

i n v e n t

**service**

**hp** LaserJet 5100  
5100tn • 5100dtn  
5100Le



hp LaserJet 5100 series printers

**service** 

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# 1

# Printer description

## Overview

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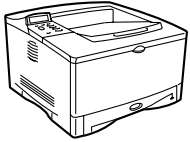
# Printer features

**Table 1. Printer features**

<b>Speed</b>	22 pages per minute (ppm) for A4-sized paper, or 21 ppm for letter-sized paper 300 MHz microprocessor First page out = 13 seconds
<b>Resolution</b>	HP ProRes 1200, a 1200-by-1200 dots-per-inch (dpi), HP FastRes 1200 and 600 dpi with Resolution Enhancement Technology (REt)
<b>Typefaces</b>	80 built-in scalable Printer Control Language (PCL) fonts, 80 internal PostScript® fonts
<b>Processor</b>	300 MHz
<b>Memory options</b>	<b>HP LaserJet 5100 printer and HP LaserJet 5100 Le printer:</b> 16 MB, expandable to 192 MB through three industry-standard dual inline memory module (DIMM) slots <b>HP LaserJet 5100tn printer and HP LaserJet 5100dtn printer:</b> 32 MB, expandable to 192 MB through three industry-standard DIMM slots
<b>Connectivity</b>	<b>HP LaserJet 5100 printer:</b> Bidirectional IEEE-1284-compliant parallel interface; two open enhancement input/output (EIO) slots (standard); HP Jetdirect internal print server (optional); 802.11 internal wireless connectivity card (optional) <b>HP LaserJet 5100tn printer and HP LaserJet 5100dtn printer:</b> Bidirectional IEEE-1284-compliant parallel interface; one open EIO slot; HP Jetdirect (EIO) print server for Fast Ethernet 10/100Base-TX in second slot (standard); 802.11 Internal Wireless connectivity card (optional) <b>HP LaserJet 5100Le printer:</b> Bidirectional IEEE-1284-compliant parallel interface
<b>Network compatibility</b>	Microsoft® Windows® 95, Windows NT® 4.0, Windows XP; NetWare; IBM OS/2 Warp; LAN manager; UNIX®, Appletalk; Linux®; HP-UX; LocalTalk through HP Jetdirect EIO print servers
<b>Mass-storage options</b>	>4 GB EIO hard disk
<b>Paper trays</b>	<b>Tray 1</b> <ul style="list-style-type: none"> <li>● Capacity: 100 sheets</li> <li>● Sizes: 76 by 127 mm (3 by 5 inches) to 312 by 470 mm (12.28 by 18.5 inches)</li> </ul> <b>Tray 2</b> <ul style="list-style-type: none"> <li>● Capacity: 250 sheets</li> <li>● Sizes: 149 by 210 mm (5.8 by 8.2 inches) to 279 by 432 mm (11 by 17 inches)</li> </ul> <b>250-sheet feeder</b> (optional for HP LaserJet 5100 printer, HP LaserJet 5100tn printer, and HP LaserJet 5100dtn printer) <ul style="list-style-type: none"> <li>● Capacity: 250 sheets</li> <li>● Sizes: 149 by 210 mm (5.8 by 8.2 inches) to 279 by 432 mm (11 by 17 inches)</li> </ul> <b>500-sheet feeder</b> (optional for HP LaserJet 5100 printer; standard for HP LaserJet 5100tn printer and HP LaserJet 5100dtn printer) <ul style="list-style-type: none"> <li>● Capacity: 500 sheets</li> <li>● Sizes: 149 by 210 mm (5.8 by 8.2 inches) to 279 by 432 mm (11 by 17 inches)</li> </ul>
<b>Paper path</b>	Standard path to top output bin Straight-through path from Tray 1 to the rear output bin
<b>Output capacity</b>	250-sheet top output bin 50-sheet rear output bin
<b>Paper-handling options</b>	Two-sided printing is automatic with the duplex printing accessory (duplexer). The duplexer is optional for the HP LaserJet 5100 printer, and is standard for the HP LaserJet 5100dtn printer.

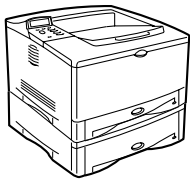
## Printer information

The printer is available in four configurations, as described here.



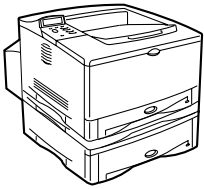
### HP LaserJet 5100 printer

The HP LaserJet 5100 printer (product number: Q1860A) is a 22 pages per minute (ppm) laser printer that comes standard with a 100-sheet multipurpose Tray 1, a 250-sheet Tray 2, and 16 MB of memory. It is designed for workgroups and can print on paper sizes up to A3 and 11 by 17 inches (279 by 432 mm).



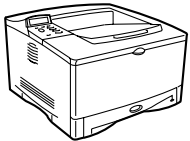
### HP LaserJet 5100tn printer

The HP LaserJet 5100tn printer (product number: Q1861A) is a 22 ppm laser printer that comes standard with a 100-sheet multipurpose Tray 1, a 250-sheet Tray 2, a 500-sheet feeder, 32 MB of memory, and an HP Jetdirect print server for connecting to a fast Ethernet (10/100Base-TX) network. It is designed for network users and can print full-bleed images on paper sizes up to A3 and 11 by 17 inches (279 by 432 mm).



### HP LaserJet 5100dtn printer

The HP LaserJet 5100dtn printer (product number: Q1862A) is a 22 ppm laser printer that comes standard with a 100-sheet multipurpose Tray 1, a 250-sheet Tray 2, a 500-sheet feeder, 32 MB of memory, an HP Jetdirect print server for connecting to a fast Ethernet (10/100Base-TX) network, an embedded Web server DIMM for remote printer management, and a duplex printing accessory for printing on two sides of a sheet of print media. The printer is designed for network users and can print full-bleed images on paper sizes up to A3 and 11 by 17 inches (279 by 432 mm).



### HP LaserJet 5100Le printer

This printer (product number: Q1863A) is a 22 ppm laser printer that comes standard with a 100-sheet multipurpose Tray 1, a 250-sheet Tray 2, and 16 MB of memory. The printer can print full-bleed images on paper sizes up to A3 and 11 by 17 inches (279 by 432 mm). Paper-handling and EIO accessories are not available for the HP LaserJet 5100Le printer.

**Table 2. Comparison of HP LaserJet 5100 Series printers**

	<b>HP LaserJet 5100 (Q1860A)</b>	<b>HP LaserJet 5100tn (Q1861A)</b>	<b>HP LaserJet 5100dtn (Q1862A)</b>	<b>HP LaserJet 5100 LE (Q1863A)</b>
<b>Ethernet 10-T/ 10-2</b>	optional	standard	standard	not available
<b>Input bins (standard/ maximum)</b>	2/4	3/4	3/4	2/2
<b>Standard RAM</b>	16 MB internal	32 MB	32 MB	16 MB
<b>250-sheet feeders (Tray 2, Tray 3)</b>	1 standard 1 optional	1 standard 1 optional	1 standard 1 optional	1 standard
<b>500-sheet feeder</b>	optional	standard	standard	N/A
<b>EIO hard disk</b>	optional	optional	optional	N/A
<b>Duplexer</b>	optional	optional	standard	N/A
<b>LocalTalk</b>	optional	optional	optional	N/A
<b>Processor</b>	300 MHz	300 MHz	300 MHz	300 MHz



# Identification

## Model and serial numbers

The model and serial numbers are listed on identification labels that are located inside the top cover. The serial number is alphanumeric, such as USB0000146 for the HP LaserJet 5100 series printer.

The serial number contains information about the origin location, as well as the revision level, the production code, and the production number of the printer.

The labels also contain power rating and regulatory information as shown in figure 1.

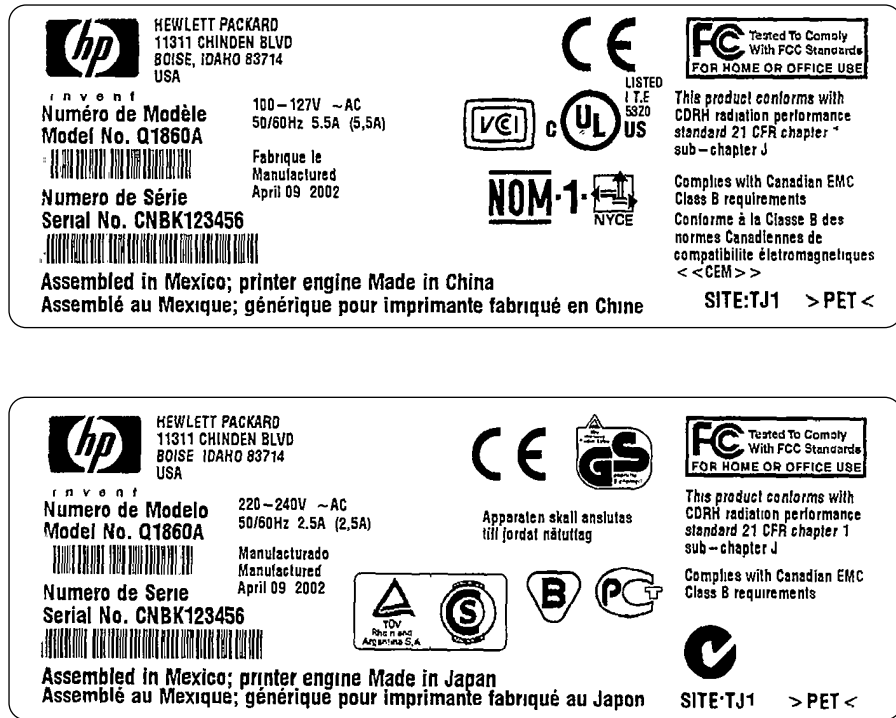


Figure 1. Sample identification labels

# Site requirements

## Environmental and power requirements

The following environmental specifications must be maintained to ensure the proper operation of the printer. Consider the following points before installing the printer:

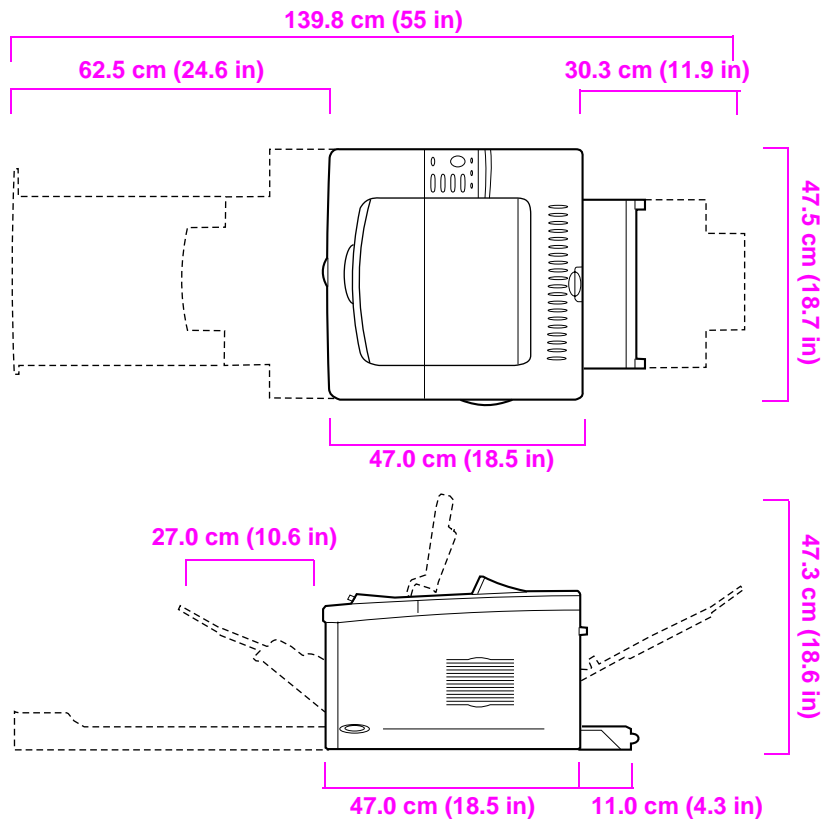
- Install the printer in a well-ventilated, dust-free area.
- Install the printer on a hard, flat, and continuous surface on which all four printer feet are level. Do not install the printer on carpet or other soft surfaces.
- Make sure that adequate power is supplied. The printer power requirements are listed in table 3.
- Install the printer where temperature and humidity are stable, and away from water sources, humidifiers, air conditioners, refrigerators, or other major appliances.
- Install the printer away from direct sunlight, open flames, or ammonia fumes. If the printer is placed near a window, make sure the window has a curtain or blind to block any direct sunlight.
- Install the printer with enough space around it for proper access and ventilation.
- Install the printer away from the direct flow of exhaust from air-ventilation systems.

**Table 3. Power requirements**

<b>Volts</b>	<b>Frequency</b>	<b>Amps (current rating)</b>	<b>Amps (rated short-term current)</b>	<b>Watts (average maximum, based on HP LaserJet 5100dtn printer)</b>
100 to 127 Vac (+/-10%)	50 to 60 Hz (+/-3 Hz)	5.4 amps	6 amps	printing = 480 standby = 24 PowerSave on = < 30 (ENERGY STAR®)* printer off = 0
220 to 240 Vac (+/-10%)	50 to 60 Hz (+/-3 Hz)	2.5 amps	3 amps	printing = 515 standby = 29 PowerSave on = < 30 (ENERGY STAR®)* printer off = 0

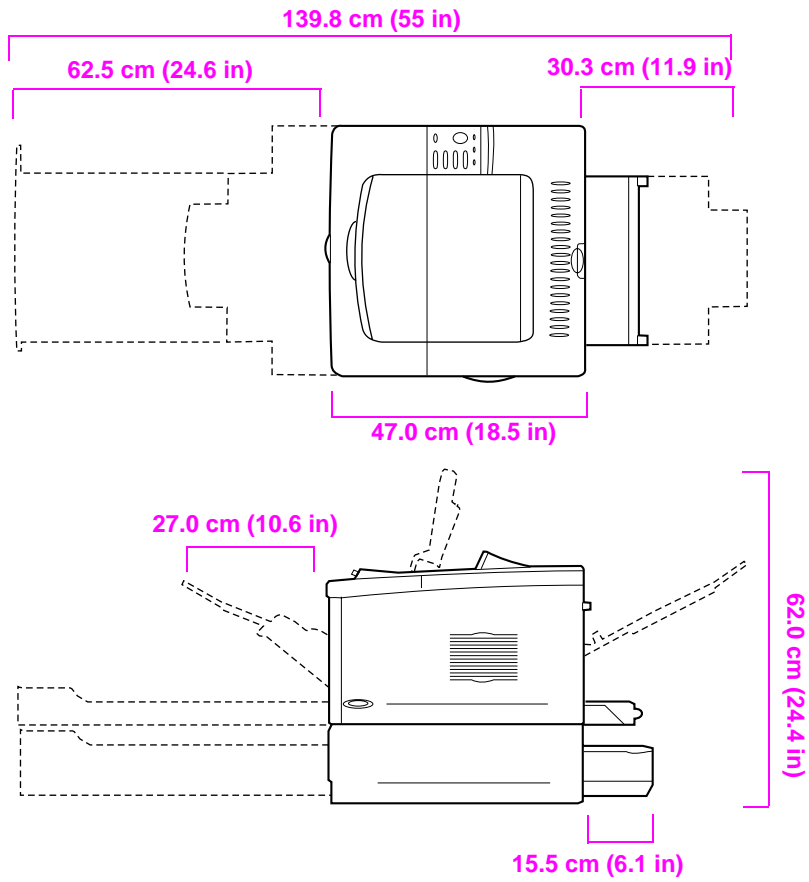
\*ENERGY STAR is a U.S. registered service mark of the United States Environmental Protection Agency.

## Space requirements

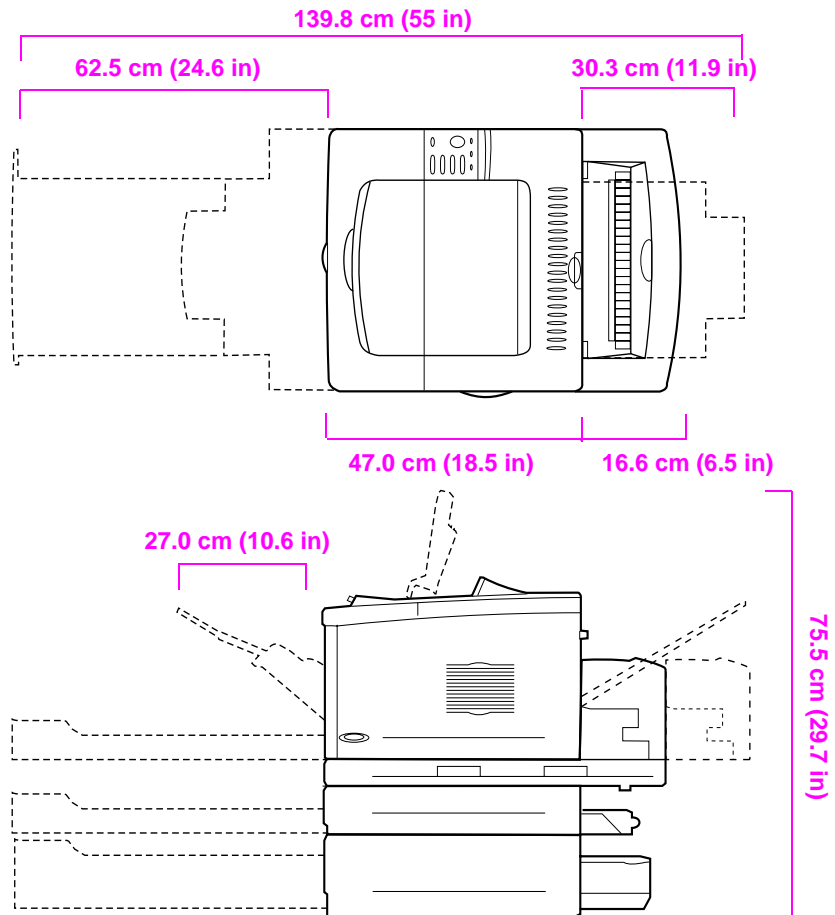


**Figure 2.**

**Printer dimensions—HP LaserJet 5100 printer and HP LaserJet 5100Le printer**



**Figure 3.** Printer dimensions—HP LaserJet 5100tn printer and HP LaserJet 5100dtn printer



**Figure 4. Printer dimensions, HP LaserJet 5100 series printer with accessories**

**Printer weight (without toner cartridge)**

- HP LaserJet 5100 printer: 23 kg (50 lb)
- HP LaserJet 5100tn printer with optional 500-sheet feeder: 34 kg (75 lb)
- HP LaserJet 5100dtn printer with duplexer and optional 500-sheet feeder: 52 kg (114 lb)
- HP LaserJet 5100Le printer: 23 kg (50 lb)

## Environmental requirements

**Table 4. Environmental specifications**

Item	Operating	Storage
Temperature	10° to 32° C (50° to 91° F)	-20° to 60° C (-4° to 140° F)
Relative humidity (RH)	20 to 80 percent RH (with no condensation)	10 percent to 95 percent RH

**Table 5. Acoustics specifications**

Printer state	Sound power	Bystander position	Operator position
Printing at 22 ppm	$L_{WA_d}$ = 6.8 bels (A)	$L_{pAm}$ = 53 dB	$L_{pAm}$ = 60 dB maximum*
Printing at 11 ppm	$L_{WA_d}$ = 6.4 bels (A)	$L_{pAm}$ = 50 dB	$L_{pAm}$ = 56 dB maximum*
PowerSave	$L_{WA_d}$ = 4.4 bels (A)	$L_{pAm}$ = 32 dB	$L_{pAm}$ = 37 dB maximum*

\*Maximum values are based on the HP LaserJet 5100dtn printer.

# Paper specifications

The following tables show paper specifications for the printer.

**Table 6. Paper specifications, Tray 1**

Supported paper	Dimensions <sup>1</sup>	Weight	Capacity <sup>2</sup>
Minimum size (custom)	76 by 127 mm (3 by 5 inches)	60 to 199 g/m <sup>2</sup> (16 to 53 lb)	100 sheets of 75-g/m <sup>2</sup> (20-lb) paper
Maximum size (custom)	312 by 470 mm (12.28 by 18.5 inches)		
Transparencies	Same as minimum and maximum paper sizes as listed above.	Thickness: 0.099 to 0.114 mm (0.0039 to 0.0045 in)	75 transparencies
Labels		Thickness: 0.127 to 0.178 mm (0.005 to 0.007 in)	50 labels
Envelopes		75 to 105 g/m <sup>2</sup> (20 to 28 lb)	10 envelopes

1. The printer supports a wide range of paper sizes. Check the printer software for supported sizes. To print custom-size paper see the user's guide.
2. Capacity might vary depending on paper weight and thickness, and environmental conditions.

**Table 7. Paper specifications, Tray 2 or other 250-sheet feeder**

Supported Paper	Dimensions <sup>1</sup>	Weight	Capacity <sup>2</sup>
Letter	216 by 279 mm (8.5 by 11 in)	60 to 105 g/m <sup>2</sup> (16 to 28 lb)	250 sheets of 75-g/m <sup>2</sup> (20-lb) paper 50 to 100 transparencies
A4	210 by 297 mm (8.3 by 11.7 in)		
Executive	191 by 267 mm (7.3 by 10.5 in)		
Legal	216 by 356 mm (8.5 by 14 in)		
B5 (JIS)	182 by 257 mm (7.2 by 10 in)		
A5	148 by 210 mm (5.8 by 8.2 in)		
11 by 17	279 by 432 mm (11 by 17 in)		
A3	297 by 420 mm (11.7 by 16.5 in)		
B4 (JIS)	257 by 364 mm (10.1 by 14.3 in)		

1. The printer supports a wide range of media sizes. Check the printer software for supported sizes.
2. Capacity might vary depending on media weight and thickness, and environmental conditions.

**Table 8. Paper specifications, 500-sheet feeder**

Supported paper	Dimensions <sup>1</sup>	Weight	Capacity <sup>2</sup>
Letter Letter-R <sup>3</sup>	216 by 279 mm (8.5 by 11 inches)	60 to 105 g/m <sup>2</sup> (16 to 28 lb)	500 sheets of 75-g/m <sup>2</sup> (20-lb) paper 50 to 100 transparencies
A4 A4-R <sup>3</sup>	210 by 297 mm (8.3 by 11.7 inches)		
Executive	191 by 267 mm (7.3 by 10.5 inches)		
Legal	216 by 356 mm (8.5 by 14 inches)		
B5 (JIS)	182 by 257 mm (7.2 by 10 inches)		
A5	148 by 210 mm (5.8 by 8.2 inches)		
11 by 17	279 by 432 mm (11 by 17 inches)		
A3	297 by 420 mm (11.7 by 16.5 inches)		
B4 (JIS)	257 by 364 mm (10.1 by 14.3 inches)		
Minimum Size (Custom <sup>4</sup> )	148 by 210 mm (5.8 by 8.3 inches)		
Maximum Size (Custom <sup>4</sup> )	297 by 432 mm (11.7 by 17 inches)		

1. The printer supports a wide range of media sizes. Check the printer software for supported sizes.
2. Capacity may vary depending on media weight and thickness, and environmental conditions.
3. To print rotated paper, see the user's guide.
4. To print custom-size paper, see the user's guide.

**Table 9. Paper specifications, duplexer**

	Dimensions <sup>1</sup>	Weight
Minimum	148 by 210 mm (5.8 by 8.3 inches)	60 to 105 g/m <sup>2</sup> (16 to 28 lb)
Maximum	297 by 432 mm (11.7 by 17 inches)	

1. The printer supports a wide range of media sizes. Check the printer software for supported sizes.

## Supported types of paper

The printer supports a wide variety of media, such as:

- plain
- letterhead
- prepunched
- bond
- color
- rough
- vellum
- preprinted
- transparency
- labels
- recycled
- card stock
- user-defined (5 types)



## Guidelines for using paper

For best results, use conventional 75-g/m<sup>2</sup> (20-lb) paper. Make sure the paper is of good quality and free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, voids, and curled or bent edges.

Some paper causes print-quality problems, jamming, or damage to the printer.

For more specific information, see “Image defects” on page 209.

**Table 10. Media issues**

Symptom	Problem with paper	Solution
Poor print quality or toner adhesion. Problems with feeding.	Too moist, too rough, too smooth, or embossed; faulty paper lot.	Try another kind of paper, between 100 and 250 Sheffield, and with 4% to 6% moisture content.
Dropouts, jamming, curl.	Stored improperly.	Store paper flat in its moisture-proof wrapping. Open the rear output bin.
Increased gray background shading.	Too heavy.	Use lighter paper. Open the rear output bin.
Excessive curl. Problems with feeding.	Too moist, wrong grain direction, or short-grain construction.	Open the rear output bin. Use long-grain paper. Set FUSER MODE=LOW.
Jamming, damage to the printer.	Cutouts or perforations.	Do not use paper with cutouts or perforations.
Problems with feeding.	Ragged edges.	Use higher quality paper.

### Note

Do not use letterhead paper that is printed with low-temperature inks, such as those used in some types of thermography.

Do not use raised letterhead.

The printer uses heat and pressure to fuse toner to the paper. Make sure that any colored paper or preprinted forms use inks that are compatible with the printer's temperature (200° C or 392° F for 0.1 second).

## Paper weight equivalence table

Use this table to determine approximate equivalent points in weight specifications other than U.S. bond weight. For example, to determine the equivalent of 20-lb U.S. bond-weight paper in U.S. cover weight, locate the bond weight (in row 3, second column) and scan across the row to the cover weight (in the fourth column). The equivalent is 28 lb.

Shaded areas indicate a standard weight for that grade.

	U.S. postcard <sup>1</sup> thickness (mm)	U.S. bond weight (lb)	U.S. text/book weight (lb)	U.S. cover weight (lb)	U.S. bristol weight (lb)	U.S. index weight (lb)	U.S. tag weight (lb)	Europe metric weight (g/m <sup>2</sup> )	Japan metric weight (g/m <sup>2</sup> )
1		16	41	22	27	33	37	60	60
2		17	43	24	29	35	39	64	64
3		20	50	28	34	42	46	75	75
4		21	54	30	36	44	49	80	80
5		22	56	31	38	46	51	81	81
6		24	60	33	41	50	55	90	90
7		27	68	37	45	55	61	100	100
8		28	70	39	49	58	65	105	105
9		32	80	44	55	67	74	120	120
10		34	86	47	58	71	79	128	128
11		36	90	50	62	75	83	135	135
12	.18	39	100	55	67	82	91	148	148
13	.19	42	107	58	72	87	97	157	157
14	.20	43	110	60	74	90	100	163	163
15	.23	47	119	65	80	97	108	176	176
16		53	134	74	90	110	122	199	199

1. U.S. postcard measurements are approximate. Use for reference only.

## Labels

---

### CAUTION

To avoid damaging the printer, use only labels that are recommended for use in laser printers.

If you have problems printing labels, use Tray 1 and open the rear output bin.

Never print on the same sheet of labels more than once.

---

When selecting labels, consider the quality of each component:

- **Adhesives:** The adhesive material should be stable at 200° C (392° F), the printer's maximum temperature.
- **Arrangement:** Only use labels that have no exposed backing between them. Labels can peel off of sheets that have spaces between the labels, causing serious jams.
- **Curl:** Before printing, labels must lie flat with no more than 13 mm (0.5 inch) of curl in any direction.
- **Condition:** Do not use labels that have wrinkles, bubbles, or other indications of separation.

## Transparencies

Transparencies used in the printer must be able to withstand 200° C (392° F), the printer's maximum temperature. For best results, close the rear output bin to print transparencies to the top output bin.

---

### CAUTION

To avoid damaging the printer, use only transparencies that are recommended for use in monochrome laser printers.

If you have problems printing on transparencies, use Tray 1.

---

## Vellum

Vellum is typically a special lightweight paper similar to parchment. Print vellum from Tray 1 only, and open the rear output bin. Do not print on both sides of vellum.

Vellum used in the printer must be able to withstand 200° C (392° F), the printer's maximum temperature.

## Envelopes

Always print envelopes from Tray 1. To help prevent envelopes from wrinkling or jamming, open the rear output bin.

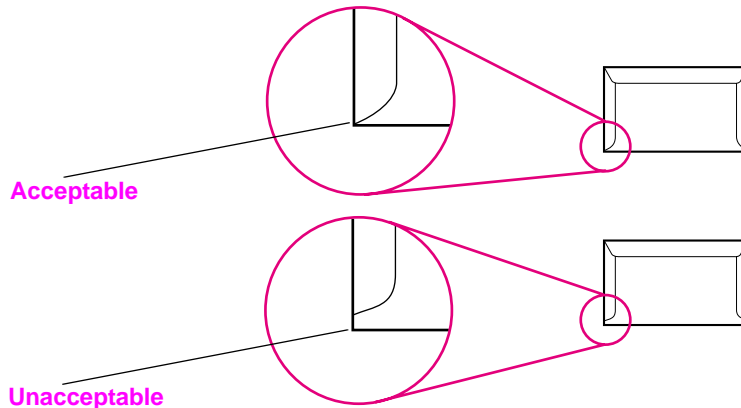
### Envelope construction

Envelope construction is critical. Envelope fold lines can vary considerably, not only between manufacturers, but also within a box from the same manufacturer. Successful printing on envelopes depends upon the quality of the envelopes. When selecting envelopes, consider the following components:

- **Weight:** The weight of the envelope paper should not exceed 105 g/m<sup>2</sup> (28 lb), or jamming can result.
- **Construction:** Before printing, envelopes should lie flat with less than 6 mm (0.25 inch) curl, and should not contain air. (Envelopes that trap air can cause problems.)
- **Condition:** Make sure envelopes are not wrinkled, nicked, or otherwise damaged.
- **Size:** Tray 1, the multipurpose tray, handles envelope sizes from 76 by 127 mm (3 by 5 inches) to 312 by 470 mm (12.28 by 18.5 inches).

## Envelopes that have double side seams

Double-side-seam construction has vertical seams at both ends of the envelope rather than diagonal seams. This style can be more likely to wrinkle. Be sure that the seam extends all the way to the corner of the envelope as illustrated below.



**Figure 5.** Envelopes with double side seams

## Envelopes that have adhesive strips or flaps

Envelopes that have a peel-off adhesive strip or more than one flap that folds over to seal must use adhesives that are compatible with the heat and pressure in the printer. The extra flaps and strips might cause wrinkling, creasing, or jams.

## Envelope margins

The following table shows typical address margins for a Commercial #10 or DL envelope.

**Table 11. Envelope margins**

Type of address	Top margin	Left margin
Return address	15 mm (0.6 inch)	15 mm (0.6 inch)
Delivery address	51 mm (2 inches)	89 mm (3.5 inches)

**Note** For the best print quality, position margins no closer than 15 mm (0.6 inch) from the edges of the envelope.

## Envelope storage

Proper storage of envelopes helps contribute to good print quality. Envelopes should be stored flat. If air is trapped in an envelope, creating an air bubble, the envelope might wrinkle during printing.

## Card stock and heavy paper

Many types of card stock can be printed from Tray 1, including index cards and postcards. Some card stock performs better than others because its construction is better suited for feeding through a laser printer.

For optimum printer performance, do not use paper heavier than 199 g/m<sup>2</sup> (53 lb) in Tray 1 or 105 g/m<sup>2</sup> (28 lb) in other trays. Paper that is too heavy might cause misfeeds, stacking problems, paper jams, poor toner fusing, poor print quality, or excessive mechanical wear.

---

### Note

Printing on heavier paper might be possible if the tray is not filled to capacity, and if paper with a smoothness rating of 100 to 180 Sheffield is used.

### Card stock construction

- **Smoothness:** 135- to 199-g/m<sup>2</sup> (36 to 53 lb) card stock should have a smoothness rating of 100 to 180 Sheffield; 60- to 135-g/m<sup>2</sup> (16 to 36 lb) card stock should have a smoothness rating of 100 to 250 Sheffield.
- **Construction:** Card stock should lie flat with less than 5 mm (0.2 inch) of curl.
- **Condition:** Make sure card stock is not wrinkled, nicked, or otherwise damaged.
- **Sizes:** Use only card stock within the following size ranges:
  - minimum: 76 by 127 mm (3 by 5 inches)
  - maximum: 312 by 470 mm (12.28 by 18.5 inches)

---

### Note

Before loading card stock in Tray 1, make sure it is regular in shape and not damaged. Also, make sure the cards are not stuck together.

### Card stock guidelines

- If cards curl or jam, try printing from Tray 1 and opening the rear output bin.
- Set margins at least 2 mm (0.08 inch) away from the edges of the paper.

# 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.

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### WARNING!

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Using controls, making adjustments, or performing procedures other than those specified in this service manual might result in exposure to hazardous radiation.

## Canadian DOC regulations

Complies with Canadian EMC Class B requirements.

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

## 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 this equipment 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 the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a different circuit from that to which the receiver is connected.
- Consult your dealer or an experienced radio and television technician.

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### Note

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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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# Laser statement for Finland

## Luokan 1 laserlaite

### Klass 1 Laser Apparat

HP LaserJet 5000, 5000 N, 5000 GN -laserkirjoitin on käyttäjän kannalta turvallinen luokan 1 laserlaite. Normaalisissa käytössä kirjoittimen suojakotelointi estää lasersäteiden 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.

### Varning!

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 5000, 5000 N, 5000 GN -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 alttiina näkymättömälle lasersäteilylle laitteen ollessa toiminnassa. Älä katso säteeseen.

### Varning!

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

Tiedot laitteessa käytettävän laserdiodin säteilyominaisuuksista:

Aallonpituus 775-795 nm

Teho 5 mW

Luokan 3B laser

## Material Safety Data Sheet

Material Safety Data Sheets can be obtained from the HP LaserJet Supplies website at <http://www.hp.com/go/msds>.

# Environmental product stewardship

## Protecting the environment

Hewlett-Packard Company is committed to providing quality products in an environmentally-sound manner. The printer has been designed to minimize impacts on the environment.

### The printer design eliminates:

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**Ozone production** The printer does not use high-voltage corona wires in the electrophotographic process and therefore generates no appreciable ozone gas (O<sub>3</sub>). Instead, this printer uses charging rollers in the toner cartridge and in the print engine.

**Energy consumption**

#### **This HP LaserJet printer design reduces:**

Power usage drops significantly while in PowerSave mode, which saves natural resources and saves money without affecting the high performance of this printer. This printer qualifies for ENERGY STAR®, which is a voluntary program to encourage the development of energy-efficient office products.



ENERGY STAR is a U.S. registered service mark owned by the U.S. government. As an ENERGY STAR partner, Hewlett-Packard Company has determined that this printer meets ENERGY STAR Guidelines for energy efficiency. For more information, see <http://www.energystar.gov/>



# 2 Service approach

## Overview

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Limited warranty for the print cartridge .....	36
Service and support .....	37
Worldwide service and support offices .....	38

## Regulatory information

For regulatory information and requirements, FCC regulations, and declaration of conformity, please see the *start* guide.

For environmental product stewardship program information, please see the *use* guide.

## Service approach

Repair of the printer normally begins with a three-step process:

- 1 Isolate the problem to the major system (the host computer, the network and/or server, or the printer).
- 2 Determine whether the problem is located in the print engine or an accessory device.
- 3 Troubleshoot the problem using the troubleshooting information in chapter 7.

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

## Parts and supplies

### Information about ordering

Chapter 8 of this manual contains field replacement unit (FRU) and replacement part numbers. Replacement parts can be ordered from the HP Customer Support (HPCS) organization.

Chapter 8 of this manual also contains information about products specifically designed for this printer. Order accessories from HPCS.

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**Note**

See "Worldwide service and support offices" on page 38 to find information for a local HP office in the appropriate region.

### HPCS phone listings

- HPCS (for U.S.)  
(1) (800) 752-0900
- HPCS (for Canada)  
(1) (800) 387-3867
- HPCS (for Europe)  
(49 7031) 142253

### Exchange program

HP might offer remanufactured assemblies for parts. These can be ordered through HPCS.

## Warranty

For warranty information and requirements, see the *start* guide.

### Limited warranty for the print cartridge

For print cartridge warranty information, see the *start* guide.

# Service and support

## World Wide Web

Print drivers, updated HP MFP firmware, and product and support information can be obtained from the following URLs:

- U.S., <http://www.hp.com/support/lj5100>
- Europe, <http://www.hp.com/support/lj5100>
- China, <ftp://www.hp.com.cn/support/lj5100>
- Japan, <ftp://www.jpn.hp.com/support/lj5100>
- Korea, <http://www.hp.co.kr/support/lj5100>
- Taiwan, <http://www.hp.com.tw/support/lj5100>, or the local driver website, <http://www.dds.com.tw>

## HP support assistant CD-ROM

This support tool offers a comprehensive online information system designed to provide technical and product information about Hewlett-Packard products. To subscribe to this quarterly service in the U.S. or Canada, call (1) (800) 457-1762. In Hong Kong SAR, Indonesia, Malaysia, or Singapore, call Mentor Media at (65) 740-4477.

## HP-authorized resellers and support

To locate HP-authorized resellers and support, call (1) (800) 243-9816 in the U.S. or (1) (800) 387-3867 in Canada. See "Worldwide service and support offices" on page 38 for areas outside of North America.

## HP service agreements

Call (1) (800) 743-8305 in the U.S. or (1) (800) 268-1221 in Canada.

## HP PartnerCare

You can use the following information to contact HP PartnerCare:

- PartnerShip Web. <http://www.partner.americas.hp.com>  
e-mail at [websupport@mnl.com](mailto:websupport@mnl.com)
- Connect Online. <http://www.connect-online.hp.com>  
e-mail at PTS, INFOLINE (HP-Germany, [exgen1](mailto:exgen1))
- Asia-Pacific countries/regions. <http://partnercare.asiapac.hp.com/>
- Canada Partner. <http://www.canada.hp.com>
- Latin America. <http://www.conecta.latinamerica.hp.com>  
e-mail at SUPPORT-TEAM,LAR (HP-Miami, [exgen1](mailto:exgen1))

## Worldwide service and support offices

- For the U.S., call (1) (208) 323-2551 Monday through Friday from 6 A.M. to 6 P.M., Mountain time.
- For Canada, call (1) (905) 206-4663 or (1) (800) 387-3867 Monday through Friday from 8 A.M. to 8 P.M., Mountain time.
- For customers outside of North America, use the following list and call the appropriate telephone number for the country or region.

### Europe

- Austria: 43 (0)810 00 6080
- Belgium  
Dutch: 32 (0)2 626-8806  
French: 32 (0)2 626-8806
- Czech Republic: 42 (0)2 6130 7310
- Denmark: +45 39 29 4099
- International English: +44 (0)207 512 52 02
- Finland: 358 (0)203 47 288
- France: 33 (0)1 43 62 34 34
- Germany: 49 (0)180 52 58 143
- Greece: +30 (0)1 619 64 11
- Hungary: +36 (0)1 382-1111
- Ireland: +353 (0)1 662 5525
- Italy: 39 02 264 10350
- Netherlands: 31 (0)20 606 8751
- Norway: 47 22 11 6299
- Poland: +48 22 865 98 00
- Portugal: 351 21 3176333
- Romania: +40 1 315 44 42 (or 01 3154442)
- Russian Federation  
Moscow: +7 095 797 3520  
St. Petersburg: +7 812 346 7997
- Spain: +34 902 321 123
- Sweden: +46 (0)8 619 2170
- Switzerland: +41 (0)848 80 11 11
- Turkey: +90 212 221 69 69
- Ukraine: +7 (380-44) 490-3520
- U.K.: +44 (0)207 512 52 02

### Africa and Middle East

- Egypt: +202 7956222
- International English: +44 (0)207 512 52 02
- Israel: +972 (0)9 9524848
- South Africa  
Inside RSA: 086 000 1030  
Outside RSA: +27-11 258 9301
- United Arab Emirates, Bahrain, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, and Yemen: 971 4 883 8454

## Asia-Pacific countries/regions

- Australia: (03) 8877 8000
- China: +86 (0)10 6564 5959
- Hong Kong SAR: +85 (2) 2802 4098
- India: +91 11 682 6035
- Indonesia: +62 (21) 350-3408
- Japan: +81 3 3335-8333
- Republic of Korea  
Seoul: +82 (2) 3270-0700  
Outside Seoul: 080 999-0700
- Malaysia: +60 (3) 295 2566
- New Zealand: +64 (9) 356 6640
- Philippines: +63 (2) 867 3551
- Singapore: +65 272 5300
- Taiwan: +886 (2) 2717 0055
- Thailand: +66 (2) 661 4000
- Vietnam: +84 (0) 8 823 4530

## Latin America

- Argentina: 0810-555-5520
- Brazil  
Greater Sao Paulo: (11) 3747-7799  
Outside Greater São Paulo: 0800-157751
- Chile: 800-22-5547
- Guatemala: 800-999-5305
- Mexico  
Mexico City: 52-58-9922  
Outside Mexico City: 01-800-472-6684
- Peru: 0-0800-10111
- Puerto Rico: 1-877-2320-589
- Venezuela  
Caracas: 207 8488  
Outside Caracas: 800 47 777



# 3

## Printer operation

### Overview

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# Using the control panel

## Control panel layout

The printer's control panel consists of the following components:

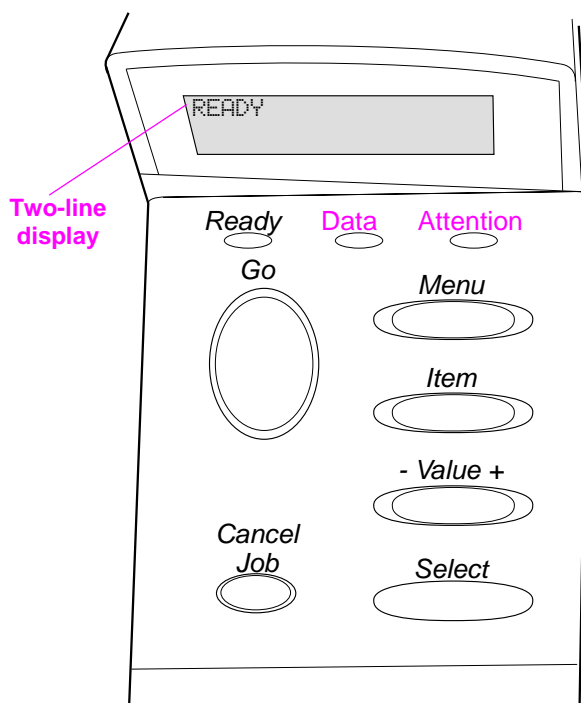


Figure 6.

Control panel layout

## Control panel lights

Table 12. Interpreting control panel lights

Light	Indication
Ready	The printer is ready to print.
Data	The printer is processing information.
Attention	Action is required. See the control panel display.



## Control panel keys

Press the control panel keys to perform the functions shown in table 13.

**Table 13. Control panel keys**

Key	Function
[Go]	<ul style="list-style-type: none"><li>• Places the printer either online or offline.</li><li>• Prints any data that resides in the printer's buffer.</li><li>• Allows the printer to resume printing after being offline.</li><li>• Clears most printer messages and places the printer online.</li><li>• Allows the printer to continue printing with an error message such as TRAY × LOAD [TYPE] [SIZE] or UNEXPECTED PAPER SIZE.</li><li>• Confirms a manual feed request if Tray 1 is loaded and TRAY 1 MODE=CASSETTE has been set from the Paper Handling menu on the printer's control panel.</li><li>• Overrides a manual feed request from Tray 1 by selecting paper from the next available tray.</li><li>• Exits the control panel menus. (To save a selected control panel setting, first press [Select].)</li></ul>
[Cancel Job]	Cancels the print job that the printer is processing. The time it takes to cancel depends on the size of the print job. (Press it only once.)
[Menu]	Cycles through the control panel menus. Press the right end of the button to move forward or the left end of the button to move backward.
[Item]	Cycles through the selected menu's items. Press the right end of the button to move forward or the left end of the button to move backward.
[- Value +]	Cycles through the selected menu item's values. Press [+] to move forward or [-] to move backward.
[Select]	<ul style="list-style-type: none"><li>• Saves the selected value for that item. An asterisk (*) appears next to the selection, indicating that it is the new default. Default settings remain when the printer is switched off or reset (unless you reset all factory defaults from the Resets Menu).</li><li>• Prints the printer information page shown on the control panel display.</li></ul>

## Settings and defaults

The printer makes most printing decisions based on either temporary settings or permanent defaults.

### Note

Settings that are sent from software applications override printer defaults.

**Table 14. Settings and defaults**

Setting or default	Explanation
Temporary setting	A value set for the current print job by the software application or driver. For example, a request from the software to print three copies instead of the control panel default value of one copy is a temporary setting. The printer continues to use the temporary setting until it receives another software request or until it is reset.
Control panel default	A value set at the control panel when you select a menu item. An asterisk appears, indicating the default setting. The printer retains this default when it is turned off.
Factory default	The value set for each menu item at the factory. Factory defaults are listed in the item column in the menu tables starting on page 47.

### Setting the display language

- 1 Press and hold **[SELECT]** while turning on the printer. Hold **[SELECT]** until **SELECT LANGUAGE** appears.
- 2 Release **[SELECT]**. **INITIALIZING** appears briefly. Wait for **LANGUAGE=[(current selected language)]** to appear.
- 3 Press **[- VALUE +]** repeatedly until the language you want appears.
- 4 Press **[SELECT]** to save your choice. An asterisk (\*) appears beside the selected language.
- 5 Press **[GO]** to exit the menu.

# Control panel menus

Press [MENU] for access to all control panel menus. When additional trays or other accessories are installed in the printer, new menu items automatically appear.

## To change a control panel setting:

- 1 Press [MENU] until the menu you want appears.
- 2 Press [ITEM] until the item you want appears.
- 3 Press [- VALUE +] until the setting you want appears.
- 4 Press [SELECT] to save the selection. An asterisk (\*) appears next to the selection in the display, indicating that it is now the default.
- 5 Press [GO] to exit the menu.

---

### Note

Settings in the printer driver and software application override control panel settings. (Software application settings override printer-driver settings.)

If you cannot gain access to a menu or item, it is either not an option for the printer or the customer's network administrator has locked the function. (The control panel reads ACCESS DENIED MENU LOCKED.) See the customer's network administrator.

---

## To print a control panel menu map:

To see the current settings for all of the menus and items available in the control panel, print a control panel menu map.

- 1 Press [MENU] until INFORMATION MENU appears.
- 2 Press [ITEM] until PRINT MENU MAP appears.
- 3 Press [SELECT] to print the menu map.

## Private/stored jobs menu

This menu provides a list of the private, stored, quick-copy, and proof-and-hold jobs on the printer's hard disk or in RAM memory. The user can send the command from the control panel to print or delete these jobs.

### Note

If no private, stored, quick-copy, or proof-and-hold jobs exist on the printer's optional hard disk or in RAM memory, this menu does not appear on the control panel.

**Table 15. Private/stored jobs menu**

Item	Explanation
[JOBNAME]	The name of the job stored on the printer's hard disk or in RAM.
PIN:0000	To print a private job, the user must enter the personal identification number (PIN) assigned to the job in the driver.
COPIES=X	The number of copies the user wants to print. 1-999: Prints the requested number of copies of the job.
DELETE:	Deletes the job from the printer's hard disk or RAM memory.

## Information menu

This menu contains printer information pages that give details about the printer and its configuration. To print an information page, scroll to the page you want and press **[SELECT]**.

**Table 16. Information menu**

Item	Explanation
PRINT MENU MAP	The menu map shows the layout and current settings of the control panel menu items.
PRINT CONFIGURATION	The configuration page shows the printer's current configuration. If an HP Jetdirect print server card is installed (HP LaserJet 5100tn and 5100dtn printers), a Jetdirect configuration page will print out as well.
PRINT PCL FONT LIST	The PCL font list shows all the PCL fonts currently available to the printer.
PRINT PS FONT LIST	The PS font list shows all the PS fonts currently available to the printer.
PRINT FILE DIRECTORY	This item appears only when a mass-storage device (such as an optional flash DIMM or hard disk) containing a recognized file system is installed in the printer. The file directory shows information for all installed mass-storage devices.
PRINT EVENT LOG	The event log lists printer events or errors.
SHOW EVENT LOG	This item allows you to view the most recent printer events on the control panel display. Press <b>[-Value+]</b> to scroll through the event-log entries.
PRINT PAPER PATH TEST	Use the paper-path test to verify that the paper path is working properly, or to troubleshoot problems with a type of paper. Choose the input tray, output bin, duplexer (if available), and number of copies.

## Paper-handling menu

When paper-handling settings are correctly configured through the control panel, you can print by choosing the type and size of paper from the printer driver or software application.

Some items in this menu (such as duplex and manual feed) can be opened from a software application, or from the printer driver (if the appropriate driver is installed). Printer-driver and software application settings override control panel settings.

**Table 17. Paper-handling menu**

Item/default	Values	Explanation
TRAY 1 MODE= FIRST	FIRST CASSETTE	Determine how the printer will use Tray 1. FIRST: If paper is loaded in Tray 1, the printer will pull paper from that tray first. CASSETTE: A paper size must be assigned to Tray 1 by using the TRAY 1 SIZE option (the next item in this menu when TRAY 1 MODE=CASSETTE). This allows Tray 1 to be used as a reserved tray.
TRAY 1 SIZE= LETTER	For supported media, see page 26.	This item appears only when TRAY 1 MODE= CASSETTE. Set the value to correspond with the paper size in Tray 1.
TRAY 1 TYPE= PLAIN	For supported media, see page 26.	This item appears only when TRAY 1 MODE= CASSETTE. Set the value to correspond with the paper type in Tray 1.
TRAY 2 TYPE= PLAIN	For supported media, see page 26.	Set the value to correspond with the paper type in Tray 2.
TRAY 3 TYPE= PLAIN	For supported media, see page 26.	This item appears only when a Tray 3 is installed. Set the value to correspond with the paper type in Tray 3.
TRAY 4 TYPE= PLAIN	For supported media, see page 26.	This item appears only when a Tray 4 is installed. Set the value to correspond with the paper type in Tray 4.
MANUAL FEED=OFF	OFF ON	Feed the paper manually from Tray 1, rather than automatically from a tray. When MANUAL FEED=ON and Tray 1 is empty, the printer goes offline when it receives a print job and displays MANUALLY FEED [PAPER SIZE].
DUPLEX=OFF	OFF ON	This item appears only when an optional duplexer is installed. Set the value to ON to print on both sides (duplex) or OFF to print on one side (simplex) of a sheet of paper.
BINDING= LONG EDGE	LONG EDGE SHORT EDGE	This item appears only when an optional duplexer is installed and the duplex option is on. Choose the binding edge when duplexing (printing on both sides of paper).
OVERRIDE A4 WITH LETTER=NO	NO YES	Choose YES to print on letter-size paper when an A4 job is sent but no A4-size paper is loaded in the printer (or to print on A4-size paper when a letter job is sent but no letter-size paper is loaded in the printer).
CONFIGURE FUSER MODE MENU=NO	NO YES	Configure the fuser mode that is associated with each paper type. (This is only necessary if you are experiencing problems when printing on certain paper types.) NO: The fuser-mode menu items are not accessible. YES: Additional items appear. <b>Note:</b> To see the current default fuser mode for each paper type, select YES, scroll back to the information menu, and then print a menu map (page 47).

**Table 17. Paper-handling menu**

<b>Item/default</b>	<b>Values</b>	<b>Explanation</b>
[TYPE]= NORMAL	NORMAL LOW HIGH VELLUM	This item appears only when CONFIGURE FUSER MODE MENU=YES. Most paper types are set to NORMAL by default. ROUGH=HIGH VELLUM=VELLUM  For a complete list of supported paper types, see page 26.

## Print-quality menu

Some items in this menu can be opened from a software application, or from the printer driver (if the appropriate driver is installed). Printer-driver and software application settings override control panel settings.

**Table 18. Print-quality menu**

Item	Values	Explanation
RESOLUTION= FASTRES 1200	300 600 FASTRES 1200 PRORES 1200	<p>Select the resolution from the following values:</p> <p>300: Produces draft print quality at the printer's maximum speed (22 ppm). 300 dpi (dots per inch) is recommended for some bitmapped fonts and graphics, and for compatibility with the HP LaserJet III family of printers.</p> <p>600: Produces high print quality at the printer's maximum speed (22 ppm).</p> <p>FASTRES 1200: Produces optimum print quality (comparable to 1200 dpi) at the printer's maximum speed (22 ppm).</p> <p>PRORES 1200: Produces optimum print quality (true 1200 dpi) at half the printer's maximum speed (11 ppm).</p> <p>When the resolution is changed, any resources that have been downloaded (such as fonts or macros) have to be downloaded again, unless they are stored on an optional hard disk or flash DIMM.</p> <p><b>Note:</b> It is best to change the resolution from the printer driver or software application. (Driver and software settings override control panel settings.)</p>
RET=MEDIUM	OFF LIGHT MEDIUM DARK	<p>Use the printer's Resolution Enhancement technology (REt) setting to produce print with smooth angles, curves, and edges.</p> <p>REt does not affect print quality when the print resolution is set to ProRes 1200. All other print resolutions, including FastRes 1200, benefit from REt.</p>
ECONOMODE=OFF	OFF ON	<p>Turn EconoMode on (to save toner) or off (for high quality). EconoMode creates draft-quality printing by reducing the amount of toner on the printed page by up to 50 percent.</p> <p><b>Caution:</b> HP does not recommend full-time use of EconoMode. (If EconoMode is used full-time, it is possible that the toner supply will outlast the mechanical parts in the toner cartridge.)</p> <p><b>Note:</b> It is best to turn EconoMode on or off from the printer driver or software application. (Driver and software settings override control panel settings.)</p>
TONER DENSITY=3	1 2 3 4 5	<p>Lighten or darken the print on the page by changing the toner density setting. The settings range from 1 (light) to 5 (dark), but the default setting of 3 usually produces the best results.</p>
CREATE CLEANING PAGE	No value to select.	<p>Press <b>[Select]</b> to print a cleaning page (for cleaning excess toner from the paper path).</p> <p>In order for the cleaning page to work properly, print the page on copier-grade paper (not bond or rough paper). Follow the instructions on the cleaning page.</p>
PROCESS CLEANING PAGE	No value to select.	<p>This item appears only after a cleaning page has been generated (as described above).</p> <p>Press <b>[Select]</b> to process the cleaning page.</p>



## Printing menu

Some items in this menu can be opened from a software application, or from the printer driver (if the appropriate driver is installed). Printer-driver and software application settings override control panel settings.

**Table 19. Printing menu**

Item	Values	Explanation
COPIES=1	1 to 999	Set the default number of copies by selecting any number from 1 to 999. Press <b>[-Value+]</b> once to change the setting by increments of 1, or hold down <b>[-Value+]</b> to scroll by increments of 10. <b>Note:</b> It is best to set the number of copies from the printer driver or software application. (Driver and software settings override control panel settings.)
PAPER=LETTER (110 V printers) or PAPER=A4 (220 V printers) and ENVELOPE=COM10 (110 V printers) ENVELOPE=DL (220 V printers)	For supported paper sizes see page 25.	Set the default image size for paper and envelopes. (The item name will change from paper to envelope as you scroll through the available sizes.) <b>Note:</b> It is best to set the number of copies from the printer driver or software application. (Driver and software settings override control panel settings.)
CONFIGURE CUSTOM PAPER=NO	NO YES	NO: The custom paper menu items are not accessible. YES: The custom paper menu items appear (see the next three items).
UNIT OF MEASURE=INCHES (110 V printers) or MILLIMETERS (220 V printers)	INCHES MILLIMETERS	This item appears only when CONFIGURE CUSTOM PAPER=YES. Select the unit of measurement for the custom paper size.
X DIMENSION= 12.28 INCHES (110 V printers) or 312 MILLIMETERS (220 V printers)	3.00 to 12.28 INCHES (110 V printers) or 76 to 312 MILLIMETERS (220 V printers)	This item appears only when CONFIGURE CUSTOM PAPER=YES. Select the dimension of the leading edge to be fed into the printer (short edge).
Y DIMENSION= 17.70 INCHES (110 V printers) or 470 MILLIMETERS (220 V printers)	5.00 to 18.50 INCHES (110 V printers) or 127 to 470 MILLIMETERS (220 V printers)	This item appears only when CONFIGURE CUSTOM PAPER=YES. Select the other dimension (long edge).
ORIENTATION= PORTRAIT	PORTRAIT LANDSCAPE	Determine the default orientation of print on the page. <b>Note:</b> It is best to set the page orientation from the printer driver or software application. (Driver and software settings override control panel settings.)
FORM=60 LINES (110 V printers) or 64 LINES (220 V printers)	5 to 128	Set vertical spacing from 5 to 128 lines for default paper size. Press <b>[-Value+]</b> once to change the setting by an increment of 1, or hold down <b>[-Value+]</b> to scroll by increments of 10.

**Table 19. Printing menu**

<b>Item</b>	<b>Values</b>	<b>Explanation</b>
PCL FONT SOURCE=INTERNAL	INTERNAL SOFT SLOT 1, 2, or 3	INTERNAL: Internal fonts. SOFT: Permanent soft fonts. SLOT 1, 2, or 3: Fonts stored in one of the three DIMM slots.
PCL FONT NUMBER=0	0 to 999	The printer assigns a number to each font and lists the numbers on the PCL Font List. The font number appears in the Font # column of the printout.
PCL FONT PITCH= 10.00	0.44 to 99.99	This item might not appear, depending on the font selected. Press [-Value+] once to change the setting by an increment of .01 for pitch, or hold down [-Value+] to scroll by increments of 1.
PCL FONT SIZE=12.00	4.00 to 999.75	This item might not appear, depending on the font selected. Press [-Value+] once to change setting by an increment of .25 for point size, or hold down [-Value+] to scroll by increments of 1.
PCL SYMBOL SET=PC-8	PC-8 many others	Select any one of several available symbol sets from the printer control panel. A symbol set is a unique grouping of all the characters in a font. PC-8 or PC-850 is recommended for line-draw characters. See the user guide for more information about symbol-set charts.
COURIER=REGULAR	REGULAR DARK	Select the version of Courier font to use: REGULAR: The internal Courier font that is available on the HP LaserJet 4 series printers. DARK: The internal Courier font that is available on the HP LaserJet III series printers. These two fonts are not available at the same time.
WIDE A4=NO	NO YES	The Wide A4 setting changes the number of characters that can be printed on a single line of A4 paper. NO: Up to 78 10-pitch characters can be printed on one line. YES: Up to 80 10-pitch characters can be printed on one line.
APPEND CR TO LF= NO	NO YES	Select YES to append a carriage return to each line feed that is encountered in backward-compatible PCL jobs (pure text, no job control). Some environments, such as UNIX, indicate a new line using only the line-feed control code. This option allows the user to append the required carriage return to each line feed.
PRINT PS ERRORS=OFF	OFF ON	Select ON to print the PS error page when PS errors occur.

## Configuration menu

Items in this menu affect the printer's behavior. Configure the printer according to your printing needs.

**Table 20. Configuration menu**

Item	Values	Explanation
POWERSAVE= 30 MINUTES	15 MINUTES 30 MINUTES 1 HOUR 2 HOURS 3 HOURS	<p>Set the printer to change to PowerSave mode after it has been idle for a specified amount of time. Turning PowerSave off is not recommended. The PowerSave feature does the following:</p> <ol style="list-style-type: none"> <li>1. Minimizes the amount of power consumed by the printer when it is idle.</li> <li>2. Reduces wear on the printer's electronic components. (Turns off the display's backlight.)</li> </ol> <p>When you send a print job, press a control panel key, open a paper tray, or open the top cover, the printer automatically comes out of PowerSave mode.</p> <p><b>Note:</b> PowerSave turns off the backlight on the display, but the display is still readable.</p>
PERSONALITY= AUTO	AUTO PCL PS	<p>Select the default printer language (personality). Possible values are determined by which valid languages are installed in the printer.</p> <p>Normally, you should not change the printer language (the default is AUTO). If you change it to a specific printer language, the printer will not automatically switch from one language to another unless specific software commands are sent to the printer.</p>
RESOURCE SAVE= OFF	OFF AUTO ON	<p>Dedicate printer memory to save each language's permanent resources. (You might have to add memory to the printer in order for this item to appear.) The amount of memory set aside can be different for each installed language. Some languages might have memory set aside for resource saving without requiring all languages to do so. Any time the amount of memory dedicated to a specific language is changed, all languages will lose all saved resources, including any unprocessed print jobs.</p> <p>OFF: No language resource saving is performed, and language-dependent resources, such as fonts and macros, are lost when language or resolution changes.</p> <p>ON: An item will appear for each installed language that allows the user to allocate a particular amount of memory to that language's resource saving area. (See the items below.)</p> <p>AUTO: The printer automatically determines the amount of memory to use for each installed language's resource saving area.</p>
PAGE PROTECT= AUTO	AUTO ON	<p>This item appears only after a 21 PAGE TOO COMPLEX; PRESS GO TO CONTINUE message appears.</p> <p>Memory Enhancement technology (MEt) attempts to guarantee that all pages will print. If the page does not print, turn PAGE PROTECT to ON. This might increase chances of a 20 INSUFFICIENT MEMORY; PRESS GO TO CONTINUE message. If this occurs, simplify the print job or install additional memory.</p>

**Table 20. Configuration menu**

Item	Values	Explanation
CLEARABLE WARNINGS=JOB	JOB ON	Set the amount of time that a clearable warning appears on the printer control panel. JOB: Warning messages appear on the control panel until the end of the job from which they were generated. ON: Warning messages appear on the control panel until [Go] is pressed.
AUTO CONTINUE=ON	ON OFF	Determine how the printer reacts to errors. ON: If an error occurs that prevents normal printing, the message appears, and the printer will go offline for 10 seconds before returning online. OFF: If an error occurs that prevents printing, the message will remain on the display and the printer will remain offline until [Go] is pressed. If the printer is on a network, you will probably want to turn AUTO CONTINUE to ON. <b>Note:</b> This setting has no effect on some errors that prevent normal printing, such as jams.
TONER LOW=CONTINUE	CONTINUE STOP	Determine how the printer behaves when toner is low. The TONER LOW message first appears when the toner cartridge is almost out of toner. (About 100 to 300 sheets can still be printed.) CONTINUE: The printer continues to print while the TONER LOW message appears. STOP: The printer goes offline and waits for further action.
JAM RECOVERY=AUTO	AUTO ON OFF	Determine how the printer behaves when a jam occurs. AUTO: The printer automatically selects the best mode for printer jam recovery (usually ON). This is the default setting. ON: The printer automatically reprints pages after a jam is cleared. OFF: The printer does not reprint pages after a jam is cleared. Printing performance might be increased with this setting.
MAINTENANCE MESSAGE=OFF	OFF	This item appears only after the PERFORM PRINTER MAINTENANCE message appears. OFF: The PERFORM PRINTER MAINTENANCE message is cleared and will not be appear again until the next maintenance is due. The message should not be turned off unless the printer maintenance has been performed. If the required maintenance is not performed, the printer's performance will decline.
SMALL PAPER SPEED=NORMAL	NORMAL SLOW	Sets the speed with which smaller-sized media passes through the printer.
NEW TONER CARTRIDGE =NO	YES NO	This item allows the user to tell the printer that a new print cartridge has been installed. Setting this item to YES resets the HP TonerGauge to full.
QUICK COPY JOBS=32	1 to 50	Specifies the number of quick-copy jobs that can be stored on the printer hard disk.
JOB HELD TIMEOUT=OFF	OFF 1 HOUR 4 HOURS 1 DAY 1 WEEK	Sets the amount of time that quick-copy, proof-and-hold, private, and stored jobs are kept before being automatically deleted from the queue.

## I/O menu

Items in the I/O (input/output) menu affect the communication between the printer and the computer.

**Table 21. I/O menu**

Item	Values	Explanation
I/O TIMEOUT=15	5 to 300	<p>Select the I/O timeout period in seconds. (I/O timeout refers to the time, measured in seconds, that the printer waits before ending a print job.)</p> <p>This setting allows you to adjust timeout for best performance. If data from other ports appears in the middle of your print job, increase the timeout value.</p> <p>Press [- Value +] once to change settings by an increment of 1, or hold down [- Value +] to scroll by increments of 10.</p>
I/O BUFFER=	AUTO ON OFF	<p>Allocate memory for I/O buffering.</p> <p>AUTO: The printer automatically reserves memory for I/O buffering. Additional configurations are not required and the I/O BUFFER SIZE menu item does not appear.</p> <p>ON: The I/O BUFFER SIZE item appears (see the following information in this table). Specify the amount of memory to be used for I/O buffering.</p> <p>OFF: I/O buffering is not performed and the I/O BUFFER SIZE item does not appear.</p> <p>When the I/O buffer setting is changed, any downloaded resources (such as fonts or macros) have to be downloaded again, unless they are stored on an optional hard disk or flash DIMM.</p>
I/O BUFFER SIZE=	10K and up 100K	<p>This item appears only when I/O BUFFER=ON. Specify the amount of memory for I/O buffering. The maximum amount of memory available for I/O buffering is determined by the amount of memory installed in the printer, the languages installed in the printer, and other memory allocations that must be made.</p> <p>Press [-Value +] to change settings by increments of 10 (up to 100 KB) or by increments of 100 (above 100 KB).</p>
PARALLEL HIGH SPEED=	YES NO	<p>Select the speed at which data is transmitted to the printer.</p> <p>YES: The printer accepts faster parallel communications that are used for connections with newer computers.</p> <p>NO: The printer accepts slower parallel communications that are used for connections with older computers.</p>
PARALLEL ADV FUNCTIONS=	ON OFF	<p>Turn the bidirectional parallel communication on or off. The default is set for a bidirectional parallel port (IEEE-1284).</p> <p>This setting allows the printer to send status readback messages to the computer. (Turning on the parallel advanced functions might slow the language switching.)</p>



**Table 22. EIO menu for networked printers**

<b>Item</b>	<b>Values</b>	<b>Explanation</b>
CFG LINK=NO	NO YES	NO: The 10/100Base-TX link configuration menu is not used. YES: You can use and manually set 10/100Base-TX link parameters. <ul style="list-style-type: none"><li>● AUTO: (Default) The print server automatically configures itself to match the network's link speed and communication mode.</li><li>● 10T HALF: Sets 10 Mbps, half-duplex operation on the print server.</li><li>● 10T FULL: Sets 10 Mbps, full-duplex operation on the print server.</li><li>● 100TX HALF: Sets 100 Mbps, half-duplex operation on the print server.</li><li>● 100TX FULL: Sets 100 Mbps, full-duplex operation on the print server.</li></ul>

## Resets menu

Use this menu with caution. You can lose buffered page data or printer configuration settings when you select these items. Only reset the printer under the following circumstances:

- You want to restore the printer's default settings.
- Communication between the printer and computer has been interrupted.
- You are using multiple I/O ports, and one of the ports is having problems.

The items in the resets menu clear all memory in the printer, while **[CANCEL JOB]** clears only the current job.

**Table 23. Resets menu**

Item	Explanation
POWERSAVE=ON	This item allows the user to turn PowerSave on and off. If PowerSave is off, the printer never uses the PowerSave mode and no asterisk appears next to any item when the user selects the menu item POWERSAVE TIME in the configuration menu.
RESET MEMORY	This item clears the printer buffer and the active I/O input buffer, and resets the printer to use the default control panel menu settings. The DATA RECEIVED message might appear on the printer control panel. Resetting memory during a print job can result in data loss.
RESTORE FACTORY SETTINGS	This item performs a simple reset and restores all non-EIO control panel settings to factory (default) settings. This item also clears the input buffer for the active I/O. The DATA RECEIVED message might appear on the printer control panel.
RESET ACTIVE I/O CHANNEL	This item performs a simple reset and clears the input and output buffers (for the active I/Os only). The DATA RECEIVED message might appear on the printer control panel.
RESET ALL I/O CHANNELS	This item performs a simple reset and clears the input and output buffers for all I/O ports.



# Service mode

Service mode should be used only by authorized service personnel. While in service mode, you can:

- Verify and set the page count, maintenance count (pages since last maintenance), and serial number. These are shown on the configuration page.
- Set the cold reset default. (This sets the factory default paper size to either Letter or A4).
- Turn the diagnostic functions on or off (for developers only).
- Clear the event log.
- Set the page interval at which the next `PERFORM PRINTER MAINTENANCE` message appears on the control panel.

## To use service mode

- 1 Hold down `[SELECT]` and `[CANCEL JOB]` while turning on the printer. (If the control panel reads `INITIALIZING`, you released the keys too soon.)
- 2 After the three LEDs under the display are lit, press the right side of the `[MENU]` key, and then press `[SELECT]`. The `SERVICE MODE` message appears. To exit the service mode press `[GO]`.

## Service menu

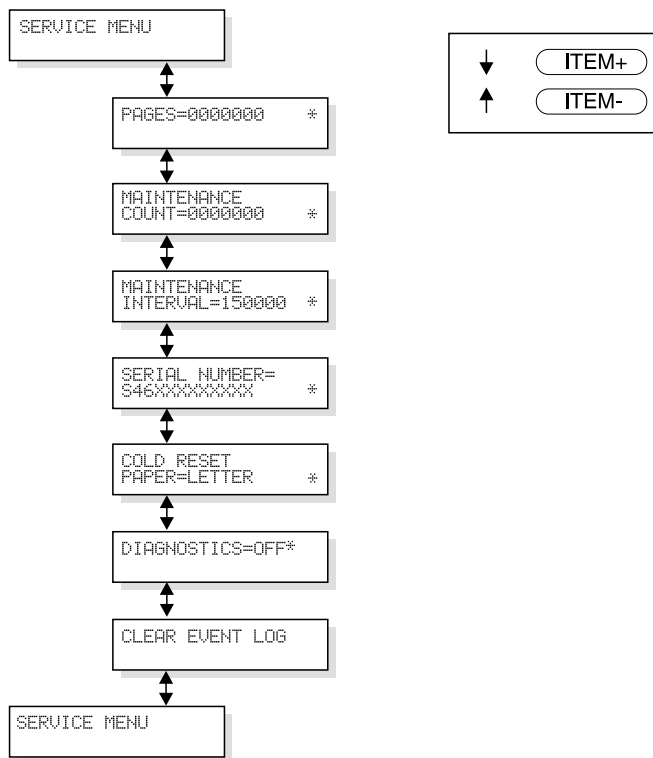


Figure 7.

Service menu

## Setting the page count, maintenance count, and serial number

The page counts and serial numbers are stored in nonvolatile random-access memory (NVRAM). If it is necessary to replace the formatter PCA, the page counts should be set to the current value to reflect the age of the print engine and maintenance items. The procedure for setting the serial number is similar to setting the page counts.

---

### Note

---

Before replacing the formatter PCA, print a configuration page to verify the current page count and serial number of the printer, if possible. Use the information on the configuration page to reset the page counts and serial number for the new formatter PCA.

### Page count

The page count stored in NVRAM and shown on the configuration page printout represents the number of pages that the printer has printed (excluding engine test prints). If it becomes necessary to repair a printer by installing a new formatter, the page count must be set so that it represents the age of the print engine rather than the age of the formatter.

The page count value is changed by using a different method than that used for other control panel values. Instead of increasing the entire value by increments, each digit can be selected and modified individually. The following control panel keys are used to modify the page count value:

- |          |   |
|----------|---|
| [SELECT] | Makes any changes to the current digit and advances the cursor one digit to the right. If the last digit is currently selected, pressing [Select] wraps the cursor around to the first digit. |
| [VALUE+] | Increases the value of the currently selected digit by one. Pressing [Value+] when 9 is the value of the currently selected digit changes the value of the digit to 0.                        |
| [-VALUE] | Decreases the value of the currently selected digit by one. Pressing [-Value] when 0 is the value of the currently selected digit changes the value of the digit to 9.                        |

Table 24 shows the sequence of keystrokes that is used to change the page count from a value of 000000 to a value of 0010480.

**Table 24. Using control panel keys to change page count (an example)**

Key Press	Display	Description
	SERVICE MODE	
[Menu+]	SERVICE MENU	Open the SERVICE MENU.
[Item+]	PAGES=0000000 *	Advance to the first item in the SERVICE MENU.
[Select]	PAGES=0000000 *	Advance the cursor one digit to the right.
[Select]	PAGES=0000000 *	Advance the cursor one digit to the right.
[Value+]	PAGES=0010000 *	Increase the value of the third digit by one.
[Select]	PAGES=0010000 *	Enter the change to the third digit and advance the cursor one digit to the right.
[Select]	PAGES=0010000 *	Advance the cursor one digit to the right.
[Value+] (4 presses)	PAGES=0010400 *	Increase the value of the fifth digit by four.
[Select]	PAGES=0010400 *	Enter the change to the fifth digit and advance the cursor one digit to the right.
[-Value] (2 presses)	PAGES=0010400 *	Decrease the value of the sixth digit by two.
[Select] (2 presses)	PAGES=0010480 *	Enter the change to the sixth digit and advance the cursor one digit to the right, causing the cursor to wrap around to the first digit.
[Go]		Exit the service menu.

## Maintenance page count, interval, and reset

The maintenance page count allows for input of the number of pages since the last maintenance kit was installed. This corresponds to “pages since last maintenance” on the configuration page. Editing this number is similar to editing the PAGES item (see table 24).

If the printer has not reached the first maintenance interval (for example, 150,000 pages), then set the maintenance count equal to the page count.

The maintenance page count should be reset only after a maintenance kit has been installed.

This resets the maintenance counter so that the message PERFORM PRINTER MAINTENANCE appears after another 150,000 pages have been printed (default).

- Hold down the [-ITEM] and [-VALUE] keys.
- Turn the printer on.
- Wait for RESET MAINT COUNT to appear and then release both keys.

MAINTENANCE INTERVAL in the service mode menu sets the page count interval at which the next service is due for the printer. This is set initially at the factory to 150,000 pages. (For example, the message appears at 150,000 pages. If the printer maintenance kit is installed at, and the counter is set to, 150,114 pages, then the message appears 150,000 pages later, at 300,114 pages.) Editing this number is similar to editing the PAGES item (see table 24).

## Serial number

If a formatter is replaced, then the serial number must be recorded. Editing this number is similar to editing the PAGES item (see table 24).

## Cold reset paper size

The default paper size is stored in NVRAM. When the printer is cold reset, the default paper size is set to the factory setting. Possible values are `COLD RESET PAPER=LETTER` and `COLD RESET PAPER=A4`. When you replace the formatter in countries that use A4 rather than letter size paper, set the cold reset paper size to A4.

## Diagnostics

This menu item enables or disables the use of the firmware diagnostic features. Possible values are `DIAGNOSTICS=OFF*` and `DIAGNOSTICS=ON`.

---

**Note**

For developers only.

## Clear event log

Use this item to clear the internal event log.

## Testing the printer

When you print a configuration page, the printer checks its internal controller and I/O interface, and then prints a test page. You can review the configuration page printout to verify proper installation of such options as paper trays or printer languages. For more information, see page 205.

### Engine test

The engine test print can be used to verify that the print engine is functioning correctly. For more information, see page 190.

## Resetting the printer

### Cold reset

A cold reset clears all data from the printer memory and sets all of the control panel menu settings back to the initial factory default settings.

#### CAUTION

Performing a cold reset resets the Jetdirect and other EIO configurations. To avoid making changes to your configuration, remove the Jetdirect card before performing a cold reset.

If possible, print a menu map and a configuration page before performing a cold reset. This page documents current settings for later reference.

### To perform a cold reset

- 1 Turn off the printer.
- 2 While pressing **[Go]**, turn the printer on. `COLD RESET` appears briefly on the display, then `INITIALIZING` appears. After a few seconds, `RESTORING FACTORY SETTINGS` appears on the display, followed by `OFFLINE`. The cold reset is complete.
- 3 Press **[Go]** to return the printer online. `READY` appears on the display.

### Clearing NVRAM

This procedure will clean up the NVRAM by removing old areas that are not being used.

- 1 Turn off the printer.
- 2 While pressing **[CANCEL JOB]**, turn the printer on. `CLEANUP NVRAM` appears briefly on the display, followed by `INITIALIZING`. After a few seconds `READY` appears.

### Initializing the hard disk

#### To initialize the hard disk

- 1 Print a configuration page and a menu map.
- 2 Turn off the printer.
- 3 While turning on the printer, hold down **[SELECT]** and **[CANCEL JOB]** until all of the lights on the control panel are lit.
- 4 Press **[-MENU]**, and the **[-VALUE]**.
- 5 Press **[SELECT]**.

