service

HP LaserJet 4345mfp Series

Service Manual

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1 Product information

This chapter contains information about the following topics:

HP LaserJet 4345mfp configurations

The HP LaserJet 4345mfp Series is available in the following configurations.

HP LaserJet 4345mfp (Q3942A—base model)
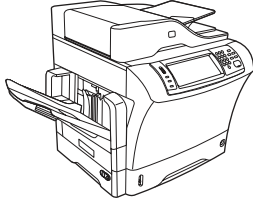
The HP LaserJet 4345mfp comes standard with the following items:

- A 100-sheet input tray (tray 1)

- A 500-sheet input tray (tray 2)

- An automatic document feeder (ADF) that holds up to 50 pages

- An HP Jetdirect embedded print server for connecting to a 10/100Base-T network

- 256 megabytes (MB) synchronous dynamic random access memory (SDRAM)

HP LaserJet 4345x mfp (Q3943A)
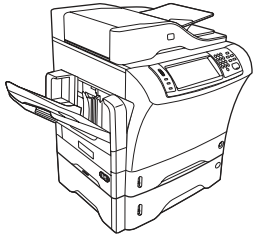
The HP LaserJet 4345x mfp has the same features as the base model and also includes the following items:

- An automatic duplex printing accessory (duplexer)

- An additional 500-sheet feeder (tray 3)

- An analog fax accessory

HP LaserJet 4345xs mfp (Q3944A)

The HP LaserJet 4345xs mfp has the same features as the base model and also includes the following items:

- An automatic duplex printing accessory (duplexer)

- An additional 500-sheet feeder (tray 3)

- An analog fax accessory

- A stapler/stacker accessory

- A cabinet/stand

HP LaserJet 4345xm mfp (Q3945A)
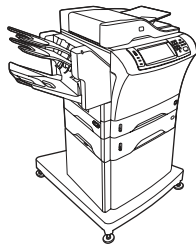
The HP LaserJet 4345xm mfp has the same features as the base model and also includes the following items:

- An automatic duplex printing accessory (duplexer)

- An additional 500-sheet feeder (tray 3)

- An analog fax accessory

- A 3-bin mailbox accessory

- A cabinet/stand

Features and benefits of the MFP

The HP LaserJet 4345mfp Series is designed to be shared by a workgroup. Use the MFP to copy and print black-and-white documents or to digitally send color or black-and-white documents. The MFP is a standalone copier that does not require connection to a computer. With the optional HP LaserJet mfp analog fax accessory 300 (included with some models), the MFP can also send and receive faxes. With the exception of digital sending and network printing, you can select all functions at the MFP control panel.

Functions

- 45 pages per minute (ppm) when scanning and printing on letter-size paper; 43 ppm when copying and printing on A4-size paper

- 25% to 400% scalability when using the scanner glass

- 25% to 200% scalability when using the ADF

- Less than 10 seconds to print the first page

- Transmit Once, Raster Image Processing (RIP) ONCE technology

- Duty cycle of up to 200,000 pages per month

- 533 MHz microprocessor

Speed and throughput

- Two-sided copying (duplexing)

- Image modification

- Color digital sending

- Document finishing

Resolution

- 600 dots per inch (dpi) with Resolution Enhancement technology (REt)

- FastRes 1200 provides 1200 dpi quality at full speed

- Up to 220 levels of gray

Memory

- 256 MB of random-access memory (RAM), expandable to 512 MB by using industry standard 100-pin double data rate dual inline memory modules (DDR DIMMs)

- Memory Enhancement technology (MEt) that automatically compresses data to use RAM more efficiently

User interface

- A graphic display on the control panel

- An embedded Web server to gain access to support and order supplies (for network-connected products)

- HP Toolbox software to provide MFP status and alerts and print internal information pages

Language and fonts

- HP Printer Command Language (PCL) 6

- HP PCL 5e for compatibility

- Printer Management Language

- PDF

- XHTML

- 80 scalable TrueType typefaces

- HP PostScript® 3 emulation (PS)

Copying and sending

- Modes for text, graphics, and mixed text and graphics formats

- A job-interrupt feature (at copy boundaries)

- Multiple pages per sheet

- E-mail compatibility

- A sleep feature that saves energy

- Automatic duplex (two-sided) scanning

    NOTE An automatic duplex printing accessory is required for two-sided copying.

Print cartridge

- Prints up to 18,000 pages at 5% coverage.

- No-shake cartridge design

- Authentic HP print cartridge detection

Paper-handling

- **Input**

    - **Tray 1 (multipurpose tray):** A multipurpose tray for paper, transparencies, labels, and envelopes. Holds up to 100 sheets of paper or 10 envelopes.

    - **Tray 2 and optional trays 3, 4, and 5:** 500-sheet trays. These trays automatically detect standard paper sizes up to legal and allow printing on custom-size paper.

    - **ADF:** Holds up to 50 sheets of paper.

    - **Duplex printing and copying:** With the optional duplexing accessory, provides two-sided printing and copying (printing on both sides of the paper).

    - **ADF duplex scanning:** The ADF has an automatic duplexer for scanning two-sided documents.

    - **Optional envelope feeder:** Holds up to 75 envelopes.

- **Output**

    - **Standard output bin:** The standard output bin is located on the left side of the MFP. This bin can hold up to 500 sheets of paper.

    - **ADF output bin:** The ADF output bin is underneath the ADF input tray. The bin holds up to 50 sheets of paper, and the MFP automatically stops when this bin is full.

    - **Optional stapler/stacker:** The stapler/stacker staples up to 30 sheets and stacks up to 500 sheets.

    - **Optional 3-bin mailbox:** One bin stacks up to 500 sheets, and two bins stack up to 100 sheets each for a total capacity of 700 sheets.

Connectivity

- IEEE 1284B-compliant parallel connection

- A Foreign Interface Harness (FIH) connection (AUX) for connecting other devices

- Local area network (LAN) connector (RJ-45) for the embedded HP Jetdirect print server

- Optional analog fax card

- Optional HP Digital Sending Software (HP DSS)

- Optional HP Jetdirect enhanced input/output (EIO) print server cards

    - Universal serial bus (USB), serial, and LocalTalk

    - Fast Ethernet 10/100TX

Environmental features

- The Sleep setting saves energy (meets ENERGY STAR® guidelines, Version 1.0).

    NOTE See Protecting the environment for more information.

Security features

- Foreign Interface Harness (FIH)

- Secure Disk Erase

- Security lock

- Job retention (password protected)

- HP DSS authentication

- Control-panel lock (by using Web Jetadmin)

Minimum system requirements for e-mail functionality

To use the e-mail functionality, the MFP must be connected to an IP-based server that has simple mail transfer protocol (SMTP). This server can either be on the local area network or at an outside Internet service provider (ISP). HP recommends that the MFP be located on the same local area network (LAN) as the SMTP server. When using an ISP, you must connect to the ISP by using a digital subscriber line (DSL) connection. When obtaining e-mail services from an ISP, ask the ISP to provide the correct SMTP address. Dial-up connections are not supported. If no SMTP server is on the network, third-party software is available that allows you to create an SMTP server. However, purchase and support of this software is the customer's responsibility.

MFP parts and accessories

Before using the MFP, familiarize yourself with the parts of the MFP.

MFP parts
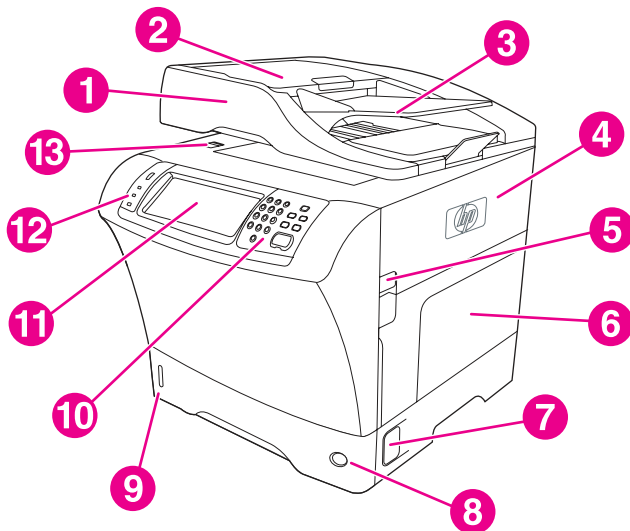
1	ADF assembly
2	ADF top cover
3	ADF input tray
4	Top cover (provides access to the print cartridge)
5	Top-cover lever
6	Tray 1 (multipurpose tray)
7	Jam-access lever (for tray 2)
8	Tray-number indicator
9	Paper-level indicator
10	Control-panel keypad
11	Control-panel display
12	Control-panel status lights
13	Scanner lock (raise the ADF for access)
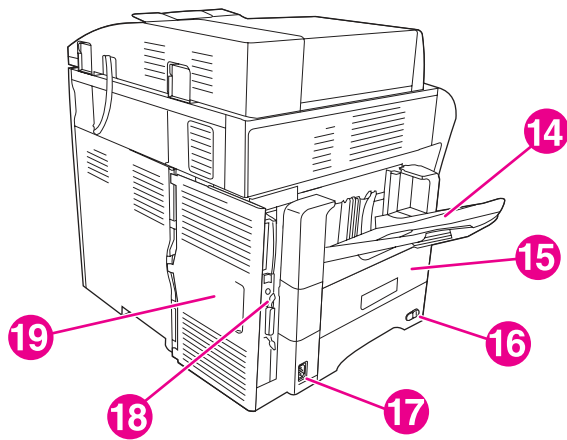
14	Output bin
15	Optional duplexer
16	On/off switch
17	Power connection
18	Interface ports
19	Formatter cover (provides access to the flash memory cards and the hard disk)

Interface ports

The MFP has five ports for connecting to a computer or a network. The ports are at the left, rear corner of the MFP.
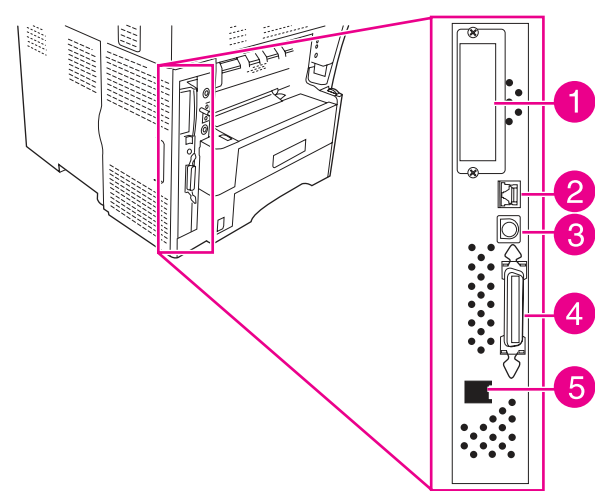
1	Slot for connecting optional EIO devices
2	Network connection (embedded HP Jetdirect print server)
3	Foreign interface harness (FIH) port
4	IEEE 1284B-compliant parallel port
5	Fax connection (for connecting to an optional analog fax accessory)

Model and serial numbers

The model numbers and serial numbers are located underneath the top cover, at the rear of the MFP.

Accessories and supplies

You can increase the capabilities of the MFP by adding optional accessories. For information about ordering accessories and supplies, see Ordering parts, accessories, and supplies.

NOTE   Use the accessories and supplies that have been specifically designed for the MFP in order to ensure optimum performance.
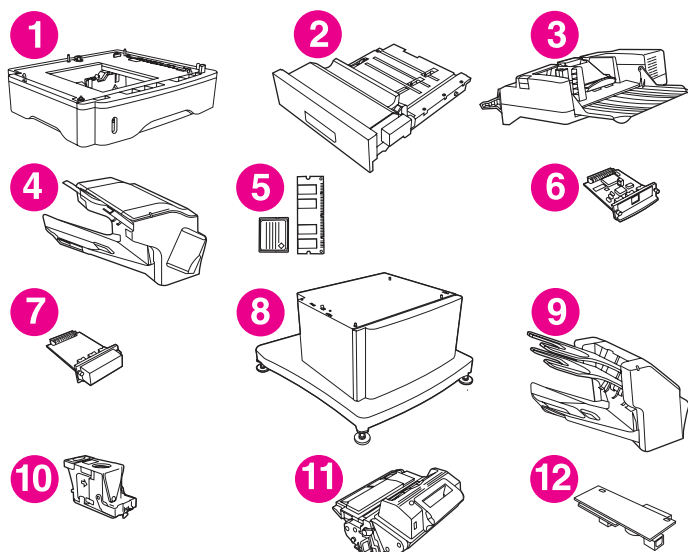
1	500-sheet feeder (Q5968A) (See the note that follows.)
2	Duplexer (Q5969A)
3	Envelope feeder (Q2438B)
4	Stapler/stacker (Q5691A)
5	Memory DIMMs and flash memory cards
6	HP Jetdirect print server (EIO card)
7	Hard-disk accessory (EIO card)
8	Storage cabinet/stand (Q5970A)
9	3-bin mailbox (Q5692A)
10	Staple cartridge (C8091A)
11	Print cartridge (Q5945A)
12	HP LaserJet analog fax accessory 300(Q3701A)

NOTE   The MFP can accept up to three optional 500-sheet feeders. HP recommends also using a cabinet/stand when using the optional 500-sheet feeders.

Parts compatibility with other HP LaserJet products

Some parts and accessories for this MFP are compatible with previous HP LaserJet products. Table 1-1 Parts compatibility indicates which parts and accessories can be installed on other products. It also indicates which parts from earlier products are *not* compatible with this MFP.

Table 1-1 Parts compatibility

Part	Description	Product number	4200 series	4300 series	4345mfp series
Envelope feeder	Envelope feeder	C8053A	Yes	Yes	No
	Envelope feeder	Q2438A	Yes	Yes	No
	Envelope feeder	Q2438B	Yes	Yes	Yes
Duplex printing accessory	Duplex printing accessory	Q2439A	Yes	Yes	No
	Duplex printing accessory	Q5969A	No	No	Yes
Print cartridge	Print cartridge (12,000 pages)	Q1338A	Yes	No	No
	Print cartridge (18,000 pages)	Q1339A	No	Yes	Yes
	Print cartridge (18,000 pages)	Q5945A	No	No	Yes
Memory DIMMs	4 MB SDRAM DIMM	C4140A	Yes	Yes	No
	8 MB SDRAM DIMM	C4141A	Yes	Yes	No
	16 MB SDRAM DIMM	C4142A	Yes	Yes	No
	32 MB SDRAM DIMM	C4143A	Yes	Yes	No
	64 MB SDRAM DIMM	C3913A	Yes	Yes	No
	128 MB SDRAM DIMM	C9121A	Yes	Yes	No
	2 MB flash DIMM	C4286A	Yes	Yes	No
	4 MB flash DIMM	C4287A	Yes	Yes	No
	8 MB flash DIMM	C8530A	Yes	Yes	No
	16 MB flash DIMM	C7867A	Yes	Yes	No
	64 MB DDR DIMM	Q2625A	No	No	Yes
	128 MB DDR DIMM	Q2626A	No	No	Yes
	256 MB DDR DIMM	Q2627A	No	No	Yes
HP Jetdirect EIO cards	USB, serial, and LocalTalk	J4135A	Yes	Yes	Yes
	Token Ring RJ-45 and DB 9	J4167A	Yes	Yes	No
	Fast Ethernet 10/100Base-TX	J6057A	Yes	Yes	No
	620n Fast Ethernet 10/100Base-TX	J7934A	No	No	Yes
Hard disk	EIO hard disk	J6054B	Yes	Yes	Yes
	20 GB hard disk	J7948-61003	No	No	Yes
Preventive maintenance kits	Printer maintenance kit (110 volt)	Q2429A	Yes	No	No

Table 1-1 Parts compatibility (continued)

Part	Description	Product number	4200 series	4300 series	4345mfp series
	Printer maintenance kit (220 volt)	Q2430A	Yes	No	No
	Printer maintenance kit (110 volt)	Q2436A	No	Yes	No
	Printer maintenance kit (220 volt)	Q2437A	No	Yes	No
	Printer maintenance kit (110 volt)	Q5998A	No	No	Yes
	Printer maintenance kit (220 volt)	Q5999A	No	No	Yes
	ADF maintenance kit	Q5997A	No	No	Yes

Moving the MFP

Before moving the MFP, be sure to lock the scanner. The scanner lock is underneath the scanner lid, to the left of the scanner glass.

NOTE After moving the MFP, unlock the scanner. The MFP cannot initialize correctly when the scanner is locked.

The MFP is heavy and should be lifted by three people. One person should stand at the front of the MFP and should grip the sides, and the other two people should stand at the sides of the MFP and should grip the sides and back. Remove the output bin or other optional output accessories before moving the MFP. To lift the MFP, grip the lift handles that are on the sides and on the back of the MFP. *Do not attempt to lift the MFP by gripping any other part of the MFP.* If the bottom of the MFP is attached to an optional accessory (such as a 500-sheet feeder or a storage cabinet), the accessory latches must be unlocked before moving the MFP.

WARNING! To prevent possible injury to yourself or damage to the MFP, separate the MFP from any currently installed optional accessories (for example an optional feeder or a stapler/stacker) before lifting the MFP.
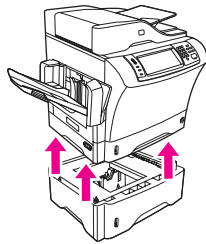
CAUTION When placing the MFP onto the 500-sheet feeder, be sure to place it directly over the alignment pins.

Locking and unlocking optional accessories

For more stability to prevent the MFP from tipping over, the optional 500-sheet feeders and the cabinet are automatically locked to the bottom of the MFP. When accessories are installed, verify that the lock on each accessory is in the rear (locked) position.

To unlock the accessories, slide the lever to the forward (unlocked) position.
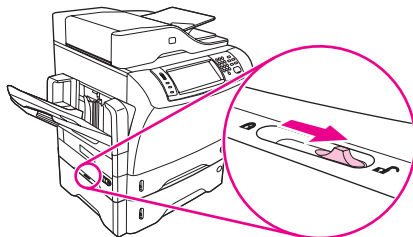
Site requirements

Place the MFP on a sturdy surface, away from direct sunlight. Allow enough space around the MFP to open the doors and trays.

Physical specifications

Product	Width	Depth	Height	Weight[1]
HP LaserJet 4345mfp	761 mm (30.0 inches)	566 mm (22.3 inches)	545 mm (21.5 inches)	44.1 kg (97.2 lb)
HP LaserJet 4345x mfp	761 mm (30.0 inches)	566 mm (22.3 inches)	667 mm (26.3 inches)	52.4 kg (115.5 lb)
HP LaserJet 4345xs mfp	1026 mm (40.4 inches)	743 mm (29.3 inches)	111.0 cm (43.7 inches)	58.4 kg (128.7 lb)
HP LaserJet 4345xm mfp	1026 mm (40.4 inches)	743 mm (29.3 inches)	111.5 cm (43.9 inches)	58.2 kg (128.3 lb)
Optional 500-sheet feeder	559 mm (22.0 inches)	483 mm (19.0 inches)	122 mm (4.8 inches)	8.3 kg (18.3 lb)
Optional cabinet	825.5 mm (32.5 inches)	743 mm (29.3 inches)	440 mm (17.3 inches)	41.8 kg (92.2 lb)
Optional stapler/stacker				6.0 kg (13.2 lb)
Optional 3-bin mailbox				5.8 kg (12.8 lb)
Optional envelope feeder				2.5 kg (5.5 lb)
Optional duplexer				2.5 kg (5.5 lb)

[1] Without print cartridge

Table 1-3 Product dimensions, with all doors and trays fully opened

Product	Width	Depth	Height
HP LaserJet 4345mfp	1295 mm (51.0 inches)	982 mm (38.7 inches)	1054 mm (41.5 inches)
HP LaserJet 4345x mfp	1295 cm (51.0 inches)	982 mm (38.7 inches)	1175 mm (46.3 inches)
HP LaserJet 4345xs mfp	1472 mm (58.0 inches)	1168 mm (46.0 inches)	1585 mm (62.4 inches)
HP LaserJet 4345xm mfp	1472 mm (58.0 inches)	1168 mm (46.0 inches)	1585 mm (62.4 inches)

Environmental specifications

Table 1-4 Environmental specifications

Environmental condition	Printing	Storage/standby
Temperature (MFP and print cartridge)	10° to 32.5°C (50° to 89°F)	-20° to 40°C (-4° to 104°F)
Relative humidity	10% to 80%	10% to 90%

MFP specifications

Electrical specifications

> **WARNING!** Power requirements are based on the country/region where the MFP is sold. Do not convert operating voltages. This can damage the MFP and void the product warranty.

Table 1-5 Power requirements (HP LaserJet 4345mfp Series)

Specification	110-volt models	230-volt models
Power requirements	100 to 127 volts (± 10%)	220 to 240 volts (± 10%)
	50/60 Hz (± 2 Hz)	50/60 Hz (± 2 Hz)
Rated current	15.0 Amps	8.0 Amps

Table 1-6 Power consumption HP LaserJet 4345mfp Series (average, in watts)

Product model	Copying	Printing[2]	Ready	Sleep	Off
HP LaserJet 4345mfp	800 W	790 W[3]	44 W	15 W	0.25 W
HP LaserJet 4345x mfp	800 W	790 W[3]	49 W	15 W	0.25 W
HP LaserJet 4345xs mfp	800 W	790 W[3]	49 W	15 W	0.25 W
HP LaserJet 4345xm mfp	800 W	790 W[3]	49 W	15 W	0.25 W

[1] Values subject to change. See www.hp.com/support/lj4345mfp for current information.

[2] Power numbers are the highest values measured using all standard voltages.

[3] HP LaserJet 4345mfp Series printing and copying speeds are 45 ppm Letter size and 43 ppm A4 size.

[4] Default time from Ready mode to Sleep = 60 minutes.

[5] Recovery time from Sleep to start of printing = less than 10 seconds.

[6] Heat dissipation in Ready mode = 167 BTU/hour.

Acoustic specifications

Table 1-7 Sound power and pressure level[1] (HP LaserJet 4345mfp Series)

Sound power level	Declared per ISO 9296
Printing[2]	L_{WAd}= 7.0 Bels (A) [70 dB(A)]
Copying	L_{WAd}= 7.2 Bels (A) [72 dB(A)]
Ready	L_{pAm}=33 dB (A)
Sound pressure level	**Declared per ISO 9296**
Printing[2]	L_{pAm}=55 dB (A)
Copying	L_{pAm}=56 dB (A)
Ready	L_{pAm}=33 dB (A)

[1] Values subject to change. See www.hp.com/support/
lj4345mfp for current information.

[2] HP LaserJet 4345mfp Series speed is 43 ppm A4 size.

[3] Configuration tested (HP LaserJet 4345mfp): Base model,
simplex printing with A4 paper size.

Image area

The MFP can place printed or copied images on the page within the following margins:

■ **Printing**: 4.23 mm (0.17 inch) from each edge

■ **Copying** (standard): 4.23 mm (0.17 inch) from each edge

■ **Copying** (edge-to-edge): 2.0 mm (0.08 inch) from each edge

To use edge-to-edge copying, touch **CONFIGURE DEVICE**, touch **SYSTEM SETUP**, touch **COPY/
SEND SETTINGS**, and then touch **EDGE-TO-EDGE COPIES**.

NOTE Using edge-to-edge copying as the default setting can result in printing off the page.
This can cause print-quality defects and can cause damage to the MFP internal components.

NOTE Margins vary when using digital sending. The margins depend on the type of file
being sent and its dpi resolution.

Skew specifications

The MFP has the following skew specifications:

■ **Print engine** (cut-sheet paper): less than 1.5 mm (0.06 inches) over a 260-mm (10.24-inch) length

■ **Print engine** (envelopes): less than 3.3 mm (0.13 inches) over a 220-mm (8.66-inch) length

■ **ADF and scanner glass** (cut-sheet paper): less than 0.6%

Media specifications

For complete media specifications for all HP LaserJet printers and MFPs, see the *HP LaserJet Printer Family Print Media Guide* (available at www.hp.com/support/ljpaperguide).

Category	Specifications
Acid content	5.5 pH to 8.0 pH
Caliper	0.094 to 0.18 mm (3.0 to 7.0 mils)
Curl in ream	Flat within 5 mm (0.02 inch)
Cut edge conditions	Cut with sharp blades that create no visible fray
Fusing compatibility	Must not scorch, melt, offset, or release hazardous emissions when heated to 200°C (392°F) for 0.1 second
Grain	Long grain
Moisture content	3% to 9% by weight
Smoothness	100 to 250 Sheffield

Printing and paper-storage environment

Ideally, the printing and paper-storage environment should be at or near room temperature, and not too dry or too humid. Remember that paper is hygroscopic; it absorbs and loses moisture rapidly.

Heat works with humidity to damage paper. Heat causes the moisture in paper to evaporate, while cold causes it to condense on the sheets. Heating systems and air conditioners remove most of the humidity from a room. As paper is opened and used, it loses moisture, causing streaks and smudging. Humid weather or water coolers can cause the humidity to increase in a room. As paper is opened and used it absorbs any excess moisture, causing light print and dropouts. Also, as paper loses and gains moisture it can distort. This can cause jams.

As a result, paper storage and handling are as important as the paper-making process itself. Paper storage environmental conditions directly affect the feed operation.

Care should be taken not to purchase more paper than can be easily used in a short time (about 3 months). Paper stored for long periods might experience heat and moisture extremes, which can cause damage. Planning is important to prevent damage to a large supply of paper.

Unopened paper in sealed reams can remain stable for several months before use. Opened packages of paper have more potential for environmental damage, especially if they are not wrapped with a moisture-proof barrier.

The paper storage environment should be properly maintained to ensure optimum MFP performance. The required condition is 20° to 24°C (68° to 75°F), with a relative humidity of

45% to 55%. The following guidelines should be helpful when evaluating the paper-storage environment:

■ Paper should be stored at or near room temperature.

■ The air should not be too dry or too humid (due to the hygroscopic properties of paper).

■ The best way to store an opened ream of paper is to rewrap it tightly in its moisture-proof wrapping. If the MFP environment is subject to extremes, unwrap only the amount of paper to be used during the day's operation to prevent unwanted moisture changes.

Envelopes

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^2 (28 lb) or jamming might occur.

■ **Construction:** Prior to printing, envelopes should lie flat with less than 6 mm (0.25 inch) curl, and should not contain air.

■ **Condition:** Envelopes should not be wrinkled, nicked, or otherwise damaged.

■ **Temperature:** Use envelopes that are compatible with the heat and pressure of the MFP.

■ **Size:** Use only envelopes that are within the following size ranges:

    ■ **Minimum**: 76 x 127 mm (3 x 5 inches)

    ■ **Maximum**: 216 x 356 mm (8.5 x 14 inches)

NOTE Use only tray 1 or the optional envelope feeder to print on envelopes. Some jams might occur when using any media with a length less than 178 mm (7 inches). This might be caused by paper that has been affected by environmental conditions. For optimum performance, make sure to store and handle the paper correctly (see Printing and paper-storage environment). Select envelopes in the printer driver.

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 might be more likely to wrinkle. Be sure that the seam extends all the way to the corner of the envelope, as illustrated.
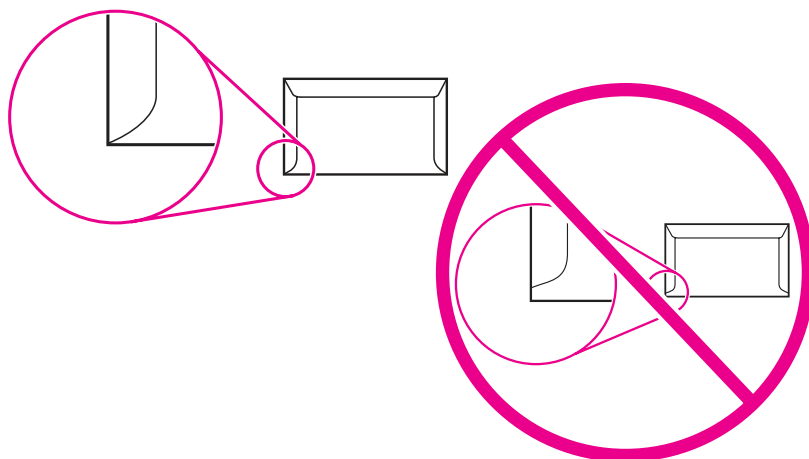
Envelopes that have adhesive strips or flaps

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

Envelope margins

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

Type of address	Top margin	Left margin
Return address	15 mm (0.6 inch)	15 mm (0.6 inch)
Delivery address	51 mm (2.0 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. Avoid printing over the area where the envelope seams meet.

Envelope storage

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

Labels

> **CAUTION**   To avoid damaging the MFP, use only labels that are recommended for use in laser printers. Never print on the same sheet of labels more than once or print on a partial sheet of labels.

Label construction

When selecting labels, consider the quality of each component:

- **Adhesives:** The adhesive material should be stable at 200°C (392°F), the MFP's fusing temperature.

- **Arrangement:** Only use labels that have no exposed backing between them. Labels can peel off sheets that have spaces between the labels, causing serious jams.

- **Curl:** Prior to printing, labels must lie flat with no more than 13 mm (0.5 inch) of curl in any direction.

- **Condition:** Do not use sheets of labels that have wrinkles, bubbles, or other indications of separation.

> **NOTE**   Select labels in the printer driver.

Transparencies

Transparencies used in the MFP must be able to withstand 200°C (392°F), the MFP's fusing temperature.

> **CAUTION**   To avoid damaging the MFP, use only transparencies recommended for use in HP LaserJet printers, such as HP-brand transparencies. (For ordering information, see How to order parts, supplies, and accessories.)

> **NOTE**   Select transparencies in the printer driver.

Supported types and sizes of print media

The following table lists the types of media that the MFP supports.

Table 1-8 Supported types of media

Type of media	Tray 1	Trays 2, 3, 4, and 5	Optional duplexer	Optional envelope feeder	3-bin mailbox or stacker part of stapler/ stacker	Stapler part of stapler/ stacker
Plain	X	X	X	X	X	X
Preprinted	X	X	X	X	X	X
Letterhead	X	X	X	X	X	X
Transparency	X	X			X	
Prepunched	X	X		X	X	X
Labels	X	X	X	X	X	
Bond	X	X	X	X	X	X
Recycled	X	X	X	X	X	X
Color	X	X	X	X	X	X
Cardstock	X			X	X[1], [2]	
Rough	X	X	X	X	X	X
Envelope	X			X	X[1]	

[1] Face-up delivery only.

[2] If a 3-bin mailbox is installed, select the bottom bin when printing on cardstock. Media weights that are 200 g/m^2 (53 lb) or heavier are supported only in the bottom bin.

Table 1-9 Tray 1 supported sizes and weights

Size	Dimensions[1]	Weight	Capacity[2]
Letter	216 x 279 mm (8.5 x 11 inches)	60 to 200 g/m^2 (16 to 53 lb)	100 sheets of 75 g/m^2 (20 lb) paper
A4	210 x 297 mm (8.3 x 11.7 inches)		
Legal	216 x 356 mm (8.5 x 14 inches)		
Executive	184 x 267 mm (7.3 x 10.5 inches)		
Statement	140 x 216 mm (5.5 x 8.5 inches)		
8.5x13	216 x 330 mm (8.5 x 13 inches)		
A5	148 x 210 mm (5.8 x 8.3 inches)		

Table 1-9 Tray 1 supported sizes and weights (continued)

Size	Dimensions[1]	Weight	Capacity[2]
B5 (JIS)	182 x 257 mm (7.2 x 10.1 inches)		
Executive (JIS)	216 x 330 mm (8.5 x 13 inches)		
D Postcard (JIS)	148 x 200 mm (5.8 x 7.9 inches)		
16K	197 x 273 mm (7.75 x 10.75 inches)		
Custom	Minimum: 76 x 127 mm (3 x 5 inches) Maximum: 216 x 356 mm (8.5 x 14 inches)		
Envelope, Commercial #10	105 x 241 mm (4.1 x 9.5 inches)	75 to 105 g/m^2 (20 to 28 lb)	10 envelopes
Envelope, DL ISO	110 x 220 mm (4.3 x 8.7 inches)		
Envelope, C5 ISO	162 x 229 mm (6.4 x 9.0 inches)		
Envelope, B5 ISO	176 x 250 mm (6.9 x 9.8 inches)		
Envelope, Monarch #7-3/4	98 x 191 mm (3.9 x 7.5 inches)		

[1] The MFP supports a wide range of sizes. Check the MFP software for supported sizes.
[2] Capacity can vary depending on media weight and thickness, as well as environmental conditions.

Table 1-10 Trays 2, 3, 4, and 5 supported sizes and weights

Size	Dimensions[1]	Weight	Capacity[2]
Letter	216 x 279 mm (8.5 x 11 inches)	60 to 120 g/m^2 (16 to 32 lb)	500 sheets of 75 g/m^2 (20 lb) paper
A4	210 x 297 mm (8.3 x 11.7 inches)		
Executive	184 x 267 mm (7.3 x 10.5 inches)		
Legal	216 x 356 mm (8.5 x 14 inches)		
B5 (JIS)	182 x 257 mm (7.2 x 10.1 inches)		
A5	148 x 210 mm (5.8 x 8.3 inches)		
8.5x13	216 x 330 mm (8.5 x 13 inches)		
Executive (JIS)	216 x 330 mm (8.5 x 13 inches)		

Table 1-10 Trays 2, 3, 4, and 5 supported sizes and weights (continued)

Size	Dimensions[1]	Weight	Capacity[2]
16K	197 x 273 mm (7.75 x 10.75 inches)		
Custom	Minimum: 148 x 210 mm (5.8 x 8.3 inches) Maximum: 216 x 356 mm (8.5 x 14 inches)		

[1] The MFP supports a wide range of sizes. Check the MFP software for supported sizes.

[2] Capacity can vary depending on media weight and thickness, as well as environmental conditions.

Table 1-11 Optional duplexer supported sizes and weights

Size	Dimensions	Weight
Letter	216 x 279 mm (8.5 x 11 inches)	60 to 120 g/m^2 (16 to 32 lb)
A4	210 x 297 mm (8.3 x 11.7 inches)	
Executive	184 x 267 mm (7.3 x 10.5 inches)	
Legal	216 x 356 mm (8.5 x 14 inches)	
B5 (JIS)	182 x 257 mm (7.2 x 10.1 inches)	
A5	148 x 210 mm (5.8 x 8.3 inches)	
8.5x13	216 x 330 mm (8.5 x 13 inches)	
Executive (JIS)	216 x 330 mm (8.5 x 13 inches)	
16K	197 x 273 mm (7.75 x 10.75 inches)	

Table 1-12 Optional envelope feeder supported sizes and weights

Size	Dimensions	Weight	Capacity
Monarch #7-3/4	98 x 191 mm (3.9 x 7.5 inches)	75 to 105 g/m^2 (20 to 28 lb)	75 envelopes
Commercial #10	105 x 241 mm (4.1 x 9.5 inches)		
DL ISO	110 x 220 mm (4.3 x 8.7 inches)		
C5 ISO	162 x 229 mm (6.4 x 9.0 inches)		
B5 ISO	176 x 250 mm (6.9 x 9.8 inches)		

Table 1-13 Optional 3-bin mailbox or stacker part of the stapler/stacker supported sizes and weights

Size	Dimensions[1]	Weight	Capacity[2]
Letter	216 x 279 mm (8.5 x 11 inches)		For the stacker on the stapler/stacker or the lower bin on the 3-bin mailbox: 500 sheets of 75 g/m^2 (20 lb) paper
A4	210 x 297 mm (8.3 x 11.7 inches)		
Executive	184 x 267 mm (7.3 x 10.5 inches)		For the top two bins on the 3-bin mailbox: each can hold 100 sheets of 75 g/m^2 (20 lb) paper
Legal	216 x 356 mm (8.5 x 14 inches)		
B5 (JIS)	182 x 257 mm (7.2 x 10.1 inches)		
A5	148 x 210 mm (5.8 x 8.3 inches)		
Statement	140 x 216 mm (5.5 x 8.5 inches)		
8.5x13	216 x 330 mm (8.5 x 13 inches)		
Executive(JIS)	216 x 330 mm (8.5 x 13 inches)		
D Postcard (JIS)	148 x 200 mm (5.8 x 7.9 inches)		
16K	197 x 273 mm (7.75 x 10.75 inches)		
Envelope, #10 [3]	105 x 241 mm (4.1 x 9.5 inches)		
Envelope, Monarch #7-3/4 [3]	98 x 191 mm (3.9 x 7.5 inches)		
Envelope, C5 ISO [3]	162 x 229 mm (6.4 x 9.0 inches)		
Envelope, DL ISO [3]	110 x 220 mm (4.3 x 8.7 inches)		
Envelope, B5 ISO [3]	176 x 250 mm (6.7 x 9.8 mm)		
Custom	Minimum: 76 x 127 mm (3 x 5 inches) Maximum: 216 x 356 mm (8.5 x 14 inches)		

[1] The MFP supports a wide range of sizes. Check the MFP software for supported sizes.
[2] Capacity can vary depending on media weight and thickness, as well as environmental conditions.
[3] Face-up delivery only.

Table 1-14 Stapler part of the optional stapler/stacker supported sizes and weights

Size	Dimensions	Weight	Capacity
Letter	216 x 279 mm (8.5 x 11 inches)	For plain media: 60 to 120 g/m^2 (16 to 32 lb)	For plain media: 30 sheets of 75 g/m^2 (20 lb) paper
A4	210 x 297 mm (8.3 x 11.7 inches)	For thick media: 128 to 199 g/m^2 (34 to 53 lb)	For glossy media: 20 sheets
Legal	216 x 356 mm (8.5 x 14 inches)		For thick media: the stack height must not exceed 7 mm (0.27 inch)
8.5x13	216 x 330 mm (8.5 x 13 inches)		
Executive(JIS)	216 x 330 mm (8.5 x 13 inches)		

Table 1-15 ADF supported sizes and weights

Size	Dimensions	Weight	Capacity
Letter	216 x 279 mm (8.5 x 11 inches)	60 to 120 g/m^2 (16 to 32 lb)	50 sheets of 75 g/m^2 (20 lb) paper
A4	210 x 297 mm (8.3 x 11.7 inches)		
A5	148 x 210 mm (5.8 x 8.3 inches)		
Legal	216 x 356 mm (8.5 x 14 inches)		

Regulatory information

FCC and Telecom regulations

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; the presence of interference can be determined by turning the equipment off and on. If this equipment does cause harmful interference to radio or television communications, 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 distance between equipment and receiver.

■ Connect equipment to an outlet on a circuit different from that to which the receiver is located.

■ Consult your dealer or an experienced radio/television technician.

NOTE Any changes or modifications to the MFP 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.

Telecom

The HP LaserJet 4345x mfp, HP LaserJet 4345xs mfp, and HP LaserJet 4345xm mfp models have the HP LaserJet analog fax accessory 300 already installed to provide communication to the public switch telephone network (PSTN) for fax functionality. See the *HP LaserJet Analog Fax Accessory 300 User Guide* for all regulatory approval information and regulatory notices associated with the fax functionality and that device.

Environmental Product Stewardship program

Protecting the environment

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

Ozone production

This product generates no appreciable ozone gas (O_3).

Energy consumption

Power usage drops significantly while in sleep mode, which saves natural resources and saves money without affecting the high performance of this product. This product qualifies for ENERGY STAR® (Multifunctional devices, Version 1.0), 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 product meets ENERGY STAR Guidelines for energy efficiency. For more information, see www.energystar.gov.

Toner consumption

EconoMode uses significantly less toner, which might extend the life of the print cartridge.

Paper use

This product's optional automatic duplex feature (two-sided printing) and n-up printing (multiple pages printed on one page) capabilities can reduce media usage and the resulting demands on natural resources. (The automatic duplex feature is available only for models that include a built-in duplexer. Manual duplexing is available for all models. See HP LaserJet 4345mfp configurations.)

Plastics

Plastic parts over 25 grams are marked according to international standards that enhance the ability to identify plastics for recycling purposes at the end of the product's life.

HP LaserJet printing supplies

In many countries/regions, this product's printing supplies (for example, print cartridge and fuser) can be returned to HP through the HP Printing Supplies Environmental Program. An easy-to-use and free take back program is available in more than 30 countries/regions. Multilingual program information and instructions are included in every new HP LaserJet print cartridge and supplies package.

HP Printing Supplies Returns and Recycling Program Information

Since 1992, HP has offered HP LaserJet supplies return and recycling free of charge in 86% of the world market where HP LaserJet supplies are sold. Postage-paid and pre-addressed labels are included within the instruction guide in most HP LaserJet print cartridge boxes. Labels and bulk boxes are also available through the Web site at www.hp.com/recycle.

More than 10 million HP LaserJet print cartridges were recycled globally in 2002 through the HP Planet Partners supplies recycling program. This record number represents 26 million pounds of print cartridge materials that were diverted from landfills. Worldwide, HP recycled an average of 80% of the print cartridge by weight, consisting primarily of plastic and metals. Recycled plastics and metals are used to make new products, such as HP products, plastic trays, and spools. The remaining materials are disposed of in an environmentally responsible manner.

- **U.S. returns** For a more environmentally responsible return of used cartridges and supplies, HP encourages the use of bulk returns. Simply bundle two or more cartridges together and use the single, prepaid, preaddressed UPS label that is supplied in the package. For more information in the U.S., call 1-800-340-2445 or visit the HP LaserJet Supplies Web site at www.hp.com/recycle.

- **Non-U.S. returns** Non-U.S. customers should call the local HP Sales and Service Office or visit the www.hp.com/recycle Web site for further information regarding availability of the HP Supplies Returns and Recycling Program.

Paper

This product is capable of using recycled papers when the paper meets the guidelines outlined in the *HP LaserJet Printer Family Print Media Guide*. Go to www.hp.com/support/ljpaperguide to download this guide in .PDF format. This product is suitable for the use of recycled media according to EN12281:2002.

Material restrictions

This HP product contains mercury in the fluorescent lamp of the control-panel liquid-crystal-display that might require special handling at end of life.

This HP product may initially contain lead in solder that might require special handling at end-of-life. This product will eventually switch to lead-free construction in compliance with the European Waste from Electrical and Electronic Equipment (WEEE) law.

This HP product contains a battery that might require special handling at end-of-life.

Type	Lithium Carbon Monofluoride (BR1632), 3 Volt, button-style battery, 1.5 grams
Materials	Mercury-free, Cadmium-free, Lead-free
Location	On printed circuit board
User removable	No

For recycling information, you can contact www.hp.com/recycle or contact your local authorities or the Electronics Industry Alliance:www.eiae.org

Material safety data sheet

Material Safety Data Sheets (MSDS) for supplies that contain chemical substances (for example, toner) can be obtained by contacting the HP Web site at www.hp.com/go/msds or www.hp.com/hpinfo/community/environment/productinfo/safety.

For more information

To obtain information about the following environmental topics, visit www.hp.com/go/environment or www.hp.com/hpinfo/community/environment/productinfo/safety.

■ Product environmental profile sheet for this and many related HP products.

■ HP's commitment to the environment

■ HP's environmental management system

■ HP's end-of-life product return and recycling program

■ Material Safety Data Sheets (MSDS)

Country-/region-specific safety statements

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.

> **WARNING!** Using controls, making adjustments, or performing procedures other than those specified in this user guide may result in exposure to hazardous radiation.

Canadian DOC statement

Complies with Canadian EMC Class B requirements.

«Conforme àla classe B des normes canadiennes de compatibilité électromagnétiques (CEM).»

Japanese VCCI statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準
に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用すること
を目的としていますが、この装置がラジオやテレビジョン受信機に近接して
使用されると、受信障害を引き起こすことがあります。
　取り扱い説明書に従って正しい取り扱いをして下さい。

Korean EMI statement

사용자 안내문 (B급 기기)

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

Finnish laser statement

LASERTURVALLISUUS

LUOKAN 1 LASERLAITE

KLASS 1 LASER APPARAT

HP LaserJet 4345mfp, HP LaserJet 4345x mfp, HP LaserJet 4345xs mfp,
HP LaserJet 4345xm mfp -laserkirjoitin on käyttäjän kannalta turvallinen luokan 1
laserlaite. Normaalissa käytössä kirjoittimen suojakotelointi estää lasersäteen pääsyn
laitteen ulkopuolelle.

Laitteen turvallisuusluokka on määritetty standardin EN60825-1 (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 4345mfp, HP LaserJet 4345x mfp, HP LaserJet 4345xs mfp,
HP LaserJet 4345xm mfp -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 770-800 nm

Teho 5 mW

Luokan 3B laser

Australia

This equipment complies with Australian EMC requirements.

Declaration of conformity (HP LaserJet 4345mfp)

Declaration of Conformity

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name:	Hewlett-Packard Company
Manufacturer's Address:	11311 Chinden Boulevard,
	Boise, Idaho 83714-1021, USA
declares that the product	
Product Name:	HP LaserJet 4345mfp
Regulatory model number:	BOISB-0407-00[3]
Model Number:	Q3942A
Product Options:	ALL

conforms to the following Product Specifications:

Safety:	IEC 60950-1:2001 / EN60950-1: 2001
	IEC 60825-1:1993 +A1 +A2 / EN 60825-1:1994 +A11 +A2 (Class 1 Laser/LED Product)
	GB4943-2001
EMC:	CISPR 22:1998 / EN 55022:1998 - Class B[1]
	EN 61000-3-2:2000
	EN 61000-3-3:1995 + A1:2001
	EN 55024:1998
	FCC Title 47 CFR, Part 15 Class B[2] / ICES-003, Issue 4
	GB9254-1998

Supplementary Information:

The product herewith complies with the requirements of the EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/EEC, and carries the CE-Marking accordingly.

1) The product was tested in a typical configuration with Hewlett-Packard Personal Computer Systems.

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

3) For regulatory purposes, this product is assigned a Regulatory model number. This number should not be confused with the marketing name or the product number(s).

Boise, Idaho, USA

May 26, 2004

For regulatory topics only:

Australia Contact:	Product Regulations Manager, Hewlett-Packard Australia Ltd., 31-41 Joseph Street, Blackburn, Victoria 3130, Australia
European Contact:	Your Local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department HQ-TRE / Standards Europe, Herrenberger Strasse 140, D-71034, Böblingen (FAX: +49-7031-14-3143)
USA Contact:	Product Regulations Manager, Hewlett-Packard Company, PO Box 15, Mail Stop 160, Boise, ID 83707-0015, (Phone: 208-396-6000)

Declaration of conformity (HP LaserJet 4345x mfp, 4345xs mfp, and 4345xm mfp)

2 Service approach

This chapter contains information about the following topics:

Service approach

MFP repair normally begins by using the MFP internal diagnostics and the following three-step process.

1   Isolate the problem to the major system (for example, the host computer, the network or server, or the MFP system).

2   Determine if the problem is located in the accessories, the scanner assembly, or in the MFP engine.

3   Troubleshoot the problem using the procedures in Chapter 7.

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

Ordering parts, accessories, and supplies

Several methods are available for ordering parts, supplies, and accessories:

- Ordering directly from HP

- Ordering directly through the embedded Web server (for MFPs that are connected to a network)

- Ordering directly through the HP Toolbox software (for MFPs that are directly connected to a computer)

Ordering directly from HP

You can obtain the following directly from HP:

- **Replacement parts** To order replacement parts in the U.S. see www.hp.com/go/hpparts/. Outside the United States, order parts by contacting your local authorized HP service center.

- **Supplies and accessories** To order supplies in the U.S., see www.hp.com/go/ljsupplies. To order supplies worldwide, see www.hp.com/ghp/buyonline.html. To order accessories, see www.hp.com/support/lj4345mfp.

Ordering directly through the embedded Web server (for MFPs that are connected to a network)

Use the following steps to order printing supplies directly through the embedded Web server.

To order directly through the embedded Web server

1   In the Web browser on the computer, type the IP address for the MFP. The MFP status window appears.

2   In the **Other links** area, double-click **Order Supplies**. This provides a URL from which to purchase consumables. Supplies information with part numbers and MFP information is provided.

3   Select the part numbers that you want to order and follow the instructions on the screen.

Ordering directly through the HP Toolbox software (for MFPs that are directly connected to a computer)

The HP Toolbox software gives you the ability to order supplies and accessories directly from the computer. To order supplies by using the HP Toolbox, click **Toolbox Links**, and then click **Order Supplies**. A link is provided to the HP Web site for ordering supplies.

Hewlett-Packard Limited Warranty Statement

HP product	Duration of Limited Warranty
HP LaserJet 4345mfp	1 year, on-site
HP LaserJet 4345x mfp	
HP LaserJet 4345xs mfp	
HP LaserJet 4345xm mfp	

HP warrants HP hardware, accessories, and supplies against defects in materials and workmanship for the period specified above. If HP receives notice of such defects during the warranty period, HP will, at its option, either repair or replace products which prove to be defective. Replacement products may be either new or like-new.

HP warrants that HP software will not fail to execute its programming instructions, for the period specified above, due to defects in material and workmanship when properly installed and used. If HP receives notice of such defects during the warranty period, HP will replace software media which does not execute its programming instructions due to such defects.

HP does not warrant that the operation of HP products will be uninterrupted or error free. If HP is unable, within a reasonable time, to repair or replace any product to a condition as warranted, customer will be entitled to a refund of the purchase price upon prompt return of the product.

HP products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use.

Warranty does not apply to defects resulting from (a) improper or inadequate maintenance or calibration, (b) software, interfacing, parts or supplies not supplied by HP, (c) unauthorized modification or misuse, (d) operation outside of the published environmental specifications for the product, or (e) improper site preparation or maintenance.

TO THE EXTENT ALLOWED BY LOCAL LAW, THE ABOVE WARRANTIES ARE EXCLUSIVE AND NO OTHER WARRANTY, WHETHER WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED AND HP SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, SATISFACTORY QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE.

TO THE EXTENT ALLOWED BY LOCAL LAW, THE REMEDIES IN THIS WARRANTY STATEMENT ARE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. EXCEPT AS INDICATED ABOVE, IN NO EVENT WILL HP OR ITS SUPPLIERS BE LIABLE FOR LOSS OF DATA OR FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE.

FOR CONSUMER TRANSACTIONS IN AUSTRALIA AND NEW ZEALAND; THE WARRANTY TERMS CONTAINED IN THIS STATEMENT, EXCEPT TO THE EXTENT LAWFULLY PERMITTED, DO NOT EXCLUDE, RESTRICT OR MODIFY AND ARE IN ADDITION TO THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE SALE OF THIS PRODUCT TO YOU.

The warranty period begins on the date of the delivery or on the date of installation if installed by HP. If customer schedules or delays HP installation more than 30 days after delivery, warranty begins on the 31st day from delivery.

Print Cartridge Limited Warranty Statement

This HP Print Cartridge is warranted to be free from defects in materials and workmanship.

This warranty does not apply to print cartridges that (a) have been refilled, refurbished, remanufactured or tampered with in any way, (b) experience problems resulting from misuse, improper storage, or operation outside of the published environmental specifications for the printer product or (c) exhibit wear from ordinary use.

To obtain warranty service, please return the product to place of purchase (with a written description of the problem and print samples) or contact HP customer support. At HP's option, HP will either replace products that prove to be defective or refund your purchase price.

TO THE EXTENT ALLOWED BY LOCAL LAW, THE ABOVE WARRANTY IS EXCLUSIVE AND NO OTHER WARRANTY OR CONDITION, WHETHER WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED AND HP SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, SATISFACTORY QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE.

TO THE EXTENT ALLOWED BY LOCAL LAW, IN NO EVENT WILL HP OR ITS SUPPLIERS BE LIABLE FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE.

THE WARRANTY TERMS CONTAINED IN THIS STATEMENT, EXCEPT TO THE EXTENT LAWFULLY PERMITTED, DO NOT EXCLUDE, RESTRICT OR MODIFY AND ARE IN ADDITION TO THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE SALE OF THIS PRODUCT TO YOU.

Availability of support and service

Around the world, HP provides a variety of service and support options for purchase. The availability of these programs will vary depending upon your location.

HP maintenance agreements

HP has several types of maintenance agreements that meet a wide range of support needs. Maintenance agreements are not part of the standard warranty. Support services vary by location. Contact HP Customer Care or go to www.hp.com/services/carepack to determine the services that are available and for more information about maintenance agreements. In general, the MFP will have the following maintenance agreements:

Priority Onsite Service

This agreement provides 4-hour service response to the customer's site for calls made during normal HP business hours.

Next business day

This agreement provides next-business-day service, Monday through Friday. This service agreement comes standard with the MFP for a period of one year. The customer can purchase an extension of this agreement.

Installation and maintenance-kit replacement

An HP-authorized service or support provider will come to the customer's site to install the MFP or to replace the maintenance kits.

3   Installation and configuration

This chapter contains information about the following topics:

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Installation checklist

When setting up the MFP for the first time, perform the following tasks to ensure that the MFP is installed correctly.

Table 3-1 Installation checklist

✓	Task	Details
	Connect the MFP to an adequate power source.	The MFP requires a minimum of 15 amps for 110-volt models or 8 amps for 220-volt models. Do not connect the MFP to a power strip or to an uninterruptible power supply (UPS). Attaching other devices to the same power source can cause intermittent problems.
	Install the MFP in a location that has enough space.	Make sure that all sides of the MFP are easily accessible. For space requirements, see Site requirements. If the space around the MFP is too tight, clearing jams and servicing the MFP are more difficult.
	Place the MFP on a sturdy, level surface.	Place the MFP on a hard surface so it does not shift when opening and closing the MFP components. If the MFP is on a cabinet/stand, make sure that the feet are level and stable.
	Install media in tray 2 and install the print cartridge.	Use media that meets HP specifications. See the *HP LaserJet Printer Family Print Media Guide*, which is available for download in .PDF format at www.hp.com/support/ljpaperguide. Be sure to remove the sealing tape from the print cartridge. It is possible to insert the print cartridge without removing the sealing tape, but an error message appears on the control-panel display.
	Connect the network cable to the HP Jetdirect port on the left side of the MFP. Also connect the fax line if an HP LaserJet analog fax accessory 300 is installed.	See Connecting to a computer or network.
	Move the scanner shipping lock to the unlocked position.	Raise the ADF. The scanner shipping lock is to the left of the scanner glass. Move the switch toward the front of the MFP to unlock it.
	Set the correct language, date, and time.	The first time you turn on the MFP, it prompts you to set the language, date, and time. If the MFP does not prompt you to set the language, use this procedure to change the language, if necessary. 1 Turn the MFP off and then on. 2 When the memory count appears on the control-panel display, press and hold 6 until all three LEDs flash once and then stay on. (This might take up to 20 seconds. 3 Release 6 and then press 6 again. 4 Wait while the MFP completes its initialization sequence. When it is finished, the **SELECT LANGUAGE** menu appears on the control-panel display. Scroll to and touch the correct language. For more information about setting the date and time, see Setting the real-time clock.

Table 3-1 Installation checklist (continued)

✓	Task	Details
	Prepare the MFP for digital sending by configuring the e-mail gateways.	1 Press MENU. 2 Touch **CONFIGURE DEVICE**, and then touch **SENDING**. 3 Touch **E-MAIL**, and then touch **FIND SEND GATEWAYS**. If the auto-discovery process does not find the e-mail gateway addresses, obtain the gateway addresses from the system administrator and configure them manually.
	If a fax accessory is installed, configure it for sending and receiving faxes.	1 Press MENU. 2 Touch **FAX**, and then touch **FAX SETUP REQUIRED.** 3 Type the date/time, location, and fax header information.
	Print the configuration pages to verify that the MFP is able to print.	1 Press MENU. 2 Touch **INFORMATION**, and then touch **PRINT CONFIGURATION**.
	Verify that each of the following items is listed on the configuration pages: ■ The LDAP Gateway Address ■ The SMTP Gateway Address ■ All optional devices ■ If a fax accessory is installed, the Modem Status should indicate "Operational/Enabled." ■ On the embedded Jetdirect page, make sure that the IP address is valid and that the Status indicates "I/O Card Ready."	For more information about interpreting the configuration pages, see Information pages in chapter 7 of this manual.
	Make a copy by using the scanner glass to verify that the scanner is working.	
	Make a copy by using the ADF to verify that it is working.	
	If a fax accessory is installed, send a test fax to verify that it is set up correctly.	
	Digitally send a document by using the e-mail feature.	
	Send a print job to the MFP from a computer to verify that the printer driver software is installed correctly.	
	Make sure that all users are aware of the user-training CD that came with the MFP.	

Connecting to a computer or network

The MFP has five ports for connecting to a computer or a network. The ports are at the left, rear corner of the MFP.
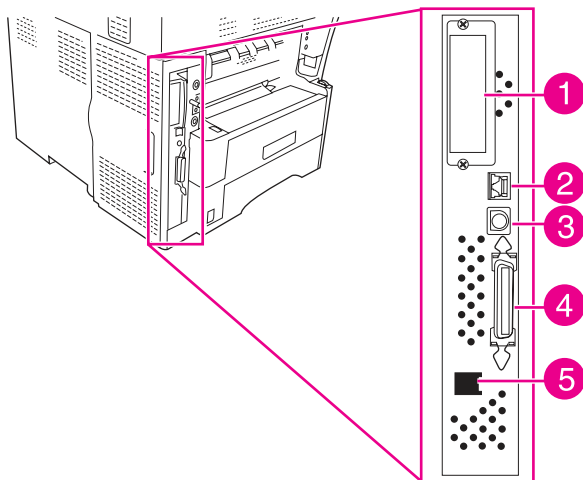
1	Slot for connecting optional EIO devices
2	Network connection (embedded HP Jetdirect print server)
3	Foreign interface harness (FIH) port
4	IEEE 1284B-compliant parallel port
5	Fax connection (for connecting to an optional analog fax accessory)

NOTE   The MFP does *not* have a USB port. To connect the MFP to a computer with a USB cable, you must install an EIO card that has a USB connection.

Network connection

When installing the MFP on a network, connect the network cable to the embedded HP Jetdirect print server before installing the MFP software.

For complete information about installing the MFP on a network, see the network installation guide that was included with the MFP.

Parallel connection

Install the MFP software before connecting the MFP directly to a computer or to a print server with a parallel cable.

For complete information about installing connecting the MFP directly to a print server, see the network installation guide that was included with the MFP.

Fax connection

The HP LaserJet 4345x mfp, HP LaserJet 4345xs mfp, and HP LaserJet 4345xm mfp models come with an HP LaserJet analog fax accessory 300 already installed. Microsoft® Windows® users can also install the optional HP Digital Sending Software (HP DSS), which provides digital faxing services.

For complete instructions for configuring the fax accessory and for using the fax features, see the *HP LaserJet Analog Fax Accessory 300 User Guide*. A printed copy of this guide is included with the HP LaserJet 4345x mfp, HP LaserJet 4345xs mfp, and HP LaserJet 4345xm mfp.

Analog faxing

When the HP LaserJet analog fax accessory 300 is installed, the MFP can function as a standalone fax machine.

The HP LaserJet 4345x mfp, HP LaserJet 4345xs mfp, and HP LaserJet 4345xm mfp models come with an HP LaserJet analog fax accessory 300 already installed. For the HP LaserJet 4345mfp (base model), you can order this accessory as an option. See How to order parts, supplies, and accessories for information about ordering the analog fax accessory.

Connecting the fax accessory to a phone line

When connecting the fax accessory to a phone line, ensure that the phone line being used for the fax accessory is a dedicated line that is not used by any other devices. Also, this line should be an analog line because the fax will not function correctly if it is connected to some digital PBX systems. If you are not sure whether you have an analog or digital phone line, contact your telecom provider.

NOTE   HP recommends using the phone cord that comes with the fax accessory to ensure that the accessory functions correctly.

Follow these instructions to connect the fax accessory to a phone jack.

1   Locate the phone cord that is included with the fax accessory kit. Connect one end of the phone cord into the fax accessory phone jack that is on the formatter. Push the connector until it clicks.
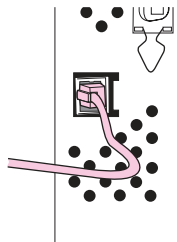
CAUTION   Be sure to connect the phone line to the fax accessory port , which is near the bottom of the formatter. Do not connect the phone line to the HP Jetdirect LAN port, which is nearer the top of the formatter.

2   Connect the other end of the phone cord into the phone jack on the wall. Push the connector until it clicks.

Configuring and using the fax features

Before you can use the fax features, you must configure them in the control-panel menus. For complete information about configuring and using the fax accessory and for information about

troubleshooting problems with the fax accessory, see the *HP LaserJet Analog Fax Accessory 300 User Guide*, which is provided with the fax accessory.

Digital faxing

Digital faxing is available when you install the optional HP Digital Sending Software. For information about ordering this software, go to www.hp.com/go/lj4345mfp_software.

With digital faxing, the MFP does *not* need to be connected directly to a phone line. Instead, the MFP can send a fax in one of three ways:

■ **LAN fax** sends faxes through a third-party fax provider.

■ **Microsoft Windows 2000 fax** is a fax modem and Digital Sender Module on a computer that allows the computer to operate as a turnkey gateway fax.

■ **Internet fax** uses an Internet fax provider to process faxes, and the fax is delivered on a traditional fax machine or sent to the user's e-mail.

For complete information about using digital faxing, see the documentation that is provided with the HP Digital Sending Software.

Optional output and input devices

Several paper-handling devices are available for the MFP.

- A 3-bin mailbox

- A stapler/stacker

- Up to three 500-sheet feeders

- An envelope feeder

- A cabinet/stand (use with the optional 500-sheet feeders)

Each of these accessories comes with an installation guide that explains how to install it. After installing an accessory, print a configuration page to verify that the accessory was installed successfully. If the accessory is installed correctly, it is listed on the configuration page in the section for **Paper trays and options**.

Security features

Several important security features are available for the MFP. Use the information in this section to configure these features to meet the customer's needs.

Securing the embedded Web server

You can assign a password for access to the embedded Web server so that unauthorized users cannot change the MFP settings.

To secure the embedded Web server

1   Open the embedded Web server. See Using the embedded Web server.

2   Click the **Settings** tab.

3   On the left side of the window, click **Security**.

4   Type the password next to **New Password**, and type it again next to **Verify Password**.

5   Click **Apply**. Make note of the password, and store it in a safe place.

Foreign Interface Harness (FIH)

The Foreign Interface Harness (FIH) provides a portal on the MFP. By using the FIH and third-party equipment, you can track information about copies that are made on the MFP.

Requirements

- Windows 9*X*, Windows Me, Windows NT® 4.0, Windows 2000, or Windows XP

- Access to third-party accounting hardware solutions, such as Equitrac or Copitrak devices

Using the FIH

To use the FIH, you must download and install the FIH software. The software is available from www.hp.com/go/lj4345mfp_software. The software is used to enable or disable the FIH portal. Use the software to set and change the administrator personal identification number (PIN).

Administrators can use the PIN option to configure the FIH to prevent any unauthorized changes. Changes can be made only with the correct PIN authentication.

> **NOTE**   It is important to remember the PIN that is assigned to the FIH administration software. The PIN is required to make any changes to the FIH.

To enable the FIH portal

1   Double-click the FIH.EXE file. The **Foreign Interface Harness** dialog box appears.

2   Click **OK**.

3   Click **Enable**.

4   If you have not entered a PIN before, click **No**. If you have entered a PIN before, click **Yes**. If you click **No**, type and confirm the PIN, and then click **OK**. If you click **Yes**, type the PIN and click **OK**.

> 📝 **NOTE** The PIN must be numeric.

5 Click the appropriate button for the type of connection: **Direct** or **Network**. If you select **Direct**, type the MFP port. If you select **Network**, type the IP address and port for the MFP.

> 📝 **NOTE** The IP address for the MFP can be found on the configuration page. You can print a configuration page from the control panel by touching MENU, touching **INFORMATION**, and then touching **PRINT CONFIGURATION**.

If you typed an incorrect IP address, you will receive an error message. Otherwise, the portal is enabled.

To disable the FIH portal

1 Double-click the FIH.EXE file. The **Foreign Interface Harness** dialog box appears.

2 Click **OK**.

3 Click **Disable**.

4 Type the PIN and click **OK**.

5 Click the appropriate button for the type of connection: **Direct** or **Network**. If you selected **Direct**, type the MFP port and click **OK**. If you selected **Network**, type the IP address and port for the MFP, and then click **OK**. The portal is disabled.

> 📝 **NOTE** If you lose the PIN number and the portal needs to be disabled, try using the default PIN that is listed to disable it. For assistance, use the HP Instant Support service, which is available through the embedded Web server or at instantsupport.hp.com. See Using the embedded Web server.

Secure Disk Erase

You might need to protect deleted data from unauthorized access on the MFP hard drive. Secure Disk Erase is a security feature that you can use to securely erase print and copy jobs from the hard drive.

Secure Disk Erase offers the following levels of disk security:

■ **Non-Secure Fast Erase**. This is a simple file-table erase function. Access to the file is removed, but actual data is retained on the disk until it is overwritten by subsequent data-storage operations. This is the fastest mode. Non-Secure Fast Erase is the default erase mode.

■ **Secure Fast Erase**. Access to the file is removed, and the data is overwritten with a fixed identical character pattern. This is slower than Non-Secure Fast Erase, but all data is overwritten. Secure Fast Erase meets the U.S. Department of Defense 5220-22.M requirements for the clearing of disk media.

■ **Secure Sanitizing Erase**. This level is similar to the Secure Fast Erase mode. In addition, data is repetitively overwritten by using an algorithm that prevents any residual data persistence. This mode will impact performance. Secure Sanitizing Erase meets the U.S. Department of Defense 5220-22.M requirements for the sanitization of disk media.

Data affected

Data affected (covered) by the Secure Disk Erase feature includes stored jobs, proof and hold jobs, disk-based fonts, disk-based macros (forms), and temporary files that are created during the print and copying process.

> **NOTE** Stored jobs will be securely overwritten only when they have been deleted through the **RETRIEVE JOB** menu on the MFP after the appropriate erase mode has been set.

This feature will not impact data that is stored on flash-based product non-volatile RAM (NVRAM) that is used to store default settings, page counts, and similar data. This feature does not affect data that is stored on a system RAM disk (if one is used). This feature does not impact data that is stored on the flash-based system boot RAM.

Changing the Secure Disk Erase mode does not overwrite previous data on the disk, nor does it immediately perform a full-disk sanitization. Changing the Secure Disk Erase mode changes how the MFP cleans up temporary data for jobs after the erase mode has been changed.

Gaining access to Secure Disk Erase

Use HP Web Jetadmin to gain access to and set the Secure Disk Erase feature.

Additional Information

For additional information about the HP Secure Disk Erase feature, see the HP support flyer or go to www.hp.com/go/webjetadmin/.

Job-storage features

Several job-storage features are available for this MFP. These features include printing private jobs, storing print jobs, quick-copying jobs, and proofing and holding jobs.

For more information about job-storage features, see Job-storage features.

HP DSS authentication

Optional HP Digital Sending Software (HP DSS) for the MFP is available for purchase separately. The software provides an advanced sending program that contains an authentication process. This process requires users to type a user identification and a password before they can use any of the HP DSS features that require authentication.

See Ordering parts, accessories, and supplies for ordering information.

Locking the control-panel menus

To prevent someone from changing MFP configuration, you can lock the control-panel menus. This prevents unauthorized users from changing the configuration settings such as the SMTP server. The following procedure describes how to restrict access to the control-panel menus by using the HP Web Jetadmin software. (See Using HP Web Jetadmin software.)

To lock the control-panel menus

1   Open the HP Web Jetadmin program.

2   Open the **DEVICE MANAGEMENT** folder in the drop-down list in the **Navigation** panel. Navigate to the **DEVICE LISTS** folder.

3   Select the MFP.

4   In the **Device Tools** drop-down list, select **Configure**.

5   Select **Security** from the **Configuration Categories** list.

6   Type a **Device Password**.

7   In the **Control Panel Access** section, select **Maximum Lock**. This prevents unauthorized users from gaining access to configuration settings.

Locking the formatter cage

You can place a Kensington lock on the formatter cage to prevent unauthorized access to components on the formatter.

📝 **NOTE**   A Kensington lock is typically used for locking laptop computers in order to prevent theft.

The following figure indicates where you should place the lock.
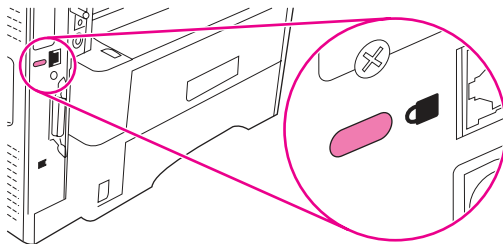
4 Maintenance

This chapter contains information about the following topics:

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Cleaning the MFP

To maintain print quality, clean the MFP thoroughly whenever print-quality problems occur and every time you replace the print cartridge.

> **WARNING!** Avoid touching the fusing area when cleaning the MFP. It can be hot.

> **CAUTION** To avoid permanent damage to the print cartridge, do not use ammonia-based cleaners on or around the MFP except as directed.

Cleaning the outside of the MFP

- Clean the outside of the MFP if it is visibly marked.

- Use a soft, lint-free cloth dampened with water, or with water and a mild detergent.

Cleaning the touchscreen

Clean the touchscreen whenever it is necessary to remove fingerprints or dust. Wipe the touchscreen gently with a clean, water-dampened, lint-free cloth.

> **CAUTION** Use water only. Solvents or cleaners can damage the touchscreen. Do not pour or spray water directly onto the touchscreen.

Cleaning the scanner glass

- Clean the scanner glass only if dirt is visible, or if you are experiencing a decrease in copy quality, such as streaking.

- Clean the scanner glass by wiping it gently with a clean, slightly damp, lint-free cloth. Use an ammonia-based surface cleaner only when a water-dampened cloth does not clean the scanner glass. Spray or pour the cleaner onto the cleaning cloth. Do not spray or pour the cleaner onto the scanner glass.

> **CAUTION** Do not pour or spray liquids directly onto the scanner glass. Do not press hard on the glass surface. (You could break the glass.)

Cleaning the fuser

Use the MFP cleaning page to keep the fuser free of toner and paper particles that can sometimes accumulate. Accumulation of toner and particles can cause specks to appear on the front or back side of your print jobs.

> **CAUTION** Do not attempt to clean the fuser with water or any other liquid. Use only the internal cleaning page to clean the fuser.

To ensure optimum print quality, HP recommends that you use the cleaning page every time you replace the print cartridge or whenever print-quality problems occur.

The cleaning procedure takes about 2.5 minutes to complete. A **CLEANING** message appears on the control-panel display while the cleaning is taking place.

Running the cleaning page

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

To run the cleaning page

1   Press MENU.

2   Scroll to and touch **CONFIGURE DEVICE**.

3   Touch **PRINT QUALITY**.

4   Touch **PROCESS CLEANING PAGE**.

Cleaning the ADF delivery system

Clean the ADF only if it is visibly marked or dirty, or if you are experiencing a decrease in copy quality (such as streaking).

To clean the ADF delivery system

1   Open the scanner lid.
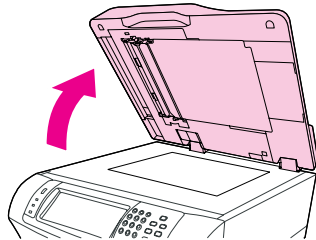
2   Locate the white, vinyl ADF backing.
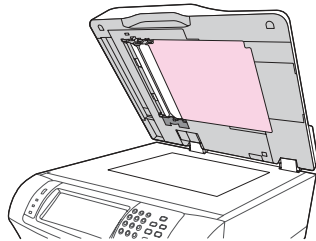
3   Locate the white, vinyl calibration strips.
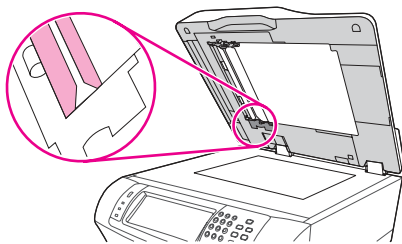
4   Clean the ADF backing and the calibration strips by wiping them with a clean, damp, lint-free cloth. Use an ammonia-based surface cleaner only when a water-dampened cloth does not clean the ADF components.

5   Clean the scanner glass by wiping it gently with a clean, slightly damp, lint-free cloth. Use an ammonia-based surface cleaner only when a water-dampened cloth does not clean the scanner glass.

6   Close the scanner lid.
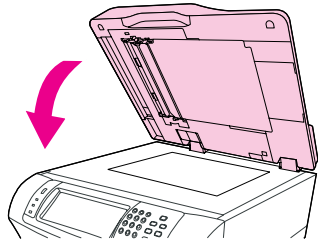
To clean the ADF rollers

You should clean the rollers in the ADF if you are experiencing misfeeds or if your originals show marks as they exit the ADF.

CAUTION   Clean the rollers only if you experience misfeeds or marks on the originals, and you notice dust on the rollers. Cleaning the rollers frequently could introduce dust into the device.

1   Open the scanner lid.
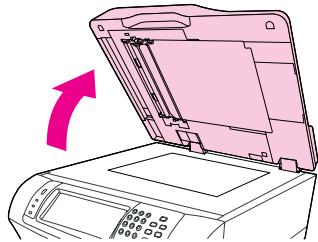
2   Locate the rollers near white, vinyl calibration strips.
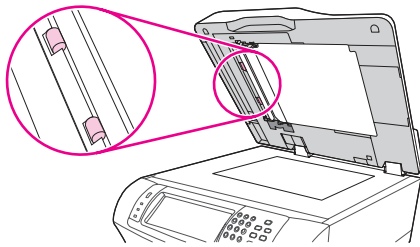
3   Wipe the rollers gently with a clean, water-dampened, lint-free cloth.

⚠   **CAUTION**   Do not pour water directly onto the rollers. Doing so might damage the device.

4   Close the scanner lid.
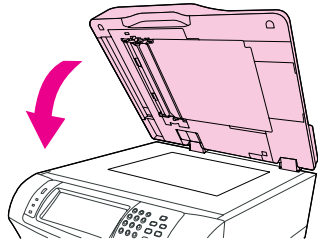
5   Pull the release lever to open the ADF cover.
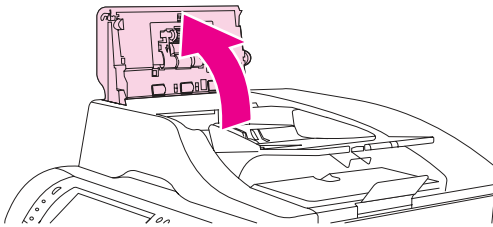
6   Locate the rollers.
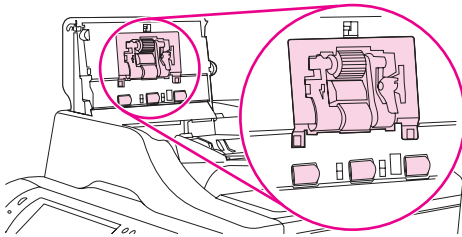
7   Wipe the rollers with a clean, water-dampened, lint-free cloth.

⚠️ **CAUTION**   Do not pour water directly onto the rollers. Doing so might damage the device.

8   Locate the separation pad.
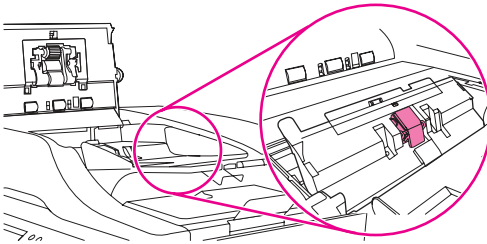
9   Wipe the pad with a clean, water-dampened, lint-free cloth.

10 Close the ADF cover.
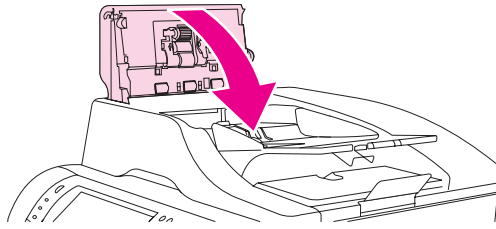
Calibrating the scanner

Calibrate the scanner to compensate for offsets in the scanner imaging system (carriage head) for ADF and flatbed scans. Because of mechanical tolerances, the scanner's carriage head might not read the position of the image accurately. During the calibration procedure, scanner offset values are calculated and stored. The offset values are then used when producing scans so that the correct portion of the document is captured.

Scanner calibration should be carried out only if you notice offset problems with the scanned images. The scanner is calibrated before it leaves the factory. It needs to be calibrated again only rarely.

Before calibrating the scanner, print the calibration target.

To print the calibration target

1   Place letter- or A4-size paper in tray 1, and adjust the side guides.

2   Touch **DIAGNOSTICS**

3   Touch **CALIBRATE SCANNER**.

4   Print the first pass of the calibration target.

5   Place the first pass of the calibration target in tray 1 so that the arrows are facing into the MFP.

6   Print the second pass. The final calibration target *must* look like the following figure.
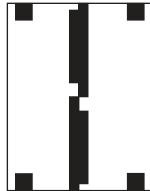
> ⚠ **CAUTION**   If the calibration target does not look like the figure shown here, the calibration process will fail and the quality of scans will be degraded. *The black areas must extend completely to the short edges of the page. If they do not, use a black marker to extend the black areas to the edge of the page.*

7   Place the calibration target face-up into the ADF, and adjust the side guides.

8   Press MENU, touch **DIAGNOSTICS**, then touch **CALIBRATE SCANNER**.

9   After the calibration target has passed through the ADF once, place it face-down in the ADF. After both passes through the ADF, place the calibration target face-down on the scanner glass to complete the calibration.

Performing preventive maintenance

The MFP requires periodic maintenance to maintain optimum performance. A control-panel message alerts you when it is time to purchase the preventive maintenance kits. Separate maintenance procedures are required for the printer-portion of the MFP and for the ADF.

Printer preventive maintenance

You should replace certain parts when the **PERFORM PRINTER MAINTENANCE** message appears on the control-panel display.

After printing 215,000 pages, the MFP alerts you to order a maintenance kit. The message can be temporarily cleared for approximately 10,000 pages by using the **CLEAR MAINTENANCE MESSAGE** item on the **RESETS** submenu. When the page count reaches 225,000, you can no longer clear the message and you must install the maintenance kit. To check the number of pages that the MFP has printed since new maintenance-kit components were installed, print either a configuration page or a supplies-status page.

The printer maintenance kit includes the following items:

■   Fuser

■   Rollers (transfer, feed, and separation)

■   Installation instructions

For the installation procedures, see chapter 6.

> **NOTE**   The printer maintenance kit is a consumable item and is not covered under the original MFP warranty or under most extended warranties.

After a maintenance kit is installed, the maintenance-kit counter must be reset.

To reset the maintenance-kit counter

1   Turn the MFP off and then on.

2   When the memory count appears on the control-panel display, press and hold 6 until all three LEDs flash once and then stay on. (This might take up to 20 seconds.)

3   Release 6 and then press 3.

4   Press 6 to select **NEW MAINTENANCE KIT**.

5   The MFP completes its initialization sequence. The maintenance-kit counter is automatically reset.

> **NOTE**   Perform this procedure only after a maintenance kit has been installed. Do not use this procedure to temporarily clear the **PERFORM PRINTER MAINTENANCE** message.

The ADF maintenance kit

After feeding 85,500 pages through the ADF, the MFP alerts you to order a document feeder kit. This message appears approximately one month before the kit needs to be replaced. Order a new kit when this message appears. After feeding 90,000 pages through the ADF, a **REPLACE DOCUMENT FEEDER KIT** message appears on the control-panel display. Replace the ADF maintenance kit at that time.

The ADF maintenance kit includes the following items:

- One pick-up roller assembly

- One separation pad

- One mylar sheet kit

- An instruction sheet

Follow the instructions that come with the kit to install it.

After replacing the kit, reset the ADF maintenance-kit count.

To reset the ADF maintenance-kit count

1   Turn the MFP off and then on.

2   When the memory count appears on the control-panel display, press and hold 6 until all three LEDs flash once and then stay on. (This might take up to 20 seconds.)

3   Release 6 and then press 3 twice.

4   Press 6 to select **NEW DOCUMENT FEEDER KIT**.

5   The MFP completes its initialization sequence. The ADF maintenance-kit counter is automatically reset.

Managing the print cartridge

This section provides information about HP print cartridges, their life expectancies, how to store them, and how to identify genuine HP supplies. Information also appears about non-HP print cartridges.

HP print cartridges

When you use a genuine HP print cartridge, you can obtain several types of information, such as the following:

■ Amount of toner remaining

■ Estimated number of pages remaining

■ Number of pages printed

Non-HP print cartridges

Hewlett-Packard Company cannot recommend use of non-HP print cartridges, either new or remanufactured. Because they are not HP products, HP cannot influence their design or control their quality. Service or repair that is required as a result of using a non-HP print cartridge will *not* be covered under the MFP warranty.

Using genuine HP supplies ensures the availability of all HP printing features.

Print-cartridge authentication

The MFP will let you know if a print cartridge is not a genuine HP print cartridge when you insert it into the MFP. If you believe that you purchased a genuine HP supply, go to www.hp.com/go/anticounterfeit.

Print-cartridge storage

Do not remove the print cartridge from its package until you are ready to use it.

Always store the print cartridge in the proper environment. The storage temperature should be between -20°C and 40°C (-4°F to 104°F). The relative humidity should be between 10% and 90%.

⚠ **CAUTION** To prevent damage to the print cartridge, do not expose it to light for more than a few minutes.

Print-cartridge life expectancy

The life of the print cartridge depends on the amount of toner that print jobs require and the length of life for the components inside the cartridge. When printing text at approximately 5% coverage (typical for a business letter), the HP print cartridge lasts an average of 18,000 pages. The page-yield specification that HP provides is a general guideline. Actual yield can vary according to usage conditions.

At any time, you can verify life expectancy by checking the supply level, as described in Checking the supply level.

Checking the supply level

You can check the supply (toner) level by using the control panel, the embedded Web server, HP Toolbox software, or HP Web Jetadmin.

To check the supply level by using the control panel

1 Press MENU.

2 Touch **INFORMATION**.

3 Touch **SUPPLIES STATUS**.

To check the supply level by using the embedded Web server

1 In your Web browser, type the IP address for the MFP. (See Opening the embedded Web server.)

2 On the left side of the screen, click **Supplies Status**. This takes you to the supplies status page, which provides supply-level information.

To check the supply level by using the HP Toolbox software

You can configure HP Toolbox to notify you when the print cartridge is low. You can choose to receive alerts by e-mail or as a pop-up message or taskbar icon. To check the supplies status by using the HP Toolbox software, click the **Status** tab, and then click **Supplies Status**.

To check the supply levels by using HP Web Jetadmin

In HP Web Jetadmin, select the MFP. The device status page shows supply-level information.

Cartridge-low and cartridge-out conditions

The MFP alerts you if the print cartridge is low on toner or out of toner.

When the cartridge is low on toner or drum life

When the cartridge is low, the control panel shows the **ORDER CARTRIDGE** message. The message first appears when about 15% of the life remains in the print cartridge. This percentage is set with the intent of providing approximately 2 weeks of typical use before the cartridge is depleted. You should have time to purchase a new cartridge before the old cartridge is depleted.

The default is for the MFP to continue printing until the cartridge runs out, but you might prefer to have the MFP stop instead of continuing when the **ORDER CARTRIDGE** message first appears—for example, if you want print quality to remain consistently high during print jobs, or if you do not want the cartridge to run out during a long print job. To configure the MFP to stop, in the **CONFIGURE DEVICE** menu, under **SYSTEM SETUP**, set **CARTRIDGE LOW** to **STOP**. Then, when **REPLACE CARTRIDGE** appears, the MFP will stop printing. You can resume printing by pressing START for each print job.

When the cartridge is out of toner or drum life

The **REPLACE CARTRIDGE** message appears in one of these situations:

■ **When the print cartridge is out of toner.** If **CARTRIDGE OUT** is set to **CONTINUE** (in the **SYSTEM SETUP** submenu of the **CONFIGURE DEVICE** menu), the MFP continues printing without interaction until the cartridge reaches the end of drum life. HP does not guarantee print quality after the **REPLACE CARTRIDGE** message first appears. Replace the print cartridge as soon as possible. (See Ordering parts, accessories, and supplies.) The **REPLACE CARTRIDGE** message remains until you replace the print cartridge. If **CARTRIDGE OUT** is set to **STOP**, the MFP stops printing until you replace the print cartridge or resume printing by configuring the MFP to continue: In the **CONFIGURE DEVICE** menu, under **SYSTEM SETUP**, set **CARTRIDGE OUT** to **CONTINUE**.

■ **When the drum life of the print cartridge is out**. You must replace the print cartridge to continue printing. No override is possible, even if toner remains in the cartridge. (See Ordering parts, accessories, and supplies.) This situation occurs to protect the MFP.

Setting the real-time clock

Use the real-time clock feature to set the date and time settings. The date and time information is attached to stored print, fax, and digital-send jobs, so you can identify the most recent versions of stored print jobs. You can also set the MFP to automatically warm up and prepare for use at a set time each day.

Setting the date and time

When setting the date and time you can set the date format, date, time format, and time.

To set the date format

1   Press MENU.

2   Scroll to and touch **CONFIGURE DEVICE**.

3   Scroll to and touch **SYSTEM SETUP**.

4   Touch **DATE/TIME**.

5   Touch **DATE FORMAT**.

6   Touch the appropriate format. The settings are saved and the control panel returns to the **DATE/TIME** submenu.

7   Touch **EXIT** to exit the menu.

To set the date

1   Press MENU.

2   Scroll to and touch **CONFIGURE DEVICE**.

3   Scroll to and touch **SYSTEM SETUP**.

4   Touch **DATE/TIME**.

5   Touch **DATE**.

6   Touch the appropriate options to set the correct month, date of the month, and the year.

> **NOTE**   The order of modifying the month, date of the month, and year depends upon the date-format setting.

7   The settings are saved and the control panel returns to the **DATE/TIME** submenu.

8   Touch **EXIT** to exit the menu.

To set the time format

1   Press MENU.

2   Scroll to and touch **CONFIGURE DEVICE**.

3   Scroll to and touch **SYSTEM SETUP**.

4 Touch **DATE/TIME**.

5 Touch **TIME FORMAT**.

6 Touch the appropriate format. The settings are saved and the control panel returns to the **DATE/TIME** submenu.

7 Touch **EXIT** to exit the menu.

To set the time

1 Press MENU.

2 Scroll to and touch **CONFIGURE DEVICE**.

3 Scroll to and touch **SYSTEM SETUP**.

4 Touch **DATE/TIME**.

5 Touch **TIME**.

6 Touch the appropriate options to set the correct hour, minute, and AM/PM setting.

> **NOTE** The order of modifying the hour, minute, and AM/PM setting depends upon the time-format setting.

7 The settings are saved and the control panel returns to the **DATE/TIME** submenu.

8 Touch **EXIT** to exit the menu.

Setting the wake time

Use the wake time feature to wake the MFP at a set time each day. If a wake time is set, use an extended sleep-delay period. See Setting the sleep delay.

To set the wake time

1 Press MENU.

2 Scroll to and touch **CONFIGURE DEVICE**.

3 Scroll to and touch **SYSTEM SETUP**.

4 Touch **WAKE TIME**.

5 Touch the day of the week for which you want to set the wake time.

6 Touch **CUSTOM**.

7 Touch the appropriate options to set the correct hour, minute, and AM/PM setting.

8 If you want to wake the MFP at the same time each day, on the **APPLY TO ALL DAYS** screen, touch **YES**.

-or-

If you want to set the time for individual days, touch **NO**, and repeat the procedure for each day.

9   The settings are saved and the control panel returns to the **WAKE TIME** submenu.

10   Touch **EXIT** to exit the menu.

Setting the sleep delay

Use the sleep-delay feature to set the period of time that the MFP must be idle before it enters the sleep mode.

NOTE   If the sleep-delay feature is turned off in the **RESETS** menu, the MFP never enters the sleep mode. Selecting a sleep-delay value automatically turns the sleep feature on. The default value for the sleep-delay setting is 60 minutes.

To set the sleep delay

1   Press MENU.

2   Scroll to and touch **CONFIGURE DEVICE**.

3   Scroll to and touch **SYSTEM SETUP**.

4   Touch **SLEEP DELAY**.

5   Scroll to and touch the sleep-delay setting that you want.

6   The settings are saved and the control panel returns to the **SYSTEM SETUP** submenu.

7   Touch **EXIT** to exit the menu.

Configuring and verifying an IP address

You can use either of two options to assign and configure TCP/IP addresses on an HP Jetdirect print server:

- HP Web Jetadmin

- Embedded Web server

TCP/IP assignment

The system administrator or primary user is responsible for determining the TCP/IP address for a specific print server. If you are unsure what the TCP/IP address should be or if you are unfamiliar with using TCP/IP on a network, go to the HP Web site at www.hp.com. Click **Search** in the upper-left corner of the Web page and search for **TCP/IP Overview**.

Automatic discovery

The product is equipped with an HP Jetdirect embedded print server. If a BootP or DHCP server is available during product installation, the print server is automatically assigned an IP address for use on the network. This occurs because the print server defaults to 192.0.0.192 (Legacy default) or to 159.254.x.x (Auto IP) if the print server cannot obtain an IP address over the network from a BootP or DHCP server. The default that is assigned depends on the particular network (small/private or enterprise) by using sensing algorithms.

To determine the new IP address, print a configuration page and check the TCP/IP status and address.

Dynamic host configuration protocol (DHCP)

When the product is turned on, the HP Jetdirect print server broadcasts DHCP requests. The DHCP automatically downloads an IP address from a network server. The DHCP servers maintain a fixed set of IP addresses and only loan an IP address to the print server. Consult your operating system documentation to set up a DHCP service on your network.

Verifying the TCP/IP configuration

Print a configuration page at the control panel. Check the TCP/IP status and the TCP/IP addresses. If the information is incorrect, check your hardware connections (cables, hubs, routers, or switches).

Changing an IP address

Use the following procedures if you need to change the product TCP/IP address.

To change an IP address by using HP Web Jetadmin

Open HP Web Jetadmin. Type the TCP/IP address in the **Quick Device Search** field and click **Go**. At the top menu bar, follow this procedure for discovery options.

1   In the drop-down menu, click **Devices**.

2   In the drop-down menu, click **New Devices**. Click **Go**.

3   Click the column header of your choice (such as IP Address or Device Model) to arrange the list of available devices in ascending or descending order.

4   Highlight the product to configure, and click **Open Device**.

5   From the sub-menu at the top of the HP Web Jetadmin screen, click **Configuration**.

6   Click the network link located on the left side of the configuration screen.

7   Type the new IP information. You might need to scroll down for more options.

8   Click **Apply** to save the settings.

9   Click the **Refresh** button located next to the question mark on the right side of the screen.

10 Verify the IP information by clicking **Status Diagnostics** or by printing a configuration page.

To change an IP address by using the embedded Web server

The MFP has an embedded Web server that can be used to modify the TCP/IP parameters. In order to use the embedded Web server, the HP Jetdirect print server must have an IP address already configured. On a network, this is done automatically during initial product installation.

1   In a supported Web browser, type the current IP address of the HP Jetdirect print server as the URL. The **Device Status** page of the embedded Web server appears.

2   Click **Networking**. From this page, you can modify the MFP network configuration.

To change an IP address by using the control panel

You can manually configure or verify the IP address by using the control panel.

1   Press MENU.

2   Touch **CONFIGURE DEVICE**.

3   Touch **I/O**.

4   Touch **EMBEDDED JETDIRECT MENU** or **EIO JETDIRECT MENU**, depending on which type of network connection you are using.

5   Touch **TCP/IP**.

6   Touch **CONFIG METHOD**, and touch **MANUAL**.

7   Touch **MANUAL SETTINGS**

8   Touch **IP ADDRESS**

9   Touch the left arrow or the right arrow to highlight each segment of the IP address.

10 Use the numeric keypad to type the digits in each segment of the IP address.

11 Touch **OK** to save the IP address.

Upgrading the firmware

The MFP has remote firmware update (RFU) capability. Use the information in this section to upgrade the MFP firmware. The overall process involves the following steps:

1 Determine the current level of firmware that is installed on the MFP.

2 Go to the HP Web site and find out whether a firmware update is available. If an update is available, download the latest firmware to your computer.

3 Transfer the new firmware from your computer to the MFP.

Determining the current level of firmware

To determine the current level of firmware, view the configuration information on the MFP control panel. To view the configuration information, follow these instructions.

1 Press MENU.

2 Touch **INFORMATION**.

3 Touch **PRINT CONFIGURATION**. The configuration page prints.

4 The firmware datecode is listed in the section called **Device Information**. The firmware datecode has this format: YYYYMMDD XX.XXX.X. The first string of numbers is the date, where YYYY represents the year, MM represents the month, and DD represents the date. For example, a firmware datecode of that begins with `20040225` represents February 25, 2004.

Downloading the new firmware from the HP Web site

To find the most recent firmware upgrade for the MFP, go to www.hp.com/go/lj4345mfp_software. This page provides instructions for downloading the new firmware version.

Transferring the new firmware to the MFP

Use one of the following methods to update the firmware.

Using FTP to upgrade the firmware on a network connection

> **NOTE** The MFP can receive an .RFU file update as long as it is in a "ready" state.

The elapsed time for an update depends on the I/O transfer time, as well as the time that it takes for the MFP to reinitialize. The I/O transfer time depends on a number of things, including the speed of the host computer that is sending the update. If the remote firmware update process is interrupted before the firmware is downloaded (while **Receiving Upgrade** appears on the control-panel display), the firmware file must be sent again. If power is lost during the flash DIMM update (while the **Performing Upgrade** message appears on the control-panel display), the update is interrupted and the message **Resend Upgrade** appears (in English only) on the control-panel display. In this case, you must send the upgrade by using the parallel port. Finally, any jobs that are ahead of the RFU job in the queue are completed before the update is processed.

Follow these instructions to perform the upgrade by using FTP.

To upgrade the firmware on a network connection by using FTP

1   Take note of the IP address on the HP Jetdirect page. The HP Jetdirect page is the second page that prints when you print the configuration page.

> **NOTE**   Before upgrading the firmware, make sure that the MFP is not in Sleep mode. Also make sure that any error messages are cleared from the control-panel display.

2   Open an MS-DOS command prompt on your computer.

3   Type: `ftp <TCP/IP ADDRESS>`. For example, if the TCP/IP address is 192.168.0.90, type `ftp 192.168.0.90`.

4   Press Enter on the keyboard.

5   When prompted for the user name, press Enter.

6   When prompted for the password, press Enter.

7   Type `bin` at the command prompt.

8   Press Enter. The message **200 Types set to I, Using binary mode to transfer files** appears in the command window.

9   Type `put <filename>` where <filename> is the name of the .RFU file that was downloaded from the Web, including the path. For example, type `put C:\LJ\4345FW.RFU`, and then press Enter.

> **NOTE**   If the file name or path includes a space, you must enclose the file name or path in quotation marks. For example, type `put "C:\MY DOCUMENTS\LJ\4345FW.RFU"`

The following series of messages appears in the command window:

- **200 PORT command successful**

- **150 Opening BINARY mode data connection**

- **226 Ready**

- **226 Processing Job**

- **226 Transfer complete**

Then, a message that contains the transfer-speed information appears.

10   The download process begins and the firmware is updated on the MFP. This can take approximately five minutes. Let the process finish without further interaction with the MFP or computer.

> **NOTE**   The MFP automatically turns off and then on again after processing the upgrade.

11   At the command prompt, type: `bye` to exit the ftp command.

12   At the command prompt, type: `exit` to return to the Windows interface.

Using HP Web Jetadmin to upgrade the firmware

This procedure requires that you install HP Web Jetadmin Version 7.0 or later on the computer. See Using HP Web Jetadmin software. Complete the following steps to update a single device through HP Web Jetadmin after downloading the .RFU file from the HP Web site.

1   Start HP Web Jetadmin.

2   Open the **Device Management** folder in the drop-down list in the **Navigation** panel. Navigate to the **Device Lists** folder.

3   Expand the **Device Lists** folder and select **All Devices**. Locate the MFP in the list of devices, and then click to select it.

   If you need to upgrade the firmware for multiple HP LaserJet 4345mfps, select all of them by pressing the Ctrl key as you click the name of each MFP.

4   Locate the drop-down box for **Device Tools** in the upper-right corner of the window. Select **Update Printer Firmware** from the action list.

5   If the name of the .RFU file is not listed in the **All Available Images** box, click **Browse** in the **Upload New Firmware Image** dialog box and navigate to the location of the .RFU file that you downloaded from the Web at the start of this procedure. If the filename is listed, select it.

6   Click **Upload** to move the .RFU file from your hard drive to the HP Web Jetadmin server. After the upload is complete, the browser window refreshes.

7   Select the .RFU file from the **Printer Firmware Update** drop-down menu.

8   Click **Update Firmware**. HP Web Jetadmin sends the selected .RFU file to the MFP. The control panel shows messages that indicate the progress of the upgrade. At the end of the upgrade process, the control panel shows the **Ready** message.

Using MS-DOS commands to upgrade the firmware

To update the firmware by using a network connection, follow these instructions.

1   From a command prompt or in an MS-DOS window, type the following: `copy /B <FILENAME> \\<COMPUTERNAME>\<SHARENAME>`, where <FILENAME> is the name of the .RFU file (including the path), <COMPUTERNAME> is the name of the computer from which the MFP is being shared, and <SHARENAME> is the MFP share name. For example: `C:\>copy /b C:\9200fW.RFU \\YOUR_SERVER\YOUR_COMPUTER`.

   NOTE   If the file name or path includes a space, you must enclose the file name or path in quotation marks. For example, type: `C:\>copy /b "C:\MY DOCUMENTS \3500FW.RFU" \\YOUR_SERVER\YOUR_COMPUTER`.

2   Press Enter on the keyboard. The control panel shows a message that indicates the progress of the firmware upgrade. At the end of the upgrade process, the control panel shows the **Ready** message . The message **1 file(s) copied** appears on the computer screen.

Upgrading the HP Jetdirect firmware

The HP Jetdirect network interface in the MFP has firmware that can be upgraded separately from the MFP firmware. This procedure requires that you install HP Web Jetadmin Version 7.0 or later on the computer. See Using HP Web Jetadmin software. Complete the following steps to update the HP Jetdirect firmware by using HP Web Jetadmin.

1   Open the HP Web Jetadmin program.

2   Open the **Device Management** folder in the drop-down list in the **Navigation** panel. Navigate to the **Device Lists** folder.

3   Select the device that you want to update.

4   In the **Device Tools** drop-down list, select **Jetdirect Firmware Update**.

5   Under **Jetdirect firmware version** the HP Jetdirect model number and current firmware version are listed. Make a note of these.

6   Go to www.hp.com/go/wja_firmware.

7   Scroll down to the list of HP Jetdirect model numbers and find the model number you wrote down.

8   Look at the current firmware version for the model, and see if it is later than the version you wrote down. If it is, right-click on the firmware link, and follow the instructions on the Web page to download the new firmware file. The file must be saved into the <drive>:\PROGRAM FILES\HP WEB JETADMIN\DOC\PLUGINS\HPWJA\FIRMWARE\JETDIRECT folder on the computer that is running the HP Web Jetadmin software.

9   In HP Web Jetadmin, return to the main device list and select the digital sender again.

10   In the **Device Tools** drop-down list, select **Jetdirect Firmware Update** again.

11   On the HP Jetdirect firmware page, the new firmware version is listed under **Jetdirect Firmware Available on HP Web Jetadmin**. Click the **Update Firmware Now** button to update the Jetdirect firmware.

5   Theory of operation

This chapter presents an overview of the relationships between major components in the MFP, and includes information about the following topics:

- Basic operation

- Formatter system

- Engine-control system

- Laser/scanner system

- Image-formation system

- Pickup, feed, and delivery system

- Scanner system

Basic operation

All high-level MFP processes are routed through the formatter, which stores font information, processes the print image, and communicates with the host computer.

The basic MFP operation can be divided into five systems:

■ The engine control system, which includes the power supply and dc controller PCA

■ The laser/scanner system, which forms the latent image on a photosensitive drum

■ The image formation system, which transfers a toner image onto the print media

■ The pickup and feed system, which consists of various rollers and transports the media through the MFP

■ The scanner system, which scans data and sends it to the formatter for copying or for sending to e-mail

Sequence of operation (printer)

A microprocessor on the dc controller PCA controls the operating sequence. The tables in this section describe the basic operating sequence from when the MFP power is turned on until the final printed page is delivered to an output bin. For information about the timing of the basic operating sequence, see General timing chart.

Period (sequence)	Description
Waiting	The period of time from when the MFP power is turned on until the main motor or drum motor begins to rotate. During this time the transfer roller is cleaned and the microprocessor on the dc controller PCA checks to determine if a print cartridge is installed in the MFP.
Standby	The period of time from the end of the waiting sequence or from the end of the last rotation until a print command is received from the host computer or until the MFP power is turned off. The message **Ready** appears on the control-panel display.
Initial rotation	The period of time when the photosensitive drum is stabilized to prepare for printing.
Print	The period of time from the initial rotation until the positive bias on the transfer-charging roller is turned off.
Last rotation	The period of time from the completion of the print job until the main motor or drum motor stops. The final page of the job is delivered to an output bin and the transfer roller is cleaned. If another print job is immediately detected (sent by the host computer), then the MFP returns to the initial rotation period. If no print jobs are waiting, then the MFP returns to the standby period.

Sequence of operation (scanner)

Period (sequence)	Description
Power on	During this time, the scanner motors rotate, the MFP checks the status of all the sensors, the scanner lamp is illuminated, the optical scan head moves from its home position, the scanner calibrates, and then the optical scan head returns to its home position.
Initialization	The period of time after the initial power-on sequence and before the MFP is ready to scan or copy. During this time, the scanner and ADF initialization is completed, scanner calibration is performed, and the ADF checks for media in the input tray.
Standby	The period of time from the end of the initialization sequence until a request for a scan. During this time, the MFP might go into Sleep mode and the scan carriage rests in its home position.
Scan	The period of time immediately following a request for a scan. The scanner fan turns on, the scan start position is adjusted, the MFP performs the scan, and data is sent to the formatter.

Formatter system

The formatter is responsible for the following procedures:

- Controlling Sleep mode

- Receiving and processing print data from the various MFP interfaces

- Monitoring control-panel functions and relaying MFP-status information (through the control panel and the network or the bidirectional interface)

- Developing and coordinating data placement and timing with the dc controller PCA

- Storing font information

- Communicating with the host computer through the network or the bidirectional interface

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

The formatter also provides the electrical interface and mounting locations for one EIO card, three memory DIMMs, two additional flash memory cards (one slot is reserved for the firmware), the hard-disk accessory, and the optional analog fax accessory.

Sleep mode

This feature conserves power after the MFP has been idle for an adjustable period of time. When the MFP is in Sleep mode, the control-panel backlight is turned off, but the MFP retains all settings, downloaded fonts, and macros. The default setting is for Sleep mode to be enabled, and the MFP enters the Sleep mode after a 90-minute idle time. Sleep mode can also be turned off from the **RESET** menu on the control panel.

The MFP exits Sleep mode and enters the warm-up cycle when any of the following events occurs:

- A print job, valid data, or a PML or PJL command is received

- A control-panel button is pressed or you touch the touchscreen

- The top cover is opened

- A paper tray is opened

- The engine-test switch is pressed

NOTE   MFP error messages override the Sleep message. The MFP enters Sleep mode at the appropriate time, but the error message continues to appear.

Resolution Enhancement technology (REt)

The formatter contains circuitry for Resolution Enhancement technology (REt), which modifies the standard video dot data on its way to the dc controller PCA to produce "smoothed" line edges. The REt can be turned on or off from the control panel or from some software programs. The default setting is medium.

> 📝 **NOTE** The REt settings that are sent from software programs or printer drivers override the control-panel settings.

EconoMode

The EconoMode setting uses up to 50% less toner than standard mode printing by reducing the dot density. However, using EconoMode does not extend the life of print-cartridge components. EconoMode, which can be thought of as "draft mode," can be selected from the control panel (**PRINT QUALITY** menu) and through some software programs and printer drivers. The default setting is OFF.

> ⚠️ **CAUTION** 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 print cartridge.

> 📝 **NOTE** EconoMode does not affect print speed or memory usage, or extend the life of the print cartridge.

Input/output

The MFP receives print data primarily from the embedded HP Jetdirect print server. The MFP also has an IEEE 1284B-compliant parallel interface for connecting directly to a computer.

CPU

The formatter incorporates a 533 MHz RISC processor.

Memory

The formatter system contains the MFP memory, which is divided into several components. This section describes each memory component.

> 📝 **NOTE** If the MFP encounters a problem when managing available memory, a clearable warning message appears on the control panel.

Hard disk

The MFP comes standard with a hard disk that has a capacity of greater than 20 GB. The hard disk can permanently store fonts and forms. It can also be used for making multiple original prints and for job-storage features.

Random-access memory

The random-access memory (RAM) contains the page, I/O buffers, and the font storage area. It stores printing and font information 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. Memory capacity can be increased by adding up to two DIMMs to the formatter. Note that adding memory (DIMMs) might also increase the print speed for complex graphics.

DIMM slots

The DIMM slots can be used to add memory or fonts.

Flash memory

Two flash memory slots are available for storing forms, fonts, and signatures.

Firmware flash memory card

The firmware is contained on a flash memory card on the formatter. *Do not remove this flash memory card.* A remote firmware upgrade process is available, which overwrites the firmware on the flash memory card.

Nonvolatile memory

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

HP Memory Enhancement technology

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

NOTE   The MEt is available only in PCL mode; it is not functional when printing in PS mode.

PJL overview

The printer job language (PJL) is an integral part of configuration, in addition to the standard printer command language (PCL). With standard cabling, the MFP can use PJL to perform a variety of functions, such as these:

■   Two-way communication with the host computer through a network connection or a bidirectional parallel connection. The MFP can inform the host about such things as the control-panel settings, and the control-panel settings can be changed from the host.

■   Dynamic I/O switching. The MFP uses this switching to be configured with a host on each I/O. The MFP can receive data from more than one I/O simultaneously, until the I/O buffer is full. This can occur even when the MFP is offline.

■   Context-sensitive switching. The MFP can automatically recognize the personality (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 MFP in landscape mode, the subsequent print jobs print in landscape only if they are formatted for landscape printing.

PML

The printer management language (PML) allows remote configuration and status readback through the I/O ports.

Control panel

The formatter sends and receives MFP status and command data to and from a control-panel PCA.

Scanner interface

The formatter receives data from the scanner to produce copies and to send scanned data in e-mail format.

Engine-control system

The control system consists of three PCAs: the power supply PCA, the power-factor correction PCA, and the dc controller PCA. This system controls the laser/scanner, image-formation, and pickup-and-feed systems. The microprocessor on the dc controller PCA controls the operating sequence of the printer.

DC controller PCA

The dc controller PCA controls the operation of the MFP and its components. The dc controller PCA starts the MFP operation when the MFP power is turned on and the power supply sends dc voltage to the dc controller PCA. After the MFP enters the standby sequence, the dc controller PCA sends out various signals to operate motors, solenoids, and other printer components based on the print command and image data that the host computer sends. For a description of dc controller PCA connectors, see DC controller connections. Figure 5-1 DC controller PCA block diagram illustrates the dc controller function.
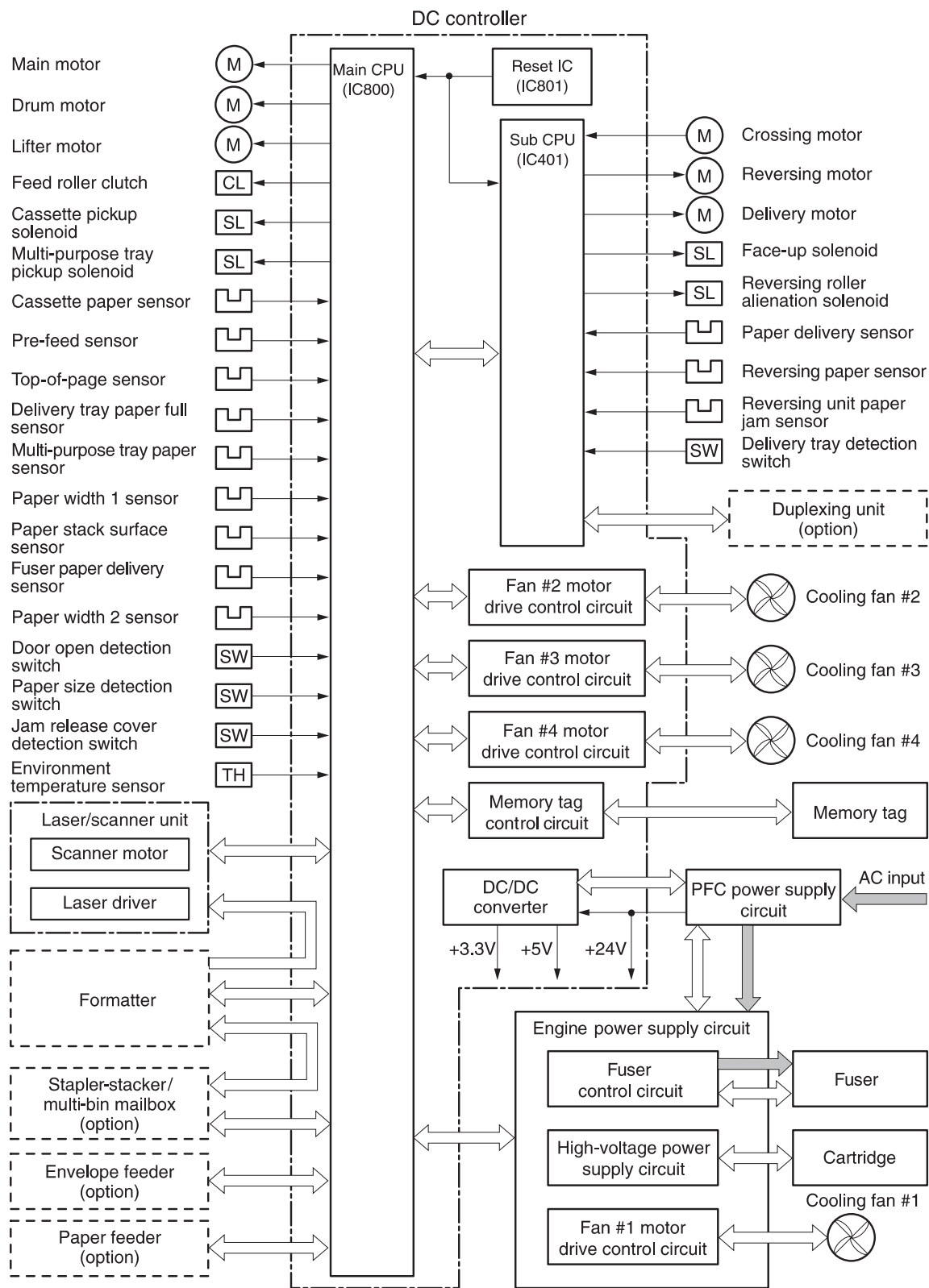
Figure 5-1 DC controller PCA block diagram

Motors and fans

The MFP print engine has 10 motors: two brushless dc motors, one dc motor that has brushes, four fan motors, and three stepping motors. The MFP print engine also has four cooling fans. Table 5-1 Print-engine motors describes the function of each motor, and Table 5-2 Print-engine fans describes the function of each fan.

Motor and fan functions

Table 5-1 Print-engine motors

Name	Purpose	Type	Rotation	Speed	Failure detection
Main motor (M101)	Drives the following rollers: tray 2 pickup, feed, separation, tray 1 pickup, pre-transfer, pressure, and delivery	DC motor (brushless)	Clockwise	2-speed	Yes
Drum motor (M102)	Drives the transfer-charging roller, photosensitive drum, and developing cylinder	DC motor (brushless)	Clockwise	2-speed	Yes
Lifter motor (M103)	Moves the lifting plate	DC motor (with brushes)	Clockwise	1-speed	Yes
Crossing motor (M104)	Drives the crossing roller	Stepping motor	Clockwise	3-speed	No
			Counterclockwise	2-speed	
Reversing motor (M105)	Drives the reversing roller	Stepping motor	Clockwise	3-speed	No
			Counterclockwise	2-speed	
Delivery motor (M106)	Drives the intermediate delivery roller and the delivery roller	Stepping motor	Clockwise	4-speed	No

Table 5-2 Print-engine fans

Name	Purpose	Motor type	Motor rotation	Motor speed	Failure detection
Cooling fan 1 (FN101)	Cools the interior of the print engine	DC motor		2-speed	Yes
Cooling fan 2 (FN102)	Cools the print-cartridge area	DC motor		1-speed	Yes
Cooling fan 3 (FN103)	Cools the reversing-unit area	DC motor		1-speed	Yes
Cooling fan 4 (FN104)	Cools the dc controller	DC motor		1-speed	Yes

Ambient-temperature detection

The MFP contains a sensor that measures the air temperature of the surrounding environment. The MFP automatically adjusts the temperature settings in the fuser to adjust for changes in the ambient temperature.

Engine power supply circuit

The engine power supply consists of the fuser-control circuit, the high-voltage circuit, and the low-voltage circuit. The fuser-control and high-voltage circuits control the temperature of the fuser and generate high-voltage according to signals from the dc controller PCA. The low-voltage circuit generates the dc voltages that other components in the MFP use (for example the dc controller PCA, the motors, and fans).
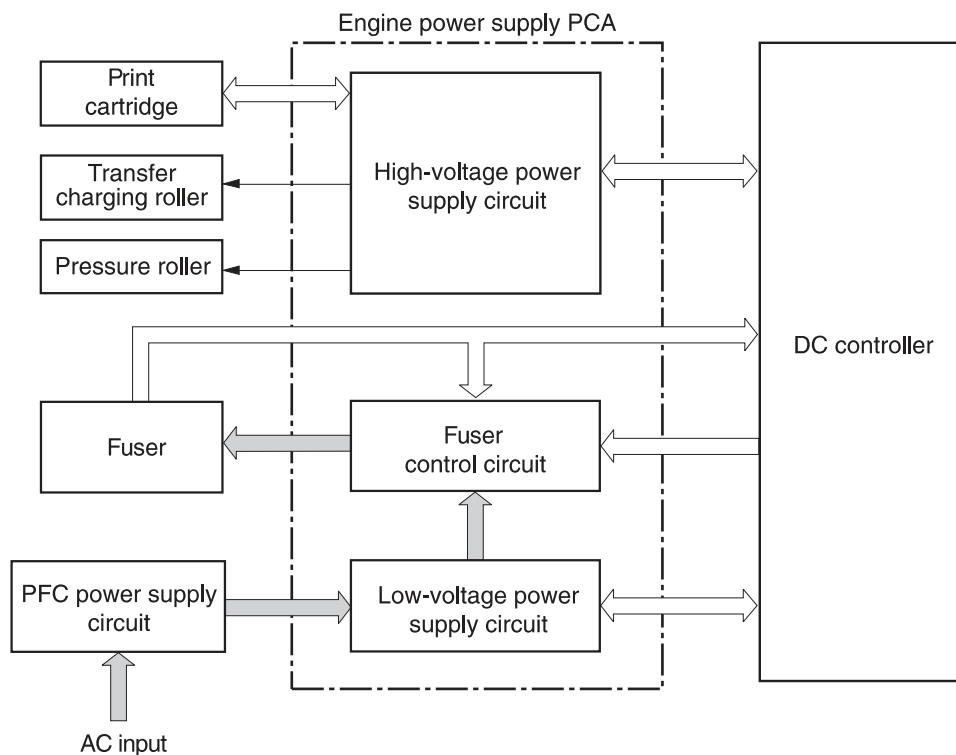
Figure 5-2 Power supply circuit block diagram

Fuser control

The fuser-control circuit controls the fuser components. The two fuser heaters provide the high temperatures that permanently bond the toner to the media. The fuser thermistor monitors the fuser temperatures. The thermal switch detects abnormally high fuser temperatures and interrupts the supply of voltage to the fuser if the temperature is determined to be too high.
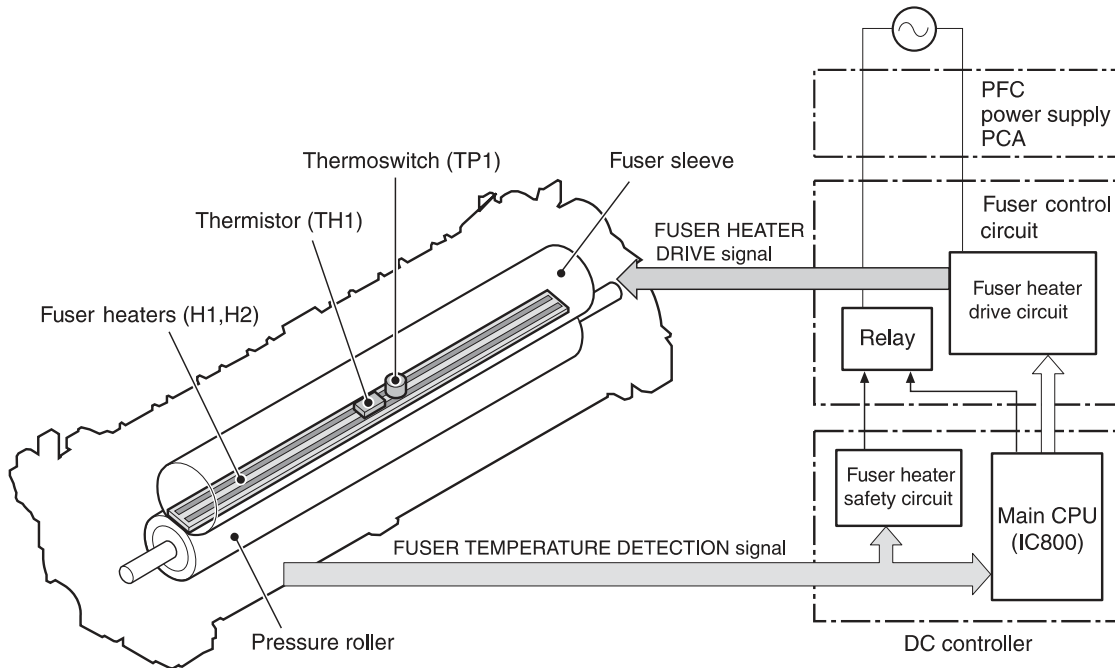
Figure 5-3 Fuser components

The fusing-heater safety circuit is located on the power supply and constantly monitors the fusing temperature. The fusing heater adjusts the temperature of the fuser as required by the stage in the printing process.

■ **Start-up temperature control**: The thermistor on the fuser heater has two different modes depending on the temperature of the fuser when a print job is sent. If the fuser temperature is below 85ºC (185ºF), the fuser continues to heat until it reaches a temperature of 100ºC (212ºF), and then the main motor actuates. If the fuser temperature is 85ºC (185ºF) or higher at the beginning of a print job, the main motor is actuated immediately.

■ **Print temperature control**: The fuser temperature is maintained at a target temperature throughout a print job. This target temperature varies depending on the type of media and the number of pages in the print job.

■ **Between-pages temperature control**: When printing on smaller-sized media, the fuser temperature is decreased between the pages to prevent an abrupt rise in temperature because of the larger gap between pages.

■ **Print-speed adjustment to control temperature**: For certain types of media and when printing several pages continuously, the interval between pages is increased to allow the fuser to maintain the temperature that is required for good fusing. If the fuser cools too much, the toner is not correctly fused to the media.

Fuser over-temperature protection

To protect the fuser from excessive temperatures, the MFP has the following three protective functions:

- The CPU monitors the voltage of the thermistor. If the fuser temperature reaches 240º C (464º F) or higher, the CPU turns off the relay (RL101) to interrupt the power to the fusing heater.

- If the temperature of the fusing heater continues to rise abnormally and the temperature of the thermistor (TH1) exceeds about 250ºC (482ºF), the relay 1 (RL101) opens up to cut off the power supply to the fusing heater.

- When the temperature of the heater exceeds about 250ºC (482ºF), the thermal switch (TP1) is turned off to cut off the power supply to the fusing heater. In the rare instance that this happens, the fuser must be replaced.

Figure 5-4 Fuser circuit illustrates the fuser circuit.
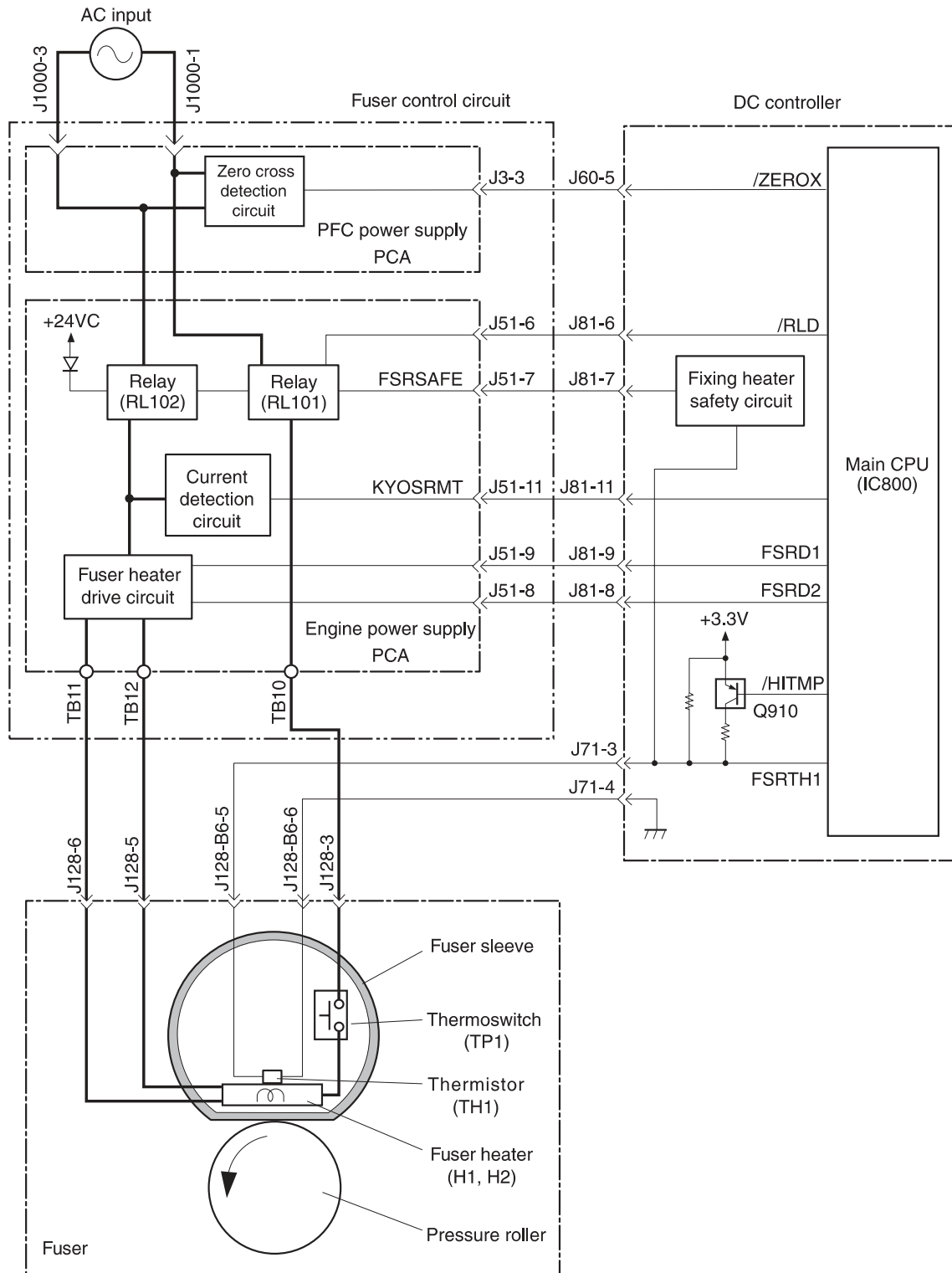
Figure 5-4 Fuser circuit

High-voltage power supply

The high-voltage circuit produces the voltage biases that are applied to the primary charging roller, the developing cylinder, the transfer charging roller, the fuser sleeve, and the pressure roller.
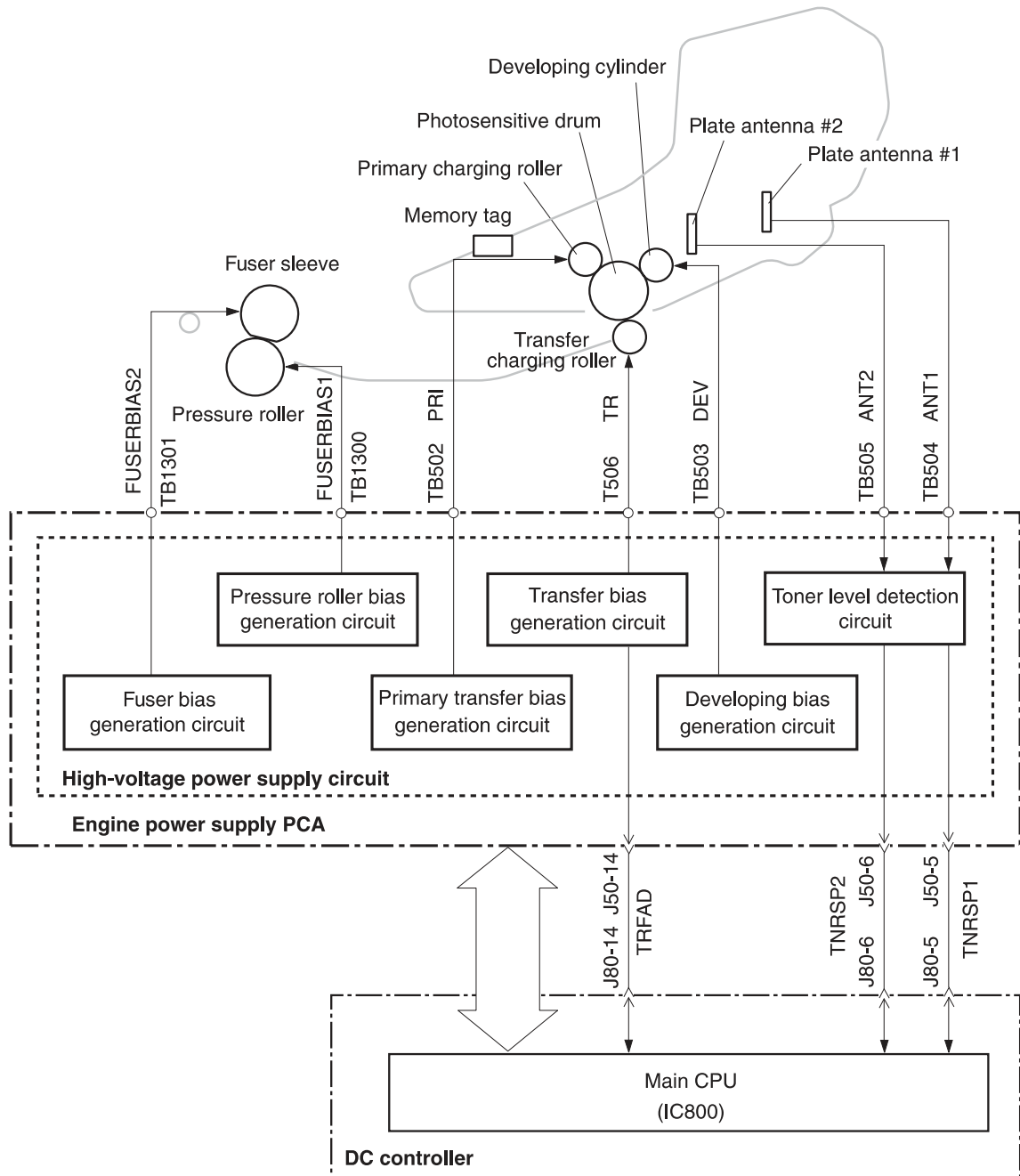
Figure 5-5 High-voltage power supply circuit

The primary charging voltage (bias) applies a uniform negative charge to the photosensitive drum in the print cartridge. Two types of primary charging bias are used: the primary charging dc negative voltage and the primary charging ac bias. The high-voltage circuit on the power supply generates both biases. These biases are superimposed on one another and then applied to the primary charging roller, which transfers the biases to the drum. The laser/scanner assembly generates the

electrostatic image on the primary charged photosensitive drum. See Image-formation system. The electrostatic image cannot be seen until toner is deposited on the drum.

The developing voltage (bias) causes the toner to adhere to the electrostatic image that the laser/scanner assembly created on the photosensitive drum. Two types of developing biases are used: the developing dc negative bias and the developing ac bias. The high-voltage circuit on the power supply generates both biases. These biases are superimposed on one another and then applied to the primary charging roller, which transfers the biases to the drum. The biased developing cylinder picks up toner particles and deposits them onto the electrostatic image on the photosensitive drum. The image is now visible on the drum.

The transfer voltage (bias) transfers the toner image on the photosensitive drum to the media. Two types of developing biases are used: the transfer dc positive bias and the dc negative bias. The high-voltage circuit on the power supply generates both biases. Transfer dc positive bias is applied to the transfer roller during the toner-transfer process. Transfer dc positive bias is applied to the transfer roller during the transfer-roller cleaning process. The dc positive bias attracts the toner to the media (this transfers the toner image on the photosensitive drum to the media). This bias is weakened between pages to prevent residual toner that is on the photosensitive drum from adhering to the transfer-charging roller when media is not present. The dc-negative bias is used to clean residual toner off of the transfer roller.

The fuser pressure-roller voltage (bias) prevents toner on the media from sticking to the fuser's pressure roller. The pressure-roller bias is dc-positive.

The fuser-sleeve voltage (bias) prevents toner on the media from sticking to the fuser sleeve. The fuser-sleeve bias is dc-negative.

Low-voltage power supply

The low-voltage circuit converts the ac power from the power source into the direct current voltage (Vdc) that the MFP components use. The low-voltage power supply circuit has three components:

- The **power-factor controller power supply** converts the ac voltage to dc voltage.

- The **engine power supply** generates the +24 Vdc that the high-voltage power supply requires.

- The **dc controller** generates the +5 Vdc that the laser/scanner and formatter require, and the +3.3 Vdc that the sensors and control-panel require.

Figure 5-6 Low-voltage power supply circuit illustrates the low-voltage power supply circuit.
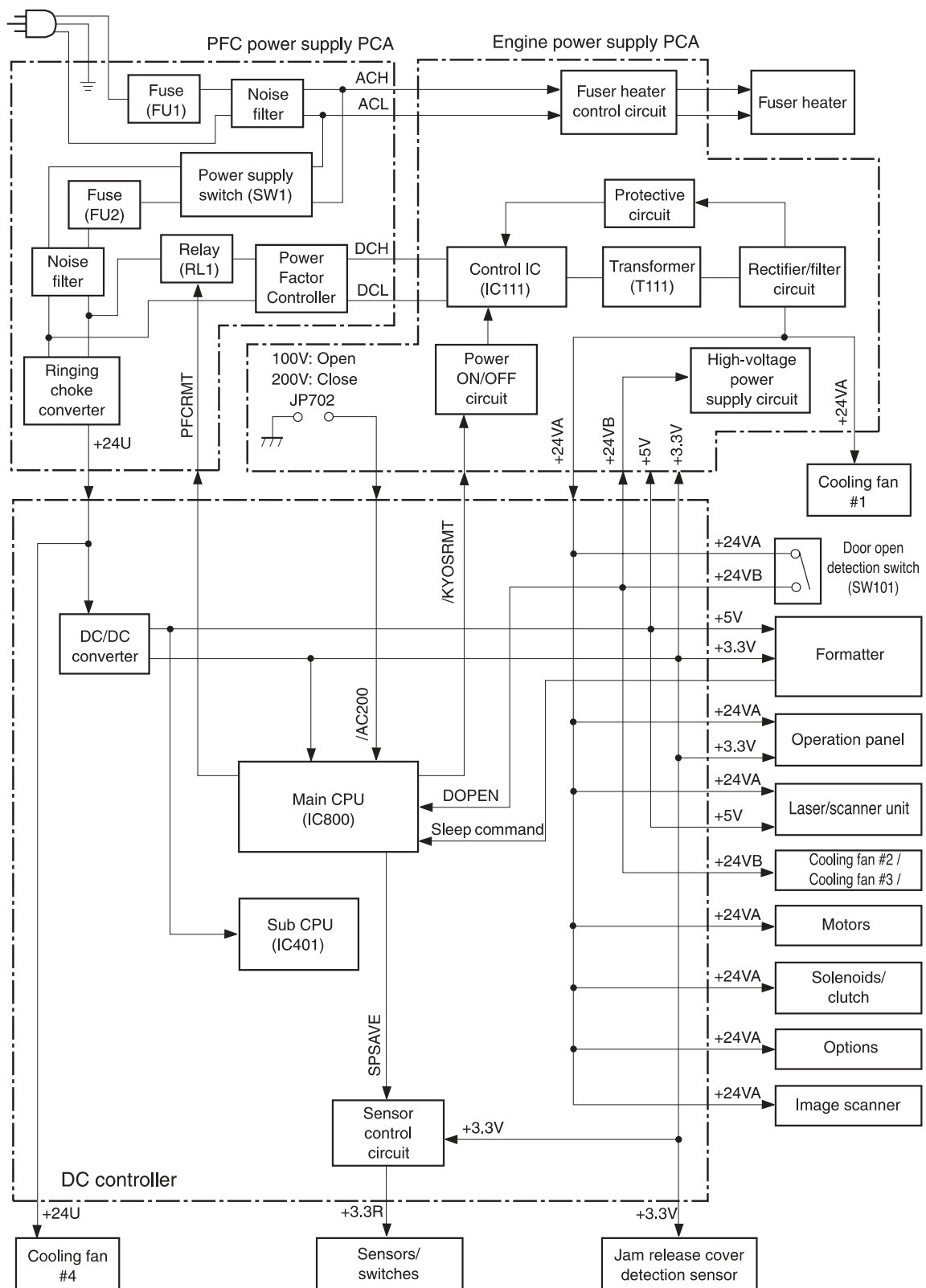
Figure 5-6 Low-voltage power supply circuit

Overcurrent/overvoltage protection

If a short-circuit or other problem on the load side causes an excessive current flow or generates abnormal voltage, the overcurrent/overvoltage protection systems automatically cut off the output voltage to protect the power supply circuit.

If the overcurrent or overvoltage protection system are activated and the power supply circuit does not generate dc voltage, it is necessary to turn the power off, correct the problem, and then turn the MFP on again.

The circuit has two fuses (FU1, FU2), which break and cut off the output voltage if overcurrent flows through the ac line.

Toner detection

To monitor the toner level, the MFP uses two plate antennas and a toner-level circuit in the high-voltage power supply circuit. The dc controller PCA detects the toner level and monitors the output signal of the toner-level circuit. The signal is fed back to the dc controller PCA from the antennas during the wait and standby operating periods. The dc controller PCA detects toner level from 1% to 100%. If the dc controller PCA detects a low toner level, a message appears on the control-panel display (see Resolving control-panel messages).

Cartridge detection

The dc controller PCA detects the presence of the cartridge by using information stored in plate antenna 2 and the print cartridge memory tag. The dc controller PCA detects the presence (or lack) of the print cartridge during the wait operating period.

Laser/scanner system

The laser/scanner produces the latent electrostatic image on the photosensitive drum in the print cartridge. The main components of the laser/scanner assembly are the laser driver PCA, the scanner motor, various mirrors, and the focusing lenses.
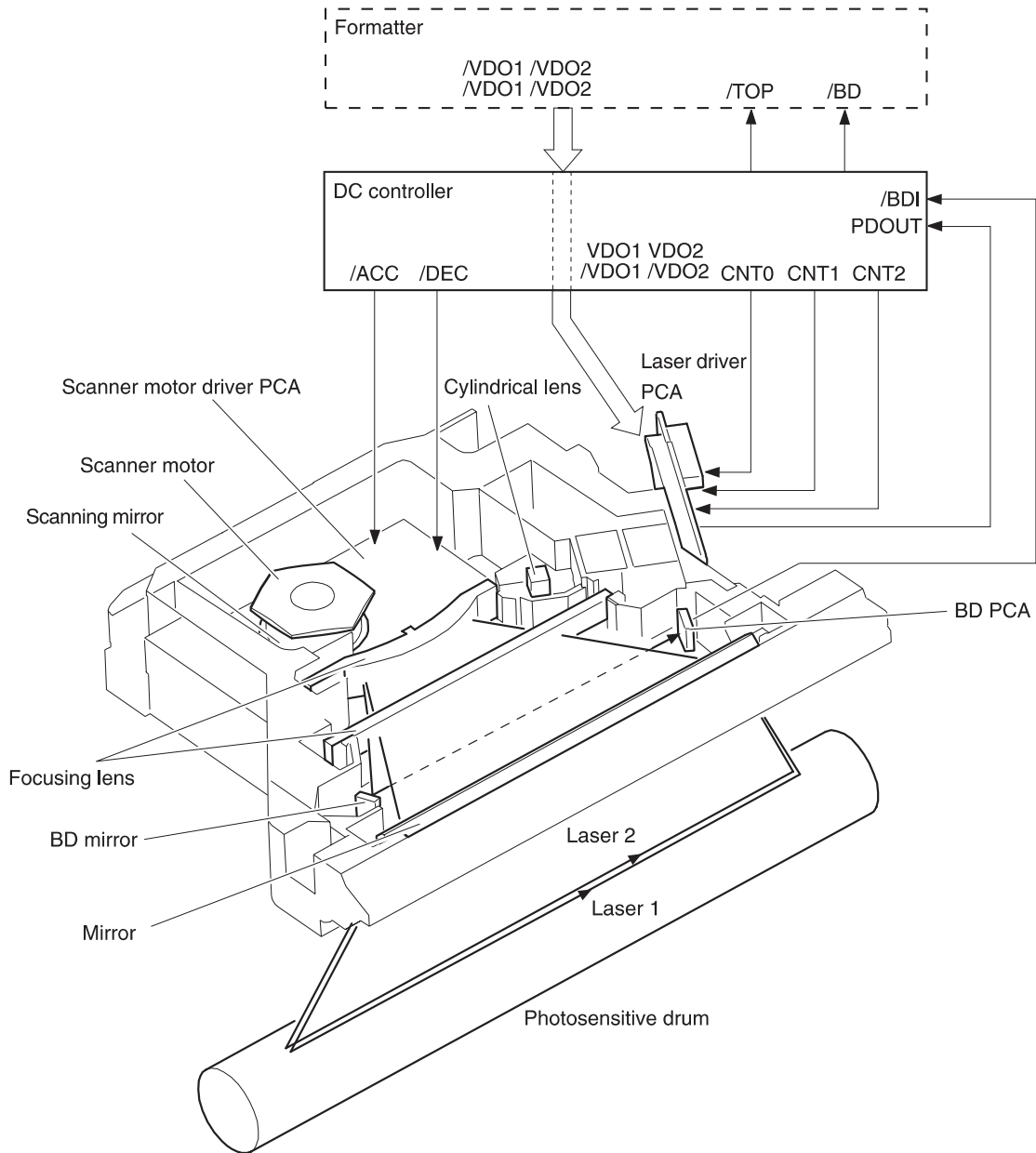
Figure 5-7 Laser/scanner assembly

The laser scanner uses two laser diodes to scan two lines simultaneously, producing high-speed laser scanning. After receiving the print command from the host computer, the dc controller PCA activates the scanner motor, which rotates the six-sided scanner mirror. The laser driver PCA emits light from the two laser diodes according to signals from the dc controller PCA. The two laser beams strike the six-sided scanning mirror and are directed through the focusing lenses and onto the

photosensitive drum. The modulated laser beams generate the latent electrostatic image on the photosensitive drum according to the image data signals that are received from the dc controller PCA.

Laser/scanner control

The laser/scanner-control circuit on the laser driver PCA turns the laser diodes on and off according to image-data signals that the dc controller PCA sends. The dc controller PCA sends image-data signals VD01/VD01,VD02, and /VD02 and the laser-control signals CNT0, CNT1, and CNT2 to the logic circuit on the laser driver PCA. The laser-control signals control laser emission, automatic power control (APC), horizontal-synchronization control, and image-mask control. Figure 5-8 Laser-control-circuit block diagram illustrates the laser-control system.
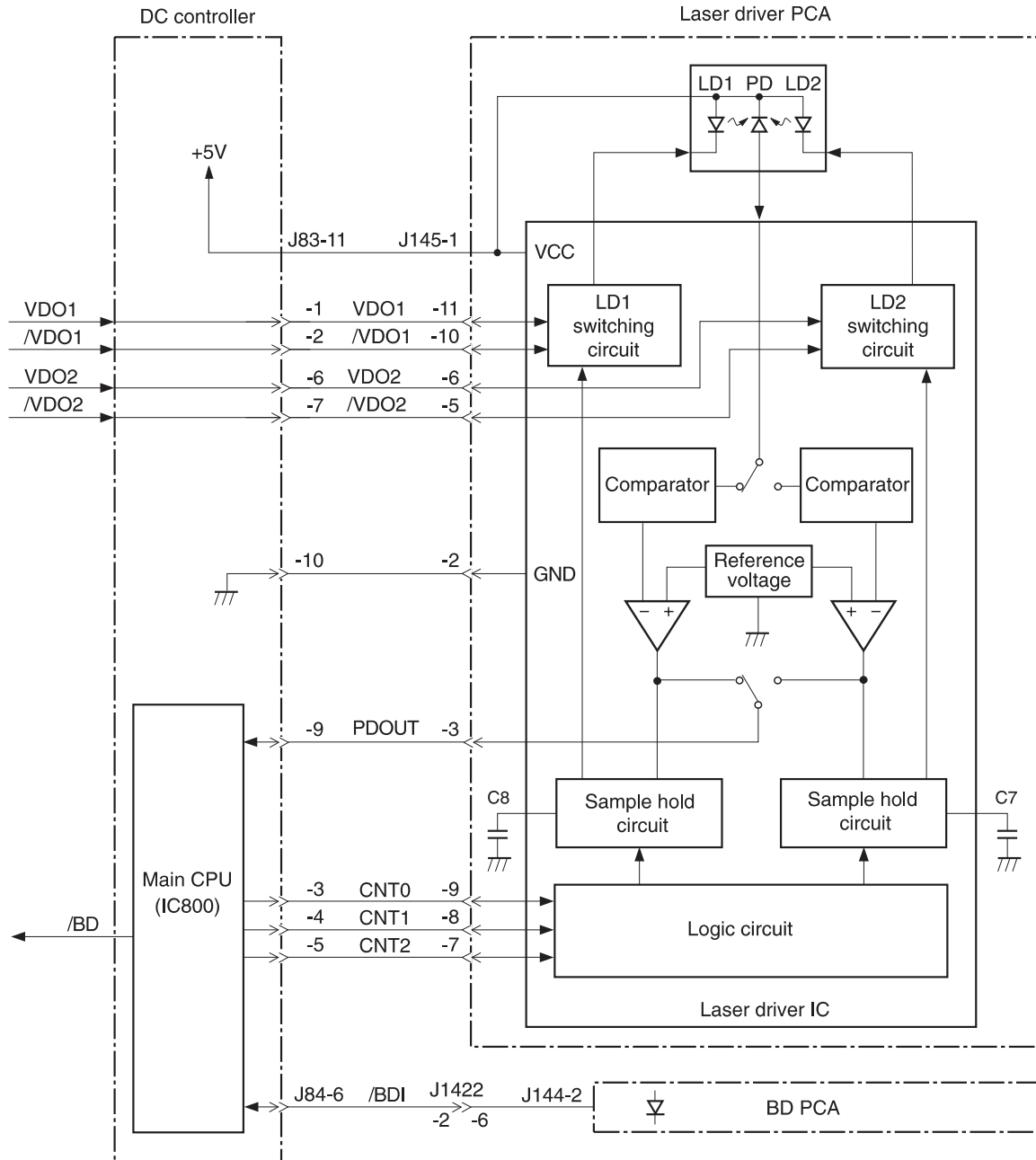
Figure 5-8 Laser-control-circuit block diagram

Laser-emission control simply turns the laser diodes on and off. Automatic power control limits the amount of light that the laser diodes emit. Horizontal-synchronization control determines the starting position for the horizontal direction of the image. Image-mask control prevents laser beams from striking the non-imaging areas of the drum, which is approximately 5 mm (0.2 inch) along the vertical edges and 8 mm (0.3 inch) at the top and bottom.

