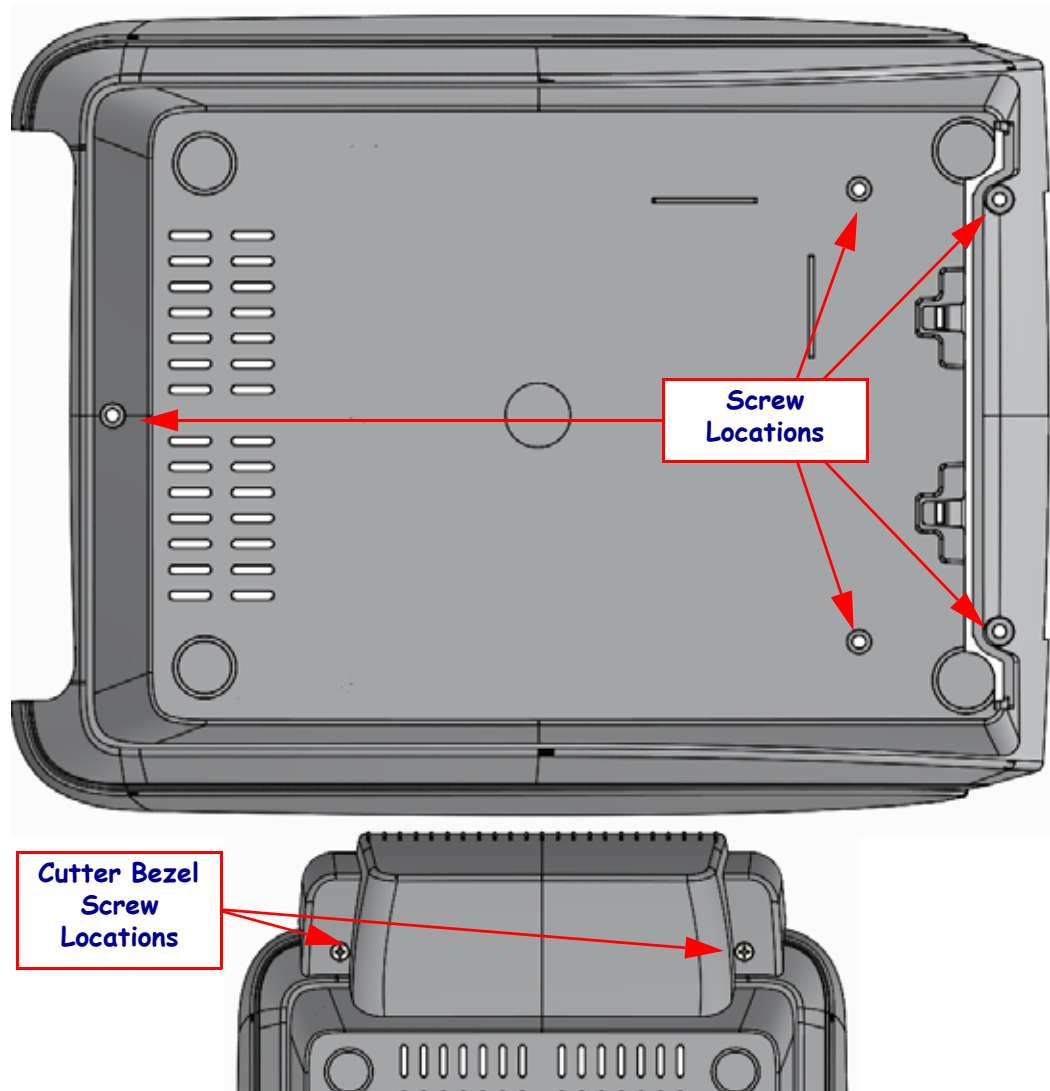
Installation

1. With the printer bottom facing up, slide the Main PCBA's connectors, plugs and power switch through the back panel's interface access (or the back panel access if it has been removed).

2. Seat the printer base to the print mech. Secure it withe the five (5) screws.

3. Verify that the all of the connectors, plugs and power switch has cleared the back panel or install the Back Panel per it's spares procedure (*Replacing the Back Panel on page 50*).

4. Replace the five (5) screws back into their places and tighten with screwdriver.

5. *Cutter Option: The cutter's mounting bracket slides inside of the top lip located on top of the inside of the cutter bezel. Swing the bezel over the cutter bracket and secure it with the two (2) screws.*

Replacing the Standard Bezel

Caution • 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.

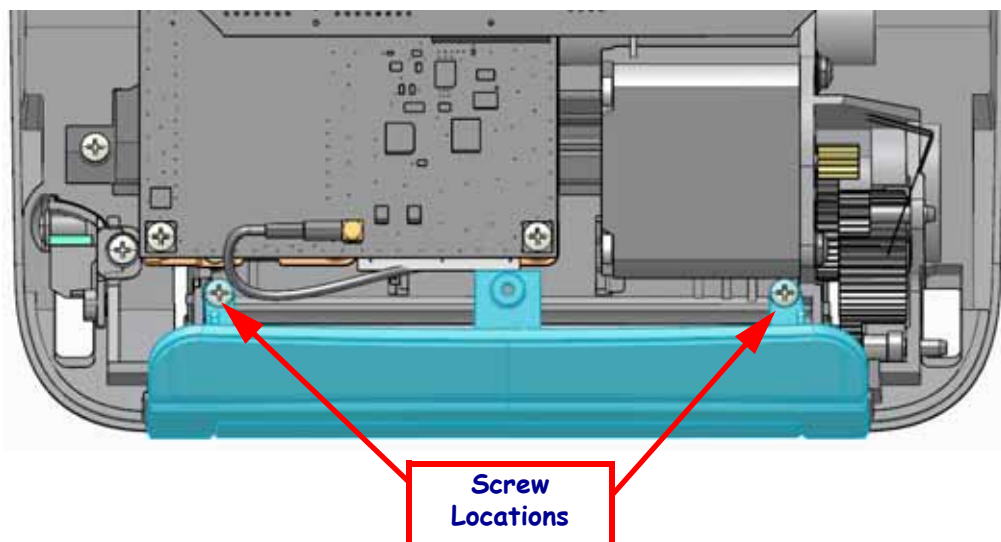You must remove the Printer Base before performing this procedure.

Removal

The bezel is located on the front of the printer below the media exit.

1. Turn the printer upside down. Use a #1 Phillips screwdriver to loosen and remove the screws on the left and right sides immediately behind the bezel.

2. Lift the bezel cover away from the printer.

Installation

1. With the printer upside down, align the bezel cover so that the mounting holes face the rear of the printer and the flat media exit faces to the top of the printer.

2. Place the bezel against the printer.

3. Replace the screws and use a #1 Phillips screwdriver to tighten them.

Screw Locations

Replace the Printer Base. Reload media. Plug in power, turn on the printer and print a status report to ensure proper function.

Replacing the Dispenser (Peel) Bezel

> ⚠ **Caution •** 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.

You must remove the Platen Roller and Printer Base before performing this procedure.

Removal

The dispenser is located on the front of the printer below the media exit.

1. With the printer open (and upright) and the platen roller removed, open the dispenser door. Turn the printer upside down.

2. Use a #1 Phillips screwdriver to remove the two (2) bezel mounting screws on each side.
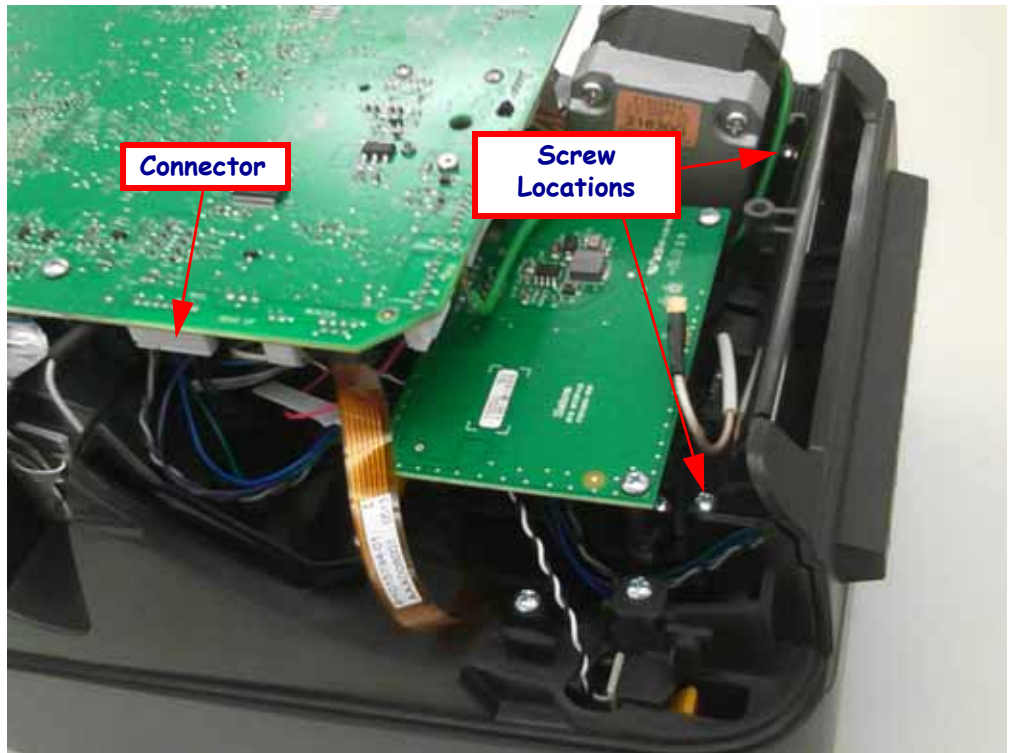
3. Use the small flat bladed screwdriver to pry the inside scoop of the dispenser away from the inside side wall holding the dispenser. Lift the dispenser (peel option) away from the printer.

4. Carefully pull the dispenser's connector off of the Main Logic circuit board. Remove the screw securing the Main PCBA to the chassis to gain better access to the connector.

5. Remove the peel-bar only if there is damage to the bar. Lift the left side up from the bottom with a small flat bladed screw driver. Slide it between the extending lip of the peel bar and the wall and lift/pry it up by swinging the screwdriver to the middle.

Installation

1. Align the peel bar so that the flat side faces up towards the top of the printer. Install the peel bar by inserting the right side into the printer and rotate the left side straight down so that it seats securely. Turn the printer over.

2. Close the dispenser door. With the printer upside down, align the dispenser so that the mounting holes face the rear of the printer and the white roller faces to the top of the printer. Place the dispenser in the front of the printer.

3. Route the dispenser's wire bundle to the right of the printer chassis inner wall.

4. Attach the bezel to the printer mech chassis the two (2) screws.

5. Plug the wire bundle into its connector on the Main PCBA. 'Peel' is printed on the backside of the Main PCBA. Re-attach the Main PCBA if the screw was removed to provide better access to the connector.

