

2

Adjustments and Maintenance

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2.0 Introduction

This section details the correct calibrations, hardware adjustments, and maintenance for the printer.

2.1 Media Sensor Calibration

In addition to selecting the Media Sensor type and positioning the Media Sensor, calibration is required to ensure that each label is detected correctly and reliably. Three calibration methods, described below, are available.

2.1.1 Quick Calibration

Quick Calibration should be performed during initial printer set-up or after changing the media to fine-tune the TOF and label values.

Notes: (1) *Quick Calibration is not required for continuous media; however, if UNCALIBRATED is displayed, use Standard Calibration (see Section 2.1.2) to calibrate the printer.*

(2) *Media containing large gaps may require a change in the PAPER OUT DISTANCE setting before Quick Calibration is performed; see MEDIA SETTINGS in the Operator's Manual for details.*

Use the steps below to calibrate the printer:

1. Ensure that the printer is ON and in an idle state (i.e., not off-line) with media loaded, the media sensor adjusted, and the sensor type selected. (See the *Operator's Manual* for details).
2. Press and hold the FEED Key until one label TOF has been output then release the key and wait for the printer to process the data. There are two possible outcomes:
 - ♦ If CALIBRATION COMPLETE is displayed, then calibration was successful. (A 'WARNING LOW BACKING' message may appear if using notched stock or media with a transparent liner; however, the calibration was successful). The printer will advance the media to the next top of form ready to begin printing; or,
 - ♦ If CANNOT CALIBRATE is displayed, then calibration was unsuccessful. In this case, press and hold the FEED Key until two successive label TOFs have been output. If, however, CANNOT CALIBRATE is displayed again, perform the Standard Calibration routine; see Section 2.1.2.

2.1.2 Standard Calibration

Standard Calibration should be performed when 'CANNOT CALIBRATE' or 'UNCALIBRATED' is displayed. During this process, the printhead assembly can be raised for visual access. In addition, active sensor readings can be used to further determine the best position for small, position-critical TOF notches or marks. Three readings are required:

- ♦ Empty: A measurement taken with no media over the sensor.
- ♦ TOF Indicator: A measurement taken with only the media backing, notch, or reflective mark placed over the sensor.
- ♦ Paper: A measurement taken with the label (and the liner) placed over the sensor.

Ensure that the ADVANCED MENU (in the SYSTEM SETTINGS menu) has been enabled, and that the Media SENSOR TYPE (in the MEDIA SETTINGS menu) has been selected. Then, use the steps below and the displayed prompts to guide you through the procedure:

Step	Action	Displayed Message	Comment(s)
1	Press the MENU Button.	CANNOT CALIBRATE -or- UNCALIBRATED	See the <i>Operator's Manual</i> for menu navigation tips.
2	Press the ENTER Key to access MEDIA SETTINGS, and then use the UP Button to scroll to SENSOR CALIBRATION.	MEDIA SETTINGS	This is the MEDIA SETTINGS menu branch.
3	Press the ENTER Key to access SENSOR CALIBRATION. Press the ENTER Key again to access PERFORM CALIBRATION, and then press the YES Key to proceed.	PERFORM CALIBRATION	You are beginning the calibration procedure. Press the NO Key to abort this procedure.

Step	Action	Displayed Message	Comment(s)
4	Ensure that no label stock is installed in the printer then press the ESC Key.	REMOVE LABEL STOCK PRESS ESC KEY <input type="text" value="yyy"/>	This sets the empty value - where 'yyy' is a numerical value representing the sensor reading when no media is installed.
5	<p>Proceed according to the kind of media being calibrated:</p> <p>Die-Cut Media -- Remove at least six inches (15cm) of the beginning label material from the liner, and then install the media. Adjust the Media Sensor (per the table below) then press the ESC Key.</p> <p>Notched or Reflective Media -- Install media. Adjust the Media Sensor (per the table below), and then press the ESC Key.</p> <p>Continuous Media -- Install media. Position the Media Sensor (per the table below).</p>	<p><i>For die-cut media:</i></p> <p>SCAN BACKING PRESS ESC KEY <input type="text" value="yyy"/></p> <p><i>- or, for reflective media:</i></p> <p>SCAN MARK PRESS ESC KEY <input type="text" value="yyy"/></p>	<p>This sets the gap (or mark) value - where 'yyy' is a numerical value representing the sensor reading for the TOF indicator.</p> <p><u>Do not</u> position a media perforation over the sensor when taking any sensor reading.</p> <p>If using media with small notches or reflective marks, ensure that the labels exit straight from the printer.</p> <p><u>Do not</u> move the position of the Media Sensor following this step.</p>

Media	Sensor Type	Sensor 'Red Dot' Position
Die-cut	Gap	Centered under the label
Notched	Gap	Centered under the notch
Reflective	Reflective	Centered under the black mark
Continuous	Continuous	Centered under the label



Step	Action	Displayed Message	Comment(s)
6	Position the label material (and liner, if any) over the sensor then press the ESC Key.	SCAN PAPER PRESS ANY KEY <div style="border: 1px solid black; padding: 2px; display: inline-block;">yyy</div>	<p>This sets the paper value - where 'yyy' is a numerical value representing the sensor reading for the media.</p> <p>If using preprinted media, ensure that the label area placed over the sensor is free of preprinted text, graphics, or borders.</p>
7	Observe the display for the outcome of the calibration then press the ESC Key.	<p><i>For die-cut media:</i></p> GAP MODE CALIBRATION COMPLETE <p><i>- or, for reflective media:</i></p> REFLECTIVE MODE CALIBRATION COMPLETE <p><i>- or, for continuous media:</i></p> CONTINUOUS MODE CALIBRATION COMPLETE	<p>Calibration was successful.</p> <p>If 'Warning Low Backing' is displayed (a typical message when calibrating notched media or die-cut labels on a transparent liner), calibration was still successful. For other possible messages, see Fault Messages in the <i>Operator's Manual</i>.</p>

Step	Action	Displayed Message	Comment(s)
8	Press the ESC Key to exit the calibration routine, and then press the EXIT Key to exit the Menu System. Finally, to complete the calibration for die-cut, notched, and reflective media, press and hold the FEED Key until at least one label has been output.	CALIBRATION COMPLETE <i>followed by...</i> READY	The printer is now ready for use.

2.1.3 Advanced Entry Calibration

ADVANCED ENTRY should only be used when the Standard Calibration method has failed (see Section 2.1.2). To facilitate the placement of the media sensor, the printhead assembly can be raised. During this procedure, sampled readings will be used to manually establish the best gain algorithm for sensing the media. The steps below will guide you through the procedure:

Step	Action	Displayed Message	Comment(s)
1	Press the MENU Button.	CANNOT CALIBRATE <i>-or-</i> UNCALIBRATED	See the <i>Operator's Manual</i> for menu navigation tips.
2	Press the ENTER Key to access MEDIA SETTINGS, and then use the UP Button to scroll to SENSOR CALIBRATION.	MEDIA SETTINGS	

Step	Action	Displayed Message	Comment(s)
3	Press the ENTER Key to access SENSOR CALIBRATION. Use the UP Button to scroll to ADVANCED CALIBRATION and press the ENTER Key.	ADVANCED CALIBRATION	You are beginning ADVANCED ENTRY calibration. Press the ESC Key to abort this procedure.
4	Scroll to TRAN SENSOR GAIN (or REFL SENSOR GAIN, if using reflective media) then press the ENTER Key.	TRAN SENSOR GAIN (0 - 31)  25	The examples that follow detail the calibration of die-cut media; however, unless otherwise noted, the procedure for calibrating reflective media is the same.
5	Install media. Position the Media Sensor under the label, then lower and latch the Printhead Assembly.	TRAN SENSOR GAIN (0 - 31)  25	If using preprinted media, ensure the label area over the sensor is free of text, graphics, lines, etc.

Step	Action	Displayed Message	Comment(s)
6	<p>Create a table with 32 rows (one for each of the Gain Numbers that will be tested) and four columns with headings similar to the one shown below.</p> <p>Use the UP, DOWN, LEFT, and RIGHT Buttons to set the Gain Number to 00 and then press the ENTER Key.</p> <p>Record the reading as a Label Value for Gain Number 00 in your table.</p> <p>Increment the Gain Number by one, press the ENTER Key, note the Label Value. Repeat this process to document the Label Values for the thirty remaining Gain Numbers.</p>	<p>TRAN SENSOR GAIN</p> <p>(0 - 31)</p> <p>YYY</p> <p>00</p>	<p>The YYY value represents the current sensor reading. (The numbers given in this procedure are meant only as samples -- actual measurements will vary.)</p> <p>Do not position the Media Sensor under a perforation.</p> <p>The LEFT and RIGHT Buttons shift the cursor position.</p>

Gain Number	Label Value	TOF Value	Difference Value
00	252		
01	250		
02	248		
...	...		
31	131		

Step	Action	Displayed Message	Comment(s)
7	<p>Raise the printhead assembly and proceed according to your media type:</p> <ul style="list-style-type: none"> Die-cut stock -- Remove a label or two from the liner material, and then position liner over the Media Sensor. Notched stock -- Position the notch over the Media Sensor. Reflective stock -- Position the black mark over the Media Sensor. <p>Lower and latch the Printhead Assembly.</p>	<p>TRAN SENSOR GAIN</p> <p>(0 - 31)</p> <p>YYY</p> <p>31</p>	<p>Do not position the Media Sensor under a perforation.</p> <p>Also, do not move the position of the Media Sensor after it has been adjusted.</p>
8	<p>Use the UP, DOWN, LEFT, and RIGHT Buttons to set the Gain Number to 00 and then press the ENTER Key.</p> <p>Record the reading as a TOF Value for Gain Number 00 in the table, as shown below.</p> <p>Increment the Gain Number and press the ENTER Key, note the TOF Value. Repeat this process to document the TOF Values for the thirty remaining Gain Numbers.</p>	<p>TRAN SENSOR GAIN</p> <p>(0 - 31)</p> <p>YYY</p> <p>00</p>	

Gain Number	Label Value	TOF Value	Difference Value
00	252	248	
01	250	245	
02	248	234	
...	
31	131	14	

Step	Action	Displayed Message	Comment(s)
9	In the table, where both the Label Value and TOF Value are above 20, subtract them and record the result as a Difference Value (see below). Then find the largest Difference Value in your table – its corresponding Gain Number will be used for sampling the media.	TRAN SENSOR GAIN (0 - 31) YYY 08	In this example, Gain Number 08 is chosen because, where both the Label Value (178) and TOF Value (32) are above twenty, it delivers the highest Difference Value (146).

Gain Number	Label Value	TOF Value	Difference Value
00	252	248	4
01	250	245	5
...
06	200	88	112
07	189	58	131
08	178	32	146
09	167	19	N/A
...
31	131	14	N/A

Step	Action	Displayed Message	Comment(s)
10	Use the UP and DOWN Buttons to enter the Gain Number determined in the previous step, and then press the ENTER Key.	TRAN SENSOR GAIN (0 - 31) YYY 08	This example uses Gain Number 08.

