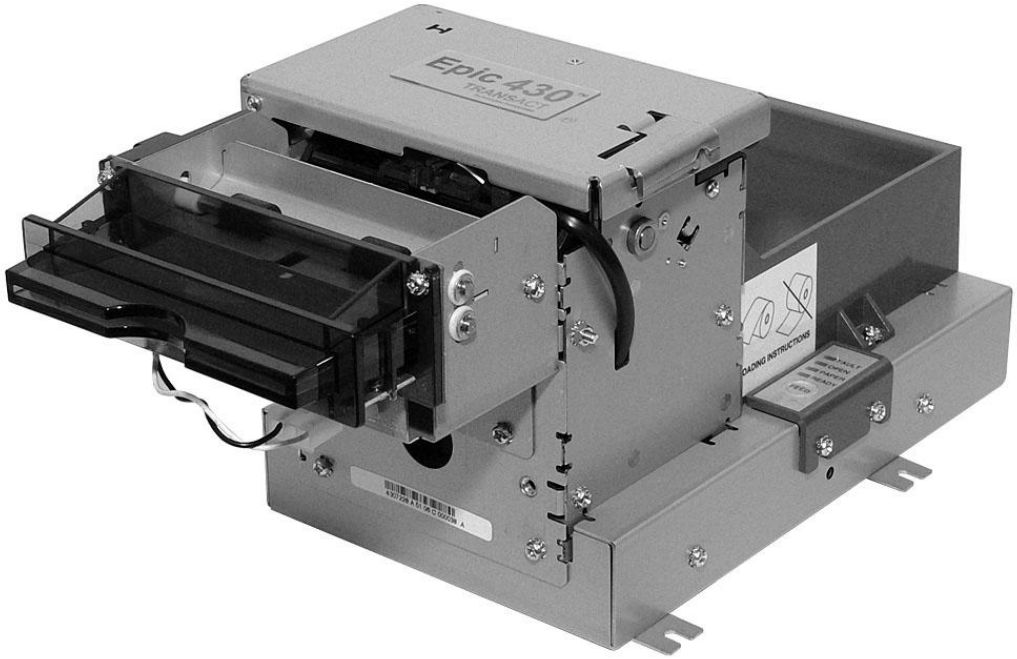
Epic430™

Maintenance Manual



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Technologies Incorporated

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Change History

Revision	Description of Change	Date
C	Pg 74 updated item #54 p/n, #17 p/n & #49 p/n	8/06
D	Pg 74 updated item #31 & #39 p/n's	9/06
E	Pg 74 updated item #54 p/n	10/06
F	Pg 18 added power connector pin out diagram; Pg 39 added warning regarding hot-plugging; Pg 47 added back-reference to interface pin outs	10/06
G	Pg 74 updated item #54 p/n	10/06
H	Pg 77 updated item #1 p/n & Pg 78 updated items #1,2,3 p/n's(view & p/n clean up)	10/06
J	Various p/n and assembly view updates	1/07
K	Pg 73-84 updated Print Mechanism view and BOM to show item #12; replaced 80mm components with 82.5mm components; corrected incorrect qty. values in BOM	12/07
L	Pg 77 removed item 43-06715	12/07
M	Various Changes throughout entire document	8/09
N	Pg 70: added modular info; Pg 72: knife (43-10948) was 43-09103; changes throughout entire document Pg 30: added 'Clearing Paper Jams' section	11/11
P	Pg 73. 43-10961L was 43-0544L (R43313)	
Q	Pg 78. Added picture of printer showing Guide-80MM Paper (R43329).	4/13

Federal Communications Commission Radio Frequency Interference Statement

The *Epic 430™* Printer complies with the limits for a Class A computing device in accordance with the specifications in Part 15 of FCC rules. These regulations are designed to minimize radio frequency interference during installation; however, there is no guarantee that radio or television interference will not occur during any particular installation. Interference can be determined by turning the equipment off and on while the radio or television is on. If the printer causes interference to radio or television reception, try to correct the interference by one or more of the following measures:

1. Reorient the radio or television receiving antenna
2. Relocate the printer with respect to the receiver
3. Plug the printer and receiver into different circuits

If necessary, the user should consult their dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: *How to Identify and Resolve Radio/TV Interference Problems*. This booklet is available from the US Government Printing Office, Washington, DC 20402. Ask for stock number 004-000-00345-4.

Canadian Department of Communications Radio Interference Statement

The *Epic 430™* Printer does not exceed Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Regulatory Compliance

FCC Class A and B
ULc
CE Mark
UL 1950, TUV

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Table of Contents

Figures

Tables

Chapter 1

Introducing your Epic 430™ Printer

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About your TransAct® Epic 430™ Printer

The TransAct® Epic 430™ printer represents the very latest technology for use for thermal receipt printing, specifically designed for the needs of gaming and kiosk applications. It builds upon the architecture of TransAct's proven thermal printers, together with a host of features specifically designed to improve the performance of your receipt printing applications, including:

- Modular printer design, with an electronics base that can be mounted up to 2 feet from the main unit.
- Paper roll bracket/spindle allowing paper roll to be mounted behind or below printer mechanism
- High-speed (6 inches per second) thermal receipt printing
- Barcode printing capabilities.
- Up to four (4) inch (100 mm) diameter paper roll
- Long-life ticket cutter
- Optional variable length presenter capable of handling from 63.5 to 254 mm. (2.5 -10 inches) length tickets
- Stroke-based fonts capable of supporting Asian and Latin characters

These features and more let you quickly and easily integrate reliable ticket printing in your gaming and kiosk applications, while giving you the quality, durability and uptime you have come to expect from TransAct® printers.

Who Should Read This Guide?

This document is intended for trained service technicians who will be working with the Epic 430™ printer.

What Is Included in This Guide?

This Maintenance Manual covers the proper maintenance procedures for servicing the Epic 430™ printer. This manual provides an overview of:

- Epic 430™ printer specifications.
- Specifications and functionality description
- Mounting requirements and mounting locations
- Printer sensors.
- Electrical connections.
- Operational procedures.
- Assembly/disassembly procedures.
- Listing of available spare parts.

We want you to have a trouble-free implementation with your TransAct® printer. For any issues not covered in this guide, quality technical support is available on-line at **www.transact-tech.com**, or by telephone or fax – consult the following pages for more details about our support services.

Warranty Options

All Epic 430™ printers come with a standard 24-month standard warranty covering both parts and labor that starts upon shipment from the factory. An optional extended warranty, covering both parts and labor for an additional 12 months, may be purchased separately. For more information concerning the warranty options, please contact the Sales Department at TransAct's Ithaca facility. You are responsible for insuring any product returned for service, and you assume the risk of loss during shipment to Ithaca. C.O.D. packages are not accepted and warranty repairs are subject to the terms and conditions as stated on the Ithaca warranty policy.

Technical and Sales Support

Your printer is backed by the resources of TransAct Technologies, a global technology firm with dedicated technical support and sales assistance. Here is how we can help you:

On-line Technical Support

Our web site at **www.transact-tech.com** is your on-line portal to obtaining technical assistance with your TransAct® printer. Click on Ithaca link and then the Technical Support link to find support information for your Epic 430™ printer. Our on-line support site also includes a convenient e-mail assistance request form, where you can submit support requests 24 hours a day, and receive a return contact from a TransAct support technician during regular business hours.

Telephone Technical Support

Live telephone support is available Monday through Friday from 8 AM to 5 PM local time, excluding holidays. We can provide general information about programming for your Epic 430™ printer, technical support, documentation, or assistance in sending a printer for service. To obtain telephone support, contact the number below for your region and ask for Technical Support.

Eastern United States: 1.877.7ITHACA (1.877.748.4222), Fax: 607.257.3911
Western United States: 1.877.822.8923, Fax: 702.254.7796
United Kingdom: 011-44-170-977-2500, Fax: 011-44-170-977-2505

To help us serve you faster, please have the following information ready when you call:

- The Model Number and Serial Number of the printer.
- A list of any other peripheral devices attached to the same port as the printer.
- What application software, operating system, and network (if any) you are using.
- What happened and what you were doing when the problem occurred.
- How you tried to solve the problem.

Return Materials Authorization and Return Policies

If a support technician determines that the printer should be serviced at a TransAct facility, and you want to return the printer for repair, we will issue you the Returned Materials Authorization (RMA) number that is required before returning the printer. Repairs are warranted for 90 days from the date of repair or for the balance of the original warranty period, whichever is greater. Please prepare the printer being returned for repair as follows:

- Pack the printer to be returned in the original packing material.
- Packing material may be purchased from TransAct's Ithaca Facility.
- Do not return any accessories unless asked to do so by a support technician.
- Write the RMA number clearly on the outside of the box.

Service Programs

TransAct Technologies Incorporated has a full service organization to meet your printer service and repair requirements. If your printer needs service, please contact your service provider first. If any problems still persist, you can directly contact the Technical Support department at the numbers listed above for a return authorization number. Customers outside the United States and United Kingdom should contact your distributor for services. TransAct offers the following service programs to meet your needs.

- Extended Warranty.
- Depot Repair.
- Maintenance Contract.
- Internet Support.

Sales Support

To order supplies, receive information about other Ithaca products, or obtain information about your warranty, contact our Sales Department at the contact telephone or fax numbers listed below. To receive information on International distribution, visit our web site at **www.transact-tech.com**.

Contact Information

TransAct Technologies Incorporated
Ithaca Facility
20 Bomax Drive
Ithaca, NY 14850 USA

TransAct Technologies
World Gaming Headquarters
& Western Regional Repair Center
6700 Paradise Road
Suite D
Las Vegas, NV 89119 USA

Telephone	877.7ithaca or 607.257.8901
Main fax	607.257.8922
Sales fax	607.257.3868
Technical Support fax	607.257.3911
Web site	**www.transact-tech.com**

Western United States: 877.822.8923, Fax: 702.254.7796
United Kingdom: 011-44-170-977-2500, Fax: 011-44-170-977-2505

Chapter 2

Epic 430™ Specifications and Requirements

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Epic 430™ Specifications and Requirements

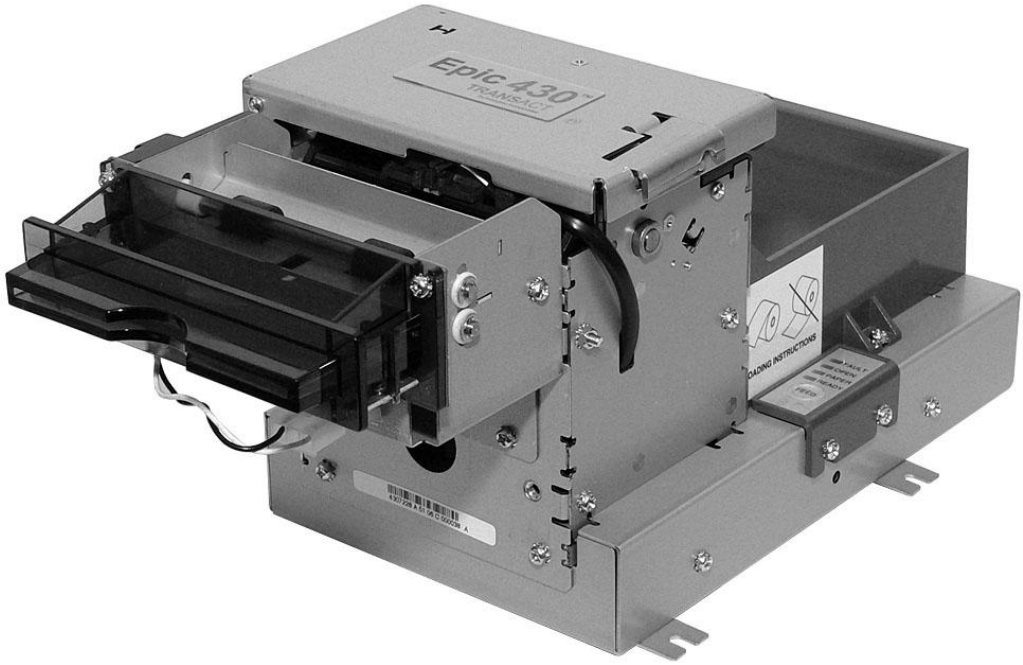


Figure 1. Epic 430™ Printer.

Standard Features

The following features are standard for Epic 430™ printers:

- Modular design, with electronics base assembly capable of being mounted remotely up to two feet from the printer mechanism.
- Full-cut auto-cutter module as part of printer mechanism
- Minimum 150 mm (6.0”)/second print speed (monochrome black text).
- 203 dpi print resolution (8 dots/mm.)
- Special print scalable to 8x with reverse, underscore, italic, and bold print
- 44/57 characters per line for 80 mm paper width
- Face-up print orientation
- ASCII and Unicode character encoding:
- Ladder and fence barcode printing supporting UPC-A, UPC-E, EAN13, EAN8, Code39, ITF, CODABAR, Code93, Code 128, Code31, and Interleaved 2 of 5
- Serial RS232C and USB interfaces built into Main Controller PCB.
- Selectable baud rates
- Drivers for Windows XP and XPe

- 4 MB minimum flash memory and 8 MB RAM
- Ithaca command set emulation
- Power: 24 VDC, 3 amps max.
- Power Connector: 4 pin Molex
- Paper Out, Paper Cover-Open, Top-Of-Form, Anti-Jam, Transport Ticket Taken and Head Temperature sensors
- ON/OFF Switch located in rear of electronics base.
- Recessed cable access with easy to use cable strain reliefs.
- Power and error LED(s)
- Paper feed button
- Easy paper loading
- Portrait or landscape printing under Windows
- Internal counters to track number of hours on, cuts completed, lines fed, and error conditions
- Capable of handling a 100 mm. (4.0 inch) diameter, 60 or 80mm. wide paper roll
- Compliant with RoHS (Restriction on Hazardous Substances)

Optional Features

The following options are available:

- Variable length presenter, capable of handling from 63.5 to 254 mm. (2.5 - 10 inches) length tickets
- Paper Low sensor
- Custom emulations (Epson, Custom)
- Universal power supply (100-240 VAC, 47-63 Hz)
- Bezel assembly, with LEDs (translucent blue)
- Remote printer mounting kit
- Unified Model (base mounted on printer mechanism as shown Figure 1)

General Specifications

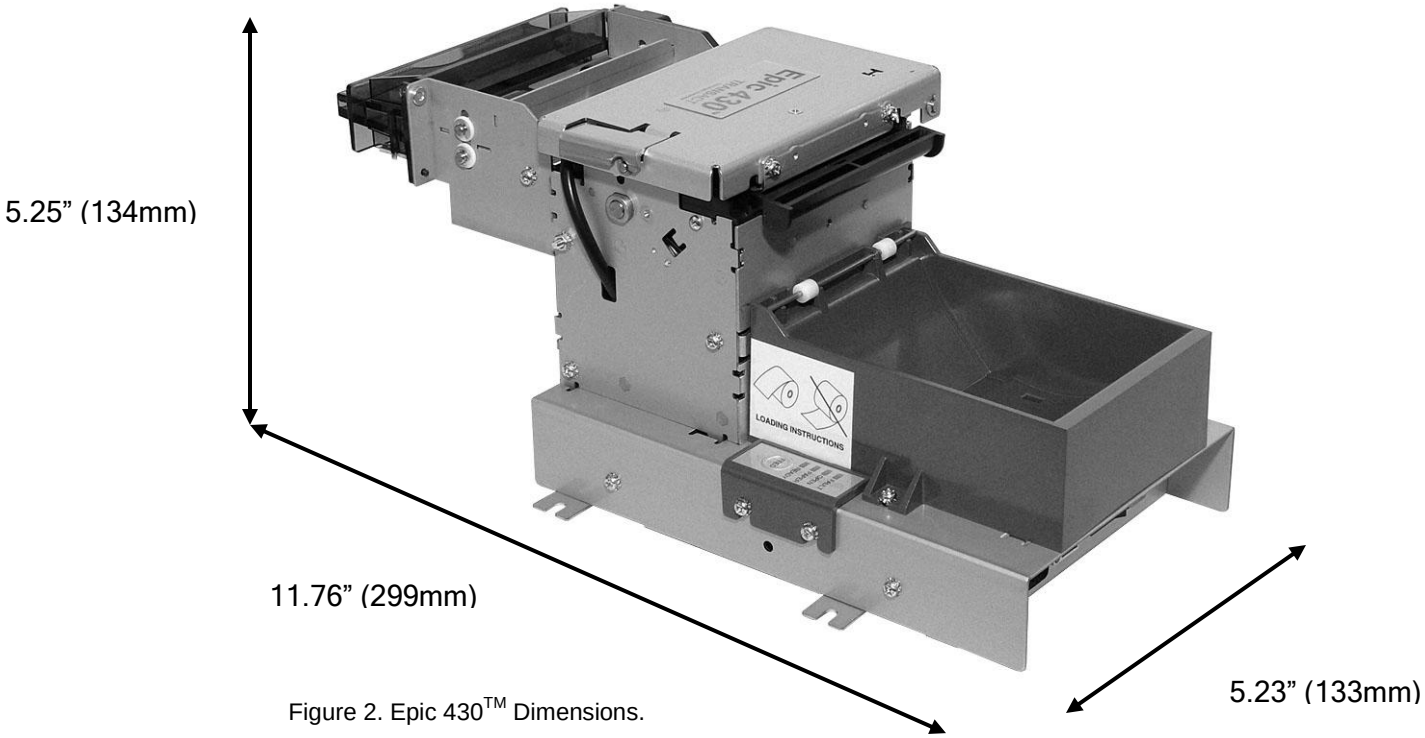


Figure 2. Epic 430™ Dimensions.

Printer Dimensions

Max Dimensions			
	W	D	H
Dimensions in inches	5.23	11.76	5.25
Dimensions in millimeters	133	299	134

(fully assembled as single unit)

Weight

Approximate weight 4.7 lb

Interface Type

Bi-directional serial RS-232 or USB

Printer Type

Fixed 80 mm linear thermal head.

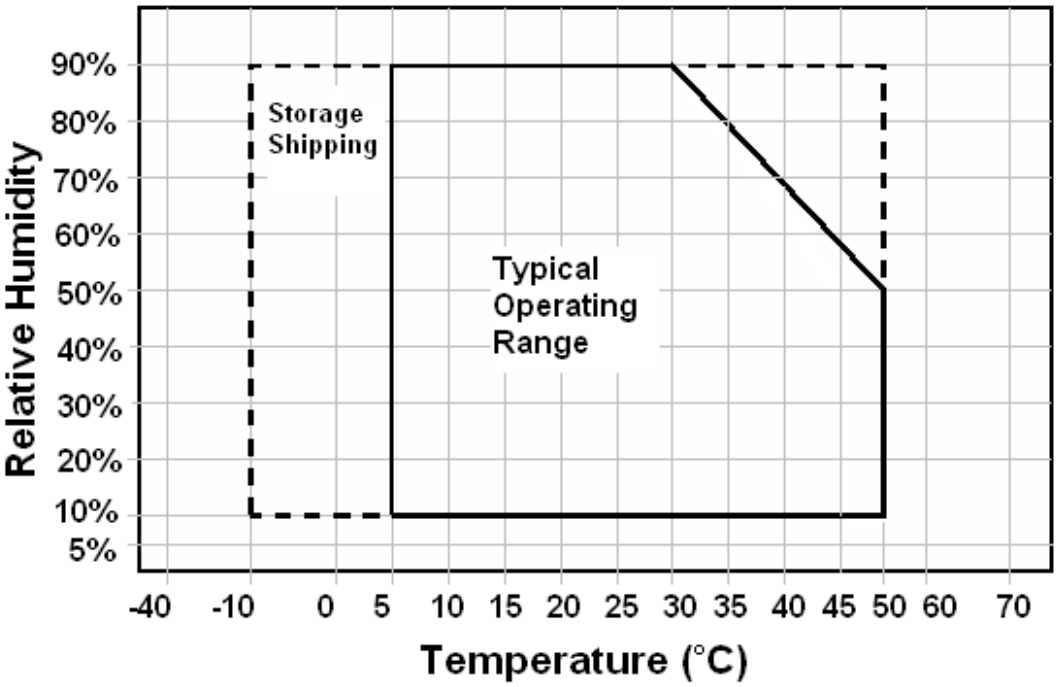


Figure 3. Temperature and Humidity Ranges.

