ENCAD®

# NovaJet® PRO 600e


60 inch

42 inch

# SERVICE MANUAL

ENCAD®

# NOVAJET® PRO 600e COLOR INKJET PRINTER SERVICE MANUAL

Part Number 210596

## Printing history

1st Edition Rev A May 1998

# FCC Statement (U.S.A.)

The United States Federal Communications Commision has specified that the following notice be brought to the attention of the users of the **NOVAJET PRO 600e** printers.

FEDERAL COMMUNICATIONS COMMISION RADIO AND TELEVISION INTERFERENCE FOR CLASS B DEVICE

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

## User Instructions:

If the equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by **ENCAD, Inc.** could void the user's authority to operate the equipment.

# VDE Statement

Hiermit wird bescheinigt, daß der ***NOVAJET PRO 600e*** in Übereinstimmung mit den Bestimmungen der BMPT-AmstbIVfg 234/1991 funkentstört ist. Der vorschriftsmäßige Betrieb mancher Geräte (z.B. Meßsender) kann allerdings gewissen Einschränkungen unterliegen. Beachten Sie deshalb die Hinweise in der Bedienungsanleitung.

Dem Zentralamt für Zulassungen im Fernmeldewesen würde dan Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf die Einhaltung der Bestimmungen eingeräumt.

***ENCAD, Inc.*** U.S.A

# Material Safety Data Sheet

***ENCAD*** QIS (Quality Imaging Supplies) ink is nonhazardous, requiring no special disposal handling. It can be harmful if swallowed and should be kept away from children.

To obtain a Material Safety Data Sheet, contact ***ENCAD, Inc.*** at:

6059 Cornerstone Court West
San Diego, CA 92121-3734
(619) 452-4350

International users should contact their local dealer or distributor.

# WARRANTY OR DAMAGE CLAIMS

**United States**

ENCAD®, Inc., warrants its printers ("PRODUCT") to be free from defects in workmanship and materials for a period of one year from the date of purchase. In order to submit a Warranty claim, please contact the ENCAD Help Desk at (619) 452-4350.

ENCAD reserves the right to make changes or improvements to Products, without incurring any obligation to similarly alter Products previously purchased.

Buyer's sole and exclusive rights pursuant to this Warranty shall be for the repair or replacement of defective Product. ENCAD specifically disclaims any and all other warranties, expressed or implied, including but not limited to, implied warranties of merchantability and fitness for a particular purpose. In no event shall ENCAD be liable for any loss of profit or other commercial damages, special, incidental or consequential damages, or any other damages or claims, whatsoever.

This Warranty gives Buyer specific legal rights, and Buyer may also have other rights that vary from state to state.

This Warranty applies only to printers purchased from ENCAD, or authorized ENCAD distributors or dealers. The intent of this Warranty is to repair or replace defective Products subjected to normal wear and tear, when operated according to ENCAD instructions.

**This Warranty does not cover damage to the Product resulting from the following:**

- **Accident or negligence.**
- **Unauthorized modification of the Product.**
- **Adverse environmental conditions.**
- **Service of the Product by other than an ENCAD authorized service provider.**
- **Unauthorized or improper use, including but not limited to:**
  - **Use in applications for which the Product was not designed.**
  - **Using cartridges or ink other than those supplied by ENCAD or authorized ENCAD resellers.**
  - **Using media other than that supplied by ENCAD or authorized ENCAD resellers.**
  - **Lubricating any part of the printer.**

Internationally: Contact your dealer or distributor for warranty information.

# Table of Contents

# Table of Contents (cont)

## Chapter 3 Maintenance (cont)

# Table of Contents (cont)

## Chapter 4 Troubleshooting (cont)

# Table of Contents (cont)

## Chapter 5 Assembly/Disassembly (cont)

# List of Illustrations

Figure Page

# List of Illustrations (cont)

Figure Page

## Chapter 3 Maintenance (cont)



## Chapter 4 Troubleshooting



## Chapter 5 Assembly/Disassembly

# List of Illustrations (cont)

Figure Page

## Chapter 5 Assembly/Disassembly (cont)



## Chapter 6 Parts List

# List of Tables

Table Page

# General Description 1



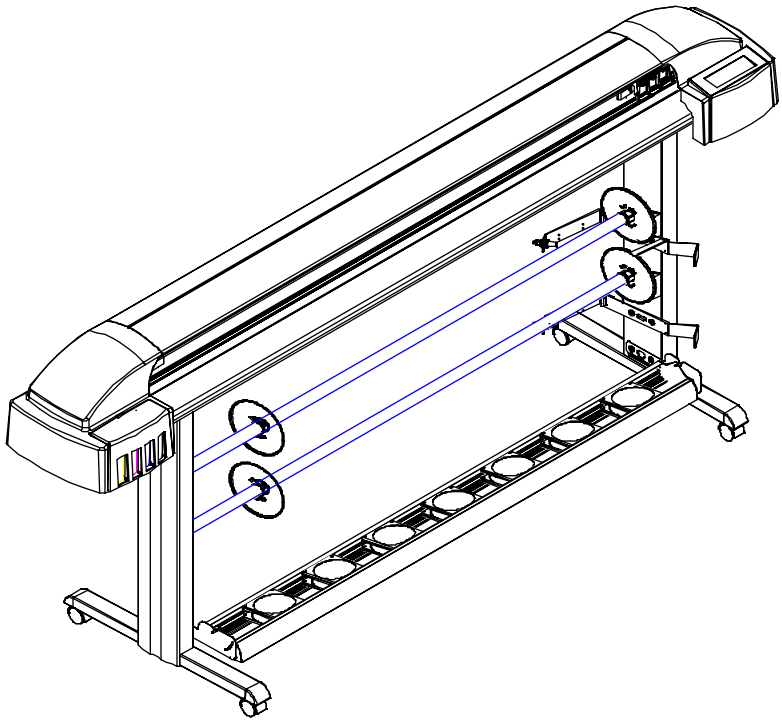

**Figure 1-1. NovaJet PRO 600e Inkjet Printers.**

## Introduction

This manual provides service information for the ***ENCAD®, Inc.*** **NovaJet® PRO 600e** Color Inkjet Printer. The **NovaJet® PRO 600e** printer comes in two sizes: a 42 inch model and a 60 inch model.

It is written for service personnel who possess analog and digital circuitry experience. Chapter 2, Theory of Operation, should be read and thoroughly understood before troubleshooting/calibrating the printers.

The printers support pre-cut and roll media. Media size is automatically determined and hardclip limits are set accordingly. Pre-cut media uses different maximum plotting areas than roll media. See the Printer Specifications for more details.

Both RS-422 serial and Centronics parallel connections are provided to interface with the host computer. Commands sent from the host computer can be in several forms including **HP-RTL** and **Encad RTL** formats.

Drivers are supplied to support Windows-based PC's (3.XX, 95, and NT) as well as Macintosh and Power PC computers.

These printers expand upon ***ENCAD*'s** tradition of delivering fast, high-quality color or monochrome graphics for a variety of applications. ***ENCAD*** has made significant advances in designing these printers to respond to and anticipate our customers' needs. Principal features are summarized below.

Locally or Remotely Configured via Host Computer
Powered Media Take-Up and Feed System
Media Drying System
Quick Ink Changeover
Self-Aligning Pinch Rollers
PowerPC 33 MHz Microprocessor
8 User Configurable Settings
208 Jet Ink Cartridges
Ink Priming System
500ml Ink Reservoirs
Smart Cartridges

# Overview

Printers draw according to instructions issued from a "host" computer. Every printer is engineered to understand a specific set of instructions and to execute each instruction in a precise manner. In addition, most printers are designed to execute predetermined characters automatically without a specific line-by-line instruction from the program. These characters are part of the printer's permanent memory.

## Related Publications

The following publication contains additional information which may be useful in servicing the ***ENCAD, Inc.* NovaJet PRO 600e** Color Inkjet Printers:

- ***ENCAD* NovaJet PRO 600e** User Guide, P/N 210131
- ***ENCAD* NovaJet PRO 600e** Quick Start Guide, P/N 210058
- ***ENCAD* NovaJet PRO 600e** Connectivity Guide, P/N 210611-1

Copies of these and other ***ENCAD, Inc.*** publications may be obtained by contacting your nearest authorized ***ENCAD, Inc.*** dealer or by contacting ***ENCAD's*** Technical Support and Service Department.

# Electrostatic Discharge (ESD) Sensitivity

All PCBs (Printed Circuit Boards) associated with the **NovaJet PRO 600e** printers have components sensitive to ESD (electrostatic discharge). Care must be taken to avoid damage to any of the components by following current ESD handling procedures and practices.

Always use an approved ESD grounding strap when handling or working with PCBs.

# Warnings, Cautions and Notes

Warnings, cautions and notes are used when additional information, instructions or care should be observed. In this manual warnings, cautions and notes precede the text to which each applies. The definition of each is provided below.

**WARNINGS -** Warnings are used to stress that the following steps or procedures has the potential to cause serious harm or death to service personnel. Extreme care should be observed when following the procedures and to exercise standard safety procedures. They are indicated by:


Followed by a paragraph describing the concern.

**CAUTION -** Cautions depict that the following steps or procedures can cause damage to the equipment if not properly followed. Extreme care should be observed when following the procedures and to exercise standard safety procedures. They are indicated by:


Followed by a paragraph describing the concern.

**NOTE -** Notes are placed before a procedure to inform the service personnel of specific details to improve quality, to give reminders of interrelated parts and to provide other helpful information. They are indicated by:

**NOTE**

Followed by a paragraph describing the concern.

# Printer Specifications

The specifications and performance characteristics of the **NovaJet PRO 600e** Color Inkjet Printers are as follows:

**Max Printing Area:**

| | 42 inch | 60 inch |
|---|---|---|
| Norm | 40.8” | 58.8” |
| | 1.04m | 1.49m |
| Extend | 41.61” | 59.61” |
| | 1.06m | 1.51m |

**Language Emulation:**
HP-RTL
ENCAD RTL

**Buffer:**
32 MB installed
upgradeable to 64 MB

**Power Requirements:**
Input Voltage:
90-246 VAC
47-63 Hz

Output Power:
20 W idle
140 W typical
215 W maximum

**Baud Rates:**
9600, 19200, 38400

**Resolution:**
600x600 dpi or
300x300 dpi, addressable

**Weight:**

| | | |
|---|---|---|
| 60” | 88 lbs | 135 lbs (boxed) |
| 42” | 72 lbs | 117 lbs (boxed) |

**Accuracy:**
+/- 0.2% line length using ROLL feed and 4 mil drafting matte film

**Interface:**
Centronics parallel (IEEE 1284)
RS-422 serial
Network Option: via 10BaseT, 10Base2 Print Server

**Environment:**
Operating:
59° to 95° F
(15° to 35° C)
10% to 70% RH
non-condensing

Storage:
-5° to 140° F
(-21° to 60° C)
5% to 80% RH
non-condensing

**Dimensions:**

| | | |
|---|---|---|
| Height | 44” (1.12m) | |
| Width | 77” (1.96m) | 42 inch |
| | 95” (2.41m) | 60 inch |
| Depth | 28” (0.71m) | |

# Contents of this Service Manual

Figures are used in this manual to clarify procedures. They are for illustrative purposes only and may not necessarily be drawn to scale.

Material in this manual may be repeated in various chapters so that each chapter can “stand alone”. This allows information to be located without having to refer back and forth between chapters.

Figures and tables are easily located and cross-referenced, and are listed in the front of the manual under List of Illustrations and List of Tables.

This manual is divided into six chapters as:

Chapter 1 GENERAL DESCRIPTION - Contains a general description of the ***ENCAD* NovaJet PRO 600e** printer. This includes printer specifications, and related materials. Also included is a description of the use of Warnings, Cautions and Notes as used in this manual and chapter contents.

Chapter 2 THEORY OF OPERATION - Functional descriptions of the overall printer and major assemblies are contained in this chapter.

Chapter 3 MAINTENANCE - This chapter covers the scheduled maintenance, cleaning procedures and alignment/ adjustments recommended to perform on the printers. Diagnostics and a signal flow diagram are also listed.

Chapter 4 TROUBLESHOOTING - A table containing problems that could occur and possible causes and repairs is found in this chapter. This table is not intended to be a complete listing of troubleshooting procedures. It will isolate the problem down to the lowest replacable assembly. If the problem happens to be the wiring between assemblies, standard troubleshooting techniques will have to be implemented to correct the problem.

Chapter 5 ASSEMBLY/DISASSEMBLY - Contains detailed procedures to remove and replace printer parts and assemblies.

Chapter 6 PARTS LIST - Contains a complete listing of all field replacable parts and assemblies for the **NovaJet PRO 600e** Color Inkjet Printer. Illustrated parts breakdown drawings are included to help clarify and identify parts for ordering. Special kits and adjustment jigs may also be required.

ORIENTATION - Instructions in this manual are based on the assumption that the service person is facing the front of the printer. References to top view, back view, and so forth are consistent with this engineering standard. References to the X Axis and Y Axis (Paper Axis and Carrier Axis, respectively) follow the standard of **AutoCAD™** absolute coordinates: up and down for X, left to right for Y.

# Technical Support

***ENCAD*** offers full technical support and service for its various products. If you are unable to find the answer to your question in either the User's Guide, Service Manual, or other related publications, check out ***ENCAD's*** Technical Bulletins located on ***ENCAD's*** bulletin board or the Internet:

| | |
|---|---|
| ***ENCAD* BBS:** | (619) 452-2653 or<br>(619) 452-3768 |
| ***ENCAD* Website:** | http://www.encad.com |

Additional information is available though our Technical Support and Service Department's Help Desk.

***ENCAD, Inc.***
Technical Support & Service Dept.
6059 Cornerstone Court West
San Diego, CA 92121

| | |
|---|---|
| **Help Desk Telephone:** | (619) 452-4350 |
| **Help Desk FAX:** | (619) 546-0659 |

International Users contact your local ***ENCAD*** service provider. see details on your ***ENCAD*** registration card.

# Theory of Operation 2

## Introduction

This chapter explains the mechanical and electrical theory of operation of the ***ENCAD* NovaJet PRO 600e** Color Inkjet printer.

The **NovaJet PRO 600e** is a PowerPC 33MHz microprocessor-based digital printer that receives plotting instructions from a host computer through either the RS-422 serial interface or the Centronics parallel interface.



## NovaJet PRO 600e Printer General Block Diagram

Figure 2-1 illustrates the major functional areas of the printer.

The NovaJet PRO 600e printer consists of three mechanical assemblies:

1. Paper (Media) Axis Drive
2. Carriage Axis Drive
3. Media Feed and Take-Up System

and four main electrical assemblies:

1. MPCB (Main Printed Circuit Board)
2. Carriage Assembly
3. Keypad
4. Power Supply

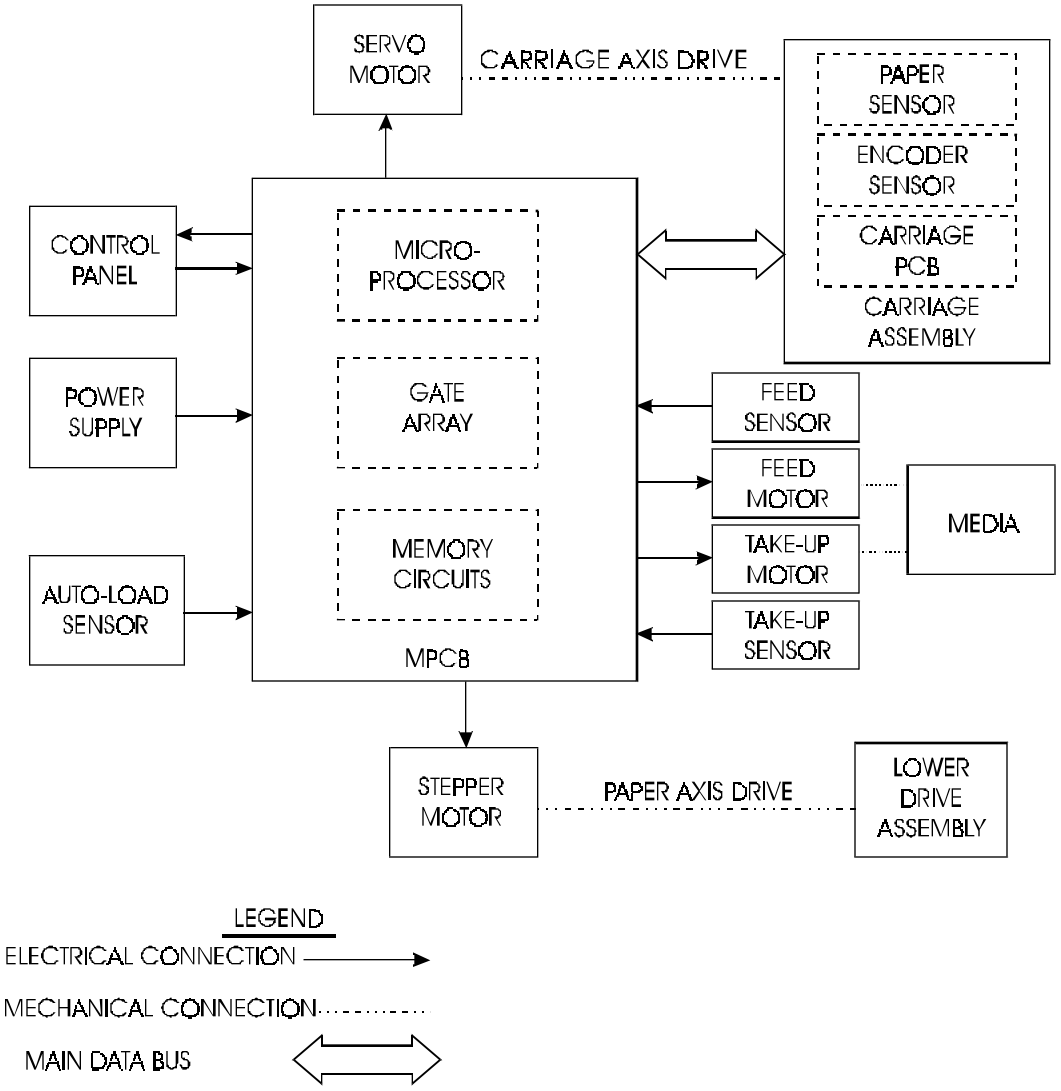


**Figure 2-1. General Block Diagram.**

# Paper (Media) Axis Drive

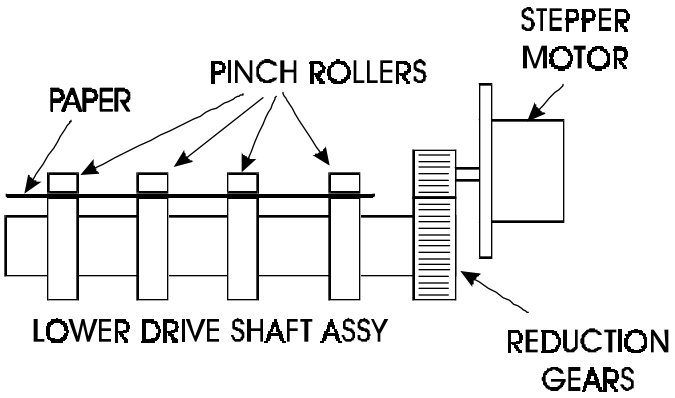


**Figure 2-2. Paper (Media) Axis Drive.**

The Paper (Media) Axis Drive moves the plotting media in a direction perpendicular to the length of the printer. This friction drive utilizes a micro-step drive technology and consists of a stepper motor, reduction gears, lower drive shaft assembly, and pinch rollers. This can be seen in Figure 2-2.

The micro-step technology associated with the stepper motor gives the capability of a resolution up to 9600 dpi.

The reduction gear meshes the stepper motor to the lower drive shaft assembly which allows the media to advance or retract. The purpose of the pinch rollers is to apply pressure to the media onto the drive shaft assembly to reduce the chance of slipping.

Misaligned pinch wheels is a main cause of skewing of the media. For that reason the NovaJet PRO 600e was designed with self aligning pinch rollers. As the media is fed forward, the rollers are aligned correctly. However, these pinch rollers will not stay aligned while the media is being fed backwards.

# The Carriage Axis Drive

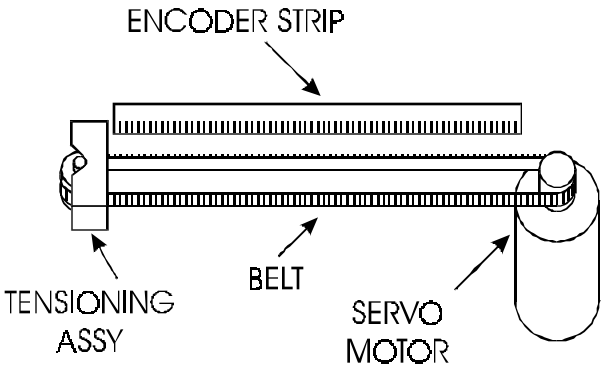


**Figure 2-3. Carriage Axis Drive.**

The Carriage Axis Drive moves the printer's carriage assembly along the length of the printer. The drive consists of a servo motor, linear encoder strip, drive belt, and tensioning assembly. These items are illustrated in Figure 2-3.

The servo motor, drive belt, and tensioning assembly are the components that actually drive the carriage assembly. The servo motor drives the belt back and forth allowing the attached carriage assembly to be repositioned as required. The tensioning assembly is spring controlled and allows the proper amount of tension on the belt.

The linear optical encoder strip is used to obtain the printers accuracy along the axis of the printer. It is made with 150 parallel lines per inch etched into it. By utilizing two optical encoder sensors that are slightly off set from each other, and reading the leading and trailing edges of the lines, a resolution of 600 dpi can be obtained.

The stepper and servo motors are controlled from the main printed circuit assembly by the microprocessor.

# Media Feed and Take-Up System

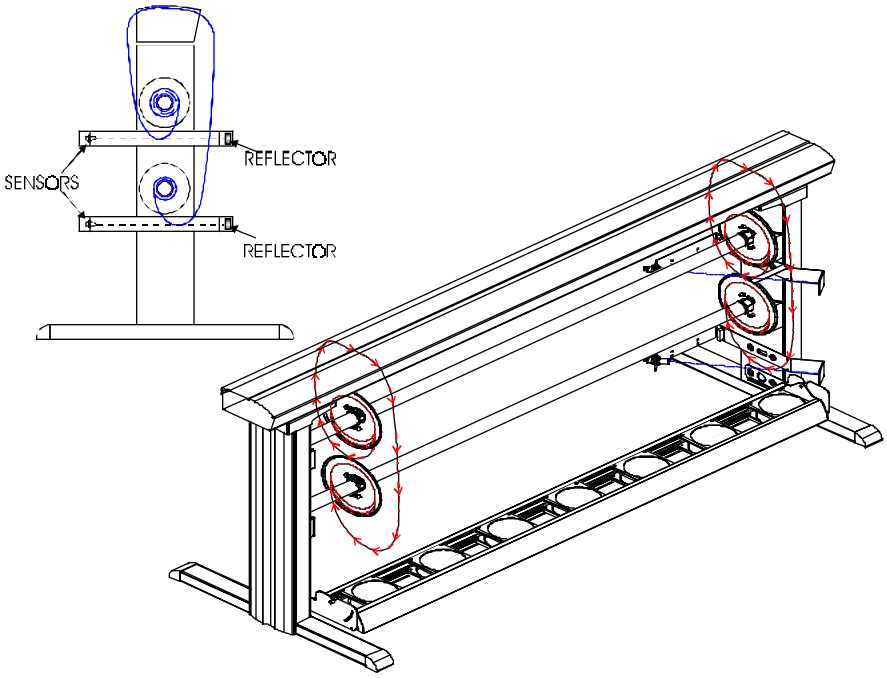


**Figure 2-4. Power Feed and Take-Up System.**

The media feed and take-up system comprises of two optical sensors and two dc motors. See Figure 2-4.

The motors are used to advance the media feed roll and the media take-up roll dependant upon the signals they receive from the MPCB. The MPCB generates the control signals for the motors from the information it receives from the media feed and take-up sensors.

The optical sensors are designed to inform the MPCB when there is not a proper amount of slack in the media by sensing the 'curl' of the media at the bottom of its loop. This method is used so that all approved forms of media (including transparent backlit media) is able to take advantage of the power feed and take-up system.

# Main Printed Circuit Board (MPCB)

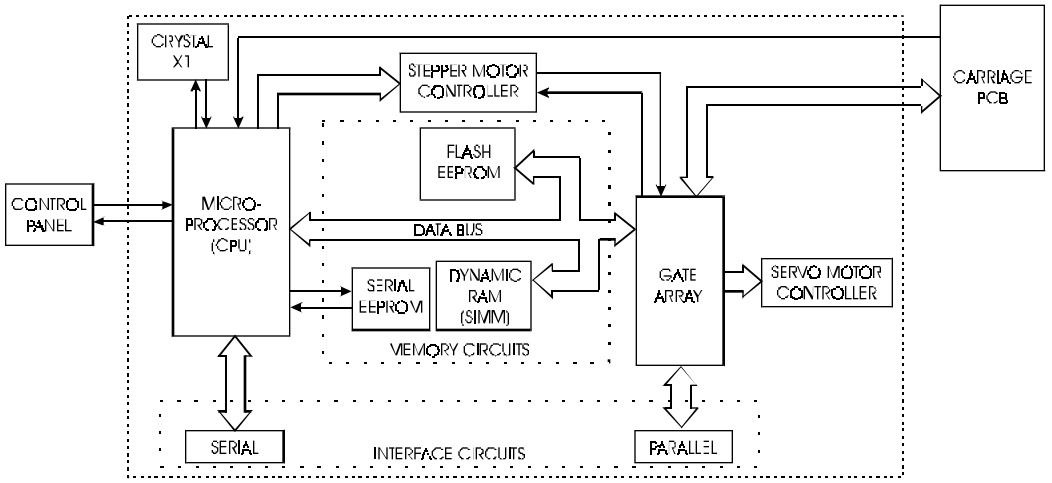


**Figure 2-5. Main Printed Circuit Board.**

The Main Printed Circuit Board (MPCB) consists of six functional areas:

1. Microprocessor (CPU)
2. Gate Array
3. Memory Circuits
4. Stepper Motor Controller
5. Servo Motor Controller
6. Interface Circuits: Serial & Parallel

## Microprocessor

The microprocessor (an IBM PowerPC) is the central processor unit which supervises system functions, executes the printer firmware, manipulates data, and controls input/output data busses. It has two built-in serial ports, a two channel DMA (Direct Memory Access) controller, a timer module, clock generator, and an on-board chip select generator. One serial port connects to the Mini-DIN connector which can be used to communicate with the host computer; the other serial port interfaces to the Control Panel. One DMA channel supplies data to the gate array for jet firing; the other DMA channel is used to receive data through the parallel port via the gate array, or the serial port when using a high speed serial mode. One timer generates a servo interrupt every millisecond; the other is used for timing the Stepper Motor.

A divide-by-two circuit generates the 33MHz system clock from a 66MHz crystal reference (X1).

The chip select generator is programmed to generate chip selects at the appropriate addresses, with the appropriate data size (byte, word) and with the appropriate number of wait states.

## Gate Array

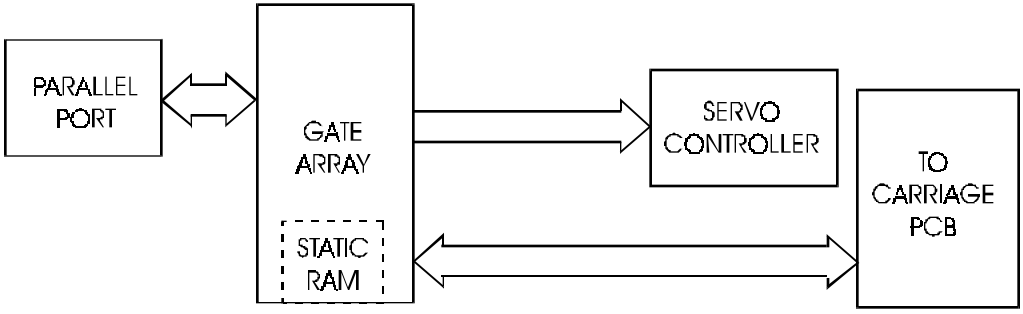


**Figure 2-6. Gate Array.**

The gate array contains the hardware logic for dot firing, monitoring changes in the Carriage Assembly position, controlling DMA through the parallel port, and generating the PWM (Pulse Width Modulation) waveforms for the servo controller.

The gate array is a Xilinx device. It is a static RAM-based field programmable gate array. This means that the logic that it implements is determined by configuration information in internal RAM storage. Each time power is turned on, this information must be downloaded from the system ROM. This type of gate array allows for the flexibility of upgrading the logic by simply downloading the new system software.

## Memory Circuits

Memory is used to retain large amounts of information. This information is stored in the device memory in the form of binary bits.

Printer memory consists of Flash EEPROM, DRAM, and EEPROM.

Maximum installable memory is as follows:

DRAM = 128 MB

Flash EEPROM = 1 MB

Serial EEPROM = 1KB

### Flash EEPROM

Flash EEPROM is Electrically Erasable, Programmable, Read Only Memory used to store instructions and data constants which the microprocessor can access and interpret, with no loss of information when power is off.

The system firmware is stored in Flash EEPROM. The Flash EEPROM allows the firmware to be upgraded by downloading the files containing the new firmware. It can be erased and reprogrammed more than 10,000 times. The term “Flash” means that bytes cannot be individually erased. A block or the whole device is erased at the same time and the block or whole device is then reprogrammed.

The normal method of downloading new firmware is to send the unit the files containing the code using either the GO.EXE utility or printing the file to the unit. This requires using an appropriate host utility and can be done through the serial port (for Macintosh users) or the parallel port (for PC users). See Firmware Downloading in Chapter 3 for the procedures.

## DRAM

DRAM is Dynamic Random Access Memory which provides temporary storage of the microprocessor calculation and input/output data. It is also a faster type of memory then the Flash EEPROM. That’s why the printer control program is also copied from the Flash EEPROM to RAM, where it can be executed faster.

The printer also has two 72-pin 32-bit SIMM sockets for DRAM. The printer is supplied with a SIMM of 32 Megabytes installed on the MPCB. The following SIMM sizes are supported: 4MB (1Mx32), 8MB (2Mx32), 16MB (4Mx32), 32MB (8Mx32) and 64MB (16Mx32.)

The SIMMs must have a minimum operating speed of 70ns, and conform to JEDEC Standard 21-D release 4 or later. Remove the Right Cover to install additional memory (see Chapter 5 for installation procedures.) Care must be taken when choosing a SIMM module for the printer. Not all SIMM’s on the market today will work on the printer. It has to do with the “presence detect” signals on pins 67 and 68 of the SIMM’s. Not all SIMM manufacturers use these signals, so they disable them. Recommended SIMM’s to be used are listed in the User Guide.

