

Zebra 110*PAX3*<sup>™</sup>-Series  
Safety and Quick  
Reference Guide



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# Contents

ZebraLink Real-time Connectivity and Control Solution . . . . .	75
Warnings . . . . .	76
AC Power Cord Requirements . . . . .	77
Media and Ribbon Loading . . . . .	79
Operator Controls . . . . .	82
Calibration . . . . .	84
Configuration . . . . .	85
Care and Adjustments . . . . .	87

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## Introduction

Congratulations! You have just purchased a high-quality thermal demand print engine manufactured by the industry leader in quality, service, and value. For over 25 years, Zebra Technologies Corporation has provided customers the highest caliber of products and support.

This *Zebra 110PAX3™-Series Safety and Quick Reference Guide* contains basic information on how to install and operate the print engine as well as some simple adjustments that can be performed by the operator. It is not comprehensive.

Additional information covering the Zebra 110PAX3-Series print engine is available from your distributor:

- User's guide
- *ZPL II Programming Guide*
- Maintenance manual

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## Specifications

### Electrical

90–264 VAC; 48–62 Hz

The print engine automatically detects 110 or 220 VAC supply voltage.

### Environmental Range

**Operating:** 41°F (5°C) to 104°F (40°C) in Thermal Transfer Operation Mode

32°F (0°C) to 104°F (40°C) in Direct Thermal Operation Mode

20% to 85% non-condensing relative humidity

**Storage:** –4°F (–20°C) to + 140°F (60°C)

5% to 85% non-condensing relative humidity

### Fuses

F5A, 250V, 5 × 20 mm IEC style as supplied with print engine or purchased from Zebra Technologies Corporation

## ZebraLink Real-time Connectivity and Control Solution



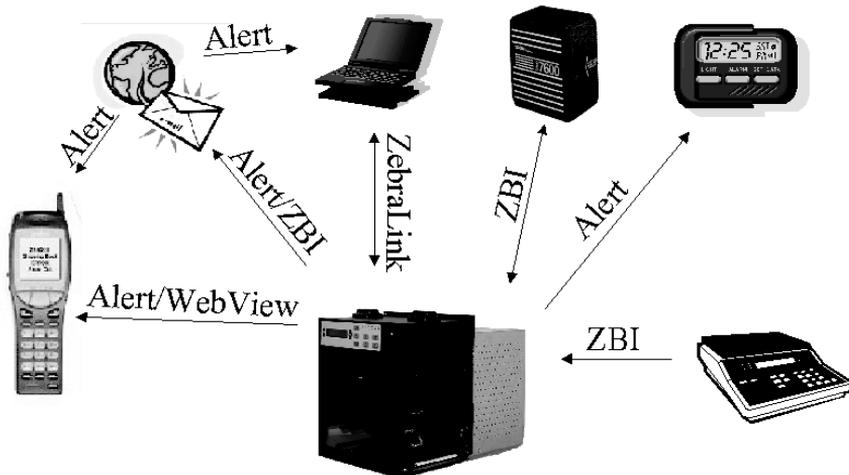
ZebraLink is the advanced print engine management tool that enables real-time, remote error notification and systems control for OEMs, distributors, system integrators, and end-users. Every ZebraLink print engine (just look for the ZebraLink logo), when used with ZebraLink-compatible network options, provides three core features:

- **WebView** — (requires ZebraNet® PrintServer II), the configuration component of ZebraLink, enables networked users to control multiple functions of the printing process using any standard Web browser such as Netscape Navigator or Internet Explorer.
- The **Alert** feature — (requires ZebraNet® PrintServer II) gives PAX3 print engines the voice to “talk back.” With ZebraLink, the print engines provide unsolicited communication to system administrators in real-time.
- With **ZBI**, users familiar with ANSI BASIC programming language can easily program advanced applications within the PAX3’s print engine, enabling it to accept and manipulate information from nearly any data source (PLCs, weigh scales, scanners, etc.).

Print-and-apply systems with PAX3 print engines have the industry’s most advanced monitoring and management tools available for any automated print-and-apply application. No other OEM print engines in the market offer this powerful combination.



## ZebraLink Integration



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# Warnings

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## Installation

**CAUTION:** To ensure that the 110PAX3-Series print engine has proper cooling, do not place any padding or cushioning material under the unit or next to the back of the unit.

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## Use of Shielded Data Cables

**CAUTION:** Zebra print engines comply with international regulations governing radiated emissions when using fully shielded data cables. Data cables must be fully shielded and fitted with metal or metalized connector shells. Shielded data cables and connectors are required to prevent radiation and reception of electrical noise. Use of unshielded data cables may increase radiated emissions above the regulated limits.

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## Setting Printhead Resistance Value

**CAUTION: Do Not Change This Setting.** This setting is for technician use **only** after a printhead replacement. When configuring the print engine, press NEXT to move past this parameter.

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## Ribbons and Printhead Wear

**CAUTION:** For Thermal Transfer Print Method, load ribbon *before* performing MEDIA CALIBRATION. Do not load ribbon if the print engine is to be used in the direct thermal mode. Ribbons used in the 110PAX3-Series printer engines *must* be as wide as or wider than the media. Zebra ribbons provide an extremely smooth backing surface that protects the printhead from abrasion by the media. If the ribbon is narrower than the media, areas of the printhead will be unprotected and subject to premature wear.

