

HP LaserJet P3010 Series Printers Service Manual



Additional product information:

www.hp.com/support/ljp3010series



HP LaserJet P3010 Series Printers

Service Manual



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Conventions used in this guide

 **TIP:** Tips provide helpful hints or shortcuts.

 **NOTE:** Notes provide important information to explain a concept or to complete a task.

 **CAUTION:** Cautions indicate procedures that you should follow to avoid losing data or damaging the product.

 **WARNING!** Warnings alert you to specific procedures that you should follow to avoid personal injury, catastrophic loss of data, or extensive damage to the product.

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1 Theory of operation

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- [Pickup, feed, and delivery system](#)
- [Tray 1 or Tray 2](#)
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Basic operation

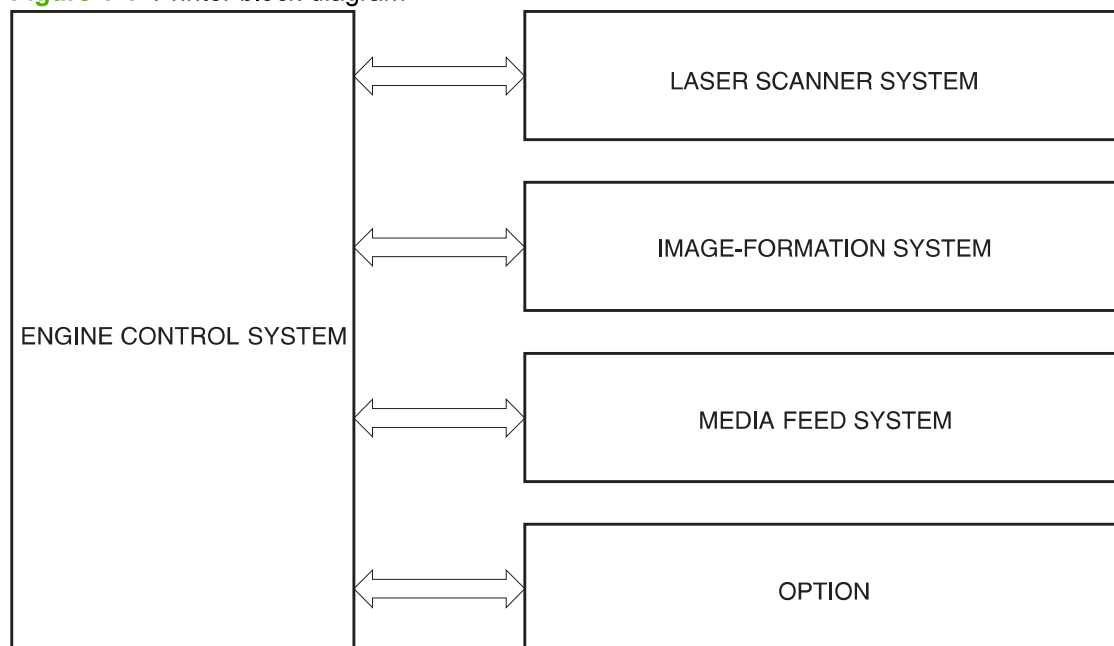
Major printer systems

The product contains the following five systems:

- Engine-control system
- Laser/scanner system
- Image-formation system
- Media feed system
- Option

Printer block diagram

Figure 1-1 Printer block diagram



Sequence of operation

The DC controller in the engine-control system controls the operational sequences of the printer. The table below describes durations and operations for each period of a print operation from when the printer is turned on until the motor stops rotating

Normal sequence of operation

Table 1-1 Sequence of operation

Name	Timing	Purpose
WAIT	From the time the power switch is turned on or the door is closed until the printer is ready for a print operation.	Brings the product to printable condition. The product performs the following during the operation: • Detects the print cartridge
STBY (standby)	From the end of the WAIT or LSTR period until either a print command is sent or the power switch is turned off.	Maintains the product in printable condition.
INTR (initial rotation)	From the time the print command is received until the temperature of the fuser unit reaches its targeted temperature.	Starts up the high-voltage biases, the laser/scanner and the fuser unit for printing.
PRINT	From the end of the INTR period until the last sheet completes the fuser operation.	Forms the image on the photosensitive drum based on the VIDEO signals from the formatter. Transfers and fuses the toner image to the paper.
LSTR (last rotation)	From the end of the PRINT period until the main motor stops rotating.	Moves the last printed sheet out of the product. The product enters the INTR period as the LSTR period is completed, if the formatter sends another print command.

Formatter-control system

The formatter is responsible for the following procedures:

- Controlling sleep mode
- Receiving and processing print data from the various product interfaces
- Monitoring control-panel functions and relaying product-status information (through the control panel and the network or 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 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 and an additional DIMM.

Sleep mode



NOTE: In the **SYSTEM SETUP** menu, this item is termed **SLEEP DELAY**.

This feature conserves power after the product has been idle for an adjustable period of time. When the product is in **SLEEP DELAY**, the control-panel backlight is turned off, but the product retains all settings, downloaded fonts, and macros. The default setting is for **SLEEP DELAY** to be enabled, and the product enters **SLEEP DELAY** after a 30-minute idle time.

The product exists **SLEEP DELAY** and enters the warm-up cycle when any of the following events occur:

- A print job, valid data, or a PML or PJJ command is received
- A control-panel button is pressed
- A cover is opened
- A paper tray is opened
- The engine-test switch is pressed



NOTE: Product error messages override the Sleep message. The product enters **SLEEP DELAY** at the appropriate time, but the error message continues to appear.

Input/output

The product receives print data primarily from the embedded HP Jetdirect print server. The product also has a USB 2.0 port for connecting directly to a computer.

CPU

The formatter incorporates a 540 MHz Coldfire processor.

Memory

The random access memory (RAM) on the formatter PCA 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 a DIMM to the formatter. Note that adding memory might also increase the print speed for complex graphics.

 **NOTE:** If the product encounters a problem when managing available memory, a clearable warning message appears on the control-panel display.

Optional hard disk

This product supports an optional EIO hard disk or an optional secure hard disk as an accessory.

Firmware

The firmware is contained on NAND flash memory soldered on the formatter board. A remote firmware upgrade process is available, which overwrites the firmware in the NAND flash.

Nonvolatile memory

The product uses nonvolatile memory (NVRAM) to store device and user configuration settings. The contents of NVRAM are retained when the product is turned off or disconnected.

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 product 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 USB connection. The product 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 product uses this switching to be configured with a host on each I/O. The product can receive data from more than one I/O simultaneously, until the I/O buffer is full. This can occur even when the product is offline.
- Context-sensitive switching. The product 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 product in landscape mode, the subsequent print jobs print in landscape mode only if they are formatted for landscape printing.

PML

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

Control panel

The formatter sends and receives product status and command data to and from the control-panel PCA.

