

***The Action Laser™ 1400 is functionally  
the same as the Action Laser™ 1100 with  
the exceptions listed in Appendix B.***

# ***ActionLaser<sub>TM</sub> 1100***

## **Service Manual**

### **Revision Level**

| <b>Revision</b> | <b>Date</b> |
|-----------------|-------------|
| 1st printing    | 8/26/94     |

**EPSON<sup>®</sup>**

## **FCC Compliance Statement**

### ***For American Users***

This equipment has been tested and found to comply with limits for a Class B digital device pursuant to Part 15 of 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 or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- ☐ Reorient or relocate the receiving antenna.
- ☐ Increase the separation between the equipment and the receiver.
- ☐ Connect the equipment into an outlet on a circuit different from the one connected to the receiver.

### ***For Canadian Users***

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectrique dépassant les limites applicable aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectriques édicté par le Ministère des Communications du Canada.

### ***Warning***

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave the cables connected to unused interfaces.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

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## Precautions

Precautionary notations throughout the text are categorized relative to

- 1) personal injury
- 2) damage to equipment.

### **WARNING**



**Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by a WARNING heading.**

### **CAUTION**



*Signs/s a precaution which, if ignored, could result in damage to equipment.*

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

### **WARNING**



1. Always disconnect the product from both the power source and the host computer before performing any maintenance or repair procedure.
2. No work should be performed on the unit by persons unfamiliar with basic safety measures as dictated for all electronics technicians in their line of work.
3. When performing testing as dictated within this manual, do not connect the unit to a power source until instructed to do so. When the power supply cable must be connected, use extreme caution in working on the power supply and other electronic components.

### **CAUTION**

**A**

1. Repairs on EPSON products should be performed only by an EPSON certified repair technician.
2. Make certain that the source voltage is the same as the rated voltage listed on the serial number/rating plate. If the EPSON product has a primary AC rating different than the available power source, do not connect it to the power source.
3. Always verify that the EPSON product has been disconnected from the power source before removing or replacing printed circuit boards and/or individual chips.
4. In order **to protect** sensitive  $\mu P$  chip and circuitry, use static discharge equipment, such as anti-static wrist straps, when accessing internal components.
5. Replace malfunctioning components only with those components recommended by the manufacturer; Production of second-source ICs or other nonapproved components may damage the product **and** void any applicable EPSON **warranty**.

## **CLASS 1 LASER PRODUCT**

The Action Laser 1100 printer is certified to comply with laser product performance standards set by the U.S. Department of Health and Human Services as a Class 1 laser product. This means that this is a class of laser product that does not emit hazardous laser radiation; this is possible only because the laser beam is totally enclosed during all modes of customer operation.

The laser and output of the laser scanning unit produces a beam that, if looked into, could cause eye damage. Service procedures must be followed exactly as written without change.

When servicing the machine or laser module, follow the procedures specified in the manual and there will be no hazards from the laser.

Use of controls, adjustments, or performance of procedures other than those specified herein may result in a hazardous radiation exposure.

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## Specifications



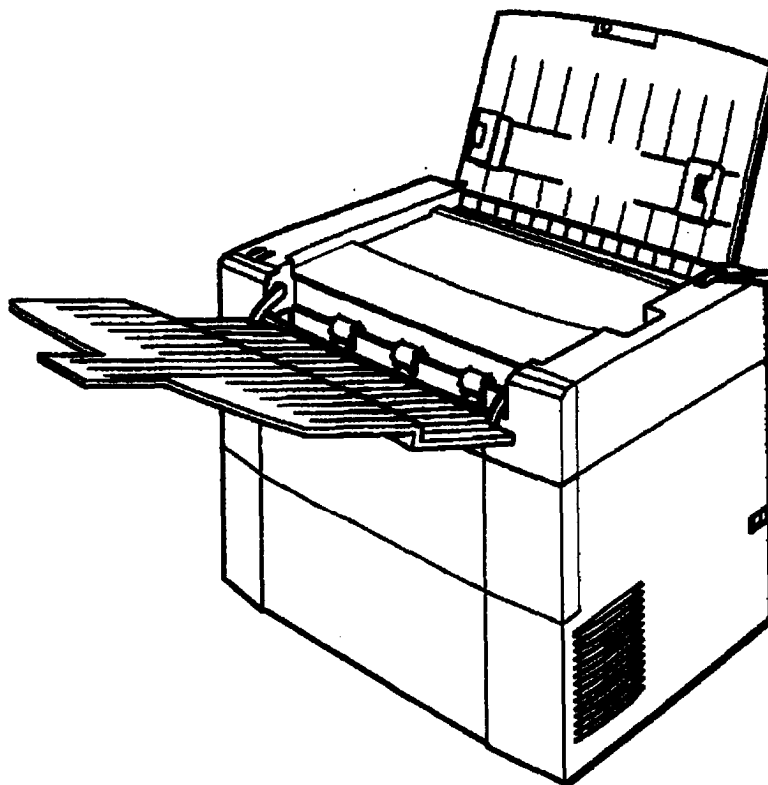
# Specifications 1

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The Action Laser 1100 is a non-impact page printer that uses a semiconductor laser and electrophotographic technology. The printer combines light weight and a small footprint with high-resolution output. The main features are:

- ☐ **300** dots per inch (DPI) resolution, enhanced by edge smoothing feature
- ☐ Easy maintenance
- ☐ HP LaserJet®III emulation
- ☐ Status monitoring through Windows® or DOS Control Panel
- ☐ Toner saving mode
- ☐ Energy Star compliant low-power standby mode
- ☐ Bidirectional parallel interface
- ☐ 1MB memory standard, expandable up to 5MB
- ☐ Optional PostScript emulation

The figure below shows an exterior view of the ActionLaser 1100.



**Figure 1-1. Exterior View of the ActionLaser 1100**

## General Specifications

The following table lists the specifications for the ActionLaser 1100 printer.

**Table 1-1. General Specifications**

| <b>Item</b>                 | <b>Specification</b>   |
|-----------------------------|--|
| Printing system             | Electro-photography  |
| Exposure system             | Semiconductor laser beam scanning  |
| Resolution                  | 300 DPI  |
| Warm up time                | 45 seconds   |
| Continuous print speed      | 4 pages per minute (letter or A4)  |
| Paper input capacity        | 100 sheets   |
| Paper output capacity       | 50 sheets (face down)  |
| Paper sizes                 | letter, legal, executive, half letter, A4, A5, B5, and envelope  |
| Paper weights               | 16 to 36 lb (60 to 135 g/m <sup>2</sup> )  |
| Nominal line voltage        | 100/110 VAC<br>220/240 VAC (outside the U.S only)  |
| Nominal line frequency      | 50 – 60 Hz $\pm$ 3 Hz  |
| Rated current               | Approximately 3.2 amps   |
| Power consumption           | Approximately 384W, Energy Star compliant; <30 W/hr in Sleep Mode  |
| Safety standards            | UL 1950<br>CSA 22.2 No. 950 Deviation 3  |
| Laser radiation regulations | FDA (NCDRH) Class 1  |
| Noise level                 | 48 dB(A) during printing   |
| Operating temperature range | 41° to 95° Fahrenheit (5° to 35° Centigrade)   |
| Operating humidity range    | 15% to 85% (non-condensing)  |
| Dimensions                  | 12.99 in. (W) x 9.25 in. (D) x 10.43 in (H)<br>330 mm (W) x 235 mm (D) x 265 mm (H)  |
| Weight                      | 11 lb (5 Kg)   |
| System requirements         | IBM Compatible PC (386/16 MHz minimum)<br>MS-DOS 3.3 or higher<br>Windows 3.1 or higher<br>4MB of RAM<br>1.7MB hard disk space plus 8.5MB hard disk space for permanent virtual memory under Windows |

Table 1-1 General Specifications, continued

| <b>Item</b>                          | <b>Specification</b>   |
|--------------------------------------|--|
| <b>Status indicators</b>             | Paper Out or Misfeed<br>Paper Jam<br>Cover Open<br>Print Cartridge Missing<br>Duplex Printing<br>Power Off or Cable Problem<br>Warming Up<br>NVRAM Failure<br>Laser Failure<br>Fuser Failure |
| <b>Job control policies</b>          | Foreground or background printing (Print Manager)  |
| <b>Display status while printing</b> | Beep on printer error<br>Beep when print job is complete<br>Simplex or manual duplex printing  |
| <b>Job control actions</b>           | Pause current job in progress<br>Resume paused job<br>Delete current or any job in queue   |
| <b>Print characteristics</b>         | Paper size<br>Orientation<br>Number of sets<br>Print density<br>EET Mode   |
| <b>Fonts</b>                         | Supports all available fonts in Windows  |
| <b>Fonts supported in PCL mode</b>   | Courier 10 point, 12 pitch, regular, bold, and italic<br>Courier 12 point, 10 pitch, regular, bold, and italic<br>Line Printer 8.5 point, 16.66 pitch, regular                               |
| <b>Interface</b>                     | Bidirectional communication over standard Centronics parallel printer port   |

## Environmental Specifications

### Temperature, Humidity, and Altitude Requirements

Print engine with print cartridge installed

|                        |   |
|------------------------|---|
| Operating Temperature: | 41° to 95° F (5° to 35° C)<br>@ 15% to 85% RH Non-condensing  |
| Storage Temperature:   | -4° to 104° F (20° to 40° C)<br>@ 5% to 95% RH Non-condensing |
| Altitude:              | 0 to 8,200 feet (0 to 2,500 meters)                           |

Print engine without print cartridge installed

|                      |  |
|----------------------|--|
| Storage Temperature: | -4° to 104° F (-20° to 40° C)<br>@ 5% to 95% RH Non-condensing |
| Altitude:            | 0 to 49,200 feet (0 to 15,000 meters)                          |

### Acoustic Noise of the 4PPM Print Engine

Print engine without print cartridge installed

Sound measurements are taken in accordance with ISO 7779 (9-position method)

Sound measurements are 9-point log average, not to exceed the following:

|             |                  |
|-------------|------------------|
| Printing:   | 48.0 dB(A)       |
| Warm-up:    | 38.0 dB(A)       |
| Sleep Mode: | Background noise |

### Ozone Concentration

The ozone output of the print engine does not exceed 0.02 PPM TWA (time weighted average). The ozone concentration is measured in accordance with the ECMA 129 standard.

### Electromagnetic Interference

The print engine meets the following noise voltage and noise field intensity standards:

|                       |   |
|-----------------------|---|
| 110/120V engine type: | FCC Class B Part 15 (Subpart B)<br>VCCI Information Processing Equipment II |
|-----------------------|---|

## Paper Specifications

Paper is a critical item in proper printer operation. Carefully select, store, and handle paper to avoid paper jams and poor print quality. This section provides information on the following:

- ☐ Paper and print material specifications
- ☐ Paper storage requirements
- ☐ Envelope specifications

**NOTE:** *The paper industry uses the term “basis weight.” When you see paper listed as “28 pound paper,” this refers to a weight specification. In English units, basis weight is given as the weight in pounds of 500 sheets of 17 by 22 inch paper. In metric units, basis weight is given as the weight in grams of one sheet of paper one meter square (grams per square meter or g/m<sup>2</sup>).*

## Print Materials

The paper you select for your printer should be of good quality, free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, **voids, and curled or bent edges**. The use of good quality paper ensures good image transfer and toner fixing without excessive curl. It is recommended that you test a particular paper prior to large purchases to determine if the performance is acceptable. This section contains guidelines for you to follow when selecting print material to use with your printer.

Print material that does not meet the suggested guidelines may:

- ☐ Increase paper jams
- ☐ Cause unnecessary wear in the printer
- ☐ Degrade print quality
- ☐ Increase service costs

The printer uses plain paper in weights of 16 to **24** pound (60 to 90 g/m<sup>2</sup>). For optimum printer performance, 20 pound or 75 g/m<sup>2</sup> paper is recommended. Use conventional white xerographic paper for most printing applications.

## Paper Sizes

|            |                    |
|------------|--------------------|
| Letter:    | 8.5 x 11 inches    |
| Legal:     | 8.5 x 14 inches    |
| Executive: | 7.25 x 10.5 inches |
| A4:        | 210 mm x 297 mm    |

### ***Colored Paper***

Do not use paper that has a colored coating added after the paper was manufactured. Pigments used in colored paper must be able to withstand temperatures of 392° Fahrenheit (200° C) without deterioration. Colored paper should be of the same high quality stock as the white paper recommended for use with the printer.

### ***Card Stock***

For best performance, use card stock in weights from 16 to 32 pounds (60 to 120 g/m<sup>2</sup>). Card stock over 36 pounds (120 g/m<sup>2</sup>) may cause paper jams.

### ***Preprinted Forms***

Use preprinted forms that are designed to be used with a laser printer. Forms must be printed with heat resistant **inks that will not melt, vaporize, or release hazardous fumes** when subjected to the fusing temperature of 392° Fahrenheit (200° C) for 0.1 second.

Make sure the ink on the forms is completely dry before using them in the printer. Wet ink from the forms may transfer to the printer rollers and contaminate the internal printer mechanisms.

### ***Labels***

Any paper with a pressure sensitive, adhesive backing is considered an adhesive label.

Label stock consists of three parts:

1. Top (or face) sheet. The top sheet is the print surface. The top sheet is usually xerographic paper.
2. Backing (or carrier) sheet. The backing sheet should be a bleached, sulfate stock with a silicone coating for easy release from the top sheet.
3. Adhesive. The adhesive should be stable at the 392° F (200° C) temperature encountered in the fusing process. The adhesive must not emit fumes in an amount that exceeds exposure levels established by regional or national safety agencies.

Adhesives on label stock should not come into direct contact with any internal part of the printer. Adhesive can stick to the drum or the feed rollers, causing paper jams and poor print quality. No adhesive should be exposed between the labels on a sheet. Labels must be arranged on the backing sheet so as to cover the entire page.

Labels can have a frame or margin around the outside edges that corresponds to the outer margins of the printable area on the page. If labels are arranged this way, do not remove excess face sheet material from the backing sheet until after printing.

Labels must lie flat with no more than 1/2 in. (12.7 mm) of curl in any direction.

Poorly manufactured labels or labels that show any indication of delamination, such as wrinkles or bubbles, should not be used.

Follow the paper specifications outlined in Table 1-3 when selecting label stock.

Face sheet: Must meet paper specifications

Fusing compatibility: All adhesives, liners, face stocks and other materials used in label construction must be compatible with the heat and pressure of the fusing process. Materials must not discolor, melt, offset material or release hazardous emissions when heated to 392° degrees Fahrenheit (200° degrees Centigrade) for 0.1 seconds.

Construction: Total construction caliper must not exceed 0.0070 inches (0.18 mm).

### ***Label Usage Hints:***

- ☐ If you store the labels in a very cold area, allow them to warm to room temperature before use. Allow approximately 72 hours for warm-up.
- ☐ Keep the labels sealed in the plastic wrapping until loaded into the printer.
- ☐ Do not fan the label sheets unless the package label instructs you to do so.

### ***Transparencies***

Thickness: 0.110 mm Cutting dimension:  $\pm 0.7$  mm

Cutting angle:  $90^\circ \pm 0.2^\circ$

### **Paper Storage**

How the paper is stored is an important part in the proper use of paper. Here are some suggestions:

- ☐ Store the paper in the original wrapper. Never store the paper unwrapped.
- ☐ In areas of high humidity wrap unused paper in plastic bags.
- ☐ Store the paper on a flat surface.
- ☐ Do not place objects on top of the paper.
- ☐ Store the paper in a closed cabinet.
- ☐ Store the paper in a cool, dry place.
- ☐ Do not store paper on the floor.
- ☐ Cartons of paper should be placed on shelves.
- ☐ Do not stack cartons more than six high.

### Envelopes

For best results, use thin, high quality envelopes. Because of the folds and multiple layers of paper, envelopes do not feed or print as well as flat paper stock. High quality envelopes will have well creased folds that are no thicker than two sheets of paper, and a leading edge that enters the printer straight. A poor quality envelope has small folds that create a thick leading edge near the envelope corners. Poor folds can cause the envelope to buckle as it passes through the printer, resulting in a wrinkled envelope or a paper jam.

#### *Envelope Sizes*

|                |                      |
|----------------|----------------------|
| B5:            | 176 mm x 250 mm      |
| Monarch:       | 3 7/8 x 7 1/2 inches |
| Commercial 10: | 4 1/8 x 9 1/2 inches |
| DL:            | 110 mm x 220 mm      |
| C5:            | 162 mm x 229 mm      |

#### *Envelopes Guidelines*

- ☐ Select envelopes that match the paper specifications in the following table.
- ☐ The basis weight of envelope stock should not exceed 24 pounds (90 g/m<sup>2</sup>).
- ☐ Envelopes should lie flat, with less than 0.25 inches of curl.
- ☐ The adhesive used on the envelope flap should be able to withstand a temperature of 392° F (200° C) for at least 0.1 second.
- ☐ Select envelopes that are designed for use with laser printers.
- ☐ Test envelopes before purchasing large quantities. Some self-sealing envelopes may be sealed shut by the printer fusing process.
- ☐ Store envelopes flat and away from high humidity.
- ☐ Never use envelopes that have worn edges.
- ☐ Never use envelopes that are irregular shapes.
- ☐ Never use envelopes that are shiny or have a highly textured surface.
- ☐ Never use envelopes that have clasps, snaps, or windows,
- ☐ Never use envelopes that have embossed printing on them.
- ☐ Never use envelopes that have folds that are not sharply creased.
- ☐ Never use envelopes that have been previously printed by a laser printer.



Table 1-2. Envelope Specifications

| <b>Envelope Properties</b>  | <b>Specifications</b>   |
|-----------------------------|---|
| Paper                       | Envelope construction must meet all specifications listed in Table 1-3.   |
| Furnish                     | 100% chemical wood pulp and/or 25% cotton fiber   |
| Basis Weight (single layer) | 20 – 24 pound (17 x 22 inches per 500 sheets) (75 to 90 g/m <sup>2</sup> )  |
| Caliper                     | 3.3 to 5.5 mils (0.084 to 0.14 mm) single layer thickness   |
| Electrical Properties       | Surface resistivity: 2.0 to 15 x 10 <sup>10</sup> ohms/sq.<br>Volume resistance: 1.2 to 15 x 10 <sup>11</sup> ohms/cm (conditioned at 73° F or 23°C and 50% relative humidity).   |
| Fusing Compatibility        | All inks, adhesives, and other materials used in the envelope must be compatible with the heat and pressure of the fusing process used in the printer.<br>Materials must not discolor, melt, offset, or release hazardous fumes when heated to 392°F (200°C) for 0.1 second.  |
| Finishing                   | Envelopes containing adhesives must not have them in an area that would come into direct contact with the printer drum or the printer fuser.<br>Each envelope must be accurately folded (± 0.04 inches) so there are no more than two thicknesses of paper anywhere along the leading edge.<br>All folds must be sharply creased. |
| Curl                        | Envelopes must lie flat, with no more than 0.25 inches of curl across the entire surface.   |
| Moisture Content            | 4% to 6% by weight  |
| Smoothness                  | 80 to 180 Sheffield   |

Table 1-3. Paper Properties and Specifications

| Item                  | Specification   |
|-----------------------|---|
| Basic weight          | Paper: 16 to 24 pound (60 to 90 g/m <sup>2</sup> )<br>Card Stock: 16 to 32 pound (60 to 120 g/m <sup>2</sup> )                            |
| Moisture Content      | 4% to 6% by weight (4.5% nominal)   |
| Composition           | 100% chemical wood pulp or up to 25% cotton fiber   |
| Grain                 | Long Grain  |
| Acid Content          | 5.5 pH minimum  |
| Opacity               | 85% minimum   |
| Brightness            | 83% minimum   |
| Caliper               | 3.0 to 7.0 mils   |
| Curl                  | In ream: Flat within 0.3 inch (8 mm)<br>Printed: Flat within 0.8 inch (20 mm)   |
| Cut Edge Conditions   | Cut with sharp blades with no visible fray  |
| Electrical Properties | Surface Resistivity: 2.0 to 15 x 10 <sup>10</sup> W/cm <sup>2</sup><br>Volume Resistivity: 1.2 to 15 x 10 <sup>11</sup> W/cm <sup>3</sup> |
| Finishing             | Cut sheets to ± 0.031 inch of nominal, ± 0.2° square  |
| Fusing Compatibility  | Must not scorch, melt, offset or release hazardous emissions when heated to 200°C (392° F) for 0.1 second                                 |
| Surface Strength      | 12 minimum wax pick (Dennison)  |
| Stiffness             | 1.6 to 7.5 machine direction (Taber)  |
| Smoothness            | 100 to 190 Sheffield or 120 to 240 Bendsten (rougher surfaces tend to reduce image quality)   |
| Packaging             | Moisture proof ream wrap  |

## Toner Cartridge Specifications

Model number: S051023

Storage temperature: 32 to 95° F (0 to 35° C)

Storage humidity: 30 to 85% RH

Shelf life: 18 months after production

Life: Up to 4000 pages under the following conditions: Letter-size paper, continuous printing, and 5% print ratio.

The number of pages you can print with a toner cartridge varies depending on the type of printing. If you print a few pages at a time or print dense text exceeding the **5% print ratio**, **your cartridge may print fewer pages. The 5% print ratio is equivalent to double-spaced standard text. You can increase** the life of the toner cartridge by using toner saving mode.

## InterFace Specifications

The printer is equipped with a parallel interface.

**Table 1-4. Parallel Interface Pin Assignments**

| Signal Pin | Return Pin | Signal                     | Direction | Description   |
|------------|------------|----------------------------|-----------|---|
| 1          | 19         | $\overline{\text{STROBE}}$ | IN        | $\overline{\text{STROBE}}$ pulse to read data. Pulse width must be at least 0.5 $\mu\text{s}$ at the receiving terminal.  |
| 2          | 20         | DATA 1                     | IN        | These signals represent parallel data bits 1 to 8, respectively. Each signal is at HIGH level when data is logical 1 and LOW when it is logical 0.                  |
| 3          | 21         | DATA 2                     | IN        |   |
| 4          | 22         | DATA 3                     | IN        |   |
| 5          | 23         | DATA 4                     | IN        |   |
| 6          | 24         | DATA 5                     | IN        |   |
| 7          | 25         | DATA 6                     | IN        |   |
| 8          | 26         | DATA 7                     | IN        |   |
| 9          | 27         | DATA 8                     | IN        |   |
| 10         | 28         | $\overline{\text{ACKNLG}}$ | OUT       | About a 1-10- $\mu\text{s}$ pulse width. LOW indicates data has been received and the printer is ready to accept more data.   |
| 11         | 29         | BUSY                       | OUT       | A HIGH signal indicates that the printer cannot receive data. The signal goes HIGH in the following cases:<br>1. During printing<br>2. During a printer-error state |
| 12         | 30         | PE                         | OUT       | A HIGH signal indicates the printer is out of paper.  |
| 13         | —          | SLCT                       | OUT       | Pulled up to +5 V through 3.3 K $\Omega$ resistance.  |

Table 1-4. Parallel Interface Pin Assignments (continued)

| Signal Pin | Return Pin | Signal                        | Direction | Description  |
|------------|------------|-------------------------------|-----------|--|
| 14         | —          | $\overline{\text{AUTO FEED}}$ | IN        | Not used   |
| 15         | —          | NC                            | —         | Not used   |
| 16         | —          | GND                           | —         | Logic ground level   |
| 17         | —          | CHASSIS GND                   | —         | Printer's chassis ground, which is connected to the signal ground.                         |
| 18         | —          | NC                            | —         | Not used   |
| 19-30      | —          | GND                           | —         | Twisted-pair return signal ground level.   |
| 31         | —          | NC                            | —         | Not used   |
| 32         | —          | $\overline{\text{ERROR}}$     | OUT       | This signal level goes LOW when the printer is:<br>1. Out of paper<br>2. In an error state |
| 33         | —          | GND                           | —         | Same as for Pins 19-30   |
| 34         | —          | NC                            | —         | Not used   |
| 35         | —          | +5V                           | —         | Pulled up to +5 V through 3.3 K $\Omega$ resistance.                                       |
| 36         | —          | $\overline{\text{SLCTIN}}$    | IN        | Available only for bidirectional use.  |

*Note: All interface conditions are based on TTL level. Both the rise and fall times of each signal must be less than 0.2 microseconds.*

*Data transfer must be carried out by observing the ACKNLG or BUSY signal. (Data transfer to this printer can be carried out only after receipt of the ACKNLG signal or when the level of the BUSY signal is LOW.)*

*The column heading "Direction" refers to the direction of signal flow as viewed from the printer.*

*"Return Pin" denotes the twisted-pair return to be connected at signal ground level. For the interface wiring, be sure to use a twisted-pair cable for each signal and to complete the connection on the return side.*

*The ACKNLG pulse width varies.*

# Operating Instructions 2

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## Operating Instructions 2

### Installing the Printer

The illustration below shows a top view of the Action Laser 1100. Install the printer so there is always adequate space around it for proper machine operation and ventilation.

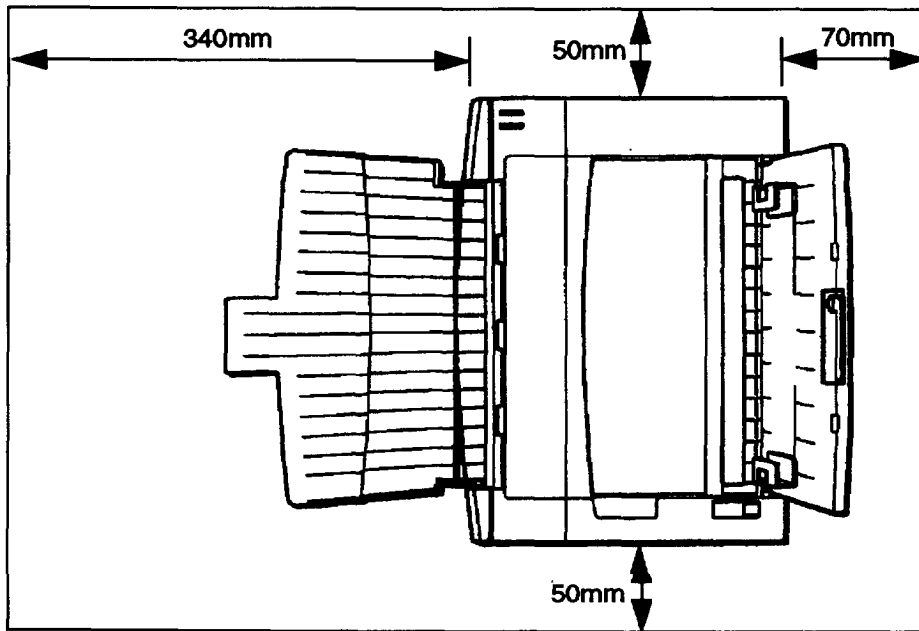


Figure 2-1. Space Guidelines for Installation

## Allocating Virtual Memory

The ActionLaser 1100 requires a total of 12.5MB of memory, which is made **up of at least 4MB of RAM and 8.5MB of Windows virtual memory**. If you have more RAM then you can have less virtual memory, as long as the sum of the two equals 12.5MB. We strongly recommended that you use permanent virtual memory rather than temporary virtual memory.

Use the Windows Control Panel to set or change your virtual memory.

1. Open the Windows Program Manager.
2. Open the Control Panel icon.
3. Open the 386 Enhanced icon.
4. Select the Virtual Memory button.
5. Select the Change Button.
6. Increase the Virtual Memory size to 8.5MB (less if you have more than 4MB of RAM).
7. Select Virtual Memory Type: Permanent.
8. Select 32 bit access for the best performance.
9. Save the changes.
10. Return to the Program Manager.

If Windows will not let you allocate the required amount of disk space for permanent virtual memory, check to make sure you have enough free space on your hard disk drive. If you have enough free disk space and Windows will still not let you create a permanent virtual memory, you may need to run a disk defragmentation utility like Norton Utilities SD (Speed Disk) to cleanup your hard disk drive. A workaround in the meantime is to use temporary virtual memory instead of permanent virtual memory.

*NOTE: For more information on virtual memory in Windows, refer to the Microsoft Windows User Guide.*



## EPSON Control Panel Utility

The EPSON Control Panel for Windows displays the printer's status and notifies the user of printing errors. Each time the printer status changes, such as when the paper tray is empty or an error occurs, a message automatically appears on screen. If an error occurs, the message includes instructions for correcting the problem.

*NOTE: If you are not using the printer in a Windows environment, the Reporter, which is included with the EPSON Control Panel for DOS, displays the printer's status.*

## Front Panel Lights

The two lights on the front panel provide additional status monitoring. The green Ready light is on when the printer is on and is ready to receive print data. As data is received from the computer, the Ready light flashes.

The orange Error light indicates an error condition. If the Error light is on continuously, it indicates that no paper is loaded or that there is a paper feed jam. A flashing Error light indicates one of the following: an internal paper jam has occurred, the front cover is open, or the toner cartridge is not installed.

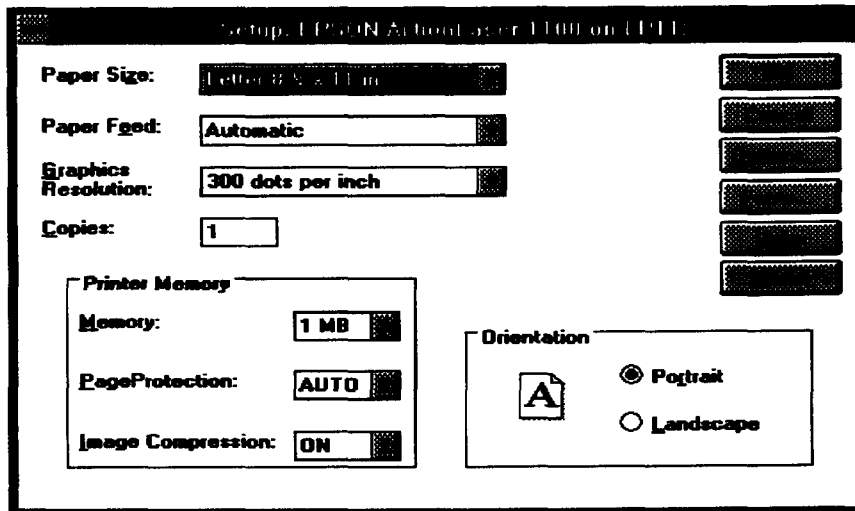
Other status conditions are indicated by the combination of the Ready and Error lights. The following table describes all status conditions that can be indicated by the printer's Ready and Error lights:

**Table 2-1. Front Panel Indicator Lights**

| Ready         | Error    | Printer status  |
|---------------|----------|---|
| Off           | Off      | Printer is off.   |
| Slow flashing | Off      | Printer is in power save mode.  |
| Flashing      | Off      | Print data is being received at the printer or has already been received.   |
| On            | Off      | Printer is ready to receive print data.   |
| Off           | On       | Either the paper tray is empty or there is a paper feed problem.  |
| Off           | Flashing | One of the following errors has occurred: <ul style="list-style-type: none"> <li>• Paper has jammed inside the printer.</li> <li>• The front cover is open.</li> <li>• The toner cartridge is not installed.</li> </ul>                                   |
| Flashing      | On       | One of the following errors has occurred: <ul style="list-style-type: none"> <li>• Insufficient memory to print job.</li> <li>• Printer is in manual feed mode and is waiting for the next sheet.</li> <li>• There is a printer overrun error.</li> </ul> |
| Flashing      | Flashing | The printer is warming up.  |
| On            | On       | A printer engine or controller error has occurred. Service required.  |

## Accessing Printer Driver Settings in Windows

When the EPSON Control Panel for Windows is installed, the Action Laser 1100 printer driver is also installed and selected as the default printer in the Windows Control Panel. If you're using a Windows-based software program, you access the printer driver settings through the Setup dialog box.



**Figure 2-2. Windows Setup Dialog Box for Printer Driver**

### Printer Driver Settings

The printer driver settings fall into three categories

- ☐ Print settings that determine how a print job is printed. These settings, which are included in the Setup dialog box, include the number of copies, orientation, and resolution used for printing graphics. The way **in which printer** memory is allocated can also be specified.
- ☐ Option settings that include toner saving and power save modes, the edge smoothing setting, and the type of halftone pattern to apply to grayscale images. Option settings are accessible by choosing the Options button in the Setup dialog box.
- ☐ Font Manager settings that allow you to copy PCL® fonts to the computer's hard disk. The Font Manager is accessible by choosing the Fonts button in the Setup dialog box.

## ***Print settings***

The Setup dialog box contains the settings described below.

### ☐ **Auto Continue**

**Permits the printer to automatically** recover from printer overrun and memory overflow errors and continue printing. By default, Auto Continue is on. To use manual feed, turn Auto Continue off. If a printer overrun or memory overflow error occurs while Auto Continue is off; press the Reset button to resume.

### ☐ **Paper Size**

Specifies the size of paper loaded in the paper tray.

### ☐ **Paper Feed**

**Specifies whether paper or envelopes are fed automatically from the paper tray or whether paper is fed manually.** The options for Paper Feed are Automatic (default), Manual, and Envelope.

By default, Automatic is selected and the printer uses the paper in the paper tray and prints pages continuously as long as print data is received from the computer.

Use the Manual setting to feed a single sheet at a time, such as when printing on heavy paper, labels, or transparencies.

Manual and Envelope stay active only until you exit Windows. Each time you start Windows, the paper feed is reset to the default (Automatic).

### ☐ **Graphics Resolution**

Specifies what resolution to use to print graphics. Note that Graphics Resolution does not affect text. The options for Graphics Resolution are 300 dpi (default), 150 dpi, and 75 dpi.

Normally 300 dpi produces the best looking graphics. The output quality decreases for the 150- and 75-dpi resolutions.

However, if the printer does not print the entire graphic on one page and displays a memory overflow message, reduce the graphics resolution to 150 or 75 dpi. Printing at a lower resolution is also faster than printing at 300 dpi.

If memory overflow problems occur frequently, you should also turn on Image Compression, which is described later in this chapter, or add more memory to the printer. See Chapter 5 for more information about adding memory.

### ☐ **Copies**

Specifies how many uncollated copies to print. This option is provided in case the software program does not specify the number of copies.

### ❑ Memory

Defines the amount of memory installed in the printer. Windows uses this information to determine the amount of memory available for printing.

The Memory setting should exactly match the total amount of memory in the printer. If you add more memory to the printer, you need to change the Memory setting to match the amount of printer memory. The additional memory will not be available unless the Memory setting is correct.

If **you are** unsure how much memory is installed in the printer, print a test page by pressing the reset button at the back of the printer. (Pressing the **Reset** button prints a test page only if the **Ready** light is on and the **Error** light is off.)

### ❑ Page Protection

When Page Protection is enabled, the printer reserves additional memory and does not print a page until the entire page is fully composed. This allows the printer to print complex pages that can otherwise cause printer overrun errors.

The settings for Page Protection are Off, On, and Automatic (default).

You do not normally need Page Protection. However, if the printer receives an unusually complicated page that contains a complex image or layout, it might start to print the page before the processor can finish imaging it, resulting in the page printing incorrectly.

If you turn on Page Protection, the printer reserves printer memory and does not begin printing until the processor has finished imaging the entire page. The page then prints correctly, although it takes slightly longer to print.

When Auto is selected, the printer first analyzes each page. If a page is complex, Page Protection is turned on automatically; otherwise, it is not used.

If you continue to encounter page overrun errors even when Page Protection is on, you might want to add more printer memory. See Chapter 5 for more information.

## ❑ Image Compression

Specifies that the printer first compress raster images before printing them. This allows printing of graphics-intensive pages using less memory.

Turn Image Compression on if you receive memory overflow errors and are not able to print pages that contain a lot of graphics. Graphics require more memory than text; for large or complex graphics, the printer might not have enough memory to correctly print the page. Image Compression compresses the image into a small amount of printer memory. The trade-off is that the page may not look as detailed as it would when printed without image compression.

If memory overflow errors continue to occur even when Image Compression is on, you might want to add more printer memory. See Chapter 5.

## ❑ Orientation

Specifies whether the page is printed in portrait or landscape orientation. Normally print orientation should be selected from the Print dialog box.

## Option Settings

When you choose the Options button of the Setup dialog box, the following dialog box appears:

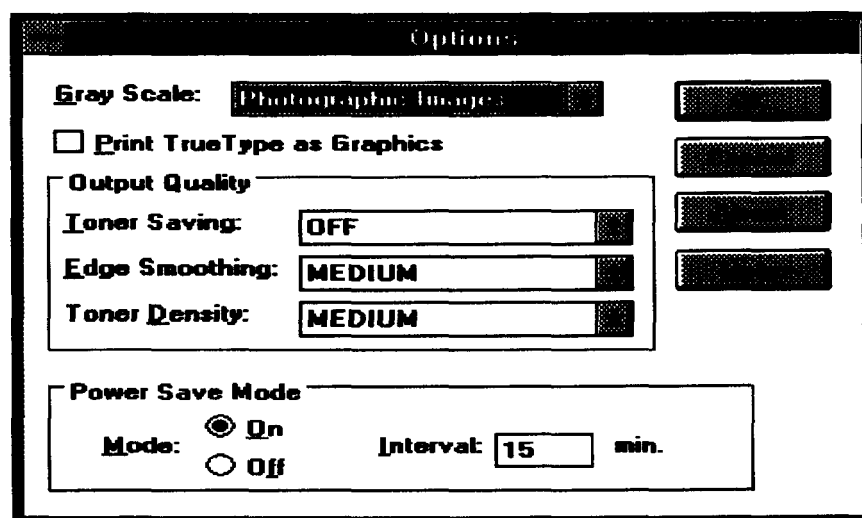


Figure 2-3. Options Dialog Box

### ☐ **Gray Scale**

Specifies what halftone pattern to apply to gray scale images. The options are Photographic Images (default), Line Art Images, and Scanned Images. Each option is described below. The best way to choose a setting for the images is to experiment. Print a grayscale image at each setting and choose the one you like best.

Choose Photographic Images for images that you want to have a smooth, realistic appearance. This setting provides soft contrasts between shades of gray and works well for images originally designed with color. When Photographic Images is selected, the printer uses an 8 bit-by-8 bit “clustered dot” method to emulate 64 levels of gray.

Choose Line Art Images for images with intricate lines and fine detail, such as clip art images. This setting provides solid lines and sharp contrasts between shaded areas. When Line Art Images is selected, the printer uses 8 bit-by-8 bit “dispersed dot” patterns to produce 32 gray tones.

Choose Scanned Images for images that were originally scanned. In this setting, the printer uses a variation of the 8 bit-by-8 bit “clustered dot” method used in the Photographic Images setting. This method also produces 64 different levels of gray.

### ☐ **Print TrueType as Graphics**

This is useful for documents that contain a lot of graphics but not a lot of TrueType text. In this case, printing TrueType fonts as graphics requires less printer memory and may speed up printing.

This setting is also useful if you want to overlay graphics on top of text.

### ☐ **Toner Saving**

Lets the printer use less toner for printing draft documents. This can reduce printing costs because you need to replace toner cartridges less often. Toner Saving can be one of the following: Light, Medium, Dark, or Off (default).

The Light setting uses the least amount of toner, and the Dark setting produces the most legible output while still saving toner.

Setting Toner Saving to Off results in normal output and toner usage.

### ☐ **Edge Smoothing**

Allows you to adjust the edge smoothing feature or turn it off. Edge smoothing improves the appearance of text and graphics by smoothing the jagged edges of characters and line art, resulting in higher quality output.

The settings for Edge Smoothing are Light, Medium (default), and Dark. Normally you should not have to adjust Edge Smoothing.

However, because edge smoothing modifies the size of dots along the edges of text, lines, and graphics, the edges might appear too dark or too light. To adjust for this, use the Light setting if the edges appear dark, and use the Dark setting if the edges appear too light.

### ☐ **Density**

Specifies the density of the toner applied to the page. Normally, you should not need to adjust this setting. It is provided to allow you to compensate for variations among toner cartridges.

The settings for Toner Density are Extra Light, Light, Medium (default), Dark, and Extra Dark.

*Note: Increasing the density increases the rate of toner consumption.*

### ☐ **Power Save Mode**

Specifies whether Power Save Mode is on or off.

When Power Save Mode is on, the printer uses less electricity by entering a low-power state when the printer is idle for the length of time specified by Power Save Interval. When the printer is in the low-power state, it takes approximately 45 seconds to warm up once it receives data.

In compliance with the Energy Star program, Power Save Mode is factory-set to on.

### ☐ **Power Save Interval**

Specifies how long the printer is idle before it enters power save mode. Power Save Interval can be any value from 1 to 999 minutes. The default is 15 minutes. Power Save Interval is valid only when Power Save Mode is on.

## **Font Manager**

The Font Manager, accessible by choosing the Fonts button of the Setup dialog box, allows you to install PCL-compatible fonts to the hard disk. You need to use Font Manager only to install PCL-compatible fonts.

## EPSON Control Panel for DOS

If you are not running Microsoft® Windows, you can control printer settings through the EPSON Control Panel for DOS. This onscreen utility consists of five screens that perform the same functions as the printer driver settings available for Windows. See the previous section for descriptions of the individual printer settings.

Some settings, such as those for page setup and font selection, are also available through most application software programs. Whenever possible, the application software program settings should be used because they override settings in the EPSON Control Panel for DOS.

After the control panel for DOS is installed, select the HP LaserJet III printer driver in the software program. If necessary, any LaserJet 11 driver or any driver that uses HP PCL can be used with the Action Laser 1100.

### Using the EPSON Control Panel for DOS

To display the control panel, type **PANEL** and press **Enter**.

The interface for the EPSON Control Panel for DOS consists of three parts: the current screen, a menu bar, and screen buttons for accessing other screens.

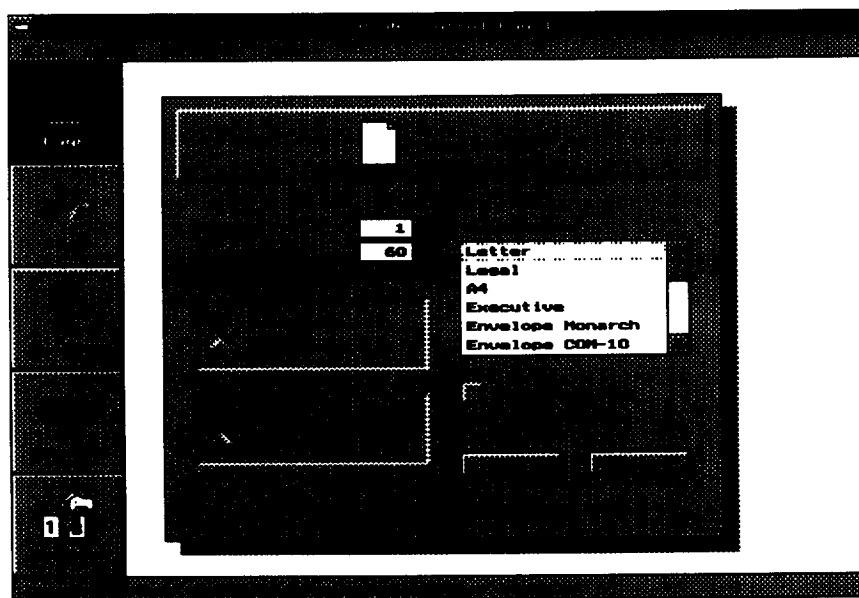


Figure 2-4. EPSON Control Panel for DOS Screen

There are five control panel screens: Page Setup, Font, Quality, Memory, and Options. One screen is displayed at a time, and the other screens are represented by buttons to the left of the current screen.



The five screens are listed below, along with the options available on each.

**Table 2-2. EPSON Control Panel for DOS Screen Options**

| <b>Screen</b>     | <b>Option</b>  |
|-------------------|--|
| <b>Page Setup</b> | Copies<br>Lines per Page<br>Orientation<br>Paper Feed<br>Paper Size<br>Auto Continue |
| <b>Font</b>       | Typeface<br>Point<br>Symbol Set  |
| <b>Quality</b>    | Toner Saving<br>Edge Smoothing<br>Toner Density                                      |
| <b>Memory</b>     | Page Protection<br>Image Compression   |
| <b>Options</b>    | Power Save Mode<br>Power Save Interval   |

### ***Moving Within and Between Screens***

When you first bring up the EPSON Control Panel for DOS, the Page Setup screen is displayed. If you want to change an item in the current screen, use the Tab key to move to the item you want to change. Then use the up and down arrows to select a new setting for the item. Press **Tab** to apply the new setting and move to the next item.

To access another screen, hold down the Alt key and press the letter that is underlined on the screen button. For example, to open the Font screen, press **Alt + N**. To move from the screen button to the currently displayed screen, press **Tab**.

Once you make changes to the settings, choose OK to save the changes and update the printer. To cancel the changes and return to the original settings, choose Cancel.

### **Menu Bar**

The menu bar contains the following four menus:

- |                |  |
|----------------|--|
| <b>File</b>    | The File selections allow you to exit the utility, save printer settings as a profile, retrieve a previously saved profile, and export a profile to the printer. For more information about profiles, see the following section. |
| <b>View</b>    | Choosing View brings up a listing of the current printer settings.   |
| <b>Utility</b> | The Utility selections allow you to reset the printer, change the port setting, and print a test page, status sheet, and demonstration page.   |
| <b>Help</b>    | <b>The Help menu contains the Help index and the About item.</b>   |

To access a menu, hold down the **Alt** key while you press the first letter of the name of the menu (e.g., press Alt + F to bring up the File menu). Use the up and down arrows to select an item on the menu. Then press Enter.

Help is available for each item in the menu bar. To bring up help, move the cursor to the item and press **F1**.

To move the cursor from the menu bar to the screen, press Esc.

### **Getting Help**

The status bar at the bottom of the screen provides a brief description for each setting. For more information about the current setting, press **F1**.

You can also bring up the Help Index in the menu bar, which allows you to get help for any EPSON Control Panel item. To bring up the Help Index, press **Alt + H**, then press **Enter**. Use the up and down arrows to move through the list of items. When you reach the item for which you want help, press Enter.

## Using Profiles

A profile is a specific set of printer settings. If you often re-use the same printer settings, you can create a profile to easily update the printer with predefined settings.

There are three ways to create a profile:

- ☐ Use the EPSON Control Panel for DOS to change the printer settings as needed. Then choose Save Profile in the File menu. This brings up a dialog box that prompts you to assign a filename and choose the directory in which to store the profile. When you complete the information in the dialog box, choose OK.
- ☐ Open an existing profile and modify the settings of the profile. To do so, use Open Profile in the File menu to open an existing profile. Change just those settings that you want to change and then choose Save As in the File menu. Enter a new filename and choose the directory in which to save the profile.
- ☐ Use the settings currently in use by the printer to create a profile. To do so, choose Import Profile From Printer in the File menu. This brings up a dialog box that prompts you to name the profile and choose the directory in which to store it.

When you open a profile, you can export the printer settings described by the profile by using the Export Profile to Printer item on the File menu.

## Reporter

The Reporter displays printer status and alerts the user to printer problems. Each time the printer status changes or an error occurs, a message automatically appears on screen. Reporter messages can be disabled.

To modify Reporter parameters, use the hot key combination **Ctrl + Alt + R** to bring up the Reporter's main menu. The main menu allows you to do the following:

- ☐ Enable messages that have been disabled.
- ☐ Review the last message displayed by the Reporter.
- ☐ Deactivate (or re-activate) the Reporter. When the Reporter is deactivated, it does not monitor the printer and does not display messages.
- ☐ Change the hot key combination used to bring up the Reporter's main menu.
- ☐ Change the colors of the Reporter's messages.

A help option on the menu provides a brief explanation for each topic on the main menu.

# Principles of Operation **3**

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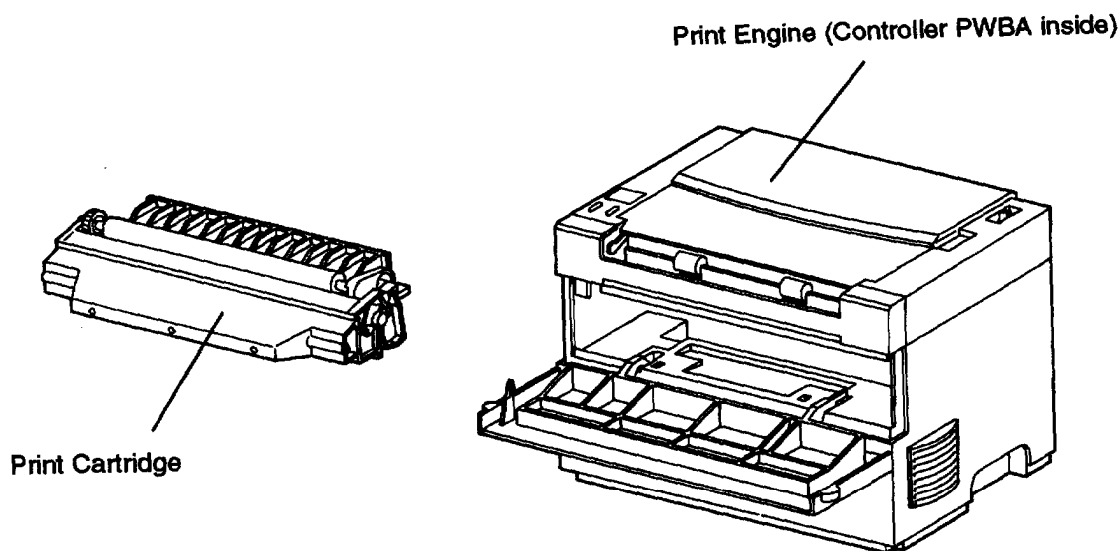
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## Principles of Operation 3

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The Action Laser 1100 is a 4 ppm (page per minute), 300 dpi (dots per inch) laser printer. Edge smoothing is incorporated into the printer to help reduce jagged diagonal lines. The printer input tray holds up to 100 sheets of standard, 20 lb paper, and the exit tray holds up to 50 printed pages of standard 20 lb paper.

The printing system consists of the Print Engine, the Print Cartridge, the Controller PWBA, and the PC software that controls print engine functions (Figure 3-1).

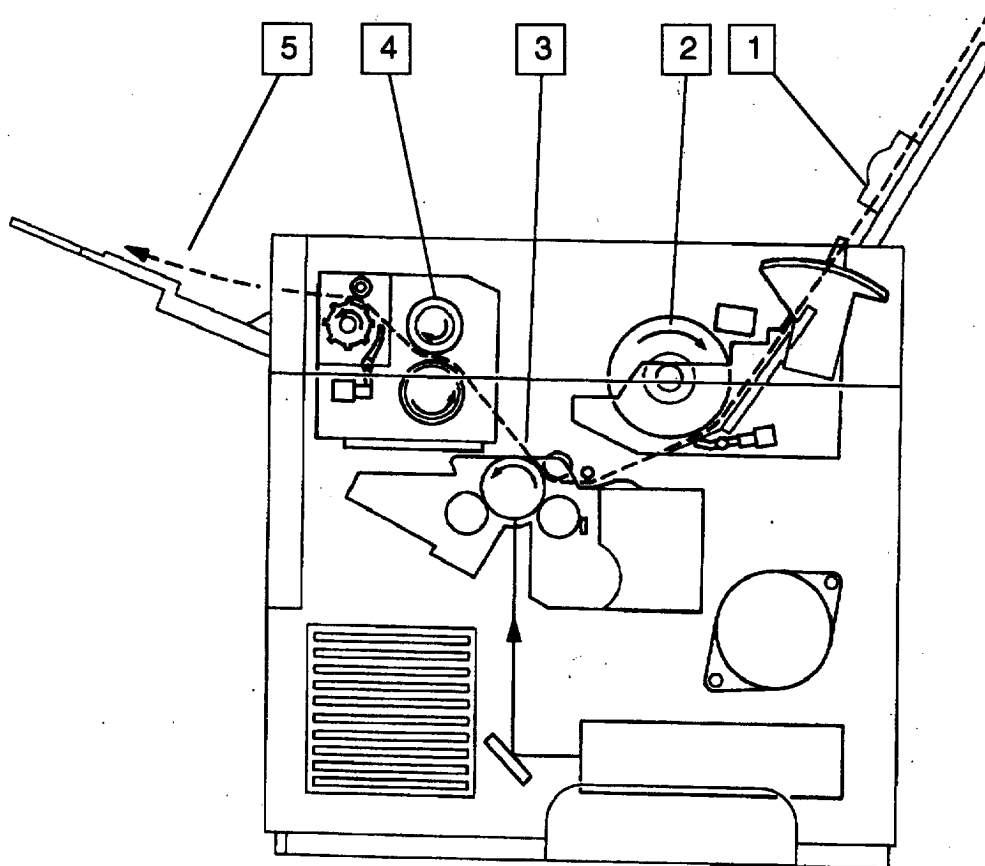


**Figure 3-1. ActionLaser 1100 Printing System**

## Overview of the Print Cycle

Figure 3-2 provides a basic overview of how a sheet of paper travels through the print engine during a normal print cycle.

1. The Input Tray holds the paper supply.
2. The Feed Roll (Paper Feeder Assembly) feeds the top sheet from the paper supply.
3. The Feed Roll transports the sheet to the Bias Transfer Roll (Print Cartridge) where the image is transferred from the drum (Print Cartridge) to the surface of the paper.
4. The paper is fed into the Fuser, where heat and pressure permanently fix the image to the paper.
5. The paper is transported out of the print engine and into the Exit Tray.



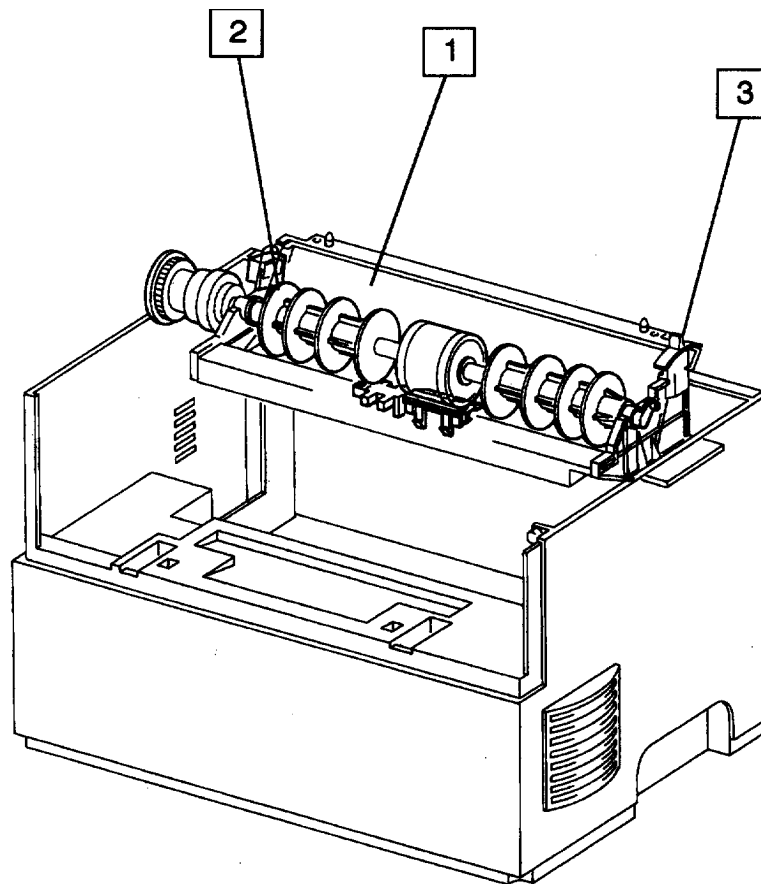
**Figure 3-2. Paper Path During Print Cycle**

## Main Component Operating Principles

### The Paper Supply

The Input Tray holds the paper for the printer. The tray holds up to 100 sheets of standard 20 lb paper, 10 envelopes, 30 transparencies, or 30 sheets of label stock. The tray's side guides are adjustable to match the width of the paper currently loaded in the Input Tray.

The spring loaded Paper Pressure Plate [1] holds the paper against the Feed Roll [2]. To release the pressure applied by the Paper Pressure Plate to the paper, pull the Paper Release Lever [3] forward. To engage the Paper Pressure Plate, push the Lever back (Figure 3-3).



**Figure 3-3. Paper Supply Assembly**



### Paper Feeding

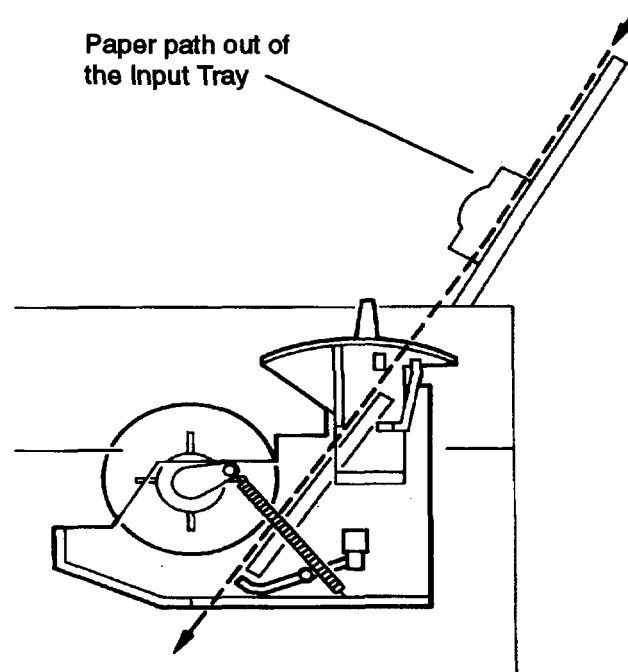
At the start of the print cycle the Feed Roller Assembly transports individual sheets of paper out of the Input Tray and into the print engine (Figure 3-4). The Feeder Roller Assembly consists of a shaft with a drive gear on the left end and a tension spring attached to the other end. The Feed Solenoid, located at the left end of the Paper Feeder Assembly, controls drive power to the Feed Roll shaft. A rubber half-wheel, called the Feed Roll, is mounted at the center of the shaft. Plastic wheels on either side of the Feed Roll help stiffen and guide the paper as it is fed into the printer.

1. **The main controller PWBA momentarily drops the voltage LOW on the signal FEED SOLENOID ON 24 VDC going to the Feed Solenoid.**
2. The drive gear has a gap in the teeth, which prevents the drive gear from contacting the Drive Assembly gears when the solenoid pawl is against the drive gear notch.
3. The Feed Solenoid actuates, releasing the solenoid pawl from the drive gear notch.
4. The Paper Feeder Spring pulls the drive gear away from the home position and into contact with the rotating gears of the Drive Assembly.
5. The Feed Roll Shaft rotates one full revolution. At the end of the revolution the Feed Roll Shaft encounters the gap in the drive gear, and the Paper Feeder Spring pulls the gear back into home position.
6. During the rotation of the Feed Roll Shaft, the Feed Roll pulls the top sheet of paper from the paper stack in the Input Tray. The Retard Pad, which is made of cork and rubber, prevents additional sheets from being pulled along with the top sheet.

7. The Feed Roll transports the single sheet of paper into the Registration Sensor Actuator. The Registration Sensor is a photo-transistor that senses the length of the sheet of paper, and if the sheet was fed early or late.

The Input Tray does not have the capability to sense the presence or the size of paper in the tray. The printer does not know when the Input Tray is empty until a print cycle is started and no paper is sensed at the Registration Sensor within a specific amount of time.

The main controller PWBA looks at when it actuated the Feed Solenoid, and when the Registration Sensor detected the sheet of paper. If the paper does not actuate the sensor within 0.979 seconds of solenoid actuation, the main controller considers it an early feed. If the paper does not actuate the sensor within 2.175 seconds of solenoid actuation, the main controller considers it a late feed or misfeed. The main controller reports the condition to the host PC. The host PC software displays whatever error message is appropriate.



**Figure 3-4. Paper Path During Paper Feed Cycle**

## The Main Drive Assembly

The Main Drive Assembly consists of the Main Drive Motor and a gear cluster that transmits mechanical power from the motor to the Fuser, the Paper Feeder, and the Print Cartridge (Figure 3-5). The Main Drive Motor is a synchronous +24 VDC stepper motor. The Main Drive Assembly also carries xerographic voltages from the HVPS to the Print Cartridge through flat metal springs that are molded into the body of the Drive Assembly. The springs press against contact points located on the end of the Print Cartridge.

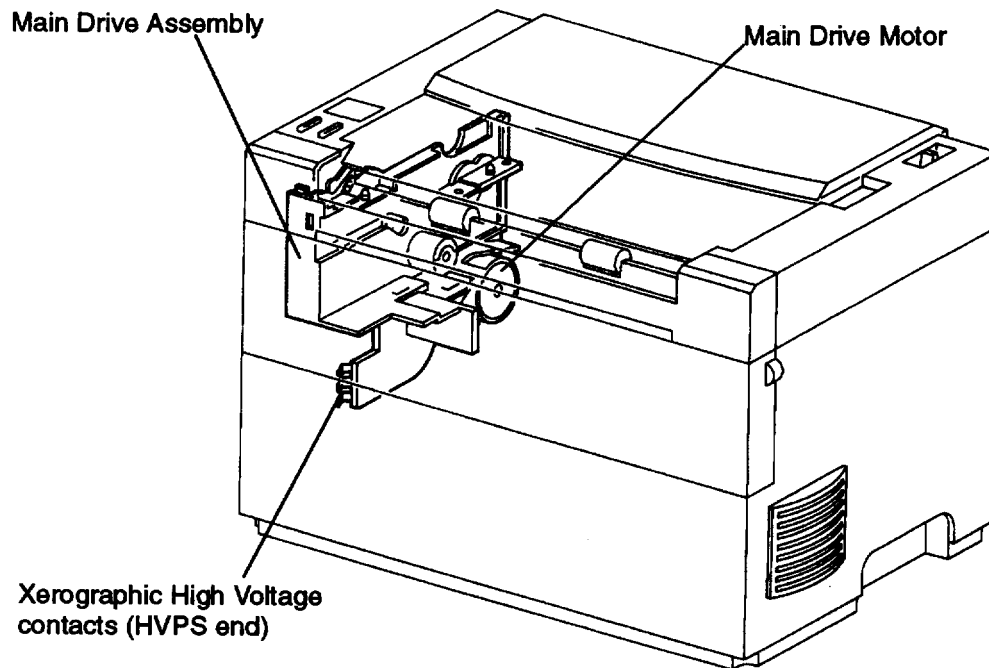


Figure 3-5. Main Drive Assembly

## Laser Scanning

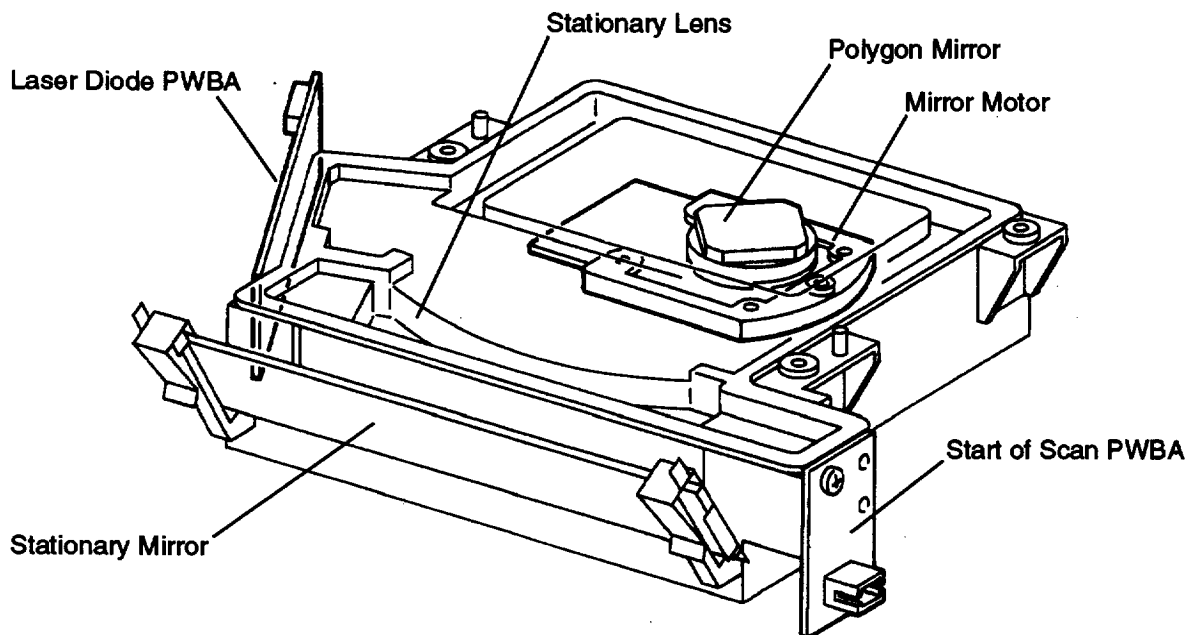
The Laser Scanner Assembly consists of a Laser Diode, a polygon mirror and mirror motor, various stationary lenses, a stationary mirror, and a start-of-scan (SOS) sensor (Figure 3-6).