Step	Action	Displayed Message	Comment(s)
11	<p>Complete a table (see below) using new measurements, as follows:</p> <p>(A) Raise the Printhead Assembly. Place the label over the Media Sensor, then lower and latch the Printhead Assembly. Record the sensor reading as P.</p> <p>(B) Raise the Printhead Assembly. Place the liner, notch, or mark over the Media Sensor, then lower and latch the Printhead Assembly. Record the sensor reading as G (or M).</p> <p>(C) Raise the Printhead Assembly. Remove all media from the Media Sensor, then lower and latch the Printhead Assembly. Record the sensor reading as E.</p>	<p>TRAN SENSOR GAIN</p> <p>(0 - 31)</p> <p>YYY</p> <p>08</p>	<p>Where YYY is a numerical value representing the current sensor reading.</p> <p>The re-sampled values may differ from those previously recorded. This is normal; do not readjust the Media Sensor.</p>

Gain Number	P (paper)	G or M (gap or mark)	E (empty)
08	185	35	11

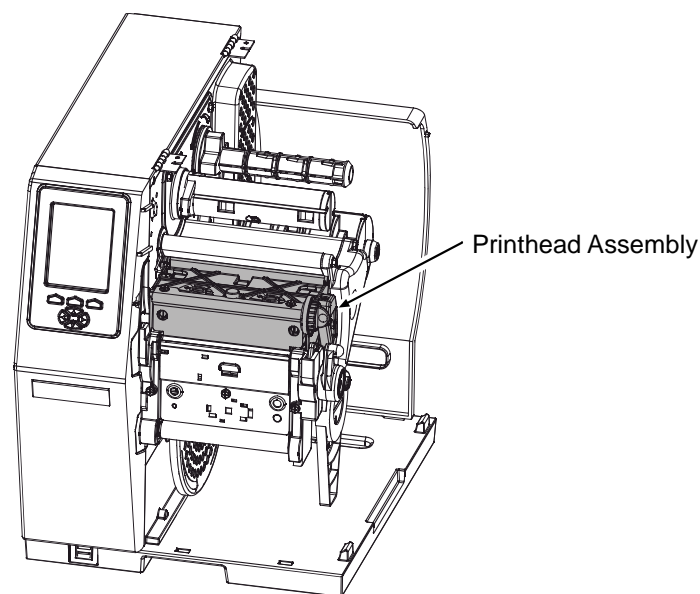
Step	Action	Displayed Message	Comment(s)
12	<p>Press the ESC Key.</p> <p>Use the UP Button to scroll to PAPER SENSOR LEVEL (or, if using reflective media, REFL PAPER LEVEL) and then press the ENTER Key.</p> <p>Use the UP, DOWN, LEFT, and RIGHT Buttons to set the Paper value determined in Step 11 and then press the ENTER Key.</p>	<p>PAPER SENSOR LEVEL</p> <p>(0 - 255)</p> <p>18⁵</p>	
13	<p>Press the ESC Key.</p> <p>Use the DOWN Button to scroll to GAP SENSOR LEVEL (or, if using reflective media, MARK SENSOR LEVEL) and then press the ENTER Key.</p> <p>Use the UP, DOWN, LEFT, and RIGHT Buttons to set the Gap (or Mark) value determined in Step 11 and then press the ENTER Key.</p>	<p>GAP SENSOR LEVEL</p> <p>(0 - 255)</p> <p>03⁵</p>	
14	<p>Press the ESC Key.</p> <p>Use the DOWN Button to scroll to EMPTY SENSOR LEVEL and then press the ENTER Key.</p> <p>Use the UP, DOWN, LEFT, and RIGHT Buttons to set the Empty value determined in Step 11 and then press the ENTER Key.</p>	<p>EMPTY SENSOR LEVEL</p> <p>(0 - 255)</p> <p>01¹</p>	

Step	Action	Displayed Message	Comment(s)
15	Press the EXIT Key and, when prompted, press the YES Key at the SAVE CHANGES prompt.	OFFLINE	This completes the Advanced Calibration procedure.
16	Press and hold the FEED Key until at least one label has been output.	CALIBRATION COMPLETE <i>followed by...</i> READY	The printer is now ready for use.

Note: If calibration fails, try desensitizing the sensor: Re-enter the Advanced Menu. Go to Media Settings / Sensor Calibration / Advanced Entry / (Tran or REFL) Sensor Gain then lower the corresponding Gain Setting by one. Exit the menu and save your changes. Test your media at the new setting. If necessary, repeat until a usable Gain setting is obtained.

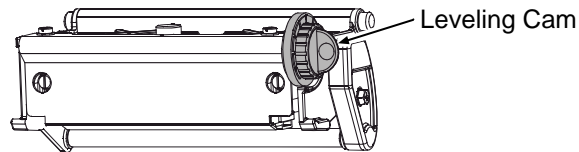
2.2 Printhead Assembly Adjustments

To ensure consistent print quality across the full range of available media types and sizes, the printhead assembly is equipped with an adjustable Leveling Cam and Printhead Burn Line.

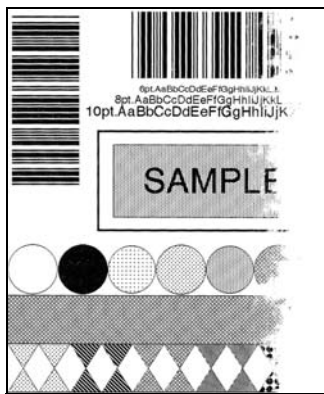


2.2.1 Leveling Cam

The Leveling Cam adjustment assures even print quality and lessens the wear on the platen roller and printhead when less than four-inch wide (102mm) media is used in the printer. Adjust the Leveling Cam whenever narrow media is used, as follows:

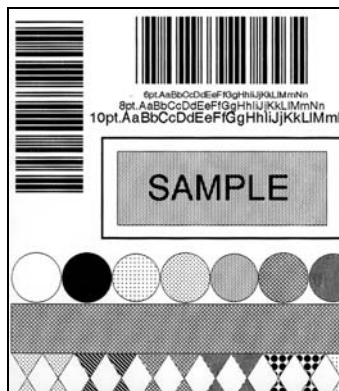


1. Load media. Select a host label format, or a resident format from the TEST Menu, and queue a batch of ten or more for printing.
2. Begin printing labels. Rotate the Leveling Cam counterclockwise into an over-adjusted position, so that the labels are produced as shown in Example 1, below.



Example 1 – An over-adjusted Leveling Cam produces an image that fades across the width of the label.

3. While continuing to print, rotate the Leveling Cam clockwise, one click at a time, until the printed labels contain a complete, even image as shown in Example 2, below.

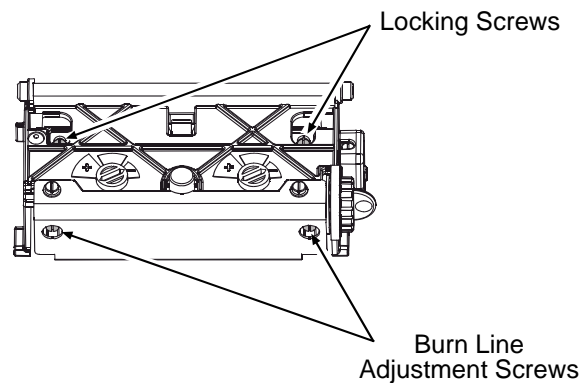


Example 2 – Proper adjustment produces a complete image with even print contrast across the label.

Note: Under-adjustment of the Leveling Cam can cause excessive lateral label movement, TOF and position faults, excessive wear on the printhead and platen roller, and ribbon wrinkling on models equipped with the thermal transfer option.

2.2.2 Printhead Burn Line

The Printhead Burn Line adjustment changes the position of the thermal element row that creates the image on the media. Factory adjusted using 6.5-mil media to ensure compliance on most labeling stocks, first try the suggestions in the *Operator's Manual* if print quality is unacceptable (also, consult the Troubleshooting section of this manual for other possible causes). If those suggestions fail, a Burn Line adjustment may be required, especially when thicker or more rigid stock is being used (for example, heavy tag media). Adjust the Burn Line as follows:



This adjustment is normally NOT REQUIRED following printhead replacement.

1. Load media (and ribbon, if thermal transfer printing). Disengage the Leveling Cam (see Section 2.2.1).
2. Rotate the two Locking Screws counterclockwise one turn.
3. Rotate the two Burn Line Adjustment Screws counterclockwise three to four turns.
4. Select the VALIDATION LABEL from the TEST Menu (see the *Operator's Manual* for details), and queue a batch of thirty or more for printing. Print one VALIDATION LABEL and examine it -- the print should be light and uneven.
5. Rotate the two Locking Screws clockwise until 'snug' (that is, tight enough to remove any play, yet loose enough to allow the Burn Line Adjustment Screws to move the printhead assembly).

6. Rotate each Burn Line Adjustment Screw clockwise about one-quarter of a turn then print another VALIDATION LABEL and examine its print quality. Repeat this step until an image with even contrast begins to be produced across the label.
7. Continue dialing in the print quality, queuing more labels as necessary. Rotate the Burn Line Adjustment Screws clockwise about one-eighth of a turn, carefully as needed (see note below), reducing your adjustments as print quality is achieved. (Aside from being visually acceptable, correct alignment can be determined by scanning the printed bar codes for compliance where, with correct heat and speed settings, the quality of the ladder bar codes becomes a critical indicator.)

Note: When the Locking Screws are snug, turning the Adjustment Screws counterclockwise will NOT move the printhead outward; if you have adjusted the printhead too far inward, restart the procedure beginning at Step 1.

8. Tighten both Locking Screws then print a final VALIDATION LABEL to verify the adjustment.

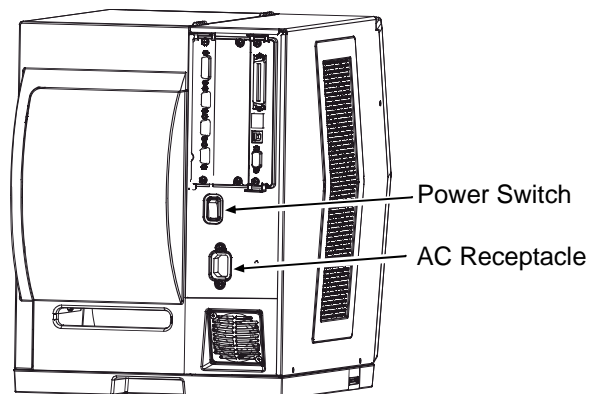
2.2.3 Printhead Voltage



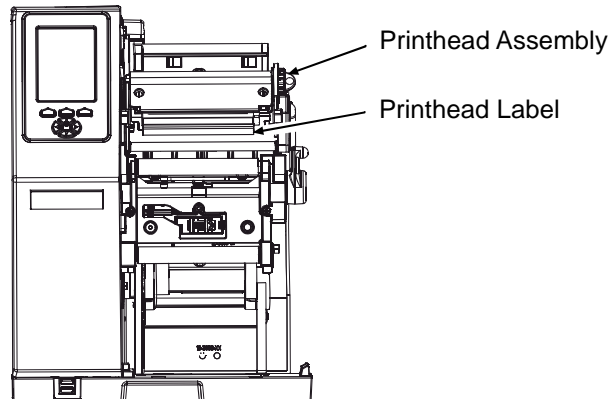
This procedure requires voltage measurement: Use extreme caution.

