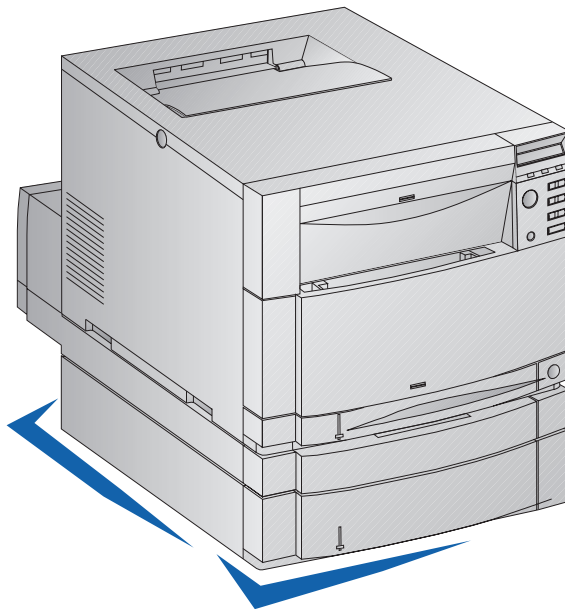


*Color*   
*LaserJet™*  
*4500, 4500 N, 4500 DN Printer*

**Service Manual**  
*October 1999 Edition*





HP Color LaserJet 4500,  
4500 N, 4500 DN Printer

**Service Manual** \_\_\_\_\_

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# Conventions

This manual uses the following conventions:

**Color** is used to emphasize items that are important to the material under discussion.

**Bold** is used for emphasis, particularly in situations where *italic* type would be confusing.

*Italic* type is used to indicate related documents or emphasis.

DISPLAY type indicates text as seen on the printer control panel display.

**Commands** you use on a computer keyboard or on the printer control panel are shown in **Keycap**. Two examples are **Select**, and **- Value +**.

COURIER type indicates text that you type on a computer keyboard exactly as shown.

---

## Hint

---

Hints are used to suggest an action that may simplify the process.

---

## Note

---

Notes contain important information set off from the text.

---

## CAUTION

---

Caution messages alert you to the possibility of damage to equipment or loss of data.

---

## WARNING!

---

Warning messages alert you to the possibility of personal injury.



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# 1

# Printer description

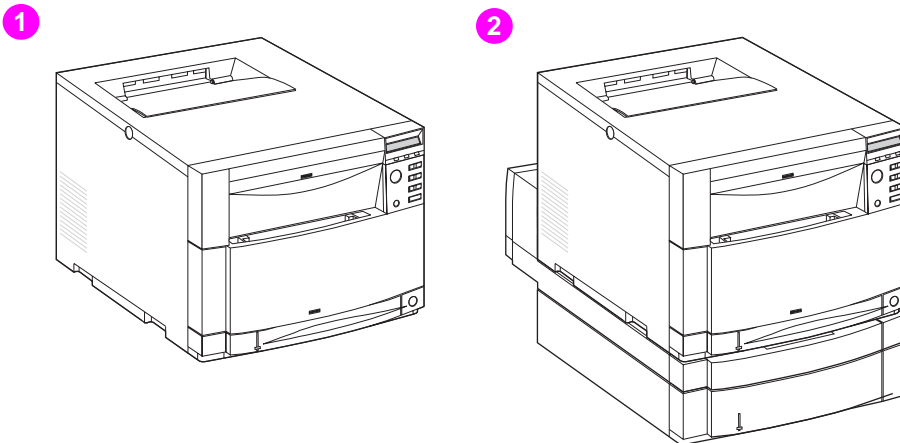
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# Printer features

The HP LaserJet 4500 printer family pictured in Figure 1-1 has three models.

- The HP LaserJet 4500 printer is the base model; it includes 32 MB of RAM.
- The HP LaserJet 4500 N printer includes the base model with an HP JetDirect 600N print server (network card) and 64 MB of RAM.
- The HP LaserJet 4500 DN printer includes the base model with an HP JetDirect 600N print server (network card), a 500-sheet paper feeder, a duplex unit, and 64 MB of RAM.



**Figure 1-1** HP Color LaserJet 4500 family printers

- 1 HP Color LaserJet 4500 and 4500 N printers
- 2 HP Color LaserJet 4500 DN printer

This printer combines the quality and reliability of Hewlett-Packard printers with the features listed in Table 1-1 below. For more information on printer features, refer to the Hewlett-Packard website at <http://www.hp.com>.

**Table 1-1 Printer features**

Feature	Description
Connectivity	<ul style="list-style-type: none"> <li>● Bidirectional parallel port (requires a “C” connector)</li> <li>● Two enhanced input/output (EIO) slots</li> <li>● Optional HP JetDirect 600N print server (network card) (included with the HP Color LaserJet 4500 N and 4500 DN printers)</li> </ul>
Duplex	<ul style="list-style-type: none"> <li>● Optional duplex unit; mounts directly beneath the printer for two-sided printing (duplex unit is standard with the HP Color LaserJet 4500 DN)</li> <li>● Requires 40 MB of memory. 64 MB of memory is recommended for optimal duplex printing.</li> </ul> <p><b>Note:</b> If the 500-sheet paper feeder (Tray 3) is installed, the duplex unit must be positioned between the printer and Tray 3.</p>
Environmental	<ul style="list-style-type: none"> <li>● PowerSave setting (meets ENERGY STAR guidelines)</li> <li>● High content of recyclable components and materials</li> </ul>
Fonts	<ul style="list-style-type: none"> <li>● 80 internal fonts</li> <li>● HP FontSmart software</li> </ul>
Memory—standard	<ul style="list-style-type: none"> <li>● 32 MB RAM (Base)</li> <li>● 64 MB RAM (HP Color LaserJet 4500 N/4500 DN)</li> <li>● Memory Enhancement Technology (MEt), which automatically compresses data to use RAM more efficiently</li> </ul>
Memory—optional	<ul style="list-style-type: none"> <li>● Install 4, 8, 16, 32, or 64 MB DIMMs into the printer's three DIMM slots. Synchronous SDRAM modules do not need to be configured in pairs (in corresponding left and right slots). The printer will only recognize 208 MB of RAM. If you install more than 208 MB of RAM, it will not be used by the printer.</li> </ul> <p><b>CAUTION:</b> The HP Color LaserJet printer uses 100-pin, non-parity, synchronous SDRAM DIMMs. Extended Data Output (EDO) DIMMs are not supported.</p>

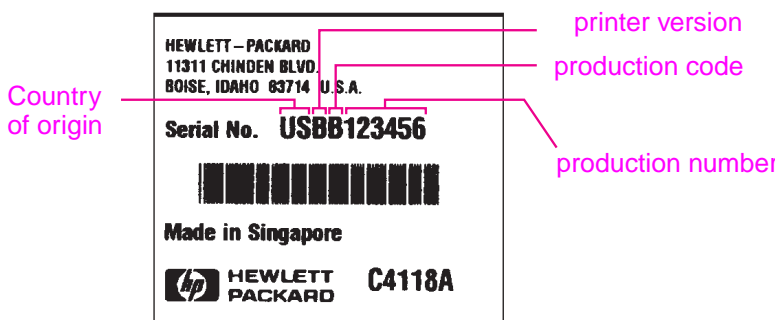
**Table 1-1 Printer features (continued)**

<b>Feature</b>	<b>Description</b>
Paper handling—input (tray capacity)	<p>The capacities will vary depending on the media being used (for example, transparencies, labels, heavier media, and envelopes):</p> <ul style="list-style-type: none"><li>● <b>Tray 1:</b>* 150-sheet multipurpose tray</li><li>● <b>Tray 2:</b>* 250-sheet standard cassette</li><li>● <b>Tray 3:</b>* Optional 500-sheet paper feeder</li></ul> <p>*Quantities based on 75 g/m<sup>2</sup> (20 lb) media.</p>
Paper handling—output (face-down, correct order output)	<ul style="list-style-type: none"><li>● Top output bin holds up to 250 sheets of standard paper</li><li>● Rear output bin holds up to 100 sheets of standard paper. (The output of the rear output bin is in reverse order, facing up.)</li></ul>
Printer language support	<ul style="list-style-type: none"><li>● HP PCL5c</li><li>● PostScript™ Emulation</li><li>● Auto language switching</li></ul>
Paper sizes supported	<ul style="list-style-type: none"><li>● A4/Letter</li><li>● Legal</li><li>● Executive</li><li>● JIS B5</li><li>● A5</li><li>● Custom (B5 ISO)</li></ul>
Print speed—monochrome printing	<ul style="list-style-type: none"><li>● 16 pages per minute (ppm)</li><li>● 8 ppm for transparencies, heavy paper, and glossy paper</li></ul>
Print speed—color printing	<ul style="list-style-type: none"><li>● 4 ppm</li><li>● 2 ppm for transparencies, heavy paper, and glossy paper</li></ul>
Standard interfaces	<p>The printer comes equipped with two enhanced input/output (EIO) slots</p> <p><b>Note:</b> If the printer is not configured with a network interface card, connect the printer using a bidirectional parallel cable (IEEE-1284 compliant) with a “C” connector.</p>

# Identification

## Model and serial numbers

The model number and serial numbers are listed on identification labels located on the rear of the printer. The model number is alphanumeric, such as C4084A for the HP Color LaserJet 4500. The serial number contains information about the country of origin; the printer version; production code; and the production number of the printer (see Figure 1-2). For information on determining the version of printer you are servicing, see page 146.



**Figure 1-2** Serial number information

**Table 1-2** Model names and numbers

Model Name	Model Number
HP Color LaserJet 4500	C4084A
HP Color LaserJet 4500 N	C4089A
HP Color LaserJet 4500 DN	C4094A

### Note

Two versions of the HP Color LaserJet 4500 series printers are available. Before servicing the printer or ordering parts, you will need to identify which printer version you are servicing. For more information, see page 146.

## Power and regulatory information

The identification labels on the rear of the printer also contain power rating and regulatory information as shown in Figure 1-3.

### CAUTION

Converting the voltage on the printer can damage the printer. Do not use any voltage other than the operating voltage. Any attempt to convert operating voltages will void the product warranty (for example, attempting to change a 110V printer to a 220V printer).



Figure 1-3 Sample label

## Site requirements

The printer must be kept in a proper location to maintain the performance level that has been set at the factory. In particular, be sure that the environment adheres to the specifications listed in this chapter.

Below are recommendations for the printer location and placement.

Make sure the printer has the following:

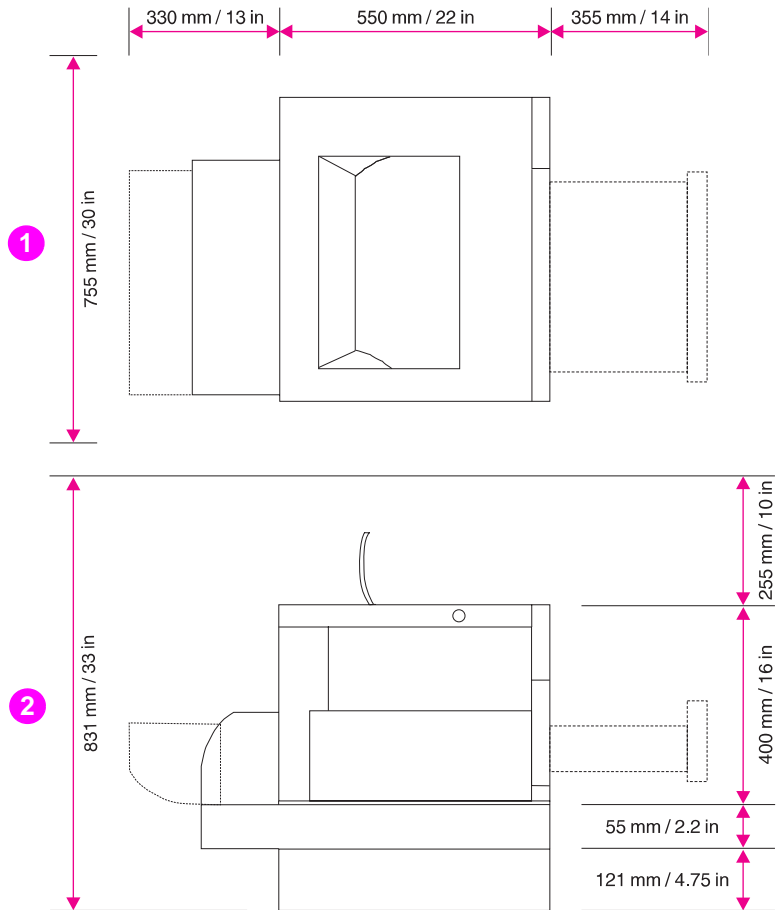
- a well-ventilated, dust-free area
- a hard, level surface (not more than a 2° angle):
  - for the HP Color LaserJet 4500 and 4500 N, the surface must support 51 kg (112 lb)
  - for the HP Color LaserJet 4500 DN, the surface must support 77 kg (169 lb)
- a level surface that supports all four corners of the 500-sheet paper feeder
- a constant temperature and humidity. (Do not install near water sources, humidifiers, air conditioners, refrigerators, or other major appliances.)

Make sure to keep the printer:

- away from direct sunlight, dust, open flames, or ammonia fumes
- away from walls or other objects. There must be enough space around the printer for proper access and ventilation. See Figure 1-4 on page 8.
- away from the direct flow of exhaust from air ventilation systems

# Space requirements

The printer must have the following amounts of space above and around it.



**Figure 1-4** Space requirements

- 1 Top view
- 2 Side view



## Electrical specifications

Table 1-3 lists the electrical specifications required to run the printer safely.

**Table 1-3 Electrical specifications**

Item	110-volt models	220-volt models
Power requirements	100-127 V (+/- 10%) 50/60 Hz (+/- 2 Hz)	220-240 V (+/- 10%) 50/60 Hz (+/- 2 Hz)
Power consumption (typical) During printing During standby <sup>1</sup> During PowerSave	470 W (average) 80 W (average) < 45 W	480 W (average) 90 W (average) < 45 W
Minimum recommended circuit capacity for typical product	16.0 A at 120 V	7.1 A at 220 V

<sup>1</sup> When the printer is in standby (off) mode, a minimal amount of energy is still consumed.

## Environmental specifications

Keep the printer within the environmental conditions shown in Table 1-4 for optimum performance.

**Table 1-4 Environmental specifications**

Item	Operating
Temperature Recommended Allowed	20 to 26° C (68 to 79° F) 15 to 30° C (59 to 86° F)
Humidity Recommended Allowed	20 to 50% RH 10 to 80% RH
Altitude Allowed	0 to 3100 m (0 to 10,000 ft)

## Consumable storage requirements

The life of consumables is greatly affected by their storage environment. Use Table 1-5 to determine the shelf life of stored consumables.

**Table 1-5 Consumable storage requirements**

Item	Storage time	Storage condition
Temperature	Normal (maximum of 2.5 years)	0 to 35° C (32 to 95° F)
	Severe (maximum of 18 days)	High 35 to 40° C (95 to 104° F) Low 0 to -20° C (32 to -4° F)
Maximum temperature change rate	40 to 15° C (104 to 59° F) within 3 minutes -20 to 25° C (-4 to 77° F) within 3 minutes	
Humidity	Normal (maximum of 2.5 years)	35 to 85% RH
	Severe (maximum of 18 days)	High 85 to 95% RH Low 10 to 35% RH
Atmospheric pressure	460 to 760 mm Hg (18.1 to 29.9 in Hg)	
Average storage time	1 year	

# Printer specifications

Table 1-6 describes the dimensions of the printer.

**Table 1-6 Printer dimensions**

	<b>HP Color LaserJet 4500, 4500 N</b>	<b>HP Color LaserJet 4500 DN</b>
Height	395 mm (15.6 inches)	578 mm (22.8 inches)
Width	500 mm (19.7 inches)	500 mm (19.7 inches)
Depth	559 mm (22 inches)	709 mm (27.9 inches)
Weight	57 kg (125 lb)	75 kg (165 lb)

Table 1-7 lists the acoustic emissions of the printer when it is printing and when it is in standby mode.

**Table 1-7 Acoustic emissions**

<b>Operating position</b> Printing Standby	Per ISO 9296, DIN 45635, T.19 $L_{PA}$ 58 dB(A) $L_{PA}$ 49 dB(A)
<b>Bystander 1m</b> Printing Standby	Per ISO 7779, DIN 45635, T.19 $L_{PA}$ 52 dB(A) $L_{PA}$ 45 dB(A)
<b>Sound power</b> Printing Standby	Per ISO 9296 $L_{WA_d}$ = 6.6 bels(A) $L_{WA_d}$ = 5.8 bels(A)

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## Note

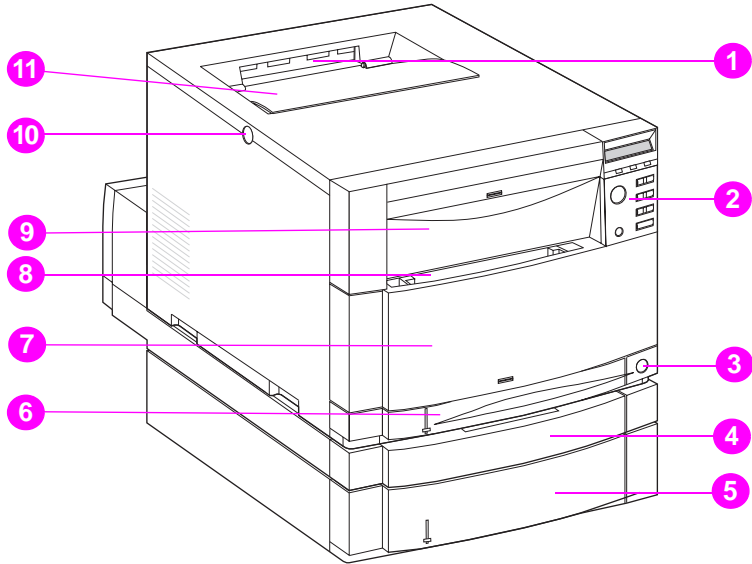
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This product emits a sound intensity level,  $L_{WA_d}$ , at 6.4 bel during printing. Do not place the printer in close proximity to users.

Maximum duty cycles is 35,000 pages per month.

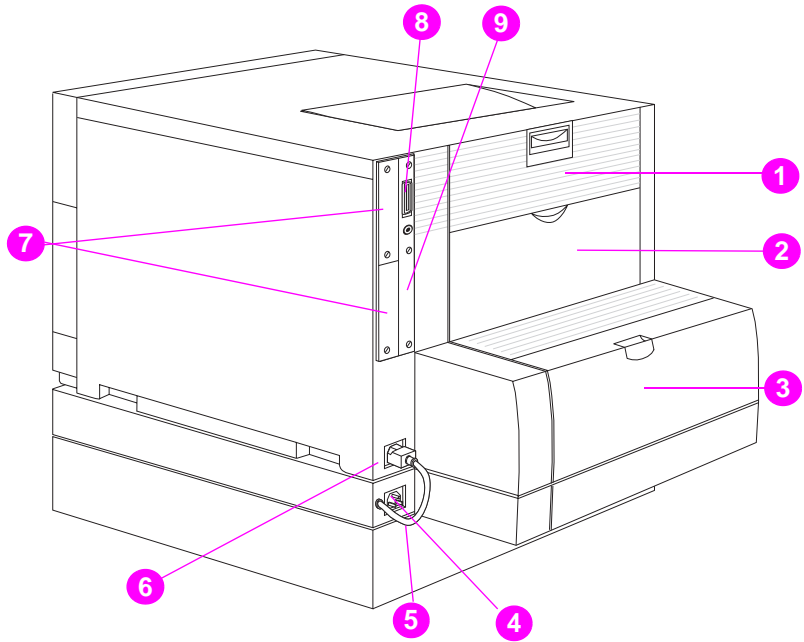
# Printer assemblies

Figures 1-5 and 1-6 show the location of each major assembly in the printer. These assemblies are described in Chapter 3.



**Figure 1-5** Front view (shown with 500-sheet paper feeder and duplex unit)

- 1 Top output bin
- 2 Printer control panel
- 3 Power switch (standby button)
- 4 Duplex unit drawer (optional on 4500 and 4500 N models)
- 5 Tray 3 (500-sheet paper feeder, optional on 4500 and 4500 N models)
- 6 Tray 2 (250 sheets of standard paper)
- 7 ITB drawer (transfer belt access)
- 8 Tray 1 (150-sheet multipurpose tray)
- 9 Drum drawer (imaging drum access)
- 10 Top cover release (toner access) button
- 11 Toner cartridge access cover



**Figure 1-6** Rear view (shown with 500-sheet paper feeder and duplex unit)

- 1 Rear door (fuser access)
- 2 Rear output bin door
- 3 Cover for duplex unit
- 4 Power receptacle for duplex unit
- 5 Duplex unit power cord to the printer
- 6 Printer power receptacle
- 7 EIO slots
- 8 Parallel connector ("C" connector)
- 9 Memory access

# Media requirements

## Selecting print media

You can use many types of paper and other print media with this printer. This section provides guidelines and specifications for selecting and using different print media.

Before purchasing any media or specialized forms in quantity, verify that your paper supplier obtains and understands the print media requirements specified in the *HP LaserJet Family Paper Specification Guide*. The guide is available through HP Direct. See the online user guide for ordering information.

It is possible that media could meet all of the guidelines in this chapter and still not print satisfactorily. This may be due to abnormal characteristics of the printing environment or to other variables over which Hewlett-Packard has no control (for example, extremes in temperature and humidity).

**Hewlett-Packard recommends testing any media before buying it in large quantities.**

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### CAUTION

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Using media that does not conform to the specifications listed here and in the *HP LaserJet Family Paper Specification Guide* can cause problems that require service. This service is not covered by the Hewlett-Packard warranty or service agreements.

## Media specifications

For optimum results, use conventional 75 g/m<sup>2</sup> (20 lb) xerographic paper. Verify that the paper is of good quality and is free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, curls, or bent edges. Avoid fanning the print media before loading it into the paper trays.

## Supported media weights and sizes

Table 1-8 shows the media types and sizes supported by the printer and the printer accessories.

**Table 1-8 Supported media specifications**

Tray	Supported media	Media specifications	Capacity
Tray 1	Paper A4/Letter Legal Executive JIS B5 A5 Custom Minimum size: 76 x 127 mm (3 x 5 in) Maximum size: 216 x 356 mm (8.5 x 14)	Single-sided:  If less than or equal to 148 mm width: 60 to 176 g/m <sup>2</sup> (16 to 47 lb)  If more than or equal to 148 mm width: 60 to 135 g/m <sup>2</sup> (16 to 36 lb)  Two-sided: 64 to 105 g/m <sup>2</sup> (17 to 28 lb)	150 sheets of 75 g/m <sup>2</sup> (20 lb) paper
	Transparencies A4/Letter Glossy Paper	0.13 mm (5 mil) 120 g/m <sup>2</sup> (32 lb/80 lb text)	Limit of 50 Limit of 50 sheets
	Envelopes (Tray 1 only) Com10 Monarch C5 DL B5 (JIS)	Maximum basis weight: 90 g/m <sup>2</sup> (24 lb)	Limit of 10
	Labels (Tray 1 only)		Limit of 50
	Cardstock (postcards) (Tray 1 only)	Maximum weight: 176 g/m <sup>2</sup> (47 lb) Maximum size: 200 mm x 148 mm (7.87 in x 5.82 in)	Do not load more than the maximum stack height of 15 mm (0.6 in)

**Table 1-8 Supported media specifications (continued)**

Tray	Supported media	Media specifications	Capacity
Tray 2*	Paper A4/Letter Legal Executive JIS B5 A5 Custom (B5 ISO)**	60 to 105 g/m <sup>2</sup> (16 to 28 lb)	250 sheets of 75 g/m <sup>2</sup> (20 lb) paper
	Transparencies Glossy Paper	0.13 mm (5 mil) 120 g/m <sup>2</sup> (32 lb/80 lb text)	Limit of 50 transparencies Limit of 200 sheets glossy
Tray 3* (optional)	Paper A4/Letter Legal Executive JIS B5 Custom (B5 ISO)**	60 to 105 g/m <sup>2</sup> (16 to 28 lb)	500 sheets of 75 g/m <sup>2</sup> (20 lb) paper
	Transparencies Glossy Paper	0.13 mm (5 mil) 120 g/m <sup>2</sup> (32 lb/80 lb text)	Limit of 50 transparencies Limit of 500 sheets glossy
Duplex printing accessory (optional)	Paper A4/Letter Legal Executive JIS B5	64 to 105 g/m <sup>2</sup> (17 to 28 lb)	

\*Trays 2 and 3 do not support the range of custom sizes available in Tray 1.

\*\*Trays 2 and 3 use “custom” size—specifically for B5 ISO.

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**Note**

Use only HP-supported transparencies (HP part number C2934A, Letter size; C2936A, A4 size)

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## Non-supported media

Use the following guidelines to avoid poor print quality or damage to your printer:

- Do not use paper that is too rough.
- Do not use paper that is embossed or coated unless it is specifically recommended for use in this printer.
- Do not use paper with cutouts or perforations other than standard 3-hole punched paper.
- Do not use multipart forms.
- Do not use paper with irregularities such as tabs or staples.
- Do not use letterhead paper with low temperature dyes or thermography. Preprinted forms or letterhead must use inks that can tolerate temperatures of 190° C (374° F) for 0.1 second.
- Do not use any media that produces hazardous emissions, or that melts, offsets, or discolors when exposed to 190° C (374° F) for 0.1 second.
- Do not use paper that has already been printed on or fed through a photocopier or printer.
- Do not use paper with a watermark if you are printing solid patterns.
- Do not duplex on glossy paper. Doing so will result in paper jams and print quality problems.

## Printing on special media

Use these guidelines when printing on special types of media.

- For optimum results, use conventional 75 g/m<sup>2</sup> (20 lb) xerographic paper.
- Verify that the paper is of good quality and free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, curls, or bent edges.

## Transparencies

When printing on transparencies, use the following guidelines:

- Do not send transparencies from Tray 2 to the rear output bin. The toner will be warm and may cause the transparencies to stick together.
- Send transparencies to the top output bin.
- Handle transparencies using the edges. Oils from your fingers can remain on the transparency and can cause print quality problems.
- Use only overhead transparencies recommended for use in this printer. Table 1-9 describes the recommended specifications for transparencies.

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### CAUTION

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Do not use DeskJet (inkjet) transparencies in this printer. The transparencies can become overheated and melt, causing serious damage to your printer. Hewlett-Packard recommends using HP Color LaserJet Transparencies with this printer. HP products are designed to work together for optimum printing results.

**Table 1-9 Printing on transparencies**

Description	Specifications
Electrical surface resistivity	2.0 to 15 x 10 ohms per square inch
Fusing compatibility	Materials must not discolor, melt, offset, or release hazardous emissions when heated to 190° C (374° F) for 0.1 second.
Caliper (thickness)	0.12 mm (0.0048 in) to 0.13 mm (0.0052 in)

## Glossy paper

For optimum results when printing on glossy paper, select the glossy print setting in the printer driver. You can also use the printer control panel to set the media type to **GLOSS** for the input tray you are using. Because this setting affects all print jobs, it is important to return the printer to its original settings once your job has printed. See the section in the online user guide on configuring input trays.

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### Note

Do not duplex on glossy paper. Doing so will result in paper jams and print quality problems.

## Colored paper

Colored paper should be of the same high quality as white xerographic paper. Pigments used must be able to withstand the printer's fusing temperature of 190° C (374° F) for 0.1 second without deterioration. Do not use paper with a colored coating that was added after the paper was produced.

The printer creates colors by printing patterns of dots, overlaying and varying their spacing to produce various colors. Varying the shade or color of your paper will affect the shades of your printed colors.

## Heavy paper

Use Tray 1 for paper that is heavier than 105 g/m<sup>2</sup> (28 lb). For optimum results when printing on heavy paper, select the heavy print setting in the printer driver. You can also use the printer control panel to set the media type to **HEAVY** for the input tray you are using. Because this setting affects all print jobs, it is important to return the printer to its original settings once your job has printed.

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### CAUTION

Do not use paper that is heavier than the recommended paper specification for this printer. Doing so can cause misfeeds, paper jams, inferior print quality, and excessive mechanical wear. See Table 1-8 for supported paper types and sizes.

## Envelopes

Envelopes can only be printed from Tray 1. For information on loading envelopes, see the section in the online user guide on loading envelopes into Tray 1.

Adhering to the following guidelines will help ensure proper printing of envelopes and help prevent printer jams:

- Do not load more than 10 envelopes into Tray 1.
- The weight rating of envelopes should not exceed 90 g/m<sup>2</sup> (24 lb).
- Envelopes should be flat.
- Envelopes must not be wrinkled, nicked, or otherwise damaged.
- Envelopes with peel-off adhesive strips must use adhesives that can withstand the heat and pressures of the printer's fusing process.
- Envelopes should be loaded with the flaps facing away from the printer and toward the left side of the printer.

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### CAUTION

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To prevent severe printer damage, do not use envelopes that have windows, clasps, snaps, or synthetic materials.

## Labels

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### Note

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To print labels, Hewlett-Packard recommends configuring Tray 1 as a cassette and setting the tray's media type to LABELS in the printer control panel.

When printing labels, use the following guidelines:

- Verify that the label's adhesive material can tolerate temperatures of 190° C (374° F) for 0.1 second.
- Verify that adhesive material is not exposed between the labels. Exposed areas can cause labels to peel off during printing, which can cause printer jams. Exposed adhesive can also cause damage to printer components.
- Do not re-feed a sheet of labels.
- Verify that labels lie flat.
- Do not use labels that are wrinkled, bubbled, or otherwise damaged.

## Preprinted forms and letterhead

Observe the following guidelines for best results with preprinted forms and letterhead:

- Forms and letterhead must be printed with heat-resistant inks that will not melt, vaporize, or release hazardous emissions when subjected to the printer's fusing temperature of approximately 190° C (374° F) for 0.1 second.
- Inks must be non-flammable and should not adversely affect any printer rollers.
- Forms and letterhead should be sealed in a moisture-proof wrapping to prevent changes during storage.
- Before you load preprinted paper such as forms and letterhead, verify that the ink on the paper is dry. During the fusing process, wet ink can come off of preprinted paper.

## Recycled paper

This printer supports the use of recycled paper. Recycled paper must meet the same specifications as standard paper (refer to the *HP LaserJet Family Paper Specification Guide*). The guide is available through HP Direct. See the online user guide for ordering information. Hewlett-Packard recommends that recycled paper contain no more than 5 percent groundwood.

# Environmental Product Stewardship Program

## Protecting the environment

Hewlett-Packard Company is committed to providing quality products in an environmentally sound manner. This HP LaserJet printer has been designed with several attributes to minimize impacts on our environment.

### This HP LaserJet printer design eliminates:

- **Ozone Emissions**—This product has been designed to minimize ozone emissions and avoid the need for an ozone filter.
- **CFC Usage**—Class I U.S. Clean Air Act stratospheric ozone-depleting chemicals (chlorofluorocarbons [CFCs], for example) have been eliminated from the manufacturing sites that produce this printer. This practice coincides with the 1987 “Montreal Protocol on Substances that Deplete the Ozone Layer” and its subsequent amendments. CFCs are not used in manufacturing of the packaging.

### This HP LaserJet printer design reduces:

- **Energy consumption**—Energy usage drops from 120 watts (W) during printing to as low as 30W (45W for a printer with optional accessories) while in low-power (PowerSave) mode. Not only does this save natural resources, but it also saves money without affecting the high performance of this printer. This product qualifies for the ENERGY STAR Program (U.S. and Japan). ENERGY STAR is a voluntary program established to encourage the development of energy-efficient office products. ENERGY STAR is a U.S. registered service mark of the U.S. EPA.



As an ENERGY STAR partner, Hewlett-Packard Company has determined that this product meets ENERGY STAR Guidelines for energy efficiency.

- **Paper use**—The printer’s optional duplex unit provides two-sided printing, reducing paper usage and the resulting demands on natural resources.

## The design of this HP LaserJet printer facilitates the recycling of:

- **Plastics**—Major plastic parts have markings that enhance the ability to identify plastics for recycling purposes at the end of the printer's life. The plastics used in the printer housing and chassis are technically recyclable.
- **HP toner cartridges/photoconductive drum**—In many countries, this product's toner cartridge/drum can be returned to HP at the end of its useful life. A prepaid shipping label and instructions on how to return the toner cartridge/drum are included with the replacement toner cartridge/drum. If your country is not listed in the replacement's brochure, call your local HP Sales and Service Office for further instructions.

## HP cartridge recycling program information:

Since 1990, the HP LaserJet Toner Cartridge Recycling Program has collected more than twelve million cartridges that otherwise would have been discarded into landfills or similar facilities. This rapidly growing program returns used cartridges to the manufacturing process, thus conserving a variety of resources. Once a cartridge is returned through the prepaid return program, it is disassembled. The reusable components and the plastic housing are cleaned and inspected for quality conformance. After passing strict inspection procedures, materials such as nuts, screws, and clips are reclaimed and used to produce new cartridges. Remaining materials, like the photoconductive drum, are melted down and used as raw materials for a variety of other products. By the weight of the materials returned, over 95 percent (%) are recycled. All HP LaserJet Toner Cartridges are shipped in recycled boxes with the entire box being recyclable through the returns program. Styrofoam end caps, which were used to support HP LaserJet Toner Cartridges during shipping, have been replaced with molded end caps made from 100% post-consumer paper products. For more information in the U.S., call (1) (800) 340-2445 or visit the HP LaserJet website at <http://www.ljssupplies.com/planetpartners>. International customers can call the local HP Sales and Service Office for further information regarding the HP Toner Cartridge Recycling Program.

- **Printer and parts**—Design for recycling has been incorporated into this printer and its accessories. The number of materials has been kept to a minimum while ensuring proper functionality and high product reliability. Dissimilar materials have been designed to separate easily. Fasteners and other connections are easy to locate, access, and remove with common tools. High priority parts have been designed to be accessed quickly for efficient

disassembly and repair. Plastic parts have been primarily designed in two colors to enhance recycling options. A few small parts are colored specifically to highlight customer access points.

HP provides a product return system for customers in Germany. Many of the functional parts are recovered, tested, and reused as fully-warranted service parts. Used parts are not placed into new product manufacturing. The remainder of the product parts are recycled, if possible. For product return information, call (49) (070) 3114-1936 or Fax (49) (070) 3114-4195.

- **Paper**—This printer is suited for the use of recycled papers when the paper meets the guidelines outlined in the *HP LaserJet Printer Family Paper Specification Guide*. This printer is suited for the use of recycled paper according to DIN 19 309.

The online user guide is provided on compact disc, which allows the same high-quality information to be provided without consuming the large quantities of energy and natural resources required to produce traditional paper manuals.

### **To ensure the longevity of your HP LaserJet printer, HP provides the following:**

- **Extended warranty**—HP SupportPack provides coverage for the HP hardware product and all HP-supplied internal components. The hardware maintenance covers a 3-year period from date of the HP product purchase. HP SupportPack must be purchased by the customer within 90 days of the HP product purchase. Information on HP SupportPack is available in a fax format by calling the U.S. HP FIRST (Fax Information Retrieval Support Technology) at (1) (800) 333-1917. The document number is 9036. Non-U.S. customers can contact the nearest HP-dealer about this service.
- **Spare parts and consumables availability**—Spare parts and consumable supplies for this product will be made available for at least 5 years after production has stopped.



# Regulatory statements

## FCC regulations

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If it is not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

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### Note

Any changes or modifications to the printer that are not expressly approved by HP could void the user's authority to operate this equipment.

Use of a shielded interface cable is required to comply with the Class B limits of Part 15 of FCC rules.

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## Canadian DOC regulations

Complies with Canadian EMC Class B requirements.

« Conforme à la classe B des normes canadiennes de compatibilité électromagnétique « CEM ». »

## VCCI statement (Japan)

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づく第二種情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取り扱い説明書に従って正しい取り扱いをして下さい。

## Korean EMI statement

### 사용자 안내문 (B급 기기)

이 기기는 비업무용으로 전자파장애검정을 받은 기기로서, 주거지역에서는 물론 모든 지역에서 사용할 수 있습니다.

# Declaration of Conformity

according to ISO/IEC Guide 22 and EN 45014

**Manufacturer's Name:** Hewlett-Packard Company  
**Manufacturer's Address:** 11311 Chinden Boulevard  
Boise, Idaho 83714-1021 USA

## declares that the product

**Product Name:** HP Color LaserJet 4500, 4500 N, 4500 DN  
**Model Number:** C4084A, C4089A, C4094A  
**Product Options:** ALL

## conforms to the following Product Specifications:

**Safety:** IEC 950:1991+A1+A2+A3+A4 / EN 60950:1992+A1+A2+A3+A4  
IEC 825-1:1993+A11 / EN 60825-1:1994+A11 Class 1 (Laser/LED)

**EMC:** CISPR 22:1993+A1 / EN 55022:1994 Class B<sup>1</sup>  
EN 50082-1:1992

IEC 801-2:1991 / prEN 55024-2:1992 -	4 kV CD, 8 kV AD
IEC 801-3:1984 / prEN 55024-3:1991 -	3 V/m
IEC 801-4:1988 / prEN 55024-4:1992 -	0.5kV Signal Lines, 1.0kV Power Lines

IEC 1000-3-2:1995 / EN61000-3-2:1995  
IEC 1000-3-3:1994 / EN61000-3-3:1995  
FCC Title 47 CFR, Part 15 Class B2 / ICES-003, Issue 2 / VCCI-2<sup>1</sup>  
AS / NZS 3548:1992 / CISPR 22:1993 Class B<sup>1</sup>)

## Supplementary Information:

The product herewith complies with the requirements of the following Directives and carries the CE-marking accordingly:

- the EMC Directive 89/336/EEC
- the Low Voltage Directive 73/23/EEC

<sup>1</sup> The product was tested in a typical configuration with Hewlett-Packard Personal Computer Systems.

<sup>2</sup> This Device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

\*This printer contains Local Area Network (LAN) options. When the interface cable is attached to either of the IEEE 802.3 connectors, the printer meets the requirements of EN 55022A Class A. February 9, 1998

## For Compliance Information ONLY, contact:

Australia Contact: Product Regulations Manager, Hewlett-Packard Australia Ltd., 31.41 Joseph Street, Blackburn, Victoria 3130, Australia.

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department HQ-TRE / Standards Europe, Herrenberger Strasse 130, D-71034 Böblingen, Germany (FAX: 49-7031-14-3143).

USA Contact: Product Regulations Manager, Hewlett-Packard Company, P.O. Box 15, Mail Stop 160, Boise, ID 83707-0015 (Phone: 208-396-6000).

# Safety information

## Laser safety statement

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration has implemented regulations for laser products manufactured since August 1, 1976. Compliance is mandatory for products marketed in the United States. The printer is certified as a “Class 1” laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape during any phase of normal user operation.

## Material Safety Data Sheet

The Toner Cartridge/Drum Material Safety Data Sheet (MSDS) can be obtained by calling the U.S. HP FIRST at (800) 231-9300, or by visiting the website at <http://www.ljsupplies.com/planetpartners/datasheets.html>. International customers should see support information in this guide for appropriate phone numbers and information

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### Hint

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To get documents from HP FIRST by fax, use a group 3 (touch tone) fax machine.

## Toner safety

Hewlett-Packard encourages responsible disposal of HP LaserJet printer consumable items through its Environmental Collection Program. For details on this program, see the recycling instruction guide enclosed with each consumable item.

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### Note

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In case of toner spills, skin and clothing are best cleaned by removing as much toner as possible with a dry tissue, then washing with cold water. Hot water causes toner to permanently set into clothing.

# Laser statement for Finland

## LASERTURVALLISUUS

### Luokan 1 laserlaite

#### Klass 1 Laser Apparat

HP LaserJet 4500 -laserkirjoitin on käyttäjän kannalta turvallinen luokan 1 laserlaite. Normaalisissa käytössä kirjoittimen suojakotelointi estää lasersäteen pääsyn laitteen ulkopuolelle.

Laitteen turvallisuusluokka on määritetty standardin EN 60825-1 (1994) mukaisesti.

#### **VAROITUS !**

Laitteen käyttäminen muulla kuin käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

#### **WARNING !**

Om apparaten används på annat sätt än i bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

#### **HUOLTO**

HP LaserJet 4500 -kirjoittimen sisällä ei ole käyttäjän huollettavissa olevia kohteita. Laitteen saa avata ja huoltaa ainoastaan sen huoltamiseen koulutettu henkilö. Tällaiseksi huoltotoimenpiteeksi ei katsota väriainekasetin vaihtamista, paperiradan puhdistusta tai muita käyttäjän käsikirjassa lueteltuja, käyttäjän tehtäväksi tarkoitettuja ylläpitotoimia, jotka voidaan suorittaa ilman erikoistyökaluja.

## **VARO !**

Mikäli kirjoittimen suojakotelo avataan, olet alltiina näkymättömälle lasersäteilylle laitteen ollessa toiminnassa. Älä katso säteeseen.

## **VARNING !**

Om laserprinterns skyddshölje öppnas då apparaten är i funktion, utsätts användaren för osynlig laserstråling. Betrakta ej strålen.

Tiedot laitteessa käytettävän laseriodin säteilyominaisuuksista:

Aallonpituus 770-795 nm

Teho 5 mW

Luokan 3B laser

# 2

## Service approach

### Chapter contents

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# Service approach

Printer repair normally begins by using the printer's internal diagnostics and the three-step process below:

Step 1 Isolate the problem to the major system (for example, the host computer, the network and/or server, or the printer system).

Step 2 Determine if the problem is located in the accessories or in the printer engine.

Step 3 Troubleshoot the problem using the procedures in Chapter 7.

Once a faulty part is located, the printer can usually be repaired at the assembly level by replacing field replaceable units (FRUs). Some mechanical assemblies may need to be repaired at the subassembly level. Hewlett-Packard does not support replacement of components on the printer circuit assemblies.



# Parts and supplies

## Ordering parts

Field replaceable and accessory part numbers are found in Chapter 8 of this manual. Replacement parts can be ordered from HP's Commercial Hardcopy Support Division-America (CHSD-A) or HP's Commercial Hardcopy Support Division-Europe (CHSD-E).

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### Note

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Use only accessories specifically designed for this printer. Accessories can be ordered from an authorized service or support provider. See "Ordering related documentation and software" on page 35 and "Ordering parts" on page 352 for additional ordering information.

### By phone:

- Commercial Hardcopy Support Division-America (CHSD-A)  
(1)(800) 227-8164 (US only)
- Commercial Hardcopy Support Division-Europe (CHSD-E)  
(49) (070) 3114-2253

### By mail:

Hewlett-Packard Company  
CHSD-A  
8050 Foothills Blvd.  
Roseville, CA 95678

Hewlett-Packard Company  
CDSD-E  
Wolf-Hirth Straße 33  
D-7030 Böblingen, Germany

## Ordering consumables

Consumables may be ordered directly from Hewlett-Packard. The phone numbers for ordering consumables are:

- U.S. (1)(800) 538-8787
- Canada (1)(800) 387-3154; Toronto (1)(416) 671-8383
- United Kingdom 0734-441212
- Other local phone numbers may also be available

## Exchange program

HP offers remanufactured assemblies for some parts. These are identified in Chapter 8 and can be ordered through Commercial Hardcopy Support Division America (CHSDA) or Commercial Hardcopy Support Division Europe (CHSDE).

## Consumables

Paper and Toner Cartridges can be ordered directly from Hewlett-Packard. See Chapter 8 for ordering information.

## World Wide Web

Printer drivers, updated HP printer software, and product and support information may be obtained from the following URL:

in the U.S. <http://www.hp.com/go/support>

Printer drivers may be obtained from the following sites:

in China <ftp://www.hp.com.cn/go/support>

in Japan <ftp://www.jpn.hp.com/go/support>

in Korea <http://www.hp.co.kr/go/support>

in Taiwan <http://www.hp.com.tw/go/support>

or the local driver website <http://www.dds.com.tw>

## HP Service Parts Information Compact Disc

This powerful, CD-ROM-based parts information tool is designed to give users fast, easy access to parts information such as pricing and recommended stocking lists for a wide range of HP products. To subscribe to this quarterly service in the U.S. or Canada, call (800) 336-5987. In Asia Pacific, call (65) 740-4484. Parts identification and pricing information can also be accessed via the World Wide Web at <http://www.hp.com/go/partsinfo>.

## HP Support Assistant Compact Disc

This support tool offers a comprehensive online information system designed to provide technical and product information on HP products. To subscribe to the quarterly service in the U.S. or Canada, call (800) 457-1762. In Hong Kong, Indonesia, Malaysia, or Singapore, call Mentor Media at (65) 740-4477.

## Ordering related documentation and software

Table 2-1 shows where to order related documentation and software. Telephone numbers for the various sources are:

- Commercial Hardcopy Support Division-America (CHSD-A)  
(1)(800) 227-8164 (US only)
- Commercial Hardcopy Support Division-Europe (CHSD-E)  
(49) (070) 3114-2253
- HP Distribution Center (HPD) (1) (661) 257-5565.  
Fax: (1) (805) 257-6995

**Table 2-1 Related documentation and software**

Description	Part Number	CHSD-A	CHSD-E	HPD
<i>HP LaserJet Printer Family Paper Specification Guide</i>	5090-3392			X
<i>HP Peripherals Connectivity Solutions Guide</i>	5091-6453E	X	X	
<i>HP JetDirect Print Server JetAdmin Setup Guide</i>	5969-3412	X	X	
<i>HP JetDirect Print Server Administrator's Guide</i>	5967-9991	X	X	
Technical reference package	5021-0377	X		
HP Color LaserJet Printer Drivers Disk	C4084-60122			
HP Color LaserJet 4500, 4500 N documentation bundle (quick reference guide and getting started guide)	C4084-99021	X		
HP Color LaserJet 4500 DN documentation bundle (quick reference guide and getting started guide)	C4094-99020	X		
<i>HP Color LaserJet Family Quick Reference Service Guide</i>	5181-3521	X		
HP Color LaserJet 4500 Series Printer Service and Support CD-ROM	C4084-60110	X	X	
HP Color LaserJet 4500 Series Printer Online User Guide	C4084-90937	X		

# Technical assistance

## HP FIRST

HP FIRST (Fax Information Retrieval Support Technology) is a phone-in fax service providing technical information for HP LaserJet users as well as service personnel. Receiving a fax requires a type 3 facsimile machine or fax card. Service related information includes:

- Service notes (HP authorized dealers)
- Application notes
- Product data sheets
- Material Safety Data Sheets (MSDS)
- Typeface and accessory information
- Printer support software information
- Toner information
- Driver request form and software matrix

## HP FIRST numbers

HP FIRST Fax will deliver detailed troubleshooting information on common software and troubleshooting tips for your HP product. Call from any touch tone phone and request up to three documents per call. These documents will be sent to the fax of your choice. In Canada, call (1) (800) 333-1917; in the United States, call (1) (800) 333-1917.

# Warranty statement

## Hewlett-Packard warranty statement

HP Color LaserJet 4500, 1 year limited warranty  
4500 N, 4500 DN Printer

- 1 HP warrants HP hardware, accessories and supplies against defects in materials and workmanship for the period specified above. If HP receives notice of such defects during the warranty period, HP will, at its option, either repair or replace products which prove to be defective. Replacement products may be either new or like-new.
- 2 HP warrants that HP software will not fail to execute its programming instructions, for the period specified above, due to defects in material and workmanship when properly installed and used. If HP receives notice of such defects during the warranty period, HP will replace software media which does not execute its programming instructions due to such defects.
- 3 HP does not warrant that the operation of HP products will be uninterrupted or error free. If HP is unable, within a reasonable time, to repair or replace any product to a condition as warranted, customer will be entitled to a refund of the purchase price upon prompt return of the product.
- 4 HP products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use.
- 5 The warranty period begins on the date of delivery or on the date of installation if installed by HP. If customer schedules or delays HP installation more than 30 days after delivery, warranty begins on the 31st day from delivery.
- 6 Warranty does not apply to defects resulting from (a) improper or inadequate maintenance or calibration, (b) software, interfacing, parts or supplies not supplied by HP, (c) unauthorized modification or misuse, (d) operation outside of the published environmental specifications for the product, or (e) improper site preparation or maintenance.
- 7 TO THE EXTENT ALLOWED BY LOCAL LAW, THE ABOVE WARRANTIES ARE EXCLUSIVE AND NO OTHER WARRANTY OR CONDITION, WHETHER WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED AND HP SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, SATISFACTORY QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE.

- 8 HP will be liable for damage to tangible property per incident up to the greater of \$300,000 or the actual amount paid for the product that is the subject of the claim, and for damages for bodily injury or death, to the extent that all such damages are determined by a court of competent jurisdiction to have been directly caused by a defective HP product.
- 9 TO THE EXTENT ALLOWED BY LOCAL LAW, THE REMEDIES IN THIS WARRANTY STATEMENT ARE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. EXCEPT AS INDICATED ABOVE, IN NO EVENT WILL HP OR ITS SUPPLIERS BE LIABLE FOR LOSS OF DATA OR FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE.
- 10 FOR CONSUMER TRANSACTIONS IN AUSTRALIA AND NEW ZEALAND: THE WARRANTY TERMS CONTAINED IN THIS STATEMENT, EXCEPT TO THE EXTENT LAWFULLY PERMITTED, DO NOT EXCLUDE, RESTRICT OR MODIFY AND ARE IN ADDITION TO THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE SALE OF THIS PRODUCT TO YOU.

To ensure longevity of your HP LaserJet printer, HP provides the following:

## **Extended warranty**

HP SupportPack provides coverage for the HP hardware product and all HP-supplied internal components. The hardware maintenance covers a three-year period from date of the HP product purchase. The customer must purchase HP SupportPack within 90 days of the HP product purchase. Information on HP SupportPack is available in a fax format by calling the U.S. HP FIRST at (1) (800) 333-1917.

# 3

# Installation and configuration

## Chapter contents

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# Unpack the printer

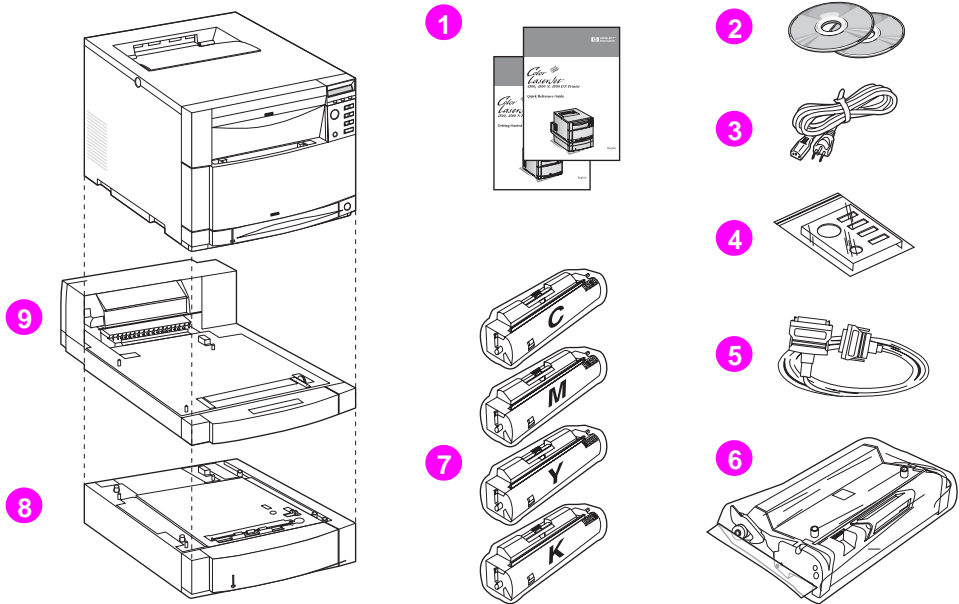
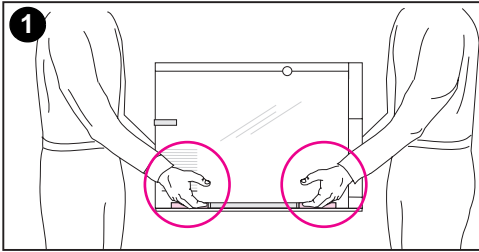


Figure 3-1 Package contents

## Package contents

The following items are included with the printer:

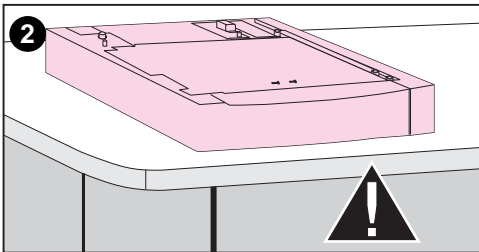
- 1 Printer guides: getting started guide and quick reference guide
- 2 Software CD-ROMs (including printer drivers and software, network administrator utilities, online user guide, and the *HP JetDirect Print Server Installation Guide*)
- 3 Power cord
- 4 Control panel overlay (for non-English language users)
- 5 Parallel cable (not included with the HP Color LaserJet 4500 N and 4500 DN printer)
- 6 Imaging drum
- 7 Four toner cartridges: cyan (C), magenta (M), yellow (Y), and black (K)
- 8 Tray 3 (500-sheet paper feeder, included only with the HP Color LaserJet 4500 DN printer)
- 9 Duplex unit (included only with the HP Color LaserJet 4500 DN printer)



## Unpacking the printer

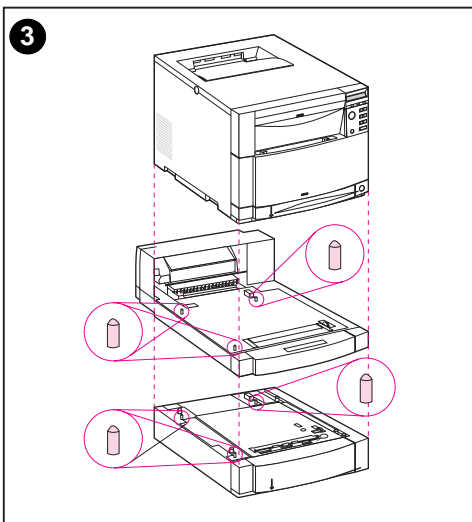
### Note

Save all of the packing materials in case you need to repack and transport the printer at a later date.



### WARNING!

The base and N model printers weigh approximately 57 kg (125 lb). The DN model weighs 77 kg (169 lb) with Tray 3 and the duplex unit installed. HP recommends having two or more people lift or move any of the printers.



- 1 Using safe lifting techniques, remove the printer and the printer accessories from the box.

### CAUTION

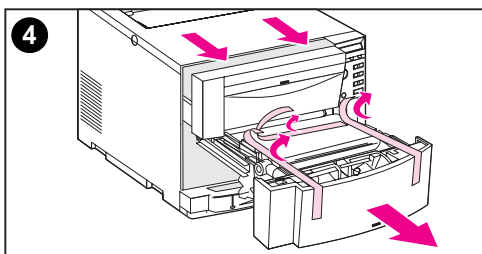
The prepared location must be level (not more than a 2° angle), able to support up to 77 kg (169 lb), and must support all four corners of the 500-sheet paper feeder (serves as printer base).

- 2 Place the 500-sheet feeder in the prepared location.

### CAUTION

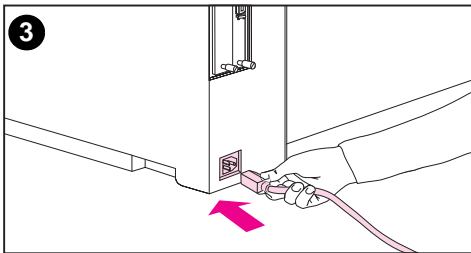
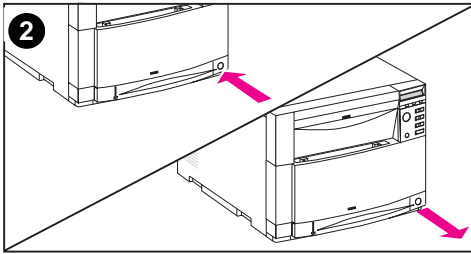
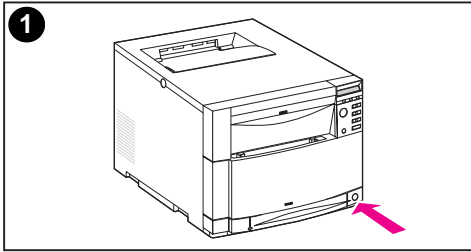
Avoid bending the guide pins while assembling the printer.

- 3 Using the guide pins for proper alignment, carefully assemble the printer and accessories.



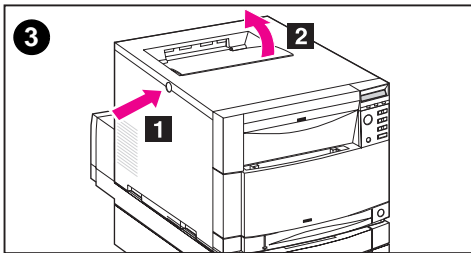
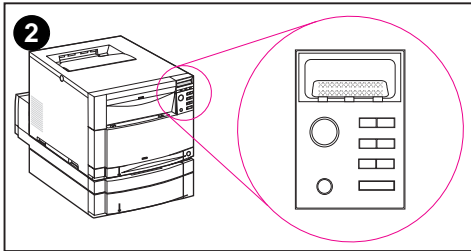
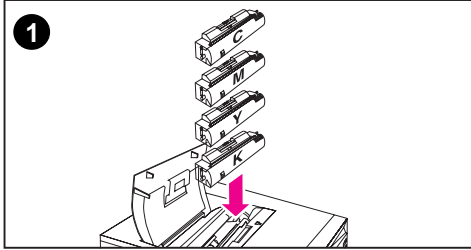
- 4 Open the ITB drawer and remove the packing tape, then close the drawer.

# Installation



## Attaching the power cord

- 1 Locate the standby button (power switch) on the front of the printer.
- 2 The standby button has two positions: in (power on) and out (standby mode—the fans remain on). Make sure that the standby button is out (standby mode).
- 3 Locate the power cord on the back side of the printer for the HP Color LaserJet 4500 or 4500 N printers or on the duplex unit for the HP Color LaserJet 4500 DN printer. Connect the power cord to the power receptacle on the back of the printer.



## Installing the toner cartridges—for older version printers

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### Note

The following instructions are for older versions of the 4500 series printers (see page 146 to determine which version of the printer you have). See page 49 for instructions on installing toner cartridges in newer version printers.

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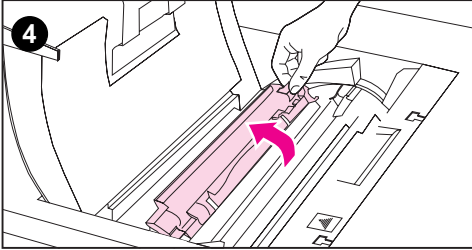
- 1 Locate the toner cartridges packaged in the printer box. The printer uses four different toner colors and has a different toner cartridge for each color: C = cyan, M = magenta, Y = yellow, and K = black.
- 2 Close all the doors and drawers on the printer. If the printer is not already turned on, turn it on. Wait for the printer to warm up. When it is ready, the control panel displays:  
TONER POSITION  
CYAN = MISSING

### Note

If the `INSTALL DRUM` message appears, wait for the `INSTALL TONER CARTRIDGE` message, then proceed with the following instructions.

---

- 3 Push the dark gray release button on the side of the printer (**1**) and open the top cover (**2**).



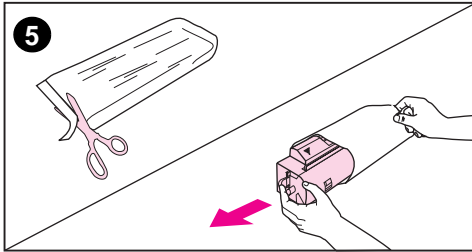
- The cartridge slot for the cyan toner cartridge is visible. Lift up the flap that partially covers the cartridge slot. The correct toner color is shown on the flap.

---

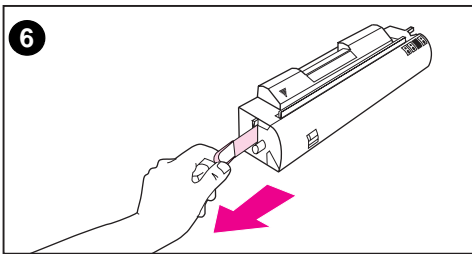
**CAUTION**

Do not shake the toner cartridges after removing them from the packaging.

---



- Remove the cyan toner cartridge from the bag. Gently rotate the toner cartridge from side to side to redistribute the toner.



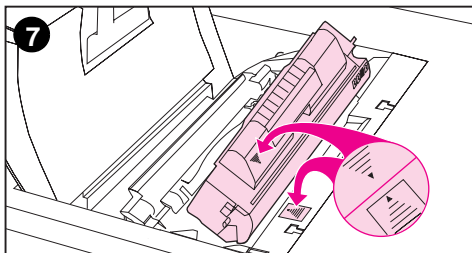
- Remove the inside sealing tape by firmly pulling the orange tab located on the end of the toner cartridge. (If the tab breaks off, pull on the tape.)

---

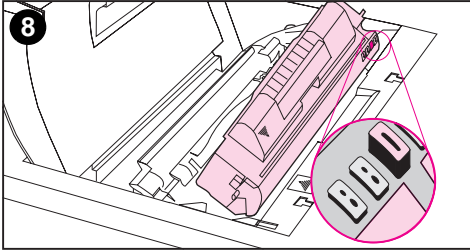
**CAUTION**

Do not shake the toner cartridge after you have removed the inside tape. Doing so could cause toner to spill.

---



- Position the toner cartridge over the cartridge slot so that the blue arrow on the toner cartridge points to the blue arrow on the printer.



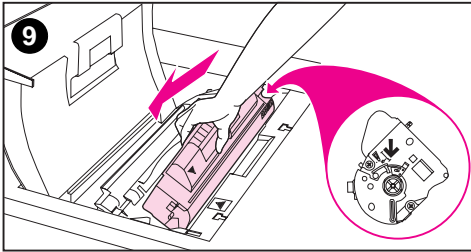
- 8 Make sure that the tab on the other end of the toner cartridge aligns with the notch on the cartridge slot.

---

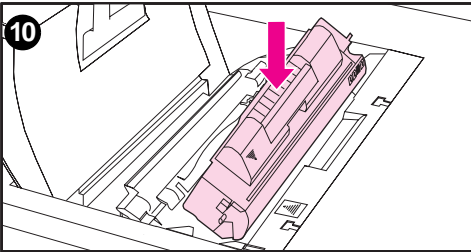
**Note**

If the tab does not fit in the notch when you insert the toner cartridge, the toner is the wrong color for that cartridge slot.

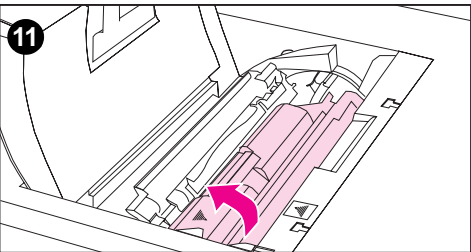
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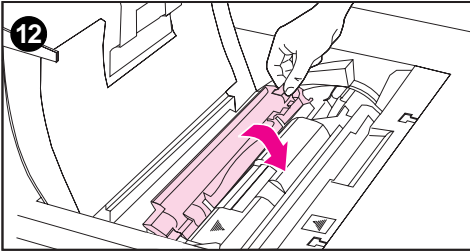
- 9 Hold the toner cartridge so that the arrow on the right side of the cartridge (the control panel side of the printer) points straight down.



- 10 Slide the toner cartridge down into the slot until the cartridge stops.



- 11 Rotate the toner cartridge toward the back of the printer (within the cartridge slot) until the cartridge stops. The cartridge shutter opens to reveal the developer sleeve.



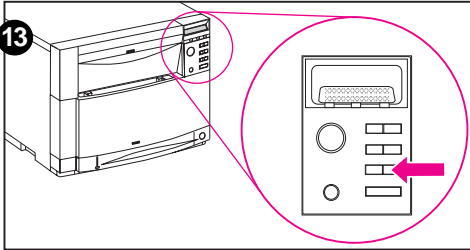
- 12** Lower the flap to partially cover the toner cartridge and close the top cover.

---

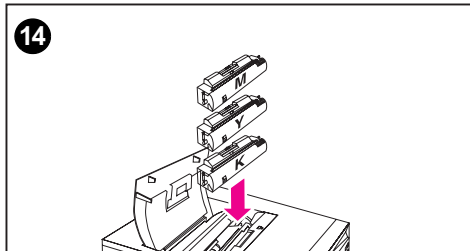
**Note**

You must close the top cover before installing the next toner cartridge.

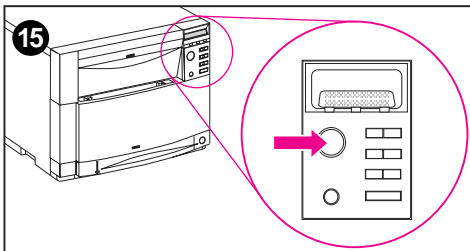
---



- 13** On the printer control panel, press **Value +** once to prepare the printer for installation of the next toner cartridge. When the printer is ready, the control panel displays:  
TONER POSITION  
(color) = MISSING



- 14** Install the other three toner cartridges by repeating steps 3-12. Install them in the following order:
1. magenta (M)
  2. yellow (Y)
  3. black (K)



- 15** After installing the fourth toner cartridge, close the top cover and press **Go**. Wait while the printer runs an internal color calibration. The calibration takes a few minutes. When the printer is ready, the control panel displays: **READY**.

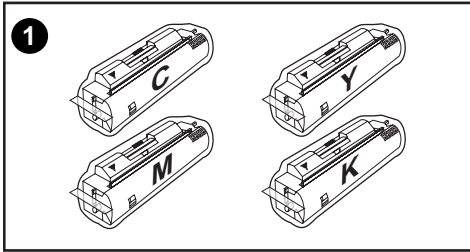
---

**CAUTION**

If you need to ship the printer, remove the toner cartridges and imaging drum before shipping.

---

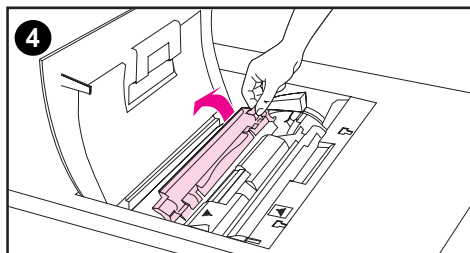
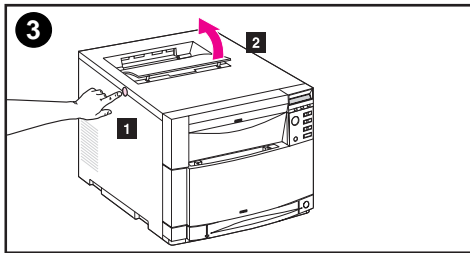
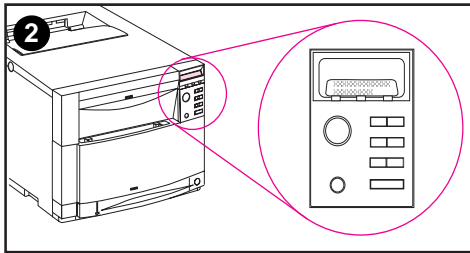




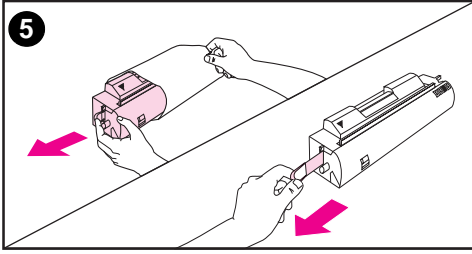
## Installing the toner cartridges—for newer version printers

### Note

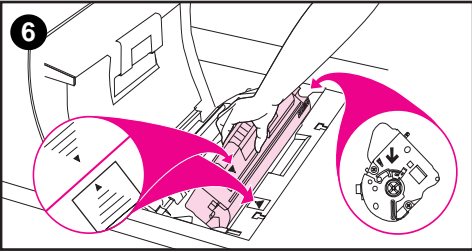
The following instructions are for newer versions of the 4500 series printers (see page 146 to determine which version of the printer you have). See page 45 for instructions on installing toner cartridges in older version printers.



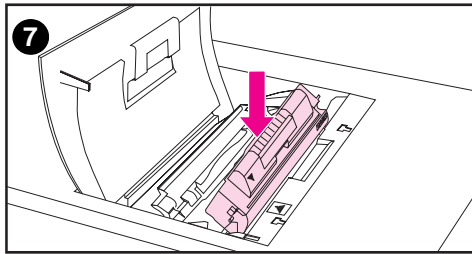
- 1 Locate the toner cartridges packaged in the printer box. The printer uses four different toner colors and has a different toner cartridge for each color: C = Cyan; M = Magenta; Y = Yellow; and K = Black.
- 2 If the printer is not already turned on, turn it on and close all doors and drawers. After the printer warms up for a few minutes, the control panel displays: TONER POSITION  
CYAN = MISSING
- 3 Push the dark gray release button on the left side of the printer ( **1** ) and open the printer's top cover ( **2** ).
- 4 The cartridge slot for the cyan toner cartridge is visible. Lift up the flap that partially covers the cartridge slot.



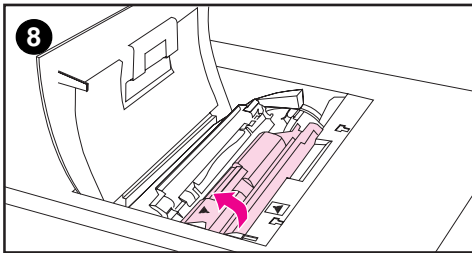
**5** Remove the cyan toner cartridge from the bag and locate the orange tab on the end of the toner cartridge. Pull the tab firmly to remove the inside sealing tape. (If the tab breaks off, pull on the tape.) Discard the tape.



**6** Position the toner cartridge over the cartridge slot so that the blue arrow on the toner cartridge points to the blue arrow on the printer. The arrow on the right (control panel side of the printer) should point straight down.



**7** Slide the toner cartridge down into the slot until the cartridge stops.



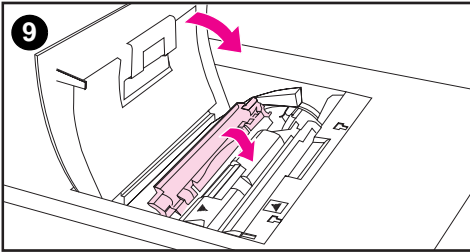
**8** Rotate the toner cartridge toward the back of the printer (within the cartridge slot) until the cartridge clicks in place.

---

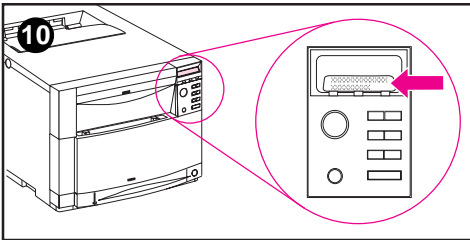
**Note**

If the cartridge does not slide easily into the slot, ensure that you have the right color cartridge for that slot.

---

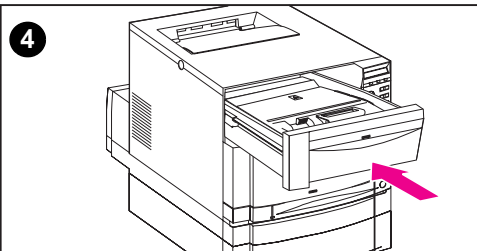
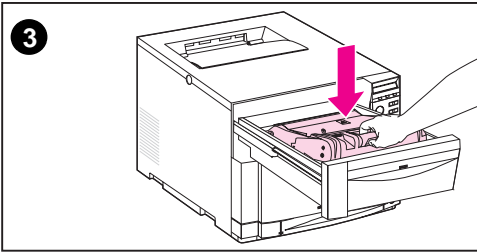
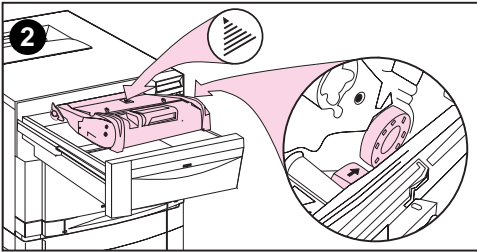
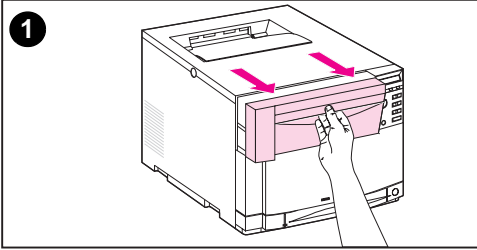


**9** Lower the flap to partially cover the toner cartridge. If the cartridge was rotated correctly, the flap covers the cartridge label. Close the top cover before installing the next toner cartridge.



**10** When the top cover is shut, the carousel advances to the next toner cartridge slot. When the printer is ready, the control panel displays:  
TONER POSITION  
<COLOR> = MISSING  
Install the other three toner cartridges by repeating steps 3 through 9.

**11** After installing the fourth toner cartridge, close the top cover and press **Go**. Wait while the printer runs an internal color calibration. The calibration takes a few minutes. When the printer is ready, the control panel displays: READY



## Installing the imaging drum

---

### CAUTION

Avoid exposing the imaging drum to direct light. Exposure to light for more than 15 seconds can seriously damage the imaging drum.

---

- 1 Pull open the drum drawer until it stops.
- 2 Align the imaging drum over the drawer so that the arrow on top points to the rear of the printer, and the blue end cap on the side slides into the slot identified with the blue arrow.
- 3 Slide the imaging drum down into place.
- 4 Push the front upper drawer shut. Wait while the printer runs an internal color calibration. The calibration takes a few minutes. When the printer is ready, the control panel displays **READY**.

---

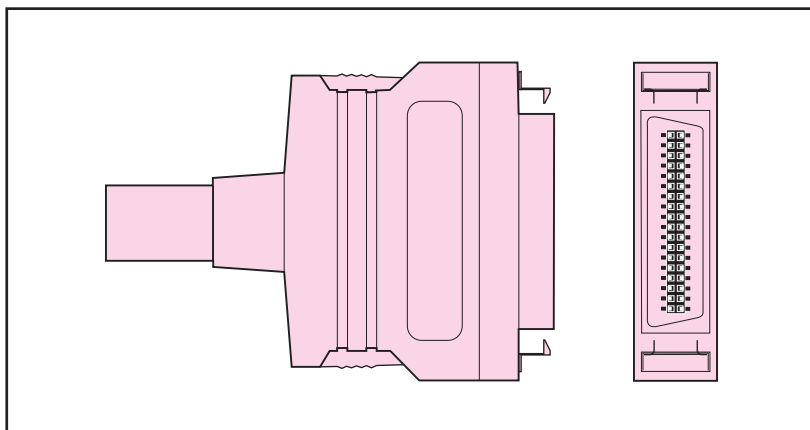
### CAUTION

If you need to ship the printer, remove the toner cartridges and imaging drum before shipping.

---

## Using the parallel cable

The printer can connect to the computer with a bidirectional parallel cable (IEEE-1284C compliant) (see Figure 3-2). Connect the male “C” connector to the printer and the male “B” connector to the computer. HP recommends that the parallel cable length be no longer than 10 meters (30 ft) in length. The cable (HP part number C2946A) is included with the HP Color LaserJet 4500 printer. It must be purchased separately for the HP Color LaserJet 4500 N and DN printers.



**Figure 3-2** Parallel cable with a “C” connector

### Parallel interface

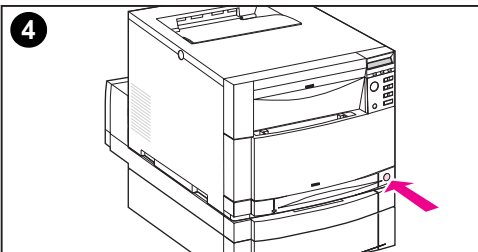
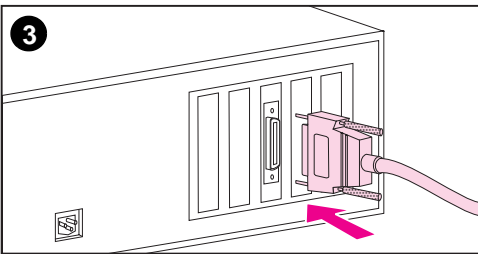
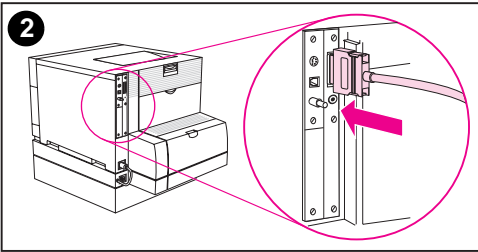
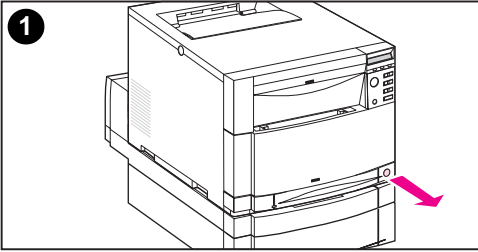
When used to describe a parallel interface, the term *bidirectional* indicates that the printer is able to both receive data from the computer and to send data to the computer through the parallel port.

---

#### Note

To use the enhanced capabilities of the bidirectional parallel interface such as bidirectional communication between the computer and printer, faster transfer of data, and automatic configuration of printer drivers, your software application must support these capabilities.

When you are using multiple ports, you can adjust automatic I/O switching to maximize performance by using the timeout feature. If data from other ports appears in the middle of your print job, increase the I/O timeout value.



## Connecting a parallel cable

- 1 Press the printer standby button (power switch) to place the printer in standby mode. Turn off the computer.
- 2 Plug the parallel cable into the printer's parallel port until it snaps into place.
- 3 Plug the other end of the parallel cable into the computer. Tighten the screws on the parallel cable to secure the cable to the computer.
- 4 Turn the computer on and then turn the printer on.

---

### Note

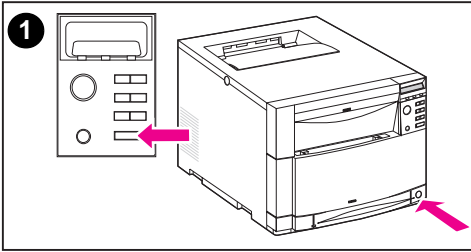
Your system will sense the printer (if your system is Plug and Play compatible). Follow the directions on your screen. To install the complete software package, cancel Plug and Play, and see the getting started guide for more information.

---

## Parallel cable pin configuration

To take advantage of the enhanced bidirectional parallel interface, use a 10-meter (30 ft.) parallel cable (IEEE-1284 compliant) with a 25-pin DB male to a (IEEE-1284C) male "C" connector. Use the following table to verify correct pin configuration.

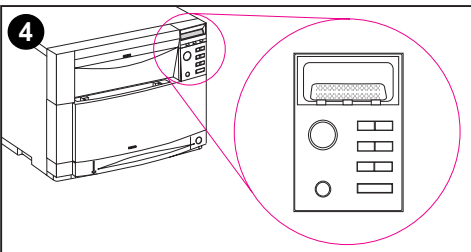
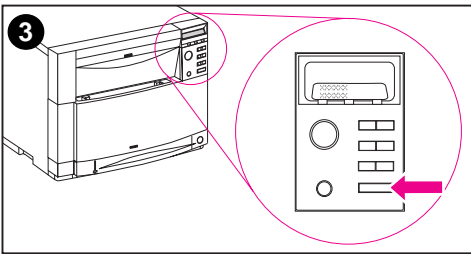
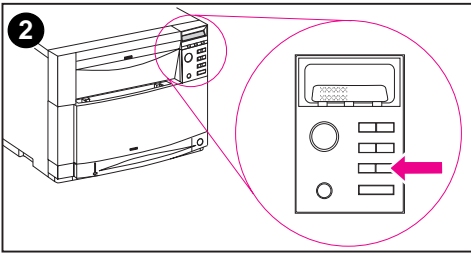
Signal Name	Printer Pin #	Computer Port #
nSTROBE	15	1
DATA 0	6	2
DATA 1	7	3
DATA 2	8	4
DATA 3	9	5
DATA 4	10	6
DATA 5	11	7
DATA 6	12	8
DATA 7	13	9
nACKNLG	3	10
BUSY	1	11
CALL (PE)	5	12
SELECT	2	13
NAutoFd	17	14
O VDC (GND)	19 – 35	18 – 25
nFAULT	4	15
nSe/In	16	17
nINIT	14	16
PERIPHLH	36	
N.C.	18	



## Selecting the display language

To change the display language on the printer control panel do the following:

- 1 Press and hold **Select** on the printer control panel while pressing the standby button (power switch). Continue holding **Select** until the control panel displays **SELECT LANGUAGE** (in English), and then release the **Select** key.
- 2 When the control panel displays **LANGUAGE=ENGLISH \***, press **Value** repeatedly until your language choice appears.
- 3 Press **Select** to save your language choice. An asterisk appears next to the selected language. Then press **Go**.
- 4 After the printer warms up, the control panel displays **READY** in the selected language. See Table 7-2 on page 226 if an error message appears.



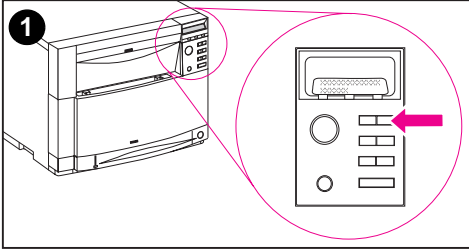
---

### Note

If the control panel does not display the message in the language you selected, press the printer standby button and repeat the instructions for changing the display language.

