Zebra *Xi*III™-Series

Maintenance Manual

48452L Rev. 2

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1 Introduction

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Description

The Zebra *Xi*III™-Series Thermal Transfer Demand Printers are versatile label and ticket printers designed to print high quality bar codes, various sizes and styles of alphanumeric characters, and graphics in either the thermal transfer or direct thermal mode. The *Xi*II-Series printers have the flexibility to meet a wide variety of applications. The Zebra Programming Language II (ZPL II®) allows the programmer to format the printed material. ZPL II is transparent to protocol converters and allows the *Xi*II-Series printers to be easily integrated with most systems and host mainframes.

Scope

This manual contains the information necessary for the proper maintenance of the Zebra 90*Xi*III™, the Zebra 140*Xi*III™, the Zebra 170*Xi*III™, and the Zebra 220*Xi*III™ printers. Information presented applies to all *Xi*II-Series models, unless otherwise indicated.

Section 1 (Introduction) provides an overview of the contents of this Maintenance Manual.

Section 2 (The Zebra *Xi*II-Series System) details the printer specifications, communication specifications, and a brief description of the front panel controls and indicators.

Section 3 (Printer Diagnostics) presents the diagnostic tests which are built into the *Xi*II-Series printers. Examples of the labels which print for most of these diagnostic tests are illustrated.

Section 4 (Preventive Maintenance) discusses the recommended cleaning procedures for the printer and the printhead. Recommended cleaning agents and a preventive maintenance schedule are specified.

Section 5 (Corrective Maintenance) provides disassembly, replacement and reassembly instructions for the *Xi*II printers. Required tools and test equipment are specified. Adjustment procedures are provided along with the required tensions, torques and tolerances. Instructions on AC power fuse replacement are also contained in this section.

Section 6 (Troubleshooting) contains troubleshooting tables showing symptom, diagnosis and action columns to assist the repair technician in quickly locating and repairing a printer fault. Example labels illustrate several common mechanical misalignment conditions and the best methods of adjustment.

Section 7 (System Repair) provides in-depth explanations of the operating and testing features of the *Xi*II-Series printers.

Section 8 (Mechanical Drawings and Parts Lists) contains mechanical assembly drawings and parts lists. Parts and assemblies common to all *Xi*II-Series models are illustrated along with their maintenance part numbers. Those parts that are specific to a particular model are individually identified.

Section 9 (Appendices) contains reference material which may assist the technician when installing and maintaining the printer.

Section 10 is available for the technician to add additional printed materials such as installation instructions provided with Option Kits and Replacement Parts Kits.

To ensure that you receive documentation updates, refer to the registration form at the front of this manual. Complete the registration form and return it to Zebra Technologies. In this way we can provide better service directly to the repair technician.

Related Manuals

The ZPL II® Programming Guide (Part # 46469L) provides information on printer commands and label formatting instructions.

Printer front panel operation and printer calibration procedures are provided in the *Xi*II-Series User's Guide (Part # 48460L) and are not repeated in this maintenance manual. Refer to the user's guide for this type of information.

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This section of the manual is intended to supplement the printer's user's guide by providing additional information to aid the service technician in troubleshooting and maintaining the printer.

Printer Specifications

Media Handling

- **Tear-Off mode:** Labels are produced in strips.
- **Rewind mode:** Requires the Media Rewind option. Labels are rewound internally onto a 3"-inner-diameter cardboard core.
- **Peel-Off mode:** Requires the Media Rewind option. Labels are dispensed and peeled from the liner which is rewound within the printer.
- **Cutter mode:** Requires the Cutter option. Media is cut into individual labels after printing.
- **Applicator mode:** Requires the Applicator Interface option. Labels are peeled from the liner and presented for use by an external applicator device.

Operator Controls

PAUSE, FEED, CALIBRATE and CANCEL Keys:

- PAUSE - pauses the printer and clears errors
- FEED - feeds a label
- CANCEL - cancels the current batch
- CALIBRATE - sets label length

Liquid Crystal Display (LCD) with 5 Membrane Keys:

- PREVIOUS - displays the previous selection
- SETUP/EXIT - enters and exits the Configuration Mode
- NEXT/SAVE - displays the next selection
- 2 unlabeled Black Oval Keys - change LCD Settings

The LCD and Membrane Keys are used to:

- Set communication parameters
- Set printing parameters
- Enable/disable continuous media mode
- Enable/disable media and ribbon sensor diagnostics
- Enable/disable communication diagnostics

Zebra Programming Language II (ZPL II®)

ASCII data commands provide the following features:

- Downloadable graphics, scalable and bitmap fonts and formats (with data compression)
- Bit image data transfer and printing, including mixing of text and graphics
- Format inversion
- Mirror image printing
- Four-position field rotation (0, 90, 180, 270 degrees)
- Slew command
- Programmable quantity with print pause
- Communicates in printable ASCII characters
- Controlled via mainframe, mini, PC, Zebra-Mate or other data-entry device
- Serialized fields
- In-spec OCR-A and OCR-B
- UPC/EAN at nominal 100% magnification Object copying between memory areas (RAM and memory card)
- Code Page 850 character set
- Adjustable print cache
- Automatic virtual input buffer management
- Automatic memory allocation
- User-programmable password
- Status message to host upon request
- Error-Checking Protocol
- Object copying between memory areas (RAM and Memory Card)

Bar Codes

The following bar codes are available:

- Code 11, Code 49, Code 93
- Code 39 (Supports ratios of 2:1, 3:1, 5:2, and 7:3)
- Code 128 (Supports serialization in all subsets B and C and UCC Case C Codes)
- CODABAR (Supports ratios of 2:1, 3:1 and 5:2)
- CODABLOCK and MAXICODE
- PDF 417 and POSTNET
- LOGMARS, Plessey and MSI
- Interleaved 2 of 5 (Supports ratios of 2:1, 3:1 and 5:2; also supports Modulus 10 Check Digit)
- Industrial 2 of 5, Standard 2 of 5
- EAN-8, EAN-13, EAN EXTENSIONS
- UPC-A, UPC-E, UPC EXTENSIONS
- Check digit calculation where applicable

Standard Printer Fonts

Fonts A, B, C, D, E, F, G, H, and GS are expandable up to 10 times, height and width independent. However, fonts E and H (OCR-A and OCR-B) are not considered "in-spec" when expanded.

The scalable smooth font Ø (CG Triumvirate™ Bold Condensed) is expandable on a dot-by-dot basis, height and width independent, while maintaining smooth edges. Maximum character size depends on the available memory.

IBM Code Page 850 international character sets are available in fonts A, B, C, D, E, F, G, and Ø through software control.

Note: Refer to the Options Section for available printer font options.

Font Matrices for 8 dots/mm Printhead

Font	Matrix			Type*	Character Size					
					Inches			Millimeters		
	Height	Width	Inter-character gap		Height	Width	Char./inch	Height	Width	Char./mm
A	9	5	1	U-L-D	0.044	0.029	33.90	1.13	0.75	1.33
B	11	7	2	U	0.054	0.044	22.60	1.38	1.13	0.89
C, D	18	10	2	U-L-D	0.088	0.059	16.95	2.25	1.50	0.67
E	28	15	5	OCR-B	0.138	0.098	10.17	3.50	2.50	0.40
F	26	13	3	U-L-D	0.128	0.079	12.71	3.25	2.00	0.50
G	60	40	8	U-L-D	0.295	0.236	4.24	7.50	6.00	0.17
H	21	13	6	OCR-A	0.103	0.093	10.71	2.63	2.38	0.42
GS	24	24	0	SYMBOL	0.118	0.118	8.48	3.00	3.00	0.33
Ø	Default: 15 x 12			U-L-D	Scalable					

* U = Uppercase, L = Lowercase, D = Descenders

Font Matrices for 12 dots/mm Printhead

Font	Matrix			Type*	Character Size					
					Inches			Millimeters		
	Height	Width	Inter-character gap		Height	Width	Char./inch	Height	Width	Char./mm
A	9	5	1	U-L-D	0.030	0.020	50.00	0.76	0.51	1.97
B	11	7	2	U	0.037	0.030	33.33	0.93	0.76	1.31
C, D	18	10	2	U-L-D	0.060	0.040	25.00	1.53	1.02	0.98
E	41	20	6	OCR-B	0.137	0.087	11.54	3.47	2.20	0.45
F	26	13	3	U-L-D	0.087	0.053	18.75	2.20	1.36	0.74
G	60	40	8	U-L-D	0.200	0.160	6.25	5.08	4.07	0.25
H	30	19	9	OCR-A	0.100	0.093	10.71	2.54	2.37	0.42
GS	24	24	0	SYMBOL	0.080	0.080	12.50	2.03	2.03	0.49
Ø	Default: 15 x 12			U-L-D	Scalable					

* U = Uppercase, L = Lowercase, D = Descenders

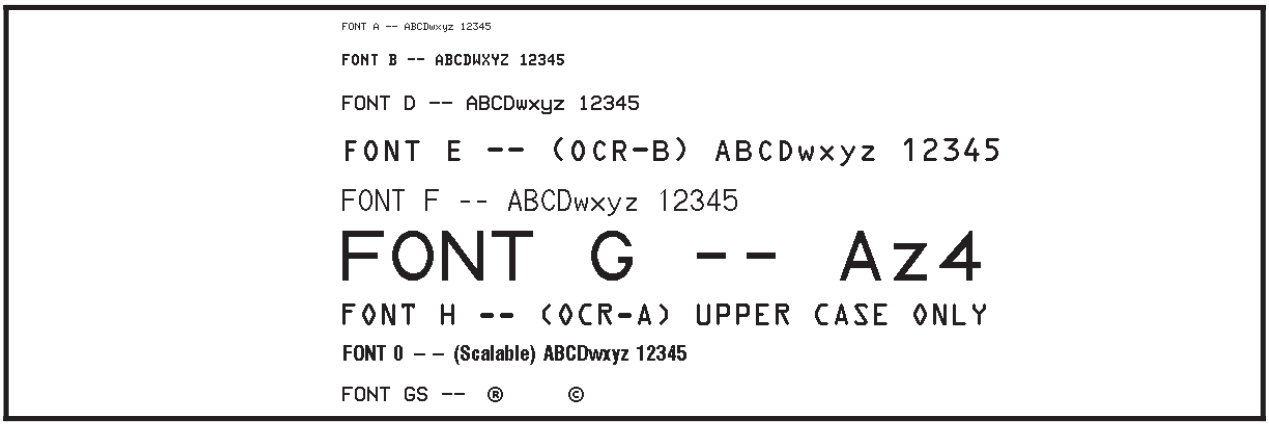


Figure 2.1 Default Fonts Examples

Media Considerations

Media Specifications		90*Xi*II		140*Xi*II		170*Xi*II		220*Xi*II	
Total media width	Maximum	3.54"	90 mm	5.59"	142 mm	7.17"	182 mm	8.8"	224 mm
	Minimum	0.79"	20 mm	1.57"	40 mm	2.0"	50.8 mm	4.25"	108 mm
Total thickness (includes liner)	Maximum *(If above 0.01", printhead position may need adjustment.)*	0.012"	0.30 mm	0.012"	0.30 mm	0.012"	0.30 mm	0.012"	0.30 mm
	Minimum	0.003"	0.076 mm	0.003"	0.076 mm	0.003"	0.076 mm	0.003"	0.076 mm
Core size		3.0"	76.2 mm	3.0"	76.2 mm	3.0"	76.2 mm	3.0"	76.2 mm
Maximum roll diameter		8.0"	203 mm	8.0"	203 mm	8.0"	203 mm	8.0"	203 mm
Interlabel gap (0.118"/3 mm preferred)		0.079" - 0.157"	2 - 4 mm	0.079" - 0.157"	2 - 4 mm	0.079" - 0.157"	2 - 4 mm	0.079" - 0.157"	2 - 4 mm
Black mark sensing	Minimum mark length (thickness)	.118”	3 mm	.118”	3 mm	.118”	3 mm	.118”	3 mm
	Minimum mark width (extending in from the edge)	.393”	10 mm	.393”	10 mm	.393”	10 mm	.393”	10 mm
Maximum internal fanfold media pack size (L x W x H)		8.0" x 3.54" x 4.5"	203 x 90 x 114 mm	8.0" x 5.59" x 4.5"	203 x 142 x 114 mm	8.0" x 7.17" x 4.5"	203 x 182 x 114 mm	8.0" x 8.8" x 4.5"	203 x224 x 114 mm

Ribbon Considerations

Ribbon Specifications			90*Xi*II		140*Xi*II		170*Xi*II		220*Xi*II	
Ribbon width *(To protect the printhead from wear, Zebra recommends using ribbon at least as wide as the media you are using.)*		Maximum	3.54"	90 mm	5.31“	135mm	6.89"	175mm	8.66"	220 mm
		Minimum	0.79"	20 mm	1.57"	40 mm	2.0"	50.8 mm	4.33"	110 mm
Standard lengths	2:1 media to ribbon roll ratio		984 ft	300 m	984 ft	300 m	984 ft	300 m	984 ft	300 m
	3:1 media to ribbon roll ratio		1476 ft	450 m	1476 ft	450 m	1476 ft	450 m	1476 ft	450 m
Roll size	Inner diameter of core		1.0"	25.4 mm	1.0"	25.4 mm	1.0"	25.4 mm	1.0"	25.4 mm
	Outside diameter of full ribbon roll		3.2"	81.3 mm	3.2"	81.3 mm	3.2"	81.3 mm	3.2"	81.3 mm

Printing Considerations

Printing Specifications		90*Xi*II	140*Xi*II	170*Xi*II	220*Xi*II
Resolution		300 dots per inch (12dots per mm)	203 dots per inch (8 dots per mm)	300 dots per inch (12 dots per mm)	203 dots per inch (8 dots per mm)
Dot size (square)		0.0033"x0.0039 (0.085x0.100 mm)	0.0049"x0.0049 (0.125x0.125 mm)	0.0033"x0.0039 (0.085x0.100 mm)	0.0049"x0.0049 (0.125x0.125 mm)
Maximum print width		3.42" (87 mm)	5.04 (128 mm)	6.61" (168 mm)	8.5" (216 mm)
Maximum print length	Standard memory	20" (508 mm)	30" (762 mm)	10." (254 mm)	16" (406 mm)
	With 8 Mbyte additional memory	39" (991 mm)	39" (991 mm)	39" (991 mm)	39" (991 mm)
Bar code modulus ("X") dimension		3.33 mil to 33.3 mil	5 mil to 50 mil	3.33 mil to 33.3 mil	5 mil to 50 mil
Printing Speeds		Configurable from 2"/sec (50.8 mm/sec) to 12"/sec (305.0 mm/sec) depending on the specific *Xi*II printer.			
Thin film printhead with Element Energy Equalizer (E^3)					

Printers' Physical Sizes

Physical Characteristics	90*Xi*II		140*Xi*II		170*Xi*II		220*Xi*II	
Height	15.5"	394 mm	15.5"	394 mm	15.5"	394 mm	15.5"	394 mm
Width	5.2"	133 mm	11.2"	286 mm	13.2"	337 mm	15.8"	401 mm
Depth	19.3"	490 mm	19.3"	490 mm	19.3"	490 mm	19.3"	490 mm
Weight (w/o options)	50 lbs.	23 kg	55 lbs.	25 kg	57 lbs.	26 kg	75 lbs.	34 kg

Electrical Requirements

- Autoselect 90-264 VAC; 48-62 Hz
- 5 Amps for entire AC voltage range
- 25 Watts standby power consumption
- 200/300/350/450 Watts maximum power consumption for 90*Xi*II/140*Xi*II/170*Xi*II/220*Xi*II respectively. (printing 100% black at 6 ips)
- UL 1950 Listed - Certified to CAN/CSA-C22.2 No. 950-M89 and IEC 950
- Complies with CISPR22B and with FCC and Canadian DOC class "A" rules
- Carries the CE mark of compliance

Environmental Operating Ranges

Temperature	Operating Thermal Transfer: +41°F to +104°F (+5°C to +40°C) Direct Thermal: +32°F to +104°F (0°C to +40°C)	
	Storage	-4°F to +140°F (-20°C to +60°C)
Non-condensing relative humidity	Operating	20% to 85%
	Storage	5% to 85%

Printer Options

- Media Cutter
- Cutter Tray
- Media Rewind
- Media Cutter/Rewind
- Fan Folded Media Supply Bin
- SIMM Memory Modules (1, 2, 4, 8 Mbyte)
- Memory Cards
- Font Cards
- Font ROMs
- IBM Twinax Interface
- IBM Coax Interface
- RS-485 Network Interface
- ZebraNet-Ethernet Interface: 10Base-T and 10Base-2
- Applicator Interface
- Media Supply Spindle
- KMT printhead (only available for the 140*Xi*II printer)

Communication Specifications

Serial Data Communication Interface Overview

The Zebra *Xi*II has a single Data Terminal Equipment (DTE) port which supports RS-232, RS-422 and RS-485 serial data communications. Baud rate, parity, data length, stop bits, and XON-XOFF or DTR control protocols are front panel selectable. Refer to Figure 2-2. A 25-pin DB25S connector at the rear of the printer provides the Data and Control Leads necessary to communicate through all three signalling methods. The method used is specific to the application of the printer.

For all RS-232 Data and Control input and output signals, the Zebra *Xi*II follows both the Electronic Industries Association's (EIA) RS-232 and the Consultative Committee for International Telegraph and Telephone (CCITT) V.24 specifications.

Communication Buffer

The *Xi*II-Series printer has a communication buffer that stores the incoming data until that information can be acted upon (imaged). Communication Handshaking (DTR/DSR control signals or X-ON/X-OFF control codes) is used to control when the host can send data to the printer.

The size of the buffer is 5000 characters. As data is received by the *Xi*II-Series printer, the processor monitors the number of characters in the buffer. If the buffer is filled beyond 4744 characters, the *Xi*II will turn the DTR control lead to the OFF condition (negative voltage) or transmit an X-OFF (DC-3) control character to the host. When the buffer empties below 4250 characters, the *Xi*II will turn DTR to the ON condition (positive voltage) or transmit an X-ON (DC-1) control character to the host.

Standard Serial Communication Connector

The DTE port is a DB25S connector located at the rear of the *Xi*II-Series printer. It provides connection to a host via RS-232, RS-422 or RS-485 signalling. Refer to Figure 2.2 for wiring diagrams.

The pinouts and signal descriptions for the DTE port are as follows:

Pin 1—Frame Ground for cable shield.

Pin 2—TXD (RS-232 Transmit Data): This lead is the serial data output from the *Xi*II-Series printer. It is on this lead that printer status or XON-XOFF information is relayed to the host.

Pin 3—RXD (RS-232 Receive Data): This is the serial data input to the XiII-Series printer from the host.

Pin 4—RTS (RS-232 Request To Send): This is a control output from the *Xi*II-Series printer to the host. RTS is active (positive voltage) when the printer is powered ON. An Active RTS indicates that the printer is ready to receive data.

Pin 6—DSR (RS-232 Data Set Ready): This is a control input to the *Xi*II-Series from the host. The printer monitors this lead to determine if the host is ready to receive data/status from the printer.

Pin 7—Signal Ground for RS-232: This lead serves as the voltage reference between the interfaced devices and is DC coupled to Frame Ground inside the printer.

Pin 9—+5VDC Source (750mA maximum)

Pin 11—RS-422/RS-485 Signal Ground Reference

Pin 13—RS-422/RS-485 Data Input B(-)

Pin 14—RS-422/RS-485 Data Output B(-)

Pin 16—RS-422/RS-485 Data Input A(+)

Pin 19—RS-422/RS-485 Data Output A(+)

Pin 20—DTR (RS-232 Data Terminal Ready): This lead is a control output from the *Xi*II-Series printer to the host. When the DTR control line from the printer is active (positive voltage), the host is allowed to send data to the printer.

When DTR is inactive (negative voltage), the host may not send data to the *Xi*II-Series printer. This condition occurs when the printer is configured for DTR/DSR hardware handshaking and the communication buffer is within 256 characters of its capacity.

Pins 5, 8, 10, 12, 15, 17-18 and 21-25 are not used and are unterminated.

Rear Panel Interface Connections

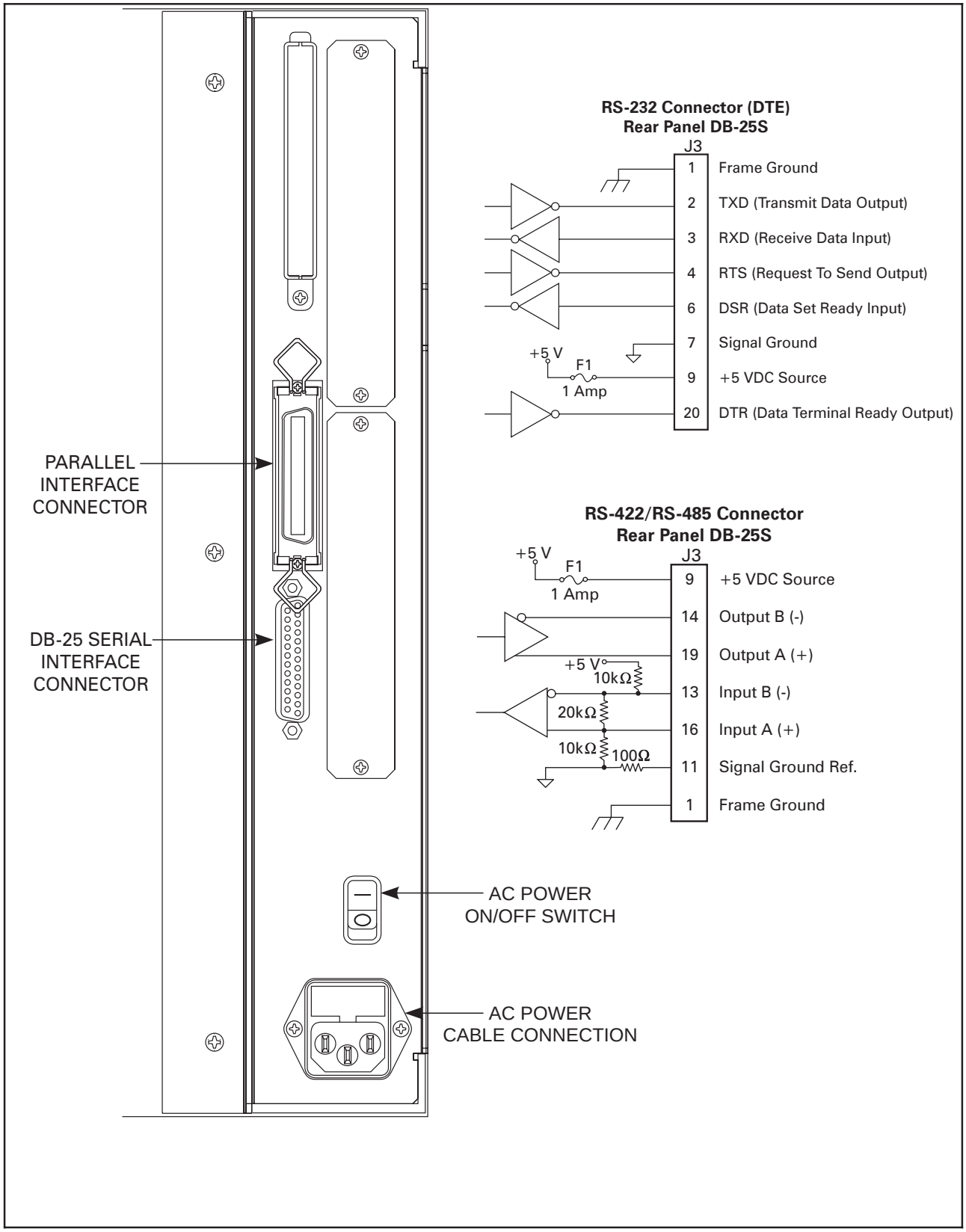


Figure 2.2 Interface Connections

Serial Communication Signal Levels

Refer to Figure 2.3. RS-232 Data Signals are defined as either MARK or SPACE while Control Signals are either ON (Active-Positive Voltage) or OFF (Inactive-Negative Voltage). Although the permitted voltage levels can range from ±3VDC to ±25VDC, the levels for the *Xi*II-Series printer are as follows:

RS-232 Transmit and Receive Data

MARK or OFF = –7 to –10 VDC
SPACE or ON = +7 to +10 VDC

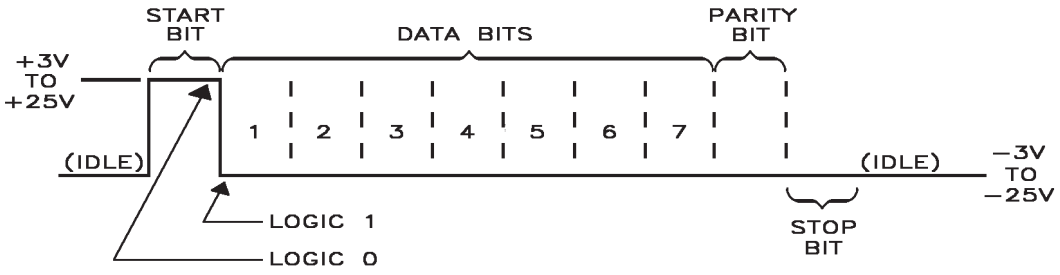


Figure 2.3 RS-232 Signalling

Refer to Figure 2.4. RS-422 and RS-485 Data Signals are also either MARK or SPACE. The voltage levels are +5 VDC and 0 VDC when monitored from a specified reference point. The levels for the *Xi*II-Series printer, when referenced to Signal Ground are:

RS-422 and RS-485 Transmit and Receive Data

MARK	Output/Input A = +5V and Output/Input B = 0V
SPACE	Output/Input A = 0V and Output/Input B = +5V

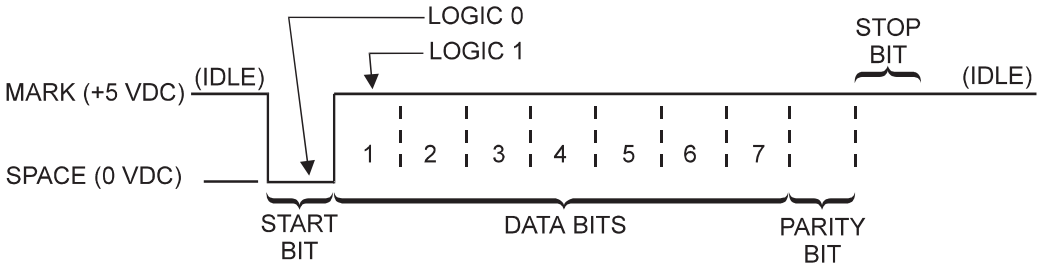


Figure 2.4 RS-422/RS485 Signalling

Communication Code

The *Xi*II-Series printer sends and receives ASCII (American Standard Code for Information Interchange) characters in either a Serial Data or Parallel Data format.

NOTE: When using the Serial Data format, the baud rate, number of data and stop bits per character, and parity are selectable. Parity only applies to data transmitted by the *Xi*II-Series printer. For received data, the Parity bit is ignored.

Parallel Data Communications Interface Overview

Refer to Figure 2-2. A standard 36-pin Centronics® Parallel Interface Connector is available at the rear of the printer for connection to a parallel data source. The Parallel Interface receives data from the data source but cannot send back printer status information over this port. When the Parallel Data Port is used, the standard RS-232 Port will not function as an Input Port. However, if the *Xi*II-Series printer receives a "Printer Status Request" command over the Parallel Port, it will send information back over the Standard RS-232 Port.

Parallel Port Connector

The following table shows the pin configuration and function of a standard PC-to-Printer Centronics® Parallel cable.

Pin No.	Parallel Data Port Signal Description
1	The **nStrobe** printer input has internal 3.3k ohm pull-up resistors to 5V (I_{OL}= 1.5mA) and is designed to receive a signal driven open collector V_{OL} <= 0.8V. This pin is a signal from the host computer.
2 - 9	**DATA** inputs have TTL input characteristics with internal 3.3k ohm pullups and represent 1 TTL unit load or less. The DATA inputs are positive logic with a HIGH voltage level corresponding to a logic 1. Pin 2 through Pin 9 = D0 through D7 respectively.
10	The **nAck** output is an active LOW pulse indicating that the printer is ready to accept data. The active LOW state precedes BUSY by 7 microseconds. nAck is driven open collector with a 3.3k ohm internal pull-up. The output sinks 7 mA to a V_{OL} <= 0.4V.
11	The **Busy** output is active HIGH whenever the printer cannot accept data due to conditions such as: Buffer Overflow, Head Open, Over Temperature, and Media Error. Busy is driven open collector with a 3.3k ohm internal pull-up. The output sinks 7 mA to a V_{OL} <= 0.4V.
12	The **PError** signal is active HIGH whenever the printer is out of media or ribbon.
13	The **Select** signal function is determined by a configuration option which becomes active when the port is selected. In the default condition, Select is active HIGH whenever the parallel port is powered up and the parallel port is enabled. In the non-default condition, Select will go active LOW whenever the printer is printing.
14	**nAutoFd**
15	Not defined
16	**Logic Ground**
17	**Frame Ground** - is at the same potential as Logic Ground (pin 16).
18	**Fused 5 VDC Supply** - 750 mA maximum. (Internal Fuse Protected)
19 - 30	**SIGNAL GROUNDS** are the Logic Grounds and Returns for all Input and Output signals.
31 - 35	NOT USED - These leads should be left unconnected.
36	**nSelectIn**

Optional Interface Boards

For information about the IBM® plug-compatible Twinax Interface, the IBM® plug-compatible Coax Interface, the ZebraNet-Ethernet Interface, the RS-485 Network Interface, or the Applicator Interface, refer to the instructions which accompany the Interface Option Kits.

Front Panel Controls and Indicators

Front Panel Status Indicators

The Status Indicators of the *Xi*II-Series printer are located on the Front Panel.

POWER Status Indicator: Controlled by the Power ON/OFF Switch located at the rear of the printer. Normally ON to indicate that Primary Power is applied to the printer. When OFF, indicates Power is removed.

TAKE LABEL Status Indicator: (Peel-Off Mode Only) This Indicator is operative only in the Peel-Off Mode. The Indicator will Flash when a label has been printed and is ready to be removed from the *Xi*II-Series printer. The *Xi*II will not print until the label is taken. It may, however, accept label formats if the buffer is not yet full.

When the label is taken, the Indicator will stop flashing and the next label, if any, will be printed.

ERROR Status Indicator: Normally OFF. Flashes ON and OFF when a printer error occurs. Read the Front Panel LCD for diagnostic information.

CHECK RIBBON Status Indicator: Normally OFF.

Direct Thermal Mode: ON if Ribbon is installed in the printer.

Thermal Transfer Mode: ON if Ribbon is not installed or when the end of the ribbon has advanced beyond the ribbon sensor. The Indicator turns OFF when the printer detects a ribbon in the printhead.

PAPER OUT Status Indicator: Normally OFF. ON if Media is not installed or when the media has advanced beyond the programmed or learned label length and no label edge or marker has been detected.

The Indicator turns OFF when the printer detects a media edge or marker AFTER the PAUSE switch is pressed when media is reloaded.

PAUSE Status Indicator: Normally OFF.

When the PAUSE Key is pressed, the PAUSE Indicator will light and printing will stop. When the PAUSE Key is pressed again, the PAUSE Indicator turns OFF and printing resumes.

The PAUSE Indicator will light under the following conditions:

- Pressing the PAUSE Key.
- Detection of a PAPER OUT condition.
- A programmed PAUSE is encountered in the label program.
- Detection of a RIBBON OUT condition.
- Printhead is opened.
- If the Printhead is too hot or too cold, PAUSE flashes and the LCD displays “TEMP OUT RANGE”. Printing will resume automatically when the printhead reaches operating temperature.

DATA Status Indicator: ON indicates that Data Processing or Printing is taking place, but no data is being received. OFF indicates that no data is being received or processed. FLASHING indicates that Data is being received. (Flashing slows down when the printer is unable to accept any more data due to the Data Input Buffer being full. Flashing returns to normal rate when the Data Input Buffer is no longer full and data is once again being received.)

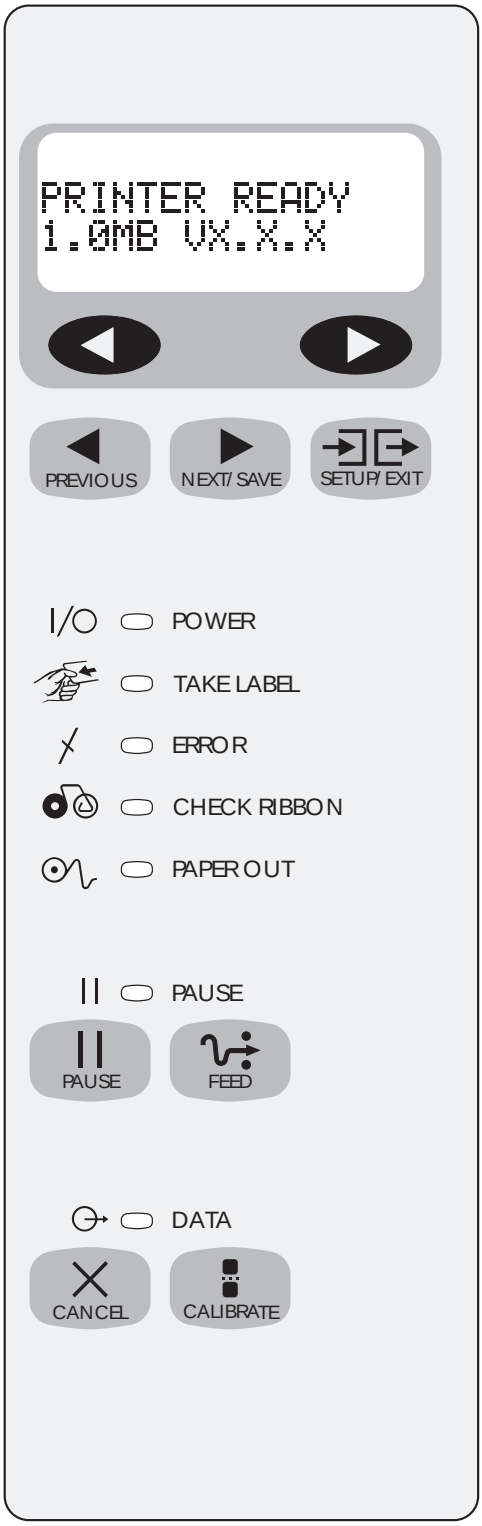


Figure 2.5 Front Panel Controls

Front Panel Keys

The Front Panel Keys shown in Figure 2.3 control the various printer operations.

PREVIOUS, NEXT/SAVE and SETUP/EXIT Keys: *See the description under Liquid Crystal Display (LCD) on page 2-13.*

PAUSE Key: Allows the operator to interrupt the printing of a batch of labels and then complete the batch by pressing the key a second time.

When this key is pressed, printing will stop after the label being printed is completed. The PAUSE Indicator will light. Label counter stops but maintains count balance and holds data in memory.

When the key is pressed again, the PAUSE Indicator goes out and printing is resumed.

FEED Key: In order to prevent accidental loss of data, this key is ignored unless the printer is not printing, is between formats, or is first PAUSED (see PAUSE Key above). Pressing this key causes the media to advance until one of the following occurs:

- The media advances to the start of the next label.
- A Paper Out condition is encountered.

Pressing the FEED Key while turning the power ON causes a printer Self Test Label to be automatically printed at the end of the Power ON Self Test.

CANCEL Key: This key is ignored unless the printer is first PAUSED (see PAUSE Key above) in order to prevent accidental loss of data. Pressing the CANCEL Key removes the current batch printing from the Print Data Buffer.

Each subsequent pressing of the CANCEL Key clears the next batch, if any, from the Print Data Buffer until the Buffer is empty.

Pressing the CANCEL Key while turning the power ON causes the printer Configuration Label to be automatically printed at the end of the Power ON Self Test.

CALIBRATE Key: This key is ignored unless the printer is first PAUSED (see PAUSE Key above) in order to prevent accidental loss of data. Pressing this key once causes the printer to recalibrate the Media and Ribbon Sensors for proper Media Length, set media type (continuous or non-continuous) and set printer mode (direct thermal or thermal transfer).

Liquid Crystal Display and Membrane Keys

The two-line, sixteen-character, liquid crystal display (LCD) and five membrane keys below it are used to program print and communication parameters and to display operator messages. The keys and their functions are:

BLACK OVAL KEYS: The function of the two black oval keys depends on the parameter being displayed. They are normally used to scroll through multiple setting choices or increase/decrease variable parameters such as burn temperature.

PREVIOUS: Scrolls back to the previous parameter.

NEXT/SAVE: Scrolls forward to the next parameter.

SETUP/EXIT: Enters and exits the Configuration Mode.

NOTES

3 Printer Diagnostics

In this section... Page

Test routines are built into the Zebra *Xi*II Series Printers to aid the technician in diagnosing faults. Some of these tests are enabled by pressing a front panel key while turning the Printer Power Switch ON.

Power On Self Test

A Power ON Self Test (POST) is performed each time the Printer is turned ON. This test checks for proper initialization of various electronic circuits and establishes starting parameters as those stored in the printer's memory. During this test sequence, the front panel LEDs will turn ON and OFF to insure proper operation.

At the end of this Self Test, only the POWER LED will remain lit. If other LEDs are also lit, refer to Section 6 (Troubleshooting) in this manual.

If the printer is set up for non-continuous media, one or more labels will feed out, up to a maximum length of one label plus three additional inches of media.

To initiate the Power On Self Test (POST), turn the Printer ON using the Power Switch in the rear. The front panel Power On indicator will light. The other front panel LEDs and the Liquid Crystal Display (LCD) monitor the progress and indicate the results of the Self Test. The normal Self Test sequence is shown on the following page.

1.		All LEDs turn ON simultaneously, then turn OFF in sequence starting at the bottom through the following steps.
2.	SRAM Test	SRAM functionality test performed.
3.	Option ROM Test	Option ROM functionality test is performed. (The words “Not Installed” will be added to the display if no ROM is used.)
4.	Printhead Test	Printhead is checked for proper operation.
5.	Processor Test	Processor functionality test is performed. (The word “Failed” will be added to the display if the test does not pass.)
6.	E-Cubed Test	E-Cubed functionality test is performed. (The word “Failed” will be added to the display if the test does not pass.)
7.	EEPROM Test	EEPROM functionality test is performed. (The word “Failed” will be added to the display if the test does not pass.)
8.	Memory Card Test	Optional Memory Card functionality test is performed. (The words “Not Installed” will be added to the display if no card is present.)
9.		The ^**MF** command causes the printer to feed to the first web or label length, calibrate Ribbon and Media Sensors, set Label Length and feed one or more labels.
10.	PRINTER READY x.x MB Vx.x.x	Printer Ready For Operation. Refer to the Configuring to the Application Section to set specific parameters.

NOTE: Refer to the Troubleshooting Section if the printer stops during the Power On Self Test due to failing a test.

Printer Self Tests

Introduction

These Self Tests produce sample labels and provide specific information which helps determine the operating conditions for the printer.

Each Self Test is enabled by pressing in a specific front panel key while turning the Power Switch ON. Keep the key pressed until the front panel LEDs turn ON.

When the Power On Self Test is completed, the selected Printer Self Test will automatically start.

NOTE: When performing Self Tests, all Data Interface Cables should be disconnected from the printer.

It is recommended that Full Width media be used when performing these Tests. Labels less than full width in size will lose printing on the right side. Label length will determine the amount of printing starting at the top of the label.

In the Peel-Off mode, the printer does not pause while performing these Self Tests. The Operator must remove the labels as they become available.

When Canceling a Self Test prior to its actual completion, always turn the printer Power OFF and then back ON to reset the printer.

CANCEL Key Self Test

This Self Test prints a single label which contains a listing of the printer's current configuration parameters stored in Configuration (EEPROM) Memory. Press the CANCEL key while turning the AC Power Switch ON. See Figure 3.1.

The Configuration may be changed either temporarily (for specific label formats or ribbon and label stock), or permanently (by saving the new parameters in EEPROM Memory.) Saving new parameters occurs whenever a Printer Configuration procedure is performed. Refer to the User's Guide for further details on the Printer Configuration procedure.

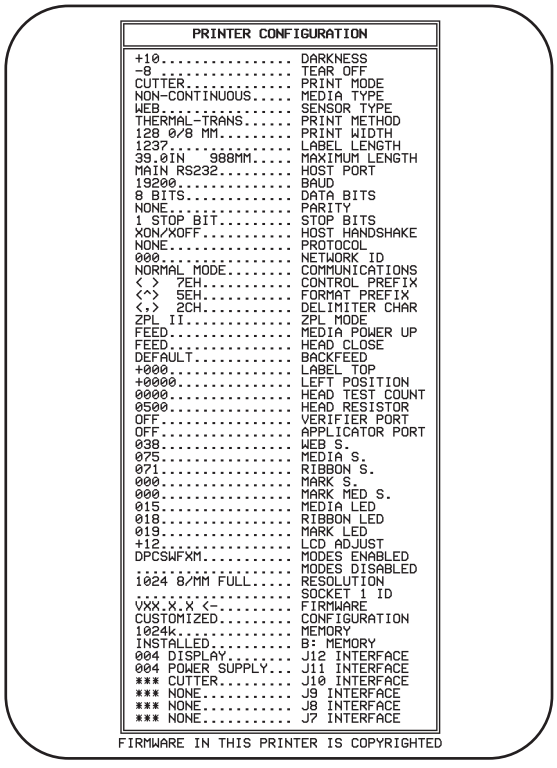


Figure 3.1 Cancel Key Test Sample Label

PAUSE Key Self Test

This Self Test is actually comprised of four individual test features.

1. The initial Self Test prints 15 labels at a speed of 2″ per second; then automatically PAUSES the printer. Each time the PAUSE key is pressed, an additional 15 labels will print.
2. While the printer is PAUSED, pressing the CANCEL key once alters the Self Test. Now each time the PAUSE key is pressed the printer prints 15 labels at a speed of 6″ per second.
3. While the printer is PAUSED, pressing the CANCEL key a second time alters the Self Test again. Now each time the PAUSE key is pressed the printer prints 50 labels at a speed of 2" per second.
4. While the printer is PAUSED, pressing the CANCEL key again alters the Self Test a third time. Now each time the PAUSE key is pressed, the printer prints 50 labels at a speed of 6" per second.
5. While the printer is PAUSED, pressing the CANCEL key again alters the Self Test a fourth time. Now each time the PAUSE key is pressed, the printer prints 15 labels at the printer's fastest speed. (8" per second for the 90*Xi*II and 170*Xi*II - 10" per second for the 220*Xi*II - 12" per second for the 140*Xi*II.)

This Self Test can be used to provide the Test Labels required when making adjustments to the Printer's Mechanical Assemblies. See the label example in Figure 3.2.

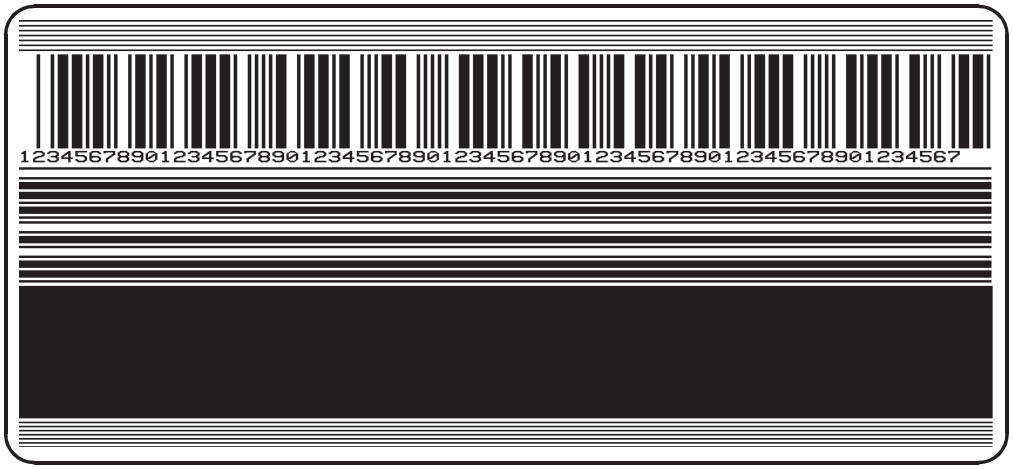


Figure 3.2 Pause Key Test Sample Label

FEED Key Self Test

NOTE: The CANCEL Key Self Test should be performed prior to this Self Test.

Information on the printed "Configuration" Label (CANCEL key Self Test) will be used with the results of this Self Test to determine the best Darkness Setting for a specific Media/Ribbon combination.

The FEED Key Self Test Label will print out at various PLUS or MINUS Darkness settings relative to the Darkness value shown on the Configuration Label. Inspect these labels and determine which one has the best darkness setting for the application. This value can be entered into the printer by configuring the "Setting Darkness" parameter found in Configuration Section of the User Guide. See the label example in Figure 3.3 below.

The value printed on the selected test label is added to (plus) or subtracted from (minus) the "Darkness" value specified on the Configuration Label.

The resulting numeric value (0 to 30) is the best darkness value for that specific Media/Ribbon combination and should be entered as the "Darkness" parameter.

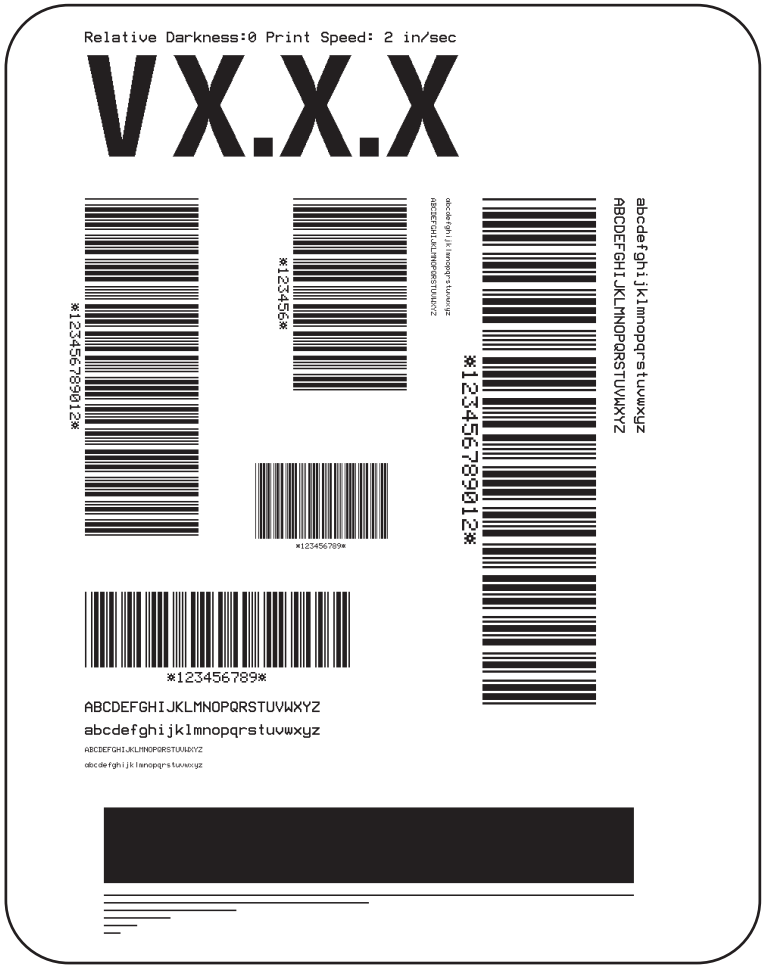


Figure 3.3 Feed Key Test Sample Label

Communications Diagnostics Test

This test is controlled by configuring the "Setting Communications Mode" parameter found in the Configuration Section of the printer's user's guide. Refer to Figure 3.4 for a sample label resulting from this test.