Image-formation system

The image-formation system consists of the print cartridge, transfer-charging roller, and fuser.

When the formatter sends a print command, the engine controller drives the main motor to rotate the photosensitive drum, primary-charging roller, developing cylinder, transfer-charging roller, and pressure roller.

The primary charging roller applies a uniform negative charge to the photosensitive drum surface. Laser beams, modulated by the signals from the formatter, focus on the photosensitive drum surface to form a latent image on the photosensitive drum.

The developing cylinder develops the latent image into a visible, toner-based image. The transfer-charging roller then transfers the toner onto media. Heat and pressure in the fuser bonds the toner to the print media in order to form a permanent image. The cleaning blade scrapes residual toner from the photosensitive drum, and the primary-charging roller applies a uniform negative charge to the photosensitive drum surface in preparation for the next latent image.
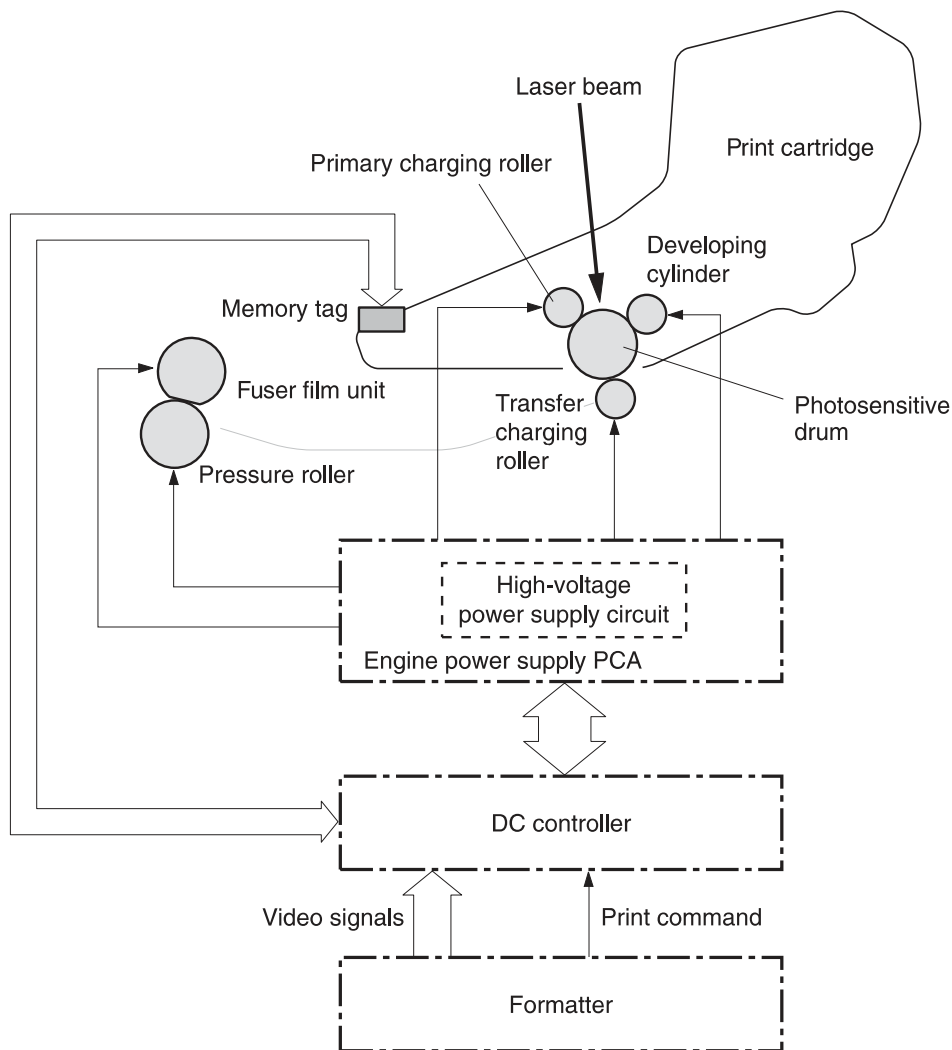
Figure 5-9 Image-formation system

Print cartridge

The print cartridge contains the primary-charging roller, photosensitive drum, and developing cylinder. The print cartridge has built-in memory that records the number of rotations and the toner level. This information is passed to the dc controller, which sends an alert when the remaining print-cartridge life reaches a low threshold.

Cartridge memory

The cartridge memory is EEPROM built into the cartridge, so that the MFP can detect the cartridge conditions.

The cartridge memory read/write is performed by the memory controller board through the antenna unit. The dc controller PCA reads the cartridge information and writes that information to the memory. The memory read/write process is implemented when the memory controller board receives a command from the dc controller PCA at the following timing.
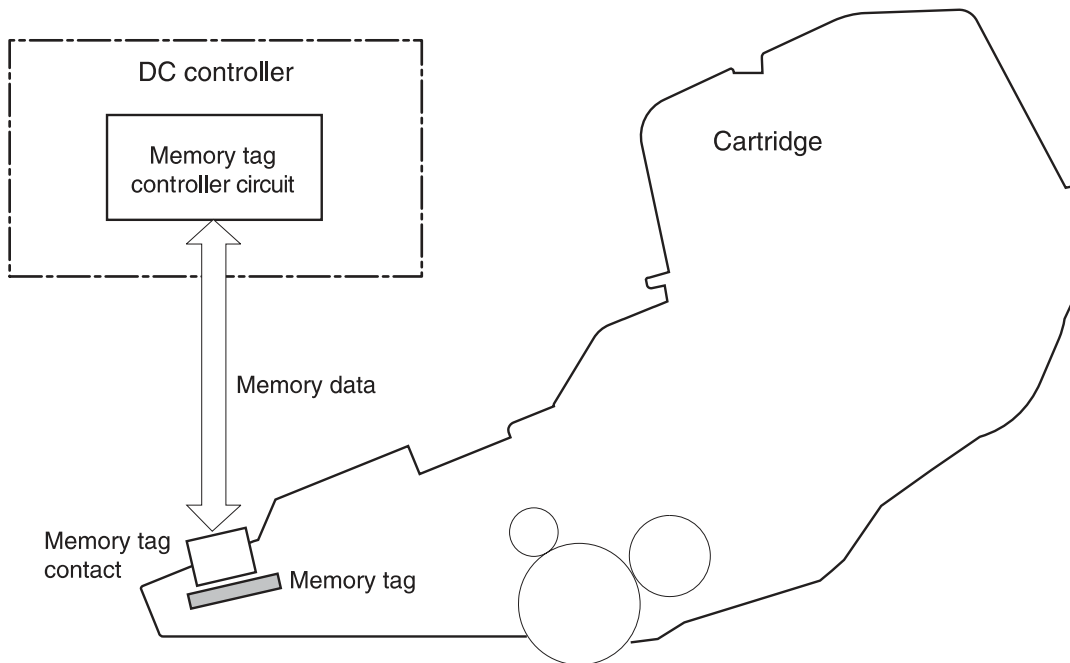
Figure 5-10 Cartridge memory

Reading timing

■ When the power is turned on

■ When the door is closed

■ When the dc controller PCA receives a command from the formatter

Writing timing

■ When printing is completed

■ When the dc controller PCA receives a command from the formatter

The memory data that the memory controller sends also contains the status of any error that has occurred during the read/write operation. When the error status is sent, the dc controller PCA makes up to four attempts to read the operation. If the error is not cleared after the operation, the dc controller PCA determines one of the following error conditions: sub-CPU failure, memory-data abnormality, or memory-access abnormality.

> **CAUTION**   Removing the print cartridge when the top cover interlock is overridden disables the cartridge memory.

Image-formation process

The image-formation process is divided into eight stages.
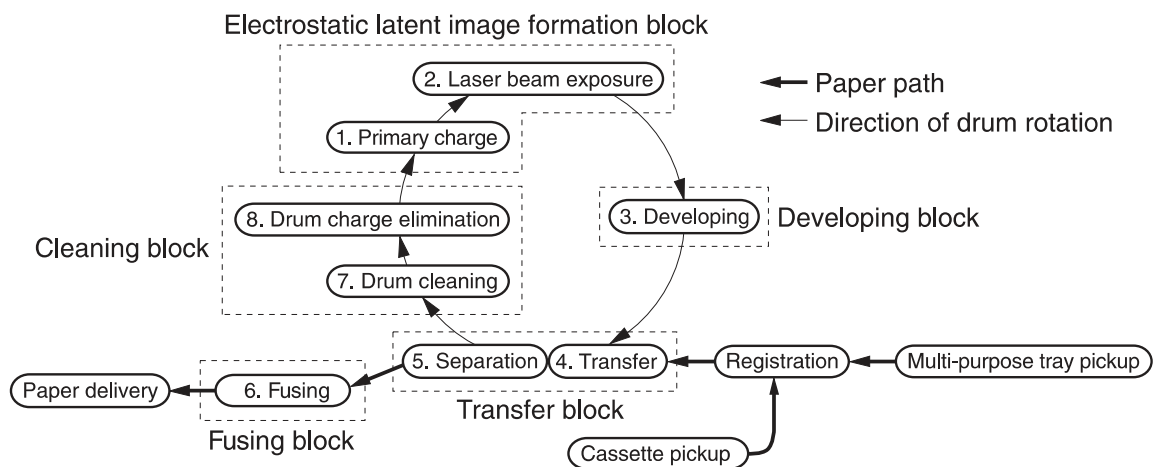
Figure 5-11 Eight stages of image-formation

1 **Conditioning** (primary charging)—The primary-charging roller in the print cartridge applies a uniform negative charge to the surface of the drum. The primary-charging roller is made of conductive rubber. An ac bias is applied to the roller to erase any residual charges from any previous image. A negative dc bias is applied by the charging roller to create a uniform negative potential on the drum surface.

2 **Writing** (laser-beam exposure)—Two laser diodes project laser beams onto a rotating scanning mirror. As the mirror rotates, the beams reflect off of the mirror, first through a set of focusing lenses, then off a mirror, and finally through a slot in the top of the toner cartridge, and onto the photosensitive drum. The twin beams sweep the drum from left to right, discharging the negative potential wherever the beams strike the surface. This creates a latent electrostatic image, which later is developed into a visible image.

3 **Developing**—At this stage of the process, the latent electrostatic image is present on the drum. 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 attracted to the discharged (exposed, grounded) areas of the drum, and is repelled from the negatively charged (unexposed) areas.

4 **Pre-transfer**—The pre-transfer roller applies bias to prevent toner on the photosensitive drum from adhering to the pre-transfer upper guide.

5 **Transfer**—During the transfer process, the toner image on the drum surface is transferred to the paper. The transfer charging roller applies a positive charge to the back of the paper and causes the negatively charged toner on the drum surface to be attracted to the paper. After separation, the drum is cleaned and conditioned for the next image.

6 **Separation**—During the separating process, the paper separates from the drum. To stabilize the feed system and to prevent dropouts on the printed image at low temperature and humidity, the static-charge eliminator reduces the charge on the back of the paper.

7 **Fusing**—During the fusing process, heat and pressure fuse the toner to the paper in order to produce a permanent image. The paper passes between a heated fuser element and a soft pressure roller. This melts the toner and presses it into the paper.

8 **Drum cleaning**—The cleaning blade is in contact with the surface of the drum at all times. As the drum rotates during printing, excess toner is scraped off and stored in the waste-toner receptacle.

Pickup, feed, and delivery system

The pickup-and-feed system consists of various rollers that the printer motors drive. The MFP uses tray 1 (the manual feeding tray) and a cassette in tray 2 as media sources. The printed media is delivered to the output device that is installed. The output device can be the standard output bin, the 3-bin mailbox, or the stapler/stacker. Only one output device can be installed. Three additional 500-sheet feeders can be added to the MFP. These input and output accessories are discussed later in this chapter.

The MFP has a built-in reversing unit that can deliver the pages either face-up or face-down. Face-down output, which is the default, is the fastest method, and pages are stacked in the correct order. Face-up output uses the straightest paper path, but pages are stacked in the reverse order.

The tray 1 paper sensor (on the tray 1 pickup assembly; PS105) detects media in tray 1. The tray 2 paper sensor (PS101) detects media in tray 2. The paper-stack-surface sensor (PS107) and the paper-size-detection switch (SW102) detect the media that is loaded in the tray 2 cassette.

The pickup operation uses three motors (M101, M102, and M103), a clutch (CL101), and two solenoids (SL101 and SL102). The delivery operation uses five motors (M101, M102, M104, M105, and M106) and two solenoids (SL105 and SL106) for the delivery sequence. For the locations of these components, see Figure 5-12 Motor, clutch, and solenoid locations.

Six photosensors (PS102, PS103, PS108, PS109, PS110, and PS111) detect media arriving and passing along the paper path. For the locations of these sensors, see Figure 5-13 Sensor and switch locations. If the media does not reach or pass these sensors within a specific amount of time, the microprocessor on the dc controller PCA halts the MFP functions and a jam error message appears on the control-panel display. See Resolving control-panel messages.

DC controller

SL106

M106
Intermediate
delivery roller
Delivery roller
Reversing roller

Crossing roller
M104
M105

Face-up deflector
Multi-purpose
tray pickup
roller
M101
SL105
Photosensitive
drum
SL102
Delivery tray
M102
Lifting
plate
Fuser delivery
roller
Pre-transfer
roller
Separation
pad
Pressure
roller
Cassette feed roller
Feed
rollers
SL101
CL101
Pickup arm
Cassette pickup roller
Separation roller

Lifter
Lifting plate
M103

M101 : Main motor   CL101 : Feed roller clutch
M102 : Drum motor   SL101 : Cassette pickup solenoid
M103 : Lifter motor   SL102 : Multi-purpose tray pickup solenoid
M104 : Crossing motor   SL105 : Face-up solenoid
M105 : Reversing motor   SL106 : Reversing roller alienation solenoid
M106 : Delivery motor

Figure 5-12 Motor, clutch, and solenoid locations

Figure 5-13 Sensor and switch locations
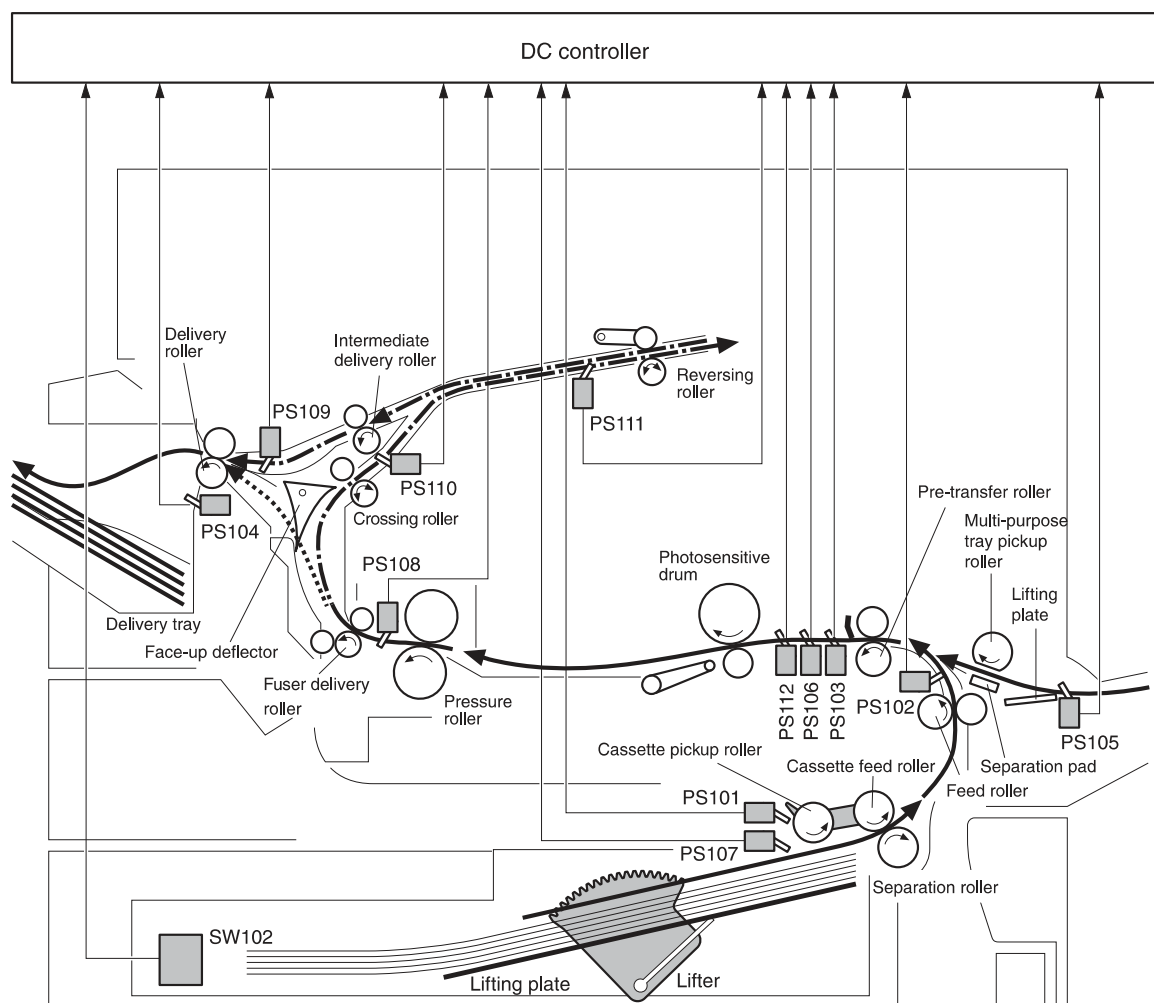
PS101 : Cassette paper sensor
PS102 : Pre-feed sensor
PS103 : Top of page sensor
PS104 : Delivery tray paper full sensor
PS105 : Multi-purpose tray paper sensor
PS106 : Paper width 1 sensor
PS107 : Paper stack surface sensor

PS108 : Fuser paper delivery sensor
PS109 : Paper delivery sensor
PS110 : Reversing paper sensor
PS111 : Reversing unit paper jam sensor
PS112 : Paper width 2 sensor
SW102 : Paper size detection switch

The pickup, feed, and delivery system is divided into two parts:

■ The **pickup and feed block** contains the paper path from each tray and stops at the fuser entrance.

■ The **fusing/reversing/delivery block** contains the paper path from the fuser entrance to the output device.
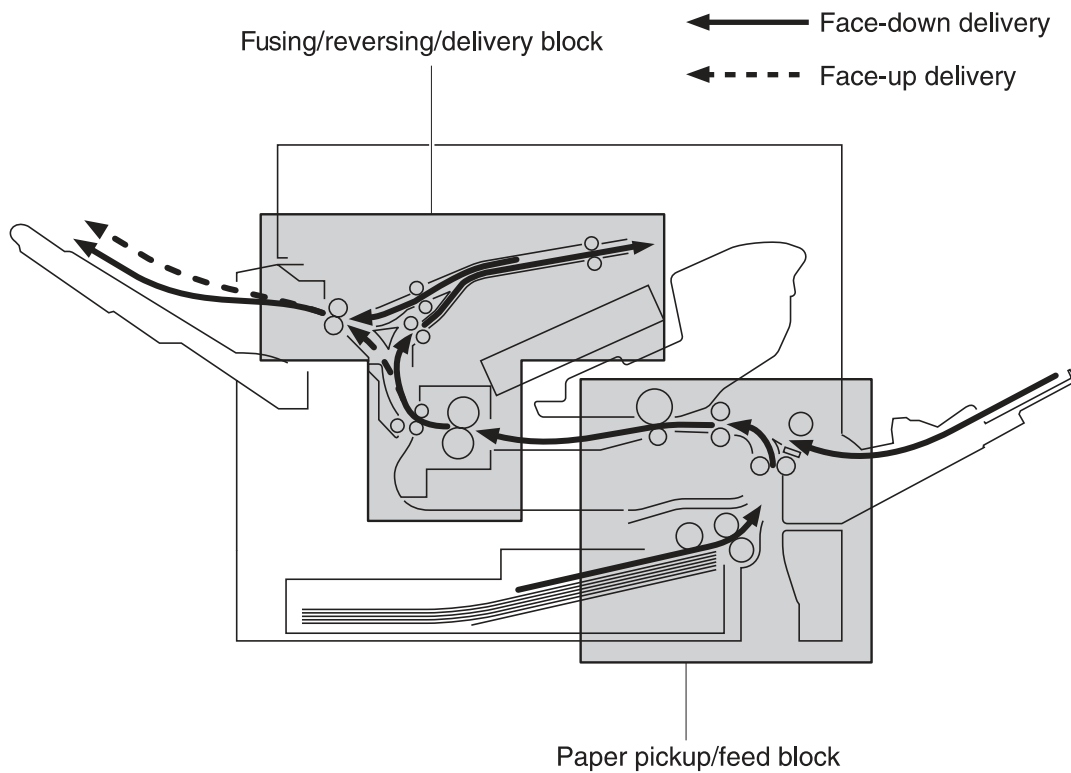
Figure 5-14 Pickup, feed, and delivery system

Pickup-and-feed block

The following functions occur in the pickup-and-feed block:

- Detecting media presence

- Detecting media size

- Detecting when media enters the paper path from the trays

- Lifting the tray 2 paper plate

- Preventing multifeeds

- Adjusting the distance between pages

- Correcting page skew

Printing from tray 1

The tray 1 paper sensor (PS105) detects the presence of media in tray 1.

When the dc controller PCA receives the print command, the printer starts the initial rotation phase, which consists of the main motor warm-up, scanner motor warm-up, high-voltage control sequence, and fuser warm-up. When the initial rotation phase ends, the tray 1 pickup solenoid (SL102) is activated.

The cam rotates, the paper-tray lifter rises, and the media comes in contact with the tray 1 pickup roller. At the same time, the tray 1 pickup roller rotates twice and picks up a sheet of media from tray 1. The separation pad prevents additional sheets from feeding with the first sheet.

When the sheet reaches the registration assembly, its skew is corrected. The sheet then passes through the transfer, separation, and fusing stages, and through the delivery unit, and is then delivered to the output bin.

NOTE   If media is removed from tray 1 after the initial rotation phase but before the pickup roller pulls the media from the tray, the tray 1 pickup roller might continue to rotate up to six times, after which a jam is detected.
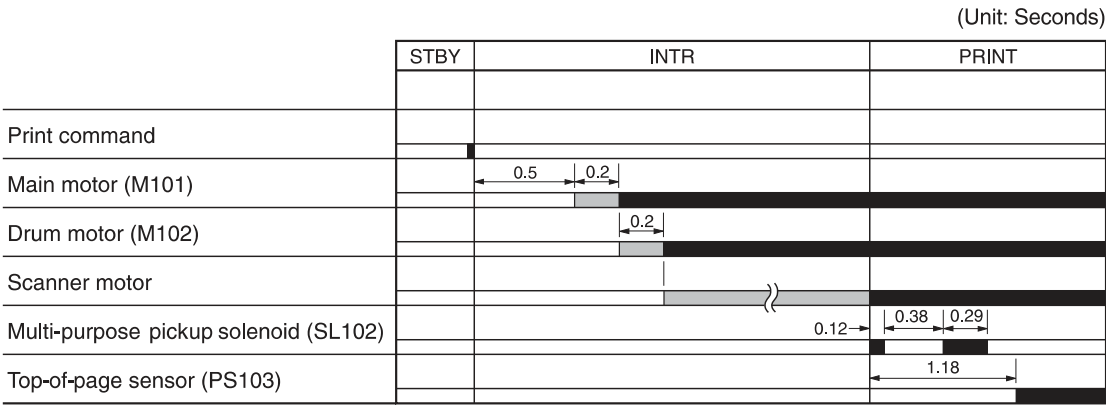
Figure 5-15 Tray 1 timing

Printing from tray 2

When the dc controller PCA receives print command, the main motor (M101) and scanner motor start their rotation. When the main motor reaches its prescribed speed, the feed-roller clutch (CL101) and tray 2 pickup solenoid (SL101) are activated. (The main motor rotation drives the tray 2 pickup roller, tray 2 feed roller, tray 2 separation roller, and paper-feed rollers.)

The pickup solenoid activates the tray 2 pickup roller, which rotates once and picks up the media in the tray. The separation roller prevents additional sheets from feeding with the first sheet, and the media is fed to the pre-feed sensor (PS102).

When the sheet reaches the registration assembly, its skew is corrected. The sheet then passes through the transfer, separation, and fusing stages, and through the delivery unit, and then is delivered to the output bin.

(Unit: Seconds)

	STBY	INTR	PRINT
Print command			
Main motor (M101)		0.5 0.2	
Drum motor (M102)		0.2	
Scanner motor			
Cassette pickup solenoid (SL101)		0.56	
Feed clutch (CL101)		0.22	
Pre-feed sensor (PS102)		0.61	
Top-of-page sensor (PS103)			0.1
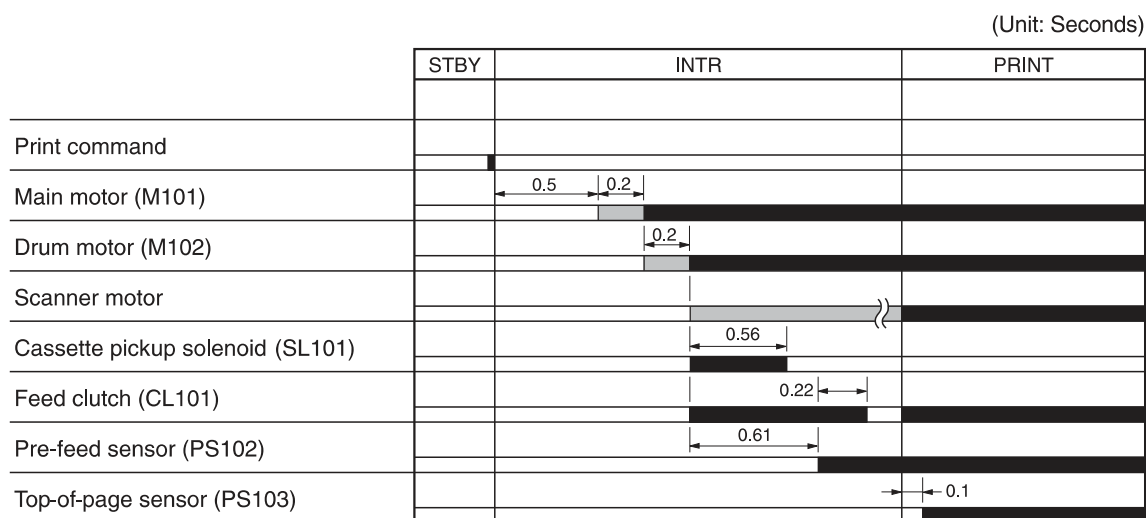
Figure 5-16 Tray 2 timing

Media-size detection

The MFP has three media-size detection systems:

- Cassette (tray 2) media-size detection

- Media-length detection

- Media-width detection

Cassette media-size detection

The media-size detection switch (SW102) has two functions: it detects the presence of the cassette, and it detects the size of the media that is loaded in the cassette. This switch has upper, middle, and lower components that act together to detect the cassette presence and the media size.

Table 5-3 Cassette media-size detection switch components

Cassette presence or media size	Upper switch	Middle switch	Lower switch
No cassette	Off	Off	Off
A4	Off	Off	On
LTR	Off	On	Off
B5	Off	On	On
A5	On	Off	Off
EXE	On	Off	On
LGL	On	On	Off
UNV	On	On	On

Media-length detection

The top-of-page sensor (PS103) determines the length of the media by measuring the time between detecting the leading and trailing edges. If this size does not match the size that SW102 detects or the size that the formatter specifies, the dc controller sends a signal to the formatter. If the media size that PS103 measures is shorter than the media size that the user selected, the formatter masks part of the image to prevent extra toner from transferring from the photosensitive drum to the transfer-charging roller.

Media-width detection

Two media-width sensors (PS106 and PS112) act together to determine if the media is narrower than expected or is skewed. If either of these conditions is detected, the dc controller adjusts the fuser temperature to prevent overheating. PS106 detects media that is narrower than 122 mm (4.8 inches). PS112 detects media that is narrower than 188 mm (7.4 inches).

Cassette pickup operation

The dc controller turns on the cassette pickup solenoid (SL101) and the main motor (M101) drives the cassette pickup roller and the cassette pickup cam. The cam causes the arm that is attached to

the pickup roller to swing down, and the pickup roller contacts the surface of the paper stack. One sheet of media is fed into the MFP.
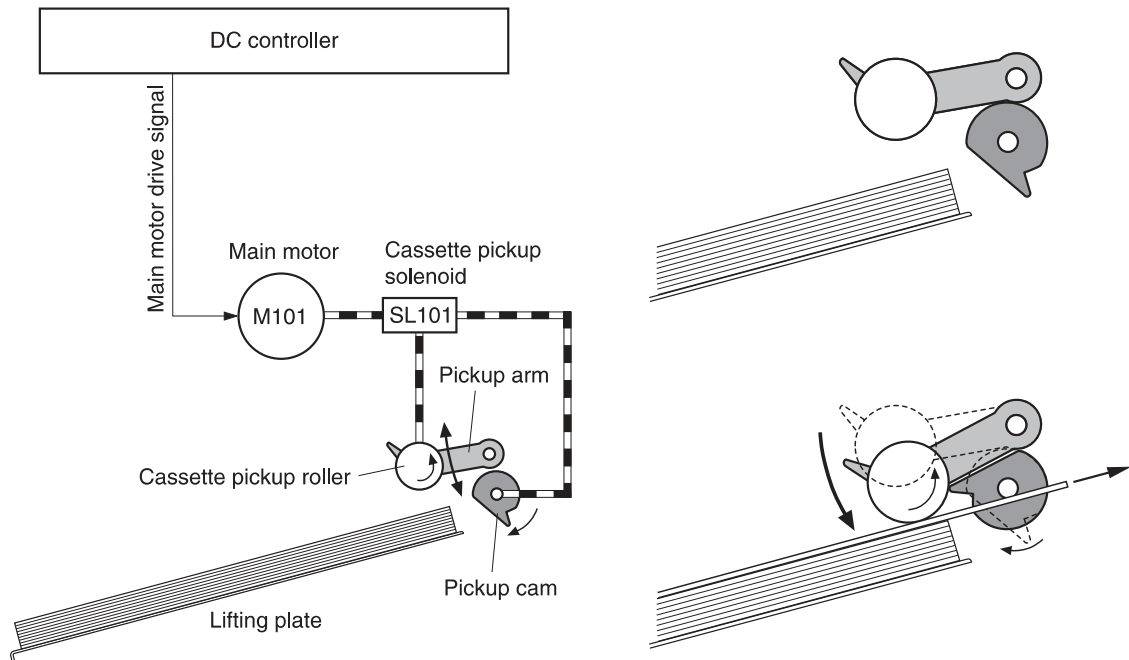
Figure 5-17 Cassette pickup operation

Lifter-driver operation

The lifter driver keeps the media stack surface at a specific level in order to have a stabilized pickup operation regardless of the size of the media in the tray 2 cassette. The dc controller PCA operates the lifter-driver motor (M103) for 30 milliseconds. The motor stops when the paper-stack-position sensor (PS107) detects the media. If the paper-stack-position sensor does not detect any media within 8 seconds after the lifting operation has begun, the dc controller PCA determines that a lifter-driver motor failure has occurred, and a message appears on the control-panel display (see Resolving control-panel messages). The dc controller PCA stops the lifting operation if the paper-stack-position sensor detects the absence of the tray 2 cassette.

Multifeed prevention

The MFP uses the separation roller in tray 2 to prevent multiple-feeding. The separation roller rotates in the same direction as the feed roller. The separation roller is equipped with a torque limiter, but because the force of the feed roller exceeds that of the torque limiter, the separation roller is actually driven by the feed roller.

If multiple sheets of media are picked up, however, the low friction force between the sheets weakens the rotational force from the feed roller to the separation roller. Consequently, the torque limiter takes control of the separation roller and rotates it in the reverse direction, which removes the extra sheets.
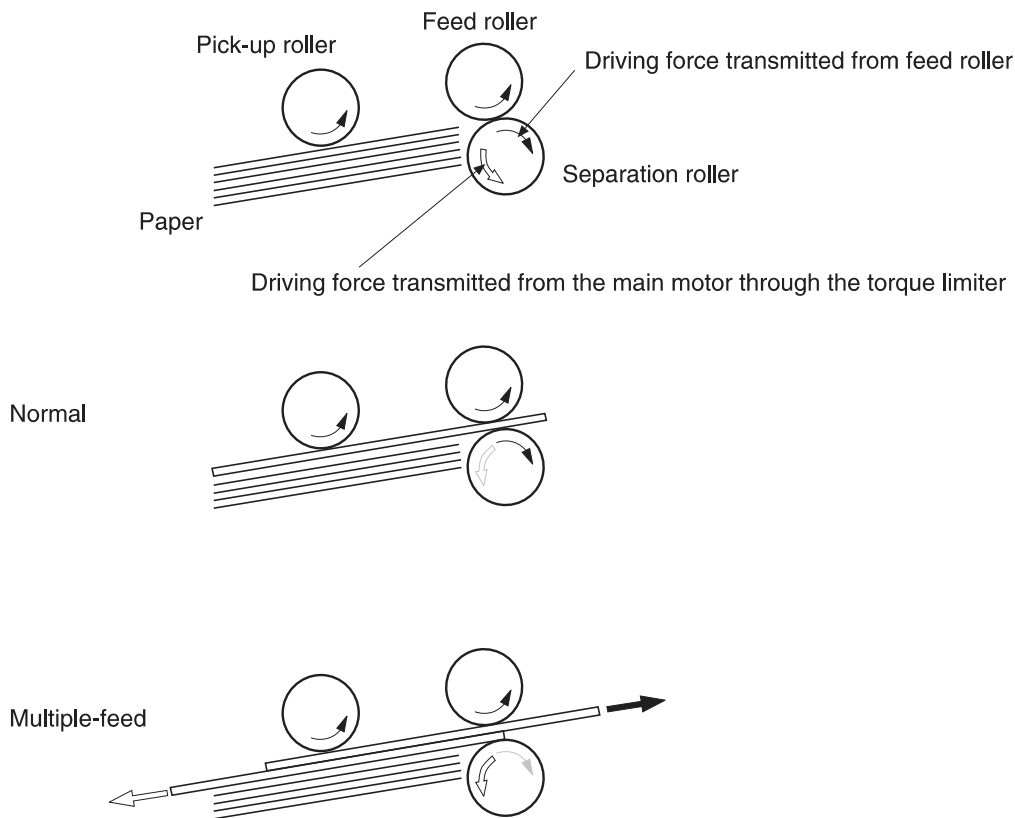
Figure 5-18 Multifeed prevention

Distance-between-pages adjustment

When a multiple-page print job is sent, the dc controller uses the pre-feed sensor (PS102) to maintain a uniform distance between the pages. If the distance between pages is too small or if the pages overlap, the dc controller turns off the feed clutch (CL101) and stops the next sheet of paper. After a specified time, the dc controller turns the clutch on to allow the paper-feed process to continue.

< Normal >
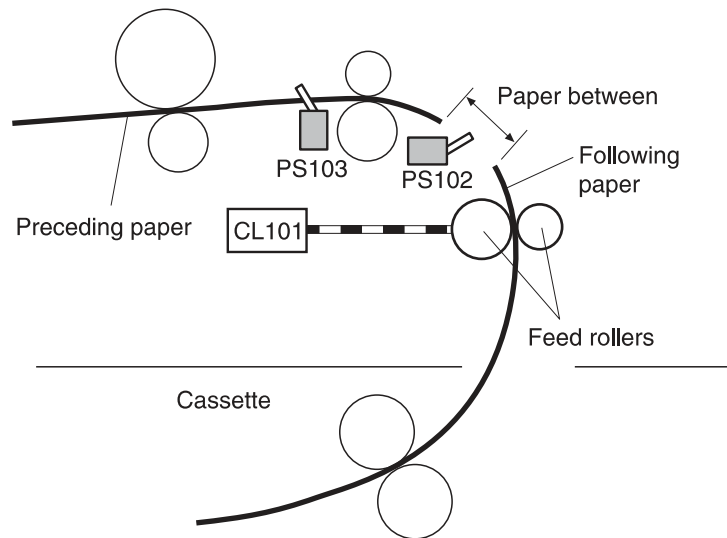
< Stretching multiple feed >
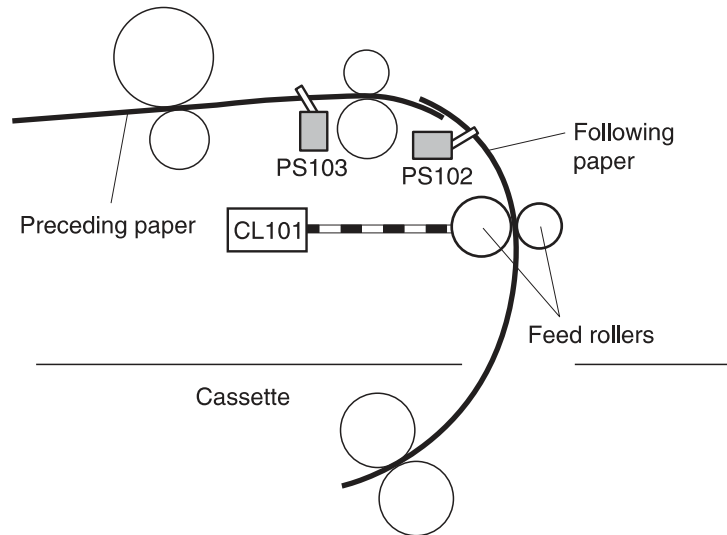
Figure 5-19 Distance-between-pages adjustment

Media-skew prevention

The MFP uses a registration shutter on the registration assembly to prevent skewed media from entering the MFP. When the leading edge of the skewed media contacts the registration shutter, the shutter does not open. The feed roller continues to rotate and the media begins to sag. When the entire leading edge comes in full contact with the shutter, the media skew is corrected and the registration shutter opens. When the shutter opens, the media can continue into the printer paper path. The overall print speed is not affected. The following three figures illustrate this process.
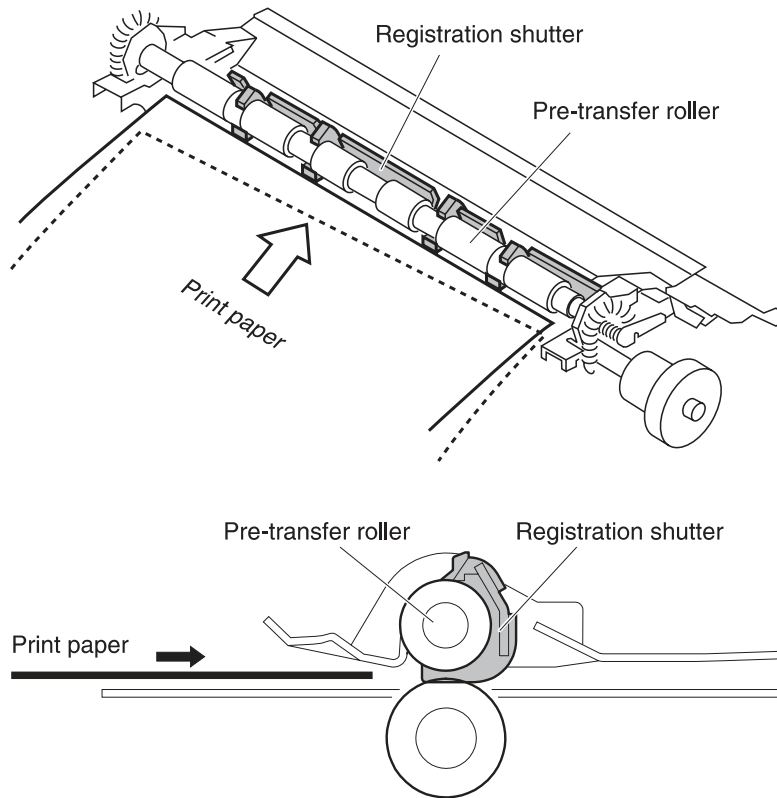
Figure 5-20 Corner of the media contacts the shutter
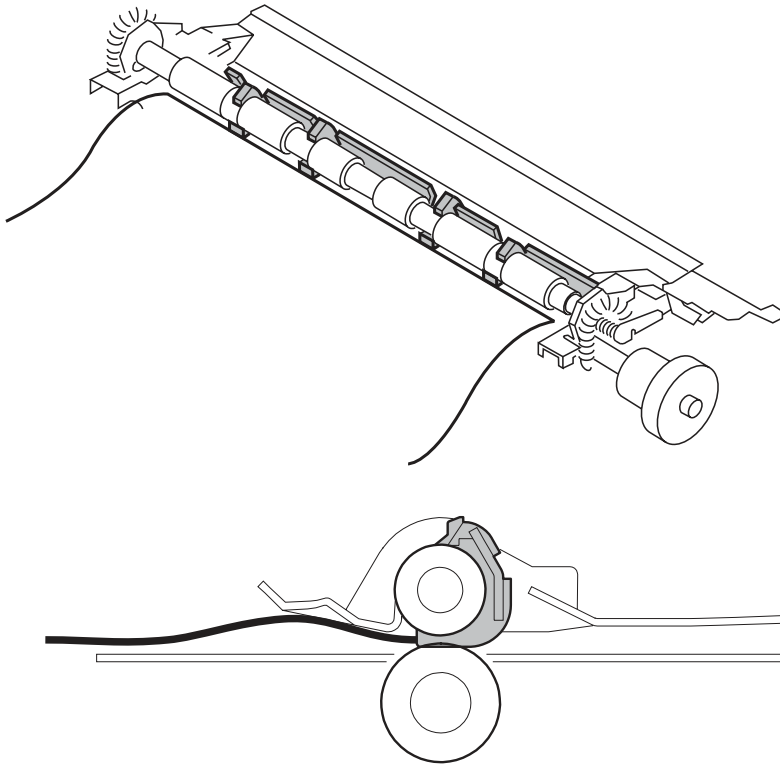
Figure 5-21 Media sags until the entire leading edge contacts the shutter
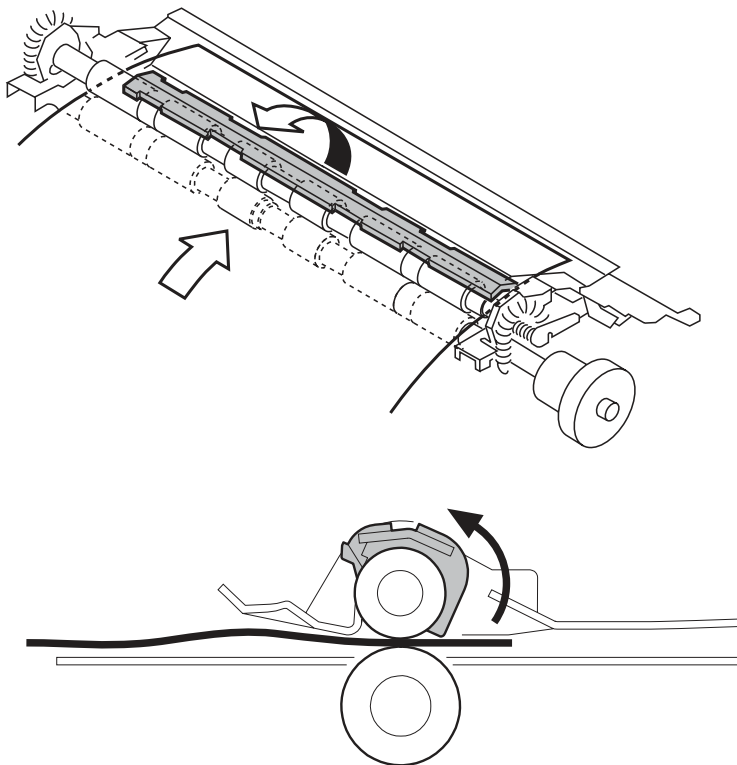
Figure 5-22 Skew is corrected, and the shutter opens

Feed-speed control

To ensure that the toner fuses sufficiently, the dc controller adjusts the speed at which media is fed according to the media type that the formatter specifies.

Fusing and reversing/delivery block

After the toner is fused to the media, the media enters the reversing/delivery unit. The MFP can deliver the media to the output bin either face-up or face-down, depending on instructions from the formatter. To stack pages of a multiple-page print job in the correct order, the pages must be flipped over in the reversing unit before they are delivered to the output bin. This is the default setting. If face-up delivery is requested, the face-up solenoid (SL105) activates the face-up deflector to prevent the media from entering the reversing unit.
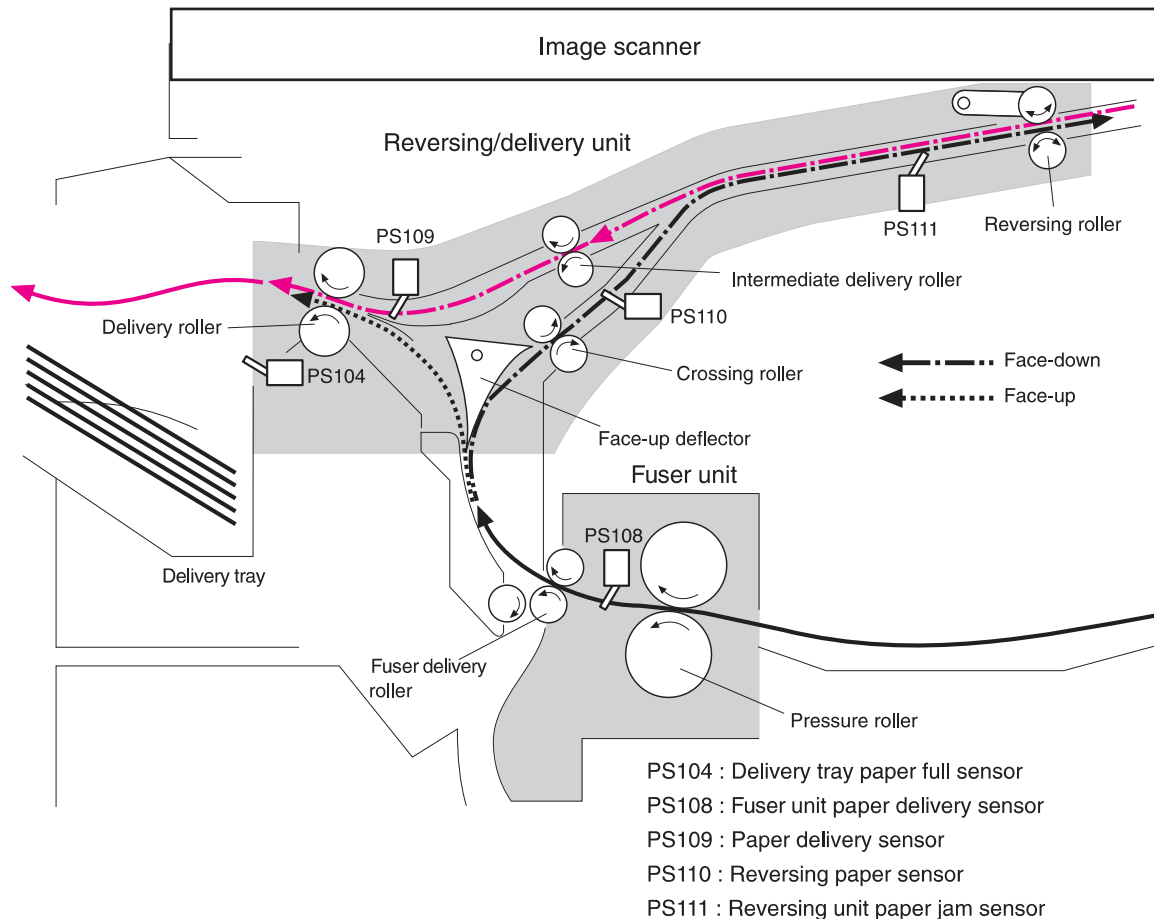
Figure 5-23 Fusing and reversing/delivery block

Fusing

The fuser applies heat and pressure to the media to permanently bond the toner image to the media.

Face-down delivery

When the fuser-delivery sensor (PS108) detects media, the crossing motor (M104) begins rotating. When the reversing-paper sensor (PS110) detects media, the reversing motor (M105) begins rotating clockwise.
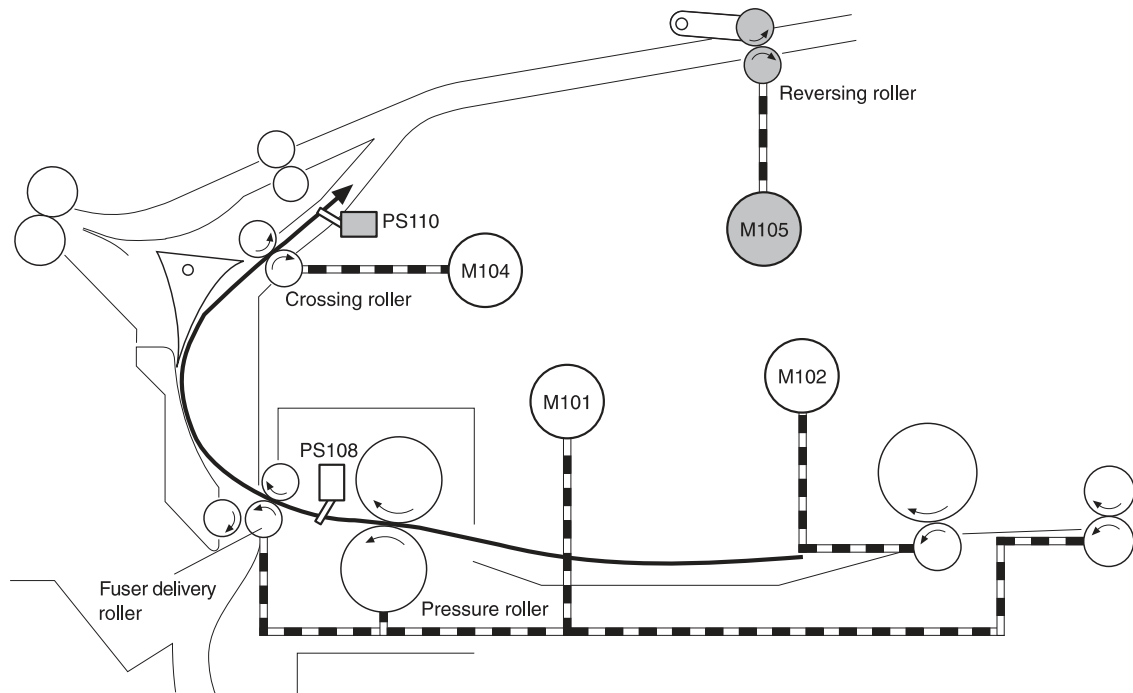
Figure 5-24 Face-down delivery: media enters the reversing unit

After a specified length of time, both motors stop, and the reversing motor begins rotating counterclockwise. Then, M106 drives the intermediate rollers and the delivery rollers, which guide the media into the output bin. When M106 begins rotating, the reversing-separation solenoid releases the reversing rollers, and the media begins traveling in the opposite direction. When the paper-delivery sensor (PS109) detects the trailing edge of the media, M106 stops rotating.
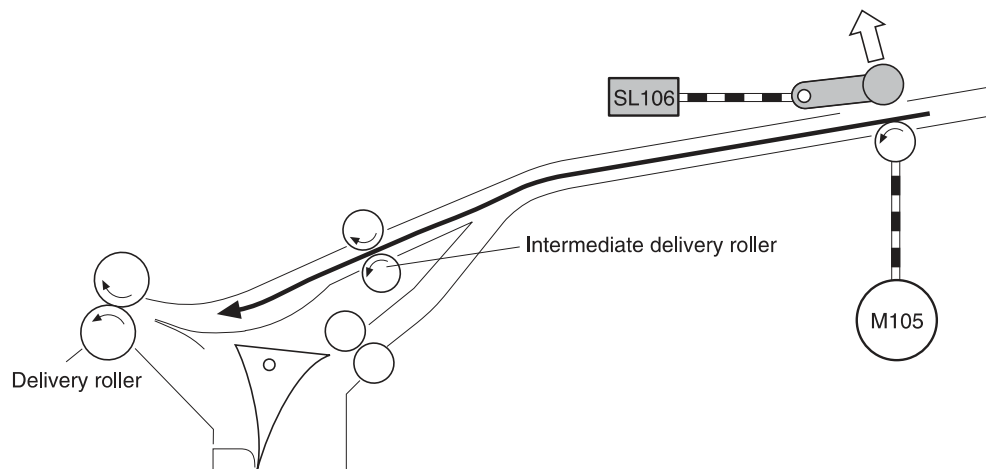
Figure 5-25 Face-down delivery: media reverses direction

Face-up delivery

As media passes through the fuser-delivery sensor (PS108), the face-up solenoid (SL105) activates the face-up deflector to prevent media from entering the reversing unit. M106 rotates clockwise and drives the delivery rollers, which carry the media into the output bin. When PS108 detects the trailing

edge of the media, SL105 turns off and the face-up deflector returns to its home position. When the paper-delivery sensor (PS109) detects the trailing edge of the media, M106 stops rotating.
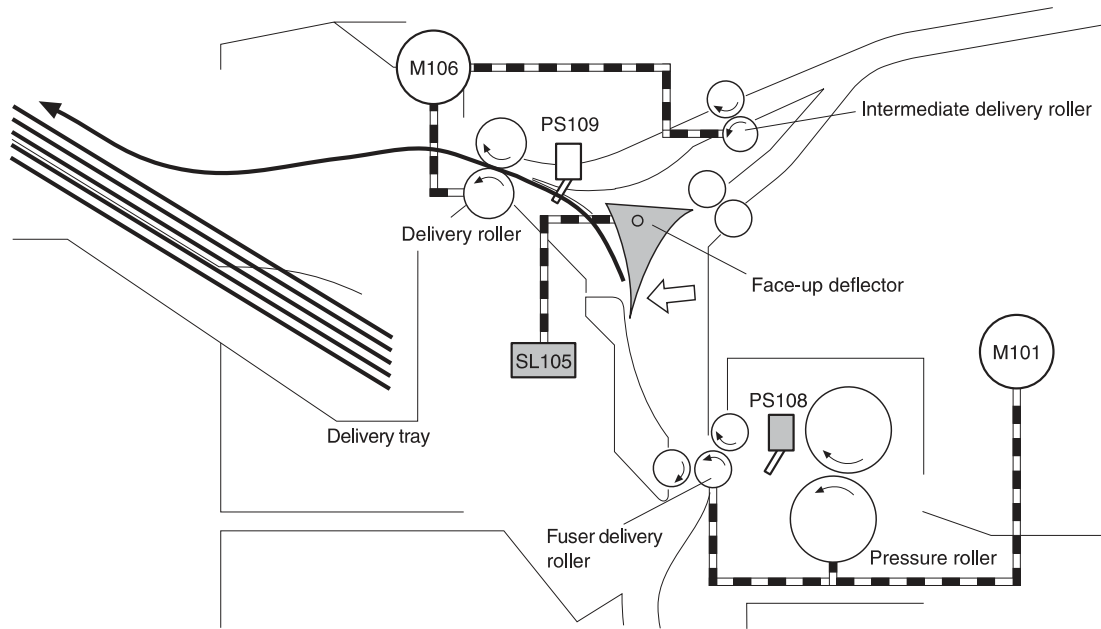
Figure 5-26 Face-up delivery

Jam detection

The MFP uses the following sensors to detect the presence of media and to check whether media is being fed correctly or has jammed:

- Pre-feed sensor (PS102)

- Top-of-page sensor (PS103)

- Fuser-delivery sensor (PS108)

- Paper-delivery sensor (PS109)

- Reversing paper-sensor (PS110)

- Reversing unit paper-jam sensor (PS111)

The microprocessor on the dc controller checks for jams by timing the media as it moves past these sensors. If the media does not pass the sensor in a specific period of time, the transport process is stopped (the motors are turned off and the rollers no longer rotate) and a jam message appears on the control-panel display.

Pickup delay jam from tray 1

If the top-of-page sensor (PS103) does not detect the leading edge of the media within a specific period of time after the media is picked up, the microprocessor on the dc controller PCA determines that a pickup jam has occurred.

NOTE The MFP attempts to pick up the media several times before determining that a pickup jam exists. The number of pickup attempts depends on the source (for example, four attempts occur if tray 1 is the source).

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Pickup delay jam from tray 2

If the pre-feed sensor (PS102) does not detect the leading edge of the media within a specific period of time after the media is picked up, the microprocessor on the dc controller PCA determines that a pickup delay jam has occurred.

NOTE The MFP attempts to pick up the media several times before determining that a pickup jam exists. The number of pickup attempts depends on the source (for example, four attempts occur if tray 1 is the source).

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Pickup stationary jam

If the top-of-page sensor (PS103) does not detect the trailing edge of the media within a specific period of time after the media is picked up, the microprocessor on the dc controller PCA determines that a pickup stationary jam has occurred.

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Fuser-delivery delay jam

If the fuser-delivery sensor (PS108) does not detect the leading edge of the media within a specific period of time after the top-of-page sensor (PS103) detects the leading edge, the microprocessor on the dc controller PCA determines that a fuser-delivery delay jam has occurred. The time varies according to the length of the media.

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Fuser wrapping jam

If the fuser-delivery sensor (PS108) does not detect the trailing edge of the media within a specific period of time after it detects the leading edge, the microprocessor on the dc controller PCA detects that a fuser wrapping jam has occurred.

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Fuser-delivery stationary jam when feeding regular-size media

NOTE   Regular-size media is defined as A4, letter, legal, B5, executive or A5.

If the fuser-delivery sensor (PS108) does not detect the trailing edge of the media within a specific time period after it detects a fuser wrapping jam, the microprocessor on the dc controller PCA detects that a fuser-delivery stationary jam has occurred.

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Fuser-delivery stationary jam when feeding custom-size media

If the fuser-delivery sensor (PS108) does not detect the trailing edge of the media within a specific time period after it detects a fuser wrapping jam, the microprocessor on the dc controller PCA detects that a fuser-delivery stationary jam has occurred.

NOTE   The time period varies according to the length of the media. The interval is longer for media that is 200 mm (7.9 inches) or longer.

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Reversing delay jam (face-down delivery only)

If the reversing-paper sensor (PS110) does not detect the leading edge of the media within a specific time period after the fuser-delivery sensor (PS108) detects the leading edge, the microprocessor on the dc controller PCA detects that a reversing delay jam has occurred.

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Reversing stationary jam (face-down delivery only)

If the reversing-paper sensor (PS110) does not detect the trailing edge of the media within a specific time period after the fuser-delivery sensor (PS108) detects the trailing edge, the microprocessor on the dc controller PCA detects that a reversing delay jam has occurred.

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Delivery delay jam during face-down delivery

If the paper-delivery sensor (PS109) does not detect the leading edge of the media within a specific time period after the paper-reversing operation starts, the microprocessor on the dc controller PCA detects that a delivery delay jam has occurred.

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Delivery delay jam during face-up delivery

If the paper-delivery sensor (PS109) does not detect the leading edge of the media within a specific time period after the fuser-delivery sensor (PS108) detects the leading edge, the microprocessor on the dc controller PCA detects that a delivery delay jam has occurred.

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Delivery stationary jam during face-down delivery

If the paper-delivery sensor (PS109) does not detect the leading edge of the media within a specific time period after the reversing-separation solenoid (SL106) is turned off, the microprocessor on the dc controller PCA detects that a delivery delay jam has occurred.

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Delivery stationary jam during face-up delivery

If the paper-delivery sensor (PS109) does not detect the trailing edge of the media within a specific time period after the fuser-delivery sensor (PS108) detects the trailing edge, the microprocessor on the dc controller PCA detects that a delivery delay jam has occurred.

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Door-open jam

If the top door is opened during printing, the top-cover switch (SW101) is activated and the microprocessor on the dc controller PCA determines that a door-open jam has occurred.

The transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Residual-media jam

If the top-of-page sensor (PS103), the fuser-delivery sensor (PS108), or the reversing-unit jam sensor (PS111) detects the leading edge of the media at the start of initial rotation, the microprocessor on the dc controller PCA identifies a residual-media jam.

In addition, if the fuser-delivery sensor (PS108) does not detect the leading edge of the media, within 2.1 seconds after the top-of-page sensor (PS103) detects the leading edge, the microprocessor on the dc controller PCA identifies a residual-media jam.

Whenever the MFP is turned on or a print sequence begins, if the pre-feed sensor (PS102) detects the presence of media, an automatic-delivery request is sent to the formatter. The dc controller PCA drives each motor, and the residual media is delivered to the output bin. Normal printing can continue.

Printing from the 500-sheet feeder

The MFP supports up to three additional 500-sheet feeders (trays 3, 4, and 5).
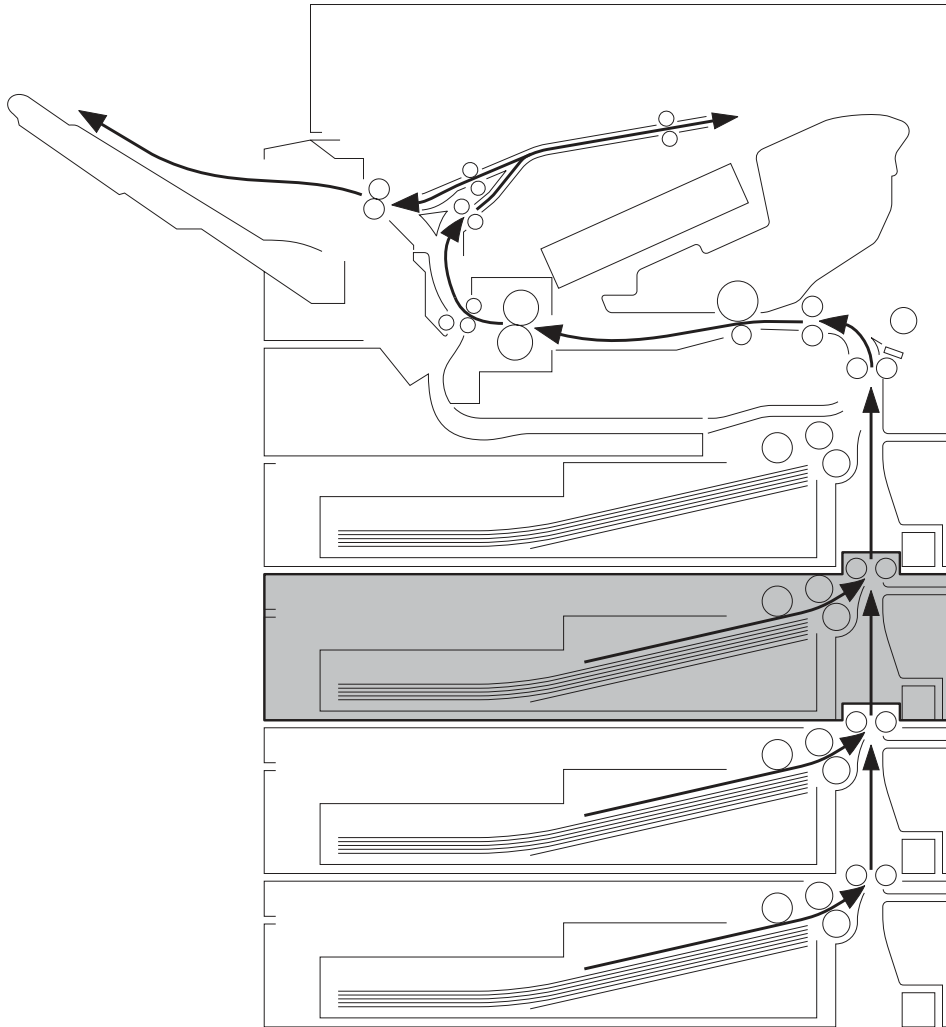
Figure 5-27 Paper path with 500-sheet feeders installed

The paper-feeder driver controls the 500-sheet feeder operation sequences. An 8-bit microprocessor in the paper-feeder driver controls the 500-sheet feeder sequences and the communication with the dc controller PCA.

The paper-feeder driver drives the solenoid in response to the pickup command. The paper-feeder driver also reports the paper-feeder status to the dc controller PCA.

The printer delivers a charge of +24 Vdc to the paper feeder, which then generates +3.3 V for the integrated circuits.
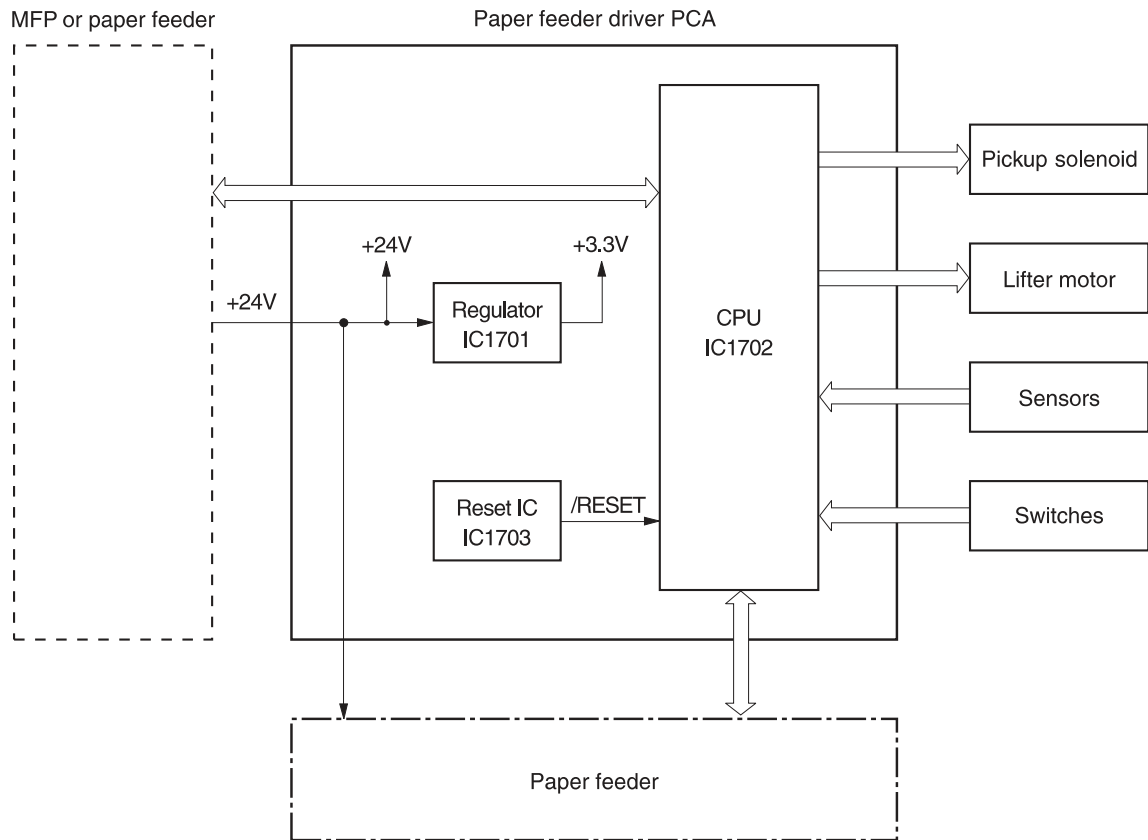
Figure 5-28 500-sheet feeder I/O block diagram

500-sheet feeder pickup and feeding

The pickup and feeding processes for the 500-sheet feeder are identical to the processes for tray 2 in the print engine. See Figure 5-29 500-sheet feeder pickup and feed diagram to identify the individual switches and sensors for the 500-sheet feeder.

M101: Main motor (printer)
CL101: Feed roller clutch (printer)
PS102: Pre-feed sensor (printer)
M1701: Lifter motor
SL1701: Paper feeder pickup solenoid
PS1701: Cassette paper detection sensor
PS1702: Paper stack surface sensor
PS1703: Paper path detection sensor
SW1701: Paper size detection switch
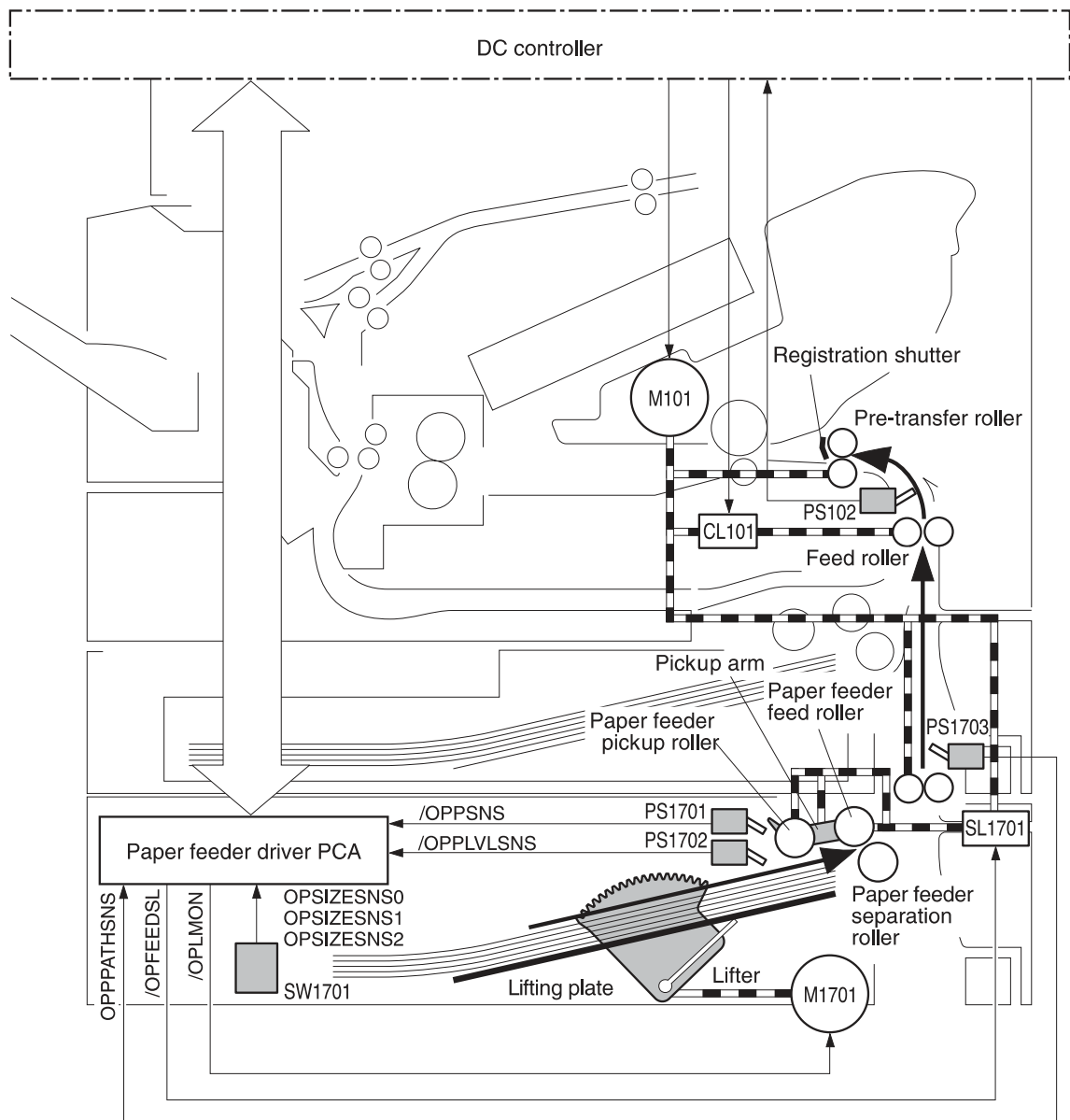
/OPLMON: LIFTER MOTOR DRIVE signal
/OPFEEDSL: PICKUP SOLENOID DRIVE signal
/OPPSNS: PAPER FEEDER PAPER DETECTION signal
/OPPPATHSNS: PAPER PATH DETECTION signal
/OPPLVLSNS: PAPER STACK SURFACE DETECTION signal
OPSIZESNS0: PAPER SIZE DETECTION signal
OPSIZESNS1: PAPER SIZE DETECTION signal
OPSIZESNS2: PAPER SIZE DETECTION signal

Figure 5-29 500-sheet feeder pickup and feed diagram

Duplex-printing unit

The optional duplex-printing unit (duplexer) adds another reversing sequence to print on both sides of a page.

NOTE The MFP cannot print on both sides of paper that is 180 mm (7.1 inches) or shorter.
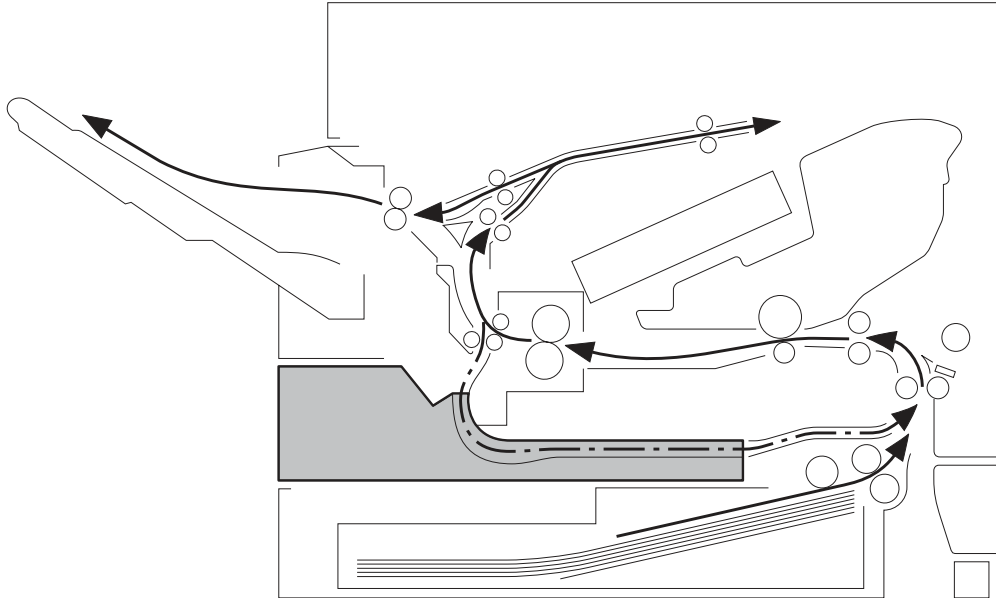
Figure 5-30 Duplex printing paper path

Reversing/duplexing pickup

Whenever the duplex-printing unit is installed and the print job specifies duplex printing, the MFP feeds the paper into the duplex-printing unit after the reversing operation rather than feeding it into the output delivery path. The duplex-printing unit feeds the paper into the print engine a second time so that the second side can be printed. After the paper has entered the reversing unit a second time, the MFP delivers the paper to the output bin.

NOTE If the top-of-page sensor (PS108) determines that the paper is 180 mm (7.1 inches) or shorter, the MFP does not feed the paper into the duplex-printing unit after the reversing operation. The paper is delivered to the output bin instead.

The dc controller PCA controls all of the components in the duplex-printing unit.
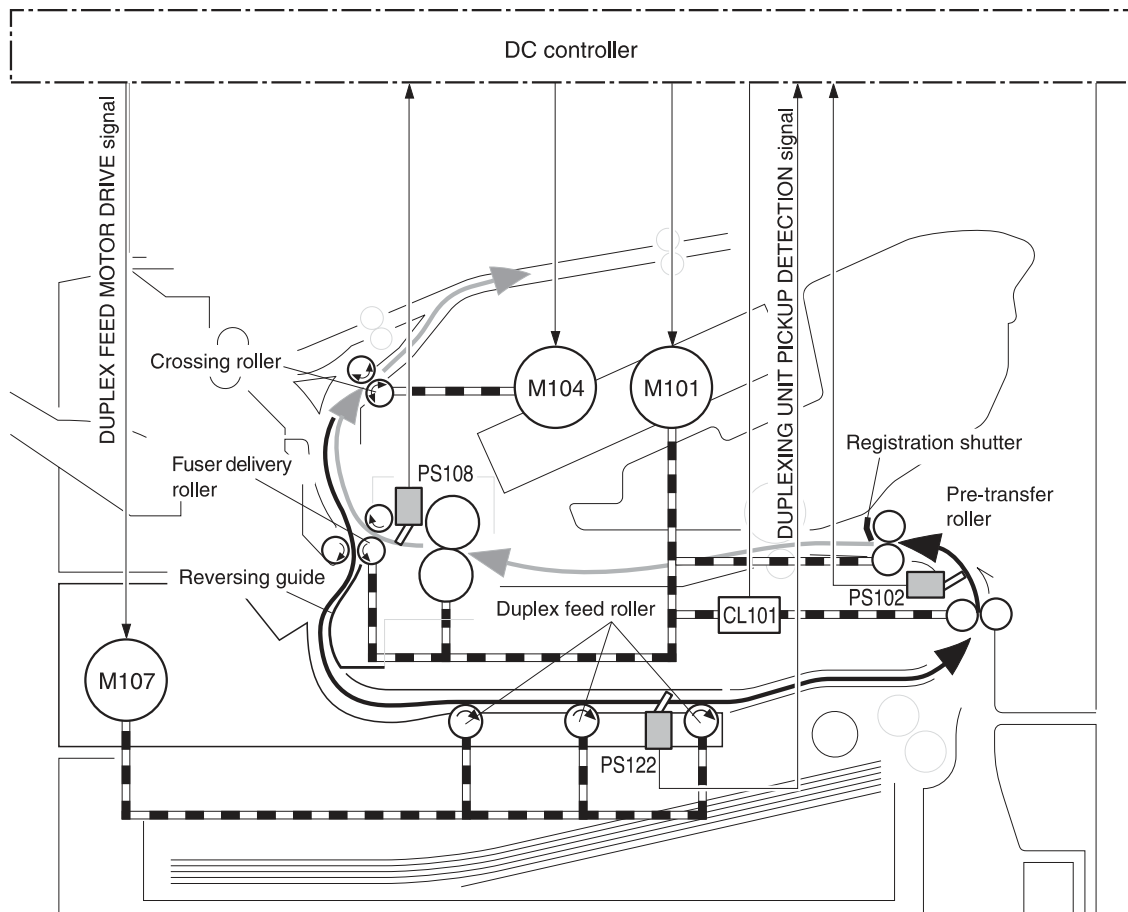
M101: Main motor (printer)

M104: Crossing motor (printer)

CL101: Feed roller clutch (printer)

PS102: Pre-feed sensor (printer)

PS108: Fuser paper delivery sensor (printer)

M107: Duplexing feed motor

PS122: Duplexing unit pickup sensor

Figure 5-31 Duplex printing control

Duplex printing jam detection

The duplex printing unit uses the duplex-unit-pickup sensor (PS122) to detect jams. The microprocessor on the dc controller PCA determines a jam situation if the sensor indicates that paper is present at an unexpected time or that paper is not present at the expected time. The microprocessor on the dc controller PCA notifies the formatter that a jam has occurred.

When a jam is detected, the transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

5   Theory of operation

Duplex-unit-pickup delay jam

If the duplex-unit-pickup sensor (PS122) does not detect the leading edge of the paper within a specific time period after the duplex feed motor (M107) starts driving, the microprocessor on the dc controller PCA determines that a duplex-unit-pickup delay jam has occurred.

Duplex-unit stationary jam

If the duplex-unit-pickup sensor (PS122) does not detect the trailing edge of the paper within a specific time period after the duplex-unit pickup operation starts, the microprocessor on the dc controller PCA determines that a duplex-unit stationary jam has occurred.

Also, if the microprocessor on the dc controller PCA cannot communicate with the formatter while paper is in the duplexing unit, it determines that a duplex-unit stationary jam has occurred.

Duplex-unit delay jam

If the duplex-unit-pickup sensor (PS122) does not detect the trailing edge of the paper within a specific time period after the fuser-delivery sensor (PS108) detects the trailing edge, the microprocessor on the dc controller PCA determines that a duplex-unit delay jam has occurred.

3-bin mailbox feed and delivery system

When the 3-bin mailbox (MBM) is installed, it receives print media from the print engine and delivers it to one of its three bins. The 3-bin mailbox has the following components:

- One feed motor that drives the rollers

- Two solenoids that operate the inlet deflector and the bin deflector

- Six sensors that detect the presence of print media and the stack height in the output bins

- One switch that determines whether the 3-bin mailbox is attached to the MFP correctly

- One fan that cools components inside the 3-bin mailbox

The 3-bin mailbox has three operating modes: stacker mode, mailbox mode, and function-separator mode.

The MBM-driver PCA controls all functions in the 3-bin mailbox. To deliver media to the different bins, the inlet deflector and the bin deflector change position as required.
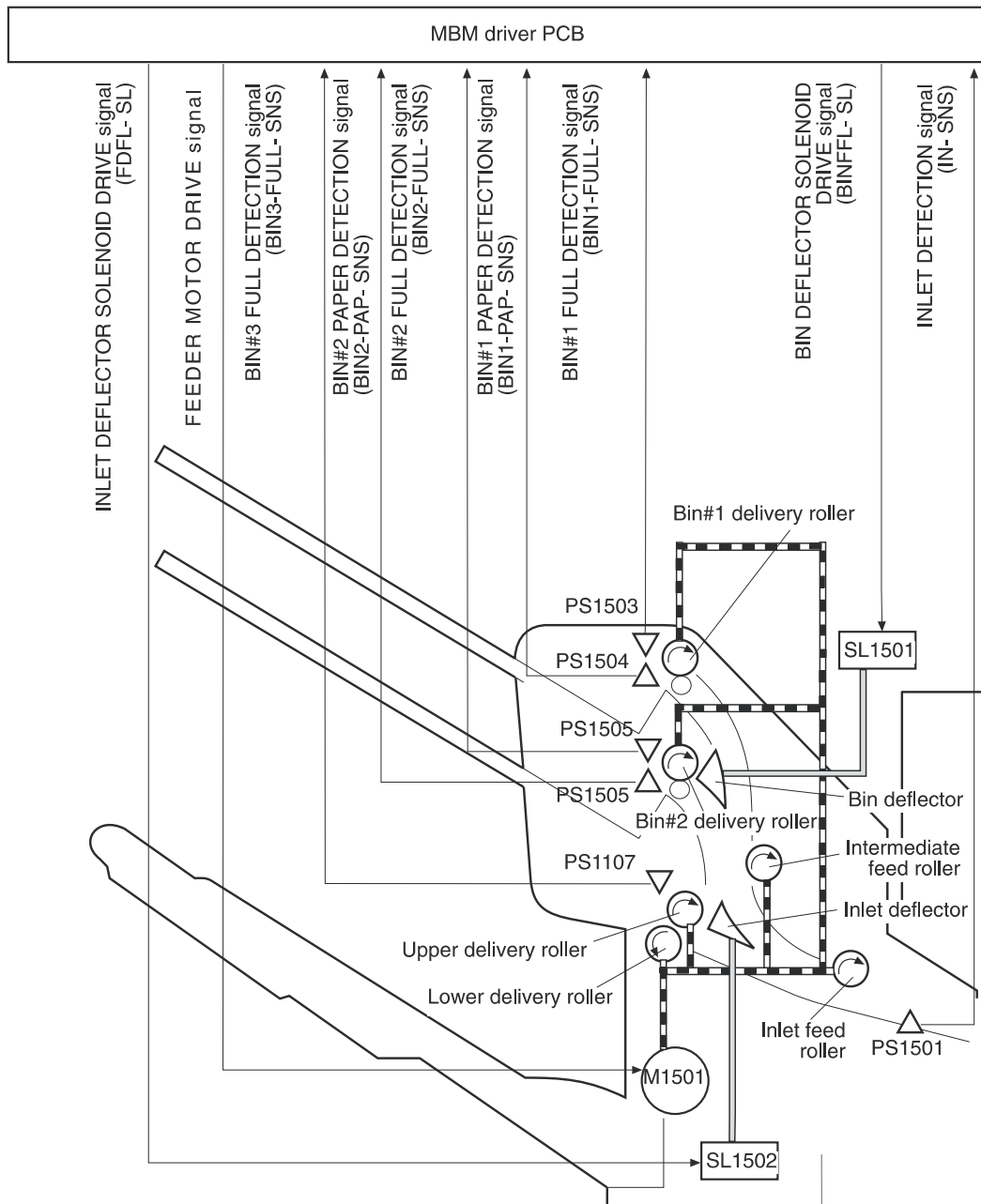
Figure 5-32 3-bin mailbox operation

Stacker mode

When configured for stacker mode, the 3-bin mailbox fills the bottom output bin (bin 3) first and then fills the next highest bin.
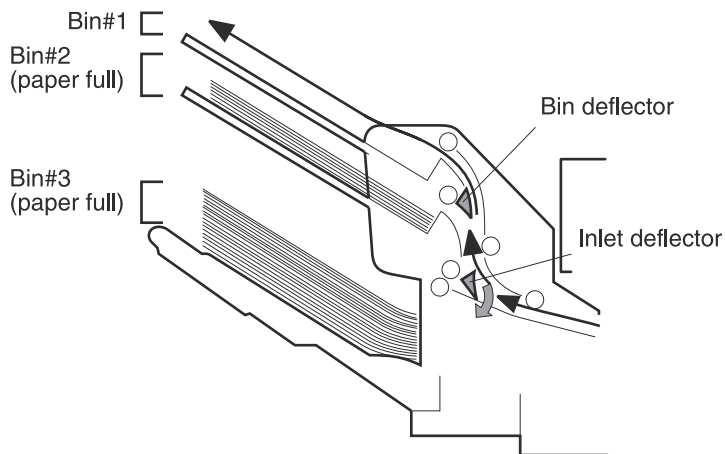
Figure 5-33 Media flow when using the stacker mode

Mailbox mode

When configured for mailbox mode, the 3-bin mailbox stacks print media in each bin as determined by the print job specifications. For example, one user might have all jobs delivered to the bottom bin, and another user might have all jobs delivered to the top bin.

Function-separator mode

When configured for function-separator mode, the 3-bin mailbox delivers print media to each bin as specified by the job type. For example, all copy jobs might be delivered to the top bin, and all faxes might be delivered to the middle bin.

Jam detection

The 3-bin mailbox uses the inlet sensor (PS1501) to detect jams. The microprocessor on the MBM-driver PCA determines a jam situation if the sensor indicates that media is present at an unexpected time or that media is not present at the expected time. The microprocessor on the MBM-driver PCA notifies the formatter that a jam has occurred.

When a jam is detected, the transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see <u>Resolving control-panel messages</u>.

Feed-delay jam

If the inlet sensor (PS1501) does not detect the leading edge of the media within a specific time period after receiving a delivery-notice command, the microprocessor on the MBM-driver PCA determines that a feed-delay jam has occurred. The time interval is longer for face-up delivery than for face-down delivery.

Feed-stationary jam

If the inlet sensor (PS1501) does not detect the trailing edge of the media within a specific time period after it detects the leading edge, the microprocessor on the MBM-driver PCA determines that a feed-stationary jam has occurred.

Residual-media jam

If the inlet sensor (PS1501) detects the presence of media during the initial WAIT period, the microprocessor on the MBM-driver PCA determines that a residual-media jam has occurred.

Stapler/stacker feed and delivery system

When the stapler/stacker is installed, it receives print media from the print engine and delivers it to the stapler or stacks it in the output bin. The stapler/stacker has the following components:

- Four motors that operate the paddle, the jogger, the feed mechanism, and the stapler unit

- One clamp solenoid

- Nine sensors that detect the media position and guide positions

- One switch that detects when the stapler door is open

The stapler/stacker has two operating modes: staple mode and stacker mode.

The stapler/stacker-driver PCA controls all functions in the stapler/stacker.

M1301: Paddle motor
M1302: Jogger motor
M1303: Feed motor
SL1301: Clamp solenoid

PS1301: Paper inlet sensor
PS1302: Delivery sensor
PS1303: Delivery roller disengaging sensor
PS1304: Jogger home position sensor
PS1305: Paddle home position sensor
PS1306: Delivery full sensor
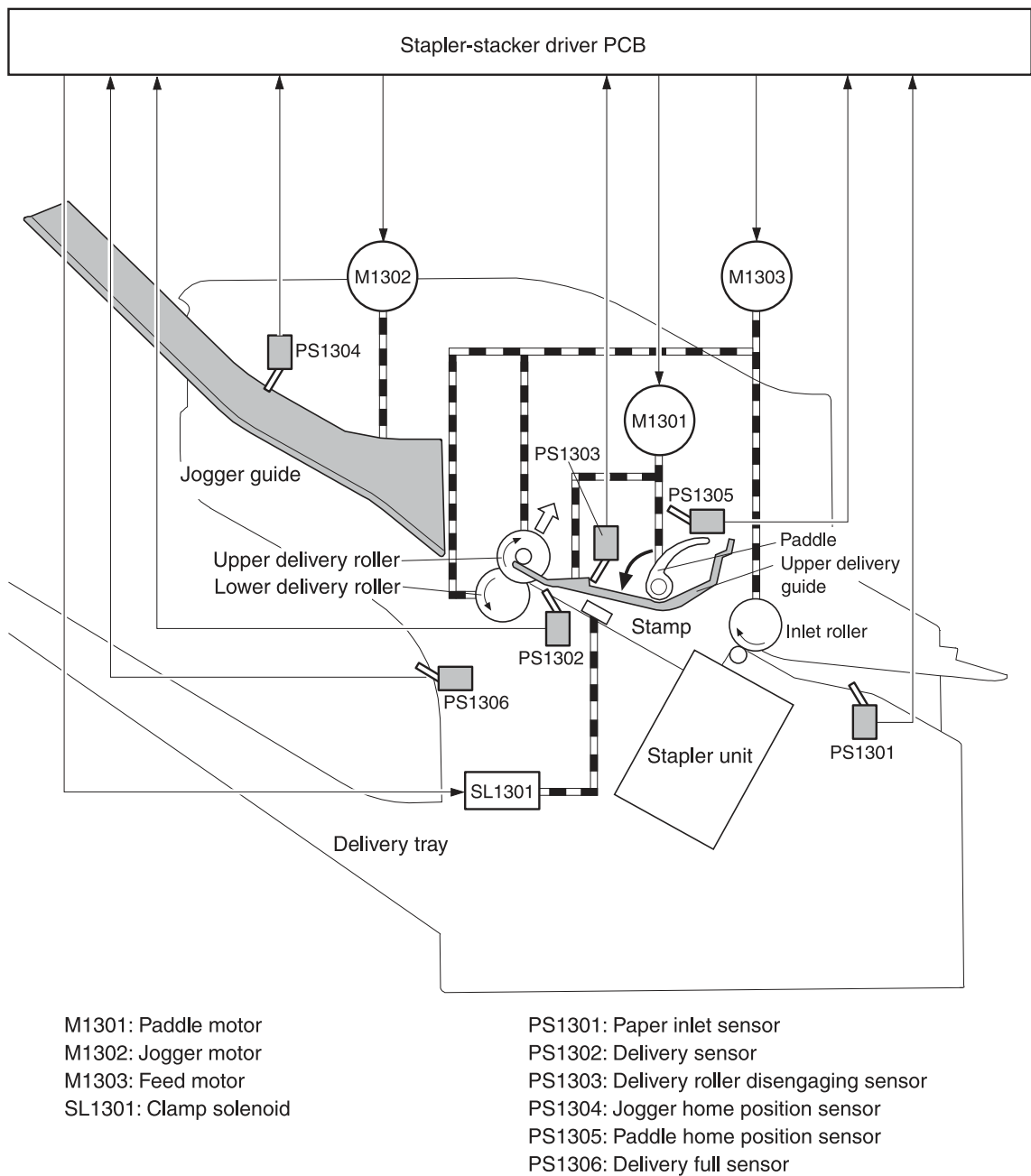
Figure 5-34 Stapler/stacker operation

Staple mode

When the print job specifications require stapling, the pages of the document are gathered inside the unit. A jogger aligns the pages horizontally, and a paddle aligns the pages vertically. When all pages of a job are gathered, a clamp compresses the stack and a staple is attached.

After the document is stapled, the jogger guides spread apart to release the stack, and the stapled document falls into the stacker bin.
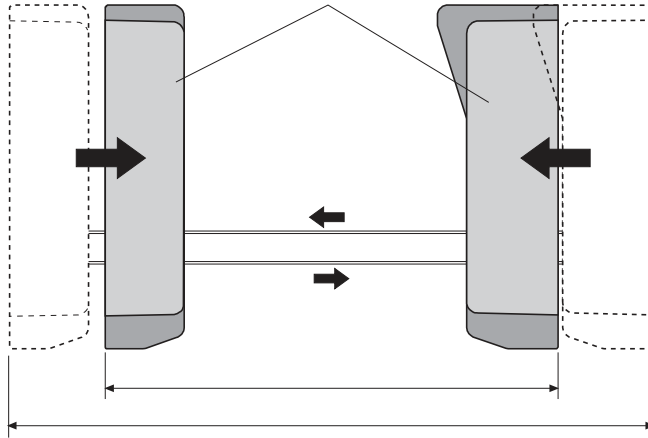
Figure 5-35 Jogger operation (top view)

Stacker mode

The stacker mode collates multiple-page print jobs without stapling them.

When the print job requires no stapling, the pages of the document are gathered inside the unit. A jogger aligns the pages horizontally, and a paddle aligns the pages vertically. When all pages of a job are gathered, the jogger guides spread apart, releasing the stack, and the document falls into the stacker bin without being stapled.

Staple-jam detection

The stapler/stacker uses the inlet sensor (PS1301) and the delivery sensor (PS1302) to detect jams. The microprocessor on the stapler/stacker-driver PCA determines a jam situation if the sensor indicates that paper is present at an unexpected time or that paper is not present at the expected time. The microprocessor on the stapler/stacker-driver PCA notifies the formatter that a jam has occurred.

When a jam is detected, the transport process stops and a **13.XX.YY JAM** message appears on the control-panel display. For more information about jam messages, see Resolving control-panel messages.

Feed-delay jam

If the inlet sensor (PS1301) does not detect the leading edge of the media within a specific time period after receiving a delivery-notice command, the microprocessor on the MBM-driver PCA determines that a feed-delay jam has occurred.

Feed-stationary jam

If the inlet sensor (PS1301) does not detect the trailing edge of the media within a specific time period after it detects the leading edge, the microprocessor on the MBM-driver PCA determines that a feed-stationary jam has occurred.

Delivery-stationary jam

If the delivery sensor (PS1302) does not detect the trailing edge of the media within a specific time period after the feed motor has begun rotating, the microprocessor on the MBM-driver PCA determines that a delivery-stationary jam has occurred.

Residual-media jam

If the inlet sensor (PS1301) detects the presence of media during the initial WAIT period, the microprocessor on the MBM-driver PCA determines that a residual-media jam has occurred.

Stapler unit

The stapler unit holds the staple cartridge and the staple motor. The staple cartridge contains up to 5,000 staples. The stapler unit also has three sensors that detect the presence of staples and staple jams.

- The staple-home-position sensor (PHOI1) detects when the stapler is in the correct position staple. If the stapler is in the incorrect position, the staple/stacker-driver PCA notifies the formatter that a staple jam has occurred.

- The staple-ready sensor (PHOI2) detects when the stapler is self-primed after a new staple cartridge is installed. If the sensor determines that the self-priming function was unsuccessful, the staple/stacker-driver PCA notifies the formatter that a staple jam has occurred.

- The staple-presence sensor (PHOI3) detects the number of staples in the staple cartridge. When the number of staples in the cartridge is 20 or fewer, the stapler/stacker-driver PCA notifies the formatter. A **STAPLER LOW ON STAPLES** message appears on the control-panel display.
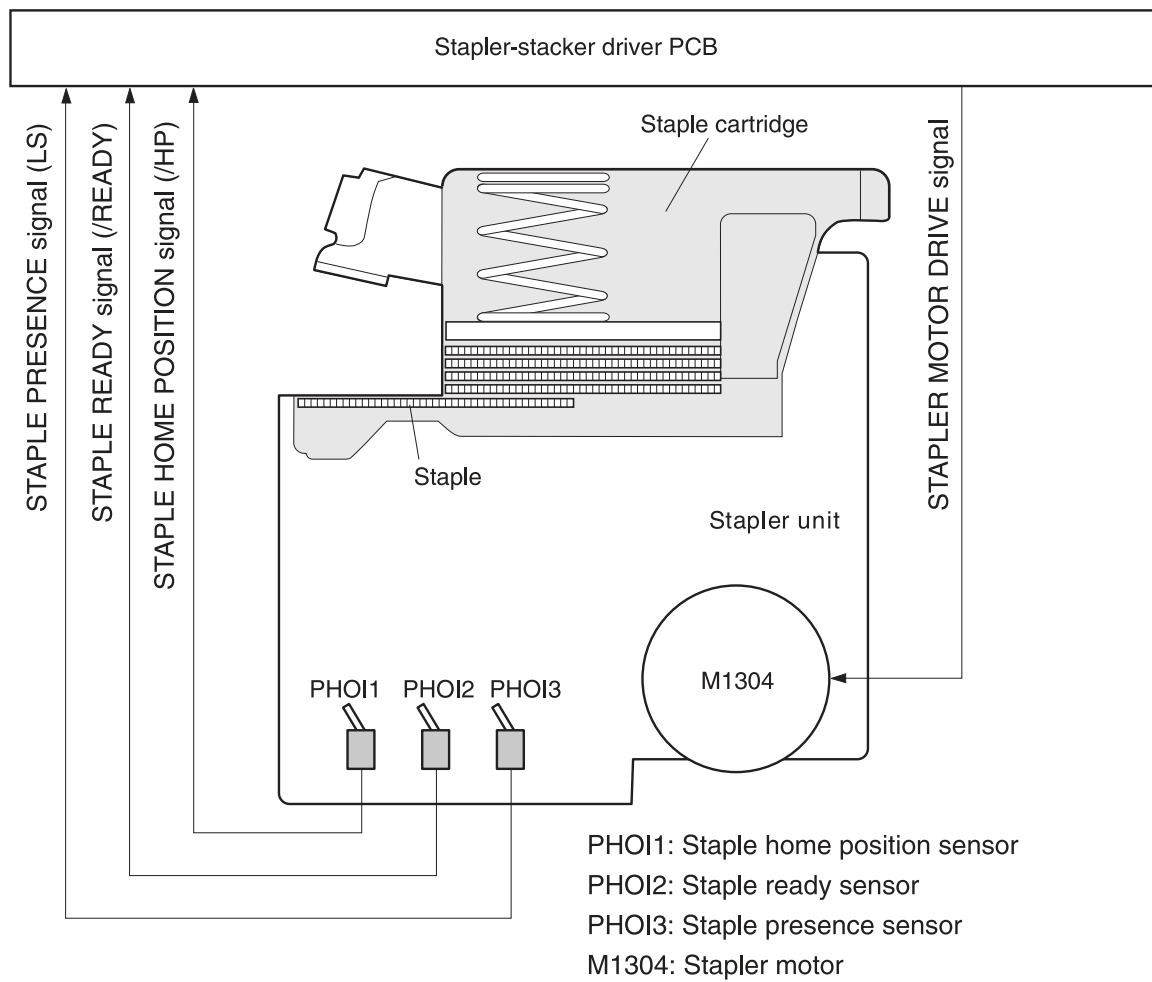
Figure 5-36 Stapler unit operation

Stapler-stacker driver PCB

STAPLE PRESENCE signal (LS)

STAPLE READY signal (/READY)

STAPLE HOME POSITION signal (/HP)

Staple cartridge

STAPLER MOTOR DRIVE signal

Staple

Stapler unit

PHOI1 PHOI2 PHOI3

M1304

PHOI1: Staple home position sensor
PHOI2: Staple ready sensor
PHOI3: Staple presence sensor
M1304: Stapler motor

Scanner system

The scanner system adds copying and sending functions to the standard MFP printing function. The scanner assembly consists of an automatic document feeder (ADF) and a flatbed scanner glass surface.

Original documents that are fed through the ADF are delivered to the ADF output bin, which is underneath the ADF input tray. Printed copies are delivered to the output device that is attached to the print engine.

The scanner unit has built-in duplexing capability for scanning two-sided documents.

NOTE The MFP delivers two-sided printed copies of original documents only when a duplex printing unit is installed in the print engine. If a duplex printing unit is *not* installed, the copies are printed on one side of the page. If a duplex printing unit is installed, the printed copies can be either one-sided or two-sided, depending on the instructions from the user.

Figure 5-37 ADF mechanical structure shows a cross-section of the ADF.
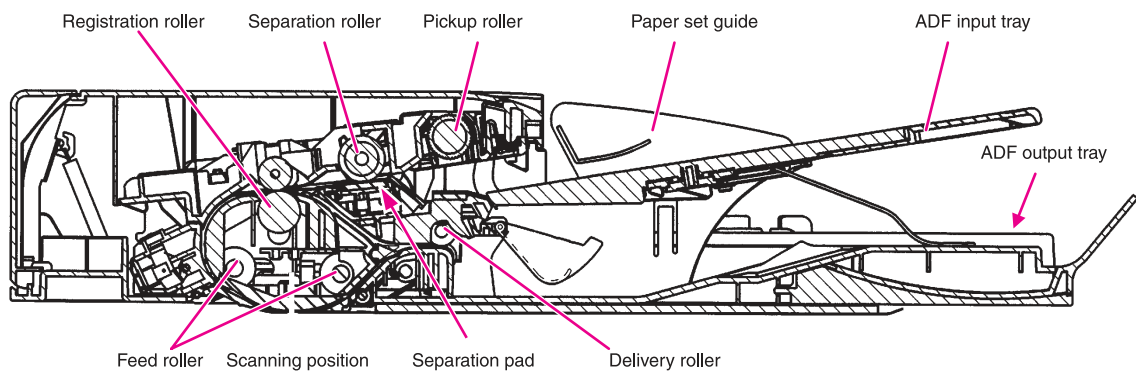
Figure 5-37 ADF mechanical structure

Electrical system

The scanner assembly electrical system consists of the following components:

- The charged-coupled device (CCD) PCA

- The inverter PCA

- The scanner PCA

- The ADF PCA

- The ADF LED PCA

The scanner assembly is connected to the print-engine formatter through a flat, flexible cable.

Figure 5-38 Scanner assembly electrical structure shows the scanner assembly electrical structure.
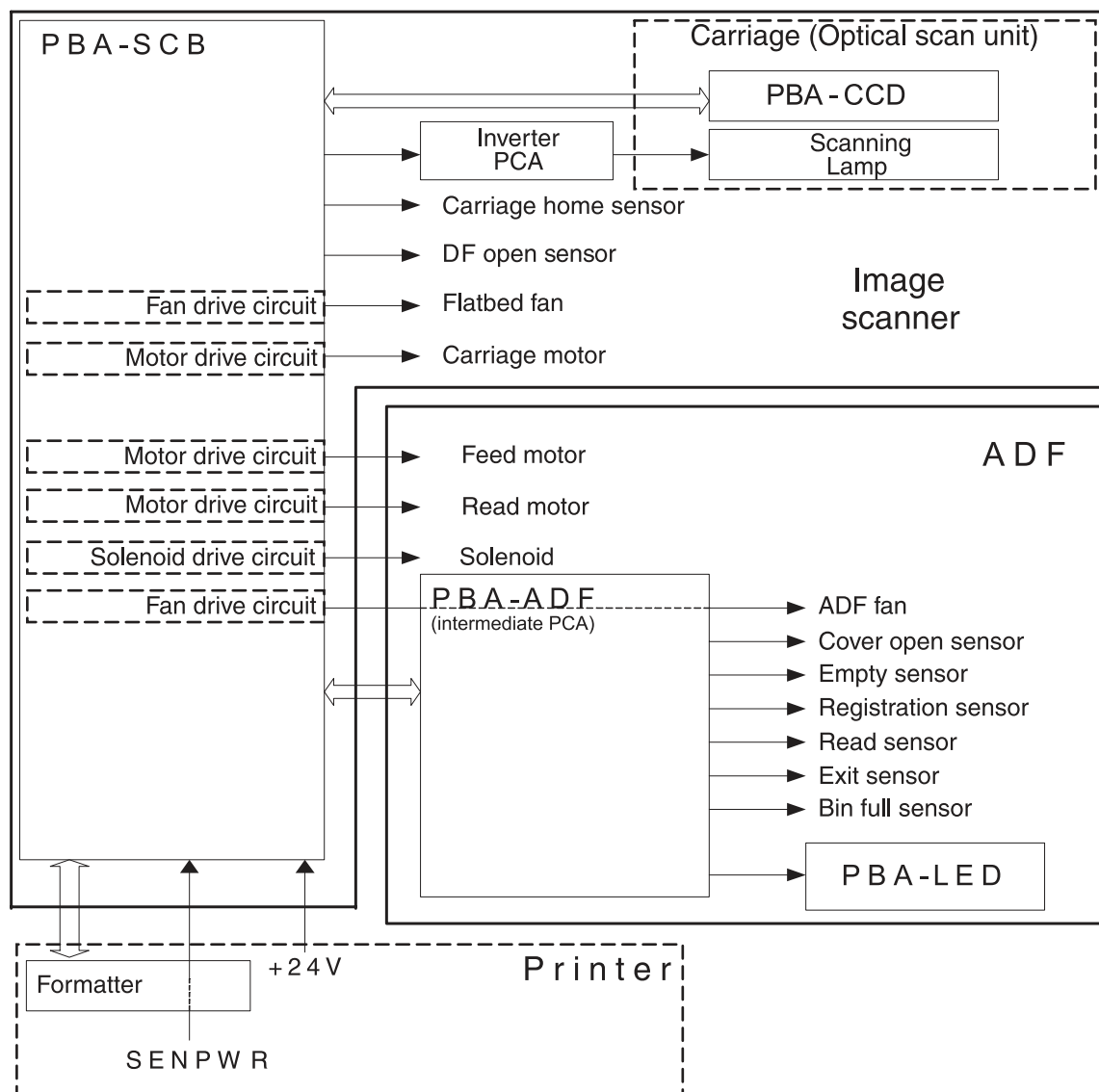
Figure 5-38 Scanner assembly electrical structure

Motors and fans

The scanner assembly has five motors and two fans. Three of the motors are stepping motors, which drive the components inside the scanner assembly. The remaining two motors are dc motors, which drive the two fans.

Name	Purpose	Type	Rotation	Failure detection
Carriage motor	Drives the carriage unit	Stepping motor	Varies	No
Feed motor	Drives the pickup, separation, and registration rollers	Stepping motor	Varies	No
Read motor	Drives the feed and delivery rollers	Stepping motor	Counterclockwise	No
Flatbed fan	Cools the scanner lamp and the CCD	DC motor	Clockwise	Yes
ADF fan	Cools the motors	DC motor	Clockwise	Yes

Optical assembly

The optical assembly contains the scan carriage and the scanner glass. The scan carriage contains the lamp, five mirrors, a lens, and the CCD.
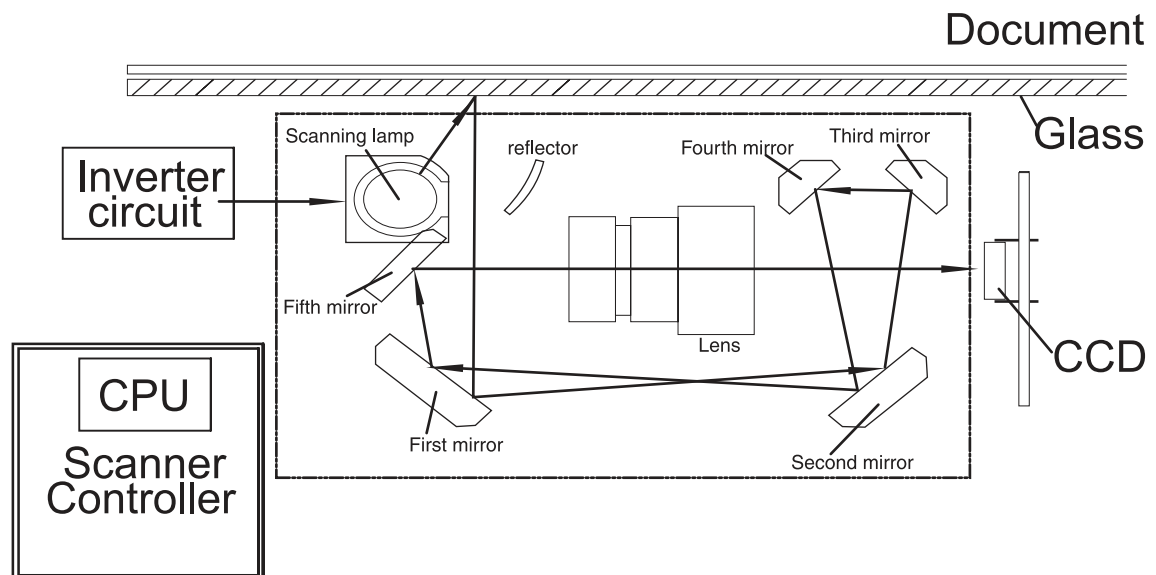
Figure 5-39 Scan carriage components

The scanner lamp illuminates a small strip of the document (called the raster line). The mirrors direct the light through the lens to the CCD. The CCD senses and records the light, creating an analog representation of the raster line. If the ADF is being used, the document then advances in the ADF to the next raster line. If the flatbed is being used, the carriage advances to the next raster line. This advancing and collection process continues to the end of the sheet.

The image data is collected on the scanner controller PCA, where it is processed and sent to the formatter.
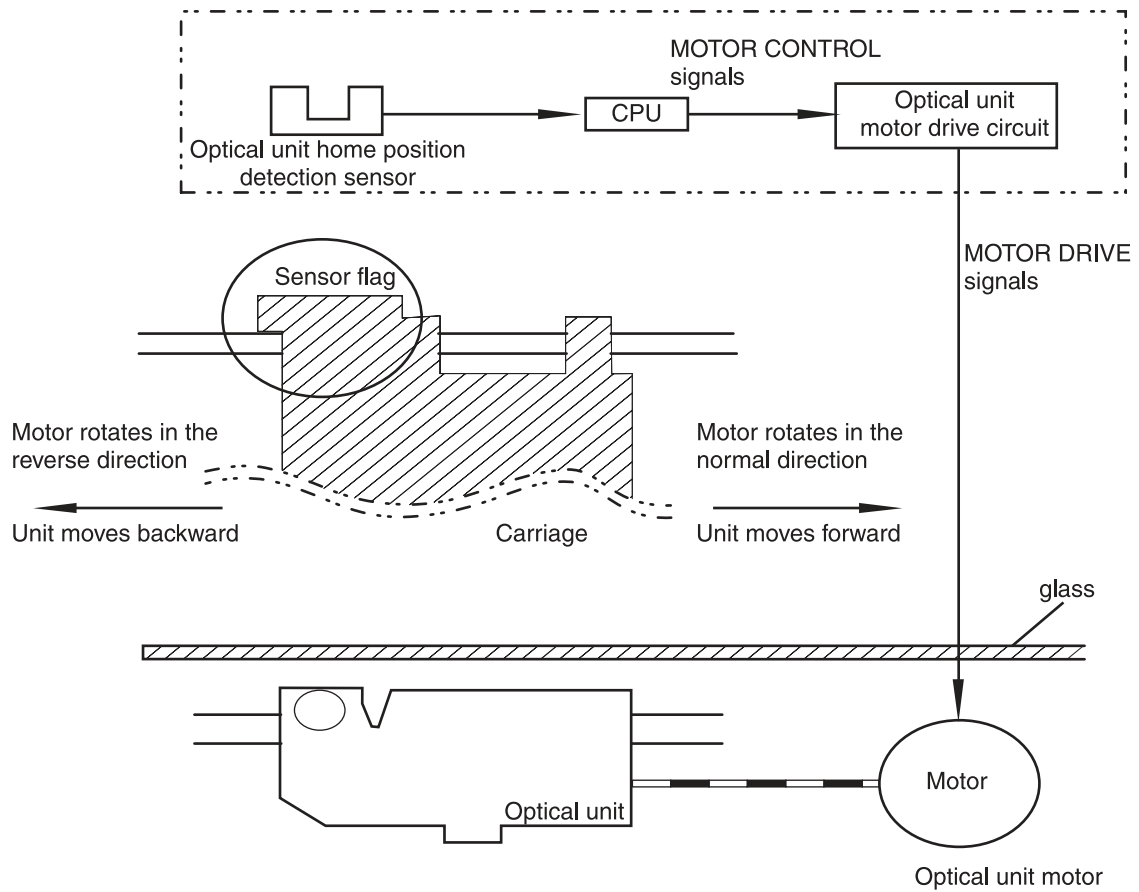
Figure 5-40 Scan carriage movement

ADF feed system

Pages from the original document enter the ADF from the ADF input tray. A separation roller and separation pad work together to separate the top sheet from the stack. The page passes through a set of registration rollers and two sets of feed rollers that advance the page. A set of delivery rollers delivers the page to the ADF output bin. A bin-full sensor detects when the ADF output bin is full, and stops the feed mechanism until the bin is emptied.
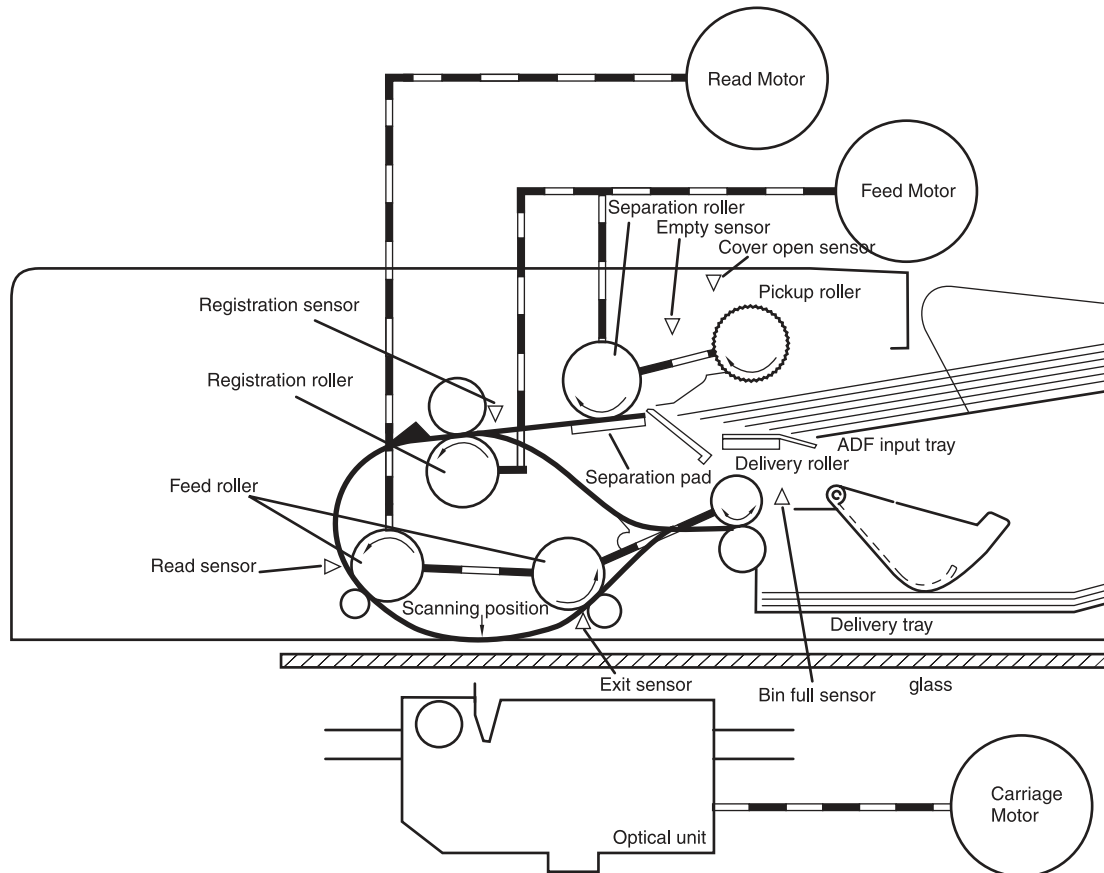
Figure 5-41 ADF paper path and sensors

Jam detection

When the sensors inside the ADF detect a jam, the feed and read motors immediately stop and send a signal to the scanner controller PCA, which notifies the formatter. An **ADF Paper Jam** message appears on the control-panel display.

To clear a jam, open the jam-access cover and remove the media. When no sensors detect media after entering the jam state, the jam message is cleared from the control-panel display.

Residual-media jam

During the initialization sequence or after the ADF jam cover has been opened and closed, if the registration sensor, read sensor, or exit sensor detects the presence of media, the scanner controller PCA determines that a residual-media jam has occurred.

ADF pickup jam

If the leading edge of the media did not reach the registration sensor within a specific period of time, the scanner controller PCA determines that an ADF pickup jam has occurred.

ADF jam

Jams can occur in three places inside the ADF: at the registration senor, read sensor, and exit sensor.

Registration sensor jam

If the registration sensor does not detect the trailing edge of the media after the leading edge reaches the scan-ready position, the scanner-controller PCA determines that an ADF paper jam has occurred.

Also, when the scanner duplexer is being used, if the registration sensor does not detect the leading edge of the media after a specific period of time after media enters the duplexer, the scanner-controller PCA determines that a jam has occurred.

Read sensor jam

If the read sensor does not detect the leading edge of the media within a specific period of time, or if the read sensor does not detect the trailing edge of the media within a specific period of time after it detects the leading edge, the scanner-controller PCA determines that a jam has occurred.

Exit sensor jam

If the exit sensor does not detect the leading edge of the media within a specific period of time after the leading edge reaches the read sensor, or if the exit sensor does not detect the trailing edge of the media within a specific period of time after the read sensor detects the trailing edge, the scanner-controller PCA determines that a jam has occurred.

ADF cover open jam

If the ADF jam-access cover is opened while media is feeding through the ADF, a jam occurs.

ADF open jam

If the ADF is opened while media is feeding through the ADF, a jam occurs.

6 Removal and replacement

This chapter contains information about the following topics:

Removal and replacement strategy

This chapter describes how to remove, replace, and reassemble the major assemblies of the MFP. Replacement is generally the reverse of removal. Notes are provided to assist with any difficult replacement procedures.

To identify the left side and right side of the MFP, face the control panel.

WARNING! Unplug the power cord from the power outlet (at the wall receptacle) before attempting to service the MFP. If you do not follow this warning, severe injury can result. Certain functional checks during troubleshooting might require power to be supplied to the MFP. However, all power should be turned off and the MFP should be unplugged when you remove any MFP assemblies or components. Never operate or service the MFP when the protective cover is removed from the laser/scanner assembly. The reflected beams, although invisible, can damage your eyes.

CAUTION The MFP contains components that are sensitive to electrostatic discharge (ESD). Always perform service work at an ESD-protected workstation. If an ESD-protected workstation is not available, discharge body static by grasping the MFP chassis before touching an ESD-sensitive component. Ground the MFP chassis before servicing the MFP.

Required tools

- #2 Phillips screwdriver

- Short #2 Phillips screwdriver (shaft length of 76 mm [3 inches])

- Right-angle #2 Phillips screwdriver

- Small flat-blade screwdriver

- Needle-nose pliers

- ESD mat (if available; see the preceding ESD caution)

- Penlight (optional)

- Tape (optional)

CAUTION A pozidriv screwdriver can damage screw heads on the MFP. Use a #2 Phillips screwdriver.

Before performing service

■ If possible, print a menu map and configuration page. See Information pages.

■ Remove all of the accessories and print media, the print cartridge, and tray 2 from the MFP.

■ Unplug the power cord from the power outlet at the wall receptacle.

■ Place the MFP on an ESD mat, if one is available. If an ESD-protected workstation is not available, discharge body static by grasping the MFP chassis before touching an ESD-sensitive component. Ground the MFP chassis before servicing the MFP.

After completing service

■ Reinstall the print cartridge.

⚠ **CAUTION**   Do not transport the MFP while the print cartridge is installed.

■ Reconnect all cables to the MFP.

■ Replace all of the accessories and load the media.

■ Print a configuration page and verify that the latest firmware is installed on the MFP.
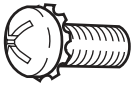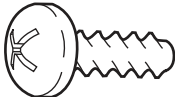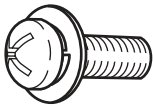
Screws that are used in the MFP

The following table describes the screws that are used in the MFP and provides guidelines to help determine where each type of screw is used. The screws can vary in length depending on the thickness of the material that is being fastened. Always note where each type of screw is located and replace each one in its original location.

NOTE When you are disassembling the MFP, place the screws into the chassis holes from which they were removed. This prevents their loss, and ensures that the correct type and length of screw for each location is used when the MFP is reassembled.

Table 6-1 Common fasteners used in this MFP

Drawing and description	Purpose
Phillips-head machine screw with captive star washer	This screw is used to fasten metal to metal when good electrical contact is needed. This screw also provides high resistance to loosening.
Phillips-head screw with self-tapping threads	This screw is used to fasten sheet metal or plastic to plastic frames (the deep, coarsely spaced threads provide an increased holding capability while decreasing the possibility of stripping the target hole). **NOTE** To install a self-tapping screw, first turn it counterclockwise to align it with the existing thread pattern, and then carefully turn it clockwise to tighten it. You will feel resistance and hear the screw click when it engages the existing threads in the hole. Do not overtighten the screw. If a self-tapping screw-hole becomes stripped, repair the screw-hole or replace the affected assembly.
Phillips washer-head machine screw with a broad, flat washer attached to the screw head	This screw is used to fasten sheet metal parts to the sheet metal chassis. It spans large clearance holes and distributes the load by increasing the bearing surface.

Screw measurement guide

6mm   8mm   10mm   12mm   M3   M4

6   Removal and replacement

User-replaceable parts

The procedures in this section describe the removal and replacement of the following user-replaceable parts:

- Print cartridge
- Control-panel overlays
- Control panel
- Transfer roller
- ADF input tray
- ADF pickup and feed rollers
- ADF separation pad
- ADF delivery guide (clear mylar sheet)
- Output-bin assembly
- Duplex-printing unit
- Fuser-entrance guide
- Fuser
- Tray 2, 3, 4, or 5 pickup and feed rollers
- Tray 1 pickup roller
- Scanner filter cover and scanner filter
- ADF-hinge flap
- Formatter cover and formatter
- Hard drive
- DIMMs
- Flash memory card (firmware)
- Fax accessory

Print cartridge

1 Open the top cover.

2 Grasp the print cartridge, and remove it from the MFP.

Control-panel overlays

Use a small, flat-blade screwdriver to release the two control-panel overlays (callout 1).

Figure 6-1 Remove the control-panel overlays

Control panel

1 Pull the top of the control panel away from the MFP to release the upper locking tabs.

Figure 6-2 Remove the control panel (1 of 2)

2 Rotate the top of the control panel away from the MFP.

3 Disconnect one connector (callout 1) and remove the control panel.
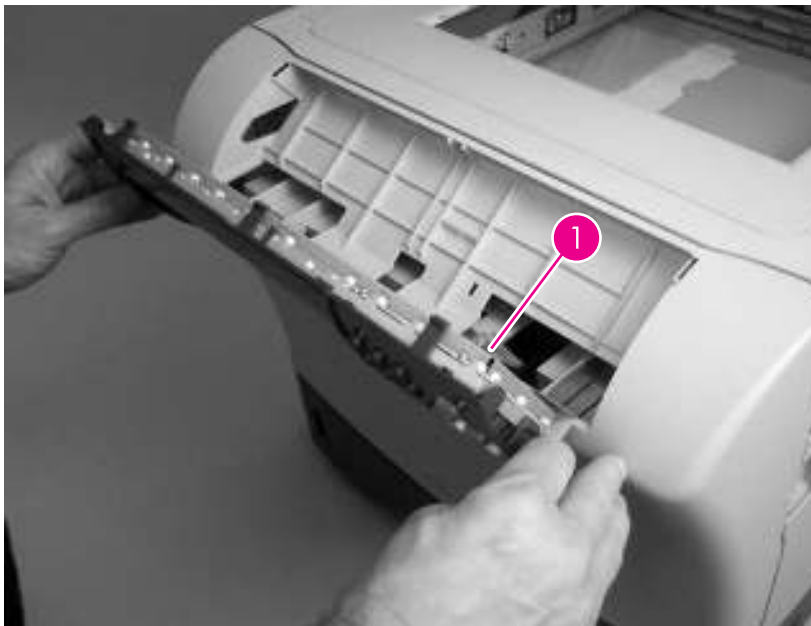
Figure 6-3 Remove the control panel (2 of 2)

Transfer roller

1   Remove the print cartridge. See <u>Print cartridge</u>.

> ⚠ **CAUTION**   Do not touch the black rubber on the transfer roller. Skin oils on the roller can cause print-quality problems. Use disposable gloves when you remove the transfer roller.

2   Use a flat-blade screwdriver to lift the left end of the metal shaft out of place (near the blue gear). Slide the transfer roller to the left to remove it.

> 📝 **NOTE**   When you install the transfer roller, make sure that the black collar on the left side is oriented correctly, with the open end face-down (the solid end is face-up).
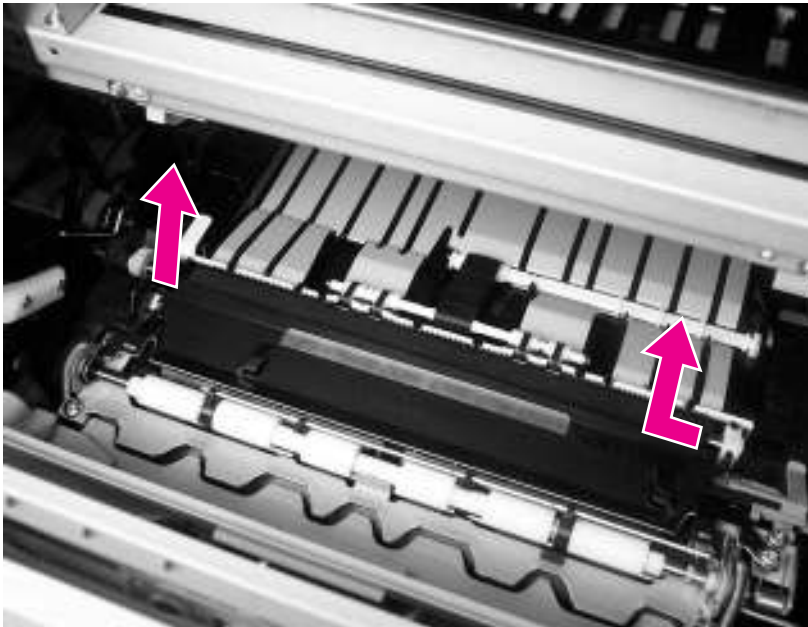
Figure 6-4   Remove the transfer roller

ADF input tray

1 Open the ADF top cover.

Figure 6-5 Remove the ADF input tray (1 of 3)

2 Flex the pivot pin (near the control panel) away from the mounting hole in the ADF chassis.

Figure 6-6 Remove the ADF input tray (2 of 3)

3   Remove the ADF input tray.

Figure 6-7 Remove the ADF input tray (3 of 3)

ADF pickup and feed rollers

1 Open the ADF top cover.

2 Push down on the locking tab (callout 1), and rotate the top of the assembly away from the ADF.
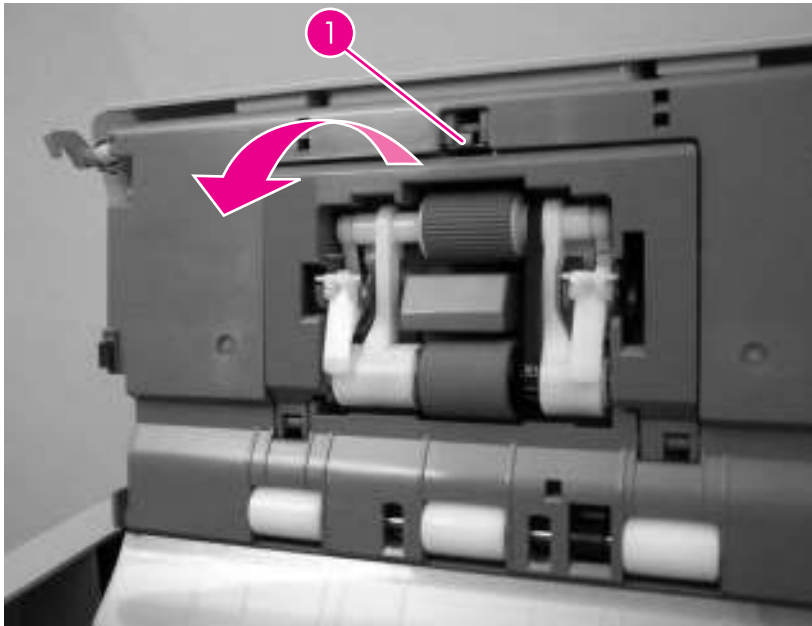
Figure 6-8 Remove the ADF pickup and feed rollers (1 of 2)

3 Release the front (gear end) of the roller-assembly drive-shaft, and slide the assembly toward the front of the MFP to remove it.
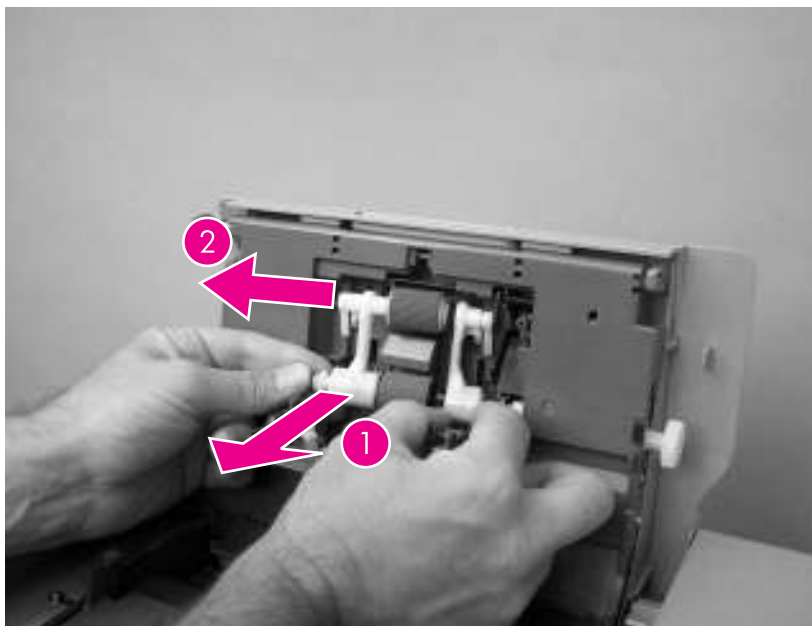
Figure 6-9 Remove the ADF pickup and feed rollers (2 of 2)

ADF separation pad

1 Open the ADF top cover

2 Raise the separation-pad-frame assembly, and push the bottom edge of the separation pad away from the frame.
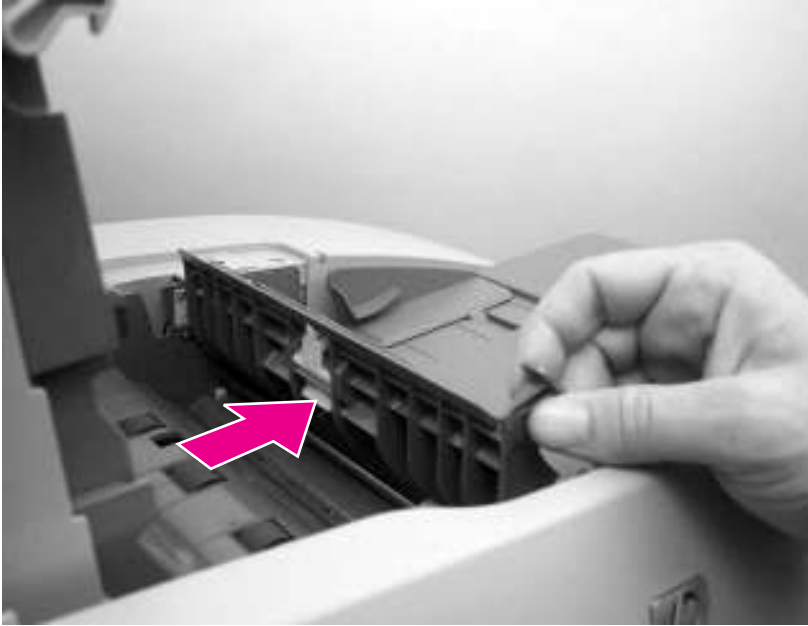
Figure 6-10 Remove the ADF separation pad (1 of 2)

3 Remove the ADF separation-pad assembly.
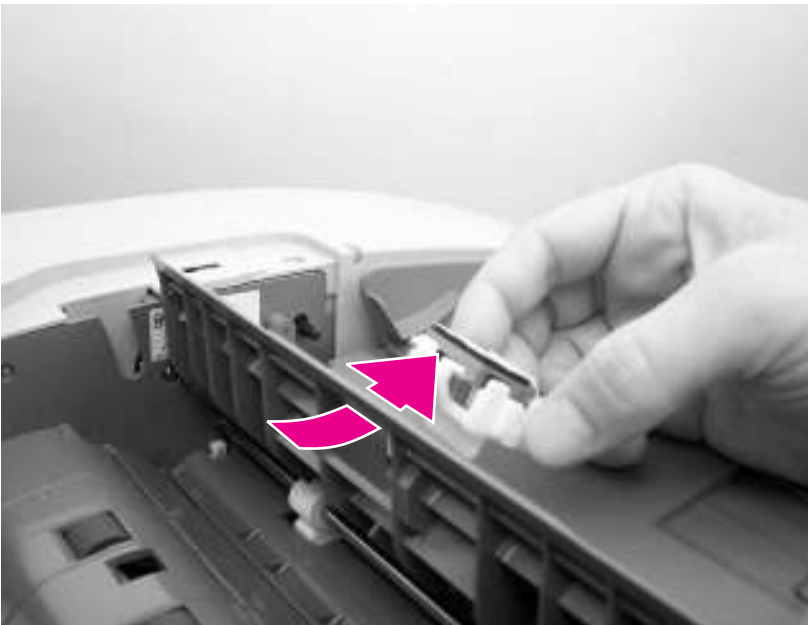
Figure 6-11 Remove the ADF separation pad (2 of 2)

ADF delivery guide (clear mylar sheet)

1   Open the ADF/scanner assembly and release the two tabs at the top and bottom of the ADF delivery-guide cover.
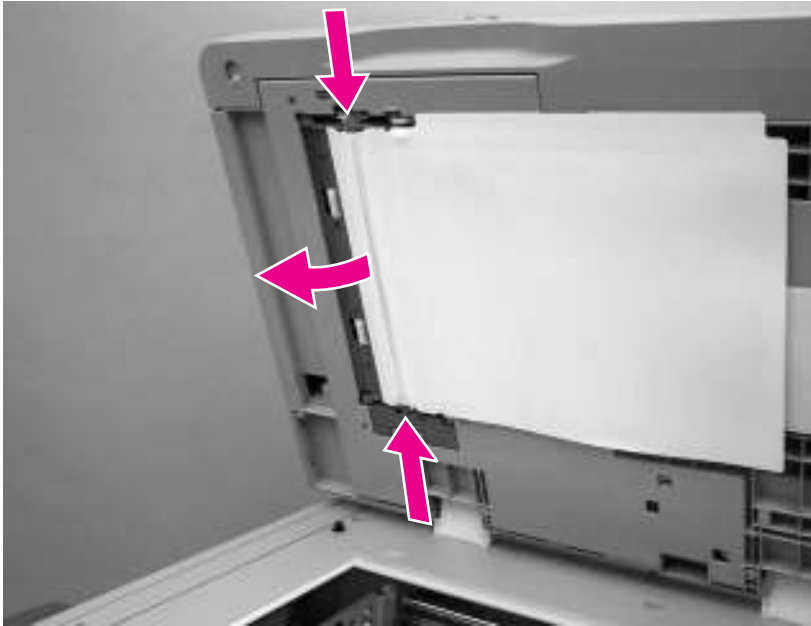
Figure 6-12 Remove the ADF delivery guide (1 of 3)

2   Carefully unhook the clear mylar sheet from the four tabs on the ADF delivery-guide cover (callout 2), and then remove the mylar sheet.
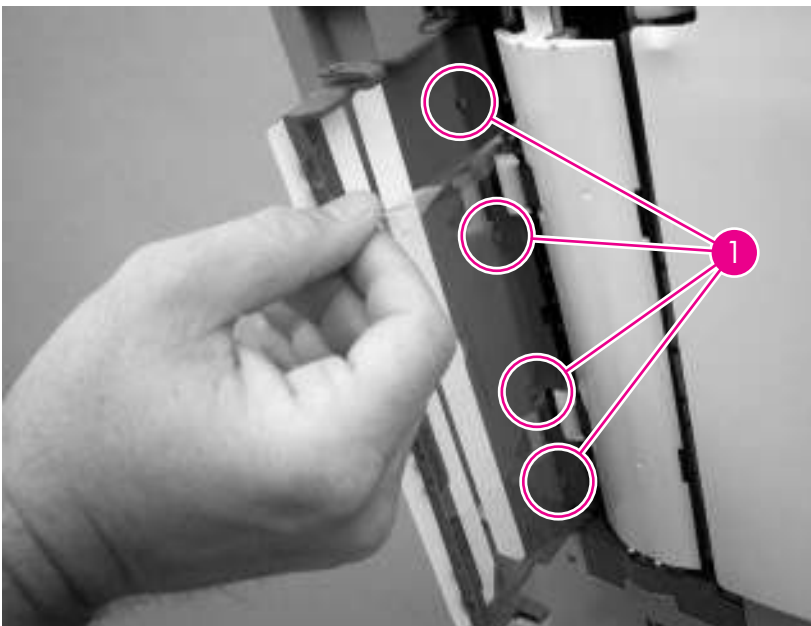
Figure 6-13 Remove the ADF delivery guide (2 of 3)

3 If necessary, pull the ADF delivery-guide-cover hinges off the hinge pins (callout 2) to remove the cover.
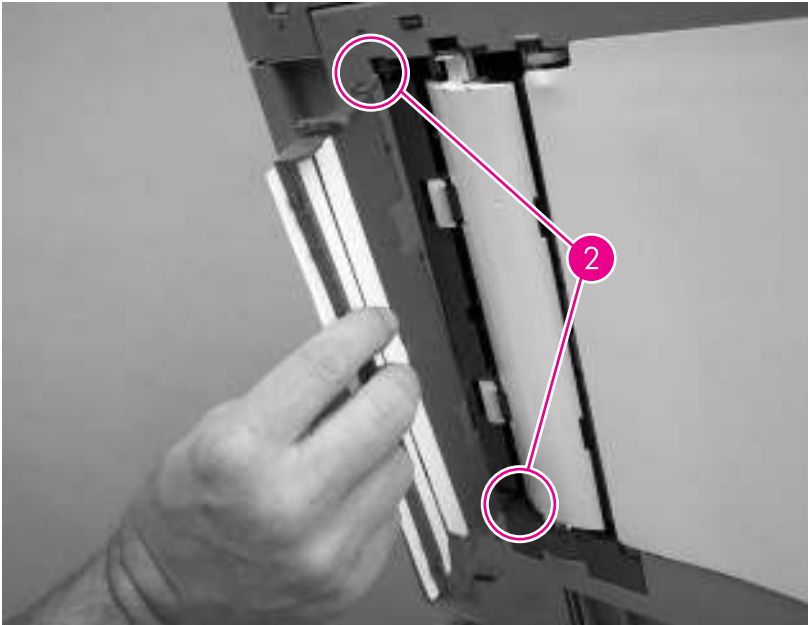
Figure 6-14 Remove the ADF delivery guide (3 of 3)

4 **Reinstallation tip:** The clear mylar sheet is keyed with a small notch at the top. Be sure to align the notch with the round pin that is on the holder.
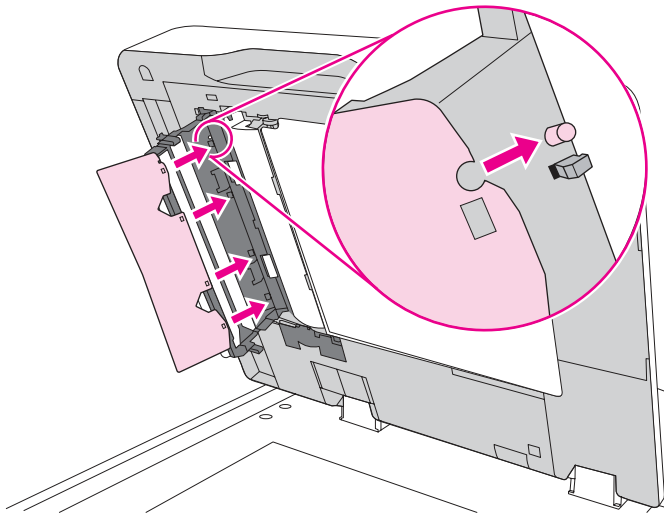
Figure 6-15 Reinstall the clear mylar sheet

6 Removal and replacement

Output-bin assembly

1 Slide the output-bin assembly away from the MFP.
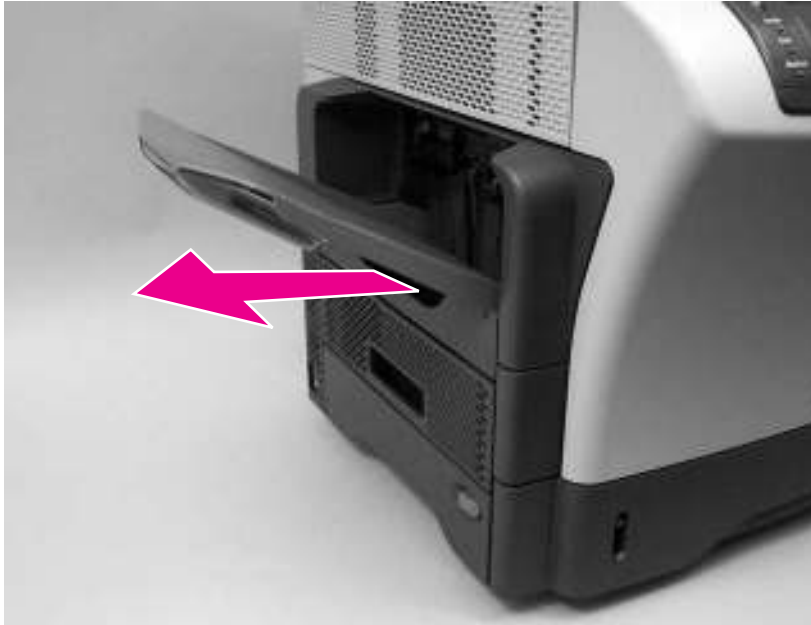
Figure 6-16 Remove the output-bin assembly (1 of 2)

2 Lift up slightly on the output-bin assembly to disengage the slide rails, and then remove the assembly.

Figure 6-17 Remove the output-bin assembly (2 of 2)

Duplex-printing unit

1   Slide the duplex-printing unit away from the MFP.
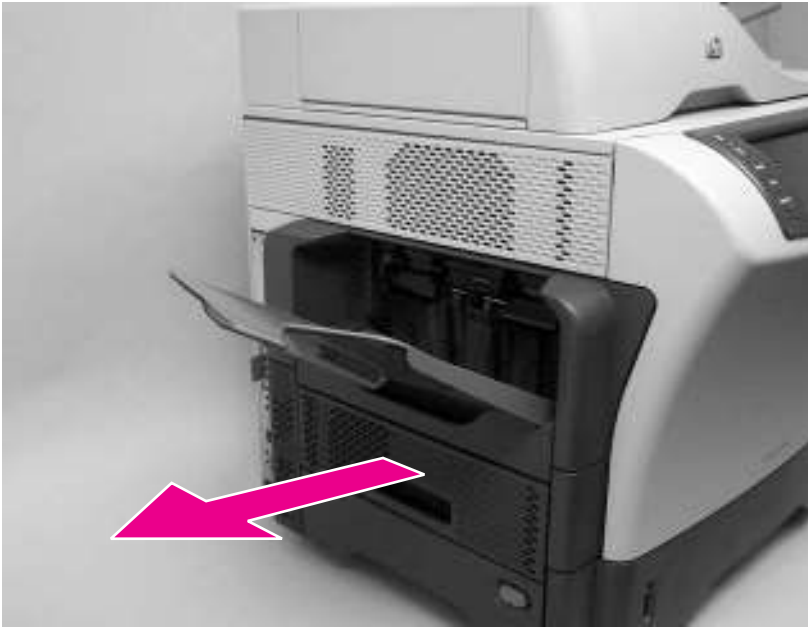
Figure 6-18 Remove the duplex-printing unit (1 of 2)

2   Slightly lift up on the duplex-printing unit to disengage the slide rails, and then remove it.

Figure 6-19 Remove the duplex-printing unit (2 of 2)

Fuser-entrance guide

1 Remove the following assemblies.

● Output bin. See Output-bin assembly.