6. Turn the printer right side up and open the dispenser door.
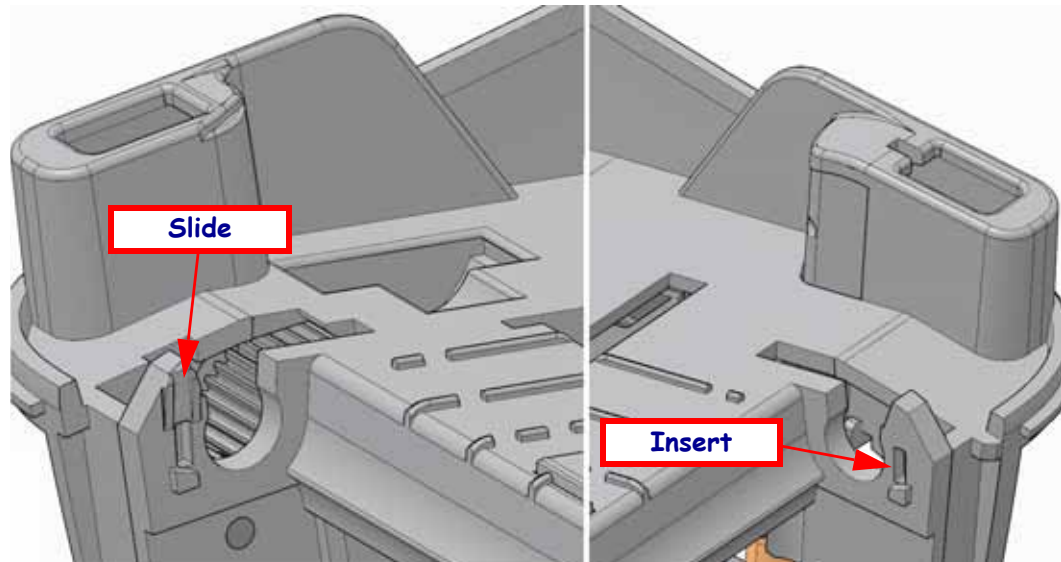
Replace the platen roller and close the Dispenser door. Replace the Printer Base. Reload media. Plug in power, turn on the printer and print a status report to ensure proper function.

Use the printer driver to turn the Label Taken sensor on. Print two (2) or more labels. Only one (1) label should print and presented (peeled and loosely attached to the peel bar). Removing the first label will cause the printer to print and present the second label.

Replacing the Cutter

⚠️ **Caution •** 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.

You must remove the Printer Base and Cutter Bezelbefore performing this procedure.

Removal of the bezel

1. Disconnect the cutter's ground wire from the Main PCBA.

2. Use a #1 Phillips screwdriver to disconnect the screws on the left and right sides behind the cutter mount. Lift the cutter mech away from the printer.
    The Cutter Mech shown below is hanging to the printer by the loose mounting screws.

3. Carefully pull the cutter's connector off Cutter Driver PCBA (located under the RFID PCBA for RFID capable printers) and the green Cutter ground wire from the Main PCBA.
    Many cutter repairs can stop here.

4. *(Continue for complete cutter replacement):* With the Main PCBA's mounting screw removed, move the Main PCBA to gain access to the RFID PCBA.

5. Remove the three (3) screws securing the RFID PCBA to the chassis. Gently move it aside to get access to Cutter Driver PCBA. Remove the RFID cable from the Main PCBA and leave the RFID antenna cable attached.

6. Remove the two (2) screws securing the Cutter Driver PCBA to the printer chassis.

7. Remove the Cutter cable from the Main PCBA.
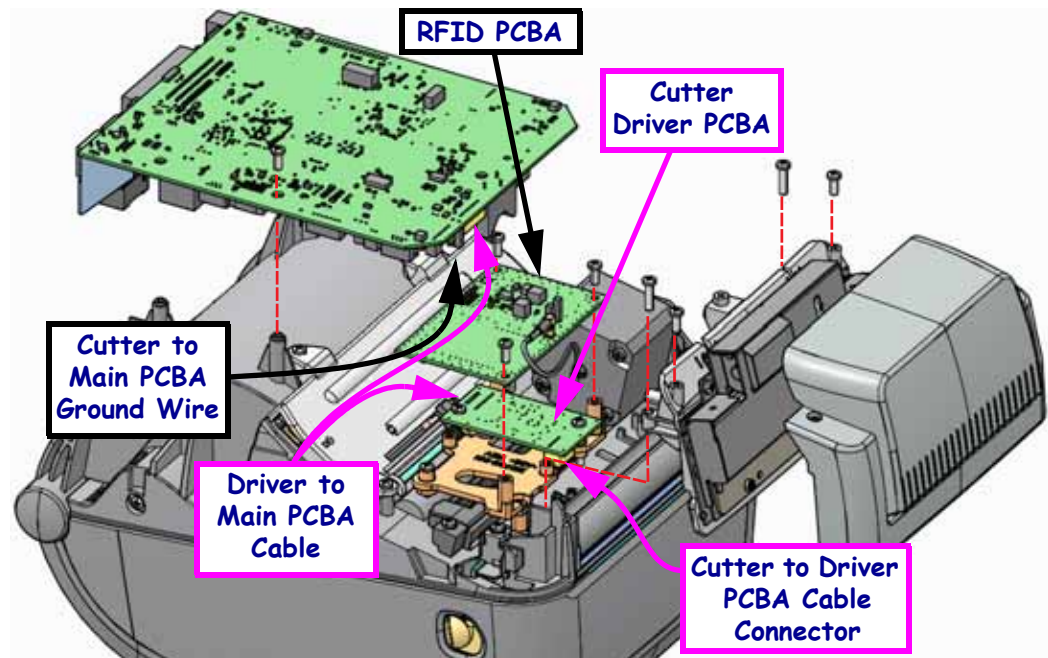
Installation of the mechanism

1. *(Start here for the complete cutter replacement):* Attach the cutter cable from the Main PCBA to the Driver PCBA.

2. Replace the Cutter's Driver PCBA while looping the Cutter cable under the Main PCBA. Secure the PCBA to the printer chassis with the two (2) screws.

3. Re-attach the RFID PCBA to the printer chassis with the three (3) screws.

4. *(For Cutter Mech only replacement - Start Here):* Using the two (2) bezel mounting screws, hang the Cutter Mech on the front of the printer as show in the picture on the previous page.

5. Attach the Cutter Mech cable to the Driver PCBA.

6. Attach the Cutter Mech green ground wire to the Main PCBA.

7. Lift the Cutter Mech off the front off the printer and insert the it into the front of the printer. Secure the cuter bezel to the printer chassis with the two (2) screws.

8. Re -attach the Main PCBA to the printer chassis with the single screw.

9. Replace the Printer Base. Replace the Cutter Bezel.

Reload media. Plug in power, turn on the printer and print a status report to ensure proper function. The Cutter will be tested if the printer has the Cutter enabled when the status report is printed. The Cutter can be enabled through programming (^MMA command) or the printer driver.

Replacing the Main PCBA

> **Caution •** 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.

You must remove the Printer Base before performing this procedure.

For the majority of the repairs, loosening the Main PCBA is sufficient. For printers with Wifi/Bluetooth radios, the antenna is very difficult to remove and replace.

Removal

1. From beneath, use a #1 Phillips screwdriver to remove the single screw holding the Main Logic circuit board to the inner mechanism.

2. Carefully lift the Main PCBA away from the printer to disconnect the wires, bundles and ribbon cables from one side of the printer and then the other. Flex circuit cable connectors include a colored locking tab. Pull the tab up to unlock the connector.

    For units with Wireless Radios, the antenna must be disconnected at the Main PCBA. The other end of the antenna cable is attached to the side wall of the printer with adhesive backing. Only use your fingers to gently remove and replace the antenna. Gently but firmly pull the coupling straight up (as close as you can get).
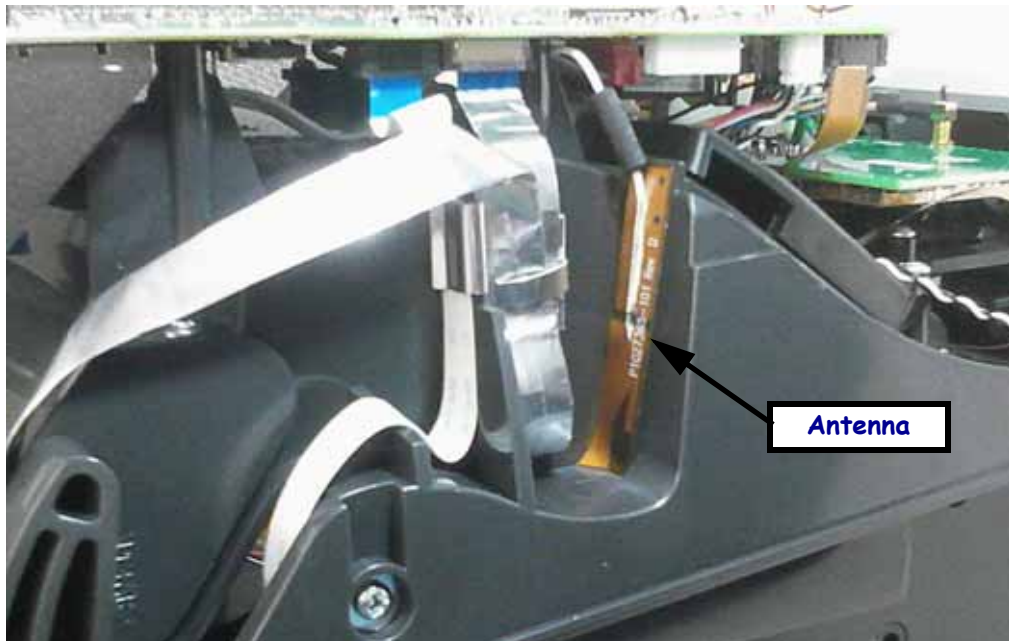
3. For printers with the Wireless Radio and it is being replaced for radio failure, peel the adhesive Antenna off the chassis's inner wall.

Installation

1. From beneath, check the wires bundles and ribbon cables; and prep them for easy re-attachment to the Main PCBA. Cables can get crossed and tangled when loose.

2. Re-attach the Antenna. Use your finger only to apply a slow steady pressure directly above the Antenna Coupling.

   If replacing the Main PCBA for radio failure, place the new adhesive backed Antenna on the inner chassis wall as shown on the previous page.

3. Align the Main PCBA over the mounting pins on the inner mechanism and connect the printer's motor, sensors, printhead, ground cables, etc. to the Main PCBA. With the locking tab pulled up (open), slide the flex circuit cables into the connector. Push the tab down to lock the cable. Check that all are securely attached.

4. Lower the Main Logic circuit board onto the mounting pins.

5. Place the screw back into place and use a #1 Phillips screwdriver to tighten it.
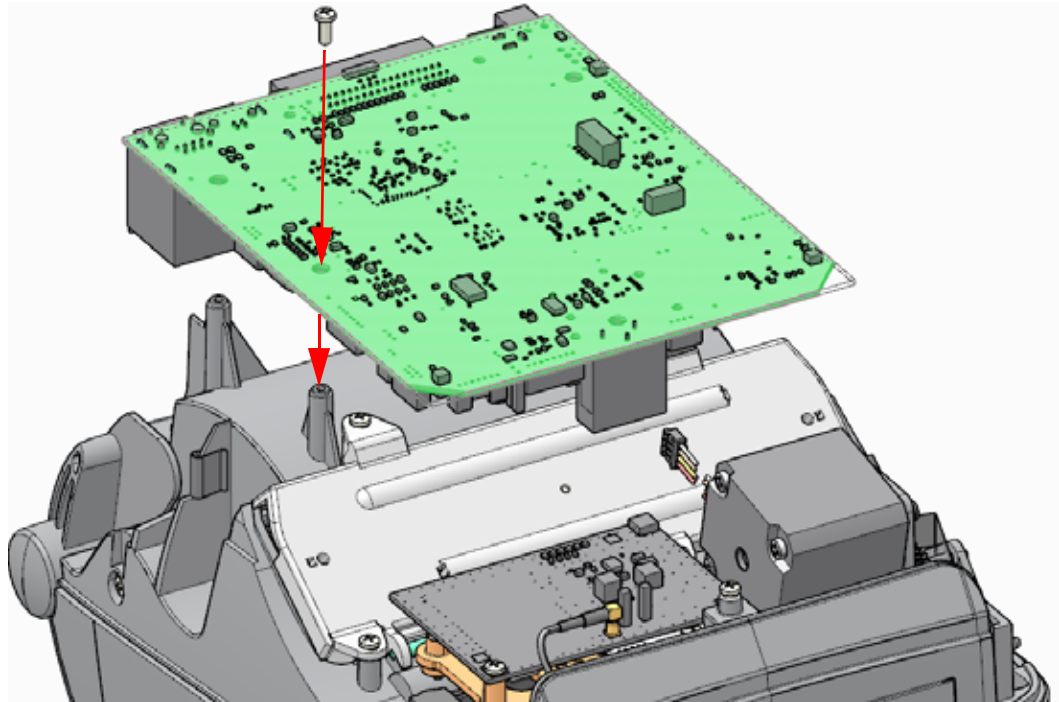
Replace the Printer Base. Reload media. Plug in power, turn on the printer and print a status report to ensure proper function.