# System configuration

## MS-DOS system configuration

To communicate properly with the printer, the MS-DOS environment requires the addition or modification of MODE commands in the AUTOEXEC.BAT file. Add or modify the MODE command(s) as follows:

### Parallel MS-DOS commands

Most IBM-compatible computers default to a parallel printer port. To make sure that information is sent to your parallel printer port, type the following MS-DOS command at your MS-DOS prompt or include it in your AUTOEXEC.BAT file:

```
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 printer port that you are using.

Because the MODE command is an external MS-DOS command (a program named MODE.COM runs when the MODE command is invoked), the program file must be contained in the root directory, or in a directory specified in a preceding PATH command in the AUTOEXEC.BAT file.

After changing the AUTOEXEC.BAT file, restart the computer to initiate the changes.

# Printer I/O configuration

## Parallel menu

The default setting for the HIGH SPEED PARALLEL I/O is YES. If it is set to NO, the interface runs at a slower speed that is compatible with older computers. When the default is set to YES, the parallel interface runs at a higher rate that is supported by newer computers.

## Advanced functions

The ADVANCED FUNCTIONS feature of the printer enables bidirectional communications between the printer and the host. The default setting is ON. This default setting (ON) must be active in order to use some software applications and driver features.

## Microsoft Windows and other popular operating systems and networks

The disk(s) that came with the printer contain drivers and other useful applications for use with current Microsoft Windows and other popular operating systems, networks, and applications. See the HP Web site—<http://www.hp.com>—for updated drivers, utilities, and applications.

# 4 Printer maintenance

## Overview

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## Cleaning the printer and accessories

To maintain high-quality printing and performance, thoroughly clean the printer and the paper-handling accessories:

- every time you change the toner cartridge (run a cleaning page).
- after printing approximately 15,000 pages.
- whenever print quality problems occur.

Clean the outside surfaces with a water-dampened cloth. Clean the inside parts as indicated in table 25. 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.

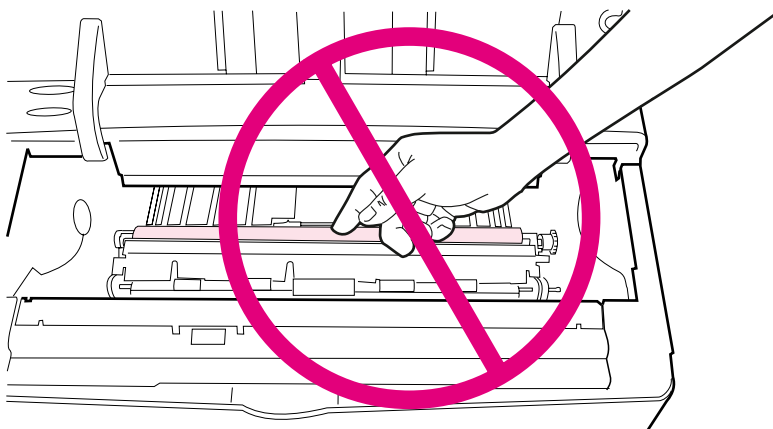
Be careful when cleaning around the fusing assembly area. It might be hot.

### CAUTION

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

Do not touch the transfer roller. Skin oils on the roller can reduce print quality.

To clean toner from clothing, wipe it off with a dry cloth and wash your clothes in cold water. Hot water sets toner into fabric.



**Figure 8.** Location of the transfer roller – do not touch!

**Table 25. Cleaning printer components**

Component	Cleaning method/notes
Outside covers	Use 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.
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 roller with your fingers.
Fuser	Use a water-dampened, lint-free cloth.



## Using the printer cleaning page

If toner specks appear on the front or back side of your print jobs, use the following procedure to print a cleaning page.

On the printer control panel, do the following:

- 1 Press **[MENU]** until PRINT QUALITY MENU appears.
- 2 Press **[ITEM]** until CREATE CLEANING PAGE appears.
- 3 Press **[SELECT]** to create the cleaning page.
- 4 Follow the instructions on the cleaning page to complete the cleaning process.

---

### Note

In order for the cleaning page to work properly, print the page on copier-grade paper (not bond or rough paper).

You might need to create and process a cleaning page more than once. When toner has been cleaned from inside the printer, shiny black spots appear on the page's black strip. If white spots appear on the black strip, create a cleaning page again.

To ensure good print quality with certain types of paper, use the cleaning page every time the toner cartridge is replaced. If the cleaning page is needed frequently, try a different type of paper.

## Cleaning spilled toner

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

---

### CAUTION

Do not touch the transfer roller with the damp cloth or with your fingers.

Do not use a vacuum cleaner to clean spilled toner unless it is equipped with a microfine particle filter that is specifically designed for use with toner.

---

### Note

Clean spilled toner using a cloth dampened with cold water.

# Preventive maintenance

The preventive maintenance cycle for this printer is every 150,000 pages. To order the maintenance kit see page 260. The kit contains one fuser, one transfer roller, one Tray 1 pickup roller, one Tray 1 separation pad, two 250-sheet tray pickup rollers, two 250-sheet tray separation pads, four 500-sheet tray pickup rollers, and two 500-sheet tray feed/separation rollers. See the instructions included in the kit for detailed replacement procedures.

## Reset maintenance count

After the printer maintenance kit has been installed, reset the maintenance count.

- 1 Turn the printer off.
- 2 While pressing [-ITEM] and [-VALUE], turn the printer on.

RESET MAINT COUNT appears, followed by INITIALIZING. After a few seconds, READY appears.

## Expected life of components

The following table shows the expected life of certain components in the printer. To order parts, see chapter 8.

**Table 26. Expected life of components**

Part name	Part number	Expected life
Tray 1 pickup roller	RB2-1820-020CN	150,000 pages
Tray 1 separation pad	RF5-4119-000CN	150,000 pages
250-sheet tray pickup roller	RB2-1821-020CN	150,000 pages
250-sheet tray separation pad	RF5-4120-000CN	150,000 pages
500-sheet tray pickup rollers	RB1-8865-000CN	150,000 pages
500-sheet tray feed/separation rollers	RF5-2634-000CN	150,000 pages
Fuser 110 to 127 V	RG5-7060-000CN	150,000 pages
220 to 240 V	RG5-7061-000CN	150,000 pages
Transfer roller assembly	RG9-1542-000CN	150,000 pages
Exhaust fan	RH7-1552-000CN	25,000 hours

# 5

## Functional information

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# Printer subsystems

This chapter presents a generalized functional overview of the printer and the printing processes.

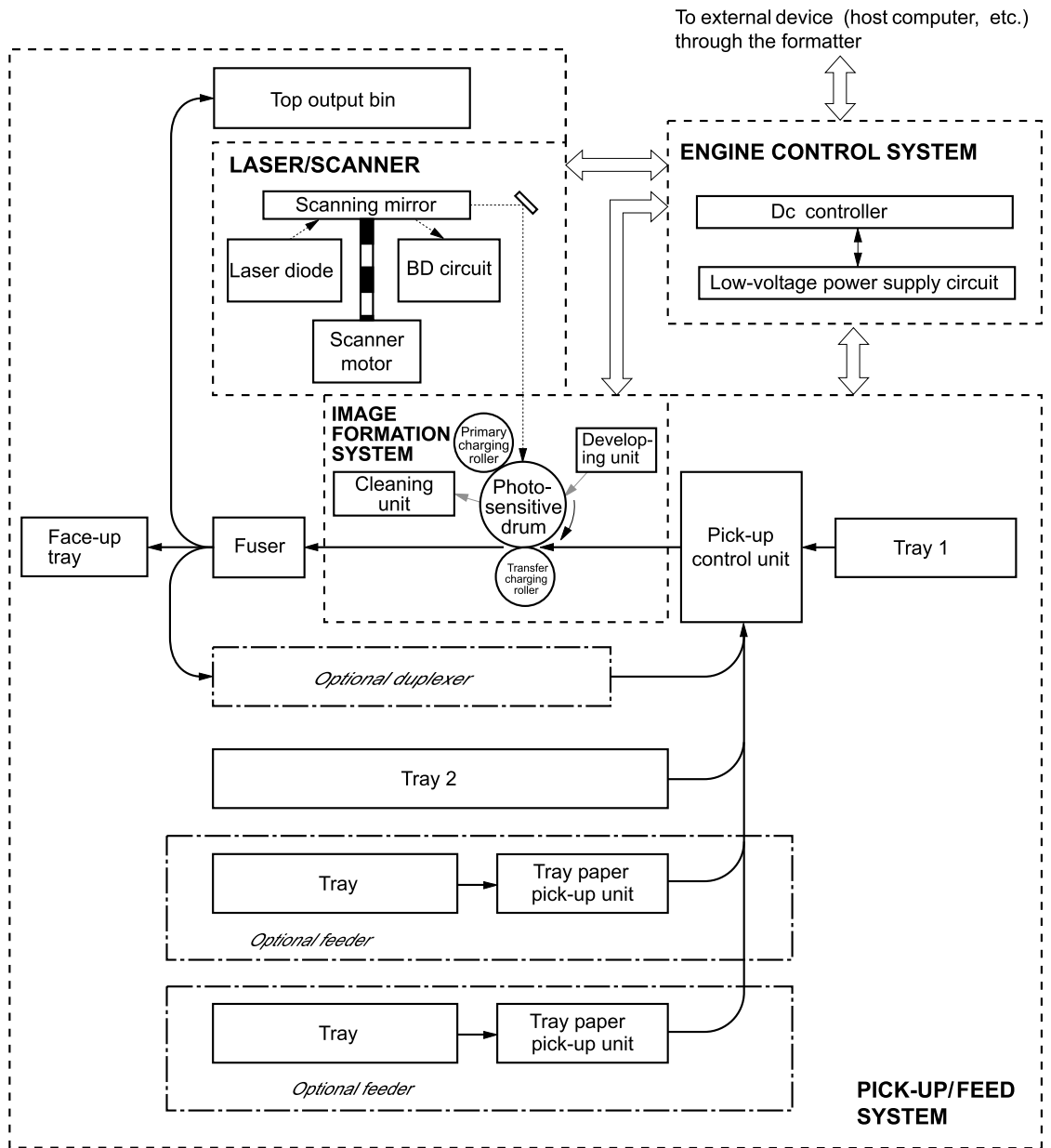


Figure 9. Paper-feed subsystem

# Power supply system

## Ac/dc power distribution

The ac line voltage for the printer is applied through the main switch (SW101) and supplied to the low-voltage power supply circuit through the fuse (F1). The low-voltage power supply divides the ac voltage to +24 Vdc, +5 Vdc and +3.4 Vdc and supplies them to the dc controller PCA. This circuit generates a zero-cross signal (ZEROX) and supplies it to the dc controller PCA.

- +3.4 Vdc is supplied to ICs on the formatter, the dc controller PCA, and the BD PCA. +5 Vdc is supplied to the laser driver PCA and sensors.
- +24 Vdc is supplied to the high-voltage power supply circuitry on the dc controller, driving the main motor, the exhaust fan, the scanner motor, the clutches, and the solenoids.
- +24 Vdc is divided into +24 Vdr, which stops when the top cover is opened and SW401 on the paper-handling PCA turns off, and +24 V, which is always supplied regardless of whether SW401 turns on or off.

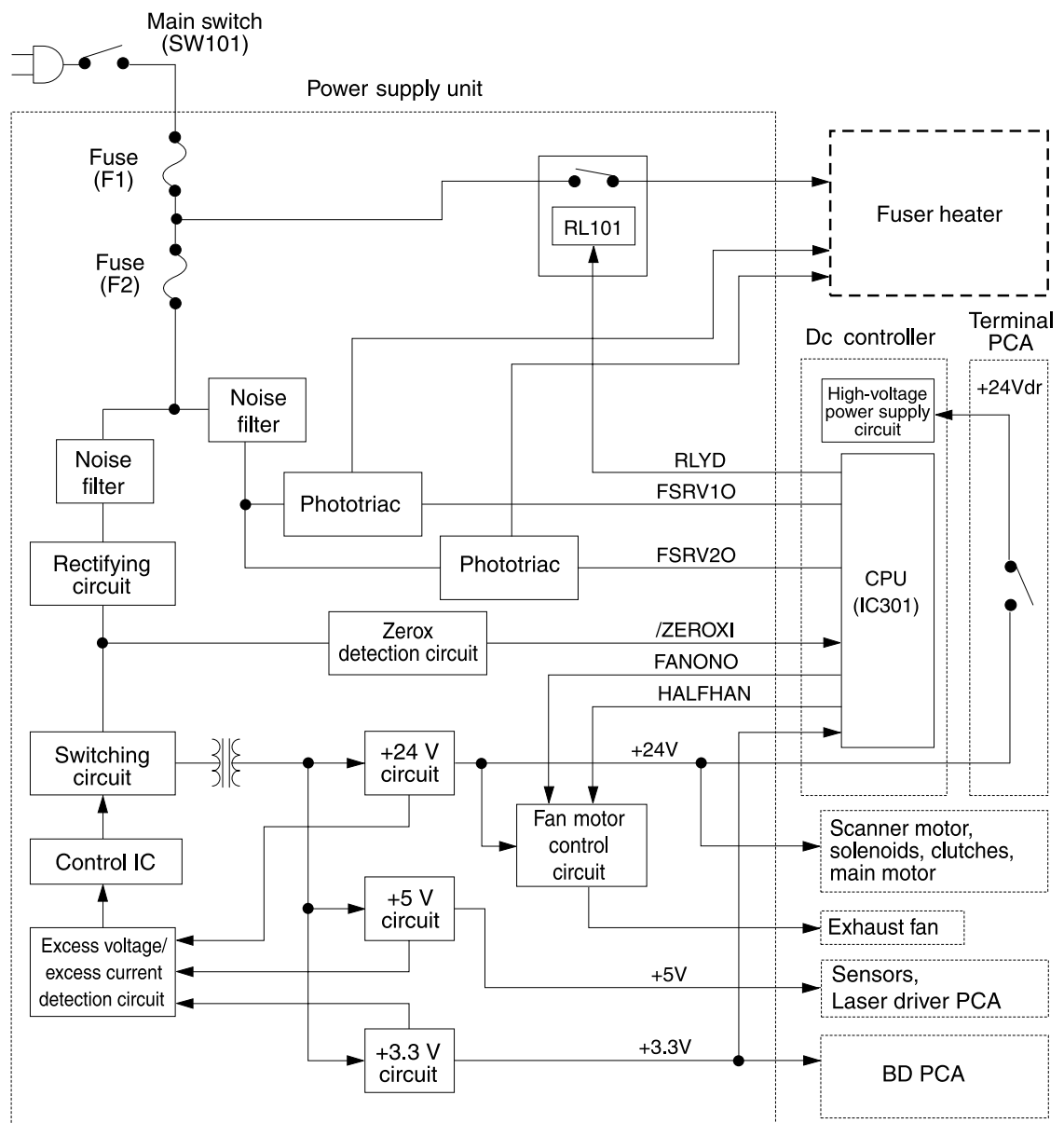


Figure 10. Low-voltage power supply circuit

If a short circuit or other problems on the load side cause an excessive current flow from the +24 Vdc or +3.4 Vdc power supplies or generate abnormal voltage, the excess-current protection system and excess-voltage protection system automatically shut off the output voltage to protect the power supplies.

If an excess-current or excess-voltage protection system is activated and the power supply circuit does not output dc voltage, it is necessary to turn the power off, correct the problem in the faulty load, then turn the printer on again.

The circuit has two fuses that break and cut off the output voltage if excess-current flows through the ac line.

## Overcurrent overvoltage protection

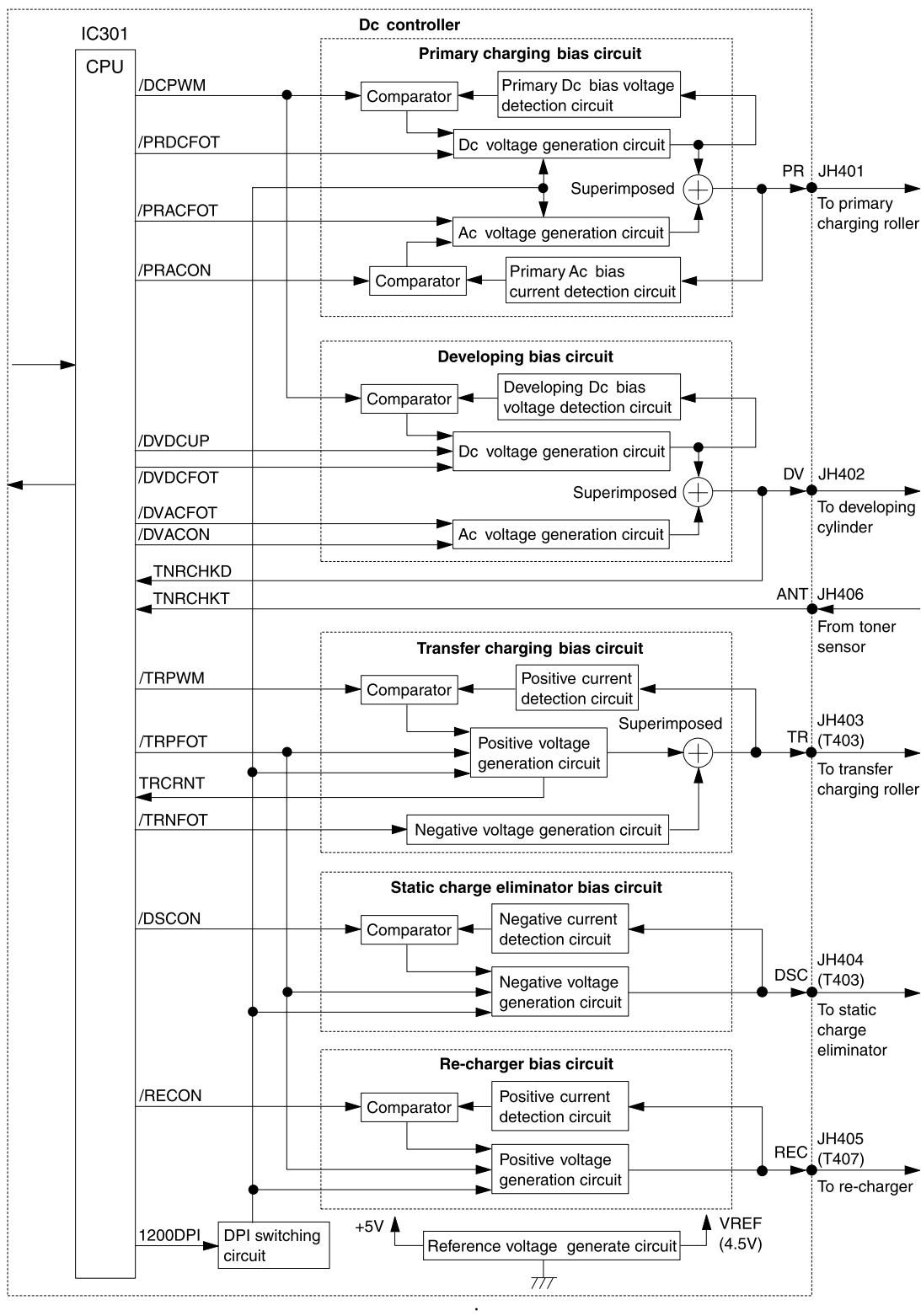
This circuit, located on the dc controller PCA, always monitors an abnormal rise in the fusing roller temperature. If an error occurs, this circuit puts out a signal to turn the relay (RL1) off and interrupt the power to the fusing roller heater. The circuit operates as follows.

When the fusing roller heater temperature rises and the output voltage of the thermistor exceeds about 0.5 V (230° C), pin 7 of the comparator (IC304) goes "L." IC304 pin 1 goes "L," Q4 turns off, and then the relay (RL1) turns off.

The printer has the following three protection functions to prevent incorrect activation of the fusing-roller heater.

- The central processing unit (CPU) monitors the thermistor voltage. If it is abnormal, the CPU identifies the fusing-roller heater error, turns the relay (RL1) off, and reports it to the formatter.
- If the fusing-roller heater temperature rises abnormally and the thermistor voltage falls below about 0.6 V (220° C), the safety circuit in the fusing-roller heater interrupts the power to the fusing heater regardless of the CPU output.
- If the fusing-roller heater temperature rises abnormally and the thermal fuse temperature exceeds 240° C, the thermal switch turns off and interrupts the power to the fusing-roller heater.

## High-voltage power distribution



**Figure 11. High-voltage power supply circuit**

In response to the instructions from the microprocessor (CPU) on the dc controller, this circuit applies the superimposed voltage of dc voltage and ac voltage to the primary charging roller and developing cylinder, and a positive or negative dc voltage to the transfer charging roller.

According to the image-density information sent from the formatter PCA, this circuit varies the primary dc bias and developing dc bias to adjust the image density.



## Toner-cartridge detection

The toner cartridge has a toner sensor. The circuit compares the output value of the developing ac bias and the output value (ANT) from the antenna inside the cartridge, and puts out the toner-detection signal.

The CPU detects the level of remaining toner and the presence of the cartridge when the developing bias is applied to the developing cylinder. The level of remaining toner is always detected when the developing bias is applied. The presence of the cartridge is detected only when the developing bias is applied during the initial rotation.

## Dc controller system

The following systems and functions are controlled by the dc controller PCA:

- Dc power distribution (+3.4 Vdc, +5 Vdc, +24 VA)
- Laser and scanner drive
- Paper-motion monitoring and control (photosensors and flags)
- Clutches (tray pickup and Tray 1 feed)
- Engine test
- Motors (main drive, scanner, and fans)

The CPU of the dc controller system regulates the operation sequences of this printer. When the printer power switch is turned on and the printer enters the standby mode, the CPU sends the signals to drive the loads (such as laser diode, motors, and solenoids) based on the print commands and the image data received from the formatter.

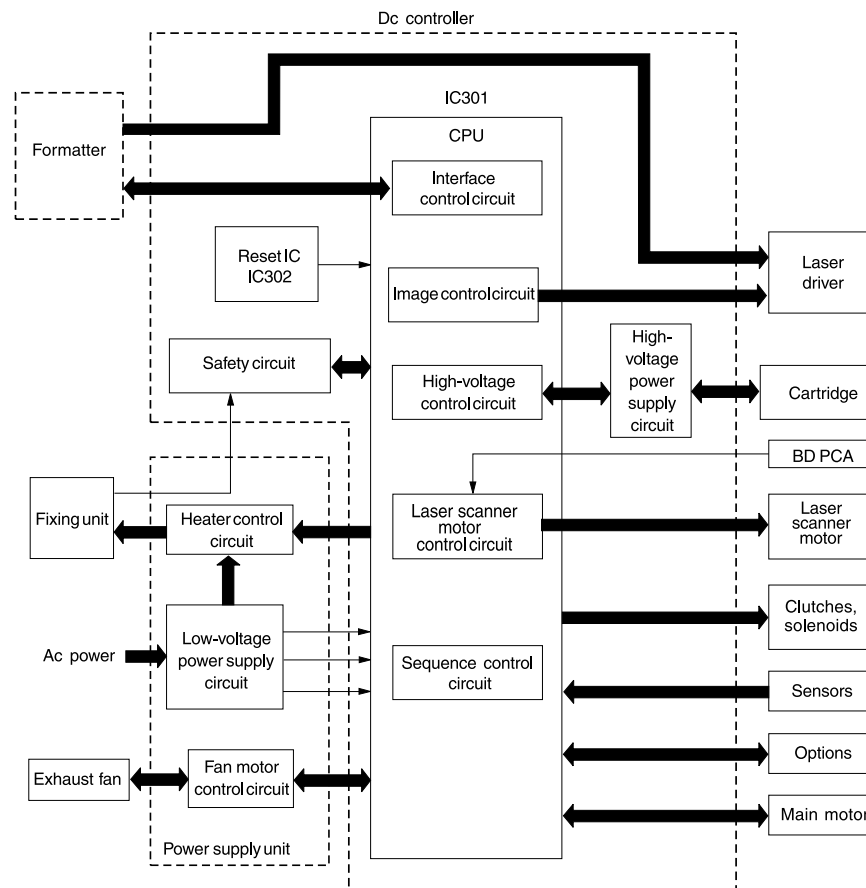


Figure 12.

Dc controller PCA

## **Laser and scanner drive**

Based on information received from the formatter, the dc controller board sends signals to the laser/scanner assembly to modulate the laser diode on and off and to drive the laser/scanner motor. See [“Image-formation system” on page 82](#) for more information.

## **Paper-motion monitoring and control**

The dc controller board controls paper motion by continuously monitoring the various paper sensors, and coordinating paper movement with the other print processes. For more information, see [“Paper feed system” on page 91](#).

## **Solenoids, sensors, clutches, and switches**

See [“Dc controller inputs and outputs” on page 252](#).

## **Engine test**

See [“Engine test” on page 190](#).

## Motors

See the timing diagram on page 102 for specific timing details for the printer motors.

The dc controller board regulates the main motor (M1). The main motor drives the main gear assembly and rotates during the initial rotation period (following power-on), the print period, the last rotation period, and whenever the printer's top cover is opened and closed.

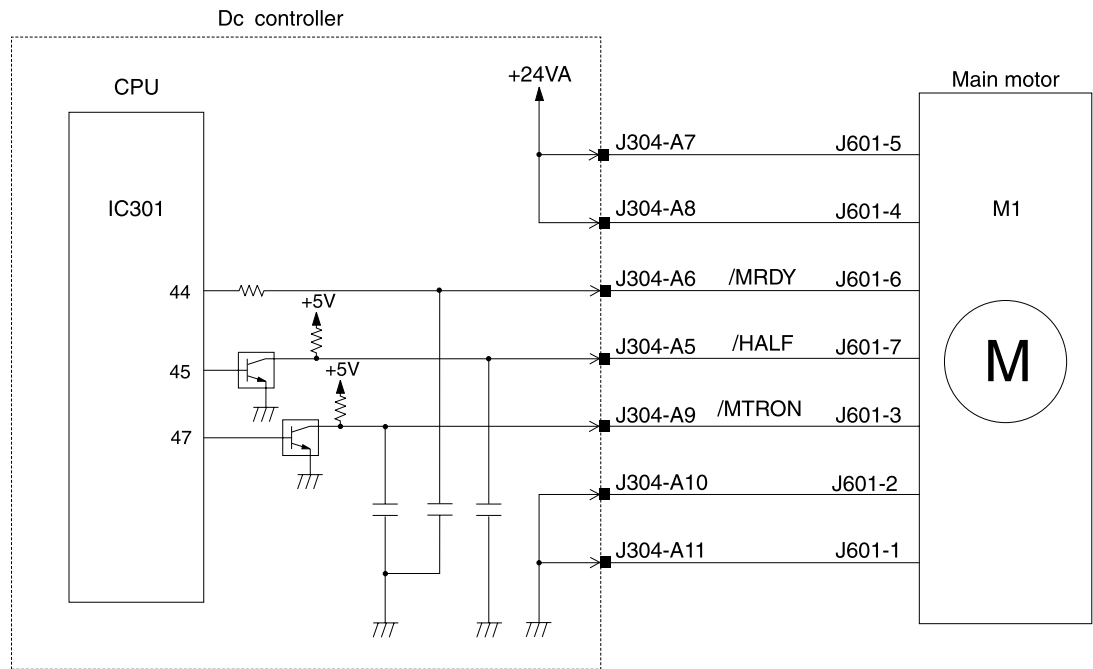


Figure 13.

### Main-motor control

The main motor is a dc brushless motor with hall elements, and is unified with the motor drive circuit.

The CPU sets the main-motor drive signal (/MON) to "L" and rotates the main motor. When printing at 1200 dpi, the CPU sets the main-motor rotation switching signal (/HALF) to "L" and decreases the rotation speed of the main motor to half.

The dc controller board regulates the scanner motor. It rotates the scanner mirror during the initial rotation period and the print period.

The fan motor is a two-phase, four-pole dc brushless motor that contains a hall element and forms a unit along with the motor drive circuit.

When the printer turns on, the CPU on the dc controller PCA initially causes the fan motor to run for one-half second.

The CPU controls the half-speed/full-speed rotations according to the target fuser roller temperature when the CPU receives the /PRNT signal from the formatter. When the fuser warms up sufficiently, it sets the fan drive voltage (FANON) to the voltage level that runs the fan motor at full speed. If the printing ends, the fan motor runs at full speed for 30 seconds after the main motor stops, and then the fan motor runs at half speed.

# Formatter system

The formatter PCA is responsible for the following actions:

- controlling the PowerSave mode
- receiving and processing print data from the various printer interfaces
- monitoring control panel input 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 Jetdirect EIO or bidirectional parallel interface

The formatter PCA receives a print job from the bidirectional interface and separates it into image information and instructions that control the printing process. The dc controller board synchronizes the image-formation system with the paper feed and delivery systems, and then signals the formatter to send the print-image data.

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

## PowerSave

This feature (accessed from the configuration menu) conserves power by shutting down the fuser and exhaust fans after the printer has been idle for an adjustable period of time. The printer retains all printer settings, downloaded fonts, and macros while it is in the PowerSave mode. The default setting is `POWERSAVE ON`, with a 30-minute idle time.

The printer exits the PowerSave mode and enters the warm-up cycle when any of the following occurs:

- a print job, valid data, or a PML or PJJL command is received at the parallel port or an EIO card
- a control panel key is pressed
- the top cover is opened and then closed
- a tray is opened and then closed
- the engine-test button is pressed

---

### Note

Printer error messages override the PowerSave message. The printer will enter the PowerSave mode at the appropriate time, but the error message will continue to appear.

## Resolution Enhancement technology

The formatter PCA contains circuitry for Resolution Enhancement technology (REt), which modifies the standard video dot data on its way to the dc controller board to produce “smoothed” black-to-white boundaries. REt can be set through the control panel, or from some software applications. The default setting is medium.

---

### Note

REt settings set from software applications or printer drivers override the control panel settings.

## EconoMode

The EconoMode setting uses up to 50 percent less toner than standard mode printing by reducing the dot density. However, EconoMode does not extend toner-cartridge component life. EconoMode, which can be thought of as “draft mode,” can be selected at the control panel (from the print-quality menu) and through some software applications and printer drivers. The default setting is off.

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**Note**

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EconoMode does not affect print speed or memory usage, nor does it extend the toner cartridge's life.

## Input/output

### Parallel interface

The formatter PCA receives incoming data through its bidirectional interface (IEEE-1284). The I/O provides high-speed and two-way communication between the printer and the host, allowing the user to change printer settings and monitor printer status from the host computer. The user can configure the HIGH SPEED item in the control panel menu. Using the default setting, YES, the I/O can run at the higher speeds supported by most newer computers. When it is set to NO, the parallel interface runs at the slower mode that is compatible for older computers. The user can also configure the ADVANCED FUNCTIONS item. The default setting, ON, accommodates two-way parallel communications. The OFF mode disables the advanced functionality. The I/O is compatible with the bidirectional parallel interface standard.

### Expanded I/O

Optional expanded I/O cards can be installed in the I/O slots on the formatter PCA. They provide automatic I/O switching between multiple computers or networks connected to the printer. The network version printers include the HP Jetdirect Print Server with Ethernet 10/100Base-TX support.

### Flash

Flash is provided in optional 2- and 4-MB flash memory DIMMs for storage of forms, fonts, and signatures.

### Disk

An optional EIO-based hard drive is used for permanent storage and allows additional space for creating multiple original prints (mopies) and other job-retention features, as well as to store forms, fonts, and signatures.

### CPU

The formatter PCA incorporates a 300 MHz processor.

## Printer memory

Memory is delivered on a single DIMM, which occupies one of the four slots available. This leaves three DIMM slots that may be used to add memory, fonts, or firmware upgrades.

The memory that comes with the printer is on one of two types of combination Flash/DRAM DIMMs. The HP LaserJet 5100 and HP LaserJet 5100Le printers use a 4 MB Flash/ROM and 16 MB SDRAM version; the HP LaserJet 5100tn and HP LaserJet 5100dtn printers use a 4MB Flash/ROM and 32 MB SDRAM version.

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**Note** DIMMs and SIMMS are not compatible.

Only one type of DRAM DIMM is supported—SDRAM DIMMs that are 32-bit, 100-pin, 100 MHz (PC100).

### Read-only memory and random-access memory (RAM)

Besides storing microprocessor control programs, the read-only memory (ROM) stores dot patterns of internal character sets (fonts). Early versions of the printer might contain downloadable flash rather than ROM to store the processor code (firmware).

The random-access memory (RAM) contains the page and I/O buffers and the font storage area. It stores printing and font information that is received from the host system, and can also serve to temporarily store a full page of print-image data before the data is sent to the print engine (see “Page protect” on page 81). RAM memory capacities for each printer are shown in on page 16. Memory capacity can be increased by adding DIMMs to the formatter PCA. Note that adding memory (DIMMs) might also increase the print speed for complex graphics.

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**Note** If the printer encounters difficulty managing available memory, a clearable warning message appears on the control panel.

Some printer messages are affected by the auto continue and clearable warning settings from the configuration menu in the printer control panel. If `CLEARABLE WARNING=JOB` is set on the control panel, warning messages appear on the control panel until the end of the job from which they were generated. If `CLEARABLE WARNING=ON` is set, warning messages appear on the control panel until **[Go]** is pressed. If an error occurs that prevents normal 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 appears until **[Go]** is pressed.

---

### Nonvolatile random-access memory

The printer uses nonvolatile random-access memory (NVRAM) to store I/O and information about printer configuration. The contents of NVRAM are retained when the printer is turned off or disconnected.

### Memory Enhancement technology

The HP Memory Enhancement technology (MEt) effectively doubles the memory capacity through a variety of font- and data-compression methods.

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**Note** MEt is only available in PCL mode; it is not functional in PS mode.

## Page protect

Page complexity (rules, complex graphics, or dense text) might exceed the printer's ability to create the page image fast enough to keep pace with the image-formation process. If page protect is disabled, and a page is too complex, it might print in parts (for example, the top half on one page and the bottom half on the next page). Some print-data loss is likely in these instances, and the 21 PAGE TOO COMPLEX error message appears, alternating with PRESS GO TO CONTINUE.

Page protect allows the formatter to create the entire page image in page-buffer memory before physically moving the paper through the printer. This process ensures that the entire page will be printed. Page protect applies only to PCL printing. The default setting is "auto."

## PJL

Printer job language (PJL) is an integral part of configuration, in addition to the standard printer command language (PCL). With standard cabling, PJL allows the printer to perform the following functions:

- Two-way communication with the host computer through a bidirectional parallel connection. The printer can tell the host such things as the control panel settings, and makes it possible for the control panel settings to be changed from the host.
- Dynamic I/O switching. This makes it possible for the printer to be configured with a host on each I/O. The printer can receive data from more than one I/O simultaneously, until the I/O buffer is full. This can occur even when the printer is offline.
- Context-sensitive switching. This makes it possible for the printer to automatically recognize the personalities (PS or PCL) of each job and configure itself to serve that personality.
- Isolation of print environment settings from one print job to the next. For example, if a print job is sent to the printer in landscape mode, the subsequent print jobs print in landscape only if they are formatted for landscape printing.

## PML

Peripheral Management Language (PML) can be used for remote configuration and status readback through the I/O Ports.

## Control panel

The formatter PCA sends and receives printer status and command data through a control panel PCA. See page 42 for more information about the control panel. See and page 193 for control panel messages.

# Image-formation system

The image-formation system is the main part of the printer, and consists of six stages:

1. Cleaning
2. Conditioning
3. Writing
4. Developing
5. Transferring
6. Fusing

When the formatter board sends the print signal to the dc controller board, it drives the main motor to rotate the photosensitive drum, the developing cylinder, the primary charging roller, and the transfer charging roller.

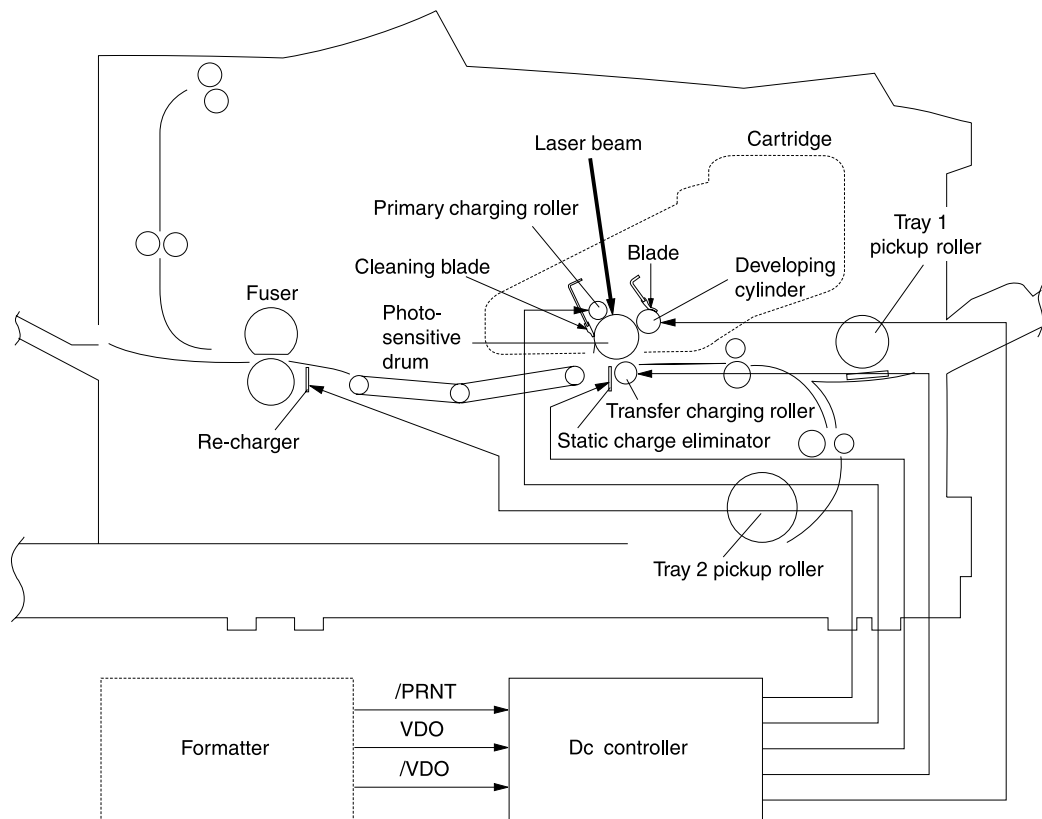
The primary charging roller places a uniform negative charge on the surface of the photosensitive drum. The laser beam modulated by the video signal is illuminated on the photosensitive drum surface to form the latent image on the drum with the laser diode.

The latent image formed on the photosensitive drum is changed to a visual image by the toner on the developing cylinder, then transferred to the paper by the transfer charging roller. The residual toner on the photosensitive drum surface is scraped down with the cleaning blade. The potential on the drum is uniformed by the primary charging roller to prepare for a new latent image.

After the image has been transferred to the paper, it is fused onto the paper by heat and pressure at the fuser.

The cartridge has a toner sensor that detects the level of remaining toner and the presence of the cartridge.

If the toner in the cartridge is lower than the specified level or if no cartridge is in the printer, that information is reported to the formatter.



**Figure 14.** Image-formation system



## Toner cartridge

A major portion of the image-formation system is contained in the toner cartridge, as shown in the figure below.

The toner cartridge is the core of the image-formation system. It houses the cleaning, conditioning, and developing steps of the process. The toner cartridge contains the photosensitive drum, primary charging roller, developing station, toner cavity, waste toner cavity, and cleaning station. Including these components that wear, degrade, or are consumed in the replaceable toner cartridge eliminates the need for a service call when replacement is required.

The printer also has a cartridge drive system that minimizes banding.

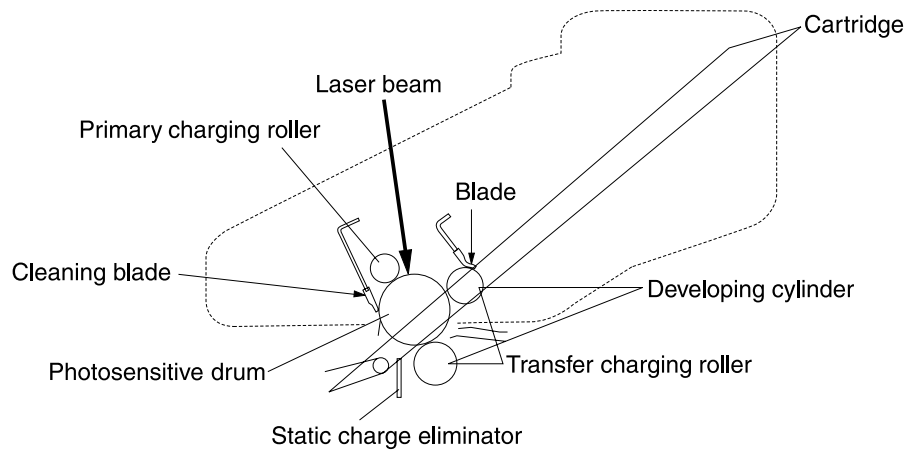


Figure 15.

Toner cartridge

## Photosensitive drum

The special properties of the photosensitive drum allow an image to be formed on the drum surface and then transferred to paper. The drum is an aluminum cylinder. The outside of the cylinder is coated with a layer of organic-photoconductive material (OPC) which is non-toxic. The OPC material has properties similar to a photo-resistor. It becomes electrically conductive when exposed to light, and the negative charges deposited on the drum are conducted to the ground potential of the drum base. Areas not exposed to light remain non-conductive and maintain their negative charge. The aluminum base of the photosensitive drum is electrically connected to ground potential.

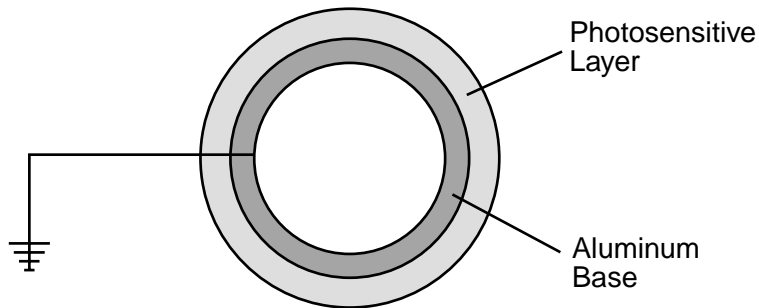


Figure 16.

### Photosensitive Drum

### Cleaning the drum

In the transfer stage, not all the toner is transferred to the paper, but some remains on the photosensitive drum.

In this stage, the residual toner is cleaned so that the next print image will be clear and distinct.

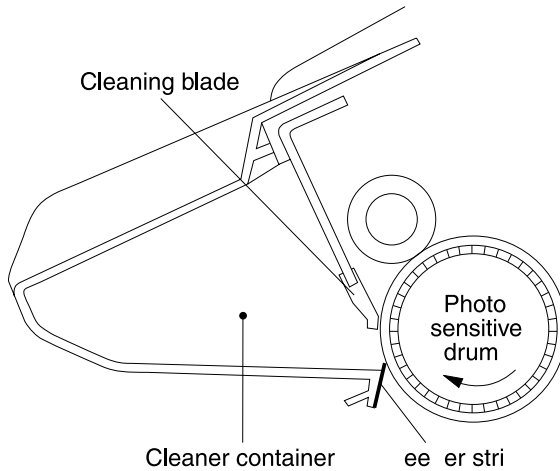


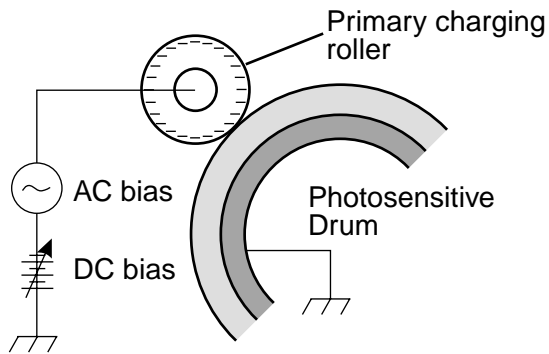
Figure 17.

### Cleaning the drum

The residual toner on the drum surface is scraped away with the cleaning blade to clean the drum surface in preparation for the next print. The removed toner is collected into the cleaner container.

## Conditioning the drum

After the drum is cleaned, it must be conditioned. This process consists of applying a uniform negative charge on the surface of the drum with the primary charging roller. The primary charging roller is coated with conductive rubber with an ac bias applied to erase any residual charges and maintain a constant drum surface to create a uniform negative potential on the drum surface. The amount of dc voltage is modified by the print density setting.



**Figure 18.**

**Primary charging roller**

## Writing the image

During the writing process, a modulated laser diode projects the beam onto the rotating six-sided scanning mirror. As the mirror rotates, the beam reflects off the mirror, through a set of focusing lenses, through a slot in the rear of the toner cartridge, and onto the photosensitive drum. The beam sweeps the drum from left to right, discharging the negative potential wherever the beam strikes the surface. This creates a latent electrostatic image, which later is developed into a visible image.

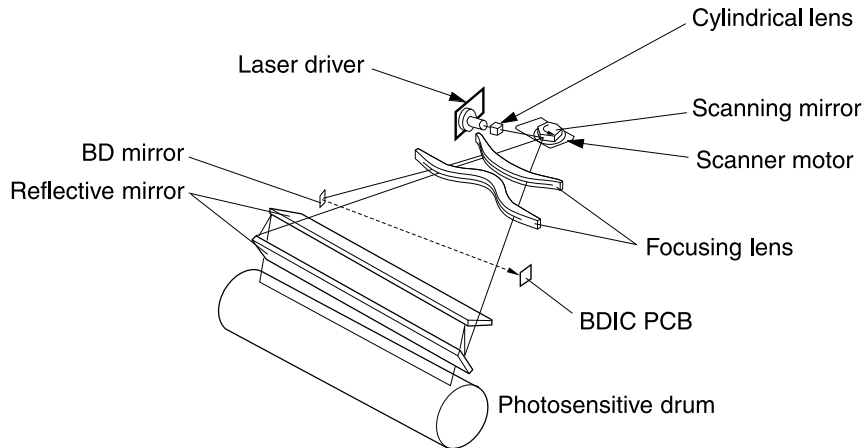


Figure 19.

### Writing the image

Because the beam is sweeping the entire length of the drum and the drum is rotating, the entire surface area of the drum can be covered. The speed of the scanner motor (which turns the scanning mirror) and the speed of the main motor (which turns the drum) are synchronized, and each successive sweep of the beam is offset by 1/1200th up to of an inch. The beam can be turned on and off to place a dot of light every 1/1200th of an inch. This is how the printer achieves its 1200x1200 dpi resolution. After the writing process, the drum surface has an invisible (latent) electrostatic image.

At the beginning of each sweep, the beam strikes the beam detect lens, generating the Beam Detect Signal (/BD). The BD signal is sent to the dc controller board, where it is converted to an electrical signal used to synchronize the output of data (/VDO) for one sweep (scan line) and to diagnose problems with the laser diode or scanner motor.

## Developing the image

The developing process develops the latent electrostatic image into a visible image on the drum. The developing unit consists of a metallic cylinder that rotates around a fixed magnetic core inside the toner cavity. Toner is a powdery substance made of black plastic resin bound to iron particles, which is uniformly attracted to the magnetic core of the cylinder.

The toner particles obtain a negative surface charge by rubbing against the developing cylinder which is connected to a negative dc supply. The negatively charged toner is attached to the discharged (exposed, grounded) areas. An ac potential is applied to the developing cylinder to decrease the attraction between the toner and the magnetic core of the cylinder, and to increase the repelling action of the toner against the areas of the drum not exposed to laser light. This ac potential improves density and contrast.

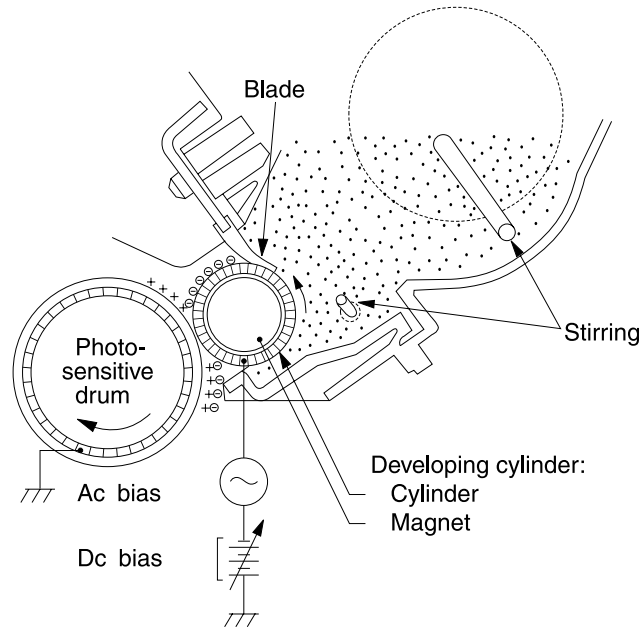


Figure 20.

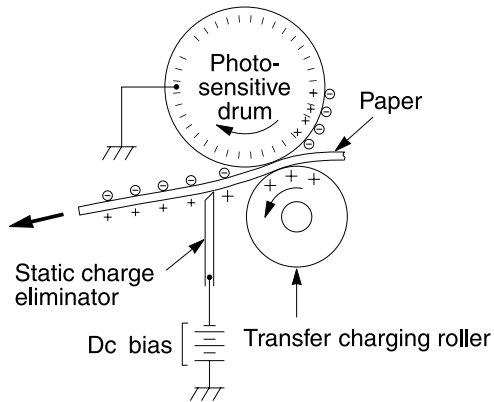
### Developing the image

The print density control in the control panel menu adjusts the dc bias of the developing cylinder by changing the force of attraction between the toner and drum. A change in the dc bias causes either more or less toner to be attracted to the drum, which in turn either increases or decreases the print density. Both the primary and developer dc bias voltages are changed in response to the density setting.

## Transferring the image

During the transferring process the toner image on the drum surface is transferred to the paper. A positive charge applied to the back of the paper by the transfer roller causes the negatively charged toner on the drum surface to be attracted to the page.

The small diameter of the drum, combined with the stiffness of the paper, causes the paper to peel away from the drum. The static eliminator teeth also help separate the paper from the drum. The static eliminator teeth weaken the attractive forces between the negatively-charged drum surface and the positively-charged paper. After separation, the drum is cleaned and conditioned for the next image.



**Figure 21.** Transferring the image

## Image fusing/variable fusing temperature

During the fusing process, the toner is fused into the paper by heat and pressure to produce a permanent image. The paper passes between a heated fusing roller and a soft pressure roller. This melts the toner and presses it into the paper.

The fusing roller contains a ceramic heating element that provides heat for the fusing process. Fusing temperature is monitored by the dc controller board, a thermistor. If the fusing system overheats (about 446° F/230° C), a relay opens, interrupting power to the fusing heater, causing a fuser error message (50.X FUSER ERROR). If the fusing system exceeds 464° F (240° C), the thermal fuse will open, cutting off power to the fuser.

The dc controller board maintains a variable fuser temperature that is dependent on factors such as the paper type set in the paper handling menu.

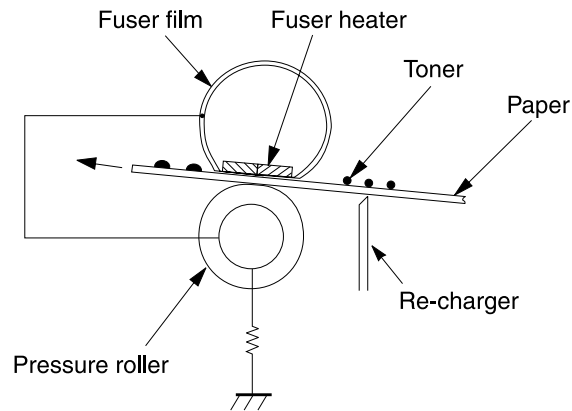
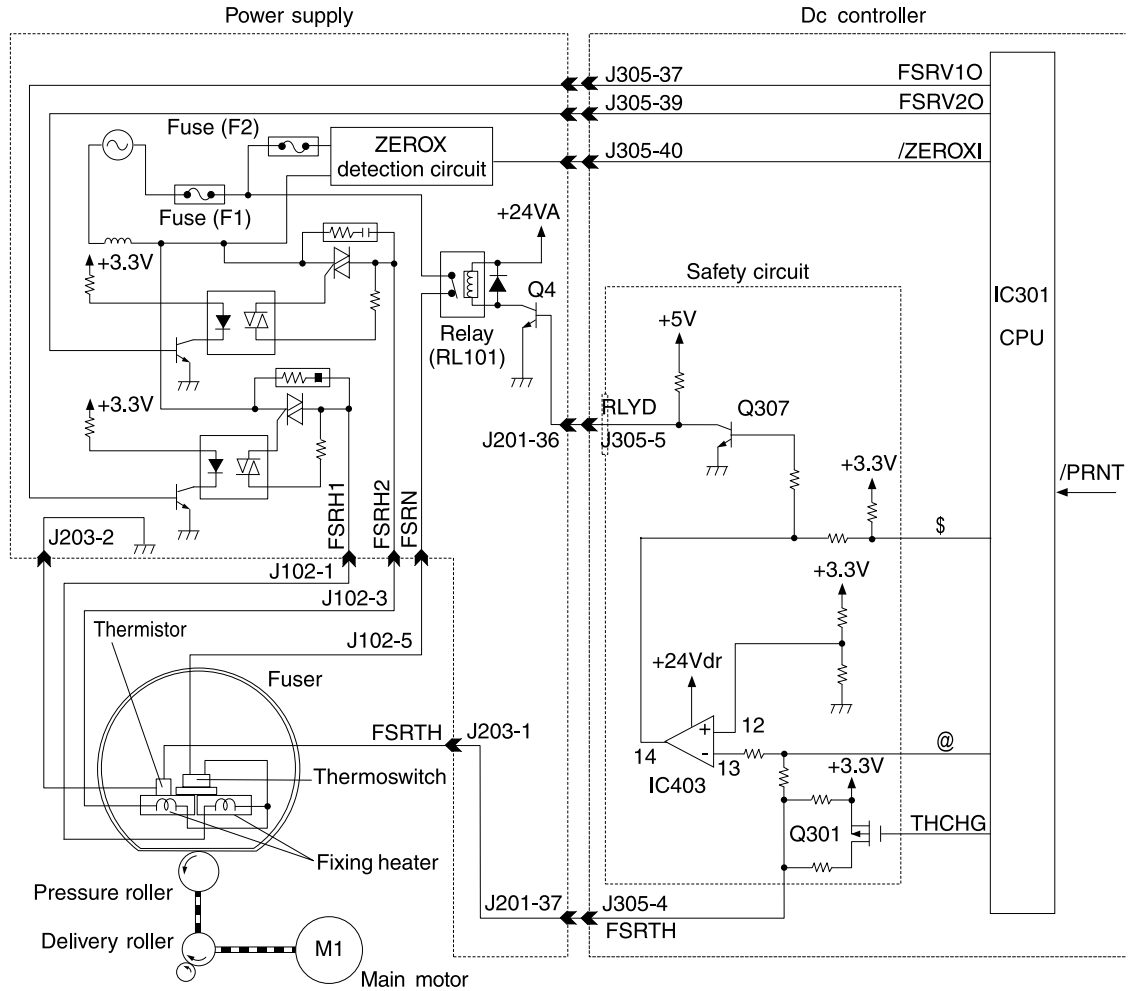


Figure 22.

Image fusing

## Variable fusing temperature



**Figure 23.** Fusing temperature control

Variable fusing temperature is a feature that gives the user or service technician the ability to adjust the fusing temperature profile based on the media being used in the printer. The default fuser mode is Normal for most types of paper, which should be optimal for most users. There are optional Vellum, Low, and High fuser mode selections. If very heavy or rough media is being used, then the high fuser mode is beneficial. If transparencies or light media are being used, then low fuser mode might be appropriate. `CONFIGURE FUSER MODE` is in the paper handling and when set to the default of NO, paper types and associated fuser modes are not displayed in the menu. When `CONFIGURE FUSER MODE` is set to YES, the different paper types are then displayed in the menu.



# Paper feed system

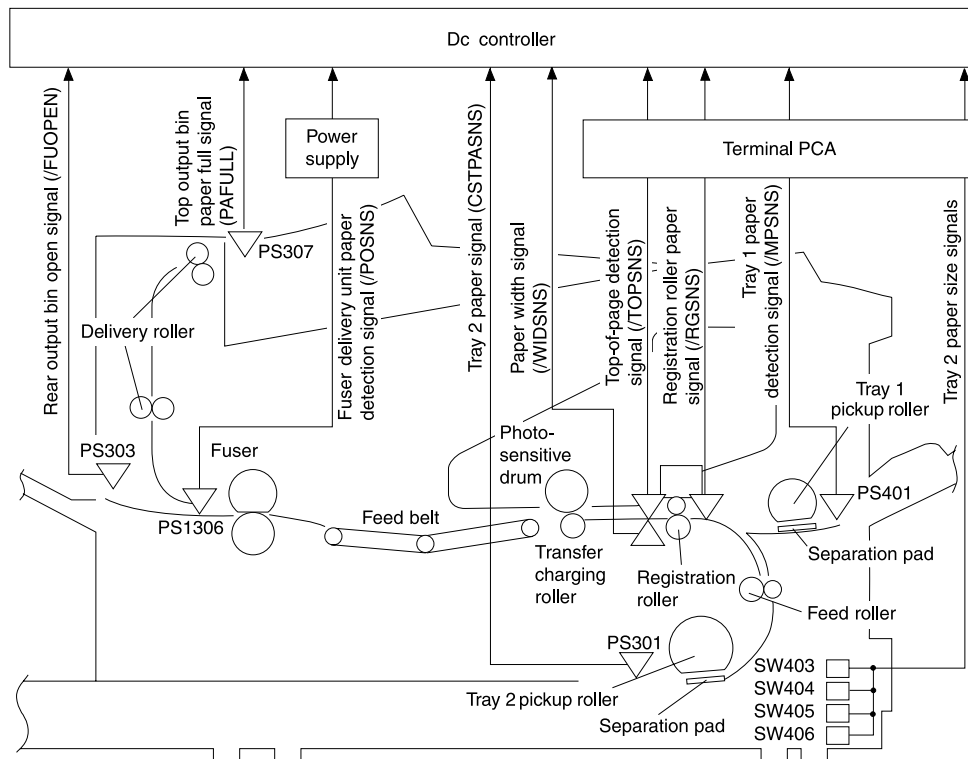


Figure 24.

## Paper path

The paper in Tray 1 is detected by the Tray 1 paper sensor (PS401). The paper in Tray 2 is detected by the Tray 2 paper sensor (PS301).

The size of the paper in Tray 2 and the presence of Tray 2 installed in the printer are detected by four switches (SW403, SW404, SW405, and SW406) on the paper-handling PCA.

When the paper is fed from Tray 2, the Tray 2 pickup solenoid (SL306) and the feed roller clutch (CL406) turn on while the main motor (M1) is rotating. Then the Tray 2 pickup roller and the feed roller start rotating to feed a sheet of paper into the printer.

When the paper is fed from Tray 1, the Tray 1 pickup solenoid (SL404) turns on while the main motor (M1) is rotating. Then the Tray 1 feed roller starts rotating to feed a sheet of paper into the printer.

The paper passes through the registration roller paper sensor (PS403) and stops at the registration rollers to momentarily stop the leading edge as its skew is corrected. Then the registration clutch (CL405) turns on to restart paper feed.

The dc controller PCA sends the top of page signal (/TOP) to the formatter PCA within a specified period of time after the top of page sensor (PS402) detects the leading edge of the paper.

The formatter PCA sends the video signal (/VDO, VDO) within a specified period of time after it receives the /TOP signal to align the image's leading edge on the photosensitive drum with the leading edge of the paper already fed. The paper then passes through the transfer area, feed belt, fuser, and delivery unit and is output onto the rear output bin or the top output bin. There are three photointerrupters (PS402, PS403, and PS1306) in the paper path to detect paper jams. If the paper does not reach or pass through any of the sensors within the specified period of time, the microprocessor (CPU) on the dc controller PCA notifies the formatter of a paper jam.

## Clutches and sensors

See “Reference diagrams” starting on page 227 for locations of switches, sensors, and clutches.

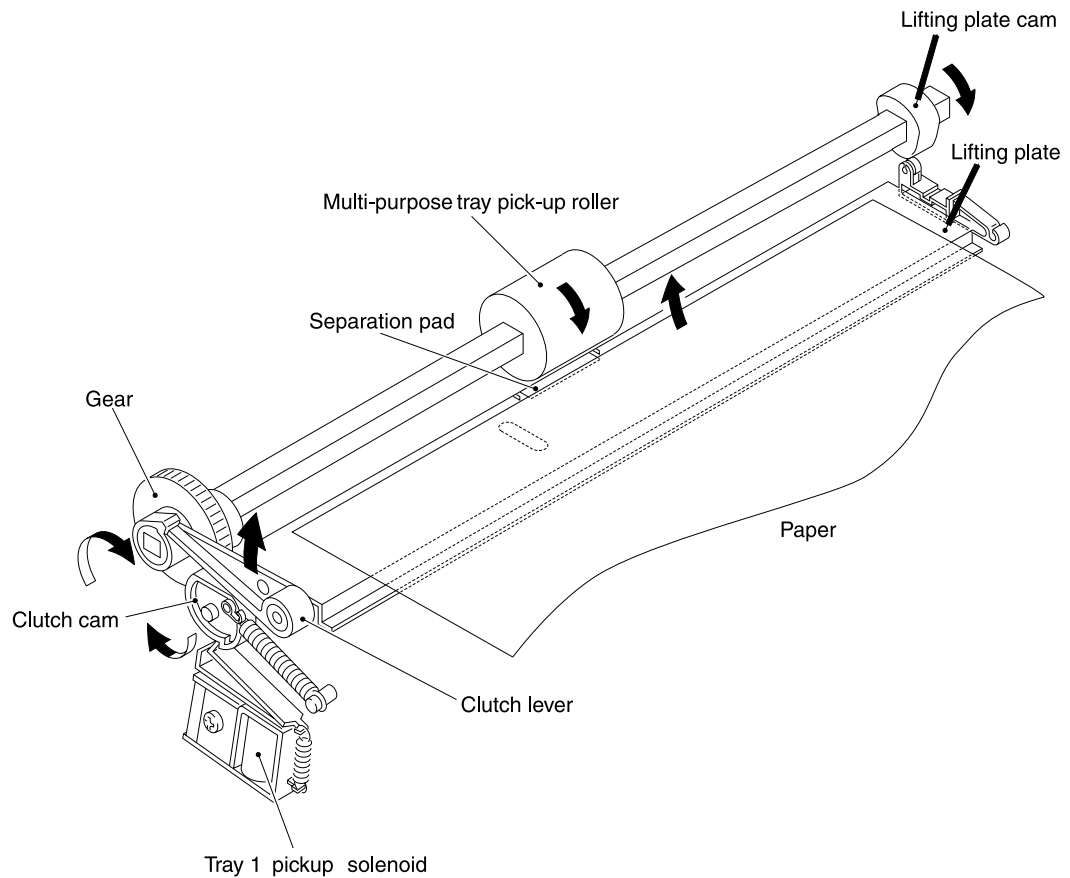
### Printing from Tray 1

The presence of paper in Tray 1 is detected by the Tray 1 paper sensor (PS401).

When the formatter PCA sends the /PRNT (print signal) to the printer, the CPU turns the Tray 1 pickup solenoid (SL404) on within the specified period of time after the main motor (M1) and the scanner motor start and the printer is ready to print.

This turns the cam on and lifts the middle plate where the paper is loaded. The paper touches the Tray 1 feed roller. The Tray 1 feed roller rotates a full circle to feed one sheet of paper. Extra sheets are removed with the separation pad, and only one sheet is fed into the printer as the Tray 1 feed roller rotates.

The paper passes through the registration roller paper sensor (PS403) and stops at the registration roller that is not turning, momentarily stopping the leading edge of the paper and correcting its skew. The CPU turns the registration roller clutch (CL405) on within a specified loop-forming time and feeds the paper through the transfer area, the feed belt, the fuser, and the delivery unit, and outputs it to the top output bin.



**Figure 25.** Tray 1 pickup

## Printing from Tray 2

When the formatter PCA sends the /PRNT (print signal) to the printer, the CPU turns the Tray 2 pickup solenoid (SL306) on about 0.15 seconds after the main motor (M1) starts rotating, then turns on the feed roller clutch (CL406). The main motor rotates the Tray 2 pickup roller and feed rollers.

The Tray 2 pickup roller rotates a full circle with the Tray 2 pickup solenoid (SL306) and picks up one sheet of paper from the tray. The paper is fed into the printer as the feed rollers rotate. The paper passes through the registration roller paper sensor (PS403) and stops at the registration roller that is not turning, momentarily stopping the leading edge of the paper and correcting its skew. The CPU turns the feed roller clutch (CL406) off within a specified time and stops the feed roller rotation. The CPU turns the registration roller clutch (CL405) and feed roller clutch (CL406) on about 1.3 seconds after the scanner becomes ready and feeds the paper through the transfer area, feed belt, fuser, and delivery unit and outputs it to the top output bin.

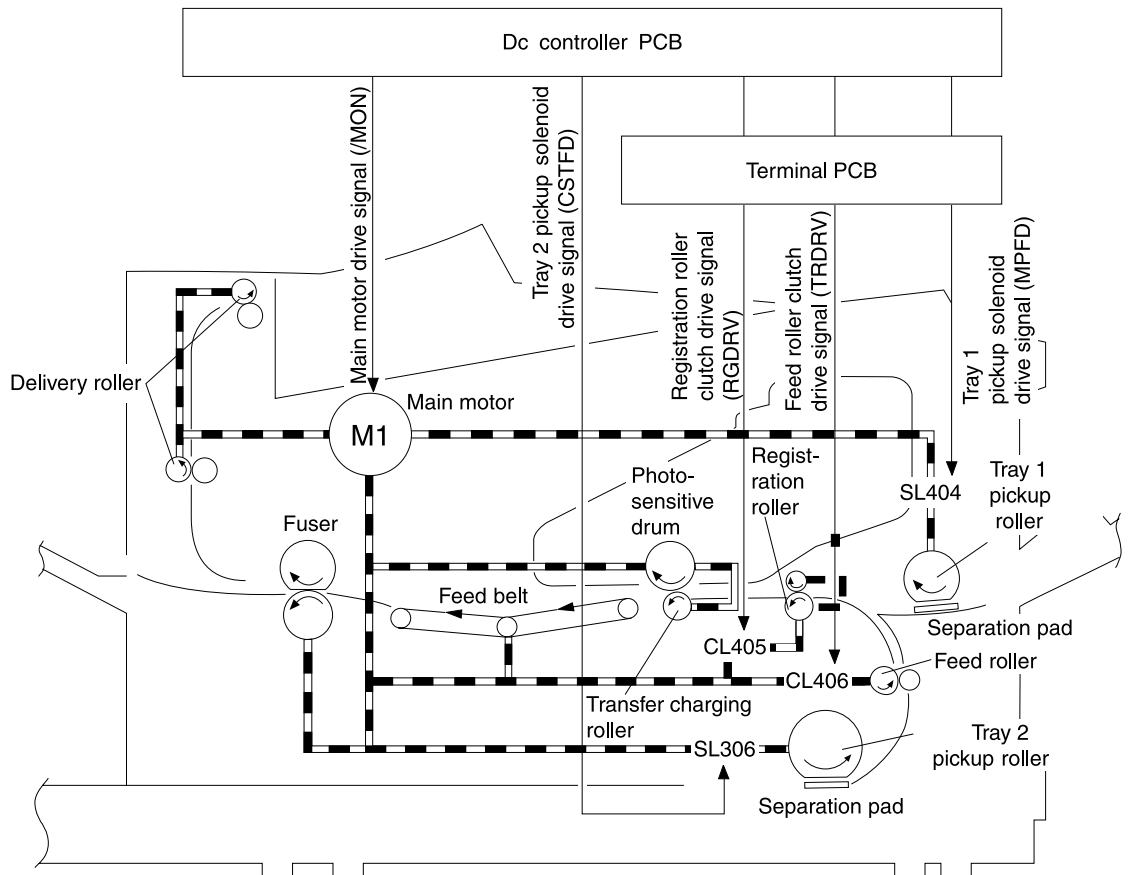
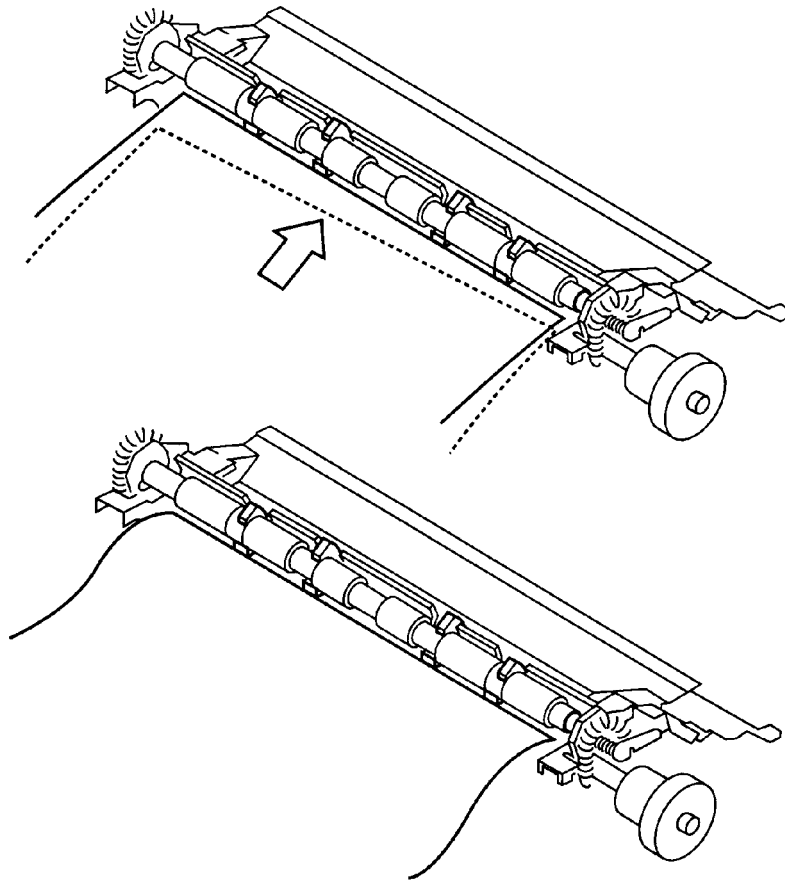


Figure 26.

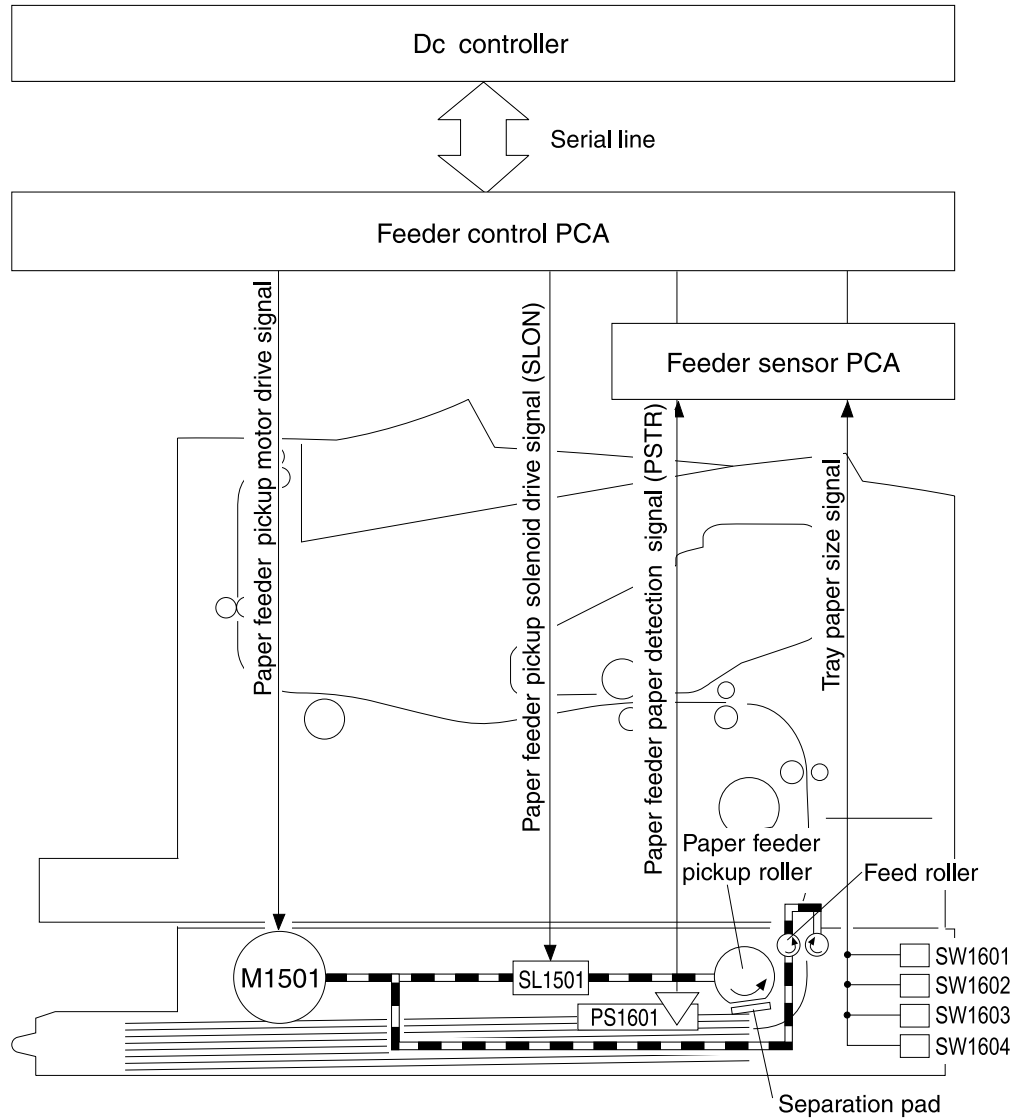
Tray 2 Paper path



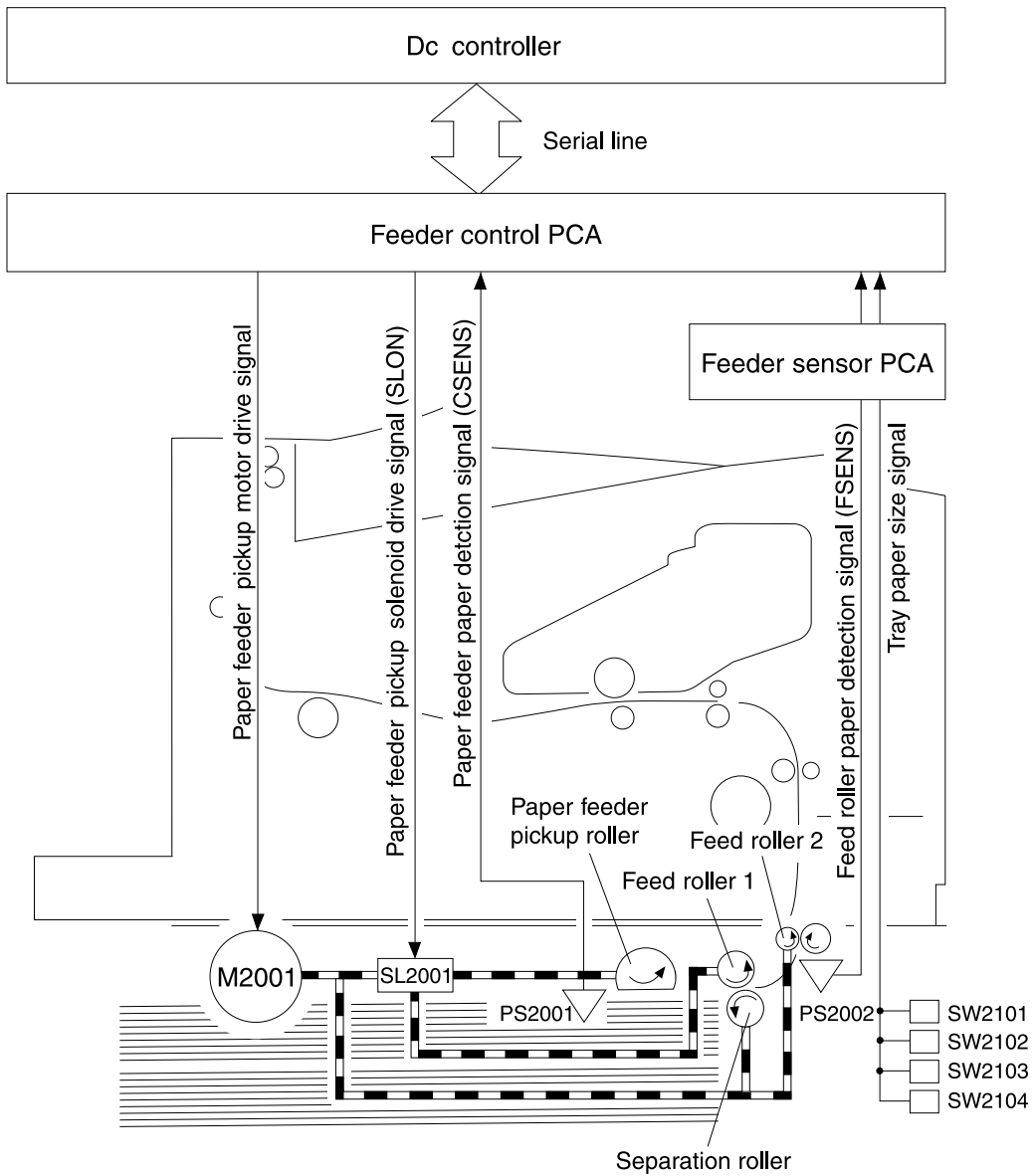
**Figure 27.** Paper skew correction

## Printing from the optional 500-sheet and 250-sheet Trays

There are two kinds of paper feeders: 250-sheet and 500-sheet. The paper feeder operation sequence is controlled by the feeder control PCA. The feeder control PCA has an 8-bit microcomputer, and controls the serial communications between the feeder(s) and the dc controller PCA of the printer. The feeder control PCA drives motors and solenoids with various commands from the dc controller PCA. The feeder control PCA sends the status of the paper feeder back to the printer at the same time.



**Figure 28.** 250-sheet paper feeder



**Figure 29.** 500-sheet paper feeder

## Paper jam

To detect the presence of paper and whether the paper has been correctly fed, the following paper sensors are installed:

- Registration roller paper sensor (PS403)
- Top of page sensor (PS402)
- Fuser paper delivery sensor (PS1306)

If the paper does not reach or pass through any of the sensors within the specified period of time, the microprocessor (CPU) on the dc controller PCA notifies the formatter of a 13.x paper jam.

# Duplexer

This function is to reverse the one side printed paper from the printer and refeed it into the printer.

The duplexer operation sequence is controlled by the duplexing driver PCA. The duplexing driver PCA has an 8-bit microcomputer, which controls the serial communications between the duplexer and the dc controller PCA of the printer.

The duplexing driver PCA drives motors and solenoids with various commands from the dc controller PCA. The duplexing driver PCA also sends the status of the duplexer back to the printer.

## Reversing/refeed system

The paper is first fed into the duplexer with the duplex deflector in the printer. In the duplexer, the reversing roller switches the feeding direction of the paper. After the side registration guide adjusts the side registration, the paper is sent back into the printer with the feed and refeed rollers.

The reversing motor (PM1701), the side registration guide drive motor (PM1702), and the refeed motor are all stepping motors. They are controlled both in straight and reverse rotation by the microcomputer (CPU) on the duplexing driver PCA.

The reversing roller is driven by the reversing motor (PM1701). The feed and refeed rollers are driven by the refeed motor (PM1703).

The side registration guide is driven by the side registration guide drive motor (PM1702), and is adjusted according to the size of the paper.

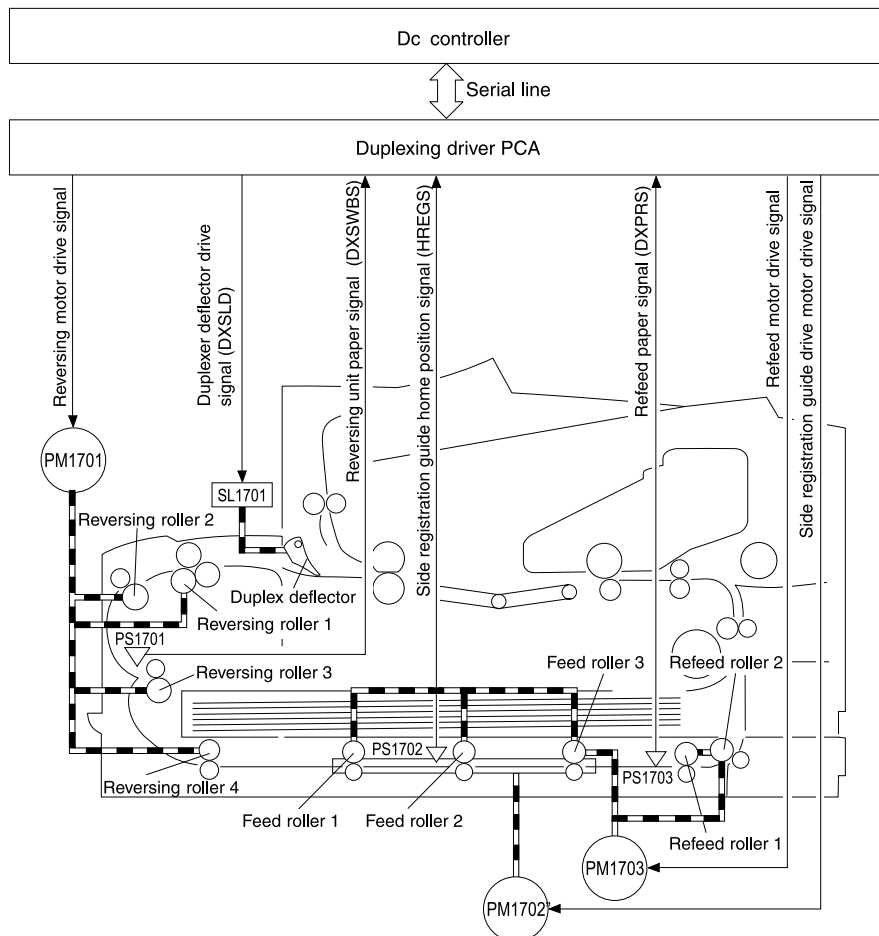


Figure 30. Paper feed for the duplexer



## Reversing system

The duplexing driver PCA receives the duplex admission command from the printer first. It turns on the duplexer deflector drive solenoid (SL1701), and the duplexer deflector in the printer then starts to send the paper into the duplexer. Within a specified period of time after receiving the command, the duplexing driver PCA also drives the reversing motor (PM1701) to turn the reversing rollers 1, 2, and 3 in the direction shown in figure 31.

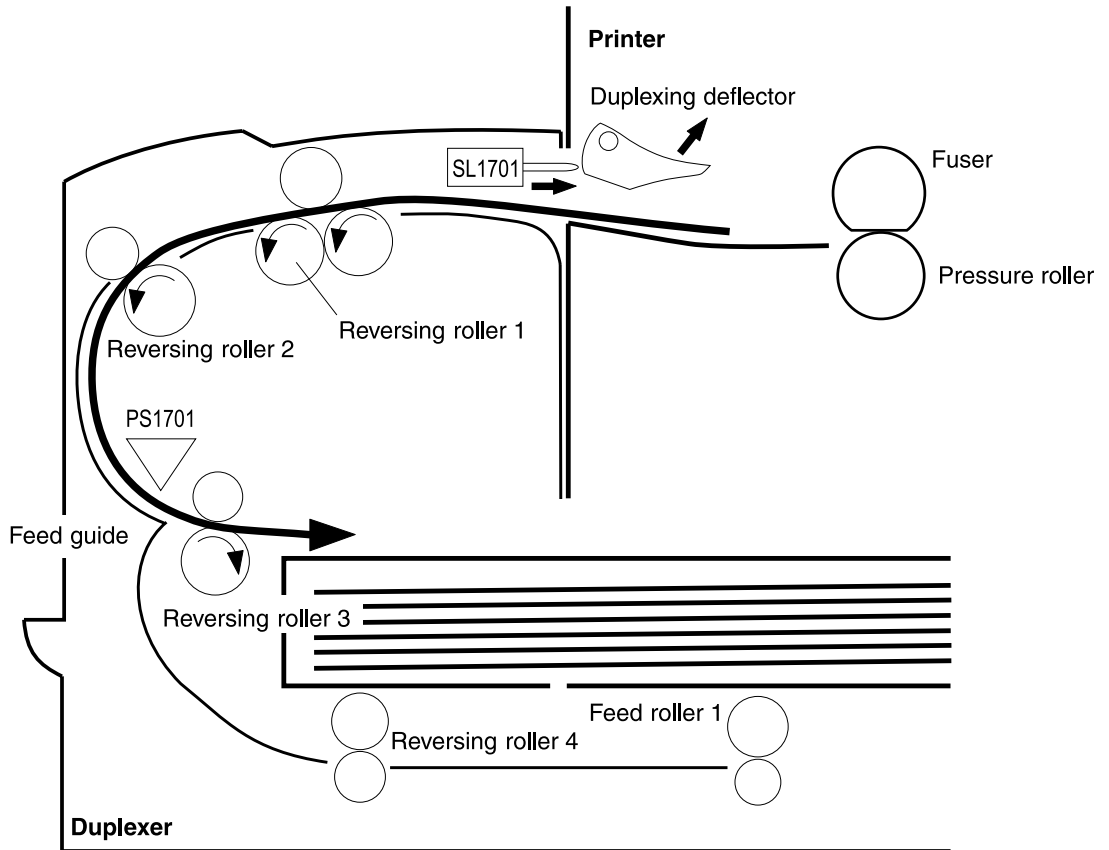


Figure 31.

## Duplexer

Within a specified period of time after the trailing edge of the paper is detected with the reversing unit paper sensor (PS1701), the duplexing driver PCA pauses the rotation of the reversing motor (PM1701). The duplexing driver PCA then switches the reversing motor (PM1701) to reverse rotation.

As the the leading edge of the paper is fed into the feed guide, it is fed through the reversing roller 4 and the feed roller 1 of the duplexer.

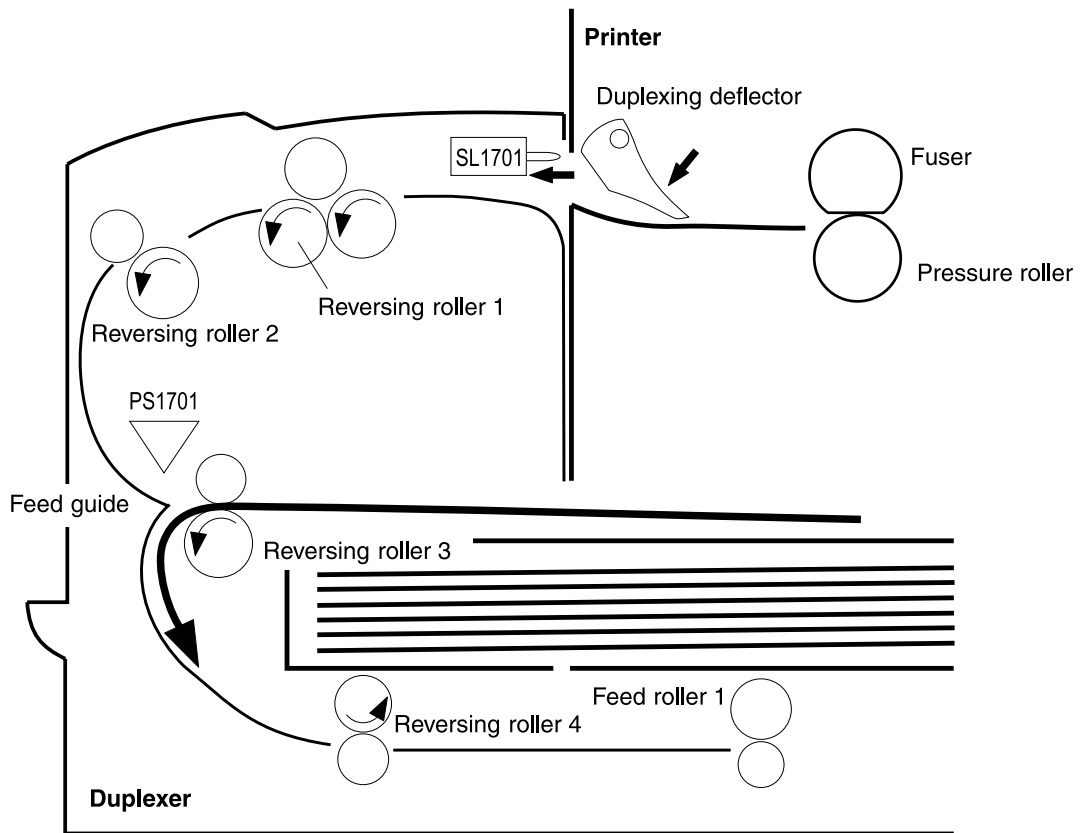


Figure 32.

## Duplexer

### Paper jam in the duplexer

The following sensors are located to detect the presence of paper and to determine whether the paper is correctly fed.

- reversing unit paper sensor (PS1701)
- refeed paper sensor (PS1703)

If the paper does not reach or pass through any of the sensors within the specified period of time, the microprocessor (CPU) on the dc controller PCA notifies the formatter of a 13.x paper jam.

## Basic sequence of operation

The formatter PCA and the dc controller board share information over a serial data bus. This allows printer status, command, and dot-image data to be passed between the two PCAs. Table 27 shows the general timing of the printer events. The following events take place during normal printer operation:

**Table 27. Basic sequence of operation**

Period	Timing	Purpose	Remark
WAIT	From power on until the main motor completes the initial drive.	Clears the drum surface potential and cleans the transfer charging roller.	During this period, the printer detects the toner level and the presence of the cartridge.
STBY (standby)	From the end of the WAIT period until the /PRNT signal is input from the formatter, or from the end of the LSTR period until the /PRNT signal is input from the formatter or until the power is turned off.	Makes the printer ready to print.	
INTR (initial rotation)	After the /PRNT signal is input from the formatter until the dc controller outputs the /TOP signal.	Stabilizes the sensitivity of the photosensitive drum in preparation for printing, and cleans the transfer charging roller to stabilize the transfer high voltage.	
PRINT	From the end of the INTR period until the top of the paper sensor detects the trailing edge of the paper.	Forms an image on the photosensitive drum according to the /VDO and VDO signals input from the formatter, and transfers the image to paper.	During this period, the printer detects the remaining toner.
LSTR (last rotations)	After the primary dc voltage turns off until the main motor stops.	Delivers the final page and cleans the transfer charging roller.	As soon as the /PRNT signal is input from the formatter PCA, the printer enters the INTR period.

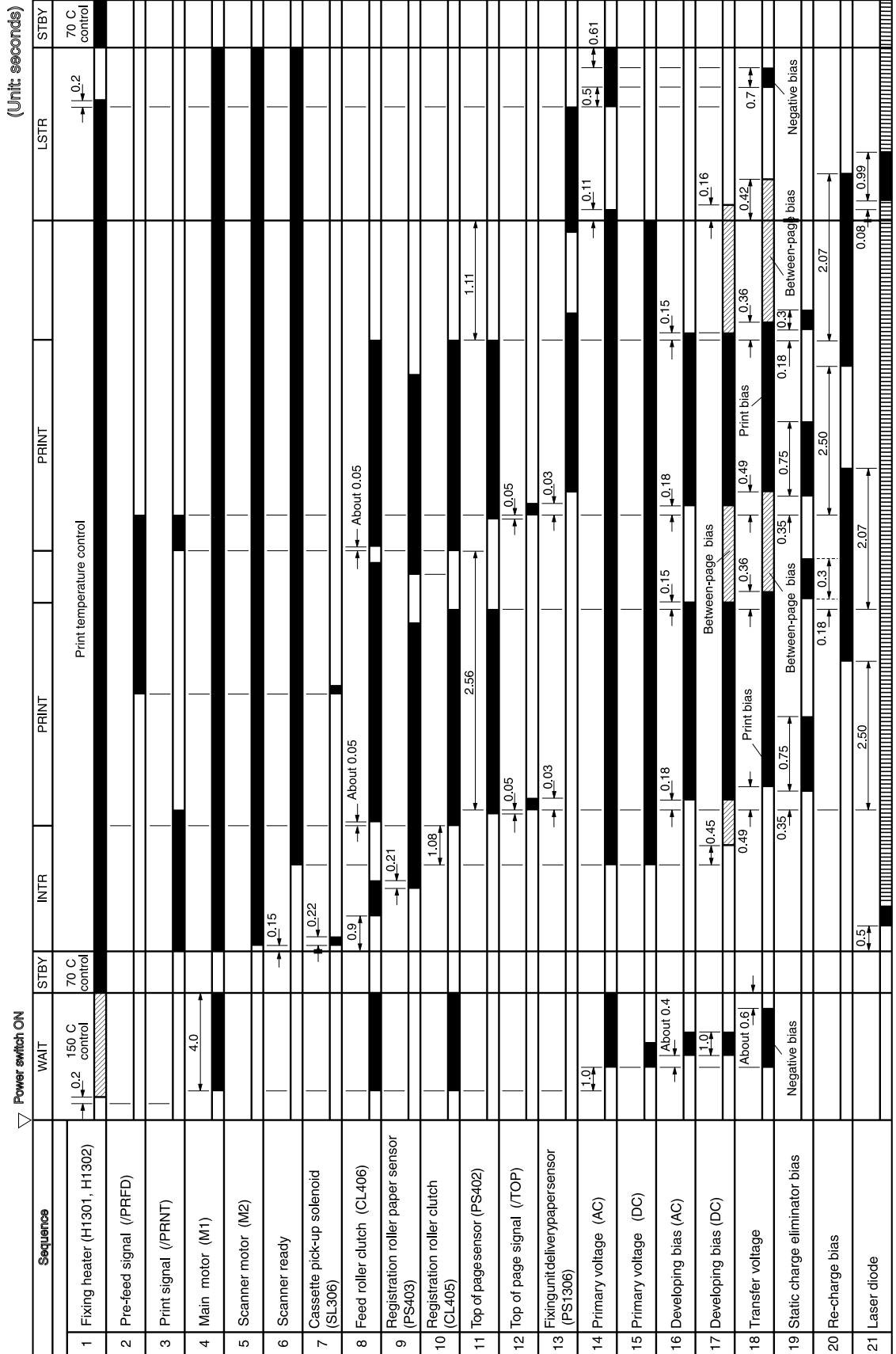


Figure 33. Timing diagram, two consecutive prints on A4 paper (600 dpi, face-down tray delivery)

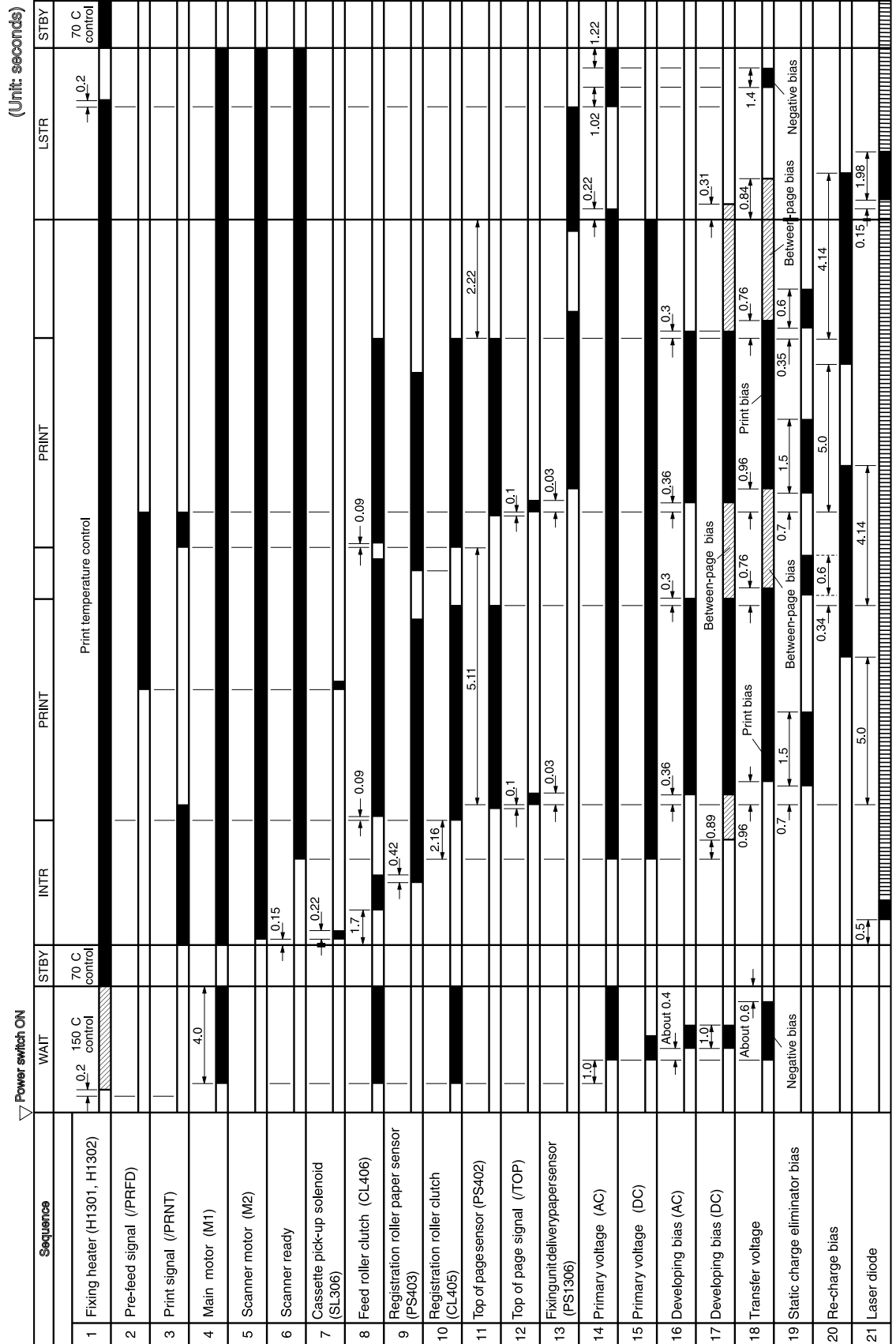


Figure 34.

Timing diagram, two consecutive prints on A4 paper (1200 dpi, face-down tray delivery)



# 6

## Removing and replacing parts

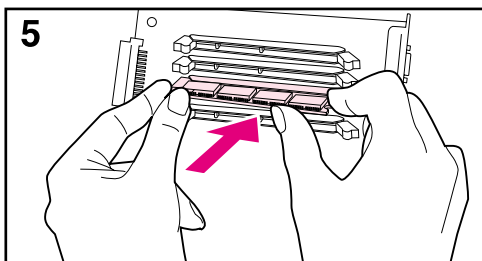
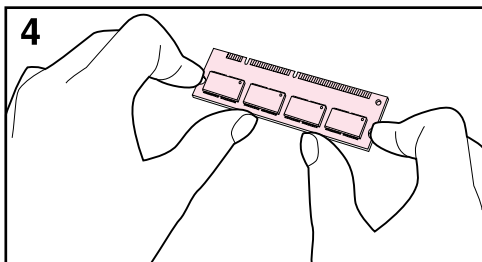
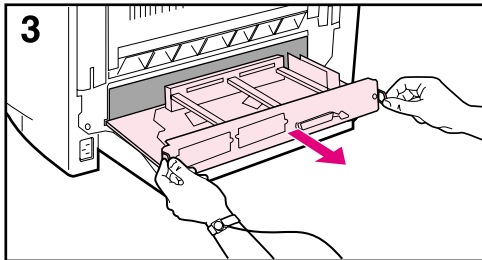
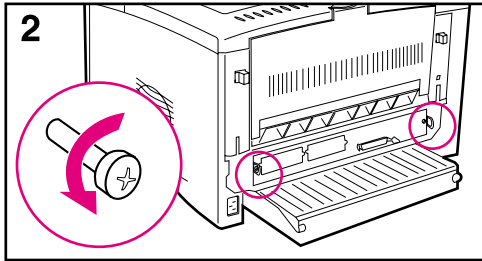
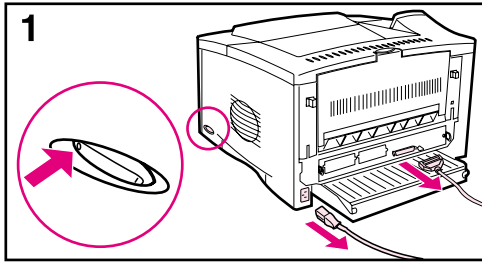
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## User-installable accessories



The user can purchase and install accessories that expand or enhance the printer's capabilities.

### Memory upgrade

#### CAUTION

Static electricity can damage the dual inline memory modules (DIMMs). When you handle DIMMs, take either of the following actions:

wear an antistatic wrist strap

-Or-

frequently touch the surface of the DIMM's antistatic package and then touch bare metal on the printer.

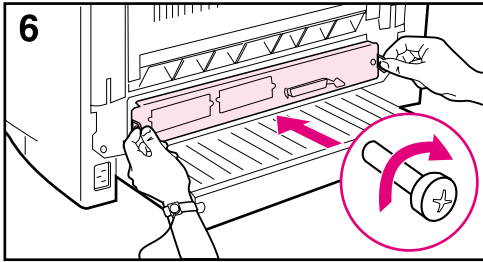
If you have not already done so, print a configuration page to find out how much memory is installed in the printer before you add more memory.

- 1 Turn the printer off. Unplug the power cord and disconnect any cables.

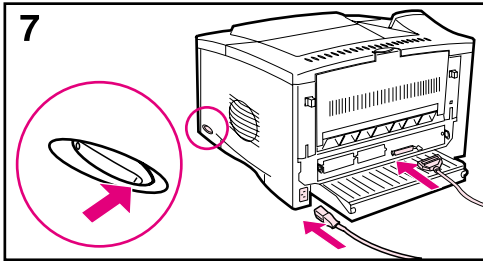
#### Note

If an optional duplexer is installed, you will first need to remove the rear section and the cable tray (see "If an optional duplexer is installed:" on page 108).

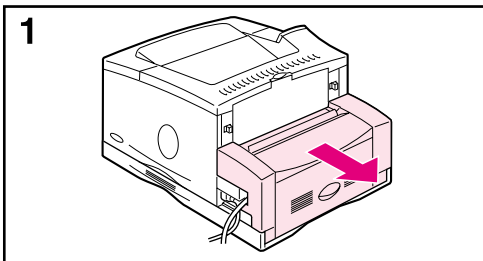
- 2 Loosen the two captive screws on the back of the printer.
- 3 Grasp the screws and pull the formatter board out of the printer. Place the board on a flat, nonconductive surface.
- 4 Remove the DIMM from the antistatic package. Hold the DIMM with your fingers against the side edges and your thumbs against the back edge.
- 5 Align the notches on the DIMM with the DIMM slot. (Make sure that the locks on each side of the DIMM slot are open, or outward.) Press the DIMM straight into the slot (press firmly). Make sure the locks on each side of the DIMM snap inward into place. (To remove a DIMM, the locks must be open.)



**6** Slide the formatter board back into the printer and tighten the two captive screws.

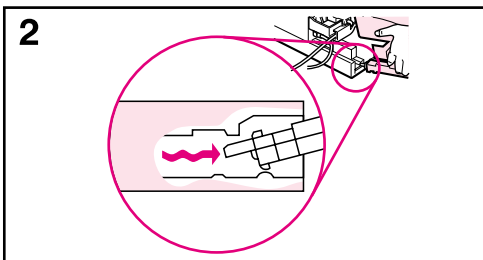


**7** If an optional duplexer is installed, reattach the cable tray and the rear section of the duplexer. Reattach any interface cables and the power cord. Turn the printer on and test the DIMM (see page 109).

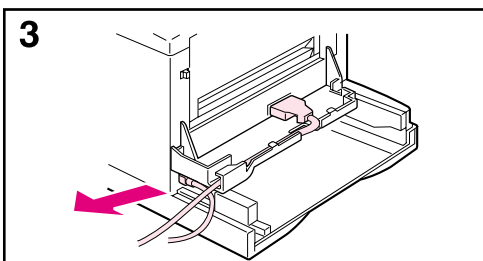


**If an optional duplexer is installed:**

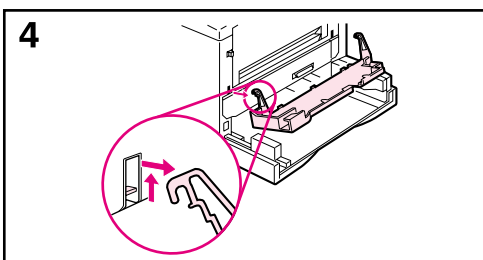
**1** Slide the rear section of the duplexer away from the printer.



**2** Remove the rear section of the duplexer by lifting and rotating the rear section to clear all of the tabs from the grooves.



**3** Unplug the power cord and disconnect any cables.



**4** Remove the cable tray by lifting it out of position.

**5** Go back to step 2 on page 107.

**Note**

Reverse these steps to reinstall the cable tray and the rear section of the duplexer. Make sure that the cable tray is properly installed and the cables are routed through the left side.

## Checking memory installation

Follow this procedure to verify that the DIMMs are installed correctly:

- 1 Check that the printer control panel shows the **READY** message when the printer is turned on. If an error message appears, a DIMM might have been incorrectly installed. Check the printer messages.
- 2 Print a new configuration page.
- 3 Check the memory section on the configuration page and compare it to the configuration page that you printed before the DIMM installation. If the amount of memory has not increased, the DIMM might not be installed correctly. Repeat the installation procedure to verify that the DIMM has been installed correctly. If the amount of memory has not increased after this reinstallation attempt, install a new DIMM to discover whether the first DIMM is defective.

---

### Note

If you installed a printer language (personality), check the Installed Personalities and Options section on the configuration page. This section should include the new printer language.

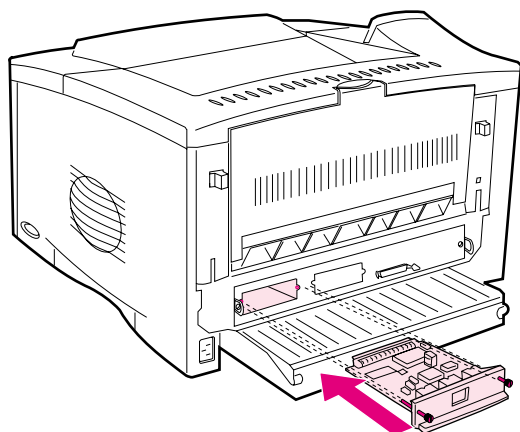
## Installing EIO cards or mass-storage devices

**Note** EIO accessories are not available for the HP LaserJet 5100Le printer.

Turn off the printer before installing the EIO card or the mass-storage device.

See figure 35 for the orientation and location of the EIO card or optional mass-storage device, such as a hard disk.

Use HP Jetdirect to delete files from a mass-storage device. For more information, see the printer software help.



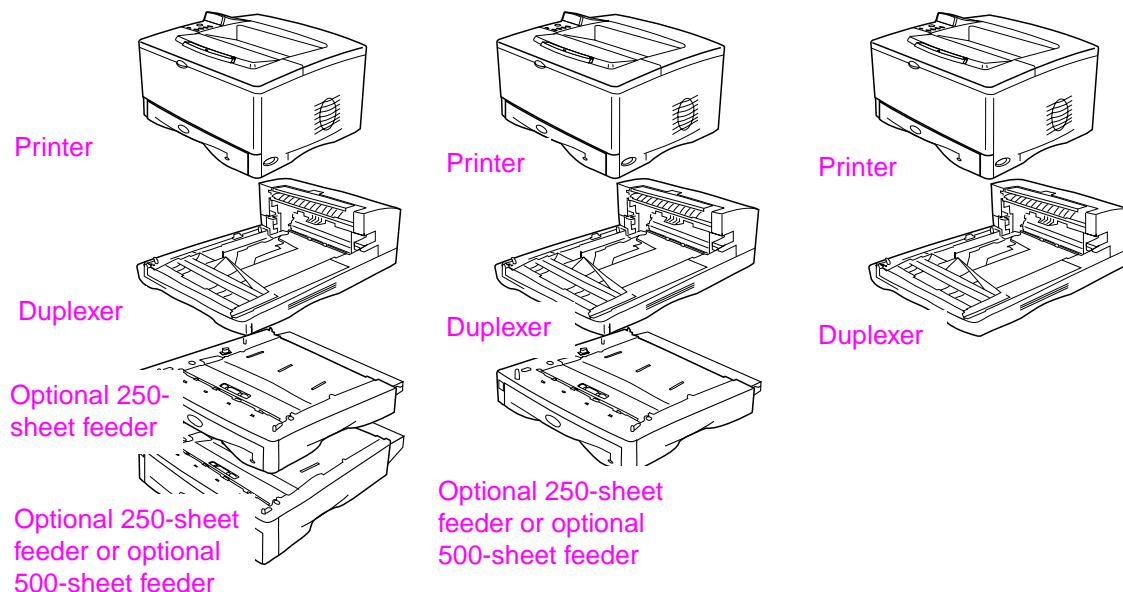
**Figure 35.** Installing EIO cards or mass-storage devices

## Paper-handling accessories

**Note** Paper-handling accessories are not available for the HP LaserJet 5100Le printer.

For the initial installation of accessories, see the documentation that comes with each accessory.

Place the duplexer on top of any optional trays, and then place the printer on top of the duplexer. Installation configurations are shown in figure 36.



**Figure 36.** Paper-handling accessories configurations

## Before you begin

Before you begin to service the printer, complete the following steps:

- 1 Turn off the printer.
- 2 Unplug the power cord from the power outlet.

### WARNING!

Severe injury can result if you attempt to service the printer while it is plugged into a power outlet.

- 3 Remove all paper-handling accessories (such as an optional duplexer and any optional trays) and interface cables from the printer.
- 4 Remove the toner cartridge and store it in a dark location. The toner cartridge should not be exposed to light for more than a few minutes.

### WARNING!

To avoid possible burns from the fuser, turn off the printer to allow the fuser to cool for 30 minutes before removing it from the printer.

This printer has some sharp, sheet-metal edges that can cause injury. Avoid contact with the edges. Also, you might want to remove jewelry that might snag on parts inside the printer.

## Replacing printer parts

Replacement is generally the reverse of removal. Occasionally, information is included that provides direction for difficult or critical replacement procedures.

All references to the right and left are assumed to be relative to the front of the printer, as you face the front of the printer, unless otherwise specified.

### CAUTION

The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service printers at ESD-protected workstations.

### Note

To install a self-tapping screw, first turn it counterclockwise until it clicks, indicating that the threads are seated. Then, turn it clockwise to tighten it. **Do not over-tighten the screw.** If a self-tapping screw-hole becomes stripped, then repair of the screw-hole or replacement of the affected assembly is required.

## Removing loose toner

Loose toner might be present inside the printer, on printer parts, or on the toner cartridge. If toner gets on your clothing, wipe it off with a dry cloth and wash the clothing in cold water.

### CAUTION

Hot water sets toner into fabric.

## Required tools

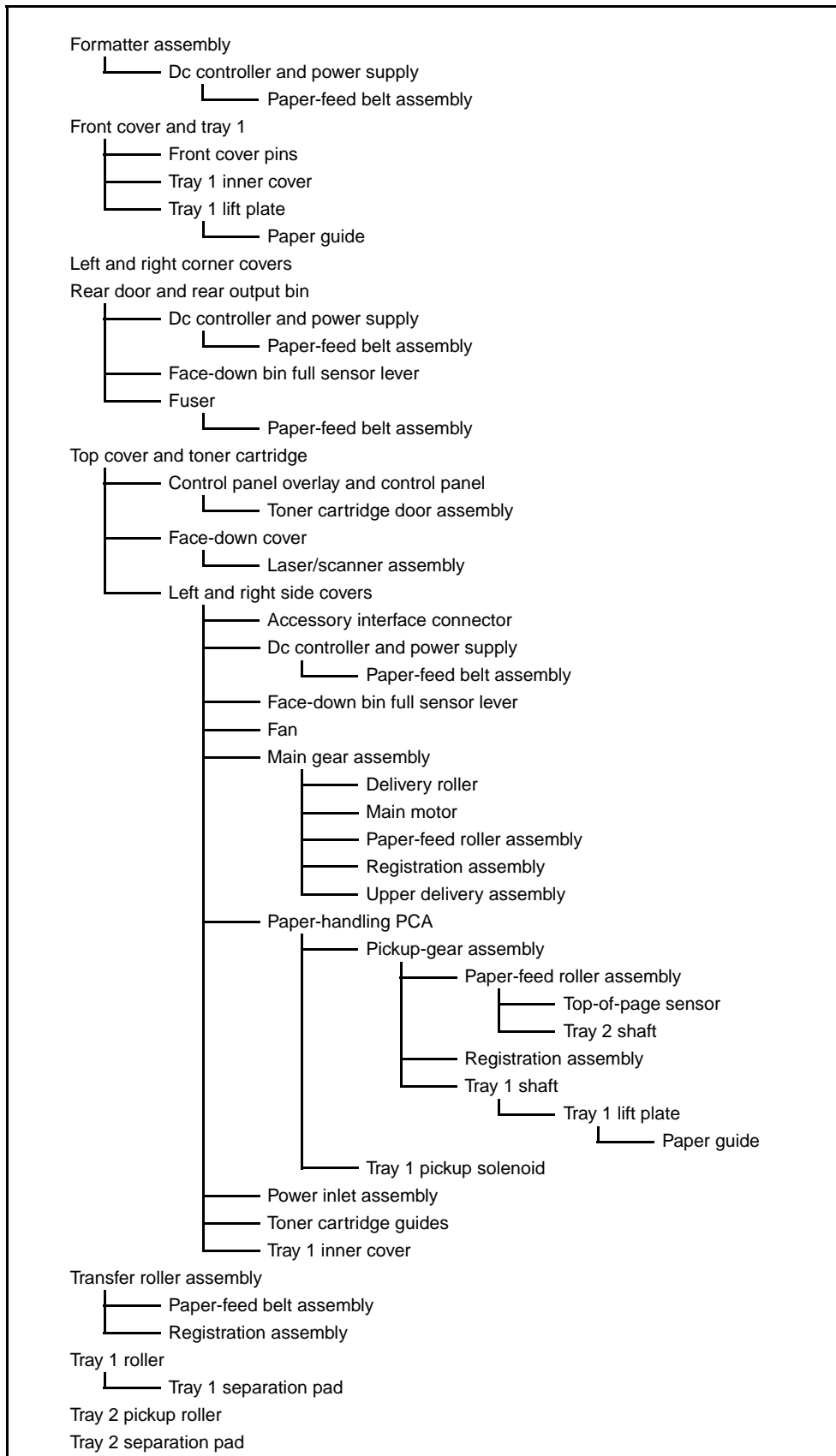
- A Phillips #2 magnetized screwdriver (with a 6-inch shaft)
- A small, flat-blade screwdriver
- A small, needle-nosed pliers

### CAUTION

All screws used in field-replaceable printer components are Phillips-head screws that require a #2-size Phillips screwdriver. Using a Pozi-Driv screwdriver can damage screw-heads.

## Parts removal order

Use the following diagram to determine which parts must be removed before removing other parts:



## Covers

### Rear door and rear output bin

- 1 Face the rear of the printer. Press the two locking tabs (callout 1) toward the center of the printer to release the rear door.

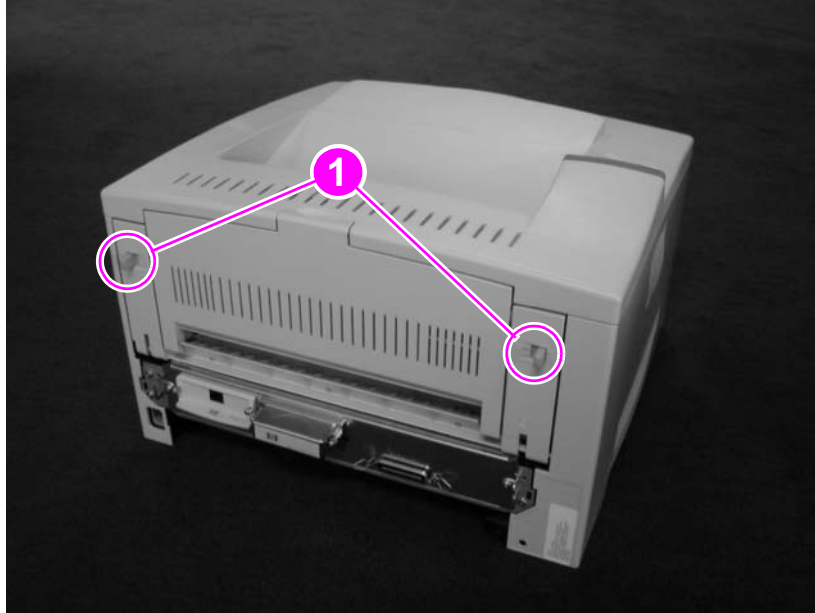


Figure 37.

#### Rear door and rear output bin removal (1 of 2)

- 2 The plastic support strap is located on the left side of the printer. To release the strap, pinch the top of the strap by placing your index finger underneath the strap and your thumb on top of the tab. Squeeze and lift up from the bottom, while pulling the strap out.

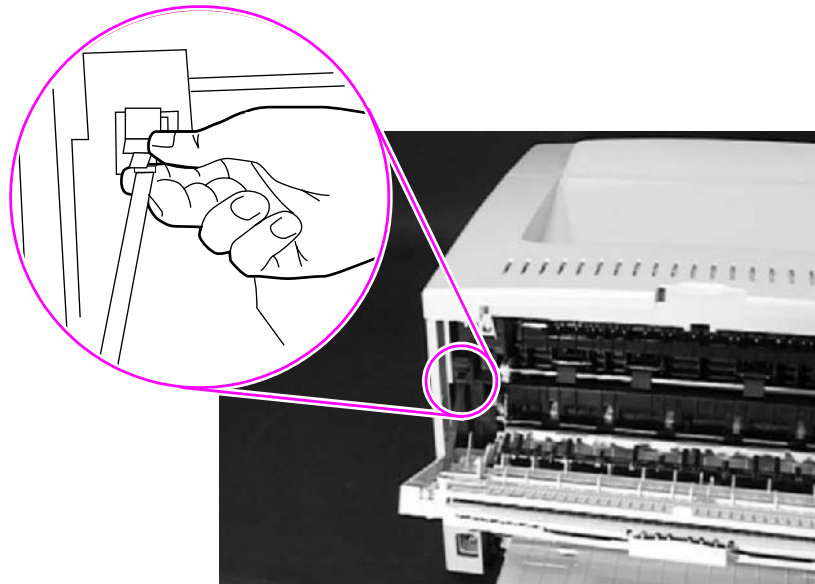


Figure 38.

#### Rear door and rear output bin removal (2 of 2)

- 3 Slide the door to the left, and then remove it from the printer.

#### Note

For reassembly, insert the pin on the left side of the cover first.

## Fuser

- 1 Remove the rear door and rear output bin (see page 113).
- 2 Facing the back of the printer, remove the two machine screws (callout 1) that hold the fuser in the chassis.
- 3 Insert a small, flat-blade screwdriver under the fuser (at callout 2), and lift to disengage the fuser assembly detents.
- 4 Grasp the green pressure-release handles (callout 3) and pull the fuser out of the chassis.

---

### Note

The fuser power connection is on the left side of the assembly.

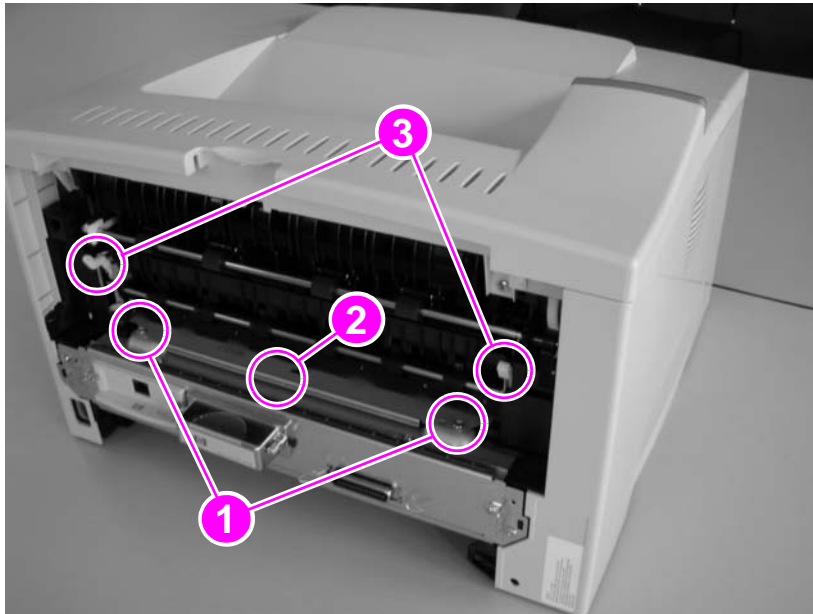


Figure 39.

Fuser removal (rear view of printer)



## Top cover

Facing the front of the printer, open the top cover and remove the toner cartridge.

### CAUTION

To prevent damage to the toner cartridge, do not expose it to light for more than a few minutes.

- 1 Release the toner cartridge engagement arm from the inside of the top cover. The shaft of the engagement arm fits through a molded plastic ring on the left side of the top cover. Gently squeeze the locking tabs on the end of the shaft, and slide the shaft through the ring.

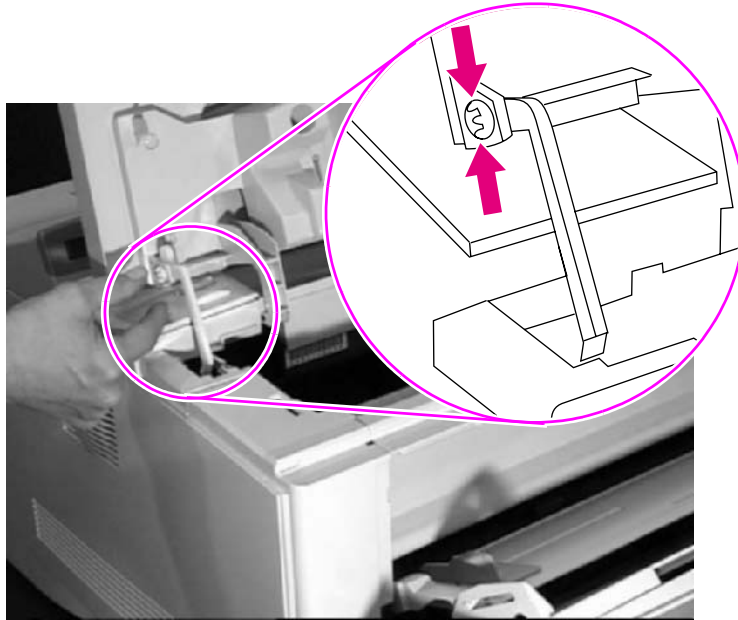


Figure 40.

Top cover removal (1 of 3)

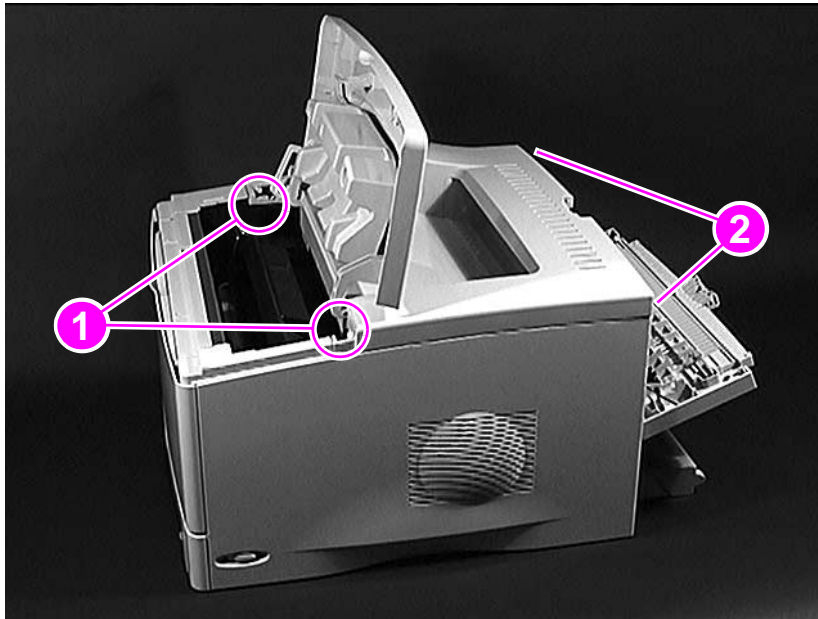
### CAUTION

It is critical that you perform step 1 before you attempt to remove the top cover. If you damage the arm, the printer will not operate.

- 2 Remove two self-tapping screws on the top of the chassis (callout 1).
- 3 Remove the two self-tapping screws on the top portion of the back of the printer (callout 2).

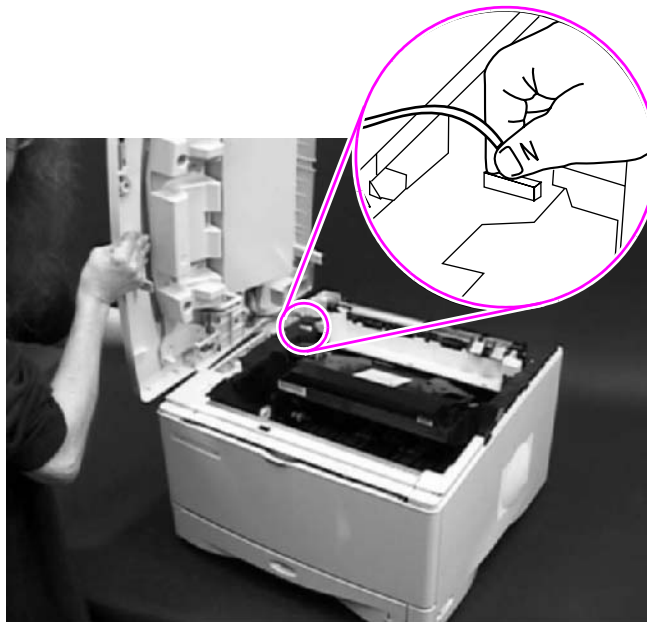
**Note**

The rear cover needs to be opened or removed before you can gain access to the screws.



**Figure 41.** Top cover removal (2 of 3)

- 4 The cable that connects the control panel to the printer chassis is on the left side of the top cover. Tilt the cover to the left as you lift it. Be careful not to stress the cable as you loosen the cover.
- 5 Disconnect the control panel cable from the printer chassis by grasping the wires and gently pulling the connector straight up.

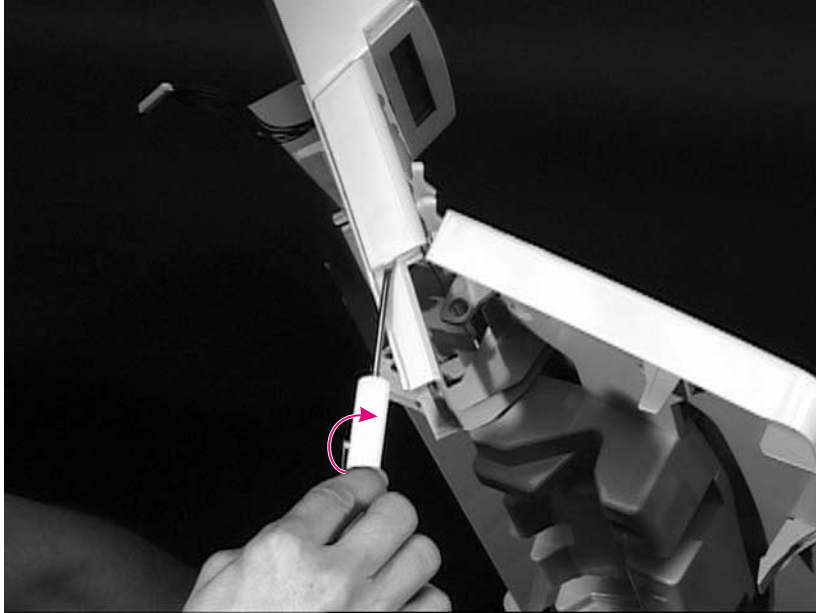


**Figure 42.** Top cover removal (3 of 3)

- 6 Remove the top cover.

## Control panel overlay and control panel

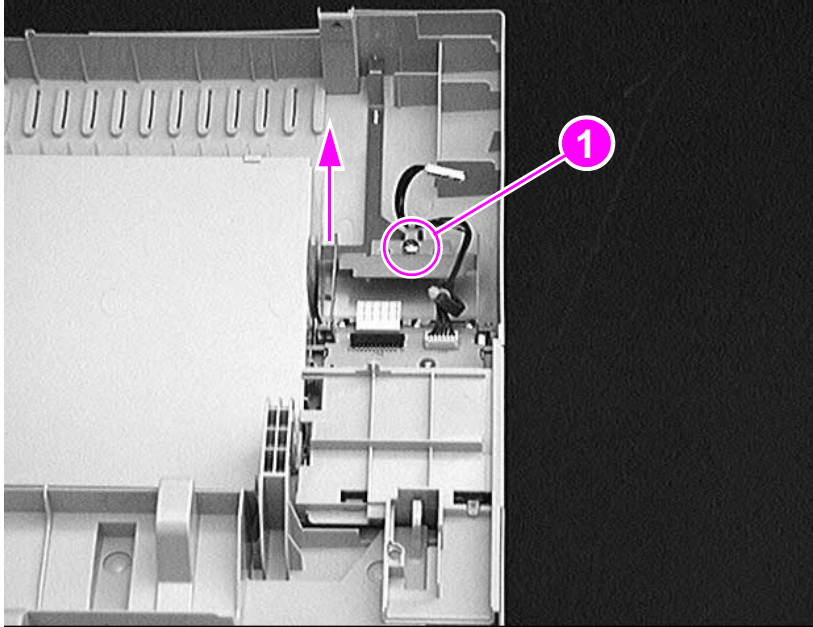
- 1 Remove the top cover (see page 115).
- 2 The control panel overlay is held in place on the top cover by two tabs on each side. Slide a small flat-blade screwdriver along the outside edge of the control panel overlay to disengage the two tabs on the outside of the cover.
- 3 Lift the overlay off of the control panel.



**Figure 43.**

**Control panel overlay removal**

- 4 Remove the single self-tapping screw (callout 1) that holds the control panel to the underside of the top cover.



**Figure 44.**

**Control panel removal**

- 5 Lift up gently on the metal plate to free the control panel.
- 6 Grasp the control panel by its metal frame and remove it from the underside of the top cover.

## Toner cartridge door assembly

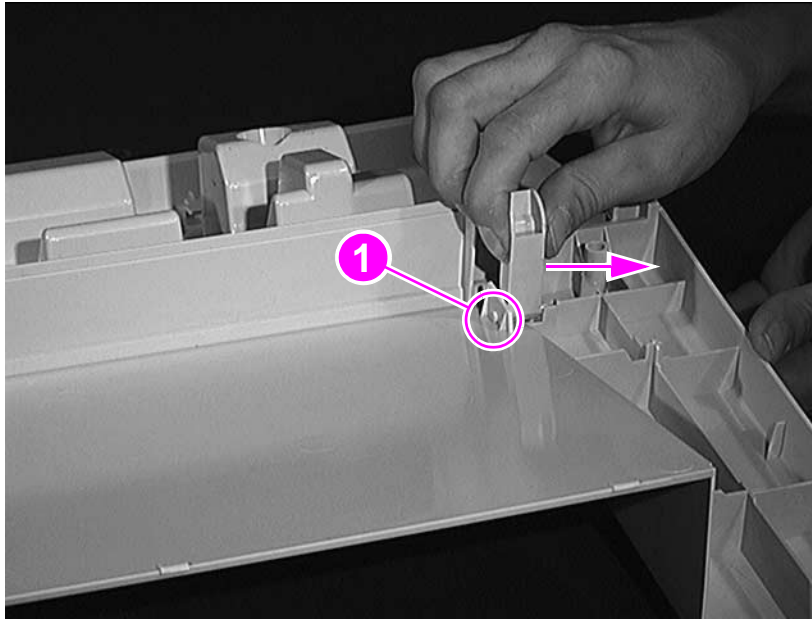
- 1 Remove the top cover (see page 115).
- 2 Remove the control panel from the top cover (see page 117).

---

### Note

The control panel must be removed before you can separate the toner cartridge door from the top cover.

- 3 Disengage the pins (callout 1) by pressing them outward.



**Figure 45.**

**Toner cartridge door assembly removal (underside of the top cover door)**

## Front cover and Tray 1

### Note

The front cover and the Tray 1 guide must be removed individually.

- 1 Open the front cover (callout 1).
- 2 Disengage the Tray 1 guide pins (callout 2) from inside the front cover by pushing the guides outward. The cover and Tray 1 will separate from each other.
- 3 Press the Tray 1 guide (callout 3) against the printer.

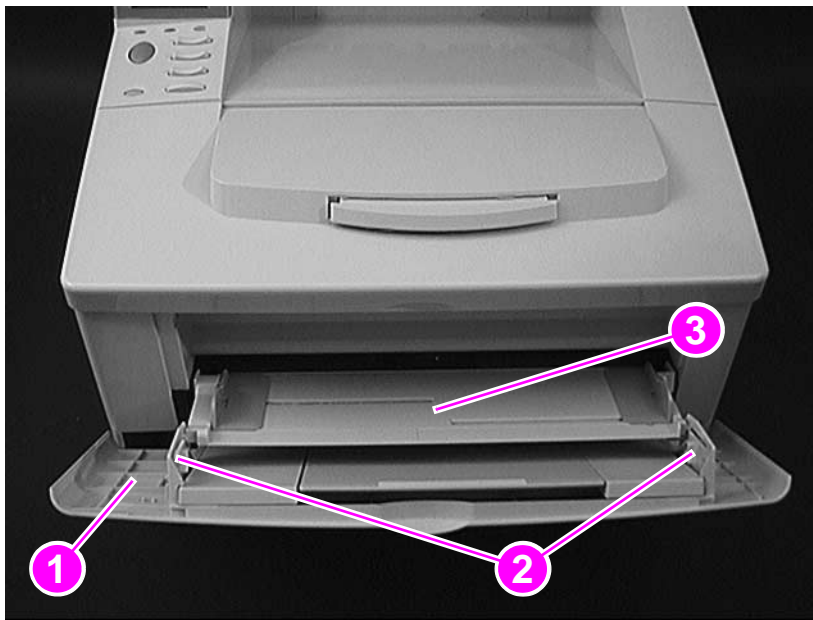


Figure 46.

### Front cover removal

- 4 Release the front cover, allowing it to pivot freely on its keyed pins. The cover will slide off the pins to the right at its lowest position.
- 5 Release the Tray 1 guide by allowing the guide to slide off the keyed pins at its lowest position.

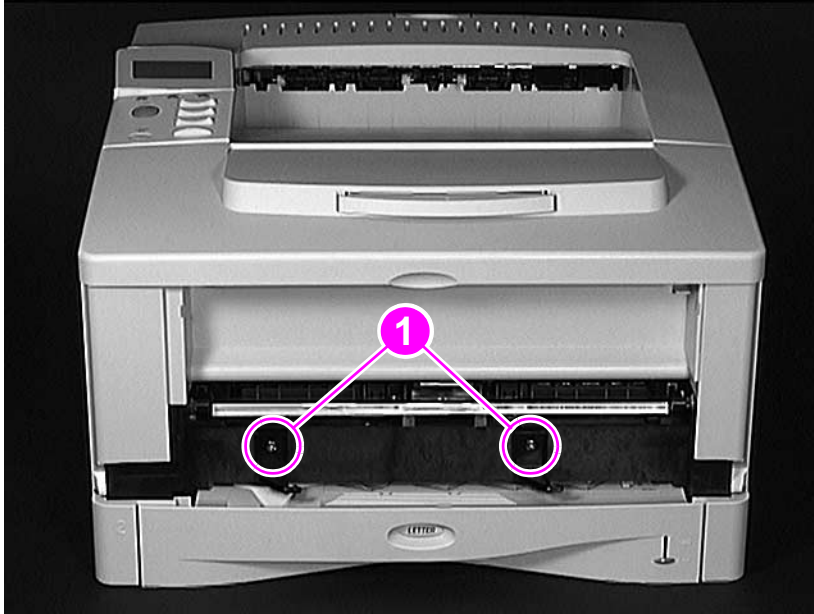


Figure 47.

### Tray 1 guide removal

## Front cover pins

- 1 Remove the front cover and Tray 1 (see page 120).
- 2 Remove two screws (callout 1) to free the front cover pins.



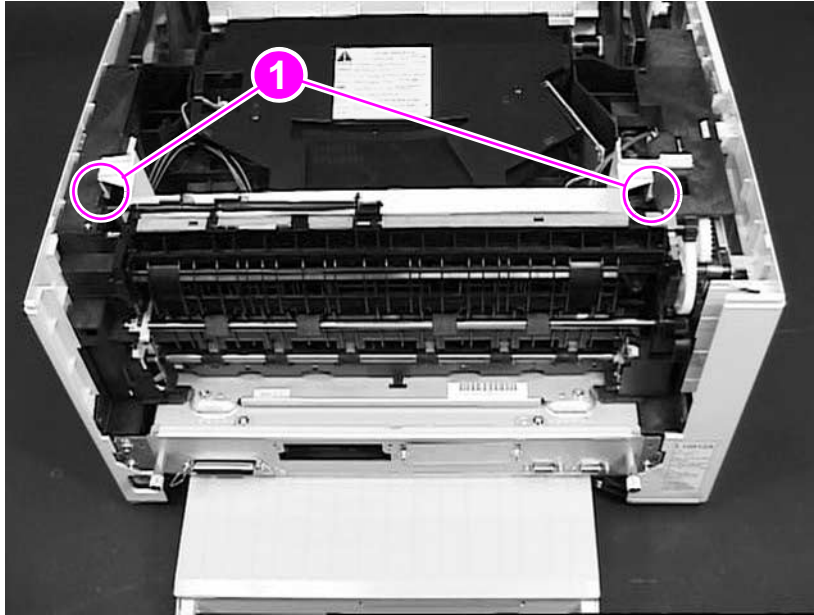
**Figure 48.**

**Front cover pins removal**



## Face-down cover

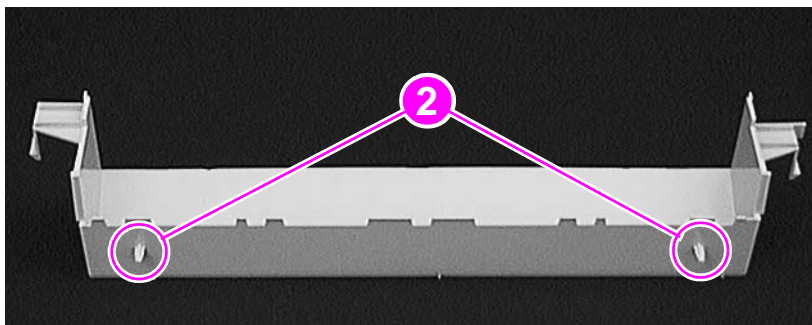
- 1 Remove the top cover (see page 115).
- 2 Face the back of the printer.
- 3 Squeeze the locking tabs (callout 1) inward, one side at a time, to release the face-down cover.



**Figure 49.** Face-down cover removal (1 of 2)

- 4 Grasp the cover (in the middle, approximately), and then lift it up to clear the laser/scanner, removing it with a rolling motion away from you.

**Note** Be careful not to break the two locator pins (callout 2) on the front of the assembly.



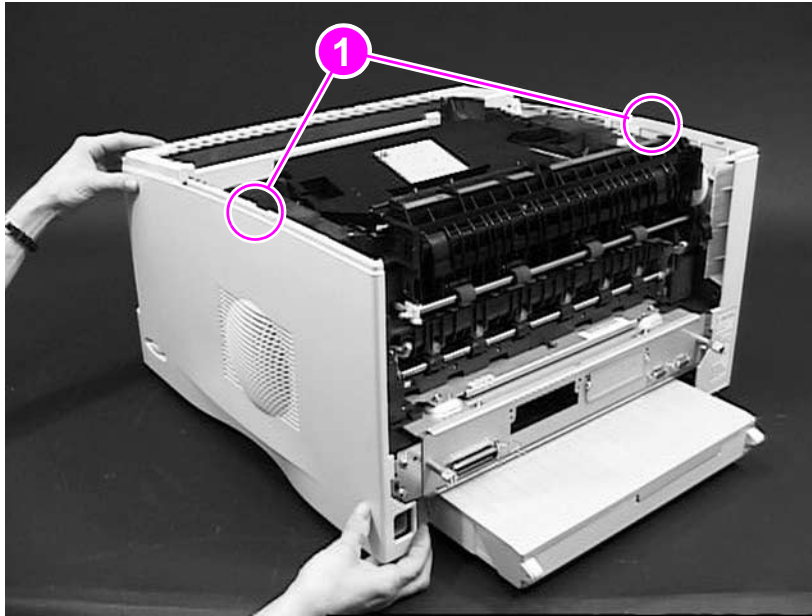
**Figure 50.** Face-down cover removal (2 of 2)



## Left and right side covers

The removal procedure is the same for both the left and the right side covers.

- 1 Remove the top cover (see page 115).
- 2 Locate the tab (callout 1) in the top, middle of the cover and release the tab by pushing down on it.
- 3 Grab the side cover at the top and pull it toward the front of the printer to release the tabs. With your other hand, grab the lower, back edge. Rock the cover gently until it comes loose, and remove the cover.
- 4 Repeat steps 1 through 3 for the other side cover.



**Figure 51.** Side covers removal

**Note** For reassembly, seat the tabs in the bottom of the side cover first. Then snap on the top of the cover.

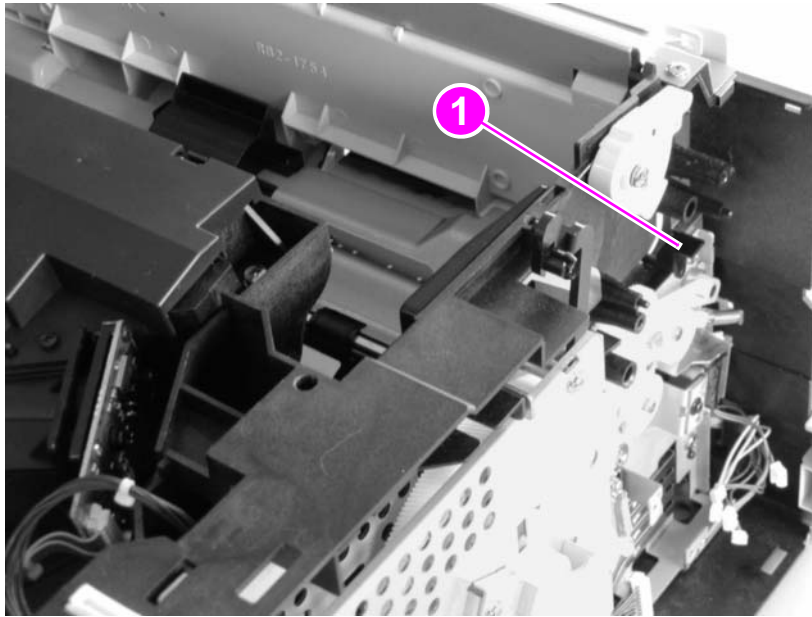
## Tray 1 inner cover

The Tray 1 inner cover is a plastic tray located at the top front of the printer. See figure 53.

- 1 Remove the top cover (see page 115), the front cover and Tray 1 (page 120), and the left and right side covers (page 123).

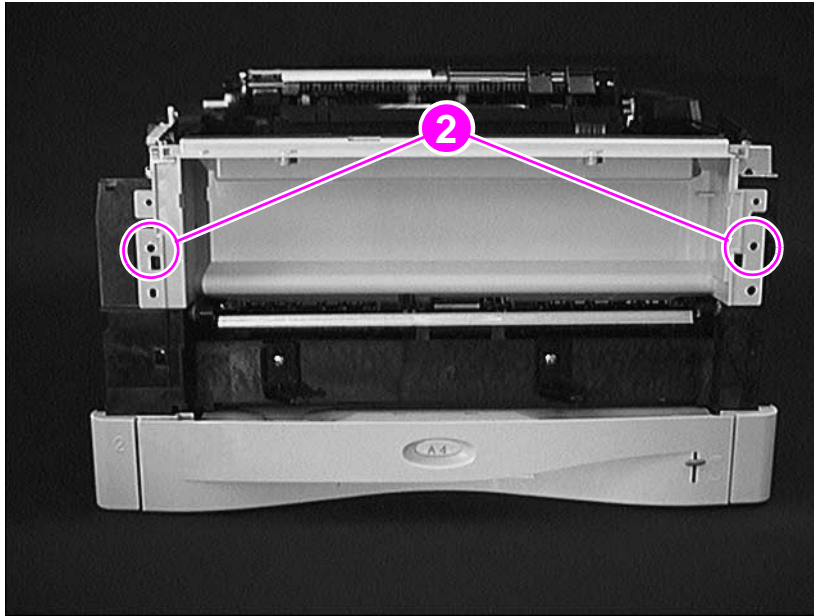
### CAUTION

Be sure to locate the paper-sensor flag on the left side of the cover before proceeding to step 3. The left end (callout 1) rests in a cutout in the left side of the chassis and is easily broken. In figure 52, the paper-handling PCA is removed to make identification of the left end of the paper sensor flag easier. The PCA does not have to be removed to remove the Tray 1 inner cover.



**Figure 52.** Tray 1 inner cover removal (1 of 2, inner cover flag)

- 2 Remove the two self-tapping screws (callout 2) that hold the cover to the front of the chassis.



**Figure 53.**

**Tray 1 inner cover removal (2 of 2, front of printer)**

- 3 Facing the front of the printer, slip the cover off of the locator pins by tilting it to the right and then sliding it off to the right, avoiding the paper sensor.

**Note**

An extension of the paper-sensor flag fits into a slot in the Tray 1 lift plate (see page 154). Orient the flag so that it aligns with both the slot and the cutout in the left side of the chassis.

## Right and left corner covers

Each cover is secured by one self-tapping screw (callout 1). Remove the screw, and then lift off the cover.

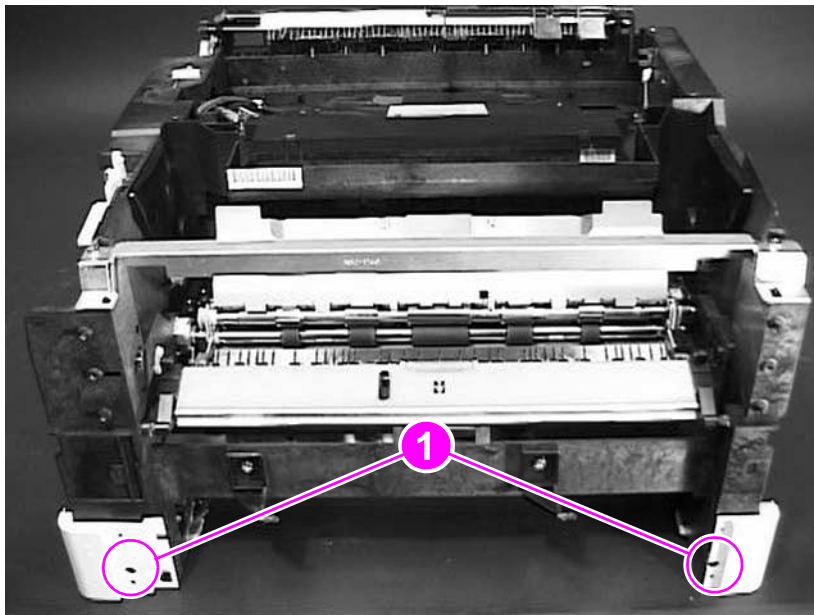


Figure 54.

Corner covers removal

## Internal assemblies

Internal assemblies are shown in figure 55. All references to the right and left are assumed to be relative to the front of the printer, unless otherwise specified.

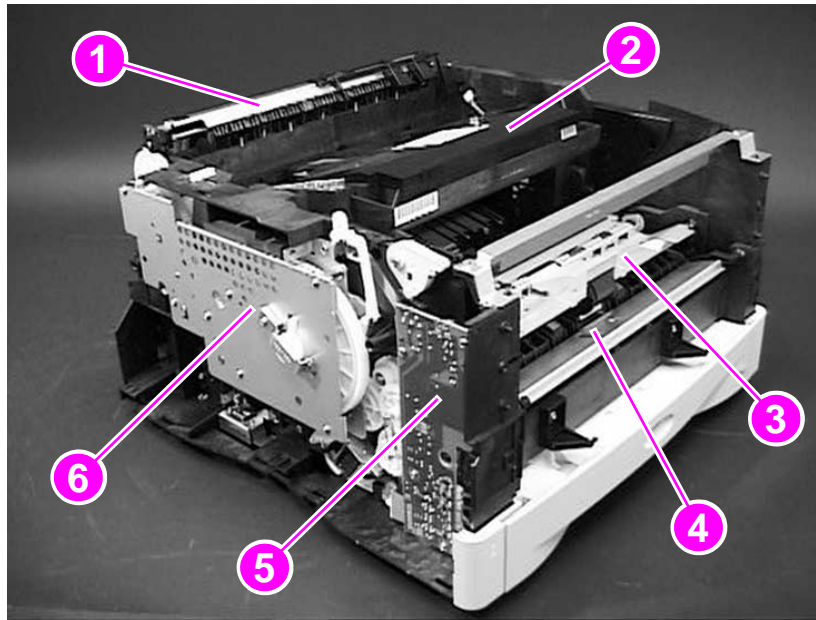


Figure 55.

Internal assemblies

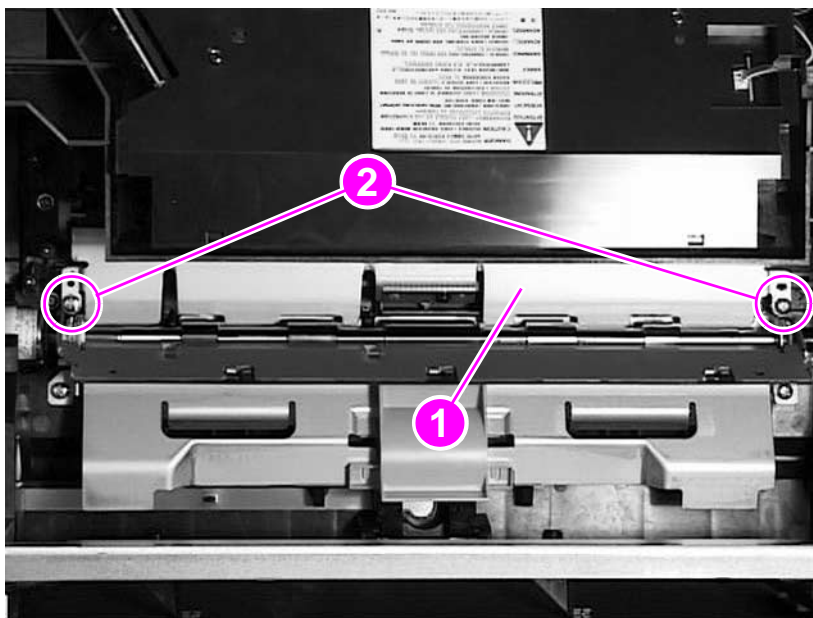
Item	Explanation
1	Upper delivery assembly
2	Laser/scanner
3	Registration assembly
4	Tray 1 paper-guide plate assembly
5	Paper-handling PCA
6	Main gear assembly

## Transfer-roller assembly

### CAUTION

Never touch the transfer roller with your fingers. Wear unpowdered latex gloves when you remove and replace the transfer roller. Roll the transfer roller into a clean sheet of paper to protect it after removal.

- 1 Face the front of the printer, open the top cover, and lift the small green handle on the right side of the registration assembly to expose the transfer guide (callout 1—the metal plate that rests against the transfer roller).
- 2 While holding the plate, remove the two self-tapping screws (callout 2) and then carefully lift out the transfer guide.

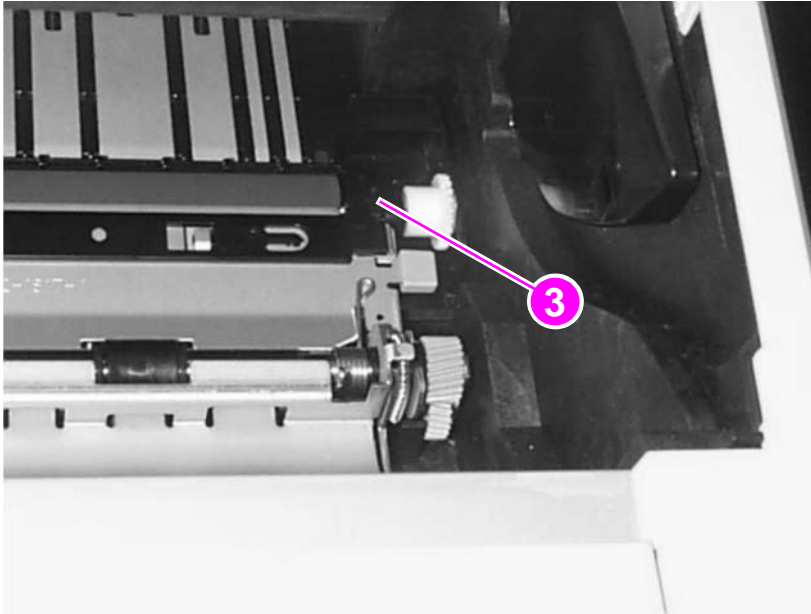


**Figure 56.** Transfer-roller assembly removal (1 of 3)

**Note**

The transfer roller is held on the right side by a hinged clip (callout 3; also see callout 4 in figure 59).

- 3 Use the needle-nosed pliers to lift the transfer roller straight up to free the transfer roller from the hinged clip.



**Figure 57.**

**Transfer-roller assembly removal (2 of 3)**

- 4 Free the left side of the transfer roller by lifting it straight up.
- 5 Remove the transfer roller, being careful not to touch the roller with your fingers.

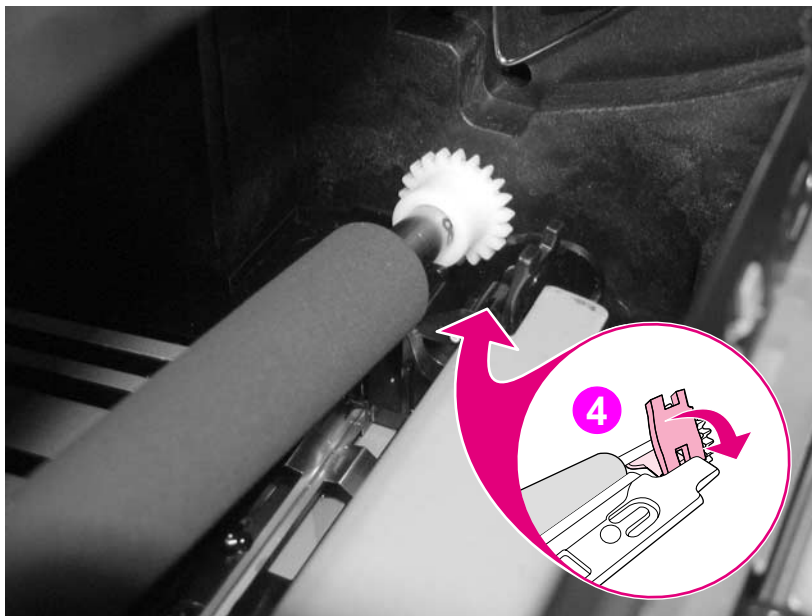


**Figure 58.**

**Transfer-roller assembly removal (3 of 3)**

## To reinstall

Before reinstalling the transfer roller, make sure that the hinged clip (callout 4) is up.



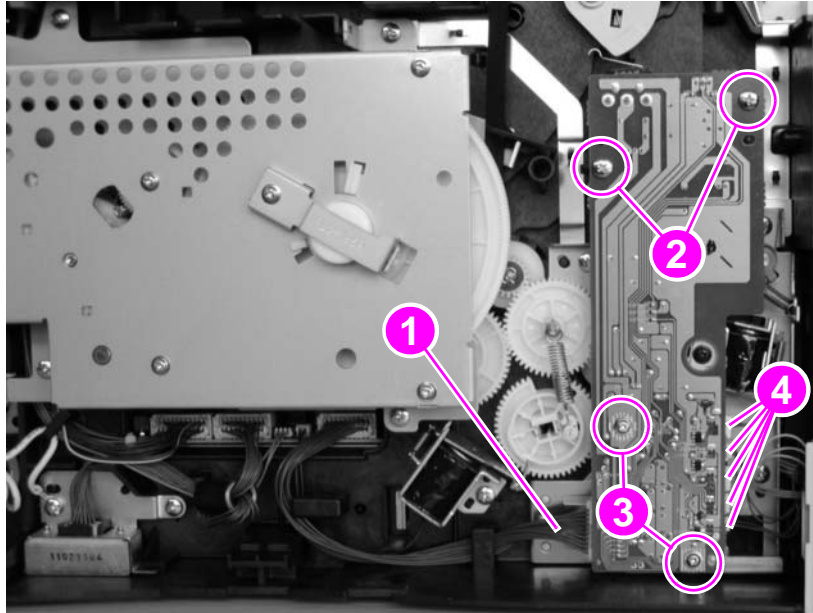
**Figure 59.**

**Reinstalling the transfer roller**



## Paper-handling PCA

- 1 Remove the top cover (see page 115) and the left side cover (page 123).
- 2 Facing the left side of the printer, disconnect the cable (callout 1) from the PCA.
- 3 Remove two self-tapping screws (callout 2) and two machine screws (callout 3) from the PCA.
- 4 Rotate the PCA outward, and disconnect the five cables (callout 4).



**Figure 60.** Paper-handling PCA removal

**Note** Readjust the top margin after you replace the paper-handling PCA (see page 132).

## Top margin adjustment

After replacing the paper-handling PCA, readjust the top margin. This adjustment is also necessary if the top margin of test prints that are made after laser/scanner or dc controller replacement is not 2.0 mm.

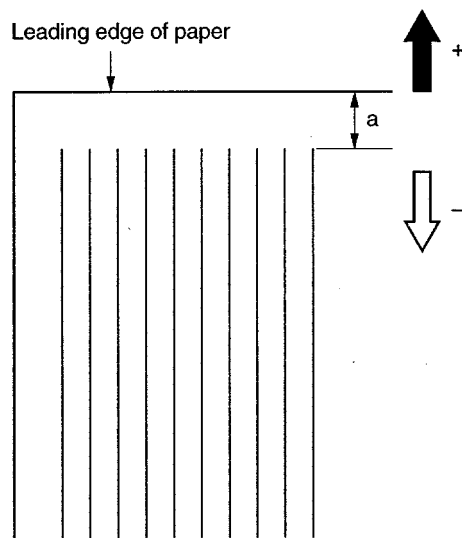
The following steps comprise the adjustment procedure:

- 1 After you set the VR401 on the paper-handling PCA to the center position (+/-0), place letter- or A4-sized paper in the tray. Press the test-print switch to make several test prints.

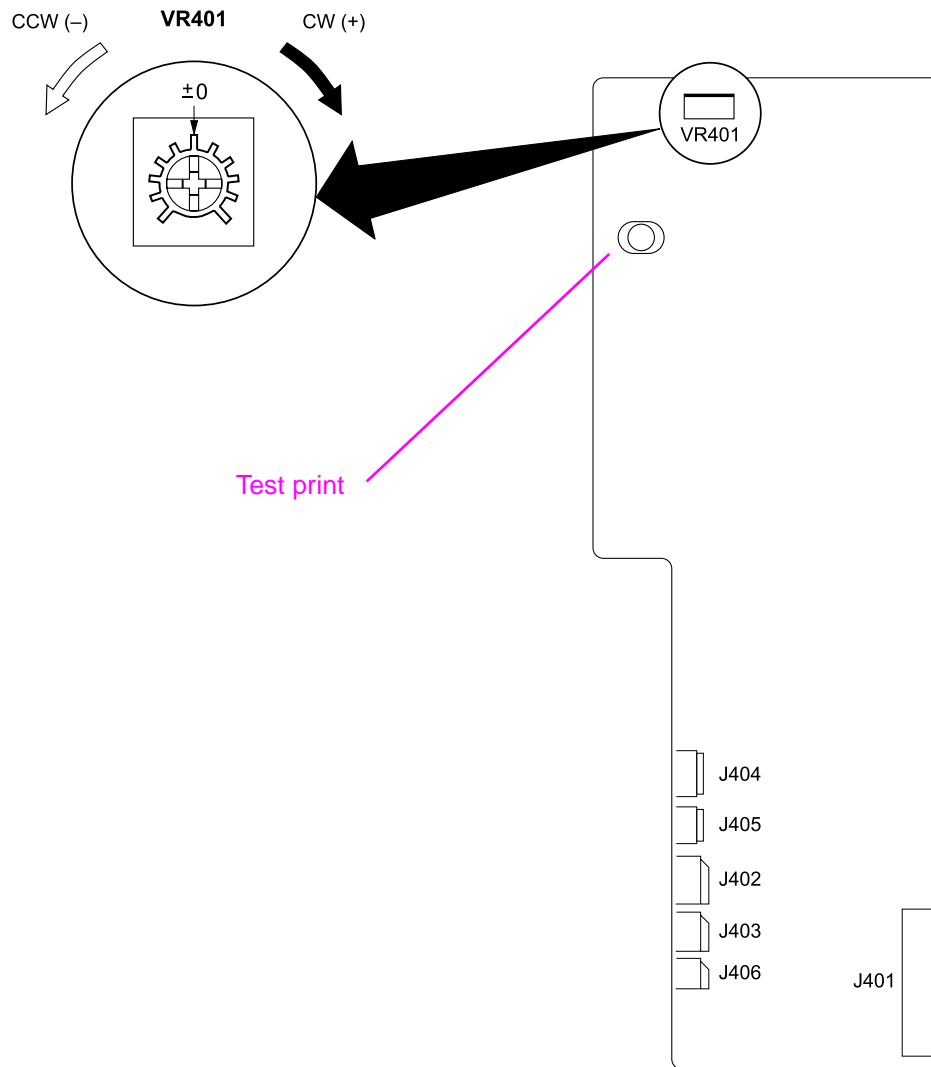
### Note

The test-print switch is also located on the paper-handling PCA (a hole in the Tray 1 cavity allows access); see figure 62.

- 2 Measure the length from the leading edge of the paper to the print pattern ("a" in figure 61). Measure all the test prints and calculate the average.
- 3 Adjust the VR401 so that the calculated value in step 2 becomes 2.0 mm. The pattern image shifts in the "+" direction in figure 61 if the VR401 (see figure 62) is turned clockwise, and in the "-" direction if the VR401 is turned counterclockwise. Turning the VR401 one scale shifts the pattern approximately 0.8 mm. For example, if the average value calculated in step 2 is 2.8 mm, then the difference is 0.8 mm; turn the VR401 clockwise for one scale.
- 4 Make several test prints again, and perform step 2. Make sure that the top margin is 2.0 mm. If the value is not 2.0 mm, then repeat these steps as necessary.



**Figure 61.** Adjusting the top margin



**Figure 62.** Location of VR401 on the paper-handling PCA

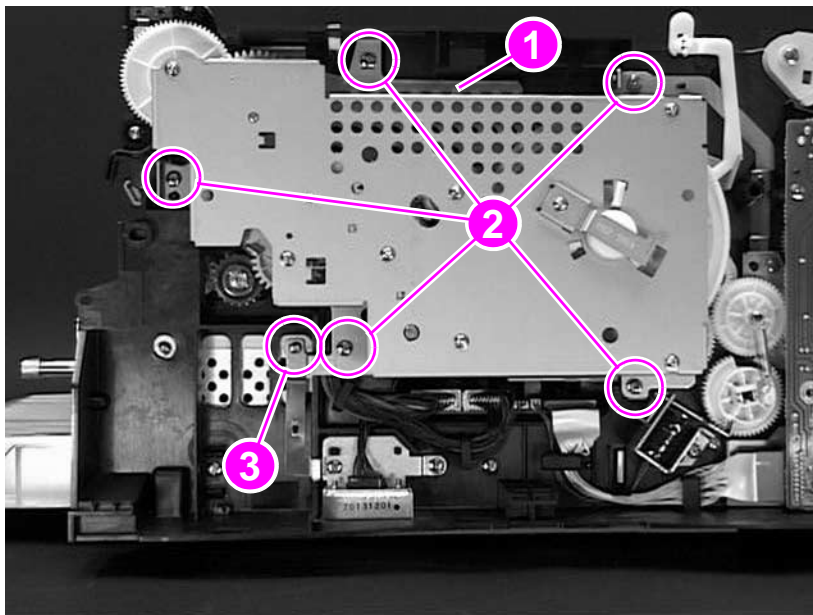
## Main gear assembly

1 Remove the top cover (see page 115) and the left cover (page 123).

The main motor is located on a PCA that is on the back of the main gear assembly.

2 Disconnect the main motor cable (callout 1).

3 Remove five self-tapping screws (callout 2) and the grounding screw (callout 3) that hold the gear assembly to the chassis.



**Figure 63.**

**Main gear assembly removal (1 of 2, left side)**

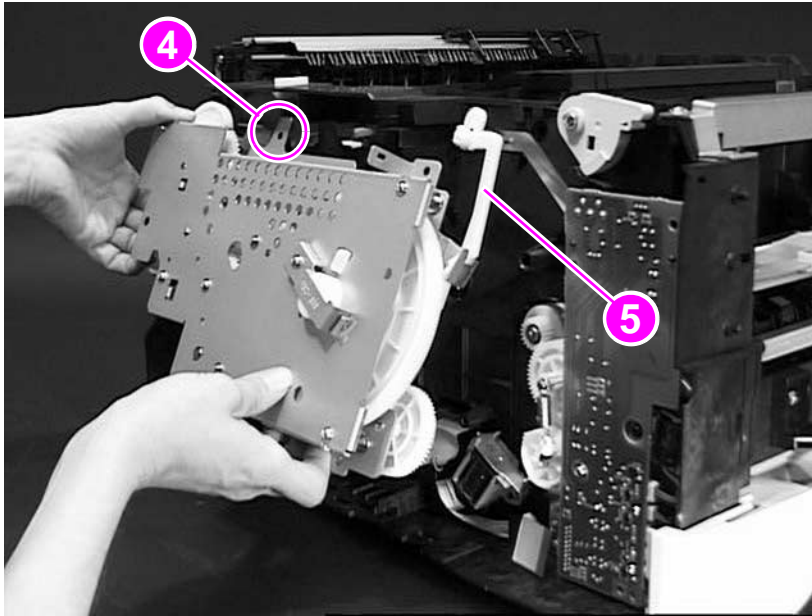
- 4 Rotate the bottom of the assembly out, and then lower it to release the locating tab (callout 4) and remove the main gear assembly.

---

**CAUTION**

---

Be careful when you remove the assembly. The toner cartridge engagement arm (callout 5) can break if it is not handled carefully.



**Figure 64.** Main gear assembly removal (2 of 2)

---

**Note**

---

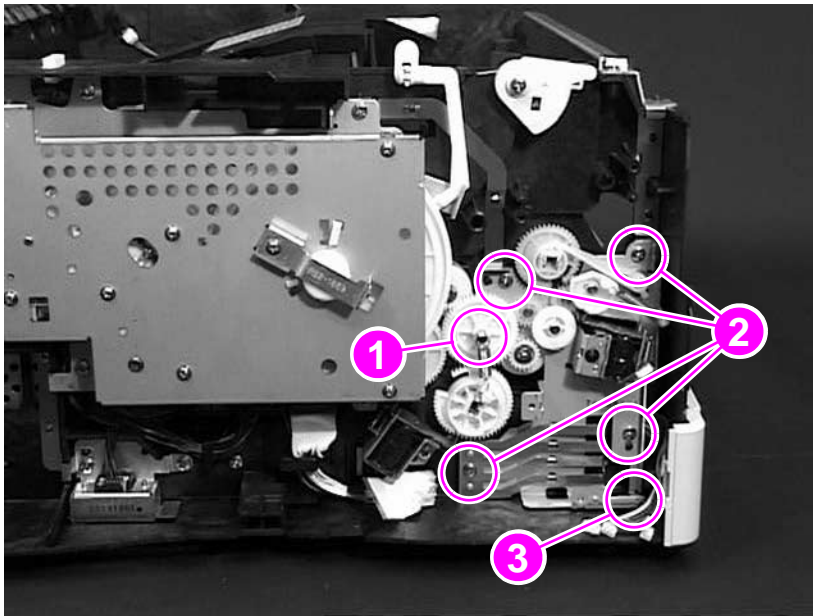
Remember to reconnect the cable at the top of the main gear assembly after you reinstall the assembly.

## Pickup gear assembly

- 1 Remove the top cover (see page 115), the left side cover (page 123), and the paper-handling PCA (page 131).
- 2 Release the small spring (callout 1) on the gear.
- 3 Remove the four self-tapping screws (callout 2) from the gear assembly.
- 4 Remove the pickup gear assembly from the chassis.

### CAUTION

Be careful not to damage the tray-size sensor springs when removing or replacing the pickup gear assembly.



**Figure 65.** Pickup gear assembly removal (left side of printer)

### Note

Before replacing the pickup gear assembly, route the cables through the wire clip (callout 3) that is on the back of the left corner cover. Reattach the spring from the Tray 2 shaft gear to the shaft of the pickup assembly gear.

## Tray 1 pickup solenoid

- 1 Remove the paper-handling PCA (see page 131).
- 2 Remove the Tray 1 solenoid by removing one black machine screw (callout 1) and sliding the solenoid assembly away from the pickup gear assembly.

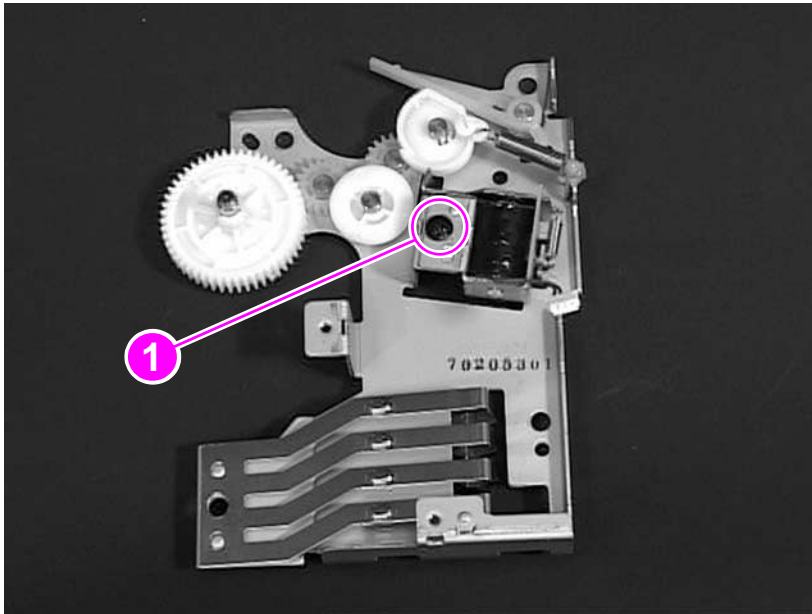
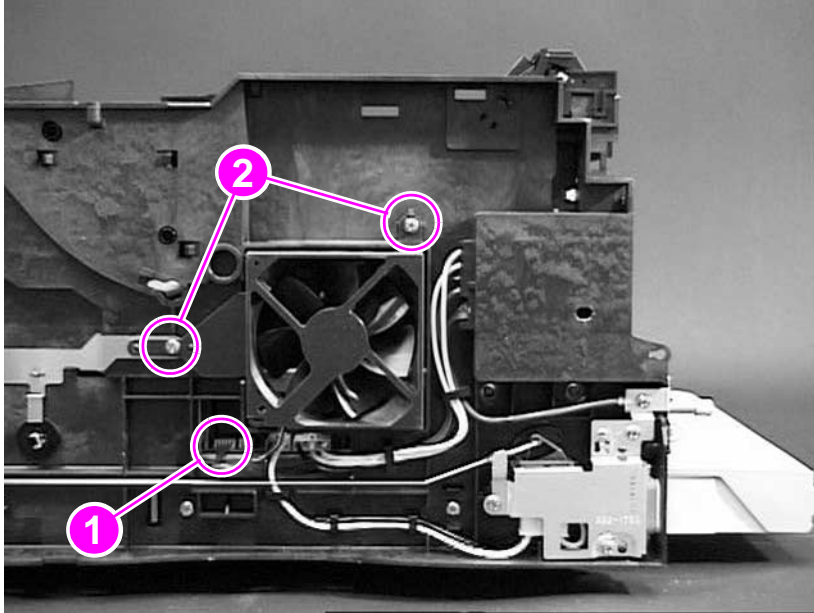


Figure 66.

Tray 1 pickup solenoid removal

## Fan

- 1 Remove the top cover (see page 115) and the right side cover (page 123).
- 2 Disconnect the cable (callout 1) that supplies power to the fan.
- 3 Remove the two self-tapping screws (callout 2) that secure the fan to the chassis.
- 4 Remove the fan from the chassis.



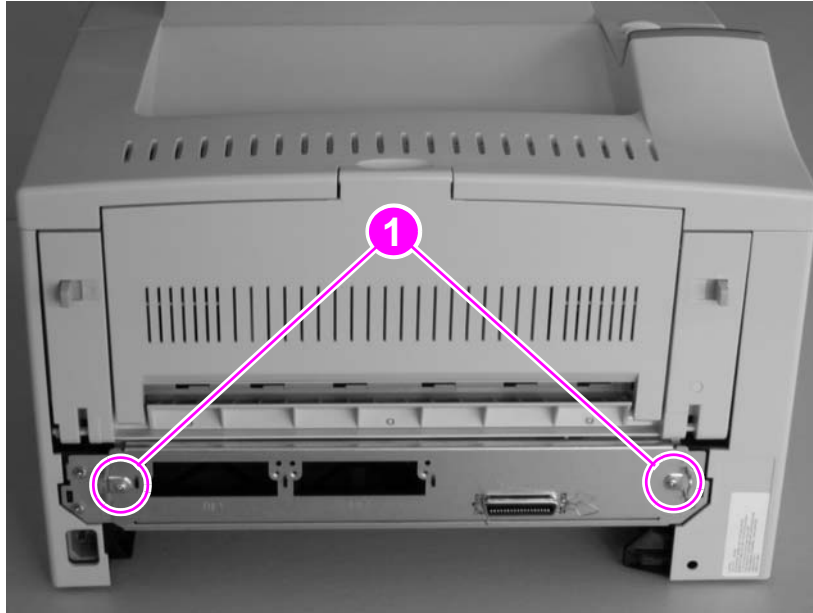
**Figure 67.**

**Fan removal (right side of printer)**



## Formatter assembly

- 1 Print a menu map and a configuration page, if possible, to use as a reference when you reinstall the new formatter.
- 2 Remove any EIO accessories from the EIO slots.
- 3 Facing the back of the printer, loosen the two captive screws (callout 1) and slide the formatter assembly out.
- 4 Remove any DIMMs from the DIMM slots.



**Figure 68.** Formatter assembly removal

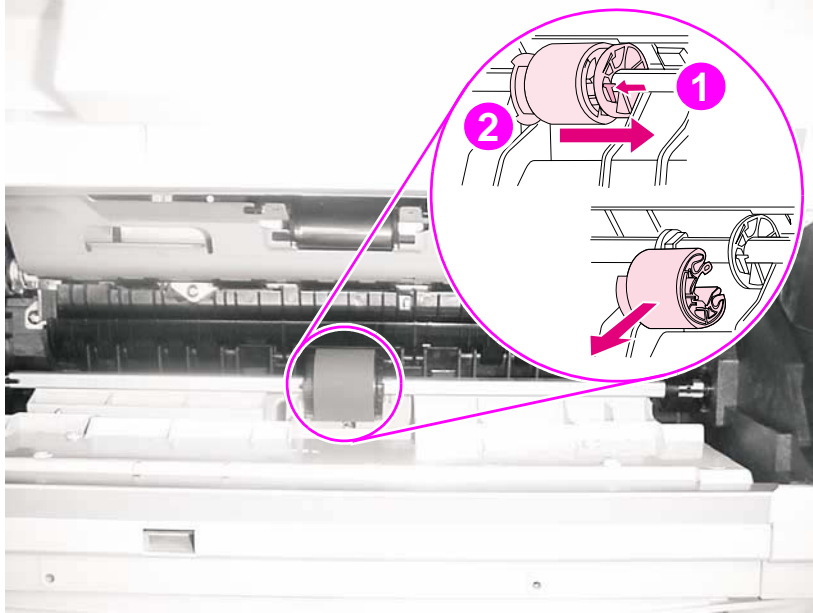
---

**Note** After you reinstall the formatter, update the printer configuration, if necessary, using the pages that you printed in step 1 (see “Service mode” on page 59).

---

## Tray 1 roller

- 1 Open the top cover and remove the toner cartridge.
- 2 Facing the front of the printer, raise the green center handle of the registration assembly.
- 3 Lift the locking tab (callout 1) on the right-side roller cam, and slide the cam to the right.
- 4 Slide the roller between the two cams, and then remove the roller from the shaft.



**Figure 69.** Tray 1 roller removal

## To reinstall

### Note

If the Tray 1 separation pad should be replaced, replace the separation pad before you replace the pickup roller (see “Tray 1 separation pad” on page 141).

- 1 Orient the roller so that the thumb grip (callout 2) is on the left.
- 2 Insert the roller onto the shaft, and then slide the roller to the right until it is seated.
- 3 Slide the roller and cam to the left until they click into place.

### Note

Make sure that the locking tab is engaged by trying to move the roller to the right. The roller will not move if the locking tab is engaged.

## Tray 1 separation pad

- 1 Open Tray 1 and remove the Tray 1 roller (see page 140).
- 2 With one hand, use a small flat-blade screwdriver to pry the Tray 1 separation pad (callout 1) from the holder.

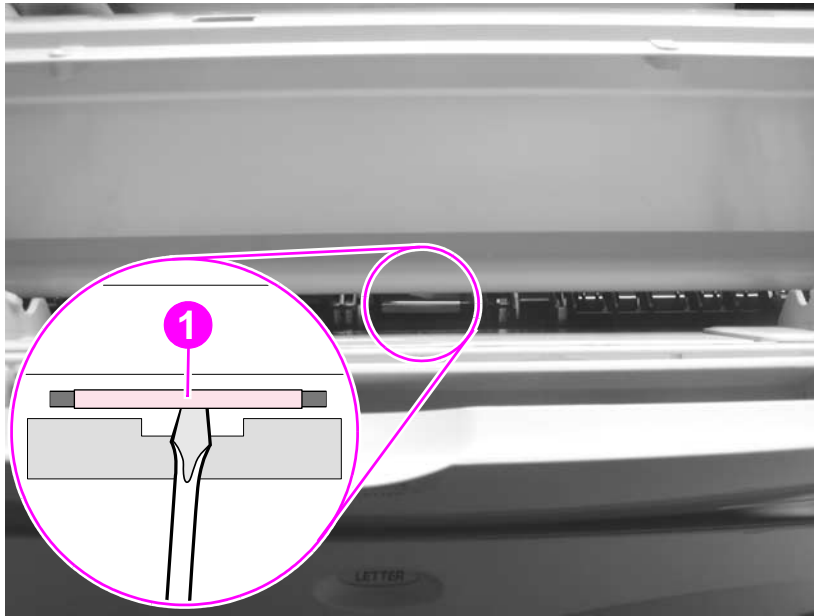


Figure 70.

Tray 1 separation pad removal (1 of 2—view through slot in Tray 1)

- 3 With the other hand inside the printer, remove the separation pad (callout 2).

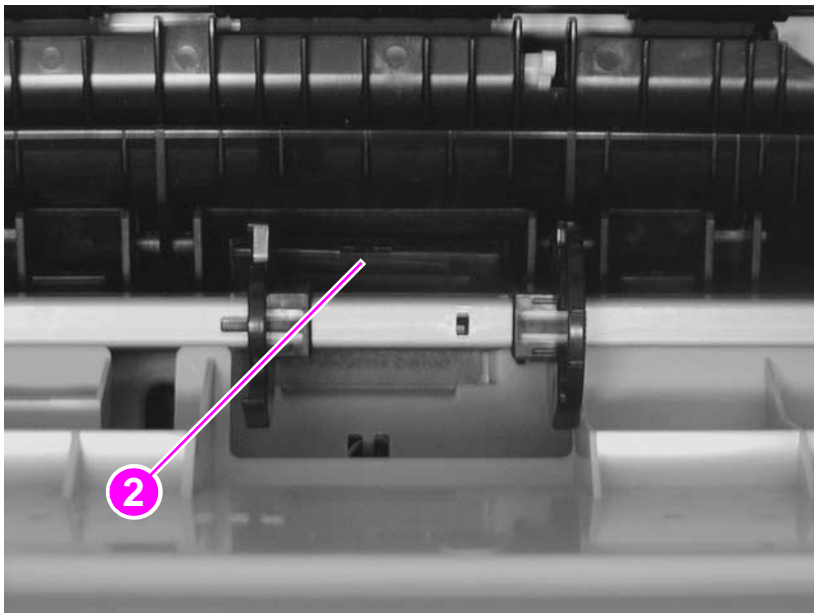


Figure 71.

Tray 1 separation pad removal (2 of 2)

### To reinstall

Make sure that the silver clip faces the front of the printer, and firmly press the new separation pad into the holder until it clicks into place.

## Tray 2 pickup roller

### Note

This procedure applies to Tray 2 and to any optional 250-sheet tray.

- 1 Remove the 250-sheet tray.
- 2 For Tray 2, carefully tilt the printer onto its left side.  
-Or-  
For an optional 250-sheet tray, set the feeder upside-down on the work surface.
- 3 Press the locking tab (callout 1) that is on the white, side cam (callout 2), and slide the cam and the black bushing (callout 3) away from the roller (callout 4).
- 4 Slide the roller between the two cams, rotate the roller 180 degrees, and then remove the roller from the shaft.

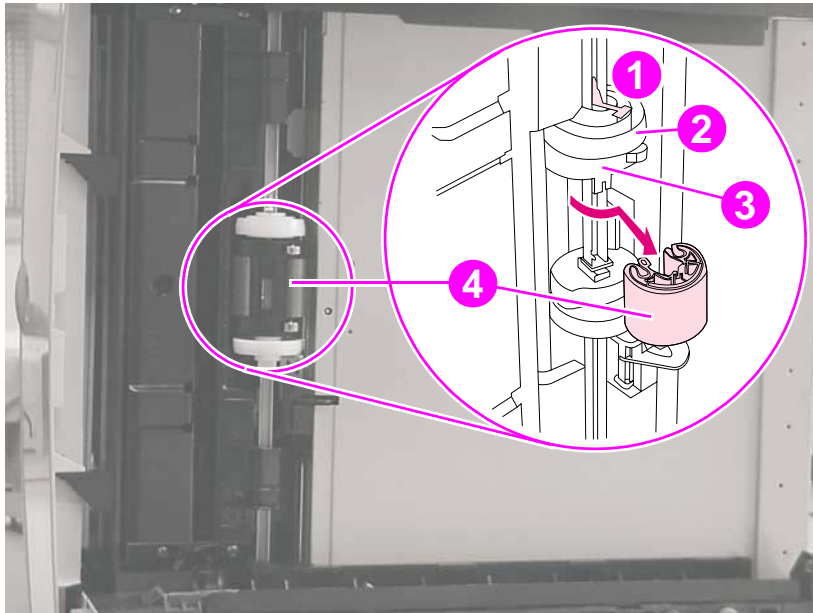


Figure 72.

Tray 2 pickup roller removal (bottom of the printer)

### To reinstall

Orient the pin on the roller so that it lines up with the hole in one of the side bushings. Slide the cam toward the roller until the tab snaps into place.

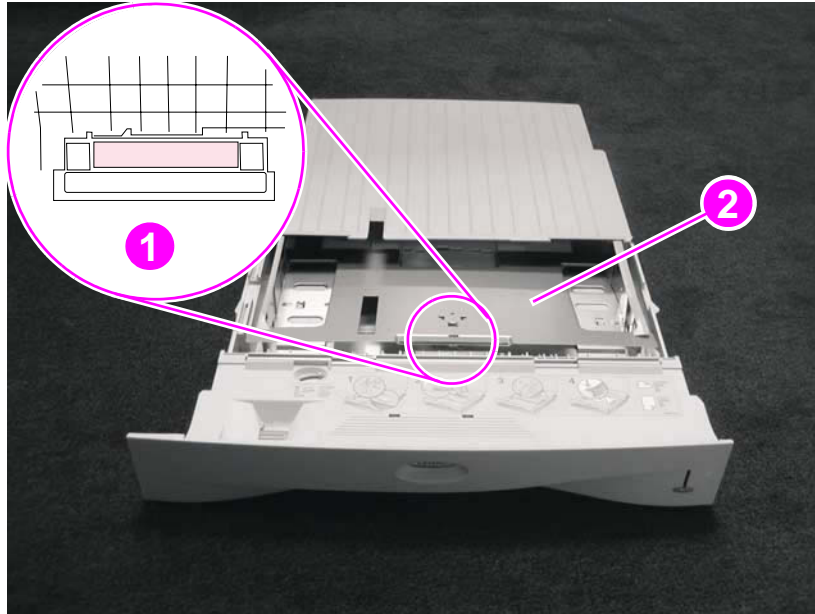
## Tray 2 separation pad

**Note** This procedure applies to Tray 2 and to any optional 250-sheet tray.

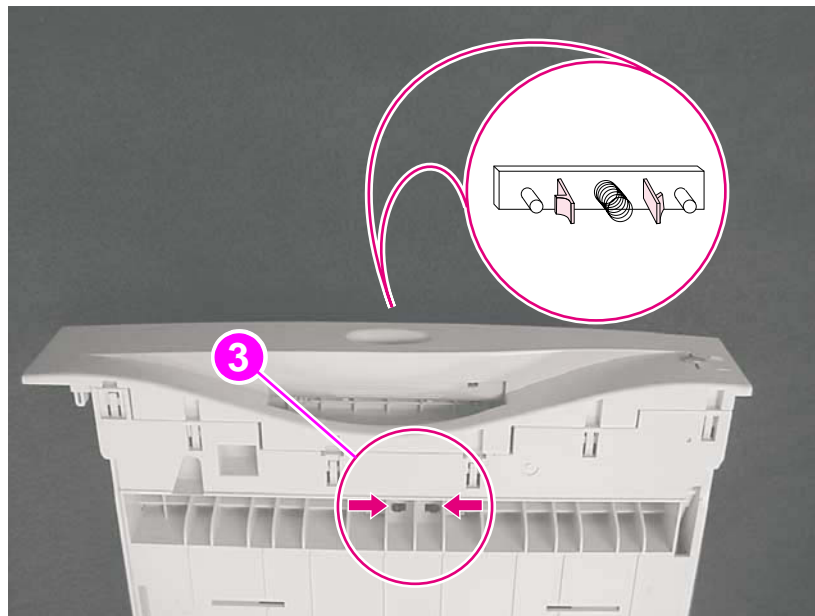
- 1 Remove the paper from the tray.

**Note** Callout 1 in figure 73 shows a detail of the separation pad.

- 2 While pressing down the paper lift plate (callout 2), reach under the front of the tray and squeeze the black tabs (callout 3 in figure 74) to release the separation pad from the tray.



**Figure 73.** Tray 2 separation pad removal (1 of 2)

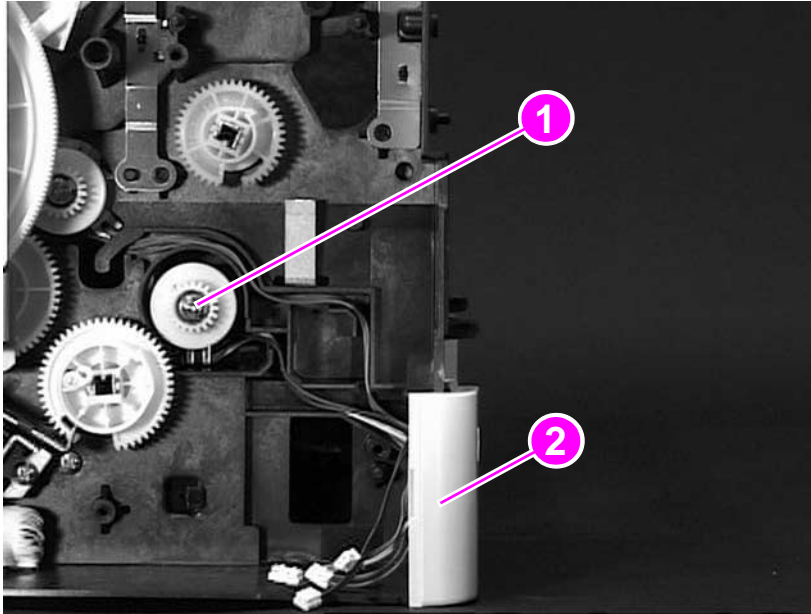


**Figure 74.** Tray 2 separation pad removal (2 of 2)

- 3 Pull the spring off of the old separation pad, and then insert the spring onto the new separation pad.
- 4 Replace the separation pad.

## Paper-feed roller assembly

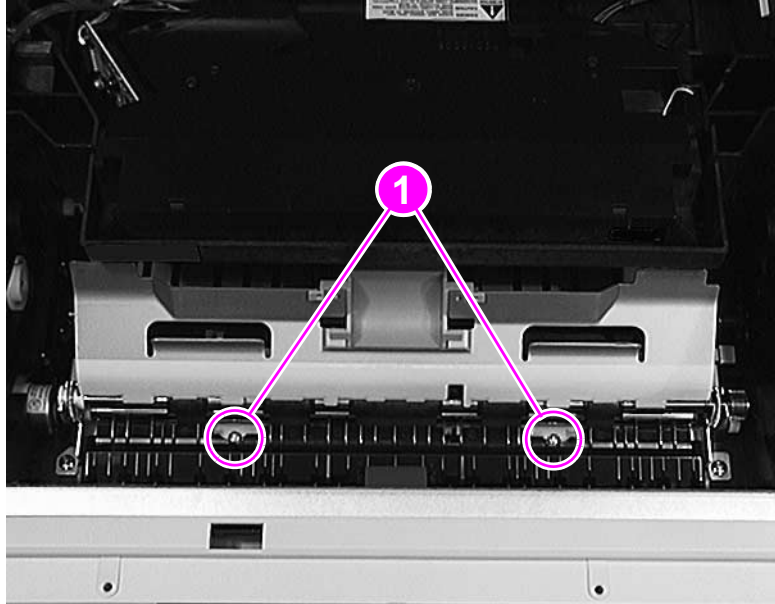
- 1 Remove the top cover (see page 115), the left side cover (page 123), the main gear assembly (page 134), the paper-handling PCA (page 131), and the pickup gear assembly (page 136).
- 2 Remove the paper-feed roller clutch (callout 1) that is located on the left side of the paper-feed roller assembly. Remove the e-clip on the clutch, and slide the clutch off the shaft.
- 3 Free all cables from the retaining clip on the inside of the chassis, behind the left corner cover (callout 2).



**Figure 75.**

**Paper-feed roller assembly removal (1 of 3, left side view of printer)**

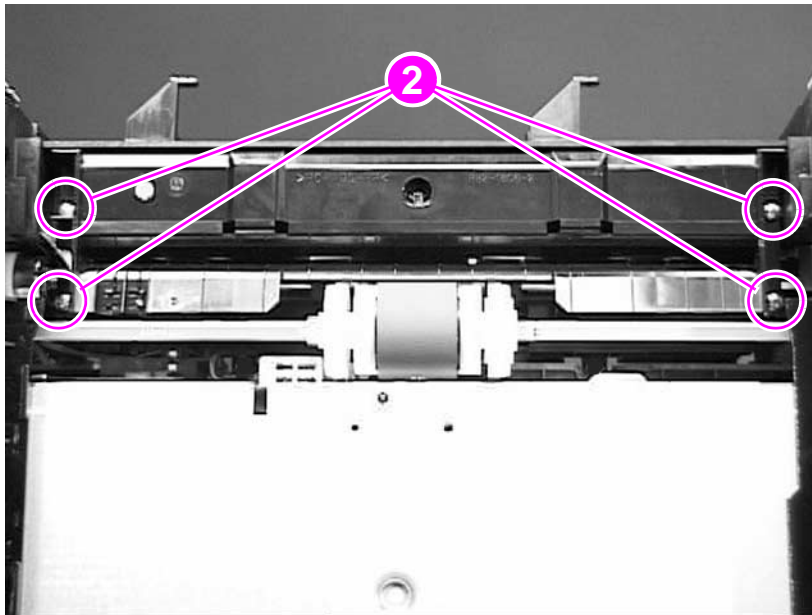
- 4 Remove the two M3x8 machine screws (callout 1) that are in the center of the printer and under the registration assembly roller guide.



**Figure 76.**

**Paper-feed roller assembly removal (2 of 3, location of two screws inside the printer)**

- 5 Remove the paper tray, and tilt the printer back, with the front facing up.
- 6 Remove the four self-tapping screws (callout 2) that hold the paper-feed roller assembly to the chassis. They are located on the bottom of the printer.



**Figure 77.**

**Paper-feed roller assembly removal (3 of 3, bottom view of printer)**

- 7 Remove the paper-feed roller assembly from the chassis, carefully feeding the cable through the hole in the chassis.

## Dc controller and power supply

This assembly contains two PCAs. One is the dc controller (including the high-voltage power supply), and the other is the low-voltage power supply.

- 1 Remove the rear door (see page 113), the top cover (page 115), the left and right side covers (page 123), and the formatter assembly (page 139).
- 2 Disconnect four cables that are on the right side of the chassis.

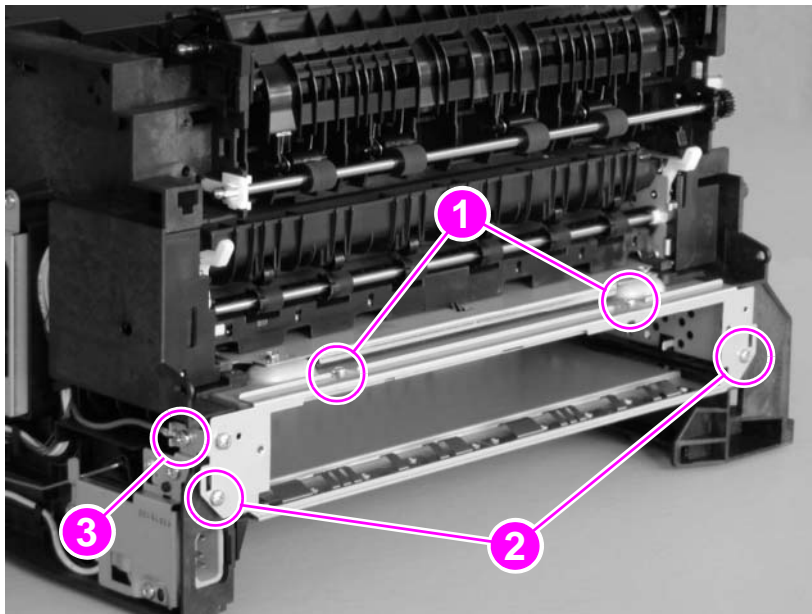
---

### Note

For the two large connectors, use a flat-blade screwdriver to release the locks by pressing down on the tabs that are on top of the connectors. Be sure to pull the cables away from the chassis.

The remaining connections are located on the left side of the chassis.

- 3 Disconnect the 2-pin, the 3-pin, and the three large connectors. Be sure to pull the cables away from the chassis.
- 4 Remove two machine screws (callout 1) from the top surface of the metal housing.
- 5 Remove two self-tapping screws (callout 2) from the bottom of the dc controller assembly.
- 6 Remove one machine screw (callout 3) and its lock washer, disconnecting the ground wire.
- 7 Remove the grounding screw below the main gear assembly on the left side of the printer (see figure 63 on page 134, callout 3).



**Figure 78.** Dc controller assembly removal (1 of 3, rear view of printer)

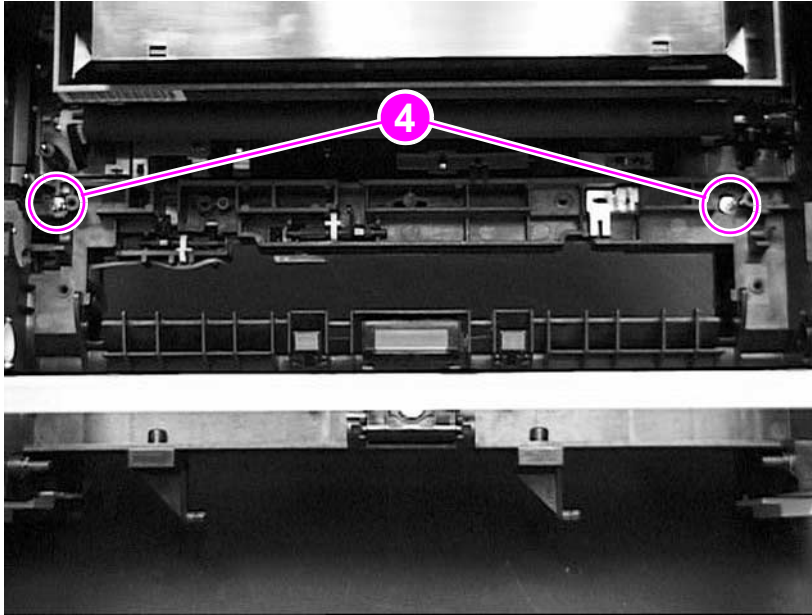
---

### Note

You might have to readjust the top margin after you replace the dc controller (see page 132).



- Remove the two screws (callout 4) that are located at the front of the dc controller assembly and inside the chassis. These are long screws; their position requires the use of a magnetized screwdriver.



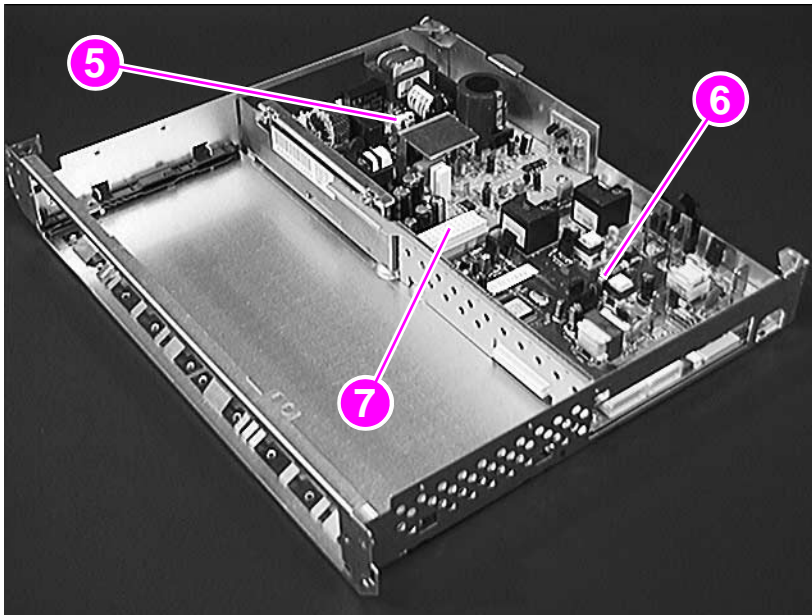
**Figure 79.**

**Dc controller assembly removal (2 of 3, long screws)**

- Slide the dc controller assembly out of the rear of the chassis.

The power-supply PCA (callout 5) and the dc controller (callout 6) are linked by a ribbon cable (callout 7) and held on the tray by four screws each.

- Carefully remove the ribbon cable, and loosen the screws on the board you want to remove.



**Figure 80.**

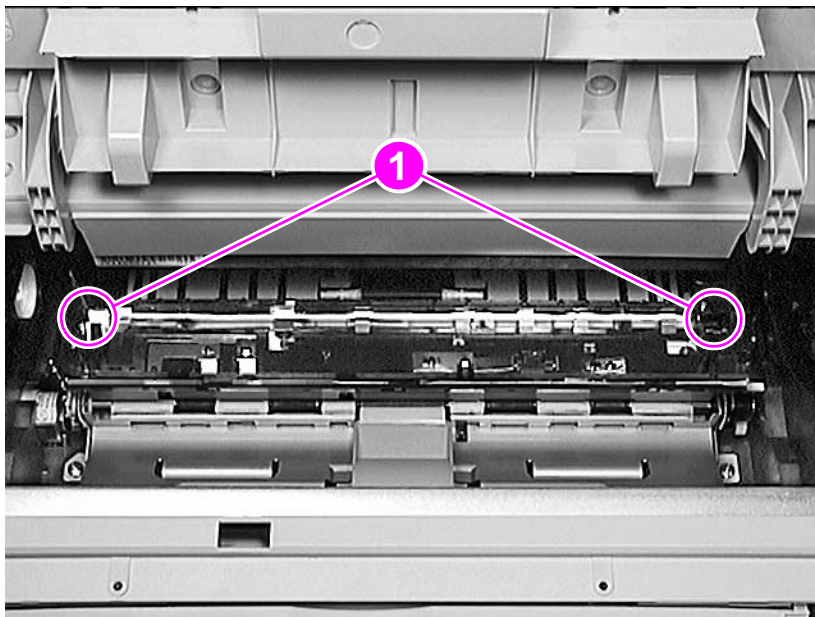
**Dc controller assembly removal (3 of 3)**

**CAUTION**

To prevent damage to the high-voltage contacts, the paper-feed belt assembly needs to be installed before the dc controller is reinstalled.

## Paper-feed belt assembly

- 1 Remove the top cover (see page 115), the left and right side covers (page 123), the transfer-roller assembly (page 128), the fuser (page 114), the main gear assembly (page 134), and the dc controller (page 146).
- 2 Facing the front of the printer, remove two machine screws (callout 1), one on each side of the belt assembly.



**Figure 81.**

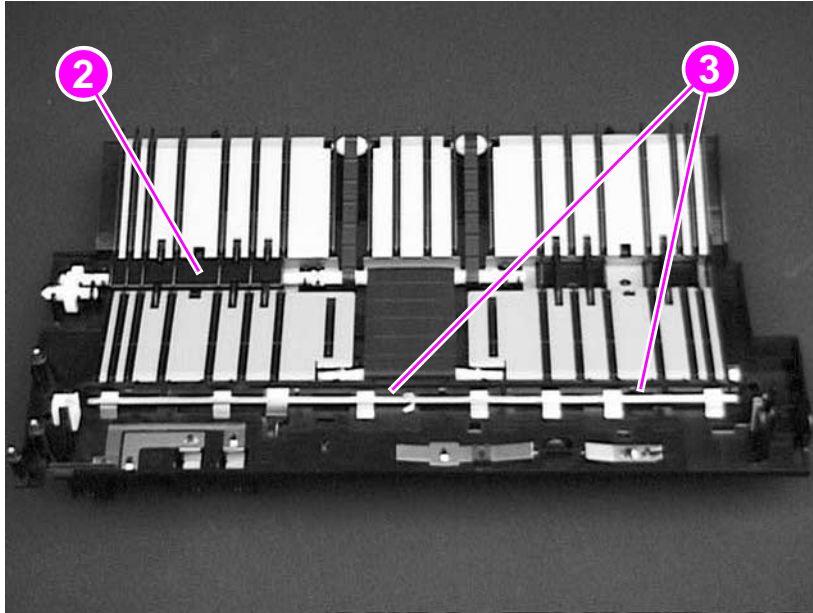
**Paper-feed belt assembly removal (1 of 2)**

- 3 Raise the registration assembly by grasping the small green handle, and lift out the belt assembly.
- 4 Remove the plastic guide (callout 2) and replace the belts if necessary. The guide snaps back in after the belt replacement.

---

**CAUTION**

The edge (callout 3) has a metal ridge with sharp teeth. Avoid contact with the edge.



**Figure 82.** Paper-feed belt assembly removal (2 of 2)

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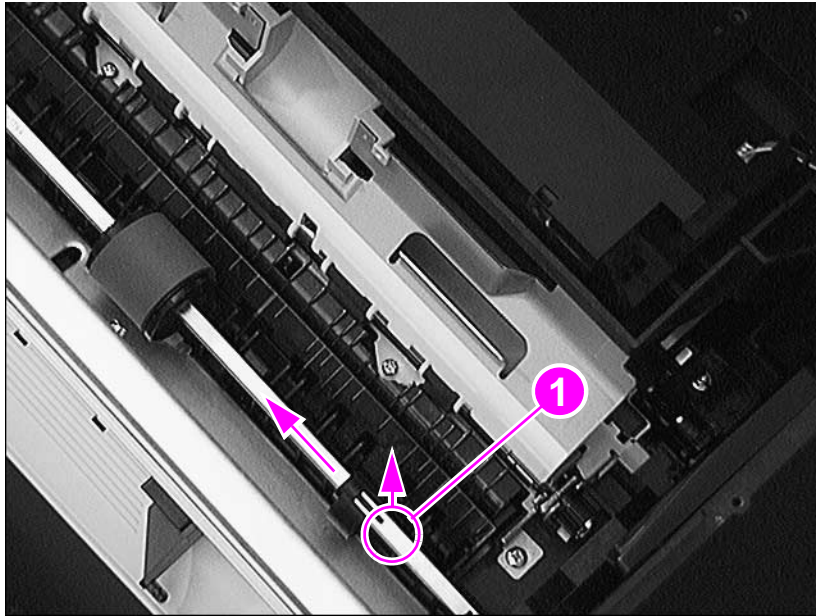
**CAUTION**

To prevent damage to the high-voltage contacts, the paper-feed belt assembly must be reinstalled before you reinstall the dc controller.

---

## Tray 1 shaft

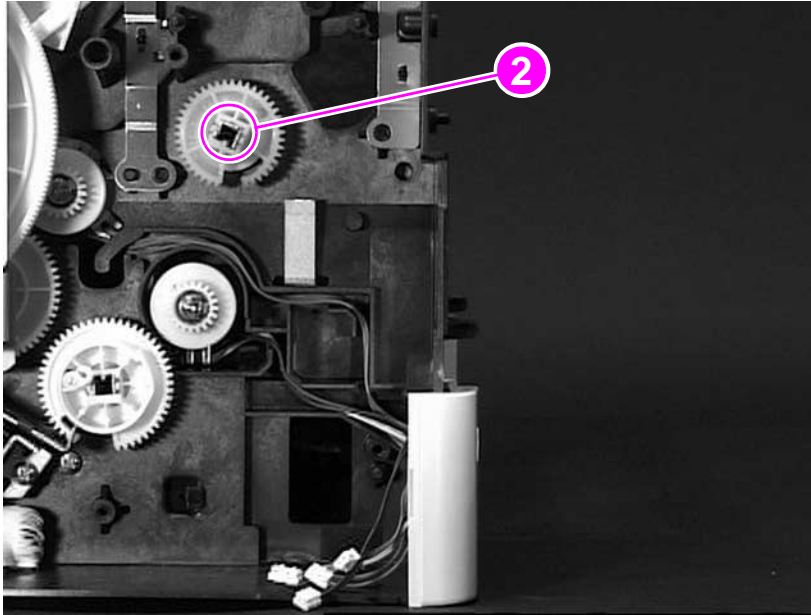
- 1 Remove the top cover (see page 115), the left and right side covers (page 123), the pickup gear assembly (page 136), and the paper-handling PCA (page 131).
- 2 Remove the plastic collar on the outside, right of the chassis, by pulling outward on the collar's release tab and sliding the collar off of the shaft.
- 3 Raise the green center handle of the registration assembly.
- 4 Release the collar on the inside, right of the chassis by pulling *up* on the release tab (callout 1), and sliding the collar to the left.



**Figure 83.**

**Tray 1 shaft removal (1 of 2, right side view of printer)**

- 5 Release the tabs (callout 2) of the gear that is on the left side of the shaft, outside of the chassis, and slide the gear off.



**Figure 84.** Tray 1 shaft removal (2 of 2)

- 6 Slide the shaft to the right, and then angle it out of the chassis.

---

**Note**

Make sure that the Tray 1 lift plate (with its spring) is pressed down before you reinstall the Tray 1 shaft. The shaft holds the Tray 1 lift plate, and must be installed on top of it. Also make sure that the shaft is reinstalled in the correct orientation.

---

## Tray 2 shaft

- 1 Remove the top cover (see page 115), the left and right side covers (page 123), the pickup gear assembly (page 136), the paper-handling PCA (page 131), and the paper-feed roller assembly (page 144).
- 2 Remove the small spring from the gear that is on the left side of the shaft (see figure 65 on page 136, callout 1).
- 3 Turn the Tray 2 shaft to align the solenoid arm (callout 1) with the gap in the gear (on the left side of the printer).
- 4 Press the release tabs (callout 2) outward, and slide the gear off of the shaft.
- 5 Remove the bushing on the right side of the shaft by lifting the release tab and sliding the bushing off of the shaft.
- 6 Slide the shaft to the right, then angle it out of the chassis.

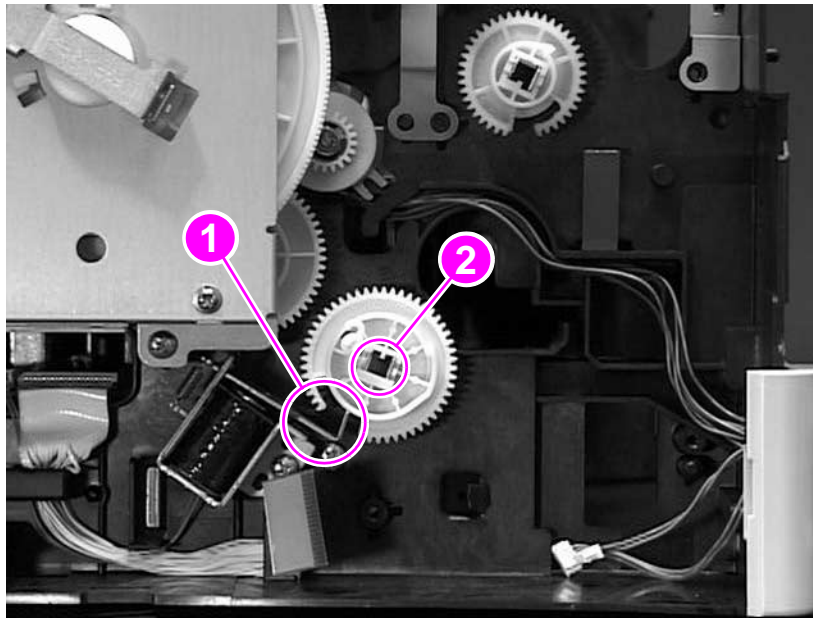


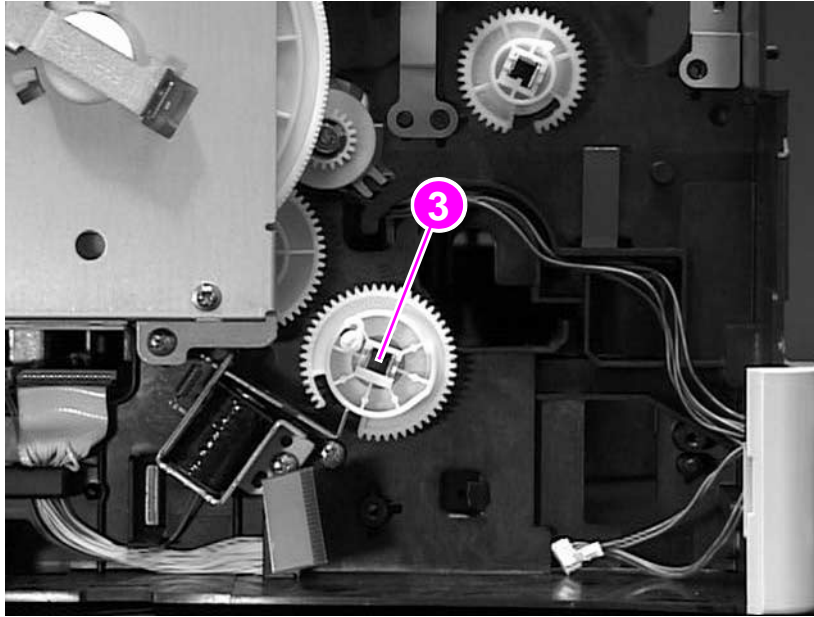
Figure 85.

Tray 2 shaft removal (left side view of printer)



## To reinstall

- 1 Tip the printer back, so that the front faces up.
- 2 Insert the shaft into the fitting on the right side. Then, angle the shaft into the other side.
- 3 Place the bushing on the right end of the shaft, and push until the tab locks in the indentation on the shaft.
- 4 Facing the left side of the printer, orient the shaft so that the open end of the shaft (callout 3) points away from the solenoid arm.
- 5 Depress the solenoid arm, and slide the gear into place. Press the gear into the plastic collar until it locks in place.
- 6 Reinstall the spring on the arm of the gear.



**Figure 86.**

**Reinstallation of Tray 2 shaft**

## Tray 1 lift plate

- 1 Remove the top cover (see page 115), the front cover (page 120), the left and right side covers (page 123), and the Tray 1 shaft (page 150).
- 2 Rotate the Tray 1 lift plate to the front of the printer, and then carefully pry down each hook (callout 1) until the hook is released from the pivot pin.

---

### Note

When you remove the lift plate, be careful not to lose the spring (callout 2).

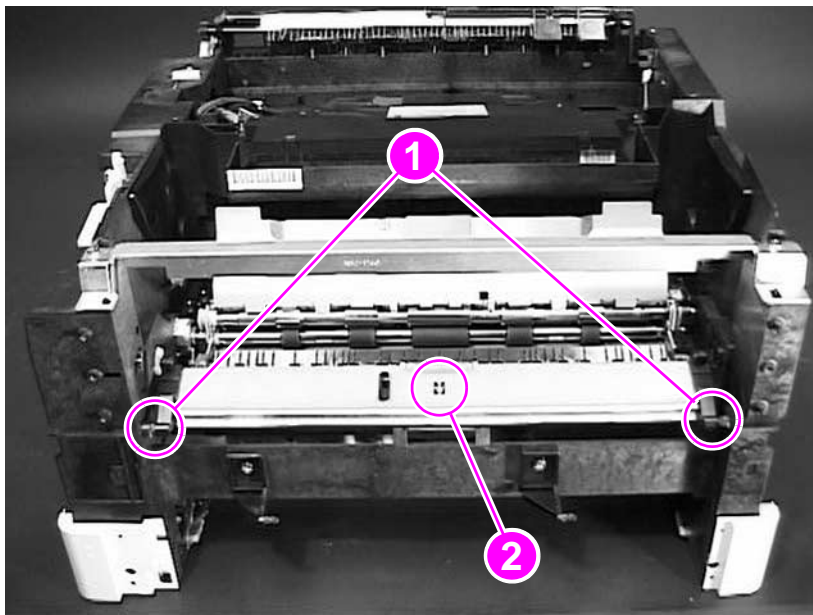


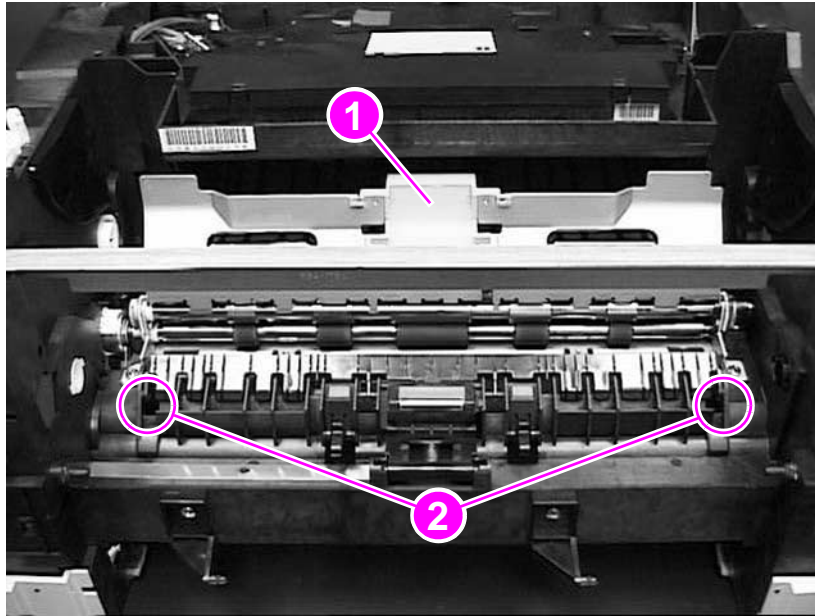
Figure 87.

Tray 1 lift plate removal



## Paper guide

- 1 Lift the green handle (callout 1) in the middle of the registration assembly.
- 2 Release the guide by freeing the end pins (callout 2), and then lift the paper guide out.

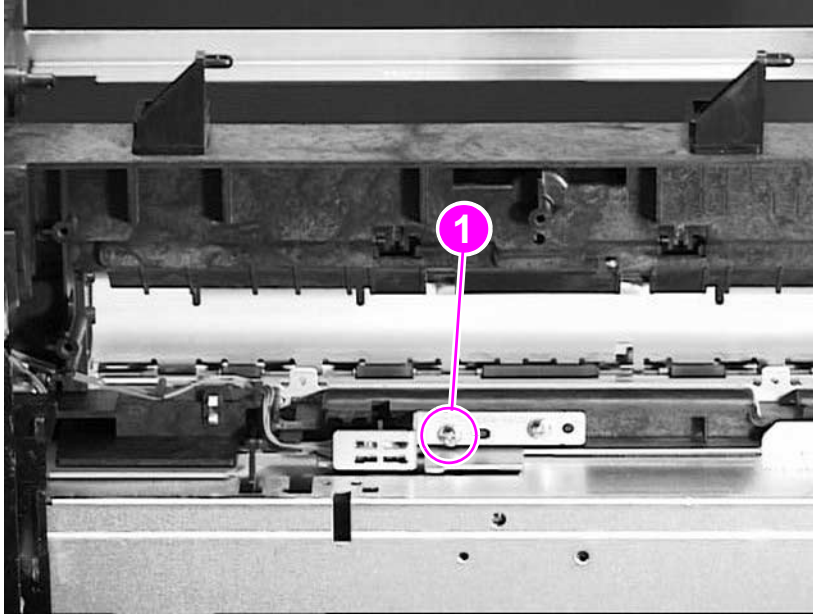


**Figure 88.**

**Paper guide removal**

## Top-of-page sensor

- 1 Remove Tray 2.
- 2 Remove the top cover (see page 115), the left side cover (page 123), the pickup gear assembly (page 136), the paper-handling PCA (page 131), and the paper-feed roller assembly (page 144).
- 3 Remove the gear from the left end of the Tray 2 shaft (see page 152, steps 1 through 4), and then slide the shaft to the right.
- 4 Remove the screw (callout 1) that secures the sensor to the chassis.



**Figure 89.**

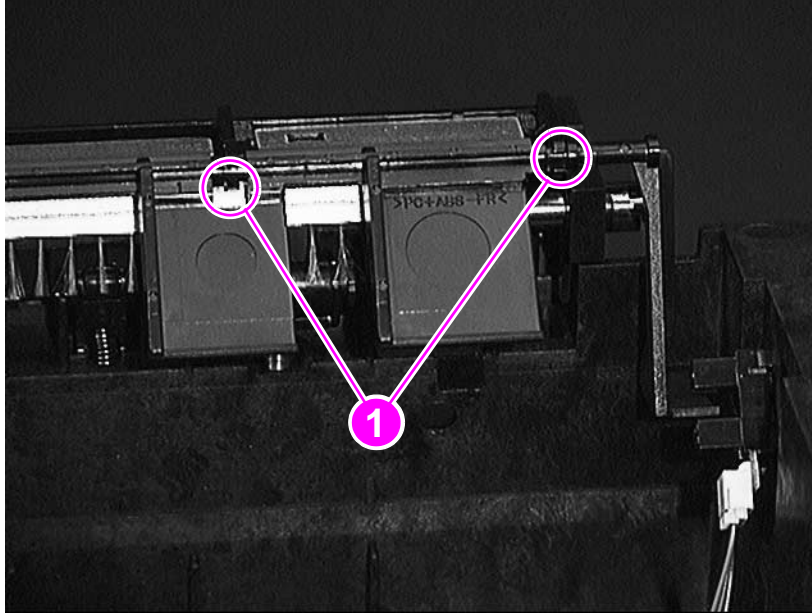
**Top-of-page sensor removal (bottom of printer)**

- 5 Remove the sensor, feeding the cable through the opening in the chassis.

## Face-down bin-full sensor lever

The face-down bin-full sensor is located on the top of the upper delivery assembly.

- 1 Remove the top cover (see page 115), the rear door and rear output bin (page 113), and the left and right side covers (page 123).
- 2 Release the two clips (callout 1), and slide the sensor to the right to remove it.

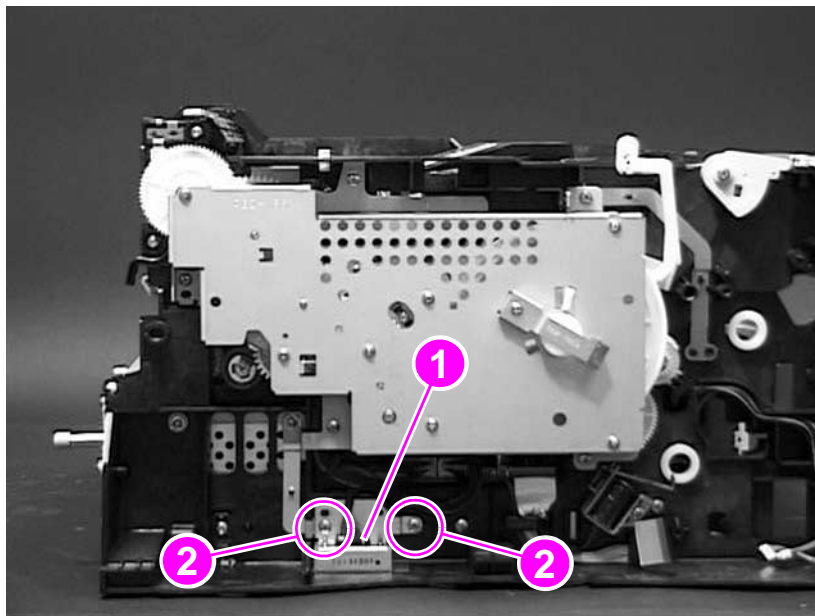


**Figure 90.**

**Face-down bin-full sensor lever removal**

## Accessory interface connector

- 1 Remove the top cover (see page 115), and the left side cover (page 123).
- 2 Disconnect the two cables (callout 1) from the connector.
- 3 Remove the two self-tapping screws (callout 2).



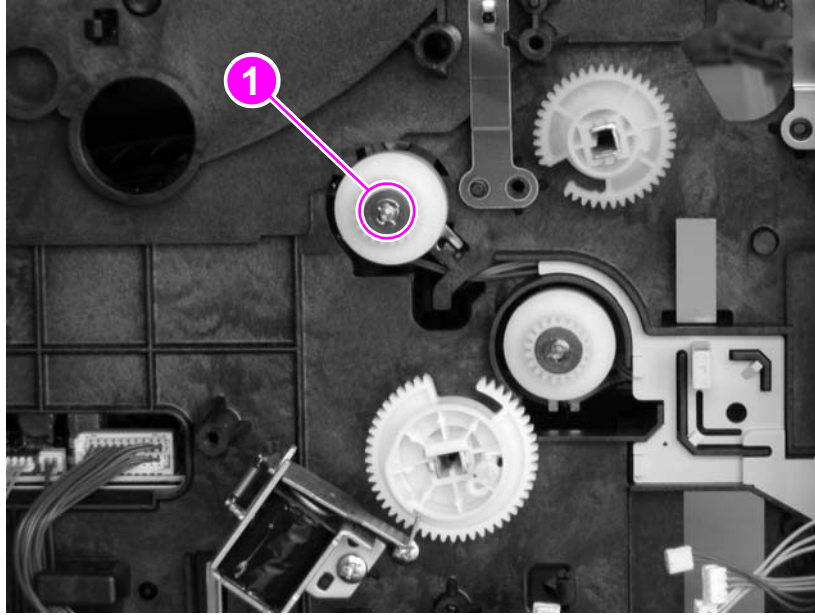
**Figure 91.**

**Accessory interface connector removal (left side of printer)**

- 4 Remove the connector.

## Registration assembly

- 1 Remove the top cover (see page 115), the left side cover (page 123), the pickup gear assembly (page 136), the main gear assembly (page 134), and the transfer guide (page 128, steps 1 and 2).
- 2 Release the e-ring (callout 1) that is on the registration assembly clutch, and remove the clutch.



**Figure 92.** Registration assembly removal (1 of 2)

- 3 Remove two screws in the top, middle of the printer (see figure 76 on page 145, callout 1).

---

### Note

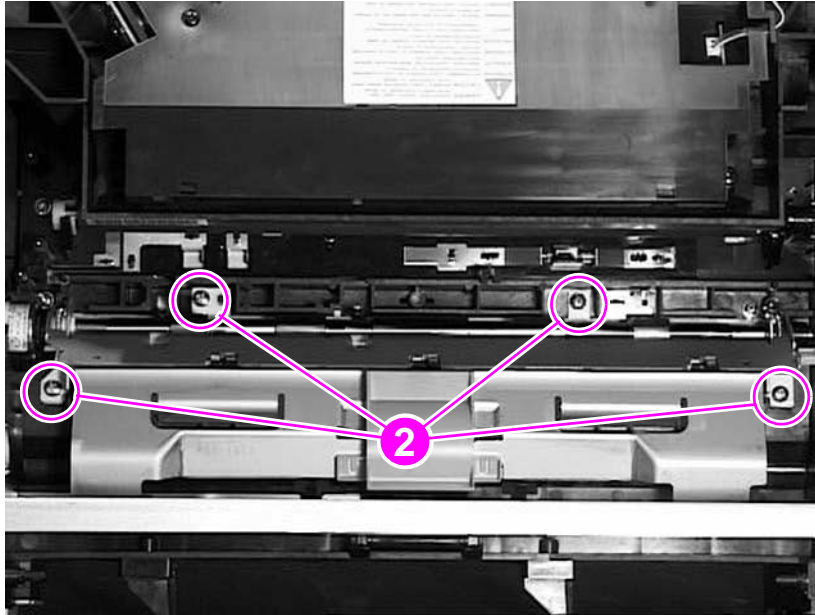
These screws are already removed if you have removed the paper-feed roller assembly. They are common to both the paper-feed roller assembly and the registration assembly.

---

- 4 Remove the four self-tapping screws (callout 2) inside the chassis.

**Note**

Lift up the small green handle of the registration assembly to gain access to two of these screws.



**Figure 93.** Registration assembly removal (2 of 2)

- 5 Lift the registration assembly out of the chassis.

### To reinstall

When you reinstall the registration assembly, be careful to align the flags in the base as you reinstall the assembly.

When you reinstall the clutch, orient the flat spot in the shaft with the clutch. When you slide the clutch on the shaft, make sure that the metal alignment tab is seated on the printer frame. Also make sure that the cable is situated away from the registration assembly.

## Upper delivery assembly

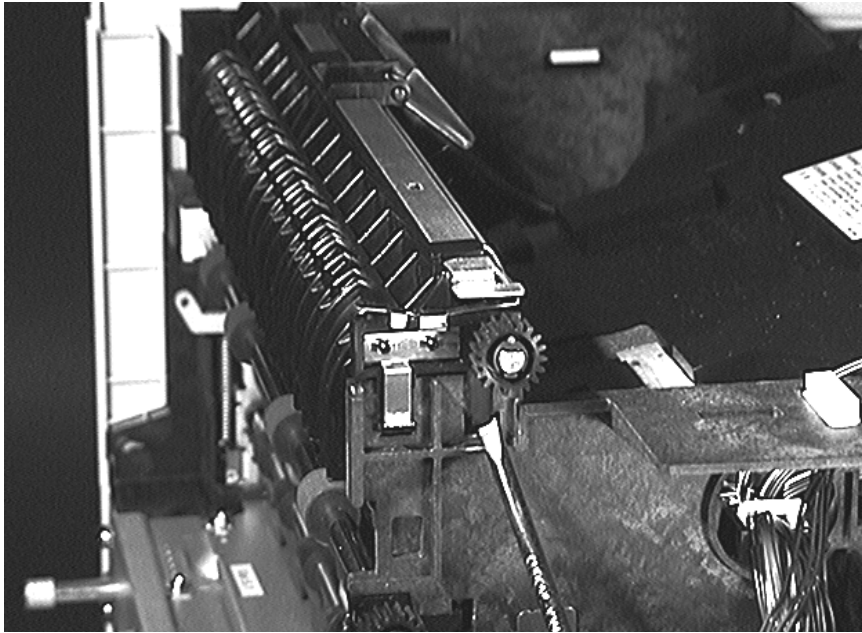
- 1 Remove the top cover (see page 115), the left and right side covers (page 123), and the main gear assembly (page 134).
- 2 Face the left side of the printer.
- 3 The delivery assembly is secured by three tabs on each side. Use the flat-blade screwdriver to gently release the tabs on each side, and then lift the assembly out.

---

### Note

After you release one tab, lift the assembly only slightly until you release the tab on the opposite side.

---



**Figure 94.** Upper delivery assembly removal

---

### CAUTION

The face-down bin-full sensor is on the left side of the upper delivery assembly. Be careful not to damage it as you slide the delivery assembly out of the chassis.

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### Note

To reassemble the upper delivery assembly, slide the assembly straight down to lock it in place. Make sure the face-down bin-full sensor is free to move on the left side.

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## Delivery roller

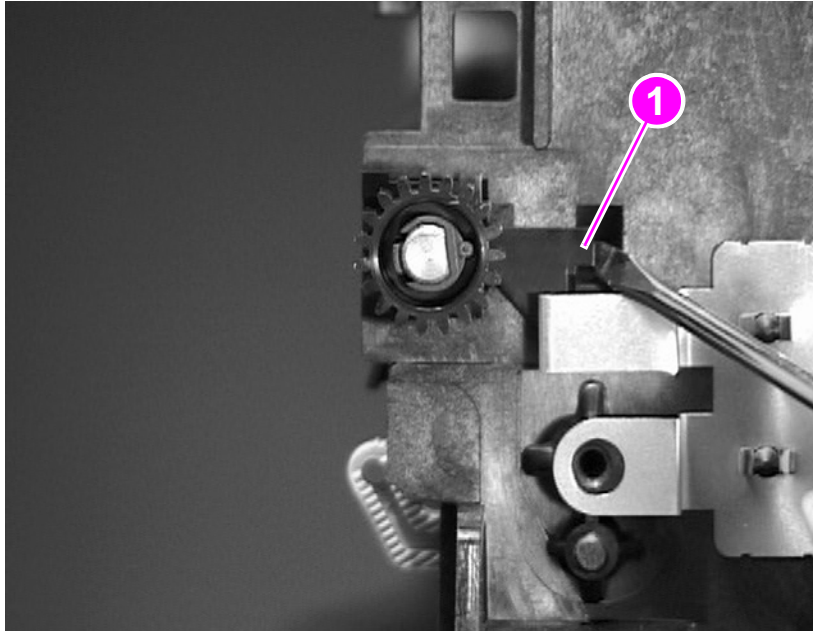
- 1 Remove the top cover (see page 115) the left and right side covers (page 123) and the main gear assembly (page 134).
- 2 Facing the left side of the printer, insert a flat-blade screwdriver and twist gently to release the tab on the left side of the delivery roller (callout 1).

---

### Note

The lower delivery rollers might fall out. When you replace them, make sure they align with the indentations in the chassis.

---

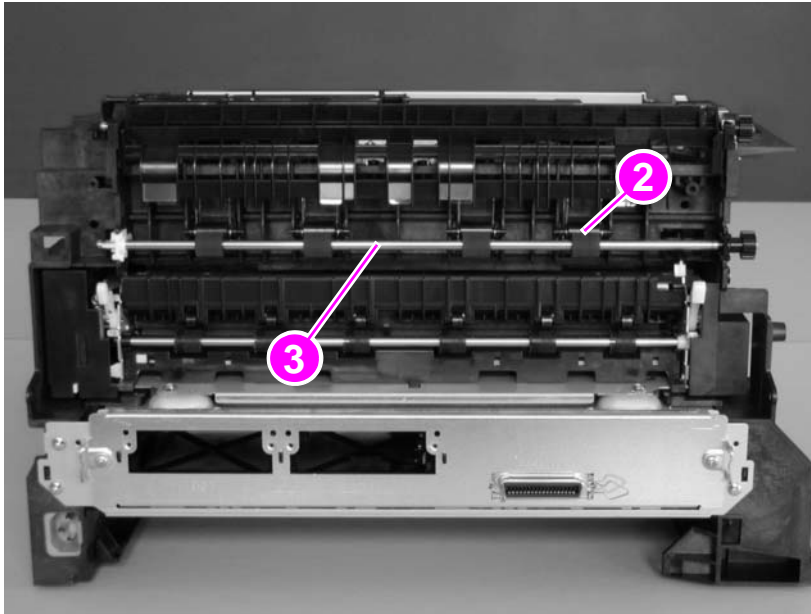


**Figure 95.** Delivery roller removal (1 of 2)

- 3 Release the tab on the right side of the roller in the same manner.



- 4 After freeing both locking tabs, gently pull the delivery roller to remove it.
- 5 Individual rollers (callout 2), located above the lower delivery rollers (callout 3), can be removed by using a flat-blade screwdriver to push gently on the top side of the roller. The roller is released by the action of the spring.



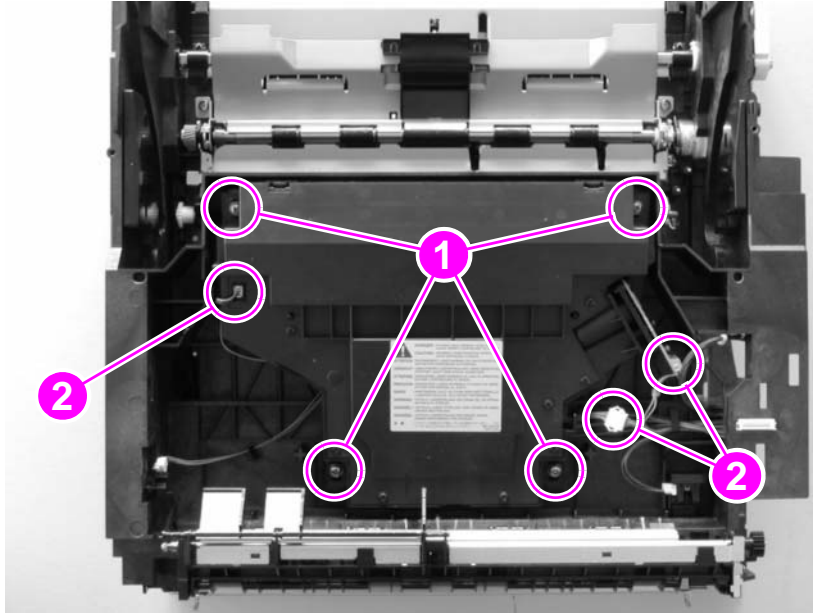
**Figure 96.** Delivery roller removal (2 of 2)

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**Note** As you reinstall the roller, realign the lower delivery rollers.

## Laser/scanner assembly

- 1 Remove the top cover (see page 115) and the face-down bin cover (page 122).
- 2 Facing the back of the printer, remove the four screws (callout 1) that hold the assembly to the chassis.
- 3 Disconnect three cables (callout 2).
- 4 Lift the laser/scanner assembly out of the chassis.



**Figure 97.**

**Laser/scanner assembly removal (top, inside view of printer)**

---

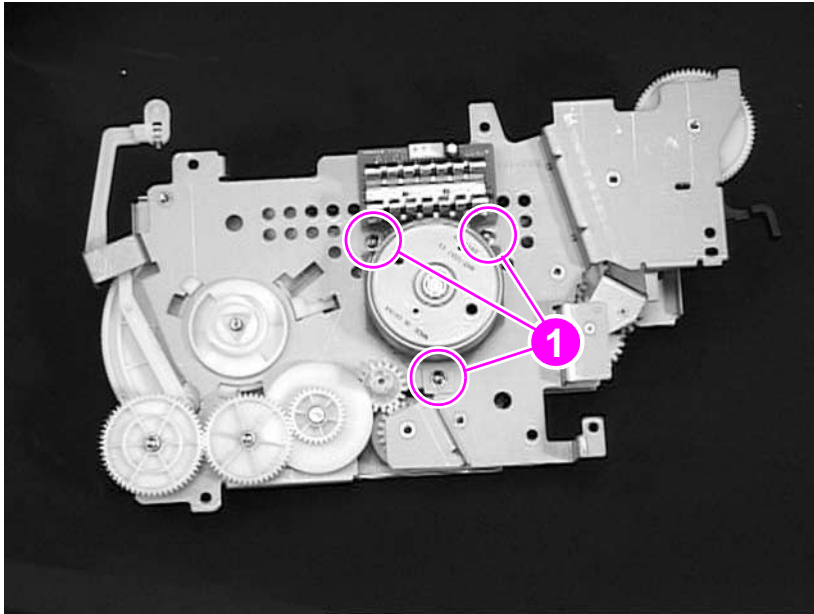
### Note

You might have to readjust the top margin after you replace the laser/scanner assembly (see page 132).

---

## Main motor

- 1 Remove the main gear assembly (see page 134).
- 2 Remove the three screws (callout 1) that secure the motor to the back of the main gear assembly.



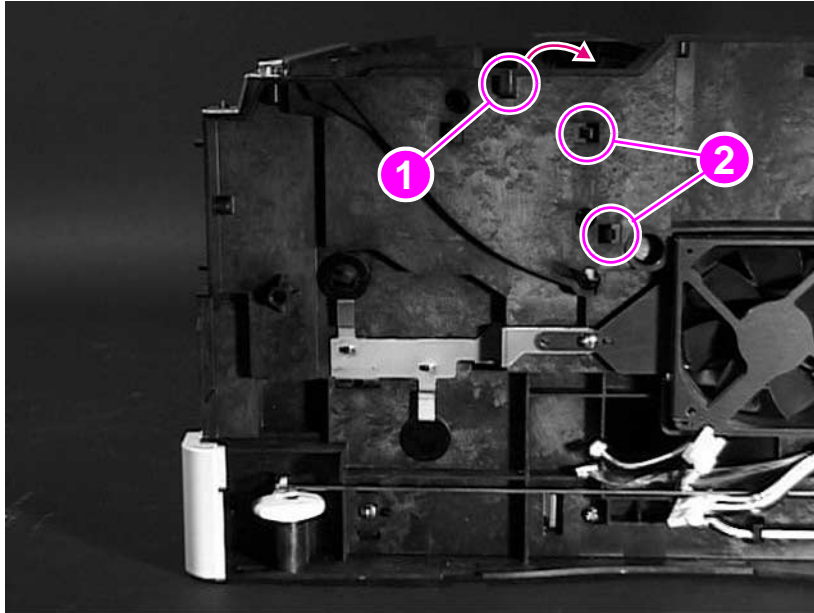
**Figure 98.**

**Main motor removal (rear view)**

- 3 Carefully separate the motor from the gear assembly.

## Toner cartridge guides

- 1 Remove the top cover (see page 115) and the left and right side covers (page 123).
- 2 Release the “leading” tab (callout 1) first.
- 3 Rotate the right guide clockwise and the left guide counterclockwise to unlock the remaining two tabs.
- 4 Slide the guide out of the chassis.



**Figure 99.** Toner cartridge guide removal (shown from right side)

---

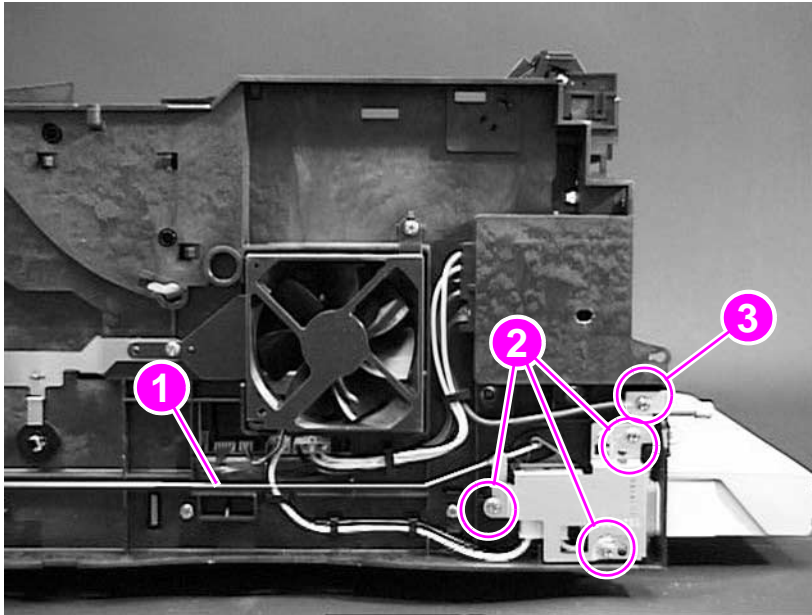
### Note

To reinstall the guide, insert the two “non-leading” tabs (callout 2) first. Twist the right guide counterclockwise and the left guide clockwise to lock the guides. Gently flex the “leading” tab so that it will fit into the slot easily. Then snap the guide into place.

---

## Power inlet assembly

- 1 Remove the top cover (see page 115) and the right side cover (page 123).
- 2 Remove the switch rod (callout 1) by flexing it slightly and unhooking it from the switches on each end.
- 3 Remove the three self-tapping screws (callout 2) from the power inlet housing.
- 4 Remove the machine screw (callout 3) and grounding wire.



**Figure 100.**

### Power inlet assembly removal

- 5 Unthread the line-voltage cable from the frame.
- 6 Press down the top of the line-voltage connector to release it from the power-supply PCA.

## Optional 250-sheet feeder

### Separation pad

- 1 Empty the paper from the tray.

#### Note

Callout 1 in figure 101 shows a detail of the separation pad.

- 2 While pressing down the paper lift plate (callout 2), reach under the front of the tray and squeeze the black tabs (callout 3 in figure 102) to release the separation pad from the tray.

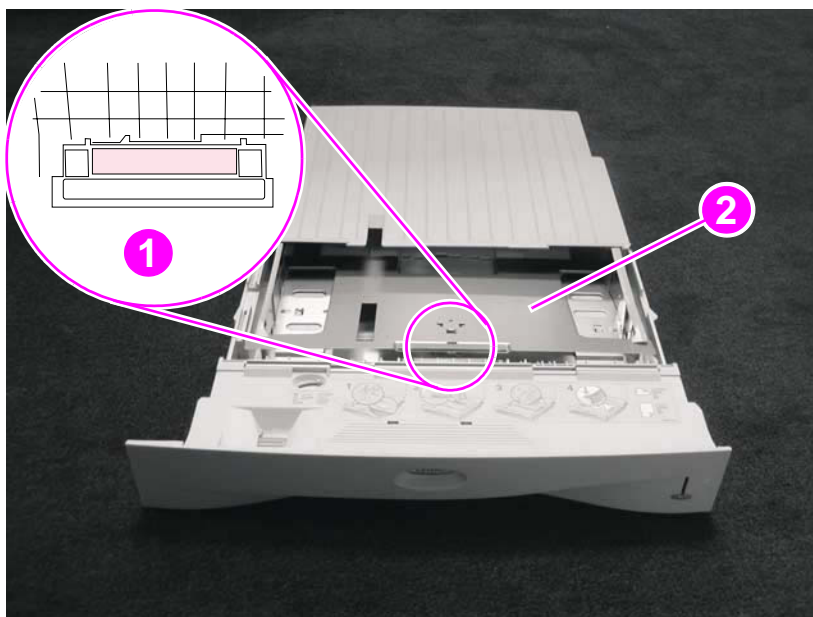


Figure 101.

Optional 250-sheet feeder separation pad removal (1 of 2)

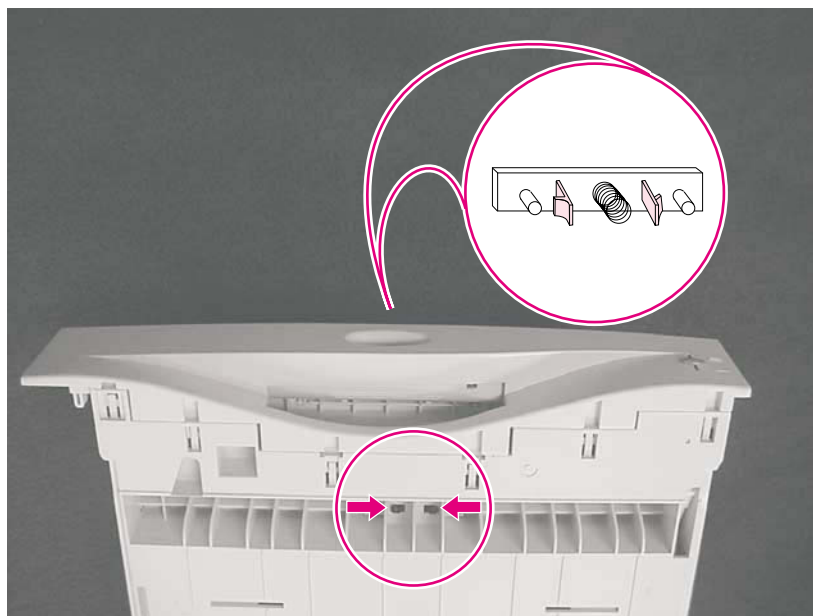


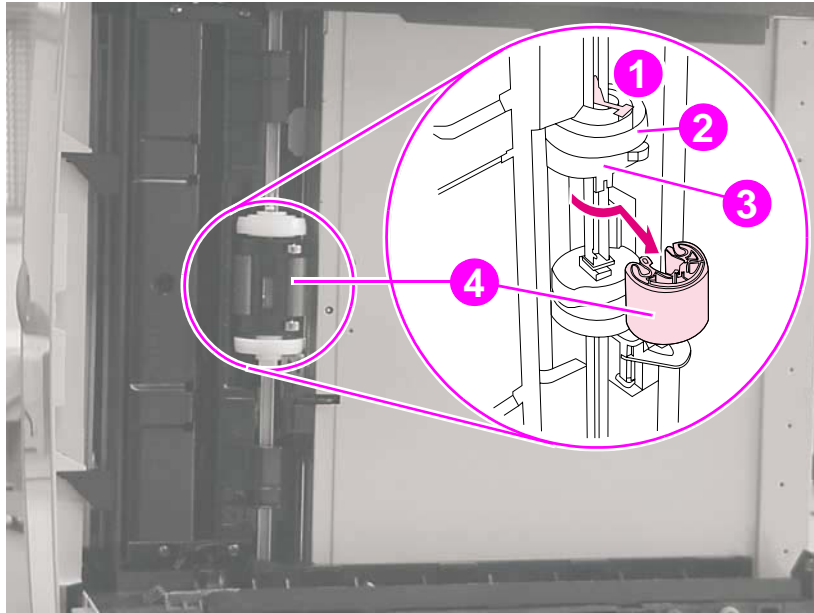
Figure 102.

Optional 250-sheet feeder separation pad removal (2 of 2)

- 3 If necessary, pull the spring off of the old separation pad, and then insert the spring onto the new separation pad.

## Pickup roller

- 1 Remove the optional 250-sheet tray.
- 2 Set the feeder upside down on the work surface.
- 3 Press the locking tab (callout 1) on the white, side cam (callout 2), and slide the cam and the black bushing (callout 3) away from the roller (callout 4).
- 4 Slide the roller between the two cams, rotate the roller 180 degrees, and then remove the roller from the shaft.



**Figure 103.**

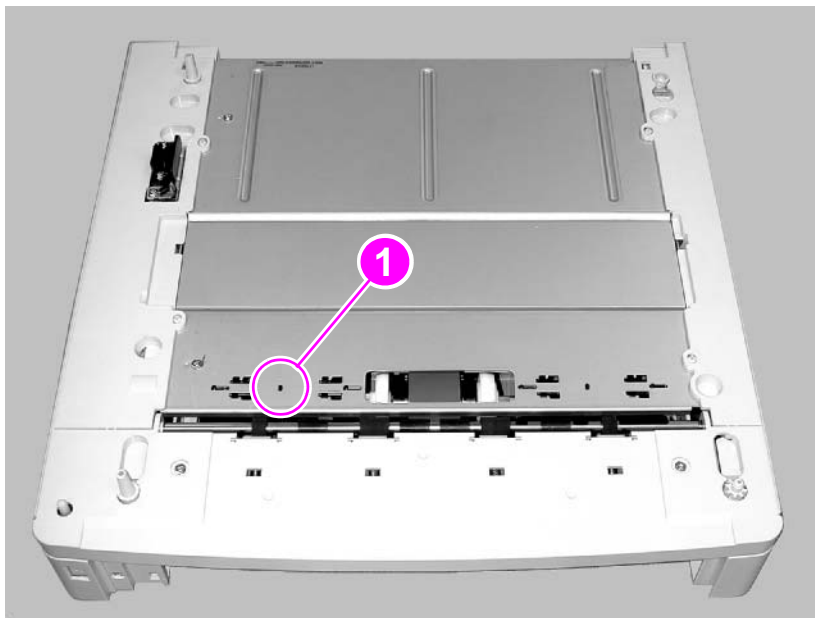
**Optional 250-sheet feeder pickup roller removal (bottom of the printer)**

### To reinstall

Orient the pin on the roller so that it lines up with the hole in one of the side bushings. Slide the cam toward the roller until the tab snaps into place.

## Sensing flag

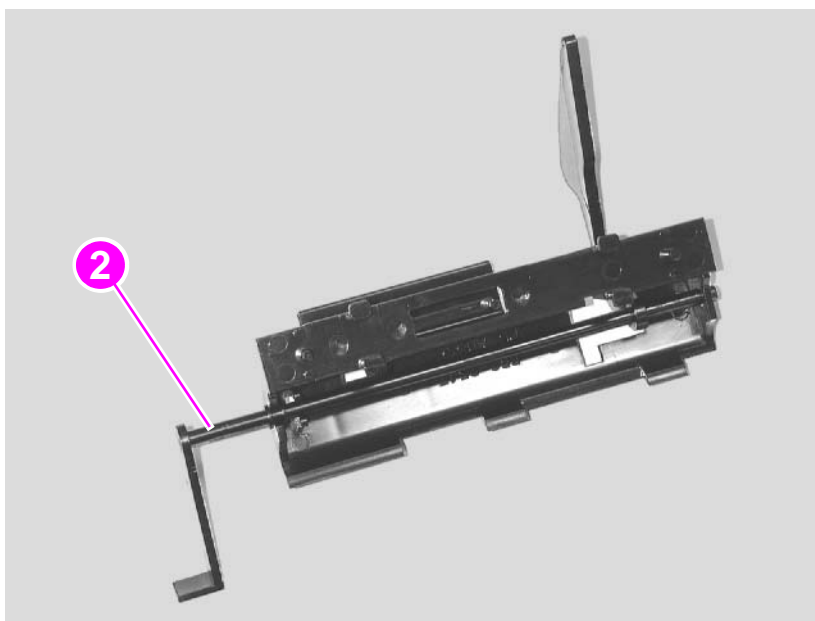
- 1 Place the optional 250-sheet feeder face-up on a work surface and remove the 250-sheet tray.
- 2 Use the small flat-blade screwdriver to press the locking tab (callout 1).



**Figure 104.**

**Optional 250-sheet feeder sensing flag removal (1 of 2)**

- 3 From the other side of the base plate, use your other hand to slide the paper-sensing-arm assembly to the right.
- 4 Lift the paper-sensing flag (callout 2) from the assembly.



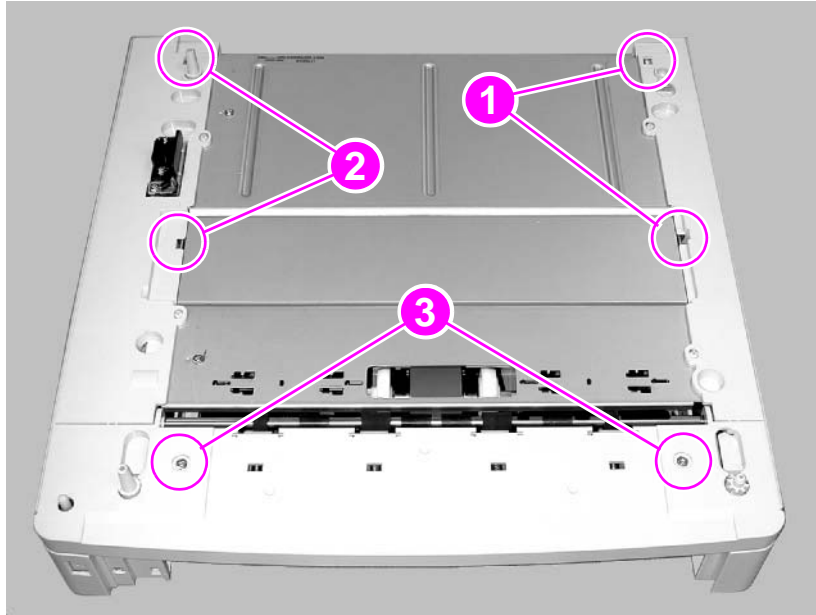
**Figure 105.**

**Optional 250-sheet feeder sensing flag removal (2 of 2)**



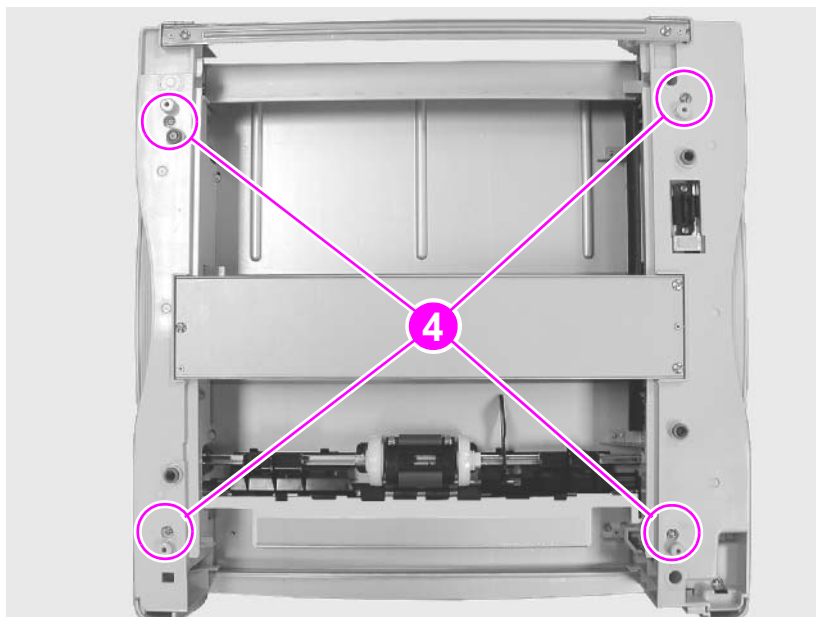
## Control PCA

- 1 Place the optional 250-sheet feeder face-up on a work surface and remove the 250-sheet tray.
- 2 Press the two tabs (callout 1) on the right side top cover and lift off the cover.
- 3 Press the two tabs (callout 2) on the left side top cover and lift off the cover.
- 4 Remove two screws (callout 3) from the front top cover and lift off the cover.



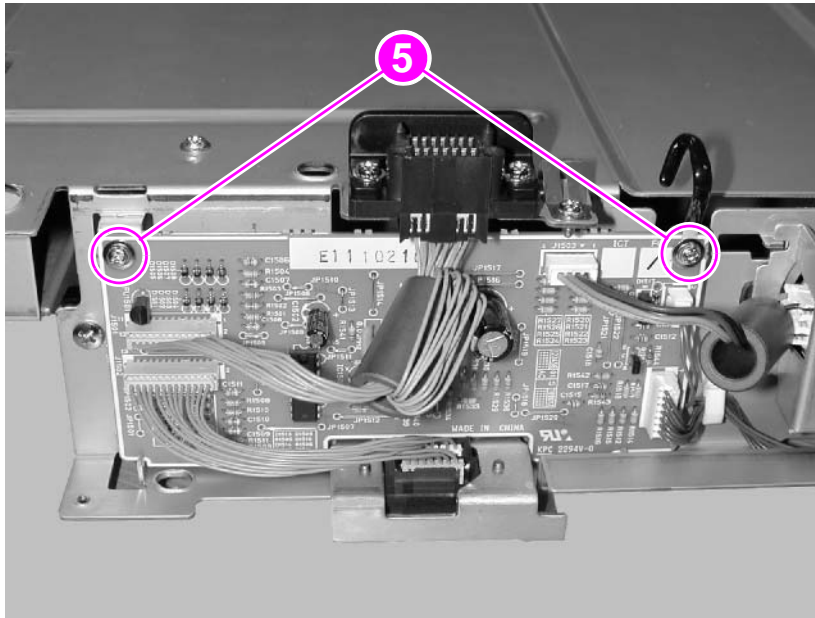
**Figure 106.** Optional 250-sheet feeder control PCA removal (1 of 3)

- 5 Turn the feeder upside-down.
- 6 Remove the four screws (callout 4) that secure the frame to the sheet metal, and then lift the frame off of the feeder assembly.