---

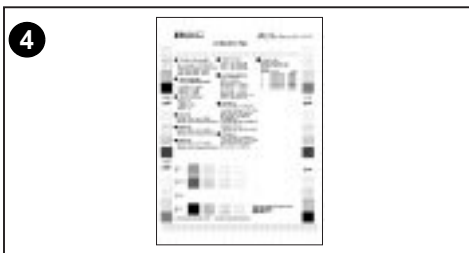
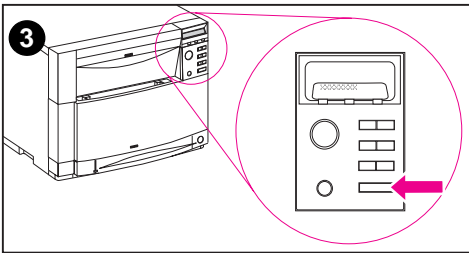
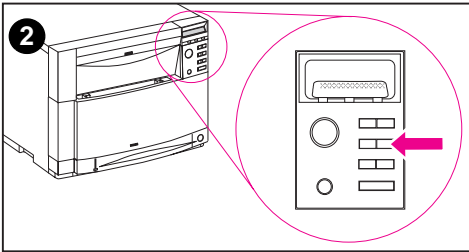


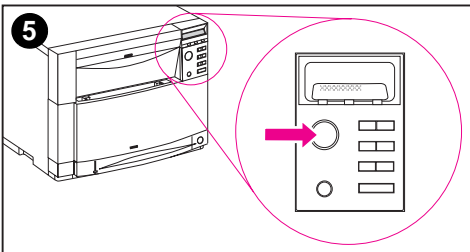
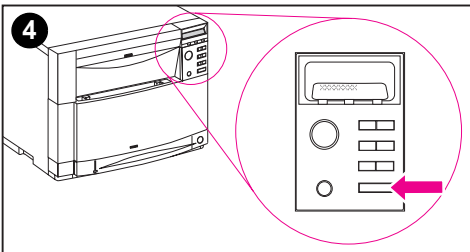
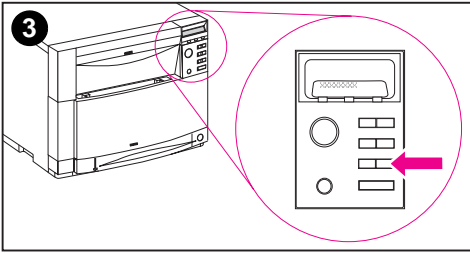
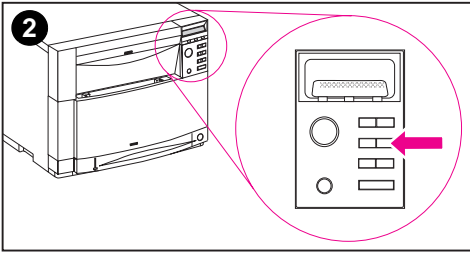
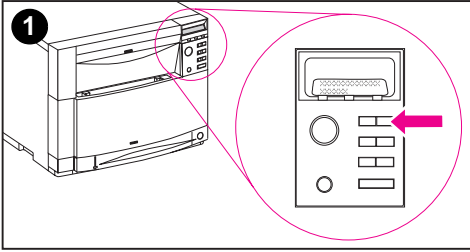


## Testing the printer operation

Print a configuration page to ensure that the printer is working properly.

- 1 On the control panel, press **Menu** until INFORMATION MENU appears on the display.
- 2 Press **Item** until PRINT CONFIGURATION appears.
- 3 Press **Select** to print a configuration page.
- 4 After about 30 seconds, the configuration page prints. If it does not print, see the “Troubleshooting flowchart” on page 221.





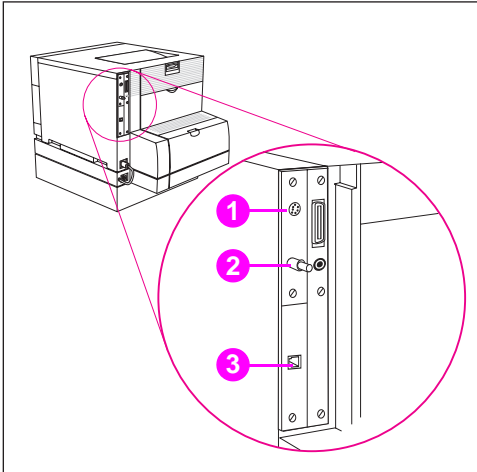
## Using PowerSave

PowerSave reduces power consumption when the printer is not in use. The factory default setting for PowerSave is ON, and the time setting is one hour. The instructions below explain how to change the time setting and how to turn PowerSave OFF.

### To set PowerSave

- 1 On the control panel, press **Menu** until CONFIGURATION MENU appears on the control panel display.
- 2 Press **Item** until POWERSAVE=1 HR \* appears.
- 3 Press **Value +** or **Value -** to display other time-setting choices between 1 minute and 8 hours, or to turn time setting off.
- 4 Press **Select** to save your choice. An asterisk (\*) appears beside your saved choice.
- 5 Press **Go**. The control panel displays READY.

# Connecting to a network



Network cable connection

The following ports are available on the HP JetDirect print servers:

- 1 LocalTalk DIN-8 port (not available on the HP JetDirect J3113A print server.)
- 2 BNC port for ThinLAN coaxial cable (not available on the HP JetDirect J3113A print server)
- 3 RJ-45 port

---

### Note

On the HP JetDirect J3113A print server, you can attach either a ThinLAN cable or a 10Base-T cable, but not both at the same time.

---

See the instructions that follow to connect one or more network cables to the printer.

## Connecting to a LocalTalk network (J3111A only)

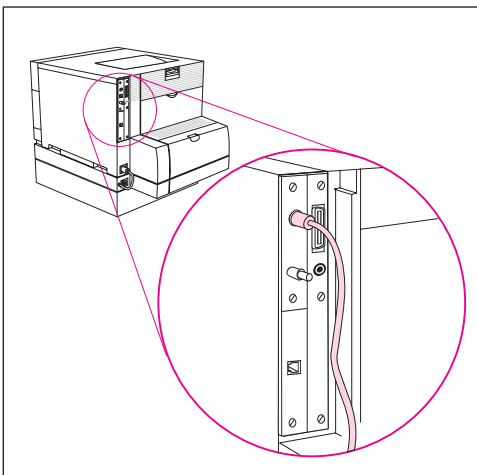
Plug the end of your DIN-8 cable into the LocalTalk port on the HP JetDirect print server. Attach the other end to the network.

---

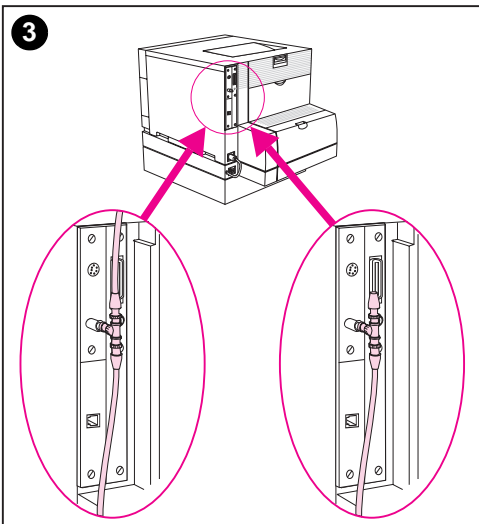
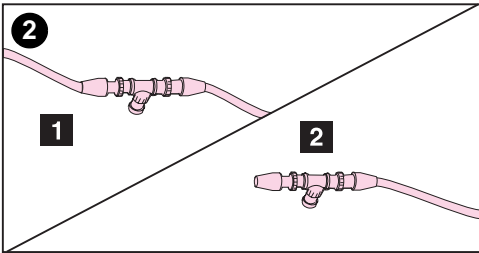
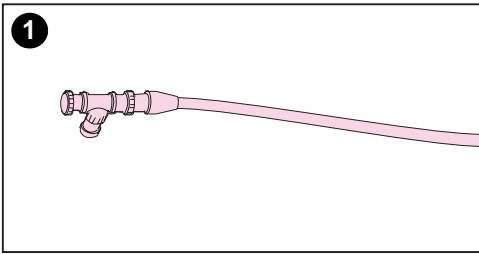
### Note

Network cables are not included with the printer. They must be purchased separately.

---



LocalTalk DIN-8 connection



BNC port

## Connecting to a 10Base2 network (J3111A only)

- 1 Attach one section of your ThinLAN cable to the BNC "T" connector.
- 2 Attach another ThinLAN cable section ( **1** ) or a 50-ohm terminator ( **2** ) to the other side of the BNC "T" connector. If you are attaching the printer to the end of your network, you must connect a 50-ohm terminator.

---

### Note

The BNC "T" connector and 50-ohm terminator for the 10Base-2 connection are not included with the printer. They must be purchased separately.

---

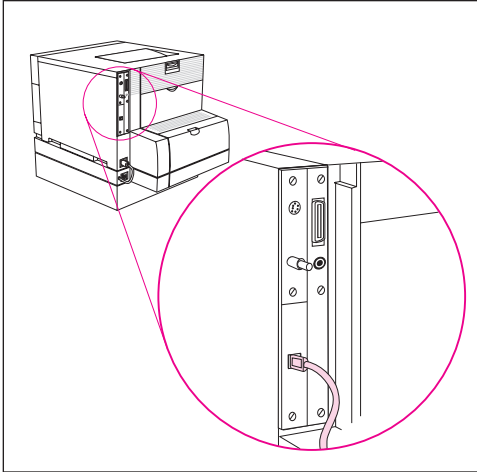
- 3 Connect the BNC "T" connector to the BNC port on the HP JetDirect print server.

---

### Note

The HP JetDirect J3111A print server supports one Ethernet cable connection at a time.

---



RJ-45 (10Base-T or 10/100Base-TX)  
connection

## Connecting to a 10Base-T or 10/100Base-TX network

Plug the connector of your unshielded twisted-pair cable into the RJ-45 port. The other end of the cable should be attached to the network.

---

### Note

The HP JetDirect print server supports one Ethernet cable connection at a time.

---

# Enhanced I/O (EIO) configuration

This printer comes equipped with two enhanced input/output (EIO) slots. These slots hold compatible external devices such as the HP JetDirect 600N Print Server. Plugging EIO cards into the slots increases the number of network interfaces available to the printer.

EIO cards can maximize printer performance when you are printing from a network. In addition, they provide the ability to place the printer anywhere on a network. This eliminates the need to attach the printer directly to a server or a workstation and enables you to place the printer closer to your network users.

The printer control panel will have an additional menu (EIO Menu) if the printer is configured with EIO cards. (See the chapter on using the printer control panel in the online user guide.)

---

**Note**

---

Installation of cards and network configuration should be performed by a network administrator.

## HP JetDirect print servers

HP JetDirect print servers (network cards) can be installed in one of the printer EIO slots. These cards support multiple network protocols and operating systems. HP JetDirect print servers facilitate network management by allowing you to connect a printer directly to your network at any location. HP JetDirect print servers also support the Simple Network Management Protocol (SNMP), which provides network managers with remote printer management and troubleshooting through HP JetAdmin software.

## **LocalTalk I/O**

The LocalTalk interface enables you to print directly from a stand-alone Apple Macintosh computer or from a Macintosh computer on a LocalTalk network. For specific information on configuring your computer and printer to print through a LocalTalk interface, refer to the printer's getting started guide and the *HP JetDirect Print Server Software Installation Guide*

## **CPU**

The formatter PCB incorporates a 133MHz RISC processor.

# Printer drivers

The optimal way to control the printer is through settings in a software application or through the printer driver. Changing print settings via a software application affects only that particular print job. Most software applications allow you to choose print settings from menus within the application. Software application settings and printer driver settings override the settings on the printer control panel.

For best print quality, always select the paper or media type in the printer driver. Different media types use different printer settings. For example, selecting transparencies in the driver causes the printer to use a different color table, one designed for maximum print quality on transparencies. Additionally, transparencies cause the printer to adjust printer speed and fuser temperature.

Other media types affect the printer settings as well: Selecting heavy or glossy media, for example, causes the printer to change the engine speed.

The printer driver also gives you customized control of color text, graphics, and photos. The following color control features are available only through your HP printer driver:

- Halftone Options
- HP ColorSmart II

Halftone options affect the resolution and clarity of your color output. You can select halftone settings for text, graphics, and photos independently. The two halftone options are Smooth and Details.

HP ColorSmart II default settings will produce optimum results for most color printing needs. However, you can also manually adjust color settings through the printer driver's Vivid Color and Screen Match color control options.

See the printer driver's online Help for details on color settings and their effect on printed output.



# Network configuration

## Configuring the printer for the network

You can configure certain network parameters on the printer from the printer control panel or, for most networks, from the HP JetAdmin Software (or the HP LaserJet Utility for Macintosh). The utilities are provided on the printing software CD-ROM that comes with the printer. You can also set these parameters from the HP Web JetAdmin Software, which is available at <http://www.hp.com/go/webjetadmin>.

For a complete list of supported networks and for instructions on configuring network parameters from software such as HP JetAdmin and HP Web JetAdmin, see the *HP JetDirect Print Server Software Installation Guide*. The guide comes on the CD-ROM with printers in which an HP JetDirect 600N print server is installed.

---

### Note

If you are configuring network parameters from the printer control panel, the control panel menu for configuring parameters appears in the languages listed below. If your language is not listed, the menu will appear in English and you will need to configure the printer by using HP JetAdmin software (or the HP LaserJet Utility for Macintosh).

Danish	French	Portuguese
Dutch	German	Spanish
English	Italian	Swedish
Finnish	Norwegian	

---

## Configuring Novell NetWare frame type parameters

The HP JetDirect 600N print server automatically selects a NetWare frame type. Select a frame type manually only when the print server selects an incorrect frame type. To identify the frame type chosen by the HP JetDirect 600N print server, print a configuration page.

## Configuration tips

HP JetDirect 600N print servers (network cards) provide software solutions for:

- Novell NetWare versions 3.x and 4.x
- Microsoft Windows 3.1 and Windows 95
- Microsoft Windows NT 3.51 and 4.0
- IBM OS/2 LAN Server or Warp Server
- LocalTalk
- UNIX (HP-UX, Solaris, and SunOS)

For information on installing HP JetDirect 600N print servers and the types of interfaces and network operating systems supported, see the *HP JetDirect Print Server Software Installation Guide*.

### **NetWare 3.x and 4.x based products**

When using Novell NetWare 3.x and 4.x products with the HP JetDirect print server, queue server mode provides improved printing performance over remote printer mode. For more information, see the *HP JetDirect Print Server Software Installation Guide*.

### **Windows 3.1, Windows 95, and Windows NT 3.51 and 4.0 networks**

For Windows 3.1 and Windows 95 networks, HP JetAdmin software works as a Windows application and supports native Novell Directory Services (NDS).

For peer-to-peer Windows 95 networks, HP JetAdmin software works as a Windows application, and connects HP printers to an IPX/SPX-compatible printer network using an HP JetDirect print server.

For Windows NT 3.51 and 4.0 networks, HP JetAdmin software supports the TCP/IP or IPX/SPX environments.

## IBM OS/2 LAN server and Warp server networks

For IBM OS/2 LAN Server and Warp Server Networks, HP JetAdmin software supports the DLC environments. Depending on the number of network printers and type of printer driver, when using virtual memory, improved performance may be realized by increasing server RAM, especially if the swapper.dat file is large.

## LocalTalk network

The LocalTalk interface enables you to print directly from a stand-alone Apple Macintosh computer or from a Macintosh computer on a LocalTalk network. For specific information on configuring your computer and printer to print through a LocalTalk interface, refer to the printer's getting started guide and the *HP JetDirect Print Server Software Installation Guide*.

## Macintosh DIN-8 cable

To connect a Macintosh computer directly to this printer, use a standard Macintosh DIN-8 printer cable. This cable cannot be used in a network configuration.

---

**Note**

---

For LocalTalk configuration, the DIN-8 printer cable must be plugged into the printer port of your Macintosh computer.

## LocalTalk configuration

To connect the printer to a Macintosh computer on a LocalTalk network, use the HP LocalTalk Cable Kit. You will need a kit for each printer and an additional kit for each Macintosh computer on your network.

## UNIX networks

HP JetAdmin software provides a TCP/IP-based solution for configuring and managing HP JetDirect print servers on HP-UX, Solaris, and SunOS systems.

## Setting network security on the printer

This printer features control panel locking, which allows network administrators to prevent users from changing certain printer control panel settings. When a menu is locked, unauthorized users trying to change settings in the printer control panel will receive the following message:

```
ACCESS DENIED  
MENUS LOCKED
```

You can use HP JetAdmin software, the HP LaserJet Utility for Macintosh, or an ASCII escape sequence to perform this procedure. For instructions on locking the printer control panel using either the HP JetAdmin software or the HP LaserJet Utility for Macintosh, see the online Help for these utilities.

## Locking the control panel

You can prevent users from changing printer control panel settings by establishing a password and locking the printer control panel. The control panel offers multiple levels of security. You can lock certain control panel menus, allowing users to change the rest of the menus, or you can lock all of the menus—and you can even lock the **Cancel Job** key. When the printer control panel is locked, unauthorized users who try to change settings at the control panel receive the following message:

```
ACCESS DENIED  
MENUS LOCKED
```

### Levels of security

Lock setting	Control panel items locked	
0 = None	No items are locked	
1 = Minimum	Configuration Menu I/O Menu	Calibration Menu Resets Menu
2 = Moderate	Configuration Menu I/O Menu Calibration Menu	Resets Menu Paper Handling Menu
3 = Maximum	Configuration Menu I/O Menu Calibration Menu Resets Menu	Paper Handling Menu Information Menu Printing Menu <b>Cancel Job</b> key

Use HP JetAdmin software, HP LaserJet Utility for Macintosh, or an ASCII escape sequence to perform this procedure. HP software, which comes on the software CD-ROM, is easier to use than an ASCII escape sequence. For instructions on locking the control panel by using either HP JetAdmin software or the HP LaserJet Utility for Macintosh, access the online Help for that software.

## Using an ASCII PJJ escape sequence to set network security

If you decide to use the ASCII escape sequence, you must use an MS-DOS® or Windows ASCII editor to create the commands. The commands must also be sent to the printer by using a DOS COPY command or an ASCII file download utility. The *PJJ Technical Reference Manual* is located on CD, part number 5961-0976. Order a copy of this manual from the HP web site: hp.com.

---

### Note

---

In the following examples, EC represents the escape character. For more information on using escape characters, see the *PJJ Technical Reference Manual*.

- To lock or unlock the printer control panel if a password has not been set, send the following ASCII sequence to the printer:

```
EC%-12345X@PJJ JOB
@PJJ DEFAULT CPLOCK=NONE
    (or MINIMUM, MODERATE, or MAXIMUM)
@PJJ EOJ
EC%-12345X
```

- To set the password, send the following ASCII sequence to the printer:

```
EC%-12345X@PJJ JOB
@PJJ DEFAULT PASSWORD=[numeric password (0 to
    65535)]
@PJJ EOJ
EC%-12345X
```

- To lock or unlock the control panel if the password has been set, send the following ASCII sequence to the printer:

```
EC%-12345X@PJJ JOB PASSWORD=(numeric password)
@PJJ DEFAULT CPLOCK=NONE
    (or MINIMUM, MODERATE, or MAXIMUM)
@PJJ EOJ
EC%-12345X
```

# 4

# Printer maintenance

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Adding memory . . . . .	92

# Cleaning the printer and accessories

To maintain high print quality and performance, use the following opportunities to thoroughly clean the printer and the paper handling accessories:

- every time you change the toner cartridge (run a few pages through)
- after printing approximately 5,000 pages for C (cyan), M (magenta), and Y (yellow); and 8,000 pages for K (black)
- whenever print quality problems occur

Clean the outside surfaces with a lightly water-dampened cloth. Observe the warning and caution below.

---

## WARNING!

Before you begin these steps, turn the printer off and unplug all power cords to avoid shock hazard.

Be careful when cleaning around the fusing assembly area. It may be hot.

---

## CAUTION

To avoid permanent damage to the toner cartridge, do not use ammonia-based cleaners on or around the printer.

Do not touch the transfer roller. Skin oils on the roller can reduce print quality. If toner gets on your clothes, wipe it off with a dry cloth and wash your clothes in cold water. Hot water sets toner into fabric.

---



**Table 4-1 Cleaning the printer**

<b>Component</b>	<b>Cleaning Method</b>
Outside covers	Use an HP Toner Cleaning Cloth (part number 5040-3379) or a water-dampened cloth. Do not use solvents or ammonia-based cleaners.
Inside general	With a dry lint-free cloth, wipe any dust, spilled toner, and paper particles from the paper path area, the registration roller, and the toner cartridge cavity.
Paper pickup, feed, and separation rollers	Use a water-dampened, lint-free cloth.
Separation pad	Use a dry, lint-free cloth.
Registration roller	Use a dry, lint-free cloth.
Transfer roller	Use a dry, lint-free cloth. DO NOT TOUCH the transfer roller with your fingers.
Fuser	Use a water-dampened, lint-free cloth.

## Cleaning spilled toner

Defective toner cartridges can develop leaks. Also, after a paper jam has occurred, some toner may remain on the rollers and guides inside the printer. The pages that print immediately after the jam may pick up this toner.

---

### CAUTION

---

When cleaning the printer, do not touch the transfer roller with the damp cloth or with your fingers.

## Vacuum specifications

Do not vacuum the printer or any spilled toner using a conventional vacuum. Toner particles used in this product may be too fine for effective vacuuming and could result in damage to conventional vacuums.

A vacuum specifically designed for cleaning toner may be used if it is capable of filtering fine particles (5 microns in diameter).

# Approximate replacement intervals for consumable items

## Imaging drum life

### Images versus pages

The life of the imaging drum (25K) is stated in terms of Letter/A-4-size images. The number of images printed for each sheet of paper varies, depending on the mix of color, type of format, and whether duplexing has occurred. The following guidelines will help determine drum life:

- An “image” is a layer of toner. An A-4/Letter-size color page printed on one side contains four A-4/Letter images, one for each color (CMYK).
- A duplexed sheet counts as two pages. In color duplex mode (printing on both sides of a page), there are eight A-4/Letter-size images per A-4/Letter sheet.
- The page count numbers on the Configuration Page give a count of the number of pages printed, regardless of size. For example, an A-4-size color duplexed page takes eight images to print, but only adds two pages to the page count.

### Usage patterns

How the printer is actually used can also have a significant effect on drum life:

- Because of pre- and post-rotations, the drum wear is approximately the same for a one-page job as for a two-page job. Frequent short jobs will decrease the drum life.
- There are extra rotations and cleaning cycles when printing duplex pages. Duplex jobs use the imaging drum at a higher rate than comparable simplex jobs.

### “Drum life low” versus “drum life out”

The DRUM LIFE LOW warning message on the control panel indicates approximately 20% of life remaining. This is intentional to allow the user enough time to order a replacement kit (C4195A). It is perfectly acceptable to continue to print while the DRUM LIFE LOW message is displayed. However, when the DRUM LIFE OUT message occurs, the end of life has been reached and the printer will not operate.

## Key points to remember

- The drum life specification assumes two-page jobs, one-sided printing on A-4/Letter-size pages. When printing in color (4 images per page), the number of pages will be 1/4 of the images printed.
- Due to the carousel arrangement of the color cartridges, color printing uses four images per page even if only one color is actually used.

## Drum life under different circumstances

The following graph shows the approximate life of the imaging drum for different types and sizes of print jobs.

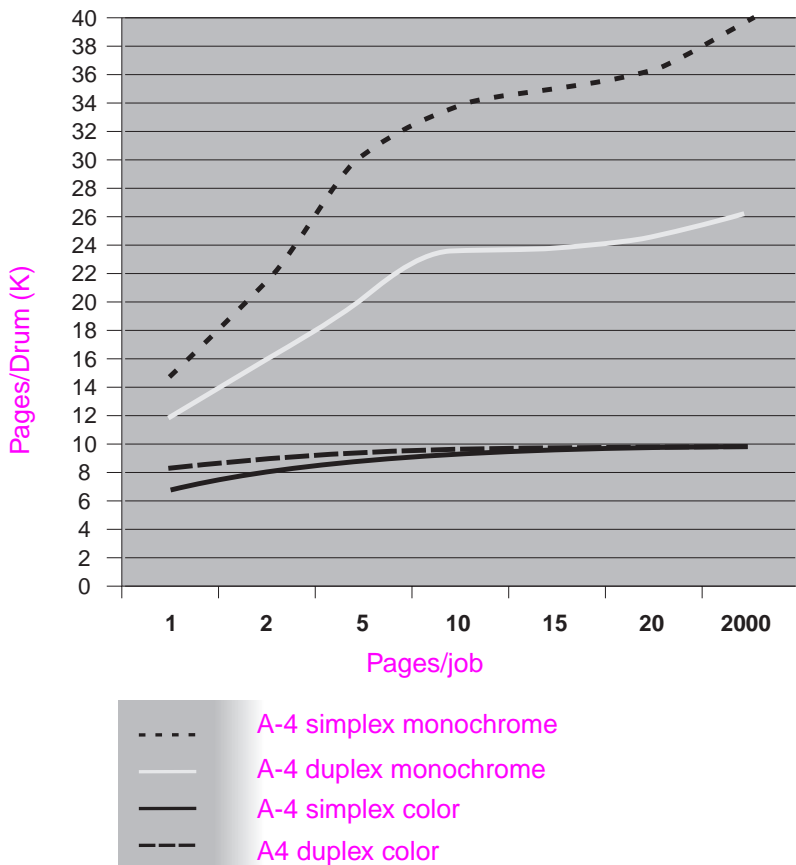
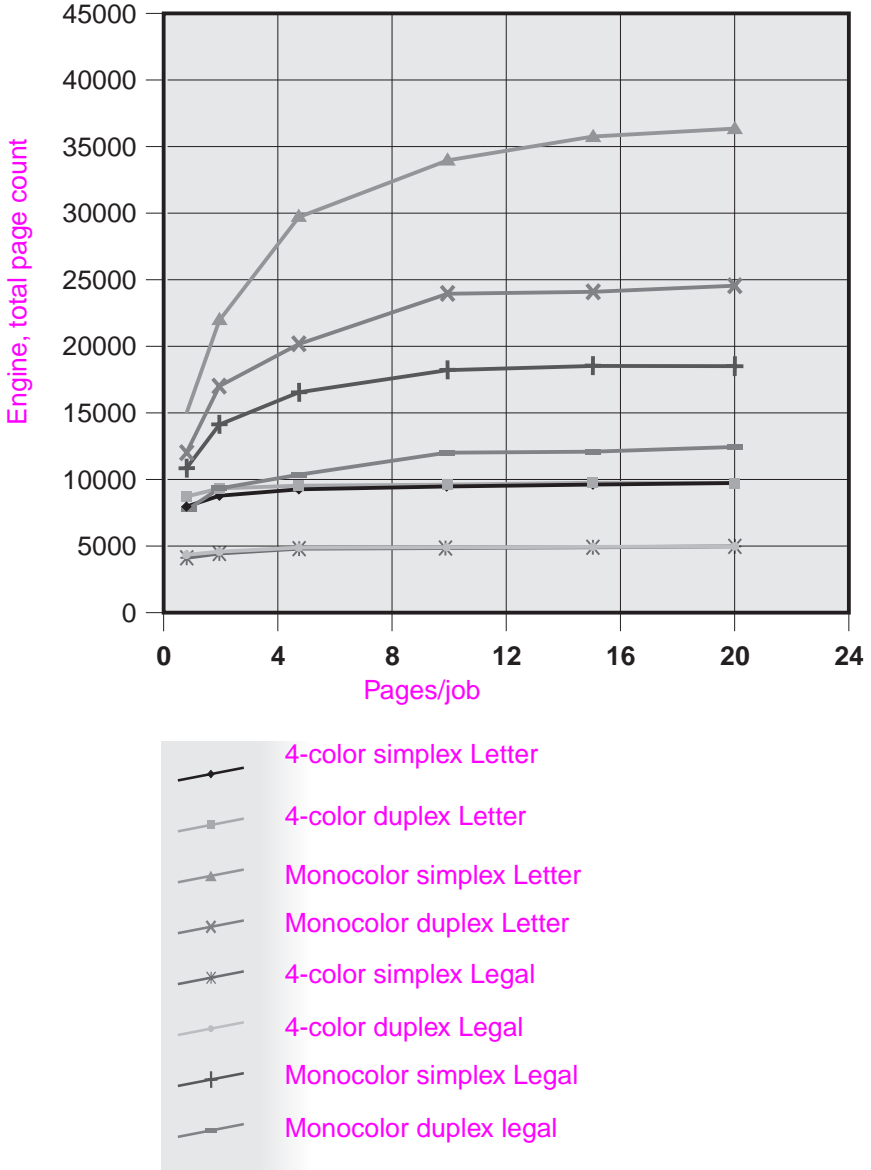


Figure 4-1 Imaging drum life

**Note**

When printing black pages, there is a wider range of variation in pages/drum. The drum life will be well below 25K images if only short monochrome jobs are printed.

The following graph shows the drum life for printing in Letter and Legal formats:



**Figure 4-2** OPC life

## Replacement intervals for consumables

You can identify consumable items by their labeling and their blue plastic handles. For instructions on installing consumables, see the installation guides supplied with each consumable item.

The following table lists the replacement intervals and part numbers for printer consumable items, and the control panel messages that prompt you when it is time to replace each item.

**Table 4-2 Approximate replacement interval for consumable items**

Consumable	Printer message	Page count	Approximate time period <sup>1</sup>	Part number
Black (K) toner cartridge	TONER K LOW or TONER K OUT	9,000 pages <sup>2</sup>	4.5 months	R94-4005-410CN (see Table 8-1)
Cyan (C) toner cartridge	TONER C LOW or TONER C OUT	6,000 pages <sup>2</sup>	3 months	R94-4004-410CN (see Table 8-1)
Magenta (M) toner cartridge	TONER M LOW or TONER M OUT	6,000 pages <sup>2</sup>	3 months	R94-4003-410CN (see Table 8-1)
Yellow (Y) toner cartridge	TONER Y LOW or TONER Y OUT	6,000 pages <sup>2</sup>	3 months	R94-4002-410CN (see Table 8-1)
Drum kit	DRUM KIT LOW or DRUM KIT OUT REPLACE DRUM KIT	25,000 black-and-white-only pages, or 6,250 color pages.	12.5 months for black-and-white-only pages, or 3 months for color pages.	R94-4001-410CN (see Table 8-1)
Transfer kit	TRANSFER KIT LOW or TRANSFER KIT OUT REPLACE KIT	100,000 black-and-white-only pages, or 25,000 color pages.	50 months for black-and-white-only pages, or 12.5 months for color pages.	R96-5009-000CN (see Table 8-1)
Fuser kit	FUSER KIT LOW or FUSER KIT OUT REPLACE KIT	100,000 black-and-white-only pages, or 50,000 color pages.	50 months for black-and-white-only pages, or 25 months for color pages.	R96-5007-000CN (110V) R96-5008-000CN (220V) (see Table 8-1)

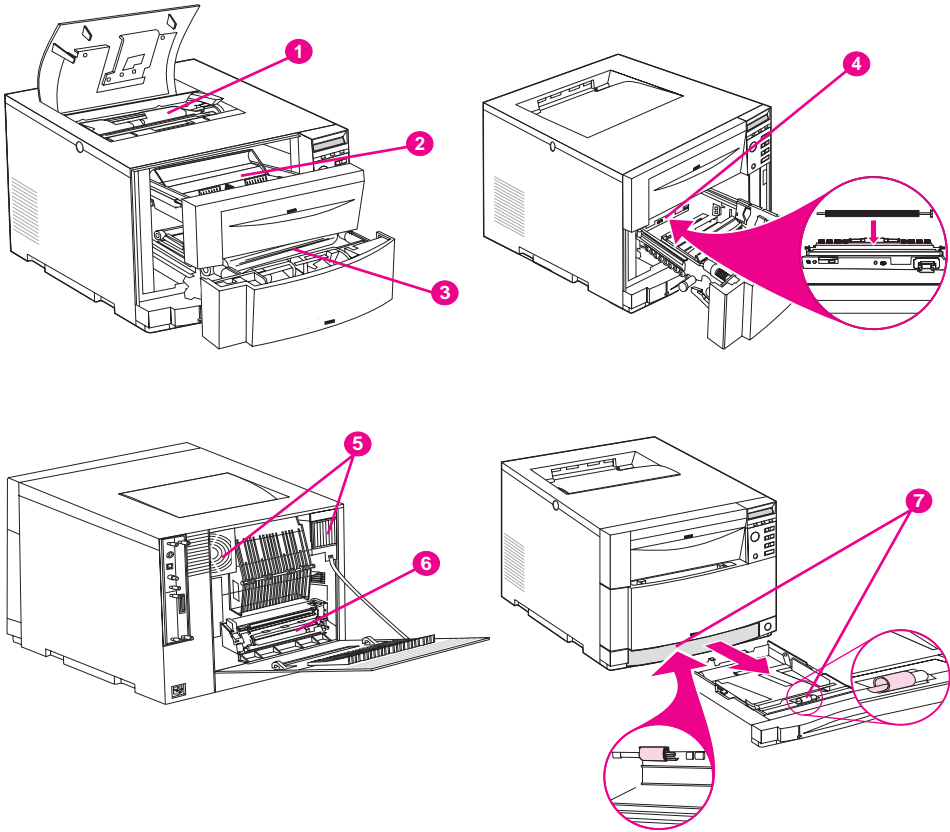
1. Approximate lives are based on 2,000 pages per month.
2. The approximate average A4/Letter-size page count is based on 5% coverage of individual toner colors. Page counts are only estimations; usage conditions and print patterns cause results to vary.

### CAUTION

Hewlett-Packard recommends the use of HP products in this printer. Use of non-HP products may cause problems requiring service that is not covered by the Hewlett-Packard warranty or service agreements.

# Locating consumables

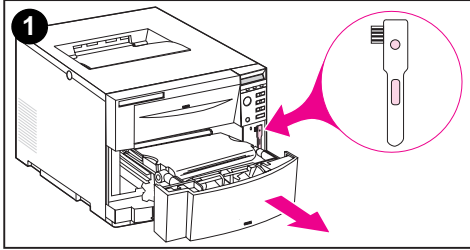
Figure 4-3 illustrates the location of each consumable item.



**Figure 4-3** Location of consumables

- 1 Toner cartridges
- 2 Imaging drum cartridge
- 3 Intermediate transfer belt
- 4 Transfer roller
- 5 Air filters
- 6 Fuser
- 7 Paper feed and separation rollers

# Replacing consumable items

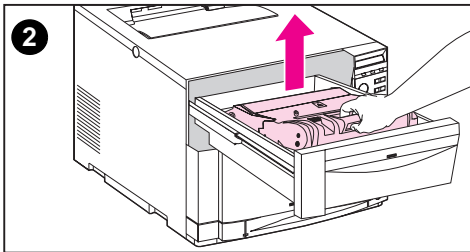


## Cleaning the toner density sensor

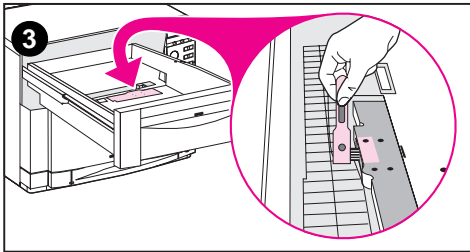
Clean the toner density sensor whenever the imaging drum is replaced or when the control panel message displays: DENSITY SENSOR OUT OF RANGE.

### CAUTION

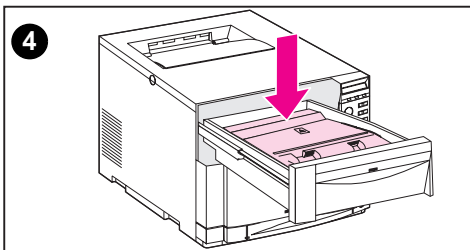
To avoid scratching the sensor, do not clean it with any paper products.

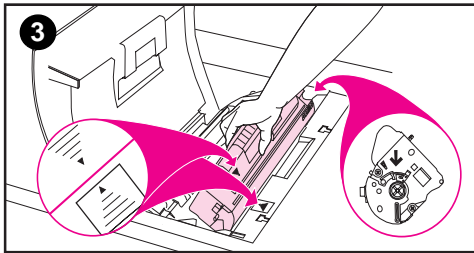
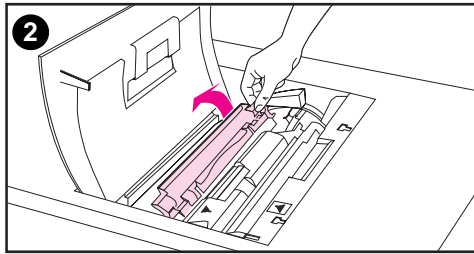
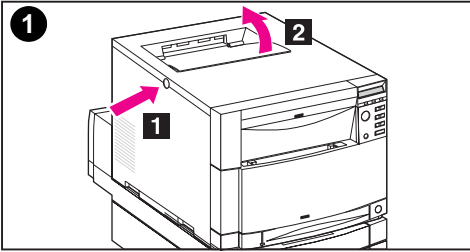


## To clean the toner density sensor



- 1 Open the ITB drawer and remove the cleaning brush mounted inside.
- 2 Open the drum drawer and remove the imaging drum using the blue handle.
- 3 Using the cleaning brush, remove all dust and toner particles from the sensor as illustrated.
- 4 Replace the imaging drum.





## Replacing the toner cartridges

Replace the toner cartridge when the control panel displays:  
TONER CMYK OUT.

The display can indicate that one or more toner colors are out.

- 1 With the printer turned on and warmed up, push the dark gray release button on the side of the printer ( **1** ) and open the printer's top cover ( **2** ).

---

### Note

If you need to replace a toner cartridge and the TONER CMYK LOW or TONER CMYK OUT messages are not displayed on the control panel, open and close the top cover. Wait for the PRESS SELECT TO CHANGE TONER message to display on the control panel. Press **Select** and the message TONER=(COLOR) displays on the printer control panel. Press **-Value+** to select the toner cartridge you want to replace, and proceed to the following steps.

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- 2 Lift the toner access cover and remove the used toner cartridge.

---

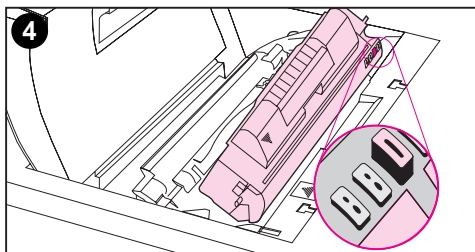
### CAUTION

Do not shake the toner cartridges after removing them.

---

- 3 Position the toner cartridge over the cartridge slot so that the blue arrow on the toner cartridge points to the blue arrow on the printer. The arrow on the right (control panel side of the printer) should point straight down).





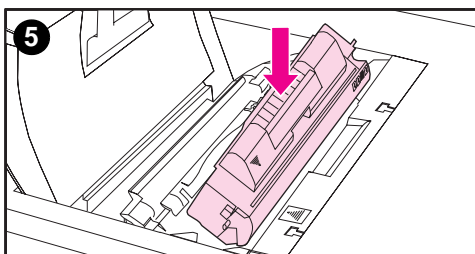
- 4 Make sure that the tab on the other end of the toner cartridge aligns with the notch on the cartridge slot.

---

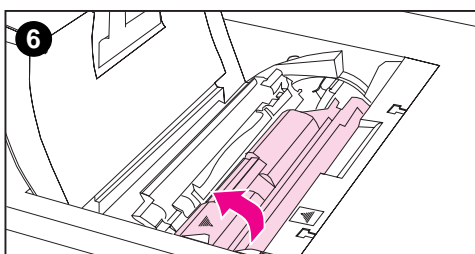
**Note**

If the tab does not fit in the notch when you insert the toner cartridge, the toner is the wrong color for that cartridge slot.

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- 5 Slide the toner cartridge down into the slot until the cartridge stops.
- 6 Rotate the toner cartridge toward the back of the printer (within the cartridge slot) until the cartridge stops. The cartridge shutter opens to reveal the developer sleeve.



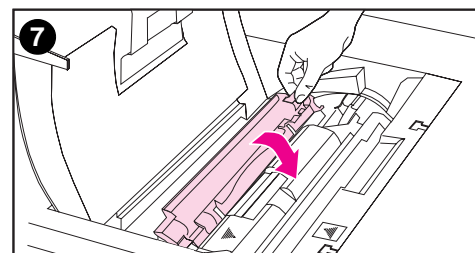
- 7 Lower the toner access cover and close the printer's top cover.

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**Note**

You must close the top cover before installing another toner cartridge.

---



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**CAUTION**

If you need to ship the printer, remove the toner cartridges and imaging drum before shipping.

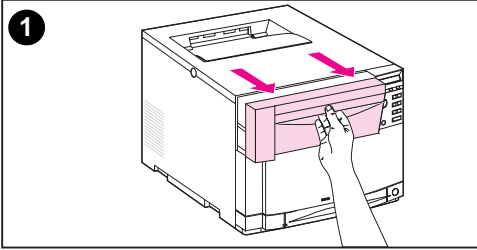
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**Note**

If you receive a 54.2 error, see page 250 for more information.

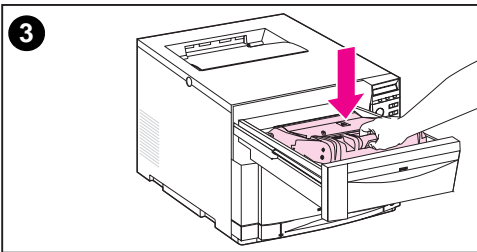
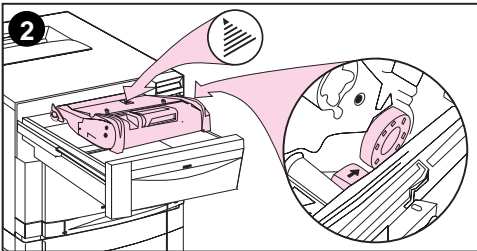
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## Replacing the imaging drum

Replace the imaging drum when the printer control panel displays:  
REPLACE DRUM KIT

- 1 Open the drum drawer and remove the used imaging drum.
- 2 Locate the new imaging drum. Align it over the drawer so that the arrow on top points to the rear of the printer, and the blue end cap on the side fits into the slot identified with the blue arrow.



---

### CAUTION

Avoid exposing the imaging drum to direct light. Exposure to light for more than 15 seconds can seriously damage the imaging drum.

---

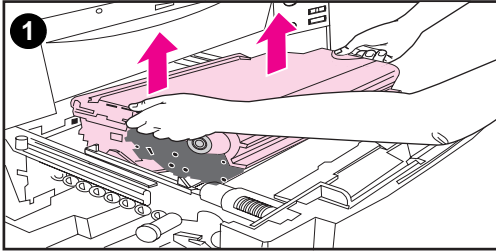
- 3 Slide the imaging drum down into place and close the drawer.

---

### CAUTION

If you need to ship the printer, remove the toner cartridges and imaging drum before shipping.

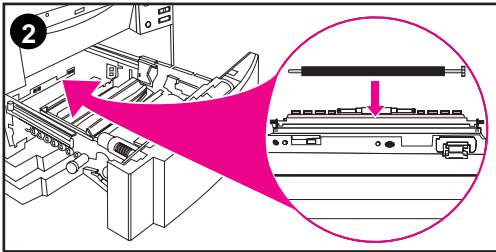
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## Replacing the transfer kit

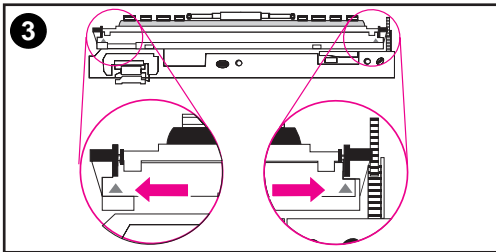
Replace the transfer kit when the printer control panel displays:  
TRANSFER KIT OUT REPLACE KIT.

The transfer kit consists of an intermediate transfer belt (ITB), a transfer roller, two air filters, and a hand wipe.



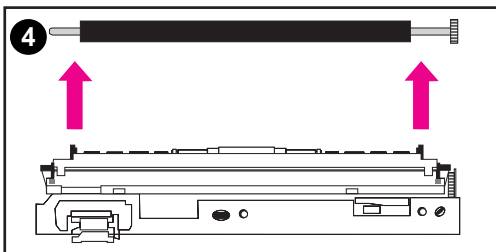
1 Open the ITB drawer. Remove the used transfer belt by pulling up on the green handles located on the sides.

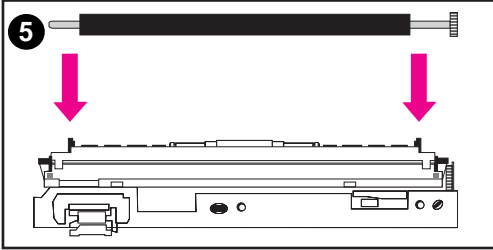
2 Locate the transfer roller inside the printer.



3 To unlock the used transfer roller, gently push back and up (in a rotating motion) on the blue triangles located on the lower corners of the flap that is in front of the roller.

4 Remove the used transfer roller by lifting it up and then out.





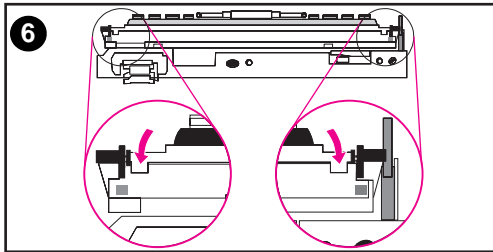
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**CAUTION**

Avoid touching the foam portion of the roller. Oil from your fingers can affect the print quality.

---

- 5 Locate the new transfer roller and place it in the notches behind the roller flap.



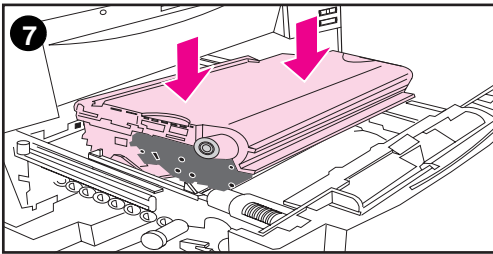
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**CAUTION**

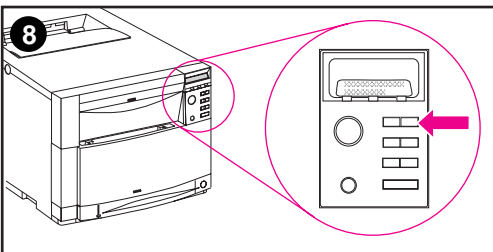
Be careful not to insert the transfer roller backwards. Doing so can damage the printer.

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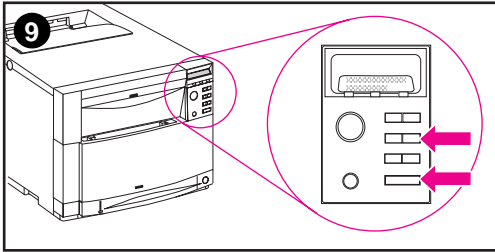
- 6 Snap in the new transfer roller into place by pushing both ends of the roller toward the rear of the printer.



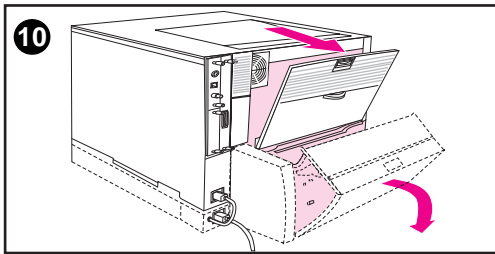
- 7 Remove the new transfer belt from the bag. Align the blue pins that are on both sides of the new transfer belt with the blue slots in the drawer. Then slide the transfer belt down into place. Close the ITB drawer.



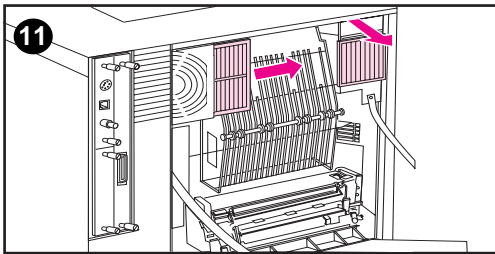
- 8 To reset the printer for the new transfer kit, push **Menu** on the control panel until **RESETS MENU** appears in the control panel display.



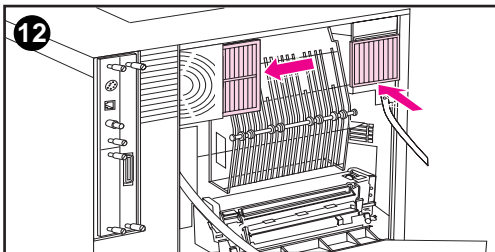
9 Press **Item** until TRANSFER KIT SELECT IF DONE appears in the control panel display. Then press **Select**.



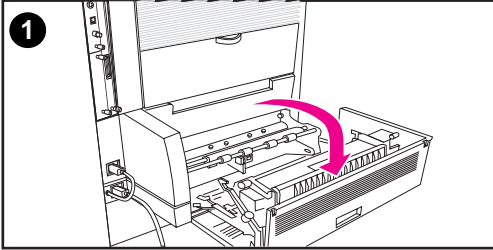
10 To replace the air filters, turn the printer off and wait 10 minutes for the fans to stop running. Unplug the power cord and open the upper rear door of the printer. If the printer has a duplex unit, open the rear cover of the duplex unit.



11 Remove the two used air filters from the rear of the printer. Then use the hand wipe to clean excess dust away from the fan areas.



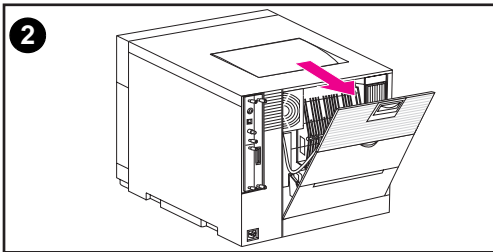
12 Insert the new air filters. Close all doors, plug in the printer, and turn the printer on.



## Replacing the fuser kit

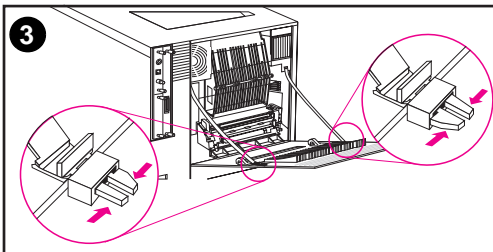
Replace the fuser kit when the printer control panel displays:  
**FUSER LIFE OUT REPLACE KIT.**

The fuser kit contains one fuser, four paper rollers, and a hand wipe.

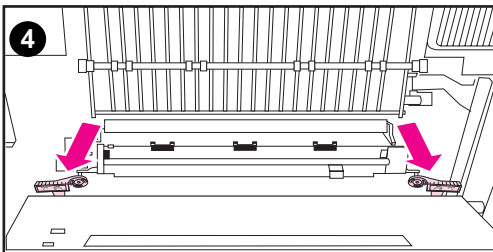


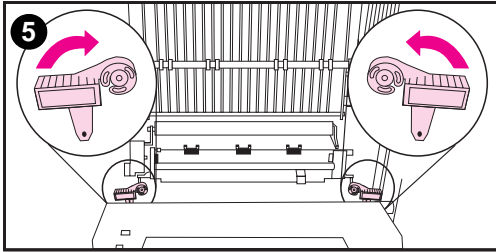
### WARNING!

To prevent possible burns, be sure the power cord is unplugged and that the printer has cooled for 30 minutes.



- 1 Open the upper-rear door of the duplex unit, if attached.
- 2 Open the upper-rear door of the printer.
- 3 Release the straps from the rear door by squeezing the latches on the straps where the latches connect to the rear door.
- 4 Inside the back of the printer, near the bottom, locate the two blue latches on the fuser.

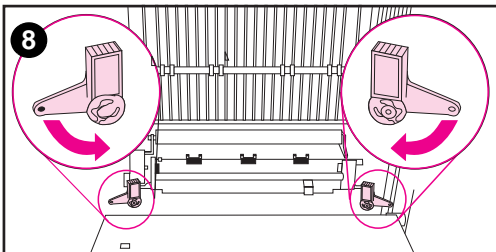
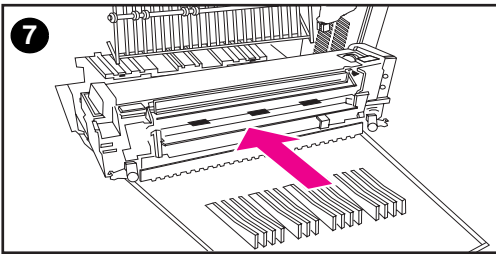
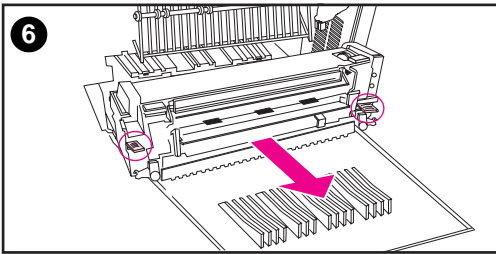




5 Rotate the two blue latches upward 90 degrees.

6 Grasp the finger holds on the fuser and pull the used fuser out of the printer.

7 Remove the new fuser from the bag using the finger holds. Holding the new fuser by the finger holds, slide the fuser into the printer.



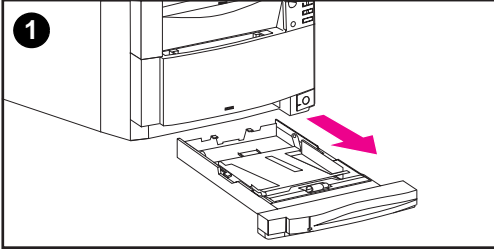
8 Lock the fuser in place by rotating the two blue latches down. Reconnect the support straps to the upper rear door.

---

**CAUTION**

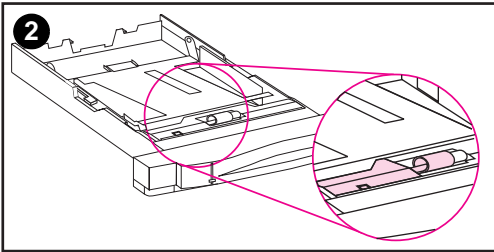
The blue latches will lock only if the fuser is installed.

---



## Replacing the paper rollers

- 1 Remove Tray 2 from the front of the printer.
- 2 On Tray 2, locate the paper roller and the cover next to the roller.
- 3 Squeeze the cover release lever and open the cover.
- 4 Remove the old paper roller from Tray 2 by squeezing together the blue tabs and then sliding the roller off its spindle.

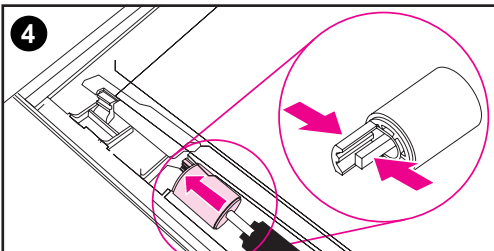
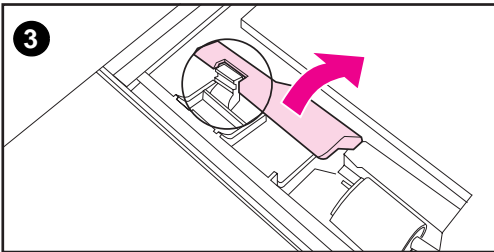


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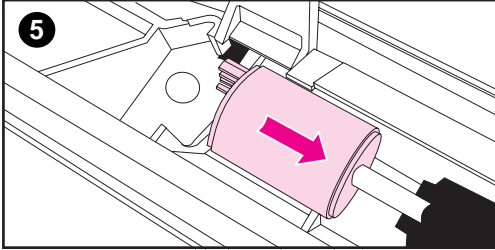
### Note

The feed roller has a D-shaped hub and the separation roller has a round shaped hub.

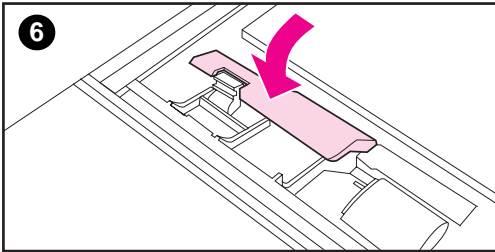
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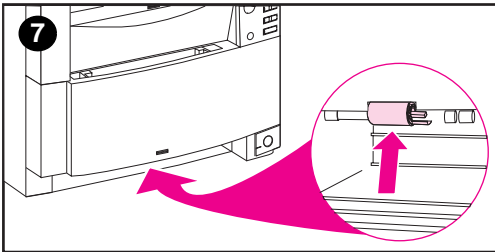




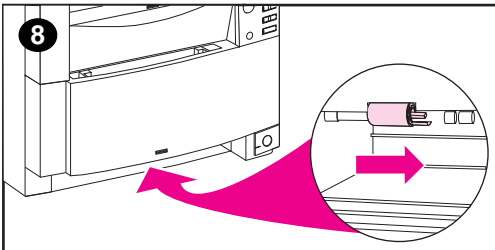
**5** Install a new paper roller on Tray 2. Slide the new roller onto the spindle until the roller clicks into place.



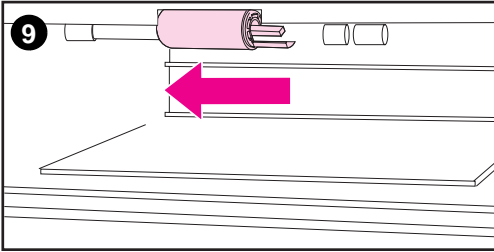
**6** Close the cover.



**7** Inside the tray cavity on the printer, locate the paper roller in the top of the tray cavity.



**8** Squeeze the blue tabs on the roller and remove the old paper roller from the tray cavity.

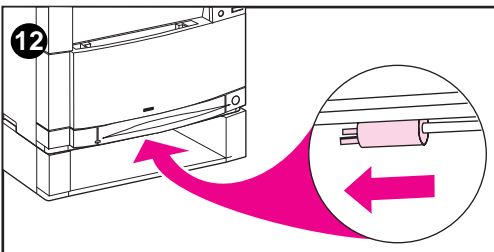
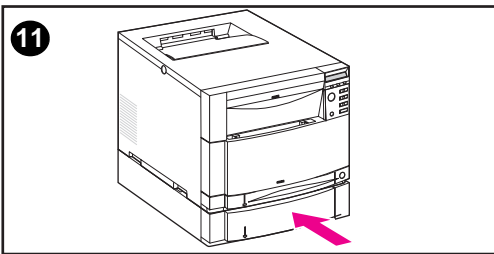
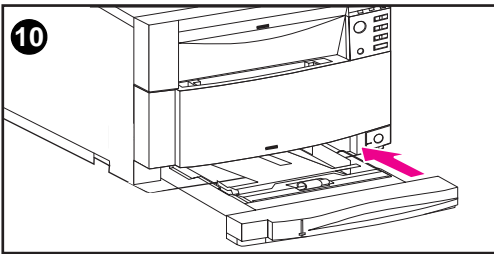


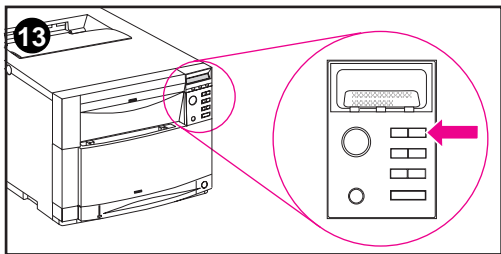
**9** Install a new paper roller on the tray cavity. Slide the new roller onto the spindle until the roller clicks into place.

**10** Replace Tray 2.

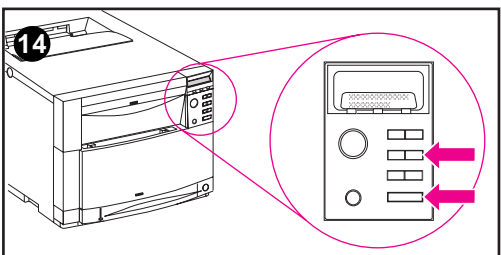
**11** If you have the optional 500-sheet paper feeder (Tray 3), repeat steps 3-9 to replace the two paper rollers for Tray 3.

**12** Remove the paper roller in the tray cavity for Tray 3 in the opposite direction as the paper roller in the other tray cavity.

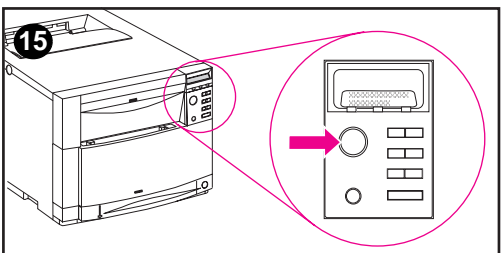




13 Turn the printer on. When the printer control panel displays **READY**, reset the printer for the new fuser kit and push **Menu** on the control panel until **RESET MENU** appears.



14 Press **Item** until **NEW FUSER KIT; SELECT IF DONE** appears. Then press **Select**.



15 Press **Go** to return the printer to **READY**.

# DIMM configuration

You can add additional Random Access Memory (RAM) to this printer by installing Dual Inline Memory Modules (DIMMs). The printer uses 100-pin, non-parity, synchronous SDRAM memory modules. SDRAM modules do not need to be configured in pairs (in corresponding left and right slots).

---

**Note**

Extended Data Output (EDO) DIMMs are not supported.

## Adding memory

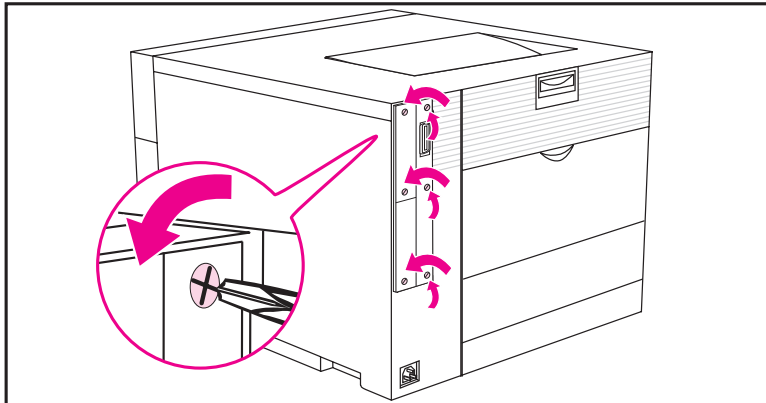
You can install 4, 8, 16, 32, or 64 MB DIMMs into the printer's three DIMM slots. The DIMM slots may be used to add memory, fonts, or firmware upgrades. Note that DIMMs and Single Inline Memory Modules (SIMMS) are not compatible.

---

**Note**

The printer will only recognize up to 208 MB of RAM. Additional memory will not be used by the printer.

Installing memory in the printer requires the removal of the formatter board from the rear of the printer. To remove the formatter board, you must unscrew 6 screws, as shown here. The DIMMs are then inserted into the available slots in the formatter board. See Appendix A in the online user guide for installation instructions.



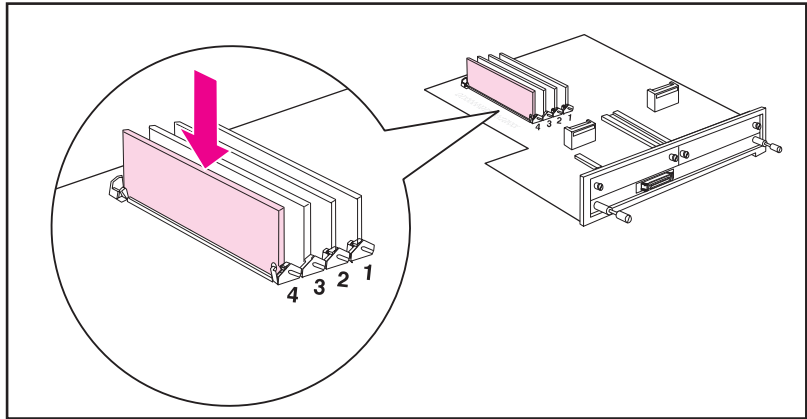
**Figure 4-4** Removing the formatter board

---

**CAUTION**

---

Do not attempt to remove the DIMM in slot #4 (see Figure 4-5). The DIMM in slot #4 is part of the printer's firmware. Removing it will affect printer operation.



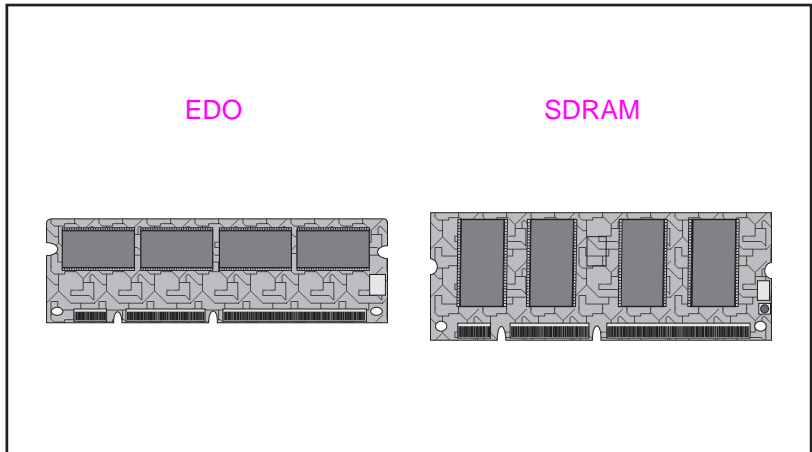
**Figure 4-5** Do not remove the DIMM in slot #4.

---

**CAUTION**

---

The HP Color LaserJet 4500 printer uses 100-pin, non-parity, synchronous SDRAM DIMMs. Extended Data Output (EDO) DIMMs are not supported. To ensure you are using the correct DIMM, see the differences below.



**Figure 4-6** EDO and SDRAM memory modules

## **Non-volatile memory (NVRAM)**

The printer uses NVRAM to store I/O and information on the print environment's configuration. The contents of NVRAM are retained when the printer is deactivated or disconnected. There is one NVRAM on the formatter and one on the DC controller.

# 5

## Theory of operation

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# Introduction

This section presents the theory of operation and the functional overview for the HP Color LaserJet 4500, 4500 N, and 4500 DN printer.

It provides the service representative with an understanding of the printing process.

This chapter is also the course material for the Service Authorization class and discusses the following printing functions.

- Basic operation
- Image formation
- Toner density
- Mechanical system
- Paper path
- DC controller subsystem
- Motors and fans
- Formatter system
- Power supplies



# Basic operation

The HP LaserJet 4500, 4500 N, and 4500 DN printer functions are divided into three systems: the image formation system, paper pick-up feed system, and engine control system. These systems are thoroughly described in this chapter.

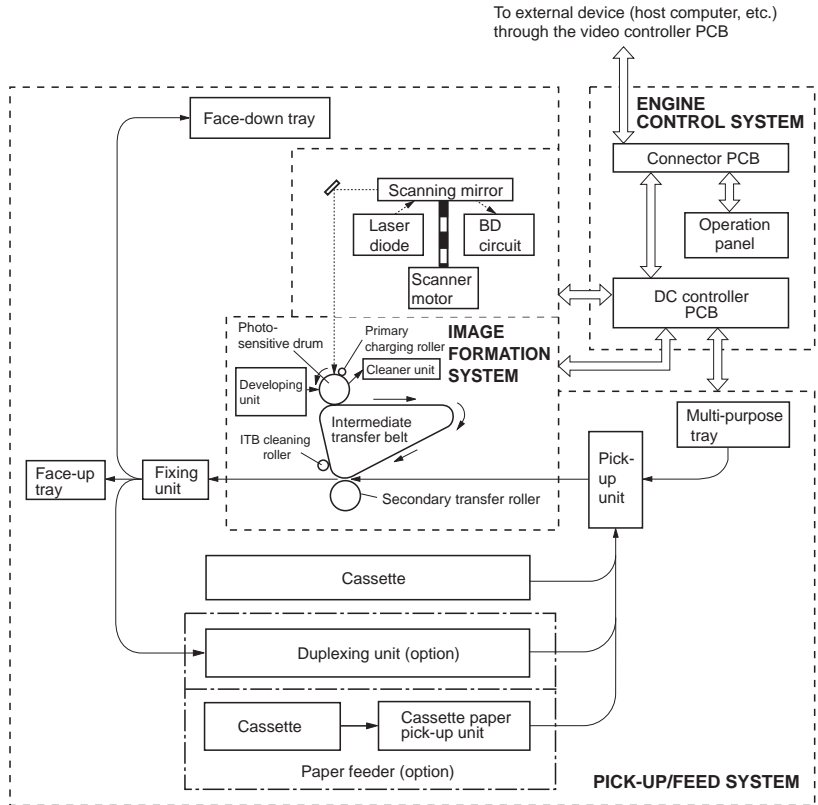


Figure 5-1 Basic system operation

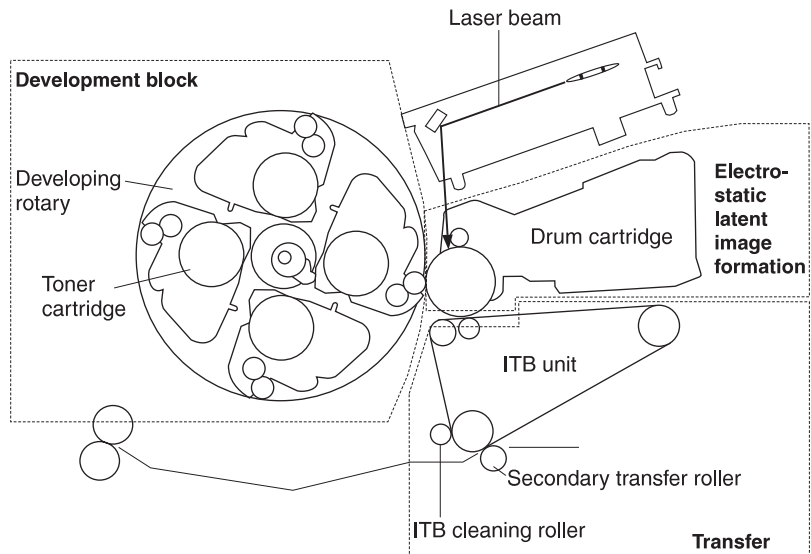
# Image formation

The image formation system is the central hub of the HP LaserJet 4500 printer. During image formation, the color image is created.

The image formation system consists of the following imaging units:

- photosensitive drum cartridge
- carousel, laser/scanner
- toner cartridges
- intermediate transfer belt (ITB) unit
- secondary transfer roller (see Figure 5-2)

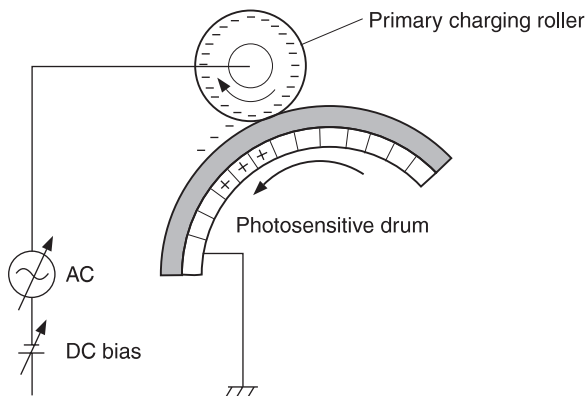
A detailed description of the imaging units follows the image formation process.



**Figure 5-2** Image formation

## Primary charge

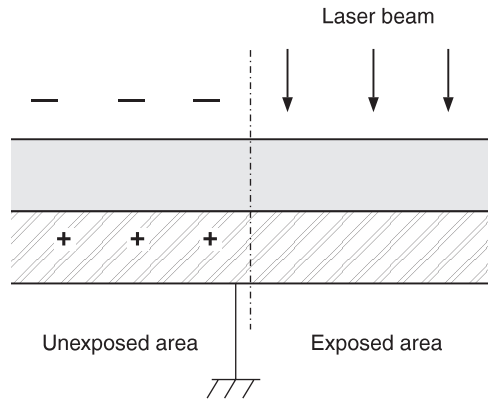
The primary charge roller applies a negative DC bias to the drum. To maintain a consistent charge across the drums surface, an AC bias is also applied. The charge voltage on the drum surface ranges from approximately -700 V to -500 V. With the large negative charge on the drum surface, an equal positive charge forms below the photoconductive material.



**Figure 5-3** Primary charge

## Laser exposure

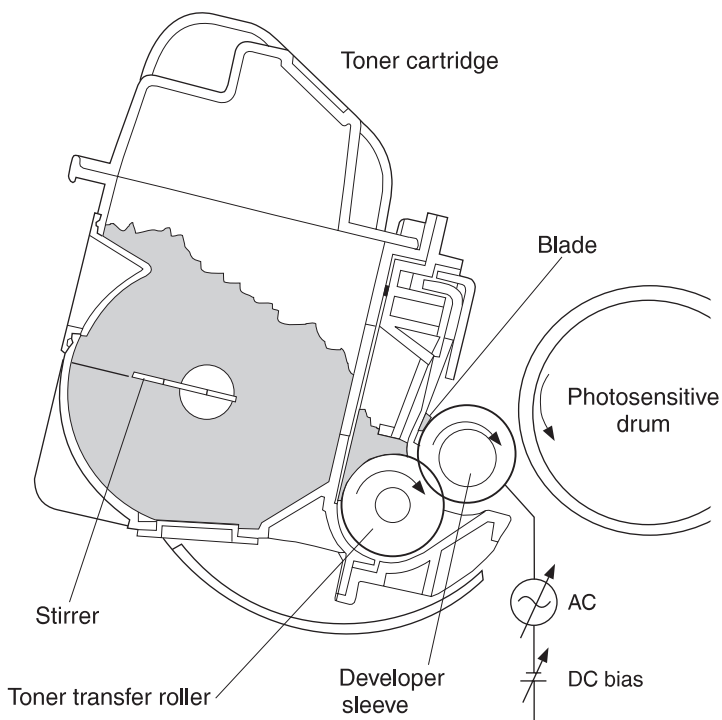
Photoconductive material, in the absence of light, allows the negative charge that was placed on the imaging drum's surface by the charging roller to remain in place. Areas of the photoconductor that are exposed to the laser become conductive and discharge the negative charge on the surface to the metal cylinder of the drum. These discharged areas are what form the electrostatic image.



**Figure 5-4** Laser exposure

## Development

With the toner cartridge in position, a negative charge is applied to the toner particles. As the developer sleeve and drum rotate past one another, the toner particles are drawn to the drum's surface. Areas of the drum's surface that are exposed to the laser attract and hold the toner while the unexposed areas repel the toner.



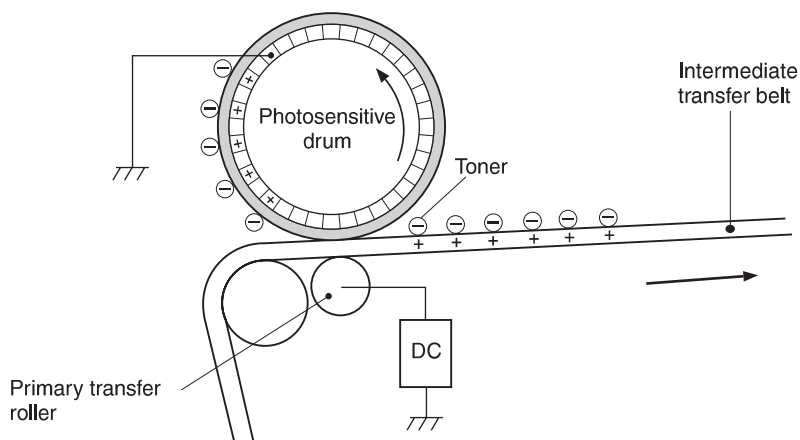
**Figure 5-5** Development

## Transfer

During transfer, the toner image is transferred from the drum surface to the ITB (primary transfer) and then from the ITB to the paper (secondary transfer).

### Primary transfer

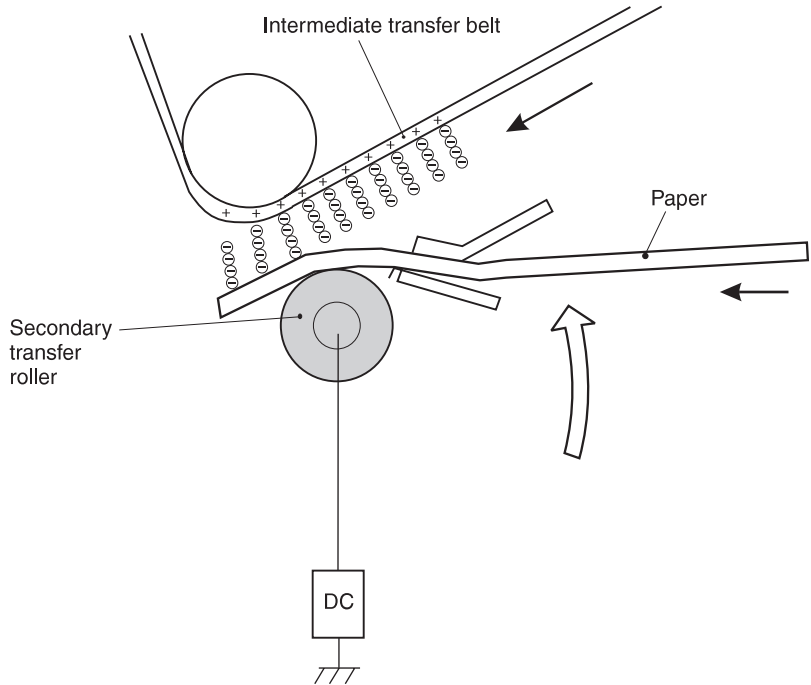
The ITB has a primary transfer roller that provides a positive bias that pulls the toner image from the drum to the ITB. This process is repeated four times (one time for each toner cartridge). The positive bias applied by the transfer roller increases with each pass to compensate for increasing layers of toner. As shown in Figure 5-6, the toner particles still maintain their negative charge. Only the transfer belt is charged positively.



**Figure 5-6** Primary transfer

## Secondary transfer

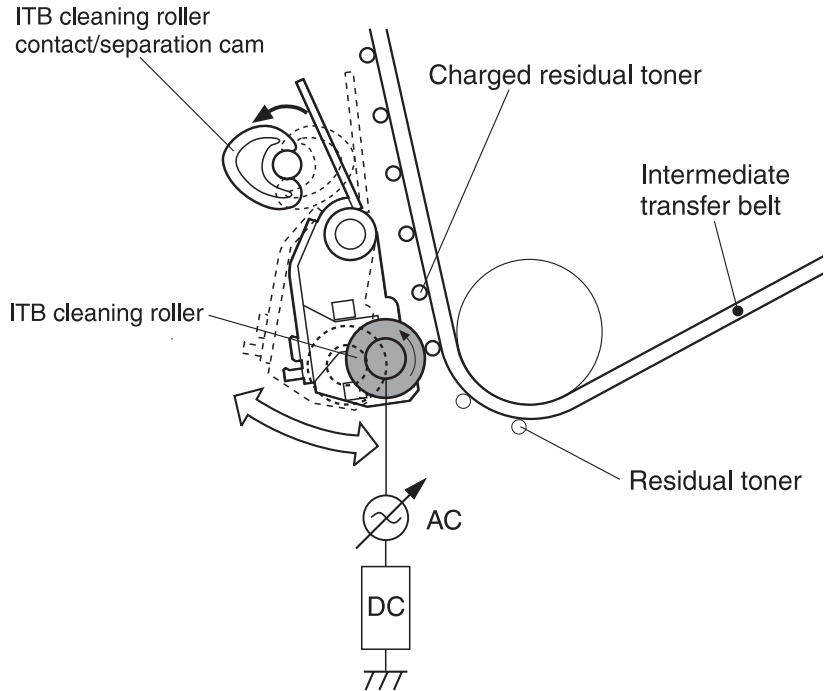
Once the entire print image is on the intermediate transfer belt (ITB), the secondary transfer roller is lifted into position. At the appropriate time, media is pulled into the transfer area. With the secondary transfer roller biased at a positive potential, the toner on the ITB is pulled onto the media as the ITB passes over the secondary transfer roller.



**Figure 5-7** Secondary transfer

## Separation

As the media passes the secondary transfer roller, it passes over the charge eliminator. The charge eliminator removes any positive charge on the media that came from the secondary transfer roller. The elimination of positive charges decreases adhesion of the paper to the belt and allows for better separation.



**Figure 5-8** Separation



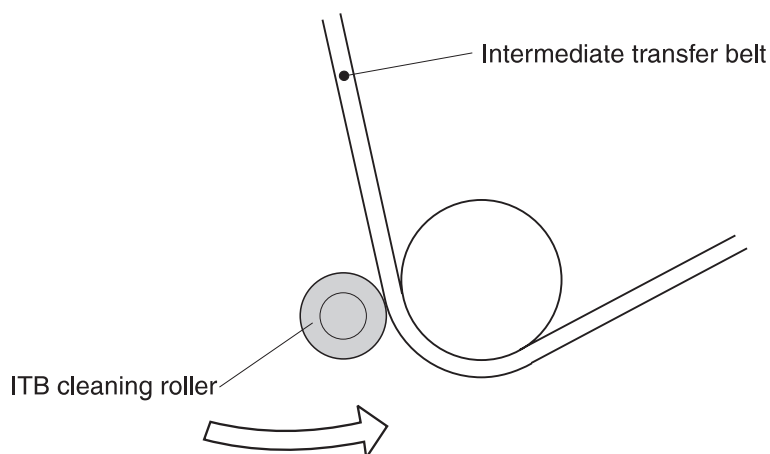
## Waste toner cleaning

The waste toner cleaning process begins when residual toner from the ITB is transferred to the photosensitive drum. The toner is then transferred to the waste toner reservoir.

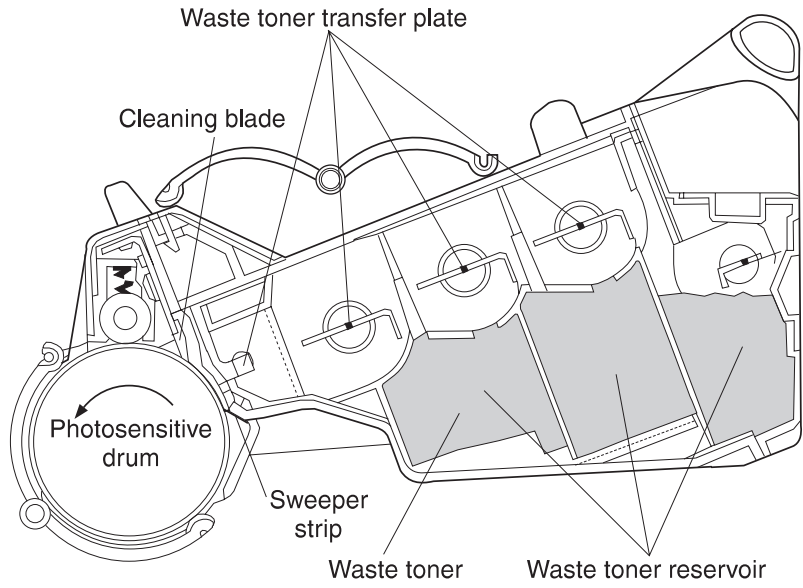
### Waste toner cleaning operation

Although most of the toner is transferred from the ITB, some residual toner remains. The ITB cleaning roller moves into position and places a positive charge on the residual toner. When the residual toner reaches the drum, it is transferred to the drum's surface by the drum's negative charge. The residual toner is then transferred from the ITB to the drum.

This waste toner is then removed from the drum's surface by a cleaning blade, collected by the sweeper strip, and placed in the waste toner reservoir by the waste toner transfer plates.



**Figure 5-9** ITB residual toner cleaning



**Figure 5-10** Waste toner to waste toner reservoir

## Fusing

The final step in the image formation process is the fusing of the toner to the media. The heat and pressure provided by the fusing assembly serve two purposes: to permanently fuse the toner to the media and to melt the toner together to produce the full color image on the page. This process uses upper and lower rollers made of Teflon tubing to reduce sticking. Both rollers are heated by Halogen heaters, which cause the four colors to fuse and mix on the paper, creating the permanent image.