NOTE: This label will be inverted when printed.

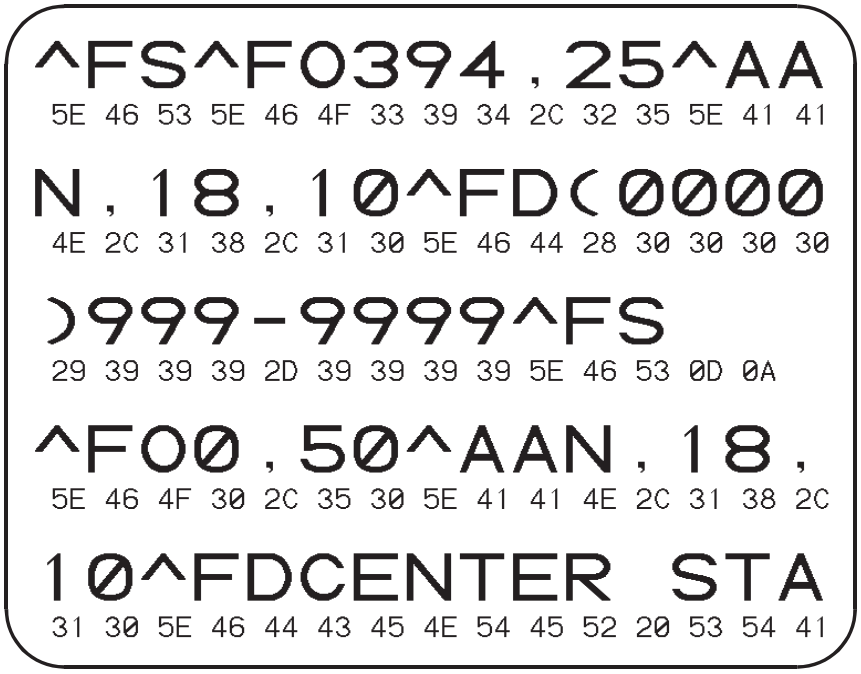


Figure 3.4 Results of Communications Diagnostic Test

FEED Key and PAUSE Key

To temporarily reset the Printer Configuration to the Factory Default values, press these two keys at the same time, while turning the Power ON. The Factory Default values will be active until power is turned OFF. **If Factory Default values are "Saved" during configuration, a Media Calibration procedure must be performed and some parameters must be reconfigured.** Refer to the printer's user's guide for more details.

Table 3.1 indicates which printer function controls each of the configuration parameters.

Parameter	Controlled By
Darkness	Configuration or ZPL II
Tear Off	Configuration or ZPL II
Print Mode	Configuration or ZPL II
Media Type	Configuration or ZPL II
Sensor Type	Configuration or ZPL II
Print Method	Configuration or ZPL II
Print Width	Configuration or ZPL II
Label Length	Calibrate key, configuration or ZPL II
Maximum Length	Configuration or ZPL II
Host Port	Configuration
Baud	Configuration
Data Bits	Configuration
Parity	Configuration
Stop Bits	Configuration
Host Handshake	Configuration
Protocol	Configuration
Network ID	Configuration or ZPL II
Control Prefix	Configuration or ZPL II
Format Prefix	Configuration or ZPL II
Delimiter Char	Configuration or ZPL II
ZPL Mode	Configuration or ZPL II
Media Power Up	Configuration or ZPL II
Head Close	Configuration or ZPL II
Backfeed	Configuration or ZPL II
Label Top	Configuration or ZPL II
Left Position	Configuration or ZPL II
Head Test Count	Configuration or ZPL II
Head Resistor	Configuration or ZPL II
Verifier Port	Configuration or ZPL II
Applicator Port	Configuration or ZPL II
Web S.	Configuration or ZPL II
Media S.	Configuration or ZPL II
Ribbon S.	Configuration or ZPL II
Mark S.	Configuration or ZPL II
Mark Med S.	Configuration or ZPL II
Media Led	Configuration or ZPL II
Ribbon Led	Configuration or ZPL II
Mark Led	Configuration or ZPL II
LCD Adjust	Configuration
Modes Enabled	Configuration or ZPL II
Modes Disabled	Configuration or ZPL II
Resolution	Configuration or ZPL II

Table continued on following page.

Table 3.1 Configuration Parameter Controls

Parameter	Controlled By
Socket 1 ID	Hardware
Firmware	Hardware
Configuration	Hardware
Memory	Hardware
B: Memory	Hardware
J12 Interface	Hardware
J11 Interface	Hardware
J10 Interface	Hardware
J9 Interface	Hardware
J8 Interface	Hardware
J7 Interface	Hardware

Table 3.1 Configuration Parameter Controls (con't)

PAUSE Key and CANCEL Key Self Test

This self test can be used to verify proper printer operation after parts have been replaced or adjusted. When activated, the printer prints a maximum of 500 Head Test Labels. Each label backfeeds prior to printing and feeds forward to the rest position after printing. A serialized number will print on each label. Press the PAUSE key or turn the printer power OFF to stop printing. See Figure 3.5 for a sample label.

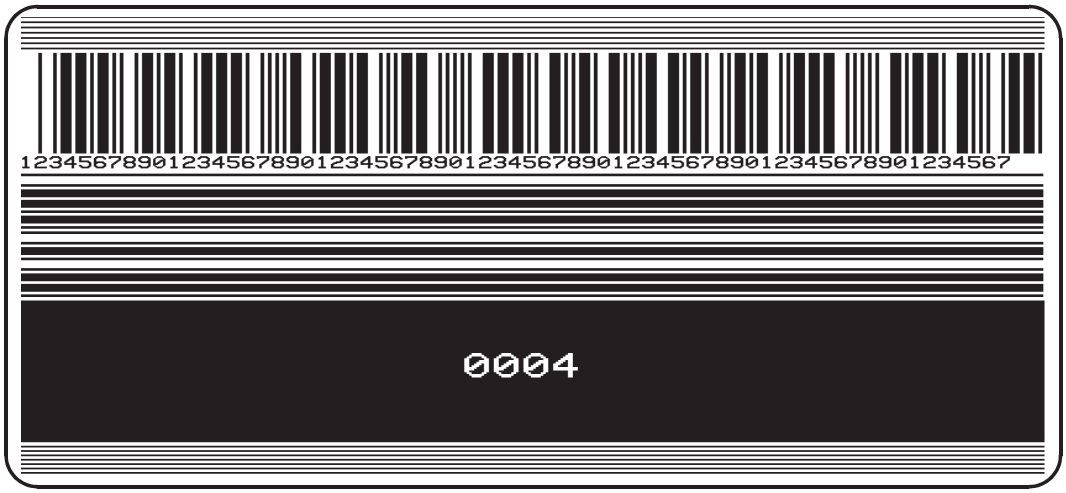


Figure 3.5 PAUSE Key and CANCEL Key Self Test Label

FEED Key and CANCEL Key

This self test is normally performed during the manufacturing process or after a major overhaul of the mechanical assemblies. This test prints seven pre-programmed label formats, first at a speed of 6″ per second, then the same formats at a speed of 2″ per second. The printer will automatically PAUSE after each format. The sequence of label formats is shown in Table 3.2. Refer to Figures 3.7 through 3.13 for sample labels.

FORMAT	PRINTING	TEST FUNCTION
1	20 at 6" per second	Left Ribbon Wrinkle Test
2	20 at 6" per second	Right Ribbon Wrinkle Test
3	20 at 6" per second	Bar Code Wrinkle Test (Code-39)
4	20 at 2" per second	Left Ribbon Wrinkle Test
5	20 at 2" per second	Right Ribbon Wrinkle Test
6	20 at 2" per second	Bar Code Wrinkle Test (Code-39)
7	10 at 6" per second	Useable Area Test
8	10 at 6" per second	Head Temperature Test
9	10 at 6" per second	Upper Smear Test
10	10 at 6" per second	Lower Smear Test
11	10 at 2" per second	Useable Area Test
12	10 at 2" per second	Head Temperature Test
13	10 at 2" per second	Upper Smear Test
14	10 at 2" per second	Lower Smear Test

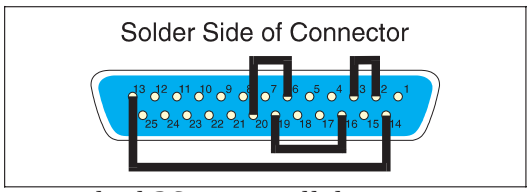
Table 3.2 FEED Key and CANCEL Key Label Formats

Extended Printer Diagnostics

Additional Diagnostic Tests are available for Printhead Assembly Adjustments. These Diagnostic Tests are only accessible when the Data Interface Cable is disconnected from the printer and a Loopback Connector is attached in its place.

The Serial Loopback Connector is a 25-pin “D” Type (DB25P- Male) style with the following pins tied together.

- pins 2 and 3
- pins 6 and 20
- pins 13 and 14
- pins 16 and 19



The Parallel Loopback Connector is a standard 36-pin parallel connector mounted to a small Circuit Board. This connector is available from Zebra Technologies as Part # 44680.

For each of these Diagnostic Tests, the printer will “Transmit” the Test Label Format out of the Data Interface Connector to the Loopback Connector. The Loopback Connector passes the Test Label Format back to the printer as Receive Data and the Test Label is printed.

PAUSE Key Loopback Test

This test demonstrates the media movement capabilities of the printer and provides a test label to view while making print quality adjustments.

With the Loopback Connector in place, press the PAUSE key while turning the AC Power Switch ON.

After the Power On Self Test, the printer will print 500 Head Test labels. Each label will backfeed prior to printing and feed to the rest position after printing.

A serialized number will print on each label for label comparison purposes if required. See the label example in Figure 3.6 below.

The PAUSE key can be used to stop and restart the printing operation.

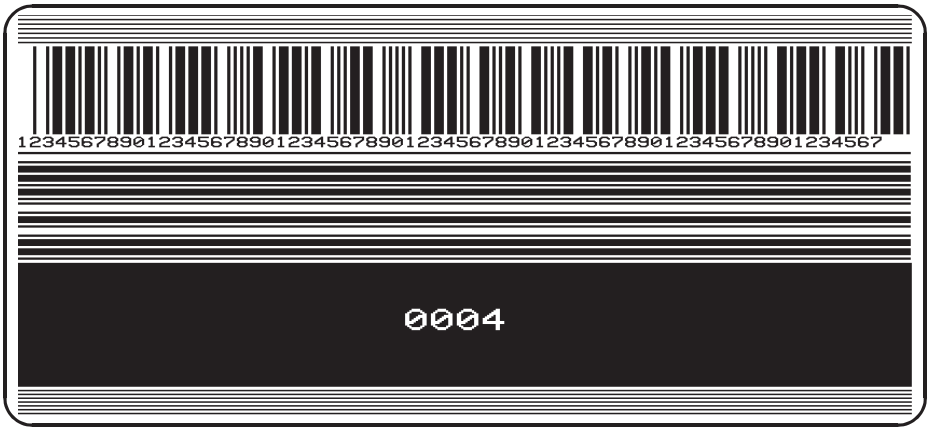


Figure 3.6 PAUSE Key Loopback Test Label

FEED Key Loopback Test

With the Loopback Connector in place, press the FEED key while turning the AC Power Switch ON.

After the POST, the printer will begin printing the same series of label formats as shown in Table 3.2 for the FEED Key/CANCEL Key test. The printer will PAUSE at the end of each printed format. Press the PAUSE key to begin printing the next format. Refer to the label examples in Figures 3.7 through 3.13.

The PAUSE Key can be used to stop and restart the printing operation. When the printer is paused, the CANCEL key can be used to move to the next label format.

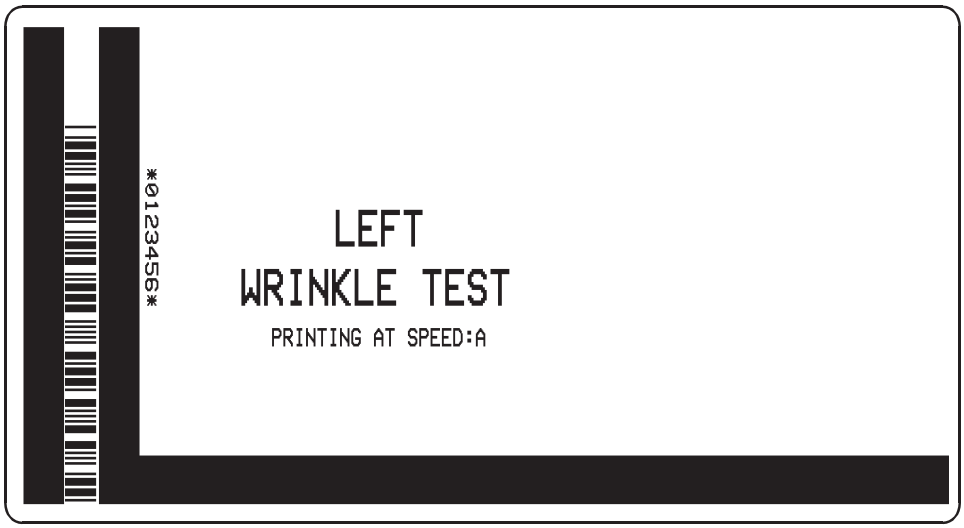


Figure 3.7 Format 1 (4) Test Label

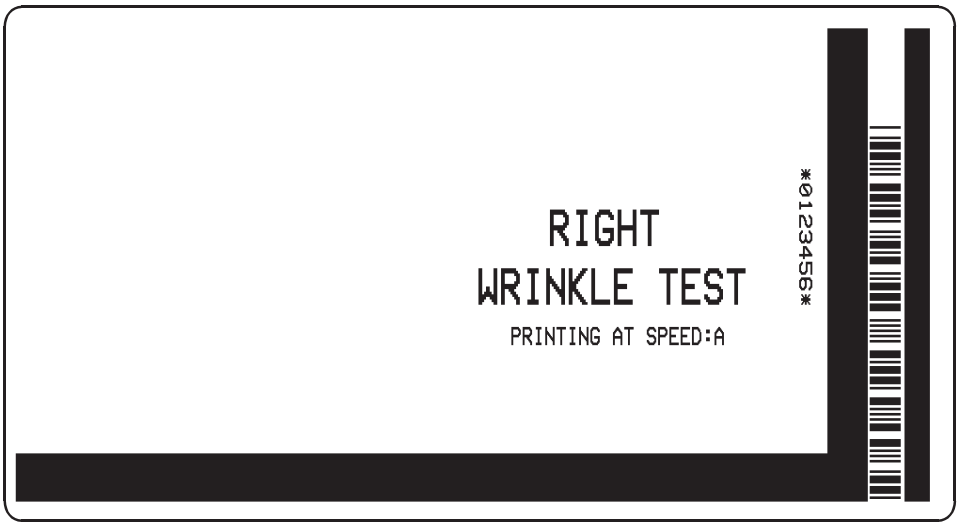


Figure 3.8 Format 2 (5) Test Label

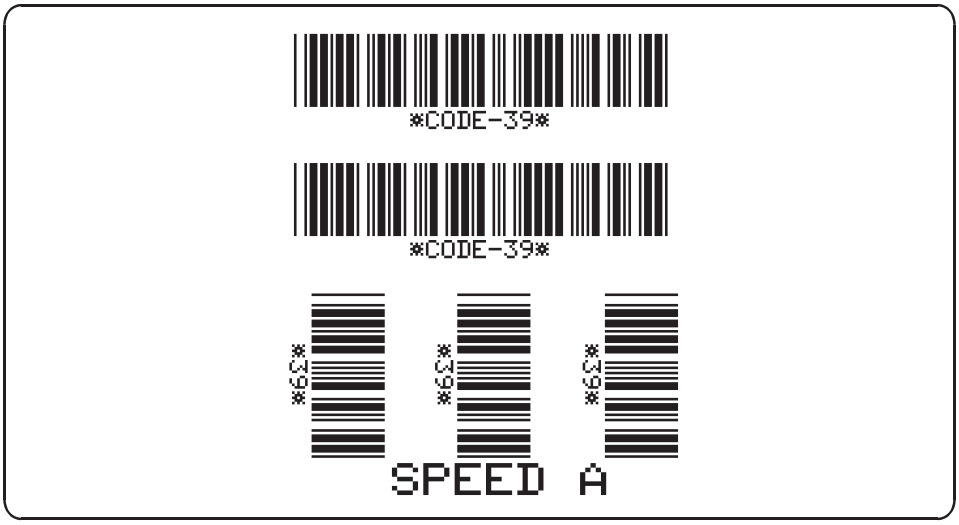


Figure 3.9 Format 3 (6) Test Label

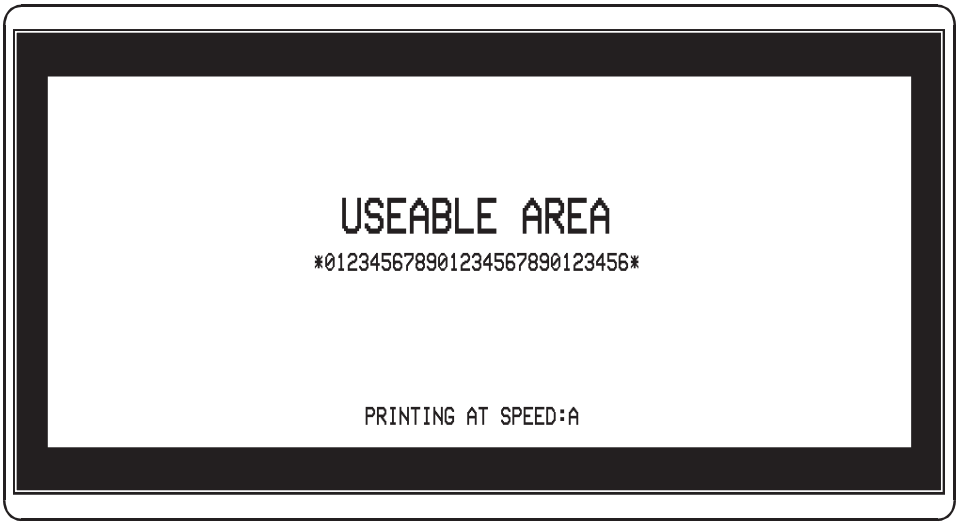


Figure 3.10 Format 7 (11) Test Label

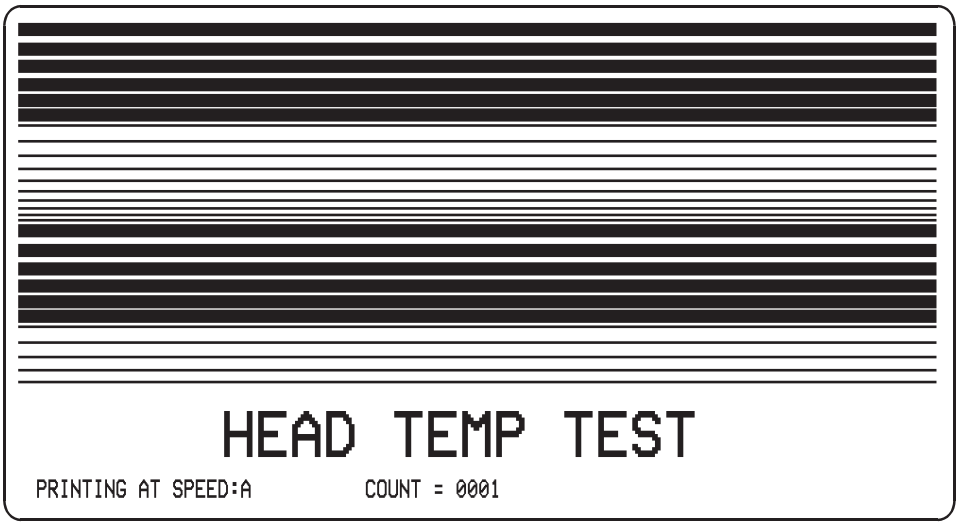


Figure 3.11 Format 8 (12) Test Label

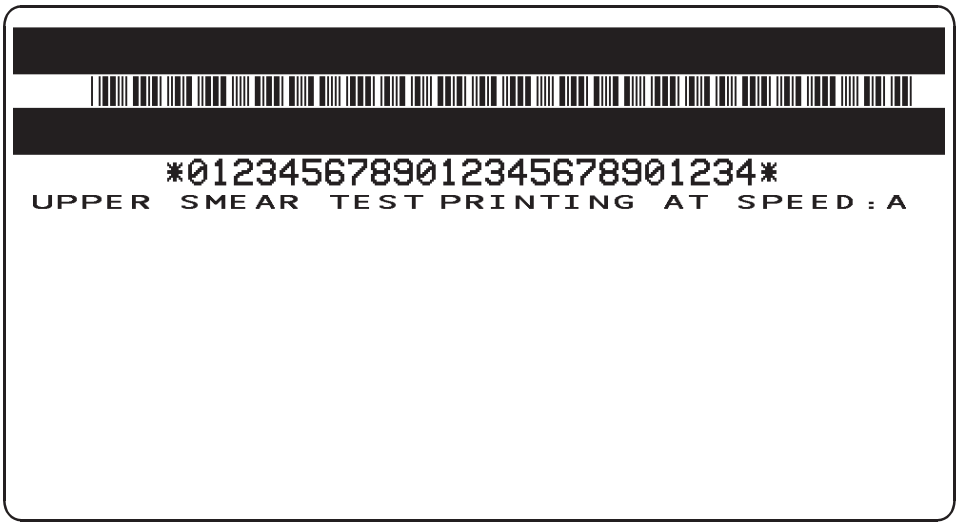


Figure 3.12 Format 9 (13) Test Label

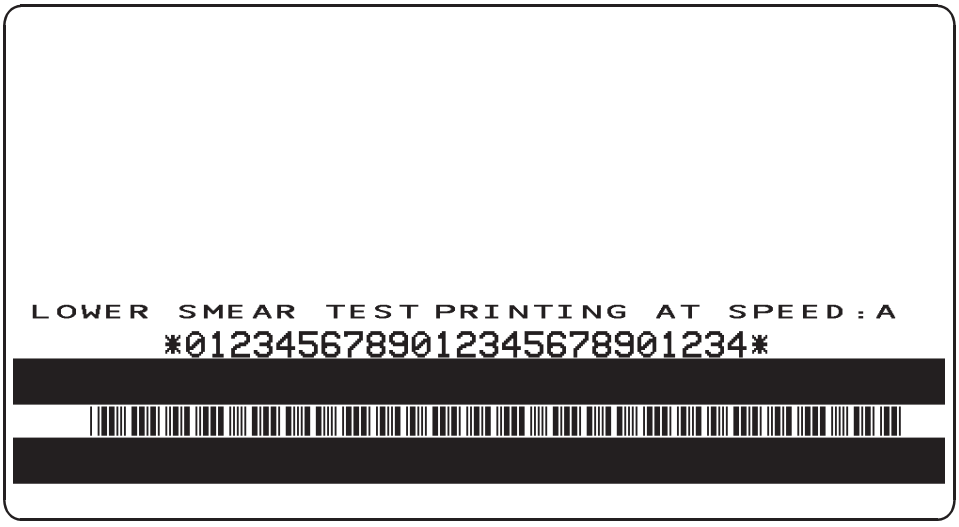


Figure 3.13 Format 10 (14) Test Label

4 Preventive Maintenance

In this section... Page

Maintenance Concepts

Maintenance for the Zebra *Xi*III Thermal Transfer Demand Printer can be divided into two basic categories.

- This section of the manual contains Preventive Maintenance procedures and Operator Care instructions. These procedures may be performed by the operator as well as the Service Technician and should be performed on a regular basis. Preventive Maintenance consists of a visual inspection and general cleaning of the interior and exterior of the printer. Preventive Maintenance also includes cleaning the printhead and the associated media and ribbon paths.

- Corrective Maintenance provides the Service Technician with detailed steps for resolving faults by adjustment or the replacement of components or modules. The next section (Section 5) of this manual provides detailed Corrective Maintenance procedures.

Tools Required

A Preventive Maintenance Kit (part # 01429) containing six cleaning swabs soaked in solvent (alcohol) is available from Zebra Technologies Corporation.

WARNING
Unless indicated otherwise, turn printer power OFF before performing maintenance procedures.

Cleaning The Zebra *Xi*III Printer

CAUTION
Use only the cleaning agents described in the following procedures. Zebra Technologies will not be responsible for any other fluids being used on this printer.

EXTERIOR - The exterior surfaces of the *Xi*III-Series printer may be cleaned as required by using a lint-free cloth. DO NOT use solvents or harsh cleaning agents. If the unit is excessively dirty, a mild detergent solution or desktop cleaner may be used sparingly.

INTERIOR - As required, remove any dirt/lint accumulated in the interior of the printer using a soft bristle brush and/or vacuum cleaner. It is a good practice to inspect these areas after every fourth roll of media.

WARNING
The use of certain lubricants such as Penetrating Oil and Silicone Oil will damage the printer's spindles and inhibit proper operation. DO NOT LUBRICATE any parts in this printer unless called for in the installation and adjustment procedures.

CLEANING SUPPLIES: When cleaning supplies are required, reorder the Preventive Maintenance Kit (part # 01429).

Cleaning The Printhead

Inconsistent print quality such as voids in the bar codes or graphics may indicate a dirty printhead. For optimum performance, the printhead should be cleaned regularly. Zebra Technologies Corporation recommends performing the cleaning procedure when installing a new Roll of Ribbon, when installing a new Roll of Direct Thermal Media or after having printed 500 feet of Continuous or Fanfold Media.

It is not necessary to turn the Printer Power OFF prior to cleaning. If Power is turned OFF, all label formats, images and parameter settings stored in the printer's formatting RAM Memory will be lost. Permanent parameter settings stored in EEPROM will be retained. When Power is turned back ON, it may be necessary to reload some items into the printer's memory.

Printhead Cleaning Procedure:

1. Open the Printhead by moving the Printhead Lever to the OPEN position.
2. Remove the media and ribbon (if present).
3. Refer to Figure 4.1. Use a cleaning swab and wipe the print elements from end to end. (The print elements are the grayish/black strip just behind the chrome strip on the underside of the printhead.) Allow a few seconds for the solvent to evaporate.
4. Rotate the Platen Roller and clean thoroughly with a cleaning swab.
5. Brush or vacuum any accumulated paper lint and dust away from the Rollers and the Media and Ribbon Sensors.
6. Reload ribbon and/or media, close and latch the Printhead, restore power (if necessary) and run the PAUSE Key self test to check print quality.

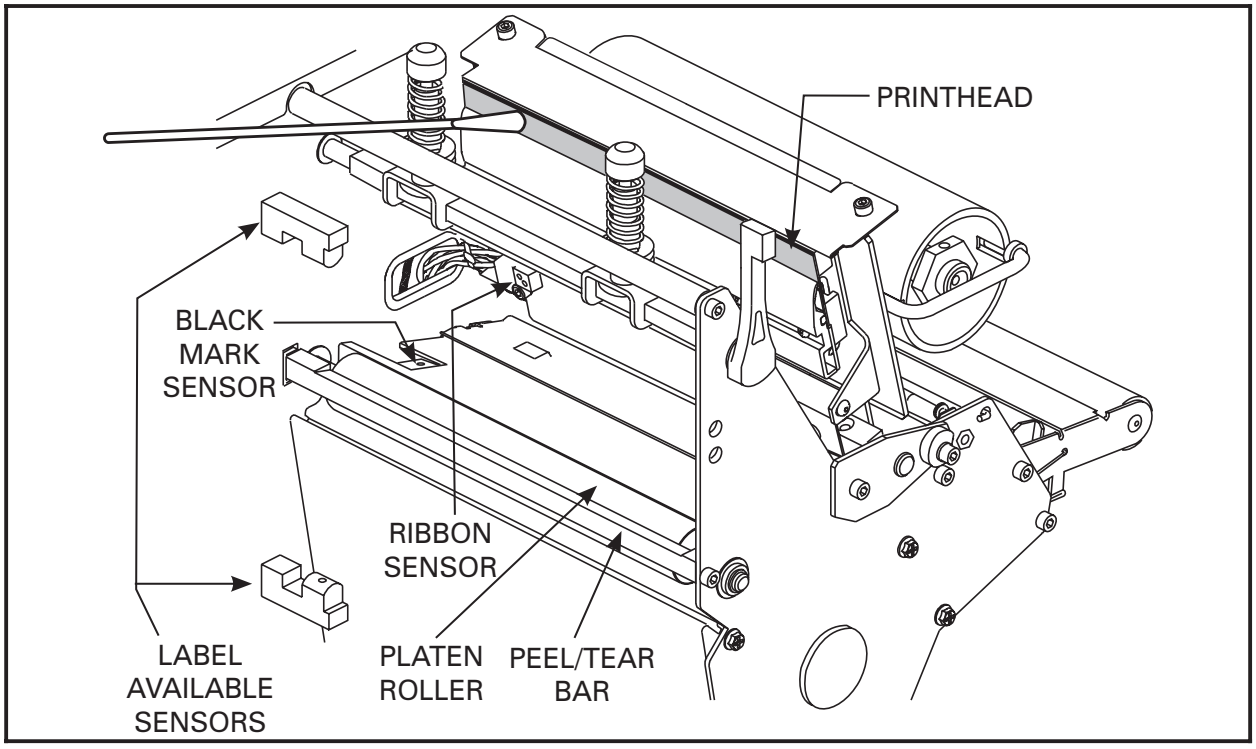


Figure 4.1 Cleaning a Typical Printhead

Cleaning the Upper Media Guide Plate

In the event of a label jam, the Upper Media Guide Plate (Snap Plate) can be removed and cleaned following these steps.

1. To open the printhead to its fully open position, rotate the lever counterclockwise. The printhead pivots to almost vertical.
2. From the front of the printer, pop up the front edge of the Snap Plate using your fingernail or a flat-blade screwdriver.
3. Lift the front edge of the Snap Plate while pulling it up and out of the mechanism.
4. Clean the Snap Plate. Remove any stuck-on labels and remove all adhesive residue using the using swabs soaked in cleaning solvent (alcohol).
5. Replace the Snap Plate by placing the back legs in the openings in the Main Media Guide while sliding it to the rear of the openings and snapping it down into position. Refer to Figure 4.2 below.

NOTE: Incorrect installation may disable the Ribbon Sensor or contribute to print quality problems.

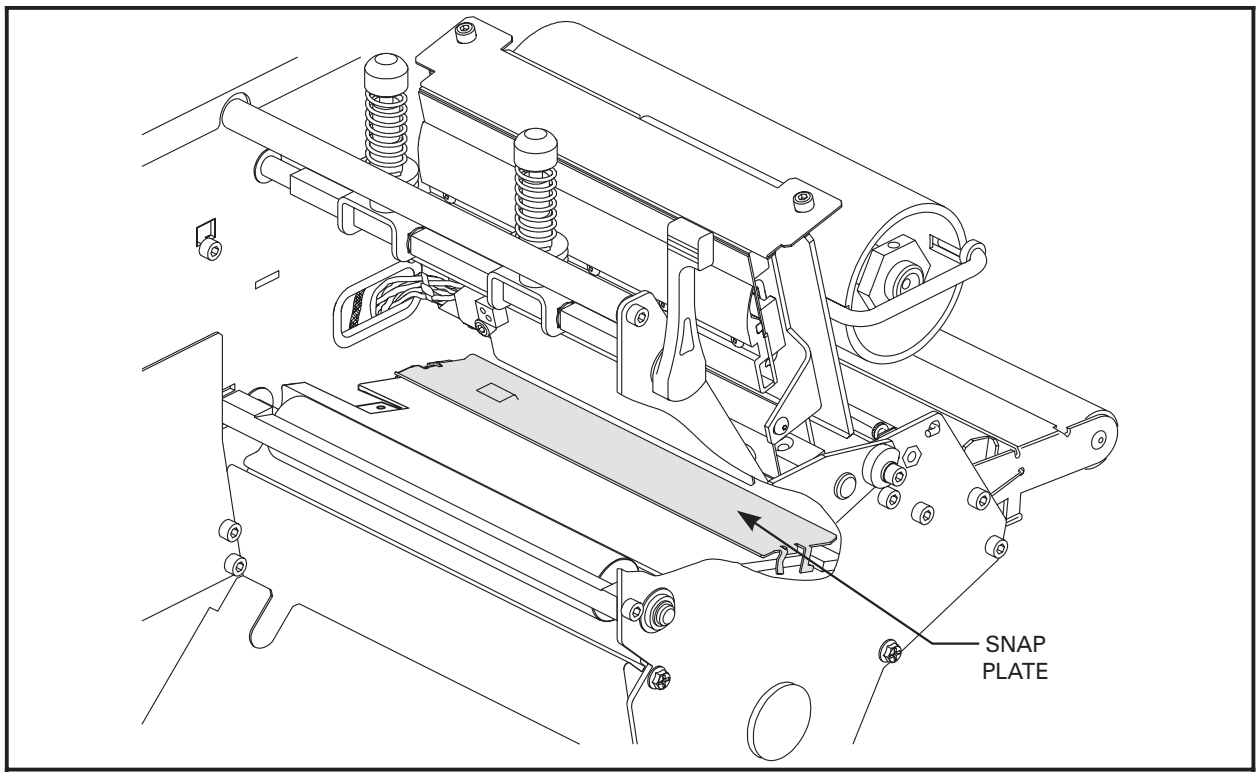


Figure 4.2 Typical Upper Media Guide Plate (Snap Plate)

Recommended Preventive Maintenance Schedule

<table>
<tr><th>AREA</th><th>METHOD</th><th>INTERVAL</th></tr>
<tr><td>PRINTHEAD</td><td>Solvent</td><td rowspan="5">After every roll of Media (or 500 feet of Fanfold Media) when printing in Direct Thermal Mode and after every Roll of Ribbon when printing in the Thermal Transfer Mode</td></tr>
<tr><td>PLATEN ROLLER</td><td>Solvent</td></tr>
<tr><td>TRANSMISSIVE MEDIA SENSOR</td><td>Air Blow</td></tr>
<tr><td>REFLECTIVE (BLACK MARK) SENSOR</td><td>Solvent</td></tr>
<tr><td>MEDIA PATH</td><td>Solvent</td></tr>
<tr><td>LABEL AVAILABLE SENSOR</td><td>Air Blow</td><td>Once Per Six Months</td></tr>
<tr><td>RIBBON SENSOR</td><td>Air Blow</td><td>Once Per Six Months</td></tr>
<tr><td>RIBBON FEEDING</td><td>Visual Inspection</td><td>Once Per 3 Months</td></tr>
<tr><td>BELTS</td><td>Visual Inspection (look for belt wear)</td><td>6 Months/500 Rolls</td></tr>
<tr><td>MEDIA SUPPLY SPINDLE</td><td colspan="2" rowspan="4">Formal Preventive Maintenance is not required.

The Spindle Torques should be tested every year, or 500 rolls of Media for the Media Take-up and optional Media Supply Spindles or every 200 rolls of Ribbon for the Ribbon Supply and Ribbon Take-up Spindles.

The Spindle Torques need not be readjusted unless the printer is malfunctioning.</td></tr>
<tr><td>MEDIA TAKE-UP SPINDLE</td></tr>
<tr><td>RIBBON SUPPLY SPINDLE</td></tr>
<tr><td>RIBBON TAKE-UP SPINDLE</td></tr>
<tr><td>CUTTER OPTION</td><td colspan="2">Clean stationary cutter blade with solvent when it becomes gummed up with label adhesive and cut debris.

After cleaning, apply a small amount of grease to the moving cutter parts.</td></tr>
</table>

Table 4.1 Preventive Maintenance Schedule

NOTES

In this section... Page

Corrective Maintenance Functions

When a problem is encountered with the Zebra *Xi*II Printer, the Service Technician should first insure the unit is being used properly, then exercise it to localize the fault. Once localized, refer to the appropriate replacement or adjustment procedure to correct the fault.

Tools Required

Screwdriver, Regular 1/4" flat-blade Extended Reach (10" shaft) (Magnetic)
Screwdriver, Regular 1/4" flat-blade
Screwdriver, Phillips No. 1
Screwdriver, Phillips No. 1, Extended Reach (10" shaft) (Magnetic)
Screwdriver, Phillips No. 2
Nut Driver, 1/4"
Nut Driver, 5/16"
Long-nose pliers
Set of inch combination (Open End/Box End) wrenches (must include a 7/16")
Set of inch Allen wrenches (1/16", 3/32", 5/64", 7/64", 9/64")
Hex Head Driver, 3/32"
Hex Head Driver, 7/64"
Hex Head Driver, 7/64" Extended Reach (10" shaft) (part # HT368)
Hex Head Driver, 7/64" Extended Reach (15" shaft) (part # 46482)
Springscale, 0 – 2250 g (part # HT344)
Wire Cutters
Spindle Torque Adjustment Kit (part # 01773)

Test Equipment Required

Multimeter and Test Leads.
Anti-Static Mat and Anti-Static Wrist Strap (used when removing Electronic Circuit Boards or updating Firmware).

WARNING
Unless indicated otherwise, turn printer power OFF before performing maintenance procedures.

Optional Cutter Module

The Cutter Module should **NOT** be disassembled, but replaced as a unit. **Any disassembly of the Cutter Module voids the warranty.**

Configuration

After you have installed the media and ribbon and the POST (Power-On Self Test) is complete, the front panel display shows “PRINTER READY.” You may now set printer parameters for your application using the front panel display and the five keys directly below it.

Refer to the Zebra XiII Printer User’s Guide for further details on configuring the printer for your application.

If it becomes necessary to restore the initial printer defaults, see the “Feed Key and Pause Key Self Test” in the Printer Diagnostics section of this manual.

Entering the Program Mode

To enter the programming mode, press the Setup/Exit key. Press either the Next/Save key or Previous key to scroll to the parameter you wish to set. Throughout this process, press the Next/Save key to continue to the next parameter, or press the Previous key to go back to the previous parameter in the sequence.

Changing Password-Protected Parameters

Certain parameters are password-protected by factory default.

CAUTION: Do not change password-protected parameters unless you're sure you know what you're doing! If they are set incorrectly, these parameters could cause the printer to function in an unpredictable way.

The first attempt to change one of these parameters (pressing one of the black oval keys) will require you to enter a four-digit password. This is done via the "ENTER PASSWORD" display. The left black oval key changes the selected digit position. The right black oval key increases the selected digit value. After entering the password, press the Next/Save key. The parameter you are trying to change will be displayed. If the password was entered correctly, you can now change the value.

The default password value is 1234. The password can be changed using the ^KP (Define Password) ZPL II instruction.

NOTE: Once the password has been correctly entered, it need not be entered again unless you leave and re-enter the programming mode using the Setup/Exit key.

NOTE: You can disable the password protection feature so that it no longer prompts you for a password by setting the password to ØØØØ via the ^KPØ ZPL/ZPL II command. To re-enable the password-protection feature, send the ZPL/ZPL II command ^KPx, where "x" can be any number, 1-4 digits in length, except Ø.

Leaving the Program Mode

You can leave the Program Mode at any time by pressing the Setup/Exit key. The SAVE CHANGES display will appear. There are five choices, described below. Press the left or right black oval key to display the sequence of choices. When your choice is displayed on the LCD, press the Next/Save key to save settings.

PERMANENT - saves the current settings. Values are stored in the printer even when power is turned OFF.

TEMPORARY - saves the current settings until changed again or until power is turned OFF.

CANCEL - cancels all setting changes made since entering the programming mode except the Darkness and Tear-Off settings (if they were changed).

LOAD DEFAULTS - loads factory defaults settings. Refer to the user's guide for default values.

NOTE: If you load factory defaults serttings, you will have to perform a Media and Ribbon Sensor Calibration and reset the Head Resistor value before operating the printer.

LOAD LAST SAVE - reloads the settings made during the last Permanent Save.

Calibration

There are two different types of calibration that can be performed by the printer:

1) **Standard Calibration -** pressing the Calibrate key causes the printer to feed media and ribbon and set the values it detects for media, media backing material (the spaces between labels), media out, and ribbon in/out status (which determines the print mode—Thermal Direct or Thermal Transfer). This form of calibration also occurs as part of the "Sensor Profile" and "Media and Ribbon Calibrate" procedures described below.

2) **Media and Ribbon Sensor Sensitivity Calibration (using non-continuous media!) -** Performing the "Media and Ribbon Calibrate" procedure below first resets the sensitivity of the sensors to better detect the media and ribbon you are using. With the sensors at their new sensitivity levels, the printer then performs the standard calibration described above. Changing the type of ribbon and/or media may require this calibration process to reset the sensitivity of the Media and Ribbon Sensors. Indications that the sensitivity may need to be reset would be a "Check Ribbon" light ON with the ribbon properly installed or non-continuous media being treated as continuous media.

Media and Ribbon Sensor Sensitivity Calibration

NOTE: Before you begin this procedure, make sure that the "Maximum Length" is set to a value equal to or greater than the length of the labels you are using. If the Maximum Length is set to a lower value, the calibration process will assume that continuous media is in the printer.

Sensor Profile

1. Press the Setup/Exit key to enter the programming mode.
2. Press the Next/Save key multiple times until the printer's LCD displays

SENSOR PROFILE

3. Press the right oval key to initiate the standard calibration procedure and print a Media Sensor Profile.

   See Figure 5.1 for a media and ribbon sensor profile sample printout.

   The Media Sensor Profile may be used to troubleshoot registration problems that may be caused when the Media Sensor detects preprinted areas on the media or experiences difficulty in determining web location. If the Media and/or Ribbon Sensors sensitivity needs to be adjusted, press the Next/Save key to access the Media and Ribbon Calibrate procedure below.

Media and Ribbon Calibrate

NOTE: The following procedure is used to adjust the sensitivity of the Media and Ribbon Sensors. It must be followed exactly as presented. All steps must be performed even if only one of the sensors requires adjustment.

1. Press the Next/Save key to skip this procedure and go to the "Setting Host Port" function, or

   Press the right oval key to start the calibration procedure. The front panel LCD should show

LOAD BACKING
CANCEL CONTINUE

2. Press the left oval key to cancel the operation, or

   Open the Printhead and remove as many labels as needed to load a section of blank backing material under the Media Sensor. (If you are unsure of the Media Sensor location, refer to Figure 5.6.)

3. Press the right oval key to continue. The front panel LCD should show

```
REMOVE RIBBON
CANCEL   CONTINUE
```

4. Press the left oval key to cancel the operation or

   Remove the ribbon (sliding it as far to the right as possible will have the same effect as removing it), and close the Printhead.

5. Press the right oval key to continue. The front panel LCD should show

```
CALIBRATING
PLEASE WAIT
```

The printer automatically adjusts the base settings as determined by the media and ribbon sensors due to the specific media and ribbon combination you are using. On the sensor profile, this essentially corresponds to moving the graph up or down to optimize the readings for your application.

When this part of the calibration process is completed, the front panel LCD should show

```
RELOAD ALL
        CONTINUE
```

6. Open the Printhead and pull the media forward until a label is positioned under the Media Sensor.

7. Move the ribbon back to its proper position.

8. Close the Printhead.

9. Press the right oval key to continue. The printer performs the second part of the calibration process and the front panel LCD shows

```
MEDIA AND RIBBON
    CALIBRATE
```

This part of the calibration is equivalent to pressing the Calibrate key on the printer's front panel. The media sensor determines a new value based on the presence of media and backing and determines the label length. The ribbon sensor determines a new value based on the presence of ribbon puts the printer in thermal direct or thermal transfer print mode.

Once media stops feeding from the printer, the calibration process is complete!

10. To see the new settings, press "PREVIOUS and print a Sensor Profile.

11. Press the Setup/Exit key to leave the programming mode. When asked to SAVE CHANGES, select "Permanent".

Sensor Sensitivity

The detailed information which follows amplifies the “Media and Ribbon Sensor Calibration” description and procedure just performed.

- The procedure prompts the user to load just the liner (backing material) in the media sensor path and remove the ribbon from the ribbon sensor area.

  This step prepares the printer to automatically adjust the gain of the media amplifier to produce a 3 volt output while sensing just the label liner.

  This step also prepares the printer to adjust the gain of the ribbon amplifier to produce a 2 volt output while no ribbon is in the path of the ribbon sensor.

Sensing Typical Thermal Transfer Non-Continuous Diecut Labels.

Once the user has loaded backing and removed the ribbon, continuing the process adjusts the gain of the sensor amplifiers. The end results of this process are subsequently indicated on the *Printer Configuration Label* as:

Media LED.....Duty cycle applied to the media amplifier to achieve the 3 volt output while viewing backing material only.

Ribbon LED ...Duty cycle applied to the ribbon amplifier to achieve the 2 volt output while viewing only the reflector (ribbon out condition).

Reinstalling the ribbon and media and continuing the process (media is feeding) automatically adjusts the remaining values needed to function properly. These values are determined as follows:

The **Max Label Length** setting is read and the printer begins feeding labels to determine the Web Sensor value. This value is indicated on the *Printer Configuration Label* as:

Web Sensor... the voltage level distinguishing “backing only” from “label plus backing”, specified as a percentage of 5 volts.

Media Sensor...the “Paper Out” value equal to a certain percentage of 5 volts. This is programmed to be at 75% (5 volts x 75% = 3.75 volts).

The **Ribbon Sensor** value is calculated. This value is indicated on the *Printer Configuration Label* as:

Ribbon Sensor ... determined by taking 75% of the minimum “ribbon in” calculation. This is displayed as a percentage of 5 volts.

The **Label Length** is now measured by feeding one label. This value is indicated on the *Printer Configuration Label* as:

Label Length....the distance (in dot rows) between the rising edge of consecutive peaks (as it crosses the web value) minus 2 millimeters.

Media Sensor Profile

The Media Sensor Profile is a graphical representation of the calculated sensor values. The limitations associated with successfully printing the profile are that the label stock must be wide enough and long enough to allow the whole display to be viewed. An incorrect label length may inadvertently allow the peaks to print in the interlabel gap.

The following profile represents these sensor values for a typical 1-1/2" 6A label stock with 5319 Ribbon used in a 140*Xi*II.