**Figure 107.** Optional 250-sheet feeder control PCA removal (2 of 3)

- 7 Turn the feeder assembly over so that it is face-up on the work surface.
- 8 Remove all cables attached to the feeder control PCA.
- 9 Remove the two screws (callout 5) that secure the PCA to the frame and lift the PCA off of the frame.

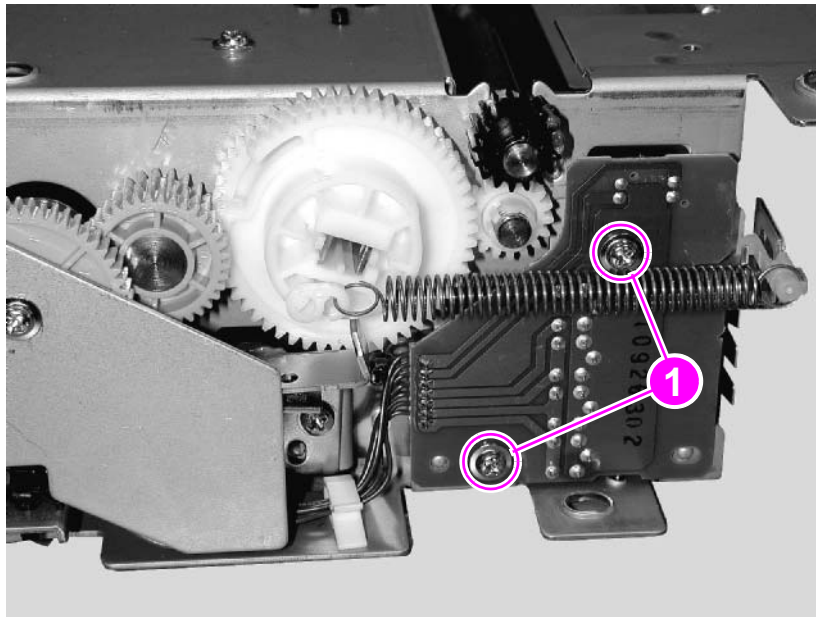


**Figure 108.**

**Optional 250-sheet feeder control PCA removal (3 of 3)**

## Paper-size spring assembly

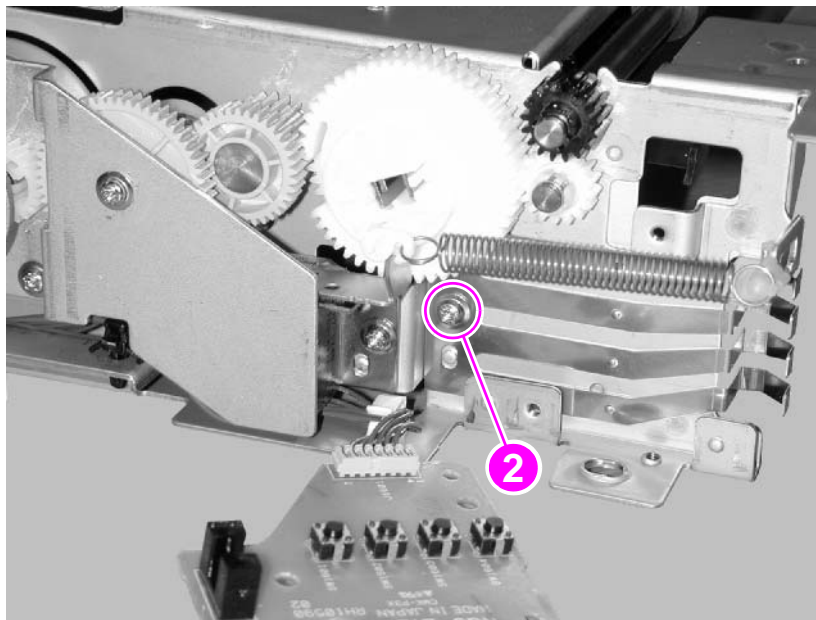
- 1 Complete steps 1 through 6 of the feeder control PCA removal procedure (see page 171).
- 2 Turn the feeder assembly over so that it is face-up on the work surface.
- 3 Remove the two screws (callout 1) that secure the paper size switch PCA to the frame.



**Figure 109.**

**Optional 250-sheet feeder paper-size spring assembly removal (1 of 2)**

- 4 Carefully lower the PCA down to the work surface to gain access to the paper-size spring assembly.
- 5 Remove the screw (callout 2) that secures the paper-size spring to the frame and lift the spring from the frame.



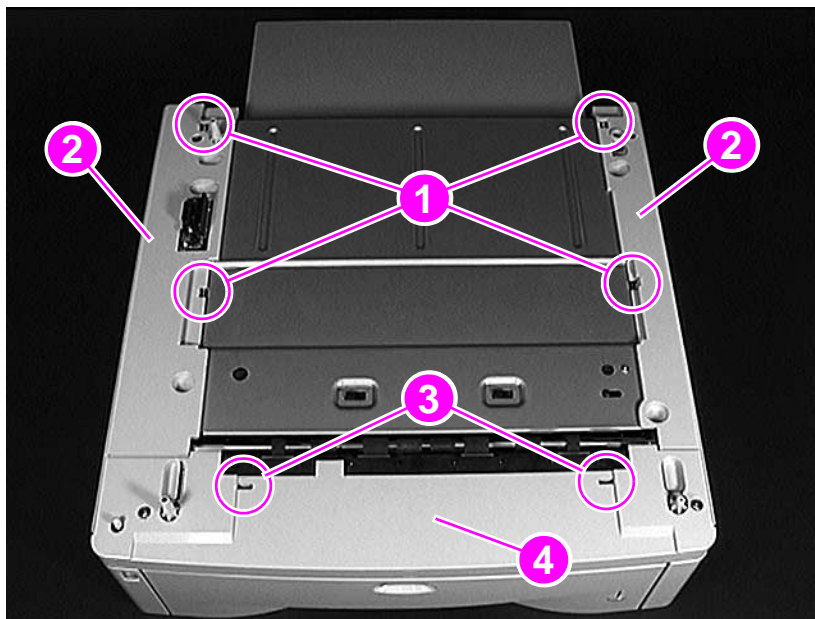
**Figure 110.**

**Optional 250-sheet feeder paper-size spring assembly removal (2 of 2)**

## Optional 500-sheet feeder

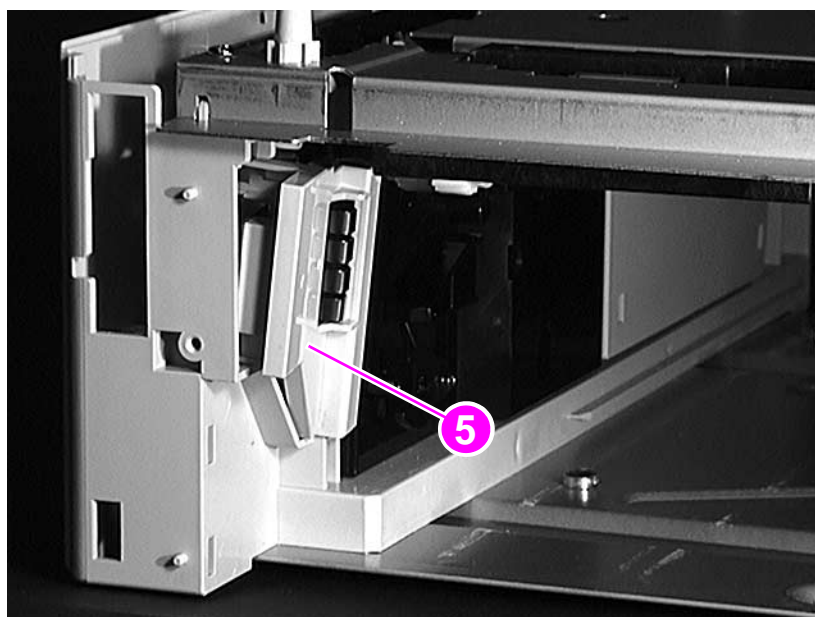
### Covers and base frame

- 1 Use the flat-blade screwdriver to press down four locking tabs (callout 1) and then remove the right and left auxiliary covers (callout 2).
- 2 Use the flat-blade screwdriver to press down the two locking tabs (callout 3) on the top of the front cover (callout 4) and then remove the front cover by reaching under the lip of the cover and pulling it toward you, one end at a time.



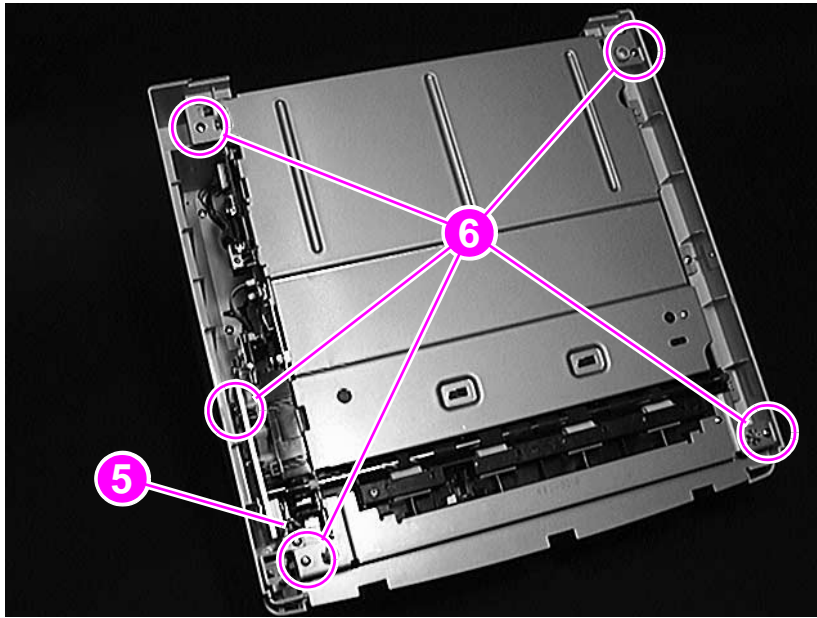
**Figure 111.** 500-sheet feeder removal (1 of 2, top view)

- 3 Remove the paper-size sensing springs (callout 5) by disengaging the locking tabs from the left frame assembly.



**Figure 112.** Paper-size spring assembly removal

4 Remove the five self-tapping screws (callout 6).



**Figure 113.**

**500-sheet feeder removal (2 of 2, top view with covers removed)**

## Tray indicator assembly

- 1 Remove the base frame from the 500-sheet feeder assembly (see page 174).
- 2 Remove the left front corner cover screw (callout 1).
- 3 Remove the cover.
- 4 Remove the top self-tapping screw.
- 5 Remove the tray indicator assembly (callout 2).

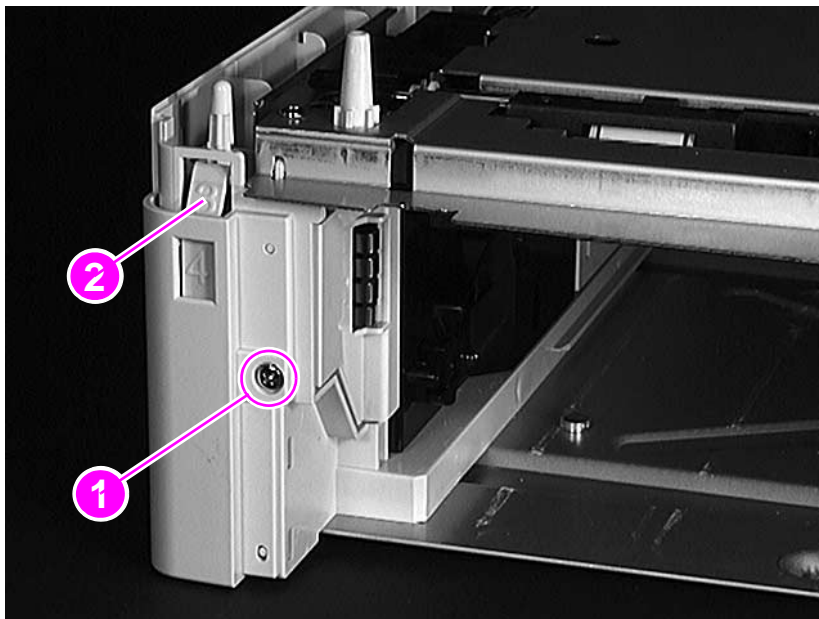


Figure 114.

Tray indicator assembly removal



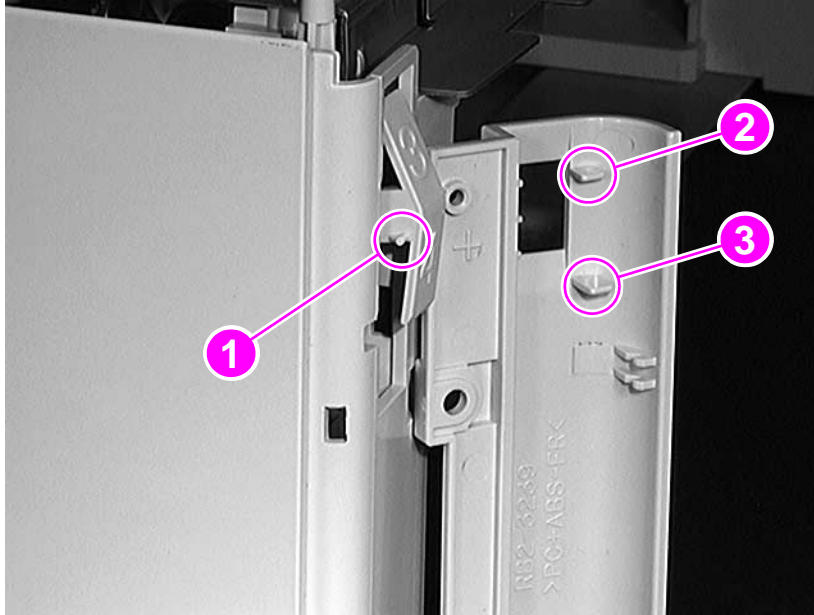
## Left front corner cover installation

- 1 Install the tray indicator assembly.
- 2 Depress the indicator so that the tray indicator limit tab (callout 1) is between the upper limit stop (callout 2) and the lower limit stop (callout 3), and then reinstall the cover.

---

### Note

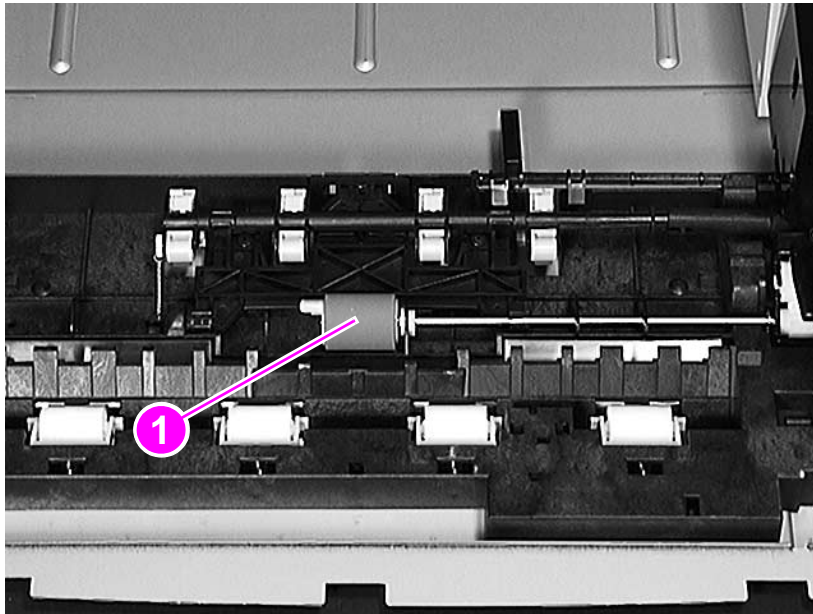
Make sure that the tray indicator operates correctly.



**Figure 115.** Installing the left front corner cover

## 500-sheet feeder feed roller

- 1 Place the feeder upside down on the work surface.
- 2 Pinch the feed roller tab and slide the feed roller (callout 1) off of the shaft.

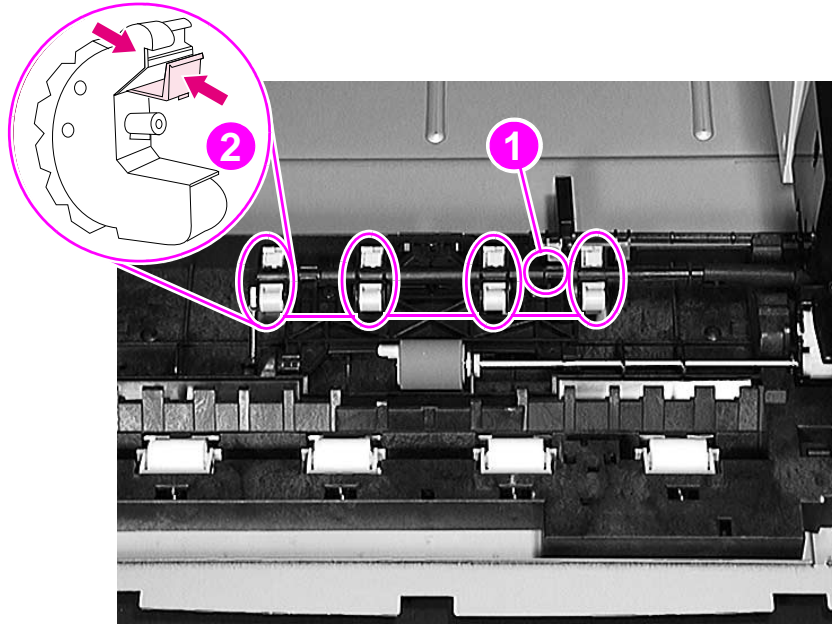


**Figure 116.** 500-sheet feeder feed roller removal



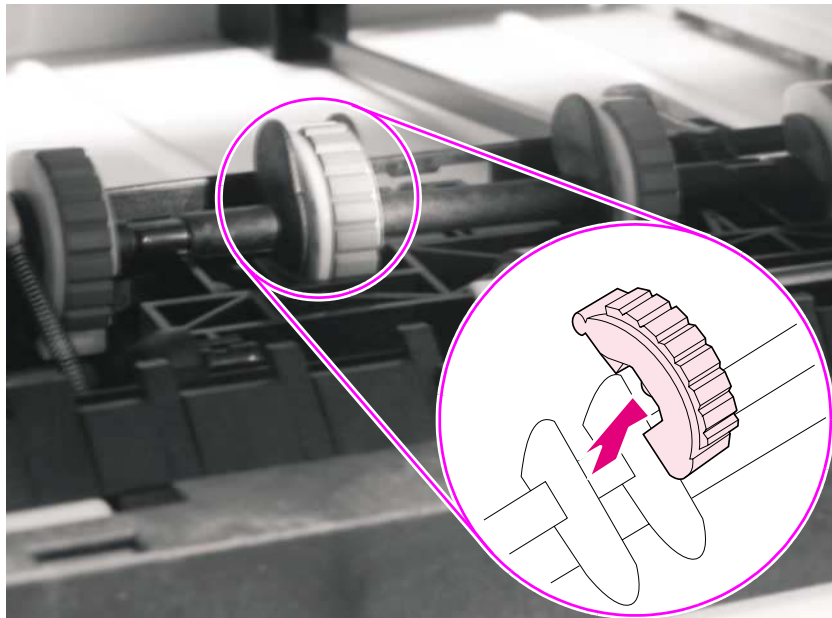
## 500-sheet feeder pickup roller

- 1 Place the feeder upside down on the work surface.
- 2 With one hand, rotate the pickup roller shaft (callout 1) 90 degrees.
- 3 With the other hand, press the locking tab on each of the rollers (callout 2) and push the rollers back slightly from their secured positions.



**Figure 117.** 500-sheet feeder pickup roller removal (1 of 2)

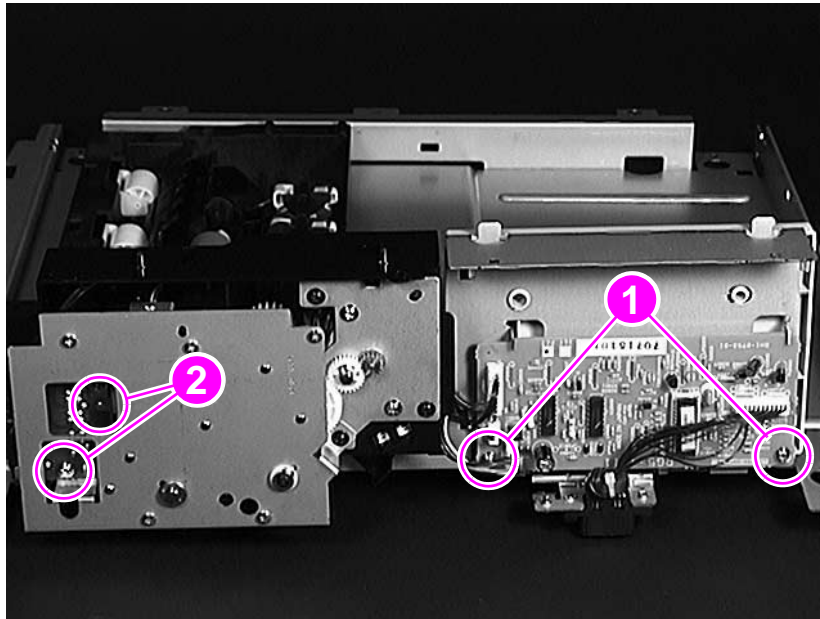
Rotate the pickup roller shaft another 90 degrees to remove the rollers completely from the shaft.



**Figure 118.** 500-sheet feeder pickup roller removal (2 of 2)

## 500-sheet feeder PCAs

- 1 Remove the feeder assembly from its base frame (see page 174) and place it upside down on the work surface.
- 2 Remove the 500-sheet feeder PCA by disconnecting the cables and then removing the two machine screws (callout 1).
- 3 Disconnect two cables from the paper-size switch PCA.
- 4 Remove two washer-head screws (callout 2), and then lift the PCA from the frame.

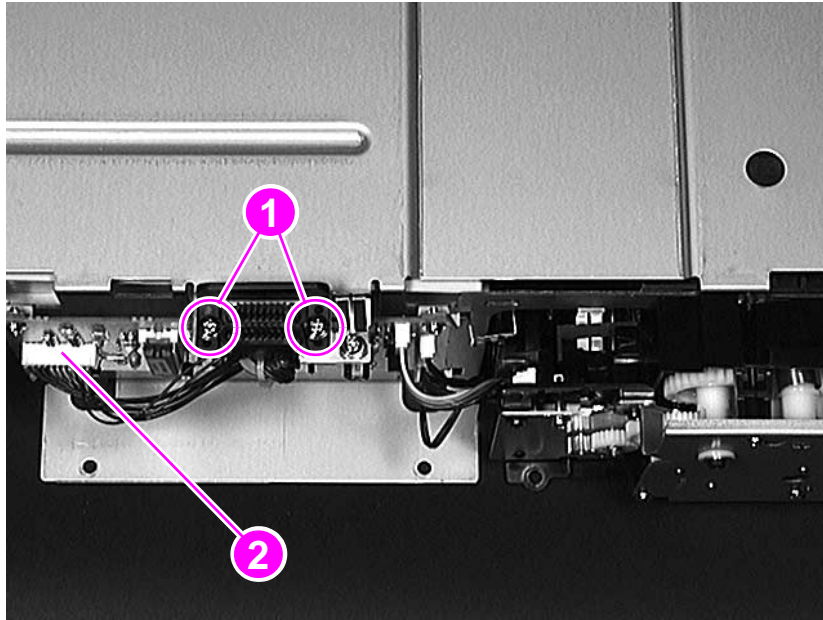


**Figure 119.**

**Gear assembly, 500-sheet feeder PCA, and paper-size switch PCA removal**

## 500-sheet feeder power connector

- 1 Remove the left cover from the 500-sheet feeder (see page 174).
- 2 Remove the two screws (callout 1).
- 3 Disconnect one cable (callout 2).



**Figure 120.** Power connector removal

- 4 Lift the connector off of the frame.

## 500-sheet feeder separation roller

- 1 With one hand, lift the return cover (callout 1) on the 500-sheet tray.
- 2 With the other hand, pinch the separation roller tab.
- 3 Slide the separation roller (callout 2) off of the shaft.

---

### Note

Make sure that the torque limiter remains in position.

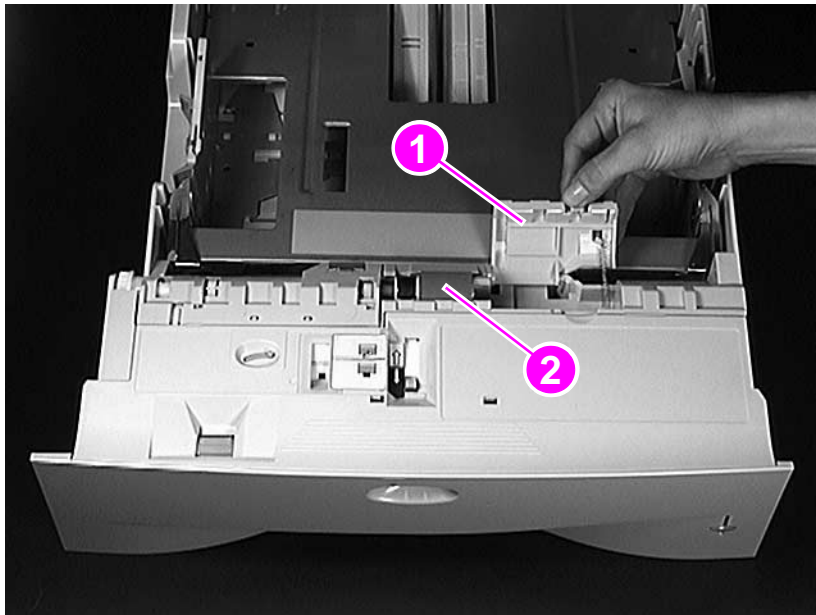


Figure 121.

Separation roller removal

# 7

# Troubleshooting

## Overview

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# Troubleshooting process

The troubleshooting process is a systematic approach that addresses the major problems first, then other problems as you identify the causes for printer malfunctions and errors.

The following list describes the basic questions to ask the customer and the corresponding troubleshooting step to help you quickly define the problem(s). Use the process flow on page 185 to investigate printer malfunctions and errors more carefully and then pursue the best approach to troubleshooting.

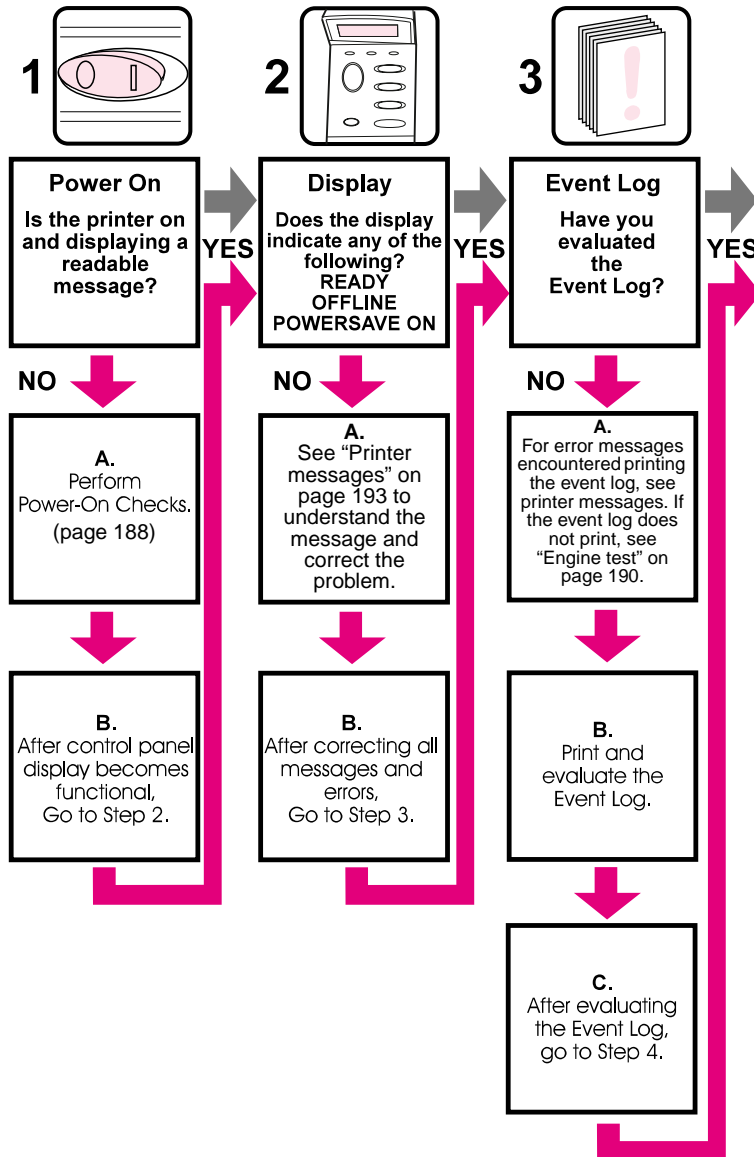
**Table 28. Major steps for troubleshooting**

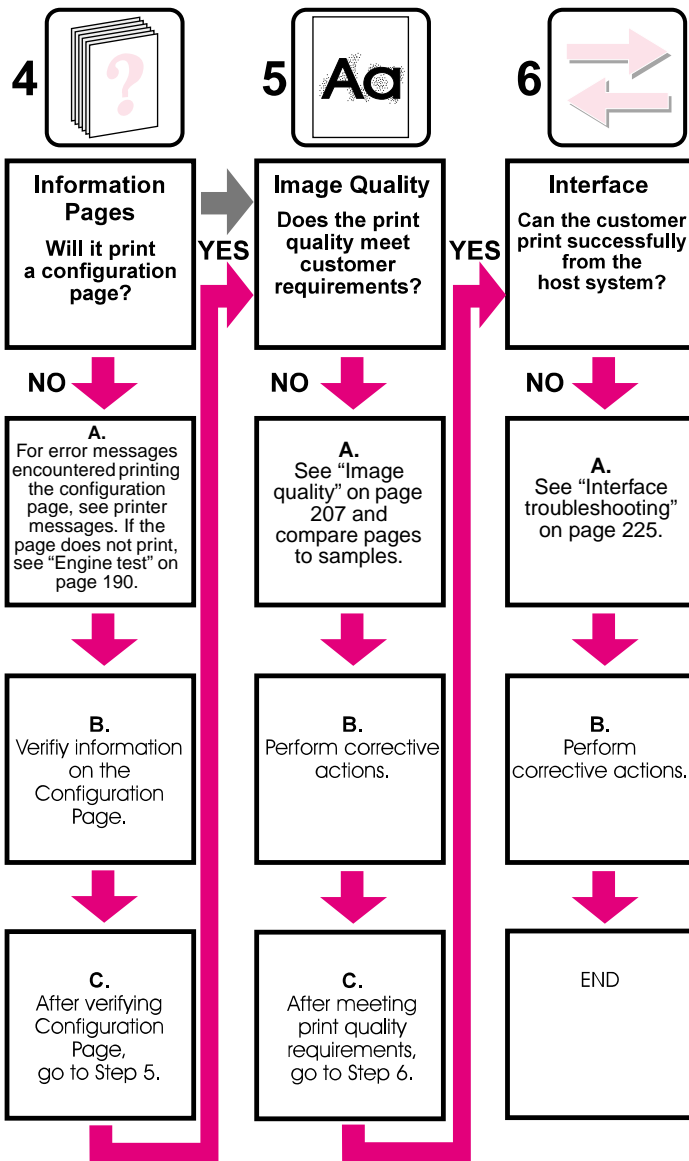
<a href="#">Power on (page 188)</a>	Does the printer perform the initialization and power-on steps?  This section contains the procedures for correcting power supply problems.
<a href="#">Display (page 190)</a>	Does the control panel show <b>READY</b> , <b>OFFLINE</b> , or <b>POWERSAVE ON</b> ?  This section contains the procedures for clearing control panel error messages and reading and correcting event log codes.
<a href="#">Event log (page 191)</a>	Does the event log show recurring problems?  This section contains information about printing the event log and evaluating the history.
<a href="#">Printer messages (page 193)</a>	How should I respond to messages on the display or in the event log?  This section describes printer messages and recommends actions.
<a href="#">General paper-path troubleshooting (page 202)</a>	Does paper jam in the printer?  This section contains information about solving problems in the paper path.
<a href="#">Information pages (page 204)</a>	Will the printer print information pages successfully?  This section contains the procedures for printing the information pages and evaluating and correcting the printer's configuration.
<a href="#">Image quality (page 207)</a>	Does the print quality meet the customer's expectations?  This section contains toner cartridge checks, information about EconoMode, image-defect examples, and the repetitive defect ruler.
<a href="#">Interface troubleshooting (page 225)</a>	Can the customer print from the host system successfully?  This section describes how to determine if the printer is communicating correctly with the host system.
<a href="#">Reference diagrams (page 227)</a>	What if the failure doesn't fit these categories?  This section provides printer reference information to help the troubleshooting process.

# Troubleshooting process flow

The following troubleshooting process flow illustrates the major steps for troubleshooting the printing system. Each heading depicts a major troubleshooting step.

- A YES answer to a question directs you 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 the printing system

## Preliminary operating checks

Before troubleshooting a specific printer problem, make sure that the following conditions are met:

- The printer is being maintained on a regular basis and in accordance with the procedures described in chapter 4.
- The customer is using acceptable print media as specified in the *HP LaserJet Printer Family Paper Specification Guide*.
- The printer is positioned on a solid, level surface.
- The line voltage does not vary more than 10 percent from the nominal rated value specified on the power-rating label.
- The operating environment for the printer and print media is within the temperature and humidity specifications listed in chapter 1 of this manual.
- The printer is never exposed to ammonia fumes, including those produced by diazo copiers or office cleaning materials.
- The printer is not exposed to direct sunlight.
- Non-HP components (such as refilled toner cartridges, font cartridges, and memory boards) are removed from the printer.

---

### Note

When the printer is moved into a warm room from a cold location such as a warehouse, various problems can result because of cold printer parts and condensation in the printer. For example, if the photosensitive drum is cold, the resistance of the photoconductive layer will be high. This will lead to incorrect contrast. Leave the printer idle for 10 to 20 minutes before printing so that the printer can warm to the temperature of the room and to dissipate condensation.

---

## Power on

It is important to have the printer control panel functional as soon as possible in the troubleshooting process so that the printer's diagnostics can assist in locating printing errors.

**Table 29. Power on defect or blank display**

<b>Problem</b>	<b>Action</b>
Is the power cord plugged into the wall and the printer? Is ac and dc power available?	Verify that power is available. See table 30 on page 189 and table 31 on page 189.
Is the power switch set to on?	Set the switch to the on position. You should hear the switch toggle. If the front right side cover has been removed recently, make sure that the rod that leads to the power supply moves as the rocker-switch is toggled.
Does the fan turn on briefly when you turn on the printer?	<p>Note: fan operation is significant because the dc controller controls the fan. An operational fan indicates the following conditions:</p> <ol style="list-style-type: none"><li>1. Ac power is present in the printer.</li><li>2. Dc power supply is functional (24 Vdc, 5 Vdc, and 3.4 Vdc are being generated).</li></ol> <p><b>If the fan is not working:</b></p> <ol style="list-style-type: none"><li>1. Turn off the printer and remove the formatter. Disconnect all of the paper-handling options.</li><li>2. Turn on the printer and check the fan again.</li></ol> <p>If the fan is still not working, perform the following steps:</p> <ol style="list-style-type: none"><li>1. Verify that the fan is connected to the power supply.</li><li>2. Replace the fan.</li><li>3. Replace the power supply.</li><li>4. Replace the dc controller</li></ol> <p><b>If the fan is working but the printer control panel is blank:</b></p> <ol style="list-style-type: none"><li>1. Print an engine test. See "Engine test" on page 190. If the engine test is successful, try the following remedies:<ol style="list-style-type: none"><li>a. Reseat the control panel and formatter.</li><li>b. If the problem persists, replace the control panel assembly.</li><li>c. If the problem persists, replace the formatter.</li><li>d. If the problem persists, replace the cable from the control panel.</li></ol></li><li>2. If the engine test is not successful:<ol style="list-style-type: none"><li>a. Remove the formatter and try again. If the engine test is now successful, replace the formatter. If the problem persists, replace the dc controller.</li><li>b. If the problem persists, verify that the button on paper-handling PCA and the cable to dc controller are in working order. Replace as necessary.</li><li>c. If the problem persists, replace the dc controller.</li><li>d. If the problem persists, replace the power supply.</li></ol></li></ol>

**Table 30. No ac power**

<b>Cause</b>	<b>Action</b>
No correct voltage present at the outlet.	Plug the power cord into another ac circuit outlet. Inform the customer that the correct line voltage is not available at the outlet.
The power cord is not firmly plugged into the printer and the outlet.	Insert the plug on the power cord firmly.
Blown fuse.	1. Check the fuses—F1 and F2—on the power supply. 2. Replace the fuses if necessary.
Defective power switch.	Remove the dc controller and power supply. Measure the resistance between the two terminals of the power switch (SW101) by applying the tester probes to the terminals. The resistance must be low (under 1 K $\Omega$ ) when the power is turned ON, and high (over 6 M $\Omega$ ) when the switch is turned OFF. If resistance does not meet these thresholds, replace the printer power supply.
Defective ac receptacle or printer power supply.	Check the printer's ac receptacle and wiring for the ac power line. If no problem is found, replace the power supply.

**Table 31. No dc power**

<b>Cause</b>	<b>Action</b>
No ac power is supplied.	Check the ac power supply (see table 30).
The overcurrent/overvoltage detection circuit is activated.	If the problem is not rectified after the power switch is turned off and on again, find the cause of activation of the overcurrent/overvoltage detection circuit in the power supply. Wait for more than two minutes before turning the printer back on.
Blown fuse.	1. Check the fuses—F1 and F2—on the power supply. 2. Replace the fuses if necessary.
Defective power supply unit.	Replace the printer power supply.

## Engine test

The engine test verifies that the print engine is functioning correctly. The formatter is bypassed during an engine test, but it can still interfere with the test. The engine test is very useful for isolating printer problems. Because the engine test prints a full page of lines across the entire printable area, it is also useful for checking and adjusting registration.

---

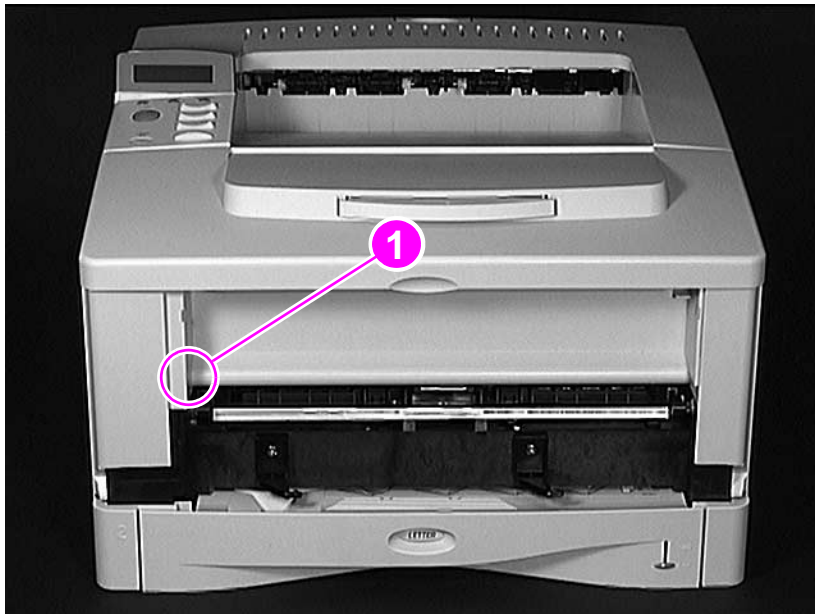
### Note

Make sure that the toner cartridge is installed in the printer before you perform an engine test.

The engine test prints either from Tray 2 (the default), or from the last tray used, and can be activated with the formatter removed. If the last tray that was used is empty or if the last source was the duplexer, then the engine test will print from Tray 2.

If Tray 2 is empty, and the last tray that was used is empty, or if the last page went through the duplexer, or if the printer is in PowerSave mode, then the engine test will not function.

## Engine test button location



**Figure 122.** Location of the engine test button (callout 1)

## Printing an engine test

To print an engine test, use a nonmetallic object of 40 mm (1.5 inches) minimum length to press the engine test button. A single test page with horizontal lines prints. To print multiple test pages, hold down the engine test button.

## Display

The control panel should show `READY`, `OFFLINE`, or `POWERSAVE ON` when the printer is on and idle. For information about error messages, see “Printer messages” on page 193, or see the event log. If the display is blank, see “Preliminary operating checks” on page 187.

## Event log

Use the event log to diagnose and troubleshoot printer errors and intermittent failures. You can either view the event log on the control panel, or you can print it.


Open the event log from the control panel information menu. (Select **PRINT EVENT LOG** or **SHOW EVENT LOG**.) The event log retains the printer's last 30 error messages.

See the list of printer messages that begins on page 193 for more information about correcting event log messages on the printer.

### Note

The event log codes and the error message that appears on the control panel do not always correspond exactly. The numbers in the control panel message might not be the same in the event log; the decimal numbers might be shifted by one digit. For example, 13.1 on the control panel appears as 13.01 in the event log.



**HP LaserJet 5100 series printers**  **HEWLETT®  
PACKARD**

**Event Log Page**

Current Page Count: 170 Serial Number: XXXXXXXXXX

Number	Error	Page Count	Description or Personality
20	41.03.00	135	PCLXL
19	13.1.50	134	PAPER FEED 1, PAPER LATE JAM
18	41.03.00	112	PCLXL
17	41.03.00	111	PCLXL
16	41.03.00	110	PCLXL
15	41.03.00	109	PCLXL
14	41.03.00	106	PCLXL
13	13.1.50	103	PAPER FEED 1, PAPER LATE JAM
12	41.03.00	101	PCLXL
11	41.03.00	100	PCLXL
10	41.03.00	99	PCLXL
9	41.03.00	92	PCLXL
8	41.03.00	91	PCLXL
7	41.03.00	90	PCLXL
6	41.03.00	89	PCLXL
5	41.03.00	72	PCLXL
4	41.03.00	71	PCLXL
3	41.03.00	70	PCLXL
2	41.03.00	69	PCLXL
1	50.02.00	0	

**Figure 123.** Event log page

## View the event log at the control panel

If the printer cannot print or move any paper, follow these steps to view the event log at the control panel:

- 1 Press **[MENU]** until `INFORMATION MENU` appears.
- 2 Press **[ITEM]** until `SHOW EVENT LOG` appears.
- 3 Press **[SELECT]** to show the event log.
- 4 Press **[+]** to scroll through the event log.
- 5 Write down the error messages.
- 6 Check the event log for specific error trends in the last 10,000 printed pages.
- 7 Ask the customer for any observed error trends. (For example, do jams tend to occur in a specific area of the printer?)
- 8 Record any specific error trends.
- 9 See table 32, “Printer messages,” on page 193 and follow the recommended action.
- 10 If the control panel shows `READY`, `OFFLINE`, or `POWERSAVE ON`, go to the next section. If it shows any other message, see “Printer messages” on page 193.

## Print the event log

The printer’s internal event log stores the last 30 errors. To print the event log:

- Press **[MENU]** until `INFORMATION MENU` appears.
- Press **[ITEM]** until `PRINT EVENT LOG` appears.
- Press **[SELECT]** to print the event log.

## Interpret the event log

The event log is the key tool for troubleshooting printer problems. Figure 123 shows a typical event log. The event log shows the current page count at the top, left of the page. The printer’s serial number appears directly to the right of the page count. The left column shows the error sequence number, with the most recent error listed first (the highest sequence number is the most recent error logged). The next column is the page count at the time of the error. The last column contains a short description of the error or the personality (PCL or PostScript) at the time of the error.

The event log might record errors in a different format than the format that appears on the control panel. For example, if `50.1 FUSER ERROR / CYCLE POWER` appears on the control panel, the event log shows a `50.02.01` error, in which the `02` signifies that two sensors were blocked. Likewise, when messages `13.1` through `13.9` appear on the control panel, the event log shows `13.0x.01` through `13.0x.09`, where `x` = the number of sensors that were blocked in the printer.

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**Note** Whenever a `13.XX` appears on the control panel, a good practice is to clear all jams from the printer and print the event log. If you cannot print the event log, you can still view it on the control panel.

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To interpret the event log:

- Each individual entry in the log is called an “error,” and all errors that occur at the same page count are called an “event.” Read the recommended action for each error within an event to gain a clear picture of what took place during that event. Events usually conclude with a time-out or with no response from the printer (Error `66.XX` in the event log) which requires a power cycle of the print engine.
- Use the message column in table 32, “Printer messages,” on page 193, to associate error messages in the event log with the control panel error messages. Follow the recommended action listed in the table for each error or event.

## Printer messages

The following table explains messages that might appear on the printer control panel.

### Note

If the message requesting that you load a tray persists, and you know that the tray is not empty, or if a message indicates that a previous print job is still in the printer's memory, press **[Go]** to print the job or press **[CANCEL JOB]** to clear the job from the printer's memory.

Not all messages are described; some are self-explanatory.

Some printer messages are affected by the auto-continue and clearable warning settings from the printer control panel configuration menu. If `CLEARABLE WARNING=JOB` is set on the control panel, warning messages appear on the control panel until the end of the job from which they were generated. If `CLEARABLE WARNING=ON` is set, warning messages appear on the control panel until **[Go]** is pressed. If an error occurs that prevents a print job from 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 appears until **[Go]** is pressed.

**Table 32. Printer messages**

Message	Explanation or recommended action
ACCESS DENIED MENUS LOCKED	The printer control panel function you are trying to use has been locked to prevent unauthorized access. See the network administrator.
BAD DUPLEXER CONNECTION	The duplexer is not connected correctly. Reinstall the duplexer.
CHECK INPUT DEVICE alternates with PAPER PATH OPEN PLEASE CLOSE IT	The optional input tray cannot feed paper to the printer because a door or paper guide is open, or the paper path is blocked. Check the doors, trays, and paper guides.
CHECKING PAPER PATH	The engine has activated its rollers to check for possible paper jams.
CHOSEN LANGUAGE NOT AVAILABLE	A print job requested a printer language that does not exist in the printer. The job will not print and will be cleared from memory. Print the job using a driver for a different printer language, or add the requested language to the printer, if it is available. <b>Note:</b> PostScript is not available for the HP LaserJet 5100Le printer. Press <b>[Go]</b> to continue.
CLOSE TOP COVER	The top cover is open and must be closed in order for printing to continue.
DISK DEVICE FAILURE	The EIO disk had a critical failure and can no longer be used. Remove the EIO disk and replace it with a new one.
DISK FILE OPERATION FAILED	The requested operation could not be performed. You might have attempted an illegal operation, such as trying to download a file to a nonexistent directory.
DISK FILE SYSTEM IS FULL	Delete files from the EIO disk and then try again, or add a flash DIMM. Download or delete files from HP Jetdirect, and download or delete fonts. (See the printer software help for more information.)
DISK IS WRITE PROTECTED	The EIO disk is protected, and no new files can be written to it. Disable the write protection through HP Jetdirect.
EIO n NOT FUNCTIONAL	The EIO network card is not working correctly. Reseat the EIO accessory. If the message continues, replace it with a new EIO accessory.

**Table 32. Printer messages**

Message	Explanation or recommended action
EIO n DISK INITIALIZING	The disk accessory card takes a long time to initialize. The first parameter is the accessory slot number for this disk accessory card.
EIO n DISK NOT FUNCTIONAL	The EIO disk is not working correctly. Remove the EIO disk from the slot indicated. Reseat the EIO disk. If the message continues, install a new EIO disk.
EIO n INITIALIZING alternates with DO NOT POWER OFF	Wait for the message to disappear (approximately 5 minutes). If the printer EIO card is operating correctly and communicating with the network, this message disappears after approximately one minute and no action is required. If the EIO card is unable to communicate with the network, this message remains for five minutes and then disappears. In this case the printer is not communicating with the network (even though the message is no longer present). The problem might be a bad EIO card, a bad cable or connection on the network, or a network problem. Contact the network administrator.
EIO n DISK SPINNING UP	The disk accessory card takes a moment to “spin up.” The first parameter is the accessory slot number for this accessory card.
FLASH n INITIALIZING alternates with DO NOT POWER OFF	The flash DIMM can take a long time to initialize the first time that it is used.
FLASH DEVICE FAILURE	The flash DIMM had a critical failure and no longer can be used. Remove the flash DIMM and replace it with a new one.
FLASH FILE OPERATION FAILED	The requested operation could not be performed. You might have attempted an illegal operation, such as trying to download a file to a non-existent directory.
FLASH FILE SYSTEM IS FULL	Delete files from the flash DIMM or add another one. Download or delete files using HP Jetdirect, and download or delete fonts. (See the software help for more information.)
FLASH IS WRITE PROTECTED	The flash DIMM is protected, and no new files can be written to it. Disable the write protection through HP Jetdirect.
INPUT DEVICE CONDITION xx.yy	An input paper-handling device has a condition that needs attention before printing can resume. For assistance, see the documentation that came with the paper-handling device.
INSTALL TONER CARTRIDGE	The toner cartridge has been removed and must be replaced for printing to continue.
INSTALL TRAY x	The printer is unable to print the current job, because the specified tray (x) is open or not inserted correctly. Reinsert the specified tray.
LOADING PROGRAM <number> alternates with DO NOT POWER OFF	Programs and fonts can be stored on the printer’s file system. At startup, these entities are loaded into RAM. (These entities can take a long time to load into RAM depending on the size and number of entities being loaded.) The <number> specifies a sequence number that indicates that the current program is being loaded.
MANUALLY FEED [TYPE] [SIZE]	Load the requested print media into Tray 1. Press <b>[Go]</b> if the media you want is already loaded in Tray 1. Press <b>[-VALUE+]</b> to scroll through the available types and sizes. Press <b>[SELECT]</b> to accept an alternative type or size.
MEMORY FULL STORED DATA LOST	No memory is available in the printer. The current job might not print correctly and some resources (such as downloaded fonts or macros) might have been deleted. You might want to add more memory to the printer (see page 107).



**Table 32. Printer messages**

Message	Explanation or recommended action
MEMORY SETTINGS CHANGED	The printer changed its memory settings because it did not have enough memory to use the previous settings for I/O buffering and resource saving. This usually occurs after memory is removed from the printer, a duplexer is added, or a printer language is added. You might want to change memory settings for I/O buffering and resource saving (although default settings are usually best) or add more memory to the printer (see page 107).
MEMORY SHORTAGE JOB CLEARED	The printer did not have enough free memory to print the entire job. The remainder of the job will not print and will be cleared from memory. Press [Go] to continue. Change the resource saving setting from the printer control panel (see page 53) or add more memory to the printer (see page 107).
MEMORY SHORTAGE PAGE SIMPLIFIED	The printer had to compress the job in order to fit it in available memory. Some data loss might have occurred. Press [Go] to continue. You might want to add more memory to the printer (see page 107).
MOPY PAGE TOO COMPLEX alternates with PRESS GO TO CONTINUE	The data (dense text, rules, raster or vector graphics) sent to the printer was too complex. Press [Go] to print the transferred data. (Some data might be lost.) If this message appears often, simplify the print job.
OFFLINE	Press [Go] to place the printer online.
OUTPUT BIN FULL	The output bin is full and needs to be emptied.
PERFORM PRINTER MAINTENANCE	Hewlett-Packard recommends that only HP-authorized service technicians perform service on the printer. However, you can perform most routine maintenance. When the PERFORM PRINTER MAINTENANCE message appears on the control panel, you need to purchase a printer maintenance kit and install the new parts.
RAM DISK DEVICE FAILURE	The RAM disk had a critical failure and can no longer be used. Turn the printer off, and then turn the printer on to clear the message.
RAM DISK FILE OPERATION FAILED	The requested operation could not be performed. You might have attempted an illegal operation, such as trying to download a file to a non-existent directory.
RAM DISK FILE SYSTEM IS FULL	Delete files and then try again to print, or turn the printer off and then turn the printer back on to delete all files. (Use HP Jetdirect to delete the files, or user another software utility. See the software help for more information.) If the message persists, increase the amount of RAM installed in the printer and the size of the RAM disk. Change the RAM disk size from the printer control panel configuration menu (see page 53).
RESEND UPGRADE	An error exists in the printer's flash firmware. Resend a valid firmware image.
TRAY x EMPTY	Load the empty tray (x) to clear the message. If you do not load the specified tray, the printer continues to print from the next available tray, and the message continues to appear.
TRAY x LOAD [TYPE] [SIZE]	Load the requested print media into the specified tray (x). Make sure that the trays are correctly adjusted for size. The size that is shown on the front of the paper tray must match the size of the print media loaded in the tray. The tray type settings (and the size for Tray 1) must be set at the printer control panel (see page 48). If you are trying to print A4- or letter-sized paper and this message appears, make sure that the default paper size is set correctly from printers control panel printing menu. Press [Go] to print from the next available tray. Press [-VALUE+] to scroll through the available types and sizes. Press [SELECT] to accept an alternative type or size.

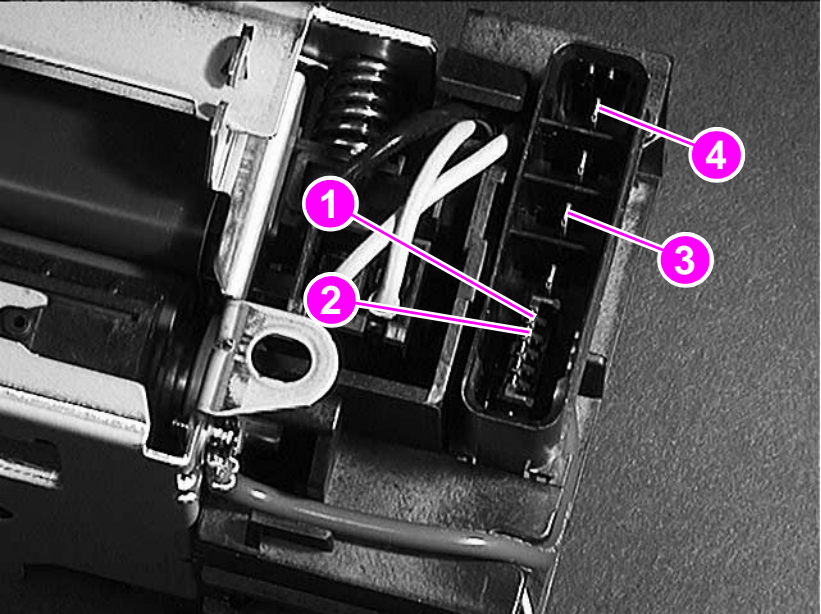
**Table 32. Printer messages**

Message	Explanation or recommended action
UNABLE TO STORE JOB	A job cannot be stored on the printer because of memory limitations or the file system configuration.
USE [TYPE] [SIZE] INSTEAD?	If the requested paper size or type is not available, the printer asks if it should use another paper size or type instead. Press [-VALUE+] to scroll through the available types and sizes. Press [SELECT] to accept an alternative type or size.
WAIT FOR PRINTER TO REINITIALIZE	The RAM disk setting has been changed at the printer control panel. This change will not take effect until the printer reinitializes.
XX.YY PRINTER ERROR PRESS GO TO CONTINUE	A printer error has occurred that can be cleared by pressing [Go] in the printer control panel.
13.1 PAPER JAM or 13.2 PAPER JAM	The event log message for a paper-delay jam at the paper feed area is 13.1. The event log message for a paper-stopped jam at the paper feed area is 13.2. 1. Make sure that paper trays are loaded correctly so that paper can feed from the tray. 2. Check the input area for obstructions, such as print media in the path, damage to the registration assembly, or an out-of-place transfer roller. 3. Check PS402 and PS403 for correct operation. Replace any defective sensors or flags. For the locations of sensors, see page 236.
13.5 PAPER JAM or 13.6 PAPER JAM	The event log message for a paper-delay jam at the fuser is 13.5. The event log message for a paper-stopped jam at the fuser is 13.6. 1. Check the transfer roller and the small media belt to ensure that they are operating and can feed media. 2. Check the paper path for obstructions at the transfer roller and toner cartridge, at the paper-feed guide, and at the fuser. 3. Check PS1306 for correct operation. Replace any defective sensors or flags. For the locations of sensors, see page 236.
13.10 PAPER JAM	The event log message for a paper-delay jam in the duplexer is 13.10. 1. Check the duplexer and the rear area of the printer for obstructions or damage. 2. Check PS1701 and PS1703 in the duplexer for correct operation. Replace the duplexer if a sensor is defective.
13.20 PAPER JAM or 13.21 PAPER JAM	The event log message for a paper-stopped jam in the paper path is 13.20. The event log message for a top door opened while printing jam is 13.21. 1. Check the entire paper path for obstructions such as print media in the path, registration area, transfer area, paper feed, and fuser. 2. Check that all of the assemblies are seated and that all of the doors are closed. 3. Check all of the sensors and flags in the paper path (see page 236).
20 INSUFFICIENT MEMORY alternates with PRESS GO TO CONTINUE	The printer received more data than can fit in its available memory. You might have tried to transfer too many macros, soft fonts, or complex graphics. Press [Go] to print the transferred data (some data might be lost), then simplify the print job or install additional memory (see page 107).
21 PAGE TOO COMPLEX alternates with PRESS GO TO CONTINUE	The data (dense text, rules, raster or vector graphics) sent to the printer was too complex. Press [Go] to print the transferred data. (Some data might be lost.) To print the job without losing data, from the configuration menu in the printer control panel, set PAGE PROTECT=ON and print the job. Leaving PAGE PROTECT=ON might degrade performance. If this message appears often, simplify the print job or leave PAGE PROTECT=ON.

**Table 32. Printer messages**

Message	Explanation or recommended action
<p>22 EIO x BUFFER OVERFLOW alternates with PRESS GO TO CONTINUE</p>	<p>Too much data was sent to the EIO card in the specified slot (x). An improper communications protocol might be in use.</p> <p>Press <b>[Go]</b> to clear the message. (Data will be lost.)</p> <p>Check the host configuration. If the message persists, update the EIO firmware or replace the Jetdirect EIO card.</p>
<p>22 PARALLEL I/O BUFFER OVERFLOW alternates with PRESS GO TO CONTINUE</p>	<p>Too much data was sent to the parallel port.</p> <p>Check for a loose cable connection and be sure to use a high-quality cable. (Some non-HP parallel cables might be missing pin connections, or might otherwise not conform to the IEEE-1284 specification.)</p> <p>This error can occur if the driver you are using is not IEEE-1284 compliant. For best results, use an HP driver that came with the printer.</p> <p>Press <b>[Go]</b> to clear the error message. (Data will be lost.)</p> <p>If the message persists, change PARALLEL ADV COMMUNICATION to OFF and PARALLEL HIGH SPEED to NO in the I/O menu. Replace the formatter, if necessary.</p>
<p>40 EIO x BAD TRANSMISSION alternates with PRESS GO TO CONTINUE</p>	<p>The connection has been broken between the printer and the EIO card in the specified slot.</p> <p>Press <b>[Go]</b> to clear the error message and continue printing.</p> <p>If the message persists, replace the EIO card, and then replace the formatter, if necessary.</p>
<p>41.x PRINTER ERROR alternates with PRESS GO TO CONTINUE</p>	<p>A temporary printing error occurred because of electrical noise or an unexpected event.</p> <p>Press <b>[Go]</b>. The page that contains the error will automatically be reprinted.</p> <p>For regular 41.1, 41.4, and 41.9 errors, check for loose connections or other source of electrical noise (for example, grounding problems, input power). If the problem persists, replace the dc controller, and then replace the formatter, if necessary.</p> <p>For regular 41.2 errors (unexpected beam detect error), check the connections between the dc controller and the laser/scanner. If the problem persists, replace the laser/scanner, and then replace the dc controller, if necessary.</p> <p>For regular 41.3 errors, see 41.3 UNEXPECTED PAPER SIZE on page 197.</p> <p>For regular 41.5 errors (media feed error):</p> <ol style="list-style-type: none"> <li>1. Check for correct operation of PS402 (top-of-page sensor) and PS403 (registration sensor) flags.</li> <li>2. Paper might be arriving too soon at the registration sensor (PS403). Check for correct operation of the feed roller clutch (CL406) and replace it, if necessary.</li> <li>3. Replace the dc controller, if necessary.</li> </ol>
<p>41.3 UNEXPECTED PAPER SIZE</p>	<p>The paper size of the media on which you are trying to print is not the same as the settings for the tray.</p> <p>Make sure that all trays are correctly adjusted for size. The size that appears on the front of the paper tray must match the size of media loaded in the tray. (The printer will continue trying to print the job until the size settings are correct.)</p> <p>If you are trying to print from Tray 1, make sure that the printer control panel setting for paper size is correctly configured (see page 48).</p> <p>After performing the actions above, press <b>[Go]</b>. The page that contains the error will automatically be reprinted. (Or, you might want to press <b>[CANCEL JOB]</b> to clear the job from the printer's memory.)</p> <p>If the problem persists:</p> <ol style="list-style-type: none"> <li>1. Make sure that only a single piece of media is fed into the printer. If not, make sure that the tray settings are correct, that the media is loaded correctly, and that high-quality media is being used.</li> <li>2. If PS302 is defective, then the printer will post a 41.3 error to report narrower paper than expected. Replace PS302.</li> </ol>

**Table 32. Printer messages**

Message	Explanation or recommended action
50.x FUSER ERROR	<p>A fuser error has occurred:</p> <p>50.1—low fuser temperature            50.2—fuser warm-up service            50.3—high fuser temperature            50.4—low/bad line voltage—the printer might be connected to an uninterrupted power supply (UPS)            50.5—unable to hold a consistent fuser temperature</p> <ol style="list-style-type: none"> <li>1. Turn the printer off for a minimum of 20 minutes to clear the error.</li> <li>2. For 50.4 errors, move the printer to another power source and disconnect it from any UPS supply.</li> <li>3. Reseat the fuser.</li> <li>4. Turn the power off and remove the fuser. Check the continuity between connectors J1307-1 (callout 1) and J1307-2 (callout 2). If the resistance is not in the range of 1 to 2.5 MΩ, then replace the fuser.</li> <li>5. Check continuity between connectors J1308-3 (callout 3) and J1308-1 (callout 4) with the fuser removed. If no continuity exists, replace the fuser.</li> <li>6. If the problem persists, replace the power supply, and then replace the dc controller, if necessary.</li> </ol> 
51.x PRINTER ERROR	<p>A beam-detect error occurred.</p> <ol style="list-style-type: none"> <li>1. Press [Go]. The page that contains the error will automatically be reprinted.</li> <li>2. Turn the printer off and then back on.</li> <li>3. Reseat the cables.</li> <li>4. Replace the laser/scanner.</li> </ol>
52.x PRINTER ERROR	<p>The laser/scanner speed is incorrect.</p> <ol style="list-style-type: none"> <li>1. Press [Go]. The page that contains the error will automatically be reprinted.</li> <li>2. Turn the printer off and then back on.</li> <li>3. Reseat the cables.</li> <li>4. Replace the laser/scanner.</li> </ol>

**Table 32. Printer messages**

Message	Explanation or recommended action
<p>53. x<sub>1</sub>. z<sub>2</sub> PRINTER ERROR</p>	<p>A problem exists in the printer's memory. The DIMM that caused the error will not be used. Values of x<sub>1</sub>, y<sub>1</sub>, and z<sub>2</sub> are as follows:</p> <p>x = DIMM type            0—ROM                                   1—RAM</p> <p>y = device location      0—internal memory (ROM or RAM)                                   1 to 4—DIMM slots 1, 2, 3, or 4</p> <p>z<sub>2</sub> = error number        0—unsupported memory                                   1—unrecognized memory                                   2—unsupported memory size                                   3—failed RAM test                                   4—exceeded maximum RAM size                                   5—exceeded maximum ROM size                                   6—invalid DIMM speed                                   7—DIMM reporting information incorrectly                                   8—DIMM RAM parity error                                   9—ROM needs to be mapped to an unsupported address                                   10—DIMM address conflict                                   11—PDC XROM out of bounds                                   12—unable to make a temporary mapping</p> <ol style="list-style-type: none"> <li>1. Turn the printer off, and then reseal the specified DIMM.</li> <li>2. Try the DIMM in another slot.</li> <li>3. Replace the DIMM that caused the error.</li> </ol>
<p>55 PRINTER ERROR alternates with PRESS GO TO CONTINUE</p>	<p>An internal communication error occurred.</p> <ol style="list-style-type: none"> <li>1. Press <b>[Go]</b>. The page that contains the error will automatically be reprinted.</li> <li>2. Check the power at the site.</li> <li>3. Replace the formatter.</li> <li>4. Replace the dc controller.</li> </ol>
<p>56. x PRINTER ERROR alternates with CYCLE POWER TO CONTINUE</p>	<p>A temporary printing error occurred.</p> <p>x = description            1—illegal input or bad accessory connection                                   2—illegal output</p> <ol style="list-style-type: none"> <li>1. Press <b>[Go]</b>. The page that contains the error will automatically be reprinted.</li> <li>2. Turn the printer off, and then turn the printer back on.</li> <li>3. Check the printer configuration.</li> <li>4. Check the accessory connections.</li> </ol>
<p>57. x PRINTER ERROR</p>	<p>A temporary printing error occurred.</p> <p>x = description            1—printer fan</p> <ol style="list-style-type: none"> <li>1. Check the fan connector and make sure that the fan is not blocked.</li> <li>2. Replace the fan.</li> </ol>
<p>59. x PRINTER ERROR</p>	<p>A motor error occurred.</p> <p>x = description            0—motor error                                   2—motor start-up error                                   3—motor rotation error</p> <ol style="list-style-type: none"> <li>1. Turn the printer off, and then turn the printer back on.</li> <li>2. Make sure that the fuser or toner cartridge does not hinder the movement of the gears in the drive train.</li> <li>3. Check the main motor cable to make sure that it is seated correctly.</li> <li>4. If the error persists, replace the motor, and then replace the dc controller, if necessary.</li> </ol>
<p>62. x PRINTER ERROR</p>	<p>A problem exists in the printer's memory.</p> <p>x= location                0—internal memory                                   1 to 4—DIMM slots 1, 2, 3, or 4</p> <p>Reseat or replace the specified DIMM.</p>

**Table 32. Printer messages**

Message	Explanation or recommended action
64.x PRINTER ERROR	<p>A scan-buffer error occurred.</p> <ol style="list-style-type: none"> <li>1. Turn the printer off, and then turn the printer back on.</li> <li>2. If the problem persists, replace the formatter.</li> </ol>
66.x.y.zz INPUT DEVICE FAILURE alternates with CHECK CABLES AND CYCLE POWER	<p>An error occurred in an external paper-handling device.</p> <p>1st x = device number in the chain 2nd x = device type      1—input    2—output    3—stapler/stacker</p> <p>yy = device-specific error</p> <ol style="list-style-type: none"> <li>1. Press <b>[Go]</b> to clear the message. If the message does not clear, go to step 2.</li> <li>2. Turn the printer off, and then turn the printer back on.</li> <li>3. Check all cables.</li> <li>4. Reseat the external paper-handling device.</li> </ol>
