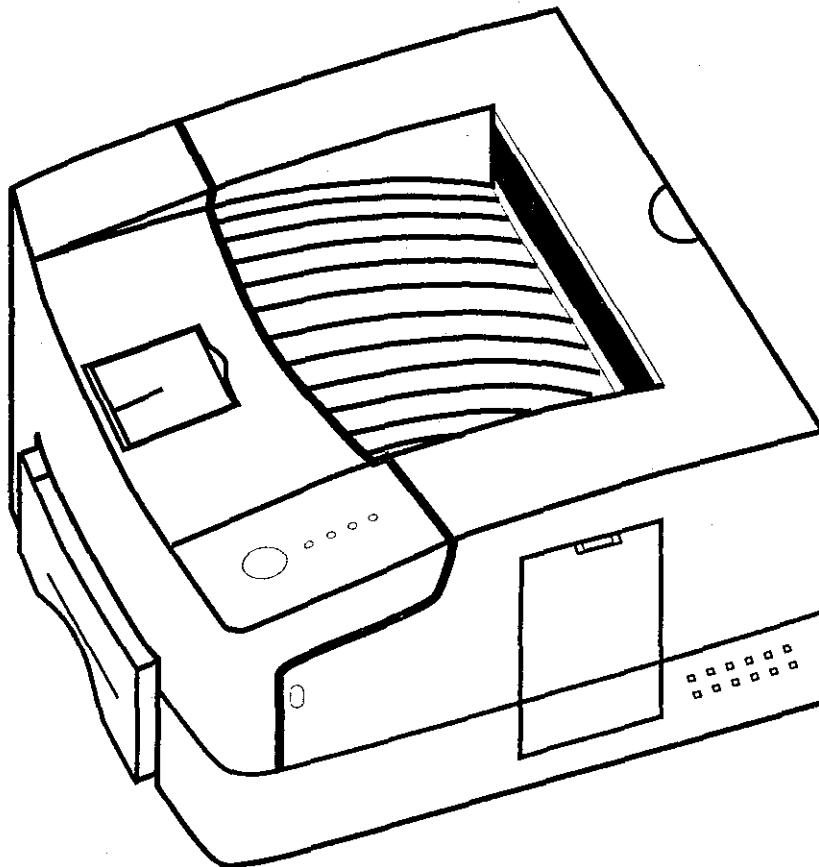


Xerox DocuPrint 4508 Service Manual



720P59711

This Service Manual contains information that applies to the Xerox DocuPrint 4508 Electronic Laser Printer.

NOTICE

This manual is for use by Xerox Technicians and Xerox trained technicians only.

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The Xerox DocuPrint 4508 uses PCL 5e
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PCL 4 emulation.

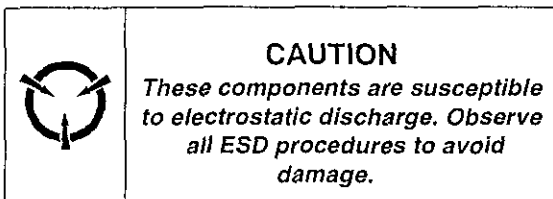
PCL and PCL 5e are trademarks of Hewlett
Packard Company. These printers contain an
emulation of the Hewlett Packard PCL 5e
command language, recognizes HP PCL PCL 5e
commands, and processes these commands in a
manner compatible with Hewlett Packard LaserJet
printer products.

Warning

This equipment complies with the requirements in Part 15 of FCC rules for a class A computing device. Operation of the equipment in a residential area may cause unacceptable interference to radio and TV reception, requiring the operator to take whatever steps are necessary to correct the interference.

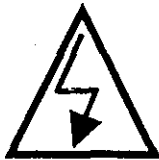
Electrostatic Discharge

This caution indicates that there are components which are sensitive to damage caused by electrostatic discharge.



Shock Hazard

This symbol indicates the presence of potentially hazardous voltages.



DP8_001

CLASS 1 LASER PRODUCT

The Xerox DocuPrint 4508 laser printers are 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 scanner 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.

Laser (FDA): Any laser label visible to service must be reproduced in the service manual with location shown or indicated. Safe working procedures and clear warnings concerning precautions to avoid possible exposure must also be included.

The Laser contained in the DocuPrint 4808 meets the following standard: Laser class 3B, maximum 5mW, wavelength 780nm.

The following LASER symbol will be displayed at the start of any procedure where possible exposure to the laser beam exists.

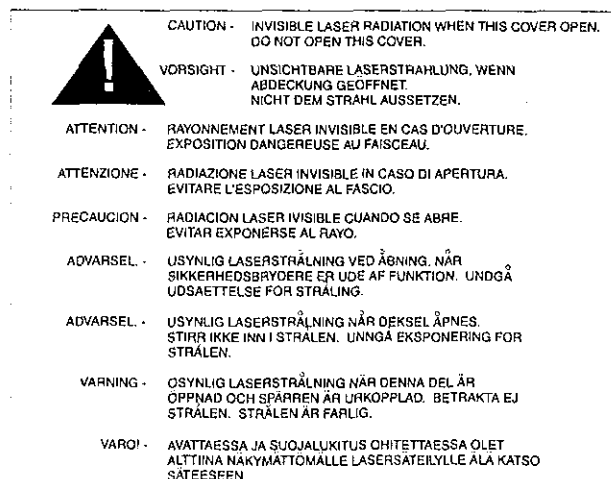


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LUOKAN 1 LASERLAITE

KLASS 1 LASER APPARAT

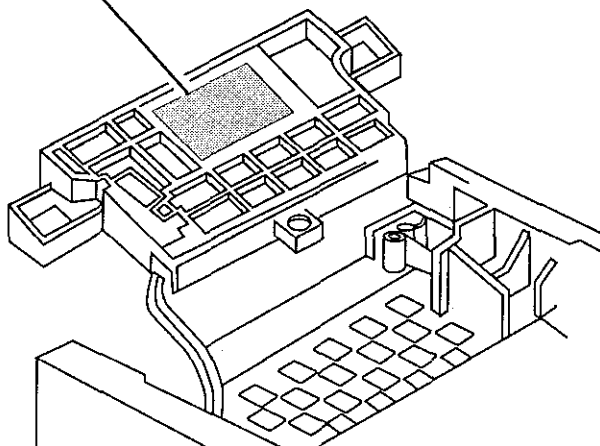
Each 4508 laser printer has the following laser warning label on the Laser Assembly.



DP8_009

The Laser Label is visible when the Main Cover is removed (Figure 1).

Laser Label.



DP8_034

Finland Laser Safety

VARO! - Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.

WARNING! - Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

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Introduction

The Xerox DocuPrint 4508 Service Manual is the primary document used for repairing and maintaining the 4508 Laser Printers.

This manual contains Service Call Procedures, Diagnostic Procedures, General Information, Repair Analysis Procedures, Copy Quality Analysis Procedures, Wiring Data, and Parts Lists that will enable the Service Representative to repair 4508 failures.

Organization

This manual is divided into seven sections. The title and description of each section of the manual is as follows:

Section 1 - SERVICE CALL PROCEDURES

This section is used to identify a suspected problem. It contains Call Flow, Initial Actions, and Final Actions. This part of the service manual should always be used to start the service call.

Section 2 - PRINTER SPECIFICATIONS

This section contains all the specifications for the 4508 printers.

Section 3 - PARTS LISTS

This section contains illustrations of disassembled subsystems and a listing of the spared parts.

Part names are listed in this section of the manual even if the part itself is not spared. All the parts that are spared will have the part number listed. Parts that are not spared will not have a number listed.

Section 4 - REPAIR PROCEDURES

This section contains the instructions for removal, replacement, and adjustment of the spared parts.

Section 5 - GENERAL PROCEDURES

This section contains diagnostic routines, printer setup procedures, and a listing of tools and supplies.

Section 6 - WIRING DATA

This section contains illustrations of the plug/jack locations and the routing of power and signal cables.

Section 7 - REPAIR ANALYSIS PROCEDURES (RAPs)

This section contains the procedures necessary to repair failures in the printer. This section also contains the procedures necessary to troubleshoot print quality problems.

Revision Control List

<u>Product</u>	<u>Manual Title</u>	<u>Part Number</u>
4508 Laser Printer	Xerox DocuPrint 4508 Service Manual	720P59711

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4-5	3/97	5-27	3/97				
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4-7	3/97	5-29	3/97				
4-8	3/97	5-30	3/97				
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4-11	3/97	6-2	3/97				

Revision Control List

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Section 1

Service Call Procedures

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1.2 Initial Actions 1-3

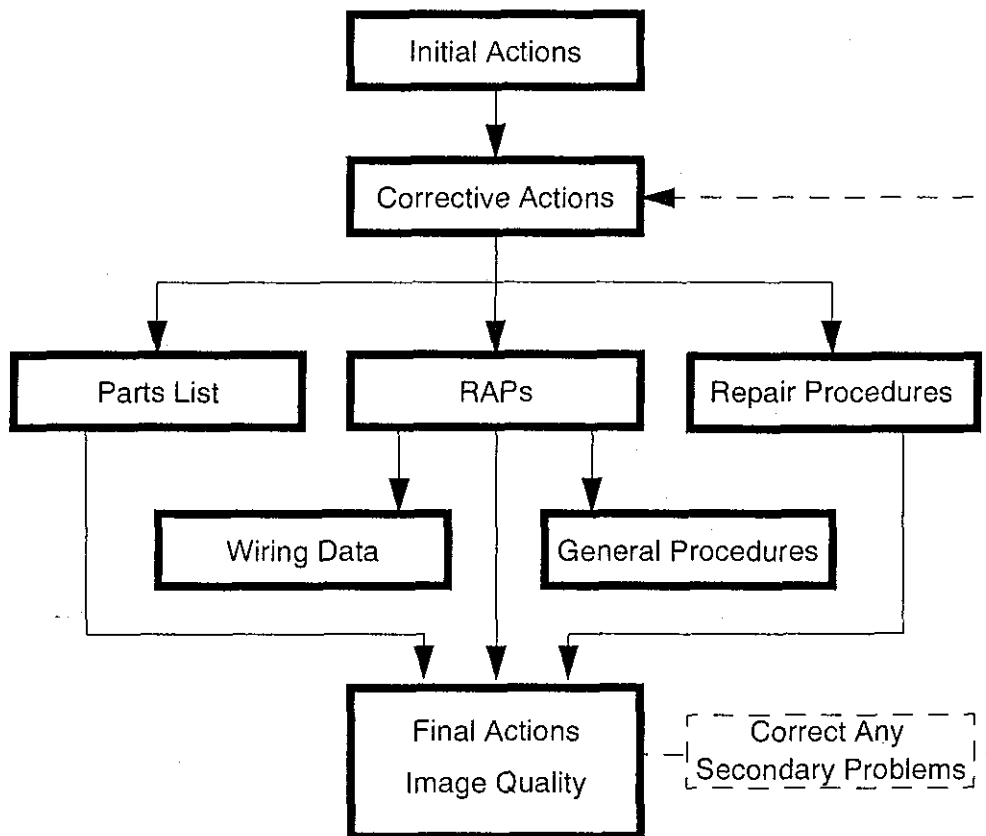
1.3 Corrective Actions..... 1-3

1.4 Final Actions 1-4

1.1 Call Flow Diagram

The basic troubleshooting steps are outlined in the Call Flow Diagram (Figure 1.1). All service calls begin with Initial Actions and end with Final Actions.

Figure 1.1 Call Flow Diagram.



1.2 Initial Actions

- 1 Question the operator and verify the problem.
- 2 Check that the printer paper path is clear of foreign matter such as staples, paper clips, and paper scraps.
- 3 After you have identified the problem symptom, check the following items:
 - The printer is connected to a wall power outlet, and the outlet is supplying the correct voltage.
 - The printer power cord is not frayed or broken.
 - The printer is correctly grounded / earthed.
 - The printer is in an appropriate operating environment, with no extremes of heat, humidity, or dirt.
 - The printer is not exposed to direct sunlight.
 - The printer is on a level and stable surface.

1.3 Corrective Actions

- 1 If the printer has an obvious failure or fault, you can go directly to the appropriate Repair Procedure (Section 4) or Repair Analysis Procedure (RAP) (Section 7) and begin corrective action.
- 2 If the fault is not obvious, follow the Entry Level RAP (Section 7) to identify the problem and begin corrective action.
- 3 After all corrective actions have been made, perform Final Actions.

1.4 Final Actions

- 1 Run Test Prints to evaluate print quality.
- 2 Perform the Image Quality Checkout procedures in section 7 to correct any print quality defects.
- 3 Correct any secondary problems (return to Corrective Actions, if necessary).
- 4 Reinstall the machine covers.
- 5 Clean the machine and the work area.
- 6 Ask the customer to send a print job to verify printer operation.
- 7 Provide operator training as required.
- 8 Close the call.

Section 2

Printer Specifications

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2.1 Electrical Specifications

2.1.1 Power Sources and Consumption

The Xerox 4508 printers are available with either a 110 or a 220 volt configuration.

Line Voltage	Line Voltage Tolerance	Frequency	Frequency Tolerance	Running Power Consumption	Power Saver
100/115 VAC	90 - 132 VAC	50/60 Hz	47 - 63 Hz	150 Watts	17 Watts
220/240 VAC	198 - 264 VAC	50/60 Hz	47 - 63 Hz	150 Watts	17 Watts

2.1.2 Power On/Off

The Xerox 4508 printers are ON as soon as the power cord is plugged into a three-wire grounded power socket. The printer powers down automatically when it is not used for a period of time (see Power Saver).

2.1.3 Power Saver

The Power Saver reduces power automatically when the printer does not receive data for a period of time. Power Saver is a menu selection in the Remote Control Panel (RCP) software which provides the user with the ability to control when the printer enters the power saver state.

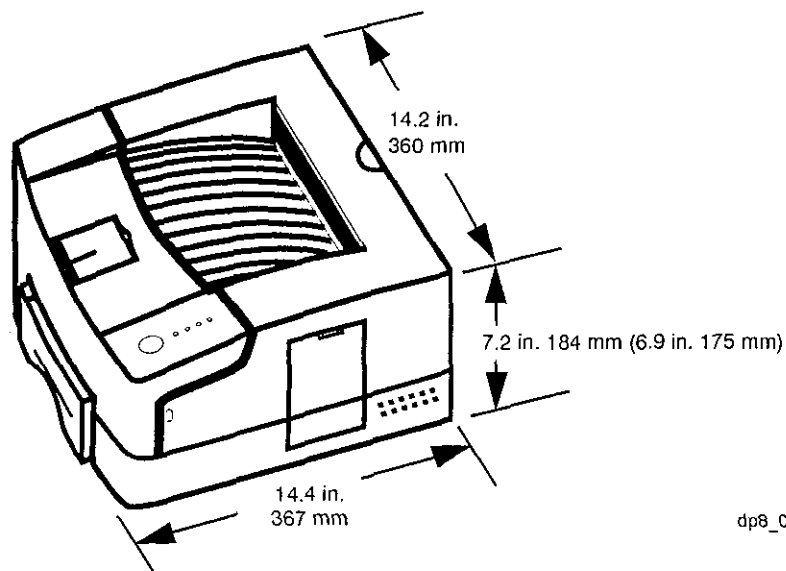
2.1.4 Mechanical

Unit	Width	Depth	Height	Weight
Metric	360 mm	367 mm	184 mm (4508) 175 mm (4408)	Under 9 Kg
SAE	14.2 in.	14.4 in.	7.2 in (4508) 6.9 in (4408)	20 lbs

2.1.5 Consumables

PRINTER CARTRIDGE: 4000 pages at 5% coverage; more with use of the toner saving Econo Mode.

2.2 Physical Location



The printer should be installed on a smooth and flat surface. There should be enough clearance around the printer to allow air circulation around the vents to prevent the printer from overheating, and also allow you to easily:

- open the front door
- open the rear door to remove any jammed paper
- retrieve paper from the rear face up path

2.3 Functional Specifications

Warm Up Time	First Print Out	Print Speed - ppm (pages per minute)	Resolution - dpi (Dots per inch)
Under 20 seconds	Under 20 seconds	8 ppm	True 600 x 600 dpi

2.4 Environment

	Temperature	Humidity	Noise	Level
Operating	10° - 32° C 50° - 90° F	20 - 80% RH	Standby - Under 29 dB Printing - Under 47 dB	Within 5°
Shipping	0° - 35° C 32° - 95° F	10 - 90% RH	-----	-----

The printer must not be exposed to:

- abrupt changes in temperature or humidity
- any condensation
- direct sunlight
- chemicals
- vibration.

2.5 Options

MEMORY/DRAM:- 2MB standard.

- With the one available memory expansion slot, memory is expandable to 34MB in units of 2, 4, 16, or 32MB.

250-Sheet Lower Base Feeder.

RS232C Serial Port.

2.6 Paper Specifications

The recommended standard paper type is Xerox DP, 20 lb. (80 gsm).

2.6.1 Paper Limitations

The following are recommended for optimum performance:

- Adhesive label sheets specifically designed for laser printers.
- Transparencies specifically designed for laser printers

- Envelopes with peel-off adhesive strips or more than one fold-over flap to seal must have adhesives compatible with the heat and pressure of the printer's fusing process.
- Avoid:
 - Paper with embossed lettering, perforations, or rough texture.
 - Paper to which color was added after the paper was made.
 - Printed forms whose ink is not for laser printing. *do they work fusing*

Most papers that meet the specifications above may be fed either automatically through the universal paper tray, or manually through the manual feed slot.

Manual feeding, however, will be necessary for

- envelopes
- transparency films
- some media that meet specifications but are not ideal for feeding from the Paper Tray, e.g., paper that is either highly textured, thicker than normal for its weight, or unusually smooth.

The paper tray capacity and paper sizes are listed in Tables 2.6.1a, 2.6.1b, and 2.6.1c.

Table 2.6.1a Standard Tray Capacity

Paper Type	Capacity (Sheets)
A4, Letter, B5, Executive, Legal, & Folio	250 (4508)

Table 2.6.1b Paper Sizes

Paper Type	Size	Feed Source
A4	8.27 x 11.69 inches (210 x 297 mm)	Paper Tray or Manual
Letter	8.5 x 11 inches (216 x 279 mm)	Paper Tray or Manual
B5 (ISO)	6.93 x 9.84 inches (176 x 250 mm)	Paper Tray or Manual
Executive	7.25 x 10.5 inches (184 x 267 mm)	Paper Tray or Manual
Folio	8.5 x 13 inches (216 x 330 mm)	Paper Tray or Manual
Legal	8.5 x 14 inches (216 x 356 mm)	Paper Tray or Manual
Com- 10 Envelope	4.13 x 9.5 inches (105 x 241 mm)	Manual Only
Monarch Envelope	3.87 x 7.5 inches (98 x 191 mm)	Manual Only
DL Envelope	4.33 x 8.66 inches (110 x 220 mm)	Manual Only
C5 Envelope	6.38 x 9.02 inches (162 x 229 mm)	Manual Only
OHP Film (Transparency)	A4 or Letter	Manual Only
Label Paper	A4 or Letter	Manual Only

Table 2.6.1c Output Tray

Output	Paper Type	Capacity (Sheets)
Face Down Tray	A4, Letter, B5, Executive, Legal, & Folio	125
Face Up	All	One At A Time

2.7 Operating Language and Emulation

The Xerox 4508 uses the enhanced PCL5 language (PCL 5e).

The Xerox 4508 emulates the HP LJ4 (PCL 5e).

2.8 Communication Interfaces

Parallel port - Centronics IEEE P1284 compatible bi-directional (Nibble, Byte and ECP).

Serial port - RS-232C; supports data transfer up to 115,200 bps.

Auto Interface Switching (AIS), when the serial interface is installed.

2.9 Status Display/Controls

The printer's status is controlled and displayed by both:

- a panel with a Front Panel Key and four LED's
- software programs that enable the user to:
 - monitor the printer's status on the computer screen (the Status Monitor)
 - change printer settings from the computer screen (Remote Control Panel).

The 4508 software diskettes includes Status Monitor, printer driver, and the Remote Control Panel (RCP) for DOS, Windows 3.1 and Windows 95. Detailed specifications are in Section 5, General Procedures.

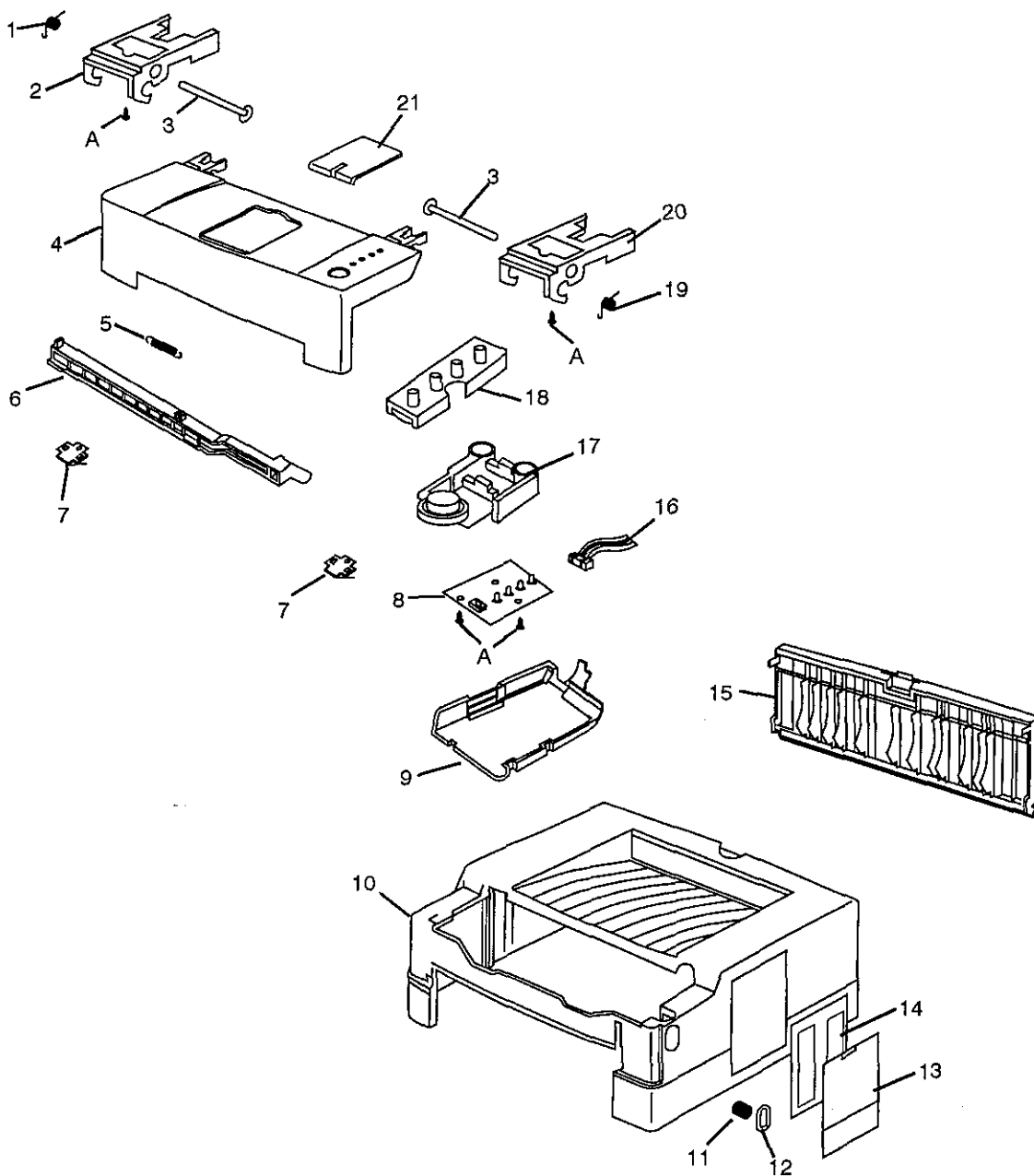
Section 3

Parts Lists

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PL 1 Covers

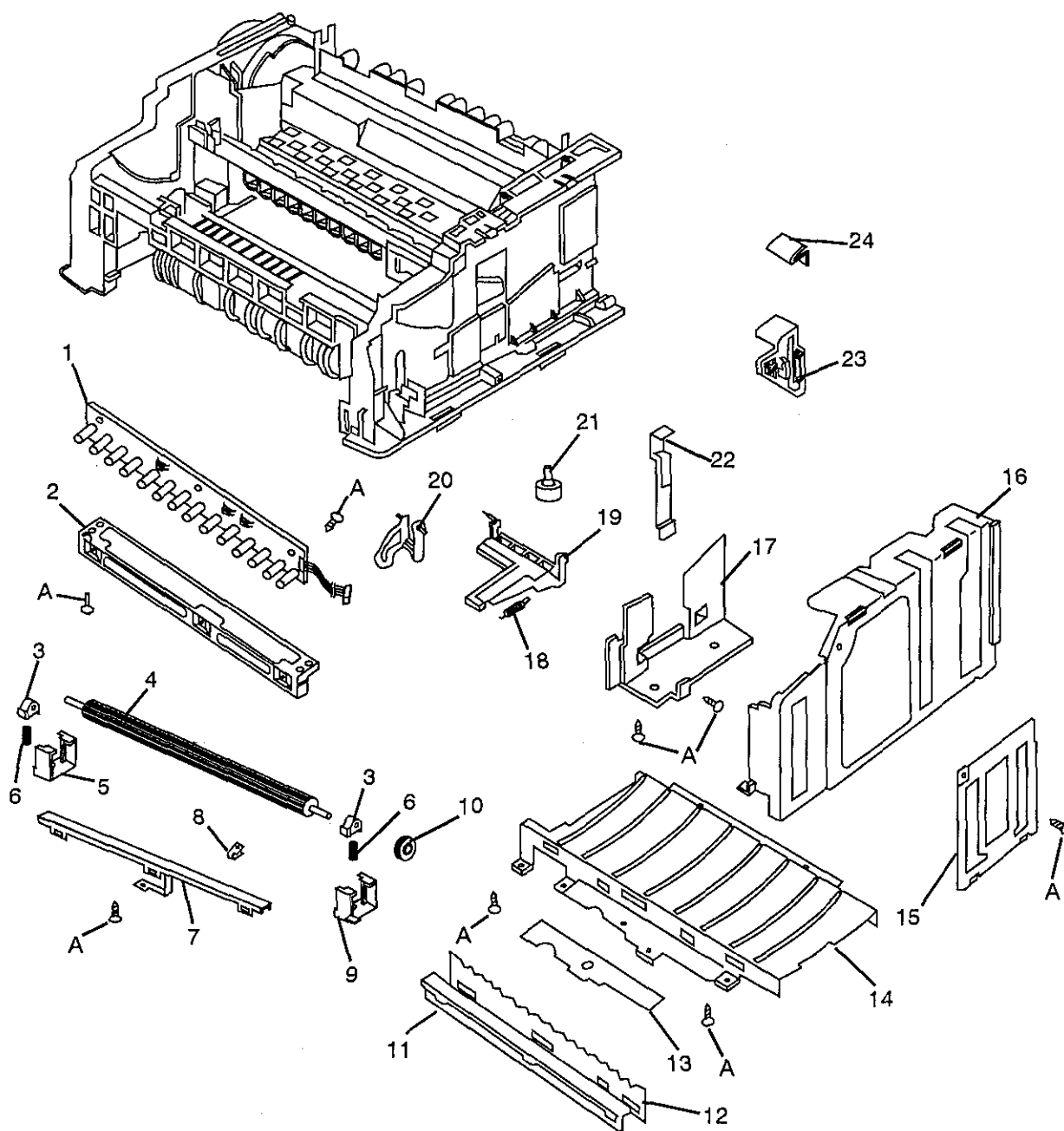
Item	Part	Description
1)	-----	Cover Open Spring (Left) {P/O item 4}
2)	-----	Front Cover Hinge (Left) {P/O item 4}
3)	-----	Cover Open Shaft {P/O item 4}
4)	48E33570	Front Cover Assembly {includes items 1, 2, 3, 5, 6, 7, 19, 20, & 21}
5)	-----	Hook Lever Spring {P/O item 4}
6)	11E07640	Hook Lever {P/O item 4}
7)	-----	Print Cartridge Plate Spring {P/O item 4}
8)	160K24230	Control Panel PWB
9)	-----	Control Panel Harness Cover {P/O item 18}
10)	48E33580	Main Cover {includes items 11, 12, & 13}
11)	-----	Button Spring {P/O item 10}
12)	-----	Front Cover Open Button {P/O item 10}
13)	-----	SIMM Cover {P/O item 10}
14)	-----	SIMM Cover Shield
15)	48E33590	Exit Cover
16)	-----	Control Panel Harness {P/O item 18}
17)	-----	Control Panel Button Panel {P/O item 18}
18)	600K54180	Control Panel Accessory Assembly {includes items 9, 16, & 17}
19)	-----	Cover Open Spring (Right) {P/O item 4}
20)	-----	Front Cover Hinge (Right) {P/O item 4}
21)	-----	Stacker {P/O item 4}
A)	600K54200	Hardware Kit