50.....Web Sensor

75.....Media Sensor

64.....Ribbon Sensor

19.....Media LED

24.....Ribbon LED

304.....Label Length

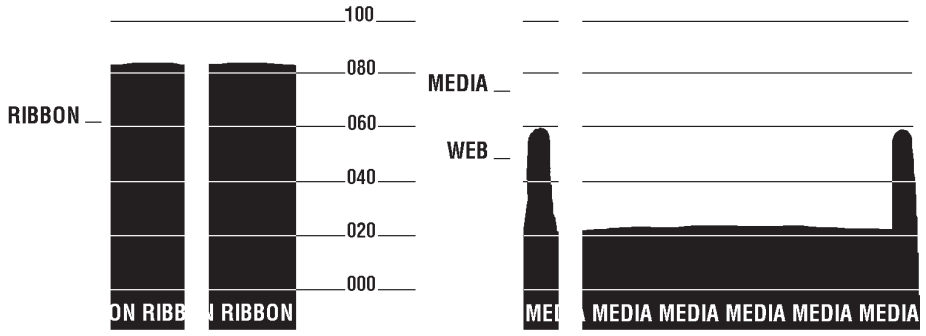


Figure 5.1 Typical Media Sensor Profile

NOTE: A Paper Out condition will occur during *normal* printing functions, if the sensed level is above 75% (3.75 volts) for 1/2" of media movement. However, if the sensed value is above 75%, after recovering from an error condition (i.e. Head Open, Paper Out, Ribbon Out), the printer will indicate PAPER OUT immediately. Thus there is no attempt to feed a label any distance until the sensed value is below the Media Sensor value.

Sensing Continuous Media

Continuous media does not present a web to the Media Sensors. When monitored, the **Web Sensor** value will be greater than the **Media Sensor** value. The printer then automatically reconfigures the Media Type to “Continuous”.

Sensing Tag Stock with a Notch

The Media Sensors can be calibrated using no backing, however this may allow one label length to feed during a paper out condition as if a label were missing from the liner. This may occur if the adjusted level of the **Media LED** allows a no backing condition to achieve 3 volts. A better method of calibration is to use a strip of standard label liner to adjust the sensor sensitivity. The only drawback to this method is that a “Paper Out” condition will result if the hole or notch is present at the Media Sensor (**Web Value** exceeds the **Media Sensor Value**) after an error condition. See the previous “NOTE” regarding a Paper Out condition.

Direct Thermal Printing

During the **Ribbon LED** adjustment, if there is no ribbon in the printer, no difference in the “Ribbon In” and “Ribbon Out” values is detected. During direct thermal printing, the printer continues to monitor the Ribbon Sensor input and will generate a “Ribbon In” error and stop printing if the **Ribbon Sensor** value increases during the printing process.

Standard KST Printhead Replacement

Refer to Figure 5.32 while performing the following procedure.

CAUTION
The printer electronics are susceptible to static discharge. The Technician must wear an anti-static wrist strap connected to the printer chassis when removing and replacing the Printhead.

1. Turn the printer OFF and remove the Power Cord.
2. Open the Printhead Assembly and remove the media and ribbon; then close the Printhead Assembly.
3. Properly connect yourself to an anti-static protection system.
4. Locate the Spring-loaded Printhead Mounting Screw on top of the Printhead Assembly.
5. Loosen the Mounting Screw until it disengages from the Printhead.

CAUTION
Use care to minimize any physical damage to the Printhead during the remainder of this procedure.

6. Slowly open the Printhead Assembly. The Printhead will be resting on the Platen while the rest of the Assembly pivots back out of the way.
7. Spread apart the holding tabs on the sides of the Printhead Data Connectors to release the Data Cables.
8. Grasp the outside edges of the Printhead Power Cable Connector and press down on the Power Cable Locking Tab.
9. While maintaining pressure on the locking tab, disconnect the Printhead Power Cable and remove the Printhead through the front of the printer.
10. **Prior to installing the new Printhead, note the Resistance Value located on the right side of the new Printhead Label.**
11. Connect the Printhead Power Cable to the appropriate connector.
12. Spread apart the holding tab on the top of the two data connectors and press the appropriate Printhead Data Cable into each connector. The Holding Tabs must “snap” into place around the cable connectors.
13. Carefully position the alignment slots in the new Printhead over the alignment posts on the underside of the mounting bracket.
14. Once the Printhead is seated properly, carefully tighten the mounting screw to a value of 5-6 inch/pounds. (If any problems occur during this installation, contact your distributor or Zebra Technologies Corporation for technical support.)
15. Refer to Figure 4.1. Use a cleaning swab to thoroughly clean the print element (gray area) of the new Printhead.
16. Reinstall media and ribbon.
17. Connect the AC Power Cord and turn the printer power ON.
18. After the POST, enter the Configuration Mode, enter the new Printhead Resistance value, then permanently save the configuration.
19. Turn the printer OFF, then activate the PAUSE Key Self Test and check print quality.
20. The printer should be ready for operation. If problems arise, refer to the Troubleshooting Section.

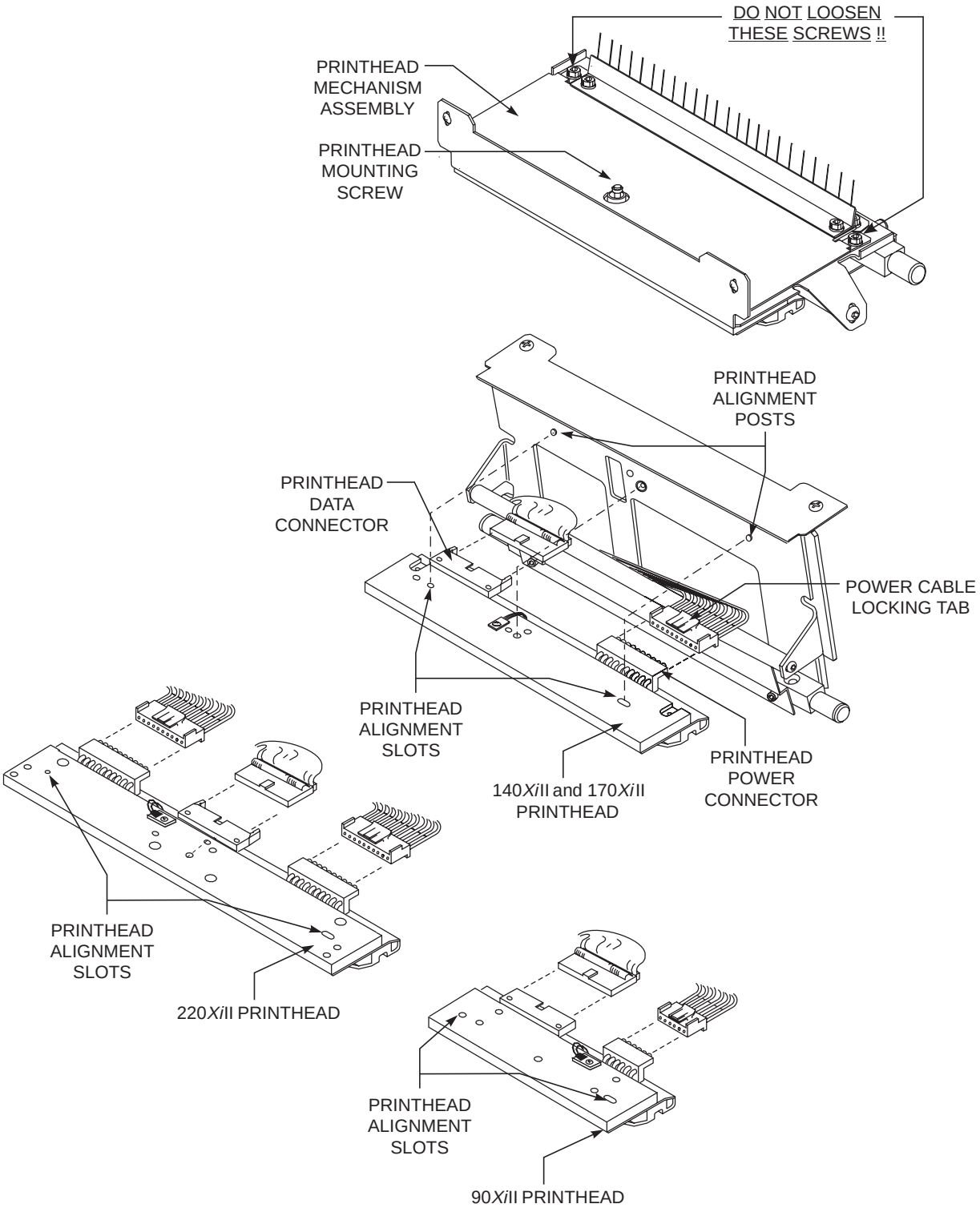


Figure 5.2 Printhead Replacement

Printhead Adjustments

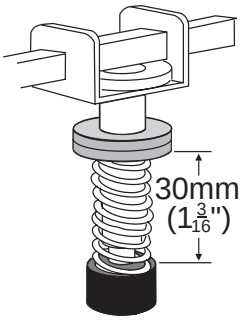
Print Quality Adjustments

There are five interrelated adjustments that lead to optimum print quality with increased Printhead life:

- Printhead Parallelism
- Wear Plate (Balance) Position
- Printhead Position
- Printhead Pressure
- Strip Plate Positioning

To achieve optimum results with print quality adjustments, install full width media and ribbon.

Prior to performing Printhead Adjustments



1. Position the toggle(s) as follows:

   (90*Xi*II) Position the Toggle in the center of the upper print mechanism.

   (140*Xi*II, 170*Xi*II and220*Xi*II) Reference the Printhead Mounting Screw as the center of two halves of the print mechanism, and position each toggle at the center of each half.
2. Compress the Toggle spring by turning the lower knurled nut clockwise until the distance from the top of the toggle foot to the bottom of the lower knurled nut equals 30mm (1 and 3/16").
3. Activate the PAUSE Key Self Test by pressing the PAUSE Key while turning the printer power ON.

NOTE: The order in which the adjustments are performed depends on the print quality of the labels printed during the PAUSE Test above.

The first two Printhead Adjustments (Parallelism and Wear Plate) must be completed prior to attempting to locate the optimum print position. As with the other adjustments, Parallelism and Wear Plate adjustments are interrelated. Adjusting one may have an effect on the position of the other.

Excessive toggle pressure will lead to increased Printhead wear and decreased Printhead life.

Increased Printhead life is possible by combining minimum toggle pressure and optimum Printhead position over the Platen Roller.

Printhead Parallelism Adjustment

This adjustment is performed in conjunction with the Wear Plate Position, Printhead Position, and Printhead Pressure Adjustments.

Adjusting the Printhead Parallelism squares the Printhead in reference to the media.

Refer to Figure 5.4 for location of adjustment screws used in the following procedure.

Printhead Parallelism Test

1. Prior to starting this test, insure the installed media is “squared” with the Tear-Off Bar.
2. When the printer begins printing PAUSE Key Self Test labels, refer to the user’s guide and adjust the Darkness for a clear presentation of all lines on the test label.
3. The uppermost line on the test label should be parallel to the top edge of the label within a tolerance of 0.020”.
4. If the print lines are not parallel with the top of the label, proceed to the Printhead Parallelism Adjustment. If parallelism is within tolerance, proceed to the Wear Plate Position Adjustment.

Printhead Parallelism Adjustment

Refer to Figure 5.4 during this procedure.

1. Using a 7/64" Allen wrench or 7/64" Hex driver, loosen the four Allen screws at the top rear of the Print Mechanism.
2. Adjust the parallel location of the uppermost lines by turning one of the two flat head screws located at the back of the Print Mechanism.

   NOTE: Only small adjustments should be required.
3. To move the Printhead forward, turn the adjustment screw clockwise as viewed from the rear of the printer.
4. To move the Printhead backward, turn the adjustment screw counterclockwise as viewed from the rear of the printer.
5. Adjust each side as necessary to align the uppermost line of the test label in parallel with the top edge of the label.
6. To check the results of your adjustments, run additional PAUSE Key Self Test labels and check for proper parallelism.
7. Tighten the four top Allen screws and run more PAUSE Key Self Test labels to verify proper positioning.

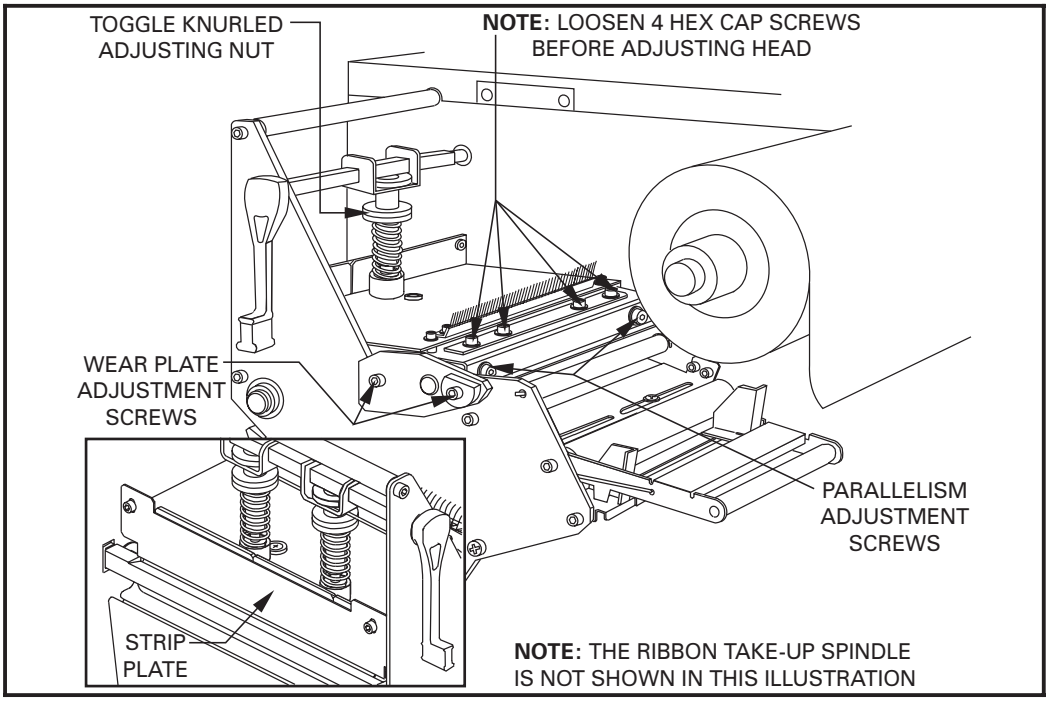


Figure 5.3 Printhead Adjustment Illustration

Wear Plate Position Adjustment

This adjustment is performed in conjunction with the Printhead Parallism, Printhead Position and Printhead Pressure Adjustments.

Adjusting the Wear Plate position produces even pressure across the full width of the printhead and platen roller.

Refer to Figure 5.3 for the location of the adjustment screws used in the following procedure.

1. Using a # 1 Phillips screwdriver, loosen the 2 screws on the front of the Strip Plate.
2. Activate the PAUSE Key Self Test by pressing the PAUSE Key while turning the Printer Power ON.
3. After printing a few labels, PAUSE the printer and reduce the DARKNESS value until the test labels are a charcoal gray color.
4. Print additional PAUSE Key Self Test labels and observe the print quality.
5. If lighter or no printing is observed on one side of the label as compared with the other, continue with this adjustment.
6. Using a 7/64″ Allen wrench, slightly loosen the 2 Allen Set Screws mounted on the Wear Plate.
7. Continue to print PAUSE Test labels while adjusting the Wear Plate Eccentric for even printing.
8. Adjust the Wear Plate Eccentric by turning it by hand or with a 7/16″ open end wrench or with a pair of utility pliers.
9. Adjust the Wear Plate Eccentric clockwise to increase pressure on the Main Frame side of the label or adjust it counter-clockwise to increase pressure on the outboard side of the printer.
10. When even print quality is achieved, hold the Wear Plate in position and tighten the 2 Wear Plate Set Screws.
11. Continue to print PAUSE Test labels and verify Parallelism is correct.
12. If Parallelism is out of tolerance, perform the Printhead Parallelism Adjustment.
13. If no other adjustment is required, align the Strip Plate and tighten the 2 Phillips screws.

Printhead Position Adjustment

This adjustment is performed in conjunction with the Printhead Parallelism, Wear Plate Position, and Printhead Pressure Adjustments.

Adjusting the Printhead position aligns the head for optimum print quality.

Refer to Figure 5.3 for location of adjustment screws used in the following procedure.

1. The thermal elements of the Printhead should be aligned just behind the crest of the Platen Roller.
2. Print test labels using the PAUSE Key Self Test.
3. Set the Darkness to achieve as close to optimum print quality as possible.
4. Using a 7/64" Allen wrench, loosen the four Allen screws at the top rear of the Print Mechanism.

CAUTION
In step 5, to prevent Printhead damage, loosen the four top screws before turning the two rear adjustment screws.

---

5. Adjust the Printhead position for optimum print quality by equally turning the two screws located at the back of the print mechanism.

   Adjustments are made in very small increments.
   Turn both screws one eighth turn clockwise and observe the changes in print quality. Turn both screws 1/8 turn counter-clockwise and observe the changes in print quality. (Due to spring pressure, there may be a dead spot in the actual Printhead movement when switching adjustments from one direction to the other.)
6. Enter the configuration mode and decrease the Darkness until the PAUSE Test labels are a charcoal gray color.
7. Carefully look at the PAUSE Test labels for streaks, flouring, and other print quality problems.
8. If required, adjust the hex head screws and observe if print quality problems are corrected.
9. Enter the configuration mode and increase the Darkness until the PAUSE Test labels are printed at optimum resolution and contrast.
10. Since Printhead parallelism, Wear Plate position and Printhead position are interrelated, carefully look at the test labels for changes in these settings and adjust if necessary.

Printhead Pressure Adjustment

Printhead Pressure is the fourth of the four interrelated adjustments. Using lower Printhead Pressure and Darkness settings can extend Printhead life. If printing is too light on one side, or if thick media is used, Printhead Pressure may require adjustment.

Refer to Figure 5.4 for the location of the Pressure Toggles. The 90*Xi*II printer uses only one toggle which should be positioned over the center of the media width. The 140*Xi*II, 170*Xi*II, and 220*Xi*II printers have two toggles. These toggles are typically positioned at the 1/4 and 3/4 positions across the width of the media. If the media is sufficiently narrow that both toggles will not fit within its edges, the inside toggle should be centered above the media and the outside toggle should be reduced to a minimum.

1. Print PAUSE Key Self Test labels to check print quality.
2. To increase Printhead Pressure, loosen the Upper Knurled Nut on the Toggle and adjust the Lower Toggle Adjusting Nut downwards.
3. To decrease Printhead Pressure, loosen the Upper Knurled Nut and adjust the Lower Toggle Adjusting Nut upwards.
4. Adjust Printhead Pressure for optimum print quality.
5. To lock the toggle pressure, tighten the Upper Knurled Nut against the Lower Toggle Adjusting Nut.
6. Though different media and ribbon combinations may require different Toggle settings, a suggested initial distance between the flat area at the bottom of the Printhead Pressure Bracket and the top of the upper knurled adjustment nut is 8mm.
7. Enter the configuration mode and set the Darkness to the optimum level for the installed media.

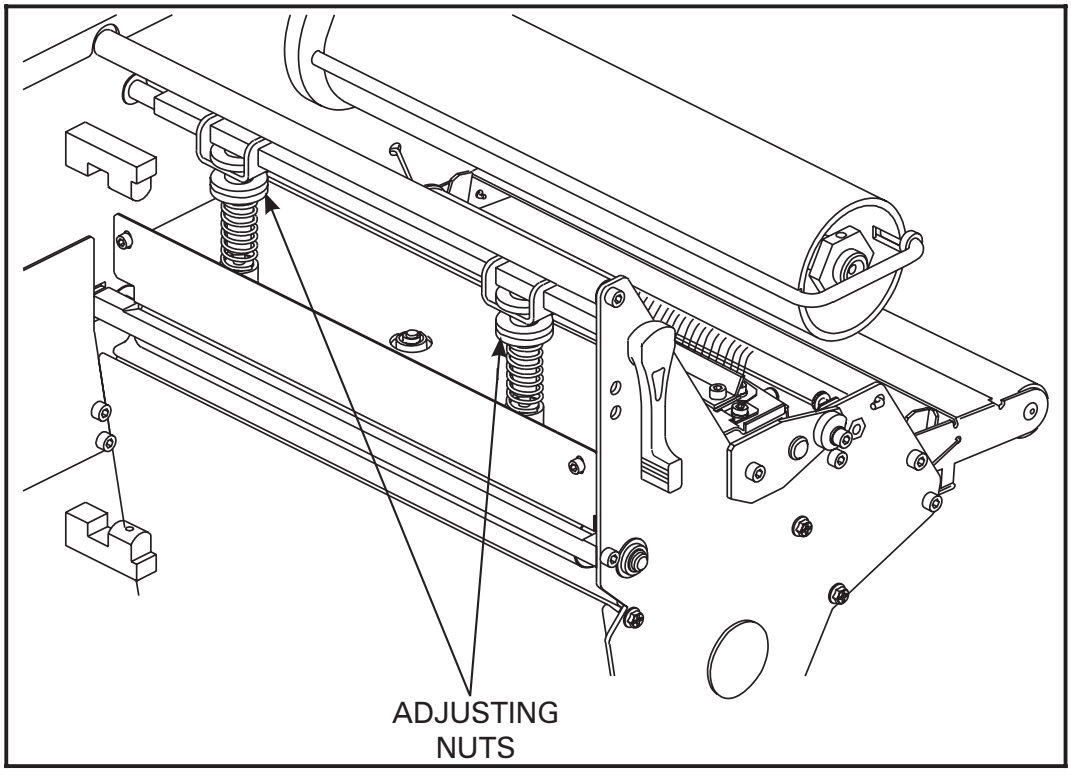


Figure 5.4 Printhead Pressure Adjustment

Strip Plate Adjustment

The Strip Plate Adjustment is a very important part of total printhead adjustment procedure.

The Strip Plate can be adjusted for proper tracking and separation of the ribbon from the media after printing. Refer to Figure 5.3.

1. Print PAUSE Key Self Test labels.
2. Press the PAUSE Key and, after the printer pauses, observe the ribbon for possible problems such as wrinkling.
3. Loosen the two Phillips screws holding the Strip Plate to the front of the Printhead Assembly.
4. While running the PAUSE Key Self Test, lower the Strip Plate so that the ribbon is flat and smooth and tracks properly when fed to the Ribbon Take-up Spindle.
5. Tighten the Strip Plate Phillips screws and print a minimum of 25 labels while checking for ribbon wrinkle, tracking and media/ribbon separation problems. (If ribbon problems persist, check the torque settings of the Ribbon Supply Spindle and adjust tension if required.

Darkness Adjustment

Due to differences in types of media/ribbon and wear on Thermal Printhead Elements, it may be necessary to adjust the Darkness Setting (Burn Temperature) of the *Xi*II Printhead to achieve proper printing. This adjustment is accomplished by using the LCD Display and the Membrane Keys.

NOTE: Turning the Printer OFF is not required for the new setting to take effect.

To adjust the Darkness, follow the procedure below:

CAUTION

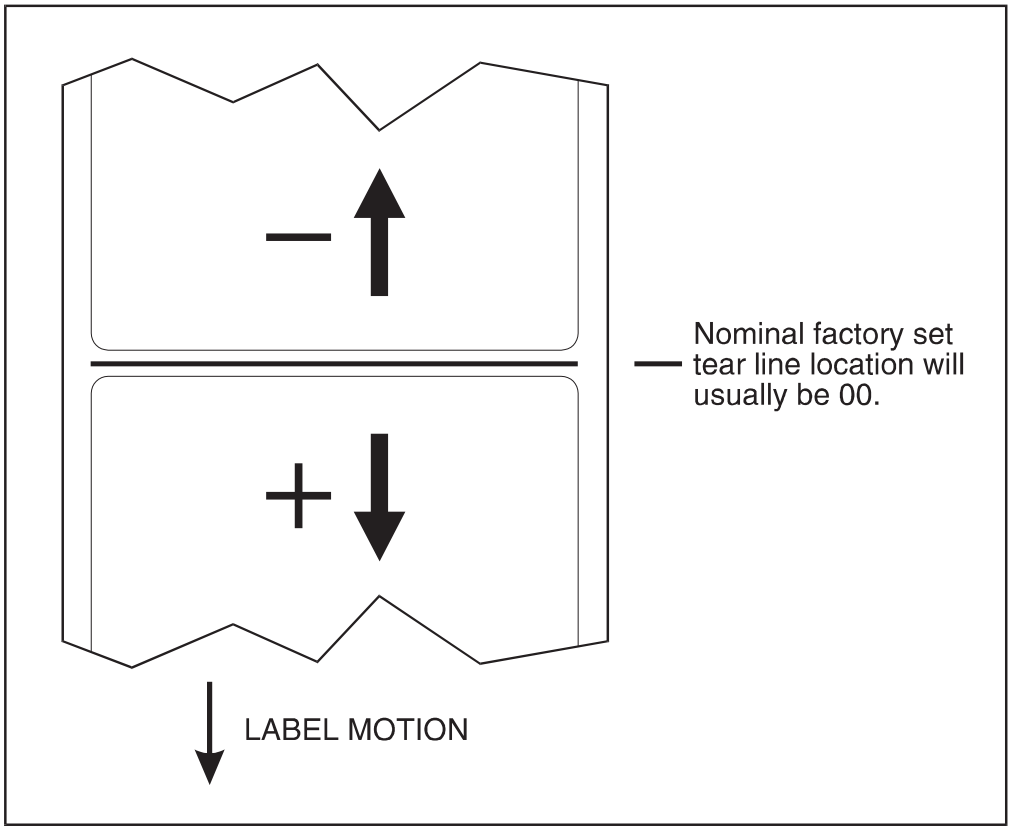
Set the Darkness to the lowest setting possible for the desired print quality. Darkness set too high for a given ribbon may cause ink smearing, ribbon wrinkle and/or burning through of the ribbon, as well as reduced printhead life.

---

1. Begin printing a batch of labels. Refer to Section 3 and use the Pause Key and Cancel Key Self Test Label or, preferably, one of your own formats.
2. (Refer to the Printer Configuration discussion in the User Guide.) Using the Front Panel Display and the Membrane Keys, adjust the Darkness Setting to obtain the desired print quality. Decreasing the value in the display causes a lighter (less black) image. Increasing the value causes a darker (more black) image.

Media Tear-Off Position Adjustment

Refer to Figure 5.5. This adjustment sets the rest position of the media over the Tear Bar after printing. To achieve the desired Tear-Off position refer to the user's guide. Power need not be turned OFF to set this parameter.



This illustration shows how higher values move the label further out from the printer (moves the tear line closer to the leading edge of the next label) while lower values move the label into the printer (moves the tear line closer to the edge of the printed label).

Figure 5.5 Tear-Off Position Adjustment

Transmissive Media Sensor Position Adjustment

The Transmissive Media Sensor senses either the “web” between labels or a hole or notch in the print media to determine the length of the label or ticket.

The factory-set position should be sufficient for any width label when using media with a web, so little or no repositioning should be required. If it does become necessary to reposition the Transmissive Media Sensor, refer to Figures 5.6 and 5.7 and perform the Upper Media Sensor Adjustment followed by the Lower Media Sensor Adjustment.

To adjust the **Upper Media Sensor** for the inside half of the media width, follow these steps:

1. Remove the ribbon and locate the Upper Media Sensor.
2. **(90*Xi*II/140*Xi*II/170*Xi*II)** Carefully loosen the Phillips screw located at the top of the sensor.

   (220*Xi*II) DO NOT loosen the Phillips screw.
3. Slide the Upper Sensor along the slot to the desired position.

   (When using label stock that has a web between labels, position the Upper Media Sensor anywhere along the web, except where the rounded corners of the label are detected. When using tag stock, position the Upper Sensor directly over the hole or notch.)
4. Tighten the Phillips screw.

To adjust the **Upper Media Sensor** for the outside half of the media width, follow these steps:

1. Remove the ribbon and locate the Upper Sensor.
2. Remove the Phillips screw. This releases the Upper Sensor and the Sensor Wire Cover.
3. Lift the Upper Media Sensor Assembly and move the sensor and the wire cover to the outside half of the mounting bracket. Carefully pull the wires through the tie wrap. You may need to set aside the Sensor Wire Cover if the adjustment is far to the outside.
4. Replace and tighten the Phillips screw.

To adjust the **Lower Media Sensor**, follow these steps:

1. Locate the Lower Media Sensor assembly (a spring clip holding a circuit board) under the Rear Idler Roller.
2. Position the Sensor by sliding it in its slot, so that the two brass colored infra-red emitters are centered under the Upper Sensor.
3. Gently pull wires out as required. (Wires should have a little slack.)

NOTE: If the Sensor is being moved inward and a large loop of wire results, remove the cover from the Electronics side of the printer and gently pull the wires through. It is important that the wires be properly clamped so that they do not rub any drive belts.

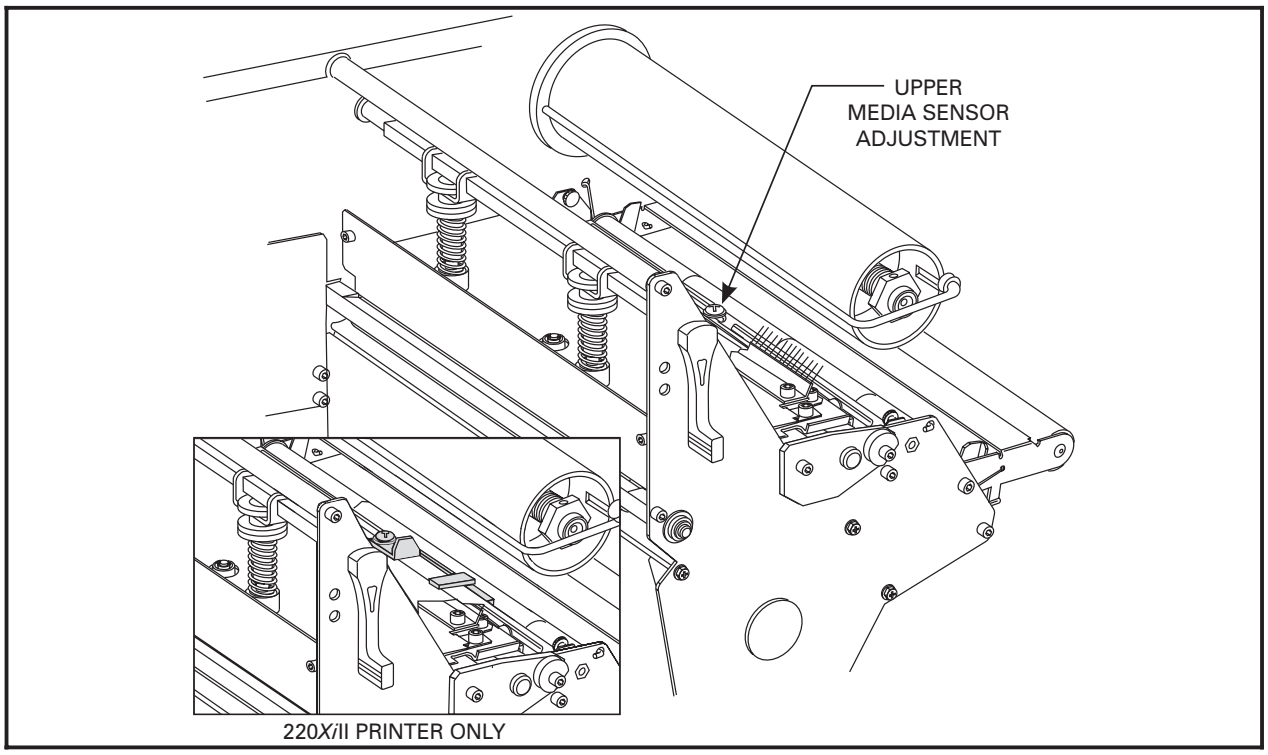


Figure 5.6 Upper Media Sensor Position Adjustment

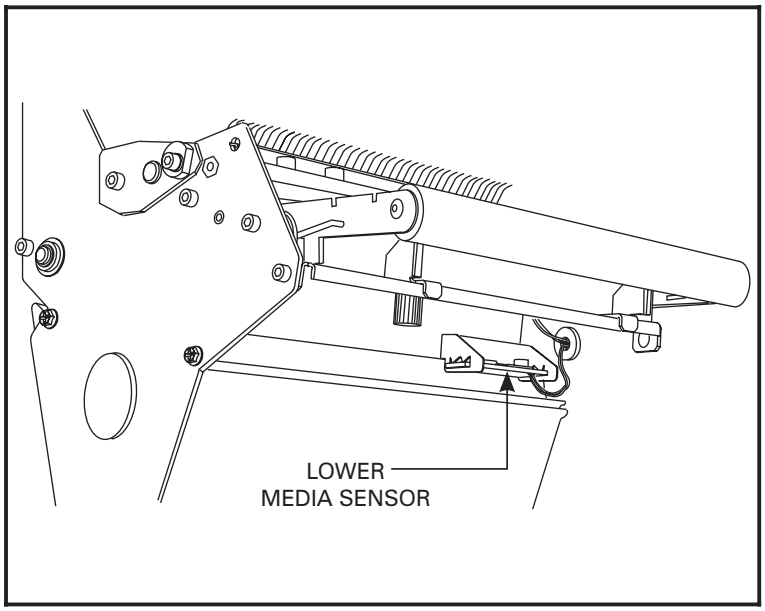


Figure 5.7 Lower Media Sensor Position Adjustment

Reflective Media Sensor Adjustment

The Reflective Media Sensor is placed into operation for those applications where the sensing of Black Marks on the underside of the media is desired. For the *Xi*II-Series printers, the position of the Reflective Media Sensor is fixed against the Mainframe and has no adjustment. Refer to the printer user's guide to configure the printer for operation with either the Reflective Media Sensor or the Transmissive Media Sensor previously discussed.

LCD Viewing Adjustment

The brightness of the Liquid Crystal Display (LCD) may be adjusted for optimal viewing. Refer to the LCD ADJUST configuration parameter in the printer's user's guide.

Motor Balance Adjustment

DO NOT ADJUST THIS SETTING — It is for technical use only. The motor balance is set at the factory. Call Zebra Technical Support with any questions.

Take Label Sensor Alignment

The Take Label Sensor activates only when the Zebra *Xi*III is set to Peel-Off Mode. This mode requires the media rewind spindle option. The media sensor pair is NOT installed on Zebra *Xi*III printers without this option.

Refer to Figure 5.8 for the location of the Take Label Sensor components. When the beam is broken, the *Xi*III printer will be inhibited from printing or feeding (in Peel-Off Mode only). It may, however, accept additional label formats if the buffer is not full. There is no sensitivity adjustment for the Take Label Sensor. If you encounter problems, make certain the *Xi*III printer is set to Peel-Off mode using the front panel display and that the sensors are aligned. Sensors are aligned at the factory or when the media rewind spindle option is installed. No adjustments are required after installation.

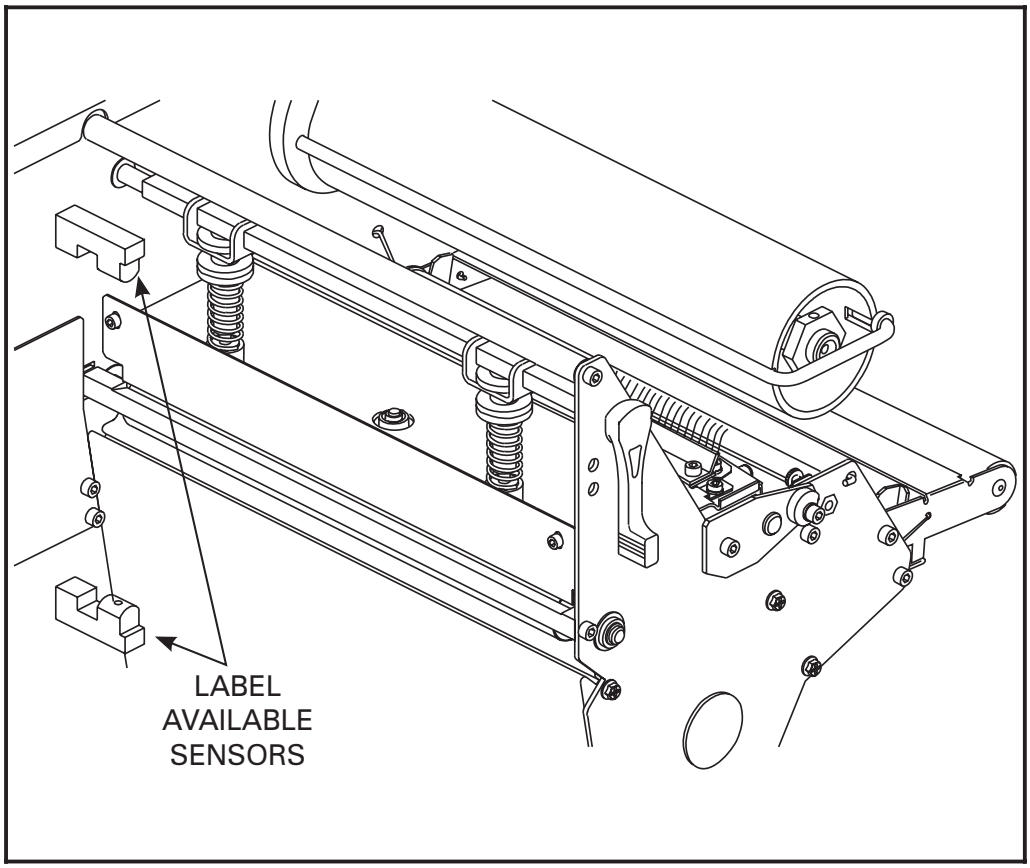


Figure 5.8 Take Label Sensor Location

Media Tracking Adjustments

Rewind Mode

If the media walks from side to side, tears, or wrinkles against the Media Rewind Tracking Plate, it will be necessary to adjust the Rewind Plate Assembly. Refer to Figures 5.9 and 5.10.

1. Remove the Rewind Plate Assembly and loosen the 5/16 Hex Nuts (01130) which attach the Hook Plate to the Rewind Plate. Moving the outer end of the Hook Plate up will force the media towards the Rewind Tracking Plate while moving this end down will move the media away from the Tracking Plate. (The opposite effect will occur if the same adjustments are performed on the inner end of the Hook Plate.)
2. Reinstall the Rewind Plate Assembly and print a number of test labels. If problems persist, readjust the Hook Plate.
3. If the media cannot be made to track correctly with this adjustment, check the distance from the outside of the Tracking Plate to the Main Frame. This dimension is set at the factory and should be 0.547″ (13.9 mm) to 0.567″ (14.4 mm). If the distance needs to be reset, refer to Figure 5.10 and proceed to step 4 below.
4. Use a 1/16 Hex Allen Wrench to loosen the two set screws in the Collar located inside the Rewind Spindle Assembly. The screws are accessible through a single hole in the Spindle Assembly, as shown in Figure 5.10. Reposition the Spindle Assembly closer to or farther from the Main Frame as required, and retighten the two collar set screws.
5. Perform steps 1 and 2 until required results are achieved.

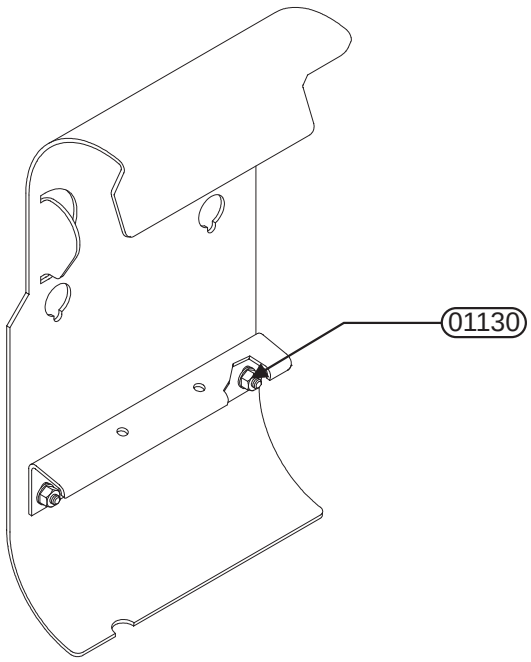


Figure 5.9 Rewind Plate Assembly

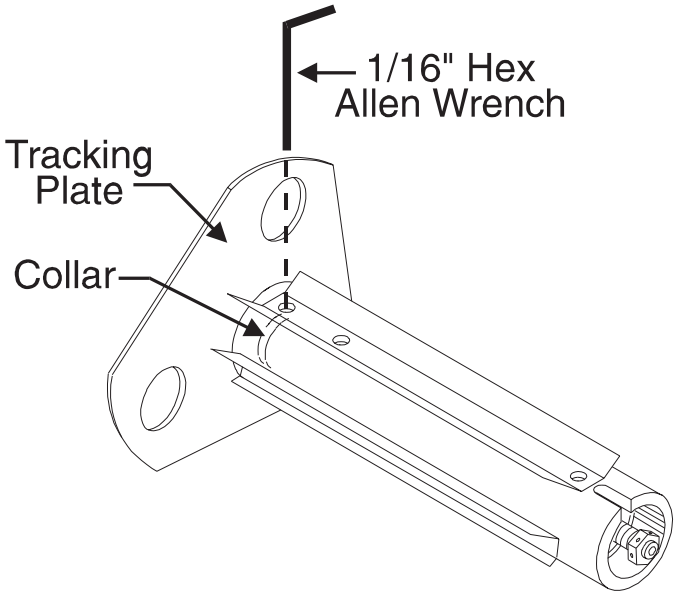


Figure 5.10 Rewind Spindle Positioning

Peel-Off Mode

In “PEEL-OFF MODE” the Lower Roller alignment has the same affect on media tracking as the Rewind Plate alignment does in “REWIND MODE”. Refer to Figure 5.11 and perform the following procedure.

1. Use a 7/64″ Hex Allen wrench to loosen the two Allen Head screws which attach the Platen Support Bracket to the Side Plate.
2. Moving the Bracket toward the front of the machine moves the label backing material away from the Rewind Tracking Plate. Moving the Bracket toward the rear of the machine moves the label backing toward the Tracking Plate. Adjust Bracket position as required and tighten the Allen Head screws.
3. Repeat steps 1 and 2 until required results are achieved.

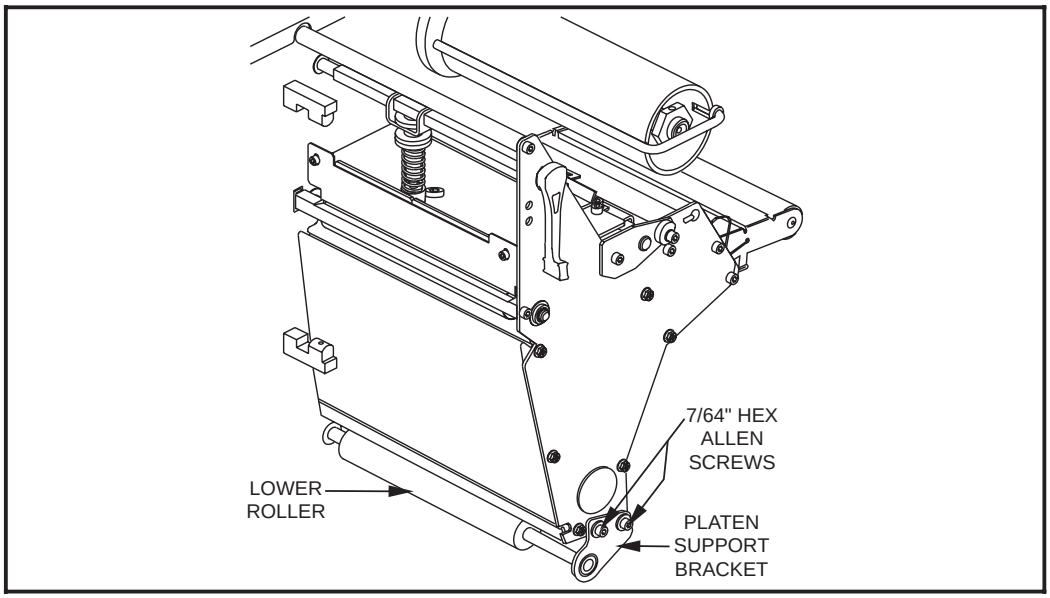


Figure 5.11 Peel-Off Lower Roller Alignment

Spindle Adjustment and Maintenance

There are four spindles which require periodic tension measurement and adjustment. Measuring spindle tension should be done at least once each year unless required more often due to high printer use. Tension should be adjusted whenever it is not within the tolerance range associated with that spindle.

Tension Measurement Procedure

The procedure for measuring spindle tension is similar for all four spindles. Refer to the Spindle Tension Adjustment Diagram in Figure 5.12 for any specific requirements.

1. Use adhesive tape to attach a 2″ wide strip of polyester film (part # 01776) to the Spindle Shaft (or Core where required) as illustrated in Figure 5.12. Wind the polyester film around the Spindle (or Core) about 5 times in the direction indicated.
2. Measure tension by slowly pulling the film with a springscale. Pull ONLY in the direction shown. The pull rate should typically be 2″ per second.
3. Compare the springscale reading with the force values provided in Figure 5.12. Perform the Spindle Adjustment only if the reading is out of spec.
4. If adjustment is made, recheck the tension after running a full roll of labels.

Spindle Tension Adjustment

Refer to the Spindle Tension Adjustment Diagram in Figure 5.12 and adjust the Spindle Tension as follows:

1. **Loosen the set screw(s)** if present in the Adjustment Nut at the end of the Spindle.
2. Turn the Adjustment Nut clockwise to increase the tension or counter-clockwise to decrease the tension. Tighten the set screws if present.