● Duplexer. See Duplex-printing unit.

2 Flex the rear hinge-pin of the fuser-entrance guide until it clears the mounting hole in the MFP chassis.

3 Rotate the rear of the guide away of the MFP and slide the guide to the left to release the front hinge-pin. Remove the fuser-entrance guide.

Figure 6-20 Remove the fuser-entrance guide

Fuser

> **CAUTION** The fuser is very hot. After turning the MFP power off, allow the fuser to cool for at least 30 minutes before removing it.

1   Remove the following assemblies.

   ●   Output bin. See Output-bin assembly.

   ●   Duplex-printing unit. See Duplex-printing unit.

   ●   Fuser-entrance guide. See Fuser-entrance guide.

2   Squeeze the two blue tabs on the fuser to release it, and then slide it out of the MFP.
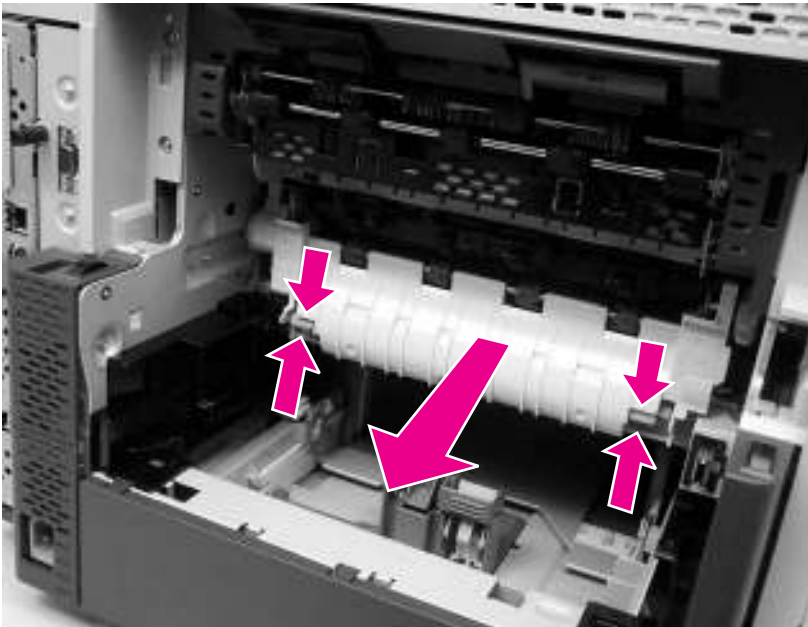
Figure 6-21 Remove the fuser

Tray 2, 3, 4, or 5 pickup and feed rollers

1   Remove the cassette from the tray.

2   Pinch the roller latch (callout 1) to release the roller, and then slide the roller off of the shaft.
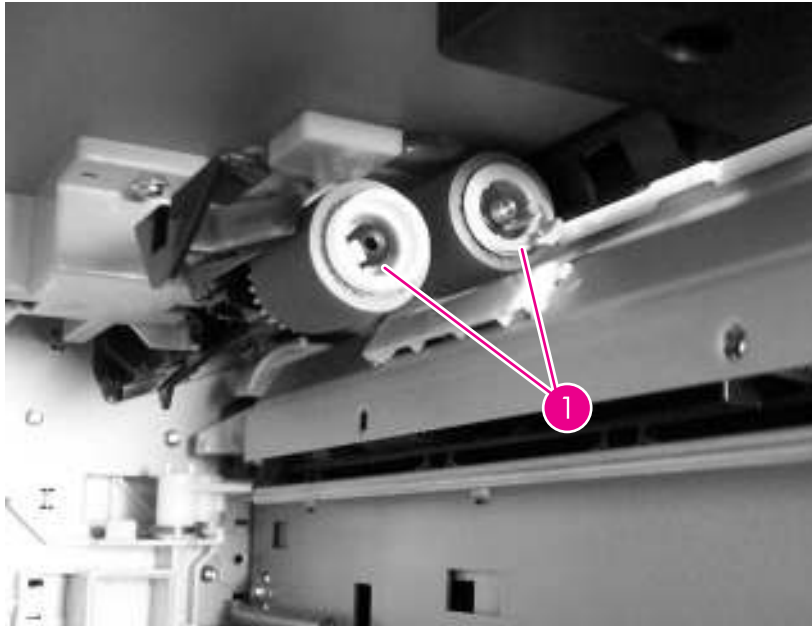
Figure 6-22   Remove the tray 2, 3, 4, or 5 pickup and feed rollers (1 of 2)

3   Open the jam-access door. Pinch the roller latch to release the roller, and then slide the roller off of the shaft.
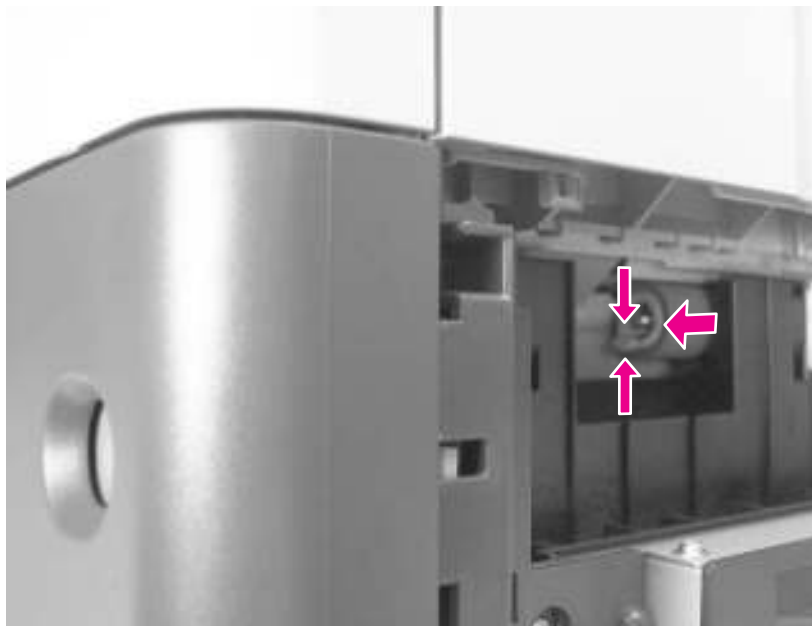
Figure 6-23   Remove the tray 2, 3, 4, or 5 pickup and feed rollers (2 of 2)

Tray 1 pickup roller

1 Open tray 1.

📝 **NOTE** If the optional envelope-feeder accessory is installed, remove it.

2 Release the two locking tabs on the pickup-roller frame and remove the tray 1 pickup roller.
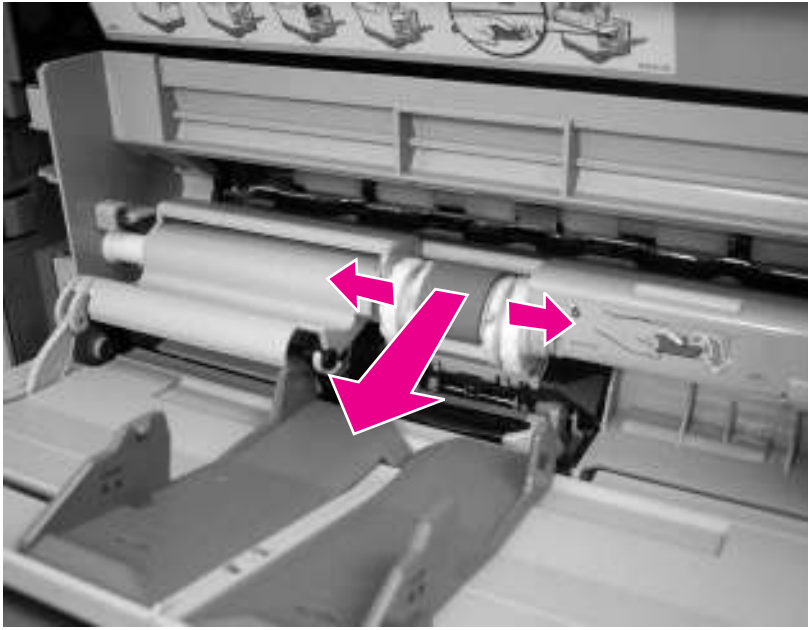
Figure 6-24 Remove the tray 1 pickup roller

Scanner filter cover and scanner filter

1 Remove the scanner-filter cover.

Remove the scanner filter (1 of 2)

2 Remove the filter.

Figure 6-26 Remove the scanner filter (2 of 2)

ADF-hinge flap

1 Use a small, flat-blade screwdriver to release the locking tabs on one side of the ADF-hinge flap.

Figure 6-27 Remove the ADF-hinge flap (1 of 3)

2 Repeat step one for the other side of the ADF-hinge flap.

Figure 6-28 Remove the ADF-hinge flap (2 of 3)

6   Removal and replacement

3 Pull the ADF-hinge flap away from the MFP to remove it.

Figure 6-29 Remove the ADF-hinge flap (3 of 3)

NOTE To position the ADF-hinge flap correctly when reinstalling it, insert the locator pins that are in the middle of the plastic mounting-bracket into the first row of slots above the ADF hinge.

Formatter cover and formatter

1 Slide the formatter cover toward the left side of the MFP and remove it.

Figure 6-30 Remove the formatter cover and formatter (1 of 3)

2 Remove two thumb screws (callout 1).
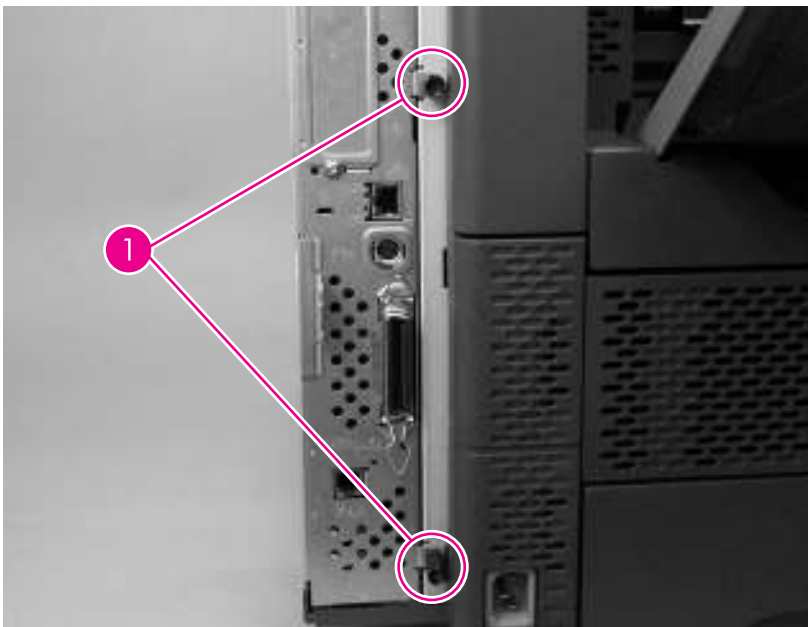
Figure 6-31 Remove the formatter cover and formatter (2 of 3)

3 Slide the formatter toward the left side of the MFP, and then remove it.

Figure 6-32 Remove the formatter cover and formatter (3 of 3)

NOTE Dislodging the formatter might require considerable force.

Hard drive

WARNING! The MFP contains components that are sensitive to electrostatic discharge (ESD). Always perform service work at an ESD-protected workstation. If an ESD-protected workstation is not available, discharge body static by grasping the MFP chassis before touching an ESD-sensitive component. Ground the MFP chassis before servicing the MFP.

1   Remove the formatter cover, and open the formatter-cage door. See Formatter cover and formatter.

2   Disconnect the flat, flexible cable (FFC) (callout 1) from the hard drive.
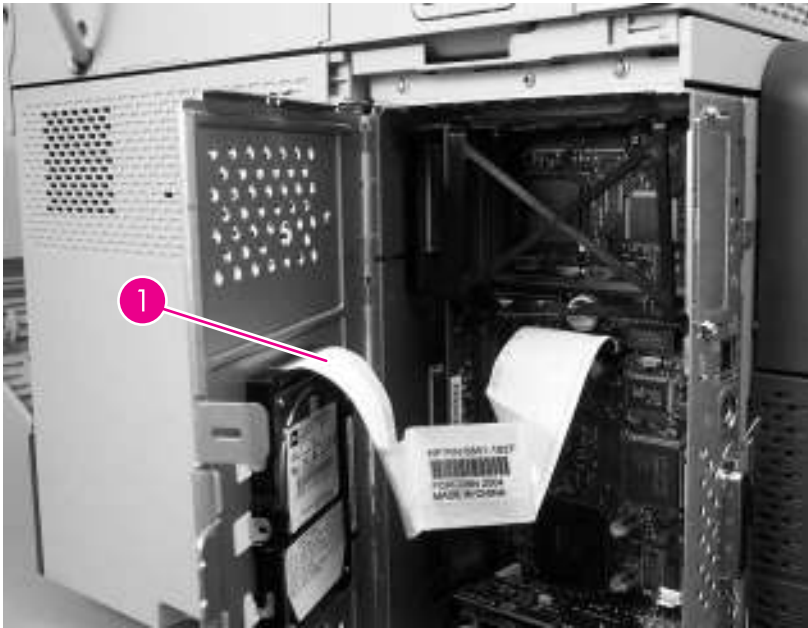
Figure 6-33 Remove the hard drive (1 of 2)

3 Squeeze the locking tab that is in the center of the left side of the hard drive. Push up on the hard drive to remove it.
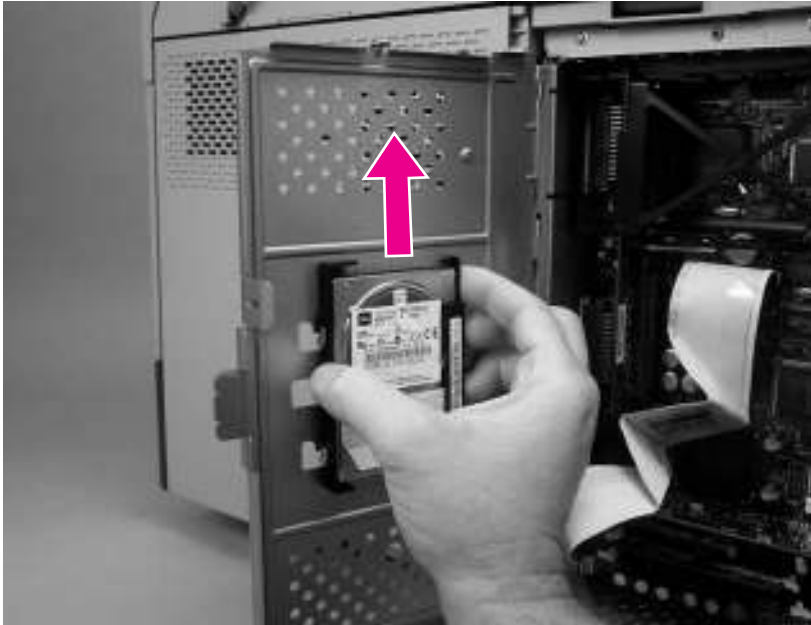
Figure 6-34 Remove the hard drive (2 of 2)

DIMMs

WARNING! The MFP contains components that are sensitive to electrostatic discharge (ESD). Always perform service work at an ESD-protected workstation. If an ESD-protected workstation is not available, discharge body static by grasping the MFP chassis before touching an ESD-sensitive component. Ground the MFP chassis before servicing the MFP.

NOTE If possible, print a menu map and a configuration page. See Information pages. Use the information on the these pages to restore any user-set MFP configuration options after you install the replacement DIMMs.

---

1   Remove the formatter cover, and open the formatter cage door. See Formatter cover and formatter.

2   Push the DIMM locking arms away from the DIMM to release it. Remove the DIMM
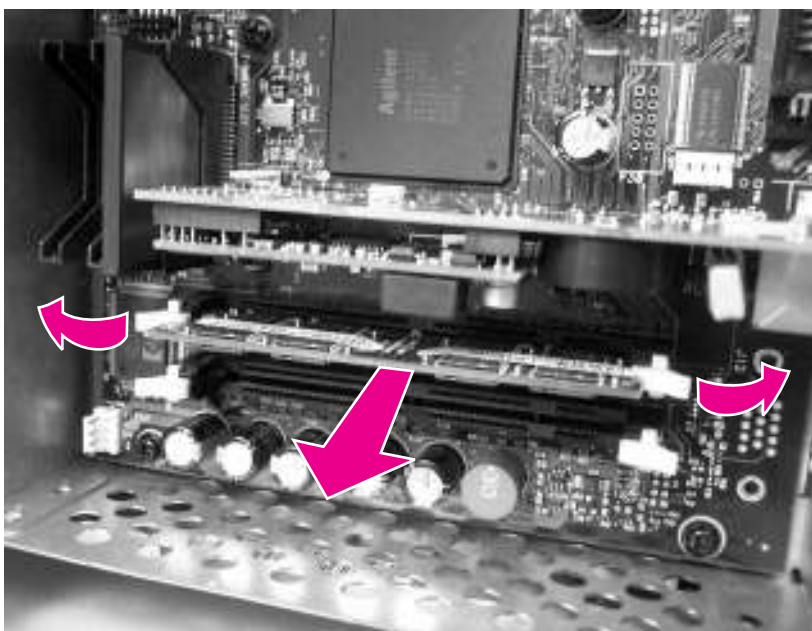
Figure 6-35 Remove the DIMM

Flash memory card (firmware)

> **WARNING!** The MFP contains components that are sensitive to electrostatic discharge (ESD). Always perform service work at an ESD-protected workstation. If an ESD-protected workstation is not available, discharge body static by grasping the MFP chassis before touching an ESD-sensitive component. Ground the MFP chassis before servicing the MFP.

1   Remove the formatter cover, and open the formatter-cage door. See Formatter cover and formatter.

2   Grasp the flash memory card, and then pull it out of the formatter cage.

> **NOTE** When reinstalling the firmware flash memory card, it *must* be installed in the slot marked *FIRMWARE SLOT*.
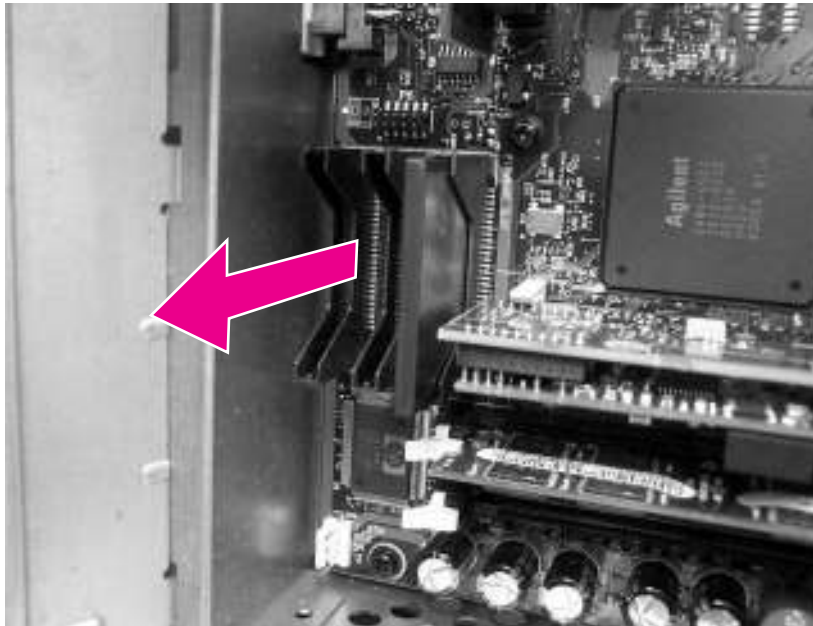
Figure 6-36 Remove a flash memory card

Fax accessory

WARNING!   The MFP contains components that are sensitive to electrostatic discharge (ESD). Always perform service work at an ESD-protected workstation. If an ESD-protected workstation is not available, discharge body static by grasping the MFP chassis before touching an ESD-sensitive component. Ground the MFP chassis before servicing the MFP.

---

1   Remove the formatter cover, and open the formatter-cage door. See Formatter cover and formatter.

2   Grasp the fax-accessory card, and then pull it out of the formatter cage.
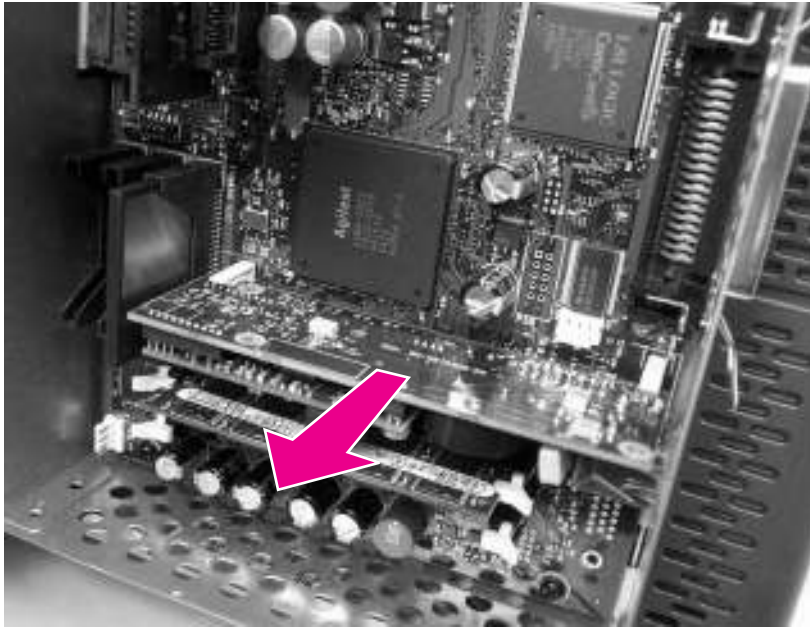
Figure 6-37   Remove the fax accessory

Covers, doors, and external panels

The procedures in this section describe the removal and replacement of the following components:

- <u>Top-cover flatbed flange</u>
- <u>Front cover</u>
- <u>Back cover</u>

Top-cover flatbed flange

1   Grasp one end of the flange and push up on it to release the flange locking pins.

Figure 6-38 Remove the top-cover flatbed flange (1 of 2)

2   Repeat step 1 for the other end of the flange, and then remove the flange.

Figure 6-39 Remove the top-cover flatbed flange (2 of 2)

Front cover

1 Remove the following assemblies.

- Control panel. See Control panel.

- Top-cover flatbed flange. See Top-cover flatbed flange.

2 Remove two screws (callout 1).

📝 **NOTE** Both screws are behind the control-panel frame.
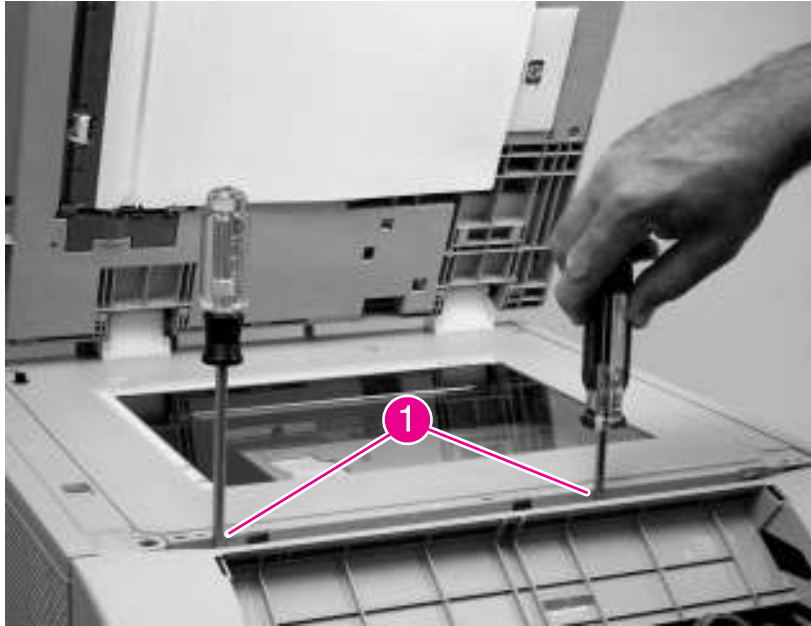
Figure 6-40 Remove the front cover (1 of 7)

3 Open the top cover, and remove one screw (callout 2).
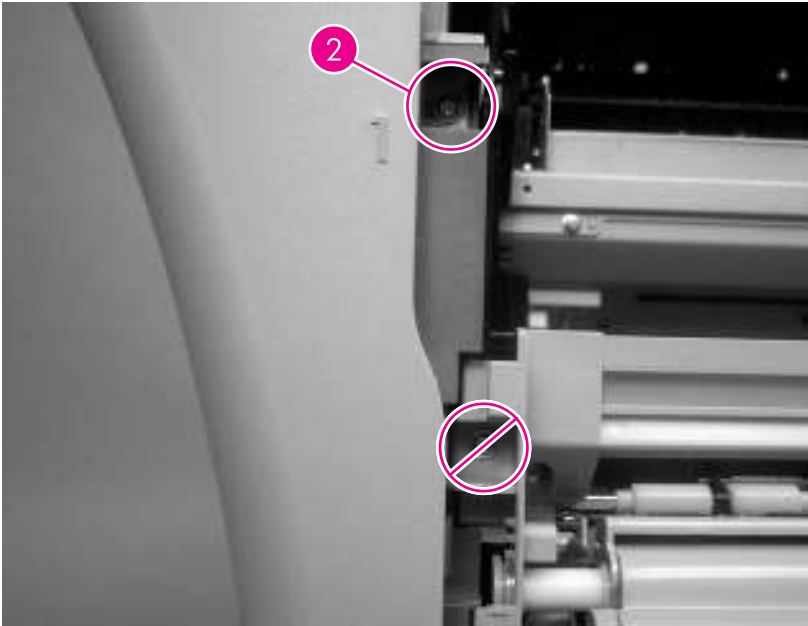
Figure 6-41 Remove the front cover (2 of 7)

⚠ **CAUTION** Do not remove the screw near the feed assembly.

4 Remove the tray 2 cassette, and then remove two screws (callout 3).
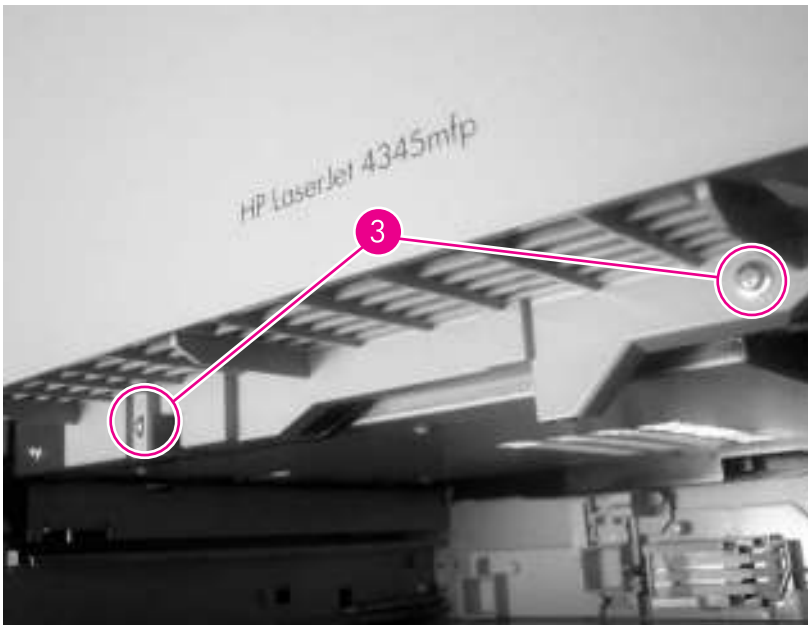
Figure 6-42 Remove the front cover (3 of 7)

5 Slide the output bin away from the MFP, and release the front-cover retaining tab on the left side.

Figure 6-43 Remove the front cover (4 of 7)

6 Release the two locking tabs on the right side.
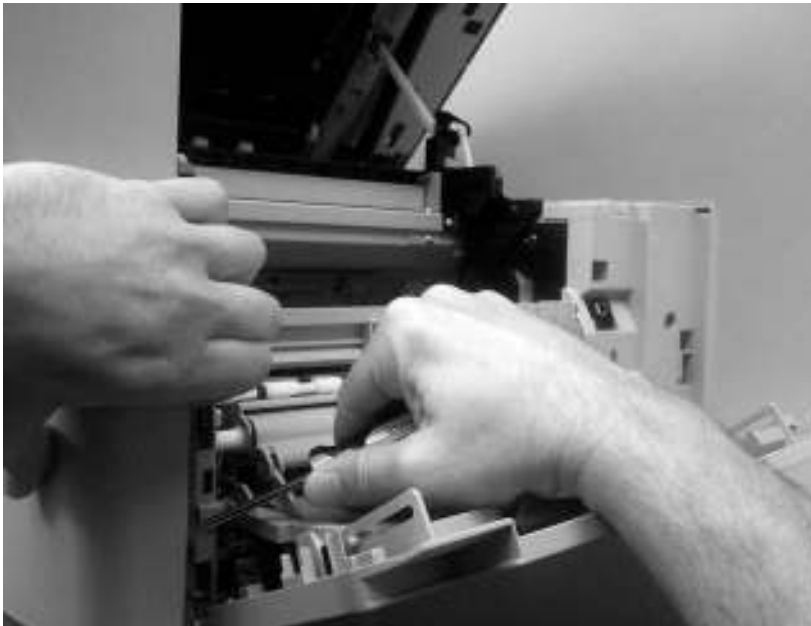
Figure 6-44 Remove the front cover (5 of 7)

7 Flex the bottom of the cover away from the MFP to release the locking tab at the mid-bottom, and then push up on the cover to raise it slightly.

Figure 6-45 Remove the front cover (6 of 7)

8 Pull the front cover away from the MFP and then up to remove it.

Figure 6-46 Remove the front cover (7 of 7)

6   Removal and replacement

Back cover

1 Remove the formatter. See <u>Formatter cover and formatter</u>.

2 Remove one screw (callout 1)
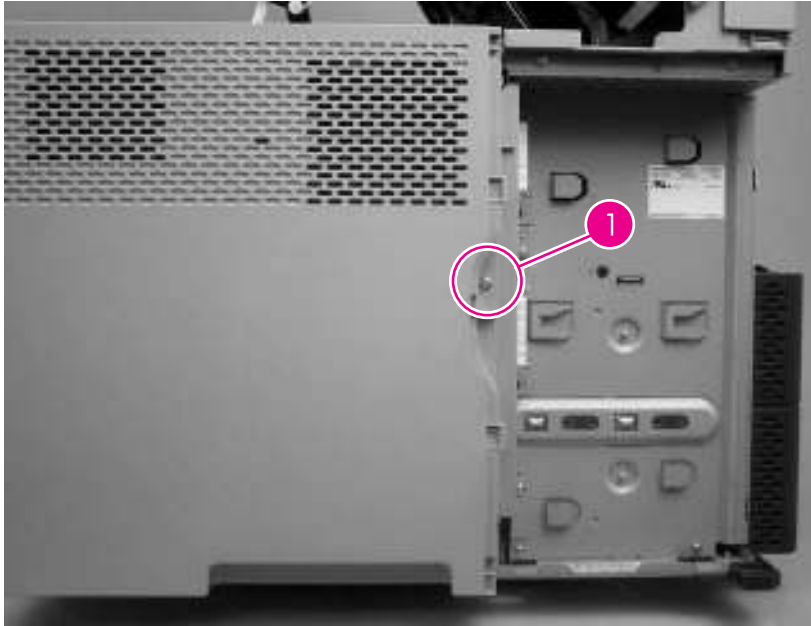
Figure 6-47 Remove the back cover (1 of 3)

3 Release three locking tabs along the top of the back cover.

Figure 6-48 Remove the back cover (2 of 3)

4 Release three locking tabs along the side of the back cover. (The bottom tab is behind the hinge for the tray 2 jam-access cover.) Rotate the top of the back cover away from the MFP, and then lift it up and off of the MFP.
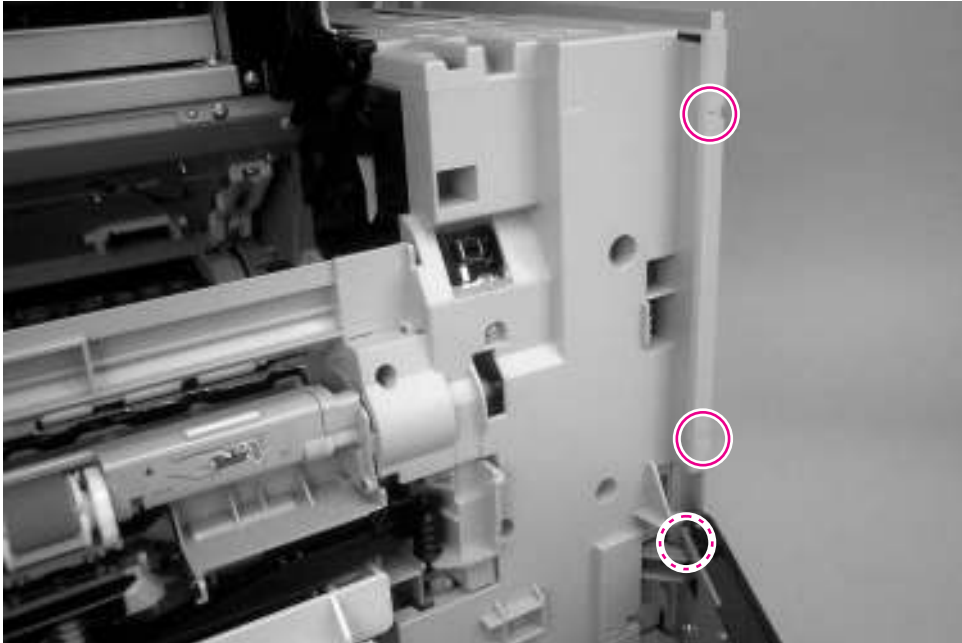
Figure 6-49 Remove the back cover (3 of 3)

Internal assemblies

The procedures in this section describe the removal and replacement of the following components:

- Reversing-separation-guide assembly
- Reversing assembly
- Main fan (FN101) and reversing-unit fan (FN103)
- Thermistor (TH3)
- Tray 2 jam-access-cover switch (SW105)
- Tray 1 assembly
- Front-cover support
- Tray 1 feed-assembly
- Feed-roller assembly
- DC controller
- Main motor (M101)
- DC controller fan (FN104)
- Print-cartridge fan (FN102)
- Print-cartridge motor (M102)
- Top-cover switch (SW101)
- Registration assembly
- Paper-pickup-drive assembly
- Lifter-drive assembly
- Power-factor-correction (PFC) power supply
- Engine power supply
- Paper-feed assembly
- Tray 2 detection switch
- Paper-size-detection switch (SW102)
- Tray 2 paper-present sensor (PS101)
- Laser/scanner
- Output-bin-full sensor

Reversing-separation-guide assembly

1 Open the top cover.

2 Flex the front tab to release one side of the reversing-separation-guide assembly.

Figure 6-50 Remove the reversing-separation-guide assembly (1 of 2)

3 Lower the released side, and then pull the rear pivot-pin out of the metal bracket.

Figure 6-51 Remove the reversing-separation-guide assembly (2 of 2)

NOTE When it is installed, the reversing-separation-guide assembly normally fits loosely.

6 Removal and replacement

Reversing assembly

1   Remove the reversing-separation-guide assembly. See Reversing-separation-guide assembly.

2   Remove three screws (callout 1).
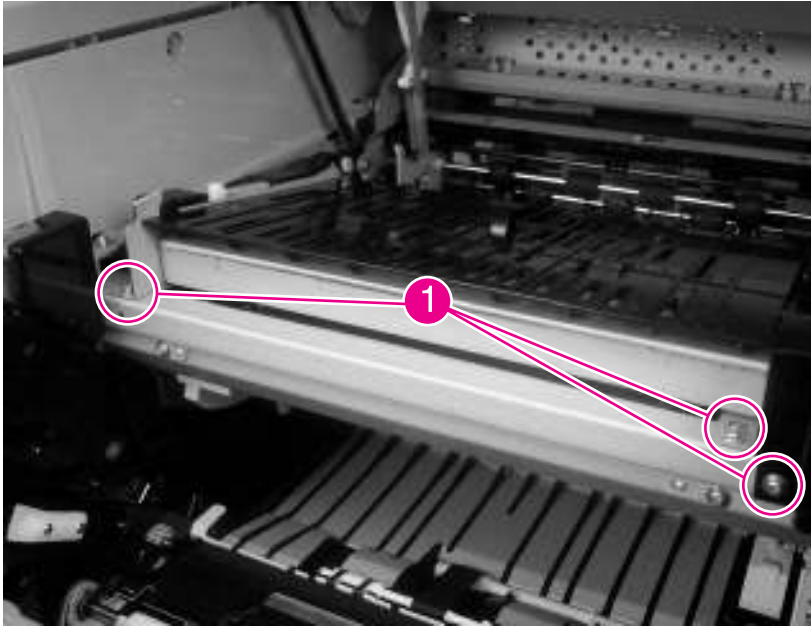
Figure 6-52   Remove the reversing assembly (1 of 8)

3 Unlock the tab on the right-reverse-assembly-drive cover, and remove the cover.

Figure 6-53 Remove the reversing assembly (2 of 8)

> **CAUTION** The spring that is under the right-reversing-assembly lever is not captive. Do not lose the spring that is under the lever when you remove the cover. Make sure you seat the spring correctly on the chassis pedestal when you reinstall the cover.

4 Unlock the two tabs (callout 2) on the left-reverse-assembly-drive cover, and remove the cover.
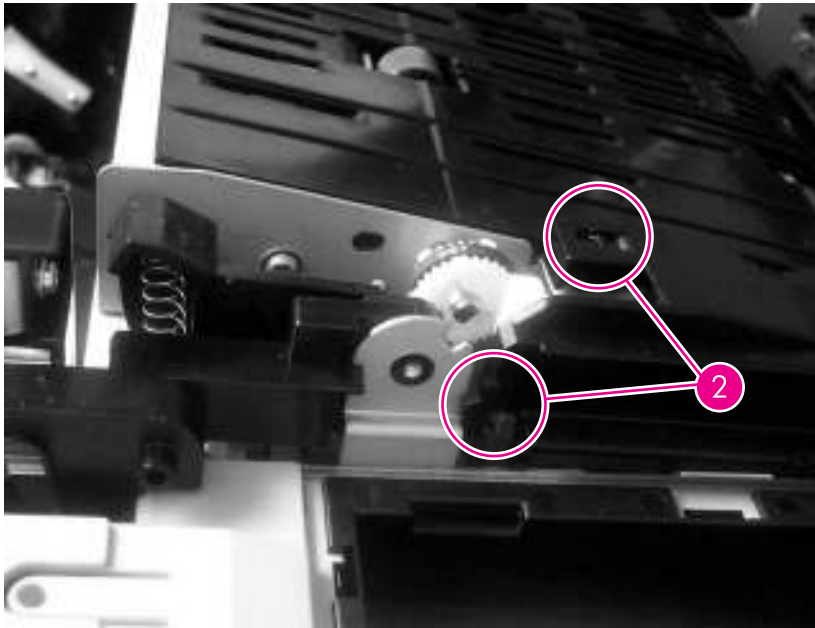
Figure 6-54 Remove the reversing assembly (3 of 8)

📝 **NOTE** When reinstalling the cover, make sure that the metal tab on the sheet-metal chassis (near the rear door-piston) is in the slot in the cover (callout 3).
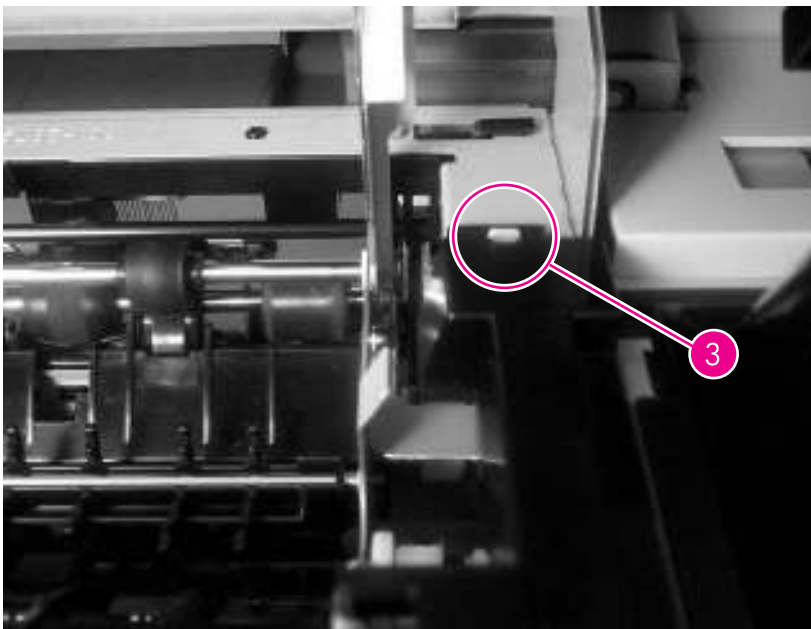
Figure 6-55 Remove the reversing assembly (4 of 8)

5 Push up on the swing-arm-locking tab, and release the bottom of the swing arm. Repeat for the remaining swing arm (near the front of the MFP).
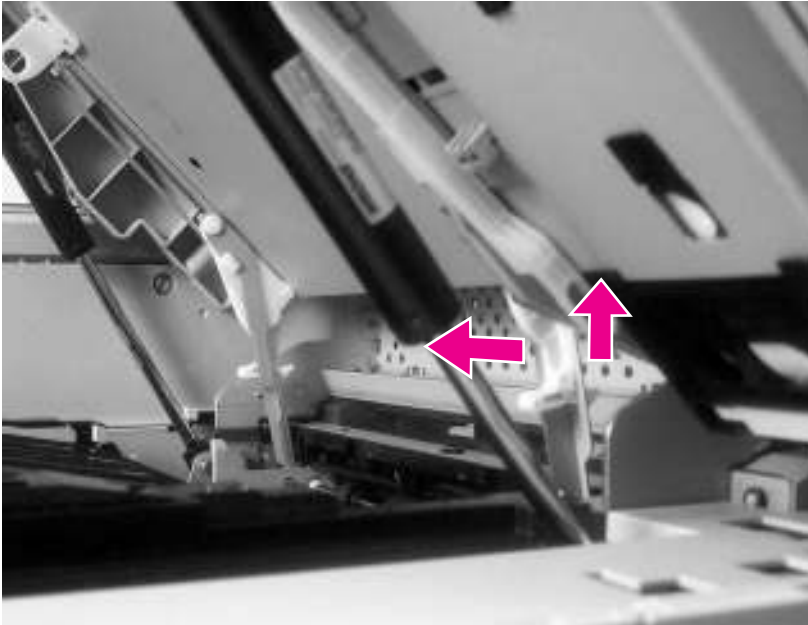
Figure 6-56 Remove the reversing assembly (5 of 8)

6 Rotate the swing arm up to release the swing-arm pivot. Repeat for the remaining swing arm (near the front of the MFP).
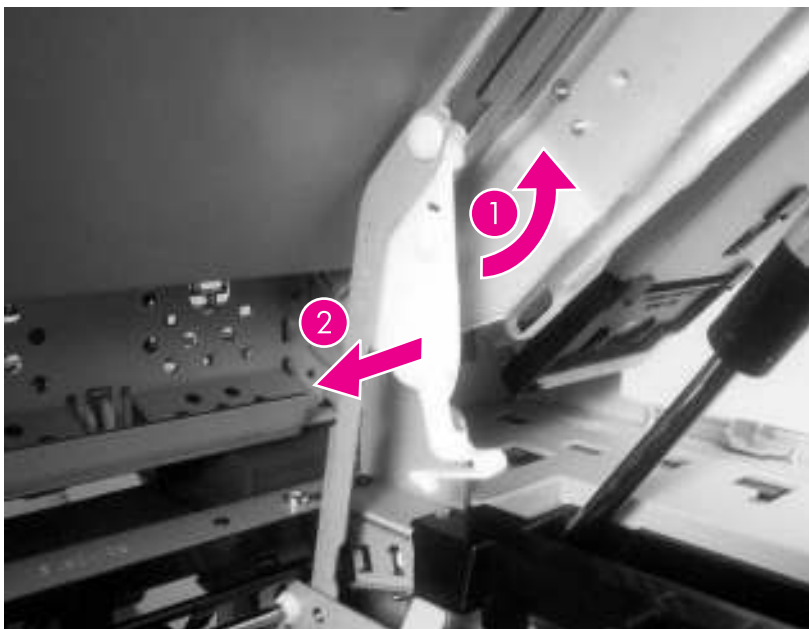
Figure 6-57 Remove the reversing assembly (6 of 8)

7   Disconnect two connectors (callout 4).
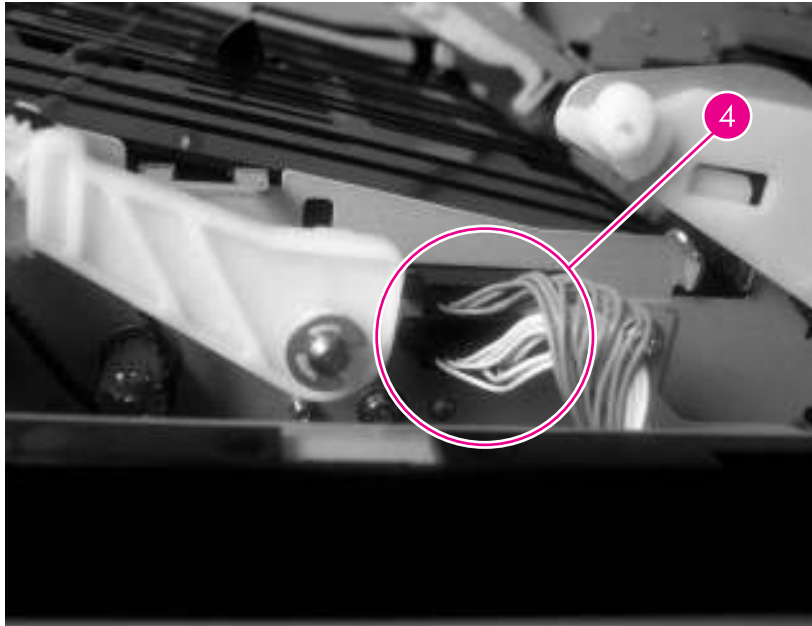
Figure 6-58 Remove the reversing assembly (7 of 8)

8   Lift out the reversing assembly.

Figure 6-59 Remove the reversing assembly (8 of 8)

NOTE   When you reinstall the reversing assembly, make sure that the swing-arm locking tabs are fully seated into the sheet-metal mounting slots.

Main fan (FN101) and reversing-unit fan (FN103)

1   Remove the front cover. See Front cover.

2   Remove two screws (callout 1), and then remove the fan duct.
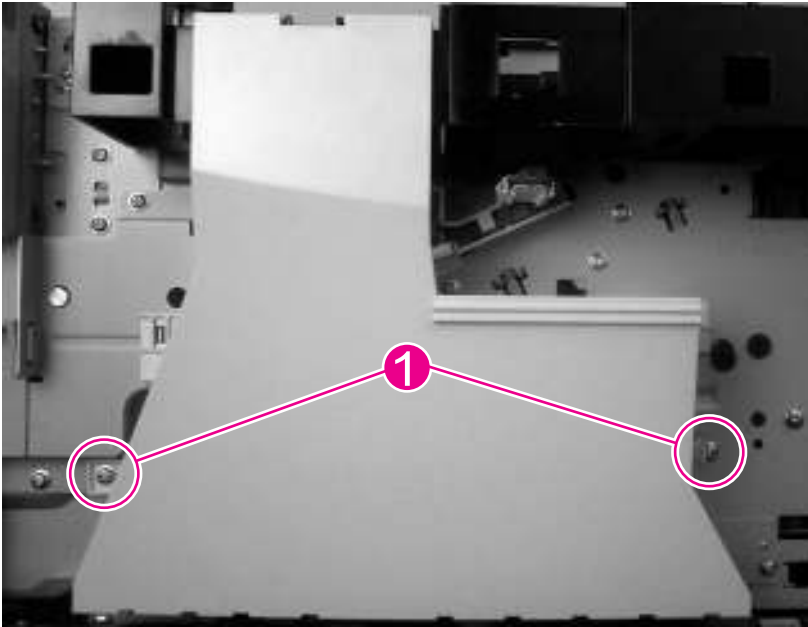
Figure 6-60 Remove the main fan and reversing-unit fan (1 of 9)

3   **Main fan**: Remove one screw (callout 2), unhook the thermistor, and then move the thermistor to the side.
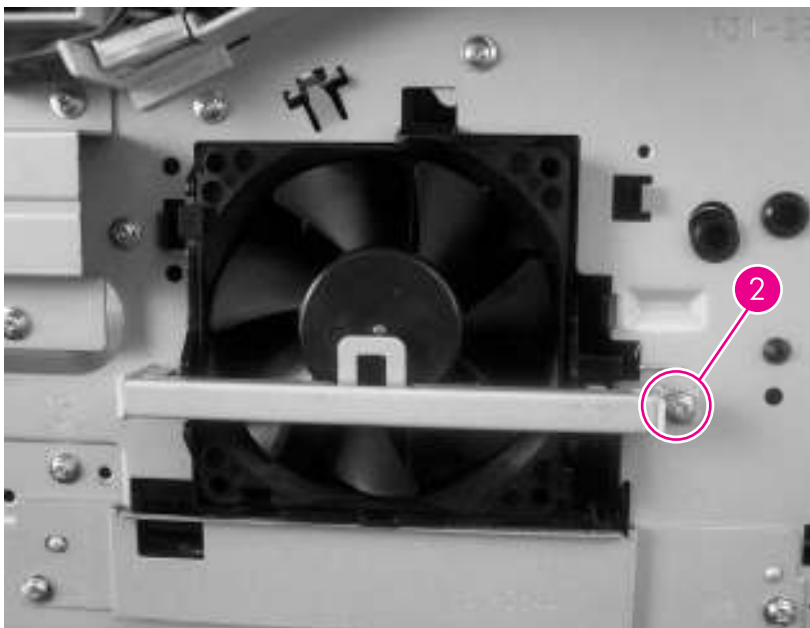
Figure 6-61 Remove the main fan and reversing-unit fan (2 of 9)

4 Remove two screws (callout 3), and remove the power-supply shield.
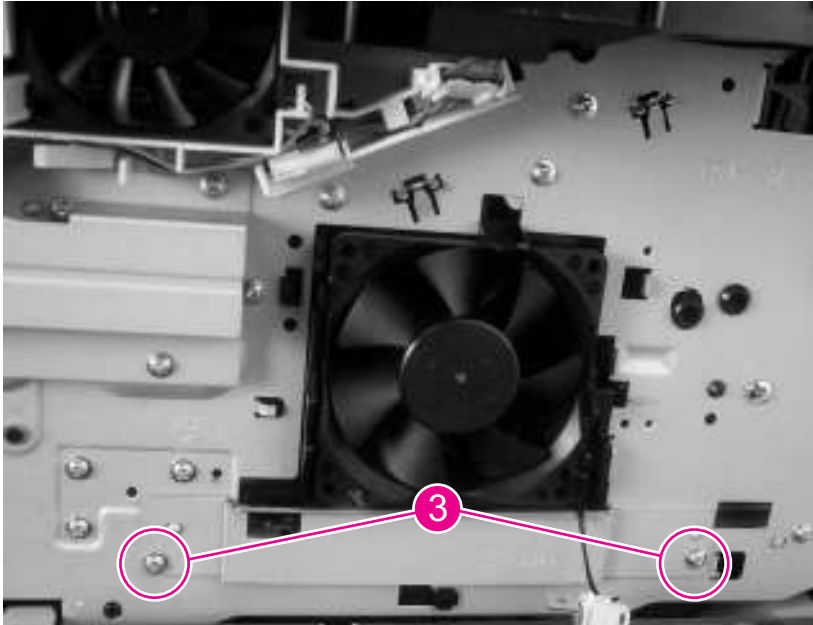
Figure 6-62 Remove the main and reversing-unit fans (3 of 9)

5 Unclip the two main-fan locking tabs (callout 4), and then remove the main fan.
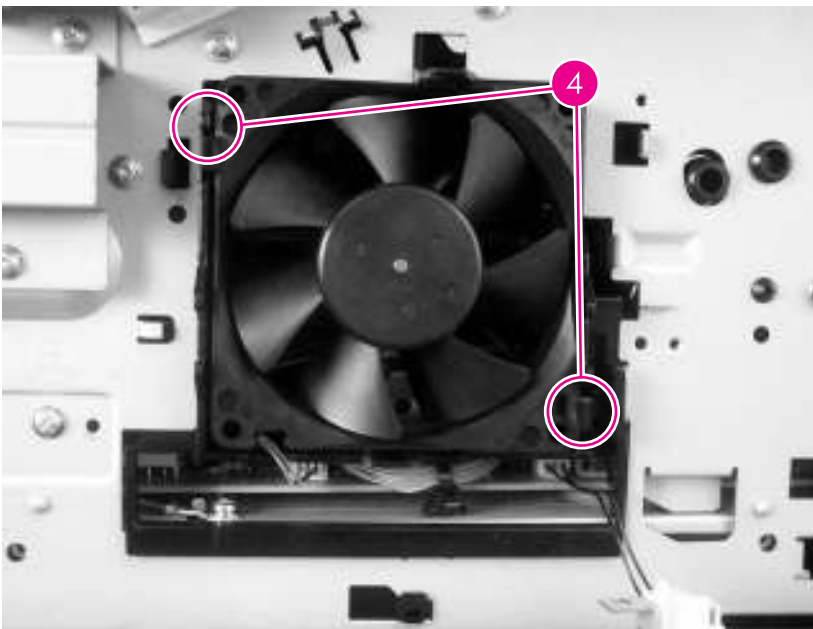
Figure 6-63 Remove the main and reversing-unit fans (4 of 9)

6 Disconnect one connector (callout 5), and then remove the main fan.
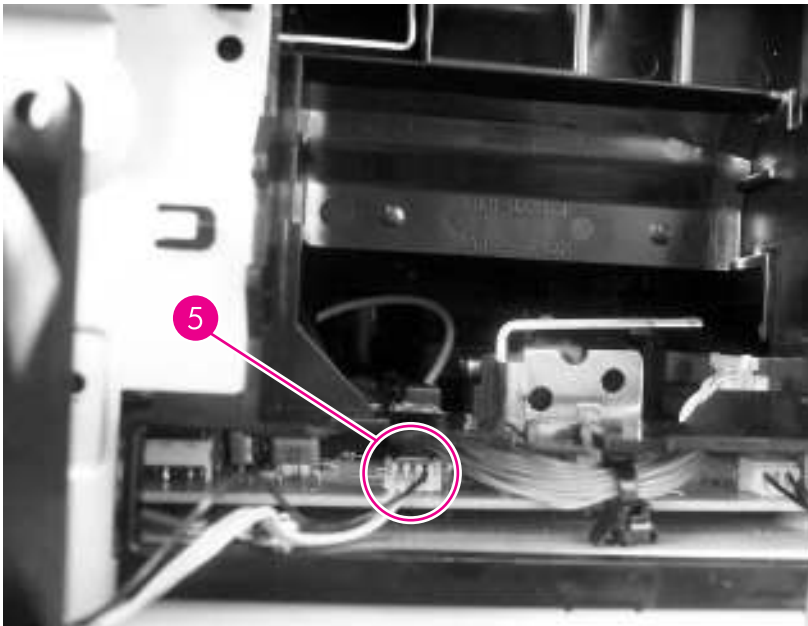
Figure 6-64 Remove the main and reversing-unit fans (5 of 9)

7 **Reversing-unit fan**: Disconnect one connector (callout 6).
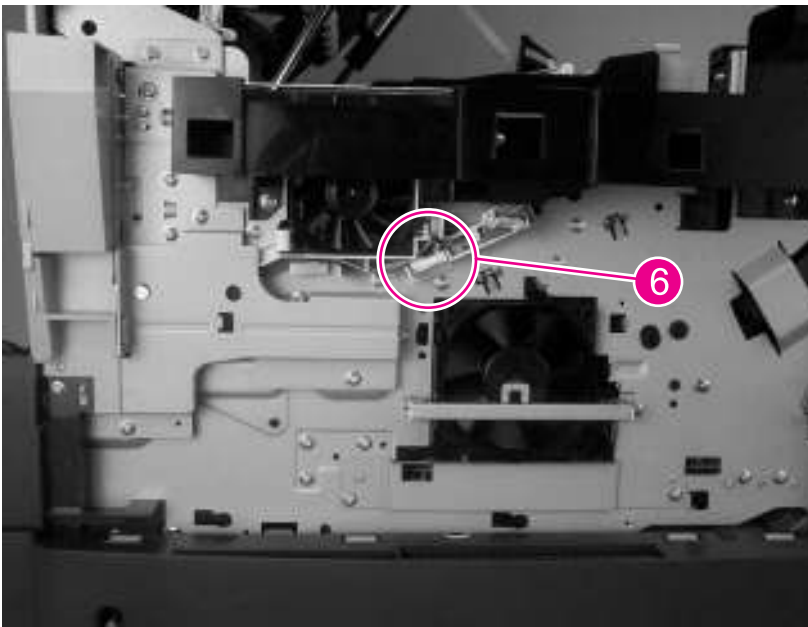
Figure 6-65 Remove the main and reversing-unit fans (6 of 9)

8 Remove three screws (callout 7), unplug the control-panel connector (callout 8), and then remove the control-panel-cable guide.
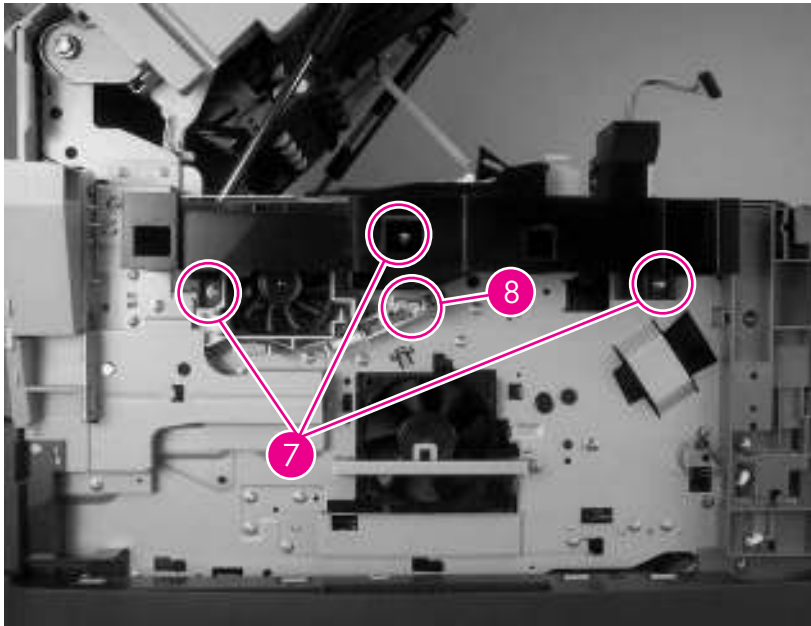
Figure 6-66 Remove the main and reversing-unit fans (7 of 9)

9 Release the locking tab, slide the fan assembly to the right, and then remove the bracket that holds the reversing-unit fan.
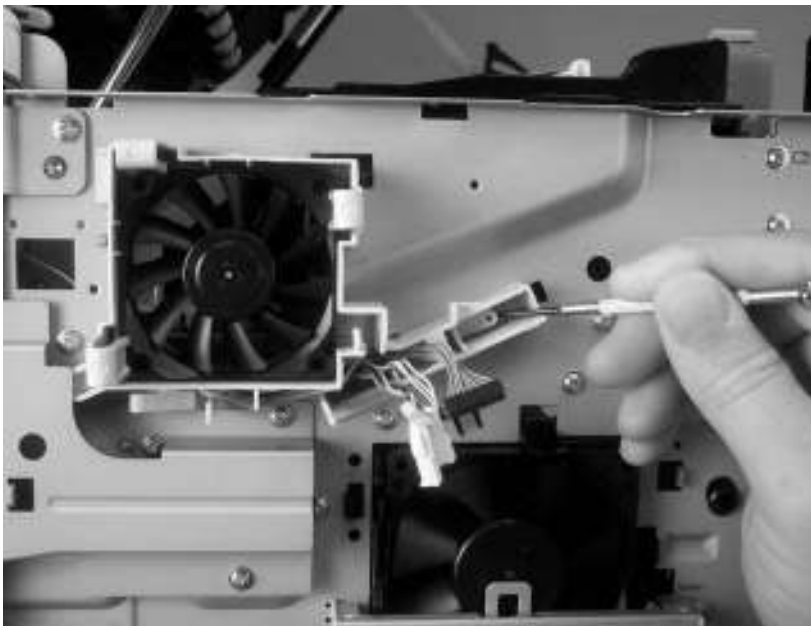
Figure 6-67 Remove the main and reversing-unit fans (8 of 9)

10 Release the three locking tabs on the fan bracket, and then remove the fan from the bracket.
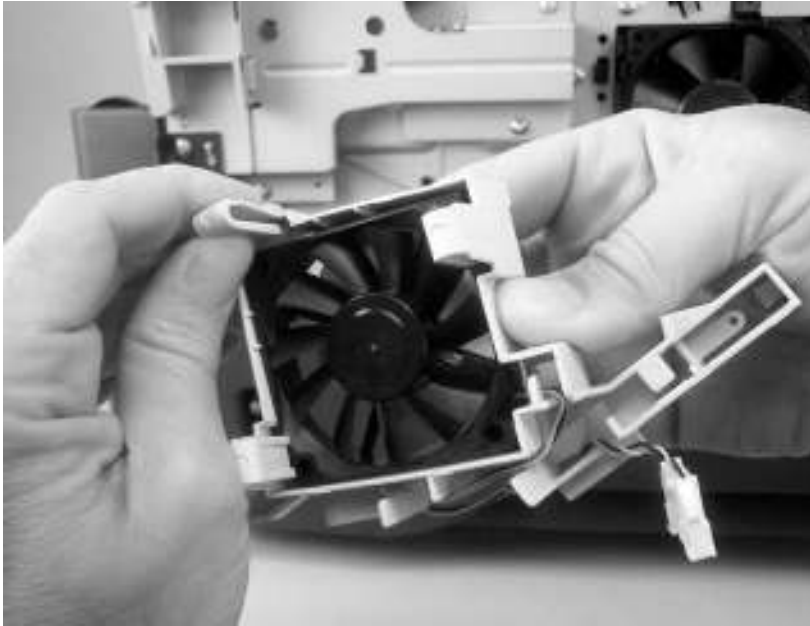
Figure 6-68 Remove the main and reversing-unit fans (9 of 9)

Thermistor (TH3)

1   Remove the front cover. See Front cover.

2   Remove one screw (callout 1), unhook the thermistor, and then move the thermistor to the side.
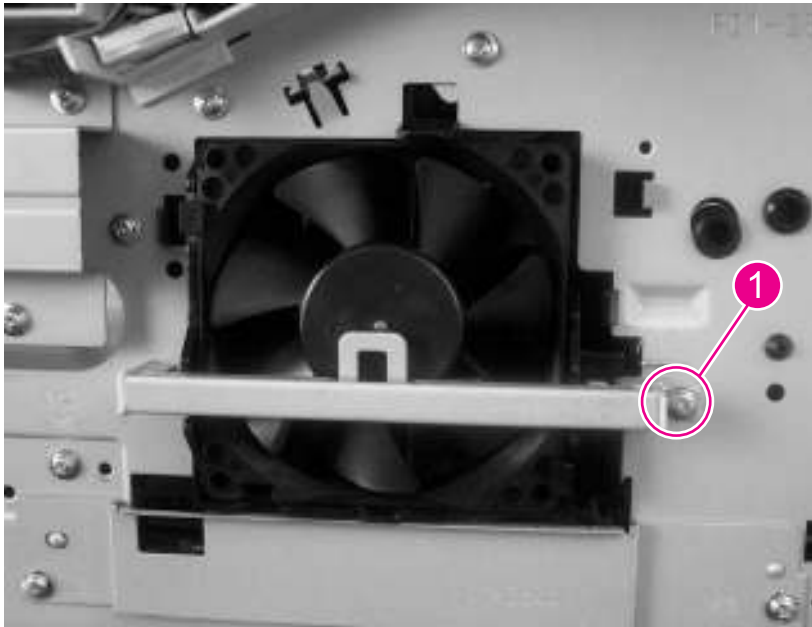
Figure 6-69 Remove the thermistor (1 of 4)

3   Remove two screws (callout 2), and remove the power-supply shield. Disconnect the thermistor from the power supply, and remove it.
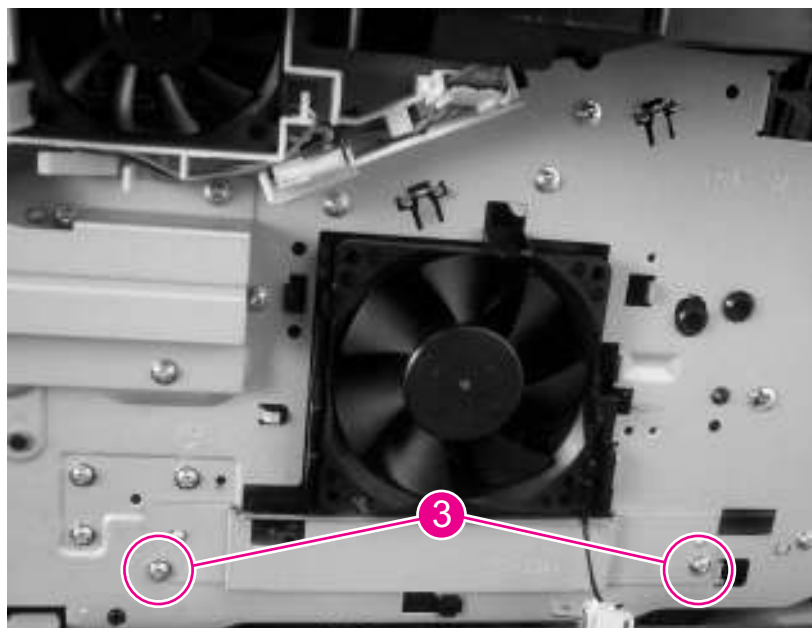
Figure 6-70 Remove the thermistor (2 of 4)

4 Disconnect two locking tabs (one at each end of the thermistor assembly), and remove the plastic thermistor-bracket from the sheet-metal holder. Thread the thermistor wire-harness out of the plastic bracket.

Figure 6-71 Remove the thermistor (3 of 4)

5 When installing the replacement thermistor, make sure that the thermistor body is fully inserted into the plastic bracket.
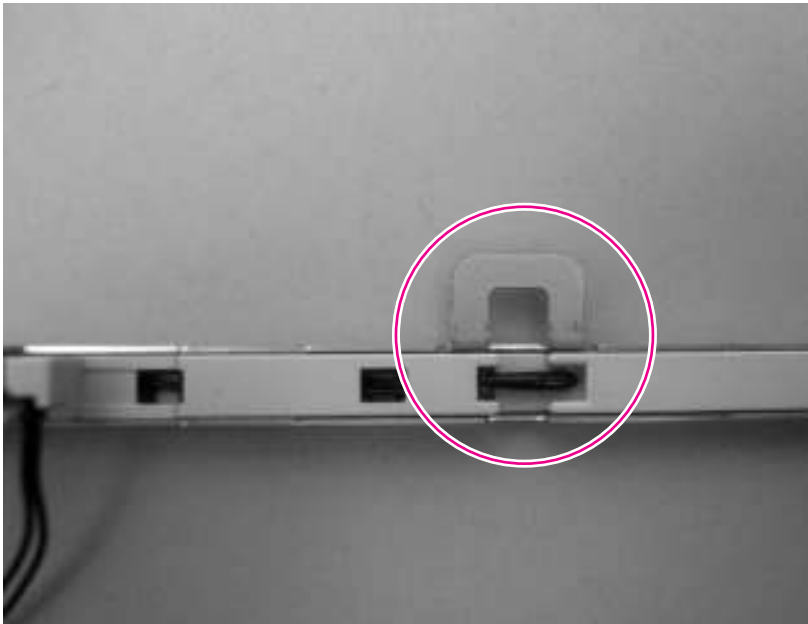
Figure 6-72 Remove the thermistor (4 of 4)

Tray 2 jam-access-cover switch (SW105)

1   Remove the front cover. See [Front cover](#).

2   Open the jam-access door, and then remove two screws (callout 1) and the jam-access-door-switch cover.
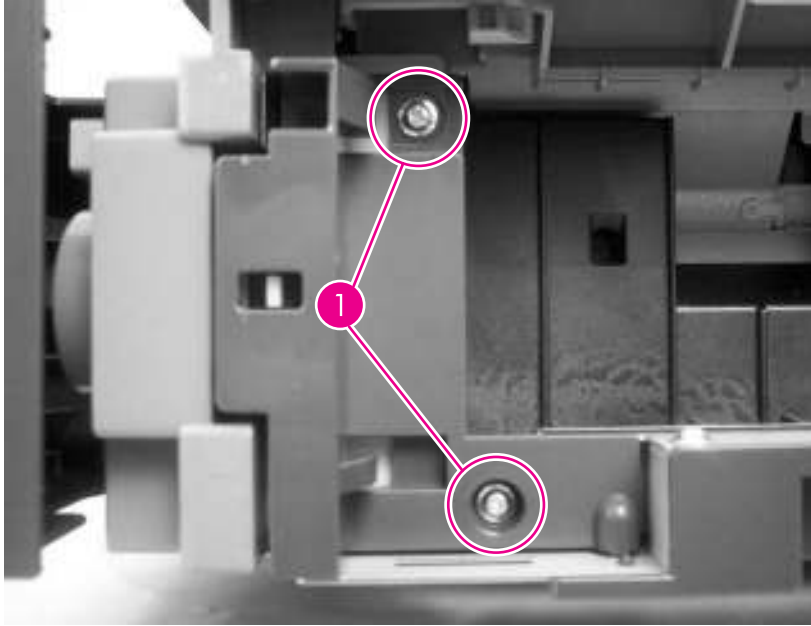
Figure 6-73 Remove the jam-access-cover switch (1 of 3)

3   Remove one screw (callout 2), and then remove the switch frame (callout 3).
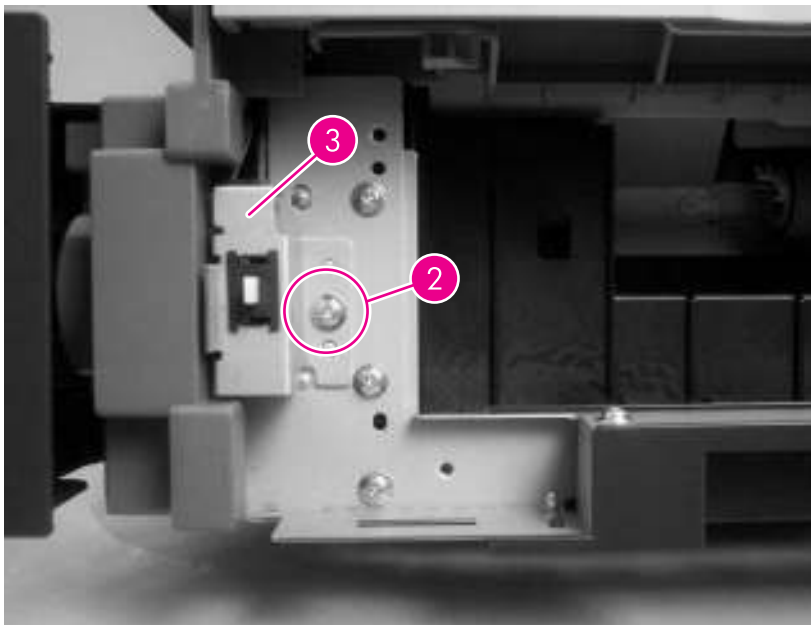
Figure 6-74 Remove the jam-access-cover switch (2 of 3)

4 Disconnect the jam-access-cover-switch connector (callout 4) and remove the switch.
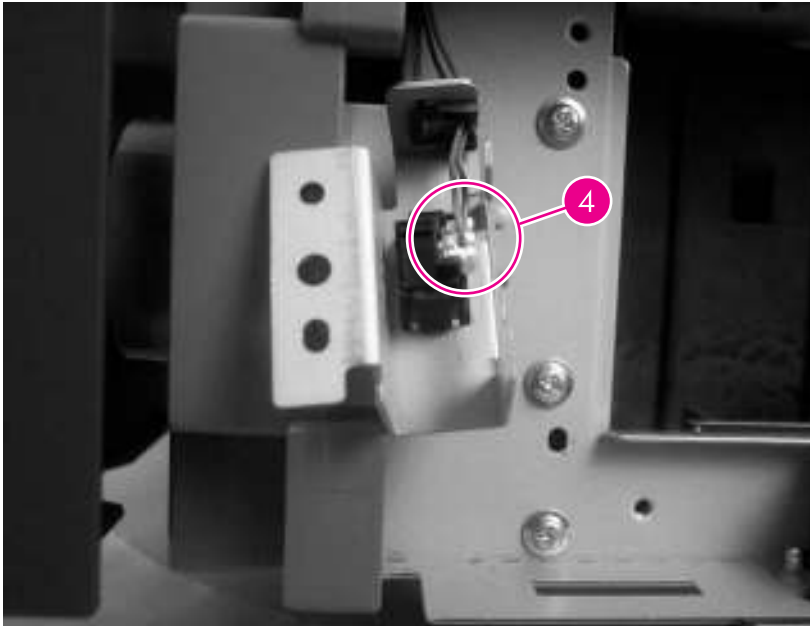
Figure 6-75 Remove the jam-access-cover switch (3 of 3)

Tray 1 assembly

1   Open tray 1, and then flex the two door-pin guides to release the two door pins. Separate the tray 1 door from the paper-guide assembly.

Figure 6-76 Remove the tray 1 assembly (1 of 5)

2   Slide the door toward the rear of the MFP to remove it.
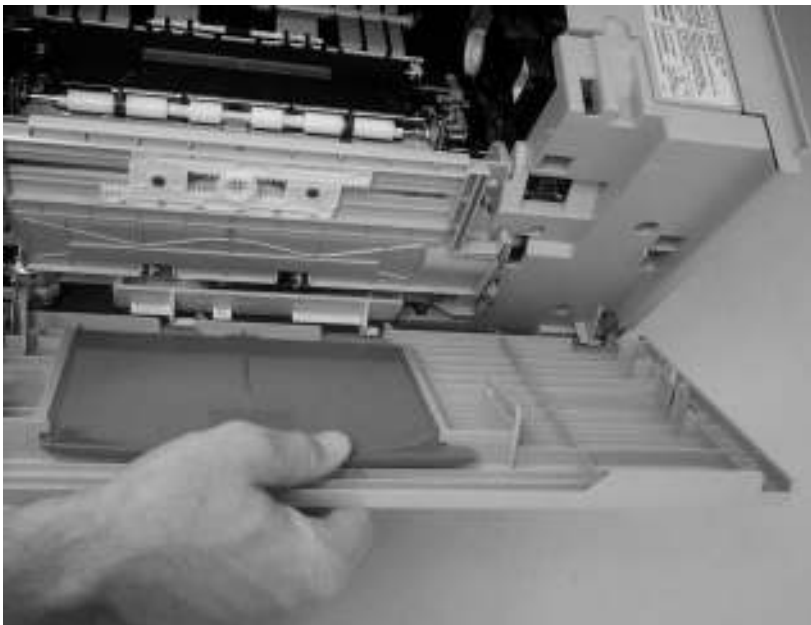
Figure 6-77 Remove the tray 1 assembly (2 of 5)

3 Unclip the sensor-flag holder from the pickup-roller shaft.

Figure 6-78 Remove the tray 1 assembly (3 of 5)

4 Rotate the paper guide down, and disengage the front hinge from the pin that is on the feed assembly.

Figure 6-79 Remove the tray 1 assembly (4 of 5)

5 The spring on the rear hinge is not captive and can easily be lost. Take note of how this spring is installed before removing the tray assembly.

Figure 6-80 Correct tray 1 rear-hinge-spring placement

6 Move the paper-guide slightly toward the front of the MFP to disengage the paper-guide rear-hinge. Remove the paper guide.

Figure 6-81 Remove the tray 1 assembly (5 of 5)

Front-cover support

1   Remove the tray 1 assembly. See <u>Tray 1 assembly</u>.

2   Open the jam-access door.

3   Use a small, flat-blade screwdriver to release the front cover support locking tab.

Figure 6-82 Remove the front-cover support (1 of 2)

4   Use a small, flat-blade screwdriver to release the rear cover-support locking tab. Remove the front-cover support.
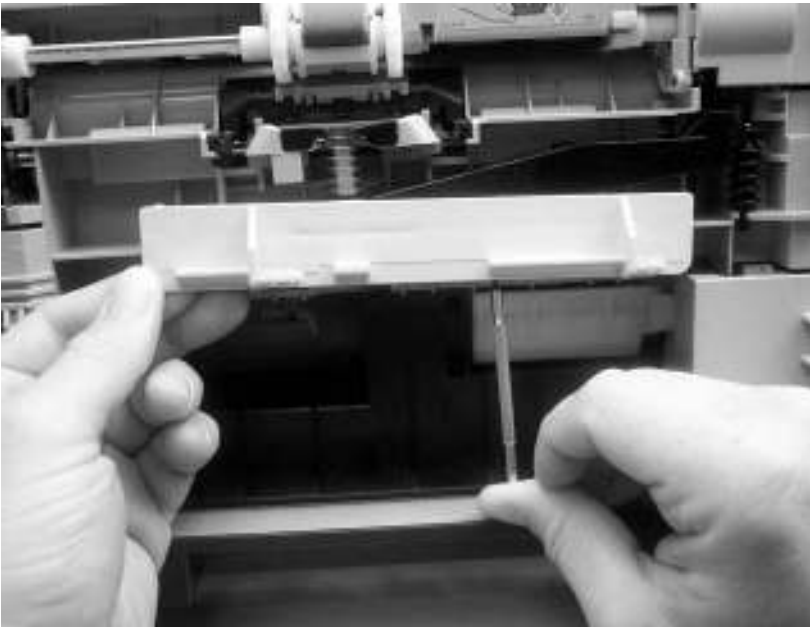
Figure 6-83 Remove the front-cover support (2 of 2)

Tray 1 feed-assembly

1   Remove the following assemblies:

● Formatter. See [Formatter cover and formatter](#)

● Front cover. See [Front cover](#).

● Back cover. See [Back cover](#)

● Tray 1 assembly. See [Tray 1 assembly](#).

2   Release the retainer from shaft on the jam-access-door hinge.
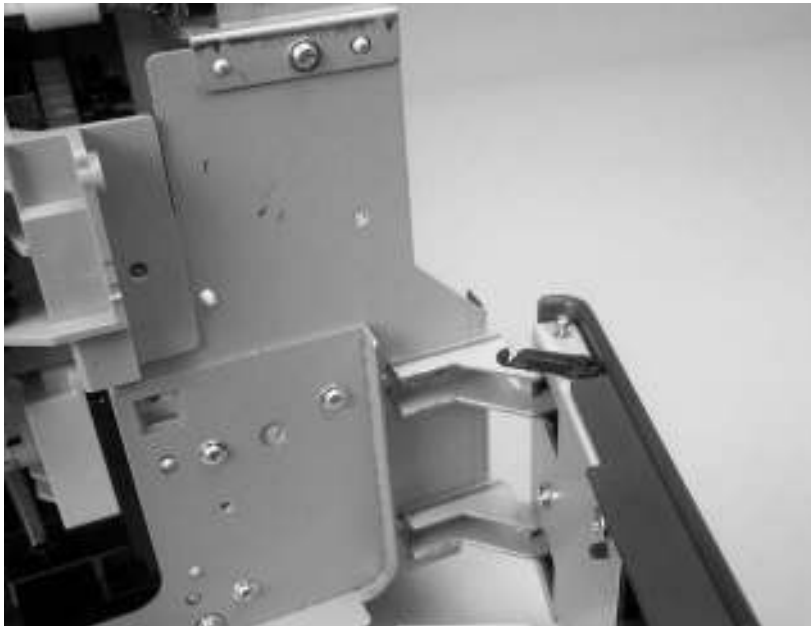
Figure 6-84 Remove the tray 1 feed-assembly (1 of 13)

3 Remove the shaft from the jam-access-door hinge.
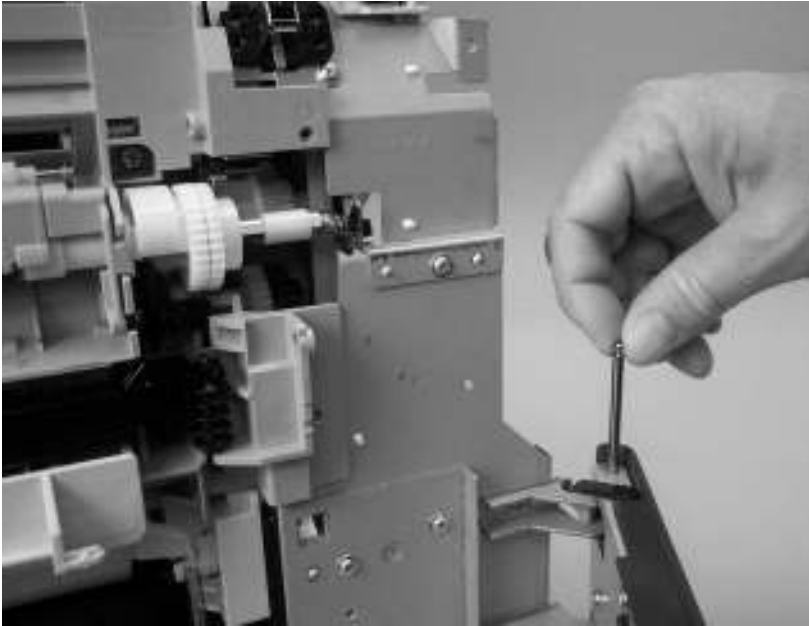
Figure 6-85 Remove the tray 1 feed-assembly (2 of 13)

4 Slide the door and retainer arm toward the front of the MFP until the arm clears the slot in the chassis.

Figure 6-86 Remove the tray 1 feed-assembly (3 of 13)

5 Remove six screws (callout 1).
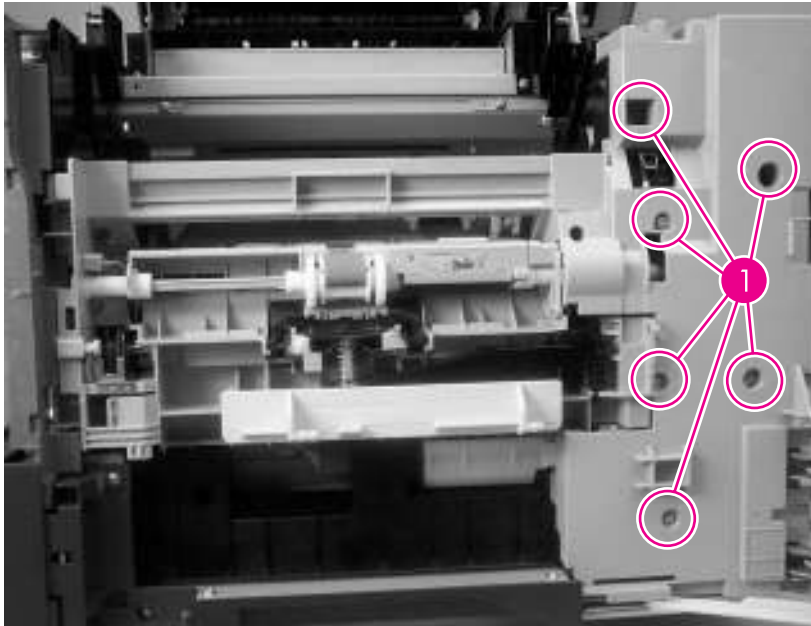
Figure 6-87 Remove the tray 1 feed-assembly (4 of 13)

NOTE When you reinstall the feed-assembly cover, place the three long screws into the lower holes that are along the left side of the cover.

6 Release the locking tab, and then remove the feed-assembly cover from the MFP.

Figure 6-88 Remove the tray 1 feed-assembly (5 of 13)

7 Remove six screws (callout 2) from the front of the tray 1 feed-assembly.
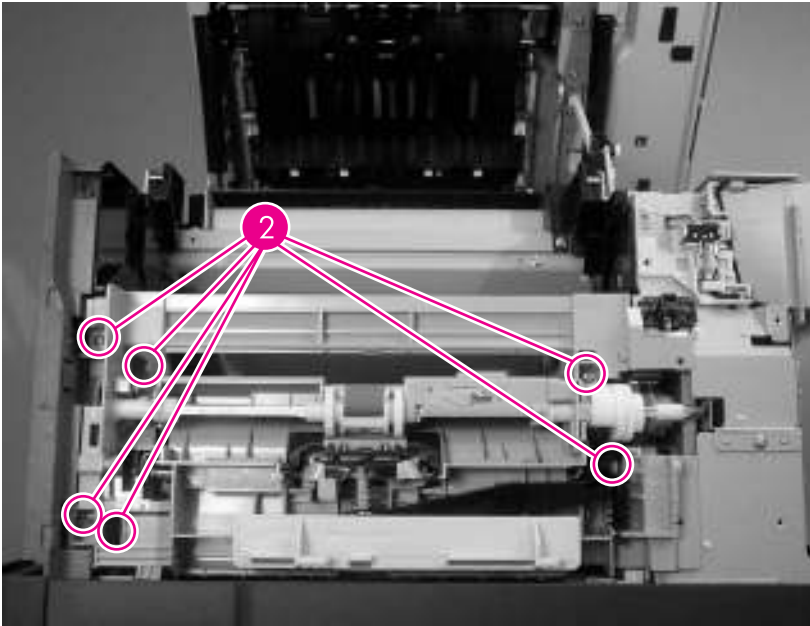
Figure 6-89 Remove the tray 1 feed-assembly (6 of 13)

8 Remove one grounding screw (callout 3) from the front of the MFP.
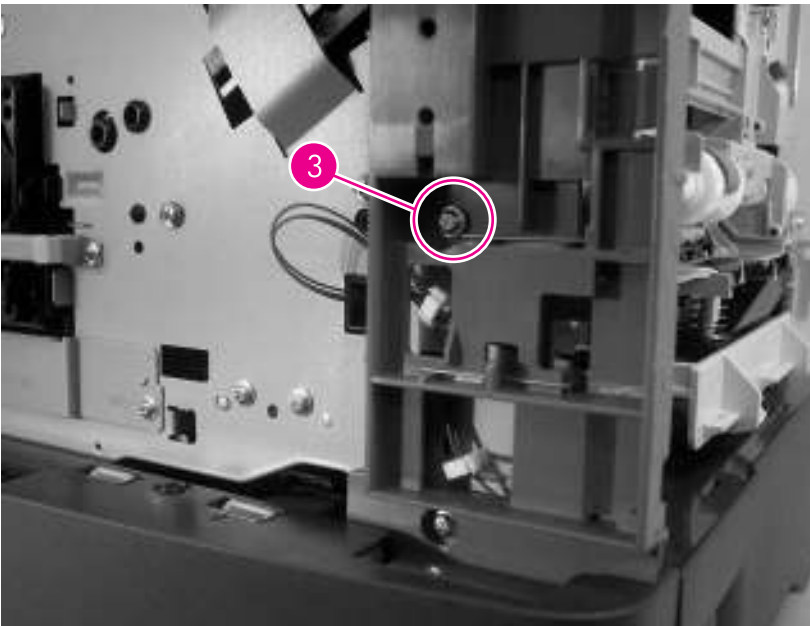
Figure 6-90 Remove the tray 1 feed-assembly (7 of 13)

9 Use a small, flat-blade screwdriver to release one locking tab. Grasp the middle of the rear-top cover, and slide it toward the tray 1 feed-assembly to remove it.
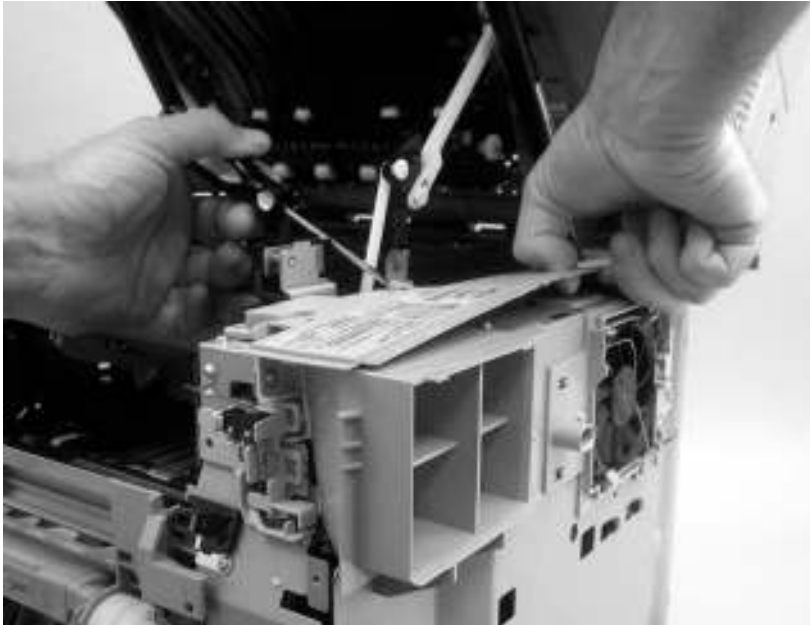
Figure 6-91 Remove the tray 1 feed-assembly (8 of 13)

10 Remove two screws (callout 4), and remove the fan shroud.
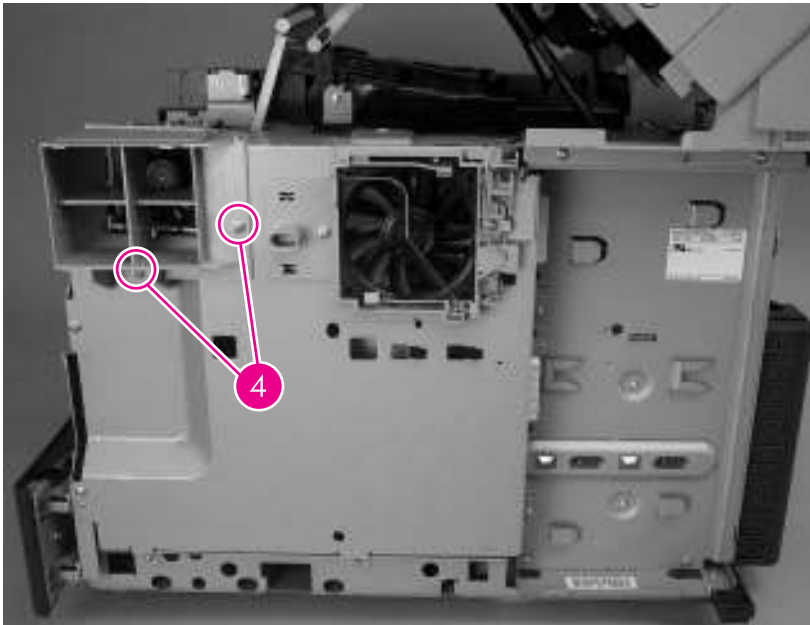
Figure 6-92 Remove the tray 1 feed-assembly (9 of 13)

11 Remove seven screws (callout 5), and then rotate the rear sheet-metal shield away from the MFP.
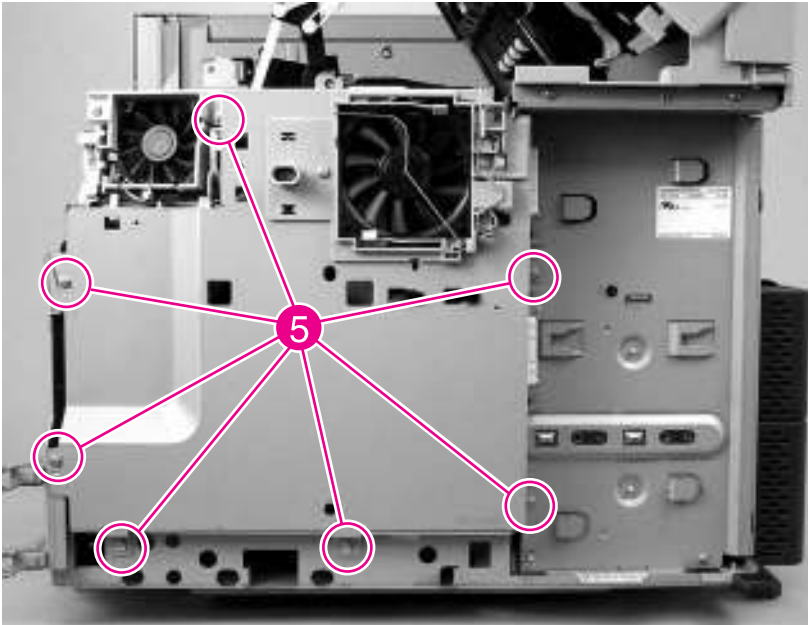
Figure 6-93 Remove the tray 1 feed-assembly (10 of 13)

12 Disconnect one connector (callout 6; J66) from the dc controller, and remove the sheet-metal shield.
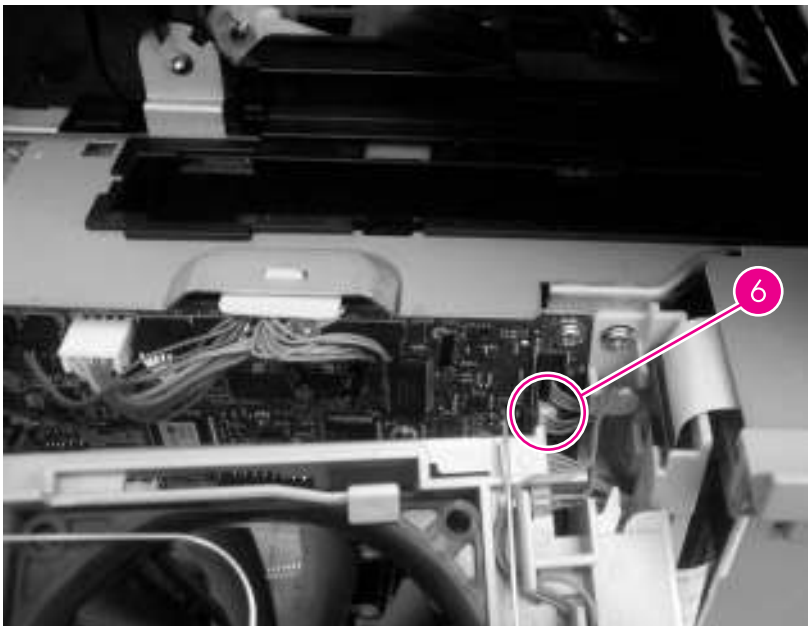
Figure 6-94 Remove the tray 1 feed-assembly (11 of 13)

6 Removal and replacement

13 Disconnect one connector (callout 7; J79) from the dc controller, and unwind the wire harness from the MFP.
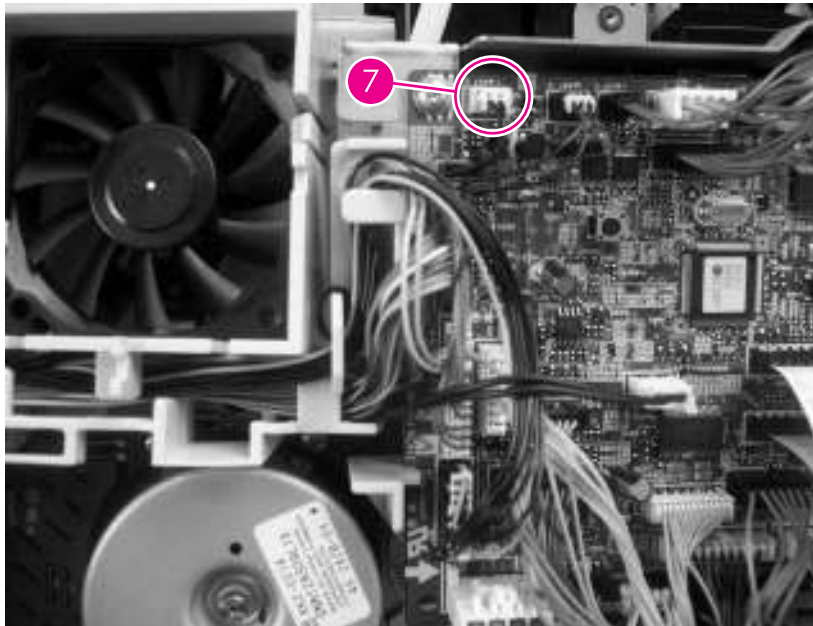
Figure 6-95 Remove the tray 1 feed-assembly (12 of 13)

14 Disconnect one connector (callout 8) from the tray 1 feed-assembly. Remove the tray 1 feed-assembly.
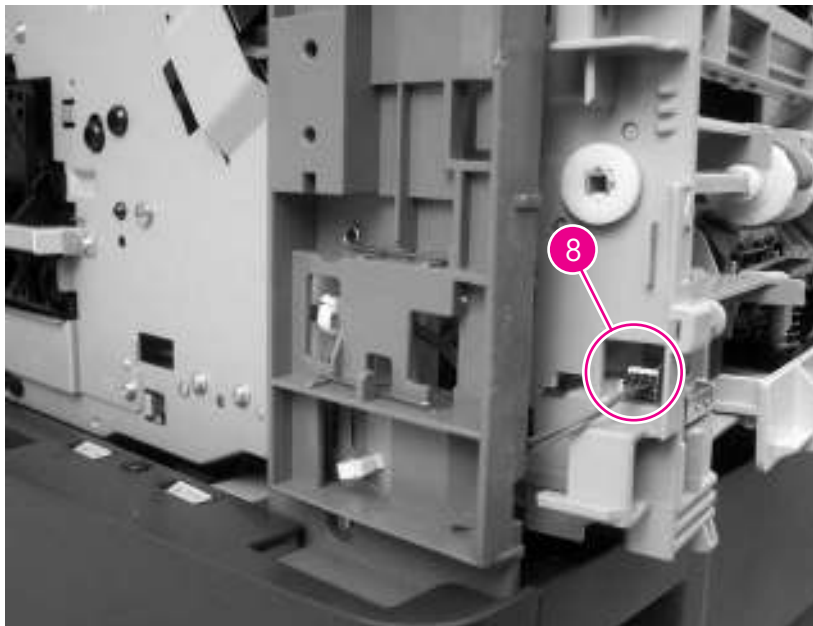
Figure 6-96 Remove the tray 1 feed-assembly (13 of 13)

NOTE The grounding spring that is on the dc-controller side of the feed assembly is not captive and can be easily lost. When you reinstall the feed assembly, make sure that the grounding spring is correctly seated against the sheet-metal chassis.

Feed-roller assembly

1 Remove the tray 1 feed-assembly. See Tray 1 feed-assembly.

2 Remove two screws (callout 1), and then remove the inner front cover.
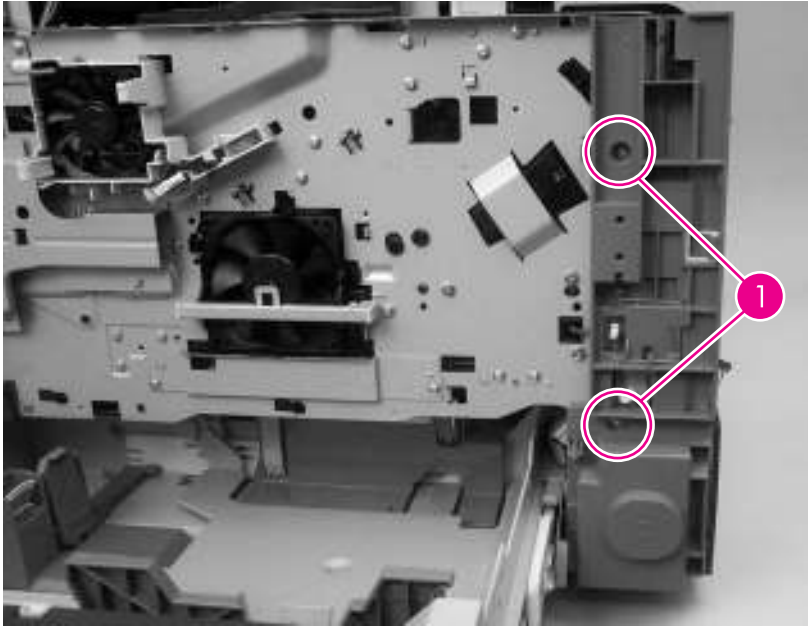
Figure 6-97 Remove the feed-roller assembly (1 of 4)

3 Remove one grounding screw (callout 2) on the front of the MFP.
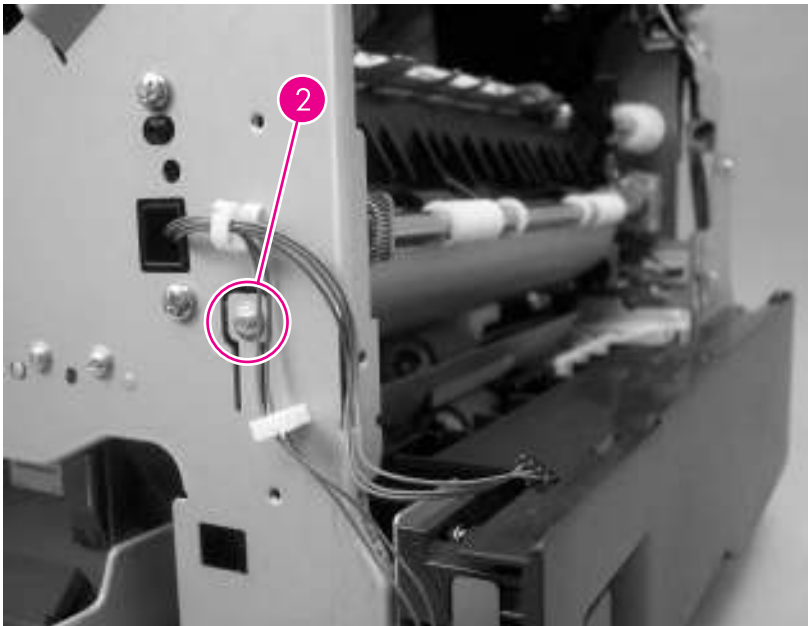
Figure 6-98 Remove the feed-roller assembly (2 of 4)

4 Remove two screws (callout 3).
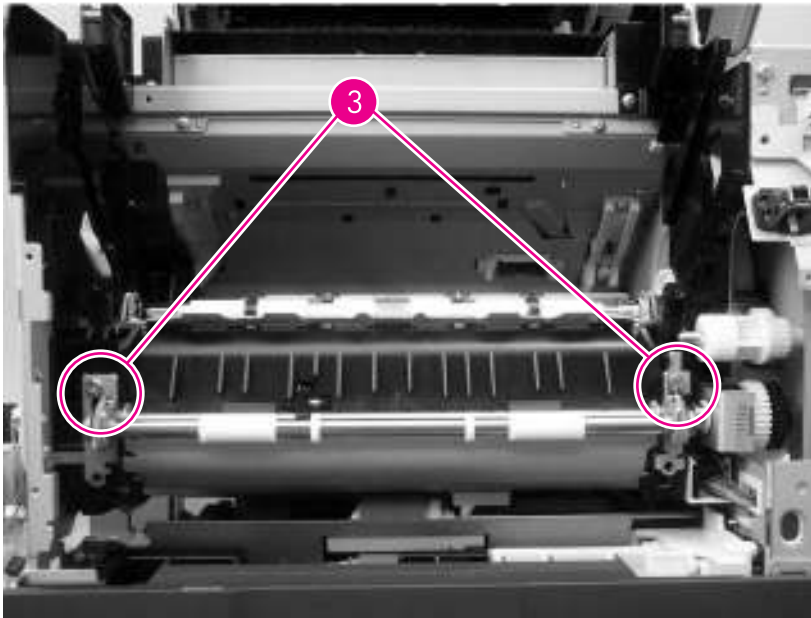
Figure 6-99 Remove the feed-roller assembly (3 of 4)

5 Disconnect one connector (callout 4; J89) and unwind the wire harness from the MFP. Remove the feed-roller assembly.
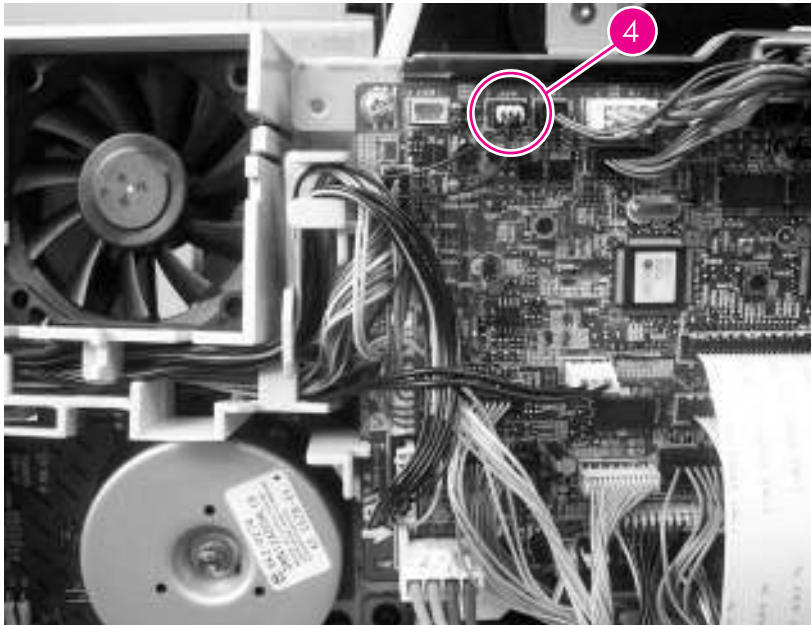
Figure 6-100 Remove the feed-roller assembly (4 of 4)

6   **Reinstallation tip:** When the feed-roller assembly is installed, the sensor-flag spring must be correctly positioned in order for the flag to operate. If a paper-jam error message **13.20.00 JAM** appears on the control-panel display after you replace the feed-roller assembly, verify that this sensor-flag spring is installed correctly.

Hook the spring over the flag tab (see callout 1 in). Fasten the feed-roller assembly to the chassis and insert the flag into the hole in the plastic frame. Release the spring from the tab on the flag. Verify that the flag is held in the upright position, can move freely, and always returns to the upright position.

If the flag does not move freely, or does not return to the upright position, an error message **13.20.00 JAM** appears on the control-panel display when the MFP power is turned on.
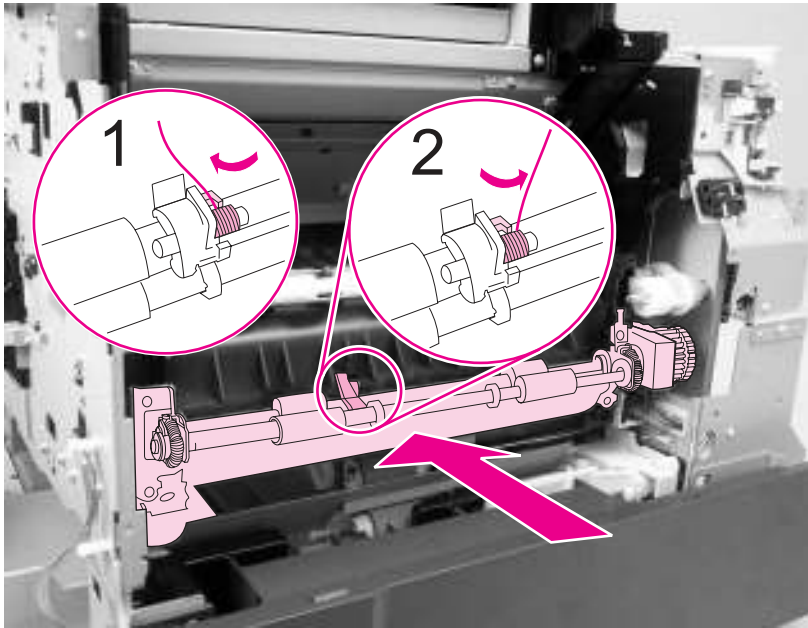
Figure 6-101 Sensor-flag spring placement

DC controller

1 Remove the back cover. See <u>Back cover</u>.

2 Remove two screws (callout 1), and remove the fan shroud.
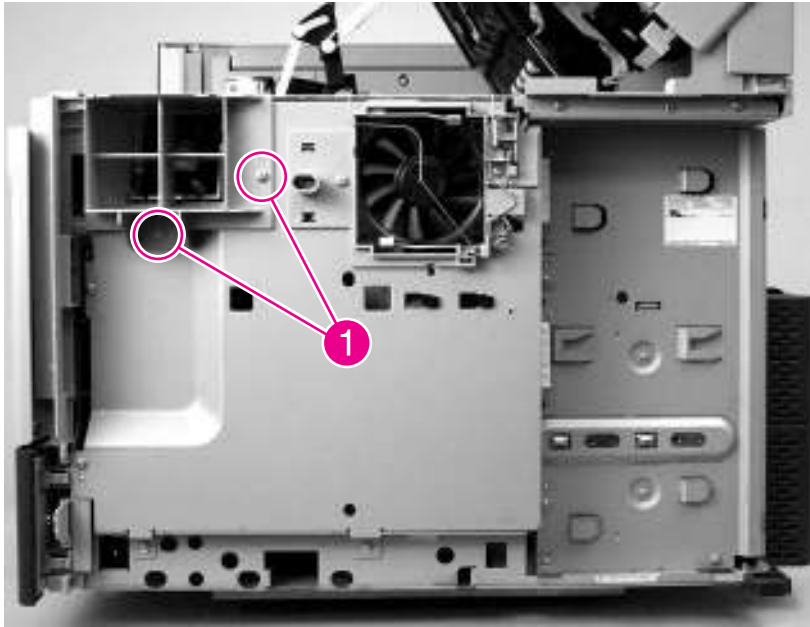
Figure 6-102 Remove the dc controller (1 of 6)

3 Remove seven screws (callout 2), and then rotate the rear sheet-metal shield away from the MFP.
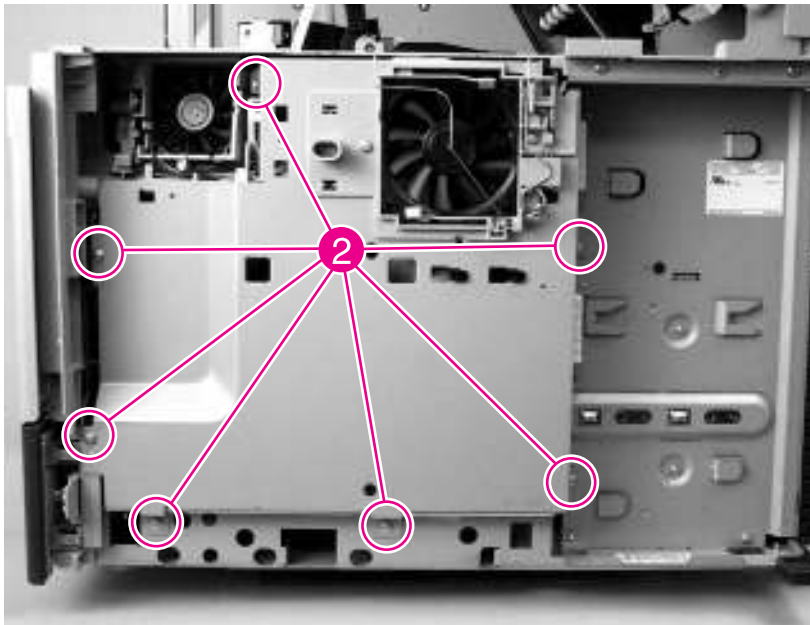
Figure 6-103 Remove the dc controller (2 of 6)

4 Disconnect one connector (callout 3; J66) from the dc controller and remove the sheet-metal shield.
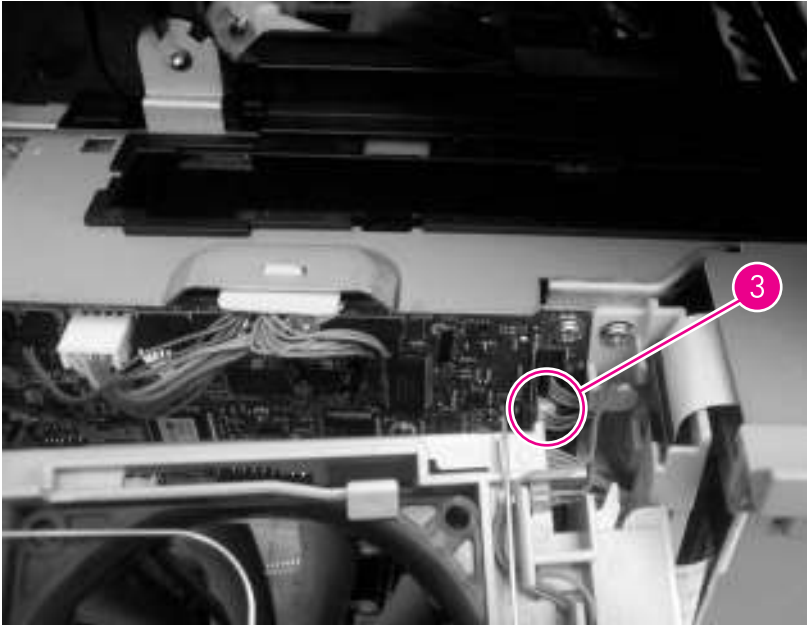
Figure 6-104 Remove the dc controller (3 of 6)

5 Remove two screws (callout 4), and then remove the formatter connector (callout 5).
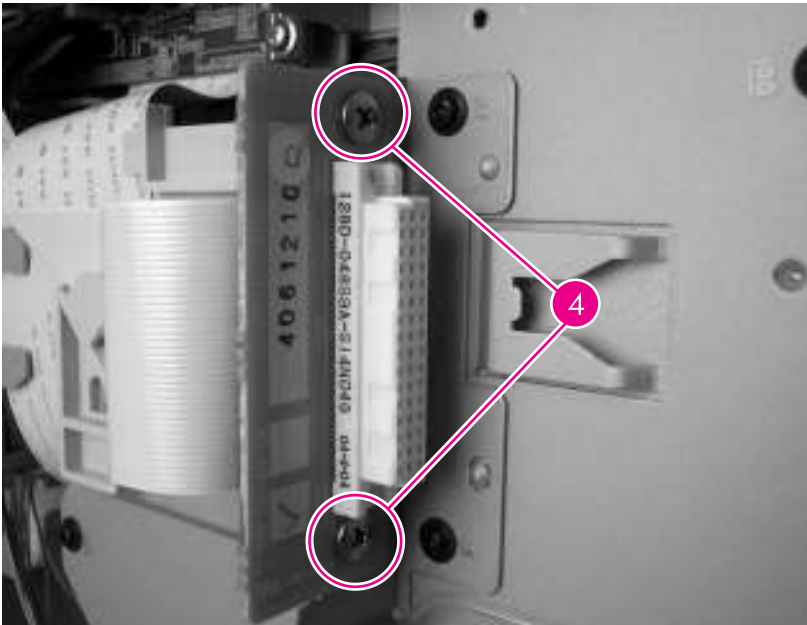
Figure 6-105 Remove the dc controller (4 of 6)

6 Disconnect all of the connectors on the dc controller, and then remove three screws (callout 5).
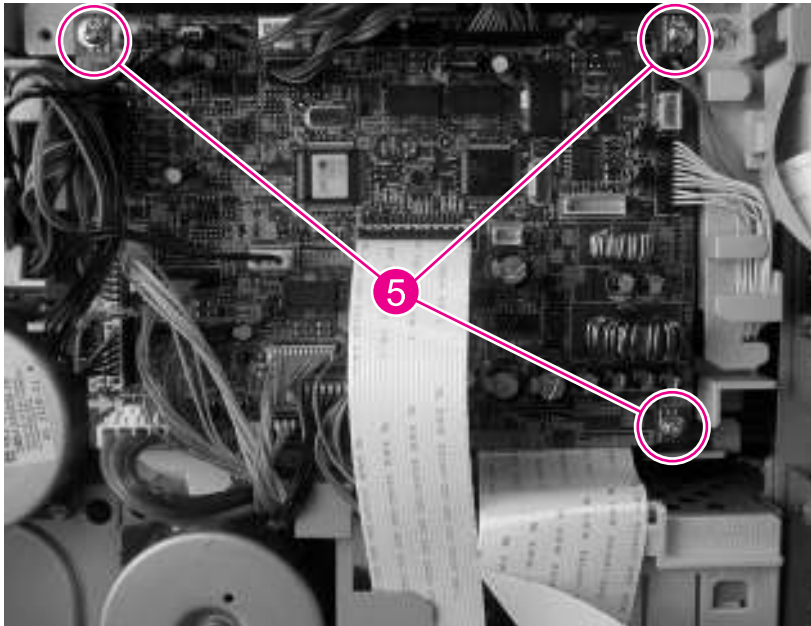
Figure 6-106 Remove the dc controller (5 of 6)

7 Rotate the formatter side of the dc controller away form the MFP. Pull the dc controller out of the two locking tabs (callout 6) on the fan duct to remove it.
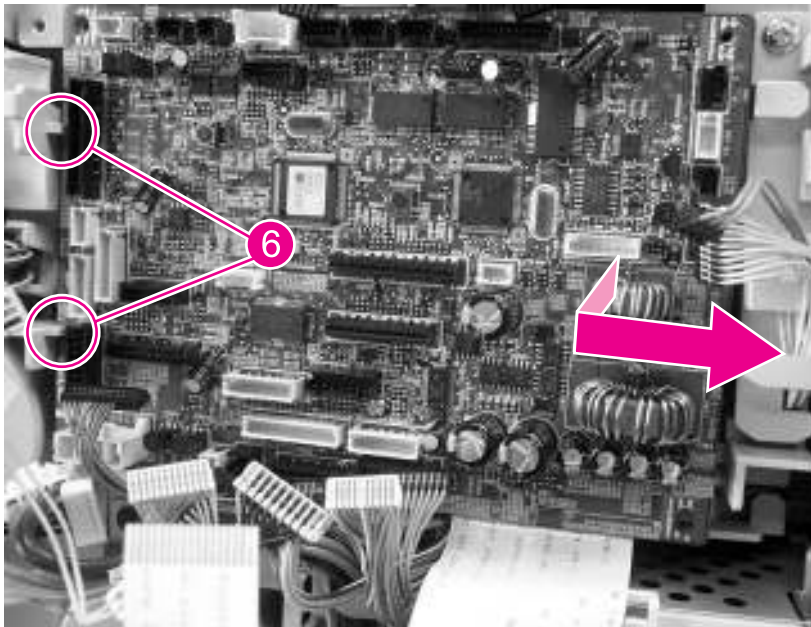
Figure 6-107 Remove the dc controller (6 of 6)

Main motor (M101)

1 Remove the dc controller. See <u>DC controller</u>.

2 Remove three screws (callout 1), and then remove the main motor.
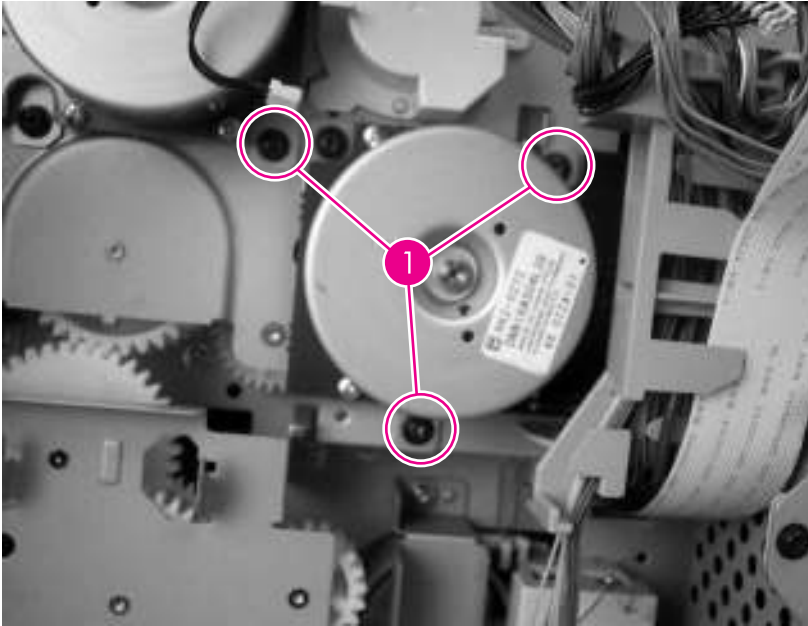
Figure 6-108 Remove the main motor

DC controller fan (FN104)

1 Remove the back cover. See Back cover.

2 Remove the grounding wire that is in front of the dc controller fan.
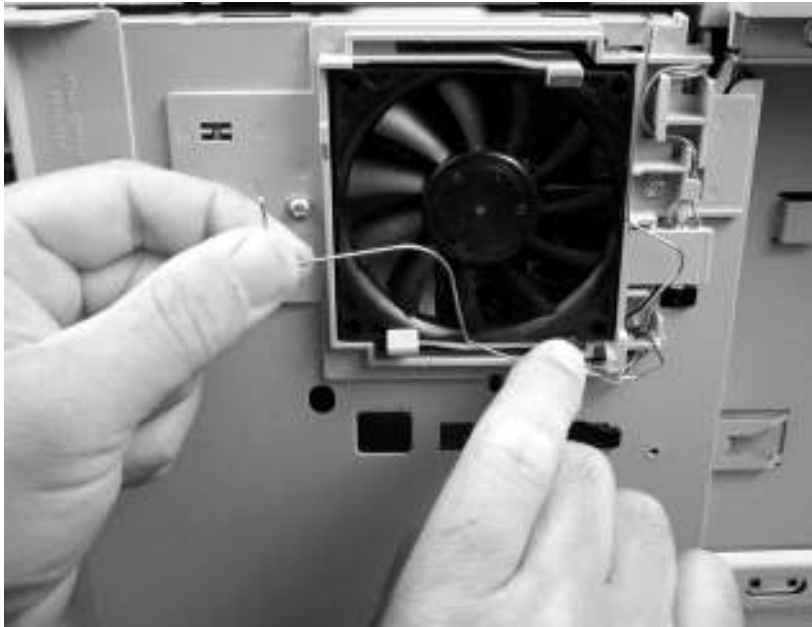
Figure 6-109 Remove the dc controller fan (1 of 3)

3 Pull away the tab that is to the right of the dc controller fan, and slide out the connector that is behind the tab. Disconnect the fan connector.
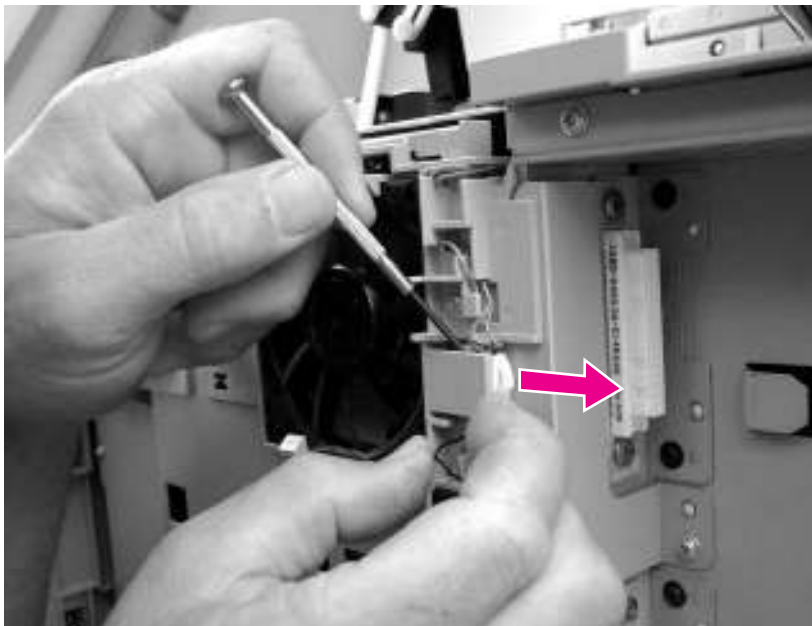
Figure 6-110 Remove the dc controller fan (2 of 3)

4 Unwind the connector wire from the frame (callout 1). Release the two tabs (callout 2), and remove the fan.
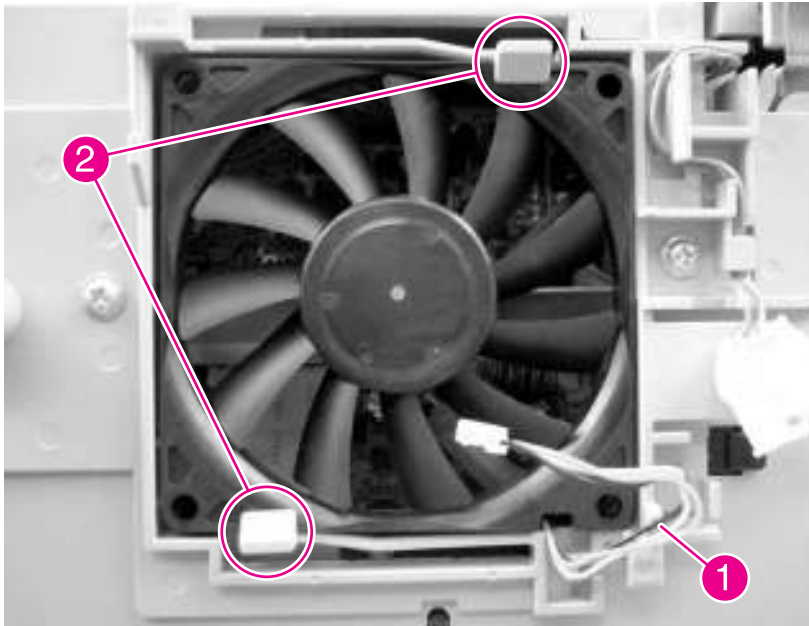
Figure 6-111 Remove the dc controller fan (3 of 3)

Print-cartridge fan (FN102)

1 Remove the back cover. See [Back cover](#).

2 Remove two screws (callout 1), and remove the fan shroud.
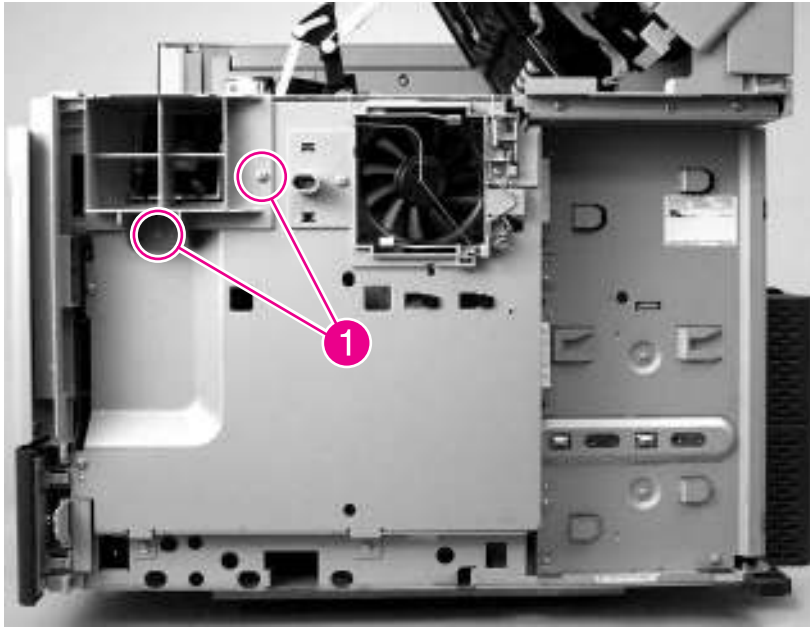
Figure 6-112 Remove the print-cartridge fan (1 of 4)

3 Remove seven screws (callout 2), and then rotate the rear sheet-metal shield away from the MFP.
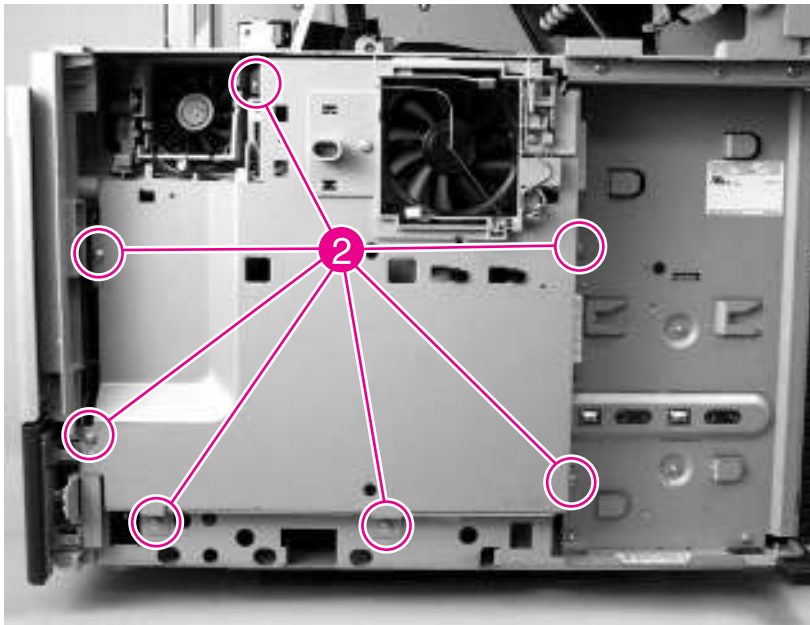
Figure 6-113 Remove the print-cartridge fan (2 of 4)

4 Disconnect the fan connector (J78, callout 3) from the dc controller.
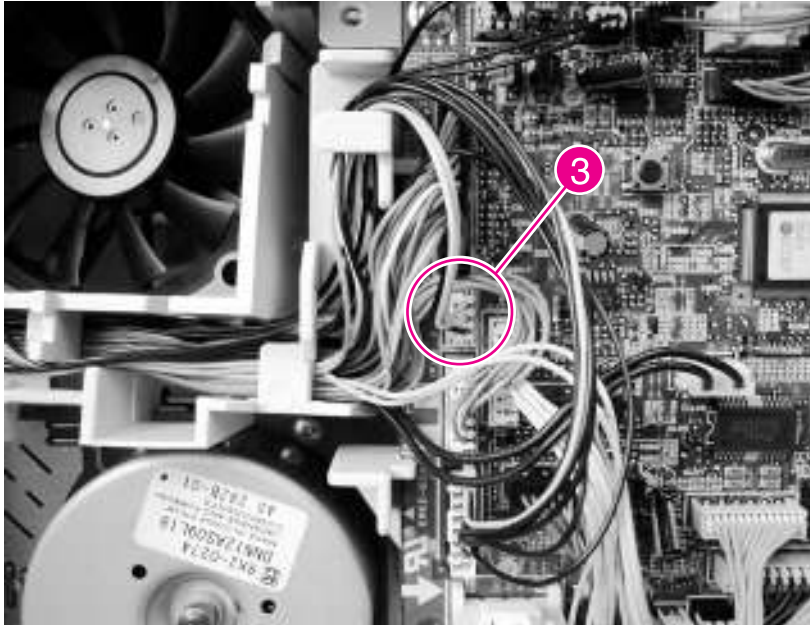
Figure 6-114 Remove the print-cartridge fan (3 of 4)

5 Use a small, flat-blade screwdriver to release the locking tabs that are on each side of the fan (callout 4). Insert a second flat-blade screwdriver behind the fan, and push the fan out.
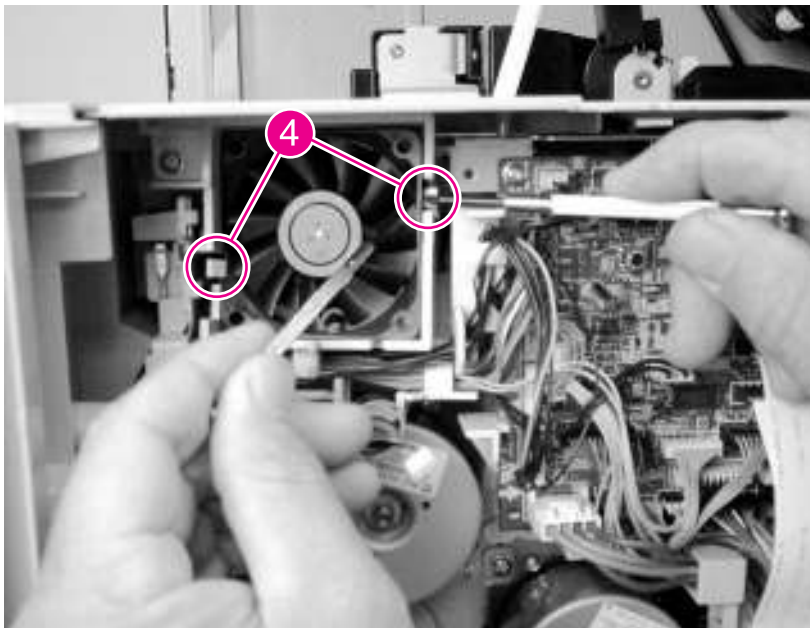
Figure 6-115 Remove the print-cartridge fan (4 of 4)

Print-cartridge motor (M102)

1 Remove the back cover. See Back cover.

2 Remove the print-cartridge fan. See Print-cartridge fan (FN102).

3 Remove two screws (callout 1), and remove the fan shroud.
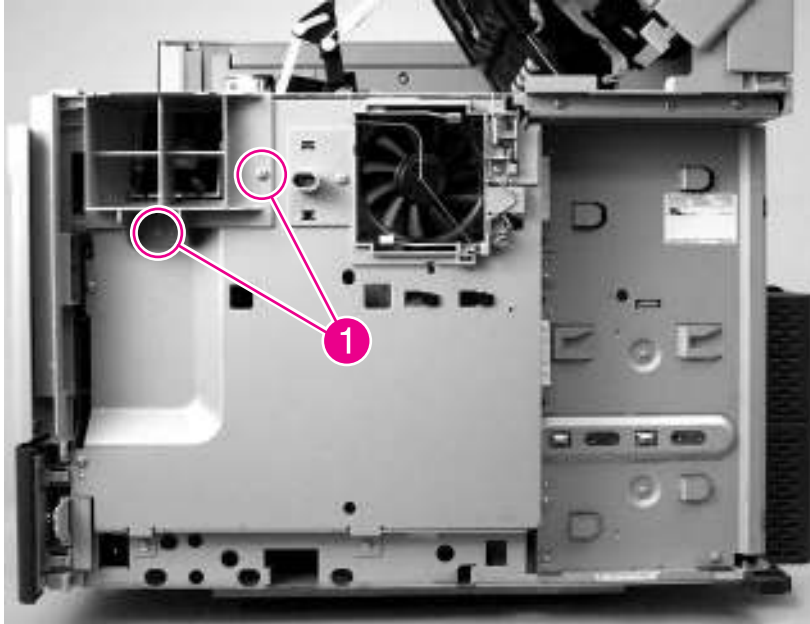
Figure 6-116 Remove the print-cartridge motor (1 of 4)

4 Remove seven screws (callout 2), and then rotate the rear sheet-metal shield away from the MFP.
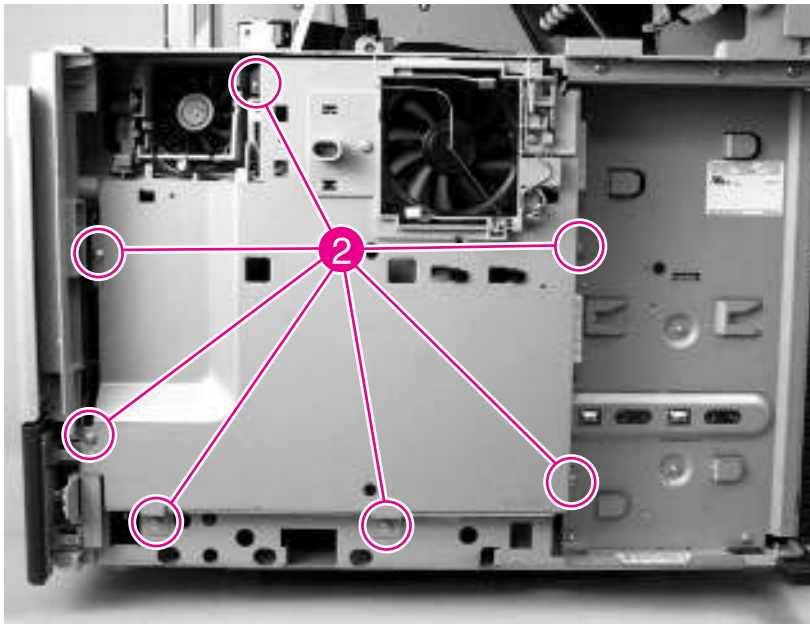
Figure 6-117 Remove the print-cartridge motor (2 of 4)

5 Disconnect one connector (callout 3; J66) from the dc controller and remove the sheet-metal shield.
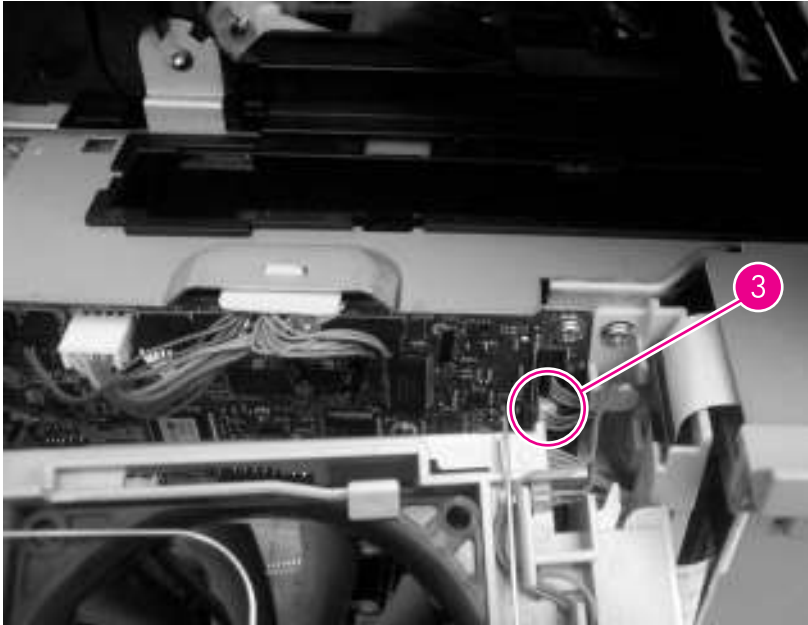
Figure 6-118 Remove the print-cartridge motor (3 of 4)

6 Remove three screws (callout 4), disconnect one connector (callout 5; J86), and then remove the print-cartridge motor.
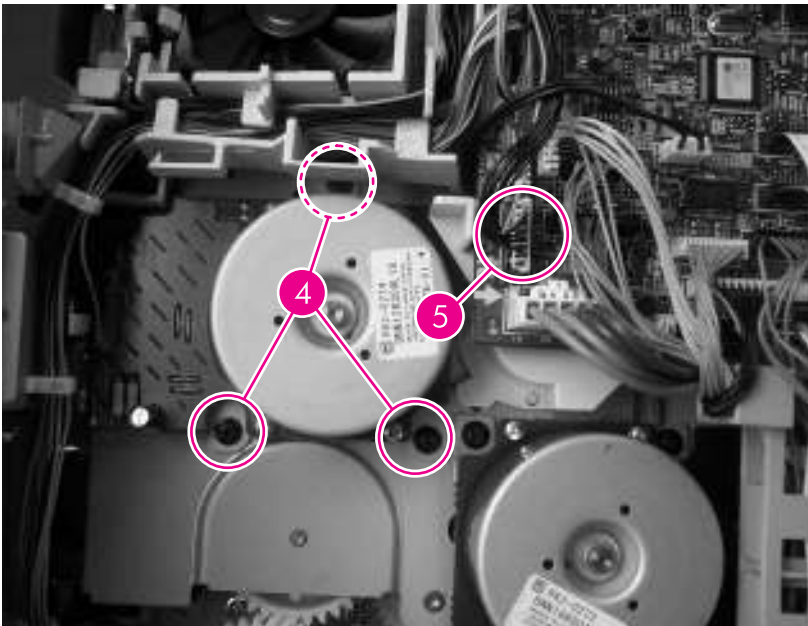
Figure 6-119 Remove the print-cartridge motor (4 of 4)

Top-cover switch (SW101)

1 Remove the following assemblies:

- Back cover. See Back cover.