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PL 2 Base and Right Side Components

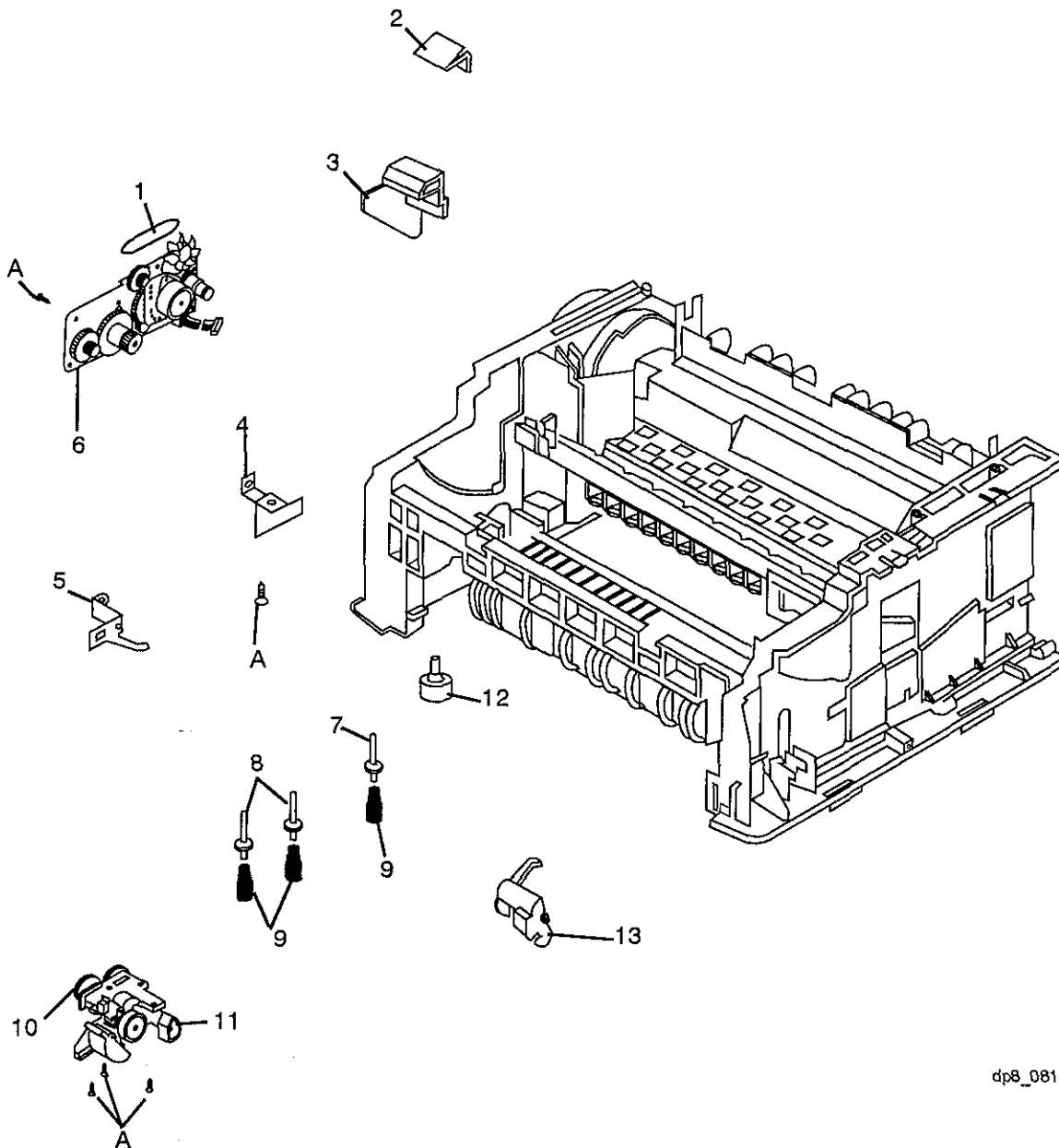
Item	Part	Description
1)	122K01660	Erase Lamp Assembly {includes item 2}
2)	-----	Erase Lamp Bracket {P/O item 1}
3)	-----	Inter Bushing BTR Roller {P/O item 4}
4)	22K49710	BTR Roller {includes items 3, 5, 6, 8, 9, & 10}
5)	-----	BTR Roller Bushing Holder (Left) {P/O item 4}
6)	-----	BTR Roller Spring {P/O item 4}
7)	-----	Transfer Ground Plate
8)	-----	BTR Spring Plate {P/O item 4}
9)	-----	BTR Roller Bushing Holder (Right) {P/O item 4}
10)	-----	BTR Transfer Gear {P/O item 4}
11)	-----	Saw Plate Holder
12)	-----	Saw Plate
13)	-----	Insulator
14)	-----	Transfer Guide
15)	-----	SIMM Cover Shield
16)	-----	System Controller Shield
17)	-----	System Controller Ground
18)	-----	Front Cover / Printer Cartridge Actuator Spring {P/O item 19}
19)	120E13890	Front Cover / Printer Cartridge Actuator {includes item 18}
20)	120E13880	Out of Paper Actuator
21)	-----	Rubber Foot
22)	-----	Wire Cap Shield
23)	-----	Printer Cartridge Guide (Right)
24)	-----	Printer Cartridge Spring Plate
A)	600K54200	Hardware Kit



dp8_080

PL 3 Left Side Components

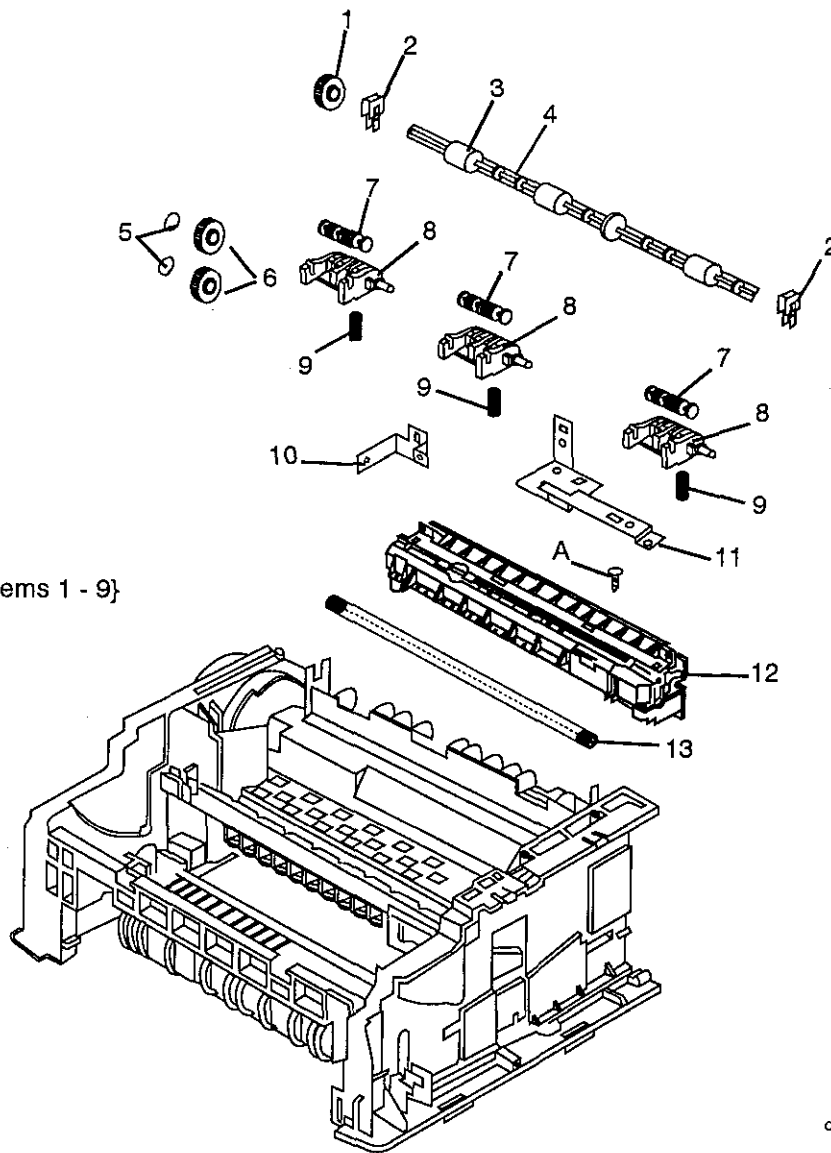
Item	Part	Description
1)	23E14110	Impeller Belt
2)	-----	Printer Cartridge Spring Plate
3)	-----	Printer Cartridge Guide (Left)
4)	-----	Motor Ground
5)	-----	Printer Cartridge Ground
6)	127K18430	Main Drive Motor Assembly {includes item 1}
7)	-----	High Voltage Terminal 1
8)	-----	High Voltage Terminal 2
9)	-----	High Voltage Terminal Spring
10)	22K49700	Pick-up Roll Drive Assembly {includes item 11}
11)	22E18940	Pick-up Roll
12)	-----	Rubber Foot
13)	120E13870	Paper Feed / Registration Sensor Actuator
A)	600K54200	Hardware Kit



dp8_081

PL 4 Fuser & Paper Exit

Item	Part	Description
1)	-----	Exit Gear {P/O Item 14}
2)	-----	Exit Bearing {P/O Item 14}
3)	-----	Rubber Exit Roller {P/O Item 14}
4)	-----	Exit Shaft {P/O Item 14}
5)	-----	Speed Nut {P/O Item 14}
6)	-----	Exit Gear {P/O Item 14}
7)	-----	Exit Roller {P/O Item 14}
8)	-----	Exit Roller Holder {P/O Item 14}
9)	-----	Exit Roller Spring {P/O Item 14}
10)	-----	Earth Plate
11)	-----	Transfer Ground Plate
12)	126K06060	Fuser Assembly (120 VAC)
	126K06070	Fuser Assembly (220 VAC)
13)	126E01760	Heat Rod (120 VAC)
X	126E01770	Heat Rod (220 VAC)
14)	600K54190	Fuser Exit Kit {includes items 1 - 9}
A)	600K54200	Hardware Kit



14 {Includes items 1 - 9}

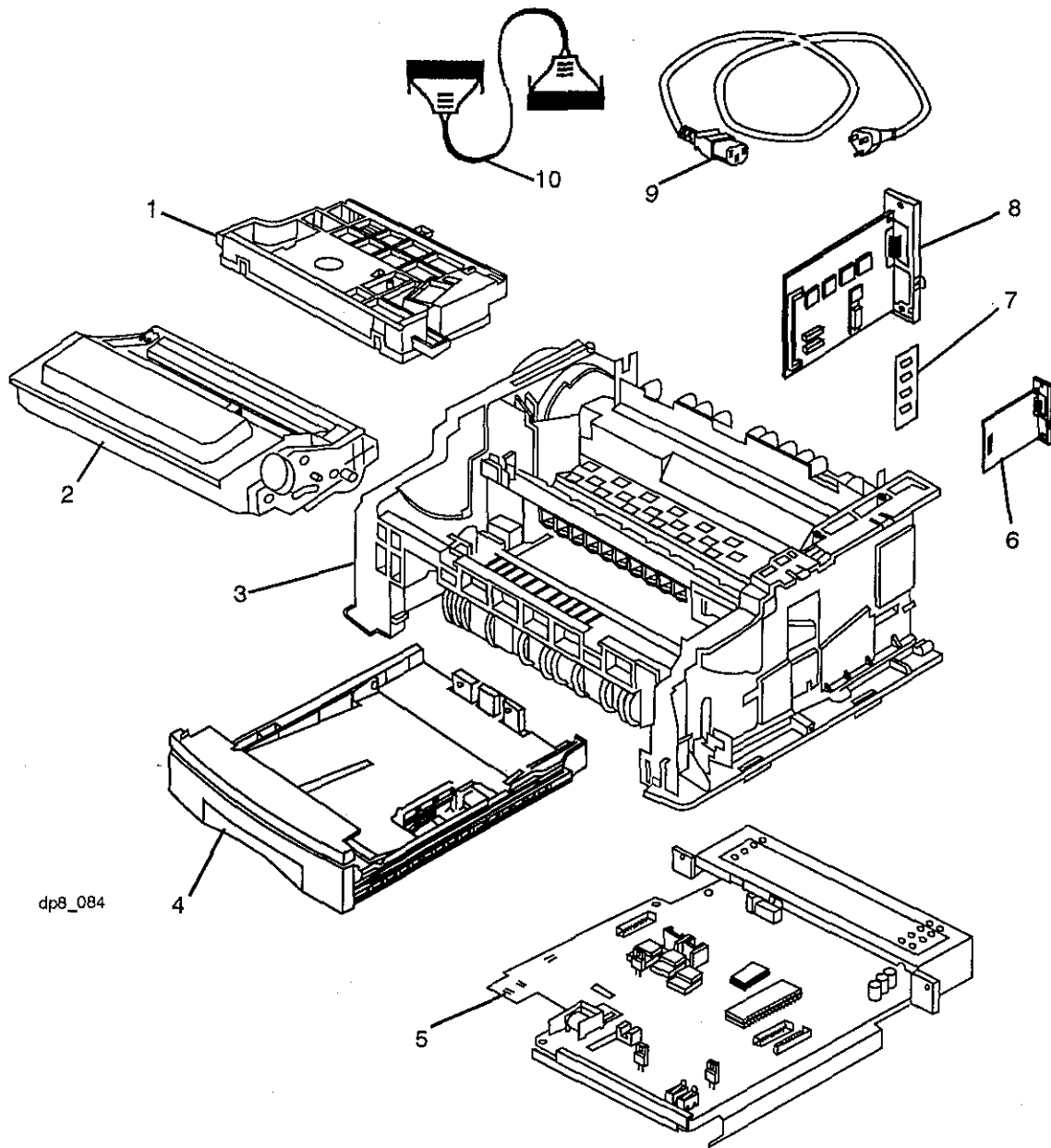
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PL 5 Electronic Modules

Item	Part	Description
1)	62K08121	Laser Assembly
2)	113R00123	Printer Cartridge
3)	-----	Base Frame
4)	109R00308	Universal Paper Tray (4508)
5)	160K24241	Printer Engine PWB (120 VAC) (4508)
	160K24251	Printer Engine PWB (220 VAC) (4508)
6)	160K23840	Serial Option PWB
7)	733W05738	SIMM, 2 Meg.
	733W03665	SIMM, 2 Meg. (Alternate)
	733W03660	SIMM, 4 Meg.
	733W03642	SIMM, 16 Meg.
	733W03675	SIMM, 32 Meg. (4508 only)
8)	160K24261	System Controller PWB (4508)
9)	117E16890	Power Cord (120 VAC)
10)	152P05661	Serial Interface Cable

do we supply this ?

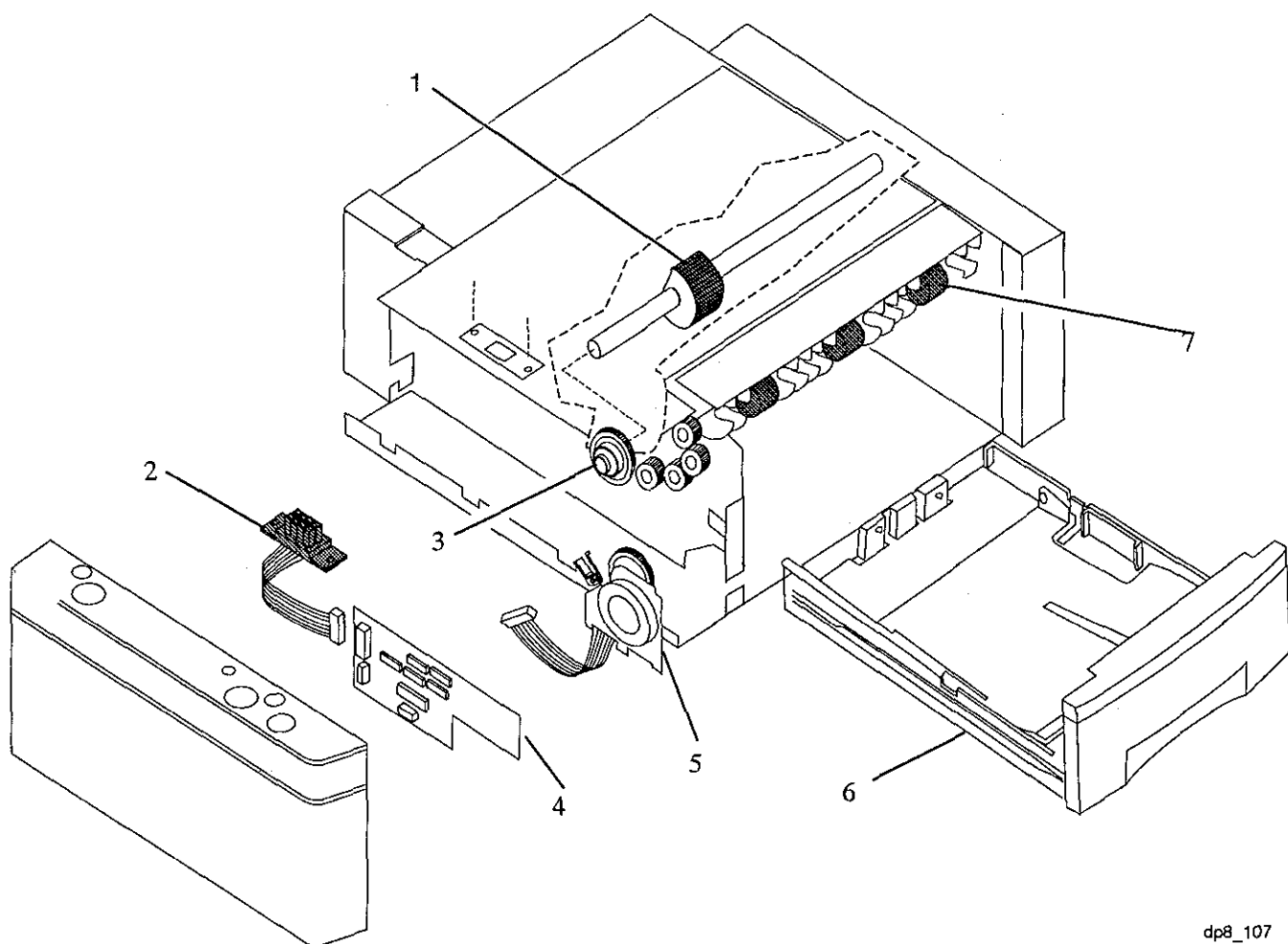
What about RXX ones ?



PL 6 Optional Lower Feeder

Item	Part	Description
1)	22E20420	Feed Roll (Segmented)
2)	162K27190	Harness
3)	121E12490	Feed Clutch
4)	160K28270	Feeder PWB
5)	127E10590	Drive Motor / Feed Clutch
6)	109R00311	Paper Tray
7)	22K51880	Roller Shaft

No solenoid. ?



dp8_107

Notes:

See page 2

Section 4

Repair Procedures

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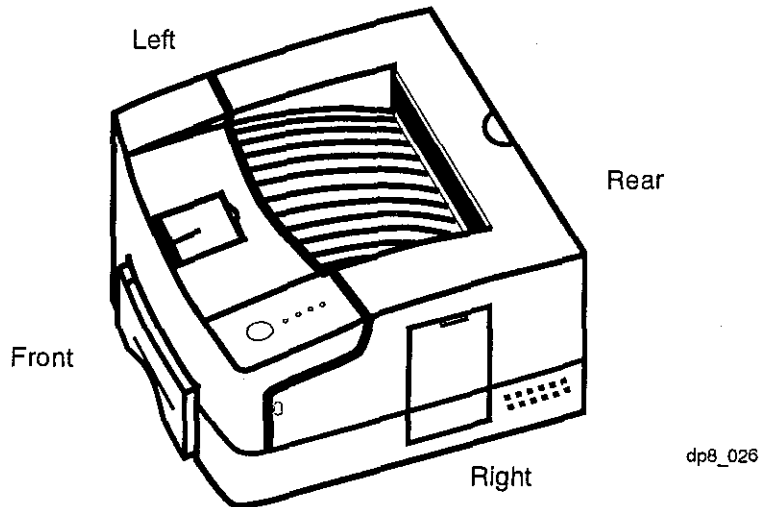
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4.0 Overview

Locations given in the Repair Procedures (REPs) assume you are facing the Control Panel with the following orientation:

Figure 4.0.1 Printer Orientation.



The following notations apply:

- Arrows in the illustrations show direction of movement. Follow the numerical order if the arrows are numbered.
- The notation *Figure X.Y.Z* references the illustration corresponding to the REP you are performing.
- Numbers in an illustration refer to the corresponding steps in the procedure being performed. Example, REP 4.1.1, step 6 says to remove the two screws. Notice that the two screws in the illustration are labeled 6, indicating step 6.

There are a number of steps you should follow each time before you begin a procedure:

- 1 Do not use force to remove or install printer components.
- 2 Use only the screw size and type designated in the REP. The wrong screw could easily damage tapped holes.
- 3 Wear a wrist strap to dissipate static electricity, which may damage sensitive electronic parts, and use a grounded mat when working with PWBs.
- 4 See *Section 6* for the precise location of electrical connectors in the printer.

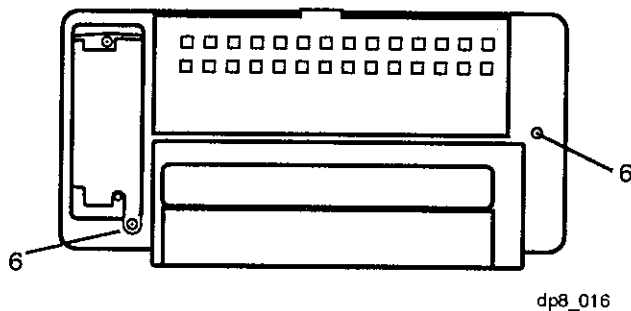
REP 4.1 Covers

REP 4.1.1 Main Cover

Removal

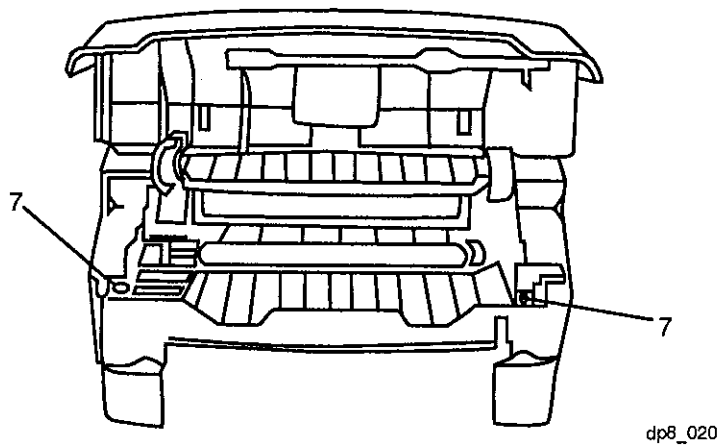
- 1 Disconnect the AC Power Cord and remove the Paper Tray.
- 2 Remove the Printer Cartridge (REP 4.5.1).
- 3 Remove the System Controller PWB (REP 4.6.1).
- 4 Remove the Control Panel Harness Cover (REP 4.1.3).
- 5 Disconnect the Control Panel Harness from J1 on the Control Panel.
- 6 Remove the two screws from the rear of the Main Cover (Figure 4.1.1a).

Figure 4.1.1a Rear Screws.



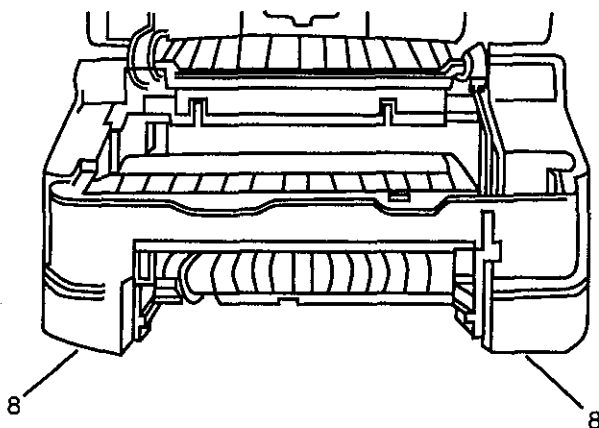
- 7 Remove the two screws from the front of the Main Cover (Figure 4.1.1b).

Figure 4.1.1b Front Screws.



- 8 The Main Cover is held in place by four hooks, two in the front and two in the rear. Pull out and up at the two positions indicated in Figure 4.1.1c until the front hooks release.

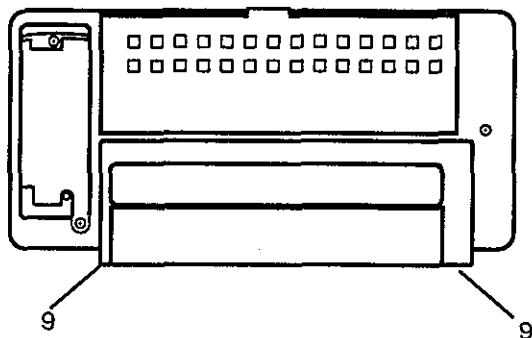
Figure 4.1.1c Front Hooks.



dp8_021

- 9 Pull out and up at the two positions indicated in Figure 4.1.1d until the rear hooks release.

Figure 4.1.1d Rear Hooks.



dp8_016

- 10 Remove the Main Cover.

When are hooks at rear?

Replacement

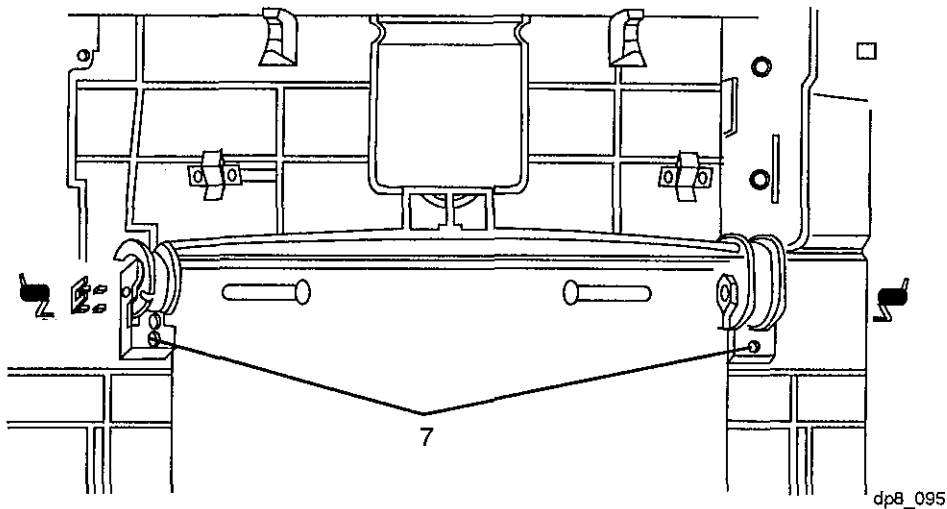
- 1 Assemble in reverse order.
- 2 Verify proper operation.