The printhead voltage adjustment is required (1) when replacing the power supply, or (2) if the factory voltage setting of the power supply has been changed. (Voltage adjustment is not typically required during routine printhead replacements.) Adjust the printhead voltage as follows:

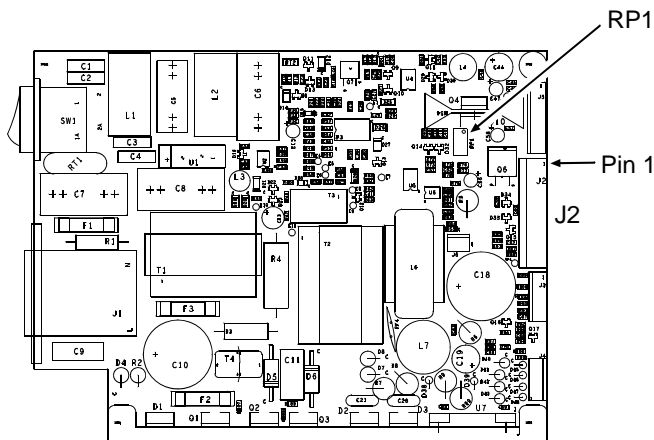
1. Turn OFF the **Power Switch** and unplug the power cord from the **AC Receptacle**.



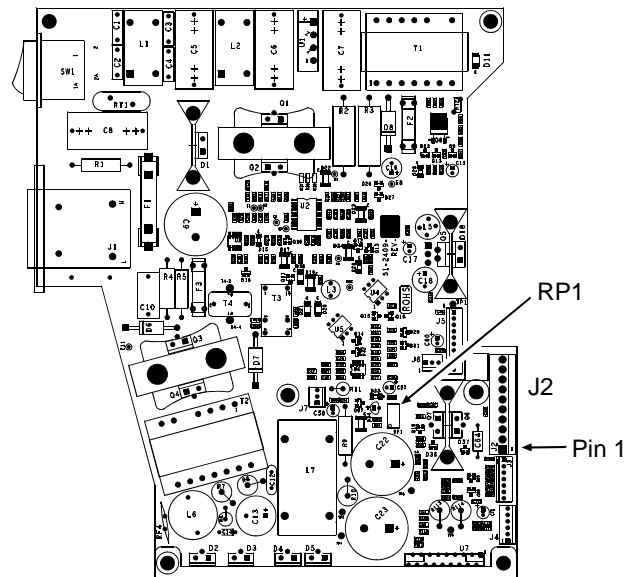
- Remove the Cover (see Section 4.1 for details). Raise the **Printhead Assembly**. Locate the attached **Printhead Label** and note the resistance value of the printhead. Make sure that media is loaded in the printer then lower and lock the **Printhead Assembly**.



- Locate the **Power Supply CCA** (see Section 4.7), then using a digital multi-meter (DMM) set to measure DC voltage, probe **J2 - Pin 3** with the positive lead and **J2 - Pin 8** with the negative lead.



Short Model Potentiometer and J2 Location



Tall Model Potentiometer and J2 Location

- In the table below, locate the **Resistance** (found in Step 2). Turn ON the printer and wait briefly. Press the **FEED Key** to temporarily enable (about thirty seconds) the voltage. Using **RP1** (see illustration above) adjust the **Voltage**.

**WARNING**

Excessive voltage can damage or shorten the service life of the printhead.

Printhead Voltage Adjustment					
Model	Resistance (Ohms)	Voltage (+/- 0.1VDC)	Model	Resistance (Ohms)	Voltage (+/- 0.1VDC)
H42XX	572 – 597	22.4	H43XX	947 – 989	22.4
	598 – 622	22.9		990 – 1030	22.9
	623 – 647	23.3		1031 – 1072	23.4
	648 – 672	23.8		1073 – 1114	23.8
	673 – 697	24.2		1115 – 1156	24.2
	698 – 722	24.7		1157 – 1197	24.7
	723 – 747	25.1		1198 – 1239	25.1
	748 – 772	25.5		1240 – 1281	25.5
H44XX	935 – 976	22.4	H46XX	1530 – 1598	22.4
	977 – 1018	22.9		1599 – 1665	22.9
	1019 – 1059	23.3		1666 – 1733	23.3
	1060 – 1100	23.8		1734 – 1800	23.8
	1101 – 1141	24.2		1801 – 1868	24.2
	1142 – 1183	24.7		1869 – 1935	24.7
	1184 – 1224	25.1		1936 – 2003	25.1
	1225 – 1265	25.5		2004 – 2070	25.5
H62XX	808 – 843	22.4	H63XX	947 – 978	22.4
	844 – 879	22.9		979 – 1012	22.9
	880 – 914	23.3		1013 – 1049	23.3
	915 – 950	23.8		1050 – 1088	23.8
	951 – 985	24.2		1089 – 1130	24.2
	986 – 1021	24.7		1131 – 1176	24.7
	1022 – 1056	25.1		1177 – 1226	25.1
	1057 – 1093	25.5		1227 – 1281	25.5
H8308	1250 – 1300	23.8			
	1301 – 1349	23.9			
	1350 – 1400	24.0			
	1401 – 1449	24.1			
	1450 – 1500	24.4			
	1501 – 1549	24.6			
	1550 – 1600	25.0			
	1600 – 1649	25.4			
	1650 – 1700	26.0			
	1701 – 1749	26.4			
	1750 – 1800	26.6			

- Turn OFF the Power Switch and unplug the power cord from the AC Receptacle. Remove the DMM leads from J2. Reinstall the Cover (see Section 4.1).

2.3 Ribbon Path Alignment *(Thermal Transfer Equipped Models)*



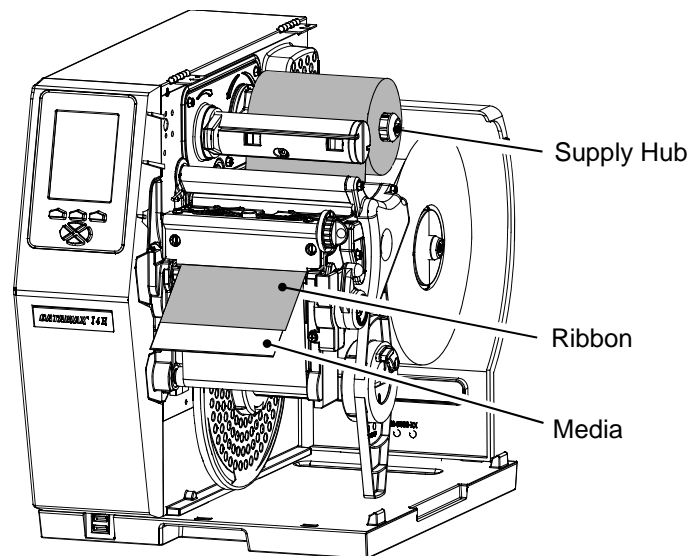
During operation hazardous moving parts are present; always keep body parts, loose clothing, etc., away from mechanisms.

The Ribbon Path Alignment is required if the ribbon wrinkles during printing. (Symptoms can include random irregular voids, typically in the direction of print.) Before performing this procedure, however, ensure that other factors are not involved:

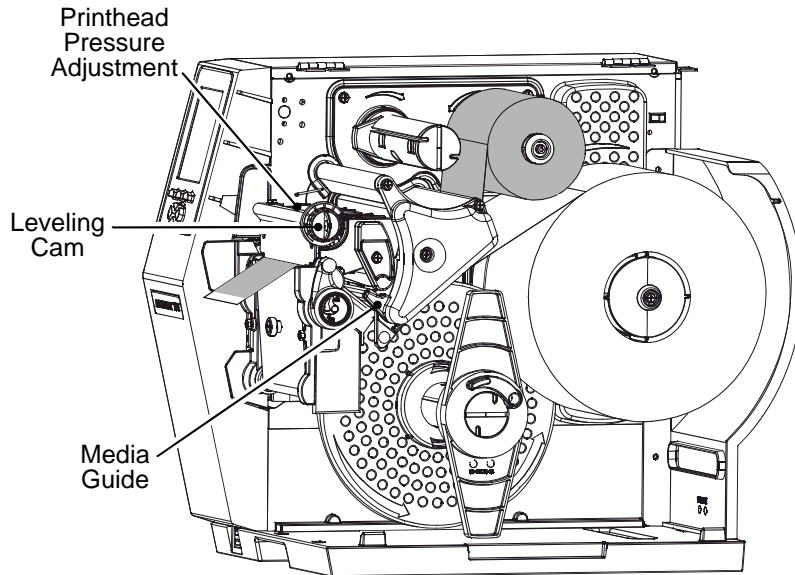
- ▶ Check the Leveling Cam adjustment (see Section 2.2.1);
- ▶ Check the Platen Roller for excessive wear, debris build-up, or lateral movement; and,
- ▶ Check the Printhead Burn Line for proper alignment (see Section 2.2.2).

Align the ribbon path as follows:

1. Install 4-inch (102 mm) wide thermal transfer **Media** into the printer. Install a slightly wider **Ribbon** onto the **Supply Hub** and route it through the printer (see the *Operator's Manual* for details). Allow the **Ribbon** to feed from the printer along with the **Media**, as shown below:

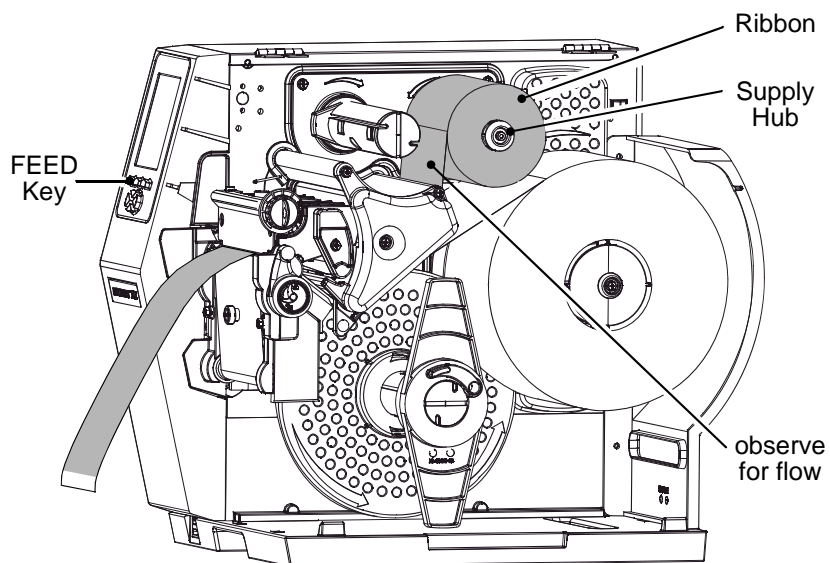


2. Adjust the **Media Guide** to fit the label width, set the **Leveling Cam** to the lowest (disengaged) position, and ensure that the **Printhead Pressure** is balanced (see the *Operator's Manual* for details).