Printer Environmental Conditions

Operating Temperature Range:	5º - 50ºC (41ºF - 122ºF)
Shipping/Storage Temperature Range:	-10º - 50ºC (14ºF - 122ºF)
Operating Humidity Range:	10% - 90% non-condensing
Shipping/Storage Humidity Range: (excluding paper)	10% - 90% non-condensing

Reliability

Printer Life:	10,000,000 print lines
Print Head Life:	75Km. min.
Cutter Life:	1,000,000 cuts (POS Grade)

AC Power Requirements

90-265 VAC at 47-63 Hz.

DC Power Requirements

24 VDC ±5% 2A

Test Standards

CE MARK (1998)
FCC CLASS B
EN60950-1
IEC 60950 (1991) Second Edition with Amendments 1,2,3,4
ROHS/WEEE

Accoustic Noise:

58 dBA

Printing Specifications

Printing method:	Thermal Sensitive Line Dot System
Vertical/Horizontal dot pitch:	0.125 mm.
Resolution:	8 dots per mm (203 DPI)
Line feed pitch:	3.2 mm. (.125 inches)
Print zone (typical)	72 mm (2.81 inches)
Print speed (monochrome):	6 inches per second
Number of print elements:	640 dots in-line

Paper Roll Specifications

Paper Type:	One ply thermal paper
Paper Width:	79.5 +/- .05 mm (3.13 +/- .02 inches)
Paper Thickness	0.076 mm to 0.09 mm (.0022 to .0035 in.) thick
Roll Diameter:	101.6 mm (4.0 in.)
Roll Core Inside Diameter:	.445 to .635 inches
Roll Core Outside Diameter:	.730 to .860 inches
Paper Grades :	POS and Lottery grades

Paper Usage Precautions:
Use only specified thermal paper. If other paper is used, print quality, head life, and cutter life may deteriorate.

Paper Out

A receipt paper out sensor is provided as a standard feature, which senses when approximately 1 inch (length) of paper is left on the paper roll.

Auto Cutter Position

A full cut auto-cutter is a standard feature with all TransAct® Epic 430™ printers.

Cutter type	Guillotine
Media width	79.5 mm: 80.0 +/- 0.5 mm. (3.13 +/- 0.01 inches)
Media thickness range	0.0022 to 0.0035 inch
Cut to line of print	0.70 inch
Cutter life	1,000,000 cuts (POS grade) 750,000 cuts (Lottery grade)
Cut time:	Less than 350 milliseconds

Communications Interface

RS-232 Serial Interface

Serial Port Features

The serial port features are as follows:

Baud Rates	300, 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K, and 57.6K
Bit Patterns	8-bit no parity; 8-bit odd; 8-bit even; 7-bit no parity; 7-bit odd; 7-bit even
Flow Control	DTR and XON/XOFF

9-pin	25-pin	Signal	Description
Pin 1	Pin 8		Not Connected
Pin 2	Pin 3	RX	Receive Data
Pin 3	Pin 2	TX	Transmit Data
Pin 4	Pin 20	DTR	Data Terminal Ready
Pin 5	Pin 7	GND	Signal Ground
Pin 6	Pin 6	DSR	Data Set Ready
Pin 7	Pin 4	RTS	Request to Send
Pin 8	Pin 5	CTS	Clear to Send
Pin 9	Pin 11		Not Connected

Table 1 Serial Interface Pin-outs

Signal Voltage and Current levels

The serial interface meets EIA RS232 interface specifications:

Voltage Levels	Max	+-15 Volts
	Min	+- 3 Volts
Mark = Off =	-3 to -15 Volts	
Space = On =	+3 to +15 Volts	

Because both the host and printer are DTE's (Data Terminal Equipment), they use the same serial port pin-outs. If the cable that is used to connect the host to the printer is a pin-to-pin inter-connect, it will not work. Therefore, a null modem or turn-around cable must be used to interconnect the host and the printer.

USB Interface

The USB interface is a Version 1.1 interface that is Version 2.0 compliant. The standard USB interface is implemented through a Standard Series "B" Receptacle as defined in the USB Specification. The does not draw power from the standard type B USB interface cable but from a separate power supply cable.

The Standard USB Type B connector has the following pin functions:

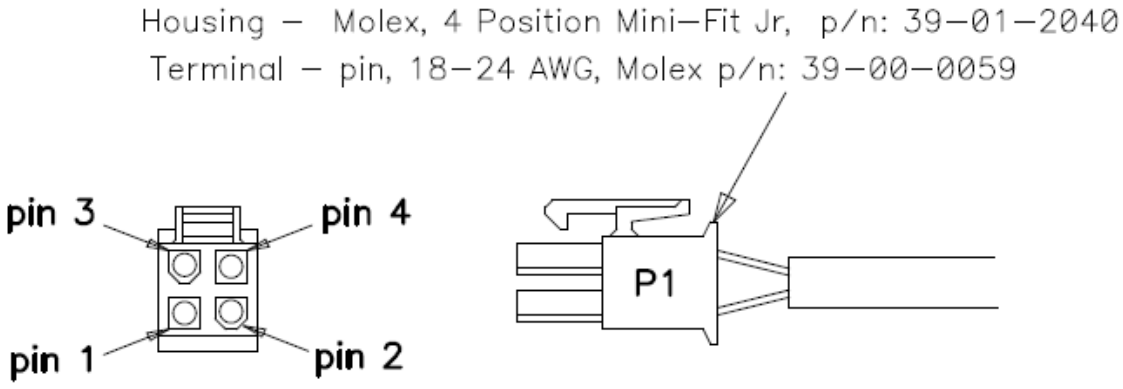
Pin Signal

1 Vbus (+5 V dc) (Not used in the POSjet® 1000)
2 Minus data
3 Plus data
4 Ground

Note: The standard USB interface does not have enough power to run the printer. It is not possible to power the printer with the USB cable alone.

Power Input Connector Interface

The power input connector for the Epic 430™ printer uses a Molex 4-pin interface, with pin functions are as shown.



SIGNAL	pin #
+24V	1
24V RTN	2
–	3
FRAME	4

Figure 4. Pin Functions for Power Input Connector.

Chapter 3

Operational Procedures

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How to Operate the Epic 430™ Printer

User Interface

Your Epic 430™ printer contains two buttons and four (LED) indicator lights.

Indicator Lights (LED)

The four Epic 430™ indicator lights are:

- **Ready LED** Indicates printer activity and non-recoverable errors
- **Open LED** Indicates the cover is open
- **Paper LED** Indicates paper status (paper low or out)
- **Fault LED** Indicates problems and probability of recovery

The FEED button

The FEED button will provide various functions, depending upon how long it is pressed.

Pressing this button will provide one of three functions. The function is time-dependent, and the display indicators will change to indicate the next mode, as follows:

- By pressing and releasing the FEED button, the printer will feed about 5 inches of paper while printing the printer firmware version. This is intended to clear the printer and align the next ticket for print. To indicate this mode is selected the Fault LED will illuminate as soon as the FEED button is pressed.

- Pressing and holding the button for about two seconds will enter journal maintenance mode. The LED indication of this mode selection is shown by the Paper LED illuminating and the Fault LED going out after about 2 seconds of holding down the FEED button.

- Holding the button for about 4 seconds will enter configuration mode. The LED indication of this mode selection is shown by the Open LED illuminating and the Paper LED going out after about 4 seconds of holding down the FEED button.

The TEST button

The printer has a TEST button on the right side of the Electronics Base. This button will require a tool (such as a pen or paper clip) in order to activate the switch.

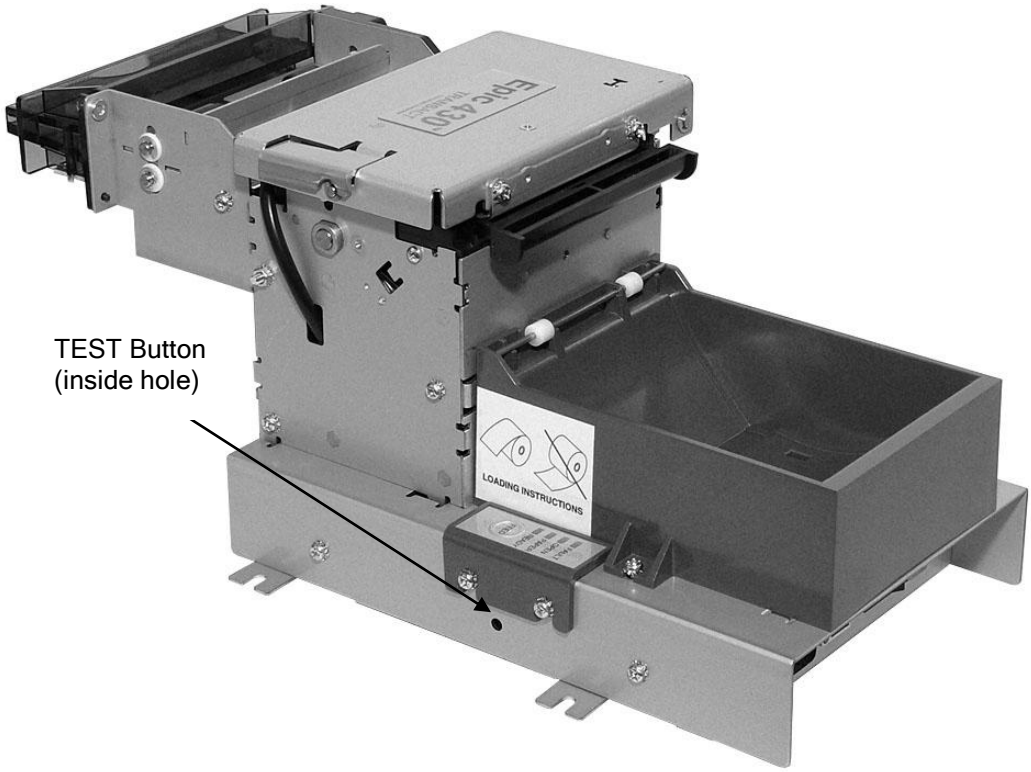

Figure 5. Location of TEST Button Inside Electronics Base.

Pressing this button will provide one of three functions. The function is time-dependent, and the display indicators will change to indicate the next mode, as follows:

- By pressing and releasing the TEST button, the printer will enter self test mode. This is intended to verify printer operation and is indicated by the Fault LED illuminating as soon as the button is pressed.

- Pressing and holding the button for about 2 seconds will enter hex dump mode. The LED indication of this mode is the illumination of the Paper LED and the Fault LED going out after about 2 seconds of the Test button being held.

- Pressing and holding the button for about 4 seconds will enter configuration mode. The LED indication of this mode is the illumination of the Open LED and the going out of the Paper LED after about 4 seconds of the TEST button being held.

Using Self-Test

Self-Test Mode allows you to perform a series of tests to show if the printer is functioning correctly.

The Epic 430™ has several Self-Test options. Some are designed to be useful when performing on-site print evaluations. Others are designed for factory setup by TransAct.

To enter self test, press and release the TEST button, a small tool may be necessary.

Once in test mode, the FEED button is used to select the test to be run. There are six available testing options. The first three are used to verify basic printer operation. The last three are options are for factory test.

Testing the printer

The testing options are as follows:

Operation –Ticket Print

This test is the primary test option used when determining if the printer is functioning correctly.

The Ticket Print Test is mostly used during the early stages of troubleshooting, to eliminate the possibility that the problem is occurring with the printer. If the printer experiences a failure, and the error indicator light is activated, call TransAct's Technical Support department.

Operation - Head Test

This test performs a test pattern that will activate all of the printing elements and verify that the drive roll is free from defects or debris. The print head has two heating elements per dot position. A print element is not considered bad unless both elements are missing. If the head test shows that there is an inconsistency in the print there may be debris on the drive roll. Cleaning the drive roll may correct the problem. If this does not correct the problem, contact TransAct's Technical Support department.

Operation - Marker Calibration

The printer is equipped with several sensors in the paper path, which are adjustable and will handle a wide range of paper under normal operation. However, if there appear to be problems associated with any sensor's operation, the Marker Calibration test will attempt to adjust the sensors for optimal operation with the paper installed. The Top-of-Form, Paper Out and Jam sensors will be recalibrated. To run this test, simply select it. The printer will automatically position the paper and adjust the sensors. If the paper installed does not have black dot markings, the Top-of-Form sensor will be adjusted based on the white level of the paper only.

Factory Test

The printer is equipped with several factory test modes. These test options are only used for factory testing.

Operation - Continuous
Operation - Burn-in
Operation - Rolling ASCII

Level 0 Diagnostics

Level 0 diagnostics are only and always run at power up, e.g. when power is first applied. These diagnostics perform the following tasks:

Power On

1. Basic System Integrity
2. Vector Integrity
3. RAM Test
4. Flash Boot Loader Integrity
5. Flash Firmware Integrity (NOTE: If the firmware is corrupted, the printer will remain in boot load.)
6. USB Controller Diagnostics and verify.
7. Start Normal Firmware
8. Verify Configuration Integrity
9. Interface Configuration
10. File System Integrity
11. Start Kernel, Verify Multitasking, Start Tasks

Once the kernel is running, the following tests must pass to allow operation. However, if any test fails (except the knife home test), the remaining tests will generate recoverable faults and normal operation will start as soon as the fault is cleared. These tests are also run when operation is resumed from OFF.

12. Cover Closed Check
13. Knife Home
14. Paper Present
15. Clear Paper Path.
16. Place Printer On-line, Start Normal Operation

The first phase of testing consists of step 1-5, and determines that the boot loader is accurate and the printer firmware is correct. Tests 1 through 4 produce non-recoverable errors if they fail, in which case the power must be removed from the printer and the printer returned for service. If the boot loader is intact, but the main firmware is corrupted, the printer automatically enters boot loader mode, where the firmware can then be reloaded into the printer.

Boot Loader Mode

The boot loader may be entered during normal operation through special commands. Normal boot load operation is by manually starting boot load mode. Boot loader mode can be entered in one of three ways: (1) when Level 0 Diagnostics finds that the firmware check (also known as a cyclical redundancy check, or CRC) is bad, (2) manually, or (3) through the use of a special boot load command.

To manually enter the boot loader, hold the Test button in the side of the printer while applying the power. The Fault LED will come on, and the READY LED will blink. At this time, the firmware boot program is operating and the boot load file may be sent to the printer. When the printer receives the boot load file, the printer will automatically restart if the firmware load was successful. If the load fails, the printer will remain in boot load mode and should be reset by removing the power and reapplying it. The user should then reattempt to load the boot load file.

Note: In this download mode, the printer will only accept data on the RS232 serial port. A second level loader, described in more detail in the command section of the *Epic 430 OEM Integration Manual*, supports the USB interface.

Note: In rare cases, it may be required to load the firmware twice. The Epic 430™ contains a flash file system. The complete flash image is sometimes distributed as part of a firmware update. If the file system image is not compatible with the previous firmware configuration, the new firmware may need to reformat the file system. If this occurs, the firmware will have to be reloaded after the flash is reformatted. The indications that this is happening will be excessively long startup after a firmware update after which the printer will not print: tickets are presented, however only graphics are printed, and fonts will be missing. In this case it is important that the reformat be allowed to complete, as it can take up to 30 seconds to reformat the entire flash system.

Printer Status LED's

The Epic 430™ printer has four indicator lights to indicate various operating states of the printer. In general these are Fault, Open, Paper, and Ready.

The printer may be in normal operation, self test or in one of two boot load modes. The Ready and Fault indicators will indicate which mode by a unique blink pattern:

TransAct Boot Load Mode

In TransAct Boot Load Mode, the Ready LED will blink slowly with a 50% duty cycle. It will repeat this cycle about every 2 seconds (1 Sec on, 1 Sec off). There will be a red indication on the Fault LED indicator until the down load is started.

Self Test Mode

When the printer is in Self Test Mode, the power indicator will blink slowly with a 50% duty cycle at a 2 second rate. This is very similar to TransAct Boot Load Mode, however, the red error indicator will not be present.

Normal Operation

During Normal operation, the Ready LED will remain on unless an error is being indicated. There are two classes of errors, soft errors and hard errors. Soft errors are recoverable without power cycling the printer; conversely, recovering from hard errors requires removing the power from the printer, correcting the problem, and then reapplying power.

Status	**LED response**
Power On, Printer Ready	Ready LED on (Not Blinking)
Paper Low	Paper LED Blinking

Soft Errors

Soft errors may be recovered by the host, or by opening and closing the printer cover. Each of these errors is indicated by a 5 second repeating blink pattern on the Ready LED with the red Fault LED continuously on.

Out of Paper	2 Blinks	Paper LED will also be on.
Cover Open[1]	4 Blinks	
Jam Detected	5 Blinks	
Missed Top of Form	6 Blinks	Paper LED will blink fast.
Illegal or Bad Command	7 Blinks	Paper LED will blink fast.
Printer Over Temp	8 Blinks	Fault LED will blink slow.
Bad Power	8 Blinks	Fault LED will blink fast.

[1] The printer may be configured to beep if the cover is open.

Hard Errors

Hard errors have a similar blink pattern to soft errors, except that they are slower and repeat every 10 seconds. In general, these errors occur during level 0 diagnostics and are not recoverable. In these cases, the Fault and Ready LEDs will blink at the same time.

EEPROM read fault	2 Blinks
EEPROM write fault	3 Blinks
Error Vector Taken	4 Blinks
Knife Error	5 Blinks
User Store Format Error	7 Blinks
User Data Store Error	8 Blinks
Flash Read/Write Error	9 Blinks
Memory Error	12 Blinks
Com Adapter	14 Blinks
Kernel Fault	15 Blinks

Auto Error Recovery

The Epic 430™ printer has the ability to auto recover from some internal errors.

Flash Format Errors

The internal flash that is used to store graphic images is formatted to assure data integrity. If this format is corrupted, the printer will automatically delete and reformat the flash. The host can then reload the images.

Input Power Fault

The printer monitors the power input to the printer. If it is found to be greater than 26 volts or less than 20, the printer will stop and wait for the power to return to specification.

Head Temperature Fault

The printer monitors the head temperature. If the head temperature is greater than 60º C, the printer will start to slow down. If the head exceeds 65º C, the printer will stop. The printer will heat the head to maintain a head temperature of 25º C. If the printer can not maintain a head temperature of 0º C, the printer will stop. In all cases, the printer will automatically recover when the head temperature is within range.