The Laser Diode is a solid state device that can be switched on and off very rapidly. The Laser Diode produces a 5 milliwatt beam of invisible infrared light that has a wavelength of 780 nanometers. A set of collimating lenses shape the beam into a vertical ellipse, then project it onto the surfaces of the polygon mirror.

The polygon mirror has four mirrored surfaces and is mounted on the shaft of the polygon motor, which spins at a constant speed. The mirrored surface reflects the laser beam striking it. Because the mirrored surface is spinning, the reflected beam actually scans across a wide, stationary lens a few inches from the polygon mirror. The wide lens further shapes and focuses the beam, which strikes a stationary mirror behind the lens. The beam is then reflected through the Laser Scanner Window onto the surface of the drum.

A Start of Scan Sensor (SOS) is located close to the end of the stationary mirror. At the beginning of each scan of the laser beam across the stationary mirror, the beam momentarily strikes the SOS, signaling the main controller PWBA that another scan has begun. The SOS signal is used by the main controller PWBA to control the Line Sync signal.

The print controller modulates the laser beam according to the image data for each page. The data for each pixel of each line on each page controls whether or not the laser is on or off at a particular pixel point. The laser switches on and off extremely rapidly as it moves through each scan across the surface of the drum, one scan of the laser beam equals one line of pixels on the printed page.



**Figure 3-6. Laser Scanner Assembly**

## **The Print Cartridge and Xerographic**

The Print Cartridge houses most of the xerographic components for the printer. The Print Cartridge contains the Drum, the Charge Roll (CR), the toner supply, the Mag Roll, the Bias Transfer Roll (BTR), and the cleaning system and toner sump (Figure 3-7).

### ***The Drum***

The Drum, or photoreceptor, is a 30 mm diameter aluminum cylinder that is coated with an organic material that changes its electrical properties when exposed to light. The Drum rotates during the entire print cycle. The Main Drive Assembly provides the mechanical power used to rotate the Drum.

### ***The Charge Roll***

The Charge Roll is an electrically conductive foam roller that rotates along the surface of the rotating drum. The Main Drive Assembly provides the mechanical power used to rotate the Charge Roll. The High Voltage Power Supply (HVPS) supplies voltage to the Charge Roll through metal contacts that are molded into the Main Drive Assembly. As the drum rotates, the Charge Roll deposits an even electrical charge on the surface of the drum.

### ***The Toner Supply***

Toner is made up of lampblack (carbon), polyester resins, magnetite (a very fine magnetic iron), and trace amounts of lubricants and other compounds. Due to the magnetic properties of the magnetite, the toner sticks to the Magnetic Development Roll.

### ***The Magnetic Development Roll (Mag Roll)***

The Mag Roll is a hollow aluminum roll that is driven by the Main Drive Assembly. The HVPS supplies a DC voltage (Developer Bias) and an AC voltage to the Mag Roll through metal contacts that are molded into the Main Drive Assembly. You can use the printer software to adjust Developer Bias to either lighten or darken the printed image.

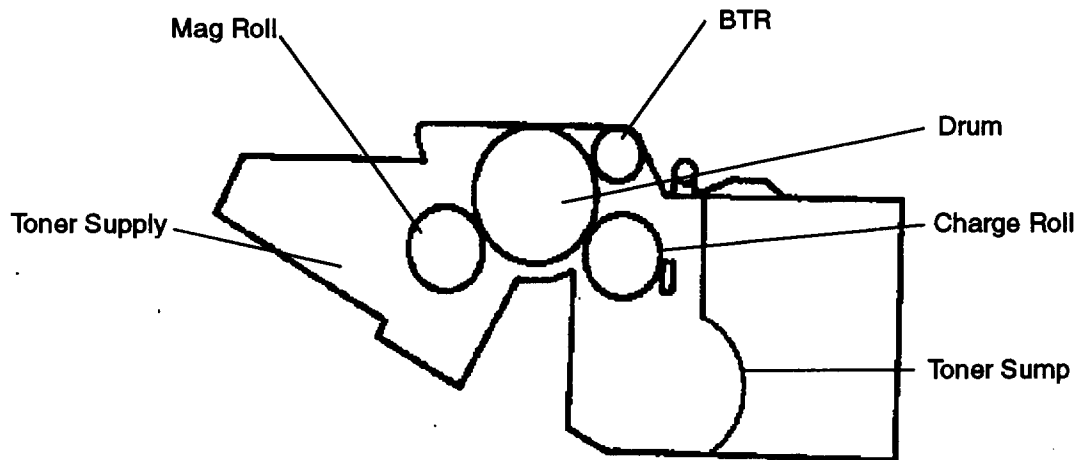
Suspended inside the Mag Roll is a rectangular, permanent magnet. The magnet is stationary, and does not rotate with the Mag Roll. As the Mag Roll rotates, toner from the toner supply sticks to it, forming a soft brush of toner over the entire surface of the roll. The Roll delivers the toner to the surface of the drum.

### ***The Bias Transfer Roll (BTR)***

The Bias Transfer Roll is an electrically conductive foam roller that rotates along the surface of the rotating drum. The Main Drive Assembly provides the mechanical power used to rotate the BTR. The HVPS supplies voltage to the BTR through metal contacts that are molded into the Main Drive Assembly. The BTR transfers the image from the surface of the drum to the surface of the paper. The BTR transfers the image by applying a high voltage charge to the back of the paper at the exact point where the paper is in contact with the drum. The voltage on the paper attracts the toner image on the drum.

### **The Cleaning System and Toner Sump**

After each print cycle, the Cleaning System uses a silicone rubber blade to scrape off any toner remaining on the drum. The rubber blade rides continuously on the surface of the drum. The unused toner is deposited in a toner sump located inside the Print Cartridge.



**Figure 3-7. Side Cut-away View of the Print Cartridge**

### The Action Laser 1100 Image Transfer Process

Figure 3-8 on the following page illustrates the process described below.

1. The Drum, the Charge Roll, the Mag Roll, and the BTR start to rotate.
2. The Charge Roll charges the surface of the Drum.
3. The laser beam strikes the surface of the drum. The controller modulates the laser beam according to the pixel information of the original electronic image. The original electronic image is reproduced, pixel by pixel, line by line, on the surface of the drum.
4. If the laser beam is ON at a particular pixel point, the laser beam discharges that point on the surface of the drum. If the laser beam is OFF at a particular pixel point, the surface of the drum at that point remains charged.
5. As the laser completes a scan, the drum rotates just enough so the next scan is placed immediately below the previous scan.
6. The drum now has a surface of charged and uncharged points that represent the corresponding pixel points of the original electronic image. The drum has a "latent image" on its surface.
7. The latent image area on the drum rotates past the Mag Roll.
8. The toner attached to the Mag Roll is attracted to the discharged areas on the surface of the drum. The toner transfers from the Mag Roll to the discharged areas. Charged areas on surface of the drum do not attract toner from the Mag Roll. At this point, the drum has a "developed image" on its surface. The amount of toner that adheres to a discharged area is directly related to the Developer Bias voltage setting. The greater the Developer Bias voltage, the more toner attracted to the uncharged areas. The more toner attached to a point on the drum, the darker the image on the paper.
9. At the start of the print cycle, the Paper Feeder Assembly feeds a single sheet of paper out of the Input tray and into contact with the drum. The printer circuitry registers the paper with the image on the drum.
10. The paper actually touches the drum at the point where the BTR and drum contact.
11. The BTR applies an electrical charge to the back of the paper, and the toner image on the surface of the drum adheres to the surface of the paper.
12. The paper leaves the drum with the transferred toner image on the print surface. At this point the image is held in place by static electricity. The image is not permanent, and it can be easily rubbed off.

13. The paper must travel through the Fuser Assembly, where the image is permanently fixed to the paper.
14. The cleaning blade cleans all untransferred toner from the drum, and places it in the toner sump. The printer does not recycle untransferred toner.
15. Because the drum is only 30 mm in diameter, the xerographic process of charge, discharge, develop, transfer, and clean occur simultaneously during the print cycle.

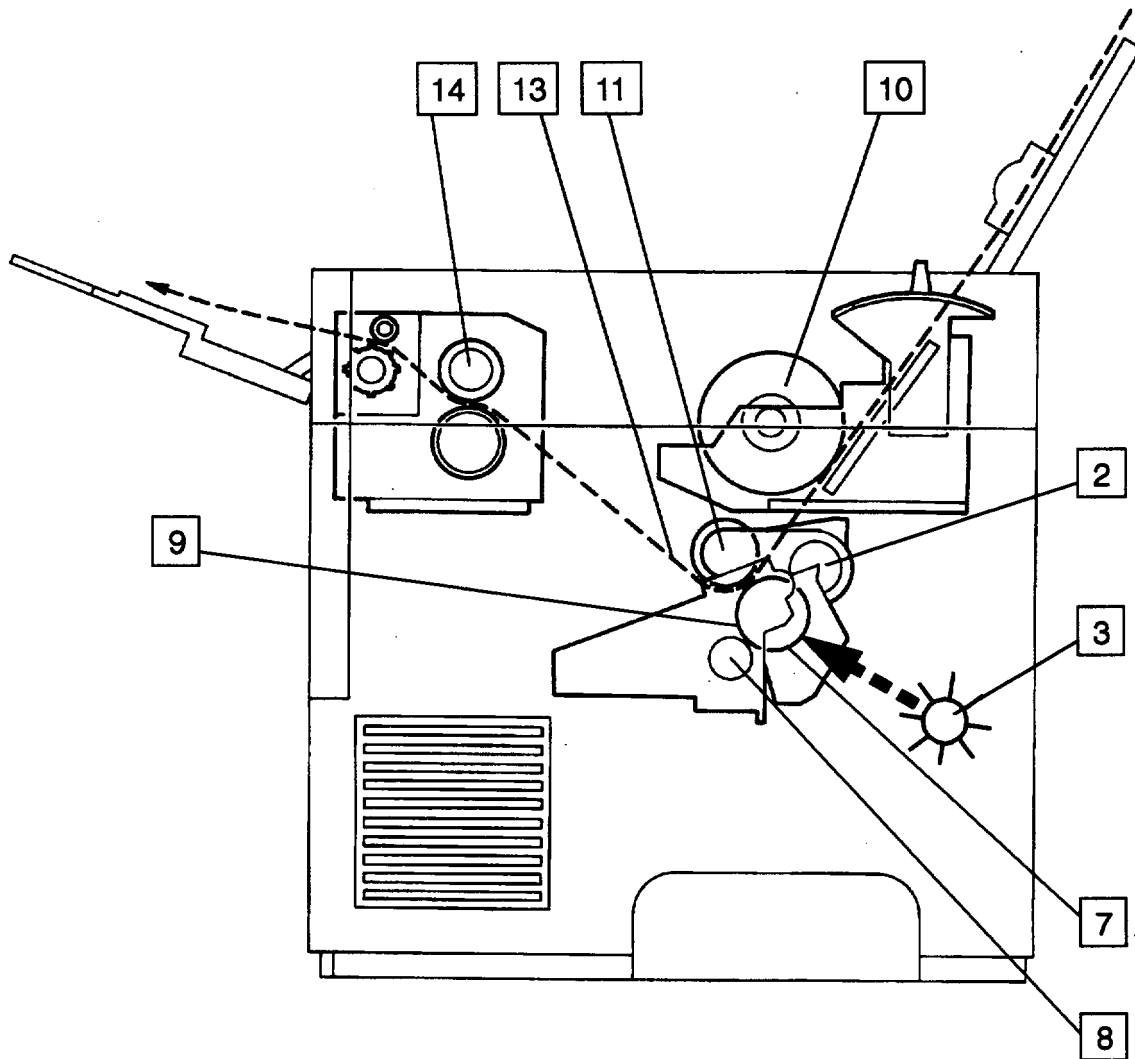
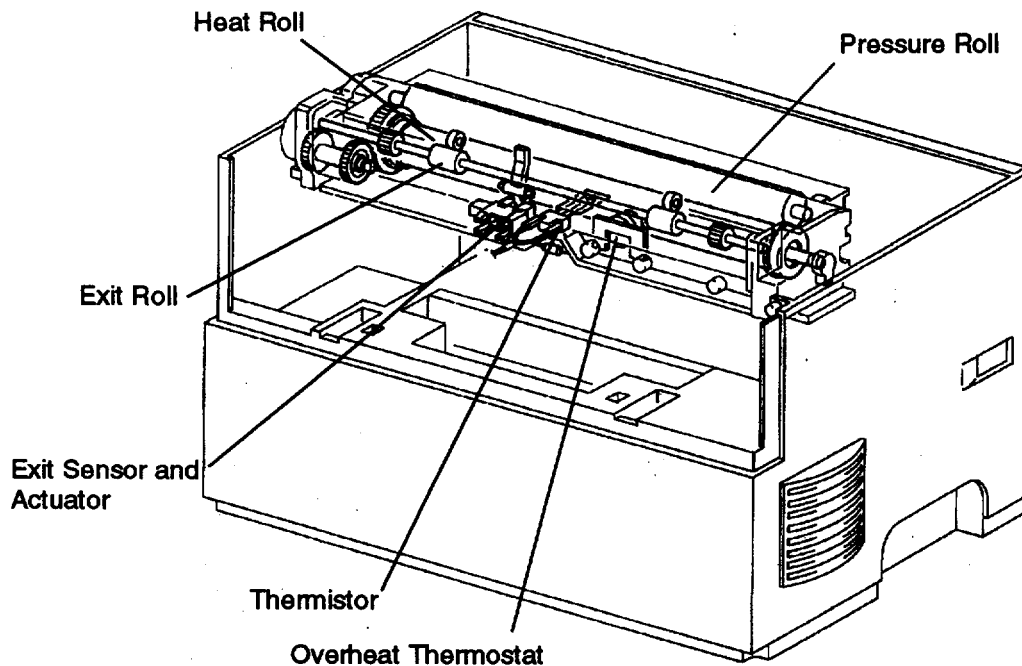


Figure 3-8. Xerographic Process of the ActionLaser 1100



### Fusing

The Fuser Assembly consists of a Heat Roll, a Pressure Roll, an Exit Sensor, an Exit Roll, a Thermistor, and an Overheat Thermostat. The Main Drive Assembly provides the mechanical power used to rotate all Fuser Assembly rolls (Figure 3-9).



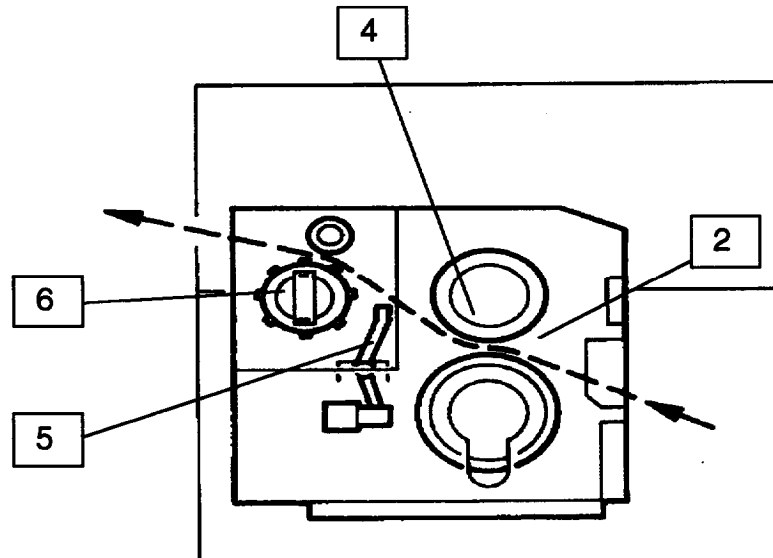
**Figure 3-9. Fuser Assembly**

The Heat Roll is a hollow, aluminum tube coated with Teflon on the outside surface. A 320 watt quartz Heat Rod mounted inside the Heat Roll heats the tube to approximately 284° F (140°C). The Fuser TRIAC on the Low Voltage Power Supply (LVPS) switches AC power to the Heat Rod. The main controller PWBA controls the TRIAC switching based on temperature input from the Thermistor. The Thermistor, which varies its resistance in accordance with heat changes, rides the surface of the Heat Roll and sends temperature readings back to the main controller PWBA. If the Heat Roll temperature raises above a predetermined limit, the Overheat Thermostat opens to cut off all power to the Heat Rod.

The Pressure Roll is a solid, silicone rubber roll that is positioned against the Heat Roll. Tension springs maintain the proper amount of pressure applied by the Pressure Roll.

The Exit Sensor is mounted at the exit end of the Fuser Assembly. Paper leaving the Fuser actuates the Exit Sensor, sending a signal to the main controller PWBA. If the paper does not actuate the Exit Sensor within a specified time period since it actuated the Registration Sensor, or if the Registration or Exit Sensors are actuated for too long a period of time, the main controller stops the printer and signals a paper jam.

The Exit Roll is a shaft with a number of small rubber wheels attached. The Exit Roll drives paper out of the fuser, and into the Exit Tray.



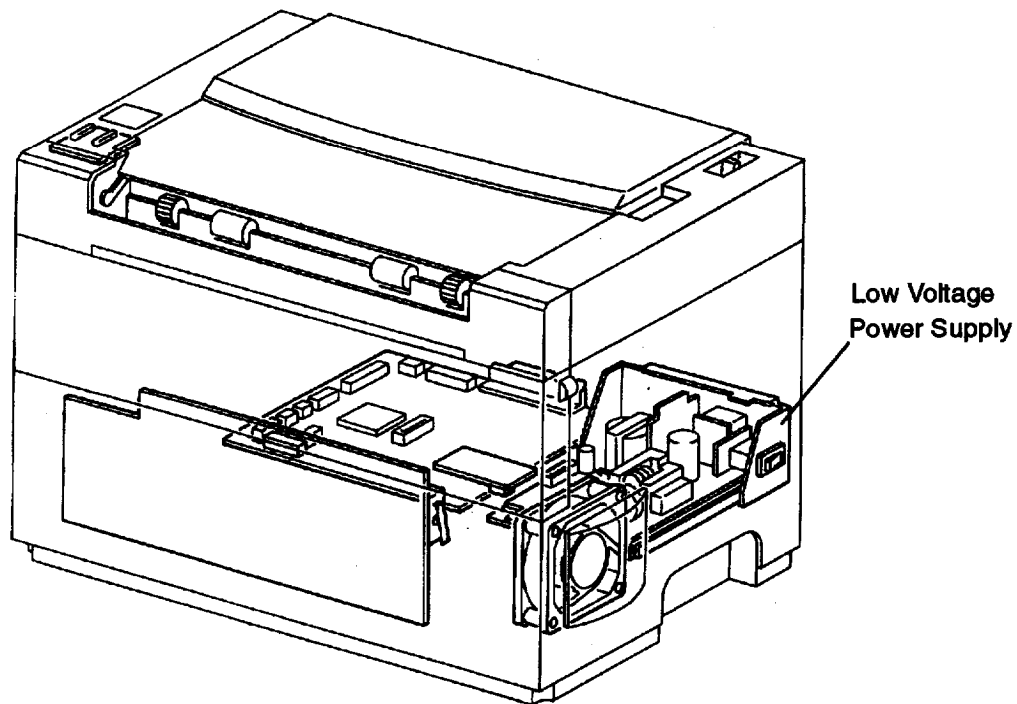
**Figure 3-10. Fusing Process**

1. Paper leaves the BTR and is driven toward the Fuser Assembly by the continuing action of the Feed Roll.
2. The Paper enters the Fuser Assembly and is captured between the Heat Roll and the Pressure Roll.
3. The two rotating rolls pull the paper through the Fuser.
4. As the paper passes between the two rolls, the toner image is heated to melting by the Heat Roll, and pressed into the paper by the Pressure Roll. This permanently fixes the toner image to the paper.
5. The fused paper exits the two rolls, and strikes the Exit Sensor Actuator. This sends a signal to the main controller PWBA that the page currently in the print cycle is leaving the Fuser.
6. The Exit Roll drives the paper into the Exit Tray.

### ***Low Voltage Power Supply (LVPS)***

The power cord located at the back of the printer delivers AC power from the AC wall outlet to the Low Voltage Power Supply (Figure 3-11).

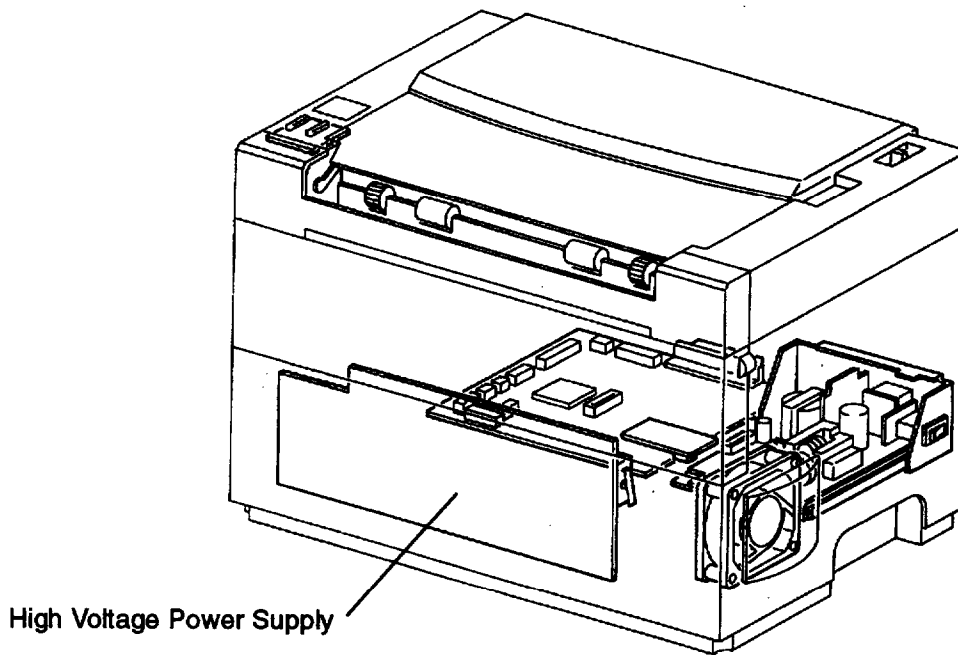
Inside the LVPS the AC line voltage passes through a filtering network and then through the Main Power Switch located on the side of the LVPS. Logic voltage and AC line voltage remain active even when the Front Cover of the printer is open (Interlock Switch deactuated). The Front Cover Interlock disables only the High Voltage circuits. After passing through the Interlock Switch, the LVPS rectifies the AC line voltage into +5 VDC and +24 VDC.



**Figure 3-11. Low Voltage Power Supply**

### **High Voltage Power Supply (HVPS)**

The High Voltage Power Supply PWBA is located in the lower front of the printer body (Figure 3-12). The HVPS switches various high voltage outputs on and off in response to commands from the main controller. The HVPS has an interlock switch that is actuated by the Front Cover Interlock. When the Front Cover is closed, the molded tab on the door moves a lever that actuates the Interlock Switch located on the HVPS. The Interlock Switch controls +24 VDC to the Main Drive and to the Laser Scanner. AC power to the Fuser is not controlled by the HVPS Interlock Switch.



**Figure 3-12. High Voltage Power Supply**

### **Software**

The Action Laser 1100 software can include the following printing modes:

**PCL** In PCL mode, most of the print processing takes place within the printer. PCL mode also lets the user use existing soft fonts and macros. The printer automatically selects PCL mode whether the user prints from the MS-DOS window or from a DOS application.

**PostScript** PostScript mode, available as a software option, can be used to print files that include Encapsulated PostScript (EPS) images. Some graphics applications deliver better results when they use PostScript mode.

## Paper Jam Detection Timing

During a print cycle, paper should move through the printer at a specific speed. A paper jam occurs if the paper moves too slow or too fast. The following tables and charts show E4, E3, and E2 paper jams, and the time windows required to create those jams.

### E4 Paper Jams

Table 3-1. E4 Jam Detection Time

| Paper Size           | E4 Detection Time |
|----------------------|-------------------|
| A4 (SEF) or smaller  | 20.06 seconds     |
| Larger than A4 (SEF) | 24.88 seconds     |

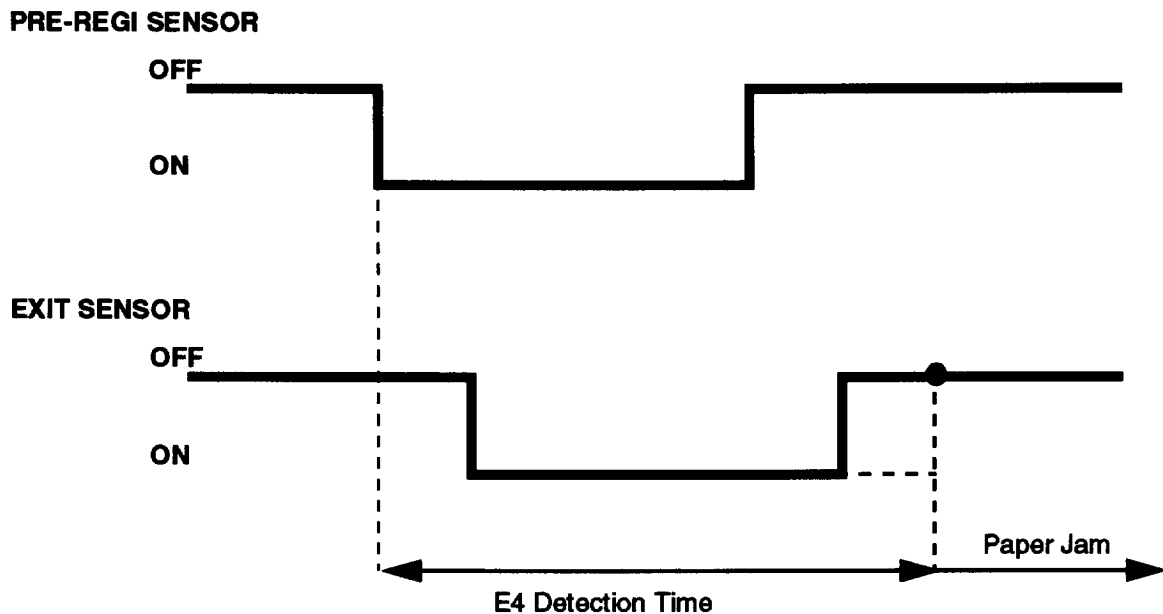


Figure 3-13. E4 Paper Jam Detection Timing

E3 Paper Jams

Table 3-2. E3 Jam Detection Time

| Paper Size | E3 Detection Time |
|------------|-------------------|
| All types  | 6.92 seconds      |

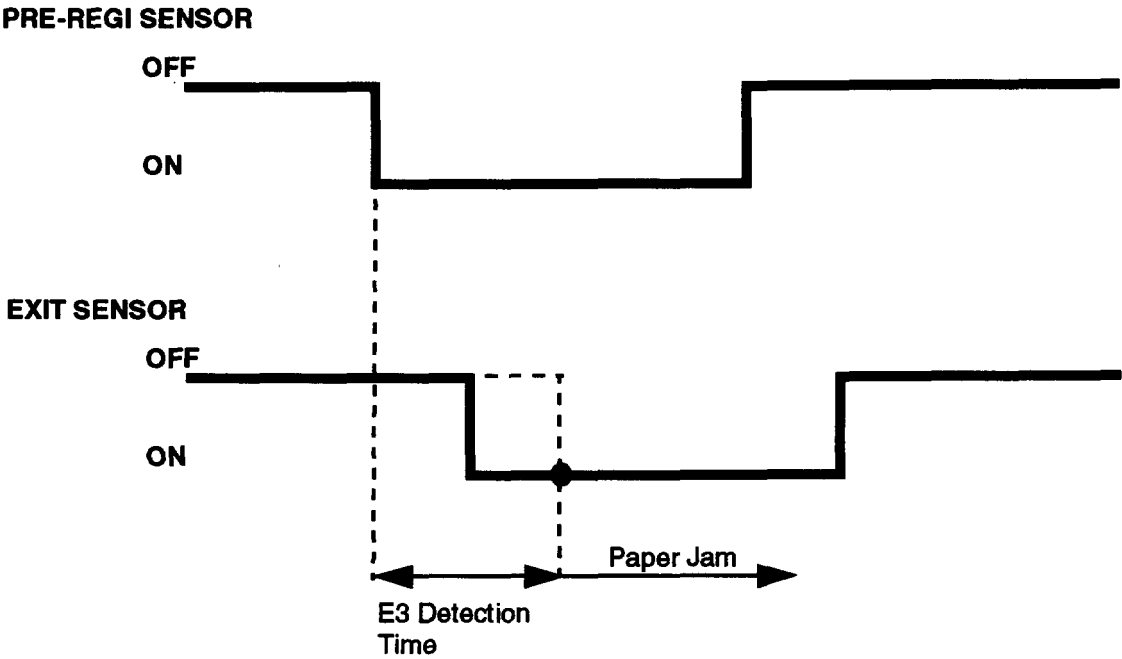


Figure 3-14. E3 Paper Jam Detection Timing

## E2 Paper Jams

Table 3-3. E2 Jam Detection Time

| Paper Size | E2-1 Detection Time<br>(Premature Feed) | E2-1 Detection Time<br>(Feed Error) |
|------------|---|-------------------------------------|
| All types  | 0.979 seconds                           | 2.175 seconds                       |

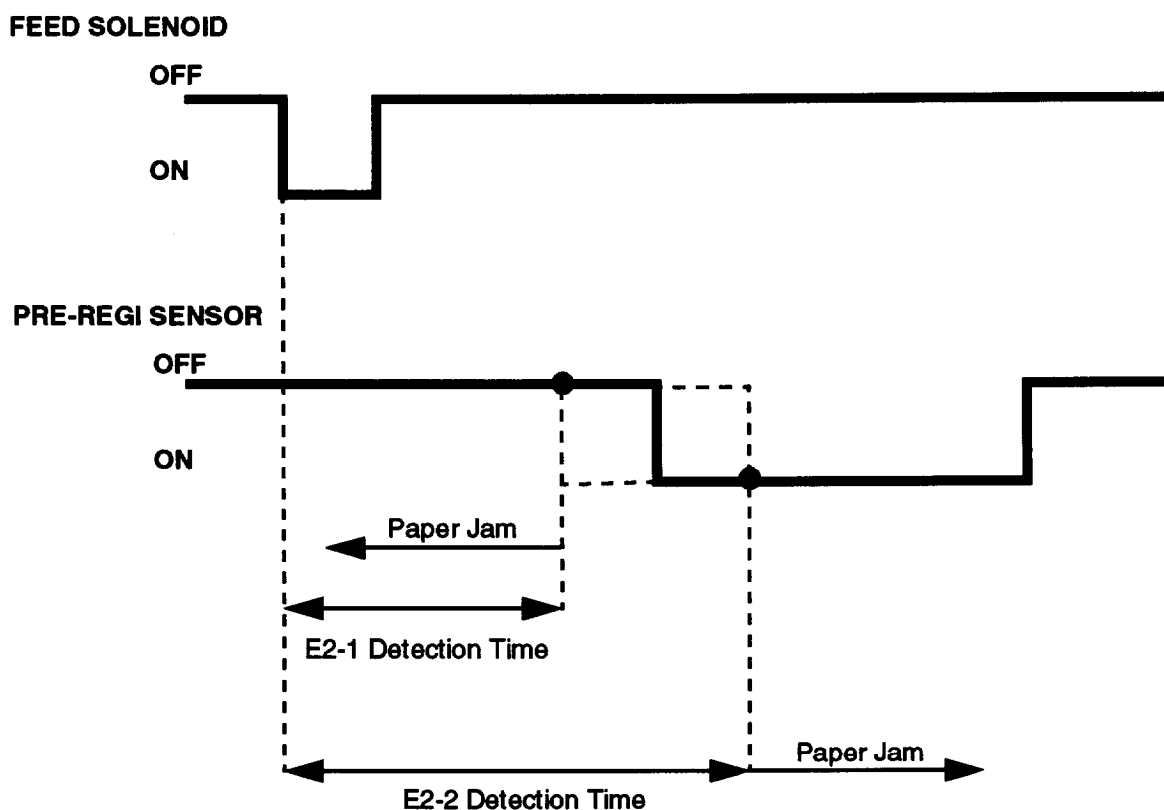


Figure 3-15. E2 Paper Jam Detection Timing

## Printer Controls

### Laser Scanner Motor Speed

The print resolution depends on how the laser reflects off of the Laser Scanner Assembly Polygon Mirror. The table below shows the relationship between the speed of the Scanner Motor and the image resolution of the printer.

**Table 3-4. Motor Speed and Print Resolution**

| <b>Print Resolution<br/>(dots per inch)</b> | <b>Speed of Scanner Motor<br/>(revolutions per minute)</b> |
|---|--|
| 300 dpi                                     | 4075 rpm   |

### Laser Scanner Warm-up Sequence

The Scanner Motor starts to spin when you switch ON main power. Laser Scanner Warm-up ends when the Scanner Motor reaches the rated speed. At rated speed (4075 RPM), the SOS signal intervals are shorter than the READY reference value (during three consecutive samplings of the SOS signal interval).

**Table 3-5. Laser Scanner (LS) Reference Value**

| <b>LS Reference Value</b> | <b>Definition</b>  |
|---------------------------|--|
| READY Reference Value     | The Scanner Motor reached at least 98% of the Scanner Motor rated speed.<br>READY Reference Value enables printer operation.   |
| FAIL Reference Value      | The Scanner Motor reached 90% or less of the Scanner Motor rated speed.<br>FAIL Reference Value inhibits printer operation.<br>If the Scanner Motor speed is less than 90% rated speed, the laser beam will not reach the SOS Sensor, and a Laser Unit Error message is displayed. |



### Fuser Controls

The printer switches the Heater Rod ON or OFF according to the Rated Fuser Temperature.

There are two Rated Fuser Temperature settings:

Warming-up Temperature      When the fuser is warming up or the Main Motor is idle.

Running-Mode Temperature      During a print cycle and the Main Motor is running.

### Heat Rod *Control*

The printer switches the Heat Rod ON when the temperature of the Heat Roll falls below the Low Allowable Temperature range.

The printer switches the Heat Rod OFF when the surface temperature of the Heat Roll exceeds the High Allowable Temperature range.

### *Fuser Warm-Up Sequence*

Fuser warm-up begins when the printer switches ON the Heat Rod. Fuser warm-up ends when the Temperature Sensor thermistor senses the Heat Roll surface has reached warm-up temperature. The Main Motor runs continuously during Fuser warm-up.

The table below shows the Heat Roll temperature parameters.

**Table 3-6. Fuser Temperature**

| <b>Fuser Temperature Parameter</b>     | <b>Heat Roll Surface Temperature</b>   |
|--|--|
| <b>High Limit Temperature</b>          | <b>Approximately 175°C (347° F)<br/>(approximately Standby Mode temperature plus 35°C)</b>                 |
| <b>High Allowable Temperature</b>      | <b>Rated Fuser Temperature <math>\pm 0^{\circ}\text{C}</math></b>  |
| <b>Rated Temperature<br/>(default)</b> | <b>Standby Mode Temperature: 140°C (284° F)<br/><br/>Running Mode Temperature: 150°C (302° F) constant</b> |
| <b>Low Allowable Temperature</b>       | <b>Rated Fuser Temperature minus 2°C</b>   |
| <b>Low Limit Temperature</b>           | <b>Approximately 115°C (239° F)<br/>(Standby Mode Temperature minus 25°C)</b>                              |

## Erase Cycle

The Erase Cycle allows the printer to return to normal operation after a print cycle interruption, such as a paper jam, a power failure, or opening the Front Cover. The Erase Cycle switches ON the Main Motor and switches ON the DC CR and TR(–) voltages from the HVPS.

If necessary, you can interrupt the Erase Cycle by deactuating the Interlock Switch or actuating the Exit Sensor. To return to the Erase Cycle, actuate the Interlock Switch or deactuate the Exit Sensor.

## Power-on Tests

Immediately after you power on the printer, the controller runs onboard CPU and memory tests. The READY/ERROR LEDs located on the top of the printer cover display the test that is currently running. Use the following table to determine which test is currently running.

**Table 3-7. LED Light Sequence for Power-on Tests**

| TEST | READY LED | ERROR LED | OPERATION                                     |
|------|-----------|-----------|---|
| 1    | OFF       | OFF       | After Power-on                                |
| 2    | ON        | OFF       | CPU Test                                      |
| 3    | OFF       | ON        | ROM Test                                      |
| 4    | ON        | ON        | Onboard memory test and ExtRAM size check     |
| 5    | OFF       | OFF       | Fill pattern for 1st MB of ExtRam (if ExtRam) |
| 6    | ON        | ON        | Read & Verify 1st MB of ExtRam                |
| 7    | OFF       | OFF       | Fill pattern for 2nd MB of ExtRam             |
| 8    | ON        | ON        | Read & Verify 2nd MB of ExtRam                |
| 9    | OFF       | OFF       | Fill pattern for 3rd MB of ExtRam             |
| 10   | ON        | ON        | Read & Verify 3rd MB of ExtRam                |
| 11   | OFF       | OFF       | Fill pattern for 4th MB of ExtRam             |
| 12   | ON        | ON        | Read & Verify 4th MB of ExtRam                |
| 13   | OFF       | OFF       | Memory test complete                          |
| 14   | BLINK     | BLINK     | Printer Warm-up (if engine warm-up)           |
| 15   | ON        | OFF       | Printer Ready (if there are no engine errors) |



## Disassembly and Assembly 4

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## Disassembly and Assembly 4

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This chapter describes the procedures to be used for replacing the main assemblies of the ActionLaser 1100. As you follow the procedures, refer to the Plug/Jack Locator Diagram and Table on the following two pages.

### Precautions

Before you begin any disassembly and assembly procedure, follow these precautions:

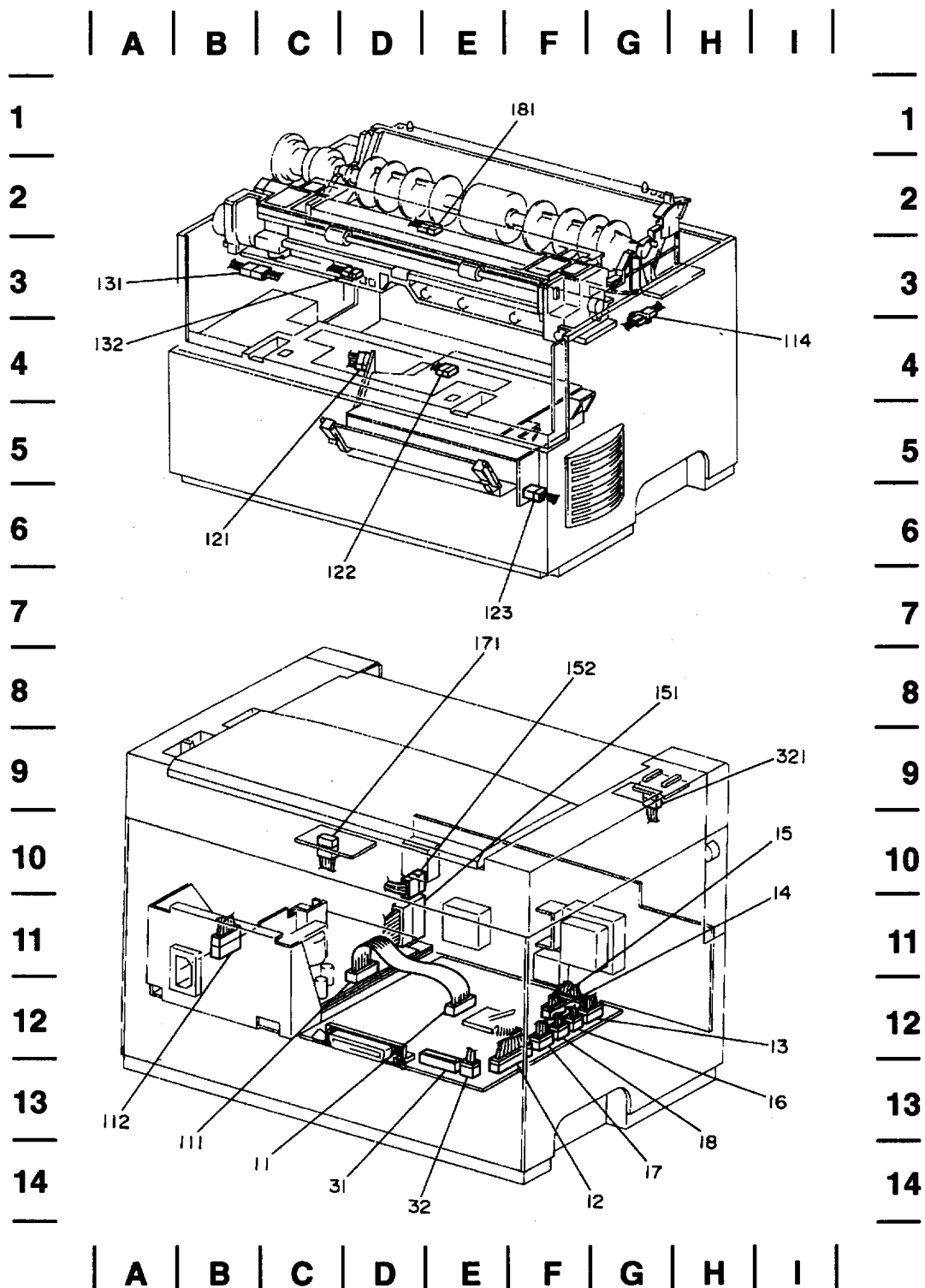
1. Switch OFF the printer power.
2. Disconnect the AC power cord from the wall outlet.
3. Remove all of the paper from the Input Tray.
4. Open the Front Cover.
5. Remove the Print Cartridge and cover it with a dark cloth or place it in a sealed container to protect it from exposure to light.
6. Disconnect all interface cables from the back of the printer.
7. Wear an electrostatic discharge wrist strap to protect sensitive printer parts from damage.

### Tools

To service the printer you need the following tools:

1. #2 Phillips Screwdriver
2. Needle Nosed Pliers

# Plug/Jack Locator Diagram



Use the following table to identify P/J connectors by their coordinate points. The points correlate to the grid in the P/J Locator Diagram on the previous page.

**Table 3-1. Plug/Jack Locator**

| <b>P/J</b> | <b>Coordinates</b> | <b>Purpose of P/J</b>   |
|------------|--------------------|---|
| 11         | E-12               | Connects Main Controller PWBA and LVPS Assembly                       |
| 12         | E-13               | Connects Main Controller PWBA and Harness Assembly Laser Scanner      |
| 13         | F-12               | Connects Main Controller PWBA to Thermistor and Harness Assembly Exit |
| 14         | F-12               | Connects Main Controller PWBA and Main Motor                          |
| 15         | F-12               | Connects Main Controller PWBA and Harness Assembly HV                 |
| 16         | F-12               | Connects Main Controller PWBA and Feed Solenoid                       |
| 17         | F-12               | Connects Main Controller PWBA and Harness Assembly Print Cartridge    |
| 18         | F-12               | Connects Main Controller PWBA and Harness Assembly P/H                |
| 31         | E-12               | Connects Main Controller PWBA and Y-Debug                             |
| 32         | E-13               | Connects Main Controller PWBA and Harness Assembly LED                |
| 111        | D-11               | Connects LVPS Assembly and Main Controller PWBA                       |
| 112        | B-11               | Connects LVPS Assembly and Harness Assembly Fuser AC                  |
| 114        | G-3                | Connects Fuser Assembly and Harness Assembly Fuser AC                 |
| 121        | D-4                | Connects LD and Harness Assembly Laser Scanner                        |
| 122        | E-4                | Connects Laser Scanner Motor and Harness Assembly Laser Scanner       |
| 123        | F-6                | Connects SOS and Harness Assembly Laser Scanner                       |
| 131        | B-3                | Connects Thermistor to Harness Assembly Exit and Thermistor           |
| 132        | D-3                | Connects Exit Sensor to Harness Assembly Exit and Thermistor          |
| 151        | D-11               | Connects Main Controller PWBA and HVPS                                |
| 152        | D-10               | Connects HVPS and Exhaust Fan   |
| 171        | C-10               | Connects Print Cartridge Sensor and Harness Assembly Print Cartridge  |
| 181        | E-2                | Connects Registration Sensor and Harness Assembly P/H                 |
| 321        | G-9                | Connects LED PWBA and Harness Assembly LED                            |



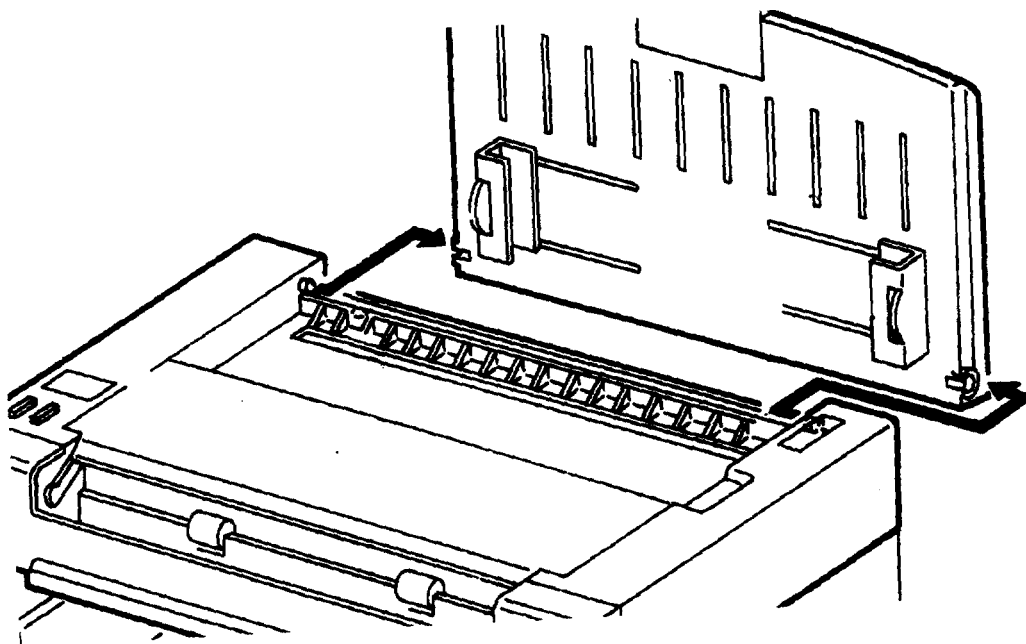
## Input Tray

### Removal

1. Close the Input Tray.
2. Gently pull upon the back edge until the tray snaps free.
3. Remove the Input Tray.

### Replacement

1. Position the input Tray so the hinges on both sides of the tray line up with the pivot points on the printer Top Cover (Figure 4-1).



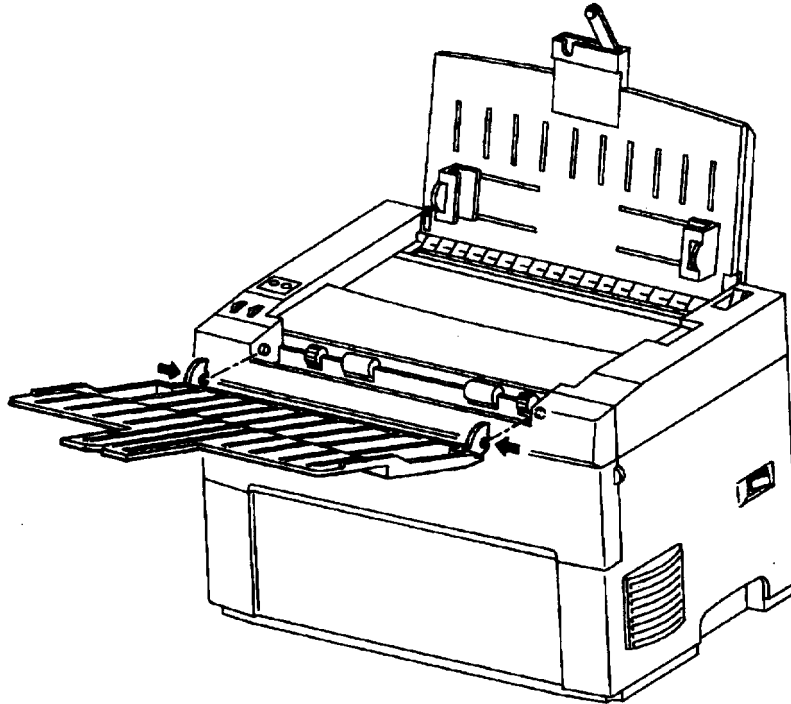
**Figure 4-1. Replacing the Input Tray**

2. Gently press the Input Tray down onto the pivot points.  
The Input Tray snaps into place.

## Exit Tray

### Removal

1. Open the Input Tray.
2. Open the Exit Tray.
3. Push the left Exit Tray hinge away from the pivot pin until the hinge snaps free (Figure 4-2).
4. Remove the Exit Tray



**Figure 4-2. Removing the Exit Tray**

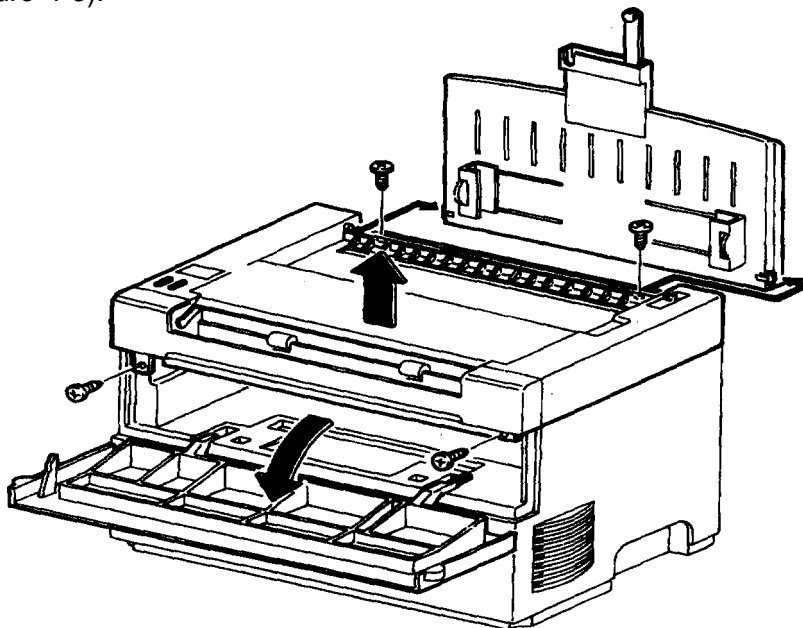
### Replacement

1. Insert the right hinge onto the right pivot pin.
2. Slowly close the Exit Tray until the left hinge snaps onto the left pivot pin.

## Top Cover

### Removal

1. Open the Front Cover.
2. Remove the Input Tray.
3. Remove the 2 screws at the front and the 2 screws at the top rear securing the Top Cover (Figure 4-3).



**Figure 4-3. Removing the Top Cover**

4. Lift the Cover to expose the LED connector.
5. Disconnect the LED connector.
6. Remove the Top Cover.

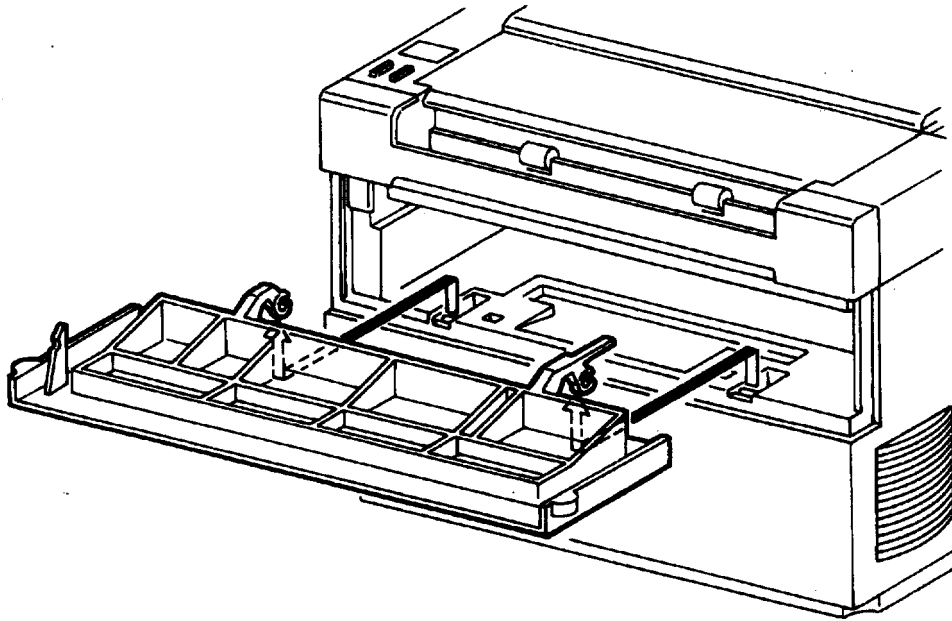
### Replacement

1. Position the Top Cover over the printer.
2. Reconnect the LED connector.
3. Seat the Top Cover onto the printer.
4. Use 4 screws to secure the cover.
5. Close the Front Cover.
6. Replace the Input Tray.

## Front Cover

### Removal

1. Open the Front Cover.
2. Use a screwdriver to gently pry up the right hinge of the Front Cover (Figure 4-4).
3. Work the left hinge free of the pivot pin, and remove the Front Cover.



**Figure 4-4. Removing the Front Cover**

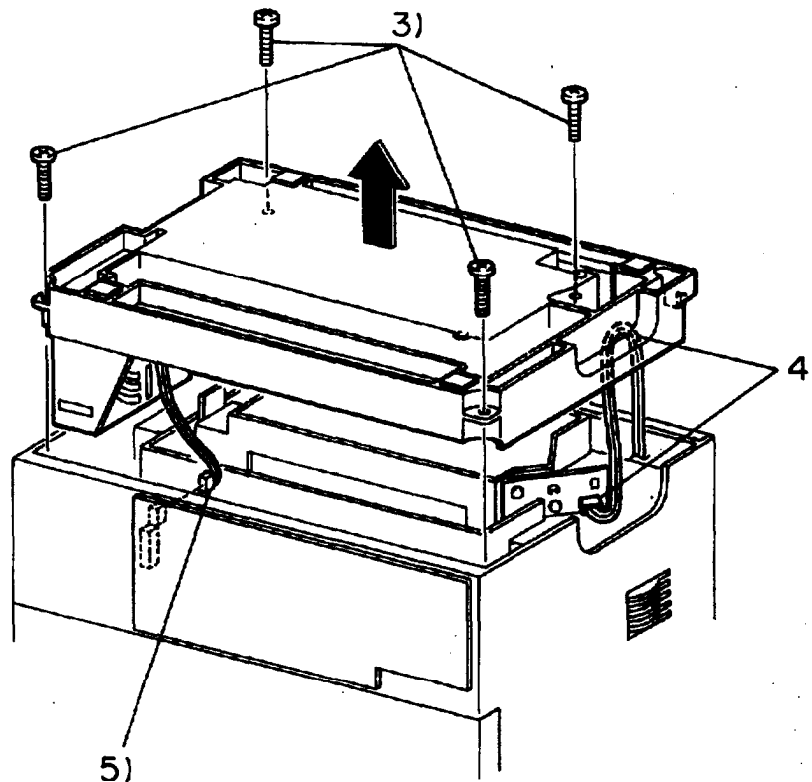
### Replacement

1. Angle the Front Cover so the hinges contact the pivot pins.
2. Press the hinges into place on the pivot pins.
3. Close the Front Cover.

## Bottom Cover

### Removal

1. Turn the printer onto the Back Cover so the Bottom Cover faces you.
2. Remove the 4 screws securing the Bottom Cover (Figure 4-5).



**Figure 4-5. Removing the Bottom Cover**

3. Slide the Bottom Cover toward you approximately one inch.
4. Disconnect P/J152 leading to the Exhaust Fan.
5. Remove the Bottom Cover.

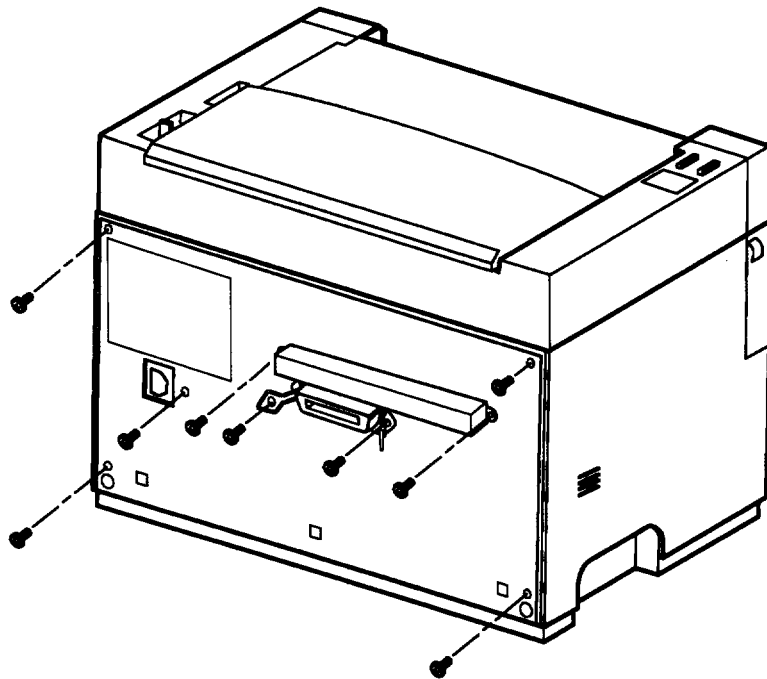
### Replacement

1. Position the Bottom Cover close enough to reconnect P/J152.
2. Reconnect P/J152.
3. Slide the Bottom Cover all the way into the printer.
4. Use 4 screws to secure the Bottom Cover.

## Rear Cover

### Removal

1. Remove the 9 screws securing the Rear Cover (Figure 4-6).
2. Remove the Rear Cover.



**Figure 4-6. Removing the Rear Cover**

### Replacement

1. Position the Rear Cover.
2. Use 9 screws to secure the Rear Cover.

## Exhaust Fan

### Removal

1. Remove the Bottom Cover.
2. Disconnect P/J152 (Fan) from the HVPS.
3. Use a screwdriver to gently pry the Fan out of the Bottom Cover (Figure 4-7).

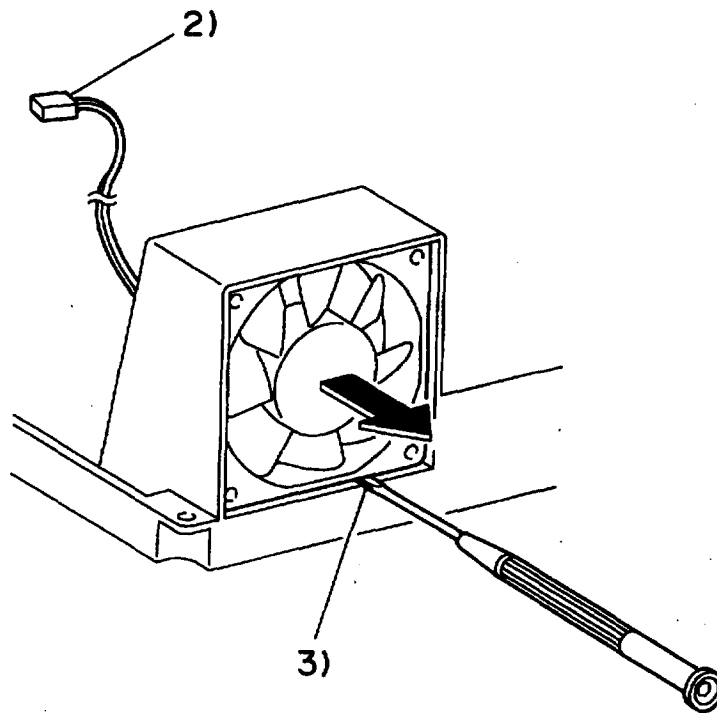


Figure 4-7. Removing the Exhaust Fan from the Bottom Cover

### Replacement

1. Reinstall the Exhaust Fan into the Bottom Cover.  
Position the Fan so the lettering on the Fan hub faces out.
2. Press the Exhaust Fan into place.
3. Reconnect P/J152 on the HVPS.
4. Replace the Bottom Cover.

## Electrical Chassis

### Removal

1. Remove the Rear Cover.
2. Remove the 3 screws securing the Electrical Chassis to the printer body (Figure 4-8).
3. Slide the chassis a few inches out of the Printer Body.
4. Remove the screws securing the EMI Shield to the Chassis.
5. Remove the Shield.
6. Disconnect P/J's 11 through 18 from the Main Controller PWBA.
7. Remove the Electrical Chassis from the Printer Body.

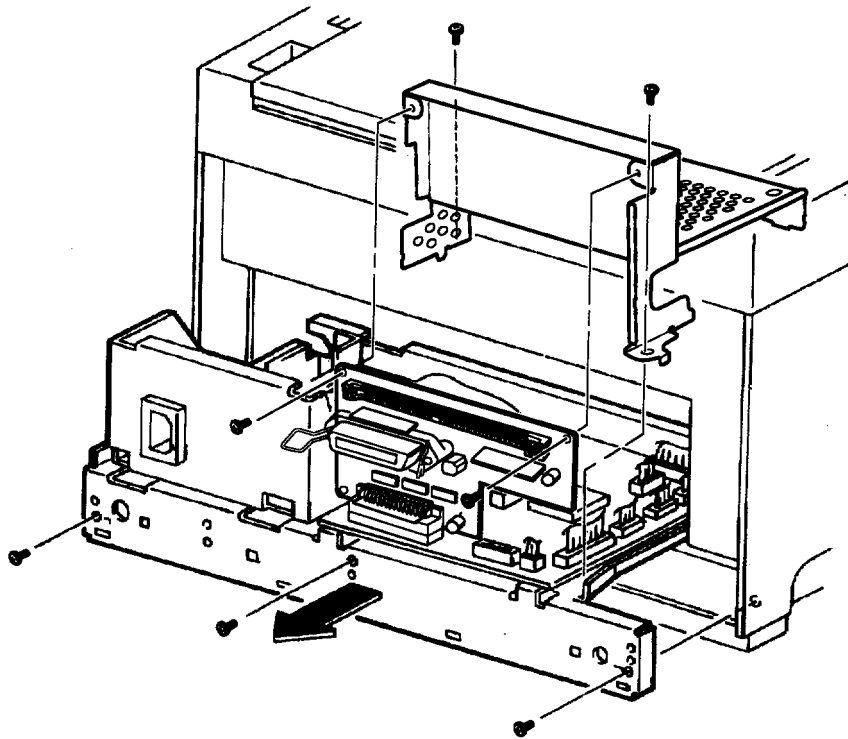


Figure 4-8. Removing the Electrical Chassis



## Replacing the Electrical Chassis

1. Reinstall the Electrical Chassis in the Printer Body.
2. Leave the Chassis sticking out a few inches so you can reconnect the P/Js on the Main Controller PWBA.
3. Reconnect P/Js 11 through 18 on the Main Controller PWBA.
4. Place the EMI Shield on the Chassis and secure it with the screws you removed previously.
5. Slide the Chassis all the way into the Printer Body.
6. Use 3 screws to secure the Chassis.