REP 4.1.2 Front Cover

Removal

- 1 Disconnect the AC Power Cord and remove the Paper Tray.
- 2 Remove the Printer Cartridge (REP 4.5.1).
- 3 Remove the System Controller PWB (REP 4.6.1).
- 4 Remove the Control Panel Harness Cover (REP 4.1.3).
- 5 Disconnect the Control Panel Harness from J1 on the Control Panel.
- 6 Remove the Main Cover (REP 4.1.1).
- 7 Turn the Main Cover up side down. Remove the four screws that secure the Front Cover to the Main Cover (Figure 4.1.2a).
- 8 Remove the Front Cover.

Figure 4.1.2a Front Cover Removal.



Replacement

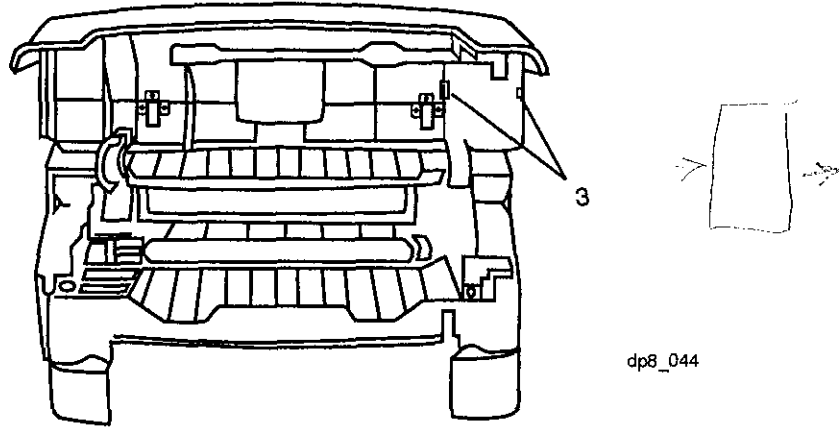
- 1 Assemble in reverse order.
- 2 Verify proper operation.

REP 4.1.3 Control Panel Harness Cover

Removal

- 1 Disconnect the AC Power Cord.
- 2 Remove the Printer Cartridge (REP 4.5.1).
- 3 Release the two tabs that secure the Control Panel Harness Cover (Figure 4.1.3a).

Figure 4.1.3a Control Panel Harness Cover.



dp8_044

- 4 Pull the bottom of the cover out and down as you release the tabs.
- 5 Slide the cover down and out to remove the cover.

Replacement

- 1 Assemble in reverse order.
- 2 Verify proper operation.

REP 4.2 Paper Feed

REP 4.2.1 Pick Up Roll Assembly

Removal

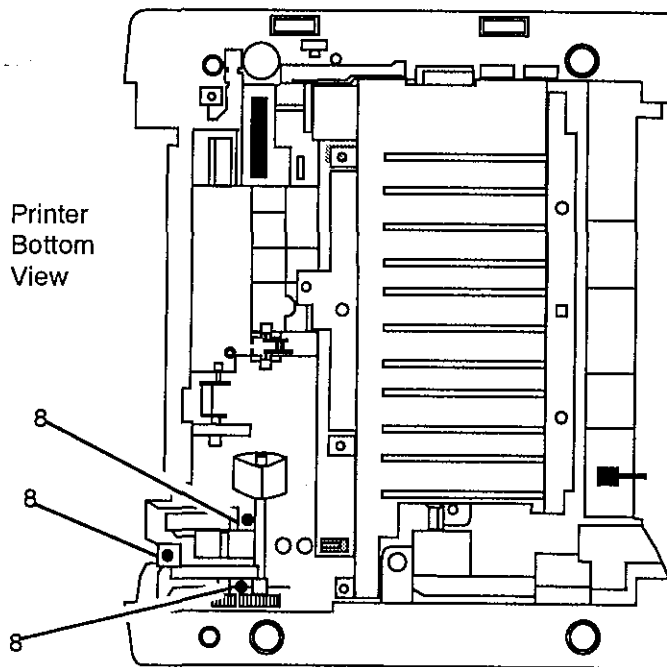
- 1 Disconnect the AC Power Cord and remove the Paper Tray.
- 2 Remove the Printer Cartridge (REP 4.5.1).
- 3 Remove the System Controller PWB (REP 4.6.1).
- 4 Remove the Control Panel Harness Cover (REP 4.1.3).
- 5 Disconnect the Control Panel Harness from J1 on the Control Panel.
- 6 Remove the Main Cover (REP 4.1.1).
- 7 Remove the Printer Engine PWB (REP 4.6.4).
- 8 Remove the three screws that secure the Pick-Up Roll Assembly to the printer (Figure 4.2.1a).

NOTE: If the Pick-Up Roll is to be replaced individually, go to step 9.

- 9 Release the lock tab on the Pick-Up Roll and remove the roll.

NOTE: When installing the Pick-Up Roll, ensure that the bearing is properly seated.

Figure 4.2.1a Pick-Up Roll Assembly Removal.



dp8_070

Replacement

- 1 Assemble in reverse order.
- 2 Verify proper operation.

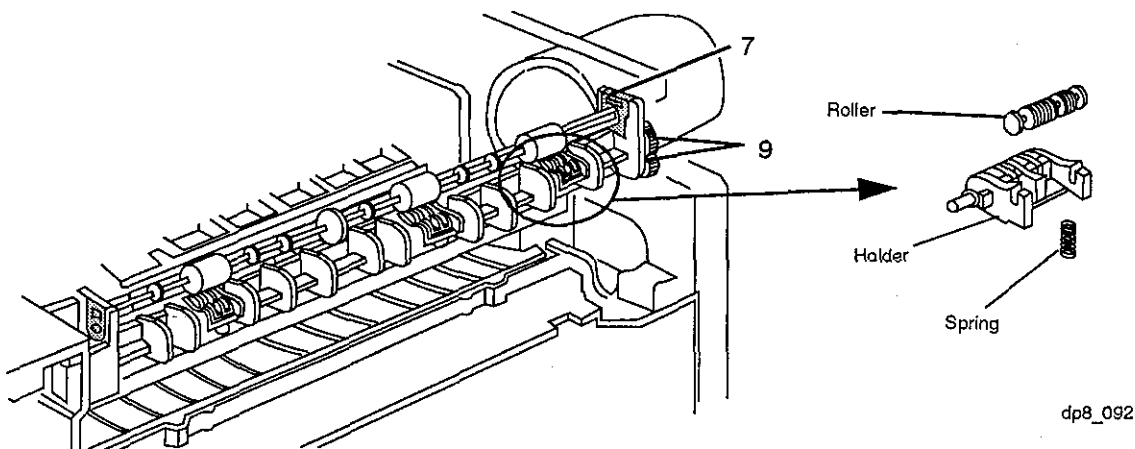
REP 4.3 Paper Transportation

REP 4.3.1 Fuser Exit Assembly

Removal

- 1 Disconnect the AC power cord and remove the Paper Tray.
- 2 Remove the Printer Cartridge (REP 4.5.1).
- 3 Remove the System Controller PWB (REP 4.6.1).
- 4 Remove the Control Panel Harness Cover (REP 4.1.3).
- 5 Disconnect the Control Panel Harness from J1 on the Control Panel.
- 6 Remove the Main Cover (REP 4.1.1).
- 7 Use a small screwdriver to release the bearings on the Exit Shaft (Figure 4.3.1a).

Figure 4.3.1a Exit Assembly Removal.



- 8 Remove the Exit Shaft and bearing.
- 9 To replace the Exit Idler gears, remove the speed nuts, then remove the idler gears. Use care not to break the gear shafts when removing the speed nuts.
- 10 To replace the Exit Rollers, lift the rollers out of the Exit Roller Holder.
- 1 If the Exit Roller Holder or spring is to be replaced, use care when removing and installing the holder. The mounting pins can break off.

Replacement

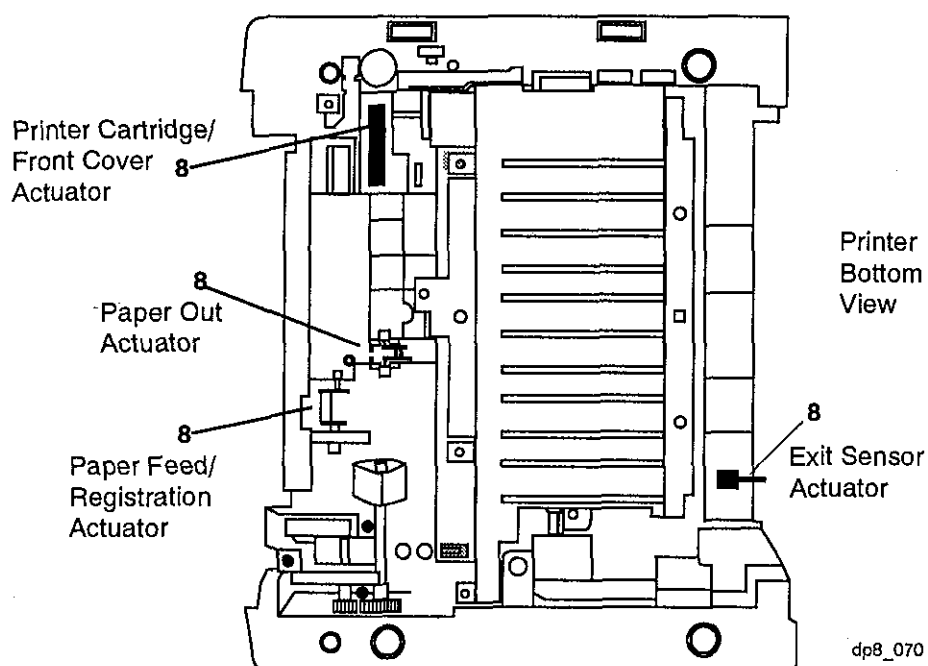
- 1 Assemble in reverse order.

REP 4.3.2 Paper Out Actuator, Paper Feed / Registration Actuator, and Printer Cartridge / Front Cover Actuator.

Removal

- 1 Disconnect the AC Power Cord and remove the Paper Tray.
- 2 Remove the Printer Cartridge (REP 4.5.1).
- 3 Remove the System Controller PWB (REP 4.6.1).
- 4 Remove the Control Panel Harness Cover (REP 4.1.3).
- 5 Disconnect the Control Panel Harness from J1 on the Control Panel.
- 6 Remove the Main Cover (REP 4.1.1).
- 7 Remove the Printer Engine PWB (REP 4.6.4).
- 8 Remove the desired actuator by gently squeezing the sides of the actuator (Figure 4.3.2a)

Figure 4.3.2a Sensor Actuators.



Replacement

- 1 Assemble in reverse order.
- 2 When reinstalling the Printer Engine PWB on the base frame, use care not to bind the four sensor actuators (Paper Out, Paper Feed/Registration, Exit, and Printer Cartridge/Front Cover).

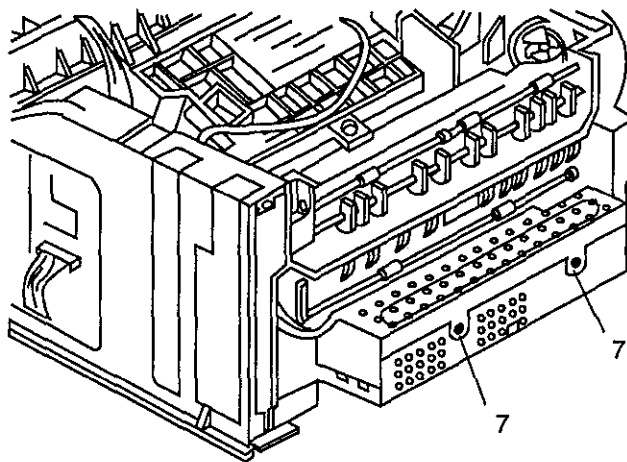
REP 4.4 Fuser

REP 4.4.1 Fuser Assembly

Removal

- 1 Disconnect the AC Power Cord and remove the Paper Tray.
- 2 Remove the Printer Cartridge (REP 4.5.1).
- 3 Remove the System Controller PWB (REP 4.6.1).
- 4 Remove the Control Panel Harness Cover (REP 4.1.3). *Page 4-7*
- 5 Disconnect the Control Panel Harness from J1 on the Control Panel.
- 6 Remove the Main Cover (REP 4.1.1).
- 7 Remove the two screws that secure the Printer Engine PWB Cover (Figure 4.4.1a). Remove the cover.

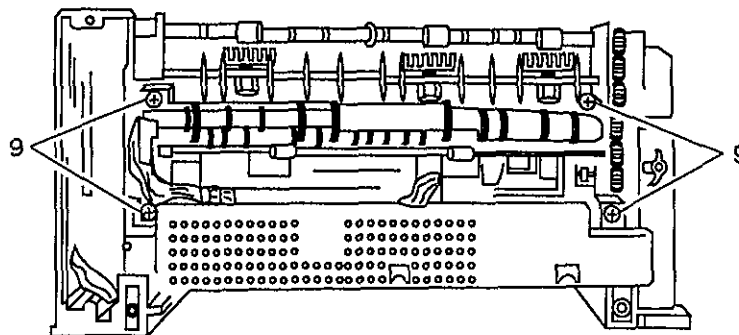
Figure 4.4.1a Printer Engine PWB Cover.



dp8_086

- 8 Disconnect the harnesses from CN102 and CN4 on the Printer Engine PWB.
- 9 Remove the four screws that secure the Fuser Assembly to the printer (Figure 4.4.1b).

Figure 4.4.1b Fuser Assembly.



dp8_087



CAUTION The Exit Sensor Actuator is located on the bottom of the Fuser near the printer's AC input wires. Ensure that the actuator is not damaged as the Fuser is removed.

- 10 Remove the Fuser Assembly.

To remove the Fuser Heat Rod:

- 11 Remove the screw that secures the Heat Rod Terminal to the right end of the Fuser Assembly.
- 12 Slide the Heat Rod out of the Fuser Assembly.

Replacement

- 1 If installing a new Heat Rod, handle the Heat Rod only by the ends. Do not touch the glass part of the Heat Rod.
- 2 Install the Heat Rod and terminal.
- 3 Replace the Fuser Assembly ensuring that the Exit Sensor Actuator is not damaged and has free movement.
- 4 Complete the assembly in reverse order.

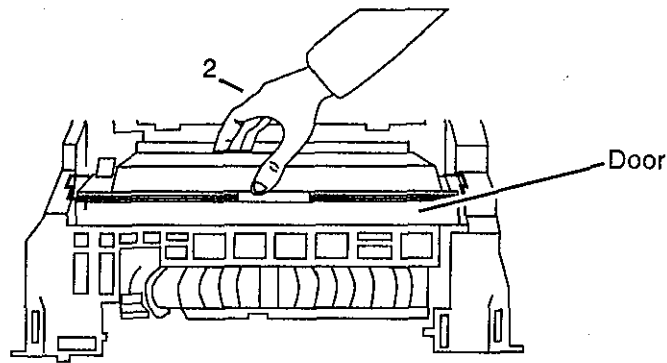
REP 4.5 Drive and Xerographic Modules

REP 4.5.1 Printer Cartridge

Removal

- 1 Open the printer's front cover.
- 2 Grasp the Printer Cartridge as shown in Figure 4.5.1a. Ensure that your thumb does not interfere with the drum protection door. *'flap' would be better*

Figure 4.5.1a Printer Cartridge Removal.



dp8_058

- 3 Remove the Printer Cartridge by rotating it up and out of the printer.
- 4 If the Printer Cartridge will be out for longer than a few minutes, cover the Cartridge with several sheets of paper to protect it from light.

Replacement

- 1 Assemble in reverse order.

REP 4.5.2 Main Drive Motor Assembly

Removal

- 1 Disconnect the AC Power Cord and remove the Paper Tray.
- 2 Remove the Printer Cartridge (REP 4.5.1).
- 3 Remove the System Controller PWB (REP 4.6.1).
- 4 Remove the Control Panel Harness Cover (REP 4.1.3).
- 5 Disconnect the Control Panel Harness from J1 on the Control Panel.
- 6 Remove the Main Cover (REP 4.1.1).
- 7 Remove the seven screws that secure the Main Drive Motor Assembly (Figure 4.5.2a).

Figure 4.5.2a Main Drive Motor Assembly.

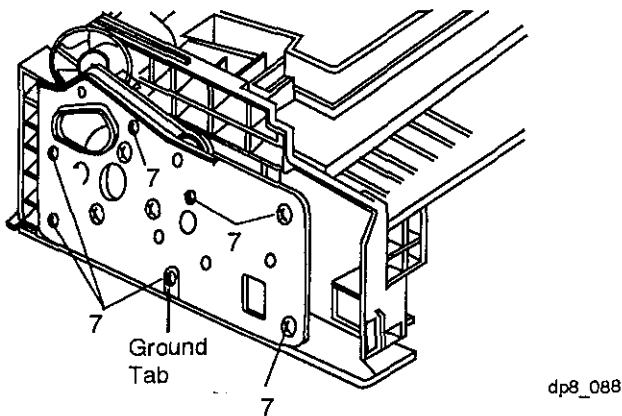
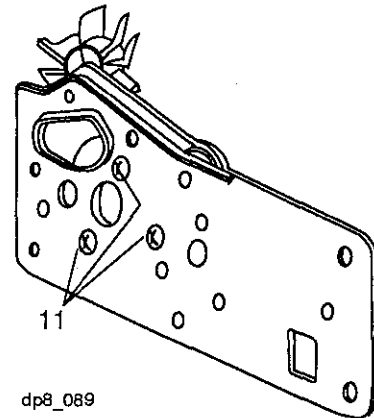


Figure 4.5.2b Main Drive Motor.



- 8 Slowly remove the Main Drive Motor Assembly and lay it next to the printer.
- 9 Disconnect the Main Drive Motor Harness from CN1 on the Printer Engine PWB.
- 10 Remove the Main Drive Motor Assembly.

NOTE: The Main Drive Motor Assembly is replaced as a unit. To replace the Impeller Belt, perform steps 11 and 12.

- 11 Remove the three screws that secure the Main Drive Motor to the assembly. Remove the Main Drive Motor (Figure 4.5.2b).

NOTE: The gears attached to the Main Drive Motor are not secured and may fall off as you remove the motor. The gear hub sizes are different, so the gears can not be reinstalled incorrectly.

- 12 Remove the Impeller Belt.

Replacement

- 1 The Main Drive Motor Assembly contacts three ground tabs. Ensure that the tabs are not damaged.
- 2 Ensure the bottom ground tab is on the outside of the Main Drive Motor Assembly (Figure 4.5.2a).
- 3 Assemble in reverse order.

REP 4.5.3 Erase Lamp

Removal

- 1 Disconnect the AC Power Cord and remove the paper tray. **Figure 4.5.3a Transfer Guide.**
- 2 Remove the Printer Cartridge (REP 4.5.1).
- 3 Remove the System Controller PWB (REP 4.6.1).
- 4 Remove the Control Panel Harness Cover (REP 4.1.3).
- 5 Disconnect the Control Panel Harness from J1 on the Control Panel
- 6 Remove the Main Cover (REP 4.1.1).
- 7 Remove the Printer Engine PWB (REP 4.6.4).
- 8 Remove the four screws that secure the Transfer Guide (Figure 4.5.3a). Remove the Transfer Guide.
- 9 Disconnect the harness from CN1 on the Erase Lamp Assembly (Figure 4.5.3b).
- 10 Remove the two screws that secure the Erase Lamp Assembly, and remove the assembly.

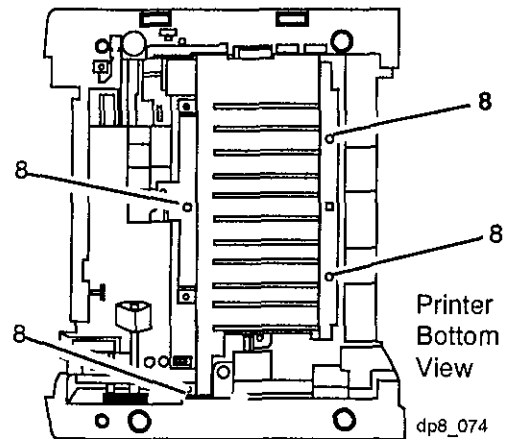
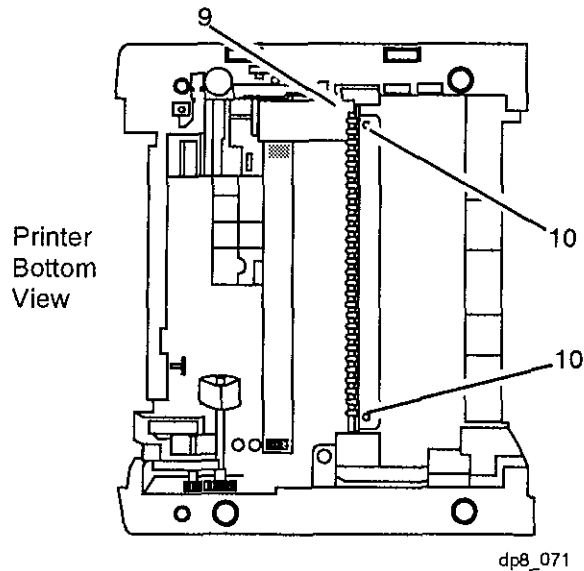


Figure 4.5.3b Erase Lamp Removal.



Replacement

- 1 Assemble in reverse order.
- 2 When reinstalling the Printer Engine PWB on the base frame, use care not to bind the four sensor actuators (Paper Out, Paper Registration, Exit, and Printer Cartridge/Front Cover).

REP 4.5.4 BTR Roller

Removal

- 1 Disconnect the AC Power Cord and remove the Paper Tray. **Figure 4.5.4a Transfer Guide.**
- 2 Remove the Printer Cartridge (REP 4.5.1).
- 3 Remove the System Controller PWB (REP 4.6.1).
- 4 Remove the Control Panel Harness Cover (REP 4.1.3).
- 5 Disconnect the Control Panel Harness from J1 on the Control Panel
- 6 Remove the Main Cover (REP 4.1.1).
- 7 Remove the Printer Engine PWB (REP 4.6.4).
- 8 Remove the four screws that secure the Transfer Guide (Figure 4.5.4a). Remove the Transfer Guide.
- 9 Release the hooks on the BTR Roller Bushing Holders on each end of the BTR Roller (Figure 4.5.4b).
- 10 The BTR drive gear and bearings are not attached to the BTR shaft. Make note of their position and orientation before removing the BTR Roller.
- 11 Slowly remove the BTR Roller by pulling on the Roller Bushing Holders. Be careful not to touch the BTR roll with your hands.

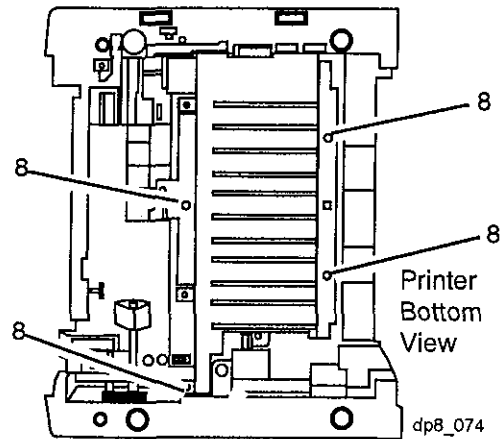
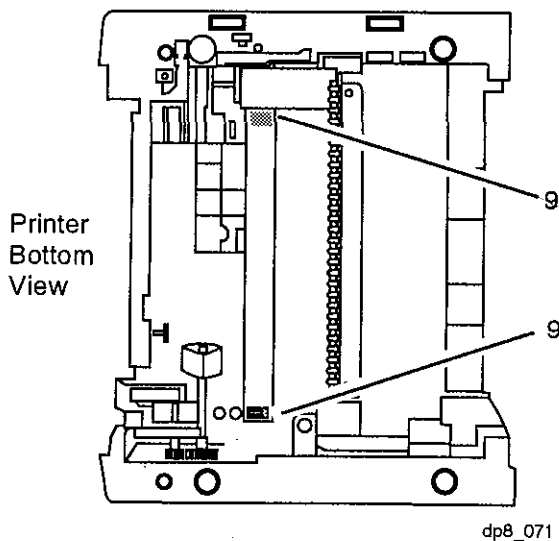


Figure 4.5.4b BTR Roller Removal.



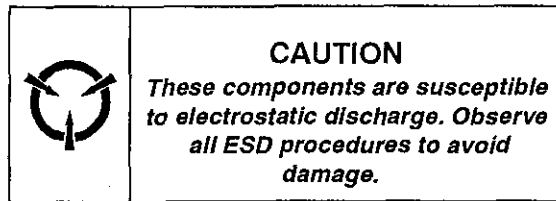
Replacement

- 1 Assemble in reverse order.
- 2 When reinstalling the Printer Engine PWB on the base frame, use care not to bind the four sensor actuators (Paper Out, Paper Registration, Exit, and Printer Cartridge/Front Cover).

REP 4.6 Electrical Modules

REP 4.6.1 System Controller PWB

Removal



- 1 Disconnect the AC Power Cord.
- 2 Disconnect any cables attached to the rear of the System Controller PWB.
- 3 Press down on the tab (Figure 4.6.1a) and remove the SIMM Cover.
- 4 Remove the screw that secures the metal shield and remove the shield. *Slide to the left*
- 5 If a SIMM is installed, release the tabs that secure the SIMM and remove the SIMM.
- 6 Disconnect connectors J3 and J4 from the System Controller PWB. *J4 is very tight*
- 7 Remove the three screws that secure the System Controller PWB to the rear of the printer (Figure 4.6.1b).
- 8 Slide the System Controller out the rear of the printer.
- 9 If an Optional Serial PWB is installed and the System Controller PWB is being replaced, remove the Optional Serial PWB and install it on the new System Controller PWB.

Figure 4.6.1a SIMM Cover/Shield Removal.

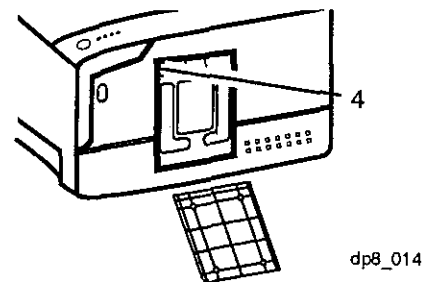
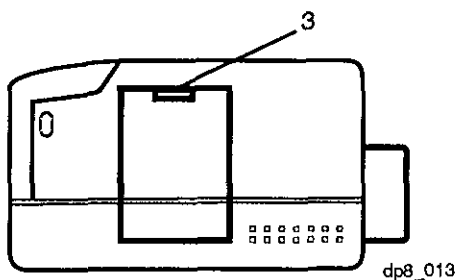
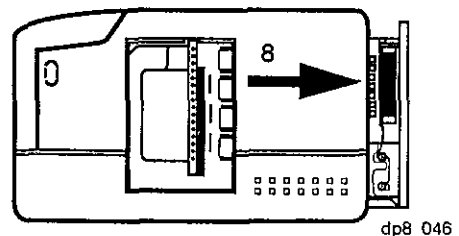
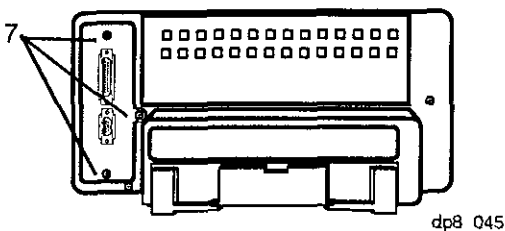


Figure 4.6.1b System Controller Removal.

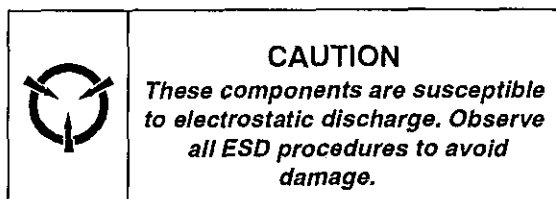


Replacement

- 1 Assemble in reverse order.