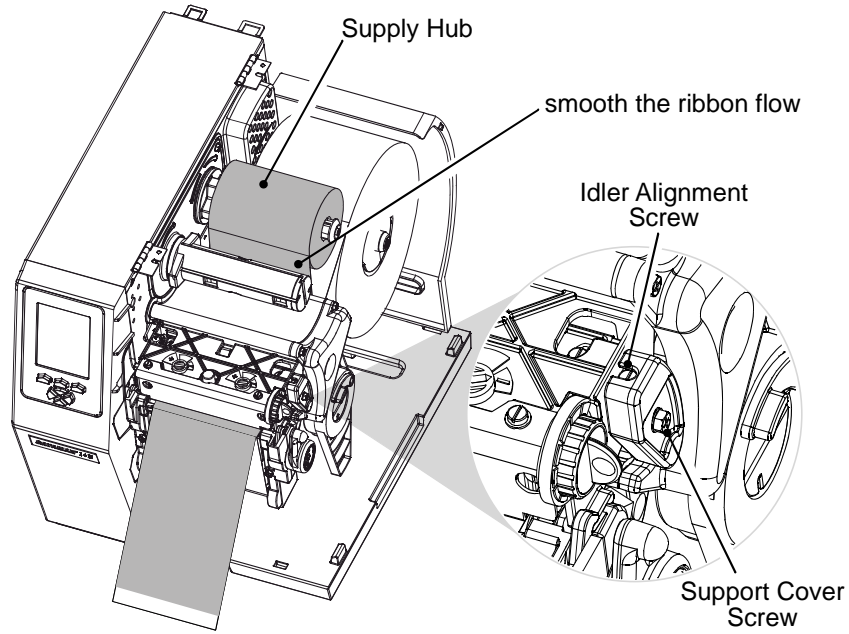


3. Press the FEED Key several times, until media tracking is normalized through the printer. Then, while feeding several more labels, **observe the flow** of the **Ribbon** from the **Supply Hub**. Proceed according to your observations:

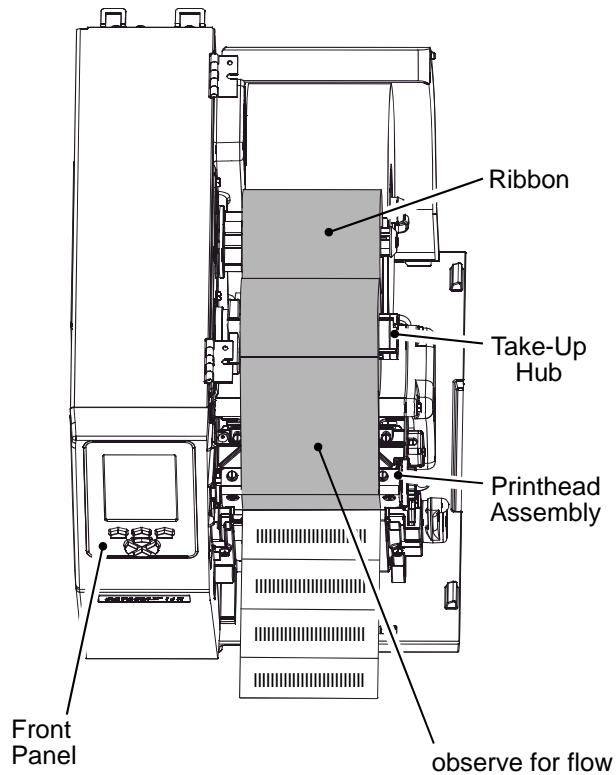
- ▶ If the ribbon flow is rippling, or if bagging is present, proceed to **Step 4**; or,
- ▶ If the ribbon flow is evenly tensioned and smooth, proceed to **Step 5**.



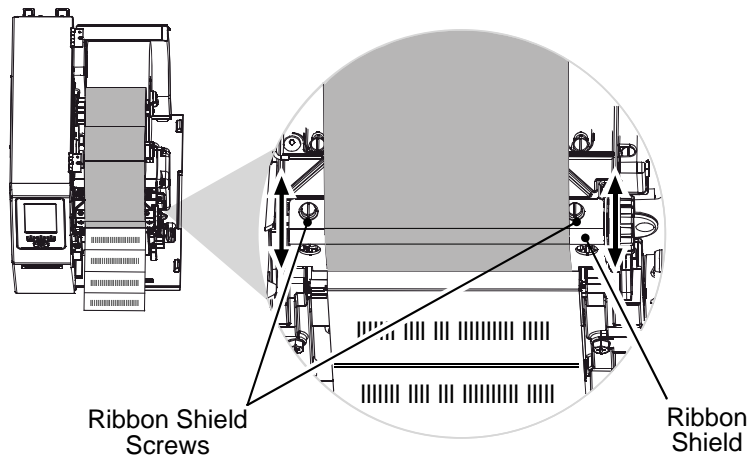
4. Slightly loosen the **Support Cover Screw** and, while repeatedly pressing the FEED Key, slowly adjust the **Idler Adjustment Screw** to **smooth the ribbon flow** from the **Supply Hub**. Afterward, carefully tighten the **Support Cover Screw**, and then feed several more labels to verify your adjustment.



5. Wrap the **Ribbon** in a clockwise direction around the **Take-Up Hub**. Press the TEST Button on the **Front Panel** then use the UP / DOWN Buttons to select the RIBBON TEST LABEL. Select a small quantity of labels and press the ENTER Key. As the labels are output, **observe the flow** of the **Ribbon** from the **Printhead Assembly** to the **Take-Up Hub** and proceed accordingly:



- ▶ If the ribbon flow is smooth, press the CANCEL Key, and then proceed to **Step 6**; or,
- ▶ If the ribbon flow is rippling or if bagging is present, slightly loosen both **Ribbon Shield Screws** and then move the **Ribbon Shield** 'in' or 'out' to smooth the flow of the ribbon. Afterward, carefully tighten the **Ribbon Shield Screws**. Print several more labels to verify your adjustment. When finished, press the CANCEL Key to stop printing.



6. Press the TEST Button then use the UP / DOWN Buttons to select the PRINT QUALITY LABEL or the TEST LABEL. Set a quantity of labels to print and then press the ENTER Key. Carefully examine the labels for evidence of ribbon wrinkling and proceed according to your findings:
 - ▶ If no evidence of wrinkling, press the CANCEL Key to stop printing to complete the procedure; or,
 - ▶ If wrinkling continues, enter the Test Menu again and reselect the PRINT QUALITY LABEL or the TEST LABEL. Set a quantity of labels to print and press the ENTER Key. Slightly loosen the Ribbon Shield Screws then slightly readjust the Ribbon Shield to eliminate the latent wrinkling. When finished, press the CANCEL Key to stop printing and complete the procedure.

2.4 Maintenance

To ensure continued peak printing performance, follow the techniques and schedules in this section to maintain the printer. The following items are recommended to safely clean the printer:

- Isopropyl alcohol
- Cotton swabs
- Clean, lint-free cloth
- Lens tissue
- Vacuum Cleaner
- Soft-bristle brush
- Soapy water/mild detergent
- Compressed air
- Printhead Cleaning Cards or Printhead Cleaning Film



For safety and to avoid damaging the printer, turn OFF and unplug the unit before cleaning. Always take proper precautions when using isopropyl alcohol, a flammable liquid.

Recommended Maintenance Schedule		
Component / Area	Cleaning Interval *	Supplies / Method
Cutter (Optional equipment)	After each roll or box of labels, or if the cutting action becomes sluggish.	Isopropyl alcohol. See Section 2.4.8.
Exterior Surfaces	As needed, based on a weekly visual inspection.	Mild detergent applied with a dampened cloth. See Section 2.4.6.
Fan Filter	As needed, based on a weekly visual inspection.	Vacuum. See Section 2.4.9.
Interior Compartment	As needed, based on a weekly visual inspection.	Compressed air or a soft brush. See Section 2.4.7.
Media Sensor and Media Path Components	As needed, based on a weekly visual inspection.	Compressed air or a soft brush. Isopropyl alcohol, as needed. See Section 2.4.4.
Present Sensor, and Peel & Present Assemblies (Optional equipment)	100,000 inches (254,000 cm) of media use, an interval that depends on the adhesive quality of the label, where “gummy” adhesives may require more frequent cleaning.	Cotton swab dampened with isopropyl alcohol. See Section 2.4.3.

Recommended Maintenance Schedule <i>(continued)</i>		
Component / Area	Cleaning Interval *	Supplies / Method
Platen and Assist Rollers	After each roll of media, ribbon, or as needed.	Cotton swab or a cloth dampened with isopropyl alcohol. See Section 2.4.2.
Printhead	<p>The interval varies according to the media type used:</p> <ul style="list-style-type: none"> • Thermal transfer media – after each roll of ribbon. • Direct thermal media – after each roll of media, or as needed. 	Isopropyl alcohol; and, if necessary, Cleaning Cards or Cleaning Film. See Section 2.4.1.
Ribbon Path Components (Optional equipment)	As needed, based on a weekly visual inspection.	Cotton swab or cloth dampened with isopropyl alcohol. See Section 2.4.5.

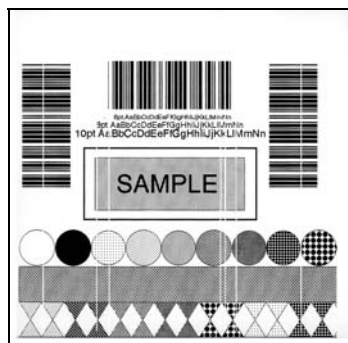
*Whichever interval comes first.

2.4.1 Cleaning the Printhead



NEVER use a sharp object on the Printhead; damage can result.

If print quality declines, the typical cause is debris build-up on the printhead (see example below). Because debris build-up can lead to premature printhead element (dot) failure, it is important to follow the Recommended Maintenance Schedule. (To help you remember, the printer can be programmed to prompt you when cleaning is scheduled; see the *Operator's Manual* for details.)