Replacing the Battery

⚠️ **Caution •** 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.

The real-time clock has a replaceable battery.

Dispose or recycle the old battery in accordance with local regulations and requirements.

You must remove the Printer Base and Main Logic circuit board before performing this procedure.

Removal

1. Locate the battery on the Main Logic circuit board (at the front).

2. Use a tipped non-conductive blunt tool to pull the battery clip out away from the top of the battery and pull the battery out of the slot.
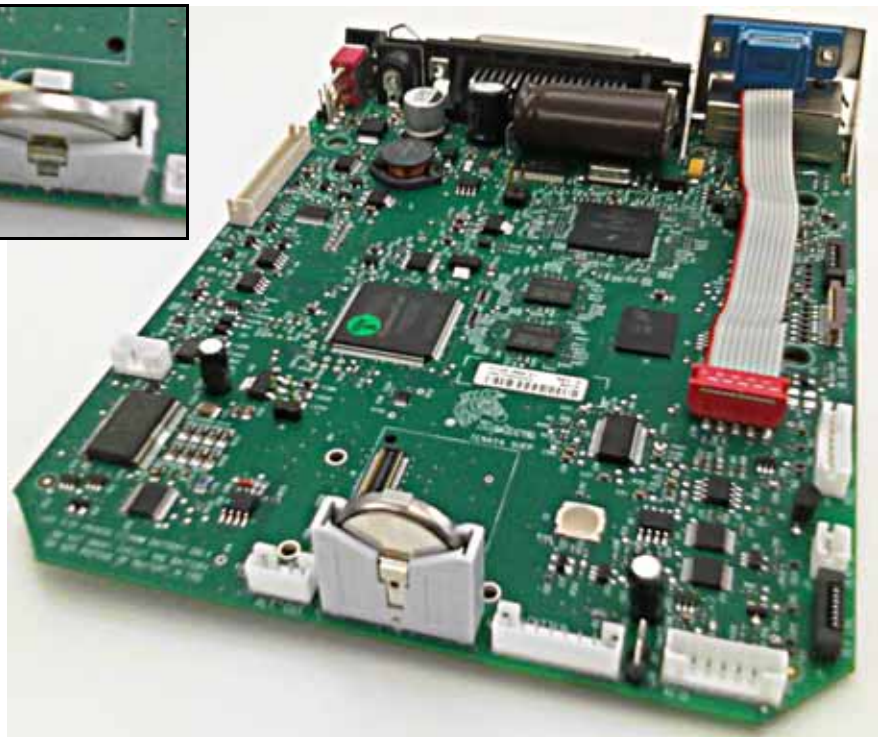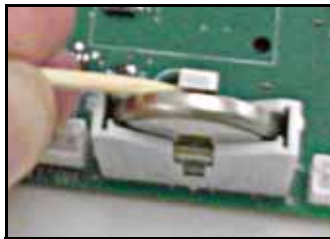
Installation

1. Check the alignment of the battery! Positive- plus symbol (+) faces the into the PCBA! Insert the battery into its slot.

Replace the Main Logic circuit board and bottom case. Reload media. Plug in power, turn on the printer and print a status report to ensure proper function. Reset the printer time and date.

Replacing the Head Up Sensor

⚠️ **Caution** • 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.

You must remove the Printer Base before performing this procedure.

Removal

From beneath, the head up sensor is located on the right side of the printer towards the front of the media compartment.

1. Use a #1 Phillips screwdriver to loosen the screw holding the head up sensor and bracket to the inner mechanism.

2. Carefully pull the sensor's connector off of the Main Logic circuit board.

Installation

1. Align the sensor into place with the switch facing forward.

2. Lower the sensor and its bracket into place.

3. Place the screw back into place and use a #1 Phillips screwdriver to tighten it.

4. Plug the wire bundle into its connector on the Main Logic circuit board.

Head-Up Sensor
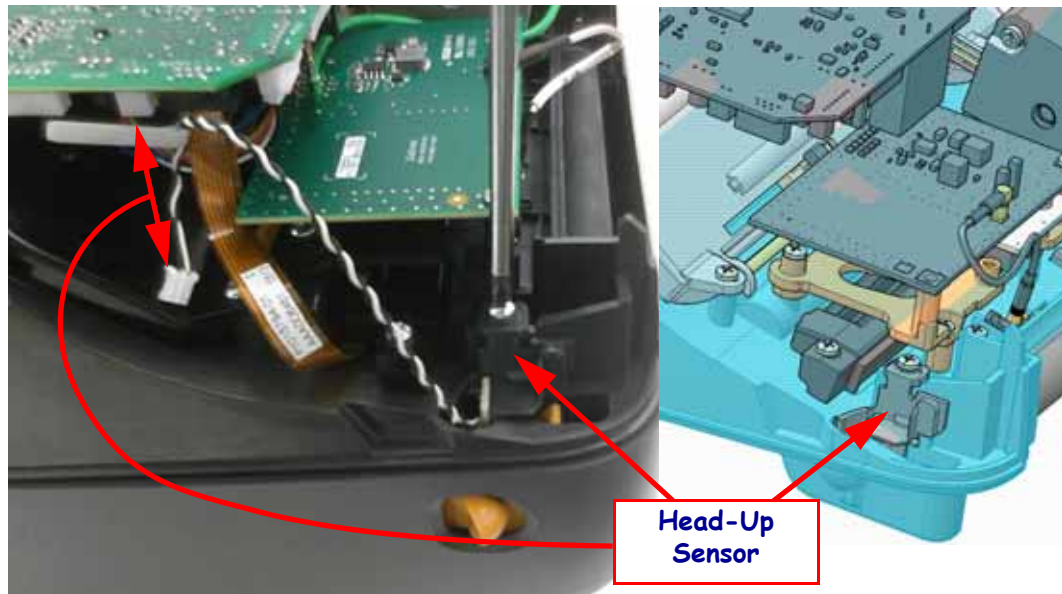
Replace the bottom case. Reload media. Plug in power, turn on the printer and print a status report to ensure proper function.

Replacing the RFID Module

> ⚠️ **Caution •** 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.

You must remove the Printer Base and (detach) Main PCBA before performing this procedure.

Removal

1. Remove the three (3) screws retaining the RFID PCBA to the chassis.

2. Disconnect the cable connecting the RFID PCBA to the Main PCBA, if connected.

3. Disconnect the cable coupling from the RFID Read/Write PCBA.

4. Push the release tab securing the RFID cover to the inner Print Mech's inner wall.
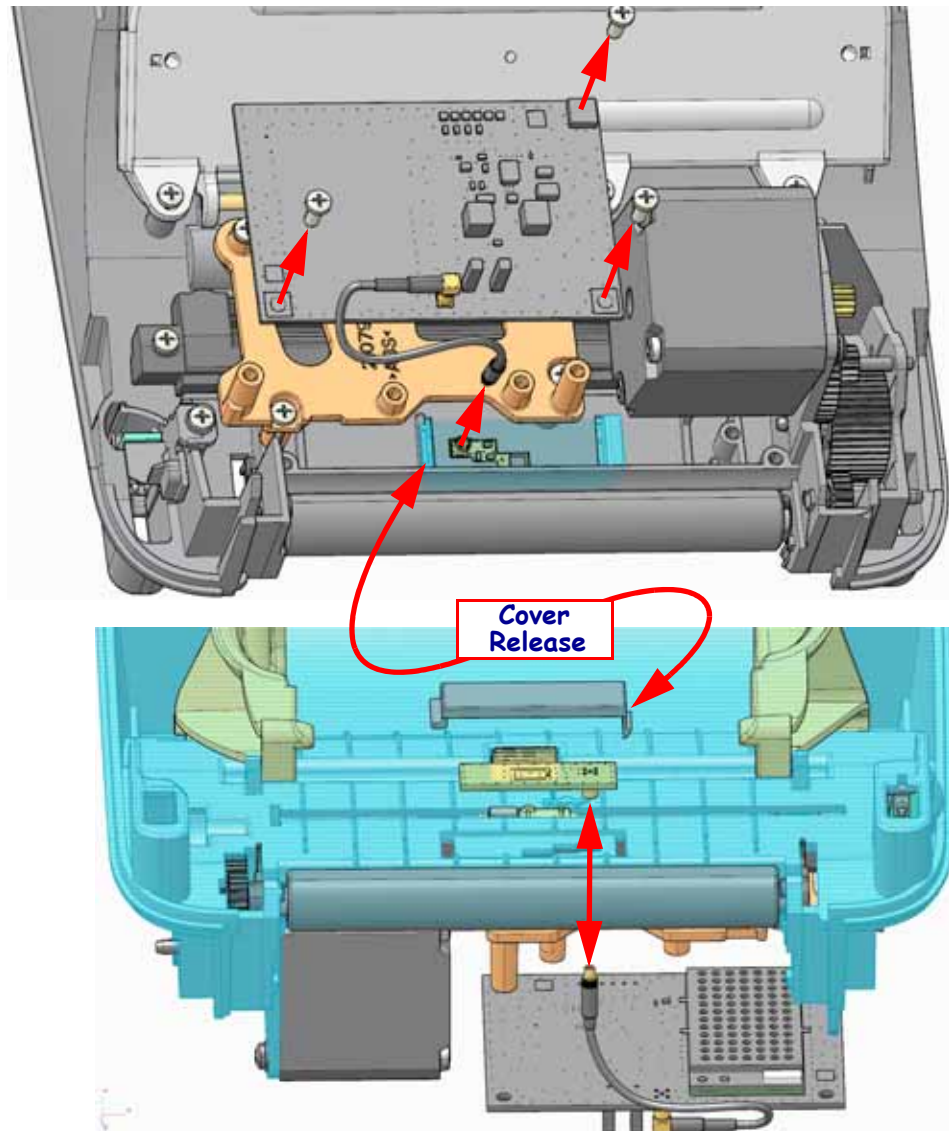
Installation

1. Connect the two RFID PCBA's with the cable (and coupling) through the Print Mech's inner wall.

2. Place the RFID Read/Write PCBA in RFID Cover with the coupling on the release tab's side of the cover.

3. Slide the RFID Cover's 'L' shaped tab into the left slot and swing the other side down and push it in to lock the cover to the chassis with the RFID Read/Write PCBA inside.

4. Attach RFID PCBA cable to the Main PCBA, if the all the other cables are attached to the loose Main PCBA.

5. Secure the RFID PCBA to the mount with the three (3) screws.

Re-attach all the other cables (if you removed them for greater access to the RFID cable) and re-secure the Main PCBA to the chassis with the single screw. Replace the bottom case.