## Serial EEPROM

Serial EEPROM is an Electrically Erasable, Programmable, Read Only Memory which provides storage for calibration constants and user configuration data entered from the host computer.

An 8K bit serial nonvolatile EEPROM stores calibration and configuration information. It retains data while the unit is off.

## Stepper Motor Controller

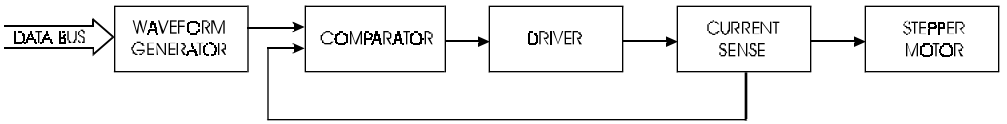


**Figure 2-7. Stepper Motor Controller.**

The media is driven by a Stepper Motor, which drives the media in a direction perpendicular to the width of the printer. The media in the printer can advance forward and backward, depending upon the commands which the Stepper Motor receives from the microprocessor.

The Stepper Motor Controller contains two identical circuits, one for each winding of the stepper motor. The circuit is a combination of two simpler types of circuits and can be thought of as a variation of either one.

A waveform generator receives digital data from the CPU and generates a sine wave output. This signal is fed into a comparator circuit that is measuring the current through the winding of the stepper motor. If the current is too low, a pulse of 24V is generated. When the current goes above the output of the waveform generator, the pulse turns off. Every time the output of the waveform generator is changed by the microprocessor, the motor moves 1 “micro-step”.

Each circuit contains four main blocks (see Figure 2-7):

1. Reference waveform generator

   The microprocessor uses a D/A (digital to analog) converter to set the desired level for the current in the stepper motor winding. The output of the D/A converter varies in time to create a reference waveform. This reference waveform is centered around 10V.

2. Motor current sense

   The voltage across a series current sense resistor is measured and level shifted so that it is centered around 5V.

3. Comparator

   This portion divides the output of the reference waveform generator by two and compares it to the output of the motor current sensor. Logic inside the gate array generates the control signals for the power driver that applies voltage across the motor winding in order to make the actual current match the reference waveform.

4. Power driver

   An H-bridge allows the supply voltage to be applied across the winding in either polarity to drive the current to the desired value.

## Servo Motor Controller

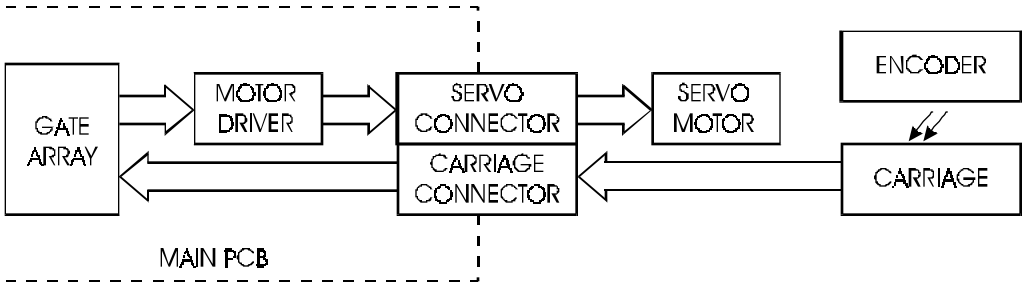


**Figure 2-8. Servo Motor Controller.**

The Carriage Assembly is driven by the Servo Motor. The speed of the Carriage Assembly is controlled by varying the duty cycle of the signal applied to the controller. The microprocessor checks the position of the Carriage Assembly approximately 1,000 times per second (during the servo interrupt). It then updates the PWM (pulse width modulator) register in the gate array which sets the duty cycle to make adjustments to the Carriage Assembly speed. A linear optical encoder is used to monitor the Carriage Assembly position.

The optical encoder strip runs the length of the Stabilizer Bracket and contains 150 lines and spaces per inch. Thus there are 300 edges per inch. The detector circuit actually consists of two optical edge detectors. They are separated from each other by one half the width of one of the optical lines on the encoder strip. This allows 4 evenly spaced pulses to be developed for each line on the encoder strip. This is known as quadrature signals. It gives an effective resolution of 600 lines per inch. See figure 2-9 for a graphical representation of quadrature signals. For 300 dpi resolution, one of the detectors is not used.

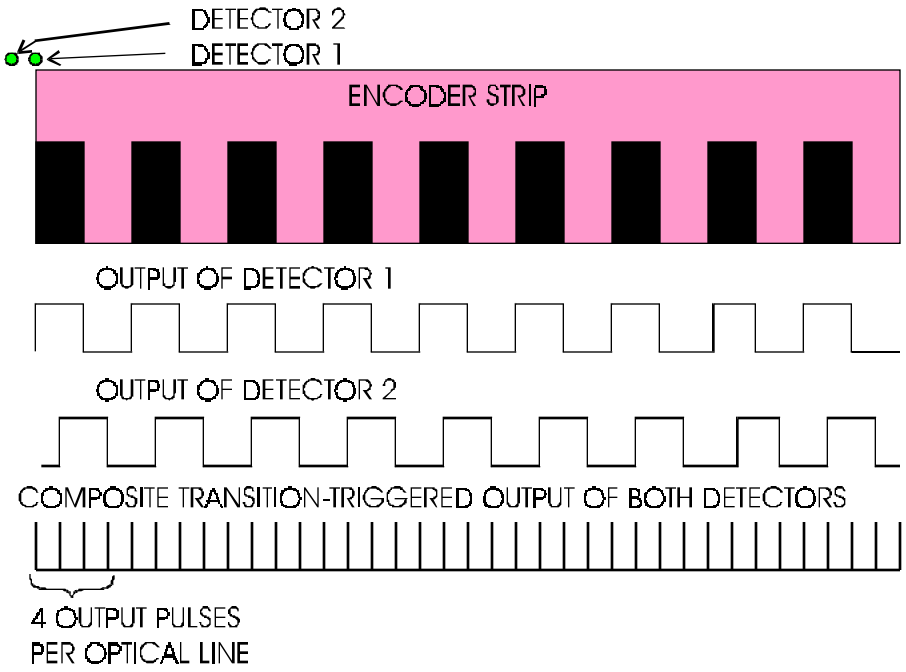


**Figure 2-9. Quadrature Signal Generation.**

The direction that the Carriage Assembly is moving is known based upon the state of one detector's output and the direction of the transition of the other detector's output.

A hardware counter in the gate array increments as the Carriage Assembly moves left and decrements as the Carriage Assembly moves right. The hardware counter is only eight bits wide, so it cannot store a value large enough to represent an absolute Carriage Assembly position. Instead, it is read during the servo interrupt and its value compared with that from the previous interrupt. This difference is used to update the absolute position value in the software.

# Interface Circuits: Serial & Parallel


**Figure 2-10. Interface Circuits.**

Data from the host computer is received either through the Centronics parallel port or the serial port. The gate array provides the control signals for DMA transfers from the parallel port to DRAM.

The serial port is designed primarily to interface to a Macintosh printer port. It has an eight pin Mini-DIN connector. The data (TXD, RXD) signals meet RS-422 electrical specifications, and the control signal (DTRCLK) meets the RS-423 electrical specifications. The control signal can be configured as a 1MHz clock for high speed serial communications with a Macintosh.

The serial port is compatible with RS-422 devices when an appropriate adapter cable is used. This cable is available from ***ENCAD***.

# Carriage Assembly Circuits

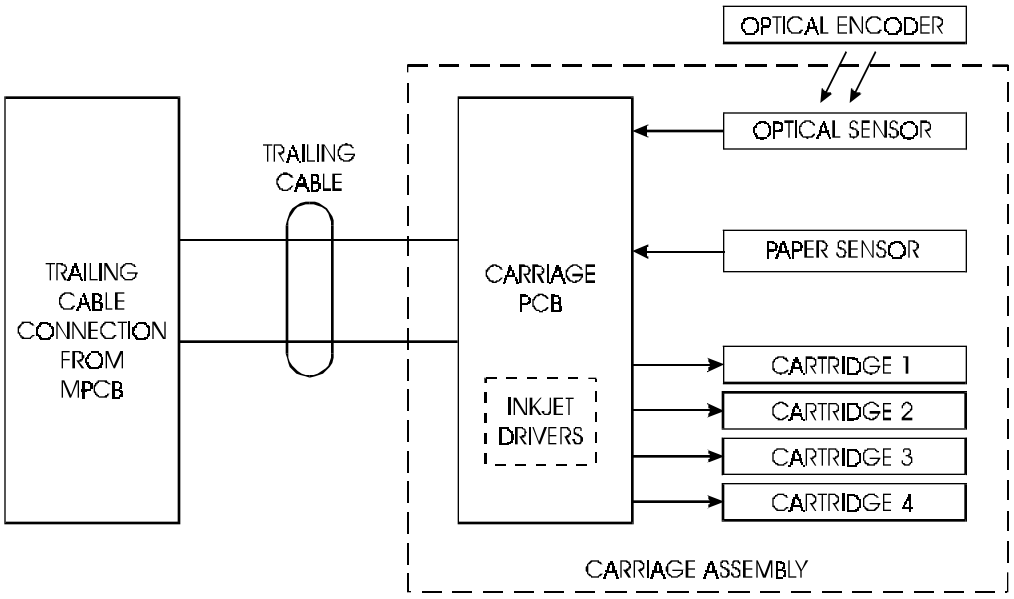


**Figure 2-11. Carriage Assembly Circuits.**

The Carriage Assembly contains:

1) Carriage PCB
2) Optical Sensors
3) Paper Sensor
4) Inkjet Cartridges

The Carriage PCB contains the logic and drive circuitry for the firing of the inkjet cartridges. It also establishes an interface path for the optical sensor and paper sensor to communicate with the MPCB.

The optical sensors receive their inputs from the optical encoder strip and sends this data to the MPCB. The MPCB uses this information to determine the horizontal position of the carrier assembly so that accurate printing can be established.

The paper sensor circuitry senses for the presence of loaded media. It does this automatically during the start-up and load sequences. It also constantly monitors the media during printing to determine if the media has run out.

If no paper is sensed, the paper sensor sends this information to the MPCB, which immediately begins an 'out of paper' subroutine. This subroutine stops the printer from printing until more media is loaded.

The sensor also checks for the size of the media loaded so it can determine the proper printing parameters.

# Keypad

The Keypad is located on the right side of the printer and consists of 8 variable-action control buttons and an LCD graphics display. The control buttons are assigned different functions and are dependant upon the selections that are presently shown on the graphics display. There are four buttons on the left of the display and four buttons on the right, with the display showing up to eight possible selections.

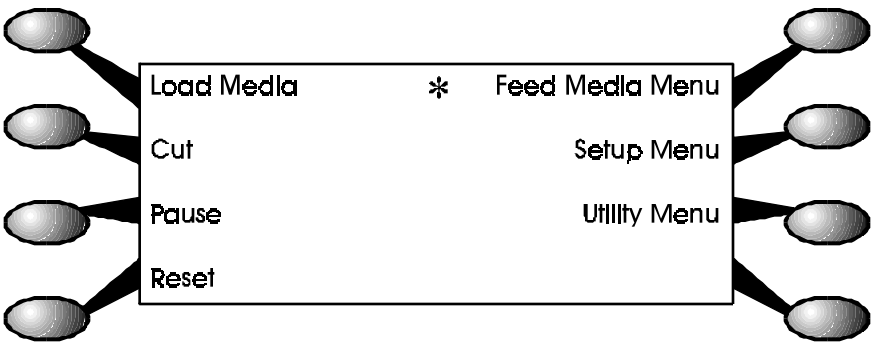


**Figure 2-12. Main Menu.**

Figure 2-12 shows the keypad after the printer has been turned on and finished the start up process. As seen in the figure, the control buttons are assigned to the corresponding command that is displayed closest to the physical location of the button.

# Power Supply

An internal UL recognized switching power module supplies power for the **NovaJet PRO 600e** printer. It provides a constant 24VDC output from input voltage in the 90-132 VAC and 180-246 VAC ranges. A power switch turns the power on and off. The 24VDC is applied to the MPCB where it is further regulated and separated into 24VDC, 13VDC, and 5VDC. The 24V supply is used for: the stepper controller (which advances the paper); the servo controller (which moves the Carriage); and power to fire the inkjets. The 5V supply powers the logic circuits.

The power supply is fused using a 6.3A 250V fast blow type fuse.

The outputs share a common ground which is isolated from earth ground with in the supply itself. Earth ground and DC ground are connected external of the power supply.

The power supply will shut down under overload/short circuit conditions on any output over the full range of input voltage. Overvoltage protection is 20%-30% above nominal for the 24V output.

# Beeper and Fans

The beeper contains built-in driver circuitry so that it beeps under firmware control. The beeper alerts the user to error conditions.

There exists three types of fans on the NovaJet PRO 600e series printers.

A single fan, located behind the power supply, is used for cooling the power supply. Air blows over the power supply and the heated air is forced out the back of the printer.

A fan is located inside the platen with its fan vent seen from under the platen on the right side of the printer. This fan provides suction on the platen bed and holds the paper (media) flat during the printing process. The 60 inch model has an additional suction fan located near the center of the printer inside the platen.

A fan assembly is attached to the lower part of the printer legs that is used to speed up the drying time of the ink that is deposited onto the media. This is to ensure that the ink is completely dry before the media is rolled onto the take-up reel. The 42 inch model has five drying fans, while the 60 inch version has seven.

The drying fan assembly has been designed to keep power consumption down to a minimum by only activating the amount of fans that are required to dry the size of media that is loaded on the printer.

The drying assembly can also be disabled through the printers firmware via the keypad.

# Maintenance 3

## Introduction

This chapter contains general maintenance and cleaning instructions for the **NovaJet PRO 600e**.

## Scheduled Maintenance

Scheduled maintenance consists of a list of checks that are planned to be performed on a regular basis or when conditions warrant it.

Scheduled maintenance can be thought of as preventive maintenance since its purpose is to prolong the life of the printer. It is not intended to repair or isolate an existing problem, though it can sometimes be helpful in detecting a condition due to a weakened component that has not yet completely failed.

Below is a list of scheduled maintenance checks and their recommended periodicity.

| | |
|---|---|
| Clean external areas: | weekly, or as required |
| Clean slide shaft: | monthly |
| Clean service station: | biweekly |
| Clean encoder strip: | monthly |
| Clean cartridge dimples: | if prime fails |
| Clean flex cable contacts: | if prime fails, or cartridge is replaced |
| Clean and inspect motor gears: | annually |
| Clean and inspect MPCB: | annually |
| Clean and inspect carrier assembly: | annually |
| Reseat connectors on MPCB: | annually |
| Reseat connectors on carriage board: | annually |
| Replace carriage bushings: | semiannually |

# Cleaning Procedures


Always turn the printer OFF, remove the power cord and the interface cable before cleaning the printer. An electrical shock hazard may be present if these procedures are not followed.

## External Cleaning


Do not use abrasive cleansers of any sort on the surfaces of the printer. Damage to the surface may result.

The exterior surfaces of the printer may be cleaned with a soft cloth which has been dampened. For more persistent stains, a small amount of liquid detergent may be used. Cleaning intervals are determined by the environment in which the printer is used.

## Slide Shaft Cleaning


Use only isopropyl alcohol on the slide shaft of the printer. Damage to the stainless steel slide shaft may result if cleaned with water and not completely dried off.

Printer problems can be caused by an accumulation of dirt or other contamination on the slide shaft. This contamination may lead to drag on the carriage. Extreme drag results in a "carriage axis failure" fault and will stop the carriage motion. These problems may be eliminated by maintaining and cleaning the slide shaft at intervals determined by the environmental conditions. **Do not use any lubrication.**

To clean the slide shaft:

1. Turn the printer OFF and remove the power cord.
2. Raise the printer lid.
3. Moisten a clean cloth or paper wipe with isopropyl alcohol.
4. Wipe the length of the slide shaft with the moistened cloth or wipe.
5. Manually move the carriage assembly from side to side.
6. Wipe the shaft again to remove any deposits left from the carrier.
7. Close the cover and reconnect the power cord, turn the printer ON and perform the PRIME procedure. Be sure that the carrier moves freely on the slide shaft.

## Service Station Cleaning

Ink and dust may build up on the service station, resulting in contamination which may smear the prints. The service station is cleaned as follows:

1. Turn the printer OFF. Disconnect the power cord and interface cable.
2. Raise the printer dust cover.
3. Carefully move the carriage toward the center of the printer.

4. Using a cotton swab dampened with distilled water, wipe the seals and the rubber wiper in the service station until no more ink residue or dust can be removed.

5. With a dry swab, wipe all moisture from the seals and wipers.

6. Close the lid and reconnect the power cord and interface cable.

7. If the service station is full of ink or very dirty it can be removed and rinsed under warm water in the sink. To remove, pull the tab on the right side of the service station and lift out. Wash, dry thoroughly and replace by placing the left side in first then pushing down on the right side until the tab locks it in place.

## Linear Encoder Strip Cleaning

Clean the linear encoder strip monthly or as necessary to remove any buildup of debris. Distilled water or isopropyl alcohol may be used. You may notice that it tends to fog the encoder strip; however, no detrimental effect has been observed in the field.

To clean the Encoder Strip:

1. Disconnect the power cord and interface cable.

2. Slightly dampen a cotton swab with distilled water or isopropyl alcohol and wipe along the length of the encoder strip on both sides.

3. Reconnect the power cord and interface cable.

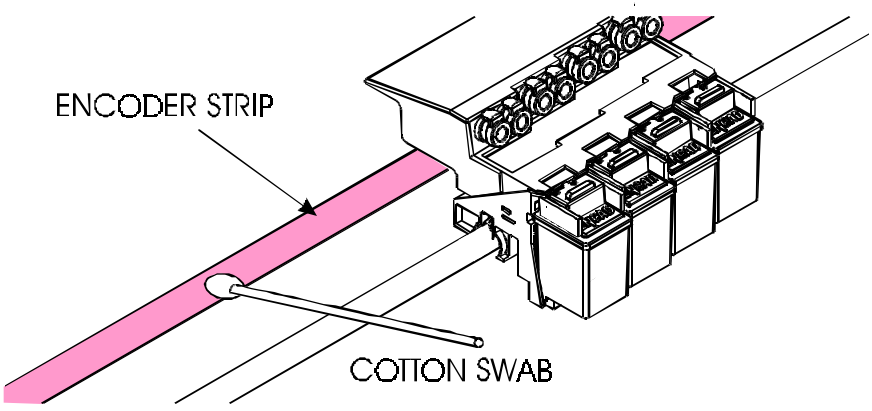


**Figure 3-1. Encoder Strip Cleaning.**



## Cartridge Dimples Cleaning

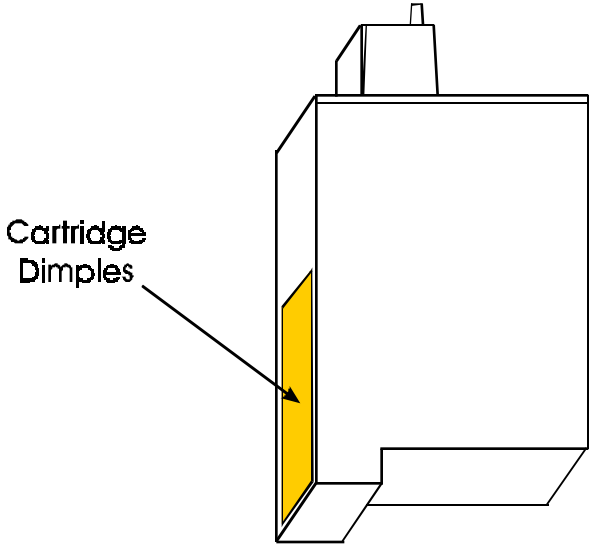


**Figure 3-2. Cartridge Dimple Region.**

The cartridge dimple area can easily be contaminated by oils and dirt on fingers and hands or ink spilled onto them. This causes the cartridges to not receive some of the electrical signals for a proper firing of the jets. This can be seen as a misfiring of the cartridge.

## NOTE

Care should be used when handling the cartridges. Avoid touching the cartridges on the dimple area or on the inkjet holes on the bottom. The oils and dirt on fingers and hands can contaminate the area and result in misfiring of the inkjets.

Clean the cartridge dimple area by gently dabbing the area with a lint free cloth or cotton swab saturated with isopropyl alcohol.

## Flex Cable Contact Cleaning

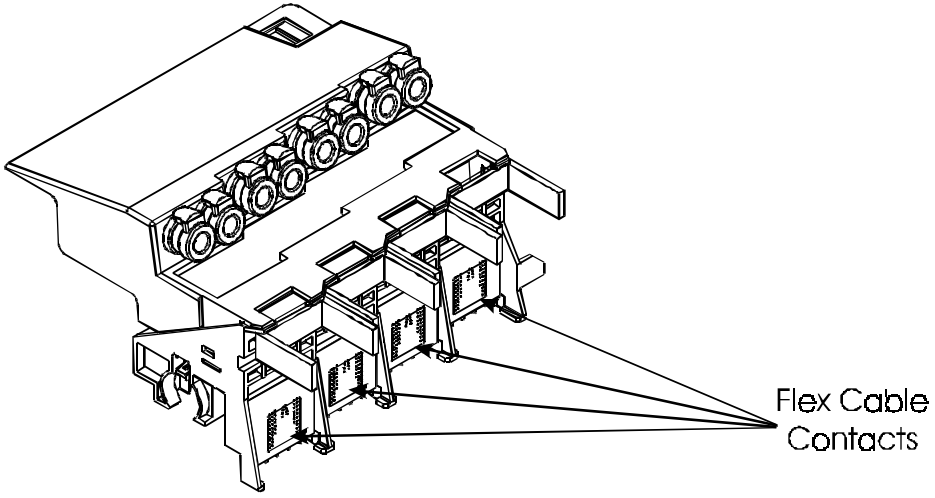


**Figure 3-3. Flex Cable Contacts.**

Cleaning the flex cable contact area is very important due to the ease of which this area can become dirty. This also causes the cartridges to not receive all of the electrical signals for a proper firing of the jets. This can be seen as a misfiring of the cartridge.

## NOTE

Care should be used when handling the flex cable contact area. Avoid touching the contact area because the oils on your skin can contaminate the area and result in misfiring of the inkjets.

Clean the flex cable contacts by gently dabbing the area with a cotton swab soaked with isopropyl alcohol.



## Clean and Inspect Stepper Motor Gears

The stepper motor gears can become dirty and after time if not cleaned up, it could cause wide banding in the print. This will reduce the quality of the intended output. Clean the motor gears with a stiff brush to knock off any debris. A cotton swab soaked isopropyl alcohol can be used to remove any ink that may have accumulated on the gears.

## Clean and Inspect MPCB

Foreign material on the MPCB could short out electrical signals being developed on the MPCB and cause erroneous prints or even damage to the MPCB. All electrical circuits should be free of foreign material, especially those materials with conductive properties.

Clean the MPCB by blowing the objects away or gently brush them aside with a soft brush if required.

Inspect the MPCB for any damage to the board, connections, or any of the components on the board. Replace board if inspection reveals any damage or flaws that could effect the function of the MPCB.

## Clean and Inspect Carriage Assembly

Foreign material on the carriage assembly could short out signals being developed on the carriage assembly and cause erroneous prints or even damage to the carriage assembly. A very common problem is where ink has been spilled onto the carriage assembly. All electrical circuits should be free of foreign material, especially those with conductive properties.

Clean the carriage assembly by blowing the objects away or gently brush them aside with a soft brush if required. Be careful not to let anything to fall into the printer as you clean or it could cause a new problem later.

Inspect the carriage assembly for any damage to the boards, connections, or any of the components on the assembly.

## Reseat Connectors on MPCB and Carriage Board


Integrated circuits may become weakened or damaged by electrical discharge. Do not touch or work near integrated circuits without wearing an ESD wrist strap.


Ribbon connectors can be easily damaged if incorrectly handled. Observe extreme caution when handling the ribbon connectors to avoid damage.

Many problems can be corrected simply by removing and reseating connections found in circuit assemblies. This process helps to clean the contacts and can dissipate any static electrical charges that might have developed.

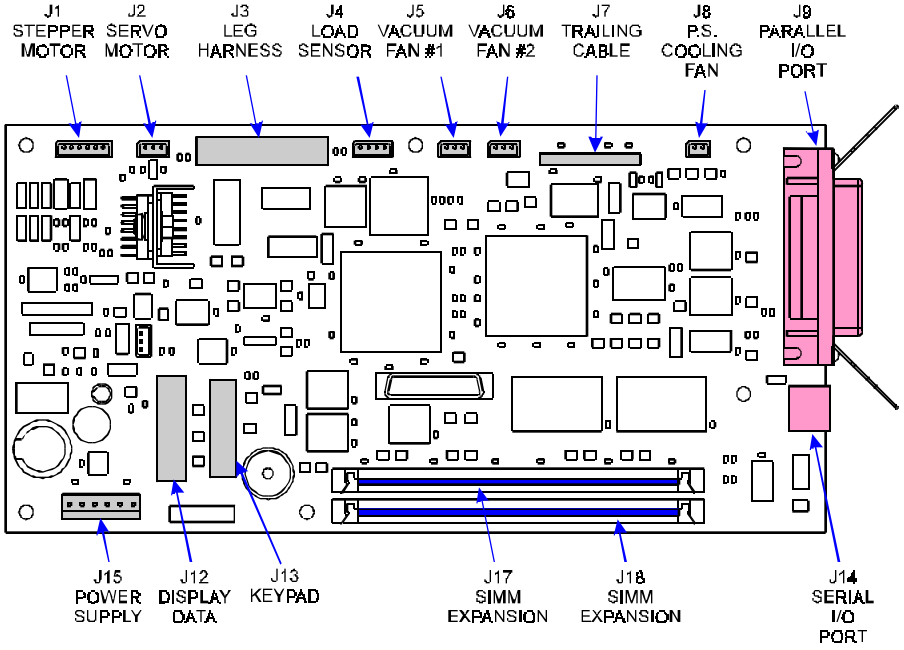


**Figure 3-4. MPCB Connection Locations.**

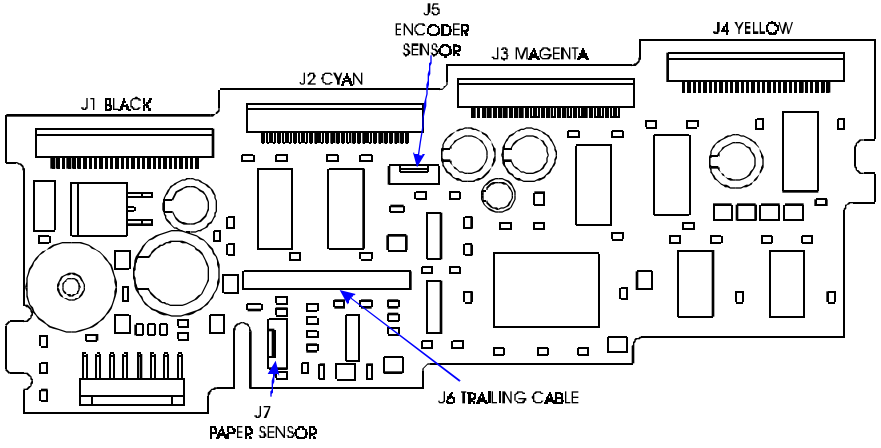


**Figure 3-5. Carriage Connection Locations.**

Figures 3-4 and 3-5 shows the locations of all the connectors on the MPCB and carriage board respectively. To remove the ribbon cables from their connectors, lift the connector's ribbon locking mechanism as shown in figure 3-6. To reattach, depress the locking mechanism back into the locking position after inserting the ribbon cable end.

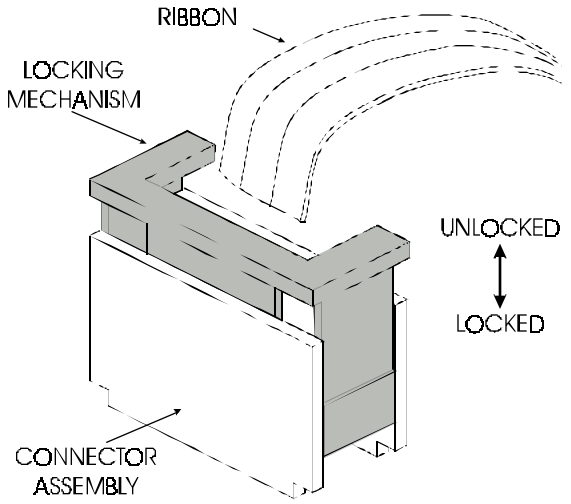


**Figure 3-6. Ribbon Connector Locking Mechanism.**

## Replace Carriage Bushings

The carriage bushings are rated for approximately 1500 hours of operational usage. Many factors including, but not limited to, hours/day used, cleanliness of the slide shaft and general ambient environment make it impossible to calculate the average time that the carriage bushings to last.

If not replaced, the wear on the bushings can result in erratic carriage motion and/or carriage axis failures. It can even cause the cartridge head height to become uneven.

To replace the carriage bushings, follow the procedures for Carriage Bushing Replacement found in Chapter 5.

# Servo Motor Winding Resistance Check

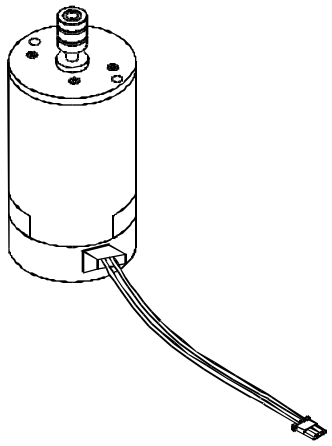

**Figure 3-7. Servo Motor.**

1. Disconnect the servo motor connection from J2 on the MPCB.

2. Using a standard ohmmeter or multimeter, connect the meter leads to the two wires going to the motor.

3. While manually rotating the servo motor, monitor the readings on the meter. The acceptable range is 6-30 ohms. Typically, the reading is 7-11 ohms.

5. If the measurement is found to be unsatisfactory, replace the servo motor.

# Stepper Motor Winding Resistance Check

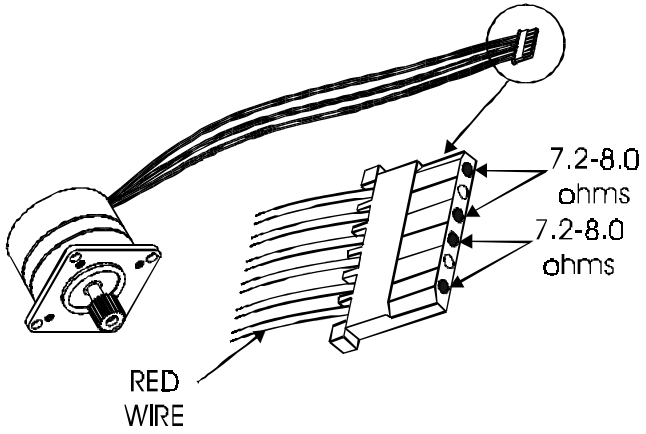


**Figure 3-8. Stepper Motor.**

1. Disconnect the stepper motor connection from J1 on the MPCB.
2. Using a standard ohmmeter or multimeter, measure between pins 1 (red wire) and 3.
3. The reading should indicate 7.2-8.0 ohms.
4. Continue by measuring between pins 4 and 6.
5. Reading should also indicate 7.2-8.0 ohms.
6. If either measurement is out of tolerance, replace the stepper motor.