## Low Voltage Power Supply (LVPS)

### Removal

1. Remove the Back Cover.
2. Remove the Electrical Chassis.
3. Remove the LVPS to Main Controller PWBA Harness from the Main Controller PWBA.
4. Disconnect the Fuser AC Harness.
5. Release the LVPS to Main Controller PWBA Harness from the LVPS PWBA by pushing down on the top of P/J111 on the LVPS PWBA (Figure 4-9).
6. Once you have opened P/J111, remove the Harness.
7. Remove the 3 screws securing the LVPS to the Electrical Chassis.
8. Remove the LVPS.

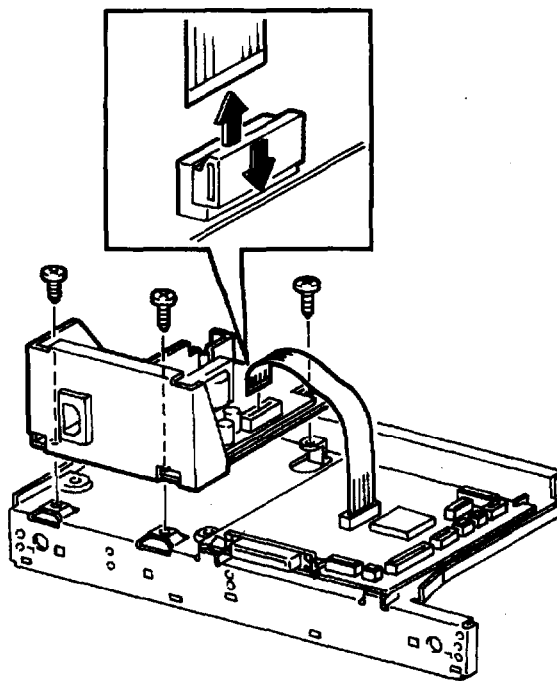


Figure 4-9. Removing the LVPS

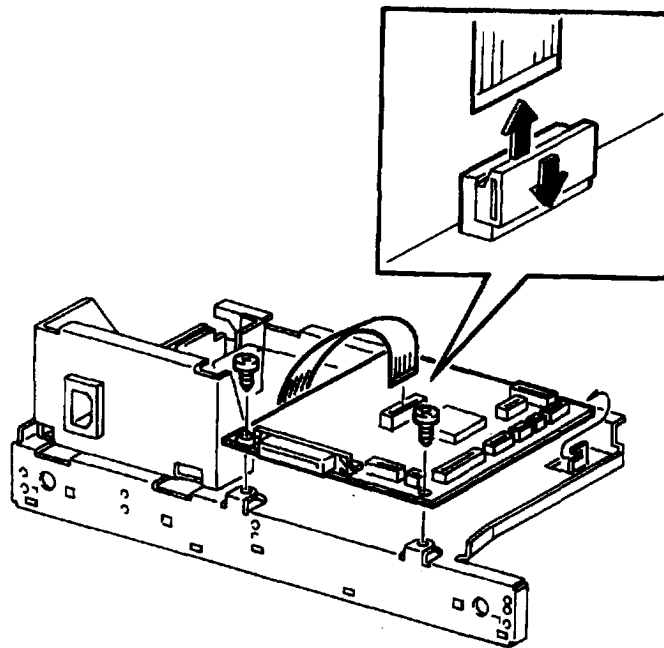
## **Replacing the LVPS**

1. Reinstall the LVPS onto the Electrical Chassis and secure it with 3 screws.
2. Open P/J111 by pushing down on the top of the P/J.
3. While holding P/J111 open, reinstall the LVPS to Main Controller PWBA Harness, making sure that each individual wire fits into the corresponding hole.
4. Stop pushing down on the P/J.  
This closes the P/J, securing the Harness to the PWBA.
5. Reinstall the Electrical Chassis into the Printer Body.
6. Reinstall the Back Cover.

## Main Controller PWBA

### Removal

1. Remove the Back Cover.
2. Remove the Electrical Chassis.
3. Remove the Harness from the Main Controller PWBA (Figure 4-10).
4. Disconnect P/Js 11 through 18 from the Main Controller PWBA.
5. Remove the two screws securing the Main Controller PWBA to the Electrical Chassis.
6. Remove the Main Controller PWBA.



**Figure 4-10. Removing the Main Controller PWBA**

### Replacement

1. Reinstall the Main Controller PWBA onto the Electrical Chassis, securing it with 2 screws.
2. Reconnect P/Js 11 through 18 on the Main Controller PWBA.
3. Reconnect the LVPS to Main Controller Harness
4. Reinstall the Electrical Chassis.
5. Reinstall the Back Cover.

## Print Cartridge Sensor Harness

### Removal

1. Remove the Bottom Cover.
2. Remove the Back Cover.
3. Slide the Electrical Chassis halfway out.
4. Disconnect P/J17 (Print Cartridge Sensor) on the Main Controller PWBA.
5. Place the printer on its side so you have access to the underside.
6. Follow the Print Cartridge Sensor Harness from the Main Controller PWBA to P/J171 on the Print Cartridge Sensor.
7. Disconnect P/J171 and remove the Harness.

### Replacement

1. Reconnect P/J171 on the Print Cartridge Sensor Harness.
2. Route the Harness along the top of the HVPS and into the hole in the Printer Body leading to the Main Controller PWBA.
3. Reconnect P/J17 on the Main Controller PWBA.
4. Reinstall and secure the Electrical Chassis.
5. Reinstall the Back Cover and Bottom Cover.

## Fuser AC Harness

### Removal

1. Remove the Back Cover.
2. Remove the Top Cover.
3. Disconnect P/J114 located near the end of the Fuser Assembly.
4. Slide the Electrical Chassis halfway out.
5. Disconnect P/J112 (Fuser AC Power) on the LVPS.
6. Free the Harness from the harness clip.
7. Remove the Harness.

### Replacement

1. Reconnect the Harness to P/J114 near the end of the Fuser Assembly.
2. Route the Harness along the side of the Printer Body and down to the LVPS.
3. Fasten the Harness to the harness clip located near the Fuser Assembly.
4. Reconnect P/J112 on the LVPS.
5. Reinstall and secure the Electrical Chassis.
6. Replace the Top Cover and Back Cover.

## High Voltage Power Supply (HVPS) Harness

### Removal

1. **Remove the Back Cover.**
2. **Remove the Bottom Cover.**
3. Slide the HVPS out of the Printer Body.
4. Disconnect P/J151 from the HVPS.
5. Slide the Electrical Chassis halfway out.
6. Disconnect P/J15 on the Main Controller PWBA.
7. Remove the Harness.

### Replacement

1. **Reconnect PIJ15 on the Main Controller PWBA.**
2. **Route the Harness into the hole** in the Printer Body that leads to the HVPS.
3. Reinstall and secure the Electrical Chassis.
4. Reconnect P/J151 on the HVPS.
5. Reinstall the HVPS by sliding it back inside the guides **in the Printer Body.**  
  
Make sure the Interlock Switch on the HVPS lines up with the Interlock Switch Actuator.
6. Manually operate the Interlock Actuator to make sure it opens and closes the Interlock Switch located on the HVPS.
7. Reinstall the Bottom Cover and Back Cover.

## Indicator LED Harness

### Removal

1. Remove the Top Cover.
2. Disconnect P/J321 on the LED PWBA.
3. Remove the Back Cover.
4. Slide the Electrical Chassis halfway out.
5. Disconnect P/J32 on the Main Controller PWBA.
6. Remove the Harness.

### Replacement

1. Reconnect P/J32 on the Main Controller PWBA.
2. Reinstall and secure the Electrical Chassis.
3. Route the Harness through the access holes to the LED PWBA.
4. Reconnect P/J321 on the LED PWBA.
5. Reinstall the Back Cover and the Top Cover.



## Registration Sensor Harness

### Removal

1. Remove the Back Cover.
2. Slide the Electrical Chassis halfway out.
3. Disconnect P/J18 from the Main Controller PWBA.
4. Remove the Top Cover.
5. Remove the Paper Feeder.
6. Disconnect P/J181 on the Registration Sensor PWBA.
7. Remove the Harness.

### Replacement

1. Reconnect P/J181 on the Registration Sensor PWBA.
2. Route the Harness through the access hole leading to the Main Controller PWBA.
3. Reinstall and secure the Paper Feeder.
4. Reconnect P/J18 on the Main Controller PWBA.
5. Reinstall and secure the Electrical Chassis.
6. Reinstall the Top Cover and Back Cover.

## **Laser Scanner Harness**

### **Removal**

1. Remove the Back Cover.
2. Disconnect P/J12 from the Main Controller PWBA.
3. Remove the Bottom Cover.
4. Disconnect P/J121 on the Laser Diode PWBA.
5. Disconnect P/J122 on the Laser Scanner Motor PWBA.
6. Disconnect P/J123 on the Start of Scan PWBA.
7. Remove the Harness.

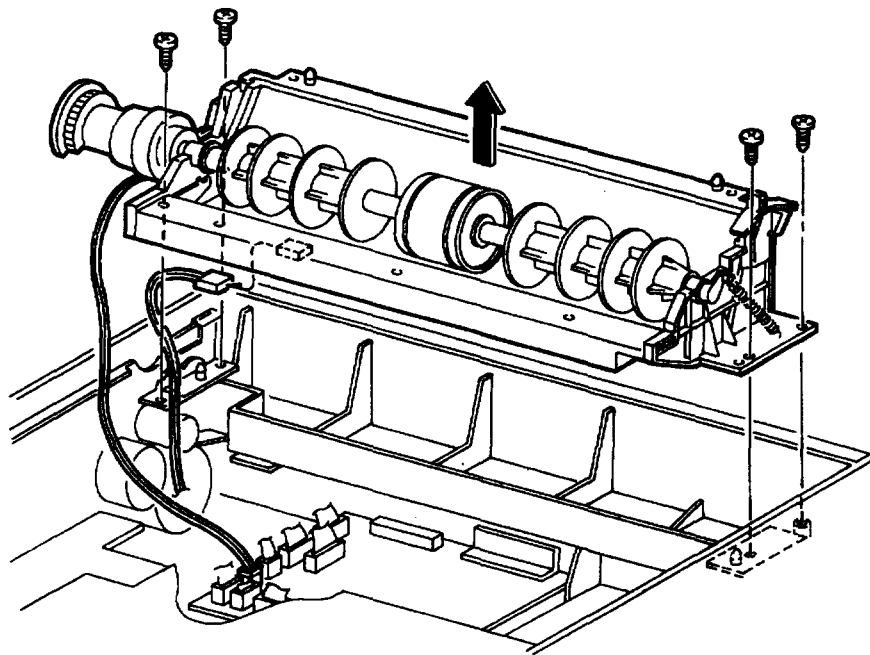
### **Replacement**

1. Reconnect P/J123 on the SOS PWBA.
2. Reconnect P/J122 on the Laser Scanner Motor PWBA.
3. Reconnect P/J121 on the Laser Diode PWBA.
4. Route the Harness into the channels around the Laser Scanner.
5. Route the free end of the Harness up through the access hole leading to the Main Controller PWBA.
6. Reconnect P/J12 on the Main Controller PWBA.
7. Reinstall the Bottom Cover and the Back Cover.

## Paper Feeder

### Removal

1. Remove the Input Tray.
2. Remove the Top Cover.
3. Remove the Rear Cover.
4. Disconnect P/J16 (Paper Feed Solenoid) on the Main Controller PWBA.
5. Disconnect P/J18 from the Registration Sensor.
6. Remove the 4 screws securing the Paper Feeder (Figure 4-11).
7. Remove the Paper Feeder.



**Figure 4-11. Removing the Paper Feeder**

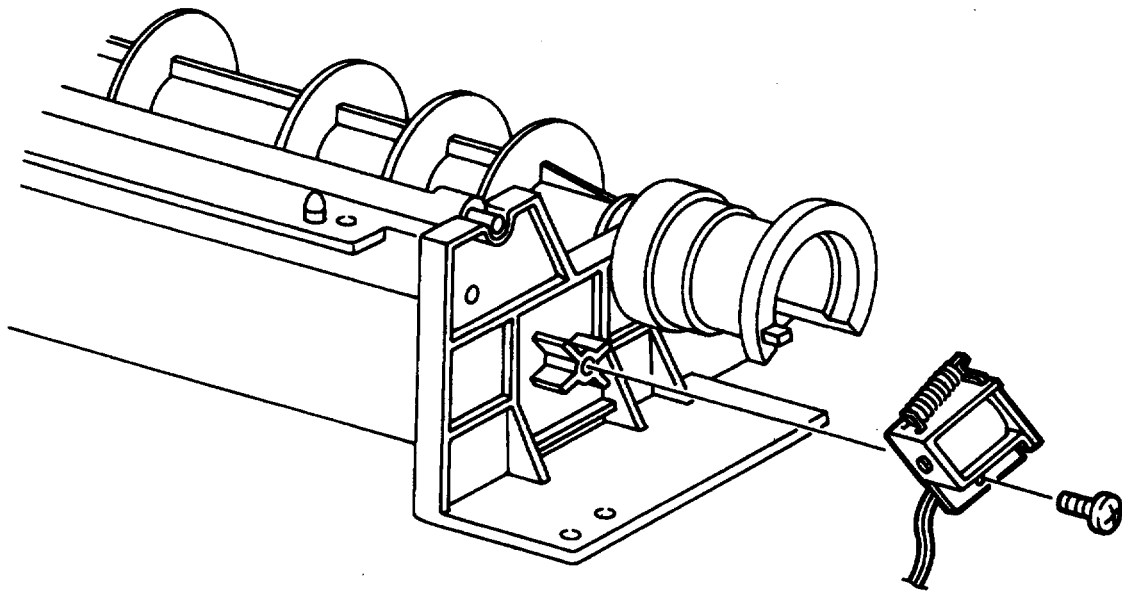
### Replacement

1. Reinstall the Paper Feeder.
2. Use 4 screws to secure the Paper Feeder.
3. Reconnect P/J18 and P/J16.
4. Reinstall the Top and Rear Covers.
5. Reinstall the Input Tray.

## Paper Feed Solenoid

### Removal

1. Remove the Top Cover.
2. Remove the Paper Feeder.
3. Disconnect P/J18 on the Main Controller PWBA.
4. Remove the screw securing the Paper Feed Solenoid (Figure 4-12).
5. Remove the Solenoid.



**Figure 4-12. Removing the Paper Feed Solenoid**

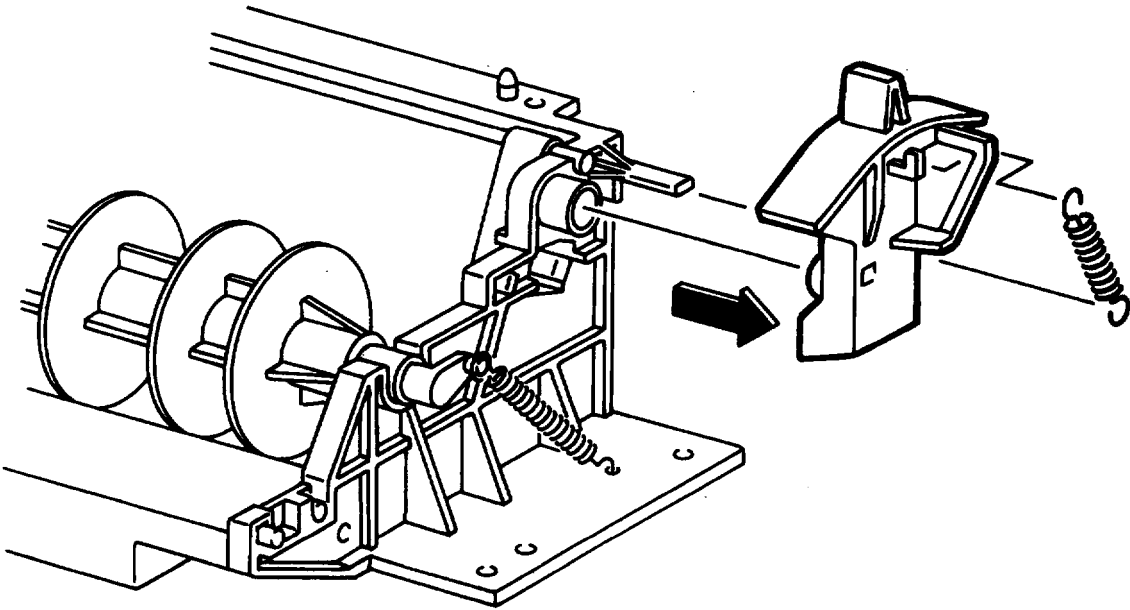
### Replacement

1. Reinstall the Paper Feed Solenoid.
  2. Use one screw to secure the Solenoid.
- NOTE: *Bias the Feed Solenoid Counter Clockwise as you tighten the screw.*
3. Reconnect P/J18 on the Main Controller PWBA.
  4. Reinstall the Paper Feeder.
  5. Reinstall the Top Cover.

## Paper Feeder Release Spring

### Removal

1. Remove the Paper Feeder.
2. Disengage the Paper Feeder Release Spring from the tab on the Paper Release Lever and the tab on the Paper Feeder (Figure 4-13).



**Figure 4-13. Removing the Paper Feeder Release Spring**

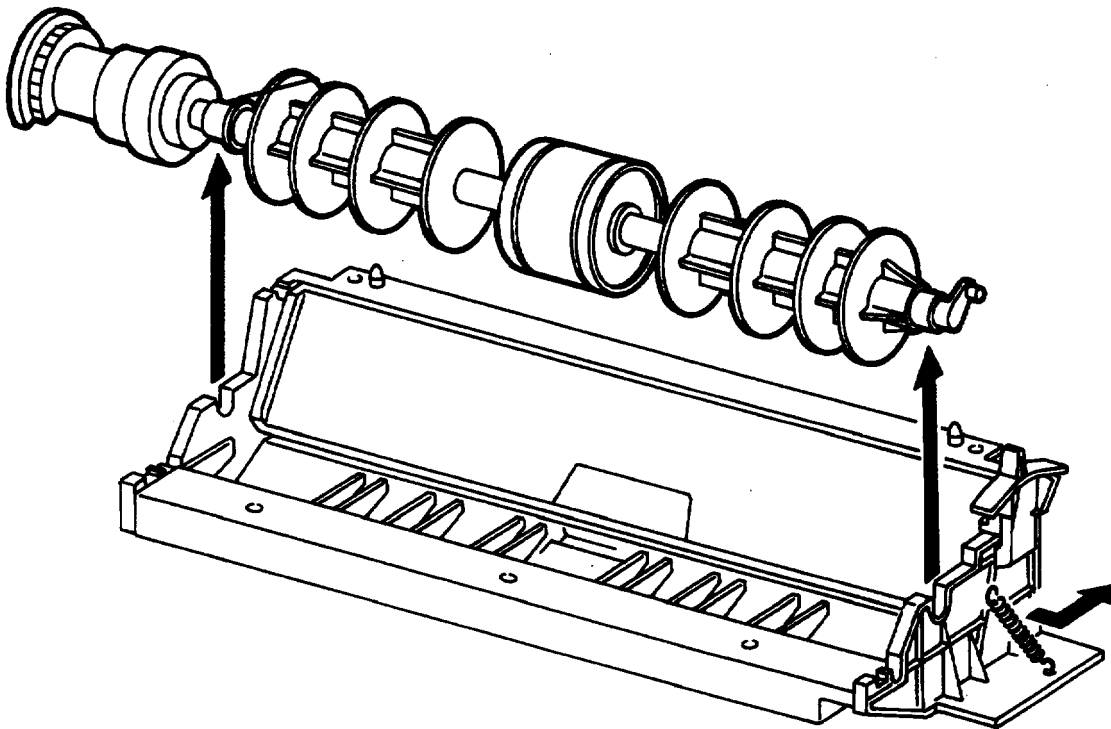
### Replacement

1. Reconnect the Paper Feeder Release Spring to the tab on the end of the Paper Release Lever and the tab on the Paper Feeder.
2. Reinstall the Paper Feeder.

## Paper Feed Roll

### Removal

1. Remove the Paper Feeder.
2. Remove the Paper Feeder Spring from the end of the Feed Roll.
3. Use a screwdriver to carefully pry both ends of the Paper Feed Roll out of the cutouts in the Paper Feeder Frame.
4. Remove the Paper Feed Roll (Figure 4-14).



**Figure 4-14. Removing the Paper Feed Roll**

## **Replacing the Paper Feed Roll**

1. Position the Feed Roll, with the clutch facing to the left, over the cutouts in the Feeder Frame.
2. Slide the nylon washers, located on each end of the shaft, away from the ends of the shaft.
3. Reinstall the Paper Feed Roll by lining up the shaft bearings with the cutouts in the Paper Feed Frame. Make sure the nylon washers are on the inside of the frame.
4. Firmly press the Feed Roll into the cutouts on the Frame.

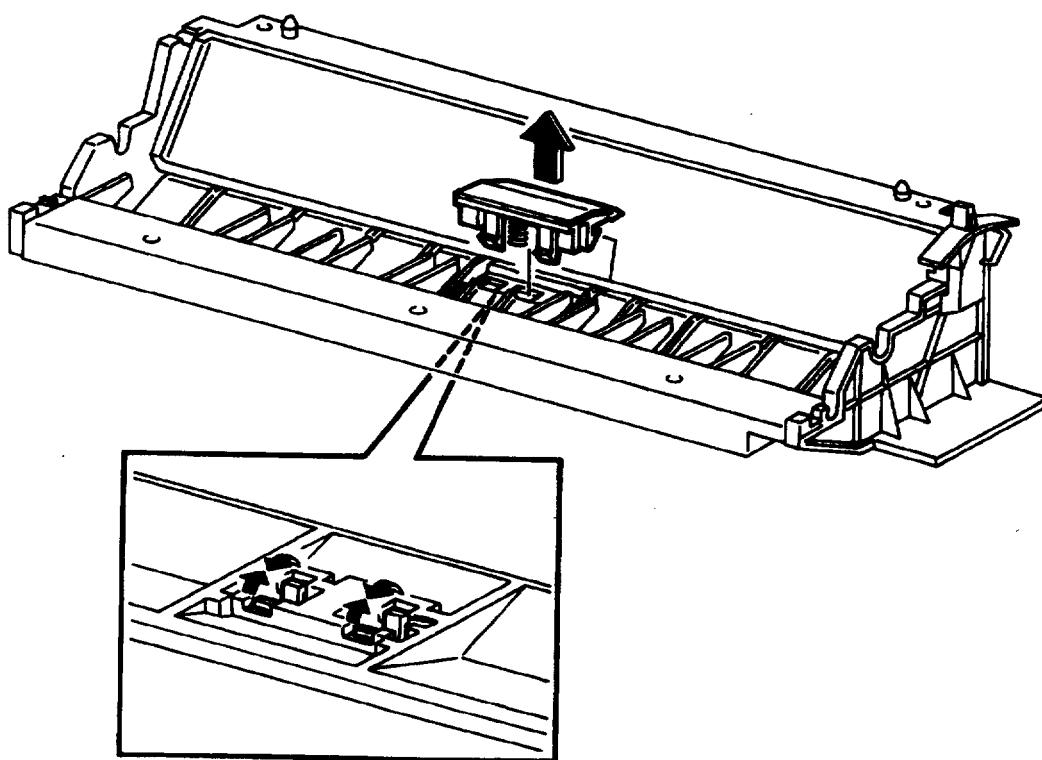
The Roll snaps into place.

5. Make sure the Paper Feed Roll is properly seated in the Frame.
6. Reinstall the Paper Feeder Spring.
7. Reinstall the Paper Feeder.

## Paper Feeder Retard Pad

### Removal

1. Remove the Paper Feeder.
2. Remove the Paper Feeder Spring.
3. Remove the Paper Feed Roll.
4. Push the Paper Feeder Pressure Plate away from the Retard Pad.
5. Turn the Paper Feeder Frame upside down.
6. Use a screwdriver to press in on the small clips under the Retard Pad (Figure 4-15).



**Figure 4-15. Removing the Paper Feeder Retard Pad**

7. Detach and remove the Retard Pad from the Feeder Frame.  
Do not lose the Retard Pad Spring that is mounted under the Pad.



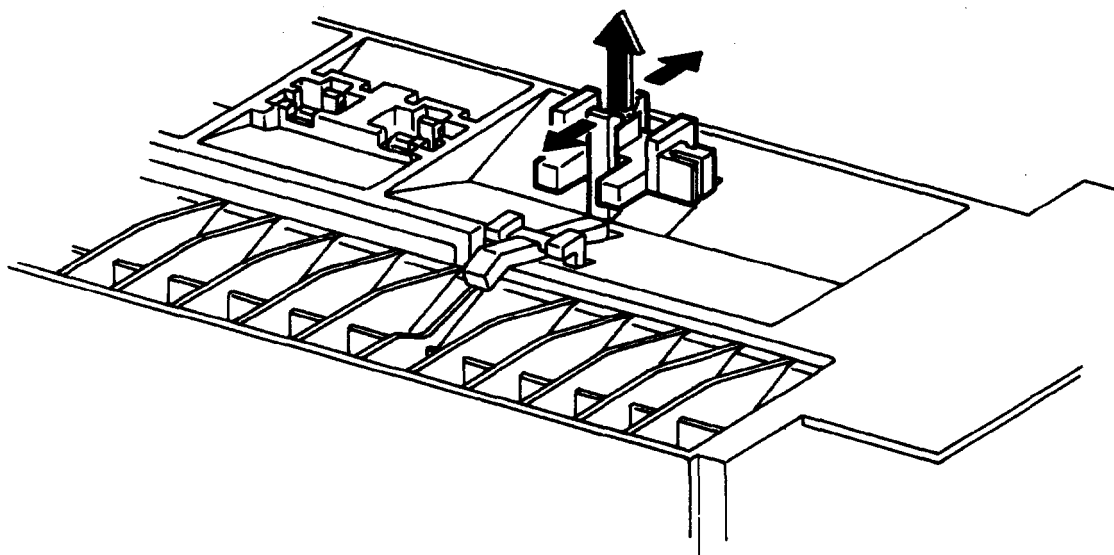
**Replacing the Paper Feeder Retard Pad**

1. Reinstall the Retard Pad Spring under the Retard Pad.
2. Push the Paper Feeder Pressure Plate away from the Retard Pad.
3. Position the Retard Pad so the silver side of the Pad faces the rear of Paper Feeder Frame.
4. Reinstall the Retard Pad on the Paper Feeder Frame.
5. Press down on the Retard Pad. It will snap into place.
6. Reinstall the Paper Feed Roll.
7. Reinstall the Paper Feeder Spring.
8. Reinstall the Paper Feeder.

## Registration Sensor

### Removal

1. Remove the Paper Feeder.
2. Turn the Paper Feeder upside down.
3. Use a screwdriver to spread apart the retaining clips securing the Registration Sensor to the Paper Feeder Frame (Figure 4-16).
4. Remove the Registration Sensor.



**Figure 4-16. Removing the Registration Sensor**

### Replacement

1. Reinstall the Registration Sensor.

Make sure you position the Sensor so the P/J connector is facing away from the Retard Pad, and the Registration Sensor Actuator fits between the two fingers on the Sensor.

2. Press the sensor into the place between the two retaining clips.

The sensor snaps into place.

3. Replace the Paper Feeder.

## Fuser

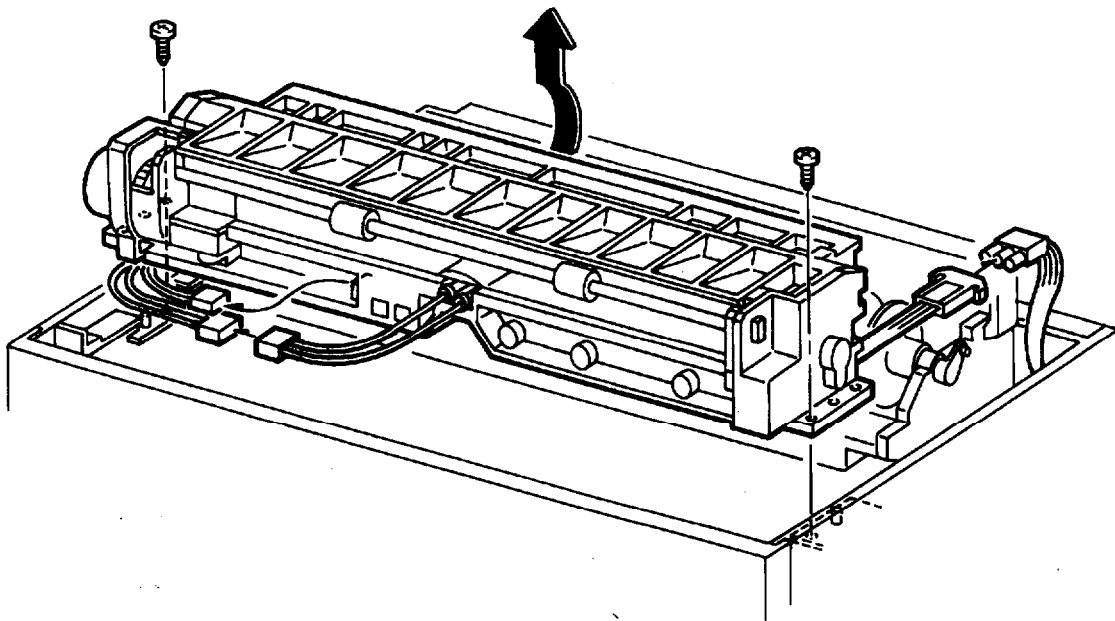
**WARNING:**



**The Fuser may be hot. Wait for the fuser to cool before removing it.**

### Removal

1. Remove the Top Cover.
2. Disconnect P/J114 located at the right side of the Fuser Assembly.
3. Disconnect the Exit Sensor P/J132 at the center of the Fuser Assembly (Figure 4-17).



**Figure 4-17. Removing the Fuser**

4. Disconnect the Thermistor P/J131 located above P/J132.
5. Remove the 2 screws securing the Fuser Assembly.
6. Tilt the back of the Fuser toward you to disengage it from the Drive Motor gears.
7. Lift the Fuser out of the printer.

## Replacing the Fuser

1. Position the Fuser above the Print Cartridge.

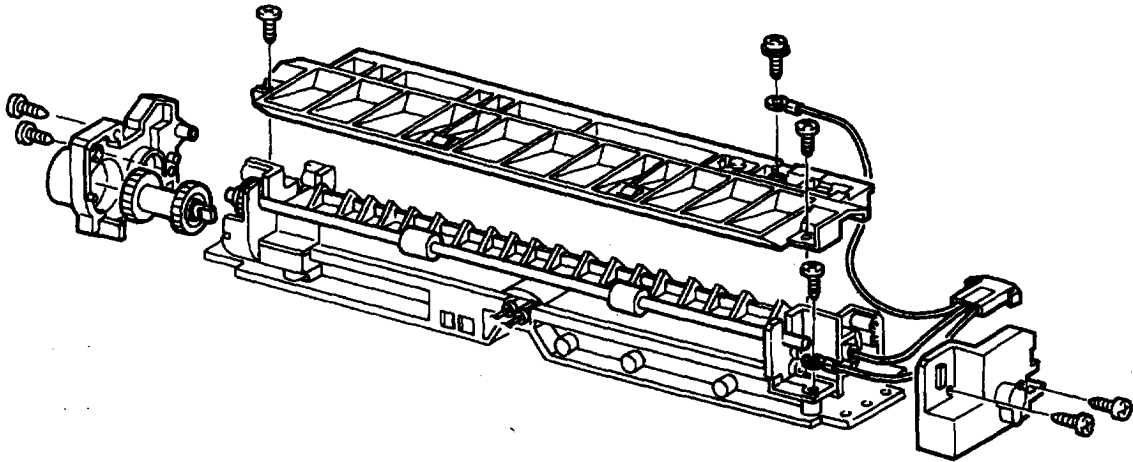
The gears at one end of the Fuser should face the Main Motor Drive Gears.

2. Tilt the back of the Fuser toward you and insert the lip located on the left side of the Fuser under the cutout in the Frame.
3. Reposition the Fuser until the locating boss on the Frame and the locating hole in the Fuser line up.
4. Use 2 screws to secure the Fuser.
5. Reconnect P/J131, P/J132, and P/J114.
6. Reinstall the Top Cover.

## Heat Rod

### Removal

1. Remove the Fuser.
2. Remove the 2 screws securing the Right End Cap, and remove the Cap.
3. Remove the 2 screws securing the Left End Cap, and remove the Cap.
4. Remove the 2 screws securing the Fuser Cover, and remove the Cover (Figure 4-18).



**Figure 4-18. Removing the Heat Rod**

5. Remove the screw securing the green wire coming from P/J114 to the Fuser Cover, and remove the wire.
6. Remove the 2 screws securing the Exit Chute, and remove the Exit Chute.
7. Remove the 2 screws and washers securing the two white wires coming from P/J114 to the Fuser, and remove both wires.
8. Carefully slide the Heat Rod out of the Heat Roll.

## Replacing the Heat Rod

1. Carefully slide the Heat Rod into the Heat Roll.

Install the Heat Rod so P/J114 is located on the right side.

**CAUTION:** *Do not touch the surface of the Heat Rod. Oil from your fingers may damage it.*



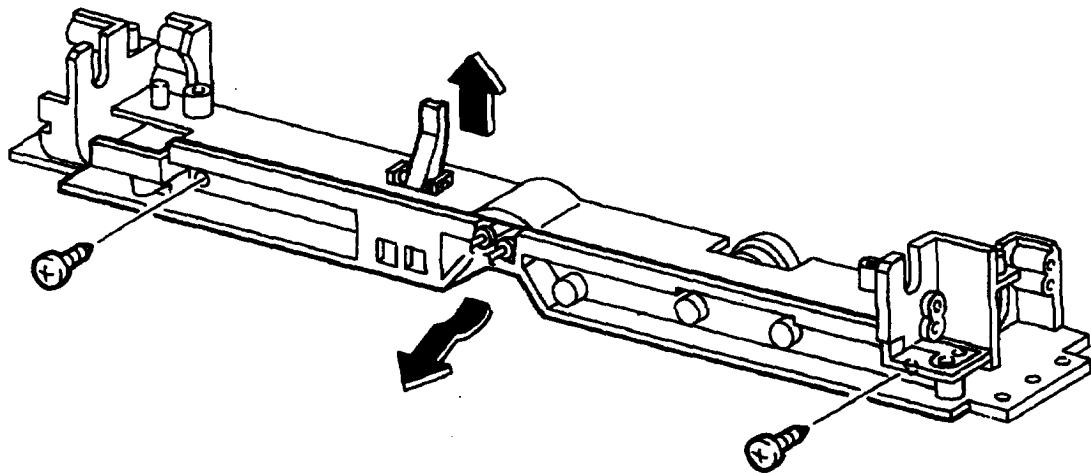
2. Route and secure the 2 white wires coming from P/J114 to the Fuser Assembly.
3. Reinstall and secure the Exit Chute.
4. Reinstall and secure the Fuser Cover.
5. Reinstall and secure the Left and Right Fuser Caps.
6. Reinstall and secure the Fuser.

## Fuser Sensor Assembly

### Removal

1. Remove the Fuser.
2. Remove the 2 screws securing the Right End Cap, and remove the Cap.
3. Remove the 2 screws securing the Left End Cap, and remove the Cap.
4. Remove the 2 screws securing the Fuser Cover, and remove the Cover.
5. Remove the 2 screws securing the Exit Chute, and remove the Exit Chute.
6. Remove the 2 screws and washers securing, the 2 white wires coming from P/J114 to the Fuser, and remove both wires.
7. Remove the 2 screws securing the Fuser Sensory Assembly, and remove the Assembly (Figure 4-19).

**CAUTION:** *The thermistor, located on the Fuser Sensor Assembly, is very fragile.*



**Figure 4-19. Removing the Fuser Sensor Assembly**

## **Replacing the Fuser Sensor Assembly**

1. Reinstall and secure the Fuser Sensor Assembly.
2. Reinstall and secure the 2 white wires coming from P/J114 to the copper strips on the Fuser Assembly.
3. Reinstall and secure the Exit Chute.
4. Reinstall and secure the Fuser Cover.
5. Reinstall and secure the Right and Left End Caps.
6. Reinstall and secure the Fuser.



## Fuser Thermistor

### Removal

1. Remove the Top Cover.
2. Remove the Fuser.
3. Remove the Fuser Sensor Assembly.
4. Remove the screw securing the Thermistor (Figure 4-20).
5. Remove the Thermistor.

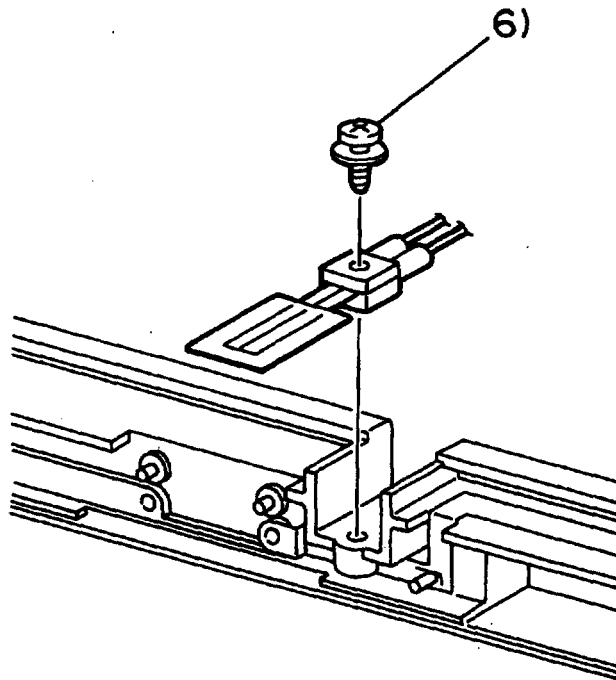


Figure 4-20. Removing the Fuser Thermistor

### Replacement

1. Reinstall and secure the Thermistor on the Fuser Sensor Assembly.
2. Reinstall the Fuser Sensor Assembly.
3. Reinstall the Fuser.
4. Reinstall the Top Cover

## Overheat Thermostat

### Removal

1. Remove the Top Cover.
2. Remove the Fuser.
3. Remove the Fuser Sensor Assembly.
4. Remove the 2 screws securing the Overheat Thermostat (Figure 4-21).
5. Remove the thermostat.

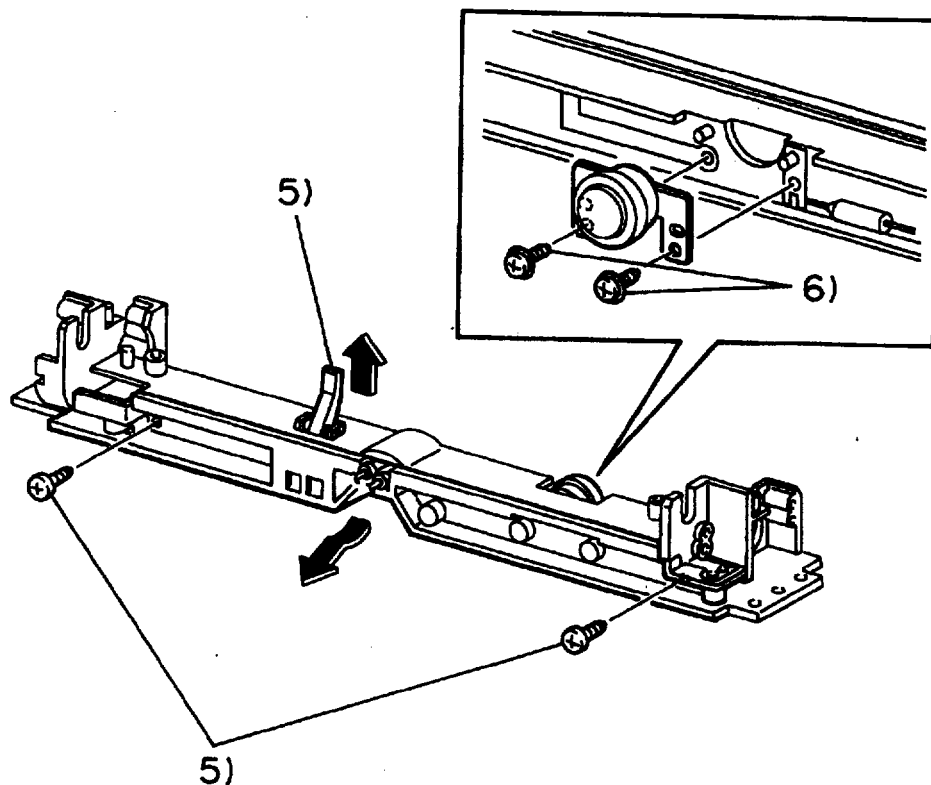


Figure 4-21. Removing the Overheat Thermostat

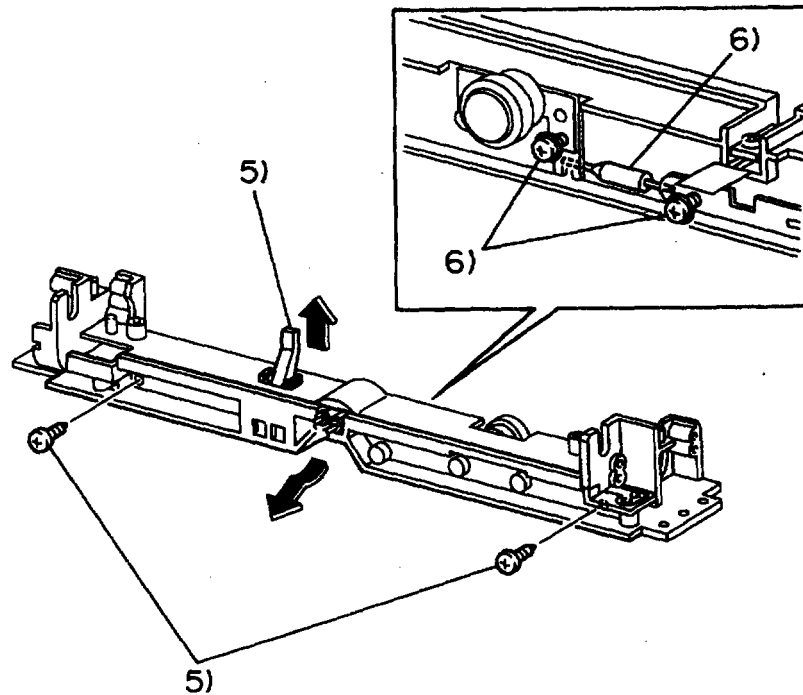
### Replacement

1. Reinstall and secure the thermostat.
2. Reinstall the Fuser Sensor Assembly.
3. Reinstall the Fuser.
4. Reinstall the Top Cover.

## Thermal Fuse

### Removal

1. Remove the Top Cover.
2. Remove the Fuser.
3. Remove the Fuser Sensor Assembly.
4. Remove the 2 screws securing the Thermal Fuse (Figure 4-22).
5. Remove the fuse.
6. Note the orientation of the fuse for reinstallation.



**Figure 4-22. Removing the Thermal Fuse**

### Replacement

1. Reinstall and secure the fuse.
2. Reinstall the Fuser Sensor Assembly.
3. Reinstall the Fuser.
4. Reinstall the Top Cover.

## Heat Roll

### Removal

1. Remove the Top Cover.
2. Remove the Fuser.
3. Remove the Fuser Upper Cover.
4. Remove the Heat Rod.
5. Remove the Heat Roll Drive Gear (Figure 4-23).
6. Remove the right side Heat Roll Bushing.
7. Slide the Heat Roll out of the Fuser Frame.
8. Remove the left side Heat Roll Bushing.

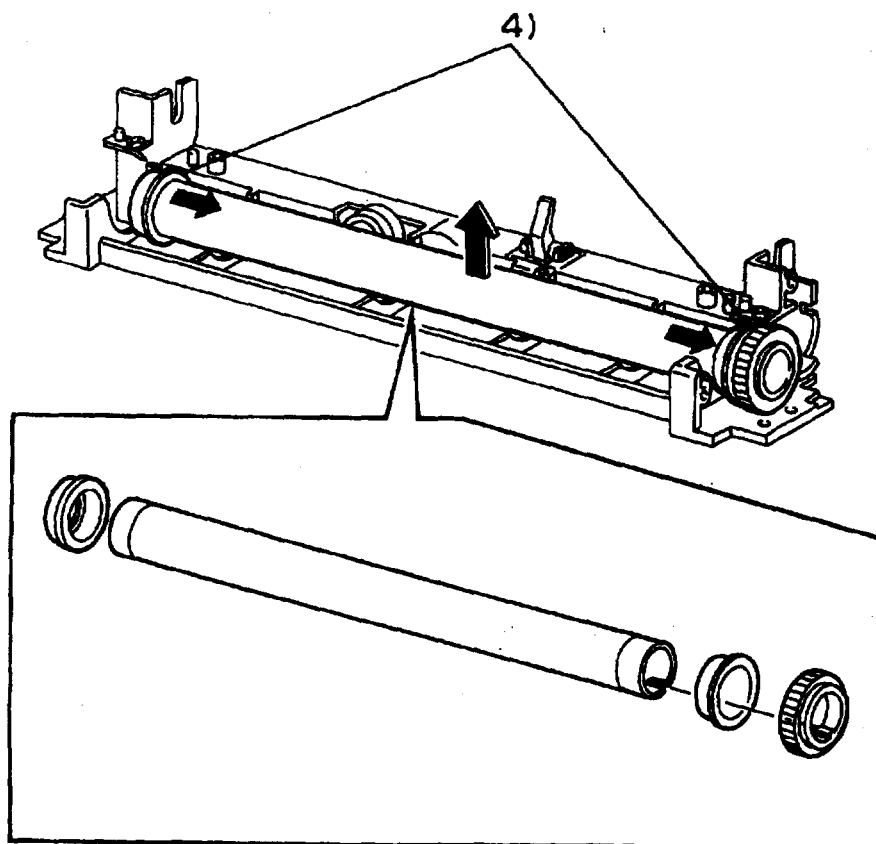


Figure 4-23. Removing the Heat Roll

## Replacing the Heat Roll

1. Slide the Heat Roll into the Fuser Frame and replace the left side Heat Roll bushing.
2. Replace the right side Heat Roll Bushing.
3. Reinstall the Heat Roll Drive Gear.
4. Reinstall the Heat Rod.
5. Reinstall the Fuser Upper Cover.
6. Reinstall the Fuser.
7. **Reinstall the Top Cover.**

## Fuser Exit and Sensing Harness

### Removal

1. Remove the Top Cover.
2. Disconnect P/J131 and P/J132 from the Fuser.
3. Remove the Back Cover.
4. Slide the Electrical Chassis halfway out.
5. Disconnect P/J13 from the Main Controller PWBA.
6. Remove the Harness.

### Replacement

1. **Reconnect P/J131 and P/J132 on the Fuser.**
2. **Route the Harness through the channel along the side of the Printer Body, and through the access hole to the Main Controller PWBA.**
3. **Reconnect P/J13 on the Main Controller PWBA.**
4. Reinstall and secure the Back Cover.
5. Reinstall and secure the Top Cover.

## Fuser Exit Sensor

### Removal

1. Remove the Top Cover.
2. Remove the Fuser Assembly.
3. Remove the Fuser Sensor Assembly.
4. Disconnect P/J132 on the Exit Sensor PWBA.
5. Press in on the retaining clips holding the Exit Sensor to the Fuser Sensor Assembly (Figure 4-24).
6. Remove the Exit Sensor.

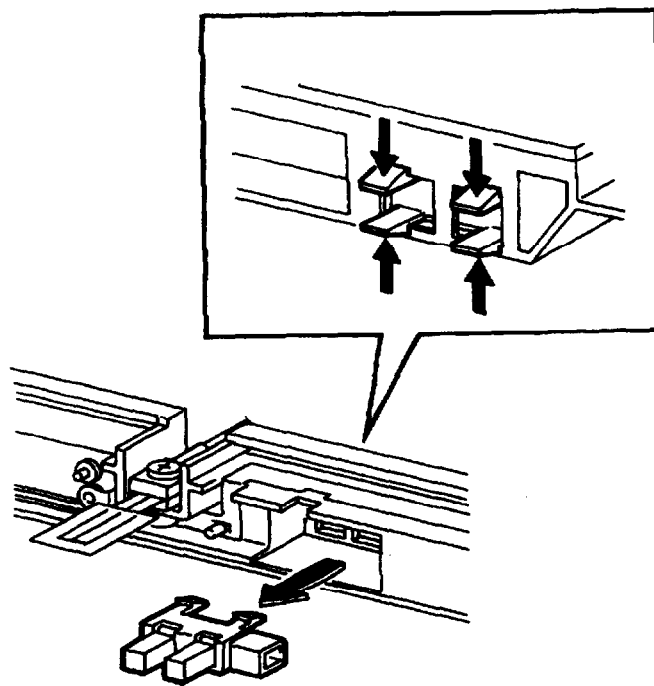


Figure 4-24. Removing the Fuser Exit Sensor

### Replacement

1. Position the Exit Sensor in the hole in the Fuser Sensor Assembly (Figure 4-24).
2. Press the Exit Sensor into the hole. It snaps into place.
3. Reconnect P/J132.
4. Reinstall the Fuser Sensor Assembly.
5. Reinstall the Fuser Assembly.
6. Reinstall the Top Cover.

## Upper Fuser Assembly

The Upper Fuser Assembly consists of the Fuser Cover, the Fuser Inlet Chute, the Pressure Roll, and associated hardware.

### Removal

1. Remove the Top Cover.
2. Remove the Fuser Assembly.
3. Remove the screw securing the green ground wire going to the diodes on the Fuser Inlet Chute, and remove the wire (Figure 4-25).
4. Remove the 2 screws securing the Fuser Cover to the Fuser Inlet Chute, and remove the Fuser Cover.
5. Remove the Pressure Roll.

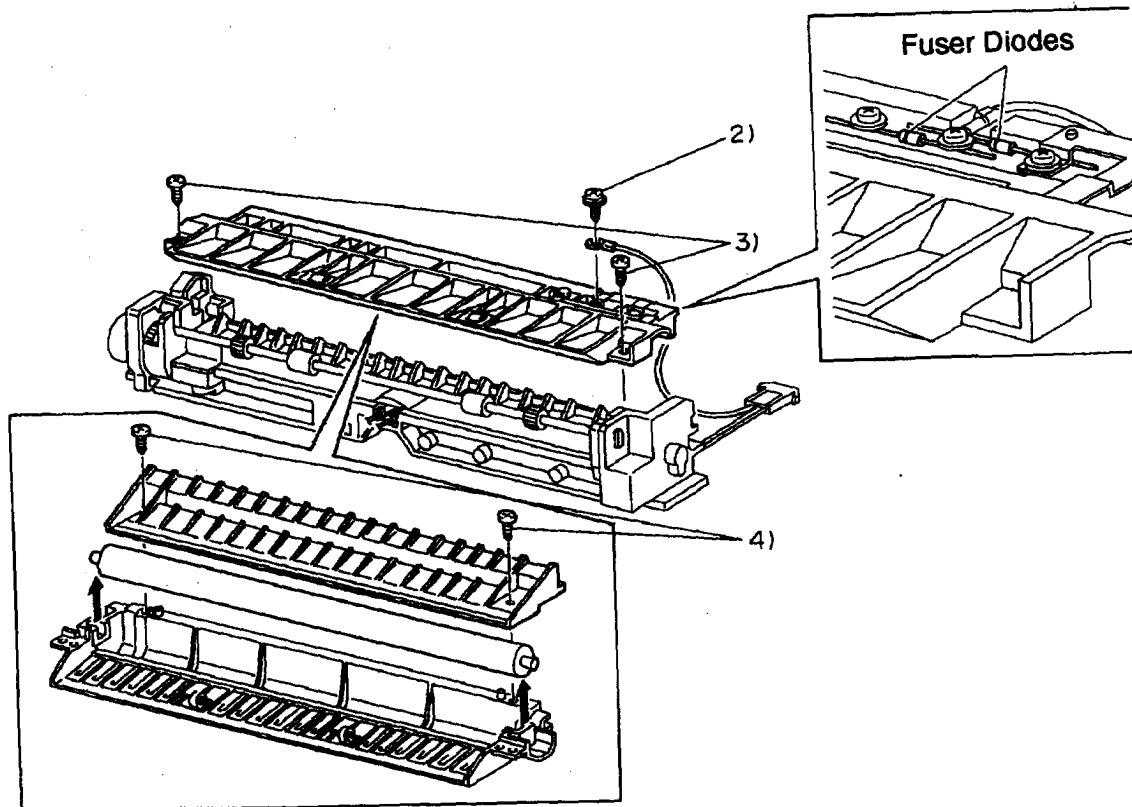


Figure 4-25. Removing the Upper Fuser Assembly



### Replacing the Upper Fuser Assembly

1. Reinstall the Pressure Roll into the channel in the Fuser Inlet Chute.
2. Reinstall and secure the Fuser Cover on top of the Fuser Inlet Chute.
3. Reinstall and secure the green ground wire to the Inlet Chute diodes.
4. Reinstall and secure the Fuser Assembly.
5. Reinstall and secure the Top Cover.

## Main Drive Assembly

### Removal

1. Remove the Top Cover, Front Cover, and Rear Cover.
2. Remove the Print Cartridge.
3. Remove the Paper Feeder.
4. Remove the Fuser.
5. Remove the 3 screws securing the Electrical Chassis, and slide the Chassis halfway out.
6. Disconnect P/J14 (Drive Motor) on the Main Controller PWBA.
7. Remove the 3 screws securing the Main Drive Assembly (Figure 4-26).
8. Lift the Main Drive Assembly out of the Printer Body.

**CAUTION:**

*When removing or replacing the Main Drive Assembly, be careful not to scratch the Laser Scanner Window or bend the High Voltage Spring Contacts located at the bottom of the Assembly.*

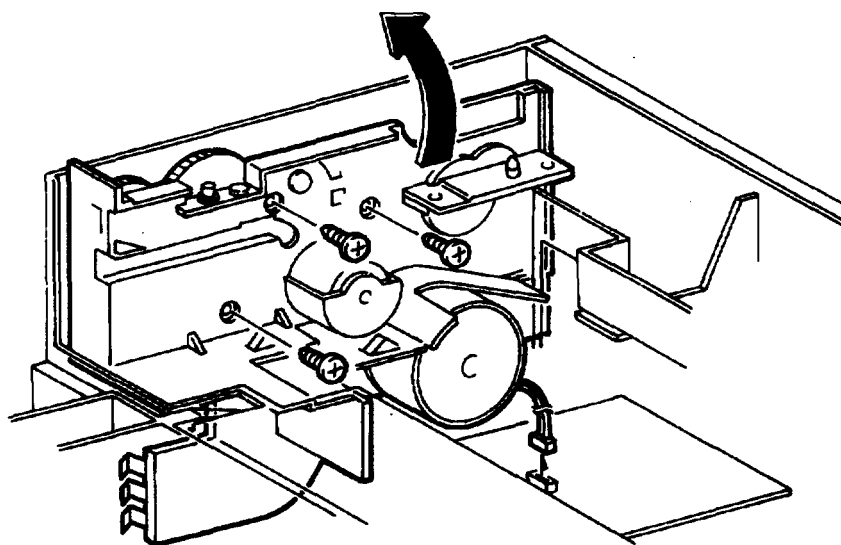


Figure 4-26. Removing the Main Drive Assembly

### Replacing the Main Drive Assembly

1. Reinstall and secure the Main Drive Assembly into the Printer Body.
2. Reconnect P/J14 on the Main Controller PWBA.
3. Reinstall and secure the Electrical Chassis.
4. Reinstall and secure the Fuser.
5. Reinstall and secure the Paper Feeder.
6. Reinstall the Print Cartridge.
7. Reinstall and secure the Top Cover, Front Cover, and Rear Cover.

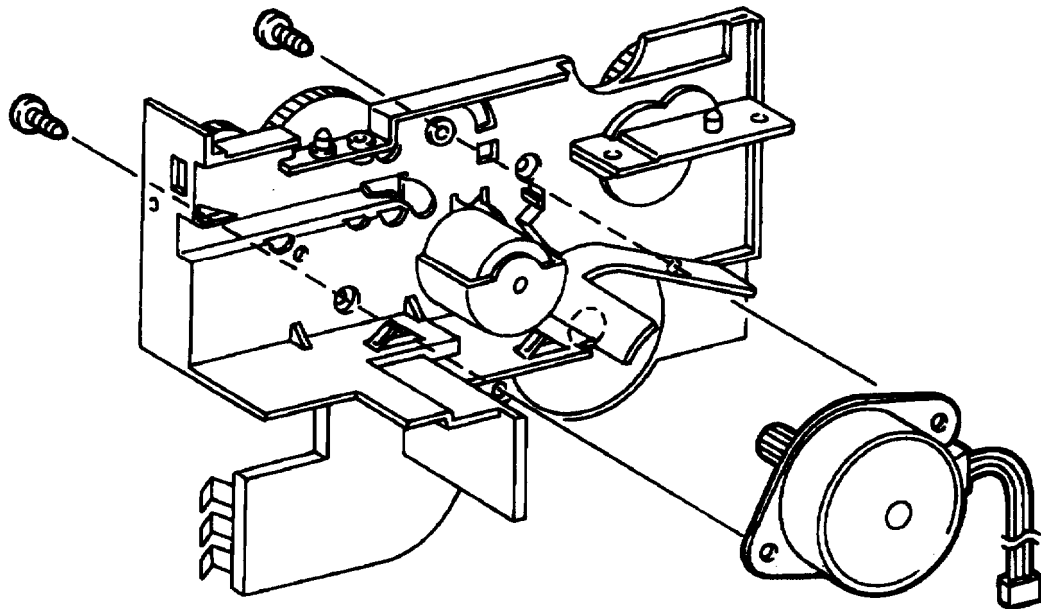
## Main Drive Motor

### Removal

1. Remove the Top Cover, Front Cover, and Rear Cover.
2. Remove the Print Cartridge.
3. Remove the Paper Feeder.
4. Remove the Fuser.
5. Remove the Main Drive Assembly.

**CAUTION:** **A** When removing or replacing the Main Drive Assembly, be careful not to scratch the Laser Scanner Window or bend the High Voltage Spring Contacts located at the bottom of the Assembly.

6. Remove the 2 screws securing the Main Drive Motor to the Main Drive Assembly, and remove the Motor (Figure 4-27).



**Figure 4-27.** Removing the Main Drive Motor

## **Replacing the Main Drive Motor**

1. Reinstall the Main Drive Motor onto the Main Drive Motor Assembly, and secure it with 2 screws.
2. Reinstall and secure the Main Drive Assembly.
3. Reinstall and secure the Electrical Chassis.
4. Reinstall and secure the Fuser.
5. Reinstall and secure the Paper Feeder.
6. Reinstall the Print Cartridge.
7. Reinstall and secure the Top Cover, Front Cover, and Rear Cover.

## Laser Scanner

### Removal

1. Remove the Bottom Cover.
2. Disconnect P/J121 on the Laser Diode PWBA (Figure 4-28).
3. Disconnect P/J122 on the Laser Scanner Motor PWBA.
4. Disconnect P/J123 on the Start of Scan PWBA.
5. Remove the 3 screws securing the Laser Scanner to the Printer Body, and remove the Scanner.

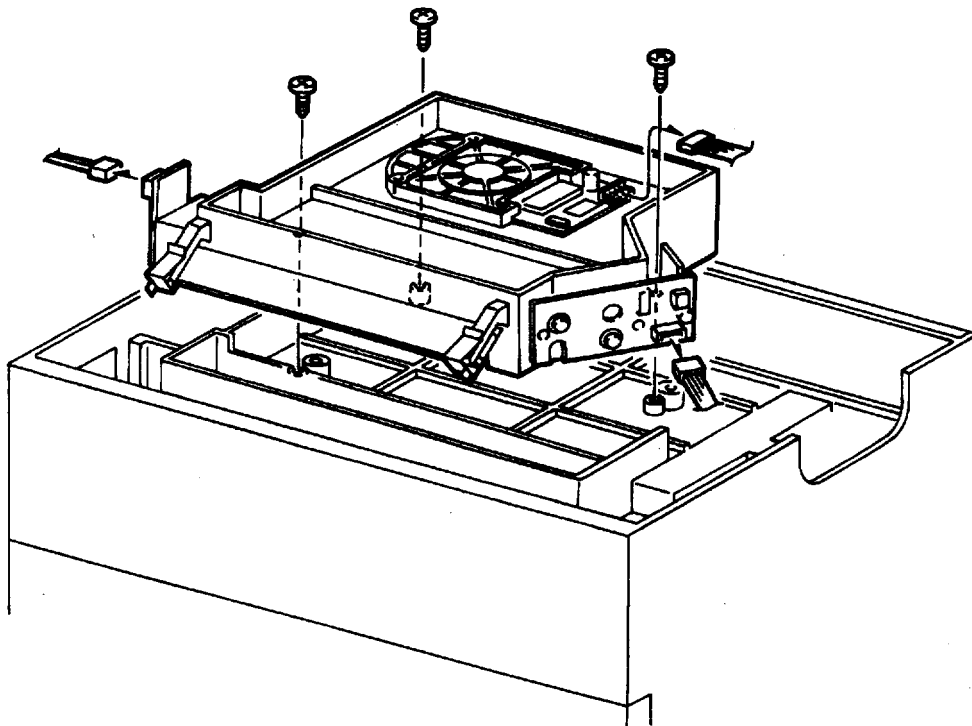


Figure 4-28. Removing the Laser Scanner

## Replacing the Laser Scanner

1. Position the Laser Scanner Assembly with the motor facing out, and the SOS PWBA facing the Exhaust Fan.
2. Reinstall the Laser Scanner and secure it with 3 screws.

**CAUTION:**



***Do not trap any of the wire harnesses between the Laser Scanner and the Printer Body.***

3. Reconnect P/J123 on the Start of Scan PWBA.
4. Reconnect P/J122 on the Motor PWBA.
5. Reconnect P/J121 on the Laser Diode PWBA.
6. Reinstall and secure the Bottom Cover.

## Laser Scanner Window

### Removal

1. Remove the Top Cover.
2. Remove the Fuser.
3. Remove the Paper Feeder.
4. Peel up the black Laser Scanner Window tape that secures the Scanner Window to the Printer Body.
5. Take a sharp knife and cut around the edge of the Window to remove any residue glue from the tape.
6. Remove the Window.