- Print-cartridge fan. See Print-cartridge fan (FN102).

2 Remove one screw (callout 1)
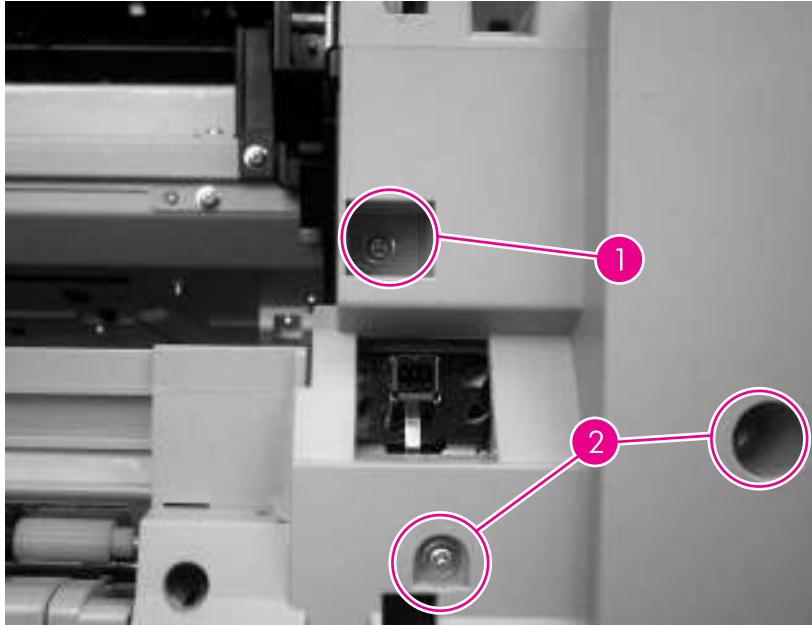
Figure 6-120 Remove the top-cover switch (1 of 3)

📝 **NOTE** Loosening the two screws (callout 2) that are below the one that you are removing makes it easier to dislodge the sensor bracket.

3 Use a small, flat-blade screwdriver to release one sensor-bracket locking tab, and then pull the sensor bracket out of the chassis.
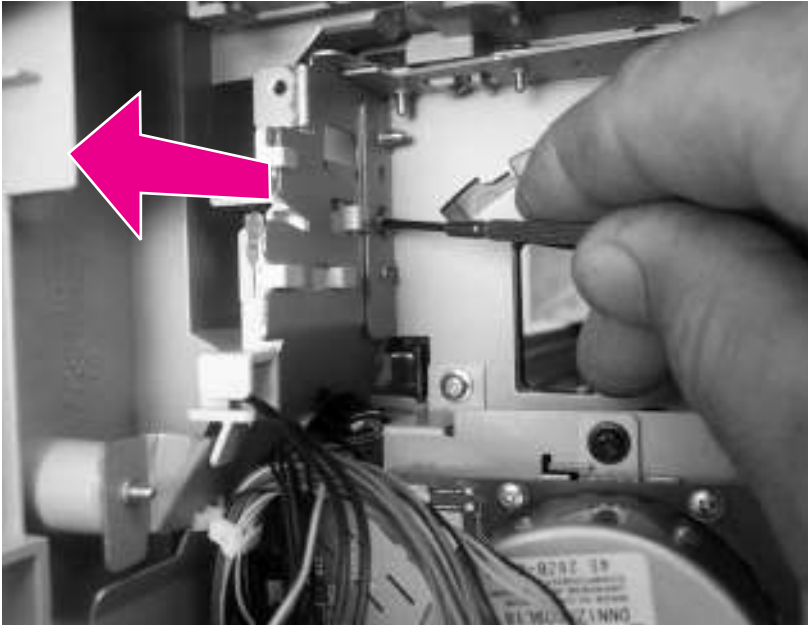
Figure 6-121 Remove the top-cover switch (2 of 3)

4 Remove the sensor wire-harness and the sensor from the bracket.
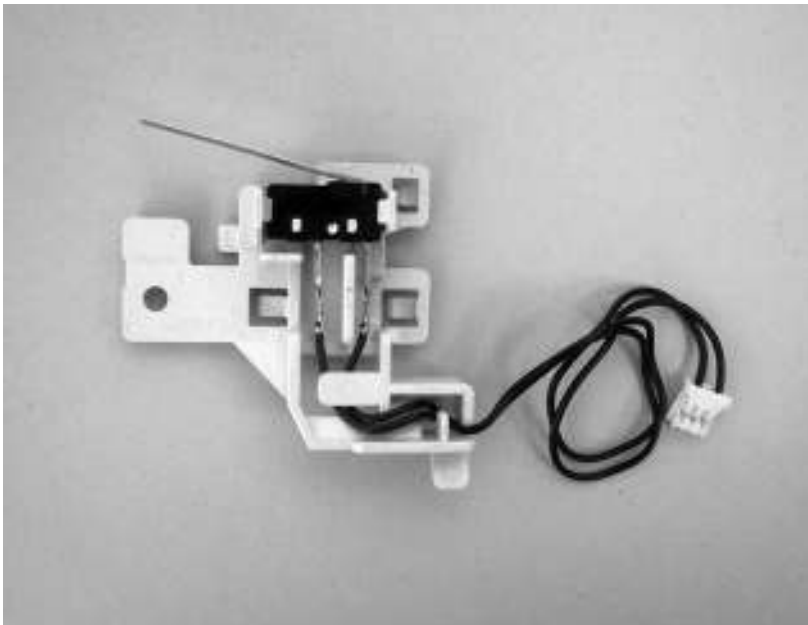
Figure 6-122 RRemove the top-cover switch (3 of 3)

Registration assembly

1 Remove the following assemblies:

- Back cover. See Back cover.

- Main motor. See Main motor (M101).

- Print-cartridge motor. See Print-cartridge motor (M102).

2 Disconnect the print-cartridge arm.

Figure 6-123 Remove the registration assembly (1 of 6)

3 Unhook the lifter-drive-assembly tension-spring from the tab on the chassis. Remove one screw (callout 1), and then remove the sheet metal bracket.

CAUTION The lifter-drive-assembly tension-spring is not captive. Do not lose the spring when you remove the assembly.
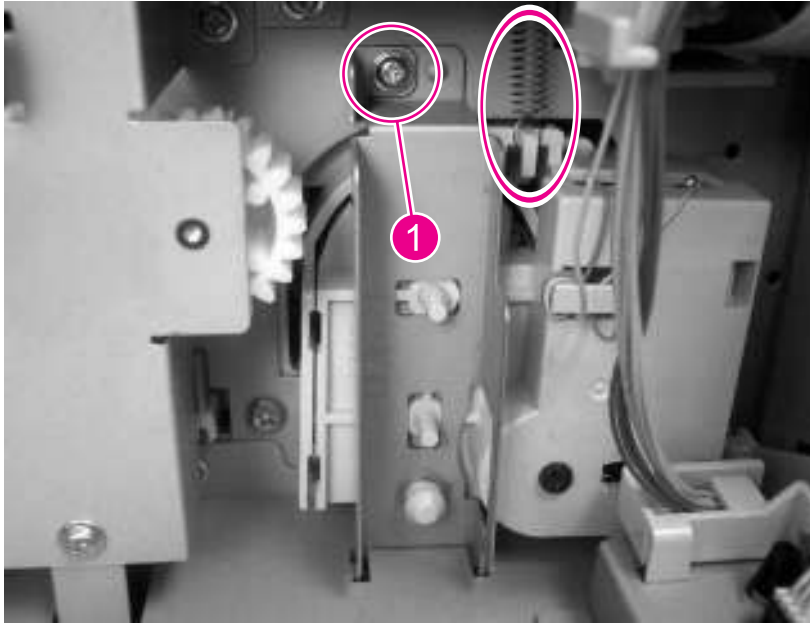
Figure 6-124 Remove the registration assembly (2 of 6)

4 Remove the wire harnesses from the wire guides, remove five screws (callout 2), and then remove the drive-gear assembly.
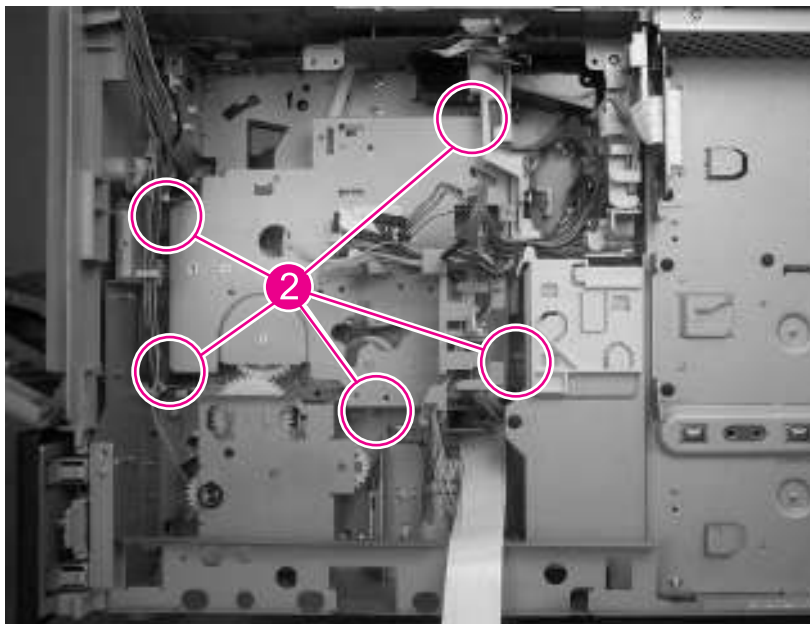
Figure 6-125 Remove the registration assembly (3 of 6)

5   Remove one e-ring (callout 3), and remove the registration-drive gear.
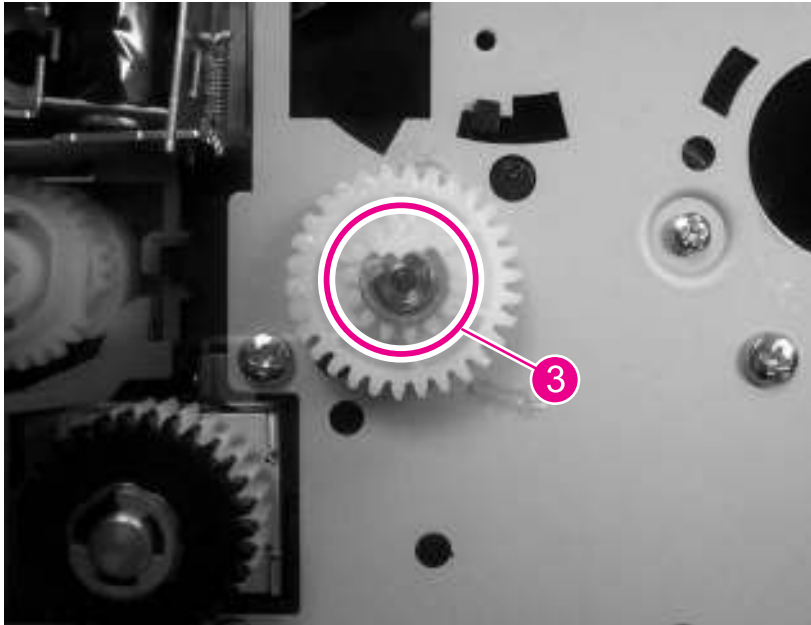
Figure 6-126 Remove the registration assembly (4 of 6)

6   Remove one grounding screw (callout 4).
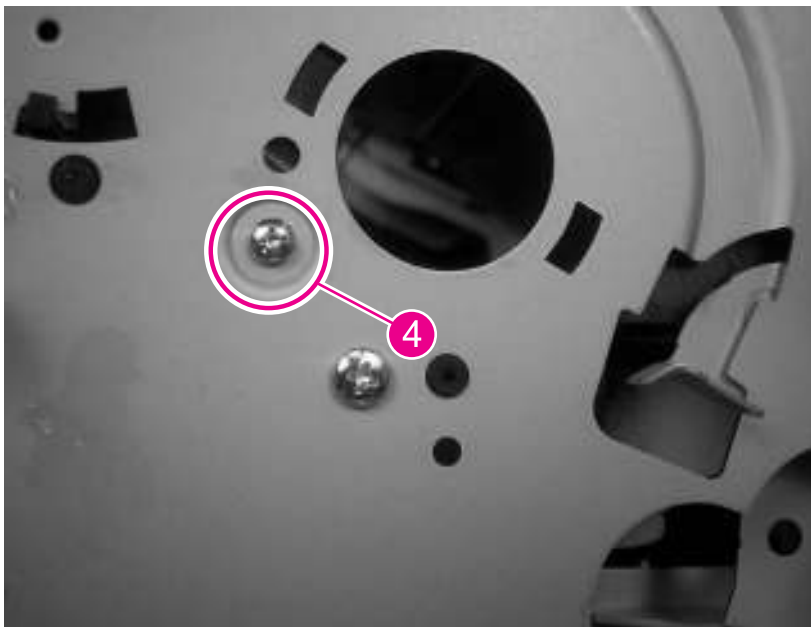
Figure 6-127 Remove the registration assembly (5 of 6)

7 Remove five screws (callout 5), and then remove the registration assembly. (Two screws are in the upper, left callout.)
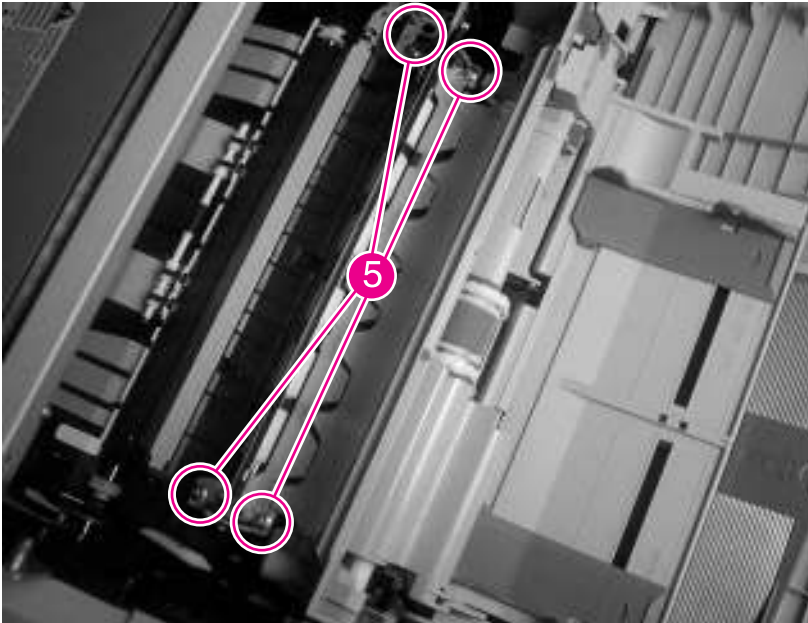
Figure 6-128 Remove the registration assembly (6 of 6)

Paper-pickup-drive assembly

1 Remove the back cover. See Back cover.

2 Remove two screws (callout 1), and remove the fan shroud.

Figure 6-129 Remove the paper-pickup-drive assembly (1 of 6)

3 Remove seven screws (callout 2), and then rotate the rear sheet-metal shield away from the MFP.

Figure 6-130 Remove the paper-pickup-drive assembly (2 of 6)

4 Disconnect one connector (callout 3; J66) from the dc controller, and remove the sheet-metal shield.

Figure 6-131 Remove the paper-pickup-drive assembly (3 of 6)

5 Disconnect one connector (callout 4; J92) from the dc controller.
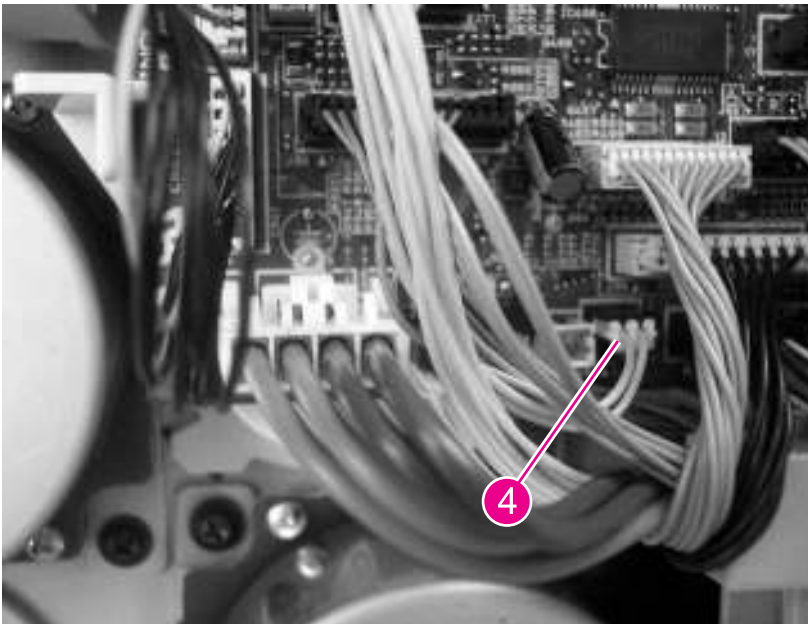
Figure 6-132 Remove the paper-pickup-drive assembly (4 of 6)

📝 **NOTE** The tray 2 pickup-solenoid (SL101) is part of the paper-pickup-drive assembly.

6 Remove four screws (callout 5), and then remove the paper-pickup-drive assembly.
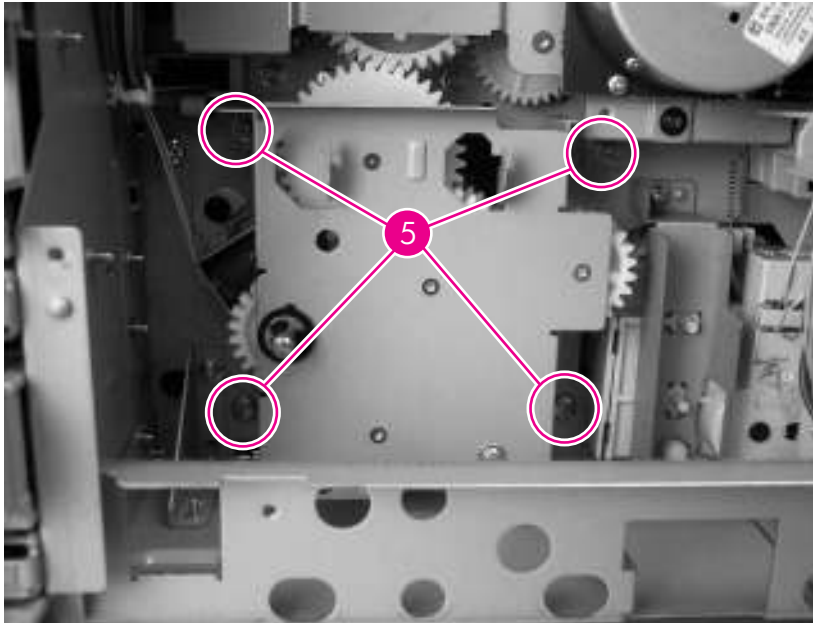
Figure 6-133 Remove the paper-pickup-drive assembly (5 of 6)

7 You *must* replace the 18-tooth gear on this assembly, even if it is not worn, when you replace the paper-pickup-drive assembly. Use a small, flat-blade screwdriver to unlatch the retaining hook on the gear, and then remove the gear.
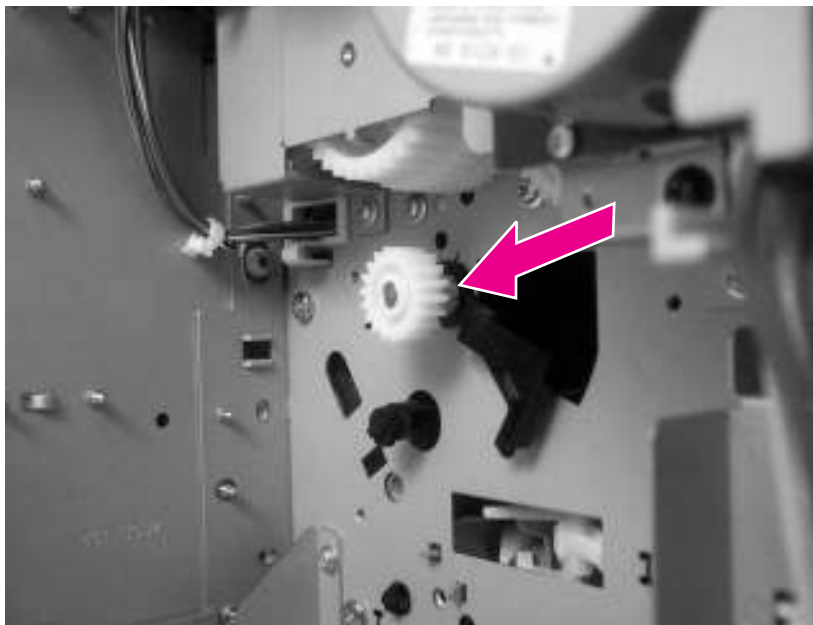
Figure 6-134 Remove the paper pickup drive assembly (6 of 6)

8   **CAUTION**: Do not let the pickup roller shaft slide into the MFP when you install the gear. The groove on the shaft that the gear clips into can get stuck on the MFP chassis. Put pressure on the cassette feed-roller shaft to keep the shaft from slipping into MFP. See the following figure.

Figure 6-135 Cassette feed-roller shaft (push here while replacing the gear)

Lifter-drive assembly

1 Remove the back cover. See Back cover.

2 Remove two screws (callout 1), and remove the fan shroud.
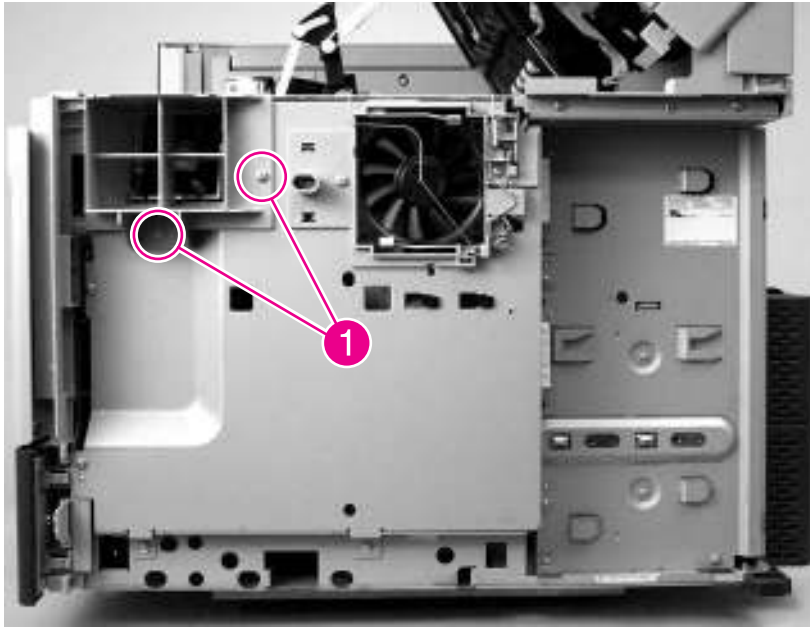
Figure 6-136 Remove the lifter-drive assembly (1 of 5)

3 Remove seven screws (callout 2), and then rotate the rear sheet-metal shield away from the MFP.
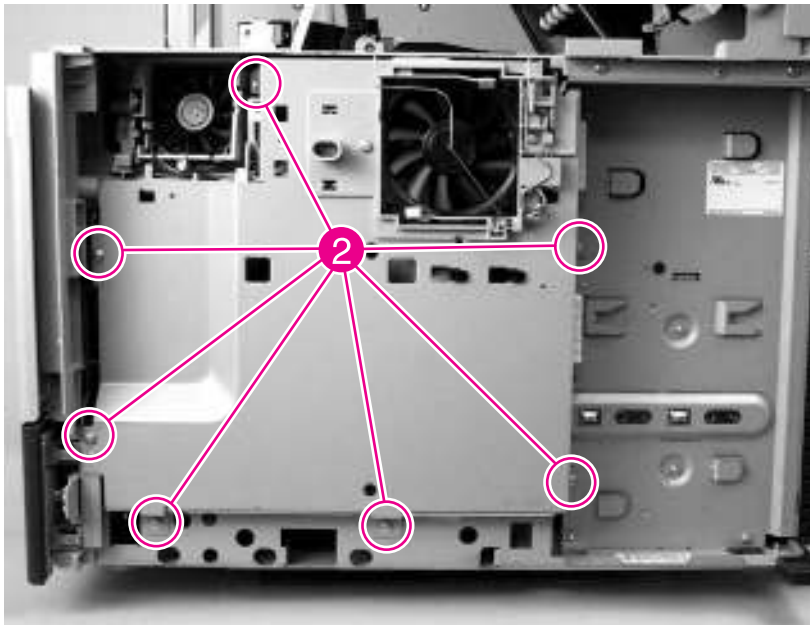
Figure 6-137 Remove the lifter-drive assembly (2 of 5)

4 Disconnect one connector (callout 3; J66) from the dc controller and remove the sheet-metal shield.
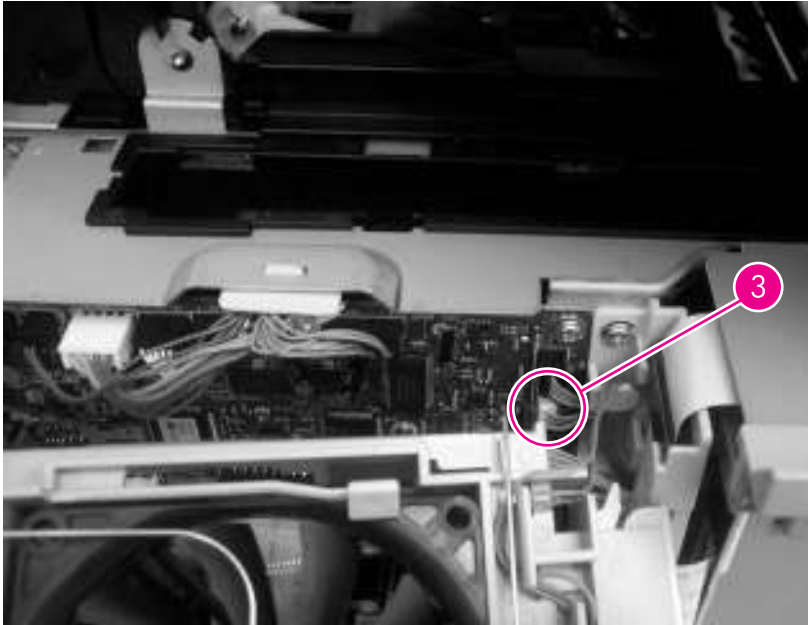
Figure 6-138 Remove the lifter-drive assembly (3 of 5)

5 Unhook the lifter-drive-assembly tension-spring from the tab on the chassis.

> ⚠ **CAUTION** The lifter-drive-assembly tension-spring is not captive. Do not lose the spring when you remove the assembly. Remove one screw (callout 4), and remove the retaining bracket (callout 3).
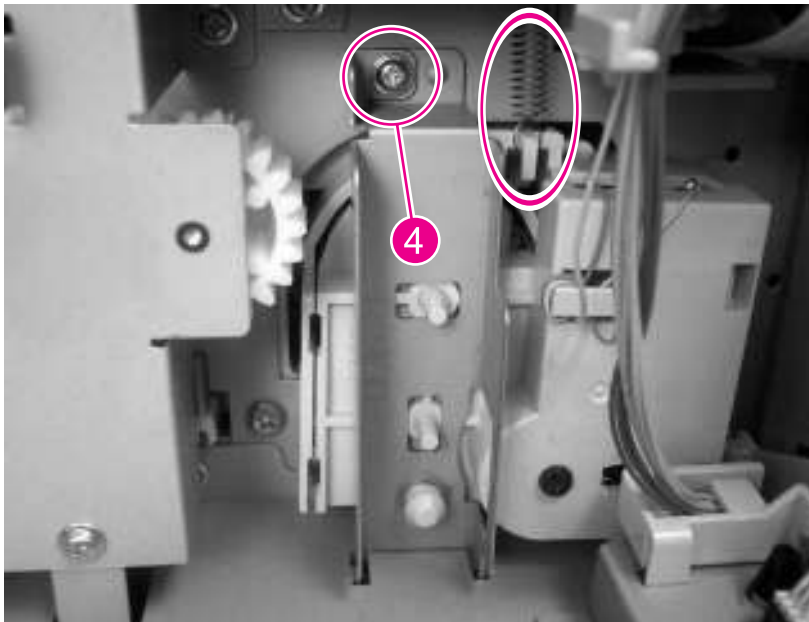
Figure 6-139 Remove the lifter-drive assembly (4 of 5)

6 Removal and replacement

6 Disconnect one connector (callout 5; J93) on the dc controller. Slide the lifter-drive assembly toward you, and then remove it.
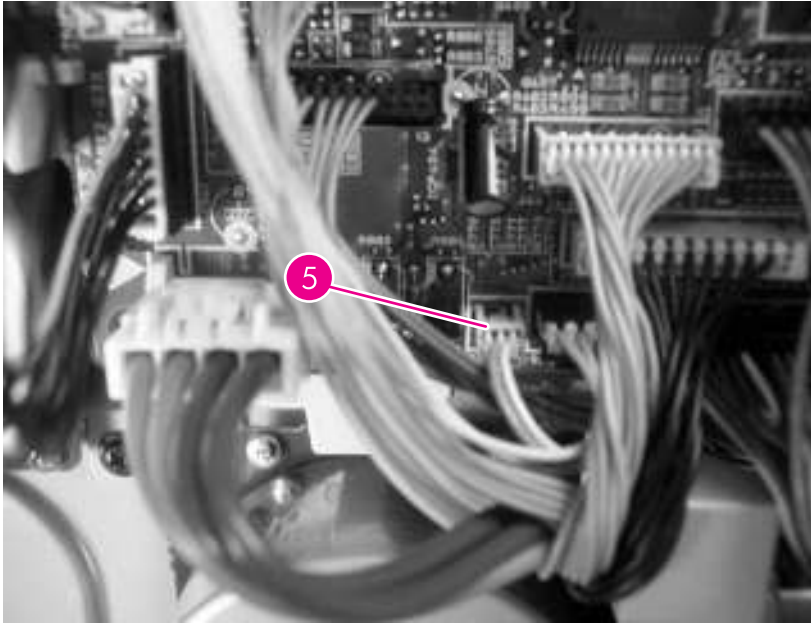
Figure 6-140 Remove the lifter-drive assembly (5 of 5)

Power-factor-correction (PFC) power supply

1 Remove the following assemblies:

- Formatter. See Formatter cover and formatter.

- Back cover. See Back cover.

- Output-bin assembly. See Output-bin assembly.

2 Remove two screws (callout 1), and remove the fan shroud.
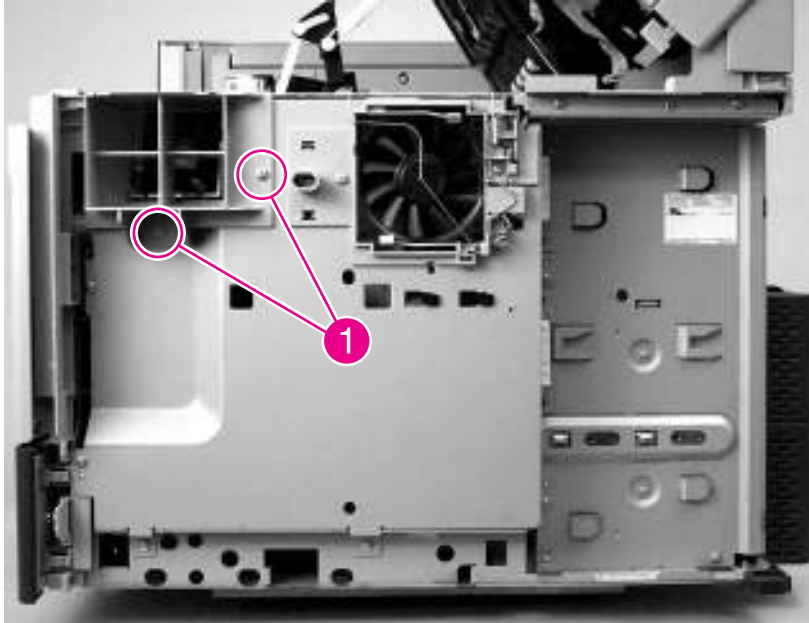
Figure 6-141 Remove the PFC power supply (1 of 8)

3 Remove seven screws (callout 2), and then rotate the rear sheet-metal shield away from the MFP.
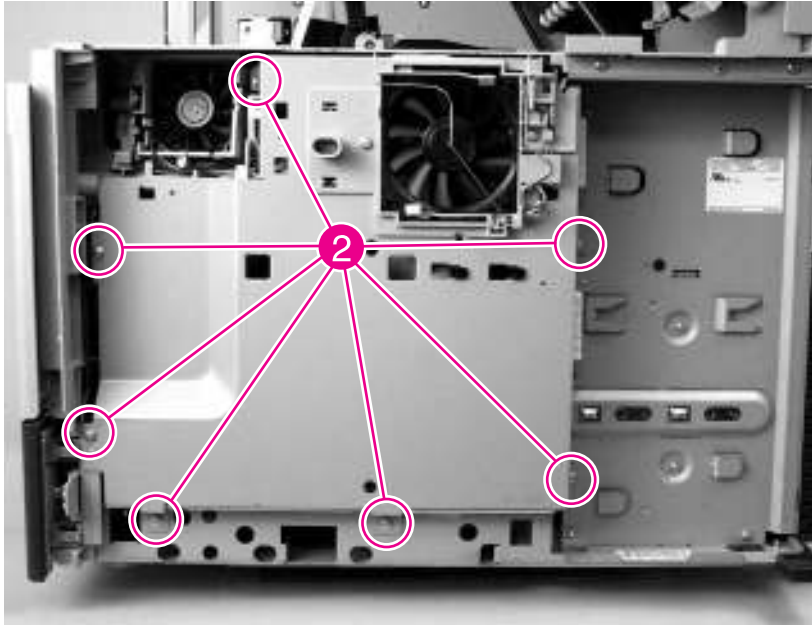
Figure 6-142 Remove the PFC power supply (2 of 8)

4 Disconnect one connector (callout 3; J66) from the dc controller, and remove the sheet-metal shield.
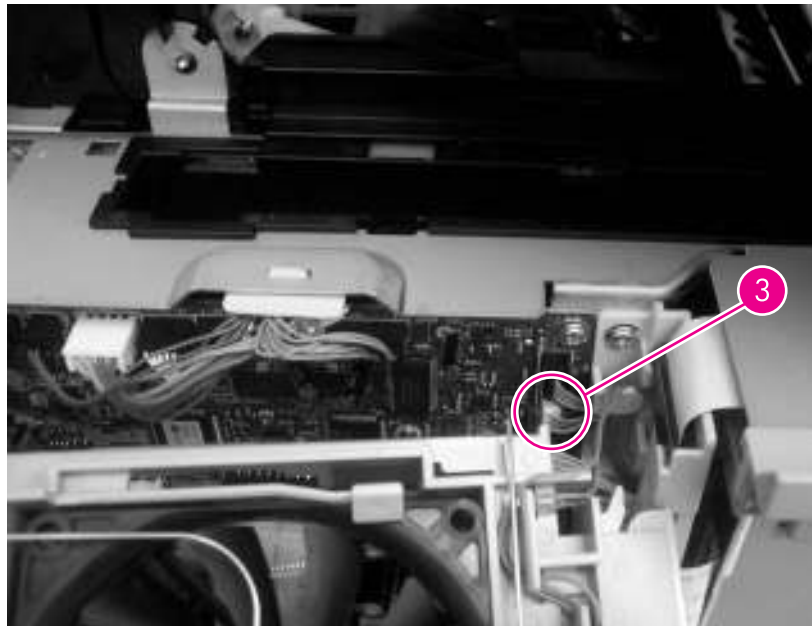
Figure 6-143 Remove the PFC power supply (3 of 8)

5   Remove one screw (callout 4), push in on the retaining tab at the top of the rear-side cover, and then slide the cover up to remove it.
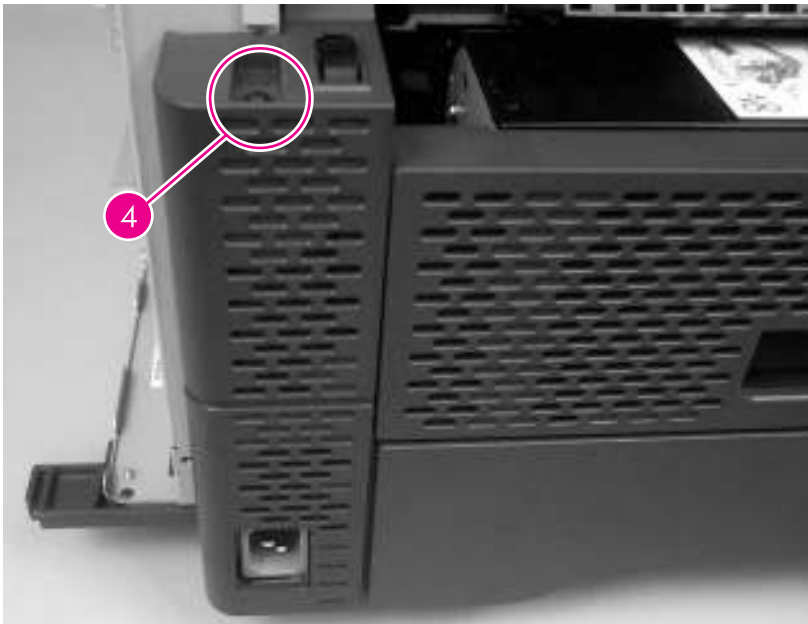
Figure 6-144 Remove the PFC power supply (4 of 8)

6   Remove four screws (callout 5), and then remove the two formatter FCC connectors (callout 6).
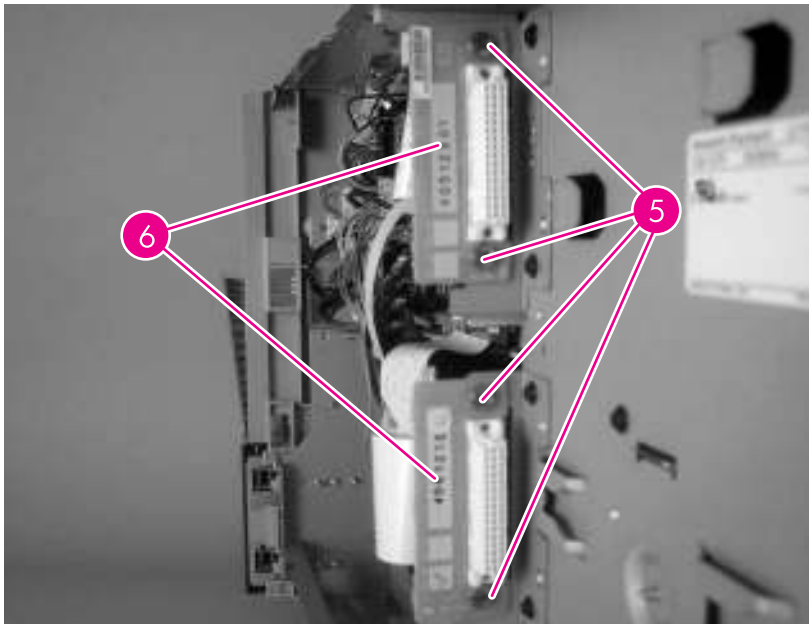
Figure 6-145 Remove the PFC power supply (5 of 8)

7 Remove ten screws (callout 7).
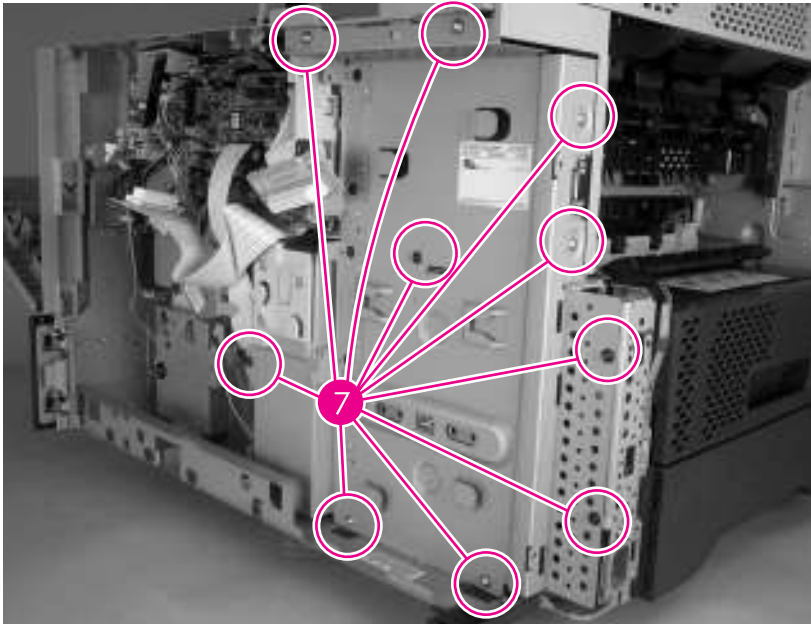
Figure 6-146 Remove the PFC power supply (6 of 8)

Reinstallation tip: Be sure to place the black screws in the holes as shown here. These screws go through printed-circuit assemblies (PCAs). Other screws could cut new threads in the PCAs.

8 Tilt the top of the PFC power-supply shield away from the MFP, and lift it up to remove it
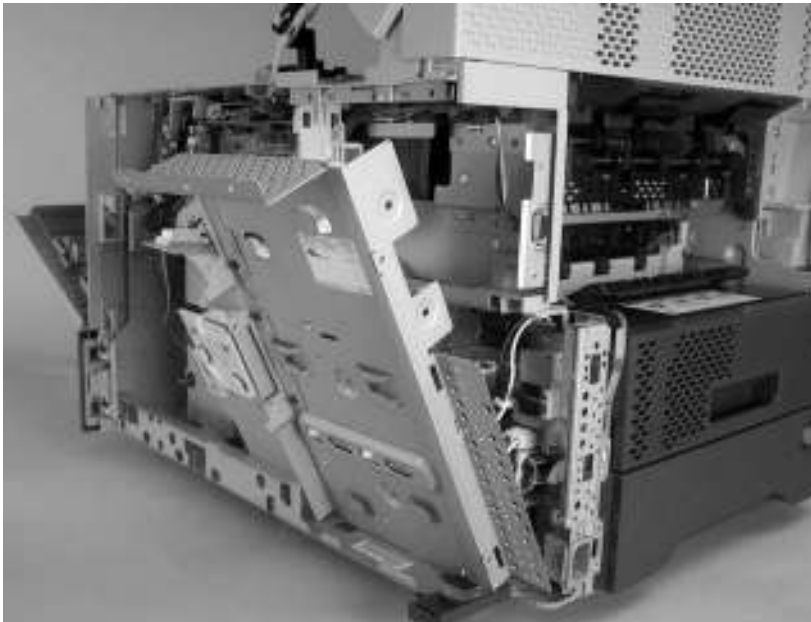
Figure 6-147 Remove the PFC power supply (7 of 8)

9 Disconnect three connectors (callout 8), remove four screws (callout 9), and then remove the PFC power supply.
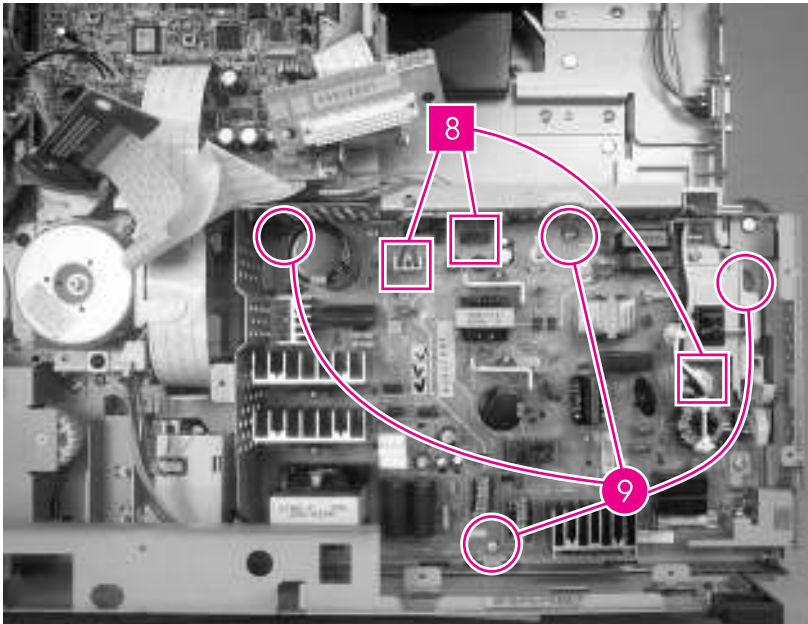
Figure 6-148 Remove the PFC power supply (8 of 8)

Engine power supply

1 Remove the following assemblies:

- Fuser. See Fuser.

- Output-bin assembly. See Output-bin assembly.

- Duplex-printing unit (or the cover if no duplex-printing unit is installed). See Duplex-printing unit.

- Front cover. See Front cover.

- Back cover. See Back cover.

- PFC power supply. See Power-factor-correction (PFC) power supply.

2 Remove two screws (callout 1), and remove the fan shroud.
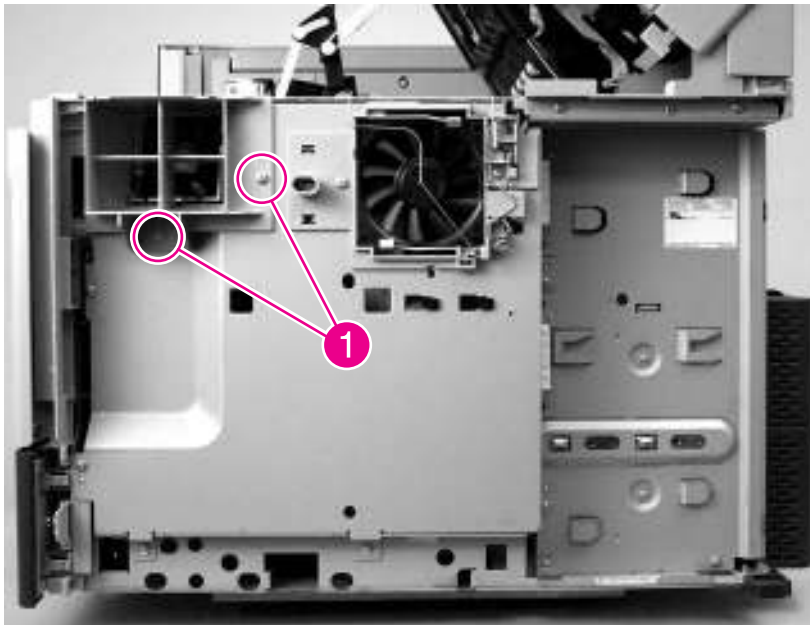
Figure 6-149 Remove the engine power supply (1 of 10)

3 Remove seven screws (callout 2), and then rotate the rear sheet-metal shield away from the MFP.
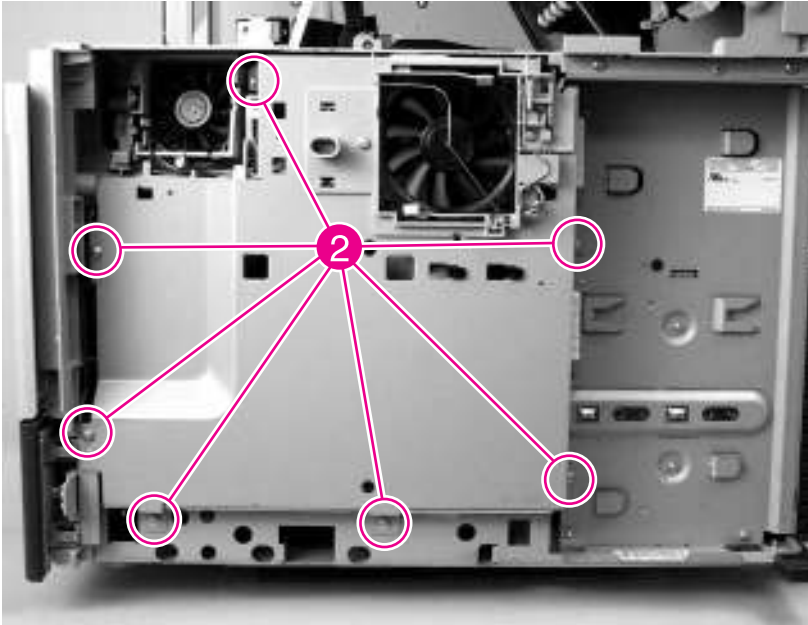
Figure 6-150 Remove the engine power supply (2 of 10)

4 Disconnect one connector (callout 3; J66) from the dc controller, and remove the sheet-metal shield.
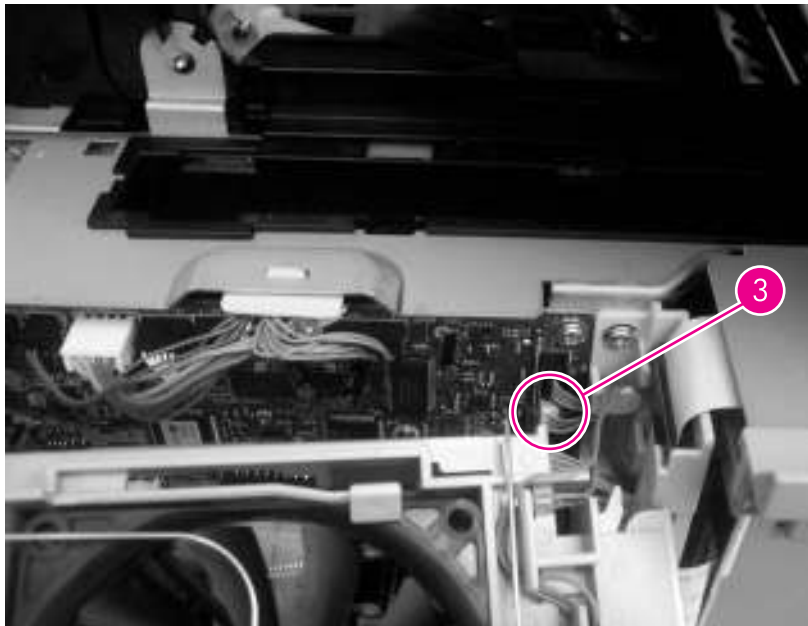
Figure 6-151 Remove the engine power supply (3 of 10)

5   On the dc controller, disconnect two FFCs (callout 4; J80, J81), the 24-volt connector (callout 5; J99) the duplexer connector (callout 6; J44), and the fuser connector (callout 7; J71).
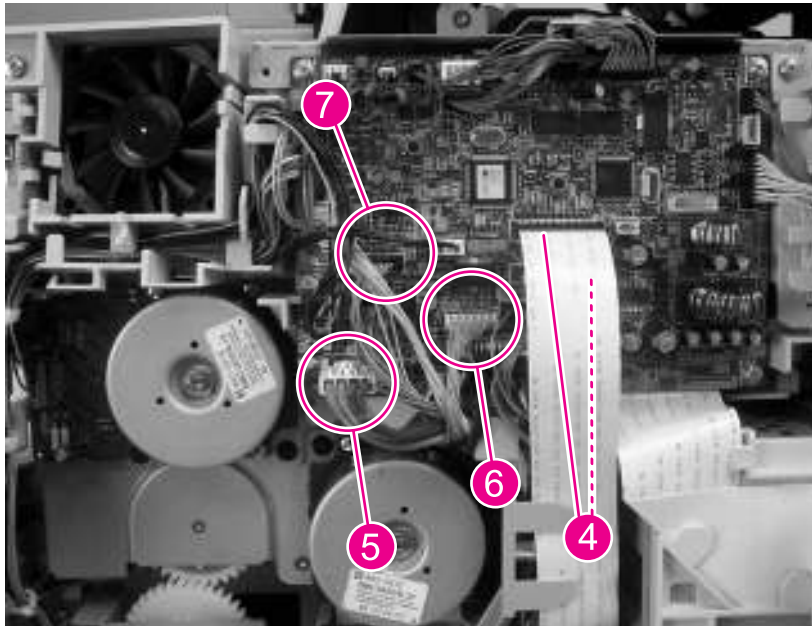
Figure 6-152 Remove the engine power supply (4 of 10)

6   Remove the cassette from tray 2. Remove two screws (callout 8), release the retaining tab (callout 9), and slide the rear duplexer-guide toward you and remove it.
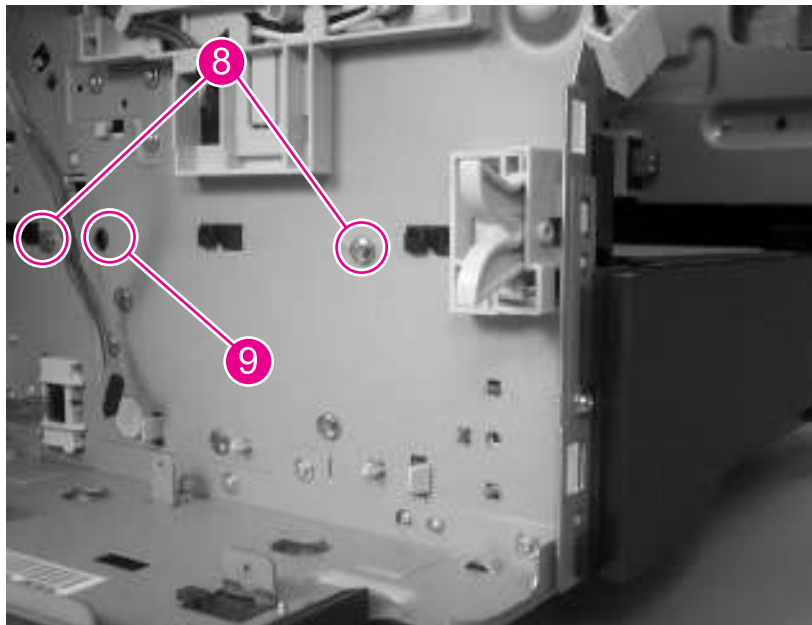
Figure 6-153 Remove the engine power supply (5 of 10)

7 Remove two screws (callout 10), remove the power supply shield, and then disconnect the thermistor and fan connectors.
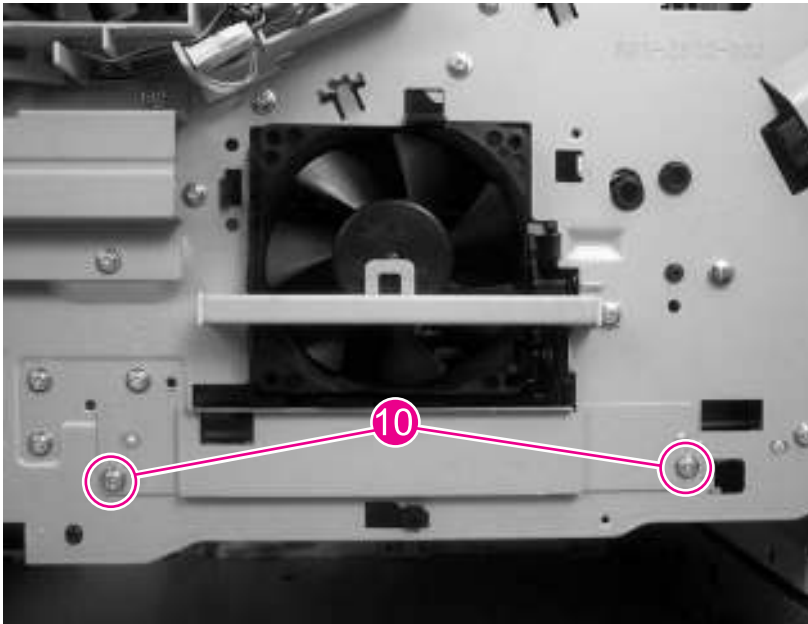
Figure 6-154 Remove the engine power supply (6 of 10)

8 Remove three screws (callout 11) on front of the MFP).
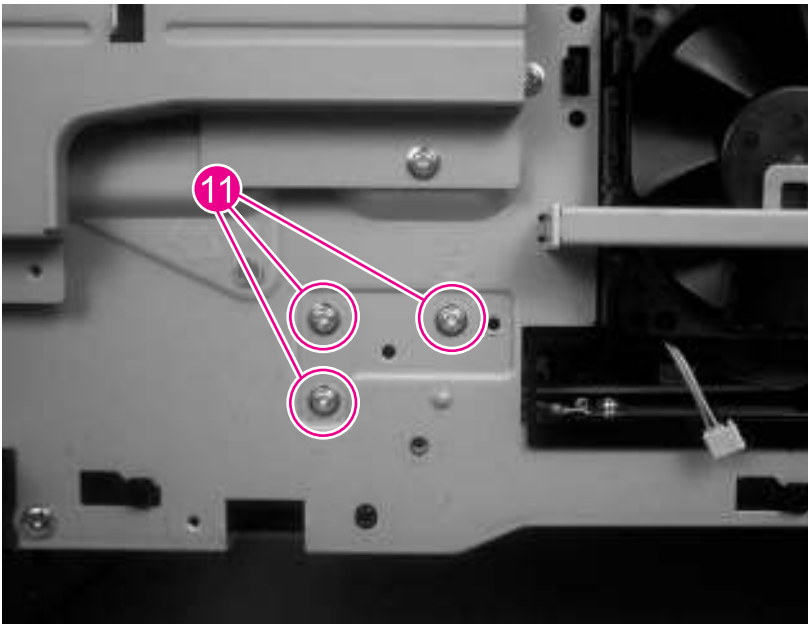
Figure 6-155 Remove the engine power supply (7 of 10)

9 Remove three screws (callout 12) on rear of the MFP.
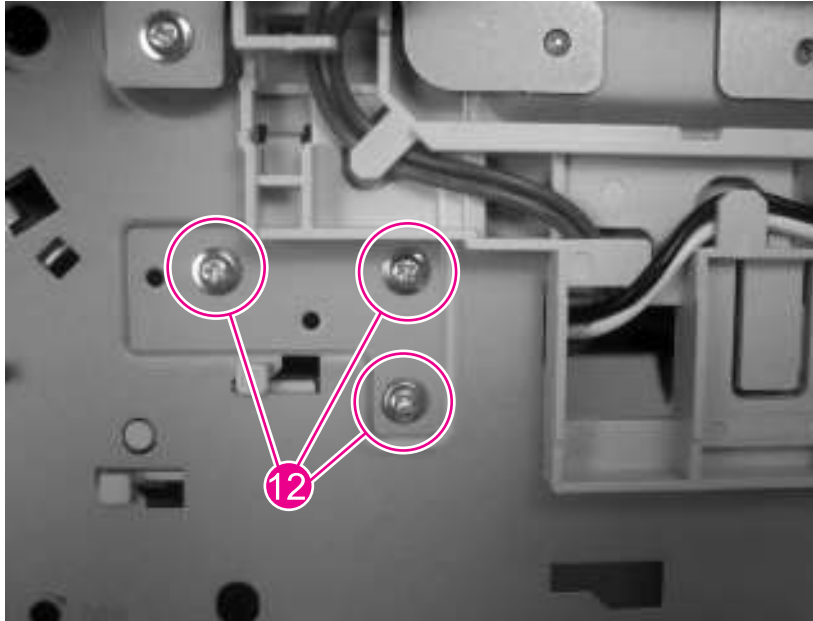
Figure 6-156 Remove the engine power supply (8 of 10)

10 Route the PFC power supply wire-harnesses out through the hole in the chassis.
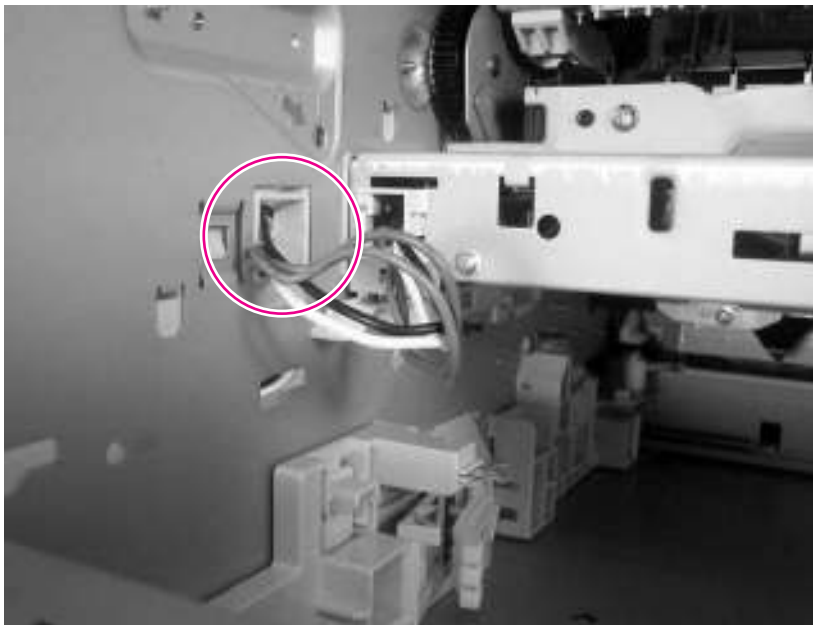
Figure 6-157 Remove the engine power supply (9 of 10)

11 Reach inside the MFP, lift up on the power supply, and slide it out of the MFP (make sure that you feed the dc-controller cables through the hole in the chassis as you remove the engine power supply).
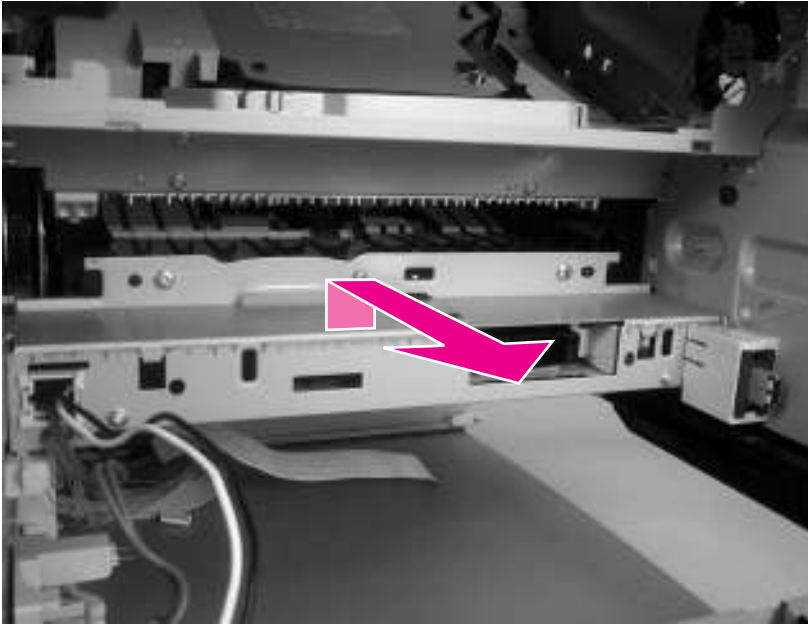
Figure 6-158 Remove the engine power supply (10 of 10)

Paper-feed assembly

1 Remove the engine power supply. See <u>Engine power supply</u>.

2 Remove three screws (callout 1).
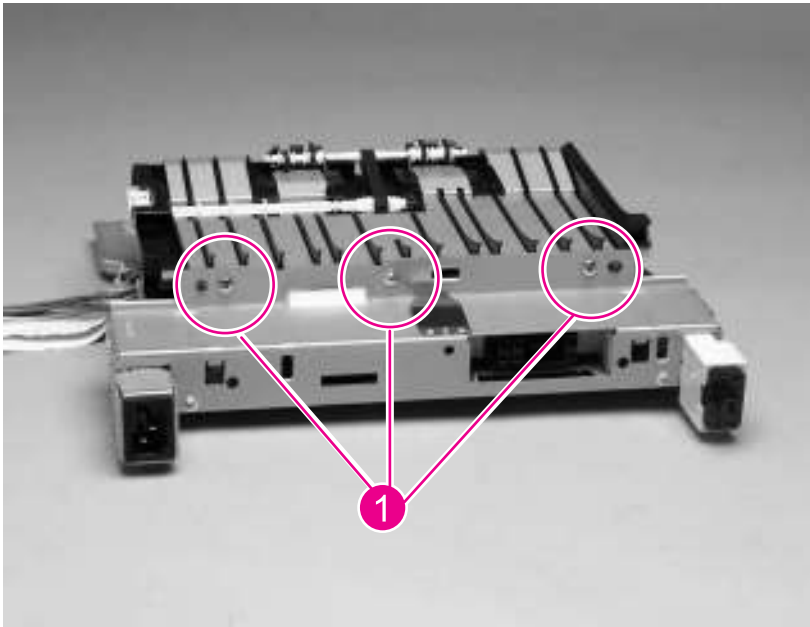
Figure 6-159 Remove the paper-feed assembly (1 of 2)

3 Release the paper-feed-assembly alignment pins. Rotate the assembly toward the back of the power supply, and remove it.
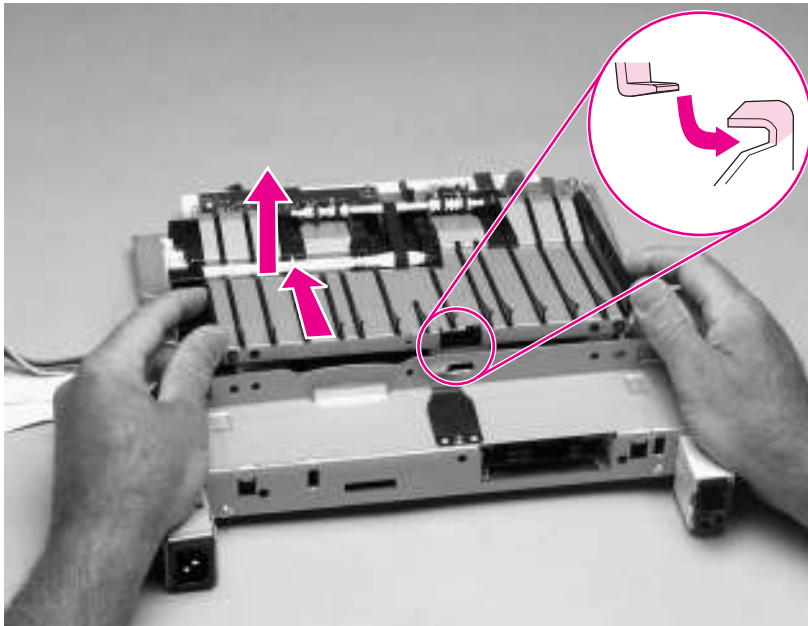
Figure 6-160 Remove the paper-feed assembly (2 of 2)

> ⚠ **CAUTION** Verify that the four rubber belts and plastic rollers remain in place. These belts and rollers can easily come off and be lost. When you install the paper-feed assembly, verify that the center foot (on the power-supply side) is correctly hooked under the support leg that is on the engine power supply.

Tray 2 detection switch

1 Remove the PFC power supply. See Power-factor-correction (PFC) power supply.

2 Remove the cassette from tray 2.

3 Remove three screws (callout 1), release the two locking tabs on the tray detection switch (callout 2), and then remove the tray 2 detection switch.
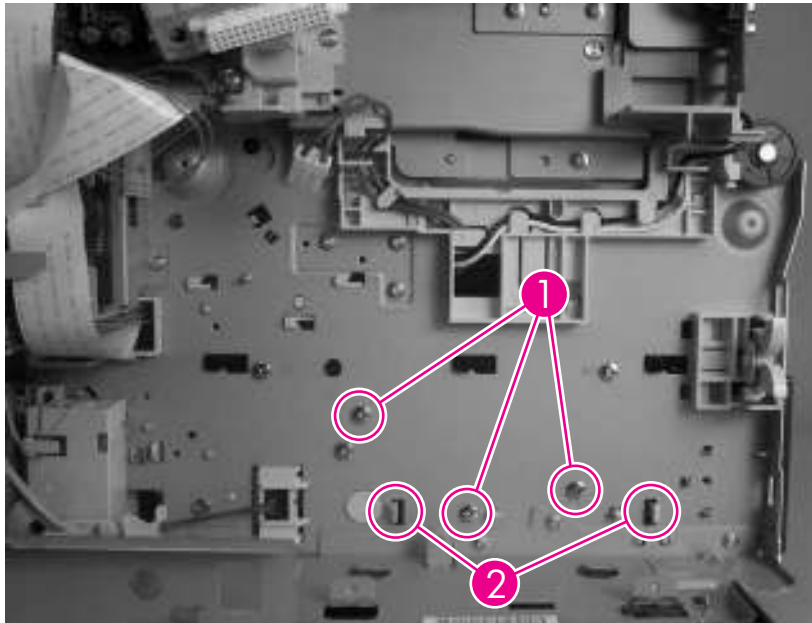
Figure 6-161 Remove the tray 2 detection switch

⚠ **CAUTION** The tray 2 detection-switch spring is not captive. Do not lose this spring when you remove the switch.

Paper-size-detection switch (SW102)

1   Remove the tray 2 detection switch. See [Tray 2 detection switch]().

2   Disconnect the paper-size-detection-switch connector (callout 1). Remove one screw (callout 2). Push in on the paper-size-detection switch, and then slide the switch toward the right side of the MFP and remove it.
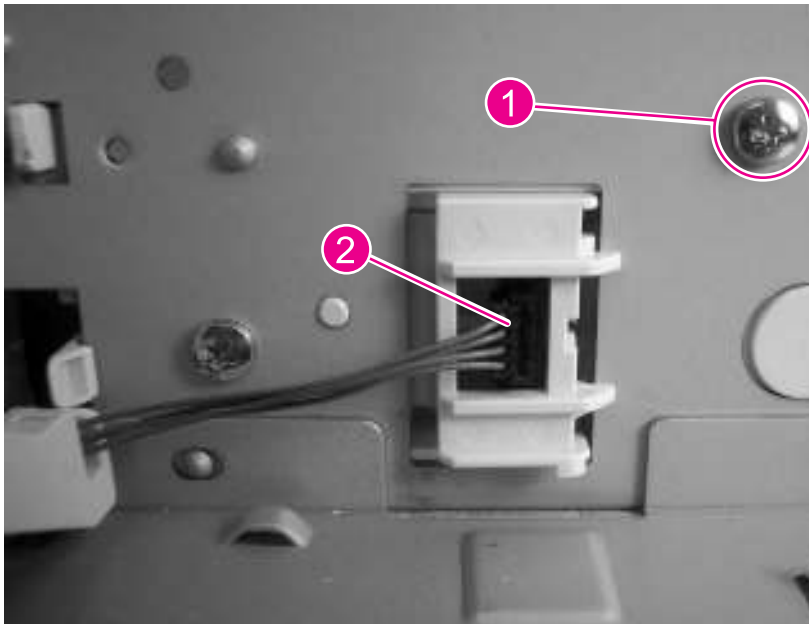
Figure 6-162 Remove the paper-size-detection switch (1 of 2)

Tray 2 paper-present sensor (PS101)

1 Use a short #2 Phillips screwdriver to remove the screw.

Figure 6-163 Remove the tray 2 paper-present sensor

2 Remove the tray 2 paper-present sensor.

Laser/scanner

1 Remove the following assemblies:

- Reversing-separation-guide assembly. See Reversing-separation-guide assembly.

- Reversing assembly. See Reversing assembly.

 NOTE This procedure requires that you use a short #2 Phillips screwdriver.

2 Remove four screws.

 NOTE Take note of the orientation of the laser/scanner grounding clips.
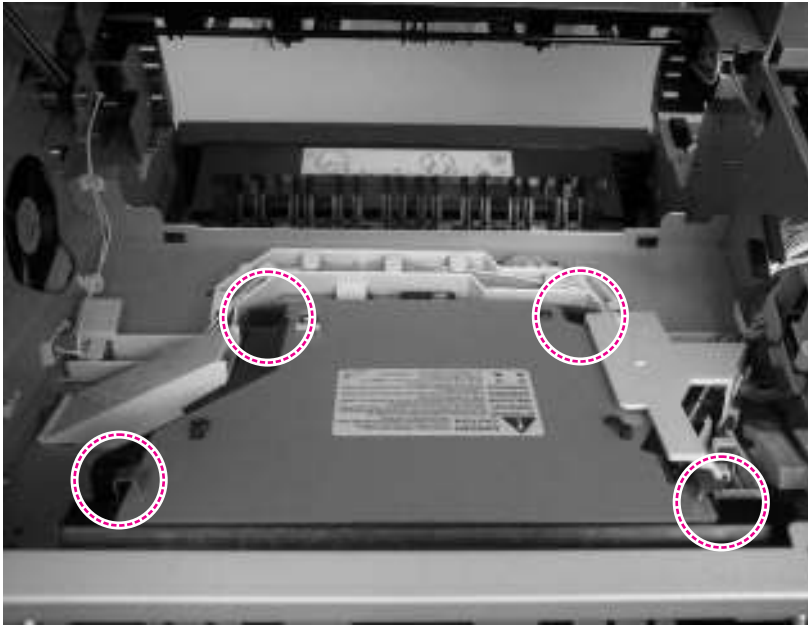
Figure 6-164 Remove the laser/scanner (1 of 2)

3 Disconnect two connectors, and then lift the laser/scanner out of the MFP.

Figure 6-165 Remove the laser/scanner (1 of 2)

Output-bin-full sensor

1   Remove the following assemblies:

   ●   Reversing-separation-guide assembly. See Reversing-separation-guide assembly

   ●   Reversing assembly. See Reversing assembly.

   ●   Output bin. See Output-bin assembly.

2   Unsnap the output-bin-full sensor from the retaining clips. Unsnap the clips at the rear of the MFP first, and work toward the front.
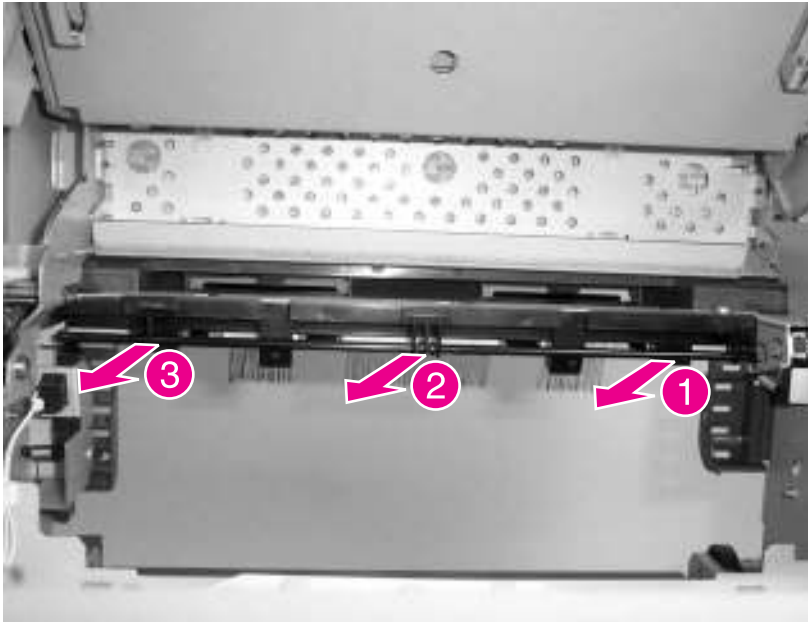
Figure 6-166 Remove the output-bin-full sensor

📝 **NOTE**   When installing the sensor, make sure that the flag (front end) is in front of the output-bin-detection lever. If the flag is not in front of the lever, this sensor will not function correctly.

3   Carefully remove the spring from the from the formatter-end of the output-bin-full sensor.

⚠ **CAUTION**   This spring can easily become dislodged from the chassis. Do not lose this spring when you remove this assembly.

4   **Reinstallation tip:** After installing the replacement output-bin-full sensor, verify that it is in the upright position. This ensures that the sensor is correctly installed and will be correctly positioned when the output bin is installed. The lever on the control-panel end of the sensor must be installed between the plastic MFP cover and the output-bin-detection lever. See Figure 6-167 Incorrect installation of the output-bin-full sensor and Figure 6-168 Correct installation of the output-bin-full sensor.
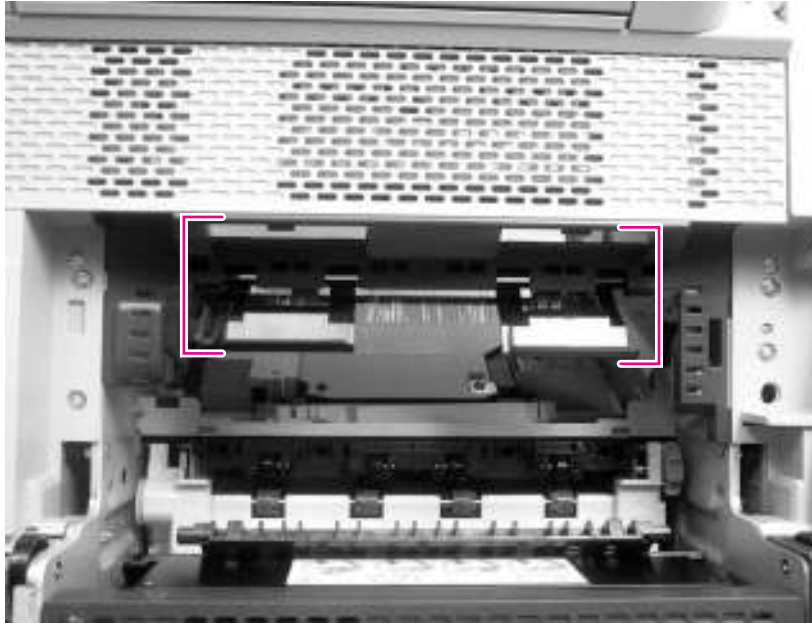
Figure 6-167 **Incorrect** installation of the output-bin-full sensor
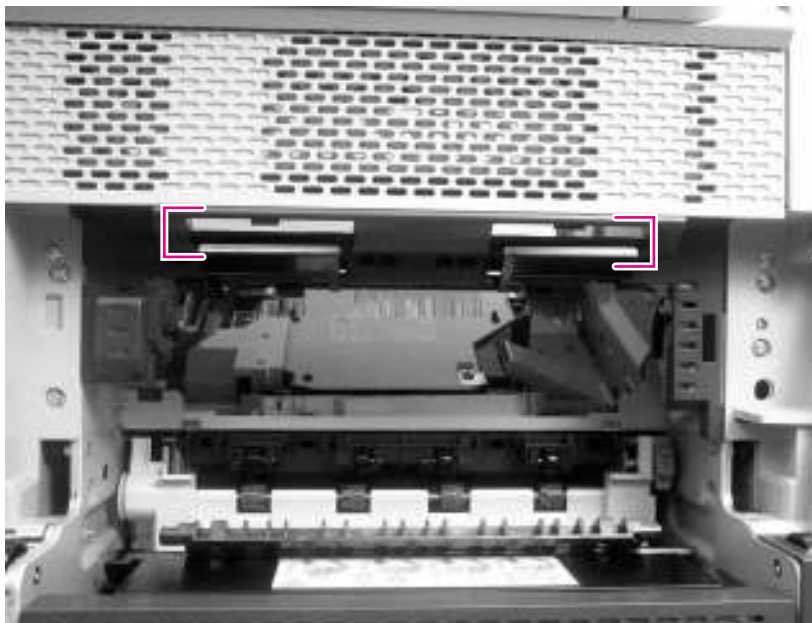
Figure 6-168 **Correct** installation of the output-bin-full sensor

ADF and scanner components

The procedures in this section describe the removal and replacement of the following components:

- ADF assembly
- Scanner assembly
- Scanner glass
- Optical unit
- Scanner bulb
- Inverter PCA
- Scanner fan
- Scanner home-position sensor
- Scanner-controller PCA

ADF assembly

⚠ **CAUTION**   When you remove the ADF assembly, do not use the ADF cable to lift or move the ADF assembly.

1   Remove two screws (callout 1), and then remove the scanner-controller cover (callout 2).
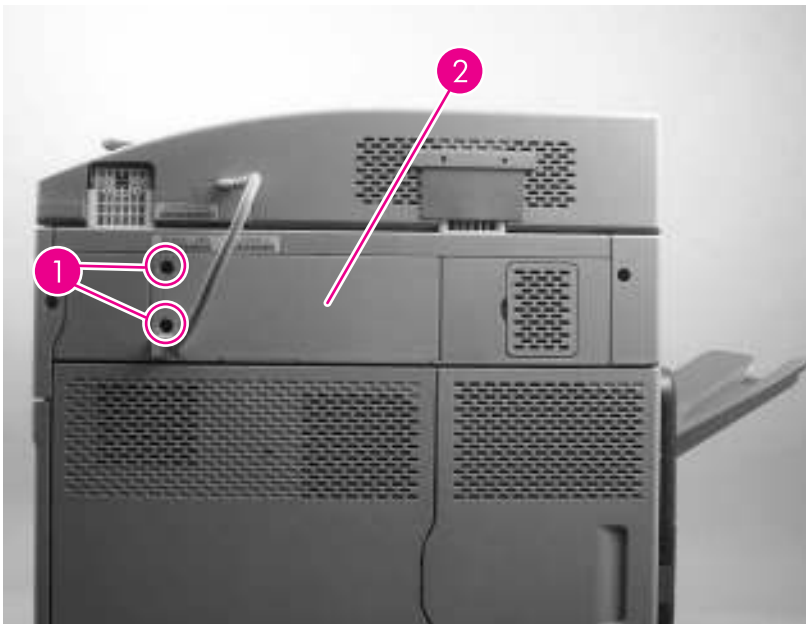
Figure 6-169 Remove the ADF assembly (1 of 3)

2 Remove one grounding screw (callout 3), and disconnect two cables (callout 4).
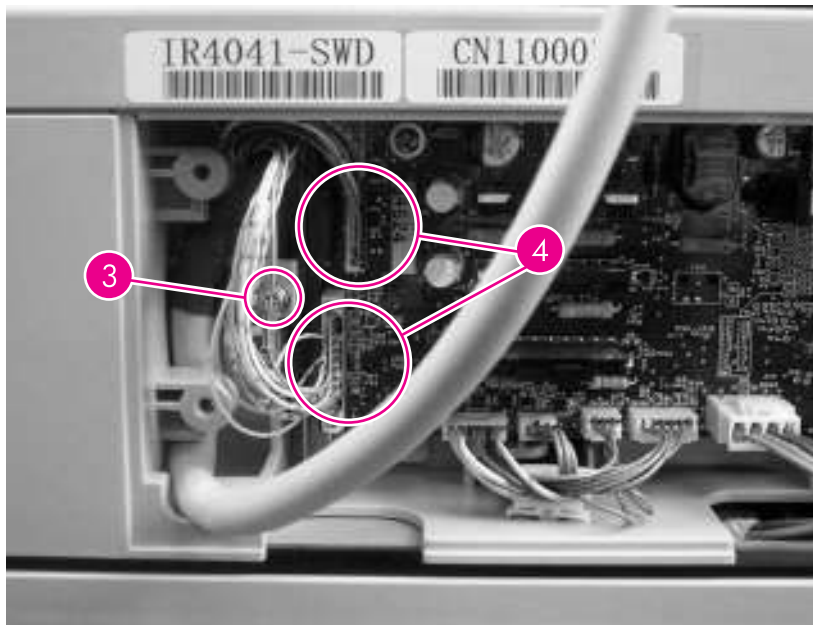
Figure 6-170 Remove the ADF assembly (2 of 3)

NOTE When you reinstall the ADF, make sure that the ADF cable is correctly routed through the cable holder into the scanner bed.

3 Open the ADF assembly, and lift it up and off of the scanner.
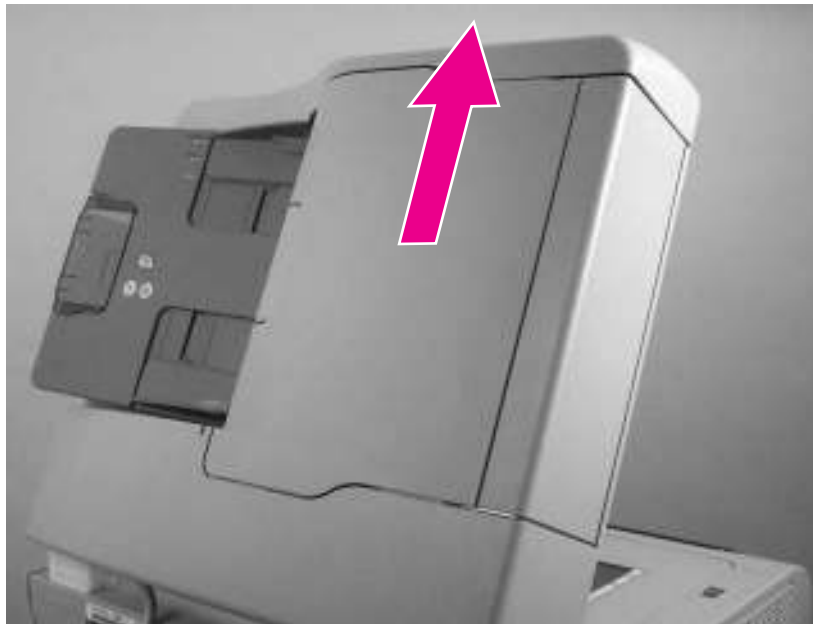
Figure 6-171 Remove the ADF assembly (3 of 3)

CAUTION The ADF assembly is calibrated to work with the scanner on which it is installed. If the ADF is installed on another scanner, that scanner needs to be calibrated to work correctly with the ADF. See Calibrating the scanner.

Scanner assembly

1 Remove the ADF assembly. See <u>ADF assembly</u>.

2 Raise the scanner, and remove the front-edge flange.

Figure 6-172 Remove the scanner assembly (1 of 8)

3 Remove two screws (callout 1), and remove the scanner-carriage-lock cover (callout 2).
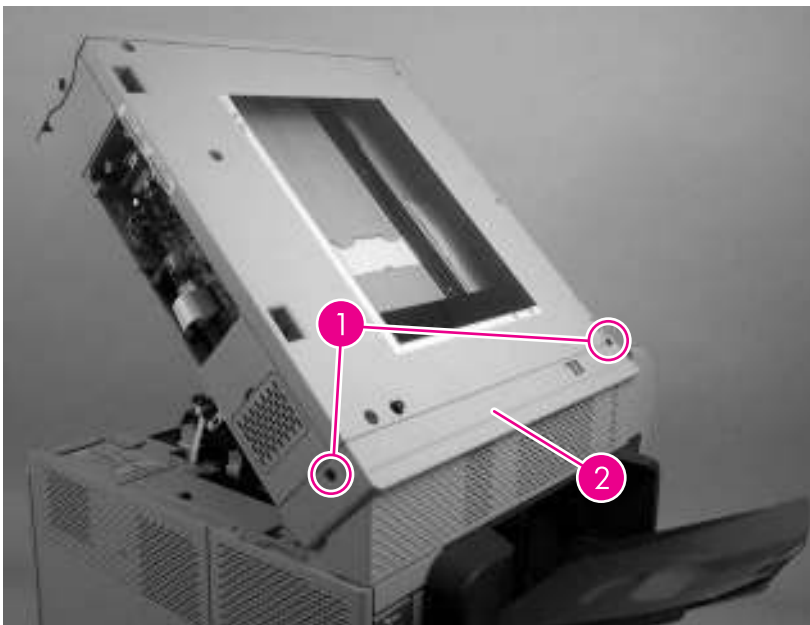
Figure 6-173 Remove the scanner assembly (2 of 8)

4 Remove the screw (callout 3), and remove the right scanner cover.

Figure 6-174 Remove the scanner assembly (3 of 8)

5 Close the top cover. Remove two screws (callout 4), and remove the left scanner-cover.
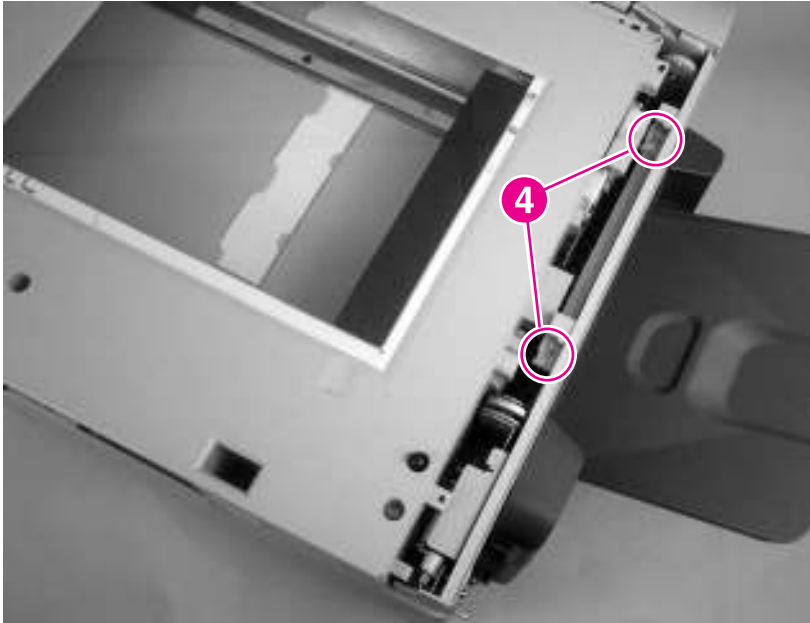
Figure 6-175 Remove the scanner assembly (4 of 8)

📝 **NOTE** The spring that is near the rear of the MFP (callout 5) is not captive. Do not lose the spring when you remove the cover.
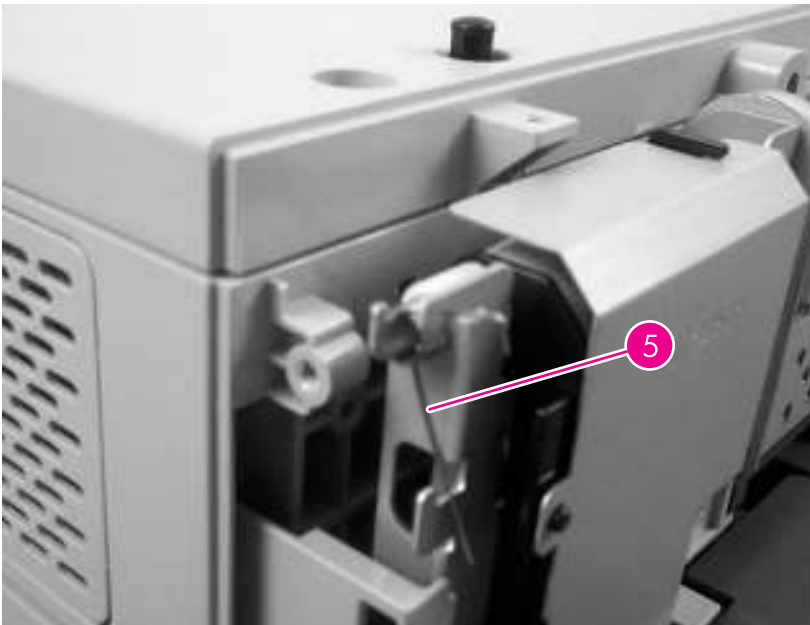
Figure 6-176 Remove the scanner assembly (5 of 8)

6 Removal and replacement

6 Remove three screws (callout 6).
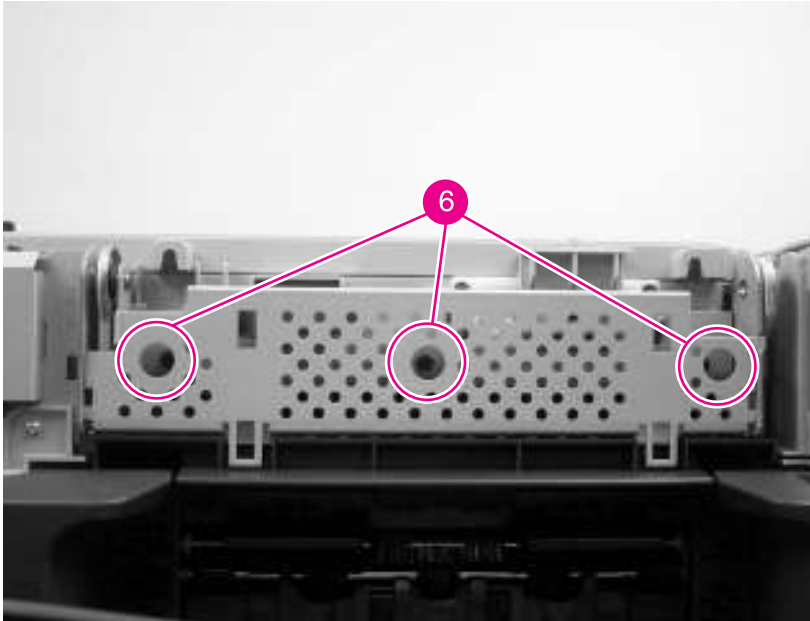
Figure 6-177 Remove the scanner assembly (6 of 8)

7 Disconnect one FFC (callout 7) and one connector (callout 8).
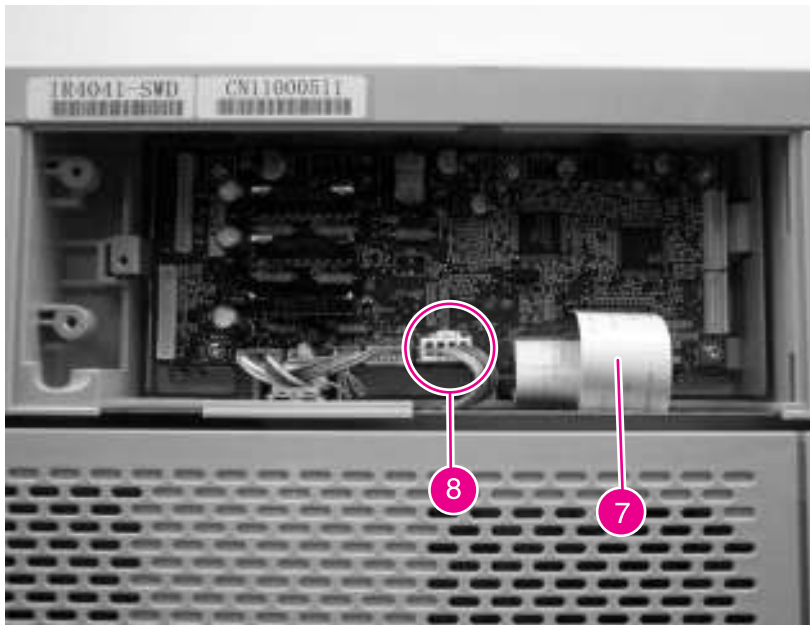
Figure 6-178 Remove the scanner assembly (7 of 8)

8 Slide the scanner slightly to the right, and then lift it up and off of the MFP.

Figure 6-179 Remove the scanner assembly (8 of 8)

> **CAUTION** Make sure that you do not release the scanner latch while the scanner assembly is removed. The gas shocks that support the scanner assembly can damage the sheet-metal scanner-assembly platform if the platform is raised when the scanner assembly is not installed.

9 **Reinstallation tip:** When you reinstall the scanner assembly, align the mark on the scanner assembly with the mark on the control panel to correctly position the scanner assembly. With the scanner assembly correctly positioned on the sheet metal platform, slide the assembly toward the left side of the MFP until it locks into place.

Figure 6-180 Correctly positioning the scanner assembly

Scanner glass

1 Remove the ADF assembly. See ADF assembly.

2 Remove the front flange.
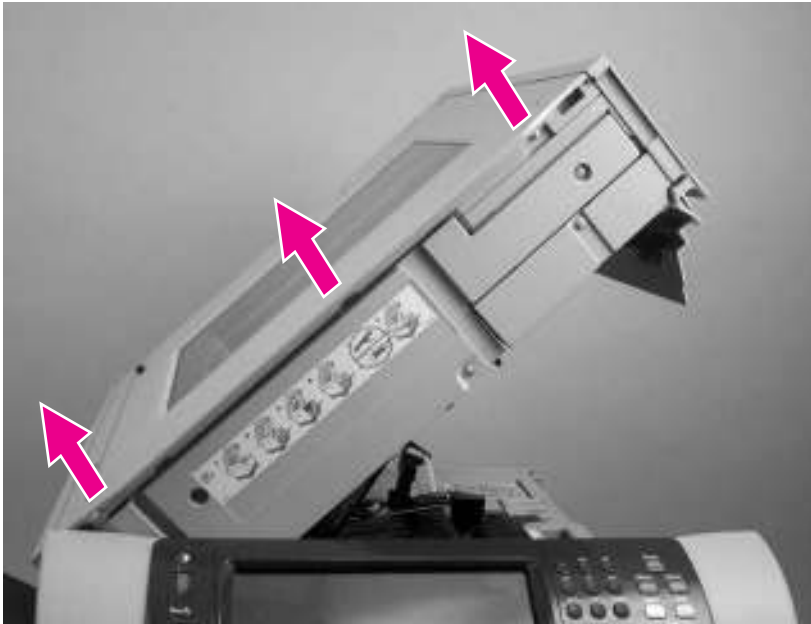
Figure 6-181 Remove the scanner glass (1 of 6)

3 Remove three screws (callout 1).
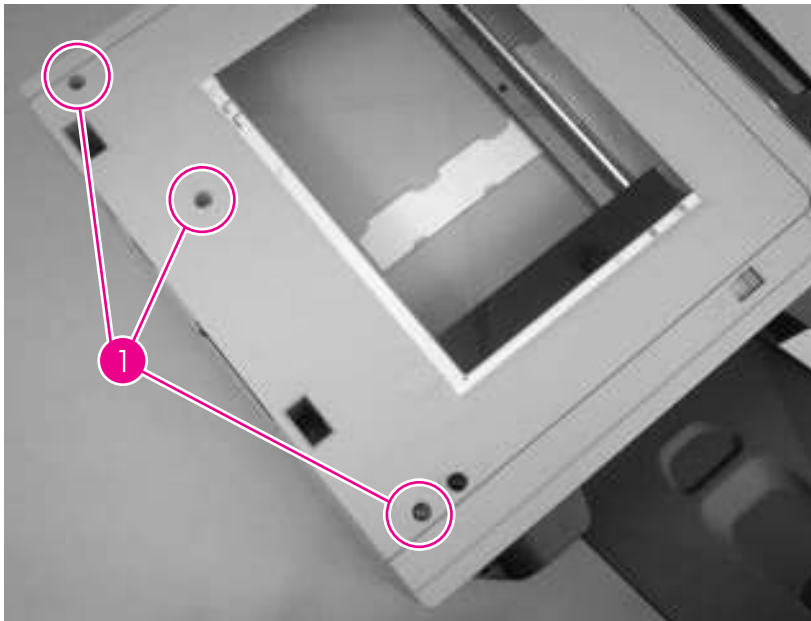
Figure 6-182 Remove the scanner glass (2 of 6)

4 Remove three screws (callout 2).
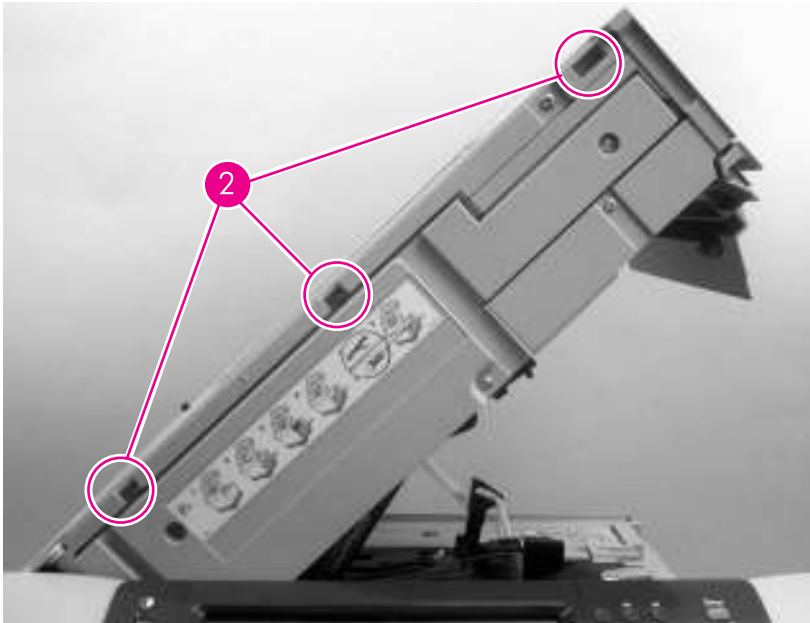
Figure 6-183 Remove the scanner glass (1 of 6)

5 Remove two screws (callout 3), and then remove the scanner-carriage-lock cover.
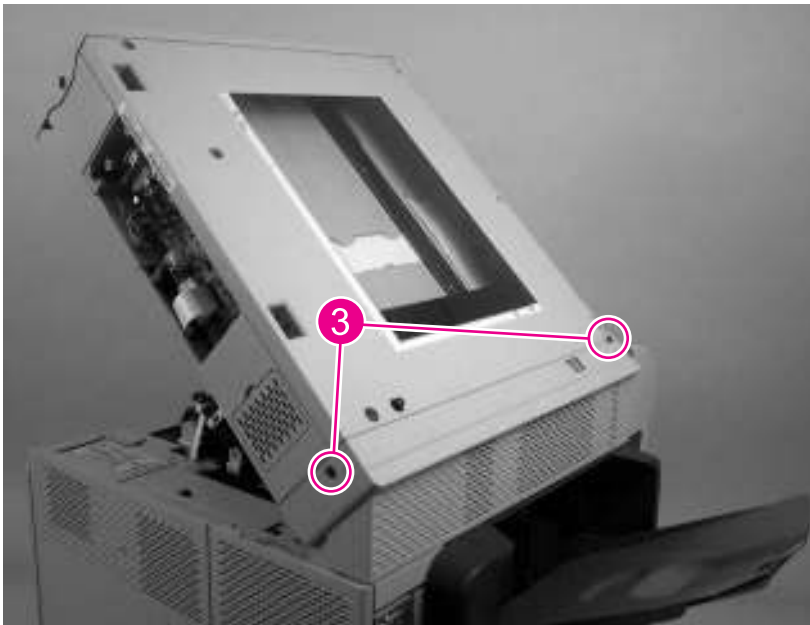
Figure 6-184 Remove the scanner glass (4 of 6)

6 Remove one screw (callout 4), and then remove the right-side scanner cover.
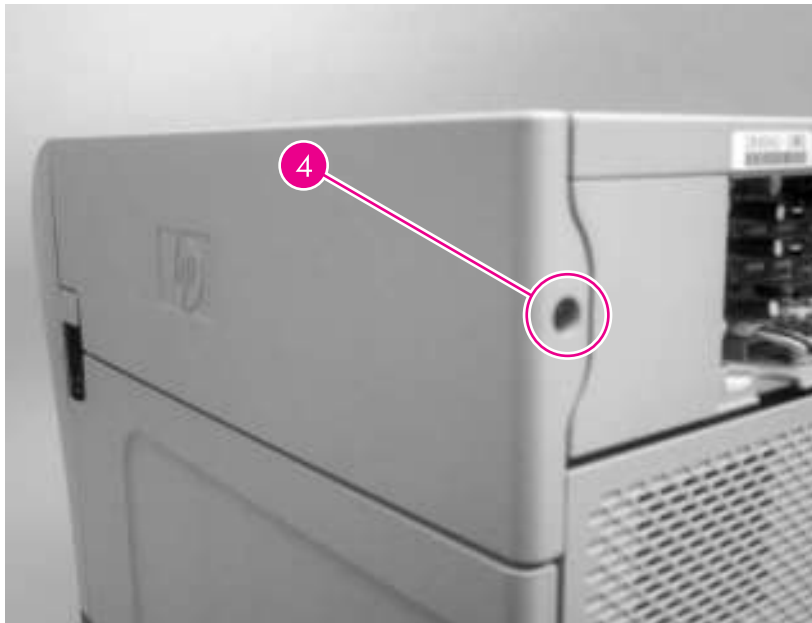
7 Lift the scanner-glass frame up and off of the scanner assembly.
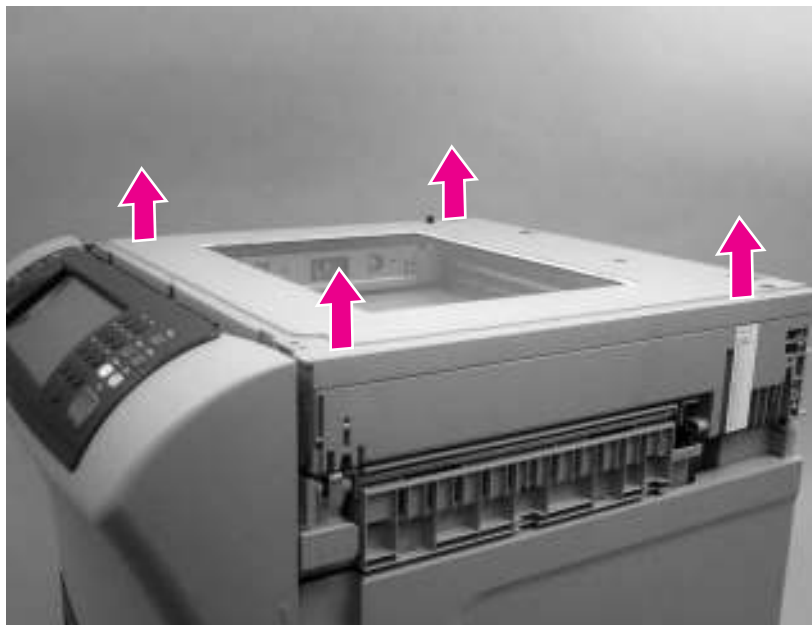
Optical unit

1 Remove the following assemblies:

- ADF assembly. See ADF assembly.

- Scanner glass. See Scanner glass.

<table>
<tr><td>⚠</td><td>**CAUTION**</td><td>Do not use lubricant on the optical-unit guide-rod.</td></tr>
</table>

2 Remove one screw (callout 1) to release the FFC cable guide, and disconnect the FFC (callout 2).
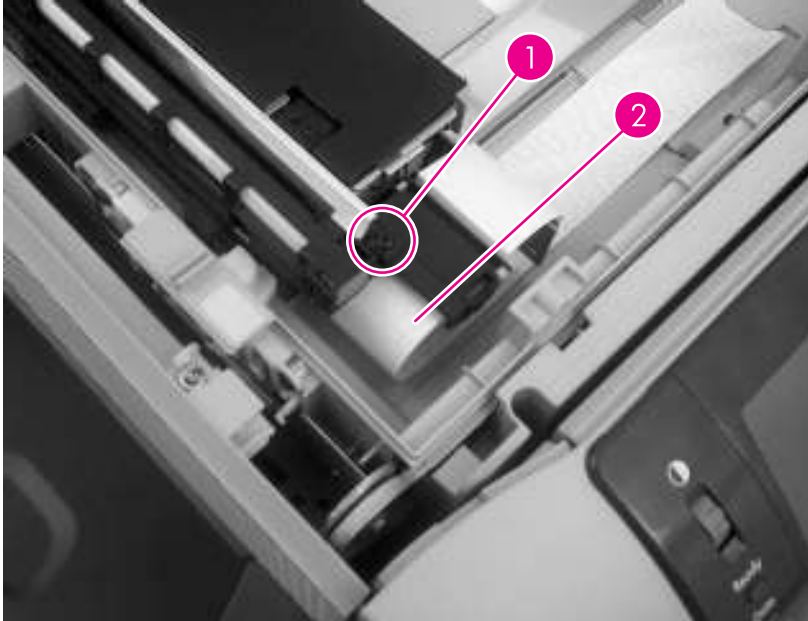
Figure 6-187 Remove the optical unit (1 of 7)

3 Disconnect one scanner-lamp connector (callout 3), and remove one grounding screw (callout 4). Remove the scanner-lamp cable from the cable guide.
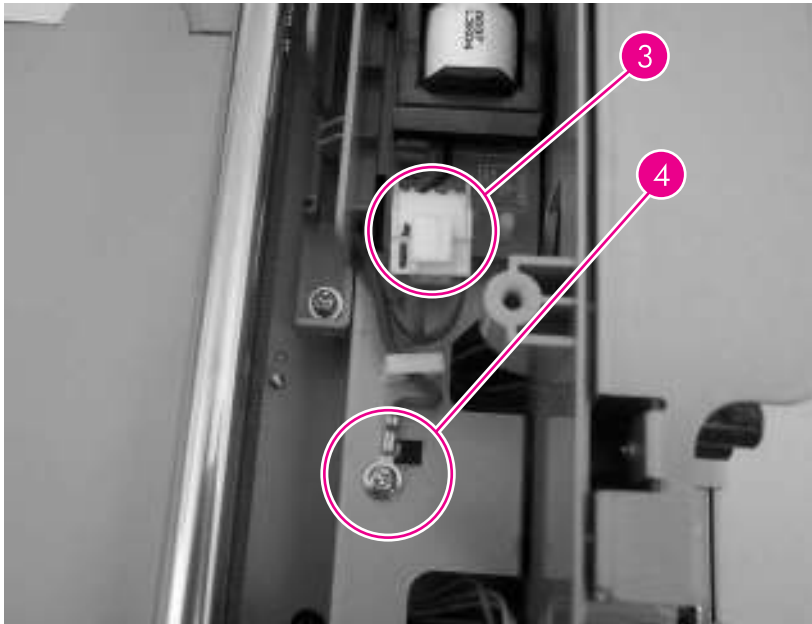
Figure 6-188 Remove the optical unit (2 of 7)

> ⚠ **CAUTION** When you reinstall the optical unit, make sure that the cable is correctly routed through the cable guide to ensure that the optical unit can move freely in the scanner bed.

4 Loosen one screw (callout 5) to release the tension on the drive belt.
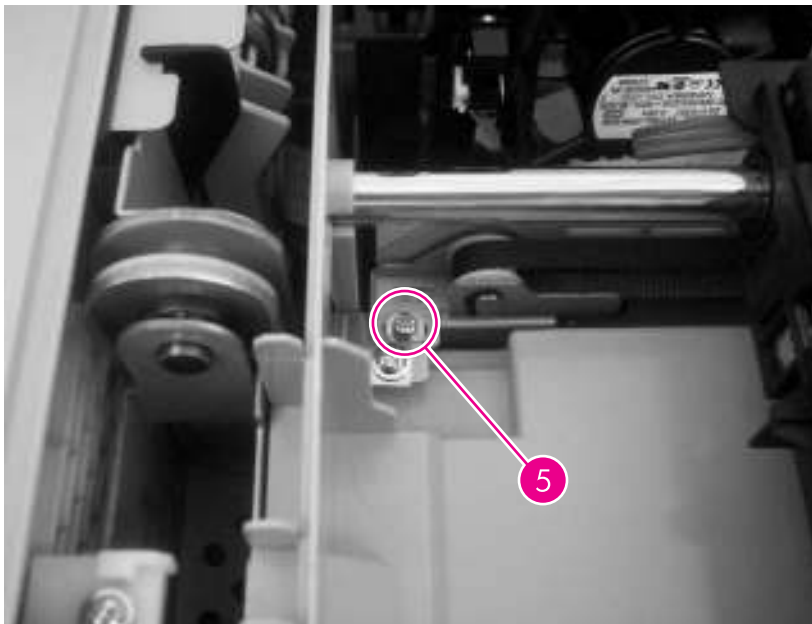
Figure 6-189 Remove the optical unit (3 of 7)

5 Flex the side of the scanner chassis to release the optical-unit guide-rod from the scanner chassis.
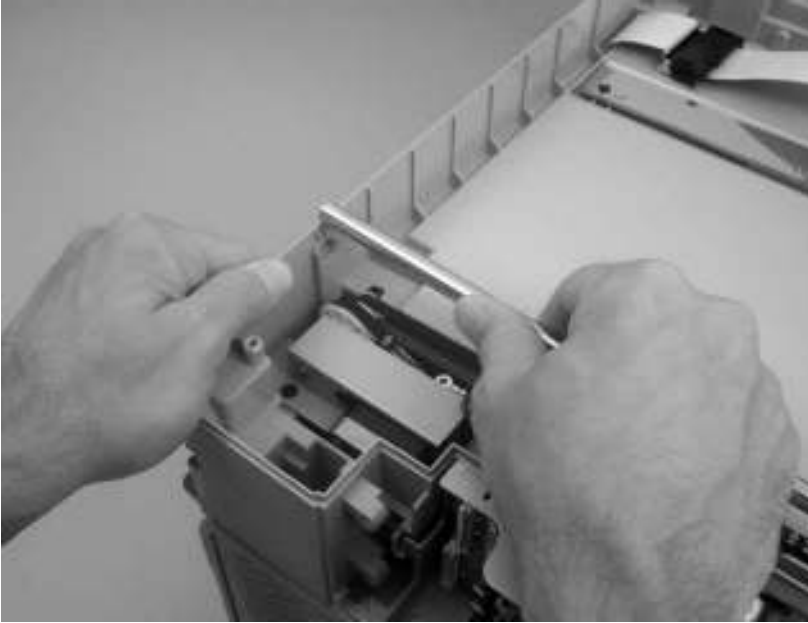
Figure 6-190 Remove the optical unit (4 of 7)

6 Tilt the optical unit up, and slide the guide-rod out of the mounting hole in the chassis and through the optical unit.

> **CAUTION** To avoid breaking the optical-unit sensor flag, slide the optical unit toward the center of the guide-rod before tilting the optical unit up.
>
> Do not touch the lamp. Skin oils and finger print cause image-quality problems, and the lamp might burn and be damaged when the MFP power is turned on.

Figure 6-191 Remove the optical unit (5 of 7)

7 Disengage the drive belt, and disconnect and then remove the optical unit.
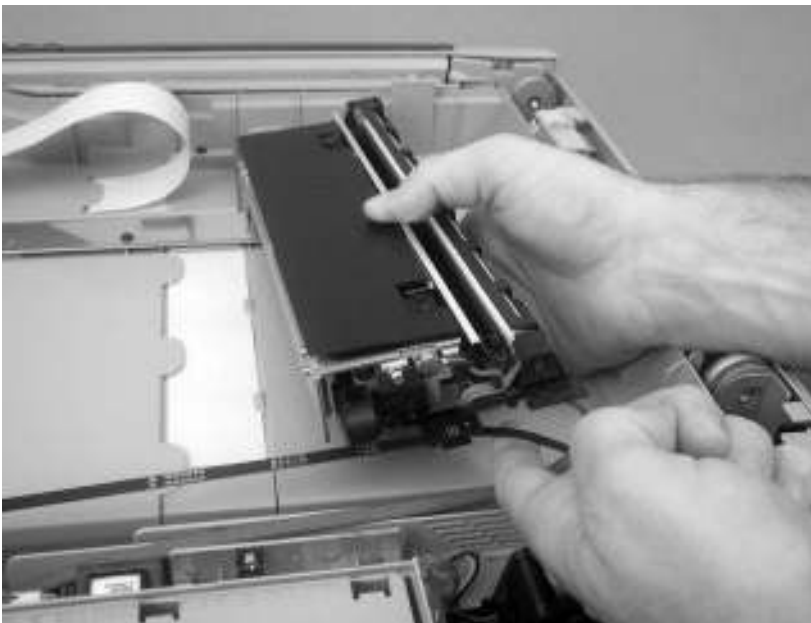
Figure 6-192 Remove the optical unit (6 of 7)

8   When the FCC cable-guide is reinstalled, make sure that the alignment hole on the guide is correctly positioned on the chassis locator-pin.

Figure 6-193   Remove the optical unit (7 of 7)

Scanner bulb

1   Remove the following assemblies:

- ADF assembly. See ADF assembly.

- Scanner glass. See Scanner glass.

- Optical unit. See Optical unit.

2 Remove two screws (callout 1).
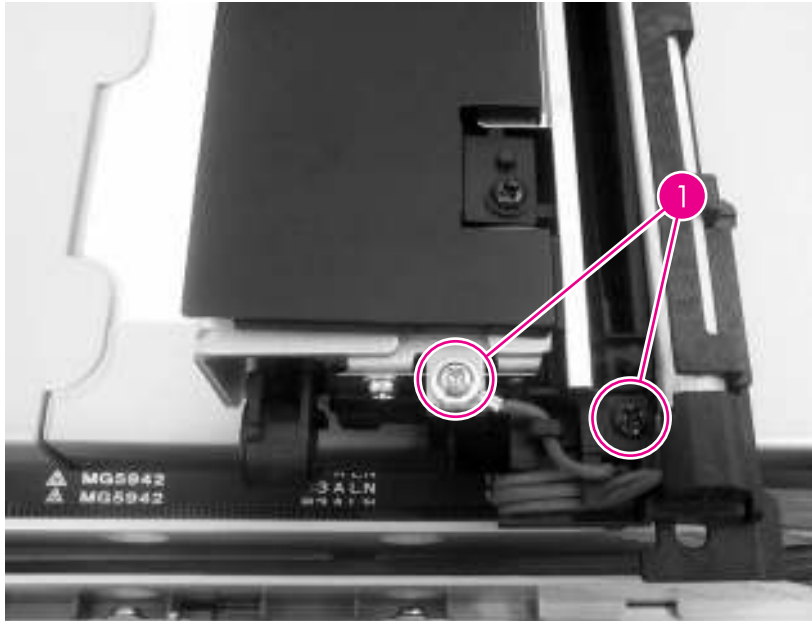
Figure 6-194 Remove the scanner bulb (1 of 2)

3 Grasp the scanner bulb, and carefully slide it out of the optical unit (towards the cable end).

Figure 6-195 Remove the scanner bulb (2 of 2)

Inverter PCA

1 Remove the following assemblies:

- ADF assembly. See ADF assembly.

- Scanner glass. See Scanner glass.

2 Remove three screws (callout 1) and two connectors (callout 2). Use needle-nose pliers to squeeze the PCA retainer (callout 3), and remove the inverter PCA.
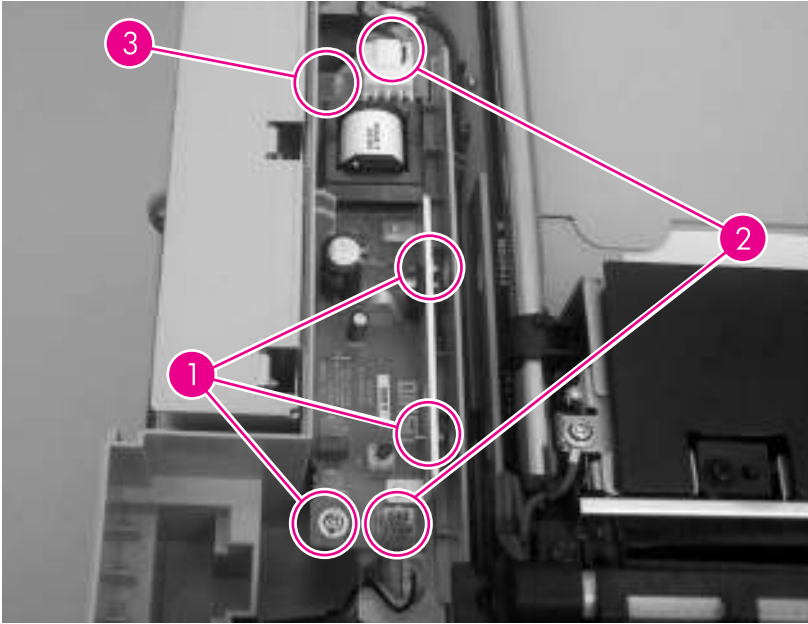
Figure 6-196 Remove the inverter PCA

Scanner fan

1 Remove the following assemblies:

- ADF assembly. See [ADF assembly](#).

- Scanner glass. See [Scanner glass](#).

2 Remove one screw (callout 1), and then remove one connector (callout 2). Remove the cable from the cable retainer, and then remove the scanner fan.
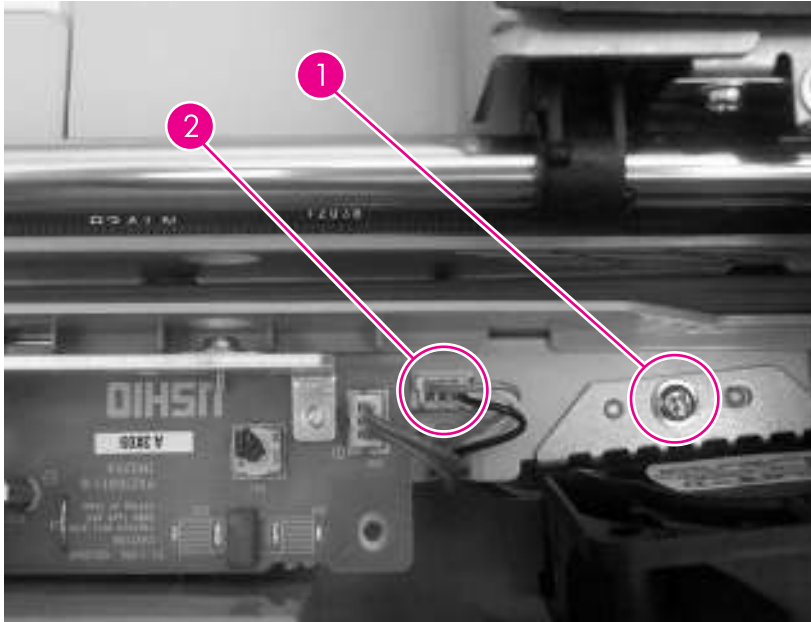
Figure 6-197 Remove the scanner fan

Scanner home-position sensor

1 Remove the following assemblies:

- ADF assembly. See ADF assembly.

- Scanner glass. See Scanner glass.

2 Remove one screw (callout 1), and then disconnect two connectors (callout 2). Remove the scanner home-position sensor.
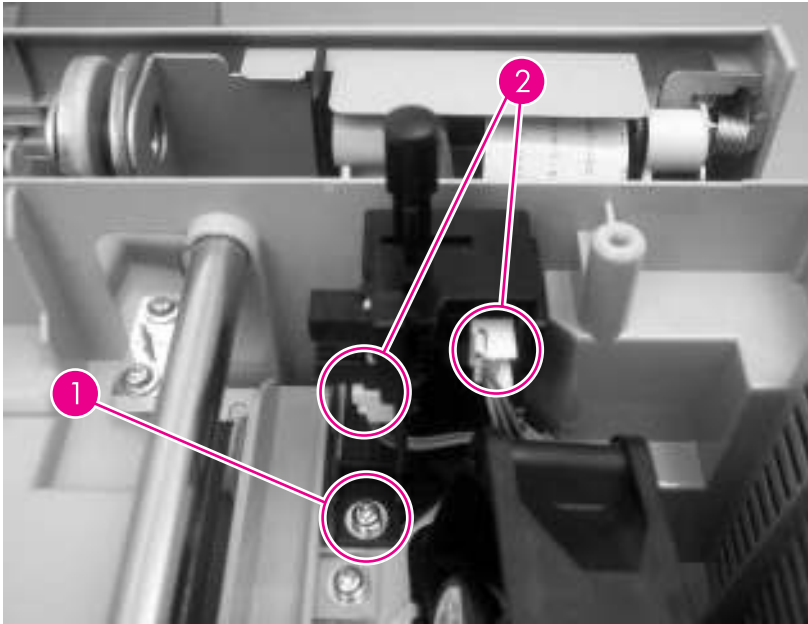
Figure 6-198 Remove the scanner home-position sensor

3 When reinstalling the scanner home-position sensor, make sure that the tab at the bottom of the sensor bracket is correctly positioned in the slot in the chassis.

Figure 6-199 Reinstalling the scanner home-position sensor

Scanner-controller PCA

1 Remove two screws (callout 1), and then remove the scanner-controller PCA cover.
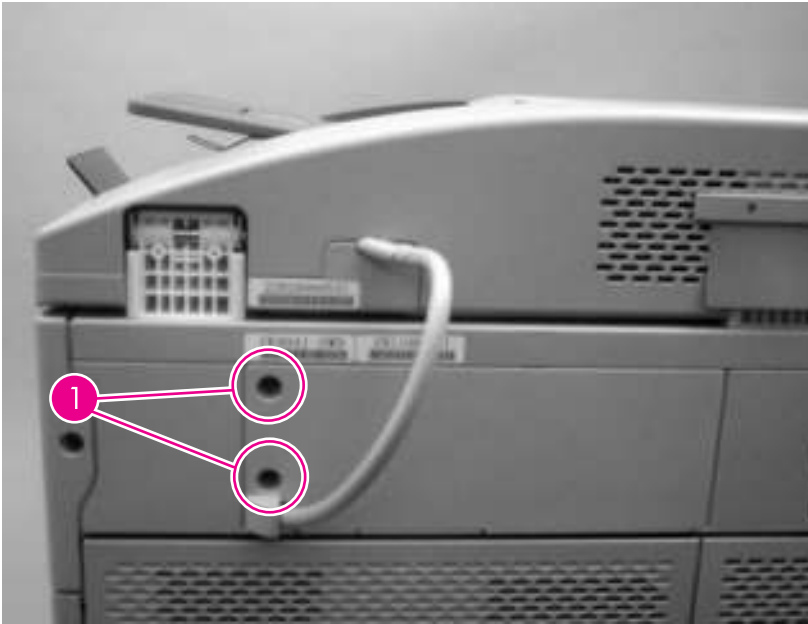
Figure 6-200 Remove the scanner-controller PCA (1 of 2)

2 Disconnect all of the scanner-controller PCA connectors, and then remove five screws (callout 2). Remove the scanner-controller PCA.
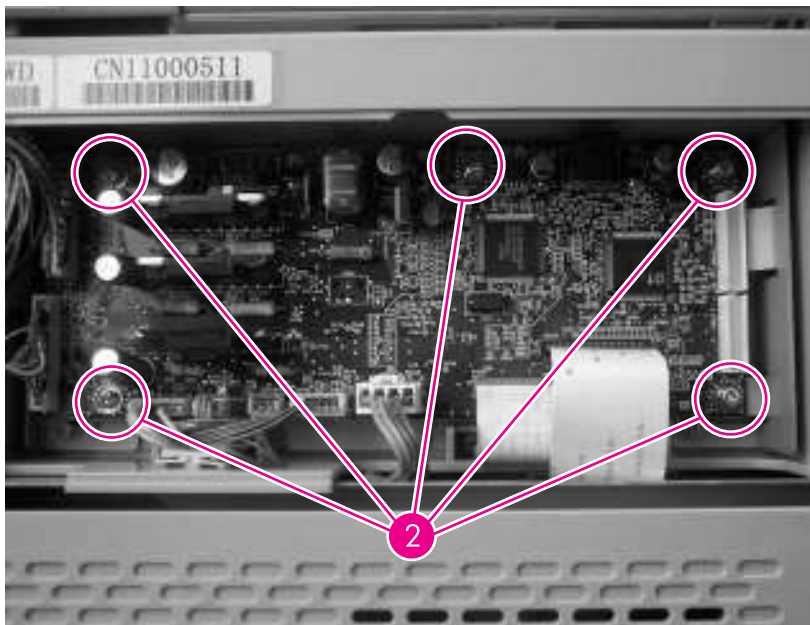
Figure 6-201 Remove the scanner-controller PCA (2 of 2)

ADF components

The procedures in this section describe the removal and replacement of the following components:

- ADF output-bin extension
- ADF white mylar-backing
- ADF front cover
- ADF rear cover
- ADF left-side cover
- ADF jam-access cover and latch
- ADF leading-edge and paper-present sensors
- ADF hinges

ADF output-bin extension

1 Open the ADF, and remove two screws (callout 1).
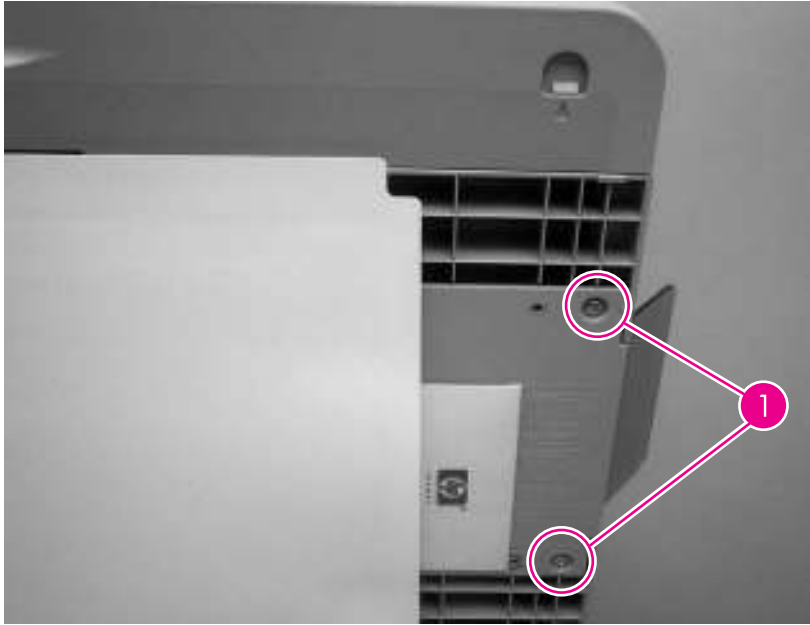
Figure 6-202 Remove the ADF output-bin extension (1 of 2)

NOTE Make sure that you store the envelope that contains the clear mylar sheets under the ADF white, vinyl scan-background after your install the replacement ADF output-bin extension.

2 Peel back the ADF white, vinyl scan-background, and then remove the ADF output-bin extension.

Figure 6-203 Remove the ADF output-bin extension (2 of 2)

NOTE When the two screws are removed, the ADF output-bin extension is not captive. Make sure that you support the ADF output-bin extension before you peel back the ADF white, vinyl scan-background.

ADF white mylar-backing

1 Open the ADF, release two locking tabs (callout 1) and then open the mylar-holder assembly.
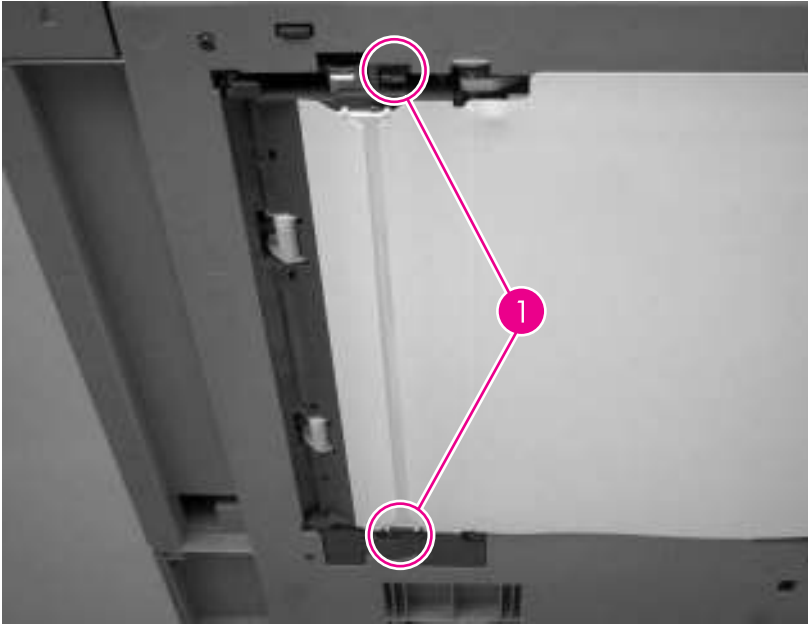
Figure 6-204 Remove the ADF white mylar-backing (1 of 3)

2 Unsnap the mylar-holder-assembly hinges from the hinge pins.
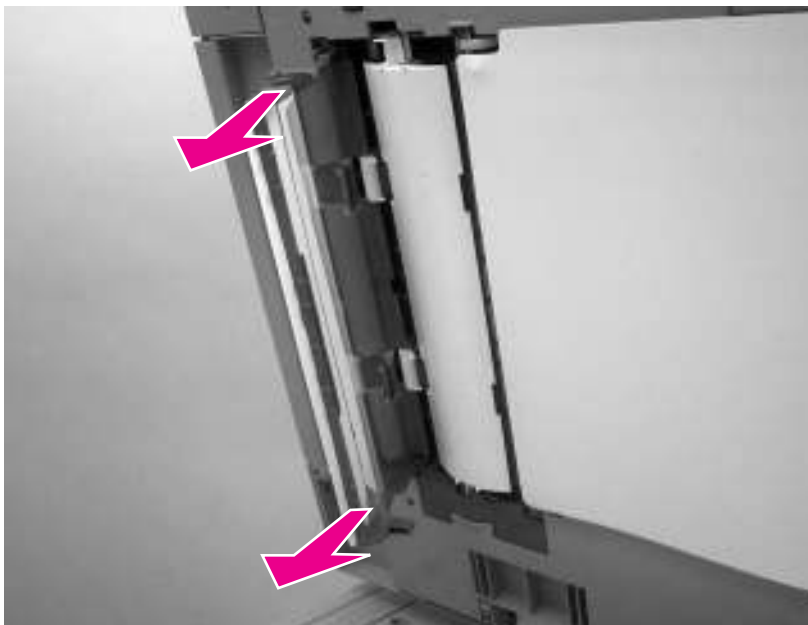
Figure 6-205 Remove the ADF white mylar-backing (2 of 3)

3 Release the ADF white mylar-backing locking tab, and lift the assembly up and out of the ADF.
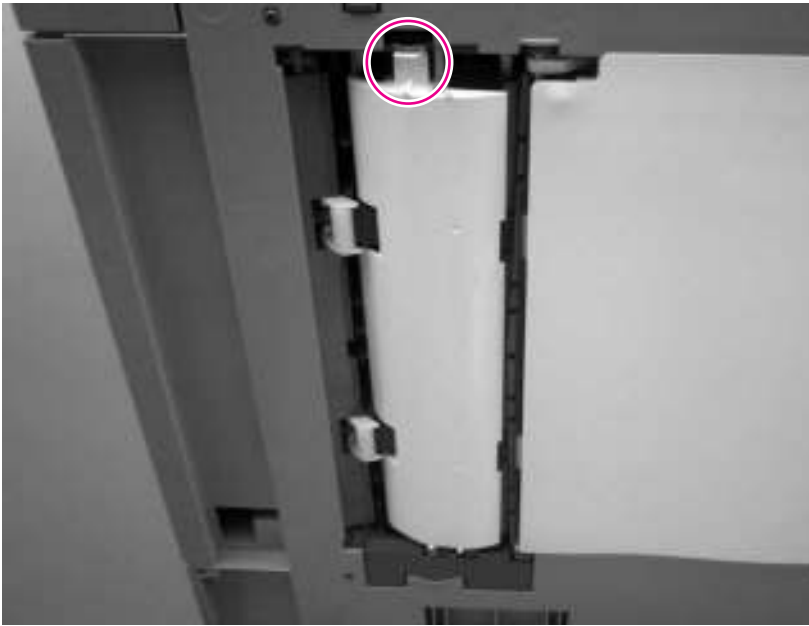
Figure 6-206 Remove the ADF white mylar-backing (3 of 3)

NOTE The springs behind the ADF white mylar-backing assembly are not captive. Do not lose the springs when you remove the ADF white mylar-backing assembly.

4 Reinstallation tip: When you reinstall the ADF white mylar-backing assembly, compress and twist the springs to make sure that they grip the pedestals on the back of the assembly.
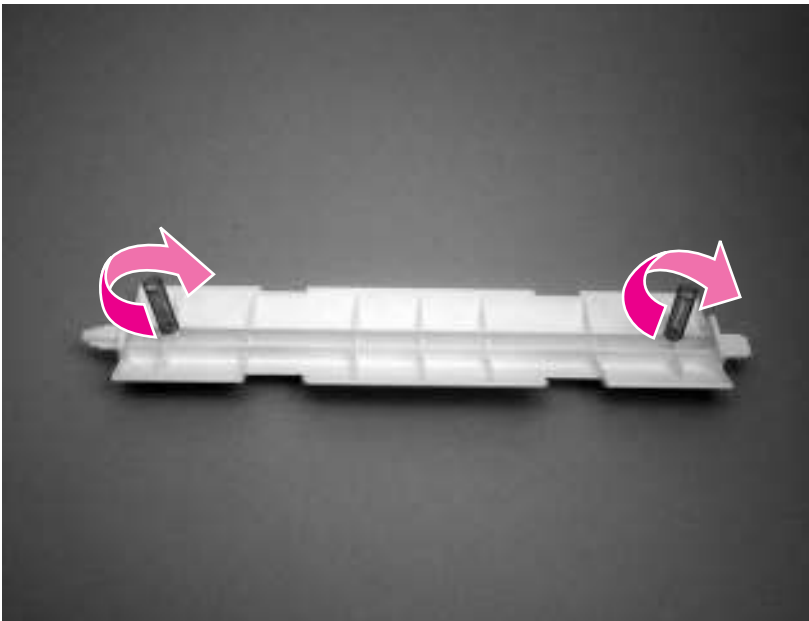
Figure 6-207 Reinstall the ADF white mylar-backing springs

ADF front cover

1 Remove the ADF input tray. See <u>ADF input tray</u>

2 Open the ADF door, and then loosen one screw (callout 1).
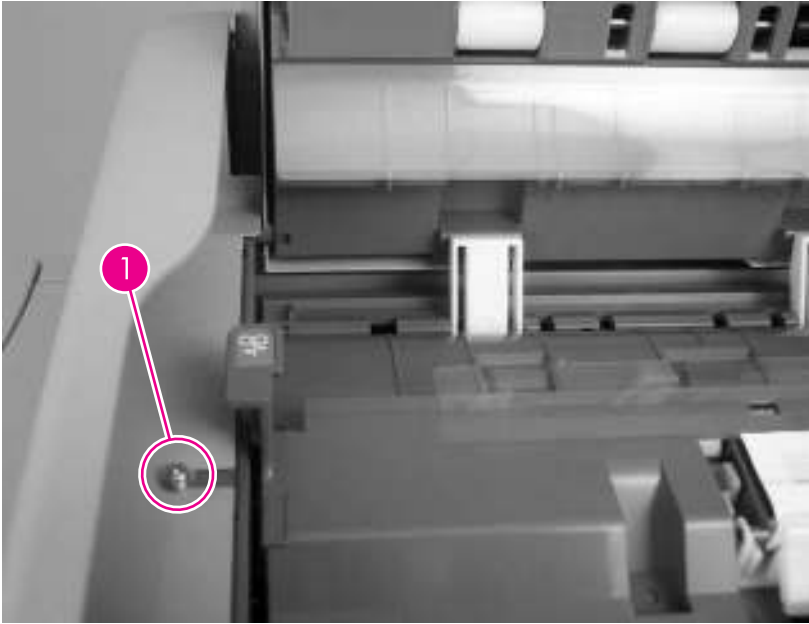
Figure 6-208 Remove the ADF front cover (1 of 2)

3 Release the two ADF front-cover locking buttons, and then remove the ADF front cover.
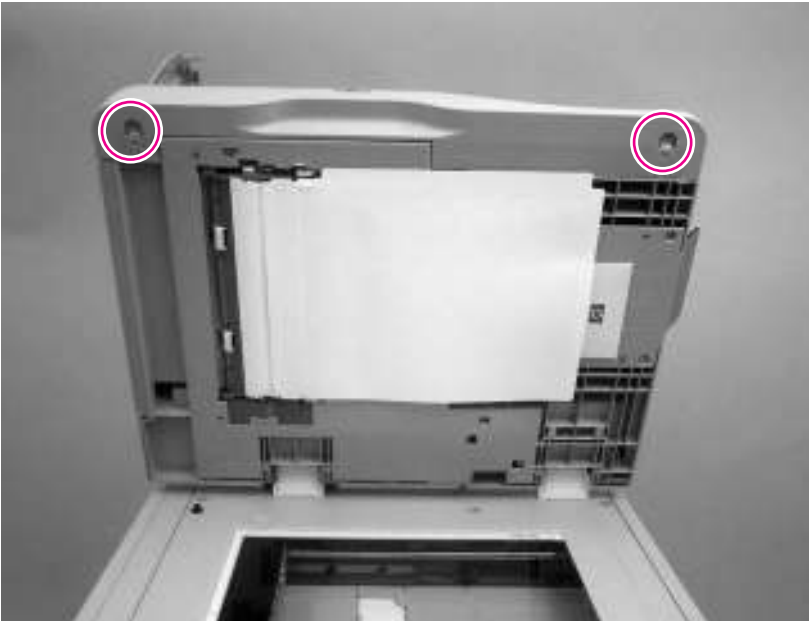
Figure 6-209 Remove the ADF front cover (2 of 2)

ADF rear cover

1 Remove one screw (callout 1).
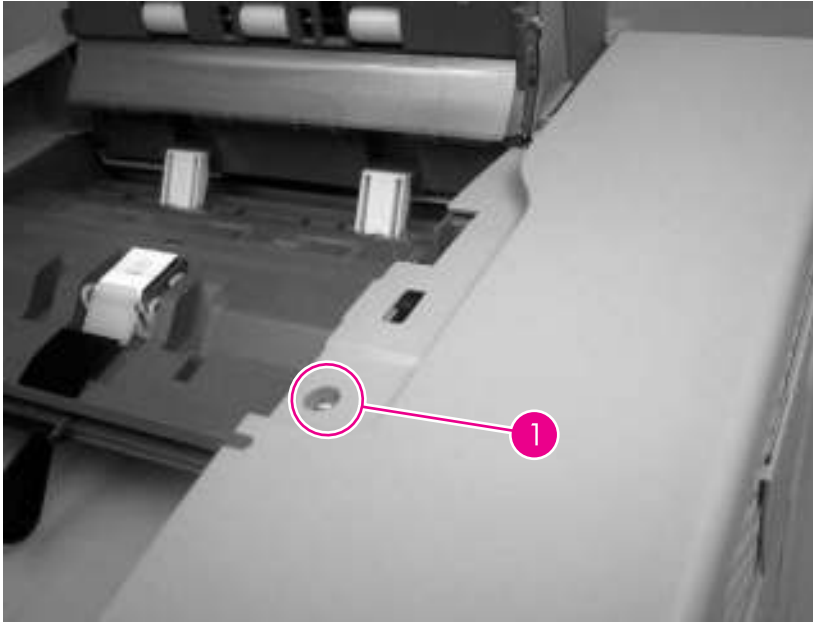
Figure 6-210 Remove the ADF rear cover (1 of 2)

2 Release the three locking tabs, and then remove the ADF rear cover.
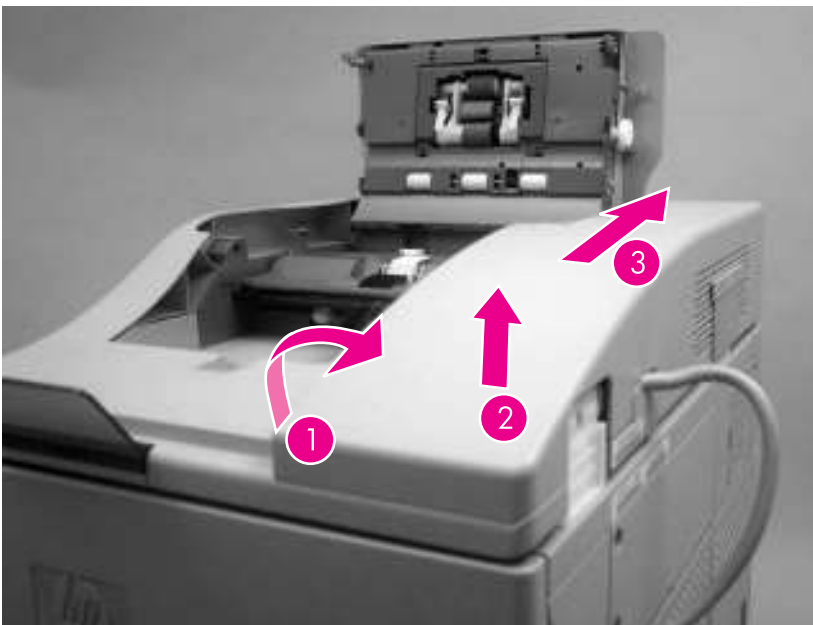
Figure 6-211 Remove the ADF rear cover (2 of 2)

ADF left-side cover

1   Remove the following assemblies:

- ADF front cover. See ADF front cover.