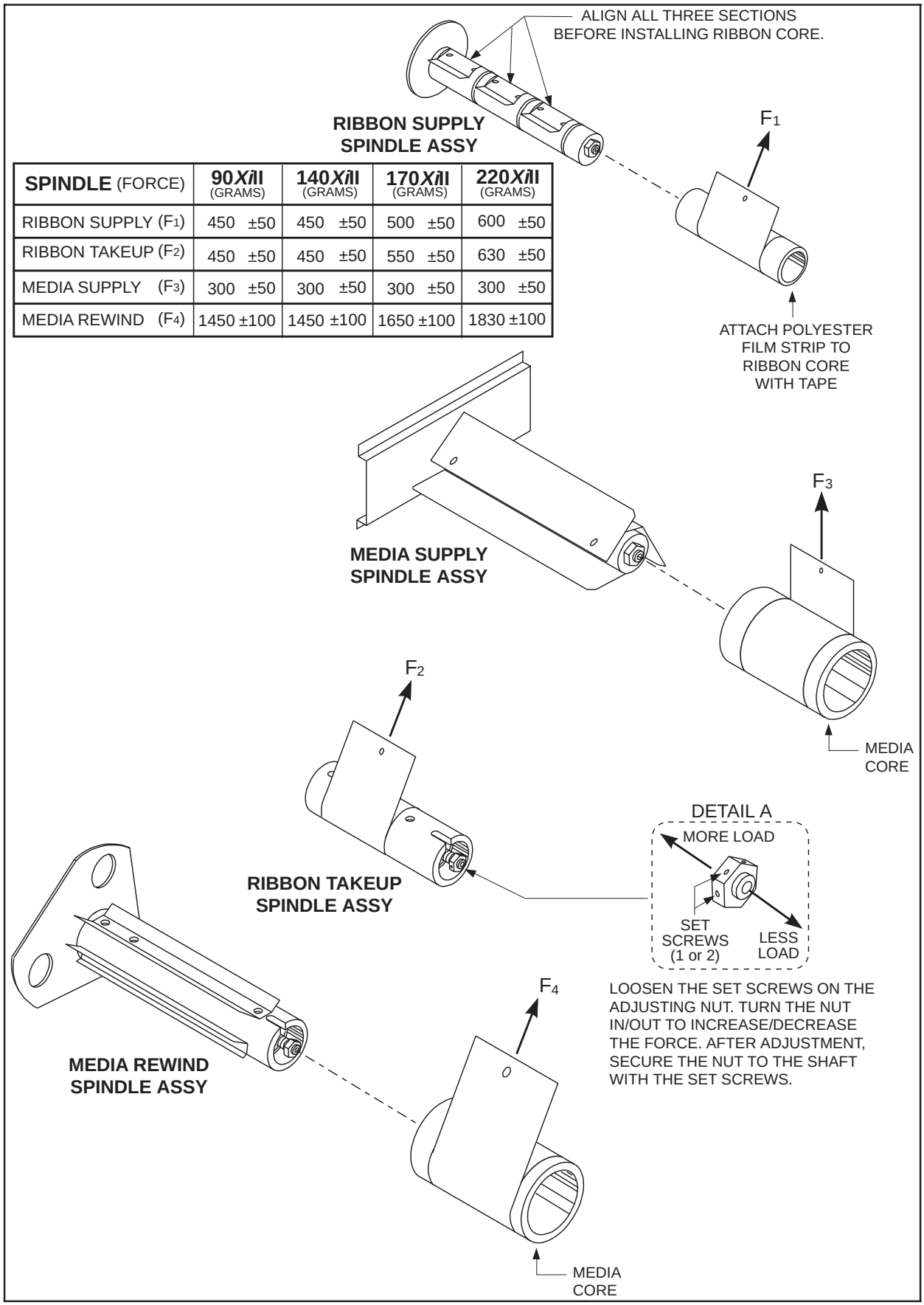
NOTE: If the shaft of the Ribbon Take-Up, Media Take-Up or optional Media Supply Spindle turns when attempting to turn the Adjustment Nut, refer to Figure 5.10 and insert an Allen wrench through the access hole on the inner end of the spindle and into the set screw in the shaft collar. DO NOT TURN THE ALLEN WRENCH. Simply hold the shaft in place with the Allen wrench while turning the Adjustment Nut.

3. Measure the spindle tension as performed above. Compare the tension reading on the springscale with the appropriate force value provided in Figure 5.12. Repeat the adjustment procedure until the correct tension is obtained.

Spindle Maintenance

Periodic spindle maintenance is not required on the *Xi*II-Series printers.

WARNING
DO NOT apply lubrication to any of the spindles in the *Xi*II-Series printers.



SPINDLE (FORCE)	90*Xi*II (GRAMS)	140*Xi*II (GRAMS)	170*Xi*II (GRAMS)	220*Xi*II (GRAMS)
RIBBON SUPPLY (F_1)	450 ±50	450 ±50	500 ±50	600 ±50
RIBBON TAKEUP (F_2)	450 ±50	450 ±50	550 ±50	630 ±50
MEDIA SUPPLY (F_3)	300 ±50	300 ±50	300 ±50	300 ±50
MEDIA REWIND (F_4)	1450 ±100	1450 ±100	1650 ±100	1830 ±100

Figure 5.12 Spindle Tension Adjustments

Removing the Main Logic Board

The *Xi*III-Series Main Logic Board may require removal when replacement is necessary or when installing various options in the field. Follow the procedure below to remove the *Xi*III-Series Main Logic Board.

CAUTION

The printer electronics are susceptible to static discharge. Before proceeding, it is highly recommended the Technician wear an anti-static wrist strap connected to the printer chassis.

---

1. Be sure the printer is OFF and the AC Power Cord and Signal Interface Cable are disconnected.
2. Remove the Left Side Panel of the printer by removing the Phillips screws which hold it on.
3. Remove any Font Card or Memory Card from the card slot located at the rear of the printer, by pressing the card release button.
4. If an optional interface board is installed in the printer, refer to the removal instructions for that board before continuing this procedure.
5. Refer to Figure 5.13. Unplug all Ribbon Cable Connectors and Small Wire Connectors from the Main Logic Board (note their positions).
6. Refer to Figure 5.14. At the rear of the printer, remove the 4 Phillips screws holding the serial and parallel interface connectors to the back of the printer.
7. Remove the Main Logic Board by squeezing the tips of the plastic stand-offs at the top and bottom right hand corners of the board.
8. Software is not included with the replacement Main Logic Board. Refer to the Program ROM Installation topic covered later in this section, and use a Zebra-approved PLCC (Plastic Leaded Chip Carrier) Extraction Tool to carefully remove the program ROMs and any optional Font ROMs from the faulty Main Logic Board. Carefully install the ROMs on the replacement board. (The label on each ROM specifies the chip location on the Main Logic Board.)
9. Perform the Installation Procedure below, being very careful with all cables.

Installing the Main Logic Board

Follow the procedure below to install the *Xi*III-Series Main Logic Board.

1. Refer to Figure 5.13 and Table 5.1 and place Rotary Switch S1 in the proper position for the printer under repair. **(Rotary Switch S2 must remain in the zero (0) position.)**

(this procedure continues on page 5-24)

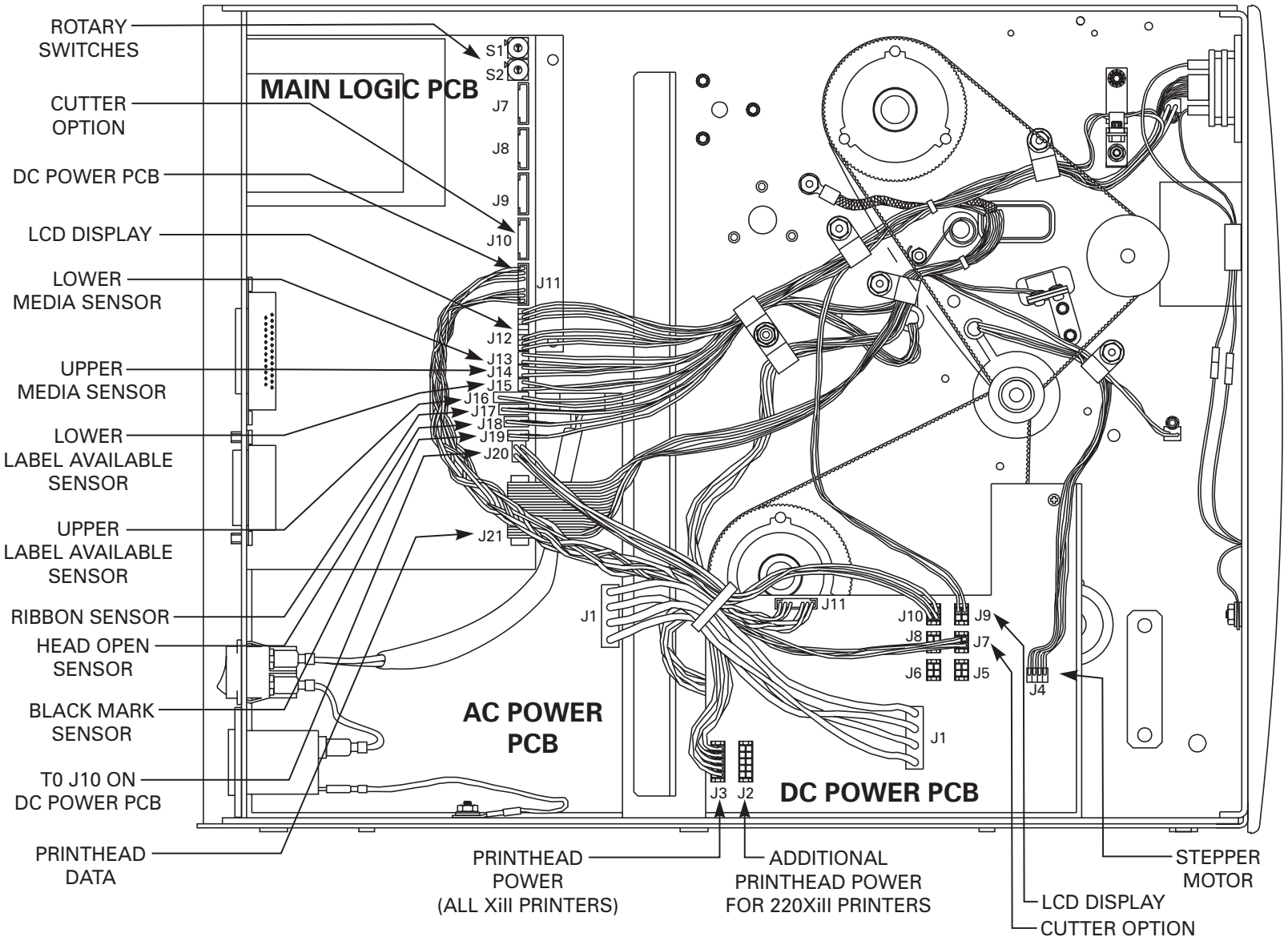


Figure 5.13 Circuit Board Location and Interconnection

2. Refer to Figure 5.14. Position the cables out of the way while placing the Main Logic Board onto the plastic stand-offs at the top and bottom right hand corners of the board.
3. At the rear of the printer, install the 4 Phillips Screws which hold the serial and parallel interface connectors to the back of the printer.
4. Refer to Figure 5.13. Carefully connect all the Ribbon Cables and Small Wire Cables to the proper connectors on the Main Logic Board.
5. Refer to Figures 5.14. If required, install the optional interface board through the rear of the printer. (Insure the data cable is properly connected between the Main Logic Board and the Interface Board
6. If required, install any Font Card or Memory Card into the card slot located at the rear of the printer.
7. Reconnect the AC Power Cord and the Signal Interface Cable.
8. Turn the printer ON and configure the printer parameters. Be sure to enter the Printhead Resistance value indicated on the label attached to the printhead
9. Hold in the PAUSE Key while turning the AC Power ON. Observe the printer Power ON Self Test and examine the test labels which print for proper print quality.
10. Reinstall the Left Side Panel.
11. Refer to the printer's user's guide and program the Printer Parameters.

NOTE: During the programming process, you must perform a complete Printer Calibration. (Pressing the Front Panel CALIBRATE Key will not provide the full calibration process required when a Main Logic Board is first installed.)

Refer to page 5-2 to begin the Configuration and Calibration process.

12. When the Printer Parameters are programmed and SAVED, turn the printer OFF and back ON to activate the new parameters.

Table 5.1 S1 Switch Settings

Switch Position	Function
0	Diagnostics
1	170PAX Left Hand (12dots/mm)
2	170PAX Right Hand (12dots/mm)
3	170PAX Left Hand (8dots/mm)
4	170PAX Right Hand (8dots/mm)
5	Undefined
6	90*Xi*II Printhead (12 dots/mm)
7	Undefined

Switch Position	Function
8	140XiII KMT (8 dots/mm 8"/sec max)
9	140XiII KST (8 dots/mm 8"/sec max)
A	140XiII KMT (8 dots/mm 12"/sec max)
B	140XiII KST(8 dots/mm 12"/sec max)
C	Undefined
D	Undefined
E	220 *Xi*II Printhead (8 dots/mm)
F	170*Xi*II Printhead (12 dots/mm)

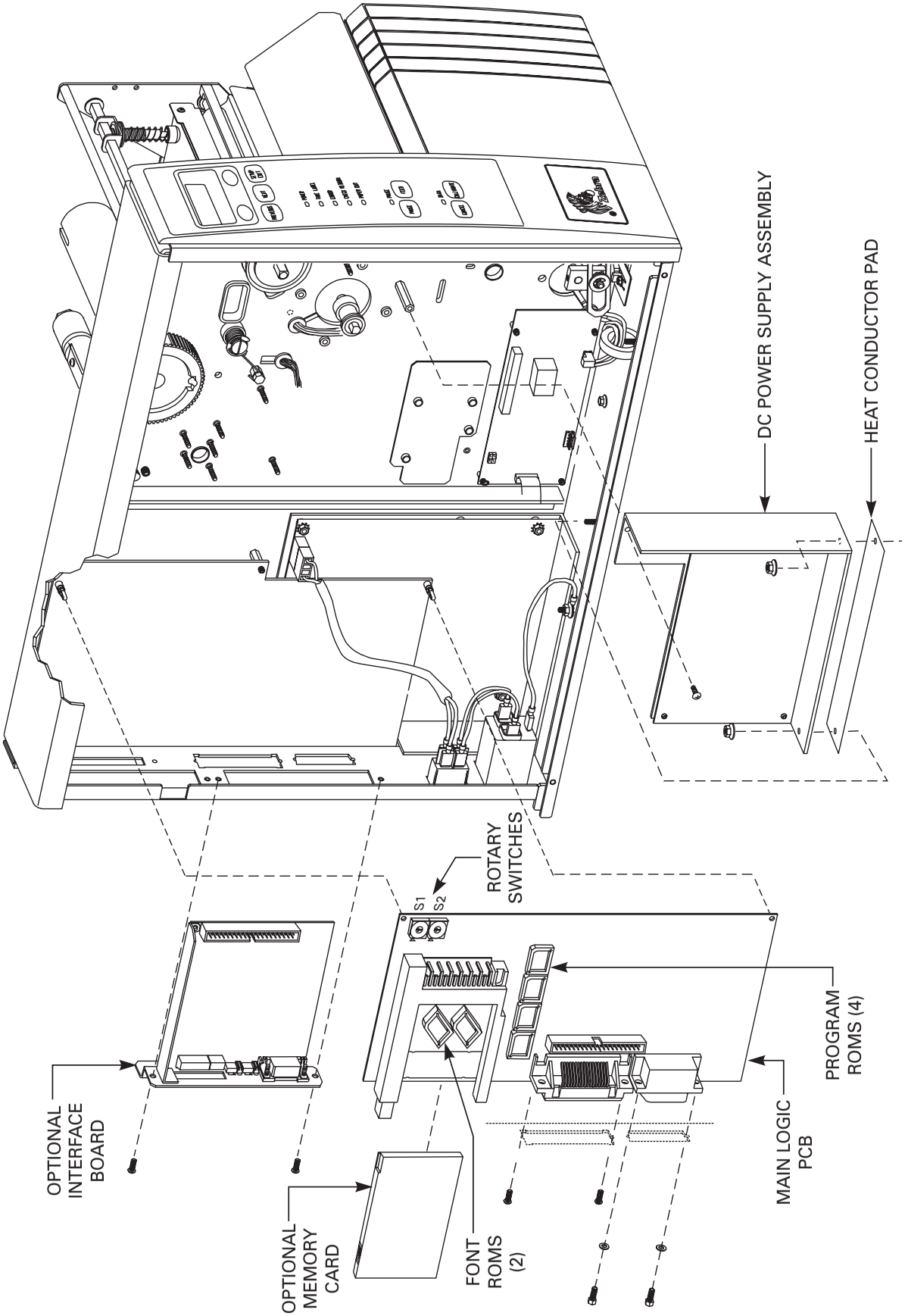


Figure 5.14 Main Logic Board & DC Power Supply Board

Removing the DC Power Supply Assembly

The *Xi*II-Series DC Power Supply Assembly may require removal when replacement is necessary or when installing various options in the field. Follow the procedure below to remove the *Xi*II-Series DC Power Supply Assembly.

CAUTION
The printer electronics are susceptible to static discharge. Before proceeding, it is highly recommended that the Technician wear an anti-static wrist strap connected to the printer chassis.

1. Be sure the printer is OFF and the AC Power Cord and Signal Interface Cable are disconnected.
2. Remove the Left Side Panel of the printer by removing the Phillips Screws which hold it on.
3. Refer to Figure 5.13. Unplug all Ribbon Cable Connectors and Small Wire Connectors from the DC Power Supply Board (note their positions).
4. Refer to Figure 5.14. Remove the mounting screw and two hex nuts holding the DC Power Supply Assembly against the printer chassis.
5. Remove the DC Power Supply Assembly from the printer. (The black heat conduction pad need not be removed.)
6. Perform the Installation Procedure below, being very careful with all cables.

Installing the DC Power Supply Assembly

Follow the procedure below to install the *Xi*II-Series DC Power Supply Assembly.

1. Refer to Figure 5.14. Position the cables out of the way while placing the DC Power Supply Assembly into the printer. (Insure the heat conduction pad is in powition.)
2. Refer to Figure 5.14. Install the mounting screw and two hex nuts which hold the DC Power Supply Assembly against the printer chassis.
3. Refer to Figure 5.13. Carefully connect all the Ribbon Cables and Small Wire Cables to the proper connectors on the DC Power Supply Board.
4. Reconnect the AC Power Cord and the Signal Interface Cable.
5. Hold in the PAUSE Key while turning the AC Power ON. Observe the printer Power ON Self Test and examine the test labels which print for proper print quality. (If necessary, refer to the user's guide to configure the Darkness setting.)
6. Reinstall the Left Side Panel.
7. The printer should now be ready for operation.

Removing the AC Power Supply Assembly

The *Xi*II-Series AC Power Supply Assembly may require removal when replacement is necessary or when installing various options in the field. Follow the procedure below to remove the *Xi*II-Series AC Power Supply Assembly.

CAUTION
The printer electronics are susceptible to static discharge. Before proceeding, it is highly recommended that the Technician wear an anti-static wrist strap connected to the printer chassis.

1. Be sure the printer is OFF and the AC Power Cord and Signal Interface Cable are disconnected.
2. Remove the Left Side Panel of the printer by removing the Phillips Screws which hold it on.
3. Refer to Figure 5.13. Unplug all Ribbon Cable Connectors and Small Wire Connectors from the Main Logic Board and AC Power Supply Board (note their positions).
4. Remove the hex nut holding the ground lead from the Power Entry Module to the printer chassis.
5. Refer to Figure 5.15. Remove the 2 screws at the top and center right hand corners of the metal mounting plate directly behind the Main Logic Board.
6. At the rear of the printer, remove the 3 Phillips screws holding the rear panel to the back of the printer.
7. Slide the Main Logic Board and Rear Panel Assembly out and away from the printer.
8. Remove the AC Power Supply Assembly by removing the 5 hex nuts and 2 spacers which hold the Assembly against the mounting posts. (The black heat conduction pad need not be removed.)
9. Perform the AC Power Supply Assembly Installation Procedure below, being very careful with all cables.

Installing the AC Power Supply Assembly

Follow the procedure below to install the *Xi*II-Series DC Power Supply Assembly.

1. Refer to Figure 5.15. Position the cables out of the way while placing the AC Power Supply Assembly into the printer. (Insure the heat conduction pad is in position.)
2. Refer to Figure 5.15. Install the 5 hex nuts and 2 spacers which hold the AC Power Supply Assembly against the printer chassis. (Insure the plastic spacers are installed on the two left posts.)
3. Slide the Main Logic Board and Rear Panel Assembly into the printer.
4. Refer to Figure 5.15. Install the 2 screws at the top and center right hand corners of the metal mounting plate directly behind the Main Logic Board.

(this procedure continues on page 5-29)

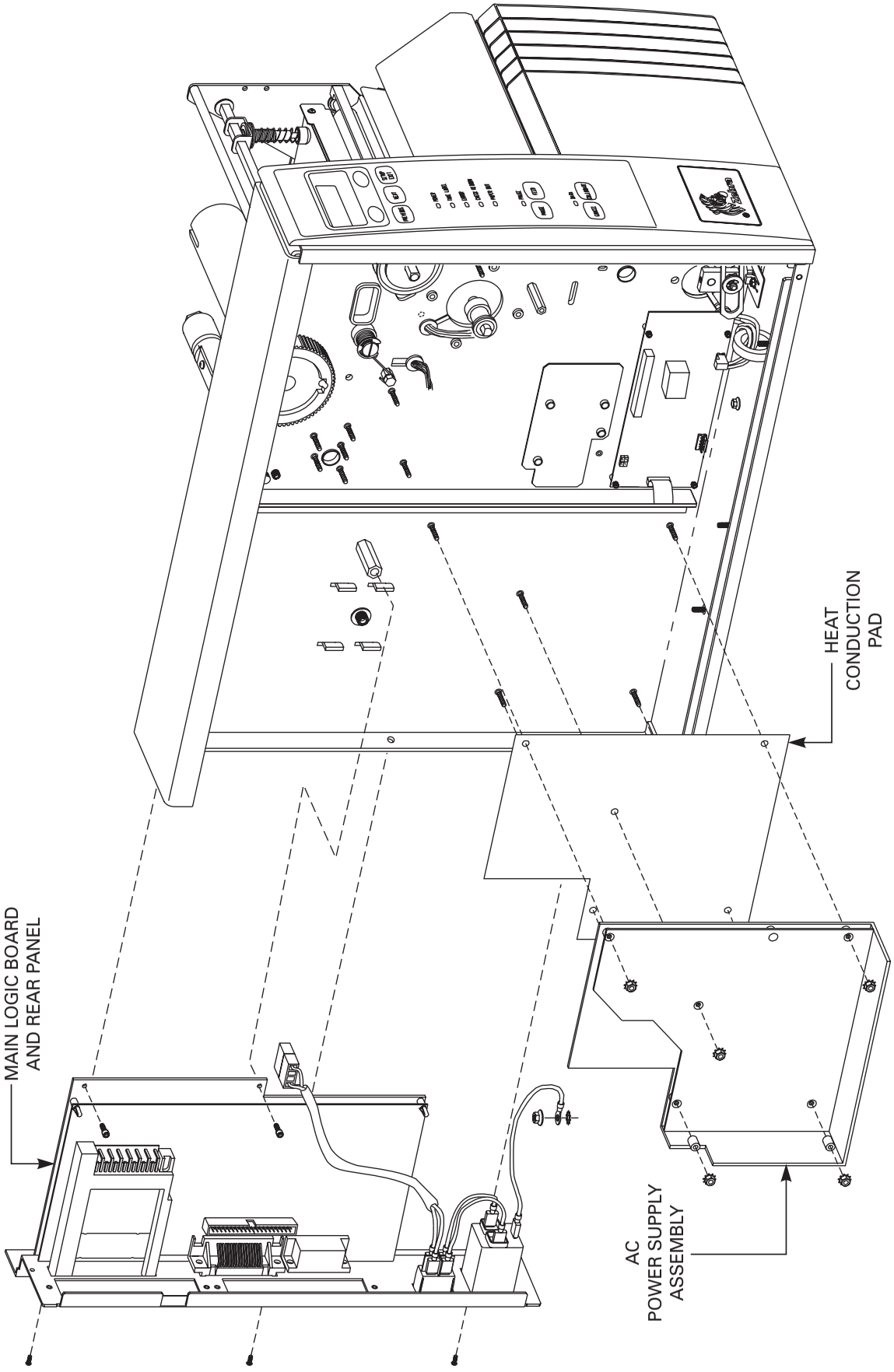


Figure 5.15 AC Power Supply Board

5. At the Rear of the printer, install the 3 Phillips Screws which hold the rear panel to the back of the printer.
6. Use the hex nut to install the ground lead from the Power Entry Module to the printer chassis.
7. Refer to Figure 5.13. Install all Ribbon Cable Connectors and Small Wire Connectors onto the Main Logic Board and AC Power Supply Board.
8. Reconnect the AC Power Cord and the Signal Interface Cable.
9. Hold in the PAUSE Key while turning the AC Power ON. Observe the printer Power ON Self Test and examine the test labels which print for proper print quality.
10. Reinstall the Left Side Panel.
11. The printer should now be ready for operation.

Program ROM Installation

To replace the program ROMs, follow the procedure below. A PLCC (Plastic Leaded Chip Carrier) Extraction Tool is included in the upgrade kit:

CAUTION
The printer electronics are susceptible to static discharge. Before proceeding, it is recommended the Technician wear an anti-static wrist strap connected to the printer chassis.

1. Turn the AC Power OFF and disconnect the Power Cord.
2. Remove the Left Side Panel of the printer by removing the Phillips Screws.
3. Refer to Figure 5.16. Insert the tines at the bottom of the Extraction Tool firmly into the slots in the chip socket. Make sure the tines catch under the ROM chip as you **gently squeeze**, and the program ROM will raise out of the socket. Repeat for positions U4, U12, U20 and U27.
4. Insert the new program ROMs with the notched corner positioned to the upper right or the positioning dot pointing up. Match the Main Logic Board "U" position with the position specified on each ROM label. Make sure all pins are properly aligned before pressing the chips into place.

(This procedure continues on page 5-30)

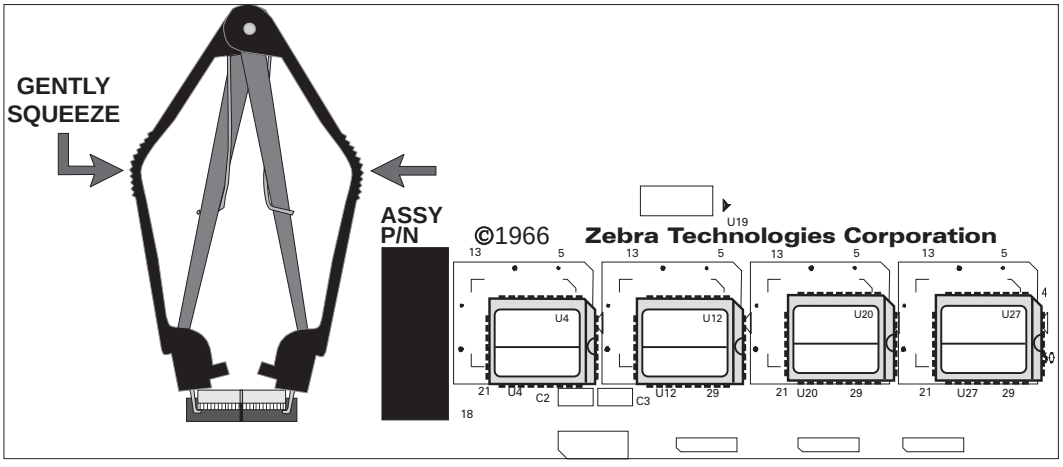


Figure 5.16 Program ROM Replacement

CAUTION
Permanent damage to the ROM will result if you power up the printer with it installed in the wrong direction.

Before you apply Power, double check that all ROMs are in the proper socket and properly aligned. If you have any doubts, contact your Distributor or Zebra Technical Support.

5. Reconnect the AC Power Cord.
6. Press and hold the FEED Key while turning the printer Power Switch ON.
7. Verify the version of software printed on the Configuration Label during the Power ON sequence.
8. Install the Left Side Panel of the printer by using the Phillips Screws.
9. Refer to the printer's user's guide and program the Printer Parameters.
10. **During the programming process, you must perform a complete Printer Calibration.** (Pressing the Front Panel CALIBRATE Key will not provide the full calibration required when new printer software is first installed.)
11. When the Printer Parameters are programmed and SAVED, turn the printer OFF and back ON to activate the new parameters.

Option Installation

Font ROM Installation

Optional scalable and bit-mapped Fonts are available in ROMs.

To install the Font ROMs, refer to Figure 5.17 below and substitute Font ROM for Program ROM as you follow the Program ROM Installation procedure previously discussed.

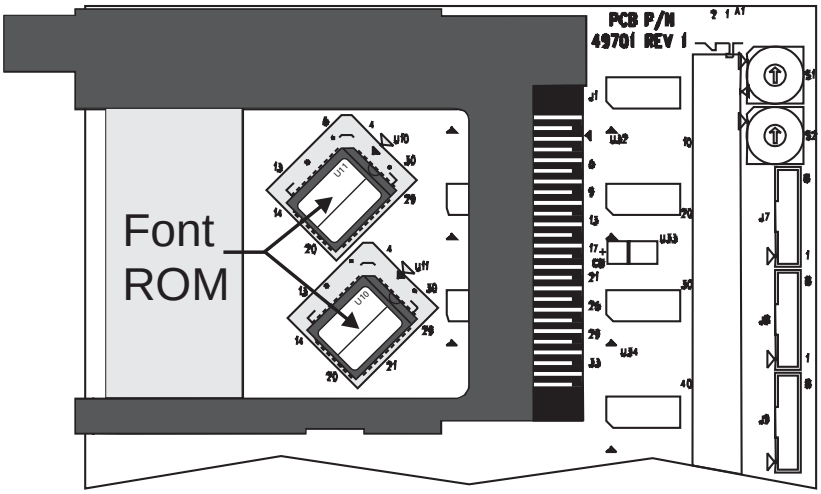


Figure 5.17 Font ROM Installation

Memory Card and Font Card Installation

To replace the Memory Card or Font Card, read the instructions included in the option kit. The general installation procedure is as follows:

1. **Turn the AC Power OFF before installing the card.**
2. Refer to Figure 5.18 and remove the Option Card Shield from the rear of the printer.
3. Insert the Memory Card or Font Card, with the notch UP, into the card slot as shown. (Insert far enough to cause the eject button to pop out.)
4. Reinstall the Option Card Shield over the Option Card and card slot.
5. Press and hold the FEED Key while turning the printer Power Switch ON.
6. Verify the presence of additional Memory or optional Fonts by checking the information indicated on the Configuration Label printed during the Power ON sequence.
7. The printer is now ready to operate with the additional Memory or Font option.

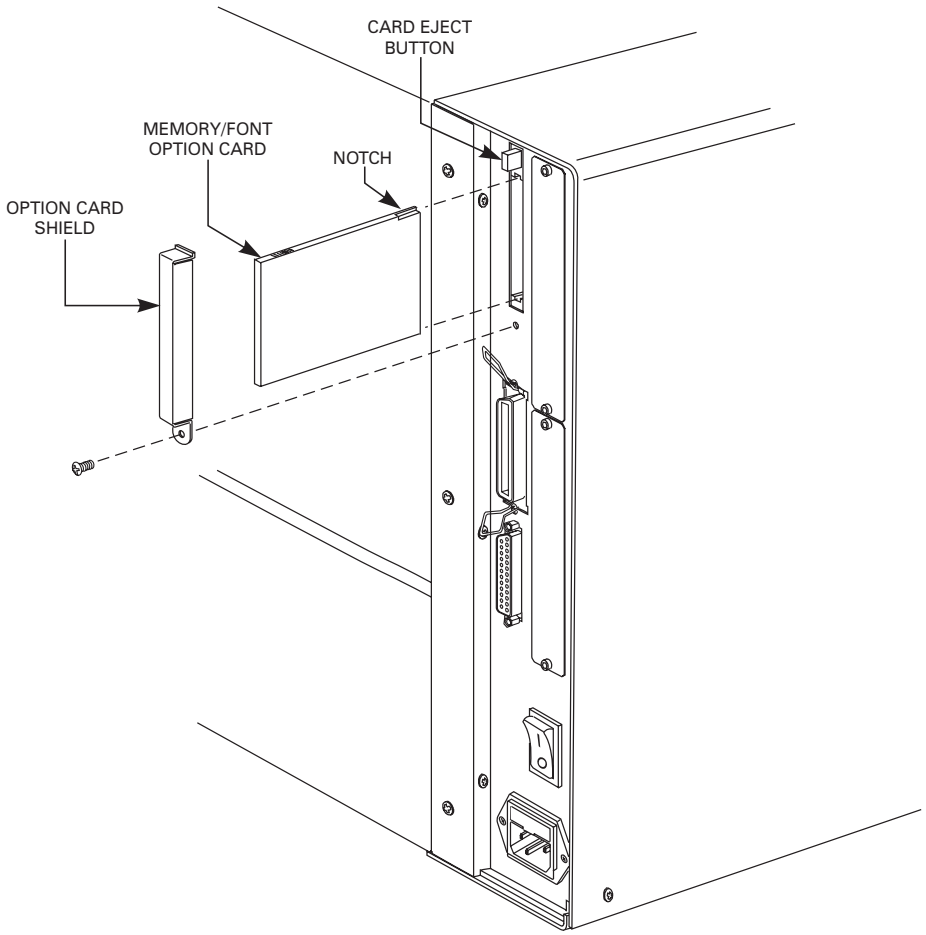


Figure 5.18 Memory Card and Font Card Installation

SIMM Installation

To replace the Memory Card or Font Card, read the instructions included in the option kit. The general installation procedure is as follows:

CAUTION

The printer electronics are susceptible to static discharge. Before proceeding, it is recommended the Technician wear an anti-static wrist strap connected to the printer chassis.

1. Be sure the printer is OFF and the AC Power Cord is disconnected.
2. Remove the Left Side Panel of the printer by removing the Phillips screws which hold it on.
3. Refer to Figure 5.19 and locate the SIMM Socket on the Main Logic Board.
4. Install the SIMM into the socket as illustrated in Figure 5.19. (Make sure the SIMM is locked securely into position.
5. Reconnect the AC Power Cord.
6. Press and hold the FEED Key while turning the printer Power Switch ON.
7. Verify the presence of additional Memory or optional Fonts by checking the information indicated on the Configuration Label printed during the Power ON sequence.
8. The printer is now ready to operate with the additional Memory option.

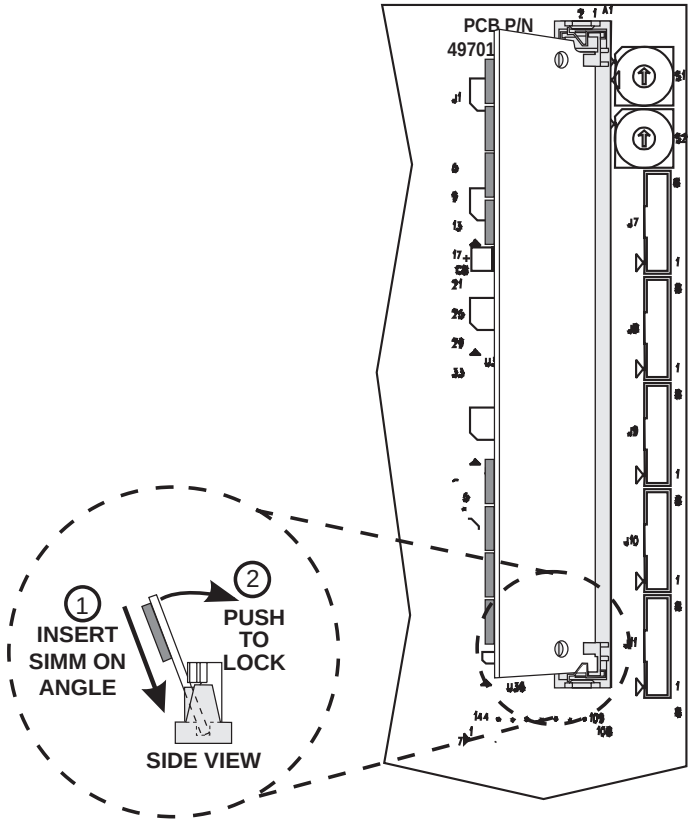


Figure 5.19 SIMM Installation

Main Drive Belt - Removal, Replacement & Adjustment

90XiII, 140XiII and 170XiII (for 220XiII, refer to the following page.)

1. Turn the printer OFF and remove the AC Power Cord.
2. Remove the Left Side Panel of the printer by removing the Phillips Screws which hold it on.
3. Refer to Figure 5.20 and rotate the Ribbon Take-Up Pulley until the 3 holes in the Pulley are aligned with the 3 mounting screws which hold the Ribbon Take-Up Spindle Assembly to the Printer Frame.
4. Use a 9/64″ Allen Wrench to reach through the holes in the Ribbon Take-Up Pulley and loosen the 3 Spindle Assembly mounting screws.
5. Slide the Ribbon Take-Up Spindle Assembly to the right to relieve the tension on the Main Drive Belt.
6. Remove the old Main Drive Belt and install the new one.
7. Hook a 2200 gram spring scale to the belt as shown in Figure 5.20, and carefully slide the Ribbon Take-Up Spindle Assembly to the left to increase belt tension.
8. When a scale reading of 2000 grams ± 250 grams (4.5 lbs ± 0.5 lbs) creates a deflection of 1/4 inch, tighten the 3 mounting screws to a torque of 20 inch-pounds.
9. Replace the Left Side Panel and reapply AC Power.

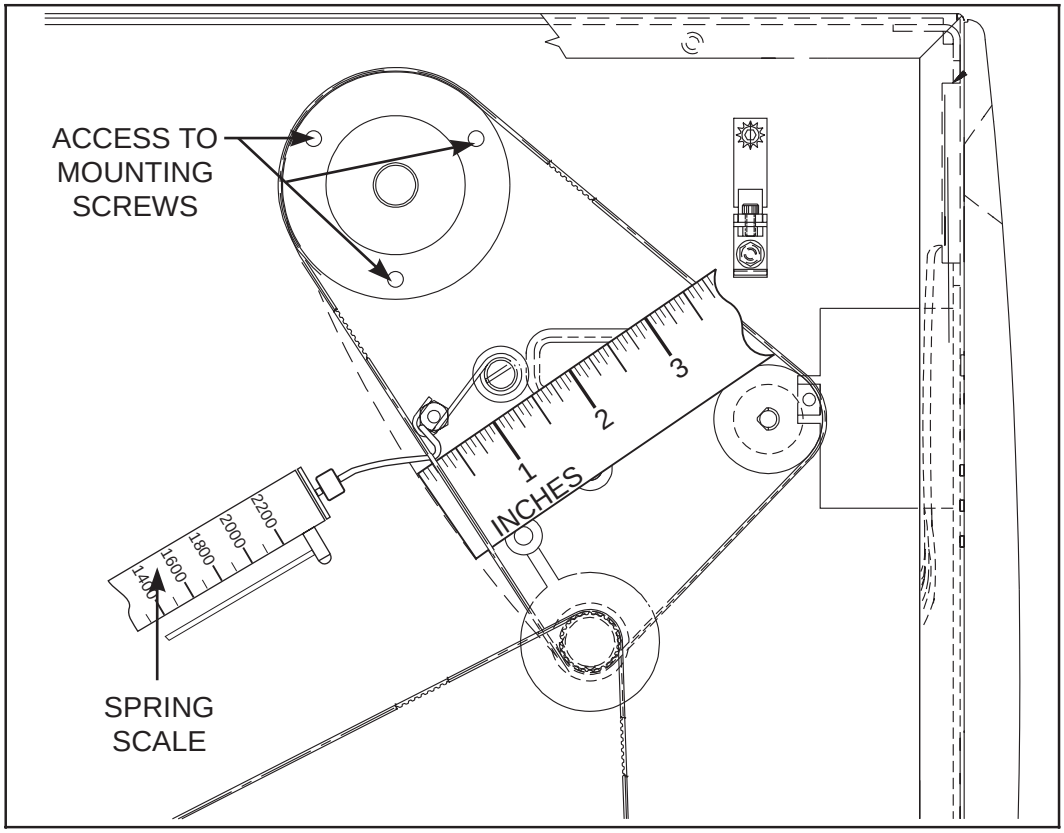


Figure 5.20 90/140/170*Xi*II Main Drive Belt

220XiII (for 90XiII, 140XiII and 170XiII, refer to the previous page.)

1. Turn the printer OFF and remove the AC Power Cord.
2. Remove the Left Side Panel of the printer by removing the Phillips Screws which hold it on.
3. Refer to Figure 5.21 and note the position of the Idler Gear used to adjust the tension of the Main Drive Belt.
4. In the Media Compartment, locate the Idler Gear Mounting Screw. Use a 7/64″ Allen Wrench to loosen the Idler Gear Mounting Screw.
5. Refer to Figure 5.21 and slide the Idler Gear Assembly toward the rear of the printer to relieve the tension on the Main Drive Belt.
6. Remove the old Main Drive Belt and install the new one.
7. Hook a 2200 gram spring scale to the belt as shown in Figure 5.21, and carefully slide the Idler Gear Assembly toward the front of the printer to increase belt tension.
8. When a scale reading of 2000 grams ± 200 grams (4.5 lbs ± 0.5 lbs) creates a deflection of 1/4 inch, tighten the Idler Gear Mounting Screw.
9. Replace the Left Side Panel and reapply AC Power.

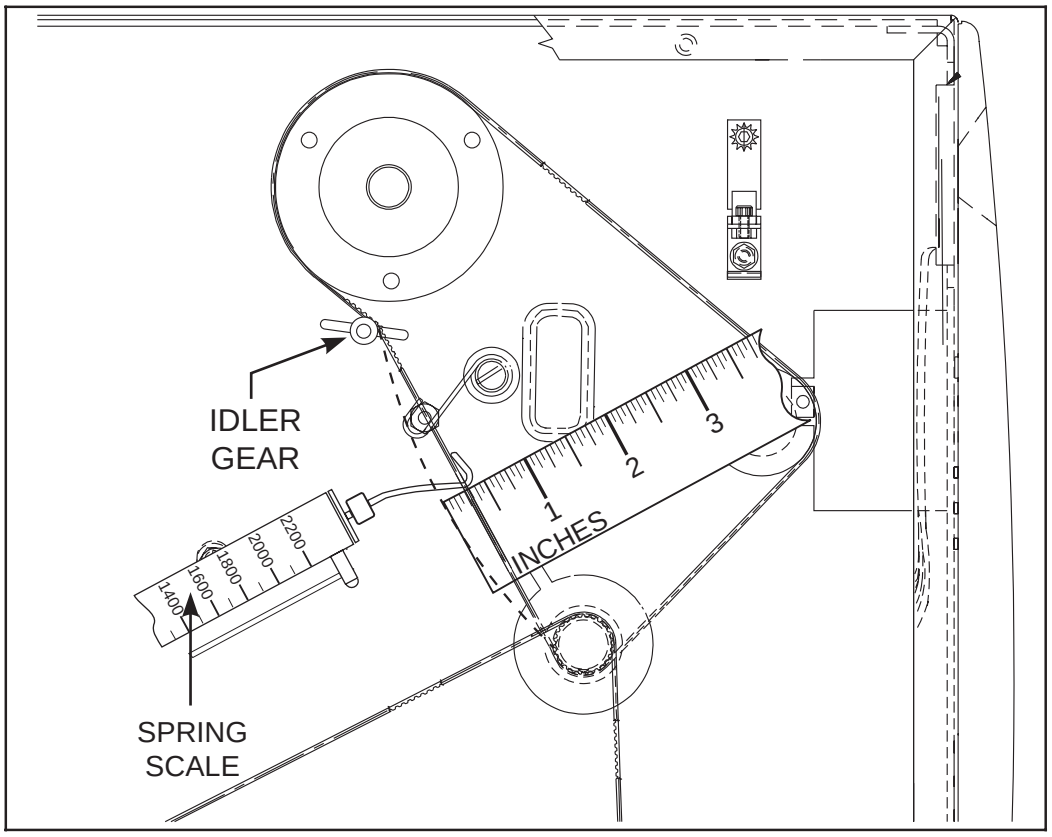


Figure 5.21 220*Xi*II Main Drive Belt

Rewind Drive Belt - Removal, Replacement & Adjustment

1. Turn the printer OFF and remove the AC Power Cord.
2. Refer to page 5-26 and remove the DC Power Supply from the Printer.
3. Refer to Figure 5.22 and note the position of the Idler Gear used to adjust the tension of the Rewind Drive Belt.
4. On the Media Side of the printer, locate the lower access hole in the Side Frame and remove the hole plug. Use a 7/64″ Allen Wrench with a 10″ minimum shaft length (90/140/170*Xi*II) or a 12″ minimum shaft length (220*Xi*II) to reach through the hole and loosen the Idler Gear Mounting Screw.
5. Slide the Idler Gear Assembly toward the front of the printer to relieve the tension on the Rewind Drive Belt.
6. Remove the old Rewind Drive Belt and install the new one.
7. Hook a 2200 gram spring scale to the belt as shown in Figure 5.19, and carefully slide the Idler Gear Assembly to the left to increase belt tension.
8. When a scale reading of 2000 grams ± 250 grams (4.5 lbs ± .5 lbs) creates a deflection of 1/4″, tighten the Idler Gear Mounting Screw to a torque of 20 inch-pounds.
9. Refer to page 5-26 and perform the DC Power Supply Installation procedure.

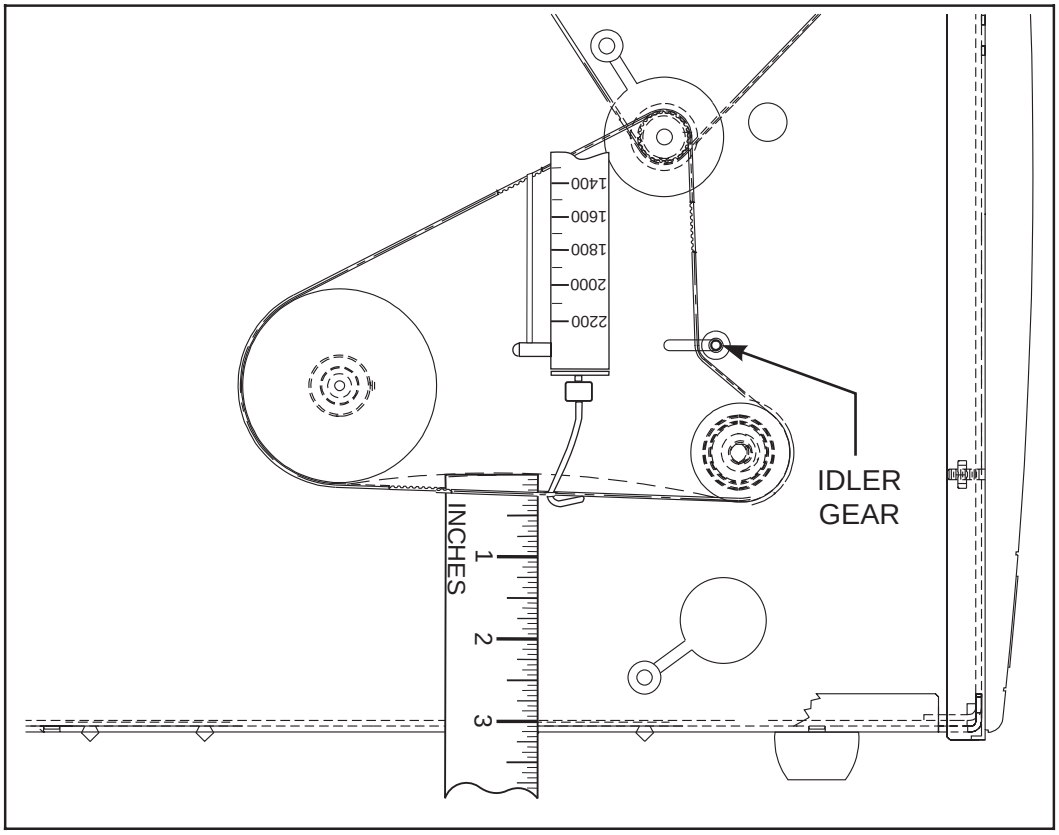


Figure 5.22 90/140/170/220*Xi*II Rewind Drive Belt

AC Power Fuse Replacement

The *Xi*III-Series printer uses a metric-style fuse (5 x 20 mm IEC) rated at F5A, 250V. The AC Power Entry Module comes with two approved fuses in the Fuse Holder: one is "In-Circuit" and the second is provided as a "spare" (refer to Figure 5.23 below). The end caps of the fuse must bear the certification mark of a known international safety organization (refer to Figure 5.24). To replace a faulty fuse, use the following procedure.

WARNING
Turn the printer's AC Power Switch OFF and disconnect the printer's AC Power Cable before replacing any Fuses.

