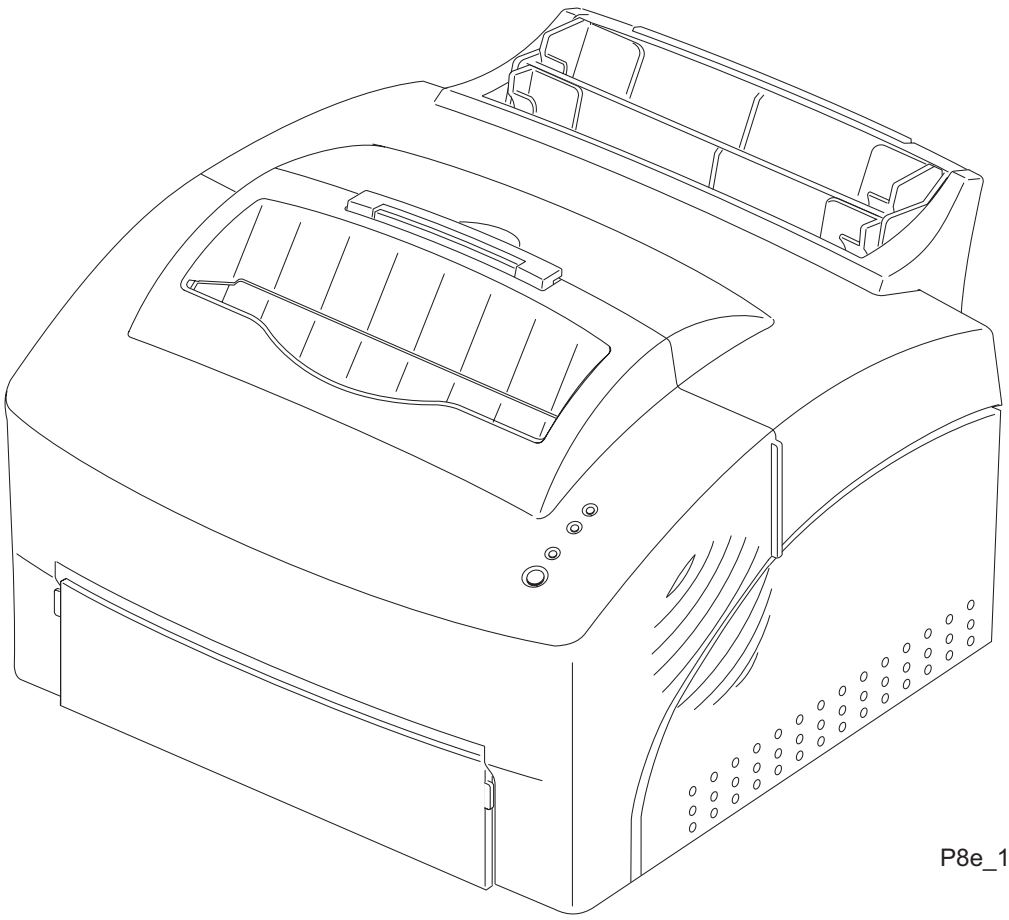
XEROX

Xerox DocuPrint P8e / P8ex
Service Manual



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This Service Manual contains information that applies to the Xerox DocuPrint P8e Electronic Laser Printer.

NOTICE

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

NOTICE

While every care has been taken in the preparation of this manual, no liability will be accepted by Xerox arising out of any inaccuracies or omissions.

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The Xerox DocuPrint P8e uses PCL 5e 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 and 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.

Product Safety

Electrostatic Discharge

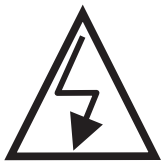
This caution indicates that there are components which are sensitive to damage caused by electrostatic discharge.

CAUTION

These components are susceptible to electrostatic discharge. Observe all ESD procedures to avoid damage.

Shock Hazard

This symbol indicates the presence of potentially hazardous voltages.



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CLASS 1 LASER PRODUCT

The Xerox DocuPrint P8e 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.

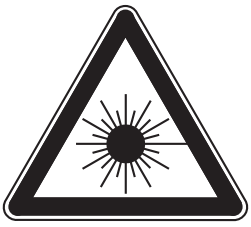
The laser and output of the laser scanner unit produces a beam that, if looked into, could cause eye damage. Service procedures must be followed exactly as written without change.

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 P8e 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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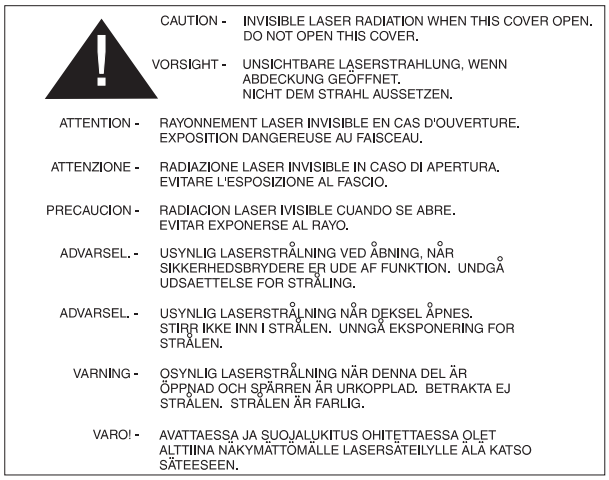
LUOKAN 1 LASERLAITE

KLASS 1 LASER APPARAT

Each P8e laser printer has the following laser warning label on the Laser Assembly.



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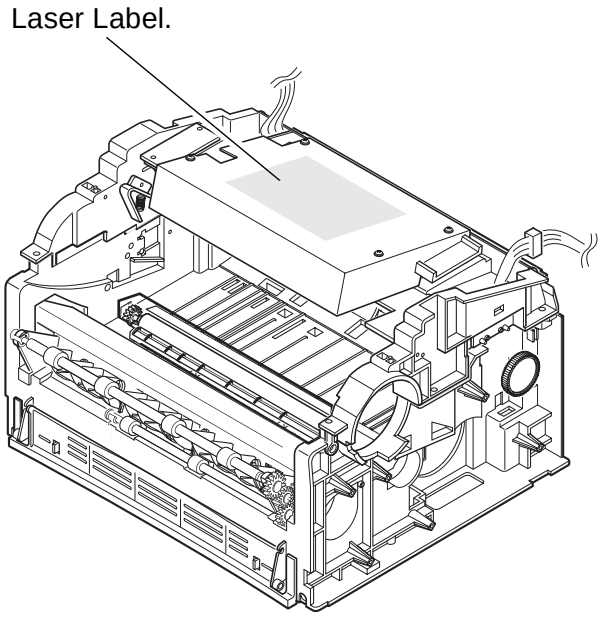
The Laser Label is visible when the Top Cover is removed (Figure 1).

Figure 1. Laser Safety Label



Finland Laser Safety

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

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

Table of Contents

Introduction

The Xerox DocuPrint P8e Service Manual is the primary document used for repairing and maintaining the P8e 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 P8e failures.

NOTE: In some of the DocuPrint P8e documentation the Print Cartridge is referred to as the Image Cartridge. Print Cartridge is the correct term.

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 P8e / P8ex 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.

Section 8 - P8ex Addendum

All procedures and technical information in the DocuPrint P8e Service Manual apply to the DocuPrint P8ex printer with the exception of the information provided in the P8ex addendum. The P8ex Addendum contains the following informatiom:

1) A description of the PCL 6 emulation
2) A description of the Universal Serial Bus (USB)
3) A new Repair Procedure for the Controller PWB, REP 4.6.3A Controller PWB (P8ex)
   - Accessing the Controller Board now provides easy access to the Memory SIMM
4) P8ex Parts List.
   - This section contains illustrations of disassembled subsystems and a listing of the spared parts for the DocuPrint P8ex.

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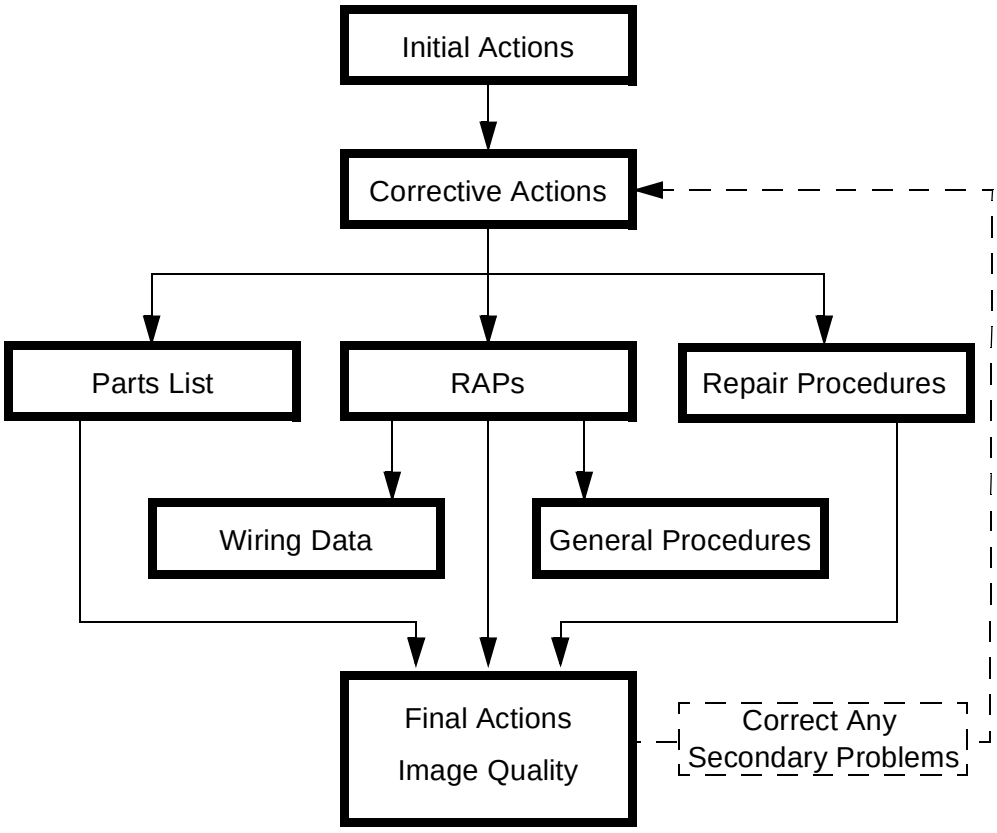
Section 1

Service Call Procedures

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

2.1 Electrical Specifications

Video Controller (Video I/F)

Video Controller Board (Video I/F) is installed in the printer.

Video Interface Specification to be provided, if necessary.

2.1.1 Power Sources and Consumption

The Xerox P8e printers are available in 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	60 Hz	57 - 63 Hz	450 Watts	25 Watts
220/240 VAC	198 - 264 VAC	50 Hz	47 - 53 Hz	450 Watts	25 Watts

2.1.2 Power On/Off

The Xerox P8e printers have an on/off power switch located on left rear corner of machine. The machine is equipped with a grounded power socket. Printer will power down automatically when 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. The default value is 30 minutes. In Power Save mode, the power consumption is under 25 watts.

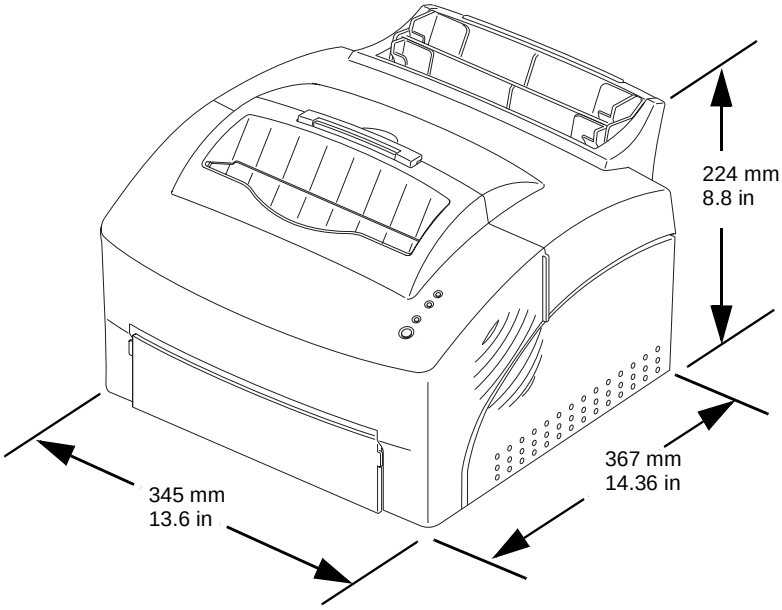
2.1.4 Mechanical

Unit	Width	Depth	Height	Weight
Metric	345 mm	364.9 mm	224 mm	7.5 Kg
SAE	13.58 in.	14.36 in.	8.8 in	15.4 lbs

2.1.5 Consumables

PRINTER CARTRIDGE: 5000 pages at 5% coverage; more with use of the toner saving Econo Mode. The starter kit cartridge shipped with the printer is 2.5 K pages with 5% coverage.

2.2 Physical Location



Place your printer on a flat, stable surface near your workstation. Leave enough space around the printer, so that you can easily:

- open the printer cover
- load the paper
- retrieve paper
- open the front single sheet output tray and retrieve the paper in the front output tray
- allow air circulation around the vents to prevent the printer from overheating

2.3 Functional Specifications

Warm Up Time	First Print Out	Print Speed - ppm (pages per minute)	Resolution - dpi (Dots per inch)
From Sleep mode to Standby mode under 30 seconds	From Standby mode 20 seconds From Power save mode 30 seconds	8 ppm	True 600 x 600 dpi

2.4 Environment

	Temperature	Humidity	Noise	Level
Operating	10^{o} - 32^{o} C 50^{o} - 90.5^{o} F	20 - 80% RH	Sleep (Power Saver) - Background Standby - Under 29 dB Printing - Under 47 dB	Within 5^{o}
Shipping	-20^{o} - 40^{o} C -4^{o} - 104^{o} F	10 - 95% RH	- - - - - -	- - - - - -

The printer must not be exposed to:

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

2.5 Options

MEMORY/DRAM: 4MB on board memory standard.

- With the one available memory expansion slot, memory can expand to include a 4, 8, 16, or 32MB SIMM. Maximum memory is 36 MB.
- The SIMM is a customer supplied item (72 pin, 60ns, 32 bit, No Parity, EDO SIMM).

2.6 Paper Specifications

Papers that meet the specifications may be fed either through the Multipurpose Paper Feeder, or the Manual Single Sheet Feeder. If you use thick paper with a weight of more than 90 g/m^2 (40lb), or envelope, you must insert paper into the Manual Single Sheet Feeder and select Thick Paper.

The Multipurpose Paper Feeder will hold 150 sheets of 60 - 90 g/m^2 (16 - 24 lb), or 10 envelopes, 10 labels, 10 transparency films.

The Manual Single Sheet Feeder capacity is 1 sheet 60 - 135 g/m^2 paper.

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.

Most papers that meet the above specifications may be fed either through the multisheet or the single sheet paper feeder. Some media meets the specifications but is not ideal for feeding, e.g., paper that is either highly textured, thicker than normal for its weight, or unusually smooth.

Paper types

Paper Type	Capacity (Sheets)
A4/Letter Letter Executive, Legal B5 A5 Monarch (7 3/4) COM10 #9 C5 D5 DL	150

2.7 Operating Language and Emulation

The Xerox P8e uses the enhanced PCL5 language (PCL 5e).

The Xerox P8e emulates the HP 5P and lower (PCL 5e).

2.8 Communication Interfaces

Parallel port - Centronics IEEE V1284 compatible bi-directional (Nibble, Byte and ECP).

2.9 Status Display/Controls

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

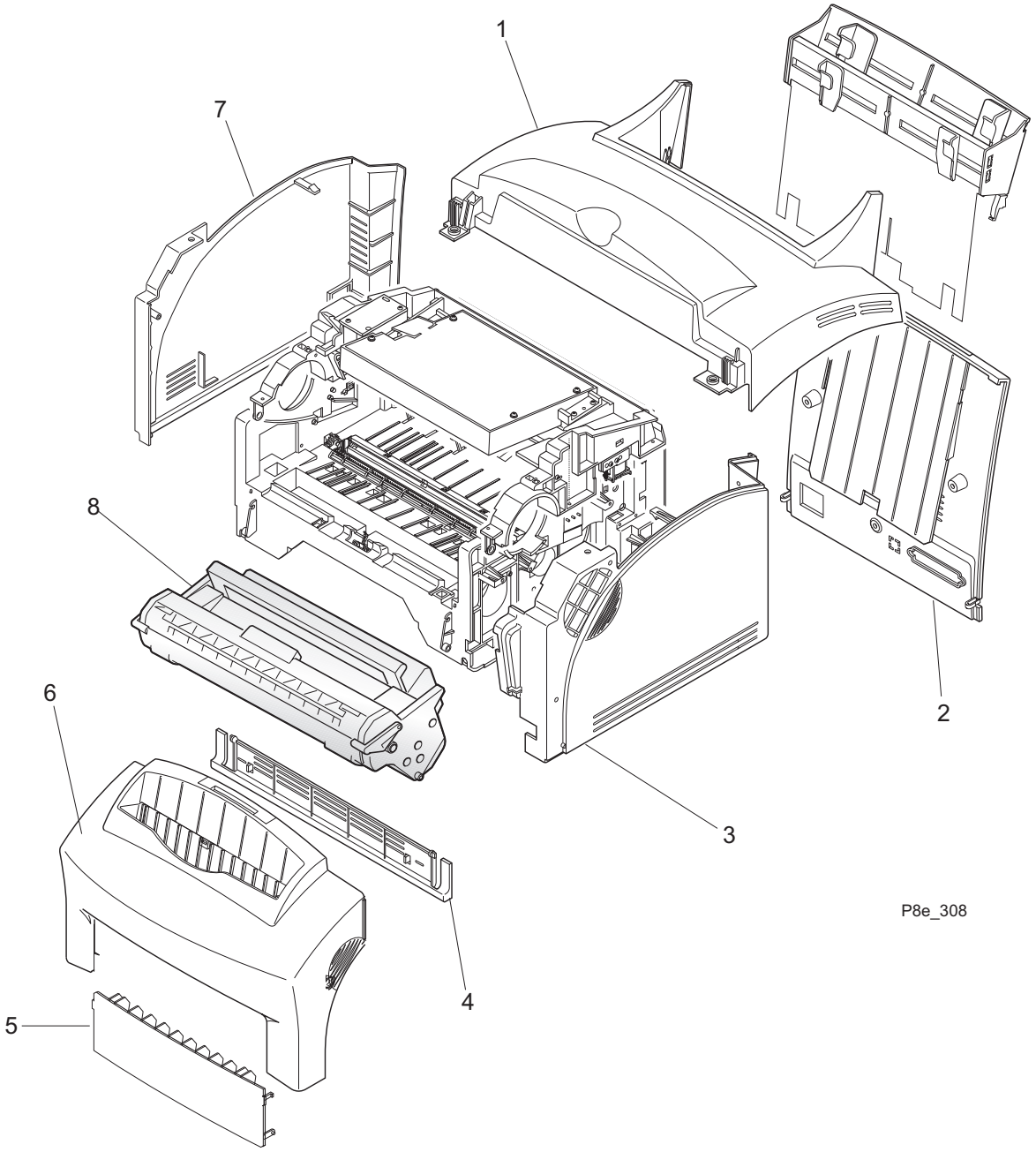
- a panel with a Front Panel Key and three LED's
  1) Error Light
  2) Paper light
  3) On-Line light
  4) On-Line / Reset Key
- software programs that enable the user to:
  - monitor the printer's status on the computer screen (the Status Monitor). The Status Monitor is a program that runs in background and automatically displays a message(s) on your computer screen whenever the printer status changes (not available for NT 4.0).
  - change printer settings from the computer screen (Remote Control Panel). The Remote Control Panel (RCP) program allows you to view and change print settings for the following operating systems; DOS, Windows 3.1, Windows 95, Windows 98, and NT 4.0.

Section 3

Parts Lists

PL 1 Covers

Item	Part Number	Description
1)	- - - - - -	Top Cover}
2)	802E00400	Rear Cover
3)	- - - - - -	Right Side Cover
4)	- - - - - -	Bottom Cover
5)	- - - - - -	Face Up Cover
6)	802E00380	Front Cover
7)	- - - - - -	Left Side Cover
8)	113R00296	Print Cartridge
A)	600K72020	Hardware Kit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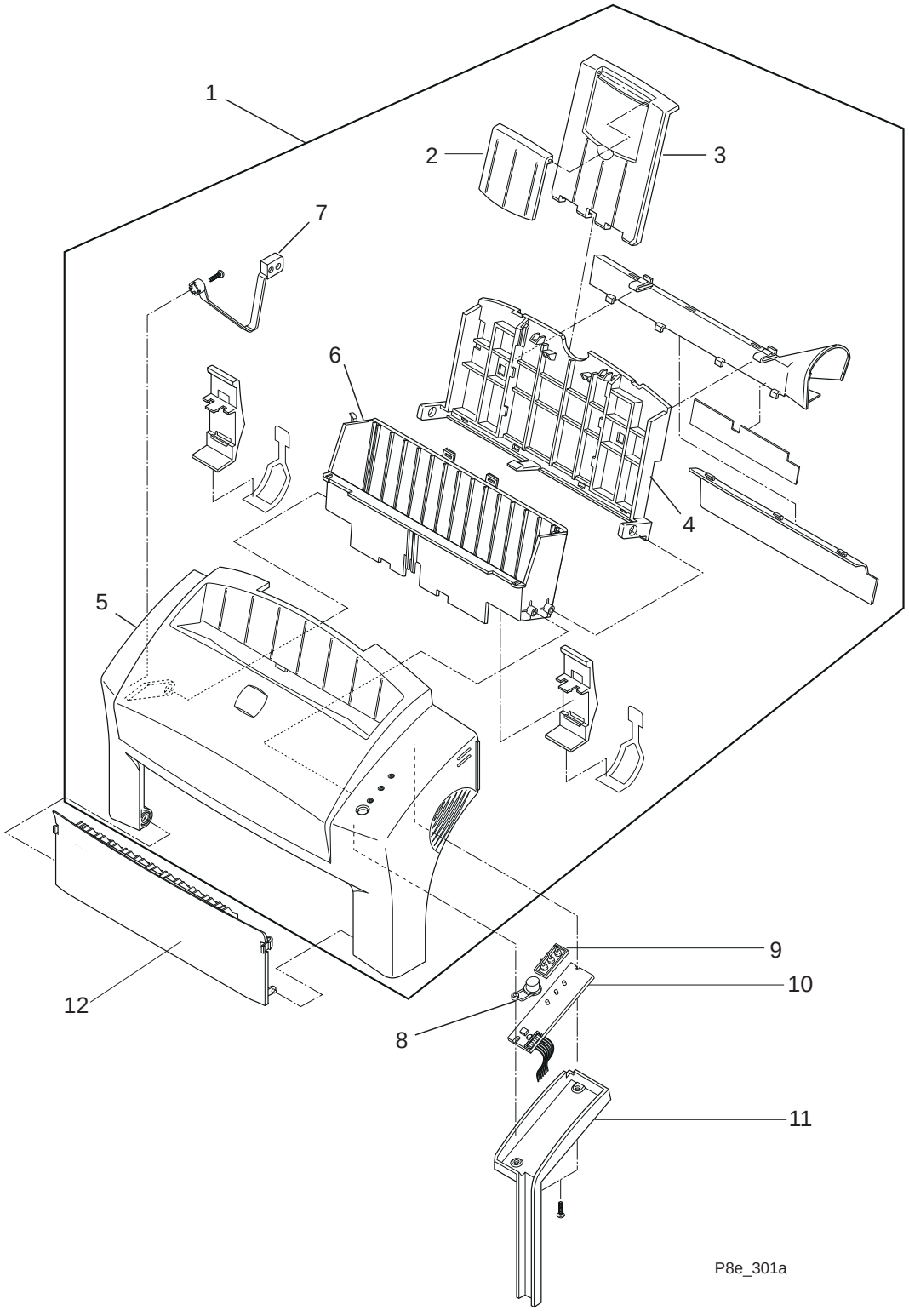
PL 2 Front Cover

Item	Part Number	Description
1)	- - - - - -	Front Cover {Includes Items 2 through 7}
2)	- - - - - -	Stacker Extender
3)	- - - - - -	Stacker
4)	- - - - - -	Duct
5)	802E00380	Front Cover
6)	- - - - - -	Stacker Guide
7)	- - - - - -	Stopper
8)	3E50440	Key
9)	107E16960	LED
10)	101E19680	Control Panel
11)	- - - - - -	Control Panel Cover
12)	802E00390	Face Up Exit Cover
A)	600K72020	Hardware Kit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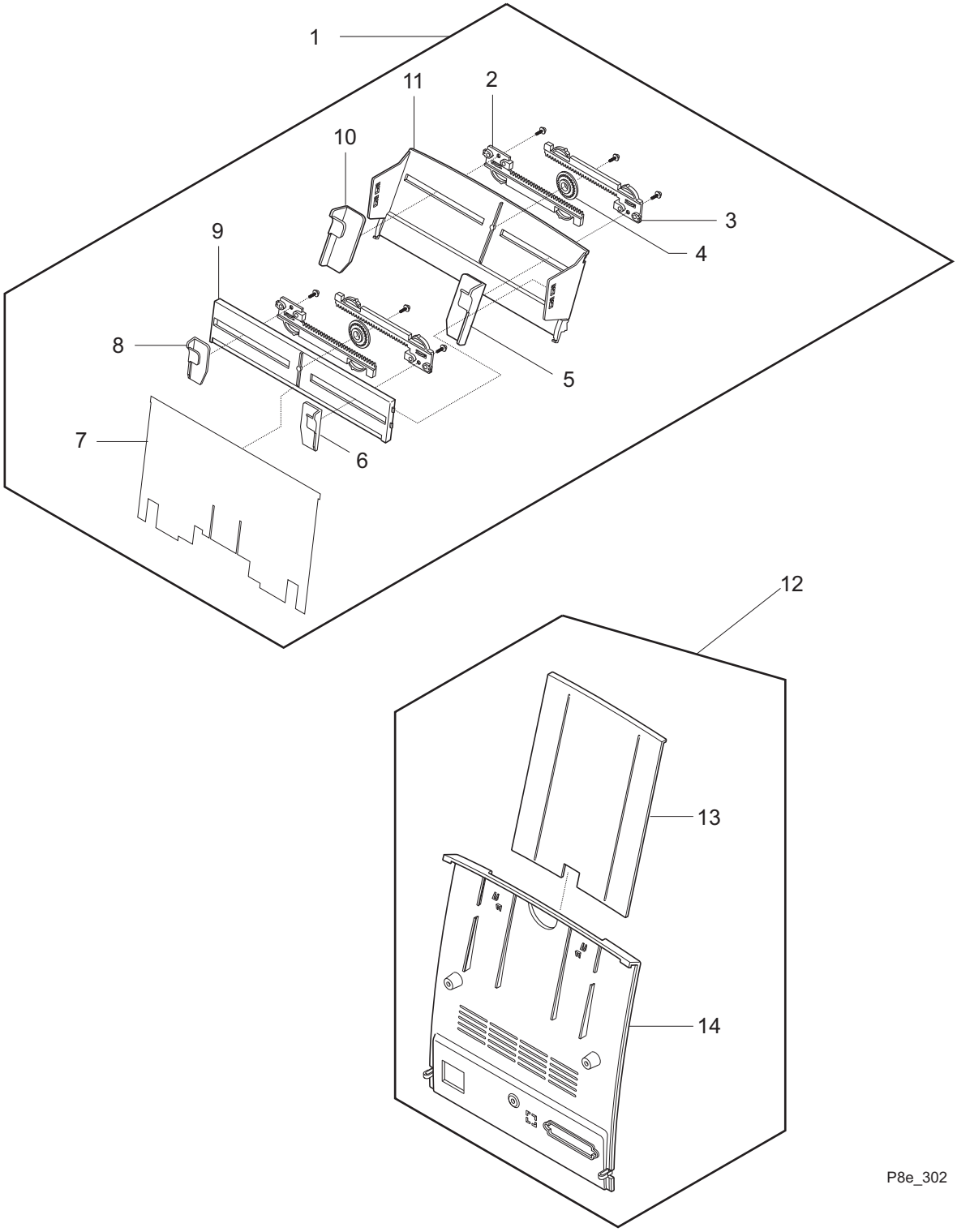
PL 3 Paper Trays

Item	Part Number	Description
1)	- - - - - -	Media (Paper) Tray {Includes Items 2 through 12}
2)	- - - - - -	Gear Adjust Rack, Left
3)	- - - - - -	Gear Adjust Rack, Right
4)	- - - - - -	Pinion Gear
5)	- - - - - -	Auto Tray Adjust, Right
6)	- - - - - -	Manual Tray Adjust, Right
7)	- - - - - -	Film Guide Sheet
8)	- - - - - -	Manual Tray Adjust, Left
9)	- - - - - -	Manual Paper Tray
10)	- - - - - -	Auto Tray Adjust, Left
11)	- - - - - -	Paper Guide Plate
12)	- - - - - -	Rear Cover Assembly {Includes Items 13 & 14}
13)	50E15050	Tray Extender
14)	802E00400	Rear Cover
A)	600K72020	Hardware Kit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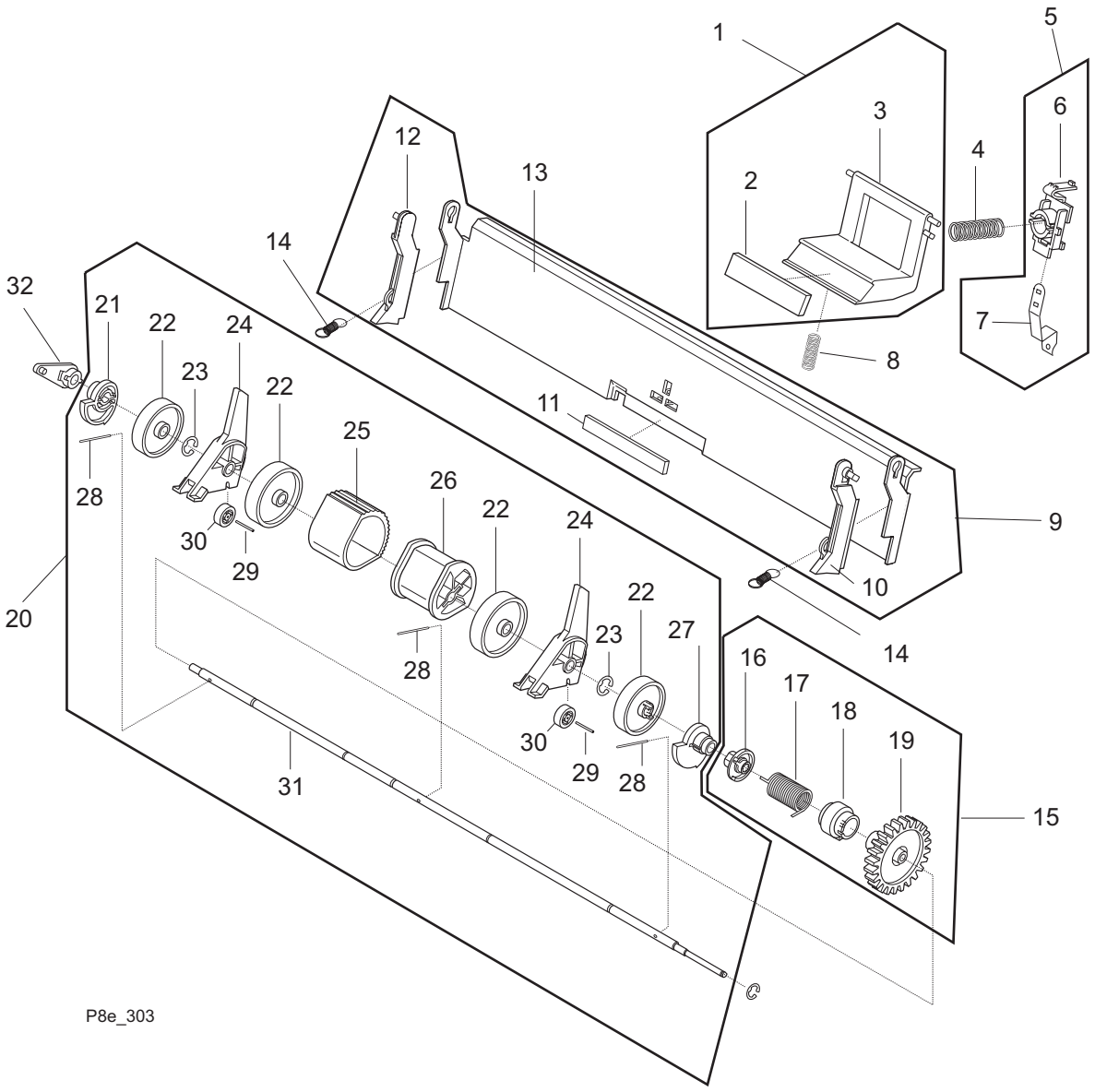
PL 4 Feeder