### Replacement

1. Reinstall the Window in the recessed area on the Printer Body.

**CAUTION:**



***Handle the Window by the edges. Do not get fingerprints on the Window surface.***

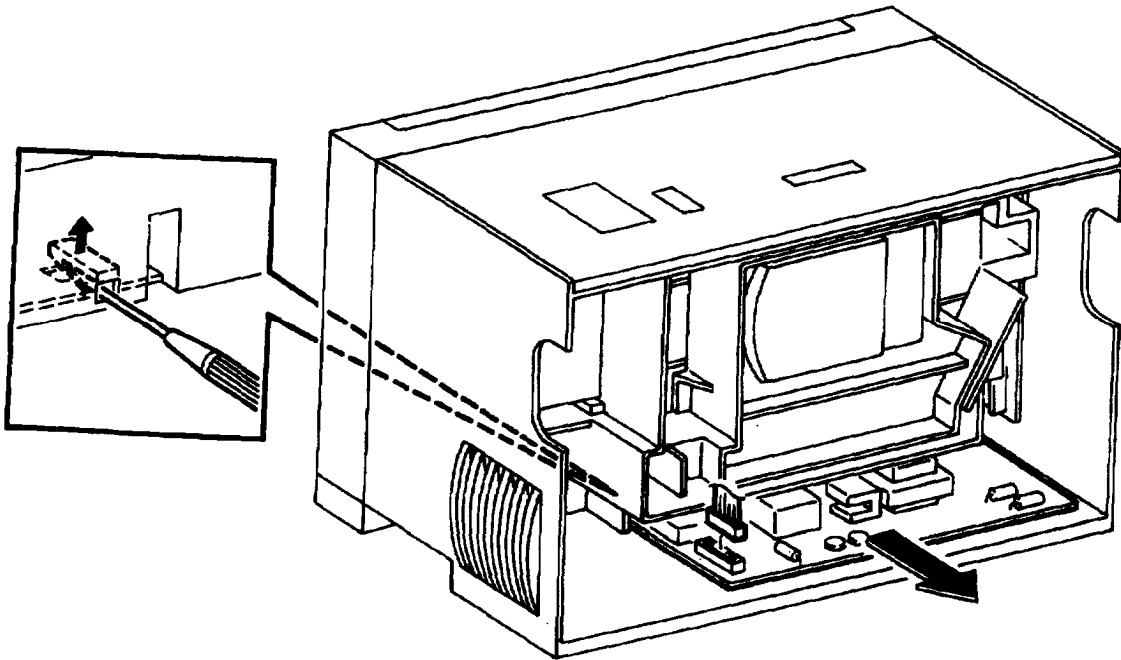
2. Use a new piece of Laser Scanner Window tape to secure the Window to the Body.
3. Reinstall the Paper Feeder.
4. Reinstall the Fuser.
5. Reinstall the Top Cover.



## High Voltage Power Supply

### Removal

1. Remove the Bottom Cover.
2. Disconnect P/J151 on the HVPS.
3. Use a small screwdriver to pry loose the locking tabs securing the HVPS to the Printer Body, and remove the HVPS (Figure 4-29).



**Figure 4-29. Removing the High Voltage Power Supply**

### Replacement

1. Slide the HVPS into the channels located at the bottom of the Printer Body.  
The HVPS snaps into place.
2. Reconnect P/J151 on the HVPS.
3. Reinstall and secure the Bottom Cover.

## Print Cartridge Sensor and Actuator

### Removal

1. Remove the Bottom Cover.
2. Disconnect P/J171 on the Print Cartridge Sensor PWBA (Figure 4-30).
3. Remove the 2 screws securing the sensor to the Printer Body, and remove the sensor.
4. Remove the two screws securing the Sensor Actuator Cap, and remove the Cap.
5. Remove the Actuator.

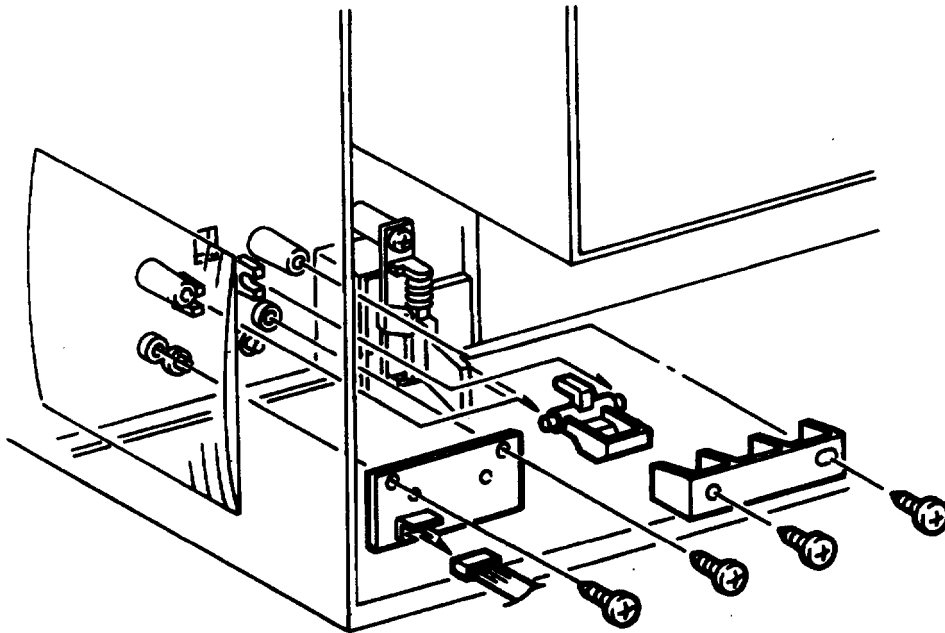


Figure 4-30. Removing the Print Cartridge Sensor

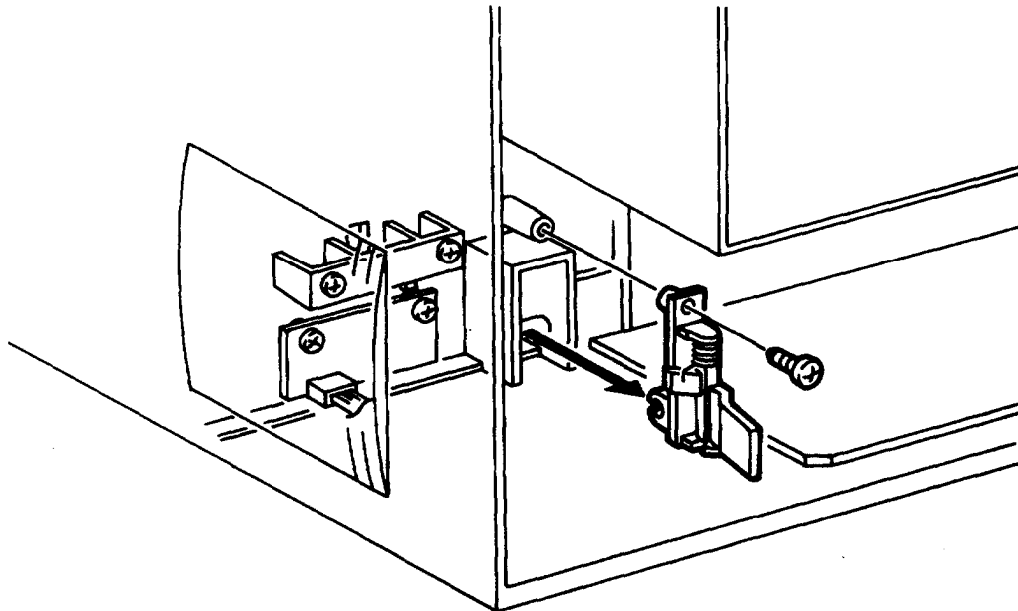
### Replacement

1. Reinstall the Actuator in the notch in the Printer Body.
2. Reinstall the Actuator Cap over the Actuator, and secure it with two screws.
3. Reinstall the Sensor PWBA with the thermistor facing the Sensor Actuator.
4. Use 2 screws to secure the PWBA.
5. Reconnect P/J171 on the sensor.
6. Reinstall and secure the Bottom Cover.

## Front Cover Interlock Actuator

### Removal

1. Remove the Bottom Cover.
2. Remove the screw securing the Actuator to the Printer Body, and remove the Actuator (Figure 4-31).



**Figure 4-31. Removing the Front Cover Interlock Actuator**

### Replacement

1. Reinstall the Actuator by pressing the clip on the Actuator onto the shaft on the Printer Body.
2. Use one screw to secure the Actuator.
3. Press the Actuator to make sure it presses against the Front Cover Interlock switch on the HVPS.
4. Reinstall and secure the Bottom Cover.

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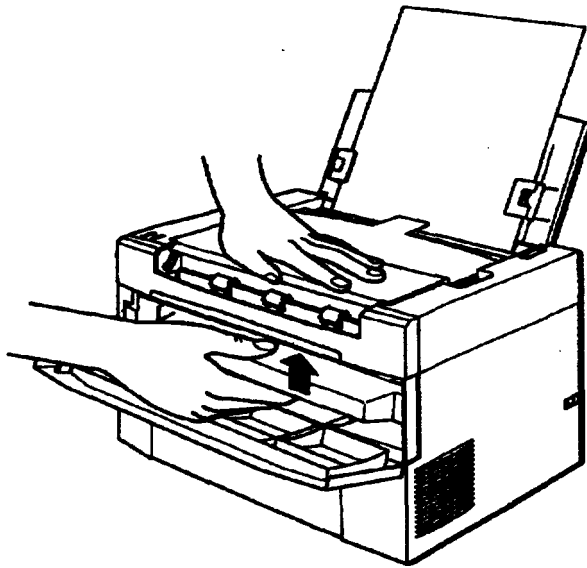
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This chapter describes basic maintenance procedures, including replacing the toner cartridge, clearing paper jams, cleaning, increasing printer memory, and testing printer accuracy.

### Replacing the Toner Cartridge

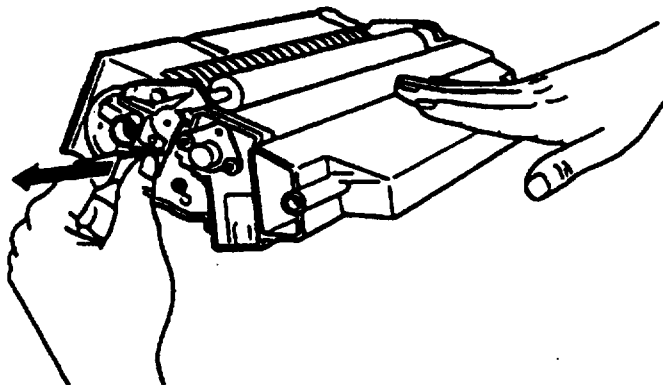
1. Turn off the printer if it is on and disconnect the power cord.
2. Remove paper from the paper tray and remove all printed pages from the exit tray.
3. Close the paper and exit trays.
4. Open the front cover.
5. Rest one hand on top of the printer. With the other hand, grasp the toner cartridge by the molded center grip and pull upward until the cartridge unlocks and releases (Figure 5-1).



**Figure 5-1. Removing the Toner Cartridge**

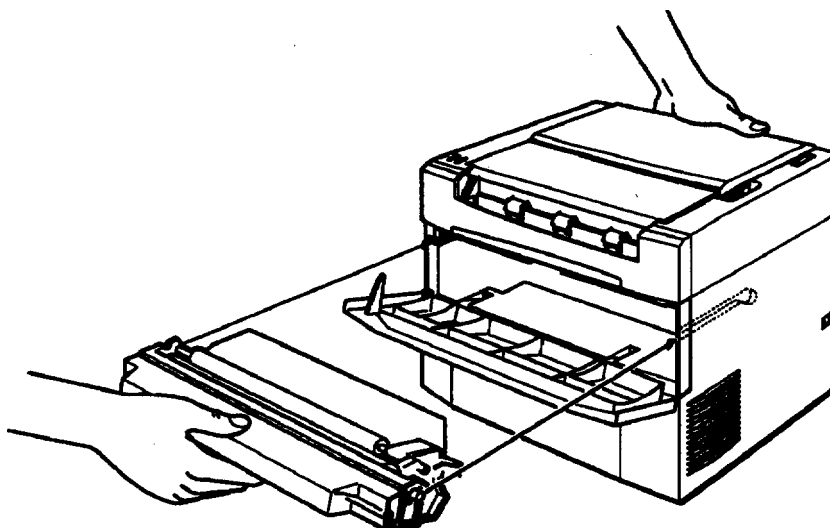
6. Tilt the front of the cartridge downward slightly until it is level and then slide it out of the printer. The cartridge will not slide smoothly unless it is level.
7. Discard the cartridge with nonburnable items.
8. Remove the new toner cartridge from its aluminum bag. Gently shake the toner cartridge back and forth a few times to distribute the toner evenly.

9. While holding the cartridge steady with one hand, firmly grip the tab on the left side of the cartridge. Pull the clear seal all the way out with firm, even pressure as shown. Do not pull up on the seal (Figure 5-2).



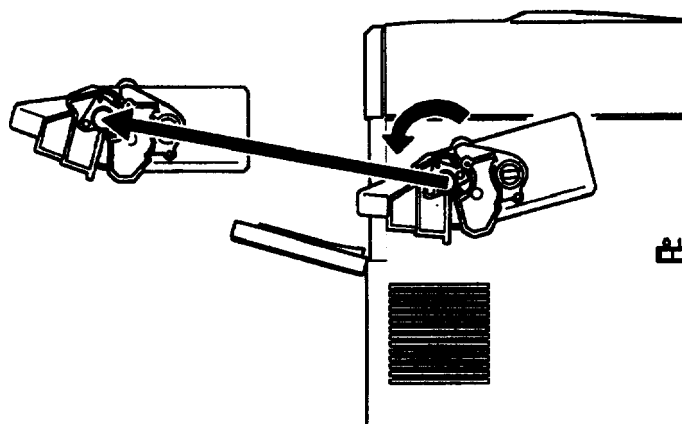
**Figure 5-2. Removing the Cartridge Seal**

10. With one hand, hold the toner cartridge in the middle. Place the other hand on the rear of the printer to hold it steady while you insert the cartridge (Figure 5-3).



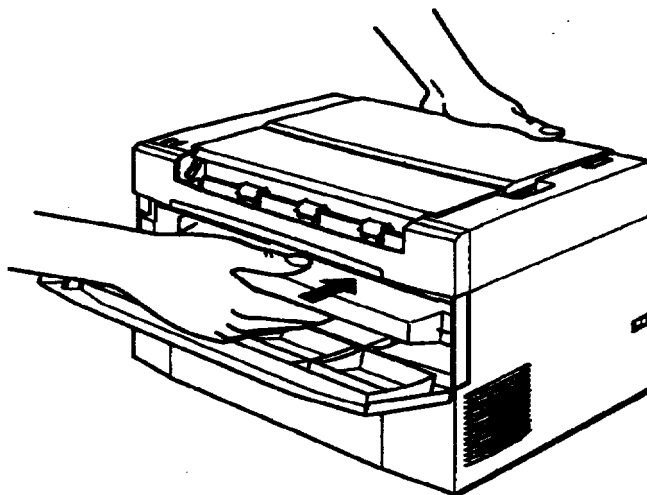
**Figure 5-3. Inserting the Cartridge**

11. Insert the cartridge into the opening at the front of the printer. Position the locking knobs on both sides of the cartridge into the guides inside the printer (Figure 5-4).



**Figure 5-4. Positioning the Locking Knobs**

12. Slide the cartridge into the printer until it stops. Then push the cartridge firmly until it locks in place (Figure 5-5).



**Figure 5-5. Completing the Toner Cartridge Installation**

13. Close the front cover and press the top corners to lock it into position.



## Clearing Feed Jams

If the printer stops printing and the Error light is on while the Ready light is off, follow these steps.

1. Unlock the paper release lever by pulling it toward the front of the printer.
2. Remove paper from the paper tray.
3. Remove any sheets that have misfed from the paper tray into the paper feeder area.
4. Tap the edges of the paper stack on a flat surface and carefully reload paper into the paper tray.
5. Push the paper release lever toward the back of the printer.

## Clearing Paper Jams

If the printer stops printing and the Error light is flashing while the **Ready** light is off, follow these steps:

1. Unlock the paper release lever by pulling it toward the front of the printer.
2. Remove paper from the paper tray and remove all printed pages from the exit tray.
3. Close the exit tray.
4. Open the front cover.

**WARNING:**

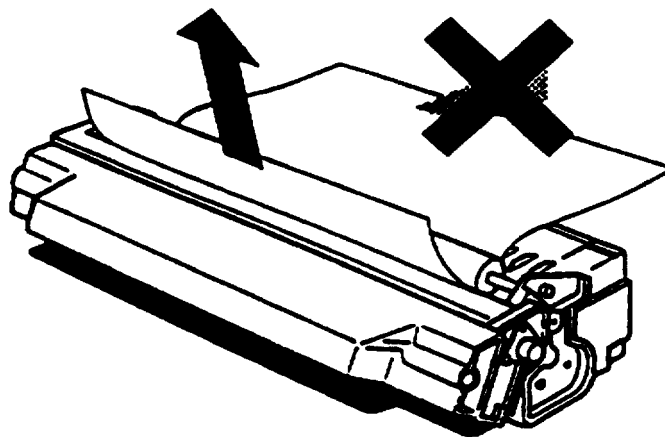


**The fuser area located in the upper area of the printer is very hot. Be careful not to touch any part of the fuser when removing jam paper.**

5. Rest one hand on top of the printer. With your other hand, grasp the toner cartridge by its molded center grip.
6. Tilt the front of the toner cartridge downward slightly **until it is level; then slide it out of the printer.**

**NOTE:** *The toner cartridge **will not slide out smoothly unless it is in a level position.** Jammed paper may have caught **in the toner cartridge, making it difficult to remove the cartridge. Pull firmly to remove the paper along with the cartridge.***

7. If the paper comes out along with the toner cartridge, remove the paper from the cartridge by pulling it toward the front of the cartridge (Figure 5-6).



**Figure 5-6. Removing Jammed Paper**

**CAUTION:**



*Never pull jammed paper out of the toner cartridge in the reverse direction, toward the rear of the cartridge.*

8. If the jammed paper does not come out with the toner cartridge, look inside the printer. If the paper is still inside, draw it out from the front of the printer.
9. After removing the jammed paper, reinstall the toner cartridge and close the front cover.
10. Open the exit tray.
11. Tap the edges of the paper stack on a flat surface and carefully reload paper into the paper tray.
12. Push the paper release lever toward the back of the printer.

## Cleaning the Printer

The printer needs only minimal cleaning. Whenever you clean the printer or replace the components, print a test sheet by pressing the reset button at the back of the printer.

Fine particles of paper dust and ordinary dust can collect inside the printer. Use a soft, clean cloth to remove any dirt inside the printer. Do not use compressed air.

If toner spills inside the printer, do not use the printer until you remove all the spilled toner. If only a small amount of toner is present, carefully wipe out the inside of the printer with a clean, dry cloth. If a large amount of toner is present, use a small vacuum cleaner to remove it. Then carefully wipe with a clean, dry cloth.

If the printer's outer case is dirty or dusty, turn off the printer and clean it with a soft, clean cloth dampened with a mild detergent.

**CAUTION:**



*Never use alcohol or thinner to clean the printer's outer case; these chemicals can damage the components and case. Be careful **not to get** water on the printer mechanism or any electronic **components**.*

## Installing Memory

By installing a 1MB, 2MB, or 4MB SIMM, you can increase printer memory up to 5MB.

Be sure the SIMM meets the following requirements:

- ☐ 72-pin type
- ☐ Capacity of 1,2, or 4MB
- ☐ Access speed of 70ns or less

1. Remove the metal access cover located above the parallel connector.

**WARNING:**



**Avoid touching the electrical components that are exposed after you remove the metal access cover. They may be very hot if the printer has been used recently**

2. Mount the SIMM in the slot provided for it.
3. Replace the metal access cover.

After you install the SIMM, the printer driver's memory setting needs to be updated. In the Setup dialog box, change the memory setting for the amount of memory now installed in the printer. (Be sure to include the 1MB already installed.)

To verify that memory is correctly installed, print a test sheet by pressing the reset button at the back of the printer.

## Testing the Print Engine

You can print a grid pattern test print, like the one shown below, at the highest printer speed. The test print grid is made up of black lines that are one dot wide, spaced at 128 dot intervals, running horizontally and vertically across the page. There is a 4mm  $\pm$  1mm border of clear paper around the test grid (Figure 5-7).

The printer, not the print controller, generates the test print. If there is a print quality problem on a PCL or PostScript test print, but not on the print engine test print, the cause of the problem is likely to be something wrong with the controller or driver software.

You can generate a print engine test print by using an insulated screwdriver to short pins 1 and 2 of P/J31 on the Main Controller PWBA.

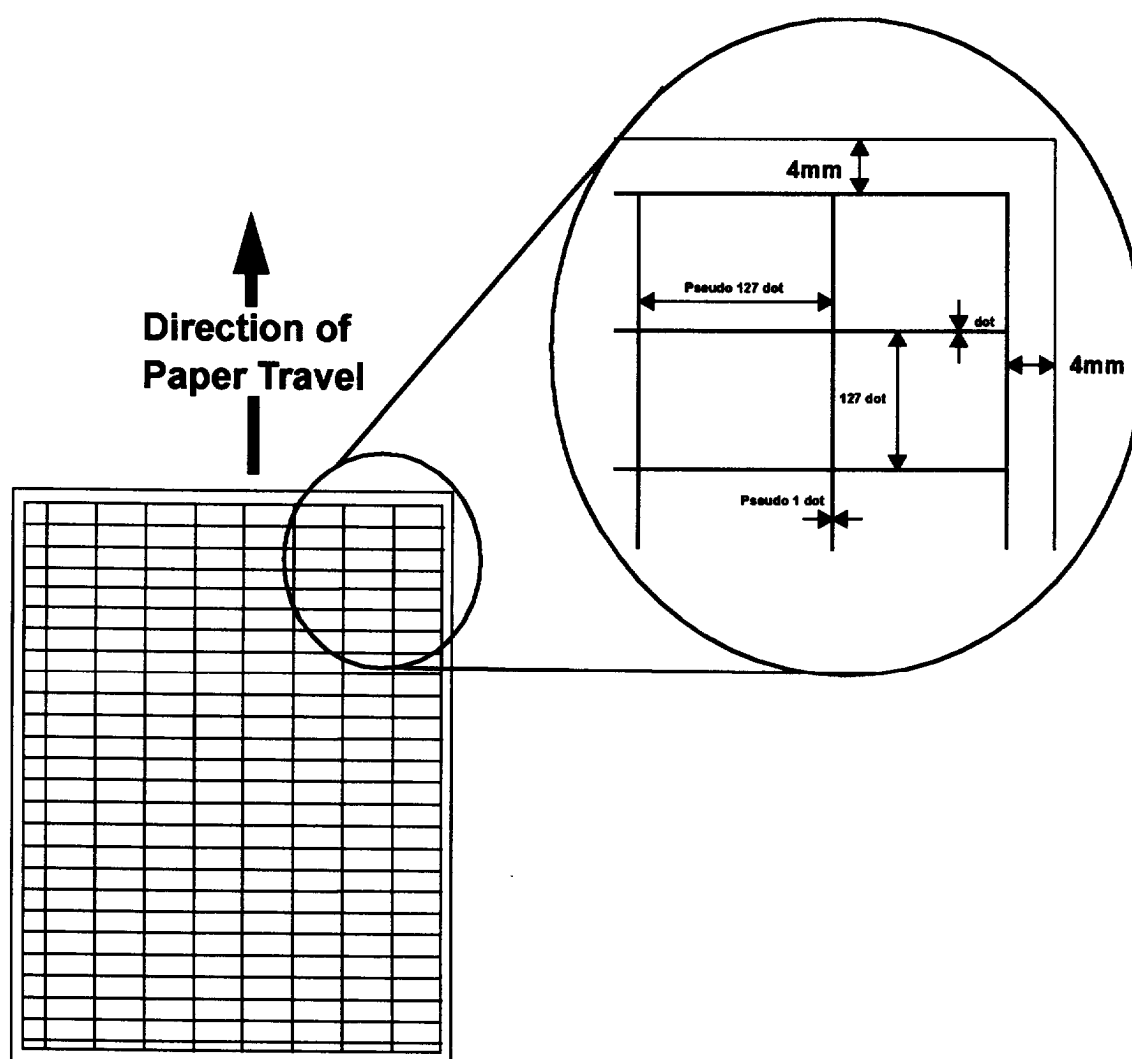


Figure 5-7. Print Engine Test Print

The following section shows five ways to check for image accuracy using test prints. Allow newly opened paper to stand for 12 hours before using it for these tests.

### Lead Edge Registration

$$(4.0 - 2.0 \text{ mm}) \leq A \leq (4.0 + 2.0 \text{ mm})$$

$$B=B$$

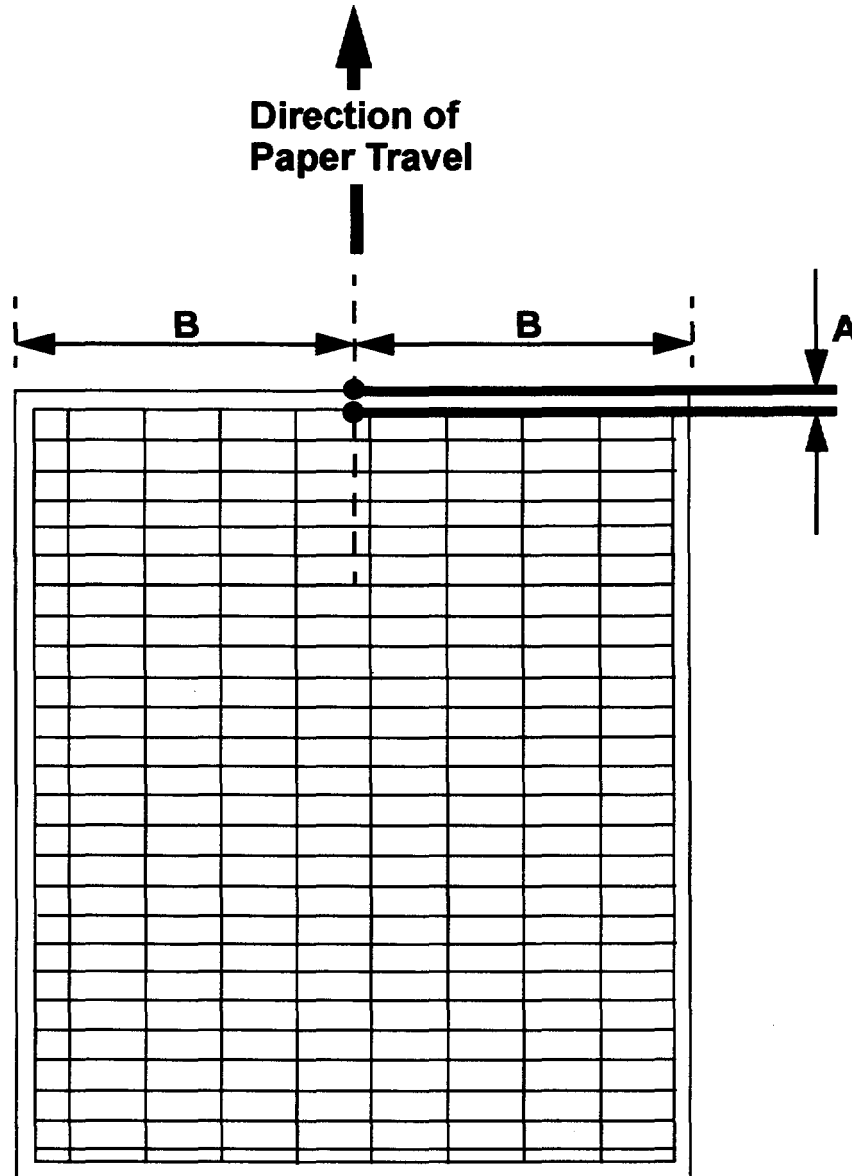


Figure 5-8. Lead Edge Registration Test Print

## Side Edge Registration

$$(4.0 - 2.5 \text{ mm}) \leq C \leq (4.0 + 2.5 \text{ mm})$$

$$D=D$$

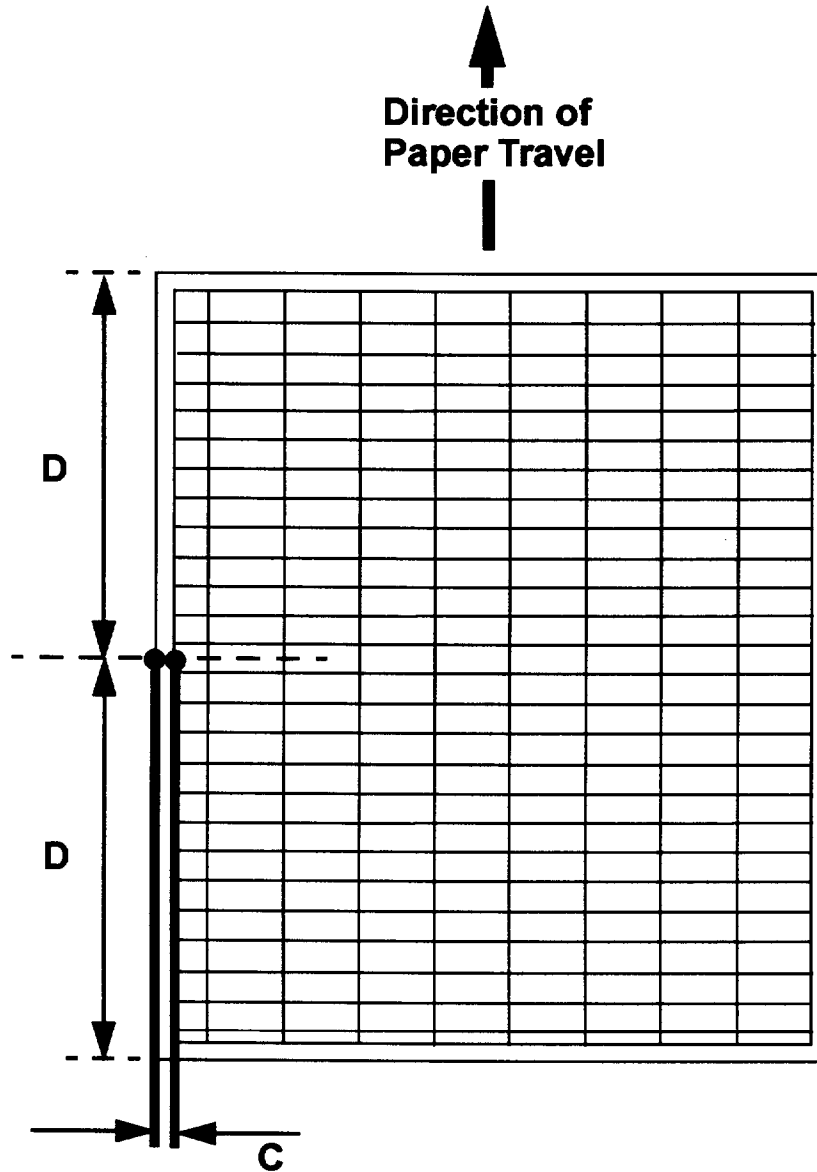


Figure 5-9. Side Edge Registration Test Print

## Skew

$$(-2.0 \text{ mm}) \leq E \leq (+2.0 \text{ mm})$$

$$E = F - G$$

$$H = 245 \text{ mm}$$

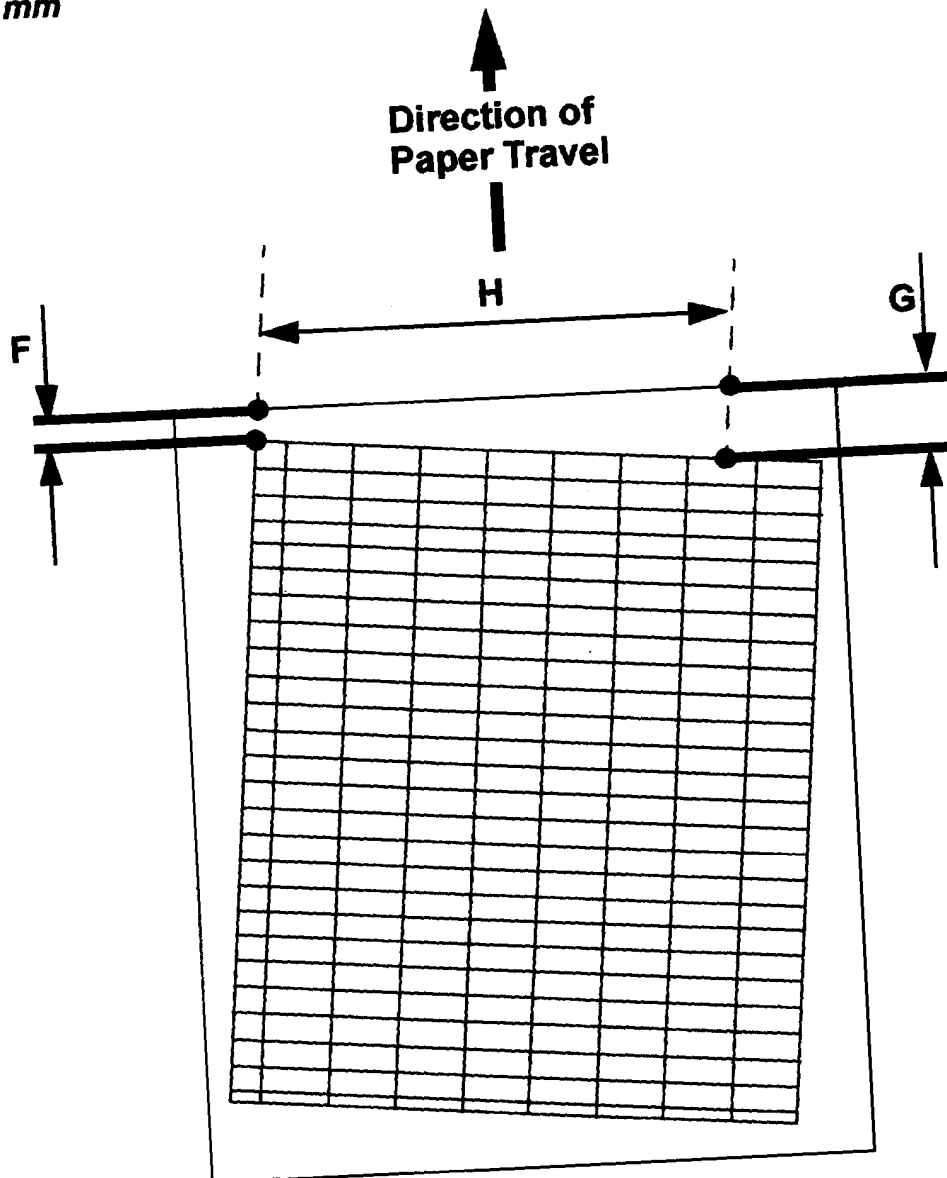


Figure 5-10. Skew Test Print



## Vertical Accuracy

$$(-1.3\text{ mm}) \leq J \leq (+1.3\text{ mm})$$

$$K=L$$

$$M=210\text{ mm}$$

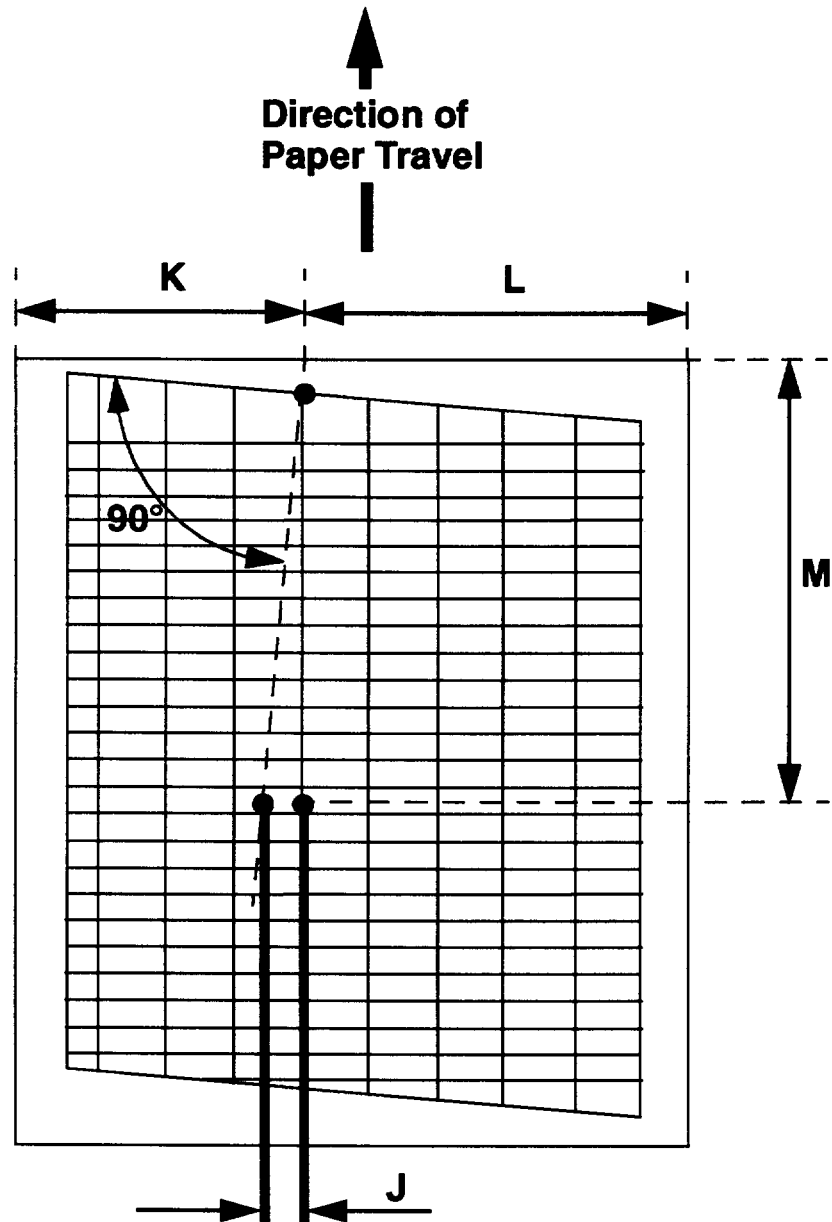


Figure 5-11. Vertical Accuracy Test Print

**Horizontal Accuracy**

$$(-2.0\text{ mm}) \leq T \leq (+2.0\text{ mm})$$

$$T = U - V$$

$$U \leq 390\text{ mm}$$

$$W \leq 245\text{ mm}$$

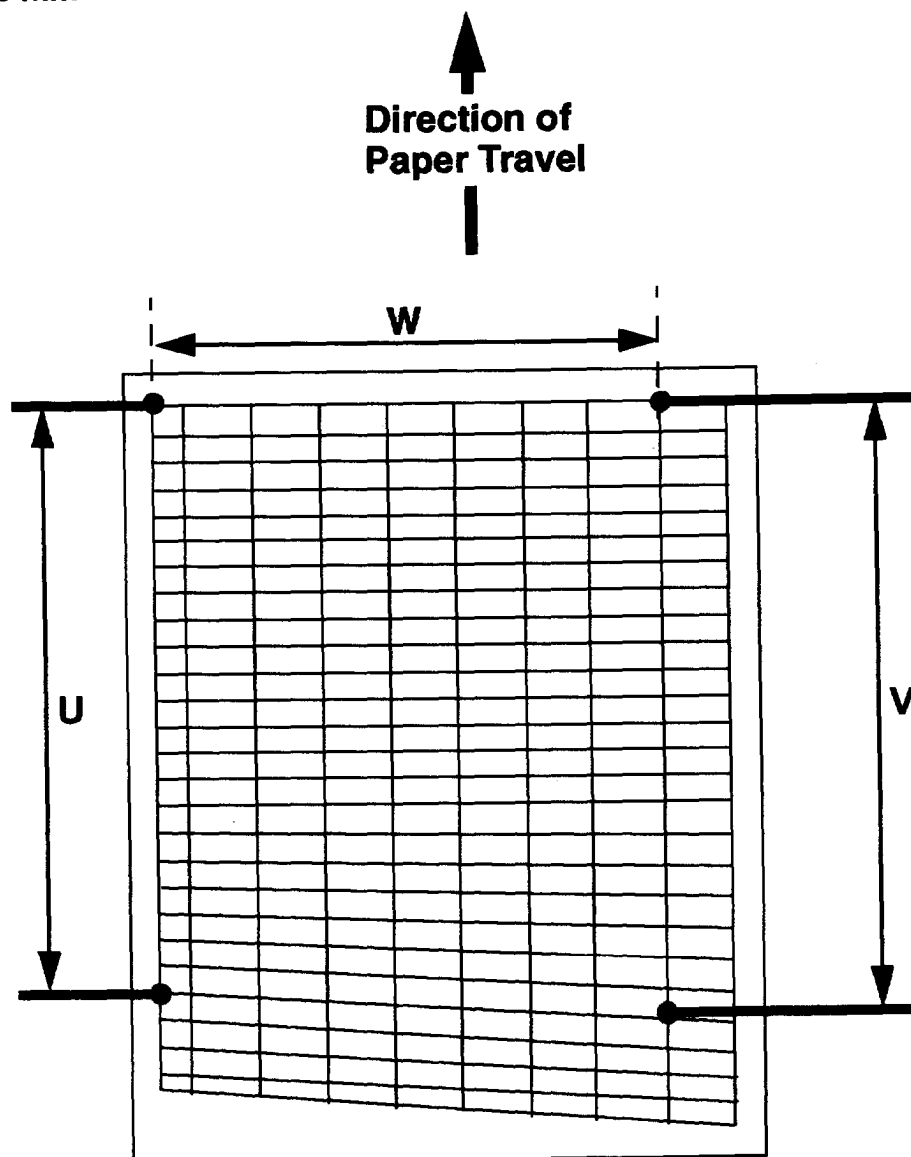


Figure 5-12. Horizontal Accuracy Test Print



# Troubleshooting: Error Messages **6**

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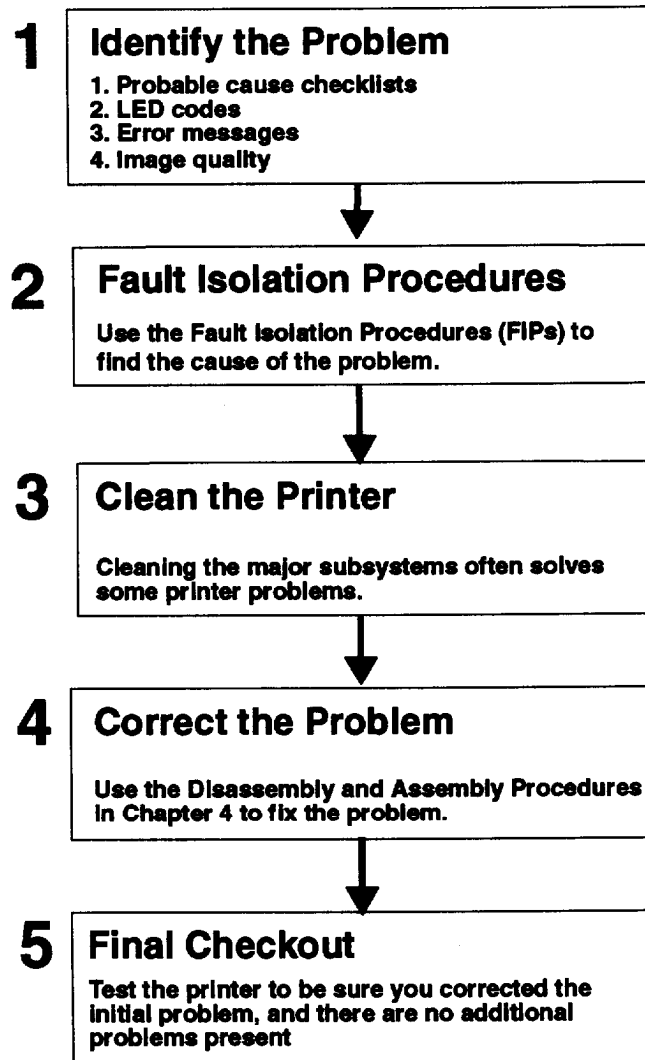
# Troubleshooting: Error Messages **6**

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This chapter explains basic procedures for analyzing and repairing printer problems.

## Basic Procedures

When you service the Action Laser 1100 printer, follow these steps from start to finish.



## **Identify the Problem**

1. Verify that the reported problem does exist.
2. Check for any LED codes or error messages.
3. Print a set of three test prints using the Test Print Utility or generate a Print Engine test print.
4. Take note of any mechanical or electrical abnormalities that are present.
5. Take note of any unusual noise or smell coming from the printer.
6. Use the Fault Isolation Procedures flowchart to analyze your printer problem.

## **Clean the Printer**

1. Switch OFF the printer power.
2. Disconnect the AC power cord from the wall outlet.
3. Disconnect the power cord from the printer.
4. Open the Front Cover.
5. Remove the Print Cartridge.  
Cover the cartridge with a dark cloth and store it away from strong light.
6. Inspect for and remove any foreign matter such as paper clips, staples, scraps of paper, paper dust, or toner from the interior of the printer.  
Clean the interior with a lint-free cloth, dampened slightly with cold water. Clean the Laser Scanner window with a soft, dry cloth.
7. While cleaning, inspect the interior of the printer for damaged wires, loose connections, toner leakage, and worn or damaged parts.
8. Follow the instructions in Chapter 4 to replace any defective parts.

## Final Checkout

1. Reinstall all of the covers that you removed during the repair.

2. Check for any error or fault messages.

The original error message is gone, and there are no new error messages displayed.

3. Print a series of test prints using the Test Print Utility or a Print Engine test print.

The printer generates test prints without jamming and without any print image defects.

4. Take note of any mechanical or electrical abnormalities that are present.

The printer runs through the entire print cycle without any obvious problems.

5. Take note of any unusual noise or smell coming from the printer.

During the print cycle there are no unusual noises or smells coming from the printer.

6. The repair is completed.

Clean up your work area, and return use of the printer to the customer.



## Probable Cause Checklists

To use these checklists, look **down the right hand columns** and find the combination of indicators or symptoms in the printer. Look at the matching boxes on the left hand side of the table. The component listed is a possible cause of the malfunction. Perform the diagnostic procedure indicated to confirm the diagnosis.

**Table 6-1. General Error Indicator Checklist**

| <b>Parts</b>                             | <b>Diagnostic Procedure</b>                                | <b>Both LEDs OFF</b> | <b>Orange LED ON at Power On</b> | <b>Orange LED ON 60 seconds after Power On</b> | <b>Cooling Fan Does Not Rotate</b> |
|--|--|----------------------|----------------------------------|--|------------------------------------|
| Low Voltage Power Supply (LVPS) Assembly | LVPS FIP (+5 VDC)<br>LVPS FIP (+24 VDC)                    | X                    | X                                |  | X                                  |
| Laser Scanner Assembly                   | Scanner Assembly Failure<br>Laser Scanner Assembly Failure |                      | X                                |  |                                    |
| Heat Rod                                 | Heat Rod Failure   |                      |                                  | X  |                                    |
| Thermistor                               | Thermistor Failure   |                      |                                  | X  |                                    |
| Thermal Fuse                             |  |                      |                                  | X  |                                    |
| Overheat Thermostat                      |  |                      |                                  | X  |                                    |
| Registration Sensor                      | Registration Sensor Failure                                |                      | X                                |  |                                    |
| Print Cartridge Sensor                   | Print Cartridge Sensor Failure                             |                      | X                                |  |                                    |
| Main Drive Motor Assembly                | Drive Assembly Failure                                     |                      | X                                |  |                                    |
| Cooling Fan                              | Fan Failure  |                      |                                  |  | X                                  |
| High Voltage Power Supply                | HVPS CR/TR/DB Failure                                      |                      | X                                |  | X                                  |
| LED PWBA                                 | LED Failure  | X                    |                                  |  |                                    |
| Controller PWBA                          | Replace the Controller PWBA                                | X                    | X                                |  |                                    |

**Table 6-2. Paper Feed Error Indicator Checklist**

| <b>Part</b>               | <b>Diagnostic Procedure</b> | <b>If the Orange (Error) LED comes on:</b> |  |                         | <b>If the Print Engine Test Print prints properly</b> |
|---------------------------|-----------------------------|--|--|-------------------------|---|
|                           |                             | <b>Before paper feed</b>                   | <b>After paper feed, but before paper exit</b> | <b>After paper exit</b> |   |
| Fuser Exit Sensor         | Fuser Exit Sensor Failure   |  | X  |                         |   |
| Registration Sensor       | Registration Sensor Failure | X  | X  |                         |   |
| Feed Solenoid             | Feed Solenoid Failure       | X  |  |                         |   |
| Main Drive Motor Assembly | Drive Assembly Failure      | X  |  |                         |   |
| Controller                | Replace the Controller PWBA |  |  |                         | X   |
| Print Cartridge           | Replace the Print Cartridge |  | X  |                         |   |

## LED Status Codes

The LED lights located on the Top Cover of the printer indicate printer status and error conditions. The green LED is the READY light. The orange LED is the ERROR light.

Use the following table to determine printer status from READY/ERROR LED states.

**Table 6-3. LED Codes and Printer Status**

| READY<br>OFF | READY<br>ON | READY<br>BLINKING | ERROR<br>OFF | ERROR<br>ON | ERROR<br>BLINKING | PRINTER STATUS  |
|--------------|-------------|-------------------|--------------|-------------|-------------------|---|
|              | <b>X</b>    |                   | <b>X</b>     |             |                   | Printer is ready to print.<br>No problems detected.                 |
|              |             | <b>X</b>          | <b>X</b>     |             |                   | Printer is processing<br>data or has unprinted<br>data yet to print |
|              |             | <b>X</b>          |              | <b>X</b>    |                   | Manual load   |
|              |             | <b>X</b>          |              | <b>X</b>    |                   | Paper size error  |
|              |             | <b>X</b>          |              | <b>X</b>    |                   | Memory overflow error   |
|              |             | <b>X</b>          |              | <b>X</b>    |                   | Print over-run error  |
| <b>X</b>     |             |                   |              |             | <b>X</b>          | Paper jam   |
| <b>X</b>     |             |                   |              |             | <b>X</b>          | Cover is open   |
| <b>X</b>     |             |                   |              |             | <b>X</b>          | Print Cartridge is not<br>installed                                 |
|              |             | <b>X</b>          |              |             | <b>X</b>          | Printer is warming up   |
|              | <b>X</b>    |                   |              | <b>X</b>    |                   | Print engine error  |
|              |             | <b>X*</b>         | <b>X</b>     |             |                   | Power saver on  |

*\*slow blink*

# Error and Status Messages

Table 6-4. Error and Status Messages

| Screen Displays                              | Cause   | <div>Results</div> <hr/> <div>How to clear the message</div>   |
|--|---|--|
| <b>FIRMWARE ERROR</b>                        | There is a problem in NVRAM.<br>1. An NVRAM error occurred when you switched ON main power.<br>2. A write error occurred when you tried to write to NVRAM.  | Main Motor, Laser Scanner, and Fuser controls stop at end of print cycle.<br><hr/> Switch OFF Main Power.<br>Switch ON Main Power. |
| <b>LASER UNIT ERROR</b>                      | There is a problem with the Laser Scanner Assembly.<br>1. SOS signal intervals are longer than READY reference value.<br>2. Output LD is lower than Configuration NV2 setting.<br>3. SOS signal intervals are longer than FAIL reference.   | Main Motor, Laser Scanner, and Fuser controls stop at end of print cycle.<br><hr/> Switch OFF Main Power.<br>Switch ON Main Power. |
| <b>FUSER ERROR</b>                           | There is a problem with the Fuser Assembly.<br>1. Fuser temperature is lower than Low Temperature limit.<br>2. Fuser takes more than 120 seconds to warm up.<br>3. The Thermistor is open.<br>4. Fuser temperature is higher than High Temperature limit.<br>5. After warm-up sequence, the Heater Rod is ON for more than 10 seconds and the Main Motor does not spin. | Main Motor, Laser Scanner, and Fuser controls stop at end of print cycle.<br><hr/> Switch OFF Main Power.<br>Switch ON Main Power. |
| <b>COVER OPEN OR TONER CARTRIDGE MISSING</b> | The Front Cover is open and/or the Interlock Switch is not actuated.  | Main Motor, Laser Scanner, and Fuser controls stop at end of print cycle.<br><hr/> Close the Front Cover.                          |

Table continued on next page

Table 6-4. Error and Status Messages (continued)

| Screen Displays                        | Cause   | <b>Results</b><br><hr/> <b>How to clear the message</b>   |
|--|---|---|
| <b>PAPER JAM</b>                       | <p>There is a paper jam in the printer. Paper jams come in three categories:</p> <ul style="list-style-type: none"> <li>• Paper can be jammed (or mistfed) at paper feed (E2).</li> <li>• Paper can be jammed between paper feed and paper exit (E3).</li> <li>• Paper can be jammed at paper exit (E4).</li> </ul> <p>A paper jam could be caused by one of the following:</p> <ol style="list-style-type: none"> <li>1. The Exit Sensor remains in an OFF state although E3 detection time has elapsed since the Registration Sensor was actuated.</li> <li>2. The Registration Sensor switches ON within E2 detection time.</li> <li>3. The Registration Sensor remains OFF after E2 detection time.</li> <li>4. The Registration Sensor is in an ON state when you switch ON main power.</li> <li>5. The Registration Sensor switches from an OFF to an ON state during POD or during the Erase Cycle.</li> </ol> | <p>Main Motor, Laser Scanner, and Fuser controls stop at end of print cycle.</p> <hr/> <p>Open the Front Cover.<br/>Remove the jammed paper.<br/>Close the Front Cover.</p>                             |
| <b>PRINT CARTRIDGE NOT IN POSITION</b> | <p>The Print Cartridge is either not installed or not correctly installed in the printer.</p> <ol style="list-style-type: none"> <li>1. The Print Cartridge Sensor is OFF.</li> </ol>   | <p>Main Motor, Laser Scanner, and Fuser controls stop.</p> <hr/> <p>Reinstall or reseal the Print Cartridge.</p>  |
| <b>PAPER SIZE ERROR</b>                | <p>The paper loaded into the Input Tray is not the same as the sheet size stored in NVRAM.</p>  | <p>Main Motor, Laser Scanner, and Fuser controls stop.</p> <hr/> <p>Reload correct paper into Input Tray.<br/>or<br/>Reconfigure the NVRAM data to reflect the paper size loaded in the Input Tray.</p> |

Table continued on next page

Table 6-4. Error and Status Messages (continued)

| Screen Displays                   | Cause  | <div>Results</div> <hr/> <div>How to Clear the Message</div>  |
|-----------------------------------|--|---|
| <b>MEMORY OVER-FLOW</b>           | The page is too complex to print.  | <div>Page may print incorrectly.</div> <hr/> <div>Press Reset.<br/>Add memory to printer<br/>or turn page protect on<br/>or use image compression.</div>  |
| <b>PRINTER OVER-RUN</b>           | The page is too complex to print.  | <div>Page may print incorrectly.</div> <hr/> <div>Press Reset.<br/>Add memory to printer<br/>or turn page protect on<br/>or use image compression.</div>  |
| <b>RAM ERROR</b>                  | Printer found error in RAM during PODS or during print.  | <div>Main Motor, Laser Scanner, and Fuser controls stop.</div> <hr/> <div>Switch OFF Main power.<br/>Switch On Main power.<br/>Replace any optional memory (if installed).</div>  |
| <b>ROM ERROR</b>                  | The printer found an error in the ROM checksum during PODS.  | <div>Main Motor, Laser Scanner, and Fuser controls stop.</div> <hr/> <div>Switch OFF Main power.<br/>Switch On Main power.<br/>Replace the Controller PWBA.</div>   |
| <b>POWER OFF OR CABLE PROBLEM</b> | The printer is turned off, or the cable is disconnected or broken.   | <div>Main Motor, Laser Scanner, and Fuser controls stop.</div> <hr/> <div>Switch OFF Main power.<br/>Switch On Main power.<br/>Check the interface cable.<br/>Check the power cable.<br/>Replace the controller PWBA.</div> |
| <b>PAPER OUT OR PAPER MISFEED</b> | The printer did not detect paper at the registration sensor within the specified time after a paper feed command was sent. | <div>Main Motor, Laser Scanner, and Fuser controls stop.</div> <hr/> <div>Add paper if the input tray is empty.<br/>Check the paper path and the operation of the paper feeder.</div>                                       |

## Fault Isolation Procedures (FIPs)

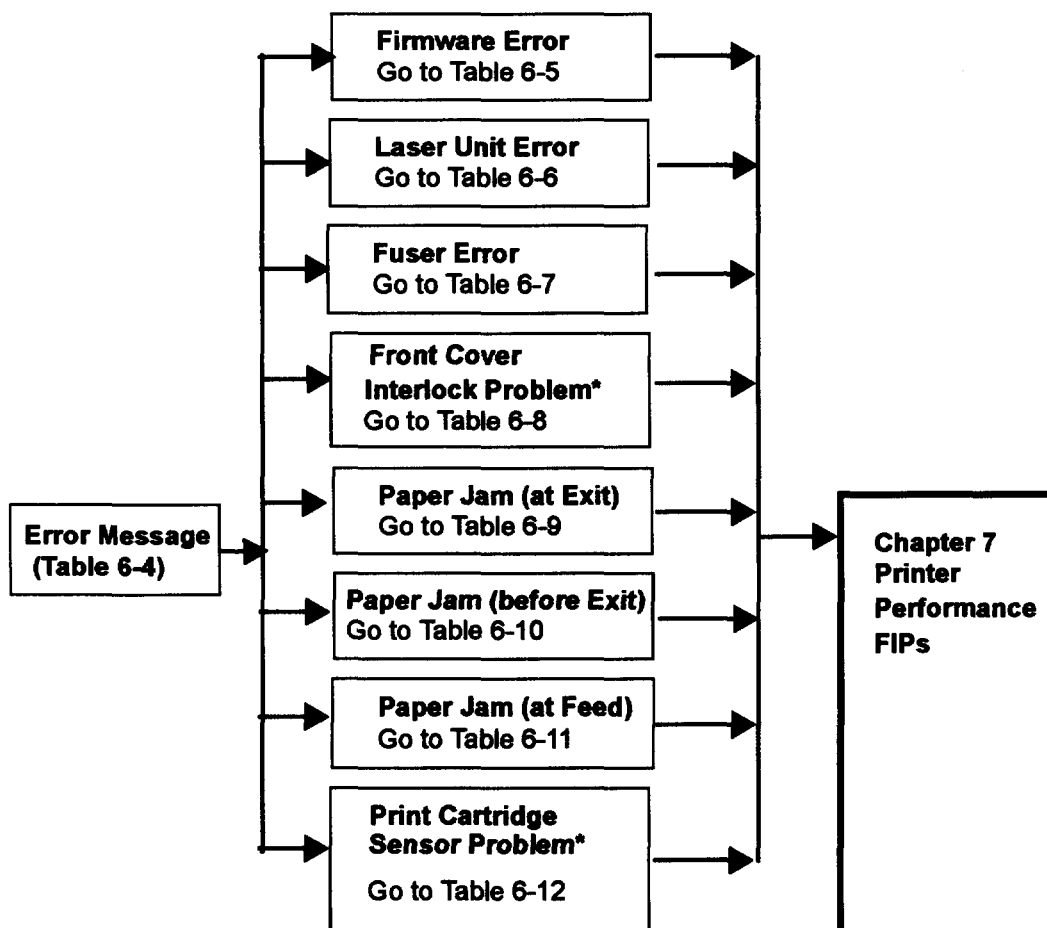
Follow these steps to use the **Fault Isolation Procedures Flowchart on the next page**.

1. If you see an error message displayed on the host computer screen, go to the **ERROR MESSAGE** box.
2. If you have an print image problem, go to the **IMAGE QUALITY** box.
3. If you have a printer operation problem, go to the **PRINTER PERFORMANCE** box.
4. If you have a problem with the LEDs on the printer, go to the **LED FAILURE** box.
5. If the LEDs on the printer indicate an error, go to the **LED ERROR** box.
6. Follow the arrow leading from your problem box to the individual FIP that corresponds to your error message, print image problem, or printer operation problem.
7. Follow the instructions in the FIP.

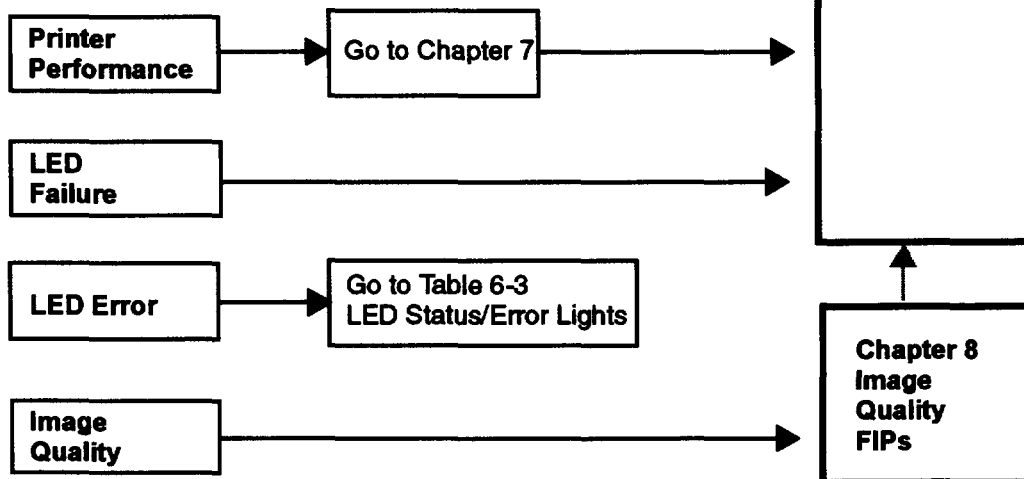
### How to Follow a FIP

1. Each numbered step in a FIP instructs you to perform a certain action or procedure. The instruction is followed by a question.
2. If your response to the question is Yes, then follow the instructions for a Yes reply.
3. If your response to the question is No, then follow the instructions for a No reply.
4. FIPs often ask you to take voltage readings at certain test points within the printer. The Appendix has information on signal names and test point locations.
5. FIPs often ask you to replace a printer component. Chapter 4 provides detailed procedures for removing and replacing all parts on the printer.

# Fault Isolation Procedures Flowchart



\*Message displayed is "Cover Open or Toner Cartridge Missing"





## General Notes on Using Fault Isolation Procedures (FIPs)

1. FIPs assume there is no malfunction of the printer controller. If you are unable to fix a problem using the FIPS, we recommend you replace the printer controller.
2. FIPs use new and “known good” components as troubleshooting tools. We recommend you carry a spare Print Cartridge and Main Controller PWB.
3. Unless indicated otherwise, the instruction “switch ON main power” means for you to switch ON printer power, and let the printer proceed through power-on diagnostics and warm-up until it is on-line and ready to print.
4. Conventions used to represent connectors:  
P/J XX means a Plug and its corresponding Jack, are connected.  
PXX means a Plug is disconnected. (Unless this plug is soldered to a PWB  
JXX means a Jack is disconnected. (Unless this jack is soldered to a PWB).
5. When you are instructed to take a voltage reading between “P/J A-B and P/J X-Y,” place the positive probe (+) of your meter on pin B of P/J A, and place the negative probe (-) of your meter on pin Y of P/J X.
6. When you are instructed to take voltage readings between “P/J X and P/J Y” (without specified pin numbers), check all voltage carrying pins. Refer to the Wiring/Connection Diagrams in the Appendix for signals and pin numbers.
7. When you are instructed to take a voltage reading, the negative probe (-) is generally connected to a pin that is either RTN or SG. You can substitute any RTN pin or test point in the printer, and you can use FG (Frame Ground) in place of any SG pin or test point.
8. Unless a FIP instructs you otherwise, before measuring voltages make sure the printer is switched ON, the Print Cartridge is installed, the Front Cover is closed or the Interlock Switch is actuated.
9. All voltages values given in FIPs are approximate values. Actual measured voltages may vary somewhat from the given values.
10. FIPs may instruct you to remove or replace a component. Refer to Chapter 4 for instructions on removing and replacing components.
11. When a FIP instructs you to replace a component, and that component is only available as part of a larger assembly, replace the entire assembly.

## Error Message Fault Isolation Procedures

The FIP Flowchart should have directed you to this section.

Before you use the Error Message FIPs, verify the following:

1. Is the printer plugged into a recommended AC wall outlet?
2. Is the AC power provided at the wall outlet within recommended specifications?
3. Is the **AC** power cord connected to the printer.
4. **Is the AC power cord in good condition-not frayed or broken?**
5. **Is the printer properly grounded through the AC wall outlet?**
6. **Is the printer located in an area** where the temperature and humidity are moderate and stable?
7. Is the printer located in an area that is free of dust?
8. Is the printer located in an area away from water outlets, steamers, electric heaters, volatile gases, or open flames?
9. Is the printer shielded from the direct rays of the sun?
10. Does the printer have recommended space around all sides for proper ventilation?
11. Is the printer sitting on a level and stable surface?
12. Is recommended paper stock being used in the printer?
13. Does the customer use the printer as instructed in the **User's** Guide?
14. Are consumables, such as the Print Cartridge, replaced at recommended intervals?
15. Have you read and understood the Service **Warnings**?