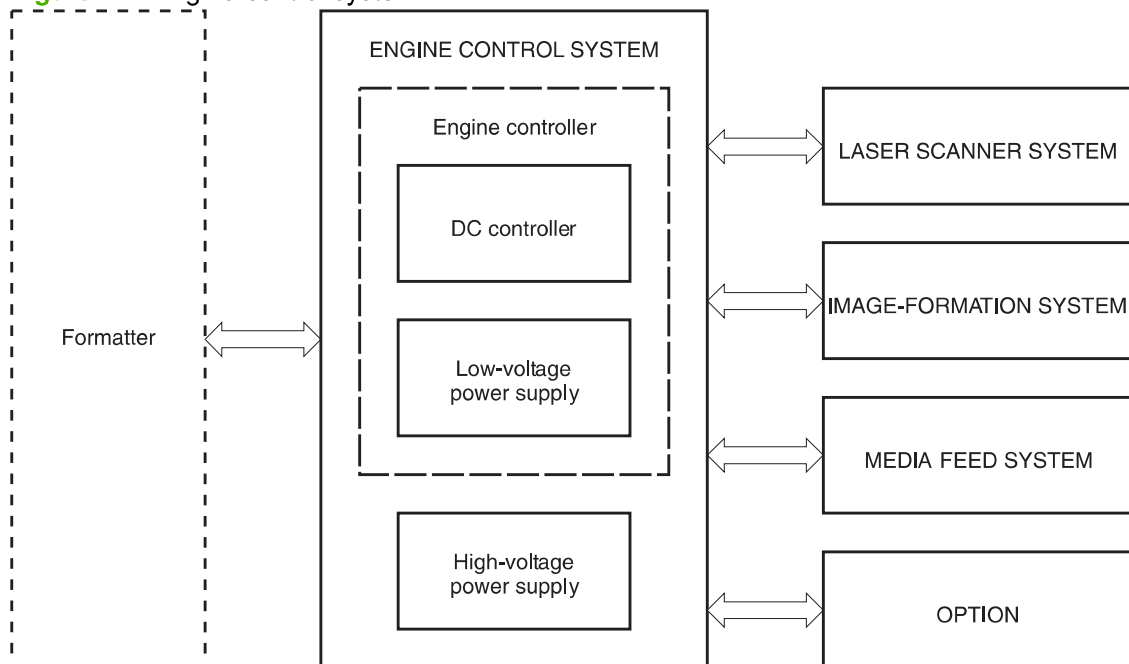
Engine-control system

The engine-control system coordinates all product functions, according to commands that the formatter sends. The engine-control system drives the laser/scanner system, the image formation system, and the pickup/feed/delivery system.

The engine control system contains the following major components:

- Engine-control unit (ECU)
 - DC controller
 - Low-voltage power supply
- High-voltage power supply

Figure 1-2 Engine-control system



Motors, fans, clutches, solenoids, switches, and sensors

Figure 1-3 Motors

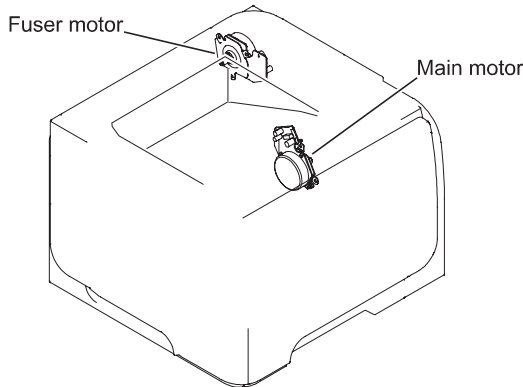


Table 1-2 Motors

Description	Components driven	Fault detection
Main motor (M8001)	• Pickup roller • Feed roller • Transfer roller • Photosensitive drum • Developing roller • Duplex repickup roller (duplex models only)	Yes
Fuser motor (M8002)	• Pressure roller • Delivery roller • Fuser-delivery roller • Duplex-feed roller (duplex models only)	Yes

Figure 1-4 Fans

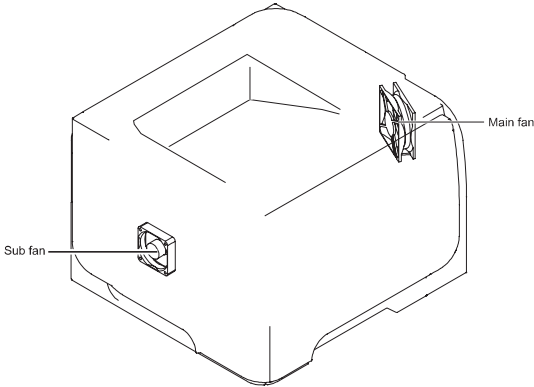


Table 1-3 Fans

Description	Area cooled	Type	Speed
Main fan (FM1)	Inside the product	Intake	Full
Sub fan (FM2)	Inside the product	Intake	Full

Figure 1-5 Solenoids and clutches (product)

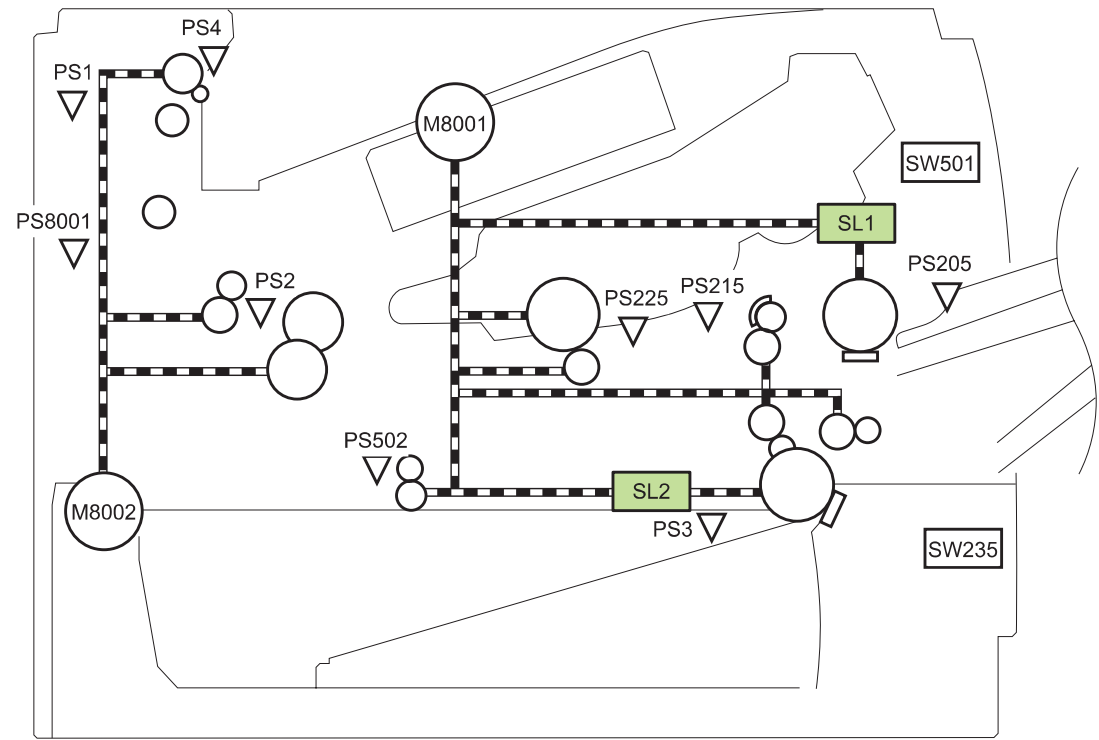


Table 1-4 Solenoids and clutches (product)

Item	Description
SL1	Tray 1 (multipurpose tray) pickup solenoid
SL2	Cassette (Tray 2) pickup solenoid

Figure 1-6 Solenoids and clutches (Tray 3 and Tray 4)