Item	Part Number	Description
1)	19K04760	Paper Separator Unit {Includes Items 2 & 3}
2)	- - - - - -	Separator Pad
3)	- - - - - -	Separator Holder
4)	809E18310	Knock Up Spring
5)	19K04770	Knock Up Spring Holder Assembly {Includes Items 6 & 7}
6)	- - - - - -	Knock Up Spring Holder
7)	- - - - - -	Knock Up Ground
8)	- - - - - -	Separator Spring
9)	15K39950	Media Unit Knock Up Assembly {Includes Items 10 through 13}
10)	- - - - - -	Knock Up Holder, Right
11)	- - - - - -	Knock Up Pad
12)	- - - - - -	Knock Up Holder, Left
13)	- - - - - -	Knock Up Plate
14)	- - - - - -	Extension Spring
15)	7K10890	Media Unit Clutch {Includes Items 16 through 19}
16)	- - - - - -	Clutch Hub
17)	- - - - - -	Clutch Spring
18)	- - - - - -	Clutch Collar
19)	- - - - - -	Pick Up Gear
20)	- - - - - -	Media Unit Pick Up Assembly {Includes Items 21 through 31}
21)	- - - - - -	Knock Up Cam
22)	- - - - - -	Paper Guide Roll
23)	- - - - - -	E-Ring
24)	32E14350	Paper Feed Guide
25)	130E09080	Pick Up Rubber
26)	- - - - - -	Pick Up Housing
27)	- - - - - -	Knock Up Cam, Right
28)	- - - - - -	Pick Up Shaft Pin
29)	- - - - - -	Feed Idler Shaft
30)	22E23240	Feed Roller, Left
31)	- - - - - -	Pick Up Shaft
32)	- - - - - -	Shaft Lock Bushing
A)	600K72020	Hardware Kit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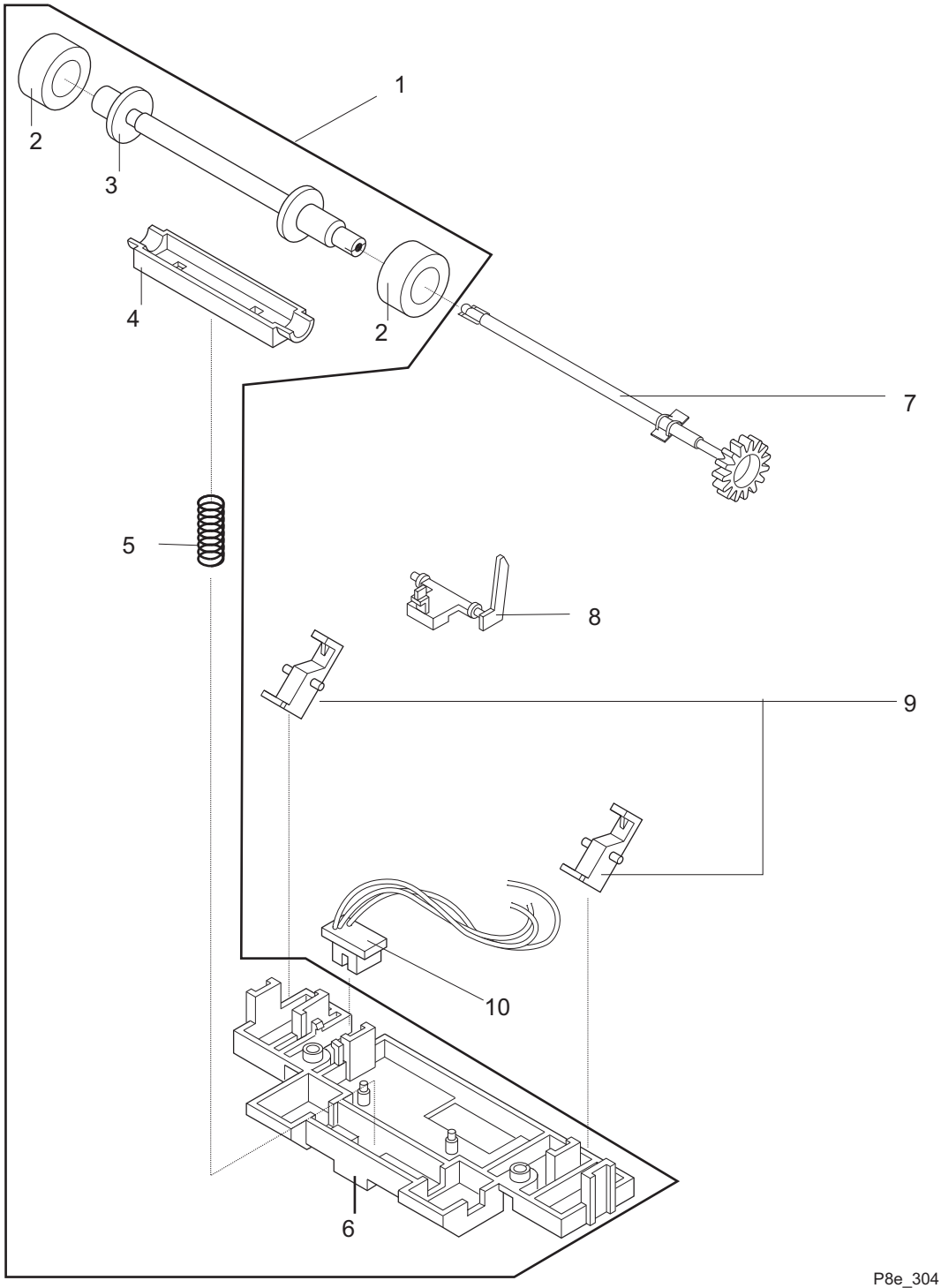
PL 5 Paper Transport

Item	Part Number	Description
1)	22K64020	Media Frame Support Unit {Includes Items 2 through 6}
2)	- - - - - -	Feed Rubber
3)	- - - - - -	Idler Feed Shaft
4)	- - - - - -	Feed Shaft Bearing
5)	- - - - - -	Feed Spring
6)	- - - - - -	Feed Support Frame
7)	- - - - - -	Media Feed Gear Unit
8)	120E19120	Paper Empty Actuator
9)	695E58680	Paper Separator
10)	130K64640	Paper Empty Assembly
A)	600K72020	Hardware Kit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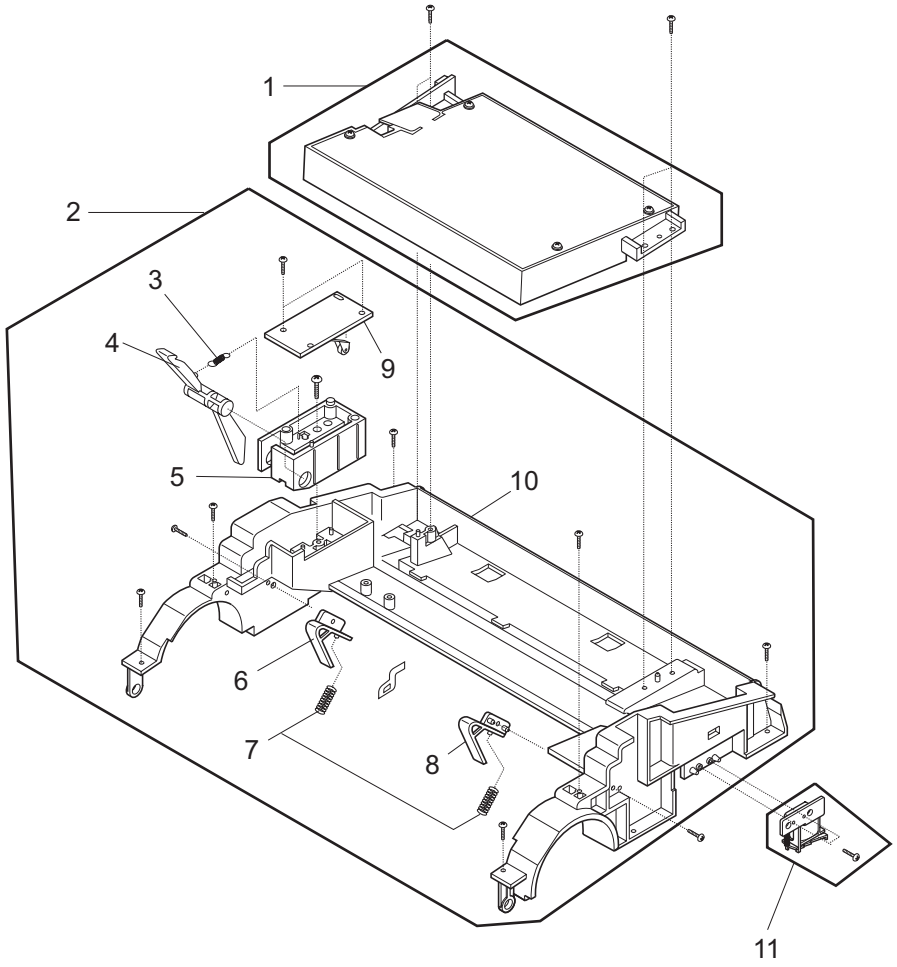
PL 6 Frame Assembly (1 of 2)

Item	Part Number	Description
1)	62K09270	LSU (Laser) Unit
2)	001K72470	Upper Frame Unit
3)	- - - - - -	Cover Open Actuator Spring
4)	- - - - - -	Cover Open Actuator
5)	- - - - - -	Cover Open Micro Switch
6)	- - - - - -	Developer Plate, Left
7)	- - - - - -	Developer Plate Spring
8)	- - - - - -	Developer Plate, Right
9)	- - - - - -	Cover Open Sensor Cover
10)	- - - - - -	Upper Frame
11)	121E15480	Paper Feed Solenoid
A)	600K72020	Hardware Kit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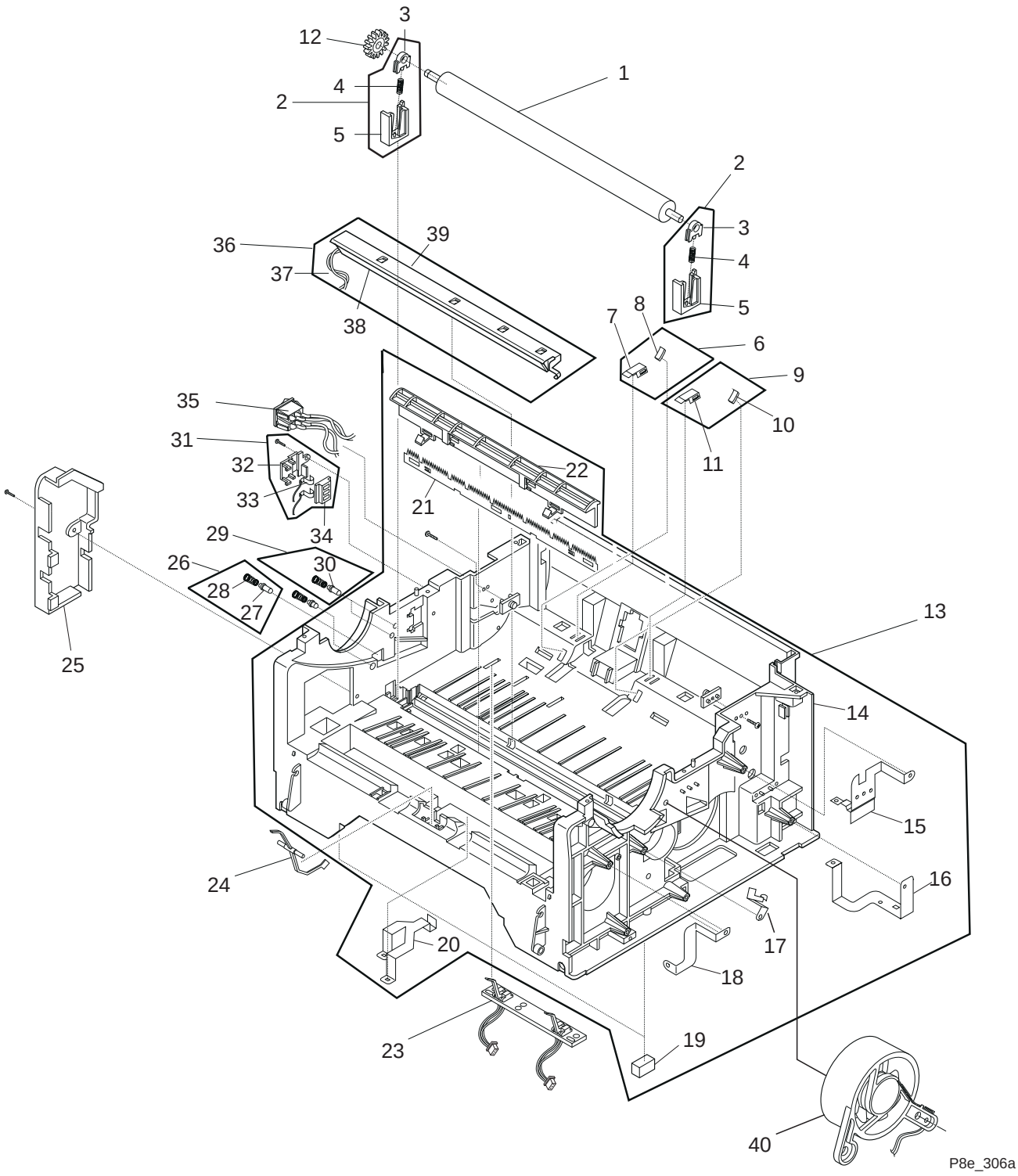
PL 7 Frame Assembly (2 of 2)

Item	Part Number	Description
1)	22E23250	Transfer Roller
2)	19K04780	Transfer Unit Holder {Includes Items 3, 4, & 5}
3)	- - - - - -	Transfer Roller Bushing
4)	- - - - - -	Transfer Roller Spring
5)	- - - - - -	Transfer Roller Holder
6)	- - - - - -	Media Unit Operator, Left {Includes Items 7 & 8}
7)	- - - - - -	Pad Holder, Left
8)	- - - - - -	Separator Pad, Left
9)	- - - - - -	Media Unit Operator, Right {Includes Items 10 & 11}
10)	- - - - - -	Separator Pad, Right
11)	- - - - - -	Pad Holder, Right
12)	007E59210	Transfer Gear
13)	15K39960	Lower Frame Unit
14)	- - - - - -	Base Frame
15)	- - - - - -	
16)	- - - - - -	
17)	- - - - - -	
18)	- - - - - -	
19)	- - - - - -	Rubber Foot
20)	- - - - - -	
21)	- - - - - -	Saw Plate
22)	- - - - - -	Saw Plate Holder
23)	130E09090	Feed Sensor Assembly
24)	120E19130	Exit Actuator
25)	101E19690	Fuser Cover
26)	- - - - - -	Transfer Roller Terminal Unit {Includes Items 27 & 28}
27)	- - - - - -	High Voltage Shaft, Large
28)	- - - - - -	High Voltage Spring, Large
29)	- - - - - -	High Voltage Terminal Unit
30)	- - - - - -	High Voltage Shaft, Small
31)	- - - - - -	Developer Unit Fuse {Includes Items 32, 33, & 34}
32)	108K00690	Developer Unit Fuse Contact, Upper
33)	- - - - - -	Developer Unit Fuse Plate
34)	- - - - - -	Developer Unit Fuse Contact, Lower
35)	- - - - - -	Off / On Switch
36)	38K12830	ELA Unit-PTL
37)	- - - - - -	
38)	- - - - - -	
39)	- - - - - -	
40)	127E12600	DC Fan Motor
A)	600K72020	Hardware Kit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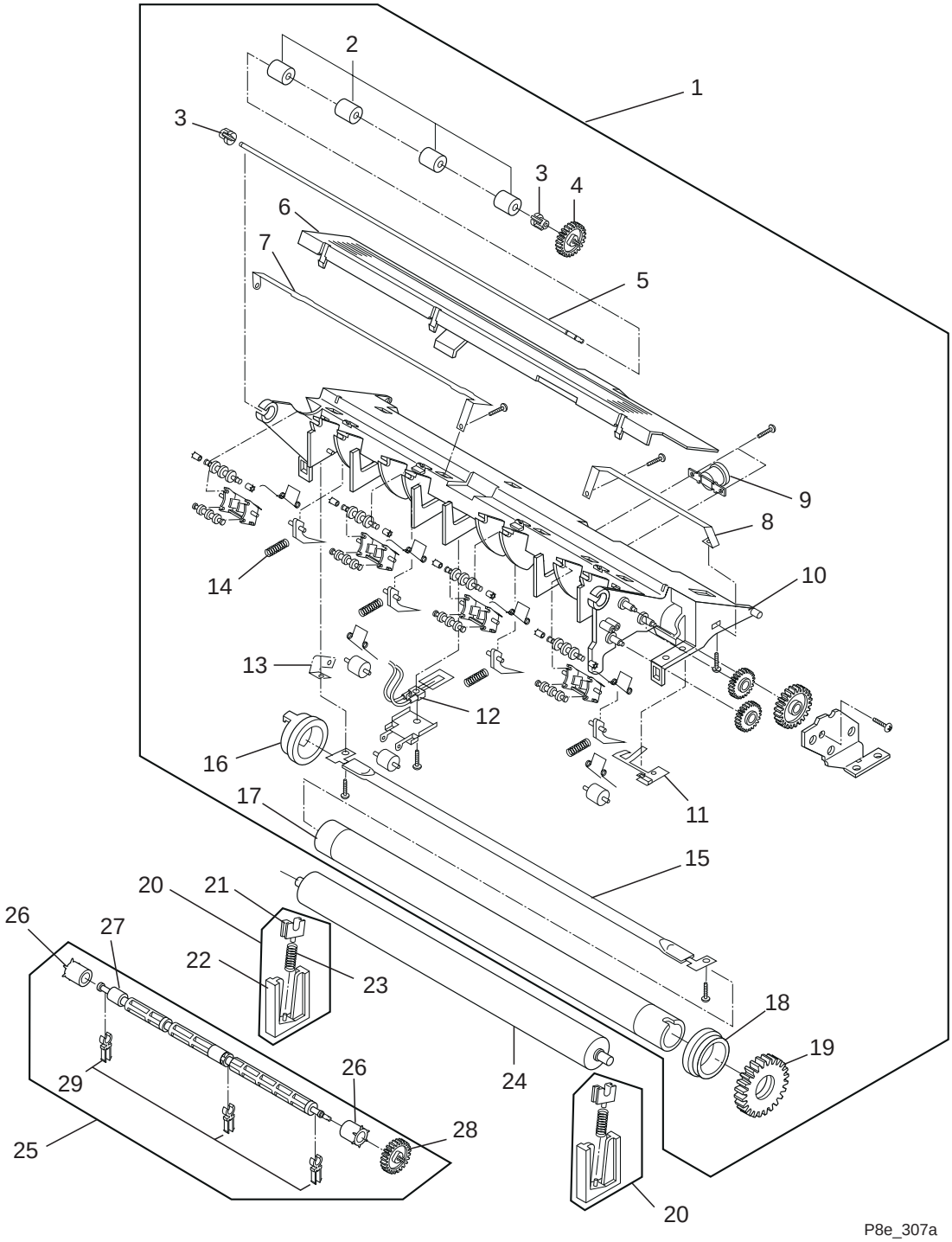
PL 8 Fuser

Item	Part Number	Description
1)	126K12920	Fuser Unit Assembly (115 VAC) {Includes Items 2 through 19}
	126K12970	Fuser Unit Assembly (220 VAC) {Includes Items 2 through 19}
2)	- - - - - -	Rubber Exit Roller
3)	- - - - - -	Exit Bearing
4)	- - - - - -	Exit Gear
5)	- - - - - -	Roller
6)	- - - - - -	Fuser Cover
7)	- - - - - -	AC Electrode, Left
8)	- - - - - -	AC Electrode, Right
9)	- - - - - -	Thermostat
10)	- - - - - -	Fuser Frame
11)	- - - - - -	Bracket
12)	130E09100	Thermistor
13)	- - - - - -	Bracket
14)	- - - - - -	Exit Spring
15)	122E02490	Halogen Lamp (115 VAC)
	122E02480	Halogen Lamp (220 VAC)
16)	- - - - - -	Heat Roll Bearing, Left
17)	- - - - - -	Heat Roller
18)	- - - - - -	Heat Roll Bearing, Right
19)	- - - - - -	Fuser Gear
20)	9K01910	Pressure Roller Holder Assembly {Includes Items 21, 22, & 23}
21)	- - - - - -	Pressure Roller Bearing
22)	- - - - - -	Pressure Roller Bearing Holder
23)	- - - - - -	Pressure Roller Bearing Spring
24)	126K12890	Pressure Roller
25)	17E09150	Exit Roller Assembly {Includes Items 26, 27, 28, & 29}
26)	- - - - - -	Rubber Exit Roll F/Up
27)	- - - - - -	Exit Shaft F/Up
28)	- - - - - -	Exit Gear
29)	115E06360	Exit Shaft Bushing - TX
A)	600K72020	Hardware Kit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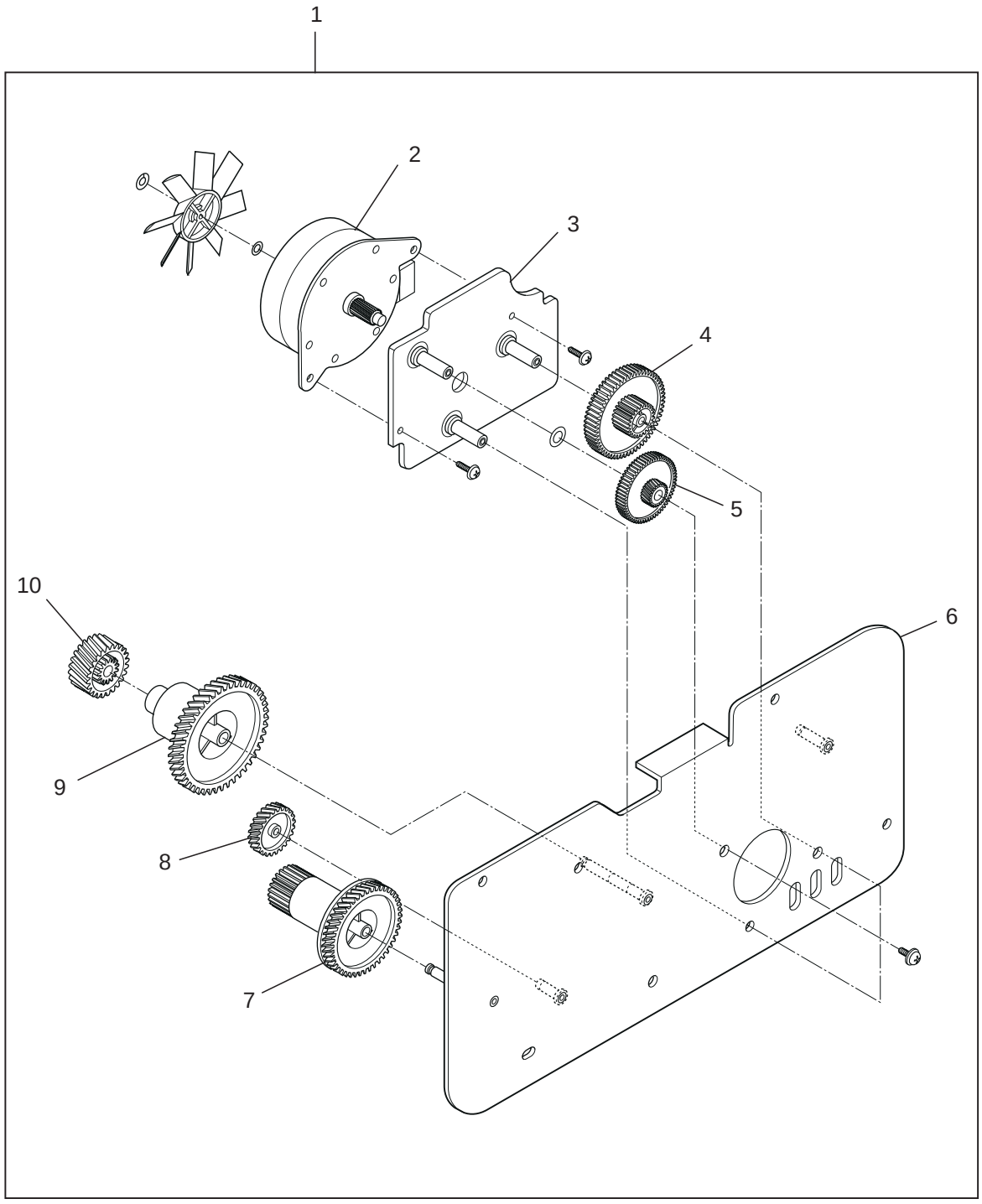
PL 9 Main Drive Motor

Item	Part Number	Description
1)	127K30150	Main Drive Motor Assembly {Includes Items 2 through 12}
2)	- - - - - -	Main Drive Motor
3)	- - - - - -	Motor bracket
4)	- - - - - -	Motor Drive Gear
5)	- - - - - -	Feed Drive Gear
6)	- - - - - -	Gear Bracket
7)	- - - - - -	Gear-Drive 1
8)	- - - - - -	Gear-Drive 2
9)	- - - - - -	Gear-Pulley
10)	- - - - - -	RCT-Belt Impeller
A)	600K72020	Hardware Kit



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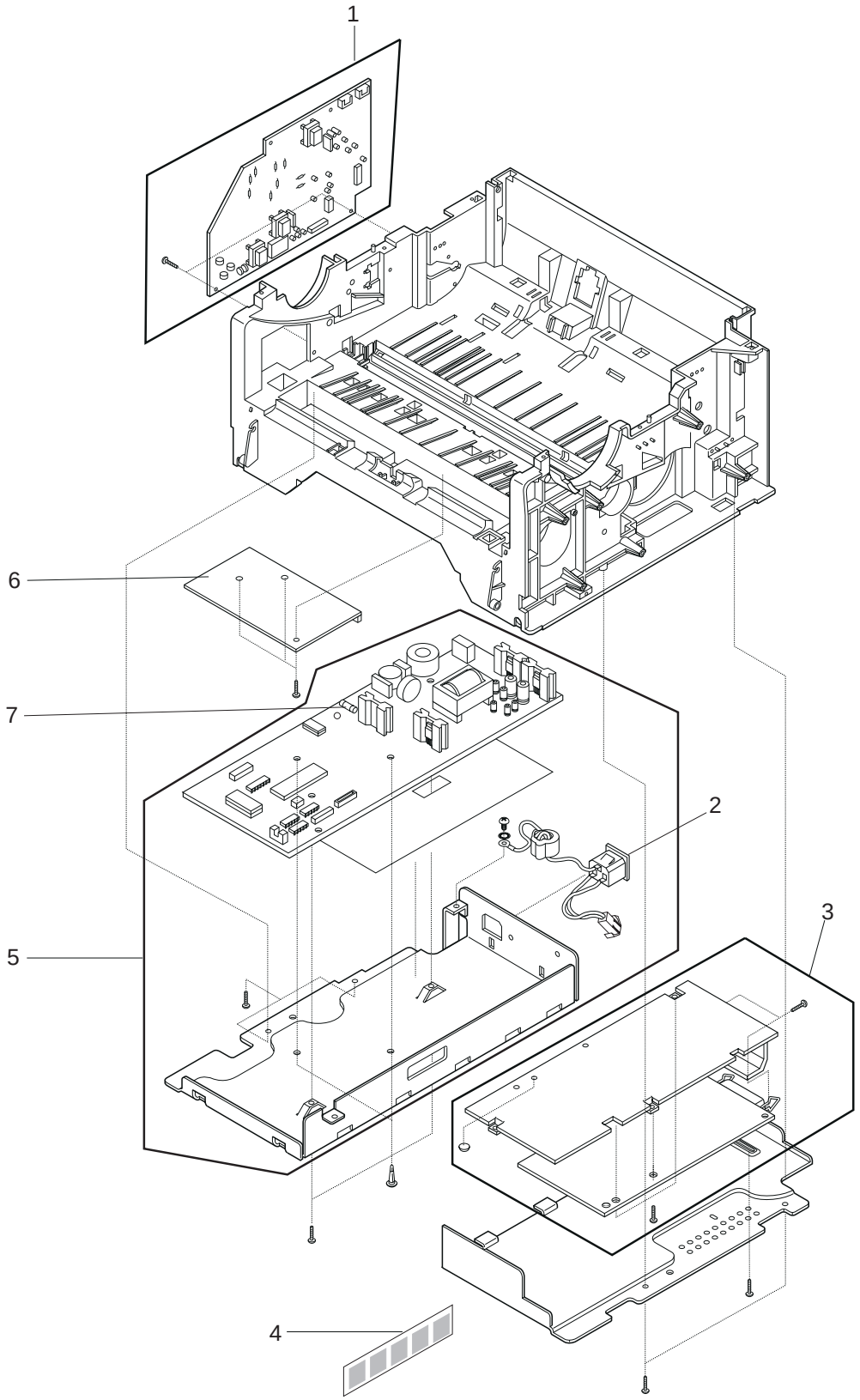
PL 10 Electronics

Item	Part Number	Description
1)	160K60070	High Voltage Power Supply PWB
2)	114E15570	AC Plug Assembly
3)	160K60060	Controller PWB (115 VAC)
	160K55520	Controller PWB (220 VAC)
4)	- - - - - -	SIMM 4MB
	- - - - - -	SIMM 8MB
	- - - - - -	SIMM 16MB
	- - - - - -	SIMM 32MB
5)	160K55660	Engine Controller PWB (115 VAC)
	160K55510	Engine Controller PWB (220 VAC)
6)	007K11190	Joint PWB
7)	108E05380	Fuse (115 VAC / T8A)
	108E05390	Fuse (220 VAC / T5A)
A)	600K72020	Hardware Kit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Notes

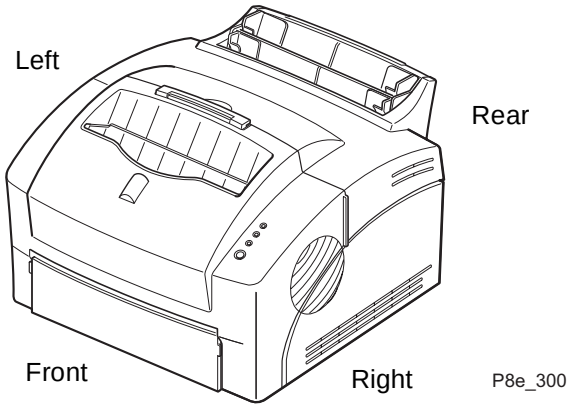
Section 4

Repair Procedures

4.0 Overview

Locations given in the Repair Procedures are always referenced from the front of the printer as you are facing the Control Panel. See figure 4.0.1.