# Power Feed and Take-Up Motor Winding Resistance Check

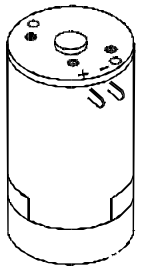

**Figure 3-9. Power Feed and Take-Up Motor.**

1. Remove the feed and/or take-up roll from the printer.

2. Using Phillips screwdriver, remove the four screws that secure the cradle idler from the right leg.

3. Ease the cradle idler off of the leg enough to disconnect the motor wires from the leg harness.

4. Using a standard ohmmeter or multimeter, measure between the + and - connections on the motor. While manually rotating the servo motor, monitor the readings on the meter. The acceptable range is 25-40 ohms. Typically, the reading is 29-36 ohms.

5. If the measurement is found to be unsatisfactory, replace the motor.

6. Perform the same procedure on the remaining motor.

# Banding: Hardware vs Software

The technician must be able to identify whether the banding that is being observed is related to either a hardware or a software problem. The two examples in Figure 3-10 represent classic types of hardware and software banding errors.


**Figure 3-10. Examples of Banding.**

Hardware banding is usually characterized by consistent banding strips as shown. It signifies a slippage in the media's normal movement that is possibly due to the stepper motor, lower drive shaft assembly, pinch rollers, or the rollguides on the back of the printer. All these possible faulty areas deal with a rotational movement that, if faulty, will generate a consistent banding pattern. The MPCB and Carriage PCB can also cause this type of error to incur.

Software banding is characterized by inconsistent banding lines. These banding lines are generated by the software when the application incorrectly interprets the media advancing/ink firing sequence of the expected print file. Because it is not directly tied to a mechanical movement, the bands become inconsistent in both frequency and duration. The possible causes are the printer driver, the original software package, or the RIP, if one is used. To eliminate the chance that it is the printer driver:

1) Remove any RIP or network systems and connect the printer directly to the computer.

2) Print a test file approved by ***ENCAD*** that uses only the printer driver software and the ***ENCAD*** printer.

If the test file prints correctly, the problem lies in either the software package that generated the print or the RIP, if used.

A simple test to determine if the banding is caused by the computer/RIP/application or the printer is to rotate the image 90 degrees and see if the banding rotates or remains in the same orientation as the previous print. If the banding does not rotate, then look for causes in the printer. If the banding does rotate with the image, then look for causes in the computer/RIP or application.

## Common Banding Causes

1. Uneven drying. Adjust the drying time to compensate for varying ink percentages and media types. Dry time values range from 10 seconds to 60 minutes. This is especially important in higher humidity environments.

2. The RIP (Raster Image Processor) and print cycles. We recommend printing to a file first and then queuing the file to the printer to avoid the RIP and print cycle delays that can cause banding while printing.

3. Uneven inkjet kogation (partial clogging or orifice restriction) on the inkjet cartridge head nozzles. Run the 100% color test and re-prime or replace the cartridge if necessary.

4. Lower quality print modes normally cause slight bands, to avoid this banding, switch to 4-pass or 6-pass printing modes.

5. Air bubbles in the ink delivery system. This indicates a loss of negative pressure within the ink cartridge or ink delivery system, check all quick release fittings and connections for possible leaks and ensure that the cartridge is primed properly.

6. Improper priming. The lower secondary chamber within the cartridge may de-prime and then temporarily recover after entering the service station causing a momentary color drop out in the print if the cartridge is improperly primed. Please reference Technical Bulletin #97 for a more detailed explaination and the corrective priming procedures.

7. A flow restriction in the ink delivery system or ink starvation in the cartridge. Ink starvation in the cartridge can be caused by a broken valve in a quick release fitting or pinched tube in the ink supply lines of the tubing/chain assembly. Check the ink delivery system for any flow restrictions by disconnecting the ink cartridge needle from the cartridge in question, raise the tip of the needle and observe the rate that the ink flows back into the reservoir. The ink should take approximately 1 inch per second to clear the 3.5 inch cartridge tubing between the cartridge and the first quick release fitting (flowing back toward the reservoir), if it takes longer than this, you may need to replace a defective quick release fitting (near the cartridge or the reservoir) or tubing/chain assembly.

8. Wiping during a print can sometimes cause a band of lighter density color in the image. Auto wipe may need to be temporarily turned off to prevent banding.

9. Operator intervention. If someone lifts up the media on the take-up side of the printer while it is printing, it can cause momentary banding in the print. Lifting up the media while printing changes the inkjet head-to-media distance and will effect the printed dot size and placement of the ink droplets.

10. Cartridge failures can cause banding — electrical cartridge failures and partial clogging of the inkjets can produce banding. With Inkjet Detection and Compensation technology, electrical cartridge failures and clogging can be corrected for up to 20 failures per cartridge with minimal degradation of the output.

11. Media width variations causing the media to drag on the media guides can cause banding. Check the edges of the media for evidence of media drag and edge anomalies.

12. Lower quality dithering. Select the highest quality dithering pattern in the printer driver. i.e. stochastic dithering.

13. Deadband and cartridge calibrations. If the deadband calibration is off, or the cartridge calibration is off, it can effect banding. Also, if one color seems to be causing the banding — shifting the color calibration of that color +/-1 unit may help.

14. Inkjet sputter. If the cartridge heater is set too high, inkjet sputter may occur causing intermittent white spots throughout the print.

15. Improper grounding or earthing. An improper A/C outlet power ground may cause banding due to excessive noise on the line between the neutral and ground. Ensure the outlet has a clean zero ground potential with minimal noise between the neutral and ground.

16. Static electricity. Using certain types of media (i.e. polyester-based media), static electricity buildup within the media roll may effect the un-roll resistance and cause momentary banding to occur. However this has not been tested.

17. Data corruption may also effect banding. If you are using a parallel cable that is too long or improperly shielded, the data being sent to the printer may get corrupted and cause artifacts in the print.

18. Overlapping images of different types on the same print may create color bands between the images at the overlaps (i.e. RGB images with CMYK images).



# Alignments/Adjustments

The ***ENCAD* NovaJet PRO 600e** printers are designed with a minimum of maintenance requirements in mind. Calibrations include: color calibration, deadband alignment, and X-axis calibration. The mechanical adjustment requirements include the slide shaft profile and cartridge head height adjustments. They do not require any electrical alignments.

## Slide Shaft Profile Adjustment

The **NovaJet PRO 600e** printers Slide Shaft height is factory set to 1.418" (36mm) from the top of the Slide Shaft to the Platen surface. The normal operating range for the height of the Slide Shaft is between 1.390" (35.3mm) to 1.440" (36.6mm). The Slide Shaft is firmly mounted on the outer sides and only has adjustments in the middle portion of the shaft, to remove any bowing of the shaft's profile. The following proce-

dure is to ensure that the Slide Shaft is relatively perpendicular to the surface of the Platen and to remove any bowing that may be present in the shaft's profile.

You will need the following:

- Height Gauge Kit Assembly
- 1/4" open and box end wrench (.110" thick)

Height Gauge (Alignment) Kit Contents are:

Dial Gauge Micrometer
Modified Novajet PROe/PRO 600e/1500 TX Cartridge
Modified Novajet 4/Pro/Pro 50 Cartridge - Not Used
Platen/Carriage Shaft Mounting Block
Calibration Jo Block (1.434") - Not used
Plastic Gauge Card (0.011") - Not used

There are two basic measurements that are to be made using this kit (ensure power is off prior to performing these procedures):

1. Slide Shaft Profile Adjustment
2. Carriage (Cartridge) Head Height Setting

1. Connect the dial gauge micrometer to the Shaft mounting block as shown in Figure 3-11.

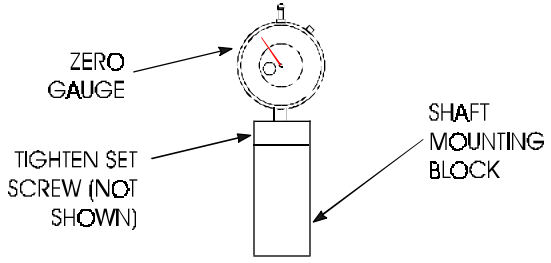


**Figure 3-11. Dial Gauge Micrometer Assembly.**

2. Place gauge against left side of shaft assembly allowing micrometer tip to rest directly on top of shaft. See Figure 3-12. **Zero the gauge** (this is to become the reference point).

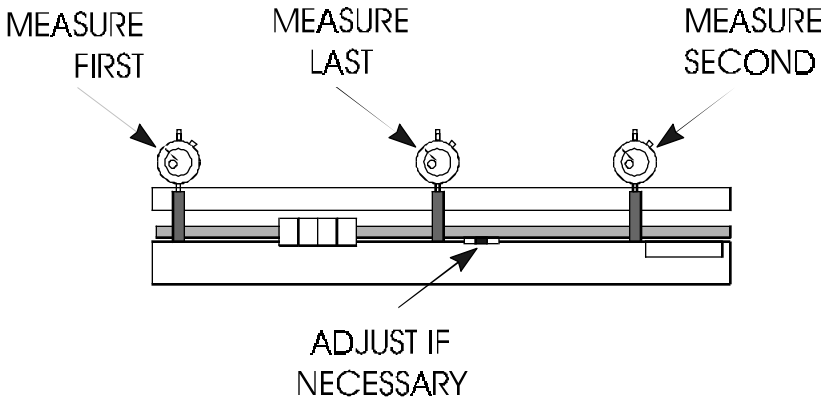


**Figure 3-12. Measurement Positions for Slide Shaft.**

3. Measure the right side (next to media alignment mark.) and note the difference. Divide this amount by two.

4. Measure just off the center of the slide shaft and adjust the center turnbuckle with an open ended wrench if required, for the average value (the value found in step 3.) See Figure 3-13.

## NOTE

The NovaJet PRO 600e 60 inch model has two turnbuckles, so these need to be adjusted together for the center position.

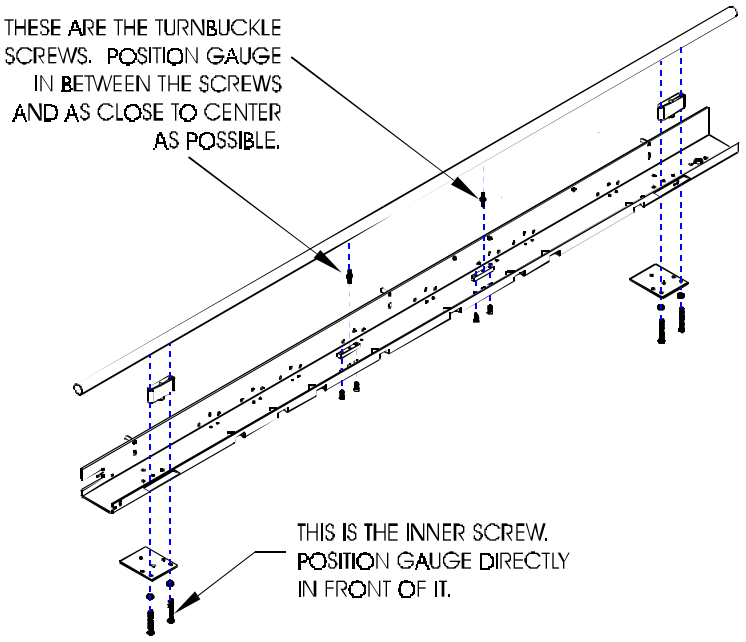


**Figure 3-13. Slide Shaft Profile Adjustment.**

For example: If the Left = 0, Right = +0.004", then the center should be adjusted to + 0.002". This will ensure a smooth plane of travel for the carriage assembly. There are no adjustments on either end of the shaft in all models.

## Head Height Alignment Procedure

Perform this procedure only when the encoder strip stabilizer has been removed from the Y-Arm or whenever the alignment is in question. The head height alignment procedure is to ensure that a 0.065" +/- 0.003" difference exists between the cartridge jet plate and the Platen. See Figure 3-14.

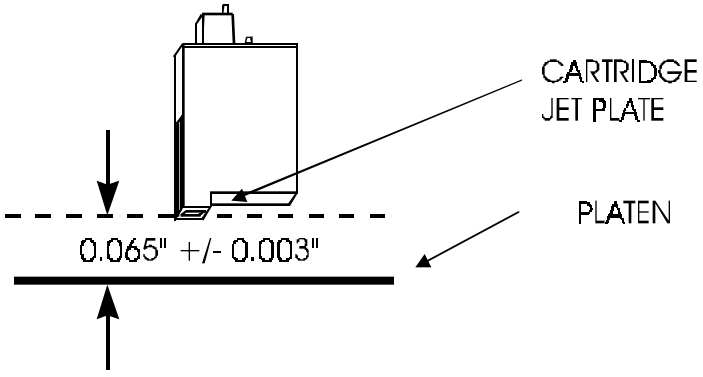


**Figure 3-14. Carriage Head Height Tolerance.**



1. Remove the lid and the right cover of the printer. See Chapter 5 for procedures.

2. Obtain the 3 tools (Micrometer Dial Gauge, Test Cartridge, and Measuring Tip Extender) from the Height Gauge Kit. Assemble the tools as shown in Figure 3-15.

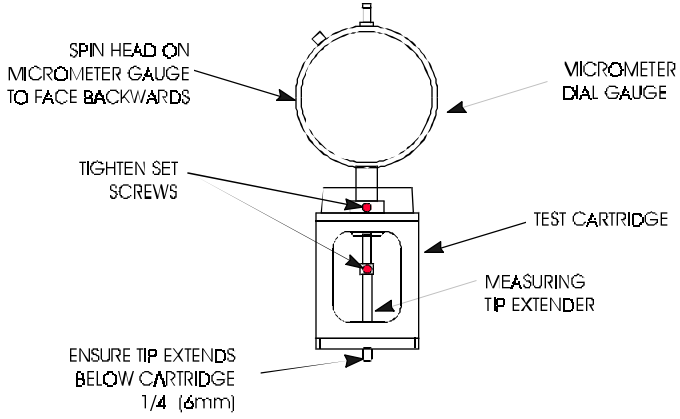


**Figure 3-15. Setting Up Tools from Height Gauge Kit.**

3. Place the test cartridge upright on a flat surface and 'zero' the gauge by loosening the knob near the top and turning the dial until the needle is at the '0' position on the dial. Tighten the knob. See Figure 3-16.

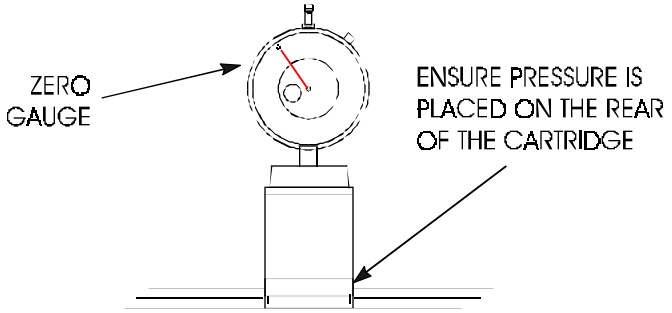


**Figure 3-16. Zeroing the Micrometer Gauge.**

4. Remove the Cyan ink cartridge. Snap the test cartridge with the micrometer gauge into the position vacated by the Cyan ink cartridge. See Figure 3-17. Ensure that the micrometer can be read from the BACK of the printer.

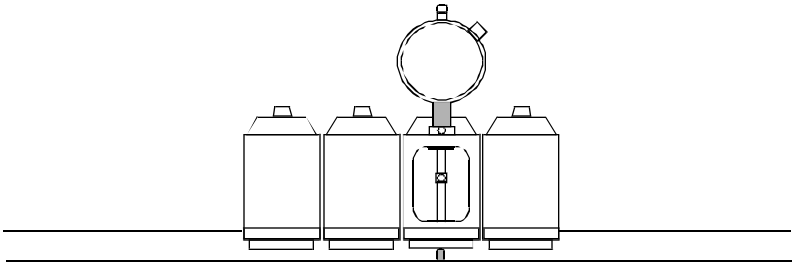

**Figure 3-17. Test Cartridge Installed.**

5. Slightly loosen the screws located on the back of the Y-arm that secures the stabilizer to the Y-arm.


Damage may occur to the micrometer gauge if the Carriage is moved without lifting up on the measuring tip. This action could also take the micrometer out of alignment and foul the results of the alignment.

6. While lifting up the measuring tip of the micrometer, slide the Carriage to the left side of the stabilizer. Position it as close to the screw as possible and drop the measuring tip onto the platen. Do this a couple of times to ensure an accurate reading.

7. Move the left end of the stabilizer bracket until a reading of 0.075" +/- 0.003" is observed. Read only the RED numbers on the micrometer gauge.

## NOTE

The measurement of 0.075" instead of 0.065" as stated earlier is used due to the fact that the test cartridge does not contain a jet plate assembly. A 0.010" difference had to be added to compensate for the lack of a jet plate assembly on the test cartridge.

8. Tighten the screw on the left side of the stabilizer.

9. While lifting up the measuring tip of the micrometer, slide the Carriage to the right until the next stabilizer screw is lined up. Position it as close to the screw as possible and drop the measuring tip onto the platen. Do this a couple of times to ensure an accurate reading.

10. Move the left end of the stabilizer bracket until a reading of 0.075" +/- 0.003" is observed. Read only the RED numbers on the micrometer gauge.

11. Tighten the screw on the stabilizer that is next to the Carriage.

12. Continue performing steps 10 through 12 until all four of the stabilizer screws have been adjusted.

13. Reposition the Carriage to all of the adjustment positions and verify that the measurements are correct.

14. Perform steps 6 through 14 as many times as necessary to correctly accomplish this adjustment.

# Color Calibration

This procedure describes how to check that the cartridges are properly aligned for color plotting and should be followed each time the ink cartridges are installed. Figure 3-18 is a representation of how a color calibration looks when printed.

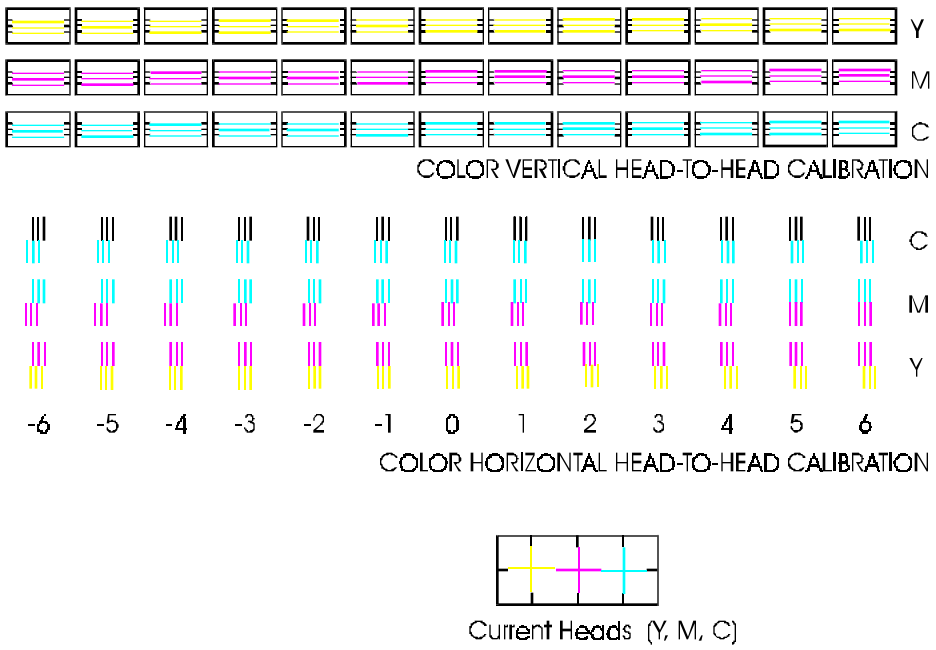


**Figure 3-18. Color Calibration.**

The “Current Heads (Y, M, C)” view represents the alignment of the heads as they are currently entered. This is just an overview of all heads and how they are aligned. Do not attempt to align the heads using this view.

The “Color Horizontal Head-to-Head Calibration” checks the alignment of the nozzles horizontally and allows corrections when required. Just enter the value below the set of lines that are correctly aligned. Be careful that you are aligning the correct color by observing the C (cyan), M (magenta), and Y (yellow) on the right side of the plot.

The “Color Vertical Head-to-Head Calibration” checks the alignment of the nozzles vertically and allows corrections when required. Just enter the value below the set of lines that are correctly aligned. Be careful that you are aligning the correct color by observing the C (cyan), M (magenta), and Y (yellow) on the right side of the plot.

To perform the Color Calibration:

1. Select “Utility Menu” from the Main Menu. This brings up the Utility Menu as shown in Figure 3-19.

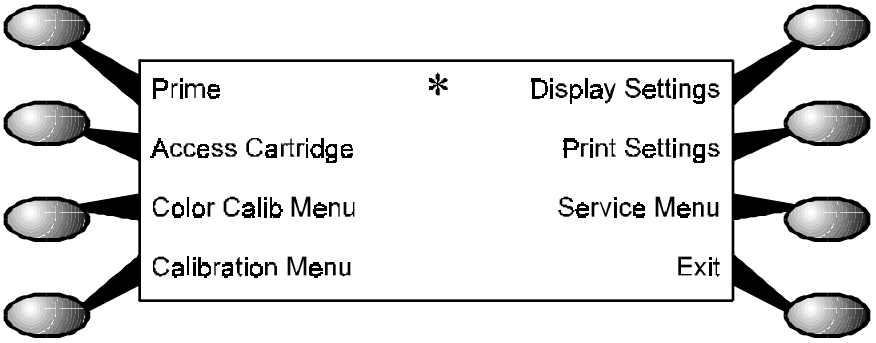


**Figure 3-19. Utility Menu.**

2. From the Utility Menu, select “Color Calib Menu”. This brings up the color calibration menu and it looks like Figure 3-20.

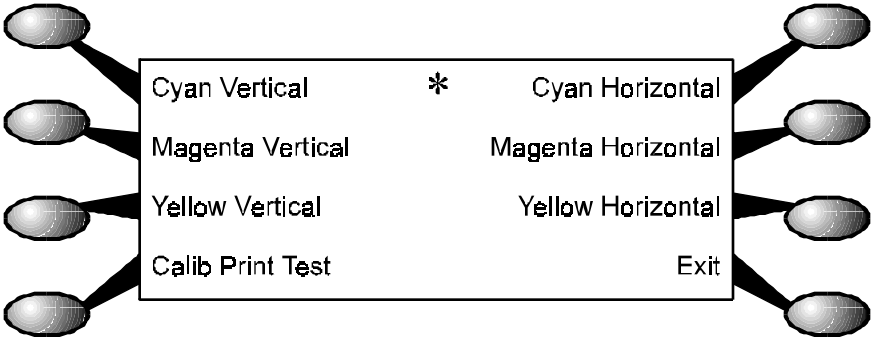


**Figure 3-20. Color Calib Menu.**

3. Select “Calib Print Test” to print the color calibration plot as shown in Figure 3-18.

4. When the plot is complete, select “Cyan Vertical” at the Color Calib Menu. This brings up the options menu for the cyan vertical adjustment as shown in Figure 3-21.

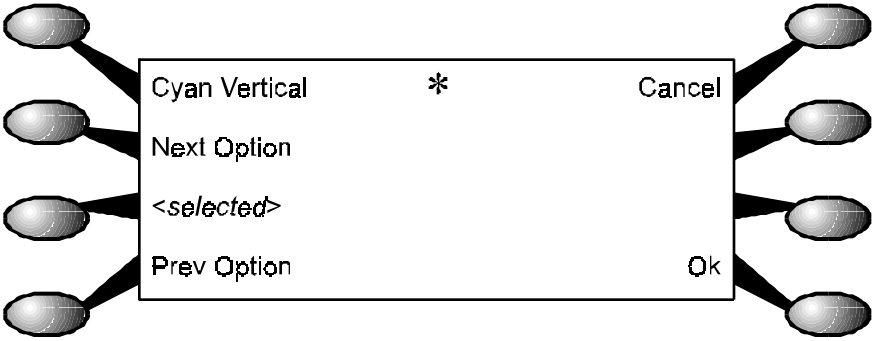


**Figure 3-21. Cyan Vertical Options Menu.**

5. Observe the plot and using either “Prev Option” or “Next Option”, rotate through the selections until the one that best aligns the cyan color on the plot is selected. Press “Ok” to accept the selection and return to the Color Calib Menu.

6. Continue until all six calibrations on the Color Calib Menu have been accomplished.

## Deadband Alignment

Deadband calibration compensates for minute differences created when bidirectional printing is used. Unidirectional printing is not affected by deadband. There are four types of deadband tests:

slow deadband
fast deadband
fast deadband; vertical lines (all)
fast deadband; vertical lines (one)

**Figure 3-22. Deadband Slow/Fast.**

Figure 3-22 shows what the display will look like when printing either the fast or slow test if it is out of alignment. A correctly aligned printer will appear as if there is only a series of vertical lines printed. No difference between the top and bottom set of lines to the center set of lines would be appearant.

The SLOW DEADBAND calibration is a precision test that checks the firing time of the jets as related to the forward and reverse direction.

Allowable values for the Slow Deadband is from -2 to 2, and from 0 to 120 for the Fast Deadband.

The Single Line Test and All Line Test are variations of the Slow and Fast Tests except they print longer lines so that long time integration of the deadband calibration can be observed. The Single Line Test prints only one line at a time while the All Line Test prints all lines at the same time.

To perform the Deadband Alignments

1. Select "Utility Menu" from the Main Menu. This brings up the Utility Menu as shown in Figure 3-19.

2. Select the "Service Menu" from the Utility Menu. This brings up the Service Menu as shown in Figure 3-23.

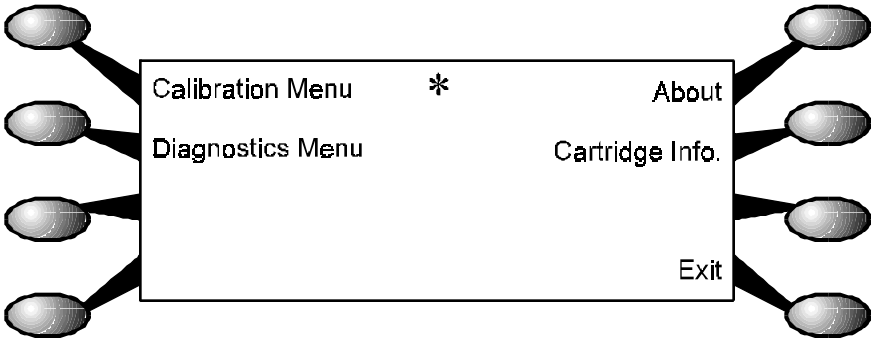


**Figure 3-23. Service Menu.**

3. Select the “Calibration Menu” from the Service Menu.

4. The Calibration Menu is shown in Figure 3-24 and is where all the deadband tests are performed. Select “Deadband Test” to perform the fast deadband test.

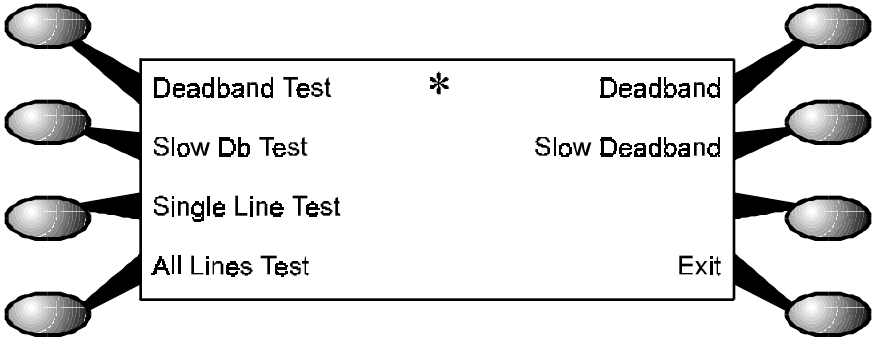


**Figure 3-24. Calibration (Deadband) Menu.**

5. When the plot is complete, select “Deadband” at the Calibration Menu. This brings up the options menu for the fast deadband adjustment. This menu is similiar to the menu depicted in Figure 3-21.

## NOTE

The values for the fast deadband adjustment is equivalent to 300 sections per inch. For every incremented value, the print will move 1/300 of an inch. Positive values move the middle segment to the right, while more negative values move the middle segment to the left.

6. Observe the plot and using either “Prev Option” or “Next Option”, rotate through the selections until one that seems closer to the correct value is selected. Press “Ok” to accept the selection and return to the Service Menu.

7. Continue performing steps 4 through 6 until the fast deadband adjustment is correct.

8. At the Calibration Menu, select “Slow Db Test” to run the slow deadband test.

9. When the plot is complete, select “Slow Deadband” at the Service Menu. This brings up the options menu for the slow deadband adjustment. This menu is similiar to the menu depicted in Figure 3-21.

10. Observe the plot and using either “Prev Option” or “Next Option”, rotate through the selections until one that seems closer to the correct value is selected. Press “Ok” to accept the selection and return to the Service Menu.

11. Continue performing steps 8 through 10 until the slow deadband adjustment is correct.

## Paper Axis Calibration

The paper axis calibration procedure ensures that the processing that drives the stepper motor is correct to minimize line length accuracy errors.

To perform the paper axis procedure:

1. Select “Utility Menu” from the Main Menu. This brings up the Utility Menu as shown in Figure 3-19.

2. From the Utility Menu, select “Calibration Menu”. This brings up the Calibration Menu as shown in Figure 3-25.

3. From the Calibration Menu, select “Use Calib XY.” Ensure that Use Calib XY is set to ON and press “Ok.” This allows the printer to store the data that is entered in step 7.