1. Refer to Figure 5.23. Using a small blade screwdriver or similar tool, remove the Fuse Holder which is part of the AC Power Entry Module at the rear of the printer.
2. Remove the faulty fuse and install a new fuse in the "In-Circuit" position. If you use the Spare Fuse, be sure to order a new replacement fuse. Fuses can be ordered from your Zebra distributor.
3. Snap the Fuse Holder back into the AC Power Entry Module.
4. Reconnect the Power Cable and turn printer ON.

NOTE: If AC power is not restored, an internal component failure may have occurred. The printer will require servicing.

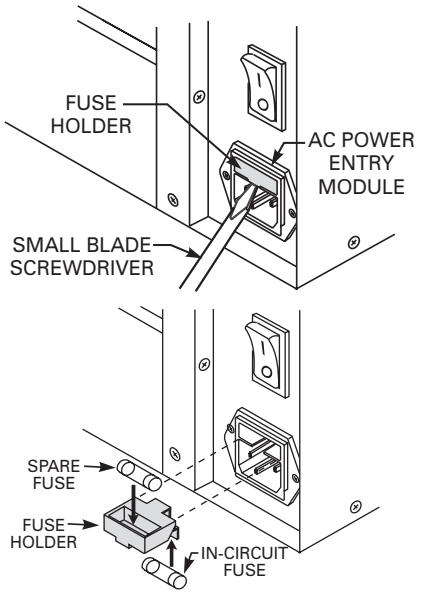


Figure 5.23 AC Power Fuse Replacement

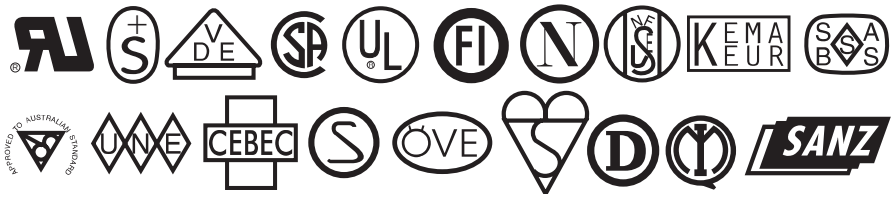


Figure 5.24 International Safety Organizations

NOTES

In this section... Page

Basic Troubleshooting

Consult the Troubleshooting Tables which follow and compare the printer output to the sample labels provided on the following pages to improve the quality of your labels.

Troubleshooting Charts

Table 6.1 Power On Troubleshooting

SYMPTOM	DIAGNOSIS	ACTION
All LEDs light, but nothing displays on LCD and printer will not operate.	Main Logic Board or Program ROM faulty.	Insure Program ROMs are properly installed or Replace the Main Logic Board.
All LEDs Flash ON and OFF.	No significant amount of DRAM tested good.	Replace the Main Logic Board.
Take Label LED Flashing.	Printer misconfigured for Peel-Off Mode.	If Peel-Off is desired, check Take Label Sensor.
Printer locks up while running Power On Self Test.	Main Logic Board failure.	Replace Main Logic Board.
CHECKSUM FOR ROM SET n INVALID	A Program ROM checksum is incorrect.	Turn the printer OFF and then ON. If the fault reoccurs, replace the Program ROMs.
EEPROM CHECKSUM INVALID	EEPROM checksum is incorrect.	Replace the Main Logic Board.

Table 6.2 Error Messages

SYMPTOM	DIAGNOSIS	ACTION
ERROR CONDITION PAPER OUT Printer stops and ERROR LED Flashes.	No media loaded or incorrectly loaded.	Load media correctly.
	Misadjusted Media Sensor.	Check Media Sensor Position and Sensitivity.
	Printer set for Non-Continuous Media, but Continuous Media is loaded.	Install proper Media or reset printer for current Media type.
WARNING RIBBON OUT Printer stops and ERROR LED Flashes.	**For Thermal Transfer:** Ribbon not loaded or incorrectly loaded. or Ribbon Sensor not sensing ribbon that is correctly loaded.	1. Load ribbon correctly. 2. Insure Snap Plate is properly installed. 3. Perform Media and Ribbon Sensor Calibration.
WARNING RIBBON IN	**For Direct Thermal:** Ribbon loaded unnecessarily.	Remove Ribbon.
ERROR CONDITION HEAD OPEN Printer stops and ERROR LED Flashes.	Printhead is not fully closed.	Close Printhead completely.
	Head Open Sensor not detecting Position Flag or Flag not in the proper position.	Check Head Open Sensor and Flag for proper operation.
WARNING HEAD OVERTEMP Printer stops and ERROR LED Flashes.	Printhead element is overheated.	Printer resumes printing when the Printhead element cools to a normal operating temperature.
WARNING HEAD UNDERTEMP Printer stops and ERROR LED Flashes.	Printhead element is not hot enough to print properly.	Environment too cold for proper printing. Relocate printer to warmer area.
ERROR CONDITION HEAD ELEMENT BAD Experiencing Print Quality Problems.	Printhead element is going bad.	To override this message, (1) place ^JT ∅ in your format and then (2) ^JO to turn off the HEAD TEST. Clean Printhead and test for proper printing. Replace Printhead if necessary.
ERROR CONDITION CUTTER JAMMED	The Cutter blade is in the media path.	Turn the Power OFF. Remove the media, reload the media and turn Power ON. If the error condition still exists, check Cutter Sensors and Control Board. Replace if necessary.

Table 6.2 Error Messages (Cont'd)

SYMPTOM	DIAGNOSIS	ACTION
Printer stops and PAUSE LED lights. LCD displays: OUT OF MEMORY CREATING BITMAP OUT OF MEMORY STORING BITMAP OUT OF MEMORY BUILDING FORMAT OUT OF MEMORY STORING FORMAT OUT OF MEMORY STORING GRAPHIC OUT OF MEMORY STORING FONT	Not enough memory to perform the function indicated in the second line of the display. (It is possible that the printer is configured for Continuous Label Stock with the Maximum Label Length set too long.) **Functions:** 1. **Creating a Bitmap** - Bitmap size is larger than the label length/width specified. 2. **Storing a Bitmap** - Not enough memory available to store the Bitmap created. 3. **Building a Format** - Label is too complex. 4. **Storing a Format** - Format size is too large to fit in available memory. 5. **Storing a Graphic** - Graphic image is too large to fit in the available memory. 6. **Storing a Font** - not enough memory to store the font.	You may do any of the following: A. STORING ERRORS - With PAUSE ON, use the ~HM ZPL II Command to display the amount of memory available. Then redesign the graphic/format to fit in the available memory or remove items from memory to create more space. or Press PAUSE to skip that step in the process and continue to the next step. B. With PAUSE ON, press CANCEL and the printer skips that label formatting process and continues to the next label format. C. Turn Power OFF to Clear printer memory and start all over again.

Table 6.3 Troubleshooting

SYMPTOM	DIAGNOSIS	ACTION
Poor Print Quality.	Darkness set too low.	Reconfigure Darkness setting.
	Incorrect Media and Ribbon.	Replace Media and Ribbon.
	Printhead just replaced.	Insure Printhead is installed properly with no wires or debris caught underneath.
	Printhead Adjustments incorrect.	Perform required adjustments.
	Printhead Resistance not configured to proper value.	Reconfigure Printhead Resistance.
Truncated print, no print, or Feed button operates incorrectly while using non-continuous media.	Maximum label length parameter set less than the actual label length.	Set the correct label length.
	Printer, that is in Rewind or Peel-Off Mode, was powered ON without media or backing around the Rewind Spindle.	Load media correctly for Rewind or Peel-Off Mode.
Long tracks of missing print on several labels.	Wrinkled ribbon.	See Wrinkled Ribbon in this Table.
	Print Element damaged.	Replace printhead.
Fine gray lines on blank labels at angles.	Wrinkled ribbon.	See Wrinkled Ribbon in this Table.
Wrinkled ribbon.	Ribbon fed through machine incorrectly.	Load ribbon correctly.
	Incorrect Burn Temperature.	Set the Burn Temperature to the lowest setting possible for good print quality.
	Incorrect Printhead pressure or balance.	Set the pressure to the minimum needed. Refer to the Printhead Balance Adjustment and Printhead Pressure Adjustment procedures.
	Media not feeding properly; it is walking from side to side.	Make sure the media is snug by adjusting the media guide.

Table 6.3 Troubleshooting (Cont'd)

SYMPTOM	DIAGNOSIS	ACTION
Continued wrinkled ribbon.	Strip Plate needs adjusting.	Perform adjustments.
	Ribbon Supply Spindle tension needs adjusting.	Perform adjustments.
	Printhead shaft needs adjusting using the Wear Plate.	Perform adjustments.
	Printhead needs realigning with Platen Roller.	Perform adjustments.
	Ribbon Take-Up Spindle tension needs adjusting.	Perform adjustments.
	3 point mount for Ribbon Supply Spindle needs adjusting.	Perform adjustments.
	Ribbon Supply Core slipping; Spindle Blades need adjusting.	Perform adjustments.
Light printing or no printing on the left or right side of the label.	Printhead needs balancing.	Adjust balance. See Printhead Balance Adjustment procedures.
	Printhead shaft needs adjusting using the Wear Plate.	Perform Wear Plate Adjustment.
Mis-registration/Skips Labels.	Misadjusted Media Sensors.	Perform Media Sensor Adjustments.
	Improper Spindle Tensions.	Perform Spindle Adjustments.
	Improper ZPL Format.	Correct ZPL Format.
Misregistration and misprint of 1 to 3 labels.	Media was pulled when motor was not moving.	Open and close the printhead, so it calibrates to find the label length.
	Printer, that is in Rewind or Peel Off mode, was powered ON without media or backing around rewind spindle.	Load media correctly for Rewind or Peel-Off Mode.
	Misadjusted Media Sensor.	Place Media Sensor in proper position.

Table 6.3 Troubleshooting (Cont'd)

SYMPTOM	DIAGNOSIS	ACTION
Vertical drift in top-of-form registration.	A plus or minus 1mm vertical drift is allowable due to the tolerances of the mechanical parts and printer modes.	Use Top Position setting to reposition the top-of-form.
Label jam in rear area of the Printhead.	Upper Media Plate (Snap Plate) needs cleaning.	Clean Upper Media Plate (Snap Plate).
Print label feeds out and then backfeeds immediately resting under the Printhead.	Printer set for Cutter Mode with no Cutter installed.	Set correct print mode.
Changes in Parameter Settings did not take effect.	Parameters are set incorrectly.	Cycle the power. Reload factory defaults. Then, set parameters and save permanently.
	If problem continues, there may be a problem on the Main Logic Board.	Replace the Main Logic Board.
Missing LCD characters or parts of characters.	LCD may need replacing.	Run the Power On Self-Test and check that LCD display is showing all characters.
ZPL was sent to printer, but not recognized. Buffer light remains ON.	Communications parameters are incorrect.	Print a Communications Diagnostic Label. Check for Format or Overrun Errors. Reset Communication parameters.
	Prefix and Delimiter characters set in printer do not match the ones used in ZPL.	Set the characters in the printer to match ZPL format. If problem continues, check the ZPL format for changed ^CC, ^CT, and ^CD.

Sample Labels

The following pages contain labels to be used with the preceeding troubleshooting charts. These labels illustrate conditions which could be seen if mechanical adjustments are necessary.

Zebra type 3P Media Stock and type 5319 Ribbon were used to obtain these labels. Any other Label and Ribbon stock combinations may produce sample labels with similar but not necessarily the same indications.

The size of these example labels has been adjusted to permit good visibility of the effects of the mechanical problem being illustrated.

Acceptable Label:

Darkness Properly Set

Printhead Positioned Correctly

Toggles Balanced (Equal Pressure on Left and Right Sides)

Unacceptable Label:

Darkness Set Too High

Printhead Positioned Correctly

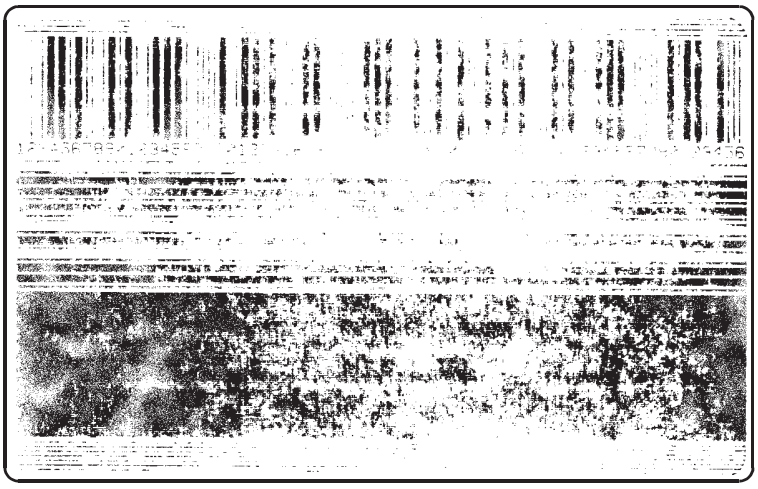
Toggles Balanced (Equal Pressure on Left and Right Sides)

Unacceptable Label:

Darkness Set Low

Printhead Positioned Correctly

Toggles Balanced (Equal Pressure on Left and Right Sides)



Unacceptable Label:

Darkness Set Very Low

Printhead Positioned Correctly

Toggles Balanced (Equal Pressure on Left and Right Sides)

Unacceptable Label:

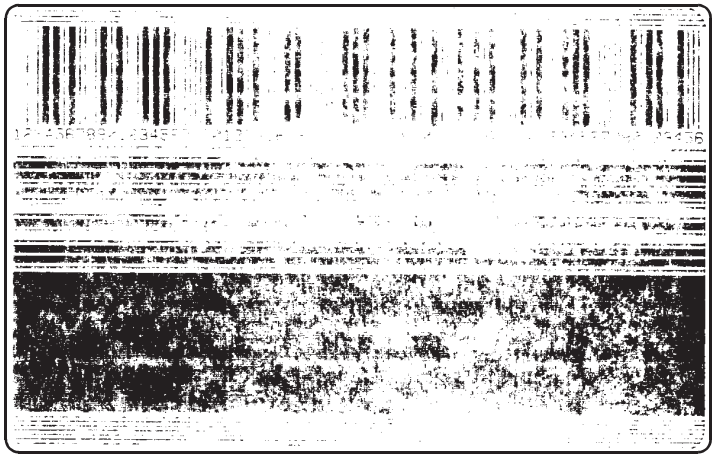
Darkness Properly Set

Printhead Too Far Forward
"Scratch Flowers" on Black Area (Foggy Appearance)

Printhead Needs to be Moved Rearward

Walk Out Wrinkle with Feed Button and Readjust

Toggles Balanced (Equal Pressure On Left and Right Sides)



Unacceptable Label:

Darkness Properly Set

Printhead Way Too Far Forward
"Scratch Flowers" on Black Area (Washed Out Appearance)

Printhead Needs to be Moved Rearward

Walk Out Wrinkle with Feed Button and Readjust

Toggles Balanced (Equal Pressure On Left and Right Sides)

Unacceptable Label:

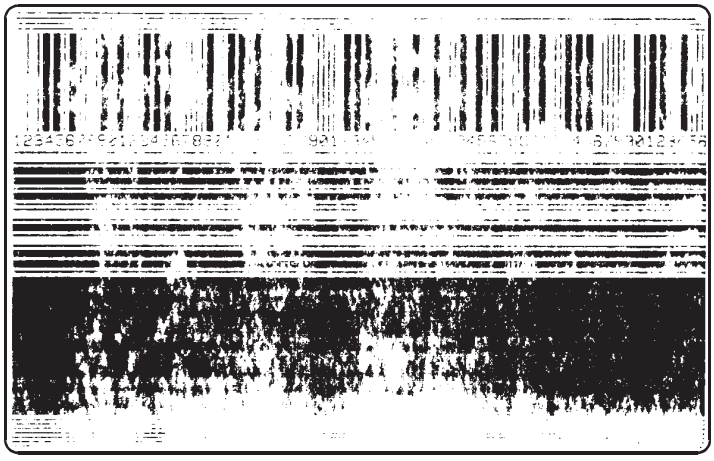
Darkness Properly Set

Printhead Too Far Back
Breakup on Trailing Edges of Bars (Opposite the Direction of Movement)

Black is Splotchy

Printhead Needs to Come Forward On Both Sides

Toggles Balanced (Equal Pressure On Left and Right Sides)



Unacceptable Label:

Darkness Properly Set

Printhead Way Too Far Back
Breakup on Trailing Edges of Bars (Opposite the Direction of Movement)

Black is Splotchy

Printhead Needs to Come Forward On Both Sides

Toggles Balanced (Equal Pressure On Left and Right Sides)

Unacceptable Label:

Darkness Properly Set

Printhead Position Correct on Right Side - Way Too Far Back on Left Side

Noisy Printing (Breakup on Trailing Edges of Horizontal Bars - Splotchy on Left Side)

Toggles Balanced (Equal Pressure On Left and Right Sides)

Unacceptable Label:

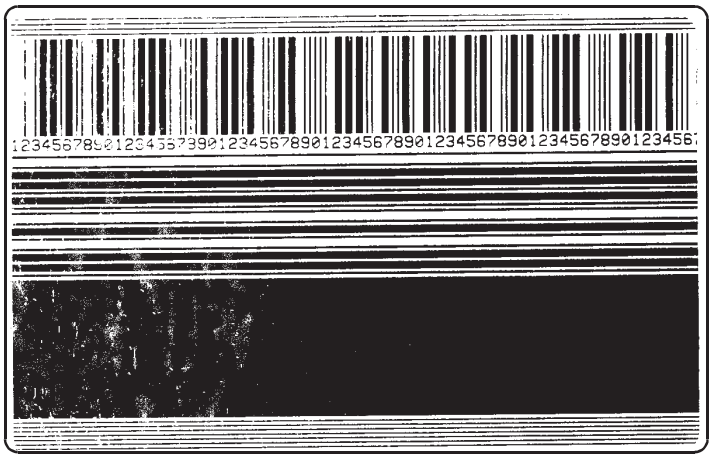
Darkness Properly Set

Printhead Position Correct on Left Side- Way Too Far Back on Right Side

Noisy Printing (Breakup on Trailing Edges of Horizontal Bars - Splotchy on Right Side)

Toggles Balanced (Equal Pressure On Left and Right Sides)

Unacceptable Label:



Darkness Properly Set

Printhead Position Correct on Right Side- Too Far Forward on Left Side

Noisy Printing (Breakup on Leading Edges of Horizontal Bars - Splotchy on Left Side)

Toggles Balanced (Equal Pressure On Left and Right Sides)

Unacceptable Label:

Darkness Properly Set

Printhead Position Correct on Left Side- Too Far Forward on Right Side

Noisy Printing (Breakup on Leading Edges of Horizontal Bars - Splotchy on Right Side)

Toggles Balanced (Equal Pressure On Left and Right Sides)

Factory Assistance

Should any problem be encountered which cannot be corrected with the aid of this manual, immediately contact your Distributor or the Zebra Technical Support Department to minimize downtime and/or assist in returning the equipment.

Returning Equipment

Should it become necessary to ship your *Xi*III-Series printer, carefully pack it in a suitable container to avoid damage during transit. A note describing the failure must be enclosed with the unit. Whenever possible, the original shipping container should be used. If the original shipping container is not available, a replacement can be ordered by contacting the Technical Support Department. If other containers are used, a procedure similar to the original factory packaging should be followed.

Remove all media and ribbon from the printer. Enclose the unit in a protective, dust-proof bag and insure that the unit floats in an outer carton of shock absorbing material.

A Return Materials Authorization (RMA) number is required for all equipment being returned. Contact Zebra Technologies Corporation's Technical Support Department to obtain an RMA number. Equipment returned for service without prior authorization may be refused.

CAUTION

Before packing the printer, remove any ribbon and paper rolls from the media compartment. DO NOT package the printer in a rigid container without utilizing shockmounts or shock-absorbing packing material. A rigid container will allow shock on the outside to be transmitted undamped to the unit and may cause damage.

In this section... Page

Printer Test Overview

This Maintenance Manual does not contain a Circuit Description section. Instead, this section of the manual provides in-depth explanations of the operation and testing features of the *Xi*III-Series printers. Faulty Electronic Assemblies should be easily located by board swapping. Further diagnostic testing of the faulty electronic assembly should be performed at a depot- level style repair facility.

Power ON Self Tests

The printer performs a complete self test sequence each time power is turned ON. This sequence of tests verifies that the printer will perform as required. Failing a critical test stops the printer from completing the self-test and stops normal printer operation. The following are the tests and their results.

LED Test

All LEDs are turned ON. Visual inspection by the operator is required to verify that all LEDs are operational.

Program ROM CRC Test

This test takes less than 5 seconds to execute. The CRC value for programming code memory space is calculated and compared to the last few bytes of the code itself. The Program ROMs are operational when the calculated CRC value matches the CRC value stored at the end of the ROM memory.

Upon successful completion of the ROM test the Data LED is turned OFF. Should the CRC test fail, the system will not advance beyond this test.

DRAM Test

This test takes less than 5 seconds to execute.

DRAM (Dynamic RAM) operation is verified by reading and writing to the DRAM area. The test is successful if one megabyte or more of DRAM is properly functioning. The DRAM size is rounded down to one, two, four, or eight megabytes available.

If the test finishes successfully, then the entire DRAM space is initialized to zero. After the memory is initialized, the Pause LED is turned OFF.

The Configuration Label and the LCD Idle Message show the amount of memory recognized. This value is compared to what was installed in the unit, to verify that all of the installed memory is functioning correctly.

Should the DRAM test fail, the system will not advance beyond this test. The failed DRAM area will be read repeatedly until power is turned OFF.

Printer Type Test

This test checks the settings of the "Printer Type" Selector Switches (S1 and S2) located on the Main Logic Board. When the Main Logic Board is installed, S1 **must be** positioned according to the type of printer. S2 **must be** in the zero (0) position.

Table 7.1 shows the valid settings for S1. This switch **should not** be set to the ZERO (0) position unless a faulty Main Logic Board is being tested. Refer to page 7-20 for further information on the Diagnostic Tests.

CAUTION

Insure this switch is properly positioned before applying Power to the printer. If this switch is set incorrectly, the Printhead or the Main Logic Board could be damaged.

Table 7.1 S1 Switch Settings

Switch Position	Function
0	Diagnostics
1	170PAX Left Hand (12dots/mm)
2	170PAX Right Hand (12dots/mm)
3	170PAX Left Hand (8dots/mm)
4	170PAX Right Hand (8dots/mm)
5	Undefined
6	90*Xi*II Printhead (12 dots/mm)
7	Undefined

Switch Position	Function
8	140*Xi*II KMT (8 dots/mm 8"/sec)
9	140*Xi*II KST (8 dots/mm 8"/sec)
A	140*Xi*II KMT (8 dots/mm 12"/sec)
B	140*Xi*II KST(8 dots/mm 12"/sec)
C	Undefined
D	Undefined
E	220 *Xi*II Printhead (8 dots/mm)
F	170*Xi*II Printhead (12 dots/mm)

LCD Display Test

The LCD (Liquid Crystal Display) shows all the displayable characters. The display then shows solid boxes at each character position allowing the operator to visually insure all dot positions are displayable.

Shared SRAM Test

This test takes less than 2 seconds.

The LCD displays “SRAM test”. The shared SRAM (Static RAM) operation is verified by reading and writing to the SRAM area. The test is successful when the full 128k of SRAM is properly functioning.

If the test finishes successfully, then the entire SRAM space is initialized to zero, and the Paper Out LED is turned OFF. After memory is cleared, the code for the second processor is loaded into memory and the second processor starts executing the code.

Should the SRAM test fail, the system will not advance beyond this test. The failed SRAM area will be read repeatedly until power is turned OFF.

Second Processor Test

This test takes less than 5 seconds to execute.

The LCD displays “Processor Test”. The CRC value for shared SRAM space is calculated by the second processor and compared to the expected value. The second processor is operational when the CRC values match. The main processor will wait for the second processor to finish this test.

Should this test fail, the system will not advance beyond this CRC test.

Optional ROM CRC Test

This test takes less than 5 seconds to execute.

The LCD displays the phrase “Option ROM Test”. The CRC for each object in the optional ROM is calculated and compared to the expected CRC. All of the object CRCs must match for the optional ROM to be valid.

Should the option ROM CRCs not match, the display will show “Not Installed” and the system will pause for one second.

EEPROM Checksum Test

The LCD displays the phrase “EEPROM Test”. A checksum is calculated for each value stored in the EEPROM. If the checksum is correct, the corresponding printer parameter is updated. Should any value be incorrect, the factory default setting is loaded for that value and the LCD displays the phrase “Failed” for one second. See the “LCD Menu” operation described later.

Printhead Test

The LCD displays the phrase “Print Head Test”. The printhead test determines the width and dot density of the printhead. The printer operation is then adjusted accordingly. This test actually checks rotary switches SW1and SW2 and not the printhead itself.

Memory Card Test

This test takes less than 5 seconds to execute.

The LCD displays the phrase “Memory Card Test”. The CRCs for objects in the optional memory card are calculated and compared to the CRCs in the card. All of the object CRCs must match for the option card to be valid.

Should the option card CRCs not match, the display will show “Not Installed” and the system will pause for one second.

Test Completion

The final action of the Power On Self Tet is to turn all of the LEDs OFF except the Power LED. At this time the LCD displays the phrase “Printer Ready”.

Power-Up Media Registration

Once the Power On Self Test is complete, if the Printhead Type Selector Switch (S1) is not “0", the media is advanced to the proper rest position. Continuous media is assumed to be at the proper rest position. The motion required to place non-continuous media at the rest position is determined by the media feed setting. Both the printer configuration and a ZPL command can set the media feed value to one of four possible values.

- **No Motion** - this indicates that the media is correctly positioned and no motion is required.
- **Feed** - (Default) this causes the media to feed to the first web, notch, hole, or mark that passes the media sensor.
- **Length** - the printer measures the length of one label and then feeds to the start of the next label.
- **Calibrate** - the printer performs a full calibration where the media type, label length, and sensor settings are determined prior to feeding the next label to the rest position.

The proper rest position is determined by the print mode, which is described later.

Self-Test Labels

Self-test labels, if requested, are generated once the media registration is completed. These self-test labels are requested by pressing a key while turning the printer power ON. (The key must be held in before the power is turned on and not released until the first LED turns OFF.) The PAUSE Key Self-Test and the FEED Key Self-Test both cause labels to print. The label formats change when a “loopback” connector is detected.

PAUSE Key and FEED Key Self-Test (Reset Defaults)

Pressing the PAUSE and FEED Keys while turning printer power ON resets the printer to the “Default” settings.

These values are not saved in EEPROM, but may be saved from the LCD menu.

PAUSE Key Self-Test (Head Alignment and Run-in Tests)

This test starts with a check of the hardware handshake lines. When a loopback connector is not detected, the following printhead test labels print. When the printer pauses during these formats, pressing the PAUSE Key re-starts printing. While paused, pressing the CANCEL Key switches to the next set of labels. This test can be performed without a loopback connector.

Eight dots per millimeter test sequence:

- 9999 labels at two inches/second pausing every 15 labels
- 9999 labels at eight inches/second pausing every 15 labels
- 9999 labels at two inches/second pausing every 50 labels
- 9999 labels at eight inches/second pausing every 50 labels

Twelve dots per millimeter test sequence:

- 9999 labels at two inches/second pausing every 15 labels
- 9999 labels at six inches/second pausing every 15 labels
- 9999 labels at two inches/second pausing every 50 labels
- 9999 labels at six inches/second pausing every 50 labels

When the loopback connector is detected, 500 Head Test labels are printed at six inches per second. The printer places the ZPL data for these labels into the printer's transmit buffer. The data is then fed back into the printer by the loopback connector. A serialized number is printed on the standard head test label. Each label backfeeds prior to printing and feeds out to the rest position after printing.

FEED Key Self-Test (Print Quality Tests)

This test starts with a check of the hardware handshake lines for a loop- back connector. If a loopback connector is not present, 14 Print Quality labels are printed. One label is printed for each darkness setting, at the slowest and fastest print speeds. The darkness starts at three settings below the currently configured value and continues to increase until it is three settings darker than the configuration value. The relative darkness and speed are printed on each label. The bar codes on these labels can then be ANSI-graded to check print quality. This test can be performed without a loopback connector.

If a loopback connector is detected, the following set of formats print with a pause after each format (refer to page 3-9 for more information on loopback connectors):

1) 20 - Fastest Speed, Left Ribbon Wrinkle labels
2) 20 - Fastest Speed, Right Ribbon Wrinkle labels
3) 20 - Fastest Speed, C39 Wrinkle test labels
4) 10 - Fastest Speed, Useable Area labels
5) 10 - Fastest Speed, Head Temp Test labels
6) 10 - Fastest Speed, Upper Smear labels
7) 10 - Fastest Speed, Lower Smear labels
8) 20 - Slowest Speed, Left Ribbon Wrinkle labels
9) 20 - Slowest Speed, Right Ribbon Wrinkle labels
10) 20 - Slowest Speed, C39 Wrinkle Test labels
11) 10 - Slowest Speed, Useable Area labels
12) 10 - Slowest Speed, Head Temp Test labels
13) 10 - Slowest Speed, Upper Smear labels
14) 10 - Slowest Speed, Lower Smear labels

CANCEL Key Self-Test (Printer Configuration)

The CANCEL Key self-test prints a Configuration Label. This label shows the active printer configuration, information about options and the software version number. A copyright notice also prints on this label.

When a single label is not long enough, the configuration information prints over several labels.

Automatically Executed Format

The printer is ready to print label formats once the Power ON Self Test and Media Registration are finished. The first labels printed are the self- test labels previously described. Once the self-test labels are printed, a check is made in the optional memory card and then the optional EPROM for a stored format named AUTOEXEC.ZPL. The first AUTOEXEC.ZPL format encountered is recalled and printed.

Printer Ready

Once the automatic format, AUTOEXEC.ZPL, has printed, the printer enters an idle state. The printer waits for operator interaction or ZPL input to determine its next operation. While in this idle state the printer continuously checks for error conditions (head open, head over-temperature, head under-temperature, ribbon out, or media out) in addition to ZPL input and Front Panel Key closures.

The printer is capable of handling data communications, operator interactions, printing and formatting all at the same time. These are all basically independent processes which are performed simultaneously by the printer.

In the following paragraphs, when there are interactions between processes, these interactions are described in detail. Otherwise, each operation functions independently, so it is described separately.

Operator Interfaces

The Front Panel Keys, LCD and LEDs are the interfaces to the operator. The LEDs provide a very quick overview of the printer's current status, while the LCD provides more detailed feedback about the printer. The keyboard supports features such as Pause, Feed and Cancel independent of the LCD. The other keys, along with the LCD display, allow the operator to configure the printer.

Front Panel Keys

The operator has complete control over the printer with the front panel keys. The black keys, along with the LCD, are used to configure the printer. Refer to the *Xi*II printer's user's guide for further details.

Liquid Crystal Display

The LCD display shows several types of information. The display starts with the printer ready message shown below. For each format printed, it displays the printing message with a label counter, as shown below.

The LCD also indicates error conditions when they occur and allows the printer to be configured. The message priority for the LCD display is therefore, configuration messages first, then error messages, printing messages, and finally the idle message.

IDLE Message

PRINTER READY 1024K Vx.x.x

PRINTING Message

PRINTING 000001 OF 999999

ERROR Messages

The error message display cycles through each of the error conditions that have occurred since the first error condition was detected. It also shows the “printing # of #” display. When an error condition is corrected, the top line of that error display indicates “ERROR CLEARED”. Once all of the errors have been cleared, the display indicates “PRINTER IDLE”. The pause key may be pressed to resume printing. The possible error conditions are:

ERROR CONDITION PAPER OUT	ERROR CONDITION HEAD ELEMENT BAD
ERROR CONDITION HEAD OPEN	ERROR CONDITION CUTTER JAMMED

Warning Messages

The “Head Overtemp” warning will cause printing to stop. The printer will resume printing after the head cools unless another error has also occurred. The Ribbon In/Out Warnings will cause printing to stop until the condition is corrected and the PAUSE Key is pressed. The “Head Undertemp” condition does not stop printing.

WARNING HEAD OVERTEMP	WARNING HEAD UNDERTEMP

WARNING RIBBON IN/OUT

Out Of Memory Messages

The OUT OF MEMORY conditions require the operator to press the PAUSE Key to clear the error condition and continue operation.

OUT OF MEMORY CREATING BITMAP	OUT OF MEMORY STORING BITMAP
OUT OF MEMORY BUILDING FORMAT	OUT OF MEMORY STORING FORMAT
OUT OF MEMORY STORING GRAPHIC	OUT OF MEMORY STORING FONT

Front Panel LEDs

LEDs on the front panel are a quick indication of the printer's status. Whenever an LED should be ON and Flashing at the same time, the LED will Flash. Refer to the *Xi*II Printer's user's guide for further details.

Communications

A separate process handles the data communications with the host system, as well as other printers and devices connected to a secondary port. This process determines whether the received data should be transmitted by the secondary port, or discarded as invalid before adding it to the label generator's input buffer. Any data received by the secondary port is automatically re-transmitted by the host port. All data transfers follow the selected hardware and software protocols. However, data received by the printer is not checked for parity, framing, or overrun errors except when the printer is in the communications diagnostic mode.

Optional Ports

The standard printer configuration is a single RS232/RS422/RS485 serial port and a Centronics-compatible parallel port. Other interface options include: an IBM twinax interface and an IBM coax interface. A hardware check at power-up determines which communications option is installed.

Host Port

The main serial port is normally the "primary" port. The parallel port or any of the optional ports may be selected as the primary port. The primary port is the interface to the host system. It receives ZPL (or ZPL II) commands from the host and, with the exception of the parallel port, transmits information back to the host.

Port Configuration

The host port is specified during the printer configuration process. Any of the ports will function as the host port.

Serial port settings for baud rate, data bits, stop bits, flow control, and parity are also configured from the LCD menu. The host port is configured with the same port settings. The printer supports three software protocols for the serial port: ZebraNet, Ack/Nak, and Zebra Packet.

ZebraNet Protocol

ZebraNet protocol connects Zebra printers together in an ethernet arrangement. Label formats can be sent to only one or a multiple number of printers at the same time through the use of a Network ID code which is unique to each printer.

The Network ID is configured via the LCD Menu or by a ZPL command. Whenever the proper ID number follows a connect command, the printer processes the data received.

Additional information about ZebraNet operation may be found in the *Xi*III printers' user's guides.

Zebra Packet Protocol

The main serial port supports a packet protocol. The packet is received and checked for accuracy prior to processing by the printer. If the packet is received correctly, an acknowledge packet is returned to the host. If an error occurs while receiving the packet, a negative acknowledge packet may be sent to the host or no response at all. Once a packet is received and verified, the data in the packet is processed normally.

A complete explanation of the Packet protocol is found in the ZPL II Programming Guide.

Ack/Nak Packet Protocol

Another version of Zebra packet protocol is supported to maintain compatibility with earlier printer models. Since this is not a reliable packet protocol, the Zebra protocol should be implemented in its place where possible.

Errors Conditions

The packet protocol responds with a negative acknowledge packet when an error is detected. This is the only communications method that attempts to correct detected errors. Standard communications errors, such as parity and overrun errors, should cause packets to be invalid.

Normal Mode

During normal printer operations, framing, overrun, and parity errors are ignored. The printer attempts to print labels from the data values it receives. The printer always transmits data with the specified parity, data bits, and stop bits.

The printer may print labels even when it is improperly configured. If the host is not receiving responses, it may be due to an incorrect setting.

Diagnostic Mode

This mode is very beneficial as a troubleshooting aid. Each character received is printed as a hex value. Its ASCII interpretation is printed directly above the hex value. Any framing, overrun or parity errors are indicated just below the hex value if the character was incorrectly received.

Flow Control

The printer will accept data and place it into the label generator's input buffer until the buffer is full. Then the printer will only process commands that can be handled in the communications process. All other data is ignored. When the label generator's 5000 character input buffer only has enough room for another 256 characters, a signal is sent to the host to stop the data transmission. This is done by either hardware (DTR/DSR) or software (Xon/Xoff) flow control as selected from the LCD menu. The label generator will remove data from it's input buffer as it is processed. Once the buffer has room for another 512 characters, the printer will signal the host to resume sending data. This guarantees that valid data will never be ignored.

Data transmissions from the printer are controlled in the same manner. When the printer receives a signal to stop sending data, it starts collecting data internally. Once the signal to resume data transmission is received, the printer will resume transmitting data. If the printer needs to transmit data and its internal transmit buffer is full, the printer will drop the data rather than wait for the buffer to empty.

The flow control for the secondary port is handled in the same manner as the host port described above. The secondary port has its own set of receive and transmit buffers. The data received by the secondary port is always retransmitted by the primary port.

The Command Processor

The data received by the primary port is processed in several steps. The first step is to remove all CR, LF, NULL, XON, and XOFF characters from the data stream. The next step is to convert all command (tilde), format (caret), and delimiter (comma) prefixes to DLE, RS and US characters respectively. The SI, STX and ETX characters are also expanded into a field separator command, a start of format command and an end of format command, respectively. The command is then either processed or placed in the label generator's input buffer.

There are three types of commands in ZPL.

- "Immediate" commands start with a DLE character. These commands are processed as soon as they are received.

  All other commands are placed directly into the label generator's input buffer.
- "Format" commands start with an RS character. These commands are only recognized when they are placed between the "start of format" and the "end of format" commands.
- The third type of command starts with either a DLE or an RS character. These commands need not be a part of a format, but are processed by the label generator, along with the format commands, in the order received.

Label Generator

The label generator interprets the data found in its input buffer and either stores it for later recall, or generates a set of label images from it. The memory required to store the data and label images comes from a memory pool managed by the label generator. Once a label image is created, it is queued for printing. Since a single format can create several different labels, this process also modifies the initial image to create the other label images needed.

Creating a label image from the data in the input buffer is a two step process. First the data must be processed for commands and the parameters associated with them. The second step is to create a dot pattern from these commands.

Processing and Formatting

Standard ZPL processes all of the commands in a format before it starts to create the dot pattern. Since data is placed into the input buffer as it is received by the communications process there may be times when the label generator is waiting for more input data.

ZPL II decodes all of the commands for a single area (or field) and then generates the dot pattern for just that area. This allows the label generator to fill the idle time when it would be waiting for the communications process. ZPL II also supports a command that allows the label generator to queue a portion of the label image so the printing process may start earlier.

The input data is decoded to determine what data is valid and where to store the information. The parser receives two types of commands. Format commands are decoded to create label images, while control commands perform some other function such as storing data as a graphic image or a font.

Line Printer Mode

When in “line printer” mode, any data that is received prior to the “start of format” command is formatted and printed (except control commands). The number of characters per line and the orientation of the text are all controlled by a ZPL command. The default line printer mode is OFF, and it must be activated to make text print. When line printer mode is disabled, the printer will ignore data prior to the “start-of-format” command, except for control commands.

Control Commands

A Control command may be received at any time. It may be between formats or during a format. The Control command will end the current Format command but has no other affect on the format. Control commands may perform one of several functions (i.e. storing or deleting graphics, fonts or formats, or printing informational labels).

Format Commands

All Format commands in ZPL have a default value for each parameter. These values are related to either the overall format or a field within the format. The input data is searched until a “start-of-format” command is found. It then copies the default format and field definitions to the current format and field definitions. As each command is decoded, the current format and field definitions are updated accordingly. Any ZPL command that affects both the current field or format and all future fields or formats updates both the current definition and the proper default definition.

Each Field Separator command ends the current field and starts the next. In standard ZPL mode, the current field is saved in a list of field definitions. In ZPL II mode, all fields are formatted as soon as possible. The only field definitions not formatted are fields with a field number and without field data. A field definition that has a field number, serialized field data, or is a variable field, must be saved for later reference. Since all fields with field numbers are saved, the field will be formatted the first time the same field number appears with field data. After saving and possibly formatting the current field, the current field definition is reset with the default field values. Commands are then decoded for the next field.

Since some commands can affect the entire label, it is VERY important with ZPL II that these commands are specified first. While the order is less critical in standard ZPL, these commands have traditionally been at the start of a format.

Command decoding continues to update the format and field definitions until the “end-of-format” command is decoded. This command causes the current field definition to be processed as described above. In standard ZPL mode, all of the fields that have been defined are now formatted one at a time. In ZPL II mode, the formatting has already been completed and the images are ready to be queued for printing. The first label image is queued once for each label to be printed from that image. The label generator then determines if additional label images are required. These additional images are created one at a time, by erasing old field data values and replacing them with new data values. The new image is then queued as many times as required. This process is repeated for all of the label images that are printed by the current format.

Once the labels are all queued, the current image is either partially or fully erased for the next format. If a field was defined as a host verify field, the label generator will wait for the label image to be printed before continuing. Once the image is printed, the label generator returns the field header data and the field data value to the host through the communications process. The parser is now ready to start searching for the next “start-of-format” command.

Memory Manager

The label generator has several memory areas available. A font ROM, RAM space, an optional ROM area, and optional memory card are available for stored information. The memory manager determines when these memory areas are available and what type of memory is available in each area. The ROM area and read-only memory cards must be pre-programmed. The format of the pre-programmed data is determined by Zebra's PC based tools for generating these ROMs and cards.

Data may be stored in all of these devices. Since it is possible to have the same name for data stored in several different devices, each device has a unique name. When the device name is not specified, the memory manager searches each device for the data item, in the following order:

RAM Space

Memory Card

Optional ROMs

Font ROM

This same search order is followed at power-up for the AUTOEXEC.ZPL label format and for automatically installed fonts. Fonts are automatically installed when they have a single character name. A font, such as D.FNT, could exist in the memory card, the option ROMs and in Zebra's font ROM. Since the memory card has the highest priority, this is the font that is installed for the AD command. The AUTOEXEC.ZPL format may override this with a font alias command.

Font ROM

The printer's standard fonts and bar codes are stored in the Font ROM space (part of the code EPROMs). This device must be present for the printer to pass the Power On Self Test. This ROM is referred to as the "Z" device.

Optional ROM

Since the ROM space is read only memory, it must be pre-programmed with fonts, formats, or graphics. At Power On, the printer determines if the optional ROMs are installed. When present, the ROMs are referred to as the "E" device.

Optional Memory Card

The optional memory card may be writable or read-only memory. At Power On, the printer determines if a memory card is installed and the type of card. Read-only cards must be pre-programmed, similar to the optional ROMs. If the printer detects a read-only card, it can not save data in the option card. If the printer detects a writable card, the printer may save data to this card. When present, the memory card is referred to as the "B" device.

Battery Failure

A battery preserves the data on a writable card when the power is turned OFF. If a writable card is detected, and the card has invalid data, the printer will display a “Battery Dead” message. The card can be re-initialized by the LCD menu or a ZPL command. The LCD does provide a “Battery Low” warning message to alert the operator when the battery should be changed. The battery status is also indicated on the Configuration Label by one of the following:

None..... Battery RAM (Memory not detected)

Dead..... Battery RAM (Memory not initialized)

Installed..... Battery RAM (Memory and battery good)

RAM

The printer’s standard one megabyte of RAM space is expandable to a total of nine megabytes. General printer operation requires 256 kilobytes of RAM. The remainder of the memory, 768K (or 8192K from 9MB), is in a single memory pool which is allocated for the storage of label images (bitmaps), graphics, formats, and fonts. The printer creates as many bitmaps as possible from the memory pool when generating label images. Only when the entire memory pool is exhausted does the label generator wait for labels to finish printing. When data needs to be stored for graphics, fonts and stored formats, the memory manager waits for enough memory to become free and then stores the data.

Memory Full Conditions

While downloading a graphic, font or stored format, the memory manager determines the amount of memory needed to store the data. It then waits until enough memory is free, or until all of the bitmaps are printed. Once all of the bitmaps are printed, if there is still not enough memory to store the data, the LCD displays the message “Out of Memory Saving Image”, ..."Font", or ..."Format". The graphic image, font or stored format is then discarded.

It is possible to run out of memory when attempting to create a bitmap. If there are other bitmaps in memory, the printer waits until the other bitmaps are printed. Once all of the other bitmaps have been printed, if there is still not enough memory, the printer pauses and displays a message “Out of Memory Creating Label”. The format is then discarded.

Print Process

The print process controls media motion and physical printing. It performs three different tasks: printing a label from the label queue, feeding blank labels and calibrating the media sensors. The highest priority task is media sensor calibration, followed by feeding blank labels, and then printing labels. The print process never interrupts one of these tasks to start another. It simply completes the current task and then checks for the highest priority task.

Media Calibration

Media calibration occurs either when the printer is paused and the CALIBRATE Key is pressed, when the printer is turned ON, and when the printhead is CLOSED. A ZPL command determines the type of calibration performed for bot the Power ON and Head Closed conditions. Media Sensor calibration may also be selected from the configuration menu or by a ZPL command. The calibration always occurs at two inches per second, the slowest speed supported.

- The simplest form of calibration moves the media, looking for the first web that passes the Media Sensor. This web is then placed at the proper rest position based on the print mode.
- A label length calibration moves the media until two webs pass the Media Sensor to measure the label length. It then feeds the second web to the rest position.
- A complete calibration moves the media and monitors the Media Sensor input to determine the voltage level associated with web only and the level associated with web plus media. (If no distinction can be made between these two voltage level readings, the media type is set to continuous media.) After analyzing the data, two webs are fed past the Media Sensor to measure the label length, and then the second of these webs is fed to the rest position. Prior to moving the media at all, a check is made to determine if ribbon is present. If ribbon is present, the printer is set to thermal transfer mode. If the ribbon is not present, the printer is set to direct thermal mode.
- The final calibration mode is the same as the complete calibration mode with one exception. The Media Sensor values are printed on the media as a bar graph. This allows the operator to analyze the same data the calibration task is analyzing. Corrections can be made with a ZPL command to any of the values set by automatic calibration. The values set by calibration are applied to any label that is then printed. Since label images may already exist, the images may appear to be truncated.

Media calibration always functions and may clear error conditions that prevented media movement. As long as the printhead is closed, a media calibration may be performed. Ribbon and paper error conditions are cleared by calibration unless the Media Sensor never detects paper.

Print Error Conditions

There are several error conditions that affect printing. Some actually stop the printing process completely while others are only reported to the operator or host system. For example, a head open error condition stops all media movement while the head under temperature error has no effect on media movement. Some error conditions must be corrected before the printer will feed or print labels again.

Paper Out, Ribbon Out, or Head Open

A paper out, ribbon out, or head open error condition stops the printer immediately. The label being printed when the error condition occurs is only partially printed. The PAUSE LED is turned ON and the printer waits for the PAUSE Key to be pressed. If all three error conditions are cleared when the PAUSE Key is pressed, the PAUSE LED turns OFF. Media registration occurs (for non-continuous media) and then the printing process resumes.

Printing resumes by reprinting the label that was in process when the error occurred. All other printer features (e.g. communications, decoding, formatting, and cancel) function normally during the error condition and while the printer is "recovering".

The feature of reprinting a label after an error condition occurs can be turned off by a ZPL command. Media registration is also controlled by a ZPL command.