Note: Streaks can indicate a dirty or faulty printhead.

Proper cleaning is critical. To maintain peak performance of the printer, Datamax-O'Neil offers a complete line of cleaning products including pens, cards, films and swabs. Visit our website at <http://www.datamax-oneil.com/> to learn more. **Certified Datamax-O'Neil – The worry free choice for optimal printer performance.**

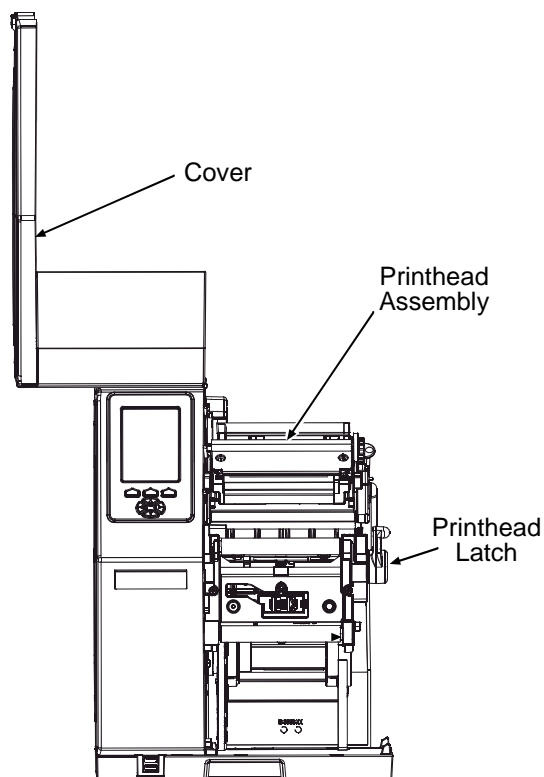
Depending upon the media type, ribbon type, and printing parameters used, different methods are recommended for cleaning the printhead:

- Cotton Swab Procedure;
- Cleaning Card Procedure; and,
- Cleaning Film Procedure.

Regardless of the cleaning method used, always begin the cleaning routine with the preliminary steps listed below:

Preliminary Printhead Cleaning Steps:

- A. Stop printing. Raise the **Cover**, unlock the **Printhead Latch**, and raise the **Printhead Assembly**.



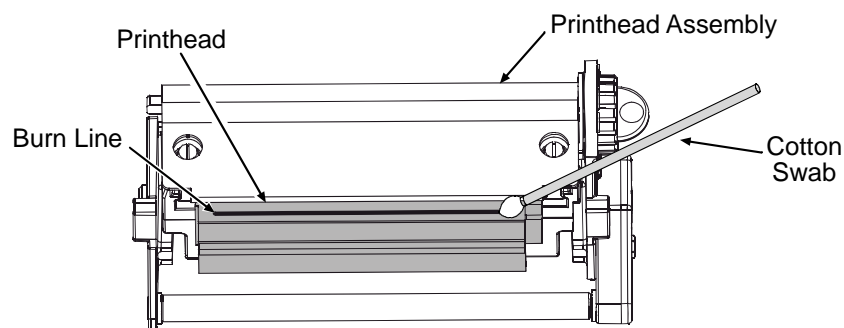
- B. **Allow the printhead to cool.**

- C. Remove media and ribbon from the printer then proceed according to your cleaning needs:

2.4.1.1 Cotton Swab Procedure

This printhead cleaning method is recommended for printers using direct thermal media or thermal transfer media with a wax ribbon.

1. Perform the Preliminary Cleaning Steps, as described in Section 2.4.1.
2. Turn OFF the Power Switch and unplug the power cord from the AC Receptacle. Using a **Cotton Swab** moistened (not soaked) with isopropyl alcohol, gently wipe the **Printhead** surface, especially the **Burn Line**, until all build-up has been removed.



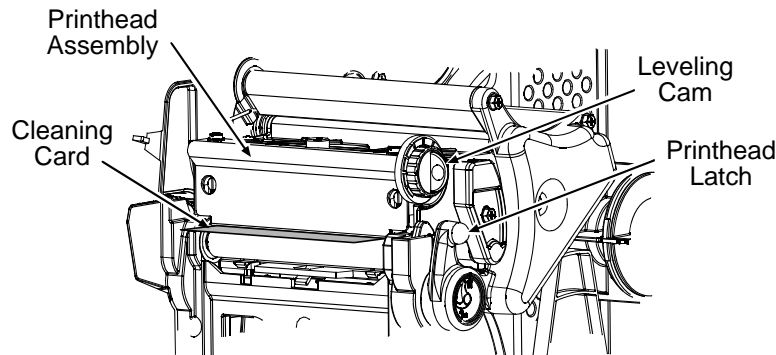
3. Allow the **Printhead** to dry.
4. Reinstall media (and ribbon, if necessary). Lock the **Printhead Latch**. If necessary, adjust the **Leveling Cam**. Close the Cover. Plug in and turn ON the printer. Run a few sample labels and examine them. If streaking is still present, go to Section 2.4.1.2 and try that cleaning method; otherwise, this completes the printhead cleaning procedure.

2.4.1.2 Cleaning Card Procedure

This printhead cleaning method is recommended for users of direct thermal media, or thermal transfer media and wax ribbon combinations; also for those who have tried, though unsuccessfully, the Cotton Swab Procedure (Section 2.4.1.1):

1. Perform the Preliminary Cleaning Steps, as described in Section 2.4.1.
2. Place a **Cleaning Card** (Part Number 70-2013-01) under the **Printhead Assembly**.

3. Lower the **Printhead Assembly**, close the **Printhead Latch**, and disengage the **Leveling Cam** (see Section 2.2.1).

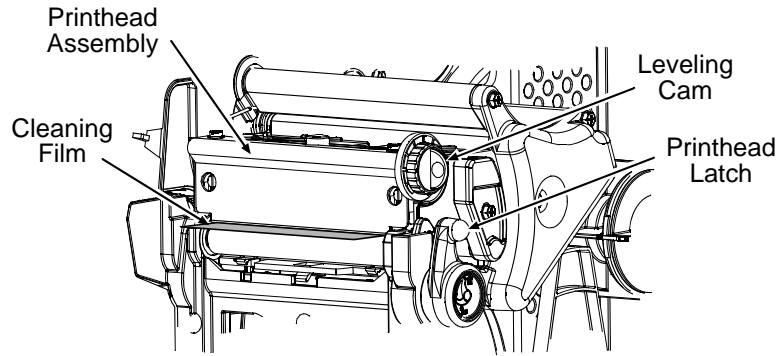


4. Close the Cover. Press and hold the **TEST Button** for approximately four seconds to begin the cleaning routine. (As an alternate, 'CLEAN HEAD NOW' can be selected in the menu system, see the *Operator's Manual* for details.)
5. After the **Cleaning Card** has passed through the printer, reinstall media (and ribbon, if necessary). Lock the **Printhead Latch**. If necessary, adjust the **Leveling Cam**. Close the Cover. Run a few sample labels and examine them. If streaking is still present, go to Section 2.4.1.3 and try that cleaning method; otherwise, this completes the printhead cleaning procedure.

2.4.1.3 Cleaning Film Procedure

This printhead cleaning method is recommended for users of thermal transfer media and resin ribbon combinations, when a Heat Value of 22 (or more) is typically used for printing, or when the previous methods have failed.

1. Perform the Preliminary Cleaning Steps, as described in Section 2.4.1.
2. Place a sheet of **Cleaning Film** (Part Number 70-2087-01) under the **Printhead Assembly**.
3. Lower the **Printhead Assembly**, close the **Printhead Latch**, and disengage the **Leveling Cam** (see Section 2.2.1).



4. Close the Cover. Press and hold the **TEST Button** for approximately four seconds to begin the cleaning routine. (As an alternate, 'CLEAN HEAD NOW' can be selected in the menu system, see the *Operator's Manual* for details.)
5. After the **Cleaning Film** has passed through the printer, turn 'Off' and unplug the printer.
6. Raise the Cover. Raise the **Printhead Assembly**. Using a cotton swab moistened (not soaked) with isopropyl alcohol, clean the printhead (see Section 2.4.1.1). **Allow the printhead to dry.**
7. Reinstall media and ribbon. Lock the **Printhead Latch**. If necessary, adjust the **Leveling Cam**. Close the Cover. Run a few sample labels and examine them. If streaking is still present, see Section 3.2.4.

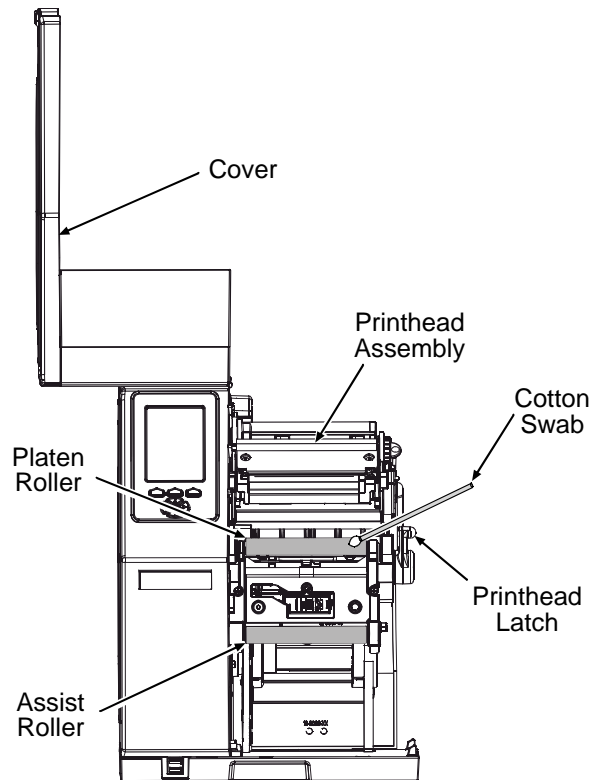
2.4.2 Cleaning the Platen and Assist Rollers



NEVER use a sharp object to clean Rollers; damage can result.

Rollers contaminated with grit, label adhesive, or ink can cause a decline in print quality and, in extreme cases, cause labels to adhere and wrap the roller. Clean the Platen and Assist Rollers as follows:

1. Turn OFF the Power Switch and unplug the power cord from the AC Receptacle. Raise the **Cover**, remove the **Door**, unlock the **Printhead Latch**, and raise the **Printhead Assembly**. Remove media and ribbon.
2. Using a **Cotton Swab** (or lint-free cloth) dampened with isopropyl alcohol, clean **Platen Roller** and **Assist Roller**. Manually rotate the rollers as necessary, wiping, rotating, and repeating until the entire surface of each is clean.