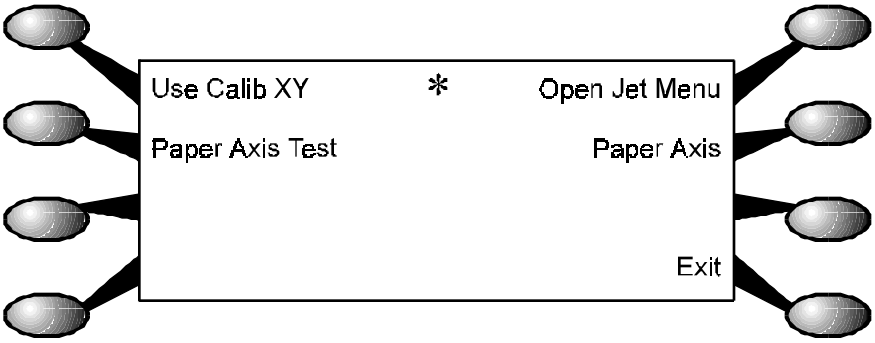


**Figure 3-25. Calibration Menu.**

4. From the Calibration Menu, select “Paper Axis Test”. This runs the paper axis test which prints out two “T” figures that are mirrored from each other and about 33” apart. See Figure 3-26.

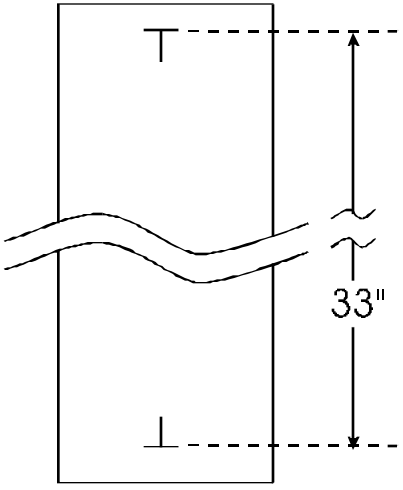


**Figure 3-26. Paper Axis Test.**

5. With a precision drafters measuring stick, measure the exact distance from each of the "T" intersections.

6. Select "Paper Axis" at the Calibration Menu. This brings up the options menu for the paper axis adjustment. This menu is similiar to the menu depicted in Figure 3-21.

7. Using either "Prev Option" or "Next Option", rotate through the selections until the exact value of the measurement found in step 5 is selected. Press "Ok" to accept the selection and return to the Calibration Menu.

# Diagnostics Menu

The Diagnostics Menu is located in the Service Menu (shown in Figure 3-23) and is seen in Figure 3-27.

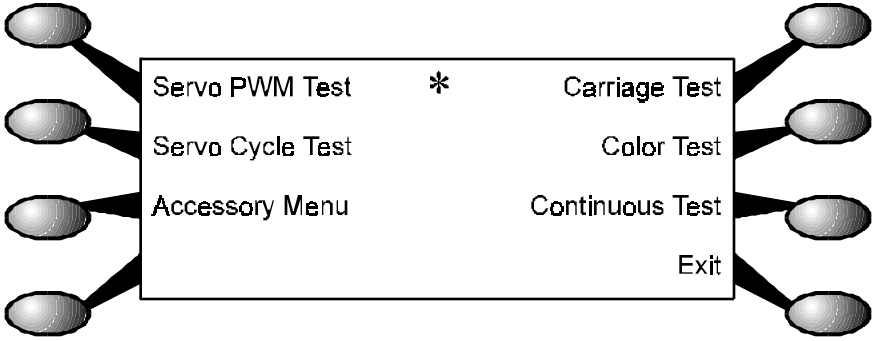


**Figure 3-27. Diagnostics Menu.**

All tests under the Diagnostics Menu should be performed by competent technicians only. The types of tests that can be performed are: Servo PWM Test, Servo Cycle Test, Carriage Test, Color Test, Continuous Test, Fan #1 Test, Fan #2 Test and Legs Test.

The Fan #1 Test, Fan #2 Test and Legs Test are located in the Accessory Menu as shown in Figure 3-28.

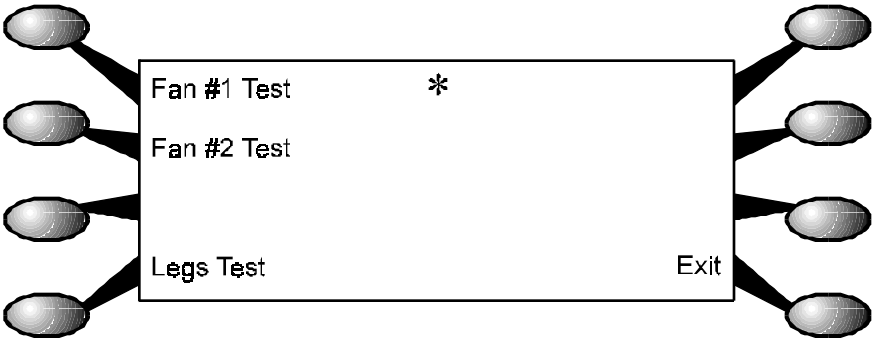


**Figure 3-28. Accessory Menu.**

Servo PWM Test - Monitors the PWM (pulse width modulation) signal applied to the servo motor from the driver on the MPCB to check the amount of force required to move the Carriage. The test includes three complete cycles of the carriage assembly and lists the average PWM, the maximum PWM, and the position of the carrier where the maximum PWM occured.

Servo Cycle Test - Tests the servo motor by moving the carrier back and forth across the slide shaft. The number of cycles is selectable and the available options are:

10
100
1,000
10,000
100,000
1,000,000.

Carriage Test - Prints 5 sets of 3 parallel lines to test the vibration characteristics of the carriage assembly.

Color Test - The Color Test prints a wide swath of color (total of four) to test for banding. The test is selectable in the amount of ink that is to be printed. The available are: 10%, 25%, 35%, 50%, 65%, 75%, and 100%.

Continuous Test - The Continuous Test sends the printer into a test loop that will perform a series of tests continuously. Powering down and restarting the printer is the only way of exiting this test loop.

The Continuous Test will first prime the cartridges, followed by a serial port test, parallel port test, a fast deadband display and a color calibration display.

The deadband and color calibration displays are used only as a visual inspection of the operating condition of the printer. No adjustments can be performed while in the Continuous Test mode.

A loopback Test Cable is required to correctly accomplish the serial and parallel port tests. Install both ends of the Loopback Cable before running this test. The Loopback Test Cable is listed in Chapter 6.

After completing the deadband display, the test will begin again with the prime and continue until power is removed.

Fan #1 and Fan #2 Tests - Tests the operation of the fans on the printer. Fan #1 Test (while depressed) turns on the power supply cooling fan and the suction fan inside the platen on the right side of the printer. Fan #2 Test (while depressed) turns on the suction fan inside the platen near the center of the printer. The 42 inch printer does not have this second suction fan, therefore, the Fan #2 Test is disabled.

Legs Test - Tests the condition of the leg harness connections and the components of the power feed and take-up system.

# Limited Access Menu

A menu that is not accessable to the operators can be activated in the Service Menu as shown in Figure 3-29. Press the lower left button in the Service Menu to bring up the Code Menu. The code to be entered to bring up the hidden menu is “16753.”

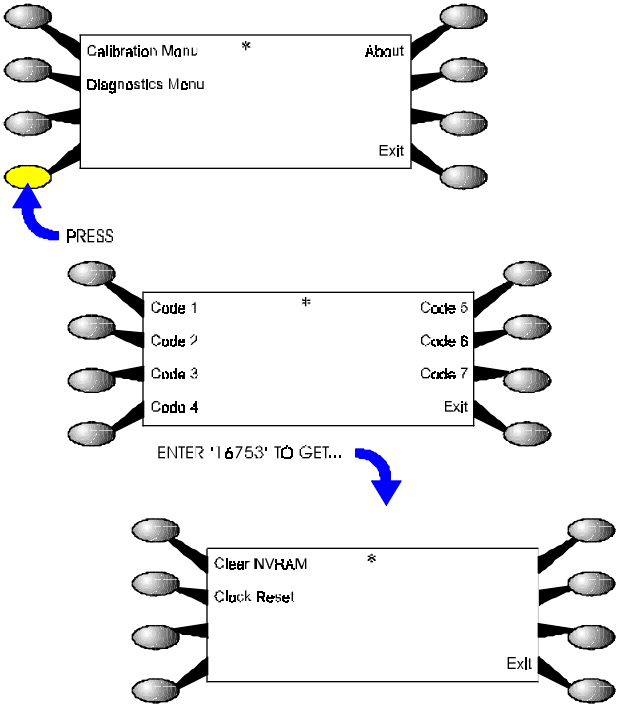


**Figure 3-29. NVRAM Clear and Clock Reset Menu.**

This menu allows the technician to clear the NVRAM and to reset the system clock.

Clear NVRAM - Clearing the NVRAM is required anytime that a MPCB is to be permanently removed from a printer. The NVRAM is a section of nonvolatile memory that stores printer size information. The MPCB is the identical for both printers but it will have to learn which size printer it is installed in. Clearing the NVRAM allows the MPCB to relearn which size printer it is reinstalled into.

Clock Reset - Resets the system clock to "000." This procedure should only be accomplished when refurbishing a MPCB and installing it into another printer.

# Firmware Download/Upgrading for the PC

The normal method of downloading new firmware is to send the file as if it was a standard print job.

To perform the firmware download, follow the steps listed below:

1. Power OFF printer, wait 15 seconds.

2. Connect parallel printer cable between the printer and PC.

3. Turn the printer ON.

4. Obtain the latest firmware for the NJ PRO 600e printer from either the BBS or web site. Save both of the files to the same directory on the hard drive. Double click on 600E.EXE file to inflate the compressed files. The file name might be different then listed above.

5. Go to a DOS environment and from within that same directory type: **`GO 600E.ROM`** and press Enter. The firmware is sent to the printer as an ordinary print job.

## NOTE

For NT3.5x or NT4.0 systems click on “Start” - “Programs”, “Command Prompt.” At the “dos” prompt go to the location of the .ROM (i.e.: if the .ROM file is on a floppy disk, type `A:` and press Enter.

Then type: **`PRINT /D:LPT1 A:\600E.ROM`** and press Enter.

6. Wait approximately 20 to 40 seconds later until you hear a SINGLE beep, indicating the download was successful. You may encounter a set of double beeps shortly after sending the firmware file, but you must wait until you hear the SINGLE beep.

7. After hearing the single beep, remove power from printer for 15-20 seconds. Apply power to the printer. The printer should initialize properly. Verify firmware revision by sequencing through **Utility Menu - Service Menu - About** menu. Verify firmware has been incorporated.

8. If the firmware download is **not** successful you may hear more than 1 beep or complete silence. Check parallel port connections and return to step 5.

# Firmware Download/Upgrading for the MAC

The normal method of downloading new firmware is to send the file as if it was a standard print job.



1. Power OFF printer, wait 15 seconds.

2. Connect an Image Writer II cable between the printer and MAC.

3. Turn the printer ON.

4. Obtain the latest firmware revision from the ENCAD web site, unpack the file and launch the “600E Firmware Utility.” File names may be different then that listed above.

   Click on “File”

   Click on “Preferences”

   Select the appropriate port that the NJ PRO 600e printer is connected to (either Modem or Printer.)

   Drag and Drop the **600E.ROM** file (or the latest version) into the “Spool Folder”.

   Wait approximately 20 to 40 seconds later until you hear a SINGLE beep, indicating the download was successful. You may encounter a set of double beeps shortly after sending the firmware file, but you must wait until you hear the SINGLE beep.

5. After hearing the single beep, remove power from printer for 15-20 seconds. Apply power to the printer. The printer should initialize properly. Verify firmware revision by sequencing through **Utility Menu - Service Menu - About** menu. Verify firmware has been incorporated.

   If the firmware download is not successful you may hear more than 1 beep or complete silence. Check port connections and return to step 4.

# Internal Cabling and Signal Flow Diagrams

Figures 3-30 through 3-32 are schematics of the major components and the cabling associated between them. The diagrams depicts component boards or assemblies, jack connections, cables, and signal flow. It is to be used by the technician as an additional aid in troubleshooting and improve understanding of the printers theory of operation.

Figure 3-30 shows all cable connections to the MPCB and the power supply. Figure 3-31 shows all cable connections to the carriage PCB and Figure 3-32 shows all connections of the leg harness assembly.

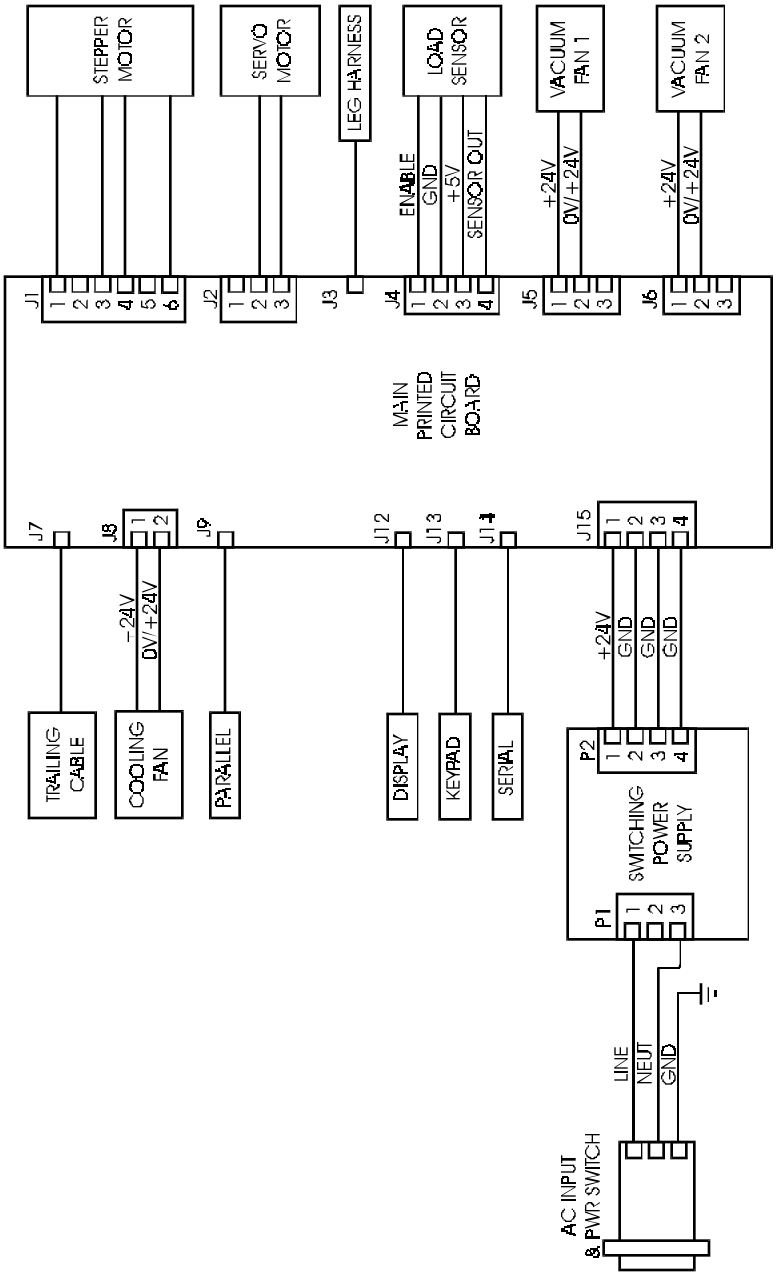


**Figure 3-30. MPCB Connections Diagram.**

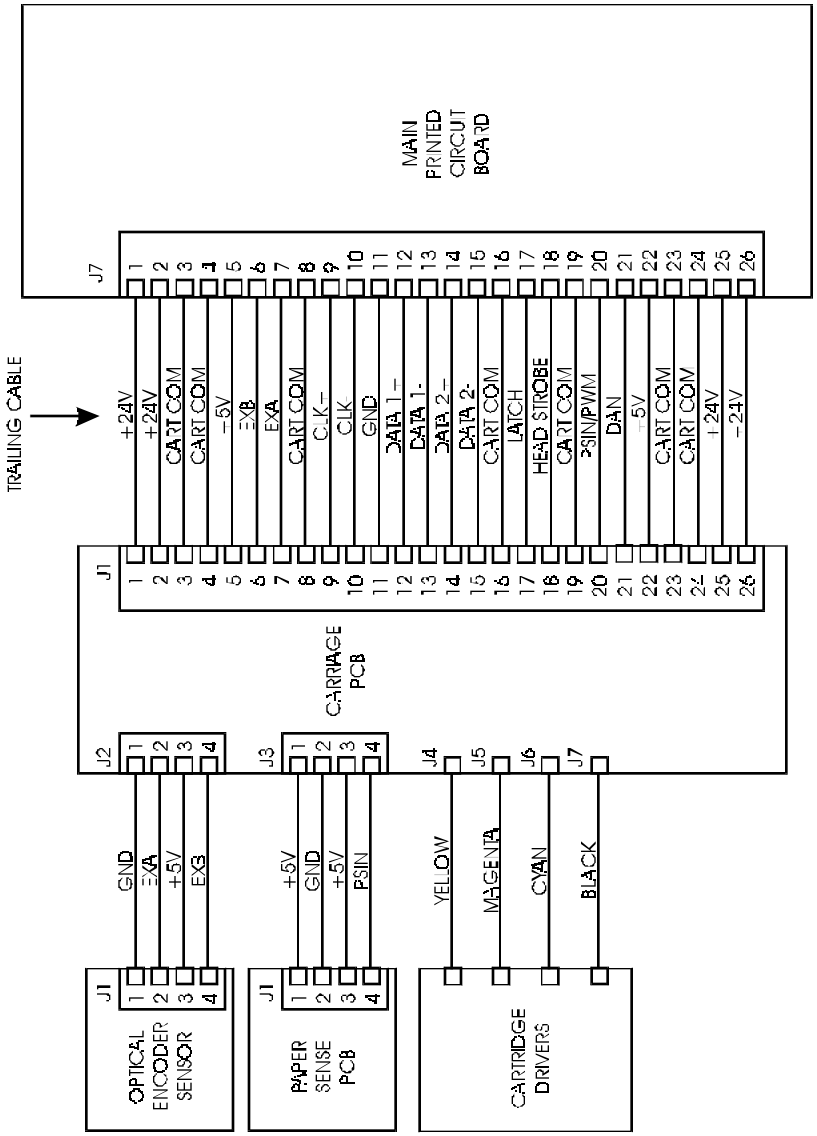


**Figure 3-31. Carriage PCB Connections Diagram.**

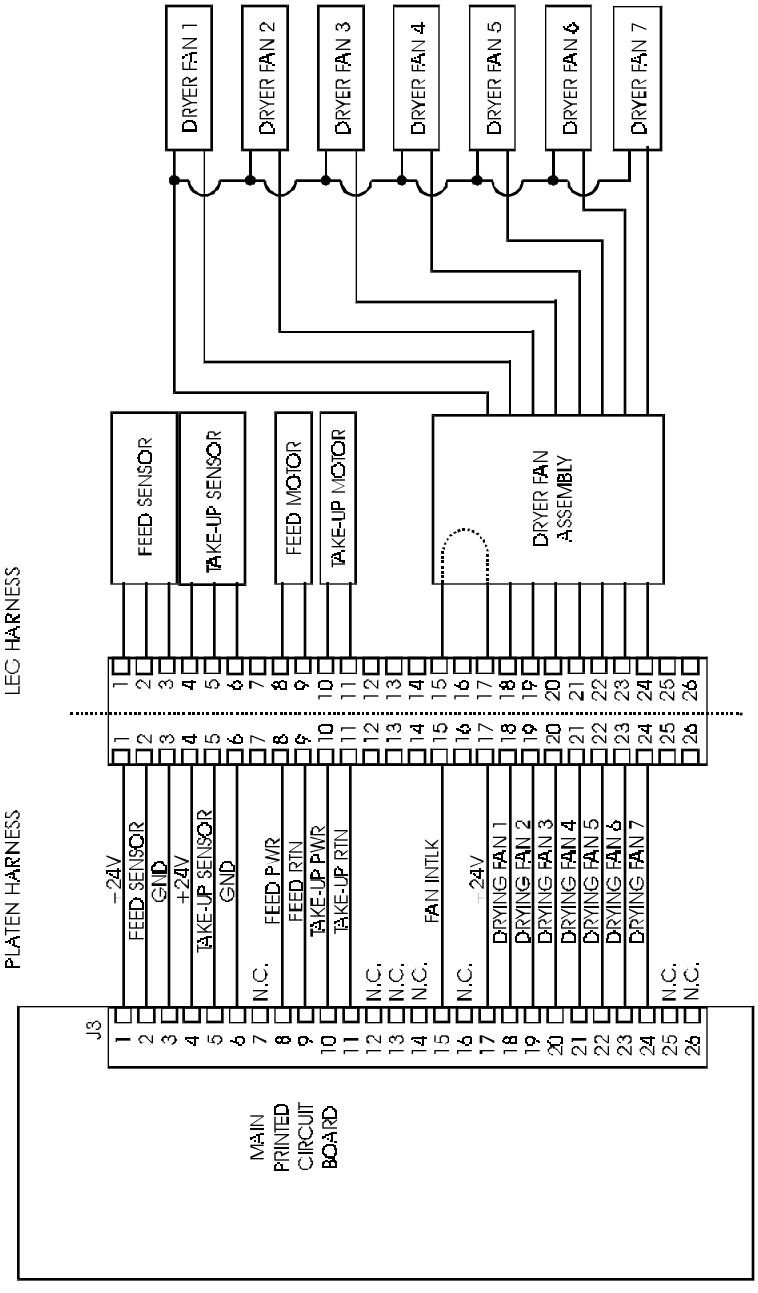


**Figure 3-32. Leg Harness Connections Diagram.**

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# Troubleshooting 4

## Introduction

Chapter 4, Troubleshooting consists of a table that is intended to aide the technician in troubleshooting the **Novajet PRO 600e** printers. This table addresses symptoms with their possible causes and solutions.

Basic troubleshooting skills will be required to perform the symptom identification, troubleshooting, fault isolation, and repair of the printer when using this table.

Ensure that all applicable software diagnostic tests have been properly executed, all visual indications (including LED status) have been observed, and all applicable pushbuttons have been depressed to obtain a complete list of symptoms to be applied to the table below.

Use the table in conjunction with Chapter 3, Maintenance, whenever the table prompts you for additional information. This information may be in the form of an illustration, additional data, or a procedure that needs to be performed.



Table 4-1. Troubleshooting Table.

| Symptoms | Possible cause | Solution |
|---|---|---|
| **No Power** | • printer not ON | depress power switch |
| | • faulty power cord | replace power cord |
| | • AC input not present at power supply | replace AC entry module |

Table 4-1. Troubleshooting Table (cont).

| Symptoms | Possible cause | Solution |
|---|---|---|
| No Power (cont) | • DC output voltage not present (see Figure 3-30 for pin-out) | replace power supply |
| | • DC voltage present at MPCB | replace MPCB |
| **Media Does Not Move** | | |
| | • perform Stepper Motor Winding Resistance check | replace stepper motor if out of tolerance |
| | • rough motion while spinning stepper motor | bad bearings - replace stepper motor |
| | • paper sensor not responding | replace paper sensor |
| | • media control switches are operating correctly | driver corrupted - reload printer driver |
| | • firmware corrupted | reload firmware |
| | • bad MPCB | replace MPCB |

Table 4-1. Troubleshooting Table (cont).

| Symptoms | Possible cause | Solution |
|---|---|---|
| **Internal ERROR "Carriage Axis Failure"** | | |
| | • dirty (or lubricated) slide shaft | perform Slide Shaft Cleaning procedure |
| | • perform Servo Motor Winding Resistance check | replace servo motor |
| | • check servo motor for smooth movement | bad bearings - replace servo motor |
| | • obstruction in path of carriage (may or may not be visible) | remove obstruction |
| | • dirty encoder strip | perform Encoder Strip Cleaning procedure |
| | • damaged encoder strip | replace encoder strip |
| | • bad encoder sensor | replace encoder sensor |
| | • worn carriage bushings | replace carriage bushings |
| | • loose trailing cable connections | remove power and reseat trailing cable connections at the MPCB and the carriage assembly |

Table 4-1. Troubleshooting Table (cont).

| Symptoms | Possible cause | Solution |
|---|---|---|
| Internal ERROR "Carriage Axis Failure" (cont) | • cutter assembly malfunction | replace cutter assembly |
| | • damaged carriage drive belt system | 1) check idler/ tension assembly<br>2) check carriage belt |
| **Internal ERROR "Encoder Sensor Failure"** | | |
| | • encoder sensor cable unseated | reseat encoder sensor cable |
| | • bad encoder sensor | replace encoder sensor |
| **Internal ERROR "Paper Sensor Failure"** | | |
| | • paper sensor cable unseated | reseat paper sensor cable |
| | • bad paper sensor | replace paper sensor |
| **Internal ERROR "Auto-Sensor Failure"** | | |
| | • auto-sensor cable unseated | reseat auto-sensor cable |
| | • bad auto-sensor | replace auto-sensor |

Table 4-1. Troubleshooting Table (cont).

| Symptoms | Possible cause | Solution |
|---|---|---|
| **Internal ERROR "Trailing Cable Failure"** | | |
| | • trailing cable cable unseated | power down and reseat trailing cable |
| | • bad paper sensor | replace paper sensor |
| **Internal ERROR "MPCB Failure"** | | |
| | • bad MPCB | replace MPCB |
| **Does Not Print** | | |
| | • bad connection between computer and printer | reseat cable connections on computer and printer |
| | • firmware is corrupted | refresh EEPROM firmware with new download |
| | • bad MPCB | replace MPCB |
| **Ink Cartridge Misfiring** | | |
| | • cartridge low on ink | refill or replace cartridge |
| | • firing rate set too fast | adjust firing rate lower (optimum is 5) |

Table 4-1. Troubleshooting Table (cont).

| Symptoms | Possible cause | Solution |
|---|---|---|
| Ink Cartridge Misfiring (cont) | • flex contacts dirty or damaged | 1) perform Flex Cable Contact Cleaning procedures<br><br>2) replace carriage assembly |
| | • cartridge dimple area dirty or damaged | 1) perform Cartridge Dimple Cleaning procedure<br><br>2) replace cartridge |
| | • cartridge not seated correctly | reseat cartridge |
| | • bad cartridge | replace cartridge |
| | • service station dirty or not properly sealing cartridge jet area | 1) perform Service Station Cleaning procedures<br><br>2) replace seal on service station |
| | • bad carriage assembly | replace carriage assembly |
| | • bad MPCB | replace MPCB |

Table 4-1. Troubleshooting Table (cont).

| Symptoms | Possible cause | Solution |
|---|---|---|
| **Paper Skewing** | | |
| | • paper guides not installed | install paper guides |
| | • stepper motor gearing dirty or damaged | perform Clean and Inspect Stepper Motor Gears procedure |
| **Printer Output is Banding** | | |
| | • if banding is consistent | 1) inspect and/or replace stepper motor (perform Stepper Motor Winding Resistance Check) |
| | | 2) inspect and/or replace stepper motor gears and/or lower roller assembly |
| | | 3) replace MPCB |
| | • check amount of ink in cartridges | replace or refill cartridges |
| | • cartridges need to be primed | perform Prime |
| | • color calibration required | perform Color Calibration |
| | • X-axis calibration required | perform X-axis Calibration |

Table 4-1. Troubleshooting Table (cont).

| Symptoms | Possible cause | Solution |
|---|---|---|
| Printer Output is Banding (cont) | • cartridge dimple area dirty or damaged | 1) perform Cartridge Dimple Cleaning procedure<br><br>2) replace cartridge |
| | • flex cable contacts dirty or damaged | 1) perform Flex Cable Contact Cleaning<br><br>2) replace carriage assembly |
| | • carriage belt is loose, too tight, worn, or damaged | reinstall, check tension assembly, and/or replace belt |
| | • carriage bushings worn or damaged | replace bushings |
| **Keypad Locked-Up or Not Functioning Properly** | | |
| | • firmware problem | 1) reset printer<br><br>2) refresh or upgrade firmware |
| | • keypad assembly damaged | replace keypad assembly |
| | • faulty connection between MPCB and keypad | reseat or replace connector |
| | • bad MPCB | replace MPCB |

Table 4-1. Troubleshooting Table (cont).

| Symptoms | Possible cause | Solution |
|---|---|---|
| **Noisy Operation** | | |
| | • ink or paper debris in printer | clean printer |
| | • obstruction in path of carriage | remove obstruction/ clean printer |
| | • carriage bushings worn | replace carriage bushings |
| | • debris or obstruction in fan | clean fan assembly |
| | • drive belt slipping on idler | replace frame tensioner, spring, or idler |
| | • hardware or assemblies loose | tighten hardware or assemblies |
| | • carriage height too low | perform Carriage Head Height Adjustment |
| | • lower drive shaft gears are dirty or misaligned | clean and/or realign lower drive shaft gears |
| | • noisy servo motor | replace servo motor |
| | • noisy stepper motor | replace stepper motor |

Table 4-1. Troubleshooting Table (cont).

| Symptoms | Possible cause | Solution |
|---|---|---|
| **Line Quality Degraded** | | |
| | • ink cartridges dirty or clogged | clean and prime ink cartridges |
| | • cartridge dimple region dirty or damaged | clean or replace cartridge |
| | • color calibration needed | perform Color Calibration |
| | • deadband calibration needed (in bidirectional printing mode) | perform Deadband Calibration |
| | • debris or lubrication on slide shaft | clean slide shaft |
| | • leaks or bubbles in ink delivery lines | 1) reseal/prime ink delivery lines on both sides<br>2) replace ink delivery lines |
| | • dirty encoder strip | clean encoder strip |
| | • carriage bushings worn | replace carriage bushings |
| | • drive belt worn | replace drive belt |

Table 4-1. Troubleshooting Table (cont).

| Symptoms | Possible cause | Solution |
|---|---|---|
| Line Quality Degraded (cont) | • drive belt slipping on idler | replace frame tensioner, spring, or idler |
| | • vacuum fan not operating | replace fan assembly |
| **Fan Does Not Power Up** | | |
| | • MPCB has 24 VDC at J3 pins 1-2 | 1) reseat connection at MPCB to fan<br>2) replace fan |
| | • power not being applied to fan | 1) reload firmware<br>2) replace MPCB |
| **Media Take-Up Motor Not Operating, Sensor Works** | | |
| | • printer not in Take-Up Mode | put in Take-Up Mode (under "Supply Type" from "Paper Option Menu") |
| | • bad connection to the motor | reconnect Take-Up motor |
| | • bad Take-Up motor | Replace Take-Up motor |
| | • faulty wiring leg harness | reseat or replace leg harness |
| | • bad MPCB | replace MPCB |

Table 4-1. Troubleshooting Table (cont).

| Symptoms | Possible cause | Solution |
|---|---|---|
| **Media Feed Motor Not Operating, Sensor Works** | | |
| | • bad connection to the motor | reconnect Feed motor |
| | • bad Feed motor | Replace Feed motor |
| | • faulty wiring leg harness | reseat or replace leg harness |
| | • bad MPCB | replace MPCB |
| **Media Feed and Take-Up Motors Not Operating, Both Sensors Working** | | |
| | • printer is in Sheet Mode | put in Take-Up Mode (to activate both) or Roll Mode (to activate feed motor only), (under “Supply Type” from “Paper Option Menu”) |

Table 4-1. Troubleshooting Table (cont).

| Symptoms | Possible cause | Solution |
|---|---|---|
| **Media Feed or Take-Up Sensor(s) Not Operating** | | |
| | • reflective decal is dirty or blocked | clean decal and/or clear obstruction |
| | • reflective decal missing | replace reflective decal |
| | • sensor not aligned correctly (sensor bracket bent or misaligned) | replace or reshape sensor bracket |

# Initialization Troubleshooting

The sequence that the printer follows during initialization (power up) is as follows:

1. Power supply turns on - LED D2 on carriage turns on
2. Reads the Flash ROM information.
3. Performs memory test with installed SIMMs.
4. Writes the Flash ROM data into RAM for quicker execution of the code. Starts executing instructions from RAM.
5. Loads MPCB gate array with boot code data.
6. Checks for a valid ROM. If the ROM is not valid, waits for a ROM image to be downloaded.
7. Steps 2 - 4 performed again.
8. Loads MPCB gate array with ROM code data.
9. Loads gate array on the carriage board. LED D2 goes out as soon as the carriage board gate array is programmed.
10. Turns on power supply cooling fan.
11. Moves carriage.
12. Checks and measures media size if loaded.
13. Turn on display.