Plug in power. Turn on the printer. Load RFID media. Calibrate both the media and it's RFID tag. Print a status report to ensure proper function of the rest of the printer.
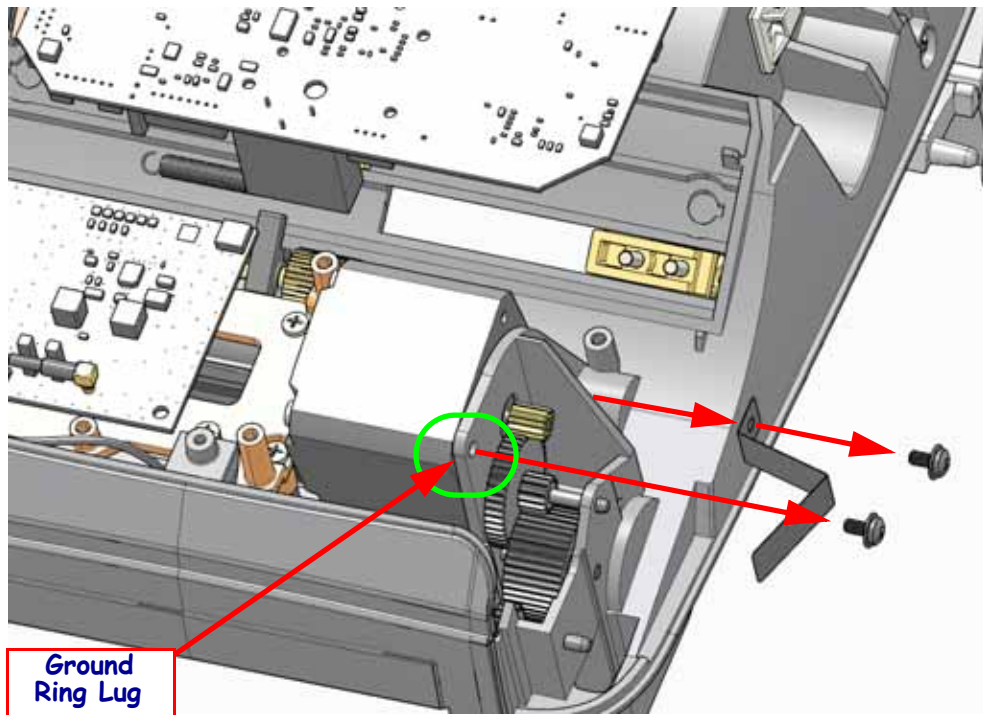
Replacing the Motor

> ⚠ **Caution •** 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.

You must remove the Printer Base and loosen the Main and RFID PCBA's (remove the mounting screws) before performing this procedure.

Removal

The motor is located on the right side of the printer under the media compartment.

1. Disconnect the motor's ground wire from the Main Logic circuit board.

2. Use a #1 Phillips screwdriver to remove the two screws securing the motor and it's ground wire and ground clip the inner chassis. Carefully pull the motor away from the chassis and out of the printer.

3. Pull the motor's wire bundle away from its connector on the Main Logic circuit board.

Ground
Ring Lug

Installation

1. Align the motor with the cables facing the rear of the printer. Slide the motor into place making sure its gears mesh with the transfer gears. Align the motor's mounting hole to the printer chassis motor mounts (threaded screw holes).

2. Loosely attach the ground wire's ring end to the motor through the motor bracket molded in the chassis with the screw/lock washer.

3. Attach the ground clip to the motor through the motor bracket molded in the chassis with the screw/lock washer. The ground clip is to touch the end of the motors drive shaft.

4. Complete tightening the screw attaching to the ground wire ring lug to the motor.

5. Reconnect the motor's ground wire to the Main Logic circuit board.

6. Connect the motor's cable to the Main PCBA.

Re attach the RFID and Main PCBA's with their mounting screws. Replace the Printer Base. Reload media. Plug in power, turn on the printer and print a status report to ensure proper function.

Replacing the Movable Sensor

⚠️ **Caution •** 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.

You must remove the Printer Base, Main PCBA, RFID PCBA and Motor before performing this procedure.

Removal

1. Use #1 Phillips screwdriver to remove the four (4) screws holding the RDIF/Cutter board mounting tray to the chassis.
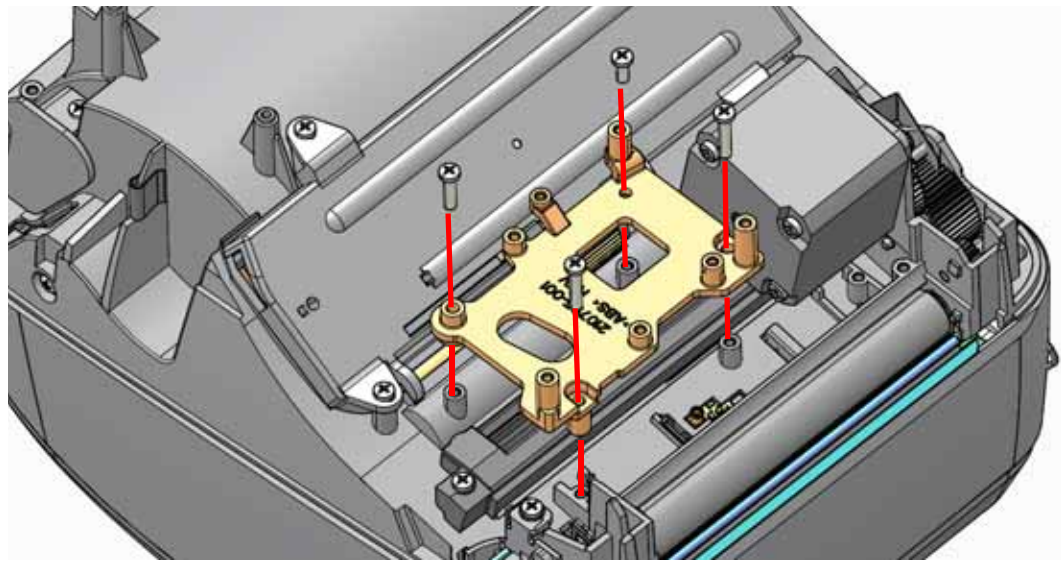
2. Remove the single screw holding the sensor's bracket track to the chassis.

3. Carefully lift the sensor and bracket track away from and out of the side wall of the printer's chassis.

Track Align Pin
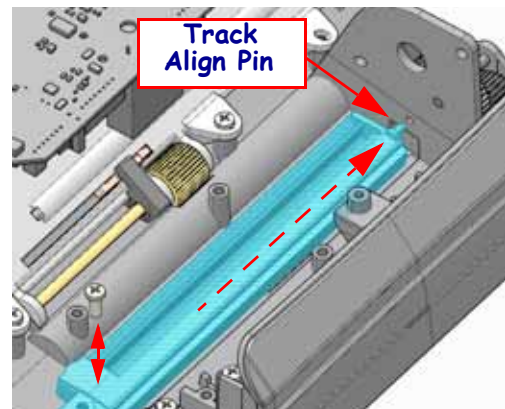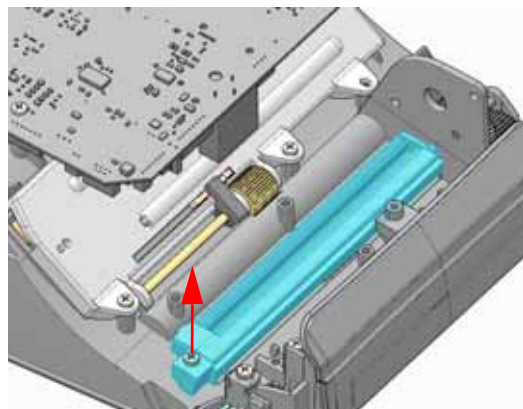
Installation

1. Place the sensor in the middle of the sensor's slide track in the chassis.

2. Align the bracket track so that the two slide tracks align up with the two metal springs on the back of the sensor. Slide the bracket track's capture and alignment pin into the printer's chassis wall. Align the screw mounting hole on the opposite end of the bracket track to chassis's bracket mounting post and snap it to the chassis.

3. Replace the screw that held the bracket track with a #1 Phillips screwdriver. Make sure the sensor and cable slide in its track.

Replace the Motor, RFID PCBA, Main PCBA and Printer Base. Reload media. Plug in power, turn on the printer, calibrate media for the new sensor, and then print a status report to ensure proper function.

Replacing the Ribbon Trailer Sensor

> ⚠️ **Caution •** 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.

You must remove the Printer Base before performing this procedure.

Removal

1. Remove the five screws securing the ribbon carriage's right side cover to the frame and remove the cover.
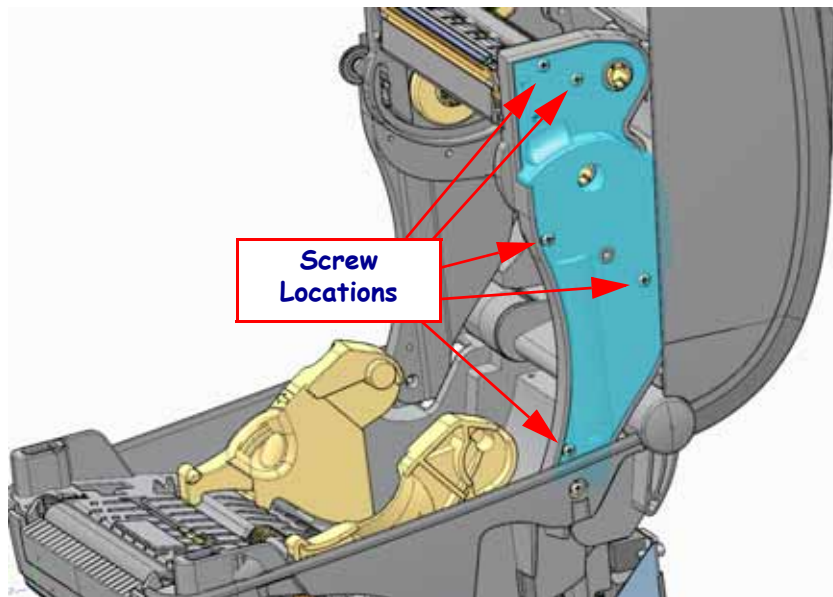
2. Use blunt tip tool to push the release tab on the ribbon guide (hi-lighted) right-side and pull it out from the right side of the ribbon carriage. Pull the left side of the guide free from the ribbon carriage.
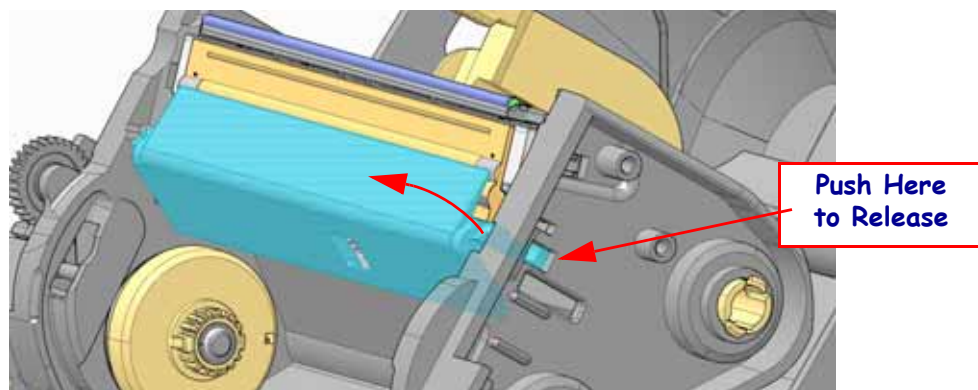
3. Use a #1 Phillips screwdriver to remove the screw securing the ribbon out sensor circuit board.