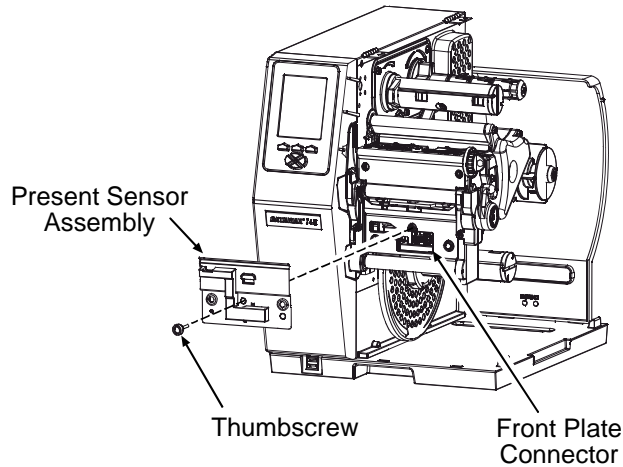
- 3 Reinstall media and ribbon. Lock the **Printhead Latch**. If necessary, adjust the **Leveling Cam**. Close the **Cover** and install the **Door**.

2.4.3 Cleaning the Present Sensor, and Peel & Present Options

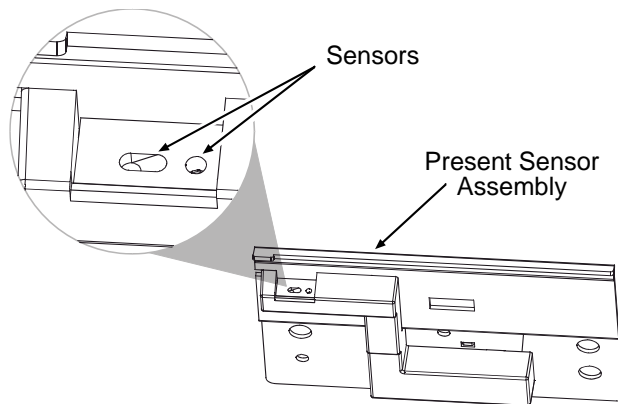
When the Present Sensor is contaminated with paper dust, debris, or adhesive, the function can become unreliable. And, when the Peel option is contaminated with grit and adhesive, peeling can be sporadic. Clean the option according to the type installed on the printer.

2.4.3.1 Cleaning the Present Sensor

1. Turn OFF the Power Switch and unplug the power cord from the AC Receptacle. Remove media.
2. Remove the **Thumbscrew** and the **Present Sensor Assembly** from the **Front Panel Connector**.



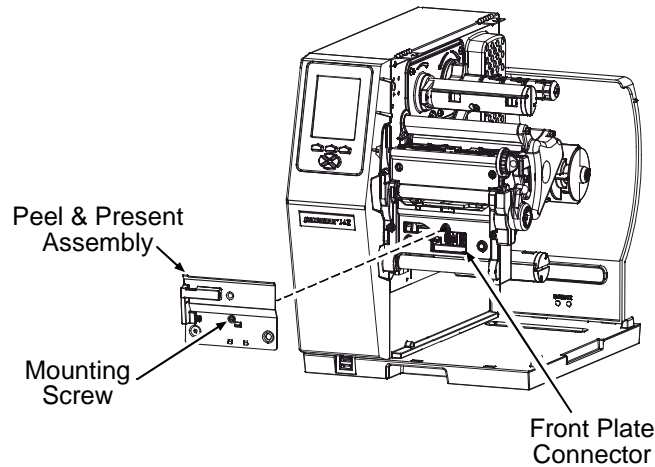
3. Clean the **Sensors** on the **Present Sensor Assembly** using compressed air or a soft brush. (For cleaning heavy deposits, isopropyl alcohol can be used – provided it is carefully applied using a cotton swab then allowed to dry.)



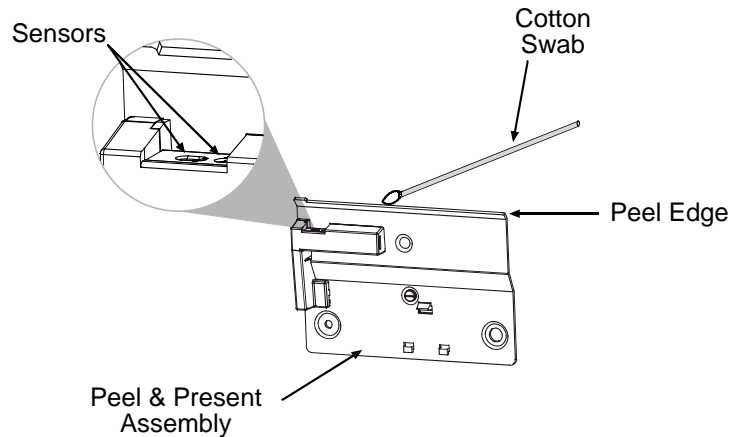
4. Press the **Present Sensor Assembly** onto the **Front Plate Connector** and, using the **Thumbscrew**, secure the assembly to the printer.

2.4.3.2 Cleaning the Standard Peel & Present Option

1. Turn OFF the Power Switch and unplug the power cord from the AC Receptacle. Raise the Cover and remove the media.
2. Loosen the **Mounting Screw** and remove the **Peel & Present Assembly** from the **Front Plate Connector**.



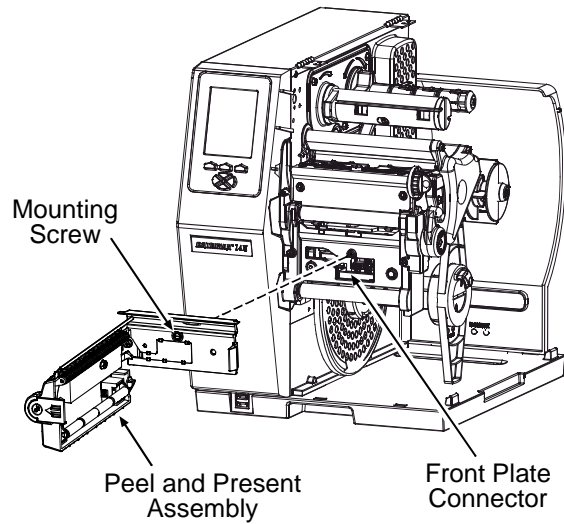
3. Using compressed air or a soft brush, clean the **Sensors**. (For cleaning heavy deposits, isopropyl alcohol can be used – provided it is carefully applied using a cotton swab then allowed to dry.)



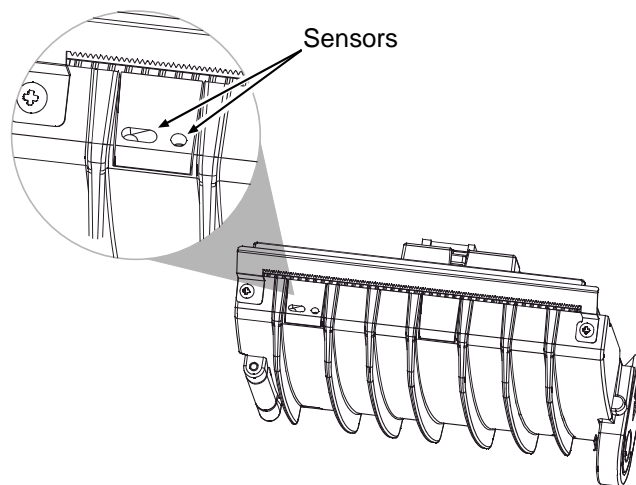
4. Using a **Cotton Swab** dampened with isopropyl alcohol, wipe the **Peel Edge** clean.
5. Reinstall the **Peel & Present Assembly** onto the **Front Plate Connector** then tighten the **Mounting Screw**. Reload media and close the Cover.

2.4.3.3 Cleaning the Heavy Duty Peel & Present Option

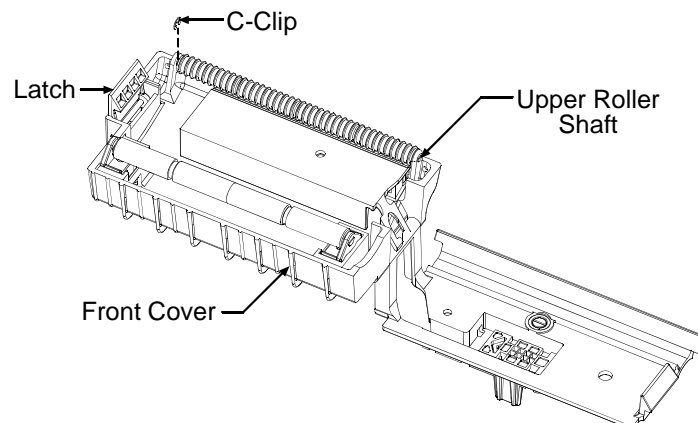
1. Turn OFF the Power Switch and unplug the power cord from the AC Receptacle. Remove media.
2. Loosen the **Mounting Screw** then remove the **Peel & Present Assembly** from the **Front Plate Connector**.



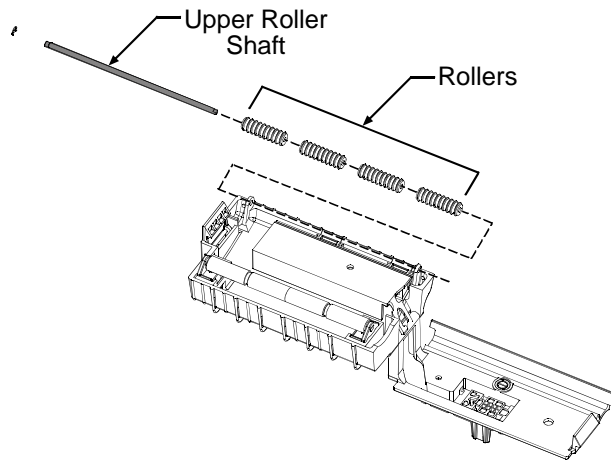
3. Using compressed air (or a soft brush), clean the **Sensors**. (For cleaning heavy deposits, isopropyl alcohol can be used – provided it is carefully applied using a cotton swab then allowed to dry.)



4. Press the **Latch**. Open the Peel and Present Assembly then remove the **C-Clip** that secures the **Upper Roller Shaft** to the **Front Cover**.