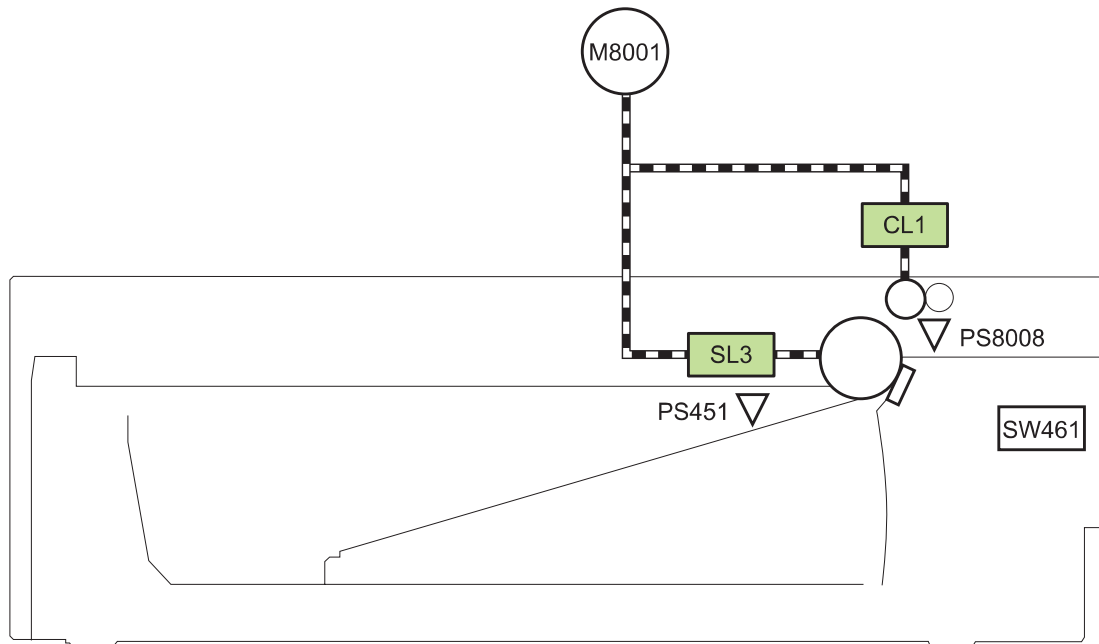


Table 1-5 Solenoids and clutches (Tray 3 and Tray 4)

Item	Description
SL3	Paper feeder pickup solenoid
CL1	Paper feeder pickup clutch

¹ Tray 3 and Tray 4 are identical 500-sheet input trays.

Figure 1-7 Switches (product)

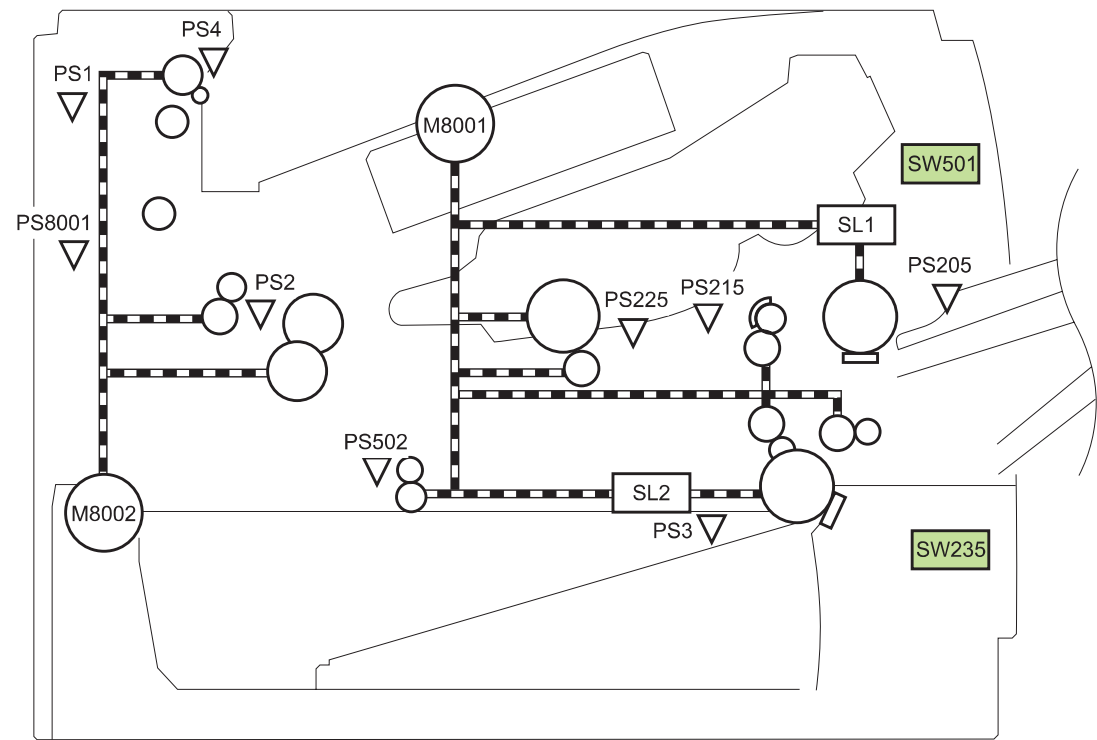


Table 1-6 Switches (product)

Item	Description
SW235	Cassette presence switch
SW501	Cartridge-door switch

Figure 1-8 Switches (Tray 3 and Tray 4)

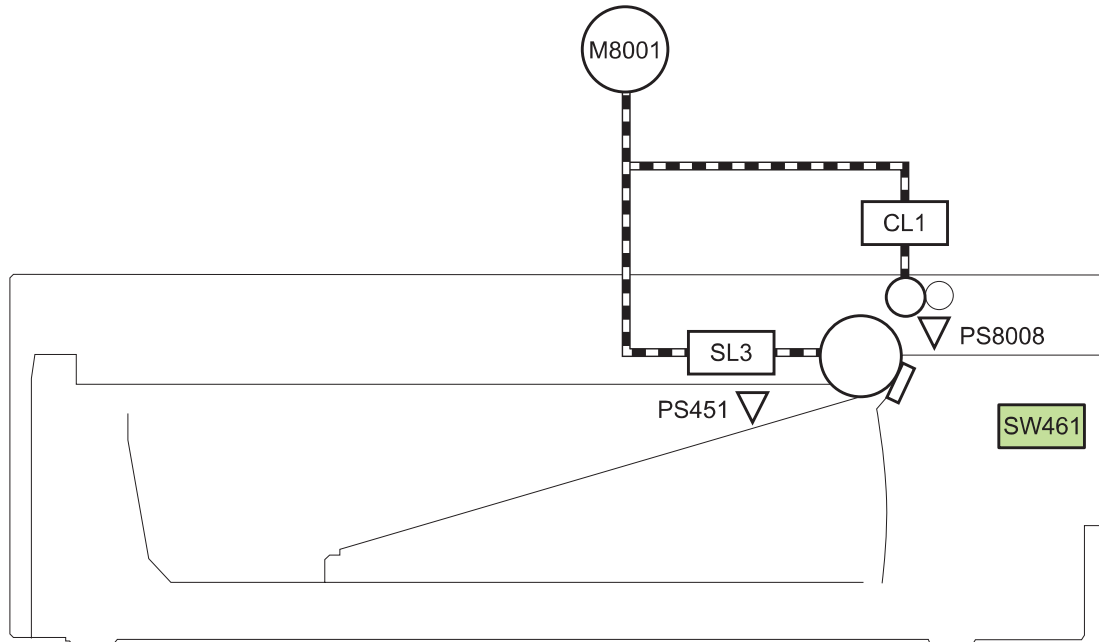


Table 1-7 Switches (Tray 3 and Tray 4)

Item	Description
SW461	Paper feeder cassette presence switch

¹ Tray 3 and Tray 4 are identical 500-sheet input trays.