4. Remove the clip securing the sensor's flex cable to the side of the printer's chassis.

5. Release the sensor's flex cable from the Main Logic circuit board. The single screw securing the Main Logic circuit board can be removed to gain better access to the connector.
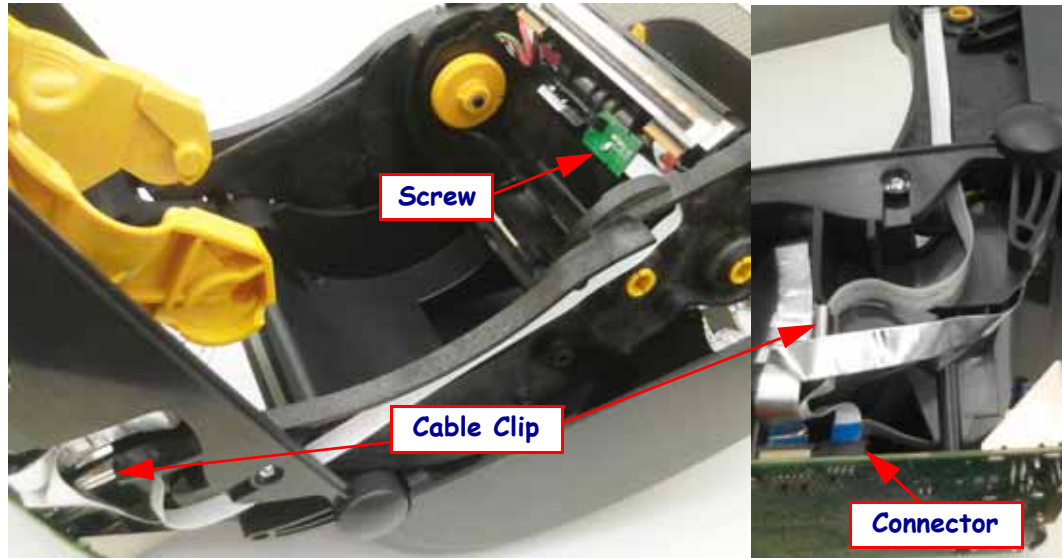
6. Slide the flex cable out of the lower chassis and ribbon carriage.

Installation

1. From the inside of the printer, insert the ribbon sensor's flex cable into the side of the ribbon carriage. The blue side of the flex cable faces out. Slide the flex cable down the side of the ribbon carriage and through the ribbon carriage's hinge and the printer chassis into the bottom half of the printer.

2. Route the flex cable under the flex cables and connect it to the Main Logic circuit board. There should be no twists in the cable. The cables circuit side (fingers) should be facing in towards the inside of the printer. Verify the flex cable is locked.

3. Re-secure the Main PCBA to the chassis with the single screw if removed.

4. At the sensor's PCBA, twist the cable a quarter turn to have the sensor facing away from the frame and secure it to the ribbon carriage with the screw.

5. Pull the cable flat into the channel on the side of the ribbon frame and replace the right side ribbon carriage cover. Secure it with the five screws.

6. Close the printer. Leaving a little slack or service loop, re-attach the flex cable to the rear side to the it's nearest frame support (rib) on the chassis with the cable clamp.

Replace the Printer Base. Reload media. Plug in power, turn on the printer and print a status report to ensure proper function.

Replacing the Ribbon Carriage

⚠️ **Caution •** 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.

You must remove the Printer Base, Cover Assembly, and loosen Main PCBA before performing this procedure.
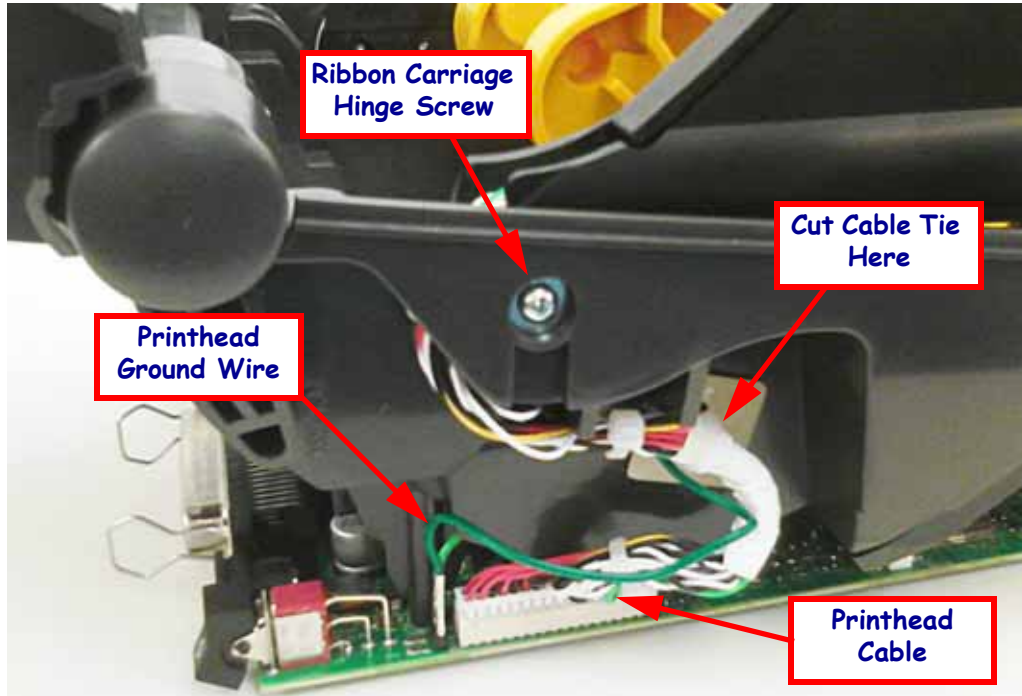
Removal

1. Use your fingers to pull the clip holding the ribbon sensor cable to the right side of the print mechanism.
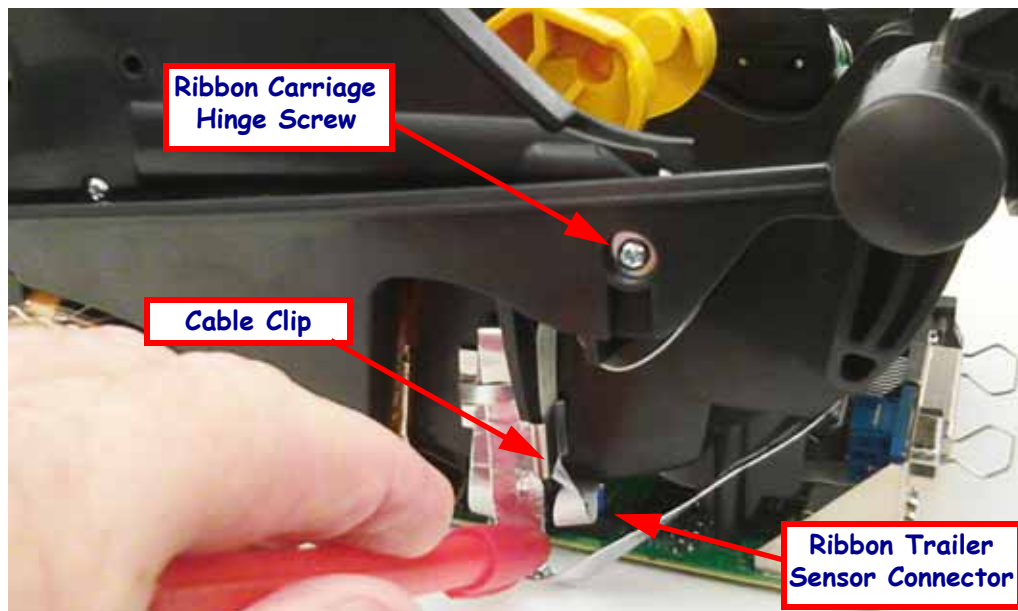
2. Disconnect the ribbon sensor cable from the Main PCBA.

3. Cut the tie wrap holding the printhead green grounding wires and wire bundle to the left side of the print mechanism.

4. Disconnect the printhead cable and ground wire from the Main PCBA.

5. Use a #1 Phillips screwdriver to loosen the screws on both the left and right sides of the ribbon carriage. Remove the screws and their washers.

6. Detach both the left and right links on the ribbon carriage from the Inner Lid.

7. Pull the Inner Lid away from the ribbon chassis and the flapper will swing free.

8. Lift the ribbon carriage away from the mechanism and carefully pull the wire bundles and cables through the print mech.

9. Remove the printhead from the ribbon carriage. See the *Replacing the Printhead on page 41*.

Installation

1. See the *Replacing the Printhead * to replace the printhead in the ribbon carriage.

2. With the print mechanism open, lower the ribbon carriage into place carefully inserting the wire bundles and cables through the print mech.

3. Replace both the screws and washers the hold the ribbon carriage to the print mech.

4. If the Main PCBA has not been removed, then re-attach the printhead cable and ground wires to the main PCBA.

5. Secure the print head wire bundle to the bottom, inner frame using a tie wrap. Snip off the excess.

6. If the Main PCBA has not been removed, then re-attach sensor cable to Main PCBA. Remove Main PCBA mounting screw to get better access to the sensor's connector.

7. Secure the ribbon sensor cable to the chassis using the clip.

8. Lower the Inner Lid over the ribbon carriage. Make sure the flapper slides into its guide tracks on the ribbon carriage.

9. Attach the links on both the left and right sides.

Replace the Main PCBA (if removed), Cover Assembly and Printer Base.

Clean the printhead. Reload media. Plug in power, turn on the printer and print a status report to ensure proper function.

Replacing the Hinges

> ⚠️ **Caution** • 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.

You must remove the Printer Base before performing this procedure.

Removal

1. Place the printer upside down (on its top). Loosen the tie arm holding the (silver) control panel's cable from the chassis side wall.

2. Use a #1 Phillips screwdriver to remove the two screws holding each hinge. Only remove the right hinge if you are only gaining access to other components or assemblies.

3. Rotate the hinge so that the mounting holes move away from the mechanism. Slide the hinge along the axis of its rotation away from the printer.

4. Repeat these steps for the other hinge.

Installation

1. Align the hinge so that the ribbon cable fits through its slot

2. Press the hinge straight along its axis of rotation onto the printer. Rotate the hinge to line up the mounting holes and is snug against the chassis.

3. Replace the two screws.
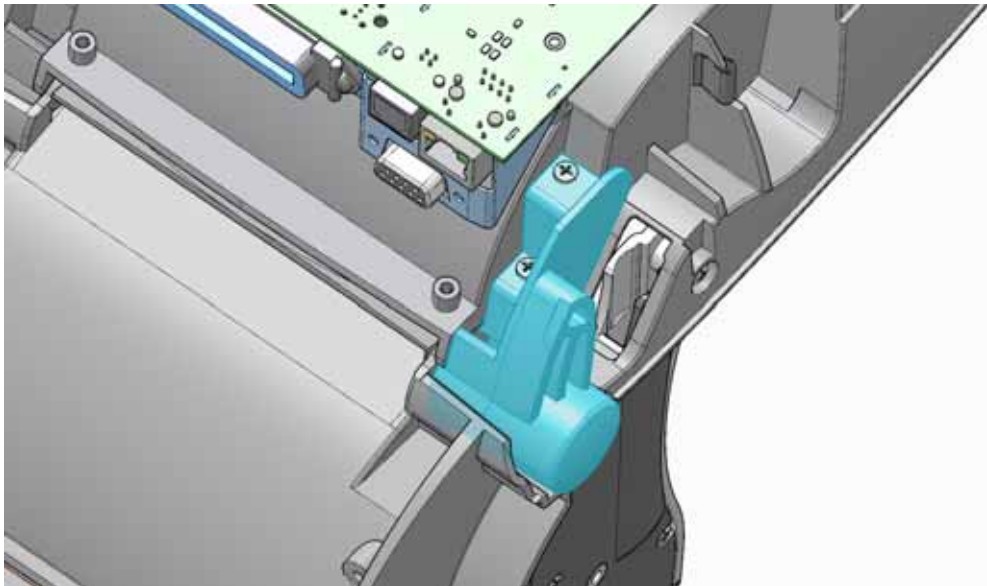
4. Repeat these steps for the other hinge.

   Replace the bottom case. Open and close the printer to verify that the cables and hinges are not binding. Reload media. Plug in power, turn on the printer and print a status report to ensure proper function.