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## Shipping

**CAUTION:** Never ship the print engine in any container other than the original packaging. Zebra will not be responsible for any damage that occurs during transit.

To ship the Zebra 110PAX3-Series print engine, remove all ribbon and media. Carefully pack the print engine in the original carton with the packing materials from the factory. A shipping container can be purchased from Zebra Technologies Corporation if the original packaging has been lost or destroyed. Contact your distributor or Zebra Technologies Corporation to order the 110PAX3-Series Packing Materials Kit.

# AC Power Cord Requirements

Since many areas of the world have specific power requirements, an AC Power Cord may not be included with your print engine. Refer to Figure 1. A power cord must be provided by you that meets your local electrical requirements.

**WARNING!!** For personnel and equipment safety, always use a three-prong plug with an earth-ground connection to the AC Power Source.

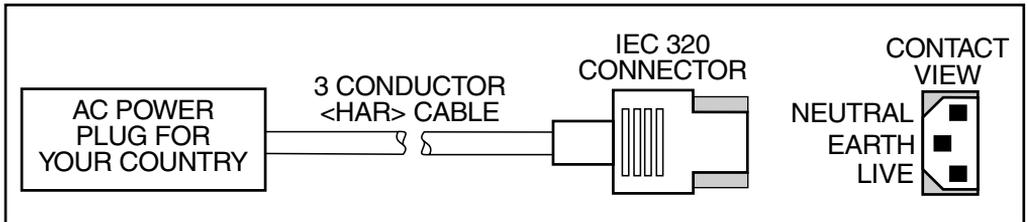


Figure 1

## AC Power Cord Specifications

- The overall length must be less than 9.8 feet (3 m).
- It must be rated for at least 5 Amp, 250 VAC.
- The chassis ground (earth) **must** be connected to ensure safety and reduce electromagnetic interference. This is done by the third wire (earth) in the power cord.
- The AC power plug and IEC320 connector should bear the certification mark of at least one of the known international safety organization shown in Figure 2.

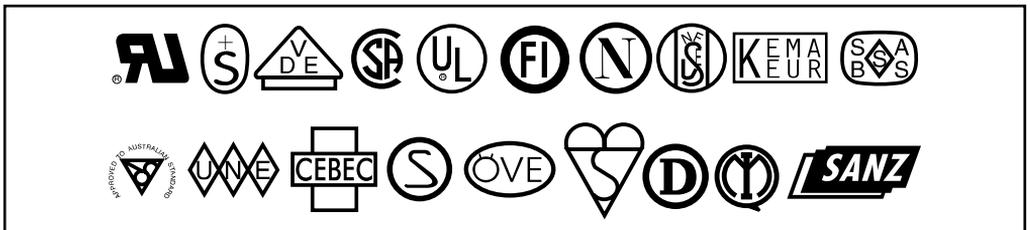


Figure 2

## Fuse Replacement

The print engine uses a metric-style fuse (5 × 20 mm IEC) rated for 5 Amps at 250 Volts.

The power entry module comes with two approved fuses in the fuse holder; one is “in-circuit” and one is provided as a “spare.”

To replace a fuse, refer to Figure 3 and follow this procedure:



**Turn the AC power switch OFF and remove the power cord before performing this procedure.**

1. Turn off the print engine and unplug the power cord from the back of the print engine.
2. Using a small-blade screwdriver, remove the fuse holder from the power entry module at the rear of the print engine.
3. Carefully remove the fuse from the “in circuit” location. To remove the fuse from the “spare” location, insert the point of a pencil through one of the two holes in the fuse holder; gently push. Repeat this procedure through the other hole.

4. Insert this fuse in the “in circuit” location.  
(Remember to replace an approved 250 VAC, 5 Amp fuse in the “spare” location!)
5. Reinstall the fuse holder into the power entry module at the rear of the print engine.
6. Reconnect the power cord and turn the print engine on.

The print engine should now be ready for operation and the POWER light should be on.

**Note:** If power is not restored, an internal component failure may have occurred and the print engine requires servicing.

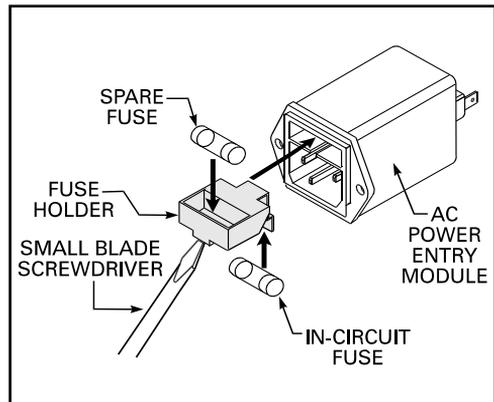


Figure 3

## Media Loading

If your print engine is a right-hand unit (printed labels are presented on the right-hand side of the unit), refer to Figure 4 while performing the following procedure. If your print engine is a left-hand configuration (printed labels are presented on the left-hand side of the unit), refer to Figure 5.