Configuration Faults Recovery

The printer maintains an operating configuration in EEPROM. Information such as the printer's serial number, operating configuration, and running totals are stored in this memory. Each section of this memory maintains a check character to signal that the data is valid. If this memory is found to be corrupted, the printer will restore it based on a backup copy saved in flash. This flash copy is generated when the printer was electronically configured using the TransAct® configuration tool. Any configuration parameters altered during normal operation, will not be saved in the flash copy. The EEPROM will be restored to the value set by the configuration program.

Loading Paper

The Epic 430 printer uses a continuous roll of POS or Lottery grade thermal paper, with specifications outlined in the chapter *Epic 430TM Specifications and Requirements*.

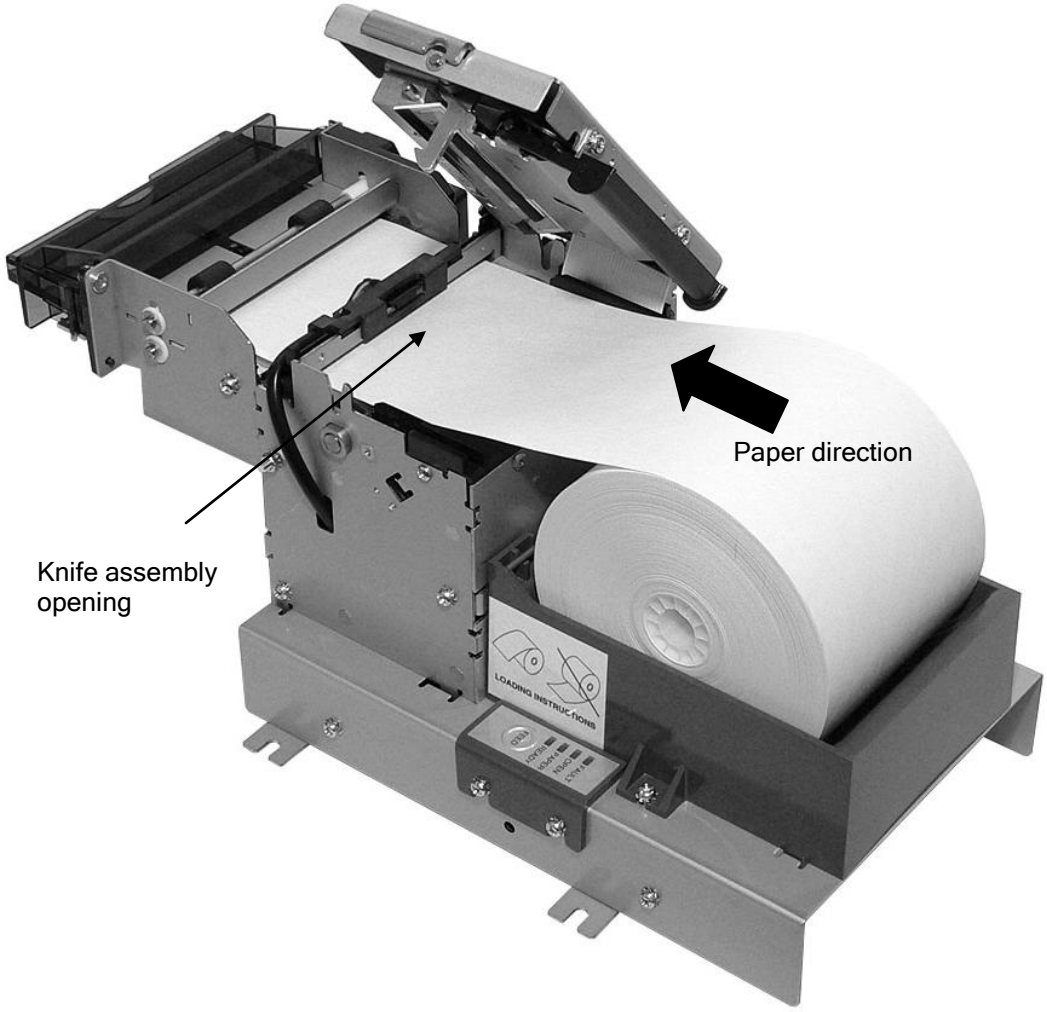

Figure 6. Loading a Paper Roll.

Instructions for loading the paper are as follows:

1. Open the top cover of the printer by pressing the button on the top cover.
2. Place a roll of new paper in the paper holder as shown in the figure.
3. Thread the free end of the paper through the knife assembly opening as shown.
4. Push the end of the paper towards the transport rollers.

5. Close the cover by rotating it back into position until it securely clicks into place. Paper will feed automatically, and then print and eject a test ticket.

Cleaning the Print Head

Once the unit is opened, the paper path is accessible for cleaning or clearing paper. Use a soft brush to clean the paper dust from inside the printer. The paper dust should also be removed from the sensor optics. If streaking on the printed ticket is evident, the thermal print head may need to be cleaned. This can be with a cotton swab moistened with an alcohol solvent (ethanol, methanol, IPA).

Warning: After printing, the print head can be very hot. Be careful not to touch it and let it cool down before you clean it. Do not damage the print head by touching it with your fingers or any hard object.

Clearing Paper Jams

If paper becomes stuck in the printer's knife mechanism, it is important to note the following when clearing jammed paper from the knife area:

1) Turn the printer power off.

2) Open the printer's top cover.

3) Tear as much paper away from the knife by hand, pulling the paper toward the center of the paper path.

4) Using a plastic or wooden thin tool (do not use metal tools), gently push any trapped paper on either the left or right sides toward the knife's center. Be aware that the knife's blades cannot be pried apart; any attempt to do so will permanently damage them.

5) After removing all of the visible paper from the knife, turn the printer's power back on. The knife will eventually cycle and return to its home position.

Chapter 4

Configuring Your Epic 430™ Printer

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Configuration Mode Overview

There are two ways to configure the Epic 430™ printer: the first is to use the manual configuration sequence by using the TEST and FEED buttons, and the second is to use TransAct's remote configuration software. TransAct Technologies offers the use of a remote CONFIG program as a fast, easy way for system integrators to configure or reconfigure your Epic 430™ printer. To obtain more information, or the latest version of the CONFIG program, call TransAct's Sales Department or Technical Support.

Most Frequent Configuration Incompatibilities

- Emulation
- RS-232 Serial Interface (baud rate)

How to Change Configuration Settings

Entering into Configuration Mode

1) Press the TEST button for approximately 4 seconds.
2) Select configuration mode using the FEED button.
   - Press and hold the Feed button to cycle through options.
   - Press and release the FEED button to select and option.
   - Power cycle to exit without changing.
   - Press the TEST button to save and exit.
3) Follow the printed instructions.

After you enter Configuration Mode, the printer will print the current configuration, the current totals and the error logs, if any. Save this printout as a guide to changing the configuration. It's also useful in case you wish to return the printer to the previous configuration.

Each emulation may have different configurable features. If you are changing the emulation, note that the printout that was printed at the beginning of the configuration process may be incorrect for the new emulation, and the configurable features may be different. If you are using this printout as a configuration guide, and you are changing the emulation, you may wish to save the new emulation and then re-enter Configuration Mode to change other options. This will print all the available features for the new emulation.

Setting up for Color Paper

The Epic 430™ may be configured to print two color thermal paper. For good print quality, the printer should be configured to print the paper being used. If the paper you are using is included in the list of papers displayed during printer configuration, that configuration should be used. If not, the printer should be set to Generic Color. If this does not produce acceptable print quality, you may select Custom Color.

Custom Color

When using Custom Color, start with a read setting of about 0.12 mJ/sq.mm and a black energy of 0.24 mJ/sq.mm. First, adjust the black level to produce acceptable black print.

DO NOT EXCEED 0.40 mJ/sq.mm, or the paper may start to stick to the print head and cause paper jams. Setting the Black energy too high will also slow the printer down. All color papers tested by TransAct will operate with black levels less than 0.35 mJ/sq.mm. When the Black energy is set, adjust the Color value.

NEVER exceed the Black energy with the Color energy. The color level can be very critical. Do not attempt to make the color darker by increasing the energy to the point where black starts to appear, the print quality will not be consistent.

Remote Configuration

Remote configuration is provided for all printers, and is accessed through a series of extended diagnostic and configuration commands. The TransAct® universal configuration program will allow the configuration to be read, edited, and written back to the printer. It will also allow the configuration of one printer to be recorded and replicated over a number of printers. The program is available from TransAct Technical Support or by downloading it from the Internet – consult the section On-line Technical Support for further details.

Remote Boot Load

The Epic 430™ printer is equipped with a special boot loader feature that will allow field updates of the printer's firmware. This loader is started by command and then a TransAct® firmware load image is sent to the printer. When the load image is successfully received by the remote boot loader, the printer will automatically reset and operate with the updated code. If the firmware update fails for any reason, the printer will remain in Remote Boot load mode until a successful load is accomplished.

Chapter 5

Mounting Requirements

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Mounting Requirements

Electronics Base Assembly to Final Product

The following shows dimensions and locations for mounting a standard Epic 430™ printer, with attachment points shown on the Electronic Base Assembly.

Bottom: 4x M4x 0.7 screws.
4x Φ.176" thru holes.

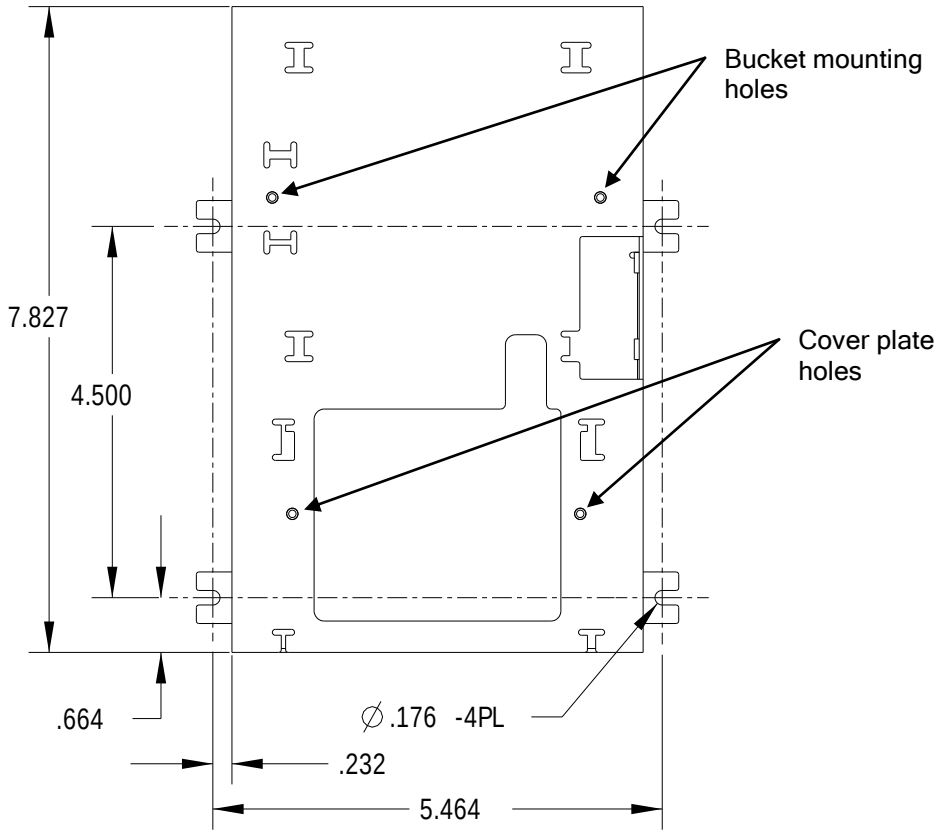

Figure 7. Electronics Base Assembly to Final Product

Remote Base Cover

The Epic 430™ printer can optionally be configured for the printer mechanism to be mounted remotely from the electronics base. In such a case, a remote base cover is attached to the base of the printer mechanism. The diagram shows mounting holes and dimensions for this base cover, while the subsequent image shows this base cover attached to the printer mechanism.

Top: 2x M4x 0.7 screws.
2x Φ.200" thru holes.

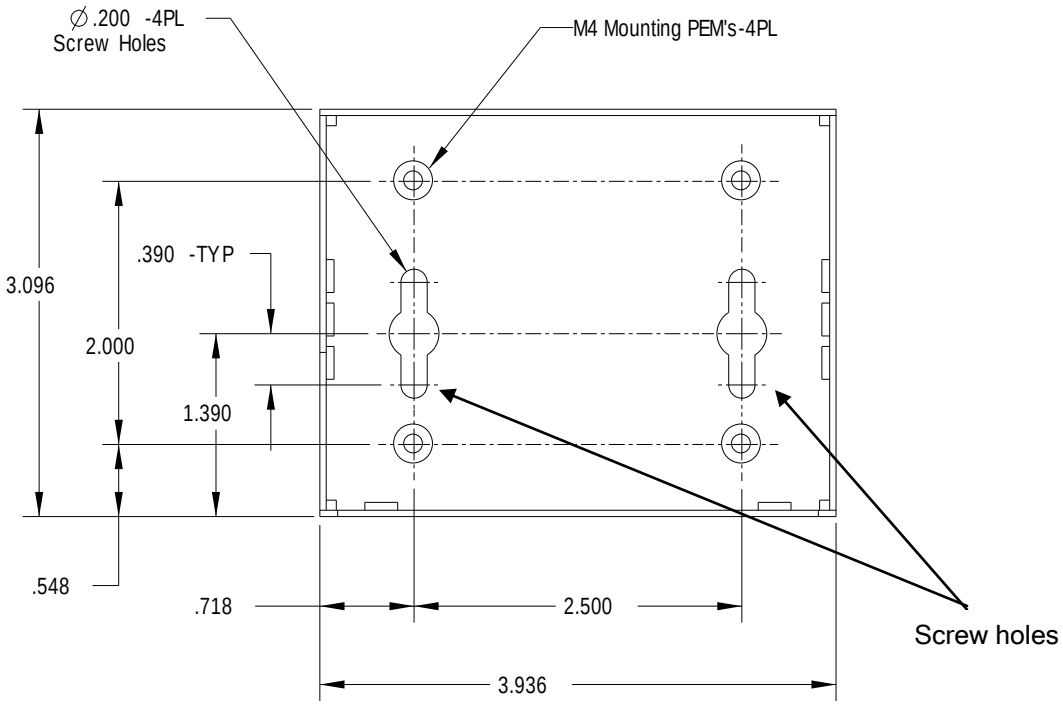

Figure 8. Optional Remote Base Cover

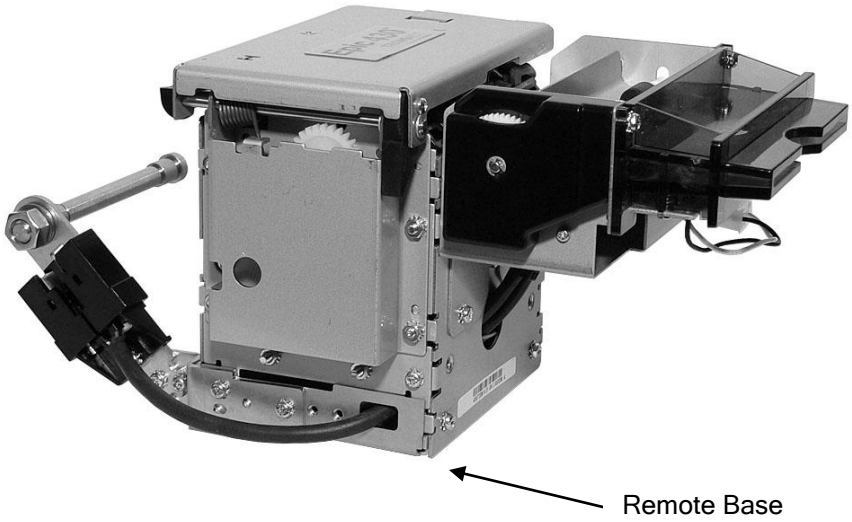

Figure 9. Remote Base Mounted to Printer Mechanism

Epic 430 Grounding

Due to the modular capability of the E430 printer, special considerations should be taken to ensure the modules are commonly grounded for immunity to external electrical faults such as ESD, magnetic transients, and radio frequency interference.

Mounting tabs are provided on the electronic module and printer mechanism to make frame ground connections during installation. In addition, when the electronic module and print mechanism are separated, such as when the electronic module mounted on a chassis and the printer mechanism is mounted on a door, the interconnecting cables may pass across potentially un-bonded boundaries. In this case it is important that chassis and door are conductively bonded by metal hinges or braid to maintain a common frame ground connection between modules. Optimum installations provide a continuous grounded surface all along the interconnecting cables between modules.

Warning: Remote cabling is not designed for "hot-plugging". Ensure that power is off to the electronics module when connecting to the print mechanism.

Custom Bezel Specifications and Recommendations

Custom Bezel to Printer Mechanism mounting points

Epic 430™ printers are designed to accommodate an optional bezel assembly that is mounted following the hardware and mounting dimensions as listed. (Bezel assemblies are available from TransAct as an option with your printer.) The following drawing shows the positioning and dimensions of the Epic 430™ printer's mounting points.

Front: 2x M3x 0.5 screws and interface with custom bezel.

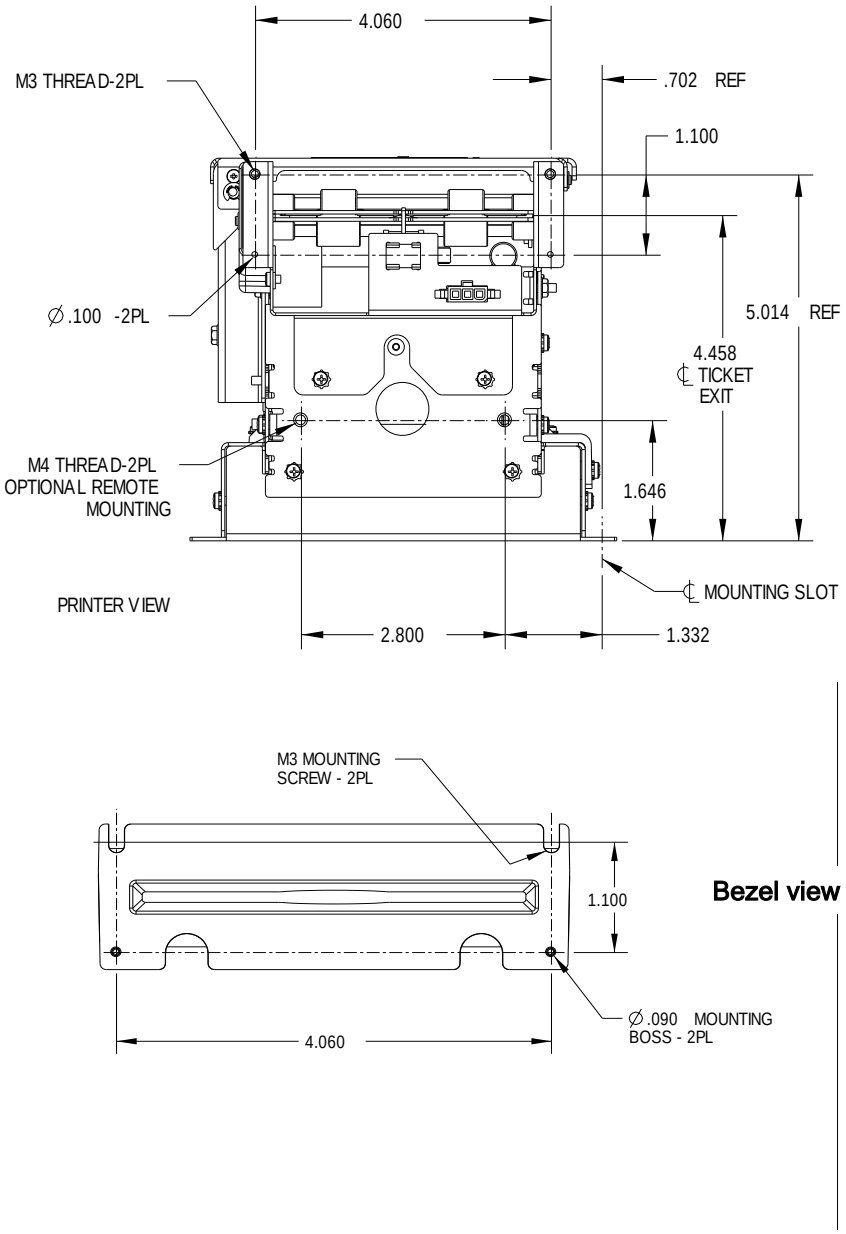

Figure 10. Custom Bezel Mounting and Hardware Requirements

Chapter 6

Printer Sensors

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Printer Sensors

The Epic 430™ printer uses several sensors to provide feedback to the host system, as pictured in Figure 11.