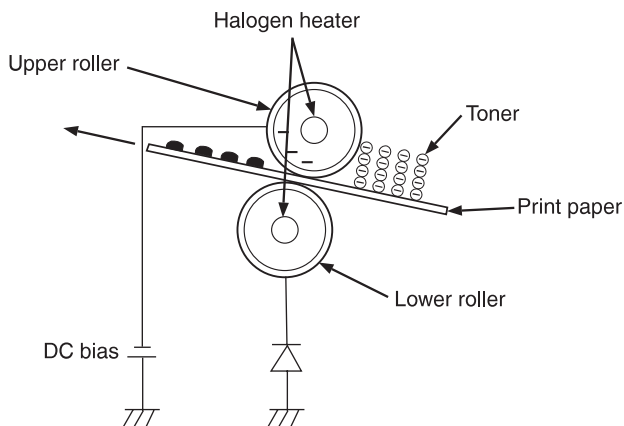


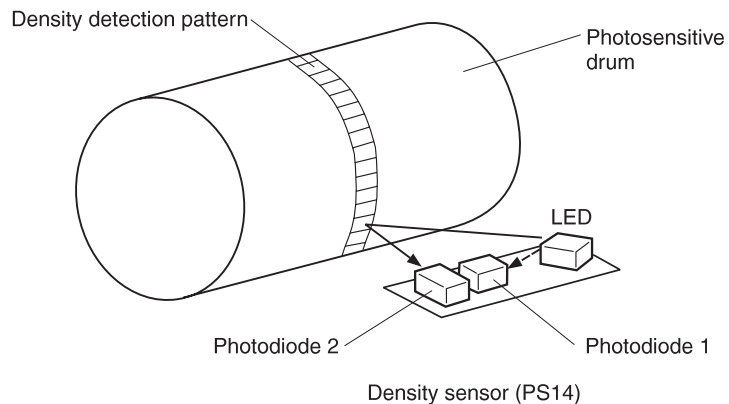
Figure 5-11 Fuser

# Toner density

Maximum toner density is monitored and corrected if outside of parameters to prevent variations in the toner density. Toner density can vary due to environmental conditions, a deteriorated photosensitive drum, or the amount of toner used.

A pattern of toner patches with varying densities is laid down on the photosensitive drum. The DC controller detects the density of these patches and determines the optimum developing bias for each color. The DC controller uses the density sensor (PS14), located in the drum drawer assembly, to read the density of the density detection pattern. PS14 contains a density detection circuit, an LED, and photodiodes 1 and 2. To read the density, the sensor emits light from the LED, reflects it off the density detection pattern on the photosensitive drum, and receives it with photodiode 2. Photodiode 1 receives the light directly from the LED. The signals from photodiodes 1 and 2 are then compared to determine density values. Toner density is monitored and corrected during the following occurrences:

- when the power is activated
- after a certain number of sheets are printed
- when a toner cartridge is replaced
- when the drum cartridge is replaced
- when the printer wakes up after a sleep mode of 6 hours or more



**Figure 5-12** Toner density sensor

# Mechanical system

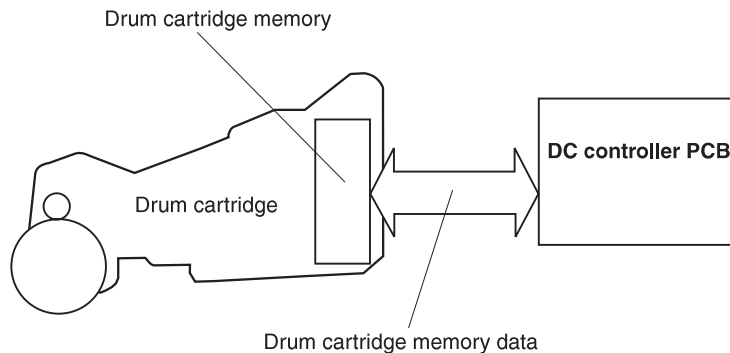
This section discusses each of the imaging units involved in the image formation process.

## Photosensitive drum cartridge

The drum drawer assembly is a user replaceable assembly containing the photosensitive drum, primary charging roller, drum memory, and waste toner storage. The drum motor (M4) drives the drum drive assembly, which in turn drives both the photosensitive drum and, discussed later in the mechanical system, the ITB. Since the primary charging roller's function was discussed in the image formation section, only the drum memory and waste storage areas are covered here.

## Photosensitive drum life

Located inside the drum cartridge is an EEPROM that stores an identification code along with drum life and waste toner information. A life threshold value is used as a comparison number to indicate when the drum has reached its end of life. During printer operation, the DC controller writes to the drum memory at specific times: when power is deactivated, when the drum drawer is opened, or whenever 20 pages are printed.

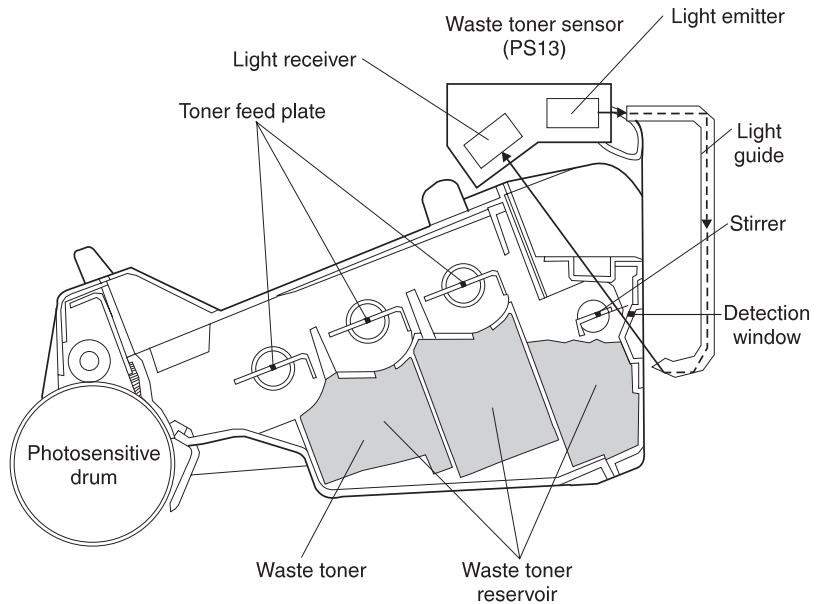


**Figure 5-13** Photosensitive drum cartridge

Two messages are displayed as the drum cartridge reaches the end of its life. The first is `DRUM LIFE LOW` and is displayed on the front panel at around 85% of the drum's life. When the drum is 100% used, the message `DRUM LIFE OUT` will be displayed and the printer will stop printing. A new drum cartridge must be installed at this time.

## Waste toner

Inside the drum cartridge are three waste toner reservoirs that store the residual toner left behind during image formation. As discussed earlier in the image formation section, the residual toner from the ITB is transferred to the drum. A cleaning blade scrapes the residual toner off the drum's surface. The waste toner is then carried by toner feed plates into the waste toner reservoirs for storage.



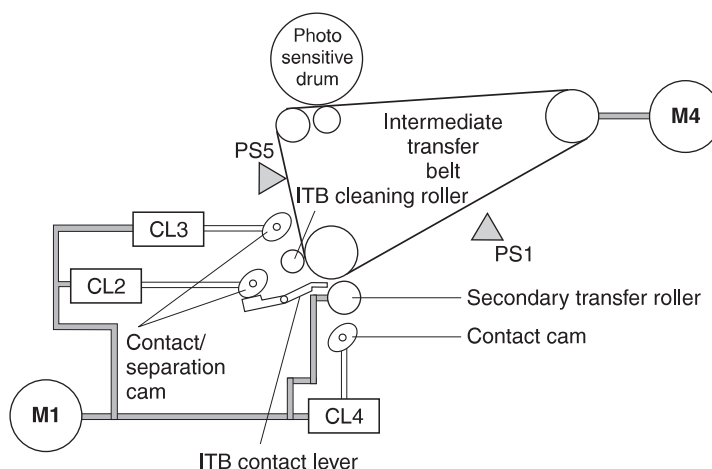
**Figure 5-14** Waste toner

As the waste toner reservoirs fill, a waste toner sensor (PS13) monitors the level of waste toner. Light from a photo sensor emitter moves along a light guide to a window on the drum. The light passes through one of the waste toner reservoirs, as shown in Figure 5-14, to the receiving side of the waste toner sensor. A stirrer rotates past the window to clean away waste toner to prevent false readings. As the reservoir fills, the length of time the window remains clear shortens. The DC Controller monitors this time and when the threshold is reached the `WASTE TONER FULL` message is displayed on the front

panel. At this point, the printer stops printing and the drum cartridge must be replaced. Under normal printing conditions the DRUM LIFE OUT message will be seen first. Only when printing full color pages with a high percentage of coverage or when a lot of waste toner is removed from the ITB will the WASTE TONER FULL message be displayed before the DRUM LIFE OUT message.

## Intermediate transfer belt

The intermediate transfer belt (ITB) is where the entire print image is formed before being transferred to the media. This process is described in the image formation section of this chapter. In this section the operation of the motors and the items associated with the ITB will be discussed. Figure 5-15 shows the components associated with the ITB.



**Figure 5-15** Transfer unit function

When the printer receives a print command, the ITB is lifted into position against the drum. This is accomplished when the ITB lift cam is rotated and the cams press against the lift levers located on each side of the ITB. Drive force for the ITB lift cam is provided by M1 and applied to the cam when CL2 is activated.

Once CL2 is activated to lift the ITB, both CL4 and CL3 are activated to position the transfer roller and cleaning roller against the transfer belt. The transfer roller is used to stabilize the belts side to side movement during its initial contact with the drum while the cleaning roller prepares the belt for the image. Just before the black image reaches the transfer roller, both CL4 and CL3 are deactivated again to

remove the transfer roller and cleaning roller from the transfer belt. This procedure only occurs when the ITB is lifted into position against the drum.

The print process continues as described in the image formation section. Once the full image is on the ITB, both CL4 and CL3 are activated, and the transfer roller and cleaning roller are moved into position against the ITB. This time the image is transferred from the ITB to the media. Any residual toner left on the ITB is charged positively for removal.

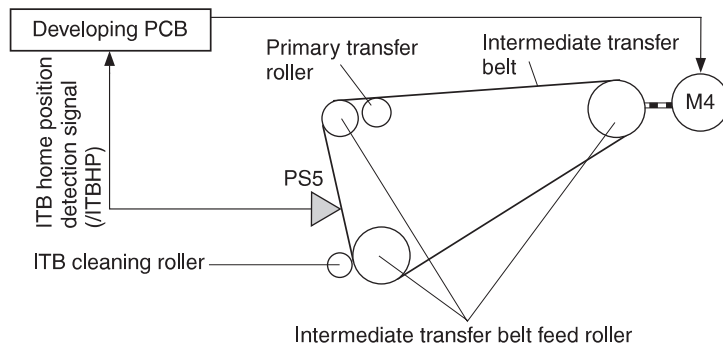
Once the print job is complete, CL4 and CL3 are deactivated and the transfer and cleaning rollers are moved away from the belt. CL2 is then deactivated and the ITB is lowered to move it away from the drum.

## Home position detection

The home position of the ITB is detected to precisely transfer the four toners to the intermediate transfer belt and align the leading edge of print paper with the leading edge of the image.

In the area outside of the toner transfer area of the ITB, there are home position detection holes. With the ITB rotating, the home position detection sensor (PS5) detects a hole and sends the information to the DC controller.

When the ITB home position detection signal is detected by the DC controller, it sends a top of page signal to the formatter. The formatter sends the image data and the DC controller begins to create the image. For full color printing, this process is repeated four times to form the image.



**Figure 5-16** Home position detection

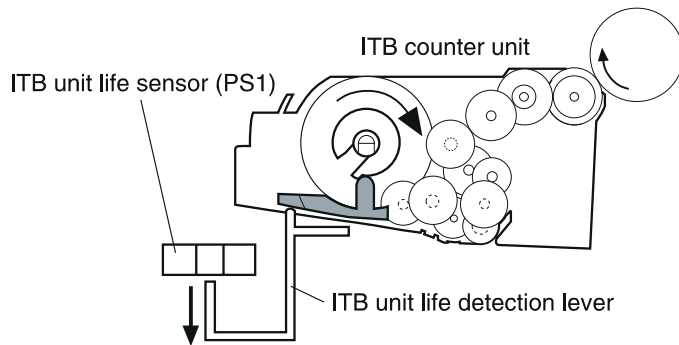


## ITB unit life detection

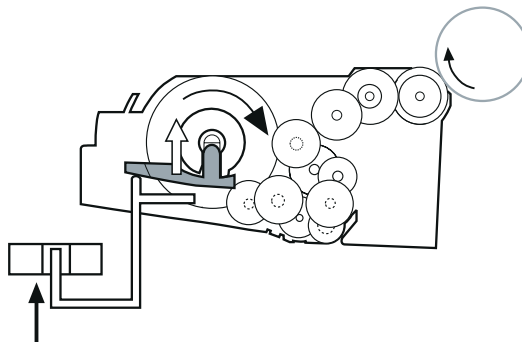
The ITB counter unit is located on the side of the ITB unit. The counter unit consists of a number of gears, including the counter gear, and an ITB unit life detection lever. The gears indicate to the ITB counter gear the number of rotations (turns) made by the intermediate transfer belt.

A “page count” is also stored on the formatter, which is used for informational purposes only. When a configuration page is printed, the percentage of ITB life remaining is indicated based upon this page count. If the ITB unit is replaced prematurely or the percentage of life is inaccurate, the page count in the formatter must be manually corrected.

Once the ITB counter gear has rotated one complete turn, the tabbed lever drops into the gear notch. This causes the life detection lever to block light from the ITB unit life sensor (PS1). When light is blocked from PS1, the DC controller sends the formatter a warning that the end of the ITB unit life has been reached.



When the end of the ITB unit life has not been reached



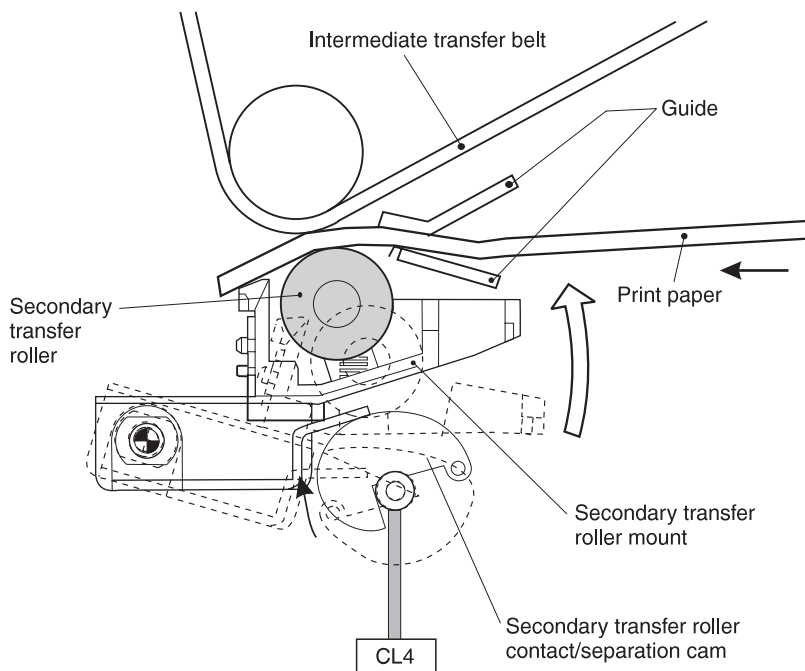
When the end of the ITB unit life has been reached

**Figure 5-17** ITB unit life detection

## Secondary transfer roller unit

The secondary transfer roller is normally detached from the ITB. This operation presses paper against the ITB with the secondary transfer roller at the time of secondary transfer. During “first page out,” the secondary transfer roller engages with the belt prior to drum-to-belt image transfer to stabilize the belt from side-to-side movement. The roller stays engaged while the black image is being transferred to the ITB. Just before the black image reaches the secondary transfer roller, the transfer roller disengages from the ITB.

Following image transfer from the photosensitive drum to the ITB and after the paper is positioned in front of the registration rollers, the DC controller turns on the secondary transfer roller clutch (CL4). Once CL4 is on, the secondary transfer roller contact/separation cam rotates and lifts the secondary transfer roller mount. This presses the secondary transfer roller against the intermediate transfer belt prior to the paper arriving from the registration rollers. Bias for the roller is turned on to enable image transfer from the belt to the paper. Once the print job is finished and the paper has passed through the unit, the DC controller then turns CL4 off and secondary transfer roller disengages from the ITB.

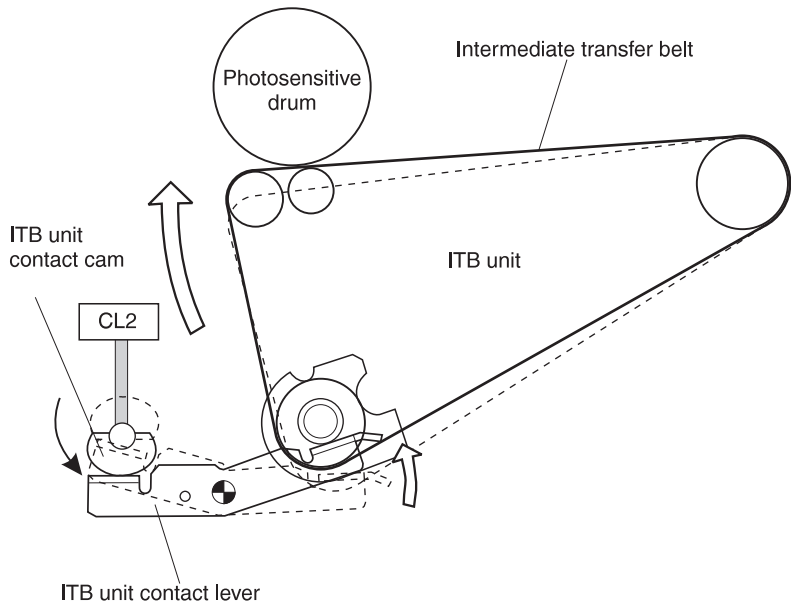


**Figure 5-18** Secondary transfer roller unit

## ITB unit contact/separation unit

Normally, the intermediate transfer belt is separated from the photosensitive drum. This operation presses the belt against the drum by moving the ITB unit contact lever at the beginning of print operation.

When the fusing unit temperature reaches the print temperature at the beginning of the print operation, the DC controller turns the ITB unit contact/separation clutch (CL2) on. Once the ITB contact/separation clutch is on, the ITB unit contact/separation cam pushes on the ITB contact/separation lever. This causes the lever to lift up on the ITB until it comes into contact with the photosensitive drum. The ITB will stay engaged with the drum throughout the transfer process. Once the entire print job is complete and CL3 and CL4 have been deactivated, the DC controller turns CL2 off and the ITB is lowered away from the photosensitive drum.



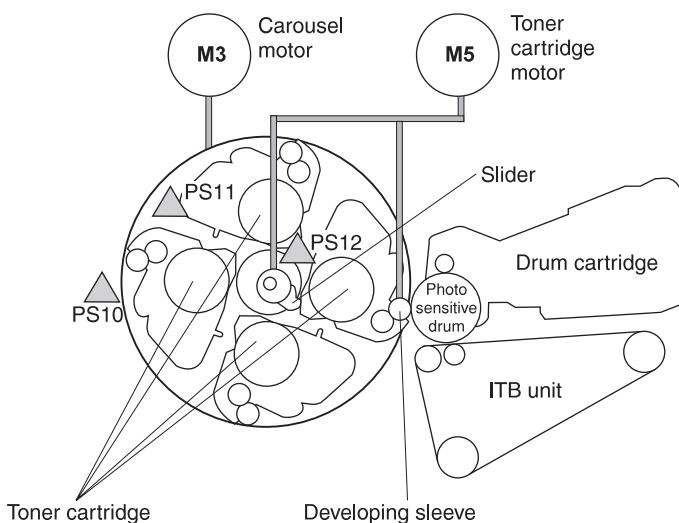
**Figure 5-19** ITB unit contact/separation unit

## Toner carousel

The toner carousel holds the printer's four toner cartridges: K (black), M (magenta), C (cyan), and Y (yellow).

The carousel motor (M3) rotates the carousel and the toner cartridge motor (M5) provides the drive for the positioning cam and the developer sleeve.

The carousel contains three sensors: developing carousel position sensor (PS10), toner cartridge contact/separation sensor (PS11), and the toner level sensor (PS12). These sensors as well as the detailed operation of the carousel assembly is discussed on the following pages.



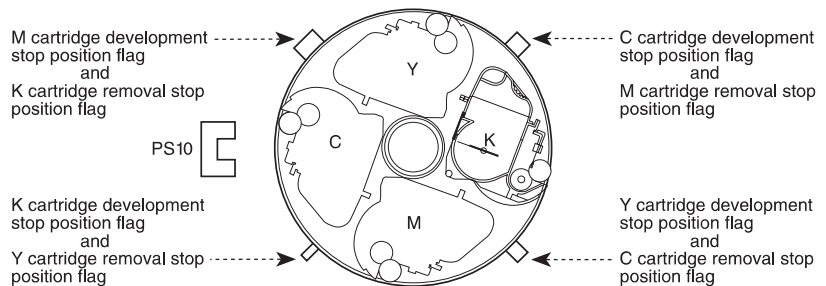
**Figure 5-20** Toner carousel assembly

**Table 5-1** Toner carousel assembly components

Reference	Description
M5	Toner cartridge motor
M3	Carousel motor
PS10	Carousel position sensor
PS11	Toner cartridge contact/separation sensor
PS12	Toner level sensor

## Operation

The DC controller activates the carousel motor (M3) and rotates the carousel. As the carousel rotates, the position sensor (PS10) monitors the carousel for the stop position flags. Each stop position flag is used as a development and toner cartridge removal flag (see Figure 5-21). When a flag is detected, the DC controller monitors the time it takes the flag to pass the sensor (PS10). Each flag is a different width and therefore takes various times to pass the sensor. This time lapse is used by the DC controller to determine which development/removal stop position flag has passed the sensor. When the carousel turns to the correct position, the DC controller stops the carousel motor (M3) and the carousel from rotating any further.



**Figure 5-21** Toner carousel operation

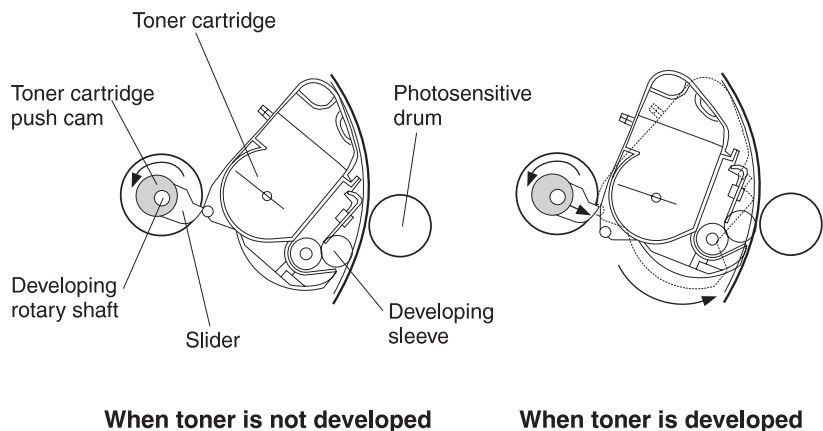
## Toner cartridge contact/separation function

This function brings the developing sleeve closer to the photosensitive drum by pushing the toner cartridge push cam out so that the toner cartridge rotates up onto the cam.

The DC controller determines the time lapse of the developing stop position flag with the carousel position sensor (PS10) to determine that the toner cartridge is in position. The DC controller then activates the toner cartridge motor (M5), and the motor begins to rotate clockwise. This causes the toner cartridge push cam to rotate and push out. The toner cartridge then rotates up onto the cam. This positions the toner cartridge and the developer sleeve near the drum and puts the spacers in contact with the drum (see Figure 5-22).

The toner cartridge contact sensor (PS11) detects when the toner cartridge is close to the drum (see Figure 5-23). Once the toner cartridge is facing the drum, the DC controller deactivates the carousel motor (M3), which stops the rotation of the carousel. At the same time, the DC controller starts development by rotating the toner cartridge motor (M5) counter clockwise to begin rotation of the developing sleeve.

Once development is complete, M5 again rotates clockwise moving the toner cartridge away from the drum. The toner cartridge contact sensor (PS11) detects when the toner cartridge has moved away from the drum. The carousel motor (M3) again begins the carousel rotation, and the process is repeated for each toner cartridge.



**Figure 5-22** Toner cartridge contact/separation function

## Toner level detection/toner cartridge detection

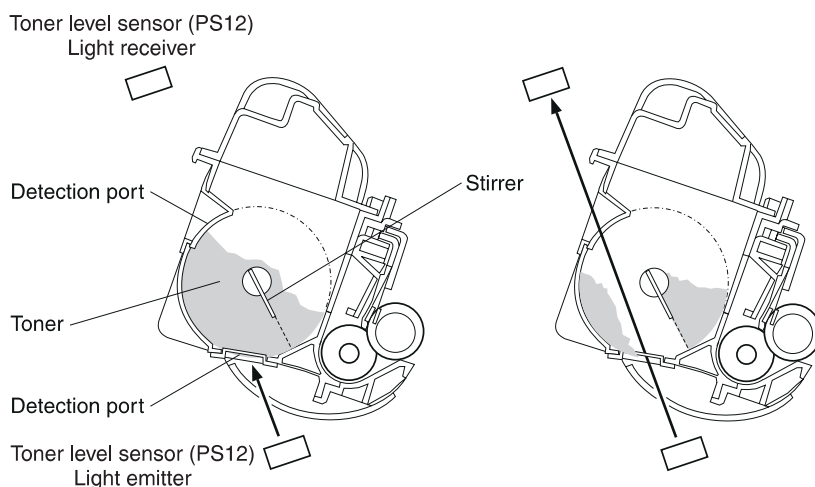
This function detects the remaining toner level in the toner cartridge and the presence of the toner cartridge in the carousel.

While the toner cartridge is facing the photosensitive drum, light from the light emitter diode passes through the light guide in the carousel and enters the detection port of the toner cartridge. The light passes through the cartridge when the toner around the detection port is scraped off by the cartridge stirring function and is detected by the light receiver of the toner level sensor (PS12) (see Figure 5-24). The printer measures the time it takes for the toner to cover the port again so that light cannot pass through. This measurement determines the amount of toner remaining in the toner cartridge.

When the light passing through the cartridge exceeds a specified time before being interrupted by toner, the DC controller warns the formatter that the toner life is low. The **TONER LIFE LOW** display panel message is also displayed on the control panel. When light passes through the cartridge all the time without interruption, the printer is stopped by the DC controller, the formatter is notified that no toner is left in the cartridge. A **TONER OUT** message also appears on the control panel.

### Note

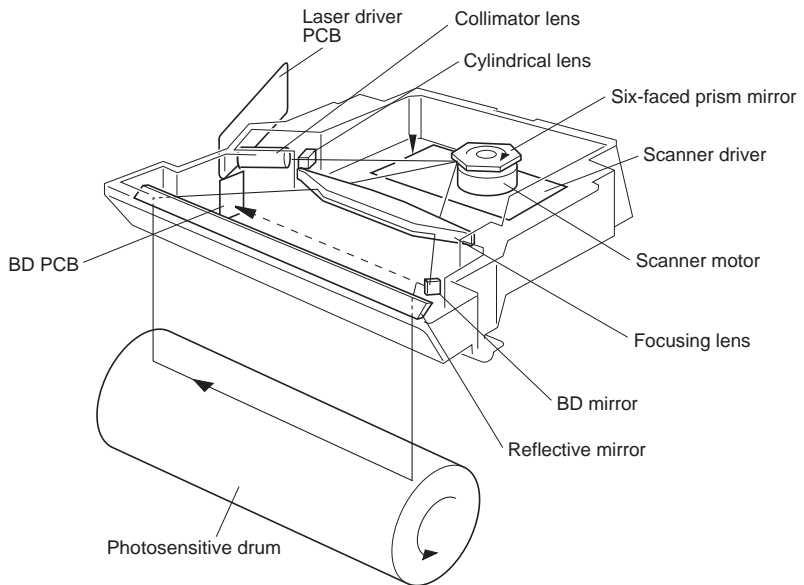
The stirrer is also used to supply toner smoothly to the sleeve. The toner cartridge motor (M5) rotates the stirrer and the toner feed roller. Both the stirrer and the toner feed roller stir the toner in the toner cartridge.



**Figure 5-23** Toner level detection/toner cartridge detection

## Laser/scanner operation

The DC controller signals the laser driver to activate the laser diode that generates the laser beam. The laser beam is aligned by the collimator lens and the cylindrical lens. The beam then strikes the six-faced prism mirror located atop the scanner motor, while the mirror is rotating at a constant speed. The beam is then reflected and brought to a point to maintain a consistent round dot (focused) on the drum surface by the focusing lens. At the beginning of the scan line, the beam first strikes the beam detect (BD) mirror and then the BD PCB. After the initial strike, the beam strikes the drum surface. With the drum rotating at a constant speed, the laser beam successively scans across the drum's surface exposing the image.



**Figure 5-24** Laser/scanner operation



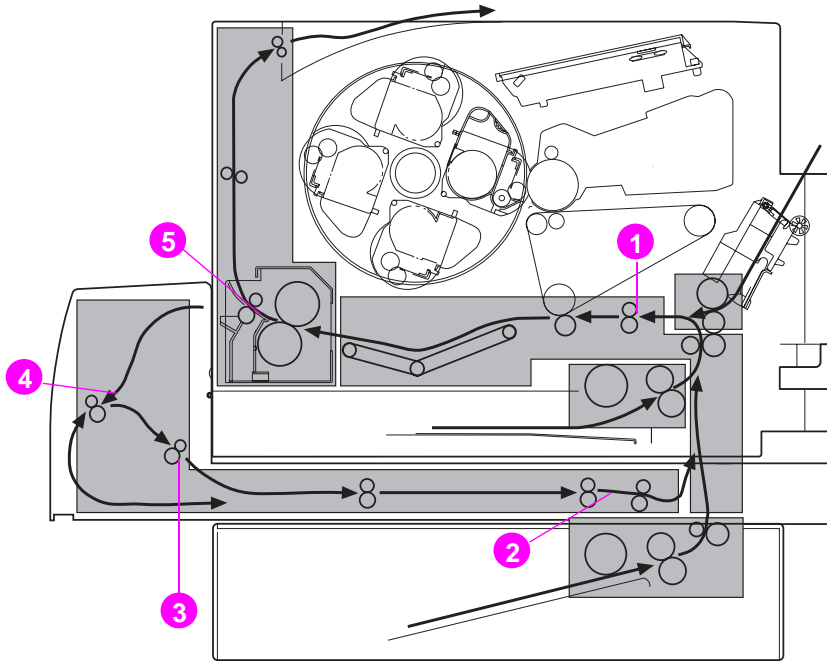
# Paper path

## Introduction

For cassette feeding, a sheet of paper is picked up by the cassette pick-up roller and is then fed by the feed rollers. For manual feeding, a sheet of paper is picked up by the multi-purpose tray pick-up roller and is then fed by the feed rollers. The pick-up motor (M2) provides the drive for the front of the paper path.

Once paper is fed into the general paper path, the paper passes through the registration rollers. The paper is temporarily stopped so that the paper's leading edge will match the leading edge of the image on the photosensitive drum. The paper then passes between the secondary transfer roller and the ITB. The paper continues past the web transport and past the upper and lower fusing rollers to either the face-up tray or the face-down tray.

The paper path is shown in Figure 5-25.



**Figure 5-25 Paper jam sensors (shown with the optional 500-sheet paper feeder and duplex unit installed)**

- 1 Registration paper sensor (PS2)
- 2 Duplex paper-pick sensor (PS3104)
- 3 Reversed unit paper sensor (PS3103)
- 4 Reversed paper sensor (PS3101)
- 5 Delivery paper sensor (PS7)

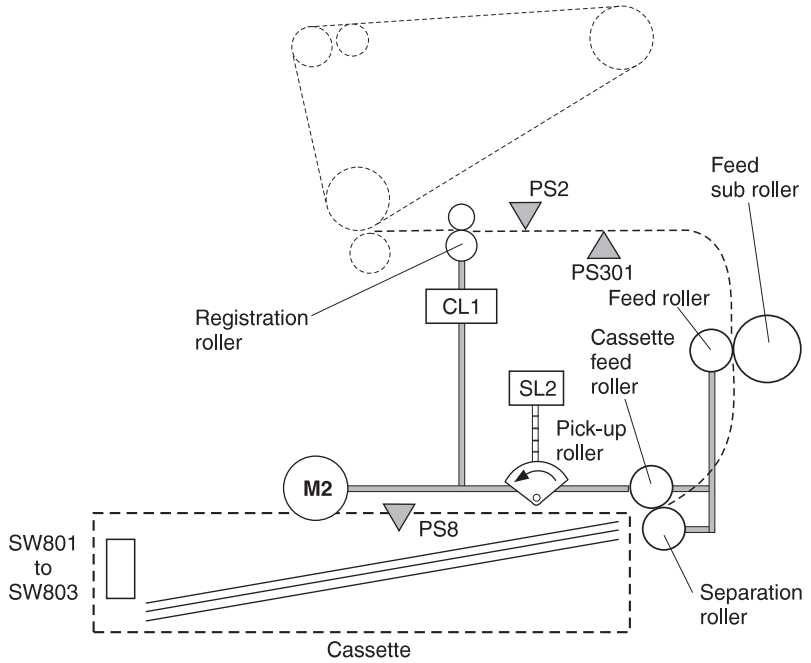
## Tray 2 (cassette)

The cassette paper sensor (PS8) senses paper on the cassette. Three paper-size detection switches (SW801, SW802, and SW803) detect both the paper size and the presence of a cassette.

The timing of the paper pick-up and feeding is based on the home position of the ITB. The pick-up motor (M2) provides the drive force for the front of the paper path. Once the paper-size detection switch receives the ITB home position detection signal, the cassette feed solenoid (SL2) is activated, and transmits the rotational force of the pick-up motor to the cassette feeding pick-up roller. The roller picks up the paper from the paper cassette.

A separation roller prevents multiple sheets from being fed while paper is fed into the printer's paper path. The cassette feed roller and another feed roller feeds the paper into the printer. The paper passes the registration paper sensor (PS2) and reaches the registration roller. Because the registration roller is not currently rotating, the paper temporarily stops. The paper's leading edge is then curled and any skew is corrected.

The DC controller activates the registration clutch (CL1), which feeds the paper to the secondary transfer unit. The leading edge of the image on the intermediate transfer belt is matched with the leading edge of the paper. The paper is fed to the fusing and delivery units (see Figure 5-26).



**Figure 5-26** Tray 2 (cassette) operation

**Table 5-2** Motors, solenoids, sensors, and switches

Reference	Description
M2	Pick-up motor
SL2	Cassette pick-up solenoid
CL1	Registration clutch
PS2	Registration paper sensor
PS301	OHT sensor
PS8	Cassette paper sensor
SW801	Paper-size detection switch
SW802	Paper-size detection switch
SW803	Paper-size detection switch

## Tray 1 (multi-purpose tray)

The multi-purpose tray paper sensor (PS4) senses the presence of the paper in the multi-purpose tray. The manual feed solenoid (SL1) transmits the rotational force of the pick-up motor to the manual feeding pick-up roller. As the pick-up roller rotates, the pick-up cam pushes up the paper-lifting plate. This causes the paper to be pressed against the pick-up roller and thus picked-up by its rotation. After the separation pad separates multiple sheets, the paper is fed into the printer one sheet at a time.

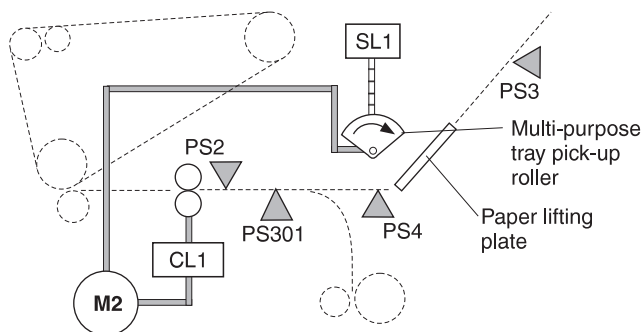


Figure 5-27 Tray 1 manual feed

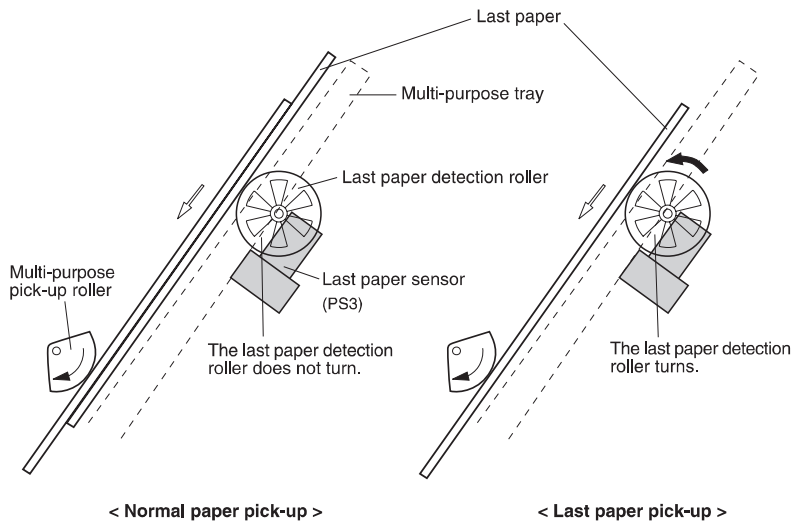
Table 5-3 Motors, solenoids, clutches, and sensors

Reference	Description
M2	Pick-up motor
SL1	Multi-purpose tray pick-up solenoid
CL1	Registration clutch
PS2	Registration paper sensor
PS3	Last paper sensor
PS4	Multi-purpose tray paper sensor
PS301	OHT sensor

## Last paper detected

The printer detects the last page of the print job before writing the next image. This prevents toner particles from smearing on the photosensitive drum and ITB.

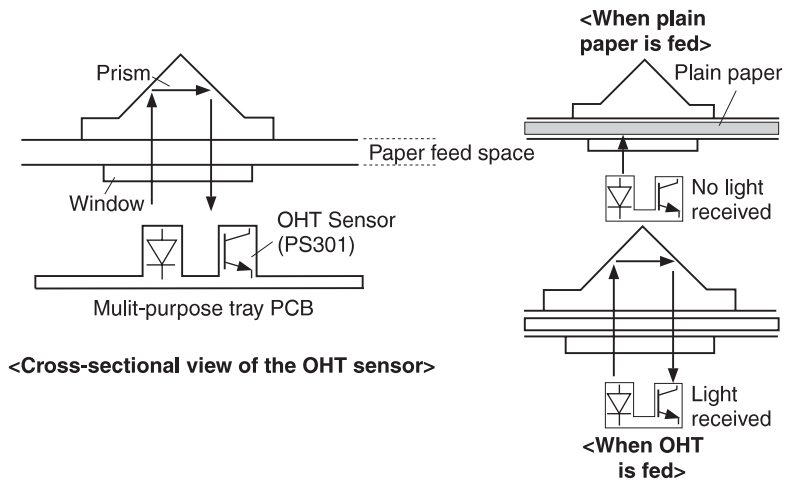
To detect the last paper, the last paper sensor (PS3) monitors the rotation of the last paper detection roller on the multi-purpose tray. If there are two or more sheets in the multi-purpose tray, the last paper detection roller does not rotate when one sheet is picked up. Once the last paper is picked up, the last paper detection roller rotates. PS3 monitors this rotation, and a warning message is sent to the control panel.



**Figure 5-28** Laser paper detected

## Overhead transparency detection

Overhead transparencies (OHT) are detected by the OHT sensor (PS301) located at the front of the registration roller. Light is emitted from PS301 and passes through the paper path, reflected by the reflective mirror, and returned to PS301. As paper passes over PS301, the light emitted from PS301 is blocked by the paper and thus does not return to PS301. Transparencies are detected when the light passes through the OHT which is reflected by the prism, and returns to the sensor. The printer is then switched to OHT mode and changes the paper path speed during transfer and fusing.



**Figure 5-29** Overhead transparency sensor

## Tray 3 (500-sheet paper feeder)

### Power supply

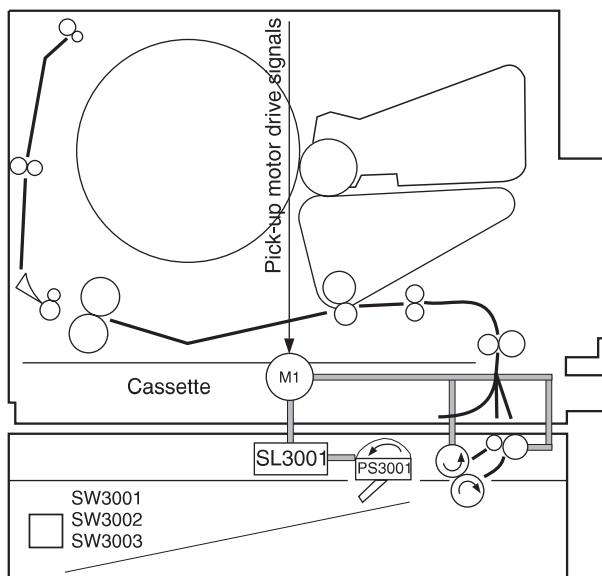
The printer supplies +24 V and +5 V to the paper feeder for power. The paper feeder is controlled by the DC controller. It does not contain a microcomputer (CPU) or a drive motor. Its rollers are controlled by the printer's pick-up motor (M2).

### Pick-up and feed system

Three switches (SW3001, SW3002, and SW3003) on the paper feeder PCB detect the paper size and presence of a cassette. The DC controller activates the pick-up motor (M2) and turns on the paper feeder pick-up solenoid (SL3001) after the pick-up motor starts. The paper feeder pick-up roller is activated by the pick-up motor and picks up the paper. Once the separation roller separates the paper from any extra sheets of paper, paper is fed into the printer by the paper feeder feed roller and printer feed roller.

The rest of the paper path is the same as the Tray 2 cassette (see Figure 5-26).





**Figure 5-30** Pick-up and feed system

**Table 5-4 Solenoids, sensors, switches**

Reference	Description
SL3001	Paper feed pick-up solenoid
PS3001	Paper feed paper detection sensor
SW3001	Paper feed paper-size detection switch
SW3002	Paper feed paper-size detection switch
SW3003	Paper feed paper-size detection switch

## Paper size detection

The paper size and presence of the cassette are detected by the paper size detection switches (SW801-SW803). The combinations of paper size detection switches are listed in Table 5-5.

**Table 5-5 Paper size detection switches**

Paper size	Cassette paper size detection switch		
	SW801	SW802	SW803
Legal	OFF	OFF	ON
A4	ON	ON	ON
Letter	OFF	ON	ON
Executive	OFF	ON	OFF
B5	ON	ON	OFF
B5-ISO	ON	OFF	OFF
A5	ON	OFF	ON
No cassette	OFF	OFF	OFF

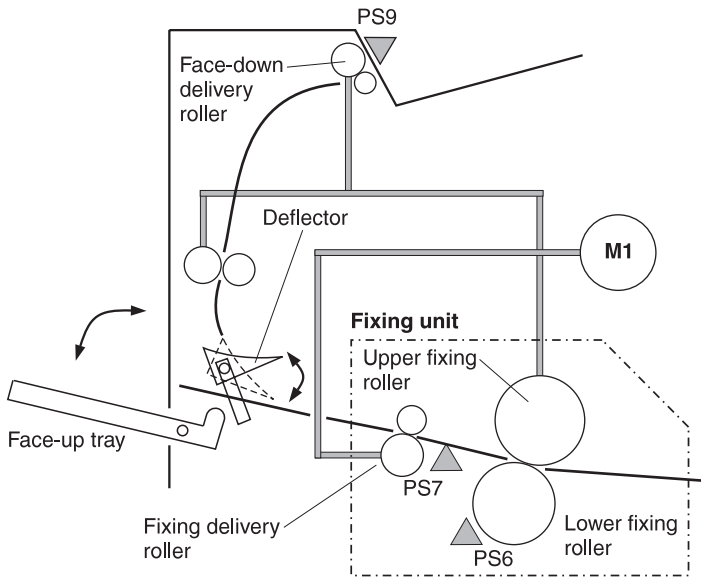
## Fusing and delivery unit

The fusing motor (M1) drives the fusing assembly, and the paper delivery rollers. Paper separated from the ITB is fed into the fusing unit, and output from the fusing unit by the upper and lower fusing rollers and fusing delivery roller. The paper output from the fusing unit is then detected by the delivery unit paper sensor (PS7).

The pressure release sensor (PS6) detects when the fusing roller pressure is off.

The printer uses a deflector to switch between the face-up bin and face-down bin. When the face-up bin is open, the paper is delivered to the face-up bin. When the face-up bin is closed, paper will be delivered to the face-down bin (see Figure 5-31).

If the face-down bin becomes full, it is detected by the face-down bin paper full sensor (PS9).



**Figure 5-31** Fusing and delivery unit

**Table 5-6** Fusing and delivery unit components

Reference	Description
M1	Fusing motor
PS6	Fusing unit pressure release sensor
PS7	Delivery unit paper sensor
PS9	Face-down tray delivery full sensor

# Duplex unit paper path

## Theory

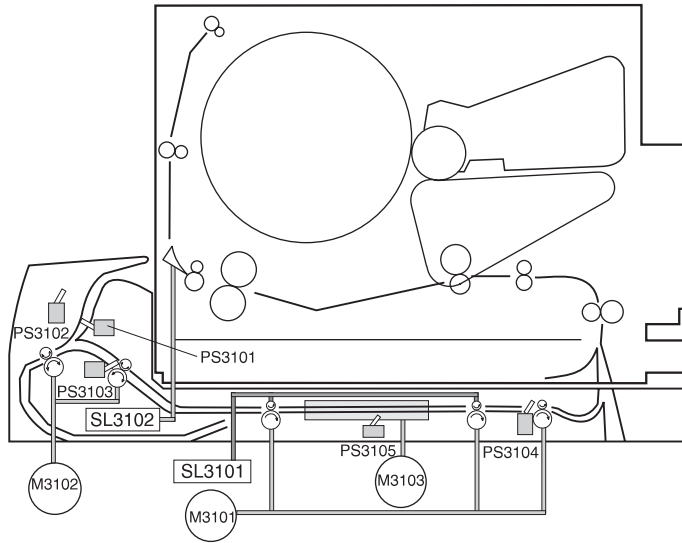
The duplex unit enables printing on both sides of a page. With two-sided printing, known as duplexing, the back side of the page is printed first. Then the page is sent through the duplex unit, where it is flipped over and sent back through the printer for printing on the front.

## Power supply

There are two power supplies for the duplexing unit: power supplied by the printer and power supplied by the internal power supply. The CPU requires +5 V of power to be supplied from the printer. This power is also used to supply power to the paper feeder. The external power supply provides +24 V and +5 V, and is used to drive the motors, solenoids, and sensors.

## Operation

Paper is fed into the duplexing unit by the duplex feed rollers, which are rotated by the duplex feed motor (M3101). The paper is reversed by the reversing roller, which is rotated by the reversing motor (M3102). The paper is then fed into the printer by the duplexing unit feed roller after the side registration roller is adjusted by the side registration guide (see Figure 5-32).



**Figure 5-32 Reversing and duplex pick-up operation**

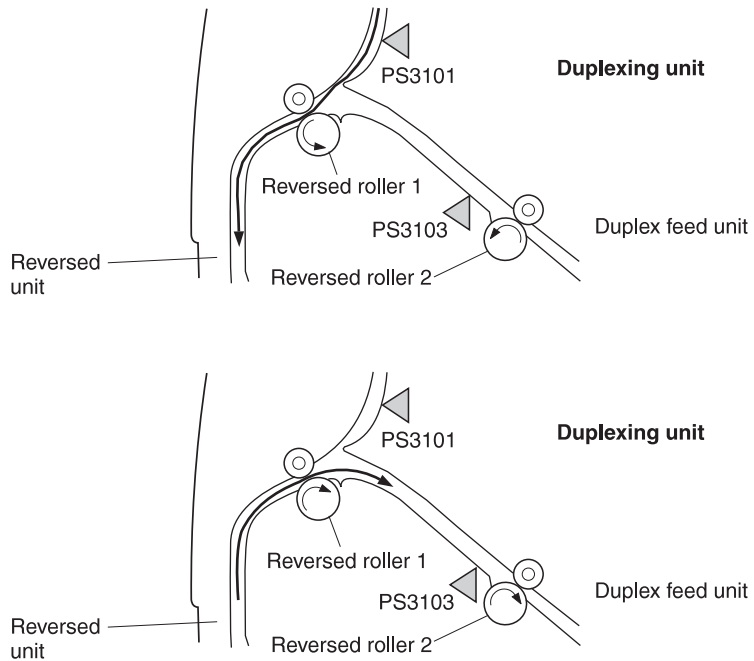
**Table 5-7 Motors, solenoids, and sensors**

Reference	Description
M3101	Duplex feed motor
M3102	Reversing motor
M3103	Side registration motor
SL3101	Duplex feed roller pressure release solenoid
SL3102	Delivery deflector solenoid
PS3101	Reversing unit paper sensor
PS3102	Face-up sensor
PS3103	Reversing unit stationary paper sensor
PS3104	Duplex pick-up paper sensor
PS3105	Side registration home position sensor

## Reversing operation

The media is guided to the duplex unit with the face-up deflector in conjunction with the face-up tray. If the face-up tray is closed, the delivery deflector solenoid (SL3102) operates the deflector. The duplex driver PCB turns the delivery deflector solenoid (SL3102). The rotation of the delivery deflector solenoid moves the delivery deflector, feeding the media into the duplexer. The reversing motor (M3102) rotates counter clockwise to feed the media into the reversing unit.

Once the reversed paper sensor (PS3101) detects the trailing edge of the paper fed into the reversed unit, the duplex driver PCB changes the paper feed direction by rotating the reversing motor clockwise. Paper is then fed along the lower duplex guide until the paper reaches the duplex feed unit.

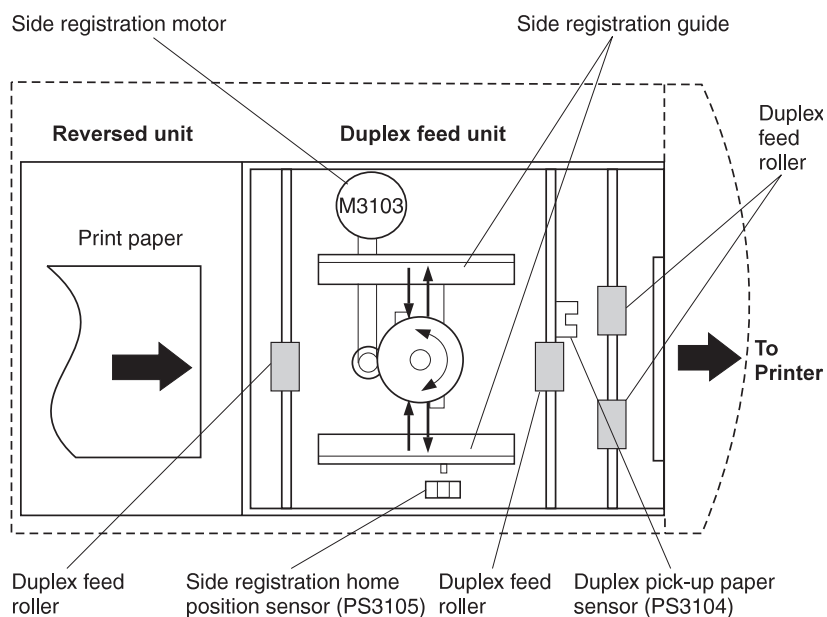


**Figure 5-33** Reversing operation

## Side registration adjustment

The printer adjusts side registration so that the center of the paper (in the horizontal direction), matches the center of the printable area on the ITB when printing on the second side. The side registration guides press against both sides of the paper in order to complete the adjustment.

The duplex driver PCB then drives the side registration motor (M3103) clockwise and moves the home registration guide to the home position. Once the side registration home position sensor (PS3105) detects the home position of the side registration guide, the duplex driver PCB stops M3103 and holds the side registration guide at the home position.

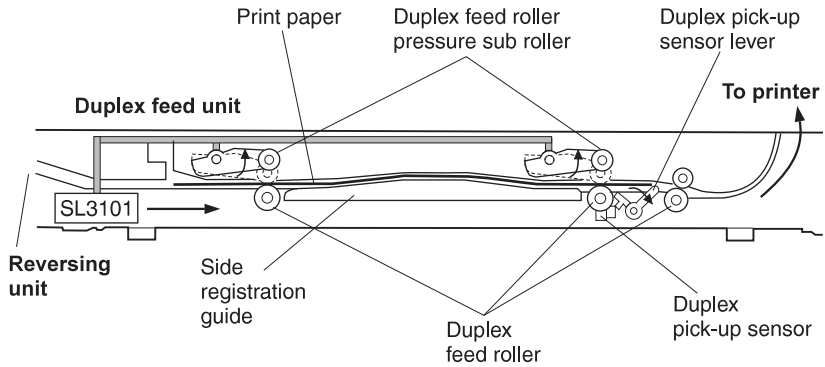


**Figure 5-34** Side registration adjustment

When the duplex unit stationary paper sensor (PS3103) detects paper, the paper is fed along the feed rollers.

Once the duplex pick-up sensor (PS3103) detects the paper, the paper is stopped and the paper is freed from the feed rollers.

According to the paper-size data received from the DC controller, the duplex driver runs the side registration motor (M3103) the prescribed number of pulses, moving the side registration guide and aligning the paper position. This completes the side registration of the paper process.



**Figure 5-35 Duplex feed roller pressure**

### Duplex unit pick-up operation

After the side registration adjustment is completed, the duplex driver sends the refeed paper presence status to the printer. Once the status is reviewed by the printer, it sends the duplex unit pick-up command to the duplex driver.

The duplex driver activates the duplex feed motor (M3101) and feeds the paper. When the paper is detected by the registration paper sensor (PS2), the duplex driver deactivates M3101, stopping the paper feed process. The duplex driver then activates M3101 to resume feeding once it receives the refeed command. Once the media is in position, the duplex driver will deactivate M3101 and stop the duplex feed roller. After the second side of paper is printed, the paper is fed to the face-down delivery bin.



## DC controller subsystem

The DC controller is responsible for coordinating the entire printing process. The DC controller enables the drive circuitry for the laser beam and coordinates print data from the formatter with paper size, laser beam motion, the high voltage system, fuser temperature, and motors. The DC controller also shares machine status information with the formatter so that proper diagnostic messages are displayed on the control panel. An overview is shown in Figure 5-36.

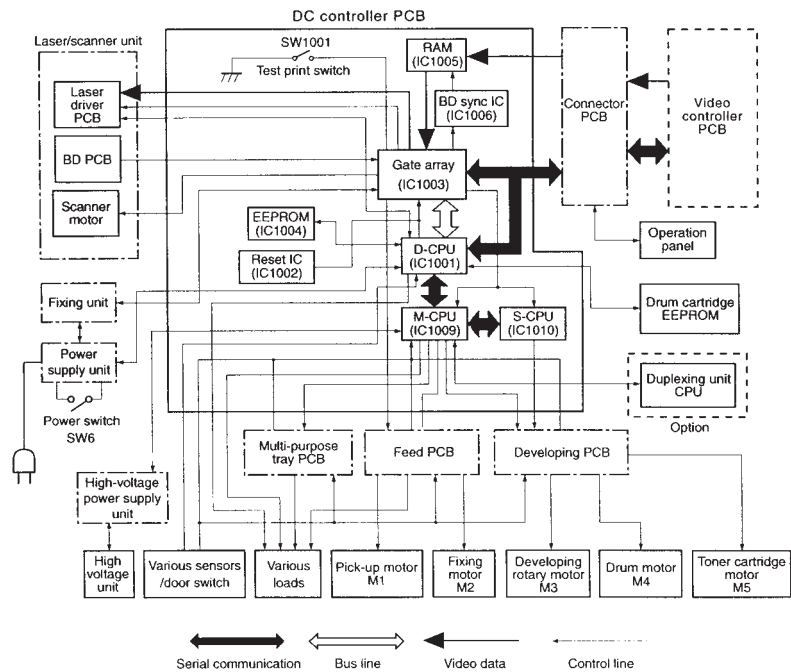
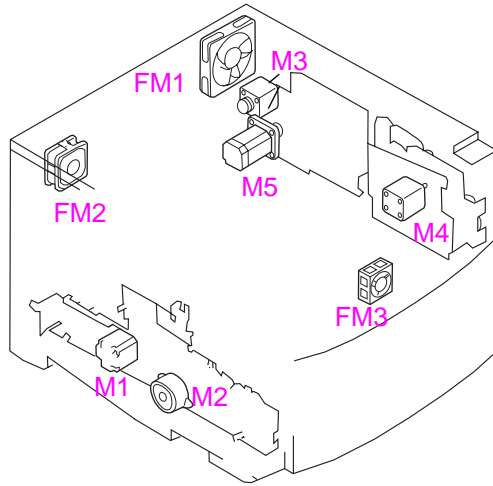


Figure 5-36 DC controller PCB

# Motors and fans

The printer contains five motors that drive the paper pick-up/feed assembly and the image formation assembly. The printer also contains three fans. Figure 5-37 and Table 5-8 illustrate the location of each motor and fan.



**Figure 5-37** Motors and fans

**Table 5-8** Motor and fan locations

Reference	Components
M1	Fusing motor
M2	Pick-up motor
M3	Carousel motor
M4	Drum motor
M5	Toner cartridge motor
FM1	Large fan
FM2	Small fan
FM3	Front fan

## **Fusing motor (M1)**

The fusing motor is a two-phase stepping motor. This motor operates the fusing assembly secondary transfer roller, feed belt, feed roller, ITB contact clutch, ITB cleaning roller contact clutch, and the secondary transfer contact clutch.

## **Pickup motor (M2)**

The pick-up motor is a two-phase stepping motor. The pick-up motor operates the cassette, multi-purpose tray, paper feeder, and registration roller.

## **Carousel motor (M3)**

The carousel motor is a two-phase stepping motor. The carousel motor operates the toner carousel.

## **Drum motor (M4)**

The drum motor is a two-phase stepping motor. The drum motor operates the intermediate transfer belt (ITB) and the photosensitive drum cartridge and its related components.

## **Toner cartridge motor (M5)**

The toner cartridge motor is a two-phase stepping motor. The toner cartridge motor operates the developer sleeve in the toner cartridge and performs the toner contact/separation function.

## **Fan motor**

The fan motor is a DC brushless motor containing a hall element and the motor driver circuit. The printer has two exhaust fans (FM1 and FM2) and one inducting fan (FM3).

# Formatter system

The formatter PCB is responsible for the following:

- Receiving and processing print data from the various printer interfaces
- Monitoring control panel inputs and relaying printer status information (through the control panel and the bidirectional I/O)
- Developing and coordinating data placement and timing with the print engine
- Storing font information
- Communicating with the host computer through the bidirectional interface
- Controlling the PowerSave mode

The formatter PCB receives a print job from the bidirectional interface and separates it into image information and instructions that control the printing process. The DC controller PCB synchronizes the image formation system with the paper input and output systems, and then signals the formatter to send the print image data.

The formatter PCB also provides the electrical interface and mounting locations for two EIO cards and additional memory DIMMs.

---

## CAUTION

Never replace both the formatter PCB and the DC controller PCB at the same time. Doing so will result in a complete loss of data. During the removal and replacement of the formatter, data is stored in the DC controller. If the DC controller is also replaced before completing a power on sequence, all data is lost.

---

## Control panel

The formatter PCB sends and receives printer status and command data via a control panel PCB. If you replace the formatter PCB, updates will be sent to the DC controller PCB and vice-versa.

# Power supplies

## Power supply overview

There are three power supplies used to power various sections of the printer. There is an AC/DC power supply and a High voltage power supply. See Chapter 6 for instructions on accessing the power supplies.

### AC/DC power supply

The low-voltage power supply circuit supplies +24 VDC and +5 VDC required for the printer and +3.3 VDC and +5 VDC required for the video controller.

+24 VDC is supplied for the paper pick up motor, scanner motor, and the high-voltage power supply PCB. +5 VDC is supplied for the sensors and the ICs on the DC controller PCB.

The front door switch or the rear door switch is deactivated by opening the drum drawer, ITB drawer, toner access cover, or delivery door. These switches are in a series and disable the +24 VDC when the drawers, covers, or doors are open.

The low-voltage power supply circuit monitors the 5 VS (volt signal) fed back from the connector PCB to ensure the 5 V power supply to the formatter.

### Overcurrent overvoltage protection

Each DC power supply circuit has an overcurrent protective function and overvoltage protective function. This will prevent a power supply circuit failure by automatically interrupting the output voltage when anomalies, such as a short, develop on the loads that result in overcurrent flow or abnormal voltage.

If this function is activated and no DC voltage is output from the low-voltage power supply circuit, turn OFF the power switch (SW6), unplug the power cord, resolve the anomaly on the load, and then turn ON the power switch (SW6) again.

---

**Note**

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Protective functions remain active for 2 minutes after activation. Wait for at least 2 minutes to turn the power back on again.

## High-voltage power supply

The printer contains two high-voltage PCBs mounted in one assembly. Together, these PCBs generate the voltage supplied to the primary charging roller, developing sleeve, primary transfer roller, secondary transfer roller, ITB cleaning roller, and upper fusing roller. DC voltage, or superimposed AC voltage and DC voltage, is applied to the primary charging roller, developing sleeve, and ITB cleaning roller. Positive or negative DC voltage is applied to the primary transfer roller and secondary transfer roller. Negative DC voltage is applied to the upper fusing roller.

# 6

# Removal and replacement

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# Introduction

## Removal and replacement strategy

This chapter explains how to remove and replace major printer components. (HP does not support repairing individual subassemblies or troubleshooting to the component level.)

Replacement is generally the reverse of removal. Occasionally, directions for difficult or critical replacement procedures are included.

## Repair notices

### WARNING!

Turn the printer off, wait five seconds, then unplug the power cord before servicing the printer. Failure to completely disconnect the printer could result in severe injury.

Never operate or service the printer with the protective cover removed from the scanner assembly. The reflected beam, although invisible, can damage your eyes.

Never operate the printer with any parts removed.

The sheet-metal parts can have sharp edges. Be careful not to cut yourself when handling sheet-metal parts.

### CAUTION

Always protect the imaging drum from light and physical contact when it is removed from the printer. HP recommends reinstalling the original cover whenever the drum is removed from the printer.

## Caution regarding electrostatic discharge (ESD)



The printer contains parts that are sensitive to electrostatic discharge (ESD). Watch for the ESD reminder shown at the left when removing printer parts. Protect the parts that are sensitive to ESD with protective ESD pouches.

## Determining the printer version

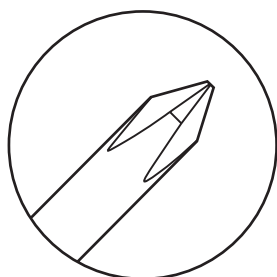
Two versions of the HP Color LaserJet 4500 series printers are available. To accurately perform removal and replacement procedures or determine the correct part for reordering, you will need to know the version of the printer that is being serviced. To identify the printer, check the serial number located at the rear of the printer. All printers will have US or JP in the first two positions of the serial number (e.g., **USBB**123456). Newer versions of the HP Color LaserJet 4500 printers will have an “H” or higher letter in the third position (e.g., **USHB**123456). If the letter in the third position in the serial number is “B”, “C”, “D”, or “F”, then you have an older version.

## Required tools

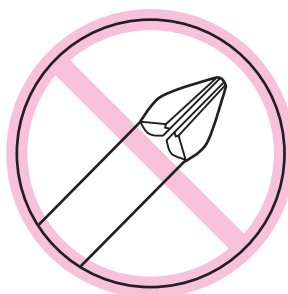
The following tools are needed to service the printer:

- Phillips #2 magnetized screwdriver (152-mm [6-inch] shaft)
- Small flat-blade screwdriver
- Small needle-nose pliers
- ESD strap
- Penlight (optional)

All components in the HP Color LaserJet 4500 printer use Phillips-head screws that require a #2 Phillips screwdriver. Ensure that you have a Phillips screwdriver and not a Posidriv screwdriver. Figure 6-1 (below) shows the difference between a Phillips and a Posidriv screwdriver. Note that the Phillips tip has more beveled surfaces.



Phillips



Posidriv

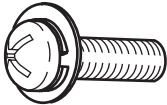

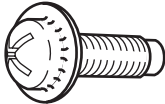

**Figure 6-1** Phillips vs. Posidriv screwdrivers

## Types of screws

Table 6-1 describes the screws used in the printer and provides guidelines to help determine where each type of screw is used. The screws can vary in length depending on the thickness of the material being fastened.

Always note where each type of screw is located and replace each one into its original location.

**Table 6-1** Types of screws

Illustration	Description	Uses
	Screw, machine w/washer	To hold plastic to metal.  example: printer skins
	Screw, self tapping	To hold plastic to plastic.  example: control panel
	Screw, trus head	To hold sheet metal to sheet metal.  example: formatter pan
	Retaining ring (e-type)	

# Consumable assemblies

The user replaces consumable assemblies as part of periodic maintenance. Chapter 4 explains the maintenance procedures.

**Note**

The printer tracks the amount of use on some of its user-replaceable parts by keeping a page count. Swapping consumable assemblies between printers might cause a misrepresentation of consumable assembly life values and is not recommended.

**Table 6-2 Approximate replacement interval for consumable items**

Consumable	Printer message	Page count	Approximate time period <sup>1</sup>	To install
Black (K) toner cartridge	TONER K LOW or TONER K OUT	9,000 pages <sup>2</sup>	4.5 months	See page 80.
Cyan (C) toner cartridge	TONER C LOW or TONER C OUT	6,000 pages <sup>2</sup>	3 months	See page 80.
Magenta (M) toner cartridge	TONER M LOW or TONER M OUT	6,000 pages <sup>2</sup>	3 months	See page 80.
Yellow (Y) toner cartridge	TONER Y LOW or TONER Y OUT	6,000 pages <sup>2</sup>	3 months	See page 80.
Drum kit	DRUM KIT LOW or DRUM KIT OUT REPLACE DRUM KIT	25,000 black and white only pages, or 6,250 color pages.	12.5 months for black and white only pages, or 3 months for color pages.	See page 82.
Transfer kit	TRANSFER KIT LOW or TRANSFER KIT OUT REPLACE KIT	100,000 black and white only pages, or 25,000 color pages.	50 months for black and white only pages, or 12.5 months for color pages.	See page 83.
Fuser kit	FUSER KIT LOW or FUSER KIT OUT REPLACE KIT	100,000 black and white only pages, or 50,000 color pages.	50 months for black and white only pages, or 25 months for color pages.	See page 86.

1. Approximate lives are based on 2,000 pages per month.
2. The approximate average A4/letter-size page count is based on 5% coverage of individual toner colors. Page counts are only estimations; usage conditions and print patterns can cause results to vary.

**CAUTION**

Hewlett-Packard recommends the use of HP products in this printer. Use of non-HP products may cause problems requiring service that is not covered by the Hewlett-Packard warranty or service agreements.

# Covers, drawers, top, and front assemblies

## Top cover

### To remove the top cover

- 1 Open the drum drawer (top drawer) until it clears the top cover, and then remove the imaging drum, protecting it from light.

#### CAUTION

Exposure to light for more than 15 seconds can seriously damage the imaging drum.

- 2 Push the release button on the left side of the printer and open the top cover.
- 3 Open the rear door(s) of the printer.
- 4 Remove the two screws from the top cover as shown in Figure 6-2.
- 5 Lift up on the rear corners of the top cover to release the plastic retaining tabs from the side cover.
- 6 Rotate the back of the cover toward the left side of the printer, then lift to remove it.

### Top cover replacement tip

- When replacing the top cover, be sure to properly seat the two plastic retaining tabs on the front of the cover.
- Be sure to firmly seat the top cover.



Figure 6-2

Top cover removal and replacement (rear view of printer)

## Left side cover

### To remove the left side cover

- 1 Remove the top cover.
- 2 Open the drum drawer (top drawer) and remove the imaging drum, protecting it from light.

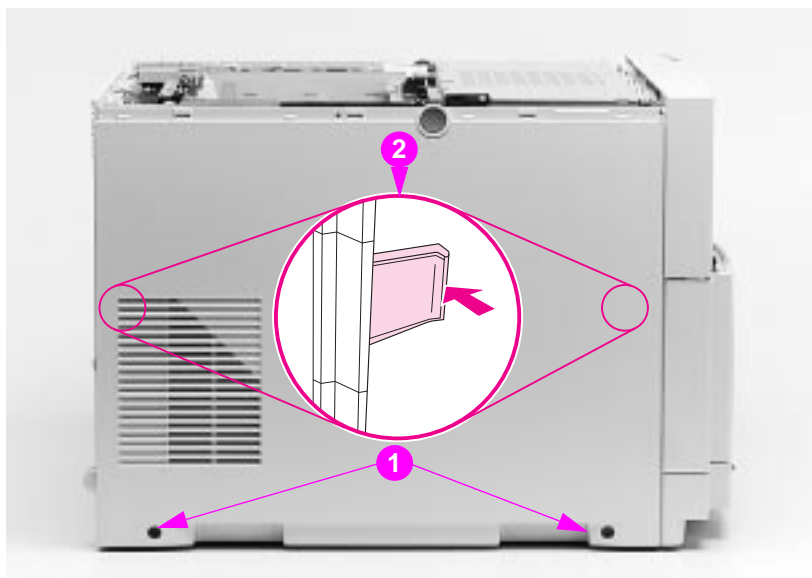
#### CAUTION

Exposure to light for more than 15 seconds can seriously damage the imaging drum.

- 3 Open the ITB drawer (middle drawer) and tray 2.
- 4 Remove the two screws as shown in callout 1.
- 5 Carefully pull out the bottom of the cover, disengage the two tab(s) located behind the cover (see callout 2), and then lift the cover up and off.

#### CAUTION

Be careful to not break the tabs when pulling out the bottom of the cover.



**Figure 6-3** Left side cover removal and replacement

## Right side cover

### To remove the right side cover from the printer

- 1 Remove the top cover.
- 2 Open the drum drawer (top drawer) and remove the imaging drum, protecting it from light.

---

#### CAUTION

---

Exposure to light for more than 15 seconds can seriously damage the imaging drum.

- 3 Open the ITB drawer (middle drawer) and tray 2.
- 4 Remove the two screws shown in callout 1, Figure 6-4.
- 5 Carefully pull out the bottom of the cover, and disengage the two tab(s) located behind the cover (see callout 2, Figure 6-4) by sliding the cover to the rear. Lift the cover up and off.

### Reinstallation tip

---

#### CAUTION

---

When reinstalling the cover, ensure that the tabs on the inside of the cover (callout 2, Figure 6-4) are seated properly by pushing in firmly on the tabs while sliding the cover forward into position.

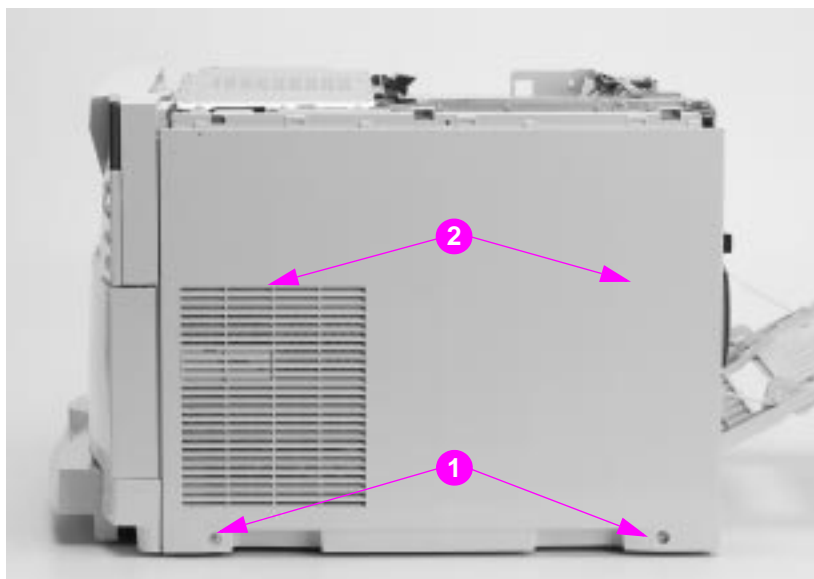


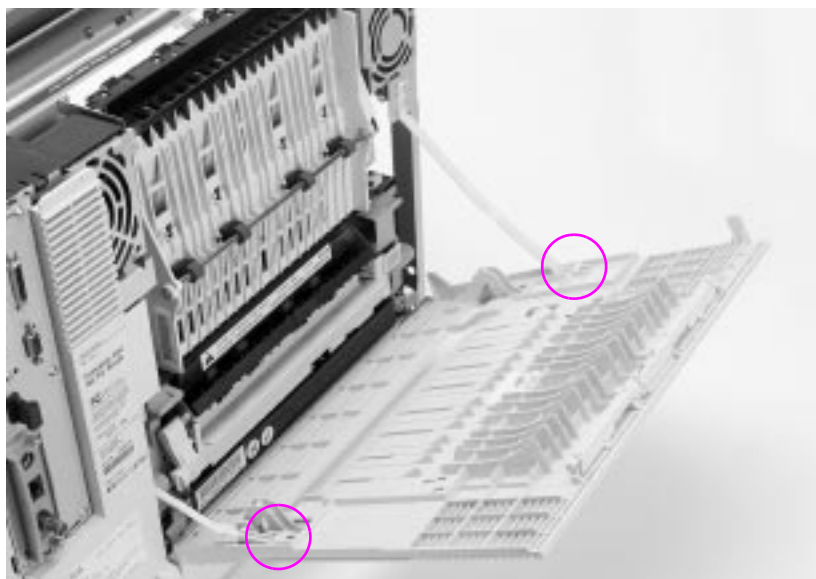
Figure 6-4

Right side cover removal and replacement

## Rear door

### To remove the rear door

- 1 Open the rear door of the printer.
- 2 Push in the retaining strap connectors to release the two plastic retaining straps attached to the inside of the rear door as shown in Figure 6-5.
- 3 Slide the bottom of the rear door to your right until the plastic guide-pin clears the guide-pin harness attached to the printer.
- 4 Remove the rear door.



**Figure 6-5** Rear door removal and replacement



## Right rear cover

### To remove the right rear cover

#### Note

Remove the duplexer, if installed.

- 1 Remove the top cover.
- 2 Remove the right side cover.
- 3 Remove the screw as shown in Figure 6-6.
- 4 Rotate the top of the cover toward the left side of the printer and remove the cover.

### Reinstallation tip

- Ensure that the lip on the lower right side of the cover slides behind the lower rear cover.



Figure 6-6

Right rear cover removal and replacement

## Drum drawer (top drawer) cover

### To remove the drum drawer (top drawer) cover

#### CAUTION

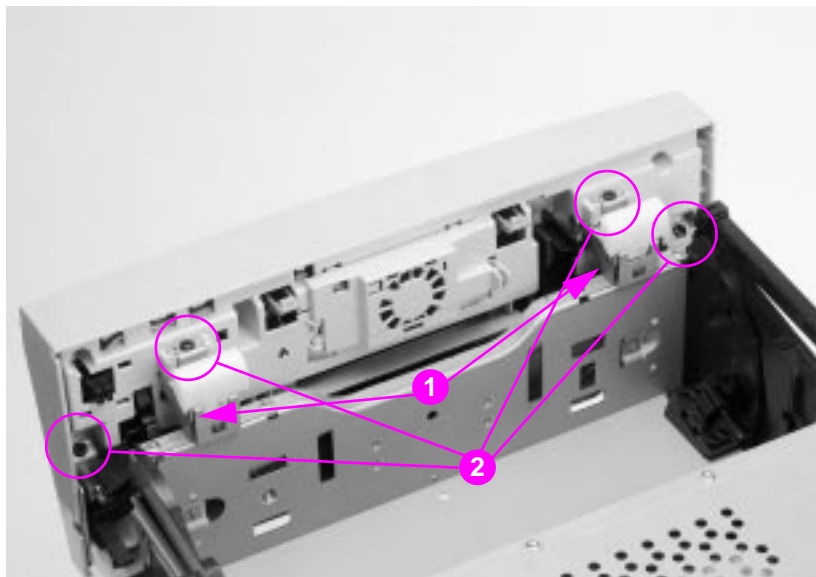
Two versions of the HP Color LaserJet 4500 series printers are available. To identify which printer version you are servicing, see page 146.

- 1 Open the drum drawer (top drawer) and remove the imaging drum, protecting it from light.

#### CAUTION

Exposure to light for more than 15 seconds can seriously damage the imaging drum.

- 2 Remove the two screws in the newer version printers (callout 1) or four screws in the older version printers (callout 2) from the inside of the drawer cover.
- 3 Reach beneath the drum drawer (top drawer) cover, firmly grasping beneath the center of the cover. Then, pull down slightly on the cover, rotating the bottom out toward you. Lift the cover up to remove.



**Figure 6-7** Drum drawer (top drawer) cover removal and replacement

## Drum drawer (top drawer) cover replacement tip

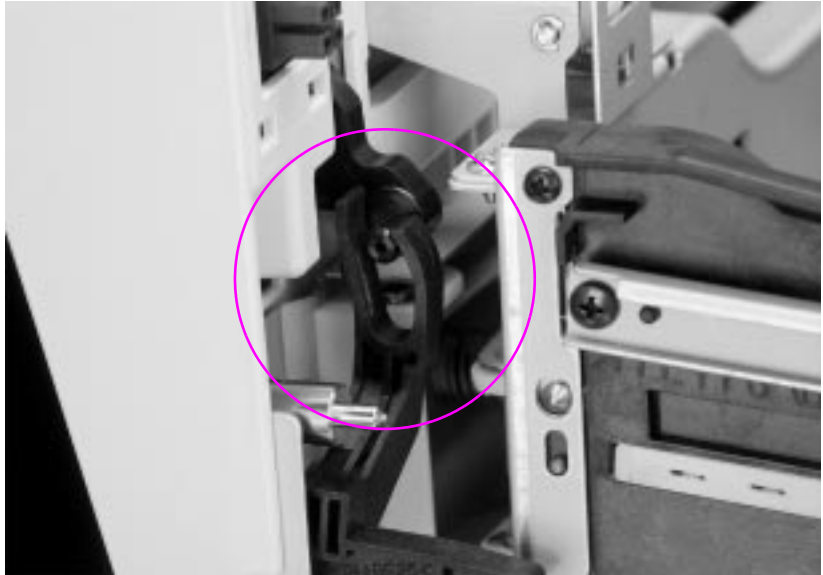
- When replacing the drum drawer (top drawer) cover, carefully insert the black plastic tabs into the black plastic levers (Figure 6-8).

---

### Note

In newer version printers, insert the metal tabs (located just inside the black plastic tabs shown in Figure 6-8) into the drum drawer (top drawer) cover before latching the cover onto the bottom of the drum drawer.

---



**Figure 6-8**

**Drum drawer (top drawer) cover tabs and levers**

## ITB drawer (middle drawer) cover

### To remove the ITB drawer (middle drawer) cover

- 1 Open the ITB drawer (middle drawer) until it stops.
- 2 Remove the two screws in the top of the ITB drawer (middle drawer) cover as shown in Figure 6-9.
- 3 Lift up on the cover slightly. Tilt the top toward you and then down to clear the two plastic retaining tabs located in the lower middle of the cover and remove the cover.

### ITB drawer (middle drawer) cover replacement tip

- Secure the two plastic retaining tabs at the bottom of the cover prior to reassembling the ITB drawer (middle drawer) cover.

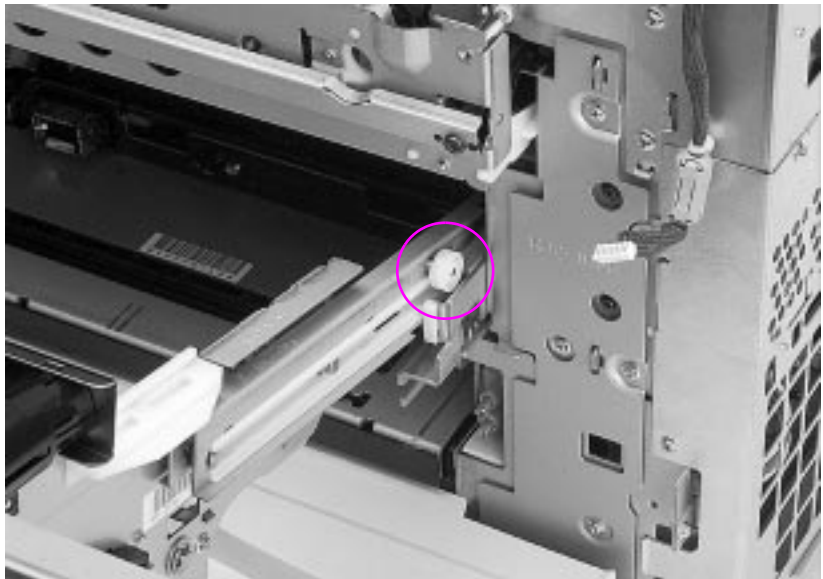


**Figure 6-9** ITB drawer (middle drawer) cover removal and replacement

## ITB drawer (middle drawer)

### To remove the ITB drawer (middle drawer)

- 1 Pull the ITB drawer (middle drawer) completely out until it stops.
- 2 Remove the intermediate transfer belt (ITB).
- 3 Lift up on the drawer, clearing the first set of guide wheels from the guide rail (Figure 6-10). Pull the guide rails until the next set of guide wheels stop, and then lift to clear the second set of guide wheels from the guide rails.



**Figure 6-10** ITB drawer (middle drawer) removal and replacement

## Control panel

### To remove the control panel

- 1 Remove the top cover.
- 2 Open the ITB drawer (middle drawer).
- 3 Remove the black self-tapping screw as shown in Figure 6-11.
- 4 Pull the bottom of the control panel out to clear the alignment pin.
- 5 Lift the control panel up to access the cable.
- 6 Disconnect the cable.



**Figure 6-11** Control panel removal and replacement

## Front right cover

### To remove the front right cover

- 1 Remove Tray 2.
- 2 Open the drum drawer (top drawer) until it stops and remove the imaging drum, protecting it from light.

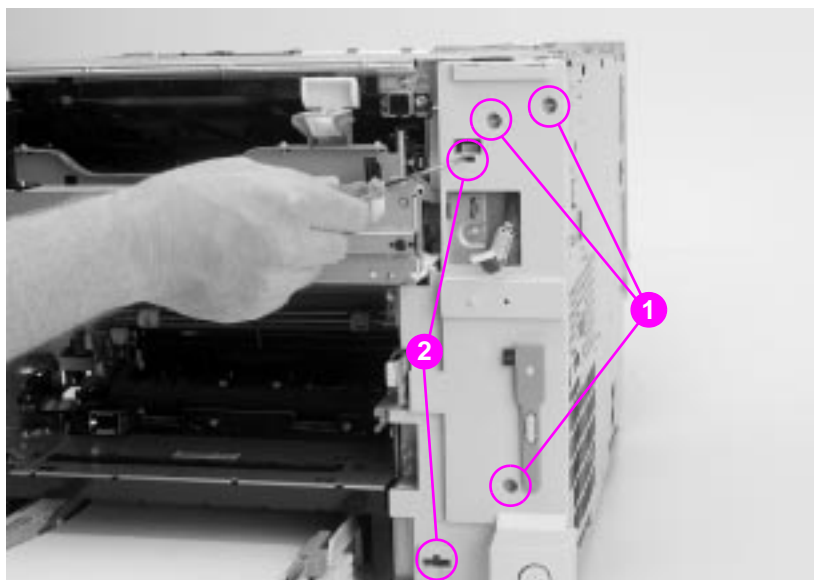
---

#### CAUTION

---

Exposure to light for more than 15 seconds can seriously damage the imaging drum.