# Replacing the Control Panel Cable

> **Caution •** 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.

You must remove the Printer Base, Cover Assembly, Main PCBA (loosen) and Right Hinge before performing this procedure.

Removal

1. Disconnect the Control Panel's ribbon cable from the Main PCBA and release the cable from the clamp above it.
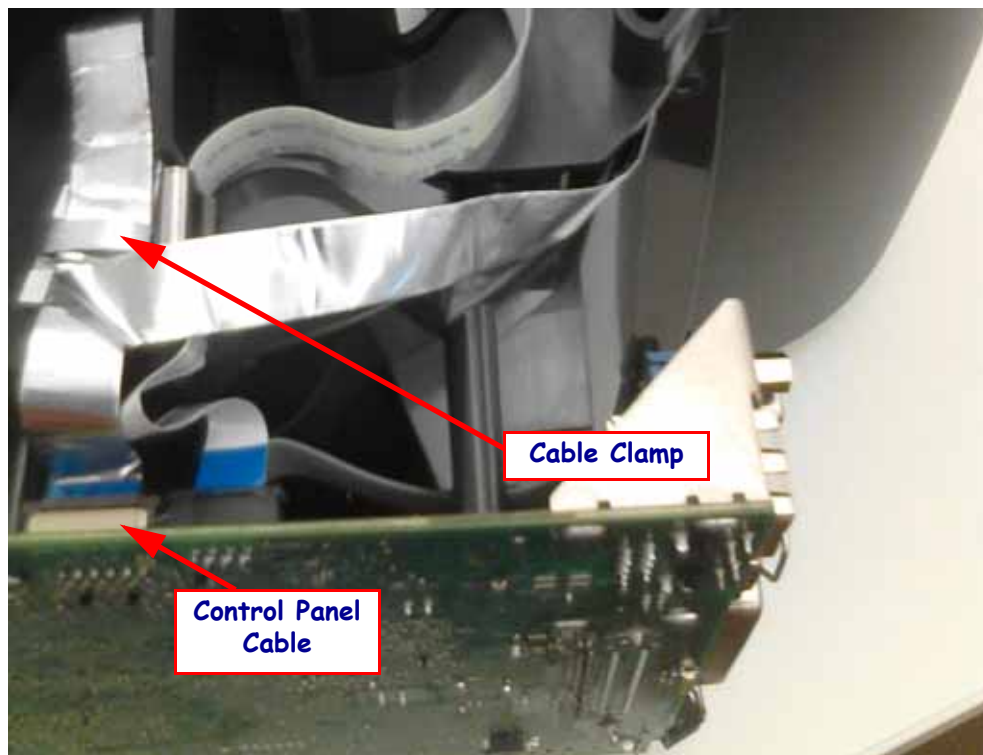

2. Remove the right hinge from the printer if not done already.

3. Remove the label securing the cable and the cable from to back of Inner Lid by the Right Hinge. Keep the cable as a fold pattern for the replacement cable.

4. Use a #1 Phillips screwdriver to remove the two screws securing the Control Panel PCBA to the top of the inner lid frame.


Screw Locations
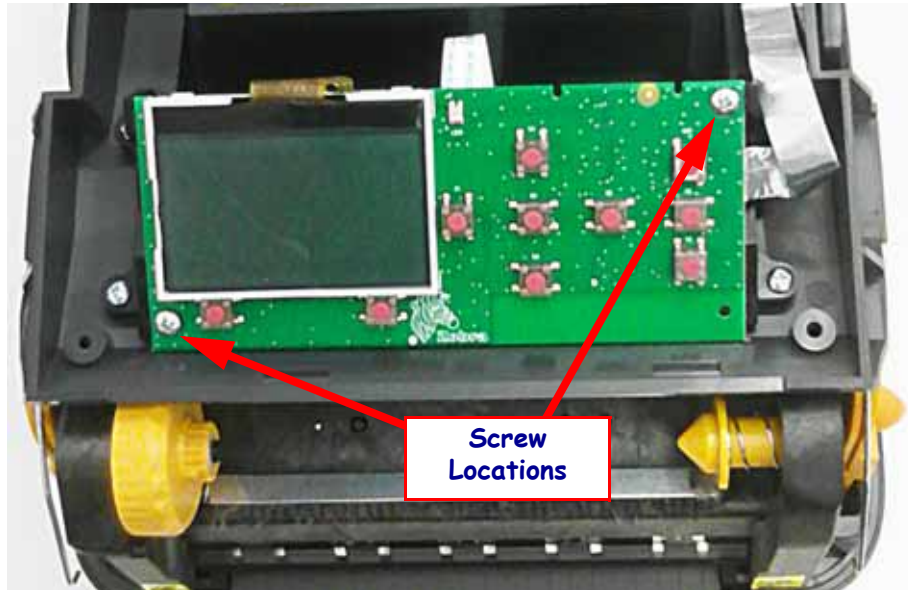
5. Release the locks on the Control Panel cable and pull the cables free of the circuit board. Note the location of the 'blue' side of the flex circuit cables end.

Release Tabs
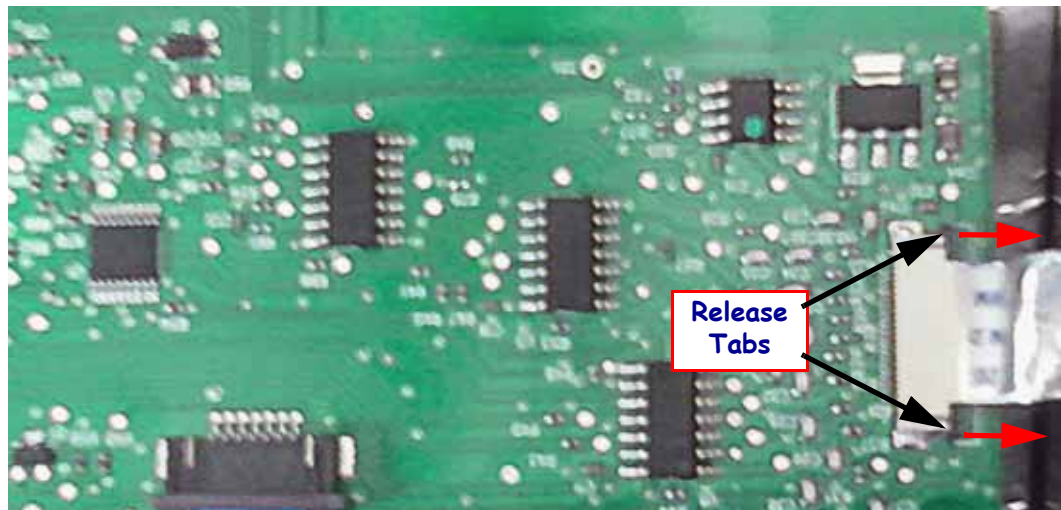
Installation

1. Use the old cable as a pattern to fold the new cable. Note the blue marks on the ends of the cable to properly orient the folds and fold directions.

2. Connect the cable to the Control Panel PCBA and re-secure the Control Panel PCBA to the Inner Lid.

3. Route the cable through the Inner Lid and then through the Inner Lid's hinge.

Cable Clamp

Secure Cable with Label
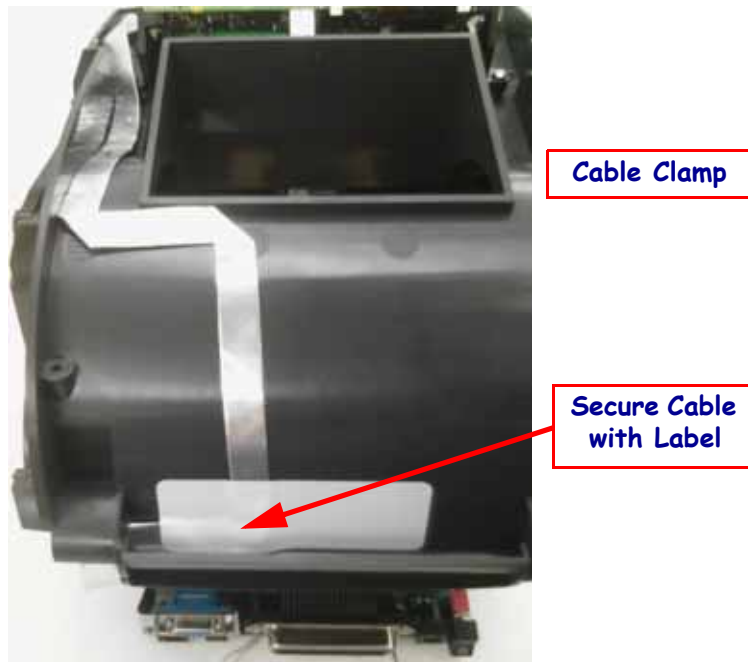
4. Remove the backing on the double sided adhesive tape and place the tightly to the curved surface on the inner lid as shown above.

5. Place the label over the 90 degree bend near the hinge to lock the cable tightly to the inner wall of lid.

6. Replace the Right Hinge and secure it with the two (2) screws.

7. Connect the Control Panel Cable to the Main PCBA and lock the connector with the 'blue' side of the cable facing out.

8. Fold the excess cable over and secure it to inner will of the Print Mech with the clamp.

Replace Main PCBA, Cover Assembly, and Printer Base.

Reload media. Plug in power, turn on the printer and print a status report to ensure proper function.

Replacing the Inner Lid

> ⚠️ **Caution** • 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.

You must remove the Printer Base, Cover Assembly, Main PCBA (loosen) and Right Hinge before performing this procedure.

Removal

1. Disconnect the Control Panel's ribbon cable from the Main PCBA and release the cable from the clamp above it. Remove the right hinge if not already done.
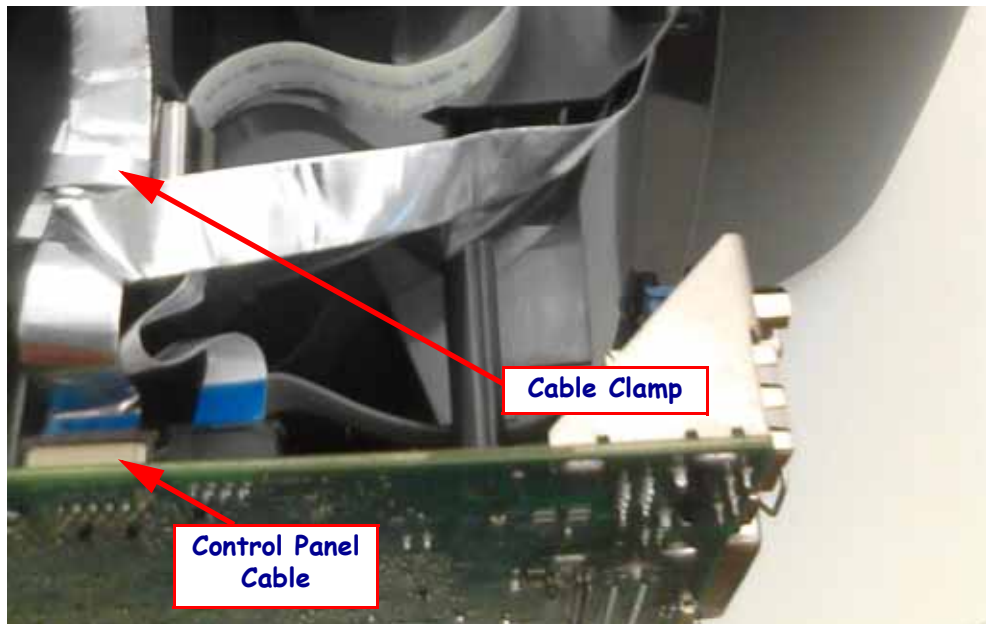
Cable Clamp

Control Panel Cable

2. Detach the links from both the left and right sides of the top, inner frame. Pull the two links until they clear the plus sign shaped post to release the links.
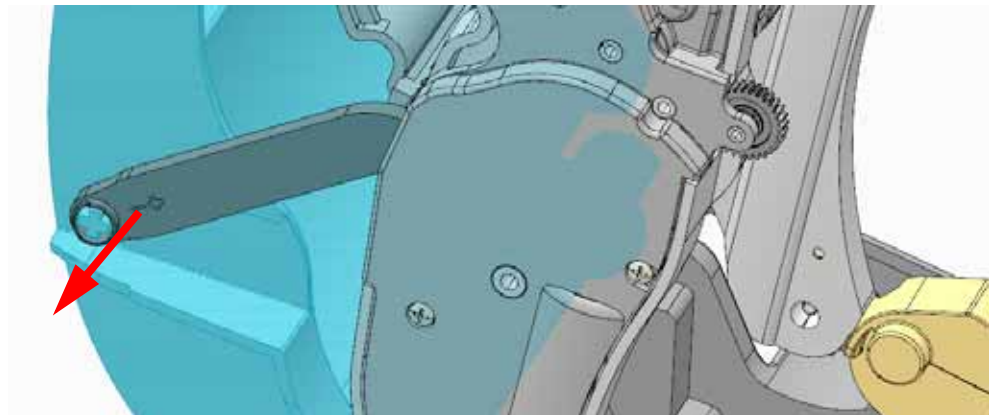
3. Pull the Inner Lid e away from the (lower) Print mech. and Ribbon Carriage.