To troubleshoot using the D2 LED:

With the power off, move the carriage away from the service station and snap the carriage cover off just enough to view the LED located in Figure 4-1.

Turn on the unit. After a short delay, the LED D2 will light. Ensure that the LED extinguishes after about 3-4 seconds.

Turn the unit off immediately after the LED extinguishes to ensure no damage occurs to the carriage or carriage cover due to the carriage movement as stated in step 11.

Snap the cover back onto the carriage.

If the LED does not go out, setup the printer and download new firmware as discussed in Chapter 3. Repeat these procedures.

If the LED still does not go out, possible areas to suspect is the MPCB, carriage board, or the trailing cable.

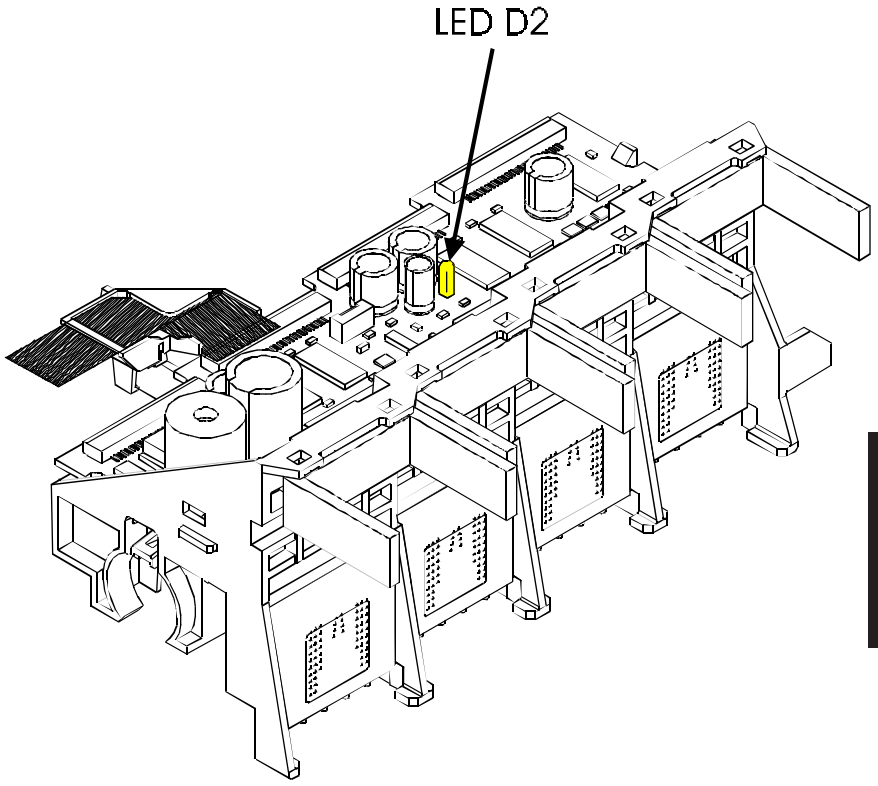


**Figure 4-1. Carriage Board LED D2 Location.**

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# Assembly\Disassembly 5

## Introduction

Chapter 5 contains the procedures for removal and replacement of the **NovaJet PRO 600e** printer assemblies and mechanisms. Illustrations are provided for clarity. Steps for each replaceable part may depend on parts already removed in previous disassembly directions. It is recommended that you read through each procedure before beginning the removal and replacement of any assemblies or mechanisms.

The following is a list of tools which are recommended to disassemble and reassemble the printer:

- #1 Phillips Torque Screwdriver
- #2 Phillips Torque Screwdriver
- #1 Slotted Torque Screwdriver
- #2 Slotted Torque Screwdriver
- #1 Phillips Screwdriver
- #2 Phillips Screwdriver
- #1 Slotted Screwdriver
- #2 Slotted Screwdriver
- Wrench, 1/4”
- Screwdriver, Socket Head, 1/4”
- Wire Cutters
- Needle Nose Pliers
- X-ACTO Knife
- ESD Wrist Strap

The following materials are also required:

- Isopropyl Alcohol
- Cotton Swabs
- Lint Free Cloth or Tissue
- Double Sided Tape (1/16” thick, 3/4” wide)
- Loctite Blackmax, P/N 200172

A Hardware Kit is available for the printers. See Chapter 6 of this manual for the part number.


Always turn the printer OFF, remove the power cord and the interface cable before beginning any disassembly procedures. An electrical shock hazard may be present if these precautions are not followed.

# Remove the Left, Top, and Right Covers

Removing the Left Cover allows access to the left side of the Platen for removal of the Carriage Assembly, Carriage Drive Belt, Tension Assembly, and the Cutter Activator. Also located on this side is the ink reservoirs and the Ink Delivery System portion that is connected to the reservoirs. Removal of the Left Cover is a requirement to remove the Lower Roller Assembly and the Vacuum Fan(s) from inside the Platen.

Removing the Right Cover provides access to the Main Printed Circuit Board (MPCB), Display and Keypad circuits, Servo Motor, AC Entry Module and the Power Supply Cooling Fan.

The Top Cover needs to be removed before any of the other covers can be removed. It also gives access to the Carriage Assembly and the Service Station when in the open (up) position and the Carriage is at the Carriage Access position.

To remove the Top Cover:

1. Put the Top Cover in the open position by lifting the front of the Cover to the full upward position.

2. Depress and hold the retracting stop assembly located on the left side of the Top Cover to disengage it from the Left Cover.

3. Lift up on the left side of the Top Cover until it clears the Left Cover while still depressing the retracting stop assembly, then slide the cover to the left to disengage it from the Right Cover.

To remove the Right Cover Assembly:

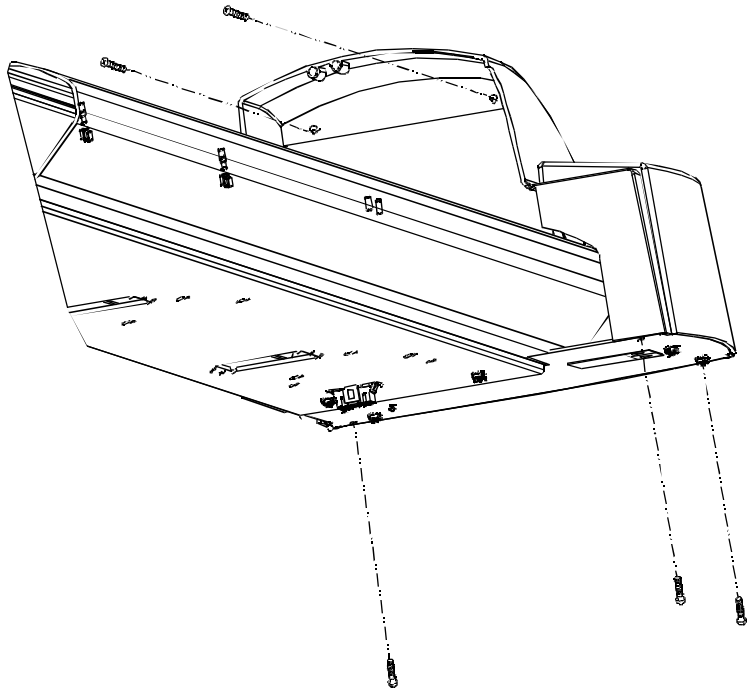

**Figure 5-1. Right Cover Assembly Removal/Installation.**

4. With a #2 Phillips screwdriver, remove the three screws securing the Right Cover Assembly to the Right Baseplate and the two screws securing it to the Right Sideplate. See Figure 5-1.

5. Reach under the Support Bracket and depress and hold the retracting stop assembly that secures the Right Cover Assembly to the Support Bracket.

6. Carefully lift up on the Right Cover Assembly until it clears the printer enough to gain access to the Keypad, Display, and Backlight connections going to the Main Printed Circuit Board (MPCB).

7. Disconnect the Keypad flex cable connection at the J13 location on the MPCB. See Figure 3-4 for jack locations on the MPCB.

8. Disconnect the Display data ribbon cable connector at the J12 location on the MPCB.

9. Disconnect the Display Power Converter connector at the J10 location on the MPCB. To disconnect, grasp the Display Power Converter connector between thumb and forefinger and pull straight out.

To remove the Left Cover Assembly:

10. Open the reservoir access Door. Disconnect and remove all ink reservoirs.

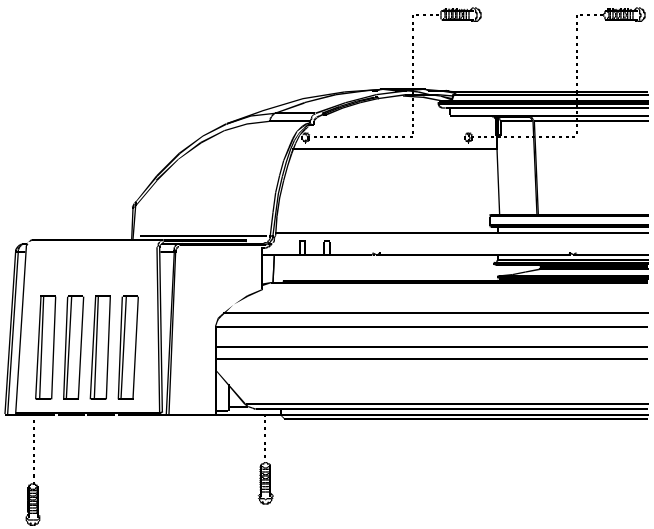

**Figure 5-2. Left Cover Assembly Removal/Installation.**

11. With a #2 Phillips screwdriver, remove the two screws securing the Left Cover Assembly to the Left Baseplate and the two screws securing it to the Left Sideplate. See Figure 5-2.

12. Reach under the Support Bracket and depress and hold the retracting stop assembly that secures the Left Cover Assembly to the Support Bracket.

13. Carefully lift the Left Cover Assembly up and off the printer.

# Install the Left, Top, and Right Covers

To install the Left Cover Assembly:

1. Position the Left Cover Assembly over the Left Baseplate and while depressing the retracting stop assembly on the Support Bracket, lower the Left Cover into position onto the Left Baseplate. Release the retracting stop assembly.


Applying too much torque to the lower screws can cause the mounts for the standoffs on the cover to break, requiring a replacement of the cover.

2. Using a #2 Phillips screwdriver, secure the Left Cover with two screws located on the right side (torque to 15 in-lbs) and two located under the baseplate (torque to 8 in-lbs).

3. Reinstall the ink reservoirs and reservoir door.

To install the Right Cover Assembly:

4. Position and hold the Right Cover Assembly over the Right Baseplate and reconnect the Display Power Converter cable to J10 on the MPCB.

5. Reconnect the Display data ribbon cable to J12 on the MPCB.

6. Reconnect the Keypad flex cable to J13 on the MPCB. Orient the side of the flex cable labeled '1' to pin 1 on the MPCB.

7. While depressing the retracting stop assembly on the Support Bracket, lower the Right Cover Assembly into position onto the Right Baseplate. Release the retracting stop assembly.


Applying too much torque to the lower screws can cause the mounts for the standoffs on the cover to break, requiring a replacement of the cover.

8. Using a #2 Phillips screwdriver, secure the Right Cover with two screws located on the left side (torque to 15 in-lbs) and three located under the baseplate (torque to 8 in-lbs.)

To install the Top Cover:

9. Insert the pin located on the right side of the Top Cover into the corresponding hole on the Right Cover Assembly.

10. While depressing the retracting stop assembly on the left side of the Top Cover, lower the left side of the Top Cover into position and secure it to the Left Cover Assembly by releasing the retracting stop assembly.

# Remove the Keypad, Display, and Display Power Converter

1. Perform steps 1 through 9 of the Remove the Left, Top, and Right Covers procedure to remove the Top and Right Covers.

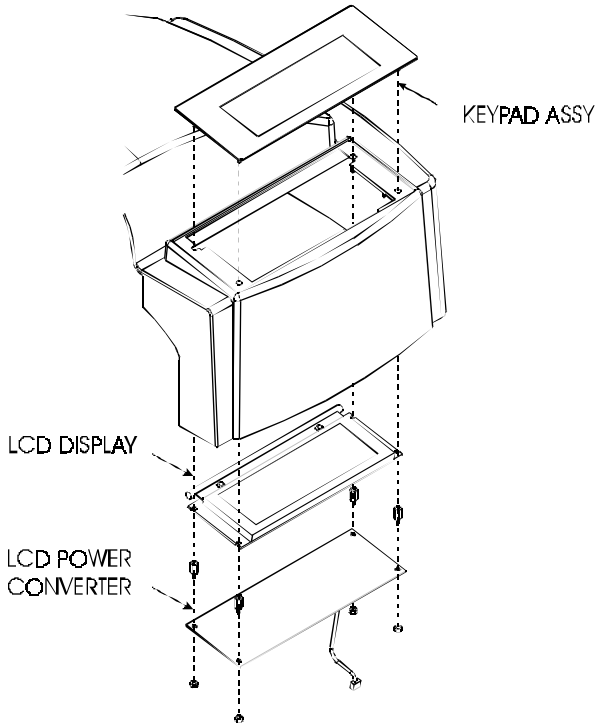


**Figure 5-3. Keypad and Display Installation/Removal.**

2. Turn the Right Cover Assembly over and disconnect the Display power cable located at J13 from the Display Power Converter. With a 1/4" socket or wrench, remove the four kepnuts securing the Display Power Converter. See Figure 5-3. Remove the Display Power Converter.

3. With a 1/4" socket or wrench, remove the four standoffs that secures the LCD Display Assembly to the Keypad. Remove the Display Assembly.

4. Disconnect the grounding flex cable from the large standoff before removing the Keypad Assembly. See Figure 5-4 for location. Remove the Keypad Assembly.

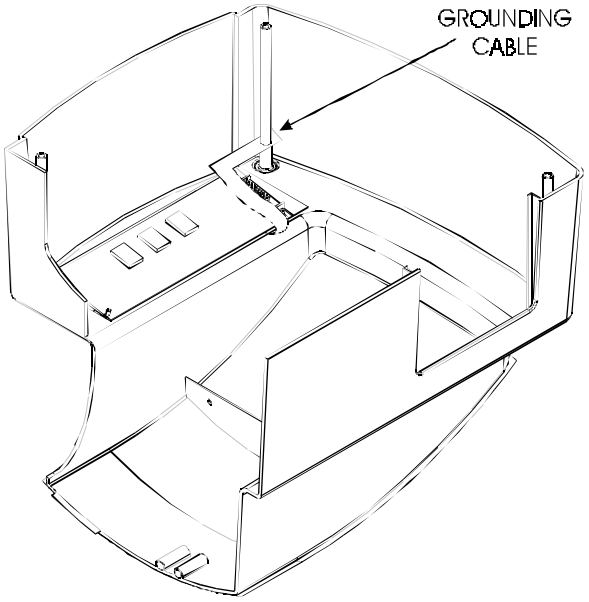


**Figure 5-4. Keypad Grounding Connection.**

# Install the Keypad, Display, and Display Power Converter

1. Route the Keypad flex data and ground cables into the Right Cover Assembly through the hole provided for the Keypad.
2. Place the Keypad into position and hold. Turn the Right Cover Assembly over and position the Display Assembly onto the threaded studs of the Keypad. Secure using four standoffs with a 1/4” socket or wrench.
3. Attach the Keypad grounding flex cable to the cover standoff as shown in Figure 5-4.
4. Secure the Display Power Converter onto the Display standoffs using four kepnuts with a 1/4” socket or wrench. Torque to 6 in-lbs.

# Remove Extra Memory (SIMM)

**CAUTION**

Integrated circuits may become weakened or damaged by electrical discharge. Do not touch or work near integrated circuits without wearing an ESD wrist strap.

1. Perform steps 1 through 9 of the Remove the Left, Top, and Right Covers procedure to remove the Top and Right Covers.

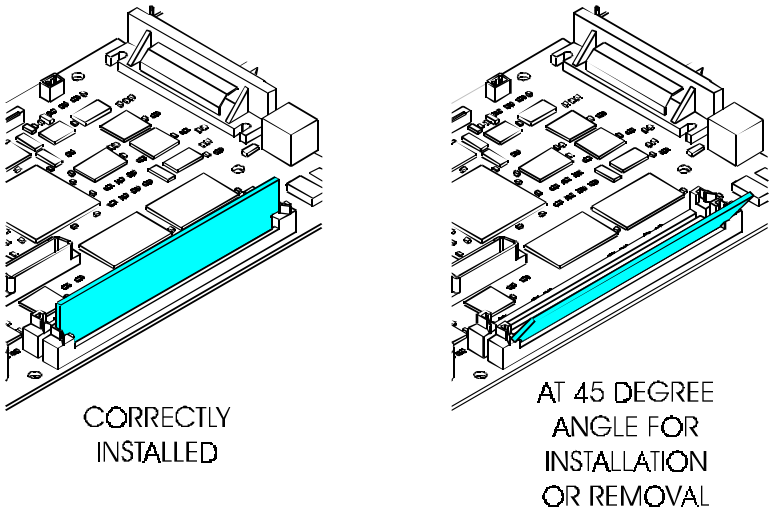


**Figure 5-5. Extra Memory (SIMM) Installation/Removal.**

2. The SIMM slots are at a 90° angle from the main circuit board. Facing the top of the SIMM, push the side clips gently to the outside (away from the SIMM) then push the top of the SIMM module towards the left side of the printer until the SIMM becomes free of the side clips. Lift up and pull the SIMM out, being careful not to damage the fingers on the top. See Figure 5-5.

# Install Extra Memory (SIMM)

**NOTE**

If you are installing two SIMM, you must install the one located in J17 first. See Figure 3-4 for location.

1. The SIMM slots are at a 90° angle from the board. Place the SIMM at a 45° into the connector as shown in Figure 5-5.
2. Slowly push the SIMM up to a 90° angle until the two side clips snap into place. Make sure the SIMM is fully seated.
3. Perform steps 4 through 10 of the Install the Left, Top, and Right Covers procedure to install the Right and Top Covers.

# Remove the MPCB (Main Printed Circuit Board)

**CAUTION**

Integrated circuits may become weakened or damaged by electrical discharge. Do not touch or work near integrated circuits without wearing an ESD wrist strap.

1. Perform steps 1 through 9 of the Remove the Left, Top, and Right Covers procedure to remove the Top and Right Covers.
2. Put on an ESD wrist strap.
3. Perform step 2 of the Remove Extra Memory (SIMM) procedure to remove any memory that was added.
4. Disconnect the Power Supply connection at the J15 location by grasping the Power Supply connector with thumb and forefinger and pulling straight out. See Figure 3-4 for jack locations.

5. Disconnect the Stepper Motor connection at the J1 location by grasping the Stepper Motor connector with thumb and forefinger and pulling straight out.

6. Disconnect the Servo Motor connection (red and blue wires) at the J2 location by grasping the Servo Motor connector with thumb and forefinger and pulling straight out.

7. Disconnect the Leg Harness connection at the J3 location by grasping the Leg Harness connector with thumb and forefinger and pulling straight out.

8. Disconnect the Load Sensor connection at the J4 location by grasping the Load Sensor connector with thumb and forefinger and pulling straight out.

9. Disconnect the Vacuum Fan 1 connection at the J5 location by grasping the Vacuum Fan 1 connector with thumb and forefinger and pulling straight out.

10. Disconnect the Vacuum Fan 2 connection at the J6 location (60 inch model only) by grasping the Vacuum Fan 2 connector with thumb and forefinger and pulling straight out.

11. Disconnect the Trailing cable connection at the J7 location. Use the thumb and forefinger to pull up on the connector lock and remove the Trailing Cable from the connector.

12. Disconnect the Power Supply Cooling Fan connection at the J8 location by grasping the Power Supply Cooling Fan connector with the thumb and forefinger and pulling straight out.

13. With a #2 Phillips screwdriver, disconnect the ground straps going to the side plate and baseplate by removing the screw located near the parallel port on the MPCB.

14. Using care, remove the MPCB by unscrewing the remaining screws securing the MPCB to the bracket using a #2 Phillips screwdriver. See Figure 5-6.

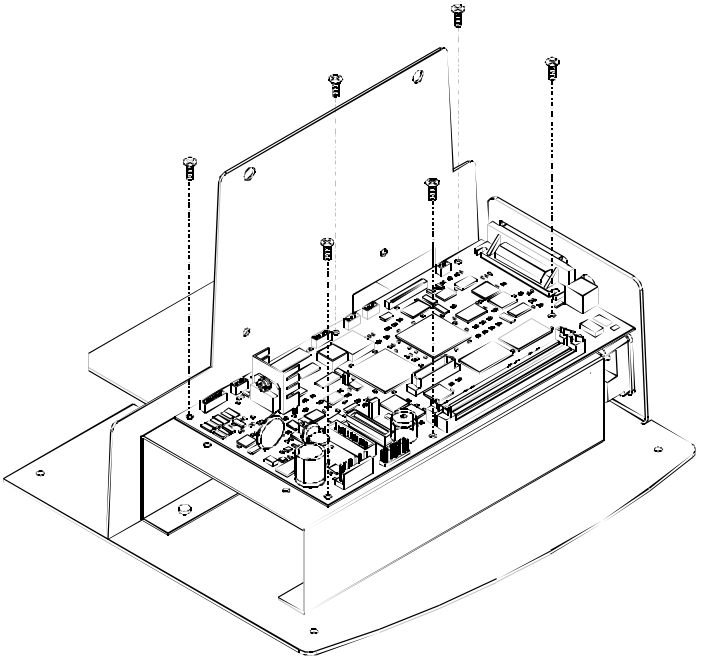

**Figure 5-6. MPCB Removal.**

CAUTION

Failure to use an approved antistatic bag for storage or shipment may cause damage to the MPCB and affect the Warranty.

15. Place the MPCB in an ESD bag (antistatic bag) in preparation for shipment to ***ENCAD*** for replacement or repair, or if it is to be stored at your facility for repair.

# Install the MPCB

CAUTION

Integrated circuits may become weakened or damaged by electrical discharge. Do not touch or work near integrated circuits without wearing an ESD wrist strap.

1. Put on an ESD wrist strap.
2. Remove the MPCB from the ESD bag.
3. Align the MPCB so that the serial and parallel connections protrude out of the back of the printer and that the screw holes are aligned to the holes on the power supply bracket.
4. Using a #2 Phillips Torque Screwdriver, fasten the MPCB to the power supply bracket with 8 in-lb of torque. Ensure that the ground straps from the side plate and baseplate are secured to the MPCB by the screw located beside the side plate nearest to the parallel port.
5. Connect the Power Supply Cooling Fan connector to J8 on the MPCB.
6. Connect and lock the Trailing Cable connector to J7 on the MPCB.
7. Connect the Vacuum Fan 2 (60 inch only) connector to J6 on the MPCB.
8. Connect the Vacuum Fan 1 connector to J5 on the MPCB.
9. Connect the Load Sensor connector to J4 on the MPCB.
10. Connect the Leg Harness connector to J3 on the MPCB.
11. Connect the Servo Motor connector to J2 on the MPCB.
12. Connect the Stepper Motor connector to J1 on the MPCB.

13. Connect the Power Supply connector to J15 on the MPCB.
14. Reinstall any additional memory into J17 by performing steps 1 and 2 of the Install Extra Memory (SIMM) procedure.
15. Perform steps 4 through 10 of the Install the Left, Top, and Right Covers procedure to install the Right and Top Covers.

# Remove Power Supply, Cooling Fan, and AC Entry Module

1. Perform steps 1 through 9 of the Remove the Left, Top, and Right Covers procedure to remove the Top and Right Covers.
2. Perform steps 3 through 15 of the Remove the MPCB (Main Printed Circuit Board) procedure to remove and protect the MPCB.
3. Reach between the Power Supply Bracket and the AC Entry Module and carefully pull out the quick disconnect assembly attaching the Power Supply input to the AC Entry Module. Disconnect the Power Supply input from the AC Entry Module.
4. Disconnect the clip securing the power supply wires to the top of the support bracket.
5. While holding the Power Supply in place, remove the four screws securing it to the Power Supply Bracket. See Figure 5-7.
6. Slide the Power Supply out of the Power Supply Bracket.

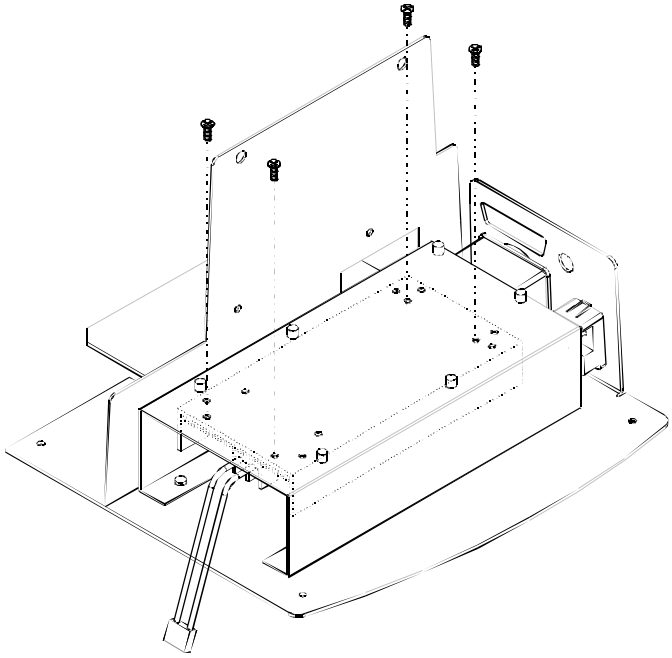

**Figure 5-7. Power Supply Removal.**

To remove the Cooling Fan and AC Entry Module:

7. Using a #2 Phillips screwdriver, remove the four screws located below the Right Baseplate securing the Power Supply Bracket to the Right Baseplate. Remove the Power Supply Bracket.

8. Using a #1 Phillips screwdriver and a 1/4" wrench or socket, remove the Fan from the Right Baseplate. See Figure 5-8.

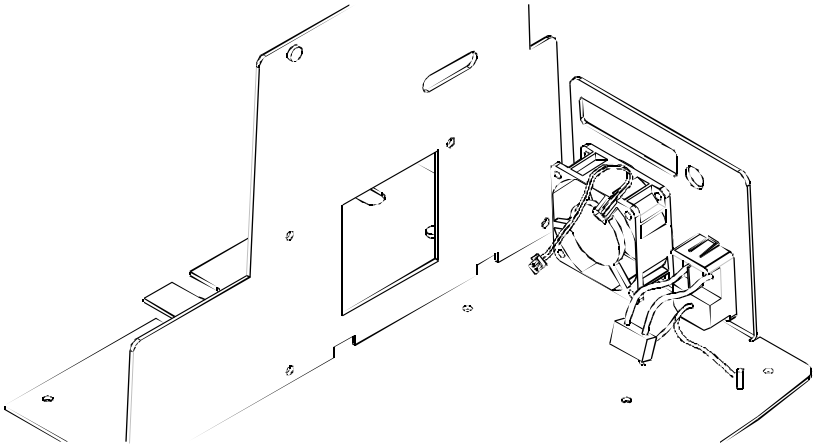

**Figure 5-8. Cooling Fan/AC Entry Module Removal.**

8. Using a 1/4” wrench or socket, disconnect the AC Entry Module ground from the ground stud on the Right Baseplate.

9. Remove the AC Entry Module by pressing in on the securing tabs until the module is released.

# Install the Power Supply, Cooling Fan, and AC Entry Module

To install the Cooling Fan and AC Entry Module:

1. Insert the AC Entry Module into the AC Entry Module hole on the Right Baseplate from the back of the printer. Press in until it snaps securely into place.

2. Attach the AC Entry Module ground connection to the grounding stud on the Right Baseplate.

3. Hold the Cooling Fan into place while inserting the four bolts into the assembly. Attach the four 1/4” nuts to the bolts to secure Fan assembly. Torque to 4 in-lbs.

4. Reinstall the Power Supply Bracket using four screws.

5. Insert and hold the Power Supply into place while securing it with four screws. Torque to 15 in-lbs.

6. Reconnect the Power Supply to the AC Entry Module by reattaching the quick disconnect connection. Push the quick disconnect assembly behind the Power Supply Bracket and out of sight.

7. Perform steps 1 through 14 of the Install the MPCB procedure to install the MPCB.

8. Perform steps 4 through 10 of the Install the Left, Top, and Right Covers procedure to install the Right and Top Covers.

# Remove Servo Motor

1. Perform steps 1 through 9 of the Remove the Left, Top, and Right Covers procedure to remove the Top and Right Covers.

2. Perform steps 3 through 13 of the Remove the MPCB (Main Printed Circuit Board) procedure to disconnect all connectors from the MPCB.

3. Reach between the Power Supply Bracket and the AC Entry Module and carefully pull out the quick disconnect assembly attaching the Power Supply input to the AC Entry Module. Disconnect the Power Supply input from the AC Entry Module.

## NOTE

The following procedure will leave the MPCB and Power Supply still attached to the Power Supply Bracket. For this procedure there is no reason to remove these assemblies from the Power Supply Bracket.

4. Using a #2 Phillips screwdriver, remove the screw securing the ground strap from the MPCB to the side plate.

5. Using a #2 Phillips screwdriver, remove the four screws securing the Power Supply Bracket to the Right Baseplate. Remove the Power Supply Bracket.