- ADF rear cover. See ADF rear cover.

2   Release two springs.
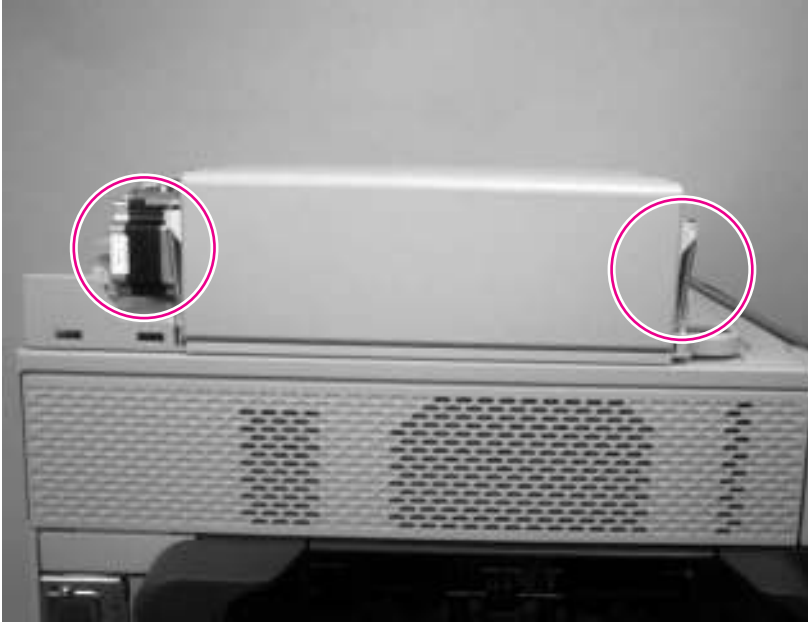
Figure 6-212 Remove the ADF left cover (1 of 2)

📝 **NOTE**   The left-cover tension-springs are not captive. Do not lose the springs when you remove the ADF left cover.

3 Flex the locking tab on the hinge at the control-panel end of the cover to release the hinge. Remove the ADF left cover.

Figure 6-213 Remove the ADF left cover (2 of 2)

ADF jam-access cover and latch

1   Remove the following assemblies:

- ADF front cover. See ADF front cover.

- ADF rear cover. See ADF rear cover.

- ADF left side cover. See ADF left-side cover.

2   Pull up on the left side of the cover to release it, and then remove the ADF jam-access cover.
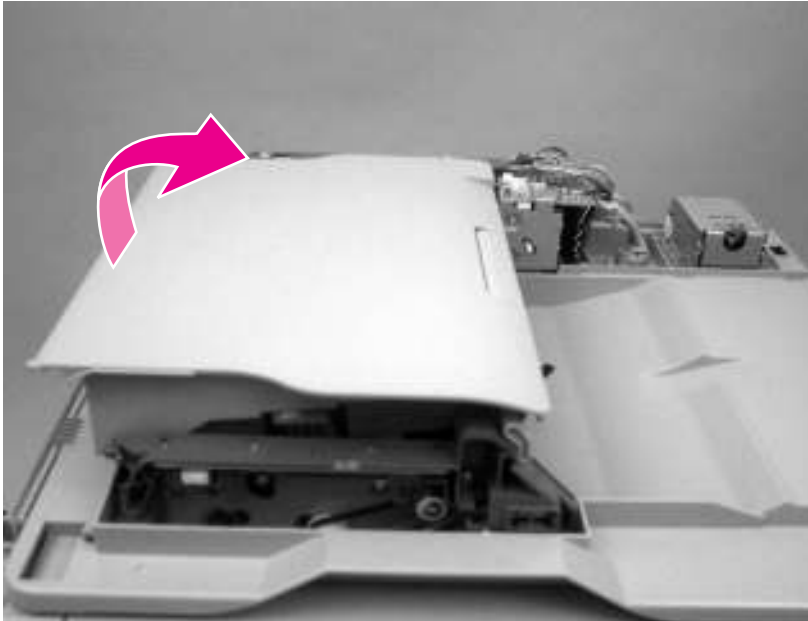
Figure 6-214 Remove the ADF jam-access cover and latch (1 of 3)

3   To remove the latch, spread the two clips, and slide the latch-rod toward the rear of the ADF and remove it.
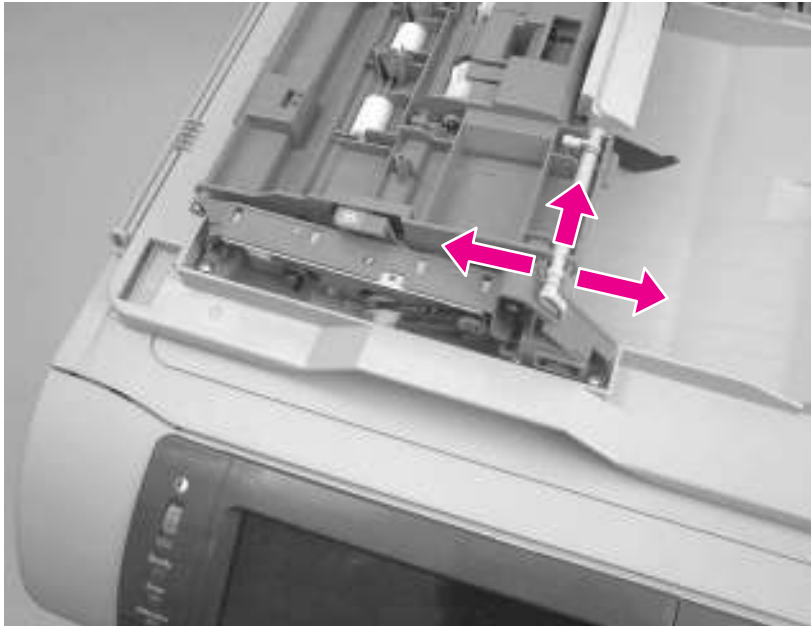
Figure 6-215 Remove the ADF jam-access cover and latch (2 of 3)

4   **Reinstallation tip:** Make sure that you wind the spring around the latch rod and hold it in place until the rod snaps into place.
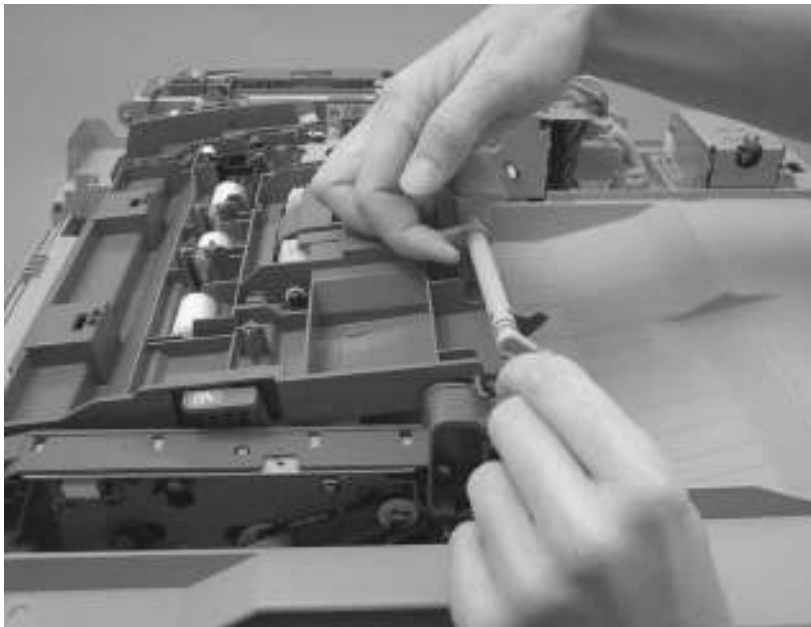
ADF leading-edge and paper-present sensors

1 Remove the ADF jam-access cover. See <u>ADF jam-access cover and latch</u>.

2 Locate the ADF leading-edge sensor (callout 1) and the ADF paper-present sensor (callout 2).
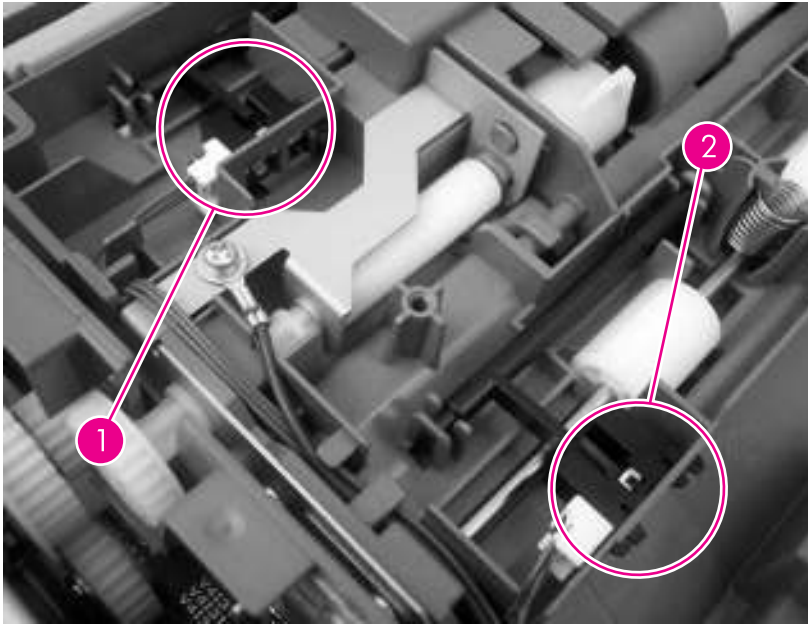
Figure 6-216 Remove the ADF leading-edge and paper-present sensors (1 of 2)

3 Squeeze the retainer tabs, and push the sensor out of the mounting frame. Disconnect the connector, and then remove the sensors
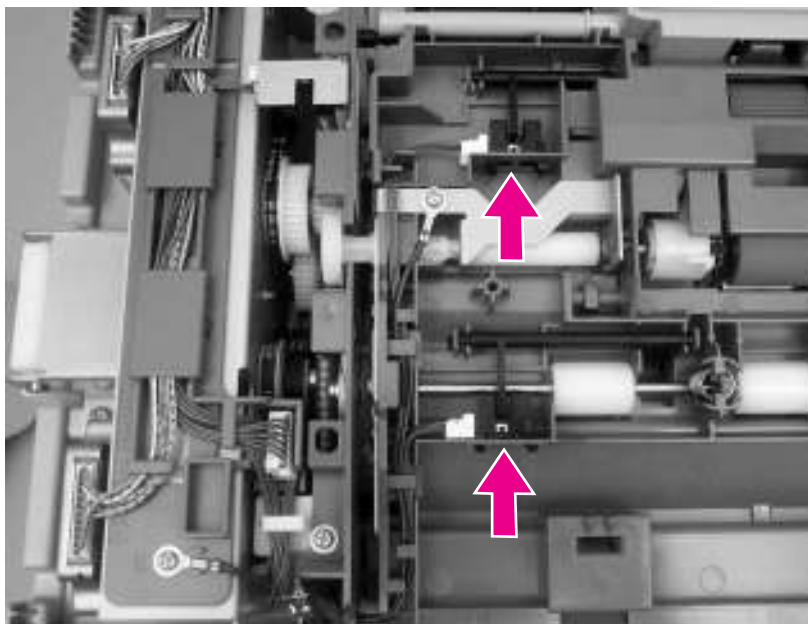
Figure 6-217 Remove the ADF leading-edge and paper-present sensors (2 of 2)

ADF hinges

1 Remove the following assemblies:

- ADF front cover. See ADF front cover.

- ADF rear cover. See ADF rear cover.

- ADF left-side cover. See ADF left-side cover.

- ADF jam-access cover. See ADF jam-access cover and latch.

- ADF assembly. See ADF assembly.

2 Remove four screws (callout 1) from the right-side hinge, and then remove the right-side hinge.
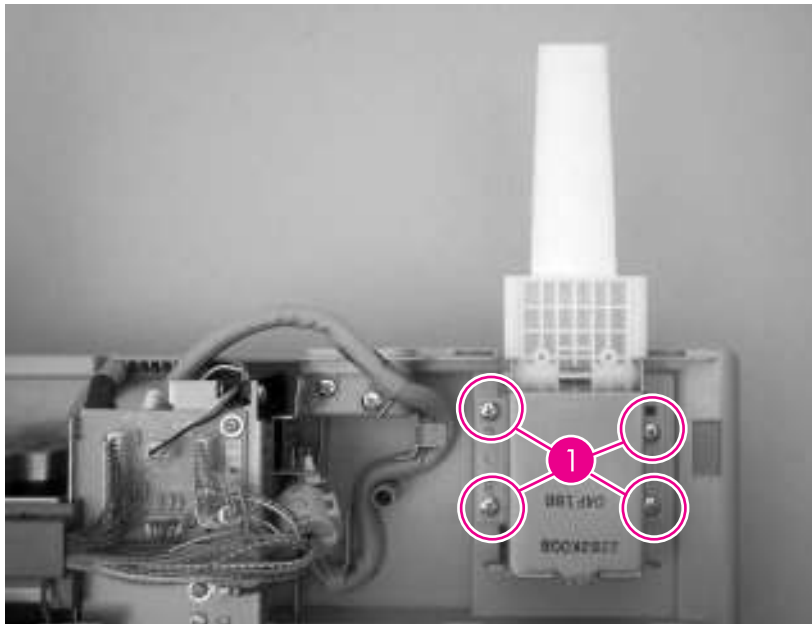
Figure 6-218 Remove the ADF hinges (1 of 2)

3 Remove two screws (callout 2) from the left-side hinge, and then remove the left-side hinge.
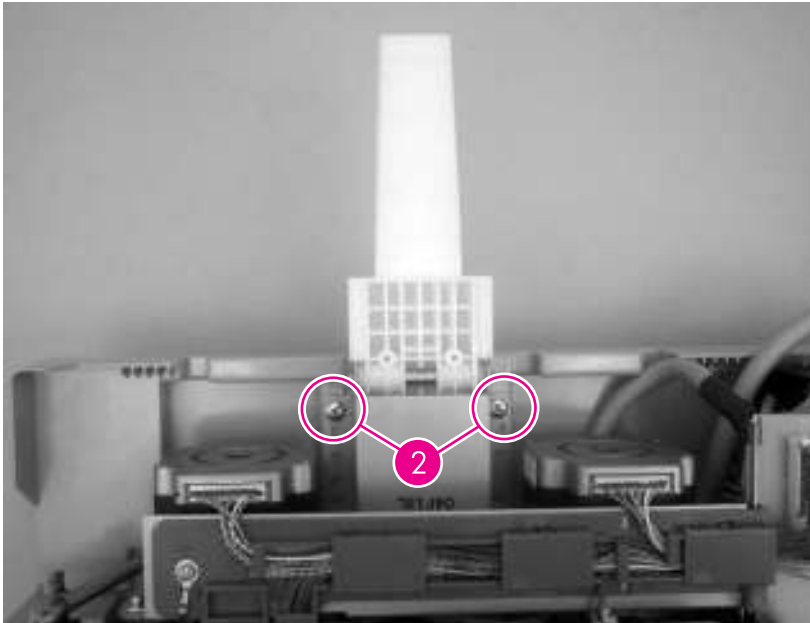
Figure 6-219 Remove the ADF hinges (2 of 2)

500-sheet feeder components

The procedures in this section describe the removal and replacement of the following components:

● 500-sheet-feeder pickup and feed rollers

● 500-sheet-feeder rear cover

● 500-sheet-feeder right cover

● 500-sheet-feeder front cover

● 500-sheet-feeder upper-left cover

● 500-sheet-feeder left-side cover

● 500-sheet-feeder number-plate assembly

● 500-sheet-cassette front cover

● 500-sheet-feeder PCA

● 500-sheet-feeder lifter-drive assembly

● 500-sheet-feeder paper-size switch

● 500-sheet-feeder jam-access-cover-open switch

500-sheet-feeder pickup and feed rollers

The procedure for removing the 500-sheet feeder rollers is the same as the procedure for removing the rollers that are in tray 2. See Tray 2, 3, 4, or 5 pickup and feed rollers.

500-sheet-feeder rear cover

1 Remove one screw (callout 1).
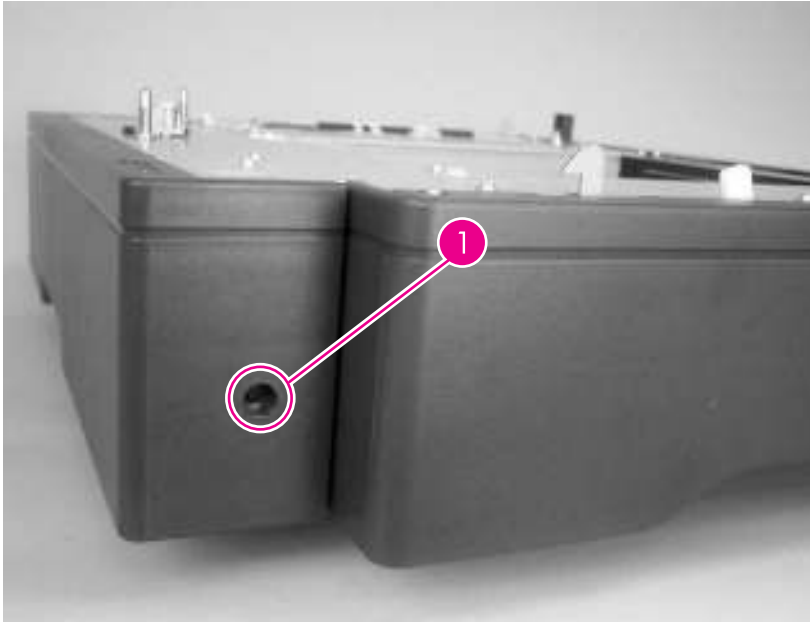
Figure 6-220 Remove the 500-sheet-feeder rear cover (1 of 2)

2 Facing the back of the feeder, slide the cover to the right until it stops, and then remove the cover.
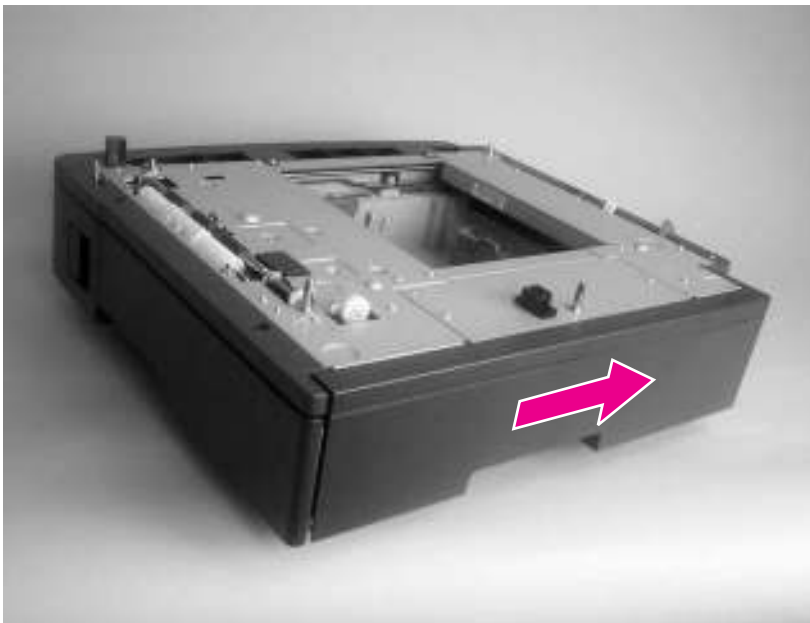
Figure 6-221 Remove the 500-sheet-feeder rear cover (2 of 2)

500-sheet-feeder right cover

Remove two screws (callout 1), and then remove the right cover.
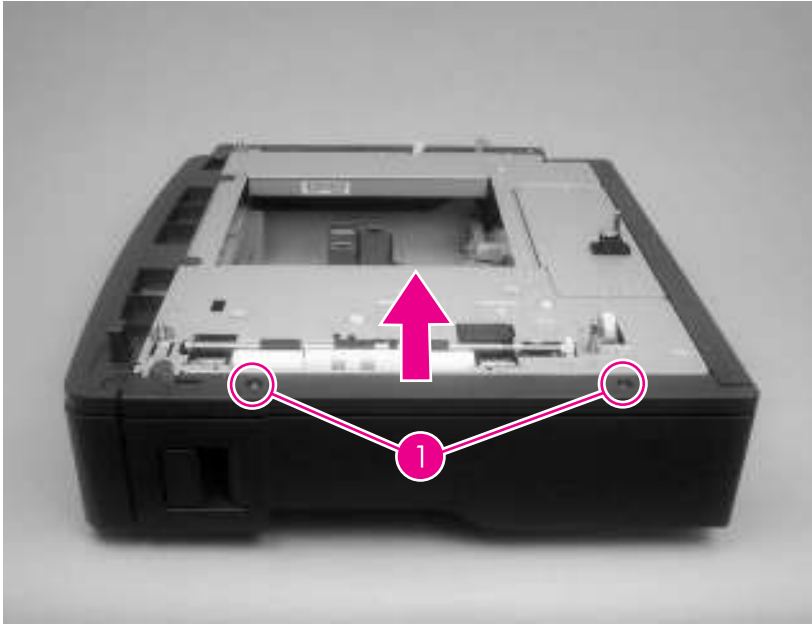
Figure 6-222 Remove the 500-sheet-feeder right cover

500-sheet-feeder front cover

1 Remove the 500-sheet-feeder right cover. See 500-sheet-feeder right cover.

2 Remove two screws (callout 1).
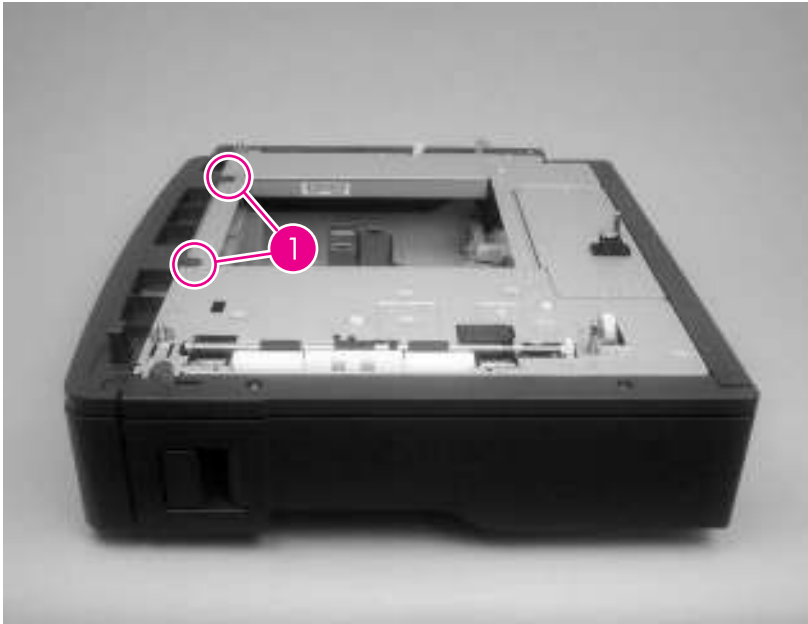
Figure 6-223 Remove the 500-sheet-feeder front cover (1 of 3)

3 Remove the cassette. Remove three screws (callout 2).
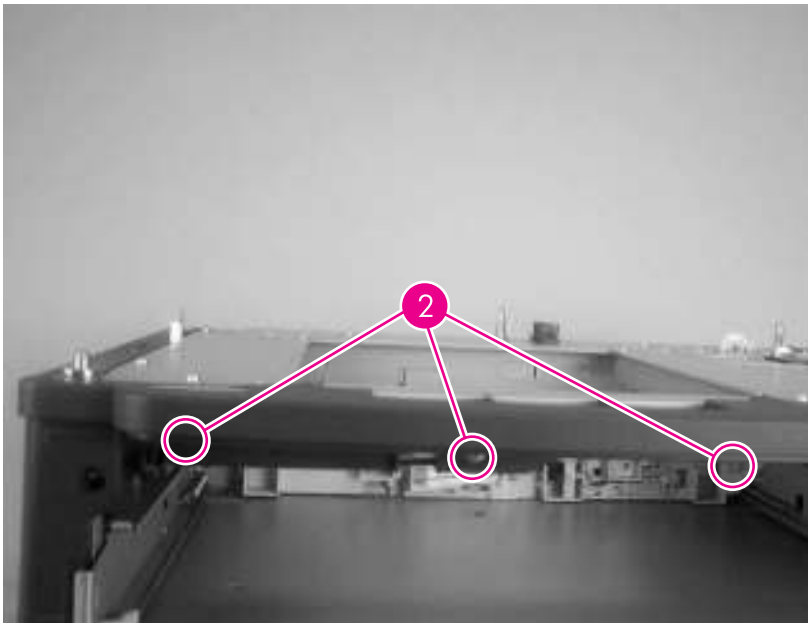
Figure 6-224 Remove the 500-sheet-feeder front cover (2 of 3)

4 Use a small, flat-blade screwdriver to release one locking tab, and then carefully pry the cover away from the chassis. Remove the 500-sheet-feeder front cover.
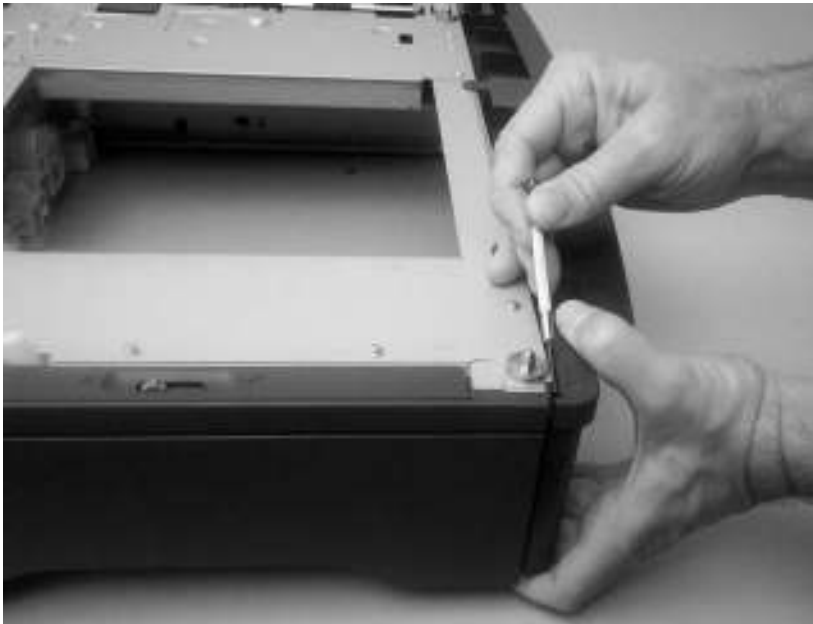
Figure 6-225 Remove the 500-sheet-feeder front cover (3 of 3)

500-sheet-feeder upper-left cover

Remove one screw (callout 1), and then remove the cover.
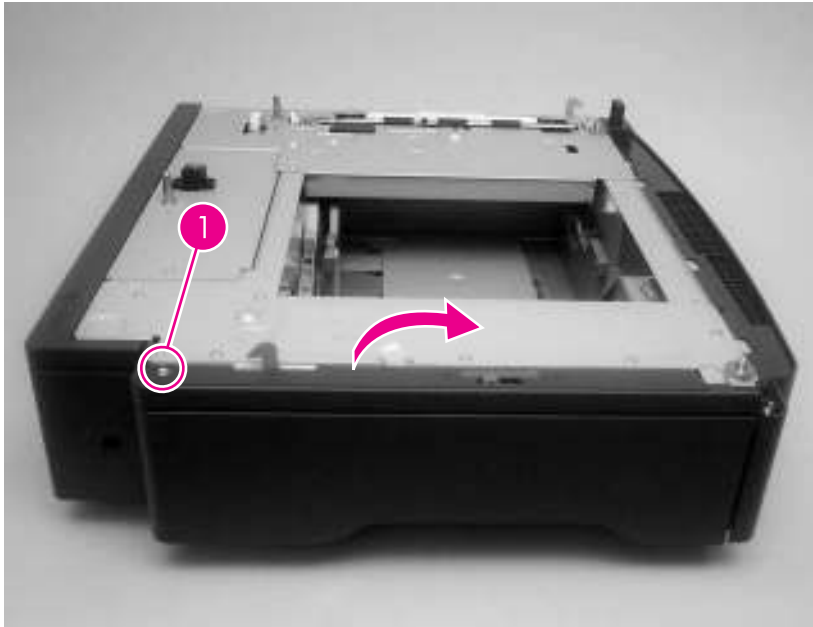
Figure 6-226 Remove the 500-sheet-feeder upper-left cover

500-sheet-feeder left-side cover

1   Remove the following assemblies:

   ●   500-sheet-feeder rear cover. See 500-sheet-feeder rear cover.

   ●   500-sheet-feeder front cover. See 500-sheet-feeder front cover.

   ●   500-sheet-feeder upper-left cover. See 500-sheet-feeder upper-left cover.

2   Remove two screws (callout 1), and then remove the cover.
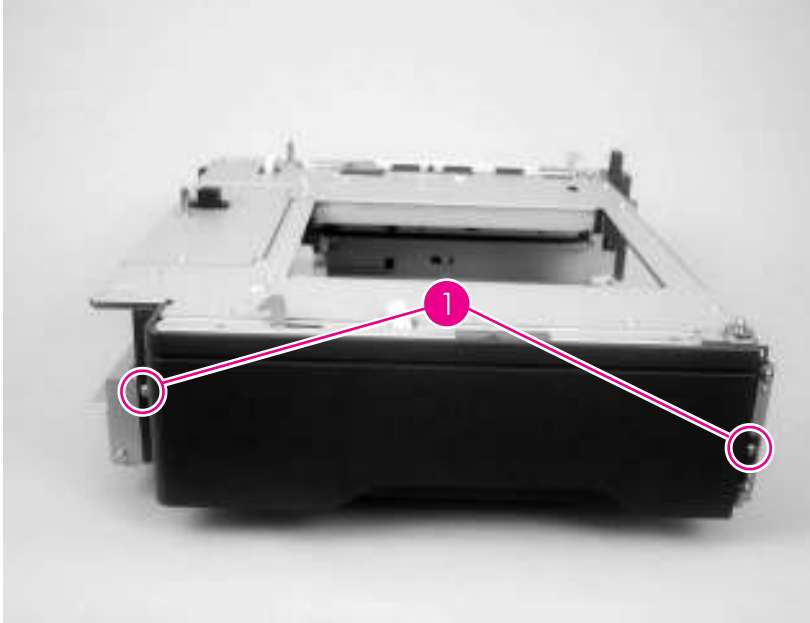
Figure 6-227 Remove the 500-sheet-feeder left-side cover

500-sheet-feeder number-plate assembly

1   Remove the 500-sheet-feeder front cover. See <u>500-sheet-feeder front cover</u>.

2   Remove two screws (callout 1), and then remove the number-plate assembly.
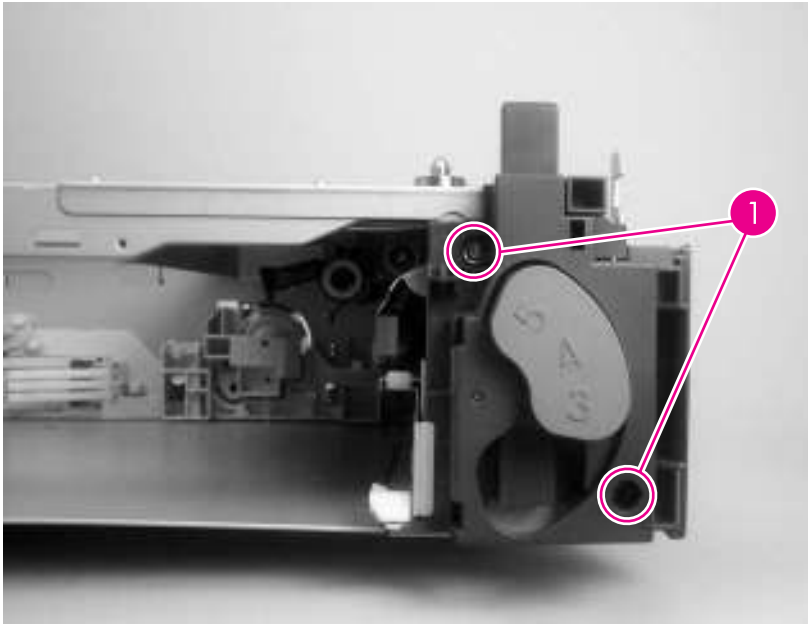
Figure 6-228 Remove the 500-sheet-feeder number-plate assembly

500-sheet-cassette front cover

1 Remove the cassette.

2 Remove two screws (callout 1) and then release four locking tabs to remove the 500-sheet-cassette front cover.
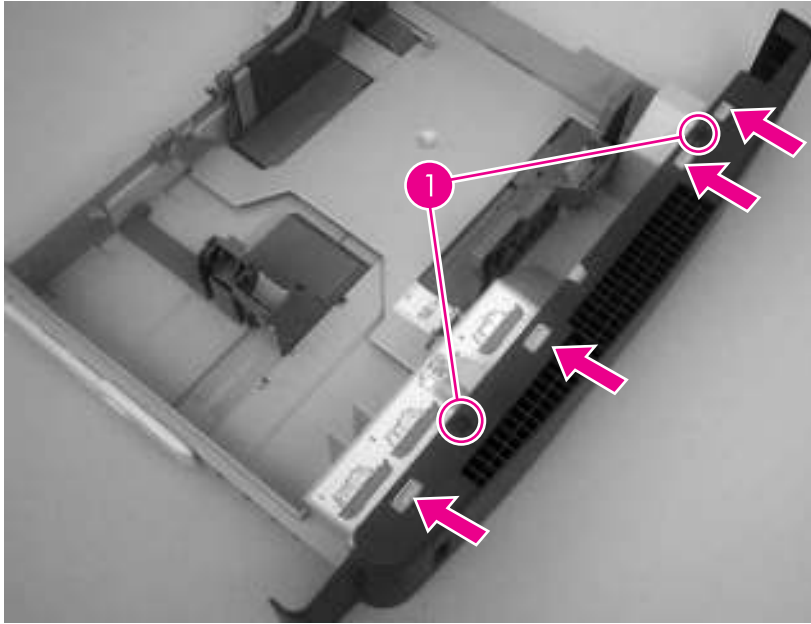
Figure 6-229 Remove the 500-sheet-cassette front cover

500-sheet-feeder PCA

1 Remove the 500-sheet-feeder rear cover. See <u>500-sheet-feeder rear cover</u>.

2 Disconnect all of the PCA connectors. Remove two screws (callout 1), and then lift up on the PCA to remove it.
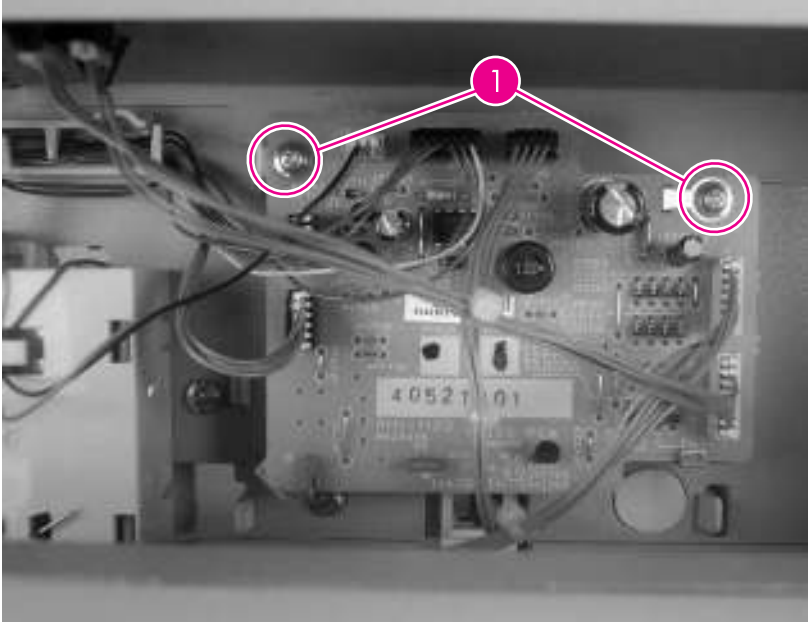
Figure 6-230 Remove the 500-sheet-feeder PCA

500-sheet-feeder lifter-drive assembly

1 Remove the 500-sheet-feeder rear cover. See 500-sheet-feeder rear cover.

2 Disconnect one connector (callout 1), release the lifter-drive spring (callout 2), and then remove one screw (callout 3). Remove the lifter-drive assembly (callout 4).
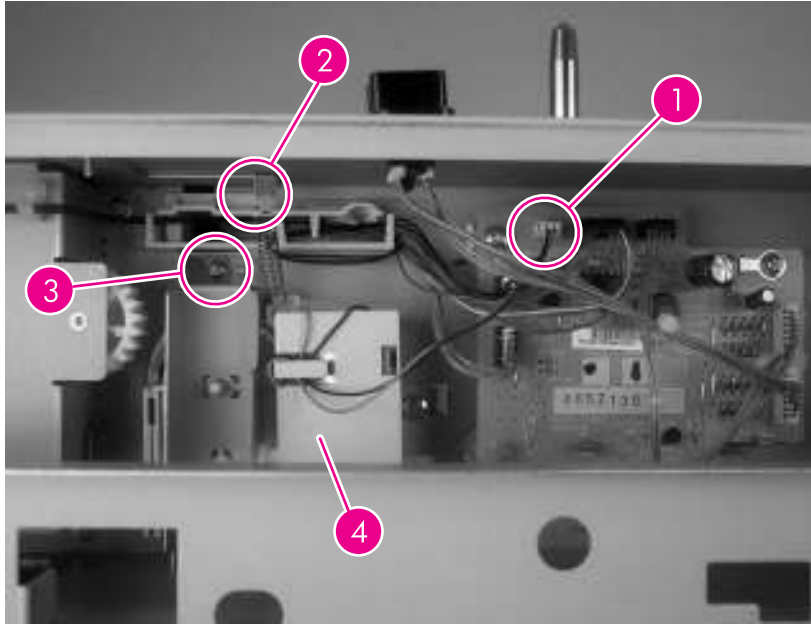
Figure 6-231 Remove the 500-sheet-feeder lifter-drive assembly

500-sheet-feeder paper-size switch

1 Remove the 500-sheet-feeder PCA. See 500-sheet-feeder PCA.

2 Remove the cassette. Remove four screws (callout 1), release one locking tab (callout 2), and then push the plastic grounding-spring bracket (callout 3) into the feeder.

📝 **NOTE** The grounding spring is not captive. Do not lose the spring when you remove the paper-size switch.
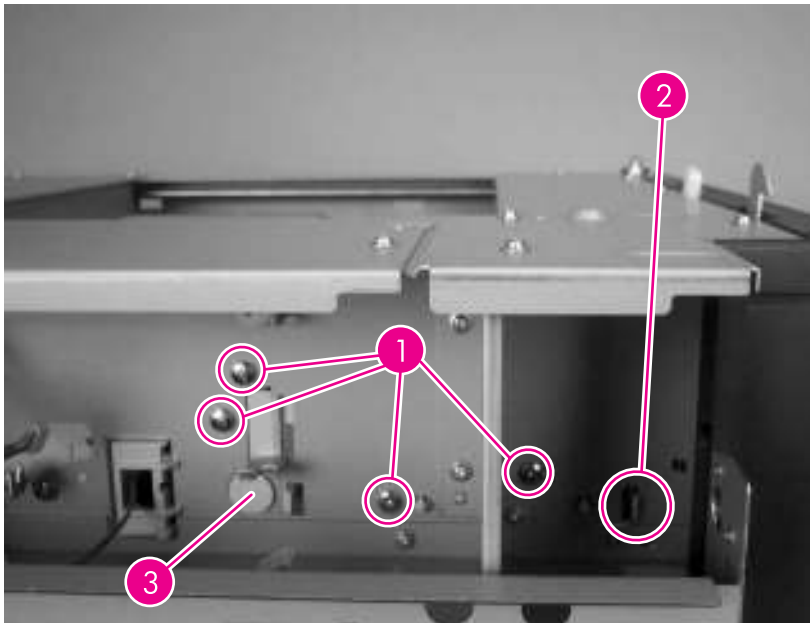
Figure 6-232 Remove the 500-sheet-feeder paper-size switch (1 of 2)

3 Remove one screw (callout 4), and push in on the paper-size switch (callout 5) to push it into the feeder.
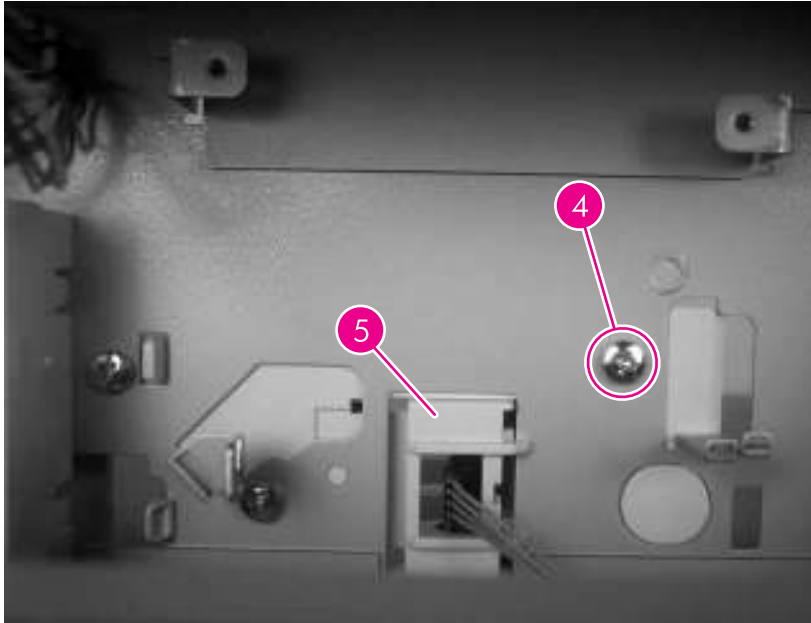
Figure 6-233 Remove the 500-sheet-feeder paper-size switch (2 of 2)

500-sheet-feeder jam-access-cover-open switch

1 Remove the 500-sheet number plate. See 500-sheet-feeder number-plate assembly.

2 Remove two screws (callout 1), and then remove the sensor cover.
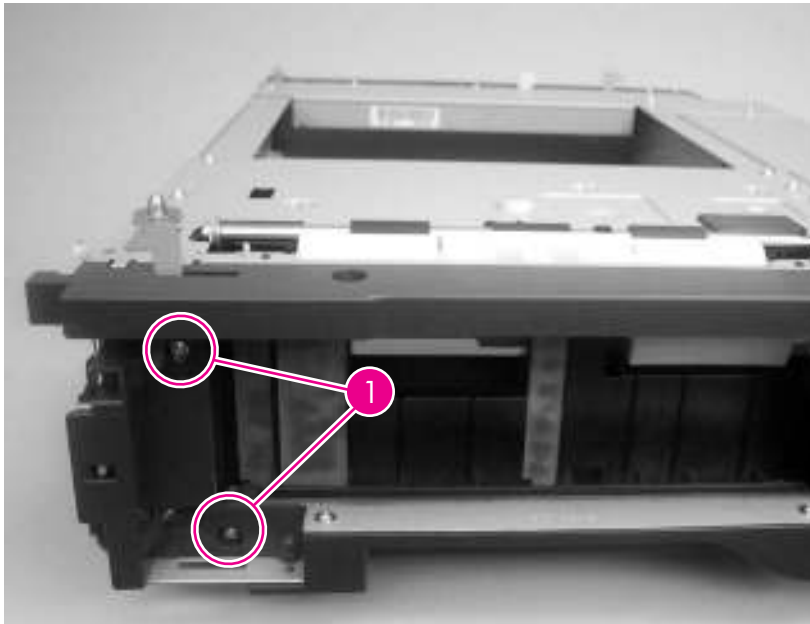
Figure 6-234 Remove the 500-sheet-feeder jam-access-cover-open switch (1 of 2)

3 Remove one screw (callout 2), and then remove the sheet-metal sensor-mounting bracket. Remove the sensor from the bracket.
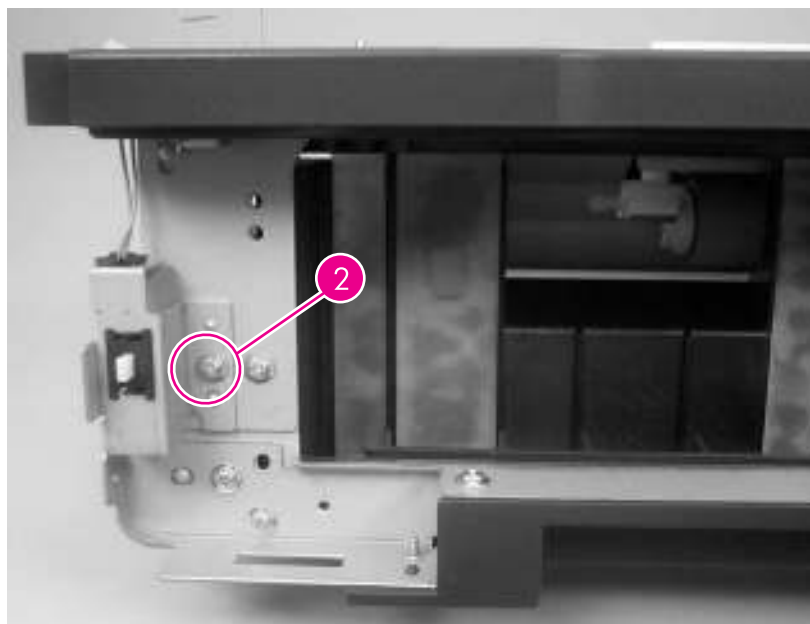
Figure 6-235 Remove the 500-sheet-feeder jam-access-cover-open switch (2 of 2)

7   Troubleshooting

In order to use the information in this chapter, you should have a basic understanding of the HP LaserJet printing process. Explanations of each mechanical assembly, the MFP systems, and the basic theory of operation are contained in chapter 5 of this manual. Do not perform any of these troubleshooting processes unless you understand the function of each MFP component.

This chapter contains information about the following topics:

- Troubleshooting process
- Control-panel messages
- Accessory lights for the 3-bin mailbox and stapler/stacker
- Formatter lights
- Jams
- Image-formation troubleshooting
- Media-transport problems
- E-mail problems
- Fax problems
- Network connectivity problems
- Functional checks
- MFP resets
- Tools for troubleshooting
- Diagrams for troubleshooting

Troubleshooting process

When the MFP malfunctions or encounters an unexpected situation, information on the control panel alerts you to the situation. This section contains an initial troubleshooting checklist that helps to eliminate many possible causes of the problem. The subsequent troubleshooting flowchart helps you to diagnose the cause of the problem. The remainder of the chapter provides steps for correcting the problems that have been identified.

■   Use the initial troubleshooting checklist to evaluate the source of the problem and to reduce the number of steps that are required to fix the problem.

■   Use the troubleshooting flowchart to pinpoint the cause of malfunctions. The flowchart lists the section within this chapter that provides steps for correcting the malfunction.

Before beginning any troubleshooting procedure, check the following:

■   Are supply items (for example, the print cartridge, fuser, and rollers) within their rated life?

   Does the configuration page reveal any configuration problems? See Information pages.

> **NOTE**   The customer is responsible for checking and maintaining supplies, and for using supplies that are in good condition. The customer is responsible for media and print-cartridge supplies. The customer is also responsible for replacing the fuser, transfer roller, and all paper pickup, feed, and separation rollers (tray 1 has a separation pad instead of a roller) that are at or near the end of their 225,000-page rated life.

Initial troubleshooting checklist

If the MFP is not responding correctly, complete the steps in the following checklist, in order. If the MFP does not pass a step, follow the corresponding troubleshooting suggestions. If a step resolves the problem, you can stop without performing the other steps on the checklist.

Troubleshooting checklist

1   Make sure the MFP Ready light is on. If no lights are on, see Power-on checks.

2   Check the cabling.

   a   Check the cable connection between the MFP and the computer or network port. Make sure that the connection is secure.

   b   Make sure that the cable itself is not faulty by using a different cable, if possible.

   c   Check the network connection. See Network connectivity problems.

3   Ensure that the print media that you are using meets specifications. See Media specifications.

4   Print a configuration page (see Information pages.) If the MFP is connected to a network, an HP Jetdirect page also prints.

   a   If the pages do not print, check that at least one tray contains print media.

   b   If the page jams in the MFP, see Jams.

5   If the configuration page prints, check the following items.

    a   If the page prints correctly, then the MFP hardware is working. The problem is with the computer that you are using, with the printer driver, or with the program.

    b   If the page does not print correctly, the problem is with the MFP hardware. See Functional checks.

6   At the computer, check to see if the print queue is stopped, paused, or set to print offline.

    Windows: Click **Start**, click **Settings**, and then click **Printers** or **Printers and Faxes**. Double-click **HP LaserJet 4345mfp**.

    -or-

    Mac OS 9: Double-click the **HP LaserJet 4345mfp** icon on the desktop.

    -or-

    Mac OS X: Open **Print Center** (or **Printer Setup Utility** for Mac OS X v.10.3), and double-click the line for the **HP LaserJet 4345mfp**.

7   Verify that you have installed the HP LaserJet 4345mfp Series printer driver. Check the program to make sure that you are using an HP LaserJet 4345mfp Series printer driver.

8   Print a page from the HP Toolbox.

    a   If it prints, then the problem is with the printer driver. For Windows, try using another printer driver. Or, for Windows or Macintosh, uninstall the printer driver and reinstall it.

    b   If the page does not print, then the problem is with the computer or the program.

9   Print a short document from a different program that has worked in the past. If this solution works, then the problem is with the program that you are using. If this solution does not work (the document does not print) complete these steps:

    a   Try printing the job from another computer that has the MFP software installed.

    b   If you connected the MFP to the network, connect the MFP directly to a computer with a parallel cable. Redirect the MFP to the correct port, or reinstall the software, selecting the new connection type that you are using.

Troubleshooting flowchart

This flowchart highlights the general processes that you can follow to quickly isolate and solve MFP hardware problems.

Each row depicts a major troubleshooting step. A "yes" answer to a question allows you to proceed to the next major step. A "no" answer indicates that additional testing is needed. Proceed to the appropriate section in this chapter, and follow the instructions there. After completing the instructions, proceed to the next major step in this troubleshooting flowchart.

Table 7-1 Troubleshooting flowchart

1 **Power on**	Is the MFP on and does a readable message appear?	Follow the power-on troubleshooting checks. See Power-on checks. After the control-panel display is functional, go to step 2.
	Yes ↓ No →	
2 **Control-panel messages**	Does the message **Ready** appear on the control-panel display?	If an error message appears, see Resolving control-panel messages. After the errors have been corrected, go to step 3.
	Yes ↓ No →	
3 **Event log**	Open the **DIAGNOSTICS** menu and print an event log to see the history of errors with this MFP. Does the event log print?	If the event log does not print, see Engine test. If the paper jams inside the MFP, see Jams. If error messages appear on the control-panel display when you try to print an event log, see Resolving control-panel messages. After successfully printing and evaluating the event log, go to step 4.
	Yes ↓ No →	
4 **Information pages**	Open the **INFORMATION** menu and print the configuration pages to verify that all of the accessories are installed. Are all of the accessories installed?	If accessories that are installed are not listed on the configuration page, remove the accessory and reinstall it. For more information about optional output devices, see Accessory lights for the 3-bin mailbox and stapler/stacker. After evaluating the configuration pages, go to step 5.
	Yes ↓ No →	
5 **Copy/scan**	Can you successfully make a copy from both the ADF and the scanner glass?	If media is jamming in the ADF, see Clearing jams from the ADF. If you cannot make a copy from the scanner glass, see Scanner tests. After you can successfully copy, go to step 6.
	Yes ↓ No →	
6 **Image quality**	Does the print quality meet the customer's requirements?	Compare the images with the sample defects in the image defect tables. See Image-defect examples. After the print quality is acceptable, go to step 7.
	Yes ↓ No →	
7 **Interface**	Can the customer print successfully from the host computer?	Verify that all I/O cables are connected correctly and that a valid IP address is listed on the Jetdirect configuration page. See Network connectivity problems. Also see Configuring and verifying an IP address in chapter 3 of this manual. If error messages appear on the control-panel display, see Resolving control-panel messages. When the customer can print from the host computer, this is the end of the troubleshooting process.
	Yes. This is the end of the troubleshooting process. No →	

Power-on checks

The basic MFP functions should start up as soon as the MFP is plugged into an electrical outlet and the power switch is pushed to the *on* position. If the MFP does not start, use the information in this section to isolate and solve the problem.

Power-on troubleshooting overview

Turn on the MFP power. If the control-panel display remains blank, random patterns appear, or asterisks remain on the display, perform power-on checks to locate the cause of the problem.

During normal operation, the main cooling fan begins to spin briefly after the MFP power is turned on. Place your hand over the holes in the rear cover, above the formatter. If the fan is operating, you will feel a slight vibration and feel air passing into the MFP. You can also lean close to the MFP and hear the fan operating. When this fan is operational, the dc side of the power supply is functioning correctly.

After the fan is operating, the main motor turns on (unless the top cover is open, a jam condition is sensed, or the paper-path sensors are damaged). You should be able to visually and audibly determine if the main motor is turned on.

If the fan and main motor are operating correctly, the next troubleshooting step is to isolate print engine, formatter, and control-panel problems. Perform an engine test (see Engine test). If the formatter is damaged, it might interfere with the engine test. If the engine test page does not print, try removing the formatter and then performing the engine test again. If the engine test is then successful, the problem is almost certainly with the formatter, the control panel, or the cable that connects them.

If the control panel is blank when you turn on the MFP, check the following items.

1   Make sure that the MFP is plugged into an active electrical outlet that delivers the correct voltage.

2   Make sure that the power switch is in the *on* position.

3   Make sure that the fan runs briefly, which indicates that the power supply is operational.

4   Make sure that the control-panel display wire-harness is connected. See Control panel.

5   Make sure that the firmware flash memory card and the formatter are seated and operating correctly. See Flash memory card (firmware).

6   Remove any HP Jetdirect or other EIO cards, and then try to turn the MFP on again.

NOTE   If the control-panel display is blank, but the main cooling fan runs briefly after the MFP power is turned on, try printing an engine test page to determine whether the problem is with the control-panel display, formatter, or other MFP components. See Engine test.

If the main cooling fan is not operating, check the following items.

1   Check the fuse on the power-factor correction (PFC) power supply (location FU1; near the power switch) to make sure that it is not open.

2   If necessary, replace the PFC power supply PCA. See Power-factor-correction (PFC) power supply.

3   If necessary, replace the dc controller. See DC controller.

4   If necessary, replace the engine power supply. See Engine power supply.

NOTE   It is important to have the control panel functional as soon as possible in the troubleshooting process so that the control-panel display can be used to help locate MFP errors.

Control-panel messages

Messages appear on the control-panel display to relay the normal status of the MFP (such as **Processing Job**), or an error condition (such as **CLOSE TOP COVER**) that needs attention. Resolving control-panel messages lists messages that require attention, or that might raise questions. Messages are listed in alphabetical order, with numeric messages at the end of the list. Not all messages are listed because some (such as **Ready**) are self-explanatory.

NOTE   Some messages are affected by the **AUTO CONTINUE** and **CLEARABLE WARNINGS** settings on the **CONFIGURE DEVICE** menu, **SYSTEM SETUP** submenu, on the control panel.

Using the MFP help system

This MFP features a help system on the control panel that provides instructions for resolving most MFP errors. Certain control-panel messages alternate with instructions about using the help system.

Whenever a **?** appears in an error message or a message alternates with **FOR HELP TOUCH ?**, touch the ⑦ (Help) button to view the help.

To exit the help system, touch the ⑦ (Help) button.

Resolving control-panel messages

Table 7-2 Control-panel messages

Control panel message	Description	Recommended action
Access denied MENUS LOCKED	The control panel function that you are trying to use has been locked to prevent unauthorized access.	Contact the network administrator.
ACTION NOT CURRENTLY AVAILABLE FOR TRAY X TRAY SIZE CANNOT BE ANY SIZE/ANY CUSTOM	A duplexed (2-sided) document was requested from a tray that is set to **ANY SIZE** or **ANY CUSTOM**. Duplexing is not allowed from a tray configured to **ANY SIZE** or **ANY CUSTOM**.	Select another tray or reconfigure the tray.
ADF Cover Open	The ADF cover is open.	The ADF cover-open sensor is located directly above the ADF feed motor (see Figure 7-22 ADF motors, solenoid, and sensors). When the ADF jam-access cover is closed, a plastic protrusion that is on the bottom of this cover blocks the sensor, and the scanner-controller PCA detects that the cover is closed.

If you have recently disassembled the ADF, make sure that all of the covers have been installed correctly and make sure that the wiring to this sensor is firmly seated. Also verify that CN105 on the scanner-controller PCA is firmly seated.

Open the **DIAGNOSTICS** menu, and touch **SCANNER TESTS** and then **SENSORS**. Open and close the ADF jam-access cover |

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
		and observe whether the status changes on the control-panel display. If the status does not change, make sure that the connectors are firmly seated. Clean or replace the sensor if necessary.
ADF OUTPUT BIN FULL	The ADF output bin holds 50 sheets of paper. The MFP stops when the bin is full.	Usually, emptying the ADF output bin clears this message. If the message persists, check the following items: 1 Verify that the ADF output-bin-full sensor flag can move freely. (See Figure 7-20 ADF output-bin-full sensor.) 2 Verify that the connector at the sensor flag is seated correctly. You can use the **SCANNER TESTS** in the **DIAGNOSTICS** menu to test this sensor. See Scanner tests. Lift up on the sensor flag to simulate the output bin being full. Observe whether the status changes on the control-panel display. If the status does not change, make sure that the connectors are firmly seated. Clean or replace the sensor if necessary.
ADF Paper Jam	Media is jammed in the ADF.	Clear the jam. See Clearing jams from the ADF. Also see Solving repeated jams. If the message persists, make sure that the ADF mylar sheet, the ADF pickup-roller assembly, and the ADF separation pad are installed correctly. If any of these components is dirty or worn, replace the component. The ADF-read motor might be defective. Observe the motor to see if it is rotating or attempting to pull paper through the paper path. See Figure 7-22 ADF motors, solenoid, and sensors. You can use the **SCANNER TESTS** in the **DIAGNOSTICS** menu to test this motor. See Scanner tests. Run the **ADF read motor** test and the **ADF read motor reverse** test. If the motor does not rotate, verify that connector CN103 is seated correctly on the scanner-controller PCA and that the connector on the motor is seated correctly. If the motor is defective, replace the ADF. See ADF assembly. The ADF paper-present sensor might be defective. See Figure 7-21 ADF pickup assembly sensors. Make sure that the sensor flag can move freely. You can use the **SCANNER TESTS** in the **DIAGNOSTICS** menu to test this sensor. See Scanner tests. Manually move the flag and observe whether the status changes on the control-panel display. If the status does not change, make sure that the wiring for

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
		the sensor is firmly seated. Clean or replace the sensor if necessary.
ADF PICK ERROR	The ADF experienced an error while picking media.	Clear the jam. See Clearing jams from the ADF. Also see Solving repeated jams. If the message persists, make sure that the ADF mylar sheet, the ADF pickup-roller assembly, and the ADF separation pad are installed correctly. If any of these components is dirty or worn, replace the component. The ADF-input motor might be defective. Observe the motor to see if it is rotating or attempting to pull paper through the paper path. See Figure 7-22 ADF motors, solenoid, and sensors. You can use the **SCANNER TESTS** in the **DIAGNOSTICS** menu to test this motor. See Scanner tests. Run the **ADF input motor** test and the **ADF input motor reverse** test. If the motor does not rotate, verify that the connector CN103 is seated correctly on the scanner-controller PCA and that the connector on the motor is seated correctly. If the motor is defective, replace the ADF. See ADF assembly.
ADF SKEW ERROR	Media has become skewed in the ADF.	Make sure that the paper guides are aligned on the sides of the originals, and that all of the originals are the same size. Remove the remaining media from the ADF and close the ADF cover. Follow the instructions in the onscreen dialog box.
Authentication information is incorrect. Please re-enter information.	A user name or password is incorrect.	Type the information again.
AUTHENTICATION REQUIRED	Authentication has been enabled for this feature or destination. A user name and password are required.	Type the user name and password, or contact the network administrator.
AUTHENTICATION REQUIRED TO USE THIS FEATURE	A user name and password are required.	Type the user name and password, or contact the network administrator.
BAD DUPLEXER CONNECTION	The duplex printing accessory is not connected correctly to the MFP.	1 Remove and reinstall the duplexer. 2 If this message persists, the connector between the duplexer and the engine might be damaged. Inspect the connector, J151L, on the duplexer. If the connector is damaged, replace the duplexer. 3 If the message still persists, replace the dc controller.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
BAD ENV FEEDER CONNECTION	The envelope feeder is not connected correctly.	1 Remove and reinstall the envelope feeder. 2 If this message persists, replace the envelope feeder.
OUTPUT BIN <X> FULL	The specified output bin is full and printing cannot continue.	Empty the bin to continue printing.
CARTRIDGE FAILURE RETURN FOR REPLACEMENT	The print cartridge still contains part of the sealing tape.	Try to remove the remaining sealing tape. If it cannot be removed, insert a new print cartridge and return the faulty print cartridge to receive a replacement.
CARTRIDGE OUT REPLACE CARTRIDGE	The print cartridge is out of toner. Printing cannot continue because damage to the MFP might result.	Replace the print cartridge.
CHECK CABLES CHECK SCANNER LOCK To continue turn off then on	The scanner might be locked or the interface cable might be seated incorrectly.	1 Lift up the ADF assembly and check the scanner lock to make sure that it is in the unlocked position. 2 Verify that the connector CN102 (dc power connection) on the scanner-controller PCA is firmly seated. 3 Verify that the connector CN104 (optical head connection) on the scanner-controller PCA is firmly seated. 4 Verify that the connector CN101 (formatter connection) on the scanner-controller PCA is firmly seated. 5 Also see the entry in this table for **30.1.8 SCAN FAILURE**.
CHECK CABLES Then turn off then on	The cable that connects the scanner to the MFP is experiencing an error.	1 Lift up the ADF assembly and check the scanner lock to make sure that it is in the unlocked position. 2 Verify that the connector CN102 (dc power connection) on the scanner-controller PCA is firmly seated. 3 Verify that the connector CN104 (optical head connection) on the scanner-controller PCA is firmly seated. 4 Verify that the connector CN101 (formatter connection) on the scanner-controller PCA is firmly seated. 5 Also see the entry in this table for **30.1.8 SCAN FAILURE**.
CHECK OUTPUT DEVICE	An error has occurred with the output device.	Remove and reinstall the output device. Observe the LED on the device. If it is flashing or is amber, see Accessory lights for the 3-bin mailbox and stapler/stacker.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
Check the glass and remove any paper, then press START	A digital send or copy job has been performed from the scanner glass, but the original document needs to be removed.	Remove the original document from the scanner glass and press Sᴛᴀʀᴛ.
CHOSEN PERSONALITY NOT AVAILABLE To continue touch OK	A print job requested a MFP language (personality) that is not available for this MFP. The job will not print and will be cleared from memory.	Print the job by using a printer driver for a different printer language, or add the requested language to the MFP (if possible). To see a list of available personalities, print a configuration page.
CLOSE RIGHT ACCESS DOOR <X>	The specified jam-access cover is open.	Open the **DIAGNOSTICS** menu and touch **MANUAL SENSOR TEST**. On the control-panel display, this switch is represented by the letter "P." Open and close the tray 2 jam-access door and observe whether the status changes on the control-panel display. If the message persists, verify that the connector J87 on the dc controller is firmly seated. Replace SW105 if necessary.
CLOSE RIGHT ACCESS DOORS	More than one jam-access cover is open.	Close all jam-access covers to continue printing. If the error persists, replace the jam-access cover switch (SW105). See Figure 7-11 Tray 2 jam-access-cover switch, SW105.
CLOSE TOP COVER	SW101 has detected that the top cover is open. See Figure 7-10 Top-cover switch, SW101.	If the top cover is closed, verify that connector J95 on the dc controller is firmly seated. You can use the **MANUAL SENSOR TEST** to test the operation of this switch. See Manual sensor test. In the diagnostic test, this switch is represented by a lowercase "f." Open the top cover while you observe the status of this switch on the control-panel display. If the status does not change, make sure that the connector for the switch is firmly seated. Replace the switch if necessary.
Digital Send Communication Error	An error has occurred during a digital send task.	Contact the network administrator.
Digital Send server is not responding Contact administrator	The MFP cannot communicate with the server.	Verify the network connection. Contact the network administrator.
DUPLEXER ERROR REMOVE DUPLEXER Install duplexer with power off	The duplexer has been removed.	Reinstall the duplexer. (Any print jobs at the MFP might be lost.)
E-mail Gateway did not accept the job because the attachment was too large.	The scanned documents have exceeded the size limit of the server.	Send the job again using a lower resolution, smaller file size setting, or fewer pages. See Using the embedded Web server to learn how to reduce the size of the attachment. Contact the network administrator to enable sending the scanned documents by using multiple e-mails.
E-mail Gateway did not respond. Job failed.	A gateway has exceeded the time out value.	Validate the SMTP IP address. See E-mail problems.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
E-mail Gateway rejected the job because of the addressing information. Job failed.	One or more of the e-mail addresses is incorrect.	Send the job again with the correct addresses.
Error executing Digital Send job. Job failed.	A digital send job has failed and cannot be delivered.	Try to send the job again.
Folder list is full. To add a folder, you must first delete a folder.	The MFP limits the number of folders that can be established.	Delete an unused folder to add a new folder.
HP Digital Sending: Delivery Error	A digital send job has failed and cannot be delivered.	Try to send the job again.
INSERT OR CLOSE TRAY XX	The specified tray is missing or open.	1 Insert or close the specified tray to continue. 2 You can use the **MANUAL SENSOR TEST** to test the operation of this switch (SW102). See Manual sensor test. In the diagnostic test, this switch is represented by the letter "S." If the control-panel display shows "S3," then A4-size media is installed, "S5" indicates that letter-size media is installed, and "S7" indicates that no tray is installed. 3 Replace the media-size detection switch (SW102). 4 Replace the dc controller PCA.
INSTALL CARTRIDGE	The print cartridge has been removed or has been installed incorrectly.	1 Make sure that the print cartridge is firmly seated and that the contact points are clean. 2 Replace the print cartridge. 3 Replace the dc controller PCA. 4 Replace the engine power supply PCA.
INSUFFICIENT MEMORY TO LOAD FONTS/DATA <DEVICE> To continue touch OK	The MFP does not have enough memory to load the data (for example, fonts or macros) from the location specified.	Touch **OK** to continue without this information. If the message persists, add more memory.
JAM IN DOCUMENT FEEDER	Media is jammed in the ADF.	Remove jammed media from the ADF. Follow the instructions in the onscreen dialog box. See Clearing jams from the ADF. Also see Solving repeated jams. If any of the scanner components have been replaced recently, make sure that the components are installed correctly. If the message persists, a sensor might be stuck or broken. Open the **DIAGNOSTICS** menu and touch **SCANNER TESTS**. Test all of the components to try to isolate the problem.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
LDAP Server is not responding Contact administrator	The LDAP server has exceeded the time out value for an address request.	Verify the LDAP server address. See E-mail problems. Contact the network administrator.
LOAD ENVELOPE FEEDER <TYPE> <SIZE>	The envelope feeder is empty.	1 Load the envelope feeder. 2 Replace the tray 1 sensor lever (PS105). 3 Replace the dc controller PCA.
LOAD TRAY 1 <TYPE> <SIZE>	The tray is empty or configured for a different size than the size requested.	1 Make sure that the tray is loaded with the media type and size that is indicated. 2 Replace the tray 1 sensor lever (PS105). 3 Replace the dc controller PCA.
MANUALLY FEED <TYPE> <SIZE>	The specified job requires manual feed from tray 1.	Load the requested media into tray 1. To override the message, touch **OK** to use a type and size of media that is available in another tray.
Network connection required For Digital Sending. Contact administrator.	A digital-sending feature has been configured, but a network connection is not detected.	Verify the network connection. See Network connectivity problems. Contact the network administrator.
NON HP SUPPLY INSTALLED Economode disabled	A non-HP supply or a refilled HP supply has been installed.	Follow the instructions in the onscreen dialog box. If you are certain that the print cartridge is a genuine HP print cartridge, make sure that the connector J97 on the dc controller PCA is connected. If the problem persists, replace the dc controller PCA.
Novell Login Required	Novell authentication has been enabled for this destination.	Enter Novell network credentials to access the copy and fax features.
ORDER CARTRIDGE	The number of pages remaining for the print cartridge has reached the low threshold. The MFP was set to stop printing when a supply needs to be ordered.	■ Touch **OK** to continue printing until the print cartridge is out of toner. ■ If this message appears after you install a new print cartridge, the new print cartridge might be defective. Install a different cartridge. ■ Replace the dc controller PCA. ■ Replace the engine power-supply PCA.
OUTPUT PAPER PATH OPEN	The paper path between the MFP and the output device is open and must be closed before printing can continue.	1 If you have a 3-bin mailbox installed, make sure that the jam-access door is closed. 2 If you have a stapler/stacker installed, make sure that the staple cartridge is snapped into position and that the staple-cartridge door is closed.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
PAPER WRAPPED AROUND FUSER	A jam has occurred because paper has wrapped around the fuser.	Follow the instructions in the onscreen dialog box. See Clearing jams from the fuser.
Password or name is incorrect. Please enter correct login.	The user name or password was typed incorrectly.	Retype the user name and password.
Phone Book is full. To add a phone number, you must first delete a phone number.	The MFP limits the number of phone numbers that you can add.	Delete an unused phone number to add a new one.
PIN is incorrect. Please re-enter PIN.	The PIN was typed incorrectly.	Retype the PIN.
PIN is incorrect. Please enter a 4-digit number.	The PIN format is incorrect.	Type the 4-digit PIN.
Please turn device off and install hard disk.	The requested job requires a hard disk, but the MFP does not have a hard disk installed.	Turn the MFP off and install a hard disk.
Reattach output bin	The output-bin-detection switch, SW103, cannot detect that an output device is attached.	Turn the MFP off. If you are using the stapler/stacker or the 3-bin mailbox, make sure that the cable is connected to the MFP. Reattach the output bin, and then turn on the MFP. Observe the LED on the output device. If it is flashing or amber, see Accessory lights for the 3-bin mailbox and stapler/stacker. If the message persists, verify that connector J65 on the dc controller is firmly seated. Replace SW103 if necessary.
REINSERT DUPLEXER	The duplexer has been removed and must be reinstalled.	1 Reinsert the duplexer in the MFP. 2 If the message persists, the connection between the duplexer and the MFP might be faulty. Remove the duplexer, and inspect the connectors: J44 on the dc controller and J151 on the duplexer. Replace the duplexer if necessary.
REINSTALL OUTPUT DEVICE	The output-bin-detection switch, SW103, has detected that no output device is installed.	Make sure that the output bin, 3-bin mailbox, or stapler/stacker is correctly installed on the MFP. Turn the MFP off. If you are using the stapler/stacker or the 3-bin mailbox, make sure that the cable is connected to the MFP. Reattach the output bin, and then turn the MFP on. Observe the LED on the output device. If it is flashing or amber, see Accessory lights for the 3-bin mailbox and stapler/stacker.
REPLACE CARTRIDGE	The print cartridge has reached the end of its life. Printing cannot continue.	1 Replace the print cartridge. 2 If this message appears after you install a new print cartridge, the new print cartridge might be defective. Install a different cartridge. 3 Replace the dc controller PCA.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
		4 Replace the engine power-supply PCA.
REPLACE STAPLE CARTRIDGE	The stapler is out of staples.	Replace the staple cartridge.
RIGHT ACCESS DOOR OPEN	The tray 2 jam-access-cover switch, SW105, has detected that the jam-access cover on tray 2 is open.	Open the **DIAGNOSTICS** menu and touch **MANUAL SENSOR TEST**. On the control-panel display, this switch is represented by the letter "P." Open and close the tray 2 jam-access door and observe whether the status changes on the control-panel display. If the message persists, verify that the connector J87 on the dc controller is firmly seated. Replace SW105 if necessary.
SANITIZING DISK <X>% COMPLETE Do not power off	The hard disk or flash memory card is being cleaned.	Contact the network administrator.
SCAN CARRIAGE LOCKED Check lock switch, cycle power	The flatbed scanner carriage is locked for shipping.	Turn off the MFP, unlock the scanner carriage, and then turn on the MFP.
SCAN FAILURE Press 'Start' to rescan	The scan was unsuccessful and the document needs to be rescanned.	If necessary, reposition the document to rescan it, and then press START.
Scanning...	This message appears while the MFP is performing a scan. However, if the message appears for a long time, the ADF fan might be broken or blocked.	1 Turn the MFP off and then on. Listen for the ADF fan to turn on briefly during the initialization sequence. 2 If the fan does not turn on during the initialization sequence, replace the ADF fan.
SMTP GATEWAY	The SMTP gateway has exceeded a time out value.	Verify the e-mail server address. See E-mail problems. Contact the network administrator.
STAPLER LOW ON STAPLES	Fewer than 20 staples remain in the staple cartridge. Printing continues until the cartridge runs out of staples and the **REPLACE STAPLE CARTRIDGE** message appears on the control-panel display.	Replace the staple cartridge. If the message persists after loading a new staple cartridge, replace the stapler/stacker.
The Digital Sending Service at <IP Address> does not service this MFP. Contact administrator.	The MFP cannot communicate with the specified IP address.	Verify the IP address. Contact the network administrator.
The Digital Sending Service must be upgraded to support this version of the MFP firmware. Contact administrator.	The Digital Sending Service is not supported by the version of the firmware that is currently installed for the MFP.	Check the firmware version. Contact the network administrator.
The folder you have entered is not a valid folder.	The folder name was entered incorrectly, or the folder does not exist.	Re-enter the folder name correctly, or add the folder.
TOO MANY PAGES IN JOB TO STAPLE	The maximum number of sheets the stapler can staple is 30.	For print jobs that have more than 30 pages, staple them manually.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
TRAY 2 OPEN	The tray 2 paper-size-detection switch, SW102, has detected that tray 2 is not installed or that no media is present.	1 Verify that connector J90 on the dc controller is firmly seated. 2 You can use the **MANUAL SENSOR TEST** to test the operation of this switch. See Manual sensor test. Status "S5" indicates that letter-size media is installed in the tray. Status "S3" indicates that A4-size media is installed in the tray. Status "S7" indicates that the tray is not installed in the MFP. Pull the tray out and reinsert it while you observe the status on the control-panel display. If the status does not change, replace SW102.
Unable to connect		To temporarily hide this message in order to fax or send to e-mail, touch **IGNORE**. If this message persists, make sure that the cable between the print engine and the scanner assembly is connected correctly. Replace the scanner assembly if necessary. See Scanner assembly.
UNABLE TO COPY	The MFP was unable to copy the document.	To temporarily hide this message in order to fax or send to e-mail, touch **IGNORE**. If this message persists, make sure that the cable between the print engine and the scanner assembly is connected correctly. Replace the scanner assembly if necessary. See Scanner assembly.
UNABLE TO SEND		To temporarily hide this message in order to fax or send to e-mail, touch **IGNORE**. If this message persists, make sure that the cable between the print engine and the scanner assembly is connected correctly. Replace the scanner assembly if necessary. See Scanner assembly.
Unable to send Fax. Please check fax configuration.	The MFP was unable to send the fax.	Contact the network administrator. For complete information about solving fax problems, see the *HP LaserJet Analog Fax Accessory 300 Service Manual*.
UNABLE TO SEND JOB		To temporarily hide this message in order to fax or send to e-mail, touch **IGNORE**. If this message persists, make sure that the cable between the print engine and the scanner assembly is connected correctly. Replace the scanner assembly if necessary. See Scanner assembly.
User name or password is incorrect. Please re-enter.	The user name or password was typed incorrectly.	Retype the user name and password.
User Name, Job Name, or PIN is missing.	One or more of the required items has not been selected or typed.	Select the correct user name and job name, and type the correct PIN.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
10.XX.YY SUPPLY MEMORY ERROR	The MFP cannot read or write to the print cartridge e-label or the e-label is missing from a print cartridge. ■ If XX=00, the e-label is damaged. ■ If XX=10, the MFP cannot communicate with the e-label.	1 Reinstall or replace the print cartridge. 2 Verify that connector J97 on the dc controller PCA is firmly seated.
11.XX Internal clock error To continue touch OK	The MFP real time clock has experienced an error.	Whenever the MFP is turned off and then turned on again, set the time and date at the control panel. If the error persists, you might need to replace the formatter.
13.JJ.NT JAM IN ENVELOPE FEEDER	Media is jammed in the envelope feeder.	Remove the jammed media from the envelope feeder. Follow the instructions in the onscreen dialog box. See Clearing jams from the optional envelope-feeder area.
13.JJ.NT JAM IN OUTPUT BIN	Media is jammed in the output bin. Use this list to determine the exact location of the jam: ■ 13.12.07 = The staple cartridge ■ 13.12.08 = The output bin paper-present sensor (media is stuck) ■ 13.12.09 = The output bin inlet sensor (media is stuck) ■ 13.12.10 = The output bin inlet sensor (media did not reach the sensor at the appropriate time) ■ 13.12.11 = Media is present in the output bin when the MFP is turned on. ■ 13.31.00 = Media is jammed in the reversing assembly.	1 Clear all jammed media. 2 Verify that the connector J50 on the dc controller PCA is firmly seated. 3 Verify that the two connectors that are on the rear of the reversing assembly are installed. See Figure 7-6 Sensors on the reversing unit (top side). 4 Use the component diagnostic test to test three motors: switchback motor, intermediate switchback motor, output motor. See Component test. 5 Use the component diagnostic test to test two solenoids: face-up/face-down solenoid (SL105) and alienation solenoid (SL106). See Component test. 6 Use the manual sensor test to test two sensors: paper-delivery sensor PS109 (sensor "K") and reversing-paper sensor PS110 (sensor "H"). See Figure 7-6 Sensors on the reversing unit (top side). Also see Manual sensor test. 7 If any of these components fail, replace the reversing assembly. See Reversing assembly.
13.03.00 JAM IN TRAY 1	The tray 1 pickup solenoid might be defective.	Remove the jammed media from tray 1. Follow the instructions in the onscreen dialog box. See Clearing jams from the tray 1 area. If the message persists, open the **DIAGNOSTICS** menu and touch **COMPONENT TEST**. Run the test for **MP**

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
		TRAY SOLENOID. If the solenoid is defective, replace it. See Component test.
		For more information, see Causes of persistent jams.
13.JJ.NT JAM IN TRAY X	Media is jammed in the specified tray. ■ 13.01.00 = Media did not arrive at the pre-feed sensor (PS102) within the specified time. ■ 13.02.00 = Media did not arrive at the top-of-page sensor (PS103) within the specified time.	Follow the instructions in the onscreen dialog box. See Clearing jams from the tray 2, 3, 4, or 5 areas. If the message persists, see Causes of persistent jams.
13.JJ.NT JAM INSIDE DUPLEXER Remove duplexer from lower left area	13.13.00 = Media is stuck inside the duplexer.	Follow the instructions in the onscreen dialog box. See Clearing jams from the optional duplexer. If the message persists, see Causes of persistent jams.
13.JJ.NT JAM INSIDE LEFT OUTPUT AREA Remove output bin and duplexer	Media has jammed in the output area. To clear the jam, remove the output bin or the duplex printing unit.	Clear the jam. See Clearing jams from the output areas. If the message persists, open the **DIAGNOSTICS** menu and run the component diagnostic test for the duplex motor. See Component test. If the motor is defective, replace the duplex printing unit.
13.JJ.NT JAM INSIDE RIGHT ACCESS DOOR Open all right access doors ABOVE tray X	Media is jammed inside the jam-access door for the tray that is indicated.	Clear the jam. See Clearing jams from the tray 2, 3, 4, or 5 areas. If the message persists, see Causes of persistent jams.
13.JJ.NT JAM INSIDE TOP COVER AREA	Media is jammed in the top cover area. ■ 13.02.00 = Media is stopped under the top-of-page sensor (PS103). ■ 13.05.00 = Media did not arrive at the fuser-delivery sensor (PS108) within the specified time. ■ 13.09–00 = Media is jammed under the reversing paper sensor (PS110). ■ 13.20.00 = The pre-feed sensor (PS102), the top-of-page sensor (PS103), or the fuser-delivery sensor (PS108) detected media inside the MFP when it was turned on. ■ 13.21.00 = The top cover was opened during printing, or the top-cover switch (SW101) is defective.	Follow the instructions in the onscreen dialog box. See Clearing jams from the top-cover and print-cartridge areas. If the message persists, see Causes of persistent jams.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
	■ 13.31.00 = Media did not arrive at the reversing paper sensor (PS110) within the specified time.	
	■ 13.33.00 = Media did not arrive at the paper-delivery sensor (PS109) within the specified time.	
13.JJ.NT JAM INSIDE TOP COVER AREA Remove print cartridge	Media is jammed in the top cover area and you must remove the print cartridge to clear the jam.	Follow the instructions in the onscreen dialog box. See Clearing jams from the top-cover and print-cartridge areas. If the message persists, see Causes of persistent jams.
13.JJ.NT JAM INSIDE TRAY 2 AREA	Media is jammed in tray 2.	Follow the instructions in the onscreen dialog box. See Clearing jams from the tray 2, 3, 4, or 5 areas. If the message persists, see Causes of persistent jams.
13.JJ.NT JAM INSIDE TRAY 2 RIGHT ACCESS DOOR	Media is jammed inside tray 2 in the jam-access door.	Follow the instructions in the onscreen dialog box. See Clearing jams from the tray 2, 3, 4, or 5 areas. If the message persists, see Causes of persistent jams.
13.JJ.NT JAMS INSIDE TOP COVER AREA Remove print cartridge	Media is jammed in more than one location inside the top cover area. You must remove the print cartridge in order to clear the jams.	Follow the instructions in the onscreen dialog box. See Clearing jams from the top-cover and print-cartridge areas. If the message persists, see Causes of persistent jams.
13.JJ.NT PAPER JAM OPEN INPUT TRAYS	Media is jammed inside one or more of the trays.	Follow the instructions in the onscreen dialog box. See Clearing jams from the tray 2, 3, 4, or 5 areas. If the message persists, see Causes of persistent jams.
20 INSUFFICIENT MEMORY To continue touch OK	The MFP received more data than can fit in the available memory. You might have tried to transfer too many macros, soft fonts, or complex graphics.	Touch **OK** to print the transferred data (some data might be lost), and then simplify the print job or install additional memory.
21 PAGE TOO COMPLEX To continue touch OK	The page-formatting process was not fast enough for the MFP.	Touch **OK** to print the transferred data. (Some data might be lost.) If this message appears often, simplify the print job.
22 EIO X BUFFER OVERFLOW To continue touch OK	Too much data was sent to the EIO card in the specified slot (x). An incorrect communications protocol might be in use.	Touch **OK** to print the transferred data. (Some data might be lost.) Check the host configuration. If this message persists, replace the device in the EIO slot.
22 EMBEDDED I/O BUFFER OVERFLOW To continue touch OK	Too much data was sent to the embedded HP Jetdirect print server.	Touch **OK** to print the transferred data. (Some data might be lost.)

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
22 PARALLEL I/O BUFFER OVERFLOW To continue touch OK	Too much data was sent to the parallel port.	Touch **OK** to clear the error message. (Data will be lost.) 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.
22 SERIAL I/O BUFFER OVERFLOW To continue touch OK	Too much data was sent to the serial buffer.	Touch **OK** to clear the error message. (Data will be lost.)
30.1.YY SCANNER FAILURE	An error has occurred in the scanner. Use the following list to identify specific errors: ■ 30.1.1 = The scanner cover is open. ■ 30.1.2 = A jam has occurred in the ADF. ■ 30.1.3 = The ADF could not pick up the paper. ■ 30.1.6 = An error has occurred at the scanner fan. (See the separate entry for this error.) ■ 30.1.7 = A communication error has occurred in the scanner. ■ 30.1.8 = A scanner-calibration error has occurred. (See the separate entry for this error.) ■ 30.1.10 = An error has occurred at the ADF fan. (See the separate entry for this error.) ■ 30.1.15 = Scanner initialization failed. ■ 30.1.17 = The scanner carriage is locked. ■ 30.1.18 = An error occurred on the scanner PCA. ■ 30.1.19 = An error occurred at the scanner lamp. ■ 30.1.22 = A fatal hardware error has occurred in the scanner. ■ 30.1.23 = A scanner-calibration error has occurred. ■ 30.1.24 = The ADF jam-access door is open. ■ 30.1.25 = A general error has occurred in the scanner or ADF. This error is most likely a memory corruption. ■ 30.1.29 = The ADF output bin is full.	1 Turn the MFP off and then on to try to clear the message. 2 If the message indicates that a jam has occurred, clear the jam. See Clearing jams from the ADF. 3 Verify that the cable between the print engine and the scanner is securely connected. See Scanner-controller PCA connections. 4 Upgrade the firmware. 5 If you are unable to resolve the problem, replace the scanner assembly. See Scanner assembly.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
	■ 30.1.36 = The scanning-firmware upgrade failed. The MFP automatically tries to upgrade the firmware again the next time the MFP is turned on.	
30.1.6 SCANNER FAILURE	This is a scanner-fan error. This fan is located in the base of the scanner assembly. It operates whenever the scanner lamp is illuminated or whenever the scanner flatbed motor is rotating. This fan also operates during the MFP initialization sequence.	1 During the MFP initialization sequence, try to listen to this fan to find out if it is operating. 2 Verify that the connector CN108 on the scanner-controller PCA is firmly seated. See Scanner-controller PCA connections. Also make sure that the connection for the fan in the base of the scanner assembly is firmly seated. 3 If all the connections are secure but the fan is not operating, replace the fan. See Scanner fan.
30.1.8 SCANNER FAILURE	This is a scanner-calibration error. The scanner might be locked, or a cable might not be connected correctly. During the MFP initialization sequence, the scanner optical assembly moves from its home position to the calibration strip. If this movement does not occur, this error appears.	1 Raise the ADF, and make sure that the scanner lock is in the unlocked position. 2 Turn on the MFP and watch to see if the optical assembly moves. If it does not move, remove the scanner glass to see if anything is hindering the optical assembly from moving. 3 Make sure that the optical-assembly drive belt is installed correctly. 4 Verify that the connector CN106 on the scanner-controller PCA is firmly seated. See Figure 7-22 ADF motors, solenoid, and sensors. Also see Scanner-controller PCA connections. 5 Verify that the connector CN109 on the scanner-controller PCA is firmly seated. Also verify that the connector for the scanner-home-position sensor is firmly seated. See Figure 7-22 ADF motors, solenoid, and sensors.
30.1.10 SCANNER FAILURE	The ADF fan is not operating. The ADF fan operates only during a scan process.	1 Remove the ADF rear cover and watch the fan during a scan process. 2 Verify that the fan connection on the ADF intermediate PCA is firmly seated. 3 If the fan does not rotate, replace the ADF. See ADF assembly.
40 BAD SERIAL TRANSMISSION To continue touch OK	A serial data error (parity, framing, or line overrun) occurred as data was being sent by the computer.	Touch **OK** to clear the error message. (Data will be lost.)
40 BAD EIO X TRANSMISSION To continue touch OK	The connection between the MFP and the EIO card has been broken.	Touch **OK** to clear the error message and continue printing.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
40 EMBEDDED I/O BAD TRANSMISSION To continue touch OK	A temporary printing error has occurred.	Turn the MFP off, and then turn the MFP on. If this message persists, the embedded HP Jetdirect print server might be damaged. Replace the formatter. See Formatter cover and formatter.
41.3 MEDIA TOO SHORT CANNOT DUPLEX	The MFP cannot print on both sides of the selected media because the media does not meet the minimum length specification.	Select single-sided printing or load a longer-size media. Resend the job.
41.3 MEDIA TOO SHORT CANNOT SEND TO FACE DOWN OUTPUT BIN	The MFP cannot deliver the selected media face-down because the media does not meet the minimum length specification.	Select the face-up output option, or load a longer-size media in the tray. Resend the job.
41.3 UNEXPECTED SIZE IN TRAY XX To use another tray touch OK	The specified tray is loaded with media that is longer or shorter in the feed direction than the size configured for the tray.	Touch **OK** to display **TRAY <N> SIZE**. Reconfigure the size in a tray so that the MFP will use a tray that is loaded with the size of media required for the print job. If the message does not clear automatically from the control-panel display, turn the MFP off, and then turn the MFP on.
41.3 UNEXPECTED SIZE IN TRAY XX LOAD TRAY XX <TYPE> <SIZE>	This is typically caused if two or more sheets of media stick together in the MFP or if the tray is not adjusted correctly.	Reload the tray with the correct media size. Reconfigure the size in a tray so that the MFP will use a tray that contains the size required for the print job. Follow the instructions in the onscreen dialog box.
41.X ERROR To continue touch OK	A temporary printing error occurred. ■ 41.1 = Unknown misprint error ■ 41.2 = Beam-detect misprint error ■ 41.4 = No VYSNC error ■ 41.7 = Feed-delay error ■ 41.9 = Signal-noise error	Touch **OK** to clear the error. If the error is not cleared, turn the MFP off, and then turn the MFP on. If these errors become a frequent problem, replace the dc controller PCA. See DC controller.
49.XXXXX ERROR To continue turn off then on	A critical firmware error has occurred. This type of error can be caused by invalid print commands, corrupt data, or invalid operations. In some instances, electrical noise in the cable can corrupt data during transmission to the MFP. Other causes include poor-quality parallel cables, poor connections, or specific software programs. Sometimes, the formatter itself is at fault, which is usually indicated by a **79 ERROR** message.	1 Turn the MFP off, and then turn the MFP on. 2 Upgrade the firmware. 3 Try printing a job from a different software program. If the job prints, go back to the first program and try printing a different file. If the message appears only with a certain software program or print job, contact the software vendor for assistance. 4 If the message persists when using different software programs and attempting specific print jobs, disconnect all of the cables that connect the MFP to the network or a computer. 5 Turn the MFP off.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
		6 Remove all DIMMs and flash-memory cards. Do **not** remove the firmware memory card that is in slot 1.
		7 Remove all of the EIO devices.
		8 Turn the MFP on.
		9 If the error message disappears, reinstall each DIMM, flash-memory card, and EIO device individually, making sure to turn the MFP power off and then on again as you install each device.
		10 Replace the component that caused the error message.
		11 If the error persists, replace the formatter. See Formatter cover and formatter.
50.X FUSER ERROR	A fuser error has occurred.	1 Turn the MFP off, and allow it to cool.
	■ 50.1 = Low fuser temperature at startup	2 Verify that the correct model of fuser is installed.
	■ 50.2 = Low fuser temperature during printing	3 Verify that the correct voltage fuser is installed.
	■ 50.3 = High fuser temperature during printing	4 Reinstall the fuser, and check the connection between the fuser and the MFP. Replace the connector if it is damaged.
	■ 50.4 = Faulty fuser	
	■ 50.5 = The wrong fuser is installed, or no fuser is installed	5 Replace the fuser.
		6 Replace the dc controller PCA. See DC controller.
		7 Replace the power supply. See Engine power supply.
51.XY ERROR To continue turn off then on	A temporary printing error has occurred.	1 Turn the MFP off, and then turn the MFP on.
	■ 51.1 = Beam-detect error	2 Reseat the connectors between the laser/scanner and the dc controller PCA (J83 and J84).
	■ 51.2 = Laser error	
		3 Replace the laser/scanner assembly. See Laser/scanner.
		4 Replace the dc controller PCA. See DC controller.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
52.XY ERROR To continue turn off then on	A temporary printing error has occurred. ■ 52.0 = Scanner error ■ 52.1 = Scanner startup error ■ 52.2 = Scanner rotation error	1 Turn the MFP off, and then turn the MFP on. 2 Reseat the connectors between the laser/scanner and dc controller PCA (J83 and J84). 3 Replace the laser/scanner assembly. See Laser/scanner. 4 Replace the dc controller PCA. See DC controller.
53.XY.ZZ CHECK RAM DIMM SLOT <X> To continue touch OK	A problem exists with the MFP memory. The DIMM that caused the error will not be used. The following list explains the meaning of **X**: **0** = Onboard memory **1** = Slot 1 **2** = Slot 2	You might need to reseat or replace the specified DIMM. Turn the MFP off, and then replace the DIMM that caused the error. Make sure that you are using the correct DIMM for this MFP. See chapter 8 for a list of supported DIMMs.
55.XX.YY DC CONTROLLER ERROR To continue turn off then on	The print engine is not communicating with the formatter. The problem could be caused by a timing error or an intermittent connection.	1 Turn the MFP off, and then turn the MFP on. 2 Reseat the connectors between the dc controller PCA and the formatter. 3 If the problem persists, replace the dc controller PCA. See DC controller. 4 Replace the formatter. See Formatter cover and formatter.
56.X ERROR To continue turn off then on	The input device or output device is unknown. ■ 56.1 = Unknown input device ■ 56.2 = Unknown output device	1 Turn the MFP off, and then turn the MFP on. 2 For 56.1 errors, reinstall all of the input devices (optional 500-sheet feeders or the envelope feeder.) For 56.2 errors, reinstall the output bin, the stapler/stacker, or the 3-bin mailbox. 3 Remove all non-HP paper-handling devices.
57.01 ERROR	The dc controller fan (FN104) is not functioning. See Figure 7-13 Rear-side fans.	1 Verify that the connector J66 on the dc controller is firmly seated. 2 Listen for the fan to operate while the MFP is initializing. 3 If the fan does not operate during the initialization sequence, replace it. See DC controller fan (FN104).

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
57.03 ERROR	The print-cartridge fan (FN102) is not functioning. See Figure 7-13 Rear-side fans.	1 Verify that the connector J78 on the dc controller is firmly seated. 2 Listen for the fan to operate while the MFP is initializing. 3 If the fan does not operate during the initialization sequence, replace it. See Print-cartridge fan (FN102).
57.04 ERROR	The main fan (FN101) is not functioning. See Figure 7-12 Front-side fans.	1 Verify that connector J64 on the dc controller is firmly seated. 2 Listen for the fan to operate while the MFP is initializing. 3 If the fan does not operate during the initialization sequence, replace it. See Main fan (FN101) and reversing-unit fan (FN103).
57.05 ERROR	The duplexing-unit fan (FN107) is not functioning.	1 Verify that the connector J44 on the dc controller is firmly seated. 2 Listen for the fan to operate while the MFP is initializing. 3 If the fan does not operate during the initialization sequence, replace the duplex-printing unit.
57.07 ERROR	The reversing-unit fan (FN103) is not functioning. See Figure 7-12 Front-side fans.	1 Verify that the connector J65 on the dc controller is firmly seated. 2 Listen for the fan to operate while the MFP is initializing. 3 If the fan does not operate during the initialization sequence, replace it. See Main fan (FN101) and reversing-unit fan (FN103)
58.XX ERROR To continue turn off then on	A memory error has been detected. ■ 58.2 = Air temperature sensor (TH3) ■ 58.3 = DC controller PCA ■ 58.4 = Engine power supply	Turn the MFP off, and then turn the MFP on. For 58.2 errors: 1 Reconnect the connector J63 on the engine power supply. The air temperature sensor is the thermistor (TH3) that is mounted across the main cooling fan (FN101). See Figure 7-12 Front-side fans. 2 Replace the air-temperature sensor. See Main fan (FN101) and reversing-unit fan (FN103). 3 Replace the engine power supply. See Engine power supply.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
		For 58.3 errors, replace the dc controller PCA.
		For 58.4 errors, replace the engine power supply.
59.XY ERROR To continue turn off then on	An error has occurred in one of the motors. ■ 59.0 = Main motor error ■ 59.1 = Main-motor startup error ■ 59.2 = Main-motor rotation error ■ 59.4 = Print-cartridge-motor error ■ 59.A = Print-cartridge-motor error	1 Turn the MFP off, and then turn the MFP on. 2 Reconnect the wire-harness on the dc controller PCA for the motor that is indicated. For the main motor, this is connector J98. For the print-cartridge motor, this is connector J86. 3 Replace the motor. See Main motor (M101) or Print-cartridge motor (M102). 4 Replace the dc controller PCA.
60.X ERROR To continue turn off then on	The tray that **X** specifies is not lifting correctly.	1 Install the tray and listen carefully. You should be able to hear the paper stack being lifted. You can also watch the paper-level indicator on the front of the tray to see if it moves. 2 For tray 2, verify that connector J93 on the dc controller PCA is firmly seated. This connector is for the lift motor. 3 For trays 3, 4, or 5, verify that connector J91 on the dc controller PCA is firmly seated. 4 If the lift motor for that tray is not functional, first verify that nothing is obstructing its movement. Replace the lift motor for the tray if necessary. See Lifter-drive assembly.
62 NO SYSTEM To continue turn off then on	A problem exists with the MFP firmware.	1 Turn the MFP off, and then turn the MFP on. 2 Reseat the firmware memory card, which is in slot 1. 3 Upgrade the firmware. 4 Replace the formatter. See Formatter cover and formatter.
65.XX.YY OUTPUT DEVICE CONDITION	The MFP has lost communication with the output device.	Make sure that the cable that connects the stapler/stacker or the 3-bin mailbox to the MFP is fully seated and that the screws are tightened.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
66.XY.ZZ OUTPUT DEVICE FAILURE	An error occurred in an external paper-handling accessory. ■ 66.00.15 = The output device was removed and then replaced while the MFP power was on. ■ 66.12.01 = Output-lift roller or paddle-motor error ■ 66.12.02 = Jogger-motor error ■ 66.12.03 = Stapler motor error	1 Turn the MFP power off. 2 Check that the accessory is properly seated on and connected to the MFP, without any gaps between the MFP and the accessory. If the accessory uses cables, disconnect and reconnect them. 3 Turn the MFP power on. 4 If this message persists, replace the output device.
68.X STORAGE ERROR SETTINGS CHANGED To continue touch OK	One or more MFP settings are invalid and have been reset to the factory-default settings. Printing can continue, but some unexpected functions might occur if an error occurred in permanent storage.	1 Touch **OK** to clear the message. If the message is not cleared, turn the MFP off, and then turn the MFP on. 2 Determine which settings have changed by printing a control-panel menu map. 3 Perform an NVRAM initialization. See NVRAM initialization. 4 Replace the formatter. See Formatter cover and formatter.
68.X PERMANENT STORAGE FULL To continue touch OK	The MFP NVRAM is full. Some settings that are saved in the NVRAM might have been reset to the factory defaults. Printing can continue, but some unexpected functions might occur if an error occurred in permanent storage. ■ 68.0 = Onboard-NVRAM failure ■ 68.1 = Memory-DIMM or hard-disk failure	1 Touch **OK** to clear the message. If the message is not cleared, turn the MFP off, and then turn the MFP on. 2 For 68.0 errors, perform an NVRAM initialization. See NVRAM initialization. 3 For 68.1 errors: ● Use the HP Web Jetadmin software to delete files from the hard disk. ● Replace the formatter. See Formatter cover and formatter. ● Reinitialize the hard disk. See Hard-disk initialization. ● Replace the hard disk. See Hard drive.

Table 7-2 Control-panel messages (continued)

Control panel message	Description	Recommended action
68.X PERMANENT STORAGE FULL To continue touch OK	The MFP NVRAM is failing to write. Some settings that are saved in the NVRAM might have been reset to the factory defaults. Printing can continue, but some unexpected functions might occur if an error occurred in permanent storage. ■ 68.0 = Onboard-NVRAM failure ■ 68.1 = Memory-DIMM or hard-disk failure	1 Touch **OK** to clear the message. If the message is not cleared, turn the MFP off, and then turn the MFP on. 2 For 68.0 errors, perform an NVRAM initialization. See NVRAM initialization. 3 For 68.1 errors: ● Use the HP Web Jetadmin software to delete files from the hard disk. ● Replace the formatter. See Formatter cover and formatter. ● Reinitialize the hard disk. See Hard-disk initialization. ● Replace the hard disk. See Hard drive.
69.X ERROR To continue turn off then on	The duplex printing unit is not functioning.	Turn the MFP off, and then turn the MFP on.
79 ERROR To continue turn off then on	A critical hardware error occurred.	1 Turn the MFP off, and then turn the MFP on. 2 If the problem persists, reseat the firmware memory card. 3 Remove and reinstall the formatter. 4 Upgrade the firmware. 5 Replace the formatter. See Formatter cover and formatter.
8X.YYYY EIO ERROR	The EIO accessory card has encountered a critical error.	Try the following actions to clear the message. 1 Turn the MFP off, and then turn the MFP on. 2 Turn the MFP off, reseat the EIO accessory, and then turn the MFP on. 3 Replace the EIO accessory. 4 Replace the formatter. See Formatter cover and formatter.
8X.YYYY INTERNAL JETDIRECT ERROR	The embedded HP Jetdirect print server has encountered a critical error.	1 Turn the MFP off, and then turn the MFP on. 2 If this message persists, see Network connectivity problems.

Accessory lights for the 3-bin mailbox and stapler/stacker

The following table lists errors that can occur in the 3-bin mailbox or stapler/stacker and that are reported by the accessory lights and on the control-panel display.

Accessory lights

Light	Explanation and solution
Solid green	■ The accessory is receiving power and is ready.
	■ The stapler is low on staples. **STAPLER LOW ON STAPLES** appears on the control-panel display. Fewer than 20 staples remain in the staple cartridge. Replace the staple cartridge.
	■ The number of pages in the job exceeds the 30-page limit for stapling. **TOO MANY PAGES IN JOB TO STAPLE** appears on the MFP control-panel display. For jobs that have more than 30 pages, staple the pages manually.
Solid amber	■ The accessory is experiencing a hardware malfunction. **66.XY.ZZ OUTPUT DEVICE FAILURE** appears on the control-panel display. (See the section for this message in Resolving control-panel messages.)
Blinking amber	■ The accessory has a staple jam. **13.JJ.NT JAM IN STAPLER** appears on the control-panel display. (See the section for this message in Resolving control-panel messages.)
	■ The accessory has a paper jam, or a sheet needs to be removed from the unit, even if the sheet is not jammed. **13.JJ.NT JAM IN OUTPUT BIN** appears on the control-panel display. (See the section for this message in Resolving control-panel messages.)
	■ The bin is full. **STACKER BIN FULL** appears on the control-panel display. (See the section for **OUTPUT BIN <X> FULL** in Resolving control-panel messages.)
	■ The stapler is out of staples. **REPLACE STAPLE CARTRIDGE** appears on the control-panel display. (See the section for this message in Resolving control-panel messages.)
	■ The jam-access cover is open. **OUTPUT PAPER PATH OPEN** appears on the control-panel display. (See the section for this message in Resolving control-panel messages.)
	■ The stapler unit is open. **OUTPUT PAPER PATH OPEN** appears on the control-panel display. Make sure the staple-cartridge cover is completely closed. (See the section for this message in Resolving control-panel messages.)
	■ The firmware is corrupt. **CORRUPT FIRMWARE IN EXTERNAL ACCESSORY** appears on the control-panel display. (See the section for this message in Resolving control-panel messages.)
Off	■ The MFP might be in sleep mode. Press any button on the control panel.
	■ The accessory is not receiving power. Turn the MFP power off. Check that the accessory is properly seated on and connected to the MFP, without any gaps between the MFP and the accessory. Turn the MFP power on.
	■ The accessory might have been disconnected and reconnected while the MFP power was on. **66.12.99 REINSTALL OUTPUT DEVICE** appears on the control-panel display. Reconnect the cable on the accessory.
	■ The job might have stalled between the MFP and the accessory. **Processing Job** appears on the control-panel display. Turn the MFP power off and then on.

Formatter lights

Three LEDs on the formatter indicate that the MFP is functioning correctly.
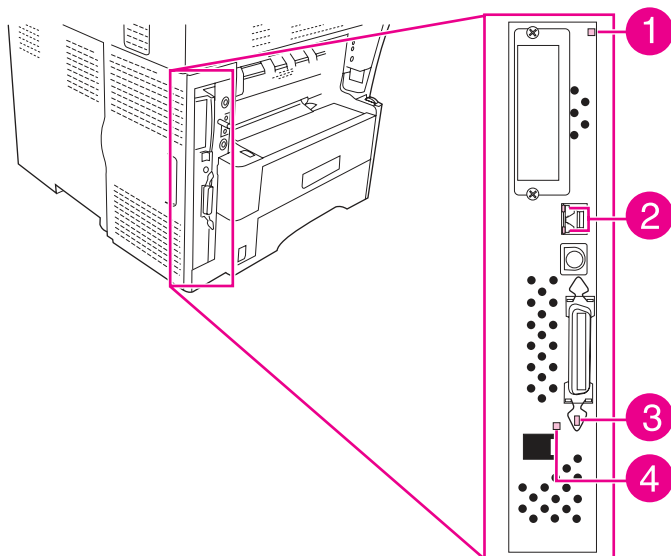
1	Copy-board LED
2	HP Jetdirect LEDs
3	Heartbeat LED
4	Fax LED

Copy-board LED

The copy-board LED flashes briefly during the MFP initialization sequence. Then, it blinks steadily to indicate that the copy-board is functioning correctly. If this LED is off after the MFP completes its initialization sequence, the copy-board is malfunctioning. Replace the formatter. See Formatter cover and formatter.

HP Jetdirect LEDs

The embedded HP Jetdirect print server has two LEDs, one for each possible link speed. When an LED is lit, the print server is functioning correctly. A link failure is indicated when both LEDs are off.

For link failures, check all of the network cable connections. In addition, you can try to manually configure the link settings on the embedded print server by using the MFP control-panel menus.

1 Touch **Menu**.

2 Touch **CONFIGURE DEVICE**.

3 Touch **I/O**.

4 Touch **EMBEDDED JETDIRECT MENU**

5 Touch **LINK SPEED**. Select the appropriate link speed.

Heartbeat LED

The heartbeat LED indicates that the formatter is functioning correctly. While the MFP is initializing after you turn it on, the LED blinks rapidly, and then turns off. When the MFP has finished the initialization sequence, the heartbeat LED pulses on and off.

If the heartbeat LED is off, the formatter might have a problem. Replace the formatter. See Formatter cover and formatter.

Fax LED

The LED on the HP LaserJet analog fax accessory 300 indicates that it is functioning correctly. If the LED is off, see the *HP LaserJet Analog Fax Accessory 300 User Guide* for information about solving the problem.

Jams

If a jam message appears on the control-panel display, look for jammed paper or other print media in the locations that are indicated in the following figure.
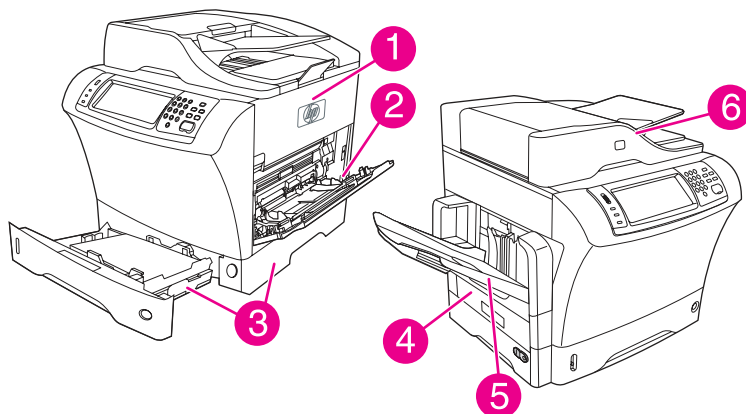
1	Top-cover and print-cartridge areas
2	Envelope-feeder area and tray 1 area (the envelope feeder is optional)
3	Tray 2 and optional 500-sheet feeder areas
4	Duplexing area (the duplexer is optional)
5	Output area
6	ADF

The following table lists the jam messages that might appear on the control-panel display. For information about clearing the jam, see the section that is indicated. You might need to look for media in locations other than those that are indicated in the jam message. If the location of the jam is not obvious, look first in the top-cover area underneath the print cartridge.

Table 7-3 Control-panel messages for jams

Jam message	Procedure for clearing the jam
JAM IN DOCUMENT FEEDER	See Clearing jams from the ADF.
ADF PAPER JAM	See Clearing jams from the ADF.
ADF PICK ERROR	See Clearing jams from the ADF.
13.JJ.NT JAM IN ENVELOPE FEEDER	See Clearing jams from the optional envelope-feeder area.
13.JJ.NT JAM IN OUTPUT BIN	See Clearing jams from the output areas.
	Also see Clearing jams from the fuser.
13.JJ.NT JAM IN TRAY 1	See Clearing jams from the tray 1 area.
13.JJ.NT JAM IN TRAY 2 (or TRAY 3, 4 or 5)	See Clearing jams from the tray 2, 3, 4, or 5 areas.

Table 7-3 Control-panel messages for jams (continued)

Jam message	Procedure for clearing the jam
13.JJ.NT JAM INSIDE DUPLEXER	See Clearing jams from the optional duplexer.
13.JJ.NT JAM INSIDE LEFT OUTPUT AREA	See Clearing jams from the output areas.
13.JJ.NT JAM INSIDE RIGHT ACCESS DOOR	See Clearing jams from the tray 2, 3, 4, or 5 areas.
13.JJ.NT JAM INSIDE TOP COVER AREA	See Clearing jams from the top-cover and print-cartridge areas.
13.JJ.NT JAM INSIDE TRAY 2 AREA	See Clearing jams from the tray 2, 3, 4, or 5 areas.
13.JJ.NT JAM INSIDE TRAY 2 RIGHT ACCESS DOOR	See Clearing jams from the tray 2, 3, 4, or 5 areas.
13.JJ.NT JAM INSIDE TOP COVER AREA	See Clearing jams from the top-cover and print-cartridge areas.
13.JJ.NT PAPER JAM OPEN INPUT TRAYS	See Clearing jams from the tray 2, 3, 4, or 5 areas.
13.JJ.NT JAM IN STAPLER	See Clearing staple jams.

When clearing jams, be very careful not to tear jammed media. If a small piece of media is left in the MFP, it could cause additional jams. If jams are a recurring problem, see Solving repeated jams.

NOTE Loose toner might remain in the MFP after a jam and cause temporary print-quality problems. These problems should clear up within a few pages.

Clearing jams from the top-cover and print-cartridge areas

Clear jams that occur during the printing process by using this procedure.

1   Open the top cover and remove the print cartridge.
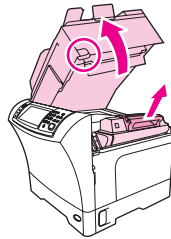
> **CAUTION**   To prevent damage to the print cartridge, do not expose it to light for more than a few minutes. Cover the print cartridge with a sheet of paper while it is outside of the MFP.

2   Use the green handle to lift the paper-access plate.
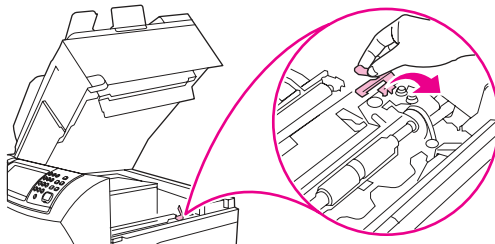
3   Slowly pull the jammed media out of the MFP. Do not tear the media.
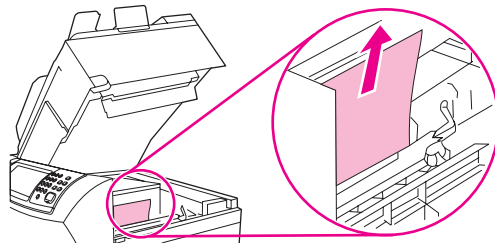
4   If jammed media is difficult to remove, open and remove the envelope-entrance cover. If media is present, remove it.
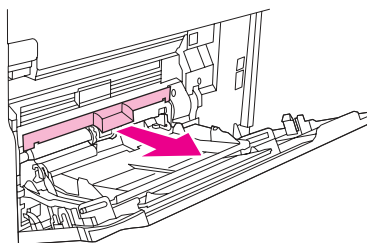
5 Rotate the paper-release guide to check for additional jammed media underneath. If jammed media is present, remove it.
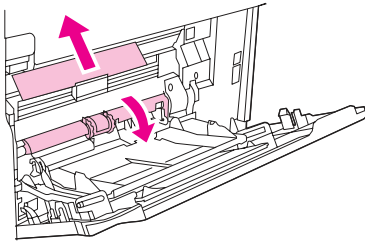
6 Replace the envelope-entrance cover and close tray 1.
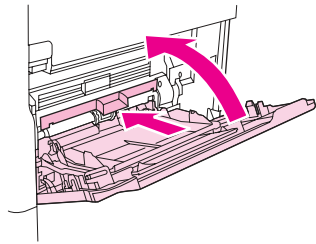
7 Reinstall the print cartridge and close the top cover.
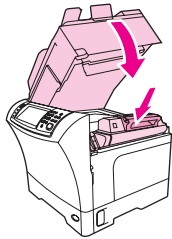
8 If a jam message persists, jammed media is still in the MFP. Look for the jam in another location.

Clearing jams from the optional envelope-feeder area

This section applies only to jams that occur when you are using an optional envelope feeder.

1   Remove any envelopes that are loaded in the envelope feeder. Lower the envelope weight and lift the tray extension up, to the closed position.
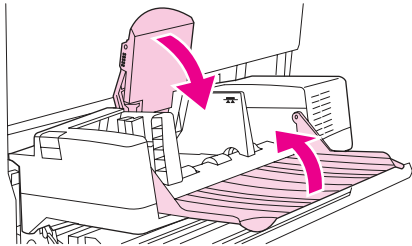
2   Press and hold the release button on the left side of the optional envelope feeder. Grasp both sides of the optional envelope feeder and carefully pull it out of the MFP.
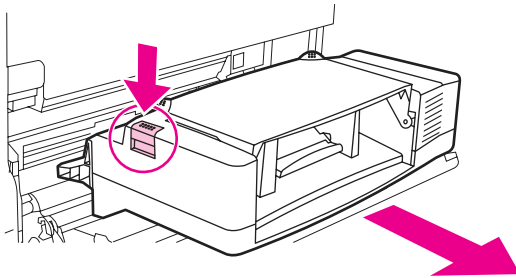
3   Slowly remove any jammed envelopes from the optional envelope feeder and from the MFP.
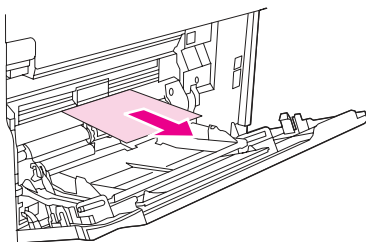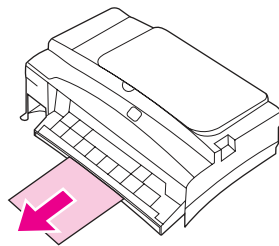
4   Insert the optional envelope feeder into the MFP until it locks into place. Pull gently on the optional envelope feeder to be sure that it is securely in place.
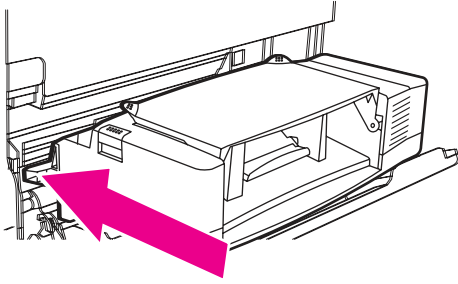
5   Fold down the envelope-feeder tray. Lift the envelope weight.
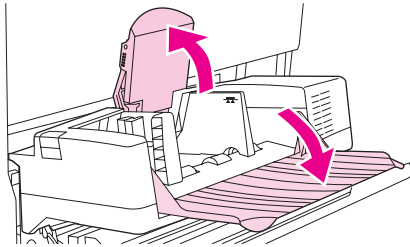
6   Reload the envelopes, making sure that you push the bottom envelopes in slightly farther than the top envelopes.

7   If a jam message persists, jammed media is still in the MFP. Look for the jam in another location.

Clearing jams from the tray 1 area

Use this procedure to clear jams that occur in the tray 1 input area.

1   Open the top cover, open tray 1, and remove the print cartridge.
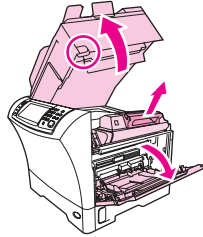
2   Use the green handle to lift the paper-access plate.
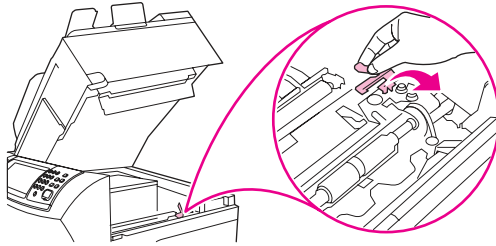
3   Slowly pull any jammed media out of the MFP. Do not tear the media. If part of the sheet has already been pulled into the MFP, follow the steps for Clearing jams from the top-cover and print-cartridge areas.
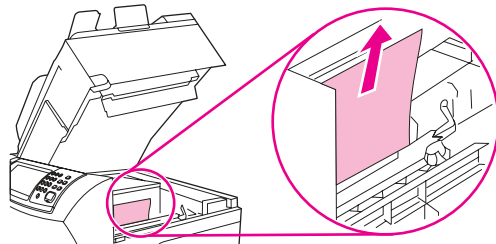
4   If jammed media is difficult to remove, remove the envelope-entrance cover. If media is present, remove it.
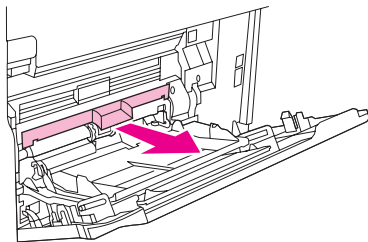
5 Rotate the paper-release guide to check for additional jammed media underneath. If jammed media is present, remove it.
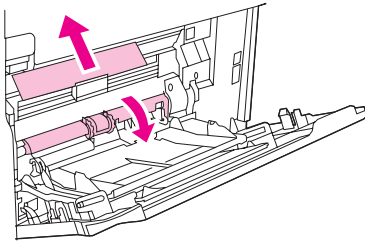
6 Replace the envelope-entrance cover and close tray 1.
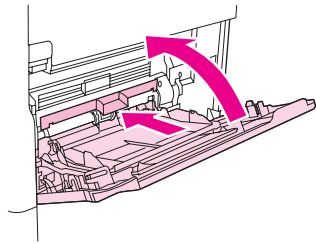
7 Reinstall the print cartridge and close the top cover.
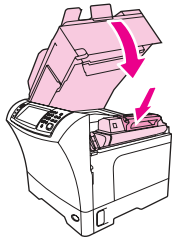
8 If a jam message persists, jammed media is still in the MFP. Look for the jam in another location.

Clearing jams from the tray 2, 3, 4, or 5 areas

Use this procedure to clear jams that occur in tray 2 or in the optional 500-sheet feeders.

To clear jams from tray 2, 3, 4, or 5

1   Pull the jam-access lever to open the jam-access cover.
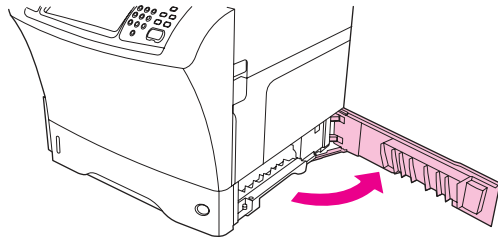
2   Carefully pull out any jammed media from either the top or the bottom of the jam-access area.
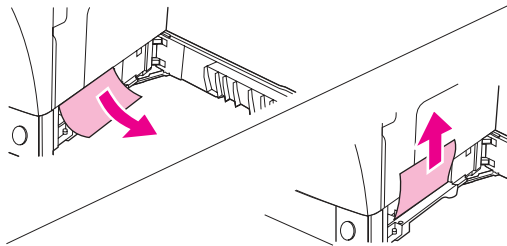
> **NOTE**   Use an upward or downward pulling motion to avoid tearing the media and to prevent toner from falling into the MFP.

3   Close the jam-access cover.
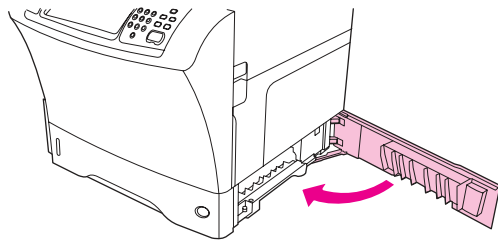
4   Slide the tray completely out of the MFP, and remove any damaged media from the tray.
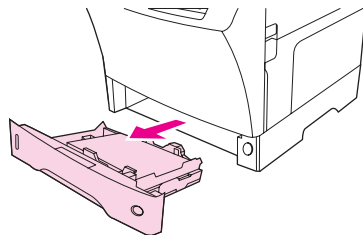
5 Slide the tray into the MFP.
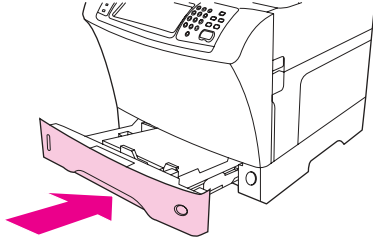
6 If a jam message persists, jammed media is still in the MFP. Look for the jam in another location.

Clearing jams from the optional duplexer

If a jam occurs during a duplex printing job, use this procedure to check for the jam and to clear it.

To clear jams from the optional duplexer

1   Remove the output bin (or remove the stapler/stacker or the mailbox).
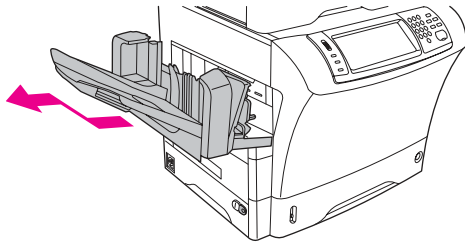
2   Remove the optional duplexer, and set it aside.
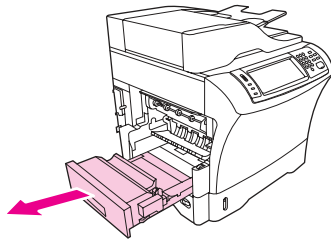
3   Check for jammed paper inside the MFP. Carefully pull out the jammed paper.
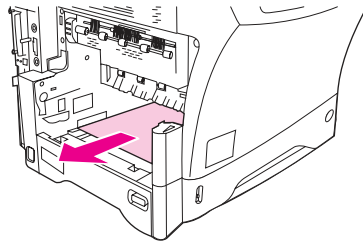
4   Check for jammed paper in the optional duplexer. Carefully pull out the jammed paper.
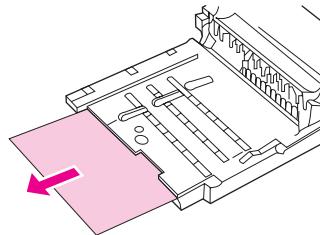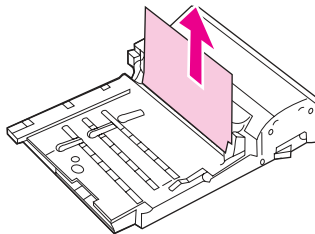
5 Reinstall the duplexer.
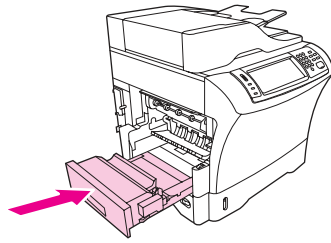
6 Reinstall the output bin (or reinstall the 3-bin mailbox or the stapler/stacker).
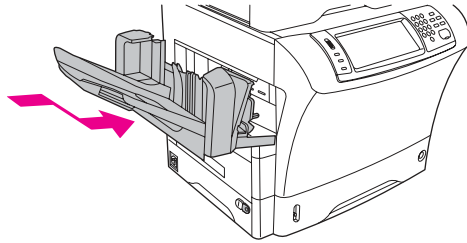
7 If a jam message persists, jammed media is still in the MFP. Look for the jam in another location.

Clearing jams from the output areas

Use this procedure to clear jams that occur in the output bin, the 3-bin mailbox, or the stapler/stacker.

To clear jams from the output areas

1   If you are using the standard output bin, grasp the handle at the bottom of the output-bin assembly, and pull it out and then up to remove it.
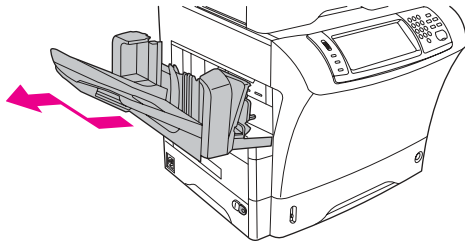
2   If you are using a 3-bin mailbox or a stapler/stacker, remove any media that is stacked, and then press and hold the release button on the top of the device. Pull the device away from the MFP.
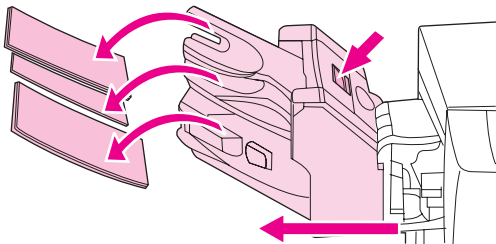
3   If the jammed media is inside the MFP, carefully pull the jammed media out of the MFP.
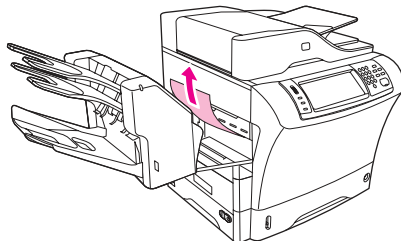
4   If the jammed media is inside the 3-bin mailbox or the stapler/stacker, carefully pull the jammed media up and out of the device.
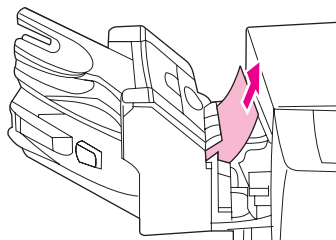
5 If you are using a 3-bin mailbox, the jammed media might be completely inside the device. Open the jam-access cover that is on the top of the 3-bin mailbox, and carefully pull the jammed media out of the mailbox.
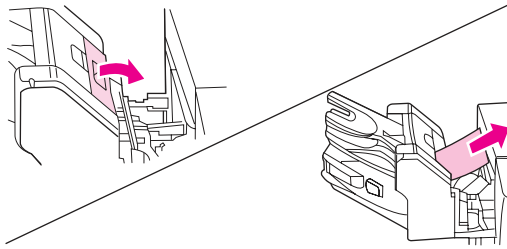
6 Reinstall the output-bin assembly, the 3-bin mailbox, or the stapler/stacker. Insert the device at an angle, and then slide it into the MFP.
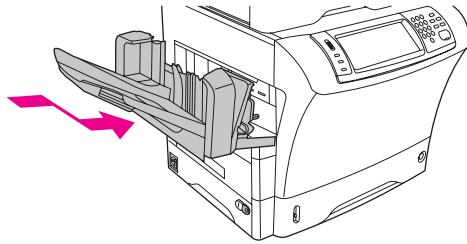
7 If a jam message persists, jammed media is still in the MFP. Look for the jam in another location.

Clearing jams from the fuser

Use this procedure to clear jams that occur in the fuser.

## To clear jams from the fuser

1 Turn the MFP off and wait 30 minutes for the fuser to cool.

> **WARNING!**   The fuser is very hot. To avoid minor burns, wait 30 minutes for the fuser to cool before removing it from the MFP.

2 If you are using the standard output bin, grasp the handle at the bottom of the output-bin assembly, and pull it out and then up to remove it.
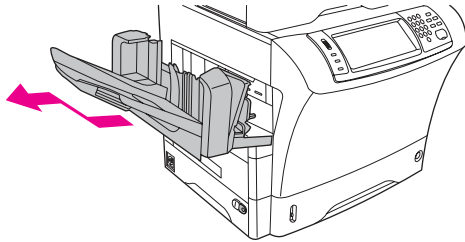
3 If you are using a 3-bin mailbox or a stapler/stacker, remove any media that is stacked, and then press and hold the release button on the top of the device. Pull the device away from the MFP.
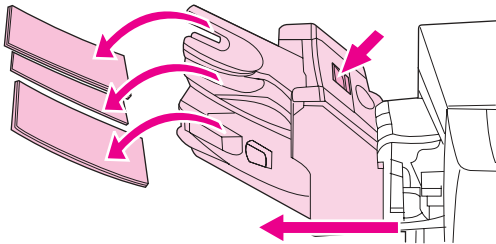
4 Remove the optional duplexer or the duplex cover.
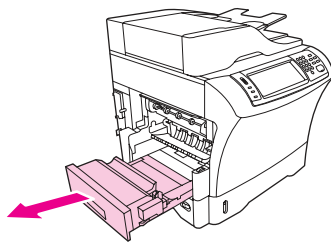
5 If you cannot see the jammed media inside the fuser, skip to step 9.

6 If you can see either the leading edge or the trailing edge of the jammed media inside the fuser, carefully pull it out.
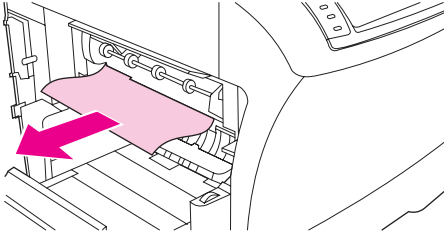
7 If you can see the jammed media, but neither the leading edge nor the trailing edge is visible, gently pull on the sides of the sheet of media until one edge becomes free. Then carefully pull the jammed media out of the fuser.
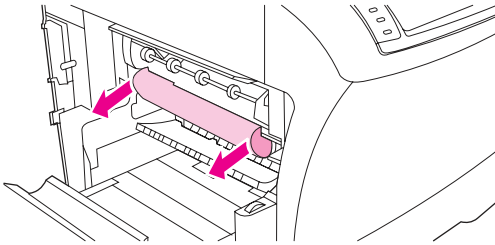
8 If the media tears as you are removing it, turn the green dial on the fuser, and then carefully pull out the jammed media. Go to step 13.
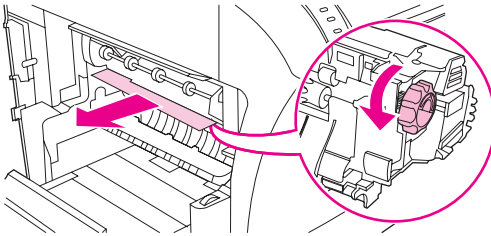
9 To remove the fuser-entrance guide, push inward at the left edge to free the left-side alignment pin. Then lift up slightly on the fuser-entrance guide, and remove it from the MFP.
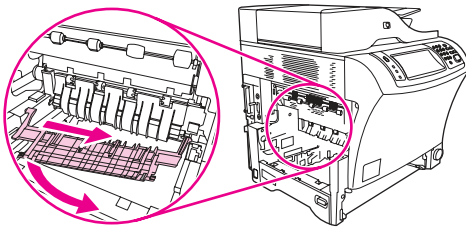
10 Place your forefingers on the blue levers on the bottom of each side of the fuser. Place your thumbs on the grip points on the top of each side of the fuser. Squeeze the blue levers up, and remove the fuser from the MFP.
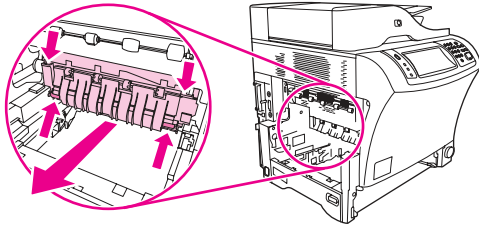
11 Open the black cover at the top of the fuser, and remove the jammed media.
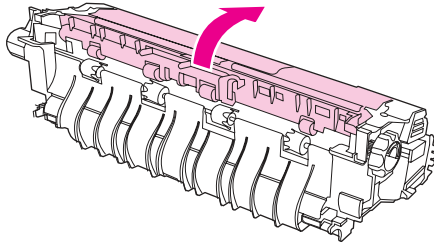
12 Reinstall the fuser. Push on the fuser with your thumbs to be sure it snaps securely into place.
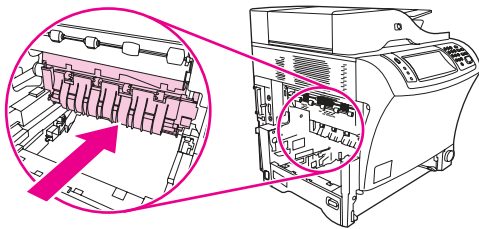
13 To reinstall the fuser-entrance guide, first insert the right-side mounting pin into the hole on the right side, and then lower the left-side mounting pin into the hole on the left side.
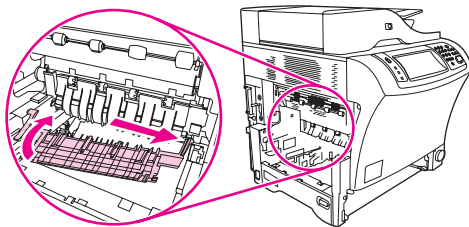
14 Reinstall the duplexer or the duplex cover.
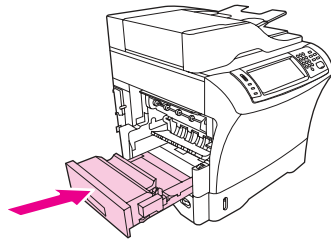
15 Reinstall the output-bin assembly, the 3-bin mailbox, or the stapler/stacker. Insert the device at an angle, and then slide it into the MFP.
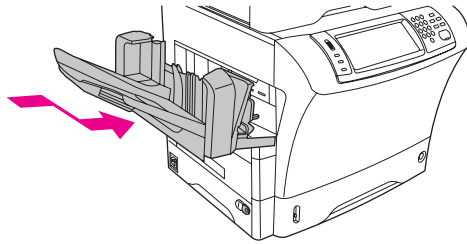
16 If a jam message persists, jammed media is still in the MFP. Look for the jam in another location.

Clearing jams from the ADF

Use this procedure to clear jams from the ADF.

1 Lift the ADF-input tray, and check for jammed media underneath the tray. Carefully remove any jammed media.
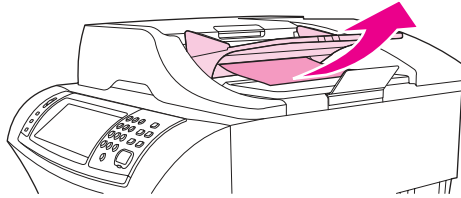
2 Pull up on the ADF-cover-release lever, and open the ADF cover. Carefully remove any jammed media.
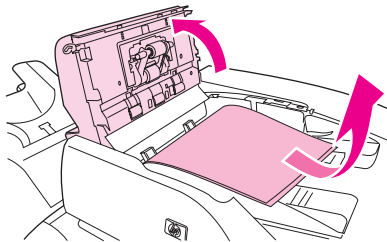
3 Lift up on the ADF-document guide, and check for jammed media. Carefully remove any jammed media.
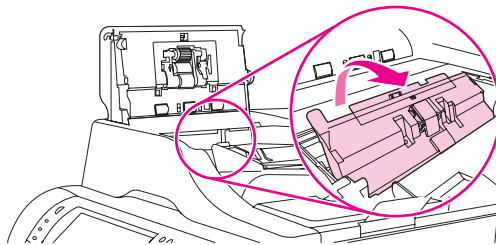
4 Close the ADF cover.
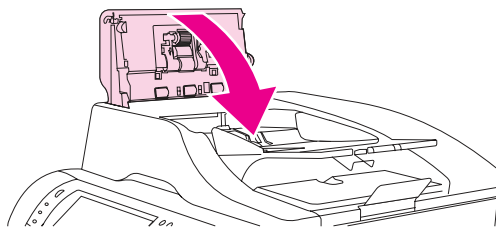
5 If a jam message persists, jammed media is still in the MFP. Look for the jam in another location.

Clearing staple jams

Occasionally, staples become jammed in the optional stapler/stacker. If jobs are not being stapled correctly or are not being stapled at all, use this procedure to clear staple jams.

To clear staple jams

1 Turn off the MFP.

2 Press and hold the release button on the top of the stapler/stacker. Pull the stapler/stacker away from the MFP.
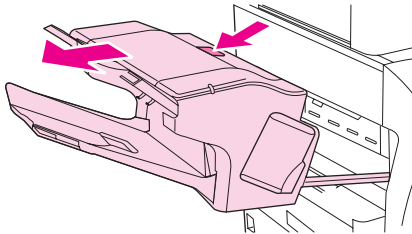
3 Open the staple-cartridge cover.
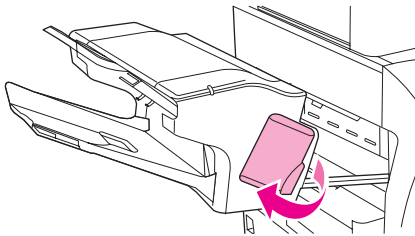
4 To remove the staple cartridge, pull up on the green handle and pull out the staple cartridge.
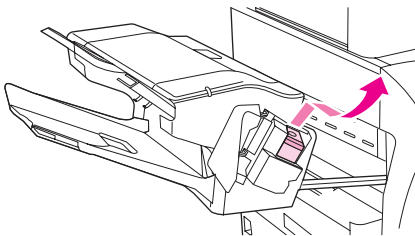
5 Lift up on the small lever at the back of the staple cartridge.
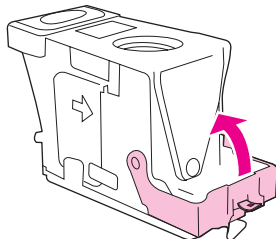
6 Remove the staples that protrude from the staple cartridge.
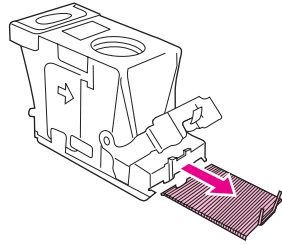
7 Close the lever at the back of the staple cartridge. Be sure that it snaps into place.
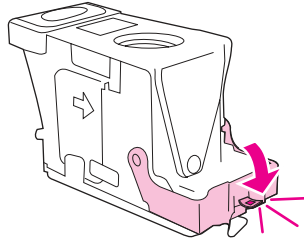
8 Reinsert the staple cartridge into the staple-cartridge holder, and push down on the green handle until it snaps into place.
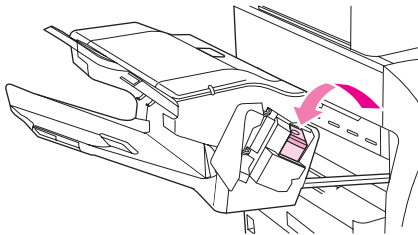
9 Close the staple-cartridge cover, and slide the stapler/stacker into the MFP.
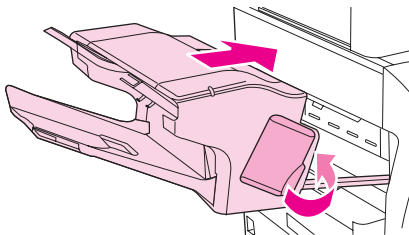
Solving repeated jams

Situation	Solution
General repeated jam problems	1 Make sure that the media is loaded correctly in the trays and that all width guides are set correctly.
	2 Make sure that the tray is set for the size of media that is installed and that the tray is not overloaded.
	3 Try turning over the stack of media in the tray. If you are using prepunched or letterhead paper, try printing from tray 1.
	4 Do not use media that has been printed on previously or torn, worn, or irregular media. See Media specifications.
	5 Check the media specifications. (See Media specifications.) If media is outside of the recommended specifications, problems can occur.
	6 The MFP might be dirty. Clean the MFP as described in Cleaning the fuser.
	7 Check that all damaged or jammed media is removed from MFP.
Repeated jams in the ADF	1 The ADF might be dirty. Clean the ADF as described in Cleaning the ADF delivery system.
	2 Make sure that the media is loaded squarely and that the media-width guides are adjusted to the sides of the media stack.
	3 Make sure that no more than 50 sheets of 75 g/m^2 (20 lb) bond paper are loaded in the ADF.
	4 Make sure that the paper is within the range of supported weight for the ADF: 60–120 g/m^2 (16–32 lb).
	5 If the original document that is being copied has been folded or stapled, flatten it as much as you can and smooth any wrinkles. Make sure the pages are not stuck together where the staple was.
	6 Media that has been pre-punched or perforated in any way might be difficult to feed through the ADF. If the leading edge of the document is excessively worn or frayed, try rotating the document 180 degrees before copying.
	7 Make sure that the media is being stored correctly. If the media is too dry, the sheets might stick together. See Media specifications.