68 NVRAM ERROR CHECK SETTINGS	<p>An error occurred in the printer's nonvolatile memory (NVRAM) and one or more printer settings have been reset to the factory default.</p> <ol style="list-style-type: none"> <li>1. Print a configuration page (see page 205) and check the printer settings to determine which values have changed.</li> <li>2. Hold down <b>[CANCEL JOB]</b> while turning the printer on. This cleans up the NVRAM by removing old areas that are not being used.</li> <li>3. If the error persists, replace the formatter.</li> </ol>
68 NVRAM FULL CHECK SETTINGS	<p>The printer's nonvolatile memory (NVRAM) is full. Some settings might have been reset to the factory defaults.</p> <p>Print a configuration page (see page 205) and check the printer settings to determine which values have changed.</p> <p>Hold down <b>[CANCEL JOB]</b> while turning the printer on. This cleans up the NVRAM by removing old areas that are not being used.</p>
69.x PRINTER ERROR	<p>A temporary printing error occurred.</p> <p>x= description              0—the duplexer failed    1—the duplex side adjust failed</p> <ol style="list-style-type: none"> <li>1. Turn the printer off, and then turn the printer back on.</li> <li>2. Reseat the duplexer.</li> <li>3. If the problem persists, replace the duplexer.</li> </ol>
79.xxxxx PRINTER ERROR	<p>The printer detected an error. The numbers (xxxxx) indicate the specific type of error.</p> <p>Turn the printer off, and then turn the printer back on.</p> <p>Try printing a job from a different software application. If the job prints, go back to the first application and try printing a different file. (If the message only appears when you use a certain software application or print job, have the customer contact the software vendor for assistance.)</p> <p>If the message persists, try the following:</p> <ol style="list-style-type: none"> <li>1. Cycle the power.</li> <li>2. Reseat or replace the interface cable and cycle the power.</li> <li>3. Download the latest firmware image (if available—the firmware download is not available for some printers) from <a href="http://www.hp.com">http://www.hp.com</a> and use HP Jetdirect or another appropriate utility to update the printer.</li> <li>4. Remove the DIMMs one at a time and cycle the power.</li> <li>5. Try using the parallel interface, if possible.</li> <li>6. Remove the EIO cards from the printer and then perform a cold reset.</li> <li>7. If the error persists, replace the formatter.</li> </ol>

**Table 32. Printer messages**

<b>Message</b>	<b>Explanation or recommended action</b>
8x.9999 PRINTER ERROR	The EIO accessory in slot x has encountered a critical error as specified by 9999. x= description 1—EIO slot 1: the printer detected an error with the EIO card. 2—EIO slot 2: the printer detected an error with the EIO card. 6—EIO slot 1: the EIO card detected an error. The EIO card might be defective. 7—EIO slot 2: the EIO card detected an error. The EIO card might be defective.  1. Turn the printer off, and then turn the printer back on. 2. Reseat, if necessary, or replace the EIO board.

## General paper-path troubleshooting

Jams occur in the printer when print media either does not reach or does not clear a photosensor along the printer's paper path in a specific amount of time. If a jam occurs, a 13.xx PAPER JAM message appears on the printer control panel. The following table contains general questions you can ask and topics to explore before troubleshooting. See the 13.xx section in the event log for specific error codes.

<b>Problem</b>	<b>Action</b>
What is the frequency of the paper jams (for example, continuous, one jam per 100 pages, one jam per 1000 pages, or some other interval)?	Ask the customer. Print or show the event log to determine the jam history. See the display and event log sections of this chapter and evaluate the event log.
Do jams only occur when the media is fed from a particular paper input source?	Use the paper-path test to isolate the problem. See the next section for details (page 203).
Do jams only occur when paper is output to a specific output bin?	Use the paper-path test to isolate the problem.
Do jams occur with a specific type of media?	Try known good media. Make sure that media meets HP's specifications.
Where does the leading edge of the first sheet stop in the paper path when a jam occurs? Are any sheets damaged or torn?	Attempt to duplicate the problem. Use the paper-path test to isolate the problem. Inspect the paper path and all of the paper-path mechanical assemblies that are located in advance of where the leading edge jams.
Is the customer loading the trays correctly?	Observe the customer loading the trays. Tell the customer not to fan the paper.
Is the customer overfilling the trays?	Make sure that media is NOT above the maximum fill marks in the paper trays. Observe the customer loading the trays.
Are the tray guides set correctly?	Make sure that Tray 2 and 3 left-side paper guides are set correctly at both the front and rear of the tray, and that the front guide is locked into the correct position. For Tray 4, make sure that all adjustments are set correctly—front, back, and side at the top and bottom of the tray.
Should the printer be cleaned?	Inspect the paper path and rollers. See the cleaning procedures in chapter 4.
When was the user maintenance performed on the printer?	Determine from the PCL configuration page the number of pages since the last maintenance (page 205). The Printer Maintenance Kit should be installed every 150,000 images.

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## Paper-path test

To perform a paper-path test:

- 1 Press [MENU] until INFORMATION MENU appears
- 2 Press [ITEM] until PRINT PAPER PATH TEST appears.
- 3 Press [SELECT].
- 4 Press [+] to cycle selections until the input tray you want to test appears.
- 5 Press [SELECT].
- 6 Press [+] until the output bin you want to use appears (open the rear output bin to print to it).
- 7 Press [SELECT].
- 8 Press [+] until the appropriate duplex mode (on or off) appears.
- 9 Press [SELECT].
- 10 Press [+] to cycle selections until the appropriate number of copies appears. Choose 1, 10, 50, 100, or 500 copies.
- 11 Press [SELECT] to perform the paper-path test.

## Information pages

From the printer control panel, you can print pages that give details about the printer and its current configuration. The following information pages are described here:

- Menu map
- Configuration page

For a complete list of the printer's information pages, print a menu map and see the information menu that is listed. For a description of the event log, see page 191.

## Menu map

To see the current settings for the menus and the items available at the control panel, print a control panel menu map:

- 1 Press **[MENU]** until INFORMATION MENU appears.
- 2 Press **[ITEM]** until PRINT MENU MAP appears.
- 3 Press **[SELECT]** to print the menu map.

The content of the menu map varies, depending on other menu settings and the options that are currently installed in the printer. (Many of these values can be overridden from the printer driver or software application.)

HP LaserJet 5100 series printers					HEWLETT® PACKARD
MENU MAP					1
<b>INFORMATION MENU</b>	<b>PAPER HANDLING MENU</b>	<b>PRINT QUALITY MENU</b>	<b>PRINTING MENU</b>	<b>Menu Continued</b>	
PRINT MENU MAP	TRAY 1 MODE=CASSETTE	RESOLUTION=600	COPIES=1	COURIER=REGULAR	
PRINT CONFIGURATION	TRAY 1 SIZE=A5	RET=MEDIUM	PAPER=LETTER	WIDE A4=NO	
PRINT PCL FONT LIST	TRAY 1 TYPE=PLAIN	ECONOMODE=OFF	CONFIGURE CUSTOM PAPER=NO	APPEND CR TO LF=NO	
PRINT PS FONT LIST	TRAY 2 TYPE=PLAIN	TONER DENSITY=3	ORIENTATION=PORTRAIT	PRINT PS ERRORS=OFF	
PRINT FILE DIRECTORY	TRAY 3 TYPE=PLAIN	CREATE CLEANING PAGE	FORM=60 LINES		
PRINT EVENT LOG	MANUAL FEED=OFF		PCL FONT SOURCE=INTERNAL		
SHOW EVENT LOG	OVERRIDE A4/LETTER=NO		PCL FONT NUMBER=0		
PRINT PAPER PATH TEST	CONFIGURE FUSER MODE MENU=NO		PCL FONT PITCH=10.00		
			PCL SYMBOL SET=PC-8		
<b>CONFIGURATION MENU</b>	<b>Menu Continued</b>	<b>I/O MENU</b>	<b>EJO 1 JETDIRECT MENU</b>	<b>RESETS MENU</b>	
POWERSAVE TIME=1 HOUR	QUICK COPY JOBS=32	I/O TIMEOUT=15	CFG NETWORK=NO	POWERSAVE=ON	
PERSONALITY=AUTO	HELD JOB TIMEOUT=OFF	I/O BUFFER=AUTO		RESET MEMORY	
RESOURCE SAVE=OFF		PARALLEL HIGH SPEED=YES		RESTORE FACTORY SETTINGS	
CLEARABLE WARNINGS=JOB		PARALLEL ADV FUNCTIONS=ON		RESET ACTIVE I/O CHANNEL	
AUTO CONTINUE=ON				RESET ALL I/O CHANNELS	
TONER LOW=CONTINUE					
JAM RECOVERY=AUTO					
SMALL PAPER SPEED=NORMAL					
NEW TONER CARTRIDGE=NO					

Figure 124. Menu map

## Configuration page

Use the configuration page to view the current printer settings, to help troubleshoot printer problems, or to verify correct installation and functionality of optional accessories, such as memory (DIMMs), paper trays, and printer languages.

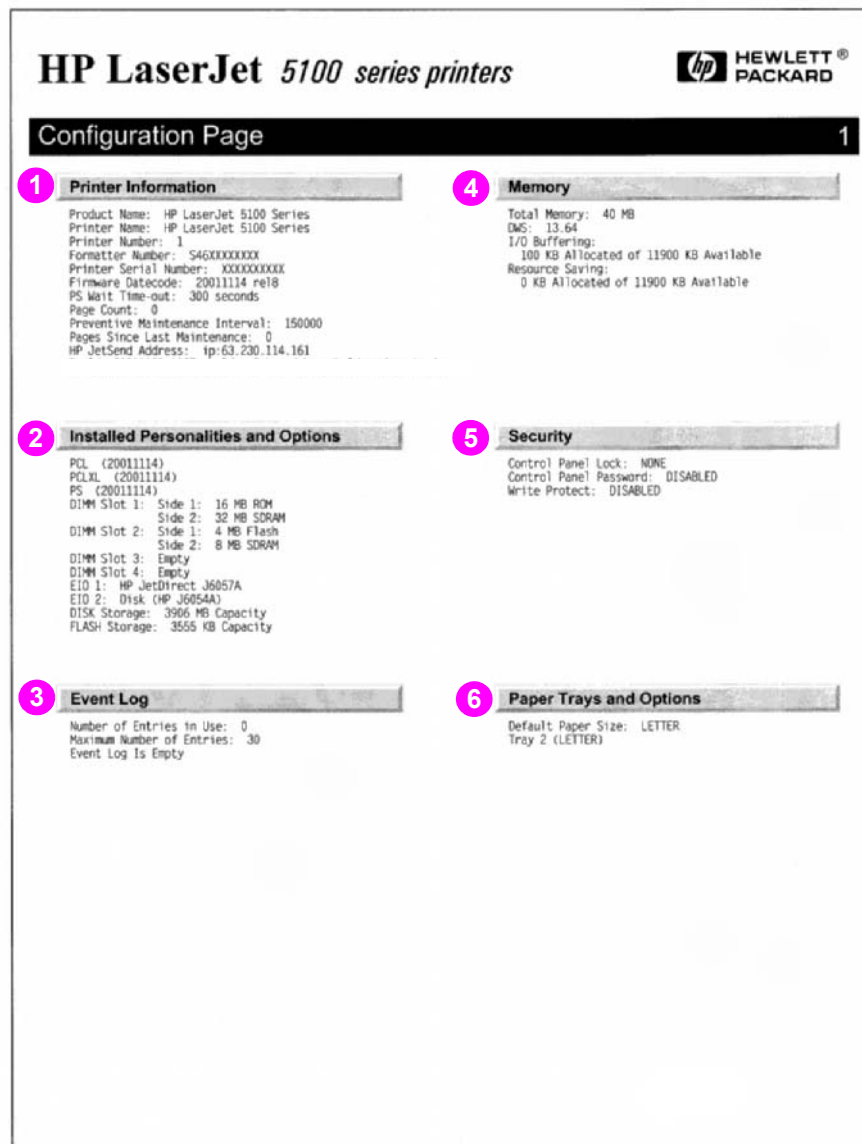
### Note

If an HP Jetdirect print server EIO card is installed, a Jetdirect configuration page is also printed.

To print a configuration page:

- 1 Press **[MENU]** until INFORMATION MENU appears.
- 2 Press **[ITEM]** until PRINT CONFIGURATION appears.
- 3 Press **[SELECT]** to print the configuration page.

Figure 125 shows a sample configuration page. The numbers in the sample printout match the numbers in table 33 on page 206. The content of the configuration page varies, depending on the options that are currently installed in the printer.



**Figure 125.** Configuration page (see table 33 for category explanations)

**Table 33. Configuration page categories**

1	Printer Information	Lists the serial number, page counts, and other information for the printer.
2	Installed Personalities and Options	Lists all printer languages that are installed (such as PCL and PS) and lists options that are installed in each DIMM slot and EIO slot.
3	Event Log	Lists the number of entries in the log, the maximum number of entries that can be viewed, and the last three entries.
4	Memory	Lists printer memory, PCL Driver Work Space (DWS), I/O buffering information, and resource-saving information.
5	Security	Lists the status of the printer control panel lock, control panel password, and disk drive.
6	Paper Trays and Options	Lists the size settings for all trays and lists optional paper-handling accessories that are installed.

### **Verify the installed options**

Under “Installed Personalities and Options” on the configuration page, look for options such as the hard disk or DIMM types and sizes.

Verify that the options that are installed in your printer are listed on the configuration page. If an installed device is not shown, reseal the device and print a new configuration page.

## Image quality

When you are working with customers, obtain a print sample before you begin troubleshooting their printer. Ask the customer to explain the quality expected from the printer. The print sample will also help clarify the image-quality issue.

Image quality checks	Action
Does the problem repeat on the page?	Use the repetitive defect ruler on page 223.
Is the toner cartridge full and is it manufactured by HP?	Use the checklist below to check the toner cartridge.
Is the customer using print media that meets all HP paper specification standards?	For more information about HP's paper specification standards, see chapter 1.
Is the print sample similar to those in the print quality tables that begin on page 210?	Compare the sample to the print quality tables and perform the corresponding procedures that are recommended.
Is the problem with the toner cartridge drum, the transfer roller, or the fuser?	Perform the half self-test functional check (see page 224) to determine the location of the defect. If a correct toner image is present on the drum's surface, assume that the first four functions of the electrophotographic process are functioning, and troubleshoot the failure as a transfer or fusing problem. If the image on the paper looks good before it enters the fuser, then a problem might exist in the fuser.

## Check the toner cartridge

Image-formation defects are often the result of problems with the toner cartridge. If you suspect that the toner cartridge is the source of the problem, replace the toner cartridge before troubleshooting image defects.

Use the following list to make sure that the toner cartridge is still operable.

- Make sure that the toner cartridge has toner. The weight of a full toner cartridge is 1880 grams (66.3 oz); the weight of an empty cartridge is 1450 grams (51.1 oz).
- Check the expiration date on the toner cartridge (it is stamped on the cartridge box).
- Check the toner cartridge to see if it has been disassembled or refilled.
- Make sure that the toner cartridge is seated correctly in the printer cavity.
- Inspect the cartridge for toner leaking through worn seals. (If the drum has been manually rotated, it might have caused internal damage and toner spills can result.)

### Note

Toner cartridges are rated for 10,000 images at 5% coverage. It is possible to wear out the gears and the cartridge seals before **TONER LOW** appears on the control panel if the 10,000-image expectancy is exceeded. See "EconoMode" on page 208.

- Check the surface of the photosensitive drum in the cartridge to see if it has been damaged or scratched. Touching the drum contaminates the photosensitive surface and can cause spotting and defects during printing.
- Dark areas on the page might indicate that the drum has been exposed to light for too long. If dark areas appear, stop the printer and wait a few minutes. This should eliminate most defective images. If not, placing the toner cartridge in a dark environment for several days can restore some life to the drum.

## EconoMode

EconoMode creates draft-quality printing by reducing the amount of toner on the printed page by up to 50%. Advise the customer to turn EconoMode on or off from the printer driver or software application, because those settings override the control panel settings. EconoMode settings can also be changed from the print-quality menu on the control panel.

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### CAUTION

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Hewlett-Packard does not recommend full-time use of EconoMode. If EconoMode is always used, it is likely that the toner supply will outlast the mechanical parts in the toner cartridge.

## Image defects

The quality of the printer's output is subject to user judgment. This section of the manual helps you define print quality defects and understand the factors that affect print quality.

The print samples in the following figures illustrate some print-quality defects. All images are depicted on letter- or A4-sized paper that has been fed in the normal landscape (non "R") orientation. Keep copies of print-quality defects that you encounter in the field and explanations of their causes to use for future reference.

The image defects listed here are covered in the following tables.

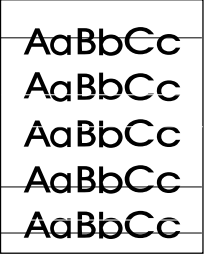
- Black lines (in paper path direction) (table 34 on page 210)
- Black lines (opposite paper path direction) (table 35 on page 210)
- Black page (table 36 on page 211)
- Blank page (table 37 on page 212)
- Character voids and dropouts (table 38 on page 213)
- Creases (table 39 on page 214)
- Curl (table 40 on page 214)
- Dark print (table 41 on page 215)
- Dirt on back of page (table 42 on page 215)
- Distorted image (table 43 on page 216)
- Dots (in the paper-path direction) (table 44 on page 216)
- Faded or light print (table 45 on page 217)
- Gray background (table 46 on page 218)
- Loose toner or toner smear (table 47 on page 219)
- Repetitive defects (table 48 on page 220)
- Skew (table 49 on page 220)
- Smudged lines (either direction) (table 50 on page 221)
- Toner specks (see also "Dots" on page 216) (table 51 on page 221)
- White lines (in the paper-path direction) (table 52 on page 221)
- White lines (opposite to the paper-path direction) (table 53 on page 222)

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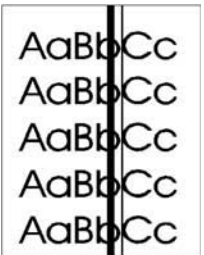
### Note

If you find a defect that is not depicted, record the cause and save a copy of the defect for future reference.

**Table 34. Black lines (in paper path direction)**

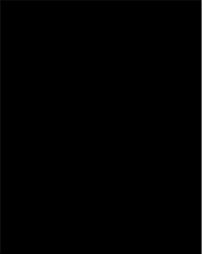
	Possible cause	Action
	<p>Toner cartridge not seated correctly.</p>	<p>Remove the toner cartridge and reinsert it.</p>
	<p>Defective toner cartridge.</p>	<p>Perform the half self-test functional check (see page 224). If the defect develops on the print drum, replace the toner cartridge.</p>
	<p>Worn or dirty fuser rollers.</p>	<p>Clean the fuser using the cleaning page procedure on page 67. Several pages might be required if the fuser is very dirty. If the problem persists, replace the fuser.</p>
	<p>Static eliminator teeth (just beyond the transfer roller) are contaminated or defective.</p>	<p>Clean the teeth by using a small brush or compressed air. Replace the assembly if it is damaged.</p>
	<p>Light is leaking into the printer</p>	<p>Make sure that all covers are in place. Move the printer away from any outside windows.</p>

**Table 35. Black lines (opposite paper path direction)**

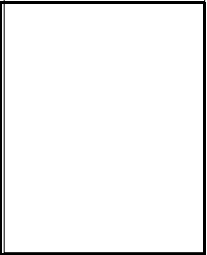
	Possible cause	Action
	<p>Repetitive defect. If the lines are repeated at a consistent interval down the page, this is a repetitive defect.</p>	<p>See “Repetitive defect ruler” on page 223 and replace the offending components.</p>
	<p>Sharp, random lines indicate a problem with the laser control circuitry.</p>	<p>Replace the following in the order indicated:</p> <ol style="list-style-type: none"> <li>1. Laser/scanner assembly.</li> <li>2. Dc controller.</li> <li>3. Cables between the dc controller and the laser/scanner.</li> <li>4. Formatter.</li> </ol>




**Table 36. Black page**

	Possible cause	Action
	Defective toner cartridge.	Replace the toner cartridge.
	High-voltage contact springs are dirty or defective. The high-voltage contacts are mounted on and above the dc controller PCA and protrude into the toner cartridge cavity.	Inspect and clean the high-voltage contacts. If damaged, replace the contacts.
	The dc controller is installed incorrectly. If the low-voltage power supply or dc controller has been removed and replaced, it might not be seated correctly.	Remove the dc controller and check the connectors for damage. Reseat the dc controller, being careful to fully seat the connectors.
	The laser beam drive circuit or dc controller high-voltage circuit is defective (it is not supplying the correct negative voltage).	Replace the dc controller PCA.
	Laser/scanner assembly is faulty (it is turning the laser on continuously).	Replace the laser/scanner assembly.
	Connectors between the laser/scanner unit and dc controller are not seated correctly or are defective.	Inspect and reseat the connectors. Replace the cables as necessary.

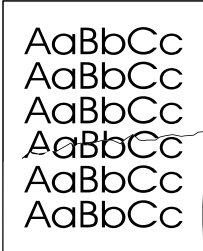
**Table 37. Blank page**

	<b>Possible cause</b>	<b>Action</b>
	Software configuration (intermittent).	Make sure that the application is not sending incorrect page-length requests or extra page-eject commands.
	Network configuration. Some sharing devices on networks might generate a blank page as a separator.	Check with the network administrator.
	Multiple feeds. The printer might be feeding two or more pages at once (intermittent).	Remove the paper from the tray and flex the stack of paper in one direction and then the other to separate the pages. Do <i>not</i> fan the paper before loading it into the trays.
	Sealing tape was left in the toner cartridge.	Remove the sealing tape.
	Empty or defective toner cartridge.	1. If you are unsure, weigh the cartridge: <ul style="list-style-type: none"> <li>• Full weight = 1880 grams (66.3 oz)</li> <li>• Empty weight = 1450 grams (51.1 oz)</li> </ul> <b>Note:</b> Some toner might reside in the waste toner cavity, which affect the weight of the cartridge. 2. Perform the half self-test function check (see page 224) or try a toner cartridge that you know is full and functional. Replace the toner cartridge if necessary.
	Laser/scanner door does not open correctly (no image on print drum).	1. Remove and reseal the toner cartridge. 2. Check the laser/scanner shutter door for proper operation. If it is defective, replace the laser/scanner assembly.
	No transfer-roller voltage.	Without transfer-roller voltage, toner does not transfer correctly from the surface of the drum to the paper. Perform the half self-test functional check to check all other electrophotographic processes (see page 224). Replace the transfer roller if necessary.
	High-voltage connector springs are dirty or defective.	The high-voltage connectors are mounted on and above the dc controller and protrude into the toner cartridge cavity. Check the springs for functionality. Clean if dirty, replace if defective or missing.
	No drum ground path.	With no ground path, the drum cannot discharge. The negative charge on the drum repels toner, and leaves a nearly-white page (possibly with bubble print). Check the drum ground that runs from the contact point in the center of the print drum drive gear through the main gear assembly side plate to the frame ground.
High-voltage circuitry is defective.	Replace the dc controller.	
Defective laser/scanner cable assembly.	Low-level signals that are exchanged between the laser/scanner assembly and the dc controller might be affecting the laser output. Replace the laser/scanner cable assembly.	

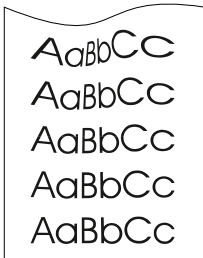
**Table 38. Character voids and dropouts**

	<b>Possible cause</b>	<b>Action</b>
	<p>Printing on the wrong side of the paper. The label on the ream of paper indicates which side to print on. The different surface properties of some papers might cause problems if the paper is loaded wrong-side-up.</p>	<ol style="list-style-type: none"> <li>1. Check for the arrow on the paper wrapper. Make sure that the paper is loaded to correspond with the arrow pointing up in Tray 1, or pointing down in other trays.</li> <li>2. Turn over the stack of paper in the tray. Also try rotating the paper 180°.</li> <li>3. Check the paper (or other print media) type and quality. Replace the paper, and advise the customer to use the recommended media and to store it correctly.</li> </ol>
	<p>Media surface is too rough.</p>	<p>Use paper with the correct finish (smoothness) to meet HP specifications.</p>
	<p>Media surface is too smooth for proper toner adhesion.</p>	<p>Use paper with the correct finish (smoothness) to meet HP specifications.</p>
	<p>Bad transparencies. Transparencies can have this problem because they are not designed for proper toner adhesion.</p>	<p>Use HP-approved transparencies for monochrome LaserJet printers (see the <i>HP LaserJet Printer Family Paper Specification Guide</i>).</p>
	<p>Printer's operating environment does not meet specifications.</p>	<p>Make sure that the printer's operating environment (and paper storage environment) meets specifications.</p>
	<p>Dirty fuser roller is lifting part of the image from the paper.</p>	<p>Process a cleaning page (see page 67). Several pages might be required if the fuser is very dirty.</p>
	<p>Defective or nearly-empty toner cartridge.</p>	<p>Replace the toner cartridge.</p>
	<p>Wrong toner density setting.</p>	<p>From the print-quality menu on the control panel, adjust the toner density setting. Make sure EconoMode is off.</p>
	<p>Wrong fuser setting for the media type.</p>	<p>From the paper-handling menu on the control panel, change the fuser mode setting or choose another media type from the printer driver.</p>
	<p>Bad transfer roller. If the transfer roller has finger oils on its surface, is dirty or is worn out, this problem can result.</p>	<p>Clean the transfer roller using a dry, lint-free cloth. <i>Do not</i> touch the transfer roller with your fingers. If the problem persists, replace the transfer roller.</p>
	<p>Poor high-voltage contacts between dc controller and toner cartridge or transfer roller.</p>	<p>Inspect the contacts and clean them if they are dirty, or replace them if they are damaged.</p>
	<p>The dc controller is defective (low transfer voltage).</p>	<p>Replace the dc controller.</p>


**Table 39. Creases**

	<b>Possible cause</b>	<b>Action</b>
	<p>Media does not meet the printer specifications or is stored improperly.</p>	<ol style="list-style-type: none"> <li>1. Print a few more pages to see if the problem corrects itself.</li> <li>2. Turn over the stack of paper in the tray. Also try rotating the paper 180°.</li> <li>3. Check the paper (or other print media) type and quality. Replace the paper, and advise the customer to use the recommended media and to store it correctly.</li> </ol>
	<p>Printer's operating environment does not meet the specifications.</p>	<p>Make sure that the printer's operating environment meets the specifications.</p>
	<p>Media is loaded incorrectly.</p>	<p>Make sure that media is loaded correctly and that the guides fit correctly against the stack.</p>
	<p>Wrong tray.</p>	<p>Print from Tray 1 when you use difficult media.</p>
	<p>Wrong output bin for the media type.</p>	<p>Print to the rear output bin.</p>
	<p>Obstruction in the paper path.</p>	<ol style="list-style-type: none"> <li>1. Check the paper path for debris.</li> <li>2. Check for damaged components that might be creasing the paper.</li> </ol>

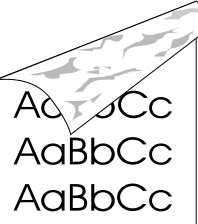
**Table 40. Curl**

	<b>Possible cause</b>	<b>Action</b>
	<p>Media does not meet the printer specifications or is stored improperly.</p>	<ol style="list-style-type: none"> <li>1. Print a few more pages to see if the problem corrects itself.</li> <li>2. Turn over the stack of paper in the tray. Also try rotating the paper 180°.</li> <li>3. Check the paper (or other print media) type and quality. Replace the paper, and advise the customer to use the recommended media and to store it correctly.</li> </ol>
	<p>Printer's operating environment does not meet the specifications.</p>	<p>Make sure that the printer's operating environment meets the specifications.</p>
	<p>Wrong output bin.</p>	<p>Print to a different output bin (top or rear output bin).</p>
	<p>Wrong fuser setting for the media type.</p>	<p>From the paper-handling menu on the control panel, change the fuser mode setting or choose another media type from the printer driver.</p>

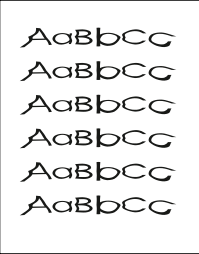
**Table 41. Dark print**

	Possible cause	Action
	Wrong toner density setting.	From the print-quality menu on the control panel, adjust the toner density setting.
	Toner cartridge print drum is close to the end of its life.	Replace the toner cartridge.
	Media does not meet the printer specifications or is stored improperly.	<ol style="list-style-type: none"> <li>1. Print a few more pages to see if the problem corrects itself.</li> <li>2. Turn over the stack of paper in the tray. Also try rotating the paper 180°.</li> <li>3. Check the paper (or other print media) type and quality. Replace the paper, and advise the customer to use the recommended media and to store it correctly.</li> </ol>
	Poor high-voltage contact to the dc controller.	Clean the contacts if they are dirty. If the problem remains after cleaning, or if the contacts are damaged or deformed, replace them.
	Defective laser/scanner.	Replace the laser/scanner.
	Defective high-voltage circuitry.	Replace the dc controller.

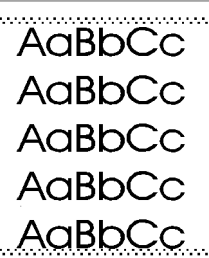
**Table 42. Dirt on back of page**

	Possible cause	Action
	Dirt inside printer (on tray separation pad or roller, feed roller, transfer roller, fuser, toner cartridge, feed belt, feed guide).	<ol style="list-style-type: none"> <li>1. Print a cleaning page (see page 67).</li> <li>2. Print at least 10 pages to see if the problem goes away.</li> <li>3. Identify and clean the dirty part. Also see "Repetitive defect ruler" on page 223. If the dirt cannot be removed, replace the dirty part.</li> <li>4. Check for toner leaks.</li> </ol>
	Media does not meet the printer specifications or is stored improperly.	<ol style="list-style-type: none"> <li>1. Print a few more pages to see if the problem corrects itself.</li> <li>2. Turn over the stack of paper in the tray. Also try rotating the paper 180°.</li> <li>3. Check the paper (or other print media) type and quality. Replace the paper, and advise the customer to use the recommended media and to store it correctly.</li> </ol>


**Table 43. Distorted image**

	Possible cause	Action
	Media does not meet the printer specifications or is stored improperly.	<ol style="list-style-type: none"> <li>1. Print a few more pages to see if the problem corrects itself.</li> <li>2. Turn over the stack of paper in the tray. Also try rotating the paper 180°.</li> <li>3. Check the paper (or other print media) type and quality. Replace the paper, and advise the customer to use the recommended media and to store it correctly.</li> </ol>
	Printer's operating environment does not meet the specifications.	Make sure that the printer's operating environment meets the specifications.
	Poor connection of the cables to the laser/scanner.	Reseat the cables that are connected to the laser/scanner.
	Poor connection of the cables to the dc controller assembly.	Reseat the cables that are connected to the dc controller assembly.
	Defective laser/scanner.	Replace the laser/scanner.
	Defective dc controller.	Replace the dc controller.

**Table 44. Dots (in the paper-path direction)**

	Possible cause	Action
	Dirty static eliminator teeth.	Clean the static eliminator with a small brush or compressed air.
	Poor contact between the static eliminator and the dc controller.	Clean the contacts, if they are dirty. If the problem remains after cleaning, or if the contacts are damaged or deformed, replace them.
	Deformed or deteriorated transfer roller.	Replace the transfer roller.
	Defective dc controller assembly.	Replace the dc controller assembly.

**Table 45. Faded or light print**


	<b>Possible cause</b>	<b>Action</b>
	<p>Begin by performing the half self-test function check (see page 224). If the image on the print drum is light, proceed with actions 1, 2, 3, 6, 7, and 8. If the drum image is normal, proceed with actions 5, 6, and 8.</p>	
	<p>Toner supply is low.</p>	<p>Action 1 Shake the cartridge gently to redistribute the toner, or replace the cartridge.</p>
	<p>EconoMode is on. EconoMode saves toner by reducing the dot density. The effect might appear to be a print-quality problem in some cases.</p>	<p>Action 2 Turn EconoMode off.</p>
	<p>Print density is set incorrectly.</p>	<p>Action 3 Change toner density (in the print-quality menu) to a darker setting and try again to print.</p>
	<p>Media does not meet specifications. The moisture content, conductivity, or surface finish might not work correctly with the electrophotographic process.</p>	<p>Action 4 Try a different paper lot.</p>
	<p>Transfer roller is defective or incorrectly installed. If the transfer roller loses conductivity, it cannot effectively pull toner from the drum to the paper.</p>	<p>Action 5 Inspect the transfer roller for correct installation and contact. If the transfer roller is damaged, replace it.</p>
	<p>High-voltage connector springs are dirty or defective.</p>	<p>Action 6 The high-voltage connectors are mounted on and above the dc controller and protrude into the toner cartridge cavity. Check the springs for functionality. Clean if dirty, replace if defective or missing.</p>
	<p>Laser/scanner door is not opening correctly.</p>	<p>Action 7 1. Remove and reseal the toner cartridge. 2. Check the laser/scanner shutter door for proper operation. If it is defective, replace the laser/scanner assembly.</p>
<p>The dc controller is defective. The dc controller contains the high-voltage circuitry.</p>	<p>Action 8 Replace the dc controller.</p>	

**Table 46. Gray background**

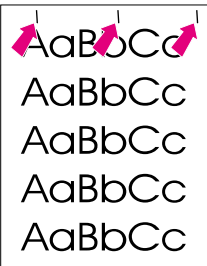
	<b>Possible cause</b>	<b>Action</b>
<div style="border: 1px solid black; padding: 5px;"> <p>AaBbCc</p> <p>AaBbCc</p> <p>AaBbCc</p> <p>AaBbCc</p> <p>AaBbCc</p> </div>	<p>Media does not meet printer specifications or is stored improperly.</p>	<ol style="list-style-type: none"> <li>1. Print a few more pages to see if the problem corrects itself.</li> <li>2. Turn over the stack of paper in the tray. Also try rotating the paper 180°.</li> <li>3. Check the paper (or other print media) type and quality. Replace the paper, and advise the customer to use the recommended media and to store it correctly.</li> </ol>
	<p>Inside of the printer is dirty (toner might have leaked out of the toner cartridge).</p>	<p>Clean the inside of the printer (see chapter 4). Install a new toner cartridge if it is leaking.</p>
	<p>Printer's operating environment does not meet the specifications.</p>	<p>Make sure that the printer's operating environment meets the specifications.</p>
	<p>Printing on envelope seams. Printing on an envelope seam can cause a background scatter problem.</p>	<p>Move the text to an area that has no seams. If you are not printing on seams, try a higher toner density setting.</p>
	<p>Wrong toner density setting.</p>	<p>From the print-quality menu on the control panel, increase the toner density setting. Make sure EconoMode is off.</p>
	<p>Faulty toner cartridge.</p>	<p>Replace the toner cartridge.</p>
	<p>High-voltage connector springs are dirty or defective.</p>	<p>The high-voltage connectors are mounted on and above the dc controller and protrude into the toner cartridge cavity. Check the springs for functionality. Clean if dirty, replace if defective or missing.</p>
	<p>High-voltage circuitry is defective.</p>	<p>Replace the dc controller.</p>




**Table 47. Loose toner or toner smear**

	<b>Possible cause</b>	<b>Action</b>
	<p><b>Dirt in the printer.</b></p>	<p>1. Print a few more pages to see if the problem corrects itself. 2. Clean the inside of the printer (see page 66) and use the printer's cleaning page (see page 67).</p>
	<p><b>Dirty fuser rollers. Toner build-up can cause the print on a page to smear.</b></p>	<p>Remove and inspect the fuser for excessive toner build-up. Run a cleaning page through the printer (see page 67). Several pages might be required if the fuser is very dirty.</p>
	<p><b>Toner cartridge is defective.</b></p>	<p>Perform a half self-test functional check (see page 224). Replace the toner cartridge if necessary.</p>
	<p><b>Media might be too smooth or too rough.</b></p>	<p>Check the paper (or other print media) type and quality.</p>
	<p><b>Wrong fuser setting for the media type.</b></p>	<p>From the paper-handling menu on the control panel, change the fuser mode setting or choose another paper type from the printer driver.</p>
	<p><b>The static eliminator is dirty or is not grounded, which allows a static charge to remain on the page.</b></p>	<p>Use a small brush or compressed air to clean the static eliminator. Replace the assembly if it is damaged.</p>
	<p><b>Fuser is defective. The print will smear if the fuser is not heated sufficiently to bond the toner image to the paper.</b></p>	<p>Replace the fuser.</p>
	<p><b>The dc controller is defective. The dc controller regulates fuser roller temperature.</b></p>	<p>If a new fuser does not resolve the problem, replace the dc controller.</p>


**Table 48. Repetitive defects**

	<b>Possible cause</b>	<b>Action</b>
	<p>Toner cartridge is damaged. The circumference of the photoconductive drum inside the toner cartridge is 94 mm (3-11/16 inches). If the defect repeats at this interval, the defect is associated with the drum.</p>	<p>Inspect the drum for scratches or damage. Replace the toner cartridge for defects that repeat at 44 mm (1-3/4 inches) or 94 mm (3-11/16 inches). Defects that repeat at 50 mm (1-15/16 inches) indicate a possible problem with either the toner cartridge or the registration assembly rollers.</p>
	<p>Dirty rollers. Any dirty roller in the paper path can result in a repetitive print defect.</p>	<p>Examine and clean (or replace) the rollers in the paper path.</p>
	<p>Fuser is dirty or defective. The circumferences of the rollers used in the fuser are 75 mm (1-15/16 inches) and 79 mm (3-1/8 inches). If the defect repeats at these intervals, the defect is associated with fuser.</p>	<p>Clean the fuser by running a cleaning page through the printer (see page 67). Several pages might be required if the fuser is very dirty. If the problem persists, replace the fuser.</p>
	<p>Gears are worn, causing slippage or jumping.</p>	<p>Inspect the gears that drive the toner cartridge and the fuser. Replace the main gear assembly if necessary.</p>
	<p>Media does not meet specifications. The surface of the paper might be too coarse, which can cause repeating marks.</p>	<p>Try a different paper.</p>
<p>Also see "Repetitive defect ruler" on page 223.</p>		

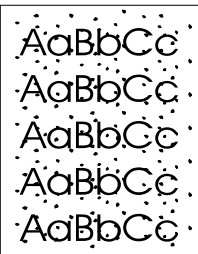
**Table 49. Skew**

	<b>Possible cause</b>	<b>Action</b>
	<p>Media does not meet printer specifications or is stored improperly.</p>	<ol style="list-style-type: none"> <li>1. Print a few more pages to see if the problem corrects itself.</li> <li>2. Turn over the stack of paper in the tray. Also try rotating the paper 180°.</li> <li>3. Check the paper (or other print media) type and quality. Replace the paper, and advise the customer to use the recommended media and to store it correctly.</li> </ol>
	<p>Media is not loaded correctly or trays are not adjusted correctly.</p>	<p>Make sure that media is loaded correctly and that the guides fit correctly against the stack.</p>
	<p>Registration assembly is incorrectly installed or damaged.</p>	<p>Make sure that the registration assembly is installed correctly. Replace it if necessary.</p>


**Table 50. Smudged lines (either direction)**

	Possible cause	Action
	<p>Paper path contamination or damage.</p>	<ol style="list-style-type: none"> <li>1. Check the toner cartridge by performing the half self-test functional check (see page 224). Replace it if necessary.</li> <li>2. Run a cleaning page through the printer (see page 67). Check the fuser and replace it if necessary.</li> <li>3. Check the Tray 1 feed roller and other trays' separation pads and rollers for contamination. Clean or replace as necessary.</li> <li>4. Check for other sources of contamination in the paper path and clean with a dry, lint-free cloth.</li> </ol> <p>Also see the "Repetitive defect ruler" on page 223.</p>

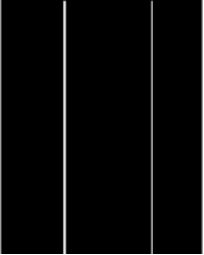
**Table 51. Toner specks (see also "Dots" on page 216)**

	Possible cause	Action
	<p>Dirt in printer.</p>	<ol style="list-style-type: none"> <li>1. Print a few more pages to see if the problem corrects itself.</li> <li>2. Clean the inside of the printer (see page 66) or use the printer's cleaning page (see page 67).</li> </ol>
	<p>Bad toner cartridge components.</p>	<p>Perform the half self-test functional check (see page 224). If the problem develops on the print drum, replace the toner cartridge.</p>
	<p>Media does not meet printer specifications or is stored improperly.</p>	<ol style="list-style-type: none"> <li>1. Turn over the stack of paper in the tray. Also try rotating the paper 180°.</li> <li>2. Check the paper (or other print media) type and quality. Replace the paper, and advise the customer to use the recommended media and to store it correctly.</li> </ol>
	<p>Alternating small and standard paper (such as envelopes and letterhead).</p>	<p>To alternate small and standard paper, set <code>SMALL PAPER SPEED=SLOW</code> from the configuration menu on the control panel.</p>
	<p>Worn fuser rollers.</p>	<p>Replace the fuser.</p>

**Table 52. White lines (in the paper-path direction)**

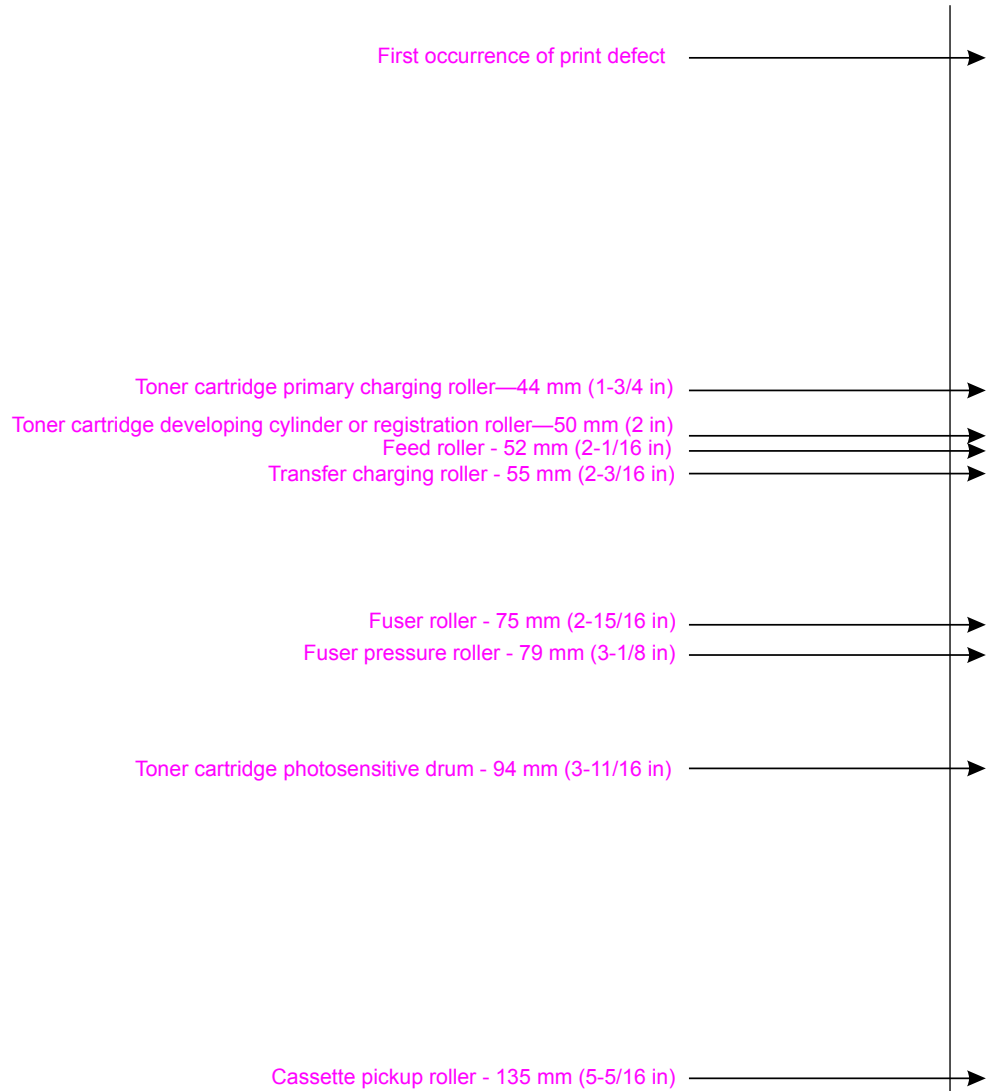
	Possible cause	Action
	<p>Lack of toner or faulty toner cartridge.</p>	<p>Redistribute the toner in the toner cartridge. If the problem continues, replace the toner cartridge.</p>
	<p>Dirt in the laser path.</p>	<p>Clean the laser path. Remove the laser/scanner assembly and check for dirt or other obstructions in the beam path.</p>
	<p>Defective fuser.</p>	<p>Replace the fuser.</p>
	<p>Dirty mirror in the laser/scanner.</p>	<p>Replace the laser/scanner.</p>

**Table 53. White lines (opposite to the paper-path direction)**

	<b>Possible cause</b>	<b>Action</b>
	Damage to the print drum.	Replace the toner cartridge.
	Damage to fuser roller.	Run a cleaning page through the printer (see page 67). If the problem persists, replace the fuser.
	Unstable laser beam or beam control circuitry.	Replace the following in the order indicated: 1. Laser/scanner assembly. 2. Dc controller. 3. Cables between the dc controller and the laser/scanner. 4. Formatter.

## Repetitive defect ruler

Repetitive print defects usually are associated with a specific roller within the printer or the toner cartridge. Use figure 126 to isolate the cause of repetitive print defects. Align the first occurrence of the defect with the top of the ruler (at the top or bottom of the misprinted page), and measure to the next occurrence of the defect to determine which roller is involved. When you are certain that your defect pattern matches the pattern of the ruler, replace the appropriate roller.



**Figure 126.** Repetitive defect ruler

# Image system troubleshooting

## Half self-test functional check

The electrophotographic process can be subdivided into the following stages:

- Cleaning (removes excess toner from the drum surface)
- Conditioning (places a uniform electrical charge on the drum)
- Writing (the laser strikes the surface of the drum to create an electrostatic image)
- Developing (forms the toner image on the drum)
- Transferring (charges transfer the image to the print media)
- Fusing (heat and pressure produces a permanent image)

The purpose of the half self-test check is to determine which process is malfunctioning. Perform the test as follows:

- 1 Print a configuration page from the control panel `INFORMATION MENU`.
- 2 Open the top cover after the paper advances half-way through the printer (about five seconds after the main motor begins rotation). The leading edge of the paper should have advanced past the toner cartridge.
- 3 Remove the toner cartridge.
- 4 Open the toner cartridge's drum shield to view the drum's surface.

If a dark and distinct toner image is present on the drum's surface, assume that the first four functions of the electrophotographic process are functioning (cleaning, conditioning, writing, and developing), and troubleshoot the failure as a transfer or fusing problem.

If no image is present on the photosensitive drum, perform the following check.

## Drum rotation functional check

The photosensitive drum, located in the toner cartridge, must rotate for the print process to work. The photosensitive drum receives its drive from the main gear assembly. To determine whether the drum is rotating:

- 1 Open the top cover.
- 2 Remove the toner cartridge.
- 3 Mark the cartridge's drive gear with a felt-tipped marker. Note the position of the mark.
- 4 Install the toner cartridge and close the top cover. The start-up sequence should rotate the drum enough to move the mark.
- 5 Open the printer and inspect the gear that was marked in step 3. Verify that the mark moved. If the mark did not move, inspect the main gear assembly to make sure that it meshes with the toner cartridge gears. If the drive gears function, and the drum does not move, replace the toner cartridge.

---

### Note

This test is especially important if refilled toner cartridges are in use.

# Interface troubleshooting

This section provides an overview of the printer's interface requirements.

## Communications check

### Note

Communication problems are normally the customer's responsibility. Time spent attempting to resolve these problems might 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, see "EIO troubleshooting" on page 225.

## PC direct connect (parallel) test

After the printer is installed, verify communications (bypassing the Windows driver) between the printer and the IBM-compatible computer. Enter the following at the MS-DOS prompt:

```
C:\DIR>LPT1 Enter (for printing to parallel port #1)
```

The printer should print a directory listing of the C:\ directory. You might need to press **[Go]** on the control panel to print the data in the buffer.

## EIO troubleshooting

The Jetdirect configuration page shown in figure 127 on page 226 contains valuable information about the current status of the EIO accessories. Before you attempt to troubleshoot a network problem or notify your network consultant of a problem, always print a configuration page.

## Jetdirect configuration

See figure 127 on page 226 for an example of a Jetdirect page. Numbers in the example match the numbers in the following table.

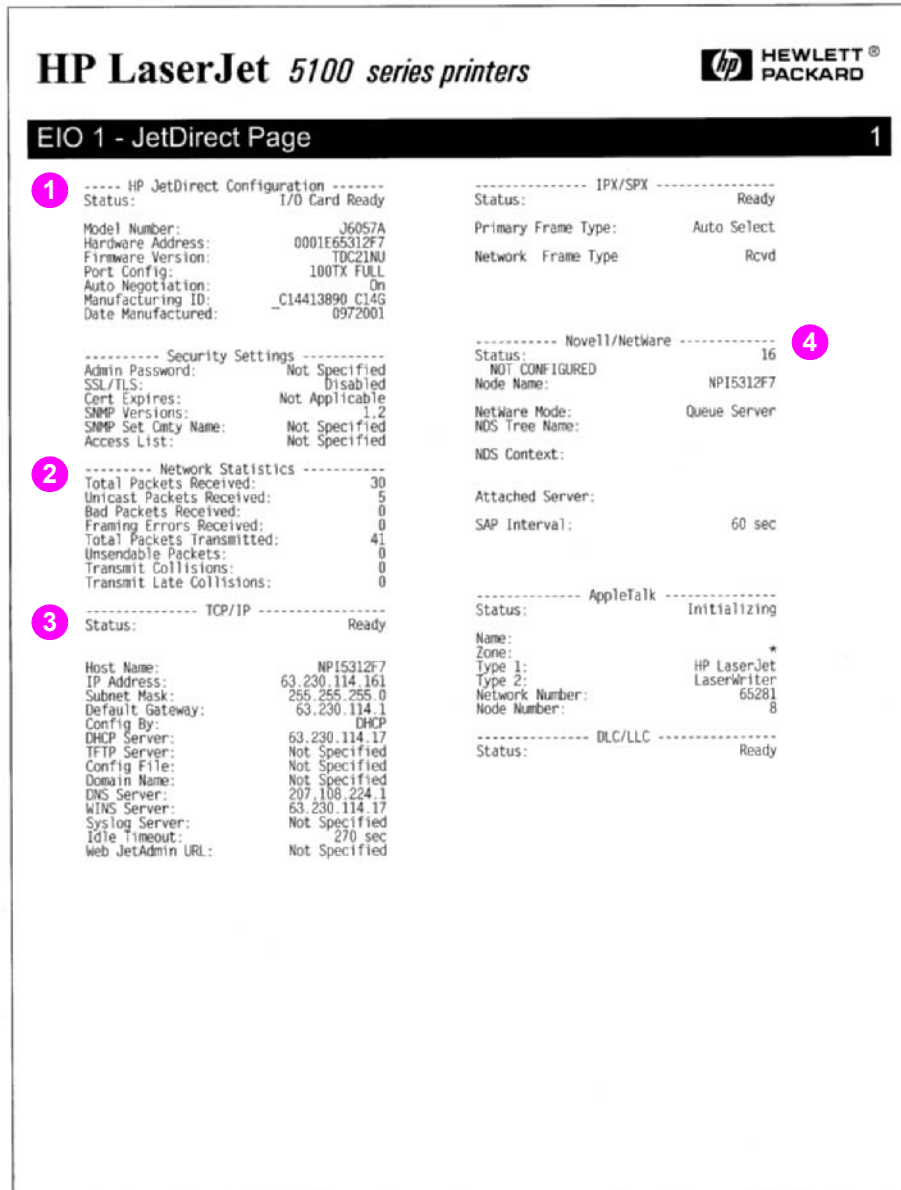
See the *HP Jetdirect Print Server Software Installation Guide* for more information.

**Table 54. HP Jetdirect configuration page categories**

1	HP Jetdirect Configuration	If the EIO Jetdirect card has successfully powered up and completed its internal diagnostics, the <code>I/O CARD READY</code> status message prints. If communication is lost, an <code>I/O NOT READY</code> status message prints, followed by a two-digit error code. See the <i>HP Jetdirect Network Interface Configuration Guide</i> for further details and recommended action.
2	Network Statistics	This block indicates that network activity has been occurring. Bad packets, framing errors, unsendable packets and collisions should be minimal. If a high percentage (greater than one percent) of these occur, contact the network administrator. All of the statistics are set to zero when the printer is powered-off.
3	TCP/IP	In this block, the default IP address is "192.0.0.192." It is acceptable to operate the printer with this default address. The error message <code>ARP DUPLICATE ADDRESS</code> might appear in this block. This is also an acceptable error code if the TCP/IP protocol is not being used. Check with the network administrator to determine the correct IP address for the printer. To configure the printer's IP address, go to the control panel EIO menu, select <code>CFG NETWORK=YES</code> , select <code>CFG TCP/IP=YES</code> , and then select <code>BOOTP=NO</code> .

**Table 54. HP Jetdirect configuration page categories (continued)**

- 4 Novell/NetWare This block should state the Novell printer server name to which the printer is connected. If the node name reads "NPIxxxxx" (where xxxxxx = the last six digits of the EIO's LAN address), the EIO card has not been configured for a Novell server. This could indicate that the card is operating under another protocol than Novell. Check with the network administrator to determine what Node Name might be appropriate.



**Figure 127. Jetdirect configuration page**



# Reference diagrams

## Locations of components

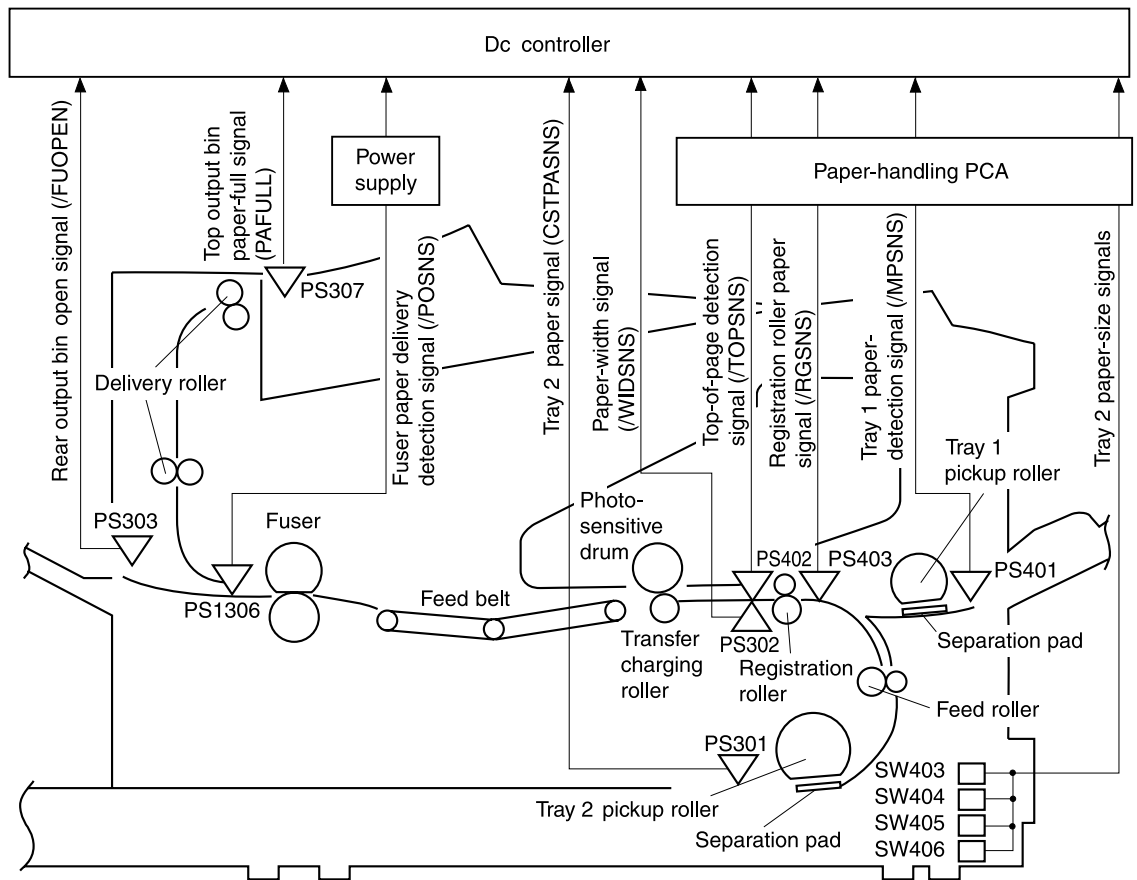
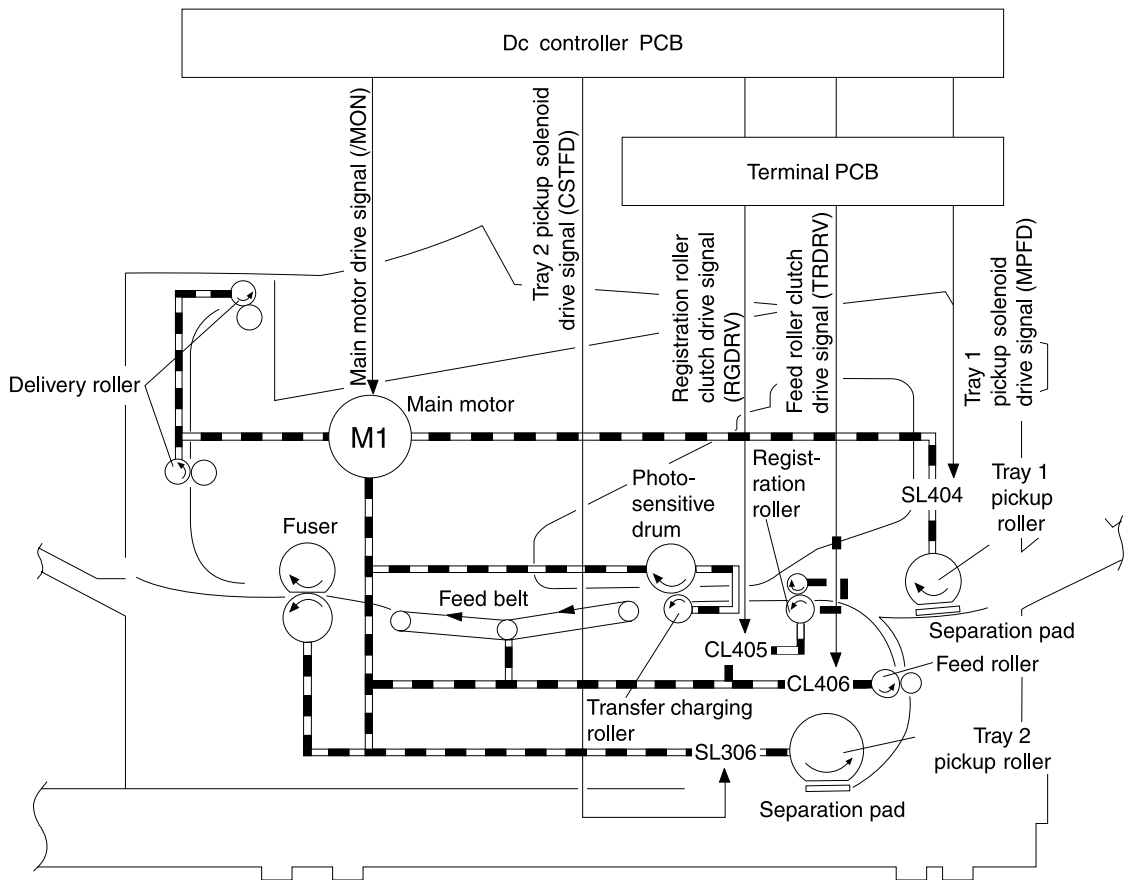
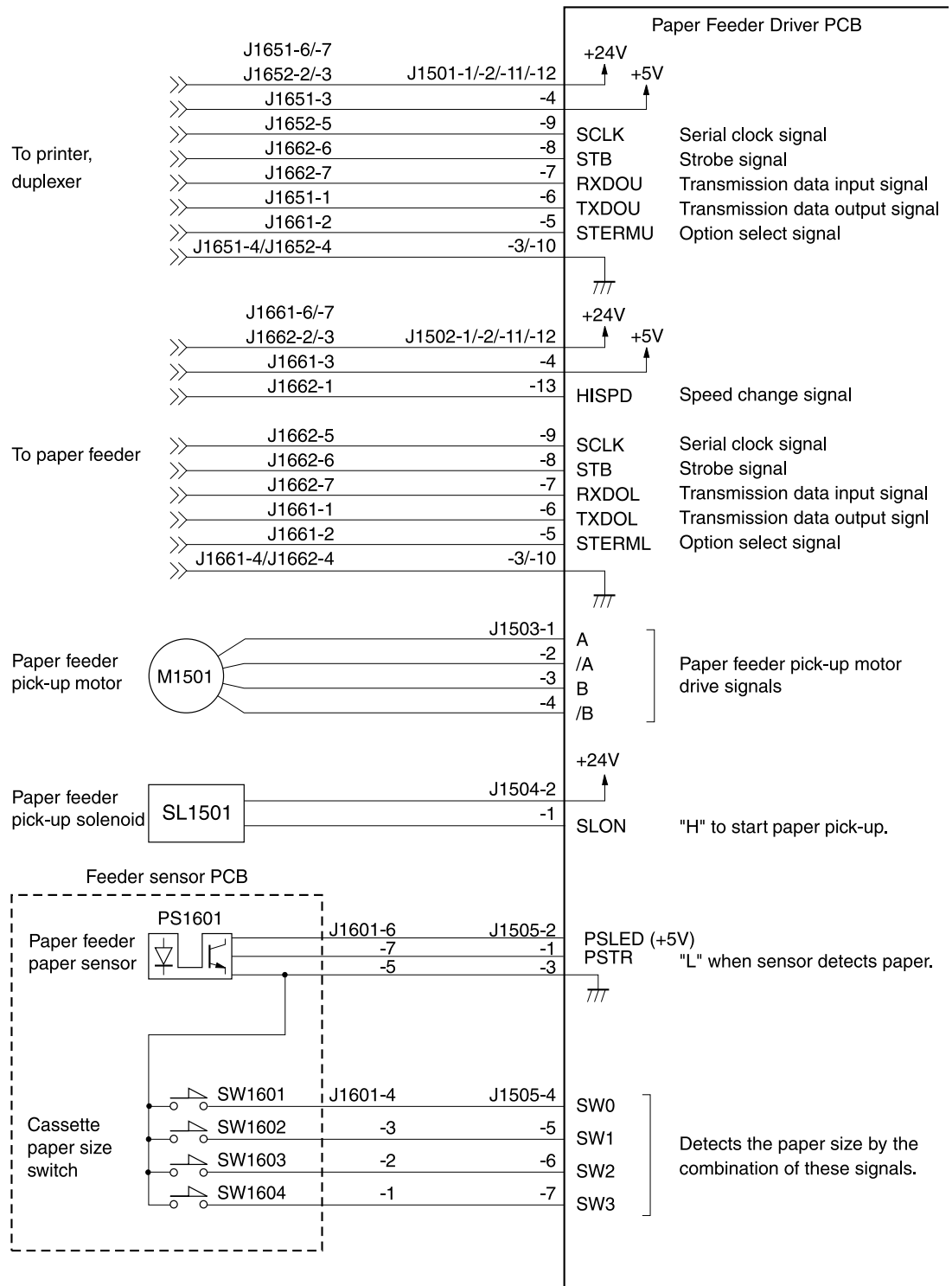


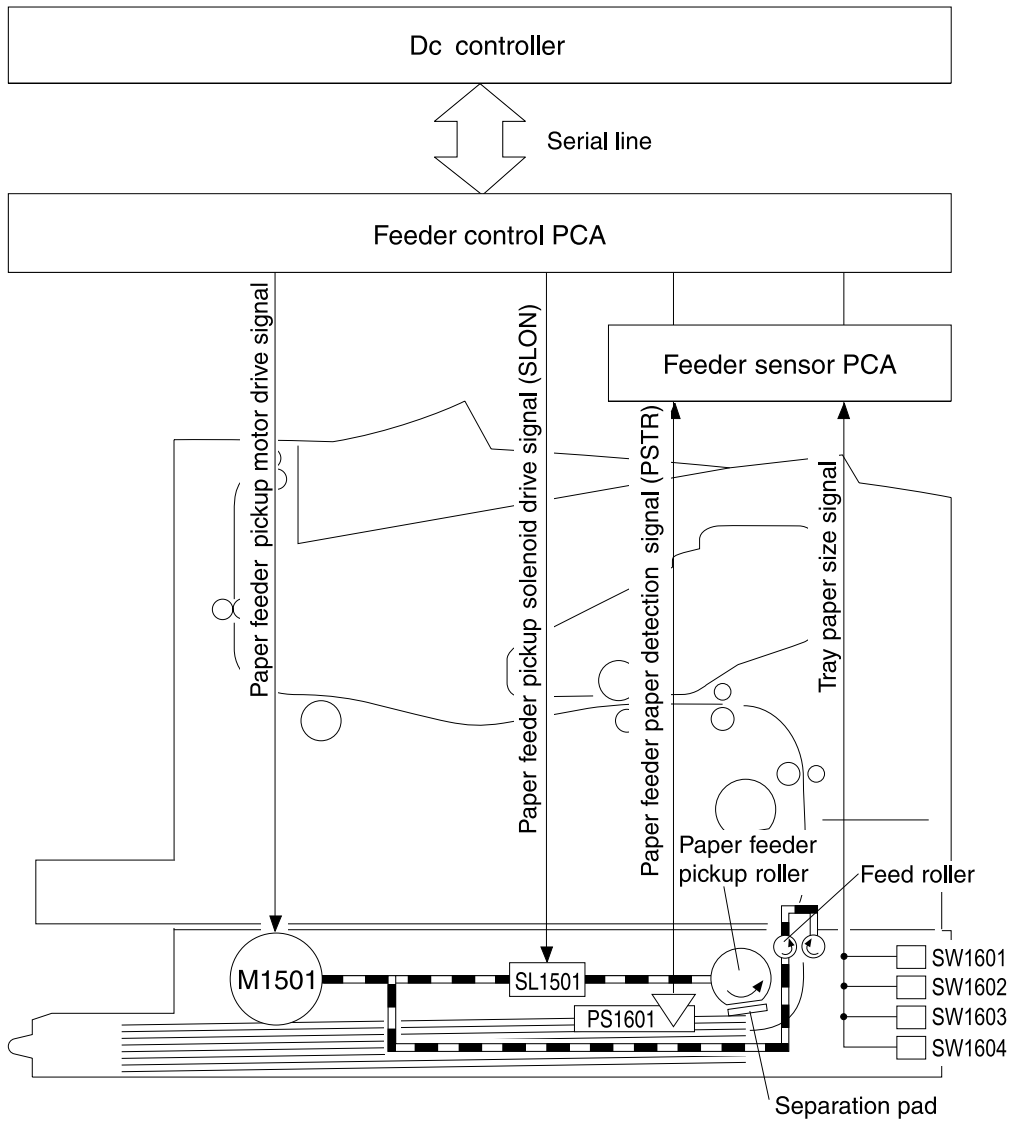
Figure 128. Paper path (sensors and switches)



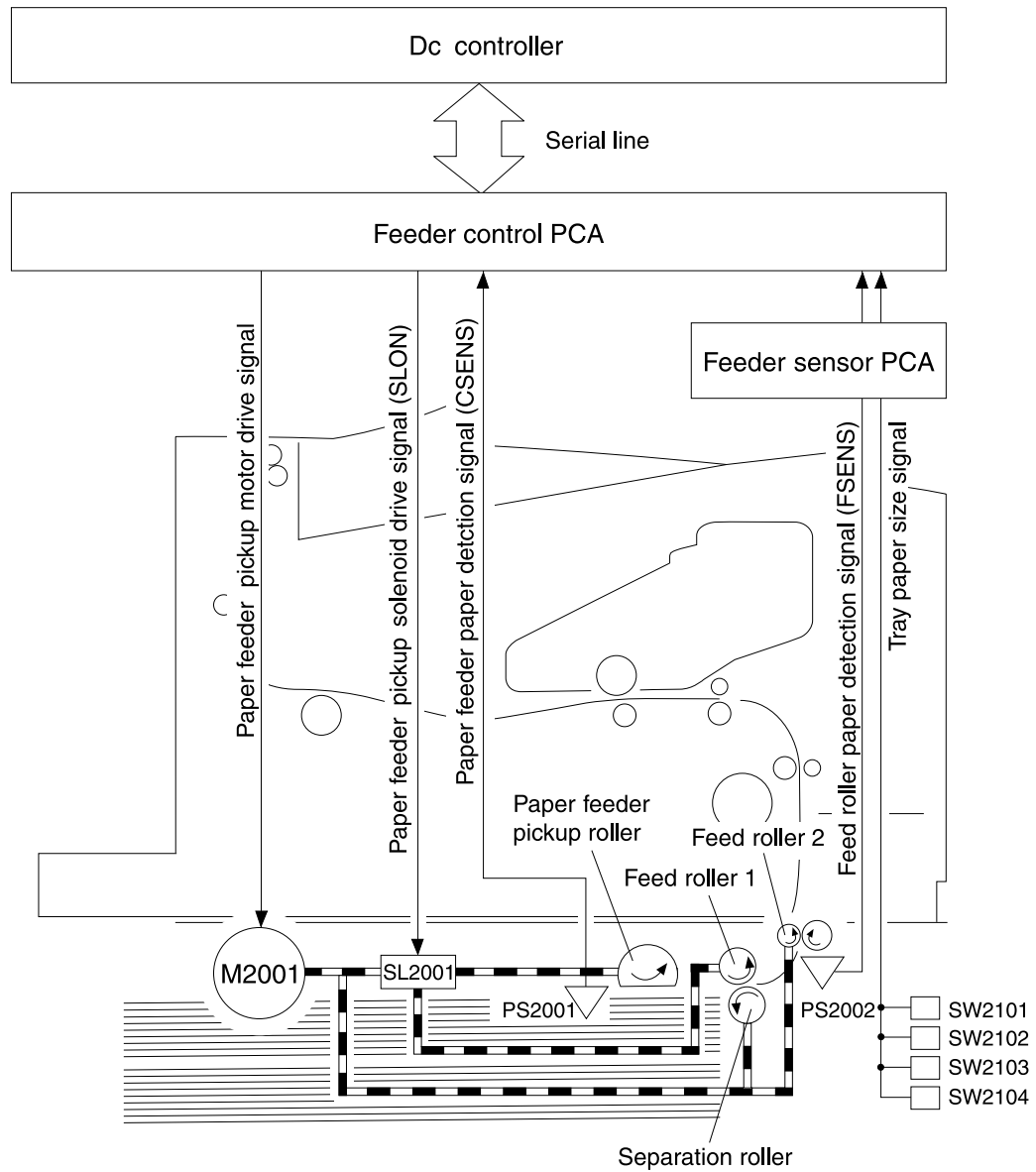
**Figure 129.** Paper path (clutches, solenoids, and motors)



**Figure 130.** 250-sheet paper feeder



**Figure 131.** 250-sheet paper feeder



**Figure 132.** 500-sheet paper feeder

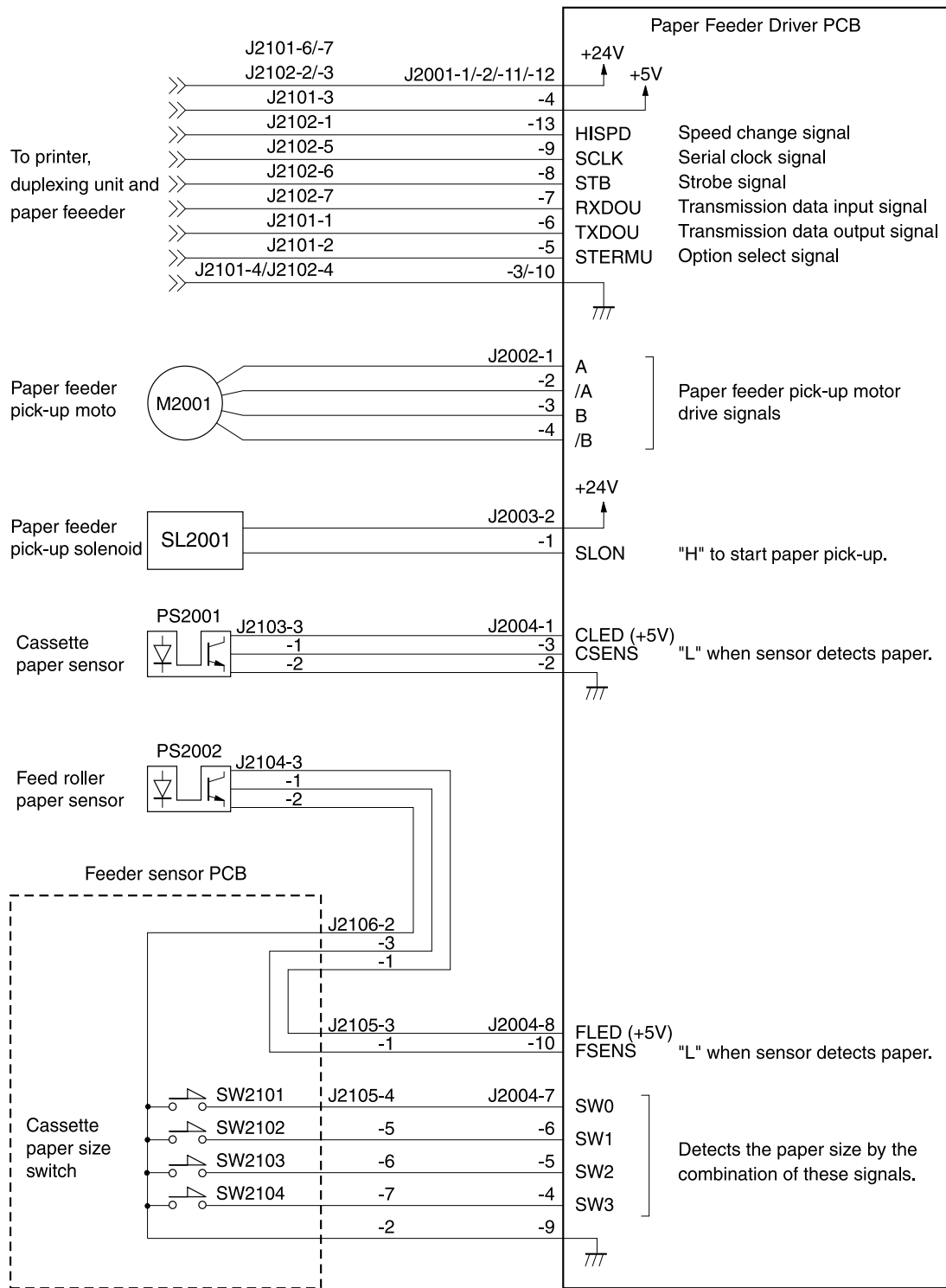


Figure 133. 500-sheet paper feeder

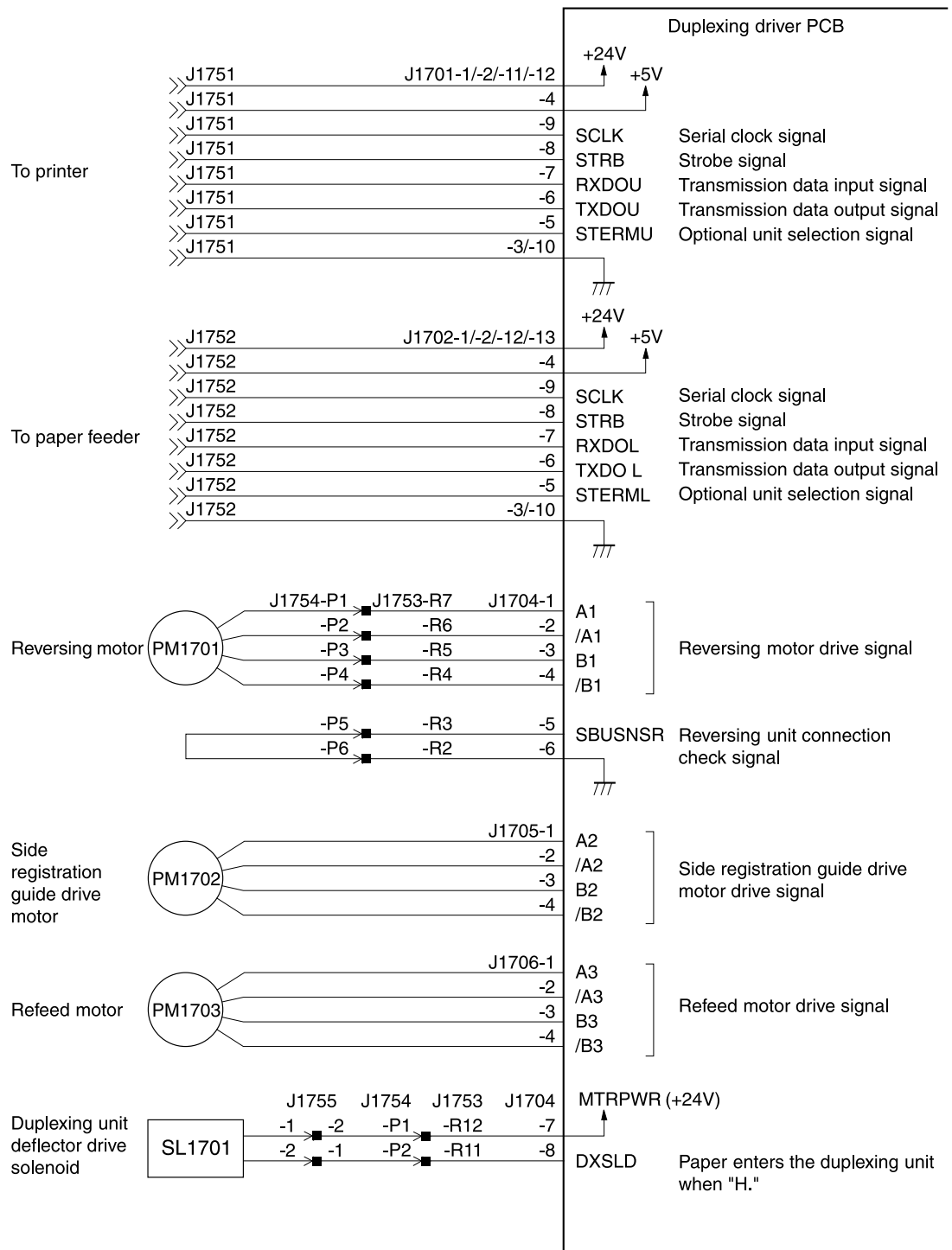
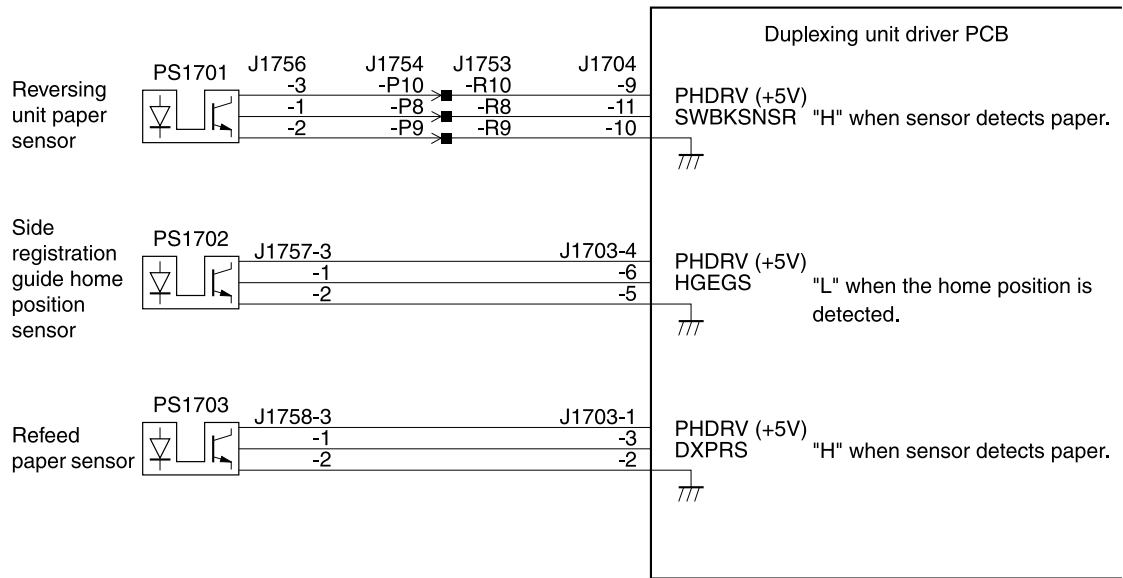


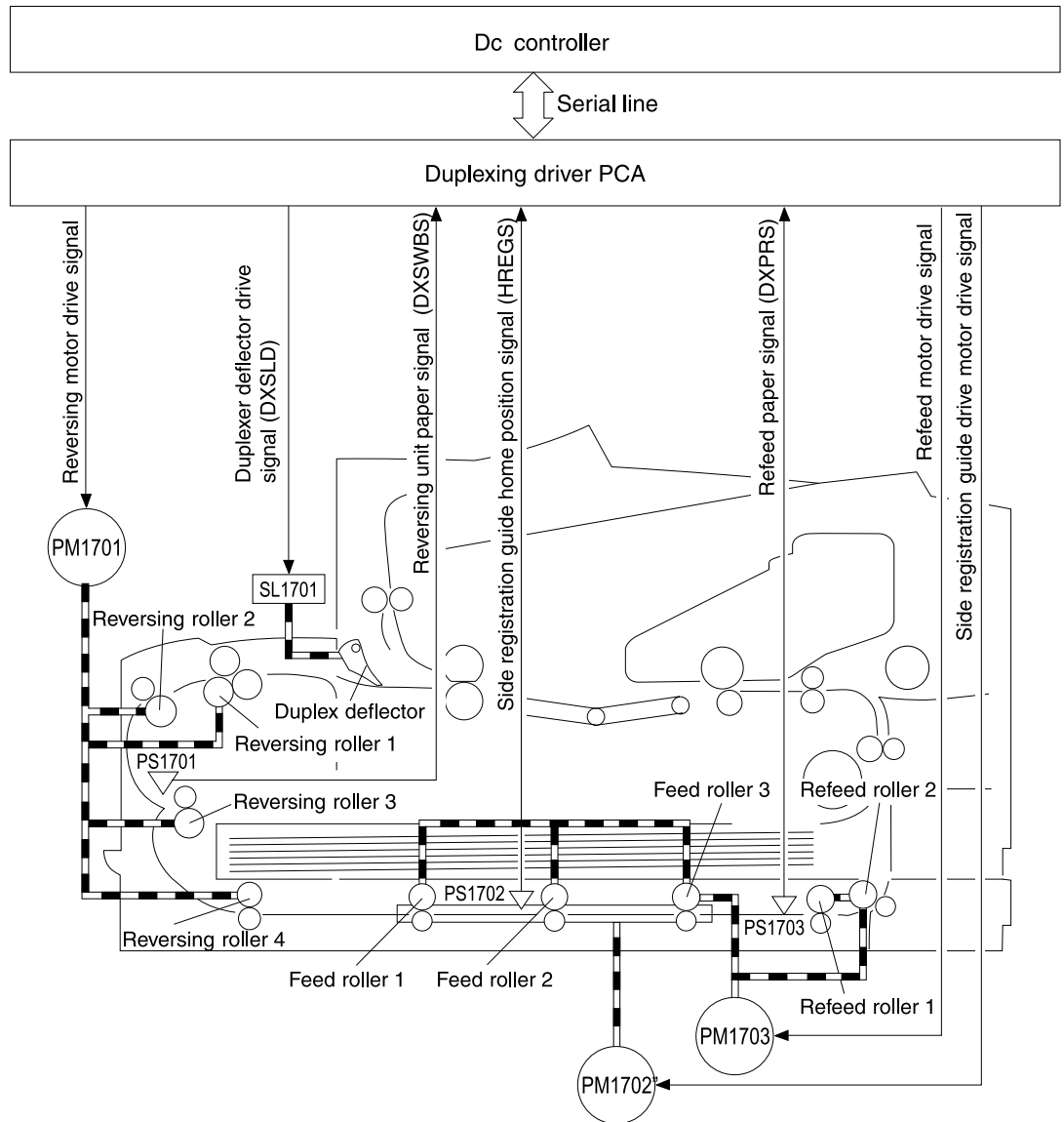
Figure 134.

Duplexer



**Figure 135. Duplexer**





**Figure 136. Duplexer**

## Sensors and signals

The following figures show key components, sensors, and switches that control the operation of the printer. Table 55 on page 237 shows the name of each sensor, switch, clutch, and solenoid in the printer.

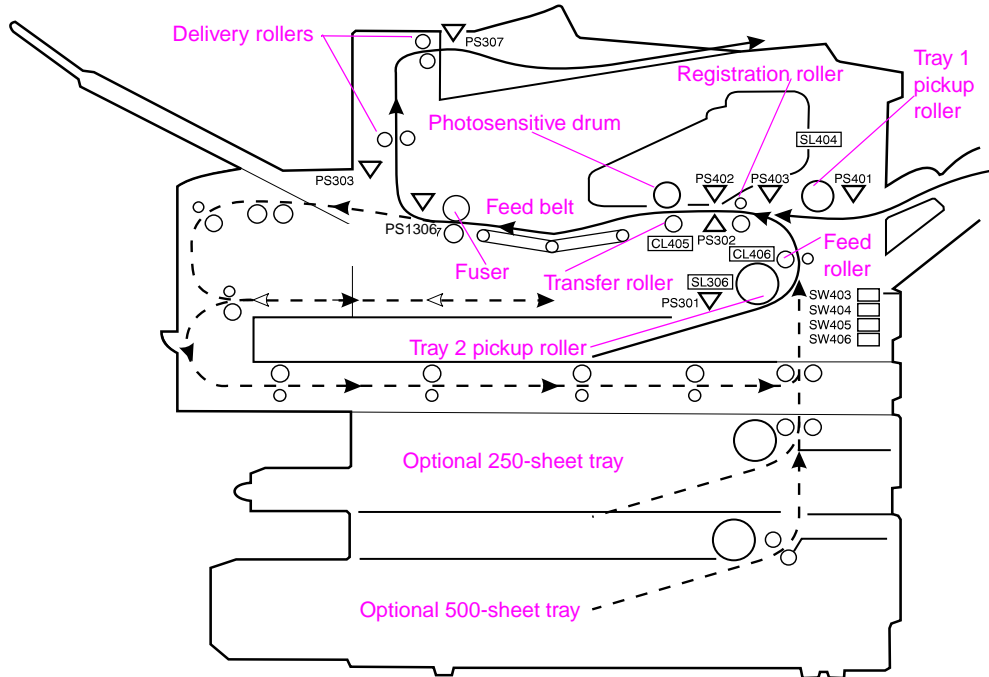


Figure 137.

Paper path and components (see figure 131, figure 132, and figure 136 for accessories)

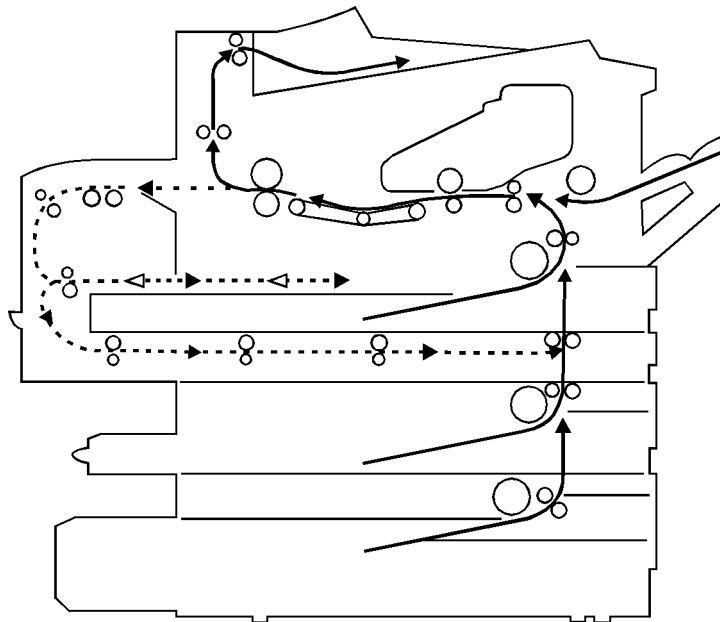
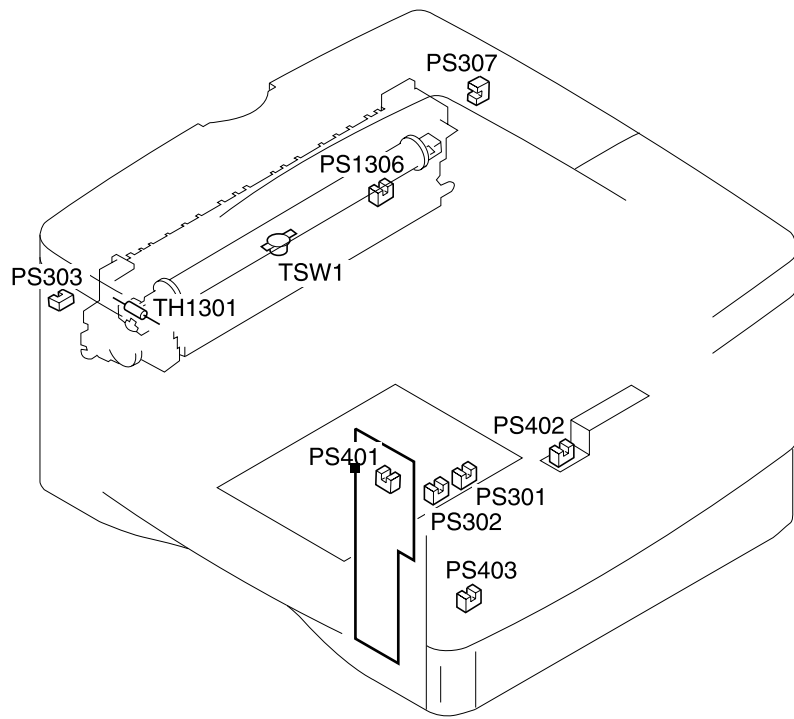


Figure 138.

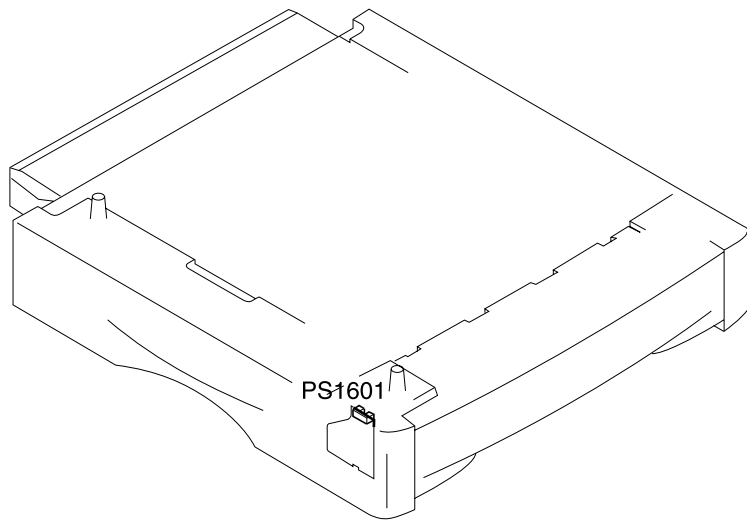
Paper path (dashed lines represent duplexer path)

**Table 55. Sensors, switches, clutches, and solenoids**

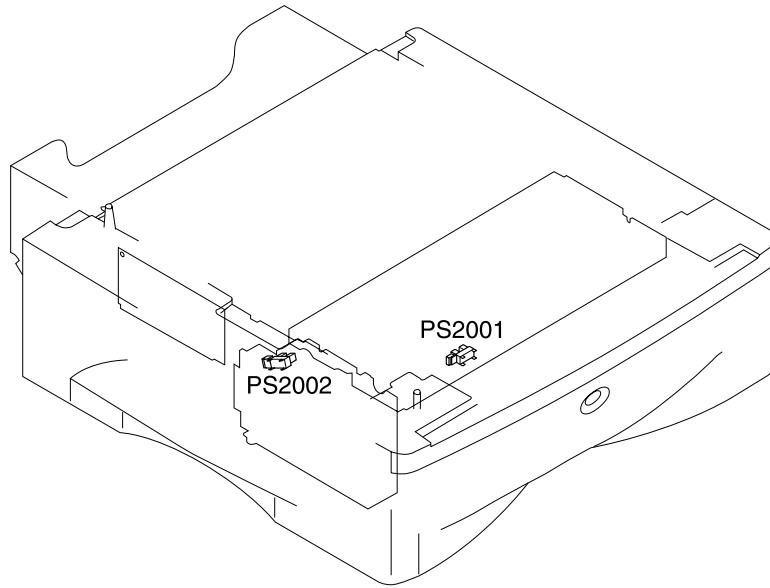
<b>Sensor</b>	<b>Name</b>
CL405	Registration roller clutch
CL406	Feed roller clutch
PS301	Tray 2 paper sensor
PS302	Paper-width sensor
PS303	Face-up tray open sensor
PS307	Face-down tray paper-full sensor
PS401	Tray 1 paper sensor
PS402	Top-of-page sensor
PS403	Registration roller paper sensor
PS1306	Fuser paper-delivery sensor
PS1601	250-sheet feeder paper sensor
PS1701	Duplexer reversing-unit paper sensor
PS1702	Duplexer side-registration guide home-position sensor
PS1703	Duplexer refeed paper sensor
PS2001	500-sheet feeder paper sensor
PS2002	500-sheet feeder paper feed sensor
SL306	Tray 2 pickup solenoid
SL404	Tray 1 pickup solenoid
SL1501	250-sheet feeder pickup roller solenoid
SL1701	Duplex deflector solenoid
SL2001	500-sheet feeder pickup roller solenoid
SW101	Main power switch
SW401	Top cover switch
SW402	Engine-test print switch
SW403	Tray 2 paper-size switch 1
SW404	Tray 2 paper-size switch 2
SW405	Tray 2 paper-size switch 3
SW406	Tray 2 paper-size switch 4
SW1601	250-sheet feeder paper-size switch 1
SW1602	250-sheet feeder paper-size switch 2
SW1603	250-sheet feeder paper-size switch 3
SW1604	250-sheet feeder paper-size switch 4
SW2101	500-sheet feeder paper-size switch 1
SW2102	500-sheet feeder paper-size switch 2
SW2103	500-sheet feeder paper-size switch 3
SW2104	500-sheet feeder paper-size switch 4
TSW1	Fuser thermal switch
TH1301	Fuser roller thermistor



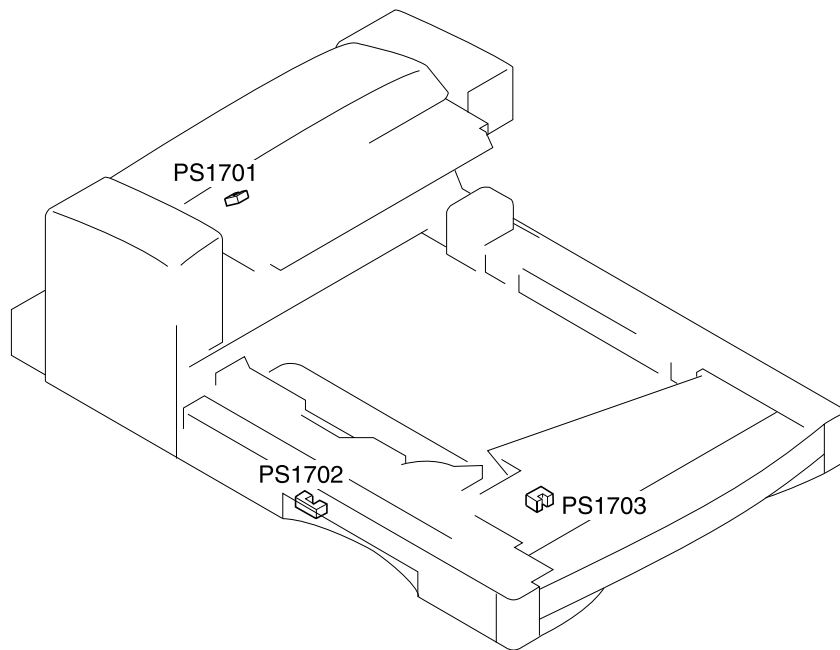
**Figure 139. Printer sensors**



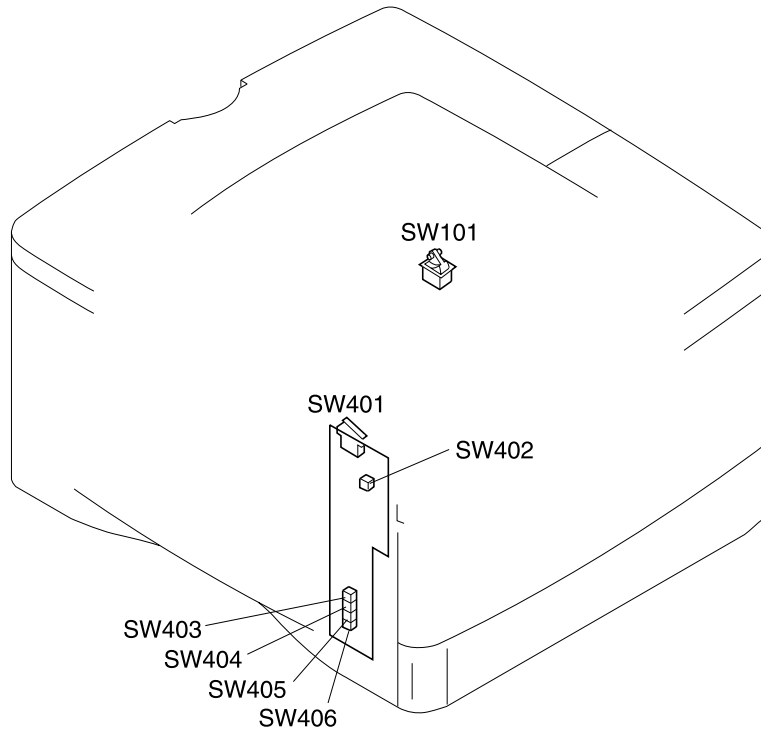
**Figure 140. 250-sheet feeder sensors**



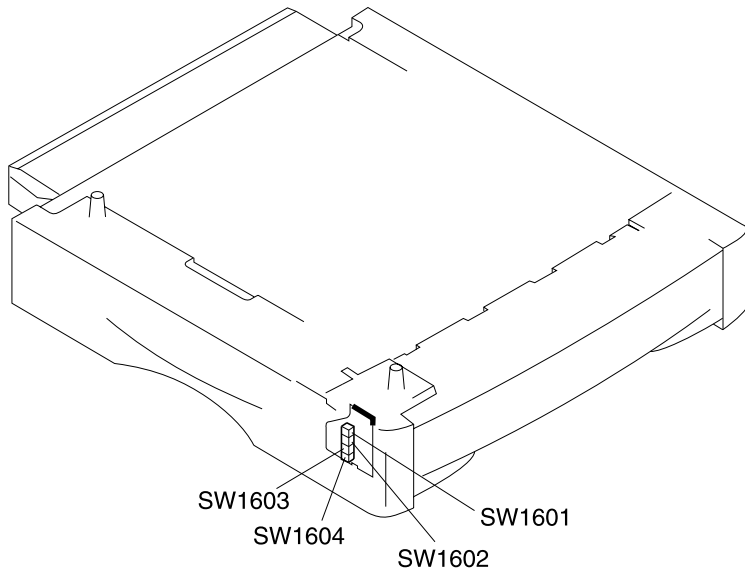
**Figure 141.** 500-sheet feeder sensors



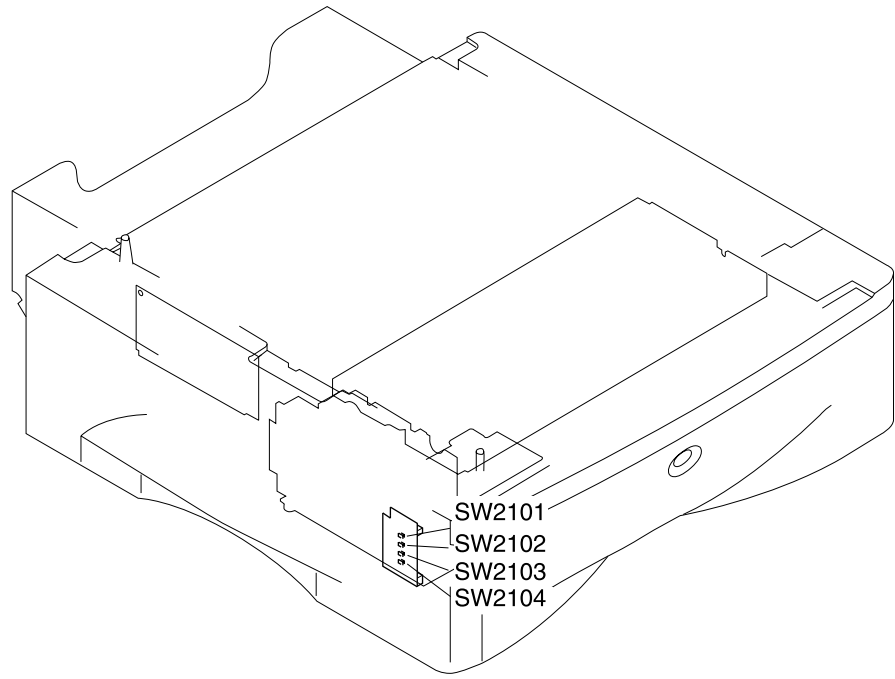
**Figure 142.** Duplexer sensors



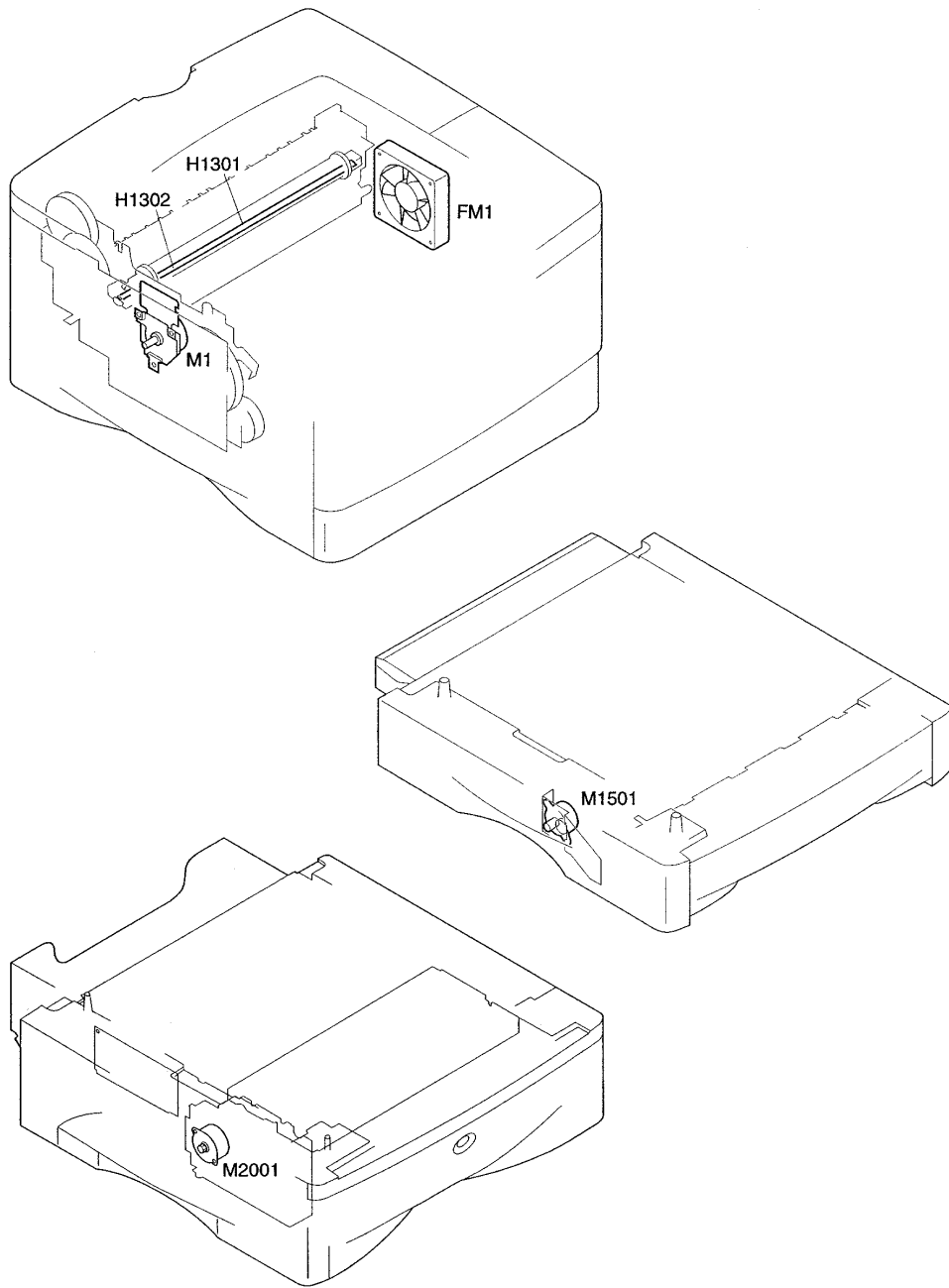
**Figure 143.** Printer switches



**Figure 144.** 250-sheet feeder switches

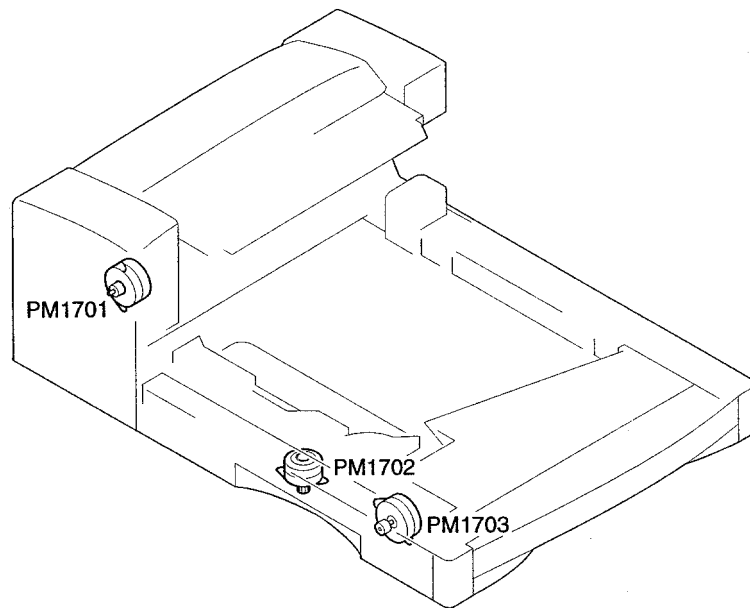


**Figure 145.** 500-sheet feeder switches






**Figure 146.** Motors, fans, and fuser heaters (see table 56 on page 243)

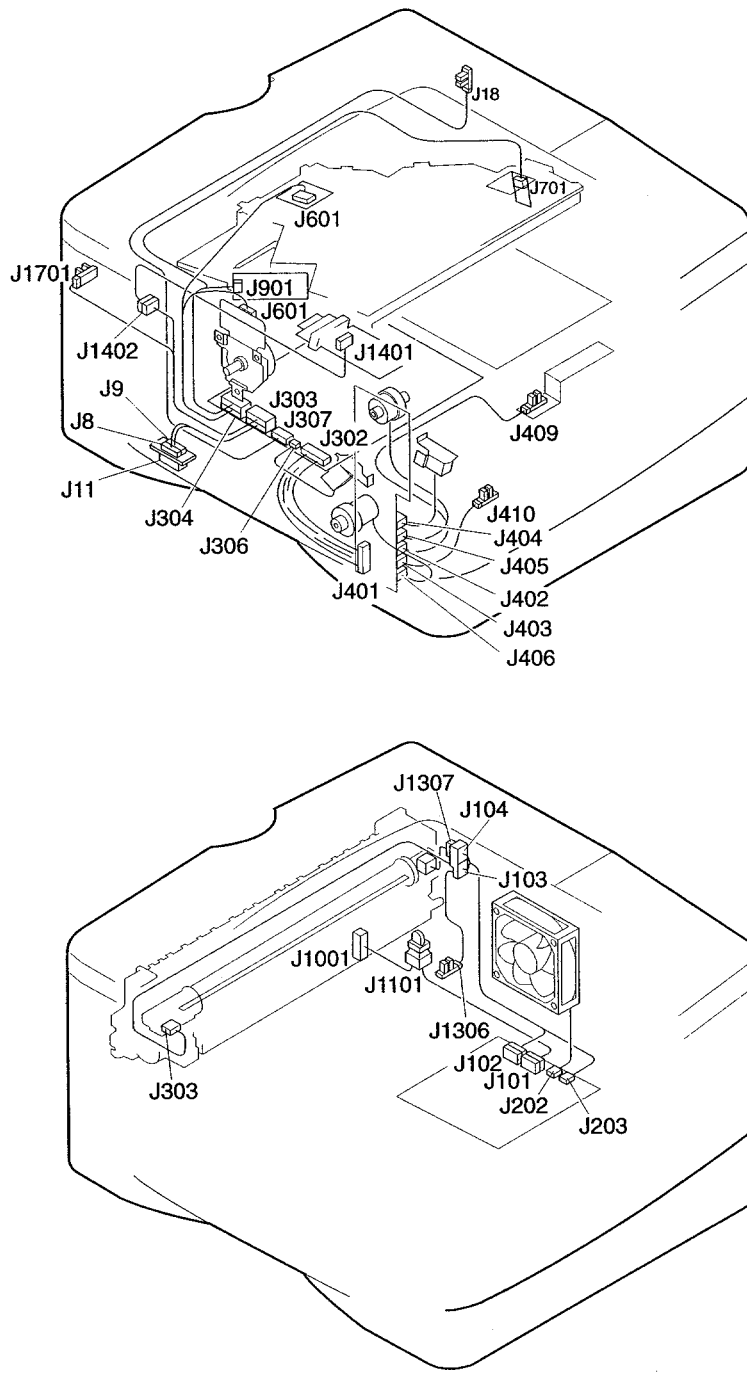




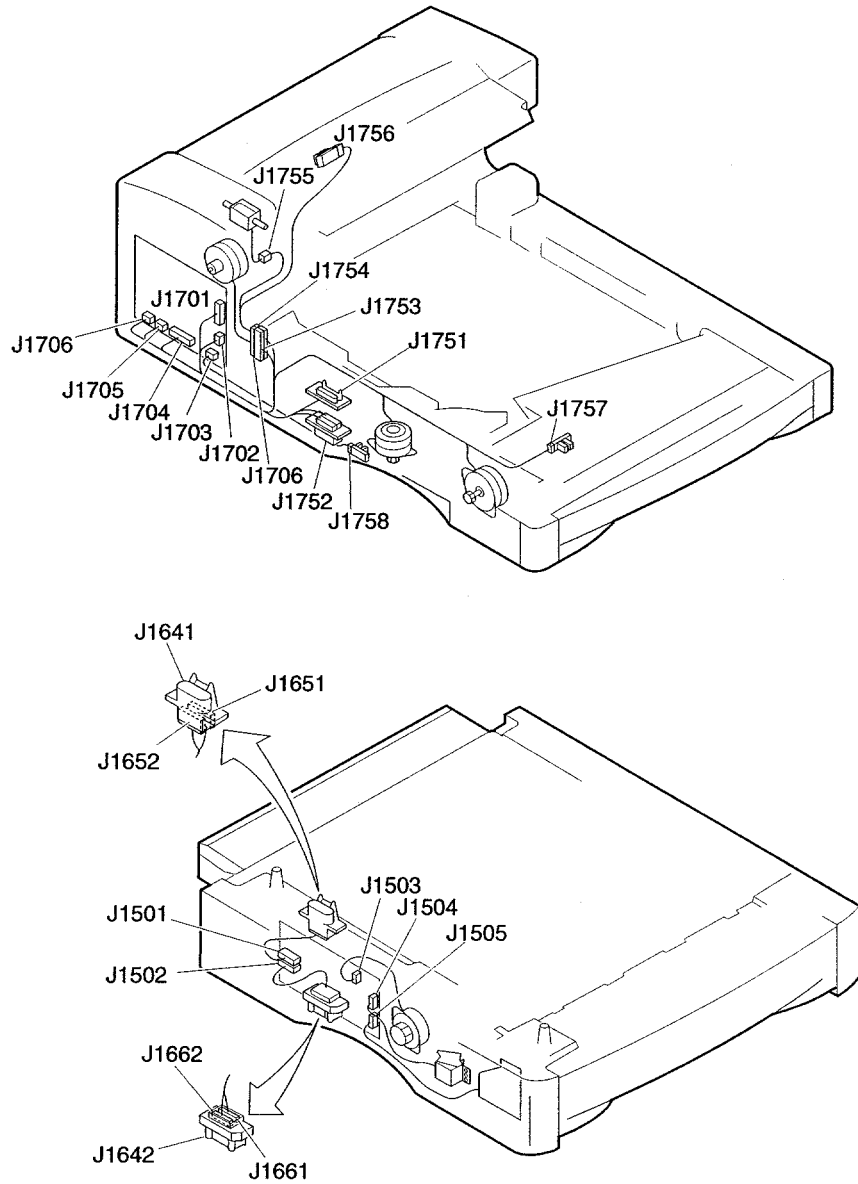
**Figure 147. Motors (duplexer)**

**Table 56. Motors, fans, and fuser heaters**

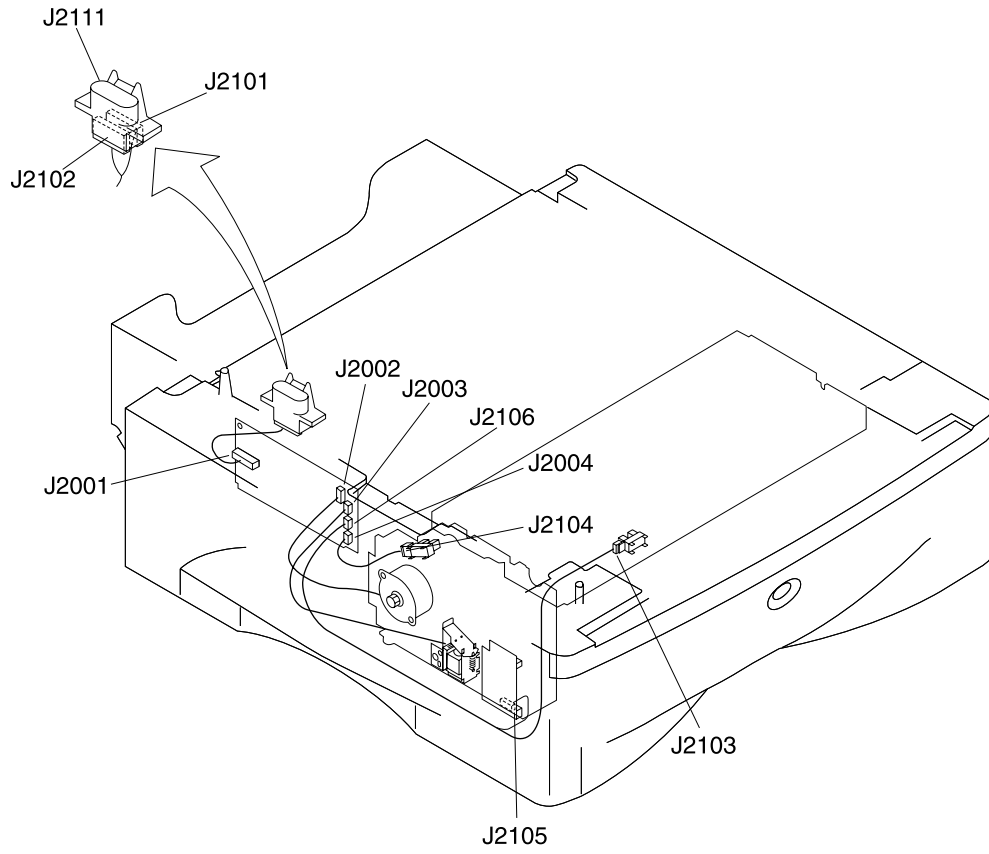
Symbol	Name of symbol	Code	Name
	Motor	M1	Main motor
		M1501	Paper feeder pickup motor (250-sheet paper feeder)
		PM1701	Reversing motor (duplexer)
		PM1702	Side registration guide drive motor (duplexer)
		PM1703	Refeed motor (duplexer)
		M2001	Paper feeder pickup motor (500-sheet paper feeder)
	Fan motor	FM1	Exhaust fan
	Fuser heater	H1301	Fuser heater 1
		H1302	Fuser heater 2



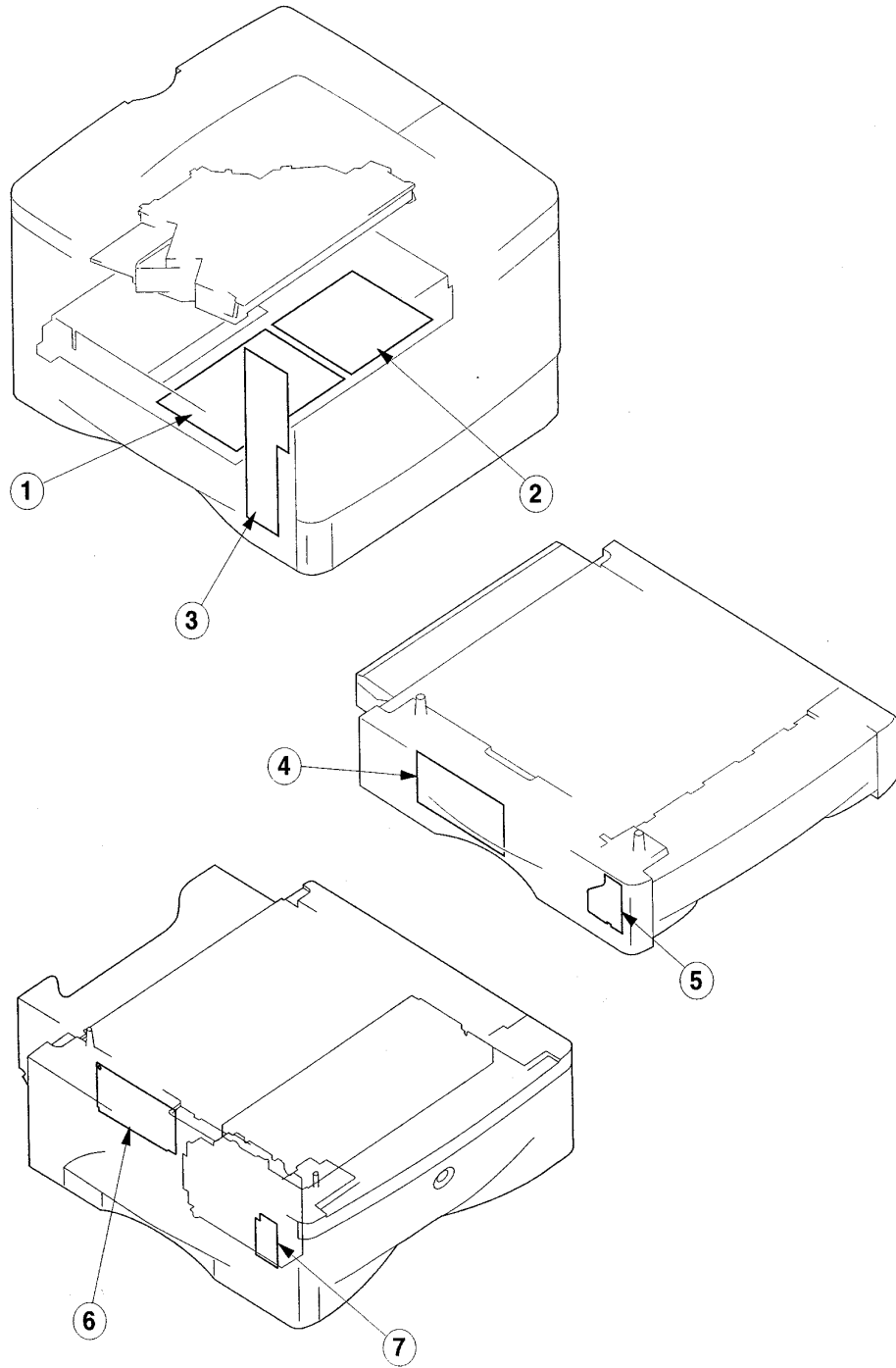
**Figure 148.** Connectors (main unit)



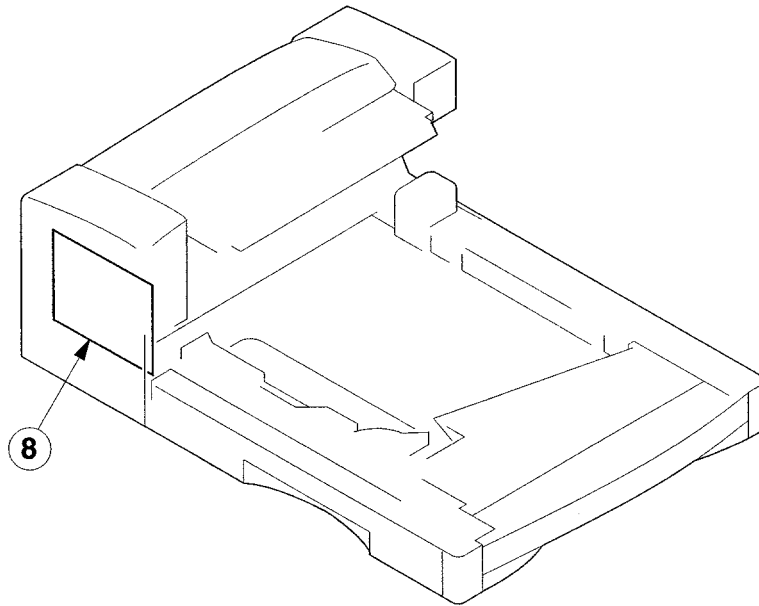
**Figure 149.** Connectors (duplexer and 250-sheet paper feeder)



**Figure 150.** Connectors (500-sheet paper feeder)



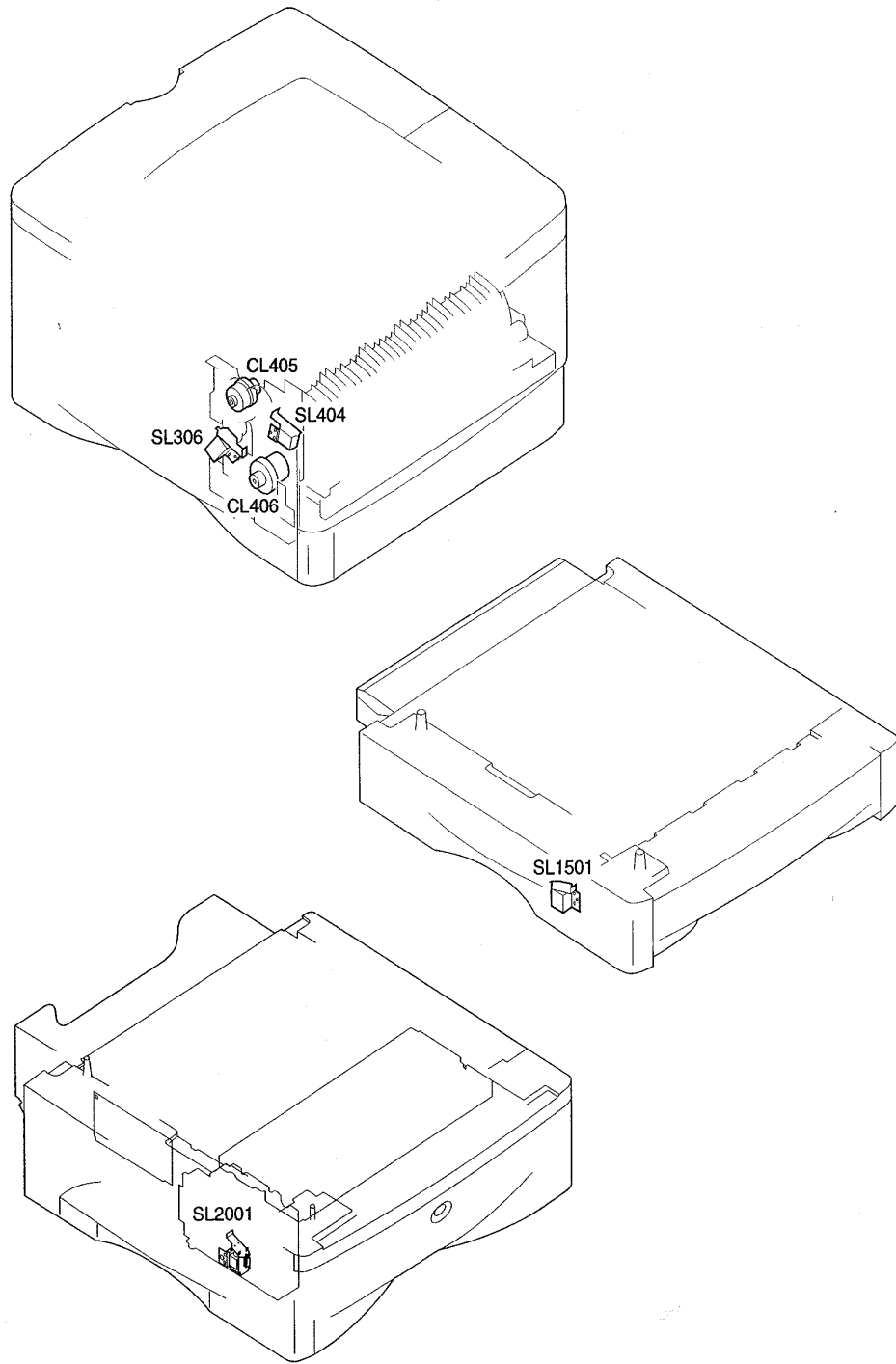
**Figure 151.**      **PCAs**



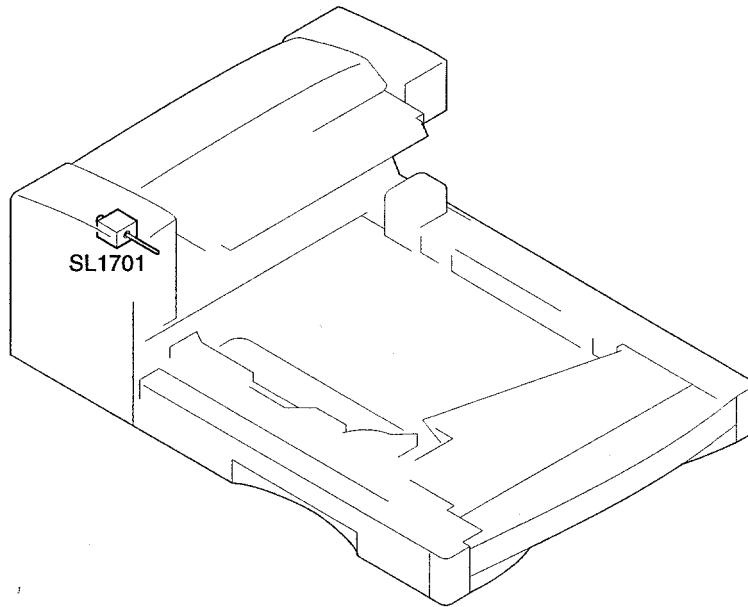
**Figure 152.** PCA (duplexer)

**Table 57. PCAs**

No.	Name	Function
1	Dc controller	Controls the print sequence
2	Power supply	Generates +24 Vdc, +5 Vdc, and +3.4 Vdc and drives the fuser heaters
3	Paper-handling PCA	Relays the signals between sensors, loads, and the dc controller
4	250-sheet paper feeder control PCA	Controls the loads in the 250-sheet paper feeder and sensors
5	Feeder sensor PCA	Monitors sensor and switches
6	500-sheet paper feeder control PCA	Controls loads in the 500-sheet paper feeder and sensors
7	Feeder sensor PCA	Monitors the sensor and switches
8	Duplexer driver PCA	Controls the loads in the duplexer and monitors sensors





**Figure 153.** Clutches and solenoids



**Figure 154.** Clutches and solenoids (duplexer)

**Table 58. Clutches and solenoids**

Symbol	Name of symbol	Code	Name
	Clutch	CL405	Registration roller clutch
		CL406	Feed roller clutch
	Solenoid	SL306	Tray 2 pickup solenoid
		SL404	Tray 1 pickup solenoid
		SL1501	Paper feeder pickup solenoid (250-sheet feeder)
		SL1701	Duplexer deflector solenoid (duplexer)
		SL2001	Paper feeder pickup solenoid (500-sheet paper feeder)



**Table 59. Paper-size detection**

Paper	Paper-size switches				
	Printer	SW403	SW404	SW405	SW406
	250F	SW1601	SW1602	SW1603	SW1604
	500F	SW2101	SW2102	SW2103	SW2104
Not installed		OFF	OFF	OFF	OFF
A3		ON	ON	OFF	OFF
A4R		OFF	ON	ON	OFF
A4		OFF	ON	OFF	OFF
A5		OFF	OFF	ON	OFF
B4		ON	OFF	ON	OFF
B5		ON	OFF	OFF	OFF
Ledger		OFF	ON	OFF	ON
Legal		OFF	ON	ON	ON
Executive		ON	ON	OFF	ON
Printer					
250F	Letter	ON	OFF	ON	ON
500F	Letter-R				
Printer					
250F	Letter	OFF	OFF	ON	ON
500f					
Printer					
250F	Letter	ON	OFF	OFF	ON
500F	Custom				

250F = 250-sheet paper feeder  
500F = 500-sheet paper feeder  
A4R = A4 paper fed 90° to normal landscape direction  
Letter-R = Letter paper fed 90° to normal landscape direction

# Dc controller inputs and outputs

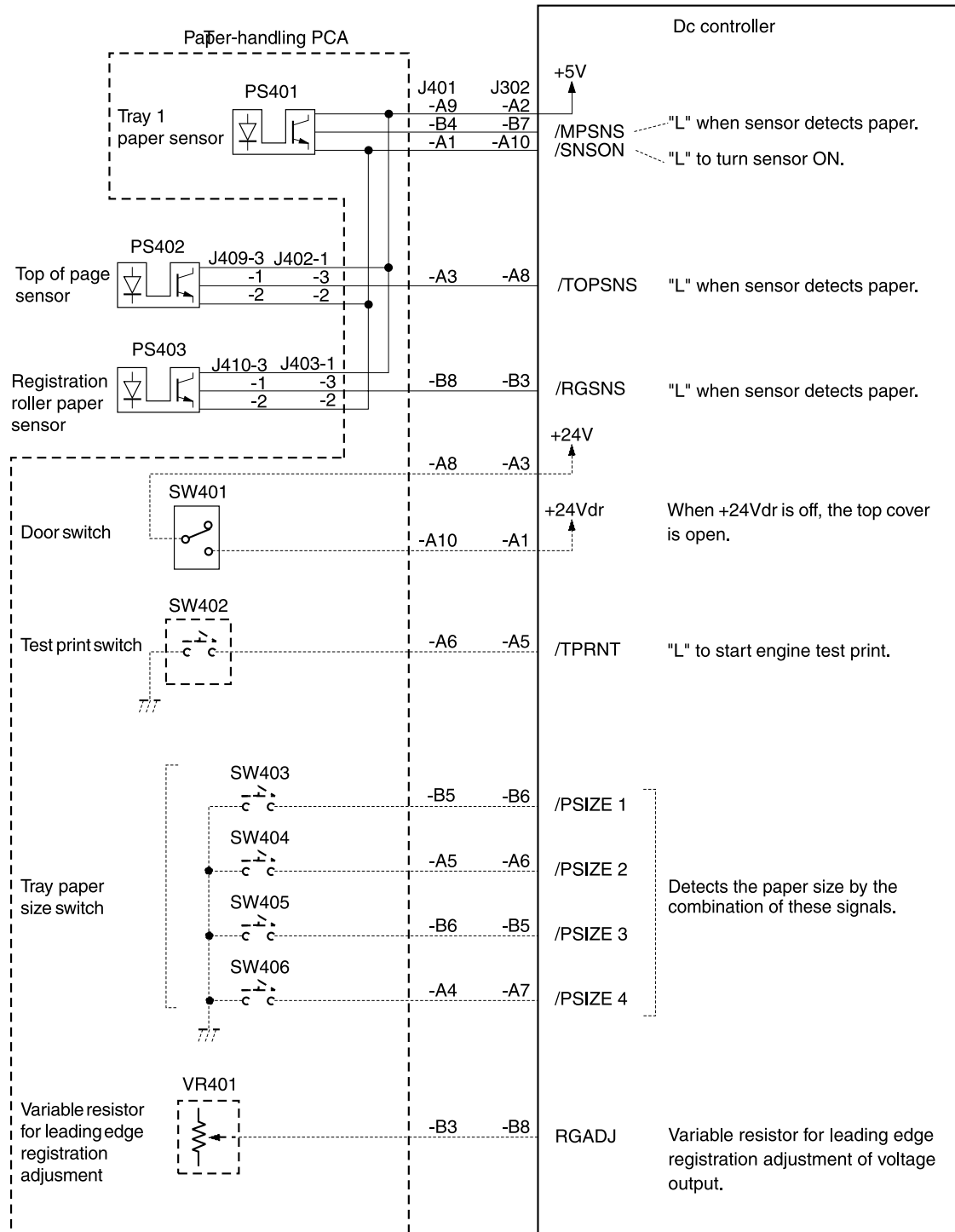
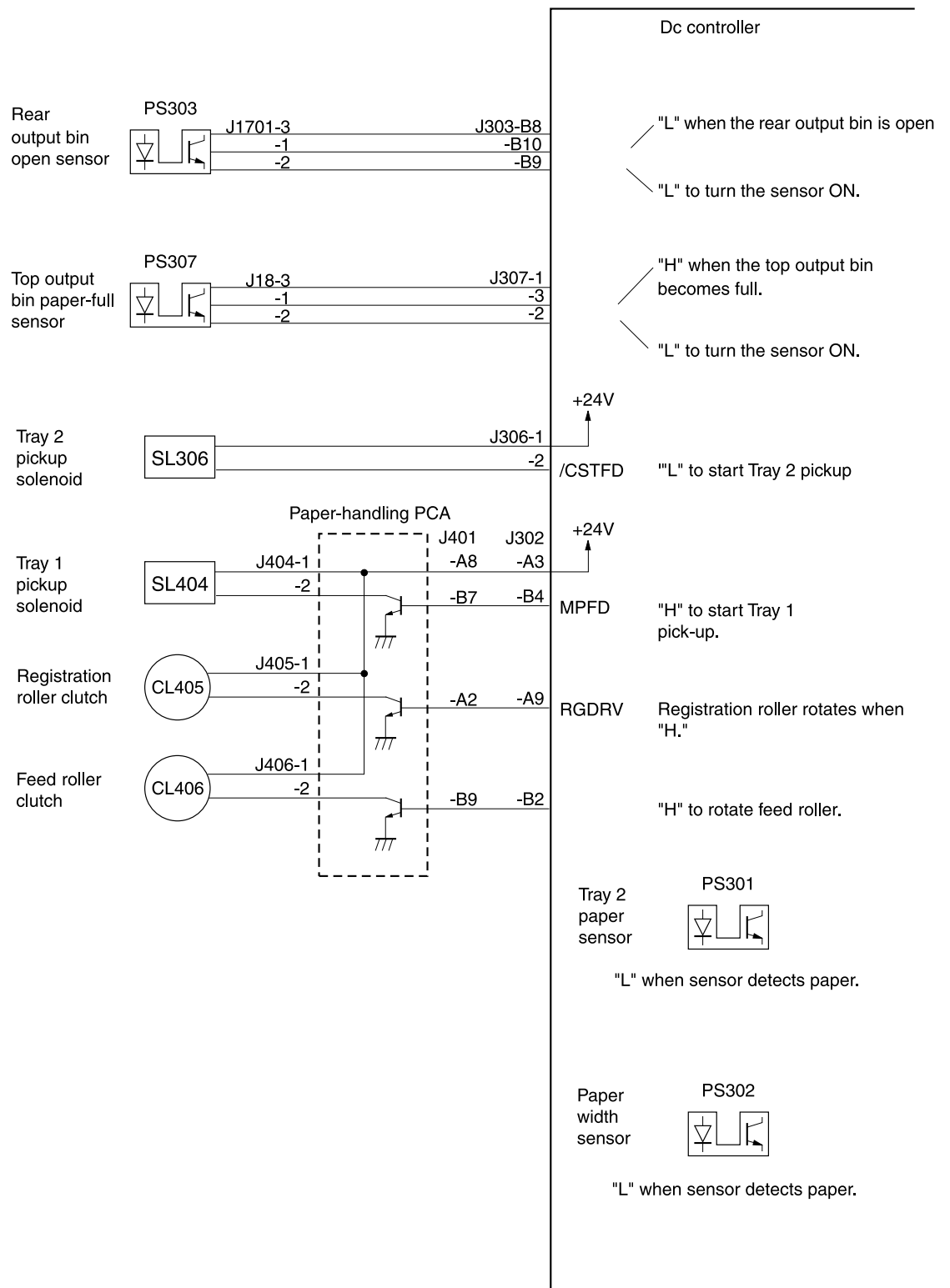


Figure 155.

Dc controller I/O (1 of 4)



**Figure 156. Dc controller I/O (2 of 4)**

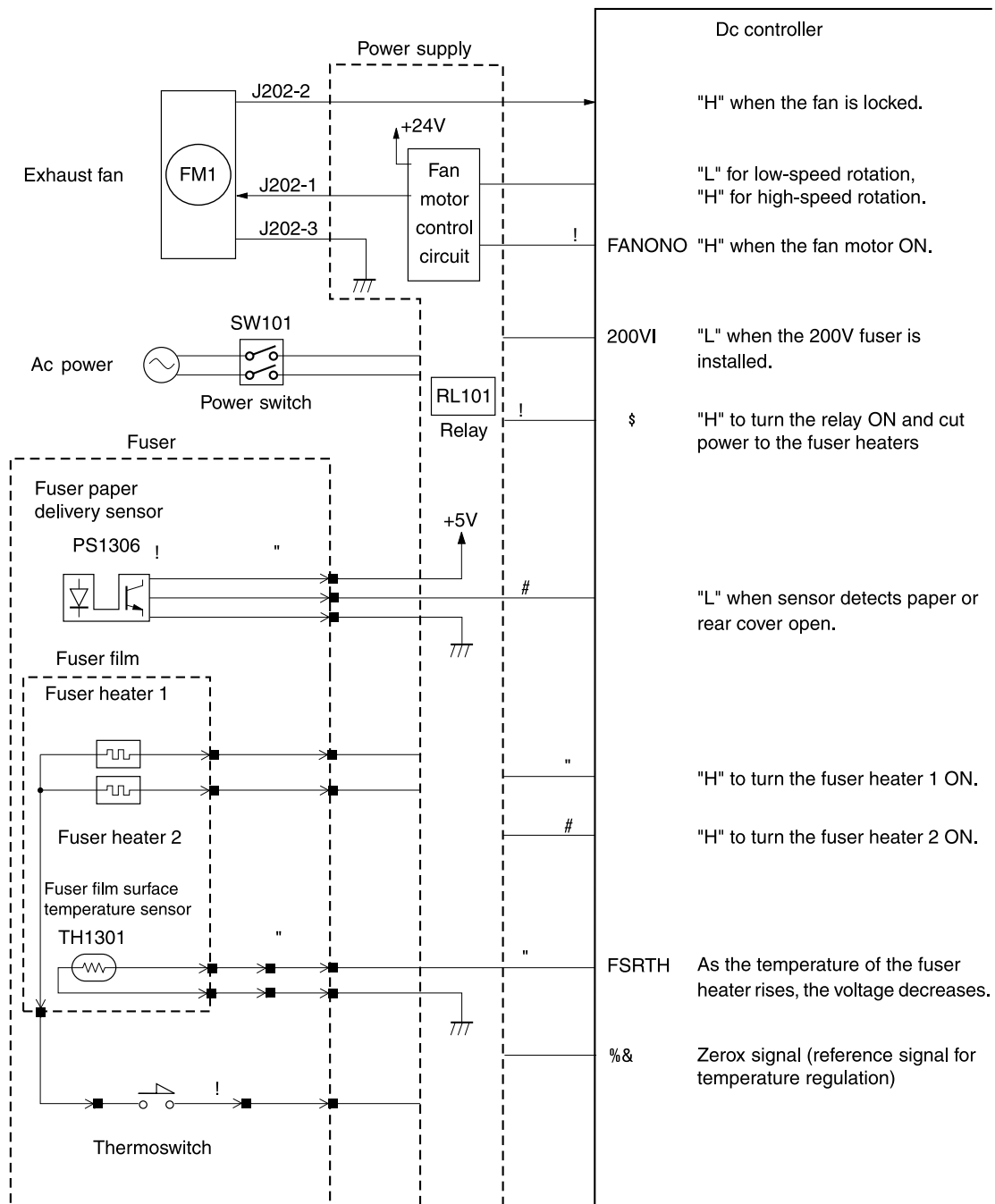


Figure 157. Dc controller I/O (3 of 4)

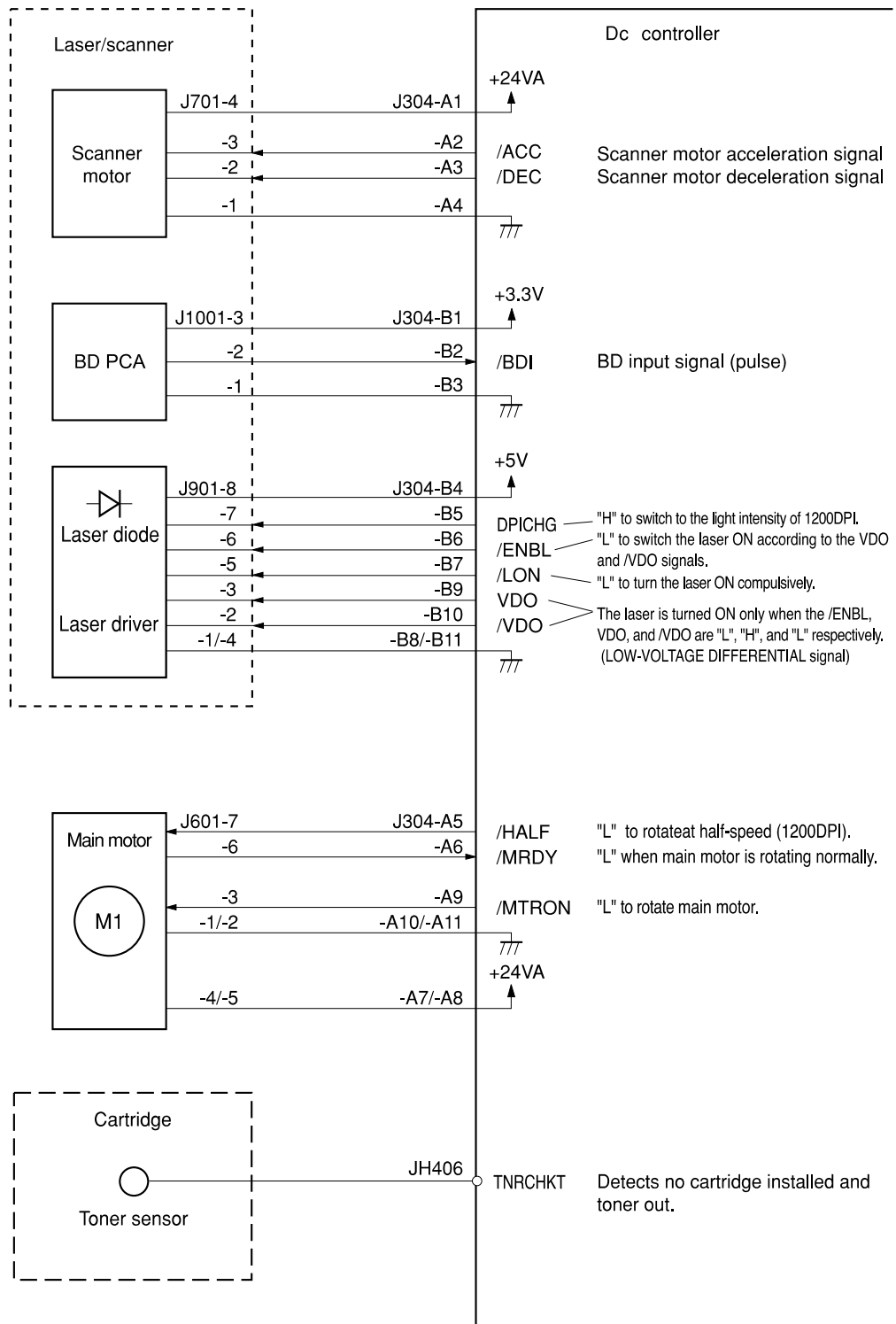


Figure 158. Dc controller I/O (4 of 4)



# 8

# Parts and diagrams

## Overview

The diagrams in this chapter identify and locate the printer's major subassemblies and replacement parts.

This chapter discusses the following:

Ordering parts and supplies, and getting support . . . . .	259
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Support . . . . .	259
Ordering parts . . . . .	259
Ordering consumables . . . . .	259
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Numerical parts list . . . . .	294





# Ordering parts and supplies, and getting support

## Related documentation and software

To order documentation, drivers, updated HP printer software, and product and support information, see the information in chapter 2.

## Support

**Table 60. Technical support websites**

<b>HP Connect Online</b> (for HP partners)	<a href="http://www.connect-online.hp.com">http://www.connect-online.hp.com</a> HP Connect Online is an Internet site that is created exclusively for our partners. You can easily find all the HP information that you need for your daily business. And you can get it earlier than from any other site.
<b>HP Customer Care Online</b> Software drivers, support documentation, and answers to frequently asked questions	<a href="http://www.hp.com">http://www.hp.com</a> Select your country or region in the “select a country or region” field located at the top right corner of the page. Select the support block.
<b>HP Technical Training</b> Classes and schedules	USA: <a href="http://www.partner.americas.hp.com">http://www.partner.americas.hp.com</a> Canada: <a href="http://www.canada.hp.com">http://www.canada.hp.com</a> Asia Pacific countries/regions: <a href="http://partnercare.asiapac.hp.com">http://partnercare.asiapac.hp.com</a> Latin America: <a href="http://www.conecta.latinamerica.hp.com">http://www.conecta.latinamerica.hp.com</a>

## Ordering parts

All standard part numbers listed are stocked and can be ordered from HP’s Customer Services and Support Center.

Hewlett-Packard Co.  
Customer Services and Support Center  
8050 Foothills Blvd.  
Roseville, CA 95678  
Parts Direct Ordering: (1) (800) 227-8164 (U.S. Only)

Hewlett-Packard Co.  
Customer Services and Support Center  
Wolf-Hirth Strasse 33  
D-7030  
Boblingen, Germany  
(49 7031) 14-2253

## Ordering consumables

Consumables and accessories such as those listed in table 61 can be ordered from Hewlett-Packard through the HP Web sites listed above or through the following phone numbers:

- U.S.: (1) (800) 538-8787
- Canada: (1) (800) 387-3154
- (Toronto) (516) 671-8383
- United Kingdom: 0734-441212
- Germany: 0130-3322

Contact your local HP Parts Coordinator for other phone numbers.

### Note

Parts that have no item number or part number listed are not field replacement parts and cannot be ordered.

## Accessories and supplies

The following items are available through a local, authorized HP dealer or through the HP Web site—<http://www.hp.com>.

**Table 61. Accessories and supplies**

Description	Part number	Exchange number	Product number
500-sheet paper feeder and tray			Q1866A
250-sheet paper feeder and tray			Q1865A
Duplex printing accessory (duplexer)		Q1860-69010	Q1864A
250-sheet replacement tray	RG5-7188-030CN		C4116A
500-sheet replacement tray	RG5-7164-000CN	C4117-69001	C4117A
HP multi-purpose paper			HPM1120
HP LaserJet paper			HPJ1124
Toner cartridge (10,000 pages)			C4129X
SDRAM dual in-line memory module (DIMM)			
4 MB	C4140-67901		C4140A
8 MB	C7842-67901		C7842A
16 MB	C7843-67901		C7843A
32 MB	C7845-67901		C7845A
64 MB	Q1887-67901		Q1887A
128 MB	C9121-67901		C9121A
Flash DIMM			
2 MB			C4286A
4 MB			C4287A
Font DIMM (8 MB Asian MROM)			
Arabic			5062-4670
Cyrillic			5062-4669
Greek			5062-4667
Hebrew			5062-4668
Korean			D4838A
Traditional Chinese			C4292A
Simplified Chinese			C4293A
Hard disk			
			J6054A
Parallel cables			
2-Meter IEEE-1284 cable			C2950A
3-Meter IEEE-1284 cable			C2951A
Enhanced I/O Cards			
Ethernet RJ-45 only	J6057-61001	J6057-69001	J6057A
Ethernet RJ-45 and BNC, Local Talk	J3111-61001	J3111-69001	J3111A
Token Ring RJ-45 and DB-9	J4167-61001	J4167-69001	J4167A
802.11 Wireless (U.S. part number only)	J6058-61201	J6058-69002	J6058A
Maintenance Kit			
110V	Q1860-67902	Q1860-69002	
220V	Q1860-67903	Q1860-69003	
Embedded Webserver DIMM			
	C9129-67902		C9129B

## Common hardware and replacement cables

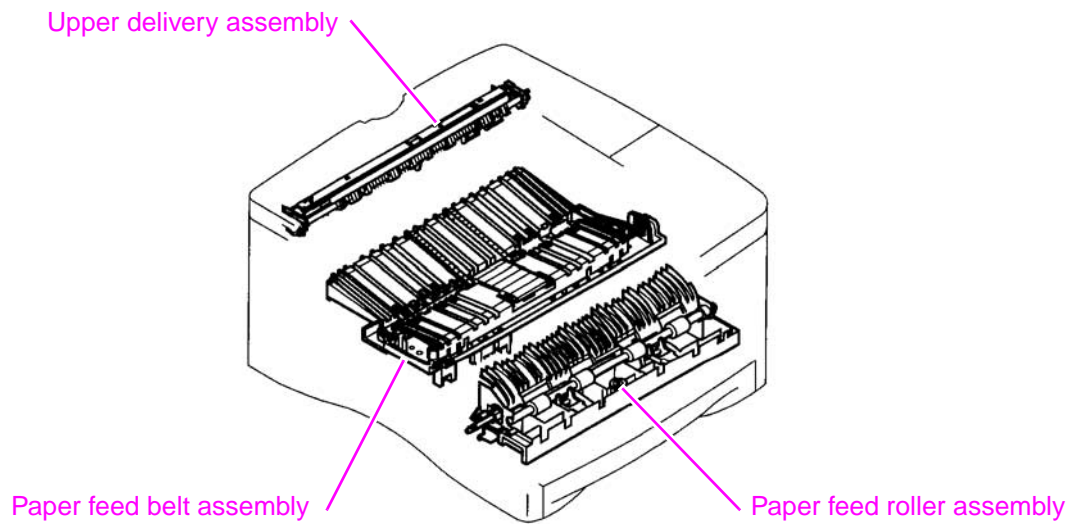
**Table 62. Screws used in the printer**

Description	Part number
Screw, M4x10 pan head tapping	XB4-7401-007CN
Screw, M4x8 truss head tapping	XB4-7400-807CN
Screw, M3x6 washer-head	XA9-0267-000CN
Screw, M4x16 w/washer	XA9-0838-000CN
Screw, M4x6 w/star washer	XA9-0265-000CN
Screw, M3x4 washer-head	XA9-0815-000CN
Screw, M4x6 screw w/washer	XB2-6400-607CN
Screw, M3x8 washer-head	XB6-7300-807CN
Screw, Long dc controller screws (M3x25)	XA9-0974-000CN

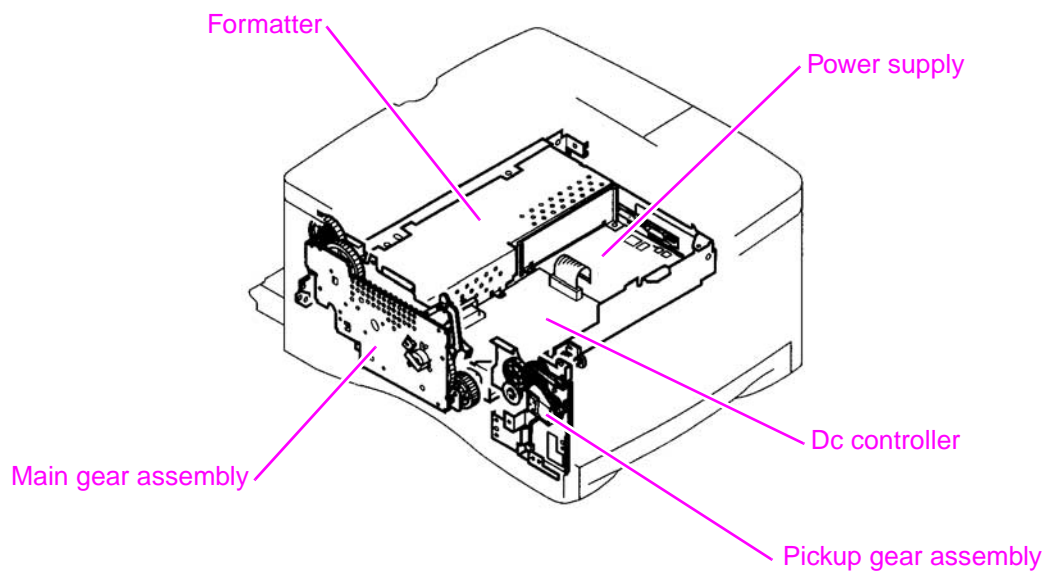
**Table 63. Replaceable cables**

Description	Part Number	Figure
Cable, display, accessory power, photo sensor	RG5-7073-000CN	Figure 164
Cable, fuser ac	RG5-3561-000CN	Figure 167
Cable, scanner	RG5-7072-000CN	Figure 167
Cable, paper sensor (PS307)	RG5-3554-000CN	Figure 164
Cable, paper sensor (PS402)	RG5-3558-000CN	Figure 164
Cable, ribbon, paper-handling PCA- to-dc controller	RG5-7086-000CN	Figure 164
Cable, DCC-LVPS	RH2-5337-000CN	Figure 177
Cable, display	RG5-3575-000CN	Figure 163

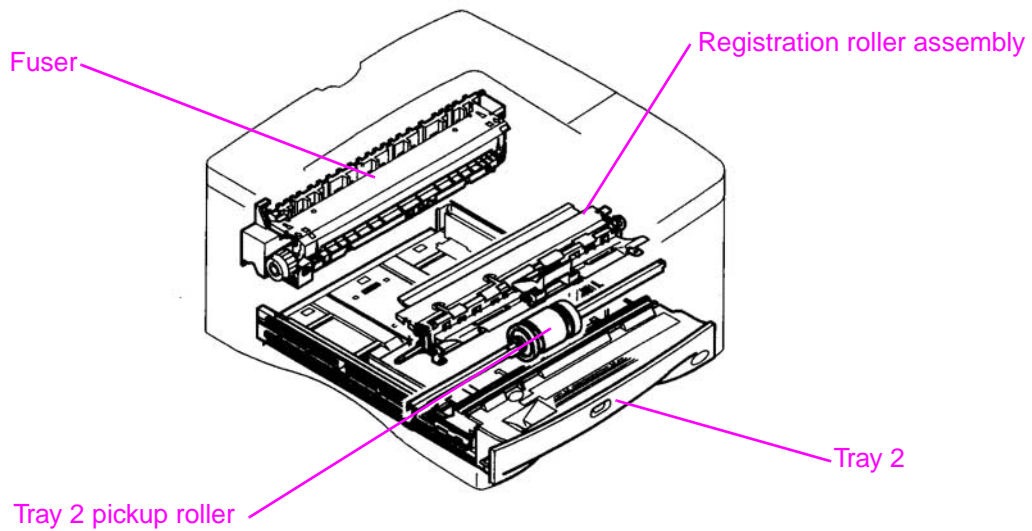
## Diagrams and parts lists



**Figure 159.** Assembly locations (1 of 3)



**Figure 160.** Assembly locations (2 of 3)



**Figure 161.** Assembly locations (3 of 3)

**Table 64. Assemblies listed alphabetically and their part numbers**

Description	Part number	Exchange number	Exploded view in figure
Dc controller	RG5-7057-000CN	Q1860-69005	Figure 176
Firmware DIMM, HPLJ 5100 (base)	Q2449-67901		Not shown
Firmware DIMM, HPLJ 5100Le	Q2467-67901		Not shown
Firmware DIMM, HPLJ 5100tn, 5100dtn	Q2451-67901		Not shown