1. Load the media on the media supply reel of the applicator (refer to the applicator's user's manual).
2. Grasp the outer media edge guide (A) and slide it as far out from the print engine frame as possible.
3. Open the printhead assembly (B) by unlatching the printhead latch (C) from the locking pin (D).
4. Press the release button (E) on the segmented pinch roller assembly (F) and allow the assembly to pivot up.
5. Thread the media under the upper guide post (G), between the rubber pinch roller and the associated roller in the segmented pinch roller assembly (F), and under the printhead assembly (B) until approximately 30" (75 cm) of media extends out of the print engine. Remove the labels from the exposed media.
6. Ensure the media is aligned to the stationary inner media edge guide and the indicator on the peel bar.
7. Close the printhead assembly (B) by rotating the printhead latch (C) until it latches onto the locking pin (D).
8. Press down on the pivoting segmented pinch roller assembly (F) until it locks closed.
9. Position the outer media edge guide (A) so it just touches the outer edge of the media.
10. Raise the peel roller latch (H) so the peel roller assembly (I) pivots down to a vertical position.
11. Thread the media liner around the peel bar (J), under the lower media liner roller (K), and through the peel roller assembly (I). (See DETAIL.)

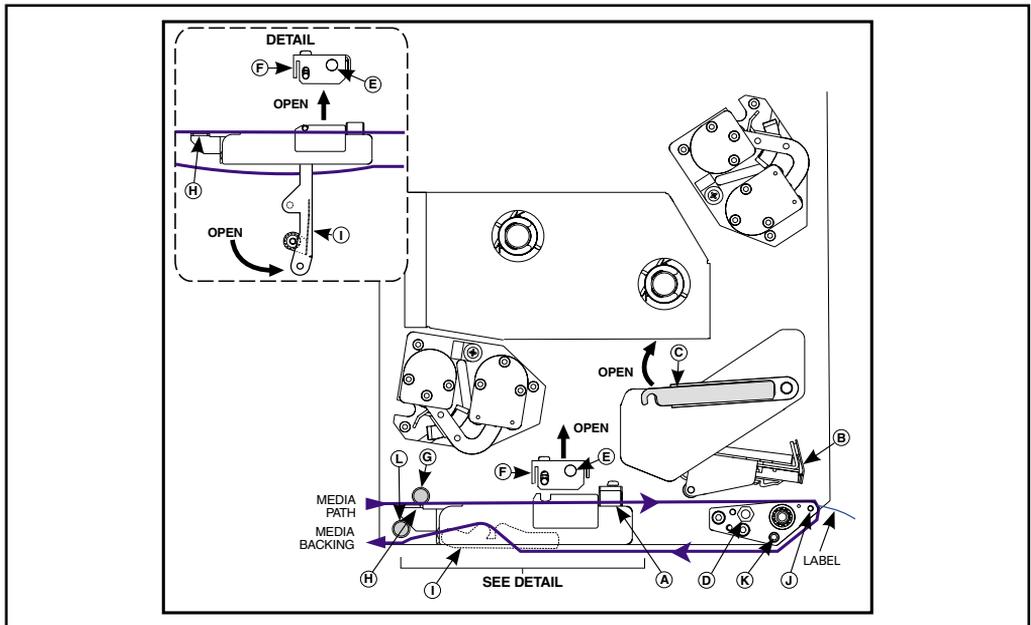
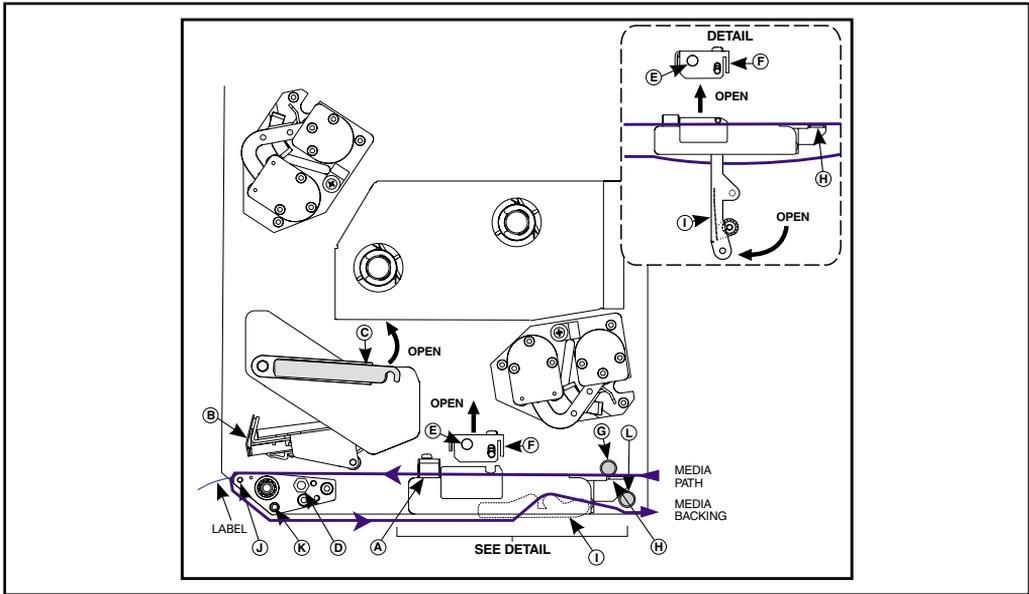


Figure 4





**Figure 5**

**Note:** If the applicator has an air tube, route the media liner between the air tube and the peel bar. Do not thread the media liner over this tube!