Figure 1-9 Sensors

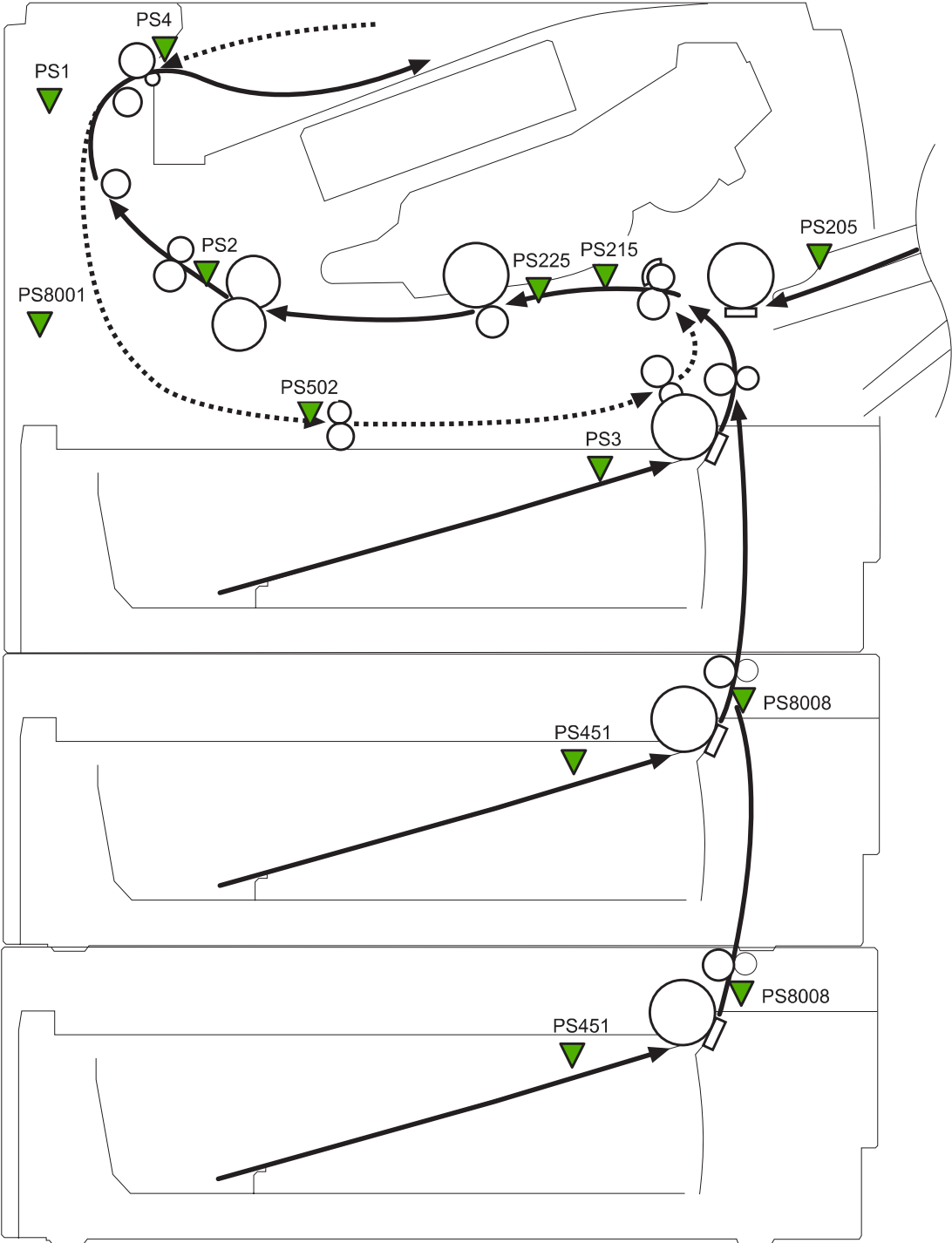


Table 1-8 Sensors

Item	Description	Item	Description
PS1	Face-up sensor	PS225	Media width sensor
PS2	Fuser delivery sensor	PS502	Duplex media-feed sensor (duplex models only)
PS3	Cassette media-presence sensor	PS451	Paper feeder cassette media-presence sensor
NOTE: PS451 is used in Tray 3, and Tray 4			

Table 1-8 Sensors (continued)

Item	Description	Item	Description
PS4	Face-down tray media-full sensor	PS8001	Rear door sensor
PS205	Tray 1 (multipurpose tray) media-presence sensor	PS8008	Paper feeder media-feed sensor NOTE: PS8008 is used in Tray 3, and Tray 4
PS215	Top-of-Page (TOP) sensor		

DC controller operations

The DC controller controls the operational sequences of the product systems.

Figure 1-10 DC controller block diagram

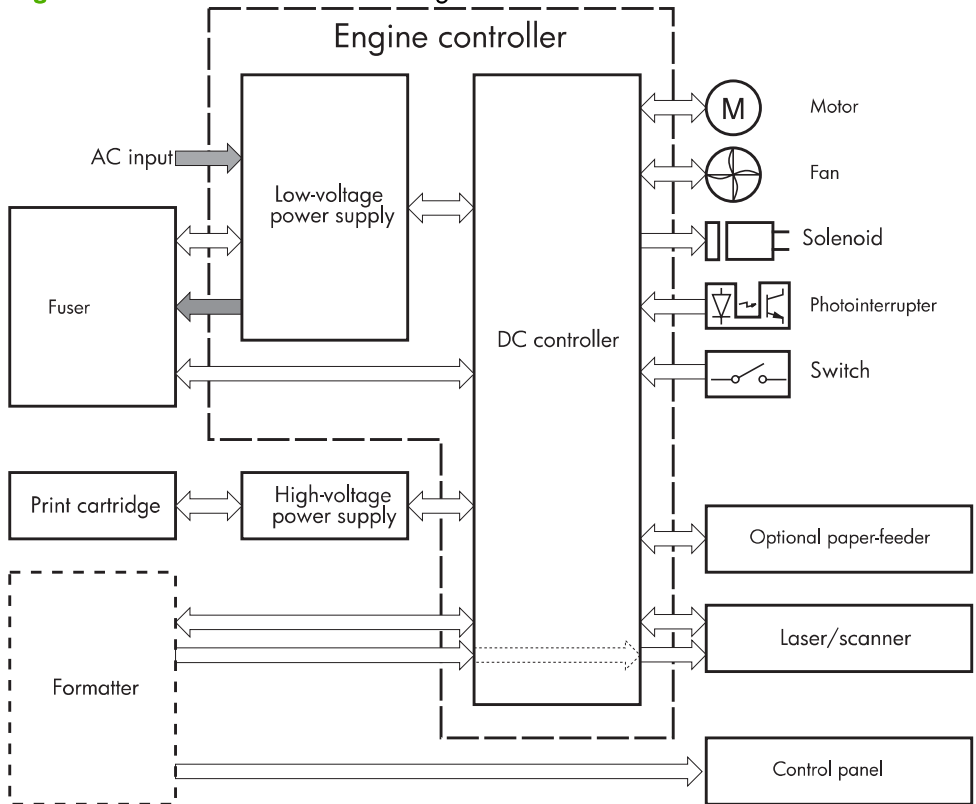


Table 1-9 DC controller controlled components

Component	Designator	Description
Motor	M8001	Main motor
	M8002	Fuser motor
Fan	FM1	Main fan
	FM2	Sub fan
Solenoid	SL1	Tray 1 (multipurpose tray) pickup solenoid
	SL2	Cassette (Tray 2) pickup solenoid