Figure 4.0.1 Printer Orientation.



The following notations apply:

- Arrows in the illustrations show direction of movement.
- Numbers in an illustration refer to the corresponding steps in the procedure being performed. Example, REP 4.1.1, step 2 indicates to press on the two locking tabs. Notice that the two locking tabs in the illustration are labeled 2.
- At the bottom of each illustration is a number. In the illustration above the number is P8e_300. This is the art number and is used by the developers for tracking and control of the art.

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 Face Up Cover

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Press on the two locking tabs and open the cover (Figure 4.1.1a).
3. Carefully bend the cover in the middle until the hinge pin is free of the printer frame (Figure 4.1.1b).
4. Remove the Face Up Cover.

Figure 4.1.1a. Face Up Cover Locking Tabs.

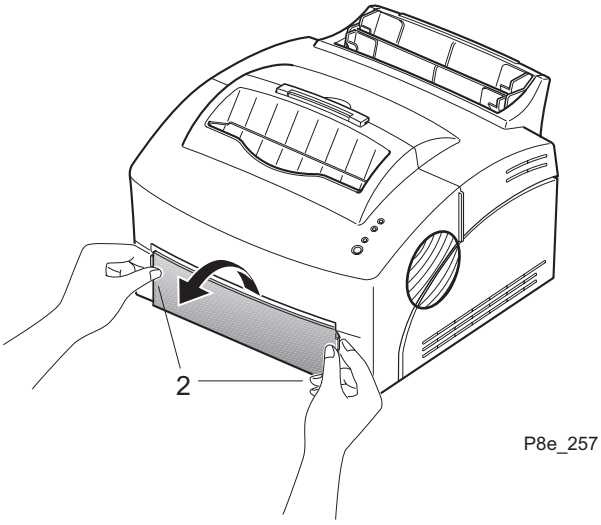
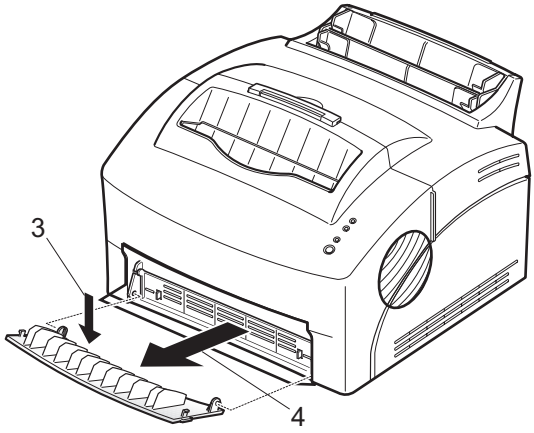


Figure 4.1.1b. Face Up Cover Removal.



Replacement

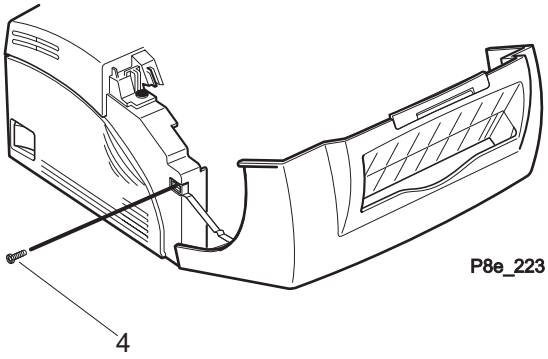
1. Assemble in reverse order.
2. Verify proper operation.

REP 4.1.2 Front Cover

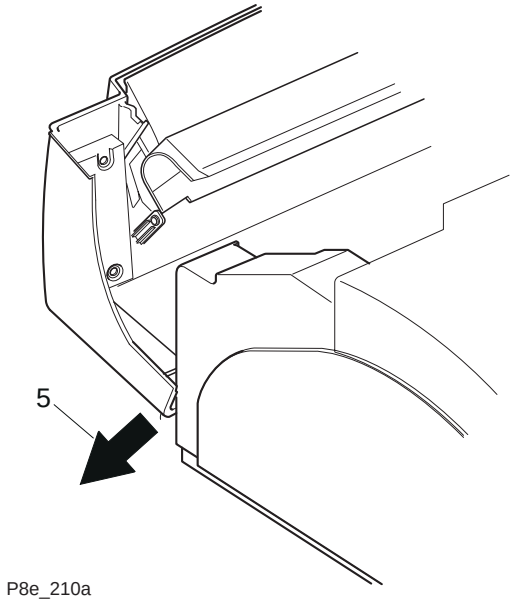
Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Face Up Cover (REP 4.1.1).
3. Open the Front Cover and remove the Print Cartridge (REP 4.5.1).
4. Remove the Panel Board Cover, the clear plastic lens, and the blue Online/Reset button. Allow the Panel Board to remain connected to the harness (Figure 4.1.2a).
5. Carefully push the right side of the Front Cover out until it is free of the hinge pin. Remove the Front Cover (Figure 4.1.2a).
6. Unplug the Control Panel connector.

Figure 4.1.2a. Front Cover Removal.



Left Side



Right Side

Replacement

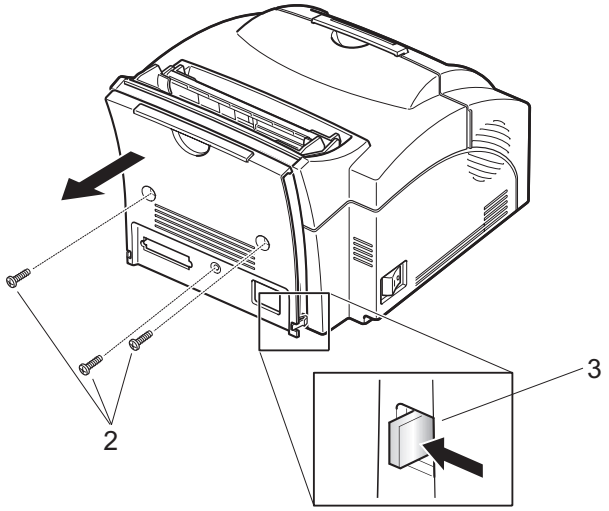
1. Assemble in reverse order.
2. Verify proper operation.

REP 4.1.3 Rear Cover

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the three screws that secure the Rear Cover (Figure 4.1.3a).
3. Release the two lock tabs that secure the bottom of the cover (Figure 4.1.3a).
4. Slide the cover up and remove.

Figure 4.1.3a. Rear Cover.



Replacement

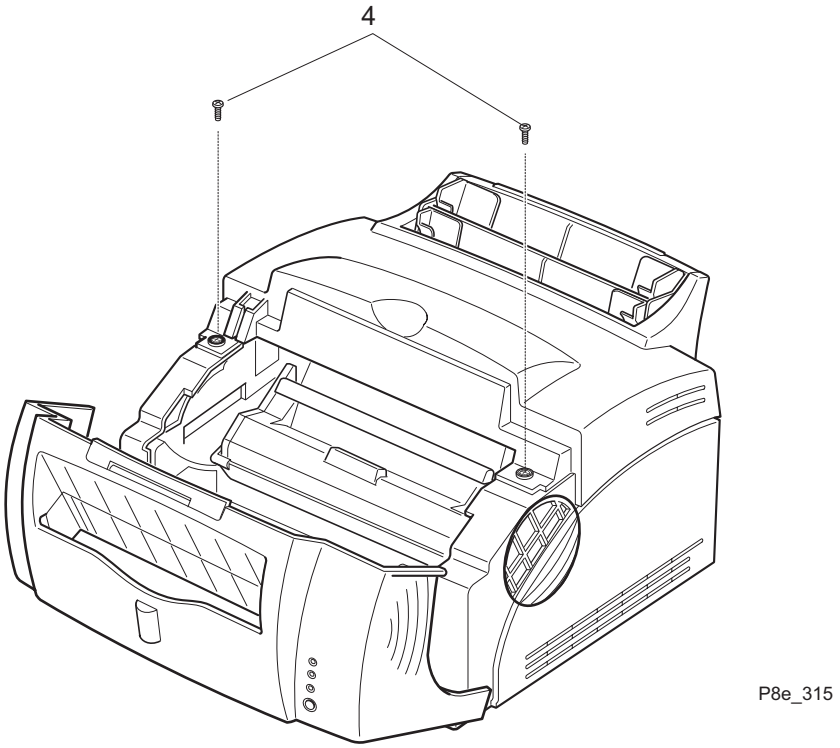
1. Assemble in reverse order.
2. Verify proper operation.

REP 4.1.4 Top Cover

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Rear Cover (REP 4.1.3).
3. Open the Front Cover and remove the Print Cartridge (REP 4.5.1).
4. Remove the two screws that secure the front of the Top Cover (Figure 4.1.4a).
5. Lift the Top Cover to remove (Figure 4.1.4a).

Figure 4.1.4a. Top Cover Removal.



Replacement

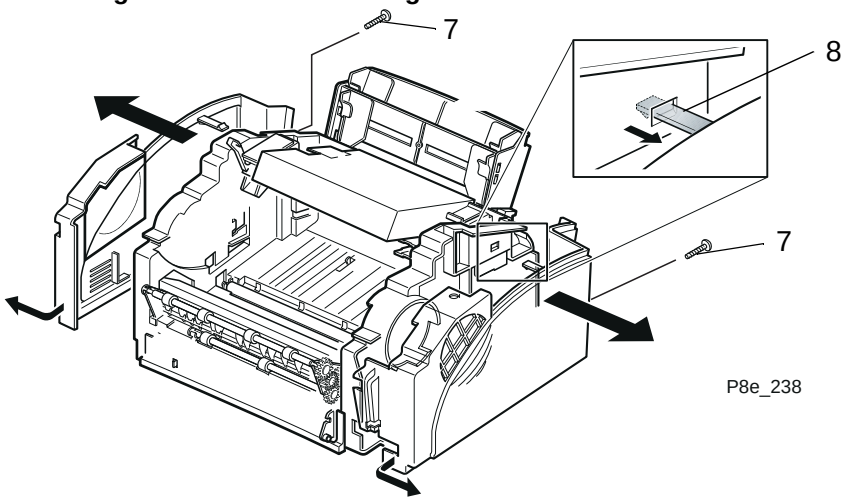
1. Assemble in reverse order.
2. Verify proper operation.

REP 4.1.5 Left and Right Side Covers

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Face Up Cover (REP 4.1.1).
3. Open the Front Cover and remove the Print Cartridge (REP 4.5.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Remove the screw securing the side cover (Figure 4.1.5a).
8. Release the locking tab located at the top of the side cover (Figure 4.1.5a).
9. Remove the side cover.

Figure 4.1.5a. Left and Right Side Cover Removal.



Replacement

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

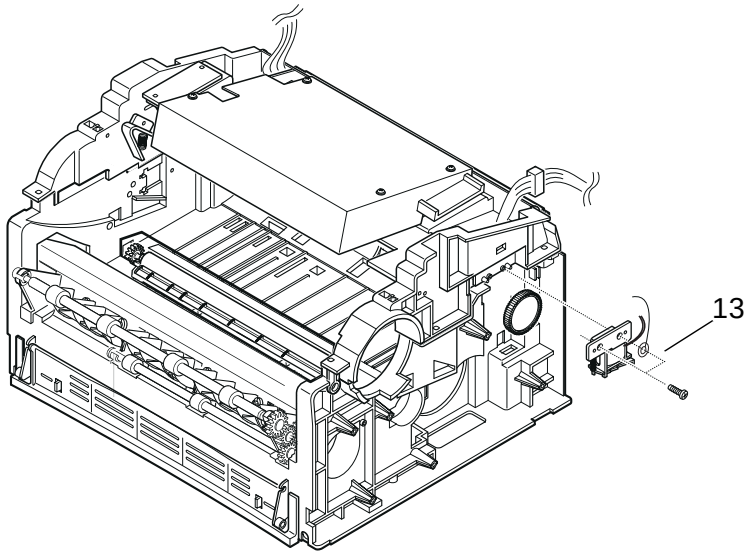
REP 4.2 Paper Feed

REP 4.2.1 Paper Feed Solenoid

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Face Up Cover (REP 4.1.1).
3. Open the Front Cover and remove the Print Cartridge (REP 4.5.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Remove the Right Side Covers (REP 4.1.5).
8. Remove the Bottom Shield (REP 4.6.1).
9. Remove the Gear Bracket (REP 4.5.2).
10. Remove the Controller PWB (REP 4.6.3).
11. Remove the Engine Controller PWB (REP 4.6.2).
12. Remove the solenoid connector from CN 402 of the Joint PWB.
13. Remove the two screws (and ground strap) that secure the Paper Feed Solenoid to the printer frame (Figure 4.2.1a).

Figure 4.2.1a. Paper Feed Solenoid Removal.



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Replacement

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

REP 4.2.2 Upper Frame Assembly

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Face Up Cover (REP 4.1.1).
3. Open the Front Cover and remove the Print Cartridge (REP 4.5.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Remove the Left and Right Side Covers (REP 4.1.5).
8. Remove the Gear Bracket (REP 4.5.2).
9. Remove the HVPS (REP 4.6.5).
10. Remove the two screws that secure the Paper Feed Solenoid to the printer frame (Figure 4.2.2a). Remove the solenoid from the frame but do not disconnect the solenoid harness.
11. Remove the six screws that secure the Upper Frame Assembly (Figure 4.2.2a).
12. Lift-up the left side of the Upper Frame Assembly approximately 12 mm (0.5 in). Lift-up the rear of the right side of the Upper Frame Assembly. Move the Upper Frame Assembly to the right to disconnect the front hinge pin and remove (Figure 4.2.2b).

Figure 4.2.2a. Upper Frame Assembly Removal.

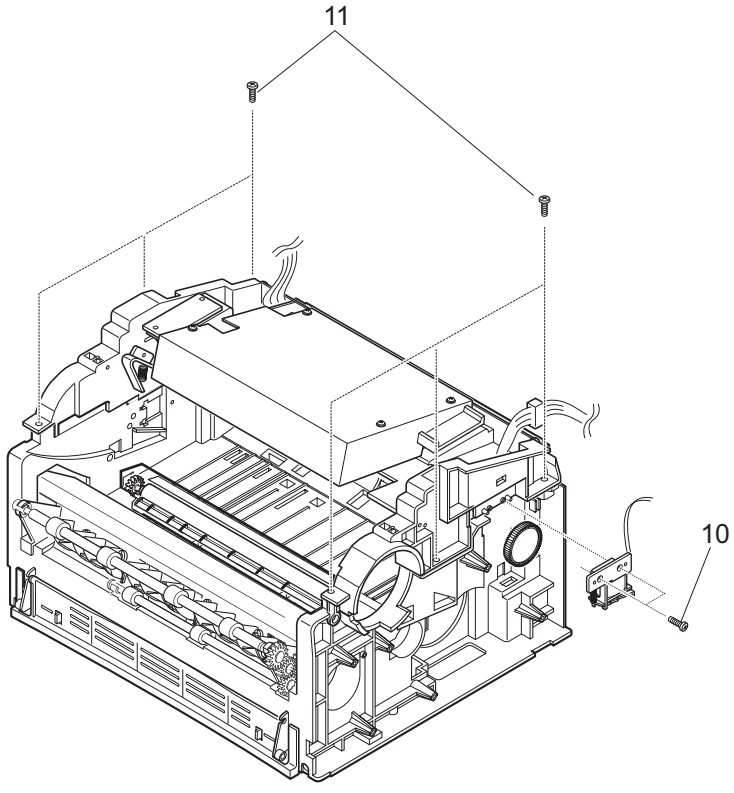

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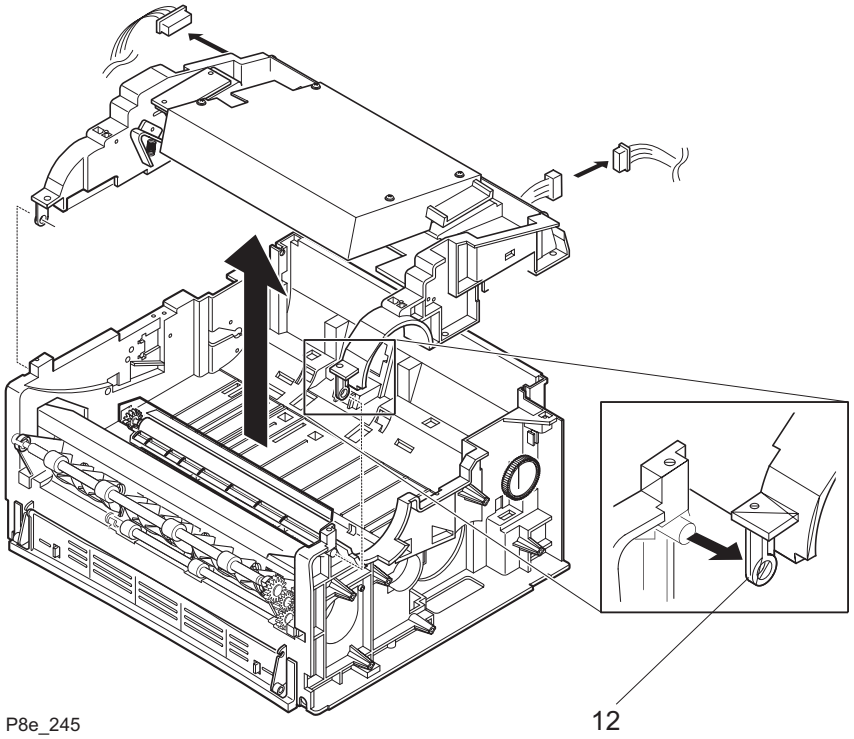
Figure 4.2.2b. Upper Frame Assembly Removal.



Replacement

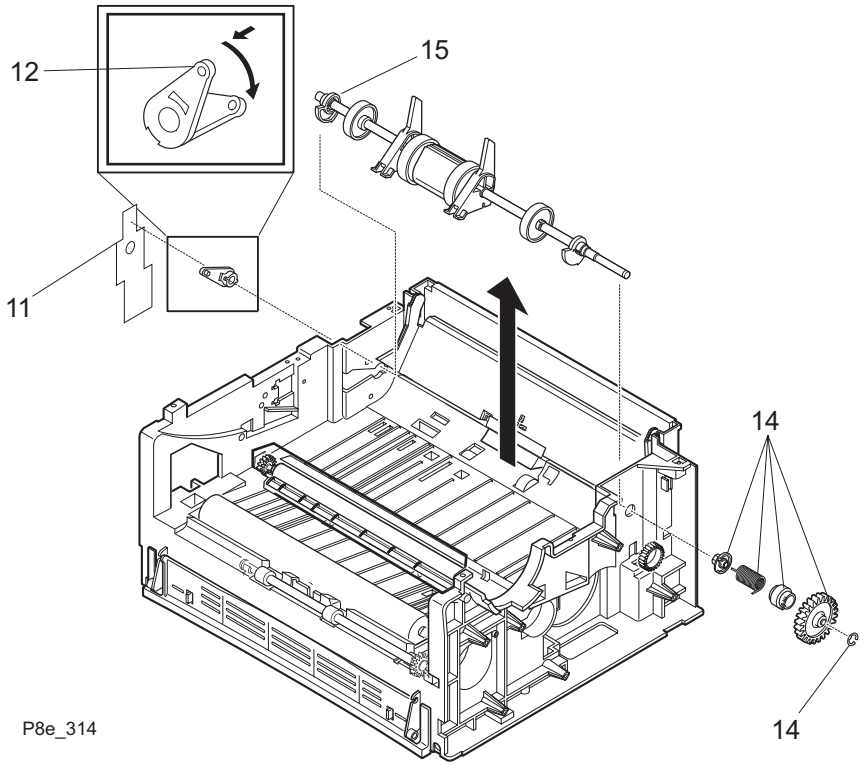
1. Assemble in reverse order.
2. Verify proper operation.

REP 4.2.3 Paper Feeder Assembly

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Face Up Cover (REP 4.1.1).
3. Open the Front Cover and remove the Print Cartridge (REP 4.5.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Remove the Left and Right Side Covers (REP 4.1.5).
8. Remove the Gear Bracket (REP 4.5.2).
9. Remove the HVPS (REP 4.6.5).
10. Remove the Upper Frame Assembly (REP 4.2.2).
11. Remove the screw that secures the earth (ground) strap to the left end of the paper feed shaft (Figure 4.2.3a).
12. Pull out on the locking tab of the left bearing and rotate the bearing 45 degrees clockwise (Figure 4.2.3a).
13. Press the locking tab and remove the frame insert.
14. Remove the E-Ring that secures the drive gear and clutch to the right end of the paper feed shaft (Figure 4.2.3a). remove the Gear and Clutch.
15. Move the left end of the Paper Feeder Assembly toward the front of the printer and remove the assembly.

Figure 4.2.3a. Paper Feeder Assembly Removal.



Replacement

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

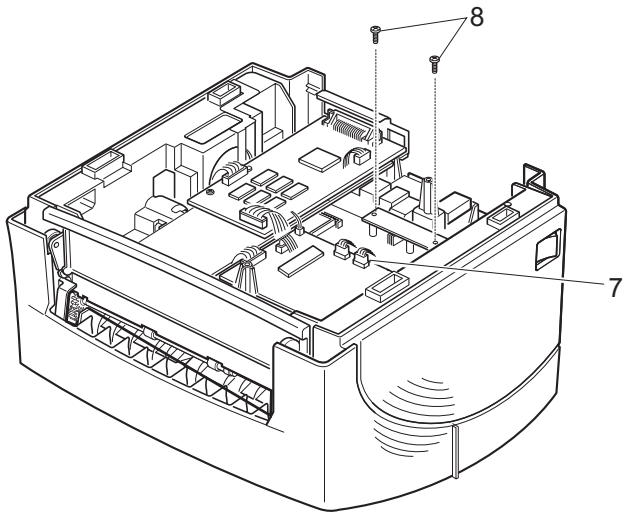
REP 4.3 Paper Transportation and Sensing

REP 4.3.1 Pfeed Sensor

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Print Cartridge (REP 4.5.1).
3. Remove the Rear Cover (REP 4.1.3).
4. Turn the printer up side down.
5. Remove the Bottom Shield (REP 4.6.1).
6. Remove the Engine Controller PWB (REP 4.6.2).
7. Disconnect CN401 from the Joint PWB (Figure 4.3.1a).
8. Remove the two screws that secure the Pfeed Sensor to the printer frame (Figure 4.3.1a). Remove the Pfeed Sensor.

Figure 4.3.1a. Pfeed Sensor Removal.



Replacement

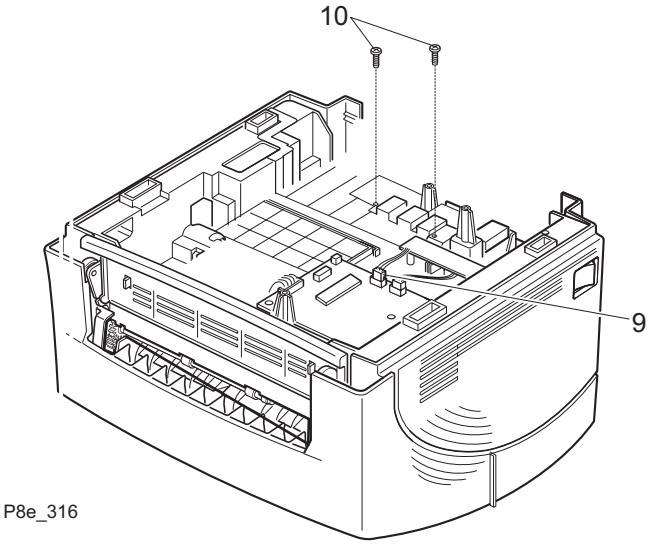
1. Assemble in reverse order.
2. Verify proper operation.

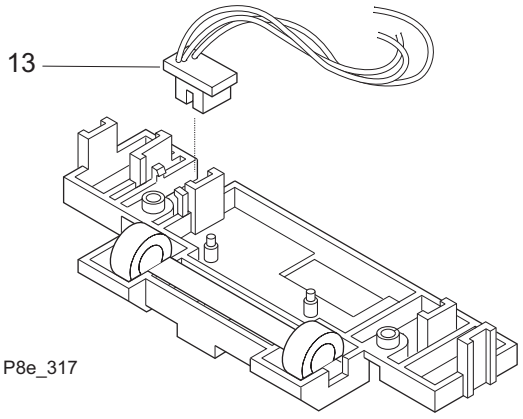
REP 4.3.2 Paper Empty Sensor

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Print Cartridge (REP 4.5.1).
3. Remove the Rear Cover (REP 4.1.3).
4. Turn the printer up side down.
5. Remove the Bottom Shield (REP 4.6.1).
6. Remove the Engine Controller PWB (REP 4.6.2).
7. Remove the Controller PWB (REP 4.6.3).
8. Remove the Pfeed Sensor (REP 4.3.1).
9. Disconnect CN403 from the Engine Controller PWB (Figure 4.3.2a).
10. Remove the two screws that secure the Paper Empty Sensor to the printer frame (Figure 4.3.2a).
11. Lift the front end of the Sensor Assembly and move the assembly to free the three tabs (Figure 4.3.2a).
12. Move the assembly to the left and disconnect the drive shaft. Remove the Paper Empty Sensor Assembly.
13. Press the lock tab and remove the Paper Empty Sensor from the assembly.

Figure 4.3.2a. Paper Empty Sensor Removal.





Replacement

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

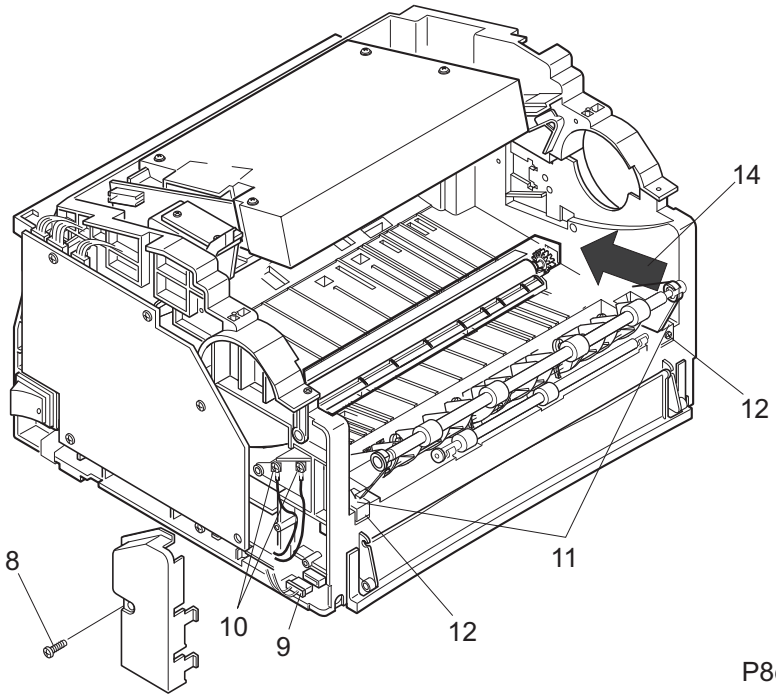
REP 4.4 Fuser

REP 4.4.1 Fuser Assembly

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Print Cartridge (REP 4.5.1).
3. Remove the Face Up Cover (REP 4.1.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Remove the Right Side Cover (REP 4.1.5).
8. Remove the screw that secures the Wire Cap (Figure 4.4.1a). Remove the Wire Cap.
9. Disconnect the Fuser Harness from CN1 on the Engine Controller PWB (Figure 4.4.1a).
10. Remove the two screws that secure the AC power wires to the Fuser Assembly (Figure 4.4.1a).
11. Remove the two screws that secure the Fuser Assembly to the printer frame (Figure 4.4.1a).
12. Use a small screwdriver to carefully release the two locking tabs on the front of the Fuser Assembly (Figure 4.4.1a).
13. Move the Fuser Assembly to the left until right hinge pin is free of the printer frame.
14. Lift the right end of the Fuser Assembly up approximately 25mm (1in.), and move the right end toward the rear of the printer. (Figure 4.4.1a)
15. Continue to move the right end toward the rear of the printer until the left end is free of the printer frame. Remove the Fuser Assembly.

Figure 4.4.1a. Fuser Assembly Removal.



Replacement

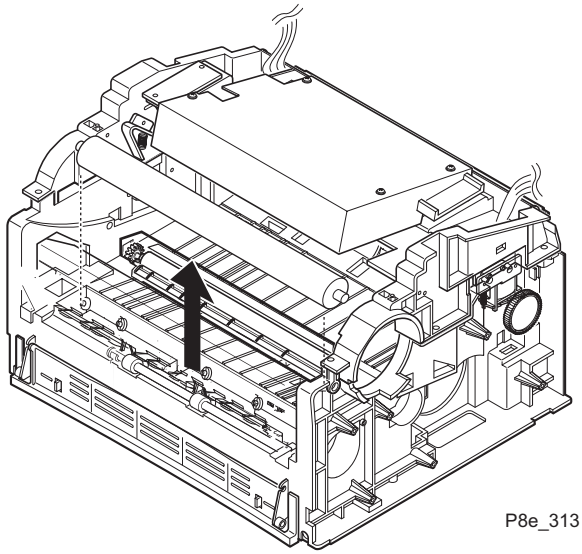
1. Assemble in reverse order.
2. Verify proper operation.

REP 4.4.2 Fuser Pressure Roller

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Print Cartridge (REP 4.5.1).
3. Remove the Face Up Cover (REP 4.1.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Remove the Right Side Cover (REP 4.1.5).
8. Remove the Fuser Assembly (REP 4.4.1).
9. Remove the Fuser Pressure Roller from the bearings (Figure 4.4.2a).

Figure 4.4.2a. Fuser Pressure Roller Removal.



Replacement

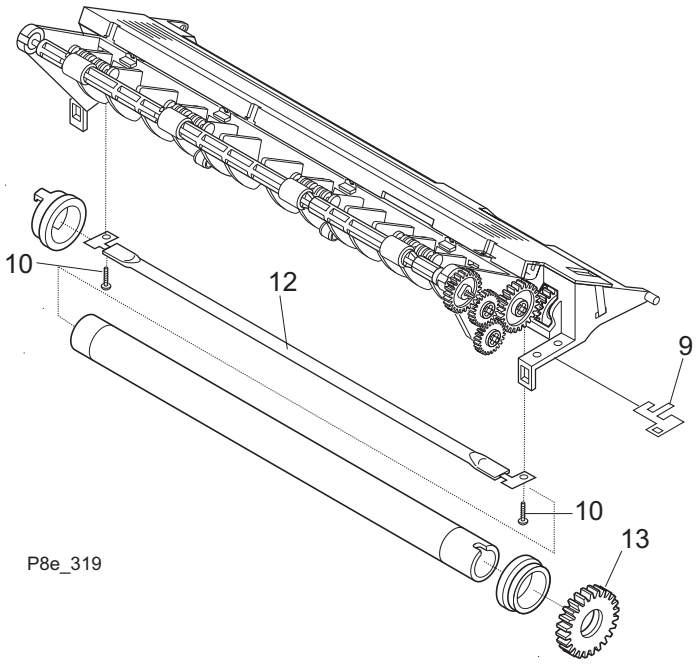
1. Assemble in reverse order.
2. Verify proper operation.