12. Rotate the peel roller assembly (I) up until it locks into the closed position.
13. Thread the media liner under the lower guide post (L) and around the take-up spindle of the applicator (refer to the applicator's user's manual).

## Ribbon Loading

To load ribbon, refer to Figure 6 (for right-hand units) or Figure 7 (for left-hand units).

**Note:** *Do not* load ribbon if the print engine is to be used in the direct thermal mode.

**CAUTION:** When installing the ribbon roll on the ribbon supply spindle, ensure that it is fully seated and that the ribbon is aligned squarely with its core. *Do not* use ribbon that is narrower than the media. If the printhead is not protected by the smooth backing of the ribbon, premature printhead failure may result due to excessive abrasion.

1. Install the ribbon roll onto the supply spindle (M) and push it on until it is fully seated, so the ribbon feeds as shown in Figure 6 for right-hand units or Figure 7 for left-hand units.
2. Install an empty ribbon core onto the ribbon take-up spindle (N) and push it on until it is fully seated.
3. Open the printhead assembly (B) by unlatching the printhead latch (C) from the locking pin (D).
4. Using your thumb and the side of your index finger, squeeze the ribbon supply dancer arm opening tab (O) toward the outer U-shaped channel and pivot open the dancer arm. Carefully thread the ribbon between the two U-shaped channels, and then **slowly** release the ribbon supply dancer arm.
5. Thread the ribbon under the printhead assembly (B) and then up toward the ribbon take-up dancer assembly.
6. Using your thumb and the side of your index finger, squeeze the dancer arm opening tab (P) toward the inner U-shaped channel and pivot open the dancer arm. Carefully thread the ribbon between the two U-shaped channels, and then **slowly** release the dancer arm.

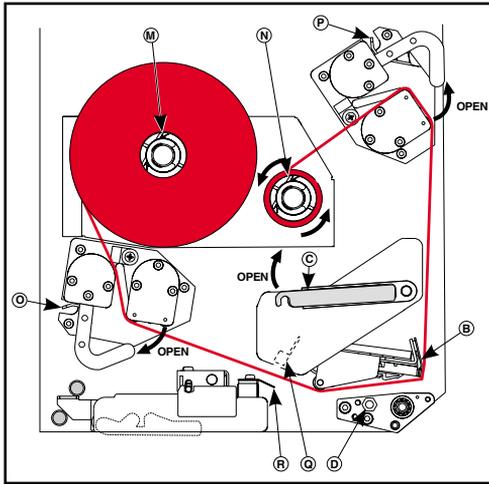


Figure 6

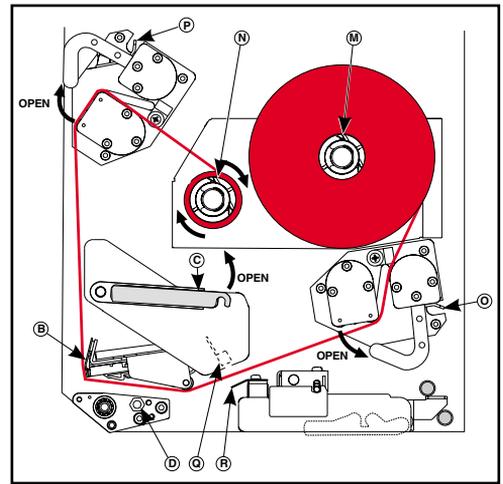


Figure 7

7. Attach the ribbon to the take-up spindle core (use a label if needed) and wind for several turns in the direction shown in the illustration. Make sure the ribbon winds evenly on the spindle to prevent the possibility of the ribbon telescoping.
8. Close the printhead assembly (B) by pivoting the printhead latch (C) onto the locking pin (D).
9. Ensure the ribbon is routed properly in both ribbon dancer assemblies and between the ribbon sensor (Q) and the ribbon sensor reflector (R) positioned below it.

## Removing Used Ribbon

To remove used ribbon, refer to Figure 6 (for right-hand units) or Figure 7 (for left-hand units):

1. Open the printhead assembly (B) by unlatching the printhead latch (C) from the locking pin (D).
2. If the ribbon is not completely exhausted, wind the remaining ribbon onto the take-up spindle (N), or cut the ribbon between the take-up spindle and the ribbon take-up dancer assembly.
3. Remove the ribbon, complete with the core, from the ribbon take-up spindle.
4. Remove the supply ribbon core from the ribbon supply spindle (M).
5. To load the new ribbon, refer to “Ribbon Loading”.

## Power On Self Test

To initiate the Power On Self Test, turn the print engine ON using the power switch on the control panel. The POWER LED illuminates. The other control panel LEDs and the LCD monitor the progress and indicate the results of the individual tests. All displayed prompts occur in English; however, when a test fails, the prompt cycles through the international languages as well. Once the Power On Self Test is complete, the media is advanced to the proper resting position.



