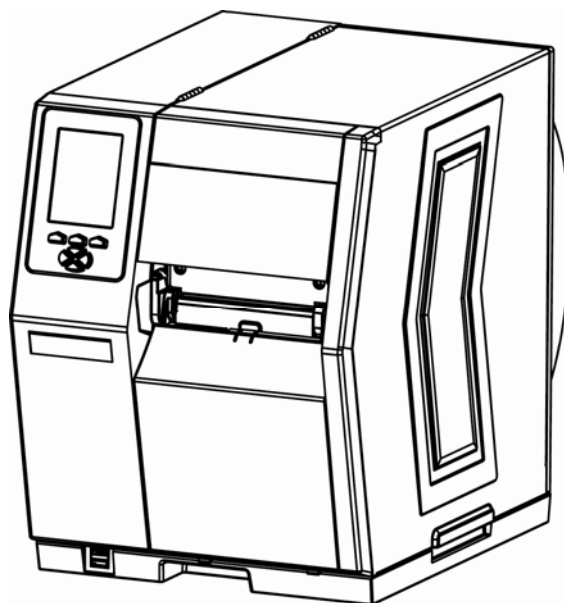


H-Class™

Maintenance Manual ■ ■ ■



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Lithium Battery: There is a danger of explosion or fire if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

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- 2** Adjustments and Maintenance
- 3** Troubleshooting
- 4** Removal and Replacement

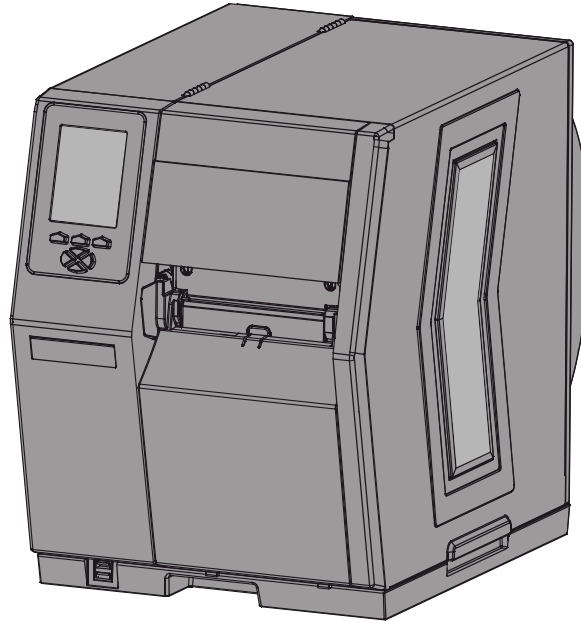
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1.0 Introduction

This manual, intended for qualified service personnel only, documents the maintenance and repair procedures for H-Class model printers. It primarily includes technical information relating to the electrical and mechanical assemblies and components of the printer.



If necessary, refer to the following documents for additional printer information (downloadable at <http://www.datamax-oneil.com/>):

- For operating information, reference the *Operator's Manual* (part number 88-2329-01); and,
- For software language information, reference the *Class Series Programmer's Manual*, part number 88-2316-01.

Important Information:

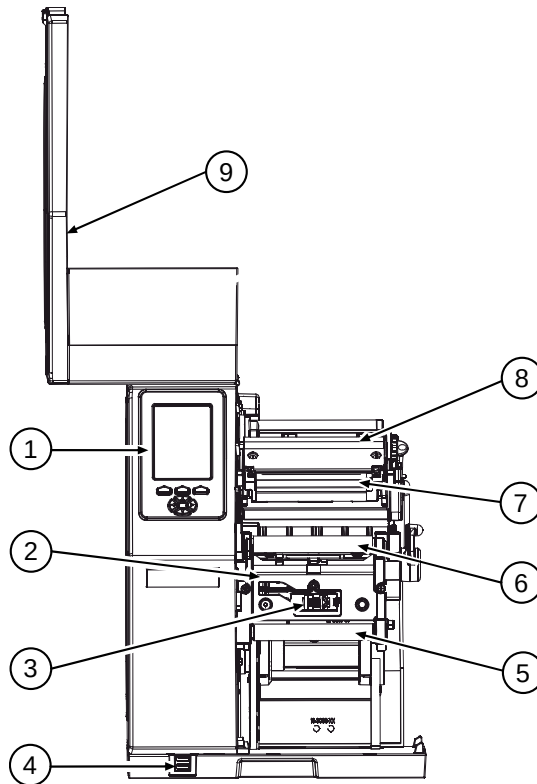


The exclamation point inside an equilateral triangle is intended to alert the technician to the presence of important operating, maintenance or servicing information. Always, as with all electrical equipment, follow basic safety precautions to avoid personal injury or printer damage.