Table 1-9 DC controller controlled components (continued)

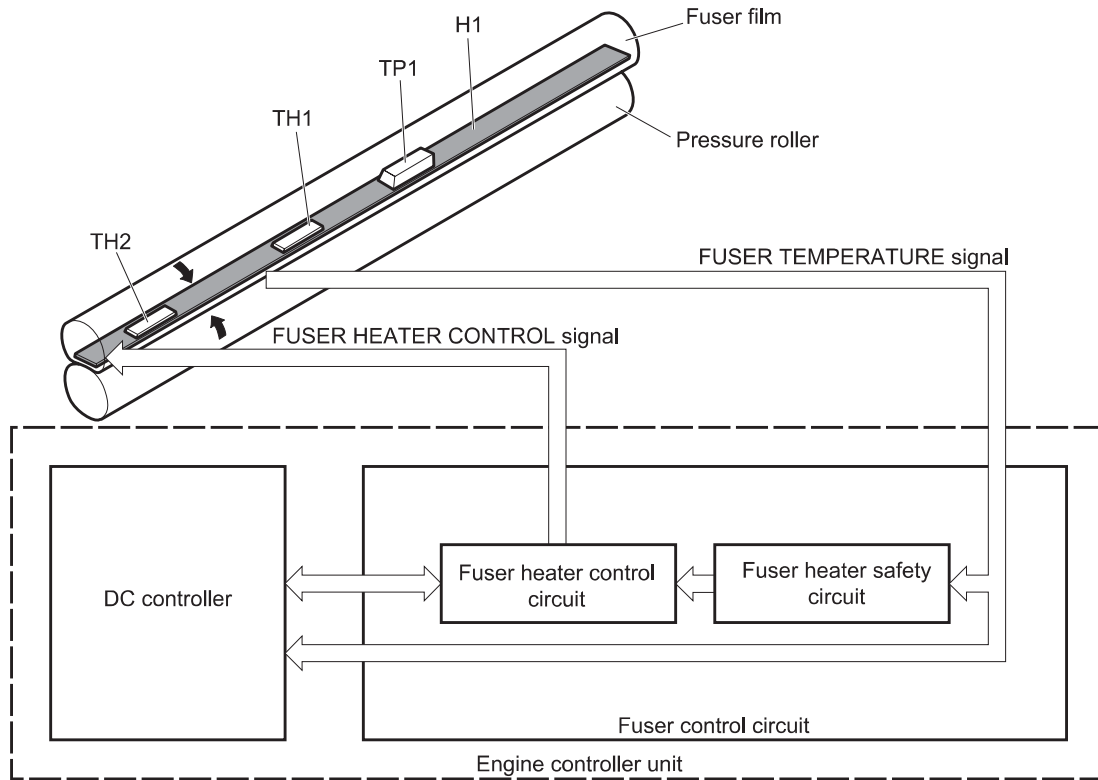
Component	Designator	Description
Photointerrupter	PS1	Face-up sensor
	PS2	Fuser delivery sensor
	PS3	Cassette media presence sensor
	PS4	Face-down tray (output bin) media-full sensor
	PS205	Tray 1 (multipurpose tray) presence sensor
	PS215	Top-Of-Page (TOP) sensor
	PS225	Media width sensor
	PS451	Paper feeder cassette media-presence sensor NOTE: PS451 is used in Tray 3, and Tray 4
	PS502	Duplex media-feed sensor (duplex models only)
	PS8001	Rear door sensor
	PS8008	Paper feeder media-feed sensor
Switch	SW235	Cassette-presence switch NOTE: PS8008 is used in Tray 3, and Tray 4
	SW240	Power switch
	SW250	Test Print switch
	SW501	Cartridge-door switch

Fuser-control circuit

The fuser-control circuit monitors and controls the temperature in the fuser. The product uses on-demand fusing. The fuser-control circuit consists of the following major components:

- Fuser heater (H1); heats the fusing film
- Thermistor (TH1 and TH2); detects the fuser temperature (contact type)
 - Main thermistor (TH1); controls the temperature in the fuser (contact type)
 - Sub thermistor (TH2); detects a one-sided temperature rise in the fuser and controls the temperature in the fuser (contact type)
- Thermoswitch (TP1); prevents abnormal temperature rise in the fuser (contact type)

Figure 1-11 Fuser control circuit



Fuser failure detection

The DC controller determines a fuser unit failure, deactivates the FUSER HEATER CONTROL signal, releases the relay to interrupt power supply to the fuser heater and notifies the formatter of a failure state when it encounters the following conditions:

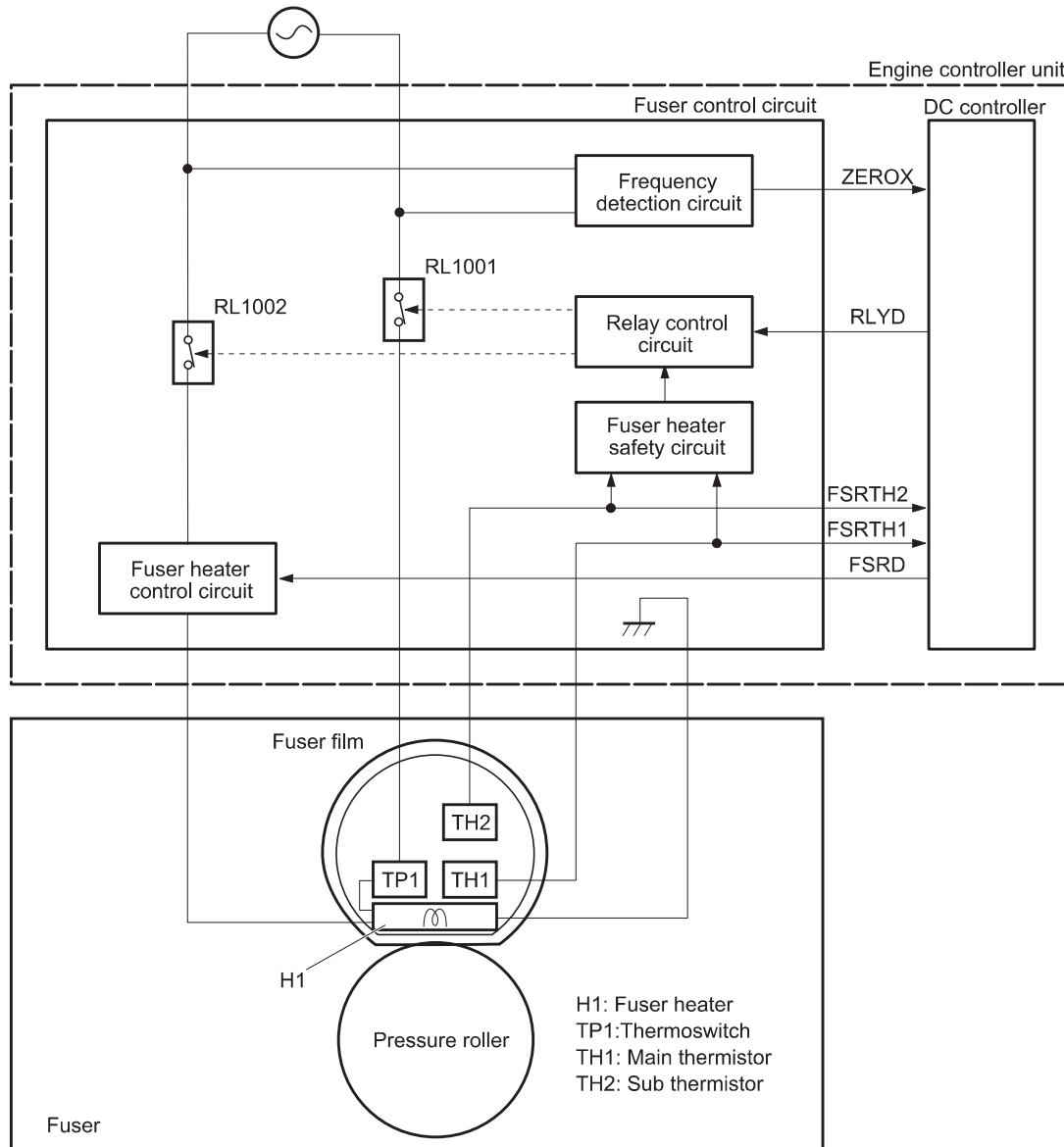
- Start-up failure
 - If the main thermistor does not detect a specified temperature during the start-up process of the heater in the wait period.
 - If the main thermistor does not detect a specified temperature during the heater temperature control in the initial rotation period.
- Abnormal low temperature
 - If the main thermistor detects an abnormal low temperature of the fuser unit during the printing operation.
 - If the sub thermistor detects an abnormal low temperature of the fuser unit during the printing operation.
- Abnormal high temperature
 - If the main thermistor detects an abnormal high temperature of the fuser unit.
 - If the sub thermistor detects an abnormal high temperature of the fuser unit.
- Frequency detection circuit failure
 - If a specified frequency of the ZERO CROSSING signal is not detected within a specified period after the product is turned on.