Formatter (HPLJ base, 5100tn, 5100dtn)	Q1860-67901	Q1860-69001	Not shown
Formatter (HPLJ 5100Le)	Q1863-67901	Q1863-69001	Not shown
Fuser, 110V	RG5-7060-000CN	Q1850-69008	Figure 178
Fuser, 220V	RG5-7061-000CN	Q1850-69009	Figure 178
Power supply, 110V	RH3-2248-000CN	Q1860-69006	Figure 176
Power supply, 220V	RH3-2249-000CN	Q1860-69007	Figure 176
Upper delivery assembly	RG5-3542-090CN		Figure 168
Paper feed roller assembly	RG5-7084-000CN		Figure 171
Paper feed belt assembly	RG5-4914-000CN		Figure 170
Registration roller assembly	RG5-4916-000CN		Figure 172
Pickup gear assembly	RG9-1524-000CN		Figure 175
Main gear assembly	RG5-7079-000CN		Figure 174
Tray 2	RG5-7188-030CN		Figure 173
Tray 2 pickup roller	RB2-1821-020N		Figure 169

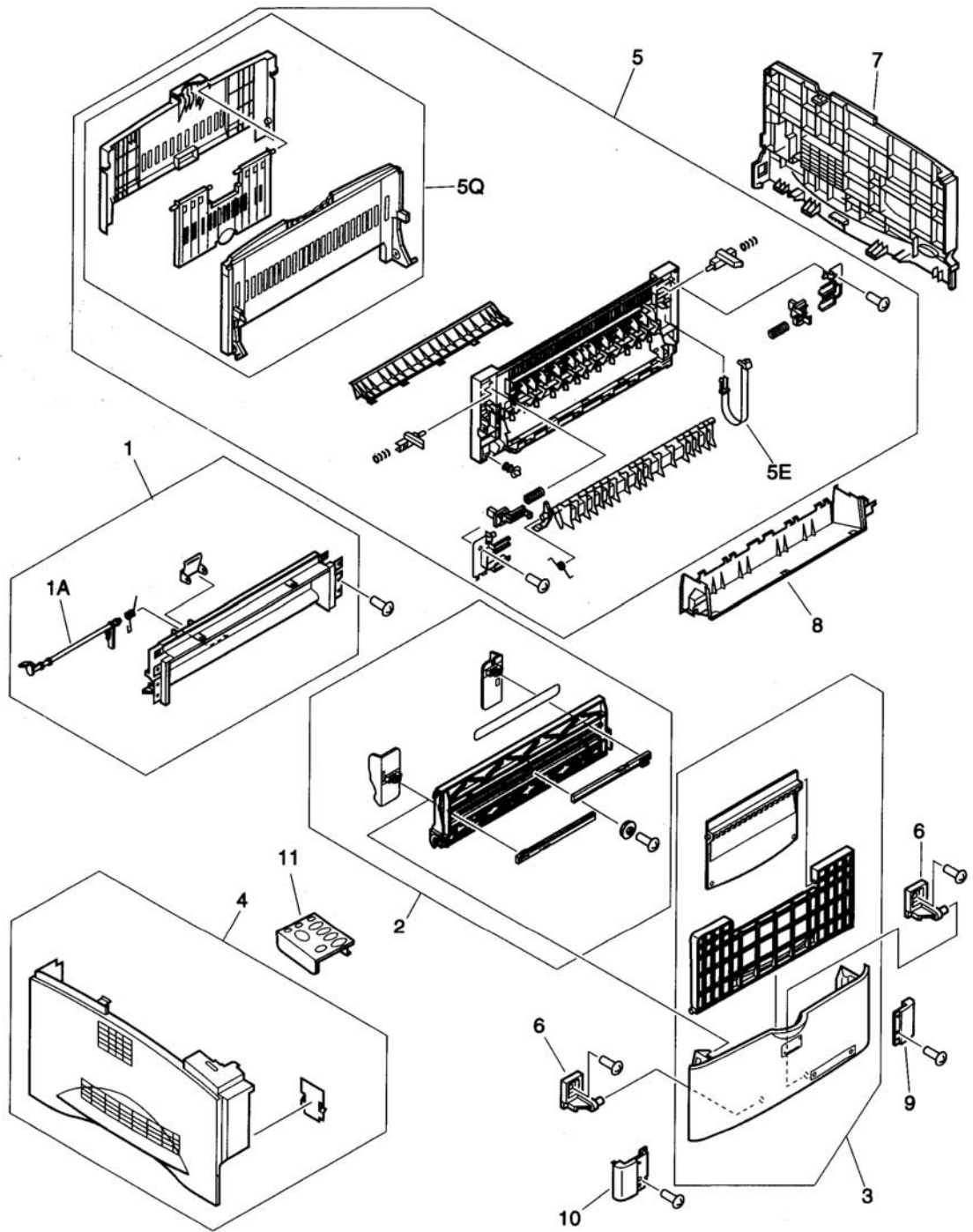


Figure 162.

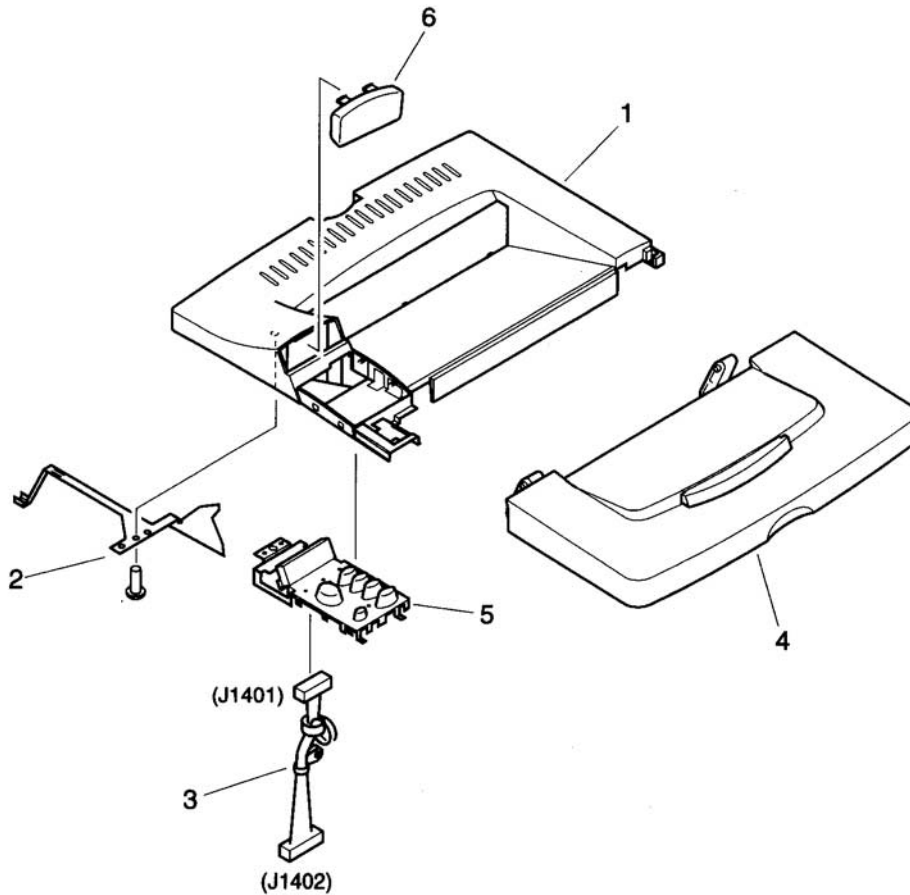
External covers and panels

Table 65. External covers and panels

Item number	Part number	Quantity	Description
1	RG5-3547-040CN	1	Cover, front inner
1A	RB1-6134-030CN	1	Tray 1 sensor arm
2	RG5-3548-000CN	1	Tray 1 paper guide
3	Q1860-67904	1	Cover, front
4	RG5-3550-000CN	1	Cover, left side
5	RG5-3551-040CN	1	Cover, rear

**Table 65. External covers and panels (continued)**

Item number	Part number	Quantity	Description
5E	RB2-1977-000CN	1	Strap, rear output support
5Q	RG5-3552-000CN	1	Face-up tray assembly
6	RB2-1745-000CN	2	Pin, front cover
7	RB2-1749-000CN	1	Cover, right side
8	RB2-1747-000CN	1	Cover, face-down auxiliary
9	RB2-1755-000CN	1	Cover, right corner
10	RB2-1756-000CN	1	Cover, left corner
11	C4110-40004	1	Overlay, English (other languages available)



**Figure 163. Upper cover assembly**

**Table 66. Top cover assembly**

Item number	Part number	Quantity	Description
1	RB2-1748-000CN	1	Cover, top
2	RB2-1759-000CN	1	Control panel leaf spring
3	RG5-3575-000CN	1	Cable, control panel
4	RG5-3556-040CN	1	Toner cartridge door assembly
5	RG5-5438-030CN	1	Control panel assembly
6	RB2-1758-000CN	1	Cover, control panel LED

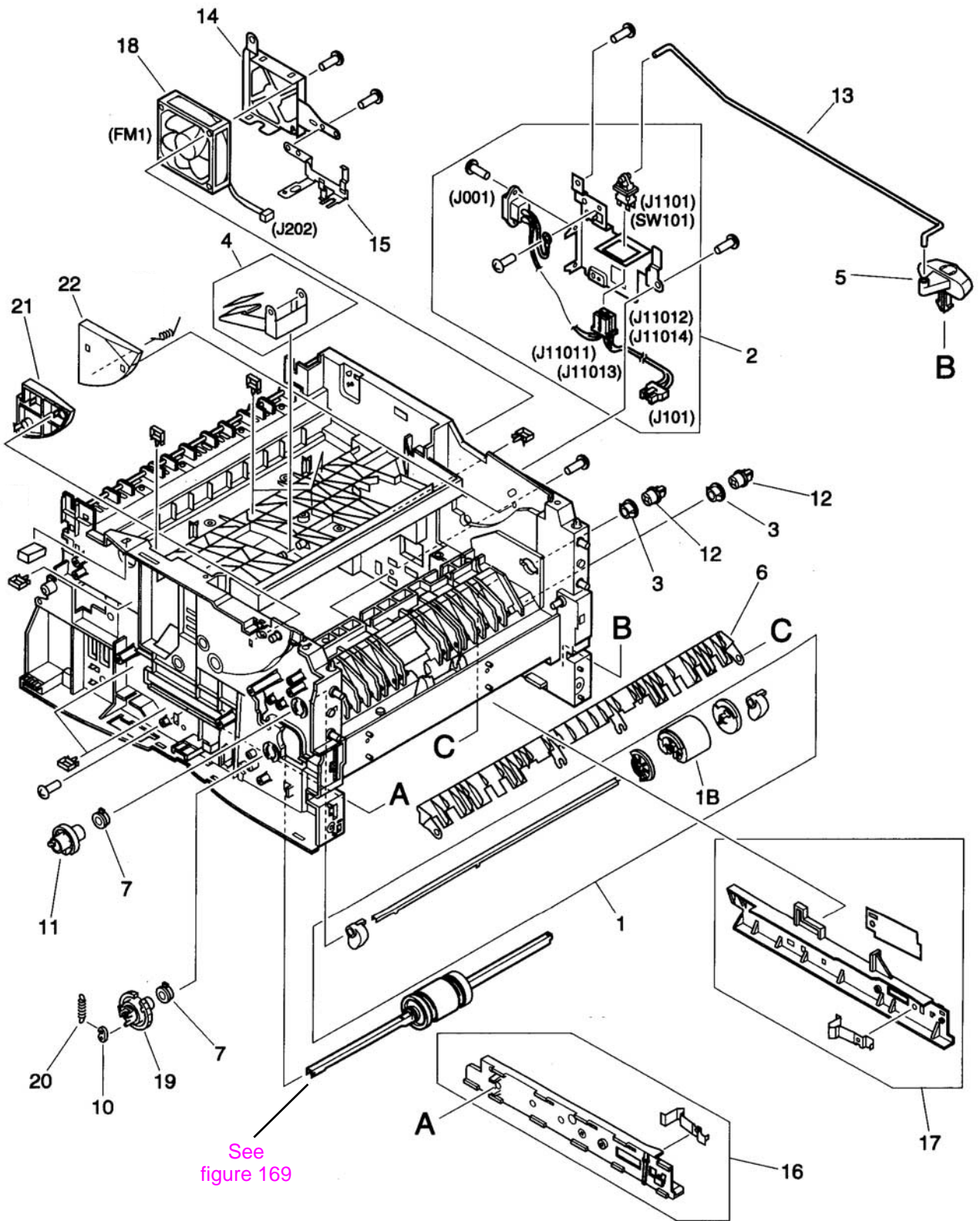






**Table 67. Internal components (1 of 4)**

Item number	Part number	Quantity	Description
1	RF5-4119-000CN	1	Tray 1 separation pad
2	RG5-3520-060CN	1	Tray 1 paper guide plate assembly
3	RG5-3553-000CN	1	Sensor, rear door
4	RG5-3554-000CN	1	Cable, paper sensor (PS307)
5	RG5-3558-000CN	1	Cable, paper sensor (PS402)
6	RB2-1985-000CN	1	Roller, lower delivery
7	RB2-1988-020CN	1	Bushing, right lower delivery roller
8	RB2-1989-000CN	1	Bushing, left lower delivery roller
9	RS6-0357-000CN	1	Gear, lower delivery shaft
11	RG5-7073-000CN	1	Cable, display, accessory power, photo sensor
13	WS6-5092-000CN	1	Power connector
14	RB1-6141-000CN	1	Grounding plate
16	RB2-1734-000CN	1	Grounding plate
17	RB2-1735-000CN	1	Grounding plate
18	RG5-7074-000CN	1	Grounding cable
19	RB2-1781-000CN	1	Lever, registration sensor
20	RB2-1782-000CN	1	Lever, top-of-page sensor
21	RB2-1783-000CN	1	Spring, registration sensor
22	RB2-1784-000CN	1	Spring, top-of-page sensor
23	RB2-1990-000CN	1	Grounding plate
26	RB2-1825-000CN	1	Spring, Tray 2 size sensor
27	XA9-0267-000CN	2	Screw, M3x6, TP
29	RG5-7086-000CN	1	Cable, ribbon, paper-handling PCA to dc controller
30	RH7-5345-000CN	1	Clutch, registration
31	RH7-5236-000CN	1	Solenoid, Tray 2 pickup
32	RS5-2441-000CN	1	Spring, compression
34	WG8-5362-000CN	1	Sensor, PS402
35	WG8-5375-000CN	1	Sensor, face-down bin-full, PS307
36	WG8-5362-000CN	1	Sensor, PS403
38	RG5-3523-000CN	1	Cable, paper sensor (PS403)
501	XB4-7401-007CN	14	Screw, M4x10, tapping
502	XD2-1100-322CN	1	E-ring



**Figure 165.** Internal components (2 of 4)

**Table 68. Internal components (2 of 4)**

Item number	Part number	Quantity	Description
1	RG5-3519-020CN	1	Pickup roller assembly, Tray 1
1B	RB2-1820-020CN	1	Roller, Tray 1 pickup
2	RG5-3545-000CN	1	Power inlet assembly
3	RB1-6179-000CN	2	Pickup shaft bushing—trays 1 and 2
4	RF5-2421-000CN	1	Shutter lever
5	RB2-1744-000CN	1	On/off switch
6	RB2-1780-000CN	1	Paper guide
7	RS5-1392-000CN	2	Tray 1 and 2 pickup shaft left bushing
10	RB1-2190-000CN	1	Tray 2 spring
11	RB1-6130-000CN	1	Gear, pickup, Tray 1
12	RB1-6177-000CN	2	Pickup shaft bushing—trays 1 and 2
13	RB2-1731-000CN	1	Switch rod
14	RB3-0352-000CN	1	Grounding plate/fan housing
15	RB2-1736-000CN	1	Grounding plate
16	RF5-2397-000CN	1	Tray 2 rail left
17	RF5-2398-000CN	1	Tray 2 rail right
18	RH7-1552-000CN	1	Fan
19	RS5-0695-000CN	1	Tray 2 shaft gear
20	RS5-2434-000CN	1	Spring
21	RB2-1774-000CN	1	Cartridge guide left
22	RB2-1775-000CN	1	Cartridge guide right

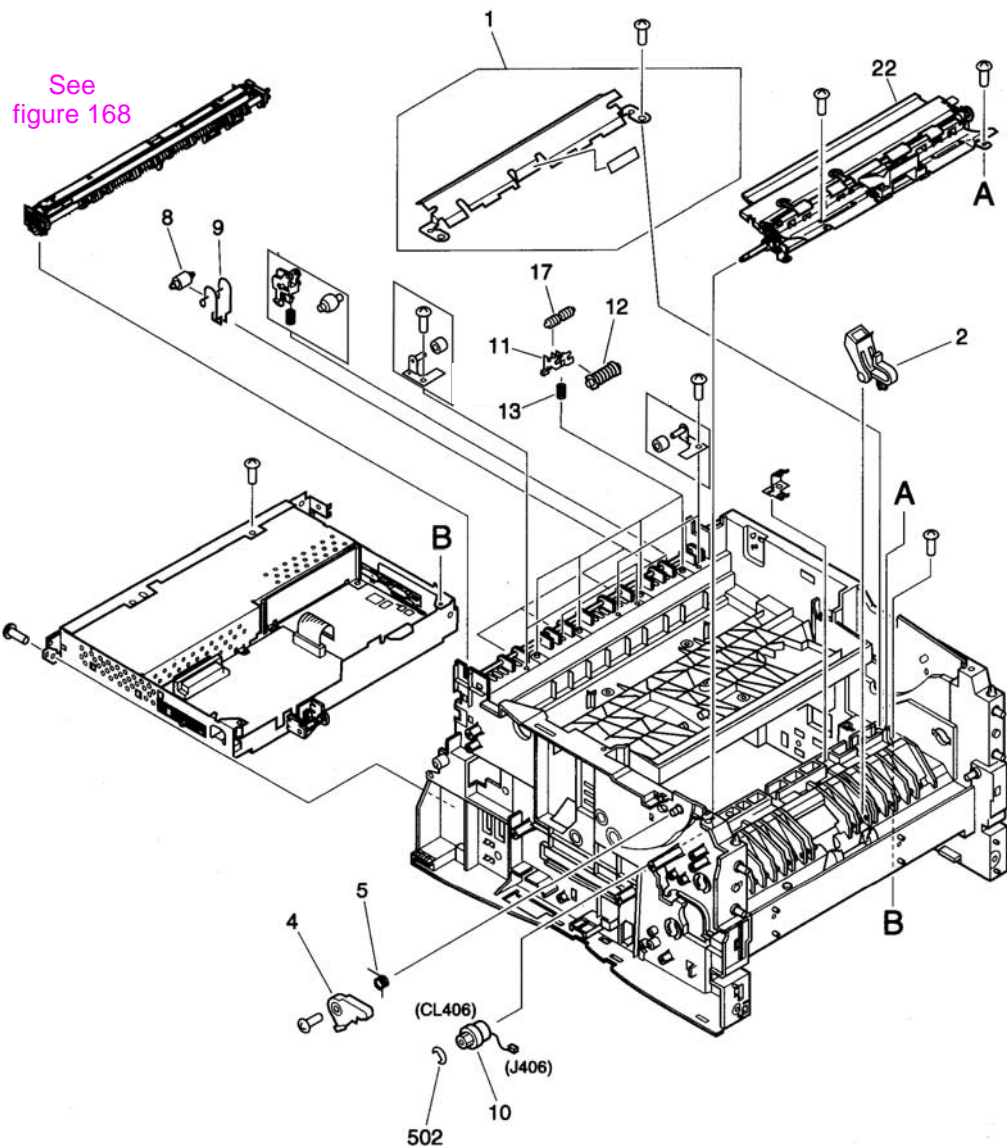
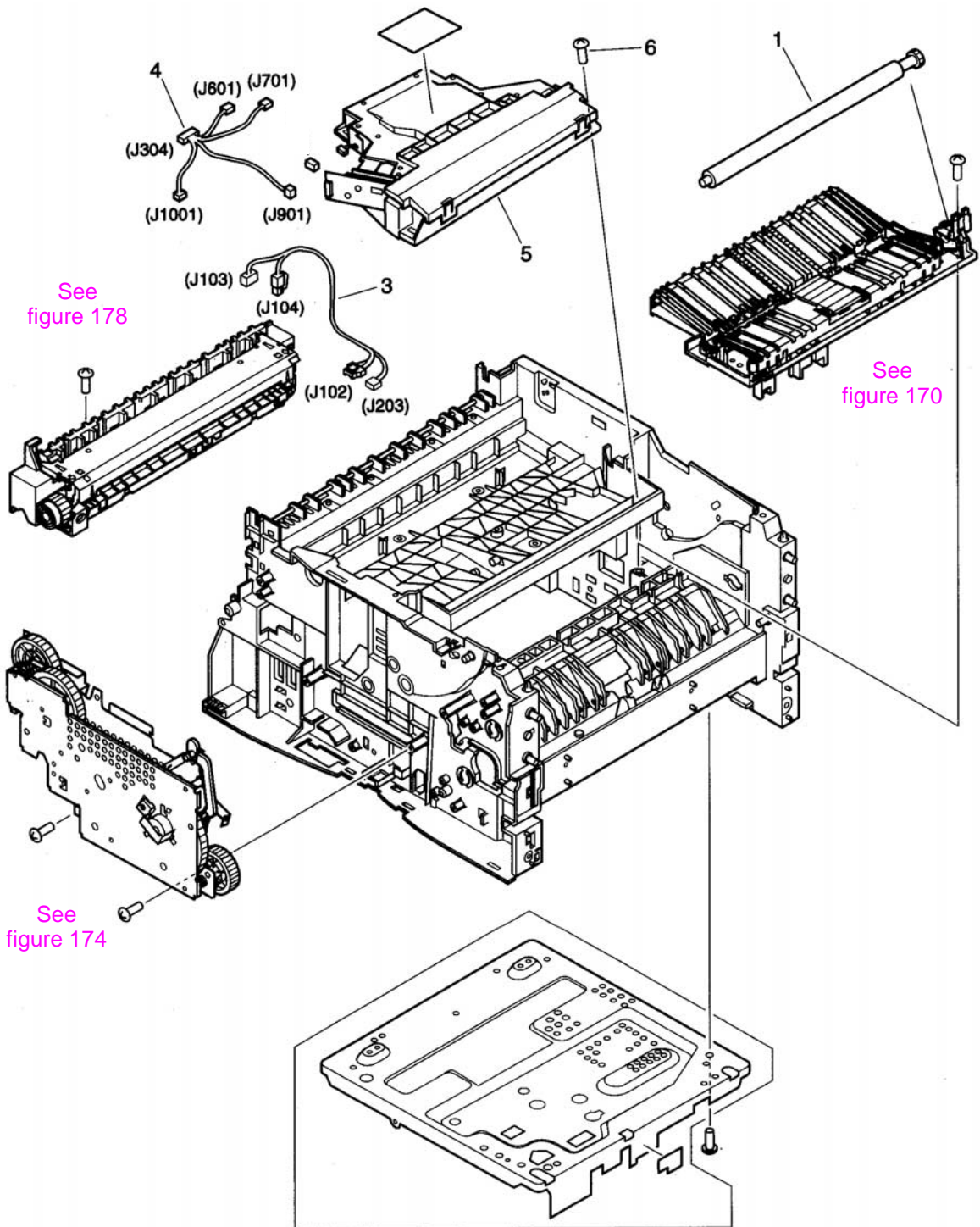


Figure 166. Internal components (3 of 4)

Table 69. Internal components (3 of 4)

Item number	Part number	Quantity	Description
1	RF5-4118-000CN	1	Transfer guide assembly
2	RF5-4117-000CN	2	Pad assembly
4	RB2-1732-000CN	1	Door switch
5	RB2-1739-000CN	1	Door switch spring
8	RB1-6251-000CN	4	Roller, lower-back delivery
9	RB2-2076-000CN	4	Roller spring, lower-back delivery
10	RH7-5346-000CN	1	Clutch, feed rollers
11	RB2-1997-000CN	4	Roller holder, top delivery
12	RG9-1337-000CN	4	Roller 1, face-down guide
13	RS5-2225-020CN	4	Roller spring, top delivery
17	RB2-1998-000CN	4	Roller 2, face-down guide
22	RG5-4916-000CN	1	Registration roller assembly
502	XD2-1100-322CN	1	E-ring

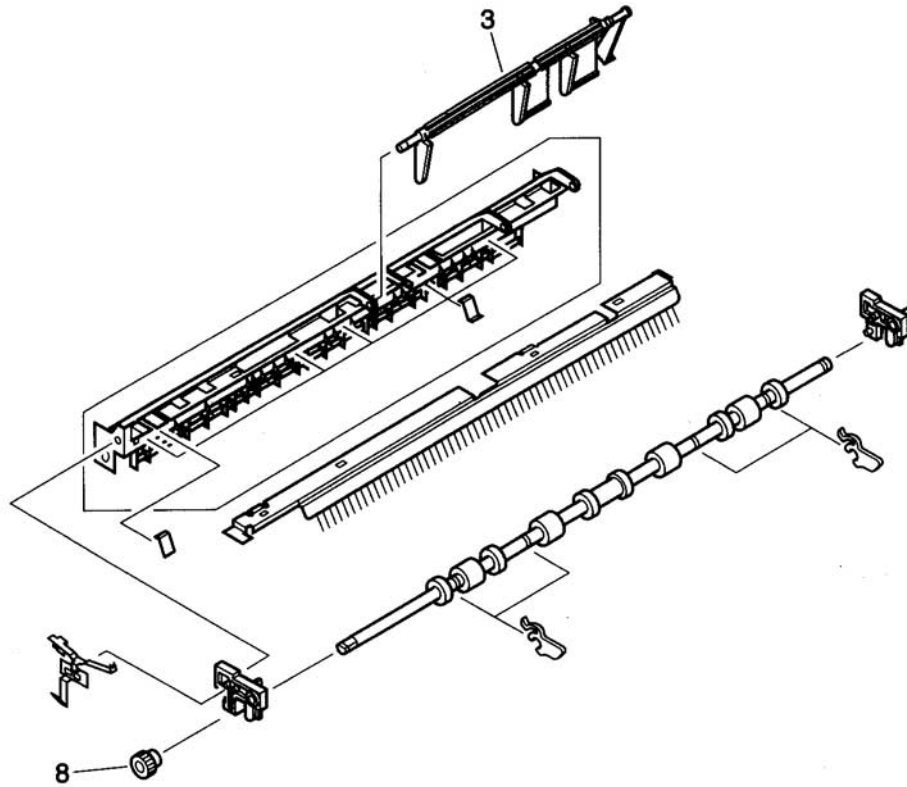


**Figure 167.** Internal components (4 of 4)

**Table 70. Internal components (4 of 4)**

Item number	Part number	Quantity	Description
1	RG9-1542-000CN	1	Transfer roller
3	RG5-3561-000CN	1	Cable (fuser ac)
4	RG5-7072-000CN	1	Cable (scanner)
5	Q1860-69004	1	Laser/scanner assembly
6	XA9-0838-000CN	4	Screw, M4x16, with washer

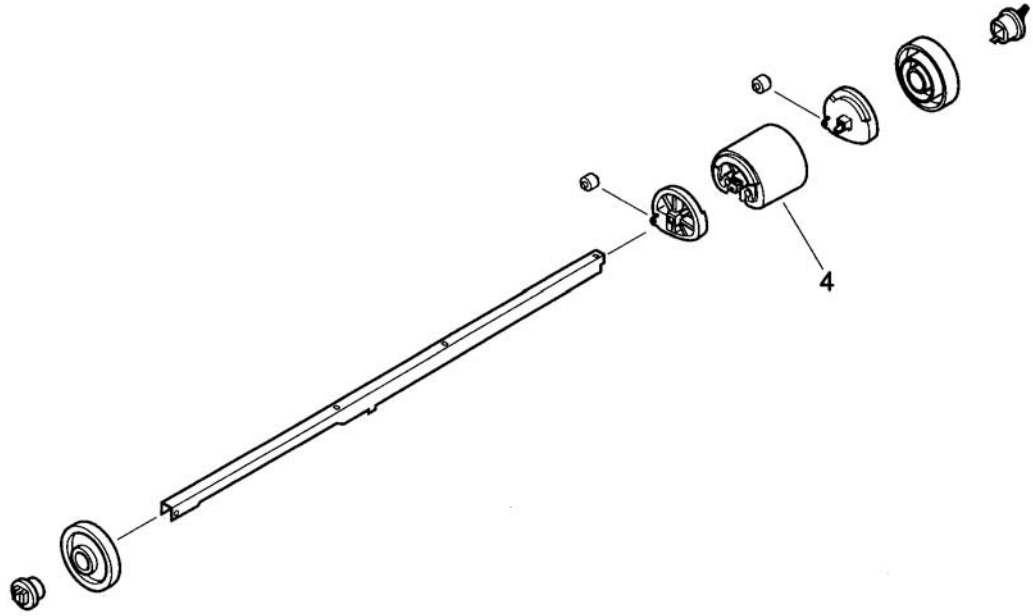




**Figure 168.** Upper delivery assembly

**Table 71. Upper delivery assembly**

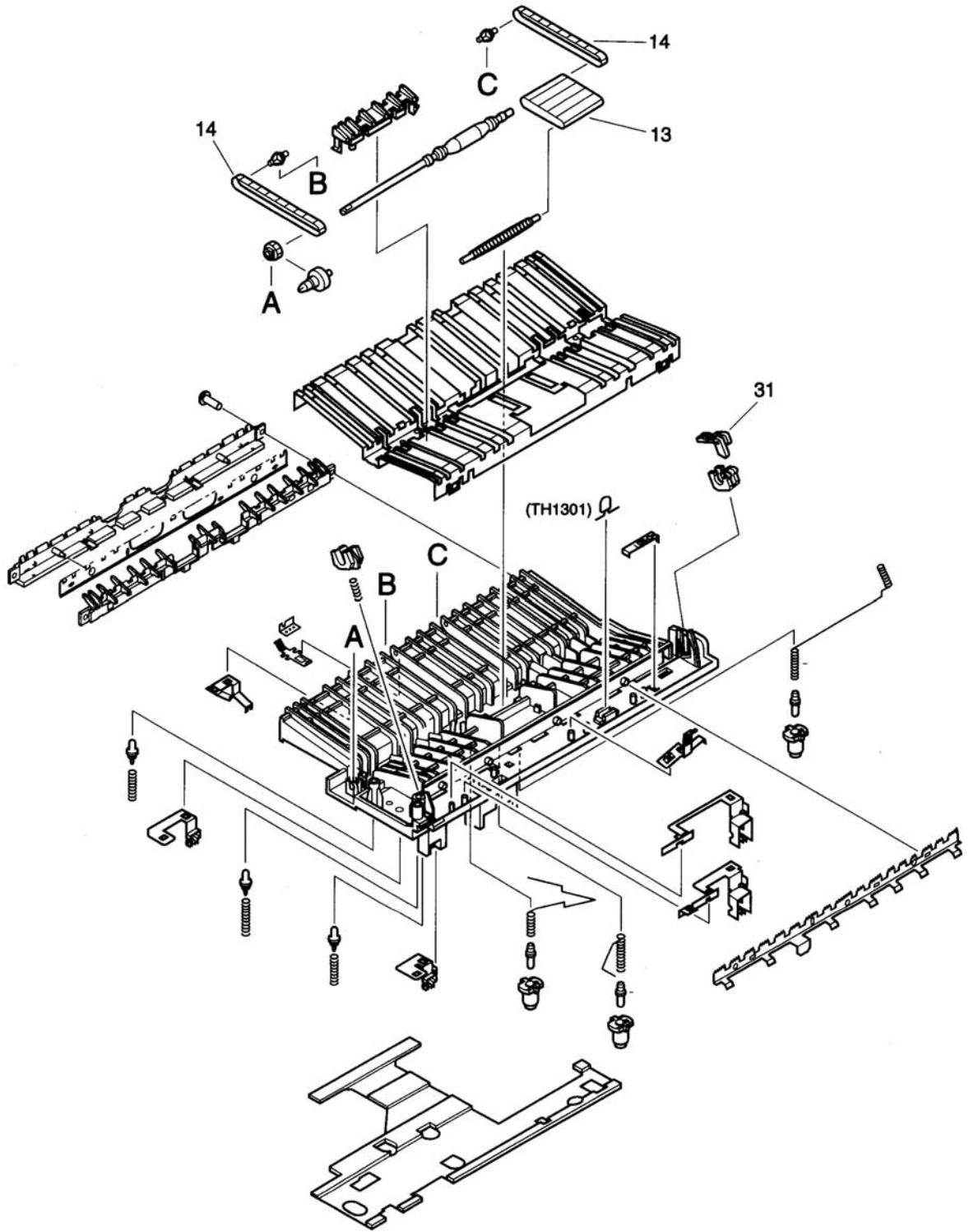
Item number	Part number	Quantity	Description
	RG5-3542-090CN	1	Upper delivery assembly
3	RB2-1980-000CN	1	Lever, bin-full
8	RS6-0357-000CN	1	Gear, delivery roller



**Figure 169.** Tray 2 paper pickup roller assembly

**Table 72.** Tray 2 paper pickup roller assembly

Item number	Part number	Quantity	Description
	RG5-3521-020CN	1	Paper pick up roller assembly (Tray 2)
4	RB2-1821-020CN	1	Pickup roller 250-sheet trays

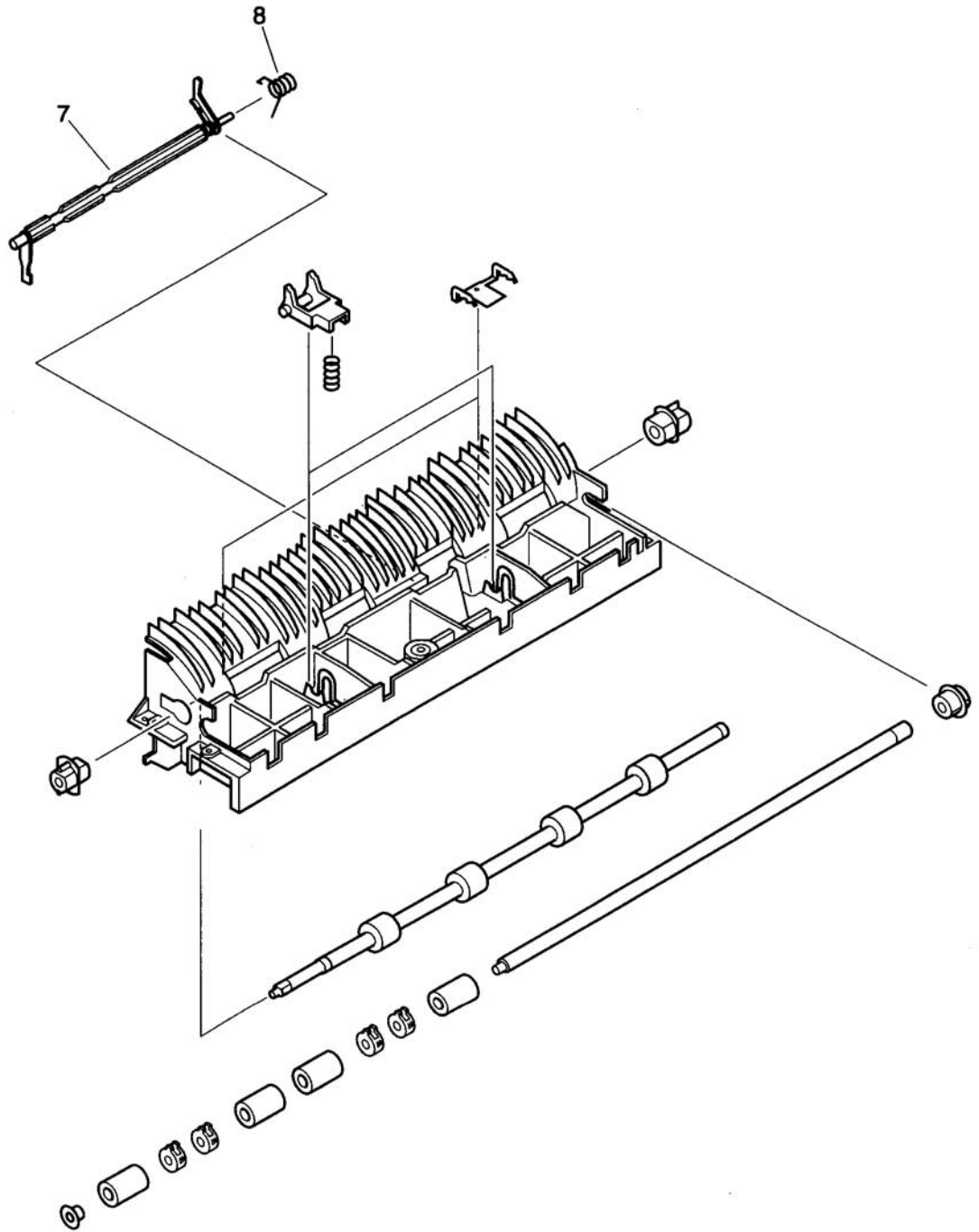


**Figure 170.** Paper feed belt assembly

**Table 73. Paper feed belt assembly**

Item number	Part number	Quantity	Description
	RG5-4914-000CN	1	Paper feed belt assembly
13	RB2-1887-000CN	1	Large feed belt
14	RB2-1888-000CN	2	Small paper feed belts
31	RB2-1905-000CN	1	Transfer roller bushing cover (right)

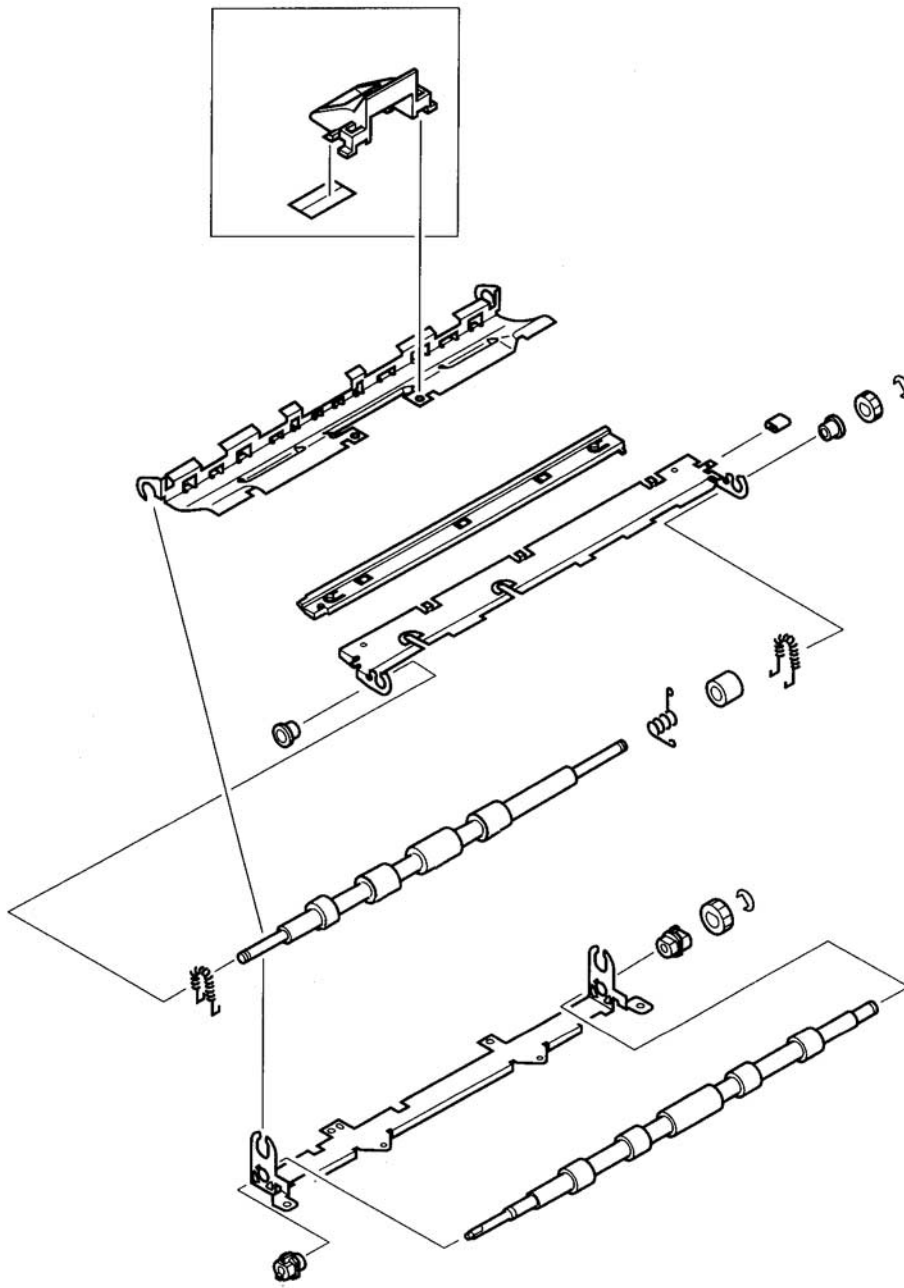




**Figure 171.** Paper feed roller assembly

**Table 74. Paper feed roller assembly**

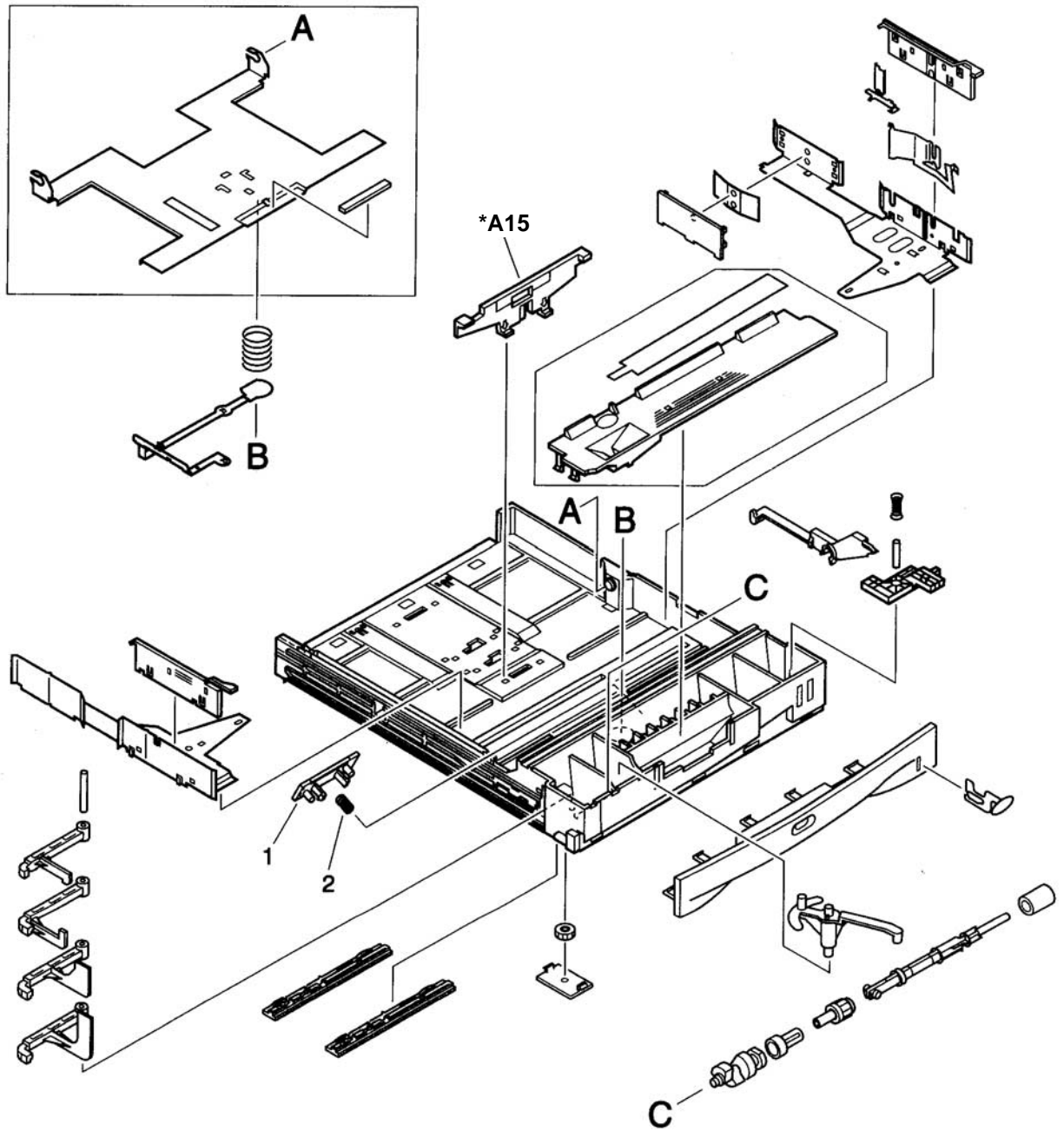
Item number	Part number	Quantity	Description
	RG5-7084-000CN	1	Paper feed roller assembly
7	RB2-1807-000CN	1	Lever, registration sensor
8	RB2-1808-000CN	1	Spring, registration sensor



**Figure 172.** Registration roller assembly

**Table 75. Registration roller assembly**

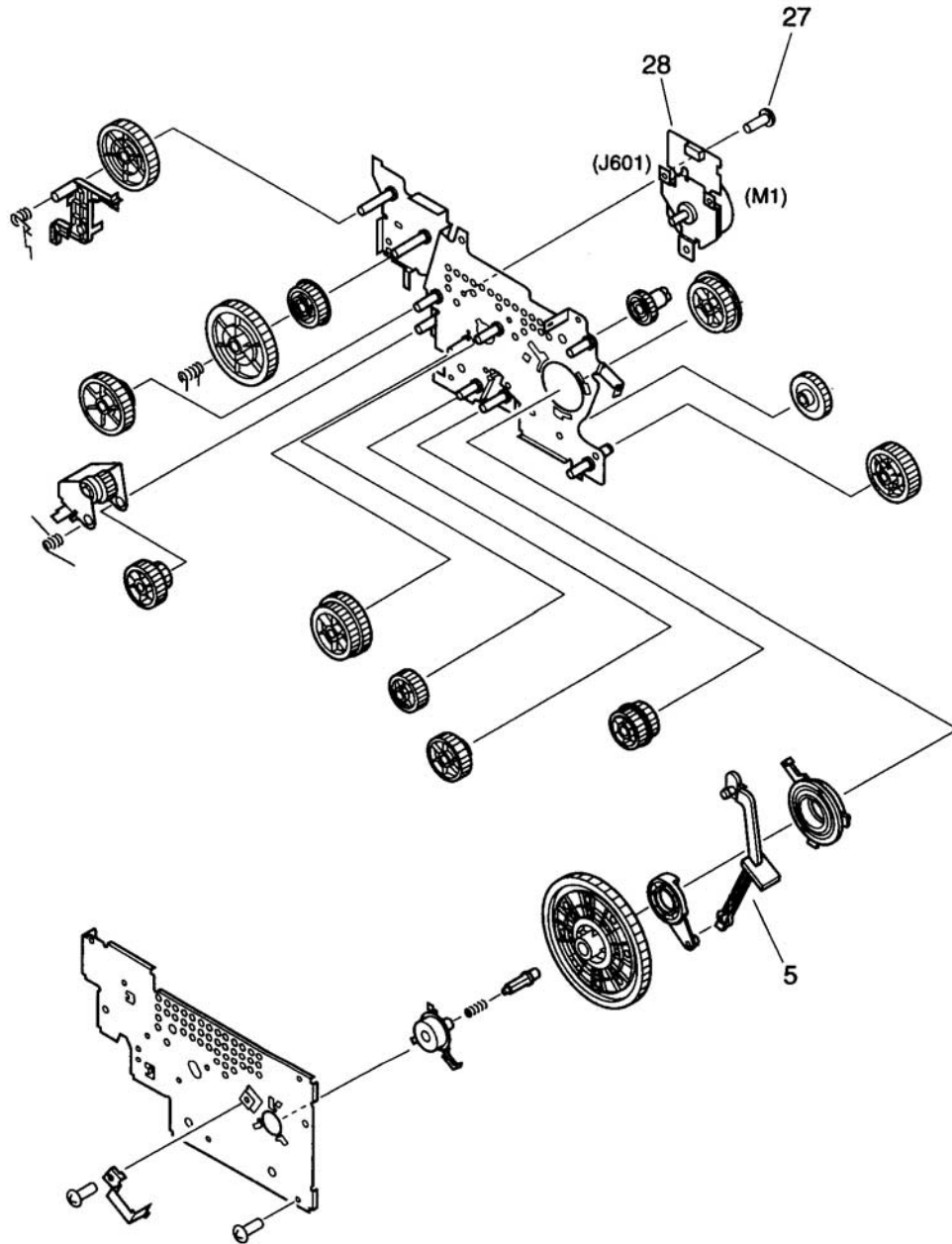
Item number	Part number	Quantity	Description
	RG5-4916-000CN	1	Registration roller assembly



**Figure 173.** 250-sheet universal tray

**Table 76.** 250-sheet universal tray

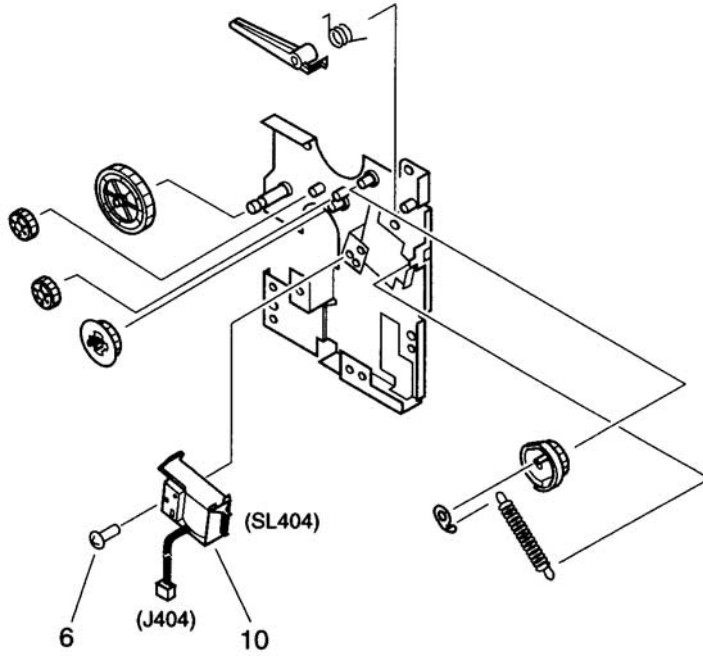
Item number	Part number	Quantity	Description
	RG5-7188-030CN	1	250-sheet universal tray
*A15	RB2-2023-000CN	1	Plate, length adjustment
1	RF5-4120-000CN	1	Separation pad (does not include spring)
2	RS5-2439-000CN	1	Spring, separation pad



**Figure 174.** Main gear assembly

**Table 77. Main gear assembly**

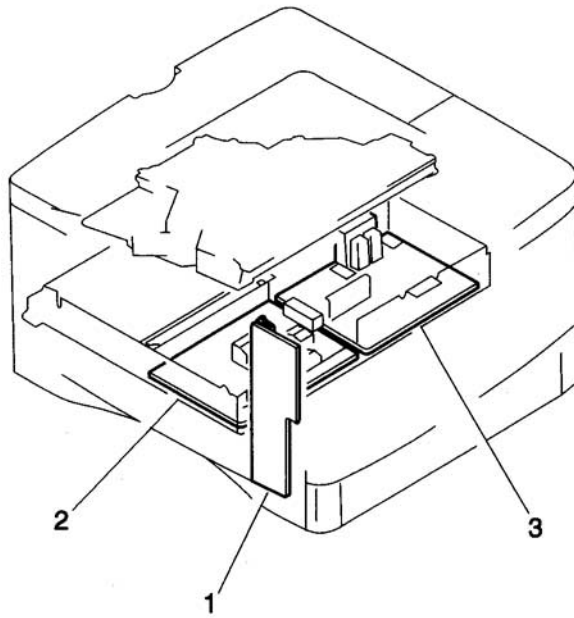
Item number	Part number	Quantity	Description
	RG5-7079-000CN	1	Main gear assembly
5	RB2-1856-040CN	1	Toner cartridge engagement arm
27	XA9-0267-000CN	3	Screw, TP, M3x6
28	RH7-1428-000CN	1	Main motor



**Figure 175.** Pickup gear assembly

**Table 78. Pickup gear assembly**

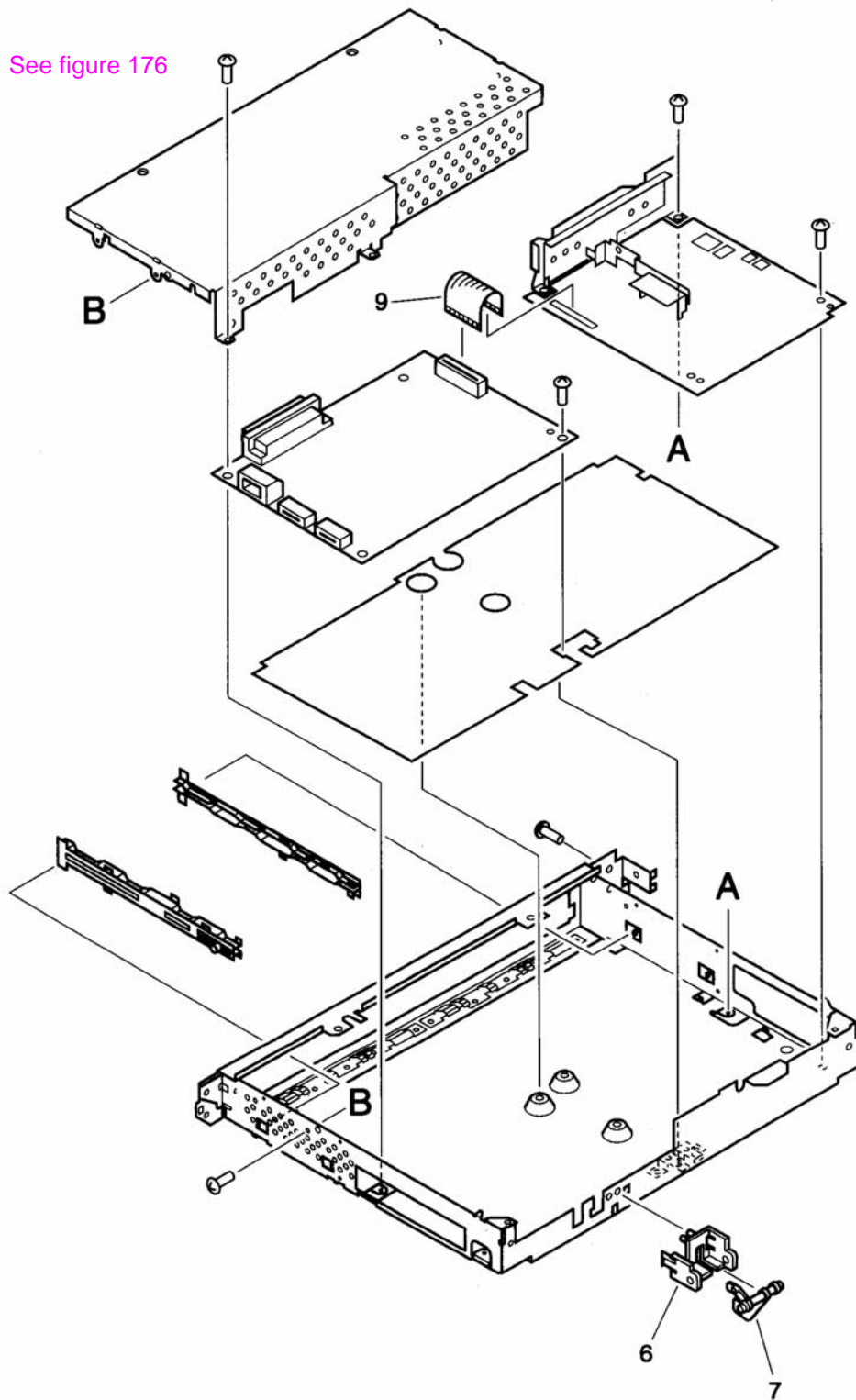
Item number	Part number	Quantity	Description
	RG9-1524-000CN	1	Pickup gear assembly
6	XA9-0815-000CN	1	Screw, tp, M3x4
10	RH7-5235-000CN	1	Solenoid, pickup, SL404



**Figure 176.** PCA assembly locations

**Table 79. PCA assembly locations**

Item number	Part number	Quantity	Description
1	RG5-7058-000CN	1	Paper handling PCA
2	Q1860-69005	1	Dc controller
3	Q1860-69006	1	Power supply (100 - 120V)
3	Q1860-69007	1	Power supply (220 - 240V)



**Figure 177.** Printer controller assembly

**Table 80. Printer controller assembly**

Item number	Part number	Quantity	Description
6	RB2-1790-000CN	1	Sensor mount (rear of controller pan)
7	RB2-1791-000CN	1	Sensor lever
9	RH2-5337-000CN	1	Flat cable



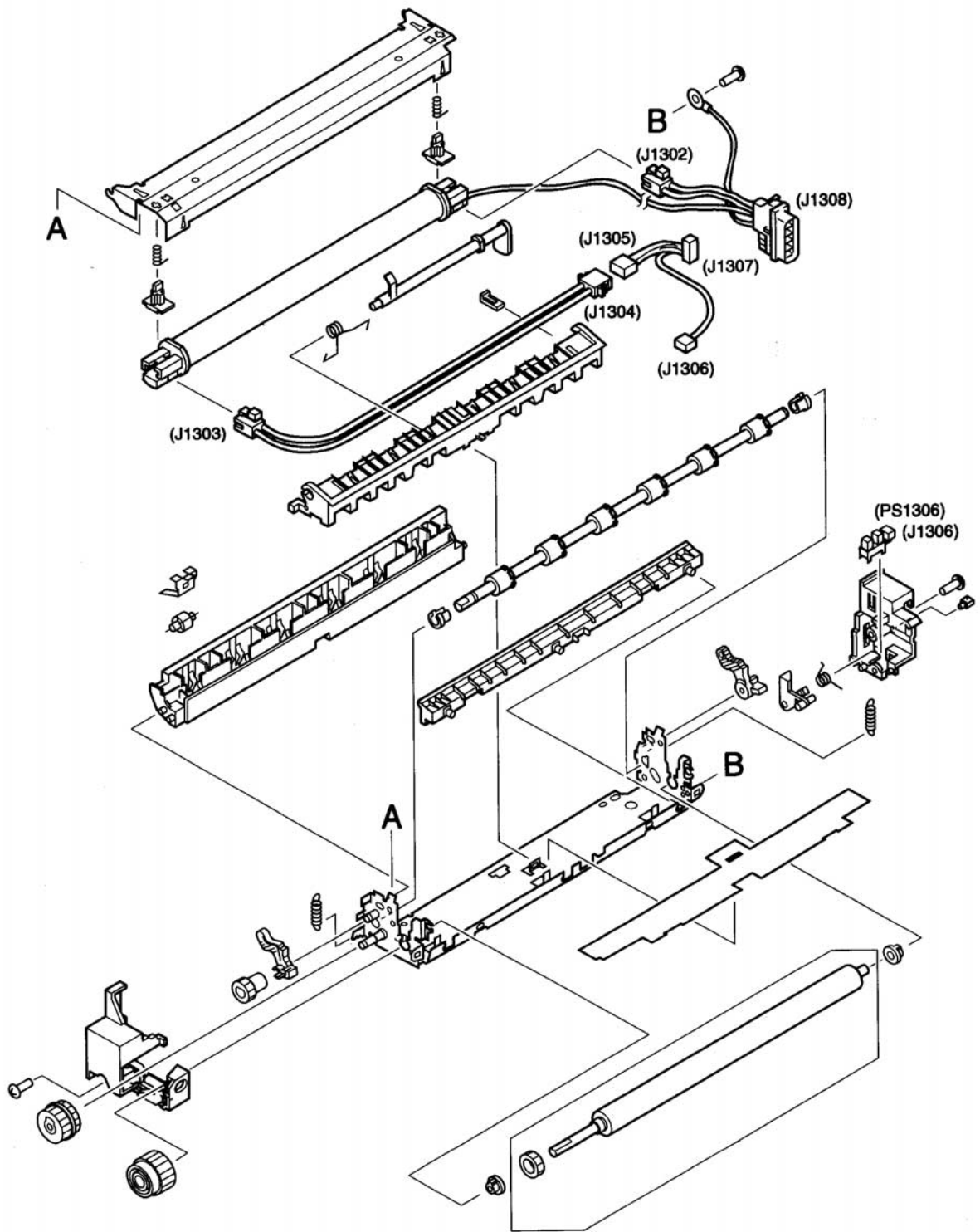


Figure 178. Fuser

Table 81. Fuser

Item number	Part number	Quantity	Description
	Q1860-69008	1	Fuser, exchange (100-120V)
	Q1860-69009	1	Fuser, exchange (220-240V)



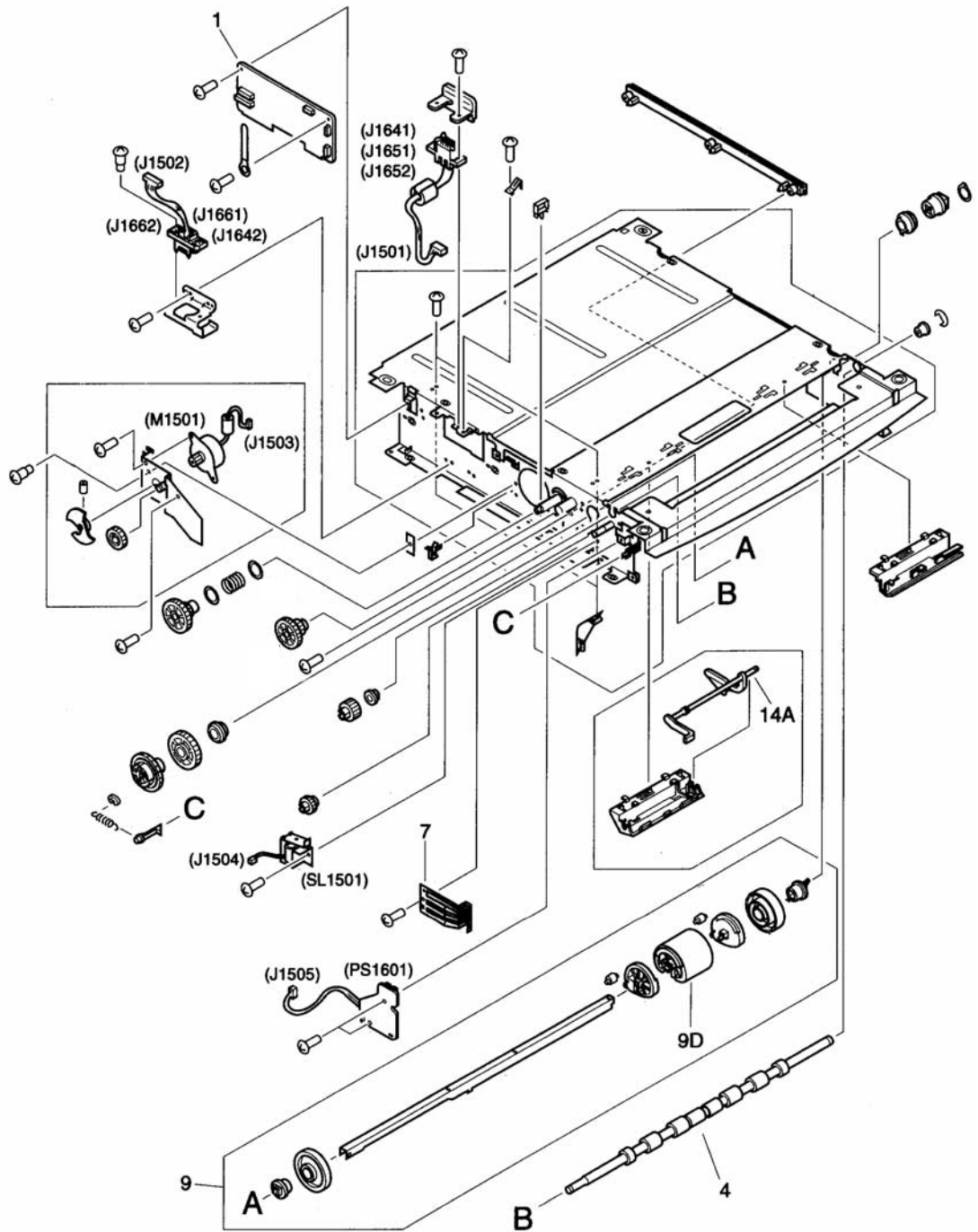
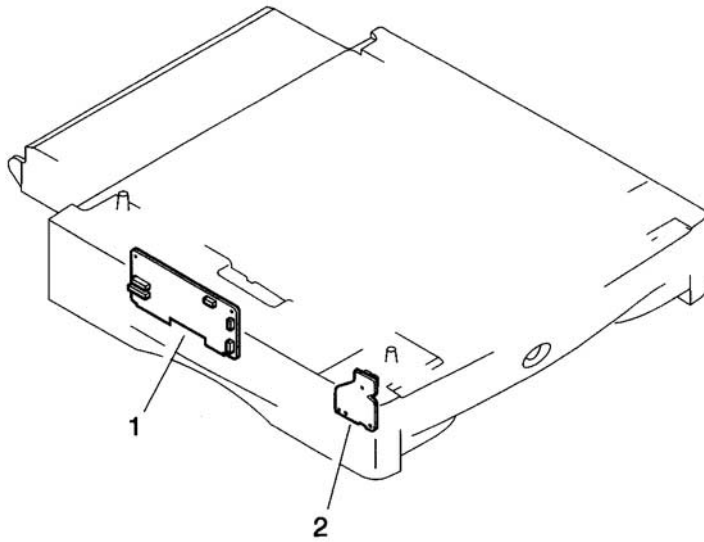


Figure 179.

250-sheet feeder

Table 82. 250-sheet feeder

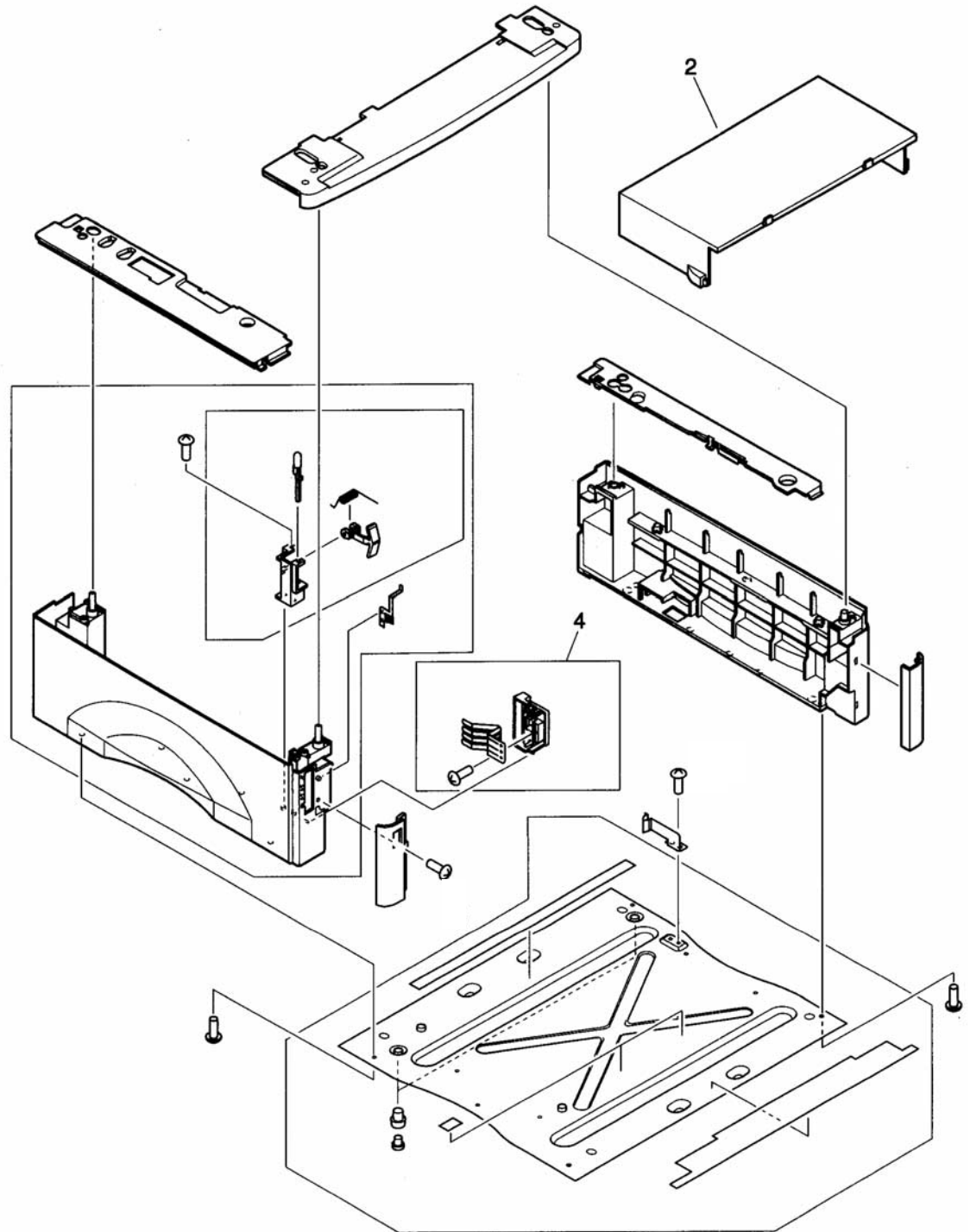
Item number	Part number	Quantity	Description
(not shown)	RG5-7188-030CN	1	250-sheet universal tray
1	RG5-7184-000CN	1	Feeder controller PCA, 250-sheet feeder
4	RB1-7499-000CN	1	Roller, feed, 250-sheet feeder
7	RB1-7503-000CN	1	Spring, tray-size detect
9	RG5-3644-000CN	1	Pickup roller assembly
9D	RB2-1821-020CN	1	Pickup roller, 250-sheet trays
14A	RB1-7501-020CN	1	Lever, paper sensor



**Figure 180.** PCA assembly locations, 250-sheet feeder

**Table 83. 250-sheet feeder**

Item number	Part number	Quantity	Description
1	RG5-7184-000CN	1	Feeder control PCA, 250-sheet feeder
2	RG5-2125-000CN	1	Paper-size switch PCA, 250-sheet feeder



**Figure 181.** 500-sheet feeder (1 of 2)

**Table 84.** 500-sheet feeder (1 of 2)

Item number	Part number	Quantity	Description
(not shown)	RG5-7164-000CN	1	500-sheet replacement tray
(not shown)	C4117-69001	1	500-sheet replacement tray (exchange)
2	RB3-0441-000CN	1	Tray cover, rear of 500-sheet feeder
4	RG5-7196-000CN	1	Paper-size detection assembly

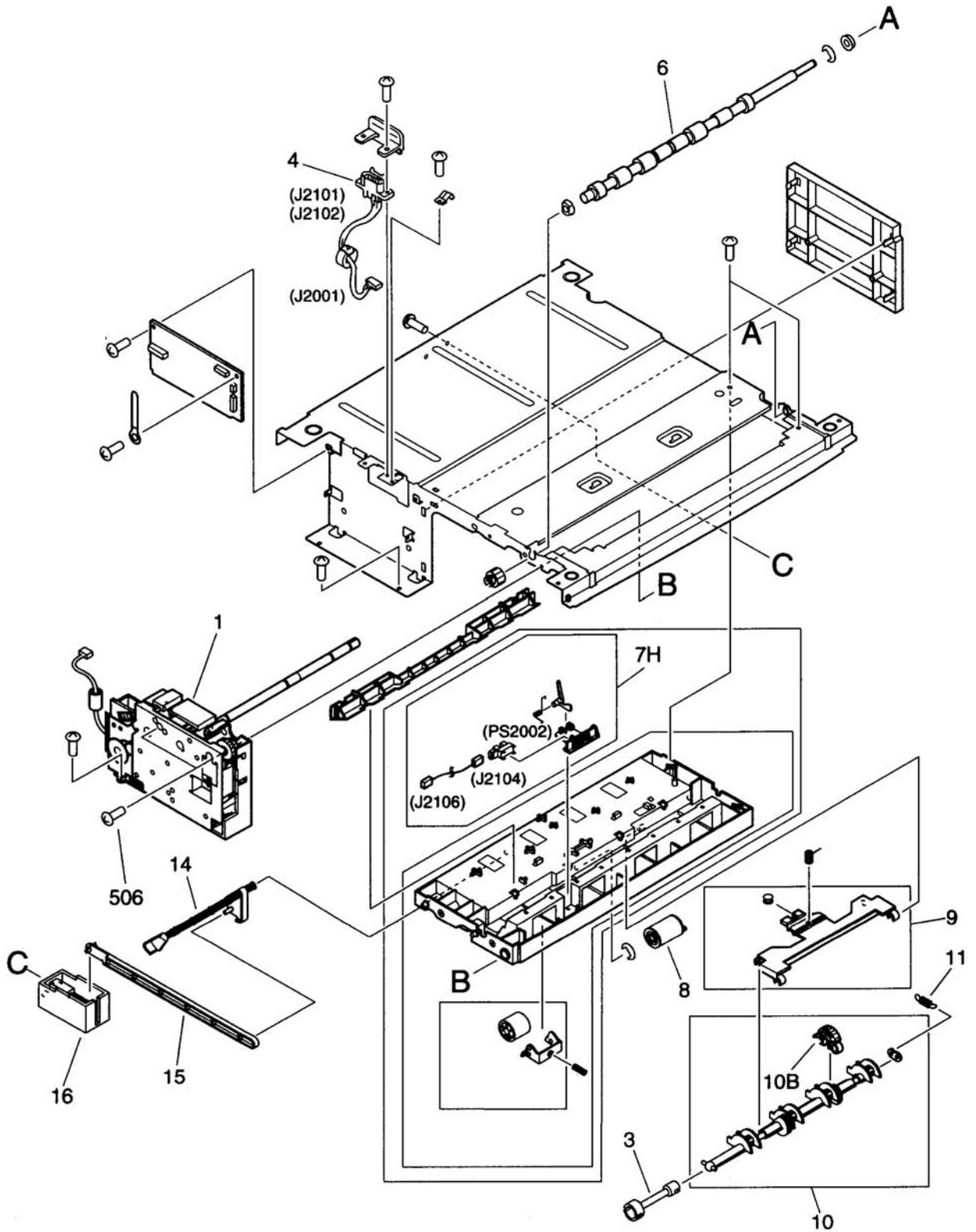
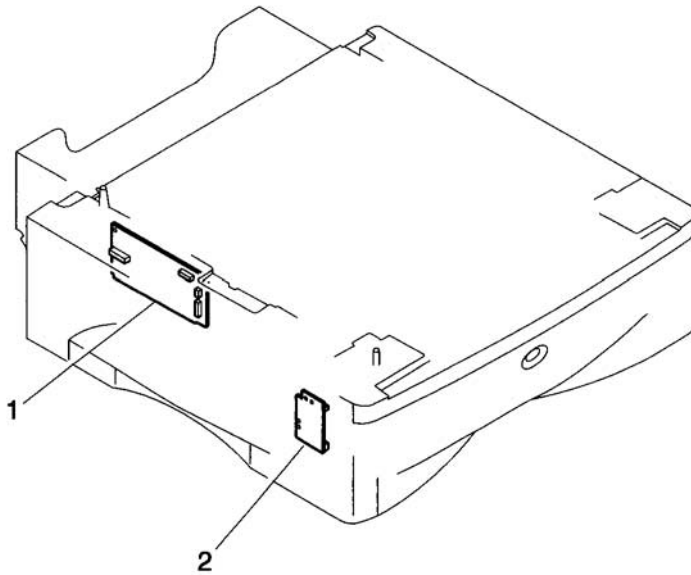


Figure 182. 500-sheet feeder (2 of 2)

**Table 85. 500-sheet feeder (2 of 2)**

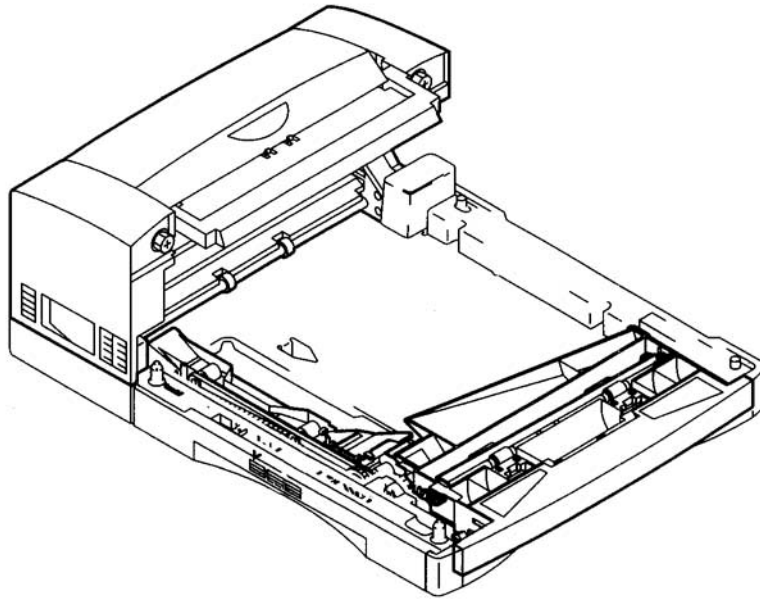
<b>Item number</b>	<b>Part number</b>	<b>Quantity</b>	<b>Description</b>
(not shown)	RG5-7164-000CN	1	500-sheet replacement tray
1	RG5-7194-000CN	1	Paper pickup drive assembly
3	RB2-3314-000CN	1	Joint
4	RG5-7198-000CN	1	Upper contact cable
6	RB2-3232-000CN	1	Feed roller
7H	RF5-4151-000CN	1	Tray sensor assembly
8	RF5-2634-000CN	1	Roller, feed, 500-sheet feeder
9	RF5-2635-000CN	1	Paper arm
10	RF5-2636-000CN	1	Pickup roller assembly
10B	RB1-8865-000CN	1	D-roller
11	RS5-2632-000CN	1	Spring, tension
14	RB3-0431-000CN	1	Paper sensor flag
15	RB3-0443-000CN	1	Paper sensor flag link
16	RB3-0444-000CN	1	Paper sensor flag link holder
506	XB4-7301-207CN	2	M3x12 screw, tapping, truss head



**Figure 183.** PCA assemblies, 500-sheet feeder

**Table 86. 500-sheet feeder**

Item number	Part number	Quantity	Description
1	RG5-7197-000CN	1	Feeder controller PCA, 500-sheet feeder
2	RG5-4212-020CN	1	Paper-size switch PCA, 500-sheet feeder



**Figure 184.** Duplexer

**Table 87.** Duplexer

Item number	Part number	Quantity	Description
	Q1860-69010	1	Duplexer

## Alphabetical parts list

**Table 88. Alphabetical parts list**

<b>Description</b>	<b>Part number</b>	<b>Figure and page</b>
Duplexer	Q1860-69010	Figure 184 on page 289
Feeder controller PCA, 500-sheet feeder	RG5-7197-000CN	Figure 183 on page 288
Paper-size switch PCA, 500-sheet feeder	RG5-4212-020CN	Figure 183 on page 288
500-sheet replacement tray	RG5-7164-000CN	Figure 182 on page 286
Paper pickup drive assembly	RG5-7194-000CN	Figure 182 on page 286
Joint	RB2-3314-000CN	Figure 182 on page 286
Upper contact cable	RG5-7198-000CN	Figure 182 on page 286
Feed roller	RB2-3232-000CN	Figure 182 on page 286
Tray sensor assembly	RF5-4151-000CN	Figure 182 on page 286
Roller, feed, 500-sheet feeder	RF5-2634-000CN	Figure 182 on page 286
Paper arm	RF5-2635-000CN	Figure 182 on page 286
Pickup roller assembly	RF5-2636-000CN	Figure 182 on page 286
D-roller	RB1-8865-000CN	Figure 182 on page 286
Spring, tension	RS5-2632-000CN	Figure 182 on page 286
Paper sensor flag	RB3-0431-000CN	Figure 182 on page 286
Paper sensor flag link	RB3-0443-000CN	Figure 182 on page 286
Paper sensor flag link holder	RB3-0444-000CN	Figure 182 on page 286
M3x12 screw, tapping, truss head	XB4-7301-207CN	Figure 182 on page 286
500-sheet replacement tray	RG5-7164-000CN	Figure 181 on page 285
500-sheet replacement tray (exchange)	C4117-69001	Figure 181 on page 285
Tray cover, rear of 500-sheet feeder	RB3-0441-000CN	Figure 181 on page 285
Paper-size detection assembly	RG5-7196-000CN	Figure 181 on page 285
Feeder control PCA, 250-sheet feeder	RG5-7184-000CN	Figure 180 on page 284
Paper-size switch PCA, 250-sheet feeder	RG5-2125-000CN	Figure 180 on page 284
250-sheet universal tray	RG5-7188-030CN	Figure 179 on page 283
Feeder controller PCA, 250-sheet feeder	RG5-7184-000CN	Figure 179 on page 283
Roller, feed, 250-sheet feeder	RB1-7499-000CN	Figure 179 on page 283
Spring, tray-size detect	RB1-7503-000CN	Figure 179 on page 283
Pickup roller assembly	RG5-3644-000CN	Figure 179 on page 283
Pickup roller, 250-sheet trays	RB2-1821-020CN	Figure 179 on page 283
Lever, paper sensor	RB1-7501-020CN	Figure 179 on page 283
Fuser, exchange (100-120V)	Q1860-69008	Figure 178 on page 282
Fuser, exchange (220-240V)	Q1860-69009	Figure 178 on page 282
Sensor mount (rear of controller pan)	RB2-1790-000CN	Figure 177 on page 281
Sensor lever	RB2-1791-000CN	Figure 177 on page 281
Flat cable	RH2-5337-000CN	Figure 177 on page 281
Paper handling PCA	RG5-7058-000CN	Figure 176 on page 280
Dc controller	Q1860-69005	Figure 176 on page 280
Power supply (100 - 120V)	Q1860-69006	Figure 176 on page 280
Power supply (220 - 240V)	Q1860-69007	Figure 176 on page 280
Pickup gear assembly	RG9-1524-000CN	Figure 175 on page 279
Screw, tp, M3x4	XA9-0815-000CN	Figure 175 on page 279
Solenoid, pickup, SL404	RH7-5235-000CN	Figure 175 on page 279
Main gear assembly	RG5-7079-000CN	Figure 174 on page 278



**Table 88. Alphabetical parts list (continued)**

<b>Description</b>	<b>Part number</b>	<b>Figure and page</b>
Toner cartridge engagement arm	RB2-1856-040CN	Figure 174 on page 278
Screw, TP, M3x6	XA9-0267-000CN	Figure 174 on page 278
Main motor	RH7-1428-000CN	Figure 174 on page 278
250-sheet universal tray	RG5-7188-030CN	Figure 173 on page 277
Plate, length adjustment	RB2-2023-000CN	Figure 173 on page 277
Separation pad (does not include spring)	RF5-4120-000CN	Figure 173 on page 277
Spring, separation pad	RS5-2439-000CN	Figure 173 on page 277
Registration roller assembly	RG5-4916-000CN	Figure 172 on page 276
Paper feed roller assembly	RG5-7084-000CN	Figure 171 on page 275
Lever, registration sensor	RB2-1807-000CN	Figure 171 on page 275
Spring, registration sensor	RB2-1808-000CN	Figure 171 on page 275
Paper feed belt assembly	RG5-4914-000CN	Figure 170 on page 274
Large feed belt	RB2-1887-000CN	Figure 170 on page 274
Small paper feed belts	RB2-1888-000CN	Figure 170 on page 274
Transfer roller bushing cover (right)	RB2-1905-000CN	Figure 170 on page 274
Paper pick up roller assembly (Tray 2)	RG5-3521-020CN	Figure 169 on page 273