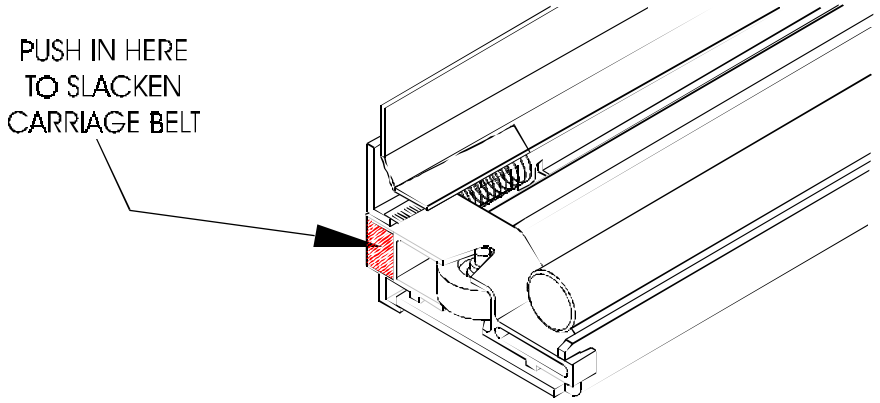


**Figure 5-9. Slacken Carriage Belt.**

6. Remove the Right Sideplate to gain access to the Servo Motor by unscrewing the four screws securing it to the Platen.
7. Depress the back of the Frame Tensioner (see Figure 5-9) to create slack in the Carriage Belt and slip it off of the Servo Motor pulley.
8. Move the Carriage Belt to the left so it is out of the way of the Servo Motor pulley.
9. Move the Carriage Assembly to the left end of the Slide Shaft.
10. Lift up gently and hold the right end of the Trailing Cable.
11. Using a #2 Phillips screwdriver, remove the back screw on the Servo Motor. The screwdriver will be at a slight angle.

CAUTION

Be careful not to strip the head of the screw or to cause damage to the Encoder Strip.

12. Lower the Trailing Cable back into place.
13. While holding the Servo Motor, remove the front screw on the Servo Motor.

14. Lower the motor to clear the pulley assembly from the platen and carefully bring the motor out of the printer.

# Install Servo Motor

1. Reinsert the Servo Motor under the Platen with the connector facing the FRONT side of the Platen. Guide the pulley up through the opening in the Platen.
2. Once the Servo Motor pulley is through the Platen, push up on the Servo Motor and align the screw holes with the screw hole openings.
3. Insert the front screw into the Servo Motor and tighten it almost all the way.
4. Lift up gently and hold the right end of the Trailing Cable.


Make sure the screw does not go into the motor at an angle, and be careful not to strip the head of the screw or to cause damage to the Encoder Strip.

5. Insert the back screw into the Servo Motor and tighten it.
6. Tighten both screws on the Servo Motor to 15 in-lb of torque.
7. Depress the back of the Frame Tensioner and wrap the Carriage Belt over the Servo Motor pulley. Make sure that the guides on the inside of the belt are inserted in the pulley grooves and that the belt is not twisted.
8. Move the Carriage Assembly back and forth to check the Carriage Belt tension.
9. Reinstall the Right Sideplate with four screws and a #2 Phillips screwdriver. Press the side plate down and towards the back of the printer before tightening. Torque to 15 in-lb.

10. Ensure that all cable endings are protruding through the cable access hole in the Right Sideplate.

11. Reinstall the Power Supply Bracket (with assemblies) using four screws.

12. Reconnect the grounding strap from the MPCB to the side plate.

13. Reconnect the Power Supply to the AC Entry Module by reattaching the quick disconnect connection. Push the quick disconnect assembly behind the Power Supply Bracket and out of sight.

14. Perform steps 5 through 13 of the Install the MPCB procedure to reinsert the removed connections from the MPCB.

15. Perform steps 4 through 10 of the Install the Left, Top, and Right Covers procedure to install the Right and Top Covers.

# Remove the Ink Delivery System

1. Perform steps 1 through 3 and 10 through 13 of the Remove the Left, Top, and Right Covers procedures to remove the Top and Left Covers.

**NOTE**

The Foam Chain Shelf being removed in step 2 is only on the 60 inch printers.

2. Remove the Foam Chain Shelf located inside the rear support bracket.

3. Move the Carriage to the center of the Slide Shaft.

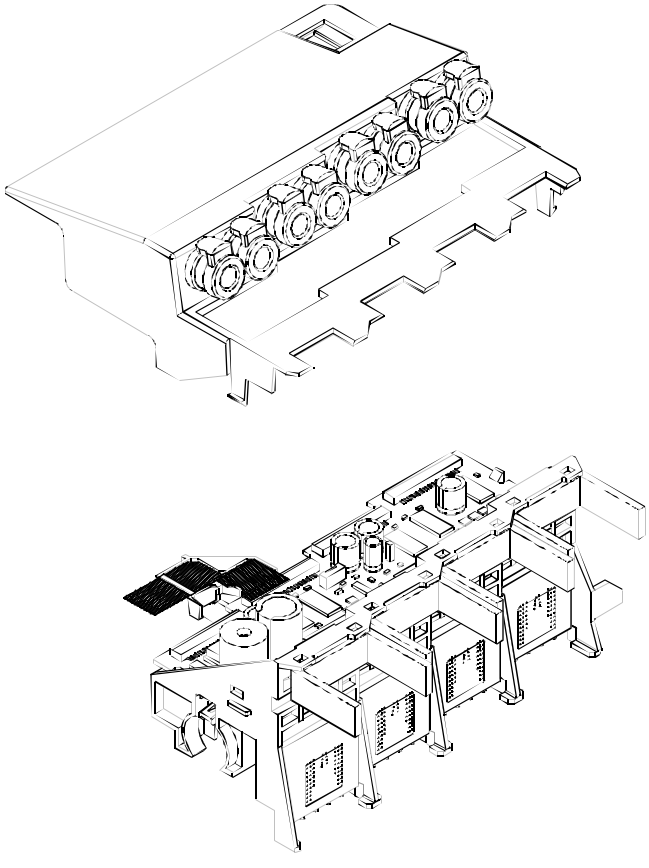

**Figure 5-10. Electronics Cover Removal.**

4. With a flathead screwdriver, press the Electronics Cover (p/o the Ink Delivery System) tab located in the upper slot on the left side of the Carriage Assembly. See Figure 5-10. Lift up on the front left side of the Electronics Cover until it comes part way off of the Carriage Assembly. Then lift up on the front right side of the Electronics Cover and move the Electronics Cover slightly to the left so that the back of it clears the Back Support Bracket.

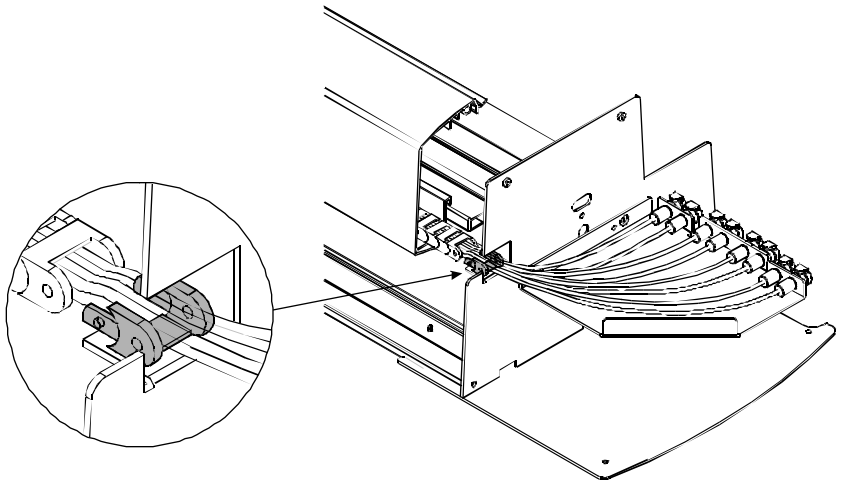

**Figure 5-11. Disconnect Ink Delivery System Link.**

## NOTE

The last link of the Ink Delivery System linkage is a special link and is to remain as part of the Left Sideplate Assembly. It is mounted to the Sideplate Assembly and will not be delivered as part of the Ink Delivery System.

5. Disconnect the last link of the Ink delivery System from the rest of the link assembly by pressing in on the two small posts from the next to last link that are located in the holes of the last link. See Figure 5-11. Releasing one post at a time may be easier to accomplish than trying both at once.

6. Disconnect the Ink Delivery System Bracket from the Left Sideplate using a #2 Phillips screwdriver.

7. Carefully slide the Ink Delivery System out of the printer.

# Install the Ink Delivery System

1. Secure the Ink Delivery System Bracket to the Left Sideplate using two screws.
2. Reattach the rest of the Ink Delivery System linkage train to the last link (located on the Left Sideplate).
3. Position the Ink Delivery System into the Support Bracket so that it is easier to orient the Electronics Cover portion of the system over the Carriage for reinstallation.
4. Position the Electronics Cover over the Carriage with the back of the Electronics Cover under the Support Bracket. Depress the two tabs on each side of the Cover and lower the Assembly onto the Carriage until it snaps into place.
5. Place the Foam Chain Shelf in the Support Bracket (PRO 60e only.) Align the left side of the Shelf to the center of the leftmost pinch roller.
6. Perform steps 1 through 3 and 9 and 10 of the Install the Left, Top, and Right Covers procedure to install the Left and Top Covers.

# Remove the Carriage Assembly, Carriage Belt, and the Frame Tensioner

1. Perform steps 1 through 13 of the Remove the Left, Top, and Right Covers procedures to remove the Left, Top and Right Covers.
2. Perform steps 2 through 7 of the Remove the Ink Delivery System procedures to remove the Ink Delivery System.
3. Using a #2 Phillips screwdriver, remove the four screws that secures the Left Sideplate Assembly to the Platen. Remove the Left Sideplate Assembly.
4. Lift up on the connector lock to unlock the Trailing Cable connector (J1) on the Carriage PCB and remove the end of the Trailing Cable.

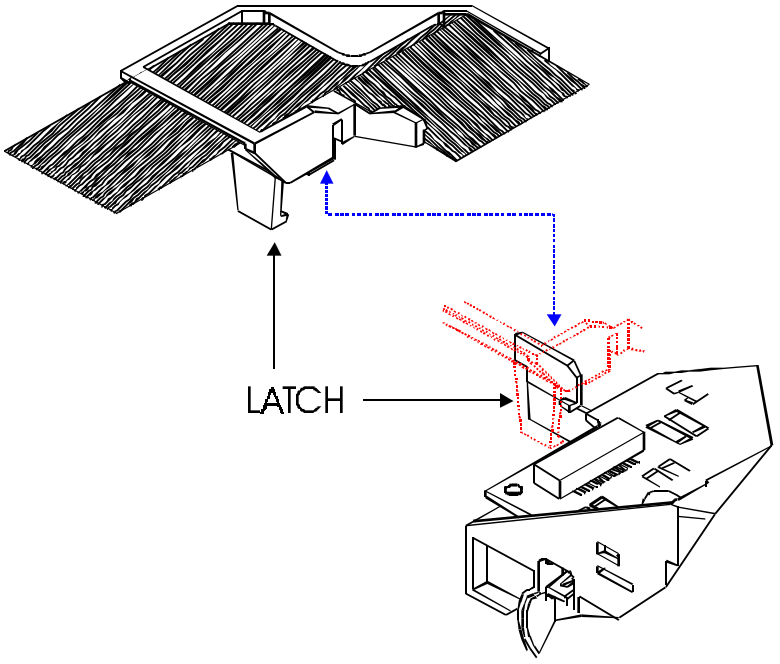


**Figure 5-12. Strain Relief Removal/Installation.**

5. Remove the Trailing Cable and Strain Relief from the Carriage Assembly by releasing the latch on the left lower side of the Strain Relief and lifting it off of the Carriage Assembly. See Figure 5-12.

6. Compress the back of the Frame Tensioner and use the end of a screwdriver to remove the Carriage Belt from the Servo Motor pulley. See Figure 5-9.

7. Remove the Compression Spring from the Frame Tensioner and set it aside.

8. Push the Carriage Belt through the Frame Tensioner enough to remove the Idler Pulley Assembly from the Frame Tensioner, and then set aside the Idler Pulley Assembly and the Frame Tensioner. See Figure 5-13.

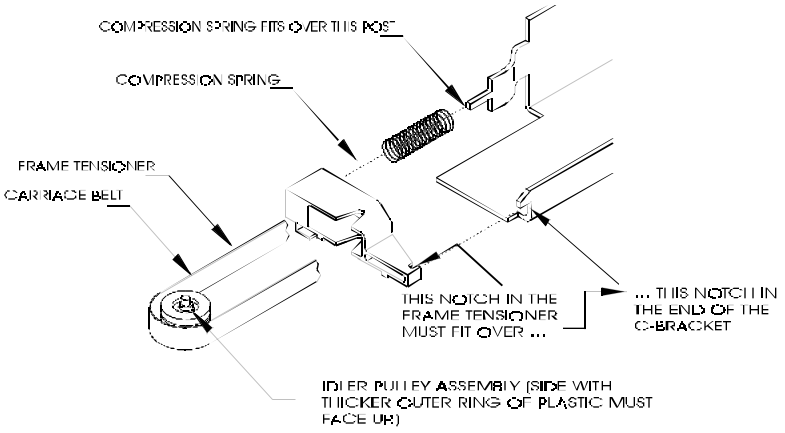


**Figure 5-13. Frame Tensioner.**

9. Slide the Carriage Assembly and Drive Belt off the left side of the Slide Shaft.

10. Once the Carriage Assembly is removed from the Slide Shaft, turn it over so that you can see the Belt Clamp. See Figure 5-14.

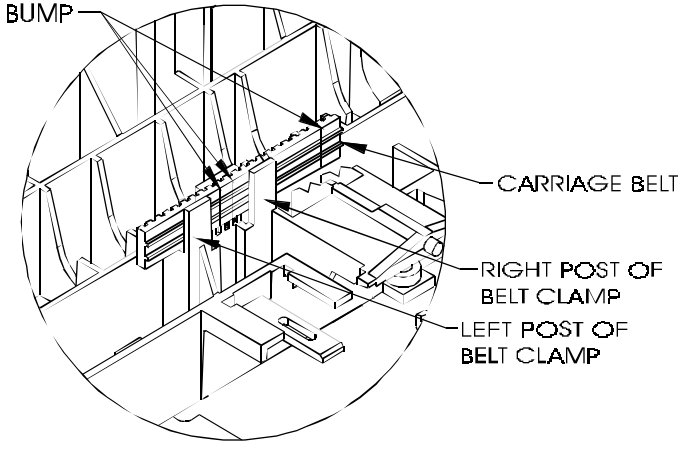


**Figure 5-14. Carriage Belt Clamp.**

11. To disengage the Carriage Belt from the Belt Clamp, push the Carriage Belt away from the left post of the Belt Clamp and gently lift up until the bottom edge of the Carriage Belt clears the top of the left post.

12. Push the Carriage Belt away from the right post of the Belt Clamp and gently lift up to finish removing the Carriage Belt from the Belt Clamp.

CAUTION

Failure to use an approved antistatic bag for storage or shipment may cause damage to the MPCB and affect the Warranty.

13. Place the Carriage Assembly in an ESD (antistatic) bag in preparation for shipment to ***ENCAD*** for replacement or repair, or if it is to be stored for repair at your facility.

# Install the Carriage Assembly, Carriage Belt, and the Frame Tensioner

1. To install the Belt onto the Carriage Assembly, the “bumps” on the belt (where the ends of the belt are joined together to make the belt continuous) must be positioned between the left and right posts of the Belt Clamp. See Figure 5-14.

2. Slide the Carriage Belt between the right post and the middle post and guide it down into the Belt Clamp. Then slide the Carriage Belt between the left post and the middle post and finish placing the Carriage Belt into the Belt Clamp.

3. Check the position of the Carriage Belt to make sure it matches Figure 5-14.

4. Make sure the left end of the Trailing Cable extends out beyond the left end of the Trailing Cable Support Assembly.

5. Slide the Carriage Assembly onto the left end of the Slide Shaft, making sure that the Encoder Strip fits into the slot in the Slider and the Encoder on the Carriage PCB. Guide the belt while sliding the Carriage Assembly from left to right on the Slide Shaft.

6. Move the Carriage Assembly to the left end of the Slide Shaft and align the left bushing on the Carriage Assembly with the left end of the Slide Shaft.

7. Insert the Strain Relief (with Trailing Cable) onto the Carriage Assembly by sliding it onto the Strain Relief Support until it snaps firmly into place. See Figure 5-13.

8. Place the Trailing Cable into the J1 connector lock on the Carriage PCB. Make sure the silver fingers on the Trailing Cable are fully inserted into the lock and slide both sides of the connector lock shut at the same time.

9. Place the right side of the back of the Electronics Cover under the Trailing Cable Support Assembly and gently press down on the ends of the Electronics Cover until the latches snap into the Carriage Assembly.

10. Slide the Carriage Assembly to about the middle of the Slide Shaft and stretch out the Carriage Belt.

11. Insert the Carriage Belt into the Frame Tensioner so that the belt extends about an inch past the Frame Tensioner.

12. Holding the Carriage Belt and Frame Tensioner, insert the Idler Pulley Assembly into the loop of the belt. Make sure that the side of the Idler Pulley Assembly with the thicker outer ring of plastic is facing up. See Figure 5-13.

13. Once the Idler Pulley Assembly is in position, pinch the belt to hold the Idler Pulley Assembly in place and pull it into the Frame Tensioner so that the axle rests in the V-shaped groove in the Frame Tensioner.

14. Insert the Compression Spring into the opening in the back of the Frame Tensioner so that the end of the spring fits over the post inside the opening.

15. Fit the Compression Spring over the post at the back of the Y-Arm Assembly.
16. Fit the notch in the front end of the Frame Tensioner over the notch in the front of the Y-Arm Assembly.
17. Depress the back of the Frame Tensioner and slip the Carriage Belt over the Servo Motor pulley. Make sure that the guides in the Carriage Belt are properly fitted over the Servo Motor pulley.
18. Gently move the Carriage Assembly from end to end and make sure that the Carriage Belt is not rubbing against any other parts.

# Remove the Carriage PCB


Integrated circuits may become weakened or damaged by electrical discharge. Do not touch or work near integrated circuits without wearing an ESD wrist strap.

1. Perform the Carriage Assembly, Carriage Belt, and the Frame Tensioner Removal procedures to remove the Carriage Assembly from the Slide Shaft.
2. Put on an ESD wrist strap.
3. Unlock the connectors and remove all flex cables on the Carriage PCB.

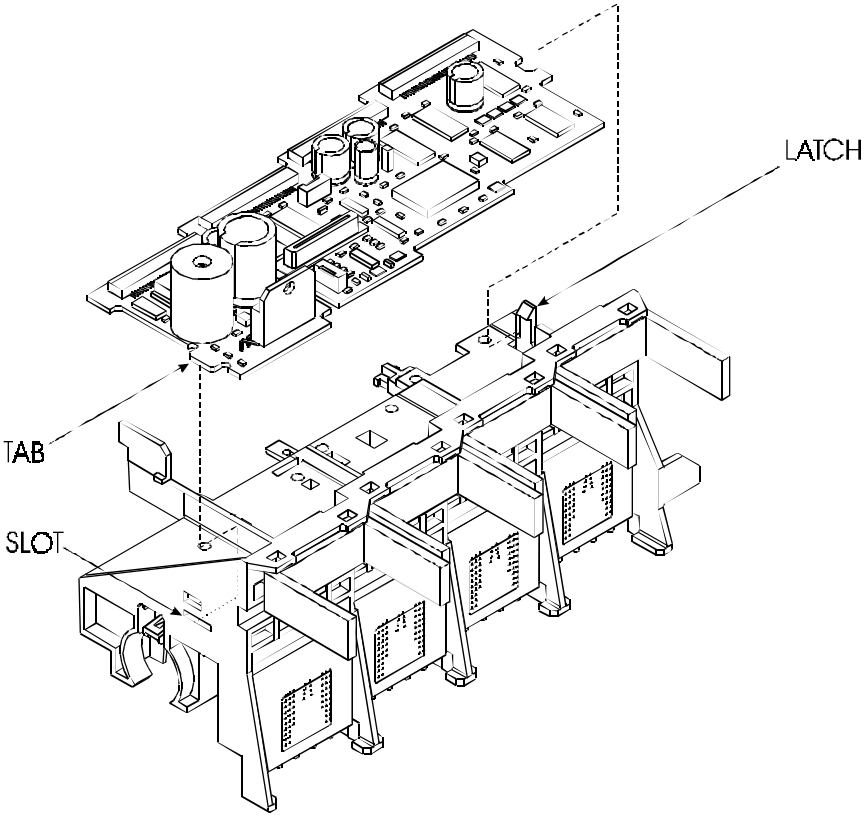


**Figure 5-15. Carriage PCB Removal/Installation.**

4. Unlock the latch on the right end of the Carriage Assembly and lift up the right end of the Carriage PCB. See Figure 5-15.

5. Slide the Carriage PCB to the right to remove the tab on the left end of the Carriage PCB from the slot in the Carriage Assembly.

CAUTION

Failure to use an approved antistatic bag for storage or shipment may cause damage to the Carriage PCB and affect the Warranty.

6. Place the Carriage PCB in an ESD bag (antistatic bag) in preparation for shipment to ***ENCAD*** for replacement or repair, or if it is to be stored at your facility for repair.

# Install the Carriage PCB

1. Put the tab on the left end of the Carriage PCB into the slot in the left side of the Carriage Assembly. See Figure 5-15.
2. Ensure that no flex cables are underneath the Carriage PCB.
3. Push down the right end of the Carriage PCB until the latch snaps into place.
4. Reattach all flex cables on the Carriage PCB.
5. Perform the Install the Carriage Assembly, Carriage Belt, and the Frame Tensioner procedures to reinstall the Carriage Assembly.

# Remove the Paper Sensor or the Encoder Sensor

1. Perform the Remove the Carriage Assembly, Carriage Belt, and the Frame Tensioner procedures to remove the Carriage Assembly from the Slide Shaft.

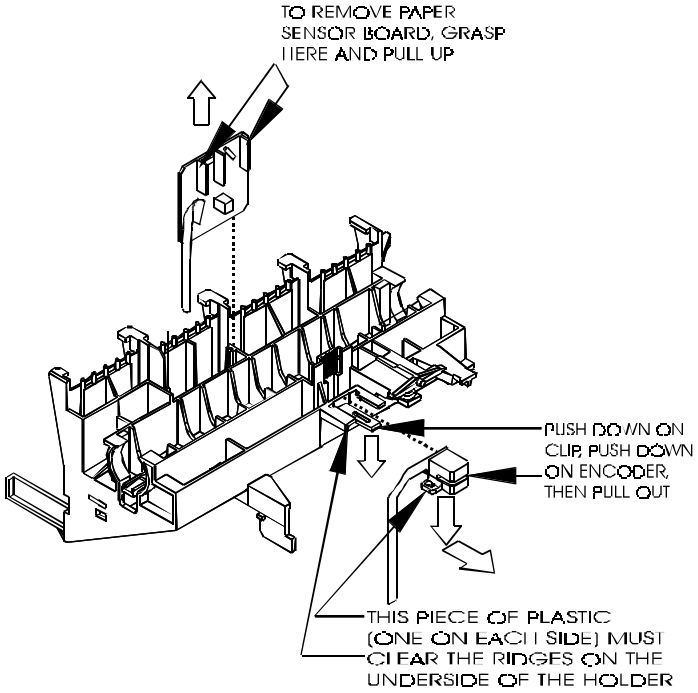


**Figure 5-16. Paper and Encoder Sensor Removal.**

2. To remove the Paper Sensor:

   a. Unlock the connector at J3 and remove the flex cable.

   b. Turn the Carriage Assembly over and hold it while firmly grasping the Paper Sensor between thumb and index finger. See Figure 5-16.

   c. Pull straight up on the Paper Sensor and remove it from the Carriage Assembly.

3. To remove the Encoder Sensor:

   a. Unlock the connector at J2 and remove the flex cable.

   b. Turn the Carriage Assembly over and lay it with the top side facing down.

c. Push down on the plastic clip and at the same time push down on the Encoder until the plastic pieces on each side of the Encoder clear the ridges which hold it in place. Then pull it straight out. See Figure 5-8.

# Install the Paper Sensor or the Encoder Sensor

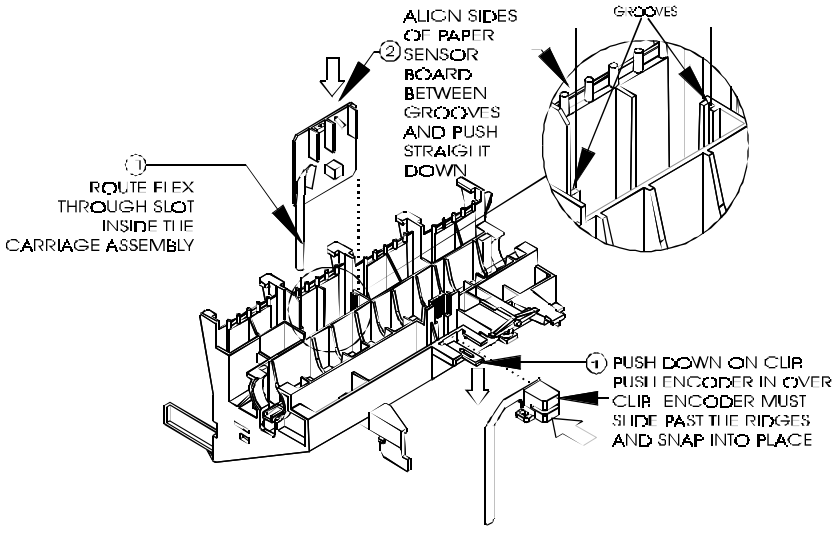


**Figure 5-17. Paper and Encoder Sensor Installation.**

1. To install the Paper Sensor:

   a. Turn the Carriage Assembly so that the bottom side of it is facing up.

   b. Route the flex on the Paper Sensor through the slot in the Carriage Assembly. Make sure the flex cable goes all the way through and does not curl under the Carriage PCB.

   c. Grasp the Paper Sensor between thumb and index finger and guide the sides of the board into the grooves on each side of the opening. See Figure 5-17.

   d. Push the Paper Sensor board down into the Carriage Assembly until it snaps firmly into place.

e. Turn the Carriage Assembly over and insert the Paper Sensor flex cable into the connector at J3.

f. Push both sides of the connector lock shut at the same time.

2. To install the Encoder Sensor:

a. Turn the Carriage Assembly so that the bottom side of it is facing up.

b. Push down on the plastic clip and slide the back of the Encoder Sensor over it.

c. Push the Encoder Sensor in past the ridges until the Encoder Sensor snaps into place.

d. Turn the Carriage Assembly over and insert the Encoder flex cable into the connector at J2.

e. Push both sides of the connector lock shut at the same time.

3. Perform the Carriage Assembly, Carriage Belt, and the Frame Tensioner Reinstallation procedures to reinstall the Carriage Assembly.

# Replacing the Carriage Bushings

1. If there is not enough space on both sides of the Slide Shaft to remove the Carriage bushings, perform the Carriage Assembly, Carriage Belt, and the Frame Tensioner Removal procedures to remove the Carriage Assembly from the Slide Shaft.

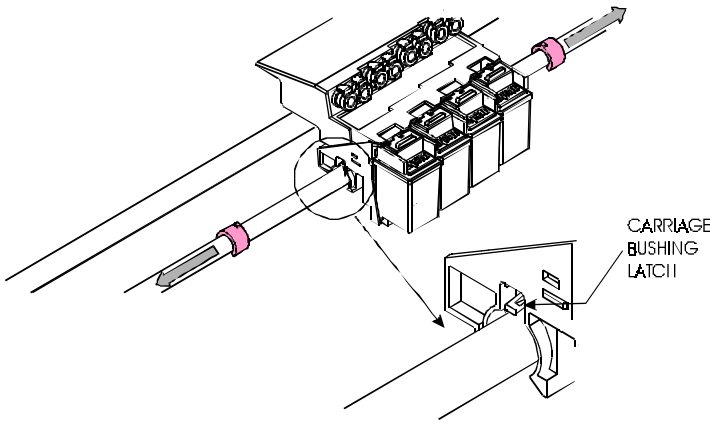


**Figure 5-18. Carriage Bushing Removal.**

2. Use a flat tip screwdriver to push up on the latch which holds the Carriage Bushing in place. See Figure 5-18.
3. Pull the Carriage Bushing out of the Carriage Assembly.
4. Repeat Steps 2 and 3 for the other Carriage Bushing.

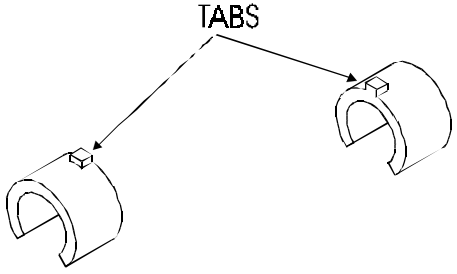


**Figure 5-19. Carriage Bushing Installation.**

5. Orient the new Bushing as shown in Figure 5-19 so that the metal tab on top of the Bushing goes into the Carriage Assembly first.
6. Push the Bushings in until they snap into place.
7. Perform the Reinstall the Carriage Assembly, Carriage Belt, and the Frame Tensioner procedures to reinstall the Carriage Assembly if Carriage was removed.

# Remove the Service Station

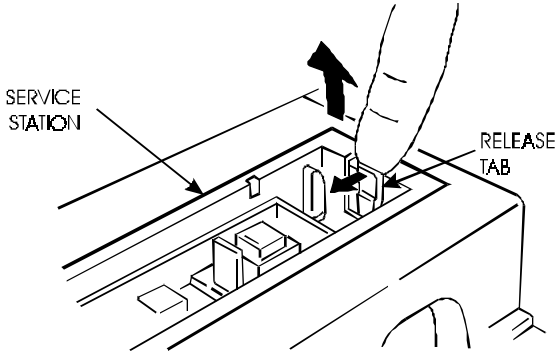


**Figure 5-20. Service Station Removal.**

1. Place the Top Cover in the open position.
2. Move the Carriage Assembly to the left side of the Slide Shaft.
3. Reach into the Right Cover and pull back on the Service Station release tab located on the far side of the Service Station. See Figure 5-20.
4. Raise the right side of the Service Station out of the Platen.
5. Lift out the left side of the Service Station from the Platen and remove the Service Station. Moving the Service Station farther to the right might be required to release the left side of the Service Station.

# Install the Service Station

1. To install the Service Station, position the Service Station inside the Right Cover and place the left side of the Service Station into the Platen.
2. Push down on the right side of the Service Station until the Service Station snaps into place.
3. Slide the Carriage Assembly to the right and back into the home position. Lower the Top Cover.