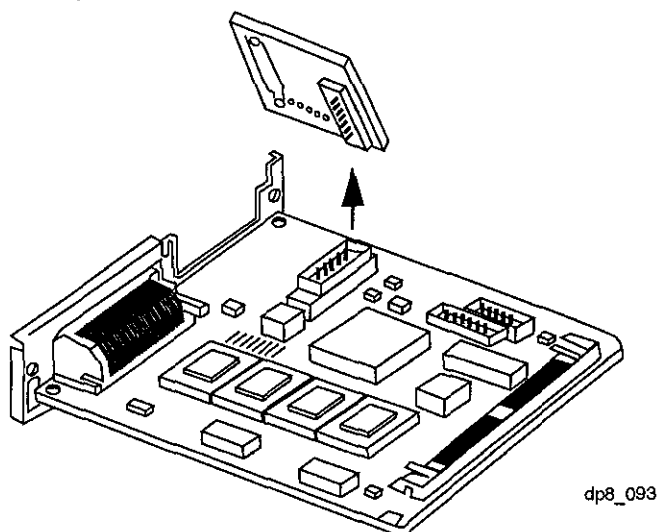
REP 4.6.2 Serial Option PWB

Removal



- 1 Disconnect the AC Power Cord.
- 2 Remove the System Controller PWB (REP 4.6.1).
- 3 Carefully remove the Serial Option PWB from the System Controller PWB (Figure 4.6.2a)

Figure 4.6.2a Serial Option PWB Removal.



Replacement

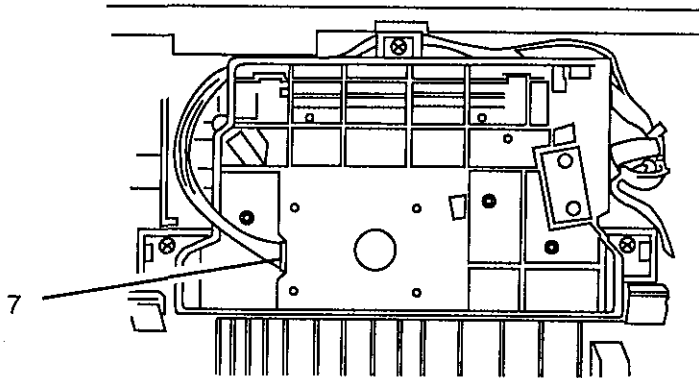
- 1 Assemble in reverse order.

REP 4.6.3 Laser Assembly

Removal

- 1 Disconnect the AC Power Cord and remove the Paper Tray.
- 2 Remove the Printer Cartridge (REP 4.5.1).
- 3 Remove the System Controller PWB (REP 4.6.1).
- 4 Remove the Control Panel Harness Cover (REP 4.1.3).
- 5 Disconnect the Control Panel Harness from J1 on the Control Panel.
- 6 Remove the Main Cover (REP 4.1.1).
- 7 Disconnect the Laser Harness from CN1 on the Laser Scanner Motor Control PWB (Figure 4.6.3a).

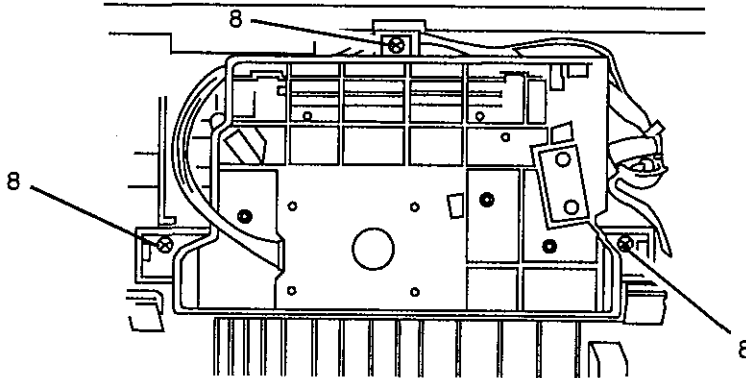
Figure 4.6.3a Laser Scanner Motor Harness.



dp8_048

- 8 Remove the three screws that secure the Laser Assembly to the printer frame (Figure 4.6.3b).

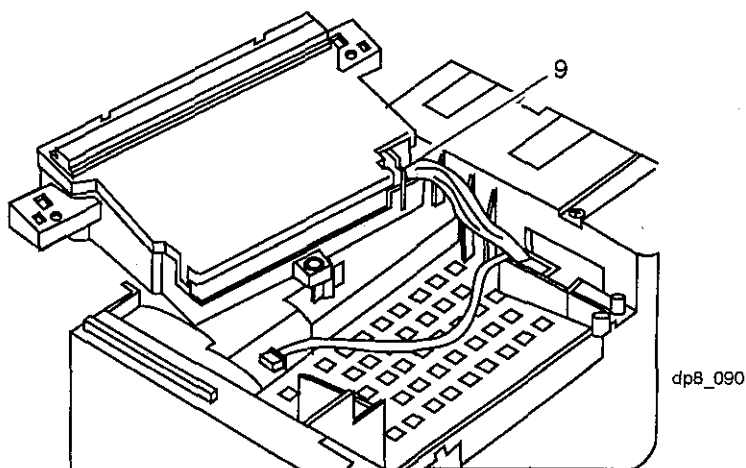
Figure 4.6.3b Laser Assembly Removal.



dp8_048

- 9 Lift the Laser Assembly and disconnect the harness that connects to CN1 on the Laser Diode PWB (Figure 4.6.3c)

Figure 4.6.3c Laser Diode Harness.

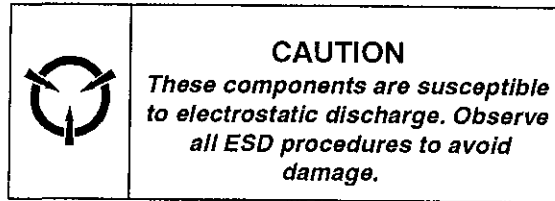


- 10 Remove the Laser Assembly.

Replacement

- 1 Assemble in reverse order.
- 2 Ensure that the harness to the Laser Scanner Motor is under the rear screw and mounting tab, but is not caught between the Laser Assembly and the Printer Frame.

REP 4.6.4 Printer Engine PWB



Removal

and Centronics cable

Figure 4.6.4a Printer Engine PWB Cover.

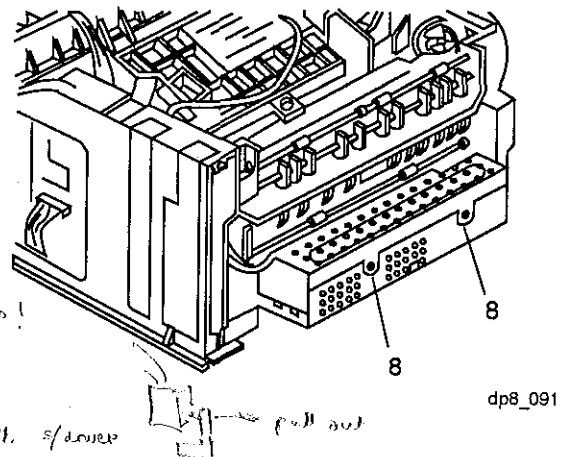
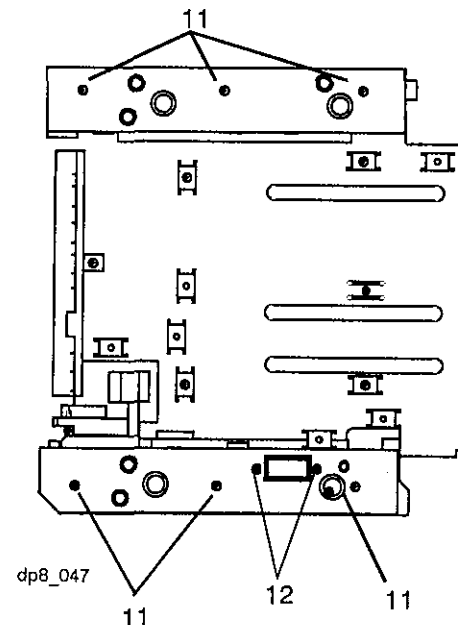


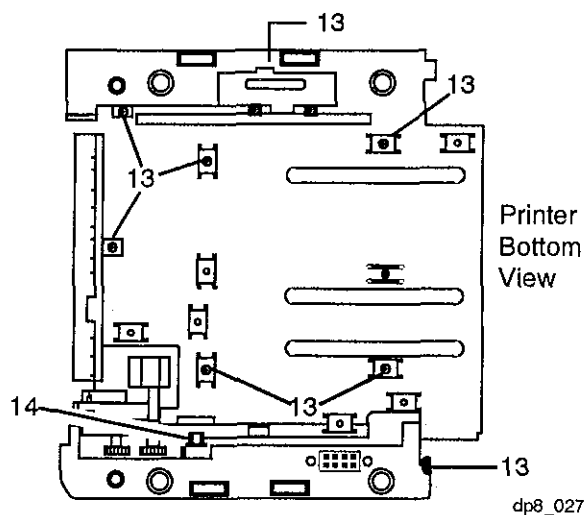
Figure 4.6.4b Base Extensions.



Printer
Bottom
View

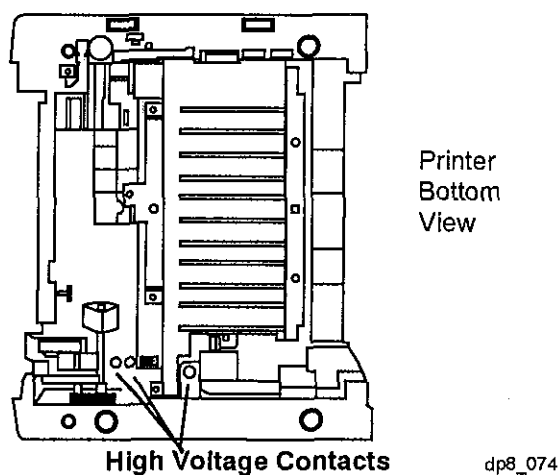
- 1 Disconnect the AC Power Cord.
- 2 Remove the Printer Cartridge (REP 4.5.1). 4.13
- 3 Remove the Paper Tray.
- 4 Remove the System Controller PWB (REP 4.6.1). 4.17
- 5 Remove the Control Panel Harness Cover (REP 4.1.3). 4.7
- 6 Disconnect the Control Panel Harness from J1 on the Control Panel.
- 7 Remove the Main Cover (REP 4.1.1). 4.4 backwards!
- 8 Remove the two screws that secure the Printer Engine PWB Cover (Figure 4.6.4a). Remove the cover. release latch with screwdriver pull out
- 9 Disconnect the harnesses from CN102 and CN4 on the Printer Engine PWB.
- 10 Rotate the printer so that it is resting on its left side. For down.
- 11 Remove the three screws that secure the Left Base Extension and the three screws that secure the Right Base Extension (Figure 4.6.4b). Remove both extensions. black Note: rubber pads to front
- 12 Remove the two screws that secure the Lower Feeder connector. Screws are located under the Left Base Extension (Figure 4.6.4b).
- 13 Remove the eight screws that secure the Printer Engine PWB to the bottom of the base frame (Figure 4.6.4c). to left of lower feeder connector
- 14 Press the plastic hook down and gently remove the Printer Engine PWB (Figure 4.6.4c). The PWB fits tightly on its locating pin. It may be necessary to gently rock the PWB as you remove it.
- 15 Remove the PWB far enough to disconnect the Laser Harness from CN3, the Interface Harness from CN5, and the Main Drive Motor Harness from CN1. Remove the Printer Engine PWB.

Figure 4.6.4c Printer Engine PWB Removal.



CAUTION With the Printer Engine PWB removed, the three High Voltage Contacts and Springs will fall out if the printer is turned upright (Figure 4.6.4d)

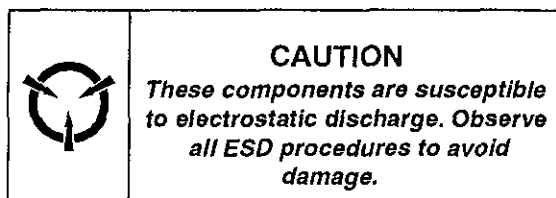
Figure 4.6.4d Printer Base.



Replacement

- 1 The spare part does not include the side mount bracket. Remove the bracket from the old assembly and install it on the new assembly.
- 2 Assemble in reverse order.
- 3 When reinstalling the Printer Engine PWB on the base frame, use care not to bind the four sensor actuators (Paper Out, Paper Registration, Exit, and Printer Cartridge/Front Cover).

REP 4.6.5 Control Panel PWB



Removal

- 1 Disconnect the AC Power Cord.
- 2 Remove the Printer Cartridge (REP 4.5.1).
- 3 Remove the Control Panel Harness Cover (REP 4.1.3).
- 4 Disconnect the Control Panel Harness from J1 on the Control Panel.
- 5 Remove the three screws securing the Control Panel PWB to the Front Cover.

Replacement

- 1 Assemble in reverse order.

1. 3 connectors on PWB (check 3 springs!)
2. Fit board - remember clip
3. 2 screws
4. Lower connector - 2 screws
5. Fit base extension x 2
6. 2 connectors on PWB (top)
7. Printer engine PWB cover
8. Top cover - don't trap ESD connectors!
9. Control panel harness
10. Harness Cover
11. System Controller PWB & 2 connectors

Notes:

Section 5

General Procedures and Information

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5.1 Precautions

The three subsections below focus on three kinds of precautions important to service persons:

- General safety precautions needed by everyone using or handling the printer.
- Precautions needed by anyone servicing the printer.
- Additional service precautions specifically related to Electrostatically Sensitive Devices (ESDs).

Read each of these precautions carefully.

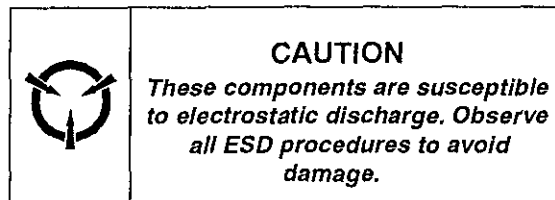
5.1.1 General Safety Precautions

- 1 Do not use this printer near water, or where any kind of liquid can spill on it, and do not expose it to inclement weather.
- 2 Make sure the printer is on a stable surface, and that the surface is large enough to keep the printer from being accidentally knocked to the floor.
- 3 The printer's ventilation slots are designed to prevent overheating. Make sure these slots are not covered or blocked. Don't put the printer in any enclosure that doesn't permit full ventilation.
- 4 Never insert objects of any kind into the printer through the ventilation slots. Such objects may touch dangerous high voltage points, causing electric shock, a short circuit, or a fire.
- 5 Use only a grounded / earthed power source. If you are not sure of the type of power available, consult your dealer or the local power company.
- 6 Make sure no one can trip on the power cord or communication cable, and that no weight is placed on them.
- 7 Avoid touching the surface of the photo-sensitive drum. The surface is easily marked, and any scratch or mark can affect print quality.
- 8 Don't expose the print cartridge to direct light for long periods.
- 9 Follow the directions in Section 2, "Paper Specifications," on the proper choice of paper.
- 10 Before cleaning, disconnect the AC power. Use only a damp cloth for cleaning. Do not use liquid cleaners or aerosol sprays.

5.1.2 Service Precautions

- 1 Before disassembly, disconnect the AC power.
- 2 Replace parts only with the same Xerox parts.
- 3 Pay attention to the proper orientation of parts when mounting or inserting them.
- 4 Pay particular attention to the Electrostatically Sensitive Device (ESD) precautions, since failure to follow them can seriously damage the unit.

5.1.3 ESD Precautions



Semiconductor (solid state) devices that are easily damaged by static electricity are called Electrostatically Sensitive Devices. Examples are integrated circuits (ICs), large-scale integrated circuits (LSIs), semiconductor chip components, and some field-effect transistors.

The following techniques are designed to reduce the danger of damage to printer components as a result of static electricity.

- 1 Check and observe all the safety and servicing precautions.
- 2 Before handling any circuit board or wiring assembly, perform the ESD procedures.

NOTE: *to avoid the danger of shock, be sure to remove the wrist strap before powering up the unit under test.*

- 3 Place any sensitive assemblies on a conductive surface. This will prevent accumulation of static electricity.
- 4 Do not use freon-propelled chemicals. These can generate enough static charge to damage sensitive components.
- 5 Do not remove a replacement component from its protective package until you are ready to install it. Most replacement components are packaged with leads that are electrically shorted together by conductive foam, aluminum foil, or other conductive material.
- 6 Immediately before removing the protective material from the component, touch the protective material to the printer chassis or the circuit assembly in which the device will be installed.
- 7 Minimize body motions when handling unpackaged replacement components. Even such simple motions as clothes brushing together or a foot being lifted from a carpet can generate enough static electricity to cause damage.

5.1.4 Laser Safety

- 1 The DocuPrint 4508 laser printer contains a Class IIIb laser. All laser safety information is contained on pages iii and iv in the front of this manual.

5.2 Printer Operations

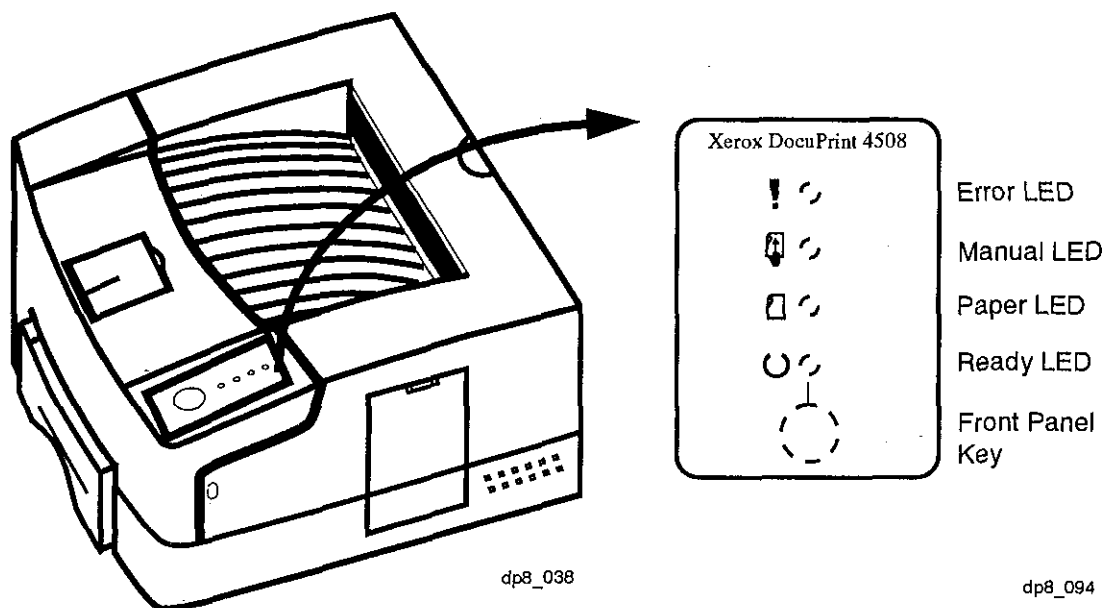
5.2.1 Control Panel

The Control Panel (Figure 5.2.1) is located on the right forward corner of the Front Cover Assembly. The Control Panel includes a single Front Panel Key and four indicator LEDs.

The Front Panel Key has multiple functions that enable the user to select the desired operation.

The four Indicator LEDs, one red (Error), two amber (Manual and Paper), one green (Ready) indicate the printer's status. (More detailed information about printer status is available through the Status Monitor software utility.)

Figure 5.2.1 Control Panel.



The table below shows the relationship between printer mode, printer status, and LED signals.

Mode Indicator	LED Statue	Printer Status
Error LED	ON ON with other LED(s)	Front Cover Open, Printer Cartridge missing or not seated correctly. Paper Jam, Laser, or Fuser problem.
Manual LED	Blinking	Manual Feed.
Paper LED	ON with Error LED ON Blinking	Paper Jam. Paper Out.
Ready LED	ON Blinking Double Blinking OFF	Online, Ready to print. Receiving data, processing data, or printing. Data in buffer/Last Page. Printer Offline
Error, Manual, Paper, and Ready LEDs	All Blinking	Printer in Diagnostic Mode, Laser, or Fuser problem.

5.2.2 Printer Modes

The Xerox 4508 has three modes of operation, each with its own set of options.

- 1 Ready Mode (online)
- 2 Manual Mode (Ready for manual operation)
- 3 Test Mode

5.2.2.1 Ready Mode (Online)

The Ready Mode (Online) is the printer's normal operating mode. In this mode the printer is online and ready to print. Ready Mode occurs automatically when the printer is connected to AC power. The printer can be taken Offline by pressing the Front Panel Key, Ready LED OFF. Ready Mode may be restored by pressing the Front Panel key.

When the printer is in Ready Mode, the "Ready" LED on the Control Panel is lit. When the "Ready" LED is blinking, the printer is receiving or processing data, or printing. When the "Ready" LED is double-blinking (blinking twice every 2 - 3 seconds) the printer is waiting with data in its memory. When the Ready LED is OFF, the printer is Offline.

5.2.2.2 Manual Mode

Manual mode provides a straight paper path for the feeding of heavier weight materials that might jam in the printer if fed from the paper tray. Some examples of paper or print media that require manual feeding and a straight paper path:

- Envelopes
- Adhesive labels
- Heavier or textured paper (letterhead, for example)
- Odd sized paper
- Transparencies

Manual Mode is selected automatically by feeding paper into the manual feed slot. In Manual Mode the Manual LED on the Control Panel is on. The printer must already be in Ready Mode in order to select Manual Mode. Therefore in Manual Mode both the Ready and the Manual LED's will be on.

When the Manual LED is OFF, and the printer is in the Ready Mode, the printer's paper source is the universal paper tray. In Manual Mode, however, the printer's paper source is the manual feed slot.

When Manual Mode is selected, and the printer has some data to print, the Manual LED will blink in one of two ways to indicate whether AUTO CONTINUE is ON or OFF.

If AUTO CONTINUE is ON, the Manual LED will blink for ten seconds to allow time for the user to insert a single sheet of paper into the manual feed slot. After ten seconds, if no paper has been inserted, the printer continues automatically, using paper in the universal paper tray.

If AUTO CONTINUE is OFF, the Manual LED continues to blink until paper is inserted into the manual feed slot.

5.2.2.3 Test Mode

In Test Mode, the printer prints three SELF-TEST sheets, one Status Report and two PCL5e Font Lists.

Local Test Mode

The printer goes into the Local Test Mode whenever the printer is in Ready Mode, no other LEDs are lit, and the Front Panel Key is pressed and held down until all four LED's are blinking. (When the key is released, all the LEDs except the Ready LED go out.)

The Local Test Mode is only one of three Front Panel functions that requires holding the key until all LED's are blinking. The other two functions are Last Page and Reset. They are discussed in the next procedure. The specific function accessible depends on the printer's status when the key is pressed and held down.

The TEST MODE is not available if the printer still has data in memory, i.e., if the "Ready" LED is blinking or double-blinking.

Remote Test Mode

Remote test prints are initiated from the Remote Control Panel (RCP) (see Remote Control Panel later in this section).

5.2.3 Last Page

The Last Page function prints any data remaining in memory. To print Last Page, while the "Ready" LED is blinking or double-blinking, press and hold the Front Panel Key until all four LED's are blinking.

The Last Page function commands the printer to print the page left in the printer's buffer.

5.2.4 Clearing Printer Memory

This function resets the printer, restoring user default settings and clearing all data from the printer's memory except permanent fonts and macros.

To clear printer memory, while the "Ready" LED is OFF (the Front Panel Key has been pressed to take the printer off line), press and hold the Front Panel Key until all four LED's are blinking. When the key is released, all the LEDs except the Ready LED go out.

5.2.5 Printer Cartridge Cleaning Procedure

This procedure is used to clean contamination present in the Printer Cartridge.

NOTE: Use this procedure prior to entering RAP 7.8 Image Quality Problems.

To initiate this procedure, the "Ready" LED must be ON.

Press and Hold the Front Panel Key until all four LED's remain lit (not blinking) and the Printer begins to come up (starts the feed of the page).

The printer will produce one page. Depending on the contamination, the page may contain a heavy concentration of background. More than one cleaning cycle may be required to remove contamination. Replace Printer Cartridge if cleaning cycles do not resolve the print quality problem.

Value of this?

5.3 Printer Software

The customer has a choice of different software configurations depending upon their needs. The 4508 can be configured with DOS, OS/2, Windows 3.x, or Windows 95 Print Driver, Remote Control Panel (RCP), and Status Monitor. This section describes each of the software selections.

These programs enable the user to:

- view printer status on screen
- configure the printer
- set parameters for the current print job
- adjust toner usage by using the Quality Econo mode
- print test pages, the current configuration, a font list, and Demo Page.

5.3.1 Installing Software

The printer need not be plugged in for installation of the software. However, the printer must of course be connected to the AC power and to the PC to enable use of the Remote Control Panel and the Status Monitor.

Installing the software for Windows

- 1 Insert the Xerox DocuPrint 4508 Software Installation diskette in the floppy drive.
- 2 In the Program Manager, click on File. Then click on Run and type A:\SETUP or B:\SETUP, then click OK.
- 3 Follow instructions on the computer screen.
- 4 Insert the Xerox Font Manager diskette into the disk drive.
- 5 Then click on Run and type A:\INSTALL or B:\INSTALL, then click OK.
- 6 Follow instructions on the computer screen.

Installing software for DOS

- 1 Insert the DOS and OS/2 Drivers diskette in your floppy drive.
- 2 Switch to the drive in which the diskette was inserted. Example: Type A: or B:, then press the Enter Key
- 3 Type README, then press the Enter Key.
- 4 Follow the instructions on the screen.
- 5 Insert the Xerox DocuPrint 4508 Software Installation Diskette in your disk drive.
- 6 Create the directory to place the DOS software in (for example: DOSUTIL) and switch to that directory.
- 7 Type COPY A:\DOSUTIL*. * or COPY B:\DOSUTIL*. *, then press the Enter Key.
- 8 Type DOS 4508, then press the Enter Key.

Installing software for OS/2

- 1 Insert the DOS and OS/2 Drivers diskette in your floppy drive.
- 2 Double click on the drive icon, then double click on disk icon, then double click on the INSTALL.TXT file. Follow the instructions on the computer screen.

NOTE: To install the Remote Control Panel (RCP) option, use the Windows subsystem of OS/2 and follow the Windows installation instructions on the previous page.

5.3.2 Status Monitor

The Status Monitor program runs in background mode in both DOS and Windows. When selected, the Status Monitor automatically displays messages from the printer on the computer screen whenever the printer's status changes.

NOTE: On some machines Windows Print Manager must be disabled to get the Status Monitor to operate correctly.

Status Monitor Messages

OFF LINE: The printer is off line, unable to receive data (the Ready LED will not be lit). Since the printer powers up automatically to Ready Mode when AC power is applied, OFF LINE status occurs only when the user presses the Front Panel key to interrupt printing or to stop data from being received. The printer may be restored to ON LINE status by pressing the Front Panel key.

ON LINE: The printer is in Ready Mode, on line and ready to receive data. In ONLINE status, the printer may be in either normal Ready Mode or in Power Saver status.

COVER OPEN: This message can have either of two meanings:

- The printer's front cover is not properly closed. Or,
- The Printer Cartridge is not installed or not installed correctly.

I/O ERROR: Input/Output error. The message means there is a problem in communication between the computer and the printer. The problem is likely to be:

- The printer was disconnected
- The printer is not properly connected to the computer
- The printer cable may be:
 - not fully plugged in at one or both ends;
 - defective;
 - the wrong cable, i.e., a parallel cable unable to properly support bi-directional communication.

- A port on either the computer or the printer may be:
 - the wrong port for the connection
 - not functioning properly
 - wrongly labeled.

PAPER JAM: Normally this means that paper is jammed in the printer. However, it can also mean that the jam sensors are stuck or worn out.

PAPER TRAY OPEN OR EMPTY: Means that the paper tray is open or the paper is empty.

MEMORY FULL or BAND ERROR: The printer has insufficient memory for the print job. Insufficient memory can be caused by:

- Documents with large or complex graphic images, which use much more memory than font characters. It is not unusual to need more than the standard 2MB of memory to print complex jobs.
- Using too many soft fonts or macros at one time.

UNKNOWN ERROR: An undetermined printer hardware fault has been detected.

Laser error - A Laser failure has occurred.

Fuser error - A Fuser failure has occurred.