- 3 Open the ITB drawer (middle drawer).
- 4 Remove the control panel.
- 5 Remove the three screws as shown in callout 1, Figure 6-12.
- 6 Using a small flat-blade screwdriver, release the two plastic tabs (callout 2, Figure 6-12).
- 7 Remove the cover.



**Figure 6-12** Front right cover removal and replacement

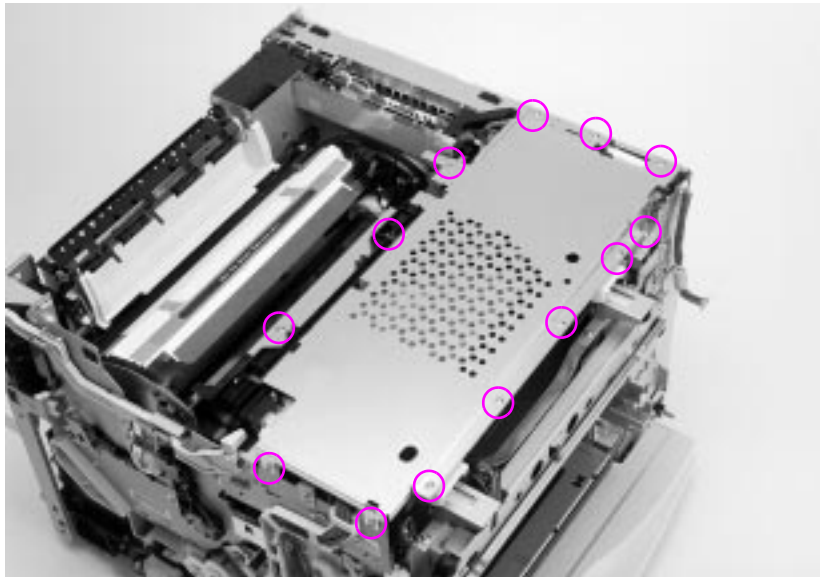
# Radio Frequency Interference (RFI) shield

## To remove the RFI shield

### Note

Turn the printer off, wait five seconds, and then unplug the printer.

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Remove the 13 screws shown in Figure 6-13.
- 4 Lift up on the RFI shield and remove.



**Figure 6-13** RFI shield removal and replacement



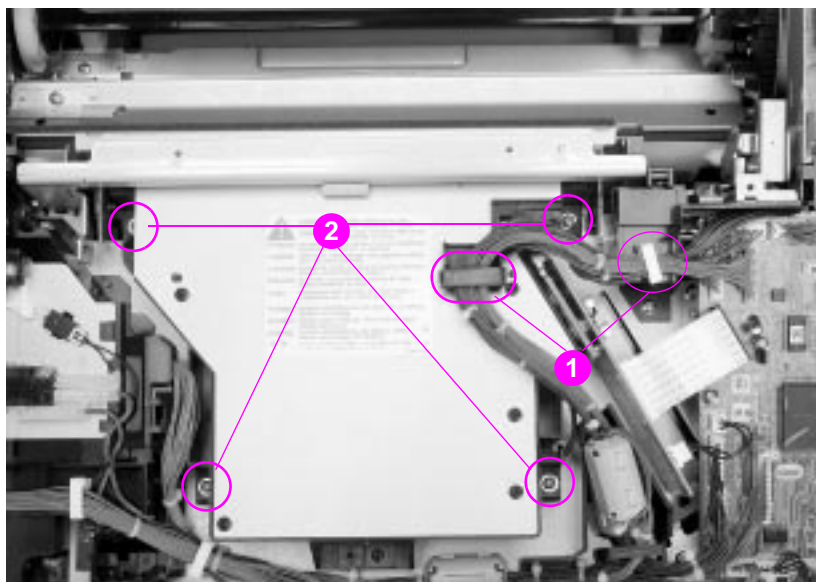
## Laser/scanner assembly

### To remove the laser/scanner assembly

#### Note

Turn the printer off, wait five seconds, and then unplug the printer.

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Remove the RFI shield.
- 4 Disconnect the cable from the laser/scanner to the DC controller (J1006 on the DC controller). See callout 1, Figure 7-31 on page 347.
- 5 Free the cable harness from the two cable stays shown below in callout 1.
- 6 Disconnect the flat ribbon cable and the other cable from the laser/scanner PCB.
- 7 Remove the four long brass screws shown in callout 2.
- 8 Tilt the narrow end of the laser/scanner assembly up, pull it toward you, and lift slightly to remove it.



**Figure 6-14** Laser/scanner assembly removal and replacement

## DC controller

### To remove the DC controller

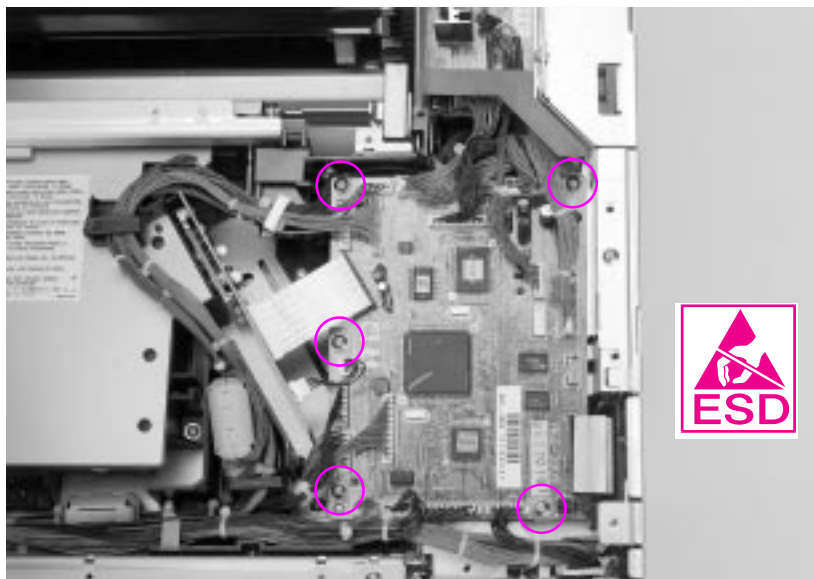
#### Note

Turn the printer off, wait five seconds, and then unplug the printer.

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Remove the RFI shield.
- 4 Disconnect all connectors from the DC controller, including the two ribbon cables.
- 5 Remove the five screws from the DC controller shown in Figure 6-15.
- 6 Lift the DC controller up and out to remove.

### DC controller replacement tip

The connectors are keyed and will fit in only one slot.



**Figure 6-15** DC controller removal and replacement

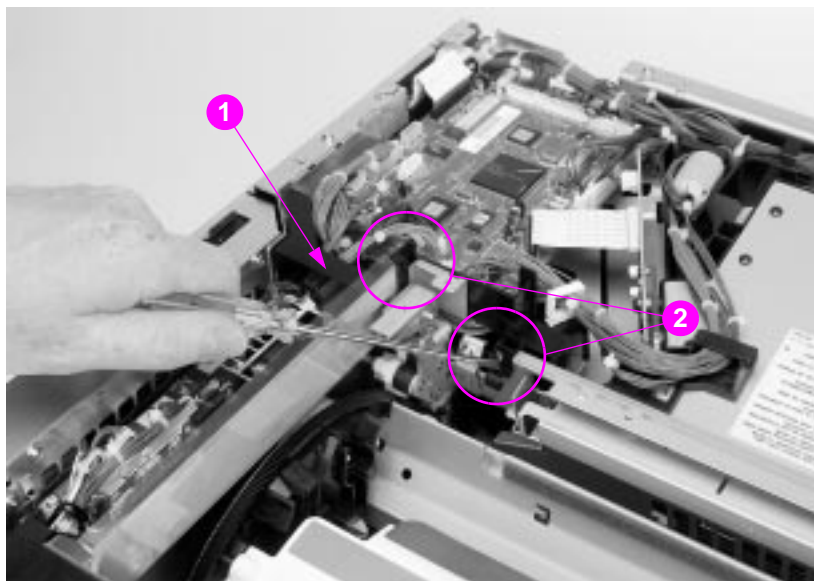
## Developing PCB

### To remove the developing PCB

#### Note

Turn the printer off, wait five seconds, and then unplug the printer.

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Remove the RFI shield.
- 4 Remove the plastic shield (callout 1, Figure 6-16) by releasing the two tabs shown (callout 2, Figure 6-16). If necessary, insert a flatblade screwdriver between the shield and the frame to release the tab.
- 5 Lift up on the shield to remove it.

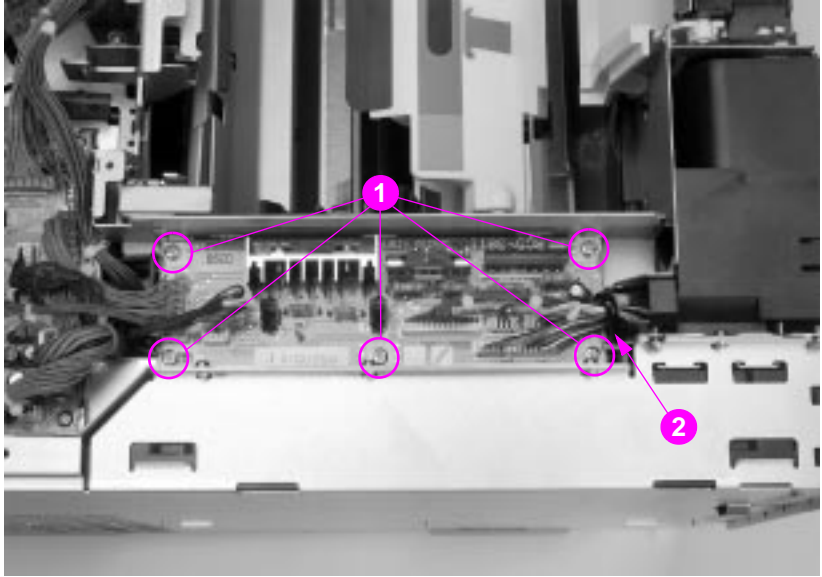


**Figure 6-16** Developing PCB removal and replacement (1 of 2)

- 6 Disconnect the connectors from the developing PCB and release the cables from the metal cable stay (callout 2, Figure 6-17 on page 164).
- 7 Remove the five or four screws (depending on the version of printer that is being serviced) from the developing PCB (callout 1, Figure 6-17 on page 164).
- 8 Lift the developing PCB up and out.

## Reinstallation tip

When securing the developing PCB with the five or four screws, secure the metal cable stay (callout 2, Figure 6-17) at the location shown.



**Figure 6-17** Developing PCB removal and replacement (2 of 2)

## Top cover switch assembly

---

### Note

Turn the printer off, wait five seconds, and then unplug the printer.

Two versions of the HP Color LaserJet 4500 series printers are available. To identify which printer version you are servicing, see page 146.

---

### To remove the top cover switch assembly

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Remove the RFI shield.
- 4 Disconnect the sensor and switch cables from the top cover switch assembly (callout 1, Figure 6-18 on page 166).
- 5 Follow the instructions below, depending on the version of printer that is being serviced.

### For printer serial numbers xxG or lower:

- 6 Free the sensor and switch cables from their cable stays.
- 7 Remove the two screws from the top cover switch assembly (callout 2, Figure 6-18 on page 166).
- 8 Slide the switch assembly to the left side of the printer, and then lift it up and out.

### For printer serial numbers xxH or higher:

- 6 Open the drum drawer (top drawer) until it stops and remove the imaging drum, protecting it from light.

---

### CAUTION

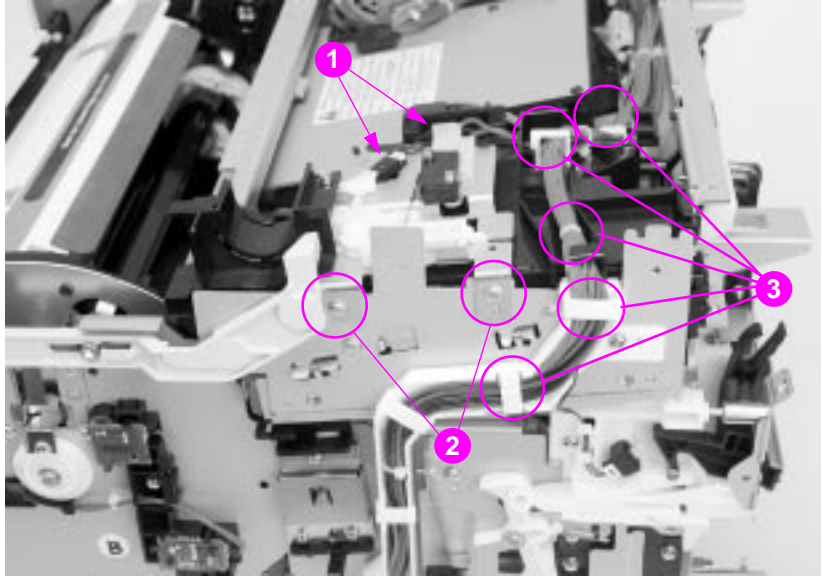
Exposure to light for more than 15 seconds can seriously damage the imaging drum.

- 7 Free the cables from the five cable stays (callout 3, Figure 6-18 on page 166).
- 8 Remove the two screws that secure the switch assembly and lower cable guide to the printer frame (callout 1, Figure 6-19 on page 167).
- 9 Pull the rear door switch arm toward the front of the printer while lifting the switch assembly up and out slightly, taking care not to damage the cable guide.

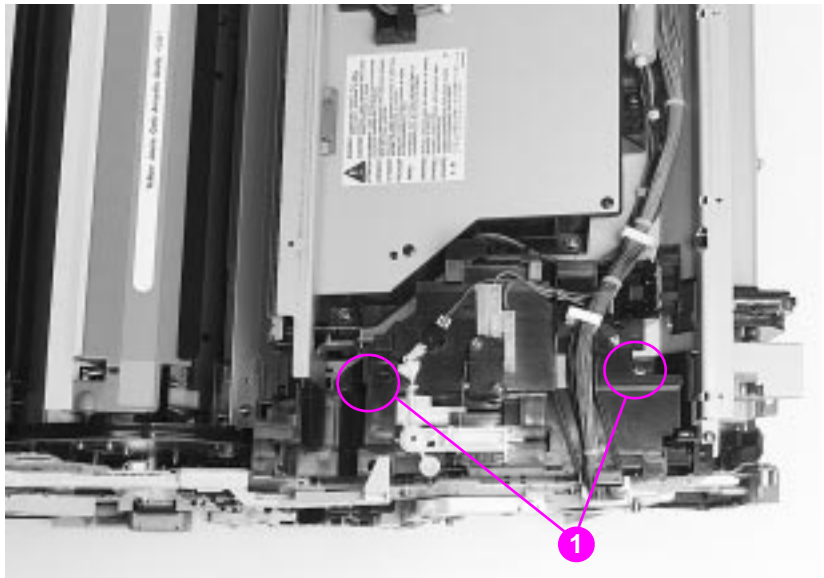
- 10 Release the five plastic retaining clips securing the switch assembly to the lower cable guide to remove the switch assembly.

### Replacement tip

When replacing the top cover switch assembly, make sure the cable is laying flat in the cable guide. Secure the two tabs on the right side of the switch assembly/cable guide before snapping the three tabs in place on the left side of the assembly.



**Figure 6-18** Top cover switch assembly removal and replacement



**Figure 6-19** Top cover switch assembly removal and replacement

## Drum drawer (top drawer) assembly

### To remove the drum drawer (top drawer)

#### Note

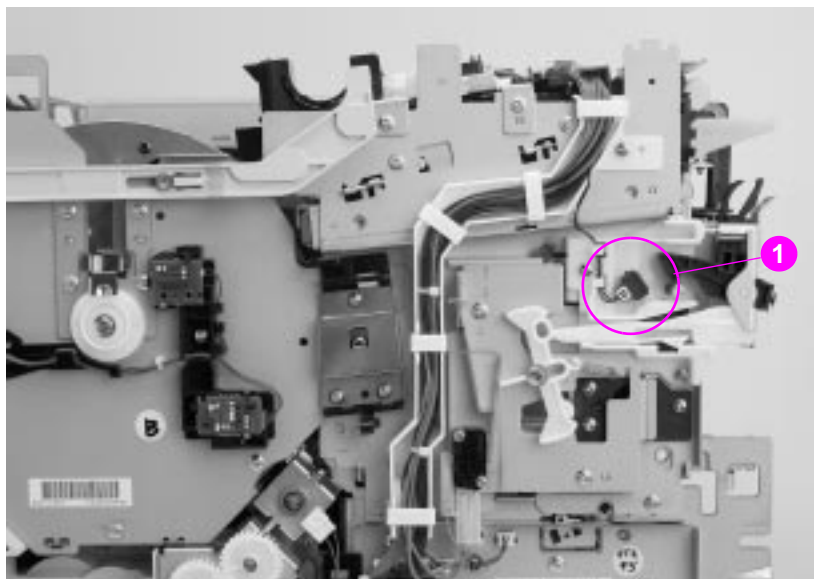
Turn the printer off, wait five seconds, and then unplug the printer.

- 1 Open the drum drawer (top drawer) until it stops and remove the imaging drum, protecting it from light.

#### CAUTION

Exposure to light for more than 15 seconds can seriously damage the imaging drum.

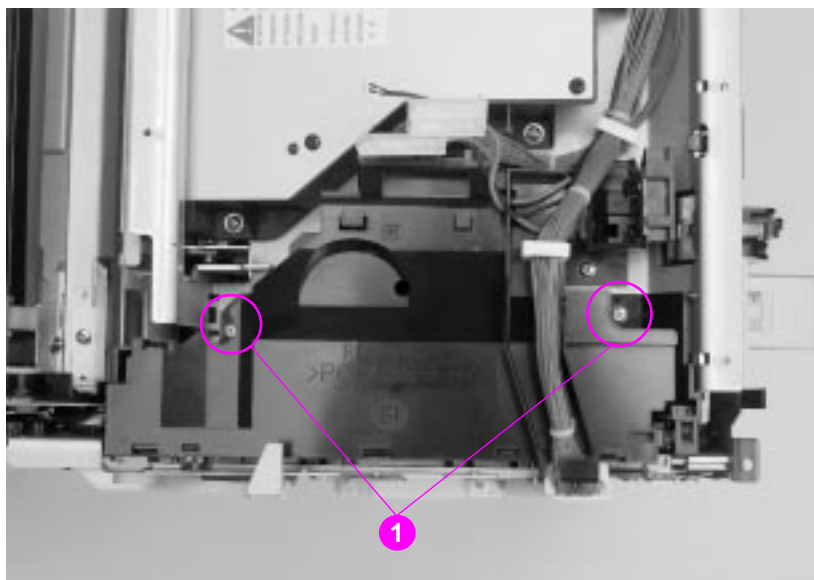
- 2 Remove the top cover.
- 3 Remove the left side cover.
- 4 Remove the RFI shield.
- 5 For printer serial numbers xxG or lower, remove the top cover switch assembly.
- 6 Disconnect connectors J1004 and J1010 on the DC controller (see callouts 2 and 3 in Figure 7-31 on page 347) and remove the cables from the cable stays.
- 7 Disconnect the drum drawer (top drawer) switch (see callout 1, Figure 6-20).



**Figure 6-20** Drum drawer (top drawer) switch



- 8 Free the main cable from all cable stays at the top and left side of the printer; push the cables back toward the rear of the printer.
- 9 Remove the two screws from the black plastic housing shown in callout 1, Figure 6-21.
- 10 Lift the black plastic housing and slide it forward onto the front drawer.

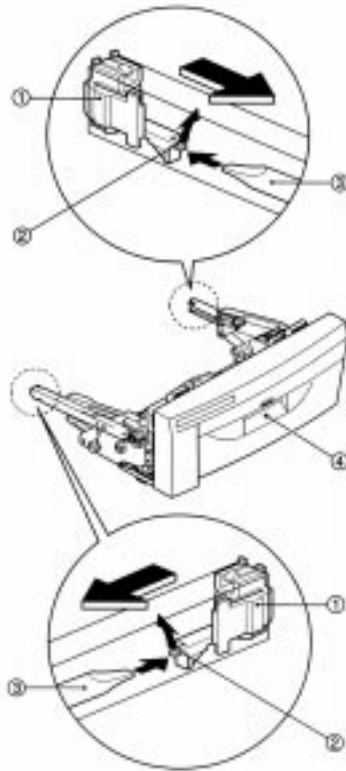


**Figure 6-21** Drum drawer (top drawer) assembly removal and replacement (1 of 3)

- 11 Slide a small flat-blade screwdriver under the black plastic retaining clips on the drawer guide rails. Then lift the tab and pull the drawer out slightly to clear the latch that holds the plastic retaining clips in place (see Figure 6-22 and Figure 6-23).
- 12 Pull the drum drawer (top drawer) straight out and away from the printer.

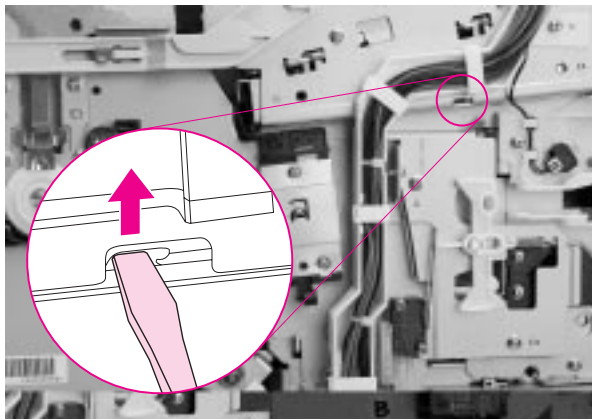
### **Reinstallation tip**

When replacing the drum drawer (top drawer) assembly, make sure the cable is laying flat in the cable guide.



**Figure 6-22** Drum drawer (top drawer) assembly removal and replacement (2 of 3)

The following graphic shows an alternative method of removing the left side of the drum drawer.



**Figure 6-23** Drum drawer assembly removal and replacement (3 of 3)

## Densitometer assembly

### To remove the densitometer

---

**Note**

Turn the printer off, wait five seconds, and then unplug the printer.

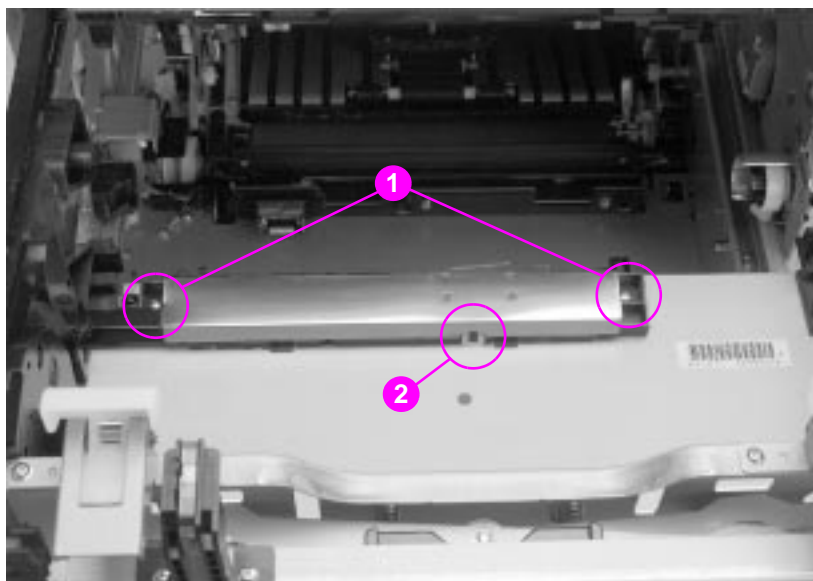
- 1 Open the drum drawer (top drawer) until it stops and remove the imaging drum, protecting it from light.

---

**CAUTION**

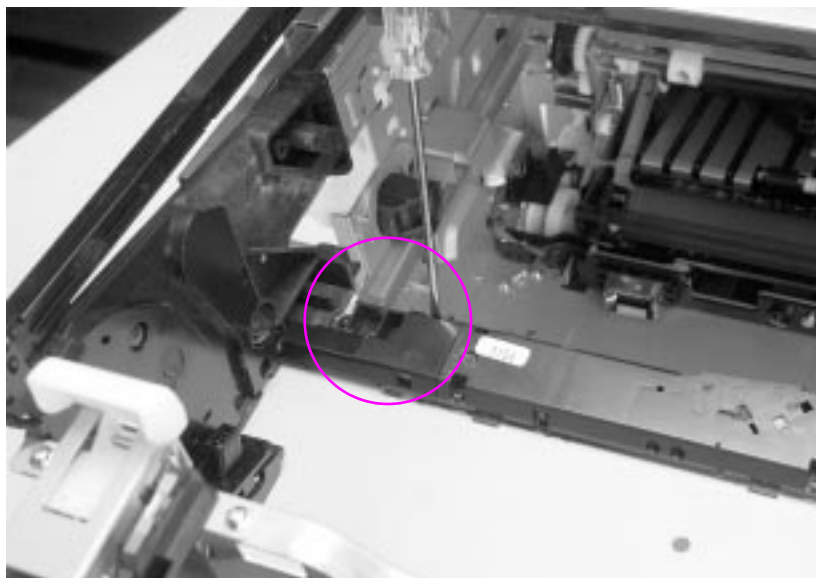
Exposure to light for more than 15 seconds can seriously damage the imaging drum.

- 2 Remove the two screws on the densitometer as shown in callout 1, Figure 6-24, and move the assembly slightly to the rear.
- 3 Use a small, flat-blade screwdriver to release the tab shown in callout 2, Figure 6-24, and remove the metal shield over the densitometer.



**Figure 6-24** Densitometer removal and replacement (1 of 2)

- 4 Remove the plastic cable cover as shown in Figure 6-25.
- 5 Remove the cable from the cable stays, and then disconnect the connector from the densitometer.
- 6 Remove the densitometer by sliding it toward the rear of the printer.



**Figure 6-25** Densitometer removal and replacement (2 of 2)

## Right side assemblies

### Formatter

#### To remove the formatter

- 1 Turn off the printer.
- 2 When the fans are turned off, unplug the printer.

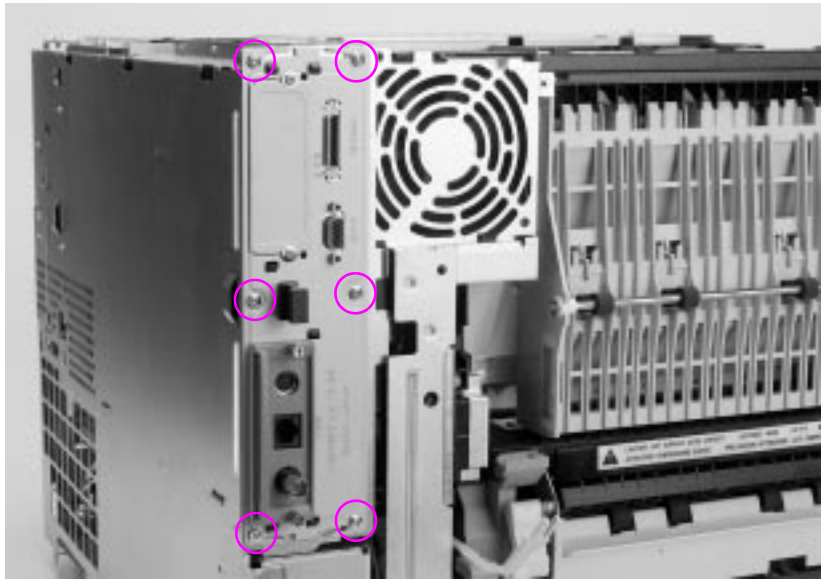
---

**CAUTION**

---

Power is applied to the formatter as long as the printer is plugged-in. Removing the formatter while power is supplied to the printer may damage the formatter.

- 3 Remove the six screws in the formatter shown in Figure 6-26.
- 4 Slide the formatter out of the rear of the printer.



**Figure 6-26** Formatter removal and replacement

## Formatter PCB

### To remove the formatter PCB from the cradle

---

**Note**

Turn the printer off, wait five seconds, and then unplug the printer.

Before replacing the formatter or firmware, make sure to record the printer's serial number, fuser maintenance count, transfer maintenance count, color page count, and total page count.

- 1 Remove the formatter from the printer by removing the six screws.
- 2 Remove the EIO cards (if any) from the EIO slots.
- 3 Disconnect the L-shaped (I/O) card from the formatter by lifting up on the narrow end of the PCB.
- 4 While lifting the two black plastic tabs located over the EIO connectors on the formatter PCB, slide the formatter PCB out of the cradle.

---

**Note**

Lift the narrow end of the L-shaped (I/O) card so the connectors have clearance.

- 5 Install the new formatter PCB by sliding it into the cradle.
- 6 Reconnect the L-shaped (I/O) card to the formatter PCB.
- 7 Pull all DIMMs from the old formatter PCB and install them on the new formatter PCB, making sure the firmware DIMM is installed in the ROM ONLY DIMM slot.
- 8 Install the EIO cards (if any).
- 9 Install the formatter back into the printer.
- 10 Power up the printer in NVRAM initialization mode as follows:
  - Step 1 Hold down both the **Cancel Job** and **Select** keys until all the LED lights are on, then release the keys.
  - Step 2 Press **Cancel Job**.
  - Step 3 Press **Select**.
- 11 Once initialization is complete, turn off the printer, then turn it back on in service mode (see chapter 7, "Service mode" for more information).
- 12 Enter the printer's serial number, fuser maintenance count, transfer maintenance count, color page count, and total page count.
- 13 Print a configuration page to verify printer operation.

## Formatter pan assembly

### To remove the formatter pan assembly

#### Note

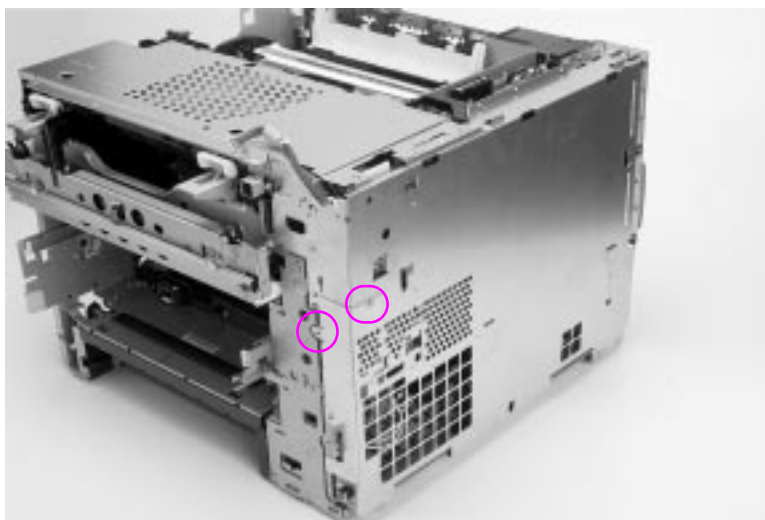
Turn the printer off, wait five seconds, and then unplug the printer.

- 1 Open the drum drawer (top drawer) until it stops and remove the imaging drum, protecting it from light.

#### CAUTION

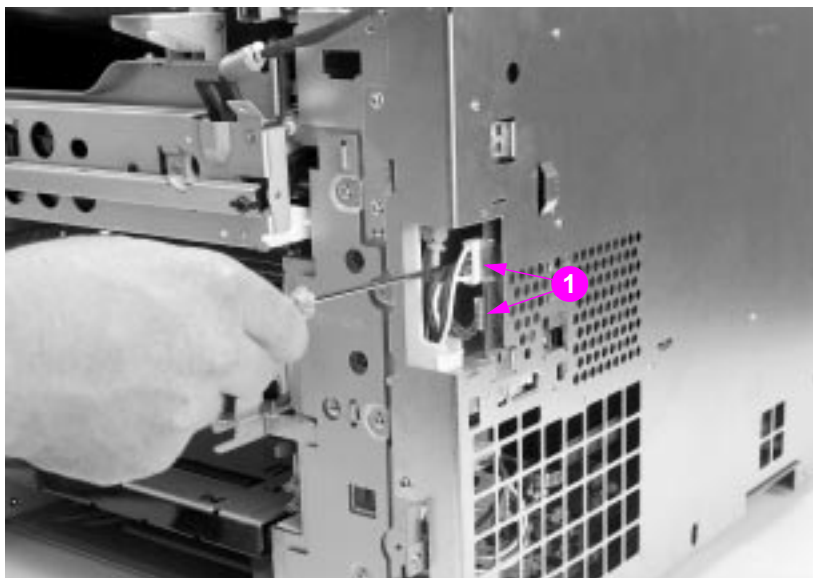
Exposure to light for more than 15 seconds can seriously damage the imaging drum.

- 2 Open the ITB drawer (middle drawer) and tray 2.
- 3 Remove the top cover.
- 4 Remove the right side cover.
- 5 Remove the right rear cover.
- 6 Remove the left side cover.
- 7 Remove the RFI shield.
- 8 Remove the control panel.
- 9 Remove the front right cover.
- 10 Remove the two screws for the connector cover shown in Figure 6-27.



**Figure 6-27** Formatter pan assembly removal and replacement (1 of 4)

11 Disconnect the two connectors shown in callout 1, Figure 6-28.



**Figure 6-28** Formatter pan assembly removal and replacement (2 of 4)

---

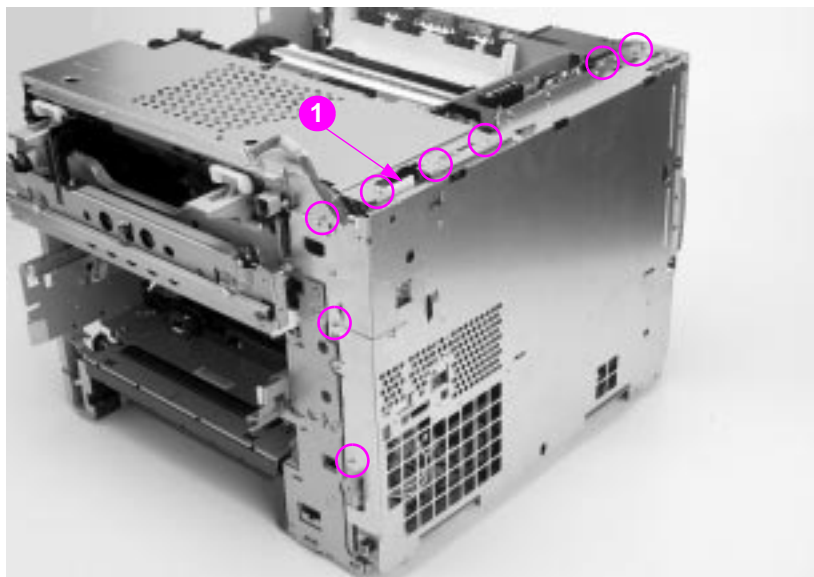
**CAUTION**

---

A small, flat-blade screwdriver should be used to release the top connector by pressing on the latch. Failure to use a flat-blade screwdriver to press on the latch will damage the connector.



- 12 Disconnect the ribbon cable from the DC controller shown in callout 1, Figure 6-29.



**Figure 6-29** Formatter pan assembly removal and replacement (3 of 4)

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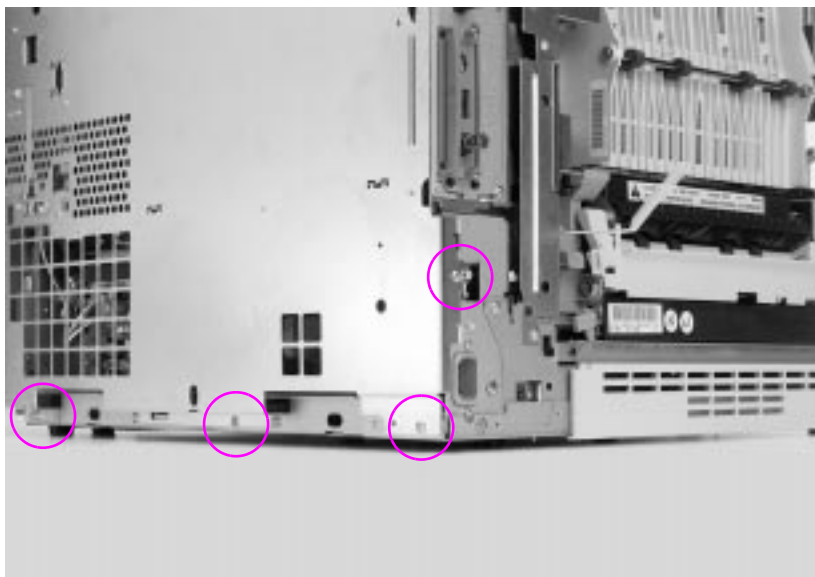
**Note**

---

Although Figure 6-29 depicts the RFI shield still installed, make sure this shield was removed at step 7.

- 13 Remove the control panel cable from its cable stay, if necessary.
- 14 Remove the screws from the formatter pan assembly (shown in Figure 6-29 and Figure 6-30).

- 15 To remove the formatter pan, lift it up slightly while pulling it out so that it clears the tabs.



**Figure 6-30** Formatter pan assembly removal and replacement (4 of 4)

### Reinstallation tip

- Be sure that the four tabs (two on the top and one each on the rear and front of the formatter pan assembly) are engaged prior to tightening the screws.
- Be sure to reconnect the ribbon cable from the DC controller shown in callout 1, Figure 6-29.

## Power supply

### To remove the power supply

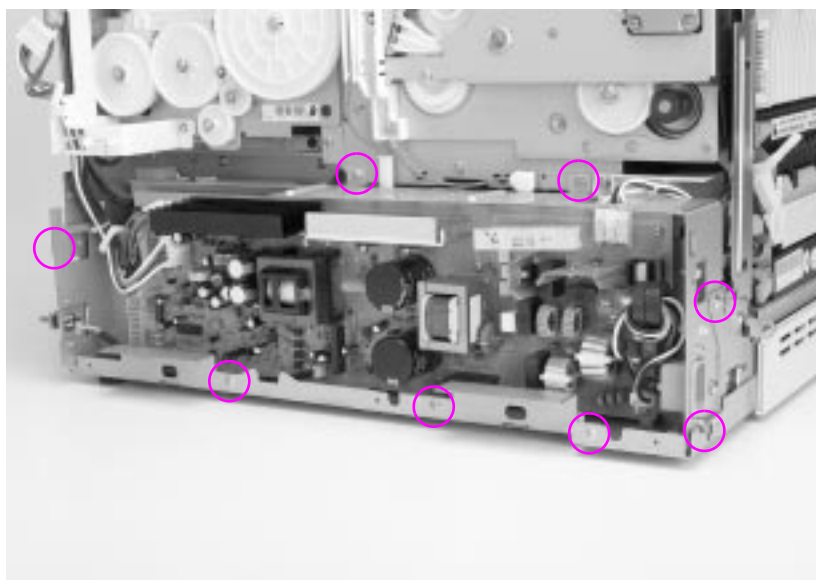
---

**Note**

Turn the printer off, wait five seconds, and then unplug the printer.

Two versions of the HP Color LaserJet 4500 series printers are available. To identify which printer version you are servicing, see page 146.

- 1 Remove the formatter pan assembly.
- 2 Disconnect the four connectors (three in front and one in top rear of printer) from the power supply.
- 3 Free the cable harness from the cable stay.
- 4 Remove the five or eight screws (depending on the version of printer you are working on) from the power supply shown in Figure 6-31.
- 5 Slide the power supply forward slightly to clear the rear retaining tab and tilt the top of the assembly out. Lift the power supply up and out.



**Figure 6-31** Power supply removal and replacement

## High-voltage power supply

### To remove the high-voltage power supply (HVPS)

---

**Note**

Turn the printer off, wait five seconds, and then unplug the printer.

Two versions of the HP Color LaserJet 4500 series printers are available. To identify which printer version you are servicing, see page 146.

- 1 Remove the formatter pan assembly.
- 2 Remove the power supply.

---

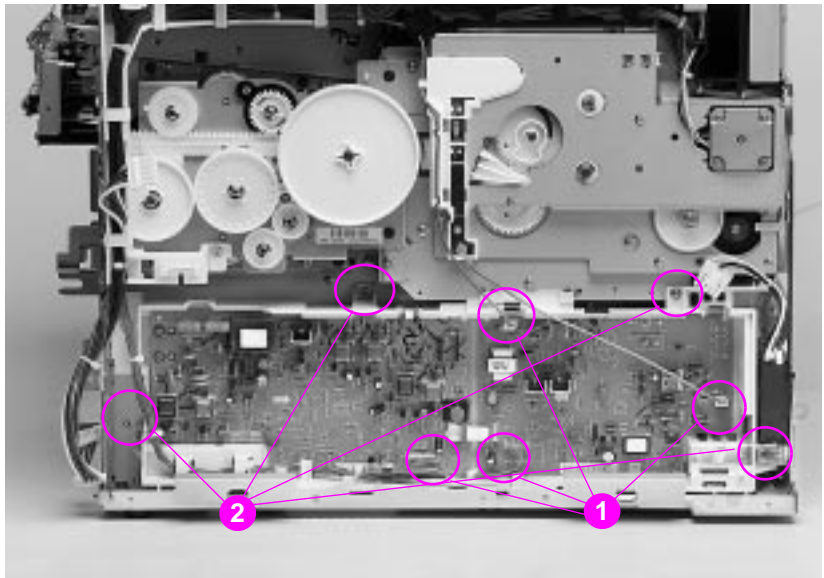
**Note**

Some printers have a cover over the high-voltage power supply.

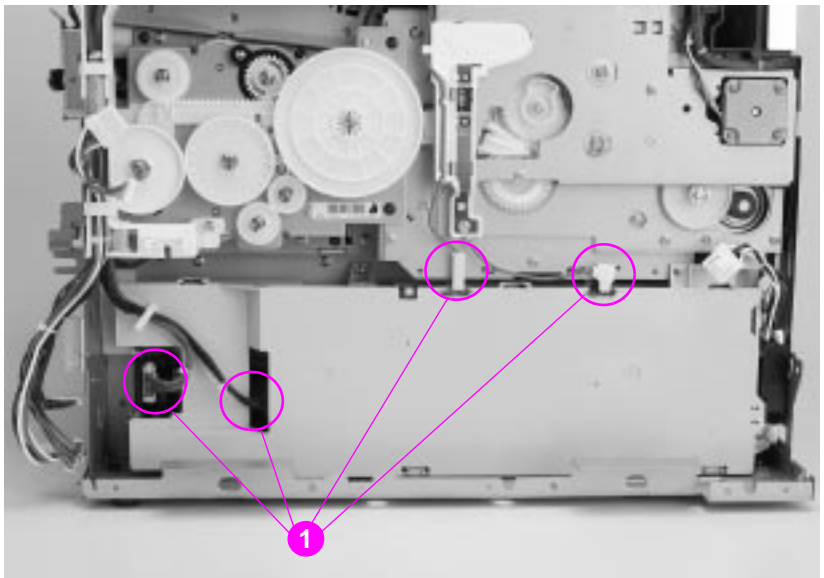
- 3 Remove the rear door.
- 4 Remove the fusing assembly.
- 5 Disconnect the four cables from their connectors (callout 1, Figure 6-32 or callout 1, Figure 6-33, depending on the version of printer being serviced).
- 6 Free the cable harness from the cable stays.
- 7 Remove the four brass screws shown in callout 2, Figure 6-32 from the HVPS.
- 8 Carefully pull the HVPS out. Ensure that the rear plastic retaining strap attached to the HVPS clears the chassis and its remaining components.

### High-voltage power supply replacement tip

When reinstalling the HVPS, carefully insert the plastic retaining strap attached to the rear of the HVPS through the chassis.



**Figure 6-32** High-voltage power supply removal and replacement (newer version printers)



**Figure 6-33** High-voltage power supply removal and replacement (older version printers)

## Drum drive assembly

### To remove the drum drive assembly

#### Note

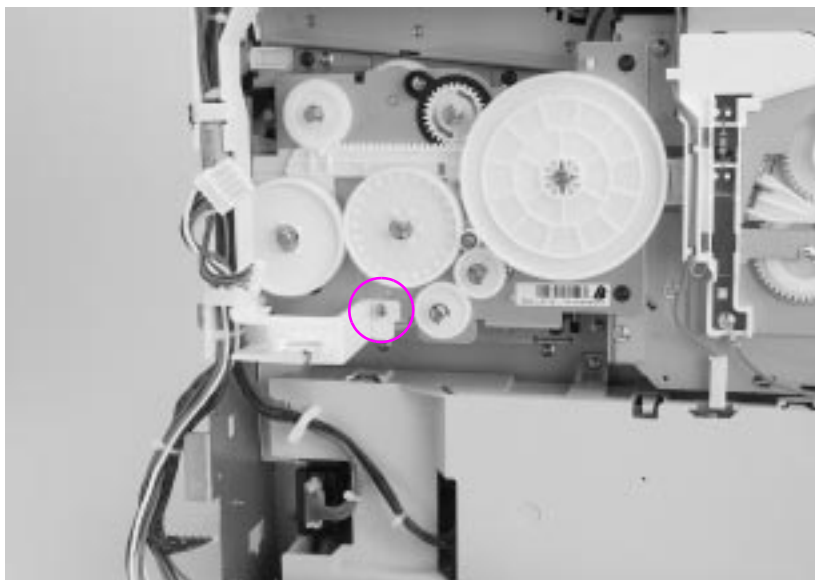
Turn the printer off, wait five seconds, and then unplug the printer.

- 1 Open both front drawers.

#### CAUTION

Make sure the imaging drum is protected from light. Exposure to light for more than 15 seconds can seriously damage the imaging drum.

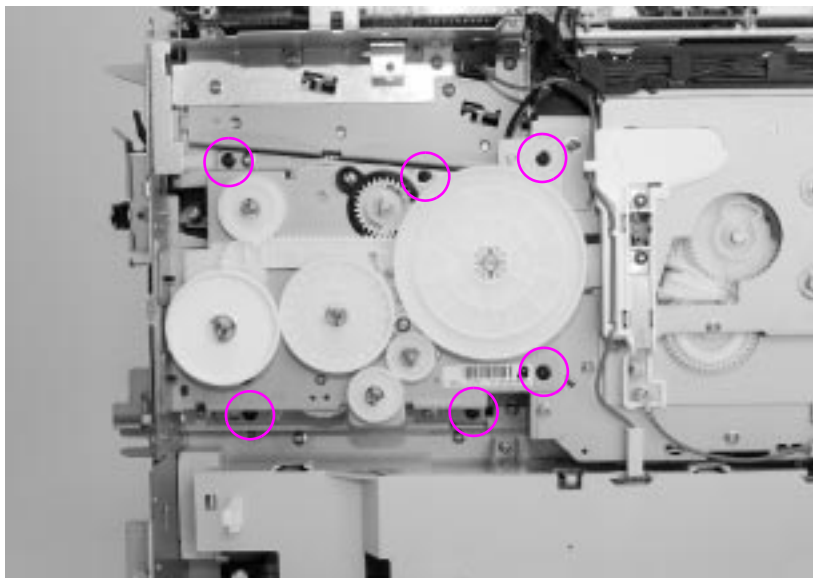
- 2 Remove the formatter pan assembly.
- 3 Remove the power supply.
- 4 Disconnect the two cables from the HVPS and free them from the cable stay.
- 5 Remove the screw that secures the cable trough to the drum drive assembly as shown in Figure 6-34.



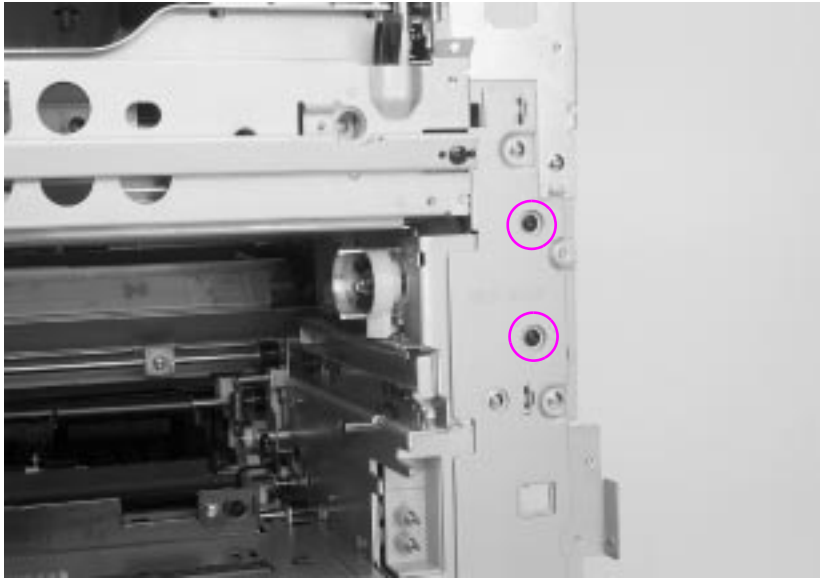
**Figure 6-34** Drum drive assembly removal and replacement (1 of 3)

- 6 Carefully release the cable trough by pulling out slightly on the bottom and releasing the clip. Depress the plastic v-shaped clip underneath the DC controller to loosen the cable guide. Slide the trough toward the rear of the printer until it is free.

- 7 Disconnect J204 on the developing PCB and free it from its cable stay.
- 8 Remove the eight black screws from the drum drive assembly shown in Figures 6-35 and 6-36.
- 9 Gently slide the drum drive assembly straight out from the printer assembly taking care not to damage the cable.



**Figure 6-35** Drum drive assembly removal and replacement (2 of 3)



**Figure 6-36** Drum drive assembly removal and replacement (3 of 3)



## Large fan housing

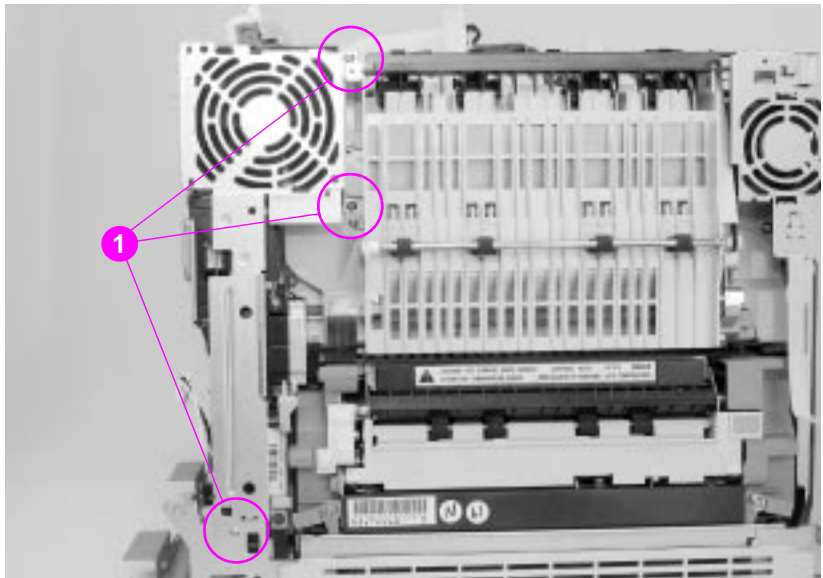
### To remove the large fan housing

---

**Note**

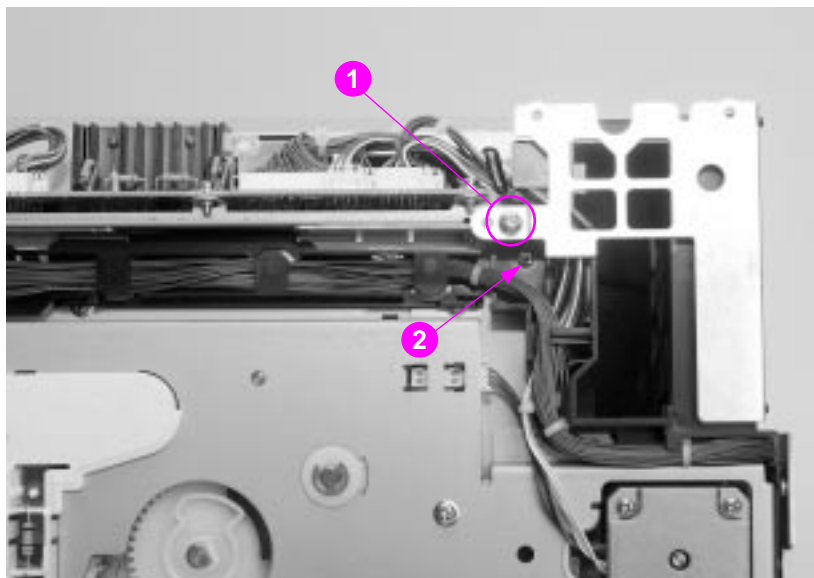
Turn the printer off, wait five seconds, and then unplug the printer.

- 1 Remove the formatter pan assembly.
- 2 Remove the four screws shown in Figures 6-37 and 6-38 (callout 1) from the large fan housing.
- 3 Remove the large fan housing.



**Figure 6-37** Large fan removal and replacement (1 of 2)

- 4 Disconnect connector J209 on the developing PCB and free the cable from its cable stays.
- 5 Unweave the cable from the cable trough to remove it.
- 6 Remove the screw from the right rear fan housing shown in callout 2.



**Figure 6-38** Large fan removal and replacement (2 of 2)

# Carousel drive assembly

## To remove the carousel drive assembly

---

**Note**

Turn the printer off, wait five seconds, and then unplug the printer.

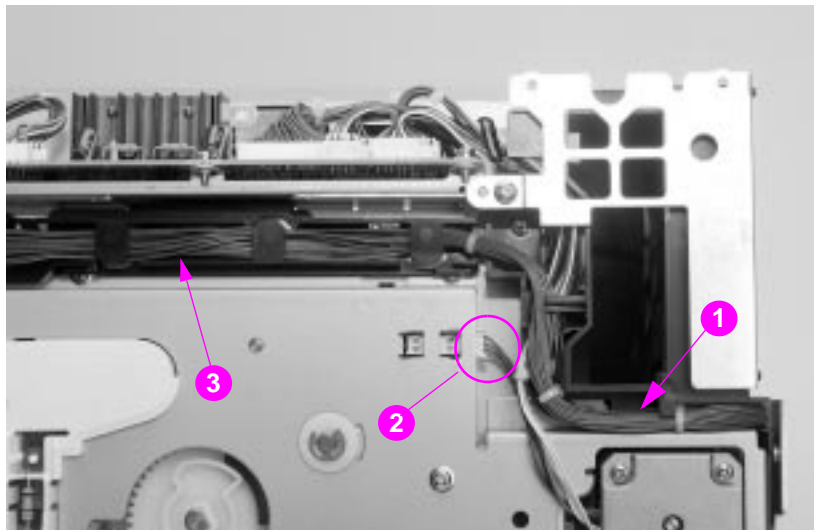
- 1 Remove the formatter pan assembly.
- 2 Remove the rear door.
- 3 Remove the large fan housing.
- 4 Free the cables from the rear cable trough located beneath the large fan housing shown in callout 1.
- 5 Disconnect the two motor cables from their connectors (J203 and J205) located on the developing PCB and remove them from their trough.
- 6 Disconnect the sensor as shown in callout 2.
- 7 Disconnect the two high-voltage (red) cables from the HVPS and free the front cable from the cable stays.
- 8 Push up and out on the cable trough shown in callout 3 to release the lower tabs. Then tilt the bottom of the cable trough out slightly to gain access to the top screws on the carousel drive assembly.

---

**Note**

To remove the cable trough, you may need to first loosen the screw on top of the developing PCB housing.

---

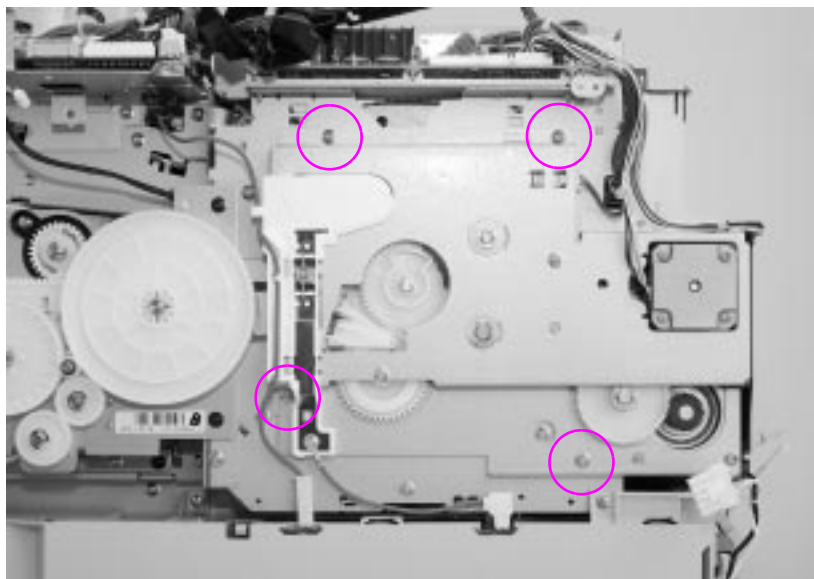


**Figure 6-39** Carousel drive assembly removal and replacement (1 of 2)

- 9 Remove the four screws shown in Figure 6-40 from the carousel drive assembly.
- 10 Carefully remove the carousel assembly by pulling the assembly straight out.

### Carousel drive assembly replacement tip

- When replacing the carousel drive assembly, be sure to align the “D” shaped shaft with the “D” shaped hub located on the gear shown in the center of Figure 6-40.



**Figure 6-40** Carousel drive assembly removal and replacement (2 of 2)

## Paper size switch PCB

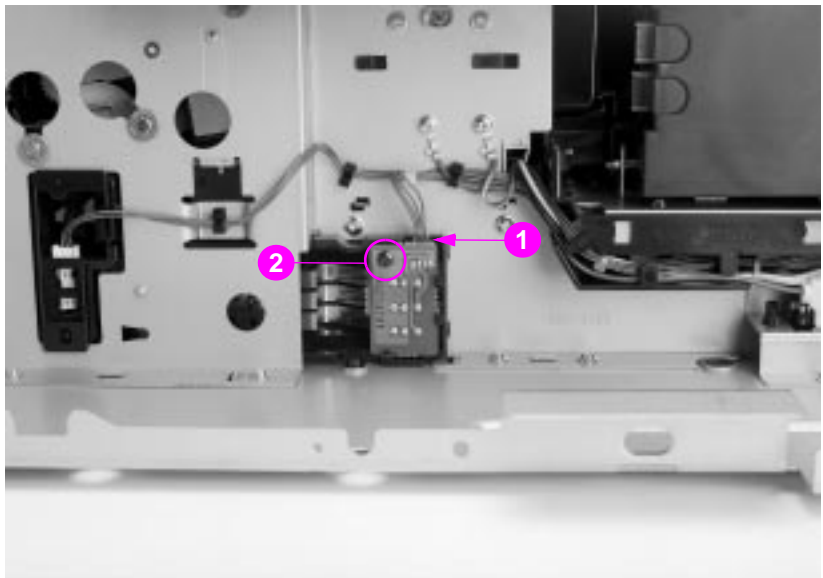
### To remove the paper size switch PCB

---

**Note**

Turn the printer off, wait five seconds, and then unplug the printer.

- 1 Pull tray 2 out.
- 2 Remove the high-voltage power supply.
- 3 Disconnect the connector as shown in callout 1.
- 4 Remove the black screw from the paper size switch PCB shown in callout 2. Remove the switch PCB.



**Figure 6-41** Paper size switch removal and replacement

## Left side assemblies

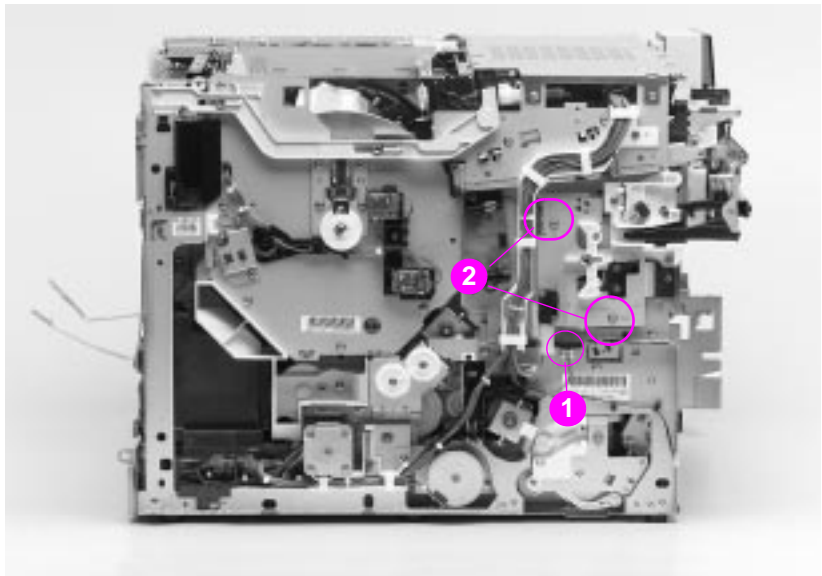
### Drawer switch assembly

#### To remove the drawer switch assembly

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Disconnect the connector shown in callout 1.
- 4 Remove the two screws from the drawer switch assembly shown in callout 2.
- 5 Pull the drawer switch assembly away from the chassis.

#### Replacement tip

- Open both front drawers for easier installation.



**Figure 6-42** Switch plate assembly removal and replacement

## Paper feed PCB

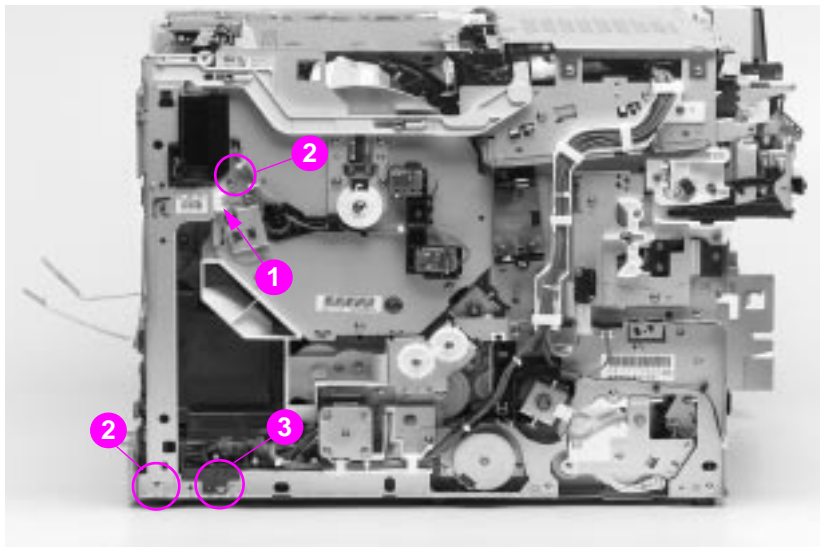
### To remove the paper feed PCB

---

**Note**

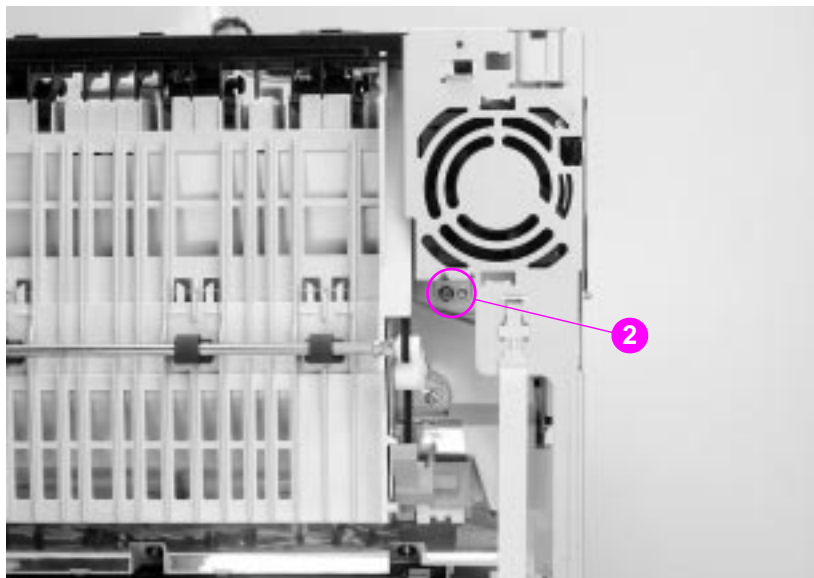
Turn the printer off, wait five seconds, and then unplug the printer.

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Remove the rear door.
- 4 Remove the fusing assembly.
- 5 Disconnect the small fan connector shown in callout 1.



**Figure 6-43** Paper feed PCB removal and replacement (1 of 3)

- 6 Remove the three screws from the left rear sheet metal fan shield shown in Figure 6-43 and Figure 6-44 (callout 2) and remove the shield.



**Figure 6-44** Paper feed PCB removal and replacement (2 of 3)

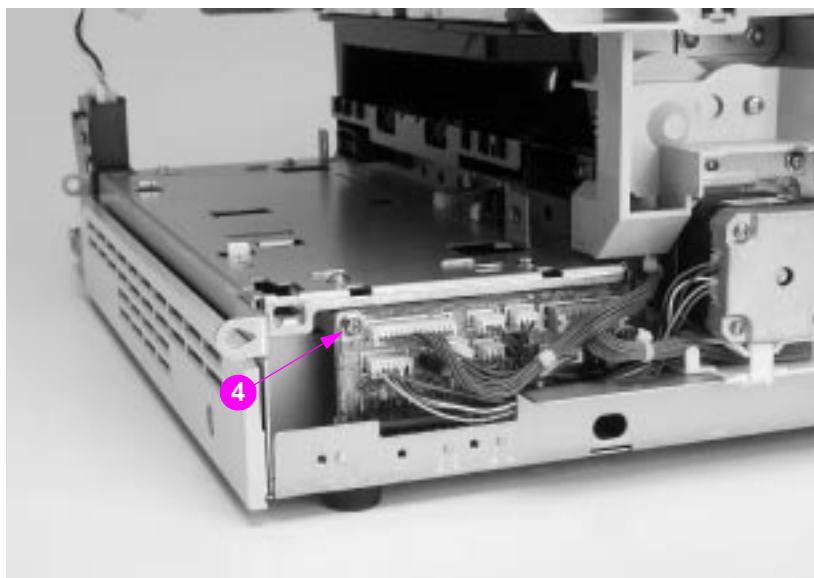
- 7 Remove the screw in the black plastic cover shown in callout 3, Figure 6-43.
- 8 Remove the black plastic cover.



- 9 Remove the eight cables from their connectors on the paper feed PCB shown in Figure 6-45.
- 10 Remove the screw from the rear of the paper feed PCB (callout 4, Figure 6-45).
- 11 Carefully remove the paper feed PCB by sliding the board backwards, then tilt the top of the board forward to clear the top of the board from the metal tab along the top of the PCB.

### Paper feed PCB replacement tip

- Carefully insert the paper feed PCB into the chassis ensuring that the two paper feed PCB metal tabs sit in the open tab holders in the chassis.



**Figure 6-45** Paper feed PCB removal and replacement (3 of 3)

## Fuser motor (M1)

### To remove the fuser motor

#### Note

Turn the printer off, wait five seconds, and then unplug the printer.

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Remove the fusing assembly.
- 4 Remove the screw shown in callout 1, and remove the black plastic piece.
- 5 Disconnect connector J102 from the paper feed PCB.
- 6 Remove the screw that secures the white cable trough to the chassis (callout 2).

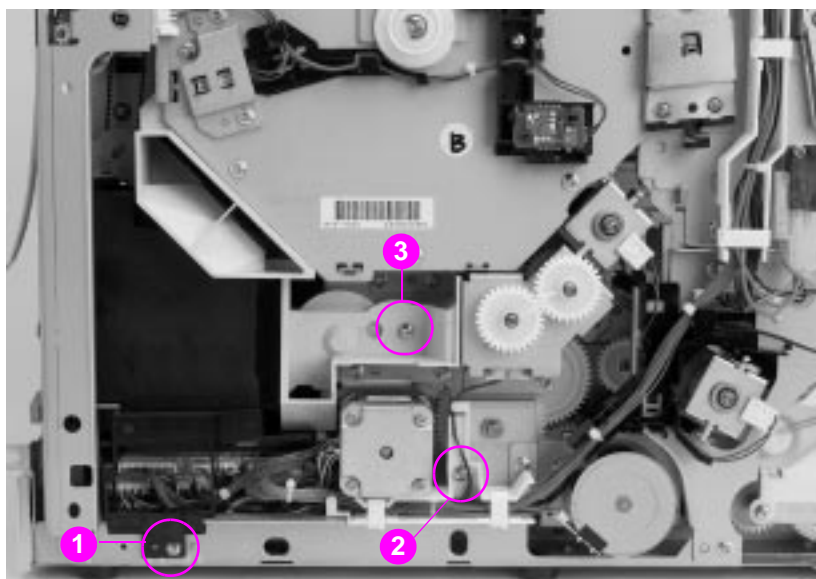
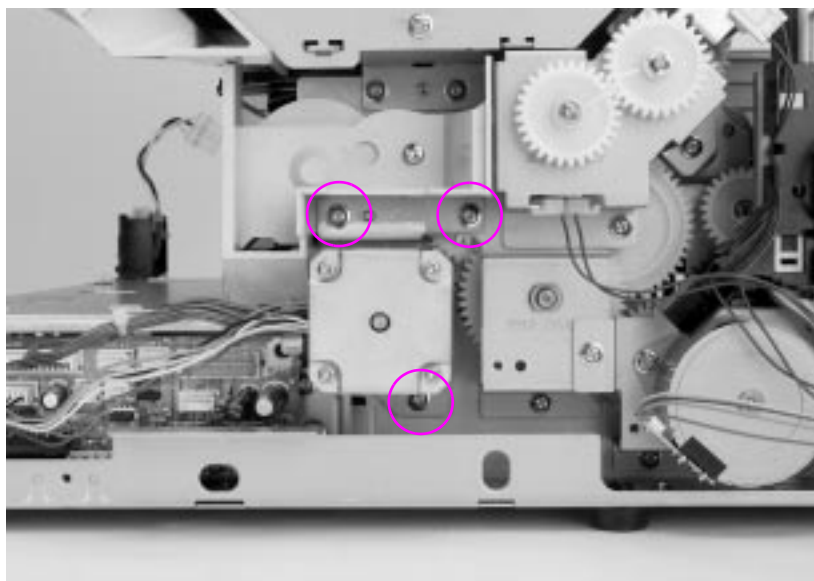


Figure 6-46 Fuser motor removal and replacement (1 of 2)

- 7 Slide the cable trough and cables out from the chassis.
- 8 Remove the screw securing the plastic gear cover, as shown in callout 3, and then remove the cover.

- 9 Remove the three fuser motor screws shown in Figure 6-47.
- 10 Carefully pull to remove the fuser motor and free the cable from the cable trough.



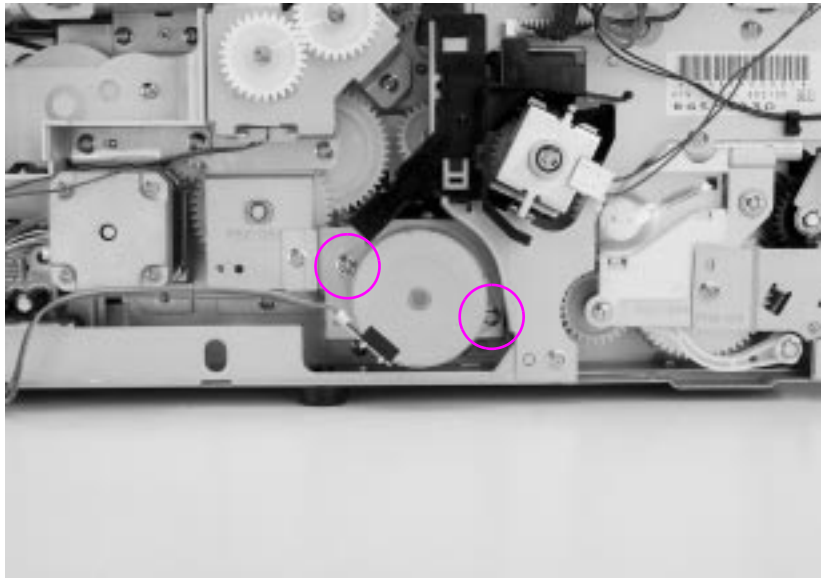
**Figure 6-47** Fuser motor removal and replacement (2 of 2)

## Paper path motor (M2)

### Note

Turn the printer off, wait five seconds, and then unplug the printer.

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Disconnect the paper path motor connector (J109) from the paper feed PCB and remove it from the cable trough.
- 4 Remove the two screws on both sides of the paper path motor shown in Figure 6-48.
- 5 Remove the paper path motor by sliding the motor back and then out to clear the gear on the motor.



**Figure 6-48** Paper path motor removal and replacement

## Paper pick solenoid (SL2)

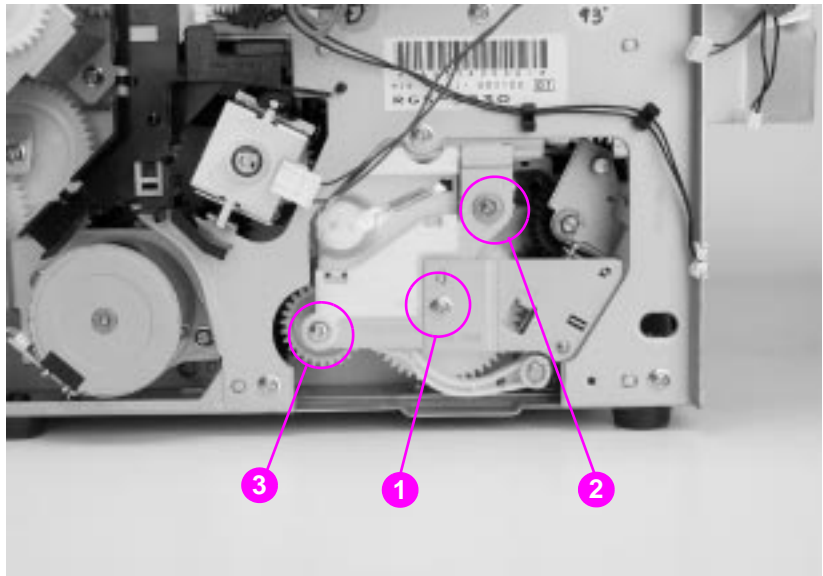
### To remove the paper pick solenoid

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Disconnect the solenoid connector (J106) from the paper feed PCB, and free the cable from the cable stays. Note the cable path when removing the cable.
- 4 Remove the screw (callout 1) and e-clip (callout 2) that hold the solenoid assembly in place, and then remove the solenoid assembly. For printers with serial numbers xxH or higher, also remove the screw shown in callout 3 to remove the solenoid assembly.

### Replacement tip

#### CAUTION

When reinstalling the solenoid assembly, make sure that the flat parts of the tray 2 pickup rollers are down and that the plastic spring-loaded gear is fully engaged.

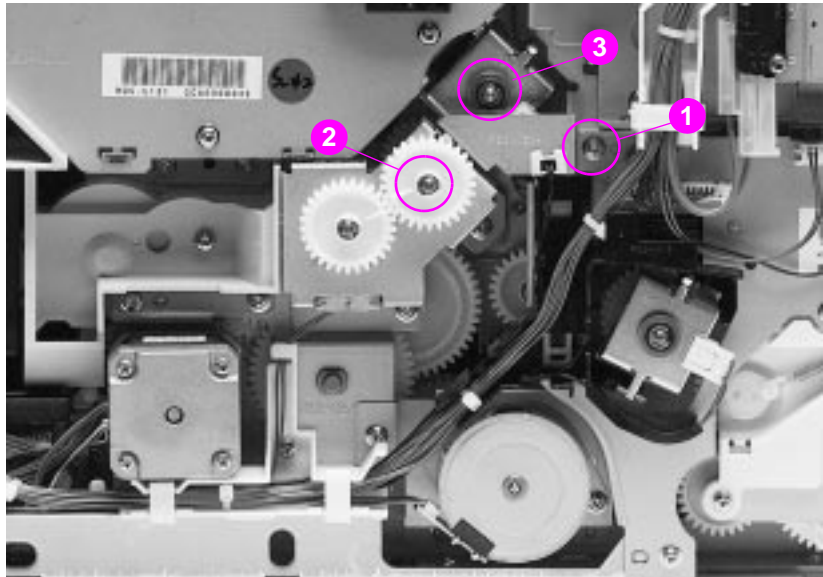


**Figure 6-49** Paper pick solenoid removal and replacement

## ITB cleaning roller clutch (CL3)

### To remove the ITB cleaning roller clutch

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Remove the screw securing the metal CL3 cover plate shown in callout 1, and remove the plate.
- 4 Unplug the connector from the cleaning roller clutch.
- 5 Using needle-nose pliers, remove the e-clip and the gear shown in callout 2.
- 6 Using needle-nose pliers, remove the e-clip and ITB cleaning roller clutch shown in callout 3.



**Figure 6-50** ITB cleaning roller clutch removal and replacement

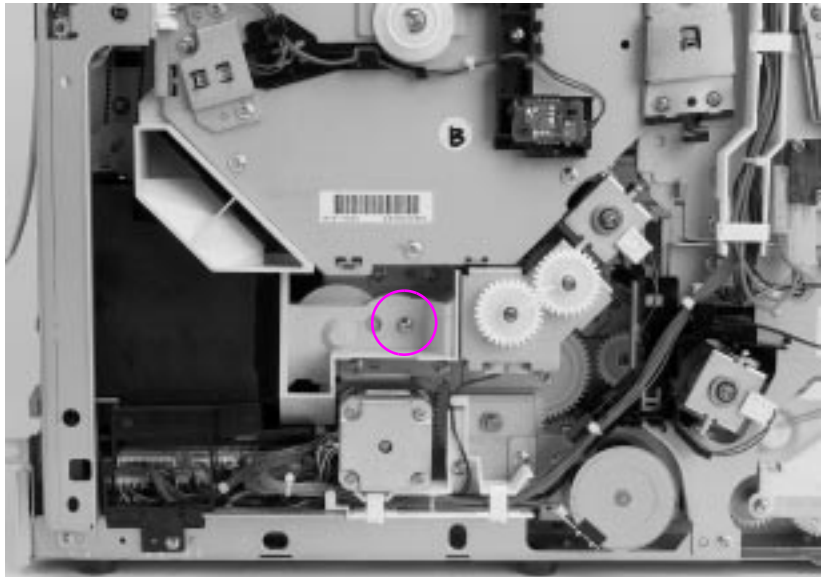
#### **CAUTION**

Make sure that the clutch assembly gears are correctly reinstalled. For older printers, the gear alignment marks should be offset by one gear tooth as shown in Figure 6-50; for newer printers, the gears, which have a double line, should be aligned.

## ITB clutch (CL2) assembly

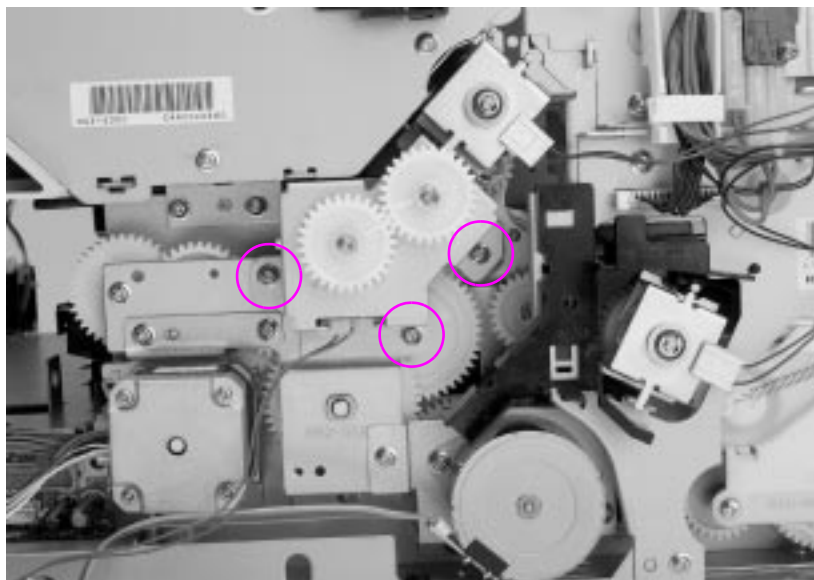
### To remove the ITB clutch assembly

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Remove the ITB cleaning roller clutch.
- 4 Remove the screw shown in Figure 6-51 and remove the plastic shroud.



**Figure 6-51** ITB clutch assembly removal and replacement (1 of 2)

- 5 Disconnect the cable from the clutch assembly.
- 6 Remove the three screws shown in Figure 6-52 and remove the clutch assembly.



**Figure 6-52** ITB clutch assembly removal and replacement (2 of 2)

---

**CAUTION**

---

Make sure that the clutch assembly gears are correctly reinstalled. For older printers, the gear alignment marks should be offset by one gear tooth as shown in Figure 6-50; for newer printers, the cams, which have a double line, should be aligned.

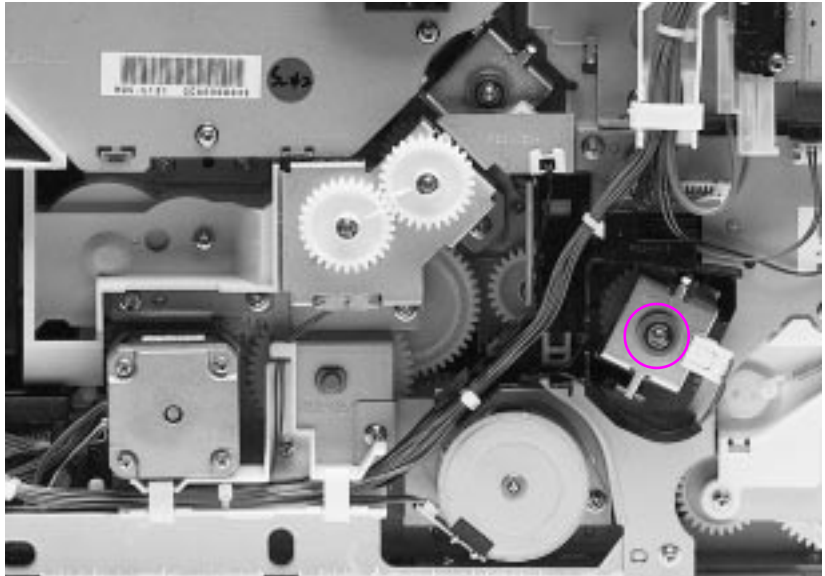
For proper operation, ensure that the ITB clutch (CL2) is connected to J103 on the Paper Feed PCB and that the ITB cleaning roller clutch (CL3) is connected to J104.



## Transfer roller cam clutch (CL4)

### To remove the transfer cam clutch

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Disconnect the connector (J105 at the Paper Feed PCB) from the clutch.
- 4 Remove the e-clip shown in Figure 6-53 with needle-nose pliers and remove the clutch.