Pickup roller 250-sheet trays	RB2-1821-020CN	Figure 169 on page 273
Upper delivery assembly	RG5-3542-090CN	Figure 168 on page 272
Lever, bin-full	RB2-1980-000CN	Figure 168 on page 272
Gear, delivery roller	RS6-0357-000CN	Figure 168 on page 272
Transfer roller	RG9-1542-000CN	Figure 167 on page 271
Cable (fuser ac)	RG5-3561-000CN	Figure 167 on page 271
Cable (scanner)	RG5-7072-000CN	Figure 167 on page 271
Laser/scanner assembly	Q1860-69004	Figure 167 on page 271
Screw, M4x16, with washer	XA9-0838-000CN	Figure 167 on page 271
Transfer guide assembly	RF5-4118-000CN	Figure 166 on page 270
Pad assembly	RF5-4117-000CN	Figure 166 on page 270
Door switch	RB2-1732-000CN	Figure 166 on page 270
Door switch spring	RB2-1739-000CN	Figure 166 on page 270
Roller, lower-back delivery	RB1-6251-000CN	Figure 166 on page 270
Roller spring, lower-back delivery	RB2-2076-000CN	Figure 166 on page 270
Clutch, feed rollers	RH7-5346-000CN	Figure 166 on page 270
Roller holder, top delivery	RB2-1997-000CN	Figure 166 on page 270
Roller 1, face-down guide	RG9-1337-000CN	Figure 166 on page 270
Roller spring, top delivery	RS5-2225-020CN	Figure 166 on page 270
Roller 2, face-down guide	RB2-1998-000CN	Figure 166 on page 270
Registration roller assembly	RG5-4916-000CN	Figure 166 on page 270
E-ring	XD2-1100-322CN	Figure 166 on page 270
Pickup roller assembly, Tray 1	RG5-3519-020CN	Figure 165 on page 268
Roller, Tray 1 pickup	RB2-1820-020CN	Figure 165 on page 268
Power inlet assembly	RG5-3545-000CN	Figure 165 on page 268
Pickup shaft bushing—trays 1 and 2	RB1-6179-000CN	Figure 165 on page 268
Shutter lever	RF5-2421-000CN	Figure 165 on page 268
On/off switch	RB2-1744-000CN	Figure 165 on page 268
Paper guide	RB2-1780-000CN	Figure 165 on page 268
Tray 1 and 2 pickup shaft left bushing	RS5-1392-000CN	Figure 165 on page 268
Tray 2 spring	RB1-2190-000CN	Figure 165 on page 268

**Table 88. Alphabetical parts list (continued)**

<b>Description</b>	<b>Part number</b>	<b>Figure and page</b>
Gear, pickup, Tray 1	RB1-6130-000CN	Figure 165 on page 268
Pickup shaft bushing—trays 1 and 2	RB1-6177-000CN	Figure 165 on page 268
Switch rod	RB2-1731-000CN	Figure 165 on page 268
Grounding plate/fan housing	RB3-0352-000CN	Figure 165 on page 268
Grounding plate	RB2-1736-000CN	Figure 165 on page 268
Tray 2 rail left	RF5-2397-000CN	Figure 165 on page 268
Tray 2 rail right	RF5-2398-000CN	Figure 165 on page 268
Fan	RH7-1552-000CN	Figure 165 on page 268
Tray 2 shaft gear	RS5-0695-000CN	Figure 165 on page 268
Spring	RS5-2434-000CN	Figure 165 on page 268
Cartridge guide left	RB2-1774-000CN	Figure 165 on page 268
Cartridge guide right	RB2-1775-000CN	Figure 165 on page 268
Tray 1 separation pad	RF5-4119-000CN	Figure 164 on page 266
Tray 1 paper guide plate assembly	RG5-3520-060CN	Figure 164 on page 266
Sensor, rear door	RG5-3553-000CN	Figure 164 on page 266
Cable, paper sensor (PS307)	RG5-3554-000CN	Figure 164 on page 266
Cable, paper sensor (PS402)	RG5-3558-000CN	Figure 164 on page 266
Roller, lower delivery	RB2-1985-000CN	Figure 164 on page 266
Bushing, right lower delivery roller	RB2-1988-020CN	Figure 164 on page 266
Bushing, left lower delivery roller	RB2-1989-000CN	Figure 164 on page 266
Gear, lower delivery shaft	RS6-0357-000CN	Figure 164 on page 266
Cable, display, accessory power, photo sensor	RG5-7073-000CN	Figure 164 on page 266
Power connector	WS6-5092-000CN	Figure 164 on page 266
Grounding plate	RB1-6141-000CN	Figure 164 on page 266
Grounding plate	RB2-1734-000CN	Figure 164 on page 266
Grounding plate	RB2-1735-000CN	Figure 164 on page 266
Grounding cable	RG5-7074-000CN	Figure 164 on page 266
Lever, registration sensor	RB2-1781-000CN	Figure 164 on page 266
Lever, top-of-page sensor	RB2-1782-000CN	Figure 164 on page 266
Spring, registration sensor	RB2-1783-000CN	Figure 164 on page 266
Spring, top-of-page sensor	RB2-1784-000CN	Figure 164 on page 266
Grounding plate	RB2-1990-000CN	Figure 164 on page 266
Spring, Tray 2 size sensor	RB2-1825-000CN	Figure 164 on page 266
Screw, M3x6, TP	XA9-0267-000CN	Figure 164 on page 266
Cable, ribbon, paper-handling PCA to dc controller	RG5-7086-000CN	Figure 164 on page 266
Clutch, registration	RH7-5345-000CN	Figure 164 on page 266
Solenoid, Tray 2 pickup	RH7-5236-000CN	Figure 164 on page 266
Spring, compression	RS5-2441-000CN	Figure 164 on page 266
Sensor, PS402	WG8-5362-000CN	Figure 164 on page 266
Sensor, face-down bin-full, PS307	WG8-5375-000CN	Figure 164 on page 266
Sensor, PS403	WG8-5362-000CN	Figure 164 on page 266
Cable, paper sensor (PS403)	RG5-3523-000CN	Figure 164 on page 266
Screw, M4x10, tapping	XB4-7401-007CN	Figure 164 on page 266
E-ring	XD2-1100-322CN	Figure 164 on page 266
Cover, top	RB2-1748-000CN	Figure 163 on page 265
Control panel leaf spring	RB2-1759-000CN	Figure 163 on page 265
Cable, control panel	RG5-3575-000CN	Figure 163 on page 265

**Table 88. Alphabetical parts list (continued)**

<b>Description</b>	<b>Part number</b>	<b>Figure and page</b>
Toner cartridge door assembly	RG5-3556-040CN	Figure 163 on page 265
Control panel assembly	RG5-5438-030CN	Figure 163 on page 265
Cover, control panel LED	RB2-1758-000CN	Figure 163 on page 265
Cover, front inner	RG5-3547-040CN	Figure 162 on page 264
Tray 1 sensor arm	RB1-6134-030CN	Figure 162 on page 264
Tray 1 paper guide	RG5-3548-000CN	Figure 162 on page 264
Cover, front	Q1860-67904	Figure 162 on page 264
Cover, left side	RG5-3550-000CN	Figure 162 on page 264
Cover, rear	RG5-3551-040CN	Figure 162 on page 264
Strap, rear output support	RB2-1977-000CN	Figure 162 on page 264
Face-up tray assembly	RG5-3552-000CN	Figure 162 on page 264
Pin, front cover	RB2-1745-000CN	Figure 162 on page 264
Cover, right side	RB2-1749-000CN	Figure 162 on page 264
Cover, face-down auxiliary	RB2-1747-000CN	Figure 162 on page 264
Cover, right corner	RB2-1755-000CN	Figure 162 on page 264
Cover, left corner	RB2-1756-000CN	Figure 162 on page 264
Overlay, English (other languages available)	C4110-40004	Figure 162 on page 264

## Numerical parts list

**Table 89. Numerical parts list**

<b>Part number</b>	<b>Description</b>	<b>Figure and page</b>
Q1860-67904	Cover, front	Figure 162 on page 264
Q1860-69005	Dc controller	Figure 176 on page 280
Q1860-69010	Duplexer	Figure 184 on page 289
Q1860-69008	Fuser, exchange (100-120V)	Figure 178 on page 282
Q1860-69009	Fuser, exchange (220-240V)	Figure 178 on page 282
Q1860-69004	Laser/scanner assembly	Figure 167 on page 271
Q1860-69006	Power supply (100 - 120V)	Figure 176 on page 280
Q1860-69007	Power supply (220 - 240V)	Figure 176 on page 280
C4110-40004	Overlay, English (other languages available)	Figure 162 on page 264
C4117-69001	500-sheet replacement tray (exchange)	Figure 181 on page 285
RB1-2190-000CN	Tray 2 spring	Figure 165 on page 268
RB1-6130-000CN	Gear, pickup, Tray 1	Figure 165 on page 268
RB1-6134-030CN	Tray 1 sensor arm	Figure 162 on page 264
RB1-6141-000CN	Grounding plate	Figure 164 on page 266
RB1-6177-000CN	Pickup shaft bushing—trays 1 and 2	Figure 165 on page 268
RB1-6179-000CN	Pickup shaft bushing—trays 1 and 2	Figure 165 on page 268
RB1-6251-000CN	Roller, lower-back delivery	Figure 166 on page 270
RB1-7499-000CN	Roller, feed, 250-sheet feeder	Figure 179 on page 283
RB1-7501-020CN	Lever, paper sensor	Figure 179 on page 283
RB1-7503-000CN	Spring, tray-size detect	Figure 179 on page 283
RB1-8865-000CN	D-roller	Figure 182 on page 286
RB2-1731-000CN	Switch rod	Figure 165 on page 268
RB2-1732-000CN	Door switch	Figure 166 on page 270
RB2-1734-000CN	Grounding plate	Figure 164 on page 266
RB2-1735-000CN	Grounding plate	Figure 164 on page 266
RB2-1736-000CN	Grounding plate	Figure 165 on page 268
RB2-1739-000CN	Door switch spring	Figure 166 on page 270
RB2-1744-000CN	On/off switch	Figure 165 on page 268
RB2-1745-000CN	Pin, front cover	Figure 162 on page 264
RB2-1747-000CN	Cover, face-down auxiliary	Figure 162 on page 264
RB2-1748-000CN	Cover, top	Figure 163 on page 265
RB2-1749-000CN	Cover, right side	Figure 162 on page 264
RB2-1755-000CN	Cover, right corner	Figure 162 on page 264
RB2-1756-000CN	Cover, left corner	Figure 162 on page 264
RB2-1758-000CN	Cover, control panel LED	Figure 163 on page 265
RB2-1759-000CN	Control panel leaf spring	Figure 163 on page 265
RB2-1774-000CN	Cartridge guide left	Figure 165 on page 268
RB2-1775-000CN	Cartridge guide right	Figure 165 on page 268
RB2-1780-000CN	Paper guide	Figure 165 on page 268
RB2-1781-000CN	Lever, registration sensor	Figure 164 on page 266
RB2-1782-000CN	Lever, top-of-page sensor	Figure 164 on page 266
RB2-1783-000CN	Spring, registration sensor	Figure 164 on page 266
RB2-1784-000CN	Spring, top-of-page sensor	Figure 164 on page 266
RB2-1790-000CN	Sensor mount (rear of controller pan)	Figure 177 on page 281

**Table 89. Numerical parts list (continued)**

<b>Part number</b>	<b>Description</b>	<b>Figure and page</b>
RB2-1791-000CN	Sensor lever	Figure 177 on page 281
RB2-1807-000CN	Lever, registration sensor	Figure 171 on page 275
RB2-1808-000CN	Spring, registration sensor	Figure 171 on page 275
RB2-1820-020CN	Roller, Tray 1 pickup	Figure 165 on page 268
RB2-1821-020CN	Pickup roller 250-sheet trays	Figure 169 on page 273
RB2-1821-020CN	Pickup roller, 250-sheet trays	Figure 179 on page 283
RB2-1825-000CN	Spring, Tray 2 size sensor	Figure 164 on page 266
RB2-1856-040CN	Toner cartridge engagement arm	Figure 174 on page 278
RB2-1887-000CN	Large feed belt	Figure 170 on page 274
RB2-1888-000CN	Small paper feed belts	Figure 170 on page 274
RB2-1905-000CN	Transfer roller bushing cover (right)	Figure 170 on page 274
RB2-1977-000CN	Strap, rear output support	Figure 162 on page 264
RB2-1980-000CN	Lever, bin-full	Figure 168 on page 272
RB2-1985-000CN	Roller, lower delivery	Figure 164 on page 266
RB2-1988-020CN	Bushing, right lower delivery roller	Figure 164 on page 266
RB2-1989-000CN	Bushing, left lower delivery roller	Figure 164 on page 266
RB2-1990-000CN	Grounding plate	Figure 164 on page 266
RB2-1997-000CN	Roller holder, top delivery	Figure 166 on page 270
RB2-1998-000CN	Roller 2, face-down guide	Figure 166 on page 270
RB2-2023-000CN	Plate, length adjustment	Figure 173 on page 277
RB2-2076-000CN	Roller spring, lower-back delivery	Figure 166 on page 270
RB2-3232-000CN	Feed roller	Figure 182 on page 286
RB2-3314-000CN	Joint	Figure 182 on page 286
RB3-0352-000CN	Grounding plate/fan housing	Figure 165 on page 268
RB3-0431-000CN	Paper sensor flag	Figure 182 on page 286
RB3-0441-000CN	Tray cover, rear of 500-sheet feeder	Figure 181 on page 285
RB3-0443-000CN	Paper sensor flag link	Figure 182 on page 286
RB3-0444-000CN	Paper sensor flag link holder	Figure 182 on page 286
RF5-2397-000CN	Tray 2 rail left	Figure 165 on page 268
RF5-2398-000CN	Tray 2 rail right	Figure 165 on page 268
RF5-2421-000CN	Shutter lever	Figure 165 on page 268
RF5-2634-000CN	Roller, feed, 500-sheet feeder	Figure 182 on page 286
RF5-2635-000CN	Paper arm	Figure 182 on page 286
RF5-2636-000CN	Pickup roller assembly	Figure 182 on page 286
RF5-4117-000CN	Pad assembly	Figure 166 on page 270
RF5-4118-000CN	Transfer guide assembly	Figure 166 on page 270
RF5-4119-000CN	Tray 1 separation pad	Figure 164 on page 266
RF5-4120-000CN	Separation pad (does not include spring)	Figure 173 on page 277
RF5-4151-000CN	Tray sensor assembly	Figure 182 on page 286
RG5-2125-000CN	Paper-size switch PCA, 250-sheet feeder	Figure 180 on page 284
RG5-3519-020CN	Pickup roller assembly, Tray 1	Figure 165 on page 268
RG5-3520-060CN	Tray 1 paper guide plate assembly	Figure 164 on page 266
RG5-3521-020CN	Paper pick up roller assembly (Tray 2)	Figure 169 on page 273
RG5-3523-000CN	Cable, paper sensor (PS403)	Figure 164 on page 266
RG5-3542-090CN	Upper delivery assembly	Figure 168 on page 272
RG5-3545-000CN	Power inlet assembly	Figure 165 on page 268
RG5-3547-040CN	Cover, front inner	Figure 162 on page 264

**Table 89. Numerical parts list (continued)**

<b>Part number</b>	<b>Description</b>	<b>Figure and page</b>
RG5-3548-000CN	Tray 1 paper guide	Figure 162 on page 264
RG5-3550-000CN	Cover, left side	Figure 162 on page 264
RG5-3551-040CN	Cover, rear	Figure 162 on page 264
RG5-3552-000CN	Face-up tray assembly	Figure 162 on page 264
RG5-3553-000CN	Sensor, rear door	Figure 164 on page 266
RG5-3554-000CN	Cable, paper sensor (PS307)	Figure 164 on page 266
RG5-3556-040CN	Toner cartridge door assembly	Figure 163 on page 265
RG5-3558-000CN	Cable, paper sensor (PS402)	Figure 164 on page 266
RG5-3561-000CN	Cable (fuser ac)	Figure 167 on page 271
RG5-3575-000CN	Cable, control panel	Figure 163 on page 265
RG5-3644-000CN	Pickup roller assembly	Figure 179 on page 283
RG5-4212-020CN	Paper-size switch PCA, 500-sheet feeder	Figure 183 on page 288
RG5-4914-000CN	Paper feed belt assembly	Figure 170 on page 274
RG5-4916-000CN	Registration roller assembly	Figure 172 on page 276
RG5-4916-000CN	Registration roller assembly	Figure 166 on page 270
RG5-5438-030CN	Control panel assembly	Figure 163 on page 265
RG5-7058-000CN	Paper handling PCA	Figure 176 on page 280
RG5-7072-000CN	Cable (scanner)	Figure 167 on page 271
RG5-7073-000CN	Cable, display, accessory power, photo sensor	Figure 164 on page 266
RG5-7074-000CN	Grounding cable	Figure 164 on page 266
RG5-7079-000CN	Main gear assembly	Figure 174 on page 278
RG5-7084-000CN	Paper feed roller assembly	Figure 171 on page 275
RG5-7086-000CN	Cable, ribbon, paper-handling PCA to dc controller	Figure 164 on page 266
RG5-7164-000CN	500-sheet replacement tray	Figure 182 on page 286
RG5-7164-000CN	500-sheet replacement tray	Figure 181 on page 285
RG5-7184-000CN	Feeder control PCA, 250-sheet feeder	Figure 180 on page 284
RG5-7184-000CN	Feeder controller PCA, 250-sheet feeder	Figure 179 on page 283
RG5-7188-030CN	250-sheet universal tray	Figure 179 on page 283
RG5-7188-030CN	250-sheet universal tray	Figure 173 on page 277
RG5-7194-000CN	Paper pickup drive assembly	Figure 182 on page 286
RG5-7196-000CN	Paper-size detection assembly	Figure 181 on page 285
RG5-7197-000CN	Feeder controller PCA, 500-sheet feeder	Figure 183 on page 288
RG5-7198-000CN	Upper contact cable	Figure 182 on page 286
RG9-1337-000CN	Roller 1, face-down guide	Figure 166 on page 270
RG9-1524-000CN	Pickup gear assembly	Figure 175 on page 279
RG9-1542-000CN	Transfer roller	Figure 167 on page 271
RH2-5337-000CN	Flat cable	Figure 177 on page 281
RH7-1428-000CN	Main motor	Figure 174 on page 278
RH7-1552-000CN	Fan	Figure 165 on page 268
RH7-5235-000CN	Solenoid, pickup, SL404	Figure 175 on page 279
RH7-5236-000CN	Solenoid, Tray 2 pickup	Figure 164 on page 266
RH7-5345-000CN	Clutch, registration	Figure 164 on page 266
RH7-5346-000CN	Clutch, feed rollers	Figure 166 on page 270
RS5-0695-000CN	Tray 2 shaft gear	Figure 165 on page 268
RS5-1392-000CN	Tray 1 and 2 pickup shaft left bushing	Figure 165 on page 268
RS5-2225-020CN	Roller spring, top delivery	Figure 166 on page 270
RS5-2434-000CN	Spring	Figure 165 on page 268

**Table 89. Numerical parts list (continued)**

<b>Part number</b>	<b>Description</b>	<b>Figure and page</b>
RS5-2439-000CN	Spring, separation pad	Figure 173 on page 277
RS5-2441-000CN	Spring, compression	Figure 164 on page 266
RS5-2632-000CN	Spring, tension	Figure 182 on page 286
RS6-0357-000CN	Gear, delivery roller	Figure 168 on page 272
RS6-0357-000CN	Gear, lower delivery shaft	Figure 164 on page 266
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