Fuser temperature control

The fuser temperature control maintains the temperature of the fuser heater at its targeted temperature.

The DC controller monitors the FUSER TEMPERATURE (FSRTH1, FSRTH2) signals and sends the FUSER HEATER CONTROL (FSRD) signal according to the detected temperature. The fuser heater control circuit controls the fuser heater depending on the signal so that the heater remains at the targeted temperature.

Figure 1-12 Fuser-heater control circuit



Fuser protective function

The protective function detects an abnormal temperature rise of the fuser unit and interrupts power supply to the fuser heater.

The following three protective components prevent an abnormal temperature rise of the fuser heater:

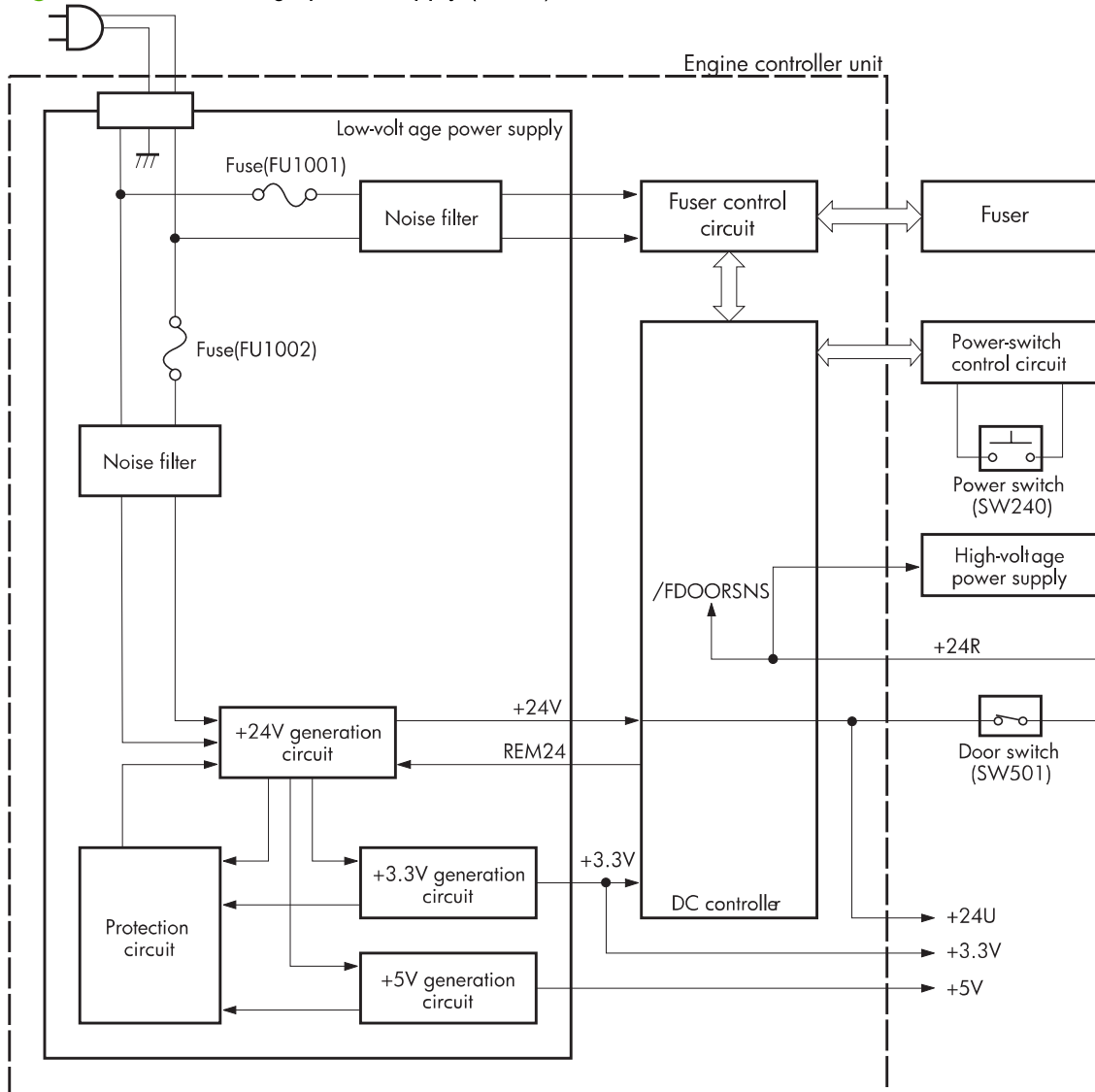
- DC controller
 - The DC controller interrupts power supply to the fuser heater when it detects an abnormal temperature of the fuser heater.
- Fuser heater safety circuit
 - The fuser heater safety circuit interrupts power supply to the fuser heater when the detected temperature of the main and sub thermistors is abnormal.
- Thermoswitch
 - The contact of the thermoswitch is broken to interrupt power supply to the fuser heater when the thermoswitch detects an abnormal temperature of the fuser heater.

Low-voltage power supply

The low-voltage power supply (LVPS) converts ac input voltage to dc voltage. The LVPS has two fuses on the PCA. The LVPS 24 V output is interrupted to the fuser and the high-voltage power supply if the cartridge-door interlock switch (SW501) is in the off position (cover open).

⚠ WARNING! The product power switch only interrupts dc voltage from the LVPS. The ac voltage is present in the product when the power cord is plugged into a power receptacle and the power switch is in the off position. You must unplug the product power cord before servicing the product.