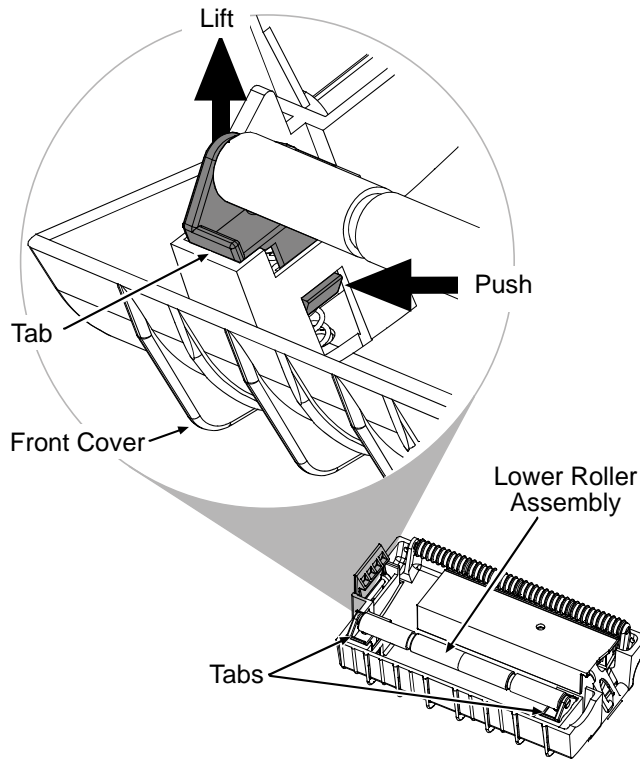
5. Remove the **Upper Roller Shaft** and the associated **Rollers**.



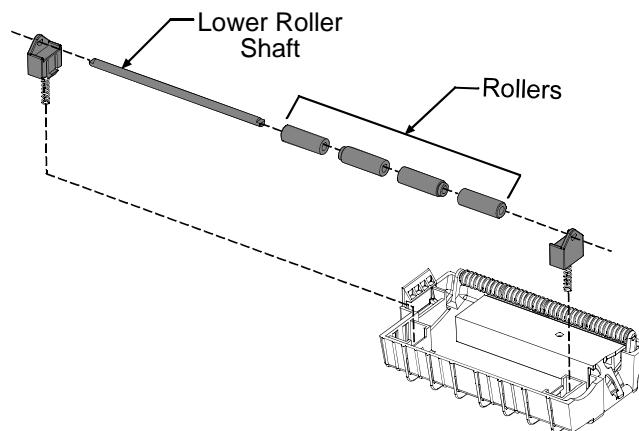
6. Using a **Cotton Swab** dampened with alcohol, wipe the **Roller** and **Upper Roller Shaft** surfaces - including the ridges on the Rollers - clean.

☑ Note: For cleaning heavy deposits from the Rollers and Shafts in the following steps, WD-40[®] or another non-damaging adhesive remover can be substituted for isopropyl alcohol – provided this adhesive remover is carefully applied using a cotton swab.

7. Slide the **Rollers** back onto the **Upper Roller Shaft**, place the components into the **Front Cover**, and reinstall the **C-Clip**.
8. **Push** and **Lift** both **Tabs** that secure the **Lower Roller Assembly** to the **Front Cover** (as shown) and, while keeping it intact, carefully remove the entire **Lower Roller Assembly**.



9. Take note of the individual **Roller** positions (later, they must be reinstalled in the same order) then carefully remove the **Rollers** from the **Lower Roller Shaft**.



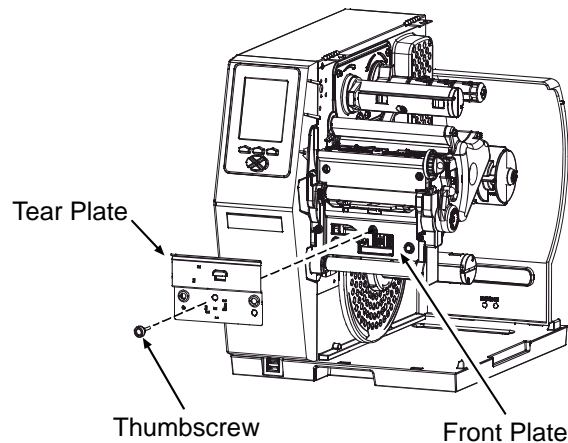
10. Using a **Cotton Swab** dampened with alcohol (or WD-40[®], see note above), wipe all **Roller** and **Lower Roller Shaft** surfaces clean. Pay special attention to the ridges on the **Rollers** to ensure that they are clean.

11. Slide the **Rollers**, in their original order, onto the **Lower Roller Shaft** and reinstall it in the **Front Cover**, ensuring that the **Tabs** are properly seated.
12. Reinstall the **Peel and Present Assembly** onto the **Front Plate Connector** and tighten the **Mounting Screw**. Reload media and close the printer's Cover.

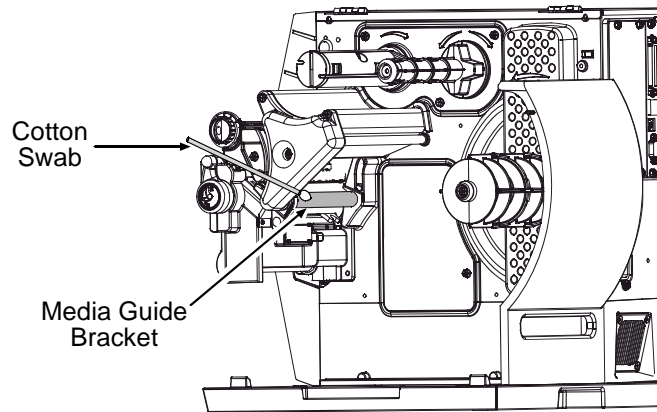
2.4.4 Cleaning the Media Sensor and Media Path Components

Over time, paper dust and adhesive build-up from the media can accumulate on the printer components to produce TOF sensing and print quality problems. To avoid printing problems clean the Tear Plate, Media Sensor, Light Bar, and Media Guide Bracket as follows:

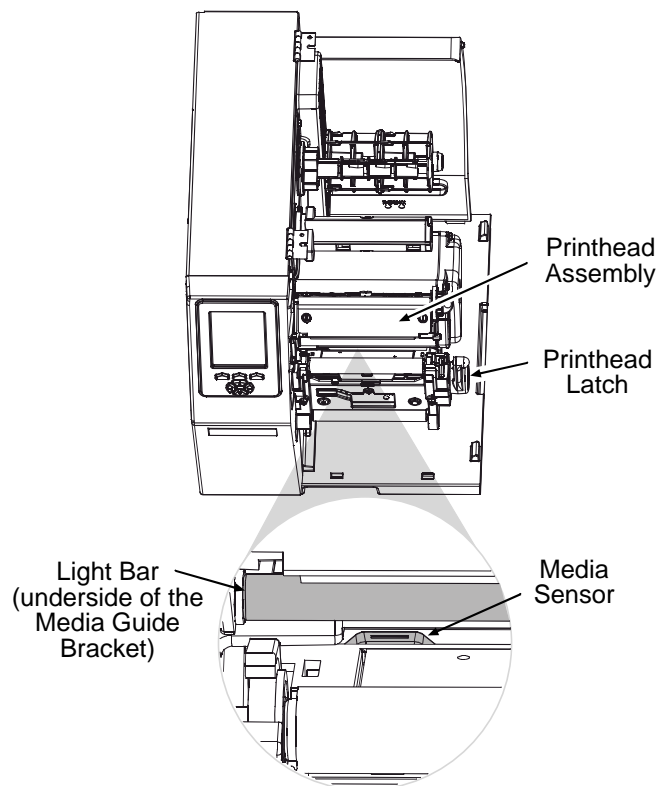
1. Turn OFF the Power Switch and unplug the power cord from the AC Receptacle. Remove media.
2. Remove the **Thumbscrew** and the **Tear Plate** from the **Front Panel**.
3. Using a **Cotton Swab** dampened with isopropyl alcohol, wipe the **Tear Plate** clean.



4. Using a **Cotton Swab** dampened with isopropyl alcohol, wipe the upper surface of the **Media Guide Bracket** clean.



5. With the **Printhead Assembly** raised, use compressed air to clean all debris from the **Media Sensor** and the **Light Bar** (mounted to the underside of the **Media Guide Bracket**). In cases of extreme build-up on the **Light Bar**, a **Cotton Swab** or **lens tissue** dampened with isopropyl alcohol can be used.

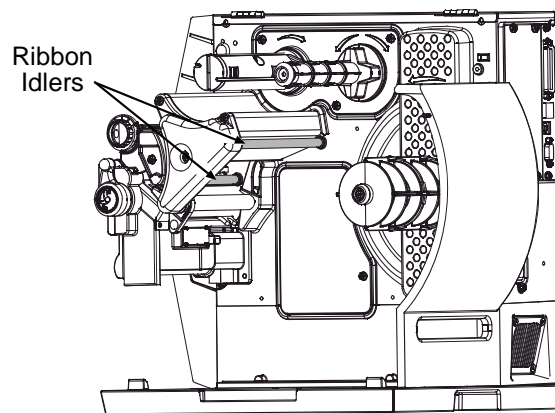


6. After all the components have dried, reinstall the **Tear Plate** onto the **Front Plate** and secure it with the **Thumbscrew**. Reinstall media. Lower and latch the **Printhead Assembly**. Plug the power cord into the AC Receptacle and turn ON the Power Switch.

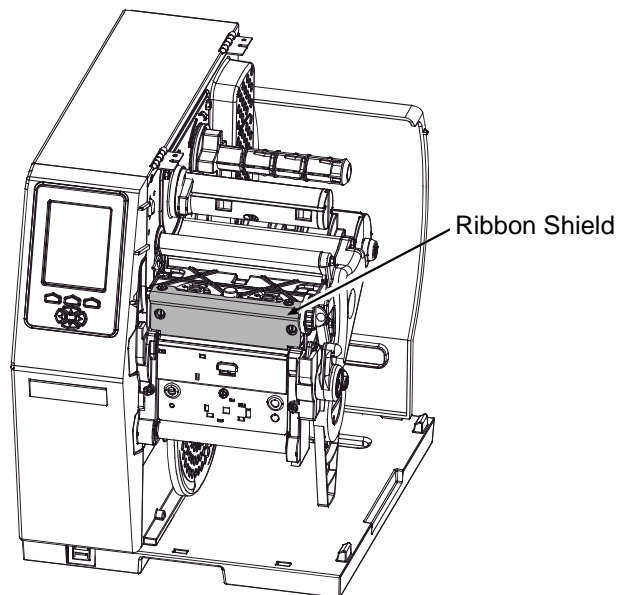
2.4.5 Cleaning the Ribbon Path Components (Thermal Transfer Equipped Models)

When the ribbon path components become caked with build-up, the smooth flow can be impeded causing intermittent ribbon stalling problems to occur. Clean the ribbon path components as follows:

1. Turn OFF the Power Switch and unplug the power cord from the AC Receptacle. Raise the Cover then remove media and ribbon.
2. Using a **Cotton Swab** dampened with alcohol, wipe the **Ribbon Idlers** clean.



3. Using a **Cotton Swab** dampened with alcohol, wipe the **Ribbon Shield** clean.



4. Reload media and ribbon then close the Cover.

2.4.6 Cleaning the Exterior Surfaces

When soiled, the exterior surfaces of the printer should be cleaned using a general-purpose cleanser. Never use abrasive cleansers or solvents, and never pour the cleansers directly onto the printer.