1.1 About the Printer

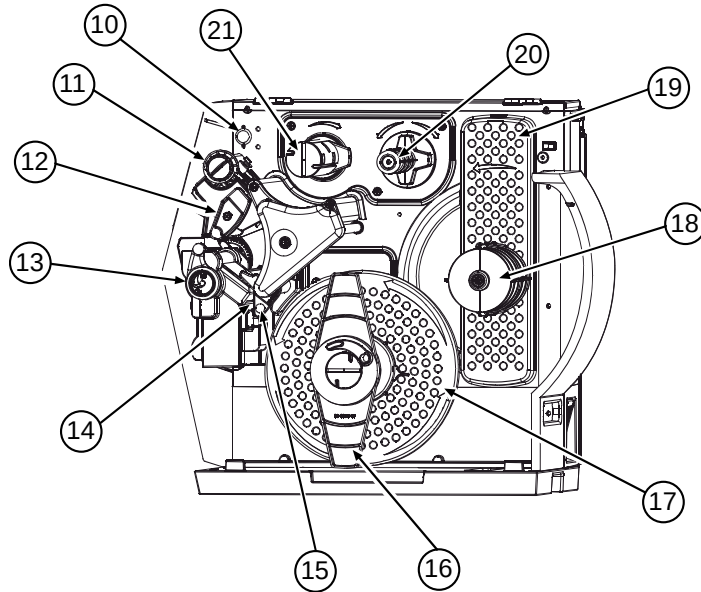
The following tables and illustrations highlight exterior printer components and controls. Note that some items are optional and may not be present on all models. To identify the model number, look on the Serial Tag affixed to the rear of the printer. Use the model number when referencing specific information in this manual.

1.1.1 Front View



Item Number	Item Description
1	User Interface
2	Front Plate
3	Front Plate Connector
4	USB Host Ports
5	Assist Roller
6	Platen Roller
7	Printhead
8	Ribbon Shield
9	Access Cover

1.1.2 Side View – User, All Models

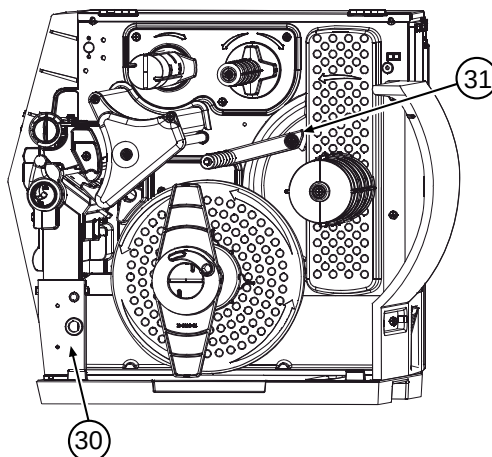


Item Number	Item Description
10	Center Plate Connector
11	Leveling Cam
12	Ribbon Idler Adjustment *
13	Printhead Latch
14	Media Sensor Slide Tab
15	Media Guide
16	Media Retainer
17	Powered Internal Rewinder Assembly *
18	Media Hub
19	Media Backstop
20	Ribbon Supply Hub *
21	Ribbon Take-Up Hub *

*Optional feature

1.1.2.1 Side View – User, H-6XXX & H-8308 Models

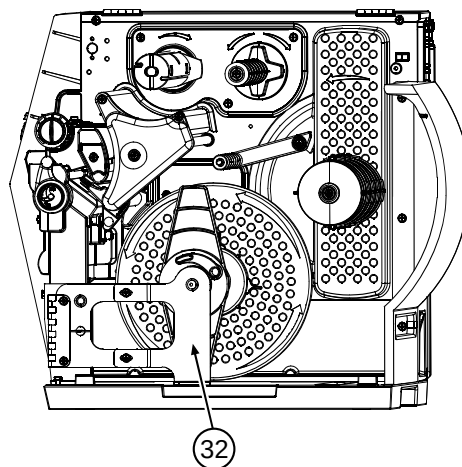
The following items are specific to wide model printers.