REP 4.4.3 Halogen Lamp (Fuser Heat Rod)

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Print Cartridge (REP 4.5.1).
3. Remove the Face Up Cover (REP 4.1.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Remove the Right Side Cover (REP 4.1.5).
8. Remove the Fuser Assembly (REP 4.4.1).
9. Turn the Fuser Assembly up side down and remove the earth (ground) strap from the right end of the Fuser (Figure 4.4.3a).
10. Remove the two screws that secure the Halogen Lamp to the AC Terminals (Figure 4.4.3a).
11. Carefully lift the Fuser Roll and bearings out of the Fuser Assembly.
12. Remove the Halogen Lamp and Fuser Drive Gear from the Fuser Roll (Figure 4.4.3a).
13. Remove the drive gear from the Halogen Lamp (Figure 4.4.3a).

Figure 4.4.3a. Halogen Lamp Removal.



Replacement

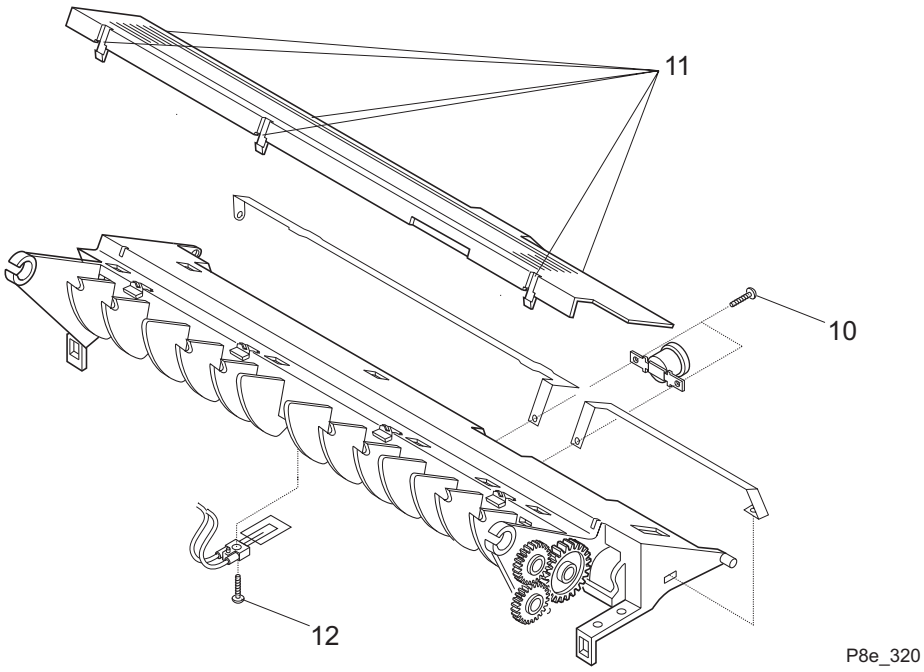
1. Assemble in reverse order.
2. Ensure the four Fuser Stripper Fingers are on top of the Fuser Roll.
3. Verify proper operation.

REP 4.4.4 Fuser Thermistor

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Print Cartridge (REP 4.5.1).
3. Remove the Face Up Cover (REP 4.1.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Remove the Right Side Cover (REP 4.1.5).
8. Remove the Fuser Assembly (REP 4.4.1).
9. Remove the Fuser Heat Roll (REP 4.4.3).
10. Remove the two screws that secure the Overheat Thermostat (Figure 4.4.4a). Remove the Thermostat.
11. Release the six locking tabs (Figure 4.4.4a) and remove the Fuser Cover (the AC Electrodes are attached to the bottom of the Fuser Cover).
12. Remove the screw that secures the Thermistor to the Fuser Assembly (Figure 4.4.4a). Remove the Thermistor.

Figure 4.4.4a. Fuser Thermistor Removal.



Replacement

1. Assemble in reverse order.
2. Ensure the four Fuser Stripper Fingers are on top of the Fuser Roll.
3. Verify proper operation.

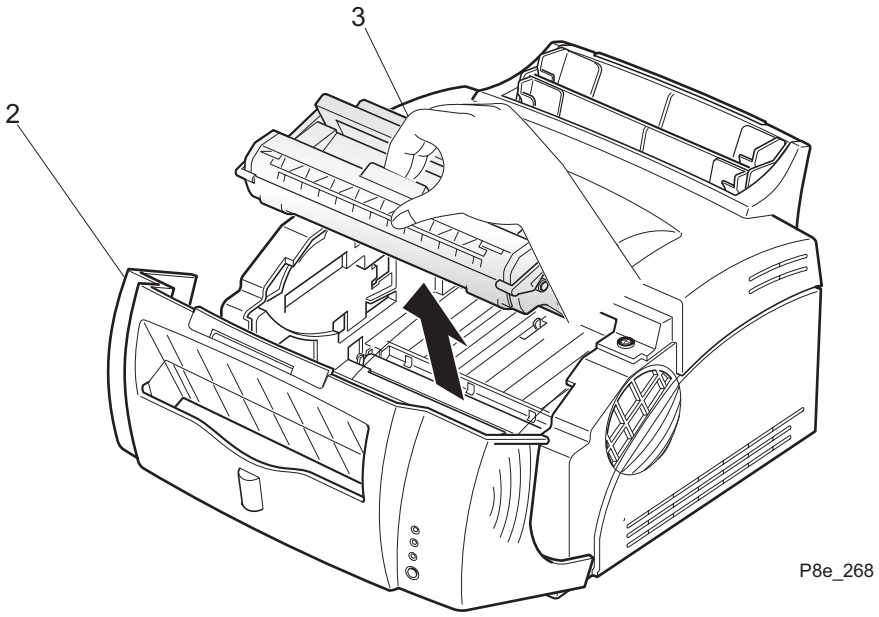
REP 4.5 Drive and Xerographic Modules

REP 4.5.1 Print Cartridge

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Open the printer's front cover.
3. Grasp the Print Cartridge Handle as shown in Figure 4.5.1a. Pull the Printer Cartridge up and out of the printer.

Figure 4.5.1a. Printer Cartridge Removal.



4. If the Printer Cartridge will be out for longer then a few minutes, cover the Cartridge with several sheets of paper to protect it from light.

Replacement

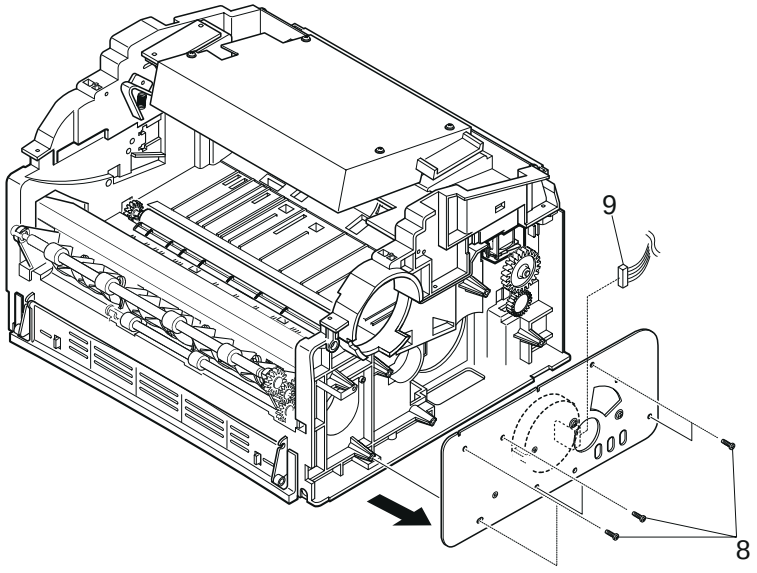
1. Assemble in reverse order.

REP 4.5.2 Gear Bracket

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Face Up Cover (REP 4.1.1).
3. Remove the Print Cartridge (REP 4.5.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Remove the Right Side Cover (REP 4.1.5).
8. Remove the six screws that secure the Gear Bracket to the printer frame (Figure 4.5.2a).

Figure 4.5.2a. Gear Bracket Removal.



9. Lower the Gear Bracket to access the Drive Motor. Disconnect the Drive Motor Harness from the Drive Motor (Figure 4.5.2a).
10. Remove the Gear Bracket.

Replacement

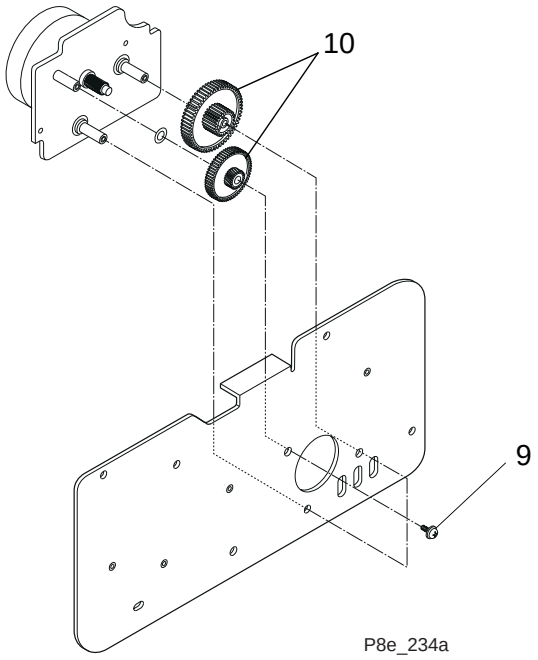
1. Assemble in reverse order.
2. Verify proper operation.

REP 4.5.3 Main Drive Motor Assembly

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Face Up Cover (REP 4.1.1).
3. Remove the Print Cartridge (REP 4.5.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Remove the Right Side Cover (REP 4.1.5).
8. Remove the Gear Bracket (REP 4.5.2).
9. Remove the three screws that secure the Drive Motor Assembly to the Gear Bracket (Figure 4.5.3a).

Figure 4.5.3a. Drive Motor Assembly.



10. Remove the two gears from the Drive Motor Assembly (Figure 4.5.3a).

Replacement

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

REP 4.5.4 Transfer Roller

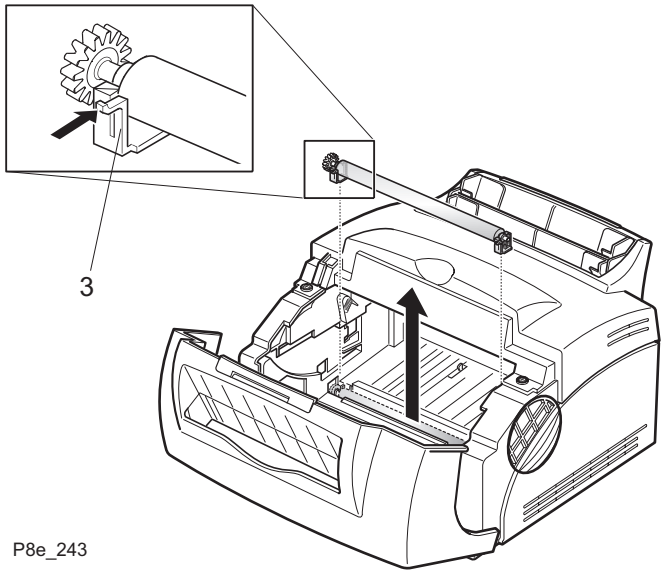
Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Open the Front Cover and remove the Print Cartridge (REP 4.5.1).

NOTE: Wear rubber gloves when removing the Transfer Roller. Touching the rubber part of the roller can cause print quality problems.

3. Press the locking tabs on the bushings on each end of the Transfer Roller. Remove the Transfer Roller and the bushings.

Figure 4.5.4a. Transfer Roller Removal.



Replacement

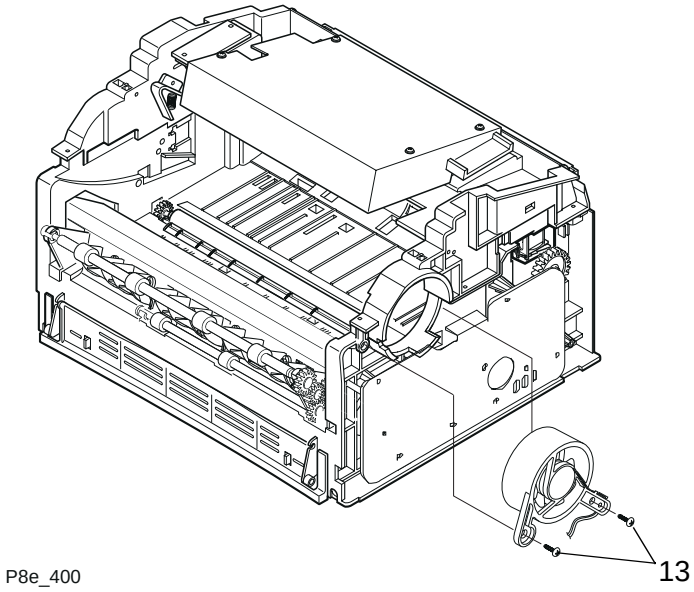
1. If installing a new Transfer Roller, remove the gear and bushings from the old roller and place on the new roller.
2. The high voltage contact for the roller is located in the left side frame. Slide the Transfer Roller to the right and insert the left bushing and gear into position.
3. Slide the roller to the left against the high voltage contact and insert the right bushing.
4. Assemble remaining components in reverse order.
5. Verify proper operation.

REP 4.5.5 DC Fan Motor

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Face Up Cover (REP 4.1.1).
3. Open the Front Cover and remove the Print Cartridge (REP 4.5.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Remove the Right Side Covers (REP 4.1.5).
8. Remove the Bottom Shield (REP 4.6.1).
9. Remove the Gear Bracket (REP 4.5.2).
10. Remove the Controller PWB (REP 4.6.3).
11. Remove the Engine Controller PWB (REP 4.6.2).
12. Remove the fan connector from CN 408 of the Joint PWB.
13. Remove the two screws securing the DC Fan Motor to the printer frame (Figure 4.5.5a).

Figure 4.5.5a. DC Fan Motor Removal.



Replacement

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

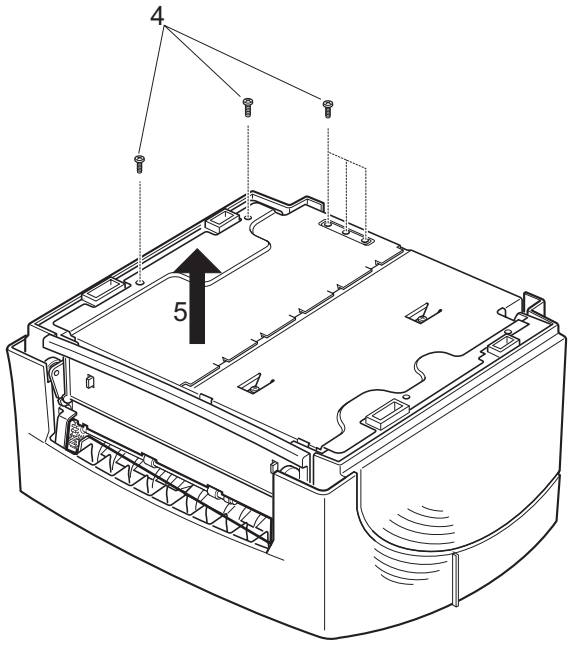
REP 4.6 Electrical Modules

REP 4.6.1 Bottom Shield

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Print Cartridge (REP 4.5.1).
3. Turn the printer up side down (Figure 4.6.1a).
4. Remove the three screws that secure the Shield to the bottom of the printer (Figure 4.6.1a).
5. Lift and remove the shield (Figure 4.6.1a).

Figure 4.6.1a. Bottom Shield.



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Replacement

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

REP 4.6.2 Engine Controller PWB

Removal

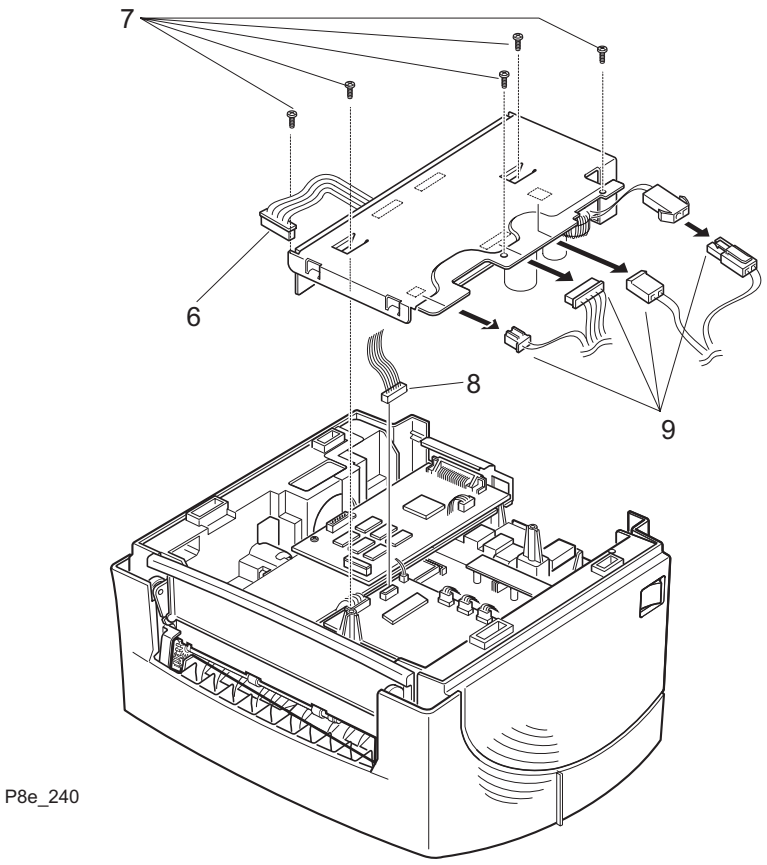
CAUTION
These components are susceptible to electrostatic discharge. Observe all ESD procedures to avoid damage.

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Print Cartridge (REP 4.5.1).
3. Remove the Rear Cover (REP 4.1.3).
4. Turn the printer up side down.
5. Remove the Bottom Shield (REP 4.6.1).
6. Disconnect J5 from the Controller PWB (Figure 4.6.2a).
7. Remove the five screws that secure the Engine Controller PWB to the bottom of the printer (Figure 4.6.2a).
8. Lift the edge of the Engine Controller PWB that is next to the Controller PWB approximately 40 mm (1.5 in.) and disconnect CN406 from the Joint PWB (Figure 4.6.2a).
9. Continue to lift the Engine Controller PWB and disconnect CN1, CN2, CN201, CN202, and the AC inline connector (Figure 4.6.2a).
10. Remove the Engine Controller PWB.

Replacement

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

Figure 4.6.2a. Engine Controller Removal.



REP 4.6.3 Controller PWB

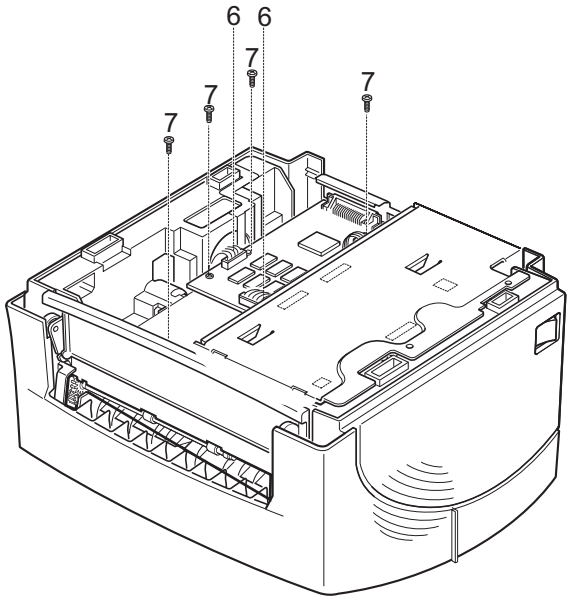
Removal

CAUTION

These components are susceptible to electrostatic discharge. Observe all ESD procedures to avoid damage.

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Print Cartridge (REP 4.5.1).
3. Remove the Rear Cover (REP 4.1.3).
4. Turn the printer up side down.
5. Remove the Bottom Shield (REP 4.6.1).
6. Disconnect J2 and J5 from the Controller PWB (Figure 4.6.3a).
7. Remove the four screws that secure the Controller PWB to the printer frame (Figure 4.6.3a). Remove the Controller PWB.

Figure 4.6.3a. Controller PWB Removal.



Replacement

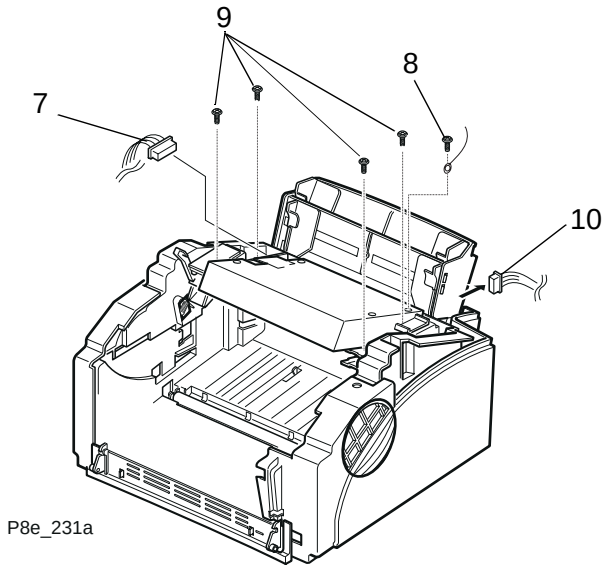
1. Assemble in reverse order.
2. Verify proper operation.

REP 4.6.4 LSU (Laser) Assembly

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Face Up Cover (REP 4.1.1).
3. Remove the Print Cartridge (REP 4.5.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Disconnect the harness connected to the left side of the Laser Assembly (Figure 4.6.4a).
8. Remove the screw that secures the ground wire to the Laser (Figure 4.6.4a).
9. Remove the four mounting screws that secure the Laser to the printer frame (Figure 4.6.4a).
10. Turn the Laser up side down and disconnect the harness connected to the right side of the Laser (Figure 4.6.4a).

Figure 4.6.4a. Laser Assembly Removal.



Replacement

1. Clean the Laser window.
1. Assemble in reverse order.
2. Verify proper operation.

REP 4.6.5 HVPS (High Voltage Power Supply) PWB

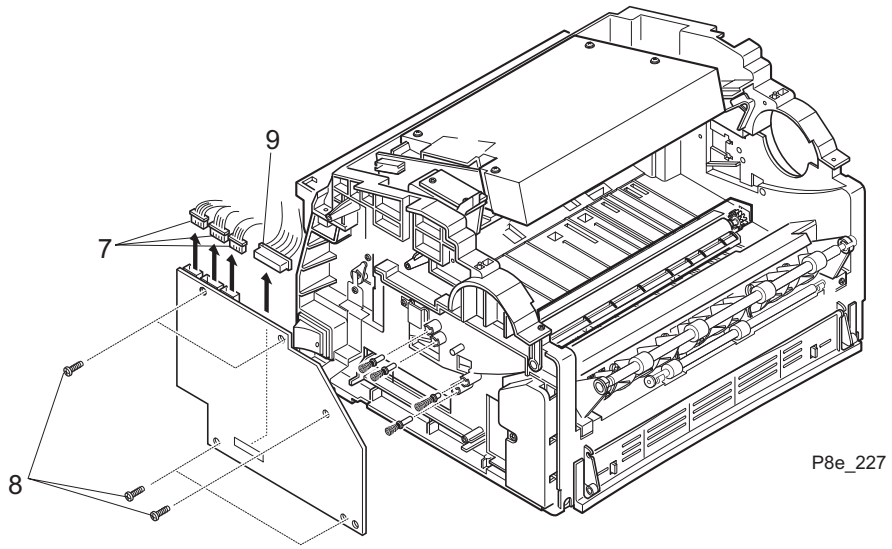
CAUTION
These components are susceptible to electrostatic discharge. Observe all ESD procedures to avoid damage.

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Face Up Cover (REP 4.1.1).
3. Remove the Print Cartridge (REP 4.5.1).
4. Remove the Front Cover (REP 4.1.2).
5. Remove the Rear Cover (REP 4.1.3).
6. Remove the Top Cover (REP 4.1.4).
7. Remove the Left Side Cover (REP 4.1.5).
8. Disconnect the following from the top of the HVPS PWB, CN2, CN3, and CN4 (Figure 4.6.5a).
9. Remove the five screws that secure the HVPS to the printer frame (Figure 4.6.5a).
10. Lower the HVPS PWB to access connector CN1. Disconnect CN1 from the HVPS PWB (Figure 4.6.5a).

NOTE: With the HVPS PWB removed, the four high voltage contacts can be removed. The three top contacts are the same size. The bottom contact (transfer) is longer than the other three (Figure 4.6.5a).

Figure 4.6.5a. High Voltage Power Supply Removal.



Replacement

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

REP 4.6.6 Joint PWB

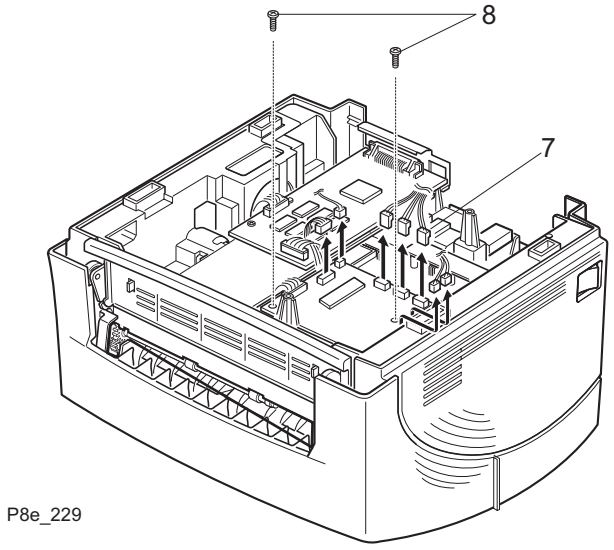
CAUTION

These components are susceptible to electrostatic discharge. Observe all ESD procedures to avoid damage.

Removal

1. Switch the printer power off and disconnect the AC power cord.
2. Remove the Print Cartridge (REP 4.5.1).
3. Remove the Rear Cover (REP 4.1.3).
4. Turn the printer up side down.
5. Remove the Bottom Shield (REP 4.6.1).
6. Remove the Engine Controller PWB (REP 4.6.2).
7. Disconnect CN401, CN402, CN403, CN404, CN405, CN407 and CN408 from the Joint PWB (Figure 4.6.6a).
8. Remove the three screws securing the Joint PWB to the Printer Frame (Figure 4.6.6a). Remove the Joint PWB.

Figure 4.6.6a. Joint PWB Removal.



Replacement

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

Section 5

General Procedures and Information

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

CAUTION

These components are susceptible to electrostatic discharge. Observe all ESD procedures to avoid damage.

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

The DocuPrint P8e 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

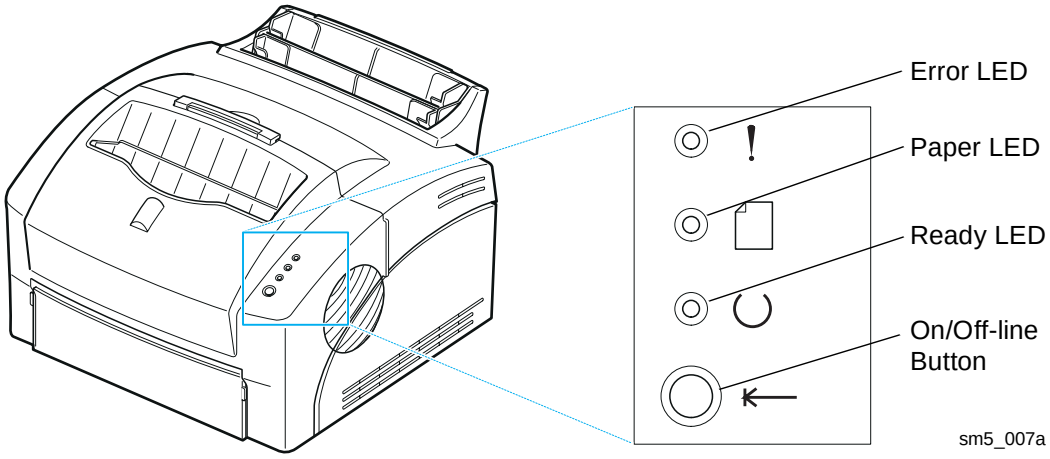
5.2.1 Control Panel

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 On/Off-line button and three indicator LEDs.

The On/Off-line button has multiple functions that enable the user to select the desired operation.

The three Indicator LEDs: red (Error), amber (Paper), and green (Ready). These LEDs 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 provides various LED conditions and describes their significance.

Indicator	Description
Error LED (on)	There is no print cartridge. The cover is open. There is a paper jam (if the Paper LED is on). Other error condition.
Error LED (blink)	Printer memory is insufficient for print job.
Paper LED (on)	The paper tray is empty. There is a paper jam (if Error LED is also on).
Paper LED (blink)	The printer is on manual feed mode (push On/Off-line button to feed paper from manual feeder).
Ready LED (on)	The printer is ready to receive and process data.
Ready LED (blink)	The printer is receiving or processing data.
Ready LED (off)	The printer is offline
All LEDs (blink)	Possible printer failure.

5.2.2 Printer Modes

The DocuPrint P8e has two modes of operation, each with its own set of options.

1. Ready Mode (online)
2. 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 switched on. The printer can be taken Offline by pressing the On/Off-line button. When the button is pressed the Ready LED will go off. Ready Mode may be restored by pressing the On/Off-line button again.

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/processing data, or printing. When the Ready LED is OFF, the printer is Offline.

5.2.2.2 Test Mode

In Test Mode, the printer is able to print a one page configuration sheet.

Local Test Mode

To initiate a printer self-test and print a configuration sheet, follow these steps:

1) Make sure the printer in on-line.
2) Press and hold the On/Off-line button until all three LEDs are blinking (approximately four seconds), then release the button. The configuration sheet will be printed.

Remote Test Mode

The Remote Control Panel software can be used to tell the printer to print a one page printer configuration sheet, although it cannot make the printer do a self-test.

5.2.3 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 On/Off-line button has been pressed to take the printer off line), press and hold the On/Off-line button until all three LED's are blinking. When the button is released, all the LEDs except the Ready LED go out.

5.2.4 Print Cartridge Cleaning Procedure

This procedure is used to remove excess toner from the Print Cartridge.

To initiate this procedure, the "Ready" LED must be ON.
Press and Hold the On/Off-line button until all four LED's remain lit (not blinking) and the Printer begins to cycle 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.

5.3 Printer Software

The customer has a choice of different software configurations depending upon their needs. The DocuPrint P8e can be configured for Windows 3.1x, Windows 95/98 or Windows NT 4.0. The printer software includes: Print Drivers, Remote Control Panel (RCP), and Status Monitor. This section describes each of the software selections.