**Figure 6-53** Transfer roller cam clutch removal and replacement

### Replacement tip

For proper operation, ensure that the cable is connected to J105 on the paper feed PCB.

## Left side gears

### To remove the left side gears

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Remove the fusing assembly.
- 4 Remove the screw shown in callout 1, Figure 6-46 on page 194 and remove the black plastic piece.
- 5 Disconnect all connectors from the paper feed PCB and free the cables from the cable stays.
- 6 Remove the screw securing the gear cover and remove the cover shown in callout 3, Figure 6-46 on page 194.
- 7 Remove the fuser motor.
- 8 Remove the paper path motor.
- 9 Remove the three clutches: CL2, CL3, and CL4.
- 10 Remove the four screws (callout 1, Figure 6-54 on page 203) and remove the sheet metal over the gears.
- 11 Remove the one or two screws (shown in callout 2, Figure 6-54 on page 203) and e-clip (shown in callout 3, Figure 6-54 on page 203) that hold the solenoid assembly in place and then remove the solenoid assembly.
- 12 Remove any e-clips or bushings necessary to remove the affected gears.

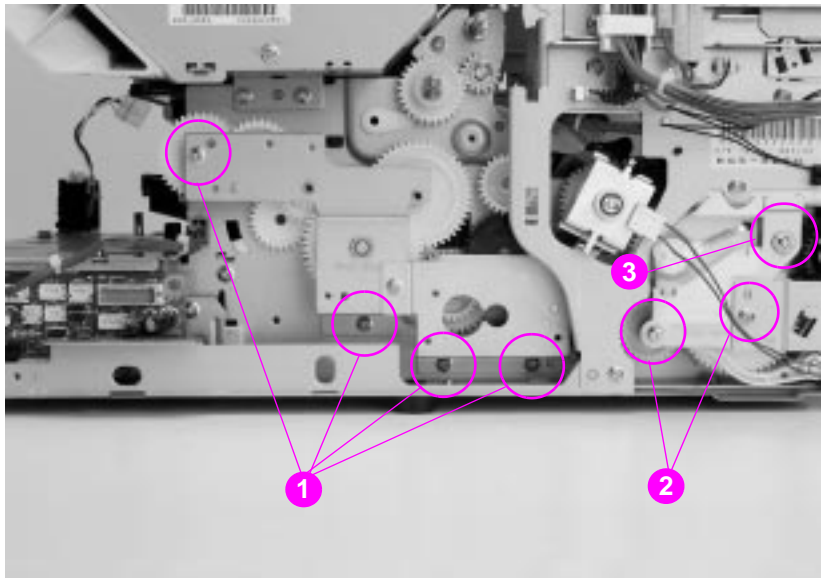
### Left side gear replacement

- 1 Install the back half of the large double gear shown in callout 1, Figure 6-55 with the small portion of the gear (18T) facing outward.
- 2 Install the two gears (shown in callout 2, Figure 6-55 on page 203) so they cover the back half of the large double gear.
- 3 Install the remaining gears and the front half of the large double gear so they appear as shown in Figure 6-55 on page 203.

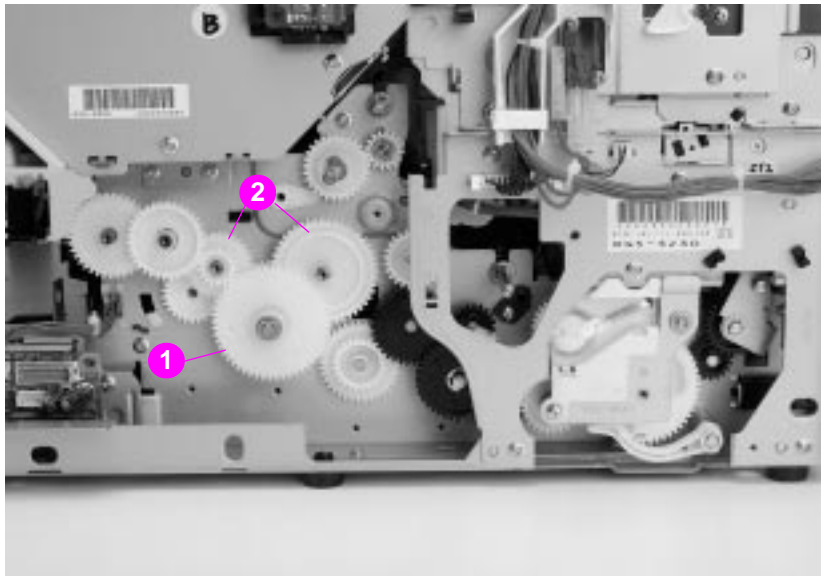
---

**CAUTION**

When reinstalling the solenoid assembly, make sure that the flat parts of the pickup rollers are down and that the plastic spring-loaded gear is fully engaged.



**Figure 6-54** Left side gears removal and replacement (1 of 2)



**Figure 6-55** Left side gears removal and replacement (2 of 2)

# Rear assemblies

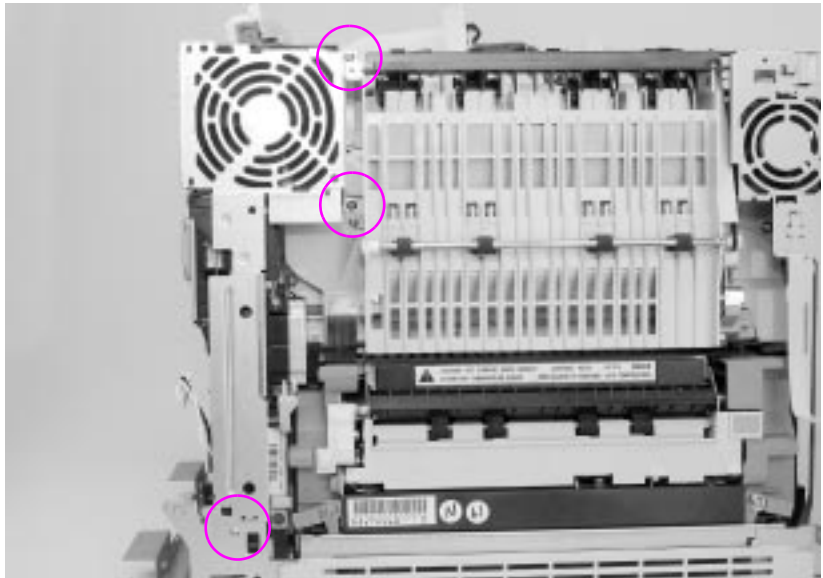
## Large right side fan

### To remove the large right side fan

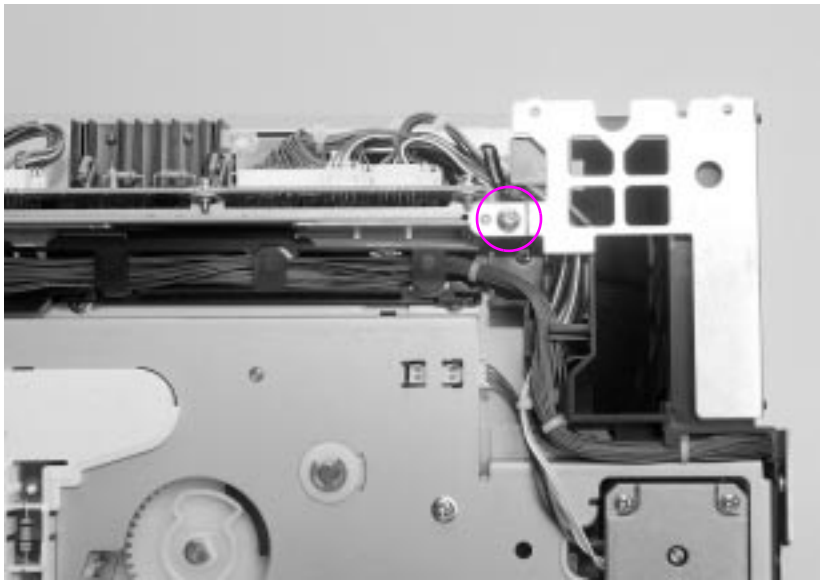
- 1 Remove the formatter pan assembly.
- 2 Remove the four screws as shown in Figures 6-56 and 6-57, and remove the fan shield.
- 3 Disconnect the fan cable (J209) from the developing PCB.
- 4 Unweave the fan cable from the cable stays.
- 5 Release the plastic tabs at the top and bottom of the fan housing, and then slide the fan out.

### Large right side fan replacement tip

- Ensure that the fan cable is facing out and located in the lower corner.



**Figure 6-56** Large right side fan removal and replacement (1 of 2)



**Figure 6-57** Large right side fan removal and replacement (2 of 2)

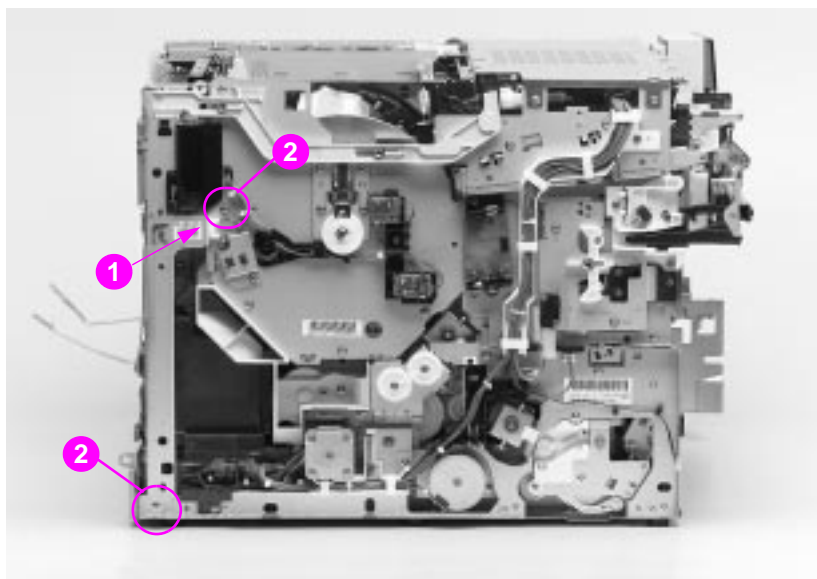
## Left side fan

### To remove the left side fan

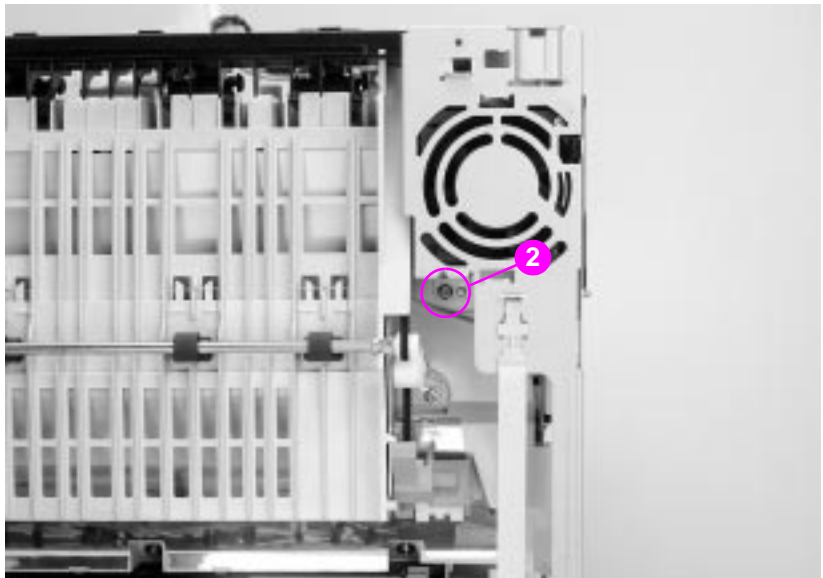
- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Remove the rear door.
- 4 Disconnect the cable shown in callout 1, Figure 6-58.
- 5 Remove the three screws from the left rear fan shield shown in Figures 6-58 and 6-59 (callout 2) and remove the fan shield.
- 6 Disconnect the cable shown in callout 1, Figure 6-60.
- 7 Remove the screw from the black plastic cover and remove the fan casing shown in callout 2, Figure 6-60.
- 8 Free the fan cable from the cable stay.
- 9 Press out on the three plastic tabs and slide the fan out.

### Left side fan replacement tip

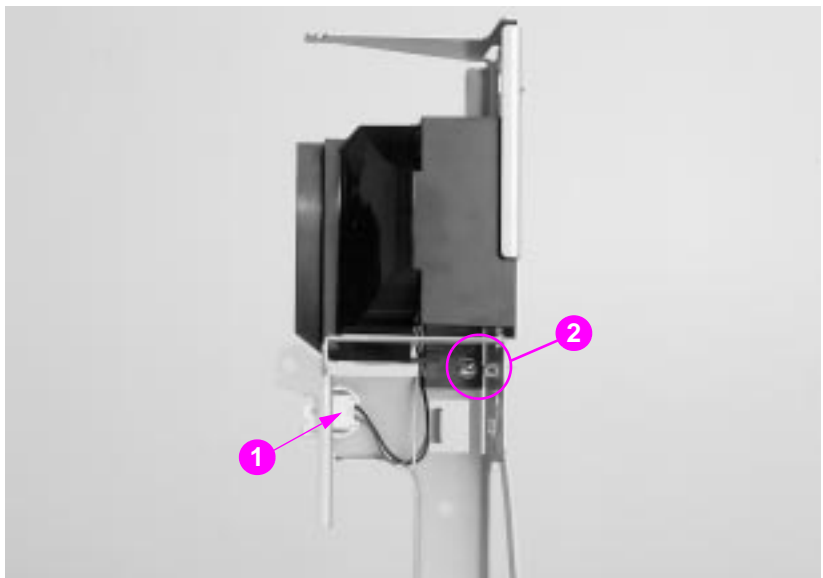
Make sure the label is facing out when replacing the left-side fan.



**Figure 6-58** Left side fan removal and replacement (1 of 3)



**Figure 6-59** Left side fan removal and replacement (2 of 3)



**Figure 6-60** Left side fan removal and replacement (3 of 3)

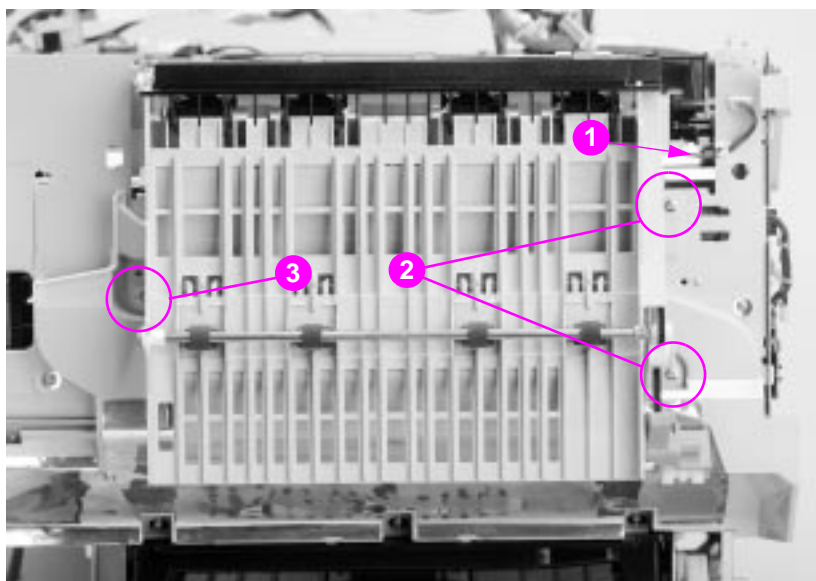
## Face-down assembly

### To remove the face-down assembly

- 1 Remove the top cover.
- 2 Remove the left side cover.
- 3 Remove the rear door.
- 4 Remove the left side fan.
- 5 Disconnect the bin full sensor shown in callout 1, Figure 6-61, and free the cable from the cable stay.
- 6 Remove the three screws from the face-down assembly shown in callouts 2 and 3, Figure 6-61.
- 7 With your right hand, lift up slightly on the assembly to release the tab. Then, pull the assembly out with your right hand while pushing the assembly to your right to release the plastic tab on your left.

### Replacement tip

Note the position of the black shoulder screw and metal bracket shown in callout 3, Figure 6-61.



**Figure 6-61** Rear paper path assembly removal and replacement

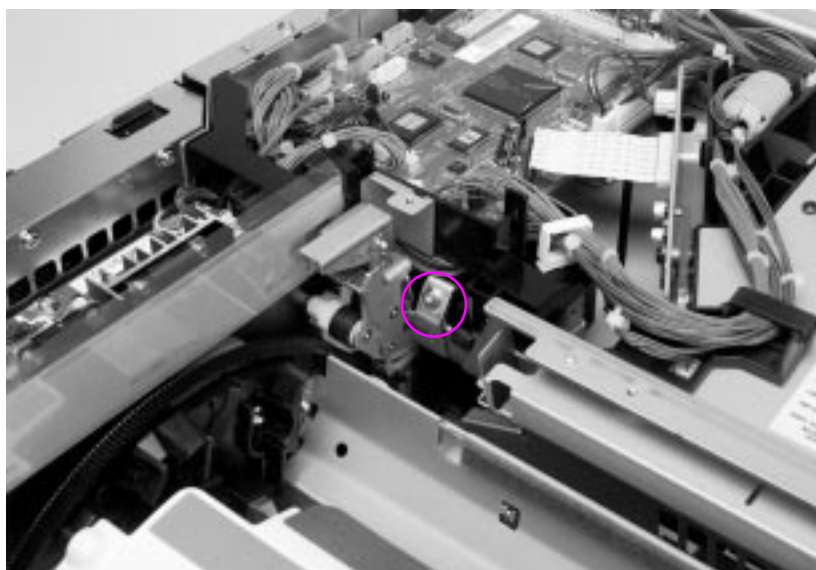


## Internal assemblies

### Carousel housing assembly

#### To remove the carousel housing assembly

- 1 Remove the toner cartridges from the carousel.
- 2 Remove the RFI shield.
- 3 Remove the formatter pan assembly.
- 4 Remove the rear door.
- 5 Remove the fusing assembly.
- 6 Remove the toner catch tray by pushing down on the clip in the middle of the tray as shown in callout 1, Figure 6-66, and then pull the tray out.



**Figure 6-62** Carousel housing assembly removal and replacement (1 of 4)

- 7 Remove the carousel drive assembly.
- 8 Detach the cable guide just beneath the developing PCB by pushing up and out on the cable trough (Figure 6-57 on page 205) to release the lower tabs. Then push down to release the upper tabs.

- 9 Detach all cables from the developing PCB and remove them from the cable stays and cable guide.
- 10 Remove the screw from the carousel brake assembly shown in Figure 6-62 and remove the brake assembly.
- 11 Remove the power supply.
- 12 Remove the HVPS.
- 13 Remove the left side fan assembly.
- 14 Open the drum drawer (top drawer) half way.
- 15 Open the drum drawer (top drawer) and remove the imaging drum, protecting it from light.

---

**CAUTION**

---

Exposure to light for more than 15 seconds can seriously damage the imaging drum.

- 16 Close the drum drawer half way.
- 17 Remove the three brass screws shown in Figure 6-63. Release the two black tabs and pull out the drum ground plate.
- 18 Remove the two screws shown in Figure 6-64.
- 19 Remove the four screws shown in Figure 6-65.

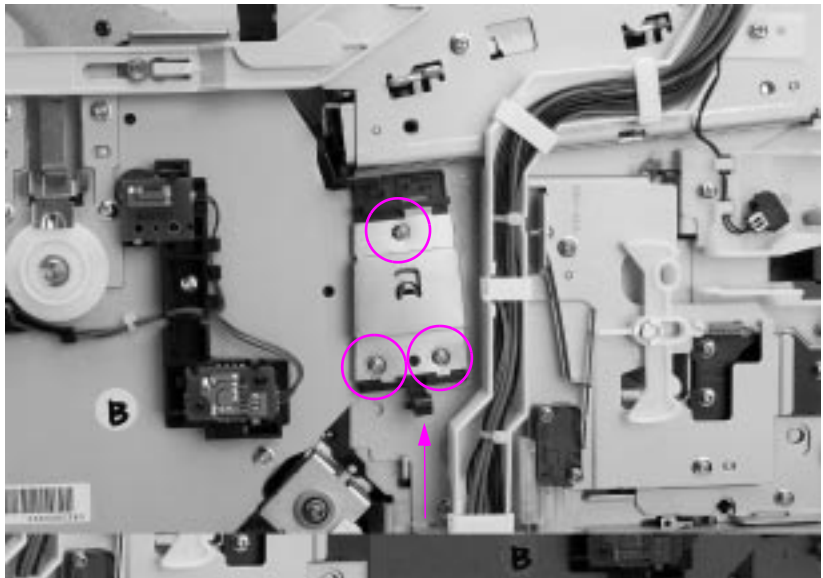
---

**WARNING!**

---

Use caution when removing the carousel assembly. The printer will tip forward if both the drum drawer (top drawer) and the ITB (middle drawer) are both fully open.

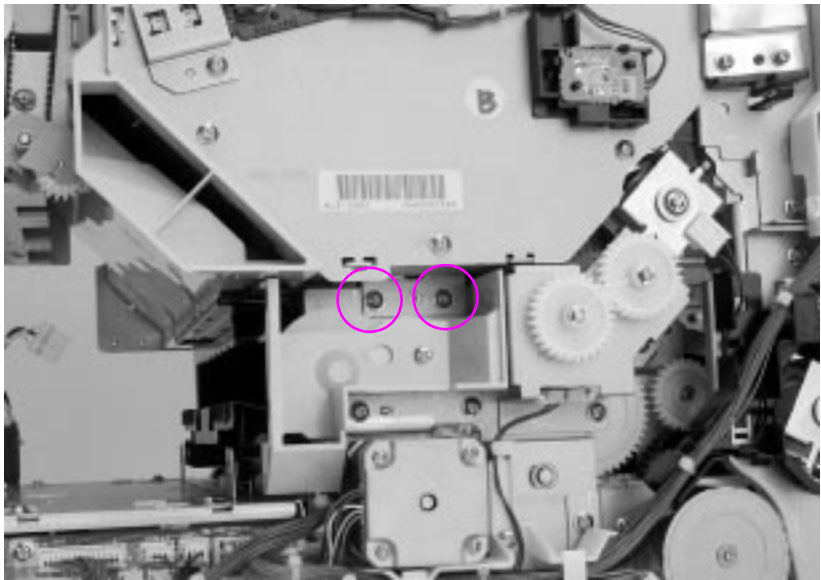
- 20 Working from the back of the printer, slide the carousel housing assembly toward your right, and then lift up and out.



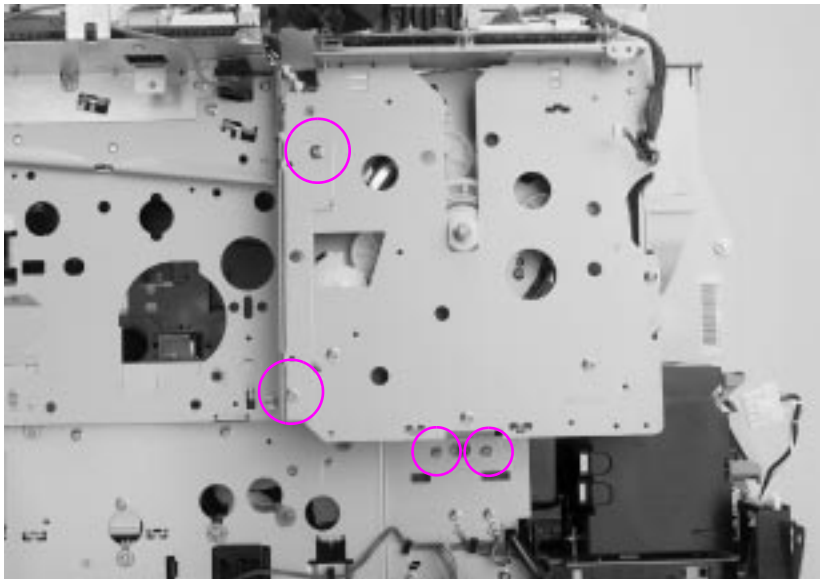
**Figure 6-63** Carousel housing assembly removal and replacement (2 of 4)

### **Carousel housing assembly replacement tip**

- Before tightening the six screws that secure the carousel housing assembly, momentarily fasten the drum ground plate (step 17, above) and left and right fan shields.



**Figure 6-64** Carousel housing assembly removal and replacement (left side view when facing printer) (3 of 4)



**Figure 6-65** Carousel housing assembly removal and replacement (right side view when facing printer) (4 of 4)

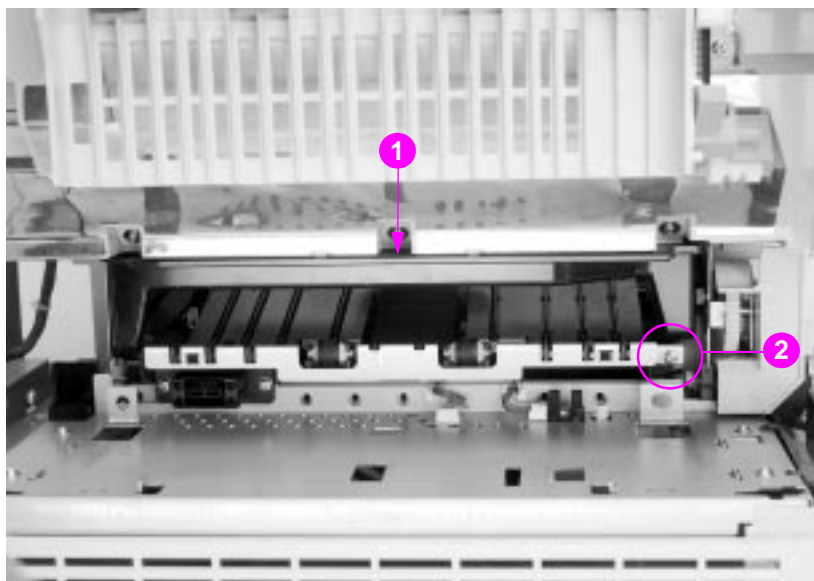
## Paper transport assembly

### To remove the paper transport assembly

- 1 Remove the fusing assembly.
- 2 Remove the toner catch tray by pushing down on the clip in the middle and sliding it straight out as shown in callout 1, Figure 6-66.
- 3 Remove the screw from the rear of the assembly (callout 2).
- 4 Slide the paper transport assembly toward your left until it stops. Tilt the assembly up to clear the drive shaft coupler on your right and carefully work the assembly out of the printer.

### Paper transport assembly replacement tip

- Make sure that all tabs are under the metal slots (two on the right, one on the left) and that the drive shaft coupler engages properly.



**Figure 6-66** Paper transport assembly removal and replacement

## Paper pick rollers

### To remove the paper pick rollers

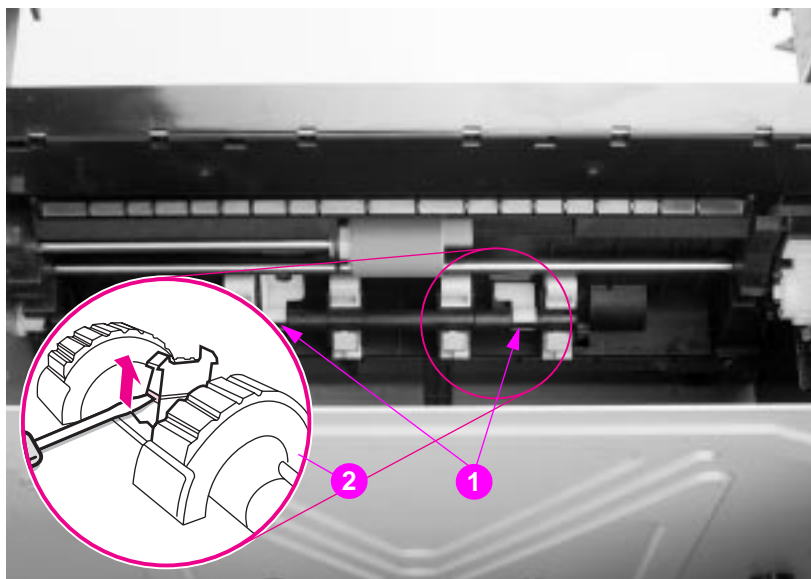
- 1 Remove tray 2. Then, follow the instructions provided below, depending on the version of printer.

**For printer serial numbers xxG or lower** (The paper pick roller shaft is held in place with two white plastic clips.)

- 2 Pull the paper pick roller shaft down until it releases from the two plastic clips shown in callout 1, Figure 6-67.

**For printer serial numbers xxH or higher** (The paper pick roller shaft is held in place with two black plastic clips.)

- 2 Do **not** remove the roller shaft unless you have to replace it. To replace the individual pick rollers, rotate the shaft by hand so that the flat parts of the D-shaped rollers are facing up. Grasping the center of the D-shaped roller with one hand, press down on the roller clip on the flat portion of the roller with the other hand and pull it off of the shaft. If you need to remove the entire shaft, insert a small flat-blade screwdriver into both of the plastic clips (as shown in callout 2, Figure 6-67) to remove the roller.



**Figure 6-67** Paper pick rollers removal and replacement

## **Paper pick roller replacement tip**

When reinstalling the roller shaft, make sure that the flat parts of the D-shaped rollers are facing down.





# 7

# Troubleshooting

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# Introduction

This troubleshooting chapter assumes the reader has a basic understanding of the color laser printing process. Explanations of each mechanical assembly, printer systems, and the basic theory operation are found in Chapter 5. Do not perform any of these troubleshooting processes without fully understanding the function of each mechanism.

This chapter contains the following sections:

- **Troubleshooting process** includes a pre-troubleshooting checklist and a troubleshooting flowchart. These tools contain information on common printer errors that may inhibit proper operation or create print quality problems. These tools also include recommendations for solving the cause of the error.
- **Printer error troubleshooting** explains each control panel display message and suggests recommendations for clearing the cause of each message. When the printer message indicates a failure whose root cause is not obvious, use the printer error troubleshooting section and the troubleshooting tools section found later in this chapter to solve the problem.
- **Paper path troubleshooting** provides techniques to solve paper feed problems. Explanations regarding print media checks, troubleshooting jams, and the differences between jams caused by media and those caused by the printer are discussed.
- **Image formation troubleshooting** provides print samples to help identify print defects, and suggests methods for solving the problems.
- **Interface troubleshooting** provides techniques for isolating communication problems to the printer hardware, printer configuration, network configuration, or software application.
- **Control panel troubleshooting** provides procedures on how to print a menu map from the printer control panel, and describes the control panel menus, the items within each menu, and the possible values for the menu items.
- **Troubleshooting tools** help isolate the cause of printer failures. This section includes explanations of the printer configuration page, and the event log.
- **The service mode** section provides procedures for entering service mode and performing service-oriented tasks. These tasks include counts for entering the serial number, transfer maintenance, fuser maintenance, color page, total page, clearing the event log, and various printer tests.
- **The diagnostics mode** section provides instructions on how to access and use the diagnostic tools incorporated into the printer.
- **Diagrams** provides graphical locations and tables for the printer's internal assemblies and sensors.

# Troubleshooting process

The troubleshooting process requires both a mental and hands-on investigation of printer errors and problems.

- Use the pre-troubleshooting checklist to evaluate the source of the problem and to reduce the number of steps required to fix the problem.
- Use the troubleshooting flowchart to pinpoint the root cause of hardware malfunctions. The flowchart guides you to the appropriate section of this chapter that provides steps for correcting the malfunction.

Check the printer for the following before troubleshooting a specific printer problem:

- Has regular maintenance been performed?
- Are the maintenance units within their rated life?
- Does the configuration page reveal any configuration errors?

---

## Note

---

The customer is responsible for checking consumable items, and using consumables that are in good working condition.

## Pre-troubleshooting checklist

The list below describes basic questions to ask the customer to help you quickly define the problem(s).

**Table 7-1 Pre-troubleshooting checklist**

<b>Environment</b>	<ul style="list-style-type: none"><li>● Is the printer installed on a solid, level surface?</li><li>● Is the power supply voltage within <math>\pm 10</math> volts of the specified power source?</li><li>● Is the power supply plug inserted in the printer and the outlet? (Also verify that the short power cord of the duplex unit is plugged into the printer, and the power supply plug of the paper deck at the duplex unit is properly connected.)</li><li>● Is the operating environment within the specified parameters, as listed in Chapter 1 of this manual?</li><li>● Is the printer exposed to ammonia gas, such as that produced by diazo copiers or office cleaning materials?</li><li>● Is the printer exposed to direct sunlight?</li></ul>
<b>Media checks</b>	<ul style="list-style-type: none"><li>● Does the customer use only supported media?</li><li>● Is the media in good condition (no curls, folds, etc.)?</li><li>● Is the media stored correctly and within environmental limits?</li></ul>

**Table 7-1 Pre-troubleshooting checklist (continued)**

<b>Media Source</b>	<ul style="list-style-type: none"><li>● Is the specified volume (or less) loaded into the media source?</li><li>● Is the printer set to the correct media source?</li></ul>
<b>Toner cartridge</b>	<ul style="list-style-type: none"><li>● Are the color toner cartridges for each color correctly installed?</li></ul>
<b>Drum cartridge</b>	<ul style="list-style-type: none"><li>● Is the drum cartridge seated in the printer properly?</li></ul>
<b>ITB and fusing</b>	<ul style="list-style-type: none"><li>● Are the ITB and fusing units seated properly?</li></ul>
<b>Doors and drawers</b>	<ul style="list-style-type: none"><li>● Are the toner cartridge door, duplexer feeder assembly, drum drawer, and ITB drawer closed correctly?</li></ul>
<b>Condensation</b>	<ul style="list-style-type: none"><li>● Does condensation occur following a temperature change (particularly in winter following cold storage)? If so, wipe affected parts dry or leave the printer on for 10-20 minutes.</li></ul>
<b>Miscellaneous</b>	<ul style="list-style-type: none"><li>● Check for and remove any non-HP components (toner, memory modules, and EIO cards) from the printer.</li><li>● If the printer hardware or software configuration has not changed, or the problem is not associated with any specific software, contact the Customer Care Center (see Chapter 1).</li><li>● Remove the printer from the network and ensure that the failure is associated with the printer before beginning troubleshooting.</li></ul>

**WARNING!**

Electrical current is present in various printer parts whenever the printer is plugged in, even if the power switch is in the standby position. Line voltage is exposed when the right cover and formatter pan are removed.

## Troubleshooting flowchart

The troubleshooting flowchart shown in Figure 7-1 highlights the processes that quickly solve printer hardware problems. During its power on sequence, the printer verifies that its components are operating correctly. If the printer fails to power on correctly, use the steps shown to troubleshoot the failure.

Each heading depicts a major troubleshooting step. A “yes” answer to the questions allows you to proceed to the next major step.

A “no” answer indicates that additional testing is needed. Proceed to the referenced location and follow the directions for that area. After completing the additional testing, proceed to the next major step.

# Troubleshooting flowchart

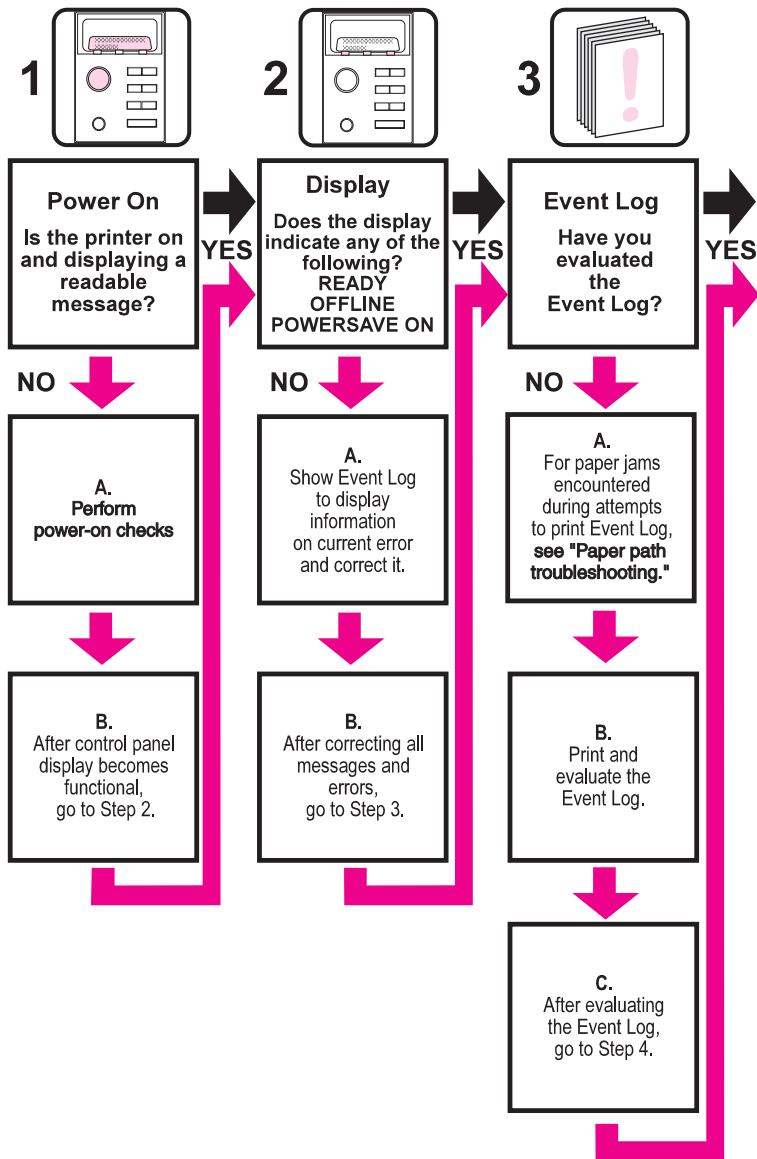


Figure 7-1 Troubleshooting flowchart (1 of 2)

## Troubleshooting flowchart (continued)

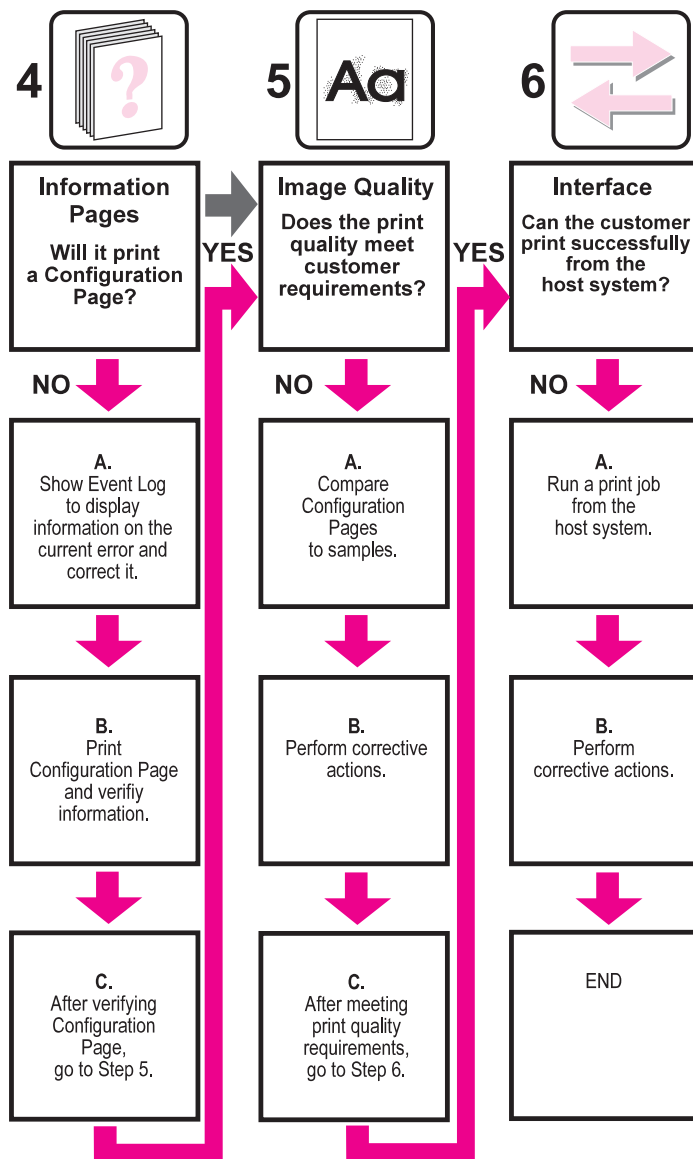


Figure 7-2 Troubleshooting flowchart (2 of 2)

## Troubleshooting power-on

### Power-on check

- 1 Verify that the printer is plugged into an active electrical outlet of the correct voltage.
- 2 Verify that the power-on button is pushed in.
- 3 Verify that the duplex unit short cord is plugged into the printer.
- 4 Make sure the fans are still running.

---

#### Note

---

If the front panel display looks dark and an error message is displayed, check the ribbon cable between the formatter and the DC controller.

- 5 Remove any HP JetDirect or other EIO cards, then retry powering-on the printer.
- 6 Make sure the control panel display is on.
- 7 Check fuse in power supply (see Figure 7-29).
- 8 Replace the power supply.
- 9 Replace the interconnect PCB.



# Printer error troubleshooting

## Printer messages

The following tables explain messages that might display on the printer control panel. Alphabetical printer messages and their meanings are listed in Table 7-2, and numerical printer messages are listed in Table 7-3.

---

### Hint

If a message requesting that you load a tray persists, or if a message indicating that a previous print job is still in the printer's memory persists, press **Go** to print or press **Cancel Job** to clear the job from the printer's memory.

---

---

### Note

Not all messages are described in the tables; those messages that are not listed are self-explanatory.

Some printer messages are affected by the `AUTO CONTINUE` and `CLEARABLE WARNING` settings from the Configuration Menu on the printer control panel:

- If `CLEARABLE WARNING=JOB` is set on the control panel, warning messages display until the end of the job from which they were generated.
- If `CLEARABLE WARNING=ON` is set, warning messages display until **Go** is pressed.
- If an error occurs that prevents printing and `AUTO CONTINUE=ON` is set, the printer goes offline for 10 seconds before it returns online.
- If `AUTO CONTINUE=OFF` is set, the message displays until **Go** is pressed.

# Alphabetical printer error messages

Table 7-2 Alphabetical printer error messages

---

## ACCESS DENIED MENUS LOCKED

**Description:**

Displayed for approximately 5 seconds when a user has attempted to select a menu value while the printer control panel locking is enabled.

**Action:**

See the system administrator for access to the printer control panel.

---

## BAD DUPLEXER CONNECTION

**Description:**

The duplex unit is not correctly installed.

**Action:**

1. Check that the duplex unit power cord is plugged into the printer and the power cord is plugged into the duplex unit.
  2. Turn printer off and then on.
  3. If the error continues, verify that the duplex unit is correctly installed.
  4. If error persists, replace duplex unit.
- 

## CALIBRATION EXECUTING

**Description:**

The printer is executing an internal color calibration. This process should take approximately 90 seconds.

**Action:**

No action required.

---

## CANCELING JOB

**Description:**

The printer is canceling the current print job. Incoming data for the current job will be discarded.

**Action:**

No action required.

---

## CANNOT DUPLEX CLOSE REAR BIN

**Description:**

The printer cannot duplex because the rear output bin is open.

**Action:**

1. Close the rear output bin door.
  2. If the error message does not clear, turn the printer off and then on.
-

**Table 7-2 Alphabetical printer error messages (continued)**

---

**CANNOT DUPLEX  
CHECK REAR BIN  
alternates with  
CANNOT DUPLEX  
CHECK PAPER**

**Description:**

The printer cannot duplex because the rear output bin is open or the media is not supported by the duplex unit.

**Action:**

1. Close the rear output bin.
  2. If the error message does not clear, turn the printer off and then on.
  3. Verify that the media is supported by the duplex unit. See “Supported media weights and sizes” in Chapter 1.
- 

**CHECKING  
PRINTER**

**Description:**

The printer is performing an internal test. This process should take approximately 30 seconds. The message is displayed during the initiation of the engine test. When finished, the printer goes online.

**Action:**

No action required.

---

**CLEARING PAPER  
FROM PRINTER**

**Description:**

The printer has jammed or was turned on and media was detected in the paper path. The printer is attempting to clear these pages.

**Action:**

No action required.

---

**CLOSE FRONT DUPLEX DRAWER**

**Description:**

The duplex drawer is not completely closed.

**Action:**

Close the duplex drawer.

---

**CLOSE MIDDLE FRONT DRAWER**

**Description:**

The drawer that holds the intermediate transfer belt is open. This drawer is called the ITB drawer, but is referred to as the middle front drawer for end users. Switch SW1 (refer to Figure 7-25) indicates the drawer is open. When the drawer is closed, a plastic protrusion on the lower left corner of the drawer pivots an arm allowing SW1 to toggle to the open position.

**Action:**

1. Close the ITB drawer.
  2. If the message persists, remove the printer's left-side cover and inspect the mechanical linkage that closes SW1.
  3. Refer to the wiring diagram to verify the wiring; the two-wire connector should be firmly seated to SW1 and the wiring harness should be firmly seated to connector J1003 of the DC controller PCB.
  4. If the message persists, use an ohmmeter to verify functionality of SW1.
-

**Table 7-2 Alphabetical printer error messages (continued)**

---

### **CLOSE UPPER REAR DRAWER**

**Description:**

Switch SW5 (refer to Figure 7-23) monitors the closing of the printer's upper rear door (this door allows you to access the fusing assembly). When the fusing door is closed, a tab on the rear door pushes a door switch actuator that runs along the left-side of the printer and closes SW5.

**Action:**

1. Close the upper rear drawer.
2. If the message persists, remove the printer's left-side cover and inspect the mechanical linkage of SW5 and the lever.
3. Refer to the wiring diagram and verify all connections (J103 of the DC controller PCB and to SW5). Verify they are firmly seated.
4. Verify that both the drum and ITB drawers are firmly closed; closing these drawers also closes SW4 (see Figure 7-25).

---

**Note**

Closing the rear door, the drum drawer, and the ITB drawers closes SW4 and SW5. When either of these switches are open, +24 V is disabled. This safety feature protects the operator from any high voltages.

---

### **CLOSE TOP COVER**

**Description:**

SW2 (refer to Figure 7-23) indicates whether or not the printer's toner access cover is closed. When the toner access cover is closed, a lever is pushed down. This in turn rotates a pivot forward, opening the top cover switch (SW2).

**Action:**

1. Close the top cover.
  2. If the message persists, remove the printer's top assembly cover and verify all mechanical linkages associated with SW2 (see Figure 7-23).
  3. Verify that the connector on J1003 of the DC controller PCB is firmly seated.
- 

### **CLOSE UPPER FRONT DRAWER**

**Description:**

The drawer that holds the imaging drum (the drum drawer) is open. Switch SW3 (refer to Figure 7-25) indicates that the drawer is open. When the drawer is closed, a plastic protrusion on the lower left corner of the drawer pivots an arm that allows SW3 to toggle to the open position.

**Action:**

1. Open the drawer and firmly push the drawer closed using one hand in the middle of the drawer.
2. If the message persists, remove the printer's left-side cover and inspect the mechanical linkage that closes SW3.
3. Refer to the wiring diagram and verify the wiring. The two-wire connector should be firmly seated to SW3 and the wiring harness should be firmly seated to connector J1003 of the DC controller PCB.
4. If the message persists, use an ohmmeter to verify functionality of SW3.

---

**Note**

Closing the drawer also closes SW4 (the drum drawer switch). When SW4 is open, +24 V is disabled. This safety feature protects the operator from any high voltages when the drum or ITB drawers are open.

---

**Table 7-2 Alphabetical printer error messages (continued)**

---

**COLD RESET**

**Description:**

The cold reset power-up sequence has been entered.

**Action:**

Most printer variables will reset to their factory default values.

---

**CONTINUOUS PAGE  
PRESS CANCEL JOB**

**Description:**

The printer configuration page is being printed continuously.

**Action:**

Press **Cancel Job** to terminate continuous configuration page printing and return the printer to the READY state.

---

**DENSITY SENSOR  
OUT OF RANGE  
alternates with  
CLEAN DENSITY SENSOR**

**Description:**

A density sensor out of range error was detected during a color calibration.

**Action:**

The density sensor may be dirty. Inspect and clean the sensor. See "Cleaning the toner density sensor" on page 79.

---

**DATA RECEIVED**

**Description:**

The printer has received and processed data and is waiting for a form feed.

**Action:**

Press **Cancel Job** and resend the last page of the job making sure a form feed is sent with it.

---

**DIAGNOSTICS MODE**

**Description:**

The extended diagnostics power-up key sequence has been entered. Refer to the diagnostics procedures at the end of this chapter.

**Action:**

No action required.

---

**DRUM ERROR  
REPLACE DRUM KIT**

**Description:**

An error has been detected with a component of the printer drum kit.

**Action:**

Replace the drum kit.

---

**DRUM LIFE LOW  
REPLACE DRUM KIT**

**Description:**

Approximately 80% of the drum's life has been consumed.

**Action:**

Continue printing or replace the drum kit. Drum replacement will be required in the near future.

---

**Table 7-2 Alphabetical printer error messages (continued)**

---

**DRUM LIFE OUT  
REPLACE DRUM KIT**

**Description:**

The imaging drum has reached the end of its expected life.

**Action:**

Replace the drum kit.

---

**DUPLEXER ERROR  
CHECK DUPLEXER**

**Description:**

An error has occurred in the duplex unit.

**Action:**

1. Verify that the duplex unit is correctly installed.
  2. Verify that the small power cord from the duplex unit is plugged into the printer, and the power cord from the AC outlet is plugged into the duplex unit.
- 

**EIO X  
INITIALIZING YYY  
alternates with  
DO NOT POWER OFF**

**Description:**

The EIO device in slot X is initializing. The YYY value will increment every 10 seconds during this process.

**Action:**

No action required.

---

**EIO X  
NOT FUNCTIONAL**

**Description:**

The EIO slot specified does not have a card installed or is not functional.

**Action:**

No action required.

---

**EVENT LOG EMPTY**

**Description:**

SHOW EVENT LOG was selected from the Information Menu, but the Event Log has no entries.

**Action:**

No action required.

---

**FUSER LIFE LOW  
REPLACE KIT**

**Description:**

Approximately 95% of the fuser's life has been consumed.

**Action:**

Continue printing, or replace the fuser kit. Fuser replacement will be required in the near future.

---

**FUSER LIFE OUT  
REPLACE KIT**

**Description:**

The fuser has reached the end of its expected life.

**Action:**

Replace the fuser kit.

---

**Table 7-2 Alphabetical printer error messages (continued)**

---

**INITIALIZING**

**Description:**

The message is displayed when the printer is initially turned on.

**Action:**

No action required.

---

**INSTALL DRUM KIT**

**Description:**

The drum kit is not installed or is incorrectly installed.

**Action:**

Verify that the drum kit is correctly installed.

---

**INSTALL TRAY 2**

**Description:**

The printer cannot print until media is loaded into Tray 2. The paper path for Tray 3 passes through Tray 2.

**Action:**

Insert Tray 2 into the printer so that printing from Tray 3 can continue/start.

---

**MEMORY FULL  
STORED DATA LOST**

**Description:**

The printer has no available memory. The current job may not print correctly. Some downloaded fonts may have been deleted.

**Action:**

Try printing simplified pages. If this does not resolve the problem, add printer memory.

---

**MEMORY SETTINGS CHANGED**

**Description:**

The I/O buffering settings were changed by the printer because there is not enough memory available to use the previous settings.

**Action:**

No action required. However, adding printer memory may prevent this from occurring.

---

**MEMORY SHORTAGE  
JOB CLEARED**

**Description:**

The available memory was not enough to continue printing. The remainder of the job was canceled.

**Action:**

No action required. However, adding printer memory may prevent this from occurring.

---

**MEMORY SHORTAGE  
PAGE SIMPLIFIED**

**Description:**

The printer's adaptive data compression had to resort to lossy compression to fit raster graphics in the available memory. This has caused a data loss in the raster output.

**Action:**

1. Reduce the complexity of the page to improve the print quality.
  2. Adding memory will not correct this problem.
-

**Table 7-2 Alphabetical printer error messages (continued)**

---

### **NO JOB TO CANCEL**

**Description:**

**Cancel Job** was pressed but there is no active job or buffered data to cancel. The printer automatically returns to the **READY** state.

**Action:**

No action required.

---

### **OFFLINE**

**Description:**

The printer is offline and there are no error messages pending.

**Action:**

Press **Go** to return the printer to the **READY** state.

---

### **PAGE CANNOT PRINT NOW alternates with RETRY WHEN PRINTING STOPS**

**Description:**

An internal page has been requested while the printer is printing an incoming job. Interrupting the job to print the internal page would corrupt the job's environment and potentially cause the job to finish printing incorrectly after the internal page is completed. Consequently, internal pages are not permitted to interrupt jobs and can only be printed when the printer is idle.

**Action:**

Retry the print job after the printer has completed the current job.

---

### **PAGE SIMPLIFIED**

**Description:**

The printer's adaptive data compression had to resort to lossy compression to fit raster graphics in the available memory. This has caused a data loss in the raster output.

**Action:**

1. Reduce the complexity of the page to improve the print quality.
  2. Adding memory will not correct this problem.
- 

### **PAGE TOO COMPLEX TO PRINT alternates with PRESS GO TO CONTINUE**

**Description:**

The page could not be printed.

**Action:**

1. Press **Go** to continue printing (with noticeably poor results on this page).
  2. Press **Cancel Job** to terminate the entire job.
  3. Reducing the complexity of the page may allow it to print successfully.
  4. Adding memory will not correct this problem.
-



**Table 7-2 Alphabetical printer error messages (continued)**

---

**PLEASE WAIT**

**Description:**

The printer is in the process of purging data so that it can go offline or into the menus.

**Action:**

No action required.

---

**POWERSAVE ON**

**Description:**

The printer is in PowerSave mode. This message is cleared by pressing any key or by the receipt of a print job.

**Action:**

No action required.

---

**PRESS GO TO PRINT  
alternates with  
PRESS SELECT TO  
CHANGE TONER**

**Description:**

The top cover was opened and closed when the printer was not in toner cartridge replacement mode.

**Action:**

Press **Go** to resume printing or press **Select** to enter the toner replacement mode.

---

**PRINTER LANGUAGE NOT  
AVAILABLE**

**Description:**

The printer received a request for a new language (personality) that does not exist in the printer.

**Action:**

No action required.

---

**PRINTING CALIBRATION  
PAGE**

**Description:**

The color calibration page is being printed. The printer returns to the **READY** stage upon completion of this page.

**Action:**

No action required.

---

**PRINTING CONFIGURATION**

**Description:**

The configuration page is being printed. The printer returns to the **READY** stage upon completion of this page.

**Action:**

No action required.

---

**PRINTING FONT LIST**

**Description:**

A typeface list for the available personalities is being printed. The printer returns to the **READY** stage upon completion of these pages.

**Action:**

No action required.

---

**Table 7-2 Alphabetical printer error messages (continued)**

---

**PRINTING MENU MAP**

**Description:**

The printer menu map is being printed. The printer returns to the **READY** state upon completion of this page.

**Action:**

No action required.

---

**PRINTING REGISTRATION PG**

**Description:**

The registration page is being printed. The printer returns to the **READY** state upon completion of this page.

**Action:**

No action required.

---

**PRINTING LASERJET DEMO**

**Description:**

The demo page is being printed. The printer returns to the **READY** state upon completion of this page.

**Action:**

No action required.

---

**PRINTING LASERJET DEMO 2**

**Description:**

The demo page is being printed. The printer returns to the **READY** state upon completion of this page.

**Action:**

No action required.

---

**PRINTING ACCESSORIES**

**Description:**

The accessories page is being printed. The printer returns to the **READY** state upon completion of this page.

**Action:**

No action required.

---

**PRINTING COLOR GUIDE**

**Description:**

The color guide page is being printed. The printer returns to the **READY** state upon completion of this page.

**Action:**

No action required.

---

**PROCESSING JOB**

**Description:**

The printer is processing the current job.

**Action:**

No action required.

---

**READY**

**Description:**

The printer is online and ready to receive data, and no status or device attendance messages are pending.

**Action:**

No action required.

---

**Table 7-2 Alphabetical printer error messages (continued)**

---

**REINSTALL TRANSFER BELT**

**Description:**

This message occurs if you do not have the intermediate transfer belt installed in the printer or if the home position marks (on the ITB) are not detected by sensor PS5.

---

**Note**

The intermediate transfer belt must be rotating before PS5 is able to detect the "home positioning" marks on the ITB. Both the ITB and the imaging drum are driven by the drum motor (M4).

---

**Action:**

1. Check SW1 (Figure 7-25) for correct operation and make sure the cables are connected.
2. Verify that the ITB is installed in the printer.
3. If the ITB is installed and seated properly, verify that PS5 is not damaged. PS5 is located on the ITB assembly (see Figure 7-19). If the sensor appears damaged replace the entire ITB assembly.
4. Clean PS5 (see Figure 7-19 for its location).
5. Verify all wiring within the ITB drawer. Note the connection on the ITB assembly (located on the front, lower, left-hand corner of the assembly). When the drawer is closed, the connector "mates" with a receptacle connector on the drawer. Verify the connector and all wiring are in good condition. Make sure there is no paper in the connector at the base of the drawer.
6. Verify that the drum motor (M4) is rotating both the imaging drum and the ITB. Place the printer in diagnostic mode and run the drum test to verify drive spindle movement for both the imaging drum and ITB.
7. If the imaging drum is not rotating, verify the imaging drum connector is firmly seated into the connector J204 of the developing PCB.

---

**REMOVE PAPER  
TOP OUTPUT BIN**

**Description:**

The top output bin holds 200 sheets of paper. Sensor PS9 (see Figure 7-15) along with its sensor flag detects the height of the output paper stack. Perform the action items if this message appears with no paper in the output bin.

---

**Note**

PS9 (a three-wire sensor) plugs into a through-wall connector on the printer's chassis and then into a 14-pin wire harness, which plugs into J206 on the developing PCB (see Figure 7-15). All signals from the developing PCB are routed to J201 on the developing PCB to J1017 on the DC controller PCB.

---

**Action:**

1. Verify that the PS9 sensor flag and arm move freely and its movement is not blocked (see Figure 7-15).
2. Verify PS9 is free of dust and debris (top assembly cover must be removed to access sensor).
3. Verify all connectors are firmly seated. Refer to the wiring diagram.

**Table 7-2 Alphabetical printer error messages (continued)**

---

### **RESETTING MEMORY**

**Description:**

The printer is executing a memory reset. The printer returns to the `READY` state upon completion of this process.

**Action:**

No action required.

---

### **RESETTING VALUES FINISHED**

**Description:**

The color calibration density values have been reset to their default values.

**Action:**

No action required.

---

### **RESTORING FACTORY SETTINGS**

**Description:**

The printer is executing a `RESTORE FACTORY SETTINGS` or a `COLD RESET`.

**Action:**

No action required.

---

### **SELECT LANGUAGE**

**Description:**

The language selection power-up key sequence has been entered. The printer will prompt the user to select a new control panel display language once it has completed its initialization process.

**Action:**

Select new language when prompted.

---

### **SERVICE MODE**

**Description:**

The Service Mode power-up key sequence has been entered. The printer will remain in Service Mode until **Go** is pressed.

**Action:**

Press **Go** to end service mode.

---

### **TONER CMYK LOW**

**Description:**

The toner cartridge specified is low on toner. This message appears if `TONER=LOW` (default) is set on the printer control panel in the Configuration Menu.

**Action:**

Printing will continue until a `TONER OUT` message appears. To change the toner cartridge now, press **Select**.

---

### **TONER CMYK OUT alternates with PRESS SELECT TO CHANGE TONER**

**Description:**

The toner cartridge specified is out of toner.

**Action:**

Press **Select** to enter the toner replacement mode. Press **Go** to resume printing without changing the cartridge.

---

**Table 7-2 Alphabetical printer error messages (continued)**

---

**TONER CMYK LOW  
alternates with  
PRESS SELECT  
TO CHANGE TONER**

**Description:**

The toner cartridge specified is low on toner and must be replaced. This message appears when TONER LOW = STOP is set on the front panel in the Configuration Menu.

**Action:**

Press **Select** to enter the toner replacement menu.

---

**TONER POSITION  
[COLOR] = [STATE]**

**Description:**

Indicates the current state of a particular toner cartridge. This message is displayed when **Select** is pressed while a TONER LOW/OUT message is displayed.

**Action:**

If necessary, replace the specified toner cartridge.

---

**TRANSFER KIT LOW  
REPLACE KIT**

**Description:**

The transfer kit is near the end of its expected life.

**Action:**

Although printing can continue, the transfer kit should be replaced for optimum printer operation.

---

**TRANSFER KIT OUT  
REPLACE KIT**

**Description:**

The transfer kit has reached the end of its expected life.

**Action:**

Replace the transfer kit.

---

**TRAY X EMPTY  
[TYPE] [SIZE]**

**Description:**

The specified tray is empty but the current job does not require this tray to complete the job.

**Action:**

No action required. However, loading the proper media type and size into the tray will avoid this message in the future.

---

**TRAY X LOAD  
[TYPE] [SIZE]**

**Description:**

The specified media type and size need to be loaded into the requested tray.

**Action:**

Load the specified media type and size into the requested tray. Press **Go** to override this request and cause the page to be printed on different media.

---

**Table 7-2 Alphabetical printer error messages (continued)**

---

**TRAY X SIZE**  
**[SIZE]**

**Description:**

Media has been loaded into the specified tray. The most recently configured size will be displayed with an asterisk next to it.

**Action:**

1. **- Value +** may be used to view all possible media sizes.
  2. Pressing **Select** will select the currently displayed size. Pressing **Go** will remove the message.
- 

**TRAY X TYPE**  
**[TYPE]**

**Description:**

Media has been loaded into the specified tray. The most recently configured type will be displayed with an asterisk next to it.

**Action:**

1. **- Value +** may be used to view all possible media types.
  2. Pressing **Select** will select the currently displayed type. Pressing **Go** will remove the message.
- 

**TRAY X OPEN**

**Description:**

The specified tray is not completely closed.

**Action:**

Close the specified tray.

---

**WARMING UP**

**Description:**

The fuser is warming up. Printing will continue when the fuser reaches the optimum temperature.

**Action:**

No action required.

---

**WASTE TONER FULL**  
**REPLACE DRUM KIT**

**Description:**

The waste toner full sensor PS13 detects a waste toner full condition. A light receiver and light pipe arrangement, along with a window in the drum assembly, look for a waste fill condition. Verify that sensors and light pipes are not blocked.

**Action:**

1. Replace the drum kit.
  2. Check the sensor, replace it if it's defective.
-

# Numerical printer error messages

**Table 7-3 Numerical printer error messages**

---

## 13.XX PAPER JAM

**Note**

Refer to the paper jam troubleshooting section for the complete details about locating paper jams (see page 255).

**XX Description:**

- 0 Jam in input feed area
- 1 Jam in fusing area
- 2 Jam in fusing area
- 3 Jam in duplex reversing unit
- 4 Jam in duplex feed unit
- 5 Jam in duplex paper feed area or ITB drawer
- 6 Jam in duplex paper feed area or ITB drawer
- 7 Jam in paper feed area or ITB drawer
- 8 Door open jam
- 9 Irregular paper jam in paper path
- 10 Paper in the paper path is too short
- 11 Paper in the paper path is too long  
(see page 1-22 for complete details)

**Action:**

1. Note the location of the leading edge of the first jammed piece of media.
2. Note the paper jam message.
3. Note the location of the media.

**alternates with  
CHECK ALL REAR DOORS**

**Description:**

Media is jammed in the rear paper path or rear duplexing area.

**Action:**

1. Open the rear duplex door (if installed) and remove any jammed media.
2. Open the upper rear door and remove any jammed media.

**alternates with  
CHECK MIDDLE  
FRONT DOORS**

**Description:**

Media is jammed in the transfer belt area or media is not picking.

**Action:**

1. Open the ITB drawer and remove any jammed media.
2. Check for media between the transfer roller and the fusing assembly.

**alternates with  
CHECK FRONT  
DUPLEX DRAWER**

**Description:**

Media is jammed in the front duplexing area.

**Action:**

Open the duplex drawer and remove any jammed media.

---

**Table 7-3 Numerical printer error messages (continued)**

---

### **13.0 Paper Jams**

**Description:**

Media is jammed in the front part of the printer immediately after the paper is picked up.

**Action:**

1. Check to see if the white plastic tabs (located inside the front of the trays under the separation tabs) have fallen off in Tray 2 or Tray 3. (Note the position of the springs.)
  2. Make sure that the correct media is loaded properly in Tray 3, and that it is not overloaded.
  3. Make sure that the two shipping locks have been removed from the back of Tray 3.
  4. Inspect the pick-up rollers for Tray 2; the flat side of the "D" on the rollers should be parallel to the paper.
  5. Make sure that the roller spring underneath the front of Tray 2 is secure.
- 

### **13.1 PAPER JAM OPEN MIDDLE FRONT DRAWER alternates with CHECK IN REAR OF DRAWER**

**Description:**

A jam has occurred inside the ITB drawer area. (The ITB drawer is also referred to as the middle front drawer for end users.) The jam may be located in the fuser area or between the transfer area and the fuser.

**Action:**

1. Open the ITB drawer and carefully inspect for any media.
  2. Be sure to inspect the fusing area. You may need to access the fusing area through the rear door.
  3. Remove any jammed media.
  4. Make sure that the transfer roller is securely in place.
- 

### **20 INSUFFICIENT MEMORY alternates with PRESS GO TO CONTINUE**

**Description:**

More data has been received from the computer than fits in the printer's internal memory.

**Action:**

1. To continue printing, press **Go**. Only the amount of data that fits in the printer's internal memory is printed.
  2. To cancel the job, press **Cancel Job**.
  3. Add more memory to resolve the problem.
-



**Table 7-3 Numerical printer error messages (continued)**

---

**22 EIO X BUFFER OVERFLOW**  
alternates with  
**PRESS GO TO CONTINUE**

**Description:**

The EIO buffer for the EIO card in slot "X" has overflowed during a busy state.

**Action:**

1. The current data in the print buffer will be lost.
  2. Press **Go** to resume printing and then resend the job.
- 

**22 PARALLEL I/O**  
**BUFFER OVERFLOW**  
alternates with  
**PRESS GO TO CONTINUE**

**Description:**

Indicates the parallel buffer has overflowed.

**Action:**

1. The current data in the print buffer will be lost.
  2. Press **Go** to resume printing and then resend the job.
- 

**40 EIO X DATA ERROR**  
alternates with  
**PRESS GO TO CONTINUE**

**Description:**

A connection with the card in the specified slot has been broken.

**Action:**

1. Check that all cables are connected to the EIO ports and that the EIO board is seated properly.
2. If possible, print to another network printer to verify the network is working properly.

---

**Note**

All data in the print buffer will be lost.

---

**41.3 UNEXPECTED PAPER SIZE**  
alternates with  
**CHECK PAPER IN TRAY X**

**Description:**

A tray is configured for a specific paper size, but the sheet loaded is a different size. This error often occurs when the printer is multifeeding.

**Action:**

Load the requested size media in tray.

---

**Table 7-3 Numerical printer error messages (continued)**

---

**41.5 UNEXPECTED PAPER TYPE  
alternates with  
CHECK PAPER IN TRAY X**

**Description:**

A tray is configured for a specific media type, but the printer detects a different media type loaded. The most common cause for this error is a paper jam at registration plate (under the ITB) where the customer does not remove the paper. The engine tries to check the OHT sensor and receives an error.

**Action:**

1. Verify that the correct media is loaded in the input tray and the printer control panel is configured correctly.
  2. Clean the detection windows of OHT sensors 1 and 2 (see Figure 7-18).
- 

**49.ERROR XXXX  
CYCLE POWER**

**Description:**

Indicates that a firmware error occurred that caused the processor on the formatter to abort operation. This type of error can be caused by invalid print commands, corrupt data, or invalid operations. In some cases data transmitted to the printer can become corrupt by electrical noise introduced into the cable. Other causes include poor quality parallel cables, poor connections, or home-grown applications. On rare occasions, the formatter is at fault and is usually indicated by a 79 Service Error.

**Action:**

1. Turn the printer off and on to reset the printer.
2. Verify that all cables are connected.
3. Cancel all print jobs then resend. Try to isolate any offending print job.
4. Delete the print job from the Windows spooler or from the print server.
5. If the formatter pan assembly or DC controller was removed, make sure the ribbon cable between the DC controller and the interconnect PCB is connected.

---

**Note**

See the diagram on page 243 for help with troubleshooting 49 errors

---

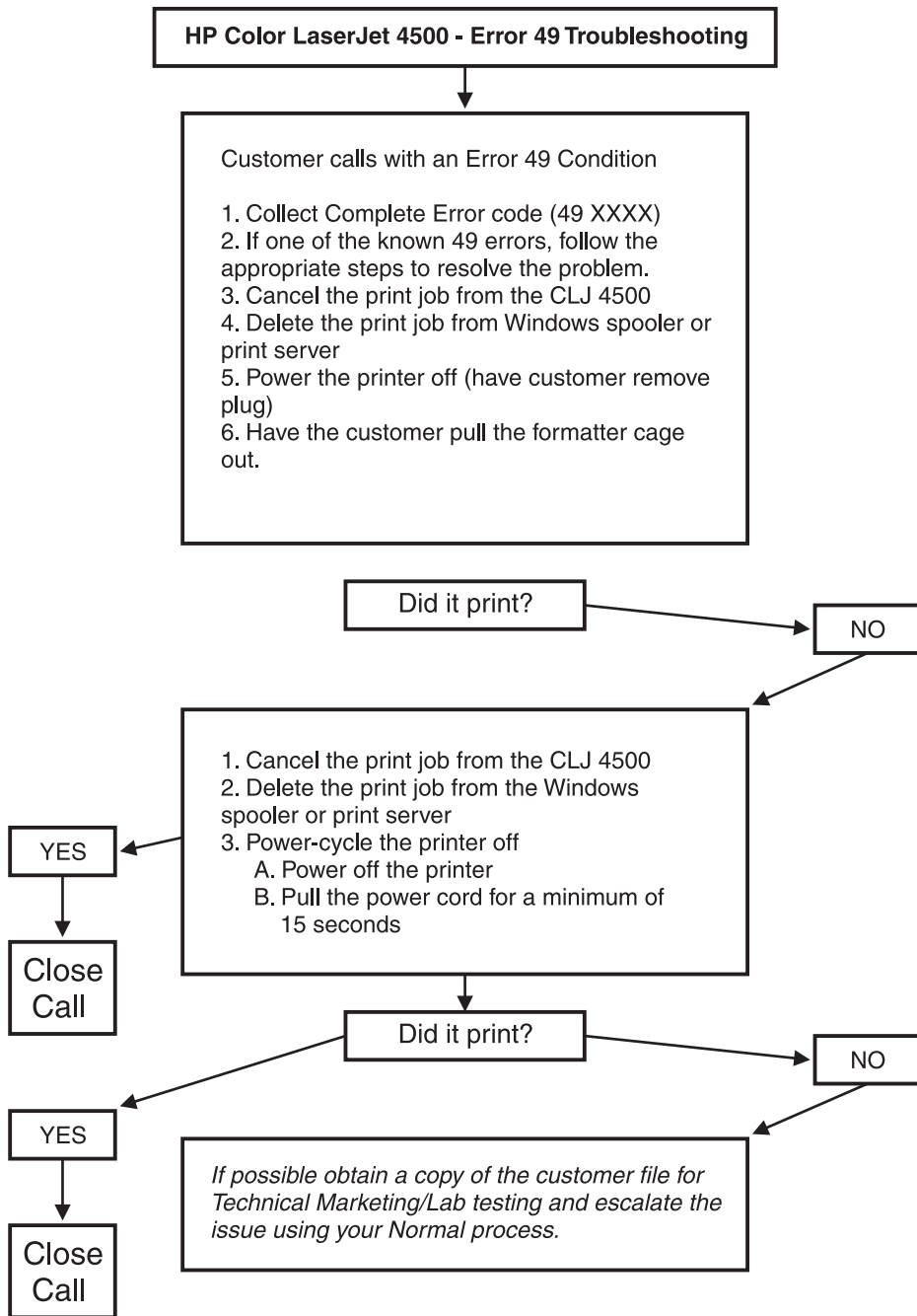
**Note**

The printer control panel will display 49 (FFFF) and the display will be dark if the ribbon cable is not connected.

6. To verify that the formatter is functioning properly, run the formatter tests available in the diagnostics mode (see page 321). If the formatter passes, the formatter is not defective. DO NOT replace the formatter.
-

Table 7-3 Numerical printer error messages (continued)

### Troubleshooting 49 errors



**Table 7-3 Numerical printer error messages (continued)**

---

**49 ADAC or AFAC**

**Description:**

Indicates that the printer is printing a PostScript file using Windows 3.1 or 9x.

**Action:**

No action required.

---

**49 FF01 to FF05**

**Description:**

An NEC firmware ROM error has occurred.

**Action:**

Replace the firmware.

---

**49 FF02**

**Description:**

Unsupported EDO memory has been installed.

**Action:**

Remove unsupported memory.

---

**49 04CC**

**Description:**

Indicates a media timing issue. This occurs when printing multiple copies of transparencies or heavy or glossy media with either the PCL or PostScript drivers. Or it could indicate a timing mismatch between the engine and formatter.

---

**49 04E7**

**Description:**

Occurs during decompression of the strip buffers when the end of the strip marker is missing. This is triggered by one of the following: 1) Marker is corrupt; 2) Strip buffer size given to HiLite is too small; 3) Strip buffer size given is too large.

---

**Note**

This error is primarily associated with the firmware and should not require a new formatter.

---

**Table 7-3 Numerical printer error messages (continued)**

---

**49 04FF**

**Description:**

A large print job (800 to 1200 pages) or complex graphics can cause the printer to quit printing.

**Action:**

Two courses of actions are available:

1. Determine the page that is causing the failure. If there is an image on the page, try to move the image down on a portrait page or left on a landscape page to move the image out of the strip that is failing. The movements will need to be very small so as not to cause the next strip to fail.
2. Put the printer in Lossy mode with a sequence of PJL commands. (Lossy compression is the process of compressing a file such that some data is lost after the file is compressed and decompressed.) Use the following series of commands to put the printer into Lossy mode:  
ESC%-12345X@PJL  
@PJL Default Service mode=HPBOISEID  
@PJL Default Diagnostics=ON  
@PJL Enter Language = PCL  
ESC%-12345X@PJL  
Esc\*z9999P  
Esc\*z50P  
Esc\*z201X

To turn off Lossy mode once the file has printed, use the following commands:

```
ESC%-12345X@PJL
@PJL Default Diagnostics=OFF
@PJL Default Service Mode=EXIT
@PJL EOJ
ESC%-12345X@PJL
```

---

**Note**

Putting the printer in Lossy mode may affect performance and print quality

---

**49 FFFF**

**Description:**

Issue reported by life test when replacing the fuser. This error may also occur during the boot cycle.

**Action:**

Replace the formatter.

---

**49FFOX**

**Description:**

This error allows you to scroll through the printer control panel to obtain all of the error information.

**Action:**

No action required.

---

**Table 7-3 Numerical printer error messages (continued)**

---

**49 OBOA**

**Description:**

A request is not understood. This error message is generated when the I/O card does not support a command that was sent to it.

**Action:**

Check the command being sent; the I/O card may not support a particular feature.

---

**49 OB22**

**Description:**

This error message is generated when the I/O card receives a control panel menu action that it does not recognize.

**Action:**

Verify the action being sent.

---

**50.x Fuser Error**

**Description:**

The fusing assembly contains two heating bulbs, two thermo-switches, and two thermistors. AC power is provided to the fusing assembly via the DC power supply, which is controlled by the DC controller PCB. The thermistors monitor the temperature of the fusing assembly and provide feedback to the DC controller PCB to regulate the fusing temperature. The two thermo-switches are wired in series with the fusing bulbs and "open" if the temperature exceeds 240° C (464° F).

**Action:**

**Note**

A visual check to determine if the fusing assembly is functional can be made by defeating the rear door interlock switch (see Figure 7-27) by pressing in on the white plastic above the left rear corner of the fan and then powering on the printer. If the fusing bulbs and thermo-switches are good, you should observe light from the lower fusing bulb as the printer warms up.

X Description:

- 1 Low temperature error
- 2 Fuser warm-up service
- 3 High fuser temperature
- 4 Faulty fuser
- 5 Fuser voltage mismatch (verify that you have NOT installed a 110V fuser in a 220V printer or vice-versa!).
- 6 Fuser heater cutoff
- 7 Fuser motor malfunction (see recommended action for 50.7 Fuser error).

1. Turn the printer off and on to reset the printer. If the error persists, try re-installing the fusing assembly. If the error continues to persist, proceed to step 2.
  2. Turn the power off and remove the fusing assembly. Measure the resistance between pin 3 and pin 4. The resistance should be between 6+/-2 ohms. If there is no continuity between pins, it may be assumed that either a heating bulb and/or a thermo-switch is "open." Replace the fusing assembly. If resistance limits were acceptable, proceed to step 3.
  3. Referring to Figure 7-30, measure the resistance for both the upper and lower thermistors. The resistance should be between 430K ohms and 310K ohms at room temperature (25° C, 77° F). If the resistance exceeds limits, replace the fusing assembly. If resistance is within limits proceed to step 4.
  4. Verify the connectors at J1011 of the DC controller PCB and J1 of the DC power supply assembly are firmly seated.
  5. Replace the power supply assembly.
-

**Table 7-3 Numerical printer error messages (continued)**

---

### **50.7 FUSER ERROR**

**Description:**

The fusing motor (M1) drives the fusing assembly, the paper transport (web) assembly, ITB lift mechanism, transfer roller, transfer roller lift mechanism, and the face down output delivery drive assembly. A 50.7 fuser error is displayed when no motion is detected within the fuser by PS6. Photosensor PS6 is the fusing unit pressure switch shown in Figure 7-21.

**Action:**

1. Power cycle the printer to try to clear the message.
2. Remove the left-side cover of the printer. Verify that the fusing motor (M1) connector is seated firmly into J102 of the feed PCB.
3. Ensure that the connector at J110 of the feed PCB is firmly seated (this connector contains the wiring for PS6, which provides fuser motion feedback).

---

**Note**

Closely inspect the mechanical linkage. The gears along the gear "drive" path may bind the gears. This will prevent M1 from rotating.

---

4. If the error persists, Observe the drive shaft of M1 (refer to Figure 7-25) while powering on the printer. If this shaft DOES NOT rotate, your failure is related to the motor drive circuitry. Referring to the printer's wiring diagram, verify that connectors J102 and J106 of the feed PCB are firmly seated. If the error still persists, replace the fusing motor and the feed PCB in sequence.
  5. If the shaft rotates (both forward and reverse), and the 50.7 fuser error is displayed, the cause of the error is related to the motion feedback circuitry. Remove the fusing assembly and verify the sensor flag (see Figure 7-21) is in good condition and functional. Verify the connector at sensor PS6 (see Figure 7-21) is firmly seated. Clean the sensor of dust and debris. If the error persists replace sensor PS6.
-

**Table 7-3 Numerical printer error messages (continued)**

---

### **51 LASER ERROR**

**Description:**

Indicates that a laser malfunction has occurred due to a beam detect error or laser failure.

**Action:**

1. Turn the printer off and on to reset the printer.
  2. Verify connectors J1102 on the laser driver PCB and J1008 on the DC controller are seated properly.
  3. Verify connectors J551 on the beam detect PCB and J1006 on the DC controller are seated properly.
  4. Replace the laser/scanner unit.
- 

### **52 SCANNER ERROR**

**Description:**

Indicates that a scanner error has occurred.

**Action:**

1. Turn the printer off and on to reset the printer.
  2. Verify connectors J551 on the beam detect PCB, J1103 on the scanner motor, and J1006 on the DC controller are fully seated and connected correctly.
  3. Replace the laser/scanner unit.
- 

### **53.XY.ZZ PRINTER ERROR**

**Description:**

Indicates a memory error. If a DIMM caused the error, the DIMM will not be recognized (configured).

**Action:**

1. Verify that the DIMM is installed correctly.
2. Turn the printer off and on to reset the printer.
3. Remove and replace the DIMM that caused the error.

**X = MemoryType**

0 = ROM

1 = RAM

**Y = Device Location**

0 = Onboard

1 = DIMM slot 1

2 = DIMM slot 2

3 = DIMM slot 3

**ZZ = Error Number**

0 = Unsupported memory

1 = Unrecognized memory

3 = Failed RAM test

---



**Table 7-3 Numerical printer error messages (continued)**

---

**54.1 PRINTER ERROR**

**Description:**

Indicates that an internal power failure has occurred.

**Action:**

1. Turn the printer off, and then turn the printer back on.
2. Replace the high-voltage power supply.
3. Check the fuser to ensure jams have not occurred.

---

**Caution**

When clearing jams, the thermistor can be damaged causing this error.

4. Make sure there is not a fluctuation in the power supply to the printer. Check that the electrical specifications (see Chapter 1) are met.
  5. Replace the low-voltage power supply.
-

**Table 7-3 Numerical printer error messages (continued)**

---

## **54.2 PRINTER ERROR**

### **Description:**

An error 54.2 indicates that a problem exists with the carousel assembly. Either the carousel is not rotating or the sensor has failed. Drive motor (M3) provides drive for the toner cartridge carousel. If motion is not detected, a 54.2 error is displayed. M3 is a 6-phase stepping motor and receives its drive signal from J203 of the developing PCB. Photosensor PS10 monitors "movement" (and the position) of the toner cartridge carousel. Different width tabs (four tabs, one for each cartridge) on the left-end of the carousel housing pass through PS10 to provide positioning information. The black toner cartridge tab is the "home" position. Toner cartridge position within the carousel is monitored by PS11. If PS11 fails or is improperly connected, a 54.2 error is displayed. Another indicator of this is that the carousel starts to rotate then stops immediately. A 54.2 error message can also occur if the sensor is installed backwards.

### **Action:**

1. Turn the printer off and then on to reset the printer.
2. Open the color toner door and look for an obstruction. If necessary, remove the toner cartridges individually by manually releasing the carousel brake and rotating the carousel around to each cartridge position and removing the cartridges. Turn the printer off and on to reset the printer.

---

### **Note**

The printer CANNOT operate with the top cover removed unless the carousel brake has been released or removed.

3. Verify the carousel drive motor wiring harness is firmly seated into connector J203 of the developing PCB (see Figure 7-32).
4. Verify PS10 (refer to Figure 7-25) is working correctly and not excessively dirty (clean if necessary) and that the wiring harness is firmly seated into both the sensor assembly, and into connector J206 of the developing PCB.
5. Verify PS11 is connected and functioning properly.
6. Verify all connectors to the developing PCB and the DC controller PCB are firmly seated.
7. Verify that the rotary drive assembly is working. Replace it on older units with more than 50K of life.

---

### **Note**

The following URL provides help with cartridge installation and removal: [http://www.hp.com/cposupport/mainindex/hpcolorlas7857\\_en\\_man.html](http://www.hp.com/cposupport/mainindex/hpcolorlas7857_en_man.html).