## Service Warnings

**WARNING:** Disconnect P/J 151 from the HVPS before proceeding with repairs with the print power ON. If a FIP instructs you to connect P/J 151 in order to check a component or make a test, be careful. High voltage is present in the circuitry.



Disconnect P/J 12 from the Controller PWB before proceeding with repairs with print power ON. The Laser Beam is active when P/J 12 is connected to the Controller PWB.

Be careful when working around the Fussr area. It is very hot.

**Table 6-5. Firmware Error**

| <b>Step</b> | <b>Actions and Questions</b>  | <b>Yes</b>                  | <b>No</b>                          |
|-------------|---|-----------------------------|------------------------------------|
| <b>1</b>    | <b>INITIAL ANALYSIS</b><br>Inspect the following component: <ul style="list-style-type: none"> <li>• Controller PWBA</li> </ul> <b>Is it compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                | Replace the problem component      |
| <b>2</b>    | <b>Does "Firmware Error" appear after you switch ON Main Power?</b>   | Replace the Controller PWBA | Go to step 3                       |
| <b>3</b>    | Switch Main Power OFF and ON several times.<br><br><b>Does "Firmware Error" still appear when you switch ON Main Power again?</b>   | Replace the Controller PWBA | Go to Table 7-19 Electrical Noise. |

Table 6-6. Laser Unit Error

| Step     | Actions and Questions  | Yes                                    | No  |
|----------|--|--|---|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• LS Assembly</li> <li>• LVPS Assembly</li> <li>• Print Cartridge Actuator</li> <li>• Harness Assembly LS</li> <li>• Controller PWBA</li> <li>• Cartridge Sensor PWBA</li> <li>• Print Cartridge</li> <li>• Harness Assembly CRU</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                           | Replace the problem components                    |
| <b>2</b> | <b>SCANNER ASSEMBLY ANALYSIS</b><br>Enter Printing Test Mode to check the Scanner Motor.<br>If you cannot hear the Scanner Motor running, unplug P/J14 (Main Drive Motor).<br><b>Can you hear the Scanner Motor running before the "Laser Unit Error" message appears?</b>   | Go to step 3                           | Go to Table 7-6<br>Scanner Assembly Failure       |
| <b>3</b> | <b>LD ASSEMBLY ANALYSIS</b><br>Close the Front Cover.<br>Switch ON Main Power.<br>Check the voltage between P12-1 and P12-3.<br><b>Is there +5 VDC between P12-1 and P12-3?</b>  | Go to Table 7-7<br>LS Assembly Failure | Go to step 5                                      |
| <b>4</b> | <b>LD ASSEMBLY ANALYSIS</b><br>Close the Front Cover.<br>Switch ON Main Power.<br>Check the voltage between P17-4 and P17-1.<br><b>Is there +5 VDC between P17-4 and P17-1?</b>  | Go to Table 7-12<br>LD Switch Failure  | Go to Table 7-4<br>LVPS Assembly Failure (+5 VDC) |

Table 6-7. Fuser Error

| Step     | Actions and Questions   | Yes                                   | No                                  |
|----------|---|---------------------------------------|-------------------------------------|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• LVPS Assembly</li> <li>• Controller PWBA</li> <li>• Fuser Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b>            | Go to step 2                          | Replace the problem components      |
| <b>2</b> | <b>THERMISTOR ANALYSIS</b><br>Switch ON Main Power.<br><b>Does the "Fuser Error" message appear immediately after you switch on the printer?</b>  | Go to Table 7-9<br>Thermistor Failure | Go to step 3                        |
| <b>3</b> | <b>HEAT ROD ANALYSIS</b><br>Switch OFF Main Power.<br>Let the Fuser Assembly cool to room temperature.<br>Switch ON Main Power.<br><b>Does the Heat Rod glow after you switch on the printer?</b>   | Go to step 4                          | Go to Table 7-8<br>Heat Rod Failure |
| <b>4</b> | <b>Does the Fuser Error message appear during warm-up?</b>  | Go to step 5                          | Go to step 6                        |
| <b>5</b> | <b>HEAT ROD/LVPS ANALYSIS</b><br>Disconnect P/J12 from the Controller PWB.<br>Check these voltages immediately after the printer has warmed up, but before the Fuser Error message appears.<br><b>Is there +90 to 132 VAC on 110 V model (+198 to 264 VAC on the 220 V model), between P/J114-2 and P/J114-3?</b> | Go to Table 7-9<br>Thermistor Failure | Replace the LVPS Assembly           |
| <b>6</b> | <b>Does the Heat Rod slowly pulse on and off after the printer was warmed up?</b>   | Go to Table 7-9<br>Thermistor Failure | Go to step 7                        |
| <b>7</b> | <b>LVPS ASSEMBLY ANALYSIS</b><br>Disconnect P/J12 from the Controller PWB.<br>Check the voltage between J11-3 and J11-6.<br>Make this check within 30 seconds after switching ON main power.<br><b>Is there +4.38 VDC between J11-3 and J11-6?</b>  | Go to step 8                          | Replace the LVPS Assembly           |
| <b>8</b> | <b>HEAT ROD ACTUATOR SIGNAL ANALYSIS</b><br>Disconnect P/J12 from the Controller PWBA.<br><b>Is there 0 VDC during the printer warm-up sequence and +4.38 VDC at Ready to Print status?</b>   | Replace the LVPS Assembly             | Replace the Controller PWBA         |

**Table 6-8. Front Cover Open or Toner Cartridge Missing  
(Front Cover Interlock Problem)**

| Step     | Actions and Questions  | Yes                         | No  |
|----------|--|-----------------------------|---|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• HVPS Assembly</li> <li>• Controller PWBA</li> <li>• Interlock Access Pin</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b>   | Go to step 2                | Replace the problem components                      |
| <b>2</b> | <b>INTERLOCK ACCESS PIN ANALYSIS</b><br>Listen for the clicking sound of Interlock Switch actuating and deactuating as you perform this step.<br><br><b>Does the Interlock Access Pin actuate the Interlock Switch on the HVPS Assembly when you close the Front Cover Assembly?</b><br><br><b>Does the Interlock Access Pin deactuate the Interlock Switch on the HVPS Assembly when you open the Front Cover Assembly?</b>   | Go to step 3                | Replace either the Front Cover or the HVPS Assembly |
| <b>3</b> | <b>INTERLOCK SWITCH ANALYSIS</b> <ol style="list-style-type: none"> <li>1. Switch off the printer power and disconnect the power cord.</li> <li>2. Remove the Back Cover.</li> <li>3. Remove the Top Cover.<br/>               Note: It may also be necessary to remove the three screws securing the Electrical Chassis and slide it partway out of the printer, then remove the EMI Shield in order to access the P/J connectors.</li> <li>4. Connect the black (-) lead of the digital volt meter (DVM) to Frame Ground.</li> <li>5. Reconnect the power cord and switch on the printer power.</li> <li>6. Place the red (+) probe of the DVM on P/J 15-11.</li> <li>7. Does the voltage change from 0 VDC to +24.0 VDC when the Interlock Switch is actuated?</li> <li>8. Place the red (+) probe of the DVM on P/J 15-12.</li> <li>9. Does the voltage change from 0 VDC to +24.0 VDC when the Interlock Switch is actuated?</li> </ol> | Replace the Controller PWBA | Replace the HVPS.                                   |

Table 6-9. Paper Jam Error (Paper Jammed at Exit)

| Step     | Actions and Questions  | Yes              | No                             |
|----------|--|------------------|--------------------------------|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Exit Sensor</li> <li>• Controller PWBA</li> <li>• Paper Feeder Assembly</li> <li>• Top Cover Assembly</li> <li>• LVPS Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b>   | Go to step 2     | Replace the problem components |
| <b>2</b> | <b>Do Paper Jam indicators appear immediately after you switch ON Main Power (see Table 6-1)?</b>  | Go to step 3     | Go to step 4                   |
| <b>3</b> | <b>Is there paper jamming the Exit Sensor?</b>   | Remove the paper | Go to step 7                   |
| <b>4</b> | <b>EXIT ROLL ANALYSIS</b> <ol style="list-style-type: none"> <li>1. Switch off the printer power and disconnect the power cord.</li> <li>2. Remove the Back Cover.</li> <li>3. Remove the Top Cover.</li> <li>4. Reconnect the power cord and switch on the printer power.</li> <li>5. Insert paper into the Paper Feeder and ensure that the Paper Feed Lever is in the feed position (towards the rear of the printer).</li> <li>6. Using a small insulated screwdriver, short pins 1 and 2 of P/J 31 together.</li> </ol> <b>Does the Exit Roll Assembly rotate correctly against the pinch roll?</b> | Go to step 5     | Replace the Fuser Assembly     |
| <b>5</b> | <b>EXIT ROLL ANALYSIS</b><br>Use the Printing Test Mode to check paper feed at the Exit Roll.<br><br>Remove the Top Cover Assembly so you can observe paper as it is fed into the Exit Roll and pinch roll.<br><br><b>Is the paper fed properly?</b>   | Go to step 6     | Replace the Fuser Assembly     |

Table continued on next page

Table 6-9. Paper Jam Error (Paper Jammed at Exit continued)

|          |   |                  |   |
|----------|---|------------------|---|
| <b>6</b> | <b>EXIT SENSOR ANALYSIS</b><br>Feed a sheet of paper into the Exit Sensor, and then remove it.<br><br><b>Does the Exit Sensor move freely and without binding?</b>  | Go to step 7     | Replace the Exit Actuator if it is binding, or go to Table 7-10 Exit Sensor Failure |
| <b>7</b> | <b>EXIT SENSOR ANALYSIS</b><br><ol style="list-style-type: none"> <li>1. Switch off the printer power and disconnect the power cord.</li> <li>2. Remove the Back Cover.</li> <li>3. Remove the Top Cover.<br/>           Note: It may also be necessary to remove the three screws securing the Electrical Chassis and slide it partway out of the printer, then remove the EMI shield in order to access the P/J connectors.</li> <li>4. Connect the black (-) lead of the digital volt meter (DVM) to Frame Ground.</li> <li>5. Reconnect the power cord and switch on the printer power.</li> <li>6. Place the red (+) probe of the DVM on P/J 13-3.</li> <li>7. Does the voltage change from +5.0 VDC to approximately 0 VDC when the Fuser Exit Sensor is actuated?</li> </ol> | Return to step 1 | Replace the Exit Sensor   |



Table 6-10. Paper Jam Error (Paper Jammed after Feed but before Exit)

| Step     | Actions and Questions   | Yes                           | No                                   |
|----------|---|-------------------------------|--------------------------------------|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Exit Sensor</li> <li>• Drive Assembly</li> <li>• Front Cover Assembly</li> <li>• Harness Assembly P/H</li> <li>• Controller PWBA</li> <li>• Print Cartridge</li> <li>• LS Assembly</li> <li>• LVPS Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                  | Replace the problem components       |
| <b>2</b> | Is the paper loaded in the input tray wrinkled or damaged?  | Replace with fresh, dry paper | Go to step 3                         |
| <b>3</b> | Is there a sheet of paper at the Exit Sensor when the Paper Jam message appears?  | Go to step 11                 | Go to step 4                         |
| <b>4</b> | <b>PAPER SIZE ANALYSIS</b><br>Check the size of paper currently loaded.<br>A paper jam can occur if the paper used is less than 139.7 mm in the direction of paper feed.<br><b>Does the size meet specifications?</b>   | Go to step 5                  | Load paper that meets specifications |

Continued on next page

Table 6-10. Paper Jam Error (Paper Jammed after Feed but before Exit, continued)

|          |   |                            |  |
|----------|---|----------------------------|--|
| <b>5</b> | <b>DRIVE ASSEMBLY ANALYSIS</b><br>1. Switch off the printer power and disconnect the power cord.<br>2. Remove the Back Cover.<br>3. Remove the Top Cover.<br>4. Reconnect the power cord and switch on the printer power.<br>5. Insert paper into the Paper Feeder and ensure that the Paper Feed Lever is in the feed position (towards the rear of the printer).<br>6. Using a small insulated screwdriver, short pins 1 and 2 of P/J 31 together.<br>The printer will produce one Print Engine Test Print (grid pattern) each time P/J 31-1 and P/J 31-2 are shorted together.<br>Observe the Main Drive Motor gears and the operation of the Paper Feed Solenoid while the printer is producing the test print.<br><br><b>Do the transmission gears rotate correctly against those of the Feed Roll, Print Cartridge, and Idler Gear?</b> | Go to step 6               | Replace the Drive Assembly             |
| <b>6</b> | <b>FEED SOLENOID ANALYSIS</b><br>Observe the operation of the Feed Solenoid.<br><b>Does the Feed Solenoid function properly?</b>  | Go to step 7               | Go to Table 7-14 Feed Solenoid Failure |
| <b>7</b> | <b>FEED ROLL ANALYSIS</b><br>Observe the operation of the Feed Roll.<br><b>Does the feed roll rotate correctly?</b>   | Go to step 8               | Replace the Feed Roll Assembly         |
| <b>8</b> | <b>HEAT ROLL AND PRESSURE ROLL ANALYSIS</b><br>Observe the operation of the Head Roll and Pressure Roll.<br><b>Do the Heat Roll and the Pressure Roll rotate correctly against each other?</b>  | Go to step 10              | Go to step 9                           |
| <b>9</b> | <b>TRANSMISSION ANALYSIS</b><br>Inspect the Idler Gear and the Transmission Gear of the Drive Assembly.<br><b>Do the Idler Gear and Transmission Gear mesh correctly?</b>   | Replace the Fuser Assembly | Replace the Drive Assembly             |

Continued on next page

Table 6-10. Paper Jam Error (Paper Jammed after Feed but before Exit, continued)

| Step      | Actions and Questions  | Yes              | No  |
|-----------|--|------------------|---|
| <b>10</b> | <b>EXIT ROLL ANALYSIS</b><br>Use the Test Printing Mode to check paper feed at the Exit Roll.<br><br><b>Is paper feed properly to the Exit and pinch roll?</b>   | Go to step 11    | Replace the Fuser Assembly  |
| <b>11</b> | <b>EXIT SENSOR ANALYSIS</b><br>Feed a sheet of paper into the Exit Sensor.<br><br><b>Does the Exit Sensor move freely and without binding?</b><br><br>Remove the sheet of paper from the Exit Sensor.<br><br><b>Does the Exit Sensor move freely and without binding, and does the diagnostic counter increment each time you remove the paper?</b>  | Go to step 12    | Replace the Exit Actuator if it is binding, or go to Table 7-10 Exit Sensor Failure |
| <b>12</b> | <ol style="list-style-type: none"> <li>1. Switch off the printer power and disconnect the power cord.</li> <li>2. Remove the Back Cover.</li> <li>3. Remove the Top Cover.<br/>                         Note: It may also be necessary to remove the three screws securing the Electrical Chassis and slide it partway out of the printer, then remove the EMI shield in order to access the P/J connectors.</li> <li>4. Connect the black (-) lead of the digital volt meter (DVM) to Frame Ground.</li> <li>5. Reconnect the power cord and switch on the printer power.</li> <li>6. Place the red (+) probe of the DVM on P/J 13-3.</li> <li>7. Does the voltage change from +5.0 VDC to approximately 0 VDC when the Fuser Exit Sensor is actuated?</li> </ol> | Return to step 1 | Replace the Exit Sensor   |

Table 6-11. Paper Jam Error (Paper Jammed at Feed)

| Step     | Actions and Questions  | Yes                           | No                                      |
|----------|--|-------------------------------|---|
| <b>1</b> | <p>Inspect the following components:</p> <ul style="list-style-type: none"> <li>• Registration Sensor</li> <li>• Retard Pad</li> <li>• Retard Spring</li> <li>• Paper Set Plate</li> <li>• Paper Release Lever</li> <li>• Feed Roll Assembly</li> <li>• Paper Feeder Assembly</li> <li>• Drive Assembly</li> <li>• Harness Assembly P/H</li> <li>• Controller PWBA</li> <li>• LVPS Assembly</li> <li>• Front Cover Assembly</li> </ul> <p><b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b></p>   | Go to step 2                  | Replace the problem component           |
| <b>2</b> | <b>Is the Paper Release Lever set to ON?</b>   | Go to step 3                  | Set the Paper Release Lever to ON       |
| <b>3</b> | <b>Is the paper loaded in the input tray wrinkled or damaged?</b>  | Replace with fresh, dry paper | Go to step 4                            |
| <b>4</b> | <b>Does "Paper Jam" appear right after you switch ON Main Power?</b>   | Go to step 12                 | Go to step 5                            |
| <b>5</b> | <p><b>MAIN MOTOR ANALYSIS</b></p> <ol style="list-style-type: none"> <li>1. Switch off the printer power and disconnect the power cord.</li> <li>2. Remove the Back Cover.</li> <li>3. Remove the Top Cover.</li> <li>4. Reconnect the power cord and switch on the printer power.</li> <li>5. Insert paper into the Paper Feeder and ensure that the Paper Feed Lever is in the feed position (towards the rear of the printer).</li> <li>6. Using a small insulated screwdriver, short pins 1 and 2 of P/J 31 together.</li> </ol> <p>The printer will produce one Print Engine Test Print (grid pattern) each time P/J 31-1 and P/J 31-2 are shorted together.</p> <p>Observe the Main Drive Motor gears and the operation of the Paper Feed Solenoid while the printer is producing the test print.</p> <p><b>Does the Main Motor run?</b></p> | Go to step 6                  | Go to Table 7-15 Drive Assembly Failure |

Table 6-11. Paper Jam Error (Paper Jammed at Feed, continued)

| Step      | Actions and Questions   | Yes                         | No   |
|-----------|---|-----------------------------|--|
| <b>6</b>  | <b>Do the transmission gears rotate correctly against those of the Feed Roller, Printer Cartridge, and Idler Gear?</b>  | Go to step 7                | Replace the Drive Assembly                   |
| <b>7</b>  | <b>RETARD SPRING ANALYSIS</b><br>Set the Paper Release Lever to ON.<br><br>Insert a piece of paper between the Retard Pad and the feed roll of the Feed Roll Assembly. Slowly pull out the paper so you can check the pressure the Retard Pad applies to the paper.<br><br><b>Does the Retard Pad press against the Feed Roll Assembly</b><br><br><b>Does the Retard Spring apply enough pressure to the paper so it is very difficult to pull out?</b>   | Go to step 8                | Replace the Retard Pad and Spring            |
| <b>8</b>  | <b>FEED SOLENOID ANALYSIS</b><br>Observe the operation of the Feed Solenoid.<br><b>Does the Feed Solenoid function correctly?</b>   | Go to step 9                | Go to Table 7-14 Feed Solenoid Failure       |
| <b>9</b>  | <b>FEED ROLL ANALYSIS</b><br>Observe the operation of the Feed Roll.<br><b>Does the feed roll feed paper correctly from the Input Tray?</b>   | Go to step 10               | Replace the Feed Roll Assembly               |
| <b>10</b> | <b>REGISTRATION SENSOR ANALYSIS</b><br>Actuate and deactuate the Registration Sensor.<br><b>Does the Registration Sensor move freely and without binding?</b>   | Go to step 11               | Go to Table 7-11 Registration Sensor Failure |
| <b>11</b> | 1. Switch off the printer power and disconnect the power cord.<br>2. Remove the Back Cover.<br>3. Remove the Top Cover.<br>. Note: It may also be necessary to remove the three screws securing the Electrical Chassis and slide it part-way out of the printer, then remove the EMI shield in order to access the P/J connectors.<br>4. Connect the black (-) lead of the Digital Volt Meter (DVM) to Frame Ground.<br>5. Reconnect the power cord and switch on the printer power.<br>6. Place the red (+) probe of the DVM on P/J 18-3.<br>7. Does the voltage change from approximately 0 VDC to +5.0 VDC when the Registration Sensor is actuated? | Replace the Controller PWBA | Replace the Registration Sensor              |

**Table 6-12. Cover Open or Toner Cartridge Missing Error  
(Print Cartridge Sensor Problem)**

| <b>Step</b> | <b>Actions and Questions</b>  | <b>Yes</b>                  | <b>No</b>                                       |
|-------------|---|-----------------------------|---|
| <b>1</b>    | <p>Inspect the following components:</p> <ul style="list-style-type: none"> <li>• Print Cartridge Sensor PWBA</li> <li>• Controller PWBA</li> <li>• Print Cartridge Sensor</li> <li>• Print Cartridge</li> <li>• Harness Assembly Print Cartridge</li> <li>• LVPS Assembly</li> </ul> <p><b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b></p>   | Go to step 2                | Replace the problem components                  |
| <b>2</b>    | <p><b>PRINT CARTRIDGE SENSOR PWBA ANALYSIS</b></p> <ol style="list-style-type: none"> <li>1. Switch off the printer power and disconnect the power cord.</li> <li>2. Remove the Back Cover.</li> <li>3. Remove the Top Cover.</li> </ol> <p>Note: It may also be necessary to remove the three screws securing the Electrical Chassis and slide it part-way out of the printer, then remove the EMI Shield in order to access the P/J connectors.</p> <ol style="list-style-type: none"> <li>4. Connect the black (-) lead of the Digital Volt Meter (DVM) to Frame Ground.</li> <li>5. Reconnect the power cord and switch on the printer power.</li> <li>6. Place the red (+) probe of the DVM on P/J 17-2.</li> <li>7. Does the voltage change from +5.0 VDC to approximately 0 VDC when the Print Cartridge Sensor is actuated (the Print Cartridge is installed)?</li> </ol> | Replace the Controller PWBA | Go to Table 7-13 Print Cartridge Switch Failure |



# Troubleshooting: Performance Problems 7

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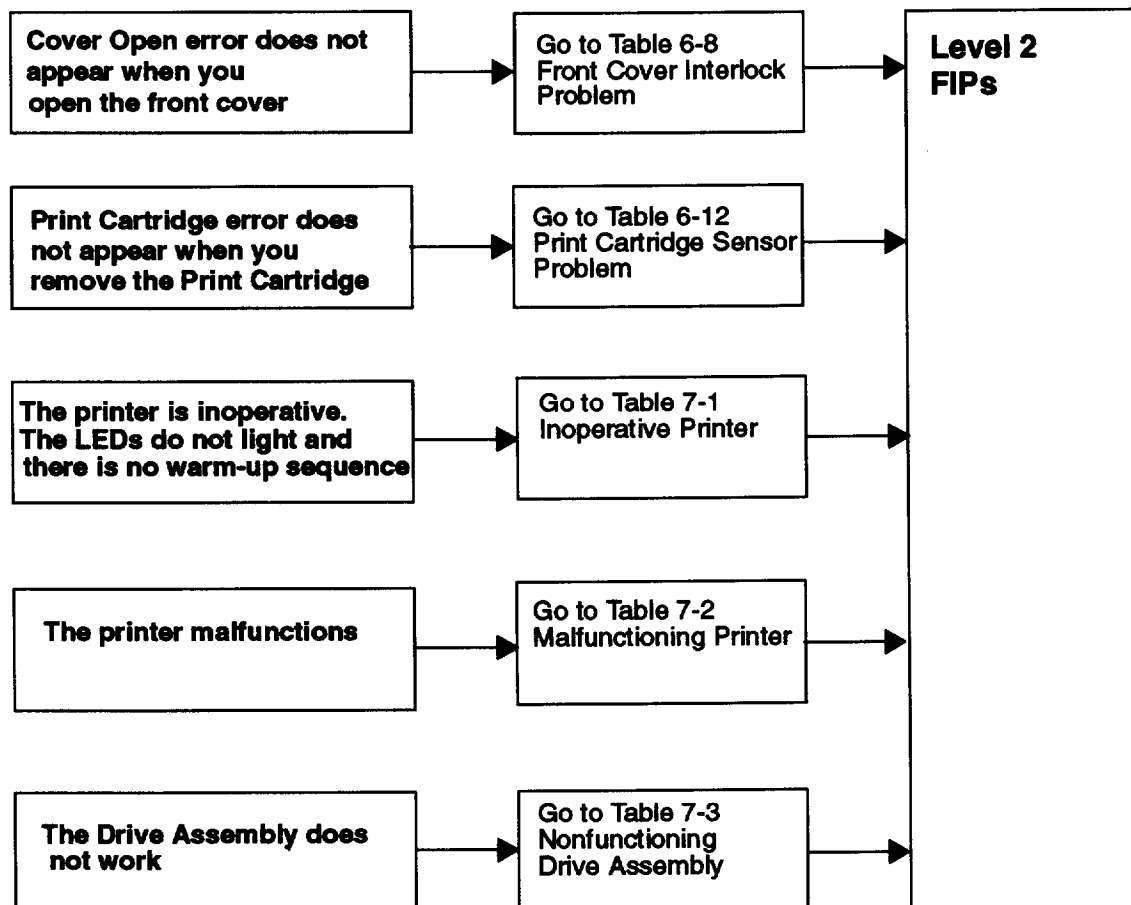


## Troubleshooting: Performance Problems 7

The Fault Isolation Procedures Flowchart in Chapter 6 should have directed you to this section.

To use the following flowchart, start at your problem box, then follow the arrow leading to the individual FIP that corresponds to that problem

### Performance Problem Flowchart



### Performance Problem Fault Isolation Procedures

Before you use the Printer Performance Problem FIPs, verify the following:

1. Is the printer plugged into a recommended AC wall outlet?
2. Is the AC power provided at the wall outlet within recommended specifications?
3. Is the AC power cord connected to the printer.
4. Is the AC power cord in good condition-not frayed or broken?
5. Is the printer properly grounded through the AC wall outlet?
6. Is the printer located in an area where the temperature and humidity are moderate and stable?
7. Is the printer located in an area that is free of dust?
8. Is the printer located in an area away from water outlets, steamers, electric heaters, volatile gases, or open flames?
9. Is the printer shielded from the direct rays of the sun?
10. Does the printer have recommended space around all sides for proper ventilation?
11. Is the printer sitting on a level and stable surface?
12. Is recommended paper stock being used in the printer?
13. Does the customer use the printer as instructed in the *User's Guide*?
14. Are consumables, such as the Print Cartridge, replaced at recommended intervals?
15. Have you read and understood the Service Warnings?

### Service Warnings

**WARNING:**



Disconnect P/J 151 from the HVPS before proceeding with repairs with the print power ON. If a PIP instructs you to connect P/J 151 in order to check a component or make a test, be careful. High voltage is present in the circuitry.

Disconnect P/J 12 from the Controller PWB before proceeding with repairs with print power ON. The Laser Beam is active when P/J 12 is connected to the Controller PWB.

Be careful when working around the Fuser area. It is very hot.

Table 7-1. Inoperative Printer

| Step     | Actions and Questions  | Yes                              | No                             |
|----------|--|----------------------------------|--------------------------------|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• LVPS Assembly</li> <li>• Main Controller PWBA</li> <li>• HVPS Assembly</li> <li>• Drive Assembly</li> <li>• Laser Scanner Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b>   | Go to step 2                     | Replace the problem components |
| <b>2</b> | <b>FUSE ANALYSIS</b><br>Check the LVPS fuse.<br><br><b>Is the LVPS fuse blown?</b>   | Replace the LVPS Assembly        | Go to step 3                   |
| <b>3</b> | <b>LVPS ASSEMBLY ANALYSIS</b><br>Disconnect P/J 11 from the Main Controller PWBA.<br><br>Wait for 5 minutes.<br><br>Close the Front Cover.<br><br>Switch ON Main Power.<br><br>Make these checks within 30 seconds after switching ON main power.<br><br>Check the voltage between P11-2 and P11-1.<br><br><b>Is there +24 VDC between P11-2 and P11-1?</b><br><br>Check the voltage between P11-4 and P11-7.<br><br><b>Is there +24 VDC between P11-4 and P11-7?</b><br><br>Check the voltage between P11-5 and P11-7.<br><br><b>Is there +5 VDC between P11-4 and P11-7?</b> | Replace the Main Controller PWBA | Replace the LVPS Assembly      |

Table 7-2. Malfunctioning Printer

| Step     | Actions and Questions  | Yes  | No                               |
|----------|--|--|----------------------------------|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• LVPS Assembly</li> <li>• Main Controller PWBA</li> <li>• HVPS Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2   | Replace the problem components   |
| <b>2</b> | <b>Can the printer generate a print?</b>   | Go to step 4   | Go to step 3                     |
| <b>3</b> | <b>Can the printer generate a print in Test Print Mode?</b>  | Go to step 5   | Replace the Main Controller PWBA |
| <b>4</b> | <b>Does the printer reset itself while generating a print?</b>   | Go to Table 7-20 Electrical Noise                            | Go to step 5                     |
| <b>5</b> | <b>MAIN CONTROLLER PWB ANALYSIS</b><br>Replace the Main Controller PWBA with a known good Main Controller PWBA.<br><br><b>Does the printer still malfunction?</b>  | Inspect the host computer as a probable cause of the problem |                                  |

Table 7-3. Nonfunctioning Drive Assembly

| Step     | Actions and Questions  | Yes                              | No                                      |
|----------|--|----------------------------------|---|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• LVPS Assembly</li> <li>• Main Controller PWBA</li> <li>• Drive Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b>  | Go to step 2                     | Replace the problem components          |
| <b>2</b> | <b>MAIN MOTOR ANALYSIS</b> <ol style="list-style-type: none"> <li>1. Switch off the printer power and disconnect the power cord.</li> <li>2. Remove the Back Cover.</li> <li>3. Remove the Top Cover.</li> <li>4. Reconnect the power cord and switch on the printer power.</li> <li>5. Insert paper into the Paper Feeder and ensure that the Paper Feed Lever is in the feed position (towards the rear of the printer).</li> <li>6. Using a small insulated screwdriver, short pins 1 and 2 of P/J 31 together.</li> </ol> <p>The printer will produce one Print Engine Test Print (grid pattern) each time P/J 31-1 and P/J 31-2 are shorted together.</p> <p>Observe the Main Drive Motor gears and the operation of the Paper Feed Solenoid while the printer is producing the test print.</p> <b>Does the Main Motor run correctly?</b> | Replace the Main Controller PWBA | Go to Table 7-15 Drive Assembly Failure |

## Level 2 Fault Isolation Procedures

The Fault Isolation Procedures Flowchart in Chapter 6 or an error message FIP should have directed you to this section.

**Before you use the Level 2 Fault Isolation Procedures, verify the following:**

1. Is the printer plugged into a recommended AC wall outlet?
2. Is the AC power provided at the wall outlet within recommended specifications?
3. Is the AC power cord connected to the printer.
4. Is the AC power cord in good condition-not frayed or broken?
5. Is the printer properly grounded through the AC wall outlet?
6. Is the printer located in an area where the temperature and humidity are moderate and stable?
7. Is the printer located in an area that is free of dust?
8. Is the printer located in an area away from water outlets, steamers, electric heaters, volatile gases, or open flames?
9. Is the printer shielded from the direct rays of the sun?
10. Does the printer have recommended space around all sides for proper ventilation?
11. Is the printer sitting on a level and stable surface?
12. Is recommended paper stock being used in the printer?
13. Does the customer use the printer as instructed in the *User's Guide*?
14. Are consumables, such as the Print Cartridge, replaced at recommended intervals?
15. Have you read and understood the Service Warnings?

## Service Warnings

**WARNING:**



Disconnect P/J 151 from the HVPS before proceeding with repairs with the print power ON. If a FIP instructs you to connect P/J 151 in order to check a component or make a test, be careful. High voltage is present in the circuitry.

Disconnect P/J 12 from the Controller PWB before proceeding with repairs with print power ON. The Laser Beam is active when P/J 12 is connected to the Controller PWB.

Be careful when working around the Fuser area. It is very hot.

Table 7-4. LVPS Assembly Failure (+5 VDC)

| Step     | Actions and Questions   | Yes                              | No                             |
|----------|---|----------------------------------|--------------------------------|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Main Controller PWBA</li> <li>• LVPS Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                     | Replace the problem components |
| <b>2</b> | <b>LVPS ASSEMBLY ANALYSIS</b><br>Check the voltage between J11-4 and J11-7.<br><b>Is there +5 VDC between J11-4 and J11-7?</b><br><br>Check the voltage between J11-5 and J11-7.<br><b>Is there +5 VDC between J11-5 and J11-7?</b>   | Replace the Main Controller PWBA | Replace the LVPS Assembly      |

Table 7-5. LVPS Assembly Failure (+24 VDC)

| Step     | Actions and Questions  | Yes                              | No                             |
|----------|--|----------------------------------|--------------------------------|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• LVPS Assembly</li> <li>• Controller PWBA</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                     | Replace the problem components |
| <b>2</b> | <b>LVPS ASSEMBLY ANALYSIS</b><br>Check the voltage between J11-2 and J11-1.<br><b>Is there +24 VDC between J11-2 and J11-1?</b>  | Replace the Main Controller PWBA | Replace the LVPS Assembly      |



Table 7-6. Scanner Assembly Failure

| Step     | Actions and Questions  | Yes                                | No  |
|----------|--|------------------------------------|---|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Main Controller PWBA</li> <li>• Laser Scanner Assembly</li> <li>• LVPS Assembly</li> <li>• Harness Assembly LS</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                       | Replace the problem components                  |
| <b>2</b> | <b>LVPS ASSEMBLY ANALYSIS TO SCANNER ASSEMBLY</b><br>Disconnect P/J151 from the LVPS.<br>Close the Front Cover.<br>Check the voltage between J12-15 and J12-14.<br><b>Is there +24 VDC between J12-15 and J12-14?</b>  | Go to step 3                       | Go to Table 7-5 LVPS Assembly Failure (+24 VDC) |
| <b>3</b> | <b>LVPS ASSEMBLY ANALYSIS TO SCANNER MOTOR</b><br>Disconnect P/J151 from the LVPS.<br>Check the voltage between J12-13 and J12-8.<br><b>Is there +0 VDC between J12-13 and J12-8 when you enter Printing Test Mode?</b><br><b>Is there +4.1 VDC between J12-13 and J12-8 when the U2 code appears?</b>   | Replace the Laser Scanner Assembly | Go to step 4                                    |
| <b>4</b> | <b>LVPS ASSEMBLY ANALYSIS TO SCANNER MOTOR</b><br>Disconnect P/J151 from the LVPS.<br>Check the voltage between J12-13 and J12-8.<br><b>Is there +4.1 VDC between J12-13 and J12-8?</b>  | Replace the Main Controller PWBA   | Go to step 5                                    |
| <b>5</b> | <b>LS HARNESS ASSEMBLY ANALYSIS</b><br>Disconnect P/J151 from the LVPS.<br>Check the continuity between J12 and J122.<br><b>Is there continuity between J12 and J122?</b>  | Replace the Laser Scanner Assembly | Replace the LS Harness Assembly                 |

Table 7-7. Laser Scanner Assembly Failure

| Step     | Actions and Questions  | Yes                                | No   |
|----------|--|------------------------------------|--|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Main Controller PWBA</li> <li>• LVPS Assembly</li> <li>• Laser Scanner Assembly</li> <li>• Harness Assembly LS</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                       | Replace the problem components                 |
| <b>2</b> | <b>LVPS ASSEMBLY ANALYSIS TO LD ASSEMBLY</b><br>Disconnect P/J151 from the LVPS.<br>Close the Front Cover.<br>Check the voltage between J12-1 and J12-3.<br><b>Is there +5 VDC between J12-1 and J12-3?</b>  | Go to step 3                       | Go to Table 7-4 LVPS Assembly Failure (+5 VDC) |
| <b>3</b> | <b>LVPS ASSEMBLY ANALYSIS TO THE SOS</b><br>Disconnect P/J151 from the LVPS.<br>Check the voltage between J12-10 and J12-8.<br><b>Is there +5 VDC between J12-10 and J12-8?</b>  | Go to step 4                       | Go to Table 7-5 LVPS Assembly Failure (+5 VDC) |
| <b>4</b> | <b>Main Controller PWBA ANALYSIS</b><br>Replace the Main Controller PWBA with a known good Main Controller.<br><b>Does the Scanner Assembly still fail?</b>  | Go to step 5                       | Problem solved                                 |
| <b>5</b> | <b>LS HARNESS ASSEMBLY ANALYSIS</b><br>Disconnect P/J151 from the LVPS.<br>Check the continuity between J12 and J122.<br><b>Is there continuity between J12 and J122?</b><br>Check the continuity between J122 and J123.<br><b>Is there continuity between J122 and J123?</b>  | Replace the Laser Scanner Assembly | Replace the LS Harness Assembly                |

Table 7-8. Heat Rod Failure

| Step     | Actions and Questions   | Yes                        | No                                 |
|----------|---|----------------------------|------------------------------------|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Main Controller PWBA</li> <li>• LVPS Assembly</li> <li>• Laser Scanner Assembly</li> <li>• Fuser Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b>             | Go to step 2               | Replace the problem components     |
| <b>2</b> | <b>HEAT ROD ANALYSIS</b><br>Switch OFF printer power.<br>Unplug the AC line from the wall outlet.<br>Close the Front Cover.<br>Check the continuity between J114-2 and J114-3.<br><b>Is there continuity between J114-2 and J114-3?</b>   | Go to step 3               | Go to step 6                       |
| <b>3</b> | <b>HEAT ROD SENSOR SIGNAL ANALYSIS</b><br>Switch OFF printer power.<br>Allow the Fuser to cool to room temperature.<br>Check the voltage between J11-3 and J11-7.<br><b>Is there +0 VDC between J11-3 and J11-7 when you actuate the interlock switch?</b><br><b>Is there +4.35 VDC between J11-3 and J11-7 when you deactivate the interlock switch?</b> | Go to step 4               | Go to Table 7-9 Thermistor Failure |
| <b>4</b> | <b>FUSER HARNESS ASSEMBLY ANALYSIS</b><br>Switch OFF printer power.<br>Allow the Fuser to cool to room temperature<br>Check the continuity between J114-2 and the left end of the Heat Rod.<br><b>Is there continuity between J114-2 and the left end of the Heat Rod?</b>  | Go to step 5               | Replace the Fuser Assembly         |
| <b>5</b> | <b>FUSER HARNESS ASSEMBLY ANALYSIS</b><br>Switch OFF printer power.<br>Unplug the AC line from the wall outlet.<br>Close the Front Cover.<br>Check the continuity between J112 and J114.<br><b>Is there continuity between J122 and J114?</b>   | Replace the Fuser Assembly | Replace the Fuser Harness Assembly |

Table 7-8. Heat Rod Failure (continued)

| Step     | Actions and Questions  | Yes  | No                         |
|----------|--|--|----------------------------|
| <b>6</b> | <b>OVERHEAT THERMOSTAT ANALYSIS</b><br>Inspect the Overheat Thermostat.<br><br><b>Is the Overheat Thermostat open?</b> | Replace the Fuser Assembly, then go to Table 6-7 Fuser Error.<br>If the Overheat Thermostat continues to open, replace all components associated with it, including the LVPS and the Main Controller PWBA. | Go to step 7               |
| <b>7</b> | <b>THERMAL FUSE ANALYSIS</b><br>Inspect the Thermal Fuse<br><br><b>Is the Thermal Fuse blown?</b>                      | Replace the Fuser Assembly, then go to Table 6-7 Fuser Error.<br>If the Overheat Thermostat continues to open, replace all components associated with it, including the LVPS and the Main Controller PWBA. | Replace the Fuser Assembly |

Table 7-9. Thermistor Failure

| Step     | Actions and Questions   | Yes                                 | No                             |
|----------|---|-------------------------------------|--------------------------------|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Main Controller PWBA</li> <li>• LVPS Assembly</li> <li>• Fuser Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                        | Replace the problem components |
| <b>2</b> | <b>THERMISTOR ANALYSIS</b><br>Inspect the Thermistor.<br><br><b>Is the Thermistor damaged, deformed, or contaminated?</b>   | Clean or replace the Fuser Assembly | Go to step 3                   |
| <b>3</b> | <b>THERMISTOR ANALYSIS</b><br>Switch OFF printer power.<br><br>Allow the Fuser to cool to room temperature.<br><br>Check the continuity between J13-4 and J13-5.<br><b>Is there approximately 200 <math>\Omega</math> to 350 <math>\Omega</math> between J13-4 and J13-5?</b>                               | Replace the Main Controller PWBA    | Replace the Fuser Assembly     |

Table 7-10. Exit Sensor Failure

| Step     | Actions and Questions   | Yes                              | No   |
|----------|---|----------------------------------|--|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Main Controller PWBA</li> <li>• LVPS Assembly</li> <li>• Harness Assembly Fuser</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b>                           | Go to step 2                     | Replace the problem components                 |
| <b>2</b> | <b>LVPS ANALYSIS</b><br>Disconnect P/J151 from the LVPS.<br>Check the voltage between P13-1 and P13-2.<br><b>Is there +1.2 VDC between P13-1 and P13-2?</b>   | Go to step 3                     | Go to Table 7-4 LVPS Assembly Failure (+5 VDC) |
| <b>3</b> | <b>EXIT SENSOR ACTUATING SIGNAL ANALYSIS</b><br>Disconnect P/J151 from the LVPS.<br>Check the voltage between P13-3 and P13-2.<br><b>Is there +5 VDC between P13-13 and P13-2?</b>  | Go to step 4                     | Replace the Main Controller PWBA               |
| <b>4</b> | <b>EXIT SENSOR ACTUATING SIGNAL ANALYSIS</b><br>Disconnect P/J151 from the LVPS.<br>Check the voltage between P13-3 and P13-2.<br>Use a piece of paper to actuate the Exit Sensor.<br><b>Is there +0 VDC between P13-13 and P13-2?</b><br>Remove the piece of paper from the Exit Sensor.<br><b>Is there +5 VDC between P13-13 and P13-2?</b> | Replace the Main Controller PWBA | Go to step 5                                   |
| <b>5</b> | <b>FUSER HARNESS ASSEMBLY ANALYSIS</b><br>Switch OFF printer power.<br>Unplug the AC line from the wall outlet.<br>Close the Front Cover.<br>Check the continuity between J13 and J132.<br><b>Is there continuity between J113 and J132?</b>  | Replace the Exit Sensor          | Replace the Fuser Harness Assembly             |

Table 7-11. Registration Sensor Failure

| Step     | Actions and Questions  | Yes                              | No   |
|----------|--|----------------------------------|--|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Main Controller PWBA</li> <li>• LVPS Assembly</li> <li>• Registration Sensor</li> <li>• Feed Roll Assembly</li> <li>• Harness Assembly P/H</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                     | Replace the problem components                 |
| <b>2</b> | <b>REGISTRATION POWER ANALYSIS</b><br>Disconnect P/J151 from the LVPS.<br>Check the voltage between P18-1 and P18-2.<br><b>Is there +1.2 VDC between P18-1 and P18-2?</b>  | Go to step 3                     | Go to Table 7-4 LVPS Assembly Failure (+5 VDC) |
| <b>3</b> | <b>REGISTRATION SENSOR SIGNAL ANALYSIS</b><br>Disconnect P/J151 from the LVPS.<br>Check the voltage between P18-3 and P18-2.<br><b>Is there +1.2 VDC between P18-3 and P18-2?</b>  | Go to step 4                     | Replace the Main Controller PWBA               |
| <b>4</b> | <b>REGISTRATION SENSOR SIGNAL ANALYSIS</b><br>Disconnect P/J151 from the LVPS.<br>Check the voltage between P18-3 and P18-2.<br>Use a piece of paper to actuate the Registration Sensor.<br><b>Is there +0 VDC between P18-3 and P18-2?</b><br>Remove the piece of paper from the Registration Sensor.<br><b>Is there +5 VDC between P18-3 and P18-2?</b>                      | Replace the Main Controller PWBA | Go to step 5                                   |
| <b>5</b> | <b>P/H HARNESS ASSEMBLY ANALYSIS</b><br>Switch OFF printer power.<br>Unplug the AC line from the wall outlet.<br>Close the Front Cover.<br>Check the continuity between J18 and J181.<br><b>Is there continuity between J18 and J181?</b>  | Replace the Registration Sensor  | Replace the P/H Harness Assembly               |

Table 7-12. LD Switch Failure

| Step     | Actions and Questions  | Yes   | No   |
|----------|--|---|--|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Main Controller PWBA</li> <li>• Print Cartridge Sensor PWBA</li> <li>• Print Cartridge Sensor</li> <li>• Print Cartridge</li> <li>• Print Cartridge Harness Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                                | Replace the problem components               |
| <b>2</b> | <b>PRINT CARTRIDGE SENSOR ANALYSIS</b><br>Remove and reinstall the Print Cartridge.<br><b>Does the Print Cartridge Switch function correctly</b>   | Go to step 4                                | Go to step 3                                 |
| <b>3</b> | <b>PRINT CARTRIDGE ANALYSIS</b><br>Check the tab on the Print Cartridge which presses the Print Cartridge Sensor Actuator.<br><b>Is the tab present on the Print Cartridge?</b><br><b>Does it press the Print Cartridge Sensor Actuator when you install the Print Cartridge?</b>  | Replace the Print Cartridge Sensor Actuator | Replace the Print Cartridge                  |
| <b>4</b> | <b>PRINT CARTRIDGE SENSOR PWBA ANALYSIS</b><br>Switch OFF printer power.<br>Disconnect P/J12 from the Main Controller PWBA.<br>Check the continuity between P171-1 and P171-2.<br><b>Is there continuity between P171-1 and P171-2?</b><br>Remove the Print Cartridge.<br><b>Is there no continuity between P171-1 and P171-2?</b>   | Go to step 5                                | Replace the Print Cartridge Sensor PWBA      |
| <b>5</b> | <b>PRINT CARTRIDGE HARNESS ASSEMBLY ANALYSIS</b><br>Switch OFF printer power.<br>Unplug the AC line from the wall outlet.<br>Close the Front Cover.<br>Check the continuity between J17 and J171.<br><b>Is there continuity between J17 and J171?</b>  | Replace the Main Controller PWBA            | Replace the Print Cartridge-Harness Assembly |

Table 7-13. Print Cartridge Switch Failure

| Step     | Actions and Questions  | Yes  | No   |
|----------|--|--|--|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Print Cartridge Sensor PWBA</li> <li>• Print Cartridge Sensor</li> <li>• Print Cartridge Harness Assembly</li> <li>• Controller PWBA</li> <li>• Print Cartridge</li> <li>• LVPS Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                                   | Replace the problem components               |
| <b>2</b> | <b>PRINT SENSOR ANALYSIS</b><br>Remove and reinstall the Print Cartridge.<br><br><b>Does the Print Cartridge press and release the LD Switch (S100) correctly?</b>   | Go to step 4                                   | Go to step 3                                 |
| <b>3</b> | <b>PRINT CARTRIDGE ANALYSIS</b><br>Check the tab on the Print Cartridge which presses the Print Cartridge Sensor Actuator.<br><br><b>Is the tab present on the Print Cartridge?</b><br><br><b>Does it press the Print Cartridge Sensor Actuator when you install the Print Cartridge?</b>  | Replace the Print Cartridge Sensor Actuator    | Replace the Print Cartridge                  |
| <b>4</b> | <b>PRINT CARTRIDGE SENSOR PWBA ANALYSIS</b><br>Disconnect P/J12 from the Main Controller PWBA.<br>Check the continuity between J171-1 and J171-2.<br><b>Is there continuity between J171-1 and J171-2?</b><br>Remove the Print Cartridge.<br><b>Is there no continuity between J171-1 and J171-2?</b>  | Go to step 5                                   | Replace the Print Cartridge Sensor PWBA      |
| <b>5</b> | <b>PRINT CARTRIDGE CHECK SENSOR SIGNAL</b><br>Disconnect P/J151 from the LVPS.<br>Check the voltage between P17-1 and P17-2.<br><b>Is there +0 VDC between P17-1 and P17-2?</b><br>Remove the Print Cartridge.<br><b>Is there +5 VDC between P17-1 and P17-2?</b>  | Replace the Main Controller PWBA               | Go to step 6                                 |
| <b>6</b> | <b>PRINT CARTRIDGE HARNESS ASSEMBLY ANALYSIS</b><br>Switch OFF printer power.<br>Check the continuity between J17 and J171.<br><b>Is there continuity between J17 and J171?</b>  | Go to Table 7-4 LVPS Assembly Failure (+5 VDC) | Replace the Print Cartridge Harness Assembly |



Table 7-14. Feed Solenoid Failure

| Step     | Actions and Questions  | Yes                       | No   |
|----------|--|---------------------------|--|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Main Controller PWBA</li> <li>• LVPS Assembly</li> <li>• Feed Solenoid</li> <li>• Feed Roll Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2              | Replace the problem components                 |
| <b>2</b> | <b>FEED SOLENOID POWER ANALYSIS</b><br>Disconnect P/J151 from the LVPS.<br>Check the voltage between P/J16–2 and P/J11–7.<br><b>Is there +24 VDC between P/J16–2 and P/J11–7?</b>  | Go to step 3              | Go to Table 7-5 LVPS Assembly Failure (+24VDC) |
| <b>3</b> | <b>FEED SOLENOID ACTUATING SIGNAL ANALYSIS</b><br>Generate a test print.<br>Check the voltage between P16–1 and P16–2.<br><b>Is there +23 VDC between P16–1 and P16–2?</b><br>Actuate the Feed Solenoid.<br><b>Is there 0 VDC between P16–1 and P16–2?</b>   | Replace the Feed Solenoid | Replace the Main Controller PWBA               |

Table 7-15. Drive Assembly Failure

| Step     | Actions and Questions  | Yes          | No  |
|----------|--|--------------|---|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Main Controller PWB</li> <li>• LVPS Assembly</li> <li>• Print Cartridge</li> <li>• Drive Assembly</li> <li>• Paper Feeder Assembly</li> <li>• Fuser Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2 | Replace the problem components                  |
| <b>2</b> | <b>DRIVE ASSEMBLY ANALYSIS</b><br>Remove the Drive Assembly.<br><br>Rotate counterclockwise, the gear on the Main Motor shaft.<br><br><i>NOTE: Do not rotate this gear clockwise.</i><br><br><b>Do all of the transmission gears rotate smoothly?</b>  | Go to step 3 | Replace the Drive Assembly                      |
| <b>3</b> | <b>FEED ASSEMBLY ANALYSIS</b><br>Remove the Feed Roll Assembly.<br><br>Manually actuate the Feed Solenoid while you rotate counter clockwise the Feed Roll Assembly.<br><br><b>Does the Feed Roll Assembly rotate smoothly?</b>  | Go to step 4 | Replace the Feed Roll Assembly                  |
| <b>4</b> | <b>MAIN MOTOR POWER ANALYSIS</b><br>Disconnect P/J151 from the LVPS.<br><br>Check the voltage between P14-1 and P11-7.<br><br><b>Is there +24 VDC between P14-1 and P11-7?</b><br><br>Check the voltage between P14-2 and P11-7.<br><br><b>Is there +24 VDC between P14-2 and P11-7?</b>   | Go to step 5 | Go to Table 7-5 LVPS Assembly Failure (+24 VDC) |

Table 7-16. Drive Assembly Failure (continued)

| Step     | Actions and Questions   | Yes                         | No                         |
|----------|---|-----------------------------|----------------------------|
| <b>5</b> | <b>MAIN MOTOR ANALYSIS</b><br>Switch OFF printer power.<br>Check the continuity between J14-1 and J14-3.<br><b>Is there 15 <math>\Omega</math> between J14-1 and J14-3?</b><br>Check the continuity between J14-1 and J14-5.<br><b>Is there 15 <math>\Omega</math> between J14-1 and J14-5?</b><br>Check the continuity between J14-2 and J14-4.<br><b>Is there 15 <math>\Omega</math> between J14-2 and J14-4?</b><br>Check the continuity between J14-2 and J14-6.<br><b>Is there 15 <math>\Omega</math> between J14-2 and J14-6?</b> | Go to step 6                | Replace the Drive Assembly |
| <b>6</b> | <b>MAIN CONTROLLER PWBA ANALYSIS</b><br>Replace the Main Controller PWBA with a known good PWBA.<br><b>Does the Drive Assembly still fail to work?</b>  | Go to step 7                | Replace the Drive Assembly |
| <b>7</b> | <b>PRINT CARTRIDGE ANALYSIS</b><br>Remove the Print Cartridge.<br>Rotate clockwise, the gear on the Main Motor shaft.<br><i>NOTE: Do not rotate this gear counterclockwise.</i><br><b>Does the Main Motor gear rotate smoothly?</b>   | Replace the Print Cartridge | Go to step 8               |
| <b>8</b> | <b>FUSER ASSEMBLY ANALYSIS</b><br>Remove the Fuser Assembly.<br>Rotate clockwise, the gear on the Main Motor shaft.<br><i>NOTE: Do not rotate this gear counterclockwise.</i><br><b>Do all of the transmission gears rotate smoothly?</b>   | Replace the Fuser Assembly  | Replace the Drive Assembly |

Table 7-16. Fan Failure

| Step     | Actions and Questions  | Yes   | No                                |
|----------|--|---|-----------------------------------|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following component: <ul style="list-style-type: none"> <li>• Exhaust Fan</li> <li>• Main Controller PWBA</li> <li>• Harness Assembly HVPS</li> <li>• HVPS</li> <li>• LVPS Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                                    | Replace the problem components    |
| <b>2</b> | <b>FAN POWER ANALYSIS</b><br>Disconnect P/J12 from the Main Controller PWBA<br><br>Check the voltage between P/J152-1 and P/J152-2.<br><b>Is there +24 VDC between P/J152-1 and P/J152-2?</b>  | Replace the Exhaust Fan                         | Go to step 3                      |
| <b>3</b> | <b>FAN POWER ANALYSIS</b><br>Disconnect P/J12 from the Main Controller PWBA<br><br>Check the voltage between P/J151-11 and P/J151-3.<br><b>Is there +24 VDC between P/J151-1 and P/J151-3?</b><br><br>Check the voltage between P/J151-12 and P/J151-4.<br><b>Is there +24 VDC between P/J151-12 and P/J151-4?</b>                                       | Replace the HVPS                                | Go to step 4                      |
| <b>4</b> | <b>HVPS HARNESS ASSEMBLY ANALYSIS</b><br>Switch OFF printer power.<br><br>Check the continuity between J15 and J151.<br><b>Is there continuity between J15 and J151?</b>   | Go to Table 7-5 LVPS Assembly Failure (+24 VDC) | Replace the HVPS Harness Assembly |

Table 7-17. HVPS CR/TR/DB Failure

| Step     | Actions and Questions  | Yes              | No   |
|----------|--|------------------|--|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Main Controller PWBA</li> <li>• HVPS</li> <li>• Drive Assembly</li> <li>• LVPS Assembly</li> <li>• Harness Assembly HVPS</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2     | Replace the problem components                 |
| <b>2</b> | <b>POWER TO HVPS ANALYSIS</b><br>Check the voltage between P15-1 and P15-9.<br><b>Is there +24 VDC between P15-1 and P15-9?</b>  | Go to step 3     | Go to Table 7-5 LVPS Assembly Failure (+24VDC) |
| <b>3</b> | <b>HVPS HARNESS ASSEMBLY ANALYSIS</b><br>Check the continuity between J15 and J151.<br><b>Is there 0Ω between J15 and J151?</b>  | Go to step 4     | Replace the HVPS Harness Assembly              |
| <b>4</b> | <b>DRIVE ASSEMBLY ANALYSIS</b><br>Check the Spring Plate Terminal on the Drive Assembly.<br><b>Does the Spring Plate contact the HVPS?</b>   | Go to step 5     | Replace the Drive Assembly                     |
| <b>5</b> | <b>PRINT CARTRIDGE ANALYSIS</b><br>Check the Spring Plate Terminal on the Drive Assembly.<br><b>Does the Spring Plate contact the terminal on the Print Cartridge?</b>   | Go to step 6     | Replace the Drive Assembly                     |
| <b>6</b> | <b>MAIN CONTROLLER PWBA ANALYSIS</b><br>Replace the Main Controller PWBA with a known good PWBA.<br><b>Is the HVPS CR/TR/DB failure still present?</b>   | Replace the HVPS | Problem solved                                 |

Table 7-18. LED Failure

| Step     | Actions and Questions   | Yes                  | No  |
|----------|---|----------------------|---|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• LED PWBA</li> <li>• Main Controller PWBA</li> <li>• Harness Assembly LED</li> <li>• LVPS Assembly</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2         | Replace the problem components                |
| <b>2</b> | <b>LED POWER ANALYSIS</b><br>Check the voltage between P/J32-3 and P/J11-7.<br><b>Is there +5 VDC between P/J32-3 and P/J11-7?</b>  | Go to step 3         | Go to Table 7-4 LVPS Assembly Failure (+5VDC) |
| <b>3</b> | <b>READY LED ACTUATING SIGNAL ANALYSIS</b><br>Check the voltage between P/J32-1 and P/J32-2.<br><b>Is there +5 VDC between P/J32-1 and P/J32-2 when the Ready To Print message appears?</b><br><b>Is there 0 VDC between P/J32-1 and P/J32-2 when an error message appears?</b>   | Go to step 4         | Replace the Main Controller PWBA              |
| <b>4</b> | <b>ERROR LED ACTUATING SIGNAL ANALYSIS</b><br>Check the voltage between P/J32-3 and P/J32-2.<br><b>Is there 0 VDC between P/J32-3 and P/J32-2 when the Ready To Print message appears?</b><br><b>Is there +5 VDC between P/J32-1 and P/J32-2 when an error message appears?</b>   | Go to step 5         | Replace the Main Controller PWBA              |
| <b>5</b> | <b>LED HARNESS ASSEMBLY ANALYSIS</b><br>Check the continuity between J32 and J321.<br><b>Is there 0 <math>\Omega</math> between J32 and J321?</b>   | Replace the LED PWBA | Replace the LED Harness Assembly              |

Table 7-19. Electrical Noise

| Step     | Actions and Questions   | Yes                                      | No                               |
|----------|---|--|----------------------------------|
| <b>1</b> | <b>INITIAL ANALYSIS</b><br>Inspect the following components: <ul style="list-style-type: none"> <li>• Main Controller PWBA</li> <li>• HVPS</li> <li>• Fuser Assembly</li> <li>• LVPS Assembly</li> <li>• Print Cartridge</li> <li>• Feed Roll Assembly</li> <li>• Harness Assembly P/H</li> <li>• Flat Cable LV</li> </ul> <b>Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?</b> | Go to step 2                             | Replace the problem components   |
| <b>2</b> | Check the AC power cable and the AC wall outlet.<br><b>Is the printer correctly grounded?</b>   | Go to step 3                             | Ground the printer               |
| <b>3</b> | Check the area around the printer.<br><b>Are there any electrical devices, such as a generator or an appliance, near the printer.</b>   | Move the device, or relocate the printer | Go to step 4                     |
| <b>4</b> | <b>LV FLAT CABLE ANALYSIS</b><br>Check the continuity at both ends of the LV Flat Cable.<br><b>Is there 0 <math>\Omega</math> between both ends of the Flat Cable LV?</b>   | Go to step 5                             | Replace the LV Flat Cable        |
| <b>5</b> | <b>P/H HARNESS ASSEMBLY ANALYSIS</b><br>Check the continuity at both ends of the P/H Harness Assembly.<br><b>Is there 0 <math>\Omega</math> between both ends of the P/H Harness Assembly?</b>  | Go to step 6                             | Replace the Harness Assembly P/H |
| <b>6</b> | <b>LVPS ASSEMBLY ANALYSIS</b><br>Check the continuity between P114–1 and the LVPS Assembly frame.<br><b>Is there 0 <math>\Omega</math> between P114–1 and the LVPS Assembly frame?</b>  | Go to step 7                             | Replace the LVPS Assembly        |
| <b>7</b> | <b>FUSER ASSEMBLY ANALYSIS</b><br>Remove the Fuser Top Cover Assembly. Do not remove the Fuser Assembly.<br>Check the continuity between the Eliminator Saw of the Fuser Assembly and the LVPS Assembly frame.<br><b>Is there 0 <math>\Omega</math> between the Eliminator Saw and the LVPS Assembly frame?</b>   | Go to step 8                             | Replace the Fuser Assembly       |

Table continued on next page





Table 7-20. Electrical Noise (continued)

| Step      | Actions and Questions  | Yes  | No                               |
|-----------|--|--|----------------------------------|
| <b>8</b>  | <b>FUSER ASSEMBLY ANALYSIS</b><br>Check the continuity between the Heat Roll of the Fuser Assembly and the LVPS Assembly frame.<br><br><b>Is there 0 <math>\Omega</math> between the Heat Roll and the LVPS frame?</b> | Go to step 9   | Replace the Fuser Assembly       |
| <b>9</b>  | <b>HVPS ANALYSIS</b><br>Disconnect P/J301, P/J302, P/J304 from the HVPS. Leave P/J151 connected.<br>Generate a test print.<br><b>Can you still hear the noise?</b>   | Go to step 10  | Replace the HVPS                 |
| <b>10</b> | <b>HVPS ANALYSIS</b><br>Reconnect P/J301, P/J302, P/J304 to the HVPS.<br>Generate a test print.<br><b>Can you still hear the noise?</b>  | Go to step 11  | Replace the Main Controller PWBA |
| <b>11</b> | <b>DRIVE ASSEMBLY ANALYSIS</b><br>Check the continuity on the Spring Plate Terminal on the Drive Assembly.<br><br><b>Is there 0 <math>\Omega</math> on the Spring Plate Terminal?</b>                                  | Go to step 12  | Replace the Drive Assembly       |
| <b>12</b> | <b>PRINT CARTRIDGE ANALYSIS</b><br>Replace the Print Cartridge with a new one.<br>Generate a test print<br><b>Can you still hear the noise?</b>  | Check the contact between the Print Cartridge and the Drive Assembly | Problem solved                   |

# Troubleshooting: Image Quality Problems **8**

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## Troubleshooting: Image Quality Problems 8


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The Fault Isolation Procedures Flowchart in Chapter 6 or a Level 1 FIP should have directed you to this section.

Before you use the Image Quality FIPs, verify the following:

1. Is the printer plugged into a recommended AC wall outlet?
2. Is the AC power provided at the wall outlet within recommended specifications?
3. Is the AC power cord connected to the printer.
4. Is the AC power cord in good condition-not frayed or broken?
5. Is the printer properly grounded through the AC wall outlet?
6. Is the printer located in an area where the temperature and humidity are moderate and stable?
7. Is the printer located in an area that is free of dust?
8. Is the printer located in an area away from water outlets, steamers, electric heaters, volatile gases, or open flames?
9. Is the printer shielded from the direct rays of the sun?
10. Does the printer have recommended space around all sides for proper ventilation?
11. Is the printer sitting on a level and stable surface?
12. Is recommended paper stock being used in the printer?
13. Does the customer use the printer as instructed in the *User's Guide*?
14. Are consumables, such as the Print Cartridge, replaced at recommended intervals?
15. Have you read and understood the Service **Warnings**?

### Service Warnings

 **WARNING:** Disconnect P/J 151 from the HVPS before proceeding with repairs with the print power ON. If a PIP instructs you to connect P/J 151 in order to check a component or make a test, be careful. High voltage is present in the circuitry.

Disconnect P/J 12 from the Controller PWB before proceeding with repairs with print power ON. The Laser Beam is active when P/J 12 is connected to the Controller PWB.

Be careful when working around the Fuser area. It is very hot.

## Working With Image Quality Problems

Use Letter size or A4 paper when troubleshooting an image quality problem.