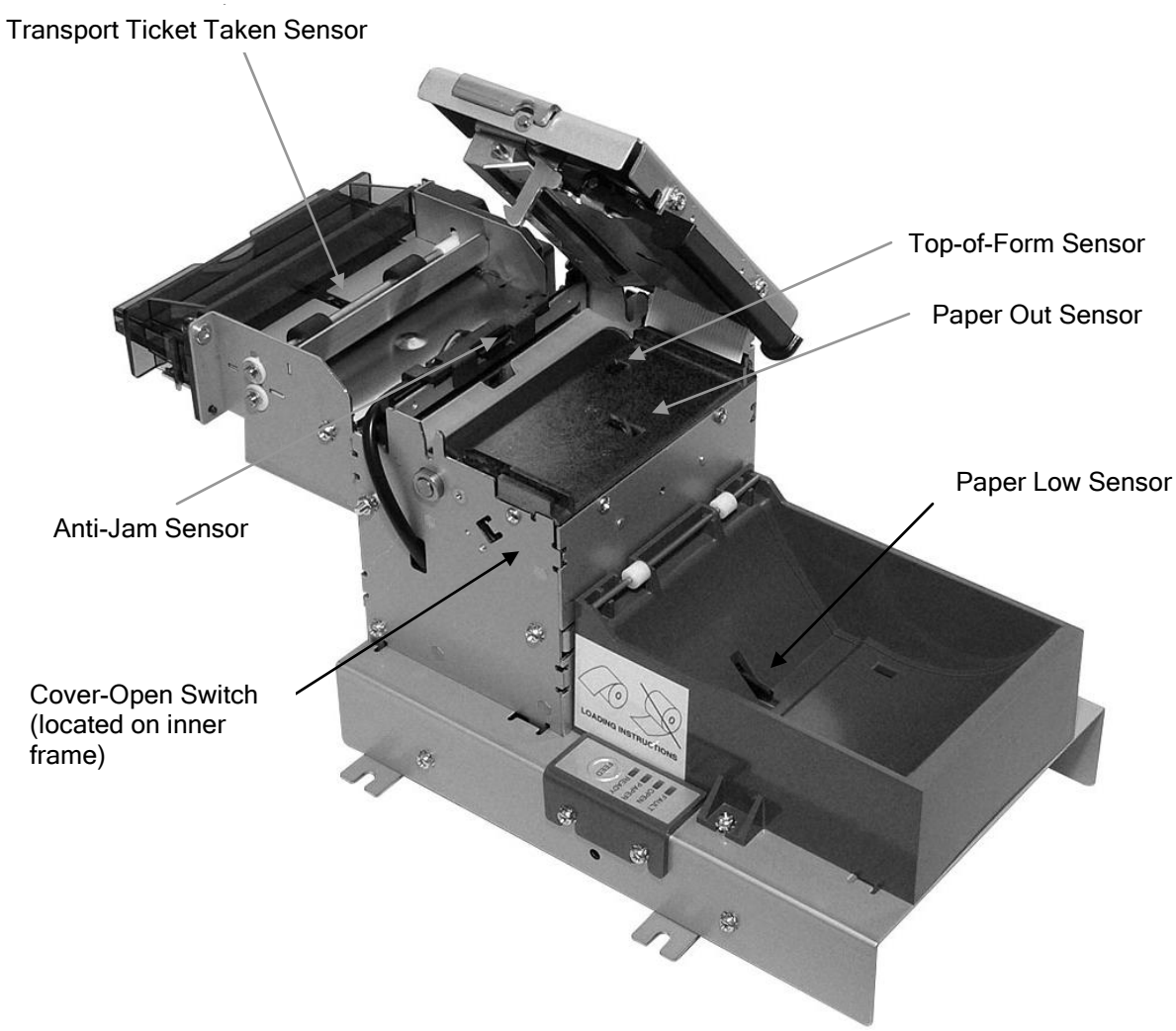

Figure 11. Sensor Breakdown and Locations.

Paper Out Sensor

A Paper Out Sensor, mounted to the Lower Paper Guide, optically senses a Paper Out flag located in the ticket path. When the sensor detects the flag, it indicates that the ticket roll is depleted.

Cover-Open Switch

A Cover-Open Switch, mounted to the inner right side plate, is activated when the Top Cover is closed and the latch depresses the switch arm. When the Top Cover is opened, the Cover Open switch trips, and the printer goes off-line.

Top-of-Form

A Top-of-Form Sensor is mounted in the Lower Paper Path, and senses a pre-printed black dot (if present) on the ticket stock. This black mark is used to position the paper for printing on a preprinted form. Typically the ticket is pre-positioned to the Top-of-Form and when the ticket is complete, the paper is fed to the Top-of-Form and then cut.

Paper Low Sensor (Option)

The Epic 430™ has an optional interruptive Paper Low Sensor. This sensor is mounted to the Paper Bucket and will provide an indication that the paper is getting low. The length of paper remaining when paper low is sensed is dependent on the paper roll core diameter. When using the modular version of the Epic 430™ the paper low sensor will be mounted on the spindle.

Anti-Jam Sensor

An Anti-Jam Sensor is mounted to the knife frame, and senses the presence of a ticket immediately before and after a knife cut. Under normal conditions, right after a knife cut, a ticket is fed into the transport and presented to the customer. If a ticket is not fed properly into the transport (for example, when a ticket jams) the Anti-Jam Sensor detects the jammed ticket and stops printer operation.

Transport Ticket Taken Sensor

A Ticket Taken Sensor, mounted in the Ticket Transport, is used to detect the lead edge of the ticket as well as determine when customers have actually taken the printed ticket.

Chapter 7

Electrical Connections

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Communications Interface

USB and RS-232 communications are supplied through interface connections at the rear of the printer, as illustrated in the figure. The Serial RS-232 interface connector is a 9-pin DB connector and the USB interface is a standard USB B connector.

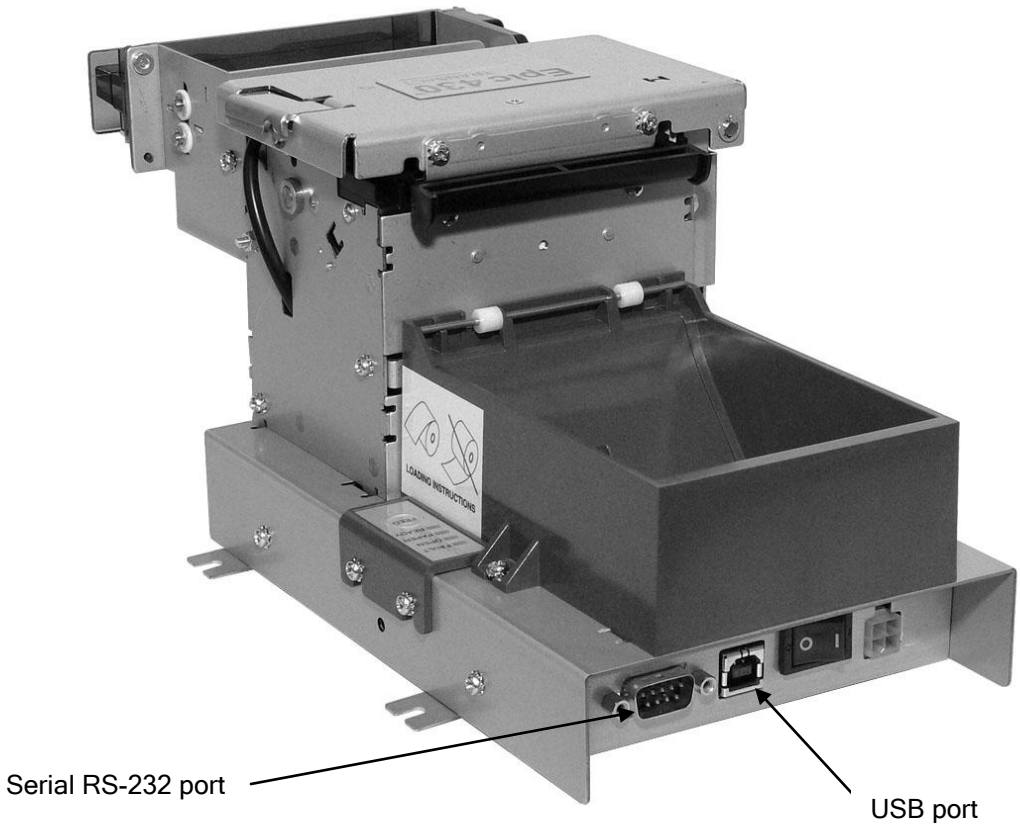
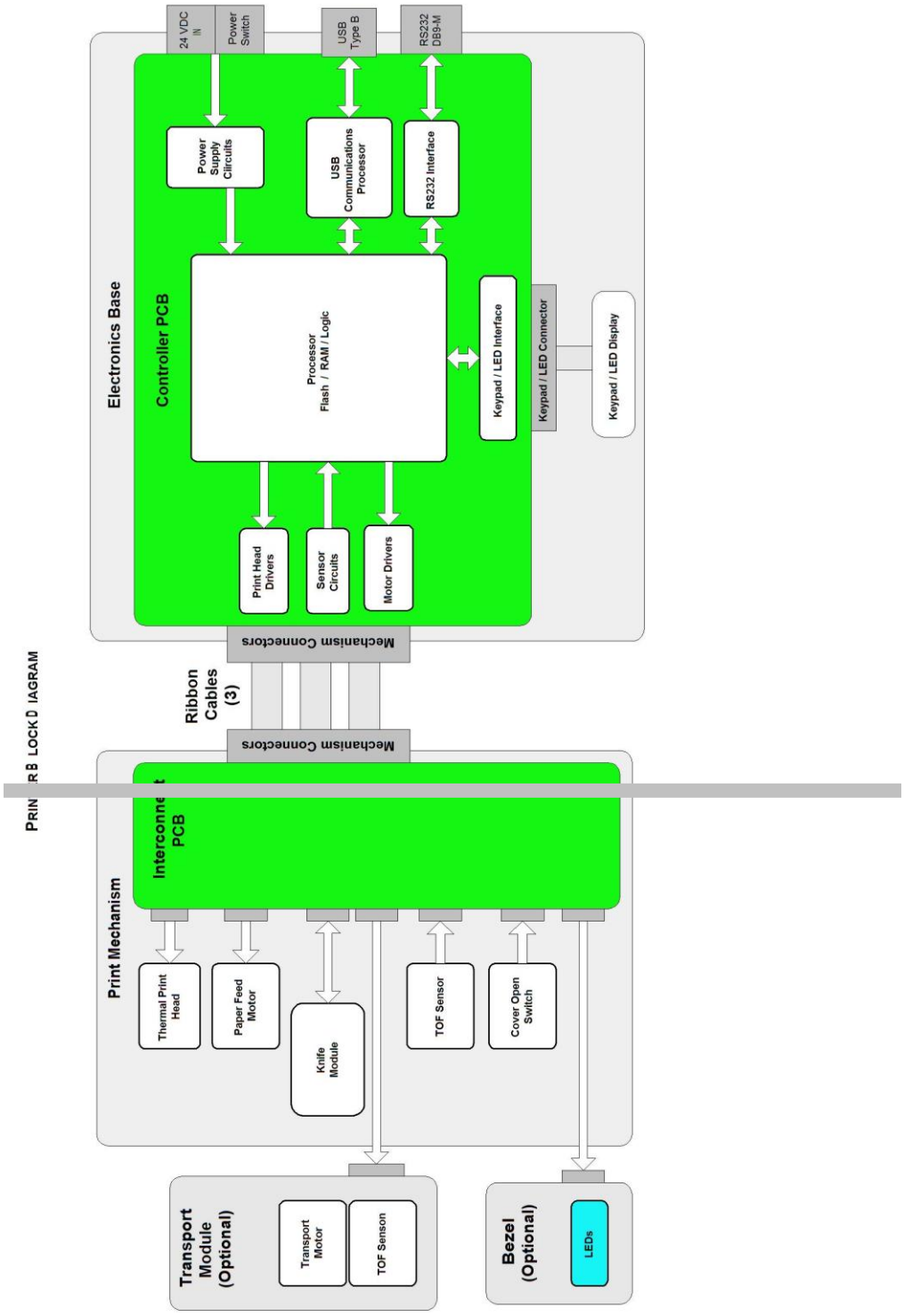


Figure 12. Communication PCB Location and Connector Info.

Note: Pin-out configurations for these interfaces are documented in Chapter 2, Epic 430™ Specifications and Requirements.

Printer Block Diagram



Chapter 8

Assembly and Disassembly

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Precautions for Disassembly

Before disassembling any part of the printer, be sure the power is turned off. The Controller Board and the Thermal Print Head can be damaged by static electricity. Observe proper ESD precautions: wear a grounded wrist strap, and use a static mat or other protected work surface.

Necessary Tools

The following tools are required to disassemble the Epic 430™ printer:

- #1 Phillips screwdriver
- 5.5mm nut driver or wrench

Disconnecting the Power and Communications Cables

- Turn off printer using switch on rear of base.
- Unplug the power cord from the power connector located at the rear of the printer.
- If a serial communications cable is used, unscrew and gently pull the cable away from the RS-232 port shown.
- If a USB communications cable is used, detach the cable from the USB port shown.

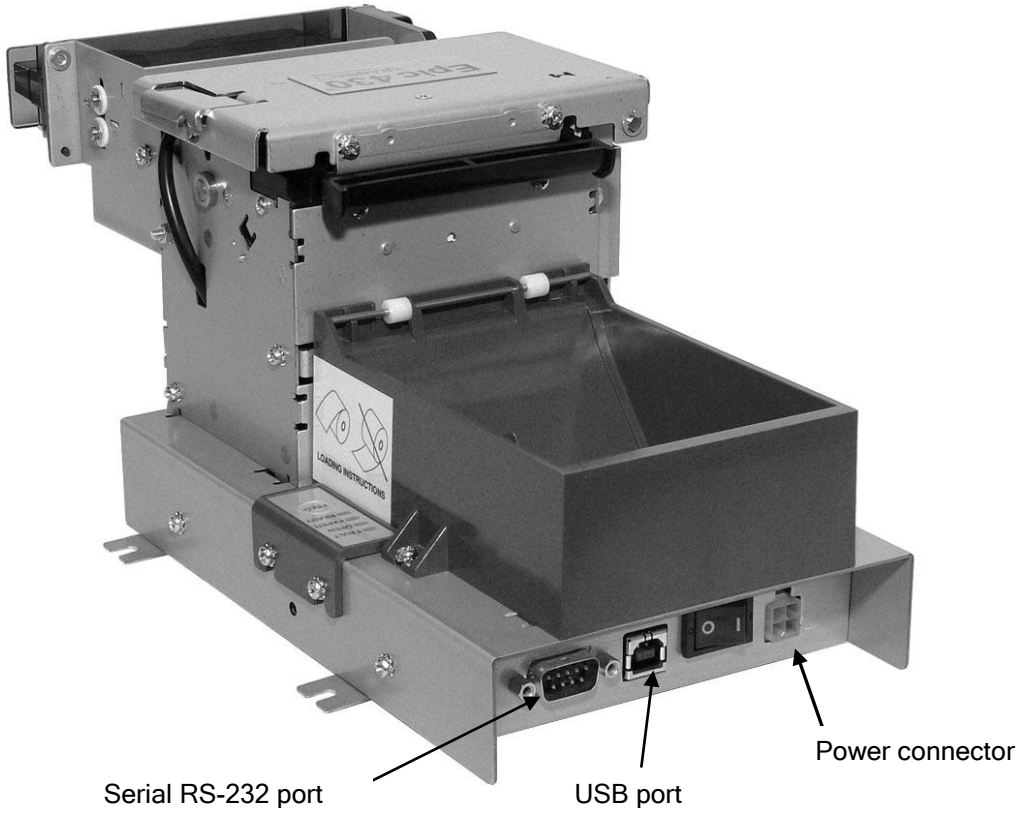


Figure 13. Power and Communications Cable Connections.

Main Printer Components

The Epic 430 printer is constructed using a set of modular assemblies, as shown in the exploded view in Figure 14.