---

**Table 7-3 Numerical printer error messages (continued)**

---

**54.3 PRINTER ERROR**

**Description:**

The printer is NOT receiving data back from the density sensor (PS14). PS14 is located in the bottom of the imaging drum drawer (refer to Figure 7-24). During calibration routines, a series of images are written on the imaging drum and the densitometer measures the density of the image (e.g. amount of toner that is placed into the drum). These measurements provide the feedback to ensure image quality is consistent throughout the life of the consumable.

**Action:**

1. Verify the densitometer is clean; perform the toner density sensor cleaning procedure in Chapter 7 of the online user guide.
  2. Inspect the density sensor wiring harness for damage. The harness runs from the density sensor through the left-side upper control arm of the imaging drum drawer to J1010 of the DC controller PCB. Verify that the cable is firmly seated into the J1010 of the DC controller PCB.
  3. If the error persists, replace the density sensor assembly.
- 

**54.4 PRINTER ERROR**

**Description:**

Optional equipment is not recognized.

**Action:**

Turn the printer off and on to reset the printer.

---

**54.5 PRINTER ERROR**

**Description:**

Indicates a waste toner sensor malfunction.

**Action:**

1. Turn the printer off and on to reset the printer.
  2. Remove the drum cartridge and clean the waste toner detection window with a dry cloth.
  3. Clean the waste toner sensor unit at the printer side with a dry cloth.
  4. Check the light guide and clean it if necessary. Replace the light guide if the ends are scarred.
  5. Reconnect the waste toner sensor unit connector and the DC controller PCB connector (J1009) correctly.
  6. Replace the waste toner sensor (PS13).
-

**Table 7-3 Numerical printer error messages (continued)**

---

### **54.6 PRINTER ERROR**

**Description:**

The OHT sensor has reported an error condition. This can be caused by contamination in the connectors, a blocked sensor, or a defective sensor. See Figure 7-18 for the sensor location.

**Action:**

1. Remove ITB and verify that the OHT sensor prism is in place.
  2. Lift the registration flap and verify that the OHT sensor is not blocked.
  3. Remove the ITB drawer and inspect the drawer connectors for contamination such as a piece of paper.
  4. If the error persists, verify that all connectors are firmly seated.
  5. Replace ITB drawer.
- 

### **55 DC CONTROLLER ERROR**

**Description:**

The print engine is not communicating with the formatter. The communication link between the formatter and DC controller was lost. This can occur due to a timing error or intermittent connection between the formatter and DC controller.

**Action:**

1. Turn the printer off and on to reset the printer.
  2. Reseat the connectors between the formatter and DC controller.
  3. Only if the error persists, replace the DC controller making sure to perform the calibration and color plane alignment procedures.
- 

### **57.1 FAN FAILURE**

**Description:**

The printer detected that the fan (an exhaust fan located in the upper, left rear corner of the printer, refer to Figure 7-28) was not rotating. This fan operates off +24Vdc and is enabled by the DC controller PCB's micro-processor.

**Action:**

1. Turn the printer off and on to reset the printer. Visually check to see if the fan is rotating (if you cannot see any rotation, place your hand over the outlet vents to see if exhaust air is moving).
  2. Remove the printer's left-side cover. Check to see if anything is preventing the fan from rotating freely.
  3. Verify that the fan's connector is firmly seated into connector J208 of the developing PCB.
  4. If the error persists, replace the fan.
-

**Table 7-3 Numerical printer error messages (continued)**

---

### **57.2 FAN FAILURE**

**Description:**

The printer detected that the fan (an exhaust fan located in the upper, right rear corner of the printer, refer to Figure 7-28) was not rotating. This fan, operates off +24Vdc and is enabled by the DC controller PCB's micro-processor.

**Action:**

1. Turn the printer off and on to reset the printer. Visually check to see if the fan is rotating (if you cannot see any rotation, place your hand over the outlet vents to see if exhaust air is moving).
  2. Remove the printer's left-side cover. Check to see if anything is preventing the fan from rotating freely.
  3. Verify that the fan's connector is firmly seated into connector J208 of the developing PCB.
  4. If the error persists, replace fan.
- 

### **57.3 FAN ERROR alternates with CLOSE UPPER FRONT DRAWER**

**Description:**

The intake fan is located in the front, center of the drum drawer (refer to Figure 7-26). (The drum drawer is referred to as the upper front drawer for end users.) Fan rotation stops when the drawer is opened. A fan error is displayed when fan motion is NOT detected by the DC controller's micro-processor if the drawer is closed and the printer is not in PowerSave mode.

**Action:**

1. Turn the printer off and on to reset the printer. Due to the difficulty of observation, listen to hear if the fan is rotating.
  2. Verify FM3 connector 27 (callout #3 in Figure 7-26) is not damaged or broken.
  3. Verify the fan connector is firmly seated into connector J1022 of the DC controller PCB.
  4. If the error persists, replace the fan.
- 

### **62 NO SYSTEM**

**Description:**

Indicates there is a printer firmware problem. Either there is no firmware DIMM installed or the DIMM has failed. If the formatter was just replaced, make sure all DIMMs have been moved from the old formatter to the new one.

**Action:**

1. Turn the printer off and on to reset the printer.
  2. Reseat the firmware DIMM, making sure it is in the slot surrounded by a white line with the text "ROM ONLY IN THIS SLOT."
- 

### **62.X PRINTER ERROR**

**Description:**

Indicates that a problem exists with the internal memory.

**X = Description**

0 = Internal memory

1-3 = DIMM slots 1-3.

**Action:**

1. Turn the printer off and on to reset the printer.
  2. Reseat and then replace the DIMM.
  3. Replace the formatter board.
- 

### **62.M BAD MPTR**

**Description:**

The firmware ran out of memory trying to build the static entity directory.

**Action:**

1. Check printer settings to determine which values have been changed.
  2. Clear the message by pressing **Go**.
-

**Table 7-3 Numerical printer error messages (continued)**

---

**68 NVRAM ERROR  
CHECK SETTINGS**

**Description:**

One or more settings saved in the non-volatile storage device are invalid. Some settings may have been reset to factory defaults.

**Action:**

1. Check printer settings to determine which values have been changed.
  2. Clear the message by pressing **Go**.
- 

**68 NVRAM FULL  
CHECK SETTINGS**

**Description:**

Indicates that a non-volatile storage device is full. Some settings may have been reset to factory defaults.

**Action:**

1. Check printer settings to determine which values have been changed.
  2. Clear the message by pressing **Go**.
- 

**79 SERVICE (XXXX)  
PRINTER ERROR**

**Description:**

A hardware error has occurred.

**X Description**

01XX = IO ASIC register error  
02XX = video ASIC register error  
03XX = IDE ASIC register error

**Action:**

1. Reseat the formatter.
  2. Reseat the firmware DIMM.
  3. Run formatter diagnostics.
  4. Replace the firmware DIMM.
  5. Replace the formatter.
- 

**80 SERVICE (XXXX)  
EIO ERROR**

**Description:**

A critical EIO failure has occurred. X indicates the slot number of the device. XXXX indicates the error type.

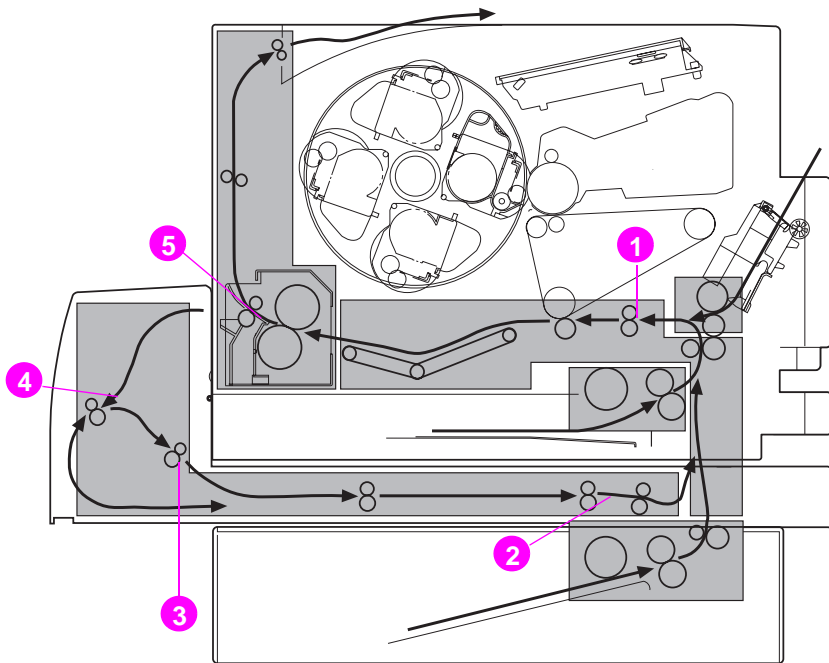
**Action:**

1. Turn the printer off and on to reset the printer.
  2. Reseat the EIO card.
  3. Replace the EIO card.
-

# Paper path troubleshooting

## Paper jams

Paper jams are posted if paper fails to arrive at or clear the paper path sensors in the allowed time. Dedicated paper sensors (PS2, PS7, PS3101, PS3103, and PS3104) detect whether paper is present in the sensor and if the paper is fed normally (see Figure 7-3). When the control board detects a paper jam, it immediately stops the printing process and displays the appropriate paper jam message for the sensor that detects the paper jam.



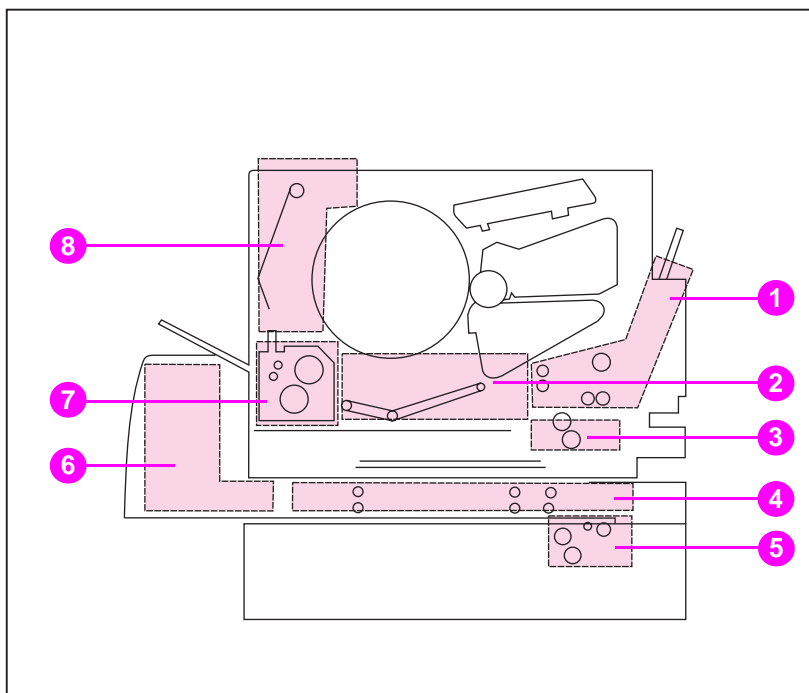
**Figure 7-3**

**Paper jam sensors (shown with the optional 500-sheet paper feeder and duplex unit installed)**

- 1 Registration paper sensor (PS2)
- 2 Duplex paper-pick sensor (PS3104)
- 3 Reversed unit paper sensor (PS3103)
- 4 Reversed paper sensor (PS3101)
- 5 Delivery paper sensor (PS7)

## Paper jam locations

Use Figure 7-4 to troubleshoot paper jams in the printer. For instructions on clearing paper jams, see the sections later in this chapter.



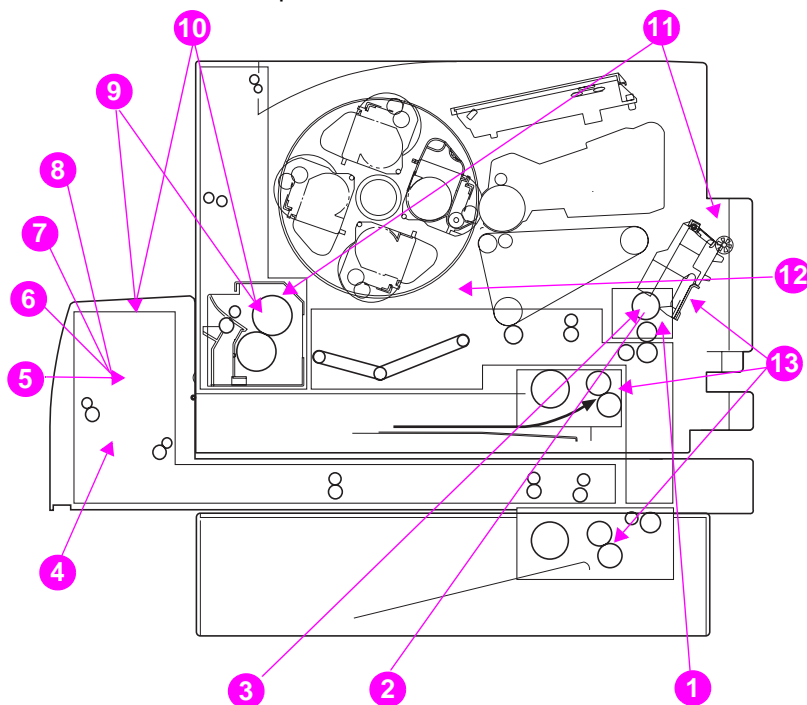
**Figure 7-4** Paper jam locations (shown with the optional 500-sheet paper feeder and duplex unit installed)

- 1 Tray 1 input area
- 2 Transfer belt area
- 3 Tray 2 input area
- 4 Front duplex drawer area
- 5 Tray 3 (500-sheet paper feeder) area
- 6 Rear duplex cover area
- 7 Fuser area
- 8 Rear paper path area



## Paper jam locations by error message

Use Figure 7-5 and Table 7-4 to troubleshoot paper jams by the error message received. For instructions on clearing paper jams, see the sections later in this chapter.



**Figure 7-5** Paper jams (shown with the optional 500-sheet paper feeder and duplex unit installed)

See the next page for the associated error messages.

**Table 7-4 Paper jam locations and associated error messages**

1	13.11 Paper in the paper path is too long. Check the Tray 1 area. Check the entire paper path.	8	13.3 Jam in duplex reverse unit. Inspect the rear of the duplex unit and the duplex tray.
2	13.10 Paper in the paper path is too short. Check the Tray 1 area. Check the entire paper path.	9	13.2 Jam in fusing area. Check the fuser assembly, output assembly, and duplex unit.
3	13.9 Irregular paper jam in the paper path. Check the Tray 1 area. Check the entire paper path.	10	13.1 Jam in fusing area. Check the fuser assembly, output assembly, and duplex unit.
4	13.8 Door open jam. Check the rear door, duplex cover, and rear output door. 13.7 Jam in paper feed area. Check the entire paper path.	11	13.1 Paper jam. OPEN MIDDLE FRONT DRAWER alternates with CHECK IN REAR OF DRAWER. Check the middle front drawer. Check and pull out the fuser.
5	13.6 Jam in duplex paper feed area. Inspect the rear of the duplex unit and the duplex tray.	12	13.1 Paper jam: Check in rear of drawer. Check the rear of the middle front drawer. Reseat the transfer roller.
6	13.5 Jam in duplex paper feed area. Inspect the rear of the duplex unit and the duplex tray.	13	13.0 Jam in input feed area. Check the input trays and duplex unit
7	13.4 Jam in duplex unit. Inspect the rear of the duplex unit and the duplex tray.		

**Table 7-5 Explanation of alternating message**

Check middle front doors	<ol style="list-style-type: none"> <li>1. Check middle front drawer.</li> <li>2. Watch pick roller to ensure it is turning.</li> </ol>
Check all rear doors	<ol style="list-style-type: none"> <li>1. Check duplex cover.</li> <li>2. Check upper rear door and rear output door.</li> </ol>
Check front duplex drawer	<ol style="list-style-type: none"> <li>1. Check front duplex drawer.</li> </ol>

## General paper path checklist

- Verify that media is correctly loaded in the input trays and that all length and width guides are set correctly.
- Clean the printer. Toner and paper dust in the paper path inhibit free movement of media through the printer and block the sensors.
- Vary the input and output selections of the printer to determine if the problem is associated with a particular area of the printer.
- Worn separation pads on the multi-purpose tray cause multifeds. Check the condition of the pickup rollers and customer replaceable feed roller. Bent separation tabs cause misfeeds and multifeds. Replace the tray if necessary.
- Defective paper tray switches can cause paper jams by indicating the wrong size paper to the formatter.
- Scraps of paper left in the paper path can cause intermittent paper jams. Always check that the paper path is clear when cleaning the printer and when clearing paper jams. Also, remove the fuser and carefully check it for jammed paper.
- There are five areas in which scraps of paper may be difficult to find:
  - The ITB drawer connector on the engine side.
  - The OHT sensor under the registration plate.
  - The fuser. Remove the fuser and check it carefully.
  - The center of the web transport before the fuser.
  - Inside the ITB. Rotate the belt by rotating the two white knobs on either side of the ITB to clear jammed paper.

## Print media checklist

Many print problems are caused by printing on media that does not meet specifications. The *HP LaserJet Printer Family Paper Specification Guide* contains detailed information about media specifications, see page 352 for ordering information. The following list helps to quickly check common media-related printing problems.

- Rough paper causes poor toner transfer and smeared print problems. Check that the paper meets specifications for smoothness.
- The printer handles only 60 to 176 g/m<sup>2</sup> (16 to 47 lb) bond media if the media is less than or equal to 148 mm width. If the media is more than or equal to 148 mm wide, the printer can handle only 60 to 135 g/m<sup>2</sup> (16 to 36 lb) bond. Use 0.13 mm (5-mil) thick transparencies.
- Paper that has absorbed moisture causes paper feed problems. If the printer is used in a humid area, damp paper may be the cause of recurring paper feed and print quality problems.
- Damaged paper, paper with ragged edges, or paper whose edges stick together cause paper jams.
- Using paper that has already been through a laser printer or a copier may cause paper jams.
- Print quality may degrade if media with a high resistivity is being used, specifically when duplexing.

## Paper jam recovery

This printer provides a paper jam recovery feature that allows you to set the printer to automatically attempt to recover from paper jams. All pages affected by the paper jam will be reprinted if the paper jam recovery feature is enabled. The options are:

ON	Printer will attempt to reprint jammed pages.
OFF	Printer will not attempt to reprint jammed pages.

---

### Note

During the recovery process, the printer may reprint several good pages that were printed before the paper jam occurred. Be sure to remove any duplicated pages.

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### To enable paper jam recovery

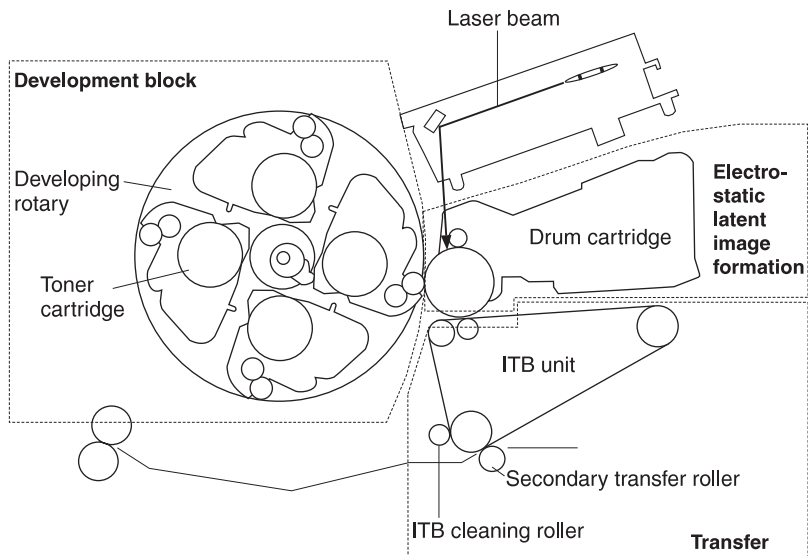
- 1 Press **Menu** until CONFIGURATION MENU displays.
- 2 Press **Item** until JAM RECOVERY displays.
- 3 Press **Value** until ON displays.
- 4 Press **Select** to save the setting.
- 5 Press **Go** to return the printer to the READY state.

To improve print speed, you may want to disable paper jam recovery. To disable paper jam recovery, select OFF in step 3 above. If paper jam recovery is disabled, the pages involved in a jam will not be reprinted.

# Image formation troubleshooting

The image formation system (Figure 7-6) consists of the following imaging units:

- photosensitive drum cartridge carousel
- laser/scanner
- toner cartridges
- intermediate transfer belt (ITB) unit
- secondary transfer roller



**Figure 7-6** Image formation

Before beginning image formation troubleshooting, check that the media meets the specifications listed in the *HP LaserJet Printer Family Paper Specification Guide*.

## Print density test and color checks

Use the configuration page to check the print density of the black, primary, and process color levels. Solid black and color filled areas on the configuration page demonstrate the ability to print at full density. To print a configuration page, see page 307.

In addition to the items listed above, the configuration page provides the following information:

- It helps isolate the problem to the software or the printer.
- It shows that all colors print.

The following media-related items are responsible for many image formation and print-quality defects:

- rough paper
- heavy paper
- transparencies out of the specified thickness range
- paper that has absorbed too much moisture from the atmosphere
- room environment (humidity too high or low)

## Understanding color variations

The printed output may not match the computer screen, and the colors printed on successive pages may not match. While color variations are inherent in this printing method, they may indicate changes in the printing environment, print media, or printer components.

### Common causes of color variation

The following list outlines the major causes of color variations between computers, applications, and output devices.

- Halftone patterns produced on monitors and the types of patterns used in the print jobs are different and might cause variations in the printed output.
- The printed output differs from the image on the monitor because the monitor and the print media have different reference values of black and white. The monitor screen has charcoal gray for the black level, and the white on the monitor screen is actually blue. Black on the print media is limited only by the fill capability of the printer, and most good quality paper has a very high white level. In addition, phosphor (used in color monitors) and toner have entirely different spectra characteristics and different color rendering capabilities. Differences between output are common. Blues generally match better than reds.
- The color of the ambient light changes the perception of color. Fluorescent light lacks many colors present in incandescent light, and the color range of natural light is broader than any artificial light. When comparing color, choose a standard light source for reference and understand that the perceived color will change as the light changes.
- Long term color variations occur as paper ages. Use high-quality paper and protect the paper from sunlight to help minimize discoloration.
- Environmental changes can cause color variation. The development process places a high potential across an air gap to attract toner to the imaging drum. Changes in relative humidity vary the point at which the toner travels to the imaging drum.
- All consumable components have a finite life span, and as these components reach the end of their useful life, their ability to produce consistent print quality diminishes.
- Paper roughness can cause colors to appear different. Use standard paper.



## Color selection process

The user selects the color in the application, but the operating system may convert or modify some characteristics of the color before sending the information to the printer driver. The printer driver may also modify color characteristics depending upon the selected output mode.

Any color characteristics not addressed by the printer driver or applications are set to the printer default. The default color may not match the color the user selected.

## Customizing color output through printer drivers

The printer driver, which is installed with your printer software, enables your software applications to use the features of the printer. It also gives you customized control of color text, graphics, and photos.

The method of accessing your printer driver depends on your computer's operating system. For specific instructions on accessing printer drivers, see the printer driver's Readme file, which is included on the printing system CD-ROM.

The following color control features are available only through your HP printer driver. See the printer driver's online Help for details on color settings and their effect on printed output.

### Halftone options

Halftone options affect the resolution and clarity of your color output. You can select halftone settings for text, graphics, and photos independently. The two halftone options are Smooth and Detail.

The Smooth option provides better results for large, solid-filled print areas. It also enhances photos by smoothing out fine color gradations.

The Detail option is useful for text and graphics that require sharp distinctions among lines or colors, such as images that contain a pattern or a high level of detail.

## HP ColorSmart II

HP ColorSmart II default settings will produce optimum results for most color printing needs. However, you can also manually adjust color settings through the printer driver's Vivid Color and Screen Match color control options.

- **Vivid color**

Vivid Color allows print to have a higher color saturation by putting more toner on the page; however, this may cause scatter.

- **Screen match**

Screen Match (sRGB) (standard red-green-blue) prints colors that are close to those you see on your screen. Screen Match can be useful for retouching photographs or when you have created colors on your screen that you wish to reproduce, such as special colors for a company logo.

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### Note

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Factors such as the type of monitor you use and the room's lighting can affect the appearance of colors on your screen.

## Print in grayscale

The Print in Grayscale option in the printer driver allows you to print documents using shades of gray in place of colors. This option is ideal for printing proofs of color documents, or for printing documents that will later be faxed or photocopied.

## Matching colors

The process of matching printer output color to your monitor is quite complex because printers and computer monitors use different methods of producing color. Monitors *display* colors by light pixels using an RGB (red, green, blue) color process, but printers *print* colors using a CMYK (cyan, magenta, yellow, and black) process.

## Color-matching factors

Several factors can influence your ability to match printed colors to those on your monitor. These factors include:

- print media
- overhead lighting
- personal differences in perception
- software applications
- operating system palettes
- monitors
- video cards and drivers

## Matching PANTONE<sup>®</sup>\* colors

In addition to controlling color through the printer driver, you can control color through PANTONE<sup>®</sup>\* color matching.

PANTONE<sup>®</sup>\* colors are certified RGB and CMYK values specified in the PANTONE<sup>®</sup>\* color-matching system, which is supported in many graphics software applications. This color-matching system is useful for matching printer output to a specific color (for example, a logo). See the documentation for your software application for instructions on using PANTONE<sup>®</sup>\* colors.

For more information on using PANTONE<sup>®</sup>\* colors, see the Readme file for the PANTONE<sup>®</sup>\* color-matching system included on the printing system CD-ROM.

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### Note

Color settings, halftone settings, and print media affect the appearance of PANTONE<sup>®</sup>\* colors. To achieve true PANTONE<sup>®</sup>\*-certified colors, all components used, including the video driver, software application or printer driver, and the print media, must be PANTONE<sup>®</sup>\*-certified.

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## Adjusting color balance

This printer features automatic color calibration to provide high-quality color output. In situations that require critical color control, you can manually adjust the density balance of the printer's four toner colors.

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### CAUTION

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This procedure should only be performed by your network administrator. Performing this procedure changes the color balance of the printer by altering halftones and affects *all* print jobs.

## To adjust color balance

### Step 1: Print a color balance calibration page.

The color balance calibration page (shown in Figure 7-7) displays current color settings and provides a record of the printer's initial settings before any adjustments are made.

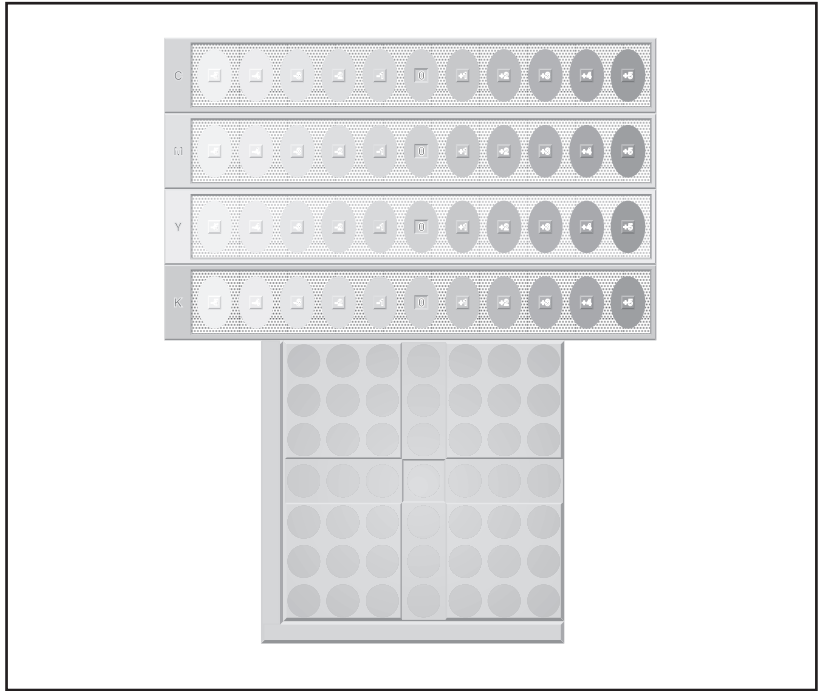
- 1 Press **Menu** until CALIBRATION MENU displays.
- 2 Press **Item** until PRINT CALIBRATION PAGE displays.
- 3 Press **Select** to print the color balance calibration page. The page consists of four color bars (cyan, magenta, yellow, and black) and a box containing gray balance circles. The factory default setting for each color is zero. The range of settings is -5 to +5.

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### Note

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Adjusting densities using the four color bars provides coarse color balance adjustments. After making these adjustments, you can fine-tune color densities by adjusting the gray balance. (See step 7 for instructions.)



**Figure 7-7** Color balance calibration page

**Step 2: Adjust the cyan (C) density setting.**

Examine the cyan density bar (C) on the color balance calibration page from a distance of 2 meters (6 ft). If the center oval matches the background pattern more than the other ovals, the cyan density does not need to be adjusted, and you should continue to the magenta (M) setting. If an oval left of center or right of center matches the background more than the center oval, use the following steps to enter the number:

- 1 Press **Item** until CYAN DENSITY displays.
- 2 Press the right side of the **Value** key to increase the value, or press the left side to decrease it, until the number corresponding to the oval that most closely matches the background pattern is displayed.
- 3 Press **Select** to save the value. An asterisk (\*) displays next to the selected setting.

### Step 3: Adjust the magenta (M) density setting.

Examine the magenta density bar (M). If the center oval matches the background pattern more than the other ovals, the magenta density does not need to be adjusted and you should continue with the next step. If not, use the following steps to adjust the density:

- 1 Press **Item** until MAGENTA DENSITY displays.
- 2 Press the right side of the **Value** key to increase the value, or press the left side to decrease it, until the number corresponding to the oval that most closely matches the background pattern is displayed.
- 3 Press **Select** to save the value. An asterisk (\*) displays next to the selected setting.

### Step 4: Adjust the yellow (Y) density setting.

Examine the yellow density bar (Y). If the center oval matches the background pattern more than the other ovals, the yellow density does not need to be adjusted and you should continue with the next step. If not, use the following steps to adjust the density:

- 1 Press **Item** until YELLOW DENSITY displays.
- 2 Press the right side of the **Value** key to increase the value, or press the left side to decrease it, until the number corresponding to the oval that most closely matches the background pattern is displayed.
- 3 Press **Select** to save the value. An asterisk (\*) displays next to the selected setting.

### Step 5: Adjust the black (K) density setting.

Examine the black density bar (K). If the center oval matches the background pattern more than the other ovals, the black density does not need to be adjusted and you should continue with the next step. If not, use the following steps to adjust the density:

- 1 Press **Item** until BLACK DENSITY displays.
- 2 Press the right side of the **Value** key to increase the value, or press the left side to decrease it, until the number corresponding to the oval that most closely matches the background pattern is displayed.
- 3 Press **Select** to save the value. An asterisk (\*) displays next to the selected setting.

### Step 6: Reprint the color balance calibration page. (See step 1.)

### Step 7: Adjust the gray balance.

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#### Note

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Adjusting densities using the gray balance pattern allows you to fine-tune color balance. This process affects all four color bars.


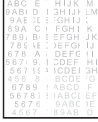
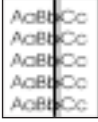




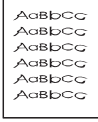






Examine the gray balance circles in the box at the bottom of the color balance calibration page. If the circle in the center most closely matches the background pattern, then the gray balance does not need to be adjusted. If the circle does not match, use the following steps to adjust gray balance.

- 1 Locate the gray circle that most closely matches the background. The magenta (M) and yellow (Y) numbers associated with this circle indicate the optimum gray balance settings for these colors.
- 2 Adjust the magenta and yellow settings (yellow is horizontal and magenta is vertical) until the gray circle is in the middle. Use the values from the bars above to select the value to be entered.
- 3 After making adjustments to the magenta and yellow settings, press **Go** to return the printer to the READY state.

# Image defects


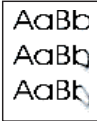
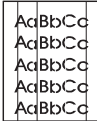

Unless otherwise specified, all references in this section to horizontal or vertical directions of print quality problems refer to problems found on letter and A4-sized media. For more information on a specific image defect, see the page numbers below each image in the table below.

**Table 7-6 Image defect table**

 <p>Background scatter (see page 274)</p>	 <p>Banding and horizontal lines (see page 274)</p>	 <p>Black lines (see page 276)</p>	 <p>Black or partially black pages (see page 276)</p>
 <p>Blank or white page(s) (see page 277)</p>	 <p>Blank spots (see page 278)</p>	 <p>Character voids (see page 278)</p>	 <p>Distorted image (see page 279)</p>
 <p>Dropouts (see page 279)</p>	 <p>Faded print, random faded areas (see page 280)</p>	<p>No image available</p>	 <p>Gray background (see page 281)</p>
 <p>Irregular raised spots or stray toner (see page 281)</p>	 <p>Light, dark, faded print (see page 282)</p>	<p>No image available</p>	 <p>Loose toner (see page 282)</p>



## Image defect table, continued

<p style="text-align: center; color: magenta;"><b>No image available</b></p> <p>Mottled or marbled output (see page 282)</p>	 <p>Random black spots (see page 282)</p>	<p style="text-align: center; color: magenta;"><b>No image available</b></p> <p>Sharkskin (see page 283)</p>	<p style="text-align: center; color: magenta;"><b>No image available</b></p> <p>Single color missing (see page 283)</p>
<p style="text-align: center; color: magenta;"><b>No image available</b></p> <p>Sunburn (see page 283)</p>	 <p>Toner smear (see page 283)</p>	 <p>Vertical lines or streaks (see page 284)</p>	 <p>Wavy characters (see page 285)</p>

Additional defect information is found in the following sections:

- Overhead transparency defects (see page 286)
- Repetitive defects (see page 288)



## Background scatter

- The media does not meet HP specifications.
- The toner cartridge is defective.
- The inside of the printer is dirty.
- The transfer roller is dirty or worn.
- Generate a cleaning page.

## Banding and horizontal lines

Banding occurs when solid fill areas show streaks or bands of shade variations. This can be caused by:

No image  
available

- Worn, damaged, or contaminated gears.
- Consumables that are beyond their rated life.
- Improper consumable storage.

If the problem persists:

- Print a configuration page to check the life of the consumables. Replace any consumable that is past its rated life.
- Banding is more visible in some halftone patterns than others. Print a page using a halftone pattern such as “banddiag” provided in the Color Smart selection in the printer driver. If the defect occurs only once on a letter size sheet, try printing the pattern on a legal-size sheet.
- Observe the following from the test sample:
  - Check the spacing or “pitch” between the defects.
  - Check to see if the defect spans all color planes.
  - If the defect is in all color planes, does the defect produce a straight line through all color planes or does it move from one color plane to the next?
  - If the defect moves from one color plane to the next, measure the amount it moves. This movement amount is called the “procession.” Keep in mind the print order is K-M-C-Y. Measure the procession from K to M or M to C, not K to C.

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### CAUTION

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Do not expose the imaging drum to light for more than 15 seconds. The drum is light sensitive, and exposure to light can cause permanent damage.

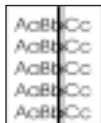
## **Banding — horizontal**

- The imaging drum may have been exposed to light. (See “Sunburn” on page 283.)
- The ITB may accumulate contamination on its rollers causing a random mechanical banding. If you notice buildup on the rollers, replace the ITB.
- As the developer rotates, the gap between the imaging drum and the developer can vary slightly. This can cause toner to be transferred lighter or darker approximately every 38 mm. This defect is more apparent in secondary colors. There is no workaround.

## **Banding — vertical**

- The doctor blade on the developer can develop notches over time. If you observe severe notching, replace the developer.
- As the imaging drum gets older, the charge roller doesn't charge the imaging drum as well as it used to. If you notice buildup or contamination on the charge roller, replace the imaging drum.

## Black lines



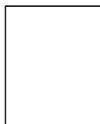
- The toner cartridge is defective.
- The toner cartridge is not seated properly.
- The fusing assembly is contaminated or damaged.
- The static eliminator teeth are contaminated or defective.

## Black or partially black pages



- Check for poor contact between the drum cartridge contact (for primary charging bias) and the primary charging bias contact. To improve the contact, clean the contacts. If the problem persists after cleaning or the contacts are deformed or damaged, replace them. If the contacts have slipped off, adjust them correctly.
- Check the drum cartridge (primary charging roller). If defective, replace the drum cartridge.
- Check for poor contacts in the connectors. Reconnect the DC controller PCB connector and the high-voltage PCB 2 connector correctly.
- Check for a defective high-voltage PCB (primary charging bias output shortage). If defective, replace the high-voltage PCB 2.
- Check for a defective DC controller PCB. If defective, replace the DC controller PCB.
- If ITB clutch was removed, check for proper timing.
- The black toner cartridge is empty.
- Make sure clutch CL2 is connected (plugged into the paper PCA).
- This defect can be caused by improper timing on the ITB clutch gears. Make sure that the cams are in sync. The two white gears on the left side of the printer (see Figure 6-46) should have two timing marks pointing toward each other.
  - Cams with a single line should be off one tooth clockwise on the right gear.
  - Cams with a double line should be aligned.

## Blank or white pages



- Your software application is sending an extra page-eject command.
  - Check the software's printing configuration information.
- There is a problem with the network configuration. Some sharing devices on networks may generate a blank page as a separator.
  - Check with the network administrator.
- The printer may be feeding two or more pages at once because the paper is difficult to separate.
- The sealing tape has been left in the toner cartridge.
- The toner cartridge is empty or defective.
- The laser scanner door does not open properly.
  - Remove and reseal the toner cartridge.
  - Check the laser scanner shutter door for proper operation.
- The toner cartridge guide is damaged, improperly positioned, or missing.
- There is no transfer roller voltage.
  - Perform the Half Self-Test Functional Check to check all other electrophotographic processes.
  - Replace the transfer roller if necessary.
- The high-voltage connectors are mounted on the high-voltage power supply (HVPS) PCA and protrude into the toner cartridge cavity.
  - Check the springs for functionality. Clean if dirty; replace if defective or missing.
  - The HVPS PCA is defective.
- The DC controller PCA is defective.
- There is no developing bias.
  - Clean the HVPS contacts. With no developing bias charge, toner is not attracted to the drum.
- There is no drum ground path.
  - Check the drum ground.
- The laser scanner cable assembly is defective.

(Continued on the next page.)

- The page length and margins are not set correctly for the paper size. Verify that the ribbon connector at J1307 of the HVPS is properly seated.
- If the HVPS has been removed recently, verify that the ribbon connector from the DC controller PCA to the HVPS is properly seated at both ends.
- Verify that the photoconductive drum is rotating properly. Perform the drum diagnostic test to visually observe if the drum is rotating or using a felt-tipped marker place an index mark on the edge of the drum outside the image area. Turn on the printer (wait for drum rotation to occur), and then look to see if the drum has moved. If the drum has not moved, investigate the mechanical and electrical drum rotation circuitry and movement mechanisms.
- The imaging drum shutter may not be retracting. Replace the imaging drum.

## Blank spots



- The paper does not meet HP paper specifications or is stored improperly.
- The toner cartridge is defective.
- The transfer roller is dirty or defective.

## Character voids



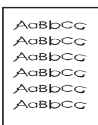
- Use paper that meets HP paper specifications.
  - The surface of the paper is too rough or the paper's surface is too smooth for proper toner adhesion.
  - Printing is on the wrong side of the paper.
  - The transparencies are not designed for proper toner adhesion.
  - The transfer roller is defective.
  - The laser scanner assembly is defective.

No image available

## Colorless output (black only)

- Make sure clutch CL2 is connected (plugged into the paper PCA).
- This defect can be caused by improper timing on the ITB clutch gears. Make sure that the cams are in sync. The two white gears on the left side of the printer (see Figure 6-46) should have two timing marks pointing toward each other.
  - Cams with a single line should be off one tooth clockwise on the right gear.
  - Cams with a double line should be aligned.
- Check for a defective development PCB. If defective, replace the development PCB.
- Check for a defective DC controller PCB. If defective, replace the DC controller PCB.

## Distorted image



- The paper does not meet HP paper specifications or is stored improperly.
- The printer operating environment does not meet HP specifications.
- The connection of the cables to the laser scanner is poor.
- The connection of the cables to the ECU is poor.
- The laser scanner is defective.
- The DC controller is defective.

## Dropouts



- The paper does not meet HP paper specifications.
- The printer's operating environment does not meet specifications.
- The print density is set incorrectly. Change to a darker setting and retry printing.
- The DC controller PCA is defective.
- The high-voltage power supply PCA is defective.
- The transfer roller is defective.

## Faded print, faded areas, or faded vertical streaks



- The moisture content of your media may be uneven or too low. Use media from a different source or from a new ream of paper.
- If some areas of the paper reject toner, try using paper from a different source or from a new ream of paper.
- The media may be too rough and exceed media specifications. See “Supported media specifications” on page 15. Do not use paper that exceeds specifications.
- Check that the printing environment is within humidity specifications.
- Faded print could result from low toner in a particular toner cartridge. If a **TONER LOW** or **TONER OUT** message displays on the printer control panel, replace the appropriate toner cartridge.
- Check to see if the transfer belt is contaminated. Use a lint-free cloth to clean any contaminants from the transfer belt surface.
- The connections into CL3 (ITB unit separation clutch) and CL3 (ITB cleaning roller separation clutch) have been switched at the clutches, not on the PCB. (This typically shows a light black print on the page.)
- The toner cartridge is getting low on toner.
- The paper you are using does not meet HP paper specifications.
- The toner density setting is not adjusted correctly.
- The internal mirror or optics are contaminated.
- The laser scanner is damaged.
- The document scanner needs to be recalibrated.
- There is a problem in the contact image sensor.
- There is a problem in the formatter.



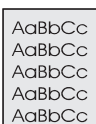
## Full-page ghosting

Full-page ghosting occurs when an image prints in full color on one page, but a faded copy of it is also seen on the following page.

No image available

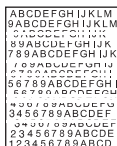
- Make sure that the top spring in the ITB drawer is properly connected.
- Replace the ITB.
- Ensure operation of the ITB Cleaning Roller Clutch (CL3).
- If the imaging drum is near end of life, replace it.
- If the toner cartridge is near end of life, replace it.

## Gray background



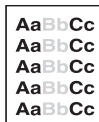
- The paper does not meet HP paper specifications or is stored improperly.
- The printer operating environment does not meet specifications.
- The toner density is set incorrectly.
- The toner cartridge is defective.
- The inside of the printer is dirty.
- The printer is printing on envelope seams.
- Move the text to an area without seams.

## Irregular, raised spots or stray toner



- Toner collected on the transfer belt can cause smudging on the back of the page. Smudges commonly appear on the edges of pages after the media size is changed. The belt is self-cleaning and the smudging will normally clear within a few pages.
- Toner on the edge of the media is usually caused by toner collecting on the paper guides. Inspect the paper guides and clean with a lint-free cloth if necessary.
- Do not re-feed paper that has already been through the printer. Re-feeding paper that has already passed through the printer can contaminate the fuser causing stray toner defects.
- Paper may have blobs after warm-up. Print a few pages to resolve the anomaly.

## Light, dark, or faded print



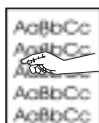
- The toner density setting is wrong.
- The toner cartridge is low.
- The transfer roller is defective.
- The paper does not meet HP paper specifications or is stored improperly.
- The laser scanner is defective.
- The high-voltage power supply is defective.

## Light black or no black print

No image available

- The black toner cartridge is empty. Replace it.
- The HVPS may be faulty.
- The connections into CL2 and CL3 have been switched at the clutches, not on the PCB.

## Loose toner



- Dirt is in the printer.
- The toner cartridge is defective.
- The paper is too smooth.
- The driver setting for the paper type is wrong.
- The fuser is defective.

## Mottled or marbled output

No image available

Determine which toner color needs to be replaced by looking at the secondary colors on the self-test page.

- If red and green are mottled, replace yellow.
- If red and blue are mottled, replace magenta.
- If green and blue are mottled, replace cyan.

## Random black spots



- The paper does not meet HP paper specifications.
- You are printing on the wrong side of the paper.
- The printer requires cleaning with a cleaning page.
- The toner cartridge is damaged.

## Sharkskin

No image available

- Use paper with lower resistivity.
- Make sure the humidity and temperature are within specifications.
- Do not use Automatic Duplex mode. Duplex manually or not at all.

## Single color missing

No image available

- Remove the toner cartridge and manually check the level of toner in the toner cartridge.
- Check for a defective light pipe sensor. If defective, replace the toner level sensor.

## Sunburn

No image available

The imaging drum might have been exposed to light. Symptoms of sunburn are streaked or blurred lines across the length of the page (side-to-side on portrait, or top-to-bottom on landscape).

- Print 50 to 100 pages on the imaging drum to remove the sunburn.
- If sunburn symptoms are still occurring, allow the imaging drum to sit in a dark place for two to three days.
- If sunburn is severe (the symptoms don't go away), replace the imaging drum.

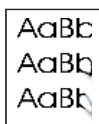
---

### CAUTION

---

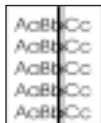
Do not expose the imaging drum to light for more than 15 seconds. The drum is light sensitive, and exposure to light can cause permanent damage.

## Toner smear



- There is dirt on the paper.
- The fusing rollers are dirty.
- The paper does not meet HP specifications.
- The toner cartridge is defective.
- The fusing assembly is defective.
- There is dirt in the printer.
- The static eliminator is dirty or is not grounded, allowing a static charge to remain on a page.
- The DC controller PCA is defective.

## Vertical lines or streaks

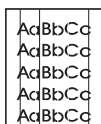


- Check for a leak where light might be entering the printer.
- Check for circumferential scars on the photosensitive drum. If scars are present, replace the drum cartridge if the line goes through all colors.
- Check for circumferential scars on the upper fusing roller. If scars are present, replace the upper fusing roller if the line goes through all colors.
- Remove the imaging drum and inspect main charger or imaging drum for a contaminate such as a fiber if the line goes through all colors.

### CAUTION

Do not expose the imaging drum to light for more than 15 seconds. The drum is light sensitive, and exposure to light can cause permanent damage.

## Vertical black lines



- The toner cartridge is defective.
- The toner cartridge is not seated properly.
- The fuser entrance is dirty.
- The fuser has scratches on it.
- This may be a repetitive defect. If so, the lines will be repeated at a consistent interval down the page.
- The printer needs to be cleaned.
- There is a problem in the heating element.

## Vertical white lines



- If white lines or streaks appear only in the black areas of the printed media, print several configuration pages to clear the anomaly. If this does not clear the problem, check the sleeve surface to confirm the defect, then replace the black toner cartridge.
- If white lines appear only in a particular color, try printing several configuration pages to clear the error. If the error does not clear, check the sleeve surface to confirm the defect, then replace the defective toner cartridge.
- There is a lack of toner or the toner cartridge is faulty.
- There is dirt in the laser path.
- The fuser is defective.
- A mirror in the laser scanner is dirty.

## Wavy characters

Mechanical instability in the scanner mechanism or the optics can cause wavy characters.



- Reprint the job to ensure that the problem persists.
- If the failure remains, replace the laser scanner assembly.

# Overhead transparency defects

Overhead transparencies may display any of the image quality defects shown in the previous samples. In addition, because transparencies are pliable while in the print path, they are subject to being marked by the media-handling components.

## Note

Allow transparencies to cool at least 30 seconds before handling them.

- Make sure that “transparency” is checked as the media type in the Paper Tab in the printer driver. Also, make sure that the media input tray is correctly configured for transparencies. When Transparency is selected as the media type and ColorSmart II is selected on the Color tab, the printer will use a color treatment optimized for projection.
- If transparencies show lines and creases in the media and/or the printed output, compare the defect against the repetitive defect ruler (page 289) to help isolate the cause to a particular component.
- Check that the transparencies meet the specifications listed in the *HP LaserJet Family Paper Specification Guide*.
- If the transparencies have spots or smudges, reprint them being careful not to touch the surface of the media. Skin oils can contaminate transparencies, causing spots and smudges.
- Small random dark areas on the trailing edge of solid fill pages may be caused by transparencies sticking together in the face up bin. Try printing the job in smaller batches.
- Send transparencies only to the face-down output bin.

Transparencies created on the printer may look rough, but they can still be used successfully on reflective-type (portable) transparency projectors.

## Dull or dark transparencies

If the transparency colors are dull or dark, ensure the transparencies meet the specifications for this printer (part number C2934A for letter, and C2936A for A4).



No image available

## Incorrect image on transparencies

This might occur even though the correct media is loaded in the correct tray. Toner might not adhere to the media and an image might show up on pages where it isn't meant to appear. (See "Full-page ghosting" on page 281.)

When this occurs on transparencies, the connections for the ITB cleaning roller (clutch 3) and for the secondary transfer roller (clutch 4) might be reversed.

## Repetitive defects on transparencies



Overhead transparencies that have repetitive defects spaced 131 mm (5.2 in) apart indicate a defect on the upper fuser roller.

- 1 Turn the printer off and unplug the printer, allow 30 minutes for the fuser to cool, and remove the fuser.

### CAUTION

Make sure to wait 30 minutes before removing the fuser. The fuser will be hot.

- 2 Turn the fuser gears and inspect the surface of the upper fusing roller. If the roller has surface defects (gouges), replace the fusing assembly.

## Streaking on transparencies



If the transparencies have streaks, this could be due to condensed wax from the toner making its way onto the fuser assembly rollers during the fusing process. Try cleaning the fuser rollers using the following process:

- Step 1 Saturate a corner of a lint-free, static-free wipe with isopropyl alcohol.
- Step 2 Open the alternate path door (the small door) at the back of the printer.
- Step 3 Place the printer into calibration mode by opening and then closing the large door at the rear of the printer, or by pulling a drawer open, and then quickly closing it.
- Step 4 While the printer is calibrating, the fuser rollers are rolling. Place the wipe up against each roller in turn, keeping it in place for five to ten seconds.

# Repetitive defects troubleshooting

Repetitive defects are defects that occur on the page. Most repetitive defects are caused by problems with one of the following:

- Developer roller
- Charge roller
- Cleaning roller
- Transfer roller
- Fuser
- Imaging drum
- Transfer belt

See page 289 for the repetitive defect ruler and Table 7-7 for the defect spacing chart.

## CAUTION

Do not expose the imaging drum to light, and be careful not to scratch or get fingerprints on the drum surface during cleaning. Do not blow on the imaging drum.

## Imaging drum defects

### Causes:



- Damage such as scratches or dents on the imaging drum. These usually appear as black or white marks on the page.
- Paper dust adhering to the imaging drum. These usually appear as white marks in the dark printed areas of the page.
- Exposure of portions of the imaging drum to light. This causes light sections in the printed output. The life of the imaging drum is shortened by exposure to light.

### Actions:

- Print at least four configuration pages to determine if the defect repeats in the same horizontal orientation.
- Inspect the imaging drum for scratches, dents, or other damage. Replace if needed.
- If the problem is dust, remove the dust with isopropyl alcohol applied with a lint-free, static-free wipe. Try this *only* if the print defect is unacceptable and the only other alternative is replacing the imaging drum.
- Defects caused by exposure to light might clear up over time. If severe, replace the imaging drum.



# Repetitive defect ruler

First occurrence of print defect

Color developer 30 mm (1.2 in)

Black developer roller 37 mm (1.5 in)

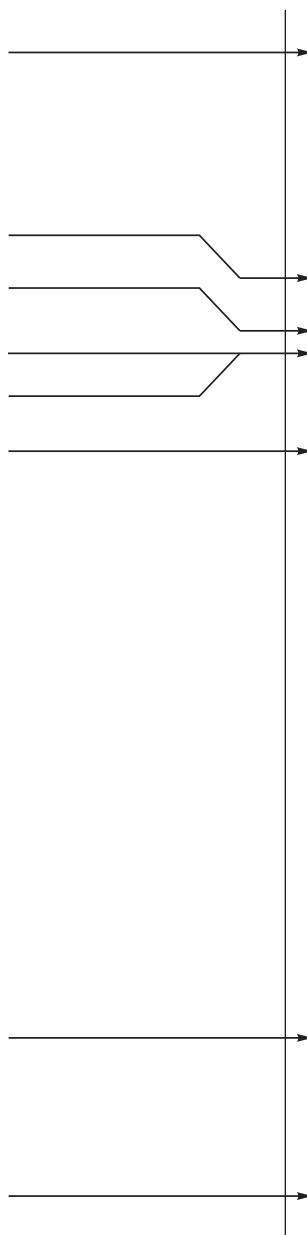
Charge roller 40 mm (1.6 in)

ITB cleaning roller 40 mm (1.6 in)

Transfer roller 53 mm (2.1 in)

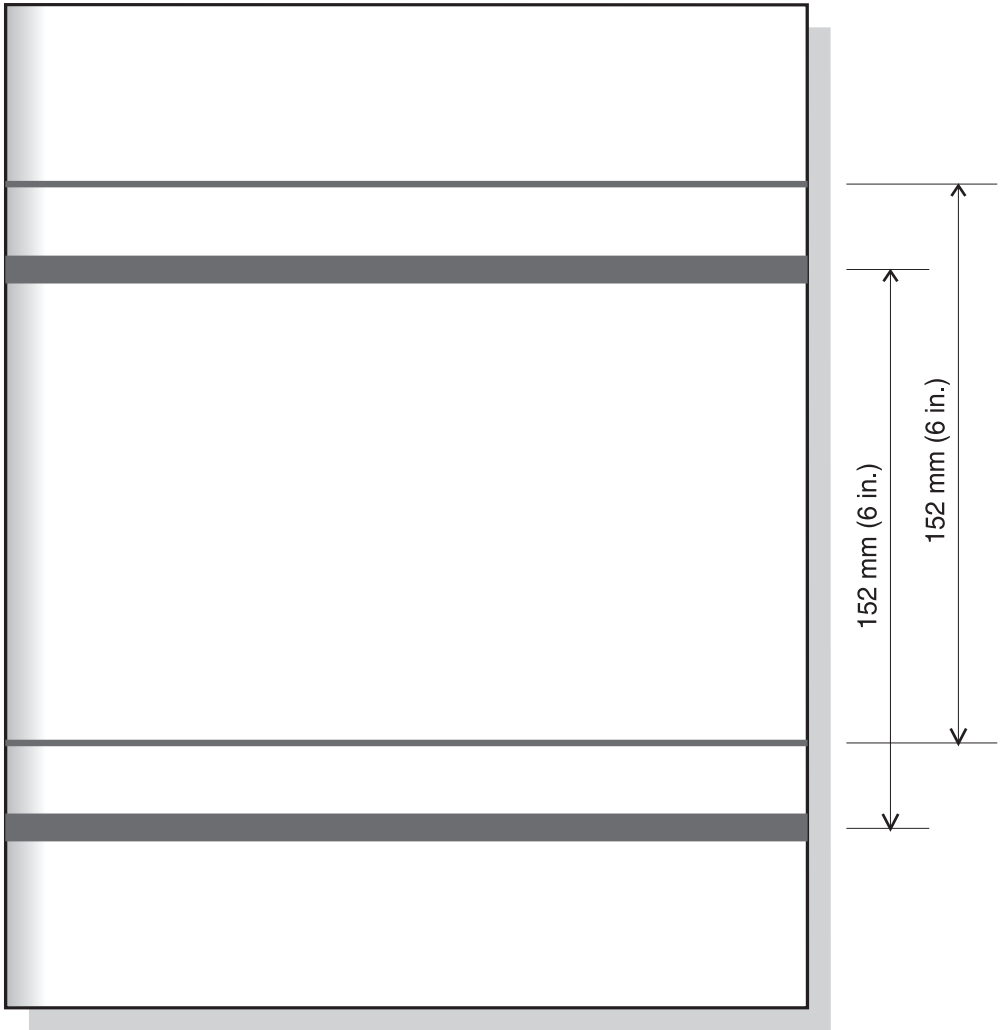
Fuser 131 mm (5.2 in)

Imaging drum 152 mm (6 in)



**Table 7-7 Defect spacing chart**

<b>Consumable</b>	<b>Roller</b>	<b>Distance</b>
Drum	Charge roller	40 mm (1.6 in)
	Imaging drum	152 mm (6 in)
Developer	Black developer	37 mm (1.5 in)
	Color developer	30 mm (1.2 in)
Fuser		131 mm (5.2 in)
ITB	ICL roller	40 mm (1.6 in)
Transfer roller		53 mm (2.1 in)



**Figure 7-8** Imaging drum exposed to light (not to scale)

# Interface troubleshooting

## Communications checks

**Note**

Communication problems are normally the customer's responsibility. Time spent attempting to resolve these problems may not be covered by the product's Hewlett-Packard warranty.

Refer the customer to the network administrator for assistance in troubleshooting network problems.

If the printer is not connected to an MS-DOS-based host, proceed to Table 7-8, Communications checks.

**Table 7-8 Communications checks**

Checks	Action
Is your computer configured to the parameters described in the configuration instructions?	<p>These parameters are required to communicate with the printer. Verify that the configuration of the computer's communications port matches these parameters.</p> <p><b>Note:</b> If these parameters are not set properly, an error may display on the control panel.</p>

## EIO troubleshooting

If the printer contains an optional HP JetDirect print server, and you cannot communicate with the printer over the network, verify the operation of the print server. Print an HP JetDirect configuration page. If the message "I/O CARD READY" does not appear on the configuration page, see the troubleshooting section of the *HP JetDirect Print Server Software Installation Guide*.

If the host system and printer still are not communicating, replace the formatter PCB and the EIO card and reconfigure the printer. If the problem persists, a protocol analyzer may be needed to find the source of the problem.

**CAUTION**

HP LaserJet printers are not designed to work with mechanical switch-box products without proper surge protection. These devices generate high transient voltages that cause permanent damage to the formatter PCB. This circumstance is not covered by the Hewlett-Packard warranty.

# AUTOEXEC.BAT standard configurations

## Parallel DOS commands

Ensure that the AUTOEXEC.BAT file contains the following statements for parallel interface communications:

```
MODE LPT1: , ,P
```

For MS-DOS version 4.0 and above:

```
MODE LPT1: , ,B
```

---

### Note

---

This example assumes that you are using parallel printer port LPT1. If you are using LPT2 or LPT3, replace LPT1 in the example with the appropriate printer port.

## Printer Job Language (PJM) commands

See the *HP Printer Job Language Technical Reference Manual* for a complete description of PJL commands. This manual is available with the *HP PCL/PJL Reference Set* on CD-ROM, part number 5961-0976.

### @PJL [Enter]

This command enables the specified printer language. If the printer does not receive this command it enables the default language. This ensures that applications that do not support PJL print correctly. The command syntax is:

```
@PJL [Enter] LANGUAGE = {PCL/PostScript} [<CR>]  
<LF>
```

## UEL

This command (also referred to as the universal exit language command) terminates the current printer language and returns control to PjL. It performs the following actions:

- Prints all data received before this command.
- Performs a reset: <esc>E in PCL, <cntrl>D in PostScript.
- Turns control over to PjL.

This command is also a valid HP-GL/2 terminator.

The UEL command must be immediately followed by the “@PjL” command prefix. Characters or control codes other than @PjL (such as <CR> or <LF>), enable the default language and process the print job in that language. All jobs must begin and end with the UEL command. Besides entering PjL, the UEL command has the same effect as the <esc>E command. However, the <esc>E command should always be included to ensure backward compatibility.

## @PjL COMMENT

This command designates the current line as a comment, which is ignored. The syntax is:

```
@PjL COMMENT <words> [<CR>] <LF>
```

## @PjL INFO CONFIG

This command solicits a response to describe the installed options. This command allows the printer to automatically configure the installed options as the applications require.

## @PjL INFO ID

This command identifies the printer type to the host for reference when selecting printer drivers for automatic installation. The command syntax is:

```
@PjL INFO ID <CR> <LF>
```

## **@PJL INFO USTATUS**

This command queries the state of unsolicited JOB status. PAGE and TIMED status are not supported. The syntax is:

```
@PJL INFO USTATUS <CR> <LF>
```

## **@PJL INFO PAGECOUNT**

This command returns the number of pages printed by the engine.

## **@PJL JOB**

This command informs the printer of the start of a PJL job and synchronizes the job status information. The printer counts print jobs, including nested jobs, incrementing the job counter for the @PJL JOB command and decrementing it for @PJL EOJ.

The printer accepts the NAME= parameter and returns the name string in the unsolicited JOB start status message (if unsolicited job status is enabled). The printer transmits the unsolicited JOB status message to every I/O channel which has enabled this function. This message's format is:

```
@PJL USTATUS JOB <CR><LF>  
START<CR><LF>  
[NAME=<job name><CR><LF>]  
<FF>
```

The printer resets the nested job counter whenever it switches the source to a different I/O channel. This prevents a corrupt job on one channel from disrupting the activities on another channel.

## **@PJL EOJ**

This command identifies the end of a print job and is a hint for the I/O switching algorithm. The printer counts nested jobs and recognizes job boundaries when the counter decrements to zero. The printer ignores isolated EOJ commands. Each EOJ must be preceded by a JOB command.

## **@PJL ECHO**

This printer supports the ECHO command which transmits its parameters over the I/O channel to the host that issued the command.

## **@PJL USTATUS JOB=ON/OFF**

This command enables or disables the JOB status for the I/O channel that delivers the command.

## **@PJL USTATUSOFF**

This command disables the unsolicited JOB status for the I/O channel that delivered the command. For this printer, it duplicates the function of @PJL USTATUS JOB=OFF, AND @PJL USTATUS DEVICE=OFF.

---

### **Note**

---

All commands not supported by this printer's PJL command set are returned with the message @PJL XXXX<CR><LF>?<CR><LF>.



# Control panel troubleshooting

## Control panel access

Accessing the diagnostics for the control panel is a simple process. Hold down the left side of the **Item** key (<-->) and turn on the printer. Hold the key down until DIAGNOSTICS MODE is displayed on the front panel, and then release the key. The front panel will change and display FORMATTER DIAGS EXECUTE TESTS. Press the **Menu** key to switch between the formatter diagnostics and the engine diagnostics. Press **Item** to scroll through the diagnostics available in each section.

A menu map helps you use the control panel menus. See the menu map sample that follows.

## Printing a menu map

Printing a menu map can help you navigate through control panel menus. See the menu map sample that follows

### Printing a menu map

- 1 On the printer's control panel, press **Menu** until INFORMATION MENU displays.
- 2 Press **Item** until PRINT MENU MAP displays.
- 3 Press **Select** to print the menu map. The printer will return to the READY state.



## Information Menu

The Information Menu selections are used for accessing and printing specific printer information.

**Table 7-9 Information Menu**

Menu item	Description
PRINT MENU MAP	Prints the control panel menu map.
PRINT CONFIGURATION	Prints the printer configuration page.
PRINT CONFIG CONTINUOUS	Continuously prints the configuration page until <b>Cancel Job</b> is pressed.
PRINT FONT LIST	Prints the available PCL and PS (emulated PostScript) font samples.
PRINT LASERJET DEMO	Prints a demonstration page containing 5 images (A4/LTR).
PRINT LASERJET DEMO 2	Prints a duplexed (simplex if no duplexer present) demo page on the size shown in default size. (48 MB required for simplex, 64 MB for duplex)
PRINT ACCESSORIES	Prints a page giving the accessory and supplies part numbers (in English, French, German, and Spanish).
PRINT COLOR GUIDE	Prints a how to use color guide (A4/LTR).
SHOW EVENT LOG	Prints a historical list of printer events.
REMAINING LIFE	Displays the projected remaining life for the transfer belt, fuser, and imaging drum.

## Paper Handling Menu

The Paper Handling Menu allows you to configure input trays by size and type. This menu can also be used to set the default media size and type.

### Note

The default mode for Tray 1 is TRAY 1 MODE=FIRST. In this mode, if media is loaded in Tray 1, and no other tray is requested, the printer will pull media from Tray 1 regardless of the size and type of media loaded in the tray. To configure Tray 1 by size or type, it must be configured as TRAY 1 MODE=CASSETTE.

**Table 7-10 Paper Handling Menu**

Menu item	Values
TRAY 1 MODE	FIRST* CASSETTE
TRAY 1 SIZE (appears only if Tray 1 mode is set to TRAY 1 MODE=CASSETTE)	LETTER*/A4** LEGAL EXEC JIS B5 A5 CUSTOM B5 COM10 C5 DL MONARC
TRAY 1 TYPE (appears only if Tray 1 mode is set to TRAY 1 MODE=CASSETTE)	PLAIN* PREPRINTD LTRHEAD TRNSPRNCY GLOSS PREPUNCHD LABELS BOND RECYCLED COLOR HEAVY CARDSTOCK
TRAY 2 TYPE	(same choices as TRAY 1 TYPE except LABELS and CARDSTOCK)
TRAY 3 TYPE	(same choices as TRAY 1 TYPE except LABELS and CARDSTOCK)
A4/LETTER OVERRIDE	NO* YES
DEFAULT SIZE	(same choices as TRAY 1 SIZE)

\*Denotes default setting

# Configuration Menu

The Configuration Menu is used to set general printer default settings.

## CAUTION

Hewlett-Packard recommends that configuration settings only be changed by a system administrator. Configuration settings seldom need to be changed.

**Table 7-11 Configuration settings**

Menu item	Values	Description
POWERSAVE	OFF 1 MIN (used for troubleshooting) 30 MIN 1 HR* 2 HRS 4 HRS 8 HRS	The length of time before the printer goes into power-saving mode.
PERSONALITY	AUTO* PCL PS	The personality (language) the printer uses to process a print job.
CLEARABLE WARNINGS	JOB* ON	If ON, message is displayed until <b>Go</b> is pressed. If JOB, message is displayed until end of print job.
AUTO CONTINUE	ON* OFF	Determines whether the printer continues printing when certain errors occur. If ON, printer returns to the READY state. If OFF, printer remains offline until <b>Go</b> is pressed.
TONER LOW	CONTINUE* STOP	Determines whether the printer continues or stops printing when a TONER LOW condition is detected.
JAM RECOVERY	OFF* ON	Printer attempts to recover from jams and reprints affected pages.
PRINT PS ERRORS	OFF* ON	Prints out an error page when emulated PostScript errors occur.

\*Denotes default setting

## Printing Menu

The Printing Menu is used to set default settings for a specific print job.

**Table 7-12 Printing Menu settings**

Menu Item	Values	Description
COPIES	1 to 999 (default:1)	Number of copies.
ORIENTATION	PORTRAIT* LANDSCAPE	Determines the default page orientation.
FORM LENGTH	5 to 128 lines (default: 60)	Maximum lines on a page before a formfeed occurs.
DUPLEX <sup>1</sup>	OFF* ON	Enables two-sided printing.
BINDING <sup>2</sup>	LONG EDGE* SHORT EDGE	Prints pages for specified binding type.
PCL FONT SOURCE	INTERNAL* SOFT SLOT n (n = 1,2,3)	Instructs the printer where to look for PCL fonts.
PCL FONT NUMBER	0 to 999 (default: 0)	Specifies a default PCL font number.
PCL FONT PITCH <sup>3</sup>	0.44 to 99.99 (default: 10)	Specifies a default pitch for PCL fonts.
PCL FONT POINT SIZE <sup>4</sup>	4 to 999.75 (default: 12)	Specifies a default font size for PCL fonts.
PCL SYMBOL SET	PC-8 (default)	Used to select an appropriate symbol set.
COURIER	REGULAR* DARK	Dark Courier was used in older LaserJet printers.
APPEND CR TO LF	NO* YES	Appends a carriage return to each line feed character in the data stream. (UNIX)

\*Denotes default setting

<sup>1</sup>Only displays when the duplex unit is attached

<sup>2</sup>Only displays when DUPLEX is selected

<sup>3</sup>Only displays when a fixed space font is specified

<sup>4</sup>Only displays when a proportional space font is specified

## I/O Menu

The I/O Menu allows you to make changes to printer interface settings. The following table lists the selections that appear for each item in this menu.

**Table 7-13 I/O Menu settings**

Menu Item	Values	Description
I/O TIMEOUT	5 to 300 SECONDS (default: 15)	Amount of time the printer waits to receive data before switching to another port.
I/O BUFFER	AUTO* OFF ON	Allocates memory to I/O ports.
I/O BUFFER SIZE <sup>1</sup>	nnnnnnK (default: 100K)	Amount of memory allocated to the I/O ports.
PARALLEL HIGH SPEED	YES* NO	Allows faster parallel communications supported by newer computers.
PARALLEL ADV FUNCTIONS	ON* OFF	Turns bidirectional parallel communication on and off.

\*Denotes default setting

<sup>1</sup>Only appears if I/O BUFFER is ON

## EIO Menu

If an Enhanced Input Output (EIO) card (for example, an HP JetDirect Print Server) has been installed in the printer, an additional menu is available. This additional menu provides a way to configure the EIO accessory and to adjust network interface settings. For information on HP JetDirect EIO menus, see the *HP JetDirect Print Server Software Installation Guide*. This guide is included with the HP Color LaserJet 4500 N and 4500 DN printers and is also available through HP Direct. (See Appendix D in the online user guide for ordering information.)

## Calibration Menu

This printer features automatic, internal calibration to produce optimum color for most print jobs. The Calibration Menu provides fine-tuning for critical color-matching requirements.

For information on using this menu to set toner densities, see page 268.

### CAUTION

Calibrating toner densities changes the color balance of your printer by altering halftones. It affects all print jobs. Notify your network administrator before performing this procedure.

**Table 7-14 Calibration Menu settings**

Menu Item	Values	Description
PRINT CALIBRATION PAGE		Prints out the color calibration page.
CYAN DENSITY	-5 to +5 (default: 0)	Used for increasing or decreasing cyan toner density.
MAGENTA DENSITY	-5 to +5 (default: 0)	Used for increasing or decreasing magenta toner density.
YELLOW DENSITY	-5 to +5 (default: 0)	Used for increasing or decreasing yellow toner density.
BLACK DENSITY	-5 to +5 (default: 0)	Used for increasing or decreasing black toner density.
RESET DENSITY VALUES		Resets density values back to default settings. Press <b>Select</b> to reset values.



## Resets Menu

The Resets Menu is used for resetting the printer's memory and for returning the printer to its factory default settings. It is also used to clear maintenance messages following the replacement of certain consumable items.

**Table 7-15 Resets Menu settings**

Menu Item	Description
RESET MEMORY	Resets the printer to user-specified default settings.
RESTORE FACTORY SETTINGS	Resets the printer to factory default settings.
NEW TRANSFER KIT SELECT IF DONE	Clears the maintenance message after the transfer kit has been replaced.
NEW FUSER KIT SELECT IF DONE	Clears the maintenance message after the fuser kit has been replaced.

# Troubleshooting tools

## Printer configuration page

Printing a printer configuration page can help you verify that the printer is configured properly. This can be useful in troubleshooting printer problems.

### To print a printer configuration page

- 1 On the printer control panel, press **Menu** until INFORMATION MENU displays.
- 2 Press **Item** until PRINT CONFIGURATION displays.
- 3 Press **Select** to print the configuration page. The printer will return to the READY state.

---

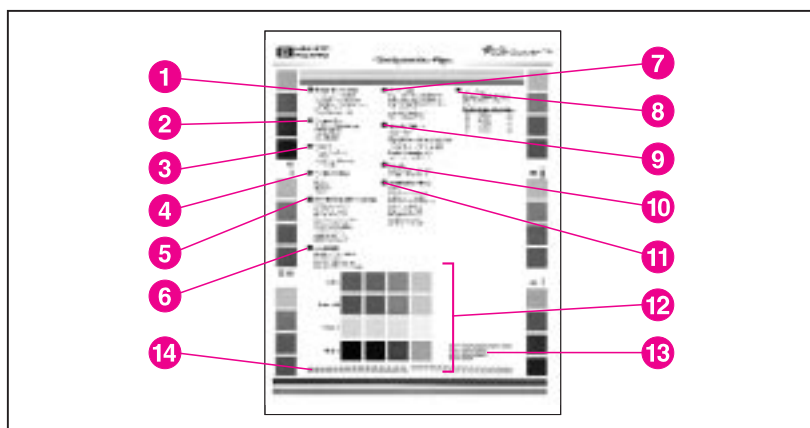
#### Note

If the printer is configured with EIO cards (for example, an HP JetDirect Print Server), an additional configuration page will print that provides interface configuration information.

---

## Interpreting the printer configuration page

The following sample illustrates a printer configuration page.



**Figure 7-10** Printer configuration page

- 1 Printer information**—Lists the printer serial number, PCL/PS firmware revision, total number of pages printed during the life of the printer, and total number of color pages printed during the life of the printer.
- 2 Consumables: Percent of life remaining**—Lists the percentage of the estimated remaining life for the transfer kit, fuser kit, and the drum kit.
- 3 Security**—Shows whether the printer control panel is locked or unlocked. Also shows whether the printer control panel password is enabled or disabled.
- 4 Density settings**—Lists the current density settings.
- 5 Configuration menu**—Lists the current settings of the configuration menu items.
- 6 I/O menu**—Lists the current settings of the I/O menu items.
- 7 Paper trays**—Lists the size and type of media currently configured for each input tray. Also lists the current Tray 1 mode, A4/letter override setting, and default size setting.
- 8 Event log**—Lists the last five printer events, including printer jams, service errors, and other printer conditions. If printed while in service mode, all events (up to 50) are printed.
- 9 Installed options**—Lists installed options such as EIO cards, DIMMs, duplex unit, and 500-sheet paper feeder.

- 10 Memory**—Shows the total memory installed and the total memory available in the printer. Also lists the memory allocation settings.
- 11 Printing menu**—Lists the current settings of the printing menu items.
- 12 Color blocks**—The color blocks verify color printing ability of the printer. The color blocks in the middle of the page are primary colors, and the color blocks surrounding the page are secondary colors. Each color is shown in 100%, 75%, 50%, and 25% fill.
- 13 Printer usage information**—shows the number of pages printed for the following items:

**Row 1: Paper size**

000000	000000	000000	000000	000000
Custom	Envelope	Legal	Executive/B5	Letter/A4

**Row 2: Fuse modes**

000000	000000	000000	000000	000000
Normal	Heavy	OHT	Gloss	Envelope

**Row 3: Source tray**

000000	000000	000000	000000
Tray 1	Tray 2	Tray 3	Duplex

**Row 4: Language**

000000	000000	000000
PCL pages	PS pages	XL pages

**Row 5: Media types**

000000	000000	000000	000000	000000	000000
Plain	Pre-printed	Letterhead	Transparency	Prepunched	Labels

**Row 6: Media types**

000000	000000	000000	000000	000000	000000
Bond	Recycled	Color	Card	Gloss	Heavy

**Note**

For rows one to three, the page count is incremented after every ten pages. Row four is incremented after every end of page. Rows one to four are counted through the engine. Rows five and six are driver requests.

The tray count is incremented based on the tray that is selected by the firmware, not the tray that is selected by the user.

Media size count is incremented based on the media size that is selected by the user. Media type count is incremented based on 1) the media type that is selected by the user when the media is pulled from tray 1; and 2) the media type configured on the tray when media is pulled from tray 2 or tray 3.

Fuse mode count is incremented twice for duplexed sheets, once when the front side is fused and once when the back side is fused.

**14 Calibration density settings**—On the bottom row of text, there are four separate blocks of numbers. The first block is for cyan, second for magenta, third for yellow, and the last is for black. Make sure the numbers are not near zero (if so, no calibration was done).

---

**Note**

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Do not print the configuration page until the printer is ready or calibration will not occur.

## Event log

Detailed service information is noted in the event log. The following is a list of the types of messages logged in the event log:

- paper jam errors
- EIO errors
- catastrophic errors

The last 50 errors are listed with the most recent error listed first. The event log can be viewed either on the control panel display or it can be printed from the control panel.

### To view the event log on the printer's control panel

- 1 Press **Menu** until INFORMATION MENU appears on the control panel display.
- 2 Press **Item** until SHOW EVENT LOG appears on the display.
- 3 Press **Select** to view the event log on the control panel display.
- 4 Press **Go** to bring the printer back online.

### To print the event log

- 1 Access the printer's service mode (see page 311).
- 2 Press **Item** until PRINT CONFIGURATION displays.
- 3 Press **Select** to print the configuration page. Up to 50 events will be printed on the configuration page.

# Service mode

Service mode allows for the modification of page counts and certain registration values for the printer. When the configuration page is printed while in service mode all event log messages (up to 50 events) will be printed. If both the formatter and DC controller are replaced at the same time, service mode will need to be utilized to execute the color plane registration sequence to ensure optimum print quality.

## Accessing the service mode

- 1 Hold down **Cancel Job** and **Select** while powering turning the printer on until the display is blank and the 3 LEDs are on.
- 2 Press the right side of the **Menu +** key, and then press **Select**.

SERVICE MODE will be displayed on the front panel briefly followed by two rows of asterisks. The printer will go through its normal start-up cycle, and then display SERVICE MODE on the front panel again. Below is a menu map showing what is available in service mode.

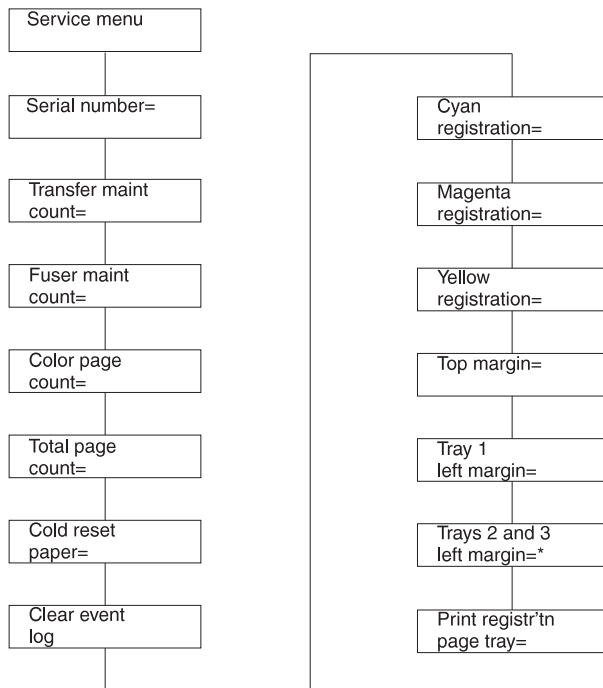


Figure 7-11 Service mode menu map

## Printing the menu map in service mode

Printing the menu map while in service mode accesses the Service Menu as well as other control panel menus and their settings.



Figure 7-12 Service menu map

- 1 Service Menu
- 2 Information Menu
- 3 Paper Handling Menu
- 4 Configuration Menu
- 5 Printing Menu
- 6 I/O Menu
- 7 Calibration Menu



## Description of Service Menu items

The following menu items should be used by trained service personnel only. These items are used to ensure proper functionality of the printer.

### Serial number

The serial number displayed on the front panel should match the serial number tag located on the rear of the printer as this is the serial number printed on the configuration page.

#### Setting the serial number:

- 1 Press the **Item** key until SERIAL NUMBER = (number) is displayed.
- 2 Press the **Value +/-** key to change the character with the cursor under it.
- 3 Press **Select** to save the character and move the cursor to the next slot.
- 4 Repeat steps 2 and 3 until all the characters match the label on the back of the printer.

### Transfer maintenance count

There are two methods to track the life of the intermediate transfer belt (ITB). The life lever on the ITB is the method used to actually indicate when the ITB has reached its end of life. The transfer maintenance count method is used to show the percent of life on the configuration page. Although this number is not critical to printer operation, it does provide a way for customers to monitor consumable life. The transfer maintenance count is set to zero when the life message for the ITB is reset. Only when the ITB is replaced before the end of life message is displayed does this value need to be set to zero.

#### Setting transfer maintenance count

- 1 Press the **Item** key until transfer maintenance count is displayed.
- 2 Press the **Value +/-** key to set the number.
- 3 Press **Select** to save.
- 4 Repeat steps 2 and 3 to change the other numbers if required.

## Fuser maintenance count

The fuser maintenance count functions the same way as other HP LaserJet printers. This count is the actual life of the fusing unit and is used to indicate its end of life. If the fuser is replaced before the end of life message is displayed, the fuser count must be reset to zero. An actual end of life condition will have a reset to clear the end of life message and set the fuser count to zero.

### Setting fuser maintenance count:

- 1 Press the **Item** key until FUSER MAINTENANCE COUNT is displayed.
- 2 Press the **Value +/-** key to set the number.
- 3 Press **Select** to save.
- 4 Repeat steps 2 and 3 to change the other numbers if required.

## Color page count

Color page count is used to track the number of pages printed with any color other than black. Although this count is not critical, there may be customers who use it to track the number of color documents printed. If the number needs to be reentered, select a number which is as close as possible to the original. An earlier configuration page is a great source if one can be found.

### Setting color page count:

- 1 Press the **Item** key until COLOR PAGE COUNT is displayed.
- 2 Press the **Value +/-** key to set the number.
- 3 Press **Select** to save.
- 4 Repeat steps 2 and 3 to change the other numbers if required.

## Total page count

Total page count tracks the total number of pages printed. As with the color page count, the number is not critical but can be useful for customers.

### Setting total page count:

- 1 Press the **Item** key until TOTAL PAGE COUNT is displayed.
- 2 Press the **Value +/-** key to set the number.
- 3 Press **Select** to save.
- 4 Repeat steps 2 and 3 to change the other numbers if required.

## Clear event log

Clear event log (event log empty) does exactly what it says. There may be time when it is necessary to clear the event log to allow the tracking of an issue. To clear the event log press the **Select** key. Once the event log is cleared it will read event log empty.

The next items in the list deal with color plane registration along with top and left margin settings for the different trays. Please refer to the registration page section for an explanation of these settings and how to set them.

## Paper tray size functional test

Use the status/test feature of the service mode to check the function of the paper tray size switches. See the status/test address table in this chapter for information on this test.

## Registration page

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### Note

You must set the registration values if both the formatter and DC controller are replaced at the same time or if the formatter was previously installed in another printer. If the DC controller is replaced by itself, these values are copied from the formatter to the DC controller. If a new formatter is replaced, or if an NVRAM initialization is performed (see “NVRAM initialization” on page 329), these values are loaded onto the formatter from the DC controller.

---

### Registration offset

As the ITB ages, the Color Plane Registration may need to be checked. See the instructions below for printing a registration page.

Registration offset has also occurred when a printer has been damaged and the scanner itself was offset.

### Printing a registration page

- 1 Scroll through the Service Menu until `PRINT REGISTRATION PAGE` is displayed.
- 2 Select which paper tray to pull paper from (only when setting left side margins will the tray actually matter).
- 3 Press **Select** to print the registration page.

In the center of the page are horizontal (Scan) and vertical (Process) sets of bars for cyan, magenta, and yellow. Each bar is made up of a series of lines with black being used as the base for setting the correct registration values for the three other colors. Along the top and left sides of the page are lines with numbers which are used for top and left side margins. The tray from which paper was pulled is listed on the bottom of the page.