Head Over Temperature

When the printhead becomes too hot (>60º C), all printing stops, the Error LED turns ON and the LCD displays "HEAD OVERTEMP". The printer will wait until the printhead has returned to an acceptable temperature (<55º C) prior to restarting. All other printer features, including calibration, function normally while the printhead is over-temperature.

Head Under Temperature

A similar condition occurs when the printhead is cooler than desired (<15º C). The printer does NOT stop but the ERROR LED turns ON and the LCD displays "HEAD UNDERTEMP" to indicate the error condition. All of the other features of the printer continue to work normally. This includes printing, which should heat the printhead to the desired temperature. While the Under Temperature condition exists, print quality will be reduced due to insufficient heating of the print elements.

Darkness of Print

The print process controls the amount of energy required to print each dot in the label. The amount of energy required depends on the setting of the DARKNESS parameter, the ZPL relative darkness setting, the current printhead temperature, the type of media (direct thermal, thermal transfer), the speed of the media, the speed of the ribbon, the resistance of the elements of the printhead, and the dots around the dot being printed. These factors combine to determine the energy required by a printhead element to print one dot.

Printhead Element Test

Since a dot cannot be printed by a damaged printhead element, the printer performs a periodic test of each element. This test is controlled by ZPL commands. This test is always performed between printed labels. The printer may be configured to stop all printing when a head element failure is detected or it may only display the error and continue printing. The printhead test only tests the elements within the print width selected from the LCD menu.

Printing Queued Labels

Without any errors, a calibration request, or a feed request, the printer is ready to print labels. The operator interface or a ZPL command may pause the printing process. This keeps the print process from printing queued labels but does not stop the feed or calibration functions. Once the print process is taken out of pause, the first label queued is printed.

Print Speed

The media speed for the label is determine by the "^PR" ZPL command. Speeds of 2 inches/sec. to 12 inches/sec. are available depending on the specific *Xi*II printer under discussion.

Media Tracking

All label images are printed completely. After the entire image is printed, the printer seeks the next web for non-continuous media. This is done by feeding up to twice the known label length while looking for a web. If no web can be detected while feeding twice the label length, an Out of Paper error will occur. Once the web is detected, the printer feeds the web to the correct position based on the print mode and related ZPL commands.

Continuous media is assumed to have the end of the label under the printhead after feeding the full label length.

The location of the label image on the physical label stock is controlled by the LCD menu and ZPL. The LABEL TOP and LEFT SHIFT parameters move the image up and down or left and right without affecting media position relative to the printer.

Print Modes

The print mode determines the media motion and the rest position of the media relative to the printer. The print mode is selected by either a ZPL command or the LCD menu. The "Tear Off Adjust" parameter of the LCD menu adjusts the final rest position of the media without affecting the position of the printed image relative to the media.

Tear-Off Mode

The media is at the rest position for tear-off mode when the web is over the tear bar. To print a label, the printer backfeeds the media until the start (or bottom) of the next label is directly under the printhead. The printer then prints the entire bitmap. After the bitmap is completely printed, the printer either feeds to the tear bar, feeds until the start of the next label is under the head, or stops at the top of the current bitmap. The final position for the label is controlled by ZPL commands and when the next format is ready to be printed. If there is another label in the print queue, the printer feeds until the start of the next label is under the head.

Peel-Off Mode

The media is at the rest position for peel-off mode when the web is slightly in front of the printhead. To print a label, the printer backfeeds the media until the start (or bottom) of the next label is directly under the printhead. The printer then prints the entire bitmap. After the bitmap is completely printed, the printer either feeds to the take-label position or just to the top of the current bitmap. When the label is completely printed, the printer feeds the label to the take-label position. The label is in the take-label position when it is still held on by only the portion of backing material that has not crossed the tear bar. This allows the label to hang off of the printer. After the label is pulled free, the printer immediately backfeeds the media to the rest position.

Rewind Mode

The media is in the rest position for rewind mode when the start of the next label is directly under the printhead. The media never backfeeds in this mode. The printer prints the entire bitmap. After the bitmap is completely printed, the printer either feeds to the rest position or to the top of the current bitmap. This final position of the label is controlled by ZPL commands.

Cutter Mode

The media is at the rest position for cutter mode when the web is slightly in front of the printhead. To print a label, the printer backfeeds the media until the start (or bottom) of the next label is directly under the printhead. The printer then prints the entire bitmap. After the bitmap is completely printed, the printer feeds the label to the cut position, the rest position or just to the top of the current bitmap. When the label is completely printed and a cut is required, the printer feeds the next web (the top of the label) out into the cutter mechanism. The cutter blade is activated and the printer waits for the cutter mechanism to complete its cycle. After cutting, the printer immediately backfeeds the media to the rest position. If a cut is not requested by ZPL, the printer simply feeds to the rest position or to the start of the next label when another label is in the print queue.

Test Mode

The media is at the rest position for test mode when the web is slightly in front of the printhead. To print a label, the printer backfeeds the media until the start (or bottom) of the next label is directly under the printhead. The printer then prints the entire bitmap. After the bitmap is completely printed, the printer feeds the label completely out of the printer and then immediately backfeeds the media to the rest portion.

Feed Labels

The print process feeds a blank label whenever the operator interface or ZPL indicates a blank label has been requested. The feed occurs between label formats or while the printer is paused. Multiple feed requests feed a single label. A second blank label may be requested once the first label feed is completed. Feed labels move the media at the slew or feed speed which is set by the second parameter of the "^PR" ZPL command. All printers support 2, 3, 4, 5, 6, 7, and 8 inches/sec. printing speed. The 220*Xi*II printer supports speeds up to 10 inches/sec.The 140*Xi*II printer supports speeds up to 12 inches/sec.

Optimized Motion

The printer always determines the minimum motion required to perform each task. Blank labels always feed forward and never backfeed first. Labels with slew commands always reduce the backfeed distance by the amount of slew requested until no backfeed is required. The printer changes print speed without stopping. It simply decelerates or accelerates until the new speed is reached.

ZPL Commands Supported

All ZPL and ZPL II commands are explained in full detail in the ZPL II Programming Guide (part # 46469L). Refer to this guide for further information.

Power-Up Diagnostics

The Diagnostic Tests may be helpful when troubleshooting the Main Logic Board and ancillary hardware. Individual circuits are enabled, providing the Technician with the means of checking for proper operation.

CAUTION
THESE TESTS MAY DAMAGE THE PRINTER.

Main Logic Board Diagnostic Testing set-up requirements:

- To perform these tests, rotary switch (SW1) must be placed in the ZERO (0) position.
- Use an *Xi*II-Series printer as a “test fixture” when troubleshooting a Main Logic Board.
- The printhead connecting cable must remain disconnected from the Main Logic Board.
- Both a Serial Loopback Connector and a Parallel Loopback Connector **must be installed** on the Serial and Parallel Data Connectors on the Main Logic Board. (Refer to section 3 for information on these connectors.)

When the power is turned ON, the printer will repeatedly perform the following series of tests until an error is detected:

LED Ripple Test - The LCD displays the phrase “LED Test”. Each LED is turned ON and then OFF in sequence. This test is repeated after each of the other tests. The operator must visually inspect the LED operation.

Program ROM CRC Test - The LCD displays the phrase “ROM Test”. This is the same test as the one performed during the Power ON Self Test. If the test fails the LCD displays the phrase “FAILED” and all testing stops.

DRAM Test - The LCD displays the phrase “DRAM Test”. This is a walking zero and walking one test (a more complete test than the Power ON Self Test). The DRAM is good when 1Mbyte passes the test. The amount of functioning memory is displayed in the lower right hand corner of the display. This value remains displayed throughout the testing cycle. If less than 1 Mbyte passes the test, the LCD displays the word “FAILED” and all testing stops.

Keyboard Test - The LCD displays “Keyboard Test”. The test looks for pressed keys. If any key is pressed, the LCD displays “FAILED-Keyname” and all testing stops.

SRAM Test - The LCD displays the phrase “SRAM Test”. This is a walking zero and walking one test (a more complete test than the Power-On Self Test). The SRAM is good when 128KB passes the test. If less than 128KB passes the test, the LCD displays the word “FAILED” and all testing stops.

Second Processor Test - After passing the SRAM Test, the SRAM is loaded with test code for the second processor. The following eight tests are run by the second processor while the main processor waits.

1. **2nd Processor Test** - The LCD displays “Processor Test”. The CRC value for the shared SRAM space is calculated by the second processor and compared to the expected value. The second processor is operational when the two CRC values match. If the test fails, the LCD displays “FAILED” and all testing stops.
2. **E^3 Test** - The LCD displays “E-Cubed Test”. Test patterns are written to the E^3 circuit. The E^3 circuit’s response is checked for proper results. If the test fails, the LCD displays “FAILED” and all testing stops.
3. **EEPROM Test** - The LCD displays “EEPROM Test”. At the start of this test the factory default values are written to the EEPROM. These initial values are then verified during the test cycle. If the test fails, the LCD displays “FAILED” and all testing stops.
4. **Head Sensor Test** - The LCD displays “Head Sensor Test”. This test checks for a “head open” condition. If the head is “closed”, the LCD displays “FAILED” and all testing stops.
5. **Head Relay Test** - The printhead power relay is opened and closed several times with a very short delay between movements.
6. **Media Sensor Test** - The LCD displays “Media Sensor Test”. This test checks for a Media out condition. If media is detected, the LCD displays “FAILED” and all testing stops.
7. **Ribbon Sensor Test** - The LCD displays “Ribbon Sensor Test”. This test checks for a ribbon out condition. If ribbon is detected, the LCD displays “FAILED” and all testing stops.
8. **Step Motor Test** - The LCD displays “Motor Test”. The step motor is driven forward a short distance (three to four inches) then reversed for an equal distance before locking into position for the next test cycle.

The second processor’s tests are now complete and the main processor resumes control of the SRAM. The second processor is placed in the reset state and waits for the test to be repeated before running again.

Serial Port Test - The LCD displays “Serial Port Test”. The loopback of pin 2 with pin 3, pin 6 with pin 20, pin 13 with pin 14, and pin 16 with pin 19 is tested. If the test fails, the LCD displays “FAILED” and all testing stops.

Parallel Port Test - The LCD displays “Parallel Test”. The Zebra parallel-port loopback connector is tested. (The loopback connector involves a small circuit board and is manufactured by Zebra.) If the test fails, the LCD displays “FAILED” and all testing stops.

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Mechanical Parts and Assemblies

Use the following Mechanical Assembly Drawings when troubleshooting or replacing components and use the Associated Parts Lists when ordering replacement parts.

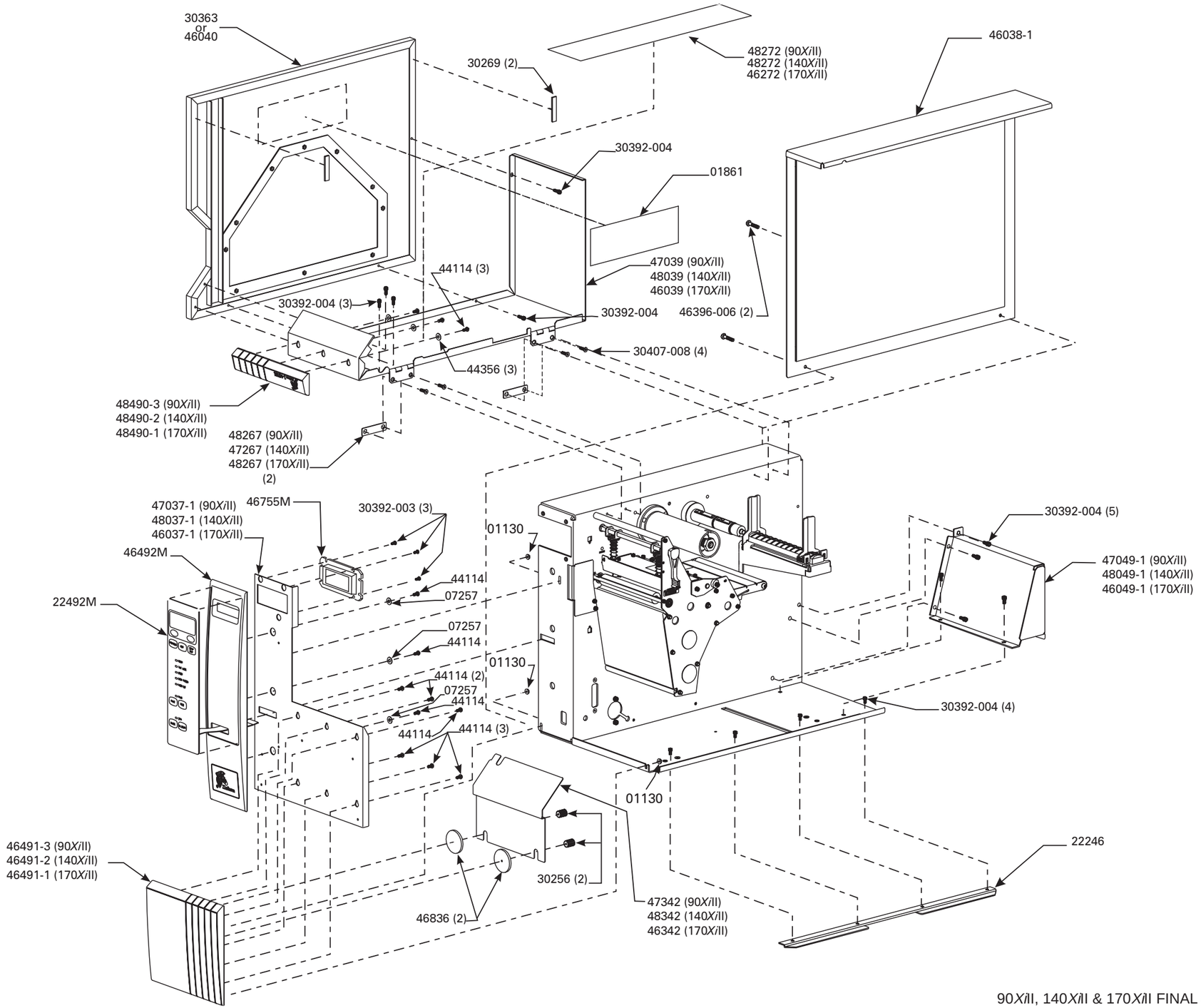
Drawing... **Page**

Drawing... Page


Zebra 220XiII™
Zebra 170XiII™
Zebra 140XiII™
Zebra 90XiII™

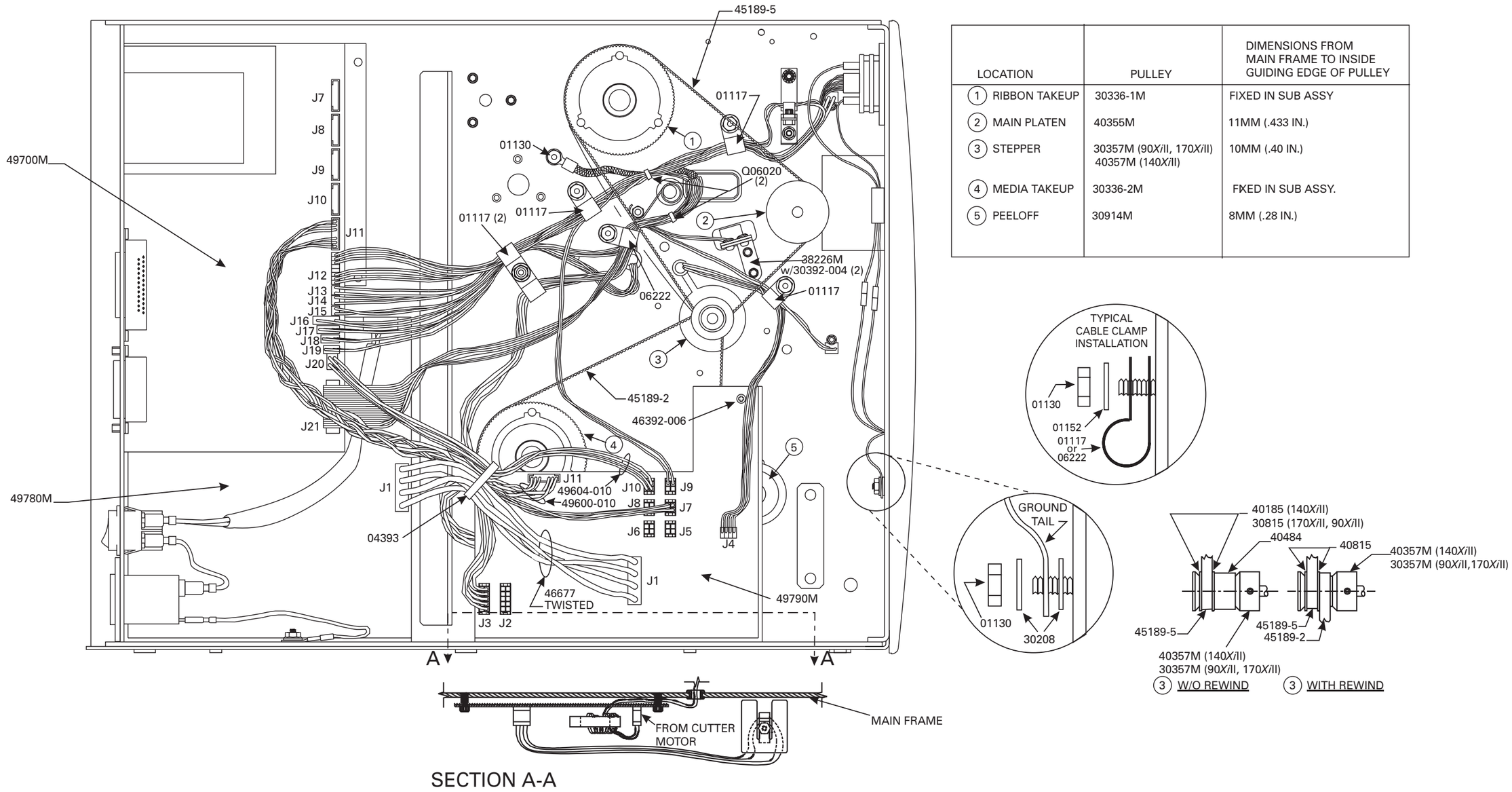
PRINTER MODEL: 90*Xi*II, 140*Xi*II, 170*Xi*II				
Final Assembly (page 1 of 2)				
PART NUMBER		DESCRIPTION		QUANTITY
01130		Nut, 6-32 Hex Washer Head		3
01861		Label, Supplies w/Logo		1
07257		Washer, Flat .438 x .188 x .065		3
22246		Support, Cover		1
22492M		Switch, Membrane		1
30256		Nut, Thumb, 6-32 .50		2
30269		Pad, PVC		2
30363		Panel, Door (with Window)		1
30392-003		Screw, 6-32 .19		3
30392-004		Screw, 6-32 .25		14
30407-008		Screw, 6-32 Socket head Flat		4

PRINTER MODEL: 90*Xi*II, 140*Xi*II, 170*Xi*II				
Final Assembly (page 1 of 2)				
PART NUMBER		DESCRIPTION		QUANTITY
44114		Screw, Hi-Lo Hex M4.2 8		12
44356		Washer .198 .75 .085		3
46037-1		Cover, Front (170*Xi*II)		1
46038-1		Panel, Left Side		1
46039		Cover, Media (170*Xi*II)		1
46040		Panel, Door (No Window)		1
46049-1		Support, Frame (170*Xi*II)		1
48272		Label, Media Load (170*Xi*II)		1
46342		Bracket, Front Cover (170*Xi*II)		1
46396-006		Screw, Truss Head Phillips 6-32 x 3/8		2
46491-1		Panel, Lower Media Trim (170*Xi*II)		1
46491-2		Panel, Lower Media Trim (140*Xi*II)		1
46491-3		Panel, Lower Media Trim (90*Xi*II)		1
46492M		Trim, Switch Panel w/Logo		1
46755M		LCD, Backlit		1
46836		Spacer		2
47037-1		Cover, Front (90*Xi*II)		1
47039		Cover, Media (90*Xi*II)		1
47049-1		Support, Frame (90*Xi*II)		1
47267		Spacer (140*Xi*II)		2
47342		Bracket, Front Cover (90*Xi*II)		1
48037-1		Cover, Front (140*Xi*II)		1
48039		Cover, Media (140*Xi*II)		1
48049-1		Support, Frame (140*Xi*II)		1
48267		Spacer (90*Xi*II & 170*Xi*II)		2
48272		Label, Media Load (90*Xi*II & 140*Xi*II)		1
48342		Bracket, Front Cover (140*Xi*II)		1
48490-1		Panel, Upper Media Trim (170*Xi*II)		1
48490-2		Panel, Upper Media Trim (140*Xi*II)		1
48490-3		Panel, Upper Media Trim (90*Xi*II)		1



90*Xi*II, 140*Xi*II & 170*Xi*II FINAL ASSEMBLY PG-1 OF 2

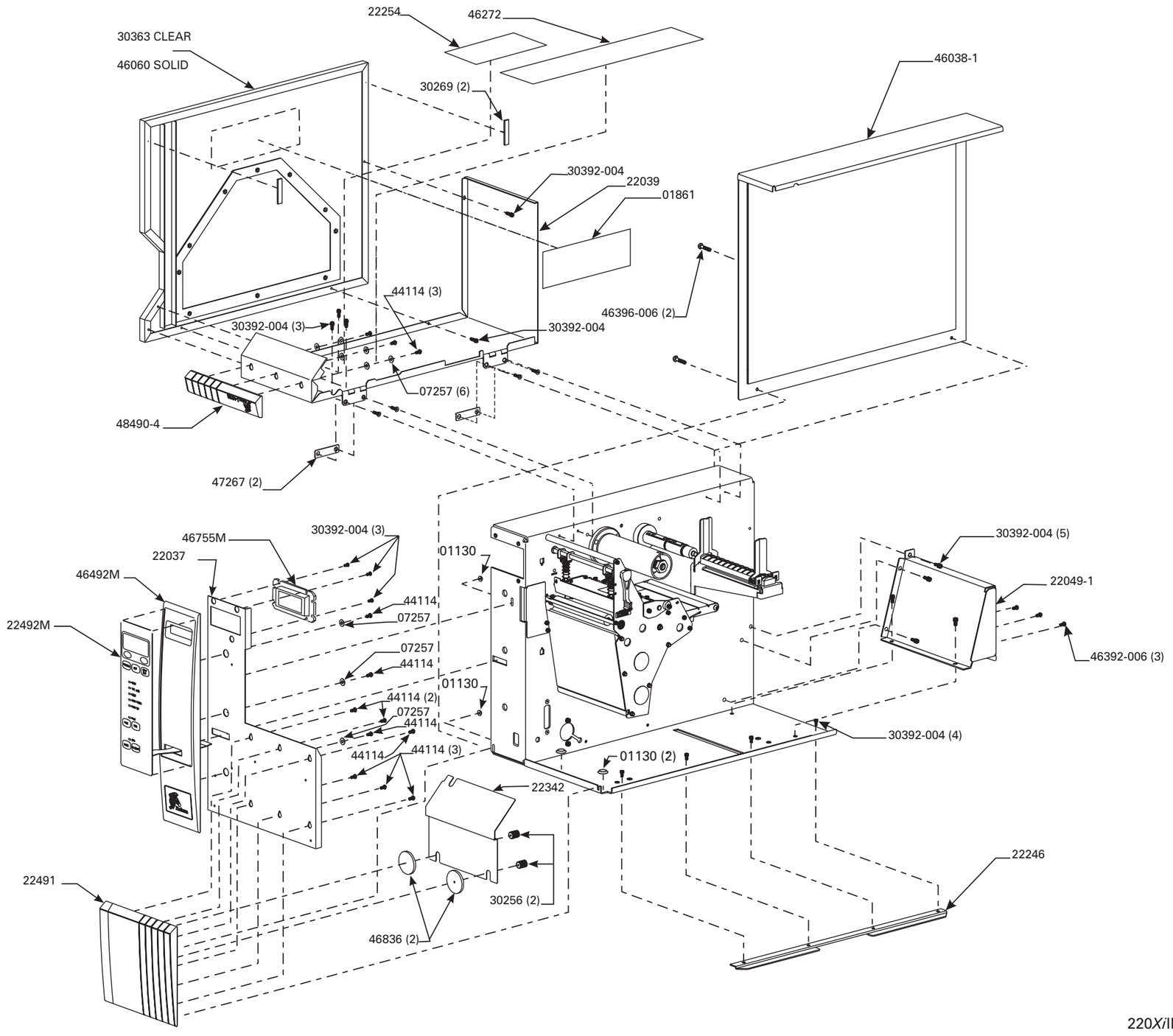
PRINTER MODEL: 90*Xi*II, 140*Xi*II, 170*Xi*II				
Final Assembly (page 2 of 2)				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
01117		Clamp, Cable .312 Nylon		5
01130		Nut, 6-32 Hex Washer Head		1
04393		Tiewrap, Beaded		1
06222		Clamp, Cable .5"		1
30336-1M		Pulley, Ribbon Take-Up		1
30336-2M		Pulley, Media Take-Up		1
30357M		Pulley, Stepper Motor (90*Xi*II & 170*Xi*II)		1
30392-004		Screw 6-32 .25		2
30914M		Pulley, Peel-Off		1
38226M		Assembly, Reflective Sensor		1
40355M		Pulley, Main Platen		1
40357M		Pulley, Stepper Motor (140*Xi*II)		1
45189-2		Belt, Conductive 255T		1
45189-5		Belt, Conductive 235T		1
46392-006		Screw, Truss Head Phillips		1
46677		Cable, AC to DC Power		1
49600-010		Cable, SP Comm		1
49604-010		Cable, Power Distribution		1
49700M		Main Logic Board		1
49780M		AC Power Supply		1
49790M		DC Power Supply		1
Q06020		Tiewrap, .09 x 3.62		2



LOCATION	PULLEY	DIMENSIONS FROM MAIN FRAME TO INSIDE GUIDING EDGE OF PULLEY
(1) RIBBON TAKEUP	30336-1M	FIXED IN SUB ASSY
(2) MAIN PLATEN	40355M	11MM (.433 IN.)
(3) STEPPER	30357M (90*Xi*II, 170*Xi*II) 40357M (140*Xi*II)	10MM (.40 IN.)
(4) MEDIA TAKEUP	30336-2M	FXED IN SUB ASSY.
(5) PEELOFF	30914M	8MM (.28 IN.)

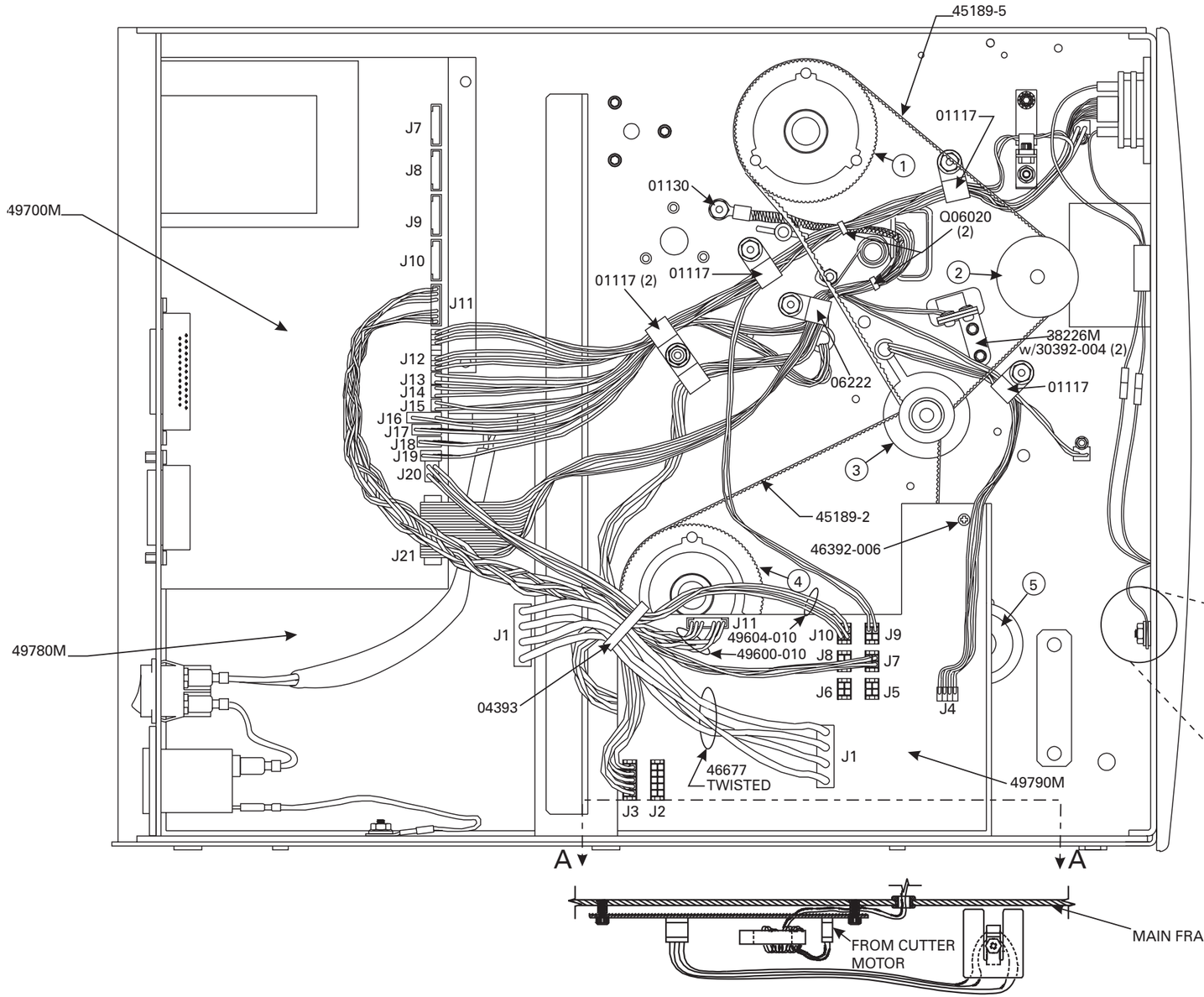
90*Xi*I, 140*Xi*I & 170*Xi*I FINAL ASSEMBLY (ELECTRICAL) PG-2 OF 2

PRINTER MODEL: 220*Xi*II				
Final Assembly (page 1 of 2)				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
01130		Nut, 6-32 Hex Washer Head		4
01861		Label, Supplies w/Logo		1
07257		Washer, Flat .438 x .188 x .065		9
22037		Cover, PCB (CE)		1
22039		Cover, Media		1
22049-1		Support, Frame		1
22246		Support, Cover		1
22254		Label, Tip Over		1
22342		Bracket, Front Cover		1
22491		Panel, Lower Media Trim		1
22492M		Switch, Membrane		1
30256		Nut, Thumb, 6-32 .50		2
30269		Pad, PVC		2
30363		Panel, Door (with Window)		1
30392-004		Screw, 6-32 .25		17
44114		Screw, Hi-Lo Hex M4.2 8		12
46038-1		Panel, Left Side		1
46060		Panel, Door (No Window)		1
46272		Label, Load Media		1
46392-006		Screw, Truss Head Phillips (Black) 6-32 x 3/8		3
46396-006		Screw, Truss Head Phillips 6-32 x 3/8		2
46492M		Trim, Switch Panel w/Logo		1
46755M		LCD, Backlit		1
46836		Spacer		2
47267		Spacer		2
48490-4		Panel, Upper Media Trim		1



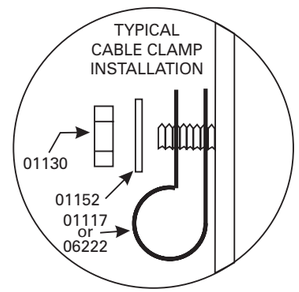
220*Xi*II FINAL ASSEMBLY PG-1 OF 2

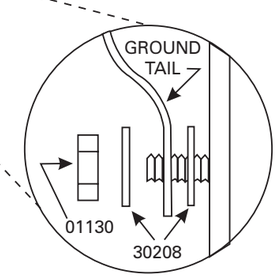
PRINTER MODEL: 220*Xi*II				
Final Assembly (page 2 of 2)				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
01117		Clamp, Cable .312 Nylon		5
01130		Nut, 6-32 Hex Washer Head		1
04393		Tiewrap, Beaded		1
06222		Clamp, Cable .5"		1
30336-1M		Pulley, Ribbon Take-Up		1
30336-2M		Pulley, Media Take-Up		1
30392-004		Screw 6-32 .25		2
30914M		Pulley, Peel-Off		1
38226M		Assembly, Reflective Sensor		1
40355M		Pulley, Main Platen		1
40357M		Pulley, Stepper Motor (220*Xi*II)		1
45189-2		Belt, Conductive 255T		1
45189-5		Belt, Conductive 235T		1
46392-006		Screw, Truss Head Phillips		1
46677		Cable, AC to DC Power		1
49600-010		Cable, SP Comm		1
49604-010		Cable, Power Distribution		1
49700M		Main Logic Board		1
49780M		AC Power Supply		1
49790M		DC Power Supply		1
Q06020		Tiewrap, .09 x 3.62		2

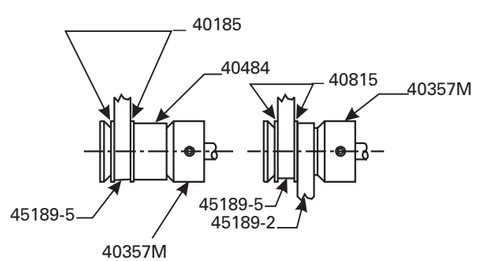


SECTION A-A

LOCATION	PULLEY	DIMENSIONS FROM MAIN FRAME TO INSIDE GUIDING EDGE OF PULLEY
1 RIBBON TAKEUP	30336-1M	FIXED IN SUB ASSY
2 MAIN PLATEN	40355M	11MM (.433 IN.)
3 STEPPER	40357M	10MM (.40 IN.)
4 MEDIA TAKEUP	30336-2M	FIXED IN SUB ASSY.
5 PEELOFF	30914M	8MM (.28 IN.)





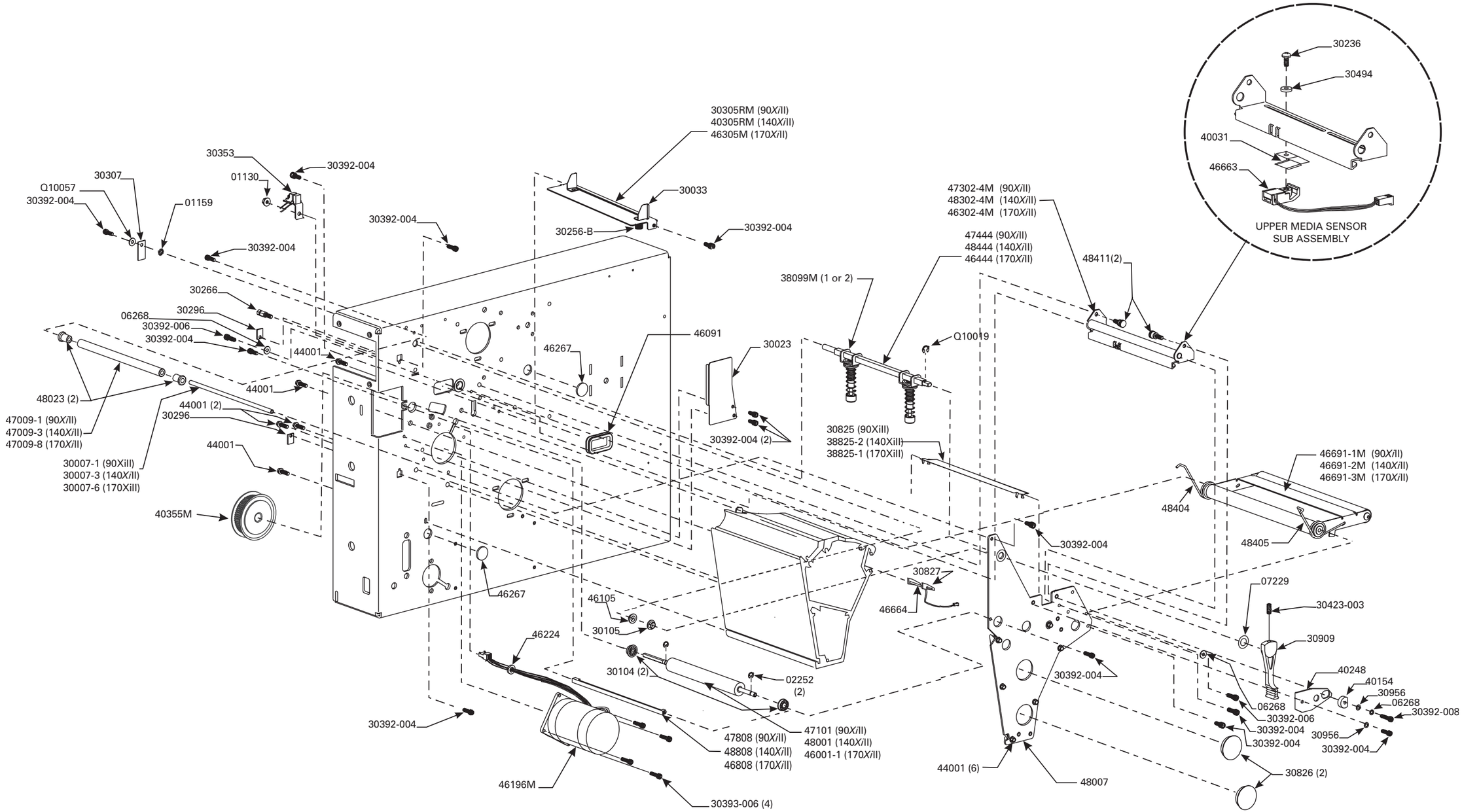


3 W/O REWIND 3 WITH REWIND

220*Xi*II FINAL ASSEMBLY (ELECTRICAL) PG-2 OF 2

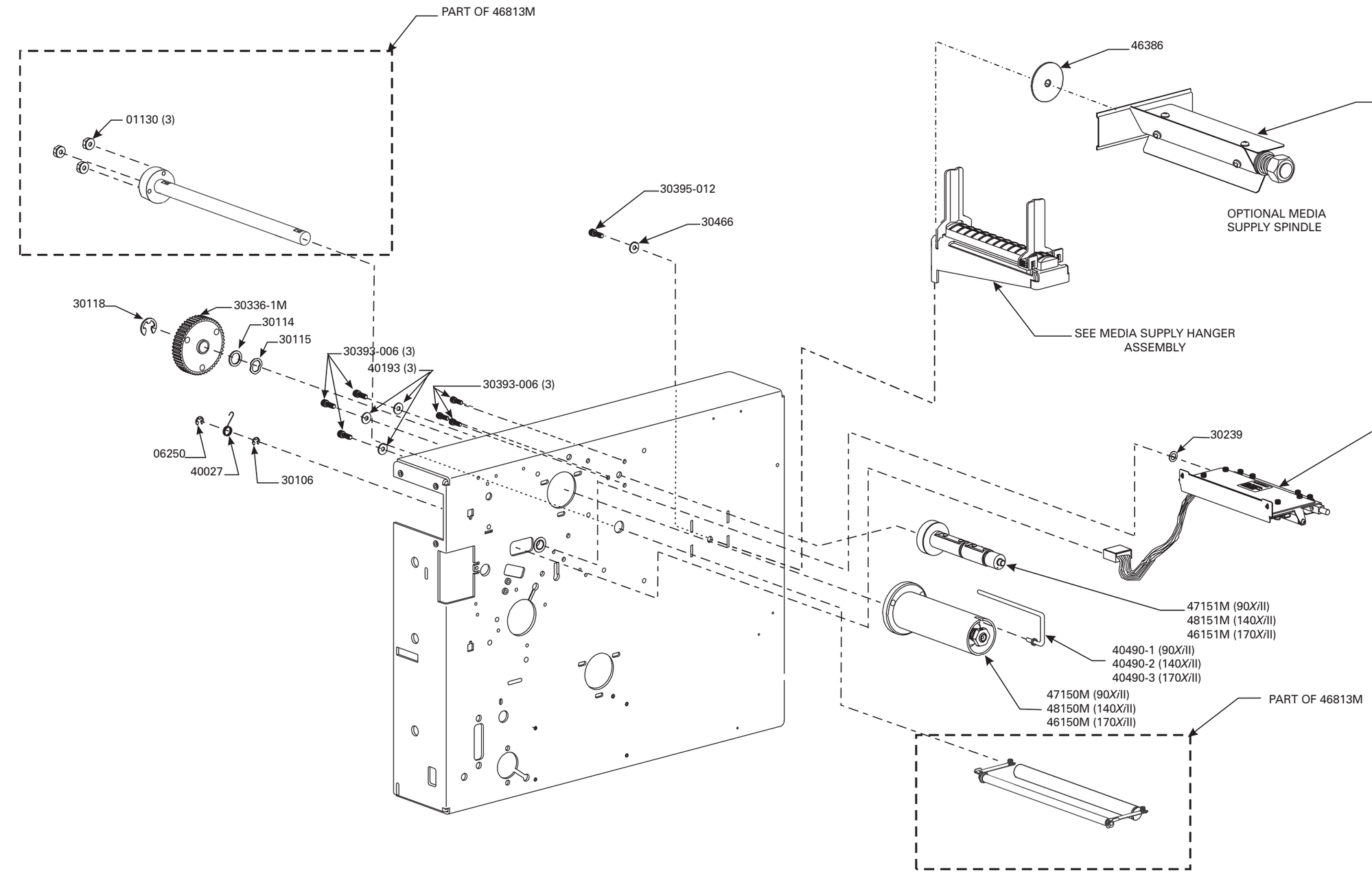
PRINTER MODEL: 90*Xi*II, 140*Xi*II, 170*Xi*II				
Print Mechanism Assembly (Page 1 of 3)				
PART NUMBER		DESCRIPTION		QUANTITY
01130		Nut, 6-32 Hex Washer Head		1
01159		Washer, Lock # 6		1
02252		Ring, Crescent, .250		2
06268		Washer, Lock # 6		3
07229		Washer, Curved, .49 x .33 x .0075		1
30007-1		Shaft, Roller (90*Xi*II)		1
30007-3		Shaft, Roller (140*Xi*II)		1
30007-6		Shaft, Roller (170*Xi*II)		1
30023		Plate, Cutter Cover		1
30033		Guide, Media, Movable		1
30104		Flange, Ball Bearing, .5 x .250 x .125		2
30105		Bearing, Nylon, .312 x .251 x .078		1
30236		Screw 4-40		1
30256-B		Nut, thumb		1
30266		Stop, Head Lift Spring		1
30296		Cover, Media Take-up Sensor		2
30305RM		Guide, Media (90*Xi*II)		1
30307		Flag, Head Open		1
30353		Assembly, Head Open Opto Switch		1
30392-004		Screw, 6-32 .25		14
30392-006		Screw, 6-32 .37		2
30392-008		Screw, 6-32 .50		1
30393-006		Screw, 8-32 .37		4
30423-003		Screw, Set, 8-32 .187		1
30494		Washer .32 .119 .062		1
30825		Plate, Upper Media Guide (90*Xi*II)		1
30826		Plug, Hole		2
30827		Holder, media Sensor PCB		1
30909		Handle, Head		1
30956		Washer, Flat .207 x .146 x .030		2
38099M		Assembly, Toggle (90*Xi*II)		1 or 2
38825-1		Plate, Upper Media Guide (170*Xi*II)		1
38825-2		Plate, Upper Media Guide (140*Xi*II)		1

PRINTER MODEL: 90*Xi*II, 140*Xi*II, 170*Xi*II				
Print Mechanism Assembly (Page 1 of 3)				
PART NUMBER		DESCRIPTION		QUANTITY
40031		Cover, Sensor Wire		1
40154		Pin, Eccentric		1
40248		Plate, Shaft Wear		1
40305RM		Guide, Media (140*Xi*II)		1
40355M		Assembly, Platen Pulley		1
44001		Screw, Self-Tap 3.5x11mm w/5mm Hex Head		11
46001-1		Roller, Main Platen (170*Xi*II)		1
46091		Grommet (for 1.25 x .625 cutout)		1
46105		Bearing, Nylon, .312 x .251 x .140		1
46196M		Motor, DC Stepper		1
46224		Grommet, Rubber, .312 .34 .109		1
46267		Plug, Hole, .5 dia x .125 thick		2
46302-4M		Assembly, Bracket, Media Sensor (170*Xi*II)		1
46305M		Guide, Media (170*Xi*II)		1
46444		Bar, Toggle (170*Xi*II)		1
46663		Assembly, Upper Media Sensor		1
46664		Assembly, Lower Media Sensor		1
46691-1M		Assembly, Dancer Arm w/Springs (90*Xi*II)		1
46691-2M		Assembly, Dancer Arm w/Springs (140*Xi*II)		1
46691-3M		Assembly, Dancer Arm w/Springs (170*Xi*II)		1
46808		Bar, Peel/Tear-off (170*Xi*II)		1
47009-1		Roller .37 .312 (90*Xi*II)		1
47009-3		Roller .37 .312 (140*Xi*II)		1
47009-8		Roller .37 .312 (170*Xi*II)		1
47101		Roller, Main Platen (90*Xi*II)		1
47302-4M		Assembly, Bracket, Media Sensor (90*Xi*II)		1
47444		Bar, Toggle (90*Xi*II)		1
47808		Bar, Peel/Tear-off (90*Xi*II)		1
48001		Roller, Main Platen (140*Xi*II)		1
48007		Side Plate		1
48023		Bearing, Rulon .313 x .190 x .375		2
48302-4M		Assembly, Bracket, Media Sensor (140*Xi*II)		1
48404		Spring, Torsion, Inboard		1
48405		Spring, Torsion, Outboard		1
48411		Screw, Thumb		2
48444		Bar, Toggle (140*Xi*II)		1
48808		Bar, Peel/Tear-off (140*Xi*II)		1
Q10019		Ring, E Ext .250		1
Q10057		Washer .372 x .158 x .032		1