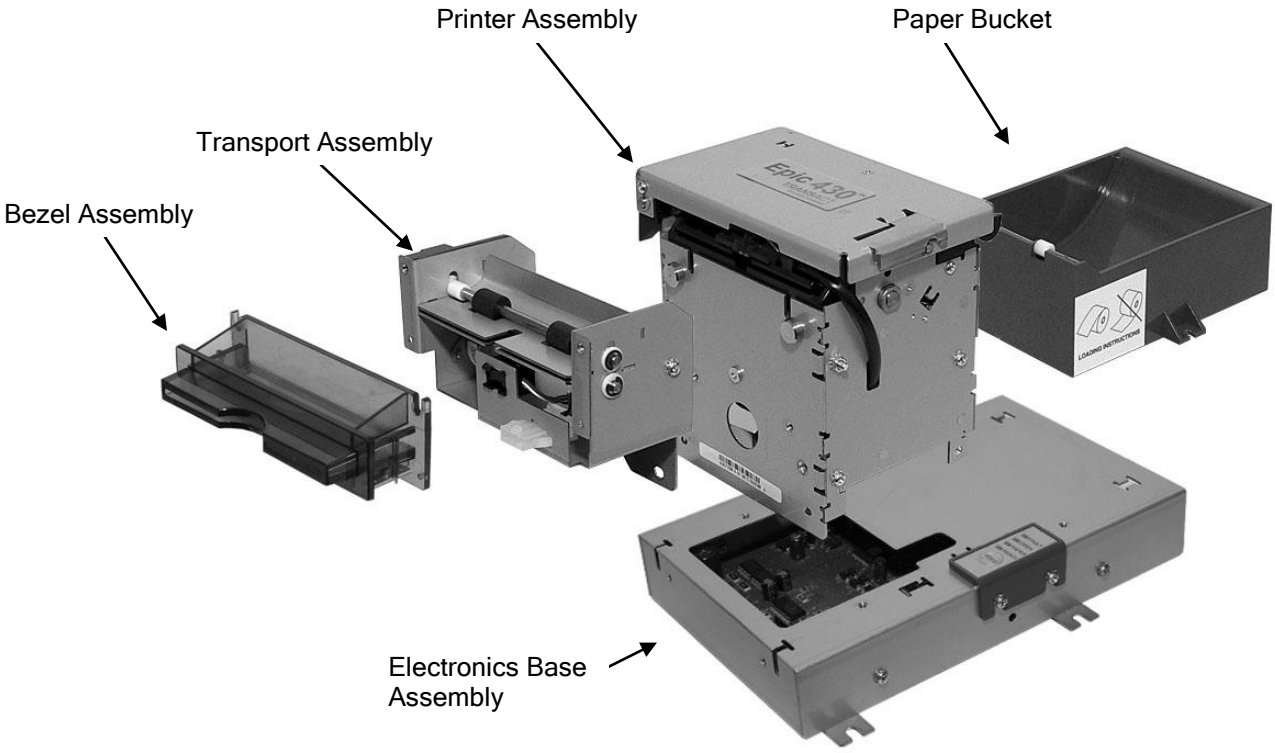


Figure 14. Exploded View of Main Assemblies for Epic 430 Printer.

Note that the electronics base assembly shown, and its corresponding paper holder, is designed to either be attached to the main printer assembly or mounted separately at a distance of up to two feet, for OEM gaming machine and kiosk applications. Limiting factors in this mounting distance include the length of the umbilical cables between the base assembly and the print mechanism assembly, as well as a clear paper path between the paper bucket, printer and transport assemblies.

Principal Subassemblies for the Epic 430™ Printer

The principal electromechanical component of the Epic 430™ printer is the printer mechanism assembly, which itself contains numerous subassemblies. The assembly instructions in this chapter refer to the following principal subassembly components for the printer mechanism assembly, outlined in further detail in the Parts List chapter.

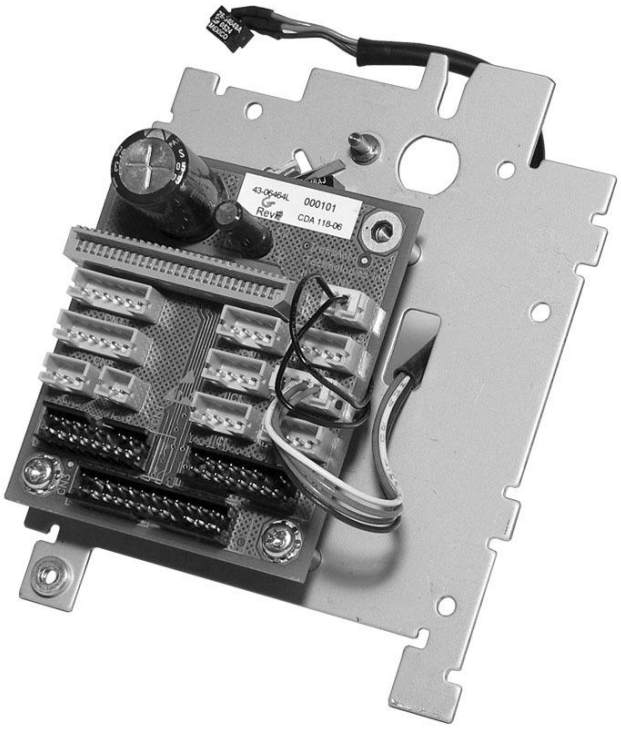


Figure 15. Right Side Frame Assembly.

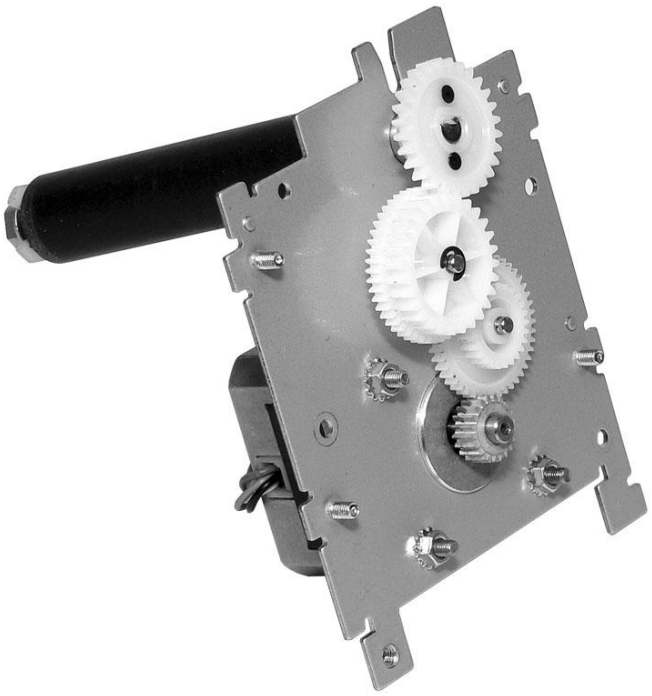


Figure 16. Left Side Frame Assembly.

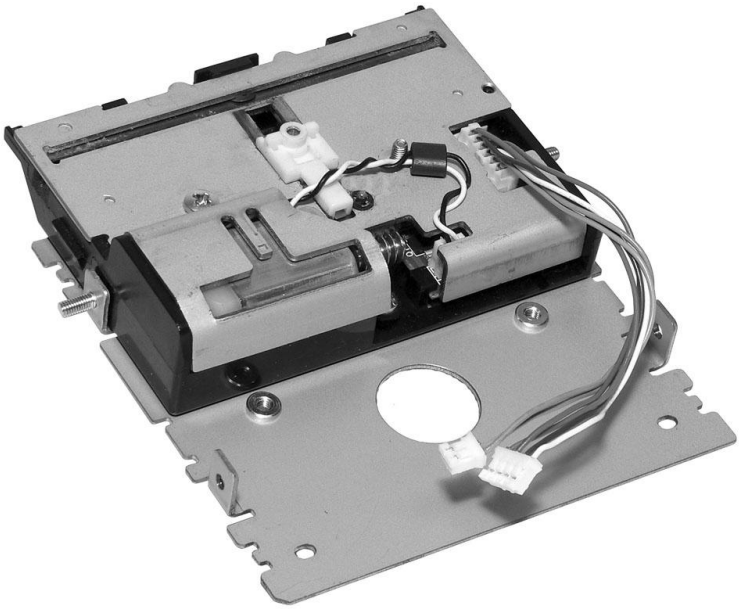


Figure 17. Front Frame Subassembly.

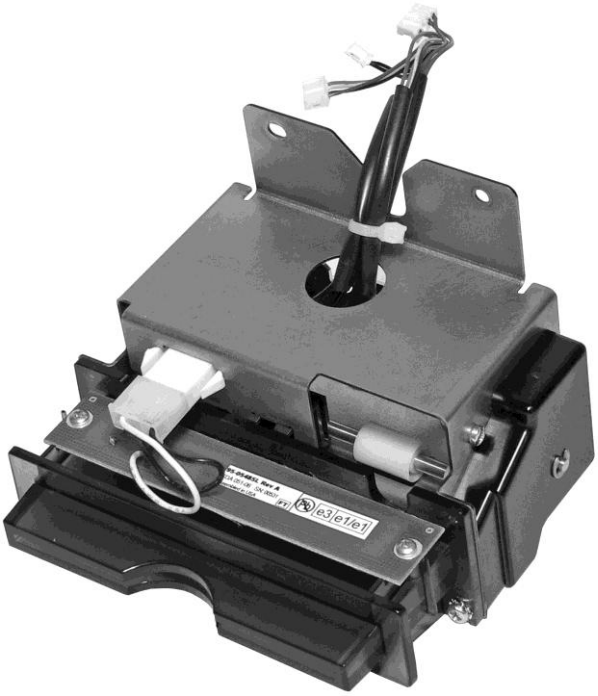


Figure 18. Transport Subassembly.

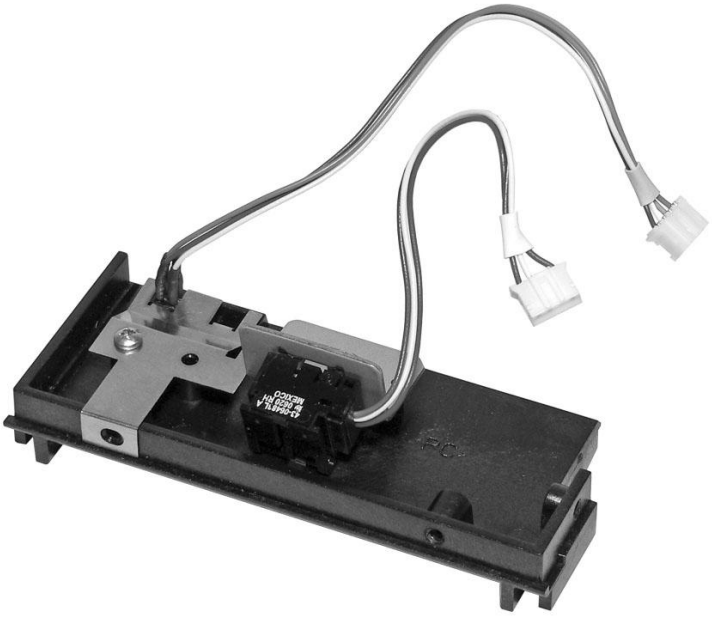


Figure 19. Paper Path Subassembly.

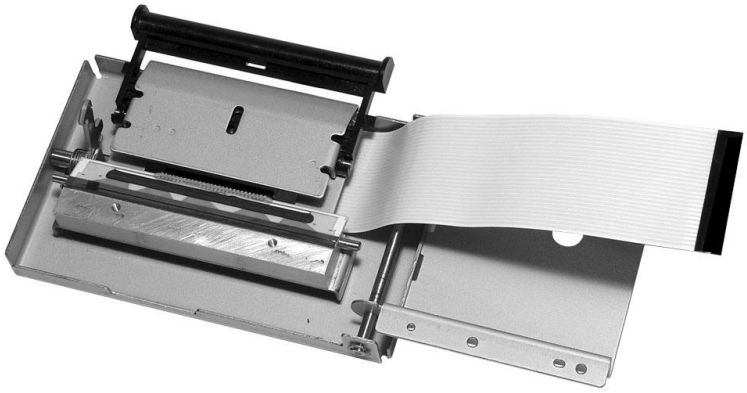


Figure 20. Top Cover Subassembly.

The following sections illustrate how these subassemblies, combined with the other main components outlined at the beginning of this chapter, are assembled to form a complete Epic 430™ printer.

Electrical connections

Internal electrical connections terminating on the printed circuit board mounted on the Right Side Frame Assembly are as follows:

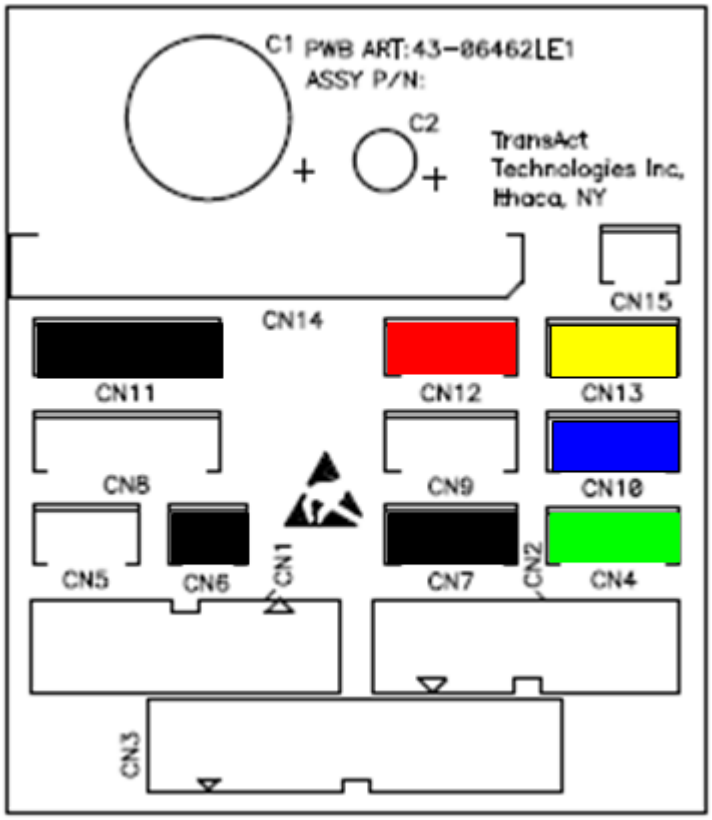


Figure 21. Connectors on Right Side Assembly Printed Circuit Board.

Wiring harnesses connected to these ports generally have either a label or a color-coded heat shrink wrap near their ends, as outlined in the following table:

CONN.	FUNC.	COLOR
CN1	cntlr motors	label
CN2	cntrl sensors	label
CN3	cntrl head cable	label
CN4	paper low sensor	green
CN5	bezel lamp	white
CN6	knife drive	black
CN7	ticket taken sensor	black
CN8	transport motor	white
CN9	paper out sensor	white
CN10	jam sensor	blue
CN11	feed motor	black
CN12	knife sensor	red
CN13	TOF sensor	yellow
CN14	mech head cable	label
CN15	cover switch	white

Assembling the Printer Mechanism

Step 1. Front Frame to Right Side Frame Assembly

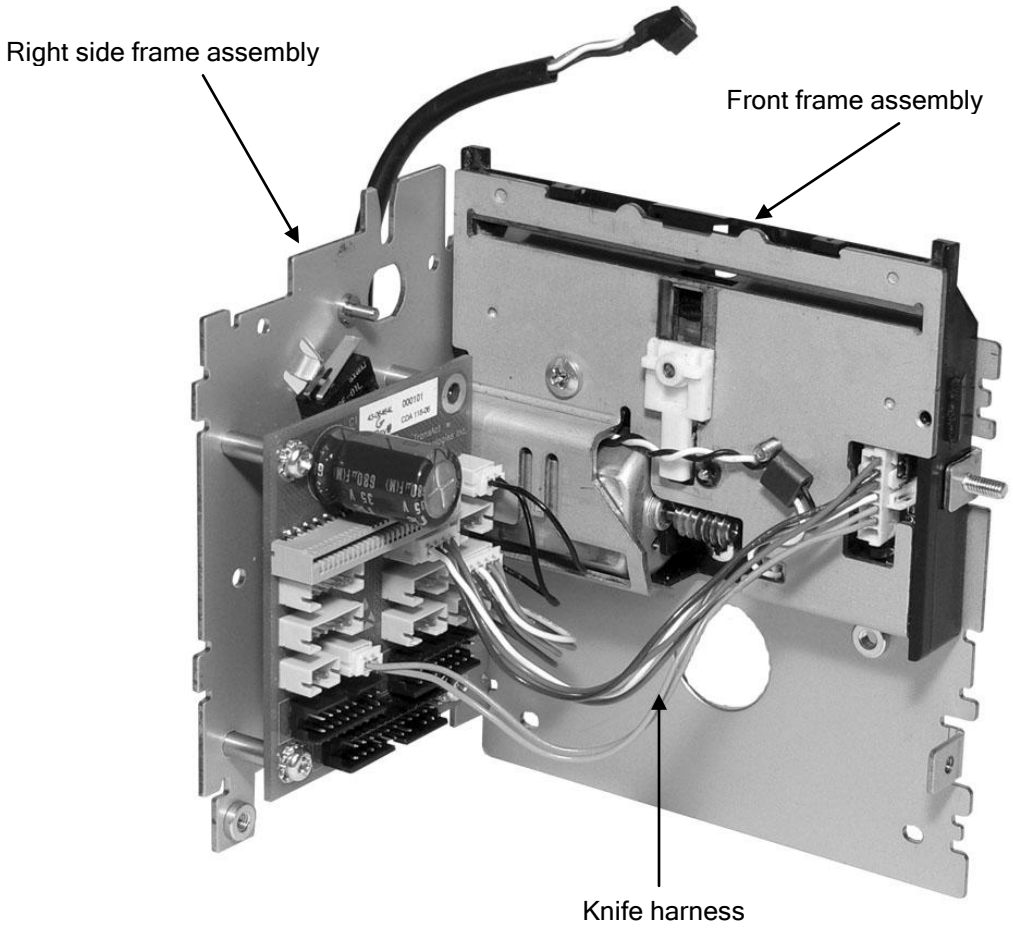


Figure 22. Attaching the Front Frame to the Right Side Frame Assembly.

- Connect the Front Frame Assembly to the Right Side Frame Assembly, aligning the stud on the Front Frame Assembly with a corresponding hole on the Right Side Frame Assembly. Fasten these two assemblies using an M3 hex nut over this stud, as well as an M3 Sems screw for the other threaded hole between the two assemblies.
- Connect the knife harness from the Knife Assembly to the printed circuit board, hooking the 2-wire connection for the knife drive motor to connector CN6 (black) and the 4-wire connection for the knife sensor to connector CN12 (red), as shown in Figure 21. Note that the Jam Sensor will already be installed and plugged into the PCB on the Right Side Frame Assembly.

Step 2. Connect Bezel Assembly (optional)

Figure 23. Bezel Assembly and Electrical Harness

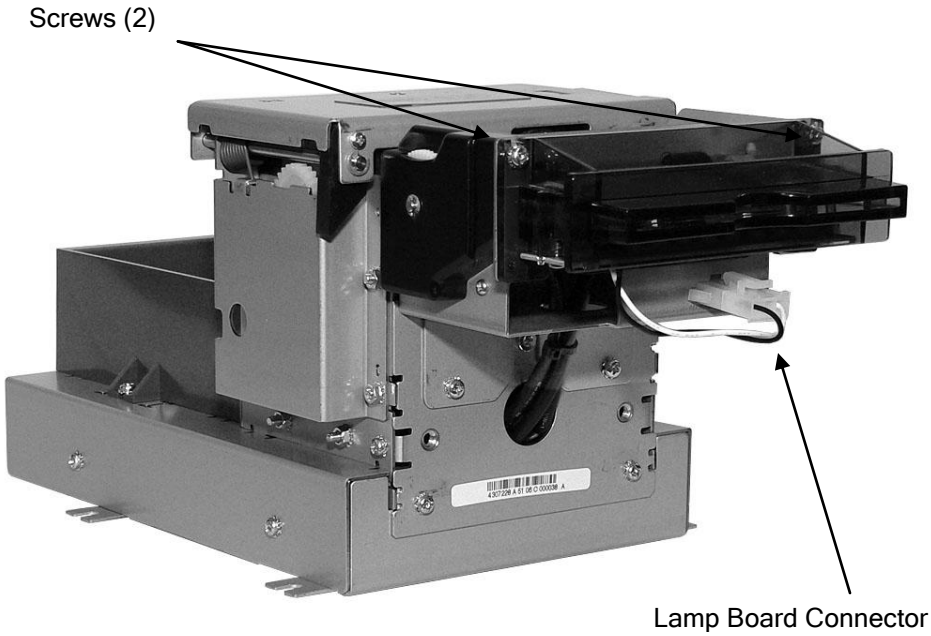


Figure 24. Bezel Assembly Attached to Transport Assembly

- Attach the optional Bezel Assembly to the front of the Transport Assembly using two M3 Sems screws as shown, and then connect its electrical harness to the Lamp Board connector on the front of the Transport Assembly.