Item Number	Item Description
30	Platen Block Support
31	Bouncer Assembly

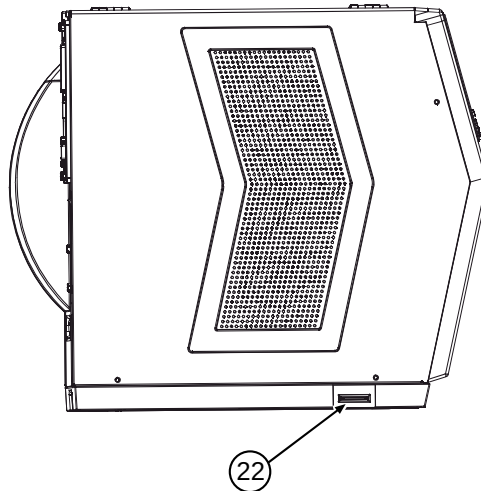
1.1.2.1.1 Side View – User, H-8308 Models

The following item is specific to H-8308 model printers equipped with the Powered Internal Rewind option.



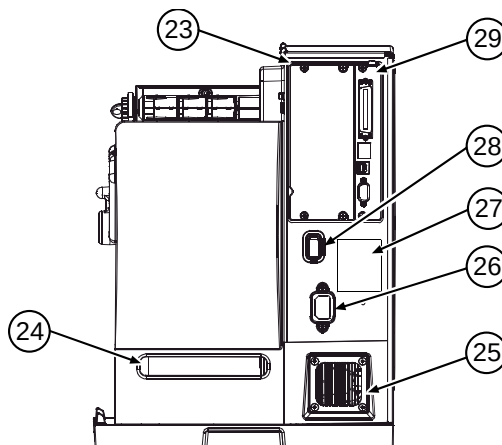
Item Number	Item Description
32	Rewinder Support Bracket Assembly

1.1.3 Side View - Electronics



Item Number	Item Description
22	SDIO Slot

1.1.4 Rear View



Item Number	Item Description
23	Card Cage
24	External Media Slot
25	Fan Filter
26	AC Receptacle
27	Serial Tag
28	Power Switch
29	Main Logic CCA

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 yyy	This sets the empty value - where 'yyy' is a numerical value representing the sensor reading when no media is installed.
5	Proceed according to the kind of media being calibrated: 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. Notched or Reflective Media -- Install media. Adjust the Media Sensor (per the table below), and then press the ESC Key. Continuous Media -- Install media. Position the Media Sensor (per the table below).	<i>For die-cut media:</i> SCAN BACKING PRESS ESC KEY yyy <i>- or, for reflective media:</i> SCAN MARK PRESS ESC KEY yyy	This sets the gap (or mark) value - where 'yyy' is a numerical value representing the sensor reading for the TOF indicator. <u>Do not</u> position a media perforation over the sensor when taking any sensor reading. If using media with small notches or reflective marks, ensure that the labels exit straight from the printer. <u>Do not</u> move the position of the Media Sensor following this step.

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 yyy	This sets the paper value - where 'yyy' is a numerical value representing the sensor reading for the media. If using preprinted media, ensure that the label area placed over the sensor is free of preprinted text, graphics, or borders.
7	Observe the display for the outcome of the calibration then press the ESC Key.	<i>For die-cut media:</i> GAP MODE CALIBRATION COMPLETE <i>- or, for reflective media:</i> REFLECTIVE MODE CALIBRATION COMPLETE <i>- or, for continuous media:</i> CONTINUOUS MODE CALIBRATION COMPLETE	Calibration was successful. 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>.

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 -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	

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	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. Use the UP, DOWN, LEFT, and RIGHT Buttons to set the Gain Number to 00 and then press the ENTER Key. Record the reading as a Label Value for Gain Number 00 in your table. 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.	TRAN SENSOR GAIN (0 - 31) YYY 00	The YYY value represents the current sensor reading. (The numbers given in this procedure are meant only as samples -- actual measurements will vary.) Do not position the Media Sensor under a perforation. The LEFT and RIGHT Buttons shift the cursor position.

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

Step	Action	Displayed Message	Comment(s)
7	Raise the printhead assembly and proceed according to your media type: - 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. Lower and latch the Printhead Assembly.	TRAN SENSOR GAIN (0 - 31) YYY 31	Do not position the Media Sensor under a perforation. Also, do not move the position of the Media Sensor after it has been adjusted.
8	Use the UP, DOWN, LEFT, and RIGHT Buttons to set the Gain Number to 00 and then press the ENTER Key. Record the reading as a TOF Value for Gain Number 00 in the table, as shown below. 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.	TRAN SENSOR GAIN (0 - 31) YYY 00	

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	Complete a table (see below) using new measurements, as follows: (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. (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). (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.	TRAN SENSOR GAIN (0 - 31) YYY 08	Where YYY is a numerical value representing the current sensor reading. The re-sampled values may differ from those previously recorded. This is normal; do not readjust the Media Sensor.