# Remove the Trailing Cable Assembly

1. Perform steps 1 through 13 of the Remove the Left, Top, and Right Covers procedures to remove the Left, Top and Right Covers.
2. If you have not already removed the Carriage Assembly from the Slide Shaft, you will need to perform Steps 3 through 7 of the Removing the Carriage Assembly, Carriage Belt, and the Frame Tensioner procedures in order to remove the Electronics Cover and release the left end of the Trailing Cable from the Carriage PCB.
3. Disconnect the Trailing Cable Assembly connector at the J6 location on the MPCB. Use the thumb and forefinger to pull forward on the connector lock and remove the Trailing Cable from the connector. See Figure 3-6 if necessary.
4. The Trailing Cable Assembly is secured to the Stabilizer Bracket by two pieces of double sided tape. Remove the Trailing Cable Assembly from the Stabilizer Bracket.
5. Remove the ferrite and the tape securing it to the Trailing Cable.

# Install the Trailing Cable Assembly

1. Apply two new pieces of double sided tape to the Stabilizer Bracket. Ensure that the tape is in the same location as the original tape was.

CAUTION

The right side of the Trailing Cable (the side connected to the MPCB) must extend beyond the Stabilizer Bracket by 5” (4 7/8” - 5 1/8”) or 128mm (125mm - 131mm.)

2. Slip the ferrite around the Trailing Cable and insert the right side of the Trailing Cable Assembly through the access hole provided in the Right Side plate.

3. Slide the Carriage Assembly (if installed) to the far left side of the Slide Shaft. While ensuring a 5" (125mm) overhang on the right side, position the Trailing Cable over the Stabilizer Bracket and slowly lower it onto the bracket. Ensure that the Trailing Cable goes on straight and that there are no buckles in the cable. Firmly press the Trailing Cable Assembly onto the tape to secure it into position.
4. Connect the right end to the MPCB at the J6 location.
5. Tape the ferrite to the Trailing Cable approximately 1/4" (6mm) from the left side of the side plate.
6. If the Carriage Assembly is not installed, perform steps 5 through 18 of the Install the Carriage Assembly, Carriage Belt, and the Frame Tensioner procedures.
7. If the Carriage Assembly is installed, insert the Trailing Cable Assembly into the Strain Relief Assembly. Insert the Strain Relief (with Trailing Cable) onto the Carriage Assembly by sliding it onto the Strain Relief Support until it snaps firmly into place. See Figure 5-4.

# Remove the Stabilizer Bracket and Encoder Strip

1. Perform steps 1 through 13 of the Remove the Left, Top, and Right Covers procedures to remove the Left, Top and Right Covers.
2. Perform steps 2 through 6 of the Remove the Ink Delivery System procedures to remove the Ink Delivery System.
3. Perform the Remove the Carriage Assembly, Carriage Belt, and the Frame Tensioner procedures to remove the Carriage Assembly from the Slide Shaft.
4. Perform steps 3 and 4 of the Remove the Trailing Cable Assembly procedures to remove the Trailing Cable Assembly.
5. Remove the Support Bracket by slightly tilting the top of the Support Bracket towards the front of the printer and lifting it straight up. See Figure 5-21.

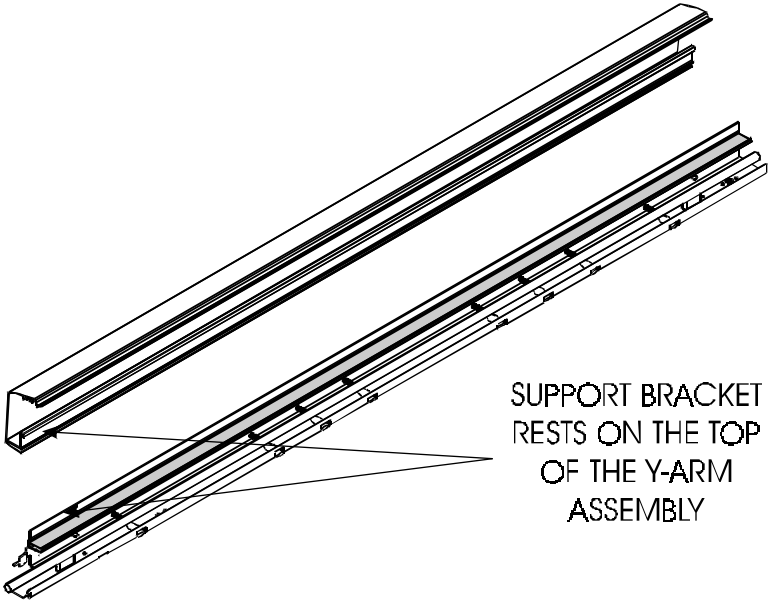


**Figure 5-21. Stabilizer Bracket Installation/Removal.**

6. Remove the Stabilizer Bracket from the Y-Arm Assembly by removing the four alignment Allen screws and washers located on the back of the Y-Arm Assembly.

CAUTION

The Encoder Strip is not a field removable item. The entire Stabilizer Bracket Assembly with the Encoder Strip and Trailing Cable installed is to be replaced if the Encoder Strip is damaged.

# Install the Stabilizer Bracket and Encoder Strip

1. Install the Stabilizer Bracket Assembly (with Encoder Strip and Trailing Cable) onto the Y-Arm Assembly using the four alignment Allen screws and washers. Hand tighten only.
2. Install the Support Bracket onto the Stabilizer Bracket Assembly by placing the Support Bracket onto the Stabilizer Bracket with a slight forward tilt.
3. Perform the Install the Carriage Assembly, Carriage Belt, and the Frame Tensioner Procedures to install the Carriage Assembly, Carriage Belt, and the Frame Tensioner.
4. Perform steps 2 through 7 of the Install the Trailing Cable Assembly procedures to finish installing the Trailing Cable Assembly.
5. Perform the Install the Ink Delivery System procedures to install the Ink Delivery System.
6. Perform the Install the Left, Top, and Right Covers procedures to install the Left, Top and Right Covers.
7. Perform the Head Height Adjustment procedures found in Chapter 3 of this service manual.

# Remove the Y-Arm Assembly, Pinch Rollers, Slide Shaft, and Auto-Load Sensor

1. Perform steps 1 through 13 of the Remove the Left, Top, and Right Covers procedures to remove the Left, Top and Right Covers.
2. Perform steps 2 through 6 of the Remove the Ink Delivery System procedures to remove the Ink Delivery System.
3. Perform the Remove the Carriage Assembly, Carriage Belt, and the Frame Tensioner procedures to remove the Carriage Assembly from the Slide Shaft.

4. Perform steps 3 and 4 of the Remove the Trailing Cable Assembly procedures to remove the Trailing Cable Assembly.

5. Perform steps 5 and 6 of the Remove the Stabilizer Bracket and Encoder Strip procedures to remove the Stabilizer Bracket Assembly.

6. Disconnect the Load Sensor connector at the J4 location on the MPCB. Grasp the Load Sensor connector with the thumb and forefinger and pull straight out.

7. Remove the seven screws that secures the Y-Arm Assembly to the Platen. See Figure 5-22.

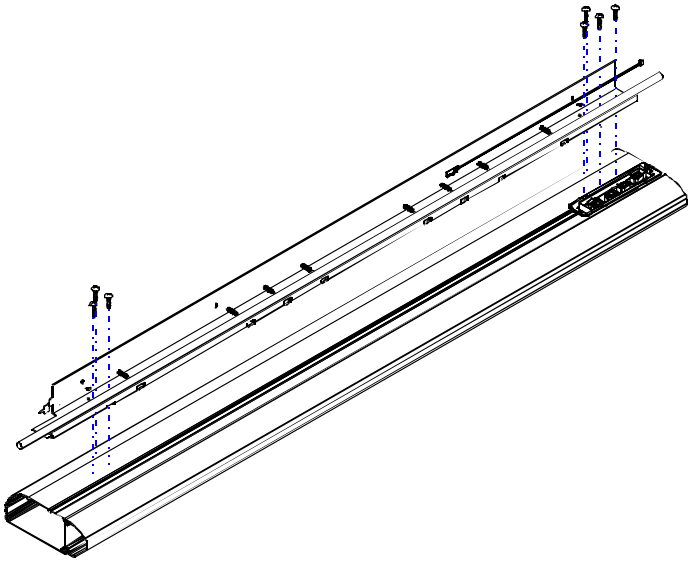

**Figure 5-22. Y-Arm Installation/Removal.**

8. The pinch rollers are held on by a small C clamp located on the back of the Y-Arm Assembly. See Figure 5-23. While holding the pinch roller, remove the C clamp and move the pinch roller towards the front of the Y-Arm Assembly until it clears the back of the Y-Arm Bracket.

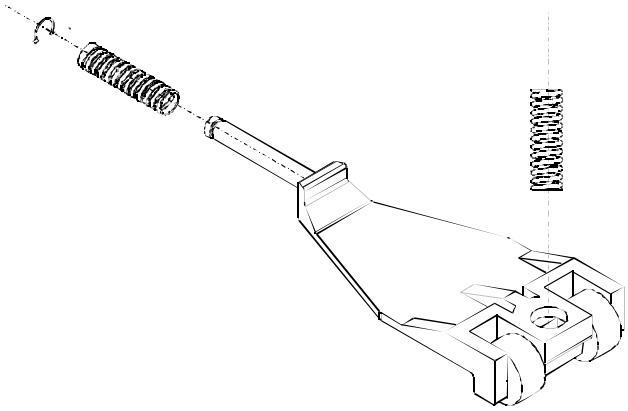

**Figure 5-23. Pinch Roller.**

9. Spin the back of the pinch roller to either side and remove the back spring.

10. Carefully tilt the back of the pinch roller upwards. This brings the front of the pinch roller down, away from the Slide Shaft. Carefully remove the spring that is going into the Slide Shaft from the top of the pinch roller.

11. Remove the pinch roller.

12. From the bottom of the Y-Arm Assembly, remove the four screws that secure the Slide Shaft and its two supports from the Y-Arm Assembly.

13. Using a #1 Phillips screwdriver, remove the two screws that secure the Auto-Load Sensor to the Y-Arm. Remove the Auto-Load Sensor wires from the four wire clamps on the back part of the Y-Arm Bracket.

# Install the Y-Arm Assembly, Pinch Rollers, Slide Shaft, and Auto-Load Sensor

1. Install the Auto-Load Sensor Assembly into the back part of the Y-Arm Bracket using a #1 Phillips screwdriver. Torque to 6 in-lbs.

2. Route the Load Sensor wires through the four wire clamps on the back part of the Y-Arm Bracket.

3. Install the Slide Shaft and two supports to the Y-Arm Assembly using four screws. Torque to 8 in-lbs.

4. Insert the back compression spring onto the shaft of the pinch roller and push the back of the shaft through the back of the Y-Arm Assembly. Install the C clamp around the shaft of the pinch roller.

5. While compressing the forward pinch roller spring with a screwdriver (or other flat object), position the pinch roller onto the Y-Arm Assembly until the forward spring is located under the hole in the Slide Shaft. Release the spring and verify that the spring enters the hole in the Slide Shaft and that no kinks are present in the spring.

6. Perform steps 4 and 5 for all pinch rollers.

7. Using a #2 Phillips screwdriver, secure the Y-Arm Assembly to the Platen using seven screws. Torque to 15 in-lbs.

8. Perform the Install the Stabilizer Bracket and Encoder Strip procedures to install the Stabilizer Bracket and Encoder Strip.

9. Perform the Install the Carriage Assembly, Carriage Belt, and the Frame Tensioner Procedures to install the Carriage Assembly, Carriage Belt, and the Frame Tensioner.

10. Perform the Install the Trailing Cable Assembly procedures to install the Trailing Cable Assembly.

11. Perform the Install the Ink Delivery System procedures to install the Ink Delivery System.

12. Perform the Install the Left, Top, and Right Covers procedures to install the Left, Top and Right Covers.

13. Perform the Head Height Adjustment procedures found in Chapter 3 of this service manual.

# Remove the Lower Roller Assembly, Stepper Motor and Vacuum Fan

The Inner Platen contains the Lower Drive Roller Assembly, the Vacuum Fan Assembly, the Stepper Motor Assembly, Drive Shaft Supports, and the Foam Block. These parts are collectively referred to as the Inner Platen Parts.

## NOTE

The removal of the Lower Drive Roller Assembly and Vacuum Fan(s) is easier if extracted out of the left side of the Platen.

1. Perform steps 1 through 13 of the Remove the Left, Top, and Right Covers procedures to remove the Left, Top and Right Covers.
2. Perform steps 2 through 4 of the Remove Servo Motor procedures to remove the Right Sideplate Assembly.
3. Perform steps 2 through 5 of the Remove Service Station procedures to remove the Service Station.


Be careful when removing the Foam Block so that it does not tear. It is very important to have an intact Foam Block to produce sufficient vacuum inside the Platen to properly hold down the media.

4. Using the accesses gained by removing the Right Sideplate and the Service Station, remove the foam block from between the Lower Drive Roller Assembly and the Servo Motor.
5. Perform steps 2 through 6 of the Remove the Ink Delivery System procedures to remove the Ink Delivery System.

6. Using a #2 Phillips screwdriver, remove the two screws that secure the Left Sideplate Assembly to the Platen. See Figure 5-24.

## NOTE

The Novajet PRO 600e 42 inch model has one Vacuum Fan and Exhaust assembly while the 60 inch has two sets of Vacuum Fans and Exhausts.

7. Using a #1 Phillips screwdriver, remove the four screws on the bottom of the Platen which holds the Fan Exhaust(s) in place.

8. While holding the Vacuum Fan through the hole left when the Exhaust assembly was removed, remove the 3 screws on the bottom of the Platen that holds the Vacuum Fan in place using a #2 Phillips screwdriver. Do not allow the screws to come out at an angle.

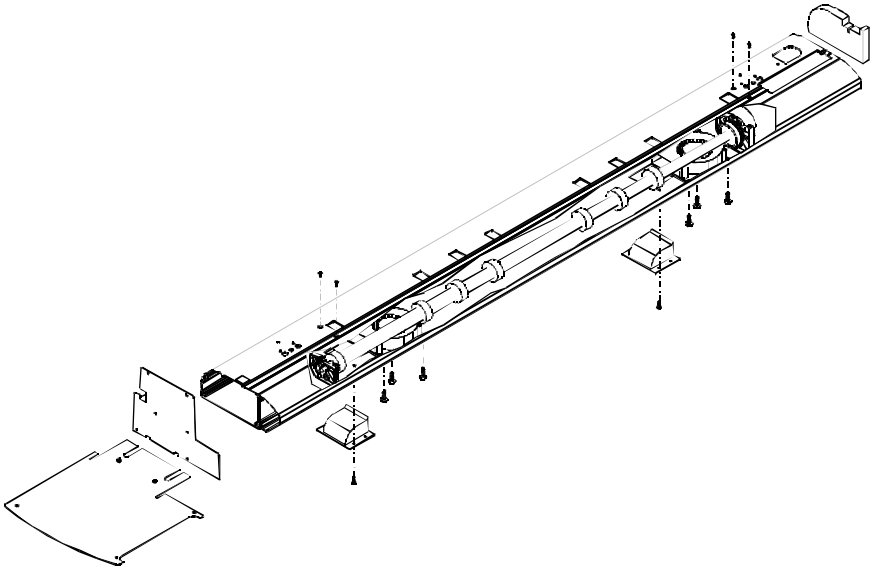

**Figure 5-24. Inner Platen Assembly/Disassembly.**

9. Using a #1 Phillips screwdriver, remove the black flat-head screws from the top of the Platen that holds the left and right Drive Shaft Supports in place.


It may be necessary to loosen (do not remove) the screws that secure the Y-Arm Assembly to the Platen so that the Lower Drive Roller Assembly clears the ends of the screws that protrude inside of the Platen when removing the Lower Drive Roller Assembly.


It may be necessary to loosen (do not remove) the screws that secure the left Leg Assembly to the Platen so that the Lower Drive Roller Assembly clears the ends of the screws that protrude inside of the Platen when removing the Lower Drive Roller Assembly.


The Fan Assemblies will be removed at the same time that the Lower Drive Roller Assembly is removed. Exercise extreme care that the fan assemblies do not drop out of the Platen when removing the Lower Drive Roller Assembly.

10. Carefully slide the Lower Drive Roller Assembly (and the Fan Assemblies) out of the left side of the Platen.

11. Remove the Stepper Motor Extension Spring from the Stepper Motor and the post on the Left Lower Drive Shaft Bracket. See Figure 5-25.

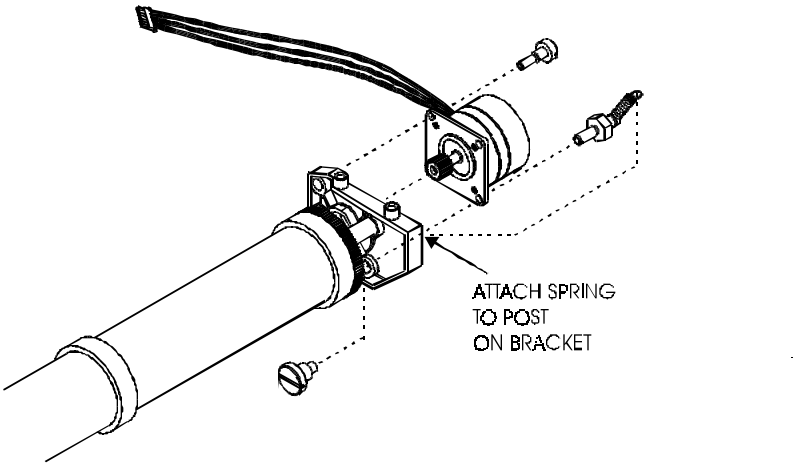


**Figure 5-25. Stepper Motor Removal/Installation.**

12. Remove the hardware securing the Stepper Motor to the Left Lower Drive Shaft Bracket and remove the Stepper Motor.

# Install the Lower Roller Assembly, Stepper Motor and Vacuum Fan

1. Loosely attach the Stepper Motor to the Lower Roller bracket using Stepper Motor hardware as shown in Figure 5-19.

2. Attach the Stepper Motor tension spring to the Stepper Motor and the Lower Roller Bracket. Tighten the Stepper Motor hardware to 8 in-lb of torque.

CAUTION

It may be necessary to loosen (do not remove) the screws that secure the Y-Arm Assembly to the Platen so that the Lower Drive Roller Assembly clears the ends of the screws that protrude inside of the Platen while installing the Lower Drive Roller Assembly.

CAUTION

It may be necessary to loosen (do not remove) the screws that secure the left Leg Assembly to the Platen so that the Lower Drive Roller Assembly clears the ends of the screws that protrude inside of the Platen when removing the Lower Drive Roller Assembly.

## NOTE

Ensure that the Lower Drive Supports and Fan Assemblies are oriented in the correct position before inserting into the Platen. See Figure 5-24 for visual indication of correct orientation.

3. Slide the right side of the Lower Drive Roller Assembly inside of the left side of the Platen until the first roller is inserted.
4. Position and hold one of the Fan Assemblies under the Lower Drive Roller Assembly and between the first and second rollers. Continue to insert the Lower Drive Roller Assembly into the Platen.
5. Position and hold the other Fan Assembly (for 60 inch model only) under the Lower Drive Roller Assembly and between the seventh and last rollers. Continue to insert the Lower Drive Roller Assembly completely into the Platen.

6. Reaching inside the Fan Exhaust hole under the Platen, position and secure the Fan Assembly(ies) using a #2 Phillips screwdriver.

7. Reinstall the Fan Exhaust Assembly(ies) using a #2 Phillips screwdriver.

8. Install the Lower Drive Roller Assembly support brackets using a #2 Phillips screwdriver.

9. Reinsert the Foam Block. Make sure that the Stepper Motor and Fan(s) cables are exiting out of the back corner of the Foam Block. See Figure 5-26. The Foam Block is positioned between the Stepper Motor and the Servo Motor. Make sure it is not tilted at an angle.

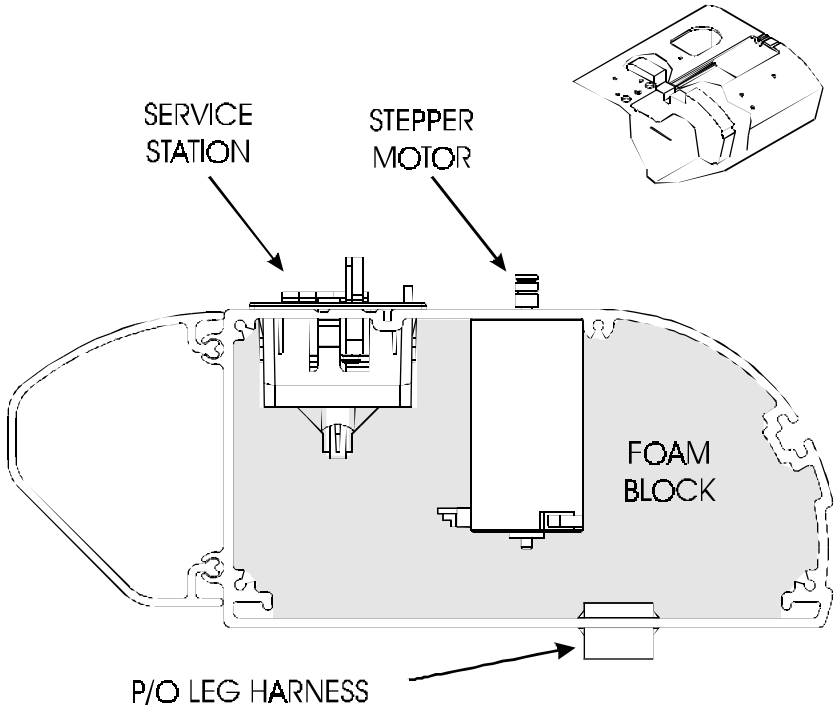


**Figure 5-26. Inside Platen, Right Side.**

11. Reinsert the Service Station.
12. Reinstall the Right Sideplate using a #2 Phillips screwdriver. Ensure that all cables from inside the Platen are exiting out of the large hole in the Sideplate.
13. Reinstall the Power Supply Bracket using four screws and a #2 Phillips screwdriver.
14. Perform steps 5 through 14 of the procedures to reconnect the MPCB.
15. Reinstall the Left Baseplate using a #2 Phillips screwdriver.
16. Reinstall the Left Sideplate using a #2 Phillips screwdriver.
17. Perform steps 1 through 4 of the Install the Ink Delivery System procedures to reinstall the Ink Delivery System.
18. Perform the Install Left, Top, and Right Covers procedures to install the Left, Top, and Right Covers.

## Remove the Media Take-Up and Feed Sensor Brackets and Sensors

**NOTE**

The sensors for the media Take-Up and Feed Assembly are identical, but the brackets that they mount to have distinct differences. The top bracket has an additional extended arm attached to help in directing the media from blocking the sensor's beam path. Ensure that the bracket is being replaced with the correct bracket.

1. Remove all media and media rollers from the printer.
2. Disconnect the sensor leads from the printers leg assembly by squeezing the sides of the connector to release the quick disconnect latches.
3. With a pair of wire cutters, cut the wire tie wraps (see Figure 5-27) that is securing the sensor leads to the sensor bracket.

4. Remove the sensor by unscrewing the plastic nut off of the front of the sensor. Pull the sensor out of the bracket.

5. Using a #2 Phillips screwdriver, remove the two screws securing the bracket to the leg assembly.

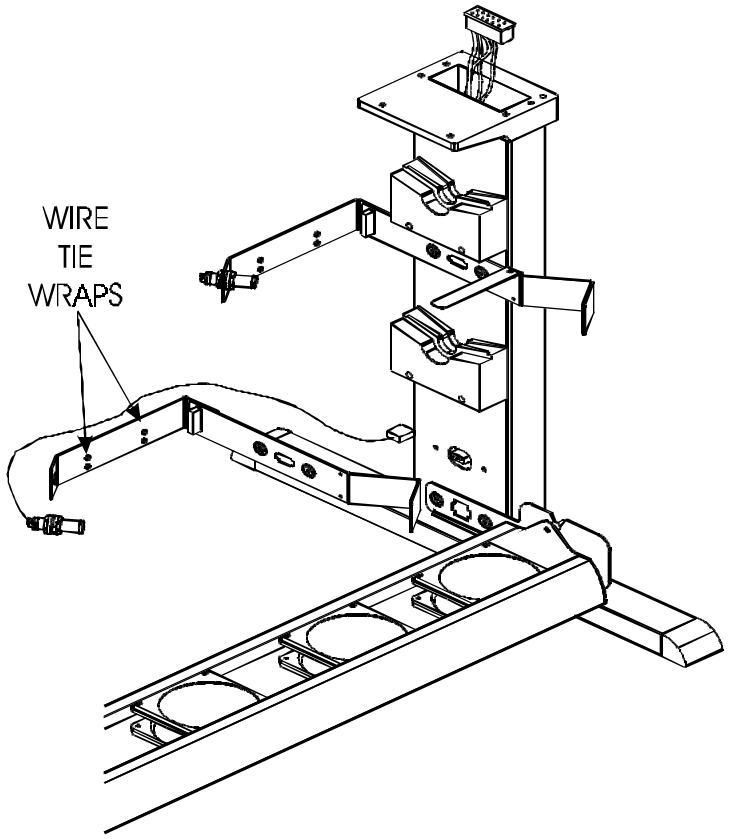


**Figure 5-27. Media Take-Up and Feed Sensor Removal.**

# Install the Media Take-Up and Feed Sensor Brackets and Sensors

1. Using a #2 Phillips screwdriver, install the two screws securing the bracket to the leg assembly.
2. Insert the sensor into the hole on the sensor bracket, secure by screwing on the plastic nut onto the front of the sensor.
3. Route the sensor wires to the back of the bracket and secure the wires using two wire tie wraps.
4. Bringing the wire from under the bracket, attach the wire connector to the leg harness plug. Push connector in until firmly seated.

# Remove the Media Take-Up and Feed Motors

1. Remove all media and media rollers from the printer.
2. Remove the four screws holding the Cradle Idler to the leg assembly. See Figure 5-28.
3. Carefully slide the Cradle Idler assembly out of the leg assembly until the wires going to the motor can be removed.
4. Remove the wires from the motor.
5. From the back of the Cradle Idler, disconnect the tension spring from the post located on the Cradle Idler.
6. Using a #2 Phillips screwdriver, remove the screw and washer holding the motor mount to the Cradle Idler. Carefully remove the motor, motor mount, and motor gear subassembly from the Cradle Idler.
7. Remove the C clamp that is securing the motor gear to the motor.
8. Using a #1 Phillips screwdriver, remove the three screws, washers, and lock washers from the motor mount to remove the motor.

# Install the Media Take-Up and Feed Motors

1. Using a #1 Phillips screwdriver, install the three screws, washers, and lock washers that secures the motor to the motor mount.
2. Install the motor gear to the motor. Secure with a C clamp.
3. Insert the motor, motor mount, and motor gear subassembly into the back of the Cradle Idler. Tilt the subassembly slightly while installing to align the motor gear with the opening on the top of the Cradle Idler.
4. Screw in the screw and washer that secures the motor mount to the Cradle Idler.
5. Attach the tension spring to the post on the Cradle Idler.
6. Position the Cradle Idler assembly in front of the hole in the leg assembly. Attach the wire connectors to the motor (red to the positive terminal, black to the negative terminal.)
7. Insert the Cradle Idler Assembly into the leg and secure with four screws.

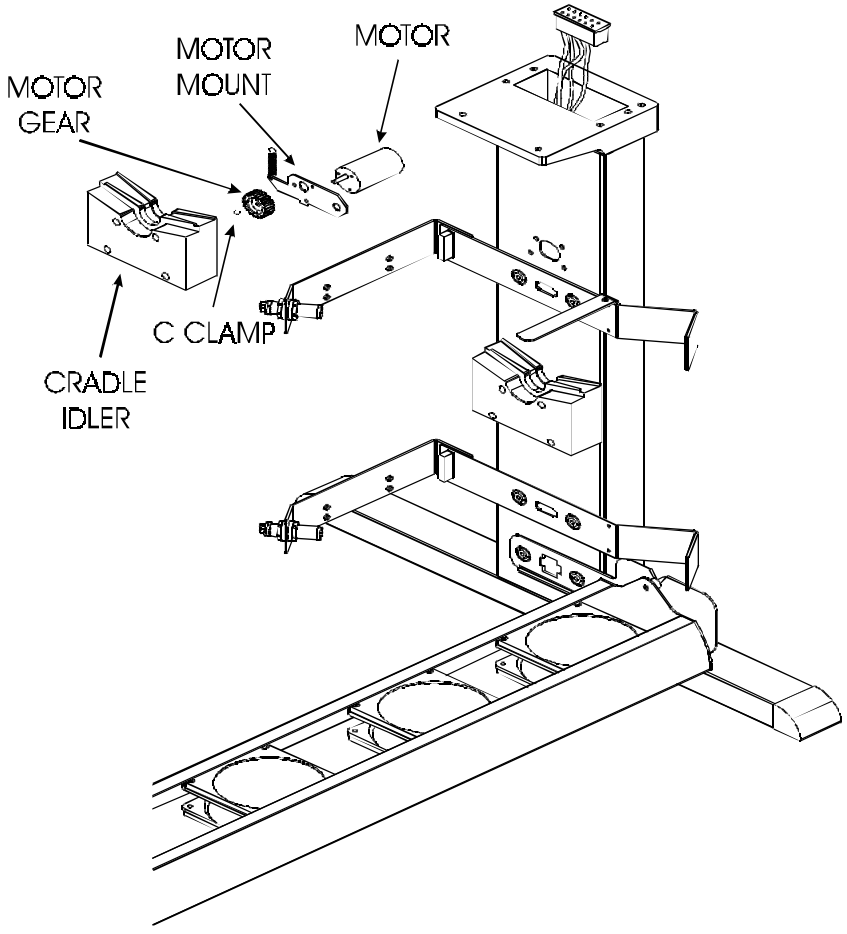


**Figure 5-28. Media Take-Up and Feed Motor Removal.**

# Remove the Media Drying Fans

1. On the left side of the drying fan assembly is a black wingnut used to adjust the position of the fan assembly. Remove the black wingnut.
2. Disconnect the drying fan assembly leads from the printers leg assembly by squeezing the sides of the connector to release the quick disconnect latches.
3. Lift the entire drying fan assembly off of the printer.
4. Remove the air filter from the fan to be removed by squeezing the tabs on the filter housing to release the housing off the fan.
5. Remove the four bolts securing the back bracket (the one with the positioning bolts on the bottom) to both of the side plates.
6. Pull the back bracket away from the fans to gain access to the faulty fan. Carefully pull the fan away from the front bracket until access is gained to reach the electrical connector.
7. Disconnect the connector to the fan.

# Install the Media Drying Fans

1. Reconnect the electrical connection to the fan. Push the connector and wires into the bracket so the fan can be seated correctly on the bracket.
2. Carefully orient all the fans so that the back bracket can be installed correctly. Secure the back bracket to the side plates.
3. Install the air filter and air filter housing.
4. Lay the entire assembly onto the support brackets on the printer. Ensure that the cable connector is on the right side of the printer as it is installed.
5. Reattach the positioning wingnut on the left side of the assembly.
6. Attach the wire connector to the leg harness plug. Push connector in until firmly seated.