Step 3. Connect Transport Assembly

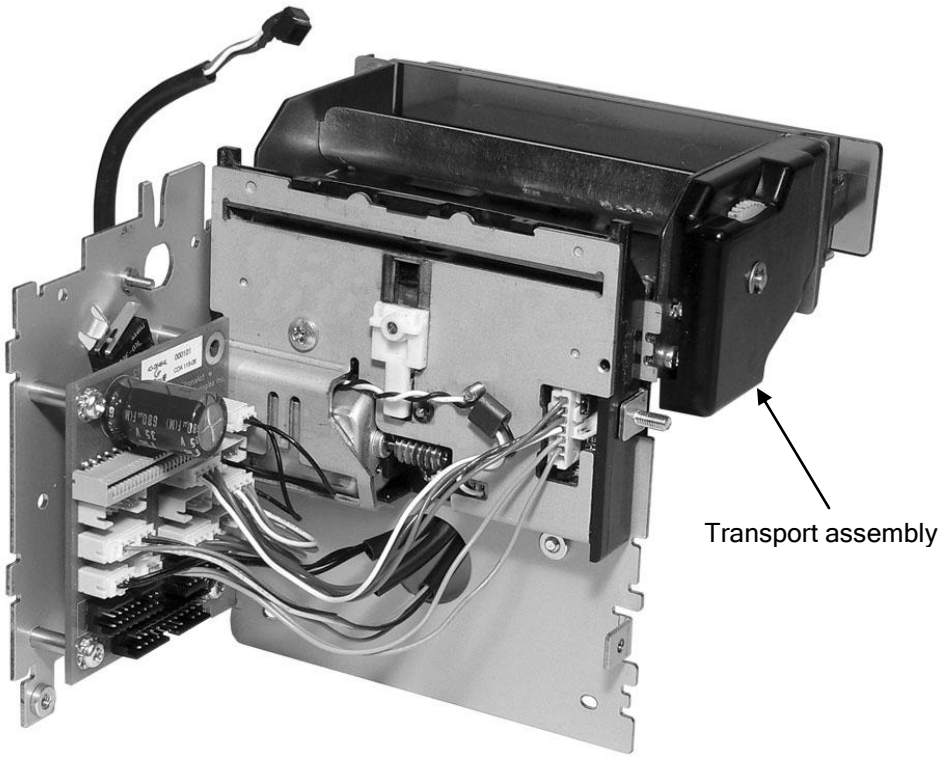


Figure 25. Connect Transport Assembly

- Mount the Transport Assembly by positioning the flange of the transport assembly over two corresponding mounting studs on the front of Front Plate Assembly, and then fastening it to the front of the plate using two M3 Sems screws.
- Thread the Ticket Taken Sensor, Transport Motor, and Bezel Lamp connections from the Transport Assembly through the hole at the bottom of the Front Plate Assembly, and then plug these into the appropriate color-coded connectors on the printed circuit board located on the Right Side Frame Assembly, as follows:
    - Ticket Taken Sensor: connector CN7 (black)
    - Transport Motor: connector CN8 (white)
    - Bezel Lamp: connector CN5 (white)

Step 4. Connect Jam Sensor Assembly

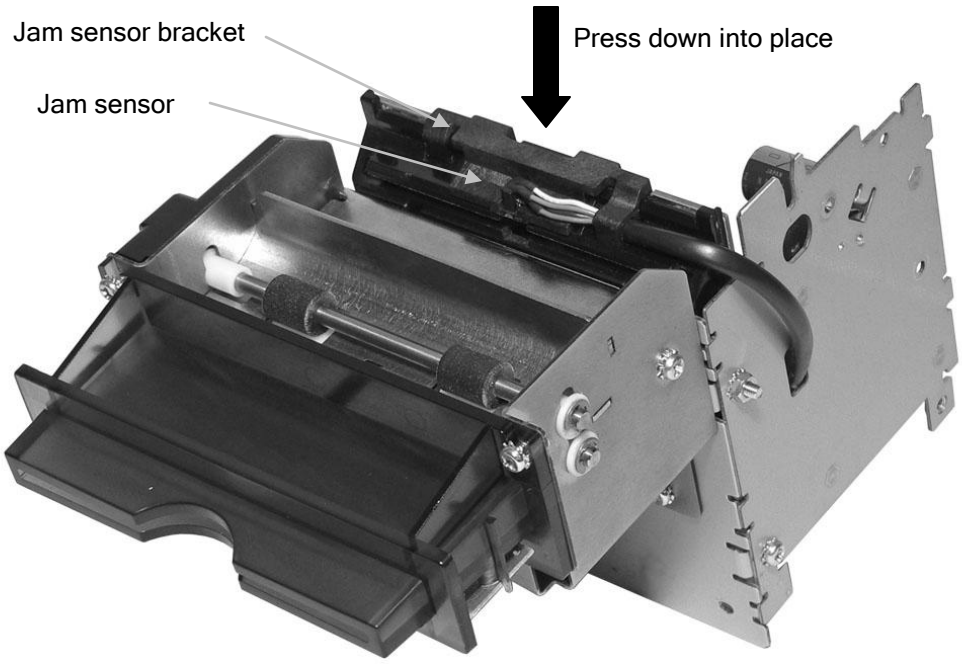


Figure 26. Connect Jam Sensor Assembly

- Attach Jam Sensor to the corresponding slot on the Jam Sensor Bracket, mounting the sensor into the center opening, then pressing the wiring into place inside the tab on the right side of the assembly.
- Snap the Jam Sensor Bracket on top of the Knife Assembly, pressing down into place as shown in the figure.

Step 5. Connect Paper Path Assembly

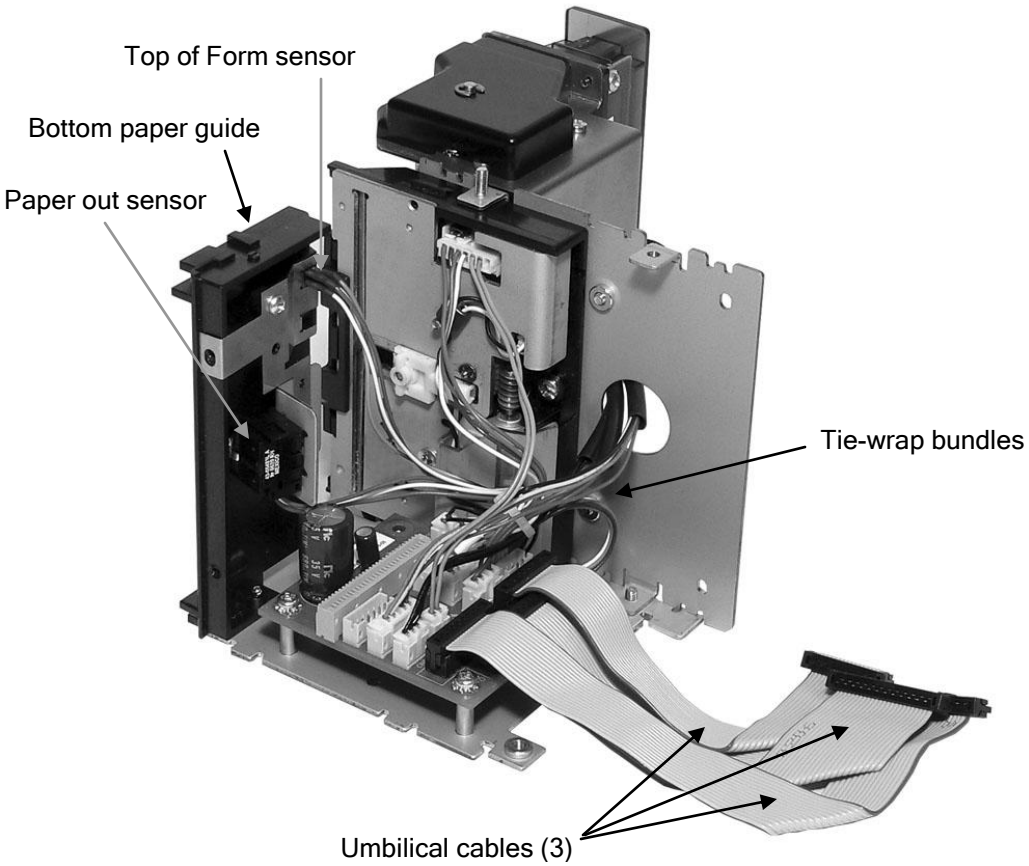


Figure 27. Connect Paper Path Assembly

- With the Paper Out and Top of Form sensors previously mounted to the Bottom Paper Guide, attach the Bottom Paper Guide to the Right Side Frame Assembly using a self-tapping plastic screw near the top edge of the Right Side Frame Assembly.
- Connect the Paper Out wiring harness to connector CN9 (white) and the Top of Form wiring harness to connector CN13 (yellow) on the Right Side Assembly printed circuit board.
- Connect the Tie-Wrap Bundles of wiring harnesses for remaining sensor and motor connections to the appropriate color-coded locations on the sensors, motors at one end, and the Right Side Frame Assembly printed circuit board at the other end.
- Connect three Umbilical Cables to the connections shown on the Right Side Assembly printed circuit board for the Print Head (CN3), Sensors (CN2) and Motors (CN1).

Step 6. Add Top Cover Assembly

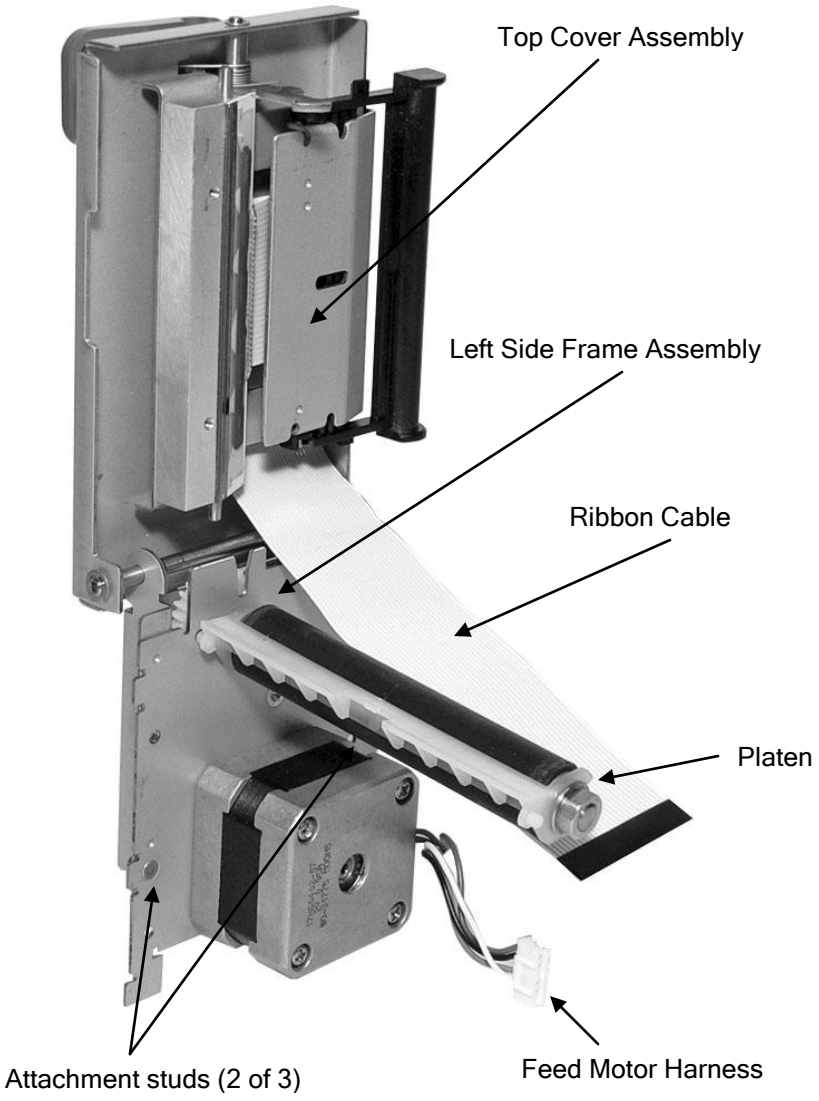


Figure 28. Top Cover Assembly Attached to Left Side Assembly

- Connect Top Cover Assembly to Left Side Assembly by positioning its holes over corresponding studs, and then fastening three of these studs (all but the upper right-hand corner, while looking at the outside of the Left Side Assembly.

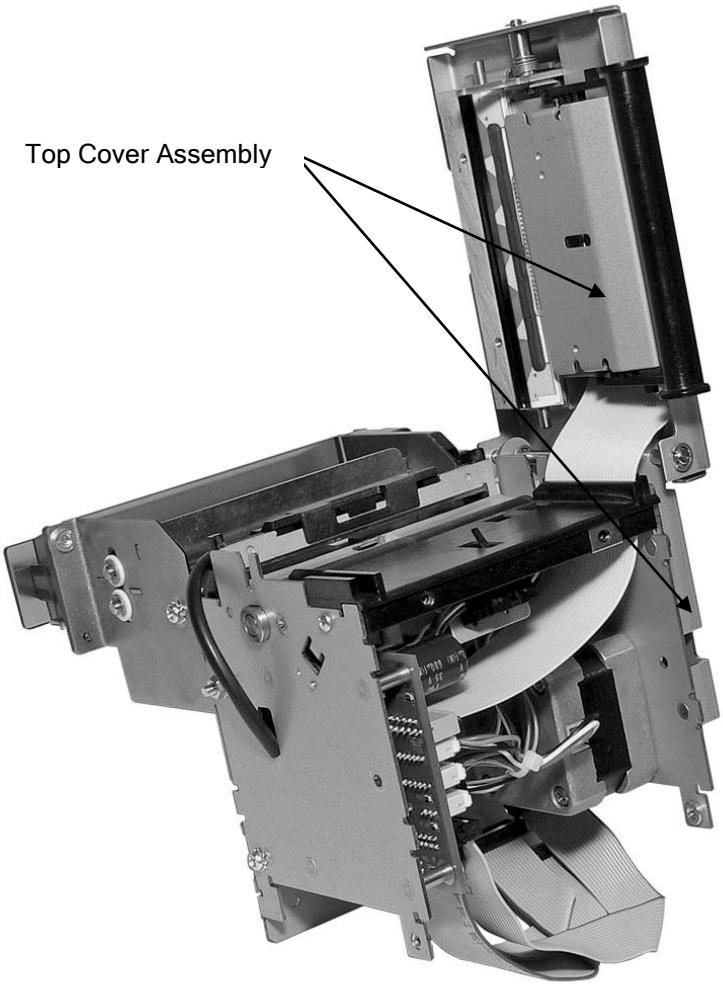


Figure 29. Top Cover Assembly and Left Side Assembly Attached to Printer Assembly

- Thread the ribbon cable from the print head through the hole in the bottom paper guide.
- Aligning bearing of platen with hole in Right Side Assembly, and aligning stripper pins with holes in left and right side plates, attach Left Side Assembly and attached Top Cover Assemblies using M3 nuts to attach to studs and M3 Sems screws to holes.
- Connect Print Head Cable to corresponding port on the Interconnect printed circuit board
- Connect Feed Motor Harness to connector port CN11 (black).

Assembling Main Printer Components

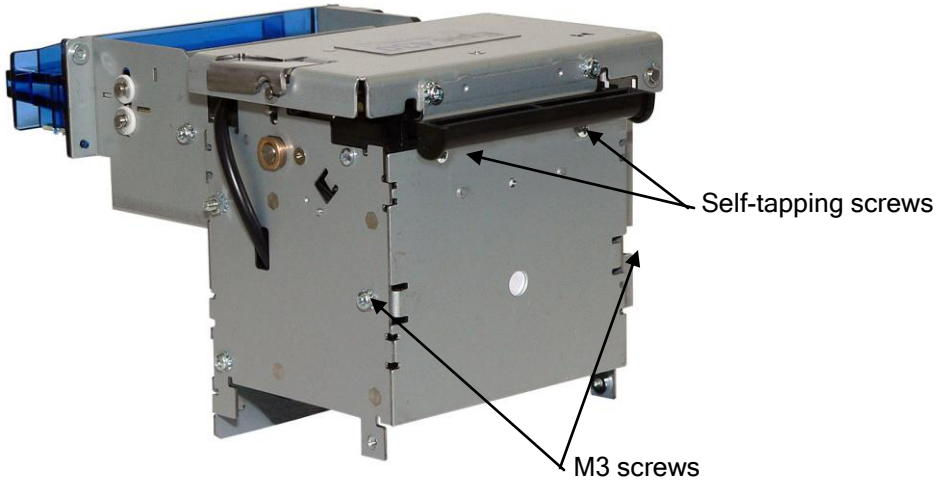


Figure 30. Attaching Rear Plate to Printer Mechanism

- Fasten rear plate to printer mechanism using two M3 Sems screws and two self-tapping plastic screws as shown.

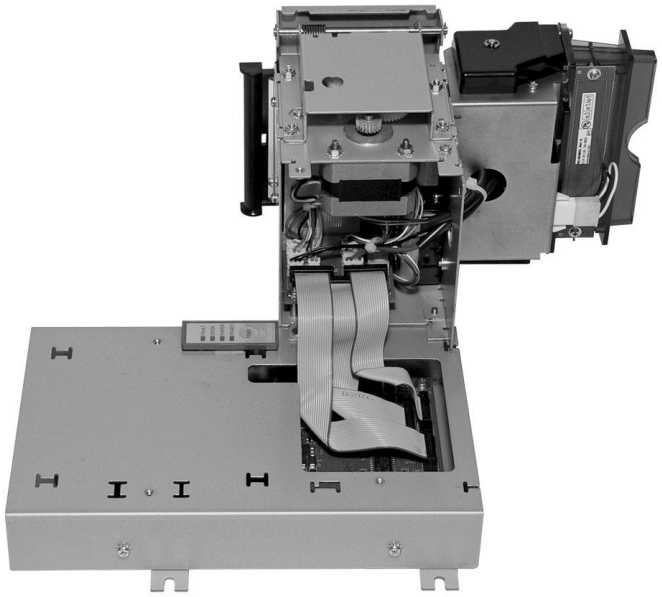


Figure 31. Connect Umbilical Cables to Electronic Base PCB

- Connect umbilical cables from printer mechanism to corresponding ports on printed circuit board of electronics base assembly.