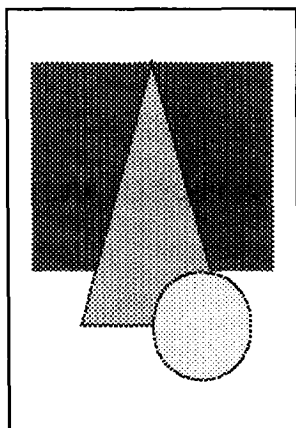
Image quality FIPs assume there is no malfunction of the printer controller. Use Printing Test Mode to determine whether an image quality problem is caused by the printer or by the controller. If you observe an image quality problem on regular prints but not on test prints, the problem may be with the printer controller.

If you are unable to solve the problem using image quality Fault Isolation Procedures, we recommend that you replace the printer controller with a known-good controller. If the problem still persists, we recommend you replace each component listed in Initial Analysis of the problem FIP, one by one, until you solve the problem.

Chapter 8 provides FIPs to solve the following image quality problems:

- ☐ Light (Undertoned) Prints
- ☐ Blank Prints
- ☐ Black Prints
- ☐ Vertical Band Deletions
- ☐ Vertical Linear Deletion
- ☐ Horizontal Band Deletions
- ☐ Vertical Streaks
- ☐ Horizontal Streaks
- ☐ Spot Deletions
- ☐ spots
- ☐ Residual Image
- ☐ Background
- ☐ Skewed Image
- ☐ Damaged Prints
- ☐ Unfused Image

# Light (Undertone) Prints



**PROBLEM** The overall image density is lighter than normal.

## INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?

Ž Print Cartridge      Ž HVPS  
 Ž Drive Assembly      Ž Laser Scanner Assembly  
 Ž Controller PWB      Ž HVPS Harness Assembly  
 Ž LVPS Assembly      Ž Fuser Assembly  
 Ž P/H Harness Assembly

2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?
3. Check the toner density setting in the EPSON Control Panel on the host computer.

**Table 8-1. Light Prints**

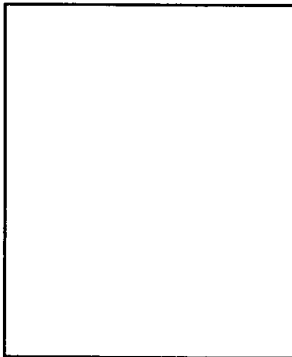
| Step | Actions and Questions  | Yes                    | No  |
|------|--|------------------------|---|
| 1    | <b>PAPER CONDITIONS</b><br>Is there moisture in the paper?   | Load fresh, dry paper. | Go to step 2  |
| 2    | <b>DRUM GROUND</b><br>Check the Drum Ground Path:<br>Drum>Pin at right end of drum shaft>Drive Assembly>HVPS> MCU PWB>LVPS Assembly>Drum>Pin at right end of drum shaft>Print Cartridge earth spring>PWBA chassis.<br>Is the Drum Ground Path functioning correctly? | Go to step 3           | Connect the Drum Ground Path correctly                        |
| 3    | <b>LASER BEAM PATH</b><br>Inspect the laser beam path, between the Laser Scanner Assembly and the Drum, for contamination or obstructions.<br>Is the laser beam path free of obstacles?  | Go to step 4           | Remove obstructions or contamination from the laser beam path |
| 4    | <b>HVPS DB FAILURE</b><br>Inspect the Spring Plate on the Drive Assembly.<br>Does the Spring Plate contact the HVPS?   | Go to step 5           | Go to Table 7-17 HVPS CR/TR/DB Failure                        |

Table continued on next page

Table 8-1. Light Prints (continued)

| Step | Actions and Questions   | Yes                                    | No               |
|------|---|--|------------------|
| 5    | <p><b>IMAGE TRANSFER PROCESS FAILURE</b></p> <p>Generate a test print and switch OFF printer power halfway through the print cycle.</p> <p>Remove the Print Cartridge and inspect the toner image on the drum.</p> <p><b>Was a dark image formed on the drum?</b></p> | Go to Table 7-17 HVPS CR/TR/DB Failure | Go to step 6     |
| 6    | <p><b>PRINT CARTRIDGE FAILURE</b></p> <p>Replace the Print Cartridge with a new one.</p> <p><b>Is the problem solved?</b></p>   |  | Return to step 1 |

# Blank Prints



**PROBLEM** The entire print is blank.

## INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?

✓ Print Cartridge      ✓ HVPS  
 ✓ Drive Assembly      ✓ Laser Scanner Assembly  
 ✓ Controller PWB      ✓ HVPS Harness Assembly  
 ✓ LVPS Assembly      ✓ Fuser Assembly  
 ✓ P/H Harness Assembly

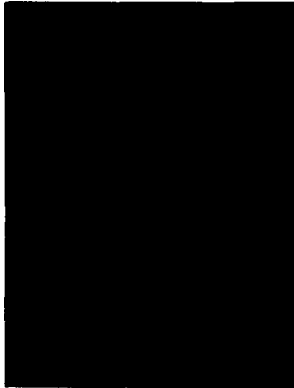
2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

**Table 8-2. Blank Prints**

| Step | Actions and Questions   | Yes   | No  |
|------|---|---|---|
| 1    | <b>LASER BEAM PATH</b><br>Inspect the laser beam path, between the Laser Scanner Assembly and the Drum, for contamination or obstructions.<br><b>Is the laser beam path free of obstacles?</b>  | Go to step 2                                      | Remove obstructions or contamination from the laser beam path |
| 2    | <b>LASER SCANNER ASSEMBLY FAILURE</b><br>Block the Main Charger by placing a piece of insulated tape over the Charge Roll contact on the lower left side of the Print Cartridge, next to the Coil Spring.<br>Generate a test print.<br><b>Is the print black?</b> | Go to Table 7-7 LS Assembly or Controller failure | Go to step 3  |
| 3    | <b>HVPS DB FAILURE</b><br>Inspect the Spring Plate on the Drive Assembly.<br><b>Does the Spring Plate contact the HVPS?</b>   | Go to step 4                                      | Go to Table 7-17 HVPS CR/ TR/DB Failure                       |
| 4    | <b>IMAGE TRANSFER PROCESS FAILURE</b><br>Generate a test print and switch OFF printer power halfway through the print cycle.<br>Remove the Print Cartridge and inspect the toner image on the drum.<br><b>Was a dark image formed on the drum?</b>                | Go to Table 7-17 HVPS CR/ TR/DB Failure           | Go to step 5  |
| 5    | <b>PRINT CARTRIDGE FAILURE</b><br>Replace the Print Cartridge with a new one.<br><b>Is the problem solved?</b>  | Problem solved                                    | Return to step 1  |



## Black Prints



**PROBLEM** The entire print is black.

### INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?

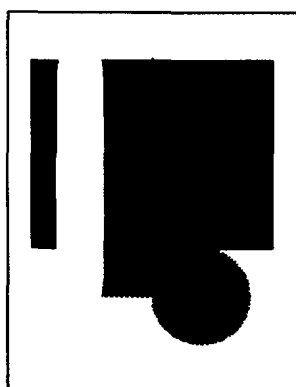
✓ Print Cartridge      ✓ HVPS  
 ✓ Drive Assembly      ✓ Laser Scanner Assembly  
 ✓ Controller PWBA      ✓ HVPS Harness Assembly

2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

**Table 8-3. Black Prints**

| Step | Actions and Questions   | Yes  | No                                     |
|------|---|--|--|
| 1    | <b>LASER SCANNER ASSEMBLY FAILURE</b><br>Cover half of the Laser Scanner window (laser beam outlet) with a piece of paper.<br>Generate a test print.<br><b>Is the print black only in the corresponding area of the Laser Scanner window not covered?</b> | Go to Table 7-7 Laser Scanner Assembly or Controller Failure | Go to Table 7-17 HVPS CR/TR/DB Failure |
| 2    | <b>PRINT CARTRIDGE FAILURE</b><br>Replace the Print Cartridge with a new one.<br><b>Is the problem solved?</b>  | Problem solved   | Return to step 1                       |

# Vertical Band Deletions



## PROBLEM

There are areas of the image that are extremely light or missing entirely. These missing areas form wide bands that run vertically along the page, in the direction of paper travel.

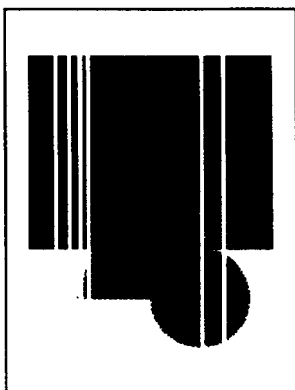
## INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?
  - Ž Print Cartridge
  - Ž Controller PWBA
  - Ž Fuser Assembly
  - Ž Laser Scanner Assembly
  - Ž Laser Scanner Window
2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

Table 8-4. Vertical Band Deletions

| Step | Actions and Questions   | Yes                                 | No  |
|------|---|-------------------------------------|---|
| 1    | <b>PAPER CONDITIONS</b><br>Inspect the paper that is loaded in the Input Tray.<br><b>Is there moisture in the paper?</b><br><b>Is the paper wrinkled?</b>   | Replace with fresh, dry paper       | Go to step 2  |
| 2    | <b>LASER BEAM PATH</b><br>Inspect the laser beam path, between the Laser Scanner Assembly and the Drum, for contamination or obstructions.<br><b>Is the laser beam path free of obstacles?</b>  | Go to step 2                        | Remove obstructions or contamination from the laser beam path |
| 3    | <b>LASER SCANNER ASSEMBLY FAILURE</b><br>Block the Main Charger by placing a piece of insulated tape over the Charge Roll contact on the lower left side of the Print Cartridge, next to the Coil Spring.<br>Generate a test print.<br><b>Is the print black?</b> | Go to Table 7-7 LS Assembly failure | Go to step 4  |
| 4    | <b>PRINT CARTRIDGE FAILURE</b><br>Replace the Print Cartridge with a new one.<br><b>Is the problem solved?</b>  | Problem solved                      | Return to step 1  |

## Vertical Linear Deletions



### PROBLEM

There are areas of the image that are extremely light or missing entirely. These missing areas form narrow lines running vertically along the pages, in the direction of paper travel.

### INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?
  - Ž Print Cartridge
  - Ž Heat Roll
  - Ž Fuser Assembly
  - Ž Laser Scanner Window
  - Ž Controller PWBA
  - Ž Pressure Roll
  - Ž Laser Scanner Assembly
2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

Table 8-5. Vertical Linear Deletions

| Step | Actions and Questions  | Yes                                 | No  |
|------|--|-------------------------------------|---|
| 1    | <b>LASER BEAM PATH</b><br>Inspect the laser beam path, between the Laser Scanner Assembly and the Drum, for contamination or obstructions.<br><b>Is the laser beam path free of obstacles?</b>   | Go to step 2                        | Remove obstructions or contamination from the laser beam path |
| 2    | <b>LASER SCANNER ASSEMBLY FAILURE</b><br>Block the Main Charger by placing a piece of insulated tape over the Charge Roll contact on the lower left side of the Print Cartridge, next to the Coil Spring. Generate a test print.<br><b>Is the print black?</b> | Go to Table 7-7 LS Assembly failure | Go to step 3  |
| 3    | <b>PRINT CARTRIDGE FAILURE</b><br>Replace the Print Cartridge with a new one.<br><b>Is the problem solved?</b>   | Problem solved                      | Go to step 4  |
| 4    | <b>HEAT ROLL DAMAGE</b><br>Inspect the Heat Roll for scratches, objects, or contamination.<br><b>Is the Heat Roll free of scratches and contamination?</b>   | Go to step 5                        | Replace the Heat Roll   |
| 5    | <b>PAPER PATH</b><br>Inspect the paper path, between Input Tray and Exit Tray for contamination or obstructions.<br><b>Is the paper path free of obstructions?</b>   | Problem solved                      | Remove obstructions or contamination from the paper path      |

# Horizontal Band Deletions

## PROBLEM

There are areas of the image that are extremely light or missing entirely. These areas form wide bands that run horizontally across the page, perpendicular to the direction of paper travel.

## INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version; correctly installed, not damaged, deformed, or contaminated?

Ž Print Cartridge      Ž Controller PWBA

Ž HVPS                      Ž Drive Assembly

Ž Heat Roll                Ž Pressure Roll

Ž Fuser Assembly      Ž Laser Scanner Assembly

2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

Table 8-6. Horizontal Band Deletions

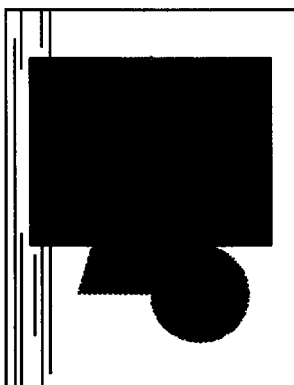
| Step | Actions and Questions  | Yes   | No                                      |
|------|--|---|---|
| 1    | <b>PAPER CONDITIONS</b><br>Inspect the paper that is loaded in the Input Tray.<br><b>Is there moisture in the paper?</b><br><b>Is the paper wrinkled?</b>  | Replace with fresh, dry paper                     | Go to step 2                            |
| 2    | <b>DRIVE ASSEMBLY FAILURE</b><br>Generate a test print.<br><b>Are the Drive Assembly gears turning the Print Cartridge gear?</b>   | Go to step 3                                      | Go to Table 7-16 Drive Assembly Failure |
| 3    | <b>LASER SCANNER ASSEMBLY FAILURE</b><br>Block the Main Charger by placing a piece of insulated tape over the Charge Roll contact on the lower left side of the Print Cartridge, next to the Coil Spring. Generate a test print.<br><b>Is the print black?</b> | Go to Table 7-7 LS Assembly or Controller failure | Go to step 4                            |

Continued on next page

Table 8-6. Horizontal Band Deletions (continued)

| Step | Actions and Questions   | Yes                        | No                                     |
|------|---|----------------------------|--|
| 4    | <b>IMAGE TRANSFER PROCESS FAILURE</b><br>Generate a test print and switch OFF printer power half-way through the print cycle.<br>Remove the Print Cartridge and inspect the toner image on the drum.<br><b>Was a dark image formed on the drum?</b> | Go to step 5               | Go to Table 7-17 HVPS CR/TR/DB Failure |
| 5    | <b>INTERMITTENT CONTACT</b><br>Generate a test print and check for intermittent contact between the print cartridge and the print engine.<br><b>Is contact intermittent?</b>  | Tighten connections        | Go to step 6                           |
| 6    | <b>PRINT CARTRIDGE FAILURE</b><br>Replace the Print Cartridge with a new one.<br><b>Is the problem solved?</b>  | Problem solved             | Go to step 7                           |
| 7    | <b>HEAT ROLL DAMAGE</b><br>Inspect the Heat Roll for scratches, objects, or contamination.<br><b>Is the Heat Roll free of scratches and contamination?</b>  | Go to step 8               | Replace the Heat Roll                  |
| 8    | <b>HEAT ROLL DAMAGE</b><br><b>Do the band deletions occur at intervals of approximately 54.0 mm?</b>  | Replace the Fuser Assembly | Go to step 9                           |
| 9    | <b>PRESSURE ROLL DAMAGE</b><br>Inspect the Pressure Roll for scratches, objects, or contamination.<br><b>Is the Pressure Roll free of scratches and contamination?</b>  | Go to step 10              | Replace the Fuser Assembly             |
| 10   | <b>PRESSURE ROLL DAMAGE</b><br><b>Do the band deletions occur at intervals of approximately 53.0 mm?</b>  | Replace the Fuser Assembly | Return to step 1                       |

# Vertical Streaks



## PROBLEM

There are black lines running vertically along the page.

## INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?
  - Ž Print Cartridge
  - Ž HVPS
  - Ž Heat Roll
  - Ž Fuser Assembly
  - Ž Laser Scanner Window
  - Ž Controller PWBA
  - Ž Drive Assembly
  - Ž Pressure Roll
  - Ž Laser Scanner Assembly
2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

Table 8-7. Vertical Streaks

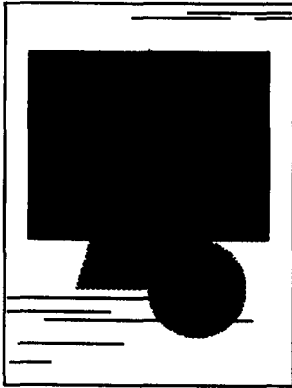
| Step | Actions and Questions  | Yes  | No  |
|------|--|--|---|
| 1    | <b>LASER BEAM PATH</b><br>Inspect the laser beam path, between the Laser Scanner Assembly and the Drum, for contamination or obstructions.<br><b>Is the laser beam path free of obstacles?</b>   | Go to step 2   | Remove obstructions or contamination from the laser beam path |
| 2    | <b>IMAGE TRANSFER PROCESS FAILURE</b><br>Generate a test print and switch OFF printer power halfway through the print cycle.<br><b>Are streaks placed on paper before fusing?</b>  | Go to step 4   | Go to step 5  |
| 3    | <b>LASER SCANNER ASSEMBLY FAILURE</b><br>Cover half of the Laser Scanner window (laser beam outlet) with a piece of paper.<br>Generate a test print.<br><b>Are the streaks printed only in the corresponding area of the Laser Scanner window not covered?</b> | Go to Table 7-7 Laser Scanner Assembly or Controller Failure | Go to step 4  |
| 4    | <b>PRINT CARTRIDGE FAILURE</b><br>Replace the Print Cartridge with a new one.<br><b>Is the problem solved?</b>   | Problem solved   | Go to step 5  |

Table continued on next page

Table 8-7. Vertical Streaks (continued)

| Step | Actions and Questions  | Yes                        | No                         |
|------|--|----------------------------|----------------------------|
| 5    | <b>HEAT ROLL DAMAGE</b><br>Inspect the Heat Roll for scratches, objects, or contamination.<br><b>Is the Heat Roll free of scratches and contamination?</b> | Go to step 6               | Replace the Fuser Assembly |
| 6    | <b>HEAT ROLL DAMAGE</b><br><b>Do the streaks occur at intervals of approximately 54.0 mm?</b>  | Replace the Fuser Assembly | Return to step 1           |

# Horizontal Streaks



## PROBLEM

There are black lines running horizontally across the page.

## INITIAL ANALYSIS

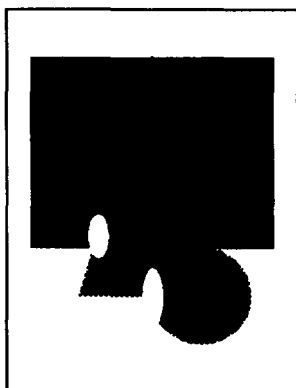
1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?
  - Ž Print Cartridge
  - Ž HVPS
  - Ž Heat Roll
  - Ž Fuser Assembly
  - Ž HVPS Harness Assembly
  - Ž Controller PWBA
  - Ž Drive Assembly
  - Ž Pressure Roll
  - Ž Laser Scanner Assembly
  - Ž LVPS Assembly
2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

Table 8-8. Horizontal Streaks

| Step | Actions and Questions   | Yes                                    | No   |
|------|---|--|--|
| 1    | <b>HVPS CR/TR FAILURE</b><br>Cover the Laser Scanner window (laser beam outlet) with a piece of paper.<br>Generate a test print.<br><b>Are the streaks still present?</b> | Go to Table 7-17 HVPS CR/TR/DB Failure | Go to Table 7-7 Laser Scanner Assembly or Controller Failure |
| 2    | <b>HVPS DB FAILURE</b><br>Inspect the Spring Plate on the Drive Assembly.<br><b>Does the Spring Plate contact the HVPS?</b>   | Go to step 3                           | Go to Table 7-17 HVPS CR/TR/DB Failure                       |
| 3    | <b>PRINT CARTRIDGE FAILURE</b><br>Replace the Print Cartridge with a new one.<br><b>Is the problem solved?</b>  | Problem solved                         | Go to step 4   |
| 4    | <b>HEAT ROLL DAMAGE</b><br>Inspect the Heat Roll for scratches, objects, or contamination.<br><b>Is the Heat Roll free of scratches and contamination?</b>                | Go to step 5                           | Replace the Fuser Assembly                                   |
| 5    | <b>HEAT ROLL DAMAGE</b><br><b>Do the streaks occur at intervals of approximately 54.0 mm?</b>   | Replace the Fuser Assembly             | Go to step 6   |
| 6    | <b>NOISE</b><br><b>Do you suspect a noise problem?</b>  | Go to Table 7-19 Electrical Noise      | Return to step 1   |



## Spot Deletions



### PROBLEM

There are areas of the image that are extremely light or missing entirely. These missing areas form spots that are localized to small areas of the page.

### INITIAL ANALYSIS

1. Inspect the following components. **Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?**

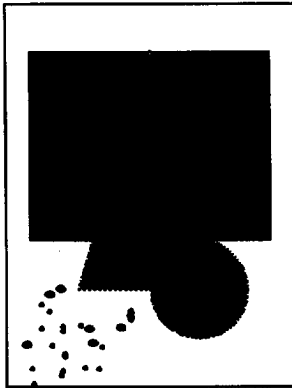
Ž Print Cartridge      Ž Fuser Assembly  
Ž Heat Roll              Ž Pressure Roll

2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

Table 8-9. Spot Deletions

| Step | Actions and Questions  | Yes                        | No                            |
|------|--|----------------------------|-------------------------------|
| 1    | <b>PAPER CONDITIONS</b><br>Inspect the paper that is loaded in the Input Tray.<br><b>Is there moisture in the paper?</b><br><b>Is the paper wrinkled?</b>              | Go to step 2               | Replace with fresh, dry paper |
| 2    | <b>PRINT CARTRIDGE FAILURE</b><br>Replace the Print Cartridge with a new one.<br><b>Is the problem solved?</b>   | Problem solved             | Go to step 3                  |
| 3    | <b>HEAT ROLL DAMAGE</b><br>Inspect the Heat Roll for scratches, objects, or contamination.<br><b>Is the Heat Roll free of scratches and contamination?</b>             | Go to step 4               | Replace the Fuser Assembly    |
| 4    | <b>HEAT ROLL DAMAGE</b><br><b>Do the spot deletions occur at intervals of approximately 54.0 mm?</b>   | Replace the Fuser Assembly | Go to step 5                  |
| 5    | <b>PRESSURE ROLL DAMAGE</b><br>Inspect the Pressure Roll for scratches, objects, or contamination.<br><b>Is the Pressure Roll free of scratches and contamination?</b> | Go to step 6               | Replace the Fuser Assembly    |
| 6    | <b>PRESSURE ROLL DAMAGE</b><br><b>Do the spot deletions occur at intervals of approximately 53.0 mm?</b>   | Replace the Fuser Assembly | Return to step 1              |

# Spots



## PROBLEM

There are spots of toner randomly scattered across the page.

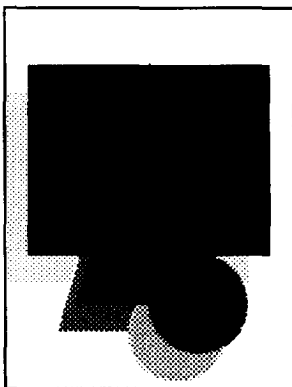
## INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?  
 Ž Print Cartridge      Ž Fuser Assembly  
 Ž Heat Roll              Ž Pressure Roll
2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

Table 8-10. Spots

| Step | Actions and Questions  | Yes                        | No                         |
|------|--|----------------------------|----------------------------|
| 1    | <b>PRINT CARTRIDGE FAILURE</b><br>Replace the Print Cartridge with a new one.<br><br><b>Is the problem solved?</b>   | Problem solved             | Go to step 2               |
| 2    | <b>HEAT ROLL DAMAGE</b><br>Inspect the Heat Roll for scratches, objects, or contamination.<br><br><b>Is the Heat Roll free of scratches and contamination?</b>             | Go to step 3               | Replace the Fuser Assembly |
| 3    | <b>HEAT ROLL DAMAGE</b><br>Do the spots occur at intervals of approximately 54.0 mm?   | Replace the Fuser Assembly | Go to step 4               |
| 4    | <b>PRESSURE ROLL DAMAGE</b><br>Inspect the Pressure Roll for scratches, objects, or contamination.<br><br><b>Is the Pressure Roll free of scratches and contamination?</b> | Replace the Fuser Assembly | Go to step 5               |
| 5    | <b>PRESSURE ROLL DAMAGE</b><br>Do the spots occur at intervals of approximately 53.0 mm?   | Replace the Fuser Assembly | Return to step 1           |

## Residual Image



### PROBLEM

There are ghost images appearing on the page. The images may be ghosts of the previous page or parts of the page being printed.

### INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?
  - Ž Print Cartridge      Ž Fuser Assembly
  - Ž Heat Roll              Ž Pressure Roll
  - Ž Drive Assembly      Ž HVPS
  - Ž Main Controller PWBA
2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

Table 8-11. Residual Image

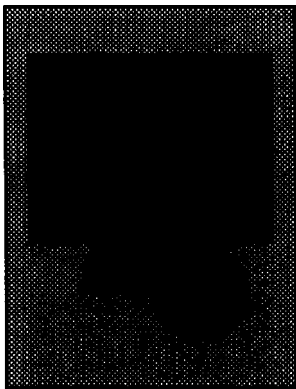
| Step | Actions and Questions   | Yes            | No                            |
|------|---|----------------|-------------------------------|
| 1    | <b>ENVIRONMENTAL CONDITIONS</b><br>Check for excess humidity or extremes in temperature.<br><b>Does the printer's environment meet the specified standards?</b> | Go to step 2   | Move the printer              |
| 2    | <b>PAPER CONDITIONS</b><br>Inspect the paper that is loaded in the Input Tray.<br><b>Is there moisture in the paper?</b><br><b>Is the paper wrinkled?</b>       | Go to step 3   | Replace with fresh, dry paper |
| 3    | <b>PRINT CARTRIDGE FAILURE</b><br>Replace the Print Cartridge with a new one.<br><b>Is the problem solved?</b>  | Problem solved | Go to step 4                  |
| 4    | <b>HEAT ROLL DAMAGE</b><br>Inspect the Heat Roll for scratches, objects, or contamination.<br><b>Is the Heat Roll free of scratches and contamination?</b>      | Go to step 5   | Replace the Fuser Assembly    |

Table continued on next page

Table 8-11. Residual Image (continued)

| Step | Actions and Questions   | Yes                        | No                         |
|------|---|----------------------------|----------------------------|
| 5    | <b>HEAT ROLL DAMAGE</b><br>Do the images occur at intervals of approximately 54.0 mm?   | Replace the Fuser Assembly | Go to step 6               |
| 6    | <b>PRESSURE ROLL DAMAGE</b><br>Inspect the Pressure Roll for scratches, objects, or contamination.<br>Is the Pressure Roll free of scratches and contamination? | Go to step 7               | Replace the Fuser Assembly |
| 7    | <b>PRESSURE ROLL DAMAGE</b><br>Do the images occur at intervals of approximately 53.0 mm?   | Replace the Fuser Assembly | Return to step 1           |

## Background



### PROBLEM

There is toner contamination on all or part of the page. The contamination appears as a very light gray dusting.

### INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?

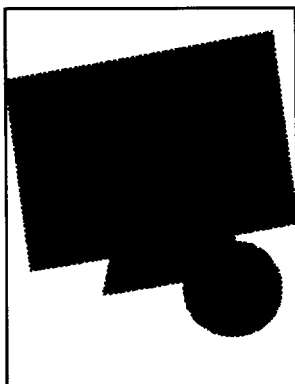
|                          |                        |
|--------------------------|------------------------|
| ✓ Print Cartridge        | ✓ HVPS                 |
| ✓ Drive Assembly         | ✓ Main Controller PWBA |
| ✓ HVPS Harness Assembly  | ✓ LVPS Assembly        |
| ✓ Laser Scanner Assembly |                        |

2. inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

**Table 8-12. Background**

| Step | Actions and Questions  | Yes            | No  |
|------|--|----------------|---|
| 1    | <b>ENVIRONMENTAL CONDITIONS</b><br>Does the printer's environment meet the specified standards?                      | Go to step 2   | Move the printer                              |
| 2    | <b>HVPS DB FAILURE</b><br>Inspect the Spring Plate on the Drive Assembly.<br>Does the Spring Plate contact the HVPS? | Go to step 3   | Go to Table 7-17<br>HVPS CR/TR/<br>DB Failure |
| 3    | <b>PRINT CARTRIDGE FAILURE</b><br>Replace the Print Cartridge with a new one.<br>Is the problem solved?              | Problem solved | Return to Initial Analysis                    |

## Skewed Image



### PROBLEM

The printed image is not parallel with the sides of the page.

### INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?

Ž Print Cartridge

Ž FeedRoll Assembly

Ž Paper Feeder Assembly

Ž Laser Scanner Assembly

2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

Table 8-13. Skewed Image

| Step | Actions and Questions  | Yes                        | No   |
|------|--|----------------------------|--|
| 1    | <b>PAPER CONDITIONS</b><br>Inspect the paper that is loaded in the Input Tray.<br><b>Is the paper loaded correctly?</b>  | Go to step 2               | Reload the paper. Make sure it is straight               |
| 2    | <b>PRINT CARTRIDGE FAILURE</b><br>Replace the Print Cartridge with a new one.<br><b>Is the problem solved?</b>   | Problem solved             | Go to step 3   |
| 3    | <b>PAPER PATH</b><br>Inspect the paper path, between Input Tray and Exit Tray for contamination or obstructions.<br><b>Is the paper path free of obstructions?</b>                               | Go to step 4               | Remove obstructions or contamination from the paper path |
| 4    | <b>PAPER TRANSPORT ROLLERS</b><br>Inspect all of the rollers in the paper path.<br>Do all of the rollers rotate correctly?<br><b>Are all of the rollers clean and free of defects and burrs?</b> | Return to Initial Analysis | Replace the problem roller assembly                      |

## Damaged Prints

### PROBLEM

The printed page comes out of the printer either wrinkled, creased, or torn.

### INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?

    ✗ Fuser Assembly    ✗ Pressure Roll

    ✗ HeatRoll

2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scraps?

Table 8-14. Damaged Prints

| Step | Actions and Questions   | Yes                           | No   |
|------|---|-------------------------------|--|
| 1    | <b>PAPER CONDITIONS</b><br>Inspect the paper that is loaded in the Input Tray.<br><b>Is there moisture in the paper?</b><br><b>Is the paper wrinkled?</b>                                 | Replace with fresh, dry paper | Go to step 2   |
| 2    | <b>HEAT ROLL DAMAGE</b><br>Inspect the Heat Roll for scratches, objects, or contamination.<br><b>Is the Heat Roll free of scratches and contamination?</b>                                | Go to step 3                  | Replace the Fuser Assembly                               |
| 3    | <b>PRESSURE ROLL DAMAGE</b><br>Inspect the Pressure Roll for scratches, objects, or contamination.<br><b>Is the Pressure Roll free of scratches and contamination?</b>                    | Go to step 4                  | Replace the Fuser Assembly                               |
| 4    | <b>SKEWED IMAGE</b><br>Inspect the print.<br><b>Is the print image skewed?</b>  | Go to Skewed Image            | Go to step 5   |
| 5    | <b>PAPER PATH</b><br>Inspect the paper path, between Input Tray and Exit Tray for contamination or obstructions.<br><b>Is the paper path free of obstructions?</b>                        | Go to step 6                  | Remove obstructions or contamination from the paper path |
| 6    | <b>PAPER TRANSPORT ROLLERS</b><br>Inspect all of the rollers in the paper path.<br><b>Do the rollers rotate correctly?</b><br><b>Are the rollers clean and free of defects and burrs?</b> | Return to Initial Analysis    | Replace the problem roller assembly                      |

# Unfused Image

## PROBLEM

The printed image is not fully fused to the paper. The image easily rubs off.

## INITIAL ANALYSIS

1. Inspect the following components. Are they compatible with your printer version, correctly installed, not damaged, deformed, or contaminated?

Ž Controller PWBA    Ž Fuser Assembly  
Ž HeatRoll              Ž Pressure Roll

2. Inspect the printer paper path. Is it clear of foreign matter such as staples, paper clips, and paper scrap?

Table 8-15. Unfused Image

| Step | Actions and Questions  | Yes                        | No                             |
|------|--|----------------------------|--------------------------------|
| 1    | <b>PAPER CONDITIONS</b><br>Inspect the paper that is loaded in the Input Tray.<br><b>Is there moisture in the paper?</b><br><b>Is the paper wrinkled?</b>              | Go to step 2               | Replace with fresh, dry paper. |
| 2    | <b>HEAT ROLL DAMAGE</b><br>Inspect the Heat Roll for scratches, objects, or contamination.<br><b>Is the Heat Roll free of scratches and contamination?</b>             | Go to step 3               | Replace the Fuser Assembly     |
| 3    | <b>PRESSURE ROLL DAMAGE</b><br>Inspect the Pressure Roll for scratches, objects, or contamination.<br><b>Is the Pressure Roll free of scratches and contamination?</b> | Return to Initial Analysis | Replace the Fuser Assembly     |





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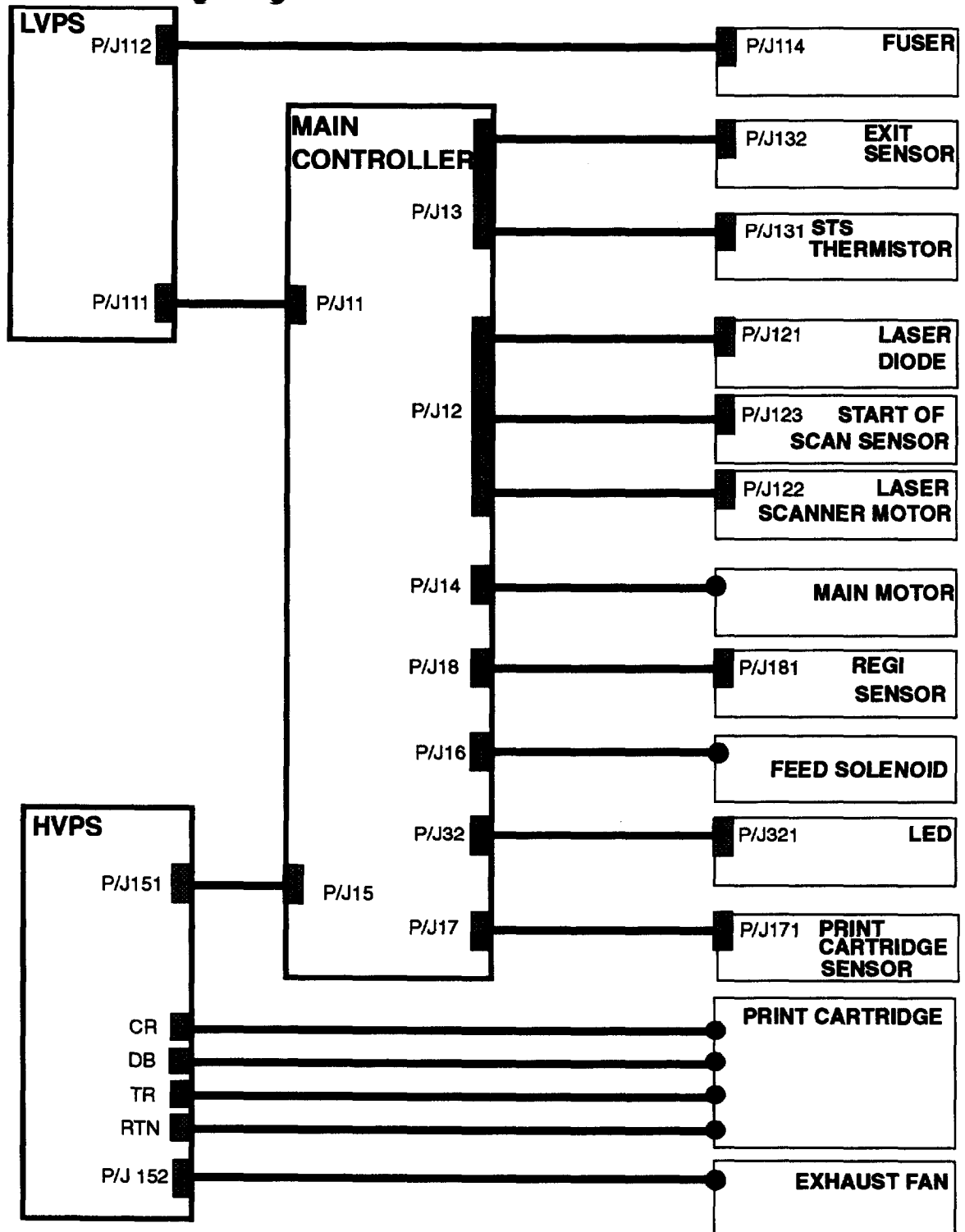
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# Appendix A

Master Wiring Diagram



## Interconnection Wiring Diagrams

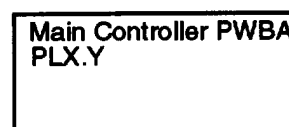
In this section, the Master Wiring Diagram is divided into nine individual blocks to better illustrate the electrical relationship between components and assemblies within the printer. Each wire in the illustrations is tagged with a signal name and terminated at both ends with a pin number.

- ☐ LVPS Assembly-Main Controller PWBA  
Shows connections between the LVPS Assembly and the Main Controller PWBA.
- ☐ LVPS Assembly-Fuser Assembly  
Shows connections between the LVPS Assembly and the Fuser Assembly.
- ☐ Main Controller PWBA-Laser Scanner Assembly  
Shows connections between the Main Controller PWBA and the Laser Scanner Assembly.
- ☐ Main Controller PWBA-Main Motor  
Shows connections between the Main Controller PWBA and the Main Motor.
- ☐ Main Controller PWBA-HVPS-Print Cartridge-Exhaust Fan  
Shows connections between the Main Controller PWBA and the HVPS, between the HVPS and the Print Cartridge, and between the HVPS and the Exhaust Fan.
- ☐ Main Controller PWBA-Exit Sensor/Thermistor  
Shows connections between the Main Controller PWBA and the Exit Sensor, and between the Main Controller PWBA and the Thermistor.
- ☐ Main Controller PWBA-Registration Sensor/Feed Solenoid  
Shows connections between the Main Controller PWBA and the Registration Sensor, and between the Main Controller PWBA and the Feed Solenoid.
- ☐ Main Controller PWBA-Print Cartridge Sensor PWBA  
Shows connections between the Main Controller PWBA and the Print Cartridge Sensor PWBA
- ☐ Main Controller PWBA-LED PWBA  
Shows connections between the Main Controller PWBA and the LED PWBA

The Interconnection Wiring diagrams use the following circuit notations to describe components and signal paths within the printer.

#### A MAJOR COMPONENT

The top line is the name of the component. The second line is where you will find this component in the Parts List.



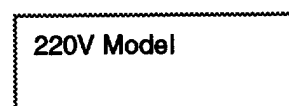
#### A SUBCOMPONENT OF A MAJOR ASSEMBLY

The top line is the name of the subcomponent.



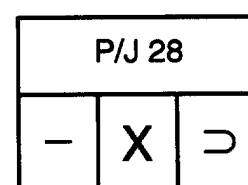
#### THE MODEL TYPE

Shows that specifications differ between printer models. The top line is the name of the printer model. (220V Model available only outside the U.S.)



#### A PLUG JACK

Shows the plug/jack number and the pins. The top line is the plug/jack number.



SYMBOLS: — or P is a Plug  
 x is a Pin number  
 D or J is a Jack

#### WIRING IS DIFFERENT DEPENDING ON PRINTER MODEL



#### A SCREW SECURING A COMPONENT



#### A CABLE CLAMP



#### THE SIGNAL NAME OF A WIRE

THE SIGNAL VALUE OF A WIRE L = Low H = High

Overscore indicates active low logic. In this case, when the HEAT ROD signal is ON, the normal voltage of 4.2 VDC drops to 0 VDC.



SG SIGNAL GROUND

FG FRAME GROUND

RTN RETURN

There is continuity between SG and RTN. Continuity between FG and SG depends on circuit specifications.

5 VDC The voltage measured using a multimeter with the negative (–) lead grounded at SG

LVPS Assembly-Main Controller PWBA

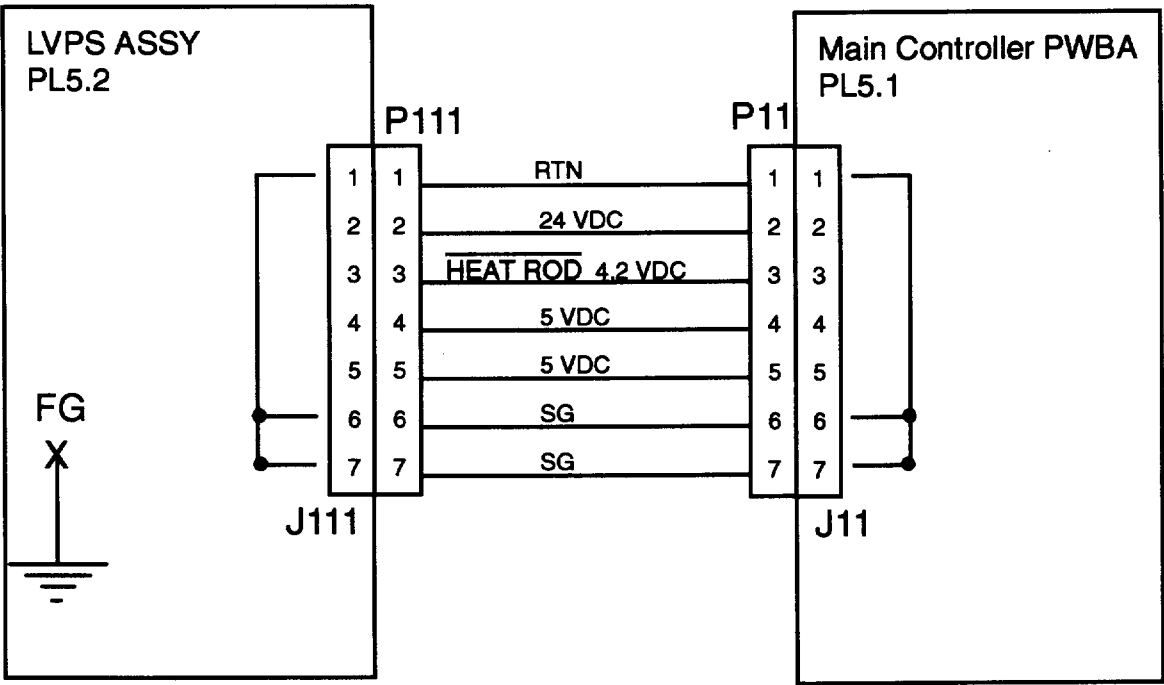


Figure A-1. Connections Between LVPS Assembly and Main Controller PWBA

Table A-1. Short-circuit Protection for the LVPS

- A: Automatically restores the pre-short-circuit output state after you correct the short-circuit.
- B: Requires you to switch OFF main power after you correct the short-circuit. Wait a few minutes. Switch ON main power.

## LVPS Assembly-Fuser Assembly

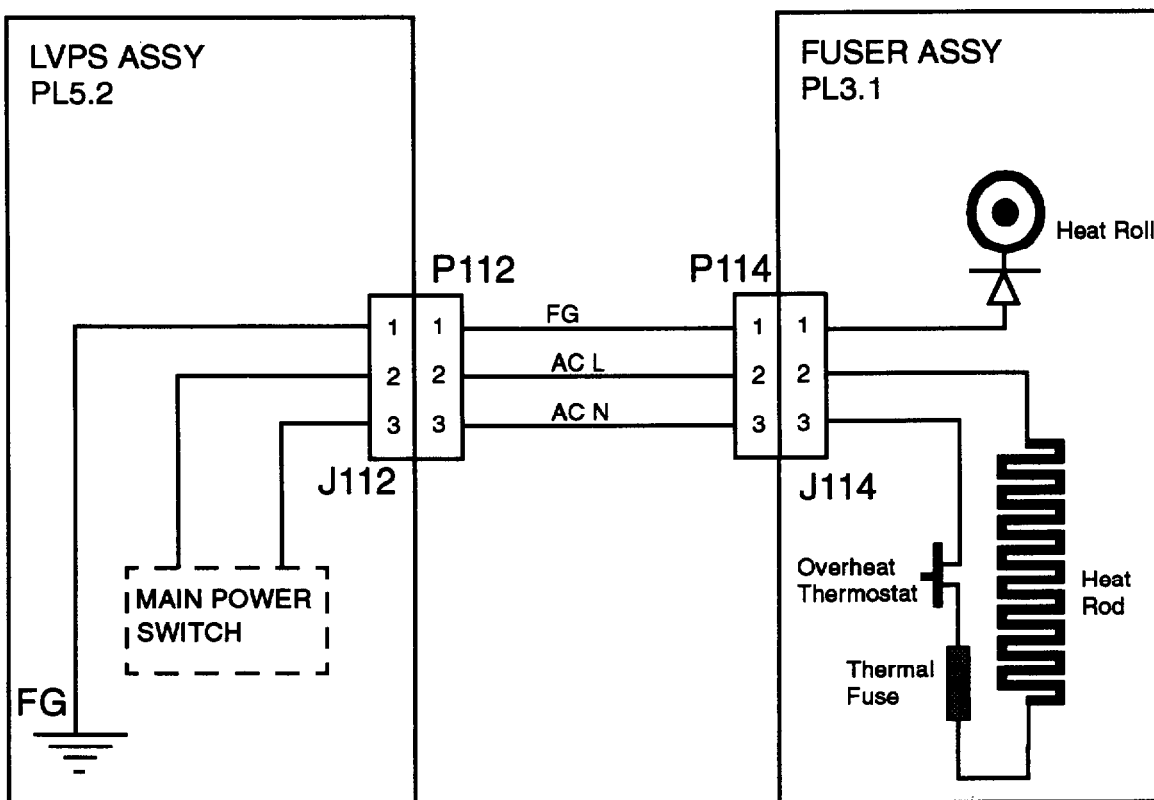


Figure A-2. Connections Between LVPS Assembly and Fuser Assembly

Table A-2. LVPS Assembly and Fuser Assembly Signals

| Signal Line Name | Signal Line Description                |
|------------------|--|
| AC N             | Neutral side of AC input from the LVPS |
| AC L             | Line side of AC input from the LVPS    |

NOTE: The Overheat Thermostat (non-contact type) opens at 125°C (257°F).  
 The rated power of the Heater Rod is 320W ± 16W (100V Model) and  
 320W ± 16W (220 Model, available only outside the U. S.)

Table A-3. Thermistor Resistance Values at Various Temperatures

| Thermistor Temperature | 10°C (50°F) | 20°C (68°F) | 30°C (86°F) | 140°C (284°F) | 160°C (320°F) |
|------------------------|-------------|-------------|-------------|---------------|---------------|
| Resistance in KΩ       | 428.5       | 270.4       | 174.7       | 4.129         | 3.178         |



## Main Controller PWBA-Laser Scanner Assembly

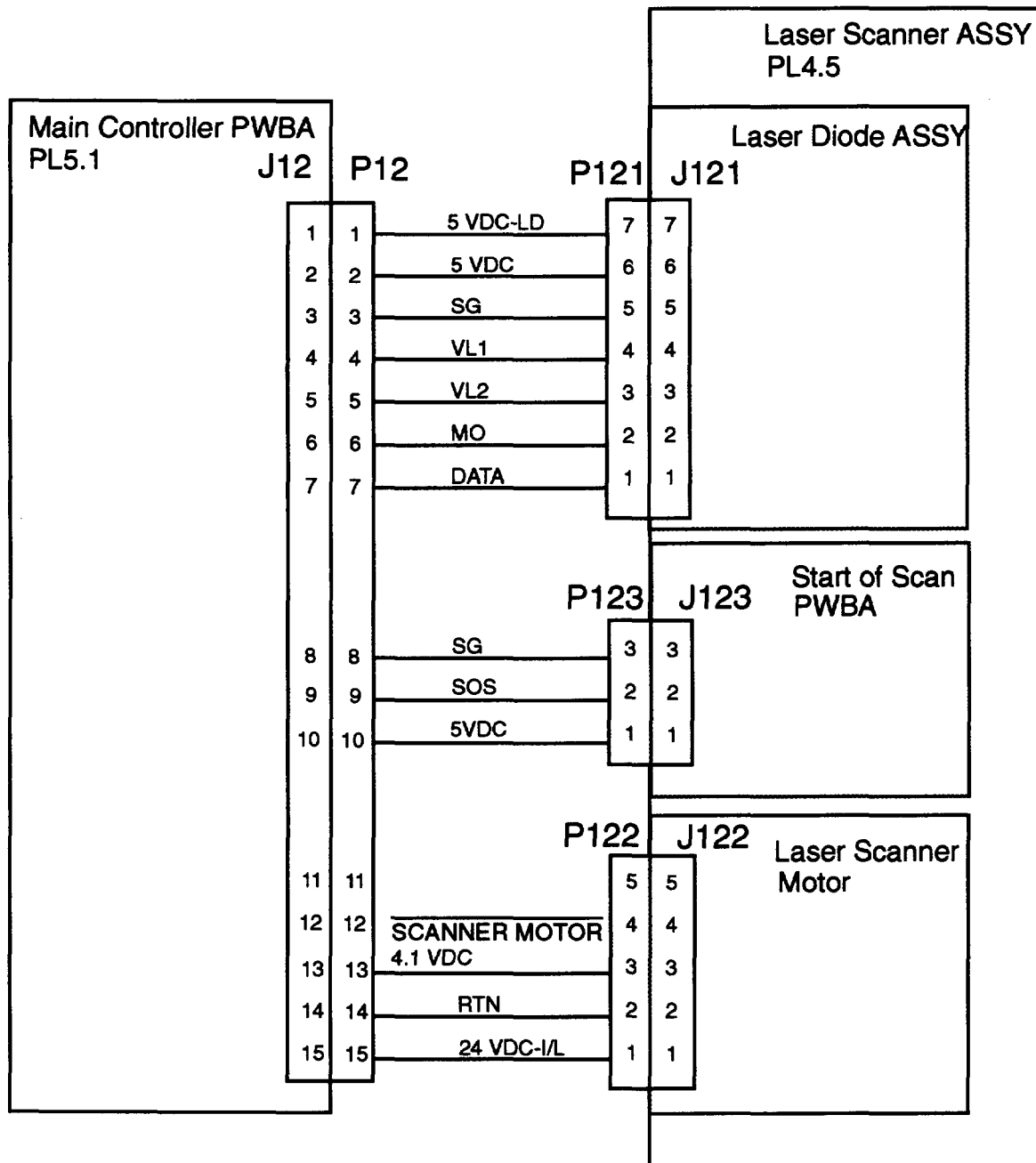


Figure A-3. Connections Between Main Controller PWBA and Lacer Scanner Assembly

Table A-4. Main Controller PWBA and Laser Scanner Assembly Signals

| Signal Line Name | Signal Line Description  |
|------------------|--|
| DATA             | Command signal for LD output from the Main Controller PWB to the LD Assembly. $\overline{\text{LD}}$ ON 3.7 VDC.         |
| MO               | Monitor signal that controls LD output based on DATA signal  |
| VL1, VL2         | LD output control  |
| 5 VDC-LD         | Power source for the LD Assembly   |
| 24 VDC-I/L       | The signal from the Interlock Switch that controls the Scanner Motor. ON (actuated) starts the Motor.                    |
| SOS              | Start of Scan reference signal sent to the Scanner Motor. The signal is sent when the laser beam strikes the SOS Sensor. |

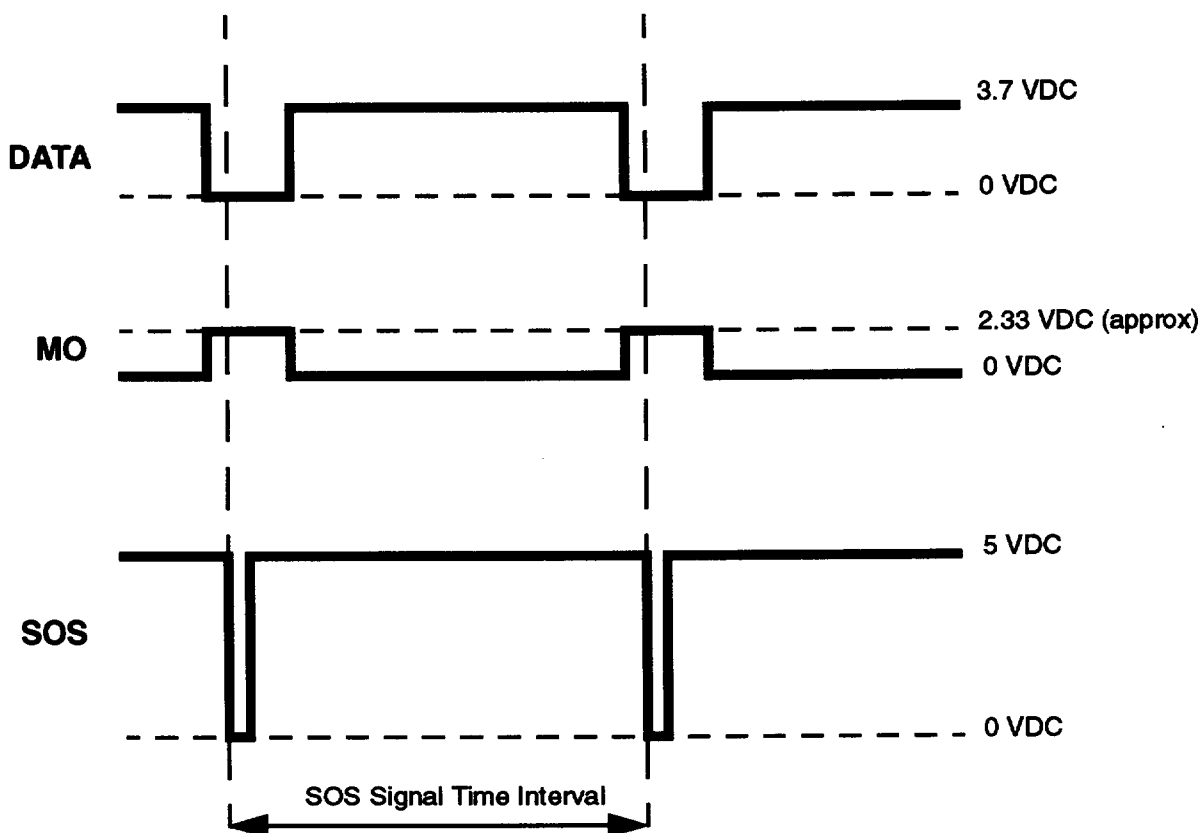


Figure A-4. Waveforms of Signal Lines DATA, MO, and SOS

## Main Controller PWBA-Main Motor

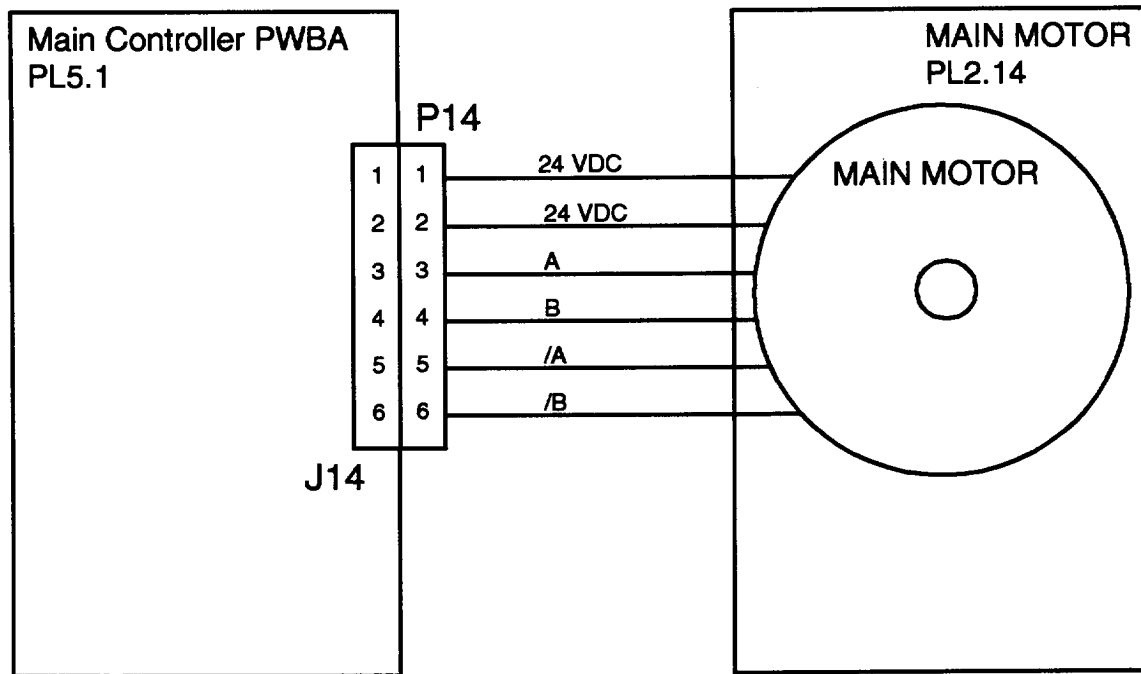


Figure A-5. Connections Between Main Controller PWBA and Main Motor

The Main Motor is a stepper motor that uses dual-phase excitation.

Table A-5. Excitation Sequence of the Main Motor

| Phase | 1 | 2 | 3 | 4 |
|-------|---|---|---|---|
| A     |   |   | X | X |
| B     |   | X | X |   |
| /A    | X | X |   |   |
| /B    | X |   |   | X |

Note: X= Excitation

The stepping angle is  $7.5 \pm 0.75^\circ$

The Frequency at Rated Speed is 270 pps (pulses per second.)