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

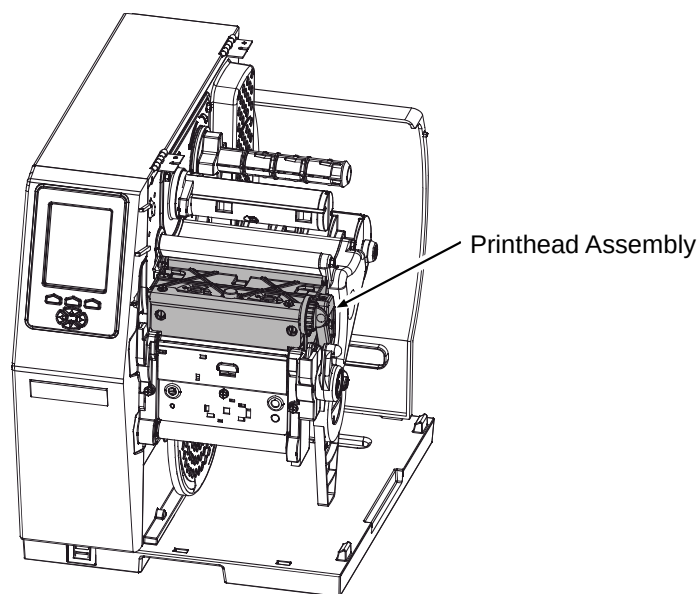
Step	Action	Displayed Message	Comment(s)
12	Press the ESC Key. Use the UP Button to scroll to PAPER SENSOR LEVEL (or, if using reflective media, REFL PAPER LEVEL) and then press the ENTER Key. Use the UP, DOWN, LEFT, and RIGHT Buttons to set the Paper value determined in Step 11 and then press the ENTER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

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.*

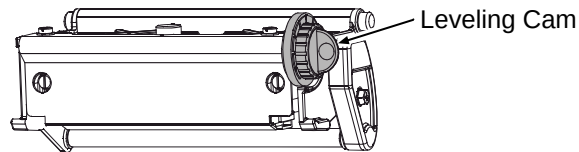
2.2 Printhead Assembly Adjustments

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.

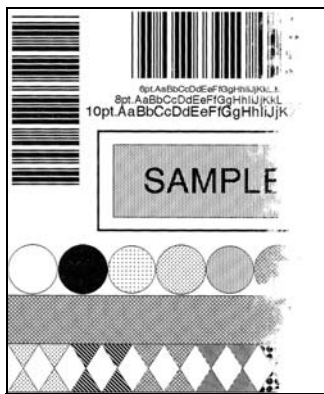


2.2.1 Leveling Cam

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:

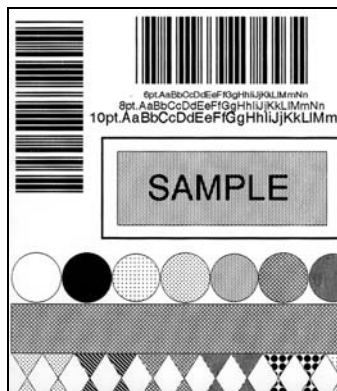


1. Load media. Select a host label format, or a resident format from the TEST Menu, and queue a batch of ten or more for printing.
2. Begin printing labels. Rotate the Leveling Cam counterclockwise into an over-adjusted position, so that the labels are produced as shown in Example 1, below.



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.

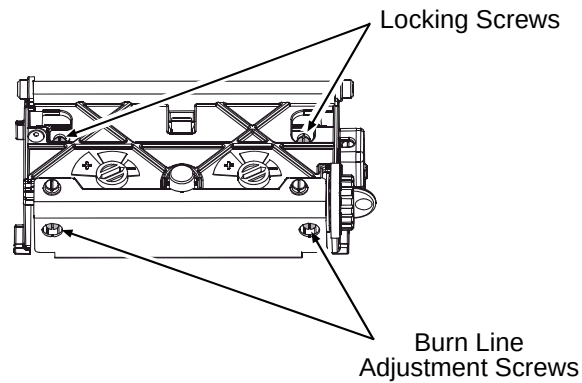


Example 2 – Proper adjustment produces a complete image with even print contrast across the label.