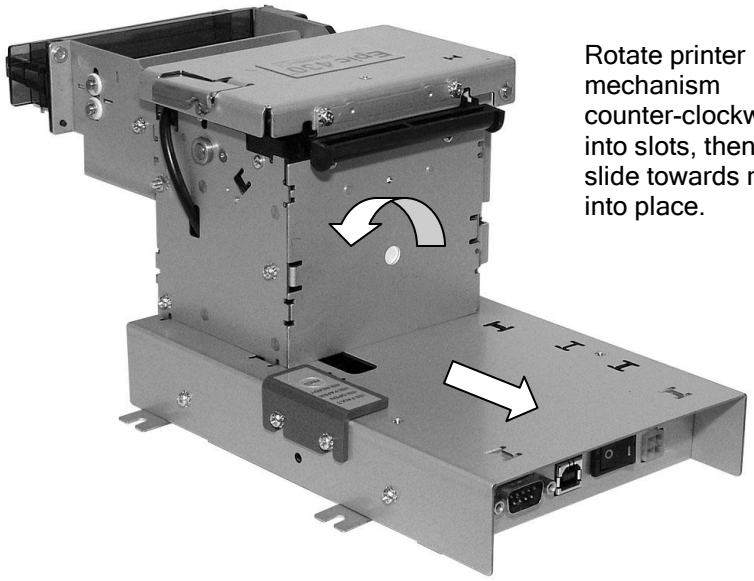


Figure 32. Attach Printer Mechanism to Electronics Base

- Slide assembled printer mechanism into corresponding slots on Electronics Base Frame, for OEM applications where base is mounted to printer. Do this by aligning the tabs on one side of the printer mechanism with the corresponding slots on the base, rotating the printer mechanism into the base, then sliding the mechanism towards the rear of the base to lock it into place.
- Attach printer mechanism to front of Electronics Base Frame using two M3 Sems screws.

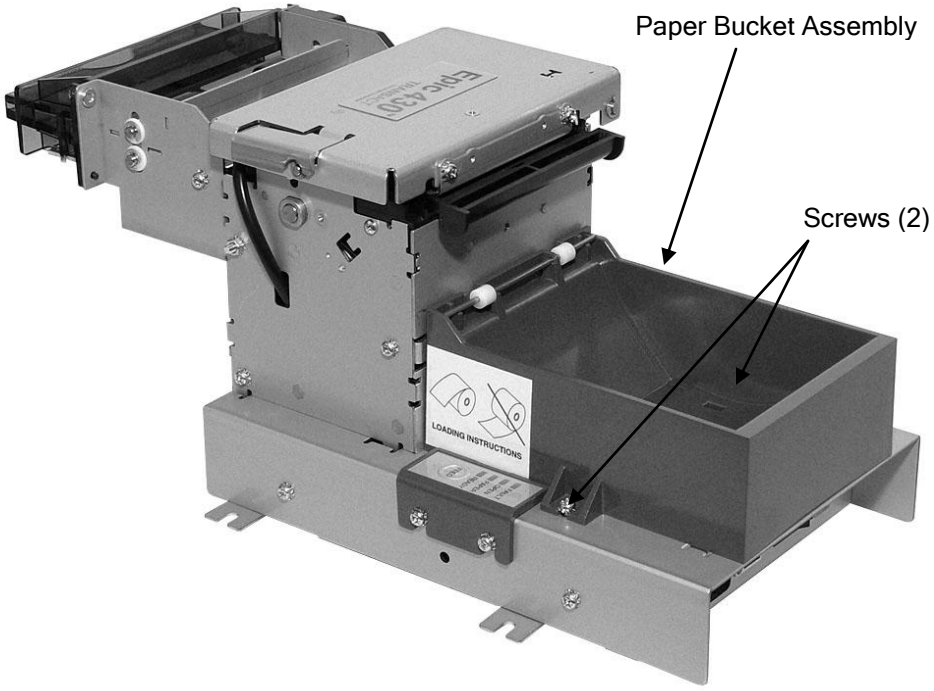


Figure 33. Attach Paper Bucket

- Attach the Paper Bucket to the Electronics Base Frame by positioning its locator tabs in the appropriate slots, and then fastening it to the base using two M3 Sems screws as shown.

Remote Mounting Applications

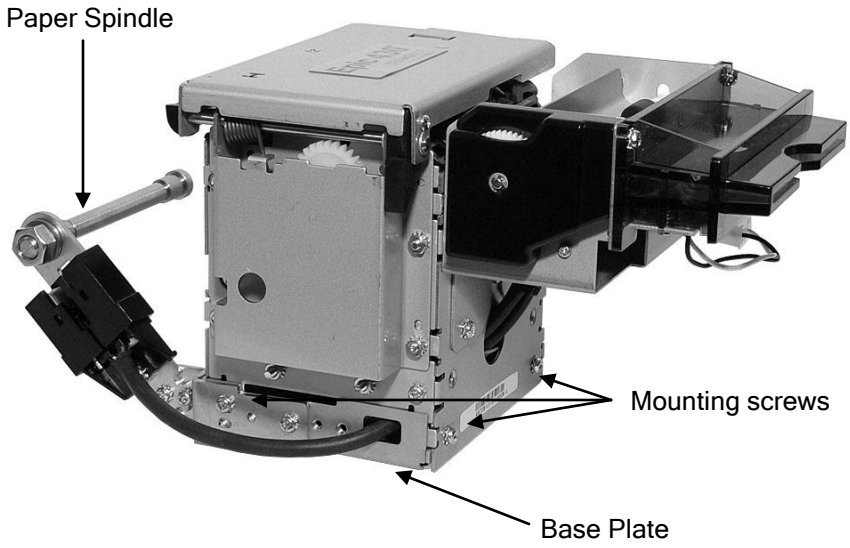


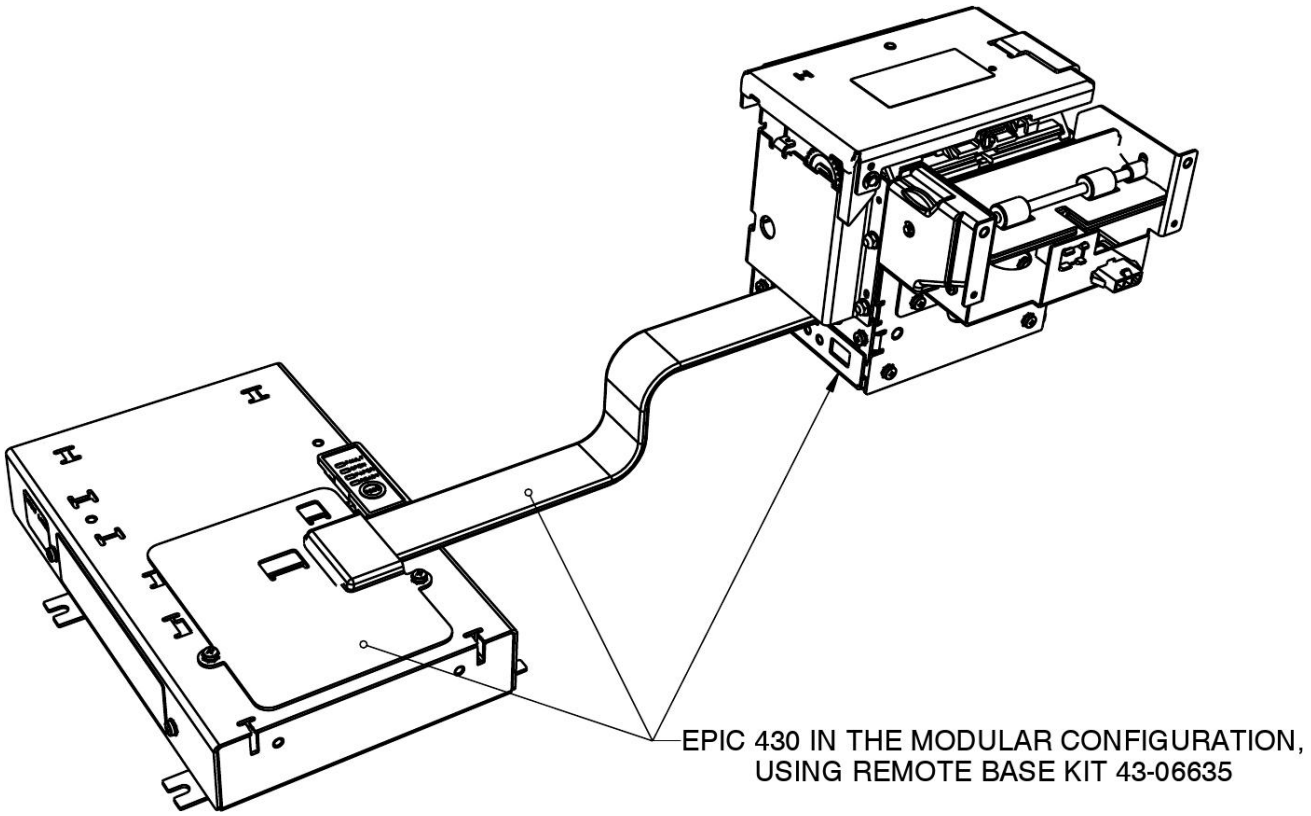
Figure 34. Base Plate and Paper Spindle for Remote Mounting Applications

- For remote mounting applications, base plates are attached to the printer mechanism (shown) and the base frame, using M3 Sems screws in corresponding holes.
- For applications where the Electronics Base Assembly is mounted remotely, a separate Paper Spindle is attached to the Printer Mechanism, using screws as shown.

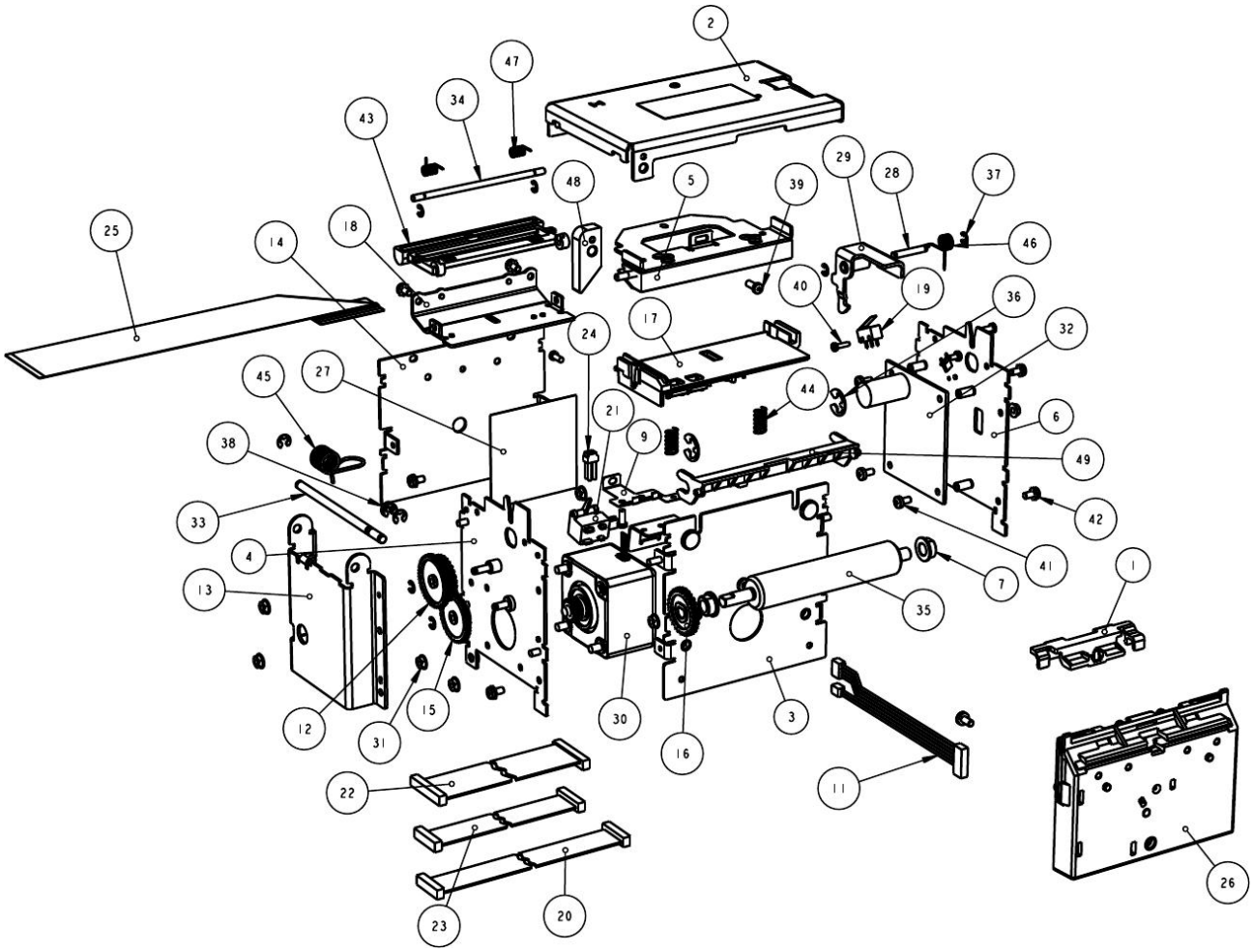
Chapter 9

Parts List

Modular Configuration



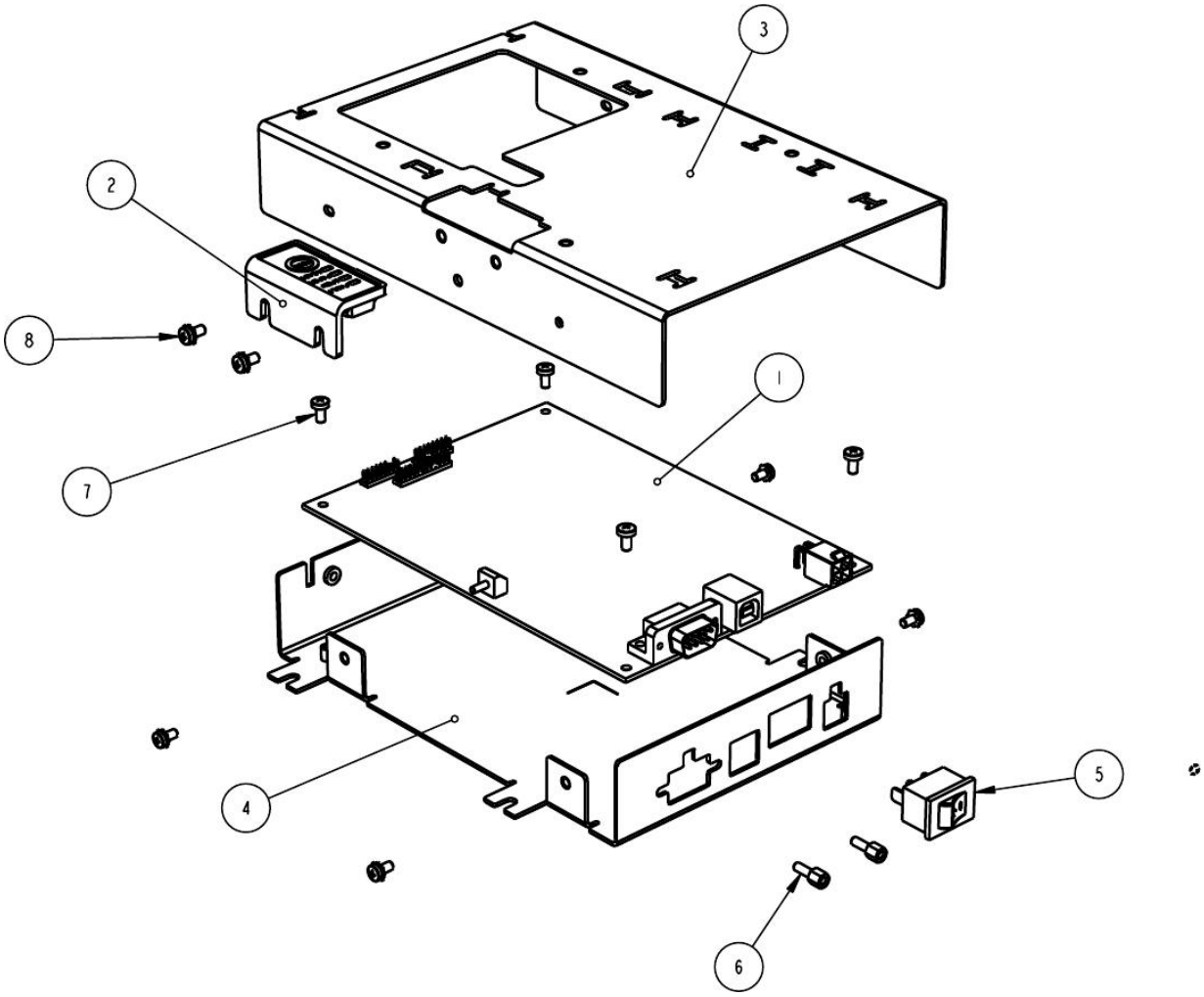
Print Mechanism



No.	Description (standard parts)	Qty.	Part No. (History)
1	Assy - Jam Sensor	1	43-08980 (43-06626)
2	Assy - Top Cover Label	1	43-07020 (43-06630, 43-06728, 43-06443)
3	Assy - Front Plate	1	43-08485 (43-06654) (43-06593)
4	Assy - Left Side Plate	1	43-07010 (43-06587)
5	Assy - Print Head Bracket	1	43-06430
6	Assy - Right Side Plate	1	43-07008 (43-06730, 43-06588)
7	Bearing - Platen	2	43-06436
8	Bracket - Sensor Mount (Paper Out)	1	43-06434
9	Bracket - Sensor Mount (TOF)	1	43-06707 (43-06417)
10	Cable Tie 3 3/8" *(not shown)*	3	98-0941
11	Cable - Knife Motor/Sensor	1	43-05507L
12	Combo Gear - 48/28 Idler	1	28-03705
13	Cover - Gear (Print Mechanism)	1	43-06576
14	Frame - Rear	1	43-06711 (43-06397)
15	Gear - Combo 26/46 Drive	1	28-03707
16	Gear - Platen	1	28-03942
17	Guide - Bottom Paper (82.5mm)	1	43-07408 (43-07013, 43-06401)