## Main Controller PWBA-HVPS-Print Cartridge-Exhaust Fan

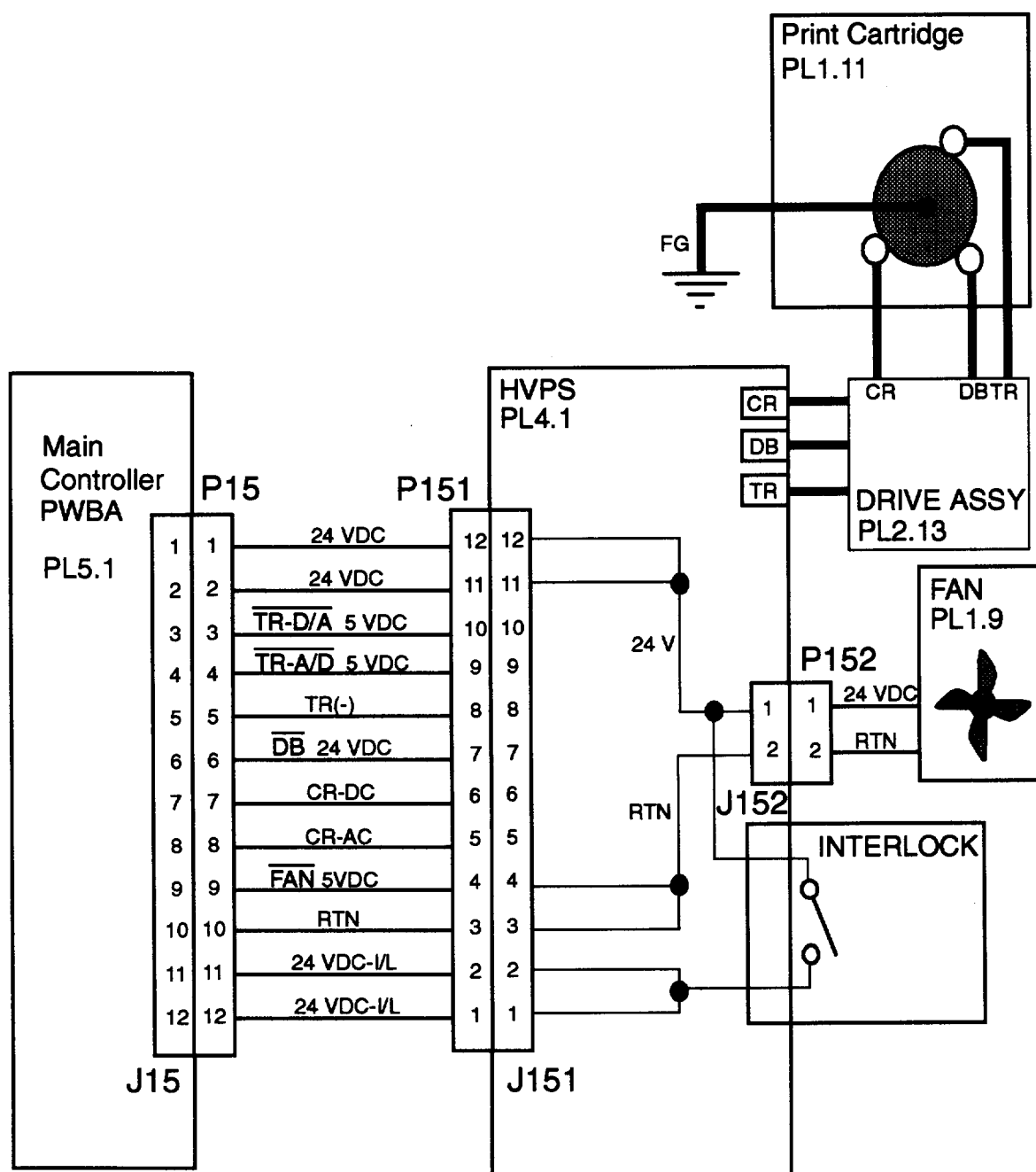


Figure A-6. Connections Between Main Controller and HVPS, HVPS and Print Cartridge, and HVPS and Fan

**Table A-6.**  
**Main Controller PWBA-HVPS-Print Cartridge-Exhaust Fan Signal Names**

| <b>Signal Name</b>               | <b>Description of Signal Name</b>   |
|----------------------------------|---|
| $\overline{\text{TR-D/A}}$ 5 VDC | Transfer Roll (TR) control signal.  |
| $\overline{\text{TR-A/D}}$ 5 VDC | Signal switches HVPS TR output current to TR output voltage.                |
| TR(-)                            | Switches HVPS DC output to the Bias Transfer Roll (BTR)                     |
| $\overline{\text{DB}}$ 24 VDC    | Developer Bias output signal for both AC and DC components                  |
| CR-DC                            | HVPS DC output to the Charge Roll (CR)                                      |
| CR-AC                            | HVPS AC output to the Charge Roll (CR)                                      |
| TR                               | HVPS output to the BTR<br>TR(-) for Transfer<br>TR(+) for BTR Cleaning      |
| DB                               | HVPS output to the Magnet Roll (Development Bias)                           |
| CR                               | HVPS output to the CR   |
| $\overline{\text{FAN}}$ 5 VDC    | Exhaust Fan control signal. The fan is ON when the signal goes LOW (0 VDC). |

**Table A-7. HVPS Voltages**

| <b>Output Name</b> | <b>Output Voltage (5 PPM)</b> |
|--------------------|-------------------------------|
| CR(AC)             | 220 $\mu$ A @ 160Hz)          |
| CR(DC)             | -350 VDC                      |
| TR(+)              | 0 to 3K VDC                   |
| TR(-)              | -600 VDC                      |
| DB(AC)             | 1.7KV p-p @ 2.4KHz            |
| DB(DC)             | -210 VDC (-265 ~ -205 VDC)    |

## Main Controller PWBA-Exit Sensor-Thermistor

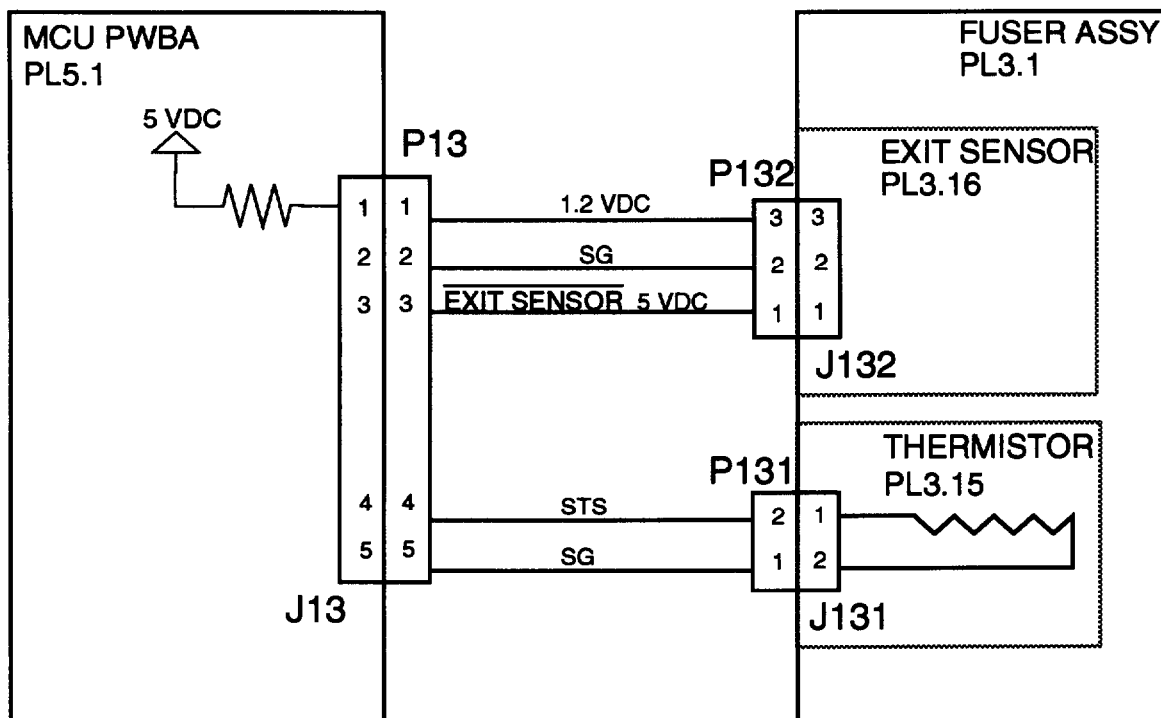


Figure A-7. Connections Between Main Controller PWBA and Exit Sensor, and Between Main Controller PWBA and Thermistor

Table A-8. Exit Sensor Connection Signal Name

| Signal Name          | Description of Signal Name   |
|----------------------|--|
| EXIT SENSOR ON 5 VDC | <p>Signal for monitoring paper at the Exit Sensor.<br/> (L) = paper at the sensor<br/> (H) = no paper at the sensor</p> <p><b>NOTE:</b> Due to resistance in the circuits, the actual voltage that reaches the Exit Sensor is approximately 1.2 VDC.</p> |

## Main Controller PWBA-Pre-Registration Sensor-Feed Solenoid

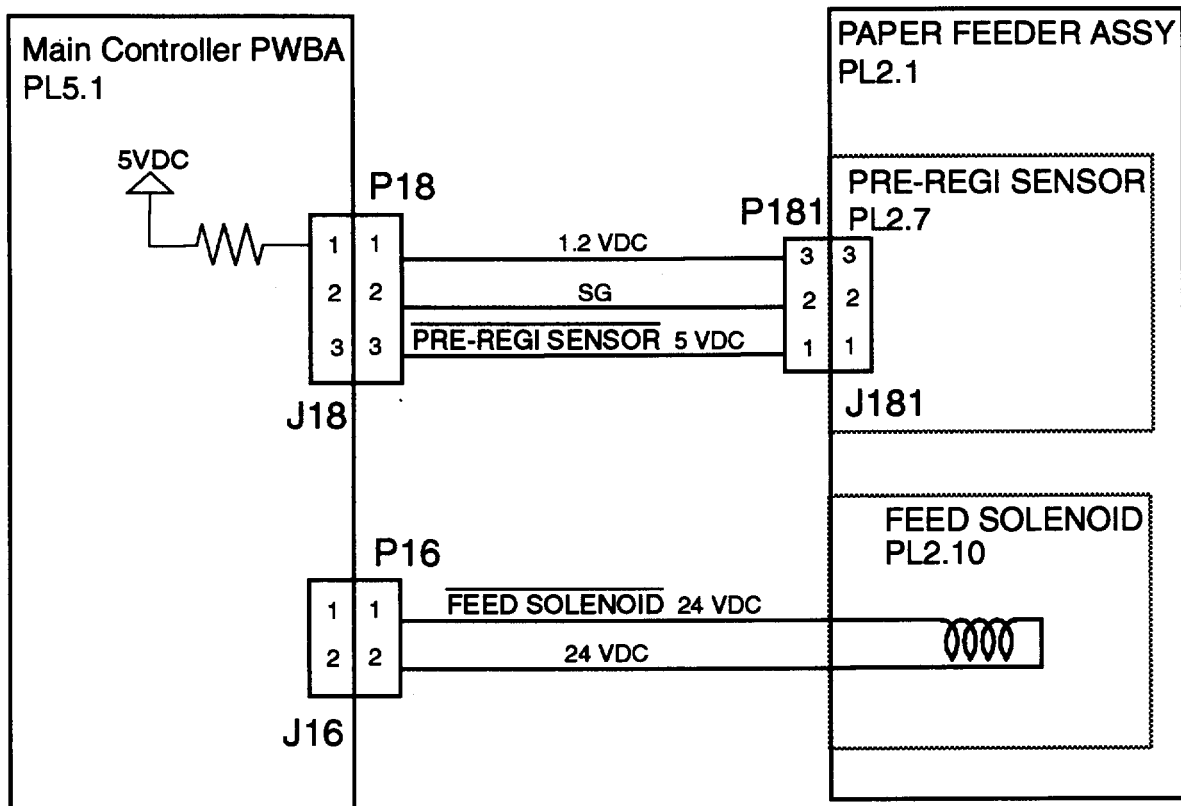


Figure A-8. Connections Between Main Controller PWBA and Registration Sensor, and between Main Controller PWBA and Feed Solenoid

Table A-9. Registration Sensor Signal Name

| Signal Name                   | Description of Signal Name  |
|-------------------------------|---|
| PRE-REGISTRATION SENSOR 5 VDC | <p>Signal for monitoring paper at the Registration Roll Sensor.<br/> (L) = paper at the sensor<br/> (H) = no paper at the sensor</p> <p><b>NOTE:</b> Due to resistance in the circuits, the actual voltage that reaches the Registration Sensor is approximately 1.2 VDC.</p> <p>Feed Solenoid coil resistance is <math>120\Omega \pm 10\%</math> at <math>20^{\circ}\text{C}</math> (<math>68^{\circ}\text{F}</math>).</p> |

## Main Controller PWBA-Print Cartridge Sensor PWBA

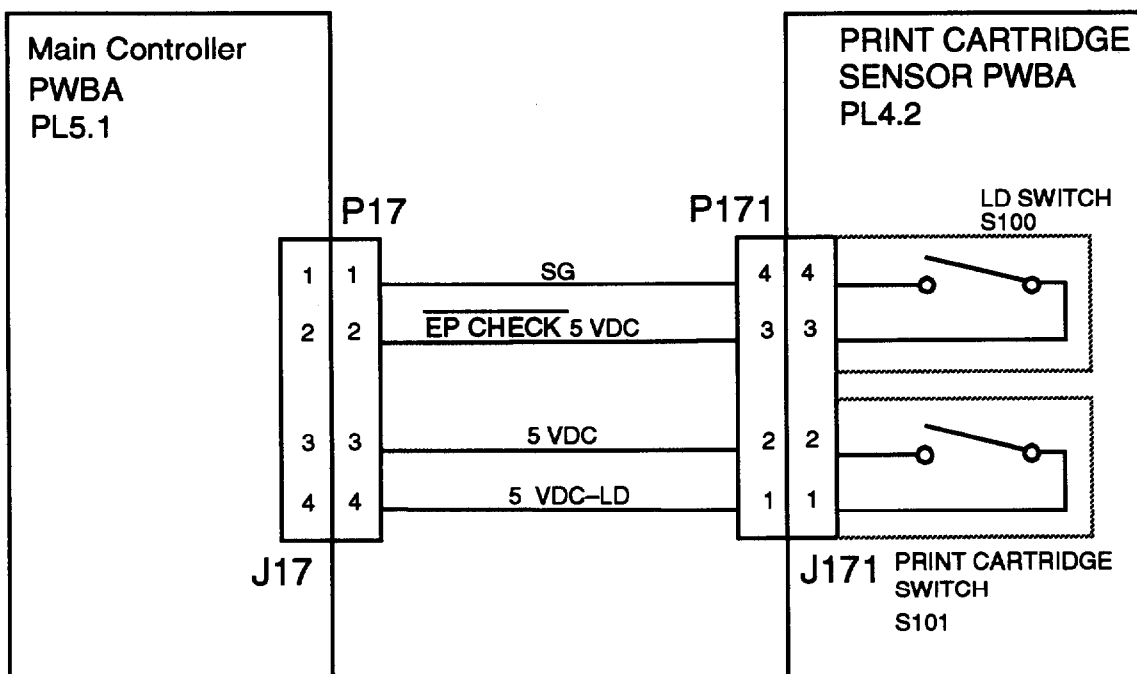


Figure A-9. Connections Between Main Controller PWBA and Print Cartridge Sensor PWBA

Table A-10. Print Cartridge Sensor Signal Names

| Signal Name                        | Description of Signal Name  |
|------------------------------------|---|
| $\overline{\text{EP CHECK}}$ 5 VDC | Signal for monitoring the presence of the Print Cartridge.<br>(L) = Print Cartridge in place<br>(H) = Print Cartridge removed |
| 5 VDC-LD                           | LVPS to LD Assembly   |



## Main Controller PWBA-LED PWBA

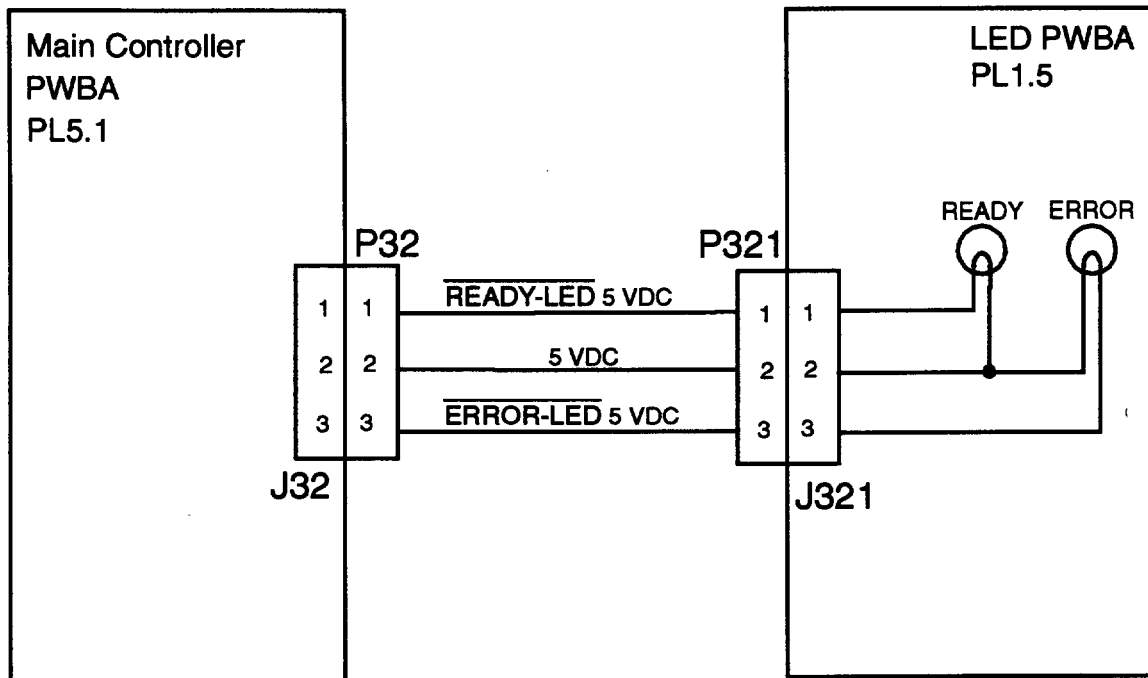


Figure A-10. Connections Between Main Controller PWBA and LED PWBA

Table A-11. LED PWBA Signal Names

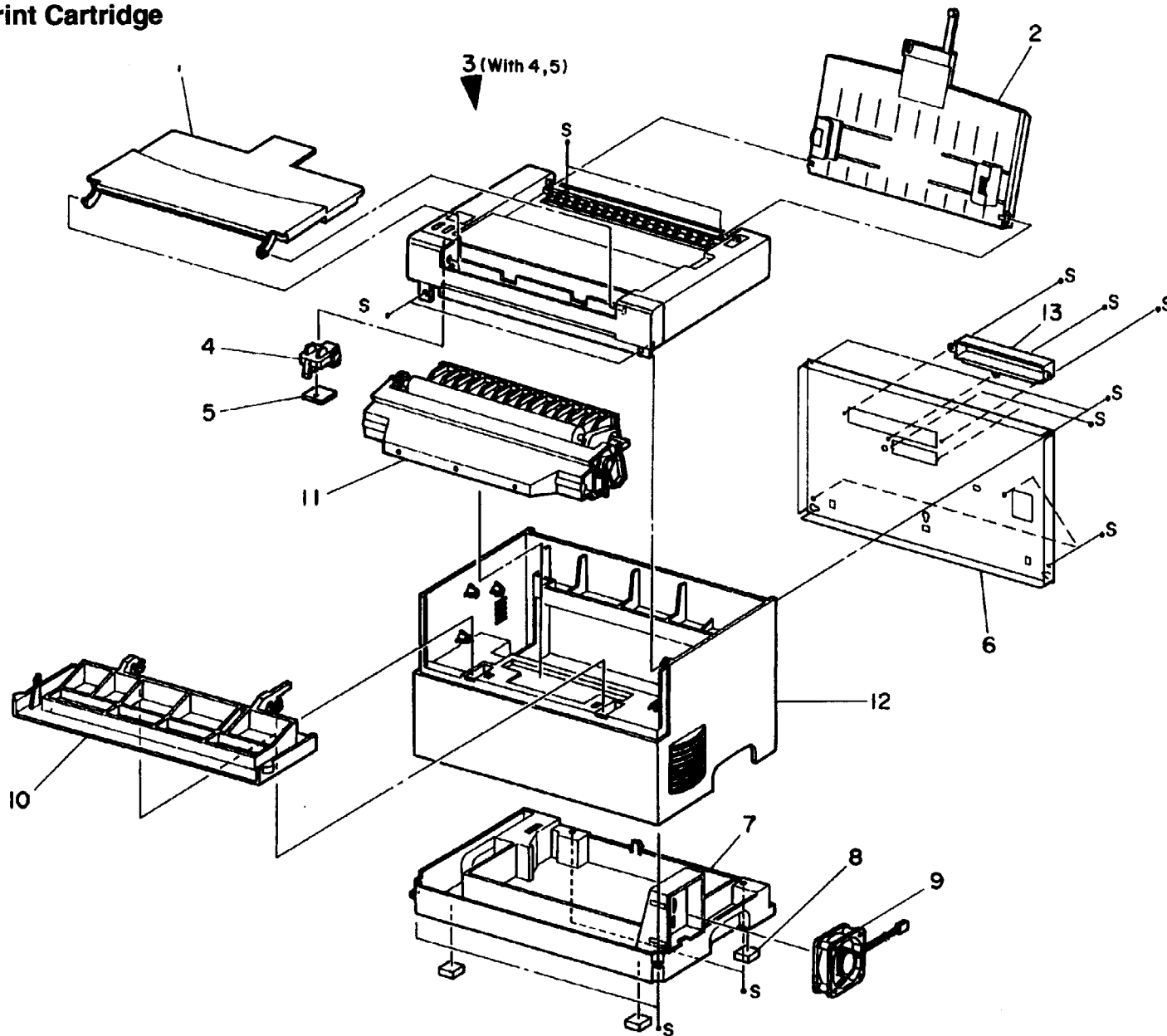
| Signal Name     | Description of Signal Name                                       |
|-----------------|--|
| READY-LED 5 VDC | Signal for READY LED. When signal goes (L), the light is on.     |
| ERROR-LED 5 VDC | Signal for ERROR LED. When the signal goes (L), the light is on. |

Table A-12. Function of the LEDs

| LED (color)    | LED State                                  | Meaning of State  |
|----------------|--|---|
| READY (Green)  | 1. Blinks<br>2. Always ON<br>3. Always OFF | 1. POD in progress<br>2. Ready to print<br>3. Error condition           |
| ERROR (Orange) | 1. Blinks<br>2. Always ON<br>3. Always OFF | 1. Paper jam<br>2. Error other than a paper jam<br>3. No error observed |

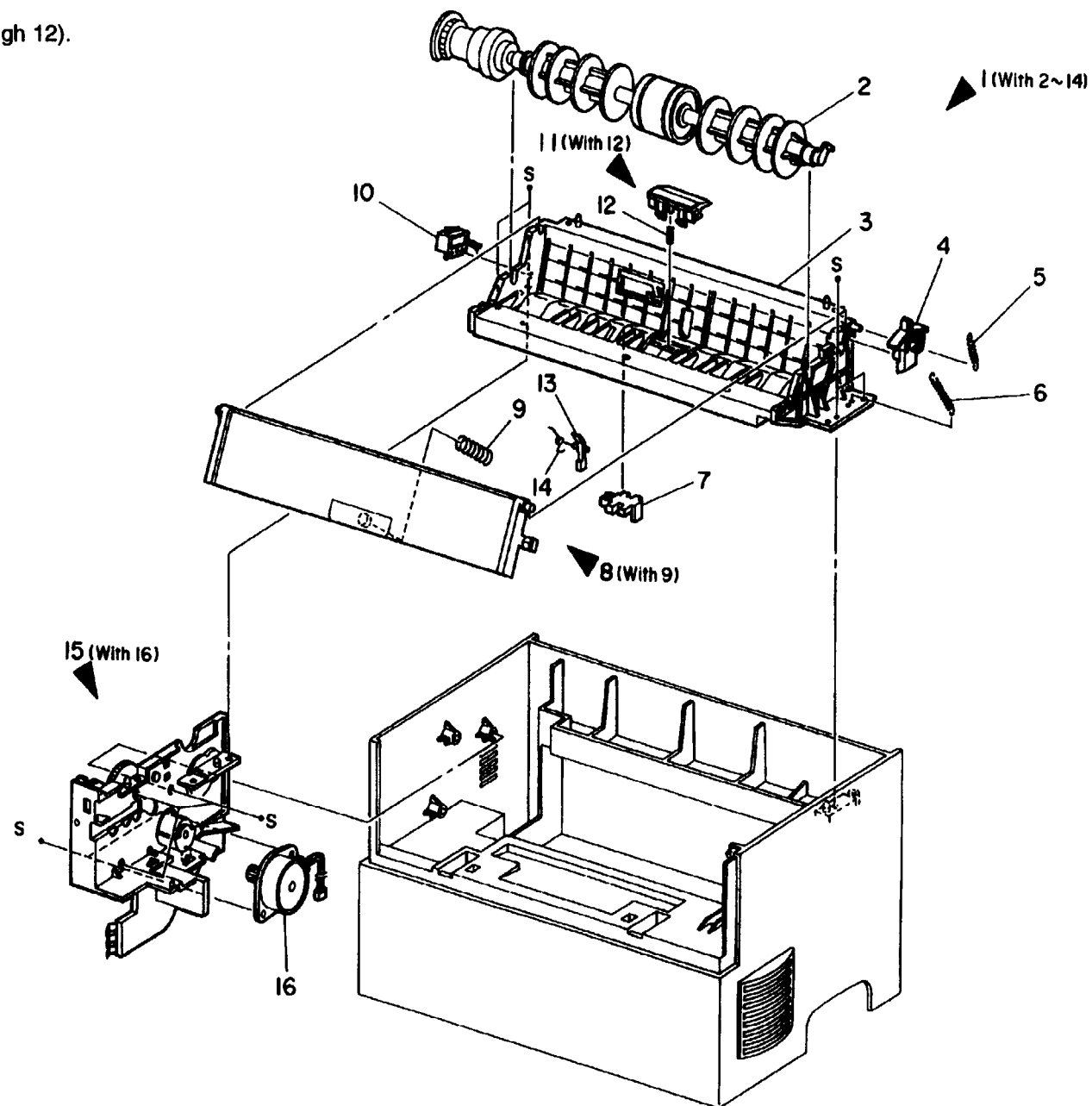
## 1. Covers and Print Cartridge

1. Exit Tray
2. Input Tray
3. Top Cover
4. LED Lens
5. LED PWBA
6. Rear Cover
7. Bottom Cover
8. Rubber Foot
9. Exhaust Fan
10. Front Cover
11. Print Cartridge
12. Printer Body
13. SIMM Cover



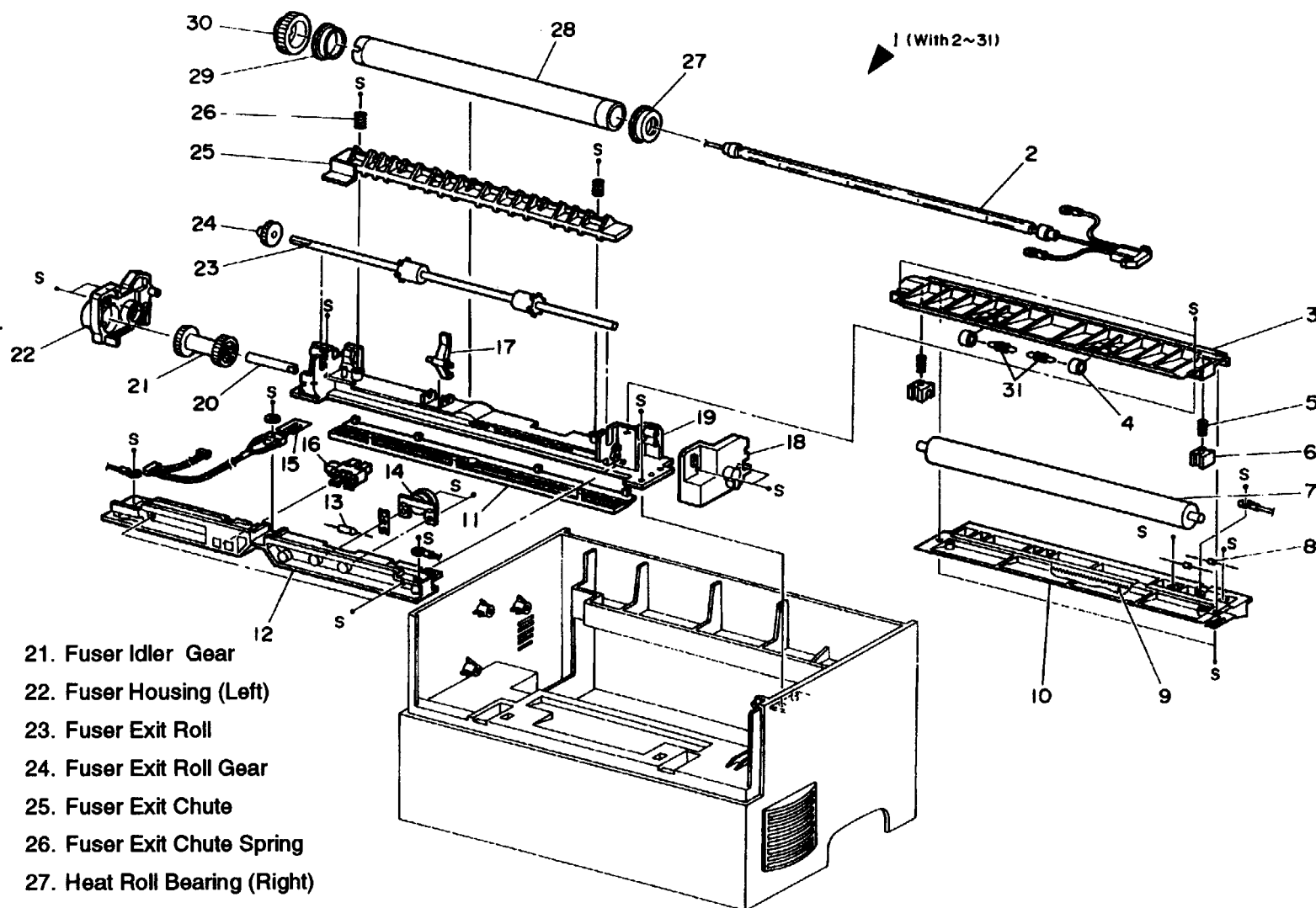
## 2. Paper Feed and Main Drive

1. Paper Feeder (includes items 2 through 12).
2. Paper Feed Roll
3. Paper Feeder Frame
4. Paper Release Lever
5. Paper Release Lever Spring
6. Paper Feeder Spring
7. Registration Sensor
8. Paper Feeder Plate (with spring)
9. Paper Feeder Plate Spring
10. Paper Feed Solenoid
11. Retard Pad (with spring)
12. Retard Pad Spring
13. Registration Sensor Actuator
14. Registration Sensor Spring
15. Main Drive Assembly
16. Main Drive Motor



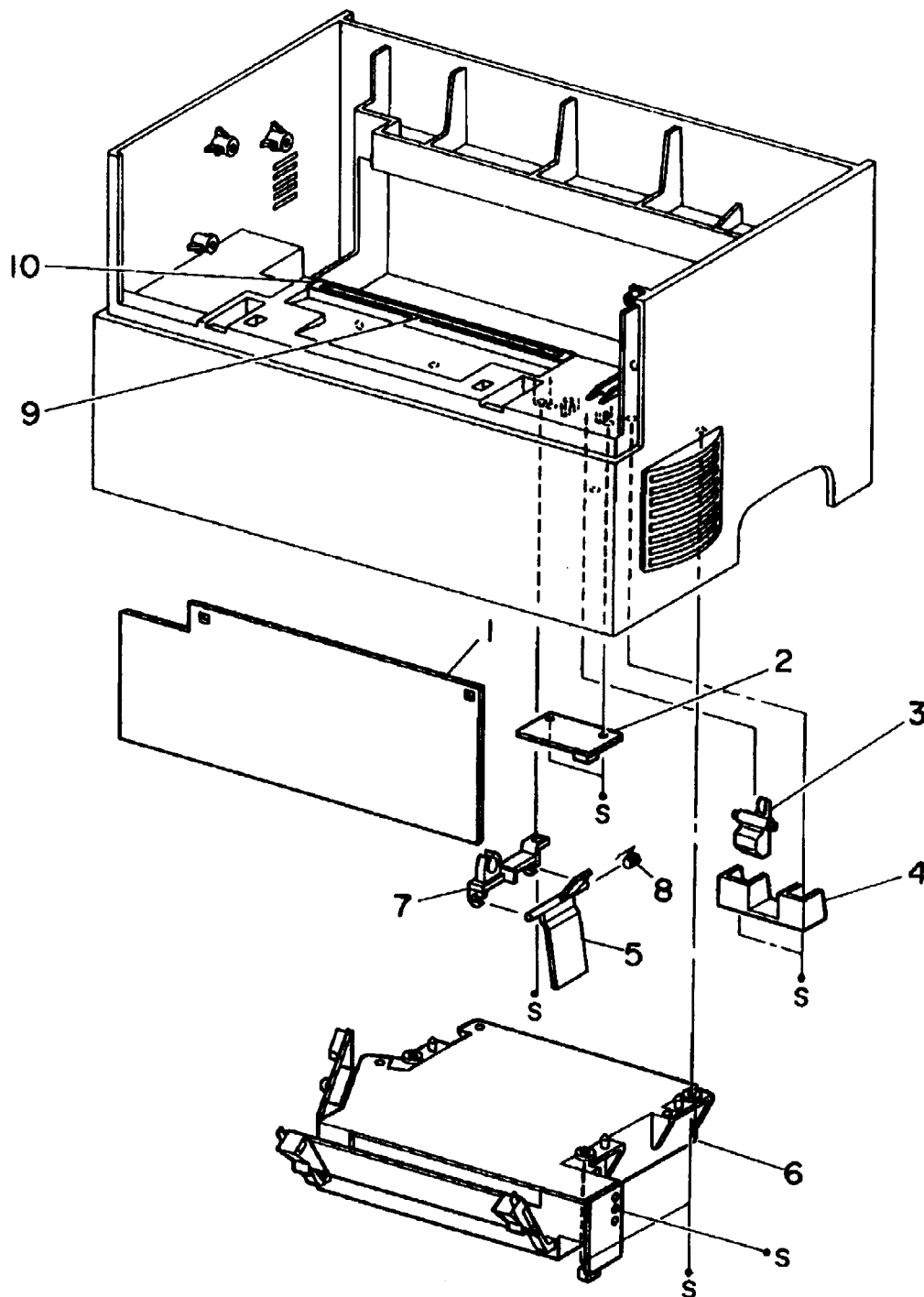
### 3. Fusing

1. Fuser (Includes Items 2-30)
2. Heat Rod
3. Fuser Cover
4. Fuser Exit Pinch Roller
5. Pressure Roll Spring
6. Pressure Roll Bearing
7. Pressure Roller
8. Fuser Diode
9. Static Eliminator Saw
10. Fuser Inlet Chute (includes Static Eliminator)
11. Fuser Bottom Plate
12. Fuser Sensor Frame
13. Thermal Fuse
14. Overheat Thermostat
15. Thermistor
16. Exit Sensor
17. Exit Sensor Actuator
18. Fuser Housing (Right)
19. Fuser Frame
20. Fuser Idler Shaft
21. Fuser Idler Gear
22. Fuser Housing (Left)
23. Fuser Exit Roll
24. Fuser Exit Roll Gear
25. Fuser Exit Chute
26. Fuser Exit Chute Spring
27. Heat Roll Bearing (Right)
28. Heat Roll
29. Heat Roll Bearing (Left)
30. Heat Roll Drive Gear
31. Exit Pinch Roll Spring



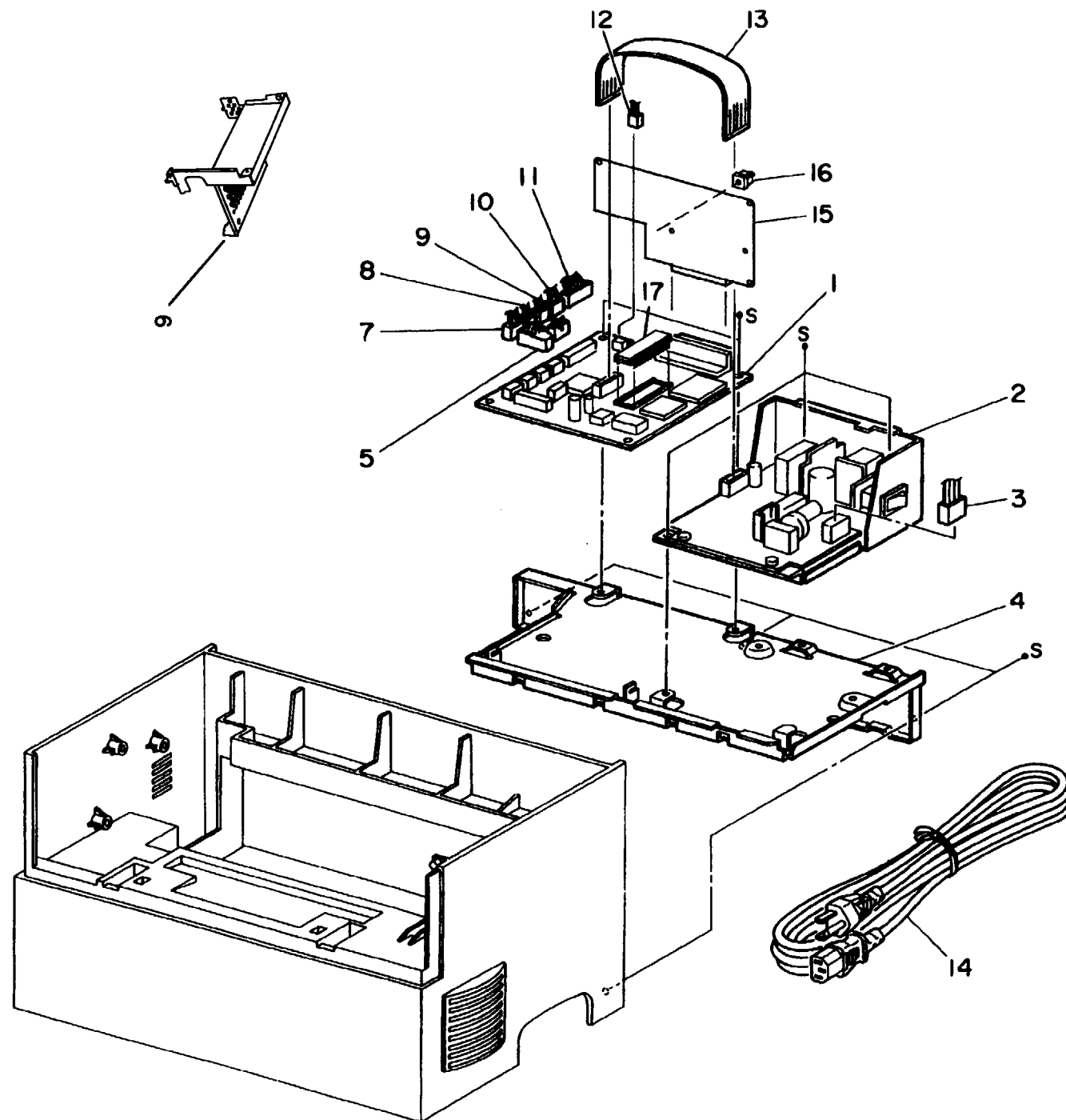
#### 4. Laser Scanner

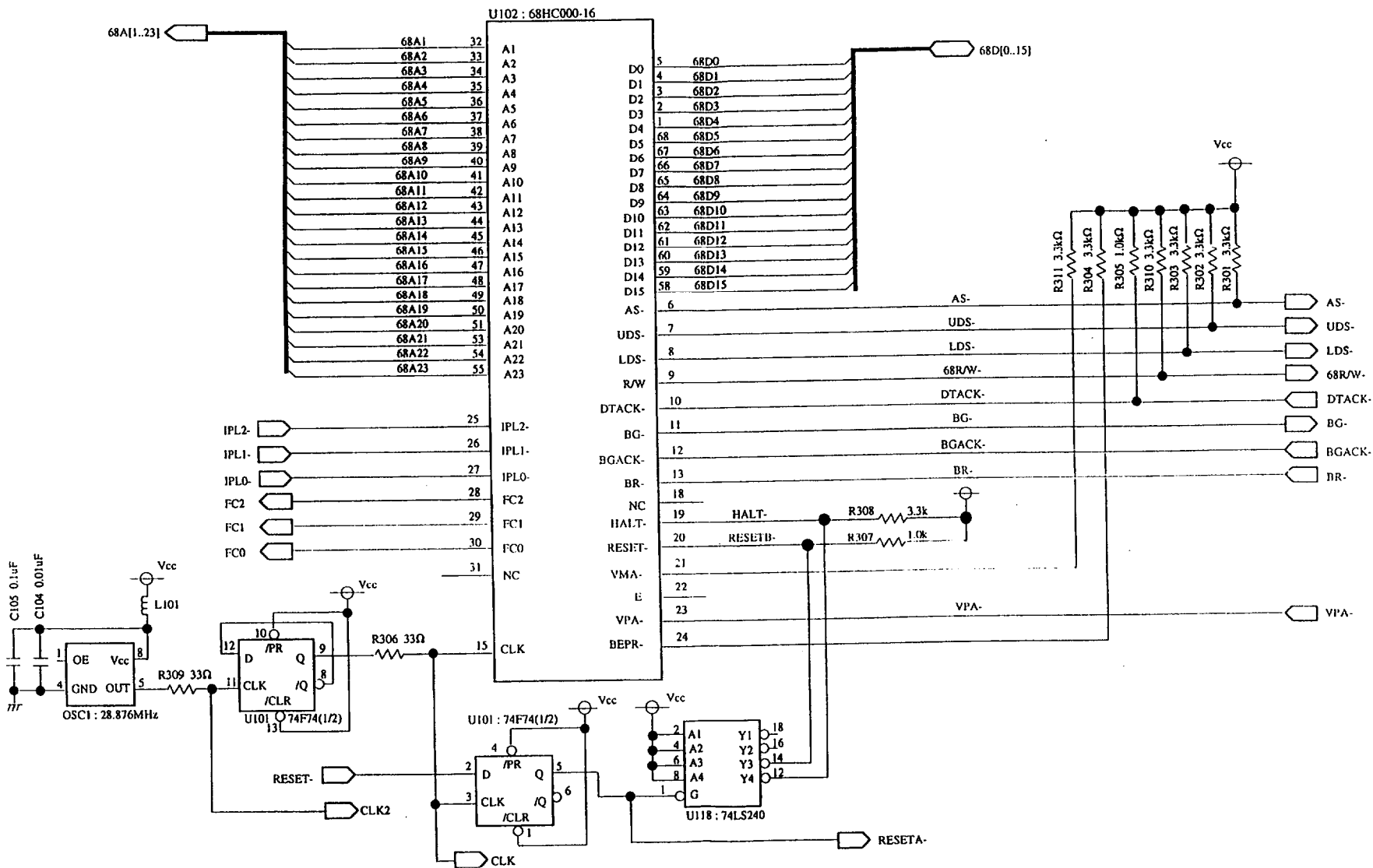
1. High Voltage Power Supply
2. Print Cartridge Sensor
3. Print Cartridge Sensor Actuator
4. Print Cartridge Sensor Actuator Cap
5. Front Cover Interlock Sensor
6. Laser Scanner
7. Front Cover Interlock Sensor Spring
8. Front Cover Interlock Pivot
9. Laser Scanner Window
10. Laser Scanner Window Tape



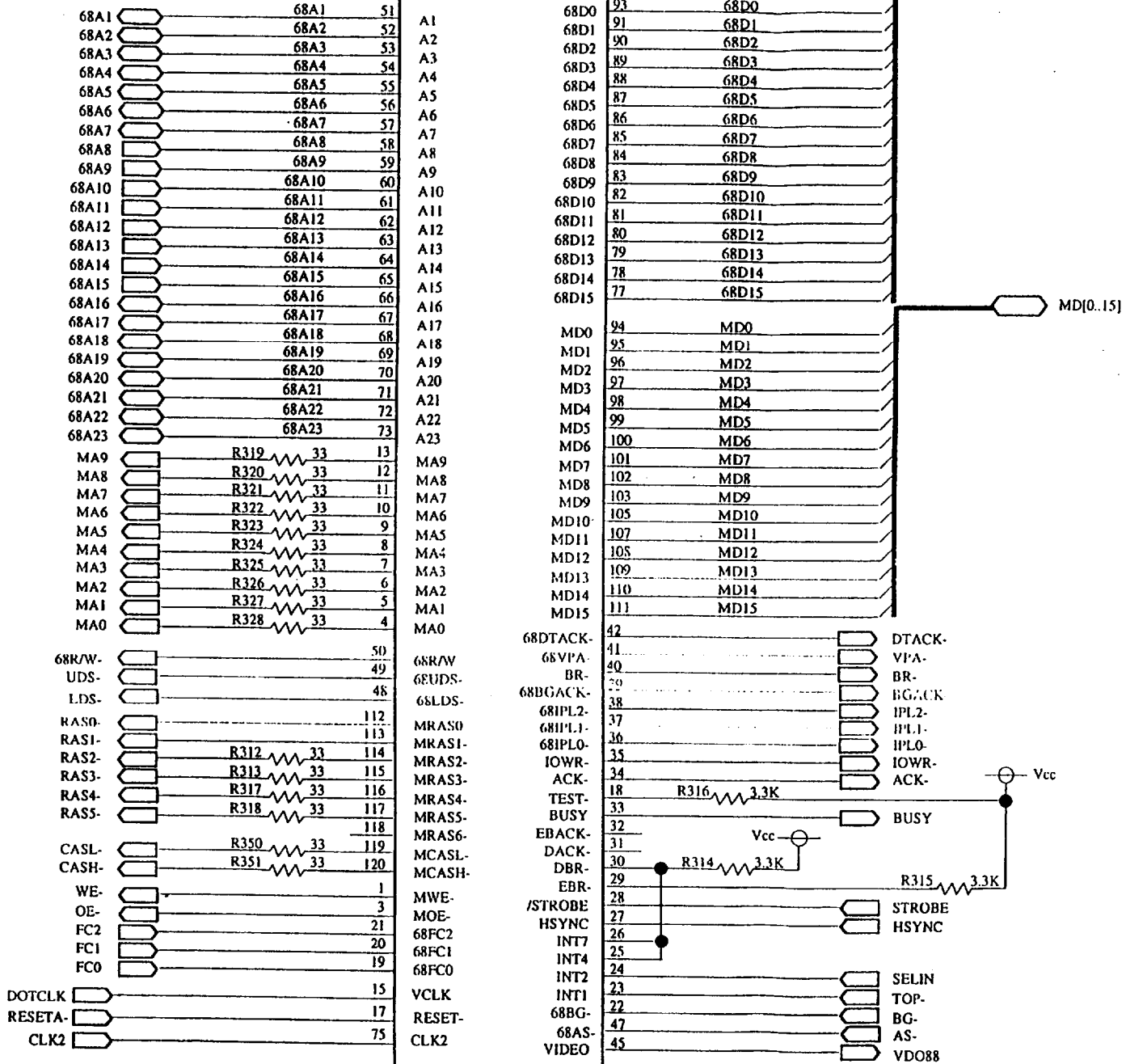
## 5. Electrical

1. Controller PWBA
2. LVPS
3. Fuser Harness
4. Electrical Chassis
5. HVPS Harness
6. EMI Shield
7. Fuser Sensor Harness
8. Paper Feed Solenoid Harness
9. Paper Feed Harness
10. Print Cartridge Sensor Harness
11. Laser Scanner Harness
12. LED Harness
13. LVPS to Controller Harness
14. Power Cord
15. Interface Board
16. Reset Switch
17. Firmware EET chip

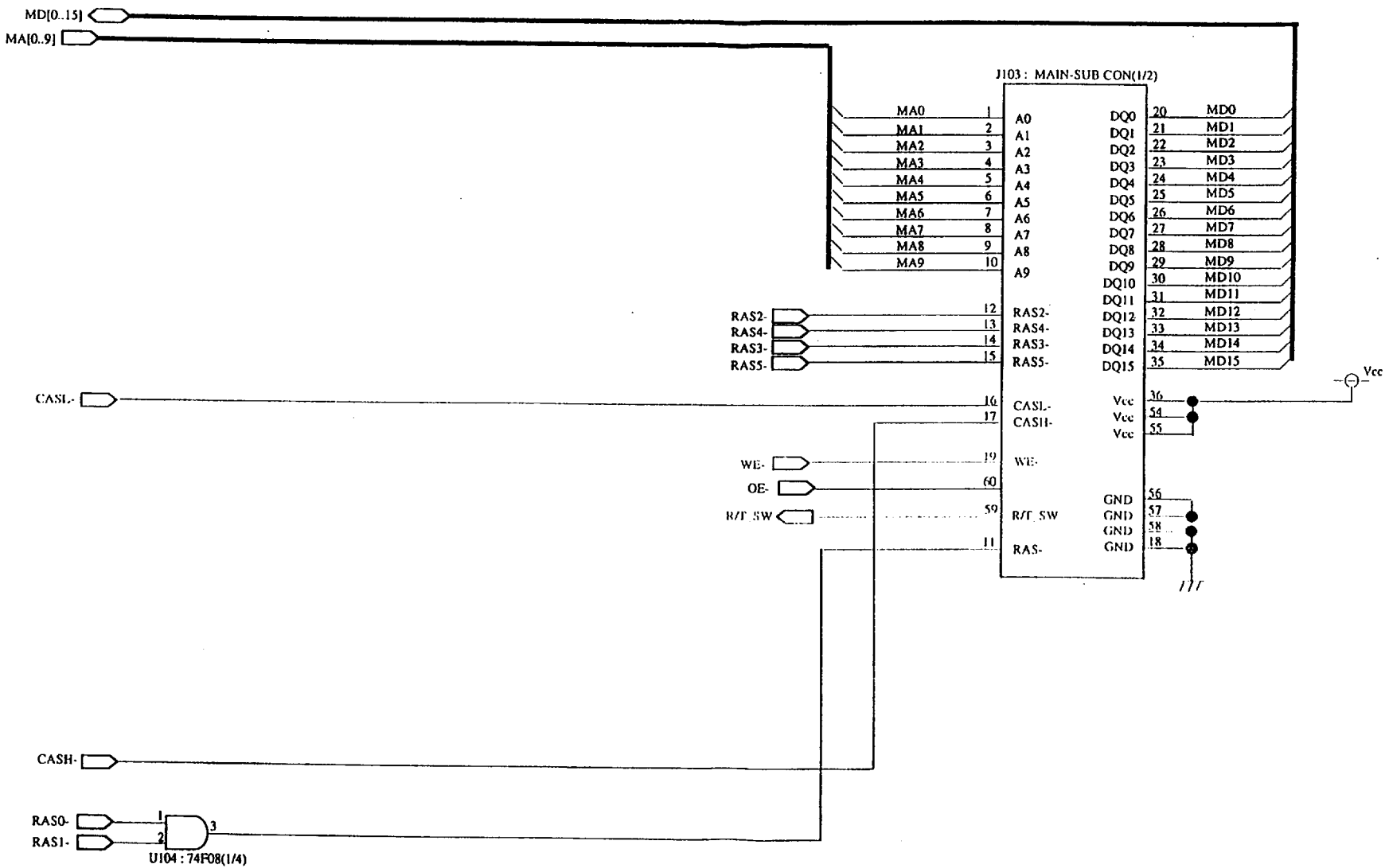


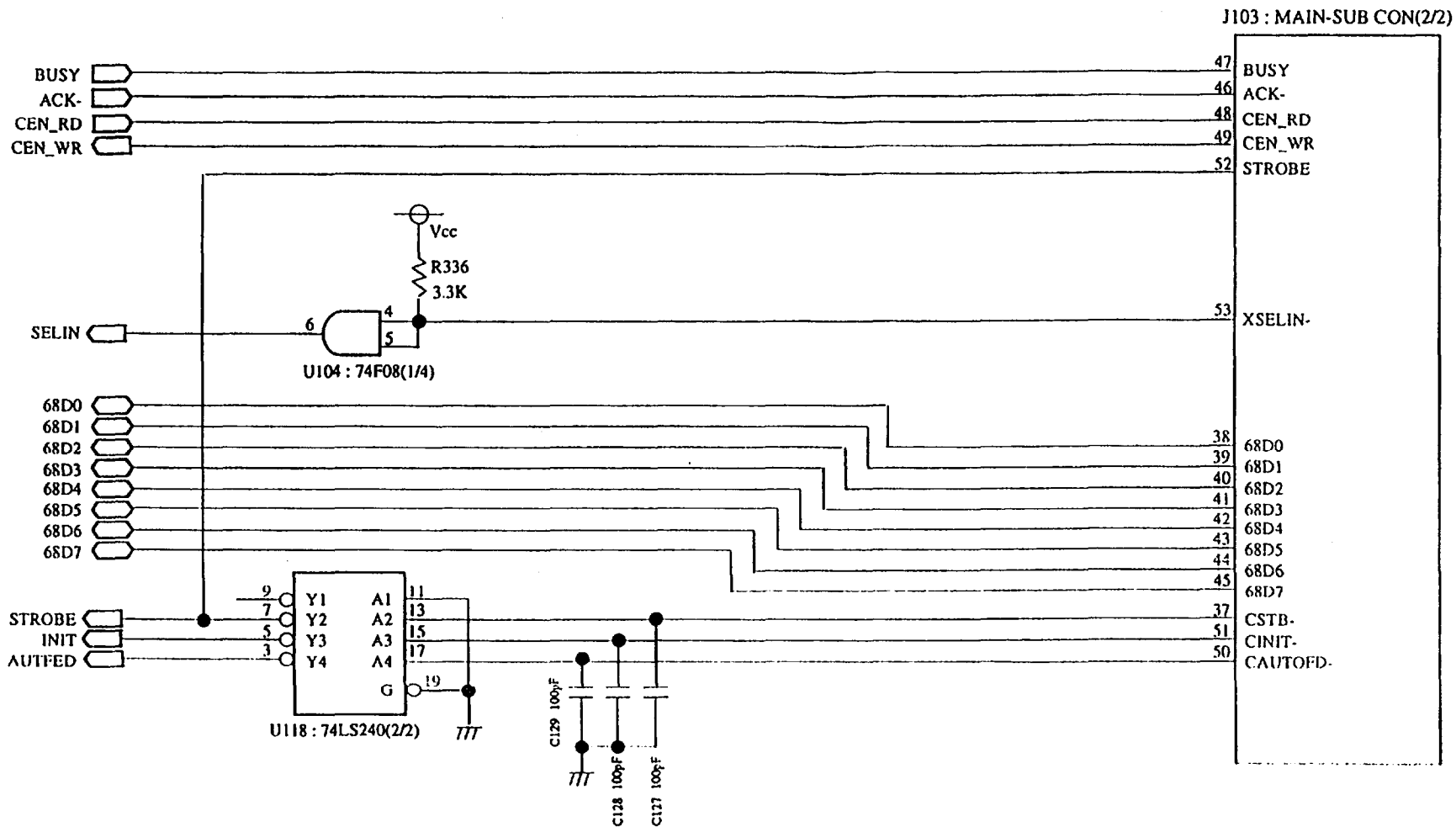


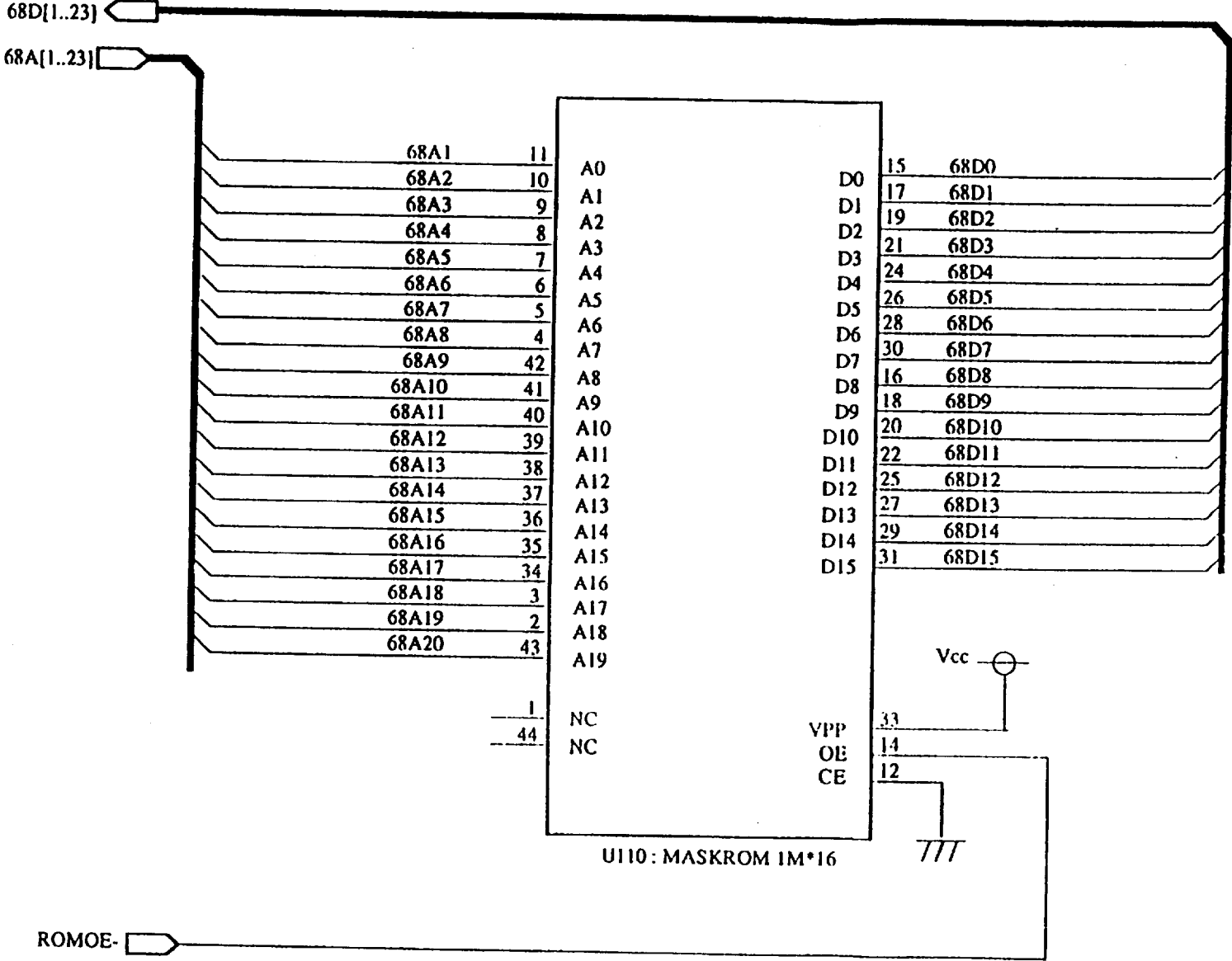
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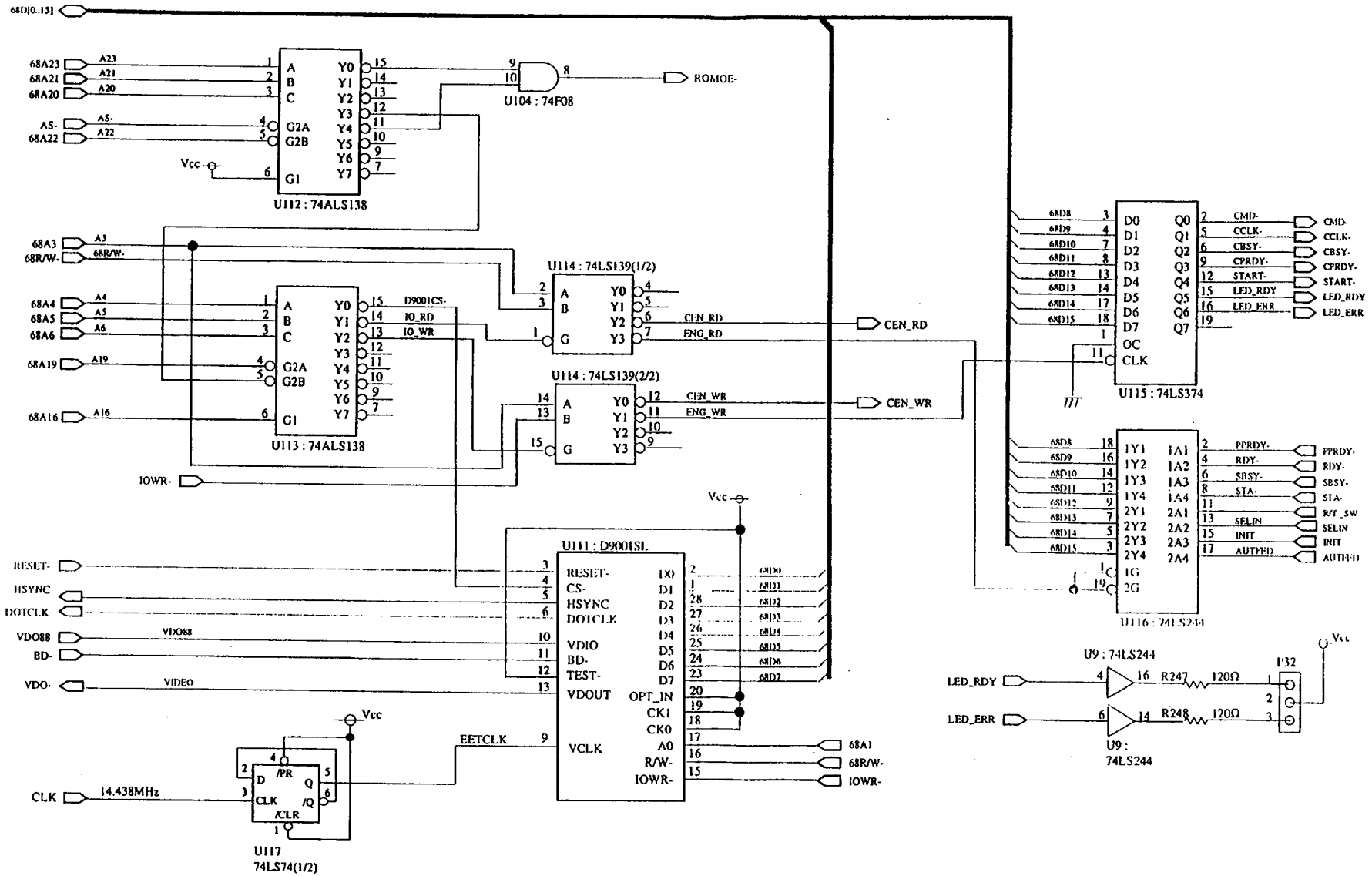


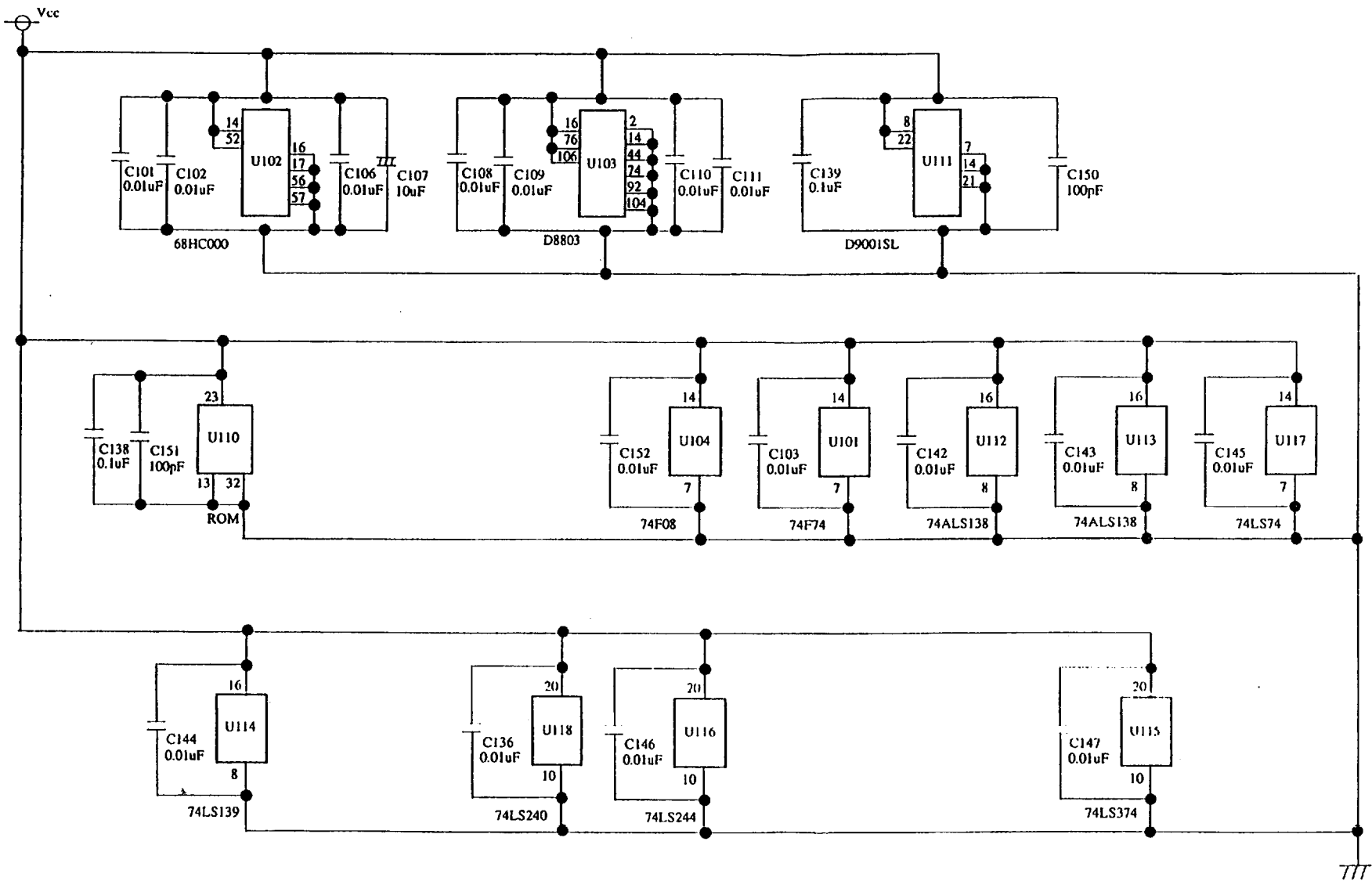




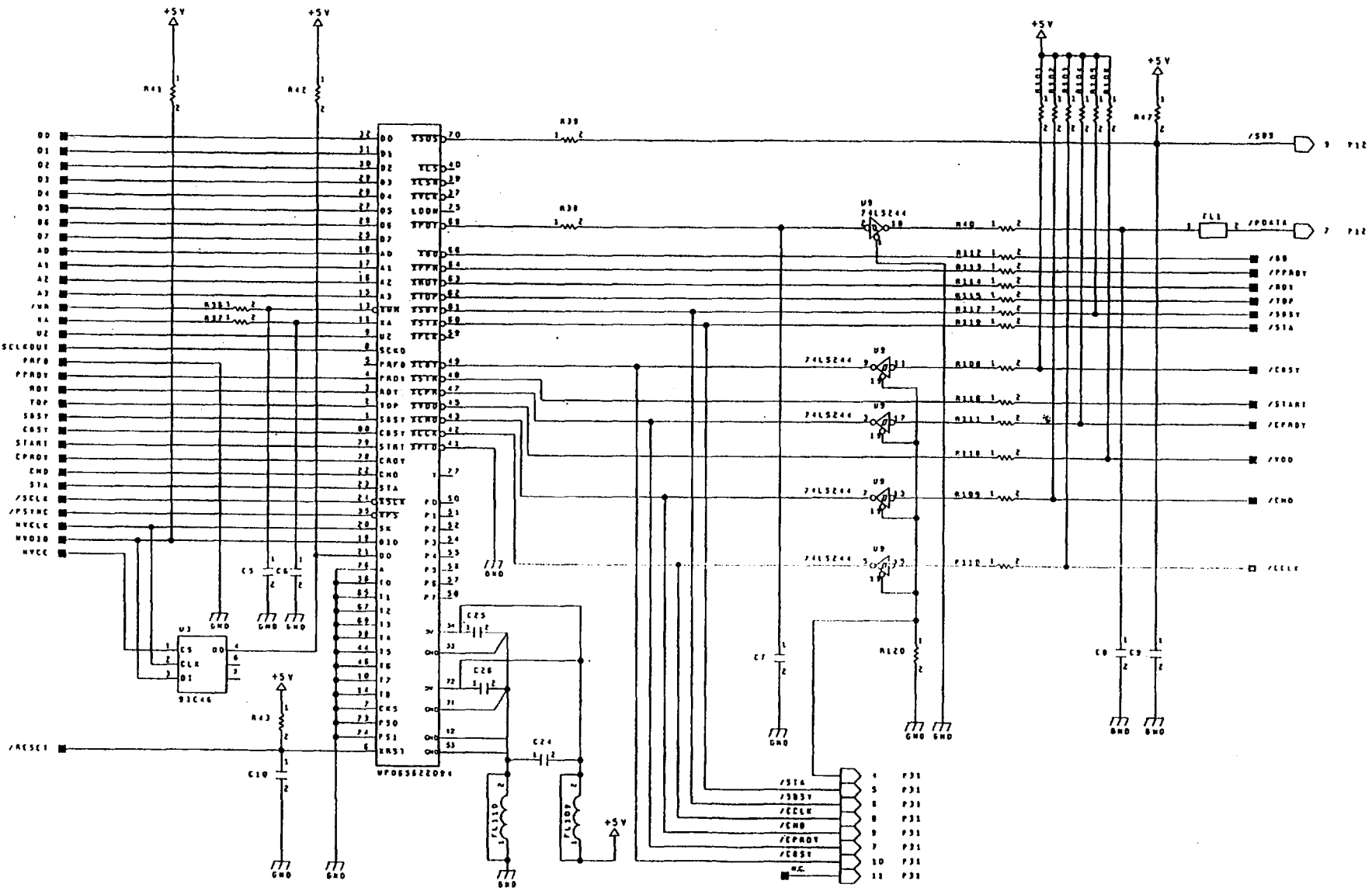


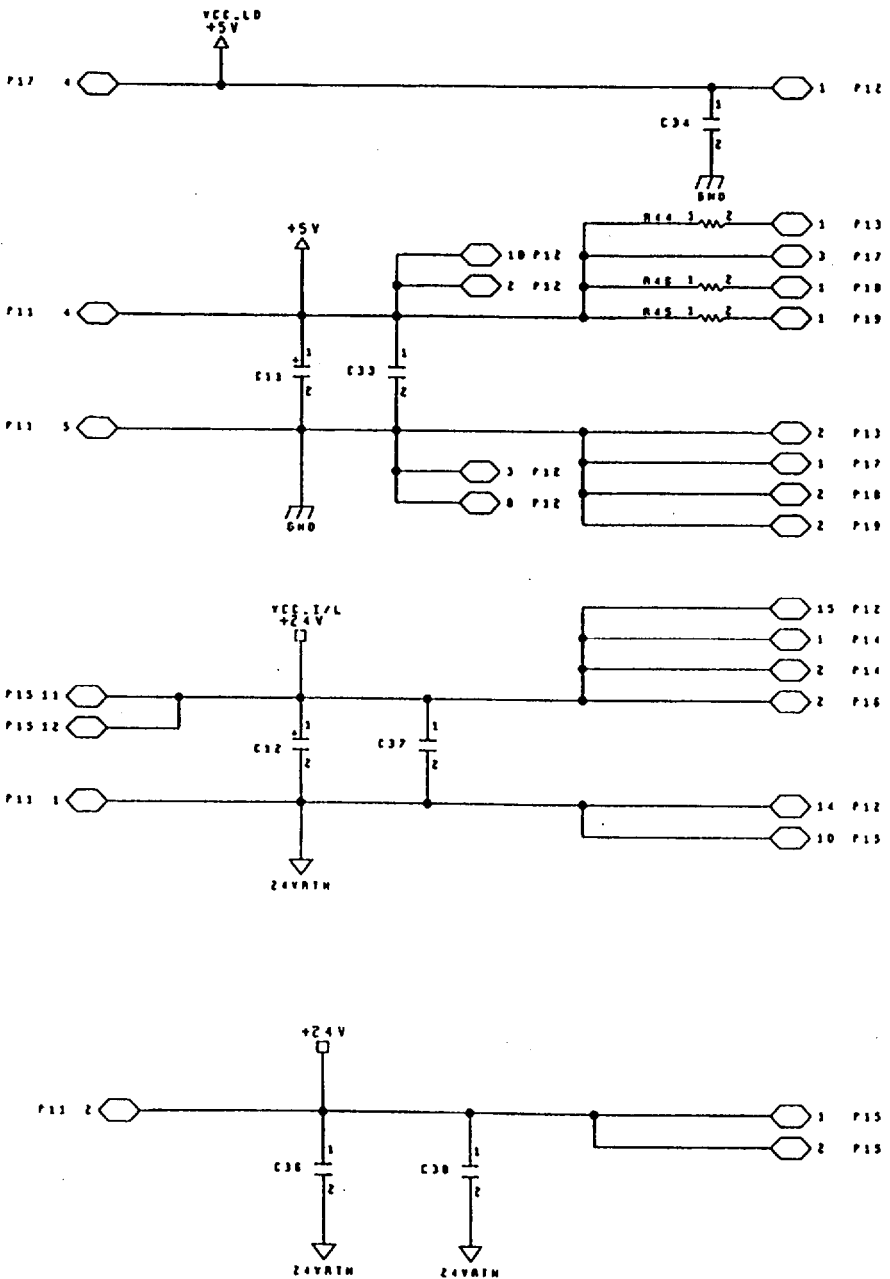
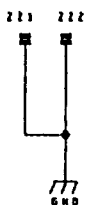
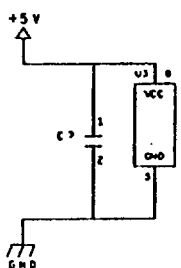
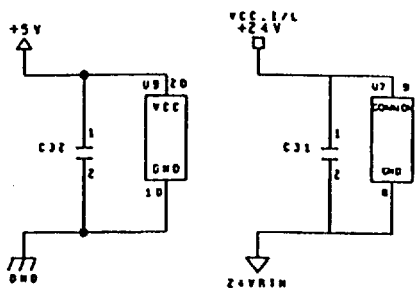