# Operator Controls

## Power On/Off Switch

The Power On/Off Switch is located on the top of the print engine housing, as shown in Figure 8. When this switch is placed in the ON ( | ) position, the POWER light goes ON and the print engine performs a Power On Self Test.

## Front Panel Indicator Lights (LEDs)

LEDs on the front panel are a quick indication of the print engine's status. An explanation of the lights is provided in Table 1.

## Front Panel Keys

 PAUSE	Press to enter/exit Pause Mode.
 FEED	Feeds one blank label each time you press the key.
 CANCEL	(Active only in Pause Mode.) Press once to cancel printing of current label batch. To clear the entire buffer, press and hold until the Data light turns off.
 CALIBRATE	(Active only in Pause Mode.) Press once to recalibrate media and ribbon sensors for proper media length, media type (continuous/non-continuous), and print mode (direct thermal/thermal transfer).

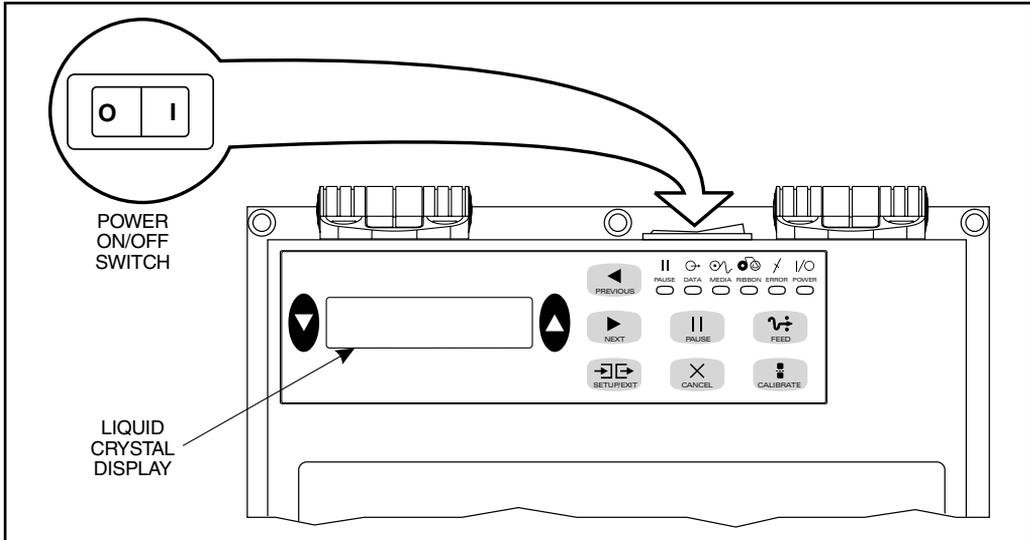


Figure 8

**Table 1**

<b>LED</b>	<b>Off</b>	<b>On</b>	<b>Flashing</b>
POWER (Green)	Print engine OFF or no power to print engine.	Power switch is ON and power is being supplied to print engine.	—
PAUSE (Yellow)	Normal operation.	Print engine is paused (Printhead, ribbon or paper error detected. <i>or</i> PAUSE key was pressed. <i>or</i> A Pause was requested from the Applicator Port. <i>or</i> A pause was received as part of the label format).	—
DATA (Green)	No data being received or processed.	Data processing or printing taking place. No data is being received.	Print engine is receiving data from or sending status information to the host computer. Flashing slows when the print engine cannot accept more data, but returns to normal once data is again being received.
MEDIA (Yellow)	Normal operation. Media properly loaded.	Out of media. (Print engine is paused, LCD displays error message, and PAUSE light is ON.)	—
RIBBON (Yellow)	Normal operation. Ribbon properly loaded.	Ribbon in (print engine is in direct thermal mode) or no ribbon loaded (print engine is in thermal transfer mode). Print engine is paused, LCD displays error message, and PAUSE light is ON.	—
ERROR (Orange)	No print engine errors.	—	Print engine error exists. Check LCD display for status.



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# Calibration

After you have correctly installed the media and ribbon, turn on the print engine. After the print engine performs the Power On Self Test, the display shows “PRINTER READY”.

Perform the Calibration procedure below.

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**IMPORTANT:** Perform the Calibration procedure when media and ribbon are first installed and whenever a different type of media or ribbon is installed.

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During this procedure, the print engine automatically determines continuous/non-continuous media, label length, media and ribbon sensor settings, and printing mode (thermal transfer/direct thermal).

1. Press  .

2. Press  .

The print engine feeds several labels.

3. Press  .

# Configuration

After you have completed the Calibration, you may set print engine parameters for your application.

The Configuration Procedure in Table 2 contains the information you need to get your print engine up and running, but it is not comprehensive. Refer to the user's guide for more information.

Enter the Configuration Mode by pressing



at the PRINTER READY display. Follow the procedure in Table 2. To exit the Configuration Mode at any time, press



the table).

- An asterisk (\*) in the upper left-hand corner of the display indicates that you have changed this setting from what is currently stored in memory.
- To change a parameter, use the up and down black oval keys:



Increases value, answers “yes”, or indicates “on”.



Decreases value, answers “no”, or indicates “off”.