These programs enable the user to:

- be alerted of any printer changes (Status Monitor)
- configure the printer (driver) (RCP for DOS programs inside Windows)
- set default parameters for the current print job (driver) (RCP for DOS programs inside Windows)
- adjust toner usage (RCP)
- print a configuration sheet, handle printer fonts and print a demo page (RCP)

5.3.1 Installing Software

To install the software, the printer does not need to be connected to the computer or be on. However, in order to start the RCP or SM programs, the printer must be powered on and properly connected by a IEEE-1284 compliant parallel printer cable.

5.3.1.1 Installing Printer Drivers

Installing the software for Windows 95/98

1. Start Windows. If Windows detects new hardware, click cancel.
2. Insert the disk labeled “Xerox DocuPrint P8e Driver Disk” into your computer’s floppy drive.
3. From the Start menu, select Run.
4. In the Run dialog box, type a:\setup (or b:\setup) and press Enter.
5. Follow the on-screen instructions to complete the installation.
6. Remove the diskette before restarting Windows.
7. Restart Windows, as prompted, when the installation is complete.

Installing the software for Windows 3.1x

1. Start Windows.
2. Insert the disk labeled “Xerox DocuPrint P8e Driver Disk” into your computer’s floppy drive.
3. From the Program Manager, select Run from the File menu.
4. In the Run dialog box, type a:\setup (or b:\setup) and press Enter.
5. Follow the on-screen instructions to complete the installation.
6. Remove the diskette before restarting Windows.
7. Restart Windows, as prompted, when the installation is complete.

Installing software for Windows NT 4.0

1. Start Windows.
2. Insert the disk labeled “Xerox DocuPrint P8e NT 4.0 Disk” into your computer’s floppy drive.
3. From the Windows NT 4.0 Start menu, select Settings, then Printers.
4. Double click on the Add Printer icon.
5. Click on My Computer and Next.
6. Select the port you are using, typically LPT1, then click on Next.
7. The computer will list different printer manufactures and models. Click on Have Disk.
8. In the Install from Disk dialog box, in the input box marked “Copy Manufacturer’s Files From:”, make sure it says “a:\”. Click on OK
9. Xerox DocuPrint P8e will be listed. Click on Next.
10. Follow the on-screen instructions to complete the installation.

5.3.1.2 Installing Status Monitor and Remote Control Panel

Installing the software for Windows 95/98

1. Insert the diskette labeled “Xerox DocuPrint P8e RCP and SM Disk” into your computer’s floppy drive.
2. From the Start Menu, select Run.
3. Type A:\setup and press Enter. Follow the on-screen instructions to complete the installation.

Installing the software for Windows 3.1x

1. Insert the diskette labeled “Xerox DocuPrint P8e RCP and SM Disk” into your computer’s floppy drive.
2. From the Program Manager, select File, Rum.
3. Type a:\setup and press Enter. Follow the on-screen instructions to complete the installation.

Installing software for Windows NT 4.0 (RCP only)

1. Insert the diskette labeled “Xerox DocuPrint P8e NT 4.0 Disk” into your computer’s floppy drive.
2. From the Start Menu, select Run.
3. Type A:\ntrcp\setup and press Enter. Follow the on-screen instructions to complete the installation.

Installing software for DOS

1. Insert the diskette labeled “Xerox DocuPrint P8e RCP and SM Disk” into your computer's floppy driver.
2. At the DOS prompt, enter the following commands:
   > md dosrcp
   > cd dosrcp
   > copy a:\dosutil*.*
   > dosp8e.bat

5.3.2 Status Monitor

NOTE: The Status Monitor is not available with Windows NT 4.0.

The Status Monitor program runs in background mode. 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 Window’s Print Manager must be disabled to get the Status Monitor to operate correctly.

Status Monitor Messages

ON-LINE: The printer is in Ready Mode, online and is ready to receive print data. The printer may be in standby mode or Power Save mode. When first turned on, the printer goes to this mode.

OFF-LINE: The printer is off-line and not ready to receive print data. The user needs to press the On/Off-line button in order to go to ON-LINE mode.

Cover Open or Missing Cartridge: This message could either mean one or both of the following conditions have occurred:

- The printer's front cover is not closed properly
- The image cartridge is not installed or installed improperly.

Can't communicate with printer. Please check printer.: This error usually indicates some sort of hardware-related problem such as:

- The printer is turned off.
- The printer cable is not connected or not connected properly.
- The printer cable is defective.
- The printer port and software driver settings don't match.

Technician's Note: In the current release of the printer and software, sometimes this message pops up for a few seconds and goes back down again when the printer is busy: i.e. printing a job or warming up the fuser.

Paper Tray Open or Empty.: There is no paper either in the Multipurpose Paper Feeder or Manual Feeder.

Paper jam near input feeder.: The printer had problems grabbing paper from either the Multipurpose Paper Feeder or Manual Feeder. Paper should be pulled out, arranged carefully, and put back into the feeder. If there are only a few sheets of paper in the MPF and/or the paper in there has excessive curl, paper jams of this type will occur.

Paper jam near inside rear of printer.: The printer had a jam while feeding paper into the xerographic area. To remedy the problem, the user should open the cover, remove the image cartridge, and paper cleared.

Paper jam near front of printer.: The printer had a jam in the area from the fuser to face-up stacker or fuser to face-down stacker. To remedy the problem, the user should clear any paper from the stackers, open the cover, tear off any jammed paper, remove the image cartridge, and clear any remaining paper - without using excessive force. If any paper is still jammed in the roller assembly to the face-down stacker, this will clear when the printer cover is closed and the printer warmed-up.

Memory Full.: The printer is unable to print the current print job because of insufficient memory due to the complexity of the print job or too many fonts. For this current release, this status error message is not implemented but is planned for future releases.

Unknown Error.: A catastrophic printer failure such as a laser or fuser error has occurred. For this current release, it is not known whether this error message has been implemented.

5.3.3 Remote Control Panel (RCP)

The Remote Control Panel (RCP) has several different functions. As opposed to the driver which allows the user to control how Windows applications drive the printer, the RCP is used to control printer defaults for DOS applications run from inside Windows, i.e. MS-DOS Command Prompt. The RCP is also used to set printer-specific features such as econo mode and Power Save time. These latter features are stored in non-volatile memory in the printer. The RCP provides six different tabbed control panels:

- **Total View** displays the current printer settings. NOTE: This view is not available in Windows NT.
- **Printer** enables adjustment of general printing parameters.
- **Page** enables choice of page layout, paper type, orientation, 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 a demonstration page and a configuration page. NOTE: This view is called About/Test Printer in Windows NT.

To start the Remote Control Panel for Windows:

Windows 95/98 and Windows NT 4.0 - Select Program from the Start menu. Select Xerox DocuPrint P8e, then Remote Control Panel from the drop down list.

Windows 3.1x - Double click the Xerox RCP folder in Program Manager. Double click the RCP&SM icon.

The RCP window (shown on the next page) contains three main areas. The top area is a series of tabs enabling the choice of any of five RCP views: Total View, Printer, Page, Font, Quality and Test. To select a view, click on the appropriate tab. Beneath the row of tabs is the content for the current tab selection.

At the bottom of the screen is an array of six buttons: Send, 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).

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

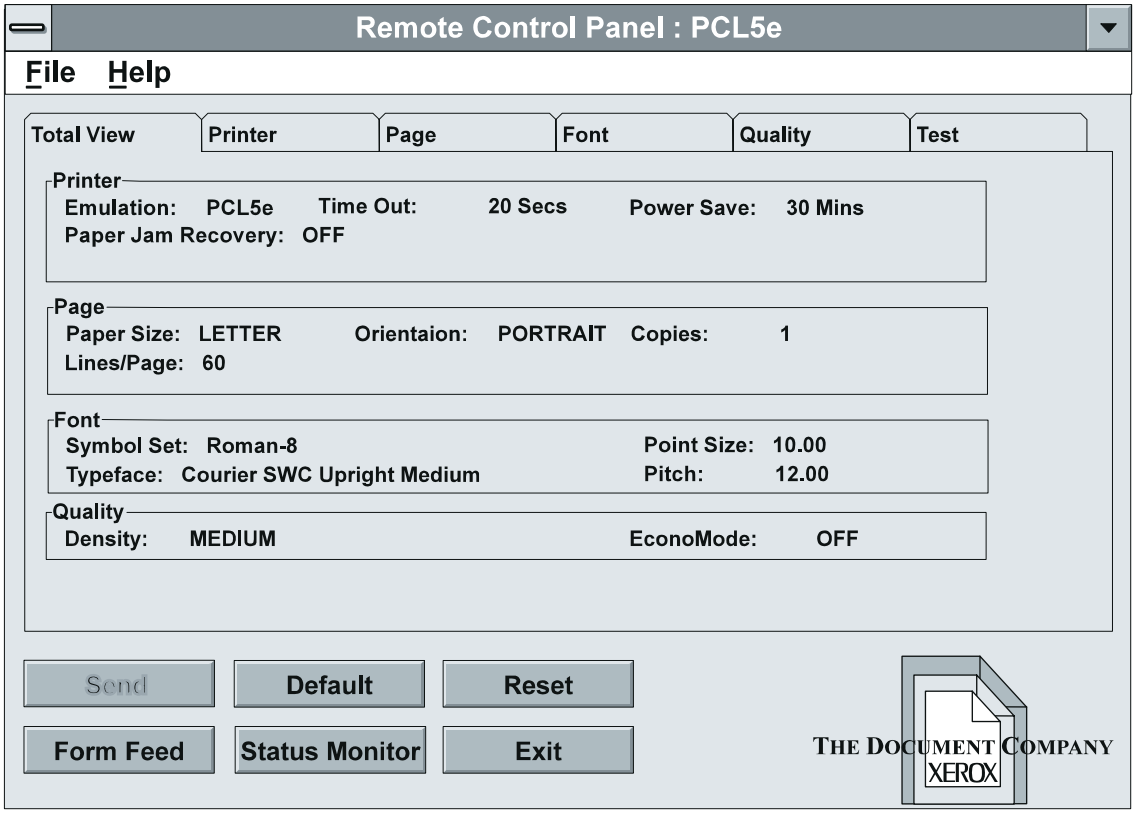
Reset: Resets any changes in the RCP the user may have considered implementing but not yet sent to the printer. Changes RCP to values older values - settings from the printer.

Form Feed: The program sends a form feed character to the printer. In most cases, the printer should print a page with whatever was in printer memory. However, if the printer was accepting graphics information before the RCP was started, the printer may interpret the form feed character to be data and thus not eject a page.

Status Monitor: Displays the current printer status. NOTE: This button is not available in Windows NT.

Exit: Closes the Remote Control Panel.

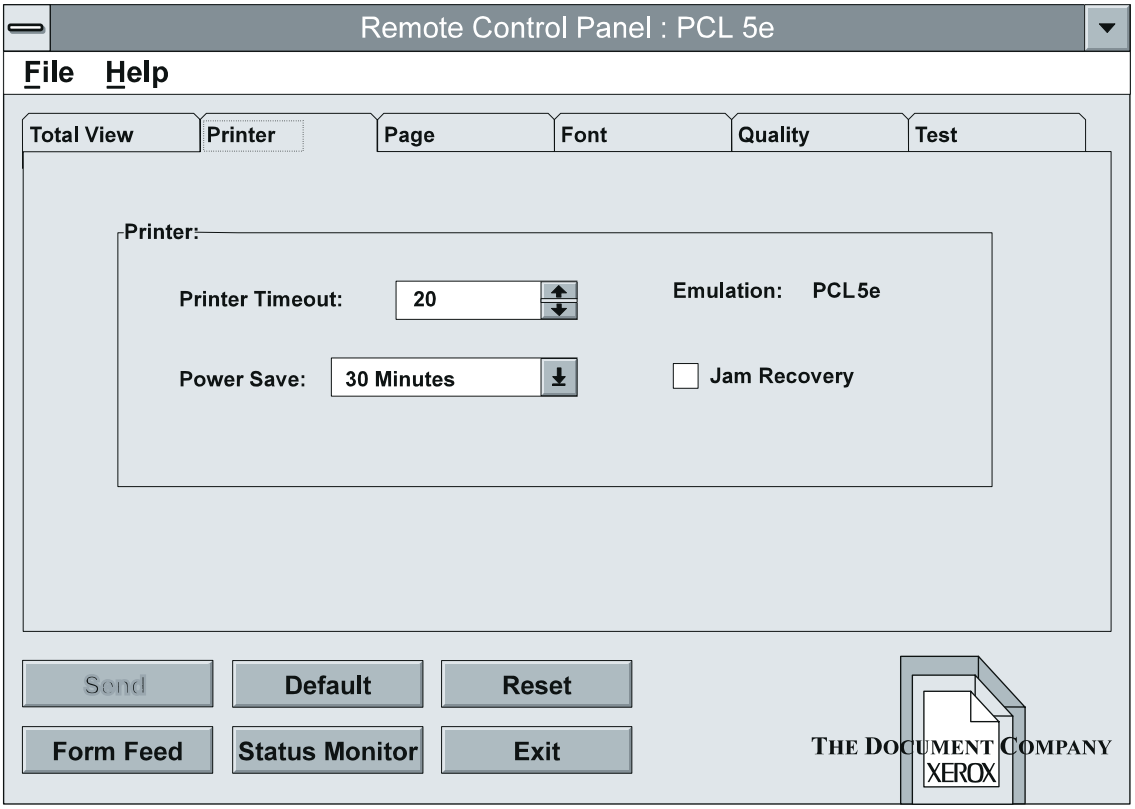
5.3.3.1 Total View Tab



sm5_001

The Total View tab (shown above) displays the current printer parameters. The parameters are divided into sub groups which correspond to the RCP tab selections. NOTE: this tab is not available in Windows NT.

5.3.3.2 Printer Tab



sm5_002

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

Timeout: Sets how long after receiving data the printer waits before feeding paper. The default value is 20 seconds.

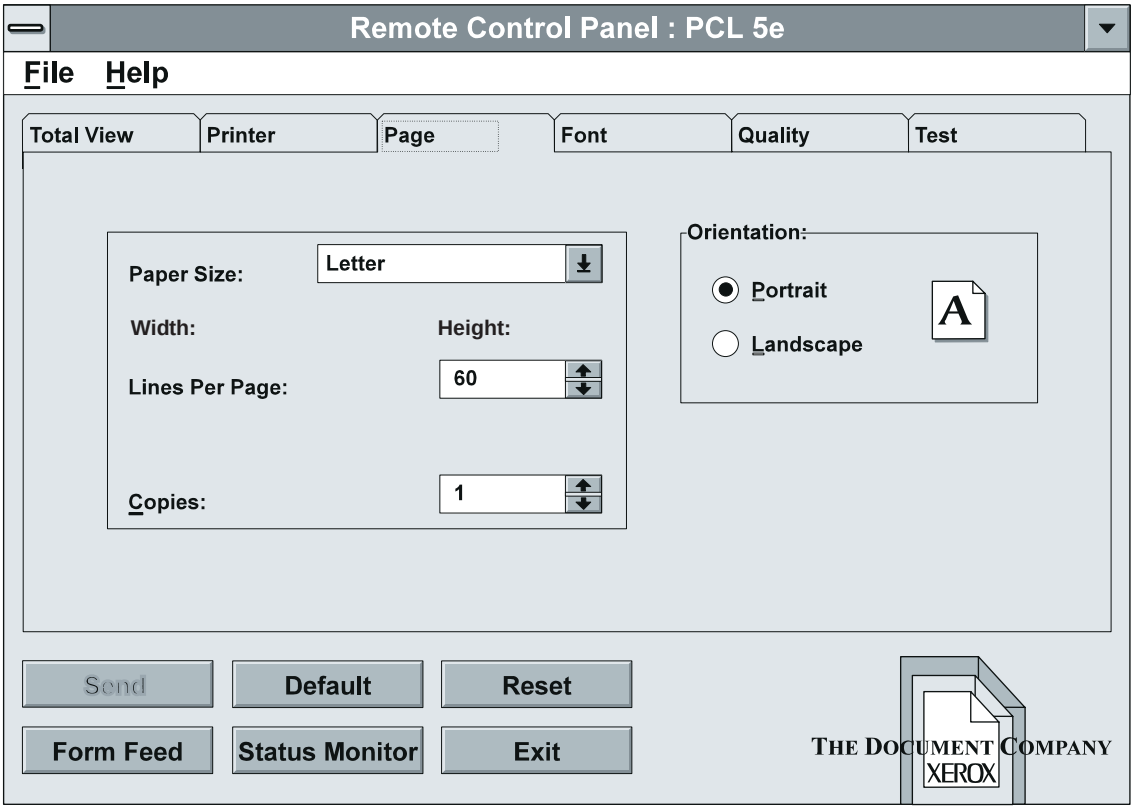
Power Save: While waiting for a printout, the printer is in standby mode (18W), but it can go into a sleep mode with the fuser off (10W). The default time value to change from standby to Power Save mode is 30 minutes.

Emulation: Shows the current emulation. It will always display PCL 5e.

Paper Jam Recovery: If this is checked, the printer will reprint pages that were jammed in the printer. This feature is only applicable when a jam occurs either in the input feeder area or xerographic area, i.e. Status Monitor messages “Paper jam near input feeder” or “Paper jam near inside rear of printer.” If a jam occurs near the output stackers, i.e. SM message “Paper jam near front of printer”, the printer will be unable to reprint this page.

.

5.3.3.3 Page Tab



sm5_003

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

Paper Size: Sets the default size of the image that will print on paper or envelope. The default value is letter for 110 VAC operation and A4 for 220 VAC printers.

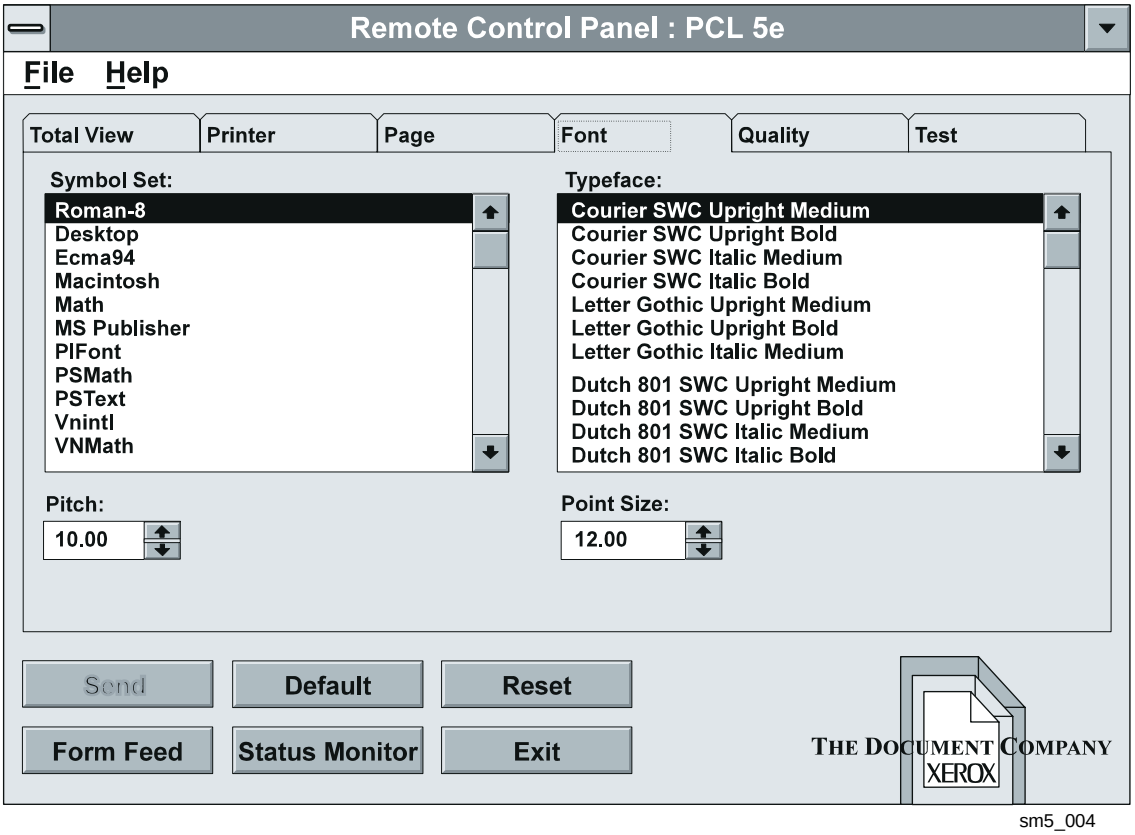
Lines Per Page: Sets the number of lines per page.

Copies: Sets number of copies to be printed.

Orientation: Determines the orientation of the image on the paper.

.

5.3.3.4 Font Tab



sm5_004

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

Typeface: Shows the typeface of the current font.

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.

Symbol: Lists the various groups of font-specific characters and symbols.

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.

5.3.3.5 Quality Tab

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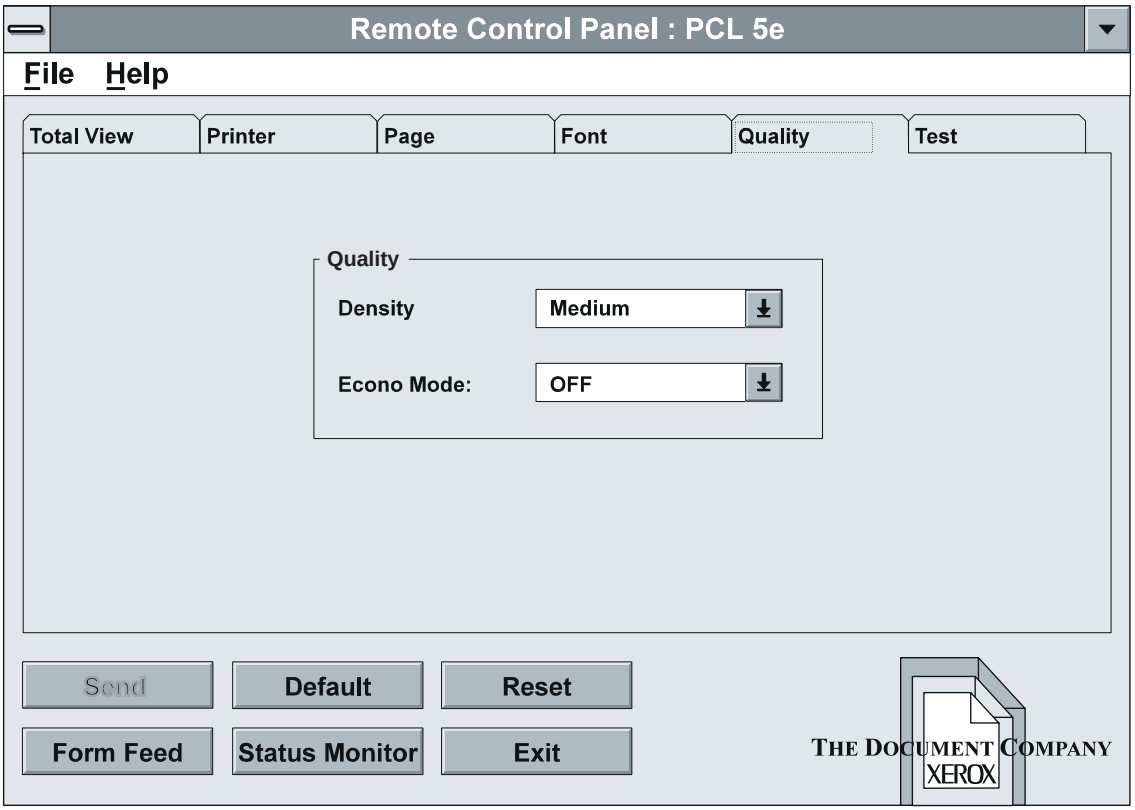

sm5_005

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

Density: Determines the overall density of the printed image.

Econo Mode: Determines the toner quantity to use when printing. If this mode is set to ON, the printer conserves toner when printing (the printer uses roughly 50% less toner than usual). If the value is OFF, it provides 100% usage. The default value is OFF.

5.3.3.6 Test Tab

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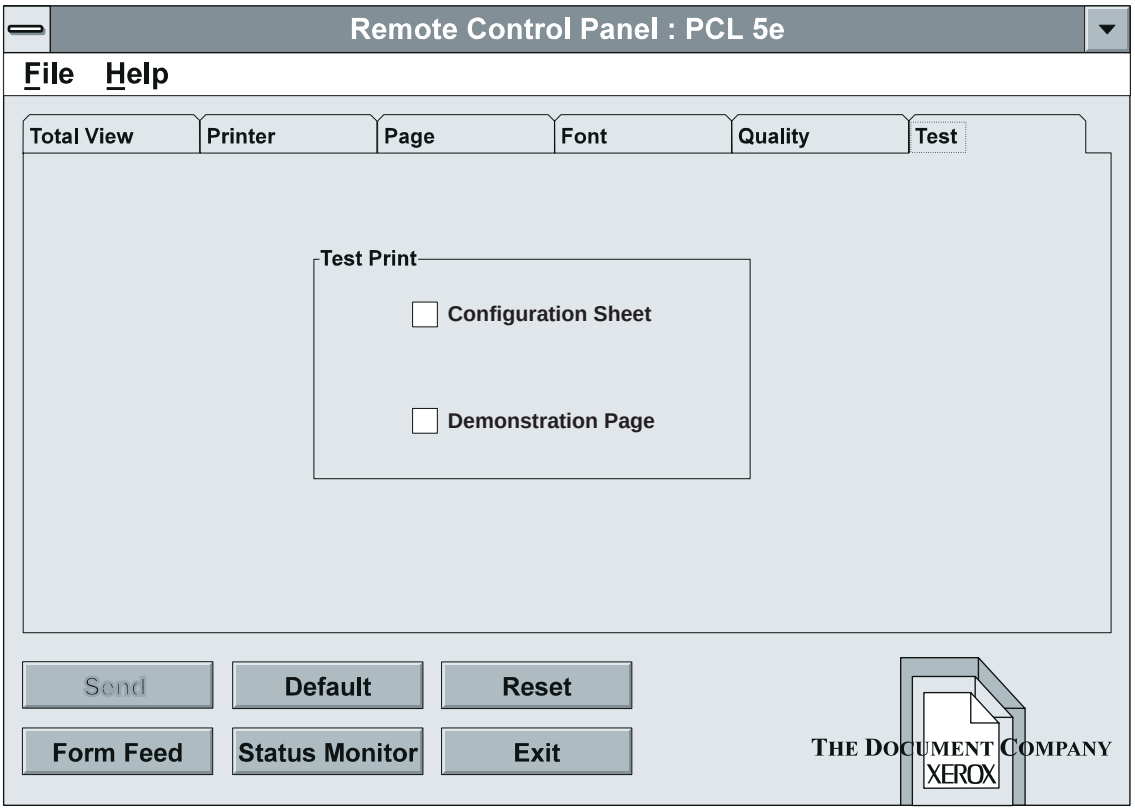


sm5_006

The Test tab (shown above) contains the software copyright notice and version level. It also enables the printing of the following test documents:

Configuration Sheet: Prints the printer's current configuration.

Demonstration Page: Prints a demonstration page showing the main features of the printer. Technician's Note: The demonstration page states that standby mode uses "less than 18 Watts" of power. The true value is 10 Watts.

5.4 The Diagnostic Control Unit (DCU)

The Diagnostic Control Unit (DCU) (600T80340) 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.

5.4.1 Connecting the DCU

Follow the instructions below to connect the DCU to the Engine Controller PWB.

1. Switch off the printer and disconnect the AC power cord. NEVER ATTEMPT TO CONNECT THE DCU WHILE THE PRINTER POWER IS ON.
2. Remove the face up Cover.
3. Remove the front cover.
4. Remove the bottom panel.
5. Install the front cover.
6. Plug the DCU's four-pin connector into CN3 on the Engine Controller PWB.
7. **The Front Cover / Print Cartridge Interlock Switch must be actuated to perform the DCU tests.** The Print Cartridge must be in place and the Front Cover closed or the interlock cheated to run the tests.
8. Reconnect AC power and switch on the printer.

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:

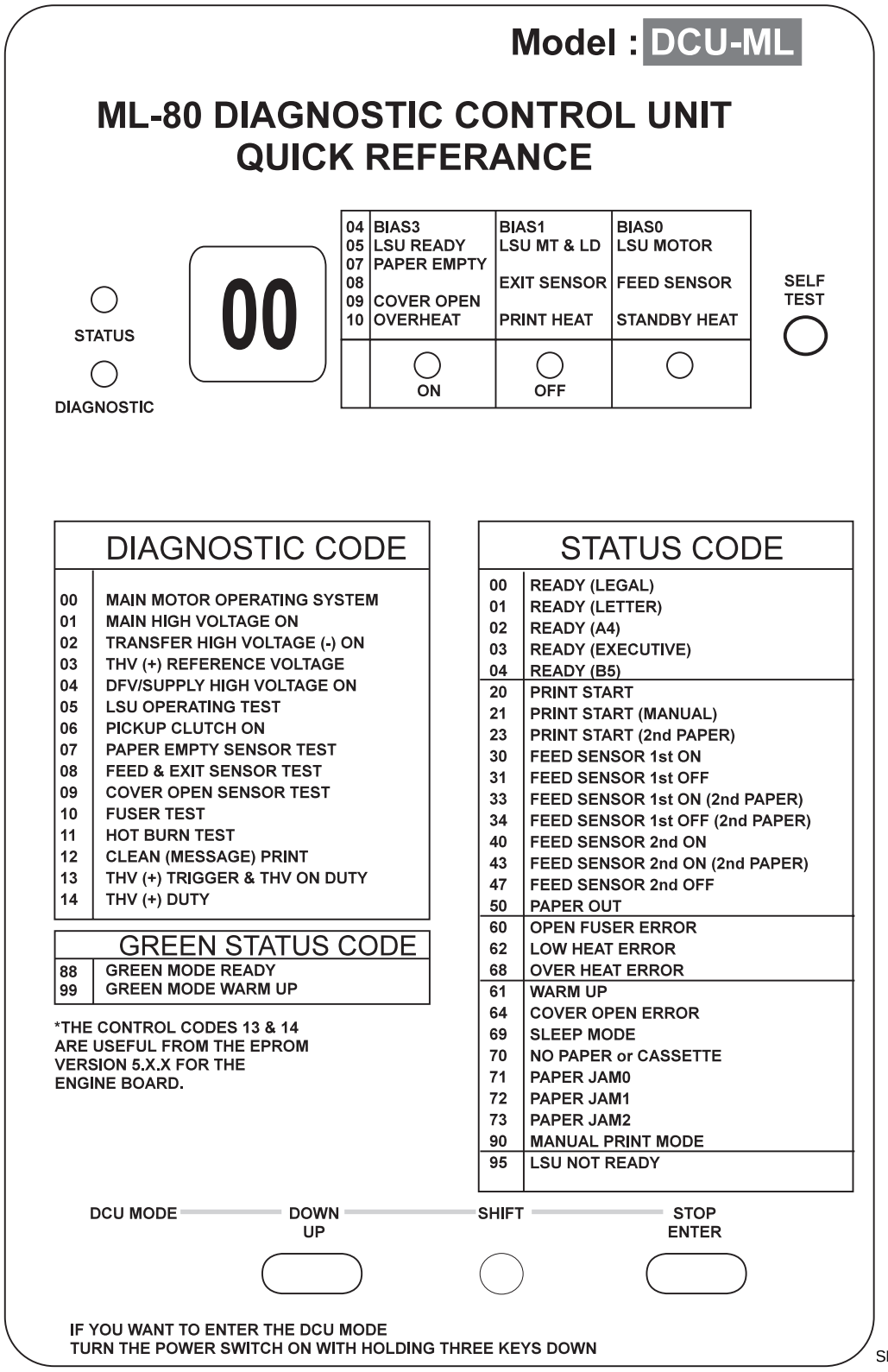
- Status Mode
- Diagnostic Mode

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



5.4.2.1 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 on the following page.)