Causes of persistent jams

If jams recur persistently, an MFP component might be defective. Use the information in this section to isolate and solve the problem.

Jams in the top-cover and print-cartridge area

Jams in the top-cover and print-cartridge area

Cause	Solution
The pre-transfer roller in the registration assembly is dirty or worn.	Replace the registration assembly.
The transfer guide in the registration assembly might be dirty or stuck.	1 If the transfer guide is dirty, clean it with a soft, dry cloth. 2 Make sure that the springs at each end of the transfer guide are adjusted correctly. 3 If the transfer guide is worn or damaged, replace the registration assembly.
The top-of-page-sensor flag (PS103) or the paper-width-sensor flag (PS106) might be stuck.	1 Verify that the connector J87 on the dc controller is correctly seated. See DC controller connections. 2 Run the manual sensor diagnostic test to make sure that these sensors are operating correctly. See Manual sensor test. The top-of-page sensor is represented by letter "F," and the paper-width sensor is represented by the letter "D." 3 While running the manual sensor test, open the top cover and move the sensor flags while you observe the control-panel display. If the sensors are operating correctly, the status should change on the control panel. If the status does not change, or you are unable to move the flag, replace the sensor.
The transfer roller or the feed rollers might be damaged.	Replace the rollers. **NOTE** These rollers are part of the printer maintenance kit.
The print cartridge might be damaged.	Replace the print cartridge.
The dc controller might be defective.	Replace the dc controller.

Jams in the envelope-feeder area and the tray 1 area

Table 7-5 Causes of jams in the envelope-feeder area and the tray 1 area

Cause	Solution
The pickup roller is dirty or worn.	Try cleaning the pickup roller with dry, lint-free paper. Replace the roller if necessary. **NOTE** The pickup roller is part of the printer maintenance kit.
The gears in the tray 1 (multipurpose tray) assembly might be worn.	Replace the tray 1 assembly. See Tray 1 assembly.
The pickup solenoid (SL102) in the tray 1 assembly might be defective.	1 Verify that the connector J79 on the dc controller is correctly seated. See DC controller connections. 2 Run the component test to verify that this solenoid is operating correctly. See Component test. If the solenoid is not activated during the test, replace it.
The dc controller might be defective.	Replace the dc controller.

Jams in the tray 2 area and the optional 500-sheet feeder areas

Table 7-6 Causes of jams in the tray 2 area and the optional 500-sheet feeder areas

Cause	Solution
The cassette pickup roller, separation roller, or feed rollers might be dirty or worn.	Clean the rollers by using dry, lint-free paper. If the problem persists, replace the rollers.
The gears in the paper-pickup-drive assembly might be damaged.	Replace the paper-pickup-drive assembly.
The gears in the cassette drive assembly might be damaged.	Replace the gears.
The tray 2 pickup-solenoid (SL101) might be damaged.	1 Verify that the connector J92 on the dc controller is correctly seated. See DC controller connections. 2 Run the component test to verify that this solenoid is operating correctly. See Component test. If the solenoid is not energized during the test, replace it.
The feed-roller clutch (CL101) might be defective.	1 Verify that the connector J89 on the dc controller is correctly seated. See DC controller connections . 2 Run the component test to verify that this clutch is operating correctly. See Component test. During the component test, remove the cover for the envelope-feeder slot. If the clutch is operating correctly, the white rollers that are inside this opening are rotating. If the rollers are not rotating, replace the clutch.

Jams in the duplexing area

Causes of jams in the duplexing area

Cause	Solution
The reversing guide or the feed guide is dirty or has burrs on it.	Clean the reversing guide or the feed guide with dry, lint-free paper. If the reversing guide or feed guide has burrs on it, replace it.
The duplexing unit pickup-sensor-lever is stuck or is damaged.	Adjust the lever, if possible, or replace the duplexing unit.
Components in the duplexing unit are worn or damaged.	Replace the duplexing unit.
The dc controller is defective.	Replace the dc controller.

Jams in the output area

Causes of jams in the output area

Cause	Solution
If a 3-bin mailbox or a stapler/stacker is installed, components in that accessory might be damaged.	To isolate the problem, remove the accessory and install the standard output bin. If jams no longer occur after installing the standard output bin, the problem is in the accessory. Replace the 3-bin mailbox or the stapler/stacker. If jams still occur after installing the standard output bin, the problem is in the MFP engine.
The face-up guide in the reverse assembly is not aligned correctly.	Make sure the guide is aligned correctly.
A spring on the reverse-separation-guide assembly is damaged or installed incorrectly.	Make sure the springs are all installed correctly. If any springs are damaged, replace the reverse-separation-guide assembly.
The lower reversing guide in the reverse assembly is dirty, worn, or damaged.	Try to clean the guide. If the problem persists, replace the reverse assembly.
Gears or belts in the reverse assembly might be damaged.	Replace the reverse assembly.
Connectors on the reversing-intermediate PCA are disconnected.	Make sure that the connectors J1401 and J1402 are connected. See Figure 7-17 Reversing-unit motors and solenoids. If they are damaged, replace the reversing-intermediate PCA.
The reversing-roller-alienation solenoid (SL106) might be defective.	1 Verify that connector J43 on the dc controller is correctly seated. See DC controller connections. This connector is also connected to J1406 on the reverse-assembly PCA. 2 Run the component test to make sure that this solenoid is operating correctly. See Component test. If the solenoid is not energized during the test, replace it.

Table 7-8 Causes of jams in the output area (continued)

Cause	Solution
Connectors on the dc controller are not connected correctly.	Make sure connectors J43 and J50 on the dc controller are connected correctly.
The dc controller is defective.	Replace the dc controller.

Jams in the fuser

Causes of jams in the fuser

Cause	Solution
The fuser-entrance guide is dirty .	Clean the fuser-entrance guide by wiping it with a cloth that is moistened with methyl ketone.
One or more components inside the fuser might be dirty or damaged.	Replace the fuser.
The dc controller is defective.	Replace the dc controller.

Jams in the ADF

Causes of jams in the ADF

Cause	Solution
The clear mylar sheet in the ADF might be installed incorrectly.	Make sure that all four alignment holes on the mylar sheet are secured over the tabs. The small notch on the sheet should be aligned with the round pin at the top of the mylar-sheet holder. See the instructions that came with the mylar sheet replacement kit.
The ADF pickup-roller assembly might be installed incorrectly.	Make sure the roller assembly is correctly seated and that the paper-present flag and the registration flag can move freely.
The ADF separation pad might be installed incorrectly.	Make sure the ADF separation pad is seated correctly. If it is excessively dirty or worn, replace it.
Specific components inside the ADF might not be functioning correctly.	From the **DIAGNOSTICS** menu, run the **SCANNER TESTS** to verify that each of these components is functioning correctly: ■ ADF input motor (forward and reverse) ■ ADF read motor (forward and reverse) ■ ADF duplex solenoid ■ ADF input-tray-empty sensor ■ ADF registration sensor If the MFP passes all of the diagnostic tests but ADF jams still persist, replace the ADF. See ADF assembly.

Using the paper-path test

The paper-path test can be used to verify that various paper paths are working correctly or to troubleshoot problems with tray configuration.

To start the paper-path test

1 Press MENU.

2 Scroll to and touch **DIAGNOSTICS**.

3 Scroll to and touch **PAPER PATH TEST**.

4 Select the input tray that you want to test, the output bin, the duplex printing accessory (if available), and number of copies, touching **OK** after you set the value for each. After selecting the last option, touch **PRINT TEST PAGE**.

Using the scanner tests

The scanner test can be used to verify that various scanner components are working correctly .

For more information about the scanner tests, see Scanner tests.

To start the scanner tests

1 Press MENU.

2 Scroll to and touch **DIAGNOSTICS**.

3 Scroll to and touch **SCANNER TESTS**.

4 Select the scanner component that you want to test, and follow the instructions on the control-panel display.

Image-formation troubleshooting

The image-formation system is the central hub of the MFP. During image formation, an image is formed with toner and then fused onto the paper. The image-formation system consists of the following physical components:

- Laser/scanner

- Print cartridge

- Fuser

- Transfer roller

- Supporting circuitry (power supply and dc controller PCA)

Before beginning the image-formation troubleshooting, check that the media meets the specifications that are listed the *HP LaserJet Printer Family Print Media Guide*. This guide is available for download in .PDF file format at www.hp.com/support/ljpaperguide. Also see Media specifications.

Media-related print-quality problems

Use media that meets HP paper specifications. See the specifications listed in the *HP LaserJet Printer Family Print Media Guide*.

If any of the following conditions exist, print-quality problems can occur:

- The surface of the media is too smooth. Use media that meets HP paper specifications. See the specifications listed in the *HP LaserJet Printer Family Print Media Guide*.

- The printer driver is set incorrectly. Change the paper-type setting.

- The media is too heavy for the MFP, and the toner is not fusing to the media.

- The transparencies are not designed for good toner adhesion or high fusing temperatures. Use only transparencies that are designed for HP LaserJet printers.

- The moisture content of the paper is uneven, too high, or too low. Use paper from a different source or from an unopened ream of paper.

- Some areas of the paper reject toner. Use paper from a different source or from an unopened ream of paper. Make sure that the paper has not been previously used.

- The letterhead is printed on rough paper. Use a smoother, photocopy-grade paper. If this solves the problem, consult with the letterhead supplier to verify that the paper used meets the specifications for this MFP.

- The paper is excessively rough. Use a smoother, photocopy-grade paper.

- The paper has a coating that is not compatible with the electrophotographic process.

- The letterhead or other preprinted media was printed with inks or other materials that can contaminate the fuser, which causes offset or repeated images.

- The use of some carbonless papers contaminates the MFP and can cause damage if used repeatedly.

Overhead transparency defects

Overhead transparencies can contain any of the image-quality problems that appear in other types of media in addition to defects that are specific to transparencies. In addition, because transparencies are pliable, they can be affected by the media-handling components in the paper path.

NOTE Allow transparencies to cool at least 30 seconds before handling them.

- On the printer driver **Paper** tab, select **Transparency** as the media type. Also, make sure that the tray is correctly configured for transparencies.

- Make sure that the transparencies meet the specifications for this monochrome HP LaserJet MFP. For more information, consult the *HP LaserJet Printer Family Print Media Guide*.

- Handle transparencies by the edges. Skin oil on the surface of transparencies can cause spots and smudges.

- Small, random dark areas on the trailing edge of solid fill pages might be caused by transparencies sticking together in the output bin. Try printing the job in smaller batches.

- To show the printed transparency, use a standard overhead projector instead of a reflective overhead projector.

Print-quality problems that are related to the environment

When the MFP is operating in excessively humid or dry conditions, print-quality problems can occur. Verify that the printing environment is within specifications. See Environmental specifications.

Print-quality problems that are related to jams

- Make sure that all media is cleared from the paper path.

- If the MFP recently jammed, print two or three pages to clean the MFP.

- Repeated jams might require that you clean the MFP as described in chapter 4. It might be necessary to process several cleaning pages through the MFP. See Cleaning the fuser.

Image-defect examples

The MFP output quality is subject to user judgment. This section of the manual helps define print-quality defects and the factors that affect print quality.

The print samples that are shown in the following figures illustrate some print-quality defects. To use for future reference, HP suggests that you keep copies of print-quality defects that you encounter in the field and note the explanation of their causes.

NOTE When troubleshooting image defects, try scanning a test page through the ADF and from the scanner glass to help isolate the cause of the problem to the ADF, the scanner, or the print engine.
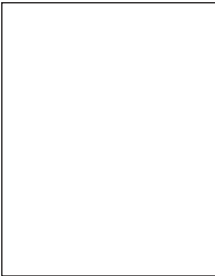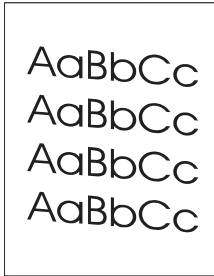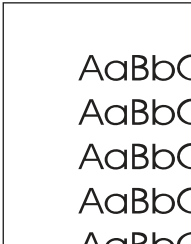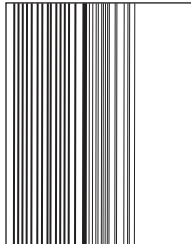
Table 7-11 Defects that can occur during printing

See Light print (partial page)	See Light print (entire page)	See Specks or dots	See Specks or dots	See Dropouts
See Dropouts	See Dropouts	See Lines	See Gray background	See Loose toner or toner smear
See Loose toner or toner smear	See Repeating defects and repeating images	See Repeating defects and repeating images	See Misformed characters	See Page skew

Table 7-11 Defects that can occur during printing (continued)

See Curl or wave	See Wrinkles or creases	See Vertical white lines	See Tire tracks	See White spots on black
See Scattered lines.	See Blurred print.	See Random image repetition (dark)	See Random image repetition (light)	

Table 7-12 Defects that can occur when using the ADF

See Blank page (ADF)	See Page skew (ADF)	See Vertical lines (ADF)
See Image shifted (ADF)	See Unexpected image (ADF)	

Light print (partial page)

AaBbCc
AaBbCc
AaBbCc
AaBbCc
AaBbCc
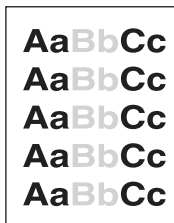
Table 7-13 Light print (partial page)

	Possible cause	Solution
1	The print cartridge is not installed correctly.	Remove the print cartridge and then reinstall it. The top cover should close completely when the cartridge is fully seated.
2	The toner supply is low or the toner cartridge developer is defective.	1 Shake the print cartridge gently to redistribute the toner. 2 Replace the cartridge.
3	The transfer roller is worn or contaminated or maintenance might due.	Print a supplies status page and look at the maintenance-kit gauge. If maintenance is due, install a maintenance kit. For information about ordering a maintenance kit, see chapter 8.

Light print (entire page)

Begin by performing the half self-test functional check (see Half self-test). If the image on the print drum is light, proceed with actions 1, 2, 3, 6, and 7. If the drum image is normal, proceed with actions 5, 6, and 8.

Table 7-14 Light print (entire page)

Action	Possible cause	Solution
1	The toner supply is low.	Shake the print cartridge gently to redistribute the toner, or replace the cartridge.
2	EconoMode is on. EconoMode saves toner by reducing the dot density. The effect might appear to be a print-quality problem.	Turn EconoMode off.
3	The toner density is set incorrectly	In the **PRINT QUALITY** menu, change the toner density to a darker setting and try to print the job again.
4	The media does not meet specifications. The moisture content, conductivity, or surface finish might not work correctly with the electrophotographic process.	Try a different media type.
5	The transfer roller is defective or is not installed correctly. If the transfer roller loses conductivity, it cannot pull toner from the drum effectively.	Verify that the transfer roller is installed correctly. If the transfer roller is damaged, replace it. See Transfer roller.
6	The high-voltage connector springs are dirty or damaged.	The high-voltage connector springs protrude into the print cartridge cavity. Clean the springs if they are dirty. Replace the springs if they are damaged or missing.
7	The laser/scanner shutter door is not opening correctly.	1 Remove and reseat the print cartridge. 2 Verify that the laser/scanner shutter door can open correctly. If necessary, replace the laser/scanner assembly. See Laser/scanner.
8	The engine power supply is defective.	Replace the engine power supply. See Engine power supply.

Specks or dots

AaBb
AaBbCc
AaBbCc
AaBbCc
AaBbCc
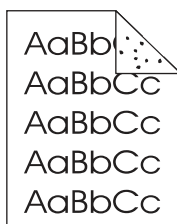
NOTE Specks might appear on a page after a jam has been cleared. Print two or three more pages and see if the specks disappear.

Table 7-15 Specks or dots

	Possible cause	Solution
1	The interior of the MFP is dirty.	1 Print a few more pages and see if the problem corrects itself. 2 Clean the inside of the MFP. 3 Process a cleaning page. See Cleaning the fuser.
2	The print cartridge is damaged.	Replace the print cartridge.
3	The media does not meet specifications or is not stored correctly.	1 Turn over the stack of media in the tray. Also try rotating media 180 degrees. 2 Check the media type and quality. Replace the media if it does not meet specifications, and advise the customer to use the HP-recommended media and to store it correctly. See Media specifications.
4	The fuser rollers are worn.	Replace the fuser. See Fuser.
5	The static-eliminator teeth are dirty.	Clean the static eliminator teeth by using a small brush compressed air.
6	Poor contact exists between the static-eliminator teeth and the power supply.	Clean the contacts, if they are dirty. If the problem persists after cleaning, or the contacts are damaged or deformed, replace them.
7	The transfer roller is deformed or has deteriorated.	Replace the transfer roller. See Transfer roller
8	The engine power supply is defective.	Replace the engine power supply. See Engine power supply.

Dropouts

Table 7-16 Dropouts

	Possible cause	Solution
1	The user is 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 incorrectly.	1 Check the arrow on the paper wrapper. From tray 1, the MFP prints on the side of the paper that faces up. From the other trays, the MFP prints on the side of the paper that faces down.
		2 Turn over the stack of paper in the tray. Also try rotating the stack 180 degrees. Do *not* fan the stack.
		3 Check the media type and quality. Replace the media If it does not meet specifications, and advise the customer to use the HP-recommended media and to store it correctly. See Media specifications.
2	The media surface is too smooth or too rough for good toner adhesion.	Use media that meets HP specifications See the *HP LaserJet Printer Family Print Media Guide*.
3	The transparencies do not meet HP specifications.	Use HP-approved transparencies for monochrome LaserJet printers. See the *HP LaserJet Printer Family Print Media Guide*.
4	The operating environment does not meet specifications.	Make sure that the MFP is installed in an area that meets the environmental specifications. See Environmental specifications.
5	The fuser roller is dirty and is lifting part of the image off of the paper.	Process a cleaning page. Several pages might be required if the fuser is very dirty.
6	The print cartridge is defective or nearly empty.	Replace the print cartridge.
7	The toner-density setting is incorrect.	Open the **PRINT QUALITY** menu at the control panel and adjust the toner-density setting. Make sure that EconoMode is off.
8	The fuser setting is incorrect for the media type.	Open the **CONFIGURE DEVICE** menu at the control panel. Open the **PRINT QUALITY** submenu, select

Table 7-16 Dropouts (continued)

	Possible cause	Solution
		FUSER MODES, and then select the media type you are using. Change the setting to HIGH 1 or HIGH 2, which helps the toner fuse more completely onto the media.
9	The transfer roller is damaged, has finger oils on its surface, or is dirty or worn.	Clean the transfer roller by using a dry, lint-free cloth. Do not touch the transfer roller with your fingers. If the problem persists, replace the transfer roller. See Transfer roller.
10	Poor high-voltage contact exists between the power supply and the print cartridge or transfer roller.	Inspect the contacts and clean them if they are dirty. Replace them if they are damaged.
11	The engine power supply is defective (the transfer voltage is low).	Replace the engine power supply. See Engine power supply.

Lines
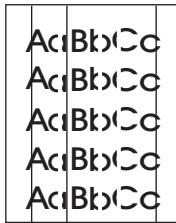
Table 7-17 Vertical lines (in the paper-path direction)

	Possible cause	Solution
1	The print cartridge is not installed correctly.	Remove the print cartridge and then reinstall it. The top cover should close completely when the print cartridge is fully seated.
2	The print cartridge is defective.	Replace the print cartridge.
3	The fuser roller is worn or dirty.	Process a cleaning page. See Cleaning the fuser. Several pages might be required the fuser is very dirty. If the problem persists, replace the fuser. See Fuser.
4	The static-eliminator teeth (just beyond the transfer roller) are contaminated or defective.	Clean the static-eliminator teeth by using a small brush or compressed air. Replace the assembly if it is damaged.
5	Light is leaking into the MFP.	Make sure that all of the covers are in place. Move the MFP away from windows that face the outdoors.

Horizontal lines

AaBbCc
AaBbCc
AaBbCc
AaBbCc
AaBbCc
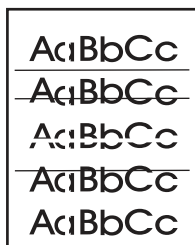
Table 7-18 Horizontal lines (perpendicular to the paper-path direction)

	Possible cause	Solution
1	If the lines are repeated at a consistent interval down the page, a repetitive defect exists.	Use the repetitive defect ruler to determine the cause of this defect. See Repetitive defect ruler.
2	Sharp, random lines indicate a problem with the laser/ scanner control circuitry.	1 Check the cables between the dc controller and the laser/scanner assembly.
		2 If the cables are not connected, connect the cables.
		3 Print an engine test page. See Engine test. If the defect appears on the engine test page, replace the dc controller PCA. See DC controller.
		4 If, after checking the cables between the dc controller and the laser/scanner, the problem persists, replace the laser/ scanner assembly. See Laser/scanner.
		5 If, after replacing the dc controller PCA, the problem persists, replace the Formatter assembly. See Formatter cover and formatter.

Gray background

AaBbCc
AaBbCc
AaBbCc
AaBbCc
AaBbCc

	Possible cause	Solution
1	The media does not meet specifications or is not stored correctly.	1 Turn over the stack of media in the tray. Also try rotating the media 180 degrees. 2 Check the media type and quality. Replace the media if it does not meet specifications, and advise the customer to use the HP-recommended media and to store it correctly. See Printing and paper-storage environment.
2	The operating environment does not meet specifications.	Make sure that the MFP is installed in an area that meets the environmental specifications. See Environmental specifications.
3	The customer is printing on the envelope seams. (Printing on an envelope seam can cause a background-scatter problem.)	Move the text to an area that has no seams.
4	The inside of the MFP is dirty (toner leaked out of the print cartridge).	Clean the inside of the MFP (see Cleaning the MFP). Install a new print cartridge.
5	The problem occurs during copying.	In the **CONFIGURE DEVICE** menu, open the **ENHANCEMENT** submenu, and adjust the **BACKGROUND REMOVAL** setting.
6	The toner-density setting is wrong.	Open the print-quality menu at the control panel and adjust the toner-density setting. Make sure that EconoMode is off.
7	The high-transfer setting is turned off.	Open the print-quality menu at the control panel. Select **OPTIMIZE** and set **HIGH TRANSFER=ON**.
8	The print cartridge is defective.	Replace the print cartridge.
9	The high-voltage connector springs are dirty or damaged.	The high-voltage connector springs protrude into the print cartridge cavity. Clean the springs if they are dirty. Replace the springs if they are damaged or missing.
10	The engine power supply is defective.	Replace the engine power supply. See Engine power supply.

Loose toner or toner smear

AaBbCc
AaBbCc
AaBbCc
AaBbCc
AaBbCc

	Possible cause	Solution
1	The interior of the MFP is dirty.	1 Print a few more pages and see if the problem corrects itself. 2 Clean the inside of the MFP. See Cleaning the MFP. 3 Process a cleaning page. See Cleaning the fuser.
2	The fuser roller is dirty.	Process a cleaning page. See Cleaning the fuser. Several pages might be required if the fuser is very dirty.
3	The media surface is too smooth or too rough for toner adhesion.	Use media that meets HP specifications. See Media specifications.
4	The static-eliminator teeth (just beyond the transfer roller) are contaminated or are not grounded, which allows a static charge to remain on the page.	Clean the static-eliminator teeth with a small brush or compressed air. Replace the assembly if it is damaged.
5	The fuser is defective. The print will smear if the fuser does not heat sufficiently to bond the toner to the paper.	Replace the fuser. See Fuser.
6	The dc controller PCA is defective. The dc controller PCA regulates the fuser roller temperature.	Replace the dc controller PCA. See DC controller.

Repeating defects and repeating images

	Possible cause	Solution
1	The print cartridge or fuser is damaged. The circumference of the photoconductive drum inside of the print cartridge is 94.2 mm (3.7 inches). If the defect repeats at this interval, the defect is associated with the drum. Repetitive defects caused by the fuser roller repeat at 94.0 mm (about 3.7 inches) Because the fuser roller is just 2 mm (0.07 inch) smaller than the photoconductive drum it can be difficult to distinguish defects that the photoconductive drum causes from those that the fuser roller causes.	1 Inspect the drum for scratches or other damage. Replace the print cartridge for defects that repeat at 37.7 mm (1.5 inches), 62.8 mm (2.5 inches), 54.0 mm (2.1 inches), or 94.2 mm (3.7 inches). 2 Process a cleaning page. See Cleaning the fuser. 3 If the problem persists, and the defect repeats at the 75.0 mm (2.95 inches) or 94.0 mm (about 3.7 inches), replace the fuser (see Fuser). For more information about repetitive defects, see Repetitive defect ruler.
2	The rollers are dirty. A dirty roller in the paper path can cause a repetitive defect.	Examine and clean (or replace) the rollers in the paper path.
3	The media does not meet specifications.	Try a different media type or quality.
4	Preprinted form paper is used.	Some preprinted forms (for example, letterheads) use an ink that cannot withstand the high temperatures in the fuser. Check the media for type and quality. Replace the media, and advise the customer to use the HP-recommended media and to store it correctly. See Media specifications.

Misformed characters

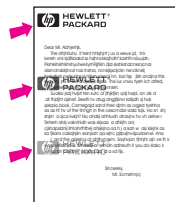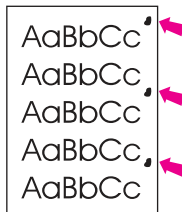|	Possible cause	Solution
1	The media does not meet specifications or is not stored correctly.	1 Turn over the stack of media in the tray. Also try rotating media 180 degrees. 2 Check the media type and quality. Replace the media if it does not meet specifications, and advise the customer to use the HP-recommended media and to store it correctly. See Media specifications.
2	The operating environment does not meet specifications.	Make sure that the MFP is installed in an area that meets the environmental specifications. See Environmental specifications.
3	The cables are not securely connected to the laser/scanner assembly.	Reseat the cables that are connected to the laser/scanner assembly.
4	The cables are not securely connected to the dc controller PCA.	Reseat the cables that are connected to the dc controller PCA.
5	The laser/scanner assembly is defective.	Replace the laser/scanner. See Laser/scanner.
6	The gears are worn.	Inspect the gears that drive the print cartridge and fuser. If any gears are worn, replace the defective assembly.
7	The print-cartridge motor is defective.	Replace the print-cartridge motor. See Print-cartridge motor (M102).
8	The dc controller PCA is defective.	Replace the dc controller PCA. See DC controller.

Page skew

	Possible cause	Solution
1	The media does not meet specifications or is not stored correctly.	1 Turn over the stack of media in the tray. Also try rotating the media 180 degrees. 2 Check the media type and quality. Replace the media if it does not meet specifications, and advise the customer to use the HP-recommended media and to store it correctly. See Media specifications.
2	The media is not loaded correctly or the trays are not adjusted correctly.	Make sure that the media is loaded correctly and that the guides fit snugly against the stack.
3	The registration assembly is not installed correctly or is damaged.	Make sure that the registration assembly is installed correctly. If necessary, replace the registration assembly. See Feed-roller assembly.

Curl or wave

	Possible cause		Solution
1	The media does not meet specifications or is not stored correctly.	1	Turn over the stack of media in the tray. Also try rotating the media 180 degrees.
		2	Check the media type and quality. Replace the media if it does not meet specifications, and advise the customer to use the HP-recommended media and to store it correctly. See Media specifications.
2	The operating environment does not meet specifications.		Make sure that the MFP is installed in an area that meets the environmental specifications. See Environmental specifications.
3	The wrong output bin is in use.		Print to a different output bin (top or rear output bin).
4	The fuser setting is incorrect for the media type.		Open the **CONFIGURE DEVICE** menu at the control panel, open the **PRINT QUALITY** menu, and change the fuser-mode setting or select another media type.

Wrinkles or creases

	Possible cause	Solution
1	The media does not meet specifications or is not stored correctly.	1 Turn over the stack of media in the tray. Also try rotating the media 180 degrees.
		2 Check the media type and quality. Replace the media if it does not meet specifications, and advise the customer to use the HP-recommended media and to store it correctly. See Media specifications.
2	The operating environment does not meet specifications.	Make sure that the MFP is installed in an area that meets the environmental specifications. See Environmental specifications.
3	The media is not loaded correctly or the trays are not adjusted correctly.	Make sure that the media is loaded correctly and that the guides fit snugly against the stack.
4	The wrong tray is in use.	Print from tray 1 when you use a heavy media.
5	Output delivery is set for FACE-DOWN.	Select FACE-UP output for the straightest paper path.
6	An obstruction exists in the paper path.	1 Check the paper path for debris.
		2 Check for damaged components that might be creasing the paper.

Vertical white lines

	Possible cause	Solution
1	The toner supply is low or the print cartridge is defective.	1 Shake the print cartridge gently to redistribute the toner. 2 If another print cartridge is available, try using that one to see if the problem goes away. 3 Replace the print cartridge.
2	The laser path is dirty.	Clean the laser path. Remove the laser/scanner assembly (see Laser/scanner) and check for dirt or other obstructions in the beam path.
3	The fuser is defective.	Replace the fuser. See Fuser.
4	The mirror in the laser/scanner is dirty.	Replace the laser/scanner assembly. See Laser/scanner.

Horizontal white lines

	Possible cause		Solution
1	The print drum is damaged.	1	If another print cartridge is available, try using that one to see if the problem goes away.
		2	Replace the print cartridge.
2	The fuser roller is damaged.		Process a cleaning page. See Cleaning the fuser.
3	The fuser is defective.		If the problem persists, replace the fuser. See Fuser.
4	The laser beam or beam circuitry is unstable.	1	Print an engine-test page to determine whether the defect is related to the print engine or the formatter. See Engine test. If the problem does not appear on the engine-test page, replace the formatter. See Formatter cover and formatter.
		2	Check the cables between the dc controller and the laser/scanner assembly.
		3	If the cables are not connected, connect the cables.
		4	If, after checking the cables between the dc controller and the laser/scanner, the problem persists, replace the laser/scanner assembly. See Laser/scanner.
		5	If, after replacing the laser/scanner, the problem persists, replace the dc controller PCA. See DC controller
		6	If, after replacing the dc controller PCA, the problem persists, replace the Formatter assembly. See Formatter cover and formatter.

Tire tracks

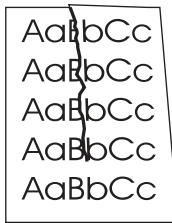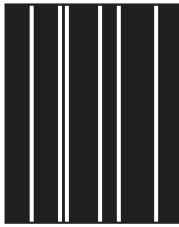|	Possible cause		Solution
1	The paper path is contaminated or damaged.	1	Perform the half self-test functional check. See Half self-test. If the print drum is damaged, replace the print cartridge.
		2	Process a cleaning page. See Cleaning the fuser. If the problem persists, replace the fuser. See Fuser.
		3	Check the tray 1 feed roller and the rollers in the other trays. Clean or replace the rollers as necessary.
		4	Check for other sources of contamination or damage in the paper path and clean or replace parts as necessary.
			This type of defect might also be a repetitive defect, See Repetitive defect ruler.
2	The print cartridge has passed its life expectancy.		This defect typically occurs when the print cartridge has far exceeded its rated life of 18,000 pages. For example, if you are printing a very large quantity of pages with very little toner coverage, toner might still remain in the print cartridge even though you have printed more than 18,000 pages.

White spots on black

	Possible cause	Solution
1	The media does not meet specifications or is not stored correctly.	1 Turn over the stack of media in the tray. Also try rotating the media 180 degrees. 2 Check the media type and quality. Replace the media if it does not meet specifications, and advise the customer to use the HP-recommended media and to store it correctly. See Media specifications.
2	The operating environment does not meet specifications.	Make sure that the MFP is installed in an area that meets the environmental specifications. See Environmental specifications.
3	The print cartridge is defective.	Replace the print cartridge.

Scattered lines

	Possible cause	Solution
1	The media does not meet specifications or is not stored correctly.	1 Turn over the stack of media in the tray. Also try rotating the media 180 degrees. 2 Check the media type and quality. Replace the media if it does not meet specifications, and advise the customer to use the HP-recommended media and to store it correctly. See Media specifications.
2	The operating environment does not meet specifications.	Make sure that the MFP is installed in an area that meets the environmental specifications. See Environmental specifications.
3	The toner-density setting is incorrect.	Open the **PRINT QUALITY** menu at the control panel and adjust the toner-density setting.
4	The high-transfer setting is turned off.	Open the **PRINT QUALITY** menu at the control panel. Select **OPTIMIZE** and set **HIGH TRANSFER=ON**.
5	The line-detail setting is turned off.	Open the **PRINT QUALITY** menu at the control panel. Select **OPTIMIZE** and set **LINE DETAIL=ON**.

Blurred print

	Possible cause	Solution
1	The media does not meet specifications or is not stored correctly.	1 Turn over the stack of media in the tray. Also try rotating the media 180 degrees.
		2 Check the media type and quality. Replace the media if it does not meet specifications, and advise the customer to use the HP-recommended media and to store it correctly. See Media specifications.
2	The operating environment does not meet specifications.	Make sure that the MFP is installed in an area that meets the environmental specifications. See Environmental specifications.
3	The toner-density setting is incorrect.	Open the **PRINT QUALITY** menu at the control panel and adjust the toner-density setting.
4	The high-transfer setting is turned off.	Open the **PRINT QUALITY** menu at the control panel. Select **OPTIMIZE** and set **HIGH TRANSFER=ON**.
5	The line detail setting is turned off.	Open the **PRINT QUALITY** menu at the control panel. Select **OPTIMIZE** and set **LINE DETAIL=ON**.

Random image repetition

AaBbCc
AaBbCc
AaBbCc
AaBbCc
AaBbCc

AaBbCc
AaBbCc
AaBbCc
AaBbCc
AaBbCc

	Possible cause		Solution
1	If an image that appears at the top of the page (in solid black) repeats farther down the page (in a gray field), the toner might not have been completely erased from the last job. (The repeated image might be lighter or darker than the field that it appears in.)	1	Change the background darkness of the field that the repeated image appears in.
		2	Change the order in which the images are printed. For example, have the lighter image at the top of the page, and the darker image farther down the page.
		3	From the software program, rotate the whole page 180° to print the lighter image first.
		4	If the defect occurs later in a print job, turn the MFP power off for 10 minutes, and then turn the MFP power on to restart the print job.

Blank page (ADF)
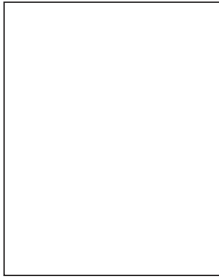
First, verify that the scanner is scanning from the ADF and not the scanner glass. If it is scanning from the glass, you should be able to see the scanner lamp and optical head move the entire length of the glass. If no document is on the glass, a blank page is produced.

If the scanner is scanning from the ADF and blank pages are produced, continue with the following troubleshooting steps.

	Possible cause	Solution
1	The source document was not placed in the ADF input tray face-up.	Verify that the source document is **face-up** in the ADF input tray.
2	The source document was not detected in the ADF input tray.	Remove and then reinsert the original page into the ADF, making sure that it is placed face-up.
3	A source document was not picked up when attempting to feed multiple documents.	Inspect the ADF pickup and feed rollers and the ADF Separation pad for damage. See ADF pickup and feed rollers and see ADF separation pad. Clean the rollers if they are dirty. See Cleaning the ADF delivery system. If the ADF separation pad or rollers are worn, replace them. See Performing preventive maintenance.

Page skew (ADF)

AaBbCc
AaBbCc
AaBbCc
AaBbCc
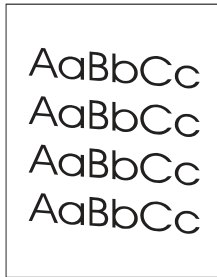
	Possible cause	Solution
1	The scanner needs to be calibrated.	Calibrate the scanner. See Calibrating the scanner.
2	The ADF input tray guides are not adjusted correctly.	Make sure the ADF input tray guides are adjusted so that they are lightly touching the sides of the paper stack.
3	The ADF mylar strip is dirty	Replacement mylar strips are stored in an envelope that is underneath the white, vinyl ADF backing. Follow the instructions that are in the envelope.

Vertical lines (ADF)

AaBbCcAa
AaBbCcAa
AaBbCcAa
AaBbCcAa

	Possible cause	Solution
1	The ADF is dirty.	Clean the ADF. See Cleaning the ADF delivery system.
		If the mylar strip is dirty or worn, replace it. Replacement mylar strips are stored in an envelope that is underneath the white, vinyl ADF backing. Follow the instructions that are in the envelope.
2	The scanner needs to be calibrated.	Calibrate the scanner. See Calibrating the scanner.
3	The ADF pickup roller is dirty.	Clean the ADF pickup roller. See Cleaning the ADF delivery system. Replace the roller if necessary. See ADF pickup and feed rollers.

Image shifted (ADF)
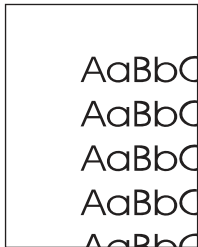
	Possible cause	Solution
1	An image that is shifted on the page horizontally, vertically, or both ways indicates that the scanner is incorrectly calibrated.	Calibrate the scanner. See Calibrating the scanner.

Unexpected image (ADF)
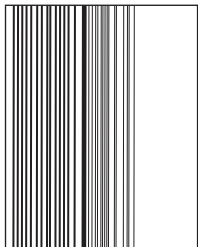
	Possible cause	Solution
1	The copied image does not look like the original document.	Make sure that no media is on the flatbed glass from a previous copy job.

Repetitive defect ruler

Defects on rollers can cause image defects to appear at regular intervals on the page, corresponding to the circumference of the roller that is causing the defect. Measure the distance between defects that recur on a page. Use Table 7-19 Repetitive defects or the repetitive defect ruler to determine which roller is causing the defect. To resolve the problem, try cleaning the roller first. If the roller remains dirty after cleaning or if it is damaged, replace the part indicated in Table 7-19 Repetitive defects.

NOTE   Do not use solvents or oils to clean rollers. Instead, rub the roller with lint-free paper. If dirt is difficult to remove, rub the roller with lint-free paper that has been dampened with water.
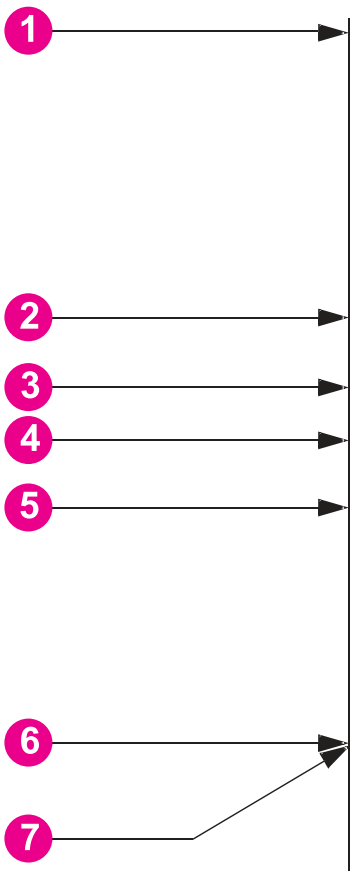
Table 7-19 Repetitive defects

Reference	Roller	Distance between defects	Replacement part
1		First occurrence of the defect	
2	Primary charging roller	38.0 mm (1.5 inches)	Print cartridge
3	Transfer roller	47.0 mm (1.9 inches)	Transfer roller (part of the printer maintenance kit)
4	Developing cylinder (see note)	54.0 mm (2.13 inches)	Print cartridge
5	Developing cylinder (see note)	63.0 mm (2.5 inches)	Print cartridge

Table 7-19 Repetitive defects (continued)

Reference	Roller	Distance between defects	Replacement part
6	Fuser	94.0 mm (3.75 inches)	Fuser
7	Photosensitive drum	94.2 mm (3.75 inches)	Print cartridge

NOTE The developing cylinder circumference is 62.83 mm (2.5 inches). A defect that is related to the developing cylinder will most likely repeat at intervals of 54.0 mm (2.15 inches) because of the way the roller is geared.

To identify if the print cartridge is the problem, insert a print cartridge from another HP LaserJet 4345mfp, if one is available, before ordering a new print cartridge.

If the defect repeats at 94.0 mm (3.75 inch) intervals, try replacing the print cartridge before replacing the fuser.

Media-transport problems

The following issues can cause media-transport problems

Multiple pages feed.

Cause	Solution
The tray 1 separation pad is worn.	Replace the separation-pad assembly.
Too much media (particularly envelopes) is loaded in tray 1.	Remove some of the media and resend the print job.
The separation and feed rollers in the tray are worn or damaged	Replace the rollers.
The media edges are locked together.	Flex the media stack before loading it into the MFP. Do *not* fan the media.

The media is wrinkled or folded.

Cause	Solution
The feed rollers or registration rollers are dirty or defective.	Replace the affected rollers.
The paper path contains foreign substances or dirt.	Remove any foreign substances or dirt from the paper path.
The cartridge shutter open/close mechanism is damaged. (This can cause jams in which the media is crumpled into an accordion fold under the print cartridge.)	The shutter in the print cartridge should open as you insert the cartridge. If a shutter does not open, replace the print cartridge.

The media is skewed.

Cause	Solution
The fuser inlet guide is dirty.	Replace the fuser. See Fuser.
The fuser pressure roller is dirty or damaged.	Run several cleaning pages through the MFP. See Cleaning the fuser. If the problem persists, replace the fuser. See Fuser.

The top margin is misaligned.

Cause	Solution
The dc controller PCA has been replaced or the laser/scanner has been replaced.	1 Press the test-print switch, and make several test prints. See Engine test.
	2 On each test print, measure the distance from the leading edge of the paper to the print pattern. Calculate the average distance. The optimal distance is 5 mm (0.2 inch).
	3 On the dc controller PCA, adjust the variable resistor VR830 clockwise to increase the distance, or turn it counterclockwise to decrease the distance.
	4 Repeat the procedure until the distance measures 5 mm (0.2 inch).

The pages feed incorrectly through the ADF.

Cause	Solution
The media guides are not adjusted correctly.	Make sure that the guides in the ADF input tray gently touch the sides of the original document.

E-mail problems

If you are unable to send e-mails by using the digital-send feature, you might need to reconfigure the SMTP gateway address or the LDAP gateway address. Print a configuration page to find the current SMTP and LDAP gateway addresses. See Information pages. Use the following procedures to check if the SMTP and LDAP gateway addresses are valid.

To validate the SMTP gateway address

NOTE This procedure is for Windows operating systems.

1   Open an MS-DOS command prompt: click **Start**, click **Run**, and then type cmd.

2   Type telnet followed by the SMTP gateway address and then the number 25, which is the port over which the MFP is communicating. For example, type telnet 123.123.123.123 25 where "123.123.123.123" represents the SMTP gateway address.

3   Press Enter. If the SMTP gateway address is *not* valid, the response contains the message Could not open connection to the host on port 25: Connect Failed.

4   If the SMTP gateway address is not valid, contact the network administrator.

To validate the LDAP gateway address

NOTE This procedure is for Windows operating systems.

1   Open Windows Explorer. In the address bar, type LDAP:// immediately followed by the LDAP gateway address. For example, type LDAP://12.12.12.12 where "12.12.12.12" represents the LDAP gateway address.

2   Press Enter. If the LDAP gateway address is valid, the **Find People** dialog box opens.

3   If the LDAP gateway address is not valid, contact the network administrator.

Fax problems

For complete information about troubleshooting fax problems, see the *HP LaserJet Analog Fax Accessory 300 Service Manual.*

Network connectivity problems

Troubleshooting network printing problems

> **NOTE** HP recommends that you use the MFP CD-ROM to install and set up the MFP on a network.

1   Make sure that the network cable is securely seated into the MFP's RJ45 connector.

2   Make sure that the Jetdirect LED on the formatter is lit. See Formatter lights.

3   Make sure that the I/O card is ready. Print a configuration page. See Information pages. If an HP Jetdirect print server is installed, printing a configuration page also prints a second page that shows the network settings and status.

> **NOTE** The HP Jetdirect embedded print server supports various network protocols (TCP/IP, IPX/SPX, Novell/Netware, AppleTalk, and DCL/LLC). Make sure that the correct protocol is enabled for your network.

4   On the HP Jetdirect configuration page, verify the following items for your protocol:

   a   Under HP Jetdirect Configuration, the status is "I/O Card Ready".

   b   The status is "Ready".

   c   An IP address is listed.

   d   The configuration method (Config by:) is listed correctly. See the network administrator if you are not sure which method is correct.

   e   The domain name is correct.

5   Perform a loopback test to verify that the firmware is functioning correctly and that the hardware that is on the formatter is functioning correctly. See Loopback test.

6   Perform a ping test to verify that the MFP is communicating with other devices on the network. See Ping test.

7   Try printing the job from another computer.

8   To verify that a MFP works with a computer, use a parallel cable to connect it directly to a computer. You will have to reinstall the printing software. Print a document from a program that has printed correctly in the past. If this works, a problem with the network might exist.

9   For advanced troubleshooting, see Troubleshooting the embedded HP Jetdirect print server.

Loopback test

Use the loopback test to verify that the firmware is functioning correctly and that the hardware that is on the formatter is functioning correctly. This test causes the formatter to send data to itself.

To perform the loopback test

1 Disconnect the network cable.

2 Press M<small>ENU</small>.

3 Touch **CONFIGURE DEVICE**.

4 Touch **I/O**, touch **EMBEDDED JETDIRECT MENU**, touch **DIAGNOSTICS**, and then touch **LOOPBACK TEST**.

5 Let the test run for several hours or overnight.

6 If the test fails, an error message appears on the control-panel display. Replace the formatter. See <u>Formatter cover and formatter</u>.

7 To stop the test, turn the MFP off and then on. Make sure that you reconnect the network cable.

Ping test

Use the ping test to verify that the MFP is communicating over the network. Before performing the ping test, obtain the IP address for a target destination, such as a PC, that is on the same network as the MFP. Consult the network administrator for help with obtaining the IP address.

To perform the ping test

1 Press M<small>ENU</small>.

2 Touch **CONFIGURE DEVICE**.

3 Touch **I/O**, touch **EMBEDDED JETDIRECT MENU**, touch **DIAGNOSTICS**, and then touch **PING TEST**.

4 Set the appropriate options for each of the menu items that follow:

- **DESTINATION IP** = XXX.XXX.XXX.XXX
- **PACKET SIZE** = 64
- **TIMEOUT** = 1 second
- **COUNT** = 4
- **PRINT RESULTS** = YES
- **EXECUTE** = YES

5 After setting **EXECUTE**= YES, the ping test starts automatically. If you selected to print the results, a page prints that lists the ping statistics. If the page prints, the test was successful.

Functional checks

Use the following procedures to help diagnose and solve problems that occur in the print engine.

Engine test

To verify that the print engine (all components except the formatter, formatter DIMMs, EIO products, and the stacker or stapler/stacker) is functioning, print an engine test page. Use a small, non-metallic, pointed object to depress the engine-test switch, which is located on the back of the MFP.

> **NOTE** The standard output bin must be installed in order for the engine-test page to print. If either the stapler/stacker or the 3-bin mailbox is installed, a jam occurs.
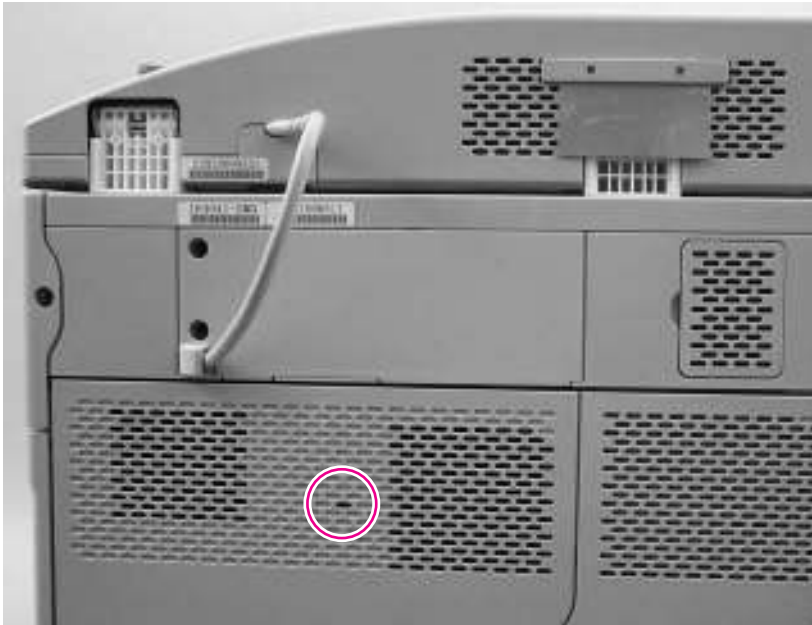
Figure 7-1 Engine-test-print switch

The test page should have a series of vertical lines. The test page prints from the last tray that you used. However, if the MFP has been turned off and then on since the most recent print job, the page prints from tray 2. The MFP continuously prints test pages as long as the test-page switch is depressed. The MFP cannot print a test page if it is in Sleep mode.

> **NOTE** A damaged formatter might interfere with the engine test. If the engine-test page does not print, try removing the formatter and performing the engine test again. If the engine test is then successful, the problem is almost certainly with the formatter, the control panel, or the cable that connects them.

Formatter test

To verify that the formatter is functioning correctly, print a configuration page. See Information pages. If the page prints, the formatter is functioning.

The heartbeat LED on the formatter also indicates whether the formatter is functioning. See Formatter lights.

Half self-test

Use the half self-test to determine which of the eight image-formation processes might be malfunctioning.

1. Print a configuration page from the control panel **INFORMATION** menu.

2. Open the top cover after the paper advances half-way through the MFP, which is about 3 to 5 seconds after the main motor begins rotation. The leading edge of the paper should have advanced past the print cartridge.

3. Remove the print cartridge.

4. Open the print cartridge drum shield to view the drum surface.

If a dark and distinct toner image is present on the drum 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 drum-rotation test.

Drum-rotation test

The photosensitive drum, which is located in the print cartridge, must rotate in order for the print process to work. The photosensitive drum receives its drive from the main gear assembly. Use this procedure to determine whether the drum is rotating.

1. Open the top cover.

2. Remove the print cartridge.

3. Mark the cartridge drive-gear with a felt-tipped marker. Note the position of the mark.

4. Install the print cartridge and close the top cover. The start-up sequence should rotate the drum enough to move the mark on the gear.

5. Open the MFP 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 print-cartridge gears. If the drive gears function but the drum does not move, replace the print cartridge.

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

MFP resets

Use the following information to perform system-wide reset procedures. Customers do not have access to this information.

Cold reset

A cold reset unlocks menus that have been previously locked and resets all control-panel menu items to the factory defaults. A cold reset does not clear the values in the service menu, such as the serial number and the page counts.

📝 **NOTE** Before performing a cold reset, print a menu map and a configuration page. See Information pages. Use the information on these pages to reset customer-specific settings.

⚠️ **CAUTION** All HP Jetdirect settings are also reset. Be sure to print a configuration page before performing a cold reset. Make note of the IP address that is listed on the Jetdirect configuration page. You will need to restore the IP address after performing a cold reset. See Configuring and verifying an IP address.

To perform a cold reset

1 Turn the MFP off and then on.

2 When the memory count appears on the control-panel display, press and hold 6 until all three LEDs flash once and then stay on. This might take up to 20 seconds.

3 Press 3 four times until **COLD RESET** appears on the control-panel display.

4 Press 6 one time. The MFP continues its initialization sequence.

NVRAM initialization

📝 **NOTE** If an HP LaserJet analog fax accessory 300 is installed, performing an NVRAM initialization can cause the MFP to violate local telephone regulations. Reset the language and country/region after performing NVRAM initialization. For more information, see the *HP LaserJet Analog Fax Accessory 300 Service Manual*.

Before performing an NVRAM initialization, print a menu map and a configuration page. See Information pages. Use the information on these pages to reset any customer-specific settings.

⚠️ **CAUTION** All HP Jetdirect settings are also reset. Be sure to print a configuration page before performing a cold reset. Make note of the IP address that is listed on the Jetdirect configuration page. You will need to restore the IP address after performing a cold reset. See Configuring and verifying an IP address.

Performing an NVRAM initialization resets the following settings and information:

- All menu settings are reset to factory default values, including the fax header and company name.

- All faxes in memory are erased.

- All speed-dials, group-dials, and phonebook entries are erased.

- All localization settings, including language and country/region, are reset.

After performing an NVRAM initialization, reconfigure any computers that print to this MFP so that the computers can recognize the MFP.

To perform an NVRAM initialization

1 Turn the MFP off and then on.

2 When the memory count appears on the control-panel display, press and hold 9 until all three LEDs flash once and then stay on. This might take up to 20 seconds.

3 Press 3 one time, and then press START.

4 Press 3 two times until **NVRAM INIT** appears on the control-panel display.

5 Press 6 one time, and wait while the MFP completes its initialization sequence.

Hard-disk initialization

A hard-disk initialization erases and reformats the hard disk. Perform a hard-disk initialization only if an error message on the control-panel indicates a disk error. Always try initializing the hard disk before replacing it.

> **NOTE** Before performing a hard-disk initialization, print a menu map and a configuration page. See Information pages. Use the information on these pages to reset any customer-specific settings.

> **CAUTION** A hard-disk initialization deletes the following information: all stored copy jobs, the local address book (e-mail addresses), the speed-dial list (fax numbers), and the Java™ applet files.

To perform a hard-disk initialization

1 Turn the MFP off and then on.

2 When the memory count appears on the control-panel display, press the *right-hand side* of the START button until all three LEDs are lit. Release the START button.

3 Press 5 one time. **INITIALIZE DISK** appears on the control-panel display.

4 Press 6 one time. A series of asterisks appears on the control-panel display. Wait for the MFP to complete its initialization sequence.

Tools for troubleshooting

The MFP has several built-in tools that can help diagnose problems.

Using the embedded Web server

Use the embedded Web server to view MFP and network status and to manage printing functions from your computer instead of from the MFP control panel. The following are examples of what you can do using the embedded Web server:

■ View MFP status information.

■ Set the type of media that is loaded in each tray.

■ Determine the remaining life for all supplies and order new ones.

■ View and change tray configurations.

■ View and change the MFP control-panel menu configuration.

■ View and print internal pages.

■ Receive notification of MFP and supplies events.

■ View and change network configuration.

The embedded Web server feature requires at least 48 MB of RAM and an HP Jetdirect print server in order to connect to your network.

To use the embedded Web server, you must have Microsoft Internet Explorer 5.01 or later or Netscape 6.2 or later for Windows, Mac OS, and Linux (Netscape only). Netscape Navigator 4.7 is required for HP-UX 10 and HP-UX 11. The embedded Web server works when the MFP is connected to an IP-based network. The embedded Web server does not support IPX-based MFP connections. You do not have to have Internet access to open and use the embedded Web server.

When the MFP is connected to the network, the embedded Web server is automatically available.

NOTE   For complete information about using the embedded Web server, see the *Embedded Web Server User Guide*, which is on the HP LaserJet 4345mfp software CD-ROM.

Opening the embedded Web server

1   In a supported Web browser on your computer, type the IP address for the MFP. To find the IP address, print a configuration page. For more information about printing a configuration page, see Information pages.

NOTE   After you open the URL, you can bookmark it so that you can return to it quickly in the future.

2   The embedded Web server has four tabs that contain settings and information about the MFP: the **Information** tab, the **Settings** tab, the **Digital Sending** tab, and the **Networking** tab. Click the tab that you want to view.

3   See the following sections for more information about each tab.

Information tab

The Information pages group consists of the following pages.

- **Device Status**. This page shows the MFP status and shows the life remaining of HP supplies, with 0% representing that a supply is empty. The page also shows the type and size of print media set for each tray. To change the default settings, click **Change Settings**.

- **Configuration page**. This page shows the information that is found on the MFP configuration page.

- **Supplies Status**. This page shows the life remaining of HP supplies, with 0% representing that a supply is empty. This page also provides supplies part numbers. To order new supplies, click **Order Supplies** in the **Other Links** area of the window. To visit any Web site, you must have Internet access.

- **Event log**. This page shows a list of all MFP events and errors.

- **Usage page**. This page details the total usage of the MFP.

- **Device information**. This page shows the MFP network name, address, and model information. To change these entries, click **Device Information** on the **Settings** tab.

- **Control panel**. View the current status of the MFP control panel.

- **Print**. Select a file on your network or on the Web, and send it to the MFP to be printed. The document must be a print-ready document, such as a .PS, .PDF, .PCL, or .TXT file.

Settings tab

Use this tab to configure the MFP from your computer. The **Settings** tab can be password protected. If this MFP is networked, always consult with the system administrator before changing settings on this tab.

The **Settings** tab contains the following pages.

- **Configure Device**. Configure all MFP settings from this page. This page contains the traditional menus found on the control-panel display. These menus include **Information**, **Fax**, **Paper Handling**, **Configure Device**, and **Diagnostics**.

- **E-mail Server**. Use this page to set up the SMTP server that will be used to send MFP e-mail alerts (set up on the **Alerts** page).

- **Alerts**. Network only. Set up to receive e-mail alerts for various MFP and supplies events. These alerts can be sent to a list of up to 20 e-mail, mobile device, or Web site destinations.

- **AutoSend**. Use the AutoSend screen to send MFP-configuration and usage information periodically to your service provider. This feature establishes a relationship with Hewlett-Packard Company or another service provider to provide you with services that include support agreements and usage tracking.

- **Security**. Set a password that must be typed in order to gain access to the **Settings**, **Digital Sending**, and **Networking** tabs. Turn on and off certain features of the EWS.

- **Edit Other Links**. Add or customize a link to another Web site. This link is shown in the **Other Links** area on all embedded Web server pages. These permanent links always appear in the **Other Links** area: **HP Instant Support**, **Order Supplies**, and **Product Support**.

- **Device Information**. Name the MFP and assign an asset number to it. Type the name of the primary contact who will receive information about the MFP.

- **Language**. Determine the language in which to show the embedded Web server information.

- **Date & Time**. Use this page to set the correct date and time for the device. Once the time is set, the device's real-time clock maintains the accurate time.

- **Wake Time page**. Wake Time can be set to wake the MFP at a certain time on a daily basis. Only one wake time can be set per day; however, each day can have a different wake time. You can also set the time delay for Sleep Mode on this page.

Digital Sending tab

Use the pages on the **Digital Sending** tab to configure the digital-sending features.

📝 **NOTE** If the MFP is configured to use the optional HP Digital Sending Software, the options on these tabs are not available. Instead, all digital-sending configuration is performed by using the HP Digital Sending Software.

- **General page**. Set up contact information for the system administrator.

- **Send to E-mail page**. Configure the e-mail settings for digital sending. You can specify the SMTP server, the default "From" address, and the default subject. You can also set the maximum file size that is allowed for attachments.

- **Addressing page**. Configure the LDAP server settings for digital sending. The LDAP server can be used to retrieve e-mail addresses for digital sending. Select the check box at the top of this page to enable this feature. Click **Find Server** to find the LDAP server on your network, then click **Test** near the bottom of the page to test access to the server. Contact your network administrator for more information about using the LDAP server.

- **Address Book page**. Use this page to import e-mail addresses, in the form of a Comma-Separated Value (CSV) file into the MFP internal address book. This process is necessary only if you are not using an LDAP server to find e-mail addresses.

- **Activity Log page**. View the digital-sending activity log for the MFP. The log contains digital-sending job information, including any errors that occur.

- **Preferences page**. Configure digital-sending defaults such as the default page-size and the default settings-reset delay. You can also configure these settings by using the MFP control-panel menus.

Networking tab

The network administrator can use this tab to control network-related settings for the MFP when it is connected to an IP-based network. This tab does not appear if the MFP is directly connected to a computer, or if the MFP is connected to a network with anything other than an HP Jetdirect print server.

Other links

This section contains links that connect you to the Internet. You must have Internet access in order to use any of these links. If you use a dial-up connection and did not connect when you first opened

the embedded Web server, you must connect before you can visit these Web sites. Connecting might require that you close the embedded Web server and reopen it.

- **HP Instant Support**. Connects you to the HP Web site to help you find solutions. This service analyzes your MFP error log and configuration information to provide diagnostic and support information specific to your MFP.

- **Order Supplies**. Click this link to connect to an ordering Web site and order genuine HP supplies, such as print cartridges and media.

- **Product Support**. Connects to the support site for the HP LaserJet 4345mfp Series. Then, you can search for help regarding general topics.

Using the HP Toolbox

The HP Toolbox is a Web-browser-based software program that you can use for the following tasks:

■ Check the MFP status.

■ Configure the MFP settings.

You can view the HP Toolbox when the MFP is connected to a TCP/IP-based network. You must perform a complete (custom) software installation in order to use the HP Toolbox.

NOTE You do not have to have Internet access to open and use the HP Toolbox. However, if you click a link in the **Other Links** area, you must have Internet access to go to the site that is associated with the link. See Other links for more information.

Supported operating systems

The HP Toolbox is supported for the following operating systems:

■ Windows 98, Windows 2000, Windows Me, Windows XP, and Windows Server 2003 (32-bit only)

■ Mac OS X, Version 10.2 or later (the MFP must be set up by using Rendezvous or TCP/IP)

Supported browsers

To use the HP Toolbox, you must have one of the following browsers:

Windows

■ Microsoft Internet Explorer 5.5 or later

■ Netscape Navigator 7.0 or later

■ Opera Software ASA Opera 7.0 or later

Mac (OS X only)

■ Microsoft Internet Explorer 5.1 or later

■ Netscape Navigator 7.0 or later

Opening the HP Toolbox

To view the HP Toolbox

1   Open the HP Toolbox in one of these ways:

-   From the Windows **Start** menu, click **Programs**, and then click **HP Toolbox**.

-   For Mac OS X, on the hard drive, click **Applications**, and then click the **Utilities** folder. Double-click the **HP Toolbox icon**.

> **NOTE**   After you open the URL, you can bookmark it so that you can return to it quickly in the future.

2   The HP Toolbox opens in a Web browser. The HP Toolbox software contains the following sections:

-   Status tab

-   Alerts tab

-   Device Settings window

-   Toolbox links

-   Other links

Status tab

The **Status** tab has links to the following main pages:

- **Device Status**. View MFP status information. This page indicates MFP conditions such as a jam or an empty tray. After you correct a problem with the MFP, click the **Refresh** button to update the device status.

- **Supplies Status**. View detailed supplies status such as the percent of life remaining in the print cartridge and the number of pages that have been printed with the current print cartridge. This page also lists the part number for each supply, and has links to order supplies and to find recycling information.

- **Print Info**. Print the configuration page, the supplies status page, and the menu map.

Alerts tab

Use the **Alerts** tab to configure the MFP to automatically notify you of MFP alerts. The **Alerts** tab has links to the following main pages:

- Set up status alerts

- Administrative settings

Set up Status Alerts page

On the Set up Status Alerts page, you can choose to turn alerts on or off, specify when the MFP should send an alert, and select from two different types of alerts:

■ Pop-up message

■ System tray icon

Click **Apply** to activate the settings.

Administrative settings page

On the Administrative settings page, you can set the frequency of how often the HP Toolbox checks for MFP alerts. Three settings are available:

■ **Less Often**. The HP Toolbox checks for alerts every 15 seconds.

■ **Normal**. The HP Toolbox checks for alerts every 8 seconds.

■ **More Often**. The HP Toolbox checks for alerts every 4 seconds.

> **NOTE** If you want to reduce network input/output (I/O) traffic, reduce the frequency at which the MFP checks for alerts.

Device Settings window

When you click the **Device Settings** button, the embedded Web server opens in a new window. See Using the embedded Web server. To return to the HP Toolbox from the embedded Web server, click **Return to Toolbox**.

Toolbox links

The **toolbox Links** item at the left of the screen provides links to the following options:

■ **Select a device**. Select from all of the HP Toolbox-enabled devices.

■ **View current alerts**. View the current alerts for all devices that have been set up. (You must be printing to view the current alerts.)

■ **Text only page**. View the HP Toolbox as a site map with links to all of the individual pages within HP Toolbox and the **Device Settings** window.

Other links

This section contains links that connect you to the Internet. You must have Internet access in order to use any of these links. If you use a dial-up connection and did not connect when you first opened the HP Toolbox, you must connect before you can visit these Web sites. Connecting might require that you close the HP Toolbox and reopen it.

■ **HP instant support**. Connects to the HP instant support page for the MFP.

■ **Product Registration**. Connects to the HP product registration Web site.

■ **Order Supplies**. Connects to the HP supplies ordering Web site. The MFP must be connected directly to a computer in order to use this Web site.

■ **Product Support**. Connects to the support site for the MFP. Then, you can search for help with a specific problem.

Using HP Web Jetadmin software

HP Web Jetadmin is a Web-based software solution for remotely installing, monitoring, and troubleshooting network-connected peripherals. The intuitive browser interface simplifies cross-platform management of a wide range of devices, including HP and non-HP printers. Management is proactive, allowing network administrators the ability to resolve printer issues before users are affected. Download this free, enhanced-management software at www.hp.com/go/webjetadmin_software.

To obtain plug-ins to HP Web Jetadmin, click **plug-ins**, and then click the **download** link that is next to the name of the plug-in that you want. The HP Web Jetadmin software can automatically notify you when new plug-ins are available. On the **Product Update** page, follow the directions to automatically connect to the HP Web site.

If installed on a host server, HP Web Jetadmin is available to any client through a supported Web browser, such as Microsoft Internet Explorer 6.0 for Windows or Netscape Navigator 7.1 for Linux. Browse to the HP Web Jetadmin host.

NOTE Browsers must be Java-enabled. Browsing from an Apple Macintosh computer is not supported.

Information pages

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

- Menu map
- Configuration page
- HP Jetdirect page
- Supplies status page
- Usage page
- PCL or PS font list

Use the following procedure to print these information pages. Then, see the following sections for more information about each page.

To print an information page

1 Press MENU.

2 Touch **INFORMATION**.

3 Scroll to the information page that you want, and touch the appropriate page. The page automatically prints.

Menu map

To see the current settings for the menus and items that are available in the control panel, print a control-panel-menu map.

Many of these values can be overridden from the driver or program. You might want to store the menu map near the MFP for reference.

The content of the menu map varies, depending on the options that are currently installed in the MFP.

Configuration pages

Depending on the model, up to four pages print when you select **PRINT CONFIGURATION**. In addition to the main configuration page, a Jetdirect configuration page prints as well as a page for the fax accessory and a page for the optional paper-handling options.

Configuration page

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

NOTE   If an optional 3-bin mailbox or stapler/stacker is installed, a page also prints for that device.

NOTE   If an HP LaserJet analog fax accessory 300 is installed, a fax accessory page also prints. See the *HP LaserJet Analog Fax Accessory 300 User Guide* for information about understanding the fax accessory page.

The MFP configuration page contains the following information:
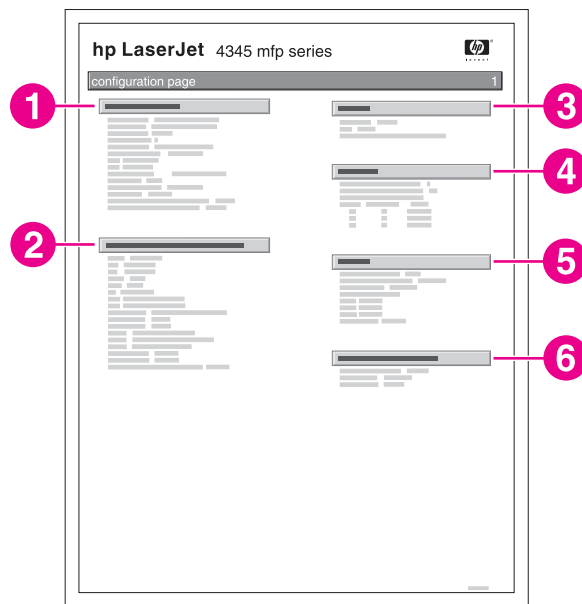
1	**Device Information** lists the serial number, page counts, firmware datecodes, maintenance-kit counts, and other information for the MFP.
2	**Installed Personalities and Options** lists all MFP languages that are installed (such as PCL and PS), and lists options that are installed in each DIMM slot and EIO slot.
3	**Memory** lists the MFP memory information, PCL Driver Work Space (DWS), and I/O buffering and Resource Saving information.
4	**Event Log** lists the number of entries in the log, the maximum number of entries viewable, and the last three entries. The second page of the event log is the manufacturer page. This page contains information that might assist HP Customer Care representatives in solving possible MFP problems.
5	**Security** lists the status of the control-panel lock, control-panel password, and disk drive.
6	**Paper Trays and Options** lists the size settings for all trays and lists paper-handling accessories that are installed.

NOTE The content of the configuration page varies, depending on the options that are currently installed in the MFP.

HP Jetdirect page

The second configuration page is the HP Jetdirect page, which contains the following information:
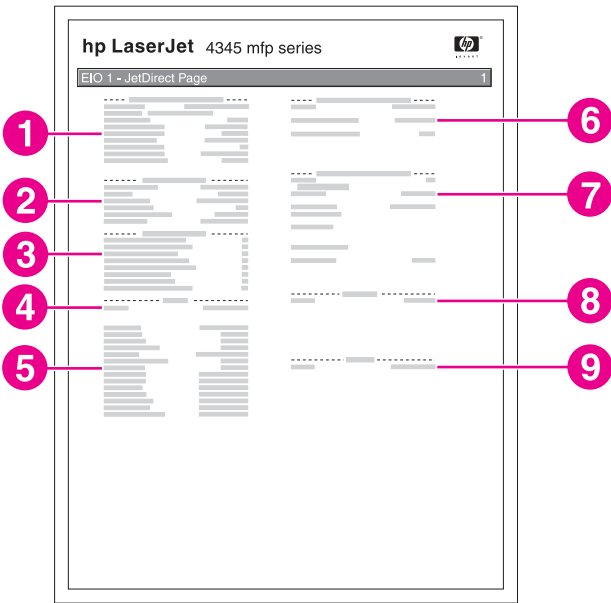
1	**HP Jetdirect Configuration** indicates the MFP status, model number, hardware firmware version, port select, port configuration, auto negotiation, manufacturing identification, and manufactured date.
2	**Security Settings** information
3	**Network Statistics** indicates the total packets received, unicast packets received, bad packets received, framing errors received, total packets transmitted, unsendable packets, transmit collisions, and transmit late collisions.
4	**Status** line
5	**TCP/IP** information, including the IP address
6	**IPX/SPX** information
7	**Novell/NetWare** information
8	**AppleTalk** information
9	**DLC/LLC** information

Always make sure the status line indicates "I/O Card Ready".

Finding important information on the configuration pages

Certain information, such as the firmware date codes, the IP address, and the e-mail gateways, is especially helpful while servicing the MFP. This information is on the various configuration pages. Table 7-20 Important information on the configuration pages describes where to look for this information.

Table 7-20 Important information on the configuration pages

Type of information	Specific information	Configuration page
Firmware date codes When you use the remote firmware upgrade procedure, all of these firmware components are upgraded. For more information see Upgrading the firmware.	DC controller date code	Look on the main configuration page, under "Device Information."
	Copy board version (CPB)	Look on the main configuration page, under "Device Information."
	Scan board version (SCB)	Look on the main configuration page, under "Device Information."
	Main firmware datecode	Look on the main configuration page, under "Device Information."
	Stapler/stacker or 3-bin mailbox firmware datecode	Look on the paper-handling configuration page, under "Product Name."
	Modem firmware version (when a fax accessory is installed)	Look on the fax accessory page, under "Hardware Information."
	Embedded Jetdirect firmware version	Look on the embedded Jetdirect page, under "HP Jetdirect Configuration."
E-mail gateway information E-mail gateway addresses appear only if the MFP is configured for sending to e-mail. If you are using the embedded e-mail function, addresses should be shown for the LDAP and SMTP gateways, and the digital sending server address should be blank. If you are using the optional HP Digital Sending Software, the LDAP and SMTP addresses should be blank, and an address for the digital sending software should be shown.	LDAP gateway	Look on the main configuration page, under "Installed Personalities and Options."
	SMTP gateway	Look on the main configuration page, under "Installed Personalities and Options."
	HP MFP digital-sending server	Look on the main configuration page, under "Installed Personalities and Options."
Accessories and internal storage All optional devices that are installed on the MFP should be listed on the main configuration page. In addition, separate pages print for the optional paper-handling devices and the fax accessory. These pages list more-detailed information for those devices.	Internal-disk model number and capacity	Look on the main configuration page, under "Installed Personalities and Options."
	Internal fax (presence)	Look on the main configuration page, under "Installed Personalities and Options."
	Embedded HP Jetdirect model number	Look on the main configuration page, under "Installed Personalities and Options."
	Total RAM	Look on the main configuration page, under "Memory."

Table 7-20 Important information on the configuration pages (continued)

Type of information	Specific information	Configuration page
	Duplex unit	Look on the main configuration page, under "Paper Trays and Options."
	Additional 500-sheet feeders and optional output devices	Look on the main configuration page, under "Paper Trays and Options."
Page counts and event logs Total page counts and maintenance-kit counts are important for ongoing MFP maintenance. The configuration page lists only the three most recent errors. To see a list of the 50 most recent errors, print an event log from the **DIAGNOSTICS** menu.	Page count	Look on the main configuration page, under "Device Information."
	Pages since last maintenance (print-engine maintenance count)	Look on the main configuration page, under "Device Information."
	Pages since Last Doc Feeder Maintenance (ADF maintenance count)	Look on the main configuration page, under "Device Information."
	Event-log information	Look on the main configuration page, under "Event log."

Supplies status page

Use the supplies status page to obtain information about the print cartridge that is installed in the MFP, the amount of toner that remains in the print cartridge, and the number of pages and jobs that have been processed. The page also lets you know when you should schedule the next preventive maintenance for each maintenance kit.

📝 **NOTE** The MFP has two separate maintenance kits: one is for the print engine, and the other is for the ADF. For more information, see Performing preventive maintenance.

The supplies status page contains the following information:
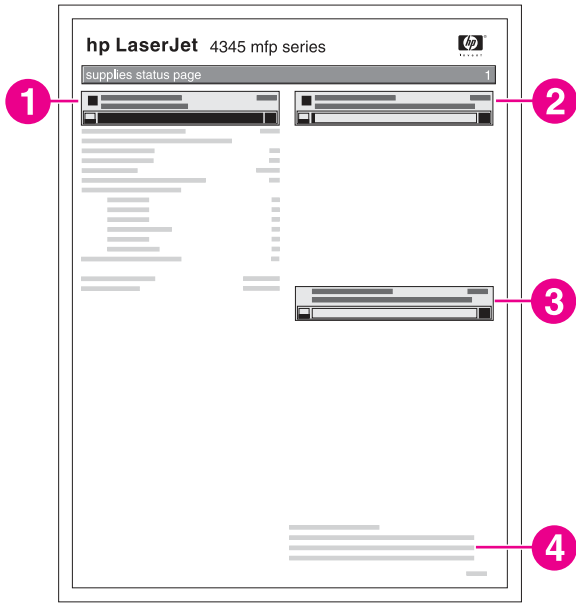
1	**Black Print Cartridge** indicates the amount of toner that remains in the print cartridge, estimated pages remaining for the amount of toner remaining in the cartridge, total number of pages and jobs processed, and the print-cartridge installation date and serial number.
2	**Maintenance Kit** indicates the percentage of the maintenance kit that remains and the HP part numbers.
3	**Document Feeder Kit** indicates the percentage of the document feeder kit that remains and the HP part number.
4	**Recycling Information** provides information about how to recycle HP supplies.

Usage page

The usage page provides information about the page sizes and number of pages printed, copied, and sent.

The usage page contains the following information:

1	**Usage Totals: Printed** indicates types of pages that have been printed, copied, and faxed; the number of single-sided pages that have been printed, copied and faxed; the number of duplexed pages that have been printed, copied and faxed (if a duplexer is installed); and the total number of pages that have been printed, copied and faxed.
2	**Usage Totals: Scanned** indicates types of pages that have been copied, sent, and faxed; the number of single-sided pages that have been copied, sent, and faxed; the number of duplexed pages that have been copied, sent, and faxed; and the total number of pages that have been copied, sent, and faxed.
3	**Print Modes and Paper Path Usage** shows the number of pages that have been printed with each fuser mode and the number of pages that have been printed from each input tray and to each output bin.
4	**Coverage** indicates the average amount of toner used on all pages that have been printed.

PCL or PS font list

Use the font lists to see which fonts are currently installed in the MFP. (The font lists also show which fonts are resident on a hard disk or flash DIMM.)

The PS font list shows the PS fonts installed, and gives a sample of those fonts. The following describes the information that can be found on the PCL font list:

- **Font** gives the font names and samples.

- **Pitch/Point** indicates the pitch and point size of the font.

- **Escape Sequence** (a PCL 5e programming command) is used to select the designated font. (See the legend at the bottom of the font list page.)

- **Font #** is the number used to select fonts from the control panel (not the software application). Do not confuse the font # with the font ID (see the following information). The number indicates the DIMM slot where the font is stored.

  - **Soft:** Downloaded fonts that stay resident in the MFP until other fonts are downloaded to replace them or until the MFP is turned off.

  - **Internal:** Fonts that permanently reside in the MFP.

- **Font ID** is the number you assign to soft fonts when you download them through software.

Diagnostics menu

The following table shows the items that are available in the **DIAGNOSTICS** menu. Values that have an asterisk are the default values.

Item	Options	Values	Explanation
PRINT EVENT LOG			Generates a localized list of the 50 most recent entries in the error log. For each entry, the printed event log shows the error number, page count, error code, and description or personality.
SHOW EVENT LOG			At the control panel, scroll through the contents of the event log, which lists the 50 most recent events.
CALIBRATE SCANNER			Use this item to calibrate the scanner. You might need to calibrate the scanner if it is not capturing the correct sections of scanned documents.
PAPER PATH SENSOR TEST		See [Table 7-21 Paper-path sensor letter designations](#) for a description of the alphabetic code that is associated with each sensor.	Initiates a paper-path-sensor test. You can then open the menus to print internal pages (including the paper path test), set menu items, and send jobs from the computer. The sensors are updated as paper passes each sensor. On the control-panel display, each sensor is represented by a string of letters followed by a corresponding status for each sensor.
PAPER PATH TEST	**PRINT TEST PAGE**		Generates a test page that is useful for testing the paper handling features of the MFP. Specifies which paper paths are tested.
	SOURCE	**ALL TRAYS** **TRAY 1** **TRAY 2*** **TRAY <N>**	Specify whether to print a test page from a specific tray or from all trays.
	DESTINATION	**ALL BINS** **OUTPUT BIN 1*** **OUTPUT BIN 2**	Specify which output bin to use during the paper path test.

Item	Options	Values	Explanation
		OUTPUT BIN 3	
	DUPLEX	**ON** **OFF***	Specify if the duplexer is included when the test is performed.
	COPIES	**1*** **10** **50** **100** **500**	Specify how many sheets of paper from the specified source are sent when the test is performed.
MANUAL SENSOR TEST		See [Table 7-22 Manual sensor test letter designations](#) for a description of the alphabetic code that is associated with each sensor.	Tests the paper path sensors and switches for correct operation. During this test, the MFP is offline. On the control-panel display, each sensor is represented by a string of letters followed by a corresponding status for each sensor.
COMPONENT TEST	**MAIN MOTOR** **DRUM MOTOR** **LASER SCANNER MOTOR** **MP TRAY SOLENOID** **TRAY 2 PAPER FEED DRIVE** **FEED ROLLER CLUTCH** **INTERMEDIATE SWITCHBACK MOTOR** **SWITCHBACK MOTOR** **OUTPUT MOTOR** **DUPLEX MOTOR** **FACEUP FACEDOWN SOLENOID** **ALIENATION SOLENOID** **REPEAT**		Use the component test to exercise individual parts one-at-a-time, so that you can determine the cause of noise inside the MFP.
PRINT/STOP TEST	**STOP TIME**	**0** to **60000**	Use this menu to isolate the potential source of print-quality problems with the MFP. The time is expressed in milliseconds.

Item	Options	Values	Explanation
SCANNER TESTS	**LOWER LAMP** **SENSORS** **ADF INPUT MOTOR** **ADF INPUT REVERSE** **FLATBED MOTOR** **ADF READ MOTOR** **ADF READ MOTOR REVERSE** **ADF DUPLEX SOLENOID** **ADF LED INDICATOR**		Use this menu to diagnose potential problems with the MFP scanner. When you touch the name of each component, a message appears on the control-panel display that indicates the manner in which the component is operating. You must physically verify that the component is behaving as indicated. For example, after touching **LOWER LAMP**, the message **Lower lamp (scanner) is on** appears on the control-panel display. You should observe the lamp to determine whether it is illuminated. If it is not illuminated, the lamp is not functioning correctly.
CONTROL PANEL	**LED'S** **DISPLAY** **BUTTONS** **TOUCHSCREEN**		Use this menu item to diagnose potential problems with the MFP control panel. Use **LED'S** to turn each LED on and off independently to make sure that it is functioning correctly. **DISPLAY** shows a test pattern on the control-panel display. If no test pattern appears, the display is not functioning correctly. Use **BUTTONS** to press each hard key to make sure that it is functioning correctly. **TOUCHSCREEN** causes a grid to appear on the display. Touch each section of the grid to verify that it is sensitive to touch.

Individual component diagnostics

From the diagnostics menu, you can run tests to check the status of various components in the MFP. During many of the diagnostic tests, the MFP enters a special diagnostics mode, which allows you to send print jobs and interact with the menus. The MFP stays in this mode until you press Sᴛᴏᴘ and then touch **EXIT DIAGNOSTICS** at the top of the **DIAGNOSTICS** menu. In some cases, the MFP must re-initialize after performing a component-level diagnostic test.

Paper-path-sensor test

The paper-path-sensor test checks for the presence of media at each of the sensors along the paper path. After you have selected this test from the **DIAGNOSTICS** menu, you can print internal pages or send a print job from a computer. As the media passes each sensor, the sensor's state is updated. On the control-panel display, each sensor is represented by a string of alphabetic letters followed by a corresponding status for each sensor. Use Table 7-21 Paper-path sensor letter designations to associate the letters that are shown on the control-panel display with the sensor that they represent. A "0" next to the letter indicates that no media is present. A "1" indicates that media is present. Press Sᴛᴏᴘ to stop the job, and then touch **EXIT DIAGNOSTICS** to exit the special diagnostics mode.

Table 7-21 Paper-path sensor letter designations

Letter	Component	Letter	Component
A	Tray 5 paper feed	F	PS103: top-of-page
B	Tray 4 paper feed	G	
C	Tray 3 paper feed	H	PS110: reversing paper sensor
D	PS106: front paper width	J	PS108: exit sensor to the fuser
E	PS102: tray 2 pre-feed	K	PS109: delivery

Manual sensor test

The manual sensor test indicates the status of the sensors and switches in the MFP. On the control-panel display, each sensor is represented by a string of letters followed by a corresponding status for each sensor. Except for the paper-size switches, a "0" next to the letter indicates that no media is present or the switch is open. A "1" indicates that media is present or the switch is closed. For the paper-size switches (SW102), the number ranges from 0 to 7 to indicate the state of the three switches. Use Table 7-22 Manual sensor test letter designations to associate the letters that appear on the control-panel display with the switch or sensor that they represent. Note that both uppercase and lowercase letters are used.

Table 7-22 Manual sensor test letter designations

Letter	Component	Letter	Component
A	Tray 5 paper feed sensor	S	SW102: tray 2 paper-size switches (3 switches) ■ S0 = all three switches are closed ■ S1 = the bottom and middle switches are closed ■ S3 = the bottom switch is closed ■ S5 = the middle switch is closed ■ S6 = the top switch is closed ■ S7 = no switches are closed
B	Tray 4 paper feed sensor	T	Tray 3 jam-access-cover switch
C	Tray 3 paper feed sensor	U	Tray 3 paper out sensor
D	PS106: paper-width sensor	V	Tray 3 paper-stack surface sensor
E	PS102: pre-feed sensor	W	Tray 3 paper-size switches (The number ranges from 0 to 7 as for tray 2. See the entry for letter "S".)
F	PS103: top-of-page sensor	X	Tray 4 jam-access-cover switch
H	PS111: reverse-unit paper sensor	Y	Tray 4 paper-out sensor
J	PS108: fuser-delivery sensor	Z	Tray 4 paper-stack surface sensor
K	PS109: delivery paper sensor	a	Tray 4 paper size switches (The number ranges from 0 to 7 as for tray 2. See the entry for letter "S".)
L	PS104: output bin full sensor	b	Tray 5 jam-access cover switch
M	PS105: tray 1 paper-present sensor	c	Tray 5 paper-out sensor
P	SW105: jam-access-cover switch	d	Tray 5 paper-stack surface sensor
Q	PS101: tray 2 paper-out sensor	e	Tray 5 paper size switches (The number ranges from 0 to 7 as for tray 2. See the entry for letter "S".)
R	PS107: tray 2 paper-stack surface sensor	f	SW101: top-cover switch

Scanner tests

Use the scanner tests to verify that specific components in the scanner assembly are operating correctly. For most of the components, you must observe or listen to the component in order to verify that it is functioning as stated on the control-panel display. For the scanner sensors, you must activate the sensor and watch the condition indicator on the control-panel display to see if it changes.

Component test

Use the component test to exercise individual parts one-at-a-time, so that you can determine the cause of noise inside the MFP. For most of the components, you must observe or listen to the component in order to verify that it is functioning as stated on the control-panel display.

Service menu

Authorized HP service technicians can use this menu to gain access to MFP settings that are reserved for service personnel. The service menu is protected by use of a personal identification number (PIN). When you select **SERVICE** from the list of menus, you are prompted to type an eight-digit PIN code.

The PIN code for this MFP is 11434504.

📝 **NOTE** The MFP automatically exits the service menu after about 1 minute if no menu items are selected or changed.

Table 7-23 Service menu

Item	Explanation
CLEAR EVENT LOG	Select this item to clear (reset to zero) the internal event log.
TOTAL PAGE COUNT	Select this item to set the total number of pages that have been printed to-date. Typically this is only required when a new formatter is installed.
REFURBISH PAGE COUNT	Select this item to set the page count if you need to send the MFP for refurbishment. This page count is stored in memory so that the correct Service ID can be restored after the MFP is refurbished.
MAINTENANCE KIT COUNT	Select this item to set the number of pages that have been printed since the last maintenance kit was installed or the total number of pages that have been printed on this MFP if a maintenance kit has not yet been installed (during the first 225,000 pages).
MAINTENANCE KIT INTERVAL	Select this item to specify the number of pages that can be printed before a **PERFORM PRINTER MAINTENANCE** message appears on the control-panel display to indicate that a maintenance kit is required.
DOCUMENT FEEDER KIT COUNT	Select this item to set the number of pages that have been printed since the last document-feeder kit was installed or the total number of pages that have been printed on this MFP if a document-feeder kit has not yet been installed (during the first 225,000 pages).
DOCUMENT FEEDER KIT INTERVAL	Select this item to specify the number of pages that can be printed before a **REPLACE DOCUMENT FEEDER KIT** message appears on the control-panel display to indicate that a document-feeder kit is required.
ADF COUNT	Select this item to set the total number of pages that have been fed through the ADF.
FLATBED COUNT	Select this item to set the number of pages that have been scanned on the flatbed glass.
ADF SIMPLEX COUNT	Select this item to set the number of simplex pages that have been fed through the ADF.
ADF DUPLEX COUNT	Select this item to set the number of duplex pages that have been fed through the ADF.
COPY SCAN COUNT	Select this item to set the number of copy pages that have been scanned.
SEND SCAN COUNT	Select this item to set the number of scanned pages that have been sent to e-mail.
COPY PAGES COUNT	Select this item to set the number of scanned pages that have been printed.

Table 7-23 Service menu (continued)

Item	Explanation
SCANNER SETTINGS	**CAUTION** The **SCANNER SETTINGS** are used for factory adjustments and should not be used by service personnel. Use the scanner calibration routine to adjust the scanner settings if necessary. See Calibrating the scanner.
SERIAL NUMBER	Select this item to update the serial number if you replace the formatter.
SERVICE ID	Service ID. Select this item to specify the date when the MFP was first used, rather than the date when a replacement formatter is installed. See Restoring the Service ID.
COLD RESET PAPER	Select this item to reset the default paper size when you replace the formatter or restore factory settings. When you replace a formatter or restore factory settings in a country/region that uses A4 as the standard paper size, use this item to reset the default paper size to A4. Letter and A4 are the only cold-reset values available.

Service ID

This information appears on the configuration page, which eliminates the need for customers to keep paper receipts for proof of the warranty. Because the MFP does not have an internal clock, the availability of the service ID date depends on the MFP being connected to a source that can provide the date, in this case a time server that is on the same network as the MFP. When the MFP is not connected to a date source, the service ID is not available, and **00000** appears on the configuration page.

Restoring the Service ID

If you replace the formatter, the date is lost. Use this menu item to reset the value to the date that the MFP was first used. The date format is YYDDD. Use the following procedure to calculate the date.

1   To calculate YY, subtract 1990 from the calendar year. For instance, if the MFP was first used in 2002, calculate YY as follows: 2002 – 1990 = 12 (YY = 12).

2   To calculate DDD, use the following formula: 30 (calendar month – 1) + calendar day = DDD. If the calendar day is 31, use 30 instead. For instance, if the MFP was first used on October 17, calculate DDD as follows:

   a   Subtract 1 from 10 (October is the tenth month of the year): 10 – 1 = 9.

   b   Multiply 9 by 30: 9 x 30 = 270.

   c   Add 17 to 270: 270 + 17 = 287 (DDD = 287).

Converting the service ID to an actual date

You can use the MFP Service ID number to determine whether the MFP is still under warranty. Use the following procedure to convert the Service ID into the installation date.

1   Add 1990 to YY to determine the actual year that the MFP was installed.

2   Divide DDD by 30, and add 1 to the whole-number part of the quotient. The total is the month.

3   The remainder from the calculation in step 2 is the day of the month.

Using the Service ID 12287 as an example, the date conversion is as follows:

1   12 + 1990 = 2002, so the year is 2002.

2   287 divided by 30 = 9 with a remainder of 17. Add 1 to 9 to get 10, so the month is October.

3   The remainder (from the above calculation) is 17, so that is the day of the month.

4   The complete date is 17-October-2002.

Troubleshooting the embedded HP Jetdirect print server

If network-connection errors occur, you can disable the HP Jetdirect print server in order to determine if the problem is with the print server or with the network. This procedure requires that you temporarily install an optional EIO HP Jetdirect print server card while disabling the embedded HP Jetdirect print server.

To disable the embedded HP Jetdirect print server

1   Turn the MFP off and then on.

2   When the memory count appears on the control-panel display, press and hold 6 until all three LEDs flash once and then stay on. This might take up to 20 seconds.

3   Release 6, and then press and release 3 until **EMBEDDED LAN DISABLE** appears on the control-panel display.

4   Press 6 one time, and wait for the MFP to complete its initialization sequence.

> **NOTE**   To enable the HP Jetdirect print server again, perform this same procedure. **EMBEDDED LAN ENABLE** appears on the control-panel display instead of **EMBEDDED LAN DISABLE**.

Firmware-stack trace

In rare instances, you might need to work with a call-center escalation agent to find the source of a **49.XXXX ERROR**. Use the firmware-stack trace procedure to collect data that the agent might need. A firmware-stack trace indicates which firmware commands were executing at the time of the error. The firmware-stack trace procedure does not produce a report. Instead, you must write down the firmware instructions that appear on the control-panel display and relay them to the agent.

To perform a firmware-stack trace

1   When the error message appears on the control-panel display, press 6 and then press 5.

2   Press 9 to scroll through each line of the firmware-stack trace.

Diagrams for troubleshooting

Use the diagrams in this section to identify MFP components.

DC controller connections

Each of the connections on the dc controller PCA are indicated in the following figure.

📝 **NOTE** A photo of the dc controller is in .
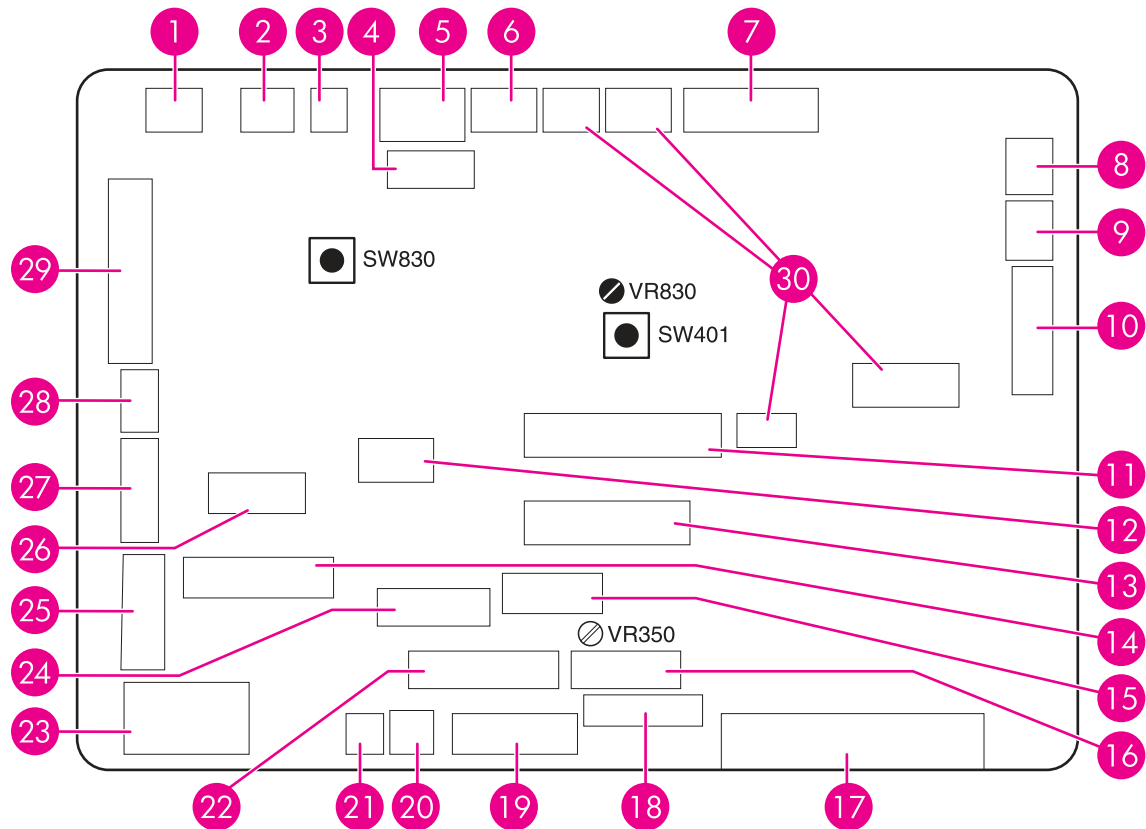
Figure 7-2 DC controller component connections

Item	Component	Connector
1	Tray 1 pickup solenoid, SL101	J79
2	Feed-roller clutch, CL101	J89
3	Memory tag	J97
4	Laser/scanner	J84
5	Image scanner (+24 volts)	J70
6	Reversing-unit fan, FN103 Delivery-door switch, SW103	J65
7	Reversing-unit motors: M104, M105, M106	J50

Item	Component	Connector
8	Output-bin full sensor, PS104	J85
9	DC controller fan, FN104	J66
10	Reversing-unit sensors and solenoids: PS109, PS110, PS111, SL105, SL106	J43
11	Engine power supply PCA	J80
12	Top-cover switch, SW101	J95
13	Engine power supply PCA	J81
14	Tray 2 paper size and paper-stack surface sensors and switches: PS101, PS107, SW102	J90
15	PFC power supply PCA	J60
16	Laser/scanner	J83
17	Formatter	J82
18	Control panel	J77
19	Optional output devices	J96
20	Tray 2 pickup solenoid, SL101	J92
21	Lifter motor, M103	J93
22	Main motor, M101	J98
23	+24 volt	J99
24	Duplex printing accessory	J44
25	Drum motor, M102	J86
26	Fuser	J71
27	Envelope feeder	J88
28	Print-cartridge fan, FN102	J78
29	Paper-path sensors and switches: PS106, PS112, PS103, PS102, PS105, SW105	J87
30	Not used	

Scanner-controller PCA connections
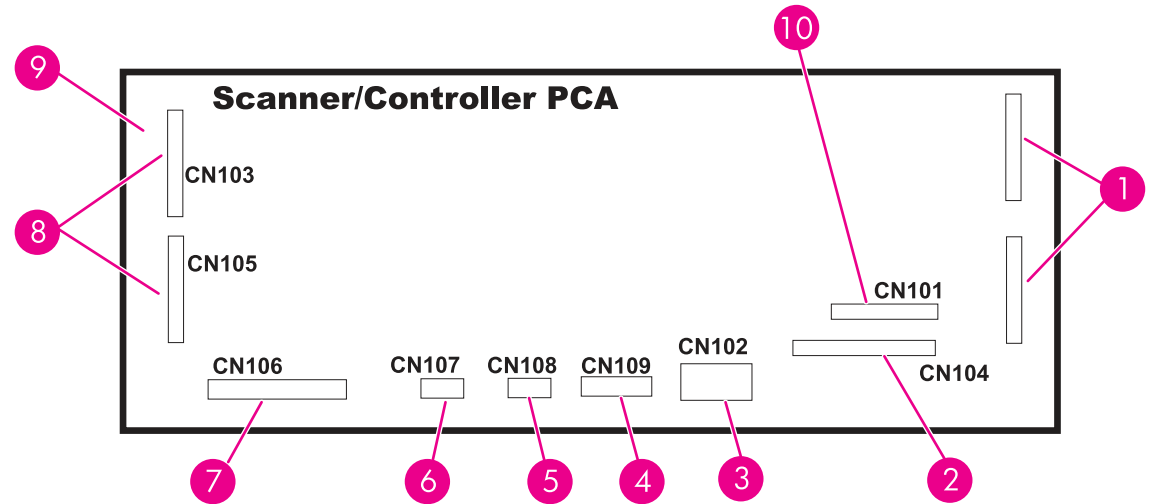
Figure 7-3 Scanner-controller PCA component connections

Item	Component
1	Not used
2	Optical-head assembly
3	Power supply
4	Cover-closed switch and home-position sensor
5	Scanner fan
6	Inverter PCA
7	Flatbed motor
8	To ADF
9	To ADF feed and read motors
10	Formatter PCA

Locations of major components

The photos in this section identify the locations of many major components in the MFP.

Component	Figure
PS101, tray 2 paper-present sensor	See Figure 7-4 Cassette sensors.
PS103, top-of-page sensor	See Figure 7-5 Sensors in the print-cartridge area.
PS104, output-bin full sensor	See Figure 7-7 Sensors in the interior of the MFP.
PS105, tray 1 paper-present sensor	See Figure 7-9 Tray 1 paper-present sensor, PS105.
PS106, paper-width sensor 1	See Figure 7-5 Sensors in the print-cartridge area.
PS107, paper-stack-surface sensor	See Figure 7-4 Cassette sensors.
PS109, paper-delivery sensor	See Figure 7-6 Sensors on the reversing unit (top side).
PS110, reversing paper sensor	See Figure 7-6 Sensors on the reversing unit (top side).
PS111, reversing-unit jam sensor	See Figure 7-6 Sensors on the reversing unit (top side).
PS112, paper-width sensor 2	See Figure 7-5 Sensors in the print-cartridge area.
SW101, top-cover switch	See Figure 7-10 Top-cover switch, SW101 and Figure 7-18 Right, rear corner components (1 of 2).
SW103, output-bin detection switch	See Figure 7-8 Output-bin detection switch, SW103 and Figure 7-7 Sensors in the interior of the MFP.
SW105, tray 2 jam-access-cover switch	See Figure 7-11 Tray 2 jam-access-cover switch, SW105.
M101, main motor	See Figure 7-14 Rear-side motors (1 of 2).
M102, print-cartridge motor	See Figure 7-14 Rear-side motors (1 of 2).
M103, lifter motor	See Figure 7-15 Rear-side motors (2 of 2).
M104, crossing motor	See Figure 7-17 Reversing-unit motors and solenoids.
M105, reversing motor	See Figure 7-17 Reversing-unit motors and solenoids.
M106, delivery motor	See Figure 7-17 Reversing-unit motors and solenoids.
FN101, main fan	See Figure 7-12 Front-side fans.
FN102, print-cartridge fan	See Figure 7-13 Rear-side fans.
FN103, reversing-unit fan	See Figure 7-12 Front-side fans.
FN104, dc controller fan	See Figure 7-13 Rear-side fans.
SL101, tray 2 pickup solenoid	See Figure 7-16 Rear-side solenoid.
SL102, tray 1 pickup solenoid	See Figure 7-18 Right, rear corner components (1 of 2).
SL105, face-up solenoid	See Figure 7-17 Reversing-unit motors and solenoids.
SL106, reversing-separation solenoid	See Figure 7-17 Reversing-unit motors and solenoids.
CL101, feed-roller clutch	See Figure 7-19 Right, rear corner components (2 of 2).
TH3, ambient-air thermistor	See Figure 7-12 Front-side fans.
DC controller PCA	See Figure 7-14 Rear-side motors (1 of 2).

Component	Figure
Reversing intermediate PCA	See Figure 7-17 Reversing-unit motors and solenoids.
ADF bin-full flag	See Figure 7-20 ADF output-bin-full sensor.
ADF pickup assembly	See Figure 7-21 ADF pickup assembly sensors.
ADF paper-present sensor	See Figure 7-21 ADF pickup assembly sensors.
ADF top-of-page sensor	See Figure 7-21 ADF pickup assembly sensors.
ADF fan	See Figure 7-22 ADF motors, solenoid, and sensors.
Scanner-controller PCA	See Figure 7-22 ADF motors, solenoid, and sensors.
ADF LED PCA	See Figure 7-22 ADF motors, solenoid, and sensors.
ADF solenoid	See Figure 7-22 ADF motors, solenoid, and sensors.
ADF motors	See Figure 7-22 ADF motors, solenoid, and sensors.

Sensors and switches

The photos in this section show the locations of the sensors and switches that are in the MFP print engine.

Cassette sensors
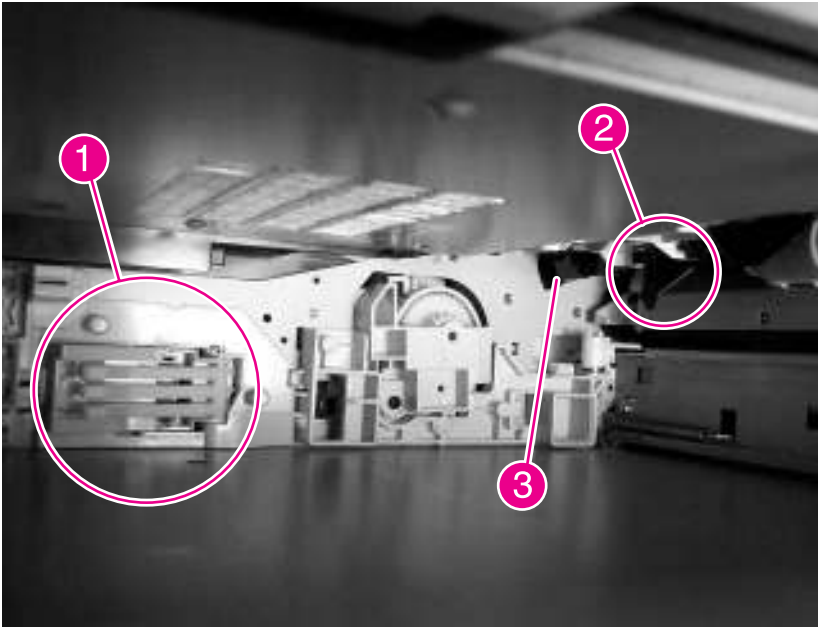
Figure 7-4 Cassette sensors

1	SW102, paper-size switches
2	PS101, tray 2 paper-present sensor
3	PS107, tray 2 paper-stack-surface sensor

Sensors in the print-cartridge area
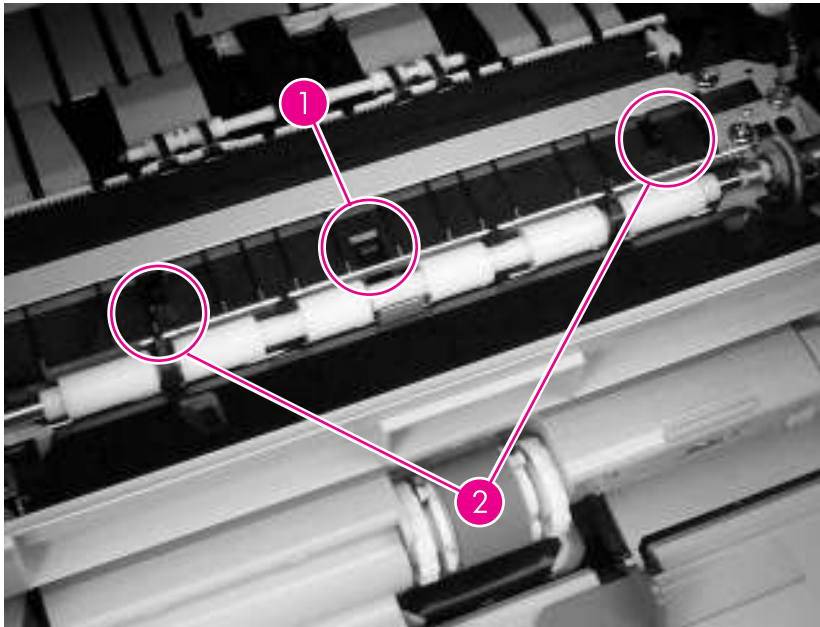
Figure 7-5 Sensors in the print-cartridge area

1	PS103, top-of-page sensor
2	PS106 and PS112, paper-width sensors

Sensors on the reversing unit (top side)
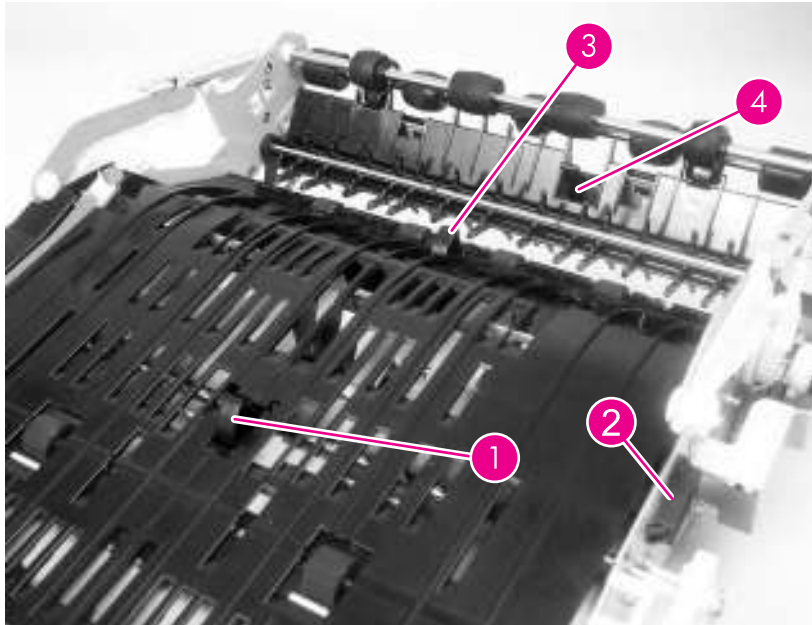
Figure 7-6 Sensors on the reversing unit (top side)

1	PS111, reversing-unit-jam sensor
2	Connectors J140 and J1402
3	PS110, reversing paper sensor
4	PS109, paper-delivery sensor

Sensors in the interior of the MFP
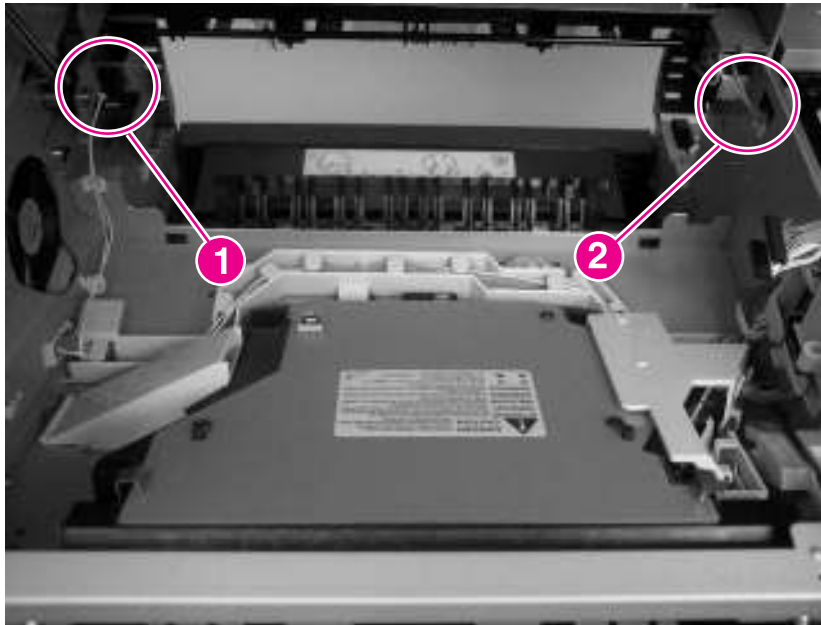
Figure 7-7 Sensors in the interior of the MFP

1	connector leading to SW103, output-bin detection switch
2	PS104, output-bin-full sensor

Output-bin detection switch, SW103
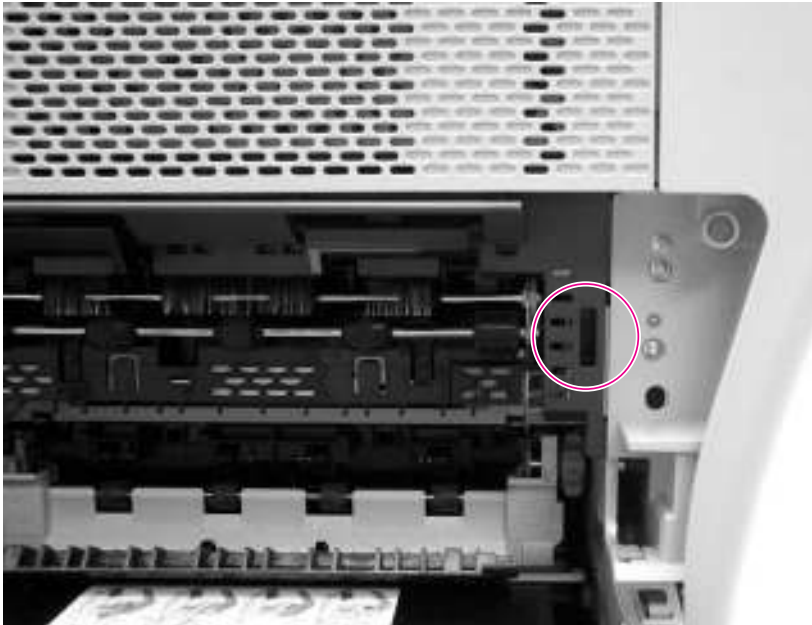
Figure 7-8 Output-bin detection switch, SW103

Tray 1 paper-present sensor, PS105
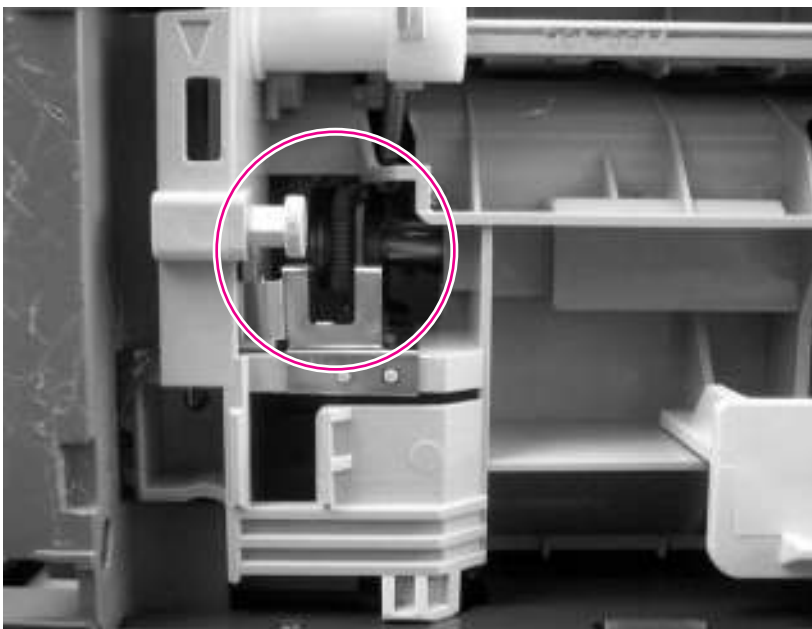
Figure 7-9 Tray 1 paper-present sensor, PS105

Top-cover switch, SW101
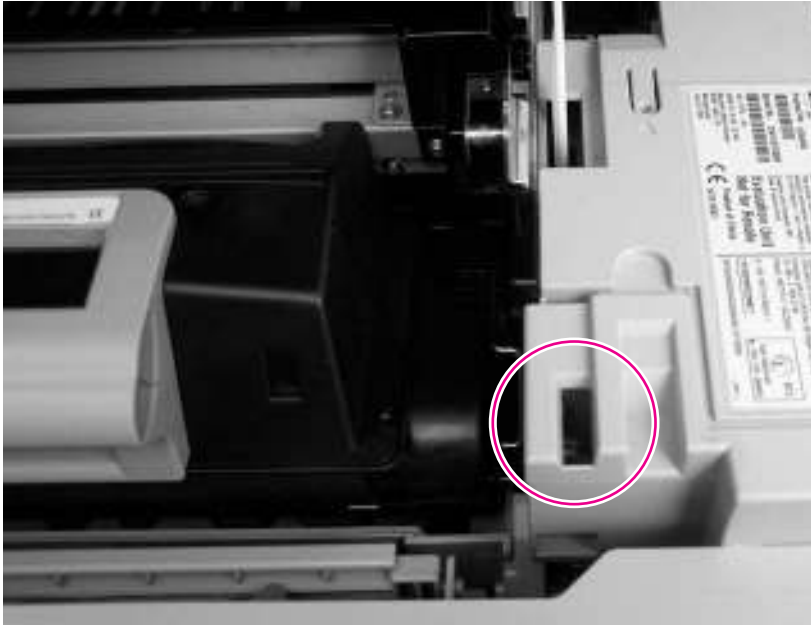
Figure 7-10 Top-cover switch, SW101

Tray 2 jam-access-cover switch, SW105

Figure 7-11 Tray 2 jam-access-cover switch, SW105

Motors, fans, solenoids, and clutch

The photos in this section show the locations of the motors, fans, solenoids, and clutches that are in the MFP print engine.

Front-side fans
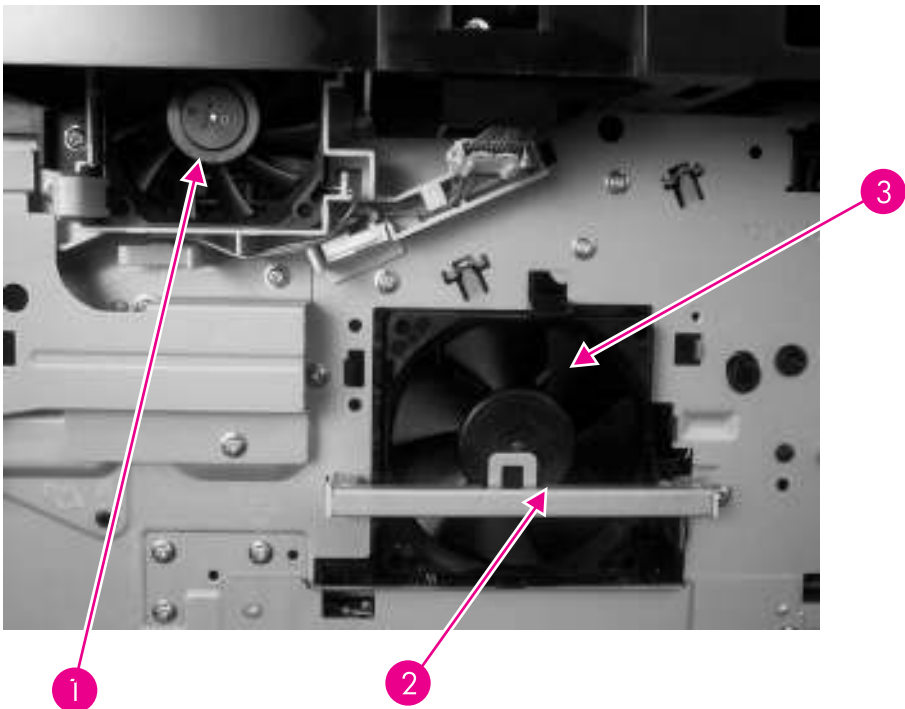
Figure 7-12 Front-side fans

1	FN103, reversing-unit fan
2	TH3, ambient-air-detection thermistor (on the rear of this metal bracket)
3	FN101, main fan

Rear-side fans
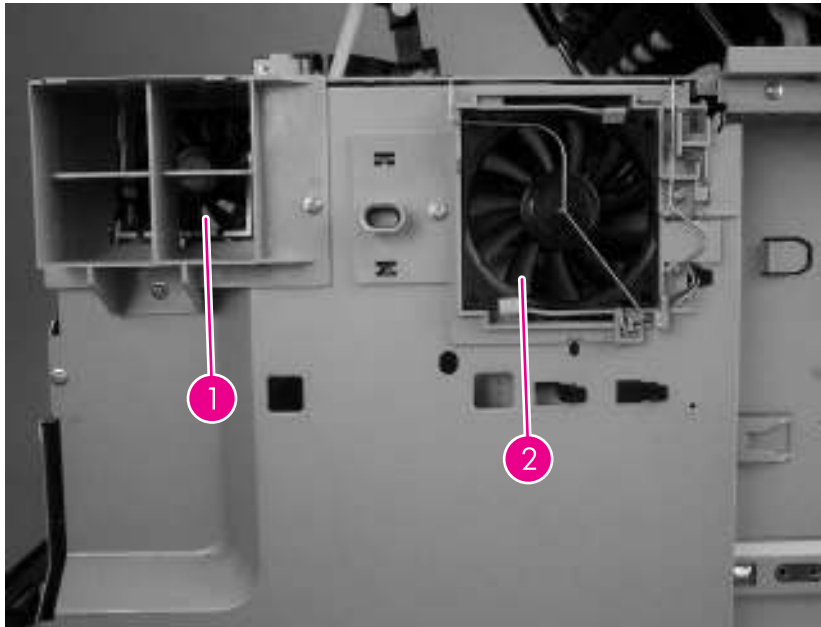
Figure 7-13 Rear-side fans

1	FN102, print-cartridge fan
2	FN104, dc controller fan

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Rear-side motors (1 of 2)
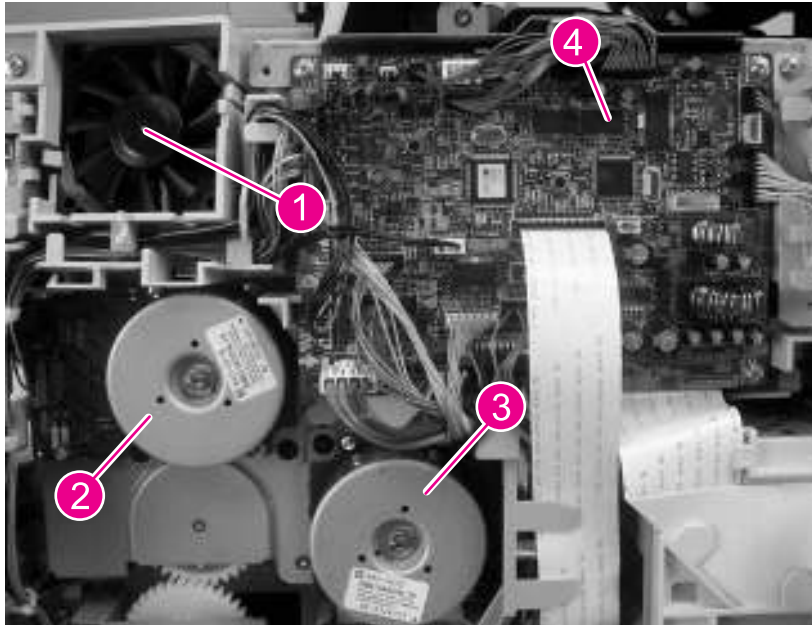
Figure 7-14 Rear-side motors (1 of 2)

1	FN102, print-cartridge fan
2	M102, drum motor
3	M101, main motor
4	DC controller PCA

Rear-side motors (2 of 2)
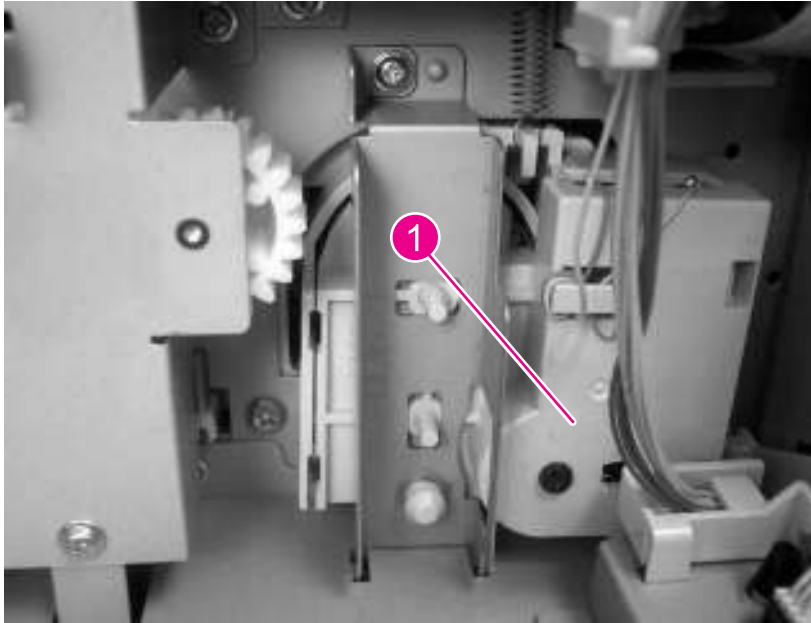
Figure 7-15 Rear-side motors (2 of 2)

1	M103, lifter motor

Rear-side solenoid
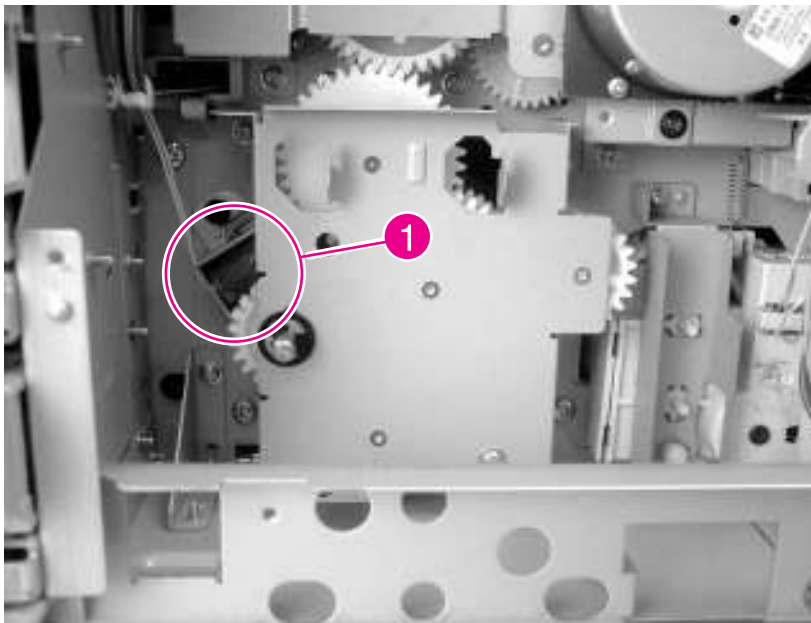
Figure 7-16 Rear-side solenoid

1	SL101, tray 2 pickup solenoid

Reversing-unit motors and solenoids
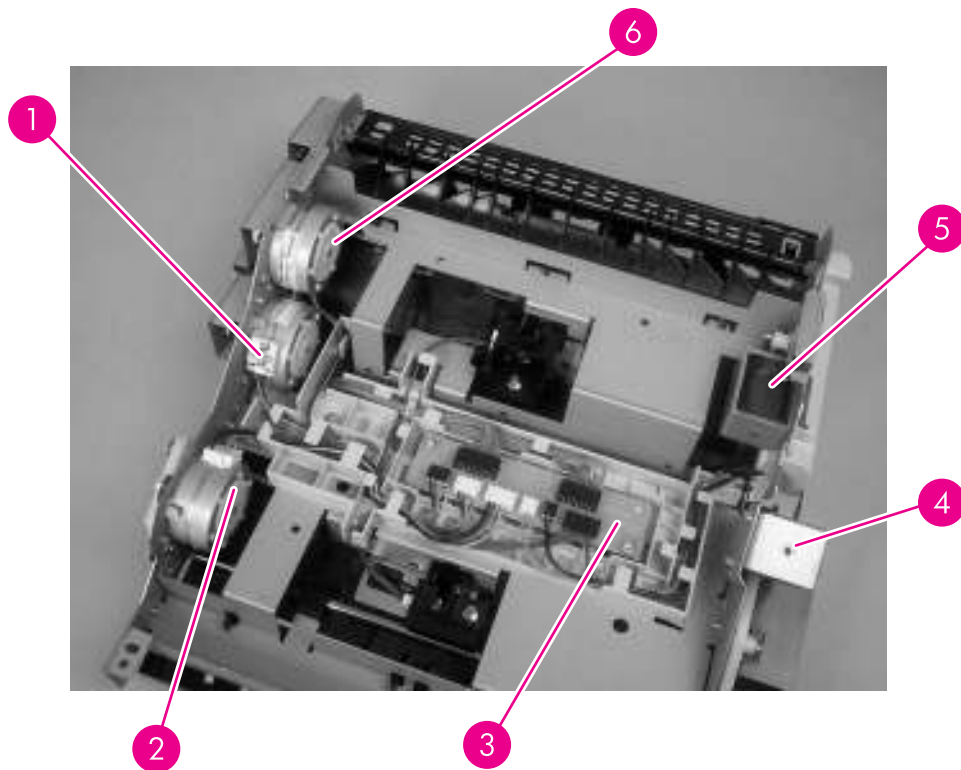
Figure 7-17 Reversing-unit motors and solenoids

1	M104, crossing motor
2	M105, reversing roller
3	Reversing-intermediate PCA
4	SL106, reversing-roller alienation solenoid (under the shield)
5	SL105, face-up solenoid
6	M106, delivery motor

Right, rear corner components (1 of 2)
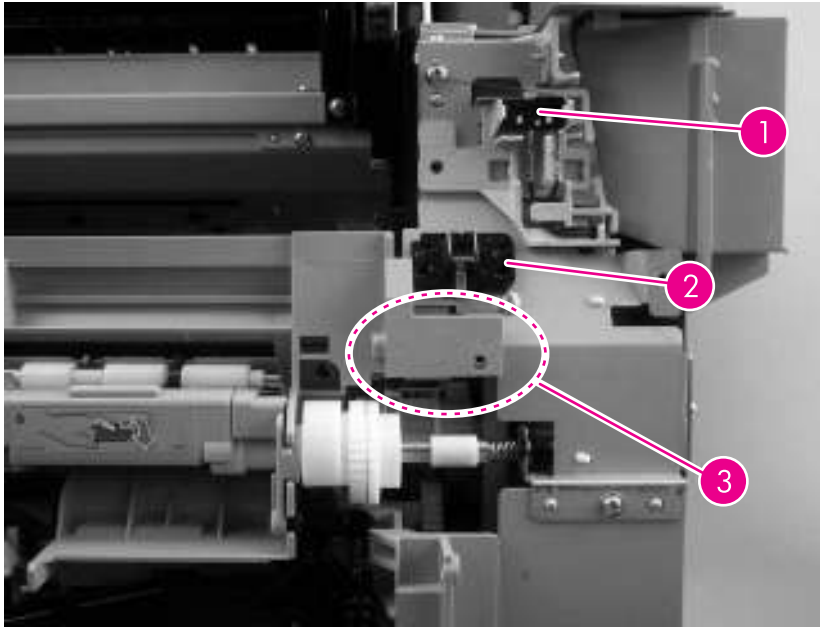
Figure 7-18 Right, rear corner components (1 of 2)

1	SW101, top-cover switch
2	Envelope-feeder connector
3	SL102, tray 1 pickup solenoid (behind the cover)

Right, rear corner components (2 of 2)
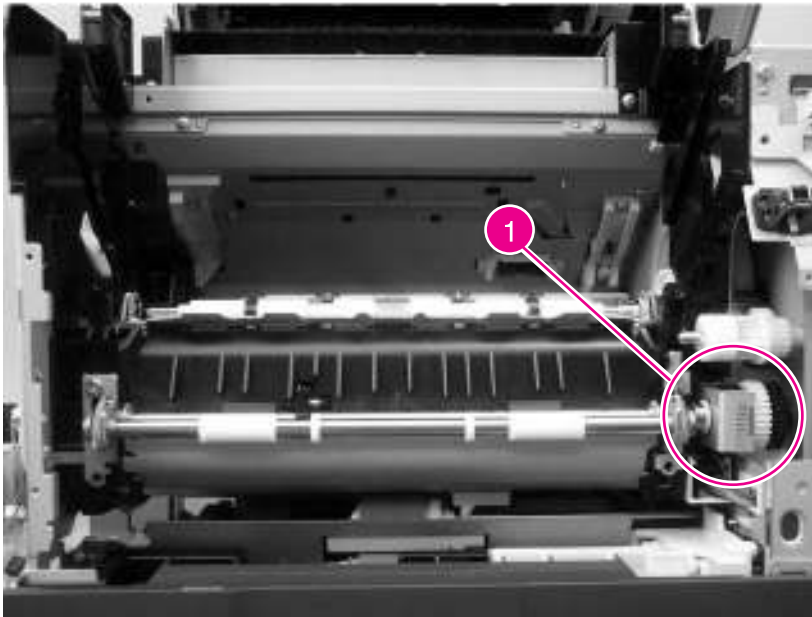
Figure 7-19 Right, rear corner components (2 of 2)

1	CL101, feed-roller clutch

Scanner and ADF components

The photos in this section show the locations of the scanner and ADF components.