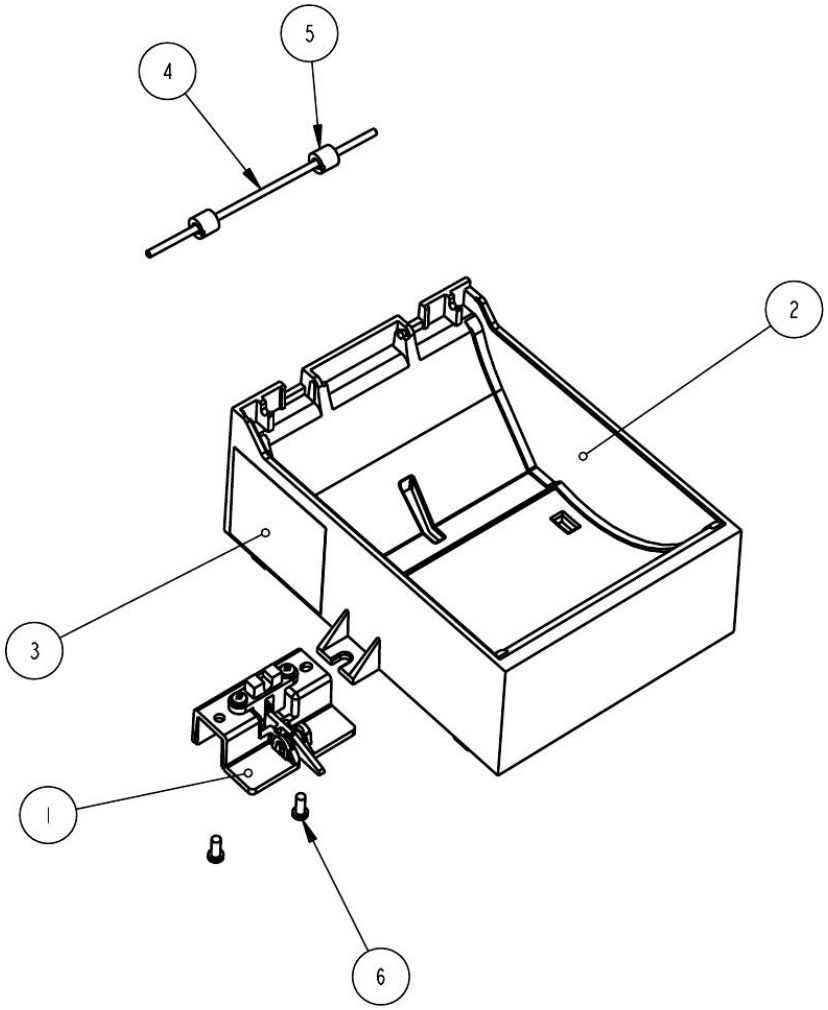
No.	Description (standard parts)	Qty.	Part No. (History)
18	Guide - Top Paper	1	43-07006 (43-06404)
19	Harness - Cover Open Switch	1	43-06484L
20	Harness - Motors	1	43-05511L
21	Harness - Paper Out Sensor	1	43-06483L
22	Harness - Printhead	1	43-05509L
23	Harness - Sensors	1	43-05510L
24	Harness - TOF Sensor	1	43-05503L
25	Harness - Printhead (Folded)	1	43-06720
26	Assy - Knife Module (Full Cut)	1	43-10948 (43-09103, 43-07018, 43-07017, 43-06969, 43-06567)
27	Label - PCB Connector	1	43-06939
28	Latch Pin (Pivot)	1	43-06408
29	Latch Arm (Assy)	1	43-07004 (43-06424)
30	Motor Assy - Paper Feed	1	43-05505L (28-00759)
31	Nut - M3 Hex	8	98-0621
32	PCB - Interconnect	1	43-08918L (43-06464L)
33	Pin Pivot	1	43-06330
34	Pin - Slacker (Pivot)	1	43-06703
35	Platen	1	43-06970 (43-06435)
36	Retainer - 'E' Ring 0.25 Dia.	2	520-9800006
37	Ring - Retaining	7	520-9800002
38	Ring - Retaining	4	520-9800003
39	Screw - #4 Plastic Thread Forming	6	98-7608
40	Screw - M2x6	1	M068306-01 (98-7819)
41	Screw - M3x6mm PHPS PHD	4	98-0611
42	Screw - M3x6mm SEMS PHD PHPS	6	98-02215
43	Slacker (82.5mm Guide)	1	43-07409 (43-06702)
44	Spring - Compression (Printhead)	2	43-08710 (43-07005) (43-06429)
45	Spring - Torsion (Cover Open)	1	43-09451 (43-06426)
46	Spring - Torsion (Latch Arm)	1	43-06428 (43-06968)
47	Spring - Torsion (Slacker)	2	43-06971 (43-06704)
48	Stop Hinge (Cover)	1	43-06905
49	Stripper - Platen	1	43-06729 (43-06437)

Base Assembly



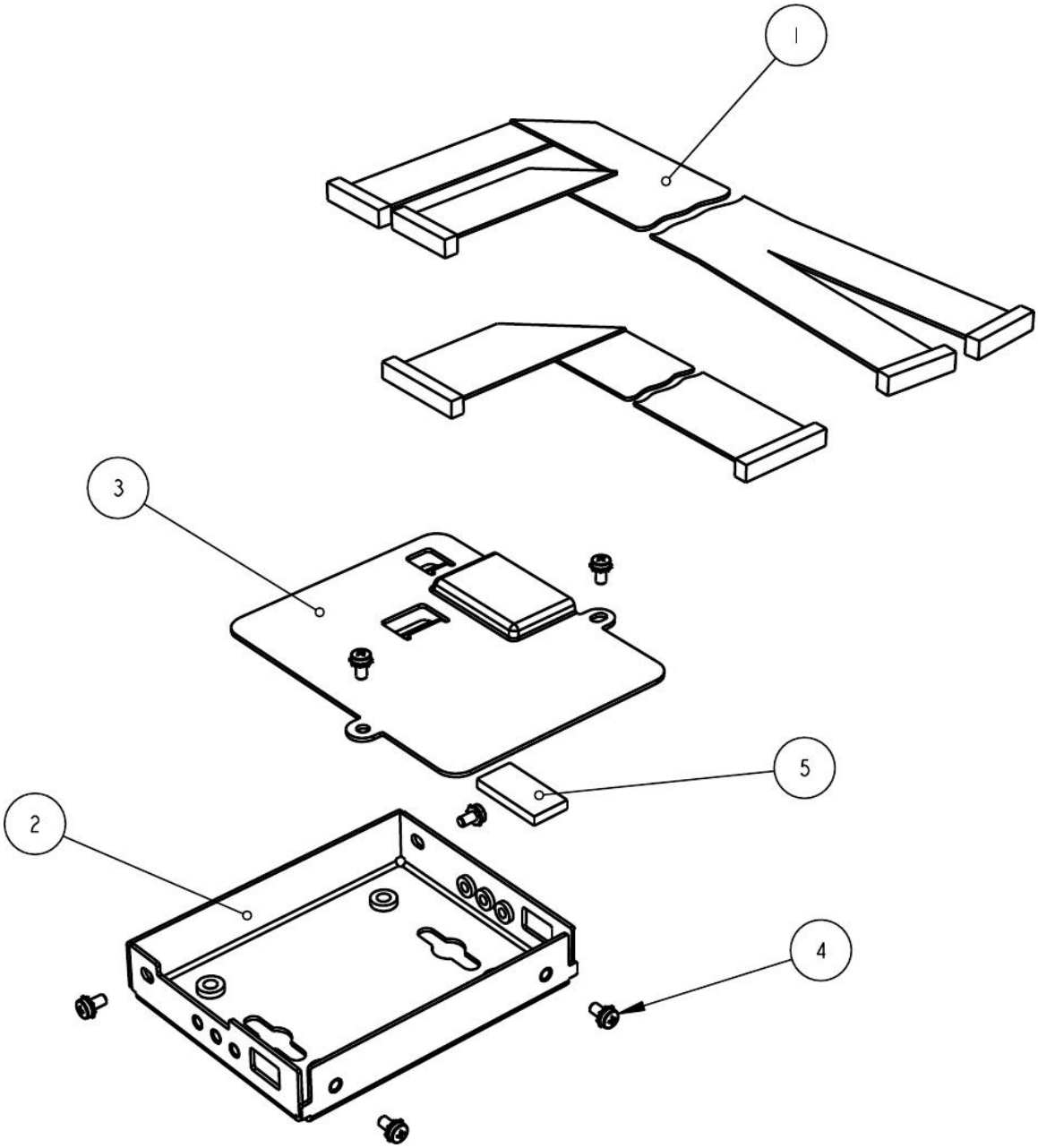
No.	Description (standard parts)	QTY.	Part No. (History)
1	Assy - Control Board	1	43-10961L (43-05494L)
2	Assy - Keypad	1	43-06319
3	Cover - PCB	1	43-06306
4	Frame - PCB	1	43-07932 (43-06305)
5	Rocker Power Switch	1	43-06468L
6	4-40 Female Lock Screw	2	99-04148L (98-02383)
7	Screw - M3x6mm Phps Phd	4	98-0611
8	Screw - M3x6mm Sems Phps Phd	6	98-02215

Paper Holder Assembly



No.	Description (standard parts)	QTY.	Part No. (History)
1	Assy-Paper Low	1	43-06611
2	Holder-Paper	1	43-06604
3	Label-Paper Loading	1	43-06930
4	Rod-Roller Support	1	15-9797
5	Roller-Paper Supply	2	15-9798
6	Screw-No. 4 Plastic Head Forming	2	98-7608

Remote Base Assembly



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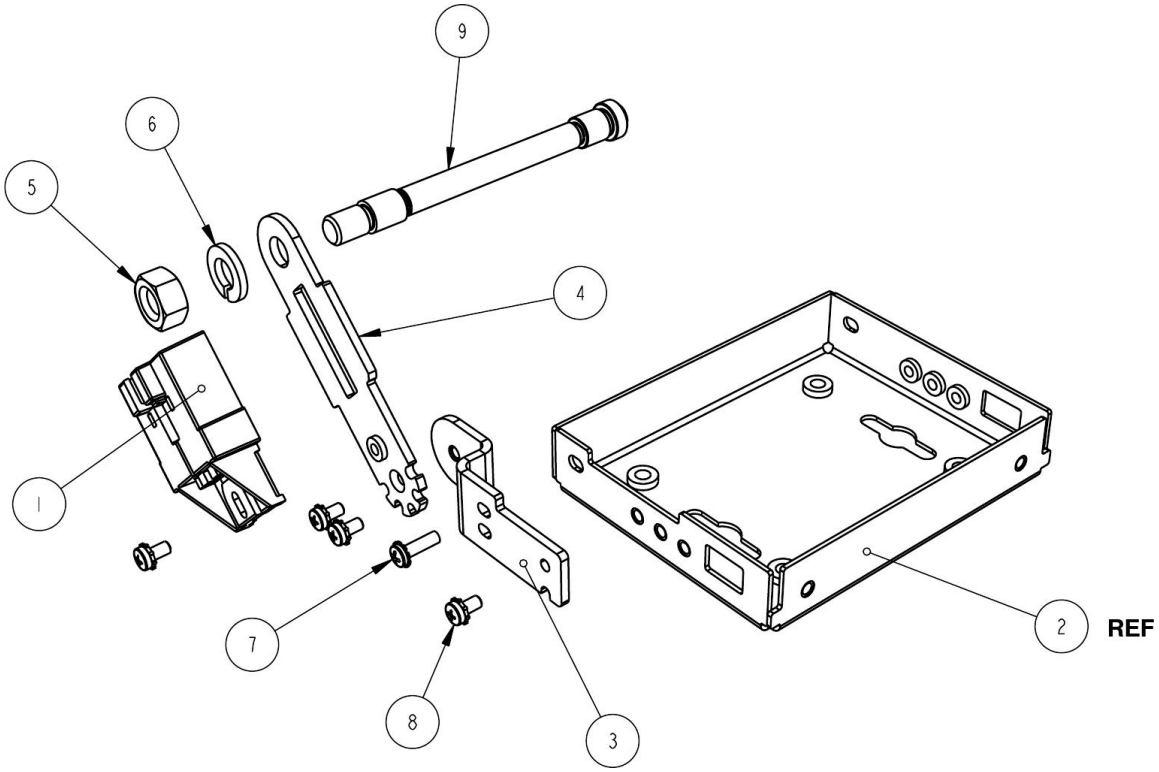
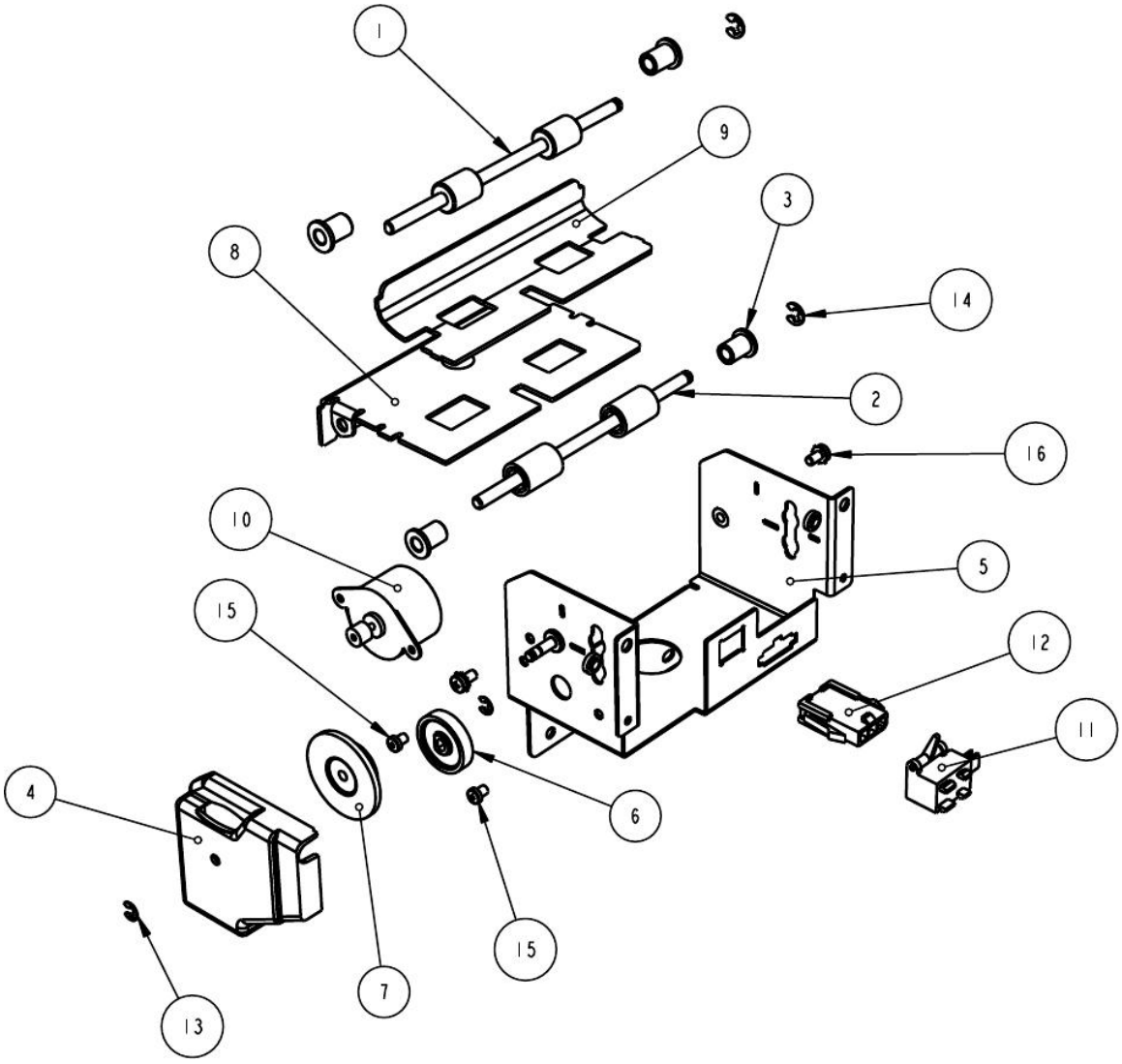
No.	Description (standard parts)	QTY.	Part No. (History)
1	Assy-Remote Cable	1	43-06553L
2	Base-Printer Mounting	1	43-06652 (43-06323)
3	Cover-Connection Opening	1	43-06598 (43-06358)
4	Screw-M3x6mm Sems Phps Phd	6	98-02215
5	Tape-1/8” Foam	2	98-03599

Spindle Assembly



No.	Description (standard parts)	QTY.	Part No. (History)
1	Assy - Paper Low (Spindle)	1	43-06642
2	Base - Printer Mounting	1	43-06652 (43-06323)
3	Bracket - Paper Roll Mounting	1	43-06651 (43-06589)
4	Bracket - Spindle Mount	1	43-06656 (43-06590)
5	Hex Nut 5/16-18 x .265 high	1	98-06906
6	Lock Washer .322 ID x .583 OD	1	98-06907
7	Screw - M3x10 Sems Phps Phd	1	M067831-02
8	Screw - M3x6mm Sems Phps Phd	3	98-02215
9	Spindle - Paper	1	43-06591

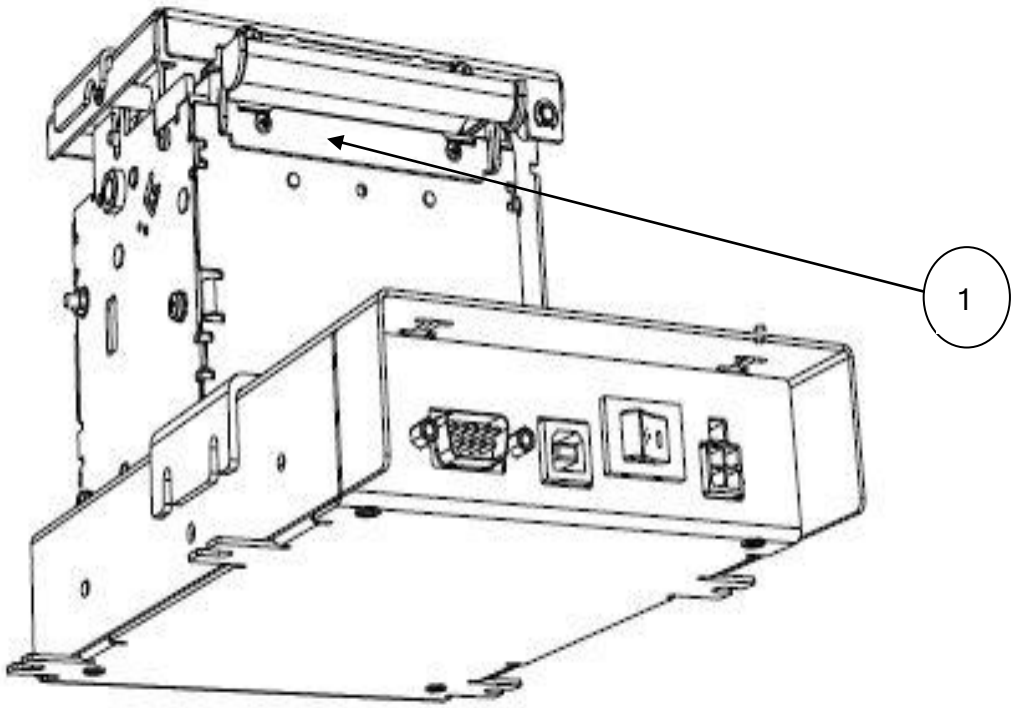
Transport Assembly



No.	Description (standard parts)	QTY.	Part No. (History)
1	Assy - Drive Shaft	1	88-09400 (28-05646)
2	Assy - Idler Shaft	1	28-05645
3	Bearing - Platen	4	95-04963
4	Cover - Transport Gear	1	43-06307
5	Frame - Transport	1	43-08995 (43-07406) (43-06600)
6	Gear - 36 Tooth	1	95-06326
7	Gear - 54/32 Tooth	1	95-04936
8	Guide - Lower	1	43-06647 (43-06628, 43-06602)
9	Guide - Upper	1	43-06601
10	Harness - Transport Motor	1	43-05506L

11	Harness - Transport Sensor	1	43-06481L
12	Harness - Bezel Lamp	1	43-05508L
13	Ring - Retaining	2	520-9800002
14	Ring - Retaining	2	520-9800003
15	Screw - M2.6x4mm Phps Phd	2	98-1182
16	Screw - M3x6mm Sems Phps Phd	2	98-02215

Optional 88 MM Paper Guide



No.	Description (standard parts)	QTY.	Part No. (History)
1	Guide-80MM Paper	1	43-07556

Index