Table 2

Press:	Display Shows:	Action/Explanation:
—	PRINTER READY	Normal print engine operation.
To change the front panel display language (skip if the display is already in your preferred language):		
	LANGUAGE	Press the oval keys to change the language of the front panel display text.
	DARKNESS	Press the oval keys to change the darkness of printing. <b>CAUTION:</b> Set the Darkness to the lowest setting that provides good print quality. Darkness set too high may cause ink smearing and/or it may burn through the ribbon.
	TEAR OFF	Press the oval keys to change the position of the media over the tear bar after printing. Adjust this setting if labels are being torn in the wrong place.
	PRINT MODE	Print Mode tells the print engine the method of media delivery that you wish to use. Press the oval keys to select Tear-Off, Rewind, or Applicator Mode.
	MEDIA TYPE	Press the oval keys to select continuous or non-continuous media type. Non-continuous: The print engine automatically determines the label length by sensing the notch, gap, web, or black mark between labels. Continuous: You must include a label length instruction in your label format (^LLxxxx if you are using ZPL or ZPL II).



**Table 2 (Continued)**

	<p>SENSOR TYPE</p>	<p>Press the oval keys to select web or mark sensing mode. If your media does not have black marks on the back, leave your print engine at the default (web) setting.</p>
	<p>PRINT METHOD</p>	<p>Press the oval keys to select the method of printing you want to use: direct thermal (no ribbon) or thermal transfer (using thermal transfer media and ribbon).</p>
	<p>PRINT WIDTH</p>	<p>Press the oval keys to set the print engine to a width that is close to your media, but AT LEAST as wide.</p>
	<p>MAXIMUM LENGTH</p>	<p>Press the oval keys to set the maximum print length. Select the value closest to, but not less, than the length of label you are using.</p>
	<p>LIST FONTS</p>	<p>Press the right oval key to print a list of available fonts.</p>
	<p>LIST BAR CODES</p>	<p>Press the right oval key to print a list of available bar codes.</p>
	<p>LIST IMAGES</p>	<p>Press the right oval key to print a list of available images.</p>
	<p>LIST FORMATS</p>	<p>Press the right oval key to print a list of all formats currently stored in the print engine's memory or on an optional memory card.</p>
	<p>LIST SETUP</p>	<p>Press the right oval key to print a list of the current print engine configuration settings.</p>
	<p>LIST ALL</p>	<p>Press the right oval key to print a list of fonts, bar code, images, formats, and the current print engine configuration settings.</p>
	<p>SAVE SETTINGS</p>	<p>Press the oval keys to select:</p> <ul style="list-style-type: none"> <li>PERMANENT—saves the changes when the power is turned off.</li> <li>TEMPORARY—saves the changes until changed again or until power is turned off.</li> <li>CANCEL—cancels all changes since entering the Configuration Mode.</li> <li>LOAD DEFAULTS—loads factory default values for all parameters. <b>Note:</b> Refer to the user's guide! This requires Calibration and resetting of the Head Resistance!</li> <li>LOAD LAST SAVE—loads values from the last permanent save.</li> </ul> <p>Press  to accept a selection.</p>
<p>—</p>	<p>PRINTER READY</p>	<p>You have exited the Configuration Mode, and you are now ready for normal print engine operation.</p>

# Care and Adjustments

## Printhead Pressure Adjustment

If the darkness setting (burn duration) is set properly, but printing is too light or if the image shows signs of bleeding or swelling, printhead pressure may need to be adjusted. Refer to Figure 9 (right-hand unit shown) and set the position of the adjusting nut (V) so that when the locking nut (U) is tightened, it is approximately 0.4" (10 mm) from the yoke (W). Use the lowest pressure possible that provides the desired print quality.

1. Set the darkness value (burn duration) appropriately for your media and ribbon.
2. Print a PAUSE Key Self Test.
3. Loosen the locking nut (U) on the threaded shaft of the toggle assembly by rotating it counterclockwise.
4. Rotate the adjusting nut (V) clockwise to increase or counterclockwise to decrease the spring pressure.
5. Print test labels and inspect for quality.
6. When print quality is acceptable, hold the adjusting nut (V) in position, and tighten the locking nut (U) against it.

**Note:** Printhead and drive system (belts and bearings) life can be maximized by using the lowest pressure that produces the desired print quality.

## Toggle Positioning

Proper Toggle positioning is important for proper print quality. The toggle should be positioned approximately midway across the width of the media.

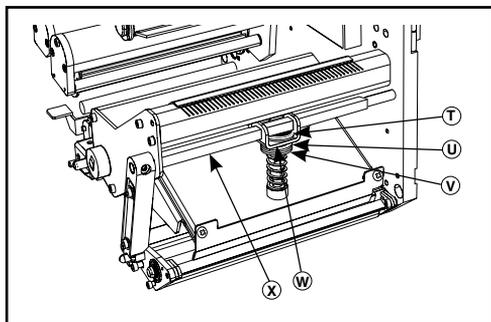


Figure 9

To position the toggle, loosen the position locking nut (T) by rotating it clockwise. Slide the toggle to the desired position, and tighten the locking nut by rotating it counterclockwise until it is just finger tight to the toggle pivot shaft (X).