Installation

1. Slide the left side of the Inner Lid into the Left Hinge.

2. Swing the Inner Lid over the ribbon carriage. Make sure the flapper slides into its guide tracks on the ribbon carriage.

3. Attach the links on both the left and right sides.

Replace the Right Hinges, Main PCBA, Cover Assembly, and Printer Base.

Reload media. Plug in power, turn on the printer and print a status report to ensure proper function.

Replacing the Print Mechanism

> ⚠️ **Caution** • 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.

You must remove the Printer Base, Bezel (Standard, Dispenser or Cutter), Cover Assembly, Main PCBA, RFID PCBA (incl. Read/Write Antenna and cover, and coupling cable), (Cutter Driver PCBA), Hinges, Inner Lid, and Ribbon Carriage before performing this procedure.

Removal

1. With the Printer Base, Bezel (Standard, Dispenser or Cutter), Cover Assembly, Main PCBA, RFID PCBA (completely removed), continue disassembly.

2. Use #1 Phillips screwdriver to remove the four (4) screws holding the RDIF/Cutter board mounting tray to the chassis.

3. Remove the front bezel (standard, dispenser or cutter).

4. Disconnect the clamp and clip from the control panel and ribbon trailer cables from the side of the chassis.

5. Cut the tie wrap securing the printhead ground wires and cable bundle from the side of the chassis.

6. Remove the hinges.

7. Pull the left and right links off the side of the Inner Lid.

8. Pull the Inner Lid and its flapper out of the ribbon carriage. Remove the Ribbon Carriage.

9. Remover the dispenser's peel bar if present.

10. Remove the platen roller.
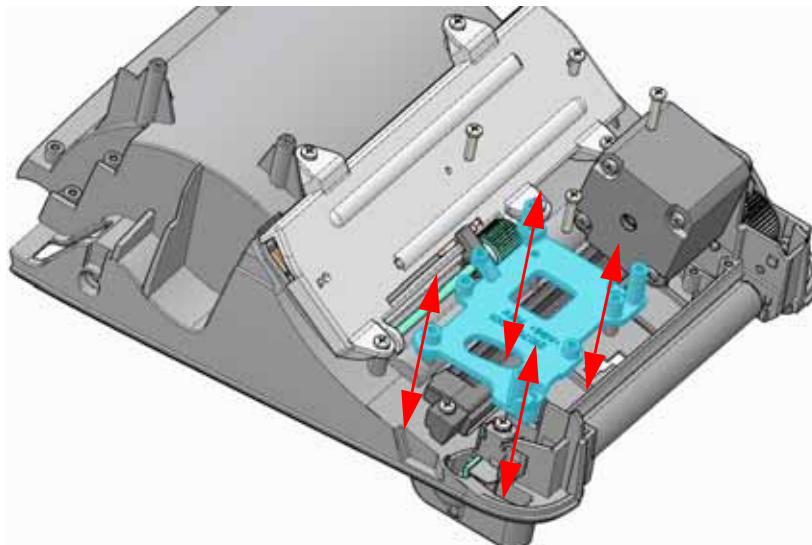
Installation

1. If the old chassis had an antenna, remove the adhesive backing on a new antenna and apply the antenna to flat inside wall of the new print mech. The bottom of the flex circuit (antenna) with the wire aligns with the bottom edge of the inner chassis wall.

2. Insert the peel bar in the front of printer if you have a dispenser. *Replacing the Dispenser (Peel) Bezel on page 62*

3. Install the ribbon carriage. *Replacing the Ribbon Carriage on page 79*

4. Attach the left hinge to the chassis. *Replacing the Hinges on page 82*

5. Install the inner lid. Insert the inner lid into the left side hinge. Lower the inner lid over and then into the ribbon carriage. Make sure the flapper slides into its tracks on the ribbon carriage. *Replacing the Inner Lid on page 86*

6. Attach the links on both the left and right sides of the inner lid to connect it to the ribbon carriage.

7. Attach the right hinge.

8. Attach the RFID/Cutter PCBA tray to the chassis with the four (4) screws.

9. For printer's with a Cutter, attach the Cutter PCBA to the tray with two (2) screws. *Replacing the Cutter on page 64*

10. For printer's with RFID, attach the RFID Read/Write PCBA to the chassis and attach the antenna the RFID PCBA. Attach the RFID PCBA to the tray on the chassis with three (3) screws. *Replacing the RFID Module on page 71*

11. Attach the front bezel (standard - *Replacing the Standard Bezel on page 61*, dispenser - *Replacing the Dispenser (Peel) Bezel on page 62*, or cutter - *Replacing the Cutter on page 64*) to the front of the printer with two (2) screws. For cutters, plug the cutter into the cutter driver PCBA before attaching the bezel to the chassis.

12. Re-attach the Main PCBA. *Replacing the Main PCBA on page 66*

13. Secure the ribbon trailer sensor's cable to the rib on the printer's chassis with the clip.

14. Secure the excess control panel cable in the clamp on the side of the chassis wall.

15. Attach the printhead wire harness and ground wires to the side the print mechanism with a tie wrap.

16. Install the Cover Assembly (*Replacing the Cover Assembly on page 52*) and Printer Base (*Removing the Printer Base (Bottom Cover) on page 59*) on the printer.
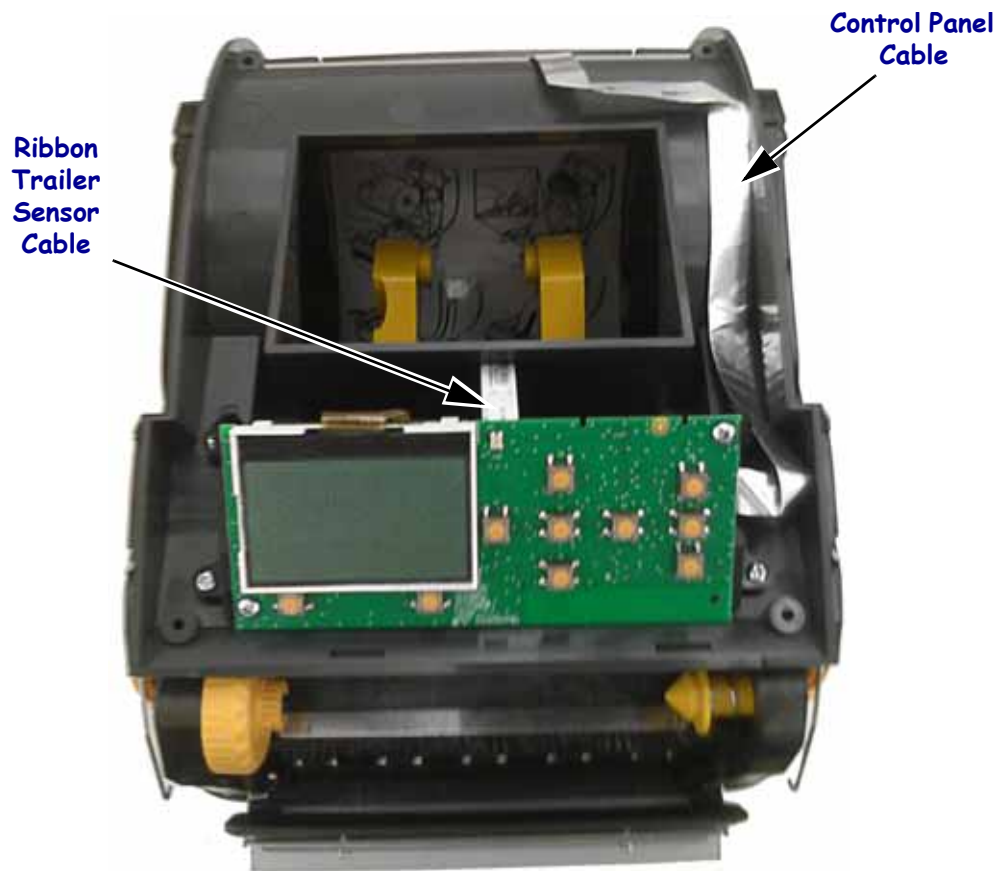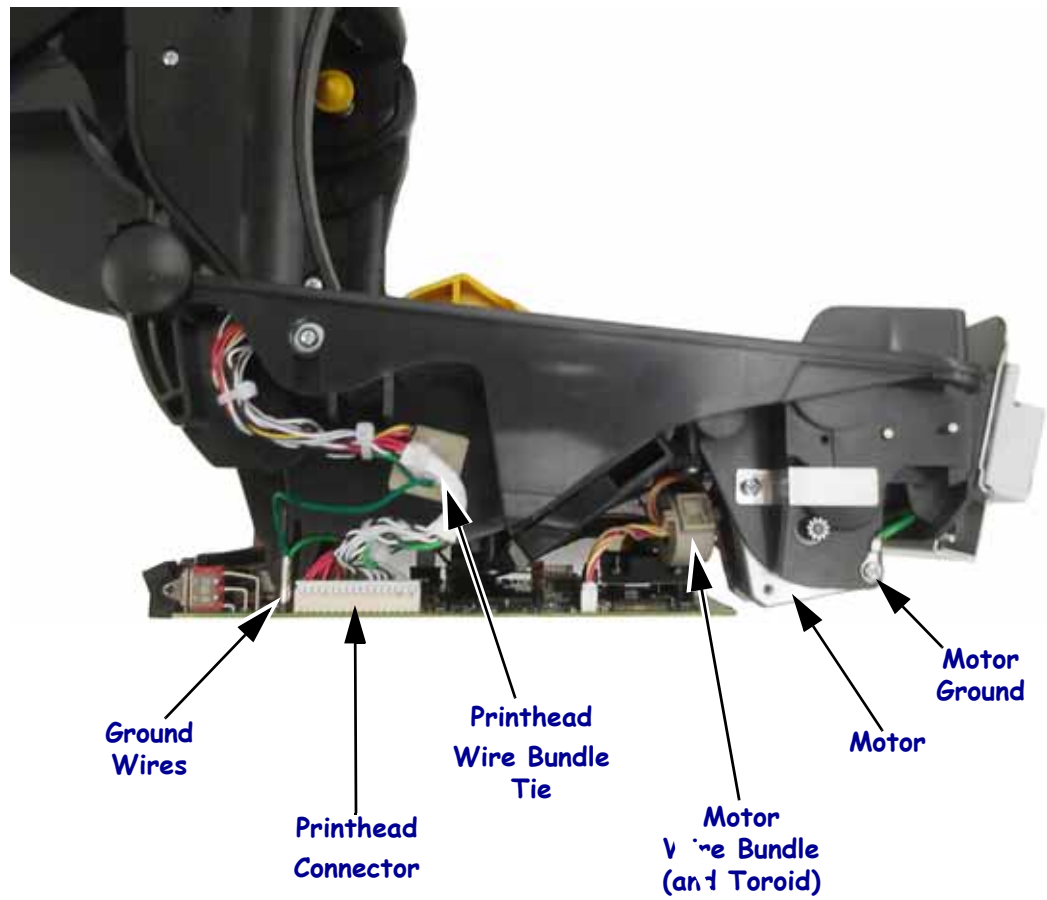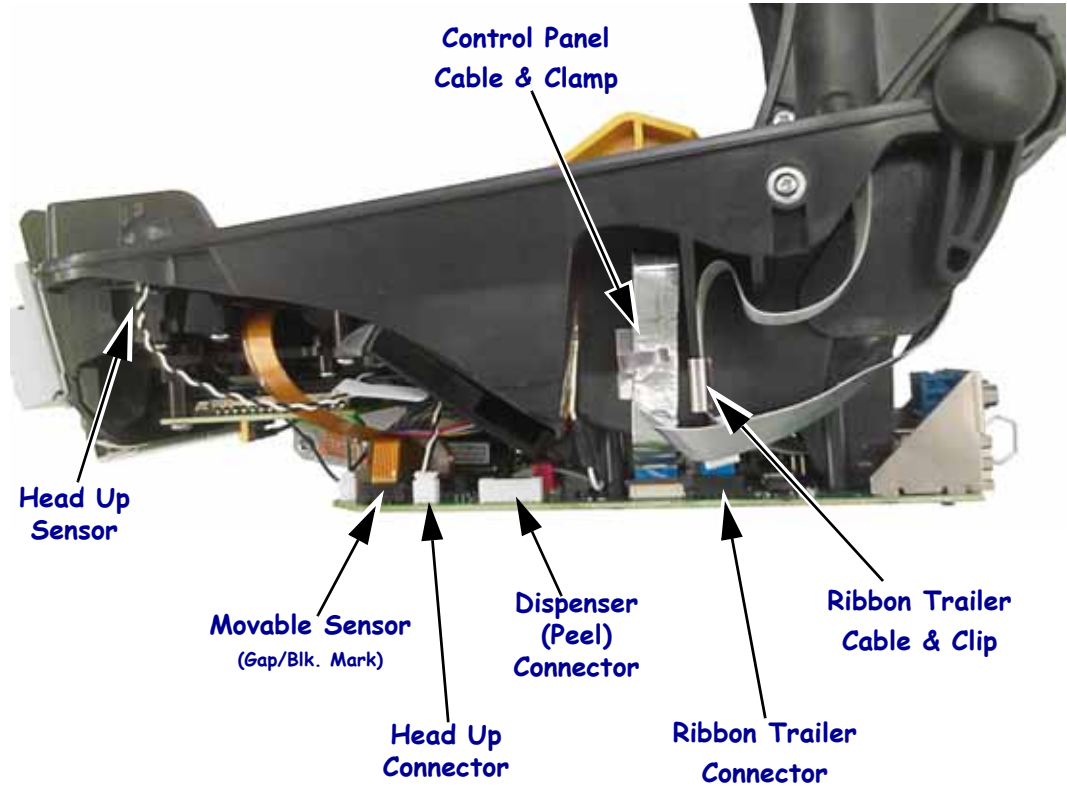
Clean the printhead.