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 5.4.2 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 sensor
30	Feed sensor 1st on	68	Overheating error
31	Feed sensor 1st off	70	No paper
33	Feed sensor 1st on (second paper)	71	Paper jam (between feeder and feed sensor)
34	Feed sensor 1st off (second paper)	72	Jam1 (between feed sensor and exit sensor
40	Second feed sensor on	73	Jam2 (at exit sensor)
43	Second feed sensor on (second paper)	90	Manual mode
		95	LSU not ready

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.

5.4.2.2 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 switched on. If the printer is already connected and in the Status Mode, it is necessary to switch off the printer, hold down the three keys, and switch on the printer.

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.

5.4.3 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 switching off the printer.

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

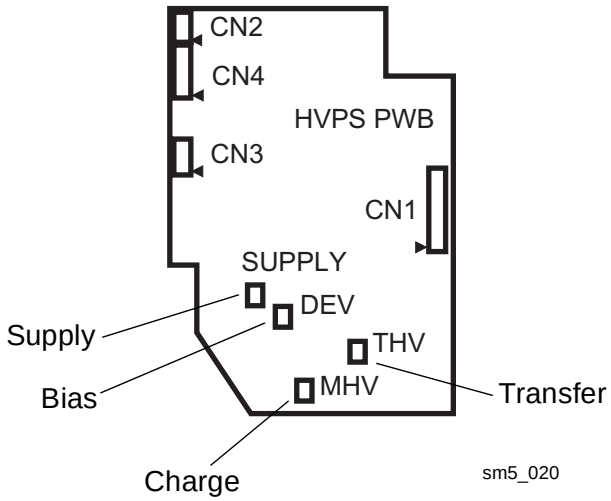
The four voltage tests (01-04) require use of a multimeter and probes. Test results are determined from the multimeter readings (Column 3). Figure 5.4.5a illustrates the locations of the high voltage test points and Table 5.4.5a indicates the voltage for each.

Table 5.4.5a High Voltage Readings.

All readings are Volts DC, +/- 5%

DCU Test	Test Point	Voltage Reading on High Voltage PS
01	Charge	-1400
02	Metal end of BTR Roller	-220 to -550
03	Metal end of BTR Roller	600 to 2800
04 Bias Medium Bias Dark Bias Medium Bias Dark	 Bias Bias Supply Supply	 -300 -350 -500 -500
13 Transfer Trigger Transfer Duty	 Transfer Transfer	 495 673
14 Transfer Duty	 Transfer	 673

Figure 5.4.5a High Voltage Test points.



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 On	LEDs Off	LEDs ___	To End Test
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 Medium Bias Dark	Press ENTER Press UP	Voltage On Voltage On	Lit	Lit	Lit	Pressing Up stops one test and starts next Shift + Stop
05	Laser Assembly Laser Diode & Motor ON  SM5_014	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	Continous Printing	Press ENTER	Prints test prints		Lit		Unplug Printer
12	Print Cartridge Cleaning Cycle (continous)	Press ENTER	Cleaning Prints		Lit		Unplug Printer
13	Transfer Transfer Trigger Transfer Duty	Press ENTER Automatically Switches	Voltage On Voltage On	Lit Lit	Lit	Lit	Shift + Stop
14	Transfer Duty	Press ENTER	Voltage On	Lit			Shift + Stop

5.5 Engine Controller PWB

The Engine Controller PWB:

- Includes a motor driver that provides the signal necessary to turn the Main Motor.
- Provides the control signal that energizes the paper pick-up solenoid.
- Includes a temperature control circuit that monitors the fuser temperature and turns the heat rod on and off.
- Monitors the signal from the Cover Open Sensor. If the front cover is open or the Developer unit is out of the machine or installed correctly the printer will not operate.
- Provides the control signals necessary to operate the laser.
- Identifies the installation of a new Print Cartridge.

The Engine Controller PWB monitors four paper sensors.

- **Feed Sensor:** Located before the transfer process. Senses if paper is feeding and starts the process of sending image data to the laser.
- **Exit Sensor:** The Exit Sensor is located next to the fuser and monitors paper travel in the fuser area.
- **Paper Detect Sensor:** This sensor senses if there are papers in the Multipurpose Paper Feeder.
- **Paper Width Sensor:** Located on the side of the paper path, this sensor is used to detect narrow paper.

5.6 Installing Additional Memory

The printer is equipped with 4Mb of resident base memory which is expandable to a total of 36Mb. 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.

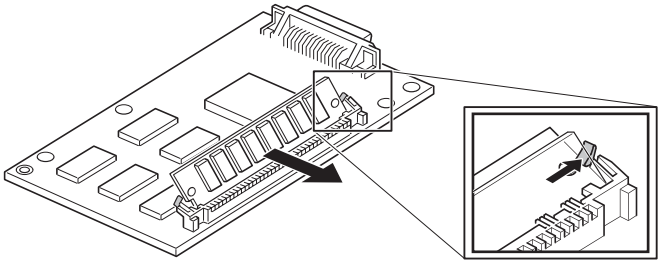
On the Controller PWB, there is only one SIMM slot dedicated to increase the printer memory. There are four available SIMM options to increase the printer memory up to a total of 36Mb. All SIMMs are industry standard EDO 72 pin 32-bit memory (no parity, 60 ns or faster), and are available in sizes of 4, 8, 16, or 32MB. When the SIMM is installed, the Controller PWB will automatically detect the memory and increase the printer buffer size.

To install an additional memory module:

1. Switch off printer and disconnect the AC power.
2. Disconnect all cables from the back of the printer.
3. Open the front cover and remove the Print Cartridge.

4 Turn the printer upside down and remove all the screws securing the shield cover. Remove the shield cover.

5 If you are replacing a SIMM, push out on the metal clips at each end of the SIMM connector and pull the SIMM toward you and lift it out.



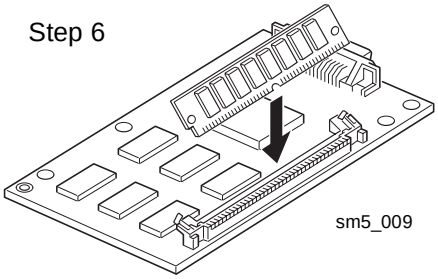
sm5_010

6 Hold the SIMM with the connection points pointing toward the control board and insert the SIMM all the way into the connector at a 45 degree angle.

7 Push the SIMM away from you until it snaps into place.

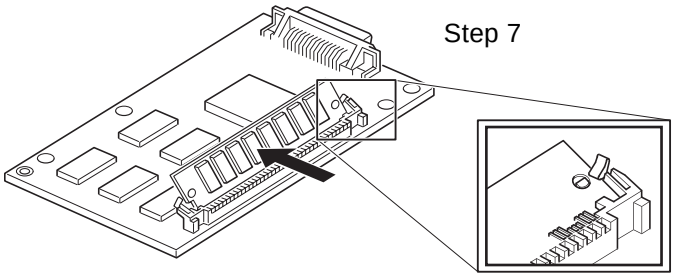
Make sure both metal clips on the connector are fastened and the two pins on the connector are pushed through the holes on the SIMM.

Step 6



sm5_009

Step 7



sm5_008

8 Replace the shield cover.

9 Turn the printer back over and replace the image cartridge.

5.7 EPROM Update Procedure

There are two components in the P8e printer that may be upgraded in the field, a Flash EPROM and an EPROM. The Flash EPROM contains the OS Version and PCL5e Version. The Flash EPROM can be upgraded without any physical work on the printer. The EPROM, on the other hand, must be upgraded by physically changing a chip on a circuit board. The EPROM contains the Engine Version. The two work together, you can not mix and match different version numbers.

The update procedure works in the following environments:

- MS-DOS version 6.22
- Windows 95, F8 Command Prompt Only boot
- Windows 95, MS-DOS Command Prompt
- Windows 95, Shutdown - Restart computer in MS-DOS mode
- Windows 3.1, Exit Windows and go to plain DOS version 6.22

NOTE: This procedure does not work with the Windows NT Version 4.0 MS-DOS Command Prompt.

The procedure requires two zipped files which contain the following files:

- fprt.exe
- xerox-lt.110 (if default paper size is letter)
  or xerox-a4.220 (if default paper size is A4)
- rom.XXX (XXX represents the version level, i.e. 103 for version 1.03)
- boot.XXX (XXX represents the version level, i.e. 103 for version 1.03)

The computer's parallel port should be assigned as standard LPT1 (hex 378) before beginning the procedure.

Procedure

1. Unzip the files to a temporary directory.
2. Make sure the printer is powered off and the parallel cable is IEEE-1284 compliant and connected properly.
3. Hold the On/Off-line button and switch on the printer. Continue holding the button for 3-4 seconds until the LEDs are scrolling in this fashion: error, paper, ready, error, paper, error. Release the On/Off-Line button.
4. At the C> prompt, type: **fprt boot.XXX lpt1** (XXX represents the version level, i.e. 103 for version 1.03).
5. When all the LEDs are blinking simultaneously, approximately 10 seconds, switch off the printer.
6. Hold the On/Off-line button and switch on the printer. Continue holding the button for 3-4 seconds until the LEDs are scrolling in this fashion: error, paper, ready, error, paper, error. Release the On/Off-Line button.
7. At the C> prompt, type: **fprt rom.XXX lpt1** (XXX represents the version level, i.e. 103 for version

1.03).

8 Wait approximately 1-2 minutes until the message “The printing is completed!” is displayed and the LED’s are blinking simultaneously. Switch off the printer.

9 Switch the printer back on. The printer should go to an on-line condition with the ready LED on.

10 At the C> prompt, type: **fprt xerox-lt.XXX lpt1** (XXX represents the version level, i.e. 103 for version 1.03). This tests 115 VAC systems with a default for letter size paper
OR
At the C> prompt, type: **fprt xerox-a4.XXX lpt1** (XXX represents the A4letter size paper.

The ready LED should stay on.

11 Switch off the printer and then switch it back on.

12 Print a configuration sheet by holding the On/Off-line button down for about 5 seconds until all the LEDs are blinking, then release the button.

13 The configuration sheet should list a OS version that corresponds with the version you have just installed.

5.8 Supplemental Tools and Supplies

5.8.1 Tools/Kits

Item	Part Number
Anacom G80	600T80138
Diagnostic Control Unit	600T80340
High Voltage Probe	600T1653

5.8.2 Supplies

Item	Part Number
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

Xerox Europe (XE)

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

5.9 Abbreviations

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

Section 6

Wiring Data

6.1 Introduction

This wiring section contains the master connection diagram, the circuit board layouts, and the circuit board wiring diagrams.

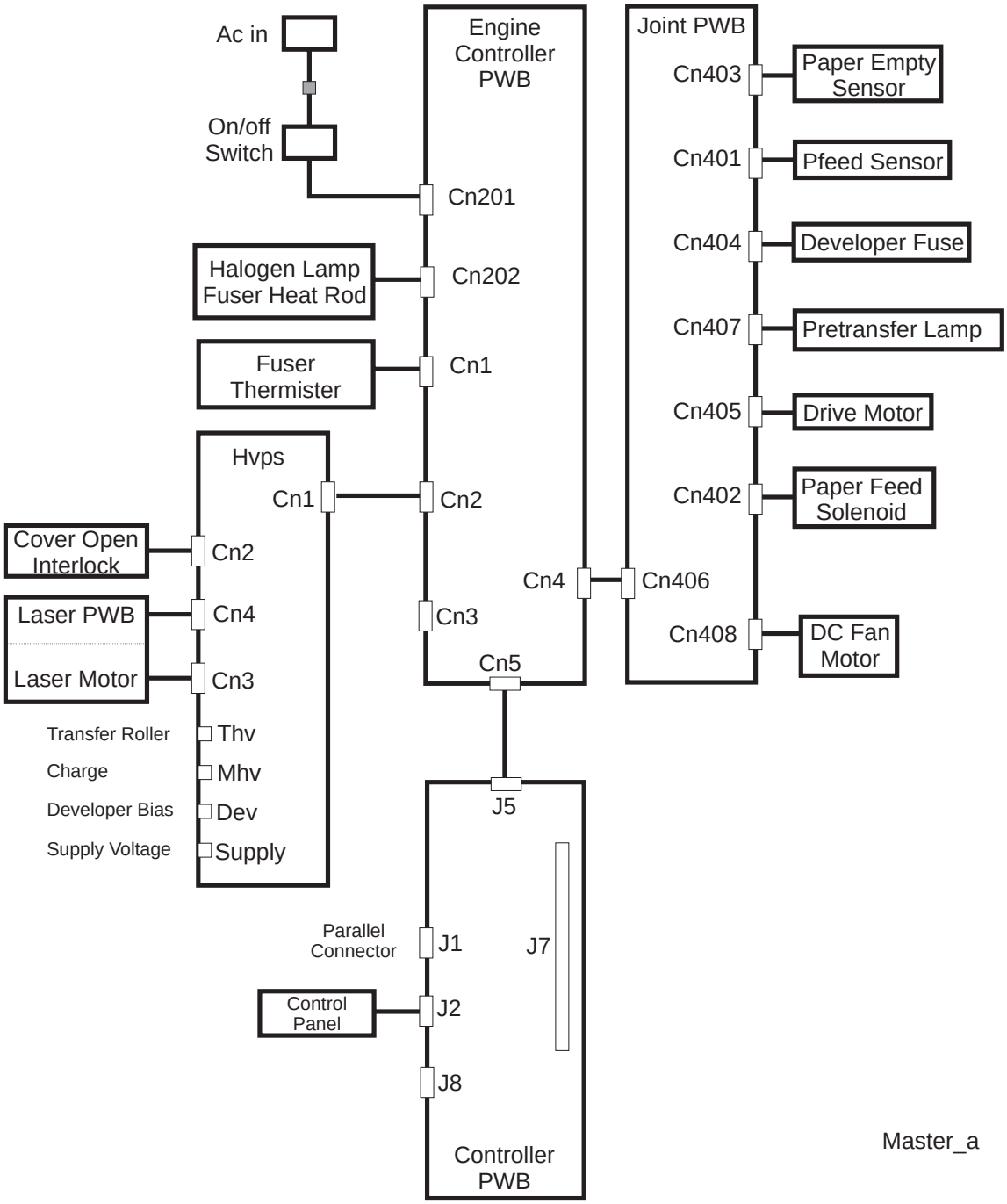
The master connection and wiring diagram illustrates all the circuit boards and electrical components and how they are connected.

The circuit board layout section contains the circuit board layouts and the wiring connectors. The circuit board illustrations show the locations of the connectors and any sensors located on the board. Each connector has an arrow that indicates the position of pin one for that connector.

The wiring diagrams illustrate the wiring connections between the circuit boards and between circuit boards and components.

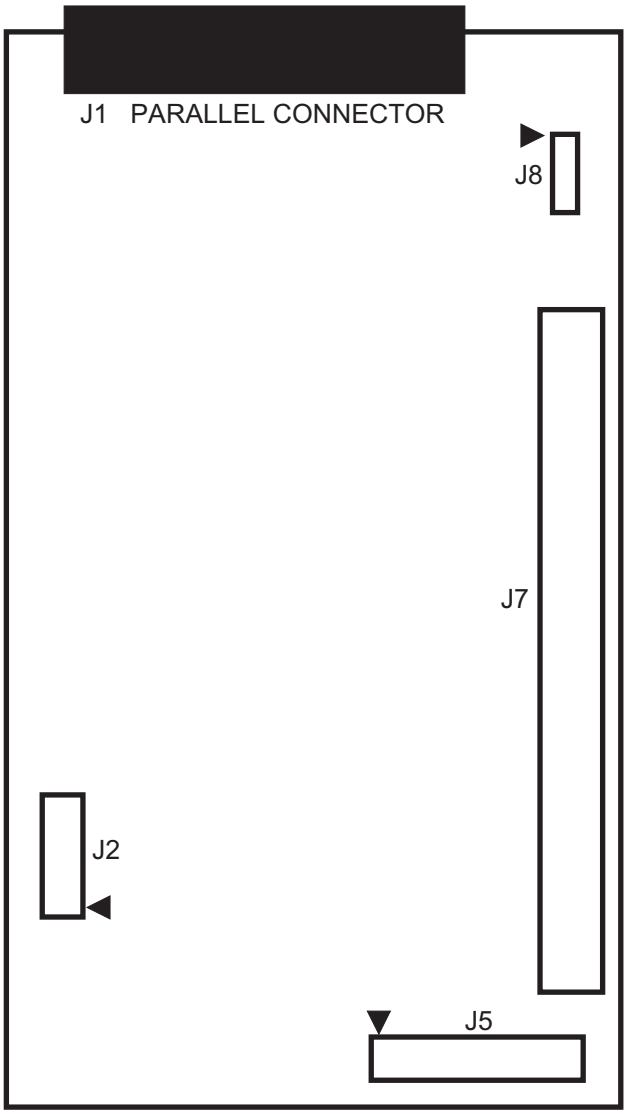
6.2 Connection and Wiring Diagrams

6.2.1 Master Connection and Wiring Diagram

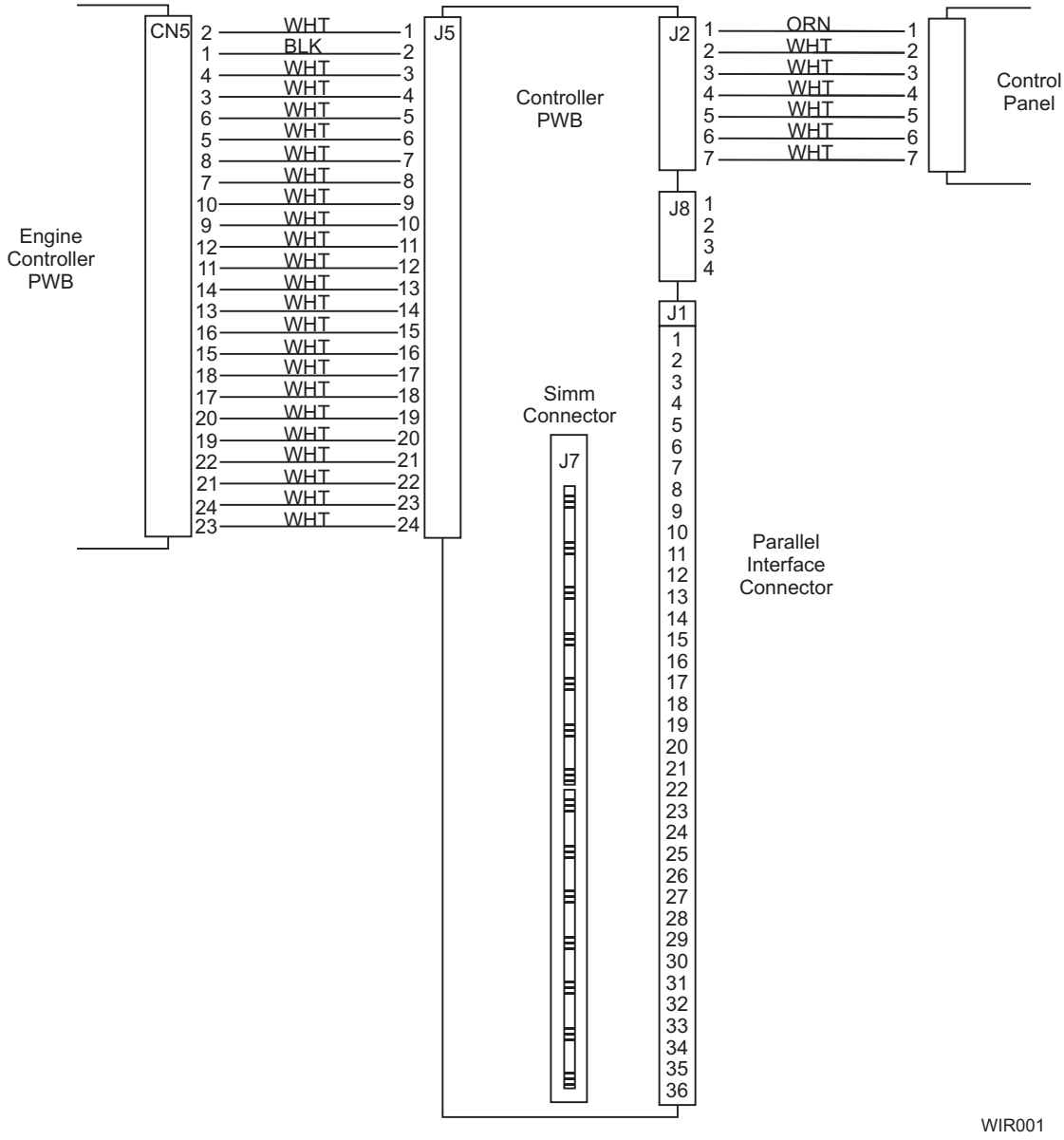


6.3 Circuit Board Layout

6.3.1 Controller PWB



Control


Engine Controller PWB
CN5
2 WHT 1
1 BLK 2
4 WHT 3
3 WHT 4
6 WHT 5
5 WHT 6
8 WHT 7
7 WHT 8
10 WHT 9
9 WHT 10
12 WHT 11
11 WHT 12
14 WHT 13
13 WHT 14
16 WHT 15
15 WHT 16
18 WHT 17
17 WHT 18
20 WHT 19
19 WHT 20
22 WHT 21
21 WHT 22
24 WHT 23
23 WHT 24
J5
Controller PWB
J2
1 ORN 1
2 WHT 2
3 WHT 3
4 WHT 4
5 WHT 5
6 WHT 6
7 WHT 7
Control Panel
J8
1
2
3
4
J1
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
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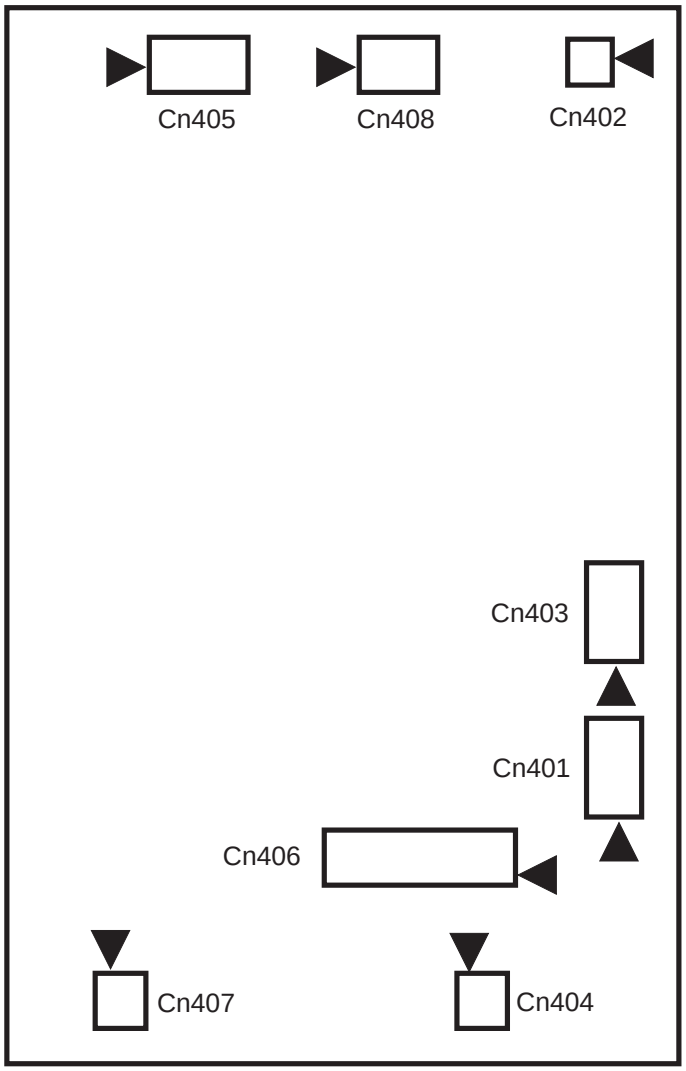
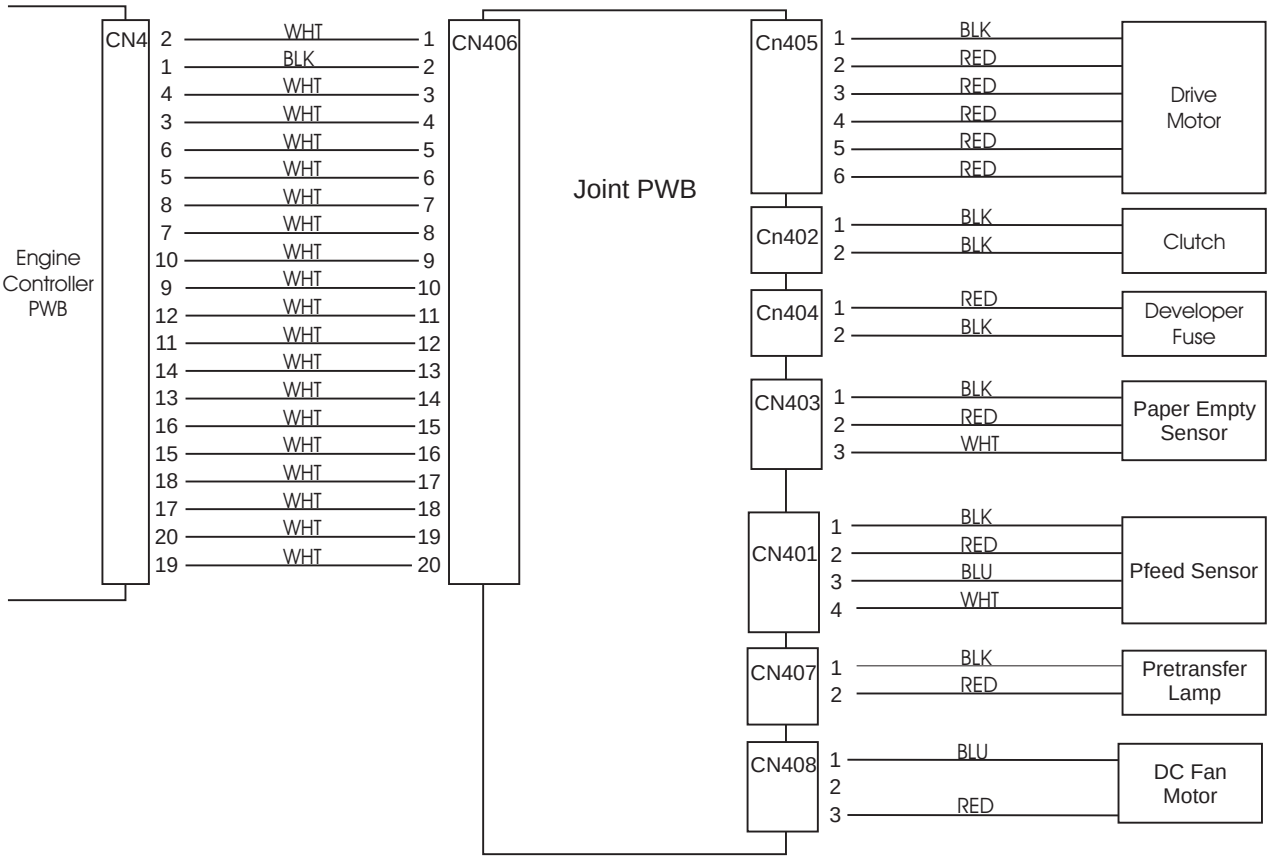
23
24
25
26
27
28
29
30
31
32
33
34
35
36
Simm Connector
J7
Parallel Interface Connector
WIR001