ADF output-bin-full sensor
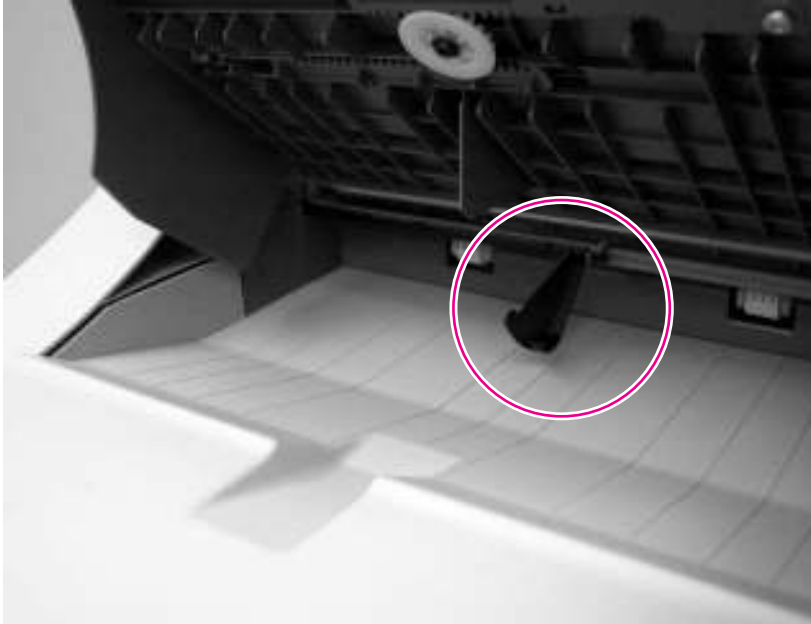
Figure 7-20 ADF output-bin-full sensor

ADF pickup assembly sensors
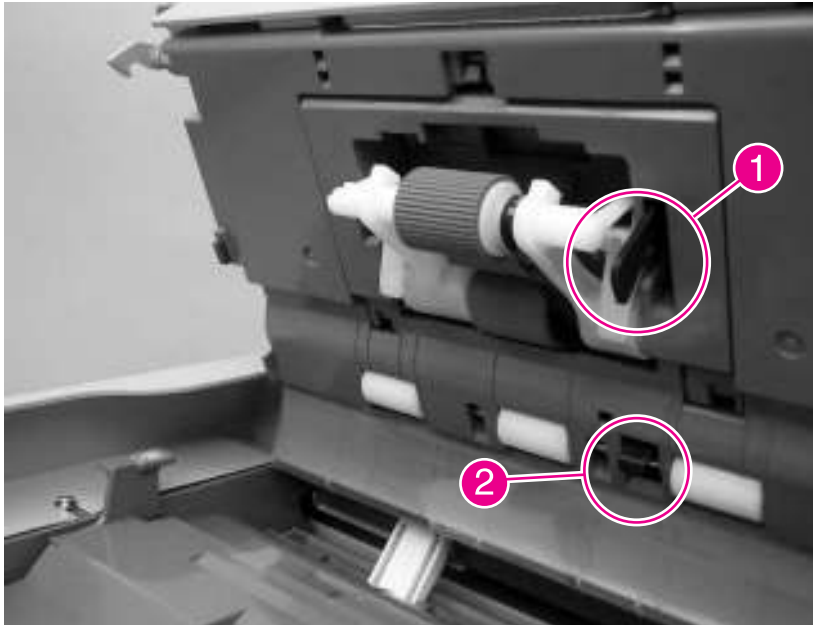
Figure 7-21 ADF pickup assembly sensors

1	ADF paper-present sensor
2	ADF top-of-page sensor

ADF motors, solenoid, and sensors
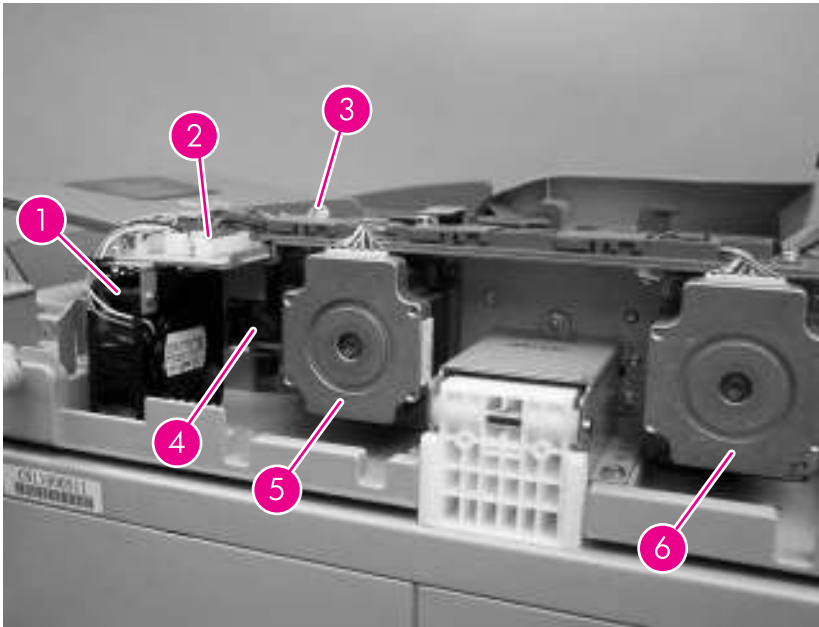
Figure 7-22 ADF motors, solenoid, and sensors

1	ADF fan
2	Scanner-controller PCA
3	ADF LED PCA
4	ADF solenoid
5	ADF feed motor
6	ADF read motor

General timing chart
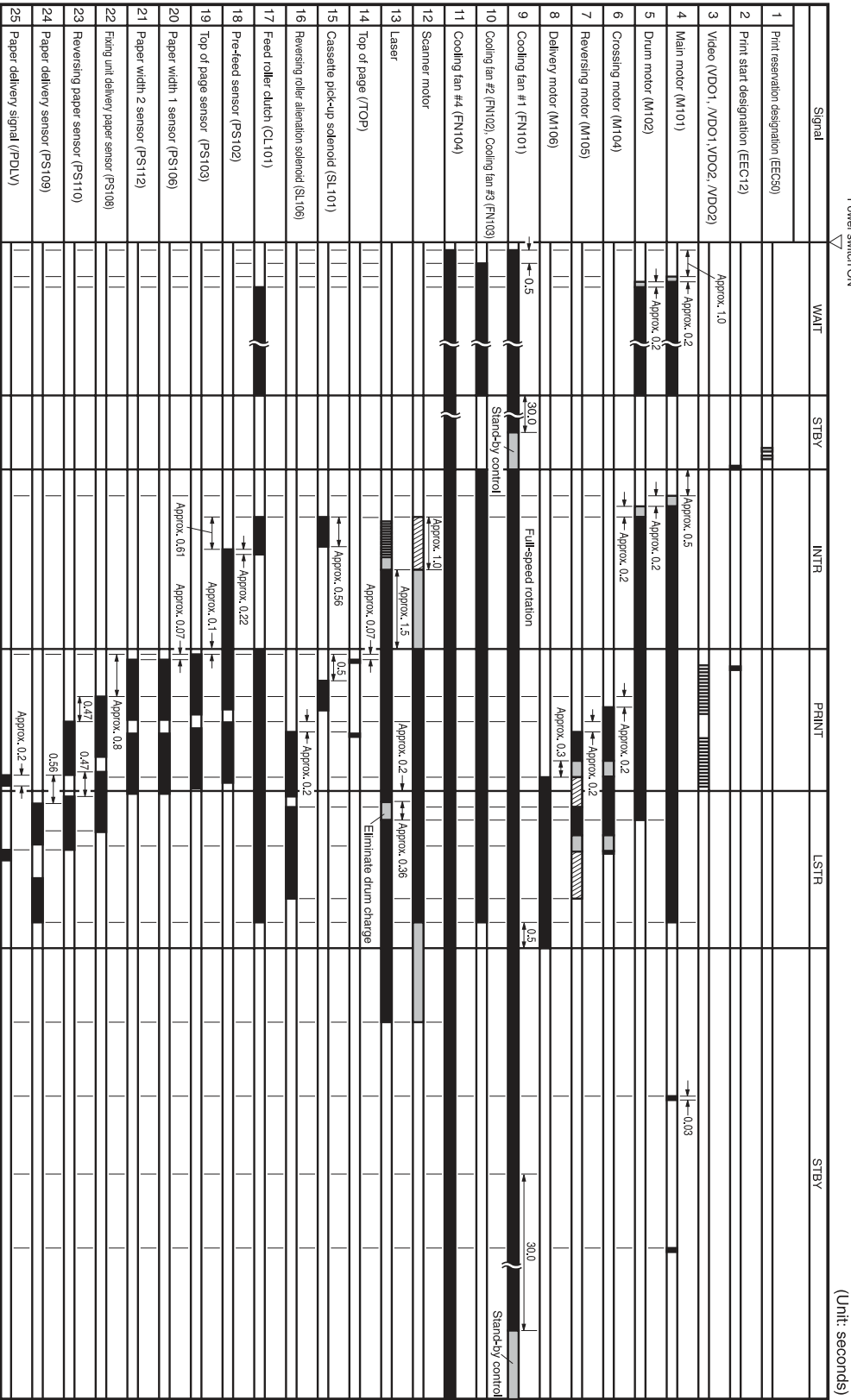
Figure 7-23 General timing chart (1 of 2)
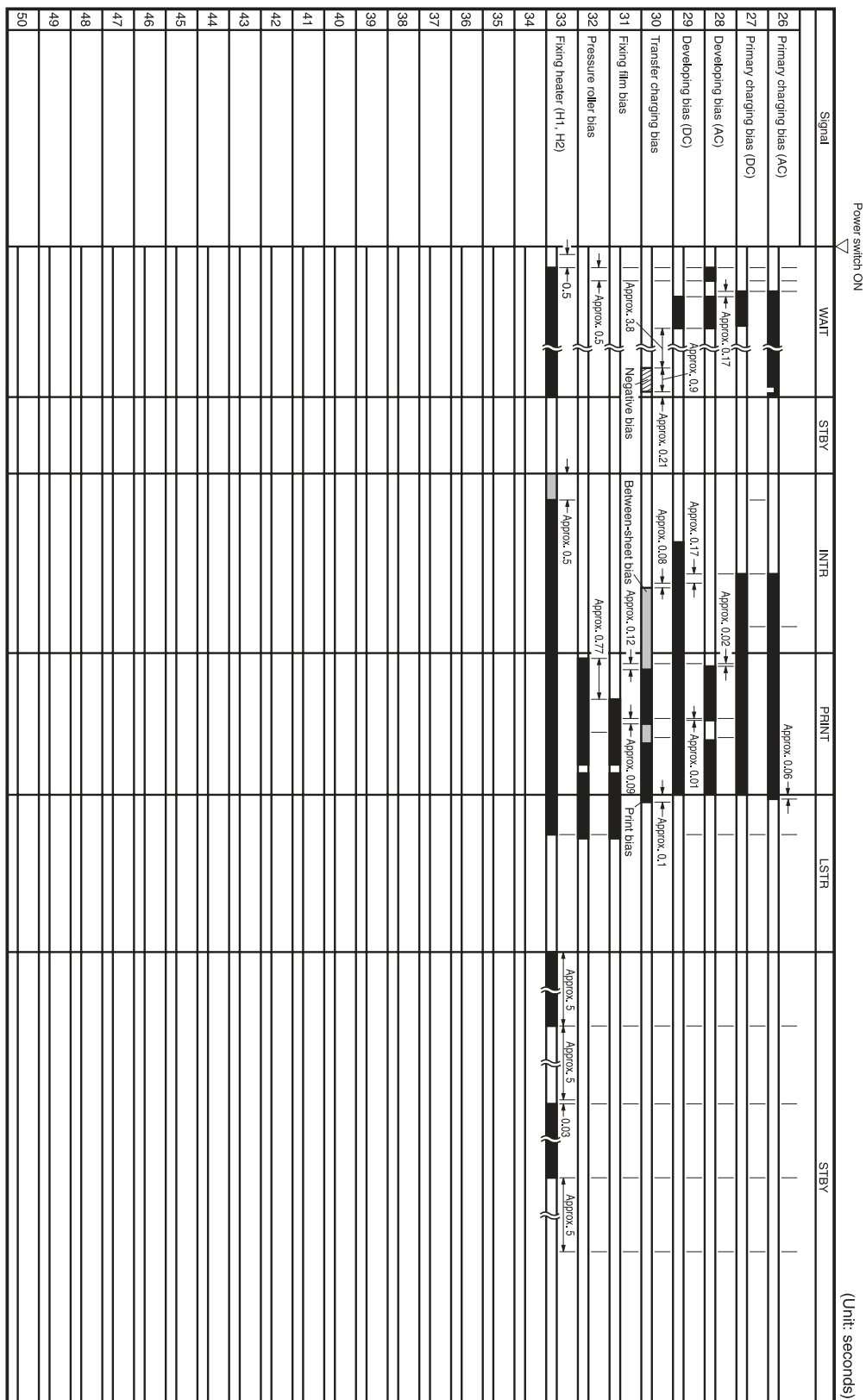
Figure 7-24 General timing chart (2 of 2)

General circuit diagrams
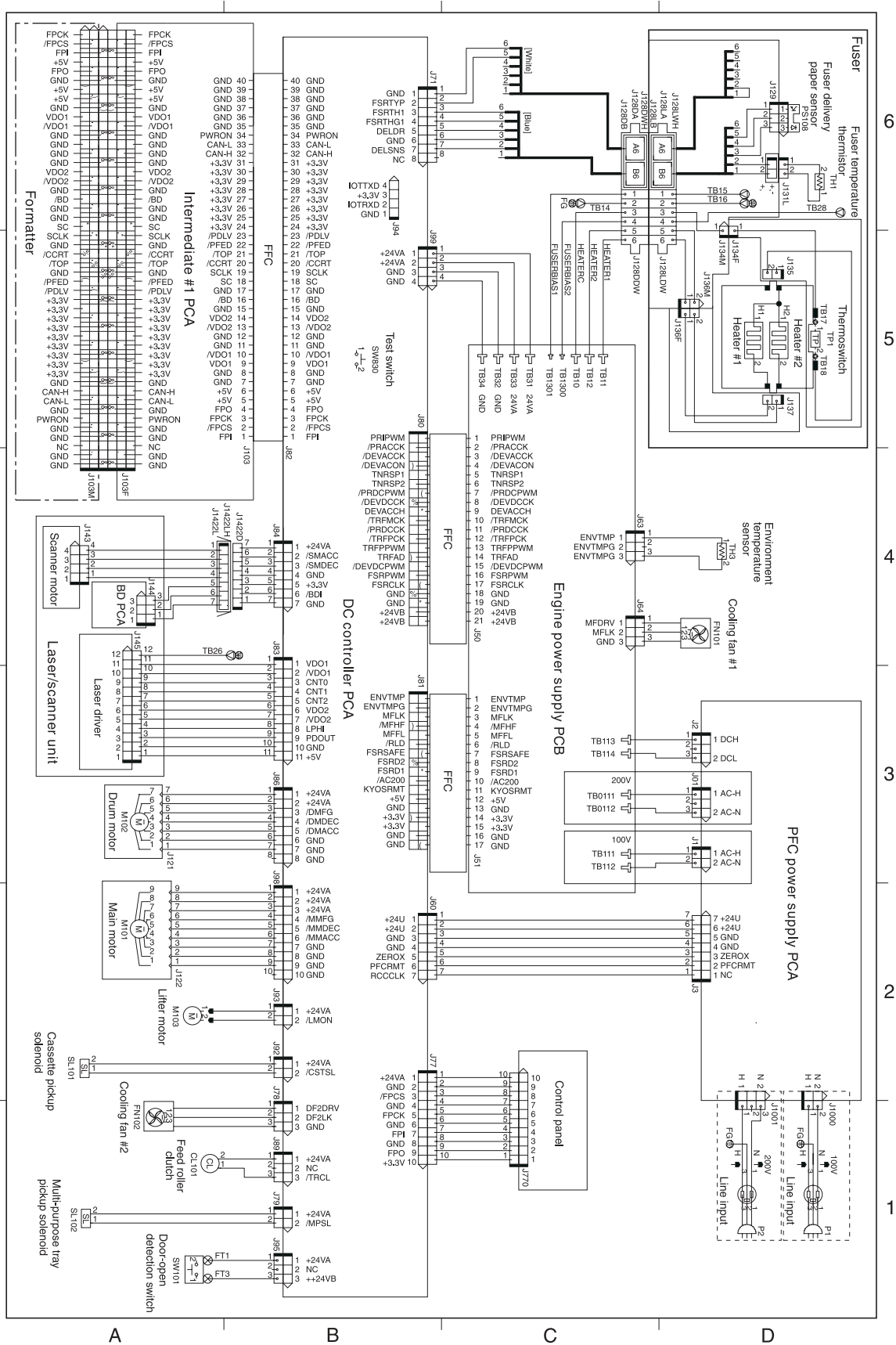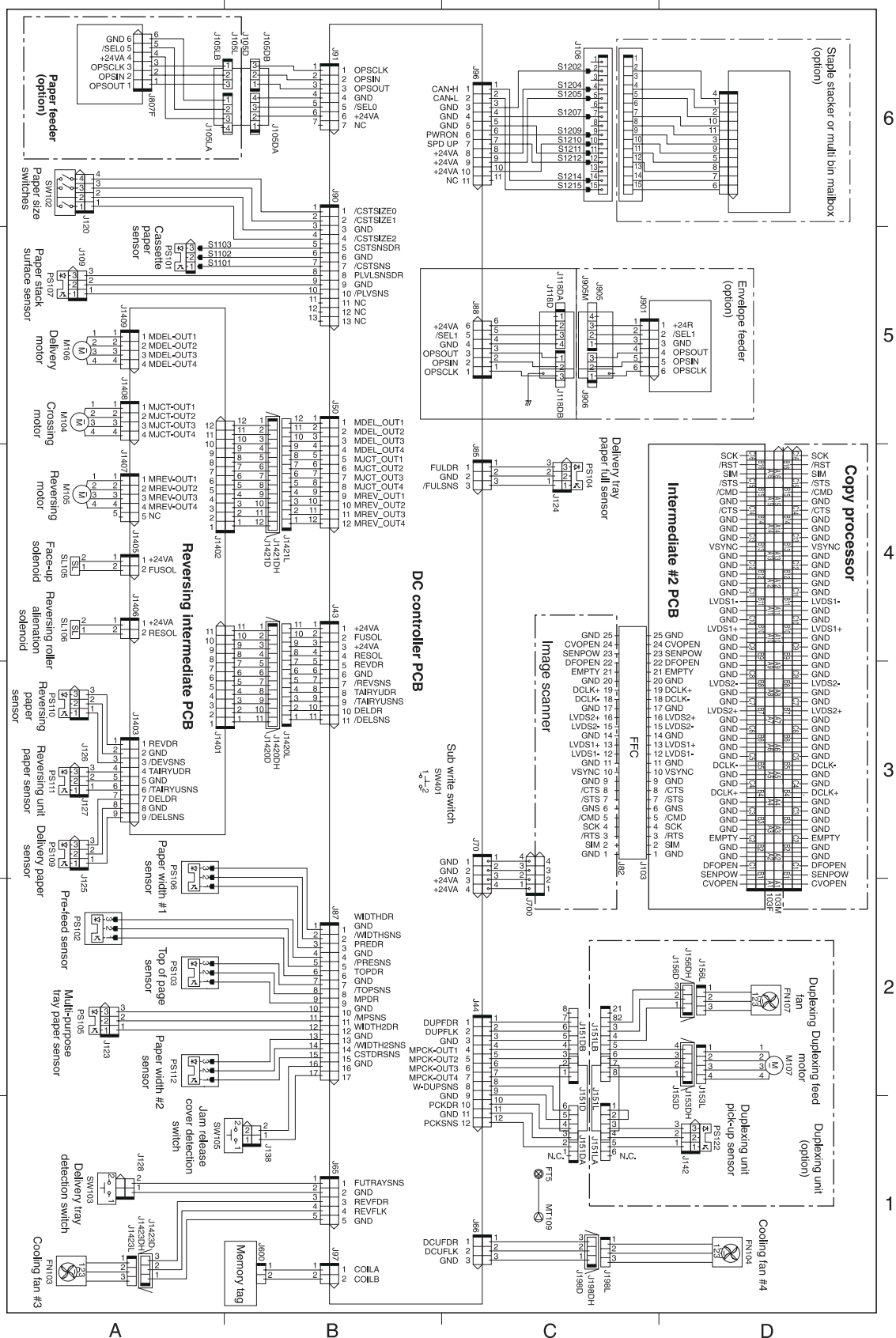
Figure 7-26 General circuit diagram (2 of 2)

Figure 7-27 Circuit diagram for the 500-sheet feeder

Upper ADF Assembly
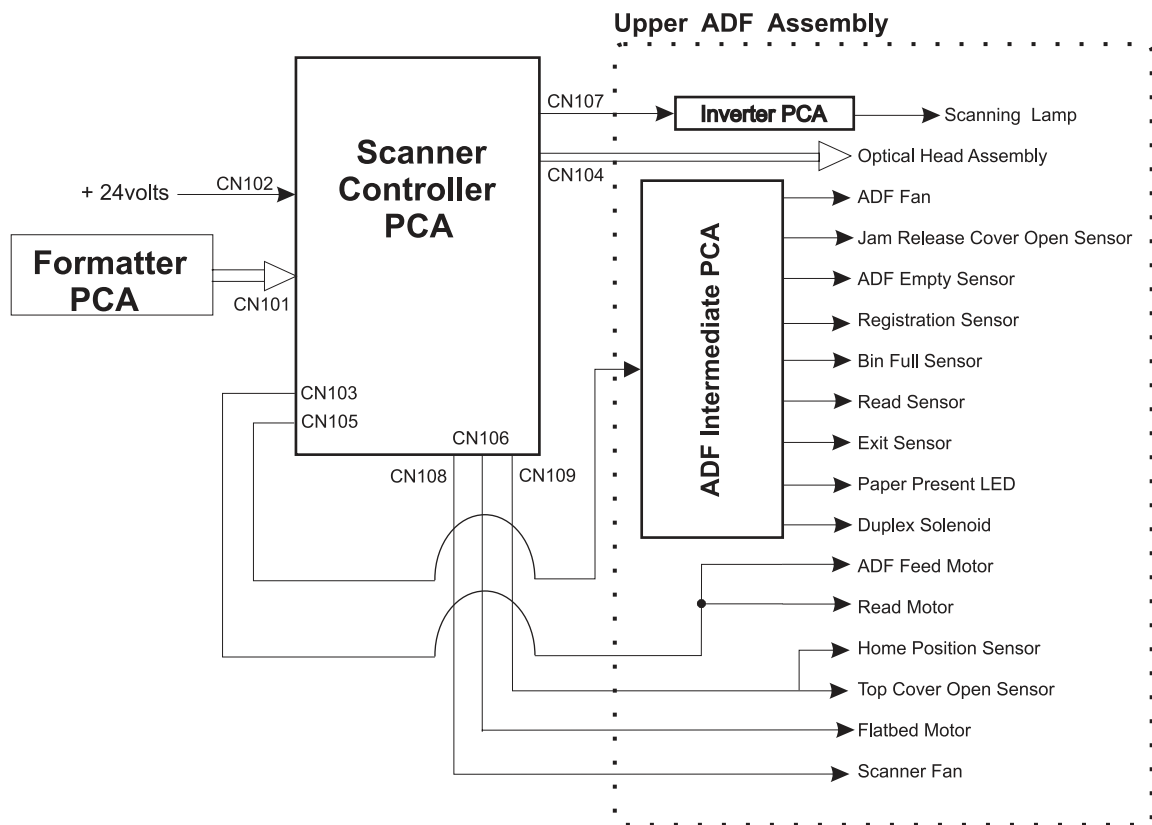
Figure 7-28 Circuit diagram for the scanner

7   Troubleshooting

8 Parts and diagrams

This chapter contains information about ordering parts, supplies, and accessories. It includes diagrams of the major subassemblies of the MFP and includes the part numbers for replaceable parts.

- How to order parts, supplies, and accessories

- How to use the parts lists and diagrams

- Screws that are used in the MFP

- Customer-replaceable parts and accessories

- Documentation, software, and training material

- Assembly locations

- External components

- Print-engine internal components

- ADF components

- Scanner components

- 500-sheet feeder components

- Optional devices

- Alphabetical parts list

- Numerical parts list

How to order parts, supplies, and accessories

Parts

All standard part numbers that are listed in this chapter can be ordered from the HP Customer Services and Support Organization. To search for HP product parts by using the HP product name, the model number, or the part number, go to www.partsurfer.hp.com. You can also choose the HP product from a list.

To order parts, go to www.hp.com/buyparts.

Supplies and accessories

Order supplies and accessories from the following Web sites:

■   North America: www.hp.com/sbso/product/supplies

■   Canada: www.hp.ca/catalog/supplies

■   Europe: www.hp.com/go/supplies

■   Asia Pacific: www.hp.com/paper

The following lists of supplies and accessories were current at the time of printing. Availability of accessories might change during the life of the MFP.

How to use the parts lists and diagrams

The figures in this chapter illustrate the major field replaceable unit (FRU) assemblies and subassemblies in the HP LaserJet 4345mfp Series. A table (parts number list) follows each exploded assembly diagram. The tables list a reference number for each specific part, the part number, and a brief description of the part.

⚠ **CAUTION**   When looking for an electrical part, pay careful attention to the voltage that is listed in the part description column to ensure that the component part number that you select is for the correct MFP model.

NOTE   Parts that do not have a reference number or part number are not FRUs, and cannot be ordered as individual replacement parts. However, all serviceable parts should be available as part of a larger operable subassembly.

The following lists of supplies and accessories were current at the time of printing. Availability of accessories might change during the life of the MFP.

Screws that are used in the MFP

The following table describes the screws that are used in the MFP and provides guidelines to help determine where each type of screw is used. The screws can vary in length depending on the thickness of the material that is being fastened. Always note where each type of screw is located and replace each one in its original location.

NOTE When you are disassembling the MFP, place the screws into the chassis holes from which they were removed. This prevents their loss, and ensures that the correct type and length of screw for each location is used when the MFP is reassembled.

Table 8-1 Common fasteners used in this MFP

Drawing and description	Purpose
Phillips-head machine screw with captive star washer	This screw is used to fasten metal to metal when good electrical contact is needed. This screw also provides high resistance to loosening.
Phillips-head screw with self-tapping threads	This screw is used to fasten sheet metal or plastic to plastic frames (the deep, coarsely spaced threads provide an increased holding capability while decreasing the possibility of stripping the target hole). **NOTE** To install a self-tapping screw, first turn it counterclockwise to align it with the existing thread pattern, and then carefully turn it clockwise to tighten it. You will feel resistance and hear the screw click when it engages the existing threads in the hole. Do not overtighten the screw. If a self-tapping screw-hole becomes stripped, repair the screw-hole or replace the affected assembly.
Phillips washer-head machine screw with a broad, flat washer attached to the screw head	This screw is used to fasten sheet metal parts to the sheet metal chassis. It spans large clearance holes and distributes the load by increasing the bearing surface.

Screw measurement guide

6mm   8mm   10mm   12mm   M3   M4

Customer-replaceable parts and accessories

Accessories
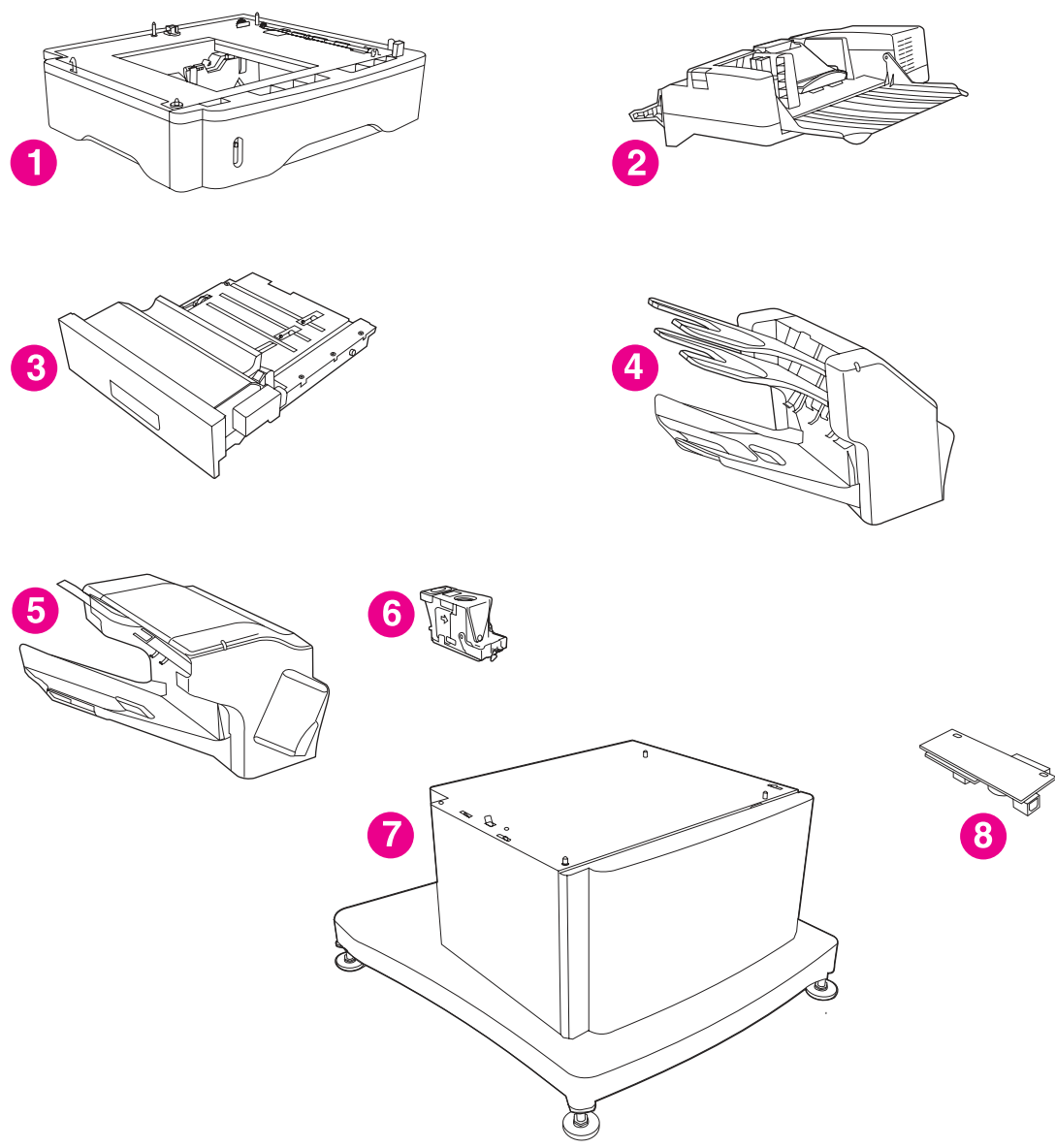
Figure 8-1 Accessories

Table 8-2 Accessories

Reference	Description	Part number	Quantity
1	Optional 500-sheet tray and feeder unit	Q5968-67901	1
2	Envelope feeder	Q2438-67902	1
3	Duplexer (duplex printing accessory)	Q5969-69001	1
4	3-bin mailbox	RM1-0981-000CN	1
5	500-sheet stapler/stacker	RC1-2597-000CN	1
6	5,000-staple cartridge	C8085-60541	1
7	Storage cabinet	Q5970A	1
8	HP LaserJet analog fax accessory 300	Q3701-60002	1

Customer-replaceable components (print engine)
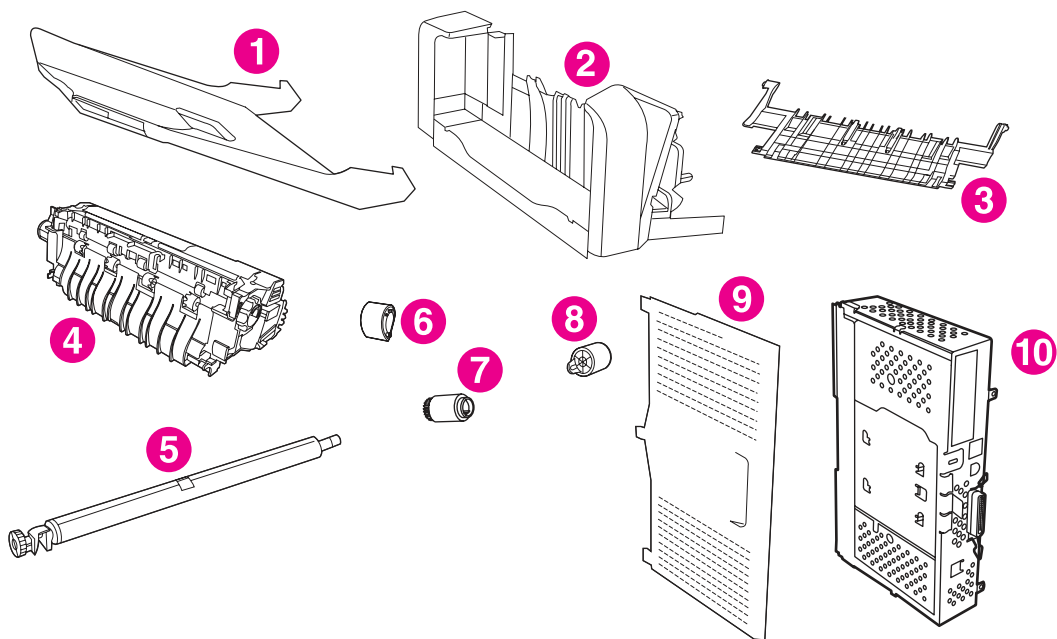
Figure 8-2 Customer-replaceable components (print engine)

Table 8-3 Customer-replaceable components (print engine)

Reference	Description	Part number	Quantity
1	Output bin	RM1-0940-000CN	1
2	Delivery tray assembly	RM1-1047-000CN	1
3	Fuser entrance guide	RM1-1046-000CN	1
4	Fuser, 110-volt, new	RM1-1043-000CN	1
4	Fuser, 2210-volt, new	RM1-1044-000CN	1
5	Roller assembly, transfer	RM1-1110-000CN	1
6	Roller, pickup, multipurpose assembly	RL1-0019-000CN	1
7	Roller, paper-feed (cassette)	RM1-0037-000CN	2
8	Roller, paper-pickup (cassette)	RM1-0036-000CN	1
9	Cover, formatter	RC1-3035-000CN	1
10	Formatter assembly, new	Q3942-67901	1
10	Formatter assembly, exchange	Q3942-69001	1

Customer-replaceable components (ADF and scanner)
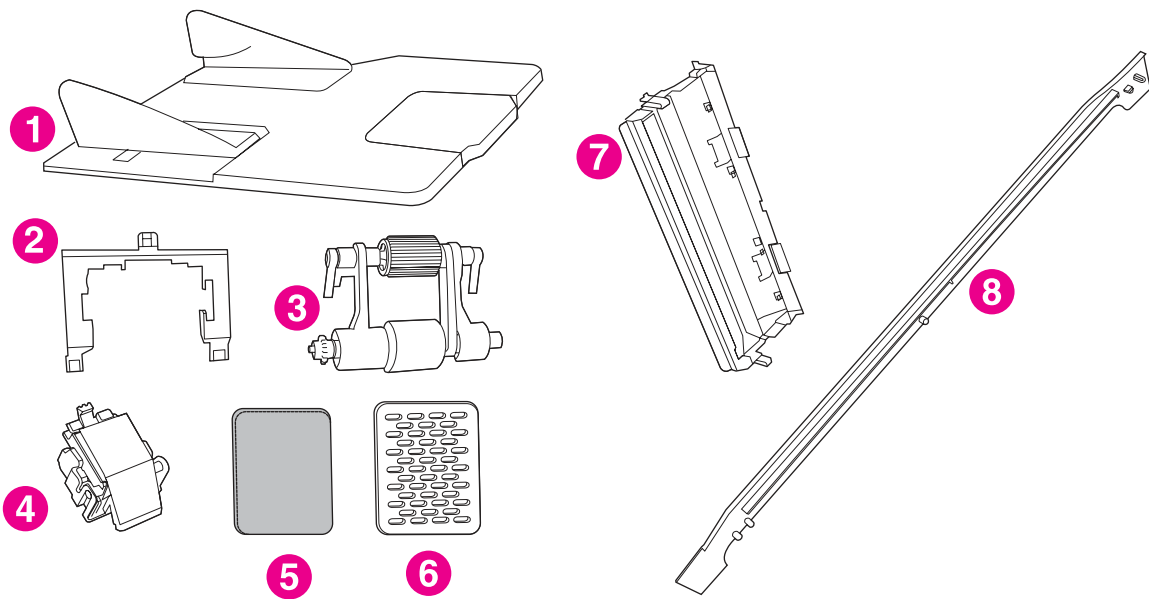
Figure 8-3 Customer-replaceable components (ADF and scanner)

Table 8-4 Customer-replaceable components (ADF and scanner)

Reference	Description	Part number	Quantity
1	ADF input tray	PF2282K042NI	1
2	ADF pickup-roller cover	PF2282K040NI	1
3	ADF pickup-roller assembly	PF2282K039NI	1
4	ADF separation-pad assembly	PF2282K035NI	1
5	ADF fan filter	IR4041P007NI	1
6	ADF fan-filter cover	IR4041P217NI	1
7	ADF mylar-holder assembly	PF2282K043NI	1
8	ADF front-cover flange	IR4041P215NI	1

Cables and interfaces
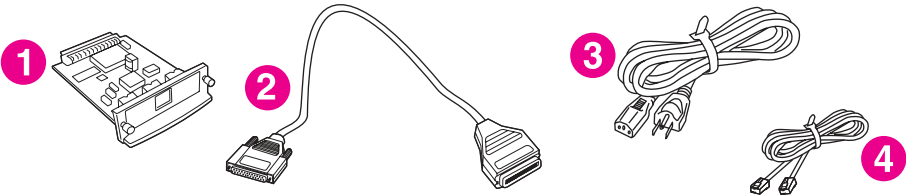
Figure 8-4 Cables and interfaces

Table 8-5 Cables and interfaces

Reference	Description	Part number	Quantity
1	HP Jetdirect 620n Fast Ethernet (10/100Base-TX) print server (EIO card)	J7934A	1
1	HP Jetdirect connectivity card for USB, serial, and LocalTalk connections	J4135A	1
2	Parallel cable, 2-meter IEEE 1284-B compliant	C2950A	1
2	Parallel cable, 3-meter IEEE 1284-B compliant	C2951A	1
3	Power cord, OPT-918 3-COND 2.3-M-LG	8120-6798	1
3	Power cord, OPT-903 3-COND 2.25-M-LG	8120-6812	1
3	Power cord, OPT-917 3-COND 2.25-M-LG	8120-6813	1
3	Power cord, OPT-912 3-COND 2.25-M-LG	8120-6814	1
3	Power cord, OPT-906 3-COND 2.25-M-LG	8120-6815	1
3	Power cord, OPT-920 3-CON 2.3-M-LG	8120-6869	1
3	Power cord, OPT-921 3-COND 2.3-M-LG	8120-6980	1
3	Power cord, OPT-900 3-COND 2.3-M-LG	8120-8706	1
3	Power cord, OPT-922 3-COND 2.3-M-LG	8120-8707	1
3	Power cord, OPT-901 3-COND 2.3-M-LG	8121-0834	1
4	Phone cord, MOD-PHONE-ASSY 6-COND 118-IN-LG	8121-0811	1
4	Phone cord, cable-modem-facsimile, Korean	8120-8908	1
4	Phone cord, United Kingdom	8120-8921	1
4	Phone cord, Germany and Eastern Europe	8120-8912	1
4	Phone cord, Netherlands	8120-8915	1
4	Phone cord, France	8120-8923	1
4	Phone cord, Norway	8120-8916	1
4	Phone cord, Switzerland	8120-8919	1
4	Phone cord, Turkey	8120-8920	1
4	Phone cord, Denmark	8120-8911	1
4	Phone cord, Italy	8120-8914	1
4	Phone cord, South Africa	8120-8917	1
4	Phone cord, Czech Republic/SK	8120-8922	1
4	Phone cord, Australia	8120-8907	1

Control panel and control-panel overlays
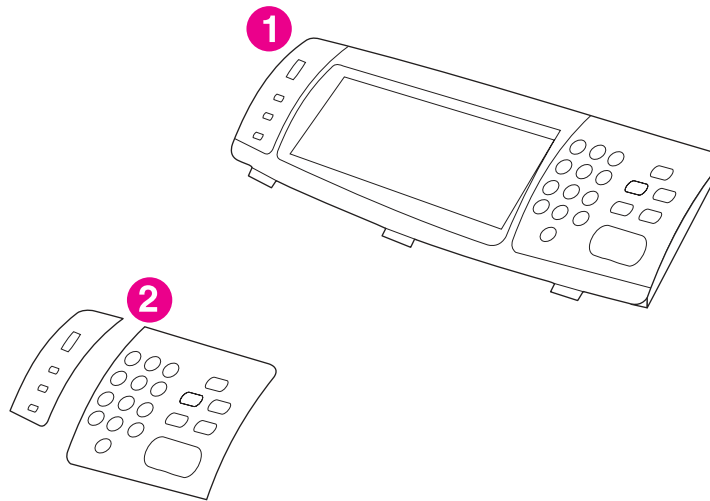
Figure 8-5 Control panel and control-panel overlays

Table 8-6 Control panel and control-panel overlays

Reference	Description	Part number	Quantity
1	Control-panel assembly	Q3942-60102	1
2	Control-panel overlays, English	Q3942-60103	1
2	Control-panel overlays, French	Q3942-60104	1
2	Control-panel overlays, Italian	Q3942-60105	1
2	Control-panel overlays, German	Q3942-60106	1
2	Control-panel overlays, Spanish	Q3942-60107	1
2	Control-panel overlays, Dutch	Q3942-60108	1
2	Control-panel overlays, Portuguese	Q3942-60109	1
2	Control-panel overlays, Norwegian	Q3942-60110	1
2	Control-panel overlays, Swedish	Q3942-60111	1
2	Control-panel overlays, Finnish	Q3942-60112	1
2	Control-panel overlays, Danish	Q3942-60113	1
2	Control-panel overlays, Polish	Q3942-60114	1
2	Control-panel overlays, Russian	Q3942-60115	1
2	Control-panel overlays, Czech	Q3942-60116	1
2	Control-panel overlays, Hungarian	Q3942-60117	1
2	Control-panel overlays, Simplified Chinese	Q3942-60119	1
2	Control-panel overlays, Traditional Chinese	Q3942-60118	1
2	Control-panel overlays, Korean	Q3942-60120	1
2	Control-panel overlays, Japanese	Q3942-60121	1
2	Control-panel overlays, Turkish	Q3942-60122	1
2	Control-panel overlays, Greek	Q3942-60123	1
2	Control-panel overlays, Hebrew	Q3942-60124	1
2	Control-panel overlays, Arabic	Q3942-60125	1
2	Control-panel overlays, Thai	Q3942-60132	1

Memory
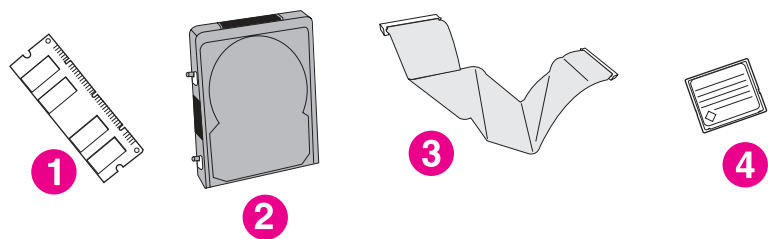
Figure 8-6 Memory

Table 8-7 Memory

Reference	Description	Part number	Quantity
1	100-pin DDR memory DIMM (dual inline memory module), 64 MB	Q2625A	1
1	100-pin DDR memory DIMM, 128 MB	Q2626A	1
1	100-pin DDR memory DIMM, 256 MB	Q2627-67951	1
2	Hard disk, 20 GB	J7948-61003	1
3	Cable for hard disk, flat-flexible	5851-1827	1
4	Flash memory card, 32 MB	Q2635-67907	1

Print cartridge and maintenance kits
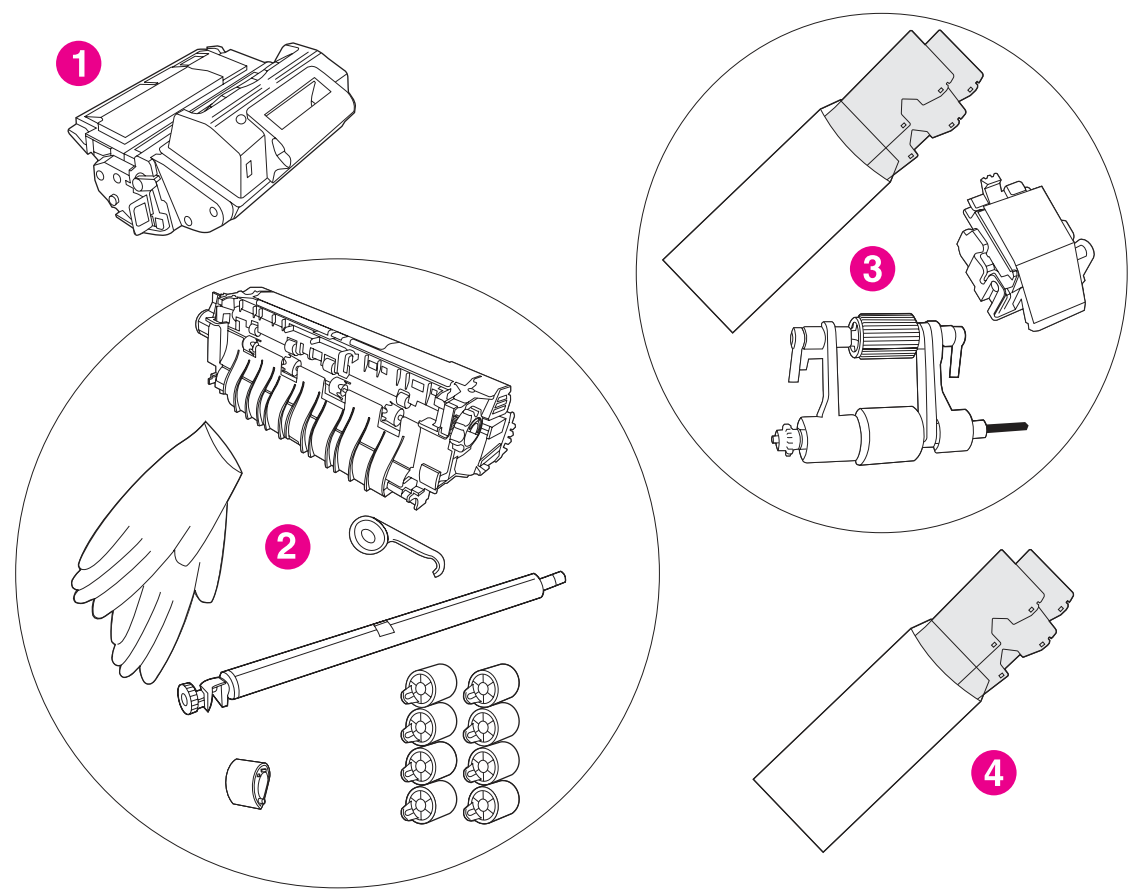
Figure 8-7 Print cartridge and maintenance kits

Table 8-8 Print cartridge and maintenance kits

Reference	Description	Part number	Quantity
1	HP LaserJet print cartridge	Q5945-67901	1
2	Printer maintenance kit, 110-volt	Q5998-67901	1
2	Printer maintenance kit, 220-volt	Q5999-67901	1
3	ADF maintenance kit	Q5997-67901	1
4	ADF mylar replacement kit	Q6496–67901	1
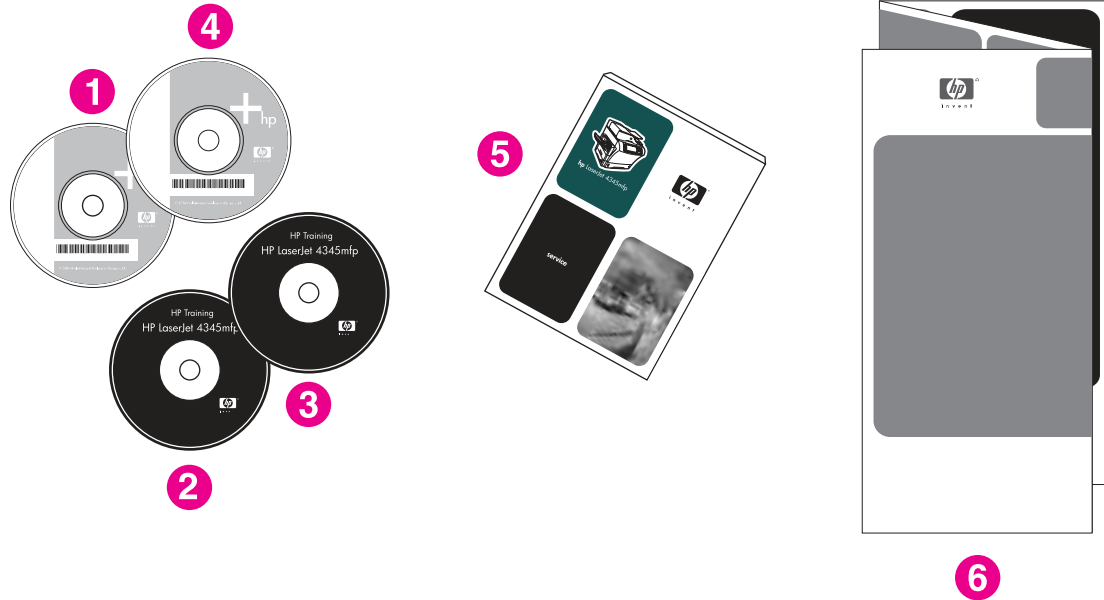
Documentation, software, and training material

Table 8-9 Documentation, software, and training material

Reference	Description	Part number	Quantity
1	HP LaserJet 4345mfp Series software CD, America and Western Europe	Q3942-60135	1
1	HP LaserJet 4345mfp Series software CD, Western Europe	Q3942-60136	1
1	HP LaserJet 4345mfp Series software CD, Northern Europe	Q3942-60137	1
1	HP LaserJet 4345mfp Series software CD, Eastern Europe	Q3942-60138	1
1	HP LaserJet 4345mfp Series software CD, Asia	Q3942-60139	1
2	Customer in-box training CD, English only	MKTNG-00473	1
3	Service and support training CD	C3942-60133	1
4	HP Digital Sending Software CD (trial version)	MKTNG-00472	1
5	HP LaserJet 4345mfp Series service manual	Q3942-90950	1
6	Wall poster, quick reference, English and French	Q3942-90925	1
6	Wall poster, quick reference, Italian and German	Q3942-90926	1
6	Wall poster, quick reference, Spanish and Portuguese	Q3942-90927	1
6	Wall poster, quick reference, Dutch and Swedish	Q3942-90928	1
6	Wall poster, quick reference, Danish and Norwegian	Q3942-90929	1
6	Wall poster, quick reference, Finnish and Russian	Q3942-90930	1
6	Wall poster, quick reference, Czech and Polish	Q3942-90931	1
6	Wall poster, quick reference, Hungarian and Turkish	Q3942-90932	1
6	Wall poster, quick reference, Simplified Chinese and Korean	Q3942-90933	1
6	Wall poster, quick reference, Traditional Chinese and English	Q3942-90934	1

Assembly locations
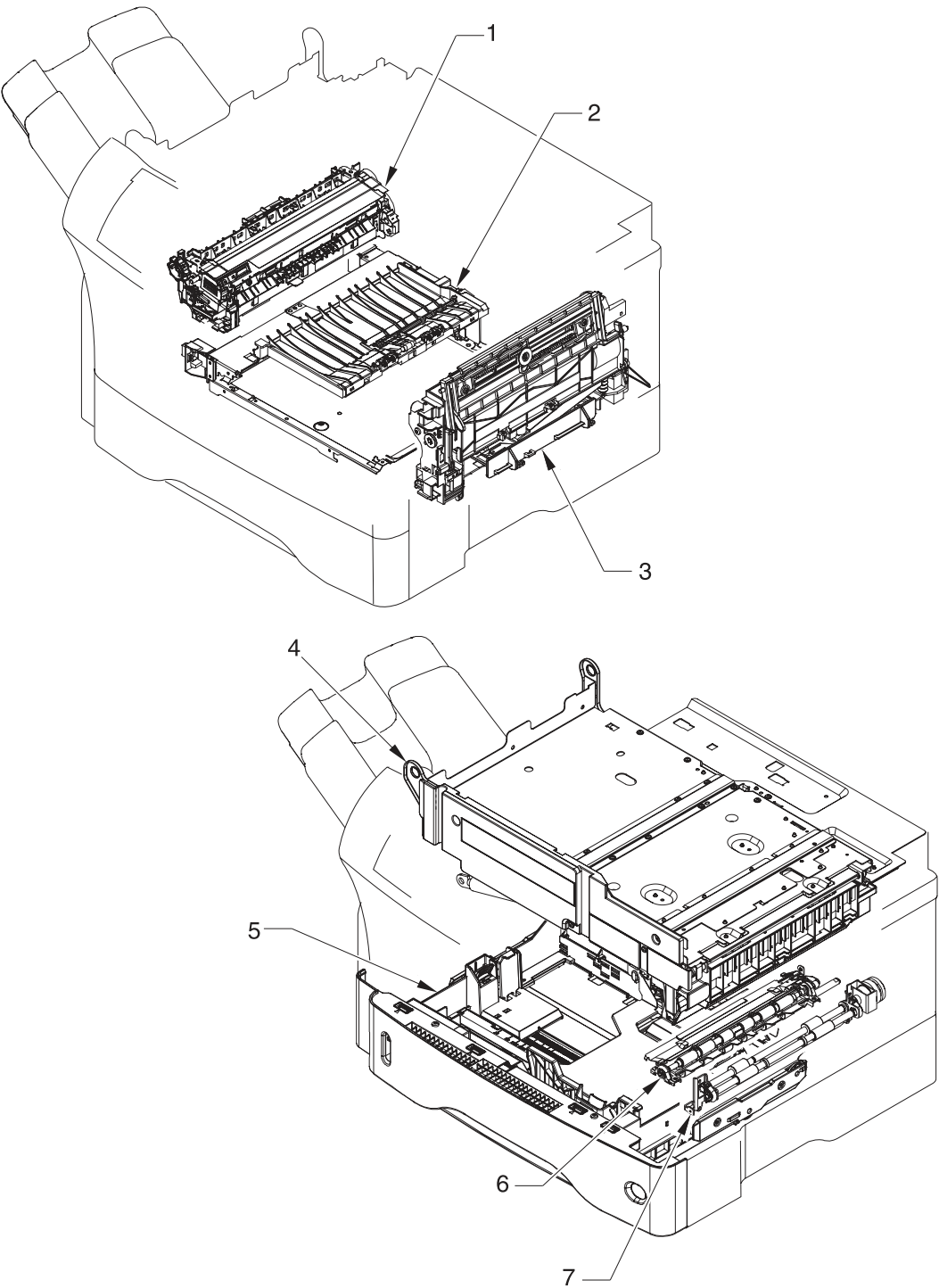
Figure 8-9 Print-engine assemblies (1 of 2)

Item	Assembly name	Details
1	Fuser	See Figure 8-29 Fuser.
2	Electrical/forward assembly	See Figure 8-18 Electrical/forward assembly.
3	Multipurpose assembly	See Figure 8-25 Multipurpose assembly.
4	Upper-plate assembly	See Figure 8-12 Upper-plate assembly.
5	Cassette	See Figure 8-22 Cassette.
6	Registration assembly	See Figure 8-24 Registration assembly.
7	Paper-feed-roller assembly	See Figure 8-23 Paper-feed roller assembly.
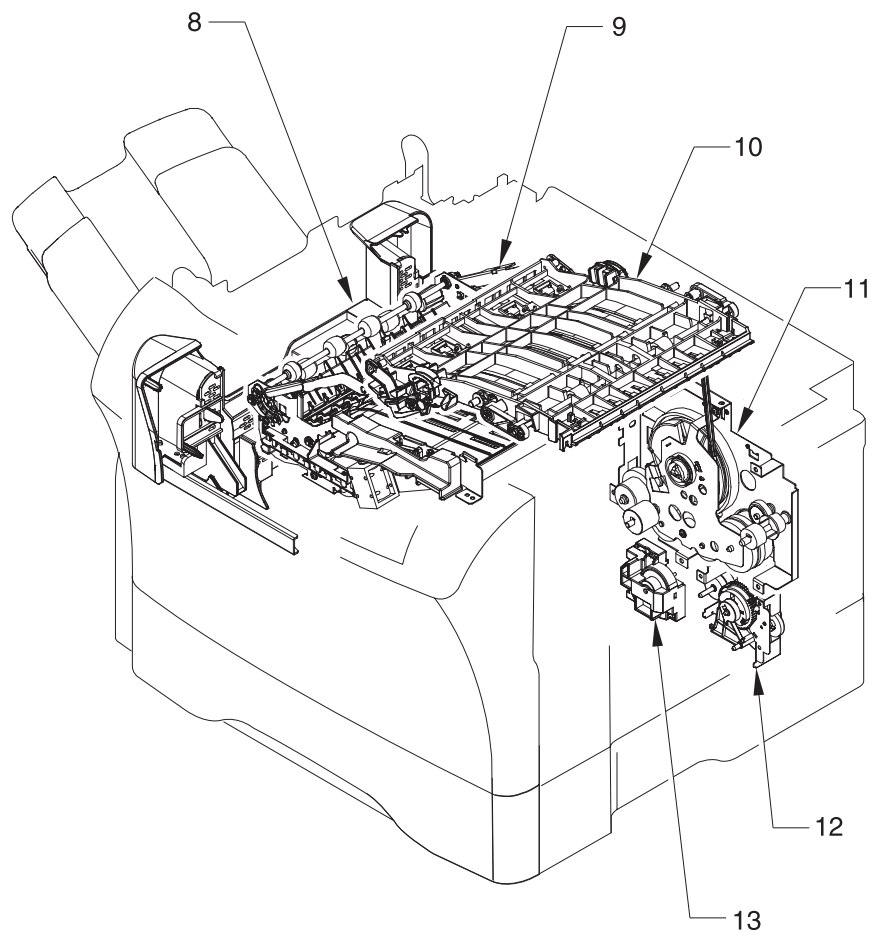
Figure 8-10 Print-engine assemblies (2 of 2)

Item	Assembly name	Details
8	Delivery assembly	See Figure 8-28 Delivery assembly.
9	Reverse assembly	See Figure 8-26 Reverse assembly.
10	Reverse-separation-guide assembly	See Figure 8-27 Reverse-separation-guide assembly.
11	Main drive assembly	See Figure 8-19 Main drive assembly.
12	Paper-pickup-drive assembly	See Figure 8-20 Paper-pickup-drive assembly.
13	Lifter-drive assembly	See Figure 8-21 Lifter-drive assembly.

External components
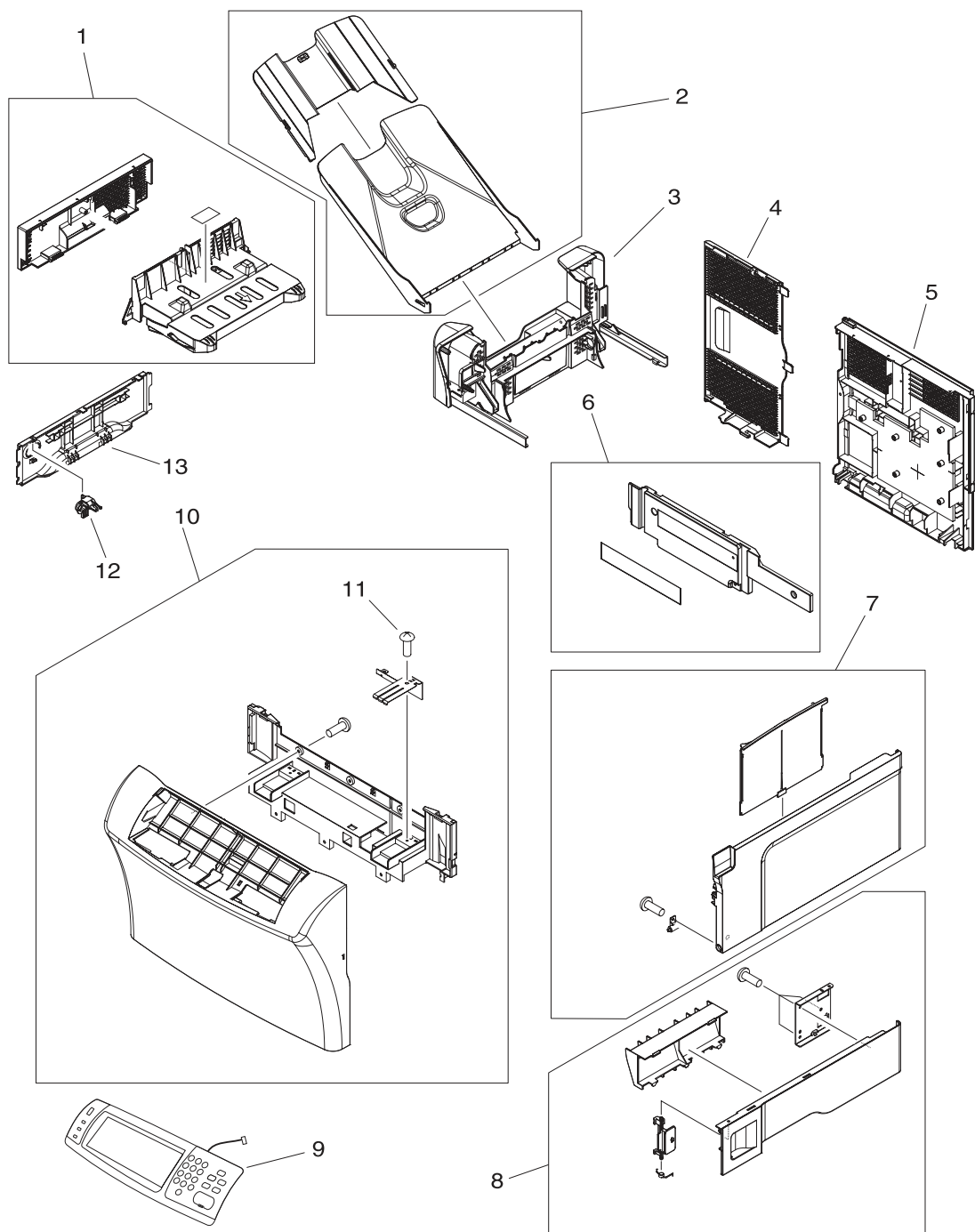
Figure 8-11 External panels and covers

Table 8-10 External panels and covers

Reference	Description	Part number	Quantity
1	Cover, duplexing-unit assembly	RM1-1018-000CN	1
2	Output-bin assembly	RM1-0940-000CN	1
3	Delivery assembly	RM1-1047-000CN	1
4	Cover, formatter	RC1-3035-000CN	1
5	Cover, rear	RM1-1017-000CN	1
6	Cover, front corner	RL1-0457-000CN	1
7	Cover, right assembly	RM1-1016-000CN	1
8	Cover, right lower assembly	RM1-1033-000CN	1
9	Control-panel assembly	Q3942-60102	1
10	Cover, front assembly	RM1-1015-000CN	1
11	Screw, tapping, pan-head, M4x10	XB4-7401-0007CN	
12	Switch, power	RC1-3044-000CN	1
13	Cover, cassette, left side	RC1-3043-000CN	1

Print-engine internal components

Upper-plate assembly
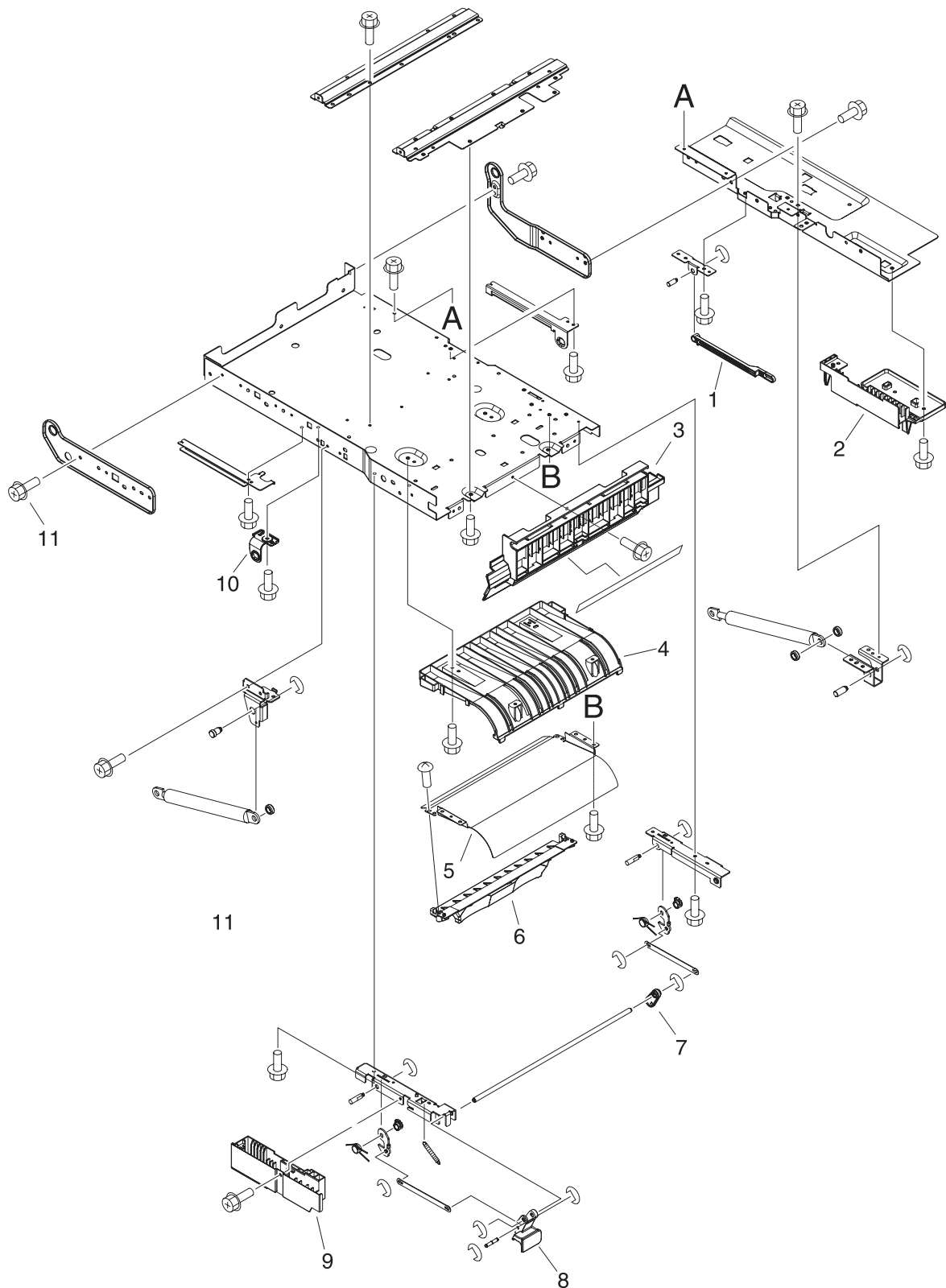
Figure 8-12 Upper-plate assembly

Table 8-11 Upper-plate assembly

Reference	Description	Part number	Quantity
1	Rod, link (upper plate)	RC1-2830-000CN	1
2	Cover, rear lock (upper plate)	RC1-2821-000CN	1
3	Holder, right shutter (upper plate)	RC1-2855-000CN	1
4	Guide, legal-size (upper plate)	RC1-2854-000CN	1
5	Guide, cartridge (upper plate)	RC1-2853-000CN	1
6	Support, cartridge (upper plate)	RC1-2856-000CN	1
7	Link, handle (upper plate)	RC1-2822-000CN	1
8	Handle, lock (upper plate)	RC1-2818-000CN	1
9	Cover, lock, front (upper plate)	RC1-2820-000CN	1
10	Block, guide support (upper plate)	RC1-3102-000CN	1
11	Screw, RS, M3x6	XA9-1495-000CN	

Internal components (1 of 5)

Figure 8-13 Internal components (1 of 5)
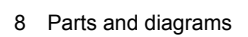
Table 8-12 Internal components (1 of 5)

Reference	Description	Part number	Quantity
1	Laser/scanner assembly	RM1-1573-000CN	1
2	Screw, RS, M3x12	XA9-1447-000CN	
3	Cable, image scanner (print engine)	RM1-1398-000CN	1
4	Registration assembly	RM1-0011-060CN	1
5	Cable, laser (print engine)	RM1-1367-000CN	1
6	Cable, beam-detect to scanner (print engine)	RM1-1372-000CN	1
7	Lever, shutter	RC1-3106-000CN	1
8	Flag, shutter	RC1-0378-000CN	1
9	Spring, torsion	RC1-0379-000CN	1
10	Paper-pickup-drive assembly	RM1-0034-070CN	1
11	Solenoid (SL101)	RK2-0269-000CN	1
12	Gear, 18T	RU5-0045-020CN	1
13	Gear, 23T	RU5-0256-000CN	1
14	Guide, paper sensing (PS101)	RM1-1010-000CN	1
15	Spring, tension	RC1-0167-000CN	1
16	Photointerrupter (PS107)	WG8-5624-000CN	1
17	Roller, paper-feed (cassette)	RM1-0037-020CN	2
18	Limiter, torque	RC1-2758-000CN	1
19	Roller, paper-pickup (cassette)	RM1-0036-000CN	1
20	Spring, torsion	RC1-0061-000CN	1
21	Roller, paper-feed assembly	RM1-0012-020CN	1
22	Flag, paper-feed sensor	RC1-0060-000CN	1
23	Thermistor (TH3)	RK2-0359-000CN	1
24	Screw, S, M3x8	XA9-1500-000CN	
25	Fan, main cooling (FN101)	RK2-0278-000CN	1
26	Fan, reversing unit (FN103)	RK2-0280-000CN	1
27	Cover, left-side, front	RC1-3052-000CN	1
not shown	Complete print engine (110 volt)	Q3942-67902	
not shown	Complete print engine (220 volt)	Q3942-67903	
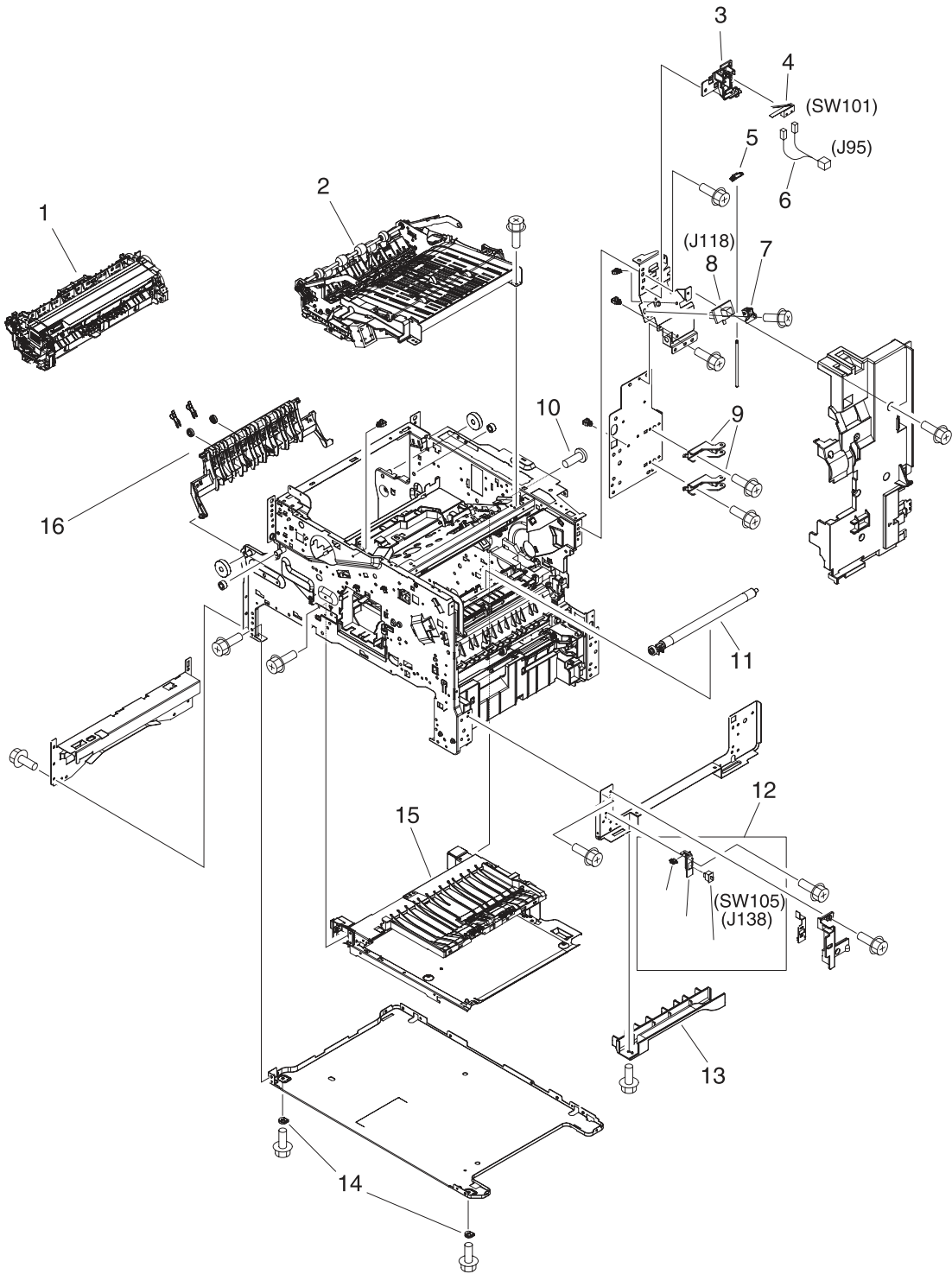
Figure 8-14 Internal components (2 of 5)

Table 8-13 Internal components (2 of 5)

Reference	Description	Part number	Quantity
1	Fuser (100–127 volt)	RM1-1043-000CN	1
1	Fuser (220–240 volt)	RM1-1044-000CN	1
2	Reverse assembly	RM1-1022-000CN	1
3	Holder, door switch	RC1-3063-000CN	1
4	Microswitch (SW101)	WC4-5139-000CN	1
5	Stopper, hinge shaft	RC1-3124-000CN	1
6	Cable, door switch	RM1-1397-000CN	1
7	Case, envelope-feeder connector	RC1-0245-000CN	1
8	Cable, envelope-feeder connector	RM1-1193-000CN	1
9	Hinge, door, right-side	RC1-2901-000CN	2
10	Screw, with washer, M3x6	XB2-7300-607CN	
11	Roller assembly, transfer	RM1-1110-000CN	1
12	Sensor assembly, right door	RM1-1045-000CN	1
13	Cover, handle, lower right	RC1-2881-000CN	1
14	Spacer, screw	RC1-0392-000CN	2
15	Electrical/forward assembly	For reference only	
16	Fuser entrance guide	RM1-1046-000CN	1
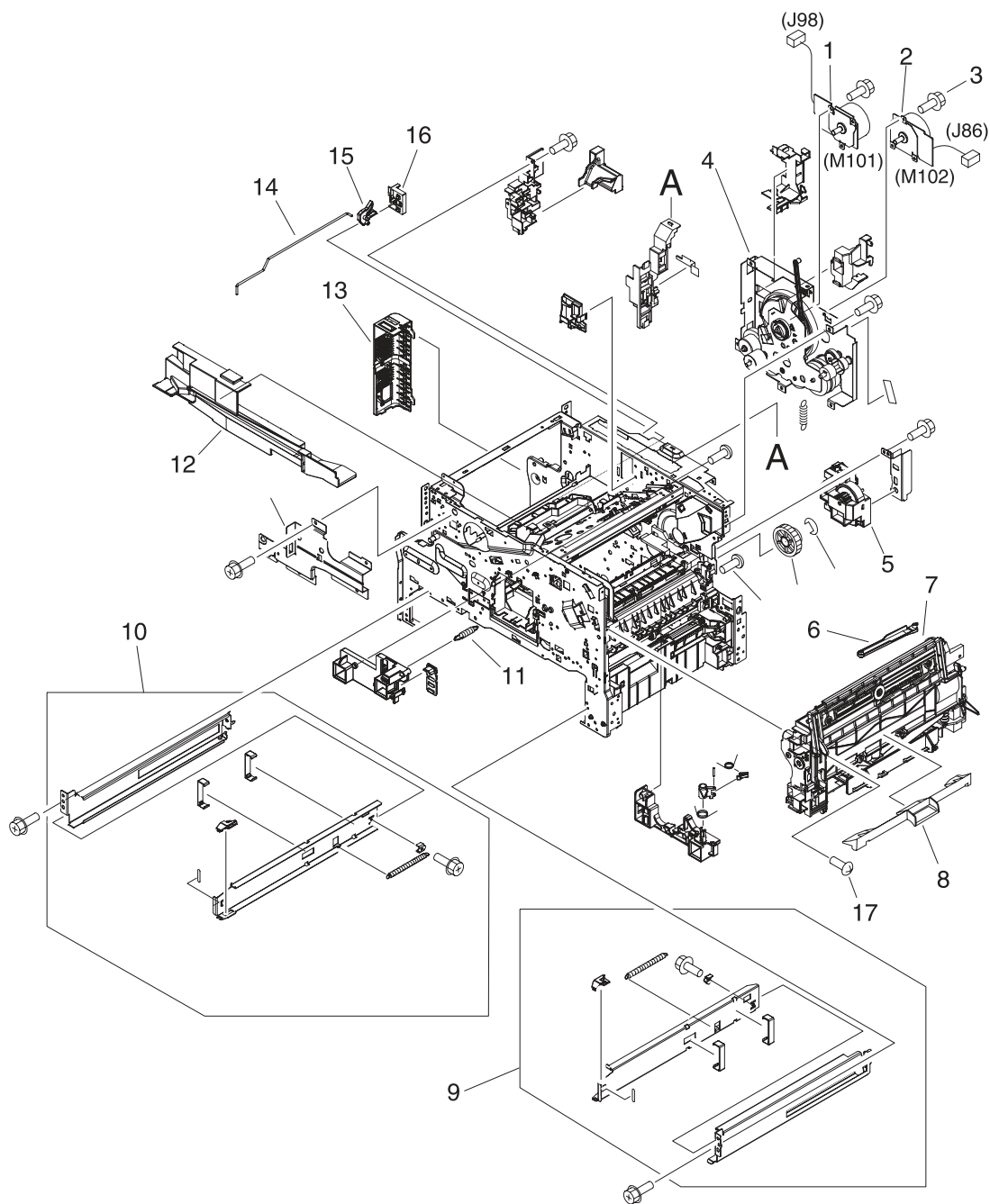
Figure 8-15 Internal components (3 of 5)

Table 8-14 Internal components (3 of 5)

Reference	Description	Part number	Quantity
1	Motor, dc 24-volt, (M101)	RK2-0272-000CN	1
2	Motor, dc 24-volt, (M102)	RK2-0274-000CN	1
3	Screw, tapping, M3x6	XA9-1503-000CN	
4	Main drive assembly	RM1-1049-000CN	1
5	Lifter drive assembly	RM1-1029-000CN	1
6	Rod, link	RC1-2902-000CN	1
7	Multipurpose tray assembly	RM1-1572-000CN	1
8	Cover, envelope-feeder slot	RL1-0455-000CN	1
9	Cassette rail assembly, right	RM1-1012-000CN	1
10	Cassette rail assembly, left	RM1-1011-000CN	1
11	Spring, grounding	RU5-2251-000CN	1
12	Guide, rear	RC1-2884-000CN	1
13	Cover, side, rear	RC1-3042-000CN	1
14	Rod, switch, front	RC1-2980-000CN	1
15	Link, switch	RC1-3003-000CN	1
16	Holder, link	RC1-3002-000CN	1
17	Screw, tapping, truss-head, M4x16	XB4-7401-605CN	
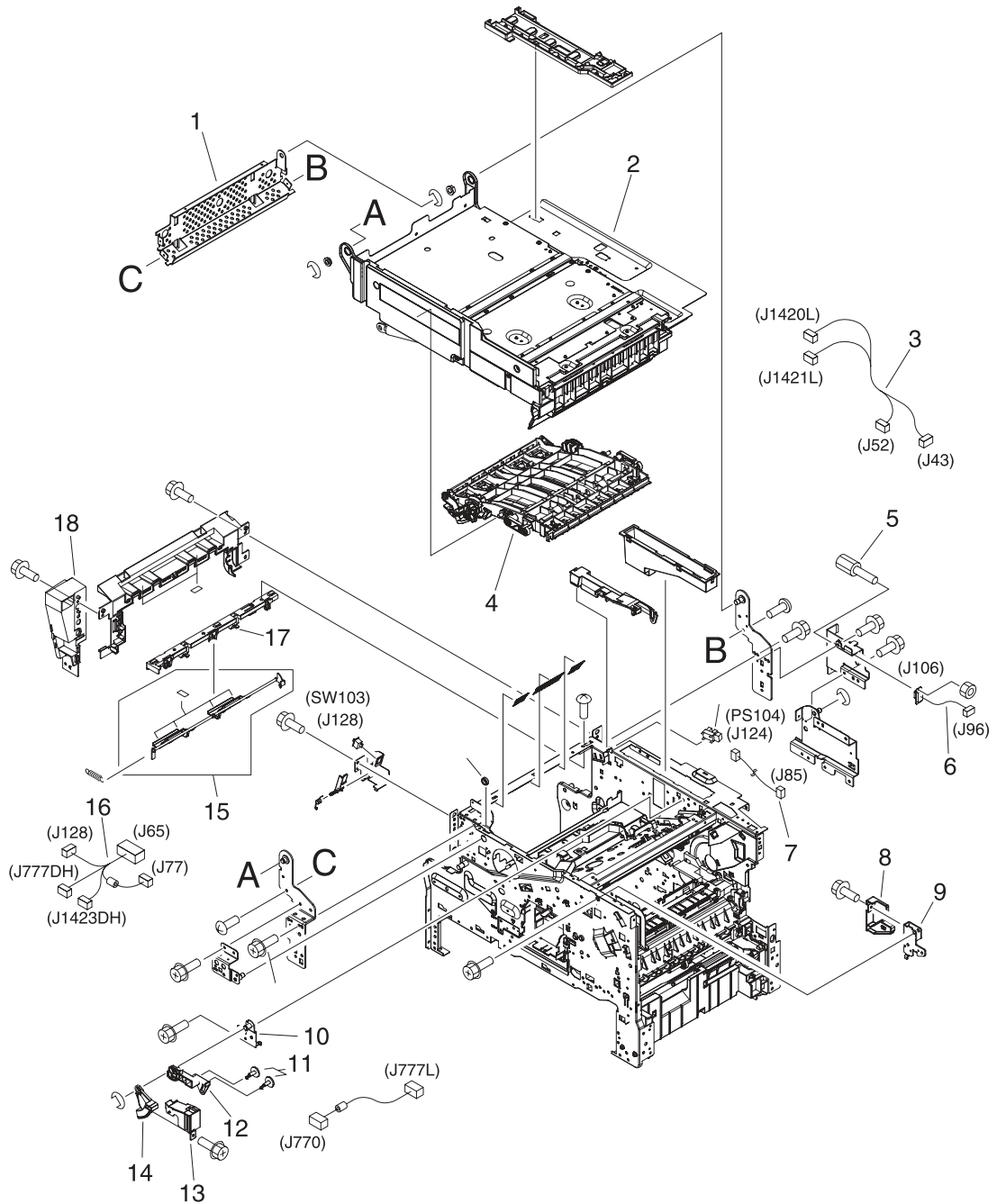
Figure 8-16 Internal components (4 of 5)

Table 8-15 Internal components (4 of 5)

Reference	Description	Part number	Quantity
1	Cross-member, support	RC1-2911-000CN	1
2	Upper plate assembly	For reference only	
3	Cable, reverse unit	RM1-1380-000CN	1
4	Reverse-separation guide assembly	RM1-1019-000CN	1
5	Bolt, hex-head	WS9-0255-000CN	2
6	Cable, output device connection	RM1-1371-000CN	1
7	Cable, output-bin full sensor	RM1-1368-000CN	1
8	Cover, front stopper	RC1-2823-000CN	1
9	Stopper, front lock	RL1-0434-000CN	1
10	Support, gas damper	RL1-0436-000CN	1
11	Stopper, bushing arm	RC1-3090-000CN	1
12	Arm, door, 1 (top cover)	RC1-2827-000CN	1
13	Cover, door arm (top cover)	RC1-2833-000CN	1
14	Arm, door, 2 (top cover)	RC1-2828-000CN	1
15	Flag, full-detect (output bin)	RC1-2863-000CN	1
16	Cable, control panel	RM1-1381-000CN	1
17	Holder, output-device-full sensor flag	RC1-2864-000CN	1
18	Cover, inner front	RC1-3041-000CN	1
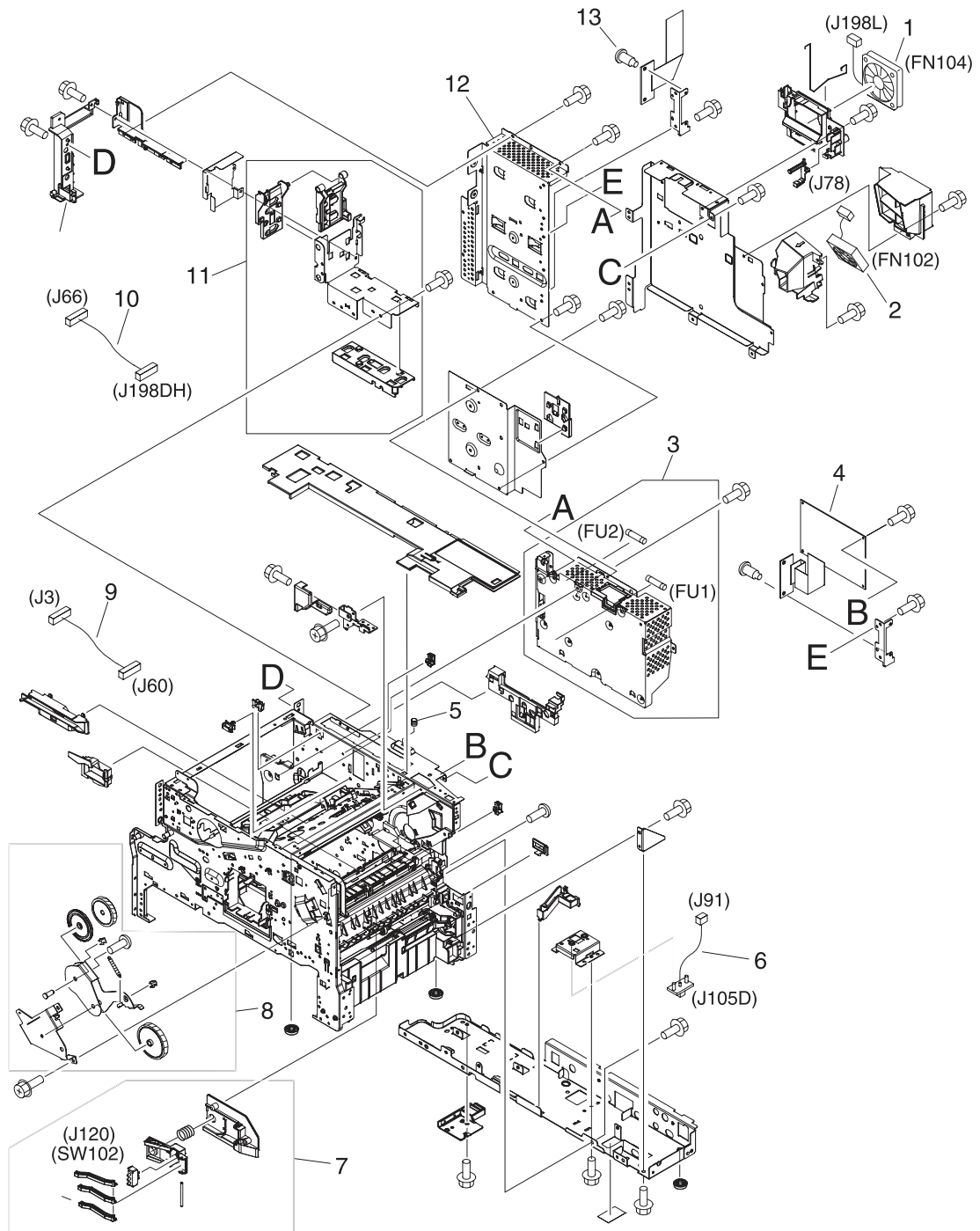
Figure 8-17 Internal components (5 of 5)

Table 8-16 Internal components (5 of 5)

Reference	Description	Part number	Quantity
1	Fan, dc controller (FN104)	RK2-0472-000CN	1
2	Fan, print cartridge (FN102)	RK2-0280-000CN	1
3	Power supply, PFC (100–127 volt)	RM1-1013-000CN	1
3	Power supply, PFC (220–240 volt)	RM1-1014-000CN	1
4	DC controller PCA	RM1-1354-000CN	1
5	Spring, compression	RU5-2265-000CN	1
6	Cable, optional 500-sheet feeder connection	RM1-1370-000CN	1
7	Sensor assembly, paper size (SW102)	RM1-0041-020CN	1
8	Swing-plate assembly	RM1-0043-020CN	1
9	Cable, power	RM1-1375-000CN	1
10	Cable, fan docking (for dc-controller fan)	RM1-1376-000CN	1
11	Guide assembly, flat-flexible cable	RM1-1027-000CN	1
12	Formatter assembly	Q3942–67901	1
13	Screw, stepped, M3	RC1-0266-020CN	

Electrical/forward assembly
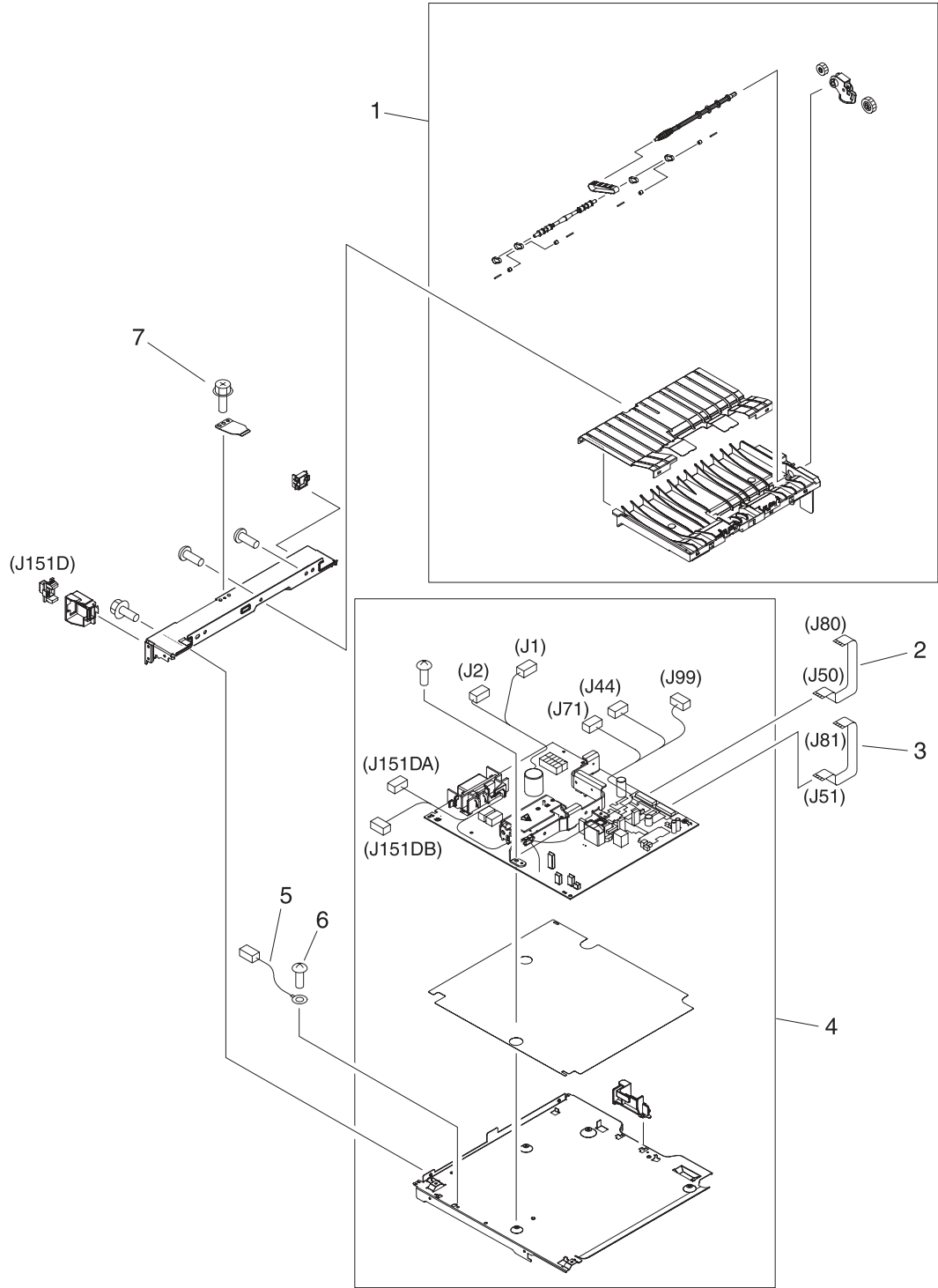
Figure 8-18 Electrical/forward assembly

Table 8-17 Electrical/forward assembly

Reference	Description	Part number	Quantity
1	Paper-feed assembly	RM1-0025-040CN	1
2	Cable, flat-flexible (engine power supply)	RK2-0470-000CN	1
3	Cable, flat-flexible (engine power supply)	RK2-0469-000CN	1
4	Engine power supply assembly (100–127 volt)	RM1-1041-000CN	1
4	Engine power supply assembly (220–240 volt)	RM1-1042-000CN	1
5	Cable, duplexing-unit grounding	RM1-1400-000CN	1
6	Screw, with washer, M3x6	XA9-1420-000CN	
7	Screw, flathead, RS, M3x6	XA9-1464-000CN	

Main drive assembly

1
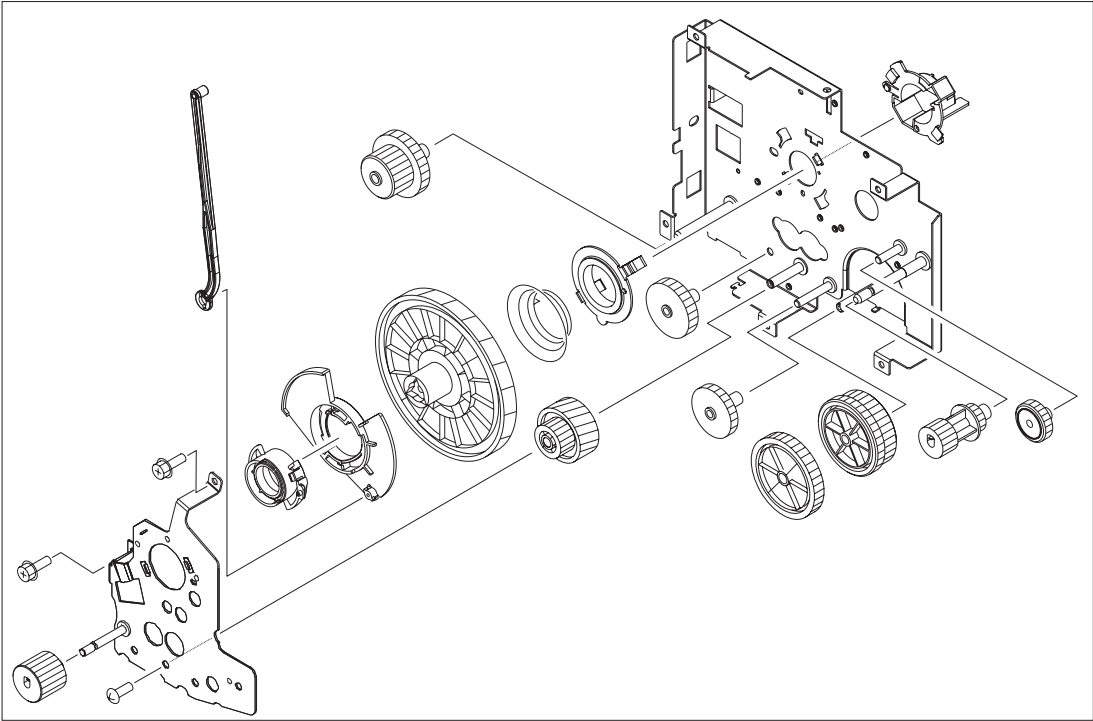
Figure 8-19 Main drive assembly

Table 8-18 Main drive assembly

Reference	Description	Part number	Quantity
1	Main drive assembly	RM1-1049-000CN	1

Paper-pickup-drive assembly
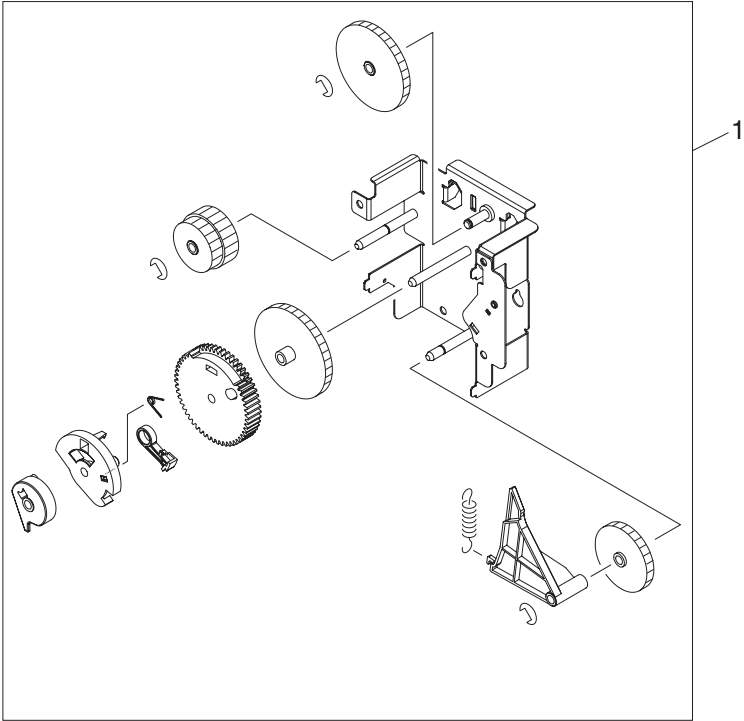
Figure 8-20 Paper-pickup-drive assembly

Table 8-19 Paper-pickup-drive assembly

Reference	Description	Part number	Quantity
1	Paper-pickup-drive assembly	RM1-0034-070CN	1

Lifter-drive assembly
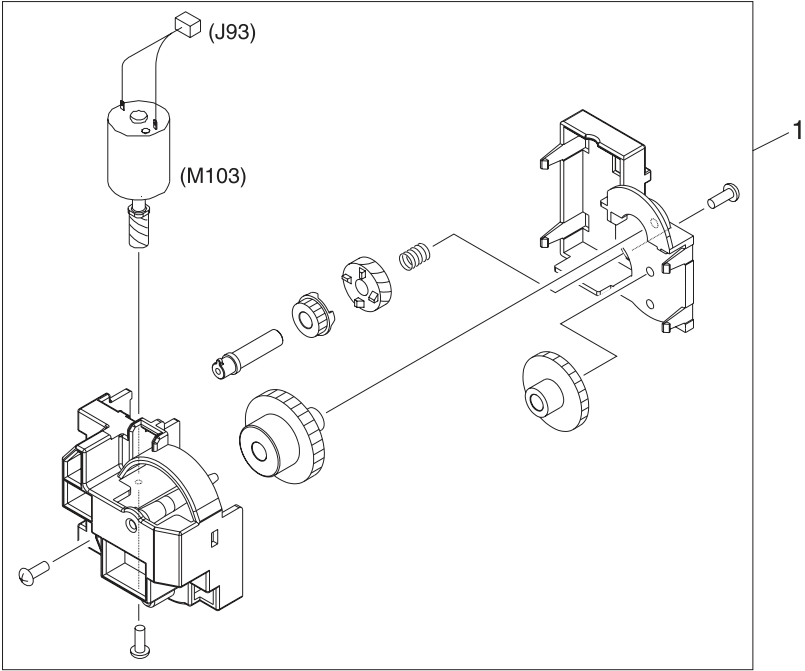
Figure 8-21 Lifter-drive assembly

Table 8-20 Lifter-drive assembly

Reference	Description	Part number	Quantity
1	Lifter-drive assembly	RM1-1029-000CN	1
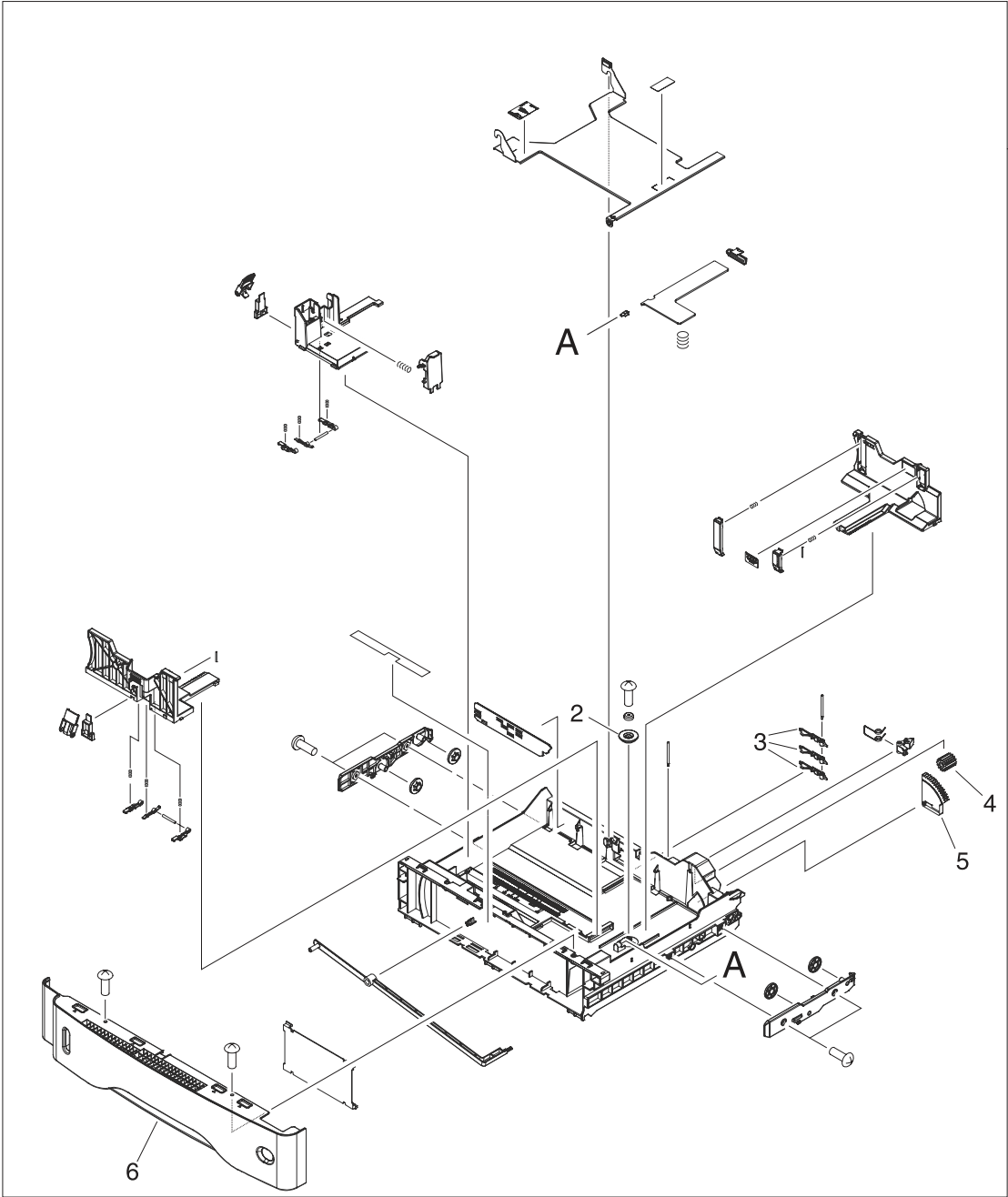
Cassette

Table 8-21 Cassette

Reference	Description	Part number	Quantity
1	Cassette (tray 2, 3, 4 or 5)	RM1-1001–000CN	1
2	Gear, 20T (cassette)	RC1-0331-000CN	1
3	Lever, paper-size-sensing (cassette)	RC1-2782-000CN	3
4	Gear, 14T (cassette)	RU5-0254-000CN	1
5	Gear, 80T (cassette)	RU5-0253-000CN	1
6	Guide, cassette, front	RC1-3020-000CN	1

Paper-feed roller assembly
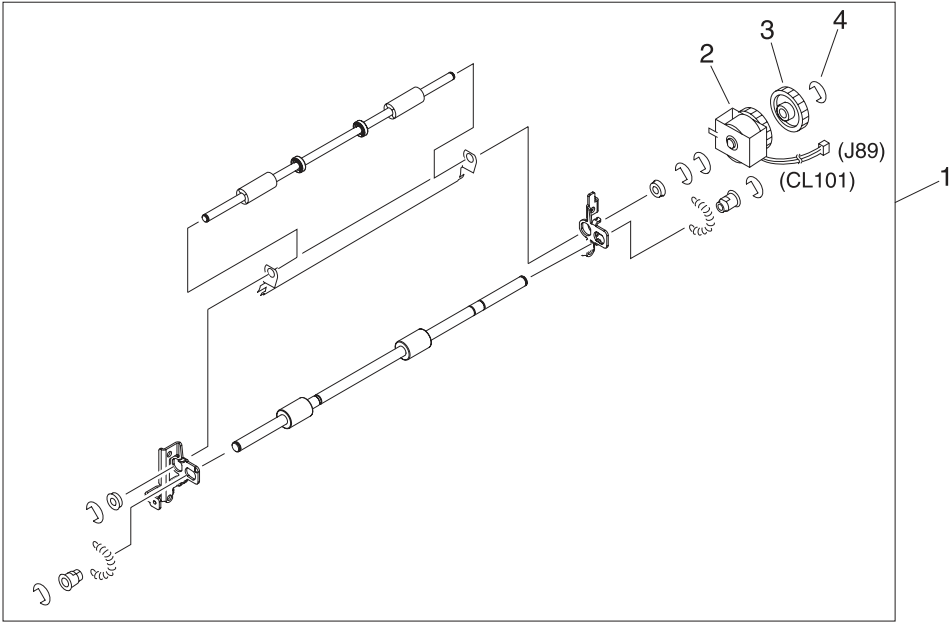
Figure 8-23 Paper-feed roller assembly

Table 8-22 Paper-feed roller assembly

Reference	Description	Part number	Quantity
1	Paper-feed roller assembly	RM1-0012-020CN	1
2	Clutch, paper feed, electromagnetic (CL101)	RK2-0349-000CN	1
3	Gear, 30T (paper-feed roller assembly)	RU5-0050-000CN	1
4	E-ring (paper-feed roller assembly)	XD9-0132-020CN	1

Registration assembly
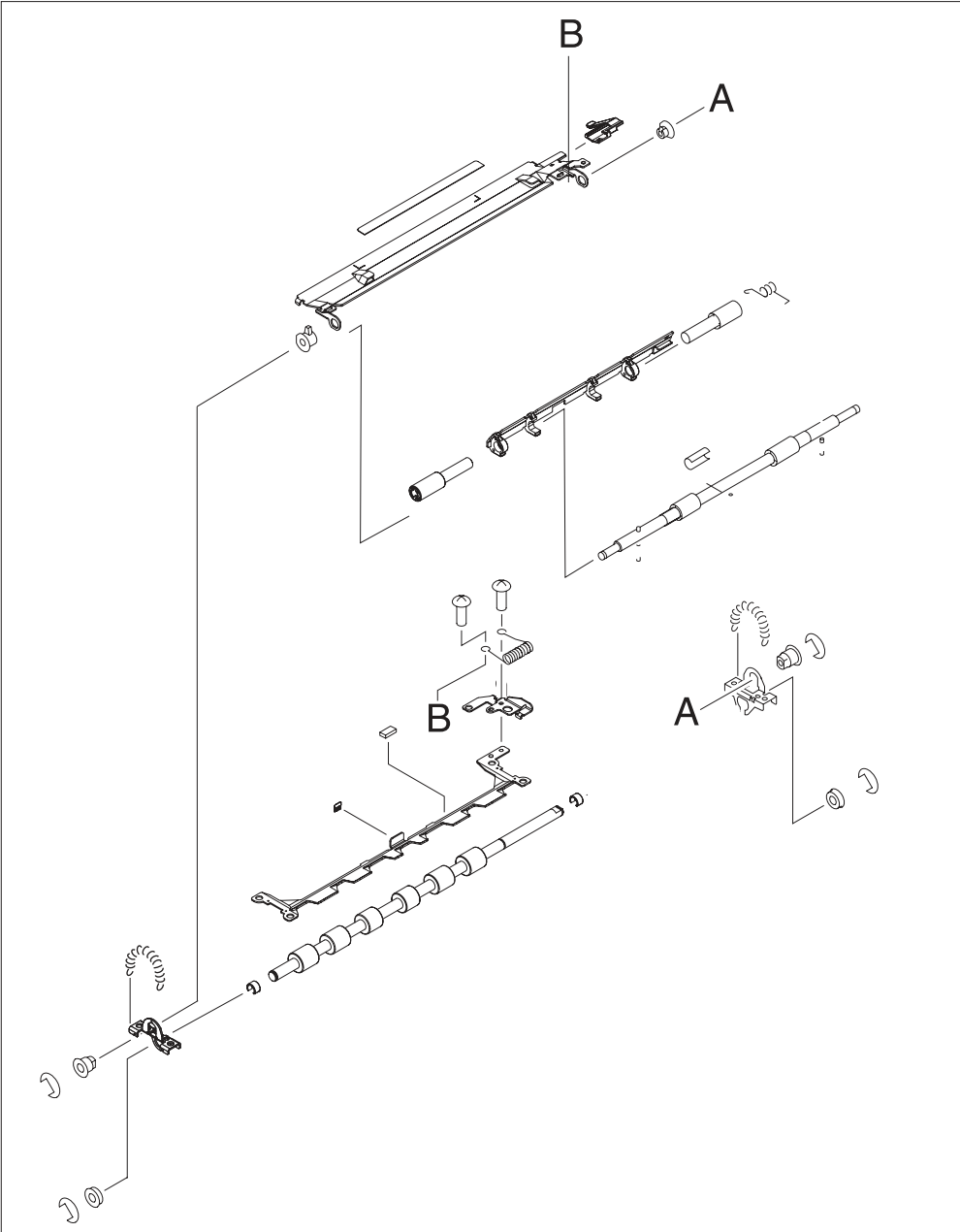
Figure 8-24 Registration assembly

Table 8-23 Registration assembly

Reference	Description	Part number	Quantity
1	Registration assembly	RM1-0011-060CN	1

Multipurpose assembly
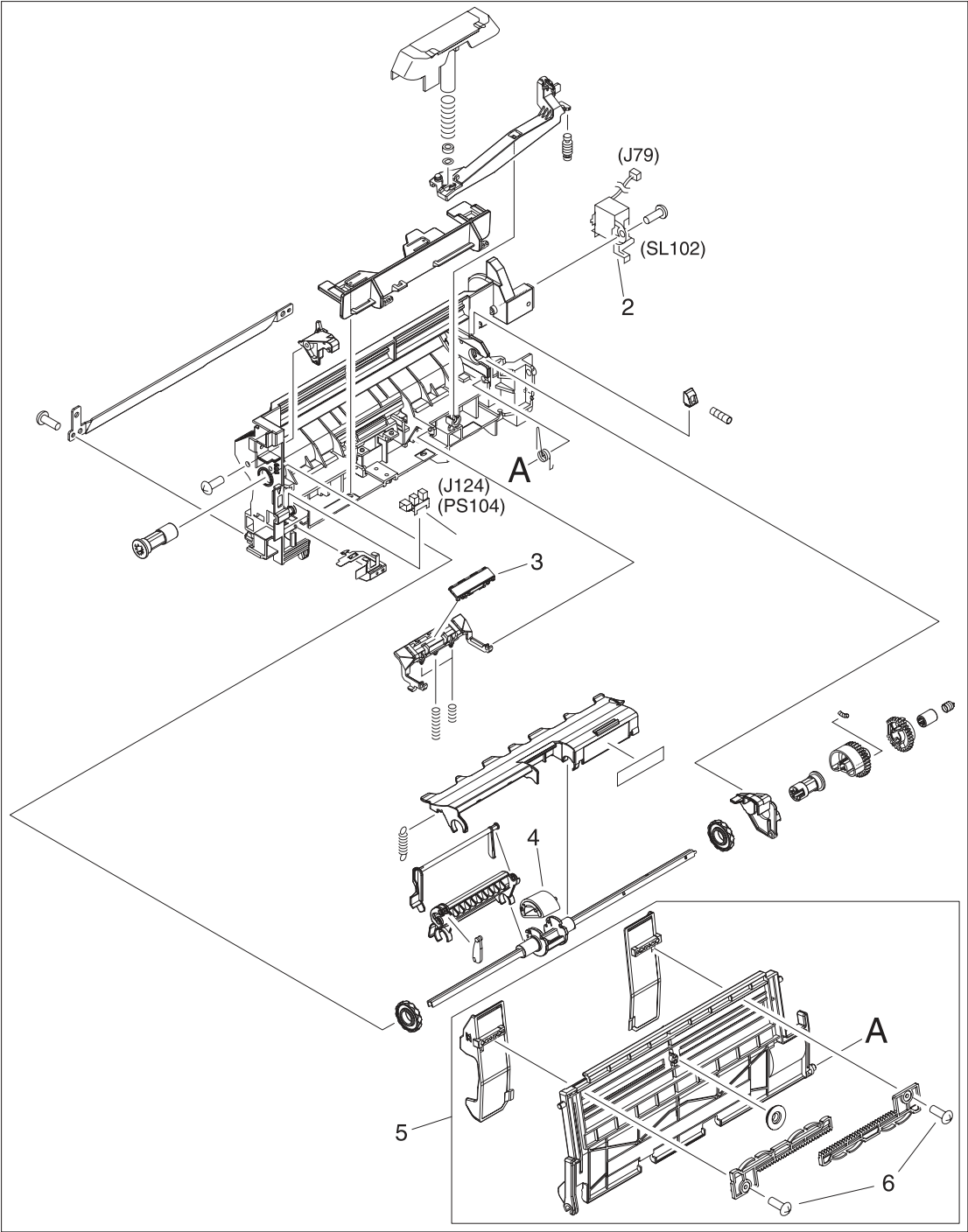
Figure 8-25 Multipurpose assembly

Table 8-24 Multipurpose assembly

Reference	Description	Part number	Quantity
1	Multipurpose assembly	RM1-1572-000CN	1
2	Solenoid, multipurpose assembly (SL102)	RK2-0276-000CN	1
3	Plate, main pad support (multipurpose assembly)	RL1-0007-000CN	1
4	Roller, pickup, multipurpose assembly	RL1-0019-000CN	1
5	Multipurpose tray assembly	RM1-0005-020CN	1
6	Screw, tapping, truss-head, M3x8	XB4-7300-809CN	

Reverse assembly
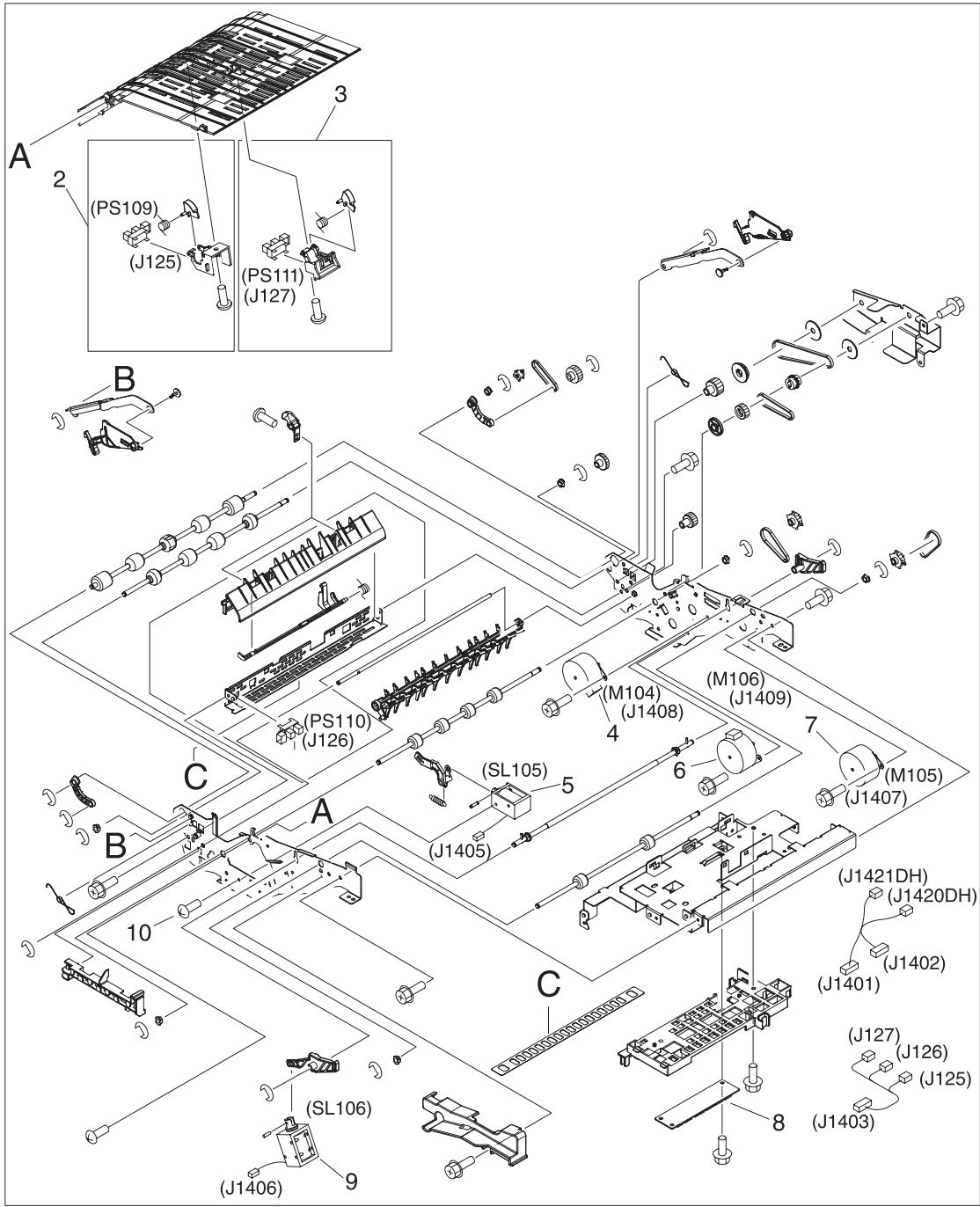
Figure 8-26 Reverse assembly

Table 8-25 Reverse assembly

Reference	Description	Part number	Quantity
1	Reverse assembly	RM1-1022-000CN	1
2	Sensor, reverse-unit (PS109)	RM1-1570-000CN	1
3	Sensor, reverse-unit jam (PS111)	RM1-1571-000CN	1
4	Motor, crossing, (stepping) (M104)	RK2-0473-000CN	1
5	Solenoid, reverse-unit (SL105)	RK2-0485-000CN	1
6	Motor, delivery (stepping) (M106)	RK2-0475-000CN	1
7	Motor, reverse-unit (stepping) (M105)	RK2-0474-000CN	1
8	Reverse-unit PCA	RM1-1379-000CN	1
9	Solenoid, reversing-roller separation (SL106)	RK2-0486-000CN	1
10	Screw, TP, M3x4	XB6-7300-406CN	

Reverse-separation-guide assembly
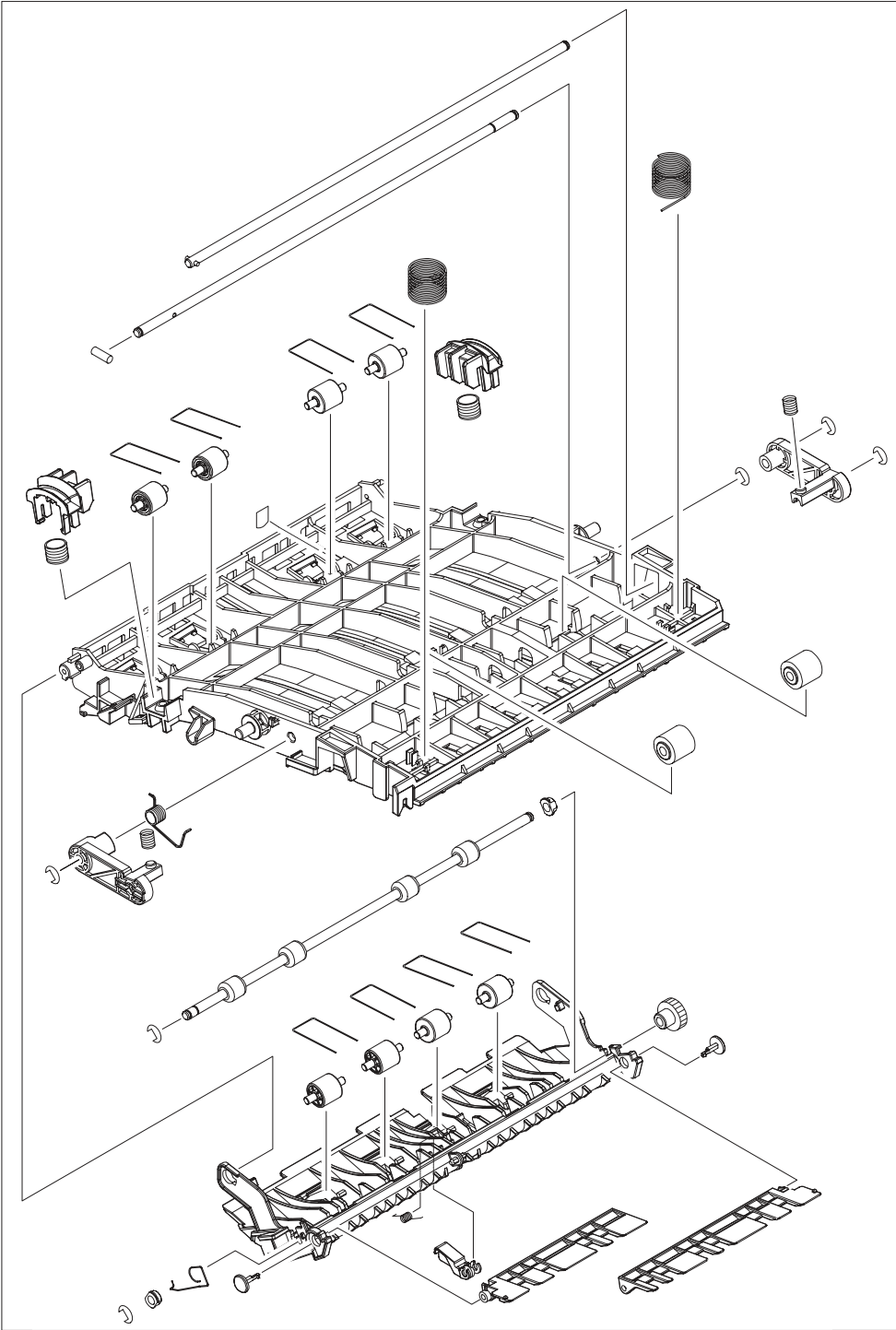
Figure 8-27 Reverse-separation-guide assembly

Table 8-26 Reverse-separation-guide assembly

Reference	Description	Part number	Quantity
1	Reverse-separation-guide assembly	RM1-1019-000CN	1

Delivery assembly
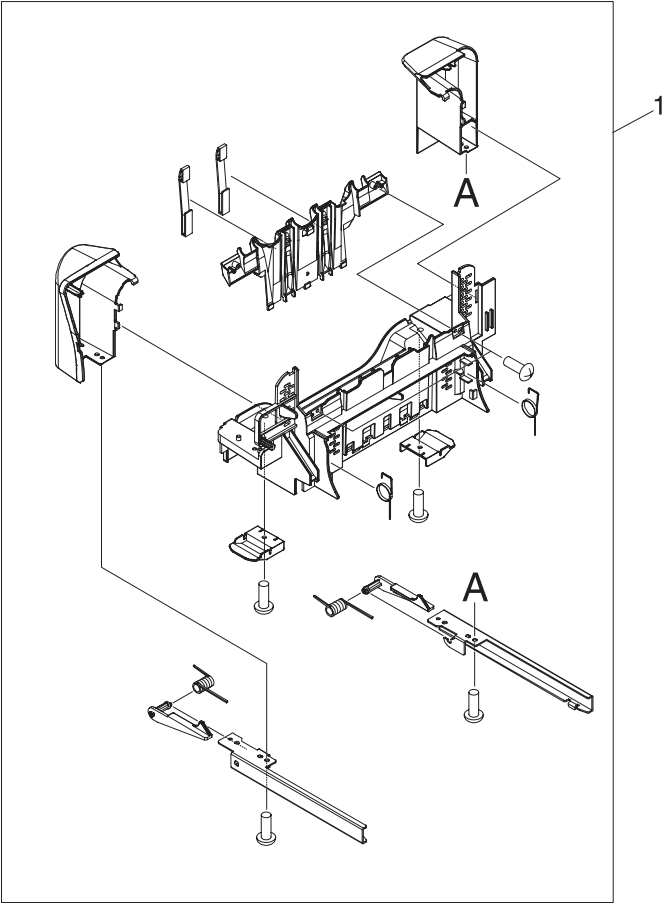
Figure 8-28 Delivery assembly

Table 8-27 Delivery assembly

Reference	Description	Part number	Quantity
1	Delivery assembly	RM1-1047-000CN	1

Fuser
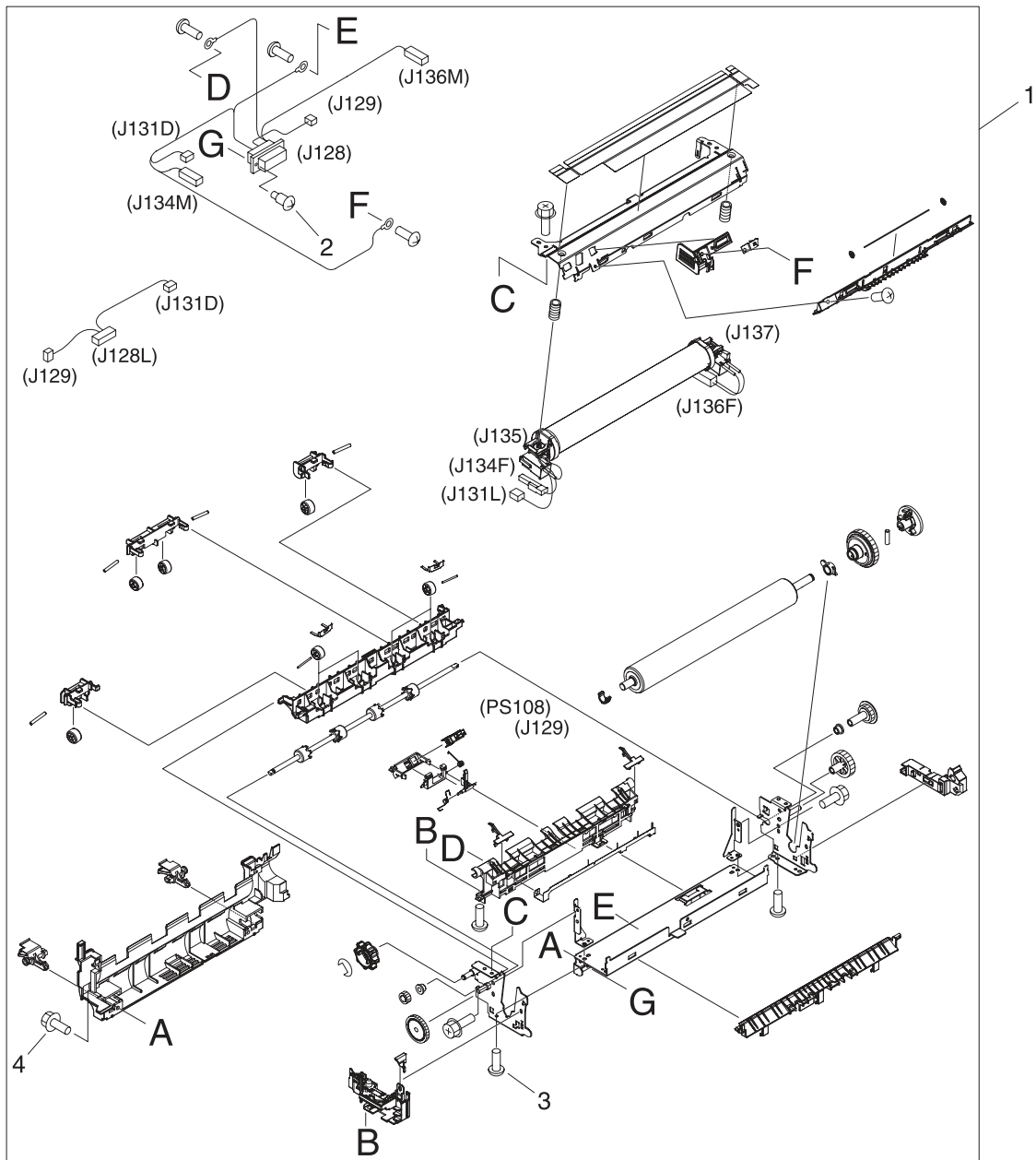
Figure 8-29 Fuser

Table 8-28 Fuser

Reference	Description	Part number	Quantity
1	Fuser (100–127 volt)	RM1-1043-000CN	1
1	Fuser (220–240 volt)	RM1-1044-000CN	1
2	Screw, stepped	RS1-9004-020CN	
3	Screw, M3x8	XA9-0650-000CN	
4	Screw, RS, M3x8	XA9-1449-000CN	

ADF components

ADF assembly
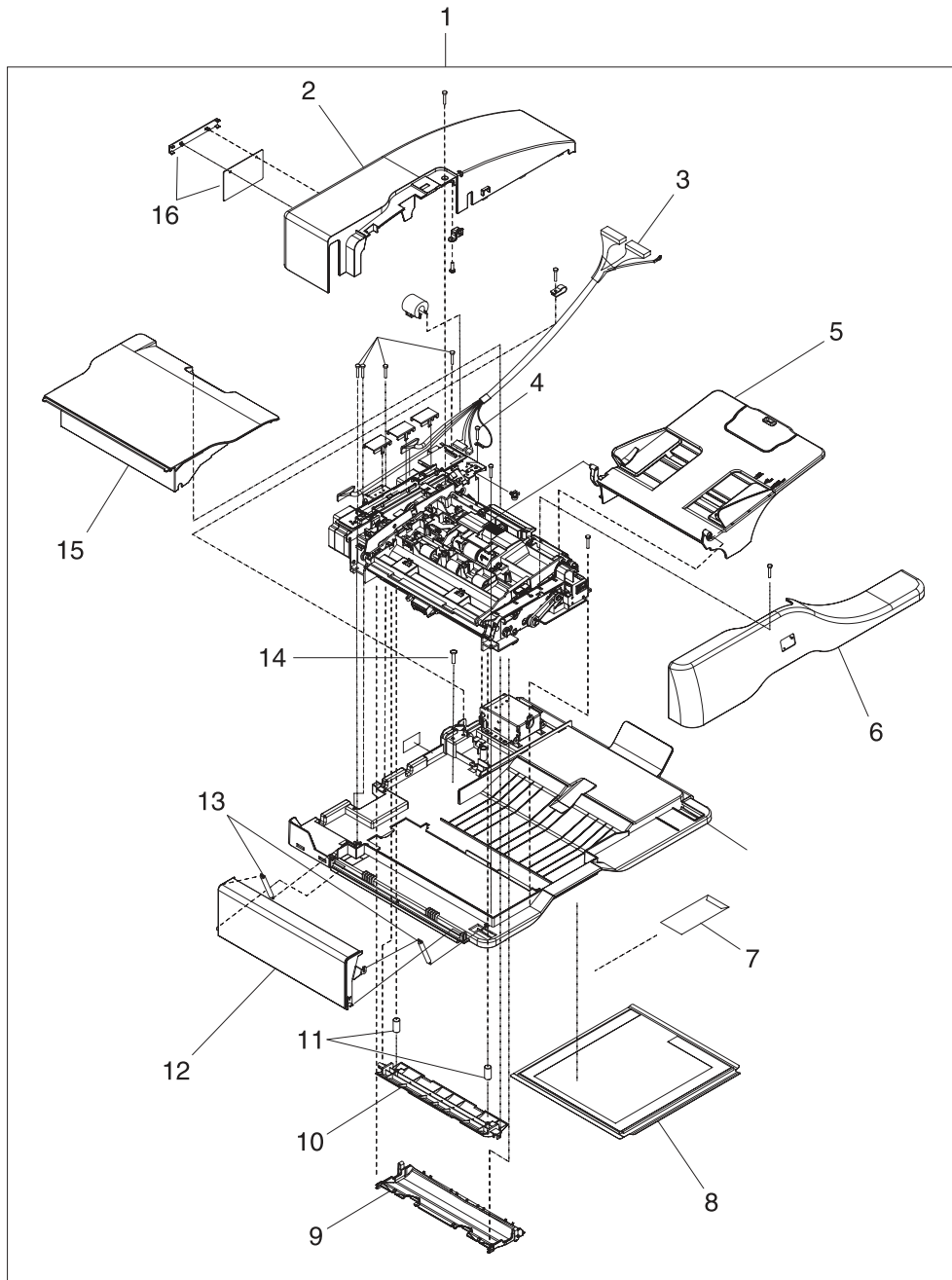
Figure 8-30 ADF assembly

Table 8-29 ADF assembly

Reference	Description	Part number	Quantity
1	ADF assembly	PF2282K006NI	1
2	ADF rear cover	PF2282P044NI	1
3	ADF cable	PF2282K165NI	1
4	Screw, ADF	030080FWWSNI	
5	ADF input tray	PF2282K042NI	1
6	ADF front cover	PF2282P059NI	1
7	ADF mylar replacement kit	Q6496–67901	1
8	ADF white scan background	PF2282P339NI	1
9	ADF mylar holder assembly	PF2282K043NI	1
10	ADF white mylar backing	PF2282P025NI	1
11	ADF, springs for white mylar backing	PF2282P343NI	2
12	ADF left cover	PF2282P058NI	1
13	ADF, springs for left cover	PF2282P352NI	2
14	Screw, ADF, wave 4x10	PF2245P369NI	
15	ADF jam-access cover	PF2282P041NI	1
16	ADF hinge flaps (ESD)	PF2282K166NI	1

ADF internal components (1 of 3)
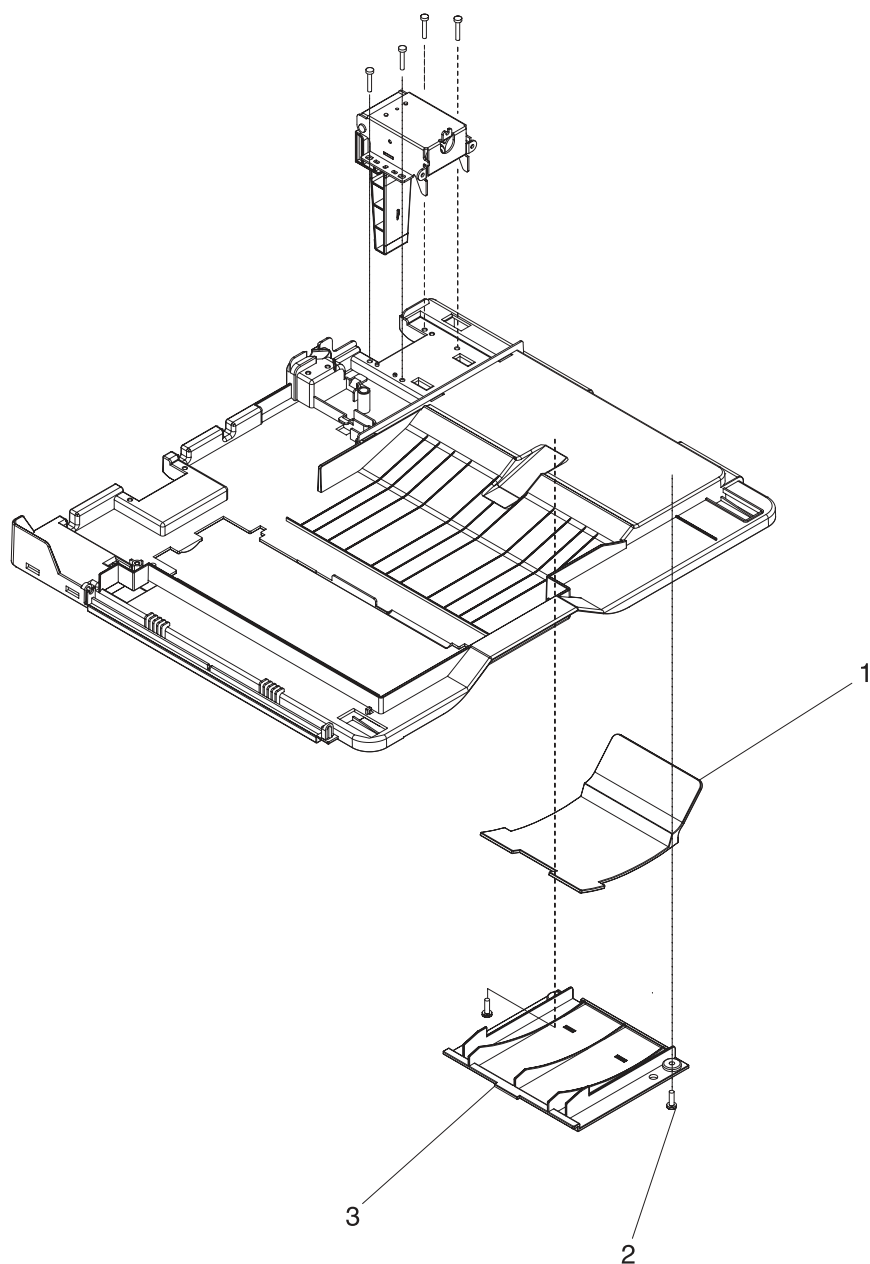
Figure 8-31 ADF internal components (1 of 3)

Table 8-30 ADF internal components (1 of 3)

Reference	Description	Part number	Quantity
1	ADF output-bin paper stop	PF2282P061NI	1
2	Screw, ADF	NS-SCR00029NI	
3	ADF output-bin-base cover	PF2282P060NI	1

ADF internal components (2 of 3)
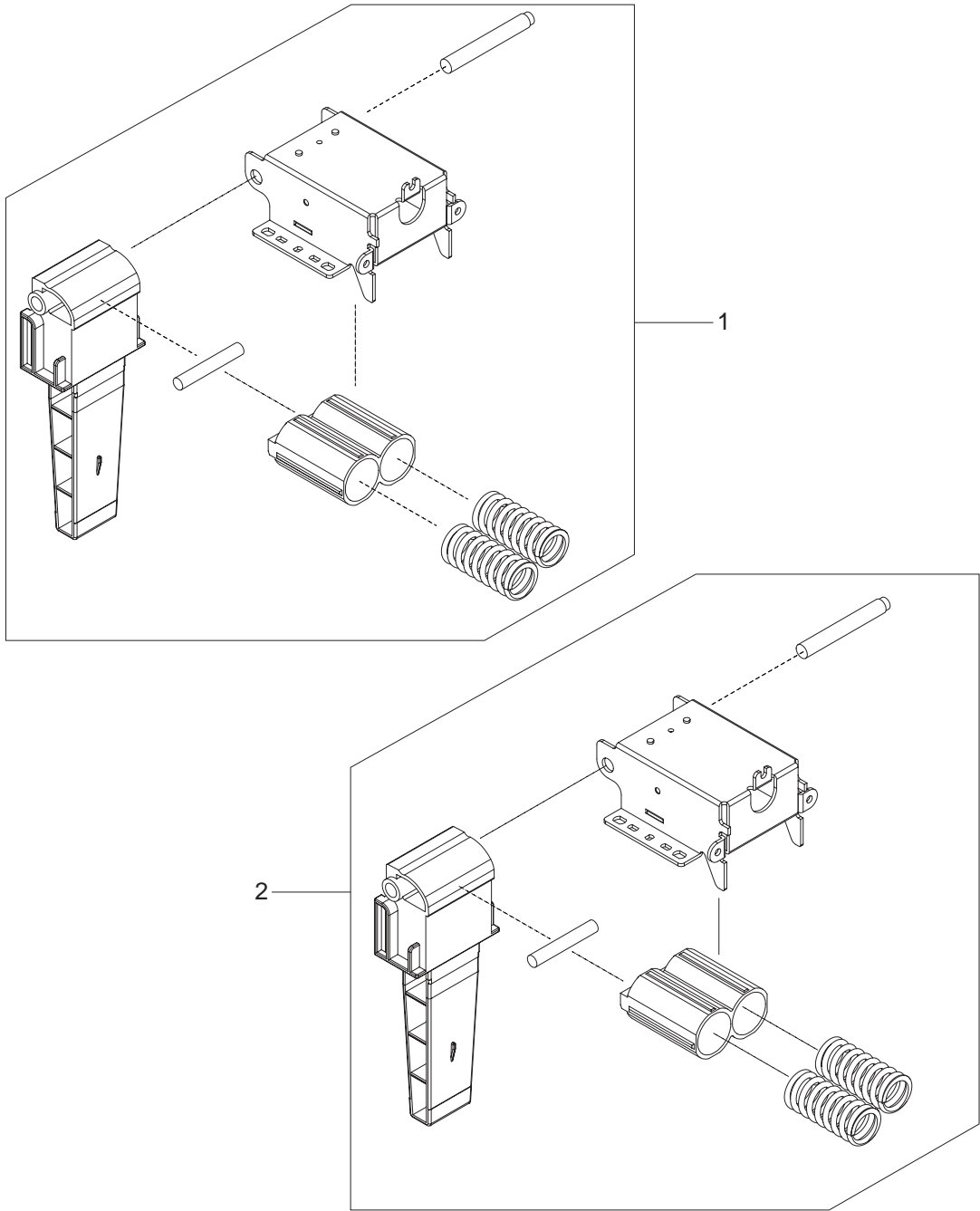
Figure 8-32 ADF internal components (2 of 3)

Table 8-31 ADF internal components (2 of 3)

Reference	Description	Part number	Quantity
1	ADF hinge, left	PF2282K041NI	1
2	ADF hinge, right	PF2282K008NI	1
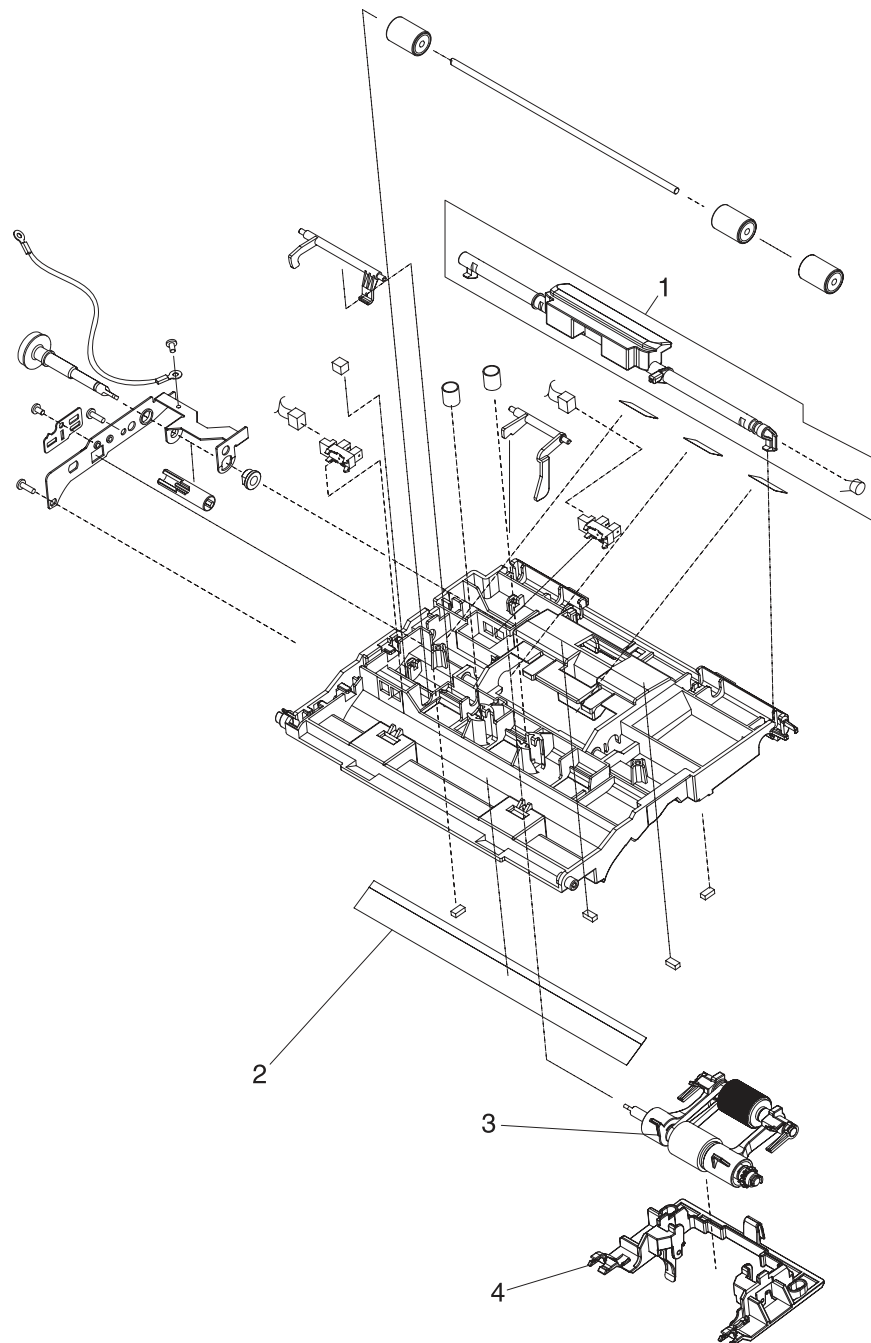
Figure 8-33 ADF internal components (3 of 3)

Table 8-32 ADF internal components (3 of 3)

Reference	Description	Part number	Quantity
1	ADF jam-access latch	PF2282K164NI	1
2	ADF clear plastic paper guide	PF2282P353NI	1
3	ADF pickup-roller assembly	PF2282K039NI	1
4	ADF pickup-roller cover	PF2282K040NI	1

ADF input tray
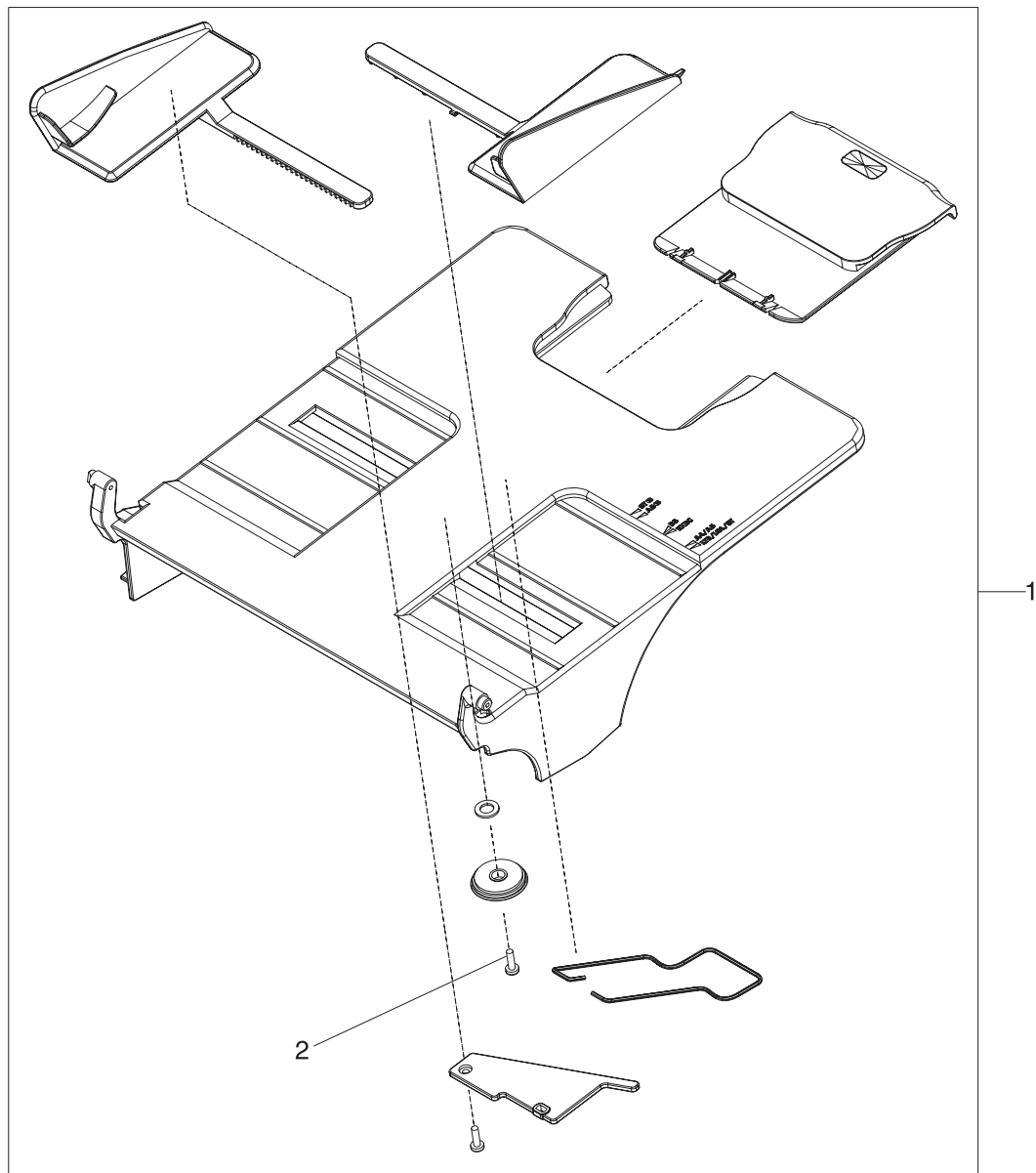
Figure 8-34 ADF input tray

Table 8-33 ADF input tray

Reference	Description	Part number	Quantity
1	ADF input tray	PF2282K042NI	1
2	Screw, ADF, button, M3x8	IR4041P021NI	