Reload media. Plug in power, turn on the printer and print a status report to ensure proper function.

Notes • _____

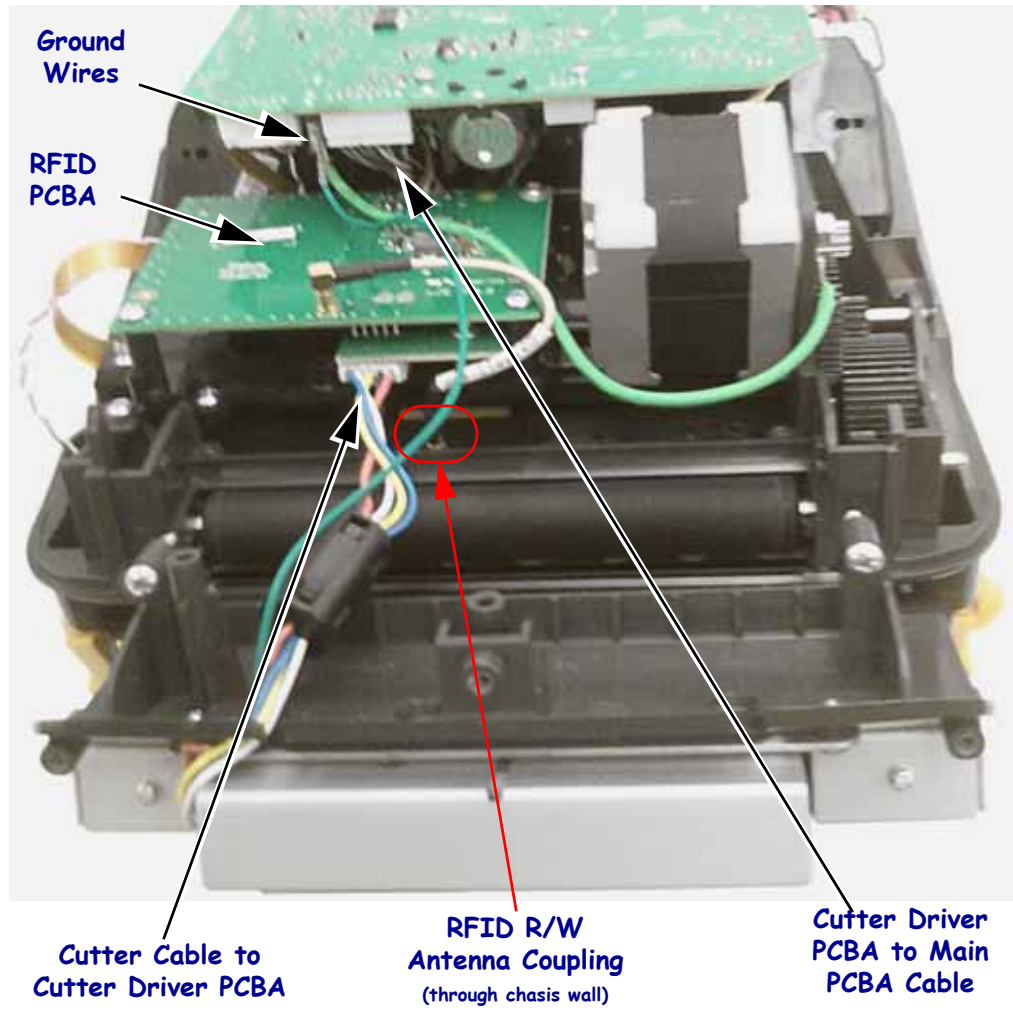_____

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6

Cable Routing

Control Panel Cable

Ribbon Trailer Sensor Cable

Control Panel
Cable & Clamp

Head Up
Sensor

Movable Sensor
(Gap/Blk. Mark)

Dispenser
(Peel)
Connector

Ribbon Trailer
Cable & Clip

Head Up
Connector

Ribbon Trailer
Connector

Ground
Wires

Printhead
Wire Bundle
Tie

Motor
Ground

Motor

Printhead
Connector

Motor
Wire Bundle
(and Toroid)

Ground
Wires

RFID
PCBA

Cutter Cable to
Cutter Driver PCBA

RFID R/W
Antenna Coupling
(through chasis wall)

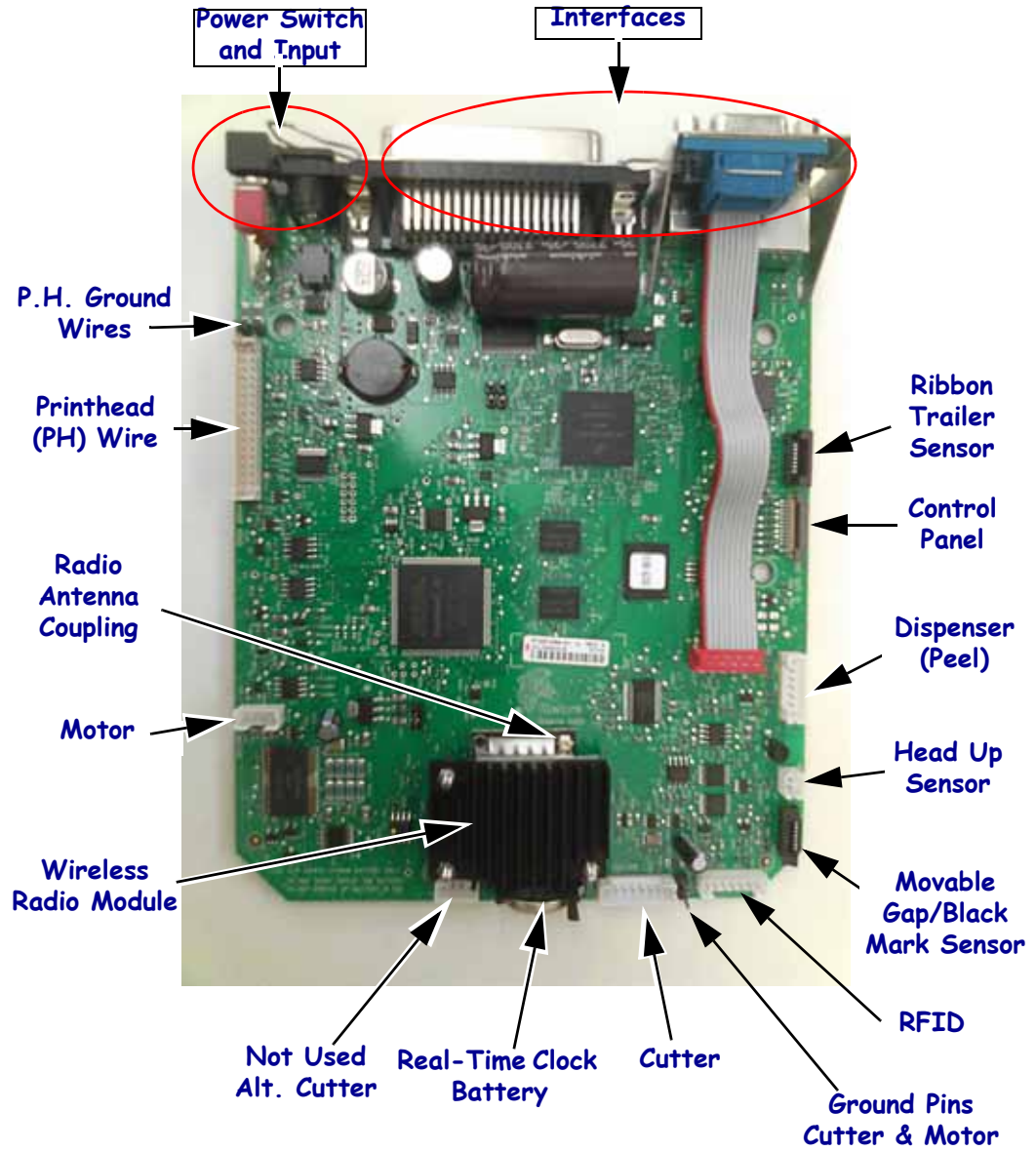Cutter Driver
PCBA to Main
PCBA Cable

Main Printed Circuit Board Assembly

Figure 6 • Connectors on the Main Logic Board PCBA