90*Xii*I, 140*Xii*I &170*Xii*I PRINT MECHANISM ASSEMBLY PG-1 OF 3

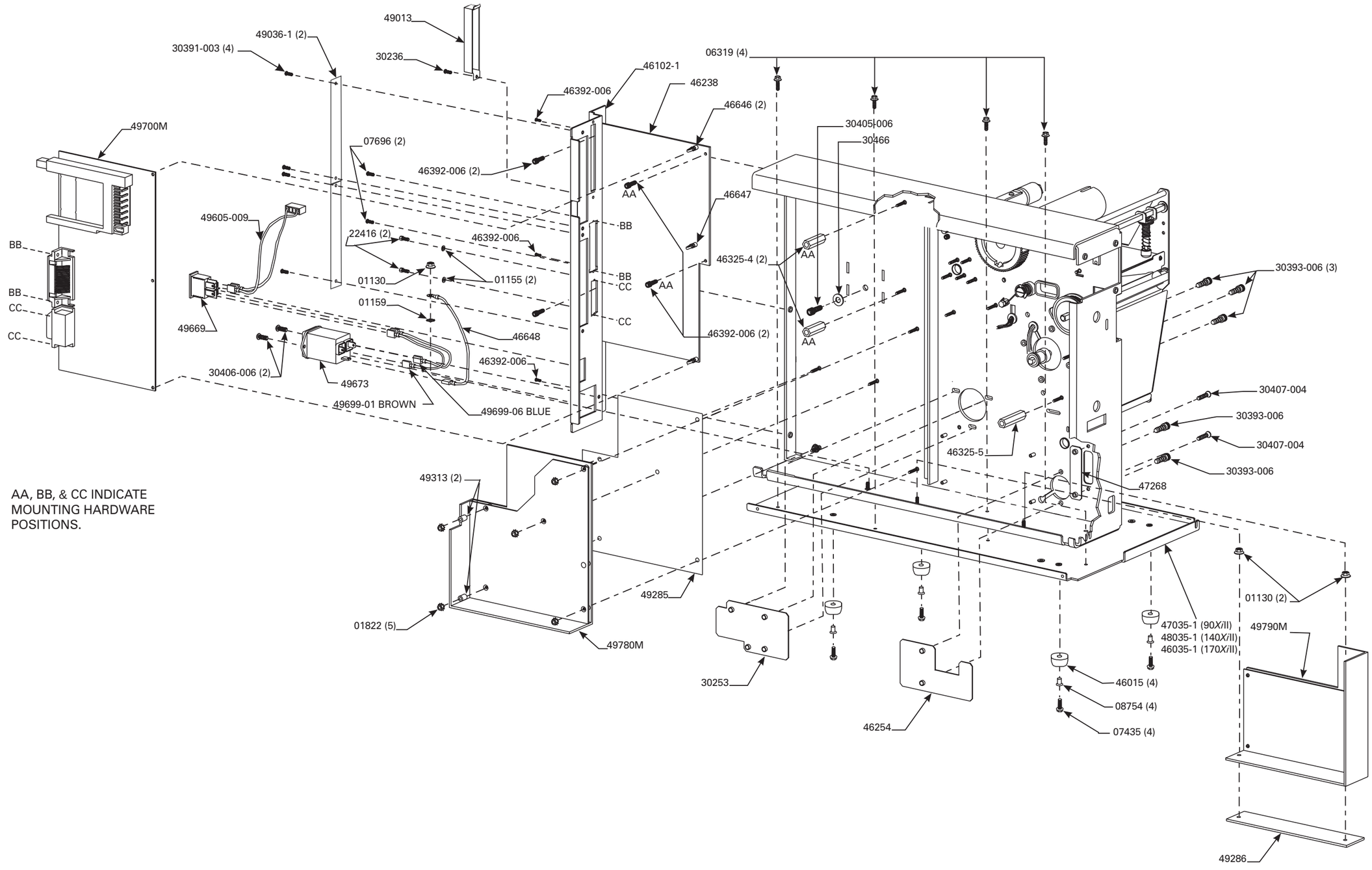
PRINTER MODEL: 90*Xi*II, 140*Xi*II, 170*Xi*II				
Print Mechanism Assembly (Page 2 of 3)				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
01130		Nut, 6-32 Hex Washer Head		1
06250		E-Ring, .312		1
30106		Ring, Crescent, External, .312		1
30114		Washer, Flat, .76 x .51 x .03		1
30115		Washer, Wave, .740 x .520 x .080		1
30118		E-Ring		1
30239		Washer, Crescent, .415 x .323 x .062		1
30336-1M		Assembly, Ribbon Take-Up Pulley		1
30393-006		Screw, 8-32 .37		6
30395-012		Screw, 1/4-20 .75 Cap		1
30466		Washer .26 x .63 x .06		1
40027		Spring, Torsion		1
40193		Washer, Flat .406 x .172 x .048		3
40490-1		Hook, Ribbon Take-up Spindle (90*Xi*II)		1
40490-2		Hook, Ribbon Take-up Spindle (14*Xi*II)		1
40490-3		Hook, Ribbon Take-up Spindle (170*Xi*II)		1
46150M		Spindle, Ribbon Take-up (170*Xi*II)		1
46151M		Spindle, Ribbon Supply (170*Xi*II)		1
46253M		Spindle, Media Supply (optional) (170*Xi*II)		1
46386		Support, Media Supply		1
46813M		Assembly, Compliance Roller (170*Xi*II)		1
47150M		Spindle, Ribbon Take-up (90*Xi*II)		1
47151M		Spindle, Ribbon Supply (90*Xi*II)		1
47253M		Spindle, Media Supply (optional) (90*Xi*II)		1
48150M		Spindle, Ribbon Take-up (140*Xi*II)		1
48151M		Spindle, Ribbon Supply (140*Xi*II)		1
48253M		Spindle, Media Supply (optional) (140*Xi*II)		1



90*Xi*II,140*Xi*II & 170*Xi*II PRINT MECHANISM ASSEMBLY PG-2 OF 3

PRINTER MODEL: 90*Xi*II, 140*Xi*II, 170*Xi*II				
Print Mechanism Assembly (Page 3 of 3)				
PART NUMBER		DESCRIPTION		QUANTITY
01130		Nut, 6-32 Hex Washer Head		3
01155		Washer, Lock # 4		2
01159		Washer, Lock # 6		1
01822		Nut, 4-40		5
06319		Screw, Lock Hex, 10-32 .37		4
07435		Screw, Lock Hex, 6-32 .37		4
07696		Screw, 4/40 .31		2
08754		Eye, .183 x .157 x .187		4
22416		Standoff, 4-40 Hex		2
30236		Screw, 4-40		1
30253		Plate, Options Cover		1
30391-003		Screw, 4-40 .19		4
30393-006		Screw, 8-32 .37		5
30405-006		Screw, 1/4-20 .38 (Media Hanger Mounting)		1
30406-006		Screw 4-40 .38		2
30407-004		Screw, 6-32 .25		2
30466		Washer		1

PRINTER MODEL: 90*Xi*II, 140*Xi*II, 170*Xi*II				
Print Mechanism Assembly (Page 3 of 3)				
PART NUMBER		DESCRIPTION		QUANTITY
46015		Foot		4
46035-1		Base, Printer (CE) (170*Xi*II)		1
46102-1		Panel, Rear		1
46238		Panel, Mounting		1
46254		Plate, Cover, Cutter		1
46325-4		Spacer, 6-32		2
46325-5		Spacer, 6-32		1
46392-006		Screw, Truss Head Phillips, 6-32 x .38		7
46646		Spacer, Locking, PCB, 5/16 x .125		2
46647		Spacer, Support, PCB, 5/16		1
46648		Assembly, Cable, Ground		1
47035-1		Base, Printer (CE) (90*Xi*II)		1
47268		Plate, Cover		1
48035-1		Base, Printer (CE) (140*Xi*II)		1
49013		Cover, Memory Card, PCMCIA		1
49036-1		Cover, PCB Option		2
49285		Pad, Insulation, AC Power Supply		1
49286		Pad, Insulation, DC Power Supply		1
49313		Spacer, Top, AC Power Supply		2
49605-009		Assembly, Cable, Power Supply		1
49669		Switch, Power Entry		1
49673		Assembly, Power Entry w/Fuse & Gnd Wire		1
49699-01		Assembly, Cable Short (Brown)		1
49699-06		Assembly, Cable Short (Blue)		1
49700M		Assembly, Main Logic Board		1
49780M		Assembly, AC Power Supply		1
49790M		Assembly, DC Power Supply		1

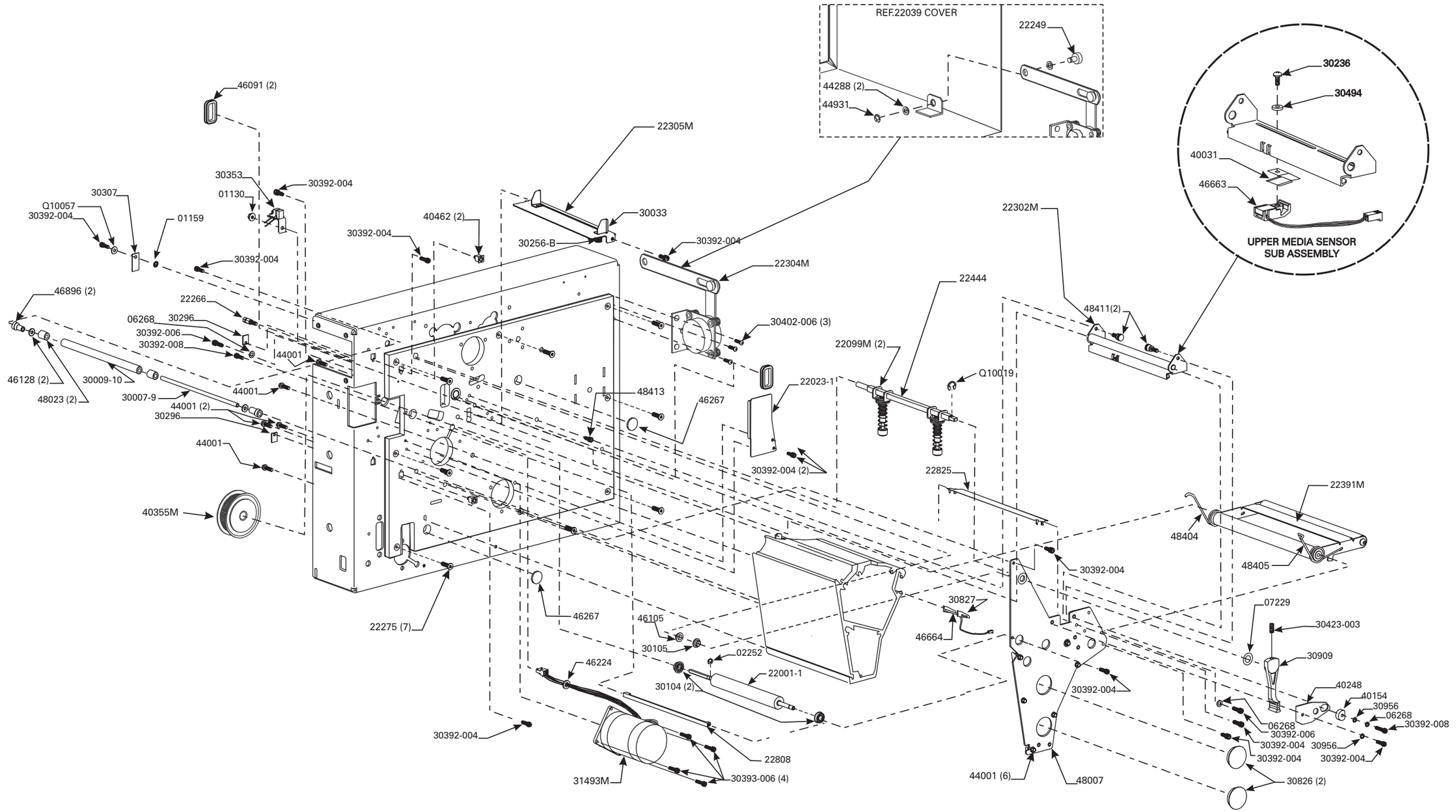


AA, BB, & CC INDICATE MOUNTING HARDWARE POSITIONS.

90*Xi*II,140*Xi*II & 170*Xi*II PRINT MECHANISM ASSEMBLY PG-3 OF 3

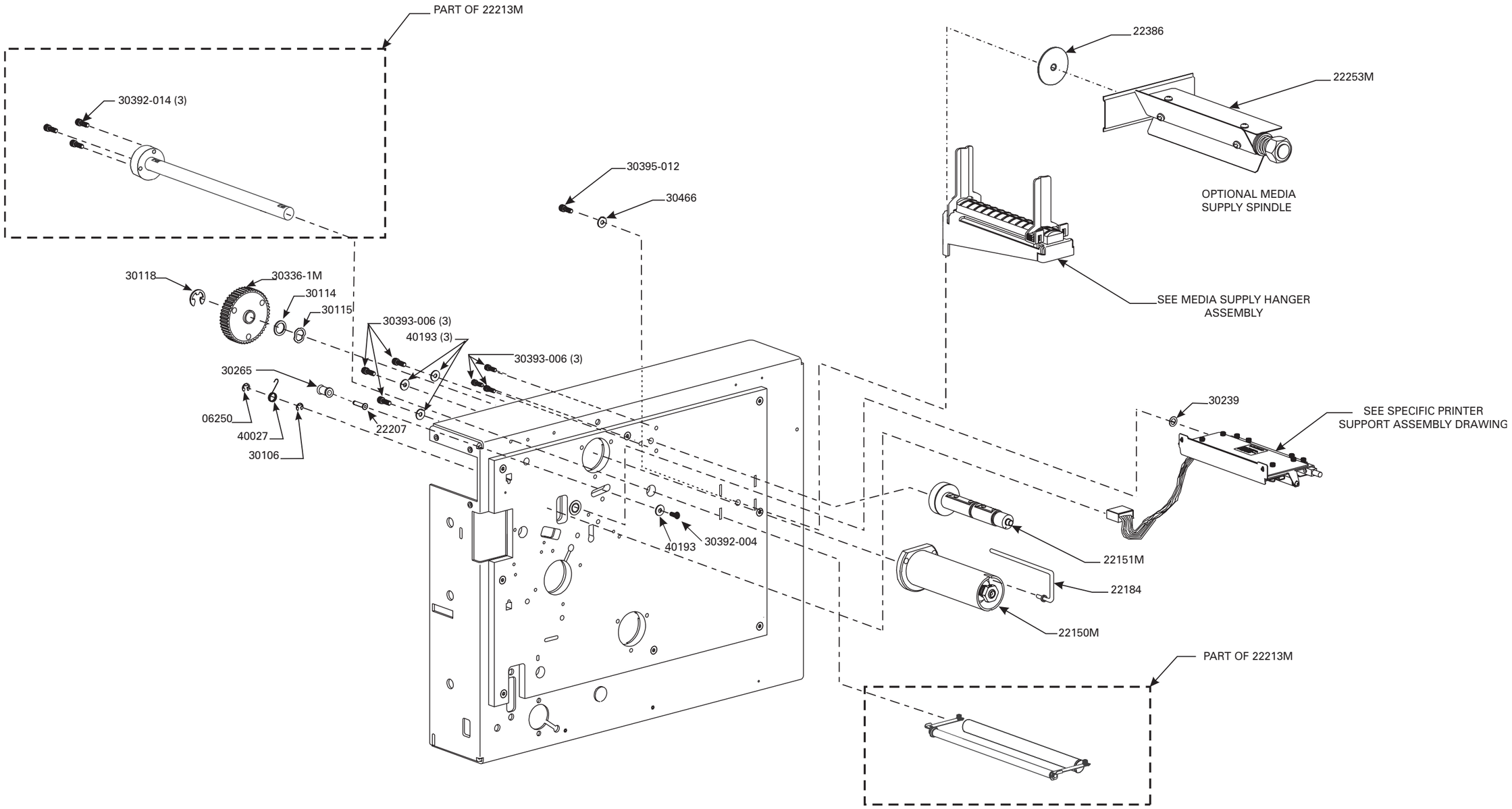
PRINTER MODEL: 220*Xi*II				
Print Mechanism Assembly (Page 1 of 3)				
PART NUMBER		DESCRIPTION		QUANTITY
01159		Washer, Lock # 6		1
02252		Ring, Crescent, .250		1
06268		Washer, Lock # 6		3
07229		Washer, Curved, .49 x .33 x .0075		1
22001-1		Roller, Main Platen		1
22023-1		Plate, Cutter Cover		1
22099M		Assembly, Toggle		2
22249		Pin, Pivot		1
22266		Stop, Head Lift Spring		1
22275		Screw, 10-32 .625 Flat Socket Cap		7
22302M		Assembly, Bracket, Media Sensor		1
22304M		Assembly, Damper, Cover		1
22305M		Guide, Media		1
22391M		Assembly, Dancer Arm w/Springs		1
22444		Bar, Toggle		1
22808		Bar, Peel/Tear-off		1
22825		Plate, Upper Media Guide		1
30007-9		Shaft, Roller		1
30009-10		Roller .37 .312		1
30033		Guide, Media, Movable		1
30104		Flange, Ball Bearing, .5 x .250 x .125		2
30105		Bearing, Nylon, .312 x .251 x .078		1
30236		Screw 4-40		1
30256-B		Nut, thumb		1
30296		Cover, Media Take-up Sensor		2
30307		Flag, Head Open		1
30353		Assembly, Head Open Opto Switch		1
30392-004		Screw, 6-32 .25		13
30392-006		Screw, 6-32 .37		2
30392-008		Screw, 6-32 .50		2
30393-006		Screw, 8-32 .37		4
30402-006		Screw, 6-32 .37		3
30423-003		Screw, Set, 8-32 .187		1
30494		Washer .32 .119 .062		1
30826		Plug, Hole		2
30827		Holder, media Sensor PCB		1
30909		Handle, Head		1
30956		Washer, Flat .207 x .146 x .030		2
31493M		Motor, DC Stepper		1

PRINTER MODEL: 220*Xi*II				
Print Mechanism Assembly (Page 1 of 3)				
PART NUMBER		DESCRIPTION		QUANTITY
40031		Cover, Sensor Wire		1
40154		Pin, Eccentric		1
40248		Plate, Shaft Wear		1
40355M		Assembly, Platen Pulley		1
40462		Nut, Expansion 8/10		2
44001		Screw, Self-Tap 3.5x11mm w/5mm Hex Head		11
44288		Washer .50 .25 .031		2
44931		Ring, E .218		1
46091		Grommet (for 1.25 x .625 cutout)		2
46105		Bearing, Nylon, .312 x .251 x .140		1
46128		Washer, Flat, Nylon .505 .192 .015		2
46224		Grommet, Rubber, .312 .34 .109		1
46267		Plug, Hole, .5 dia x .125 thick		2
46663		Assembly, Upper Media Sensor		1
46664		Assembly, Lower Media Sensor		1
46896		Bushing		2
48007		Side Plate		1
48023		Bearing, Rulon .313 x .190 x .375		2
48404		Spring, Torsion, Inboard		1
48405		Spring, Torsion, Outboard		1
48411		Screw, Thumb		2
48413		Standoff		1
Q10019		Ring, E Ext .250		1
Q10057		Washer .372 x .158 x .032		1



220*Xi*I PRINT MECHANISM ASSEMBLY PG-1 OF 3

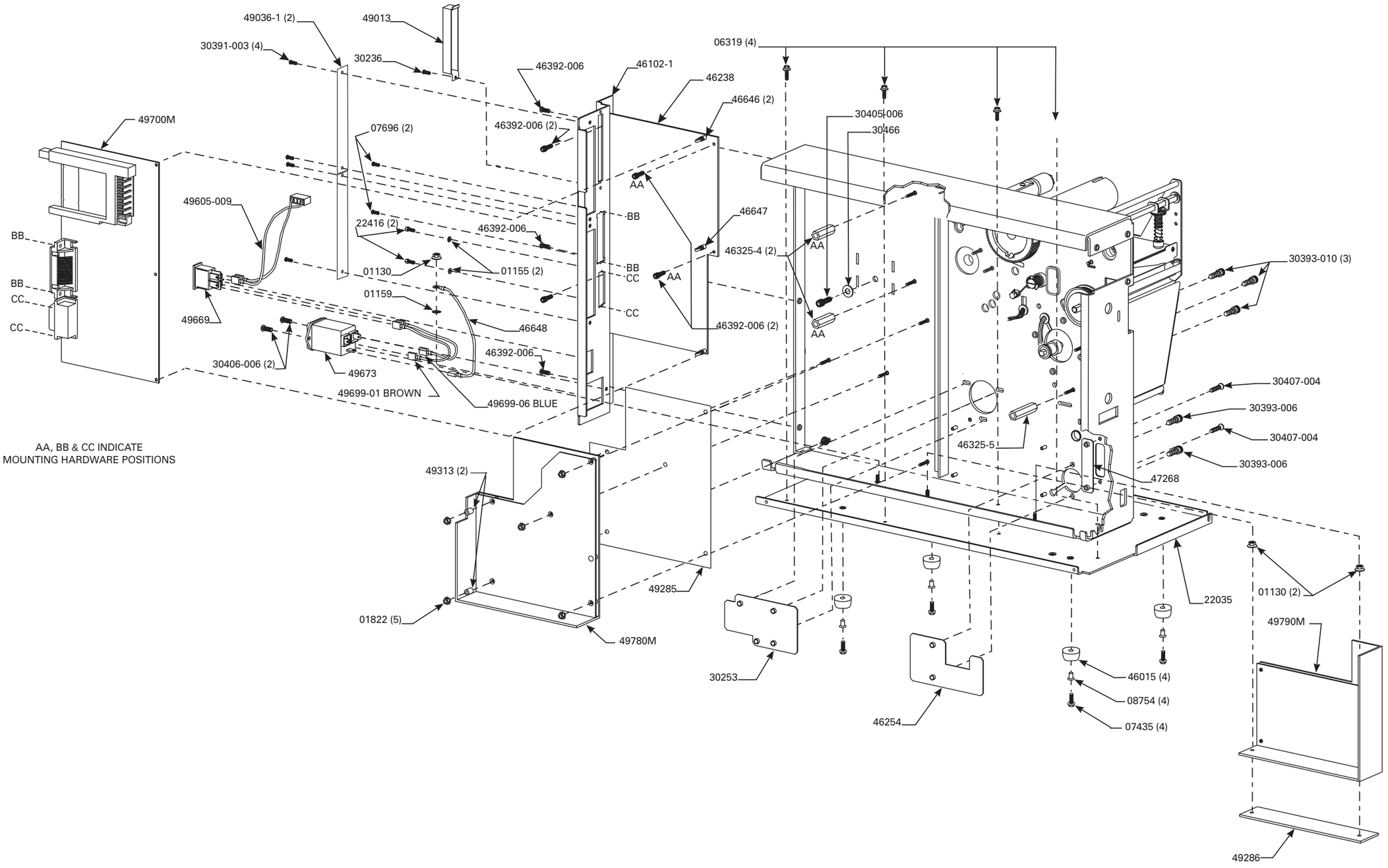
PRINTER MODEL: 220*Xi*II				
Print Mechanism Assembly (Page 2 of 3)				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
01130		Nut, 6-32 Hex Washer Head		1
06250		E-Ring, .312		1
22150M		Spindle, Ribbon Take-up		1
22151M		Spindle, Ribbon Supply		1
22184		Hook, Ribbon Take-up Spindle		1
22207		Shaft, Idler Pulley		1
22213M		Assembly, Compliance Roller		1
22253M		Spindle, Media Supply (optional)		1
22386		Support, Media Supply		1
30106		Ring, Crescent, External, .312		1
30114		Washer, Flat, .76 x .51 x .03		1
30115		Washer, Wave, .740 x .520 x .080		1
30118		E-Ring		1
30239		Washer, Crescent, .415 x .323 x .062		1
30265		Pulley, Idler		1
30336-1M		Assembly, Ribbon Take-Up Pulley		1
30392-004		Screw, 6-32 .25		1
30392-014		Screw, 6-32 .87		3
30393-006		Screw, 8-32 .37		6
30395-012		Screw, 1/4-20 .75 Cap		1
30466		Washer .26 x .63 x .06		1
40027		Spring, Torsion		1
40193		Washer, Flat .406 x .172 x .048		4



220*Xi*II PRINT MECHANISM ASSEMBLY PG-2 OF 3

PRINTER MODEL: 220*Xi*II				
Print Mechanism Assembly (Page 3 of 3)				
PART NUMBER		DESCRIPTION		QUANTITY
01130		Nut, 6-32 Hex Washer Head		3
01155		Washer, Lock # 4		2
01159		Washer, Lock # 6		1
01822		Nut, 4-40		5
06319		Screw, Lock Hex, 10-32 .37		4
07435		Screw, Lock Hex, 6-32 .37		4
07696		Screw, 4/40 .31		2
08754		Eye, .183 x .157 x .187		4
22035		Base, Printer		1
22416		Standoff, 4-40 Hex		2
30236		Screw, 4-40		1
30253		Plate, Options Cover		1
30391-003		Screw, 4-40 .19		4
30393-006		Screw, 8-32 .37		2
30393-010		Screw, 8-32 .62		3
30405-006		Screw, 1/4-20 .38 (Media Hanger Mounting)		1
30406-006		Screw 4-40 .38		2
30407-004		Screw, 6-32 .25		2
30466		Washer		1

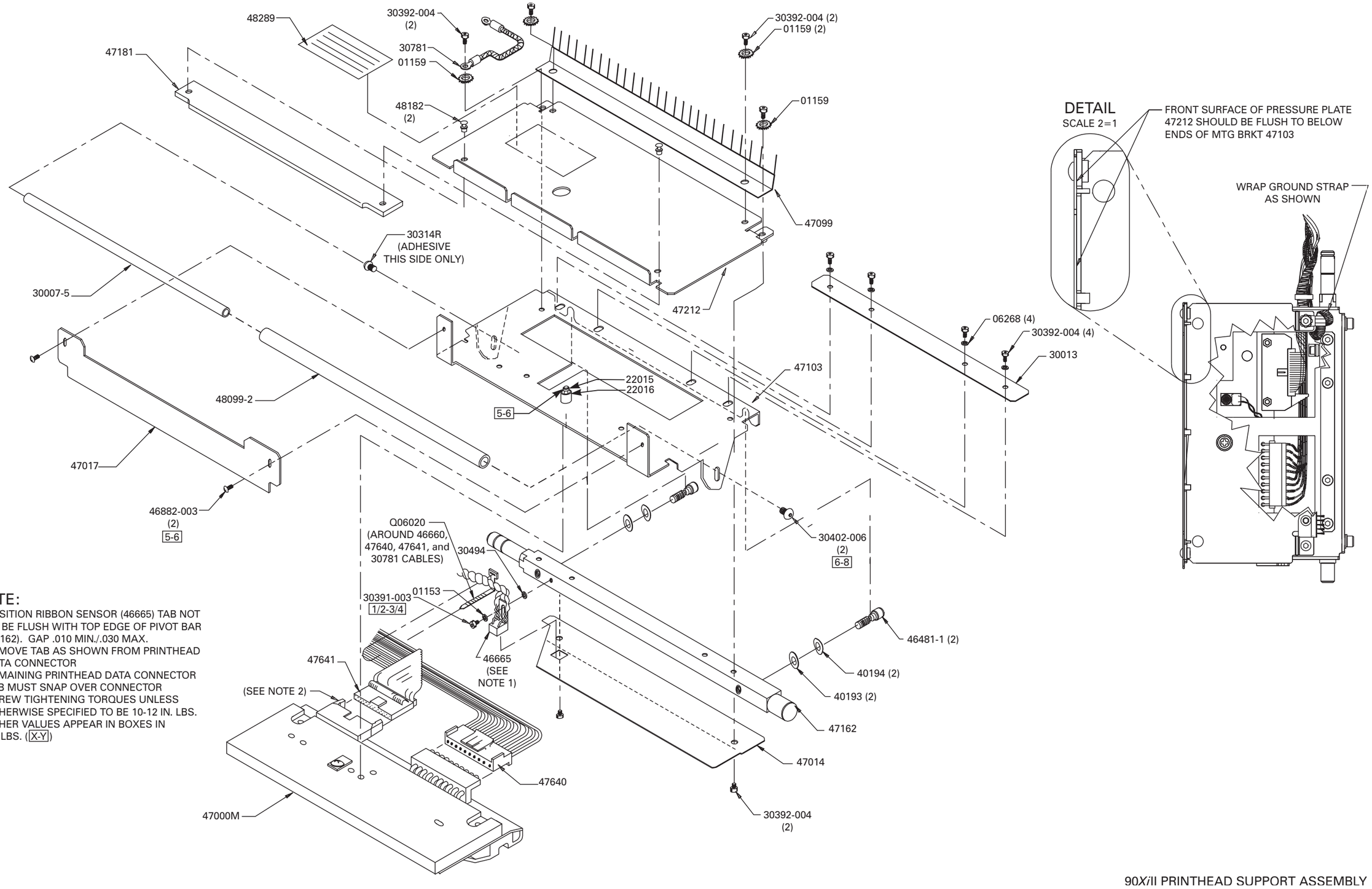
PRINTER MODEL: 220*Xi*II				
Print Mechanism Assembly (Page 3 of 3)				
PART NUMBER		DESCRIPTION		QUANTITY
46015		Foot		4
46102-1		Panel, Rear		1
46238		Panel, Mounting		1
46254		Plate, Cover, Cutter		1
46325-4		Spacer, 6-32		2
46325-5		Spacer, 6-32		1
46392-006		Screw, Truss Head Phillips, 6-32 x .38		7
46646		Spacer, Locking, PCB, 5/16 x .125		2
46647		Spacer, Support, PCB, 5/16		1
46648		Assembly, Cable, Ground		1
47268		Plate, Cover		1
49013		Cover, Memory Card, PCMCIA		1
49036-1		Cover, PCB Option		2
49285		Pad, Insulation, AC Power Supply		1
49286		Pad, Insulation, DC Power Supply		1
49313		Spacer, Top, AC Power Supply		2
49605-009		Assembly, Cable, Power Supply		1
49669		Switch, Power Entry		1
49673		Assembly, Power Entry w/Fuse & Gnd Wire		1
49699-01		Assembly, Cable Short (Brown)		1
49699-06		Assembly, Cable Short (Blue)		1
49700M		Assembly, Main Logic Board		1
49780M		Assembly, AC Power Supply		1
49790M		Assembly, DC Power Supply		1



AA, BB & CC INDICATE
MOUNTING HARDWARE POSITIONS

220*Xi*II PRINT MECHANISM ASSEMBLY PG-3 OF 3

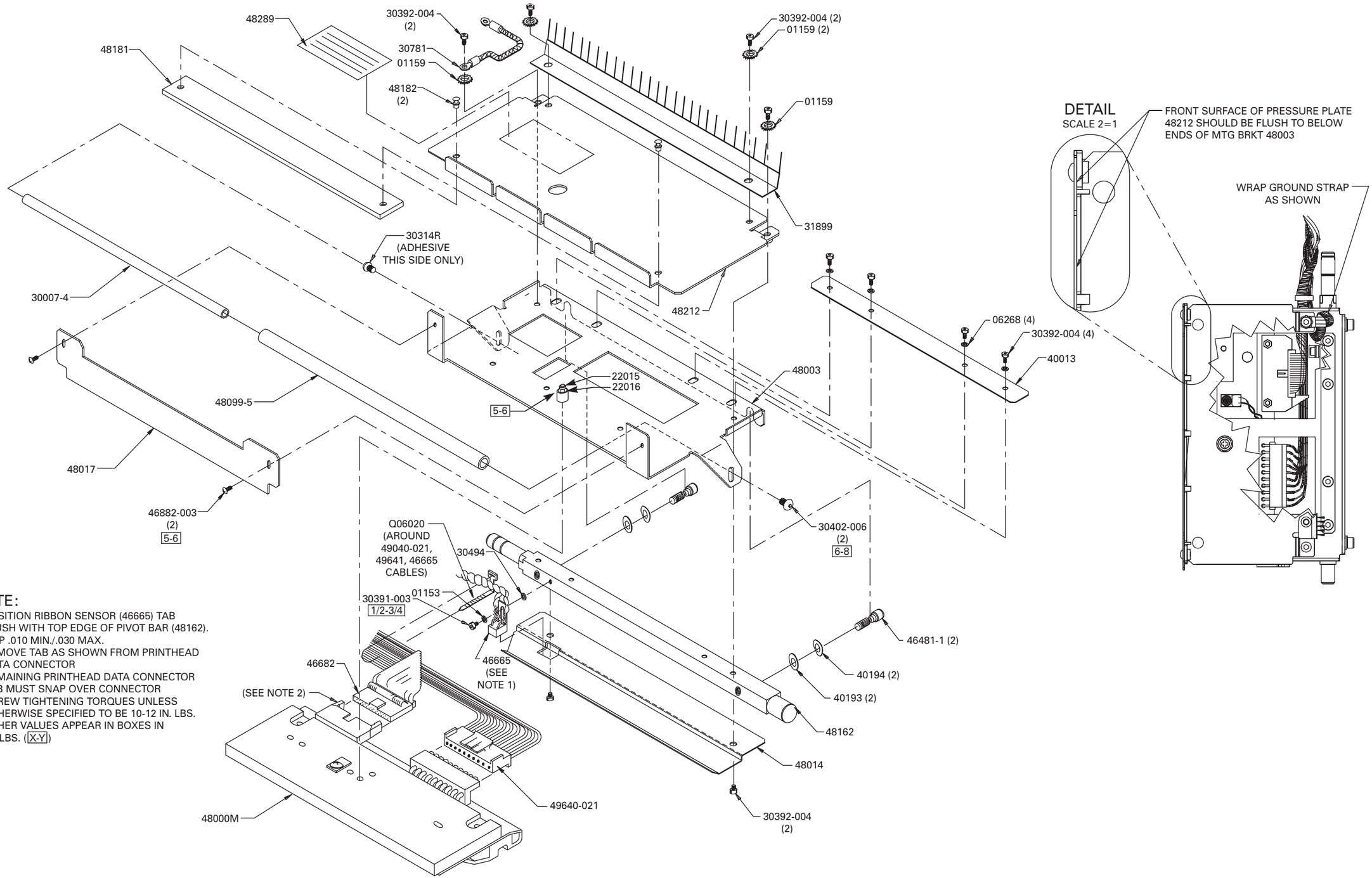
PRINTER MODEL: 90*Xi*II				
Printhead Support Assembly				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
01153		Washer, Flat, .250 x .125 x .028		1
01159		Washer, #6 Lock		4
06268		Washer, #6 Split Lock		4
22015		Spring (Printhead Mounting)		1
22016		Screw (Printhead Mounting)		1
30007-5		Shaft, Roller		1
30013		Plate, Washer		1
30314R		Adhesive		1
30391-003		Screw, 4-40 .19		1
30392-004		Screw, 6-32 .25		10
30402-006		Screw, 6-32 .37		2
30494		Washer, .320 x .119 x .062		1
30781		Cable, Printhead Ground		1
40193		Washer, Flat .406 x .172 x .048		2
40194		Washer, Curved, .312 x .144 x .016		2
46481-1		Screw, Adjustment, 6-32		2
46665		Assembly, Ribbon Sensor		1
46882-003		Screw, 4-40 .19		2
47000M		Printhead (90*Xi*II)		1
47009		Brush, Static		1
47014		Plate, Guard		1
47017		Plate, Ribbon Strip		1
47103		Bracket, Head Mounting		1
47162		Bar, Head Pivot		1
47181		Pad, Pressure		1
47212		Plate, Pressure		1
47640		Cable Assy., Printhead Power		1
47641		Cable Assy., Printhead Data		1
48099-2		Roller		1
48182		Rivet, Plastic		2
48289		Label		1
Q06020		Tiewrap		1



NOTE:

1. POSITION RIBBON SENSOR (46665) TAB NOT TO BE FLUSH WITH TOP EDGE OF PIVOT BAR (48162). GAP .010 MIN./.030 MAX.
2. REMOVE TAB AS SHOWN FROM PRINTHEAD DATA CONNECTOR
3. REMAINING PRINTHEAD DATA CONNECTOR TAB MUST SNAP OVER CONNECTOR
4. SCREW TIGHTENING TORQUES UNLESS OTHERWISE SPECIFIED TO BE 10-12 IN. LBS. OTHER VALUES APPEAR IN BOXES IN IN. LBS. ([X-Y])

PRINTER MODEL: 140*Xi*II				
Printhead Support Assembly				
PART NUMBER		DESCRIPTION		QUANTITY
01153		Washer, Flat, .250 x .125 x .028		1
01159		Washer, #6 Lock		4
06268		Washer, #6 Split Lock		4
22015		Spring (Printhead Mounting)		1
22016		Screw (Printhead Mounting)		1
30007-4		Shaft, Roller		1
30314R		Adhesive		1
30391-003		Screw, 4-40 .19		1
30392-004		Screw, 6-32 .25		10
30402-006		Screw, 6-32 .37		2
30494		Washer, .320 x .119 x .062		1
30781		Cable, Printhead Ground		1
31899		Brush, Static		1
40013		Plate, Washer		1
40193		Washer, Flat .406 x .172 x .048		2
40194		Washer, Curved, .312 x .144 x .016		2
46481-1		Screw, Adjustment, 6-32		2
46665		Assembly, Ribbon Sensor		1
46682		Cable Assy., Printhead Data		1
46882-003		Screw, 4-40 3/16		2
48000M		Printhead (140*Xi*II)		1
48003		Bracket, Head Mounting		1
48014		Plate, Guard		1
48017		Plate, Ribbon Strip		1
48099-5		Roller		1
48162		Bar, Head Pivot		1
48181		Pad, Pressure		1
48182		Rivet, Plastic		2
48212		Plate, Pressure		1
48289		Label		1
49640-021		Cable Assy., Printhead Power		1
Q06020		Tiewrap		1

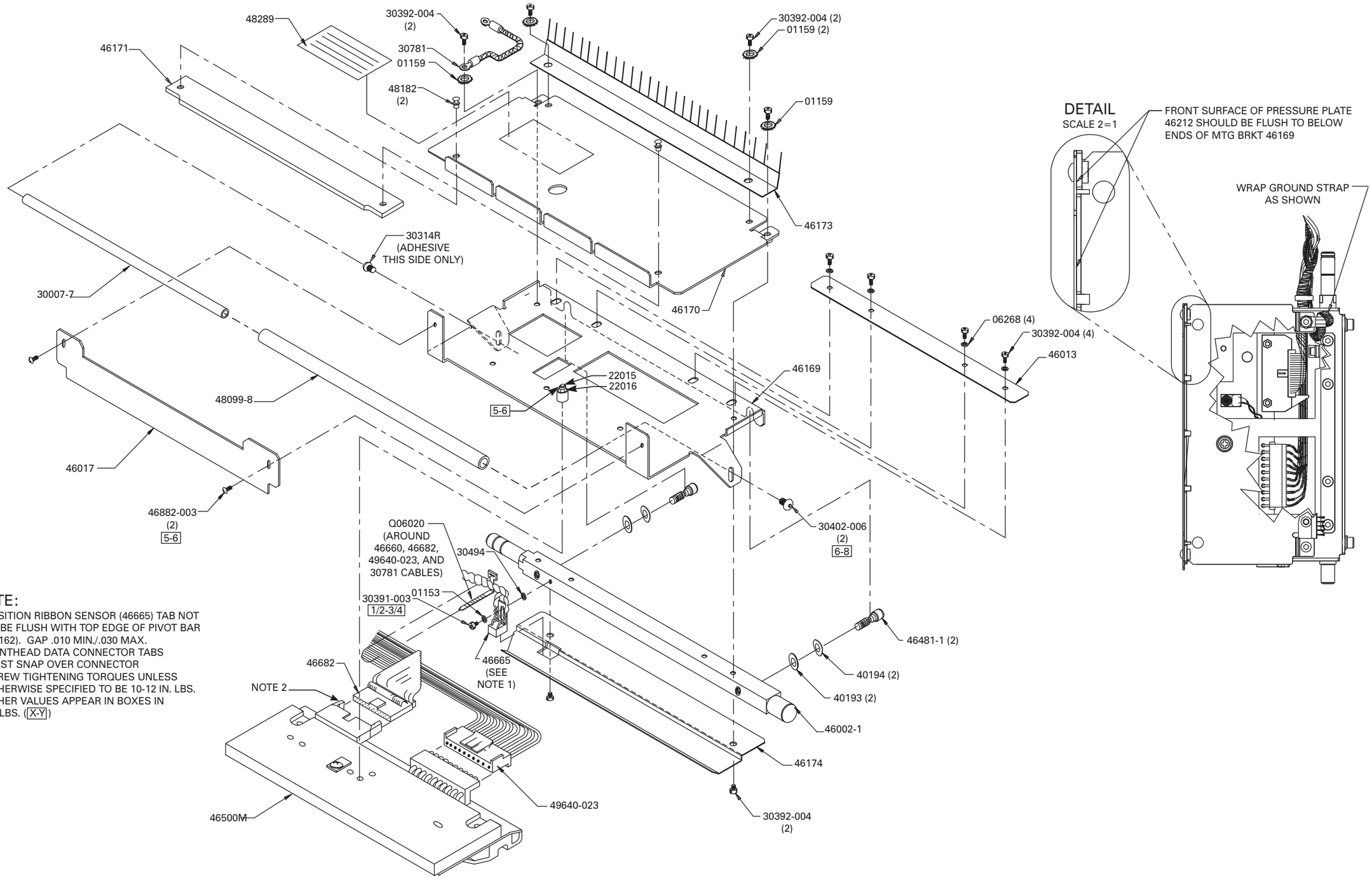


NOTE:

1. POSITION RIBBON SENSOR (46665) TAB FLUSH WITH TOP EDGE OF PIVOT BAR (48162). GAP .010 MIN./.030 MAX.
2. REMOVE TAB AS SHOWN FROM PRINTHEAD DATA CONNECTOR
3. REMAINING PRINTHEAD DATA CONNECTOR TAB MUST SNAP OVER CONNECTOR
4. SCREW TIGHTENING TORQUES UNLESS OTHERWISE SPECIFIED TO BE 10-12 IN. LBS. OTHER VALUES APPEAR IN BOXES IN IN. LBS. ([X-Y])

140*Xi*II PRINTHEAD SUPPORT ASSEMBLY

PRINTER MODEL: 170*Xi*II				
Printhead Support Assembly				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
01153		Washer, Flat, .250 x .125 x .028		1
01159		Washer, #6 Lock		4
06268		Washer, #6 Split Lock		4
22015		Spring (Printhead Mounting)		1
22016		Screw (Printhead Mounting)		1
30007-7		Shaft, Roller		1
30314R		Adhesive		1
30391-003		Screw, 4-40 .19		1
30392-004		Screw, 6-32 .25		10
30402-006		Screw, 6-32 .37		2
30494		Washer, .320 x .119 x .062		1
30781		Cable, Printhead Ground		1
40193		Washer, Flat .406 x .172 x .048		2
40194		Washer, Curved, .312 x .144 x .016		2
46002-1		Bar, Head Pivot		1
46013		Plate, Washer		1
46017		Plate, Ribbon Strip		1
46169		Bracket, Head Mounting		1
46170		Plate, Pressure		1
46171		Pad, Pressure		1
46173		Brush, Static		1
46174		Plate, Guard		1
46481-1		Screw, Adjustment, 6-32		2
46500M		Printhead (170*Xi*II)		1
46665		Assembly, Ribbon Sensor		1
46682		Cable Assy., Printhead Data		1
46882-003		Screw, 4-40 3/16		2
48099-8		Roller		1
48182		Rivet, Plastic		2
48289		Label		1
49640-023		Cable Assy., Printhead Power		1
Q06020		Tiewrap		1

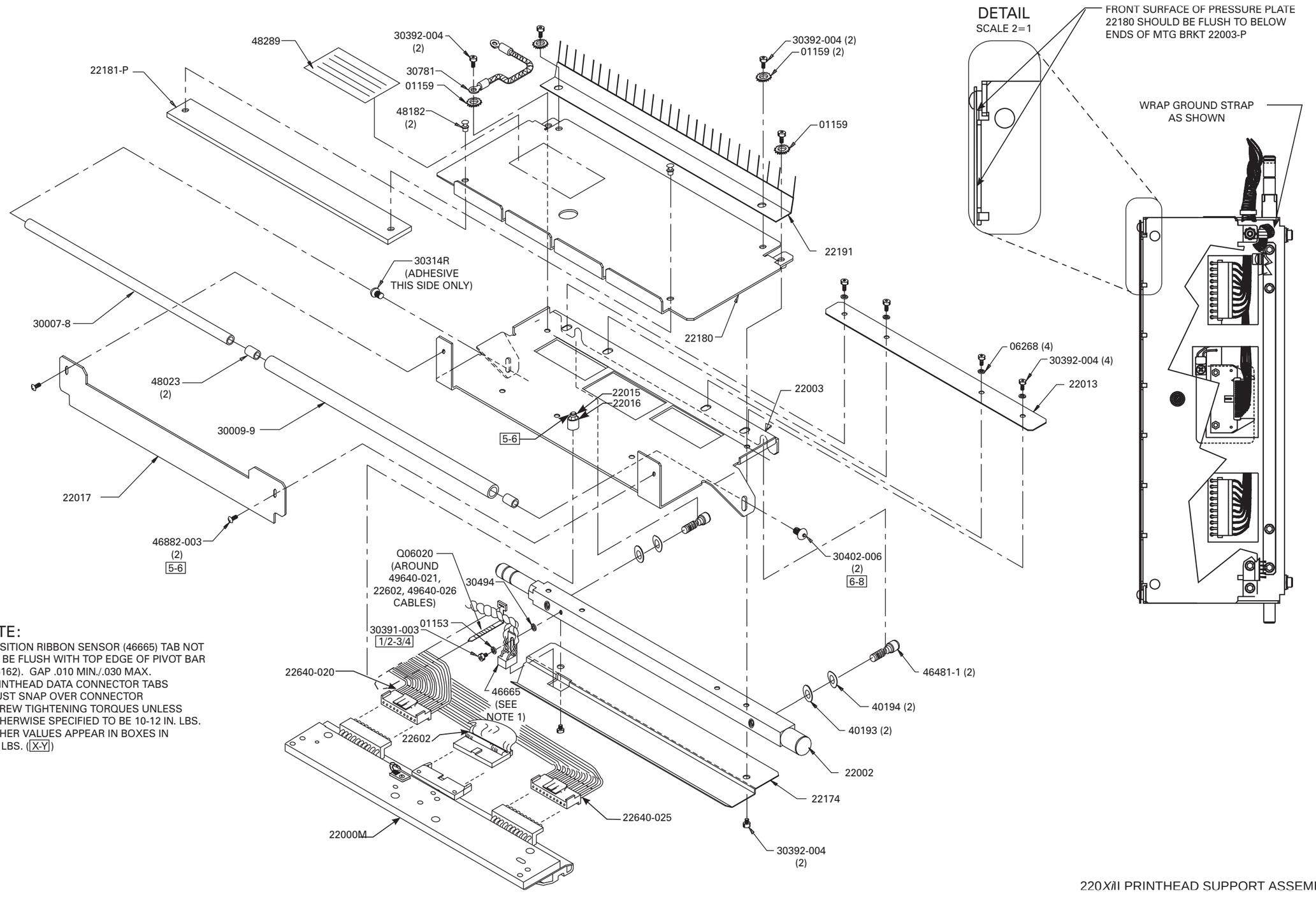


NOTE:

1. POSITION RIBBON SENSOR (46665) TAB NOT TO BE FLUSH WITH TOP EDGE OF PIVOT BAR (48162). GAP .010 MIN./.030 MAX.
2. PRINTHEAD DATA CONNECTOR TABS MUST SNAP OVER CONNECTOR
3. SCREW TIGHTENING TORQUES UNLESS OTHERWISE SPECIFIED TO BE 10-12 IN. LBS. OTHER VALUES APPEAR IN BOXES IN IN. LBS. (X-Y)