ADF separation pad

1
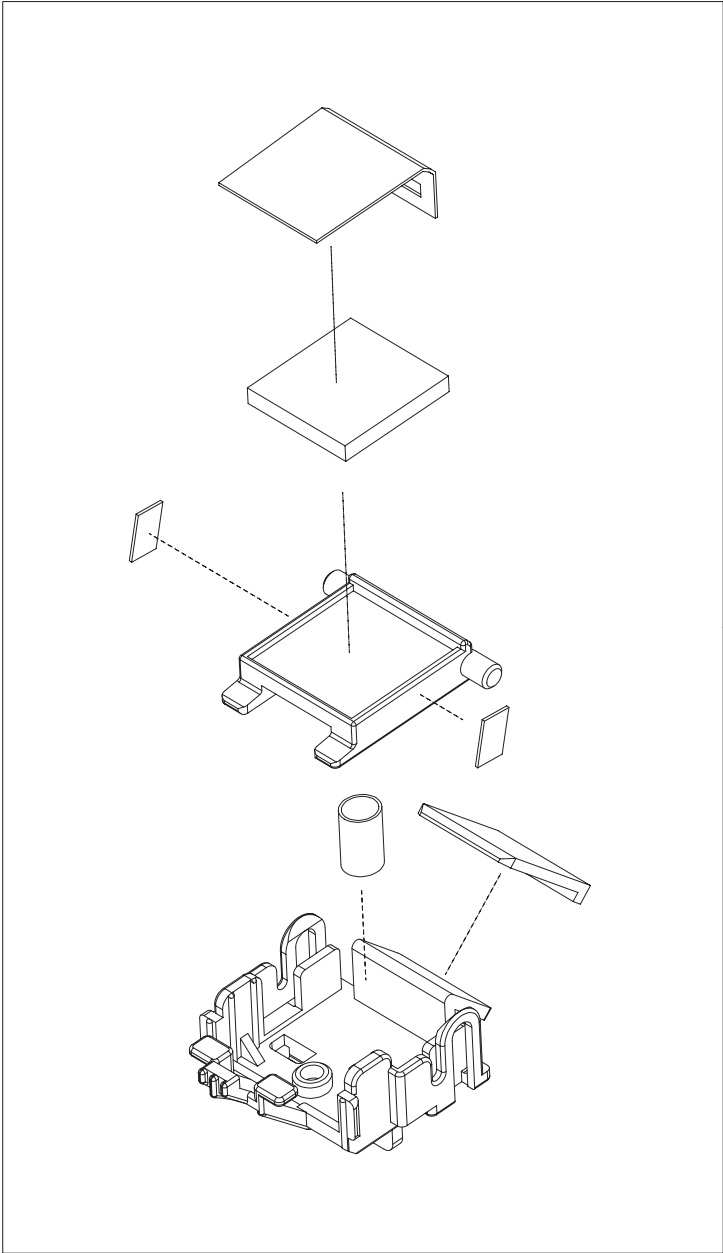
Figure 8-35 ADF separation pad

Table 8-34 ADF separation pad

Reference	Description	Part number	Quantity
1	ADF separation-pad assembly	PF2282K035NI	1

ADF separation-pad case
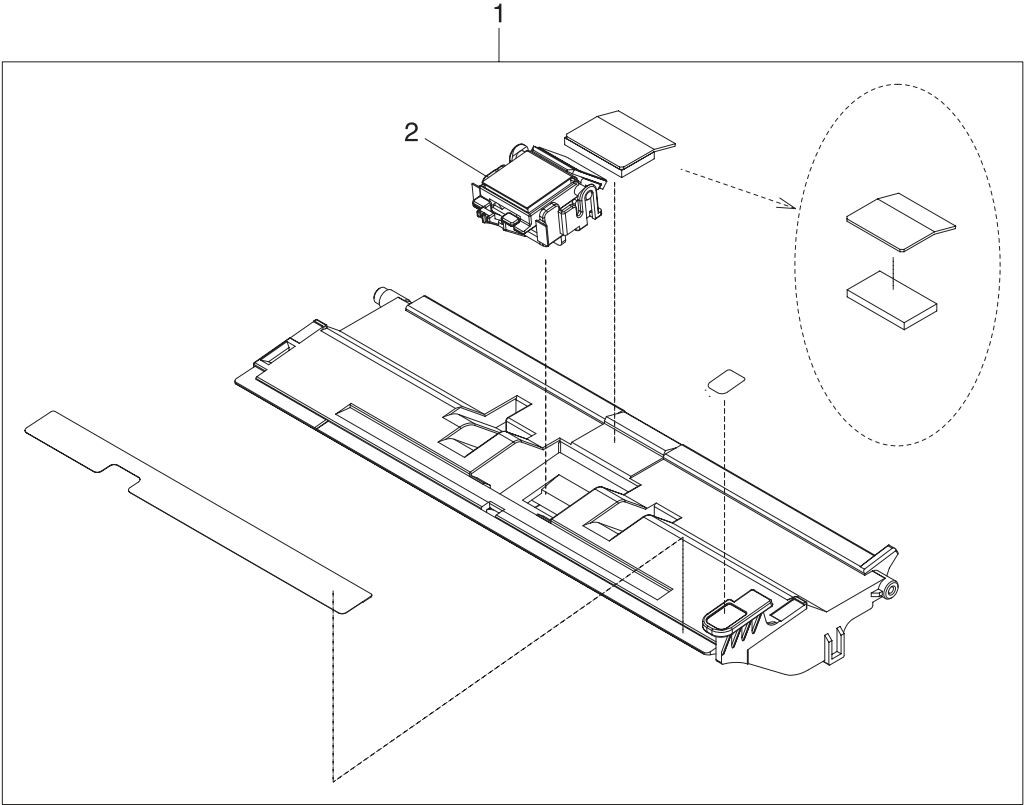
Figure 8-36 ADF separation-pad case

Table 8-35 ADF separation-pad case

Reference	Description	Part number	Quantity
1	ADF separation-pad case	PF2282K034NI	1
2	ADF separation pad	PF2282K035NI	1

ADF pickup-roller assembly

1
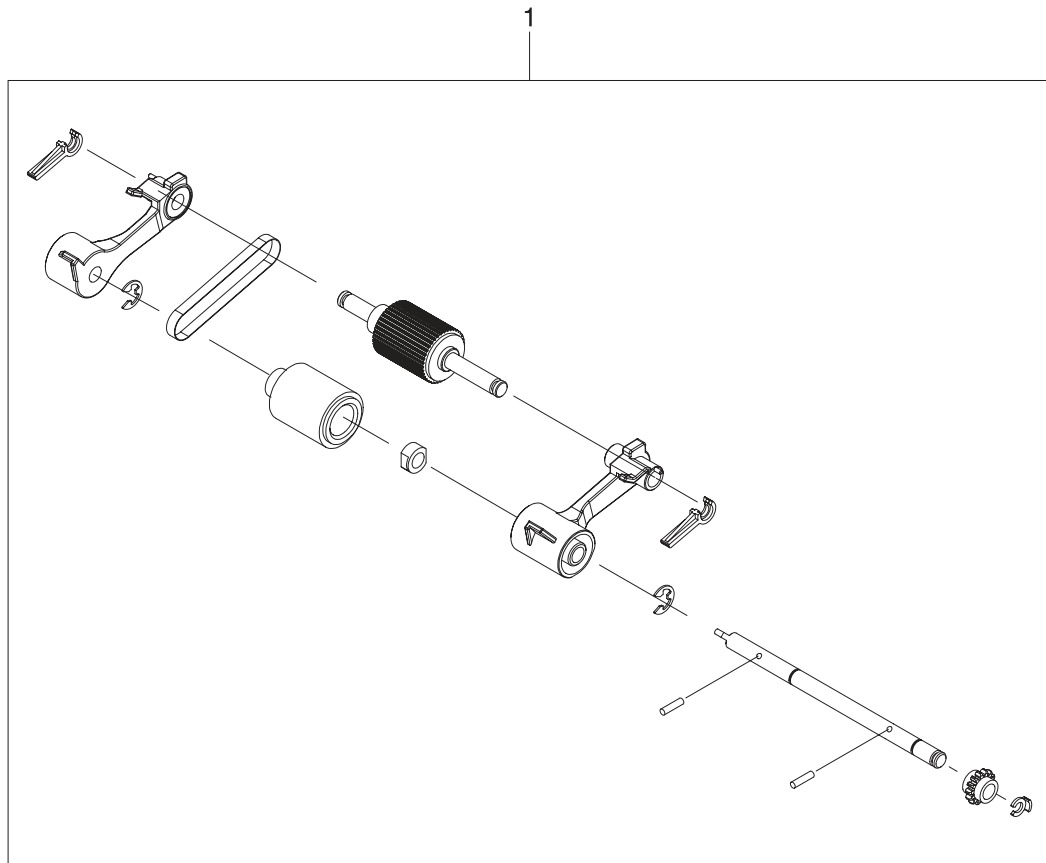
Figure 8-37 ADF pickup-roller assembly

Table 8-36 ADF pickup-roller assembly

Reference	Description	Part number	Quantity
1	ADF pickup-roller assembly	PF2282K039NI	1

ADF pickup-roller cover

1
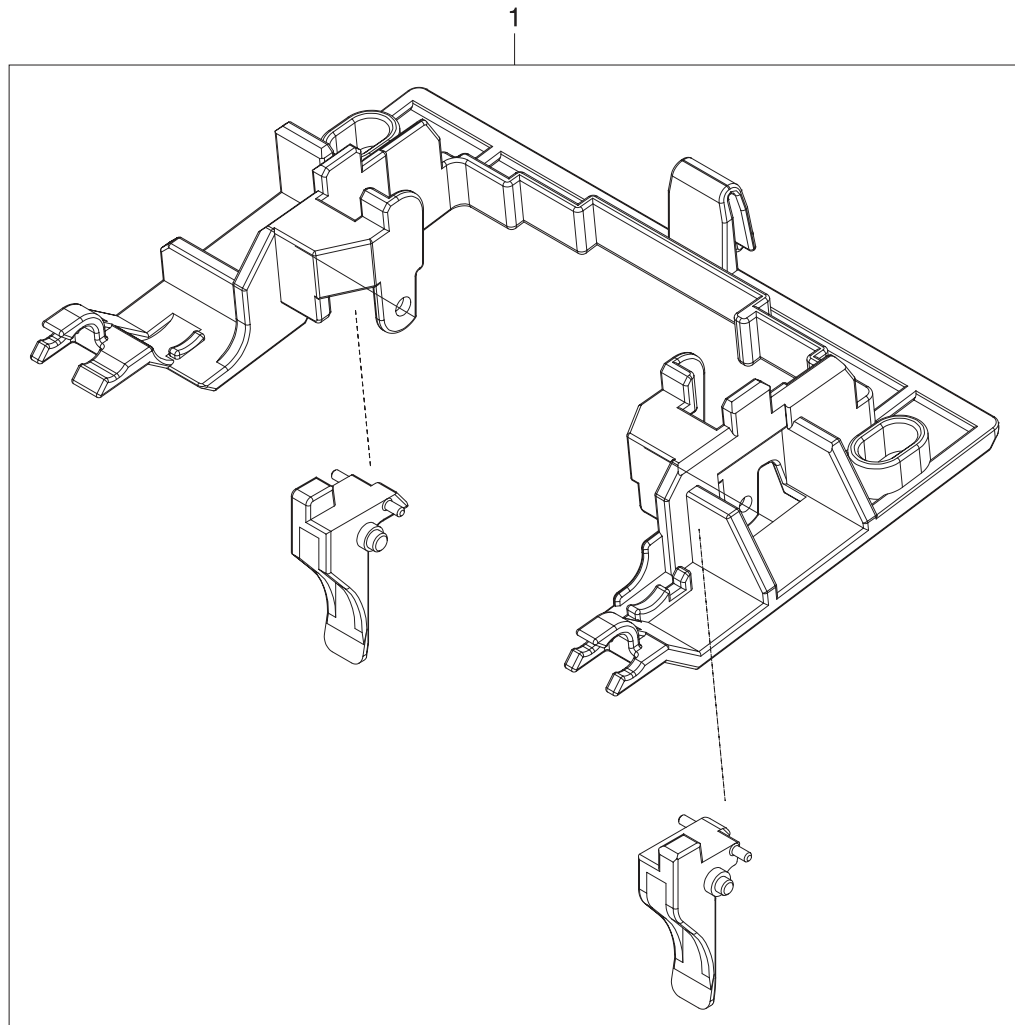
Figure 8-38 ADF pickup-roller cover

Table 8-37 ADF pickup-roller cover

Reference	Description	Part number	Quantity
1	ADF pickup-roller cover	PF2282K040NI	1

ADF mylar-holder assembly

1
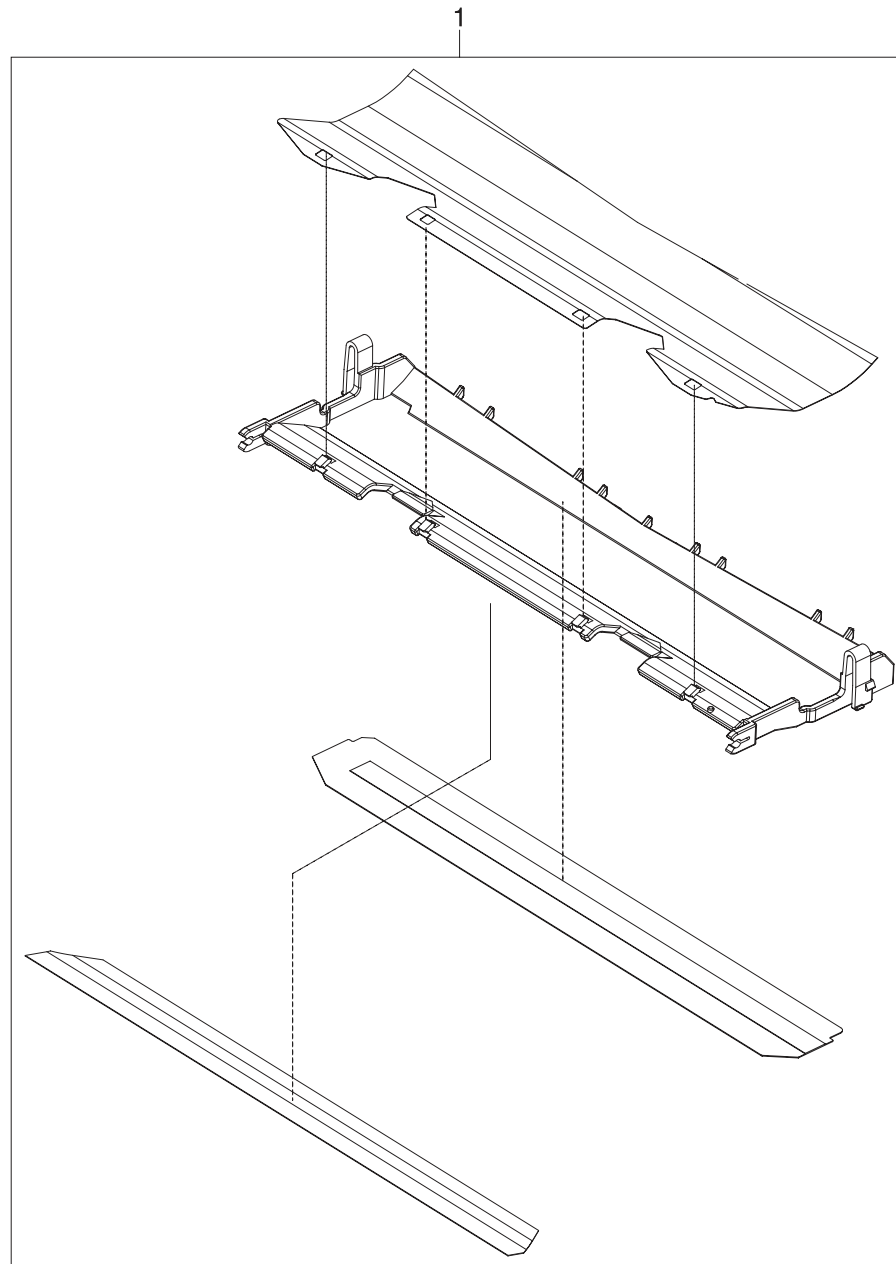
Figure 8-39 ADF mylar-holder assembly

Table 8-38 ADF mylar-holder assembly

Reference	Description	Part number	Quantity
1	ADF mylar-holder assembly	PF2282K043NI	1

ADF mylar replacement kit
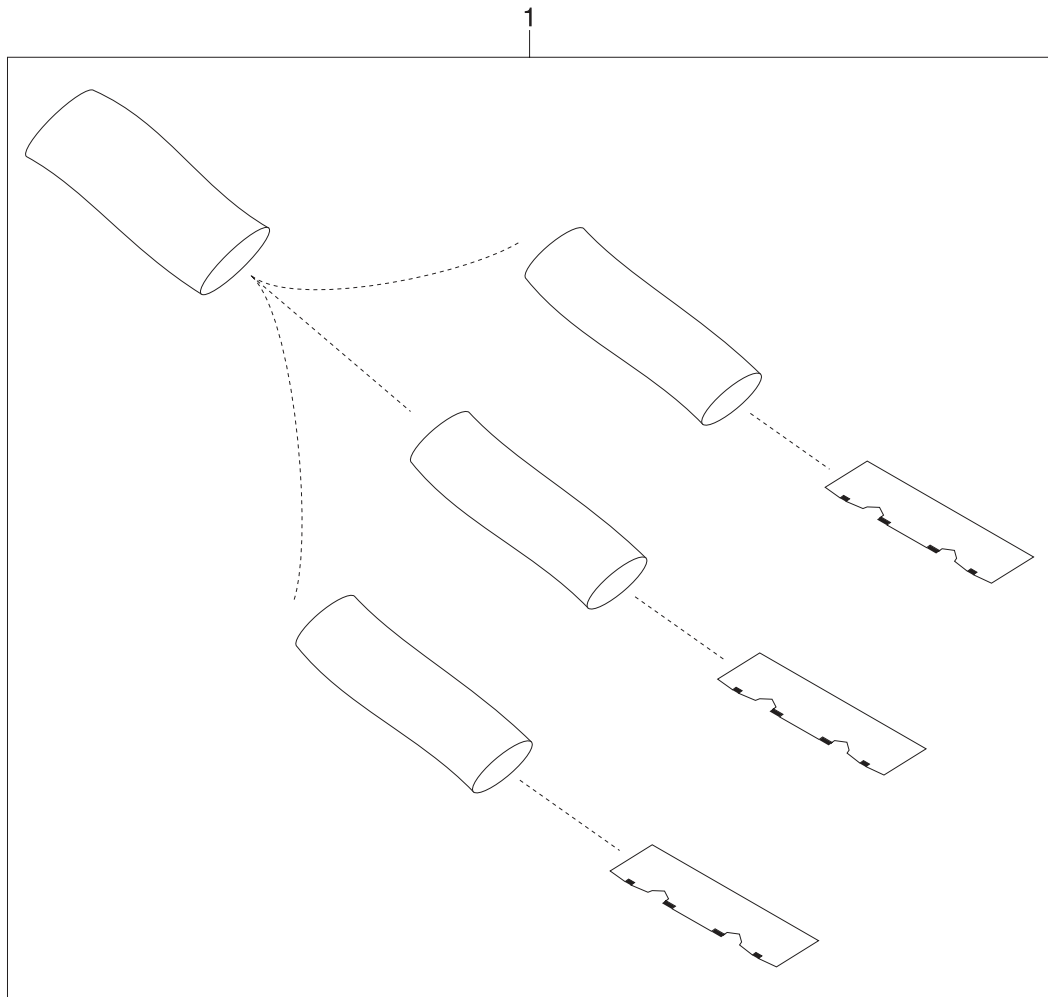
Figure 8-40 ADF mylar replacement kit

Table 8-39 ADF mylar replacement kit

Reference	Description	Part number	Quantity
1	ADF mylar replacement kit	Q6496–67901	1

Scanner components

Scanner glass and cover
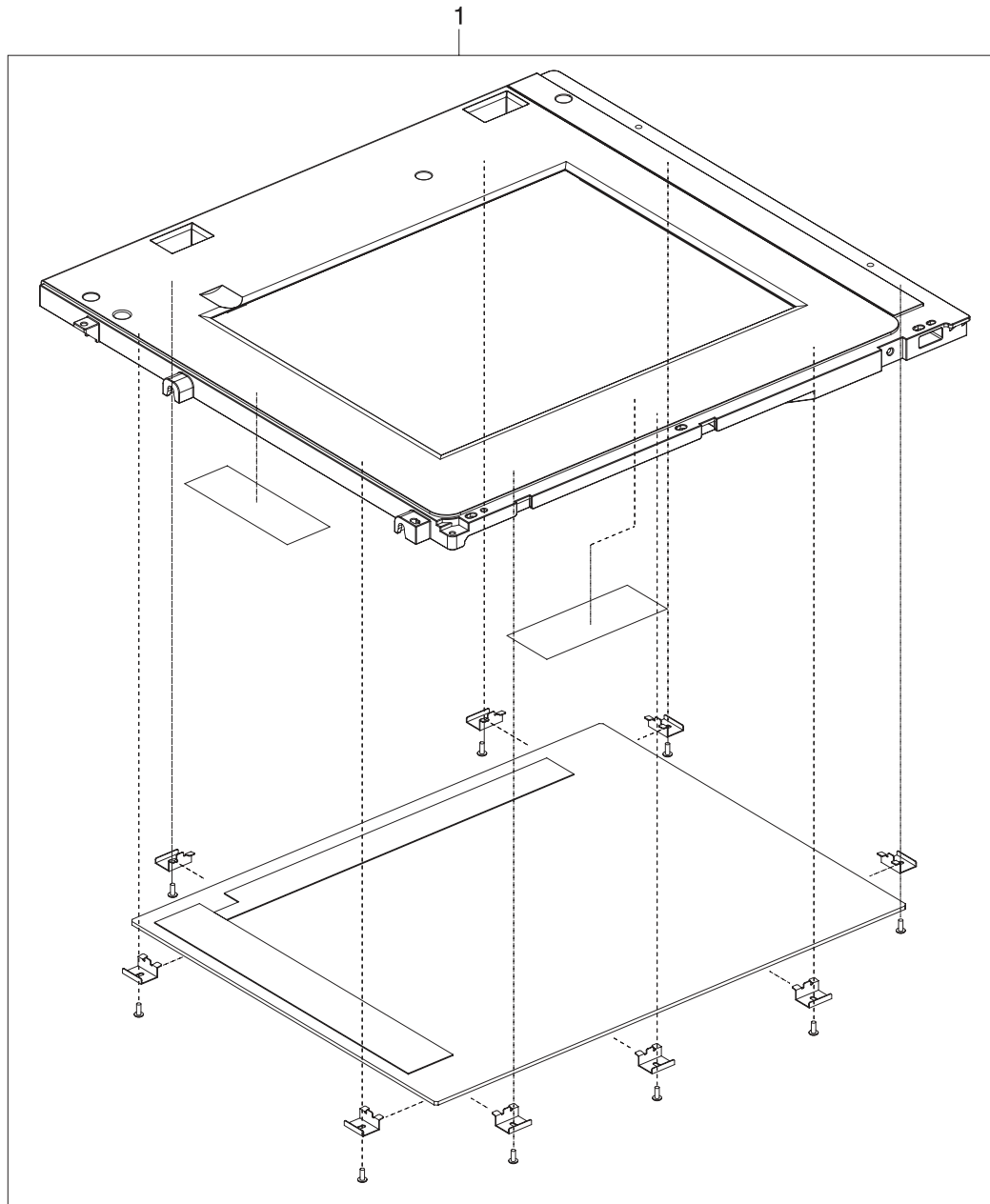
Figure 8-41 Scanner glass and cover

Table 8-40 Scanner glass and cover

Reference	Description	Part number	Quantity
1	Scanner glass and cover	IR4041K111NI	1
2	Screw, scanner, M3x8	IR4041P021NI	

Scanner-base components

Figure 8-42 Scanner-base components

Table 8-41 Scanner-base components

Reference	Description	Part number	Quantity
1	Scanner controller PCA	IR4041K512NI	1
2	Scanner fan-filter cover	IR4041P217NI	1
3	Scanner-fan filter	IR4041P007NI	1

Scanner flatbed-unit assembly
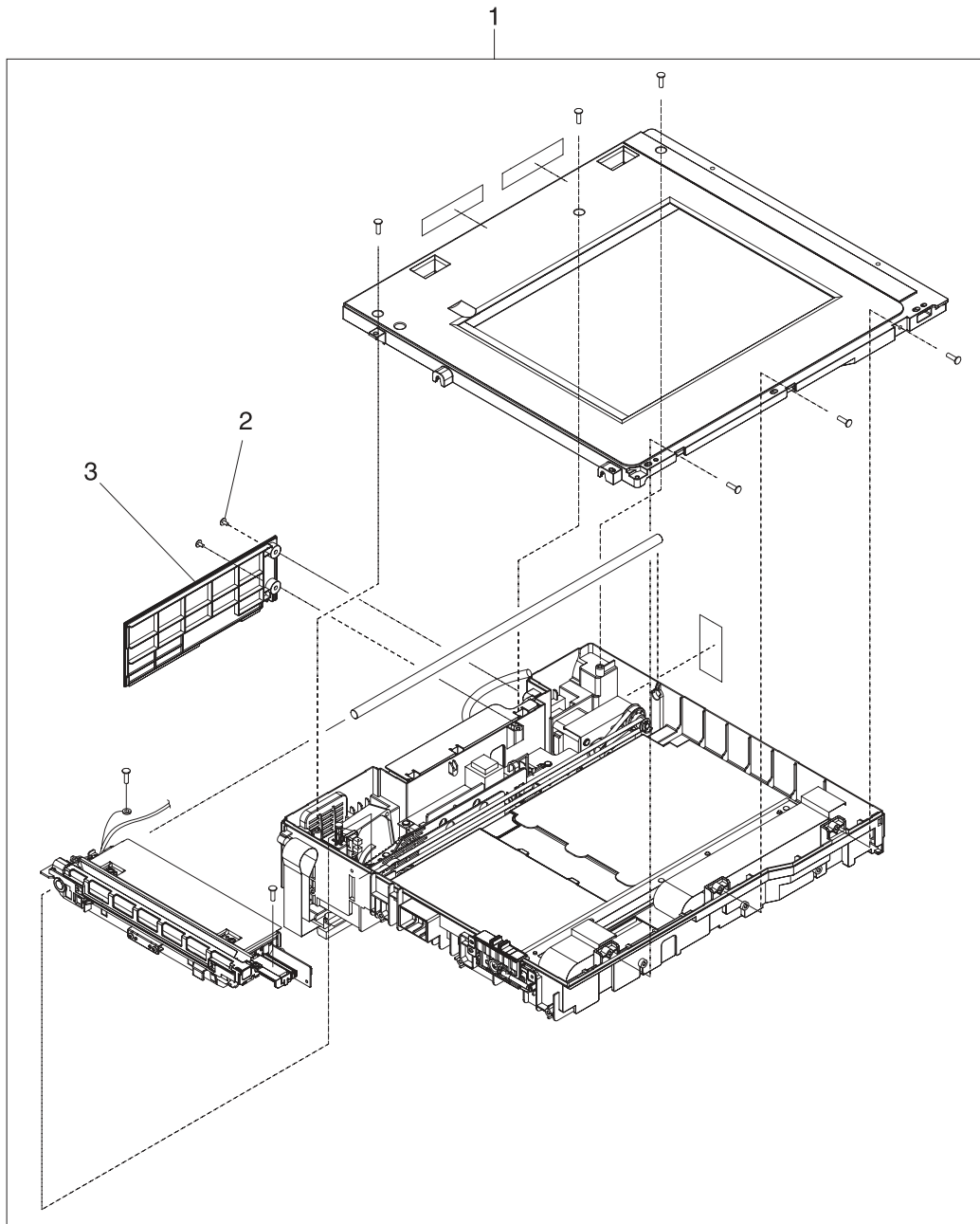
Figure 8-43 Scanner flatbed-unit assembly

8 Parts and diagrams

Table 8-42 Scanner flatbed-unit assembly

Reference	Description	Part number	Quantity
1	Scanner flatbed-unit assembly	IR4041K081NI	1
2	Screw, scanner flatbed	040100FNBBNI	
3	Scanner rear cover	IR4041P216NI	1

Scanner covers
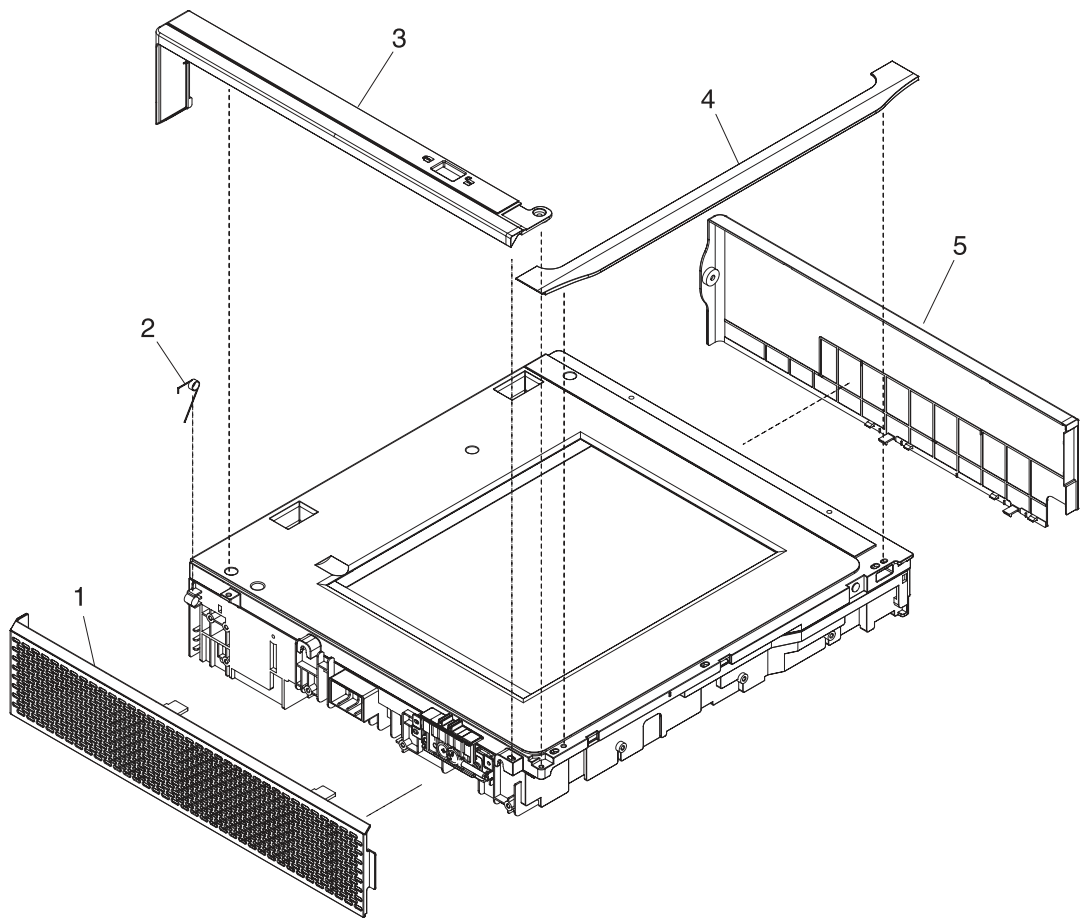
Figure 8-44 Scanner covers

Table 8-43 Scanner covers

Reference	Description	Part number	Quantity
1	Scanner left cover	IR4041K114NI	1
2	Scanner, spring for left cover	IR4041P041NI	1
3	Scanner-carriage-lock cover	IR4041P214NI	
4	Scanner top-cover flatbed flange	IR4041P125NI	1
5	Scanner right cover	IR4041P213NI	1

Scanner-carriage-lock assembly
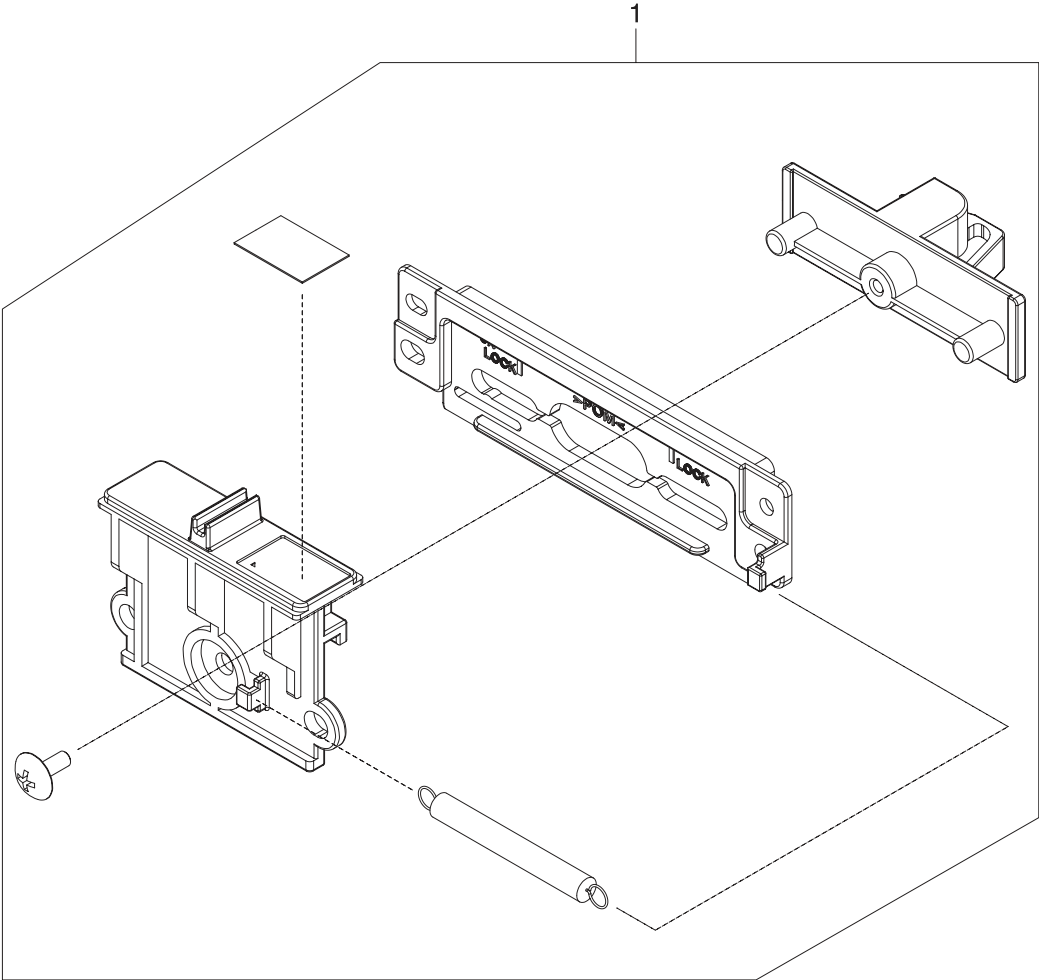
Figure 8-45 Scanner-carriage-lock assembly

Table 8-44 Scanner-carriage-lock assembly

Reference	Description	Part number	Quantity
1	Scanner-carriage-lock assembly	IR4041K102NI	1

Scanner-open-sensor assembly
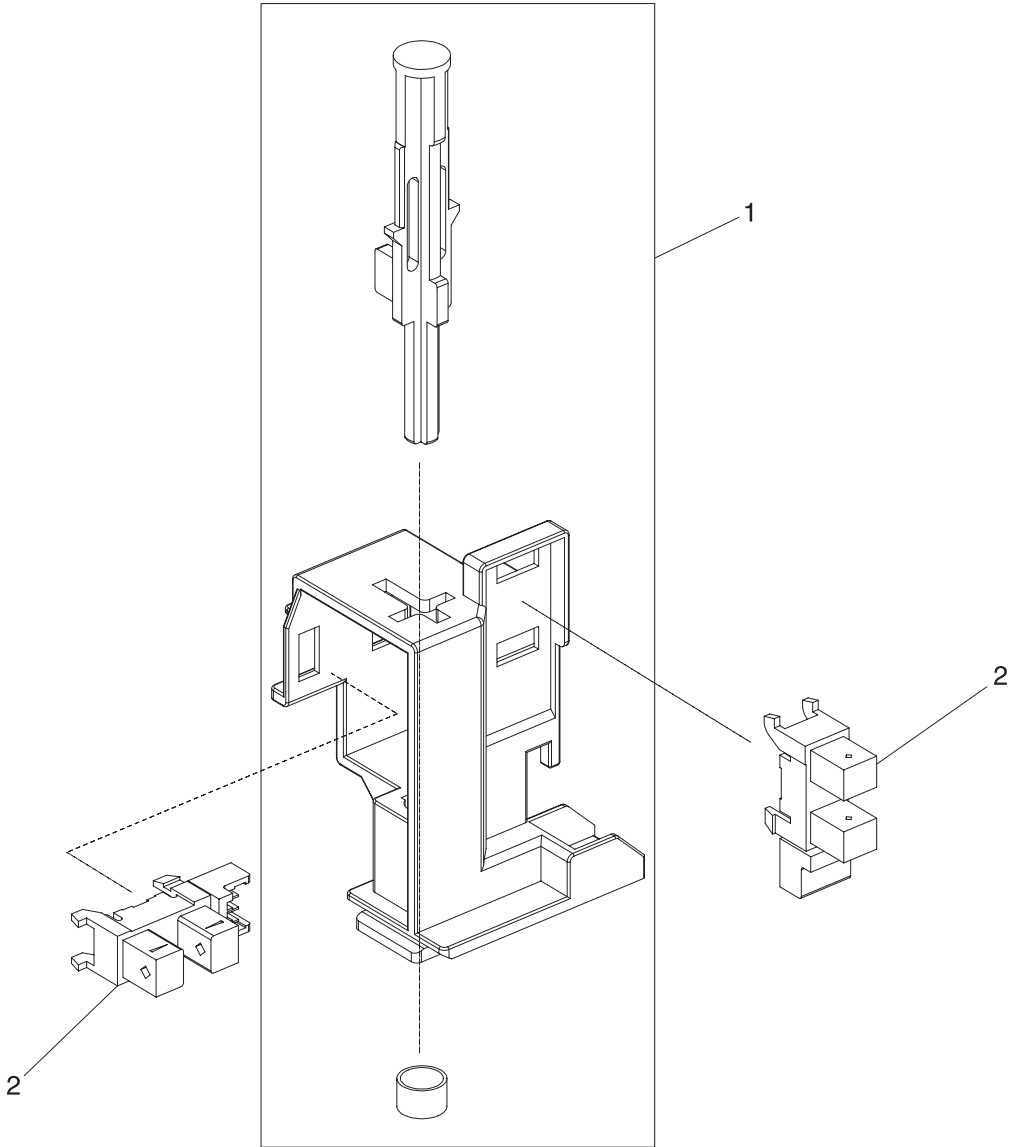
Figure 8-46 Scanner-open-sensor assembly

Table 8-45 Scanner-open-sensor assembly

Reference	Description	Part number	Quantity
1	Scanner-open-sensor assembly	IR4041K105NI	1
2	Scanner-open sensor	E314000619NI	1

Scanner-motor fan
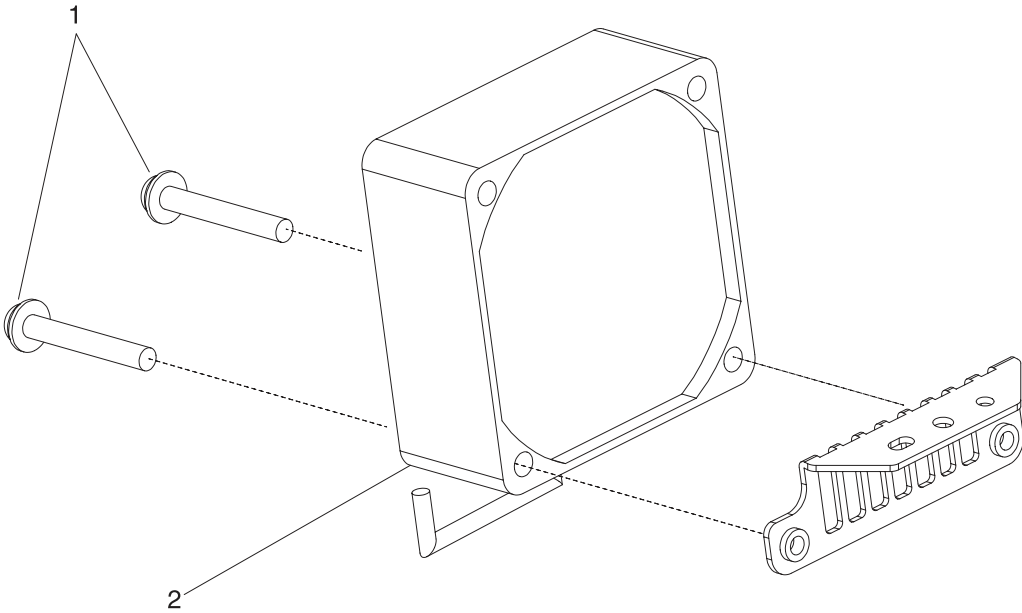
Figure 8-47 Scanner-motor fan

Table 8-46 Scanner-motor fan

Reference	Description	Part number	Quantity
1	Screw, scanner-motor fan	040300FNWSNI	
2	Scanner-motor fan	IR4041P521NI	1

Scanner motor
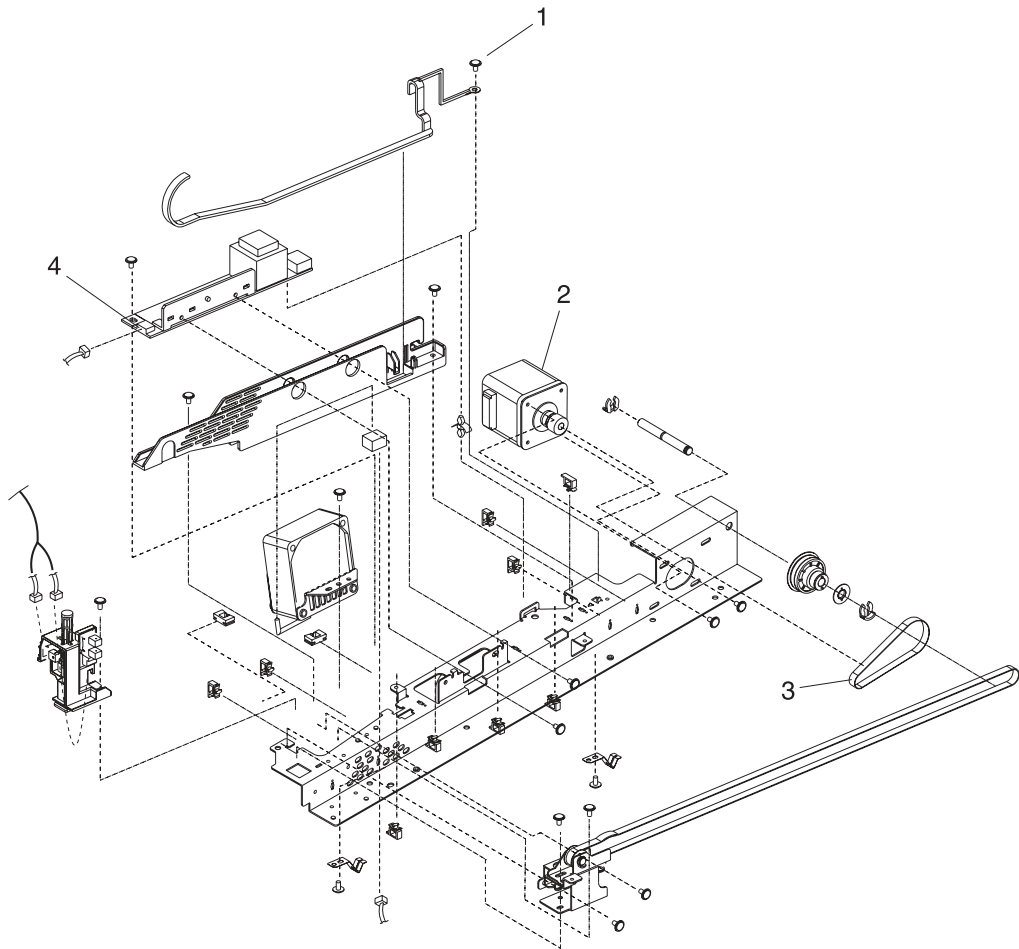
Figure 8-48 Scanner motor

Table 8-47 Scanner motor

Reference	Description	Part number	Quantity
1	Screw, scanner motor	030060FNITNI	
2	Scanner motor	IR4041K250NI	1
3	Scanner-motor belt	NS-BLT00290NI	1
4	Scanner motor inverter	IR4041P522NI	1

Scanner-belt assembly
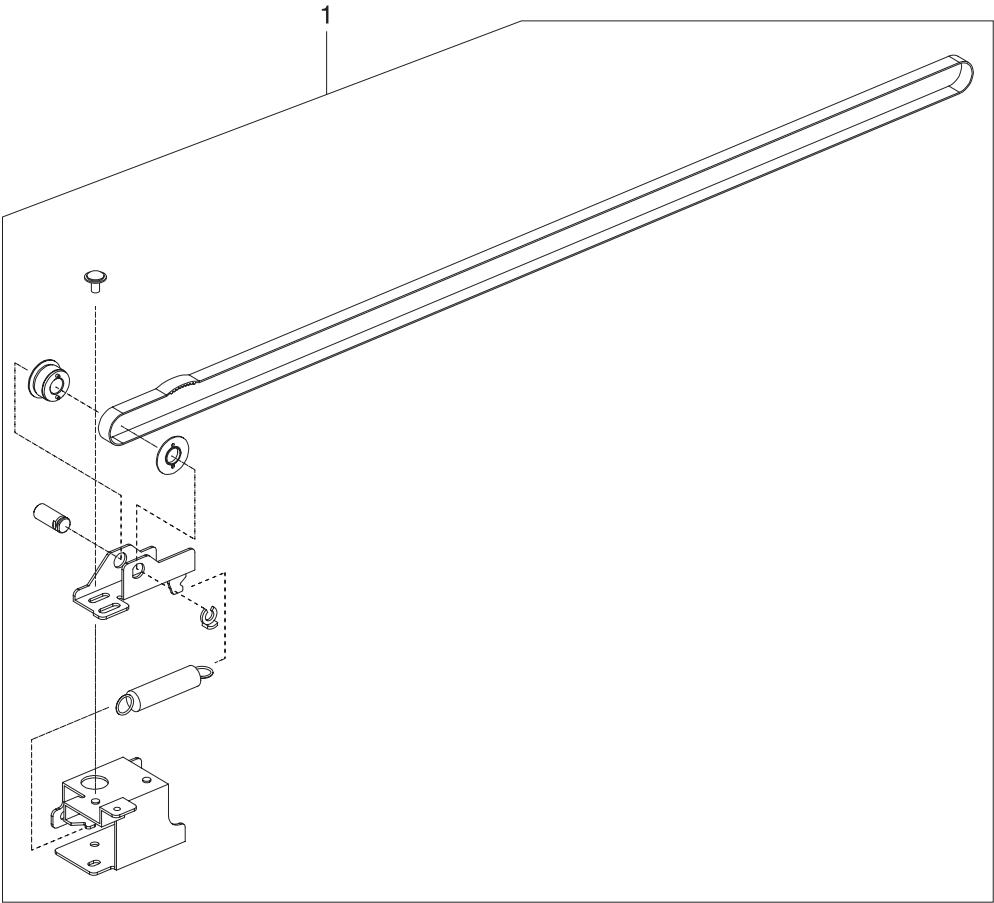
Figure 8-49 Scanner-belt assembly

Table 8-48 Scanner-belt assembly

Reference	Description	Part number	Quantity
1	Scanner-belt assembly	IR4041K107NI	1

Scanner slide-rail
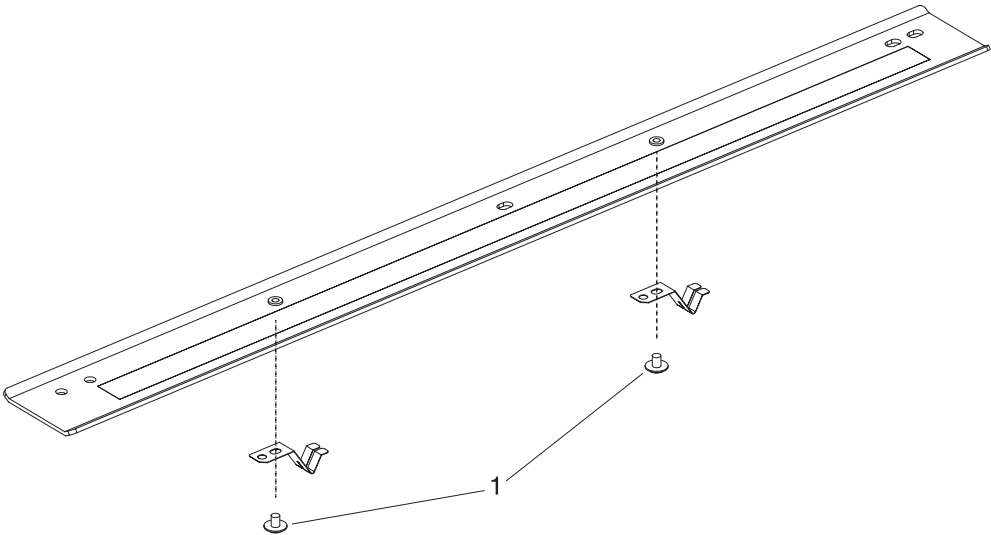
Figure 8-50 Scanner slide-rail

Table 8-49 Scanner slide-rail

Reference	Description	Part number	Quantity
1	Screw, scanner slide-rail	030040FNITNI	

Scanner optical assembly
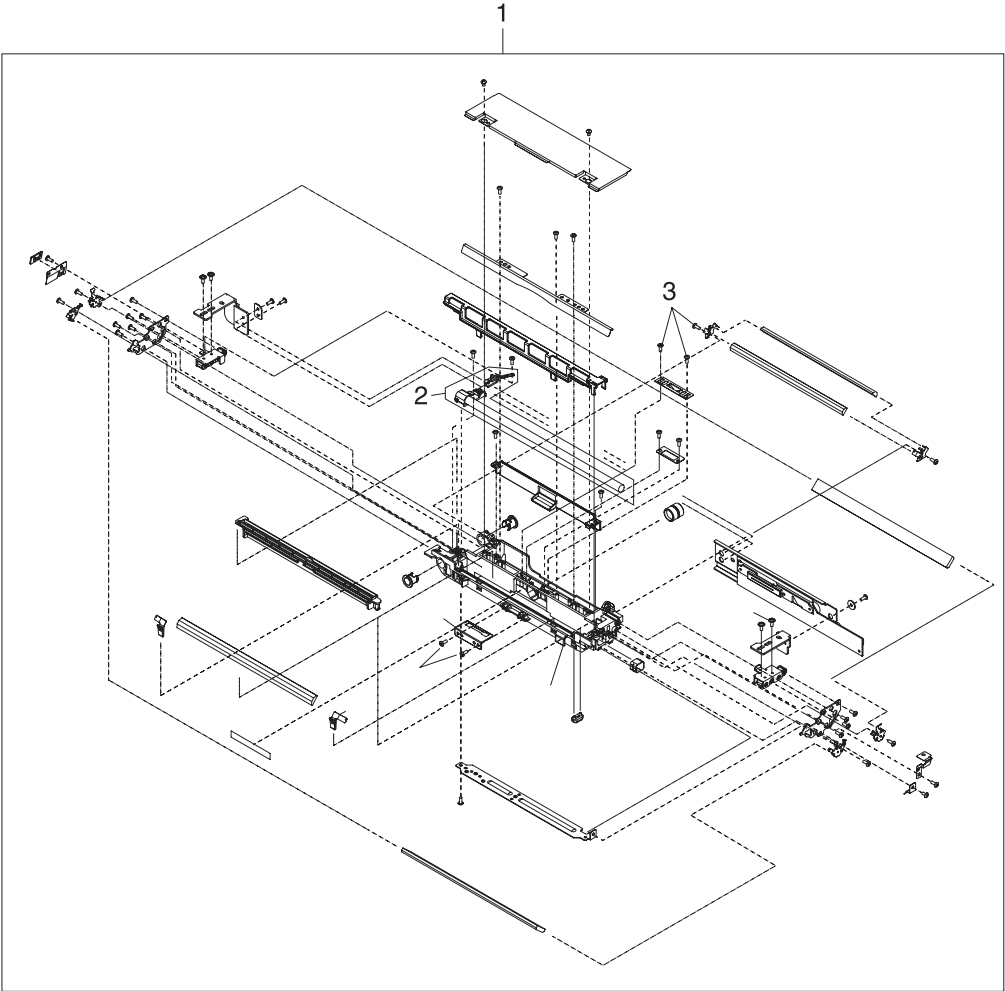
Figure 8-51 Scanner optical assembly

Table 8-50 Scanner optical assembly

Reference	Description	Part number	Quantity
1	Scanner optical assembly	IR4041K121NI	1
2	Lamp, scanner	IR4041K151NI	1
3	Screw, optical assembly	030080FBBBNI	

500-sheet feeder components

Assembly locations
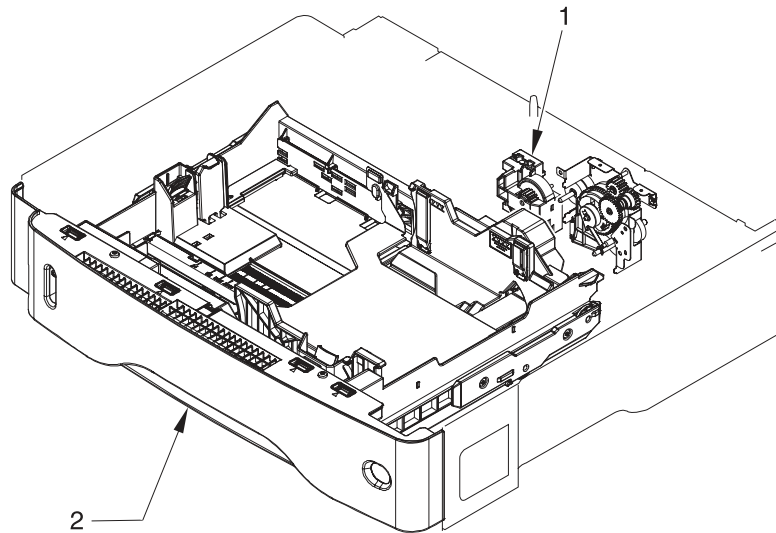
Figure 8-52 500-sheet feeder assembly locations

Item	Assembly name	Details
1	Lifter-drive assembly	See Figure 8-56 500-sheet feeder lifter-drive assembly.
2	Cassette	See Figure 8-57 500-sheet feeder cassette.

External components
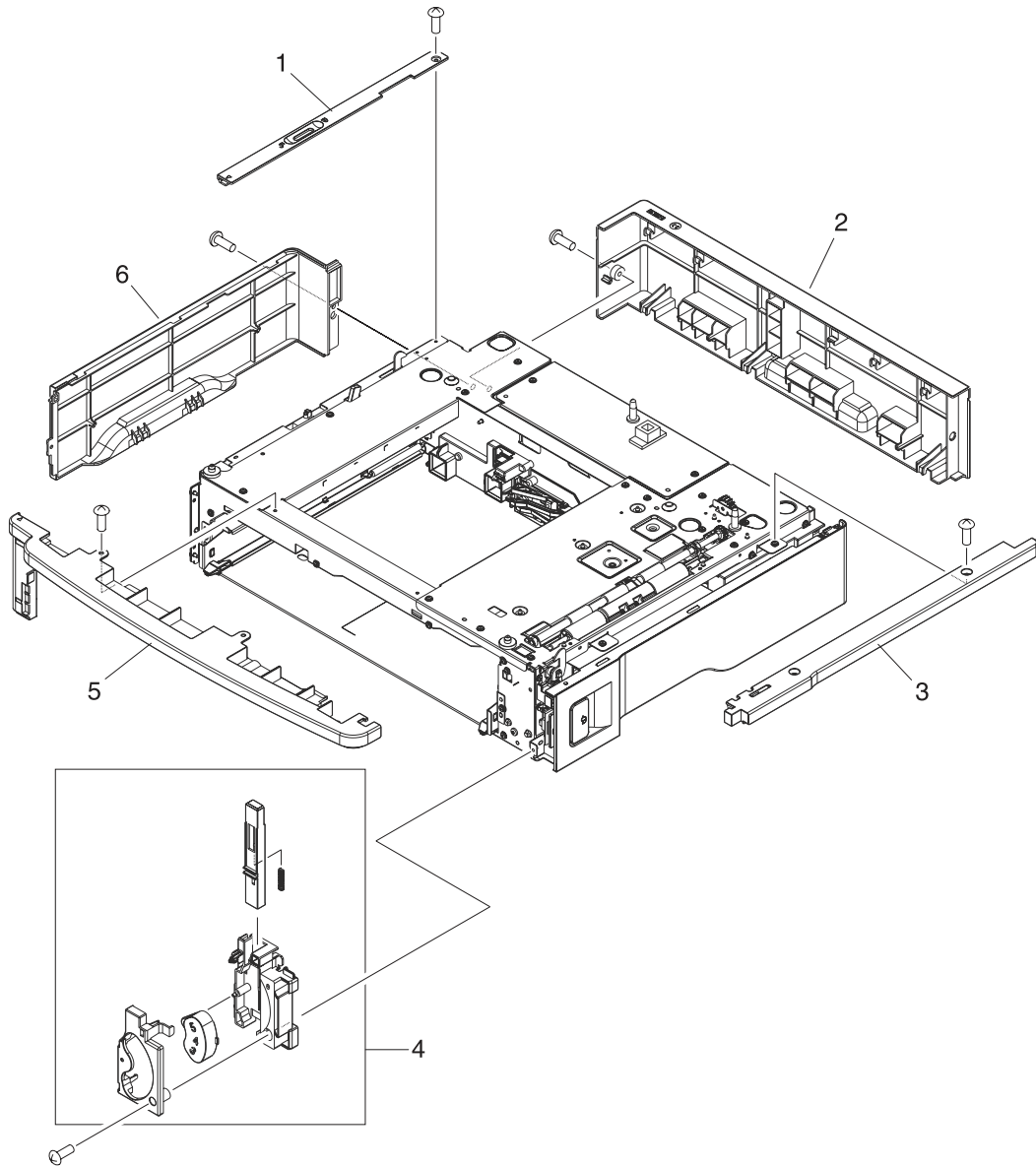
Figure 8-53 500-sheet feeder external components

Table 8-51 500-sheet feeder external components

Reference	Description	Part number	Quantity
1	Cover, left-upper, 500-sheet feeder	RC1-3200-000CN	1
2	Cover, rear, 500-sheet feeder	RC1-3197-000CN	1
3	Cover, right, 500-sheet feeder	RC1-3198-000CN	1
4	Number-plate assembly	RM1-1456-000CN	1
5	Cover, front, 500-sheet feeder	RC1-3196-000CN	1
6	Cover, left, 500-sheet feeder	RC1-3199-000CN	1

500-sheet feeder main body (1 of 2)
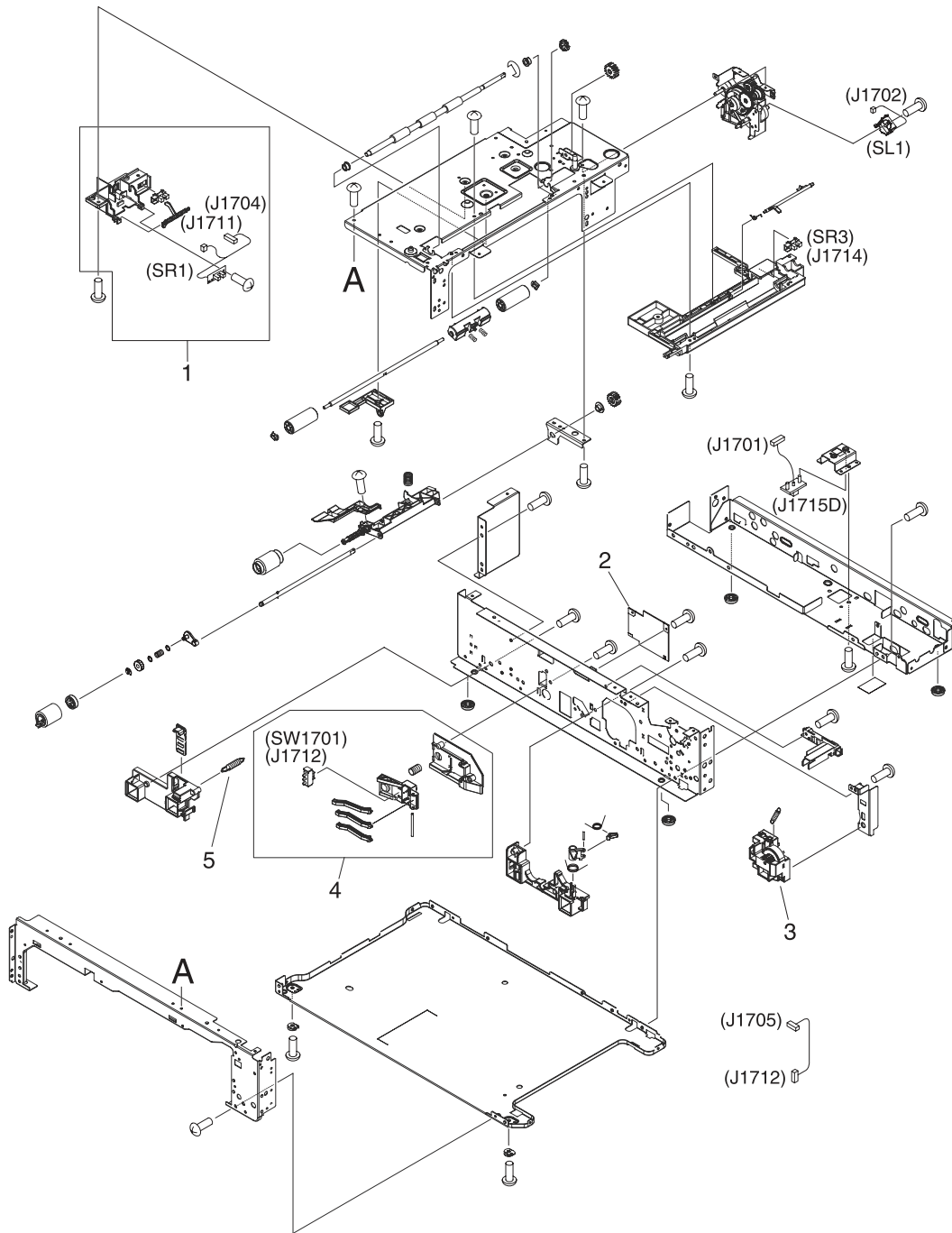
Figure 8-54 500-sheet feeder main body (1 of 2)

Table 8-52 500-sheet feeder main body (1 of 2)

Reference	Description	Part number	Quantity
1	Paper-present sensing assembly (500-sheet feeder)	RM1-1455-000CN	1
2	500-sheet feeder driver PCA	RM1-1122-000CN	1
3	Lifter-drive assembly (500-sheet feeder)	RM1-1094-000CN	1
4	Sensor, paper-size assembly (500-sheet feeder)	RM1-0041-000CN	1
5	Spring, grounding (500-sheet feeder)	RU5-2251-000CN	1

500-sheet feeder main body (2 of 2)

(J105L)

(J1707)

B

C

6

(SW1702)
(J1713)

C

B
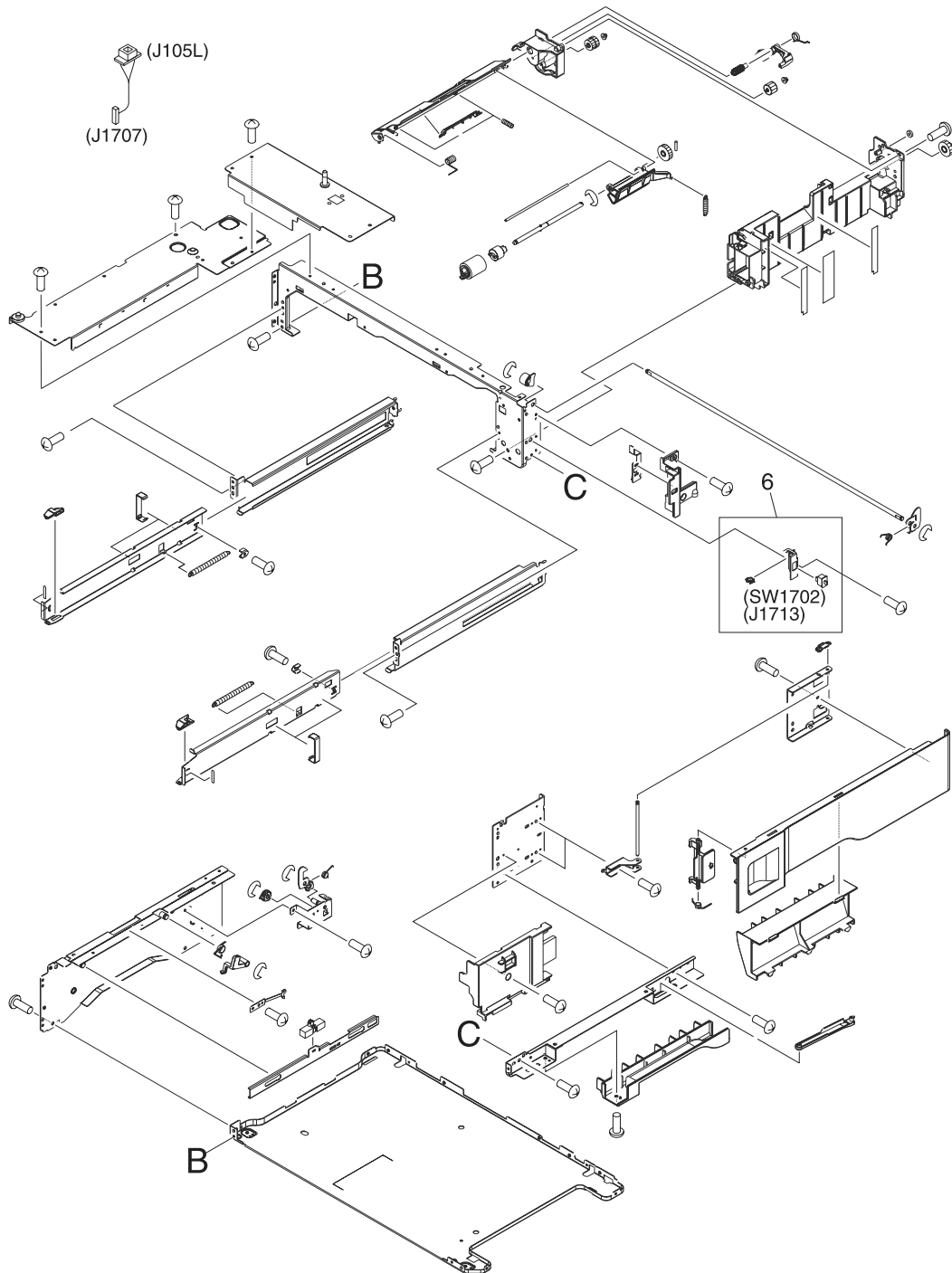
Figure 8-55 500-sheet feeder main body (2 of 2)

Table 8-53 500-sheet feeder main body (2 of 2)

Reference	Description	Part number	Quantity
6	Sensor, right-door-open (500-sheet feeder)	RM1-1045-000CN	1

500-sheet feeder lifter-drive assembly
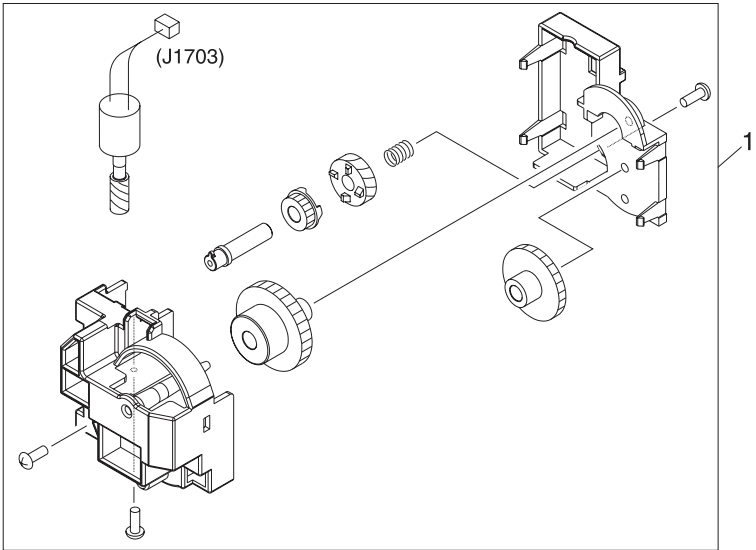
Figure 8-56 500-sheet feeder lifter-drive assembly

Table 8-54 500-sheet feeder lifter-drive assembly

Reference	Description	Part number	Quantity
1	Lifter-drive assembly (500-sheet feeder)	RM1-1457-000CN	1

500-sheet feeder cassette
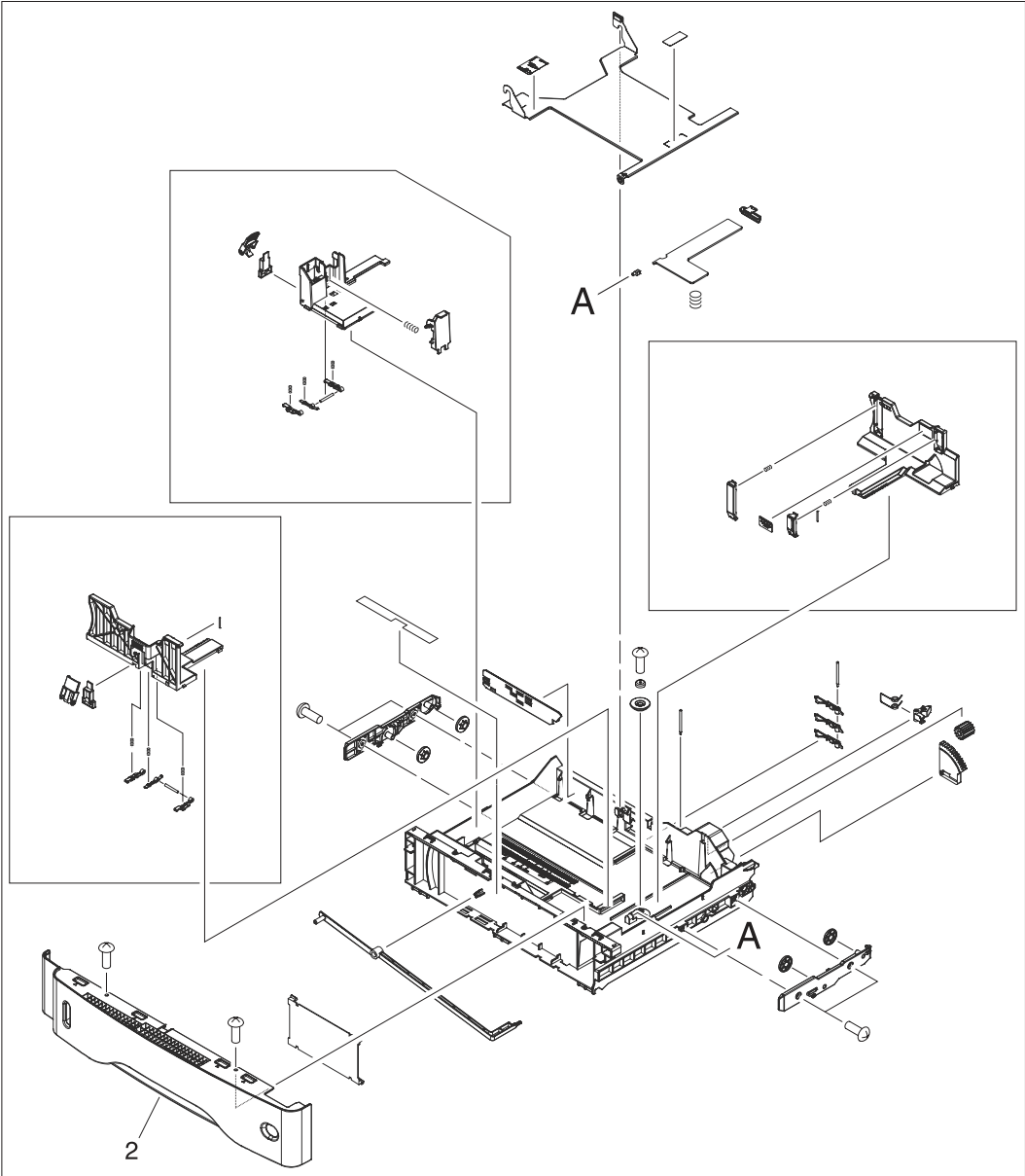
Figure 8-57 500-sheet feeder cassette

Table 8-55 500-sheet feeder cassette

Reference	Description	Part number	Quantity
1	Cassette (tray 2, 3, 4, or 5)	RM1-1001-000CN	1
2	Cover, front (cassette)	RC1-3020-000CN	1

Optional devices

Duplex-printing accessory

(FN107)
(J156)

1

(PS122)
(J142)

(M107)
(J153)

(J151L)

(J142)   (J156D)

(J153D)

(J151LB)

(J151LA)
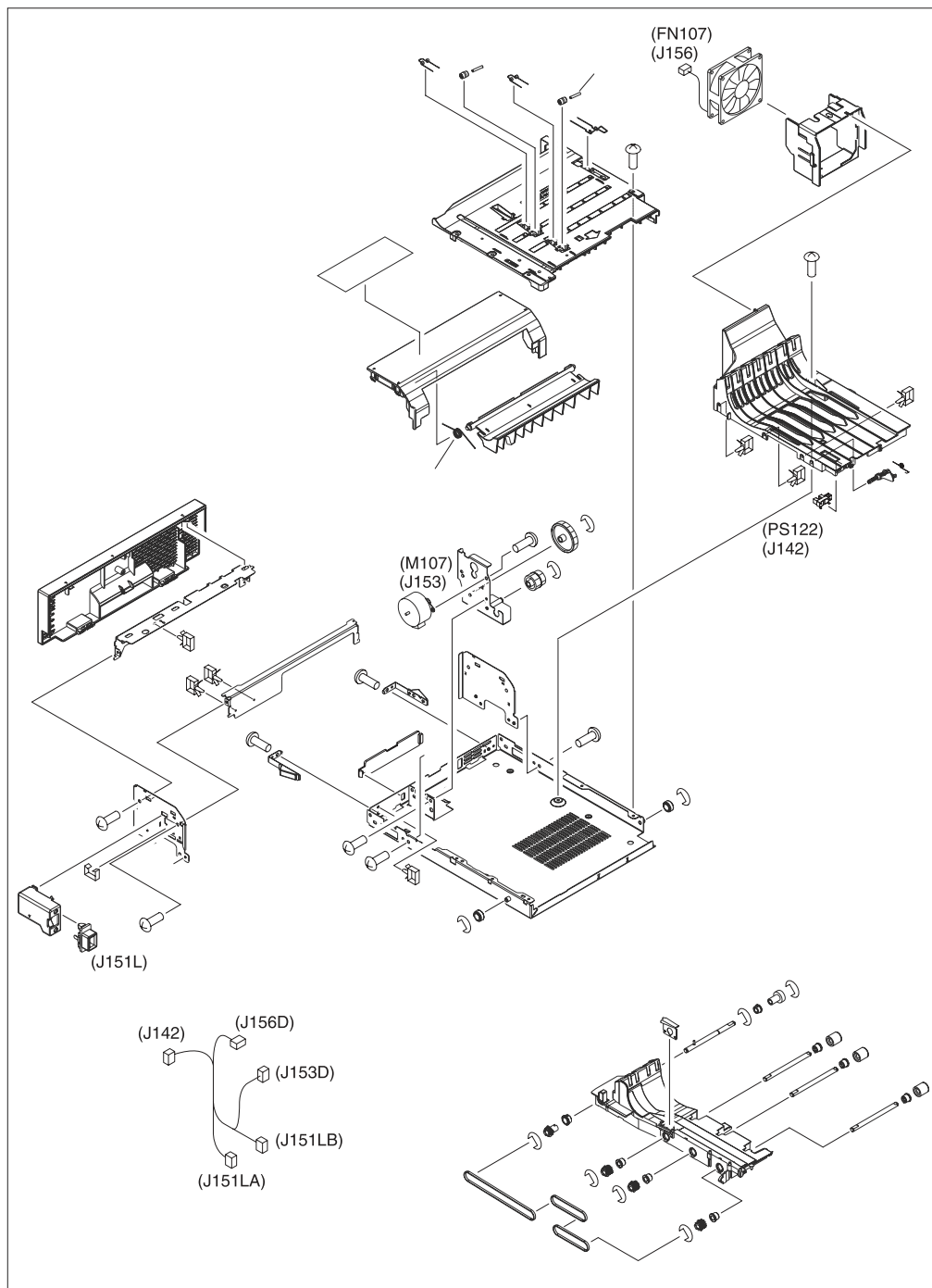
Figure 8-58 Duplex-printing assembly

Table 8-56 Duplex-printing assembly

Reference	Description	Part number	Quantity
1	Duplex-printing assembly	Q5969-67901	1

Stapler/stacker
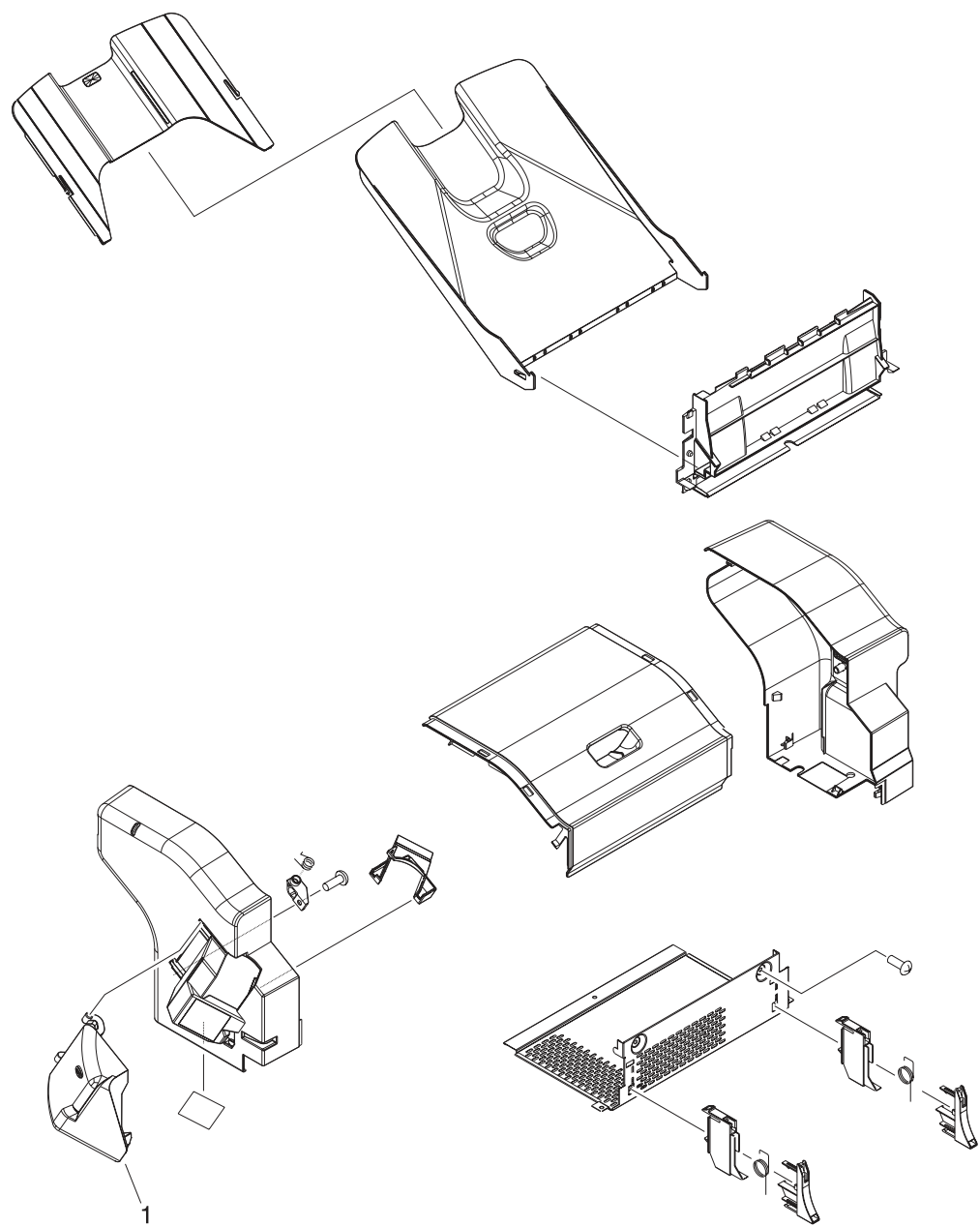
Figure 8-59 Stapler/stacker accessory

Table 8-57 Stapler/stacker accessory

Reference	Description	Part number	Quantity
	Stapler/stacker accessory	Q5691-60501	1
	Staple cartridge	C8085-60541	1
1	Stapler/stacker jam-access door	RC1-2597-000CN	1

3-bin mailbox
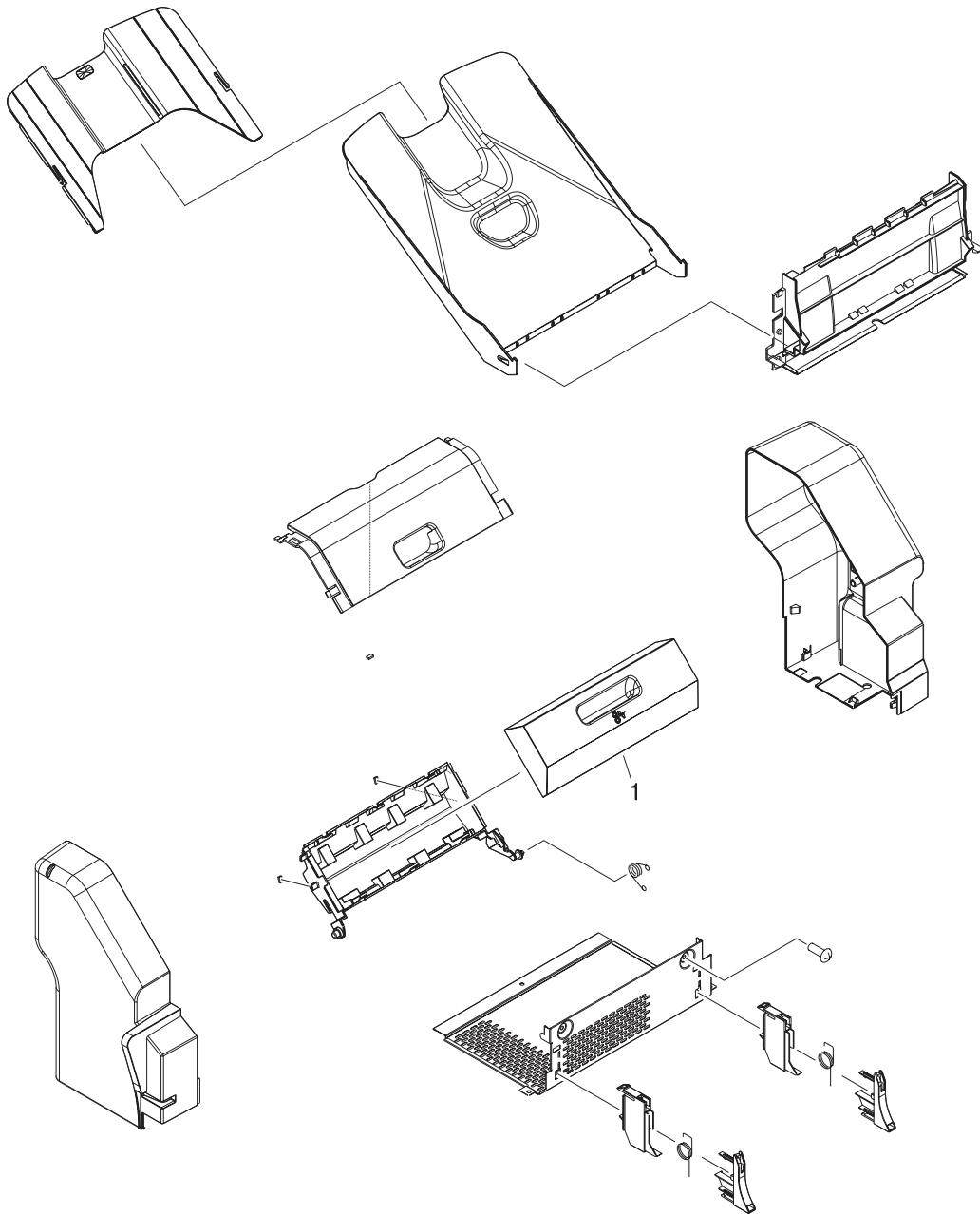
Table 8-58 3-bin mailbox accessory

Reference	Description	Part number	Quantity
	3-bin mailbox accessory	Q5962-60503	1
1	3-bin mailbox jam-access door	RM1-0981-000CN	1

Alphabetical parts list

Table 8-59 Alphabetical parts list (continued)

Description	Part number	Table and page
ADF left cover	PF2282P058NI	ADF assembly
ADF maintenance kit	Q5997-67901	Print cartridge and maintenance kits
ADF mylar holder assembly	PF2282K043NI	ADF assembly
ADF mylar replacement kit	Q6496–67901	Print cartridge and maintenance kits
ADF mylar replacement kit	Q6496–67901	ADF assembly
ADF mylar replacement kit	Q6496–67901	ADF mylar replacement kit
ADF mylar-holder assembly	PF2282K043NI	Customer-replaceable components (ADF and scanner)
ADF mylar-holder assembly	PF2282K043NI	ADF mylar-holder assembly
ADF output-bin paper stop	PF2282P061NI	ADF internal components (1 of 3)
ADF output-bin-base cover	PF2282P060NI	ADF internal components (1 of 3)
ADF pickup-roller assembly	PF2282K039NI	Customer-replaceable components (ADF and scanner)
ADF pickup-roller assembly	PF2282K039NI	ADF internal components (3 of 3)
ADF pickup-roller assembly	PF2282K039NI	ADF pickup-roller assembly
ADF pickup-roller cover	PF2282K040NI	Customer-replaceable components (ADF and scanner)
ADF pickup-roller cover	PF2282K040NI	ADF internal components (3 of 3)
ADF pickup-roller cover	PF2282K040NI	ADF pickup-roller cover
ADF rear cover	PF2282P044NI	ADF assembly
ADF separation pad	PF2282K035NI	ADF separation-pad case
ADF separation-pad assembly	PF2282K035NI	Customer-replaceable components (ADF and scanner)
ADF separation-pad assembly	PF2282K035NI	ADF separation pad
ADF separation-pad case	PF2282K034NI	ADF separation-pad case
ADF white mylar backing	PF2282P025NI	ADF assembly
ADF white scan background	PF2282P339NI	ADF assembly
ADF, springs for left cover	PF2282P352NI	ADF assembly
ADF, springs for white mylar backing	PF2282P343NI	ADF assembly
Arm, door, 1 (top cover)	RC1-2827-000CN	Internal components (4 of 5)

Table 8-59 Alphabetical parts list (continued)

Description	Part number	Table and page
Arm, door, 2 (top cover)	RC1-2828-000CN	Internal components (4 of 5)
Block, guide support (upper plate)	RC1-3102-000CN	Upper-plate assembly
Bolt, hex-head	WS9-0255-000CN	Internal components (4 of 5)
Cable for hard disk, flat-flexible	5851-1827	Memory
Cable, beam-detect to scanner (print engine)	RM1-1372-000CN	Internal components (1 of 5)
Cable, control panel	RM1-1381-000CN	Internal components (4 of 5)
Cable, door switch	RM1-1397-000CN	Internal components (2 of 5)
Cable, duplexing-unit grounding	RM1-1400-000CN	Electrical/forward assembly
Cable, envelope-feeder connector	RM1-1193-000CN	Internal components (2 of 5)
Cable, fan docking (for dc-controller fan)	RM1-1376-000CN	Internal components (5 of 5)
Cable, flat-flexible (engine power supply)	RK2-0470-000CN	Electrical/forward assembly
Cable, flat-flexible (engine power supply)	RK2-0469-000CN	Electrical/forward assembly
Cable, image scanner (print engine)	RM1-1398-000CN	Internal components (1 of 5)
Cable, laser (print engine)	RM1-1367-000CN	Internal components (1 of 5)
Cable, optional 500-sheet feeder connection	RM1-1370-000CN	Internal components (5 of 5)
Cable, output device connection	RM1-1371-000CN	Internal components (4 of 5)
Cable, output-bin full sensor	RM1-1368-000CN	Internal components (4 of 5)
Cable, power	RM1-1375-000CN	Internal components (5 of 5)
Cable, reverse unit	RM1-1380-000CN	Internal components (4 of 5)
Case, envelope-feeder connector	RC1-0245-000CN	Internal components (2 of 5)
Cassette (tray 2, 3, 4 or 5)	RM1-1001–000CN	Cassette
Cassette (tray 2, 3, 4, or 5)	RM1-1001-000CN	500-sheet feeder cassette
Cassette rail assembly, left	RM1-1011-000CN	Internal components (3 of 5)
Cassette rail assembly, right	RM1-1012-000CN	Internal components (3 of 5)
Clutch, paper feed, electromagnetic (CL101)	RK2-0349-000CN	Paper-feed roller assembly
Complete print engine (110 volt)	Q3942-67902	Internal components (1 of 5)
Complete print engine (220 volt)	Q3942-67903	Internal components (1 of 5)
Control-panel assembly	Q3942-60102	Control panel and control-panel overlays
Control-panel assembly	Q3942-60102	External panels and covers
Control-panel overlays, Arabic	Q3942-60125	Control panel and control-panel overlays
Control-panel overlays, Czech	Q3942-60116	Control panel and control-panel overlays
Control-panel overlays, Danish	Q3942-60113	Control panel and control-panel overlays

Table 8-59 Alphabetical parts list (continued)

Description	Part number	Table and page
Control-panel overlays, Dutch	Q3942-60108	Control panel and control-panel overlays
Control-panel overlays, English	Q3942-60103	Control panel and control-panel overlays
Control-panel overlays, Finnish	Q3942-60112	Control panel and control-panel overlays
Control-panel overlays, French	Q3942-60104	Control panel and control-panel overlays
Control-panel overlays, German	Q3942-60106	Control panel and control-panel overlays
Control-panel overlays, Greek	Q3942-60123	Control panel and control-panel overlays
Control-panel overlays, Hebrew	Q3942-60124	Control panel and control-panel overlays
Control-panel overlays, Hungarian	Q3942-60117	Control panel and control-panel overlays
Control-panel overlays, Italian	Q3942-60105	Control panel and control-panel overlays
Control-panel overlays, Japanese	Q3942-60121	Control panel and control-panel overlays
Control-panel overlays, Korean	Q3942-60120	Control panel and control-panel overlays
Control-panel overlays, Norwegian	Q3942-60110	Control panel and control-panel overlays
Control-panel overlays, Polish	Q3942-60114	Control panel and control-panel overlays
Control-panel overlays, Portuguese	Q3942-60109	Control panel and control-panel overlays
Control-panel overlays, Russian	Q3942-60115	Control panel and control-panel overlays
Control-panel overlays, Simplified Chinese	Q3942-60119	Control panel and control-panel overlays
Control-panel overlays, Spanish	Q3942-60107	Control panel and control-panel overlays
Control-panel overlays, Swedish	Q3942-60111	Control panel and control-panel overlays
Control-panel overlays, Thai	Q3942-60132	Control panel and control-panel overlays
Control-panel overlays, Traditional Chinese	Q3942-60118	Control panel and control-panel overlays
Control-panel overlays, Turkish	Q3942-60122	Control panel and control-panel overlays
Cover, cassette, left side	RC1-3043-000CN	External panels and covers
Cover, door arm (top cover)	RC1-2833-000CN	Internal components (4 of 5)

Table 8-59 Alphabetical parts list (continued)

Description	Part number	Table and page
Cover, duplexing-unit assembly	RM1-1018-000CN	External panels and covers
Cover, envelope-feeder slot	RL1-0455-000CN	Internal components (3 of 5)
Cover, formatter	RC1-3035-000CN	Customer-replaceable components (print engine)
Cover, formatter	RC1-3035-000CN	External panels and covers
Cover, front (cassette)	RC1-3020-000CN	500-sheet feeder cassette
Cover, front assembly	RM1-1015-000CN	External panels and covers
Cover, front corner	RL1-0457-000CN	External panels and covers
Cover, front stopper	RC1-2823-000CN	Internal components (4 of 5)
Cover, front, 500-sheet feeder	RC1-3196-000CN	500-sheet feeder external components
Cover, handle, lower right	RC1-2881-000CN	Internal components (2 of 5)
Cover, inner front	RC1-3041-000CN	Internal components (4 of 5)
Cover, left, 500-sheet feeder	RC1-3199-000CN	500-sheet feeder external components
Cover, left-side, front	RC1-3052-000CN	Internal components (1 of 5)
Cover, left-upper, 500-sheet feeder	RC1-3200-000CN	500-sheet feeder external components
Cover, lock, front (upper plate)	RC1-2820-000CN	Upper-plate assembly
Cover, rear	RM1-1017-000CN	External panels and covers
Cover, rear lock (upper plate)	RC1-2821-000CN	Upper-plate assembly
Cover, rear, 500-sheet feeder	RC1-3197-000CN	500-sheet feeder external components
Cover, right assembly	RM1-1016-000CN	External panels and covers
Cover, right lower assembly	RM1-1033-000CN	External panels and covers
Cover, right, 500-sheet feeder	RC1-3198-000CN	500-sheet feeder external components
Cover, side, rear	RC1-3042-000CN	Internal components (3 of 5)
Cross-member, support	RC1-2911-000CN	Internal components (4 of 5)
Customer in-box training CD, English only	MKTNG-00473	Documentation, software, and training material
DC controller PCA	RM1-1354-000CN	Internal components (5 of 5)
Delivery assembly	RM1-1047-000CN	External panels and covers
Delivery assembly	RM1-1047-000CN	Delivery assembly
Delivery tray assembly	RM1-1047-000CN	Customer-replaceable components (print engine)
Duplex-printing assembly	Q5969-67901	Duplex-printing assembly
Duplexer (duplex printing accessory)	Q5969-69001	Accessories

Table 8-59 Alphabetical parts list (continued)

Description	Part number	Table and page
E-ring (paper-feed roller assembly)	XD9-0132-020CN	Paper-feed roller assembly
Electrical/forward assembly	For reference only	Internal components (2 of 5)
Engine power supply assembly (100–127 volt)	RM1-1041-000CN	Electrical/forward assembly
Engine power supply assembly (220–240 volt)	RM1-1042-000CN	Electrical/forward assembly
Envelope feeder	Q2438-67902	Accessories
Fan, dc controller (FN104)	RK2-0472-000CN	Internal components (5 of 5)
Fan, main cooling (FN101)	RK2-0278-000CN	Internal components (1 of 5)
Fan, print cartridge (FN102)	RK2-0280-000CN	Internal components (5 of 5)
Fan, reversing unit (FN103)	RK2-0280-000CN	Internal components (1 of 5)
Flag, full-detect (output bin)	RC1-2863-000CN	Internal components (4 of 5)
Flag, paper-feed sensor	RC1-0060-000CN	Internal components (1 of 5)
Flag, shutter	RC1-0378-000CN	Internal components (1 of 5)
Flash memory card, 32 MB	Q2635-67907	Memory
Formatter assembly	Q3942–67901	Internal components (5 of 5)
Formatter assembly, exchange	Q3942-69001	Customer-replaceable components (print engine)
Formatter assembly, new	Q3942-67901	Customer-replaceable components (print engine)
Fuser (100–127 volt)	RM1-1043-000CN	Fuser
Fuser (100–127 volt)	RM1-1043-000CN	Internal components (2 of 5)
Fuser (220–240 volt)	RM1-1044-000CN	Internal components (2 of 5)
Fuser (220–240 volt)	RM1-1044-000CN	Fuser
Fuser entrance guide	RM1-1046-000CN	Customer-replaceable components (print engine)
Fuser entrance guide	RM1-1046-000CN	Internal components (2 of 5)
Fuser, 110-volt, new	RM1-1043-000CN	Customer-replaceable components (print engine)
Fuser, 2210-volt, new	RM1-1044-000CN	Customer-replaceable components (print engine)
Gear, 14T (cassette)	RU5-0254-000CN	Cassette
Gear, 18T	RU5-0045-020CN	Internal components (1 of 5)
Gear, 20T (cassette)	RC1-0331-000CN	Cassette
Gear, 23T	RU5-0256-000CN	Internal components (1 of 5)
Gear, 30T (paper-feed roller assembly)	RU5-0050-000CN	Paper-feed roller assembly
Gear, 80T (cassette)	RU5-0253-000CN	Cassette
Guide assembly, flat-flexible cable	RM1-1027-000CN	Internal components (5 of 5)

Table 8-59 Alphabetical parts list (continued)

Description	Part number	Table and page
Guide, cartridge (upper plate)	RC1-2853-000CN	Upper-plate assembly
Guide, cassette, front	RC1-3020-000CN	Cassette
Guide, legal-size (upper plate)	RC1-2854-000CN	Upper-plate assembly
Guide, paper sensing (PS101)	RM1-1010-000CN	Internal components (1 of 5)
Guide, rear	RC1-2884-000CN	Internal components (3 of 5)
Handle, lock (upper plate)	RC1-2818-000CN	Upper-plate assembly
Hard disk, 20 GB	J7948-61003	Memory
Hinge, door, right-side	RC1-2901-000CN	Internal components (2 of 5)
Holder, door switch	RC1-3063-000CN	Internal components (2 of 5)
Holder, link	RC1-3002-000CN	Internal components (3 of 5)
Holder, output-device-full sensor flag	RC1-2864-000CN	Internal components (4 of 5)
Holder, right shutter (upper plate)	RC1-2855-000CN	Upper-plate assembly
HP Digital Sending Software CD (trial version)	MKTNG-00472	Documentation, software, and training material
HP Jetdirect 620n Fast Ethernet (10/100Base-TX) print server (EIO card)	J7934A	Cables and interfaces
HP Jetdirect connectivity card for USB, serial, and LocalTalk connections	J4135A	Cables and interfaces
HP LaserJet 4345mfp Series service manual	Q3942-90950	Documentation, software, and training material
HP LaserJet 4345mfp Series software CD, America and Western Europe	Q3942-60135	Documentation, software, and training material
HP LaserJet 4345mfp Series software CD, Asia	Q3942-60139	Documentation, software, and training material
HP LaserJet 4345mfp Series software CD, Eastern Europe	Q3942-60138	Documentation, software, and training material
HP LaserJet 4345mfp Series software CD, Northern Europe	Q3942-60137	Documentation, software, and training material
HP LaserJet 4345mfp Series software CD, Western Europe	Q3942-60136	Documentation, software, and training material
HP LaserJet analog fax accessory 300	Q3701-60002	Accessories
HP LaserJet print cartridge	Q5945-67901	Print cartridge and maintenance kits
Lamp, scanner	IR4041K151NI	Scanner optical assembly
Laser/scanner assembly	RM1-1573-000CN	Internal components (1 of 5)
Lever, paper-size-sensing (cassette)	RC1-2782-000CN	Cassette
Lever, shutter	RC1-3106-000CN	Internal components (1 of 5)
Lifter drive assembly	RM1-1029-000CN	Internal components (3 of 5)

Table 8-59 Alphabetical parts list (continued)

Description	Part number	Table and page
Lifter-drive assembly	RM1-1029-000CN	Lifter-drive assembly
Lifter-drive assembly (500-sheet feeder)	RM1-1094-000CN	500-sheet feeder main body (1 of 2)
Lifter-drive assembly (500-sheet feeder)	RM1-1457-000CN	500-sheet feeder lifter-drive assembly
Limiter, torque	RC1-2758-000CN	Internal components (1 of 5)
Link, handle (upper plate)	RC1-2822-000CN	Upper-plate assembly
Link, switch	RC1-3003-000CN	Internal components (3 of 5)
Main drive assembly	RM1-1049-000CN	Internal components (3 of 5)
Main drive assembly	RM1-1049-000CN	Main drive assembly
Microswitch (SW101)	WC4-5139-000CN	Internal components (2 of 5)
Motor, crossing, (stepping) (M104)	RK2-0473-000CN	Reverse assembly
Motor, dc 24-volt, (M101)	RK2-0272-000CN	Internal components (3 of 5)
Motor, dc 24-volt, (M102)	RK2-0274-000CN	Internal components (3 of 5)
Motor, delivery (stepping) (M106)	RK2-0475-000CN	Reverse assembly
Motor, reverse-unit (stepping) (M105)	RK2-0474-000CN	Reverse assembly
Multipurpose assembly	RM1-1572-000CN	Multipurpose assembly
Multipurpose tray assembly	RM1-1572-000CN	Internal components (3 of 5)
Multipurpose tray assembly	RM1-0005-020CN	Multipurpose assembly
Number-plate assembly	RM1-1456-000CN	500-sheet feeder external components
Optional 500-sheet tray and feeder unit	Q5968-67901	Accessories
Output bin	RM1-0940-000CN	Customer-replaceable components (print engine)
Output-bin assembly	RM1-0940-000CN	External panels and covers
Paper-feed assembly	RM1-0025-040CN	Electrical/forward assembly
Paper-feed roller assembly	RM1-0012-020CN	Paper-feed roller assembly
Paper-pickup-drive assembly	RM1-0034-070CN	Internal components (1 of 5)
Paper-pickup-drive assembly	RM1-0034-070CN	Paper-pickup-drive assembly
Paper-present sensing assembly (500-sheet feeder)	RM1-1455-000CN	500-sheet feeder main body (1 of 2)
Parallel cable, 2-meter IEEE 1284-B compliant	C2950A	Cables and interfaces
Parallel cable, 3-meter IEEE 1284-B compliant	C2951A	Cables and interfaces
Phone cord, Australia	8120-8907	Cables and interfaces
Phone cord, cable-modem-facsimile, Korean	8120-8908	Cables and interfaces
Phone cord, Czech Republic/SK	8120-8922	Cables and interfaces

Table 8-59 Alphabetical parts list (continued)

Description	Part number	Table and page
Phone cord, Denmark	8120-8911	Cables and interfaces
Phone cord, France	8120-8923	Cables and interfaces
Phone cord, Germany and Eastern Europe	8120-8912	Cables and interfaces
Phone cord, Italy	8120-8914	Cables and interfaces
Phone cord, MOD-PHONE-ASSY 6-COND 118-IN-LG	8121-0811	Cables and interfaces
Phone cord, Netherlands	8120-8915	Cables and interfaces
Phone cord, Norway	8120-8916	Cables and interfaces
Phone cord, South Africa	8120-8917	Cables and interfaces
Phone cord, Switzerland	8120-8919	Cables and interfaces
Phone cord, Turkey	8120-8920	Cables and interfaces
Phone cord, United Kingdom	8120-8921	Cables and interfaces
Photointerrupter (PS107)	WG8-5624-000CN	Internal components (1 of 5)
Plate, main pad support (multipurpose assembly)	RL1-0007-000CN	Multipurpose assembly
Power cord, OPT-900 3-COND 2.3-M-LG	8120-8706	Cables and interfaces
Power cord, OPT-901 3-COND 2.3-M-LG	8121-0834	Cables and interfaces
Power cord, OPT-903 3-COND 2.25-M-LG	8120-6812	Cables and interfaces
Power cord, OPT-906 3-COND 2.25-M-LG	8120-6815	Cables and interfaces
Power cord, OPT-912 3-COND 2.25-M-LG	8120-6814	Cables and interfaces
Power cord, OPT-917 3-COND 2.25-M-LG	8120-6813	Cables and interfaces
Power cord, OPT-918 3-COND 2.3-M-LG	8120-6798	Cables and interfaces
Power cord, OPT-920 3-CON 2.3-M-LG	8120-6869	Cables and interfaces
Power cord, OPT-921 3-COND 2.3-M-LG	8120-6980	Cables and interfaces
Power cord, OPT-922 3-COND 2.3-M-LG	8120-8707	Cables and interfaces
Power supply, PFC (100–127 volt)	RM1-1013-000CN	Internal components (5 of 5)
Power supply, PFC (220–240 volt)	RM1-1014-000CN	Internal components (5 of 5)
Printer maintenance kit, 110-volt	Q5998-67901	Print cartridge and maintenance kits
Printer maintenance kit, 220-volt	Q5999-67901	Print cartridge and maintenance kits
Registration assembly	RM1-0011-060CN	Internal components (1 of 5)
Registration assembly	RM1-0011-060CN	Registration assembly
Reverse assembly	RM1-1022-000CN	Internal components (2 of 5)
Reverse assembly	RM1-1022-000CN	Reverse assembly
Reverse-separation guide assembly	RM1-1019-000CN	Internal components (4 of 5)

Table 8-59 Alphabetical parts list (continued)

Description	Part number	Table and page
Reverse-separation-guide assembly	RM1-1019-000CN	Reverse-separation-guide assembly
Reverse-unit PCA	RM1-1379-000CN	Reverse assembly
Rod, link	RC1-2902-000CN	Internal components (3 of 5)
Rod, link (upper plate)	RC1-2830-000CN	Upper-plate assembly
Rod, switch, front	RC1-2980-000CN	Internal components (3 of 5)
Roller assembly, transfer	RM1-1110-000CN	Customer-replaceable components (print engine)
Roller assembly, transfer	RM1-1110-000CN	Internal components (2 of 5)
Roller, paper-feed (cassette)	RM1-0037-000CN	Customer-replaceable components (print engine)
Roller, paper-feed (cassette)	RM1-0037-020CN	Internal components (1 of 5)
Roller, paper-feed assembly	RM1-0012-020CN	Internal components (1 of 5)
Roller, paper-pickup (cassette)	RM1-0036-000CN	Customer-replaceable components (print engine)
Roller, paper-pickup (cassette)	RM1-0036-000CN	Internal components (1 of 5)
Roller, pickup, multipurpose assembly	RL1-0019-000CN	Customer-replaceable components (print engine)
Roller, pickup, multipurpose assembly	RL1-0019-000CN	Multipurpose assembly
Scanner controller PCA	IR4041K512NI	Scanner-base components
Scanner fan-filter cover	IR4041P217NI	Scanner-base components
Scanner flatbed-unit assembly	IR4041K081NI	Scanner flatbed-unit assembly
Scanner glass and cover	IR4041K111NI	Scanner glass and cover
Scanner left cover	IR4041K114NI	Scanner covers
Scanner motor	IR4041K250NI	Scanner motor
Scanner motor inverter	IR4041P522NI	Scanner motor
Scanner optical assembly	IR4041K121NI	Scanner optical assembly
Scanner rear cover	IR4041P216NI	Scanner flatbed-unit assembly
Scanner right cover	IR4041P213NI	Scanner covers
Scanner top-cover flatbed flange	IR4041P125NI	Scanner covers
Scanner, spring for left cover	IR4041P041NI	Scanner covers
Scanner-belt assembly	IR4041K107NI	Scanner-belt assembly
Scanner-carriage-lock assembly	IR4041K102NI	Scanner-carriage-lock assembly
Scanner-carriage-lock cover	IR4041P214NI	Scanner covers
Scanner-fan filter	IR4041P007NI	Scanner-base components
Scanner-motor belt	NS-BLT00290NI	Scanner motor

Table 8-59 Alphabetical parts list (continued)

Description	Part number	Table and page
Scanner-motor fan	IR4041P521NI	Scanner-motor fan
Scanner-open sensor	E314000619NI	Scanner-open-sensor assembly
Scanner-open-sensor assembly	IR4041K105NI	Scanner-open-sensor assembly
Screw, ADF	030080FWWSNI	ADF assembly
Screw, ADF	NS-SCR00029NI	ADF internal components (1 of 3)
Screw, ADF, button, M3x8	IR4041P021NI	ADF input tray
Screw, ADF, wave 4x10	PF2245P369NI	ADF assembly
Screw, flathead, RS, M3x6	XA9-1464-000CN	Electrical/forward assembly
Screw, M3x8	XA9-0650-000CN	Fuser
Screw, optical assembly	030080FBBBNI	Scanner optical assembly
Screw, RS, M3x12	XA9-1447-000CN	Internal components (1 of 5)
Screw, RS, M3x6	XA9-1495-000CN	Upper-plate assembly
Screw, RS, M3x8	XA9-1449-000CN	Fuser
Screw, S, M3x8	XA9-1500-000CN	Internal components (1 of 5)
Screw, scanner flatbed	040100FNBBNI	Scanner flatbed-unit assembly
Screw, scanner motor	030060FNITNI	Scanner motor
Screw, scanner slide-rail	030040FNITNI	Scanner slide-rail
Screw, scanner, M3x8	IR4041P021NI	Scanner glass and cover
Screw, scanner-motor fan	040300FNWSNI	Scanner-motor fan
Screw, stepped	RS1-9004-020CN	Fuser
Screw, stepped, M3	RC1-0266-020CN	Internal components (5 of 5)
Screw, tapping, M3x6	XA9-1503-000CN	Internal components (3 of 5)
Screw, tapping, pan-head, M4x10	XB4-7401-0007CN	External panels and covers
Screw, tapping, truss-head, M3x8	XB4-7300-809CN	Multipurpose assembly
Screw, tapping, truss-head, M4x16	XB4-7401-605CN	Internal components (3 of 5)
Screw, TP, M3x4	XB6-7300-406CN	Reverse assembly
Screw, with washer, M3x6	XB2-7300-607CN	Internal components (2 of 5)
Screw, with washer, M3x6	XA9-1420-000CN	Electrical/forward assembly
Sensor assembly, paper size (SW102)	RM1-0041-020CN	Internal components (5 of 5)
Sensor assembly, right door	RM1-1045-000CN	Internal components (2 of 5)
Sensor, paper-size assembly (500-sheet feeder)	RM1-0041-000CN	500-sheet feeder main body (1 of 2)
Sensor, reverse-unit (PS109)	RM1-1570-000CN	Reverse assembly

Table 8-59 Alphabetical parts list (continued)

Description	Part number	Table and page
Sensor, reverse-unit jam (PS111)	RM1-1571-000CN	Reverse assembly
Sensor, right-door-open (500-sheet feeder)	RM1-1045-000CN	500-sheet feeder main body (2 of 2)
Service and support training CD	C3942-60133	Documentation, software, and training material
Solenoid (SL101)	RK2-0269-000CN	Internal components (1 of 5)
Solenoid, multipurpose assembly (SL102)	RK2-0276-000CN	Multipurpose assembly
Solenoid, reverse-unit (SL105)	RK2-0485-000CN	Reverse assembly
Solenoid, reversing-roller separation (SL106)	RK2-0486-000CN	Reverse assembly
Spacer, screw	RC1-0392-000CN	Internal components (2 of 5)
Spring, compression	RU5-2265-000CN	Internal components (5 of 5)
Spring, grounding	RU5-2251-000CN	Internal components (3 of 5)
Spring, grounding (500-sheet feeder)	RU5-2251-000CN	500-sheet feeder main body (1 of 2)
Spring, tension	RC1-0167-000CN	Internal components (1 of 5)
Spring, torsion	RC1-0379-000CN	Internal components (1 of 5)
Spring, torsion	RC1-0061-000CN	Internal components (1 of 5)
Staple cartridge	C8085-60541	Stapler/stacker accessory
Stapler/stacker accessory	Q5691-60501	Stapler/stacker accessory
Stapler/stacker jam-access door	RC1-2597-000CN	Stapler/stacker accessory
Stopper, bushing arm	RC1-3090-000CN	Internal components (4 of 5)
Stopper, front lock	RL1-0434-000CN	Internal components (4 of 5)
Stopper, hinge shaft	RC1-3124-000CN	Internal components (2 of 5)
Storage cabinet	Q5970A	Accessories
Support, cartridge (upper plate)	RC1-2856-000CN	Upper-plate assembly
Support, gas damper	RL1-0436-000CN	Internal components (4 of 5)
Swing-plate assembly	RM1-0043-020CN	Internal components (5 of 5)
Switch, power	RC1-3044-000CN	External panels and covers
Thermistor (TH3)	RK2-0359-000CN	Internal components (1 of 5)
Upper plate assembly	For reference only	Internal components (4 of 5)
Wall poster, quick reference, Czech and Polish	Q3942-90931	Documentation, software, and training material
Wall poster, quick reference, Danish and Norwegian	Q3942-90929	Documentation, software, and training material
Wall poster, quick reference, Dutch and Swedish	Q3942-90928	Documentation, software, and training material

Table 8-59 Alphabetical parts list (continued)

Description	Part number	Table and page
Wall poster, quick reference, English and French	Q3942-90925	Documentation, software, and training material
Wall poster, quick reference, Finnish and Russian	Q3942-90930	Documentation, software, and training material
Wall poster, quick reference, Hungarian and Turkish	Q3942-90932	Documentation, software, and training material
Wall poster, quick reference, Italian and German	Q3942-90926	Documentation, software, and training material
Wall poster, quick reference, Simplified Chinese and Korean	Q3942-90933	Documentation, software, and training material
Wall poster, quick reference, Spanish and Portuguese	Q3942-90927	Documentation, software, and training material
Wall poster, quick reference, Traditional Chinese and English	Q3942-90934	Documentation, software, and training material

Numerical parts list

Table 8-60 Numerical parts list

Part number	Description	Table and page
030040FNITNI	Screw, scanner slide-rail	Scanner slide-rail
030060FNITNI	Screw, scanner motor	Scanner motor
030080FBBBNI	Screw, optical assembly	Scanner optical assembly
030080FWWSNI	Screw, ADF	ADF assembly
040100FNBBNI	Screw, scanner flatbed	Scanner flatbed-unit assembly
040300FNWSNI	Screw, scanner-motor fan	Scanner-motor fan
5851-1827	Cable for hard disk, flat-flexible	Memory
8120-6798	Power cord, OPT-918 3-COND 2.3-M-LG	Cables and interfaces
8120-6812	Power cord, OPT-903 3-COND 2.25-M-LG	Cables and interfaces
8120-6813	Power cord, OPT-917 3-COND 2.25-M-LG	Cables and interfaces
8120-6814	Power cord, OPT-912 3-COND 2.25-M-LG	Cables and interfaces
8120-6815	Power cord, OPT-906 3-COND 2.25-M-LG	Cables and interfaces
8120-6869	Power cord, OPT-920 3-CON 2.3-M-LG	Cables and interfaces
8120-6980	Power cord, OPT-921 3-COND 2.3-M-LG	Cables and interfaces
8120-8706	Power cord, OPT-900 3-COND 2.3-M-LG	Cables and interfaces
8120-8707	Power cord, OPT-922 3-COND 2.3-M-LG	Cables and interfaces
8120-8907	Phone cord, Australia	Cables and interfaces
8120-8908	Phone cord, cable-modem-facsimile, Korean	Cables and interfaces
8120-8911	Phone cord, Denmark	Cables and interfaces
8120-8912	Phone cord, Germany and Eastern Europe	Cables and interfaces
8120-8914	Phone cord, Italy	Cables and interfaces
8120-8915	Phone cord, Netherlands	Cables and interfaces
8120-8916	Phone cord, Norway	Cables and interfaces
8120-8917	Phone cord, South Africa	Cables and interfaces
8120-8919	Phone cord, Switzerland	Cables and interfaces
8120-8920	Phone cord, Turkey	Cables and interfaces
8120-8921	Phone cord, United Kingdom	Cables and interfaces
8120-8922	Phone cord, Czech Republic/SK	Cables and interfaces
8120-8923	Phone cord, France	Cables and interfaces
8121-0811	Phone cord, MOD-PHONE-ASSY 6-COND 118-IN-LG	Cables and interfaces
8121-0834	Power cord, OPT-901 3-COND 2.3-M-LG	Cables and interfaces

Table 8-60 Numerical parts list (continued)

Part number	Description	Table and page
C2950A	Parallel cable, 2-meter IEEE 1284-B compliant	Cables and interfaces
C2951A	Parallel cable, 3-meter IEEE 1284-B compliant	Cables and interfaces
C3942-60133	Service and support training CD	Documentation, software, and training material
C8085-60541	5,000-staple cartridge	Accessories
C8085-60541	Staple cartridge	Stapler/stacker accessory
E314000619NI	Scanner-open sensor	Scanner-open-sensor assembly
For reference only	Electrical/forward assembly	Internal components (2 of 5)
For reference only	Upper plate assembly	Internal components (4 of 5)
IR4041K081NI	Scanner flatbed-unit assembly	Scanner flatbed-unit assembly
IR4041K102NI	Scanner-carriage-lock assembly	Scanner-carriage-lock assembly
IR4041K105NI	Scanner-open-sensor assembly	Scanner-open-sensor assembly
IR4041K107NI	Scanner-belt assembly	Scanner-belt assembly
IR4041K111NI	Scanner glass and cover	Scanner glass and cover
IR4041K114NI	Scanner left cover	Scanner covers
IR4041K121NI	Scanner optical assembly	Scanner optical assembly
IR4041K151NI	Lamp, scanner	Scanner optical assembly
IR4041K250NI	Scanner motor	Scanner motor
IR4041K512NI	Scanner controller PCA	Scanner-base components
IR4041P007NI	ADF fan filter	Customer-replaceable components (ADF and scanner)
IR4041P007NI	Scanner-fan filter	Scanner-base components
IR4041P021NI	Screw, ADF, button, M3x8	ADF input tray
IR4041P021NI	Screw, scanner, M3x8	Scanner glass and cover
IR4041P041NI	Scanner, spring for left cover	Scanner covers
IR4041P125NI	Scanner top-cover flatbed flange	Scanner covers
IR4041P213NI	Scanner right cover	Scanner covers
IR4041P214NI	Scanner-carriage-lock cover	Scanner covers
IR4041P215NI	ADF front-cover flange	Customer-replaceable components (ADF and scanner)
IR4041P216NI	Scanner rear cover	Scanner flatbed-unit assembly
IR4041P217NI	ADF fan-filter cover	Customer-replaceable components (ADF and scanner)

Table 8-60 Numerical parts list (continued)

Part number	Description	Table and page
IR4041P217NI	Scanner fan-filter cover	Scanner-base components
IR4041P521NI	Scanner-motor fan	Scanner-motor fan
IR4041P522NI	Scanner motor inverter	Scanner motor
J4135A	HP Jetdirect connectivity card for USB, serial, and LocalTalk connections	Cables and interfaces
J7934A	HP Jetdirect 620n Fast Ethernet (10/100Base-TX) print server (EIO card)	Cables and interfaces
J7948-61003	Hard disk, 20 GB	Memory
MKTNG-00472	HP Digital Sending Software CD (trial version)	Documentation, software, and training material
MKTNG-00473	Customer in-box training CD, English only	Documentation, software, and training material
NS-BLT00290NI	Scanner-motor belt	Scanner motor
NS-SCR00029NI	Screw, ADF	ADF internal components (1 of 3)
PF2245P369NI	Screw, ADF, wave 4x10	ADF assembly
PF2282K006NI	ADF assembly	ADF assembly
PF2282K008NI	ADF hinge, right	ADF internal components (2 of 3)
PF2282K034NI	ADF separation-pad case	ADF separation-pad case
PF2282K035NI	ADF separation-pad assembly	Customer-replaceable components (ADF and scanner)
PF2282K035NI	ADF separation-pad assembly	ADF separation pad
PF2282K035NI	ADF separation pad	ADF separation-pad case
PF2282K039NI	ADF pickup-roller assembly	Customer-replaceable components (ADF and scanner)
PF2282K039NI	ADF pickup-roller assembly	ADF internal components (3 of 3)
PF2282K039NI	ADF pickup-roller assembly	ADF pickup-roller assembly
PF2282K040NI	ADF pickup-roller cover	Customer-replaceable components (ADF and scanner)
PF2282K040NI	ADF pickup-roller cover	ADF internal components (3 of 3)
PF2282K040NI	ADF pickup-roller cover	ADF pickup-roller cover
PF2282K041NI	ADF hinge, left	ADF internal components (2 of 3)
PF2282K042NI	ADF input tray	Customer-replaceable components (ADF and scanner)

Table 8-60 Numerical parts list (continued)

Part number	Description	Table and page
PF2282K042NI	ADF input tray	ADF assembly
PF2282K042NI	ADF input tray	ADF input tray
PF2282K043NI	ADF mylar-holder assembly	Customer-replaceable components (ADF and scanner)
PF2282K043NI	ADF mylar holder assembly	ADF assembly
PF2282K043NI	ADF mylar-holder assembly	ADF mylar-holder assembly
PF2282K164NI	ADF jam-access latch	ADF internal components (3 of 3)
PF2282K165NI	ADF cable	ADF assembly
PF2282K166NI	ADF hinge flaps (ESD)	ADF assembly
PF2282P025NI	ADF white mylar backing	ADF assembly
PF2282P041NI	ADF jam-access cover	ADF assembly
PF2282P044NI	ADF rear cover	ADF assembly
PF2282P058NI	ADF left cover	ADF assembly
PF2282P059NI	ADF front cover	ADF assembly
PF2282P060NI	ADF output-bin-base cover	ADF internal components (1 of 3)
PF2282P061NI	ADF output-bin paper stop	ADF internal components (1 of 3)
PF2282P339NI	ADF white scan background	ADF assembly
PF2282P343NI	ADF, springs for white mylar backing	ADF assembly
PF2282P352NI	ADF, springs for left cover	ADF assembly
PF2282P353NI	ADF clear plastic paper guide	ADF internal components (3 of 3)
Q2438-67902	Envelope feeder	Accessories
Q2625A	100-pin DDR memory DIMM (dual inline memory module), 64 MB	Memory
Q2626A	100-pin DDR memory DIMM, 128 MB	Memory
Q2627-67951	100-pin DDR memory DIMM, 256 MB	Memory
Q2635-67907	Flash memory card, 32 MB	Memory
Q3701-60002	HP LaserJet analog fax accessory 300	Accessories
Q3942-60102	Control-panel assembly	Control panel and control-panel overlays
Q3942-60102	Control-panel assembly	External panels and covers
Q3942-60103	Control-panel overlays, English	Control panel and control-panel overlays

Table 8-60 Numerical parts list (continued)

Part number	Description	Table and page
Q3942-60104	Control-panel overlays, French	Control panel and control-panel overlays
Q3942-60105	Control-panel overlays, Italian	Control panel and control-panel overlays
Q3942-60106	Control-panel overlays, German	Control panel and control-panel overlays
Q3942-60107	Control-panel overlays, Spanish	Control panel and control-panel overlays
Q3942-60108	Control-panel overlays, Dutch	Control panel and control-panel overlays
Q3942-60109	Control-panel overlays, Portuguese	Control panel and control-panel overlays
Q3942-60110	Control-panel overlays, Norwegian	Control panel and control-panel overlays
Q3942-60111	Control-panel overlays, Swedish	Control panel and control-panel overlays
Q3942-60112	Control-panel overlays, Finnish	Control panel and control-panel overlays
Q3942-60113	Control-panel overlays, Danish	Control panel and control-panel overlays
Q3942-60114	Control-panel overlays, Polish	Control panel and control-panel overlays
Q3942-60115	Control-panel overlays, Russian	Control panel and control-panel overlays
Q3942-60116	Control-panel overlays, Czech	Control panel and control-panel overlays
Q3942-60117	Control-panel overlays, Hungarian	Control panel and control-panel overlays
Q3942-60118	Control-panel overlays, Traditional Chinese	Control panel and control-panel overlays
Q3942-60119	Control-panel overlays, Simplified Chinese	Control panel and control-panel overlays
Q3942-60120	Control-panel overlays, Korean	Control panel and control-panel overlays
Q3942-60121	Control-panel overlays, Japanese	Control panel and control-panel overlays
Q3942-60122	Control-panel overlays, Turkish	Control panel and control-panel overlays
Q3942-60123	Control-panel overlays, Greek	Control panel and control-panel overlays
Q3942-60124	Control-panel overlays, Hebrew	Control panel and control-panel overlays
Q3942-60125	Control-panel overlays, Arabic	Control panel and control-panel overlays

Table 8-60 Numerical parts list (continued)

Part number	Description	Table and page
Q3942-60132	Control-panel overlays, Thai	Control panel and control-panel overlays
Q3942-60135	HP LaserJet 4345mfp Series software CD, America and Western Europe	Documentation, software, and training material
Q3942-60136	HP LaserJet 4345mfp Series software CD, Western Europe	Documentation, software, and training material
Q3942-60137	HP LaserJet 4345mfp Series software CD, Northern Europe	Documentation, software, and training material
Q3942-60138	HP LaserJet 4345mfp Series software CD, Eastern Europe	Documentation, software, and training material
Q3942-60139	HP LaserJet 4345mfp Series software CD, Asia	Documentation, software, and training material
Q3942-67901	Formatter assembly, new	Customer-replaceable components (print engine)
Q3942-67902	Complete print engine (110 volt)	Internal components (1 of 5)
Q3942-67903	Complete print engine (220 volt)	Internal components (1 of 5)
Q3942-69001	Formatter assembly, exchange	Customer-replaceable components (print engine)
Q3942-90925	Wall poster, quick reference, English and French	Documentation, software, and training material
Q3942-90926	Wall poster, quick reference, Italian and German	Documentation, software, and training material
Q3942-90927	Wall poster, quick reference, Spanish and Portuguese	Documentation, software, and training material
Q3942-90928	Wall poster, quick reference, Dutch and Swedish	Documentation, software, and training material
Q3942-90929	Wall poster, quick reference, Danish and Norwegian	Documentation, software, and training material
Q3942-90930	Wall poster, quick reference, Finnish and Russian	Documentation, software, and training material
Q3942-90931	Wall poster, quick reference, Czech and Polish	Documentation, software, and training material
Q3942-90932	Wall poster, quick reference, Hungarian and Turkish	Documentation, software, and training material
Q3942-90933	Wall poster, quick reference, Simplified Chinese and Korean	Documentation, software, and training material
Q3942-90934	Wall poster, quick reference, Traditional Chinese and English	Documentation, software, and training material
Q3942-90950	HP LaserJet 4345mfp Series service manual	Documentation, software, and training material
Q3942–67901	Formatter assembly	Internal components (5 of 5)
Q5691-60501	Stapler/stacker accessory	Stapler/stacker accessory

Table 8-60 Numerical parts list (continued)

Part number	Description	Table and page
Q5945-67901	HP LaserJet print cartridge	Print cartridge and maintenance kits
Q5962-60503	3-bin mailbox accessory	3-bin mailbox accessory
Q5968-67901	Optional 500-sheet tray and feeder unit	Accessories
Q5969-67901	Duplex-printing assembly	Duplex-printing assembly
Q5969-69001	Duplexer (duplex printing accessory)	Accessories
Q5970A	Storage cabinet	Accessories
Q5997-67901	ADF maintenance kit	Print cartridge and maintenance kits
Q5998-67901	Printer maintenance kit, 110-volt	Print cartridge and maintenance kits
Q5999-67901	Printer maintenance kit, 220-volt	Print cartridge and maintenance kits
Q6496–67901	ADF mylar replacement kit	Print cartridge and maintenance kits
Q6496–67901	ADF mylar replacement kit	ADF assembly
Q6496–67901	ADF mylar replacement kit	ADF mylar replacement kit
RC1-0060-000CN	Flag, paper-feed sensor	Internal components (1 of 5)
RC1-0061-000CN	Spring, torsion	Internal components (1 of 5)
RC1-0167-000CN	Spring, tension	Internal components (1 of 5)
RC1-0245-000CN	Case, envelope-feeder connector	Internal components (2 of 5)
RC1-0266-020CN	Screw, stepped, M3	Internal components (5 of 5)
RC1-0331-000CN	Gear, 20T (cassette)	Cassette
RC1-0378-000CN	Flag, shutter	Internal components (1 of 5)
RC1-0379-000CN	Spring, torsion	Internal components (1 of 5)
RC1-0392-000CN	Spacer, screw	Internal components (2 of 5)
RC1-2597-000CN	500-sheet stapler/stacker	Accessories
RC1-2597-000CN	Stapler/stacker jam-access door	Stapler/stacker accessory
RC1-2758-000CN	Limiter, torque	Internal components (1 of 5)
RC1-2782-000CN	Lever, paper-size-sensing (cassette)	Cassette
RC1-2818-000CN	Handle, lock (upper plate)	Upper-plate assembly
RC1-2820-000CN	Cover, lock, front (upper plate)	Upper-plate assembly
RC1-2821-000CN	Cover, rear lock (upper plate)	Upper-plate assembly
RC1-2822-000CN	Link, handle (upper plate)	Upper-plate assembly
RC1-2823-000CN	Cover, front stopper	Internal components (4 of 5)
RC1-2827-000CN	Arm, door, 1 (top cover)	Internal components (4 of 5)

Table 8-60 Numerical parts list (continued)

Part number	Description	Table and page
RC1-2828-000CN	Arm, door, 2 (top cover)	Internal components (4 of 5)
RC1-2830-000CN	Rod, link (upper plate)	Upper-plate assembly
RC1-2833-000CN	Cover, door arm (top cover)	Internal components (4 of 5)
RC1-2853-000CN	Guide, cartridge (upper plate)	Upper-plate assembly
RC1-2854-000CN	Guide, legal-size (upper plate)	Upper-plate assembly
RC1-2855-000CN	Holder, right shutter (upper plate)	Upper-plate assembly
RC1-2856-000CN	Support, cartridge (upper plate)	Upper-plate assembly
RC1-2863-000CN	Flag, full-detect (output bin)	Internal components (4 of 5)
RC1-2864-000CN	Holder, output-device-full sensor flag	Internal components (4 of 5)
RC1-2881-000CN	Cover, handle, lower right	Internal components (2 of 5)
RC1-2884-000CN	Guide, rear	Internal components (3 of 5)
RC1-2901-000CN	Hinge, door, right-side	Internal components (2 of 5)
RC1-2902-000CN	Rod, link	Internal components (3 of 5)
RC1-2911-000CN	Cross-member, support	Internal components (4 of 5)
RC1-2980-000CN	Rod, switch, front	Internal components (3 of 5)
RC1-3002-000CN	Holder, link	Internal components (3 of 5)
RC1-3003-000CN	Link, switch	Internal components (3 of 5)
RC1-3020-000CN	Guide, cassette, front	Cassette
RC1-3020-000CN	Cover, front (cassette)	500-sheet feeder cassette
RC1-3035-000CN	Cover, formatter	Customer-replaceable components (print engine)
RC1-3035-000CN	Cover, formatter	External panels and covers
RC1-3041-000CN	Cover, inner front	Internal components (4 of 5)
RC1-3042-000CN	Cover, side, rear	Internal components (3 of 5)
RC1-3043-000CN	Cover, cassette, left side	External panels and covers
RC1-3044-000CN	Switch, power	External panels and covers
RC1-3052-000CN	Cover, left-side, front	Internal components (1 of 5)
RC1-3063-000CN	Holder, door switch	Internal components (2 of 5)
RC1-3090-000CN	Stopper, bushing arm	Internal components (4 of 5)
RC1-3102-000CN	Block, guide support (upper plate)	Upper-plate assembly
RC1-3106-000CN	Lever, shutter	Internal components (1 of 5)
RC1-3124-000CN	Stopper, hinge shaft	Internal components (2 of 5)
RC1-3196-000CN	Cover, front, 500-sheet feeder	500-sheet feeder external components

Table 8-60 Numerical parts list (continued)

Part number	Description	Table and page
RC1-3197-000CN	Cover, rear, 500-sheet feeder	500-sheet feeder external components
RC1-3198-000CN	Cover, right, 500-sheet feeder	500-sheet feeder external components
RC1-3199-000CN	Cover, left, 500-sheet feeder	500-sheet feeder external components
RC1-3200-000CN	Cover, left-upper, 500-sheet feeder	500-sheet feeder external components
RK2-0269-000CN	Solenoid (SL101)	Internal components (1 of 5)
RK2-0272-000CN	Motor, dc 24-volt, (M101)	Internal components (3 of 5)
RK2-0274-000CN	Motor, dc 24-volt, (M102)	Internal components (3 of 5)
RK2-0276-000CN	Solenoid, multipurpose assembly (SL102)	Multipurpose assembly
RK2-0278-000CN	Fan, main cooling (FN101)	Internal components (1 of 5)
RK2-0280-000CN	Fan, reversing unit (FN103)	Internal components (1 of 5)
RK2-0280-000CN	Fan, print cartridge (FN102)	Internal components (5 of 5)
RK2-0349-000CN	Clutch, paper feed, electromagnetic (CL101)	Paper-feed roller assembly
RK2-0359-000CN	Thermistor (TH3)	Internal components (1 of 5)
RK2-0469-000CN	Cable, flat-flexible (engine power supply)	Electrical/forward assembly
RK2-0470-000CN	Cable, flat-flexible (engine power supply)	Electrical/forward assembly
RK2-0472-000CN	Fan, dc controller (FN104)	Internal components (5 of 5)
RK2-0473-000CN	Motor, crossing, (stepping) (M104)	Reverse assembly
RK2-0474-000CN	Motor, reverse-unit (stepping) (M105)	Reverse assembly
RK2-0475-000CN	Motor, delivery (stepping) (M106)	Reverse assembly
RK2-0485-000CN	Solenoid, reverse-unit (SL105)	Reverse assembly
RK2-0486-000CN	Solenoid, reversing-roller separation (SL106)	Reverse assembly
RL1-0007-000CN	Plate, main pad support (multipurpose assembly)	Multipurpose assembly
RL1-0019-000CN	Roller, pickup, multipurpose assembly	Customer-replaceable components (print engine)
RL1-0019-000CN	Roller, pickup, multipurpose assembly	Multipurpose assembly
RL1-0434-000CN	Stopper, front lock	Internal components (4 of 5)
RL1-0436-000CN	Support, gas damper	Internal components (4 of 5)
RL1-0455-000CN	Cover, envelope-feeder slot	Internal components (3 of 5)
RL1-0457-000CN	Cover, front corner	External panels and covers
RM1-0005-020CN	Multipurpose tray assembly	Multipurpose assembly
RM1-0011-060CN	Registration assembly	Internal components (1 of 5)
RM1-0011-060CN	Registration assembly	Registration assembly

Table 8-60 Numerical parts list (continued)

Part number	Description	Table and page
RM1-0012-020CN	Roller, paper-feed assembly	Internal components (1 of 5)
RM1-0012-020CN	Paper-feed roller assembly	Paper-feed roller assembly
RM1-0025-040CN	Paper-feed assembly	Electrical/forward assembly
RM1-0034-070CN	Paper-pickup-drive assembly	Internal components (1 of 5)
RM1-0034-070CN	Paper-pickup-drive assembly	Paper-pickup-drive assembly
RM1-0036-000CN	Roller, paper-pickup (cassette)	Customer-replaceable components (print engine)
RM1-0036-000CN	Roller, paper-pickup (cassette)	Internal components (1 of 5)
RM1-0037-000CN	Roller, paper-feed (cassette)	Customer-replaceable components (print engine)
RM1-0037-020CN	Roller, paper-feed (cassette)	Internal components (1 of 5)
RM1-0041-000CN	Sensor, paper-size assembly (500-sheet feeder)	500-sheet feeder main body (1 of 2)
RM1-0041-020CN	Sensor assembly, paper size (SW102)	Internal components (5 of 5)
RM1-0043-020CN	Swing-plate assembly	Internal components (5 of 5)
RM1-0940-000CN	Output bin	Customer-replaceable components (print engine)
RM1-0940-000CN	Output-bin assembly	External panels and covers
RM1-0981-000CN	3-bin mailbox	Accessories
RM1-0981-000CN	3-bin mailbox jam-access door	3-bin mailbox accessory
RM1-1001-000CN	Cassette (tray 2, 3, 4, or 5)	500-sheet feeder cassette
RM1-1001–000CN	Cassette (tray 2, 3, 4 or 5)	Cassette
RM1-1010-000CN	Guide, paper sensing (PS101)	Internal components (1 of 5)
RM1-1011-000CN	Cassette rail assembly, left	Internal components (3 of 5)
RM1-1012-000CN	Cassette rail assembly, right	Internal components (3 of 5)
RM1-1013-000CN	Power supply, PFC (100–127 volt)	Internal components (5 of 5)
RM1-1014-000CN	Power supply, PFC (220–240 volt)	Internal components (5 of 5)
RM1-1015-000CN	Cover, front assembly	External panels and covers
RM1-1016-000CN	Cover, right assembly	External panels and covers
RM1-1017-000CN	Cover, rear	External panels and covers
RM1-1018-000CN	Cover, duplexing-unit assembly	External panels and covers
RM1-1019-000CN	Reverse-separation guide assembly	Internal components (4 of 5)
RM1-1019-000CN	Reverse-separation-guide assembly	Reverse-separation-guide assembly
RM1-1022-000CN	Reverse assembly	Internal components (2 of 5)
RM1-1022-000CN	Reverse assembly	Reverse assembly

Table 8-60 Numerical parts list (continued)

Part number	Description	Table and page
RM1-1027-000CN	Guide assembly, flat-flexible cable	Internal components (5 of 5)
RM1-1029-000CN	Lifter drive assembly	Internal components (3 of 5)
RM1-1029-000CN	Lifter-drive assembly	Lifter-drive assembly
RM1-1033-000CN	Cover, right lower assembly	External panels and covers
RM1-1041-000CN	Engine power supply assembly (100–127 volt)	Electrical/forward assembly
RM1-1042-000CN	Engine power supply assembly (220–240 volt)	Electrical/forward assembly
RM1-1043-000CN	Fuser, 110-volt, new	Customer-replaceable components (print engine)
RM1-1043-000CN	Fuser (100–127 volt)	Internal components (2 of 5)
RM1-1043-000CN	Fuser (100–127 volt)	Fuser
RM1-1044-000CN	Fuser, 2210-volt, new	Customer-replaceable components (print engine)
RM1-1044-000CN	Fuser (220–240 volt)	Internal components (2 of 5)
RM1-1044-000CN	Fuser (220–240 volt)	Fuser
RM1-1045-000CN	Sensor assembly, right door	Internal components (2 of 5)
RM1-1045-000CN	Sensor, right-door-open (500-sheet feeder)	500-sheet feeder main body (2 of 2)
RM1-1046-000CN	Fuser entrance guide	Customer-replaceable components (print engine)
RM1-1046-000CN	Fuser entrance guide	Internal components (2 of 5)
RM1-1047-000CN	Delivery tray assembly	Customer-replaceable components (print engine)
RM1-1047-000CN	Delivery assembly	External panels and covers
RM1-1047-000CN	Delivery assembly	Delivery assembly
RM1-1049-000CN	Main drive assembly	Internal components (3 of 5)
RM1-1049-000CN	Main drive assembly	Main drive assembly
RM1-1094-000CN	Lifter-drive assembly (500-sheet feeder)	500-sheet feeder main body (1 of 2)
RM1-1110-000CN	Roller assembly, transfer	Customer-replaceable components (print engine)
RM1-1110-000CN	Roller assembly, transfer	Internal components (2 of 5)
RM1-1122-000CN	500-sheet feeder driver PCA	500-sheet feeder main body (1 of 2)
RM1-1193-000CN	Cable, envelope-feeder connector	Internal components (2 of 5)
RM1-1354-000CN	DC controller PCA	Internal components (5 of 5)
RM1-1367-000CN	Cable, laser (print engine)	Internal components (1 of 5)
RM1-1368-000CN	Cable, output-bin full sensor	Internal components (4 of 5)
RM1-1370-000CN	Cable, optional 500-sheet feeder connection	Internal components (5 of 5)

Table 8-60 Numerical parts list (continued)

Part number	Description	Table and page
RM1-1371-000CN	Cable, output device connection	Internal components (4 of 5)
RM1-1372-000CN	Cable, beam-detect to scanner (print engine)	Internal components (1 of 5)
RM1-1375-000CN	Cable, power	Internal components (5 of 5)
RM1-1376-000CN	Cable, fan docking (for dc-controller fan)	Internal components (5 of 5)
RM1-1379-000CN	Reverse-unit PCA	Reverse assembly
RM1-1380-000CN	Cable, reverse unit	Internal components (4 of 5)
RM1-1381-000CN	Cable, control panel	Internal components (4 of 5)
RM1-1397-000CN	Cable, door switch	Internal components (2 of 5)
RM1-1398-000CN	Cable, image scanner (print engine)	Internal components (1 of 5)
RM1-1400-000CN	Cable, duplexing-unit grounding	Electrical/forward assembly
RM1-1455-000CN	Paper-present sensing assembly (500-sheet feeder)	500-sheet feeder main body (1 of 2)
RM1-1456-000CN	Number-plate assembly	500-sheet feeder external components
RM1-1457-000CN	Lifter-drive assembly (500-sheet feeder)	500-sheet feeder lifter-drive assembly
RM1-1570-000CN	Sensor, reverse-unit (PS109)	Reverse assembly
RM1-1571-000CN	Sensor, reverse-unit jam (PS111)	Reverse assembly
RM1-1572-000CN	Multipurpose tray assembly	Internal components (3 of 5)
RM1-1572-000CN	Multipurpose assembly	Multipurpose assembly
RM1-1573-000CN	Laser/scanner assembly	Internal components (1 of 5)
RS1-9004-020CN	Screw, stepped	Fuser
RU5-0045-020CN	Gear, 18T	Internal components (1 of 5)
RU5-0050-000CN	Gear, 30T (paper-feed roller assembly)	Paper-feed roller assembly
RU5-0253-000CN	Gear, 80T (cassette)	Cassette
RU5-0254-000CN	Gear, 14T (cassette)	Cassette
RU5-0256-000CN	Gear, 23T	Internal components (1 of 5)
RU5-2251-000CN	Spring, grounding	Internal components (3 of 5)
RU5-2251-000CN	Spring, grounding (500-sheet feeder)	500-sheet feeder main body (1 of 2)
RU5-2265-000CN	Spring, compression	Internal components (5 of 5)
WC4-5139-000CN	Microswitch (SW101)	Internal components (2 of 5)
WG8-5624-000CN	Photointerrupter (PS107)	Internal components (1 of 5)
WS9-0255-000CN	Bolt, hex-head	Internal components (4 of 5)
XA9-0650-000CN	Screw, M3x8	Fuser
XA9-1420-000CN	Screw, with washer, M3x6	Electrical/forward assembly

Table 8-60 Numerical parts list (continued)

Part number	Description	Table and page
XA9-1447-000CN	Screw, RS, M3x12	Internal components (1 of 5)
XA9-1449-000CN	Screw, RS, M3x8	Fuser
XA9-1464-000CN	Screw, flathead, RS, M3x6	Electrical/forward assembly
XA9-1495-000CN	Screw, RS, M3x6	Upper-plate assembly
XA9-1500-000CN	Screw, S, M3x8	Internal components (1 of 5)
XA9-1503-000CN	Screw, tapping, M3x6	Internal components (3 of 5)
XB2-7300-607CN	Screw, with washer, M3x6	Internal components (2 of 5)
XB4-7300-809CN	Screw, tapping, truss-head, M3x8	Multipurpose assembly
XB4-7401-0007CN	Screw, tapping, pan-head, M4x10	External panels and covers
XB4-7401-605CN	Screw, tapping, truss-head, M4x16	Internal components (3 of 5)
XB6-7300-406CN	Screw, TP, M3x4	Reverse assembly
XD9-0132-020CN	E-ring (paper-feed roller assembly)	Paper-feed roller assembly

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