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.

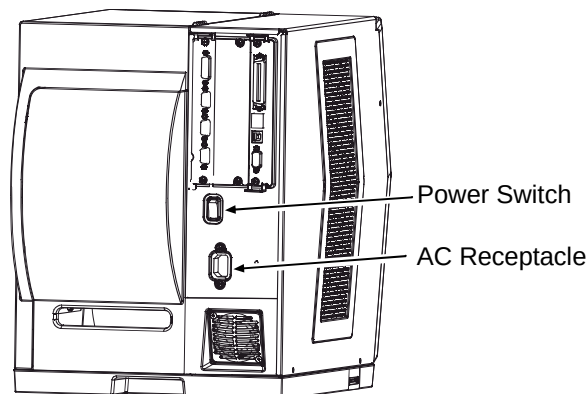
2.2.3 Printhead Voltage



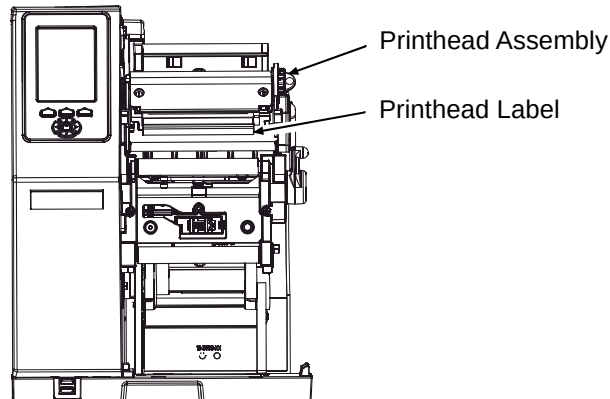
This procedure requires voltage measurement: Use extreme caution.

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:

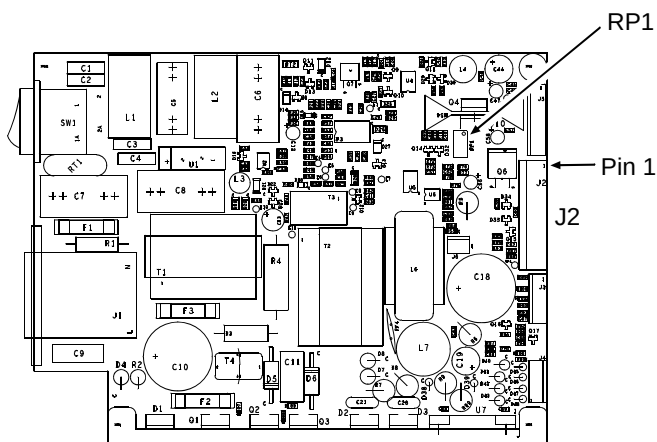
1. Turn OFF the **Power Switch** and unplug the power cord from the **AC Receptacle**.



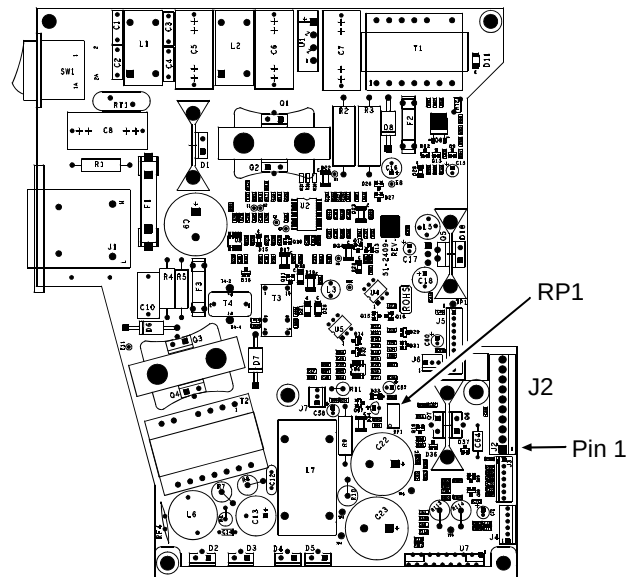
- Remove the Cover (see Section 4.1 for details). Raise the **Printhead Assembly**. Locate the attached **Printhead Label** and note the resistance value of the printhead. Make sure that media is loaded in the printer then lower and lock the **Printhead Assembly**.



- 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**.