Figure 1-13 Low-voltage power supply (LVPS)



Overcurrent/overvoltage protection

The low-voltage power supply has a protective function against overcurrent and overvoltage to prevent failures in the power supply circuit. If an overcurrent or overvoltage condition occurs, the system automatically cuts off the output voltage.

If the DC power is not being supplied from the low-voltage power supply, the protective function might be running. In such case, turn off the power switch and unplug the power cord. Do not plug in the power cord or turn on the power switch again until the cause is found.

⚠ **WARNING!** If you believe the overcurrent or overvoltage protection circuits have been activated, do not plug in the product power cord or turn on the product power until the cause of the failure is found and corrected.

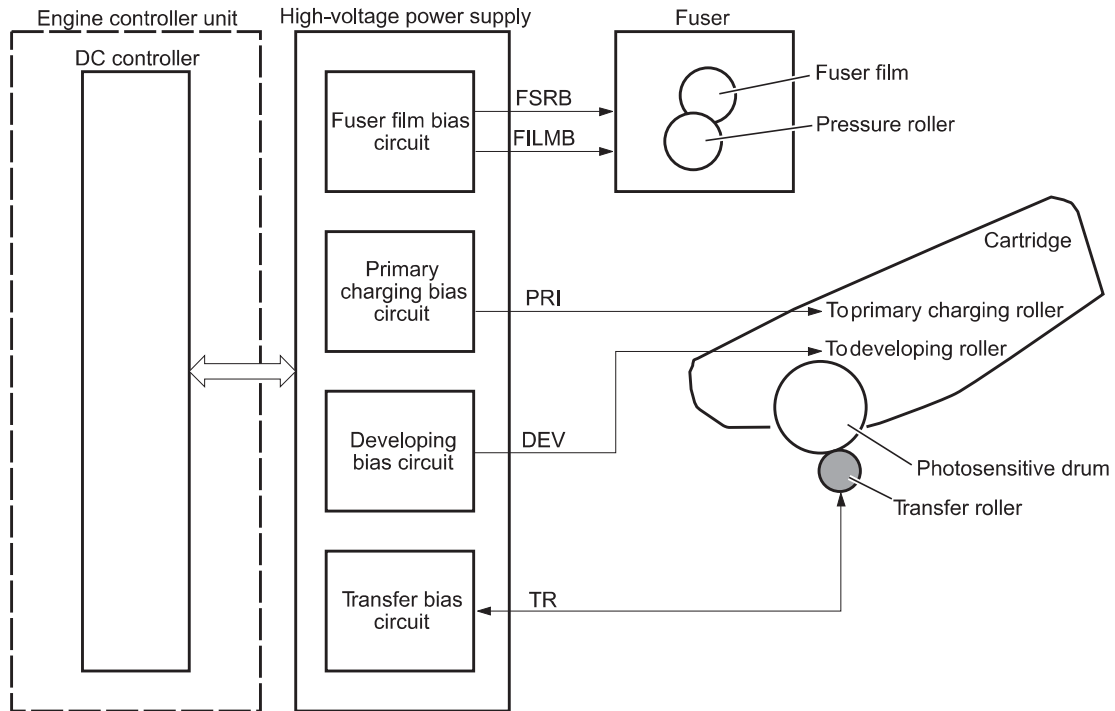
In addition, two fuses in the low-voltage power supply protect against overcurrent. If overcurrent flows into the AC line, the fuses melt and cut off the power distribution.

High-voltage power supply

The high-voltage power supply (HVPS) applies biases to the following components:

- Primary charging roller
- Developing roller
- Transfer roller
- Fusing film

Figure 1-14 High-voltage power supply



Formatter

Formatter heartbeat LED

The heartbeat LED indicates that the formatter is functioning correctly. While the product is initializing after you turn the product on, the LED blinks rapidly, and then turns off. When the product has finished the initialization sequence, the heartbeat LED pulses on and off. For more information about the heartbeat LED see [Formatter heartbeat LED on page 133](#).

DIMM slots

△ **CAUTION:** Single inline memory modules (SIMMs) used in previous HP LaserJet products are not compatible with the product.

The formatter has one dual inline memory module (DIMM) slot for upgrading the product with more memory.

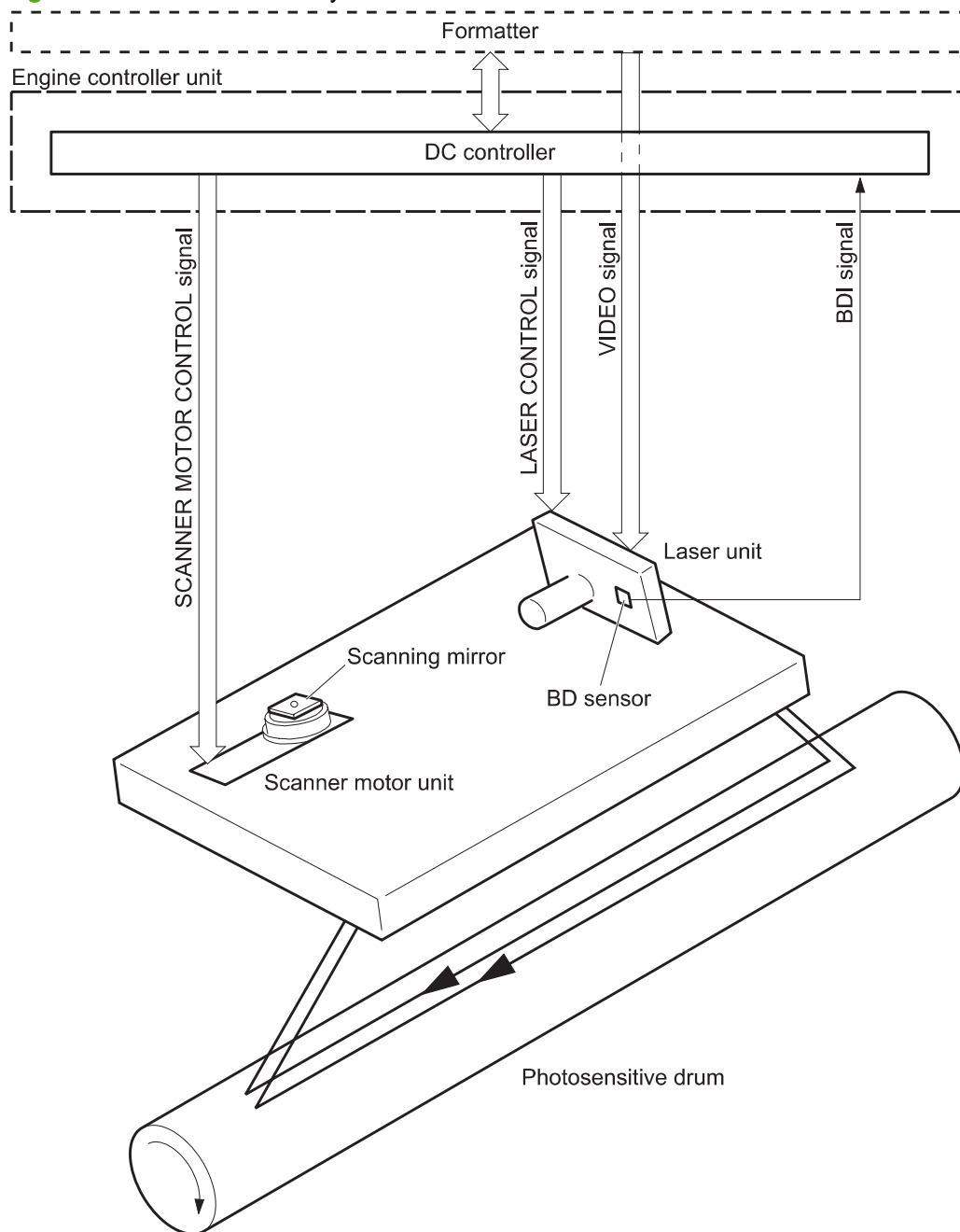
To find out how much memory is installed in the product, print a configuration page. For more information about memory, see [DIMM cover and DIMM on page 57](#).