5.3.3 Remote Control Panel (RCP)

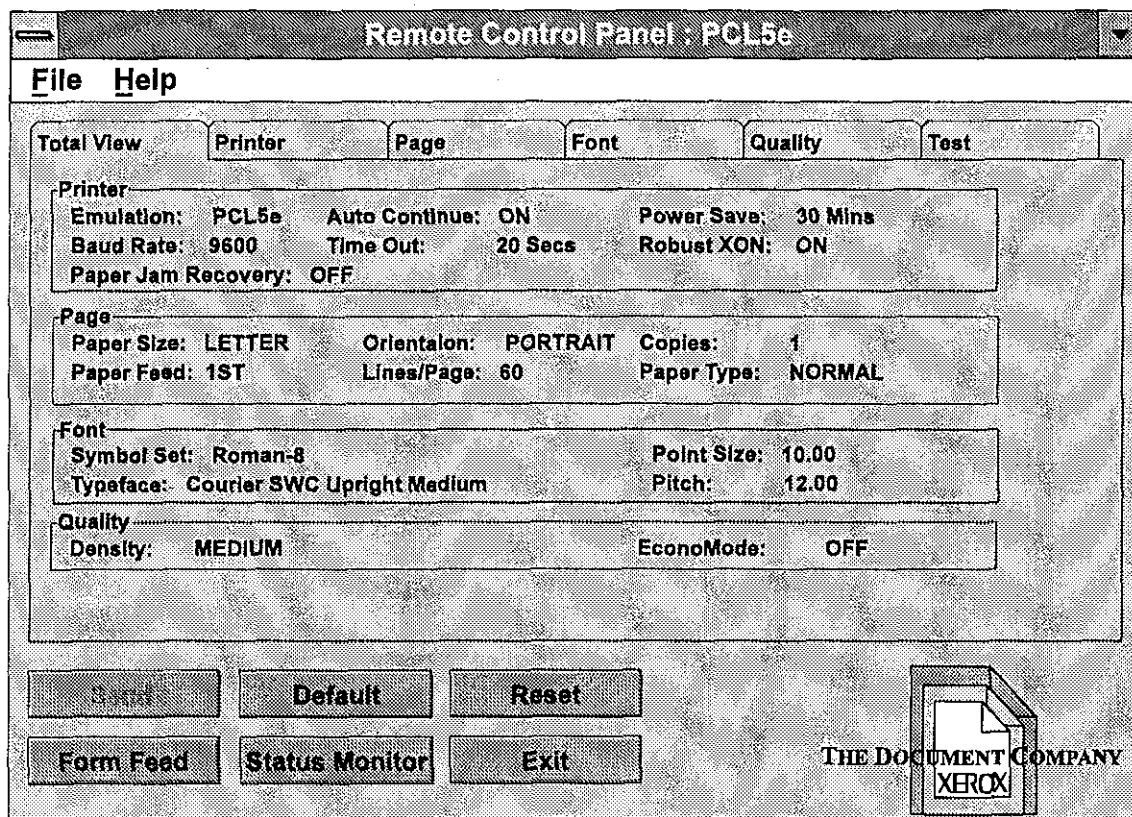
The Remote Control Panel (RCP) lets the user view and change printer settings from the host. The RCP supplements the printer driver to give the user complete control of the printer's features and options. Changes made through the RCP change the parameters of the System Controller's non-volatile memory. The RCP provides six different views, each designed for control or review of a different aspect of printer operation:

- **Total View** displays all current parameters.
- **Printer** enables adjustment of general printing parameters.
- **Page** enables choice of page layout, paper source, number of copies.
- **Font** enables selection of fonts and symbol sets.
- **Quality** enables adjustment of print density and use of Econo (toner) Saver Mode.
- **Test** enables printing of demonstration page, configuration, and font list.

5.3.3.1 Total View

To start the Remote Control Panel for Windows, double click on the RCP icon. This action brings up the Total View screen (shown below). To start the RCP for DOS, at the DOS prompt (C:\), type DOSRCP 4508, then press ENTER.

The Total View screen shows all of the printer's parameters. The Total View screen contains three main areas. The top row is a series of View Tabs enabling the choice of any of the other five views in the RCP. To select any of the views, click on the appropriate tab. Beneath the row of View Tabs is a table of current selections corresponding to the Printer, Page, Font, Quality, and the views they bring up. Test is used for printing three test patterns



dp8_099

At the bottom of the screen is another array of six buttons: Send, Factory Default, Reset, Form Feed, Status Monitor, and Exit. These six selections appear in all six RCP views. Their uses are as follows:

SEND: Works like the "Enter" command. When a parameter is changed, "SEND" is boldfaced. Selecting it writes the change in the Printers' System Controller's non-volatile memory (NVM). In the DOS version of the RCP, instead of a SEND button to direct the printer's memory to record changes made, you have a file menu item to select: "Send settings to printer."

DEFAULT: Resets all printer parameters to *factory* default values.

RESET: Resets all changes that have been made, but not sent to the printer, to their previous default values.

FORM FEED: If any data is in printer memory, the current page will be printed.

STATUS MONITOR: Displays current printer status.

EXIT: Closes the Remote Control Panel.

5.3.3.2 Printer

The Printer tab (shown below) enables the following printer settings:

BAUD RATE: The data transfer rate of the serial interface. The default value is 9600 bps.

PRINTER TIMEOUT: The port timeout, if a serial port is installed. The default value is 20 seconds.

POWER SAVE: When ON, Power Saver uses 17 Watts. The default timeout for Power Saver is 30 minutes.

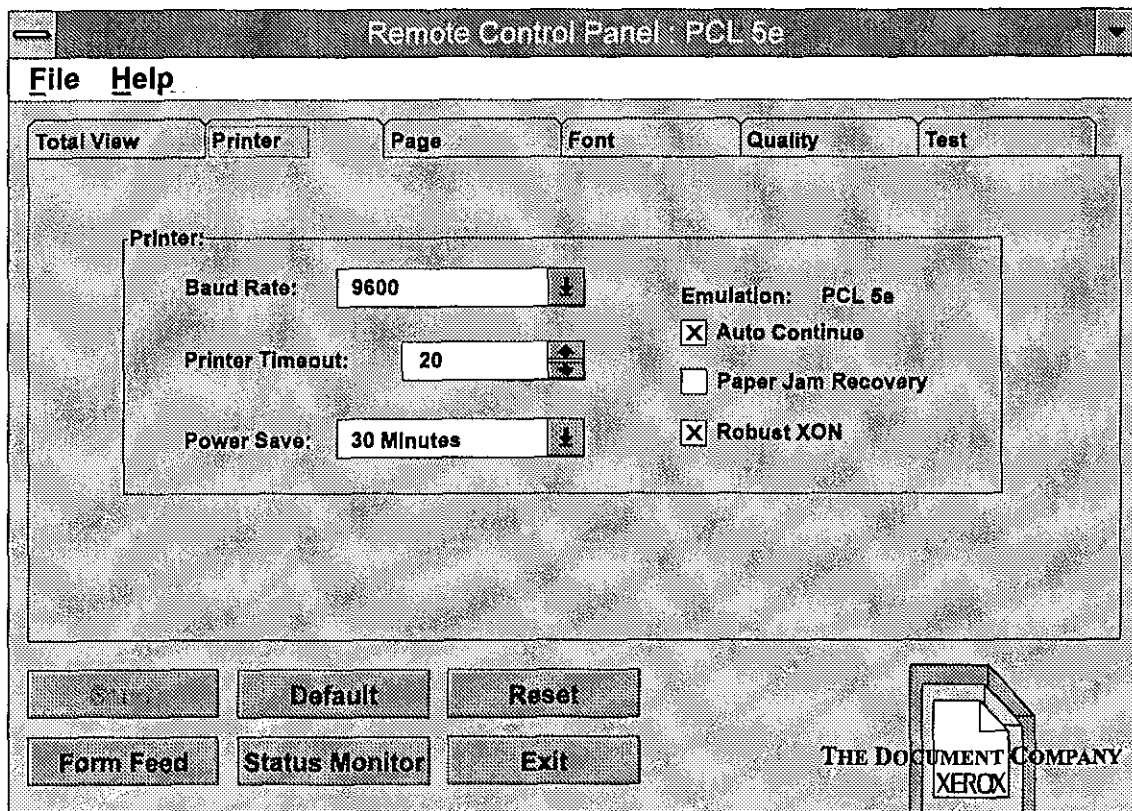
EMULATION: With the current software, this will always read "PCL5e."

AUTO CONTINUE: When ON, and no paper is in the manual feed slot, the paper will feed from the paper tray after 10 seconds. When Auto Continue is OFF, the printer waits until paper is inserted in the manual feed slot.

PAPER JAM RECOVERY: Default is OFF. When ON is selected, printing continues after a jam.

ROBUST XON: When ON, sends the XON character once every second. The default position is ON.

The array of six buttons at the bottom of the screen are the same and serve the same function as in Total View.



dp8_104

5.3.3.3 Page

The Page tab (shown below) enables the following printer settings:

PAPER SIZE: Sets the image to match the size of the paper. The default value is LETTER size for the 110 VAC printers and A4 for the 220 VAC printers.

PAPER FEED: The selections are Auto, Manual, 1st Cassette, and 2nd Cassette. Auto selection will automatically feed from the paper tray containing the size paper requested by the PC application. Manual is for manual feed. Selecting 1st cassette feeds paper from the main paper tray. Selecting 2nd Cassette feeds paper from the lower tray and is only valid if the optional lower feeder is installed.

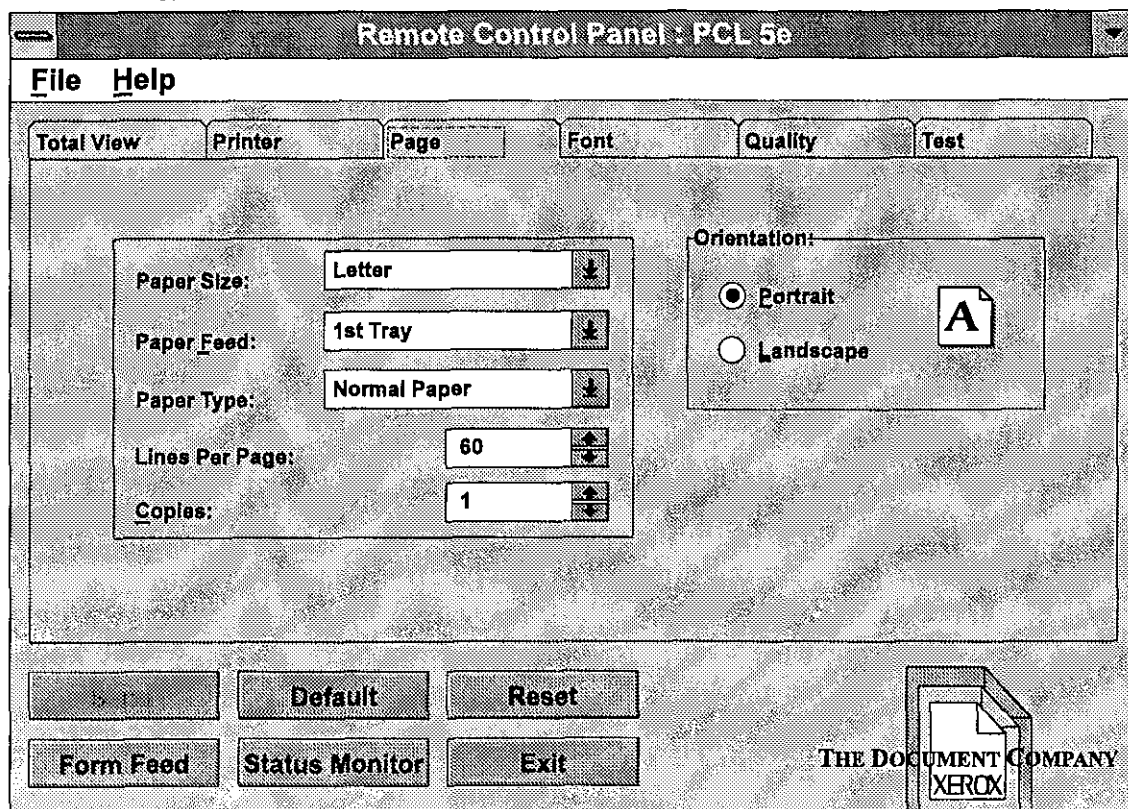
PAPER TYPE: Adjust printer for paper type. Any paper over 24 lb. recommends the "Thick Paper" setting.

LINES PER PAGE: Sets the number of lines on the page. The default value for letter size paper is 60 lines per page and for A4 64 lines per page.

COPIES: Sets number of copies to be printed. The default is 1 copy.

ORIENTATION: Chooses between PORTRAIT and LANDSCAPE layouts of the printed page. The default setting is PORTRAIT.

The array of six buttons at the bottom of the screen are the same and serve the same function as in Total View.



dp8_103

5.3.3.4 Font

The Font tab (shown below) enables the following printer settings:

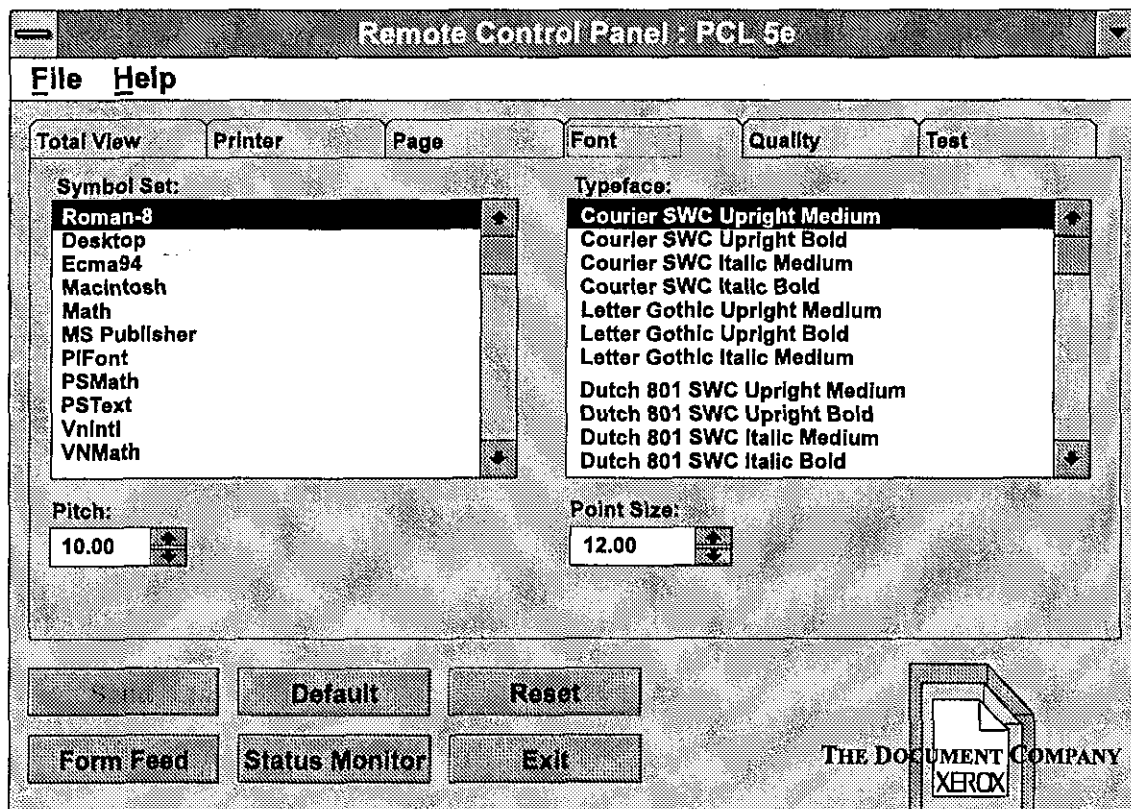
SYMBOL SET: Lists the various groups of font-specific characters and symbols. The default setting is ROMAN-8.

PITCH: The pitch (horizontal spacing) of characters in a font may be selected when a fixed pitch outline font is being used. Pitch selection is ignored by other fonts. The pitch setting range is from 0.44 to 99.99 in 0.01 increments. The default value is 10.00.

TYPEFACE: Lists the available typefaces. The default typeface is Courier SWC Upright Medium.

POINT SIZE: The point size (height) of a font may be selected when a proportionally spaced outline font is being used. This selection is ignored by other fonts. The default point size is typeface dependent.

The array of six buttons at the bottom of the screen are the same and serve the same function as in Total View.



dp8_102

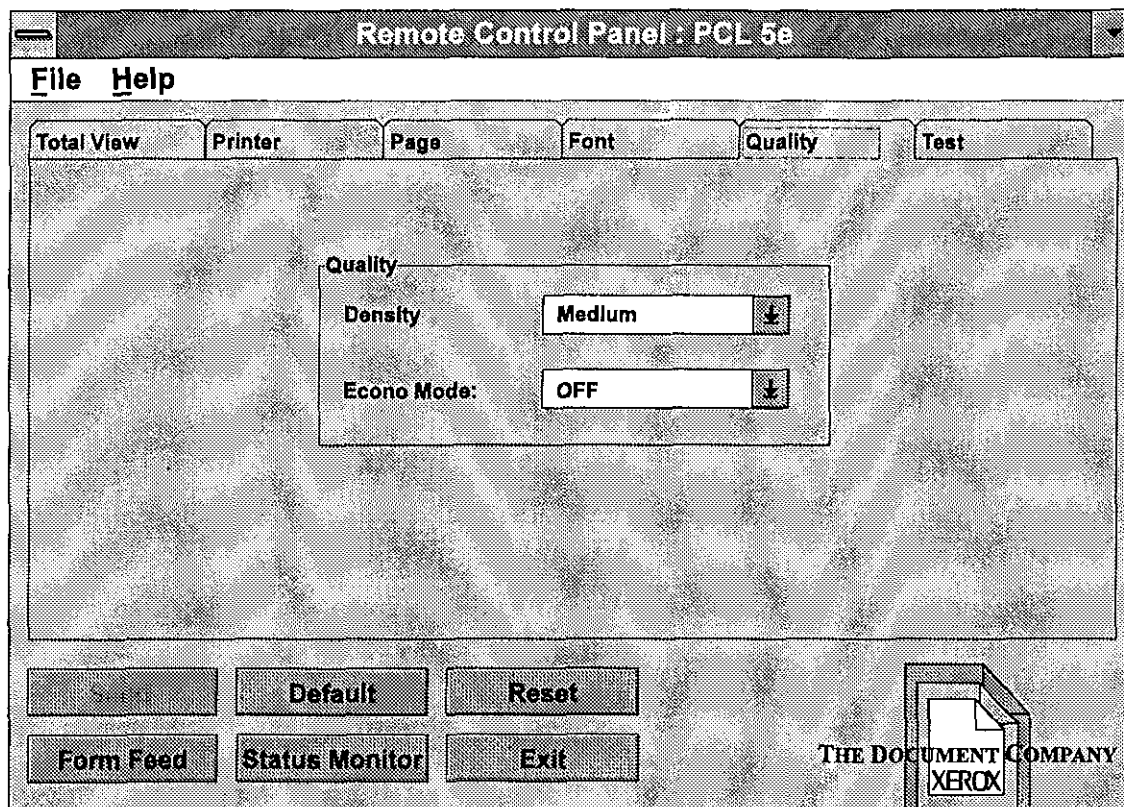
5.3.3.5 Quality

The Quality tab (shown below) enables the following printer settings:

DENSITY: Determines the overall density of the page. The selections are Light, Medium, and Dark. The default density is Medium.

ECONO MODE: Reduces the amount of toner used by reducing print resolution. The selections are in fractions: Off, 1/2, 1/4, 1/6, and 1/8. The default selection is Off.

The array of six buttons at the bottom of the screen are the same and serve the same function as in Total View.



dp8_101

5.3.3.6 Test

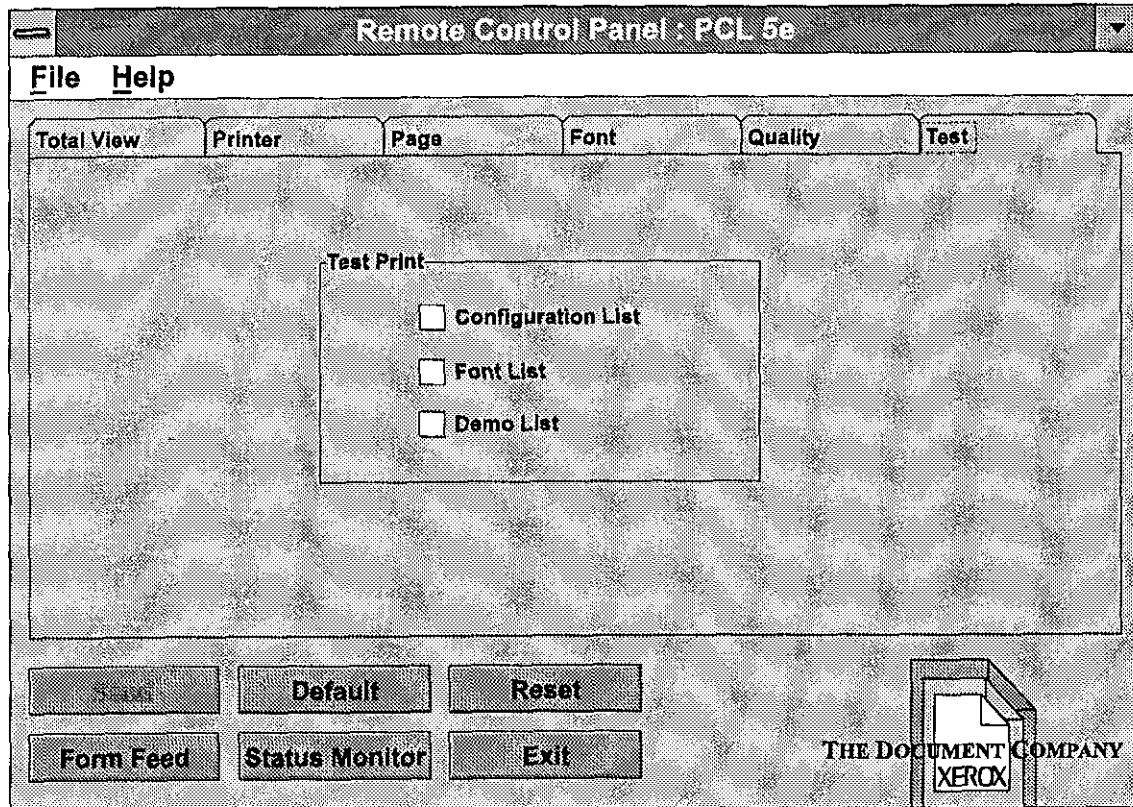
The Test tab (shown below) enables the printing of the following test documents:

CONFIGURATION LIST: Prints the printer's current configuration (Status Page).

FONT LIST: Prints a list of resident fonts.

DEMONSTRATION PAGE: Prints a page that demonstrates the main features and the print quality capabilities of the printer.

The array of six buttons at the bottom of the screen are the same and serve the same function as in Total View.



dp8_100

5.4 The Diagnostic Control Unit (DCU)

The Diagnostic Control Unit (DCU) (600T80276) is a pocket-sized test instrument that enables a variety of diagnostic tests and provides a coded digital readout which is used to monitor printer functions. The DCU will not perform any component tests on the Optional Lower Feeder.

5.4.1 Connecting the DCU

- 1 Disconnect the AC power cord. NEVER ATTEMPT TO CONNECT THE DCU WHILE THE PRINTER POWER IS ON.
- 2 Open the SIMM access cover on the printer's right side.
- 3 Remove the metal shield plate covering the System Controller PWB by removing the screw holding it in place.
- 4 Plug the DCU's four-pin connector into (J6) on the System Controller PWB beneath the two wiring harness connectors.
- 5 **The Front Cover / Printer Cartridge Interlock Switch must be actuated to perform the DCU tests.** The Printer Cartridge must be in place and the Front Cover closed or the interlock cheated to run the tests.
- 6 Reconnect AC power.

5.4.2 The DCU's Operating Modes

Operation of the DCU is simpler than it might appear from the variety of indicators and labels on the DCU's face (see Figure 5.4.2a). Only some of them are involved at any given time, depending on the DCU's current operating mode.

The DCU has two operating modes:

- Status Mode
- Diagnostic Mode

Two LEDs on the upper left of the DCU's face correspond to the two modes. One or the other will always be lit to indicate the DCU's current mode.

In both Status and Diagnostic modes, double-digit numeric codes are displayed in the readout window on the upper left. The meaning of any particular code depends on the DCU's current mode. The two modes of operation and the associated codes are explained in the next two sections.

NOTE: If there is any discrepancy between the information here and labels on the DCU, ignore the DCU labels and follow this information.

Figure 5.4.2a Diagnostic Control Unit

Model : **DCU-ML**

ML-80 DIAGNOSTIC CONTROL UNIT QUICK REFERENCE

☐
STATUS

☐
DIAGNOSTIC

00

04	BIAS3	BIAS1	BIAS0
05	LSU READY	LSU MT & LD	LSU MOTOR
07	PAPER EMPTY	EXIT SENSOR	FEED SENSOR
08		PRINT HEAT	STANDBY HEAT
09	COVER OPEN		
10	OVERHEAT		
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	ON	OFF	

SELF
TEST

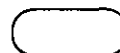
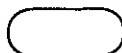
☐

DIAGNOSTIC CODE		STATUS CODE	
00	MAIN MOTOR OPERATING SYSTEM	00	READY (LEGAL)
01	MAIN HIGH VOLTAGE ON	01	READY (LETTER)
02	TRANSFER HIGH VOLTAGE (-) ON	02	READY (A4)
03	THV (+) REFERENCE VOLTAGE	03	READY (EXECUTIVE)
04	DFV/SUPPLY HIGH VOLTAGE ON	04	READY (B5)
05	LSU OPERATING TEST	20	PRINT START
06	PICKUP CLUTCH ON	21	PRINT START (MANUAL)
07	PAPER EMPTY SENSOR TEST	23	PRINT START (2nd PAPER)
08	FEED & EXIT SENSOR TEST	30	FEED SENSOR 1st ON
09	COVER OPEN SENSOR TEST	31	FEED SENSOR 1st OFF
10	FUSER TEST	33	FEED SENSOR 1st ON (2nd PAPER)
11	HOT BURN TEST	34	FEED SENSOR 1st OFF (2nd PAPER)
12	CLEAN (MESSAGE) PRINT	40	FEED SENSOR 2nd ON
13	THV (+) TRIGGER & THV ON DUTY	43	FEED SENSOR 2nd ON (2nd PAPER)
14	THV (+) DUTY	47	FEED SENSOR 2nd OFF
		50	PAPER OUT
		60	OPEN FUSER ERROR
		62	LOW HEAT ERROR
		68	OVER HEAT ERROR
		61	WARM UP
		64	COVER OPEN ERROR
		69	SLEEP MODE
		70	NO PAPER or CASSETTE
		71	PAPER JAM0
		72	PAPER JAM1
		73	PAPER JAM2
		90	MANUAL PRINT MODE
		95	LSU NOT READY

GREEN STATUS CODE	
88	GREEN MODE READY
99	GREEN MODE WARM UP

*THE CONTROL CODES 13 & 14
ARE USEFUL FROM THE EPROM
VERSION 5.X.X FOR THE
ENGINE BOARD.

DCU MODE DOWN SHIFT STOP
 UP ENTER



IF YOU WANT TO ENTER THE DCU MODE
TURN THE POWER SWITCH ON WITH HOLDING THREE KEYS DOWN

dp8_043a

5.4.3 Status Mode

When the printer is powered on after connecting the DCU, the DCU automatically enters the Status Mode. The Status Mode monitors the status of printer functions during normal operations. As each function is executed, its Status/Error Code is displayed. If any function fails, the Status/Error Code for that function is displayed until the problem or error has been corrected. (A list of codes and status/error parameters is in Table 5.4.3 below.)

If the problem is resolved without disconnecting power, Status Mode removes the error code displayed and resumes normal operation.

If power is disconnected, powering on once again causes Status Mode to repeat its status review until another problem is detected, or the review is successfully completed.

Whenever Status Mode no longer detects any problem, the displayed Status Code will be one of the three Ready codes (00, 01, 02), depending on which paper size has been selected.

Status Mode can be interrupted only by disconnecting power to the printer.