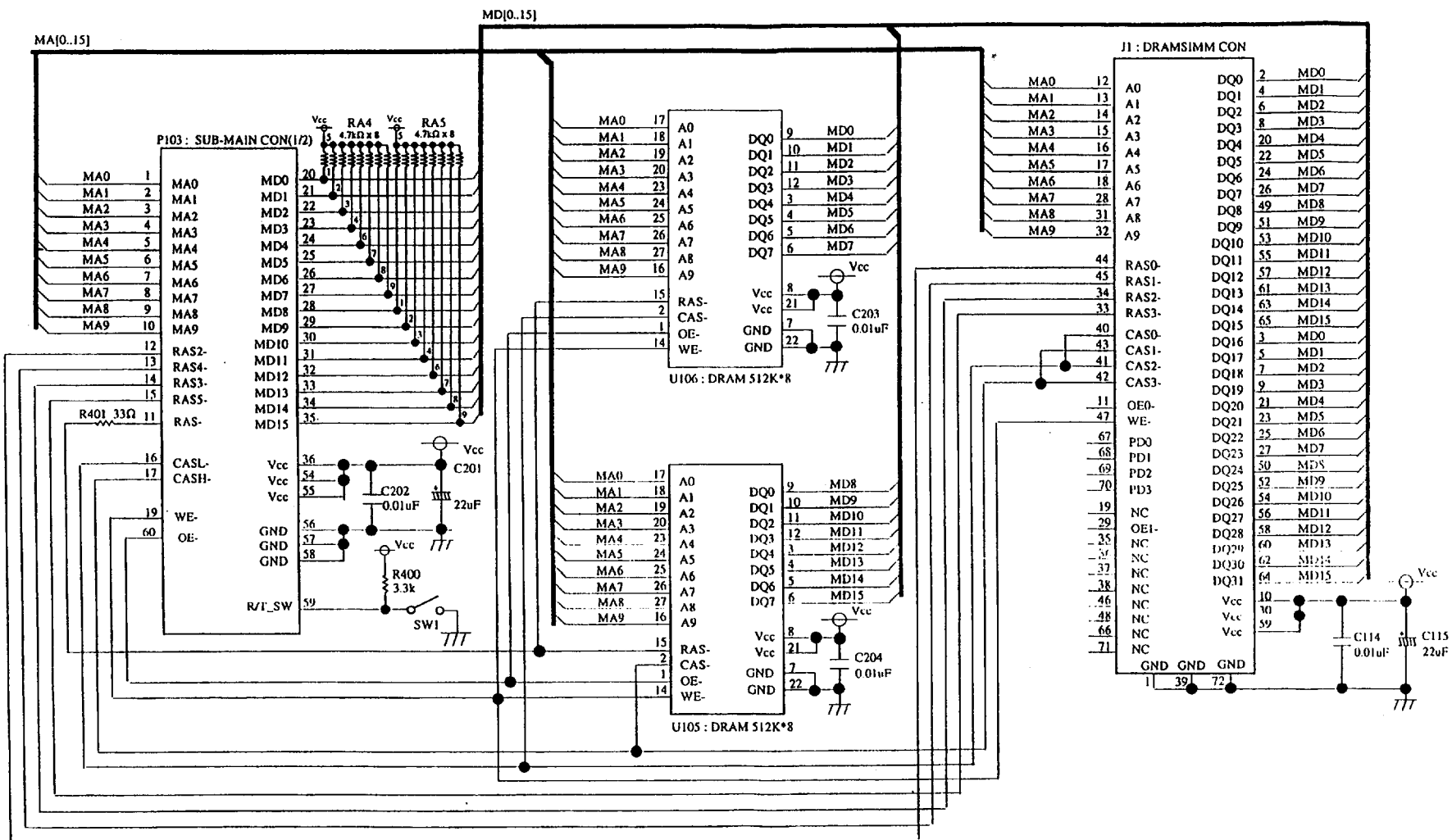




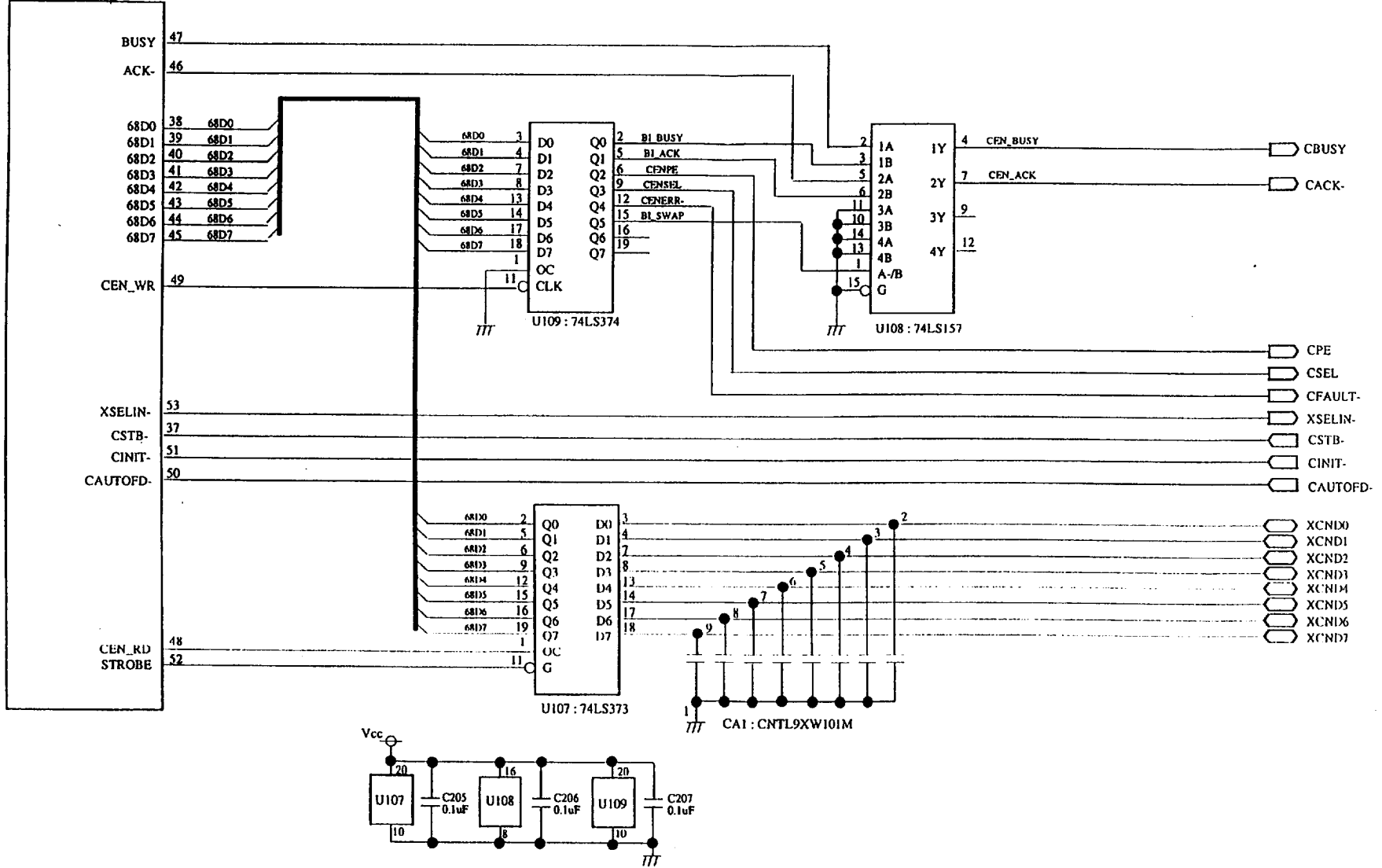


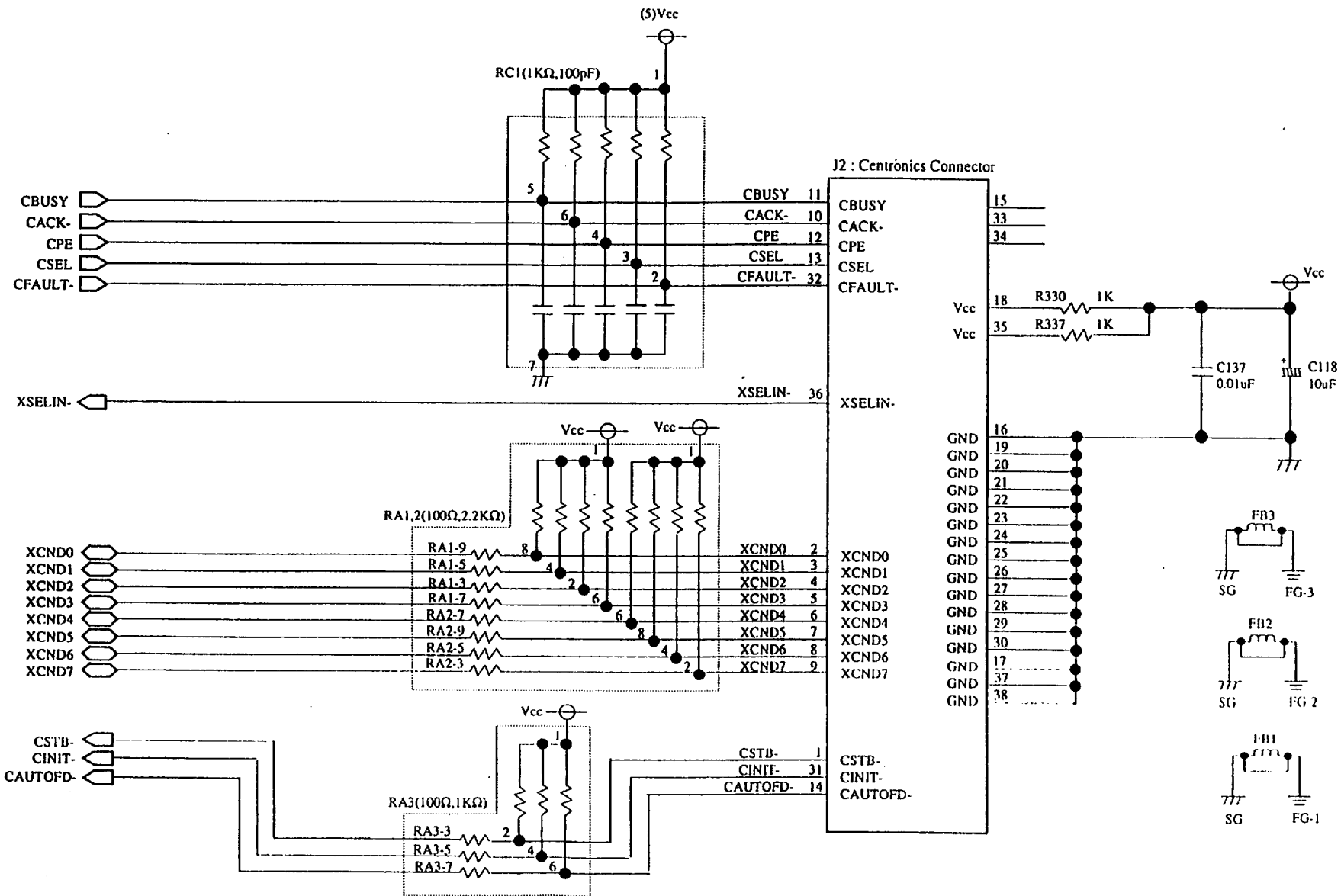


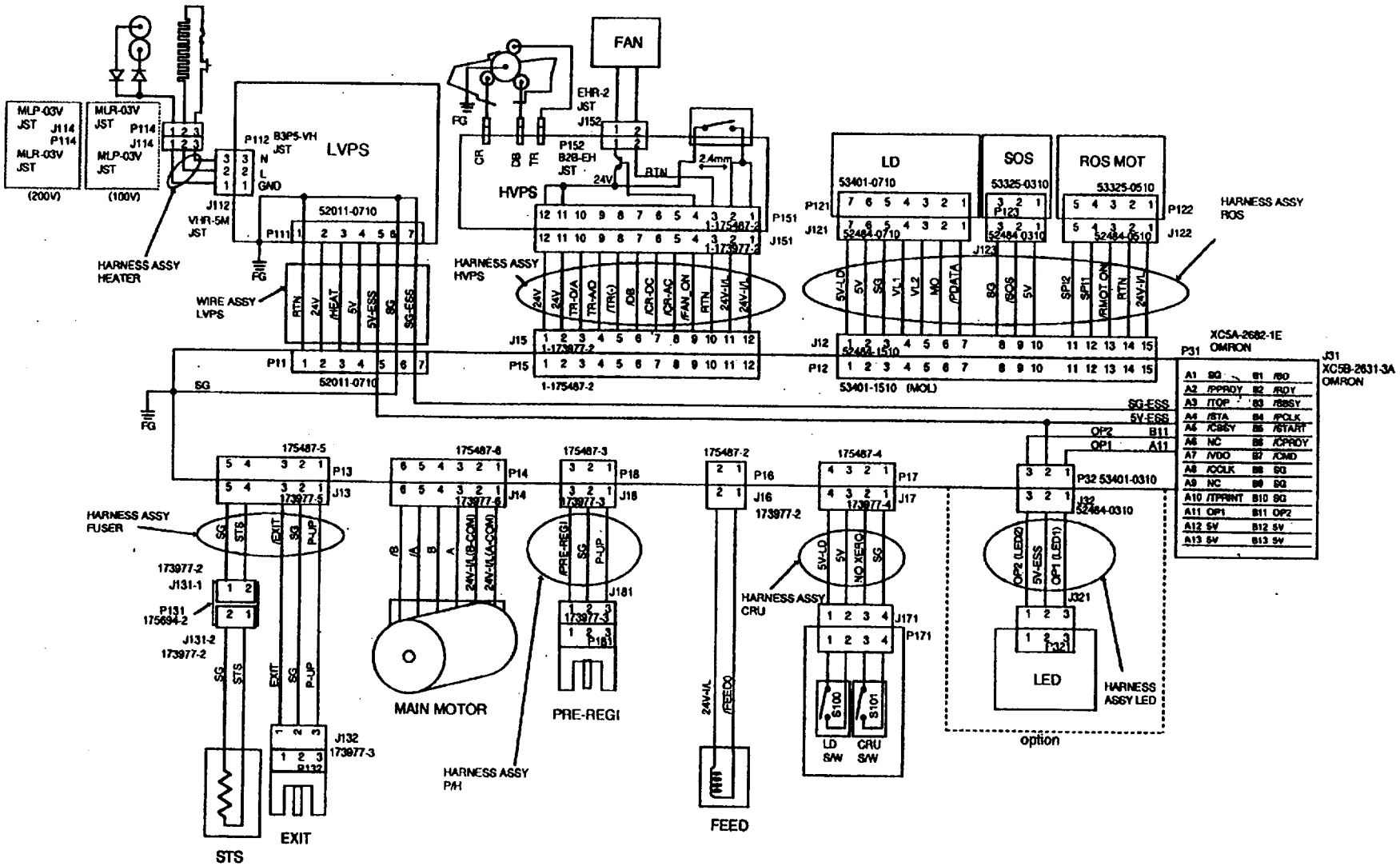




P103 : MAIN-SUB CON(2/2)







# ActionLaser 1400 Appendix B

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## ActionLaser 1400 Appendix B

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This addendum summarizes only the information that applies specifically to the ActionLaser 1400 printer.

### Features and Specifications of the ActionLaser 1400

- ☐ 300 or 600 dots per inch resolution, software selectable
- ☐ 2MB memory standard, expandable to 18MB

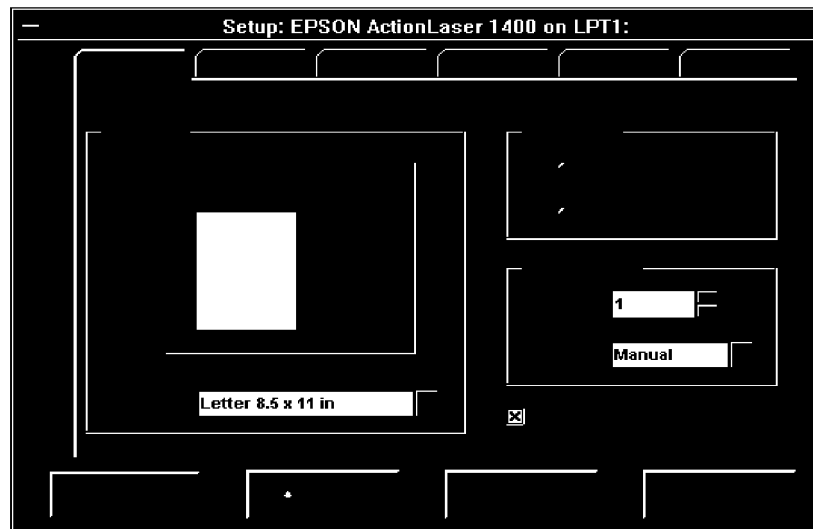
**Table B-1. Feature Comparison**

| Function/Specification | ActionLaser 1100                               | ActionLaser 1400  |
|------------------------|--|---|
| Resolution             | 300 x 300 DPI                                  | 300 x 300 or 600 x 600 DPI                              |
| Processor              | Motorola 68HC000,<br>16 MHz                    | Intel 80960SA RISC<br>processor, 16 MHz                 |
| Standard memory        | 1MB  | 2MB   |
| Memory expansion       | 5MB using 1MB, 2MB, or<br>4MB SIMM in one slot | 18MB, using 1MB, 2MB, 4MB, or<br>8MB SIMMs in two slots |
| Standard emulation     | PCL 5 (HP LaserJet 3)                          | PCL 5e (HP LaserJet 4P)                                 |
| Driver                 | PCL 5 driver for Windows                       | PCL 5e driver for Windows                               |
| Fonts                  | 14 bitmap, 8 scalable                          | 35 Intellifont, 10 TrueType                             |

## Accessing Printer Driver Settings in Windows

To access printer driver settings, first choose Print from the File menu of your application software to bring up the Print dialog box. Depending on your software program, you then need to choose the **Setup**, **Options**, or **Printer** button. Some programs then prompt you to select the ActionLaser 1400 before the Setup dialog boxes appear.

Printer driver settings are accessible on six Setup dialog boxes. The first Setup dialog box you see is for Paper settings:



**Figure B-1. Windows Setup Dialog Box for Printer Driver**

At the top of the dialog box are tabs for each Setup dialog box: Paper, Green, Graphics, Printer, Fonts, and About. The table on the next page lists the settings available on each.

To change a printer setting, open the appropriate dialog box by choosing the tab. Change one or more printer settings and then choose the **OK** button at the bottom of the dialog box. If you want information about any of the printer settings, look up the setting in this chapter or choose the **Help** button.

To return all the settings (except Printer Memory) back to their defaults, choose the **Default** button.



**Table B-2. Windows Printer Driver Settings**

| <b>Setup dialog box</b> | <b>Items</b>   | <b>Settings</b>  |
|-------------------------|--|--|
| Paper                   | Paper Size   | Letter (default)<br>Legal<br>A4<br>Executive<br>COM-10 envelope<br>Monarch envelope<br>DL envelope<br>C5 envelope<br>B5 envelope |
|                         | Orientation  | Portrait, Landscape  |
|                         | Number of Copies   | 1-999  |
|                         | Paper Feed Source  | Automatic, Manual, Envelope  |
|                         | Auto Continue  | On, Off  |
| Green                   | Toner Saving   | Off, Light, Medium, Dark   |
|                         | Edge Smoothing   | Off, Light, Medium, Dark   |
|                         | Toner Density  | Light, Medium, Dark  |
|                         | Power Saving   | On, Off  |
|                         | Power Saving Interval                                    | 1-999  |
| Graphics                | Graphics Mode  | Raster, HP-GL/2  |
|                         | Graphics Quality   | High, Medium, Low  |
|                         | Gray Scale   | Photographic Images<br>Line Art Images<br>Scanned Images   |
|                         | TrueType Mode  | Download as TrueType<br>Download as bit images   |
|                         | Use Printer TrueType Fonts                               | On, Off  |
| Printer                 | Printer Memory   | 2-18MB   |
|                         | Page Protection  | On, Off  |
|                         | Resolution   | 300, 600   |
| Fonts                   | Brings up the Font Manager so you can download PCL fonts |  |
| About                   | Displays software version information                    |  |

## Graphics Settings

The following settings allow you to control the printing of graphics:

### ☐ Graphics Mode

Specifies whether images are sent to the printer as HP-GL/2 graphics or as raster (bit-mapped) graphics. The default is HP-GL/2 graphics.

Printing images in HP-GL/2 mode is faster than printing in raster mode. However, not all graphics can be printed in HP-GL/2 mode. If you are having difficulty printing graphics, change the Graphics Mode setting to Raster.

### ☐ Graphics Quality

Specifies whether to use a lower resolution to print graphics. The settings are High (default), Medium, and Low. Note that Graphics Quality does not affect text.

The High setting prints graphics at 100% of the current resolution setting. The Medium and Low settings print graphics at 50% and 25% of the current resolution, respectively.

For example, if the current resolution is 600 dpi, graphics are printed at 600 dpi with High, 300 dpi with Medium, and 150 dpi with the Low setting. When the current resolution is 300 dpi, you can print graphics at 300, 150, and 75 dpi.

For highest quality printing, use the default High setting. Use Medium or Low if you are having difficulty printing complex graphics or if you want faster printing.

### ☐ Gray Scale

Specifies what halftone pattern to apply to gray scale images. The options are Photographic Images (default), Line Art Images, and Scanned Images. Each option is described below. The best way to choose a setting for your images is to experiment. Print a gray scale image at each setting and choose the one you like best.

Choose Photographic Images for images that you want to have a smooth, realistic appearance. This setting provides soft contrasts between shades of gray and works well for images originally designed with color. At 300 dpi, the printer uses an 8 bit-by-8 bit "clustered dot" method to emulate 60 levels of gray. At 600 dpi, the printer uses a 16 bit-by-16 bit method to emulate 120 levels of gray.

Choose Line Art Images for images with intricate lines and fine detail, such as clip art images. This setting provides solid lines and sharp contrasts between shaded areas. When Line Art Images is selected, the printer uses 8 bit-by-8 bit "dispersed dot" patterns to produce 32 gray tones.

Choose Scanned Images for images that were originally scanned. In this setting, the printer uses a variation of the 8 bit-by-8 bit "clustered dot" method used in the Photographic Images setting. This method produces 60 levels of gray at 300 dpi and 120 levels at 600 dpi.

## ☐ **TrueType Mode**

Specifies whether TrueType fonts are downloaded as TrueType fonts or are first converted to bitmapped images before being downloaded. By default, TrueType fonts are downloaded as TrueType fonts.

You might want to first convert TrueType fonts to bit images if your document contains a lot of graphics but not a lot of TrueType text. In this case, printing TrueType fonts as bit images requires less printer memory and may speed up printing.

Printing TrueType fonts as bitmap images is also useful if you want to overlay graphics on top of text.

## ☐ **Use Printer TrueType Fonts**

Substitutes printer-resident TrueType fonts for TrueType fonts contained in a document. By default, Use Printer TrueType Fonts is on.

Using printer fonts is faster than downloading fonts from your computer. However, there may be slight differences between the printer fonts and the fonts on your computer. If you require that the printed output exactly match what you see on screen and are willing to sacrifice some printer performance, turn off Use Printer TrueType Fonts.

## **Printer Settings**

### ☐ **Page Protection**

When Page Protection is enabled, the printer reserves additional memory and does not print a page until the entire page is fully composed. This allows the printer to print complex pages that can otherwise cause printer overrun errors. The amount of memory that is reserved depends on the paper size.

The settings for Page Protection are Automatic (default), Off, Letter, A4, and Legal.

When Automatic is selected, the printer first analyzes each page. If a page is complex, Page Protection is turned on automatically for the appropriate paper size; otherwise, it is not used.

If you continue to encounter page overrun errors even when Page Protection is on, you may want to add more printer memory. See Chapter 5 for instructions.

### ☐ **Resolution**

Chooses between 600- (default) and 300-dpi resolution. For highest quality, use 600 dpi for both text and graphics. If you are experiencing printer memory problems or you want faster printing, use 300-dpi resolution.

### ☐ **Memory**

Defines the amount of memory installed in the printer. Windows uses this information to determine the amount of memory you have available for printing.

The Memory setting should exactly match the total amount of memory in your printer. If you add more memory to the printer, you need to change the Memory setting to match the amount of printer memory. The additional memory will not be available unless the Memory setting is correct.

If you are unsure how much memory is installed in your printer, print a test page by pressing the reset button at the back of the printer. (Make sure the **Ready** light is on and the **Error** light is off.) The amount of memory (RAM) is stated in KB.

## Toner Cartridge Specifications

- ☐ Storage humidity: 15 to 85% (non-condensing)
- ☐ Shelf life: 24 months

## Cleaning the Printer

When cleaning the printer, be sure to clean the laser scanner window, located in the lower area of the printer interior, immediately in front of the orange strip.

## Testing the Print Engine

You can generate a print engine test print by using an insulated screwdriver to short pins A10 and B10 of P/J31 on the System Controller PWBA

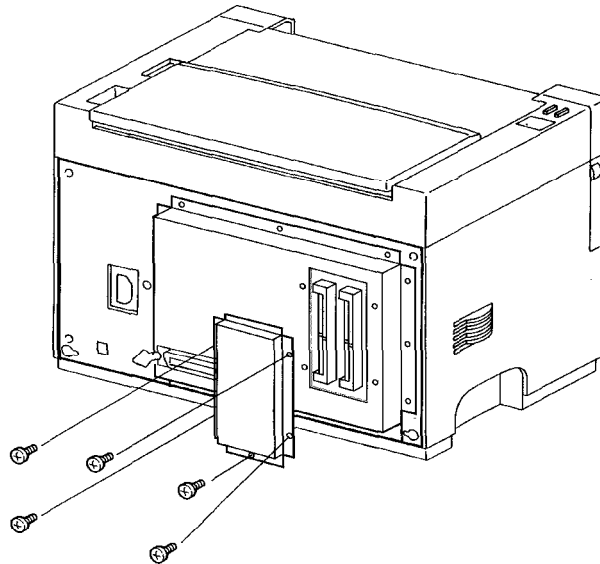
## Installing Memory

By installing one or two 1MB, 2MB, 4MB, or 8MB SIMMs, you can increase printer memory up to 18MB.

Be sure the SIMM meets the following requirements:


- ☐ 72-pin type
- ☐ Capacity of 1,2,4, or 8MB
- ☐ Access speed of 70ns or less

1. Remove the 5 screws securing the metal access cover (Figure B-2).



**Figure B-2. Removing the SIMM Cover**

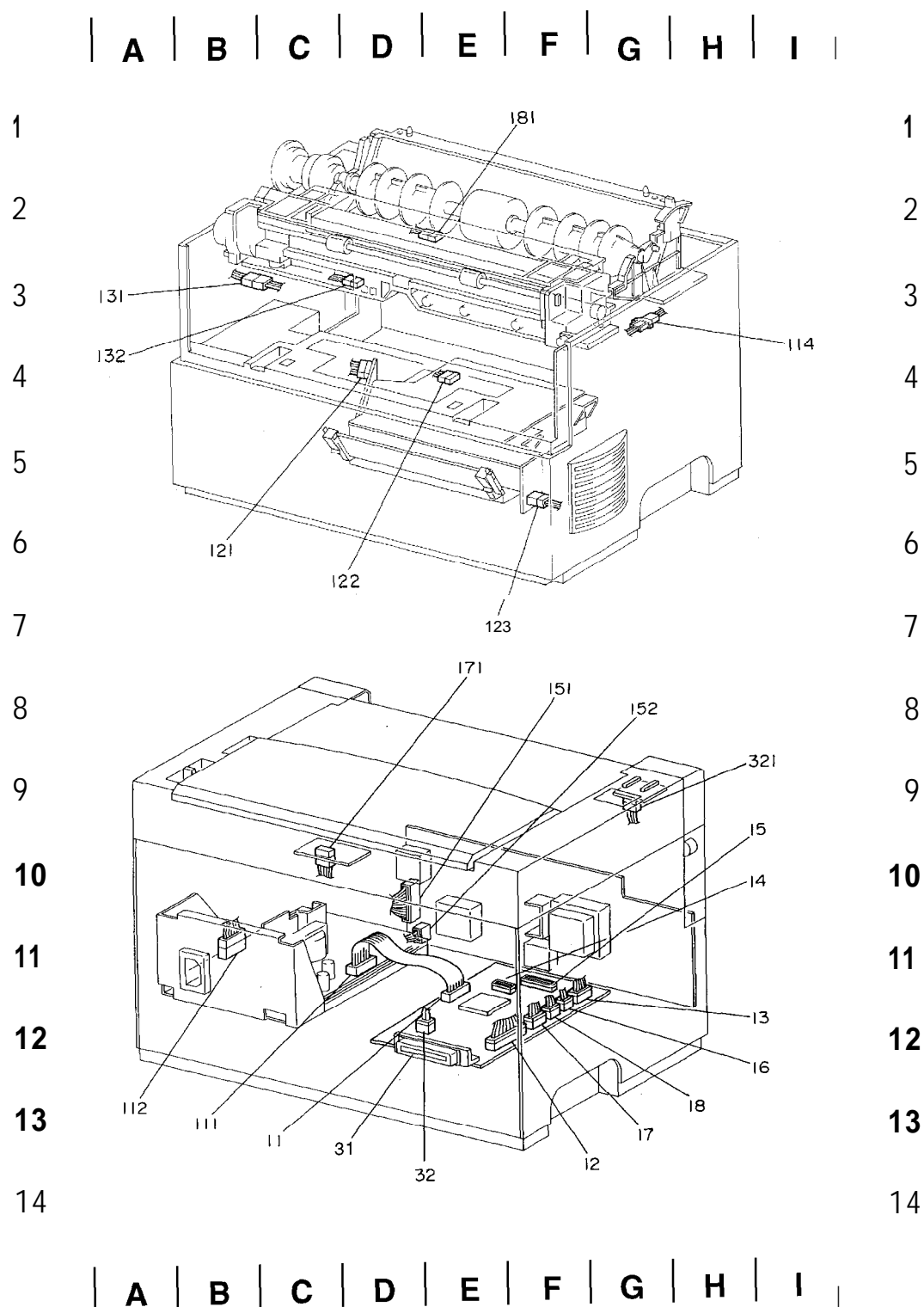
2. Remove the metal access cover.

|  |  |
|--|--|
| <b>WARNING:</b><br><br> | <b><u>Avoid touching the electrical components that are exposed after you remove the metal access cover. They may be very hot if the printer has been used recently.</u></b> |
|--|--|

3. Install the first SIMM in socket J1.
4. If you have a second SIMM, install it in socket J2.
5. Replace the metal access cover and secure it with 5 screws.

After you install the SIMM, the printer driver's memory setting needs to be updated. In the Setup dialog box, change the memory setting for the amount of memory now installed in the printer. (Be sure to include the 2MB already installed.) To verify that memory is correctly installed, print a test sheet by pressing the reset button at the back of the printer.

## Plug/Jack Locator Diagram



Use the following table to identify P/J connectors by their coordinate points. The points correlate to the grid in the P/J Locator Diagram on the previous page.

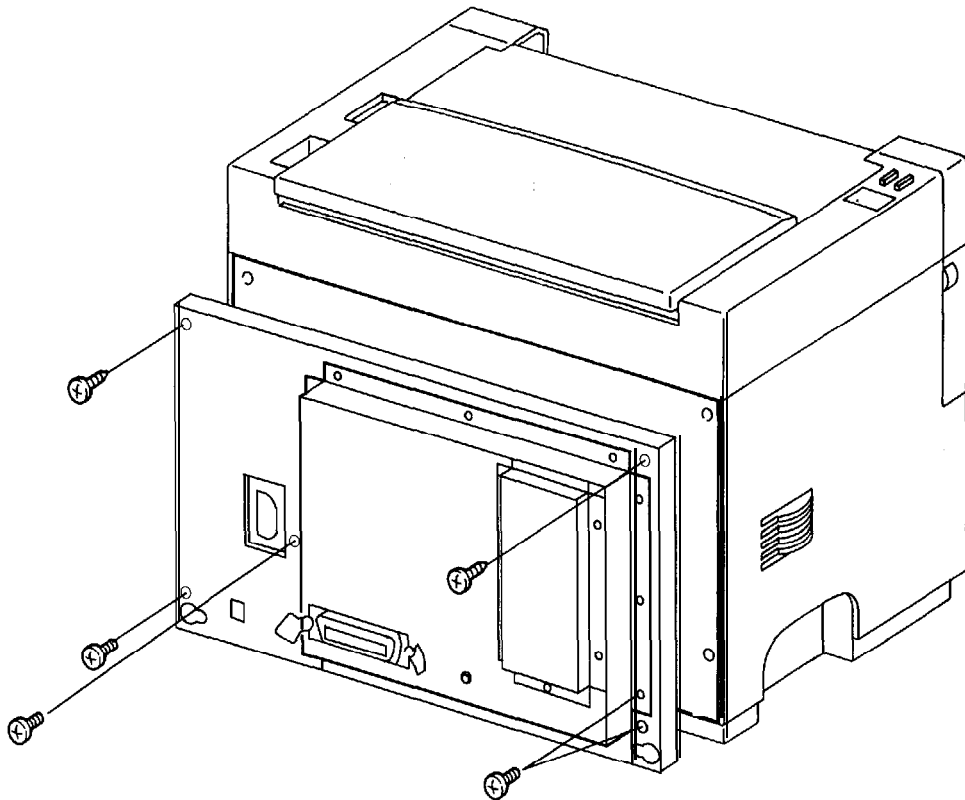
**Table B-3. Plug/Jack Locator**

| <b>P/J</b> | <b>Coordinates</b> | <b>Purpose of P/J</b>   |
|------------|--------------------|---|
| 11         | E-12               | Connects Engine Controller PWBA and LVPS Assembly                       |
| 12         | E-13               | Connects Engine Controller PWBA and Harness Assembly Laser Scanner      |
| 13         | F-12               | Connects Engine Controller PWBA to Thermistor and Harness Assembly Exit |
| 14         | F-12               | Connects Engine Controller PWBA and Main Motor                          |
| 15         | F-12               | Connects Engine Controller PWBA and Harness Assembly HV                 |
| 16         | F-12               | Connects Engine Controller PWBA and Feed Solenoid                       |
| 17         | F-12               | Connects Engine Controller PWBA and Harness Assembly Print Cartridge    |
| 18         | F-12               | Connects Engine Controller PWBA and Harness Assembly P/H                |
| 31         | E-12               | Connects Engine Controller PWBA and System Controller                   |
| 32         | E-13               | Connects Engine Controller PWBA and Harness Assembly LED                |
| 111        | D-11               | Connects LVPS Assembly and Engine Controller PWBA                       |
| 112        | B-11               | Connects LVPS Assembly and Harness Assembly Fuser AC                    |
| 114        | G-3                | Connects Fuser Assembly and Harness Assembly Fuser AC                   |
| 121        | D-4                | Connects LD and Harness Assembly Laser Scanner                          |
| 122        | E-4                | Connects Laser Scanner Motor and Harness Assembly Laser Scanner         |
| 123        | F-6                | Connects SOS and Harness Assembly Laser Scanner                         |
| 131        | B-3                | Connects Thermistor to Harness Assembly Exit and Thermistor             |
| 132        | D-3                | Connects Exit Sensor to Harness Assembly Exit and Thermistor            |
| 151        | D-11               | Connects Engine Controller PWBA and HVPS                                |
| 152        | D-10               | Connects HVPS and Exhaust Fan   |
| 171        | C-10               | Connects Print Cartridge Sensor and Harness Assembly Print Cartridge    |
| 181        | E-2                | Connects Registration Sensor and Harness Assembly P/H                   |
| 321        | G-9                | Connects LED PWBA and Harness Assembly LED                              |

## Rear Cover Removal and Replacement

### Removal

1. Remove the 5 or 6 screws securing the cover (Figure B-3).
2. Carefully pull the cover directly away from the printer until the System Controller PWBA is disconnected from the Engine Controller PWBA.



**Figure B-3. Removing the Rear Cover**

### Replacement

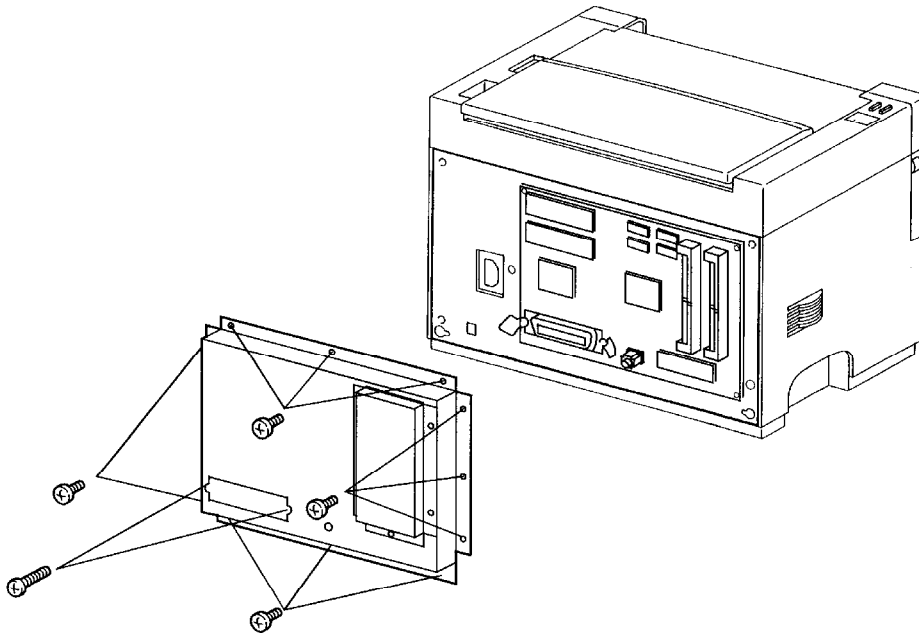
1. Align the System Controller connector with the socket on the Engine Controller PWBA.
2. Replace the cover, reconnecting the System Controller PWBA and the Engine Controller PWBA. Make sure you do not bend or damage the pins inside the connector.
3. Secure the cover with the screws you removed previously.



## System Controller Cover Removal and Replacement

### Removal

1. Remove the 13 screws securing the System Controller Cover (Figure B-4).
2. Remove the cover.



**Figure B-4. Removing the System Controller Cover**

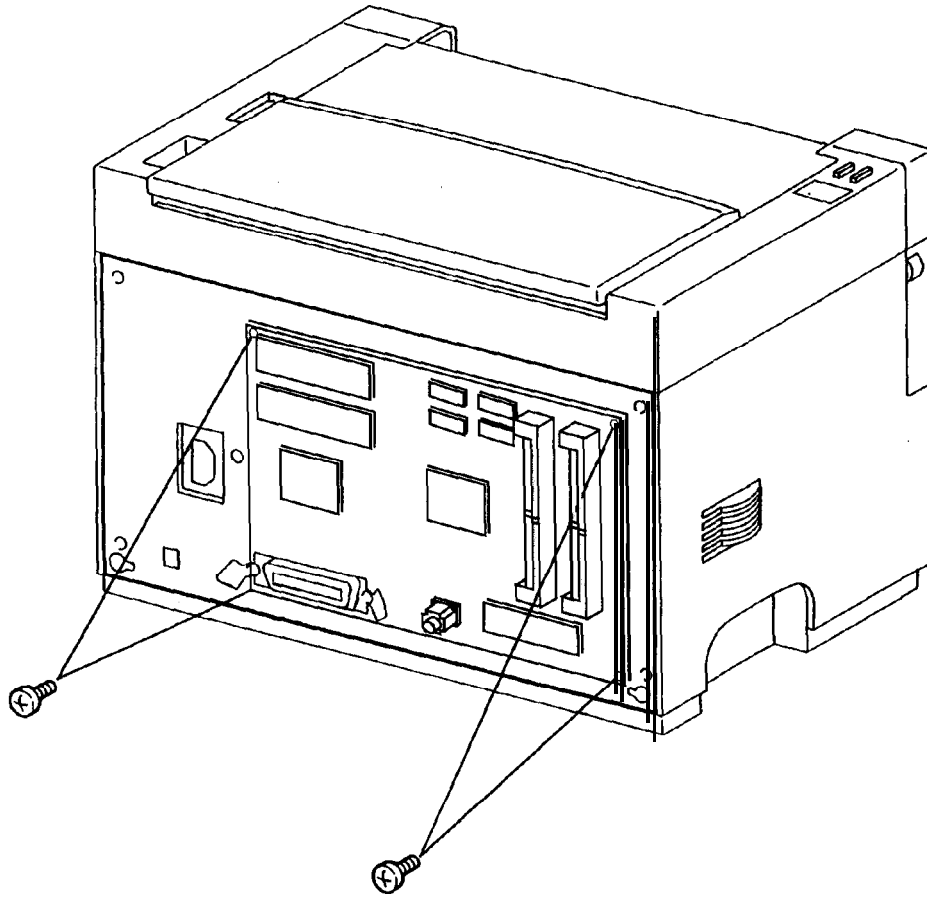
### Replacement

1. Replace the cover, making sure the wire clips on the parallel interface connector fit through the hole in the cover.
2. Replace the 13 screws securing the cover.

## System Controller PWBA Removal and Replacement

### Removal

1. Remove the System Controller Cover.
2. Remove the 4 screws securing the System Controller PWBA (Figure B-5).
3. Carefully pull the PWBA directly away from the printer until it is disconnected from the Engine Controller PWBA.



**Figure B-5. Removing the System Controller PWBA**

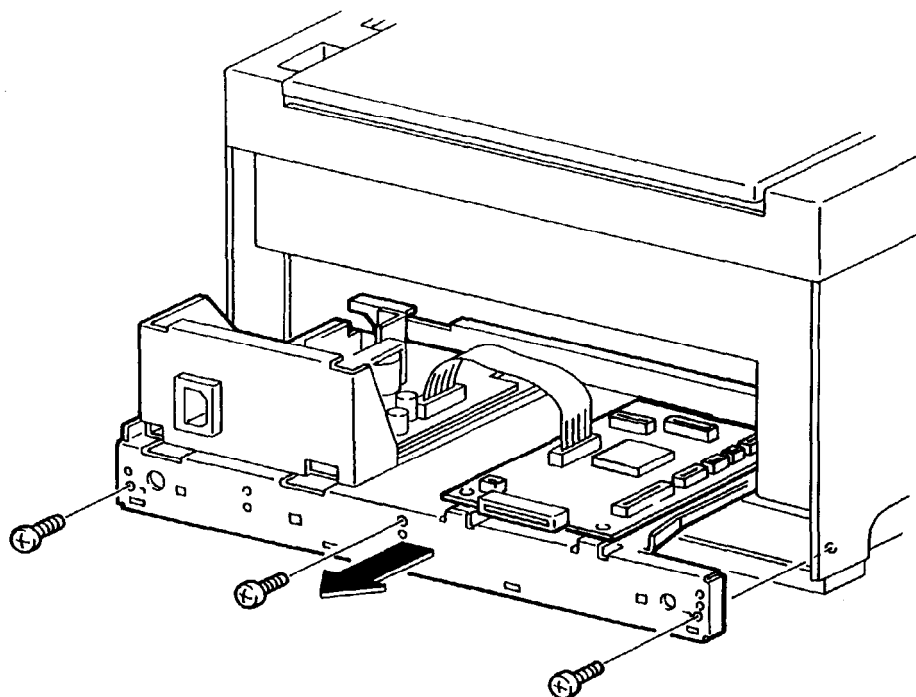
### Replacement

1. Align the System Controller connector with the socket on the Engine Controller PWBA.
2. Reconnect the System Controller PWBA and the Engine Controller PWBA. Make sure you do not bend or damage the pins inside the connector.
3. Replace the System Controller Cover.

## Electrical Chassis Removal and Replacement

### Removal

1. Remove the Rear Cover.
2. Remove the 3 screws securing the Electrical Chassis to the printer body (Figure B-6).
3. Slide the chassis a few inches out of the Printer Body.
4. Disconnect P/Js 11 through 18 from the Engine Controller PWBA.
5. Remove the Electrical Chassis from the Printer Body



**Figure B-6. Removing the Electrical Chassis**

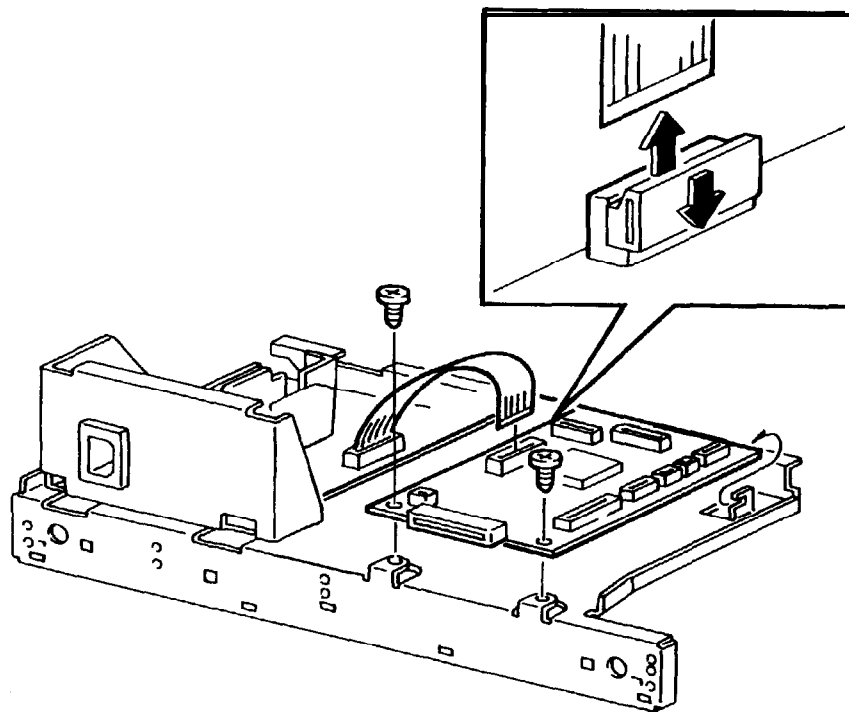
### Replacement

1. Reinstall the Electrical Chassis in the Printer Body.
2. Leave the Chassis sticking out a few inches so you can reconnect the P/Js on the Engine Controller PWBA.
3. Reconnect P/Js 11 through 18 on the Engine Controller PWBA.
4. Slide the Chassis all the way into the Printer Body.
5. Use 3 screws to secure the Chassis.

## Engine Controller PWBA Removal and Replacement

### Removal

1. Remove the Rear Cover.
2. Remove the Electrical Chassis.
3. Disconnect the LVPS to Engine Controller Harness from the PWBA by pressing down on the bar and lifting the harness out of the connector (Figure B-7).
4. Remove the 2 screws securing the Engine Controller PWBA (Figure B-7).
5. Remove the PWBA.

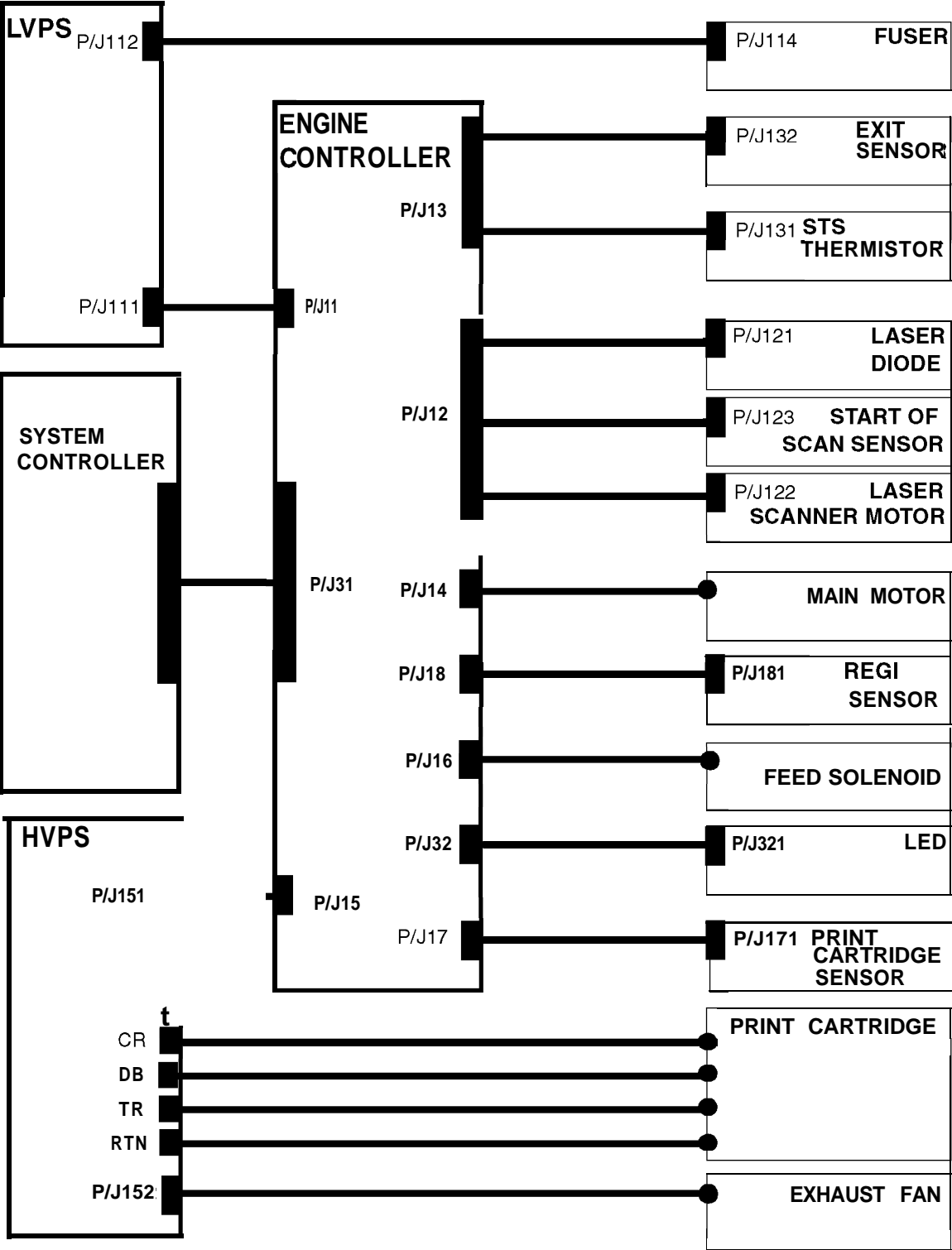


**Figure B-7. Removing the Engine Controller PWBA**

### Replacement

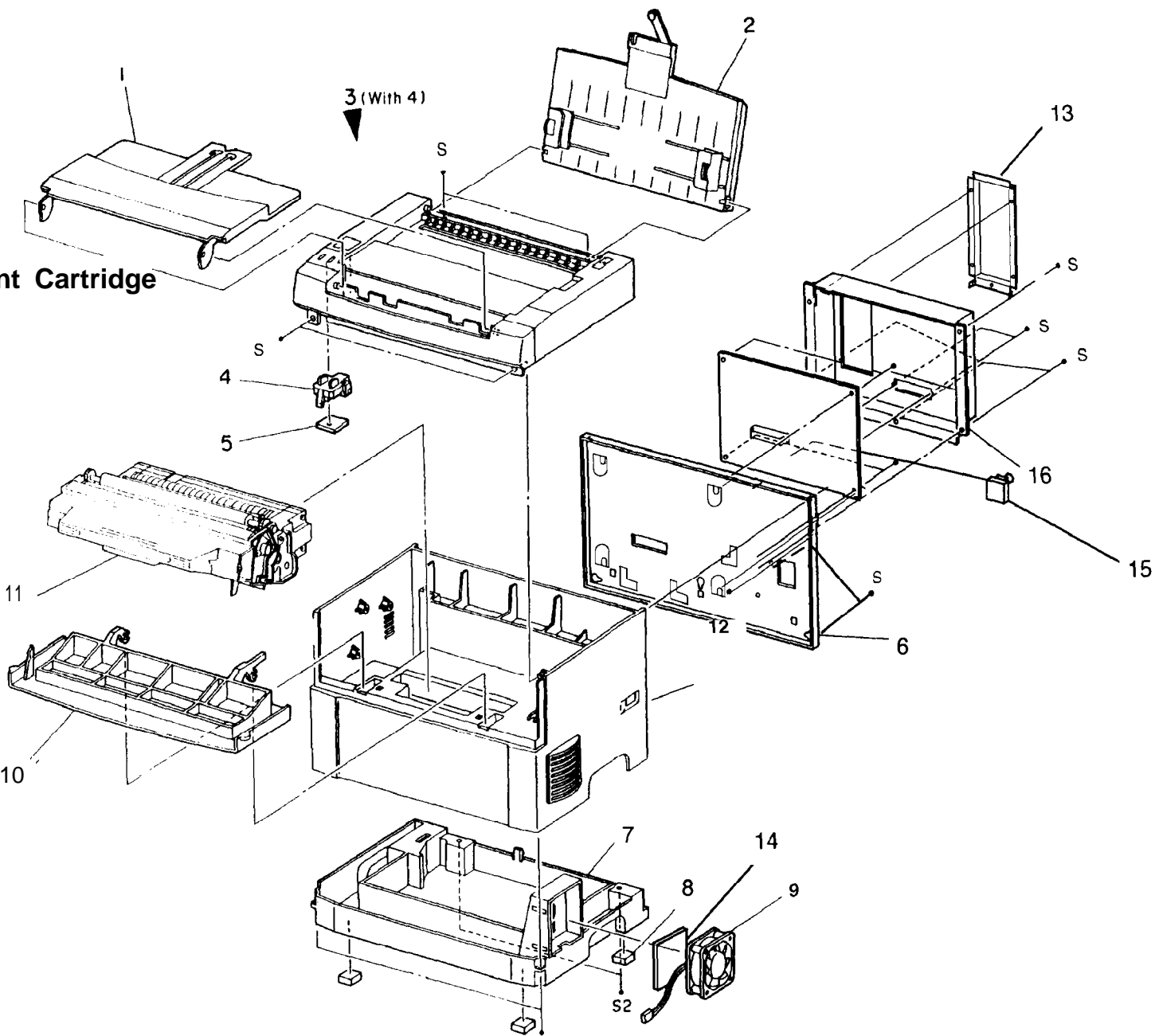
1. Replace the Engine Controller PWBA.
2. Replace the 2 screws securing the PWBA.
3. Reconnect the LVPS to Engine Controller Harness to the PWBA.
4. Replace the Electrical Chassis.
5. Replace the Rear Cover.

Master Wiring Diagram



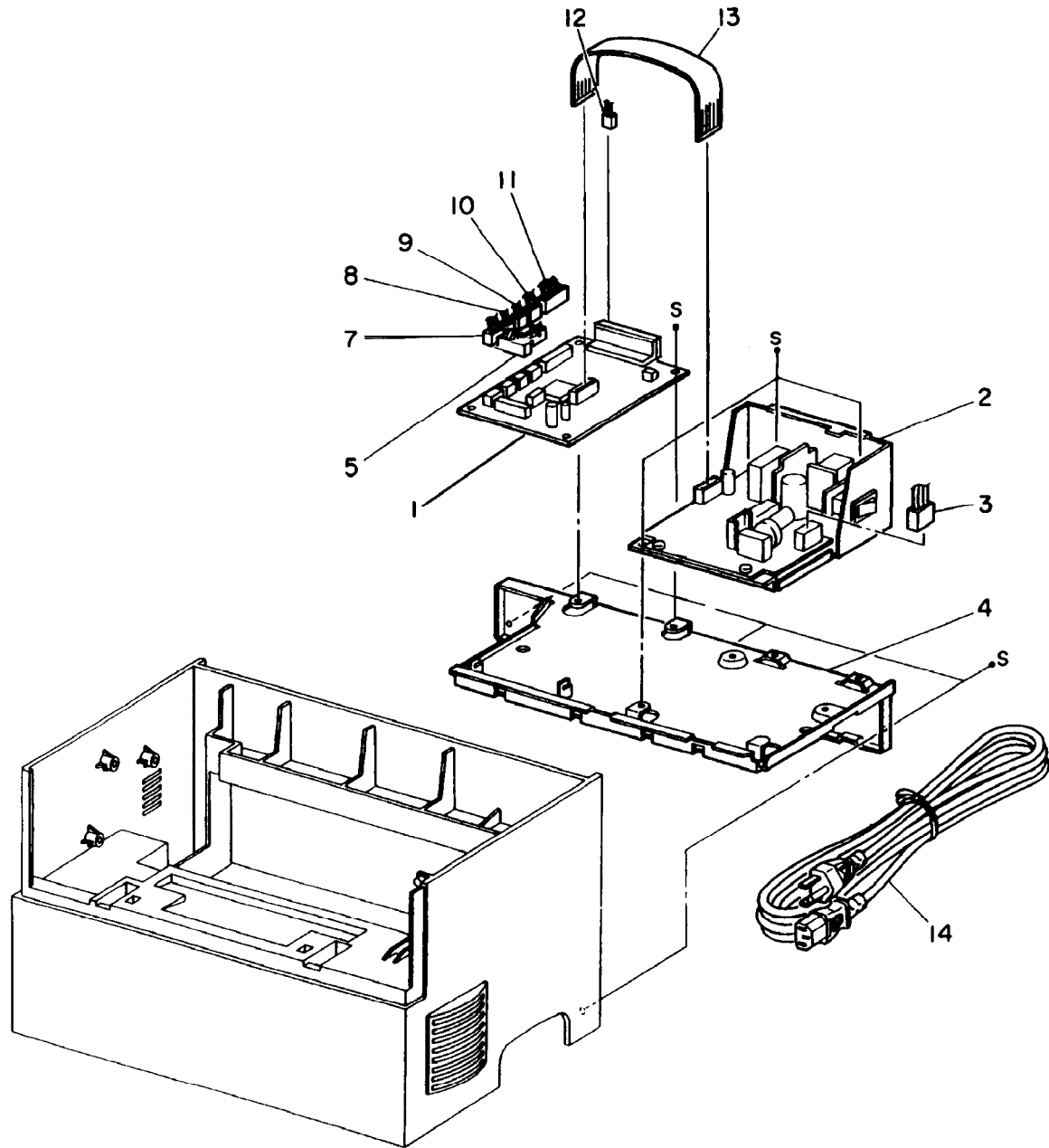
## Covers and Print Cartridge

1. Exit tray
2. Input Tray
3. Top Cover
4. LED Lens
5. LED PWBA
6. Rear Cover
7. Bottom Cover
8. Rubber Foot
9. Exhaust Fan
10. Front Cover
11. Print Cartridge 10
12. Printer Body
13. SIMM Cover
14. Air Filter
15. Reset Switch
16. Controller Cover



## Electrical

1. Engine Controller PWBA
2. LVPS
3. Fuser Harness
4. Electrical Chassis
5. HVPS Harness
6. (omitted)
7. Fuser Sensor Harness
8. Paper Feed Solenoid Har-  
ness
9. Paper Feed Harness
10. Print Cartridge Sensor  
Harness
11. Laser Scanner Harness
12. LED Harness
13. LVPS to Controller  
Harness
14. Power Cord



## Schematic