6.3.2 Joint PWB

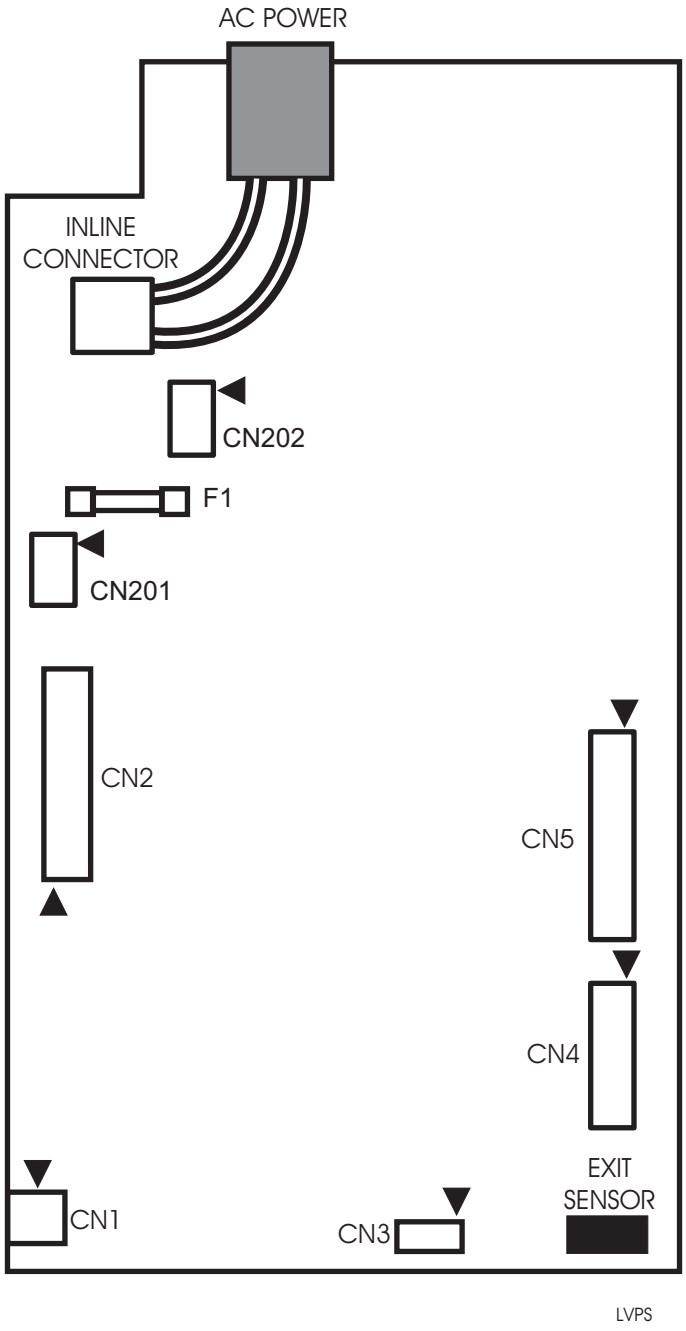


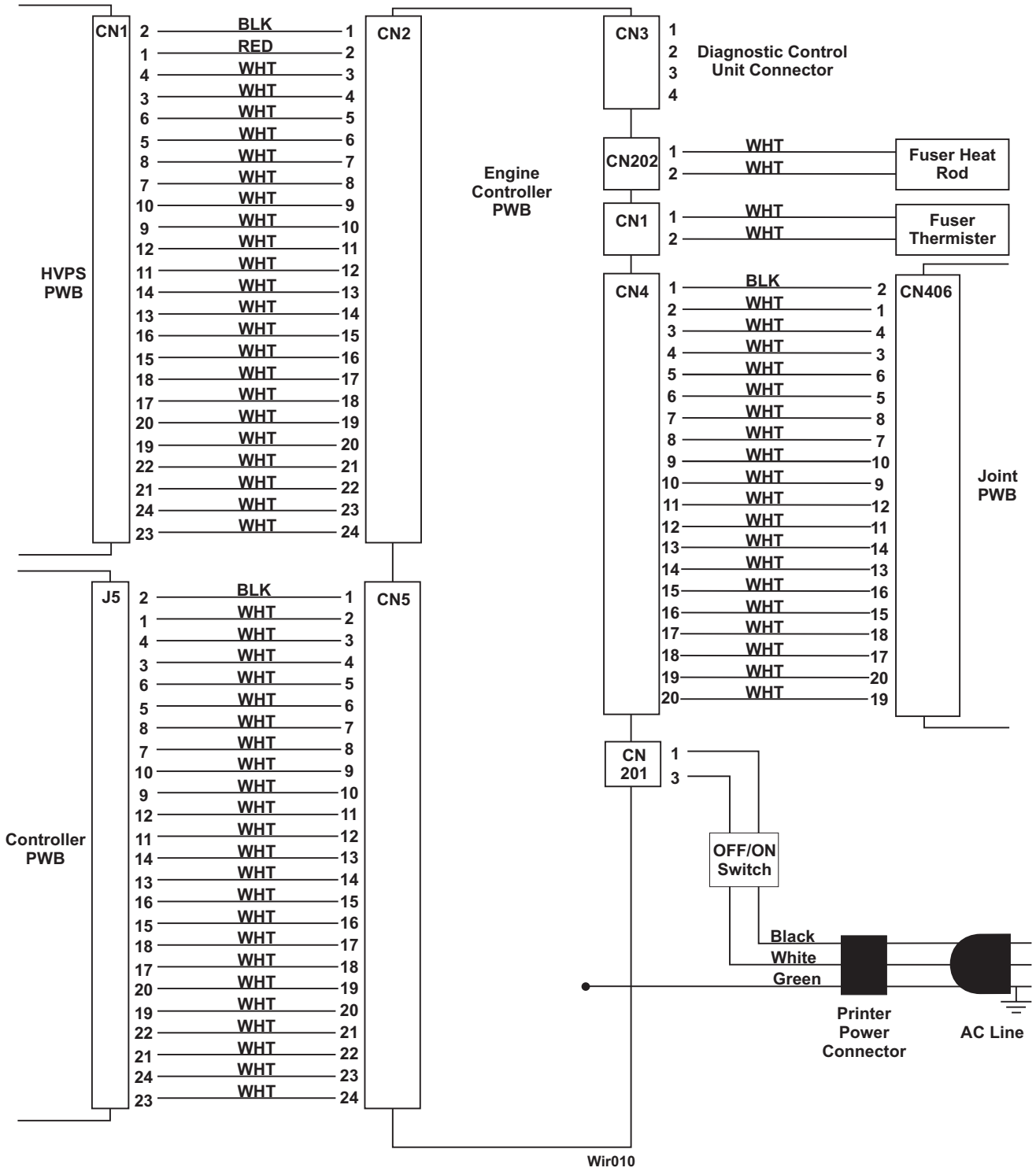
Joint_a


Engine Controller PWB
CN4
2 WHT 1
1 BLK 2
4 WHT 3
3 WHT 4
6 WHT 5
5 WHT 6
8 WHT 7
7 WHT 8
10 WHT 9
9 WHT 10
12 WHT 11
11 WHT 12
14 WHT 13
13 WHT 14
16 WHT 15
15 WHT 16
18 WHT 17
17 WHT 18
20 WHT 19
19 WHT 20
CN406
Joint PWB
Cn405
1 BLK
2 RED
3 RED
4 RED
5 RED
6 RED
Drive Motor
Cn402
1 BLK
2 BLK
Clutch
Cn404
1 RED
2 BLK
Developer Fuse
CN403
1 BLK
2 RED
3 WHT
Paper Empty Sensor
CN401
1 BLK
2 RED
3 BLU
4 WHT
Pfeed Sensor
CN407
1 BLK
2 RED
Pretransfer Lamp
CN408
1 BLU
2
3 RED
DC Fan Motor

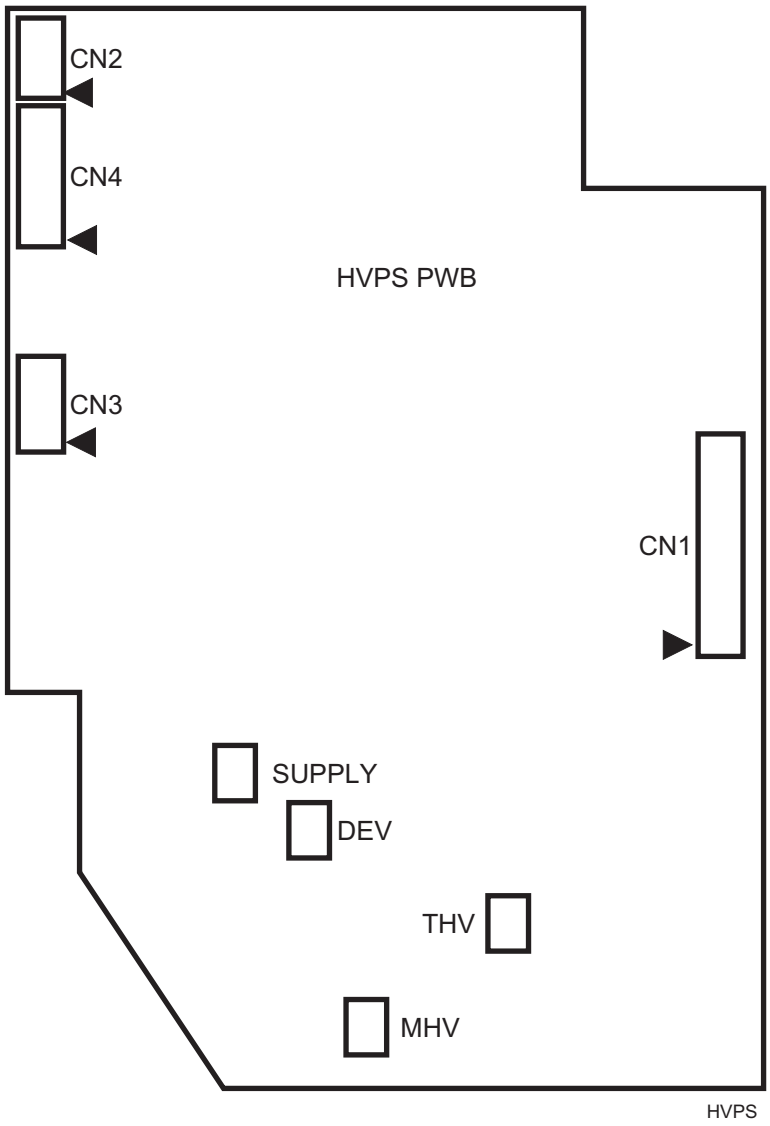
WIR002a

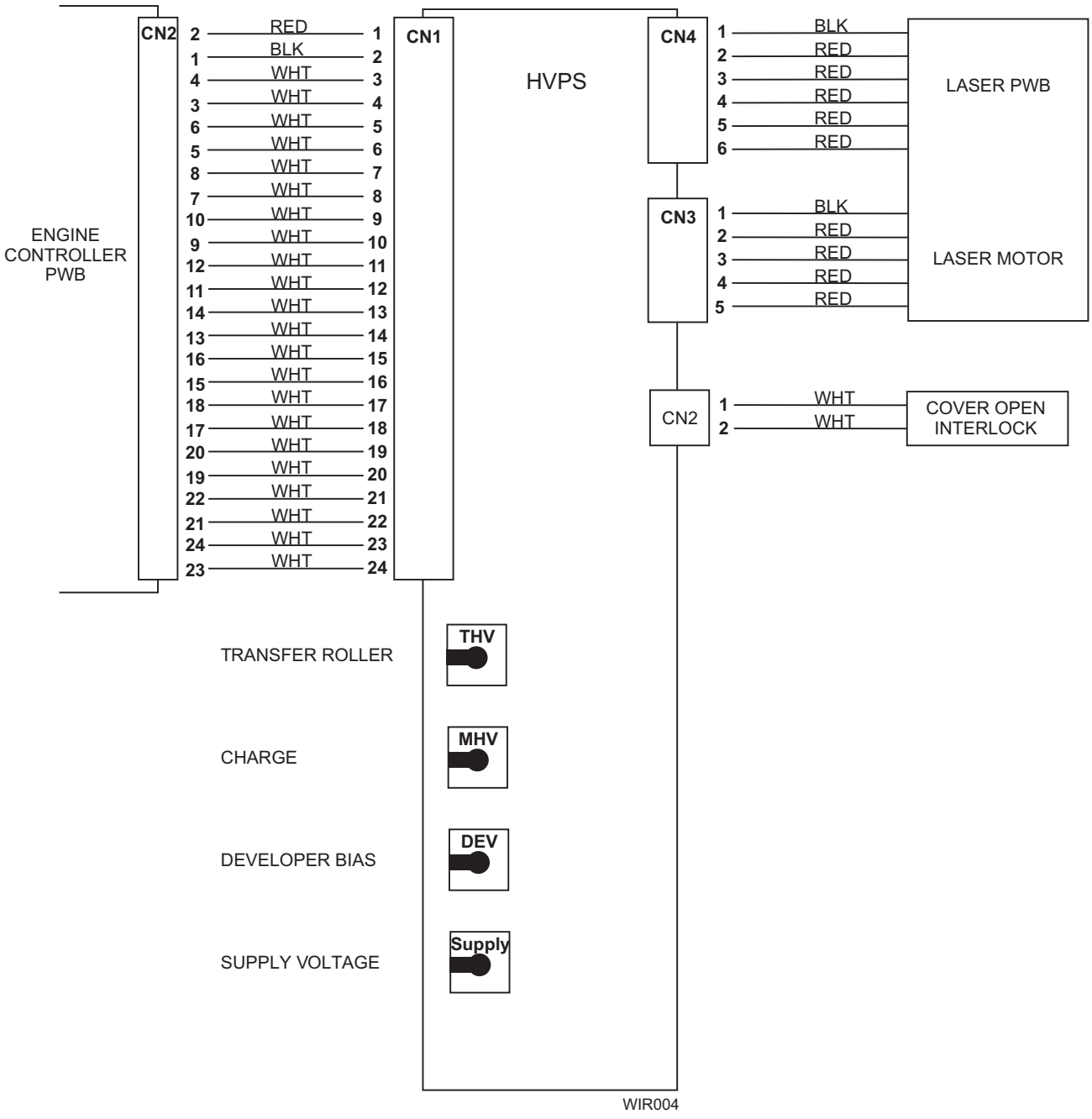
6.3.3 Engine Controller PWB



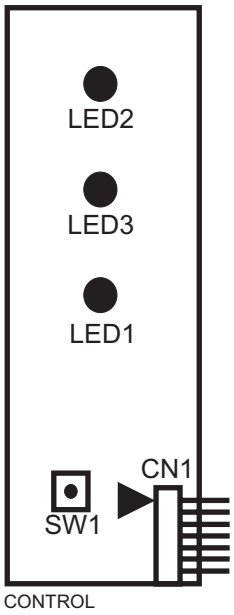

CN1
HVPS PWB
CN2
BLK
RED
WHT
CN3
Diagnostic Control Unit Connector
Engine Controller PWB
CN202
Fuser Heat Rod
CN1
Fuser Thermister
CN4
CN406
Joint PWB
J5
Controller PWB
CN5
CN 201
OFF/ON Switch
Black
White
Green
Printer Power Connector
AC Line
Wir010

6.3.4 HVPS

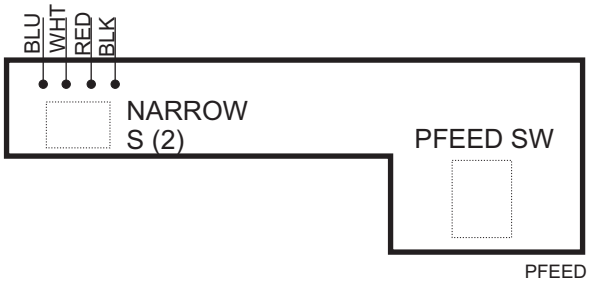



ENGINE CONTROLLER PWB
CN2
2 RED 1
1 BLK 2
4 WHT 3
3 WHT 4
6 WHT 5
5 WHT 6
8 WHT 7
7 WHT 8
10 WHT 9
9 WHT 10
12 WHT 11
11 WHT 12
14 WHT 13
13 WHT 14
16 WHT 15
15 WHT 16
18 WHT 17
17 WHT 18
20 WHT 19
19 WHT 20
22 WHT 21
21 WHT 22
24 WHT 23
23 WHT 24
CN1
HVPS
CN4
1 BLK
2 RED
3 RED
4 RED
5 RED
6 RED
LASER PWB
CN3
1 BLK
2 RED
3 RED
4 RED
5 RED
LASER MOTOR
CN2
1 WHT
2 WHT
COVER OPEN INTERLOCK
TRANSFER ROLLER
THV
CHARGE
MHV
DEVELOPER BIAS
DEV
SUPPLY VOLTAGE
Supply
WIR004

6.3.5 Control Panel PWB



6.3.6 PFeed PWB



Section 7

Repair Analysis Procedures

RAP 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 Print Cartridge/Front Cover Interlock cheated, AC power applied, and the printer power switched on.

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 A4 or letter-size 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. If the test prints are normal, but in the online mode the prints have a image quality problem, the problem may be in the Controller PWB, Interface Cable, or with the Host Computer.

RAP 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:

— Switch the AC power off

— Check the printer paper path for jammed paper or other obstacles

— Ensure that the Multipurpose Paper Feeder has a good supply of fresh paper

— Ensure the Print Cartridge is properly installed

— Ensure that all covers are properly closed.

2 Switch the AC power on. 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**
| If all three LEDs are flashing, go to RAP 7.7, otherwise go to RAP 7.4.

4 The Main Drive Motor stops.

Y **N**
| Replace the Engine Controller PWB (PL 10).

5 Press and hold the On Line/Reset Key for approximately 5 seconds. All LEDs flash.

Y **N**
| Replace in order: Controller PWB (PL 10), Control Panel (PL 2).

6 Release the On Line/Reset Key. All LEDs go out and the Ready LED flashes.

Y **N**
| Replace in order: Controller PWB (PL 10), Control Panel (PL 2).

NOTE: If during steps 7 through 13, all LEDs begin to flash, go to RAP 7.7.

7 Paper is fed from the Multipurpose Paper Feeder.

Y **N**
| Go to RAP 7.5.

8 The Error LED and Paper LED remain off.

Y **N**
| Go to RAP 7.6.

9 The Configuration sheet is 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.

10 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.

11 The print quality is acceptable.

Y **N**
| Perform procedure 5.2.4 (Print Cartridge Cleaning Procedure), then go to RAP 7.8.

12 Press and hold the Front Panel Key until the LEDs flash. Release the key. During the printing of the configuration sheet, the Exit Fan impeller blades rotate.

Y **N**
| Replace the Exit Fan (PL 9).

13 Ask the customer to enter the Remote Control Panel, select the Test Menu, and print a configuration sheet. The configuration sheet prints successfully.

Y **N**
| Go to RAP 7.9.

14 Ask the customer to select the Page Menu. Change the “Copies” selection to a different number; example: if the number is 1, change it to 3; if the number is 3, change it to 4. Select send. Select the Test Menu and print a configuration sheet. The selected parameter is change is indicated on the configuration sheet.

Y **N**
| Replace the Controller PWB (PL 10).

15 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.

16 The customer has indicated a problem with the memory SIMM.

Y **N**
| 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.

17 Go to RAP 7.10.

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 Engine Controller PWB (PL 10).
Cover Open or Missing Print Cartridge	Verify that the Print Cartridge is properly installed. Verify that the Front Cover is properly closed. Verify that the Print Cartridge/front cover interlock actuator moves freely. Replace the Engine Controller PWB (PL 10).
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 6).
Fuser Error	Replace the Halogen Lamp (PL 8). Replace the Fuser Assembly (PL 8). Replace Engine Controller PWB (PL 10).
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 Controller PWB (PL 10).
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 (Laser PL 6 or Fuser PL 8).

RAP 7.3 Main Drive Motor

1 The Error LED on the Control Panel is illuminated.

Y **N**
| Go to step 5.

2 Switch the AC power off. Connect the DCU and switch the AC power on. The DCU displays the error code 64.

Y **N**
| Replace the Engine Controller PWB (PL 10).

3 Using the DCU, enter the diagnostic mode and run diagnostic code 09. Test the Print Cartridge/Front Cover Interlock Sensor. The sensor functions normally.

Y **N**
| Verify the mechanical operation of the Print Cartridge/Front Cover Interlock Sensor Actuator. If functioning normally, replace the Print Cartridge/Front Cover Interlock Sensor (PL 6).

4 Replace the Engine Controller PWB (PL 10).

5 Remove the Gear Bracket AssemblyREP 4.5.2. The Main Drive Motor Assembly Harness is properly connected to the Main Drive Motor.

Y **N**
| Properly reconnect the harness, repair, or replace as necessary (PL 9).

6 With the Main Drive Motor Assembly Harness properly connected lay the Gear Bracket and Main Drive Motor Assembly on the table next to the printer. Cheat the Front Cover Interlock. Switch the AC power on. The Main Drive Motor Assembly runs normally.

Y **N**
| Go to step 10.

7 Switch the AC power off. Rotate the Paper Feeder Assembly gears. The gears rotate freely.

Y **N**
| Check the gears for obstructions. Repair or replace the Paper Feeder Assembly as necessary (PL 4).

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 as necessary (PL 8).

9 Replace the Print Cartridge (PL 1). If problem persists, replace the Main Drive Motor (PL 9).

10 With AC power applied, Print Cartridge/Front Cover Interlock closed, and the Main Drive Motor not running, measure the voltage on the Main Drive Motor harness connector. The voltage between pin 3 and frame ground and between pin 4 and frame ground is +24.0 +/- 2.0 VDC on both pins.

Y **N**
| Replace the following one at a time; the Engine Controller PWB (PL 10), then the Joint PWB (PL 10).

11 With AC power applied and the Main Drive Motor not running, measure the voltage between pins 1, 2, 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 9).

12 Replace the following one at a time; the Joint PWB (PL 10), then the Engine Controller PWB (PL 10).

RAP 7.4 Control Panel

1 Switch the AC Power off. After 10 seconds, switch the AC Power on. All the LEDs are off.

Y **N**
| Go to step 8.

2 Remove the Control Panel Cover and measure the voltage from CN1 pin 7 to pin 6. The voltage is +5.0 +/- 0.5 VDC.

Y **N**
| Go to step 4.

3 Replace in the following order: Controller PWB (PL 10), the Control Panel (PL 2).

4 Measure the voltage on the Controller PWB between J2 pin 7 and frame ground. The voltage is 5.0 +/- 0.5 VDC.

Y **N**
| Go to step 6.

5 Replace the Control Panel (PL 2).

6 Measure the voltage on the Controller PWB between J5 pin 15 and frame ground. The voltage is 5.0 +/- 0.5 VDC.

Y **N**
| Verify the harness between the Controller PWB and the Engine Controller PWB. Repair or replace as necessary. If harness is OK, replace the Engine Controller PWB (PL 10).

7 Replace the Controller PWB (PL 10).

8 Use Table 7.4 to isolate the problem.

Table 7.4. Control Panel LEDs.

Control Panel LEDs	Possible Cause	Solution
All three LEDs blink.	Defective Laser Defective Fuser	Go to RAP 7.7.
Error LED only is illuminated.	No Print Cartridge Open Front Cover Defective Front Cover Actuator Engine Controller PWB	Properly reinstall or replace Print Cartridge. Close Front Cover. Verify / replace Front Cover Actuator (PL 6). Replace the Engine Controller PWB (PL 10).
Flashing Paper LED.	No paper Low Paper Sensor Actuator Engine Controller PWB	Add paper or properly adjust paper in tray. Verify / replace Low Paper Actuator (PL 5). Replace the Engine Controller PWB (PL 10).
Error and Paper LEDs are illuminated	Paper Jam 0, 1, or 2	Go to RAP 7.6.
Error and On-line blink	Complex job	Add memory. Reduce to 300 X 300 DPI. Set to Raster graphics.

RAP 7.5 Paper Feed

1 Switch the AC power off. Connect the DCU to the printer (see section 5). Perform the Pick-up Solenoid test. The solenoid energizes.

Y **N**
| Go to step 6.

2 Perform the Feed and Exit Sensor Test. The Feed Sensor test indications are correct.

Y **N**
| Replace in order: Pfeed Sensor (PL 7), Joint PWB (PL 10), Engine Controller PWB (PL 10).

3 The Exit Sensor test indications are correct.

Y **N**
| Verify the operation of the Exit Sensor Actuator. If OK, replace the Engine Controller PWB (PL 10).

4 Remove the Right Side Cover. Perform the Main Drive Motor test. With the Main Drive Motor rotating, manually actuate the Paper Feed Solenoid. The Pick Up Roller rotates one complete revolution each time the solenoid is actuated.

Y **N**
| Replace the Paper Feed Solenoid (PL 6).

5 Clean or replace as necessary: the Pick-up Roll (PL 4), the Pick-up Roll Assembly (PL 4).

6 Disconnect CN402 from the Joint PWB. Measure the resistance between pins 1 & 2 of the disconnected plug. The resistance is less than 100 ohms.

Y **N**
| Replace the Paper Feed Solenoid (PL 6).

7 Replace in order: Joint PWB (PL 10), Engine Controller PWB (PL 10).

RAP 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 Transfer Roller for binding and for proper operation. Check for defective Print 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 Engine Controller PWB (PL 10).
Paper Jam 01	Paper Feed / Registration Sensor or Sensor Actuator	Use DCU test 08 to verify sensor. If OK replace the Engine Controller PWB (PL 10).
	Fuser Assembly	Verify Fuser Assembly is operational. Remove or replace as necessary (PL 8). Inspect Exit Sensor Actuator. Repair of replace as necessary (PL 8). Using DCU test 08, verify Fuser Exit Sensor is operational. If OK, replace the Engine Controller PWB (PL 10)
Paper Jam 02	Exit Drive Assembly	Inspect Exit Assembly. Repair or replace as necessary (PL 8).
	Fuser Assembly	Verify Fuser Assembly is operational. Remove or replace as necessary (PL 8). Inspect Exit Sensor Actuator. Repair of replace as necessary (PL 8). Using DCU test 08, verify Fuser Exit Sensor is operational. If OK, replace the Engine Controller PWB (PL 10).

RAP 7.7 Printer Problem

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

1 Switch the AC power off, then on. Wait for 60 seconds. All three LEDs are flashing.

Y **N**
| Return to the Entry Level RAP and continue.

2 Switch the AC power off. Connect the DCU and switch the AC power on. 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 Switch the AC power off. Remove the Left Side Cover REP 4.1.5 and the Fuser Wire Cap. Remove one of the screws that secure the AC wire to the Fuser Assembly. Measure the resistance between the two AC terminals on the Fuser. The resistance is less than 5 ohms.

Y **N**
| Replace the Halogen Lamp (REP 4.4.3) (PL 8).

4 Disconnect CN1 (Fuser Thermister) from the Engine Controller PWB. Measure the resistance between pins 1 and 2 on the disconnected plug. The resistance is between 4K ohms and 200K ohms.

Y **N**
| Replace the Thermister (PL 8).

5 Replace the Engine Controller PWB (PL 10).

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).

7 Replace in order: Laser Assembly (PL 6), Engine Controller PWB (PL 10), HVPS PWB (PL 10).

RAP 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).

7.0.1 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. Print Cartridge. 2. Print Cartridge ground. 3. Unstable high voltage output. 4. BTR contamination. 5. LSU Laser window contamination.	1. Inspect drum for deterioration or contamination. If defective, replace the Print Cartridge. 2. Verify Print Cartridge ground. Check continuity between cartridge contact and the Controller PWB 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 Transfer Roller spring tension and bearings. Remove the Transfer Roller and clean (dust off). Replace Transfer Roller if necessary (PL 7). 5. Remove the LSU (Laser) Assembly, clean or replace as necessary (PL 6).
BLACK PRINTS: the print is completely covered with toner and has no visible image.	1. Controller PWB. 2. Incorrect charge voltage. 3. Print Cartridge. 4. Engine Controller PWB. 5. Laser on all the time.	1. Using the DCU, print a DCU test print. If the test print is OK, replace the 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 HVPS PWB. 3. Replace Print Cartridge (PL 1). 4. Replace Engine Controller PWB (PL 10). 5. Replace LSU (LASER) Assembly (PL 6).
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. Controller PWB. 2. Print Cartridge grounding problem. 3. Print Cartridge. 4. Transfer Roller. 5. Laser Assembly 6. Engine Controller PWB. 7. Fuser Assembly.	1. Using the DCU, print a DCU test print. If the test print is OK, replace the Controller PWB (PL 10). 2. Verify Print Cartridge ground. Check continuity between cartridge contact and the Controller PWB metal cover. Ensure that the drum contact is clean and undamaged. 3. If deletion repeats every: 94.3 mm (3.8in) - Drum defect 37.7 mm (1.5in) - Charge Roll 40.0 mm (1.2in) - Supply Roll 46.1 mm (1.8in) - Developer Roll Replace the Print Cartridge (PL 1). 4. If deletion repeats every 47.1 mm (1.9 in.), replace the Transfer Roller (PL 7). 5. Replace Laser Assembly (PL 6). 6. Replace Engine Controller PWB (PL 10). 7. If deletion repeats every 56.1 mm (2.2 in) Heat Roll or 56.2 mm (2.2in) Pressure Roll, replace the Fuser Assembly (PL 8)

Defect Definitions	Possible Causes	Solutions
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. Print Cartridge. 2. Laser Assembly. 3. Fuser Assembly. 4. Transfer Roller.	1. Replace the Print Cartridge (PL 1). 2. Inspect the LSU (LASER) beam path for contamination. Clean as necessary. 3. Inspect fuser rolls for damage and replace as necessary. 4. Inspect Transfer Roller spring tension and bearings. Remove the Transfer Roller and clean (dust off). Replace Transfer Roller if necessary (PL 7).
SPOT DELETIONS: Solid areas are marked with irregular white areas.	1. Print Cartridge. 2. Transfer Roller. 3. Damp Paper.	1. Deletions repeat every 94.3 mm (3.7 in.). Replace Print Cartridge. 2. Remove the Transfer Roller and clean (dust off). If deletion repeats every 47.1 mm (1.9 in.), replace the Transfer Roller (PL 7). 3. Replace paper.
LIGHT PRINTS:	1. Remote Control Panel (RCP) settings. 2. Print Cartridge not installed correctly. 3. Incorrect high voltage output. 4. Low toner in cartridge.	1. Verify the RCP print quality settings. 2. Re-install the Print Cartridge. 3. Verify that all high voltage outputs are to specification (refer to section 5, DCU operation). 4. Remove the Print Cartridge and shake to redistribute toner. Replace Print Cartridge if necessary (PL 1).
BLANK PRINTS: Prints with no visible image.	1. Seal tape not removed from Print Cartridge. 2. Defective ground on Print Cartridge. 3. Controller PWB. 4. Incorrect high voltage output. 5. Defective LASER. 6. Transfer Roller pressure 7. Paper	1. Inspect cartridge for removal of seal tape. 2. Verify Print Cartridge ground. Check continuity between cartridge contact and the Controller PWB metal cover. Ensure that the Print Cartridge ground contact is clean and undamaged. 3. Using the DCU, print a DCU test print. If the test print is OK, replace the 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 LSU (LASER) Assembly (PL 6) if necessary. 6. Inspect Transfer Roller spring tension and bearings. Remove the Transfer Roller and clean (dust off). Replace Transfer Roller if necessary (PL 7). 7. Install fresh paper in the Multipurpose Feeder.
EXTRANEOUS 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.	1. Defective font download. 2. Loose / defective cables, cables out of specification (too long, etc.). 3. Electromagnetic interference. 4. Controller PWB. 5. Engine Controller PWB.	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 Controller PWB (PL 10). 5. Replace the Engine Controller PWB (PL 10).

Defect Definitions	Possible Causes	Solutions
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.	1. Defective font download. 2. Loose / defective cables, cables out of specification (too long, etc.). 3. Electromagnetic interference. 4. Defective SIMM. 5. Controller PWB. 6. Engine Controller PWB.	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 10). 5. Replace the Controller PWB (PL 10). 6. Replace the Engine Controller PWB (PL 10).
SPOTS: There are spots of toner on the page.	1. Paper. 2. Paper path contaminated. 3. Print Cartridge 4. Fuser Assembly. 5. Transfer Roller.	1. Replace paper from a fresh unopened ream. 2. Clean paper path. 3. Replace Print Cartridge (PL 1). 4. Inspect/clean/replace Fuser Assembly as necessary (PL 8). 5. If spot repeats every 47.1 mm (1.9 in.), replace the Transfer Roller (PL 7).
UNFUSED IMAGE: part of or all of the image is unfused.	1. Damp paper. 2. Paper quality. 3. Light image density 4. Fuser Assembly. 5. Engine Controller PWB.	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 settings. 4. Inspect/clean/replace Fuser Assembly as necessary (PL 8). 5. Replace the Engine Controller PWB (PL 10).
STREAKS: Extraneous dark lines/bands in or across the process direction. These are Engine Controller defects not related to the Controller PWB or Host Data.	1. Print Cartridge. 2. Fuser Assembly. 3. Transfer Roller. 4. Contaminated paper path.	1. Inspect drum surface for scratches or bands. If defective, replace the Print Cartridge (PL 1). 2. Inspect fuser rollers for scratches or contamination. If defective, replace the Fuser Assembly (PL 8). 3. Inspect Transfer Roller. If defective, replace the Transfer Roller (PL 7). 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.	1. Print Cartridge. 2. Fuser Assembly. 3. Erase Lamps. 4. High Voltage Contacts	1. Replace Printer cartage (PL 1). 2. Inspect/clean/replace Fuser Assembly as necessary (PL 8). 3. Remove the Print Cartridge, attach the DCU and perform diagnostic test 04. Verify operation of the Erase Lamps. Replace as necessary. 4. Verify that all high voltage outputs are to specification (refer to section 5, DCU operation). Clean all high voltage contacts.
BACKGROUND: Uniform toner contamination in non image areas.	1. Print Density. 2. High voltage output. 3. Print Cartridge.	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). Clean all high voltage contacts. 3. Replace the Print Cartridge (PL 1).

Defect Definitions	Possible Causes	Solutions
DAMAGED PRINTS: Creases, wrinkles, excessive curl, cuts, folds or embossed marks.	1. Paper 2. Paper source and transportation. 3. Fuser Assembl.y 4. Print Cartridge.	1. Properly install fresh paper into the Multipurpose Paper Feeder. 2. Inspect paper transportation system for proper operation. Replace worn parts. 3. Inspect/clean/replace Fuser Assembly as necessary (PL 8). 4. Replace Print Cartridge (PL 1).
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.	1. Paper transportation. 2. Main Drive Motor Assembly. 3. Fuser Assembly. 4. Print Cartridge	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 (PL 8). 4. Replace Print Cartridge (PL 1).
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.	1. Paper Feed. 2. Paper transportation. 3. Fuser Assembly.	1. Inspect Multipurpose Paper Feeder for damage. Replace parts 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 (PL 8).