Table 5.4.3 Status Mode Indications

Code	Indication	Code	Indication
00	Ready (legal)	47	Second feed sensor off
01	Ready (letter)	50	Paper Exit
02	Ready (A4)	60	Open fuser error
20	Print start	61	Warm up
21	Print start (manual)	62	Low heat error
23	Print start (second paper)	64	Cover open error
30	Feed sensor 1st on	68	Overheating error
31	Feed sensor 1st off	70	Paper out, or tray missing
33	Feed sensor 1st on (second paper)	71	Jam 0
34	Feed sensor 1st off (second paper)	72	Jam 1
40	Second feed sensor on	73	Jam 2
43	Second feed sensor on (second paper)	90	Manual mode

The Test Print Function

The Test Print Function is available in Status Mode when any of the three Ready codes (00, 01, 02) are displayed. Pressing the Self-Test button (upper right) initiates the printing of a single page and checks all functions required to produce a printed image. The Test Print is a page covered with vertical lines about a quarter inch apart.

While the test print is being produced, the display changes as the Status monitor displays the codes for each function involved in making the test print. If no problems occur during the Test Print operation the DCU will again display one of the three Ready codes.

5.4.4 Diagnostic Mode

Diagnostic Mode enables the individual testing of thirteen different printer functions.

Diagnostic Mode is entered by simultaneously pressing three keys--DOWN, SHIFT, and STOP--at the time the printer is connected to AC power. If the printer is already connected and in the Status Mode, it is necessary to disconnect AC power, hold down the three keys, and reconnect the AC power.

When the DCU enters Diagnostic Mode, the readout window displays "00" and all LEDs on the printer's Control Panel start to blink. The Control Panel LEDs continue to blink as long as the DCU is in Diagnostic Mode.

The "00" readout is the Diagnostic Code for testing the main motor. The UP and SHIFT + DOWN keys are used to scroll the Diagnostic Code list up and down in the readout window to select other diagnostic tests.

5.4.5 General Test Procedures

As you read each of the paragraphs in this section, refer to the Diagnostic Test Table (Table 5.4.5b). This will enable you to understand the similarities and differences among the thirteen test procedures. It will also familiarize you with the use of the table as a guide while performing test procedures.

All thirteen main Diagnostic tests are started in the same way. After the Diagnostic test code has been selected (see Column 1 in the table), the test is started by pressing the ENTER key (see Column 3).

Except for two, all the diagnostic tests are ended in the same way (see Column 6). After the test procedure has been completed, the test is ended by pressing SHIFT + STOP. The exceptions are tests 11 and 12, which are ended by disconnecting the AC power.

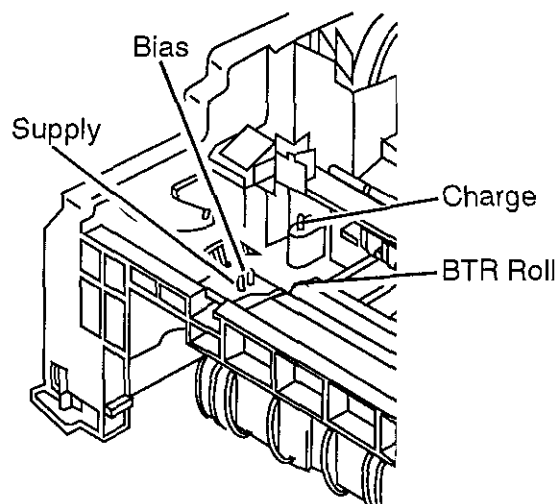
What happens between starting and stopping a test varies according to the type of test.

The four voltage tests (01-04) require use of a multimeter and probes. Test results are determined from the multimeter readings (Column 3). Figure 5.4.5a illustrates the locations of the high voltage test points and Table 5.4.5a indicates the voltage for each.

Table 5.4.5a High Voltage Readings.**Figure 5.4.5a High Voltage Test points.**

All readings are Volts DC, +/- 5%

DCU Test	Test Point	Voltage Reading with PCU Version:		
		4.4.5, 4.4.6, 5.3.0	5.3.1	5.3.2
01	Charge	-1226	-1226	-1226
02	Metal end of BTR Roller	-220 to -550	-220 to -550	-220 to -550
03	Metal end of BTR Roller	700 to 2700 Nominal 1000	700 to 2700 Nominal 1000	700 to 2700 Nominal 1000
04				
Bias Light	Bias	-302	-302	-252
Bias Medium	Bias	-348	-348	-302
Bias Dark	Bias	-404	-404	-349
Bias B Dark	Bias	-451	-451	-405
Bias Light	Supply	-497	-497	-448
Bias Medium	Supply	-544	-544	-497
Bias Dark	Supply	-600	-600	-544
Bias B Dark	Supply	-647	-647	-600



dp8_067

Seven diagnostic tests (00, and 05 - 12) (Table 5.4.5b) require no additional equipment, and indicate results in two ways: by LEDs (Column 5), and/or by obvious activity--sound or movement--as the printer responds (Column 4).


The results of most tests are indicated by the three LEDs to the right of the readout window. Two of the LEDs are labeled ON and OFF, and the third is unlabeled. However, these labels can be ignored when reading results, since it is the pattern of lit LEDs which indicates test results.

For example, consider test 08, the test of the Feed and Exit Sensors. If the feed sensor circuit is working properly, the "unlabeled" LED, and only that LED, will be lit when the Feed Sensor is actuated. If either of the other two LEDs light, or if the "unlabeled" LED fails to light, the Feed Sensor circuit is not operating properly.

Three of the thirteen tests (04, 05, and 10) are multiple tests. After the first test in the series is started by pressing ENTER, the remaining tests in the series are initiated by pressing the UP key, once in succession for each remaining test.

Three of the thirteen (07, 08, 09) are tests involving sensors. Pressing ENTER starts the tests. Manually actuating and deactuating the sensor verifies the operation.

Table 5.4.5b DCU Test Procedures

Diagnostic Code	Diagnostic Test	To Conduct Test	Response	LEDs			To End Test
				On	Off		
00	Main Drive Motor	Press ENTER	Main Drive Motor Runs	Lit			Shift + Stop
01	Charge Voltage	Press ENTER	Voltage On	Lit			Shift + Stop
02	Transfer Negative	Press ENTER	Voltage On	Lit			Shift + Stop
03	Transfer Positive	Press ENTER	Voltage On	Lit			Shift + Stop
04	Developer Bias Bias Light Bias Medium Bias Dark Bias B Dark	Press ENTER Press UP Press UP Press UP	Voltage On Voltage On Voltage On Voltage On	Lit	Lit Lit Lit	Lit Lit Lit	Pressing Up stops one test and starts next Shift + Stop
05	Laser Assembly Laser Diode & Motor ON 	Press ENTER Press up	Laser Motor On Laser Diode On	Lit	Lit	Lit	Shift + Stop
06	Pick-Up Solenoid	Press ENTER	Solenoid Activates	Lit			Shift + Stop
07	Paper Out Sensor	Press ENTER Remove Paper	----- -----	Lit			Shift + Stop
08	Feed & Exit Sensor	Press ENTER Actuate Feed Sensor Actuate Exit Sensor	----- ----- -----		Lit	Lit	Shift + Stop
09	Cover Open Sensor	Press ENTER Actuate Sensor Deactuate Sensor	----- ----- -----	Lit			Shift + Stop
10	Fuser Circuit Standby Heat Print Heat Overheating	Press ENTER Press UP Press UP	Fuser Warms At Print Temp Fuser Overheat	Lit	Lit	Lit	Shift + Stop
11	Continuous Printing	Press ENTER	Prints test prints		Lit		Unplug Printer
12	Print Cartridge Cleaning Cycle (continuous)	Press ENTER	Cleaning Prints		Lit		Unplug Printer

5.5 Printer Engine PWB Main Parts

The Printer Engine PWB consists of a high voltage power supply, a low voltage power supply, a print engine controller, a Front Cover / Printer Cartridge interlock switch, jam switches, and a feed solenoid. Some of the more important circuits are discussed briefly:

- The reset circuit initializes the CPU when power is turned on. The CPU is thus protected from unstable operation caused by an unstable power source.
- The fuser temperature control circuit turns the fuser ON or OFF, depending on changes in the thermistor's resistance and voltage.
- A motor driving circuit on the Printer Engine PWB controls the speed of the printer's stepper Main Drive Motor.
- The paper pick-up clutch is released by the pick-up solenoid. The pick-up solenoid is mounted on the Printer Engine PWB and is controlled by a signal from the CPU.
- The CPU uses dual switches to sense the status of the cover and of the printer cartridge. The switch signals are LOW when they detect an open cover or an improperly installed or missing printer cartridge. Otherwise they are HIGH.

The Printer Engine PWB includes three main sensors.

- **FEED SENSOR:** This is a photo sensor connected to the CPU. If paper is on the Feed Sensor, the sensor's state is LOW. When there is no paper to sense, the sensor's state is HIGH.
- **EXIT SENSOR:** This is a leaf switch connected to the CPU. If paper is on the Exit Sensor, the sensor's state is LOW. If there is no paper exiting, the sensor's state is HIGH.
- **PAPER OUT SENSOR:** This is a photo sensor connected to the CPU. When there is paper in the paper tray, the sensor's state is LOW. If there is no paper in the tray, the sensor's state is HIGH.

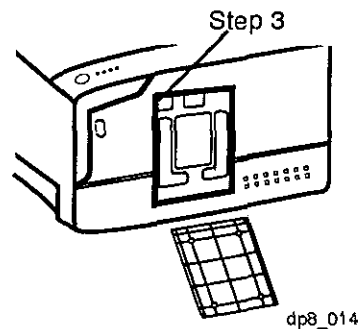
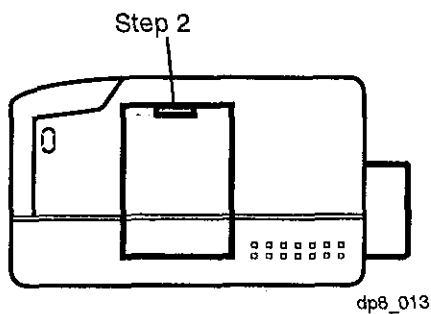
5.6 Installing Additional Memory

The printer is equipped with 2Mb of resident base memory which is expandable to a total of 34Mb. The base memory may be expanded by installing an additional Single Inline Memory Module (SIMM). By doing this, the size of the receive buffer and the size of the font download buffer are increased. This also enables the printing of more complex pages.

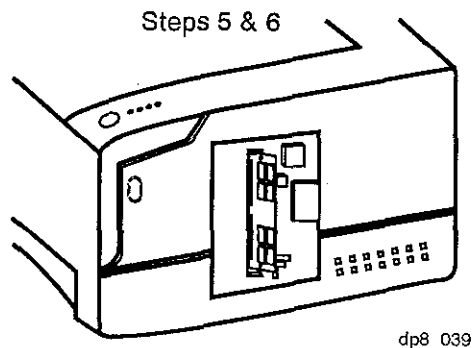
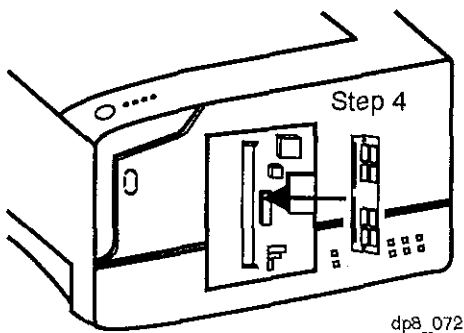
On the System Controller PWB, there is only one SIMM slot dedicated to increase the printer memory. There are four available SIMM options to increase the printer memory up to a total of 34Mb. All SIMMs are industry standard 72 pin 32-bit memory (no parity, 70 ns or faster), and are available in sizes of 2, 4, 16, or 32MB. When the SIMM is installed, the System Controller PWB will automatically detect the memory and increase the printer buffer size.

To install an additional memory module:

- 1 Disconnect the AC power.
- 2 Remove the right side cover panel by pressing the latch down and pulling it out and up (see figure).
- 3 Remove the metal plate by removing the screw holding it in place (see figure).

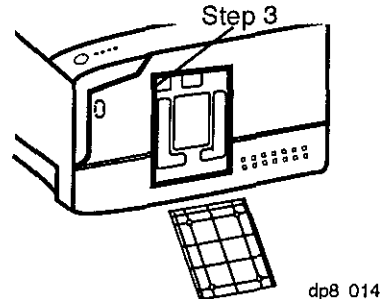
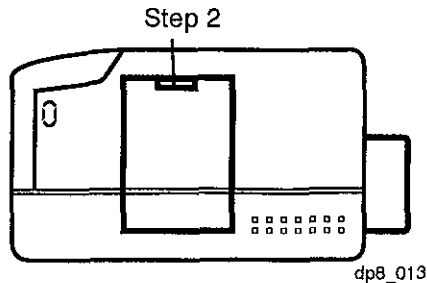


- 4 Orient the new memory module so that the side with the contacts is closest to the printer, and the notched end of the module is on the top (see figure).
- 5 Hold the SIMM at a vertical 30 degree angle and firmly push it with your thumbs into the slot. Push the module into the back of the slot to fully seat it (see figure).
- 6 Rotate the module to the right until the clips on the edges of the slot snap/click onto the module.
- 7 Run a Status Page to verify memory has been installed correctly and system recognizes the installation of additional memory.

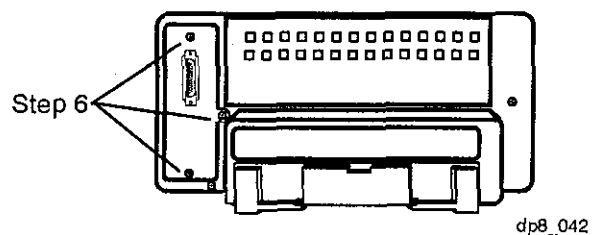
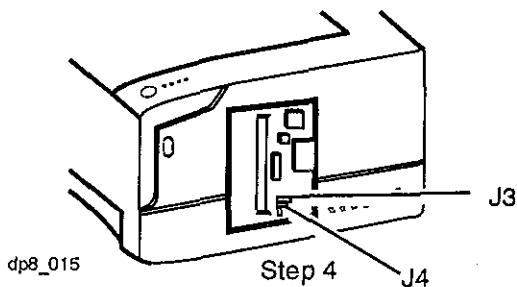


5.7 Installing the Optional Serial Port (RS 232C)

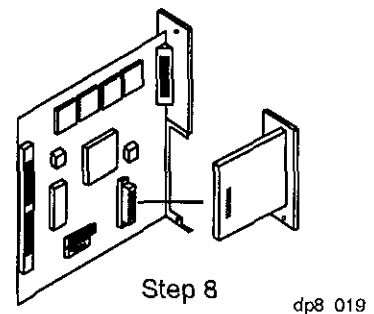
- 1 Disconnect the AC power.
- 2 Remove the right side cover panel by pressing the latch down and pulling it out and up (see figure).
- 3 Remove the metal plate by removing the screw holding it in place (see figure).



- 4 Disconnect the two wire harnesses at J3 and J4 from the System Controller PWB (see figure).
- 5 If the System Controller PWB has an additional SIMM installed, remove it. Carefully spread the clips on each end of the SIMM connector and tilt the SIMM to the left. Remove the SIMM.
- 6 Remove the three screws securing the back plate of the System Controller PWB (see figure).



- 7 Slide the System Controller PWB from the printer and place it on a flat surface. Discard the metal filler plate.
- 8 Carefully match the connector on the System Controller PWB with the connector on the Serial Board. Press the Serial Board to fully seat it on the System Controller PWB.
- 9 Slide the controller board back into the printer, and replace the three screws to secure it.
- 10 Connect the two System Controller PWB connectors (wire harnesses at J3 and J4).
- 11 Replace the right side cover panels.
- 12 Connect the serial interface cable.
- 13 Have the user set the appropriate transmission speed in the RCP.
- 14 Confirm the serial option setup for the printer matches the PC values.



5.8 Installing the Optional Lower Feeder

- 1 Disconnect the AC power.
- 2 Place the optional lower feeder where the printer is to be located.
- 3 Carefully place the printer on top of the lower feeder.
- 4 The lower feeder will automatically make electrical connection with the printer.
- 5 Set the optional feeder paper tray for the desired paper size and load paper.
- 6 Reconnect the AC power.
- 7 Use Remote Control Panel to select the Optional Lower Feeder.

5.9 Supplemental Tools and Supplies

5.9.1 Tools

<u>Item</u>	<u>Part Number</u>
Anacom G80	600T80138
Diagnostic Control Unit	600T80276
High Voltage Probe	600T1653

5.9.2 Supplies

<u>Item</u>	<u>Part Number</u>
Cleaning Cloth (treated)	35P1538
Cleaning Pads	600S4372
Cotton Swabs	35P2162
Disposable Gloves	99P3082
Disposable Plastic Bags	99P3023
Drop Cloth	5P1737
Film Remover	43P45
Formula A Cleaner	43P48
Glue Capsule	63P560
Polyurethane Pads	600S4653
Towel (heavy duty)	35P3191

Rank Xerox

Cleaner	8R90175
Cleaning Pad Kit	600S4372
Cloth	8R90019
Fuser Cleaning Solvent Pads	43P83
General Cleaning Solvent	8R90176
Lens Cleaner	8R90177

5.10 Abbreviations

<u>Abbreviation</u>	<u>Stands for</u>	<u>Abbreviation</u>	<u>Stands for</u>
BCR	Bias Charge Roll	lb	Pound(s)
BIOS	Basic Input/Output System	LDON	Laser Diode On
BPS	Bits Per Second	LED	Light Emitting Diode
BTR	Bias Transfer Roll	lin	linearity
CBUSY	Command busy	LSU	Laser Scanner Unit
CCLK	Command clock	MHV	Main High Voltage
clk	clock	motor_pa	Motor phase A
cm	centimeter(s)	motor_pb	Motor phase B
CMOS	Complementary Metal Oxide Semiconductor		
CMSG	Command message	MPU	Micro Processor Unit
CON	connector	NC	No Connection
CPU	Central Processing Unit	neg	negative
DCU	Diagnostic Control Unit	OSC	oscillator
DMA	Direct Memory Access	PCU	Printer Control Unit
DMAC	Direct Memory Access Controller	PPM	Pages Per Minute
DOS	Disk Operating System	PRINT	Print command
DPI	Dots Per Inch	psync	page synchronization
DRAM	Dynamic Random Access Memory	pwr	power
DS	Data Strobe	RAM	Random Access Memory
DVM	Digital Voltmeter	READY	Engine ready to print
EBUSY	Engine Status Busy	ROM	Read Only Memory
EEPROM	Electrically Erasable Programmable Read Only Memory		
EMSG	Engine Status message	SCC	Serial Comm. Controller
HSYNC	Horizontal sync	THV	Transfer High Voltage
INT	Interrupt	Vcc	collector supply voltage (dc)
INTA	Interrupt Acknowledge	VCU	Video Control Unit
INTR	Interrupt Request	VDI	Video data from controller
I/O	Input and Output	VDO	Video data output

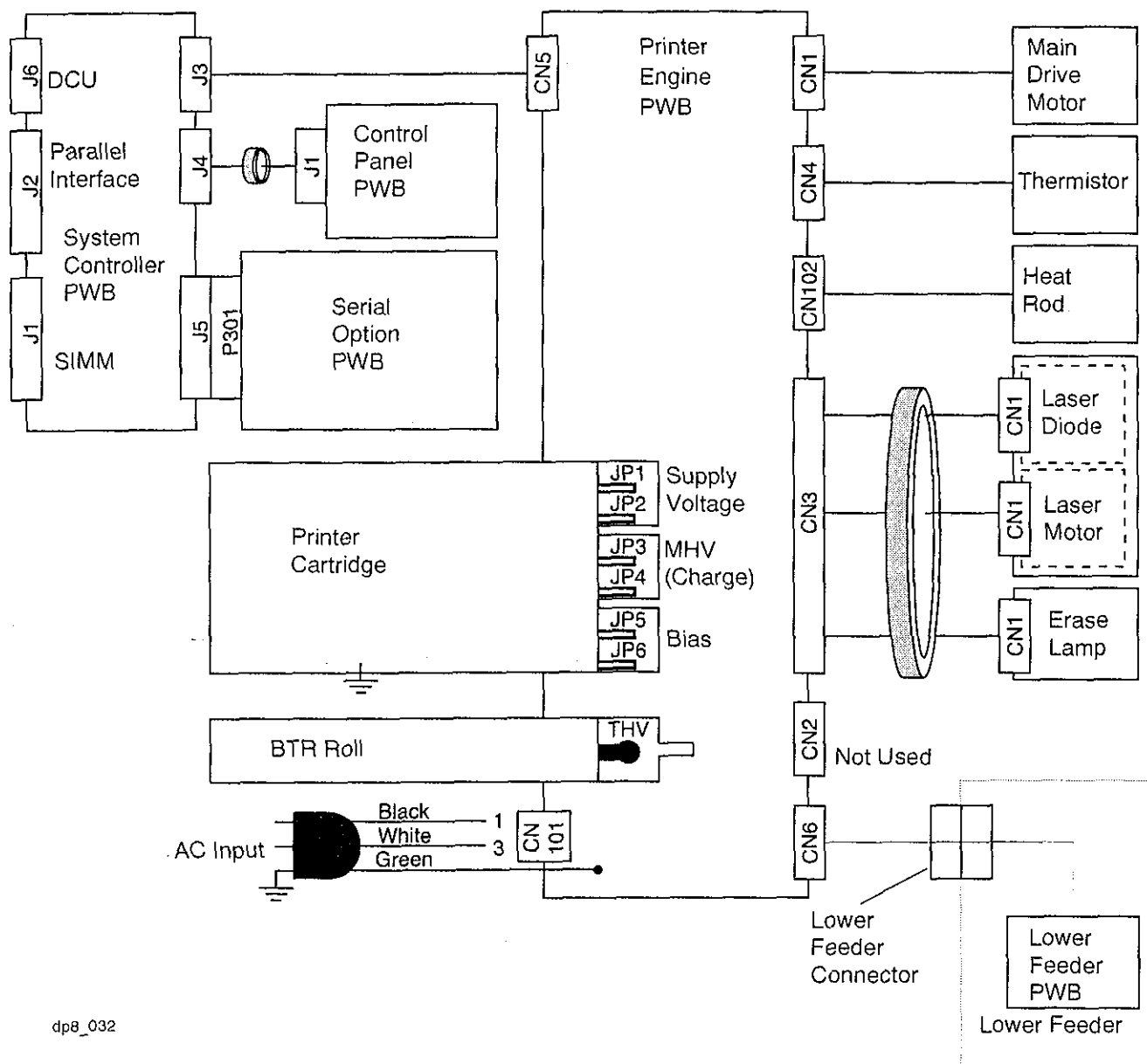
Section 6

Wiring Data

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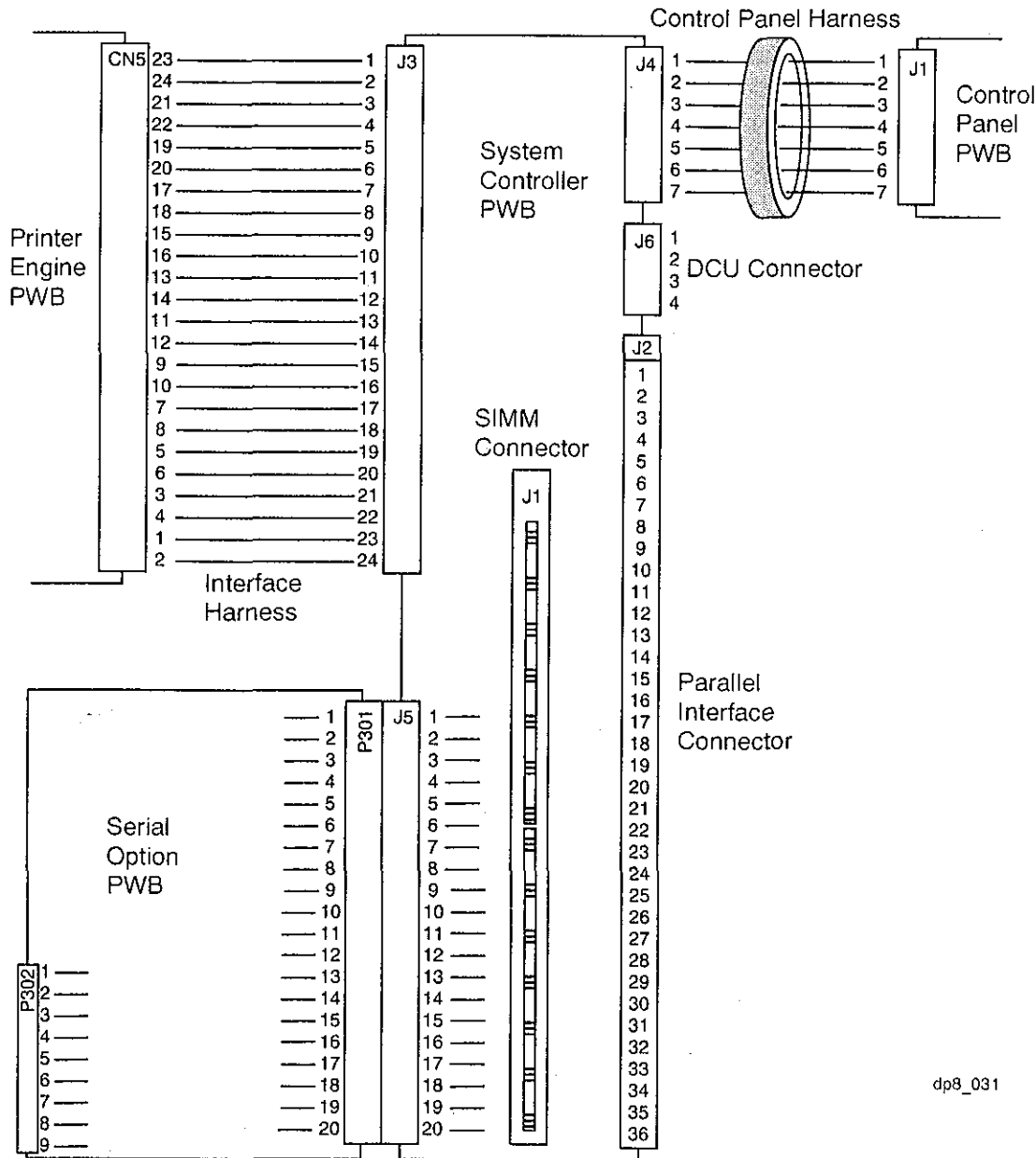
6.1 Connection and Wiring Diagrams