## Transmissive Media Sensor

The transmissive media sensor finds "Start of Label" indicators such as a notch or hole in the media or an interlabel gap between labels. This sensor consists of a light source (positioned below the media) and a light sensor (positioned above the media). To position this sensor, refer to Figure 10 (right-hand unit shown). If the media has a notch or hole, slide the sensor position indicator (Q) along the pivoting segmented pinch roller assembly (F) so the point of the indicator aligns with the notch or hole in the media. If your media uses an interlabel gap, position the media sensor approximately at the center of the media width.

## Cleaning

**CAUTION:** Use only the cleaning agents indicated. Zebra Technologies Corporation will not be responsible for damage caused by any other cleaning materials used on the 110PAX3-Series print engine.

Table 3 provides a recommended cleaning schedule. Cleaning swabs saturated with 70% Isopropyl Alcohol are available from your Zebra distributor as a Preventive Maintenance Kit (part # 47362).

### Cleaning the Exterior

The exterior surfaces of the print engine may be cleaned with a lint-free cloth. *Do not use harsh or abrasive cleaning agents or solvents!* If necessary, a mild detergent solution or desktop cleaner may be used sparingly.

### Cleaning the Interior

Remove any accumulated dirt and lint from the interior of the print engine using a soft bristle brush and/or vacuum cleaner. This area should be inspected every time a new ribbon is loaded.



**Table 3**

Area	Method	Interval
<b>See Figures 11 and 12 for parts locations.</b>		
Printhead (1)	Alcohol	After every roll of ribbon when printing in the thermal transfer mode.
Platen Roller (2)	Alcohol	
Media Path	Alcohol	
Transmissive Media Sensor (3)	Air blow	
Reflective Media Sensor (4)	Air blow	After every roll of media when printing in the direct thermal mode.
Ribbon Sensor (Q, Figures 6 and 7)	Air blow	
Ribbon Sensor Reflector (R, Figures 6 and 7)	Alcohol	
Door-Open Sensor (5)	Air blow	After every roll of media or more often if needed.
Peel Bar (6)	Alcohol	

### **Cleaning the Sensors**

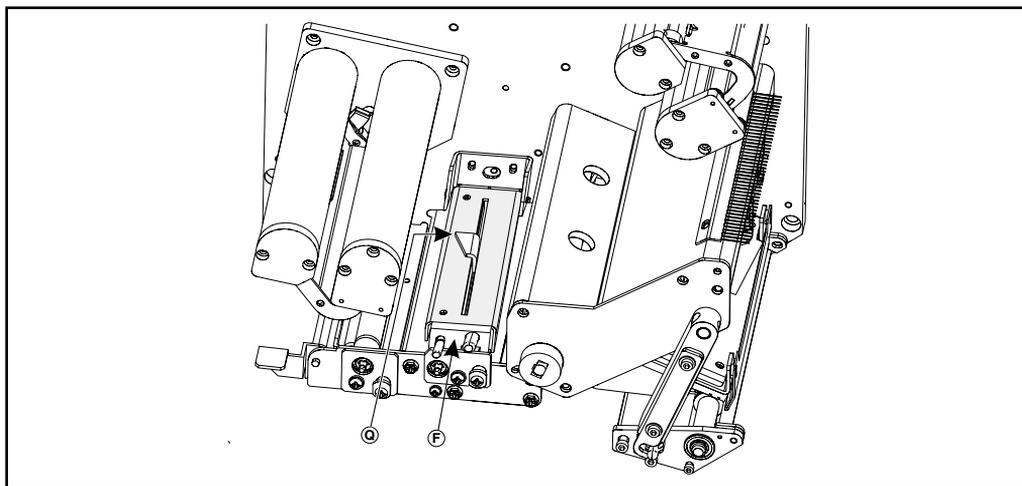
To ensure proper operation of the print engine, all sensors should be cleaned on a regular basis. To locate the position of the media and door-open sensors, refer to Figure 11. Refer to Figures 6 and 7 for the ribbon sensor and ribbon sensor reflector.

### **Cleaning the Printhead and Platen Roller**

Inconsistent print quality (such as voids in the bar code or graphics) or light print may indicate a dirty printhead. Media movement problems may indicate a dirty platen.

For optimum print quality, perform the following cleaning procedure before loading a new ribbon.

**Note:** If print quality has degraded and you have not changed to a different type of media or ribbon, cleaning the printhead may solve the problem. It should not be necessary to change the burn temperature or the toggle pressure.