### Setting registration numbers

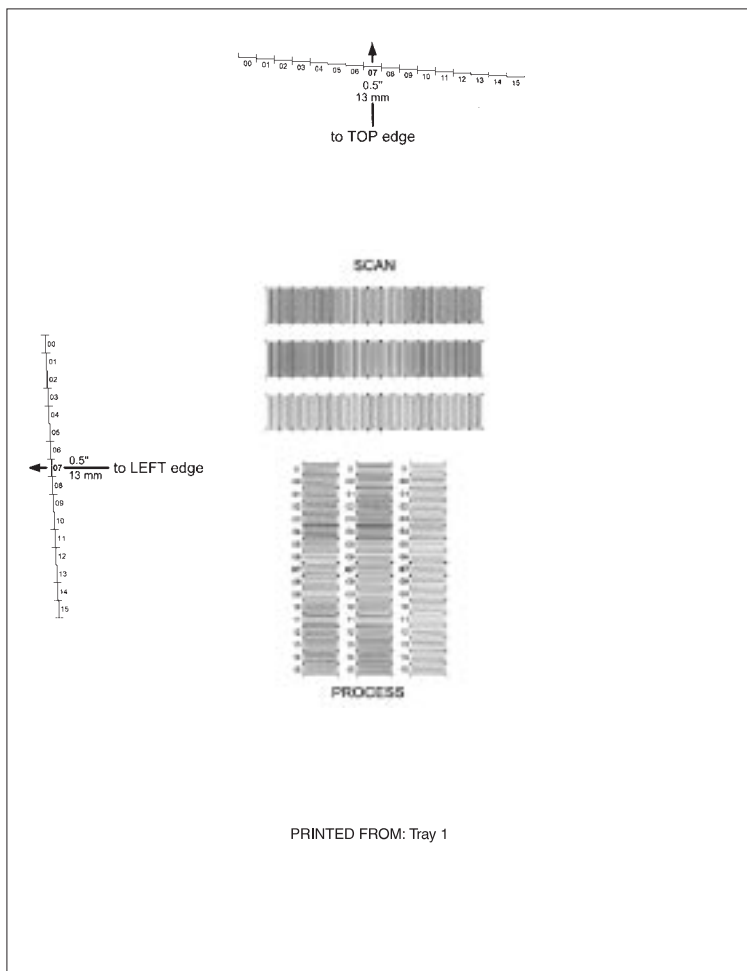
On each of the color bars in the process section are bolded numbers that indicate the current number set on the control panel. These bolded numbers will always be in the middle of the bars. To set the correct value for each of the colors, look at the lines within the bar and find the grouping that has the color line directly on top of the black line (it will have more white space). Print at least five registration pages to see if the new settings are correct.

---

### Hint

Using a magnifying glass to look at the lines will help in selecting the best number.

---



**Figure 7-13** Registration page

**Note**

Hewlett-Packard strongly recommends that the registration values be selected on the basis of averaging five consecutive samples.

**Setting the registration number:**

- 1 Press the **Item** key to select the appropriate color (cyan, magenta, or yellow) at its registration number.
- 2 Press the **Value +/-** key to change the registration number to the one identified.
- 3 Press the **Select** key to enter the value.

## Setting margin numbers

The top margin number is not tray dependent like the left side margin. Simply print the registration page from whichever tray has paper. Using a ruler, measure from the top edge of the paper to the series of lines. Find the line that is 13 mm (0.5 in) away from the paper's edge.

### Setting the top margin registration value

- 1 Press the **Item** key to scroll through the service menu until top margin is displayed.
- 2 Press the **Menu +/-** key until the number to be entered is displayed.
- 3 Press the **Select** key to enter the number.

Print another registration page and the number just entered will align with the arrow and be bolded.

The left side margin setting is tray dependent. Tray 1 has its own number while trays 2 and 3 are combined. The procedure is the same as the top margin with one exception. The page must be printed from the tray which will be adjusted.

### Printing from tray 1

- 1 Press the **Item** key until PRINT REGISTRATION PAGE TRAY =1 (default) is displayed.
- 2 Press the **Select** key.
- 3 Measure from the left side of the paper to the lines and find the line which is 13 mm (0.5 in) from the edge.

### If the number for the line is different than the current number:

- 1 Press the **Item** key until TRAY 1 LEFT MARGIN = # is displayed.
- 2 Press the **Value** key to change the number to the number required.
- 3 Press the **Select** key.

### Printing from tray 2 and 3

- 1 Press the **Item** key until PRINT REGISTRATION PAGE TRAY = 2 or 3 is displayed.
- 2 Press the **Select** key.
- 3 Measure from the left side of the paper to the lines and find the line which is 13mm (0.5 in) from the edge.

**If the number for the line is different than the current number:**

- 1 Press the **Item** key until TRAY 2 AND 3 LEFT MARGIN = \* is displayed.
- 2 Press the **Value** key to change the number to the number required.
- 3 Press the **Select** key.

# Diagnostics mode

This section provides an overview of the diagnostic tools incorporated into the HP Color LaserJet 4500/4500 N/4500 DN printer.

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## CAUTION

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Take caution when performing printer diagnostics to avoid risk of injury. Only trained service personnel should access the diagnostics mode with the skins removed.

There are two diagnostic sections built into the firmware, one for the formatter and the other for the engine. Each section contains different tests that allow the service technician to verify printer functionality. While in diagnostics mode there are no error messages associated with these tests. Therefore, determination of the problem will rely on the technician's skill. To exit diagnostics mode, turn off the printer.

## Accessing diagnostics mode

- 1 Hold down the left side of the **Item** key and turn on the printer.



## Formatter diagnostics

Formatter diagnostics are designed to be used by qualified service personnel to thoroughly test the functionality of the formatter. If all the tests pass, the formatter is working correctly and it can be assumed that the problem resides elsewhere. Listed below are descriptions of the formatter tests available.

**Table 7-16** Formatter diagnostics

Test	Description
REPEAT	If set to YES, the tests will run continuously until interrupted.
ON FAULT	The following will occur for each setting: BREAK - the test will stop when a failure occurs. PAUSE - the test will stop for a short period of time then resume with the remaining tests. CONT - will continue to execute the tests even when a failure occurs.
ROM CRC	Tests the firmware ROM for correct functionality.
DRAM	Tests the on-board RAM and the DIMMs.
SRAM 1	Tests the SRAM inside the ASIC.
SRAM 2	Tests the SRAM physically mounted on the formatter.
NVRAM	<p><b>CAUTION</b> Do not interrupt the NVRAM test. Doing so will cause the printer to lose all NVRAM values.</p> <p>Tests the formatter NVRAM. This test takes 15 minutes to run and should only be used when NVRAM values are being lost. In almost all cases, this test should never be run.</p>
EXECUTE TESTS	Runs the selected tests.

## Engine diagnostics

Engine diagnostics access portions of the printer's internal diagnostics which occur when the printer is turned on. These diagnostics are available as tools to help isolate problems that are not reported by the firmware. As mentioned previously, no error message will be displayed if there is a problem in the section being tested. A good understanding of how the printer operates is required to use the engine diagnostics successfully.

To have a better view of the areas being exercised, remove the left side cover and the ITB drawer. Defeat the two ITB drawer switches (SW 1 and SW 4) located on the left-side of the drawer cavity. Now you can run the diagnostics and watch the assemblies as they are operated.

Listed below in (Table 7-17) are the diagnostics available and a brief description of what each diagnostic will do. A detailed explanation for each diagnostic can be found under its own heading later in this document.

**Table 7-17 Engine diagnostics**

Menu Item	Selectable Value	Description
CONTINUOUS	N (default) Y	Selected test will run once. Selected test will run in a continuous loop.
PAPER PATH TEST		Turns on the motors that control the paper path section of the printer.
DEVELOPER TEST		Rotates the carousel and the developers.
DRUM TEST		Turns on the drum drive motor that drives the drum and ITB.
PATH SENSORS		Displays the state for each of the paper path sensors and switches.
DOOR SENSORS		Displays the state for each of the door and drawer switches.

## Paper path test

- 1 Press the **Item** key until you see ENGINE DIAGS PAPER PATH TEST.
- 2 Press the **Select** key to activate the test. While the test is running you will see ENGINE DIAGS E1:PAPERPATH displayed in the front panel.

The test takes approximately 15 seconds to run.

Components exercised by the paper path test include the fusing motor (M1), paper path motor (M2), and associated gears and assemblies. The paper pick roller for tray 2 can be activated by manually activating the paper pick solenoid (SL2). This test will not pick paper and move it through the paper path. To test this function, simply run a configuration page. For multiple pages, select continuous configuration page in the control panel.

The paper path test allows the service technician to verify the operation of components within the paper path. When the test is initiated both the M1 and M2 are activated. You will see the ITB lift cams rotate once and the ITB drive gear turn briefly. The remaining portion of the test simply allows both the M1 and M2 to run, thus exercising the gears and rollers associated with them.

---

### Note

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If an error occurs during the paper path test, the message PATH\_1PAPER PATH TEST FAILED is displayed.

## Developer test

The developer test rotates the carousel stopping at each toner cartridge and rotating the developer sleeve. For the best view of the carousel and the toner cartridge sleeves, remove the drum cartridge. The drum drawer must be closed before the test can run.

- 1 Press the **Item** key until ENGINE DIAGS DEVELOPER TEST is displayed.
- 2 Press the **Select** key to run the test. The front panel will display ENGINE DIAGS E2:DEVELOPER while the test is running. Watch the carousel and make sure the toner cartridge developer sleeve rotates. The sequence will be black followed by a pause, then magenta, cyan, and finally yellow.

The test will last for approximately 35 seconds. While the developer test is running you will see the drum turn if it is installed, as well as the drive gear for the ITB.

## Drum test

The drum test exercises the drum drive mechanism. Also, the fuser motor is turned on to allow the lift cams for the ITB to be rotated into the ITB up position.

- 1 Press the **Item** key until ENGINE DIAGS DRUM TEST is displayed.
- 2 Press the **Select** key to run the test. The front panel will display ENGINE DIAGS E3:DRUM while the test is running.

Watch to see if the ITB lift cams turn and if both the drum drive gear and the ITB drive gear are rotating.

## Path sensors test

The path sensors test allows the paper path sensors and switches to be tested for correct operation. Table 7-18 shows the correlation between the identifier on the front panel and the sensor or switch it represents.

**Table 7-18 Paper path sensors and switches**

Identifier	Name	Description
A	PS8	Tray 2 paper detect sensor
B	PS3	Tray 1 last sheet of media pulled sensor
C	PS4	Tray 1 paper detect sensor
D	SW801	Tray 2 paper size switch 2
E	SW802	Tray 2 paper size switch 1
F	SW803	Tray 2 paper size switch 0
G	PS3001	Optional Tray 3 paper detect sensor
H	SW3001	Optional Tray 3 paper size switch 2
I	SW3002	Optional Tray 3 paper size switch 1
J	SW3003	Optional Tray 3 paper size switch 0
K	PS10	Carousel position sensor
L	PS11	N/A
M	N/A	500-sheet feeder: 1=installed, 0=uninstalled
N	PS9	Top output tray full sensor

- 1 Press the **Item** key until ENGINE DIAGS PATH SENSORS is displayed on the front panel.
- 2 Press the **Select** key to activate the test. The front panel will display A through N with a binary value below it.

When running this test, make sure the ITB drawer is installed with tray 2 and tray 3 (if installed) removed. In this state the default value on the front panel should be: 0X11111110010, where the x can be either a 0 or 1. If there is any other value, then there is a possible

problem. Identify the sensor or switch in the table above and test to see if the value changes. Cassette paper size settings for each tray are described in Table 7-19.

**Table 7-19 Paper size settings**

<b>Paper Size</b>	<b>Tray 2 Switches (DEF)</b>	<b>Tray 3 Switches (HIJ)</b>
A4	000	000
B5	001	001
Custom (A5)	010	011*
Custom (B5 ISO)	011	011*
Letter	100	100
Executive	101	101
Legal	110	110
No tray installed	111	111

\* These values are the same for Tray 3.

## Door sensor test

The door sensor test allows service personnel to open and close doors on the printer while watching the sensor status on the front panel. Switches 4 and 5 are in series with each other which causes the value to toggle under identifier A.

Once the door sensor test is initiated, the front panel displays the status for each sensor listed in Table 7-20. As a door is opened and closed the state of the sensor changes the indicator values on the front panel.

**Table 7-20 Sensor status**

Identifier	Name	Description
A	SW4 and SW5	Front and rear door switches
B	SW1 *	ITB drawer switch
C	SW2 *	Toner cartridge door *
D	SW3 *	Drum drawer switch *
E	Drum detect	Detect if a drum cartridge is installed
F	Fuser	Detects if fuser is installed. Changes state if not detected or removed when rear door is opened and closed.

\* Activates (A) as well when opened.

- 1 Press the **Item** key until ENGINE DIAGS DOOR SENSORS is displayed on the front panel.
- 2 Press the **Select** key to activate the test.

The front panel will display A through F with a binary value below it. All the doors and drawers should be closed. In this state the display will show all 0's. Open the doors and drawers one at a time to verify correct functionality. If operating correctly, the 0 will change to a 1. If a 1 is displayed with all doors and drawers closed, there is a defective switch or connection.

## Engine test

The printer has one test pattern (vertical lines). When an image defect appears, a test print can be made to identify the problem. The test print can be made by pressing the test print switch located on the right side of the printer (Figure 7-14). A test pattern can be printed by pressing the test print switch once after the photosensitive drum has stopped and the printer has entered the standby mode. If the switch is held down, the test pattern is printed continuously. The switch can be used when paper is loaded in any tray other than tray 1.

The engine test does the following:

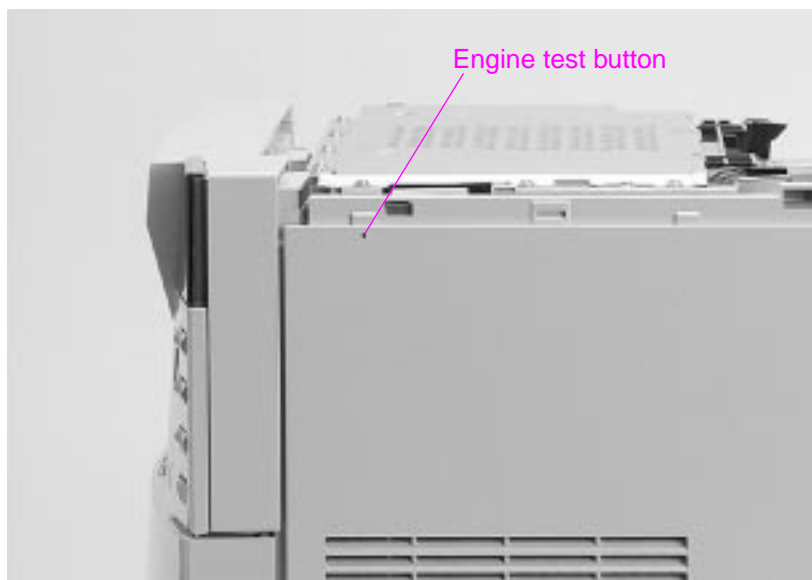
- Verifies that the print engine is functioning correctly (the formatter PCB is completely bypassed during an engine test).
- Is used for isolating printer problems.
- Is used for checking and adjusting registration.
- Prints from tray 2 or 3 only, not from tray 1.
- Can be activated with the formatter PCB removed.

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### Note

For the printer to perform an engine test, tray 2 must be installed and loaded with paper, and the toner cartridge must be installed in the printer.

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**Figure 7-14** Location of the engine test button



## NVRAM initialization

NVRAM initialization should always be executed immediately after replacing the firmware or the formatter board. This procedure aligns the firmware with the formatter. Not performing NVRAM initialization could result in deterioration of print quality. Before initializing NVRAM, be sure to gather and write down the information listed below, if possible.

- Total page count and color page count
  - Print a configuration page to obtain both page counts and the serial number.
- Percentage of life remaining for both the transfer kit and the fuser kit
  - a. From SERVICE MODE on the printer display panel, press **Menu**.
  - b. Go to SERVICE MENU and press **Item**.
  - c. Use the **Value +/-** keys to go to TRANSFER MAINT COUNT=XXXXXXX and write down the exact numbers shown.
  - d. Go to FUSER MAINT COUNT=XXXXXXX and write down the exact numbers shown.
- Serial number

### To initialize NVRAM

- 1 Turn on the printer while holding down both the **Cancel Job** and **Select** keys until all the LED lights are on, then release the keys.
- 2 Press **Cancel Job**.
- 3 Press **Select**.

After replacing the firmware or the formatter board, the following settings are changed or lost. If you do not wish to accept the new values, use Service Mode to enter the previous settings that you wrote down prior to initializing.

- Total page count and total color page count (the counter is reset to 0)
- Transfer kit percentage of life remaining (gauge is reset to 100%)
- Fuser kit percentage of life remaining (gauge is reset to 100%)
- Printer serial number

# Diagrams

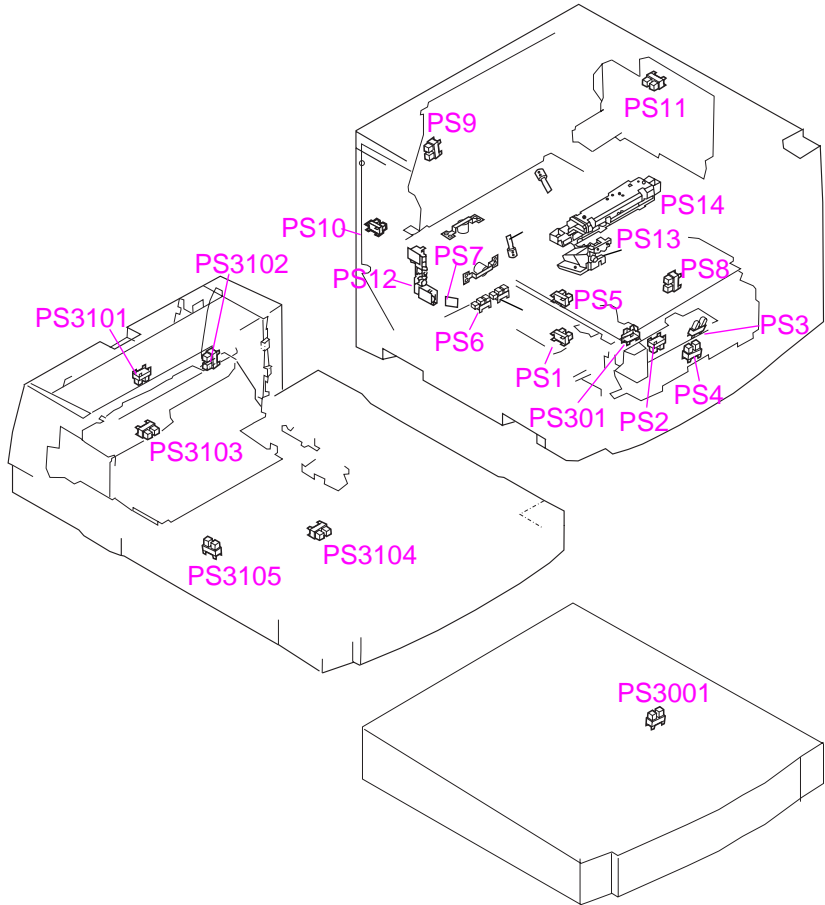
This section contains wiring diagrams and photos of all internal printer components.

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**Note**

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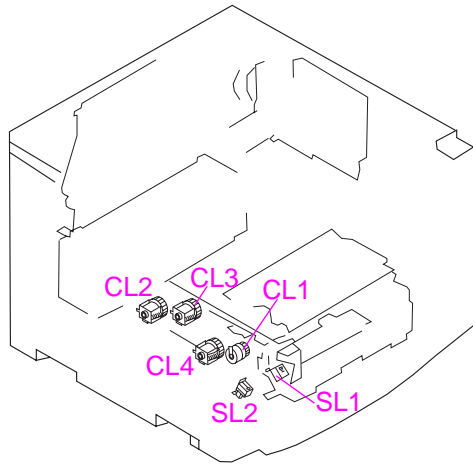
The general circuit wiring diagram and duplex unit wiring diagram have been included as fold-out pages, and are located in the back of this book.



**Figure 7-15** Sensor locations

**Table 7-21 Sensor function and locations**

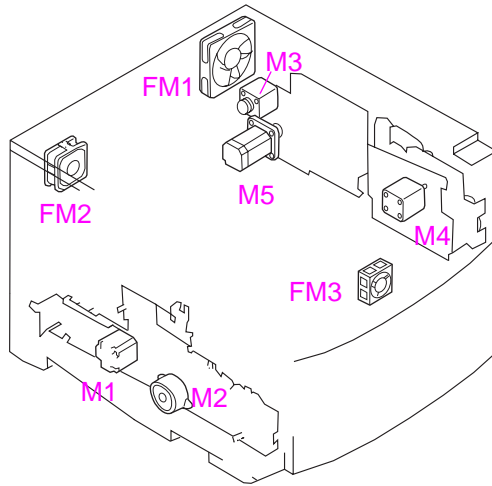
<b>Name</b>	<b>Function</b>
PS1	ITB unit life sensor
PS2	Registration paper sensor
PS3	Last paper sensor
PS4	Multi-purpose tray paper sensor
PS5	ITB home position sensor
PS6	Fusing unit pressure release sensor
PS7	Delivery paper sensor
PS8	Cassette paper sensor
PS9	Face-down tray paper full sensor
PS10	Carousel home position sensor
PS11	Toner cartridge press sensor
PS12	Toner level sensor
PS13	Waste toner sensor
PS14	Density sensor
PS301	OHT sensor (multi-purpose tray PCB)
PS3001	Paper feed detection sensor
PS3101	Reversing unit paper sensor
PS3102	Face-up sensor
PS3103	Reversing unit stationary paper sensor
PS3104	Duplex pick-up paper sensor
PS3105	Side registration home position sensor



**Figure 7-16** Printer solenoids and clutches

**Table 7-22 Solenoid and clutch functions and locations**

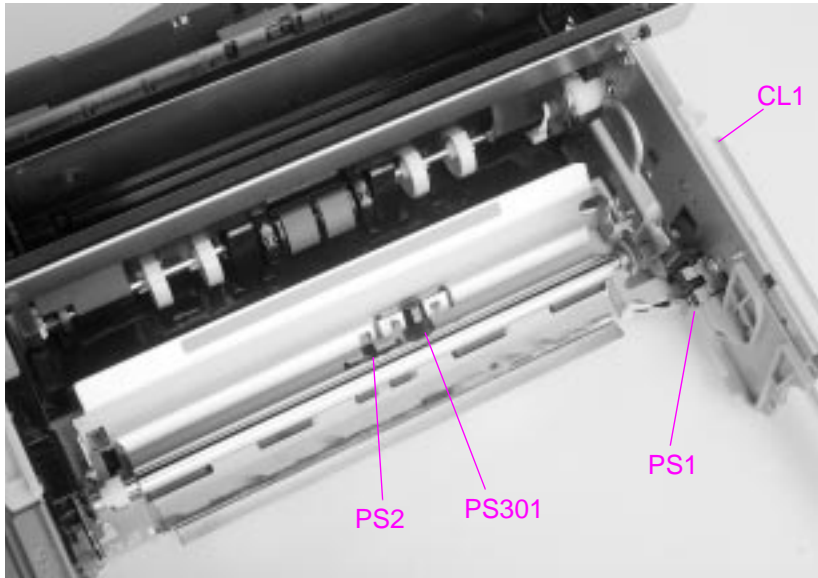
Name	Function
SL1	Multi-purpose tray pick-up solenoid
SL2	Paper pick-up solenoid
CL1	Registration clutch
CL2	ITB unit separation clutch
CL3	ITB cleaning roller separation clutch
CL4	Secondary transfer roller separation clutch



**Figure 7-17** Printer motors and fans

**Table 7-23** Printer motors and fans

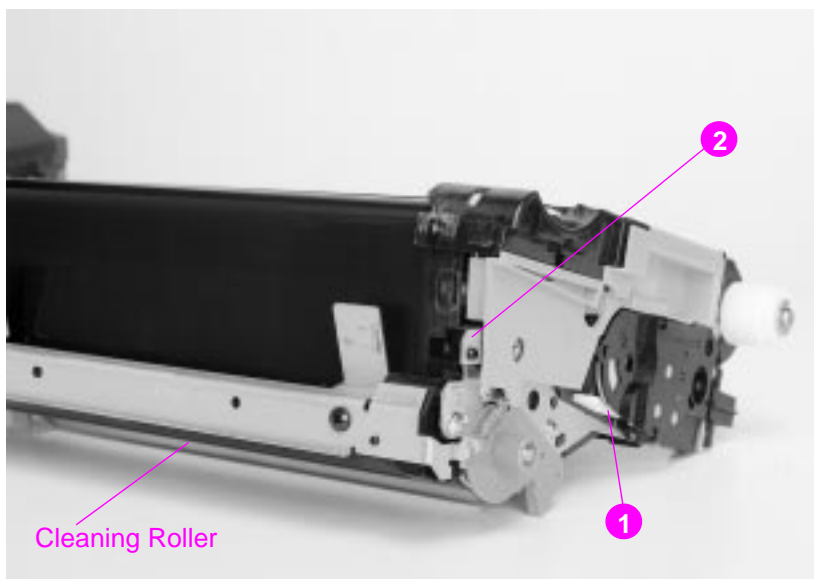
Name	Code	Description
Motors	M1	Fusing motor
	M2	Pick-up motor
	M3	Carousel motor (carousel drive unit)
	M4	Drum motor (drum drive unit)
	M5	Toner cartridge motor
Fan Motors	FM1	Large fan
	FM2	Small fan
	FM3	Fan (upper front cover fan)



**Figure 7-18** Miscellaneous sensors and clutches

**Table 7-24** Miscellaneous sensors and clutches

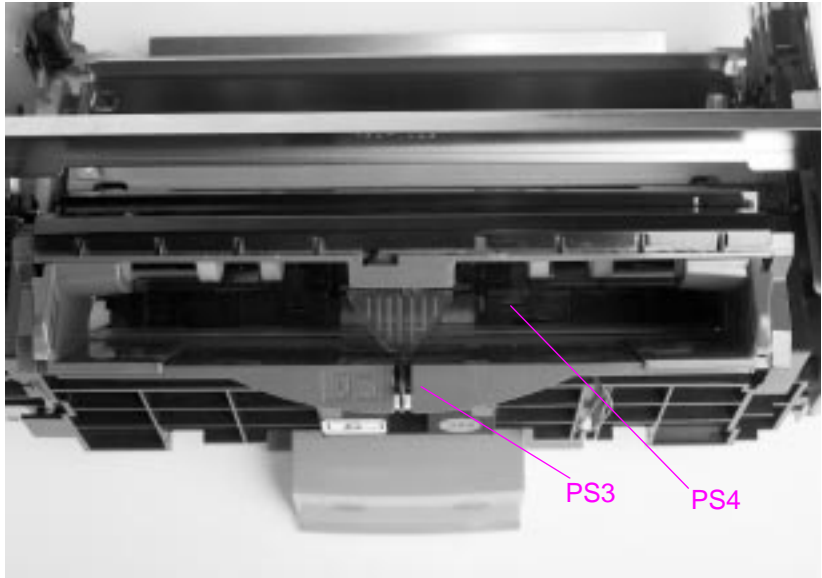
Name	Description
PS2	Registration sensor
PS301	Overhead transparency sensor
PS1	Intermediate transfer belt life sensor
CL1	Registration clutch (on outside drawer wall)



**Figure 7-19** Intermediate transfer belt sensors

**Table 7-25** Intermediate transfer belt sensors

Name	Description
1	Intermediate transfer belt (end of life lever)
2	Intermediate transfer belt (home position sensor) (PS5)

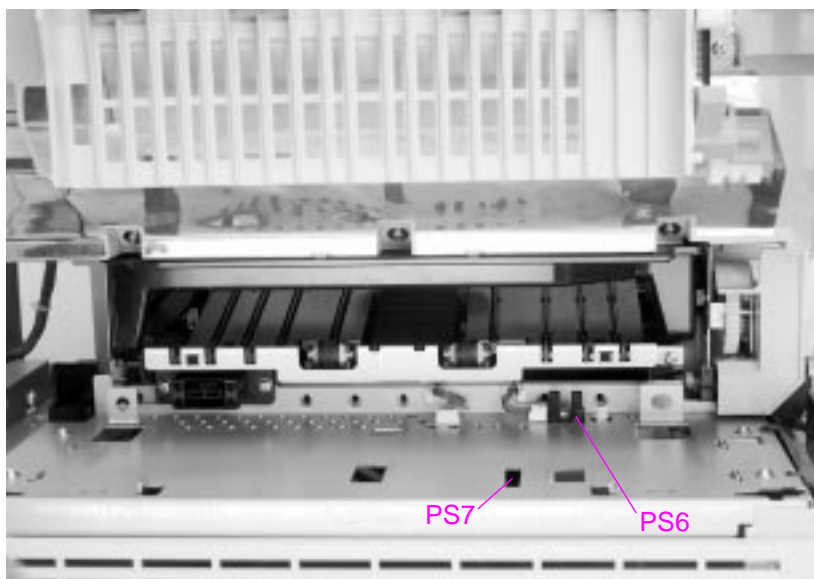


**Figure 7-20** Miscellaneous sensors (with tray 1 front cover removed)

**Table 7-26** PS3 and PS4 description

<b>Name</b>	<b>Description</b>
PS3	Tray 1 last page sensor
PS4	Tray 1 paper sensor

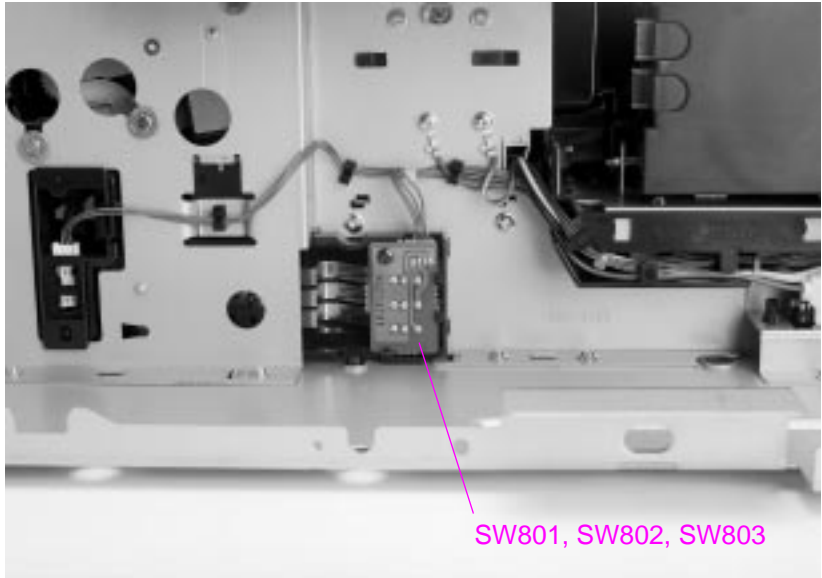




**Figure 7-21** PS6 and PS7 sensor location

**Table 7-27** PS6 and PS7 description

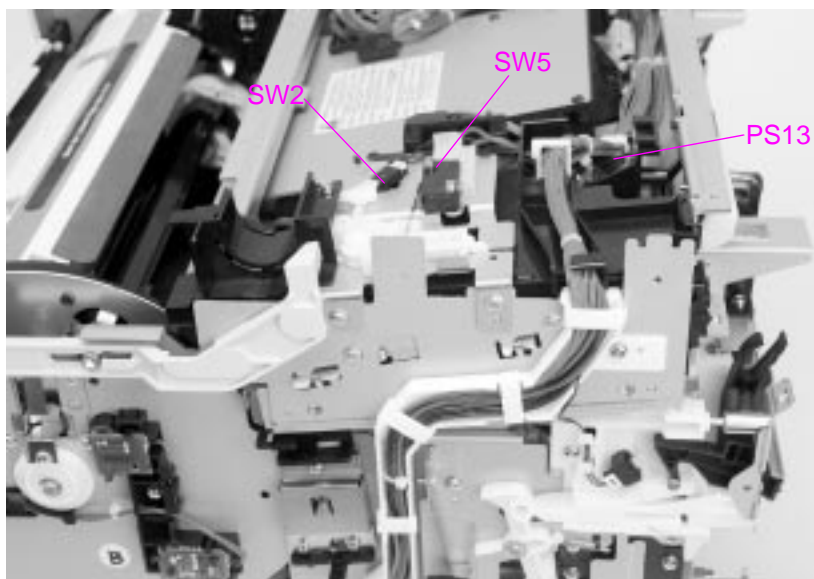
<b>Name</b>	<b>Description</b>
PS6	Fusing assembly pressure sensor
PS7	Paper exit sensor (access through the opening)



**Figure 7-22** Miscellaneous switches

**Table 7-28** Switch description

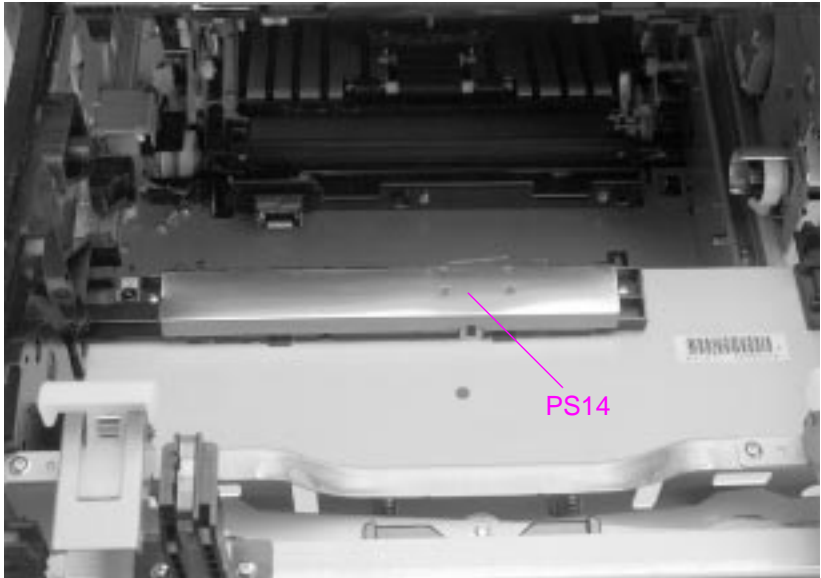
Name	Description
SW801, SW802, SW803	Paper tray size switches (power supply and high-voltage power supplies removed)



**Figure 7-23** Miscellaneous switches and sensors

**Table 7-29** SW2, SW5, and PS13 description

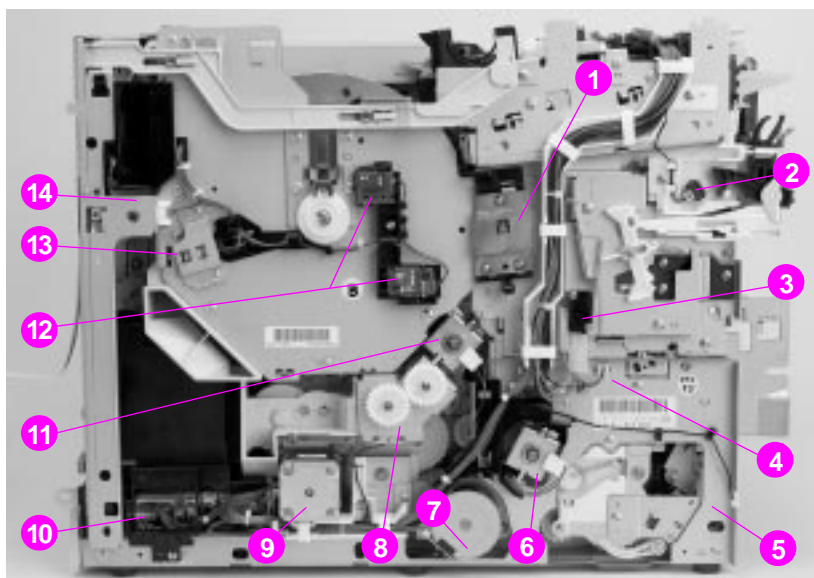
<b>Name</b>	<b>Description</b>
SW2	Top cover (toner door) switch
SW5	Top cover/rear door +24V interrupt switch
PS13	Waste toner full sensor



**Figure 7-24** PS14 sensor location

**Table 7-30** Density sensor location

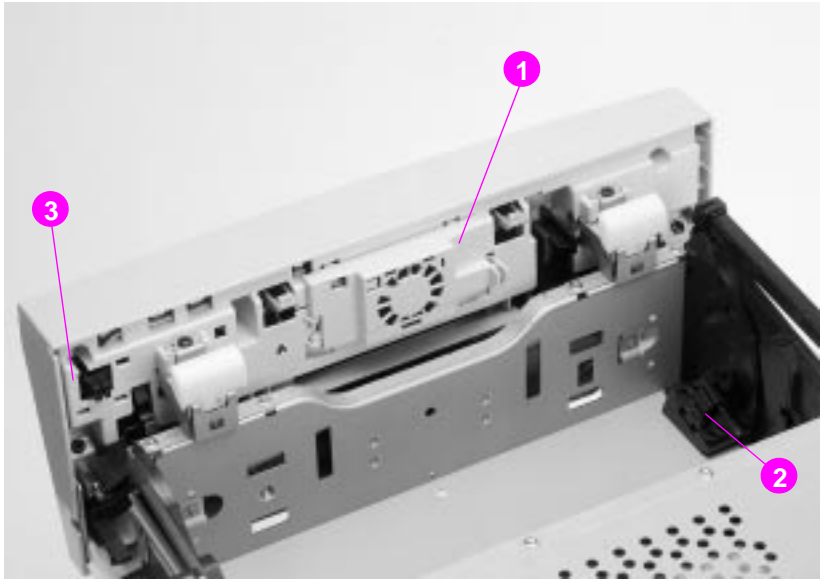
Name	Description
PS14	Density sensor



**Figure 7-25** Miscellaneous parts

**Table 7-31** Miscellaneous parts

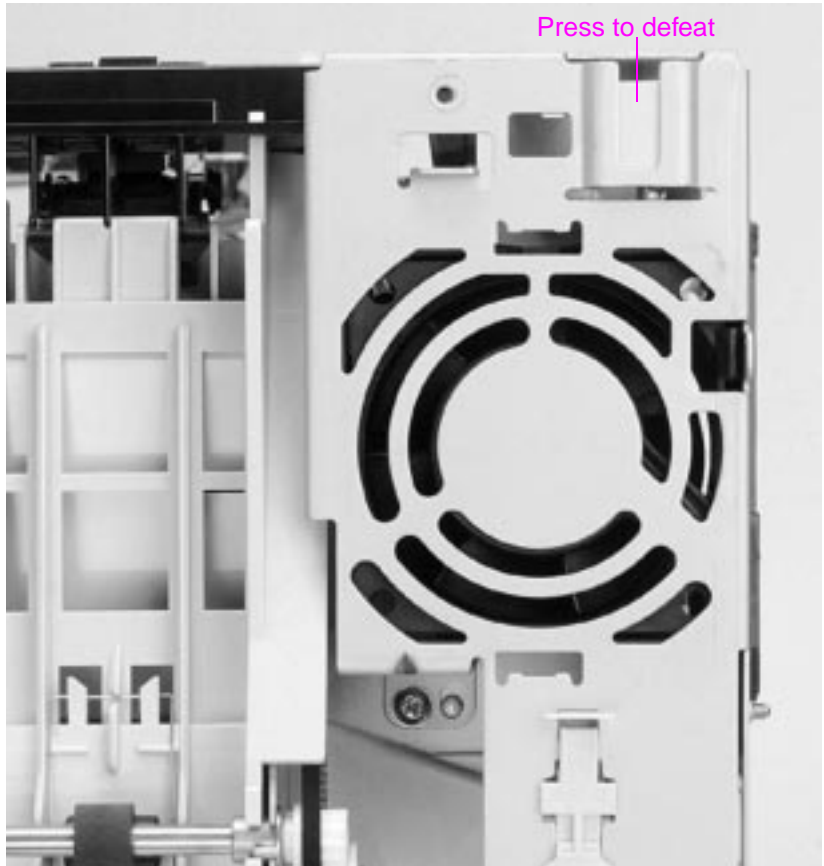
Location	Name
1	Drum ground connector
2	Drum drawer closed switch (SW3)
3	Front drawers drum/ITB +24V interrupt switch (SW4)
4	ITB drawer closed switch (inside chassis wall) (SW1)
5	Tray 2 pickup solenoid (behind chassis wall) (SL2)
6	Secondary transfer roller lift cam clutch (CL4)
7	Pickup motor (M2)
8	ITB cam clutch (behind lower gear) (CL2)
9	Fusing motor (M1)
10	Paper feed PCB
11	Cleaning roller cam clutch (CL3)
12	Toner level sensor (emitter receiver) (PS12)
13	Carousel "home position" sensor (PS10)
14	Rear left (small) cooling fan connector



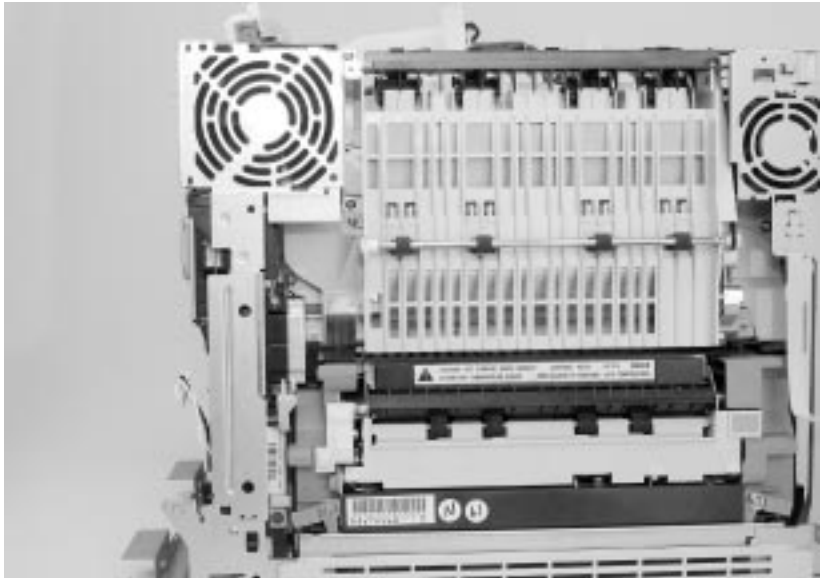
**Figure 7-26** Imaging drum connector

**Table 7-32** Imaging drum connector

Location	Name
1	Fan (FM3)
2	Imaging drum connector
3	FM3 cooling fan connector (drawer to chassis)

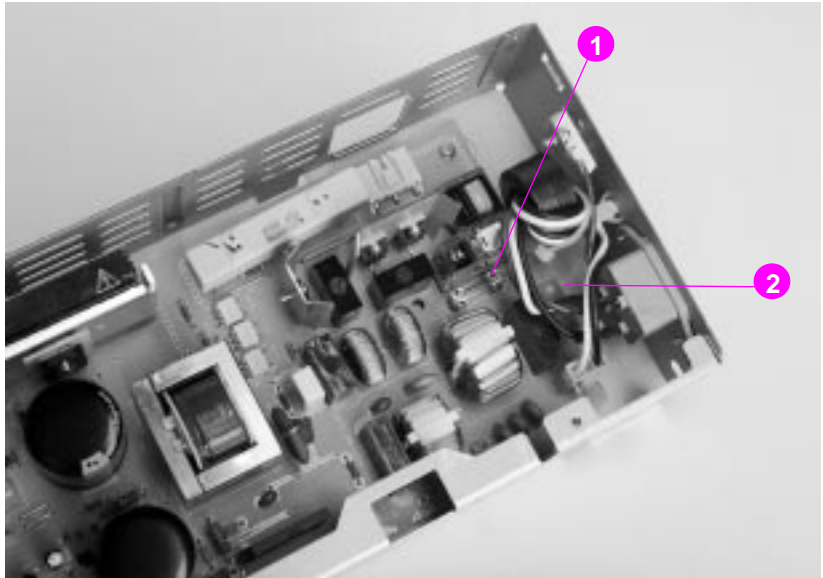


**Figure 7-27** Rear door interlock switch defeat



**Figure 7-28** Right rear fan

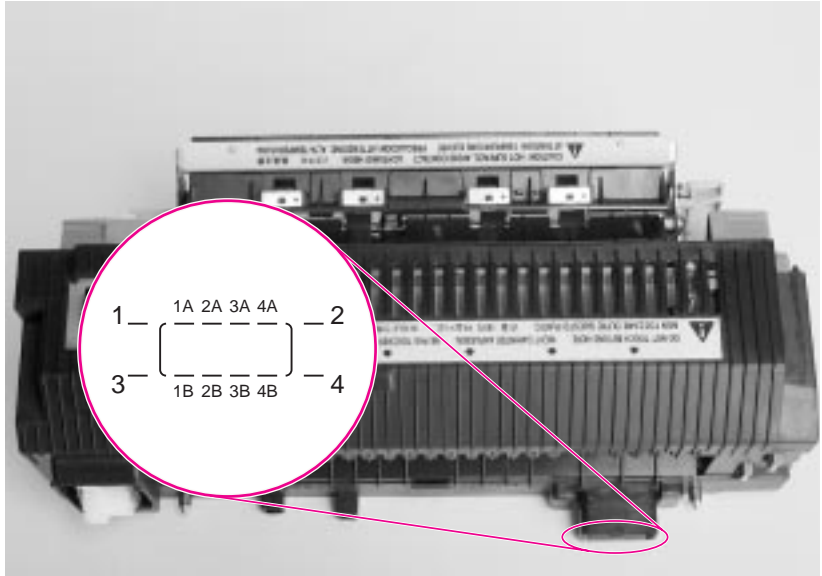




**Figure 7-29** Fuse (F1) and CB101

**Table 7-33** Fuse F1 and CB101 location

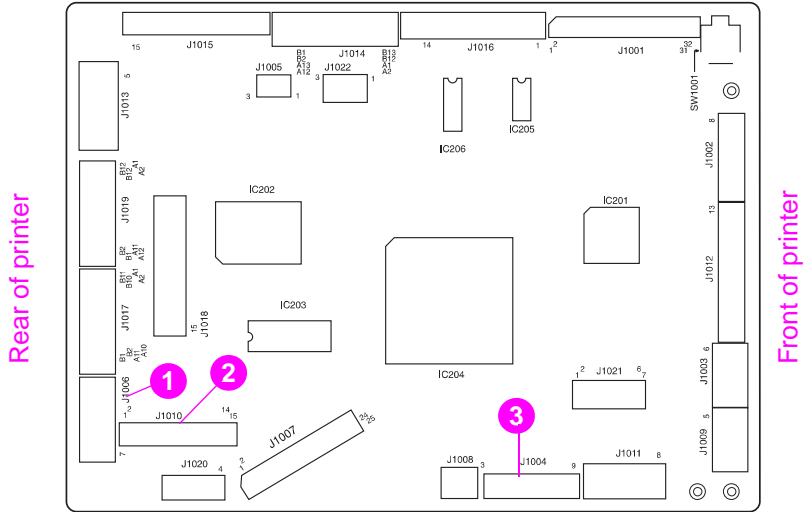
Location	Description
1	Fuse F1
2	Circuit breaker CB101



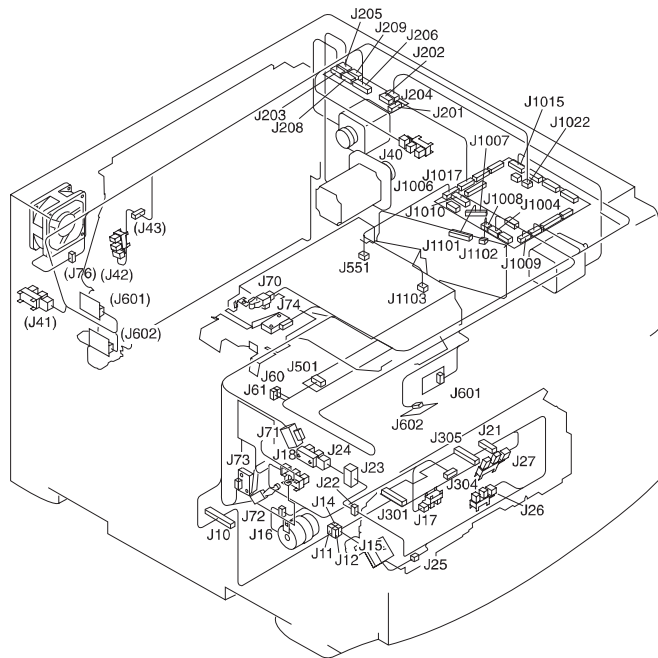
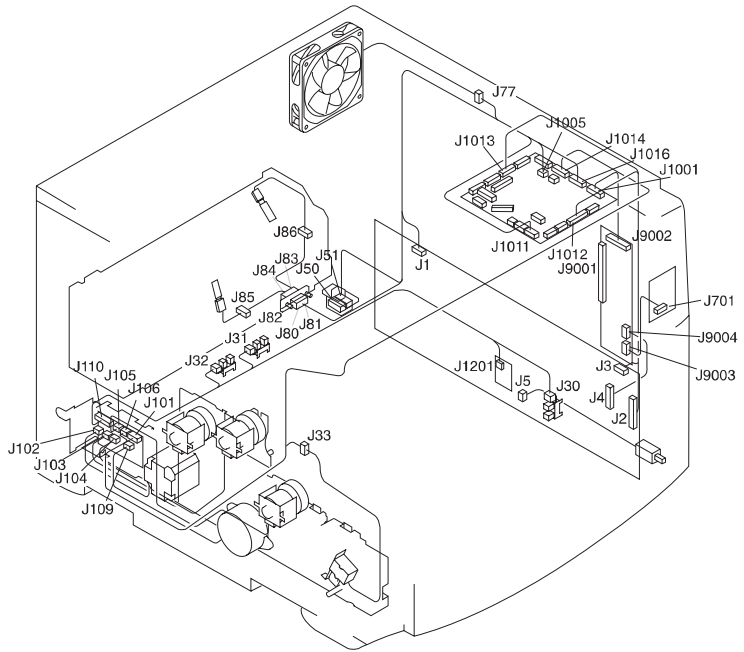
**Figure 7-30** Fusing assembly

**Table 7-34** 110-volt fusing assembly

Location	Description
Pin 1	Frame ground
Pins 2 to 4	6.3 ohms $\pm$ 1 ohm
Pins 3 to 2	3.1 ohms $\pm$ 1 ohm
Pins 4 to 3	3.1 ohms $\pm$ 1 ohm
1A to 2A	310 K to 430 K ohm at (room temperature)
1B to 2B	310 K to 430 K ohm at (room temperature)
3B to 4B	Short 110-volt unit

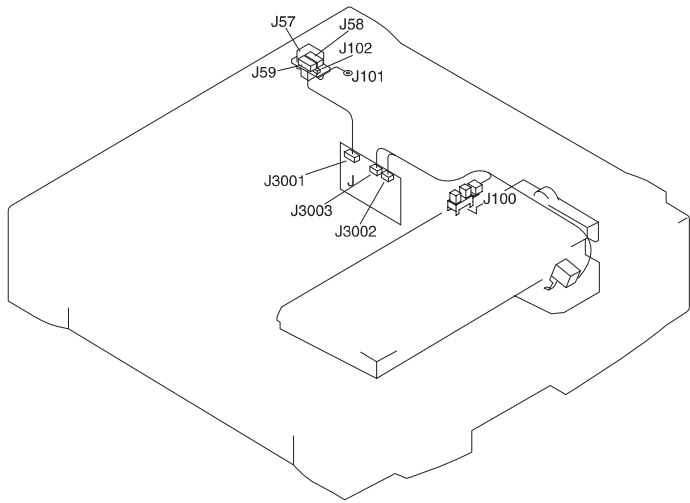
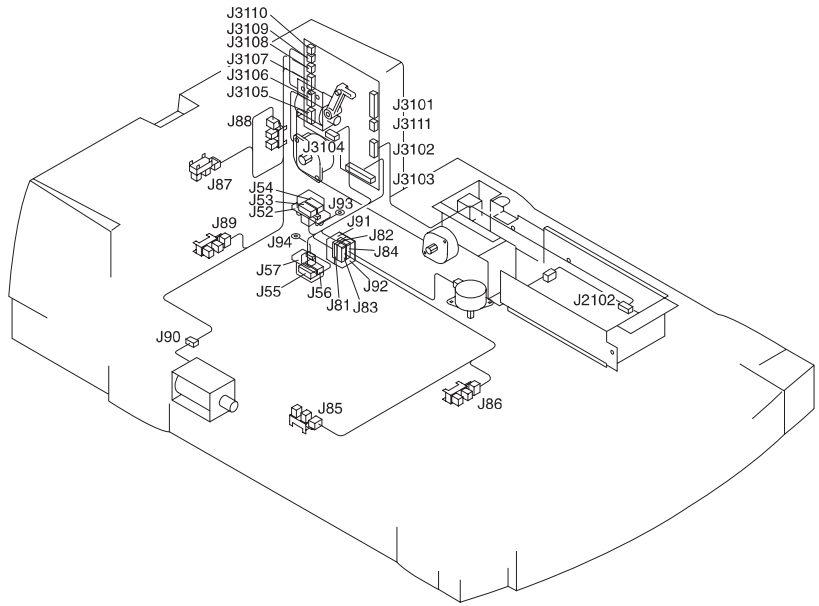


**Figure 7-31** DC controller PCB connectors



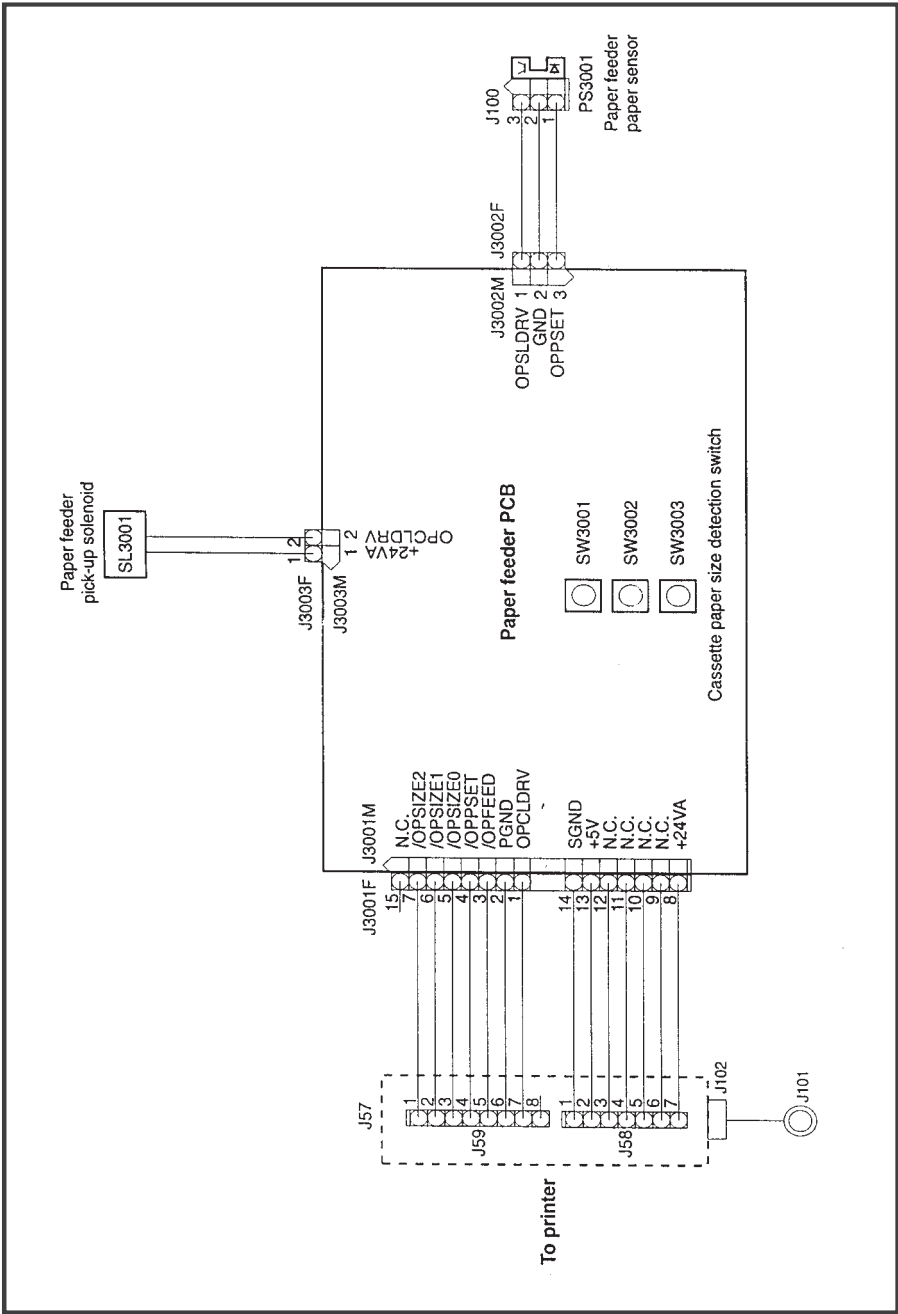
**Note:** Some locations will vary slightly depending on the version of the printer.

**Figure 7-32** Location of connectors



**Note:** Some locations will vary slightly depending on the version of the printer.

**Figure 7-33** Location of duplexer and 500-sheet paper feeder connectors



500-sheet feeder wiring diagram

**Figure 7-34** 500-sheet feeder wiring diagram

# 8

# Parts and diagrams

## Chapter contents

Introduction. . . . .	351
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Consumables, accessories, and supplies . . . . .	352
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## Introduction

The figures in this chapter show the major subassemblies in the printer and their component parts. A table (materials list) follows each exploded assembly diagram. Each table lists the reference designator (item number), the associated part number, quantity, and description of each part.

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**Note**

When looking for a part number, pay careful attention to the voltage listed in the description column to ensure that the part number selected is for the correct printer model.

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# Ordering parts

All standard part numbers are stocked and can be ordered from Commercial Hardcopy Support Division America (CHSD-A) or Commercial Hardcopy Support Division Europe (CHSD-E). For information on contacting CHSD-A or CHSD-E, see page 33.

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**Note**

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Parts that have no reference designator or part number are not field replaceable and cannot be ordered.

## Consumables, accessories, and supplies

The items listed in Table 8-1 are available through your local authorized HP dealer. To find a dealer near you (or if your local dealer is temporarily out of stock), call the HP Customer Information Center at (800) 752-0900.

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**Note**

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See page 355 for documentation part numbers.

Consumable parts and accessories are available directly from Hewlett-Packard at the following numbers:

- U.S.: (800) 538-8787
- Canada: (800) 387-3154, (Toronto) (416) 671-8383
- United Kingdom: 0734-441212

Contact your local HP Parts Coordinator for other local phone numbers.



**Table 8-1 Consumables, accessories, and supplies**

Product number	Part number	Description
<b>Cables</b>		
C2946A		3 m (6 ft) parallel cable (IEEE-1284 compliant) with a 25-pin DB male to a (IEEE-1284C) male "C" connector
92215N		LocalTalk cable kit
92215S		DIN-8 printer cable (for Macintosh computers)
<b>Consumable items</b>		
C4195A	R94-4001-410CN	Drum kit
C4196A	R96-5009-000CN	Transfer kit
C4197A	R96-5007-000CN	Fuser kit (110V)
C4198A	R96-5008-000CN	Fuser kit (220V)
	5040-3379	Toner cloths
<b>Localized font DIMMS</b>		
	5062-4667	Greek (1 MB)
	5062-4668	Hebrew (1 MB)
	5062-4669	Cyrillic (1 MB)
	5062-4670	Arabic (1 MB)
C4292A (CAS)		Traditional Chinese (8 MB)
C4293A (CAS)		Simplified Chinese (8 MB)
YS-90210		Japanese (8 MB)
<b>Media</b>		
C2934A		HP Color LaserJet Transparencies (letter)
C2936A		HP Color LaserJet Transparencies (A4)
C4179A		HP Color LaserJet Soft Gloss Paper (letter)
C4179B		HP Color LaserJet Soft Gloss Paper (A4)
<b>Memory (DIMMS)</b>		
C4140A	C4140-67901	4 MB
C4141A	C4041-67901	8 MB
C4142A	C4042-67901	16 MB
C4143A	C4043-67901	32 MB
C3913A	C3913-67901	64 MB

**Table 8-1 Consumables, accessories, and supplies (continued)**

<b>Product number</b>	<b>Part number</b>	<b>Description</b>
<b>Network connectivity</b>		
J3110A	J3110-60001	HP JetDirect 600N for ethernet (10Base-T [RJ-45])
J3111A	J3111-60001	HP JetDirect 600N for ethernet (10Base-T [RJ-45] and 10Base-2 [BNC]) and LocalTalk (DIN-8)
J3112A	J3112-60001	HP JetDirect 600N for Token Ring (DB9, RJ-45)
J3113A	J3113-60001	HP JetDirect 600N for Fast Ethernet (10/100 Base-TX [RJ-45])
<b>Options</b>		
C4082A	C4082-67901	500-sheet input tray
C4083A	C4083-67901	Duplex unit (two-sided printing)
C4235A		HP Color LaserJet 4500 cabinet
<b>Panel overlays</b>		
	C4084-40001	English
	C4084-40005	German
	C4084-40003	French
	C4084-40006	Spanish
	C4084-40004	Italian
	C4084-40015	Korean
	C4084-40018	Simplified Chinese
	C4084-40014	Traditional Chinese
	C4084-40011	Swedish
	C4084-40007	Dutch
	C4084-40009	Finnish
	C4084-40016	Russian
	C4084-40008	Danish
	C4084-40010	Norwegian
	C4084-40012	Portuguese
	C4084-40017	Czech
	C4084-40013	Polish
	C4084-40020	Japanese

**Table 8-1 Consumables, accessories, and supplies (continued)**

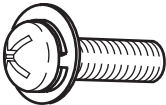

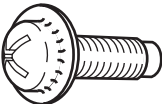

Product number	Part number	Description
<b>Reference materials</b>		
	5090-3392	<i>HP LaserJet Printer Family Paper Specification Guide</i>
	5961-0976	<i>HP PCL/PJL Reference Set</i>
	5967-9991	<i>HP JetDirect Print Server Administrator's Guide</i>
	5969-3412	<i>HP JetDirect Print Server JetAdmin Setup Guide</i>
<b>Toner supplies</b>		
C4191A	R94-4005-410CN	Black
C4192A	R94-4004-410CN	Cyan
C4193A	R94-4003-410CN	Magenta
C4194A	R94-4002-410CN	Yellow
C4191A	R94-4005-510CN	Black (Europe only)
C4192A	R94-4004-510CN	Cyan (Europe only)
C4193A	R94-4003-510CN	Magenta (Europe only)
C4194A	R94-4002-510CN	Yellow (Europe only)

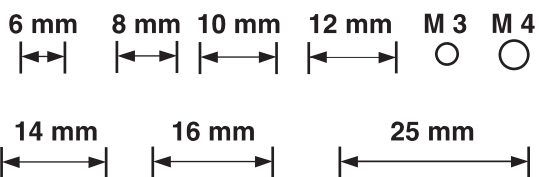
**Note**

The only difference between the toner cartridges listed above is that the Europe-only toner cartridges have different languages on the instruction sheet inside the box.

# Common fasteners

Table 8-2 Types of screws

Illustration	Description	Size	Uses
	Screw, machine w/washer	M3X6 M3X10 M3X12 M3X14	To hold plastic to metal, (ex. the skins)
	Screw, self tapping	M4X8 M4X10	To hold plastic to plastic, (ex. control panel)
	Screw, trus head	M3X4 M3X6 M3X8	Sheet metal to sheet metal, (ex. formatter pan)
	Retaining Ring (e-type)		To hold gears into place

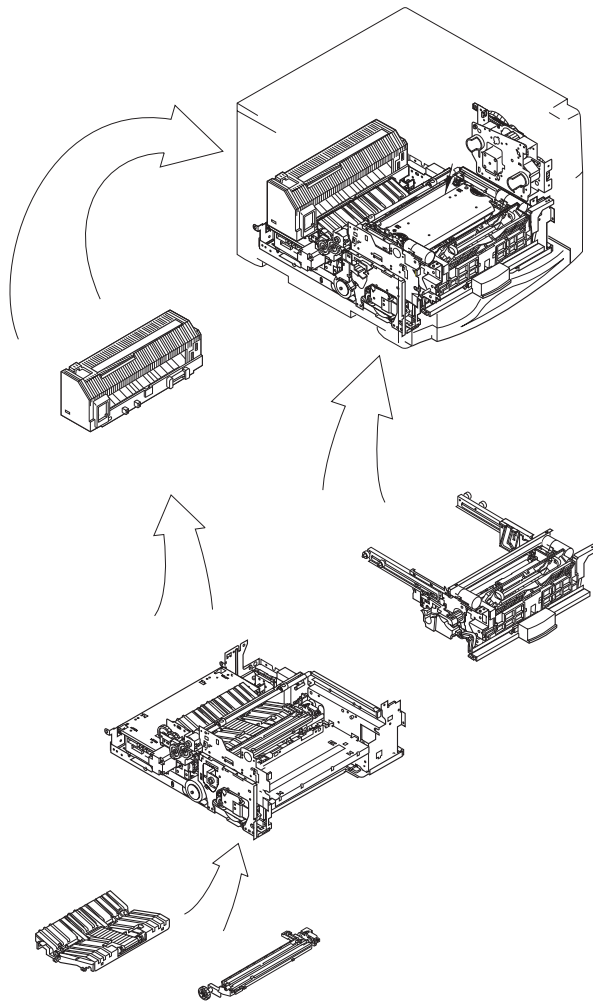


## Illustrations and parts lists

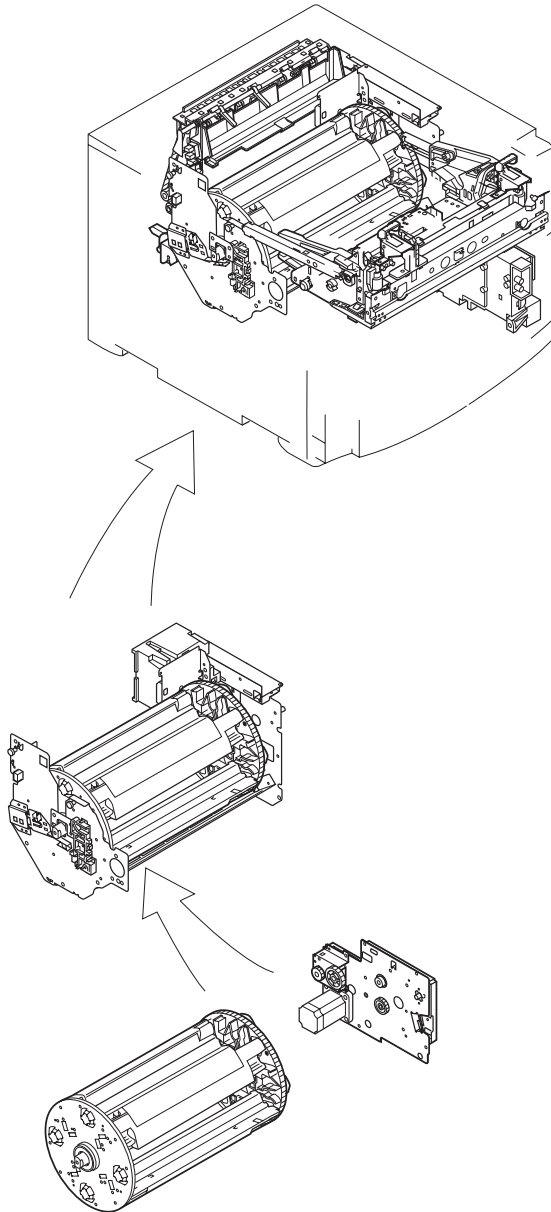
The following illustrations and parts tables list the field replaceable units (FRU) for this printer. At the end of this chapter are two tables of all of the parts shown in this chapter: Table 8-18 lists the parts in alphabetical order, and table 8-19 lists the parts in numerical order by part number. Both tables list the appropriate figure in this chapter where the part can be found.

### Determining the printer version

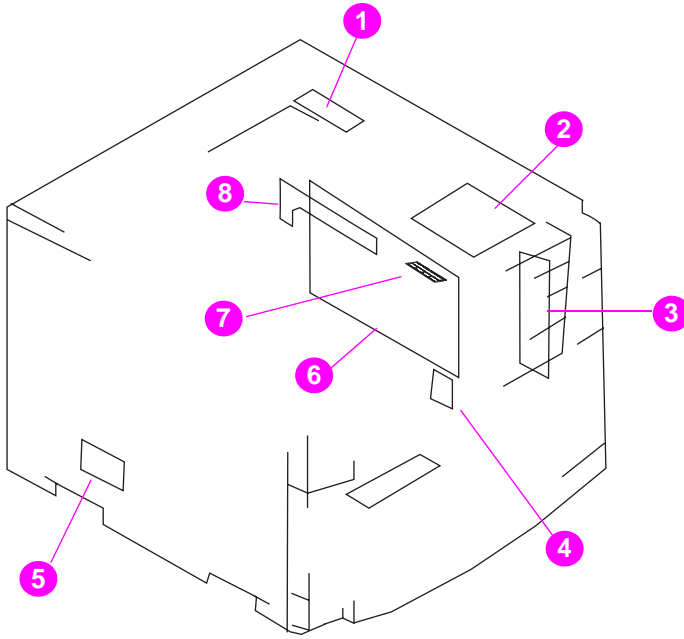
Two versions of the HP Color LaserJet 4500 series printer are available. To accurately perform removal and replacement procedures or determine the correct part for reordering, you will need to know the version of the printer that is being serviced. To identify the printer, check the serial number, which is located at the rear of the printer. All printers will have US or JP in the first two positions of the serial number (e.g., **USBB**123456). Newer versions of the HP Color LaserJet 4500 printer will have an “H” or higher letter in the third position (e.g., **USHB**123456). If the letter in the third position in the serial number is “B”, “C”, “D”, or “F”, then you have an older version of the HP Color LaserJet 4500 printer.



**Figure 8-1** Assembly location diagram (1 of 2)



**Figure 8-2** Assembly location diagram (2 of 2)



**Figure 8-3** PCB locations



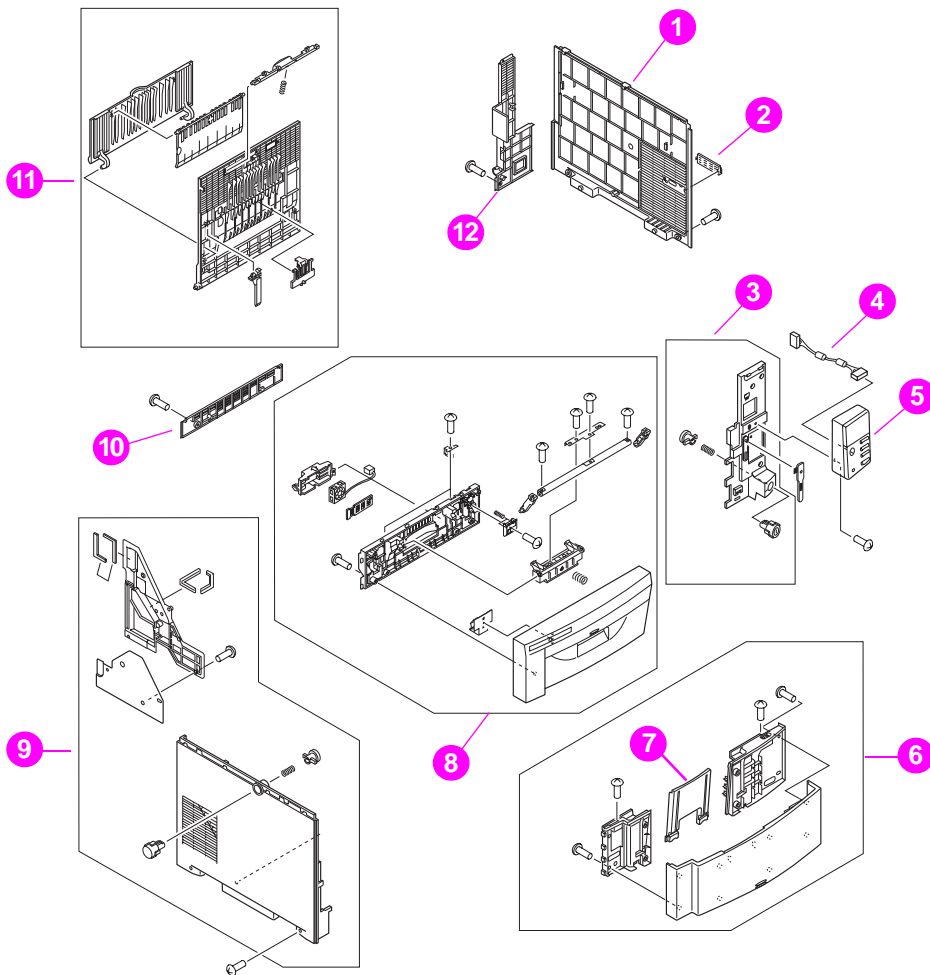
**Table 8-3 PCB assembly**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Developing PCB	1	RG5-3811-000CN	RG5-5180-000CN
2	DC controller PCB	1	RG5-3809-000CN	RG5-5179-000CN
3	Interconnect PCB	1	RG5-3808-000CN	RG5-3808-000CN
4	Paper size sensor PCB	1	RG5-3816-000CN	RG5-3816-000CN
5	Paper feed PCB assembly	1	RG5-3810-000CN	RG5-3810-000CN
6	Formatter PCB	1	C4084-69001*	C4084-69001*
7	Firmware DIMM	1	C4084-60004	C4084-60004
8	I/O card	1	C4081-60001	C4081-60001

\*These parts require exchange

### CAUTION

Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.



**Figure 8-4** External covers, panels, etc.

**Table 8-4** Printer cover and door

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Cover, right side	1	RB2-1203-000CN	RB2-1203-000CN
2	Cover, connector	1	RB2-1224-000CN	RB2-1224-000CN
3	Cover, right front	1	RG5-3310-000CN	RG5-3310-000CN
4	Cable, control panel	1	RG5-3802-000CN	RG5-5195-000CN
5	Control panel assembly	1	RG5-3345-000CN	RG5-3345-000CN
6	Cover, ITB drawer	1	RG5-3320-000CN	RG5-3320-000CN

**Table 8-4 Printer cover and door (continued)**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
7	Tray, extension	1	RB2-1215-000CN	RB2-1215-000CN
8	Cover, drum drawer	1	RG5-5232-000CN**	RG5-5152-000CN
9	Cover, left side	1	RG5-3313-000CN	RG5-5151-000CN
10	Cover, lower rear	1	RB2-1206-000CN	RB2-1206-000CN
11	Door, rear access	1	RG5-3325-040CN	RG5-3325-040CN
12	Cover, rear	1	RB2-1205-000CN	RB2-1205-000CN

\*\* Refer to the note below.

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**CAUTION**

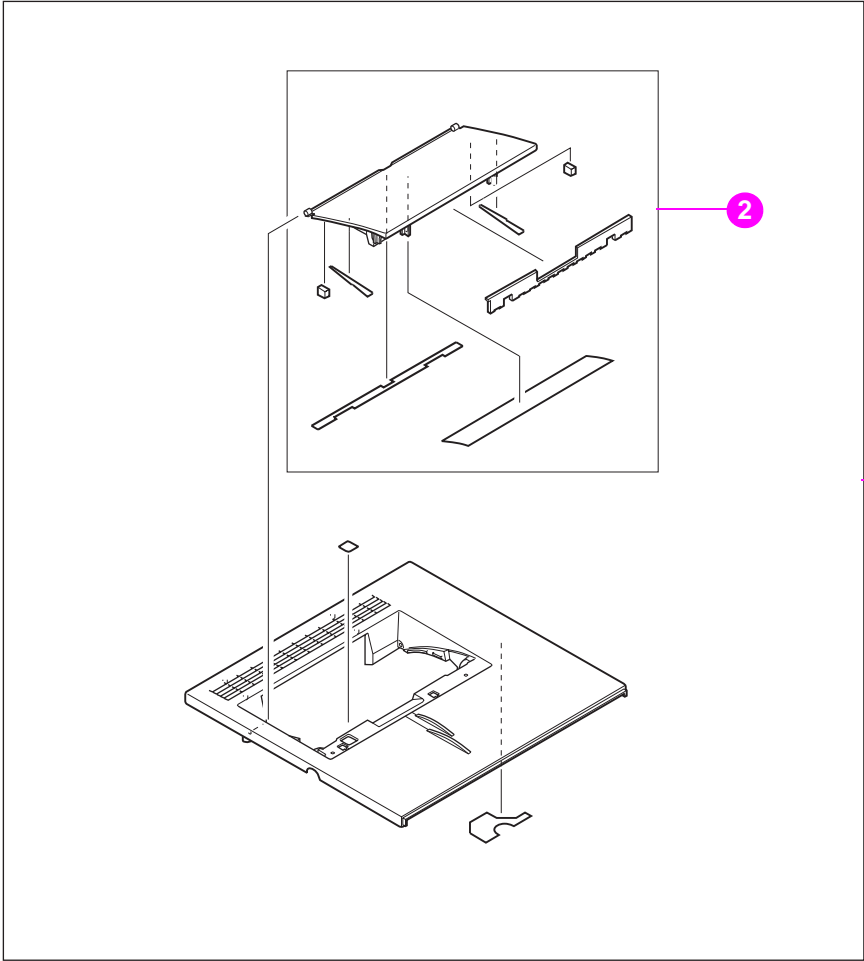
Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.

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**Note**

Early CLJ4500 printers (serial numbers xxGxxxxxxx and below) have two versions of the Drum Drawer Cover and the Upper (Drum) Drawer Assembly (Figure 8-7, item 6 and Figure 8-13, item 1). If the Drum Drawer Cover requires replacement, first determine whether you have the original version of the Drum Drawer by locating a bar code label with a part number of RG5-3315 on the inside of the Drum Drawer Cover, just to the right of the fan cover. If you have the original version of the Drum Drawer, order kit part number **RG5-5230-000CN** to obtain the newer version of the Drum Drawer Assembly, Drum Drawer Cover, plus additional hardware required to complete the update. If the newer version of the Drum Drawer is already installed, simply order the replacement Drum Drawer Cover (RG5-5232-000CN).

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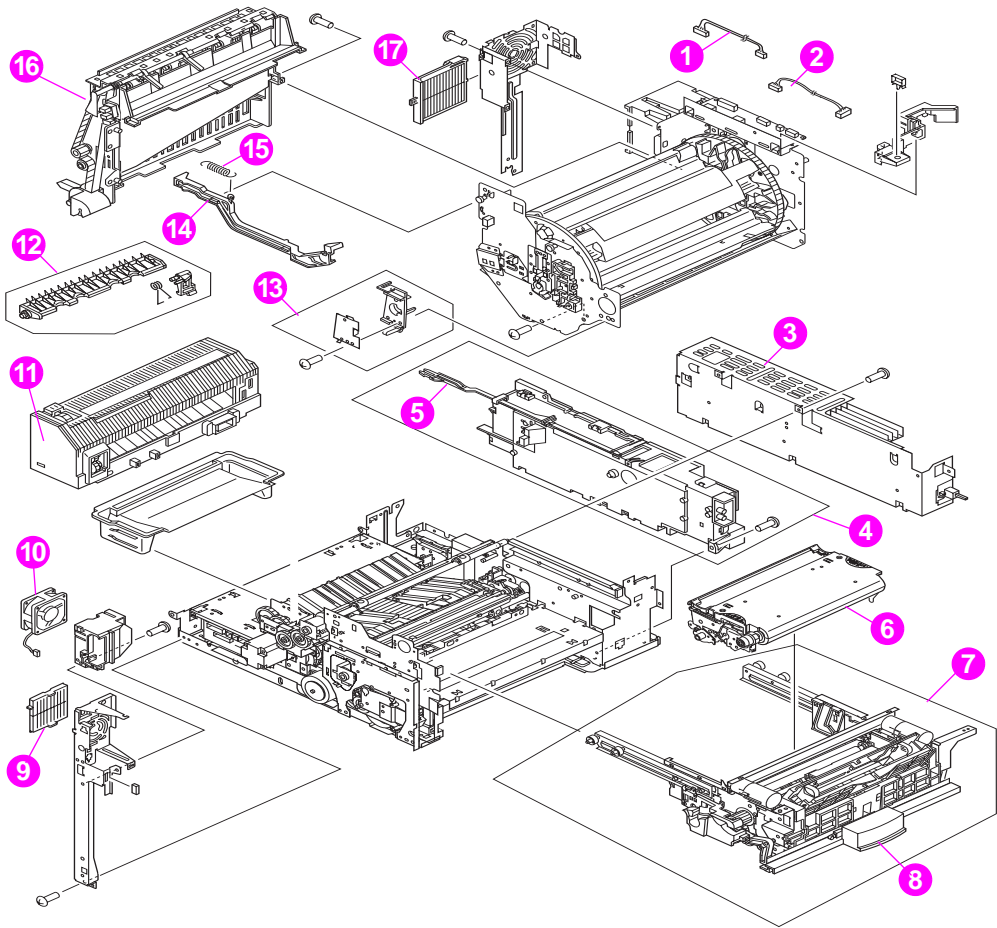
**Figure 8-5** Top cover assembly

**Table 8-5 Top cover components**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Cover, top	1	RG5-3300-000CN	RG5-5150-000CN
2	Cover, toner access	1	RF5-2076-000CN	RF5-3137-000CN

**CAUTION**

Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.