6.1.1 Master Connection and Wiring Diagram



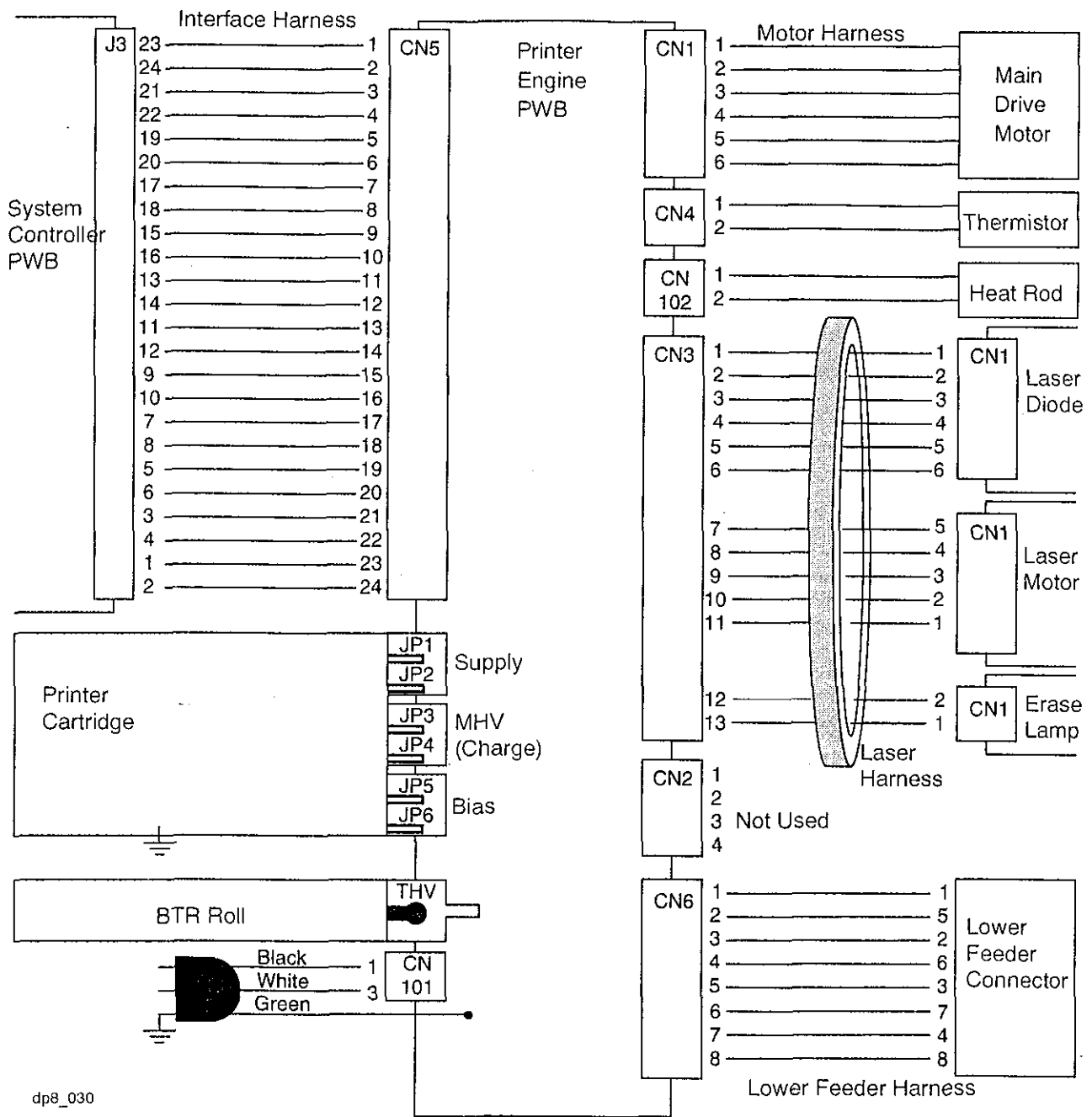
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6.1.2 System Controller PWB

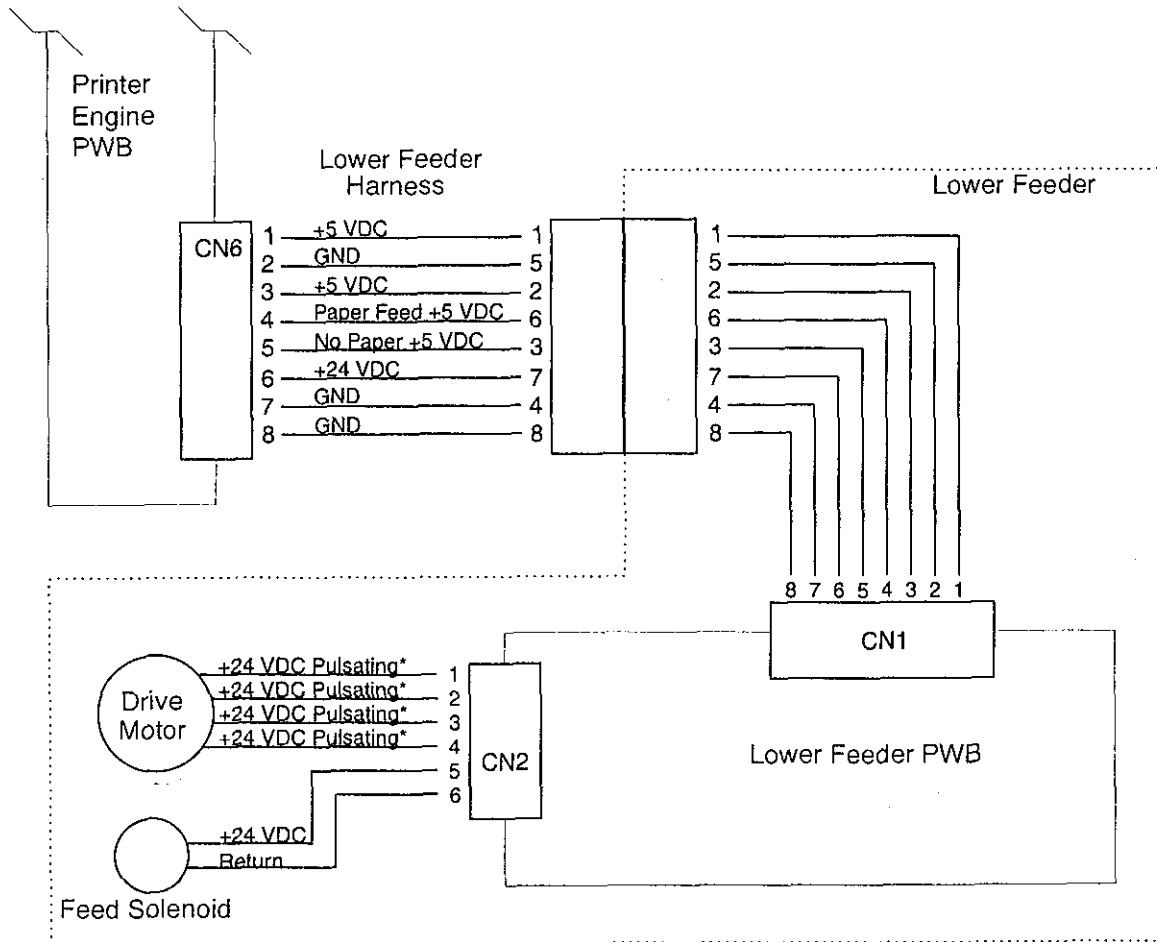


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6.1.3 Printer Engine PWB



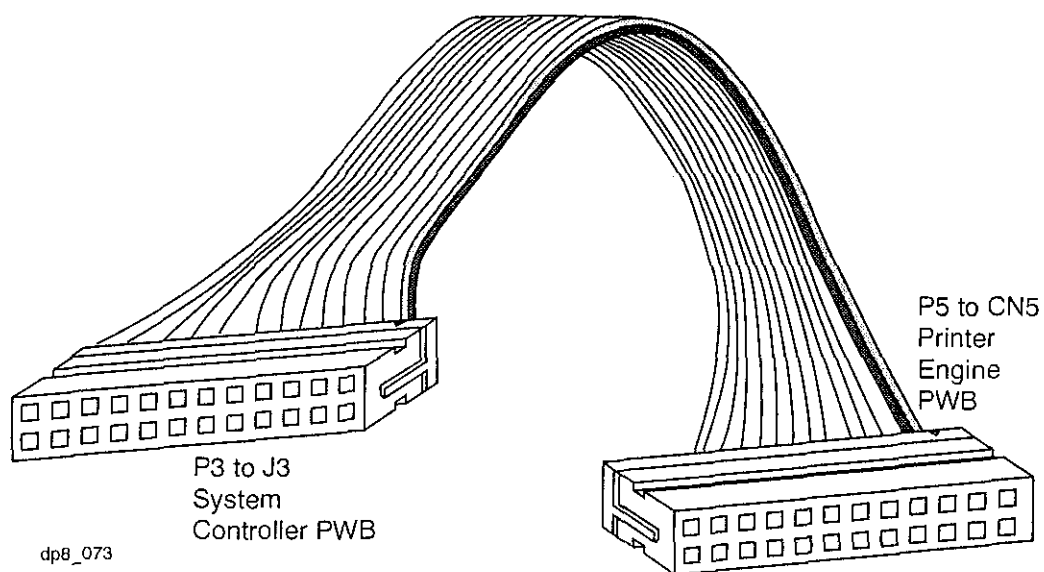
6.1.4 Lower Feeder



* Meter will read approximately +11.3 VDC

6.2 Wiring Harnesses

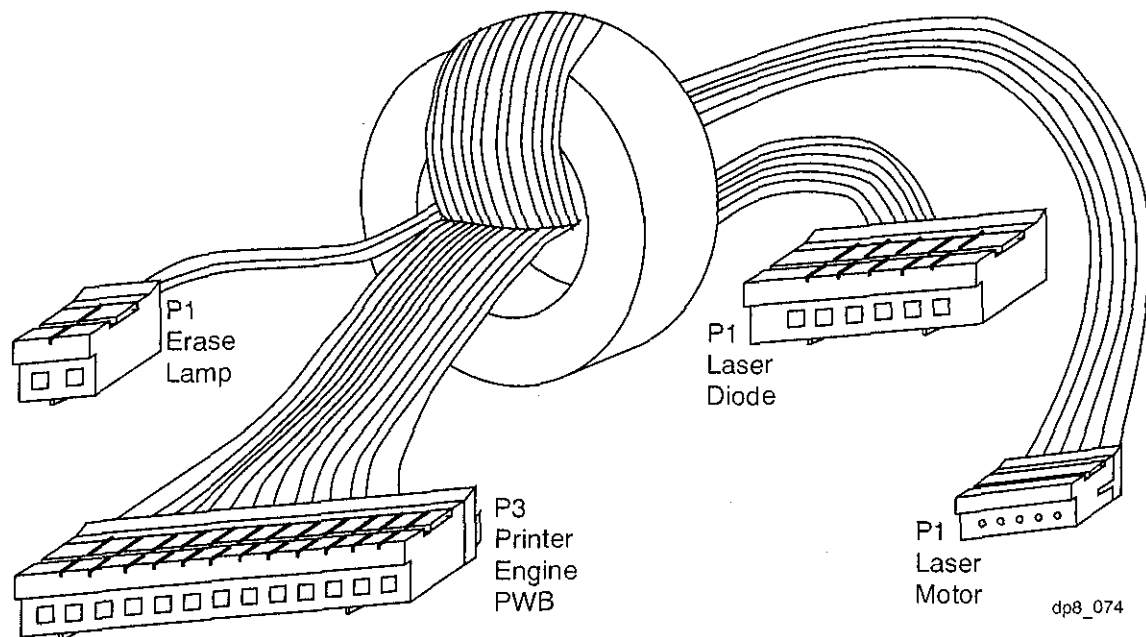
6.2.1 Interface Harness



P3/J3 Pin Number	CN5 Pin Numbers	Signal Name
1	23	/CSBY
2	24	/EBSY
3	21	/EXITAPP
4	22	/EMSG
5	19	/PRINT
6	20	/CCLK
7	18	/NC
8	17	/VDATA
9	15	//RADY
10	16	/PSYNC
11	13	NC
12	14	/HSYNC

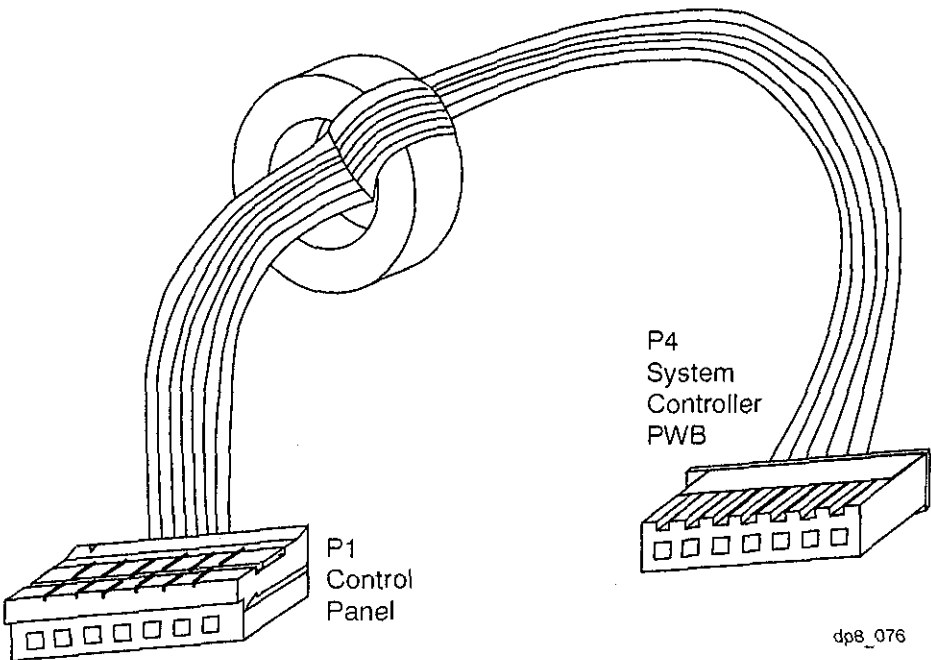
P3/J3 Pin Number	P5/CN5 Pin Numbers	Signal Name
13	11	/CMMSG
14	12	+5.0 VDC
15	9	+5.0 VDC
16	10	+5.0 VDC
17	7	+5.0 VDC
18	8	GND
19	5	GND
20	6	GND
21	3	GND
22	4	GND
23	1	/DCU CLOCK
24	2	/DCU DATA

6.2.2 Laser Harness



P3/CN3 Pin Number		Signal Name
1	P1/CN1 Laser Diode Pin 1	DGND
2	P1/CN1 Laser Diode Pin 2	VDO
3	P1/CN1 Laser Diode Pin 3	LDON
4	P1/CN1 Laser Diode Pin 4	DGND
5	P1/CN1 Laser Diode Pin 5	+5.0 VDC
6	P1/CN1 Laser Diode Pin 6	HSYNC
7	P1/CN1 Laser Motor Pin 5	NC
8	P1/CN1 Laser Motor Pin 4	LREADY
9	P1/CN1 Laser Motor Pin 3	PMOTOR
10	P1/CN1 Laser Motor Pin 2	AGND
11	P1/CN1 Laser Motor Pin 1	+24.0 VDC
12	P1/CN1 Erase Lamp Pin 2	+5.0 VDC
13	P1/CN1 Erase Lamp Pin 1	ERASE LAMP

6.2.3 Control Panel Harness



P4 to J4 Pin Number	P1 to J1 Pin Numbers	Signal Name
1	1	+5.0 VDC
2	2	GND
3	3	READY LED
4	4	PAPER LED
5	5	MANUAL LED
6	6	ERROR LED
7	7	FRONT PANEL KEY

6.2.4 Motor Harness

P1 Pin Number	Signal Name
1	+24.0 VDC
2	+24.0 VDC
3	MOTOR A
4	MOTOR B
5	MOTOR A/
6	MOTOR B/

6.2.5 DCU Connector

J6 Pin Number	Signal Name
1	+5.0 VDC
2	/DCU DATA
3	/DCU CLOCK
4	GND

6.2.6 Thermistor

P4 Pin Number	Signal Name
1	THERMISTOR
2	THERMISTOR

6.2.7 Heat Rod

P102 Pin Number	Signal Name
1	LAMP
2	LAMP

6.2.8 AC Input

CN101 Pin Number	Signal Name
1	AC IN (LINE)
3	AC IN (NEUTRAL)

6.2.9 Lower Feeder Harness

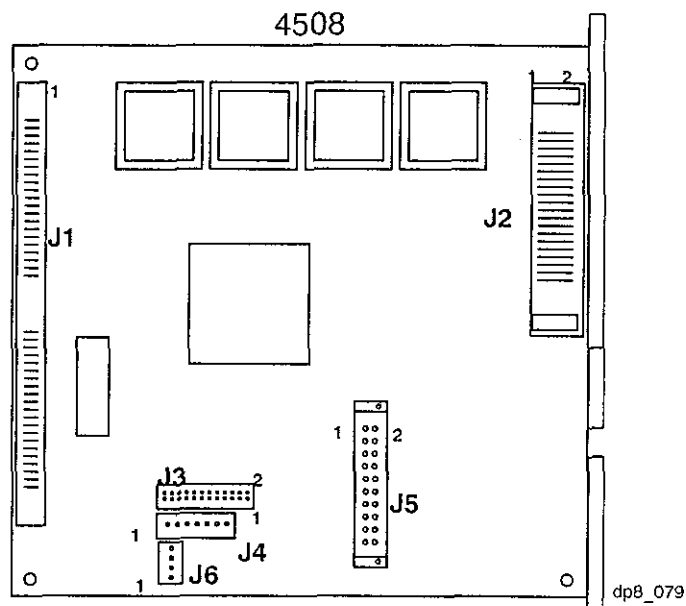
CN6 Pin Number	Lower Feeder Harness Connectors	CN1 Pin Numbers Lower Feeder PWB
1 - Red	1	1 - Red
2 - Orange	5	2 - Orange
3 - Yellow	2	3 - Yellow
4 - Green	6	4 - Green
5 - Blue	3	5 - Blue
6 - Purple	7	6 - Purple
7 - White	4	7 - White
8 - Black	8	8 - Black

6.2.10 Serial Port

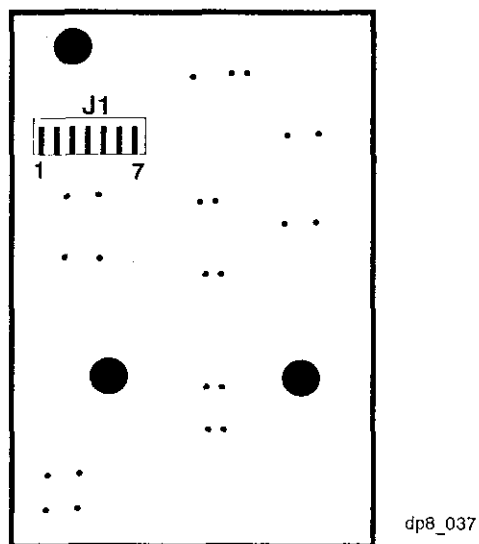
Serial Port Pin Number	Purpose
1	Request to Send (RTS)
2	Transmit Data (TXD)
3	Receive Data (RXD)
4	Data Set Ready (DSR)
5	Ground (GND)
6	Data Terminal Ready 1 (DTR1)
7	Not Connected (NC)
8	Data Terminal Ready 1 (DTR1)
9	Not Connected (NC)

6.3 PWB Layout

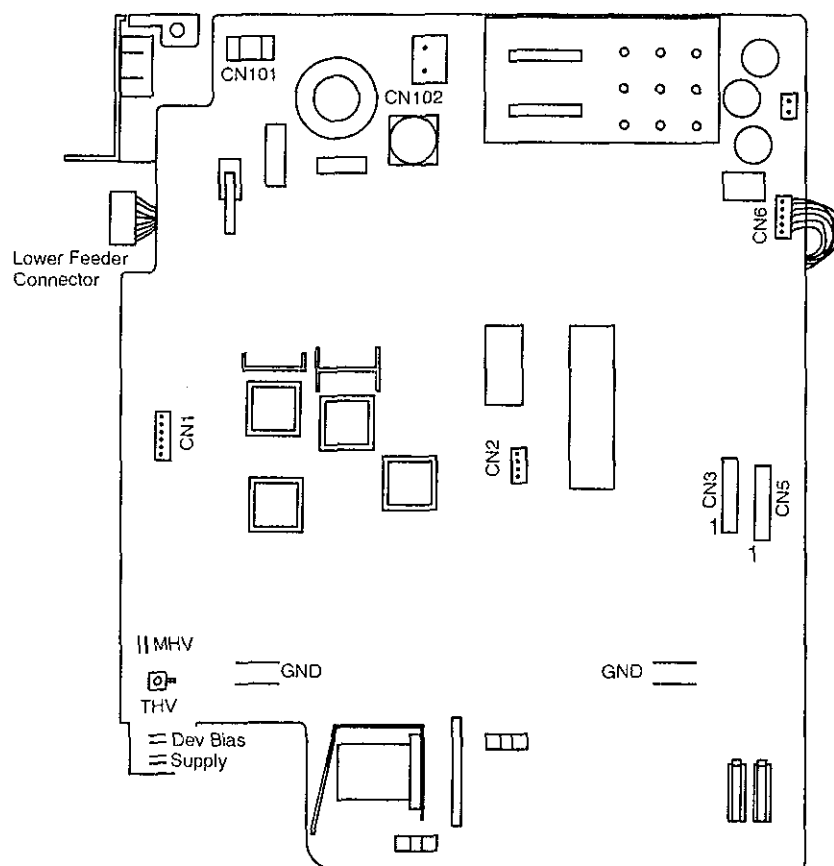
6.3.1 System Controller PWB



6.3.2 Control Panel PWB



6.3.3 Printer Engine PWB



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Section 7

Repair Analysis Procedures

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7.1 Using RAPs

In each of the following repair analysis procedures you are instructed to perform certain actions and make observations. The instruction is followed by a statement. If your response to the statement is yes, perform the action following the "Y". If your response to the question is no, perform the action following the "N."

In addition, keep the following points in mind while performing any RAP:

- 1 RAPs use the following notation when referring to printer connections:
 - P/J XX – indicates Plug/Jack XX is connected to a component.
 - CN XX – indicates connector XX is connected to a component.
 - P XX – refers to the plug of P/J XX (except for connectors soldered directly to the board).
 - J XX – refers to the jack of P/J XX (except for connectors soldered directly to the board).



CAUTION! Use an Electrostatic Discharge Kit (ESD) when handling sensitive electrical components.

- 2 When you take a voltage reading at a P/J location, the notation "P/J3-5 and P/J 2-6" indicates that you should place the red probe (+) of the voltmeter on pin 5 of P/J 3, and place the black probe (-) of the voltmeter on pin 6 of P/J 2. In most cases the second P/J pin in the notation is a Return (RTN), Frame Ground (FG), or Signal Ground (SG).
- 3 When a RAP tells you to take a voltage reading between P/J X and P/J Y, with no pin numbers given, refer to the Wiring and Connection Diagrams in Section 6 and take readings on ALL pins.
- 4 Unless otherwise instructed by a RAP, take all voltage readings with the Printer Cartridge/Front Cover Interlock cheated, AC power applied, and the Paper Tray installed.
- 5 Voltage values stated in RAPs are approximate. Actual voltages you get may differ slightly. A small difference in voltage is acceptable.
- 6 Refer to the appropriate Repair Procedures if you must remove, replace or reinstall a component.
- 7 The term *replace* means the named part or parts could be the cause of the initial problem. Example: the phrase "replace the Fuser Assembly" means to remove the current Fuser Assembly and replace with a new Fuser Assembly.

Image Quality Problems

Use letter-size paper or A4 paper when troubleshooting an image quality problem. Use the local Test Print Mode to determine whether an image quality problem is being caused by the printer or by the PC. The printer generates a Status Report and two font lists. If the test prints are normal, but in the online mode the prints have a image quality problem, the problem may be in the System Controller PWB, Serial Option PWB, Interface Cable, or with the Host Computer.

7.2 Entry Level RAP

If the Status Monitor is displaying a fault message, or there is an obvious failure or fault, go immediately to the appropriate Repair Procedure or Repair Analysis Procedure. If you are not sure where to begin, continue troubleshooting using the following steps. If the printer exhibits intermittent operation and/or inconsistent failure symptoms, the problem may be due to electrical noise.

1 Perform the following:

- 4508 with lower feeder only - ensure the customer has the RCP Paper Feed selection in the Page Tab set for 1st Cassette.
- Disconnect the AC power
- Check the printer paper path for jammed paper or other obstacles
- Ensure that the paper tray has a good supply of fresh paper and is fully inserted in the printer
- Ensure the Printer Cartridge is properly installed
- Ensure that all covers are properly closed.

2 Connect the AC power. The Main Drive Motor runs.

Y N

| Go to RAP 7.3.

3 The Ready LED illuminates and all other LEDs are off.

Y N

| Go to RAP 7.4.

4 The Main Drive Motor stops (dependant upon PCU version, motor can run for up to 60 seconds).

Y N

| Replace the Printer Engine PWB (PL 5).

5 Wait for approximately 60 seconds. The Ready LED remains illuminated and all other LEDs remain off.

Y N

| Go to RAP 7.7.

6 Press and hold the Front Panel Key until all four LEDs flash.

Y N

| Replace in order: System Controller PWB (PL 5), Control Panel PWB (PL 1).

7 Release the Front Panel Key. All LEDs go out and the Ready LED flashes.

Y N

| Replace in order: System Controller PWB (PL 5), Control Panel PWB (PL 1).

NOTE: If during steps 8 through 14, all four LEDs begin to flash, go to RAP 7.7.

8 Paper is fed from the main Paper Tray.

Y N

| Go to RAP 7.5.

9 The Error LED and Paper LED remain off.

Y N

| Go to RAP 7.6.

- 10 Three sheets of paper (Status Report, Font List 1, and Font List 2) are delivered to the output tray.
 Y N
 | Remove the Main Cover and verify the operation of the Exit Roll Assembly and drive gears. Repair or replace as necessary.
- 11 All printed pages are undamaged (no wrinkles, folded corners, rips, etc.).
 Y N
 | Check the paper path for obstructions, damaged or out of place components, gears, or rollers.
- 12 The print quality is acceptable.
 Y N
 | Perform procedure 5.2.5 (Print Cartridge Cleaning Procedure), then go to RAP 7.8.
- 13 Insert a sheet of paper in the manual feed slot. The paper is fed in approximately 1/4 inch and stops.
 Y N
 | Clean and inspect the Pick-up Roll assembly, replace if necessary (PL 3). Ensure that the slot in the paper feed actuator is clean.
- 14 The Manual LED is illuminated.
 Y N
 | Replace the System Controller PWB (PL 5).
- 15 Press and hold the Front Panel Key until all four LEDs flash. Release the key. During the printing of the test documents, the fan impeller blades rotate.
 Y N
 | Replace the Impeller Belt (PL 3).
- 16 The manually fed page is printed correctly.
 Y N
 | Replace the Printer Engine PWB (PL 5).
- 17 Ask the customer to enter the Remote Control Panel, select the Test Menu, and print a Demo List. The Demo List prints successfully.
 Y N
 | Go to RAP 7.9.
- 18 Ask the customer to print a document from an application program. The document prints successfully.
 Y N
 | Have the customer validate the application and printer setup.
- 19 Ask the customer to change a printer parameter using the Remote Control Panel. Print a configuration list. The selected parameter is changed on the status report.
 Y N
 | Replace the System Controller PWB (PL 5).
- 20 The customer has indicated a problem with the memory SIMM.
 Y N
 | Go to step 22.

- 21 Go to RAP 7.10.
- 22 This is a 4508 printer and a lower feeder is installed.
- Y N
| Go to step 24.
- 23 Request the customer to set the RCP Page Tab to 2nd Cassette. Press and hold the Front Panel Key until all four LEDs flash. Release the Front Panel Key. Paper is fed from the lower Paper Tray.
- Y N
| Go to RAP 7.11.
- 24 The printer appears to be functioning properly. If the customer reported a Status Monitor Fault / Message that has not been corrected, see Table 7.2. Status Monitor Fault / Message Table.

Table 7.2. Status Monitor Fault / Message Table.

Status Monitor Message	Corrective Action
On Line	Normal Operation, no action required.
Off line	Press the Front Panel Key to go Online. The Ready LED is illuminated.
Warming Up	Normal Operation, fuser is warming to operating temperature.
Paper Tray Open or Empty	Place paper in the paper tray. Ensure that the paper tray is fully inserted into the printer. Verify that the paper empty actuator moves freely. Replace the Printer Engine PWB (PL 5).
Cover Open or Missing Printer Cartridge	Verify that the Printer Cartridge is properly installed. Verify that the Front Cover is properly closed. Verify that the printer cartridge/front cover interlock actuator moves freely. Replace the Printer Engine PWB (PL 5).
Paper Jam 0	Go to RAP 7.6.
Paper Jam 1	Go to RAP 7.6.
Paper Jam 2	Go to RAP 7.6.
Scanner Error (LASER)	Replace the LASER Assembly (PL 5).
Fuser Error	Replace the Fuser Heat Rod (PL 4). Replace the Fuser Assembly (PL 4). Replace Print Engine PWB (PL 5).
Input/Output (I/O) Error	Inspect printer cable for damage and for proper connection, replace if necessary. Cable supports bi-directional operation. Verify settings of host computer match printer settings. Replace the System Controller PWB (PL 5).
Memory Full	Print job too large for printer memory. Add additional memory to printer or reduce the page complexity.
Band Error	Print job too large for printer memory. Add additional memory to printer or reduce the page complexity.
Port Not Available	Communications problem, go to RAP 7.9.
Unknown Status	Using the DCU, verify the Laser and Fuser operation, replace if necessary (PL 5) or (PL 4).