# Parts List 6

This chapter lists the items and their associated numbers for the parts and assemblies of the **NovaJet PRO 600e** printers that are field replaceable. The list is in order of part name as identified in the assembly/disassembly chapter.

This list is to be used in conjunction with the assembly/disassembly procedures to aquire the necessary parts and properly install them into the printer.

The parts and asssemblies may be ordered through your local authorized dealer or ***ENCAD, Inc.'s*** Technical Support and Service department.

| FIGURE | ITEM | PART NAME | PART # |
|---|---|---|---|
| 6-1 | 1 | COVER W/DOOR, LEFT | 209220-7 |
| 6-1 | 2 | RESERVIOR ASSEMBLY, BLUE | 207616-3 |
| | | RESERVIOR ASSEMBLY, GRAY | 207616-4 |
| 6-1 | 3 | CAP, RESERVIOR | 207562 |
| 6-1 | 4 | TUBE ASSY, RESERVIOR, BLUE | 209580 |
| | | TUBE ASSY, RESERVIOR, GRAY | 209581 |
| 6-1 | 5 | INK DELIVERY SYSTEM, 60” | 207613-1 |
| | | INK DELIVERY SYSTEM, 42” | 207613-2 |
| 6-1 | 6 | FITTING, FEMALE, GRAY | 207552-1 |
| | | FITTING, FEMALE, BLUE | 207553-1 |
| 6-1 | 7 | C-RING | 207789 |
| 6-1 | 8 | SIDE PLATE, LEFT | 207554-3 |
| 6-1 | 9 | BASE PLATE, LEFT | 209565 |
| | | HARDWARE KIT | 208810 |
| | | ASSEMBLY, AUTOPRIME | 207660-1 |
| | | SIMM, 32MB, 72 PIN | 210610 |
| | | ASSY, HEIGHT GAGE KIT | 209996-1 |
| | | LOOPBACK TEST CABLE | 205462 |

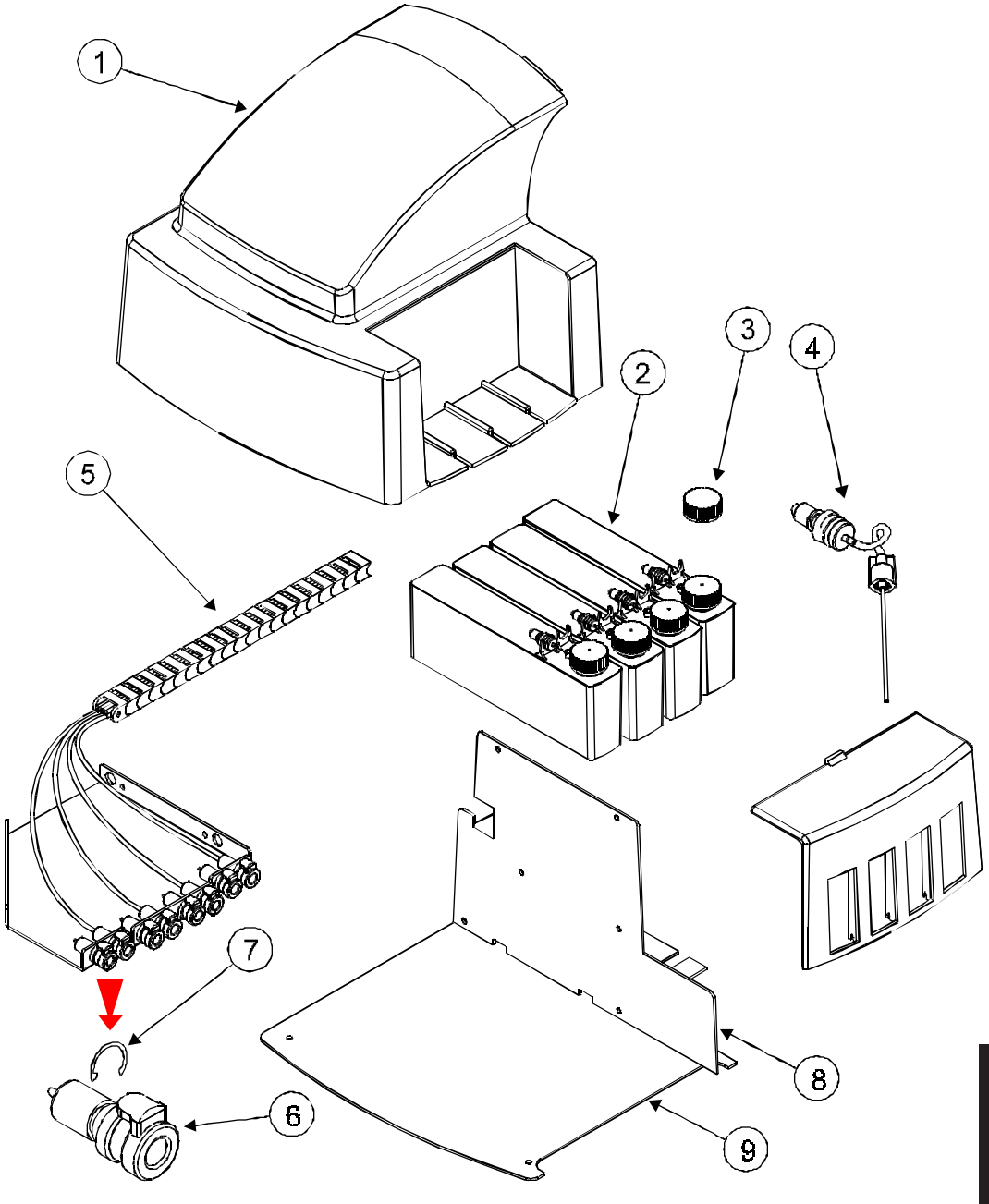


**Figure 6-1. Left Side Parts Breakdown.**

| FIGURE | ITEM | PART NAME | PART # |
|---|---|---|---|
| 6-2 | 1 | COVER ASSY, TOP, 60” | 207787-1 |
| | | COVER ASSY, TOP, 42” | 207787-2 |
| 6-2 | 2 | SPRING, COMPESSION | 209052 |
| 6-2 | 3 | RETRACTING STOP, ASSEMBLY | 208838 |
| 6-2 | 4 | TRAILING CABLE ASSY, 60” | 207573-2 |
| | | TRAILING CABLE ASSY, 42” | 207584-2 |
| 6-2 | 5 | STABILIZER ASSY WITH TRAILING CABLE AND ENCODER STRIP | |
| | | 60” | 209070 |
| | | 42” | 209069 |
| 6-2 | 6 | AUTOLOAD SENSOR ASSY | 207715 |
| 6-2 | 7 | SLIDE SHAFT, 60” | 207492 |
| | | SLIDE SHAFT, 42” | 207493 |
| 6-2 | 8 | BELT, 60” | 207475 |
| | | BELT, 42” | 207476 |
| 6-2 | 9 | FRAME, TENSIONER | 203870-1 |
| 6-2 | 10 | SPRING, COMPRESSION (IDLER) | 203999 |
| 6-2 | 11 | IDLER ASSEMBLY | 203405-1 |
| 6-2 | 12 | FOAM, CHAIN SUPPORT | 209657-1 |
| 6-2 | 13 | PINCH ROLLER ASSEMBLY | 207486 |
| 6-2 | 14 | SERVICE STATION ASSY | 207611-2 |
| 6-2 | 15 | PLATEN ASSY, 60” | 207496 |
| | | PLATEN ASSY, 42” | 207509 |
| 6-2 | 16 | KNIFE DAMPER ASSY | 202000 |

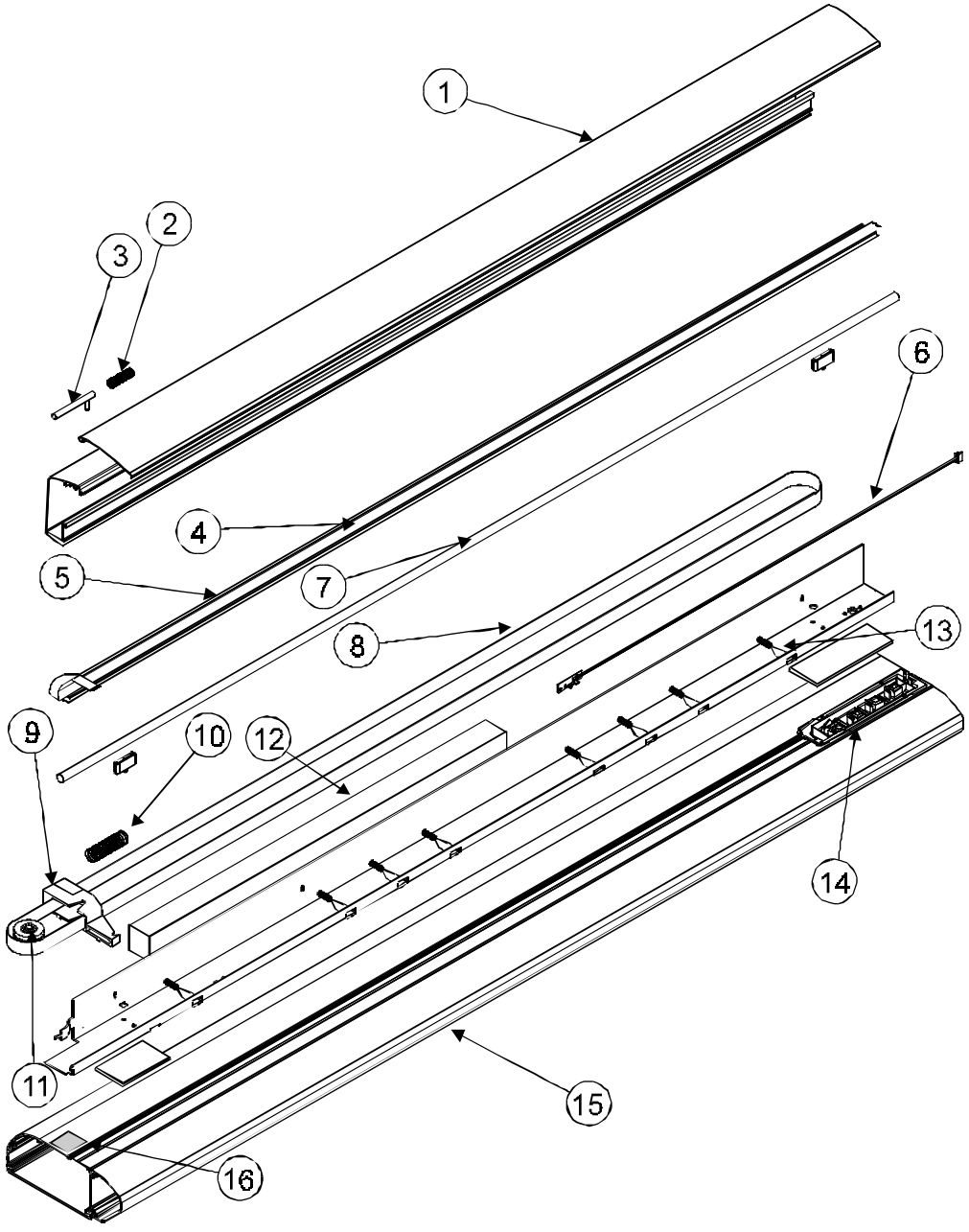


**Figure 6-2. Platen and Above Parts Breakdown.**

| FIGURE | ITEM | PART NAME | PART # |
|---|---|---|---|
| 6-3 | 1 | COVER, RIGHT | 208230-7 |
| 6-3 | 2 | KEYPAD ASSEMBLY | 209096-3 |
| 6-3 | 3 | DISPLAY ASSY | 210043 |
| 6-3 | 4 | POWER ENTRY MODULE | 207508 |
| 6-3 | 5 | FAN COOLING, POWER SUPPLY | 207593 |
| 6-3 | 6 | MAIN PRINTED CIRCUIT BOARD | 210111-101 |
| 6-3 | 7 | POWER SUPPLY ASSEMBLY | 210010 |
| 6-3 | 8 | SIDE PLATE, RIGHT | 207591-3 |
| 6-3 | 9 | BASE PLATE ASSY, RIGHT | 210089 |

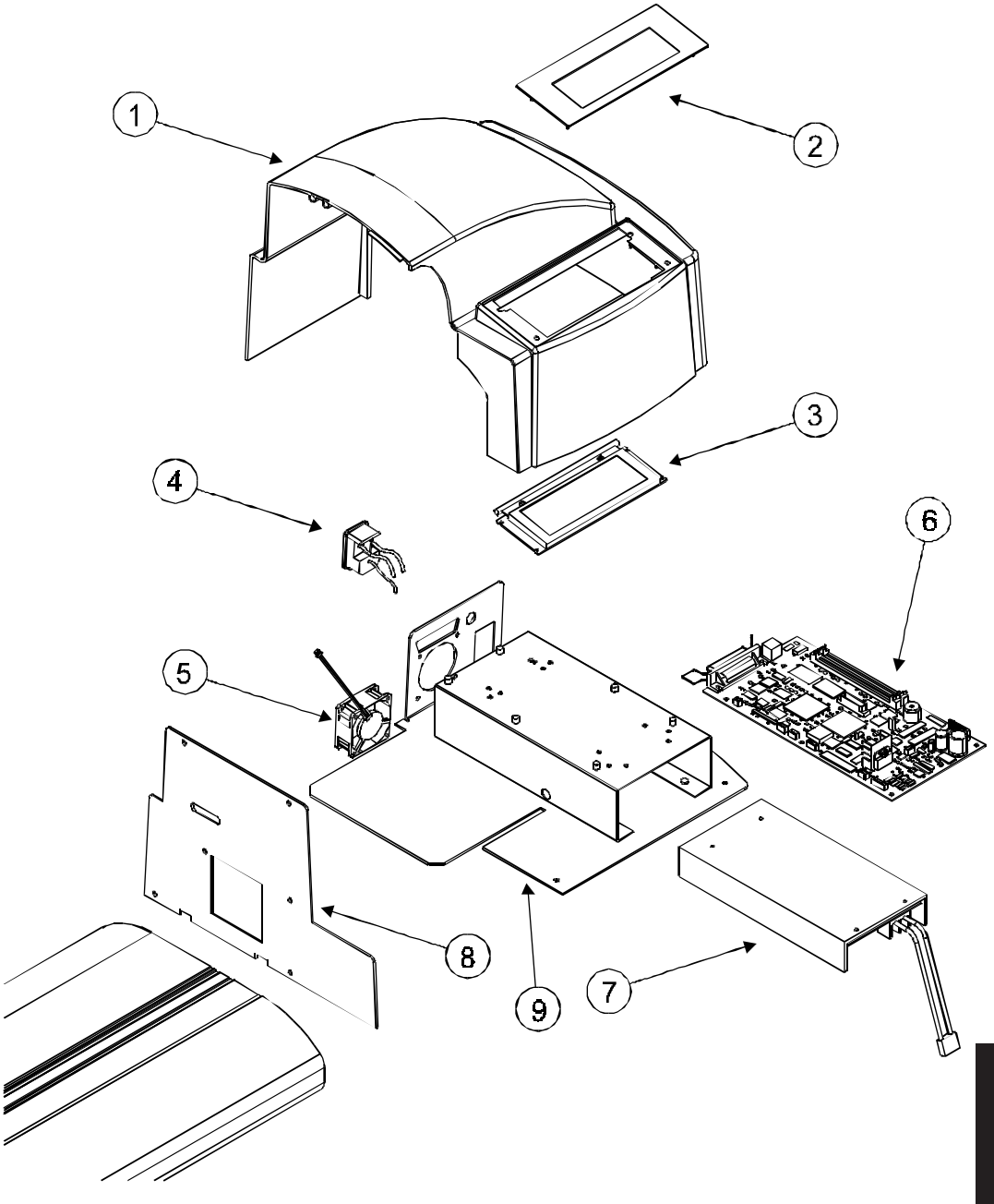


**Figure 6-3. Right Side Parts Breakdown.**

| FIGURE | ITEM | PART NAME | PART # |
|---|---|---|---|
| 6-4 | 1 | MOTOR ASSY, SERVO, W/FERRITE AND CAPACITOR | 209667 |
| 6-4 | 2 | BLOCK, RIGHT FOAM | 207559 |
| 6-4 | 3 | STEPPER MOTOR ASSY | 209071 |
| 6-4 | 4 | BRACKET, LOWER ROLLER ASSY | 208987 |
| 6-4 | 5 | FAN ASSEMBLY, VACUUM | 203443 |
| 6-4 | 6 | EXHAUST, GRILL | 204976 |
| 6-4 | 7 | LOWER ROLLER ASSY, 60” | 207023 |
| | | LOWER ROLLER ASSY, 42” | 207506 |
| 6-4 | 8 | FAN ASSY, VACUUM, 60” ONLY | 208981 |
| 6-4 | 9 | BLOCK, LEFT FOAM | 209177 |

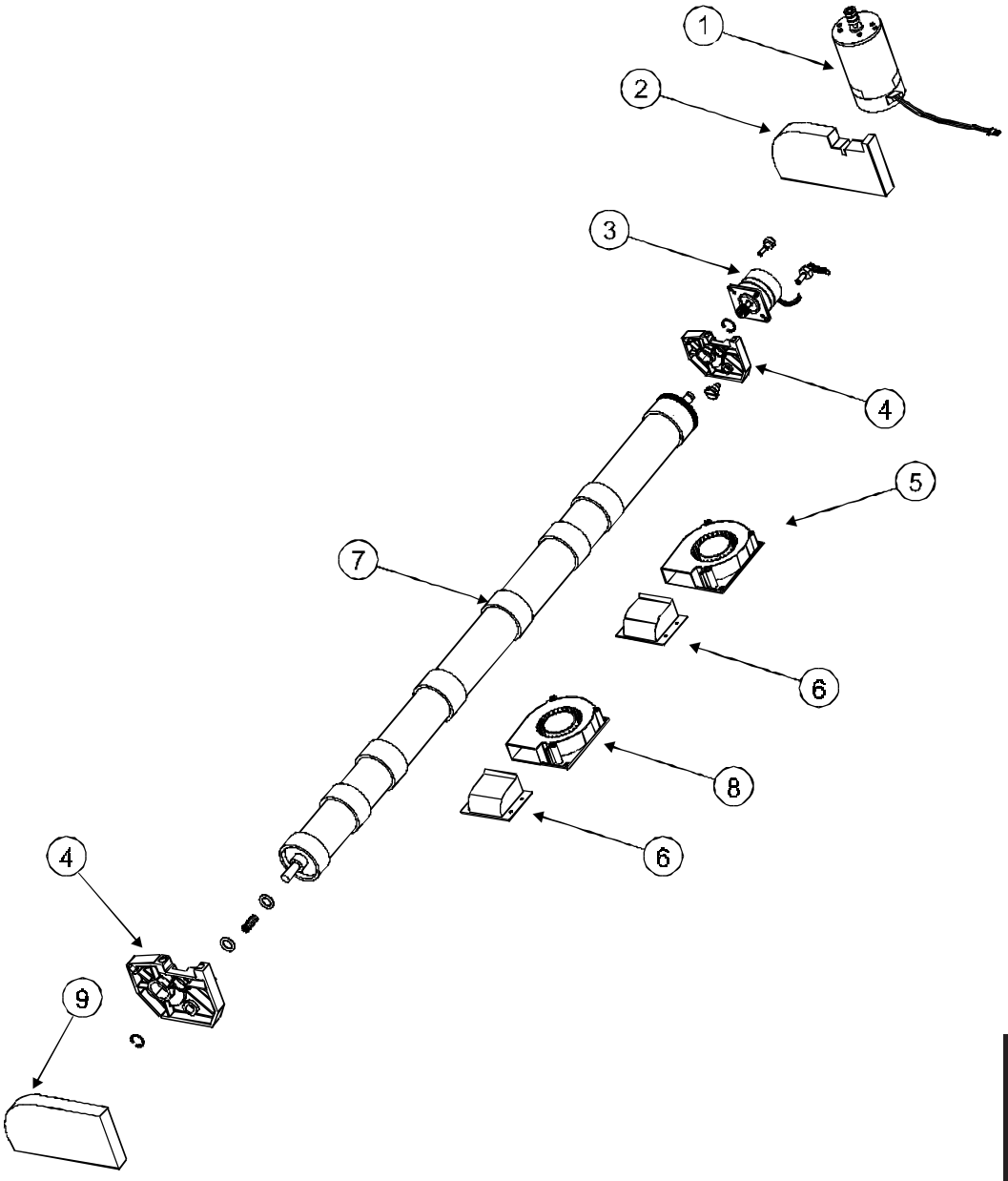


**Figure 6-4. Inner Platen Parts Breakdown.**

| FIGURE | ITEM | PART NAME | PART # |
|---|---|---|---|
| 6-5 | 1 | INK DELIVERY SYSTEM, 60” | 207613-1 |
| | | INK DELIVERY SYSTEM, 42” | 207613-2 |
| 6-5 | 2 | CARTRIDGE TUBE ASSY, BLUE (4) | 208996-1 |
| | | CARTRIDGE TUBE ASSY, GRAY (4) | 208997-1 |
| 6-5 | 3 | CARRIAGE PCB | 209567-104 |
| 6-5 | 4 | C-RING | 207789 |
| 6-5 | 5 | FITTING, FEMALE, GRAY | 207552-1 |
| | | FITTING, FEMALE, BLUE | 207553-1 |
| 6-5 | 6 | STRAIN RELIEF | 208276 |
| 6-5 | 7 | ENCODER SENSOR W/FLEX | 209578-101 |
| 6-5 | 8 | PAPER SENSOR W/FLEX | 207180 |
| 6-5 | 9 | CARRIAGE BUSHING SET (2) | 209568 |
| 6-5 | 10 | CARRIAGE FRAME ASSY | 209176 |
| | | CARRIAGE, COMPLETE ASSEMBLY | 209774-01 |

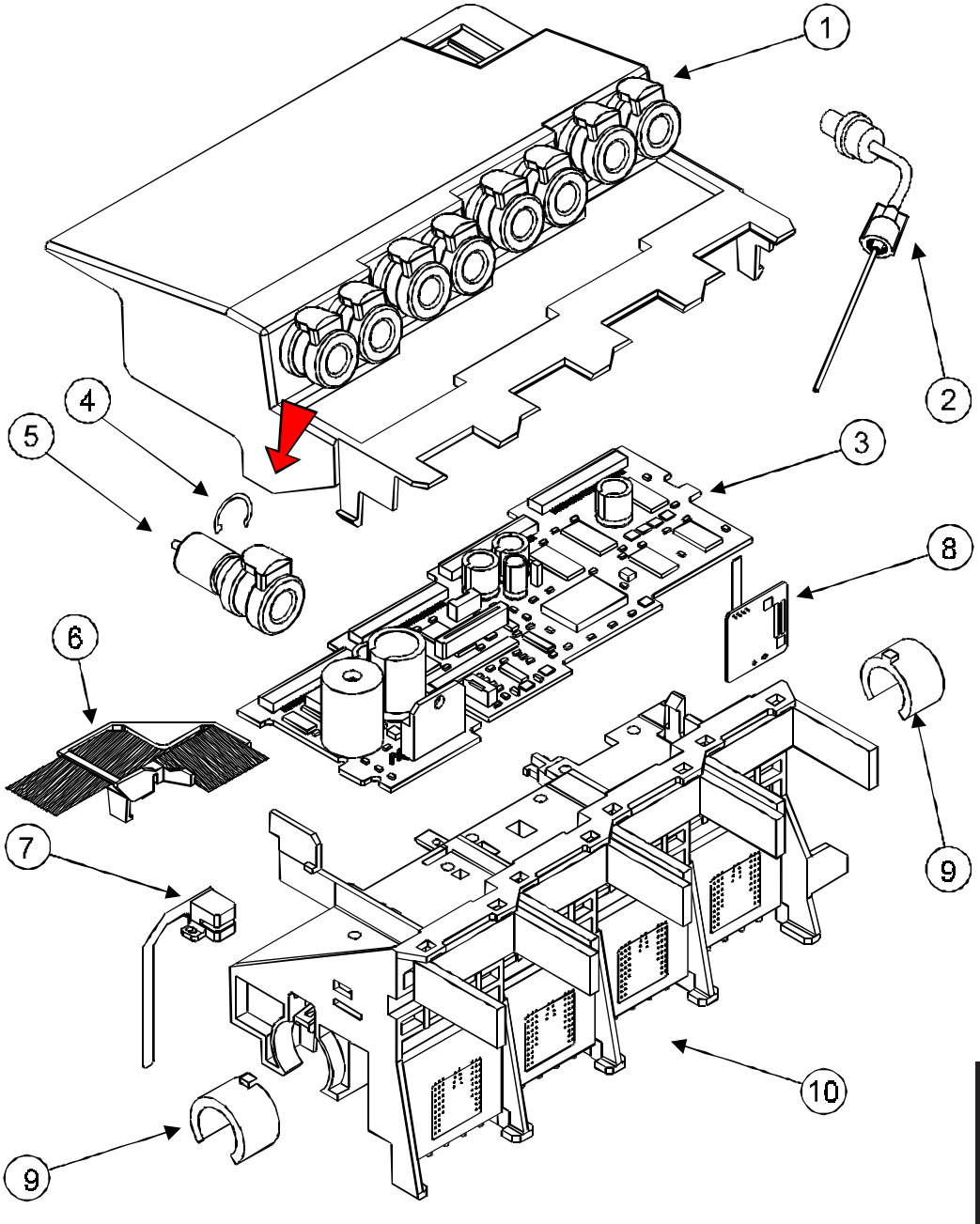


**Figure 6-5. Carriage Assembly Parts Breakdown.**

| FIGURE | ITEM | PART NAME | PART # |
|---|---|---|---|
| 6-6 | 1 | GUIDE, PAPER ADJUSTABLE | 207644 |
| 6-6 | 2 | SHAFT W/FIXED RIGHT ROLLER | |
| | | 60” | 207657-1 |
| | | 42” | 207657-2 |
| 6-6 | 3 | CLAMP, GUIDE PAPER | 207659 |
| 6-6 | 4 | CRADLE, IDLER | 207667 |
| 6-6 | 5 | GEAR, MOTOR, DRIVE | 207666 |
| 6-6 | 6 | MOTOR, DRIVE | 207767 |
| 6-6 | 7 | BRACKET ASSY, SENSOR, TOP | 207656 |
| 6-6 | 8 | BRACKET ASSY, SENSOR, BTM | 207752 |
| 6-6 | 9 | SENSOR ASSEMBLY | 207727 |
| 6-6 | 10 | HARNESS, WIRING, LEG DRIVE | 207731 |
| 6-6 | 11 | FAN ASSEMBLY, DRYER | 207725 |
| 6-6 | 12 | FILTER, DRYER, FAN | 207729 |

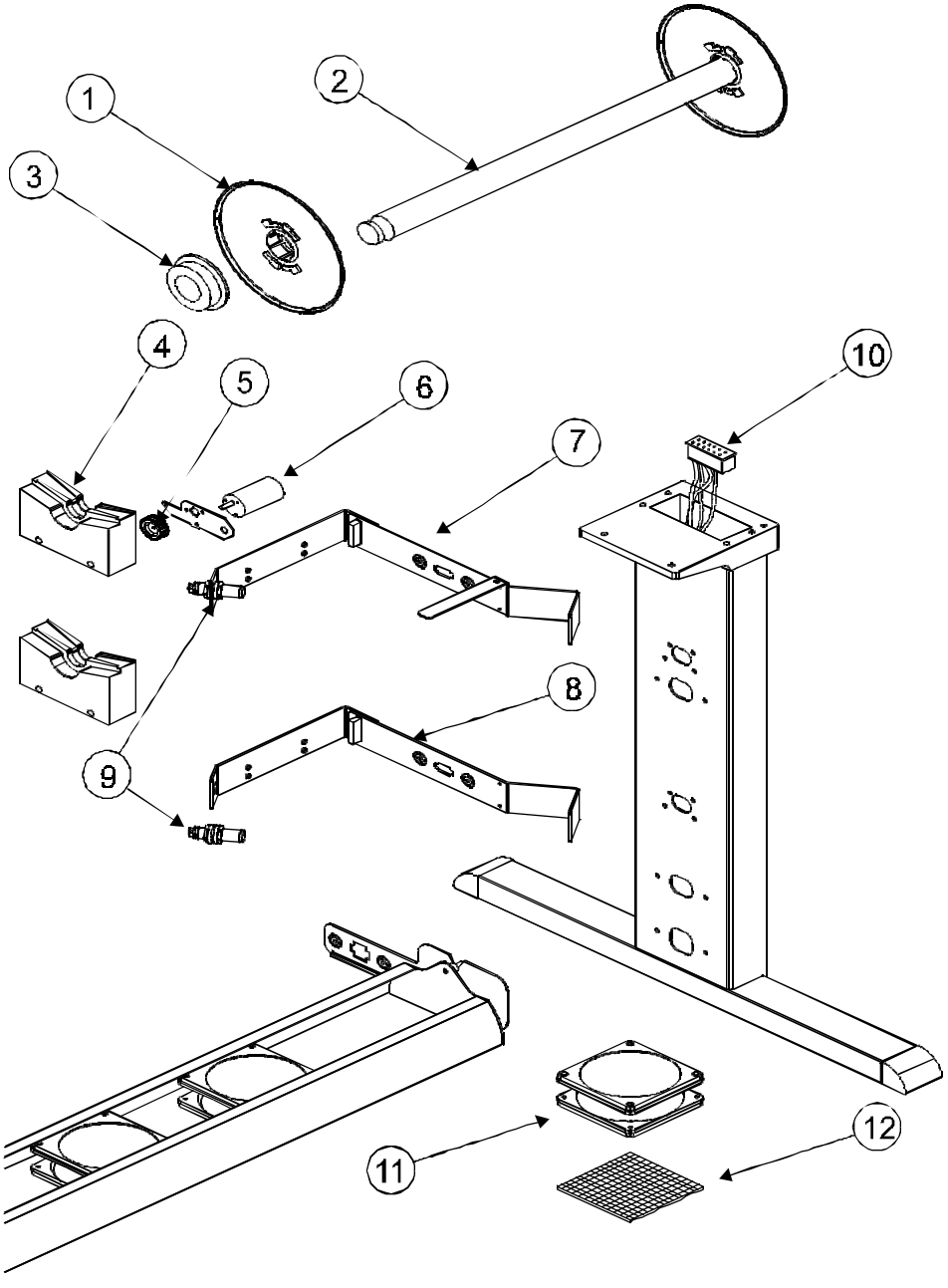


**Figure 6-6. Power Feed and Take-Up Parts Breakdown.**

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# Index

## M (cont)



## N



## O



## P



## R



## S



## T



## V



## W