170*Xi*II PRINTHEAD SUPPORT ASSEMBLY

PRINTER MODEL: 220*Xi*II				
Printhead Support Assembly				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
01153		Washer, Flat, .250 x .125 x .028		1
01159		Washer, #6 Lock		4
06268		Washer, #6 Split Lock		4
22000M		Printhead (220*Xi*II)		1
22002		Bar, Head Pivot		1
22003		Bracket, Head Mounting		1
22013		Plate, Washer		1
22015		Spring (Printhead Mounting)		1
22016		Screw (Printhead Mounting)		1
22017		Plate, Ribbon Strip		1
22174		Plate, Guard		1
22180		Plate, Pressure		1
22181-P		Pad, Pressure		1
22191		Brush, Static		1
22602		Cable Assy., Printhead Data		1
22640-020		Cable Assy., Printhead Power		1
22640-025		Cable Assy., Printhead Power		1
30007-8		Shaft, Roller		1
30009-9		Roller		1
30314R		Adhesive		1
30391-003		Screw, 4-40 .19		1
30392-004		Screw, 6-32 .25		10
30402-006		Screw, 6-32 .37		2
30494		Washer, .320 x .119 x .062		1
30781		Cable, Printhead Ground		1
40193		Washer, Flat .406 x .172 x .048		2
40194		Washer, Curved, .312 x .144 x .016		2
48023		Bearing, .313 .190 .375		2
46481-1		Screw, Adjustment, 6-32		2
46665		Assembly, Ribbon Sensor		1
46882-003		Screw, 4-40 3/16		2
48182		Rivet, Plastic		2
48289		Label		1
Q06020		Tiewrap		1

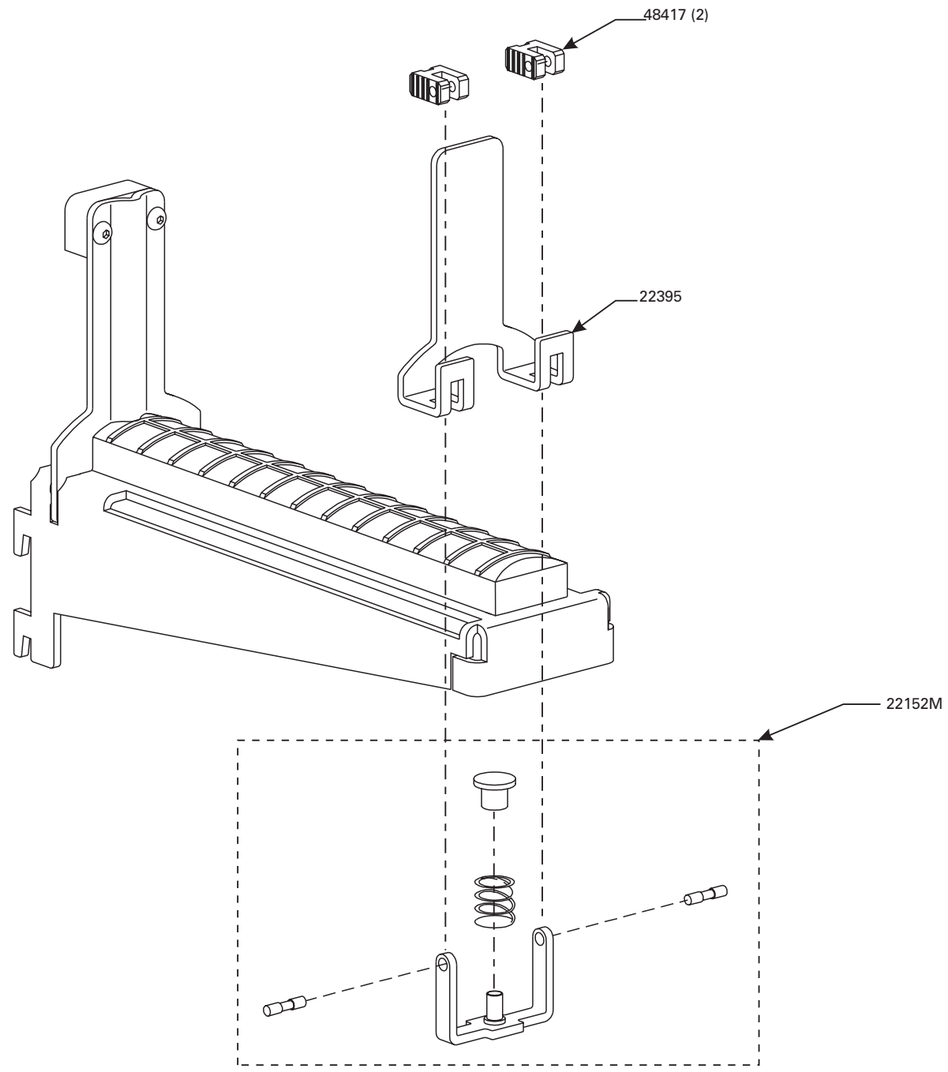


NOTE:

1. POSITION RIBBON SENSOR (46665) TAB NOT TO BE FLUSH WITH TOP EDGE OF PIVOT BAR (48162). GAP .010 MIN./.030 MAX.
2. PRINTHEAD DATA CONNECTOR TABS MUST SNAP OVER CONNECTOR
3. SCREW TIGHTENING TORQUES UNLESS OTHERWISE SPECIFIED TO BE 10-12 IN. LBS. OTHER VALUES APPEAR IN BOXES IN IN. LBS. (X-Y)

220*Xi*II PRINTHEAD SUPPORT ASSEMBLY

PRINTER MODEL: All *Xi*II-Series Printers				
Media Supply Hanger Assembly				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
22152M		Kit, Hardware		1
22153M		Assembly, Media Supply Hanger (220*Xi*II)		1
22395		Guide, Outer Edge		1
46153M		Assembly, Media Supply Hanger (170*Xi*II)		1
47153M		Assembly, Media Supply Hanger (90*Xi*II)		1
48153M		Assembly, Media Supply Hanger (140*Xi*II)		1
48417		Block, Bearing		2

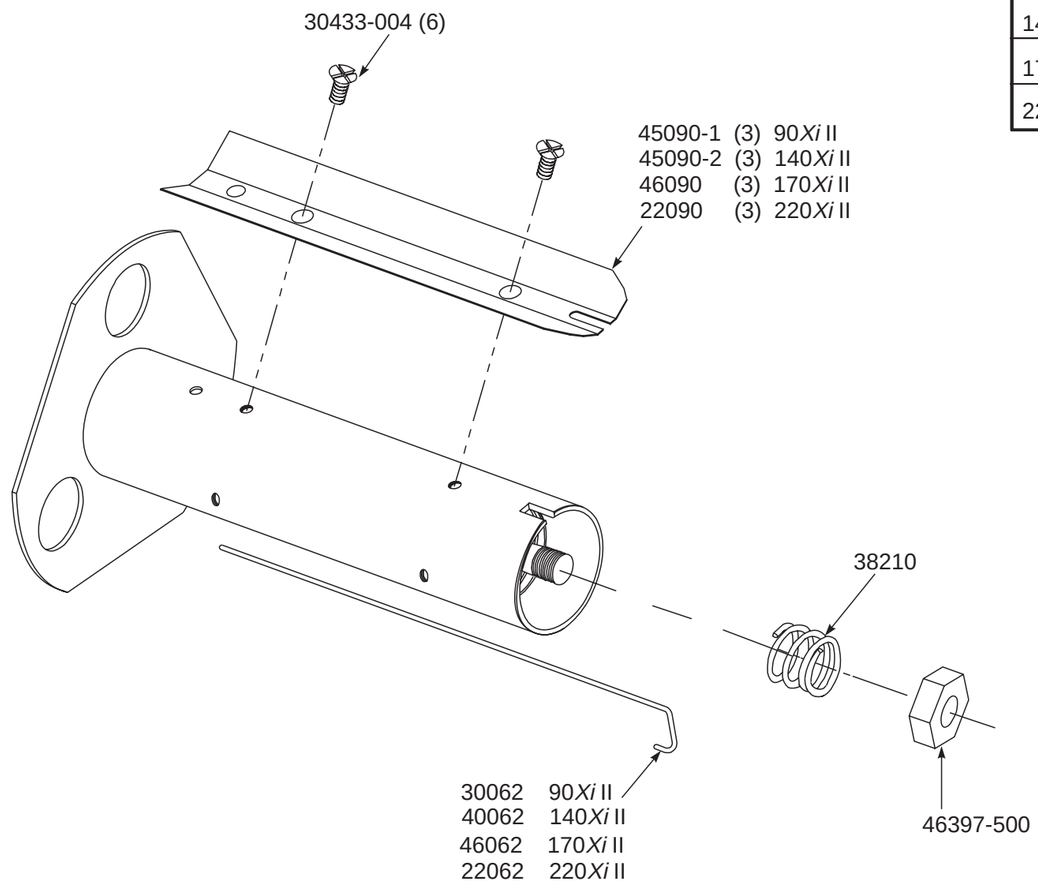


Complete Hanger Assemblies	
90*Xi* II	47153M
140*Xi* II	48153M
170*Xi* II	46153M
220*Xi* II	22153M

MEDIA SUPPLY HANGER ASSEMBLY

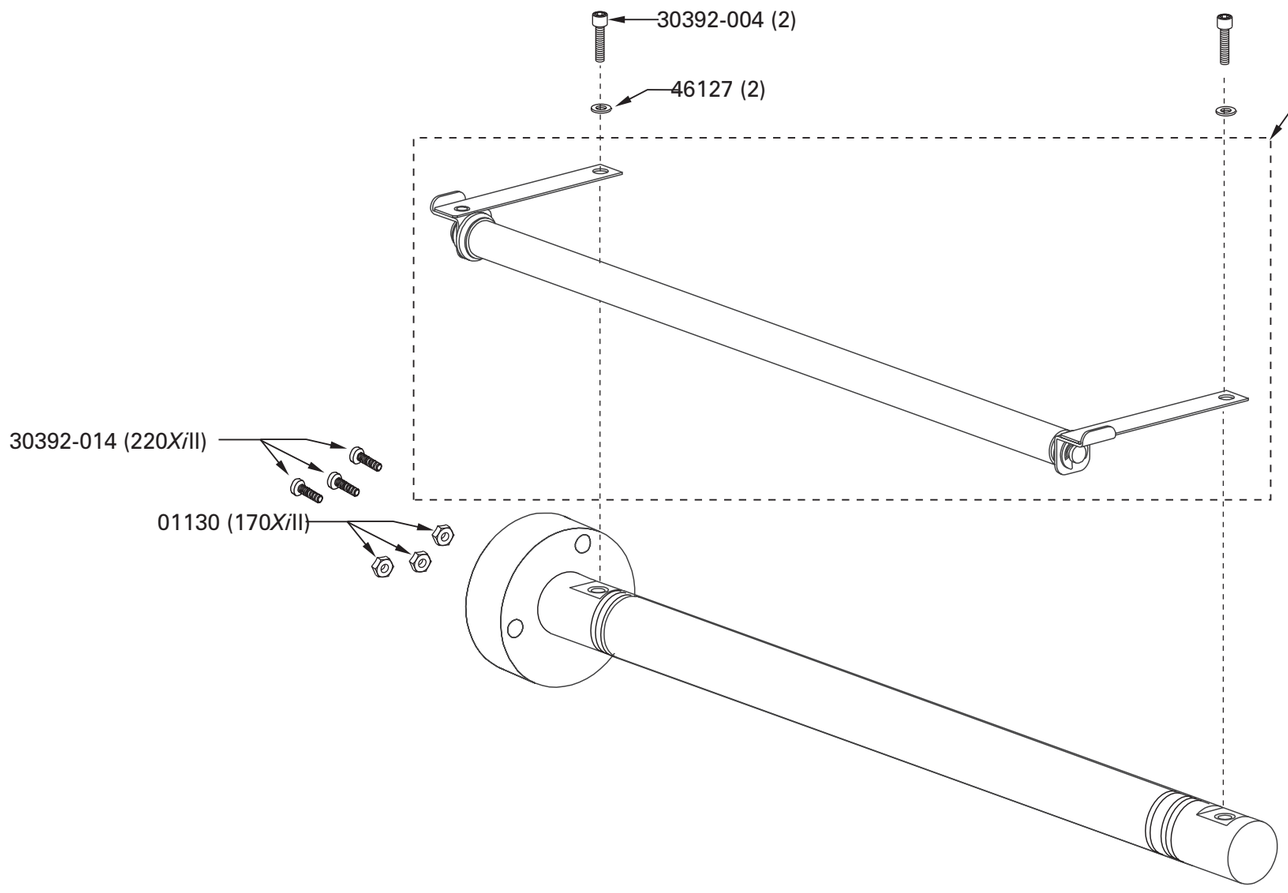
PRINTER MODEL: All *Xi*II-Series Printers				
Media Rewind Spindle Assembly				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
22062		J-Hook (220*Xi*II)		1
22090		Blade, Media Take-Up (220*Xi*II)		3
22155M		Assembly, Spindle, Replacement (220*Xi*II)		1
30062		J-Hook (90*Xi*II)		1
30433-004		Screw, 8-32 .250		6
38210		Spring, Compression, .56 x .720 x 1.0		1
40062		J-Hook (140*Xi*II)		1
45090-1		Blade, Media Take-Up (90*Xi*II)		3
45090-2		Blade, Media Take-Up (140*Xi*II)		3
46062		J-Hook (170*Xi*II)		1
46090		Blade, Media Take-Up (170*Xi*II)		3
46249M		Assembly, Spindle, Replacement (170*Xi*II)		1
46397-500		Nut, Locking, Thin Hex		1
47155M		Assembly, Spindle, Replacement (90*Xi*II)		1
48155M		Assembly, Spindle, Replacement (140*Xi*II)		1

Complete Spindle Assemblies	
90*Xi* II	47155M
140*Xi* II	48155M
170*Xi* II	46249M
220*Xi* II	22155M



MEDIA REWIND SPINDLE ASSEMBLY

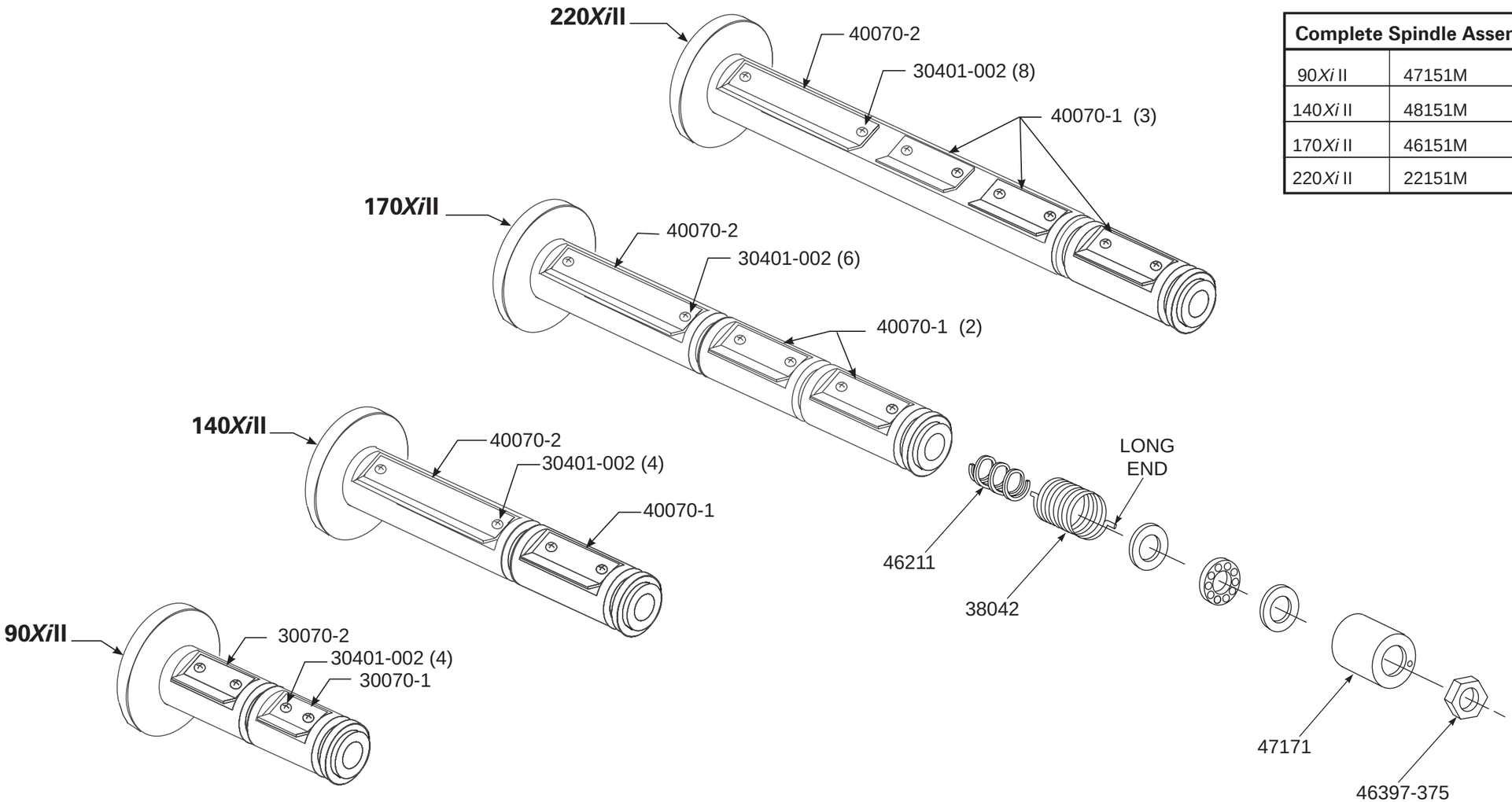
PRINTER MODEL: 170*Xi*II and 220 *Xi*II Printers				
Compliance Arm Assembly				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
01130		Nut, 6-32 Hex Washer Head (170*Xi*II)		3
22212M		Roller Assembly (220*Xi*II)		1
22213M		Assembly, Compliance Arm (220*Xi*II)		1
30392-004		Screw, 6-32 .25		2
30392-014		Screw, 6-32 .87 (220*Xi*II)		3
46127		Washer, .312 .153 .030		2
46812M		Roller Assembly (170*Xi*II)		1
46813M		Assembly, Compliance Arm (170*Xi*II)		1



Complete Assemblies	
170*Xi* II	46813M
220*Xi* II	22213M

COMPLIANCE ROLLER ASSEMBLY

PRINTER MODEL: All *Xi*II-Series Printers				
Ribbon Supply Spindle Assembly				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
22151M		Assembly, Spindle, Replacement (220*Xi*II)		1
30070-1		Blade, Ribbon Supply, Outer		X
30070-2		Blade, Ribbon Supply, Inner		X
30401-002		Screw, 4-40 .12		X
38042		Spring, Torsion, .739 x .805		1
40070-1		Blade, Ribbon Supply, Outer		X
40070-2		Blade, Ribbon Supply, Inner		X
46151M		Assembly, Spindle, Replacement (170*Xi*II)		1
46211		Spring, Compression, .53 x .660 x .62		1
46397-375		Nut, Jam		1
47151M		Assembly, Spindle, Replacement (90*Xi*II)		1
47171		Housing, Ribbon Supply Spring		1
48151M		Assembly, Spindle, Replacement (140*Xi*II)		1



Complete Spindle Assemblies	
90*Xi* II	47151M
140*Xi* II	48151M
170*Xi* II	46151M
220*Xi* II	22151M

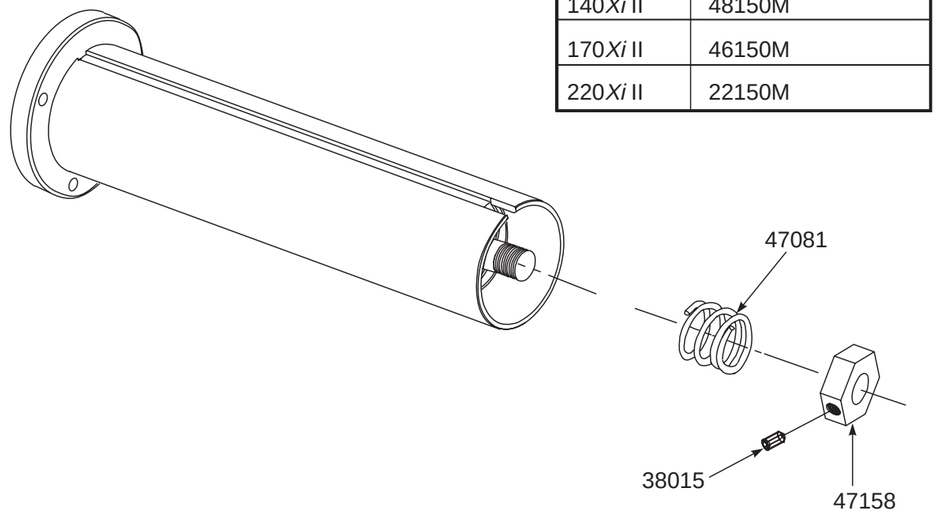
NOTES:

1. ALL COMPONENTS MUST BE OIL FREE.
2. O-RINGS, WEAR PLATES AND FRICTION CLUTCHES MUST BE HANDLED WITH CARE TO PREVENT OIL OR GREASE CONTAMINATION.

RIBBON SUPPLY SPINDLE ASSEMBLY

PRINTER MODEL: All *Xi*II-Series Printers				
Ribbon Take-Up Spindle Assembly				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
22150M		Assembly, Spindle, Replacement (220*Xi*II)		1
38015		Screw, Set, #10-24 .187		1
47081		Spring, Compression, .56 x .720 x 1.0		1
47150M		Assembly, Spindle, Replacement (90*Xi*II)		1
47158		Nut, .50 .75		1
48150M		Assembly, Spindle, Replacement (140*Xi*II)		1
46150M		Assembly, Spindle, Replacement (170*Xi*II)		1

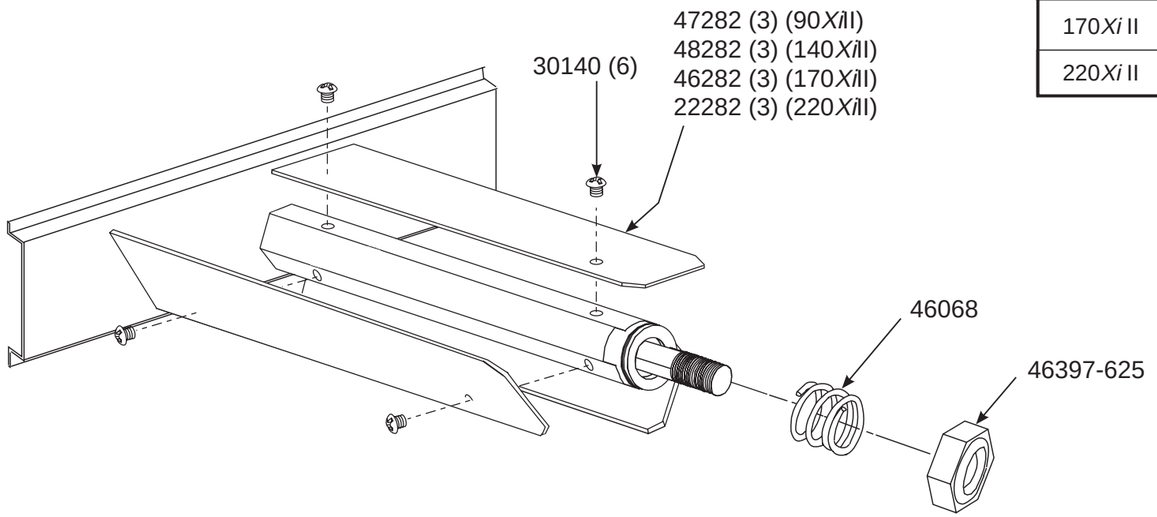
Complete Spindle Assemblies	
90*Xi* II	47150M
140*Xi* II	48150M
170*Xi* II	46150M
220*Xi* II	22150M



RIBBON TAKE-UP SPINDLE ASSEMBLY

PRINTER MODEL: All *Xi*II-Series Printers				
Optional Media Supply Spindle Assembly				
PART NUMBER		**DESCRIPTION**		**QUANTITY**
22253M		Assembly, Spindle, Replacement (220*Xi*II)		1
22282		Blade, 3" Core Media Supply (220*Xi*II)		3
30140		Screw, 6-32 .125		6
46068		Spring, Compression		1
46253M		Assembly, Spindle, Replacement (170*Xi*II)		1
46282		Blade, 3" Core Media Supply (170*Xi*II)		3
47253M		Assembly, Spindle, Replacement (90*Xi*II)		1
47282		Blade, 3" Core Media Supply (90*Xi*II)		3
48253M		Assembly, Spindle, Replacement (140*Xi*II)		1
48282		Blade, 3" Core Media Supply (140*Xi*II)		3
46397-625		Nut, Locking 5/8 18		1

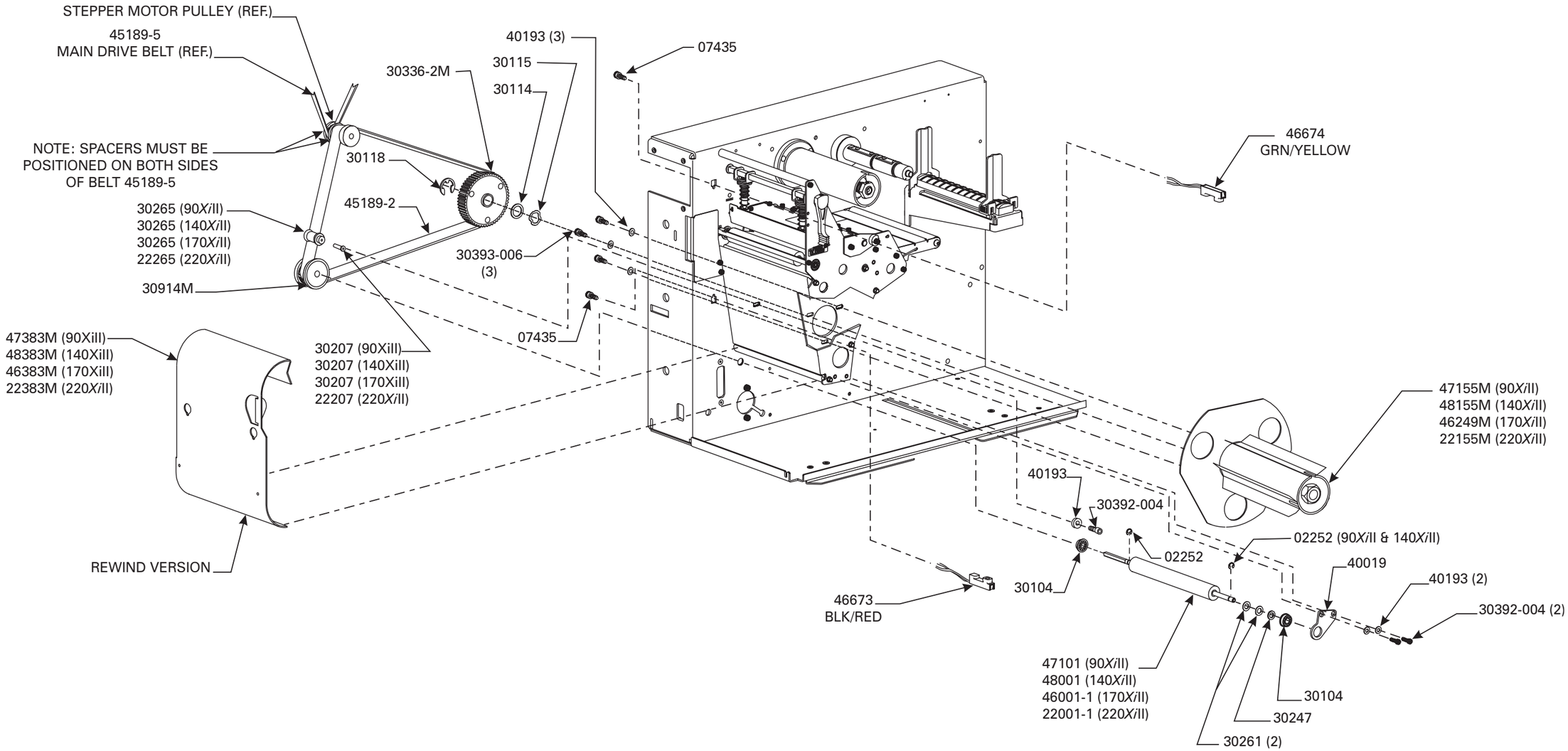
Complete Spindle Assemblies	
90*Xi* II	47253M
140*Xi* II	48253M
170*Xi* II	46253M
220*Xi* II	22253M



OPTIONAL MEDIA SUPPLY SPINDLE ASSEMBLY

PRINTER MODEL: All *Xi*II-Series Printers				
Media Rewind Option Assembly				
PART NUMBER		DESCRIPTION		QUANTITY
02252		Ring, Crescent .25		2
07435		Screw		2
22001-1		Roller, Platen, Lower (220*Xi*II)		1
22207		Shaft, Idler Pulley (220*Xi*II)		1
22155M		Assembly, Media Rewind Spindle (220*Xi*II)		1
22265		Pulley, Idler (220*Xi*II)		1
22383M		Plate, Rewind (220*Xi*II)		1
30104		Flange, Ball Bearing		2
30114		Washer, Flat .76 x .51 x .03		1
30115		Washer, Wave .740 x .520 x .080		1
30118		E-Ring, External .500 x .042		1
30207		Shaft, Idler Pulley (90*Xi*II, 140*Xi*II, 170*Xi*II)		1
30247		Washer, Flat		1
30261		Washer, Flat		2
30265		Pulley, Idler (90*Xi*II, 140*Xi*II, 170*Xi*II)		1
30336-2M		Assembly, Media Take-up Pulley		1
30392-004		Screw 6-32		3
30393-006		Screw 8-32 .31		3
30914M		Assembly, Peel-off Pulley		1

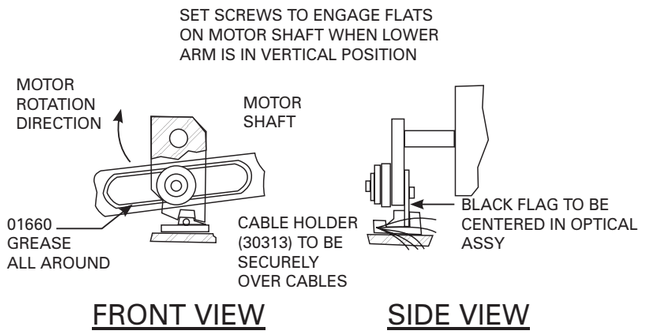
PRINTER MODEL: All *Xi*II-Series Printers				
Media Rewind Option Assembly				
PART NUMBER		DESCRIPTION		QUANTITY
40019		Plate, Roller Adjust		1
40193		Washer, Flat		6
45189-2		Belt, Drive, Rewind		1
46001-1		Roller, Platen, Lower (170*Xi*II)		1
46249M		Assembly, Media Rewind Spindle (170*Xi*II)		1
46383M		Plate, Rewind (170*Xi*II)		1
46673		Assembly, Take-Label Sensor (Lower)		1
46674		Assembly, Take-Label Sensor (Upper)		1
47101		Roller, Platen, Lower (90*Xi*II)		1
47155M		Assembly, Media Rewind Spindle (90*Xi*II)		1
47383M		Plate, Rewind (90*Xi*II)		1
48001		Roller, Platen, Lower (140*Xi*II)		1
48155M		Assembly, Media Rewind Spindle (140*Xi*II)		1
48383M		Plate, Rewind (140*Xi*II)		1

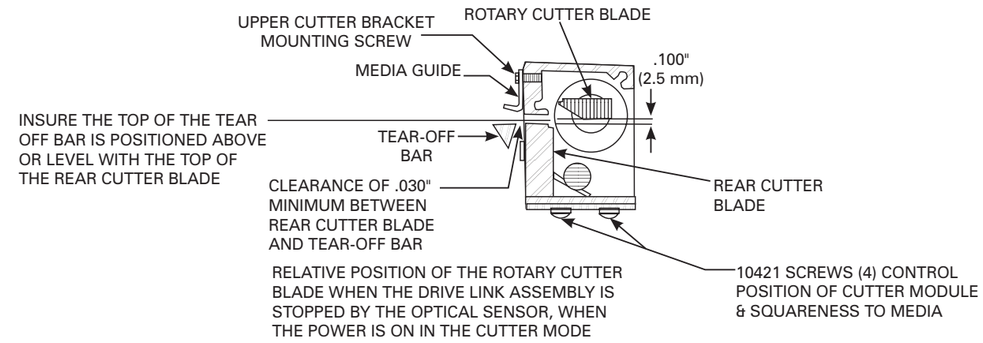


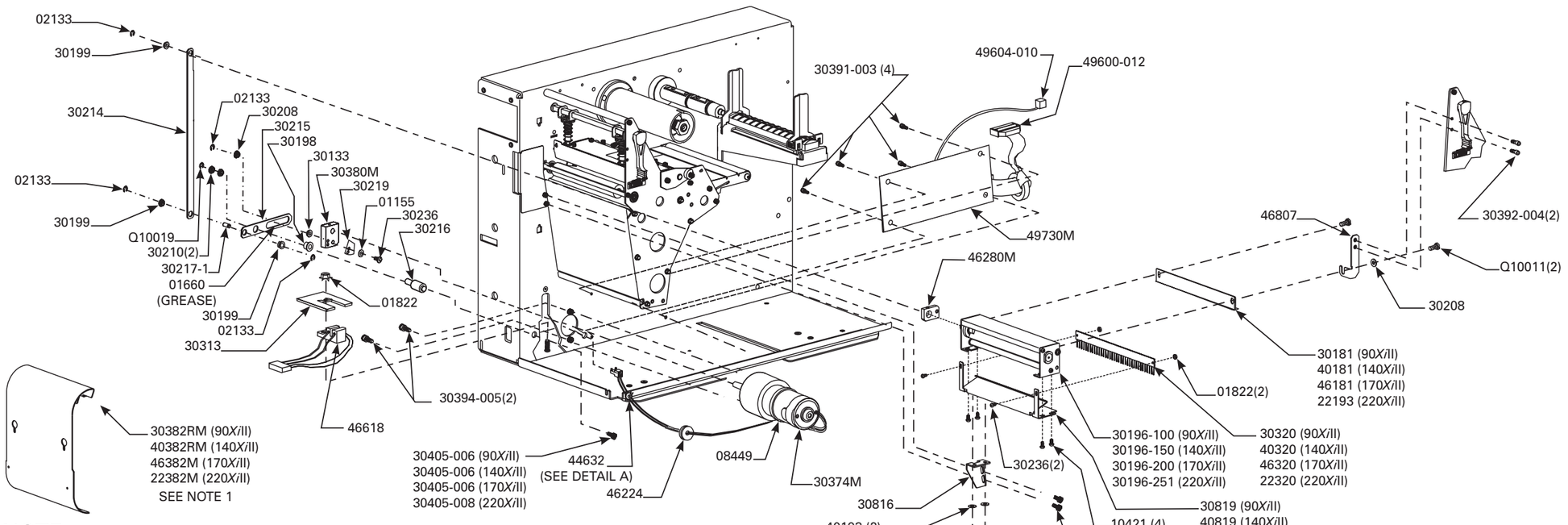
MEDIA REWIND OPTION ASSEMBLY

PRINTER MODEL: All *Xi*II-Series Printers				
Cutter Option Assembly				
PART NUMBER		DESCRIPTION		QUANTITY
01155		Washer, Lock # 4		1
01660		Grease		1
01822		Nut 4-40		3
02133		E-Ring .188 Black		4
08449		Tiewrap		1
10421		Screw M4 x .7 x 5		4
22193		Guide, Upper Cutter (220*Xi*II)		1
22320		Brush, Anti-Static (220*Xi*II)		1
22382		Plate, Cutter/Rewind (220*Xi*II)		1
22819		Bracket, Cutter Support (220*Xi*II)		1
30133		Bearing, Ball .375 x .187 x .125		1
30181		Guide, Upper Cutter (90*Xi*II)		1
30196-100		Module, Cutter (90*Xi*II)		1
30196-150		Module, Cutter (140*Xi*II)		1
30196-200		Module, Cutter (170*Xi*II)		1
30196-251		Module, Cutter (220*Xi*II)		1
30198		Bearing		1
30199		Bearing		3
30208		Washer, Felt .500 x .191 x .030		2
30210		Washer, Felt .564 x .384 x .060		2
30214		Link, Main		1
30215		Link, Slotted		1
30216		Post, Pivot		1
30217-1		Link, Pin		1
30219		Flag, Sensor		1
30236		Screw 4-40		3
30313		Clamp, Wire, Cutter		1
30320		Brush, Anti-Static (90*Xi*II)		1
30374M		Assembly, Cutter Motor		1
30380M		Assy., Drive Arm		1
30382RM		Plate, Cutter/Rewind (90*Xi*II)		1
30391-003		Screw 4-40 .19		4
30392-004		Screw 6-32 .25		6
30394-005		Screw 10-32 .312		2
30405-006		Screw 1/4-20 .38 (90*Xi*II, 140*Xi*II, 170*Xi*II)		1
30405-008		Screw 1/4-20 .50 (220*Xi*II)		1
30816		Bracket, Lower Cutter		1
30819		Bracket, Cutter Support (90*Xi*II)		1

PRINTER MODEL: All *Xi*II-Series Printers				
Cutter Option Assembly				
PART NUMBER		DESCRIPTION		QUANTITY
40181		Guide, Upper Cutter (140*Xi*II)		1
40193		Washer, Felt .406 x .172 x .048		2
40320		Brush, Anti-Static (140*Xi*II)		1
40382RM		Plate, Cutter/Rewind (140*Xi*II)		1
40819		Bracket, Cutter Support (140*Xi*II)		1
44632		Ferrite Ring 1.1 x .75		1
46181		Guide, Upper Cutter (170*Xi*II)		1
46224		Grommet, Rubber		1
46280M		Arm, Upper Drive		1
46320		Brush, Anti-Static (170*Xi*II)		1
46382M		Plate, Cutter/Rewind (170*Xi*II)		1
46618		Assembly, Cutter Sensor		1
46807		Bracket, Upper Cutter		1
46819		Bracket, Cutter Support (170*Xi*II)		1
49600-012		Assy., Cable		1
49604-010		Assy., Power Cable		1
49730M		Assy., Cutter Printed Circuit Board		1
Q10011		Screw M4 .7		2
Q10019		E-Ring .250 Black		1



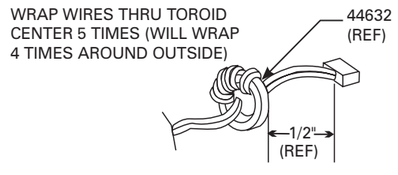




NOTE

1. IF REWIND OPTION IS INSTALLED ON CUTTER MACHINE, BE SURE TO ORDER CUTTER/REWIND PLATE (ORDER BY MODEL'S PART NO.)

2. POSITION BRUSH SO THAT APPROXIMATELY 1/8" OF THE BRUSH'S BRISTLES RUB AGAINST EACH MOVING LABEL AND THE BRUSH'S BRISTLES ARE PARALLEL TO THE LABEL EDGE.



DETAIL A

CUTTER OPTION ASSEMBLY

ASCII Code Chart

American Standard Code for Information Interchange

HEX	CHAR	HEX	CHAR	HEX	CHAR	HEX	CHAR
00	NUL	20	space	40	@	60	‘
01	SOH	21	!	41	A	61	a
02	STX	22	“	42	B	62	b
03	ETX	23	#	43	C	63	c
04	EOT	24	$	44	D	64	d
05	ENQ	25	%	45	E	65	e
06	ACK	26	&	46	F	66	f
07	BEL	27	‘	47	G	67	g
08	BS	28	(	48	H	68	h
09	HT	29	)	49	I	69	i
0A	LF	2A	*	4A	J	6A	j
0B	VT	2B	+	4B	K	6B	k
0C	FF	2C	,	4C	L	6C	l
0D	CR	2D	-	4D	M	6D	m
0E	SO	2E	.	4E	N	6E	n
0F	SI	2F	/	4F	O	6F	o
10	DLE	30	0	50	P	70	p
11	DC1	31	1	51	Q	71	q
12	DC2	32	2	52	R	72	r
13	DC3	33	3	53	S	73	s
14	DC4	34	4	54	T	74	t
15	NAK	35	5	55	U	75	u
16	SYN	36	6	56	V	76	v
17	ETB	37	7	57	W	77	w
18	CAN	38	8	58	X	78	x
19	EM	39	9	59	Y	79	y
1A	SUB	3A	:	5A	Z	7A	z
1B	ESC	3B	;	5B	[	7B	{
1C	FS	3C	<	5C	\	7C	|
1D	GS	3D	=	5D	]	7D	}
1E	RS	3E	>	5E	^	7E	~
1F	US	3F	?	5F	_	7F	DEL

NOTE: Shaded codes NOT recommended for use as a Command Prefix, Format Prefix or Delimiter Character

Setting Burn Temperature For IN SPEC Bar Codes

All Direct Thermal and Thermal Transfer materials do not have the same Burn Temperature requirements. The best way to check for the proper Burn Temperature is to use a Bar Code Verifier that actually measures bars/spaces and will calculate the PCS ratio. Without the assistance of a verifier, your eyes and/or the scanner to be used in the system, are the best bet for picking the optimum burn setting. What follows is a simple yet effective method for adjusting the burn temperature to print IN SPEC Bar Codes.

1. Load media (and Ribbon if required) according to the appropriate Media Loading and Ribbon Loading Instructions found in the printer's User Guide. Insure the Print Method is appropriately characterized for either Direct Thermal or Thermal Transfer.
2. To print a label for evaluation, use the following procedure:
   A. With Power OFF, depress and Hold the FEED Key.
   B. Turn the Printer Power ON, then release the FEED Key.
   C. The Printer will perform the Power ON Self Test (POST), calculate label length, and then begin printing test labels.
3. Print a label, then depress the PAUSE Key. The label will contain two Bar Codes as well as other printer information. Normal Bar Codes are printed in a horizontal format as they feed out of the printer. Rotated Bar Codes are printed in a vertical format.
4. Compare the test label printed, to the Bar Codes in Figure E.1. If the test label appears underburnedor overburned, Refer to section 4.1 and increase or decrease the BURN TEMP Setting accordingly.
5. Resume printing by pressing the PAUSE Key again. Print a few labels at the new setting and verify that proper IN SPEC Bar Codes are being printed. Repeat steps 3, 4 and 5 until satisfied.
6. To terminate the printing of the test labels, depress the PAUSE Key, then depress the CANCEL Key.

Printing Conditions

Overburned - Overburned labels are fairly obvious. The normal Bar Code bars increase in size, and the openings in small alphanumeric characters may fill in with ink. It may be readable but not IN SPEC. Rotated Bar Code bars and spaces will run together.

Slightly Overburned - Slightly overburned labels are not as obvious. The normal Bar Code will be IN SPEC. Small character alphanumerics will be bold and could be slightly filled in.The rotated Bar Code spaces are small when compared to the IN SPEC Code, possibly making the code unreadable.

Slightly Underburned - Slightly underburned labels are, in some cases, preferred to slightly overburned for IN SPEC Bar Codes. Both normal and rotated Bar Codes will be IN SPEC, but small alphanumeric characters may not be complete.

Underburned - Underburned labels are very obvious. Both normal and rotated Bar Codes have incomplete bars and spaces. Small alphanumeric characters are unreadable.

In Spec - The IN SPEC bar code can only be confirmed by a verifier, but it should exhibit some very visible characteristics. The normal Bar Code will have complete, even bars and clear, distinct spaces. The rotated Bar Code will also have complete bars and clear distinct spaces. Although it may not look as good as a slightly overburned Bar Code, it will be IN SPEC. In both normal and rotated styles, small alphanumeric characters will look complete.

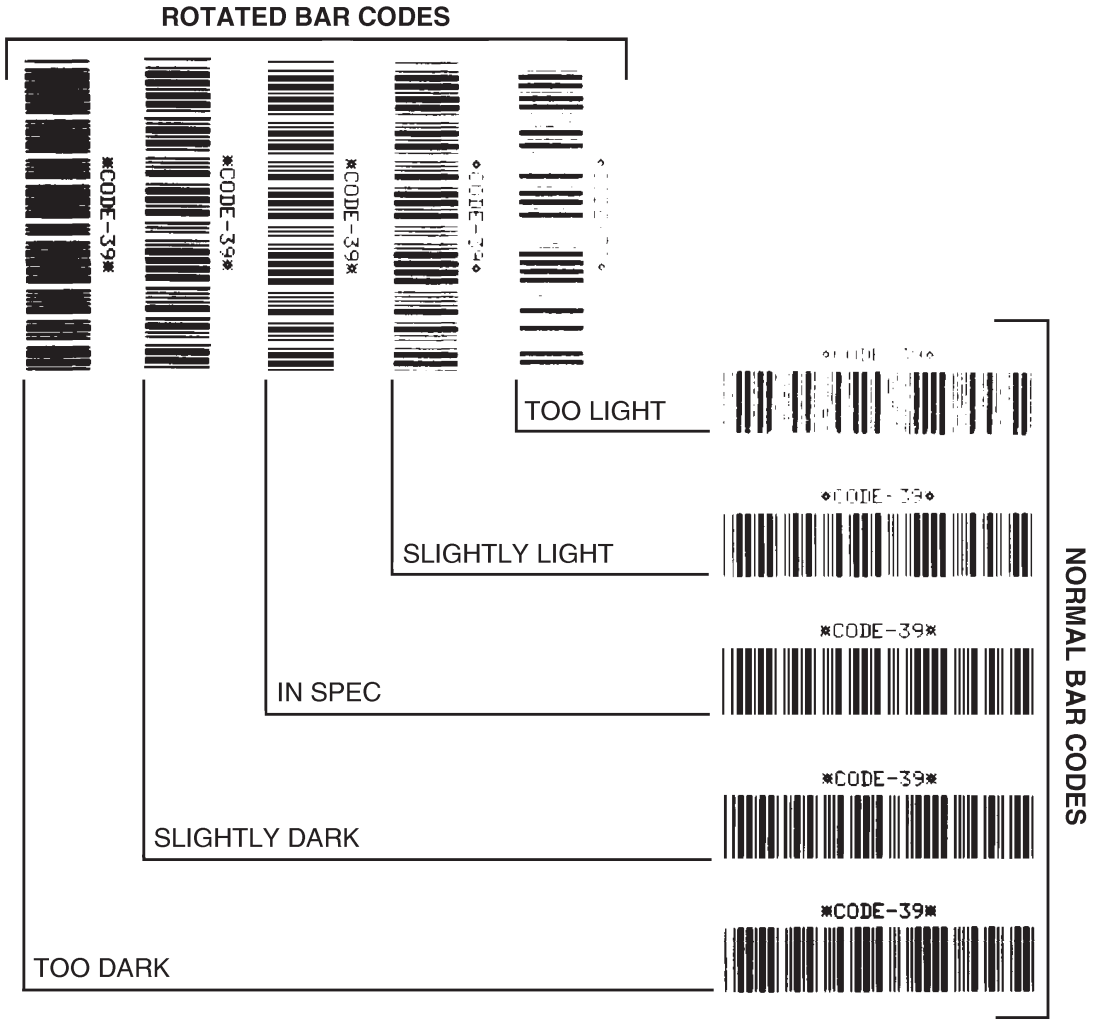


Figure 9.1 Bar Code Examples

NOTES