1. Turn OFF the Power Switch and unplug the power cord from the AC Receptacle.
2. Using a soft cloth (or sponge) dampened with a non-abrasive cleanser, wipe the exterior surfaces clean.
3. Allow the surfaces to dry before reconnecting power.

2.4.7 Cleaning the Interior Compartment

Inside the printer, paper dust from the media can accumulate to produce small voids in the text, graphics and bar codes. Clean the Interior Compartment as follows:

1. Turn OFF the Power Switch and unplug the power cord from the AC Receptacle.
2. Raise the Cover then remove media and ribbon.
3. Remove all media and ribbon.
4. Using compressed air or a soft brush, clean all debris from Interior Compartment.
5. Reload media and ribbon then close the Cover.

2.4.8 Cleaning the Cutter

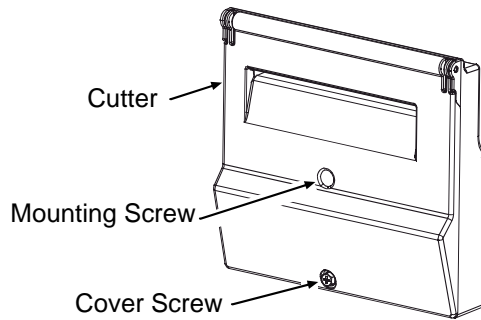
If adhesive and paper shards accumulate inside the Cutter, performance can be affected. Clean the Cutter as follows:



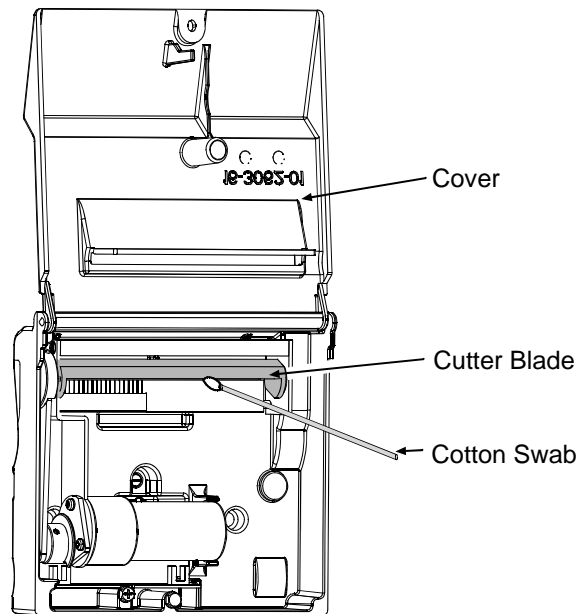
Cutter Blades are SHARP: Keep body parts away from the cutting surfaces. Never use metal objects on the cutting surfaces. Take proper precautions when using isopropyl alcohol, a flammable liquid.

1. Turn OFF the Power Switch and unplug the power cord from the AC Receptacle.
2. Raise the Cover then remove media and ribbon.

3. Loosen the **Mounting Screw** and remove the **Cutter** from the printer.



4. Remove the **Cover Screw** from the **Cutter** and open the **Cover**.

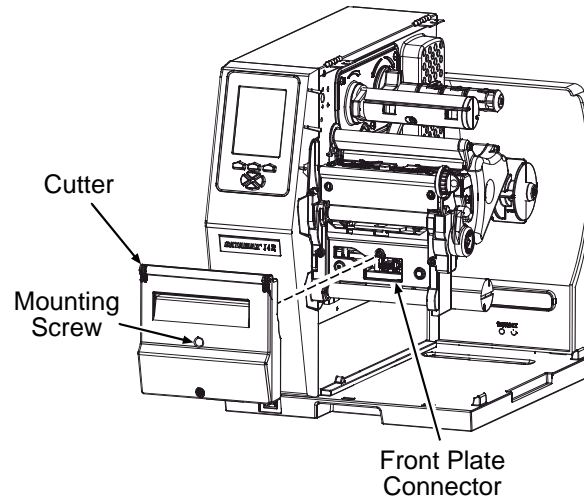


5. Using compressed air, remove any debris inside the mechanism, and then using a **Cotton Swab** dampened with alcohol, wipe the **Cutter Blade** surfaces clean. Allow the mechanism to dry.

Note: For cleaning heavy deposits from the blade, WD-40[®] or another non-damaging adhesive remover can be substituted – provided it is carefully and sparingly applied using a cotton swab. Never spray WD-40[®] directly onto the assembly; severe damage can result.

6. Close the **Cover**, then reinstall and tighten the **Cover Screw**.

7. Carefully press the **Cutter** onto the **Front Plate Connector** and, using the **Mounting Screw**, secure the assembly to the printer.

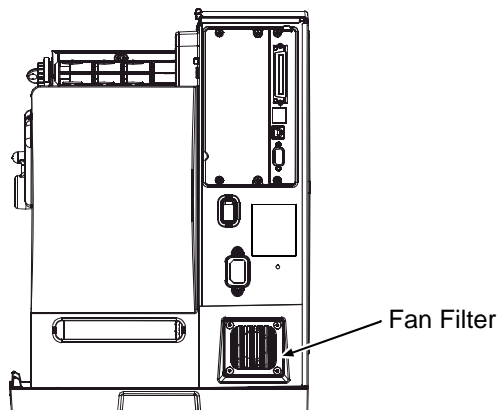


8. Reload media and close the Cover to complete the procedure.

2.4.9 Cleaning the Fan Filter

During operation, the Fan Filter stops dust and debris from entering the printer. To assure continued airflow into the printer, clean the Fan Filter as follows:

1. Turn OFF the Power Switch and unplug the power cord from the AC Receptacle.
2. Using a vacuum, clean the **Fan Filter**.



3. Plug the power cord into the AC Receptacle and turn ON the Power Switch.

2.5 Updating Firmware

Stored in Flash memory, the firmware can be easily updated. Updates can be found at <http://www.datamax-oneil.com/>. Before updating, identify the current version by printing a Configuration Label (see the *Operator's Manual* for details) then compare that version to the files available on the website and proceed as follows:



If an error occurs during the download, the update will be aborted. If ERASING FLASH or UPDATING SOFTWARE was not displayed, the previous program will remain intact; otherwise, a successful download must be completed before the printer is operable.

Note: If SECURITY is enabled, disable it before proceeding; see the *Operator's Manual* for details.

1. Download the desired file version for your printer onto your computer's hard drive.
2. Connect your computer to the printer via the parallel or USB port, and then turn 'On' the printer.
3. Using the Windows print driver, open the Printer Properties box, select the 'Tools' tab and then, from the 'Action' drop-down box, select 'Send File to Printer.'
4. When prompted, browse to the firmware or font file that you downloaded onto your computer's hard drive or floppy disk and send that file to the printer.

Following a successful download, the printer will perform a 'cold reset.' Unless substantial data structure changes have occurred as a result of the firmware upgrade, the previous printer setup will remain intact; otherwise, you may need to calibrate the printer and enter any custom settings. To verify the new version of firmware and the printer's current database configuration, print another Configuration Label.

Note: If the download was unsuccessful, the printer will perform a warm reset and the original firmware will remain operational. (If the reset fails to occur, cycle the power switch OFF and ON.) A list of error messages and possible solutions is given below.

Update Error Messages	
Displayed Message	Description, and Possible Causes and Solutions
DECOMPRESSION ERROR	An error occurred during the decompression and transfer of file data from cache storage into the Flash memory. Confirm the firmware version and try the download again; however, if the problem continues call for service.
ERROR ERASING FLASH	Flash memory could not successfully be erased. Defective Flash memory is a possible cause. Try the download again; however, if the problem continues call for service.
ERROR WRITING FLASH	The program could not successfully be written into Flash memory. Defective Flash memory is a possible cause. Try the download again; however, if the problem continues call for service.
HARDWARE MISMATCH DATA REJECTED	The firmware downloaded is not compatible with the Main Logic Card, is for a different model printer, or is not supported by the boot loader version. See CONFIGURATION LEVEL/PRINTER KEY in the <i>Operator's Manual</i> for details.
INVALID SOFTWARE DATA REJECTED	A error was detected during download, possible causes and solutions include: <ul style="list-style-type: none"> • An invalid or corrupted file was downloading – Try saving the file again to the host, and then download it again to the printer; or, • A communications error – Recheck the cabling and the port settings.
SOFTWARE MISMATCH DATA REJECTED	The software level being installed is not authorized for this printer. See CONFIGURATION LEVEL/PRINTER KEY in the <i>Operator's Manual</i> for details.

2.6 Boot Loader Program Updates

Stored in Flash memory, the Boot Loader can be easily updated. Updates can be found at <ftp://ftp.datamax-oneil.com/>. Before updating the printer, identify the current version by printing a Configuration Label (see the *Operator's Manual* for details) then compare that version to the files available on the website and then download the desired file onto your computer's hard drive.



If power is lost while UPGRADING SOFTWARE is displayed, the printer will become non-functional and must be returned to the factory for programming or the main logic board must be replaced.

Note: If enabled, disable SECURITY before proceeding; see the Operator's Manual for details.

Step	Displayed Message	Action	Comment(s)
1	READY	Using the DOS copy command (where 'filename' is the program to be loaded and 'lpt1' is the selected interface port), enter the following: copy filename lpt1:	As an example, this would be entered as: copy bootb~1.bs lpt1 (Where 'lpt1' is the host computer's output port; however, your selection can differ to include a serial or USB port.) The Comm Indicator will appear as data is received.
2	UPGRADING SOFTWARE	No action required.	The new program is being stored and verified.
3	H4210.173 7/01/2005	No action required.	The printer has automatically reset.
4	READY	No action required.	The new application is now running. If 'UNCALIBRATED' is displayed, the printer must be calibrated before use.

2.7 Resetting the Printer

Depending upon the method used and the result desired, there are three different reset levels:

- Soft Reset;
- Level One Reset; and,
- Level Two Reset.

2.7.1 Soft Reset

To clear all temporary host settings, proceed as follows:

- ▶ Press and hold the **CANCEL Key** for approximately four seconds.

2.7.2 Level One Reset

To return to the factory default settings (and, if saved, restore a Factory Setting File), proceed as follows:

- ▶ Turn OFF the printer. Then, press and hold the **PAUSE** and **CANCEL Keys** while turning ON the printer – and continue to depress the keys until READY is displayed.

Note: *This reset has the same effect as the System Settings / Set Factory Defaults menu selection. (See the Operator's Manual for details.)*

2.7.3 Level Two Reset

To return the firmware default settings, clear all calibrations, and custom adjustment parameters proceed as follows:

- ▶ Turn OFF the printer. Then, press and hold the **PAUSE, FEED, AND CANCEL Keys** while turning ON the printer – and continue to depress the keys until UNCALIBRATED is displayed.

Note: *Calibration must be performed before printing can be resumed.*