7.3 Main Drive Motor

- 1 The Error LED on the Control Panel is illuminated.

Y	N
	Go to step 5.
- 2 Disconnect the AC power. Connect the DCU and reconnect the AC power. The DCU displays the error code 64.

Y	N
	Replace in order: System Controller PWB (PL 5), Control Panel (PL 1).
- 3 Using the DCU, enter the diagnostic mode and run diagnostic code 09. Test the Printer Cartridge/Front Cover Interlock Sensor. The sensor functions normally.

Y	N
	Verify the operation of the Printer Cartridge/Front Cover Interlock Sensor Actuator. If functioning normally, replace the Printer Engine PWB (PL 5).
- 4 Replace the System Controller PWB (PL 5).
- 5 Remove the Main Drive Motor Assembly. The Main Drive Motor Assembly Harness is properly connected to the Printer Engine PWB.

Y	N
	Properly reconnect the harness, repair, or replace as necessary (PL 3).
- 6 With the Main Drive Motor Assembly Harness properly connected lay the Main Drive Motor Assembly on the table next to the printer. Check the Front Cover Interlock. Reconnect the AC power. The Main Drive Motor Assembly runs normally.

Y	N
	Go to step 10.
- 7 Disconnect the AC power. Rotate the Pick-Up Assembly gears. The gears rotate freely.

Y	N
	Check the gears for obstructions. Repair or replace the Pick-Up Assembly as necessary (PL 3).
- 8 Rotate the Fuser Drive Gears. The Fuser Drive and Exit Drive Gears rotate freely.

Y	N
	Check the gears for obstructions. Repair or replace the Fuser Assembly or Exit Drive Assembly as necessary (PL 4).
- 9 Replace the Printer Cartridge (PL 5). If problem persists, replace the Main Drive Motor (PL 3).
- 10 With AC power applied, Printer Cartridge/Front Cover Interlock closed, and the Main Drive Motor not running, measure the voltage on the Main Drive Motor harness connector CN1. The voltage between pin 1 and frame ground and between pin 2 and frame ground is +24.0 +/- 2.0 VDC on both pins.

Y	N
	Replace the Printer Engine PWB (PL 5).
- 11 With AC power applied and the Main Drive Motor not running, measure the voltage between pins 3, 4, 5, & 6 and frame ground. The voltage is +24.0 +/- 2.0 VDC on all pins.

Y	N
	Replace the Main Drive Motor Assembly (PL 3).

- 12 Disconnect the AC power. Reconnect the AC power and measure the voltages in Table 7.3. The voltages must be measured during the first 9 seconds after AC power is applied, with the Main Drive Motor running. All the voltages in column 5 (interlock closed 1 to 9 seconds) are correct.

Y N

| Replace the Printer Engine PWB (PL 5).

- 13 Replace the Main Drive Motor Assembly (PL 3).

Table 7.3. Main Drive Motor Voltages

Measure Voltage from CN1 Pin	To	Interlock Open	Interlock Closed (after 10 Seconds)	Interlock Closed (1 to 9 Seconds)
3	Frame Ground	24.4 +/- 2.0 VDC	23.8 +/- 0.5 VDC	21.8 +/- 1.0 VDC
4	Frame Ground	24.4 +/- 2.0 VDC	23.8 +/- 0.5 VDC	21.8 +/- 1.0 VDC
5	Frame Ground	24.4 +/- 2.0 VDC	23.8 +/- 0.5 VDC	21.8 +/- 1.0 VDC
6	Frame Ground	24.4 +/- 2.0 VDC	23.8 +/- 0.5 VDC	21.8 +/- 1.0 VDC

7.4 Control Panel

- 1 Reconnect the AC power. After 10 seconds, all the LEDs are off.

Y N

| Go to step 8.

- 2 Remove the Control Panel Harness Cover and measure the voltage from J1 pin 1 to pin 2. The voltage is +5.0 +/- 0.5 VDC.

Y N

| Go to step 4.

- 3 Reseat the Control Panel Harness at J1 on the Control Panel and on J4 on the System Controller PWB. If the problem persists, replace in the following order: System Controller PWB (PL 5), Control Panel PWB (PL 1).

- 4 Measure the voltage on the System Controller PWB between J4 pin 1 and frame ground. The voltage is +5.0 +/- 0.5 VDC.

Y N

| Go to step 6.

- 5 Repair or replace the Control Panel Harness (PL 1).

- 6 Measure the voltage on the System Controller PWB between J4 pin 14 and frame ground. The voltage is +5.0 +/- 0.5 VDC.

Y N

| Verify the System Controller PWB to Printer Engine PWB Harness. If harness is OK, replace the Printer Engine PWB (PL 5).

- 7 Replace the System Controller PWB (PL 5).

- 8 Use Table 7.4 to isolate the problem.

Table 7.4. Control Panel LEDs.

Control Panel LEDs	Possible Cause	Solution
All four LEDs blink.	Defective Laser Defective Fuser	Go to RAP 7.7.
Error LED only is illuminated.	No Printer Cartridge Open Front Cover Defective Front Cover Actuator Printer Engine PWB	Properly reinstall or replace Printer Cartridge. Close Front Cover. Verify / replace Front Cover Actuator. Replace the Printer Engine PWB (PL 5).
Flashing Paper LED.	No paper Low Paper Sensor Actuator Printer Engine PWB	Add paper or properly adjust paper in tray. Verify / replace Low Paper Actuator. Replace the Printer Engine PWB (PL 5).
Error and Paper LEDs are illuminated	Paper Jam 0, 1, or 2	Go to RAP 7.6.
Manual LED is illuminated.	Paper Feed/Registration Sensor Actuator Printer Engine PWB (PL 5)	Verify Paper Feed/Registration Sensor Actuator. Replace the Printer Engine PWB (PL 5).

7.5 Paper Feed

- 1 Reconnect the AC power. After ten seconds, remove the paper tray. Manually actuate and hold the Paper Empty Sensor Actuator. Press and hold the Online/Off-line Button until all four LEDs blink. Release the button. Observe the Paper Feed Solenoid. The solenoid energizes.

Y N

| Replace the Printer Engine PWB (PL 5).

- 2 Observe the Pick-Up Assembly. The Pick-Up Assembly rotates.

Y N

| Replace the Pick-Up Assembly (PL 3).

- 3 Clean or replace as necessary: the Pick-Up Roll (PL 3), the Pick-Up Roll Assembly (PL 3).

7.6 Paper Jam

- 1 Visually inspect the paper for folded corners, lead edge damage, rips, or tears. The paper is free of damage.

Y N

| Check paper path for obstructions, components out of place, damp or improperly installed paper.

- 2 Check paper path for obstructions. Check BTR Roller for binding and for proper operation. Check for defective Printer Cartridge. All items check OK.

Y N

| Repair or replace as necessary.

- 3 Disconnect the AC power. Connect the DCU and reconnect the AC power. Run a test print. The DCU indicates a jam. Use Table 7.6 to isolate the problem.

Table 7.6. Paper Jams.

Indication	Possible Cause	Solution
Paper Jam 0.	Paper Feed / Registration Sensor or Sensor Actuator	Use DCU test 08 to verify sensor. If OK replace the Printer Engine PWB (PL 5).
Paper Jam 01	Paper Feed / Registration Sensor or Sensor Actuator Fuser Assembly	Use DCU test 08 to verify sensor. If OK replace the Printer Engine PWB (PL 5). Verify Fuser Assembly is operational. Remove or replace as necessary (PL 4). Inspect Exit Sensor Actuator. Repair or replace as necessary (PL 4). Using DCU test 08, verify Fuser Exit Sensor is operational. If OK, replace the Printer Engine PWB (PL 5)
Paper Jam 02	Exit Drive Assembly Fuser Assembly	Inspect Exit Assembly. Repair or replace as necessary (PL 4). Verify Fuser Assembly is operational. Remove or replace as necessary (PL 4). Inspect Exit Sensor Actuator. Repair or replace as necessary (PL 4). Using DCU test 08, verify Fuser Exit Sensor is operational. If OK, replace the Printer Engine PWB (PL 5)/.

7.7 Printer Problem

A printer problem is indicated by all four LEDs flashing. If the customer has Status Monitor running, an Unknown Status, Laser Error, or Fuser Error indication will be displayed.

- 1 Disconnect AC power, then reconnect the AC power. Wait for 60 seconds. All four LEDs are flashing.

Y N

| Return to the Entry Level RAP and continue.

- 2 Disconnect the AC power. Connect the DCU and reconnect the AC power. After 60 seconds compare the code displayed on the DCU with Table 7.7.

Table 7.7. DCU Codes.

DCU Code	Status	Solution
00	Ready (Legal Paper)	Normal Operation, no action required.
01	Ready (Letter Paper)	Normal Operation, no action required.
02	Ready (A4 Paper)	Normal Operation, no action required.
60	Open Fuser Error	Go to step 3.
61	Warm Up	Normal Operation, No action required.
62	Low Heat Error	Go to step 3.
68	Over Heat Error	Go to step 3.
95	Laser Ready Error	Go to step 6.

- 3 Disconnect the AC power. Disconnect CN102 (Fuser AC power) from the Printer Engine PWB. Measure the resistance between pins 1 and 3 on the disconnected plug. The resistance is less than 5 ohms.

Y N

| Measure the resistance of the Fuser Heat Rod. If open (infinite resistance), replace the Fuser Heat Rod (PL 4). Otherwise, replace the Fuser Assembly (PL 4).

- 4 Disconnect CN4 (Fuser Thermistor) from the Printer Engine PWB. Measure the resistance between pins 1 and 2 on the disconnected plug. The resistance is between 3 K ohms and 26 K ohms.

Y N

| Replace the Fuser Assembly (PL4).

- 5 Replace the Printer Engine PWB (PL 5).

- 6 Disconnect the AC power. Remove the Laser Assembly and verify proper connection of both Laser harness connectors. Both connectors are properly connected and the harnesses are undamaged.

Y N

| Properly connect, repair, or replace as necessary (PL 5).

- 7 Replace in order: Laser Assembly (PL 5), Printer Engine PWB (PL 5), or System Controller PWB (PL 5).

7.8 Image Quality Problems

This section contains image quality repair procedures to assist in correcting image quality defects. These procedures provide definitions, causes and solutions.

Throughout these procedures, the term "vertical" refers to the process direction (the direction paper travels through the printer); the term "horizontal" refers to the scanning direction (the direction the laser beam scans across the page).

7.8.1 Image Quality Defect Definitions, Causes and Solutions

Defect Definitions	Possible Causes	Solutions
NON-UNIFORM IMAGE QUALITY: The line darkness and solid area density image vary across the print.	1. Printer Cartridge. 2. Printer Cartridge ground. 3. Unstable high voltage output. 4. BTR contamination. 5. Laser window contamination.	1. Inspect drum for deterioration or contamination. If defective, replace the Printer Cartridge. 2. Verify Printer Cartridge ground. Check continuity between cartridge contact and the System Controller metal cover. Ensure that the drum contact is clean and undamaged. 3. Verify that all high voltage outputs are to specification (refer to section 5, DCU operation). 4. Inspect BTR spring tension and bearings. Remove the BTR roll and clean (dust off). Replace BTR Roller if necessary. 5. Remove the Laser assembly, clean or replace as necessary.
BLACK PRINTS: the print is completely covered with toner and has no visible image.	1. System Controller PWB. 2. Incorrect charge voltage. 3. Printer Cartridge. 4. Printer Engine PWB. 5. Laser on all the time.	1. Using the DCU, print a DCU test print. If the test print is OK, replace the System Controller PWB. If test print is black, continue. 2. Verify charge voltage output. Charge voltage equals - 1.3 KVDC +/- 100 VDC. If not replace the Printer Engine PWB. 3. Replace Printer Cartridge (PL 5). 4. Replace Printer Engine PWB (PL 5). 5. Replace LASER Assembly (PL 5).
HORIZONTAL DELETIONS: There are areas of the image that are extremely light or missing entirely. These missing areas form wide bands that run horizontally across the page in the direction of scanning.	1. System Controller PWB. 2. Printer Cartridge grounding problem. 3. Printer Cartridge. 4. BTR Assembly. 5. Laser Assembly 6. Printer Engine PWB. 7. Fuser Assembly.	1. Using the DCU, print a DCU test print. If the test print is OK, replace the System Controller PWB. 2. Verify Printer Cartridge ground. Check continuity between cartridge contact and the System Controller metal cover. Ensure that the drum contact is clean and undamaged. 3. Replace the Printer Cartridge. 4. If deletion repeats every 47.1 mm (1.9 in.), replace the BTR Assembly. 5. Replace Laser Assembly (PL 5). 6. Replace Printer Engine PWB (PL 5). 7. Replace the Fuser Assembly (PL 4)
VERTICAL DELETIONS: 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 movement.	1. Printer Cartridge. 2. Laser Assembly. 3. Fuser Assembly. 4. BTR Assembly.	1. Replace the Printer Cartridge. 2. Inspect the LASER beam path for contamination. Clean as necessary. 3. Inspect fuser rolls for damage and replace as necessary. 4. Inspect BTR spring tension and bearings. Remove the BTR Roller and clean (dust off). Replace BTR Roller if necessary.

Complex

Defect Definitions	Possible Causes	Solutions
SPOT DELETIONS: Solid areas are marked with irregular white areas.	<ol style="list-style-type: none"> 1. Printer Cartridge. 2. BTR Assembly. 3. Damp Paper. 	<ol style="list-style-type: none"> 1. Deletions repeat every 94.2 mm (3.7 in.). Replace Printer Cartridge. 2. Remove the BTR Roller and clean (dust off). If deletion repeats every 47.1 mm (1.9 in.), replace the BTR Assembly. 3. Replace paper.
LIGHT PRINTS:	<ol style="list-style-type: none"> 1. Remote Control Panel (RCP) settings. 2. Seal tape not removed from Printer Cartridge. 3. Incorrect high voltage output. 4. Low toner in cartridge. 	<ol style="list-style-type: none"> 1. Verify the RCP print quality settings. 2. Inspect cartridge for removal of seal tape. 3. Verify that all high voltage outputs are to specification (refer to section 5, DCU operation). 4. Remove the Printer Cartridge and shake to redistribute toner. Replace Printer Cartridge if necessary.
BLANK PRINTS: Prints with no visible image.	<ol style="list-style-type: none"> 1. Seal tape not removed from Printer Cartridge. 2. Defective ground on Printer Cartridge. 3. System Controller PWB. 4. Incorrect high voltage output. 5. Defective LASER. 	<ol style="list-style-type: none"> 1. Inspect cartridge for removal of seal tape. 2. Verify Printer Cartridge ground. Check continuity between cartridge contact and the System Controller metal cover. Ensure that the Printer Cartridge ground contact is clean and undamaged. 3. Using the DCU, print a DCU test print. If the test print is OK, replace the System Controller PWB. 4. Verify that all high voltage outputs are to specification (refer to section 5, DCU operation). 5. Using the DCU, verify the Laser operation. Replace the LASER Assembly (PL 5) if necessary.
EXTRANEIOUS MARKS: Horizontal or vertical bands, or other marks that are print defects caused by bad or incorrect font data, print drivers, electrical noise or other causes not directly related to the electrophotographic process.	<ol style="list-style-type: none"> 1. Defective font download. 2. Loose / defective cables, cables out of specification (too long, etc.). 3. Electromagnetic interference. 4. System Controller PWB. 5. Printer Engine PWB. 	<ol style="list-style-type: none"> 1. Customer may have recently changed/modified host software or drivers. Reconfigure if necessary. 2. Inspect cable connections for proper installation and for damage. Parallel cable must be a good quality and comply with the IEEE 1284 bi-directional specification. 3. Relocate printer to another location or to another power outlet. 4. Replace the System Controller PWB (PL 5). 5. Replace the Printer Engine PWB (PL 5).
CHARACTER DEFECTS: Garbled print, missing, repeating, or scrambled characters are problems relating to font data or character generation. These are print defects not related to the electrophotographic process.	<ol style="list-style-type: none"> 1. Defective font download. 2. Loose / defective cables, cables out of specification (too long, etc.). 3. Electromagnetic interference. 4. Defective SIMM. 5. System Controller PWB. 6. Printer Engine PWB. 	<ol style="list-style-type: none"> 1. Customer may have recently changed/modified host software or drivers. Reconfigure if necessary. 2. Inspect cable connections for proper installation and for damage. Parallel cable must be a good quality and comply with the IEEE 1284 bi-directional specification. 3. Relocate printer to another location or to another power outlet. 4. Replace the SIMM (PL 5). 5. Replace the System Controller PWB (PL 5). 6. Replace the Printer Engine PWB (PL 5).
SPOTS: There are spots of toner on the page.	<ol style="list-style-type: none"> 1. Paper. 2. Paper path contaminated. 3. Printer Cartridge 4. Fuser Assembly. 5. BTR Assembly. 	<ol style="list-style-type: none"> 1. Replace paper from a fresh unopened ream. 2. Clean paper path. 3. Replace Printer Cartridge. 4. Inspect/clean/replace Fuser Assembly as necessary. 5. If spot repeats every 47.1 mm (1.9 in.), replace the BTR Assembly.

Defect Definitions	Possible Causes	Solutions
UNFUSED IMAGE: part of or all of the image is unfused.	<ol style="list-style-type: none"> 1. Damp paper. 2. Paper quality. 3. Light image density 4. Fuser Assembly. 5. Printer Engine PWB. 	<ol style="list-style-type: none"> 1. Replace paper from a fresh unopened ream. 2. Be sure that the paper is not extremely rough, heavily textured, or of a high rag content. 3. Check Remote Control Panel print quality. 4. Inspect/clean/replace Fuser Assembly as necessary. 5. Replace the Printer Engine PWB.
STREAKS: Extraneous dark lines/bands in or across the process direction. These are Print Engine defects not related to the System Controller or Host Data.	<ol style="list-style-type: none"> 1. Printer Cartridge. 2. Fuser Assembly. 3. BTR Assembly. 4. Contaminated paper path. 	<ol style="list-style-type: none"> 1. Inspect drum surface for scratches or bands. If defective, replace the Printer Cartridge. 2. Inspect fuser rollers for scratches or contamination. If defective, replace the Fuser Assembly. 3. Inspect BTR Roller. If defective, replace the BTR Assembly. 4. Clean the paper path.
RESIDUAL IMAGES: The image from a previous print, which was not removed during the cleaning process, has been developed on the current print.	<ol style="list-style-type: none"> 1. Printer Cartridge. 2. Fuser Assembly. 3. Erase Lamps 	<ol style="list-style-type: none"> 1. Replace Printer cartage. 2. Inspect/clean/replace Fuser Assembly as necessary. 3. Remove the Printer Cartridge, cheat the interlock, connect AC power, and verify operation of the Erase Lamps. Replace as necessary.
BACKGROUND: Uniform toner contamination in non image areas.	<ol style="list-style-type: none"> 1. Print Density. 2. High voltage output. 3. Printer Cartridge. 	<ol style="list-style-type: none"> 1. Verify print quality setting in the Remote Control Panel. 2. Verify that all high voltage outputs are to specification (refer to section 5, DCU operation). 2. Replace the Printer Cartridge.
DAMAGED PRINTS: Creases, wrinkles, excessive curl, cuts, folds or embossed marks.	<ol style="list-style-type: none"> 1. Paper 2. Paper source and transportation. 3. Fuser Assembly. 4. Printer Cartridge. 	<ol style="list-style-type: none"> 1. Properly install fresh paper into the paper tray. 2. Inspect paper transportation system for proper operation. Replace worn parts. 3. Inspect/clean/replace Fuser Assembly as necessary. 4. Replace Printer Cartage.
SKIPS / SMEARS: Skips, loss, or stretching of the image in bands across the process direction. Smear-The distortion of the image in bands across the process direction that cause it to appear to be blurred or compressed.	<ol style="list-style-type: none"> 1. Paper transportation. 2. Main Drive Motor Assembly. 3. Fuser Assembly. 4. Printer Cartridge 	<ol style="list-style-type: none"> 1. Inspect paper transportation system for proper operation. Replace worn parts. 2. Inspect Main Drive Motor Assembly for damaged or worn gears. Replace as necessary. 3. Inspect/clean/replace Fuser Assembly as necessary. 4. Replace Printer Cartridge.
Skewed Image: Angular displacement of the image from its intended position on the print. The printed image is not parallel with the sides of the page.	<ol style="list-style-type: none"> 1. Paper/Paper Tray. 2. Paper transportation. 3. Fuser Assembly. 	<ol style="list-style-type: none"> 1. Inspect paper tray for damage. Replace as necessary. Properly install fresh paper in the paper tray. 2. Inspect paper transportation system for proper operation. Replace worn parts. 3. Inspect/clean/replace Fuser Assembly as necessary.

7.9 Communications RAP

You were directed to this RAP because a problem exists where the customer is unable to communicate to the printer from the host computer.

- 1 A serial option PWB is installed in the printer.
Y N
| Go to step 9.
- 2 The serial port is being used for printer communications.
Y N
| Go to step 9.
- 3 Print a Status Report. The Status Report indicates that a serial interface is installed.
Y N
| Go to step 7.
- 4 Connect the Anacom G80 or similar interface test box to the serial port and generate a test print. The test print completes successfully.
Y N
| Replace the following in order: Serial Option PWB (PL 5), System Controller PWB (PL 5).
- 5 The Remote Control Panel serial setup parameters match the host computer's setup parameters.
Y N
| Have the customer reconfigure the serial interface setup parameters.
- 6 Disconnect and reconnect the host interface cable from the serial interface port. Inspect for any visual signs of damage to the cable. Replace interface cable if necessary (customer purchased item). Have customer send a print job using another application.
- 7 Remove and reinstall the serial PWB to ensure that it is properly installed. Print a Configuration Sheet. The configuration sheet indicates that a serial interface is installed.
Y N
| Replace the following in order: Serial Option PWB (PL 5), System Controller PWB (PL 5).
- 8 Return to the Entry Level RAP and continue.
- 9 Connect the Anacom G80 or similar interface test box to the parallel port and generate a test print. The test print completes successfully.
Y N
| Replace the System Controller PWB (PL 5).
- 10 Disconnect and reconnect the host interface cable from the parallel interface port. Inspect for any visual signs of damage to the cable. Replace interface cable if necessary (customer purchased item). Have customer send a print job using another application.

7.10 SIMM Check-Out Procedure RAP

- 1 Remove and reinstall the SIMM. Print a Status Report. The RAM size indicated on the Status Report matches the memory actually installed in the printer.

Y N

| Go to step 3.

- 2 Return to the Entry Level RAP and continue.

- 3 Replace the System Controller PWB (PL 5). Print a configuration sheet. The RAM size indicated on the Status Report matches the memory actually installed in the printer.

Y N

| Inform the customer that the SIMM appears defective or is not compatible with the printer.
A compatible SIMM is a 72 pin, 70 ns or faster, no parity.

- 4 Problem is resolved. Return to the Entry Level RAP and continue.

7.11 Lower Feeder

NOTE: Use wiring data procedure 6.1.4 as reference as you perform this RAP.

- 1 Disconnect the AC power. Remove the print cartridge from the printer. Remove the 4508 printer from the Lower Feeder. Inspect the lower feeder connector on the bottom of the printer and on the Lower Feeder. The connector is mounted correctly and is undamaged.

Y N
| Repair or replace as necessary.

- 2 Remove the three screws that secure the left side cover to the lower feeder and remove the cover. Reinstall the 4508 printer on the lower feeder. Reconnect the AC power. Within 10 seconds the Lower Feeder Drive Motor runs, then stops.

Y N
| Go to step 13.

- 3 Measure the voltage between CN1 pin 1 and pin 8 and between pin 3 and pin 8 on the Lower Feeder PWB (Figure 7.11). The voltage is +5.0 +/- 0.25 VDC.

Y N
| Verify continuity between the lower feeder/printer interconnect connector and CN1. Repair or replace as necessary. If cable is OK replace the Printer Engine PWB (PL 5).

- 4 Measure the voltage between CN1 pin 5 and pin 8 on the Lower Feeder PWB. The voltage is 0.0 VDC with paper in the paper tray and +5.0 +/- 0.25 VDC with the paper tray removed (no paper).

Y N
| Check the No Paper sensor actuator for damage and proper operation. Repair or replace as necessary. If the actuator is OK, replace the Lower Feeder PWB (PL 6).

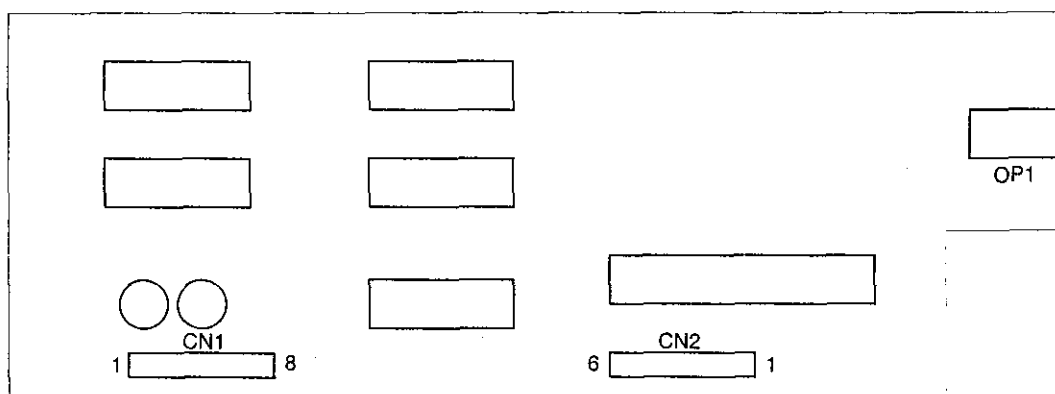
- 5 Press and hold the Front Panel Key until all four LEDs flash. Release the Front Panel Key. Within 5 seconds after the Lower Feeder Drive Motor starts, the feed solenoid energizes momentarily.

Y N
| Go to step 9.

- 6 The paper feed clutch makes one revolution then stops.

Y N
| Check all drive gears in the lower feeder. Repair or replace as necessary

Figure 7.11 Lower Feeder PWB.



- 7 Paper is fed from the lower feeder.

Y	N
	Check the paper feed roll. Replace if necessary. If feed roll is OK, replace the Paper Feed Clutch (PL 6)
- 8 Check paper transportation drive rollers and idler rollers in the lower feeder. Repair or replace as necessary.
- 9 Measure the voltage from CN2 pin 5 to CN1 pin 8 on the Lower Feeder PWB. The voltage is +24.0 +/- 1.0 VDC.

Y	N
	Replace the Lower Feeder PWB (PL 6)
- 10 Measure the voltage from CN2 pin 6 to CN1 pin 8 on the Lower Feeder PWB. The voltage is +24.0 +/- 1.0 VDC.

Y	N
	Replace the Paper Feed Solenoid (PL 6).
- 11 Reset the printer if any jam condition exists. If necessary, initiate a test print cycle by pressing and holding the Front Panel Key until all four LEDs flash. Release the Front Panel Key. Using the peak hold function of the digital meter, measure the voltage between CN1 pin 4 and CN1 pin 8 on the Lower Feeder PWB. Within 5 seconds after the Lower Feeder Drive Motor starts the voltage pulses to +5.0 +/- 1.0 VDC.

Y	N
	Replace the Printer Engine PWB (PL 5).
- 12 Replace the Lower Feeder PWB (PL 6).
- 13 Measure the voltage from CN1 pin 6 to pin 8 on the Lower Feeder PWB. The voltage is +24.0 +/- 1.0 VDC.

Y	N
	Check wiring between CN6 on the Printer Engine PWB and the Lower Feeder PWB. If wiring is OK, replace the Printer Engine PWB (PL 5).
- 14 Press and hold the Front Panel Key until all four LEDs flash. Release the Front Panel Key. Measure the voltage between CN2 pins 1, 2, 3, and 4 and CN1 pin 8 on the Lower Feeder PWB. During the time the printer main drive motor is running, the voltage is 11.3 +/- 0.5 VDC (if the peak hold function of the digital meter is used, the voltage will be approximately +24.0 VDC).

Y	N
	Replace the Lower Feeder PWB (PL 6).
- 15 Replace the Lower Feeder Drive Motor (PL 6)

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