**Figure 10**

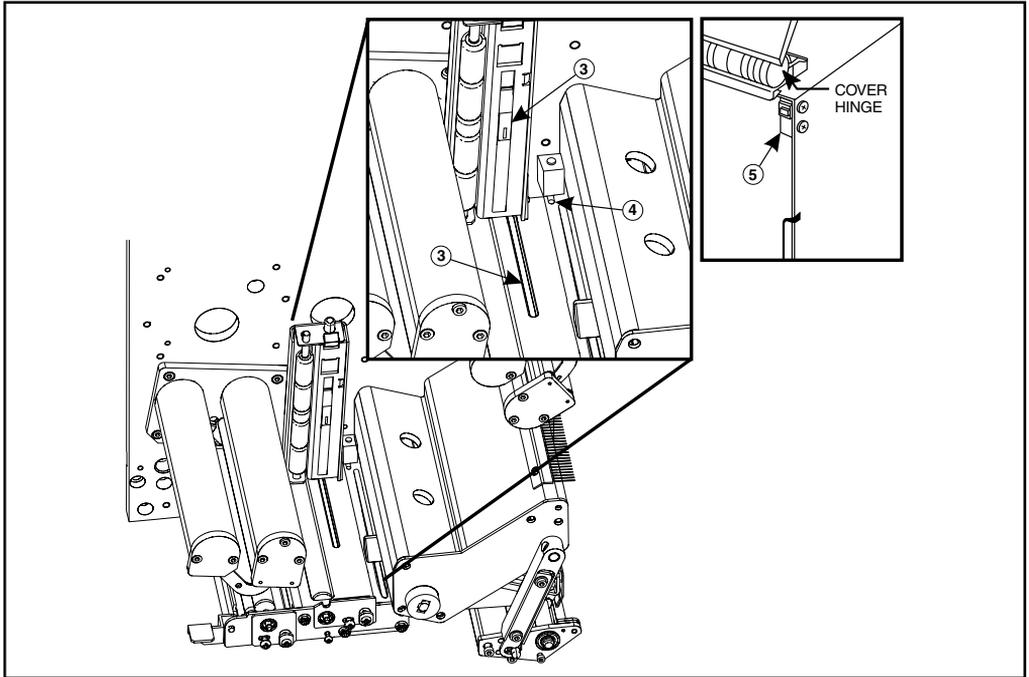


Figure 11

To clean the printhead and platen roller, refer to Figure 12 (right-hand unit shown) and perform the following steps:

1. Open the printhead assembly (B) by lifting the printhead latch (C) upward away from the locking pin (D). Remove the media and ribbon.
2. Brush, vacuum, or air blow any accumulated lint and paper dust away from the rollers. *It is good practice to clean the various media, ribbon, and door-open sensors at this time. See Figures 6, 7, and 11.*
3. Use a cleaning swab saturated with alcohol to wipe the print elements from end to end. *The print elements form the grayish/black strip (1) just behind the chrome strip on the underside of the printhead. Allow a few seconds for the solvent to evaporate.*

4. Use a lint-free cloth moistened with alcohol to clean the platen roller (2) and other rollers. Rotate the rollers while cleaning.
5. Reload the ribbon and/or media, latch the printhead, and continue printing. (Turn the print engine ON if previously turned OFF.)

**Note:** If print quality has not improved, try cleaning the printhead with *Save-A-Printhead* cleaning film. This specially coated material removes contamination buildup without damaging the printhead. Call your authorized Zebra distributor to order the *Save-A-Printhead* cleaning kit for the 110PAX3 print engine (part # 44902).



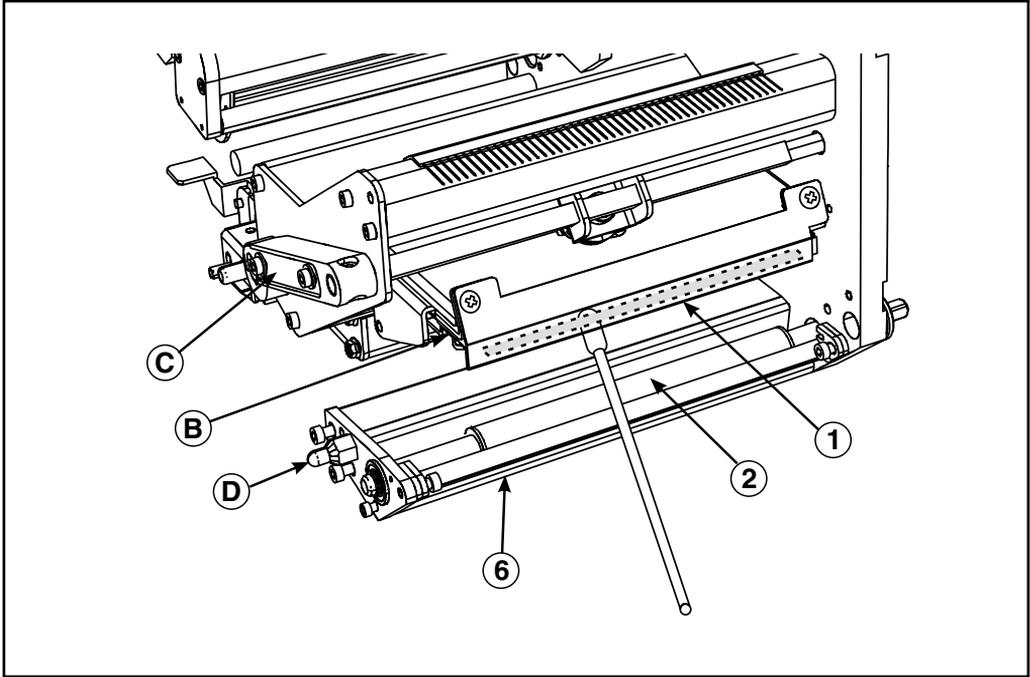


Figure 12