**Figure 8-6 Internal components (1 of 3)**

**Table 8-6 Internal components (1 of 3)**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Cable, fan	1	RG5-3887-000CN	N/A
2	Cable, developer	1	RG5-3783-000CN	RG5-5187-000CN
3	Power supply, 110V	1	RH3-2189-000CN	RH3-2189-000CN
3	Power supply, 220V	1	RH3-2190-000CN	RH3-2190-000CN
4	High-voltage power supply	1	RG5-3285-000CN	RG5-5165-000CN
5	Strap, cover support	1	RB2-1556-000CN	RB2-1556-000CN
6	ITB assembly	1	RG5-3397-000CN	RG5-3397-000CN

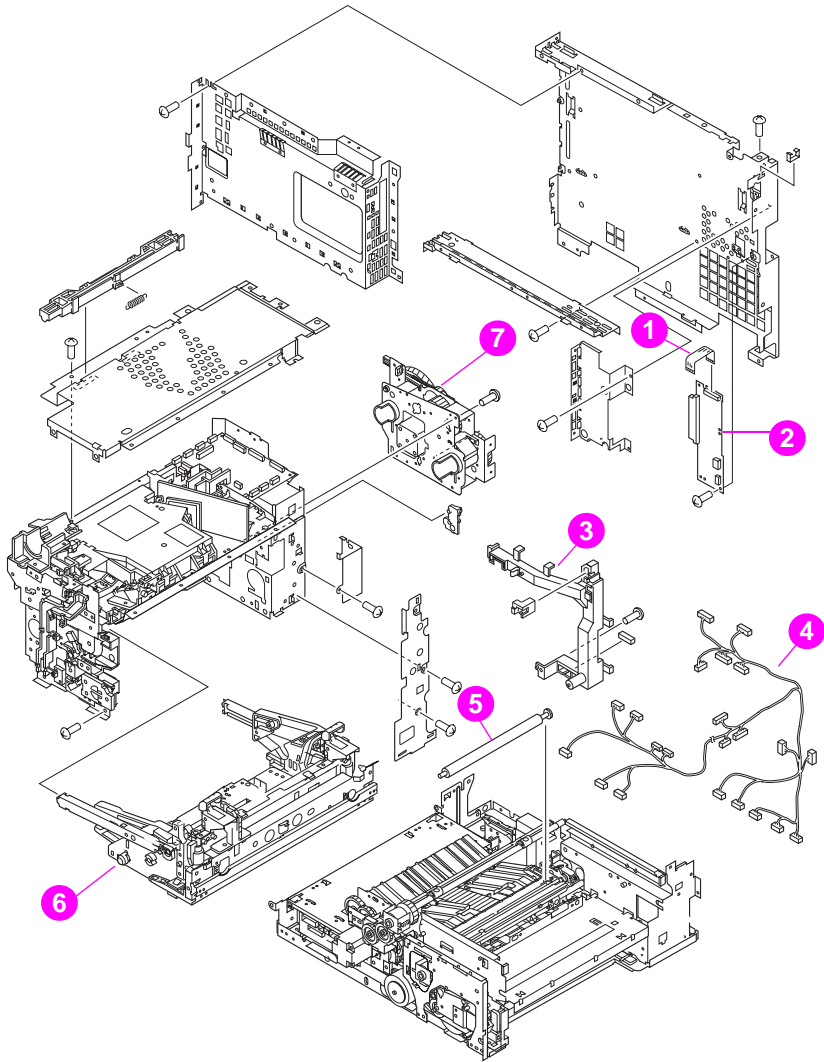
**Table 8-6 Internal components (1 of 3) (continued)**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
7	ITB drawer assembly	1	RG5-3190-000CN	RG5-3190-000CN
8	Handle, ITB drawer	1	RB2-1361-000CN	RB2-1361-000CN
9	Filter, air (small)	1	RB2-1283-000CN	RB2-1283-000CN
10	Fan, small	1	RH7-1407-000CN	RH7-1407-000CN
11	Fuser, 110V	1	RG5-3250-000CN C4084-69002*	RG5-3250-000CN C4084-69002*
11	Fuser, 220V	1	RG5-3251-000CN C4084-69003*	RG5-3251-000CN C4084-69003*
12	Kit, Fuser Deflector	1	C4084-67906	C4084-67906
13	Drum bushing assembly	1	RG5-3319-000CN	RG5-3319-000CN
14	Rod, delivery	1	RB2-1284-000CN	RB2-1284-000CN
15	Spring, tension	1	RS5-2754-000CN	RS5-2754-000CN
16	Face-down delivery assembly	1	RG5-5135-000CN	RG5-5135-000CN
17	Filter, air (large)	1	RB2-1282-000CN	RB2-1282-000CN

\*These parts require exchange

**CAUTION**

Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.



**Figure 8-7** Internal components (2 of 3)

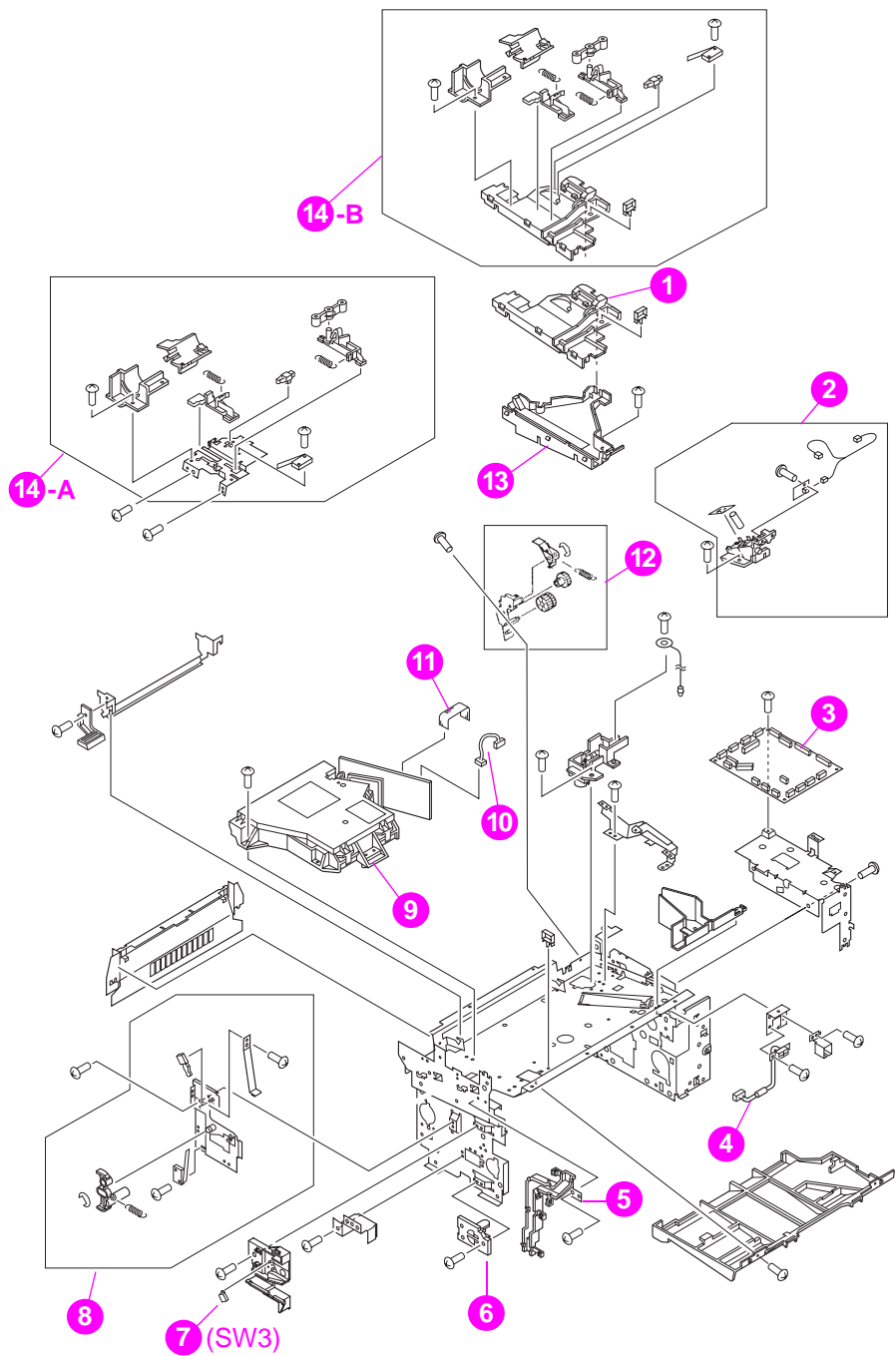


**Table 8-7 Internal components (2 of 3)**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Cable, video interface	1	RH2-5335-000CN	RH2-5335-000CN
2	Interconnect PCB	1	RG5-3808-000CN	RG5-3808-000CN
3	Guide, cable	1	RB2-1277-000CN	RB2-1277-000CN
4	Cable, main	1	RG5-3781-000CN	RG5-5186-000CN
5	Roller, transfer	1	RF5-2112-000CN	RF5-2112-000CN
6	Drum drawer assembly	1	RG5-5230-000CN	RG5-5142-000CN
7	Drum drive assembly	1	RG5-3170-000CN	RG5-3170-000CN

**CAUTION**

Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.



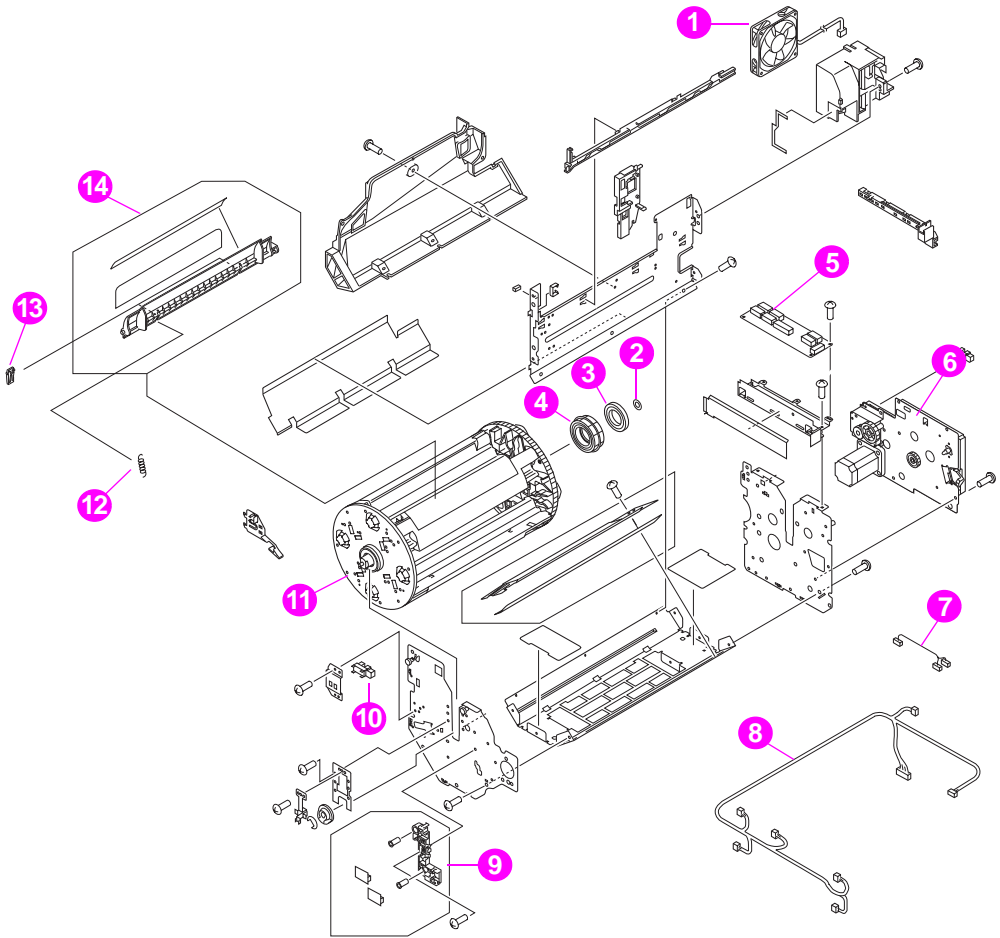
**Figure 8-8 Internal components (3 of 3)**

**Table 8-8 Internal components (3 of 3)**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Guide, upper drum drawer cable	1	RB2-1457-000CN	(included in 14B)
2	Sensor, waste toner (PS13)	1	RG5-3292-000CN	RG5-3292-000CN
3	DC controller PCB	1	RG5-3809-000CN	RG5-5179-000CN
4	Cable, fan	1	RG5-4650-000CN	RG5-4650-000CN
5	Cover, cable	1	RB2-1180-000CN	RB2-1180-000CN
6	Bushing, ITB left	1	RB2-1158-000CN	RB2-5185-000CN
7	Microswitch	1	WC2-5330-000CN	WC2-5330-000CN
8	Drawer switch assembly	1	RG5-3296-030CN	RG5-3296-030CN
9	Laser/scanner assembly	1	RG5-5175-000CN	RG5-5175-000CN
10	Cable, laser	1	RG5-3782-000CN	RG5-3782-000CN
11	Cable, laser (flat)	1	RH2-5334-000CN	RH2-5334-000CN
12	Carousel brake assembly	1	RG5-3309-000CN	RG5-5163-000CN
13	Guide, cable, lower	1	RB2-1456-000CN	RB2-1456-000CN
14A/B	Door switch assembly	1	RG5-3291-000CN	RG5-5170-000CN

**CAUTION**

Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.



**Figure 8-9** Developing carousel assembly

**Table 8-9** Developing carousel assembly

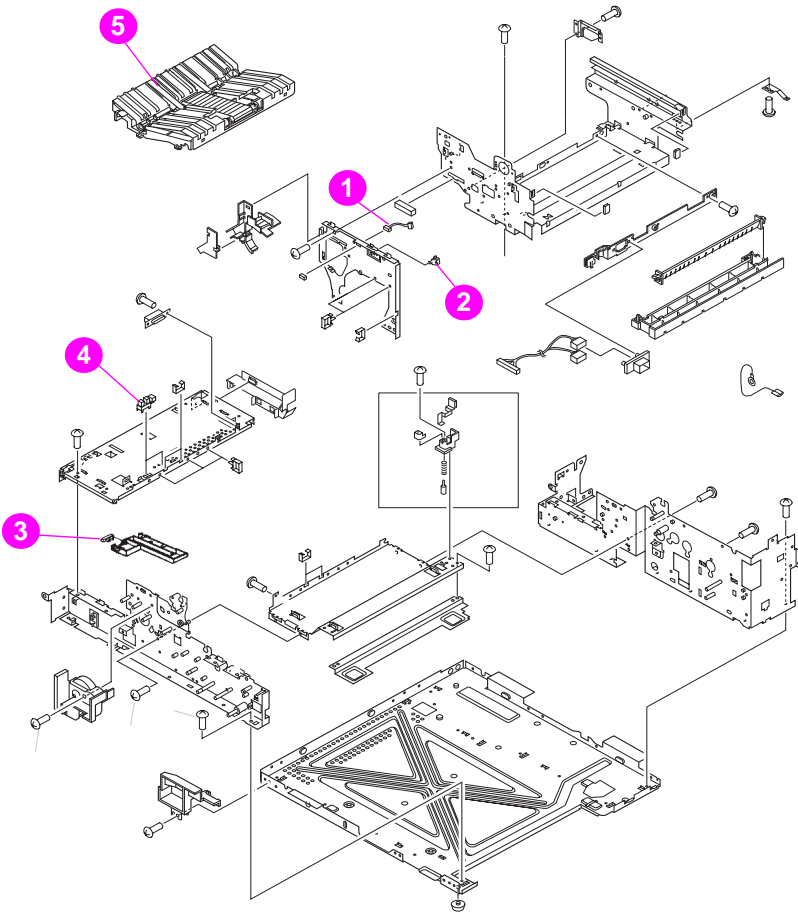
Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Fan, large	1	RH7-1346-000CN	RH7-1435-000CN
2	Spacer	1	RS5-6210-000CN	RS5-6210-000CN
3	Bearing, carousel	1	XG9-0361-000CN	N/A
4	Gear, 125T	1	RS6-0176-000CN	RS6-0759-000CN
5	Developing PCB	1	RG5-3811-000CN	RG5-5180-000CN
6	Carousel drive assembly	1	RG5-5209-000CN	RG5-5209-000CN
7	Cable, fusing connector	1	RG5-3886-000CN	RG5-3886-000CN

**Table 8-9 Developing carousel assembly (continued)**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
8	Cable, rotary	1	RG5-3795-000CN	RG5-3795-000CN
9	Sensor (PS12), toner level	1	RG5-3355-000CN	RG5-3355-000CN
10	Sensor (PS10), carousel position	1	WG8-5362-000CN	WG8-5362-000CN
11	Carousel assembly	1	RG5-3370-000CN	RG5-3370-000CN
12	Spring, toner flap	2	RS5-2739-000CN	RS5-2739-000CN
13	Cap, toner flap	2	RB2-0964-000CN	N/A
14	Kit, carousel flap	1	C4084-67909	C4084-67909

**CAUTION**

Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.



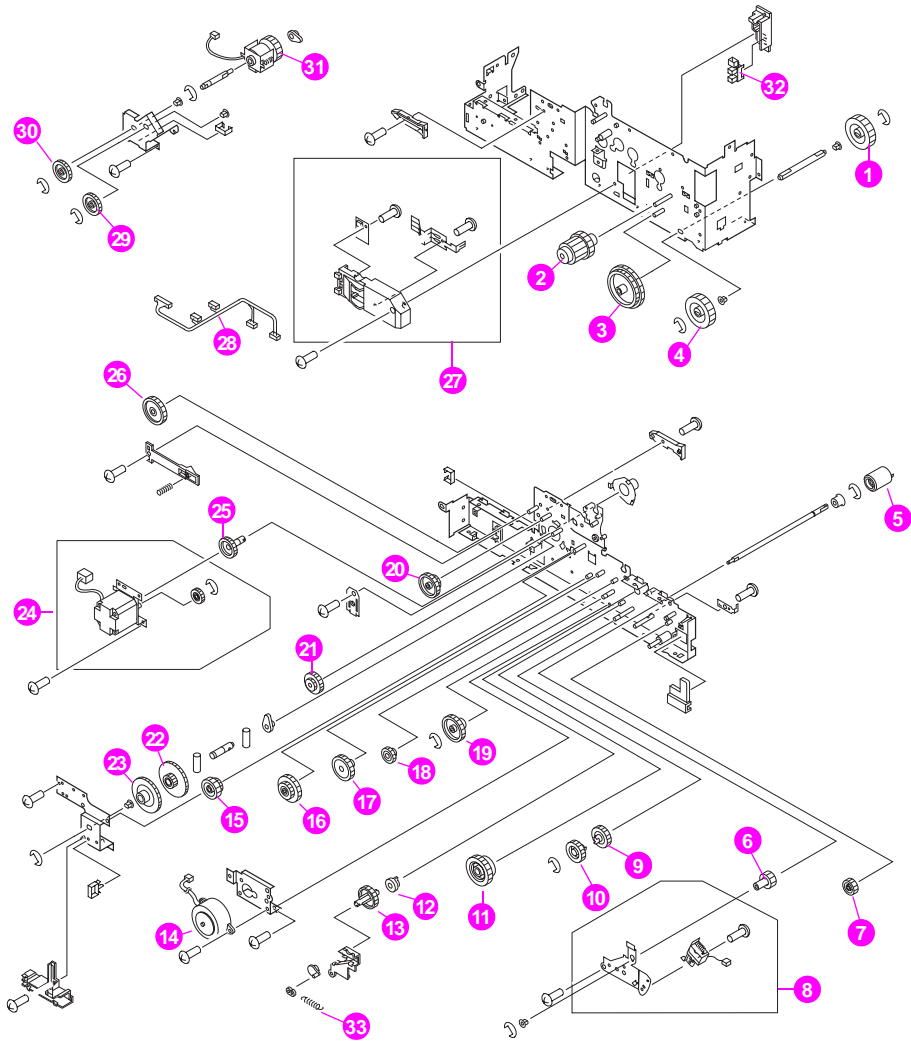
**Figure 8-10** Paper pick-up assembly (1 of 3)

**Table 8-10 Paper pick-up assembly (1 of 3)**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Cable, ITB switch	1	RG5-4651-000CN	RG5-4651-000CN
2	Microswitch, ITB	1	WC2-5330-000CN	WC2-5330-000CN
3	Sensor (PS7), delivery paper		WG8-5222-000CN	WG8-5222-000CN
4	Sensor (PS6), fusing unit pressure release	1	WG8-5309-000CN	WG8-5309-000CN
5	Feeder assembly	1	RG5-3226-000CN	RG5-5117-000CN

**CAUTION**

Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.



**Figure 8-11 Paper pick-up assembly (2 of 3)**

**Table 8-11 Paper pick-up assembly (2 of 3)**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Gear, 17T	2	RS6-0158-000CN	RS6-0158-000CN
2	Gear, 18T/14T	1	RS6-0157-000CN	RS6-0157-000CN
3	Gear, 53T/46T	1	RS6-0156-000CN	RS6-0156-000CN
4	Gear, 17T	1	RS6-0158-000CN	RS6-0158-000CN
5	Roller	1	RF5-2092-000CN	RF5-2092-000CN

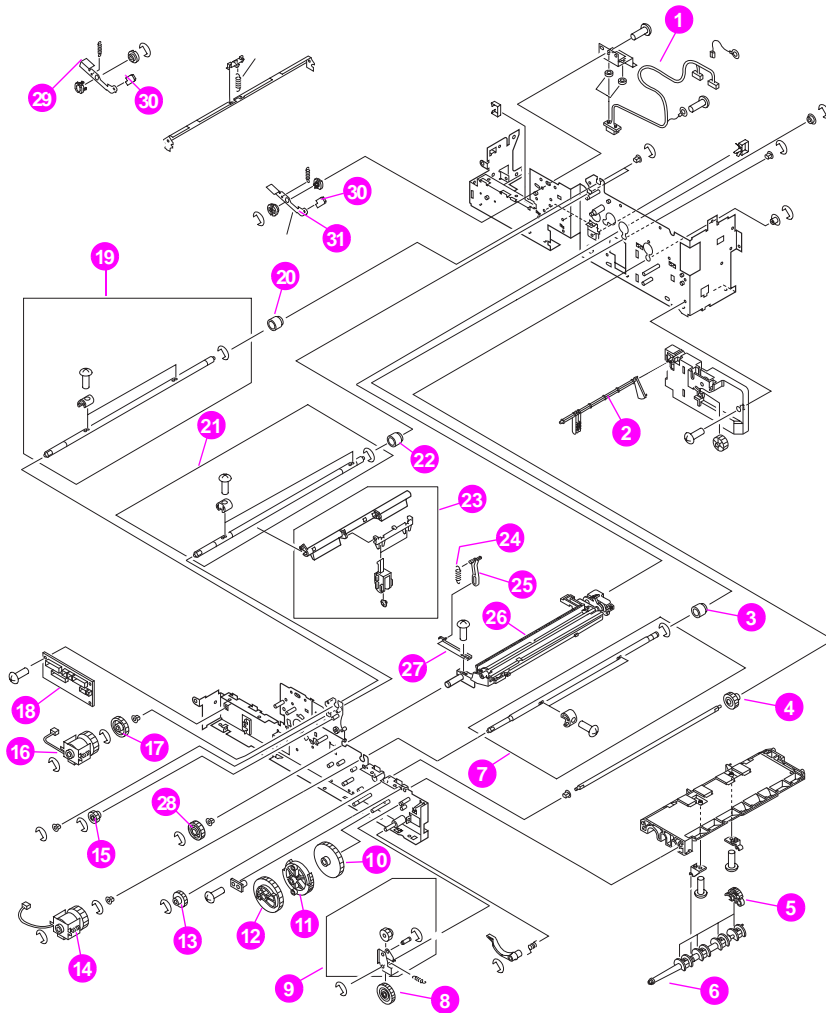


**Table 8-11 Paper pick-up assembly (2 of 3) (continued)**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
6	Gear, 18T	1	RS6-0140-000CN	RS6-0140-000CN
7	Gear, 19T	1	RS6-0141-000CN	RS6-0141-000CN
8	Solenoid, Tray 2 feed (SL2)	1	RG5-3245-000CN	RG5-5119-000CN
9	Gear, 27T	1	RS6-0135-000CN	RS6-0135-000CN
10	Gear, 27T	1	RS6-0135-000CN	RS6-0135-000CN
11	Gear, 30T/16T	1	RS6-0134-000CN	RS6-0134-000CN
12	Bushing	2	RS5-1293-000CN	RS5-1293-000CN
13	Gear, 31T	1	RS6-0136-000CN	RS6-0136-000CN
14	Motor (M2), stepping	1	RH7-1343-000CN	RH7-1343-000CN
15	Gear, 47T	1	RS6-0147-000CN	RS6-0147-000CN
16	Gear, 24T/37T	1	RS6-0163-000CN	RS6-0163-000CN
17	Gear, 35T	1	RS6-0132-000CN	RS6-0132-000CN
18	Gear, 20T	1	RS6-0138-000CN	RS6-0138-000CN
19	Gear, 37T/14T	1	RS6-0133-000CN	RS6-0133-000CN
20	Gear, 34T/15T	1	RS6-0144-000CN	RS6-0144-000CN
21	Gear, 29T/17T	1	RS6-0145-000CN	RS6-0145-000CN
22	Gear, 18T/52T	1	RS6-0148-000CN	RS6-0148-000CN
23	Gear, 52T	1	RS6-0146-000CN	RS6-0146-000CN
24	Motor (M1), fusing assembly	1	RG5-3227-000CN	RG5-3227-000CN
25	Gear, 26T	1	RS6-0149-000CN	RS6-0149-000CN
26	Gear, 37T	1	RS6-0143-000CN	RS6-0143-000CN
27	Sensor, paper size	1	RG5-3234-000CN	RG5-3234-000CN
28	Cable, paper feed	1	RG5-3785-000CN	RG5-3785-000CN
29	Gear, 29T	1	RS6-0150-000CN	RS6-0150-000CN
30	Gear, 29T	1	RS6-0150-000CN	RS6-0150-000CN
31	Clutch (CL2), electromagnetic	1	RH7-5176-000CN	RH7-5176-000CN
32	Sensor (PS8), cassette paper	1	WG8-5309-000CN	WG8-5309-000CN
33	Spring, Tray 2 pickup tension	1	RS5-2794-000CN	RS5-2794-000CN

**CAUTION**

Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.



**Figure 8-12 Paper pick-up assembly (3 of 3)**

**Table 8-12 Paper pick-up assembly (3 of 3)**

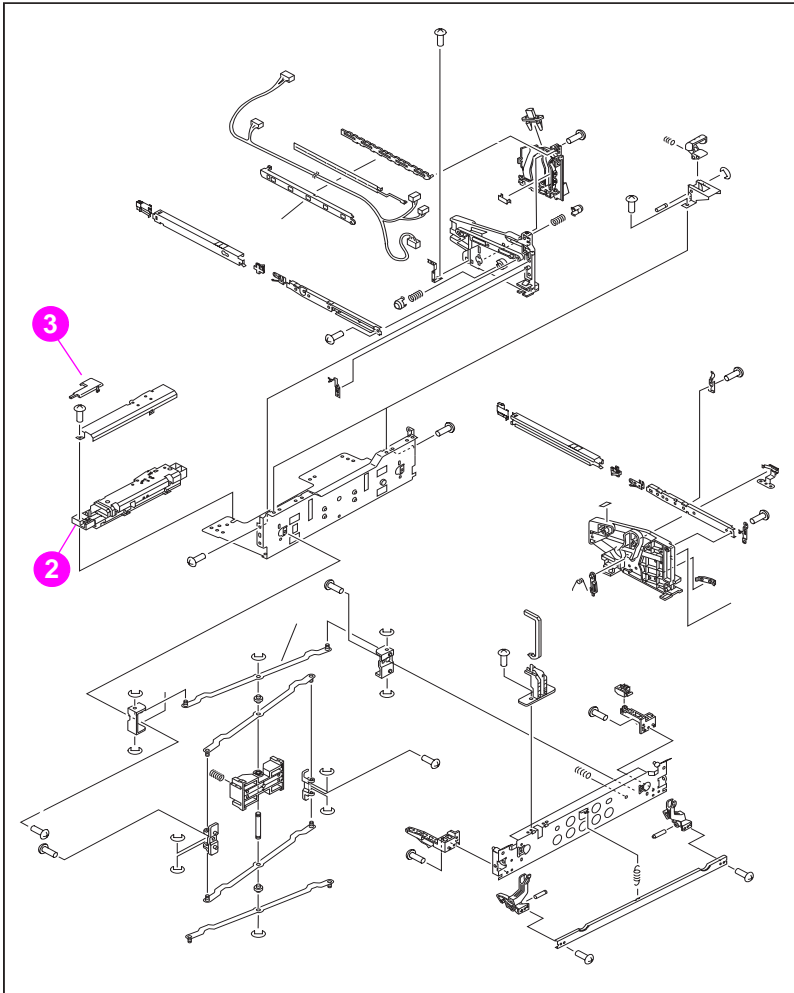
Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Cable, fusing/option	1	RG5-3787-000CN	RG5-3787-000CN
2	Lever, sensor	1	RB2-0576-000CN	RB2-0576-000CN
3	Clutch, one-way	1	RB2-0572-000CN	RB2-0572-000CN
4	Gear, 18T	1	RS6-0139-000CN	RS6-0139-000CN
5	Roller, paper pick	4	RB1-8865-000CN	RB1-8865-000CN

**Table 8-12 Paper pick-up assembly (3 of 3) (continued)**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
6	Shaft, paper pick	1	RB2-0545-000CN	RB2-0545-000CN
7	Transfer cam assembly	1	RG5-3240-000CN	RG5-5118-000CN
8	Gear, 26T/18T	1	RS6-0137-000CN	RS6-0137-000CN
9	Gear assembly	1	RG5-3228-000CN	RG5-3228-000CN
10	Gear, 53T	1	RS6-0155-000CN	RS6-0155-000CN
11	Gear, 39T/31T	1	RS6-0154-000CN	RS6-0154-000CN
12	Gear, 49T	1	RS6-0153-000CN	RS6-0153-000CN
13	Gear, 18T	1	RS6-0139-000CN	RS6-0139-000CN
14	Clutch (CL4), electromagnetic	1	RH7-5180-000CN	RH7-5180-000CN
15	Gear, 16T	1	RS6-0151-000CN	RS6-0151-000CN
16	Clutch (CL3), electromagnetic	1	RH7-5178-000CN	RH7-5178-000CN
17	Gear, 29T	1	RS6-0152-000CN	RS6-0152-000CN
18	Paper feed PCB assembly	1	RG5-3810-000CN	RG5-3810-000CN
19	ICL cam assembly	1	RG5-3242-000CN	RG5-3242-000CN
20	Clutch, one-way	1	RB2-0561-000CN	RB2-0561-000CN
21	ITB cam assembly	1	RG5-3241-000CN	RG5-3241-000CN
22	Clutch, one-way	1	RB2-0561-000CN	RB2-0561-000CN
23	Rowel swing assembly	1	RG5-4696-000CN	RG5-4696-000CN
24	Spring tension	1	RS5-2800-000CN	RS5-2800-000CN
25	Link rowel	1	RB2-0614-000CN	RB2-0614-000CN
26	Transfer assembly, secondary	1	RG5-3235-000CN	RG5-5115-000CN
27	Plate support	1	RF5-2138-000CN	(included in #26)
28	Gear, 26T	1	RS6-0159-000CN	RS6-0159-000CN
29	Plate, left	1	RF5-2094-000CN	RF5-2094-000CN
30	Cover, plate	2	RB2-1572-000CN	RB2-1572-000CN
31	Plate, right	1	RF5-2095-000CN	RF5-2095-000CN

**CAUTION**

Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.



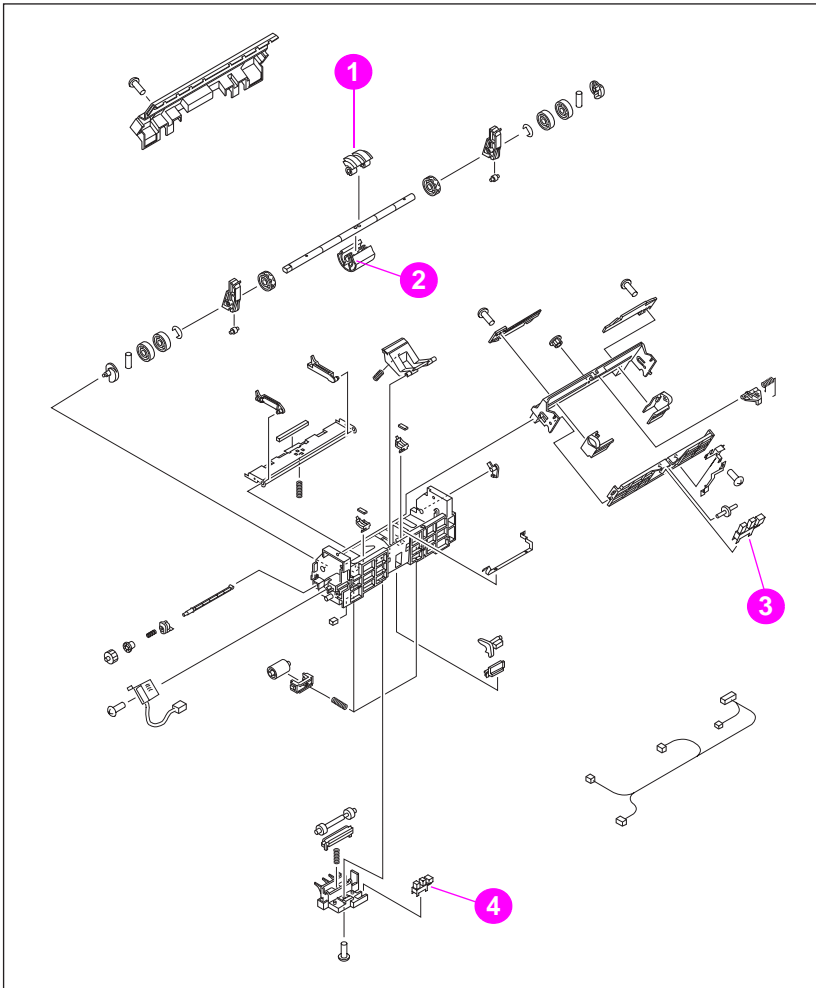
**Figure 8-13** Upper drawer assembly

**Table 8-13** Upper drawer assembly

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Drum drawer assembly	1	RG5-5230-000CN	RG5-5142-000CN
2	Sensor (PS14), density	1	RG5-3281-000CN	RG5-5149-000CN
3	Cover, connector	1	RB2-0916-000CN	RB2-0916-000CN

**CAUTION**

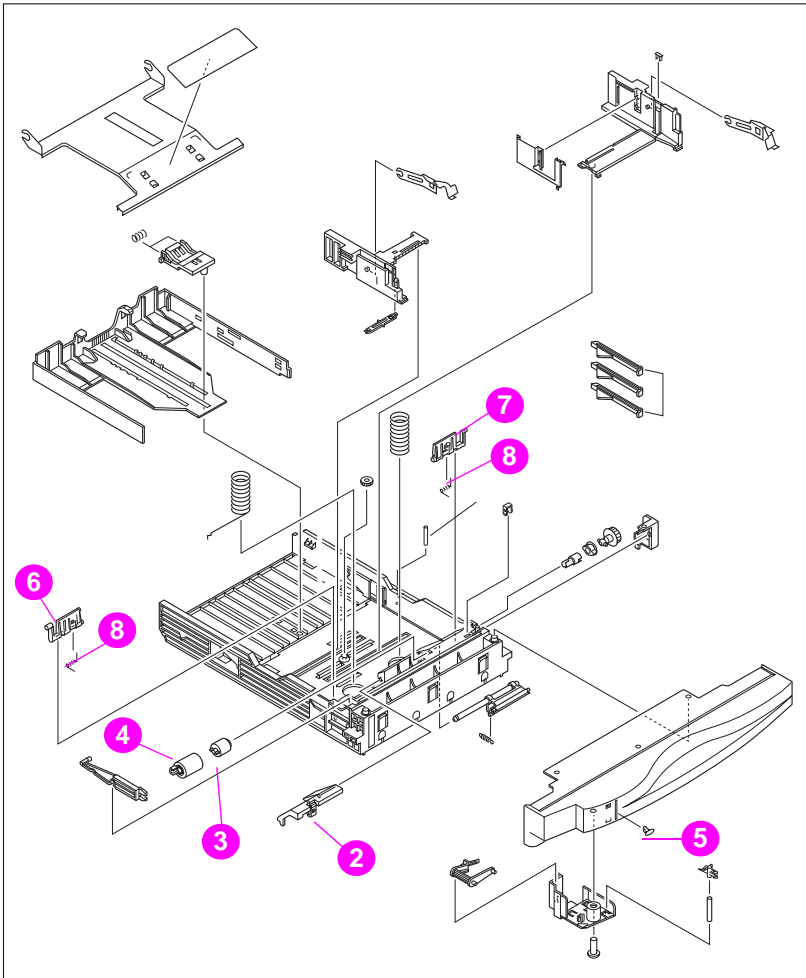
Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.



**Figure 8-14** MP tray paper pick-up assembly

**Table 8-14** MP tray paper pick-up assembly

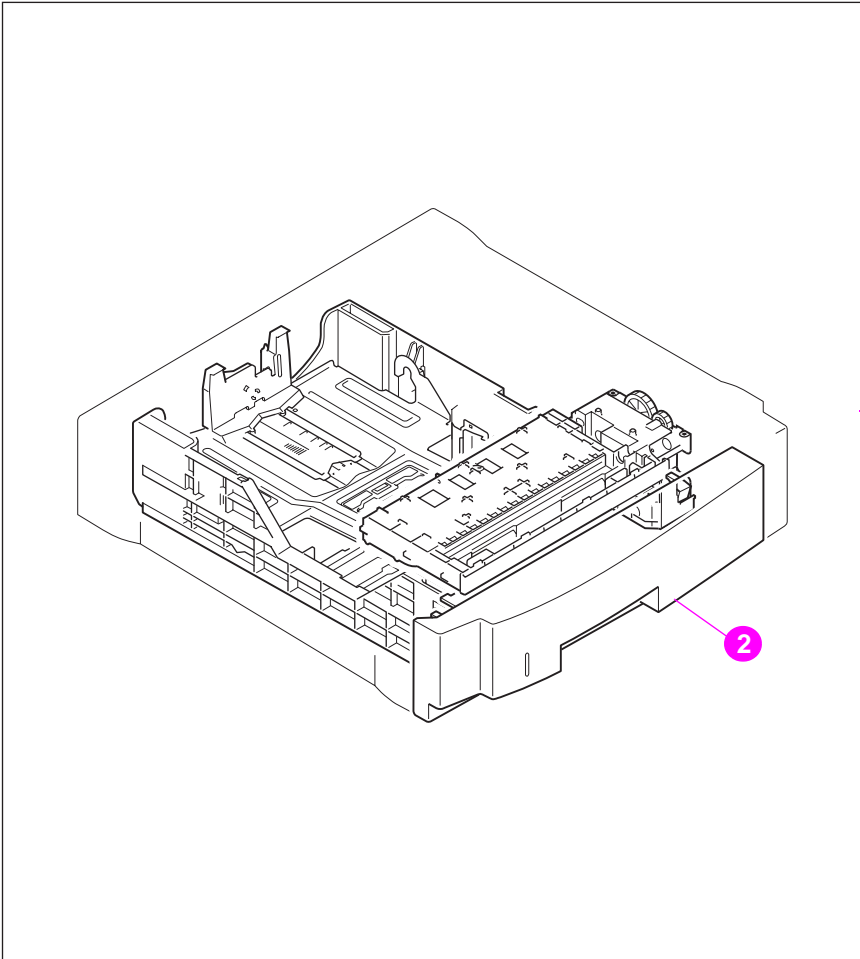
Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Roller	1	RB2-0717-000CN	RB2-0717-000CN
2	Roller	1	RB2-0744-000CN	RB2-0744-000CN
3	Sensor (PS3), last paper	1	WG8-5364-000CN	WG8-5364-000CN
4	Sensor (PS4), multi-purpose tray paper	1	WG8-5309-000CN	WG8-5309-000CN



**Figure 8-15** 250-sheet cassette

**Table 8-15 250-sheet cassette**

<b>Ref.</b>	<b>Description</b>	<b>Qty.</b>	<b>Parts for printer s/n xxG... and below</b>	<b>Parts for printer s/n xxH... and above</b>
1	Cassette, 250-sheet	1	RG5-3400-000CN	RG5-3400-000CN
2	Cover, roller	1	RB1-9001-000CN	RB1-9001-000CN
3	Limitter, torque	1	RB1-8974-000CN	RB1-8974-000CN
4	Roller, separation	1	RF5-1885-000CN	RF5-1885-000CN
5	Indicator, paper level	1	RB1-9009-000CN	RB1-9009-000CN
6	Arm, lifter, left	1	RB1-9012-000CN	RB1-9012-000CN
7	Arm, lifter, right	1	RB1-9013-000CN	RB1-9013-000CN
8	Spring, torsion	2	RB1-9016-000CN	RB1-9016-000CN

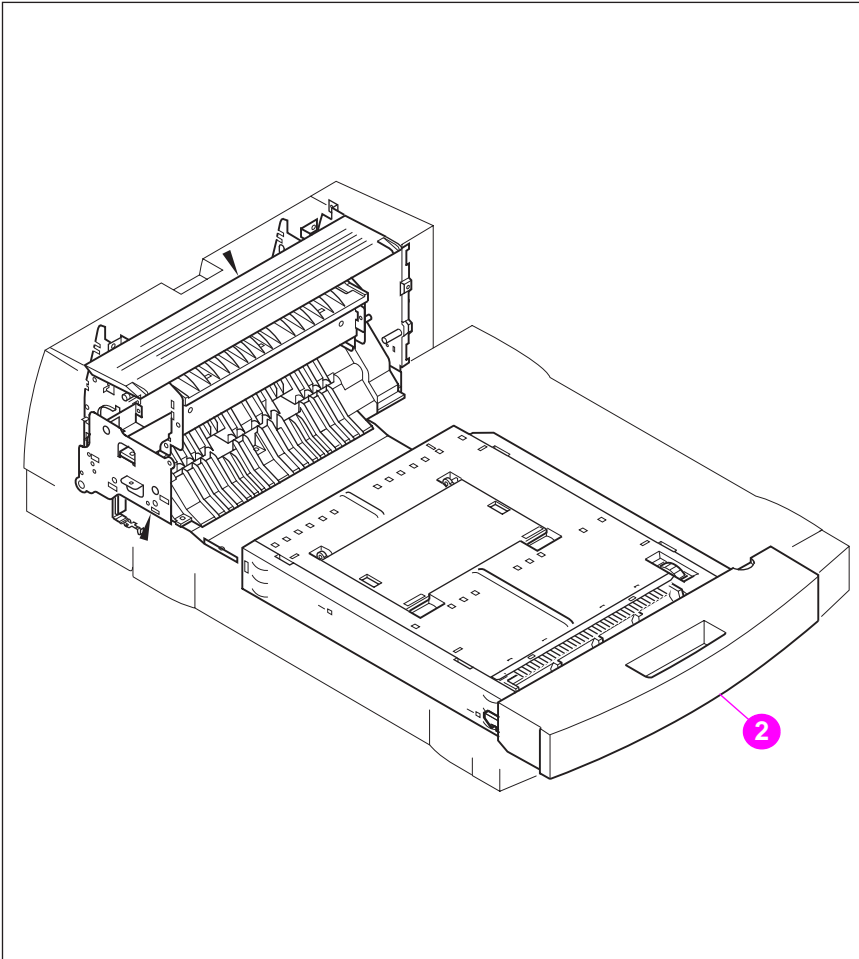


**Figure 8-16** 500-sheet paper feeder

**Table 8-16** 500-sheet paper feeder

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	500-sheet paper feeder	1	C4082-67901	C4082-67901
2	500-sheet paper cassette	1	RG5-3900-000CN	RG5-3900-000CN
	Roller, separation	1	RF5-1885-000CN	RF5-1885-000CN





**Figure 8-17 Duplex unit**

**Table 8-17 Duplex unit**

Ref.	Description	Qty.	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above
1	Duplex unit	1	C4083-67901	C4083-67901
2	Duplexing feeder assembly	1	RG5-4055-000CN	RG5-4055-000CN

# Alphabetical parts list

## CAUTION

Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.

**Table 8-18 Alphabetical parts list**

Description	Parts for printer s/n xxG... and below	Parts for printer s/n xxH... and above	Figure	Reference
500-sheet paper cassette	RG5-3900-000CN	RG5-3900-000CN	8-16	2
500-sheet paper feeder	C4082-67901	C4082-67901	8-16	1
Arm, lifter, left	RB1-9012-000CN	RB1-9012-000CN	8-15	6
Arm, lifter, right	RB1-9013-000CN	RB1-9013-000CN	8-15	7
Bearing, carousel	XG9-0361-000CN	N/A	8-9	3
Bushing, ITB, left	RB2-1158-000CN	RB2-5185-000CN	8-8	6
Bushing	RS5-1293-000CN	RS5-1293-000CN	8-11	12
Cable, fusing connector	RG5-3886-000CN	RG5-3886-000CN	8-9	7
Cable, control panel	RG5-3802-000CN	RG5-5195-000CN	8-4	4
Cable, developer	RG5-3783-000CN	RG5-5187-000CN	8-6	2
Cable, fan	RG5-3887-000CN	N/A	8-6	1
Cable, fan	RG5-4650-000CN	RG5-4650-000CN	8-8	4
Cable, fusing/option	RG5-3787-000CN	RG5-3787-000CN	8-12	1
Cable, ITB switch	RG5-4651-000CN	RG5-4651-000CN	8-10	1
Cable, laser	RG5-3782-000CN	RG5-3782-000CN	8-8	10
Cable, laser (flat)	RH2-5334-000CN	RH2-5334-000CN	8-8	11
Cable, main	RG5-3781-000CN	RG5-5186-000CN	8-7	4
Cable, paper feed	RG5-3785-000CN	RG5-3785-000CN	8-11	28
Cable, rotary	RG5-3795-000CN	RG5-3795-000CN	8-9	8
Cable, video interface	RH2-5335-000CN	RH2-5335-000CN	8-7	1
Cap, toner flap	RB2-0964-000CN	N/A	8-9	13
Carousel assembly	RG5-3370-000CN	RG5-3370-000CN	8-9	11
Carousel brake assembly	RG5-3309-000CN	RG5-5163-000CN	8-8	12

**Table 8-18 Alphabetical parts list (continued)**

<b>Description</b>	<b>Parts for printer s/n xxG... and below</b>	<b>Parts for printer s/n xxH... and above</b>	<b>Figure</b>	<b>Reference</b>
Carousel drive assembly	RG5-5209-000CN	RG5-5209-000CN	8-9	6
Cassette, 250-sheet	RG5-3400-000CN	RG5-3400-000CN	8-15	1
Clutch (CL2), electromagnetic	RH7-5176-000CN	RH7-5176-000CN	8-11	31
Clutch (CL3), electromagnetic	RH7-5178-000CN	RH7-5178-000CN	8-12	16
Clutch (CL4), electromagnetic	RH7-5180-000CN	RH7-5180-000CN	8-12	14
Clutch, one-way	RB2-0572-000CN	RB2-0572-000CN	8-12	3
Clutch, one-way	RB2-0561-000CN	RB2-0561-000CN	8-12	20
Clutch, one-way	RB2-0561-000CN	RB2-0561-000CN	8-12	22
Control panel assembly	RG5-3345-000CN	RG5-3345-000CN	8-4	5
Cover, cable	RB2-1180-000CN	RB2-1180-000CN	8-8	5
Cover, connector	RB2-1224-000CN	RB2-1224-000CN	8-4	2
Cover, connector	RB2-0916-000CN	RB2-0916-000CN	8-13	3
Cover, drum drawer	RG5-3315-000CN	RG5-5152-000CN	8-4	8
Cover, ITB drawer	RG5-3320-000CN	RG5-3320-000CN	8-4	6
Cover, left side	RG5-3313-000CN	RG5-5151-000CN	8-4	9
Cover, lower rear	RB2-1206-000CN	RB2-1206-000CN	8-4	10
Cover, plate	RB2-1572-000CN	RB2-1572-000CN	8-12	30
Cover, rear	RB2-1205-000CN	RB2-1205-000CN	8-4	12
Cover, right front	RG5-3310-000CN	RG5-3310-000CN	8-4	3
Cover, right side	RB2-1203-000CN	RB2-1203-000CN	8-4	1
Cover, roller	RB1-9001-000CN	RB1-9001-000CN	8-15	2
Cover, toner access	RF5-2076-000CN	RF5-3137-000CN	8-5	2
Cover, top	RG5-3300-000CN	RG5-5150-000CN	8-5	1
DC controller PCB	RG5-3809-000CN	RG5-5179-000CN	8-3	2
DC controller PCB	RG5-3809-000CN	RG5-5179-000CN	8-8	3
Developing PCB	RG5-3811-000CN	RG5-5180-000CN	8-3	1
Developing PCB	RG5-3811-000CN	RG5-5180-000CN	8-9	5
Door switch assembly	RG5-3291-000CN	RG5-5170-000CN	8-8	14A/B

**Table 8-18 Alphabetical parts list (continued)**

<b>Description</b>	<b>Parts for printer s/n xxG... and below</b>	<b>Parts for printer s/n xxH... and above</b>	<b>Figure</b>	<b>Reference</b>
Door, rear access	RG5-3325-040CN	RG5-3325-040CN	8-4	11
Drawer switch assembly	RG5-3296-040CN	RG5-3296-030CN	8-8	8
Drum bushing assembly	RG5-3319-000CN	RG5-3319-000CN	8-6	13
Drum drawer assembly	RG5-5230-000CN	RG5-5142-000CN	8-7	6
Drum drawer assembly	RG5-5230-000CN	RG5-5142-000CN	8-13	1
Drum drive assembly	RG5-3170-000CN	RG5-3170-000CN	8-7	7
Duplex unit	C4083-67901	C4083-67901	8-17	1
Duplexing feeder assembly	RG5-4055-000CN	RG5-4055-000CN	8-17	2
Face-down delivery assembly	RG5-5135-000CN	RG5-5135-000CN	8-6	16
Fan, large	RH7-1346-000CN	RH7-1435-000CN	8-9	1
Fan, small	RH7-1407-000CN	RH7-1407-000CN	8-6	10
Feeder assembly	RG5-3226-000CN	RG5-5117-000CN	8-10	5
Filter, air (large)	RB2-1282-000CN	RB2-1282-000CN	8-6	17
Filter, air (small)	RB2-1283-000CN	RB2-1283-000CN	8-6	9
Firmware DIMM	C4084-60004	C4084-60004	8-3	7
Formatter PCB	C4084-69001	C4084-69001	8-3	6
Fuser, 110V	RG5-3250-000CN C4084-69002*	RG5-3250-000CN C4084-69002*	8-6	11
Fuser, 220V	RG5-3251-000CN C4084-69003*	RG5-3251-000CN C4084-69003*	8-6	11
Gear assembly	RG5-3228-000CN	RG5-3228-000CN	8-12	9
Gear, 125T	RS6-0176-000CN	RS6-0759-000CN	8-9	4
Gear, 16T	RS6-0151-000CN	RS6-0151-000CN	8-12	15
Gear, 17T	RS6-0158-000CN	RS6-0158-000CN	8-11	1
Gear, 17T	RS6-0158-000CN	RS6-0158-000CN	8-11	4
Gear, 18T	RS6-0140-000CN	RS6-0140-000CN	8-11	6
Gear, 18T	RS6-0139-000CN	RS6-0139-000CN	8-12	4
Gear, 18T	RS6-0139-000CN	RS6-0139-000CN	8-12	13

\*These parts require exchange

**Table 8-18 Alphabetical parts list (continued)**

<b>Description</b>	<b>Parts for printer s/n xxG... and below</b>	<b>Parts for printer s/n xxH... and above</b>	<b>Figure</b>	<b>Reference</b>
Gear, 18T/14T	RS6-0157-000CN	RS6-0157-000CN	8-11	2
Gear, 18T/52T	RS6-0148-000CN	RS6-0148-000CN	8-11	22
Gear, 19T	RS6-0141-000CN	RS6-0141-000CN	8-11	7
Gear, 20T	RS6-0138-000CN	RS6-0138-000CN	8-11	18
Gear, 24T/37T	RS6-0163-000CN	RS6-0163-000CN	8-11	16
Gear, 26T	RS6-0149-000CN	RS6-0149-000CN	8-11	25
Gear, 26T	RS6-0159-000CN	RS6-0159-000CN	8-12	28
Gear, 26T/18T	RS6-0137-000CN	RS6-0137-000CN	8-12	8
Gear, 27T	RS6-0135-000CN	RS6-0135-000CN	8-11	9
Gear, 27T	RS6-0135-000CN	RS6-0135-000CN	8-11	10
Gear, 29T	RS6-0150-000CN	RS6-0150-000CN	8-11	29
Gear, 29T	RS6-0150-000CN	RS6-0150-000CN	8-11	30
Gear, 29T	RS6-0152-000CN	RS6-0152-000CN	8-12	17
Gear, 29T/17T	RS6-0145-000CN	RS6-0145-000CN	8-11	21
Gear, 30T/16T	RS6-0134-000CN	RS6-0134-000CN	8-11	11
Gear, 31T	RS6-0136-000CN	RS6-0136-000CN	8-11	13
Gear, 34T/15T	RS6-0144-000CN	RS6-0144-000CN	8-11	20
Gear, 35T	RS6-0132-000CN	RS6-0132-000CN	8-11	17
Gear, 37T	RS6-0143-000CN	RS6-0143-000CN	8-11	26
Gear, 37T/14T	RS6-0133-000CN	RS6-0133-000CN	8-11	19
Gear, 39T/31T	RS6-0154-000CN	RS6-0154-000CN	8-12	11
Gear, 47T	RS6-0147-000CN	RS6-0147-000CN	8-11	15
Gear, 49T	RS6-0153-000CN	RS6-0153-000CN	8-12	12
Gear, 52T	RS6-0146-000CN	RS6-0146-000CN	8-11	23
Gear, 53T	RS6-0155-000CN	RS6-0155-000CN	8-12	10
Gear, 53T/46T	RS6-0156-000CN	RS6-0156-000CN	8-11	3
Guide, cable	RB2-1277-000CN	RB2-1277-000CN	8-7	3
Guide, cable, lower	RB2-1456-000CN	RB2-1456-000CN	8-8	13
Guide, upper drum drawer cable	RB2-1457-000CN	N/A	8-8	1

**Table 8-18 Alphabetical parts list (continued)**

<b>Description</b>	<b>Parts for printer s/n xxG... and below</b>	<b>Parts for printer s/n xxH... and above</b>	<b>Figure</b>	<b>Reference</b>
Handle, ITB drawer	RB2-1361-000CN	RB2-1361-000CN	8-6	8
High-voltage power supply	RG5-3285-000CN	RG5-5165-000CN	8-6	4
ICL cam assembly	RG5-3242-000CN	RG5-3242-000CN	8-12	19
Indicator, paper level	RB1-9009-000CN	RB1-9009-000CN	8-15	5
Interconnect PCB	RG5-3808-000CN	RG5-3808-000CN	8-3	3
Interconnect PCB	RG5-3808-000CN	RG5-3808-000CN	8-7	2
I/O card	C4081-60001	C4081-60001	8-3	8
ITB assembly	RG5-3397-000CN	RG5-3397-000CN	8-6	6
ITB cam assembly	RG5-3241-000CN	RG5-3241-000CN	8-12	21
ITB drawer assembly	RG5-3190-000CN	RG5-3190-000CN	8-6	7
Kit, carousel flap	C4084-67909	C4084-67909	8-9	14
Kit, fuser deflector	C4084-67906	C4084-67906	8-6	12
Kit, imaging drum drawer	RG5-5230-000CN	N/A	Not shown	
Laser/scanner assembly	RG5-5175-000CN	RG5-5175-000CN	8-8	9
Lever, sensor	RB2-0576-000CN	RB2-0576-000CN	8-12	2
Limiter, torque	RB1-8974-000CN	RB1-8974-000CN	8-15	3
Link rowel	RB2-0614-000CN	RB2-0614-000CN	8-12	25
Microswitch	WC2-5330-000CN	WC2-5330-000CN	8-8	7
Microswitch, ITB	WC2-5330-000CN	WC2-5330-000CN	8-10	2
Motor (M1), fusing assembly	RG5-3227-000CN	RG5-3227-000CN	8-11	24
Motor(M2), stepping	RH7-1343-000CN	RH7-1343-000CN	8-11	14
Paper feed PCB	RG5-3810-000CN	RG5-3810-000CN	8-3	5
Paper feed PCB assembly	RG5-3810-000CN	RG5-3810-000CN	8-12	18
Paper size sensor PCB	RG5-3816-000CN	RG5-3816-000CN	8-3	4
Plate, left	RF5-2094-000CN	RF5-2094-000CN	8-12	29
Plate, right	RF5-2095-000CN	RF5-2095-000CN	8-12	31
Plate support	RF5-2138-000CN	N/A	8-12	27
Power supply, 110V	RH3-2189-000CN	RH3-2189-000CN	8-6	3
Power supply, 220V	RH3-2190-000CN	RH3-2190-000CN	8-6	3

**Table 8-18 Alphabetical parts list (continued)**

<b>Description</b>	<b>Parts for printer s/n xxG... and below</b>	<b>Parts for printer s/n xxH... and above</b>	<b>Figure</b>	<b>Reference</b>
Rod, delivery	RB2-1284-000CN	RB2-1284-000CN	8-6	14
Roller	RF5-2092-000CN	RF5-2092-000CN	8-11	5
Roller	RB2-0717-000CN	RB2-0717-000CN	8-14	1
Roller	RB2-0744-000CN	RB2-0744-000CN	8-14	2
Roller, paper pick	RB1-8865-000CN	RB1-8865-000CN	8-12	5
Roller, separation	RF5-1885-000CN	RF5-1885-000CN	8-15	4
Roller, separation	RF5-1885-000CN	RF5-1885-000CN	8-16	
Roller, transfer	RF5-2112-000CN	RF5-2112-000CN	8-7	5
Rowel swing assembly	RG5-4696-000CN	RG5-4696-000CN	8-12	23
Sensor (PS3), last paper	WG8-5364-000CN	WG8-5364-000CN	8-14	3
Sensor (PS4), multi-purpose tray paper	WG8-5309-000CN	WG8-5309-000CN	8-14	4
Sensor (PS6), fusing unit pressure release	WG8-5309-000CN	WG8-5309-000CN	8-10	4
Sensor (PS7), delivery paper	WG8-5222-000CN	WG8-5222-000CN	8-10	3
Sensor (PS8), cassette paper	WG8-5309-000CN	WG8-5309-000CN	8-11	32
Sensor (PS10), carousel position	WG8-5362-000CN	WG8-5362-000CN	8-9	10
Sensor (PS12), toner level	RG5-3355-000CN	RG5-3355-000CN	8-9	9
Sensor (PS13), waste toner	RG5-3292-000CN	RG5-3292-000CN	8-8	2
Sensor (PS14), density	RG5-3281-000CN	RG5-5149-000CN	8-13	2
Sensor, paper size	RG5-3234-000CN	RG5-3234-000CN	8-11	27
Shaft, paper pick	RB2-0545-000CN	RB2-0545-000CN	8-12	6
Solenoid, Tray 2 feed (SL2)	RG5-3245-000CN	RG5-5119-000CN	8-11	8
Spacer	RS5-6210-000CN	RS5-6210-000CN	8-9	2
Spring tension	RS5-2800-000CN	RS5-2800-000CN	8-12	24
Spring, tension	RS5-2754-000CN	RS5-2754-000CN	8-6	15
Spring, toner flap	RS5-2739-000CN	RS5-2739-000CN	8-9	12

**Table 8-18 Alphabetical parts list (continued)**

<b>Description</b>	<b>Parts for printer s/n xxG... and below</b>	<b>Parts for printer s/n xxH... and above</b>	<b>Figure</b>	<b>Reference</b>
Spring, torsion	RB1-9016-000CN	RB1-9016-000CN	8-15	8
Spring, Tray 2 pickup tension	RS5-2794-000CN	RS5-2794-000CN	8-11	33
Strap, cover support	RB2-1556-000CN	RB2-1556-000CN	8-6	5
Transfer assembly, secondary	RG5-3235-000CN	RG5-5115-000CN	8-12	26
Transfer cam assembly	RG5-3240-000CN	RG5-5118-000CN	8-12	7
Tray, extension	RB2-1215-000CN	RB2-1215-000CN	8-4	7



## Numerical parts list

Two versions of the HP Color LaserJet 4500 series printers are available. The following list contains part numbers for both versions of the printer.

### CAUTION

Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 357.

**Table 8-19 Numerical parts list**

Part number	Description	Figure	Reference
C4081-60001	I/O card	8-3	8
C4082-67901	500-sheet paper feeder	8-16	1
C4083-67901	Duplex unit	8-17	1
C4084-60004	Firmware DIMM	8-3	7
C4084-67906	Kit, fuser deflector	8-6	12
C4084-67909	Kit, carousel flap	8-9	14
C4084-69001*	Formatter PCB	8-3	6
C4084-69002*	Fuser, 110V	8-6	11
C4084-69003*	Fuser, 220V	8-6	11
	Cap, toner flap	8-9	13
	Cable, fan	8-6	1
	Bearing, carousel	8-9	3
RB1-8865-000CN	Roller, paper pick	8-12	5
RB1-8974-000CN	Limiter, torque	8-15	3
RB1-9001-000CN	Cover, roller	8-15	2
RB1-9009-000CN	Indicator, paper level	8-15	5
RB1-9012-000CN	Arm, lifter, left	8-15	6
RB1-9013-000CN	Arm, lifter, right	8-15	7
RB1-9016-000Cn	Spring, torsion	8-15	8
RB2-0545-000CN	Shaft, paper pick	8-12	6
RB2-0561-000CN	Clutch, one-way	8-12	20
RB2-0561-000CN	Clutch, one-way	8-12	22
RB2-0572-000CN	Clutch, one-way	8-12	3

**Table 8-19 Numerical parts list**

<b>Part number</b>	<b>Description</b>	<b>Figure</b>	<b>Reference</b>
RB2-0576-000CN	Lever, sensor	8-12	2
RB2-0614-000CN	Link rowel	8-12	25
RB2-0717-000CN	Roller	8-14	1
RB2-0744-000CN	Roller	8-14	2
RB2-0916-000CN	Cover, connector	8-13	3
RB2-0964-000CN	Cap, toner flap	8-9	13
RB2-1158-000CN	Bushing, ITB, left	8-8	6
RB2-1180-000CN	Cover, cable	8-8	5
RB2-1203-000CN	Cover, right side	8-4	1
RB2-1205-000CN	Cover, rear	8-4	12
RB2-1206-000CN	Cover, lower rear	8-4	10
RB2-1215-000CN	Tray, extension	8-4	7
RB2-1224-000CN	Cover, connector	8-4	2
RB2-1277-000CN	Guide, cable	8-7	3
RB2-1282-000CN	Filter, air (large)	8-6	17
RB2-1283-000CN	Filter, air (small)	8-6	9
RB2-1284-000CN	Rod, delivery	8-6	14
RB2-1361-000CN	Handle, ITB drawer	8-6	8
RB2-1456-000CN	Guide, cable, lower	8-8	13
RB2-1457-000CN	Guide, upper drum drawer cable	8-8	1
RB2-1556-000CN	Strap, cover support	8-6	5
RB2-5185-000CN	Bushing, ITB, left	8-8	6
RF5-1885-000CN	Roller, separation	8-15	4
RF5-1885-000CN	Roller, separation	8-16	
RF5-2076-000CN	Cover, toner access	8-5	2
RF5-2092-000CN	Roller	8-11	5
RF5-2112-000CN	Roller, transfer	8-7	5
RF5-2138-000CN	Plate support	8-12	27
RF5-3137-000CN	Cover, toner access	8-5	2
RG5-3170-000CN	Drum drive assembly	8-7	7
RG5-3190-000CN	ITB drawer assembly	8-6	7

**Table 8-19 Numerical parts list**

<b>Part number</b>	<b>Description</b>	<b>Figure</b>	<b>Reference</b>
RG5-3226-000CN	Feeder assembly	8-10	5
RG5-3227-000CN	Motor (M1), fusing assembly	8-11	24
RG5-3228-000CN	Gear assembly	8-12	9
RG5-3234-000CN	Sensor, paper size	8-11	27
RG5-3235-000CN	Transfer assembly, secondary	8-12	26
RG5-3240-000CN	Transfer cam assembly	8-12	7
RG5-3241-000CN	ITB cam assembly	8-12	21
RG5-3242-000CN	ICL cam assembly	8-12	19
RG5-3245-000CN	Solenoid, Tray 2 feed (SL2)	8-11	8
RG5-3250-000CN	Fuser, 110V	8-6	11
RG5-3251-000CN	Fuser, 220V	8-6	11
RG5-3281-000CN	Sensor (PS14), density	8-13	2
RG5-3285-000CN	High-voltage power supply	8-6	4
RG5-3291-000CN	Door switch assembly	8-8	14A
RG5-3292-000CN	Sensor (PS13), waste toner	8-8	2
RG5-3296-030CN	Drawer switch assembly	8-8	8
RG5-3300-000CN	Cover, top	8-5	1
RG5-3309-000CN	Carousel brake assembly	8-8	12
RG5-3310-000CN	Cover, right front	8-4	3
RG5-3313-000CN	Cover, left side	8-4	9
RG5-3319-000CN	Drum bushing assembly	8-6	13
RG5-3320-000CN	Cover, ITB drawer	8-4	6
RG5-3325-040CN	Door, rear access	8-4	11
RG5-3345-000CN	Control panel assembly	8-4	5
RG5-3355-000CN	Sensor (PS12), toner assembly	8-9	9
RG5-3370-000CN	Carousel assembly	8-9	11
RG5-3397-000CN	ITB assembly	8-6	6
RG5-3400-000CN	Cassette, 250-sheet	8-15	1
RG5-3781-000CN	Cable, main	8-7	4
RG5-3782-000CN	Cable, laser	8-8	10
RG5-3783-000CN	Cable, developer	8-6	2

**Table 8-19 Numerical parts list**

<b>Part number</b>	<b>Description</b>	<b>Figure</b>	<b>Reference</b>
RG5-3785-000CN	Cable, paper feed	8-11	28
RG5-3787-000CN	Cable, fusing/option	8-12	1
RG5-3795-000CN	Cable, rotary	8-9	8
RG5-3802-000CN	Cable, control panel	8-4	4
RG5-3808-000CN	Interconnect PCB	8-3	3
RG5-3808-000CN	Interconnect PCB	8-7	2
RG5-3809-000CN	DC controller PCB	8-8	3
RG5-3810-000CN	Paper feed PCB	8-3	5
RG5-3810-000CN	Paper feed PCB assembly	8-12	18
RG5-3811-000CN	Developing PCB	8-3	1
RG5-3811-000CN	Developing PCB	8-9	5
RG5-3816-000CN	Paper size sensor PCB	8-3	4
RG5-3886-000CN	Cable, fusing connector	8-9	7
RG5-3887-000CN	Cable, fan	8-6	1
RG5-3900-000CN	500-sheet paper cassette	8-16	2
RG5-4055-000CN	Duplexing feeder assembly	8-17	2
RG5-4650-000CN	Cable, fan	8-8	4
RG5-4651-000CN	Cable, ITB switch	8-10	1
RG5-4696-000CN	Rowel swing assembly	8-12	23
RG5-5115-000CN	Transfer assembly, secondary	8-12	26
RG5-5117-000CN	Feeder assembly	8-10	5
RG5-5118-000CN	Transfer cam assembly	8-12	7
RG5-5119-000CN	Solenoid, Tray 2 feed (SL2)	8-11	8
RG5-5135-000CN	Face-down delivery assembly	8-6	16
RG5-5142-000CN	Drum drawer assembly	8-7	6
RG5-5142-000CN	Drum drawer assembly	8-13	1
RG5-5149-000CN	Sensor (PS14), density	8-13	2
RG5-5150-000CN	Cover, top	8-5	1
RG5-5151-000CN	Cover, left side	8-4	9
RG5-5152-000CN	Cover, drum drawer	8-4	8
RG5-5163-000CN	Carousel brake assembly	8-8	12

**Table 8-19 Numerical parts list**

Part number	Description	Figure	Reference
RG5-5165-000CN	High-voltage power supply	8-6	4
RG5-5170-000CN	Door switch assembly	8-8	14B
RG5-5175-000CN	Laser/scanner assembly	8-8	9
RG5-5179-000CN	DC controller PCB	8-3	2
RG5-5179-000CN	DC controller PCB	8-8	3
RG5-5180-000CN	Developing PCB	8-3	1
RG5-5180-000CN	Developing PCB	8-9	5
RG5-5186-000CN	Cable, main	8-7	4
RG5-5187-000CN	Cable, developer	8-6	2
RG5-5195-000CN	Cable, control panel	8-4	4
RG5-5209-000CN	Carousel drive assembly	8-9	6
RG5-5230-000CN	Drum drawer assembly	8-7	6
RG5-5230-000CN	Drum drawer assembly	8-13	1
RG5-5230-000CN	Kit, imaging drum drawer	Not shown	
RG5-5232-000CN	Cover, drum drawer	8-4	8
RH2-5334-000CN	Cable, laser (flat)	8-8	11
RH2-5335-000CN	Cable, video interface	8-7	1
RH3-2189-000CN	Power supply, 110V	8-6	3
RH3-2190-000CN	Power supply, 220V	8-6	3
RH7-1343-000CN	Motor (M2), stepping	8-11	14
RH7-1346-000CN	Fan, large	8-9	1
RH7-1407-000CN	Fan, small	8-6	10
RH7-1435-000CN	Fan, large	8-9	1
RH7-5176-000CN	Clutch (CL2), electromagnetic	8-11	31
RH7-5178-000CN	Clutch (CL3), electromagnetic	8-12	16
RH7-5180-000CN	Clutch (CL4), electromagnetic	8-12	14
RS5-1293-000CN	Bushing	8-11	12
RS5-2739-000CN	Spring, toner flap	8-9	12
RS5-2754-000CN	Spring, tension	8-6	15
RS5-2794-000CN	Spring, Tray 2 pickup tension	8-11	33
RS5-2800-000CN	Spring tension	8-12	24

**Table 8-19 Numerical parts list**

<b>Part number</b>	<b>Description</b>	<b>Figure</b>	<b>Reference</b>
RS5-6210-000CN	Spacer	8-9	2
RS6-0132-000CN	Gear, 35T	8-11	17
RS6-0133-000CN	Gear, 37T/14T	8-11	19
RS6-0134-000CN	Gear, 30T/16T	8-11	11
RS6-0135-000CN	Gear, 27T	8-11	9
RS6-0135-000CN	Gear, 27T	8-11	10
RS6-0136-000CN	Gear, 31T	8-11	13
RS6-0137-000CN	Gear, 26T/18T	8-12	8
RS6-0138-000CN	Gear, 20T	8-11	18
RS6-0139-000CN	Gear, 18T	8-12	4
RS6-0139-000CN	Gear, 18T	8-12	13
RS6-0140-000CN	Gear, 18T	8-11	6
RS6-0141-000CN	Gear, 19T	8-11	7
RS6-0143-000CN	Gear, 37T	8-11	26
RS6-0144-000CN	Gear, 34T/15T	8-11	20
RS6-0145-000CN	Gear, 29T/17T	8-11	21
RS6-0146-000CN	Gear, 52T	8-11	23
RS6-0147-000CN	Gear, 47T	8-11	15
RS6-0148-000CN	Gear, 18T/52T	8-11	22
RS6-0149-000CN	Gear, 26T	8-11	25
RS6-0150-000CN	Gear, 29T	8-11	29
RS6-0150-000CN	Gear, 29T	8-11	30
RS6-0151-000CN	Gear, 16T	8-12	15
RS6-0152-000CN	Gear, 29T	8-12	17
RS6-0153-000CN	Gear, 49T	8-12	12
RS6-0154-000CN	Gear, 39T/31T	8-12	11
RS6-0155-000CN	Gear, 53T	8-12	10
RS6-0156-000CN	Gear, 53T/46T	8-11	3
RS6-0157-000CN	Gear, 18T/14T	8-11	2
RS6-0158-000CN	Gear, 17T	8-11	1
RS6-0158-000CN	Gear, 17T	8-11	4

**Table 8-19 Numerical parts list**

<b>Part number</b>	<b>Description</b>	<b>Figure</b>	<b>Reference</b>
RS6-0159-000CN	Gear, 26T	8-12	28
RS6-0163-000CN	Gear, 24T/37T	8-11	16
RS6-0176-000CN	Gear, 125T	8-9	4
RS6-0759-000CN	Gear, 125T	8-9	4
WC2-5330-000CN	Microswitch	8-8	7
WC2-5330-000CN	Microswitch, ITB	8-10	2
WG8-5222-000CN	Sensor (PS7), delivery paper	8-10	3
WG8-5309-000CN	Sensor (PS8), cassette paper	8-11	32
WG8-5309-000CN	Sensor (PS6), fusing unit pressure release	8-10	4
WG8-5309-000CN	Sensor (PS4), multi-purpose tray paper	8-14	4
WG8-5362-000CN	Sensor (PS10), carousel position	8-9	10
WG8-5364-000CN	Sensor (PS3), last paper	8-14	3
XG9-0361-000CN	Bearing, carousel	8-9	3

\*These parts require exchange





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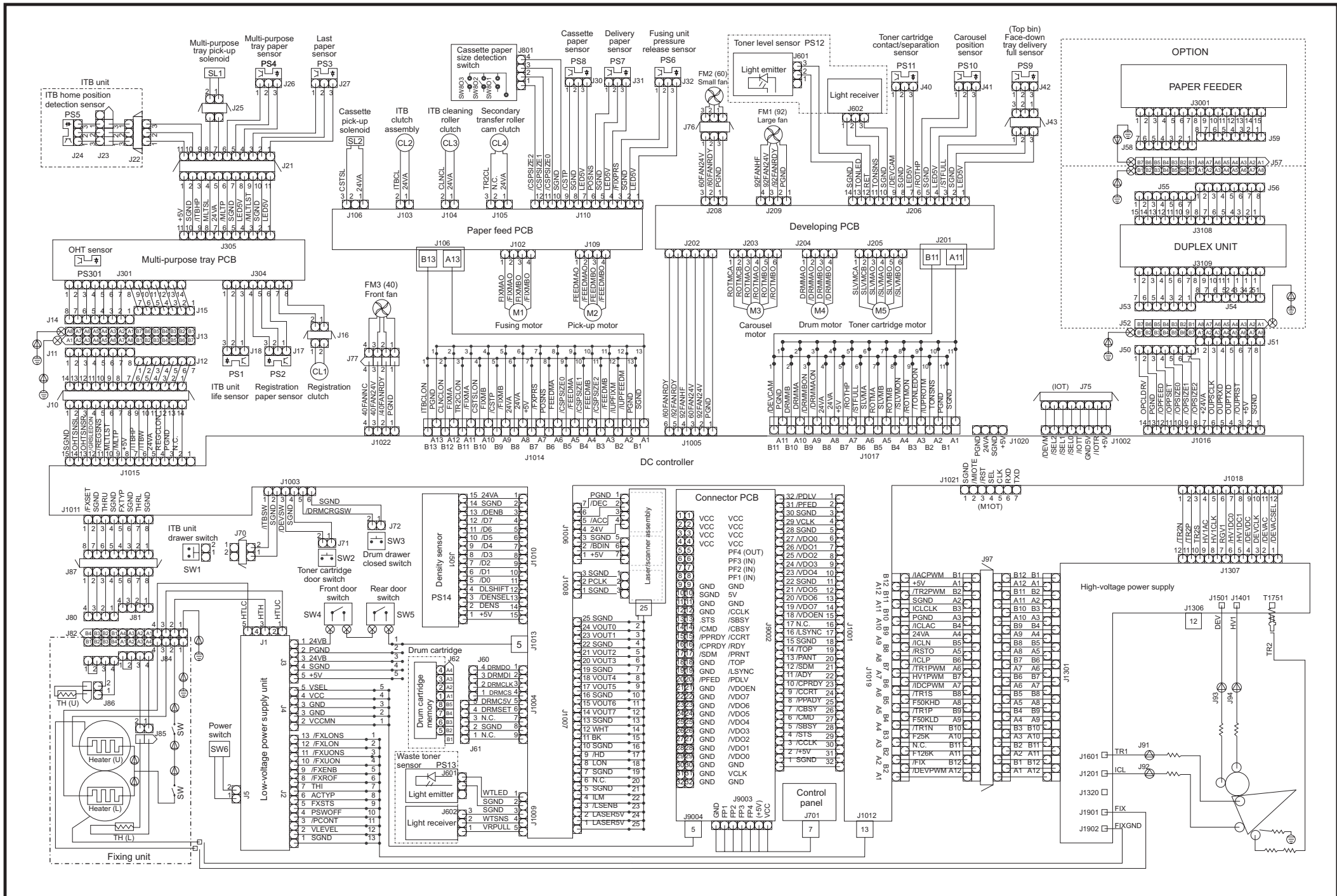
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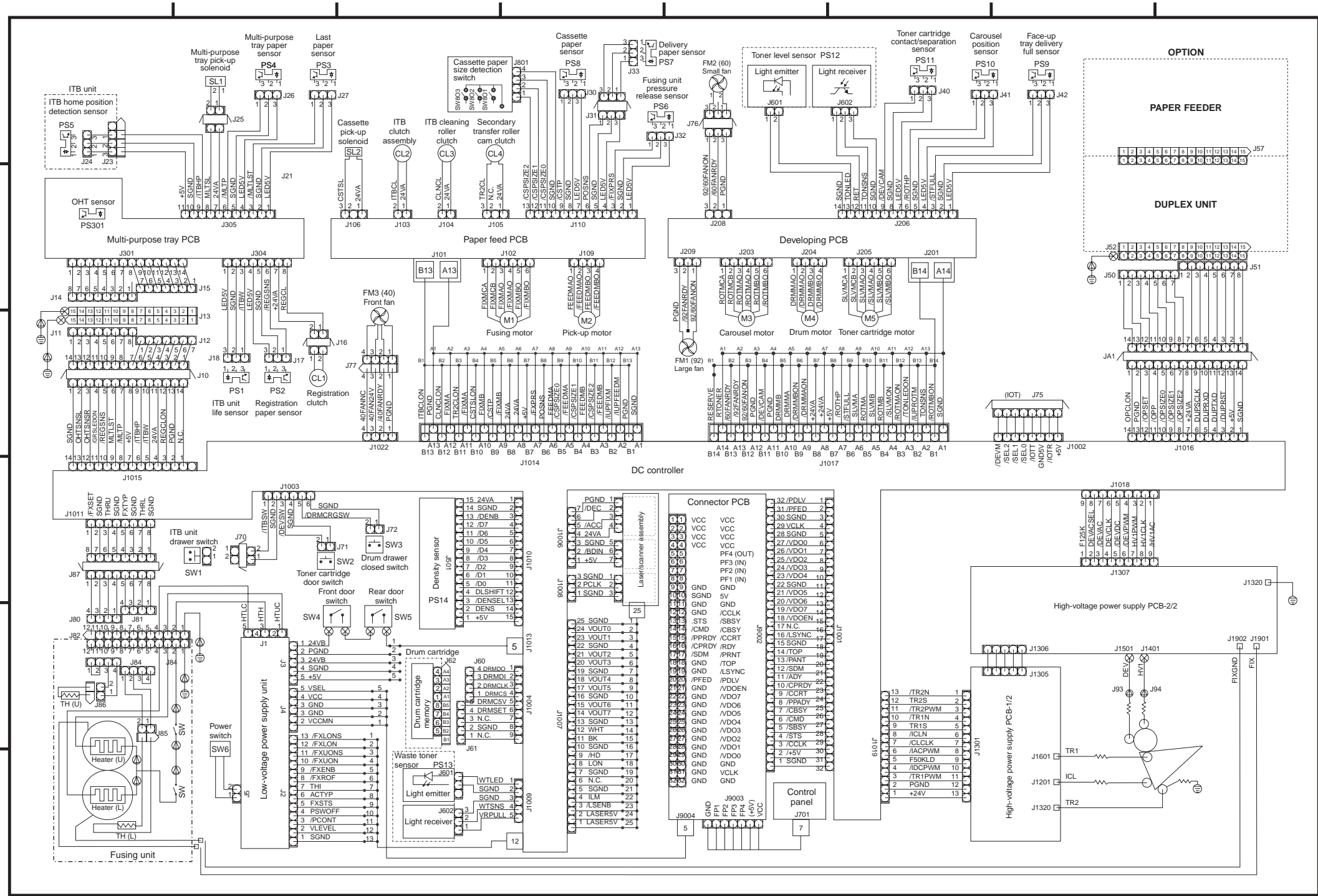
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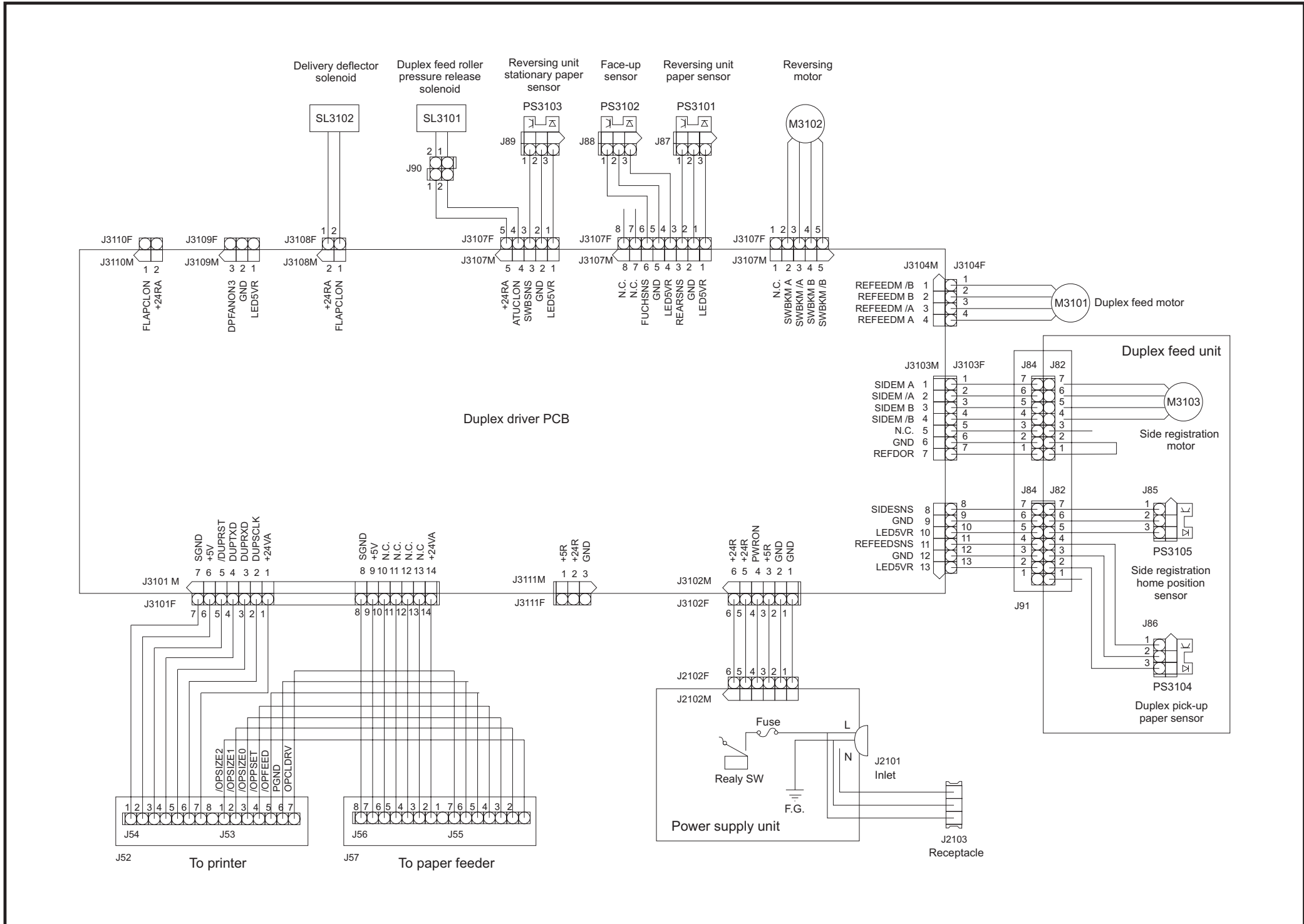




Main wiring diagram for printer serial number xxG... and below



Main wiring diagram for printer serial number xxH... and above



Duplex printing accessory wiring diagram



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