RAP 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.

NOTE: If you have access to another PC, verify that the printer does not operate.

1 Connect the Anacom G80 or similar interface test box to the parallel port and generate a test print. The test print completes successfully. *NOTE: You may have to remove the back cover to attach the plug.*

Y **N**
| Replace the Controller PWB (PL 10).

2 Disconnect the Anacom G80 or similar interface test box from the parallel port and perform the following:

- Inspect for any visual signs of damage to the host interface cable. Replace interface cable if necessary (customer purchased item)
- Reconnect the host interface cable to the parallel interface port
- If using MSWindows, have the customer check printer setup. Also check the setup in the application the customer is using.
- Have customer send a print job using another application.

RAP 7.10 SIMM Check-Out Procedure

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 Controller PWB (PL 10). 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 EDO, 72 pin, 60 ns or faster, 32 bit, no parity.

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

Notes

Section 8

P8ex Addendum

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Introduction

The purpose of this addendum is to provide the necessary information to support the DocuPrint P8ex printer.

All procedures and technical information in the DocuPrint P8e Service Manual apply to the DocuPrint P8ex printer with the exception of the information provided in this addendum.

The differences are mostly software related, however there are some changes to the hardware.

The DocuPrint P8ex hardware related changes are as follows:

- New Controller PWB with Universal Serial Bus (USB) Port
  - — The Controller PWB can be accessed from the rear of the printer by removing two screws and pulling the Controller out.
  - — The Rear cover and frame has been changed to accommodate the Controller PWB.
- The Front cover was changed to display the product name DocuPrint P8ex.

The DocuPrint P8ex software related changes are as follows:

- The software allows 1200 dpi image quality using image quality enhancement techniques
- The CD-ROM contains the software required to operate the DocuPrint P8ex printer along with useful printer utilities and a complete reference guide. If the customers PC is not equipped with a CD-ROM drive, the customer can obtain software installation files on floppy diskettes from Xerox software support.f

The addendum consist of the following information:

1) A description of the PCL 6 emulation
2) A description of the Universal Serial Bus (USB)
3) A new Repair Procedure for the Controller PWB, REP 4.6.3A Controller PWB (P8ex)
   - — Accessing the Controller Board now provides easy access to the Memory SIMM
4) P8ex Parts List.

PCL 6 Emulation

PCL 6 is a raster based printer language. PCL 6 allows the P8ex to use memory more efficiently. However, there is no way to get a legible print file to view or edit with PCL 6. The PLC 6 emulation will not allow printing from DOS, unless there is a PCL 6 DOS driver made for an application, (this is unlikely to happen). This is why PCL 5e emulation is also available on the P8ex printer. Refer to table 1.

Table 1. Printer Driver Features

Setting	Usage/Description	PCL 6	PCL 5e
Number of copies	Select 1-99 copies.	•	•
Page orientation	Select portrait or landscape.	•	•
Paper size	Select from supported paper sizes (see “Printer Specifications” in the User Guide).	•	•
Paper source	Select printing from multipurpose paper feeder or manual feeder.	•	•
Graphic quality	Select enhancement for graphical and/or text printing.	•	•
Graphic mode	Select vector or raster mode.	•	• *
True Type fonts	Select font printing.	•	• *
EconoMode	Select draft mode printing capability.	•	• *
Overlays	Include overlays in printed documents.	•	• *
Multiple images (N-Up)	Select 1-9 images per physical page.	•	
Watermarks	Create and use watermarks on documents.	•	

*** This setting is not available in the Windows NT 4.0 version of the PCL 5e driver.**

Universal Serial Bus (USB)

The Universal Serial Bus (USB) is a new interface that connects to peripheral devices. P8ex USB is only supported when Windows 98 is loaded on the PC. (NOTE: USB printing from iMAC is not supported).

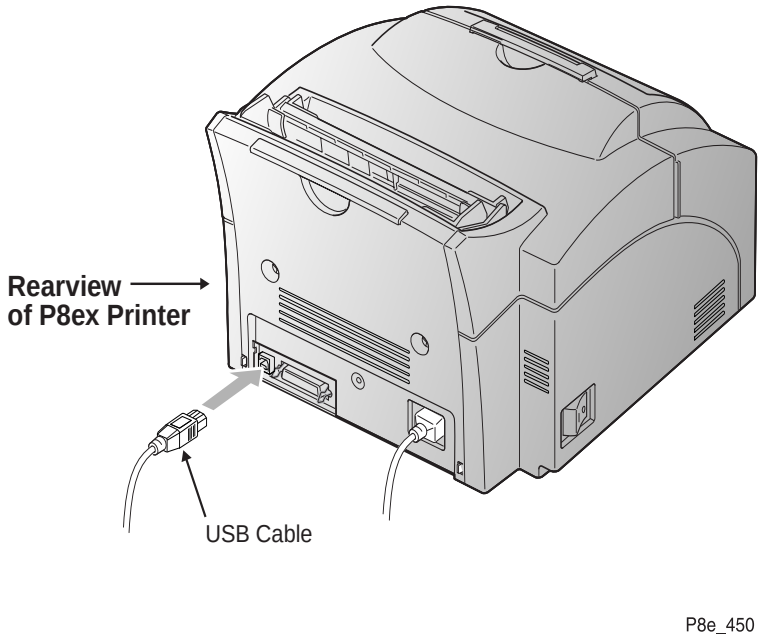
In order to use the USB, the customer must install the USB port driver on a PC which has Windows 98 and USB hardware. When the USB port driver is installed, a port called SSUSB is created. The SSUSB port allows jobs to print to the P8ex.

Connecting the USB Port

NOTE: The USB port requires USB v1.0 compliant cable.

1. Make sure that the printer and PC are turned off.
2. Plug the USB cable into the connector on the rear of the printer (Figure 1).

Figure 1. Connecting the USB



3. Connect the other end of the cable to the USB port on the customer's computer.

Installing the USB Port Driver

The USB driver must be installed in order to print to the P8ex using a USB connection. Currently, USB printing is only available using Windows 98.

1. Insert the DocuPrint P8ex CD into the CD-ROM drive.
2. If the CD starts automatically, go to step 4. Otherwise select Run from the Start menu.
3. Click Browse, select the CD-ROM drive, then double-click on setup.exe.
4. Select the appropriate language.
5. Select the USB Port Driver installation.

REP 4.6.3A Controller PWB (P8ex)

Removal

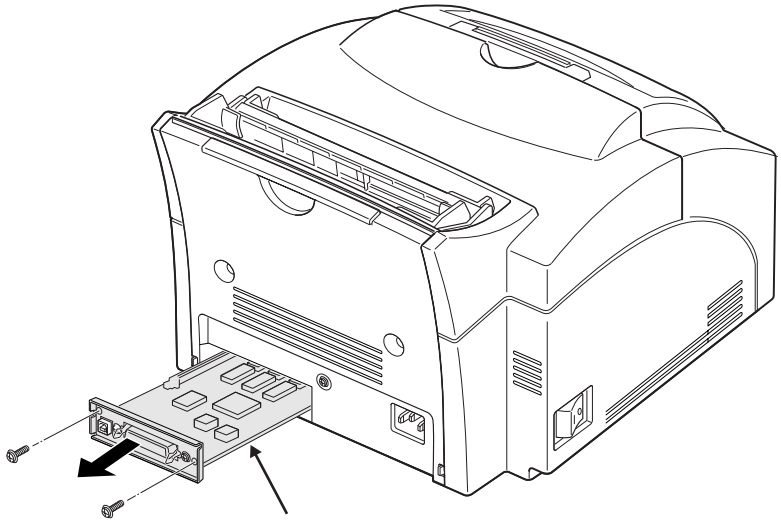
CAUTION
These components are susceptible to electrostatic discharge. Observe all ESD procedures to avoid damage.

The printer has been upgraded to allow easy access to the Controller PWB. The Controller PWB is accessed by removing two screws from the rear of the printer and pulling the board out of the printer. Memory can be upgraded or the Controller PWB can be replaced.

Removing the Controller PWB

1. Turn off the printer and unplug the power cord.
2. Disconnect all cables from the rear of the printer.
3. Remove the two screws from the Controller PWB (Figure 2).
4. Pull the Controller PWB out of the printer (Figure 2).

Figure 2. Removing the Controller PWB



5. Disconnect J2 and J5 from the Controller PWB.

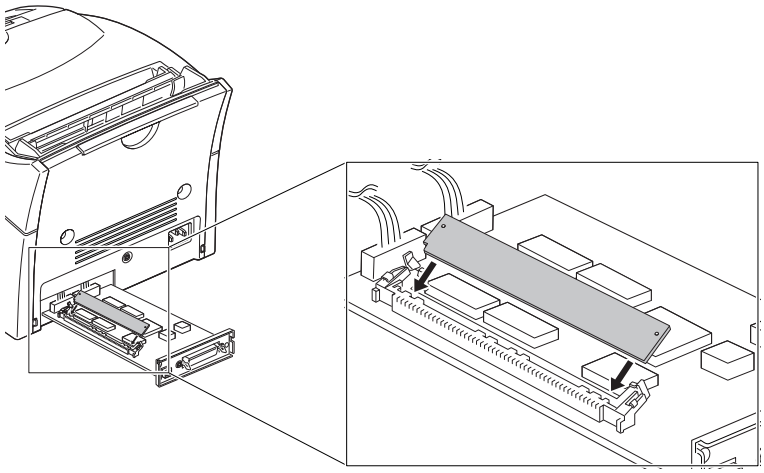
Installing Additional Memory

There is only one SIMM slot on the Controller PWB that is dedicated to increase the printer memory. There are four available SIMM options available which increase the printer memory up to a total of 36Mb. All SIMMs must be industry standard EDO 72 pin 32-bit memory (no parity, 60 ns or faster), and are available in sizes of 4, 8, 16, or 32MB. When the SIMM is installed, the Controller PWB will automatically detect the memory and increase the printer's buffer size.

To install an additional memory module:

1. Turn off the printer and disconnect the AC power.
2. Disconnect all cables from the rear of the printer.
3. Remove the two screws from the Controller PWB. Refer to figure 2.
4. Pull the Controller PWB out of the printer. Refer to figure 2.
5. Hold the SIMM with the connection points pointing toward the control board and insert the SIMM all the way into the connector at a 45 degree angle (Figure 3).

Figure 3. Installing the SIMM



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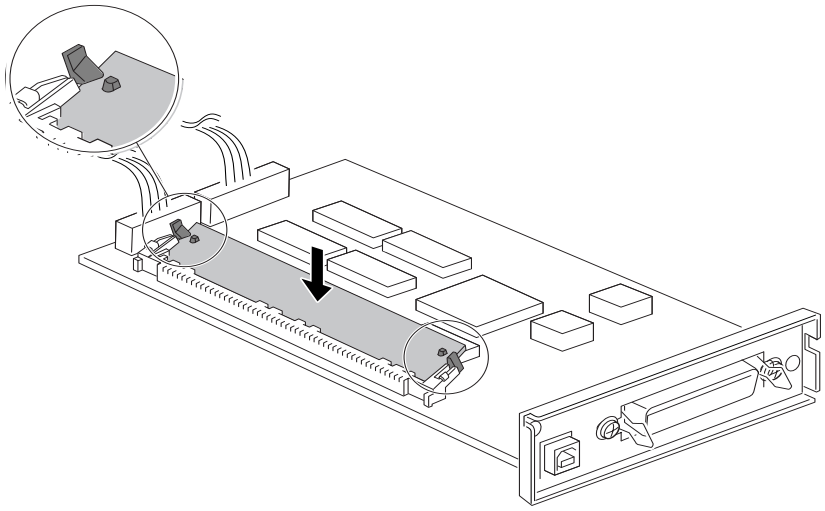
6 Push the SIMM down until it snaps into place (Figure 4).

Make sure both metal clips on the connector are fastened and the two pins on the connector are pushed through the holes on the SIMM (Figure 4).

Figure 4. Installing the SIMM



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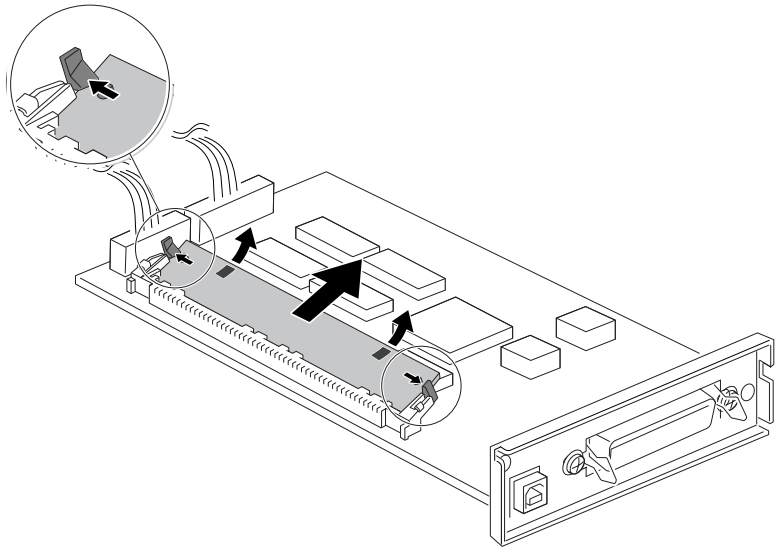
7 If you are replacing a SIMM, push out on the metal clips at each end of the SIMM connector and rotate the SIMM up to lift it out (Figure 5).

Figure 5. Removing the SIMM



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Replacement

1 Assemble in reverse order.

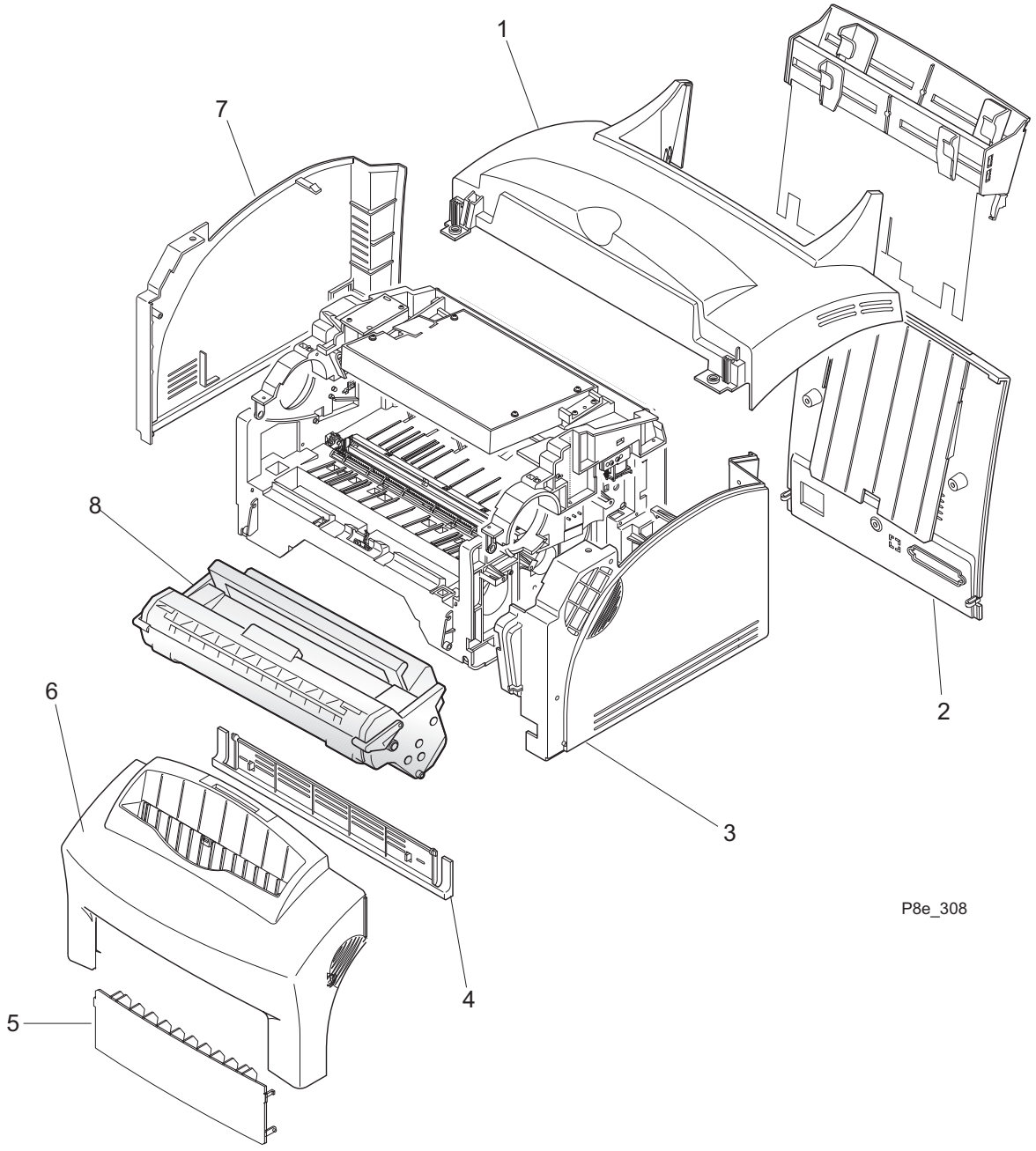
2 Print a Status Page to verify memory has been installed correctly and system recognizes the installation of additional memroy.

3 Verify proper operation.

Parts List

PL 1 Covers

Item	Part Number	Description
1)	- - - - - -	Top Cover}
2)	802E00400	Rear Cover (P8e)
	802E18660	Rear Cover (P8ex)
3)	- - - - - -	Right Side Cover
4)	- - - - - -	Bottom Cover
5)	- - - - - -	Face Up Cover
6)	802E00380	Front Cover (P8e)
	802E19230	Front Cover (P8ex)
7)	- - - - - -	Left Side Cover
8)	113R00296	Print Cartridge
A)	600K72020	Hardware Kit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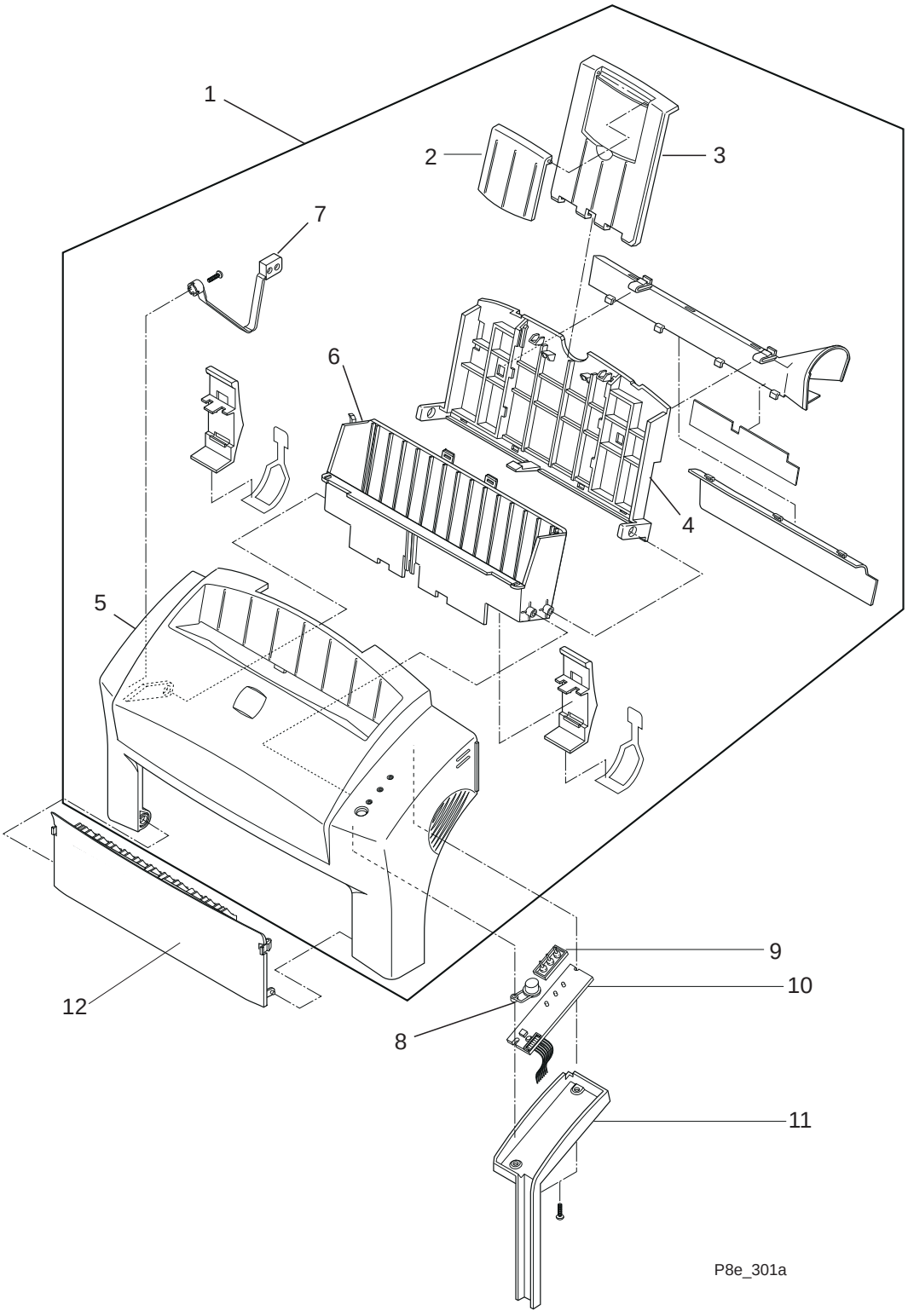
PL 2 Front Cover

Item	Part Number	Description
1)	- - - - - -	Front Cover {Includes Items 2 through 7}
2)	- - - - - -	Stacker Extender
3)	- - - - - -	Stacker
4)	- - - - - -	Duct
5)	802E00380	Front Cover (P8e)
	802E19230	Front Cover (P8ex)
6)	- - - - - -	Stacker Guide
7)	- - - - - -	Stopper
8)	3E50440	Key
9)	107E16960	LED
10)	101E19680	Control Panel
11)	- - - - - -	Control Panel Cover
12)	802E00390	Face Up Exit Cover
A)	600K72020	Hardware Kit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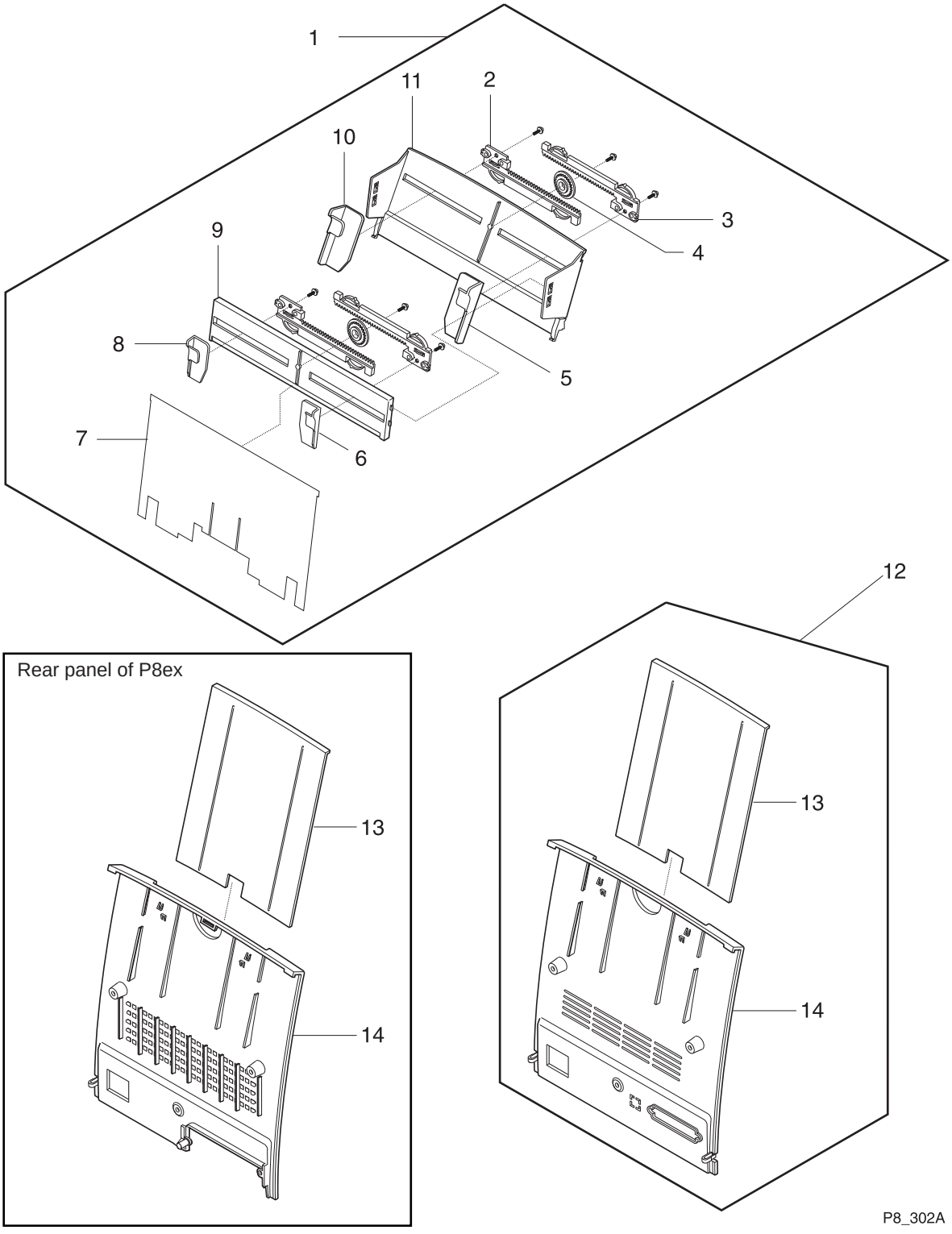
PL 3 Paper Trays

Item	Part Number	Description
1)	- - - - - -	Media (Paper) Tray {Includes Items 2 through 12}
2)	- - - - - -	Gear Adjust Rack, Left
3)	- - - - - -	Gear Adjust Rack, Right
4)	- - - - - -	Pinion Gear
5)	- - - - - -	Auto Tray Adjust, Right
6)	- - - - - -	Manual Tray Adjust, Right
7)	- - - - - -	Film Guide Sheet
8)	- - - - - -	Manual Tray Adjust, Left
9)	- - - - - -	Manual Paper Tray
10)	- - - - - -	Auto Tray Adjust, Left
11)	- - - - - -	Paper Guide Plate
12)	- - - - - -	Rear Cover Assembly {Includes Items 13 & 14}
13)	50E15050	Tray Extender
14)	802E00400	Rear Cover (P8e)
	802E18660	Rear Cover (P8ex)
A)	600K72020	Hardware Kit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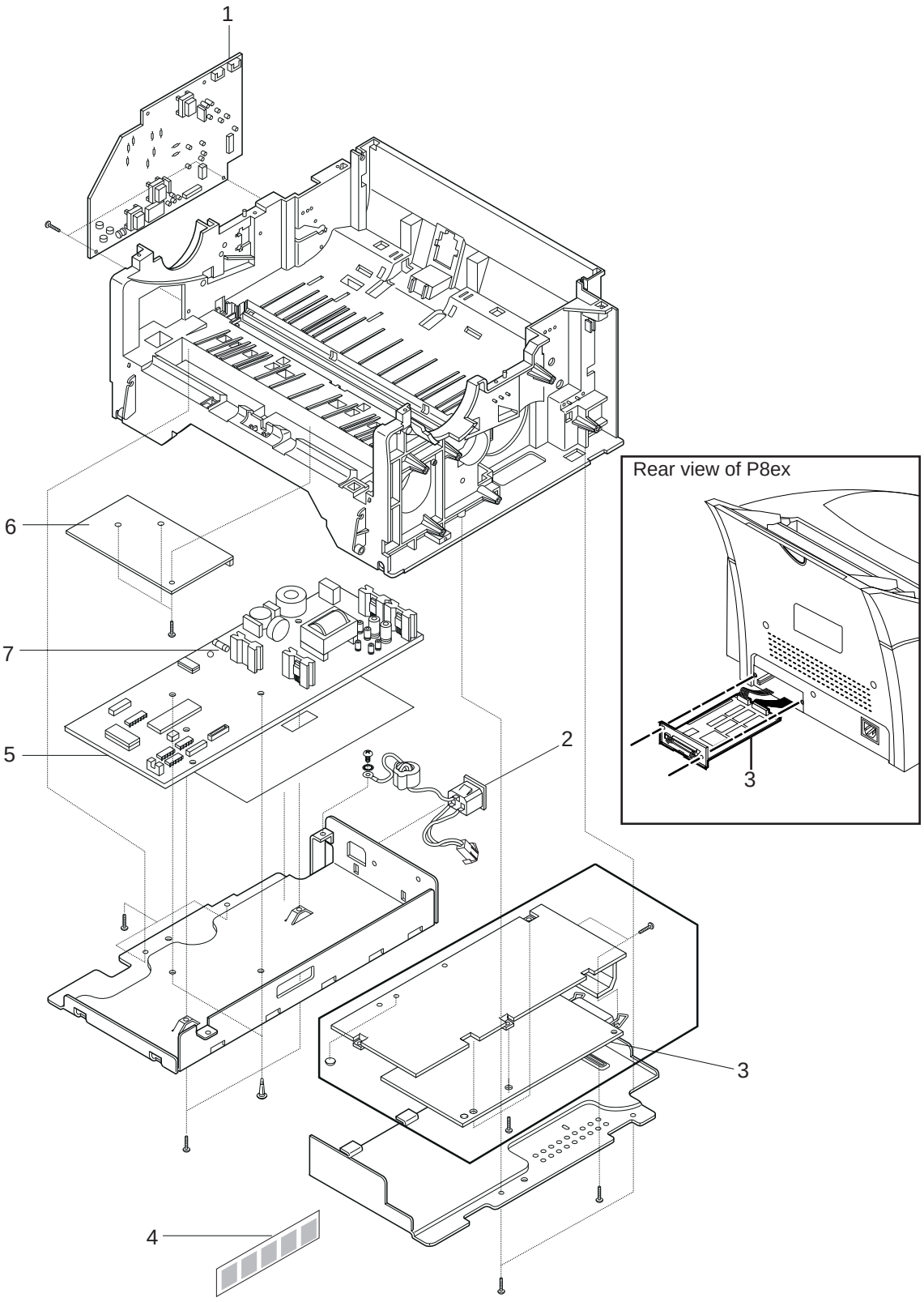
PL 10 Electronics

Item	Part Number	Description
1)	160K60070	High Voltage Power Supply PWB
2)	114E15570	AC Plug Assembly
3)	160K60060	Controller PWB (115 VAC) (P8e)
	160K55520	Controller PWB (220 VAC) (P8e)
	160K65260	Controller PWB (115 VAC) (P8ex)
	160K65270	Controller PWB (220 VAC) (P8ex)
4)	- - - - - -	SIMM 4MB
	- - - - - -	SIMM 8MB
	- - - - - -	SIMM 16MB
	- - - - - -	SIMM 32MB
5)	160K55660	Engine Controller PWB (115 VAC)
	160K55510	Engine Controller PWB (220 VAC)
6)	007K11190	Joint PWB
7)	108E05380	Fuse (115 VAC / T8A)
	108E05390	Fuse (220 VAC / T5A)
A)	600K72020	Hardware Kit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