Laser/scanner system

The laser/scanner system receives VIDEO signals from the ECU and the formatter and converts the signals into latent images on the photosensitive drum.

The main components of the laser/scanner are the laser unit and the scanner motor unit. The DC controller sends signals to the laser/scanner to control the functions of these components.

Figure 1-15 Laser/scanner system



Laser failure detection

The DC controller determines an optical unit failure and notifies the formatter, if the laser/scanner encounters the following conditions:

- The scanner motor does not reach a specified rotation within a specified period of the scanner motor start up.
- The rotation of the scanner motor is out of specified range for a specified period during the scanner motor drive.
- The BD interval is out of a specified value during a print operation.

Image-formation system

Electrophotographic process

The electrophotographic process forms an image on the paper. Following are the major components used in the process:

- Print cartridge
- Transfer roller
- Fuser
- Laser/scanner

The DC controller uses the laser/scanner and HVPS to form the toner image on the photosensitive drum. The image is transferred to the print media and then fused onto the paper.

Figure 1-16 Electrophotographic process block diagram

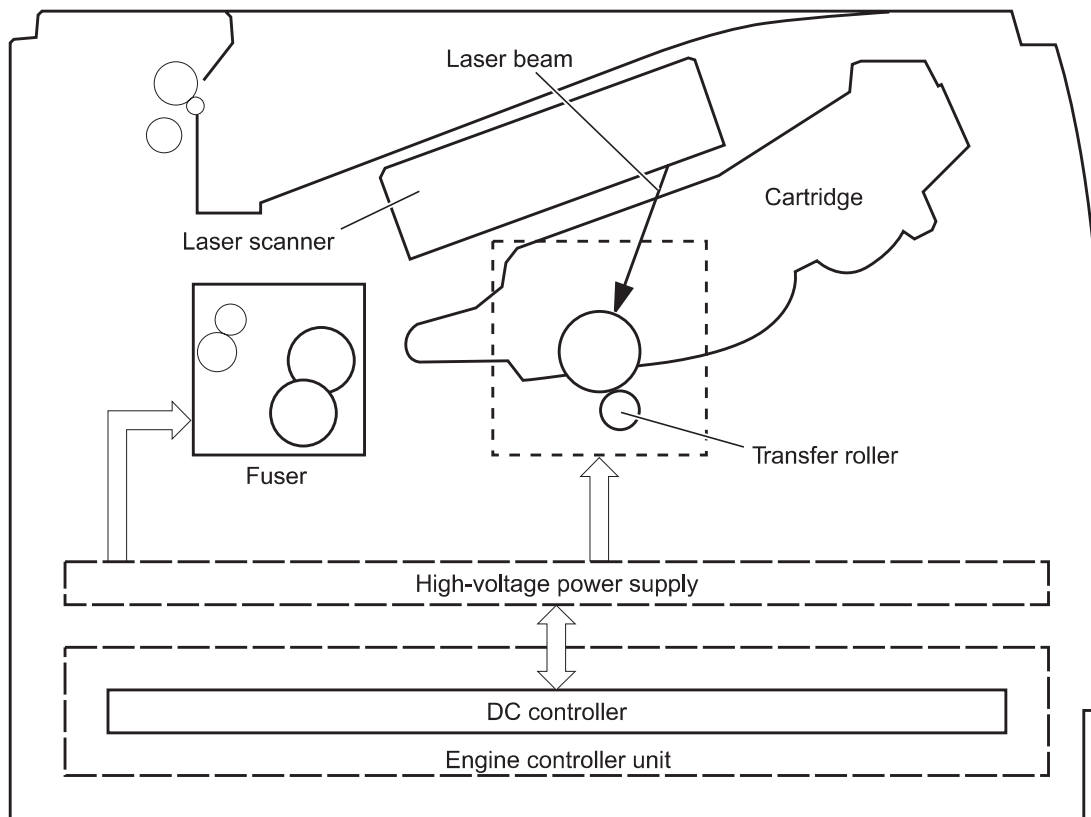
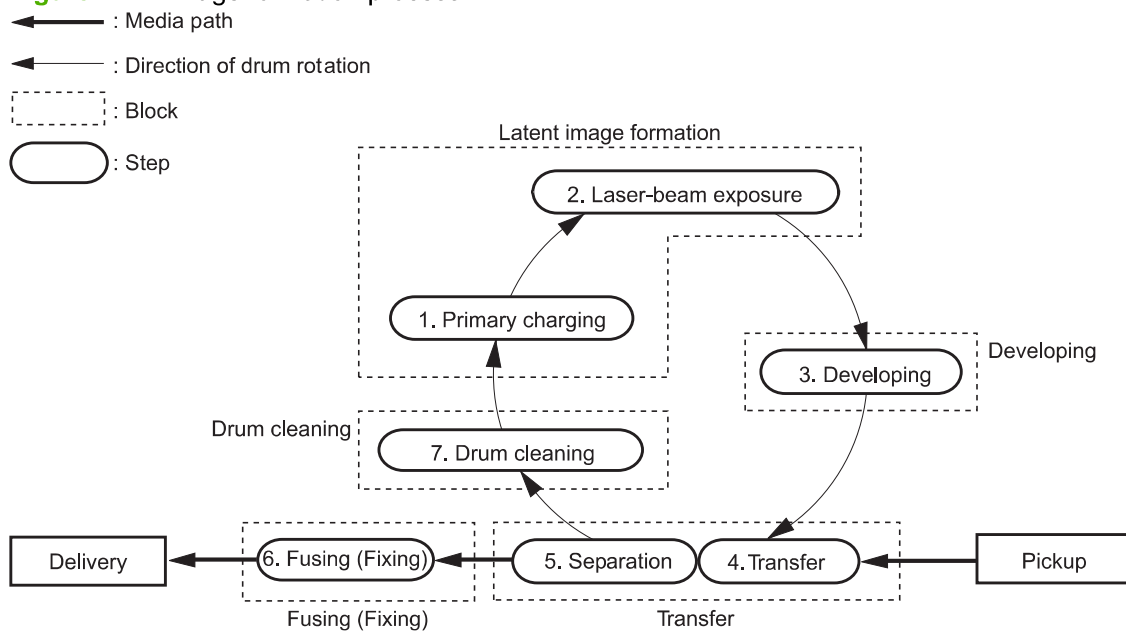


Image formation process

Each of the following process function independently and must be coordinated with the other product processes. Image formation consists of the following processes:

- Latent-image formation block
 - Step 1: primary charging
 - Step 2: laser-beam exposure
- Developing block
 - Step 3: developing
- Transfer block
 - Step 4: transfer
 - Step 5: separation
- Fusing block
 - Step 6: fusing
- Drum cleaning block
 - Step 7: drum cleaning

Figure 1-17 Image formation process



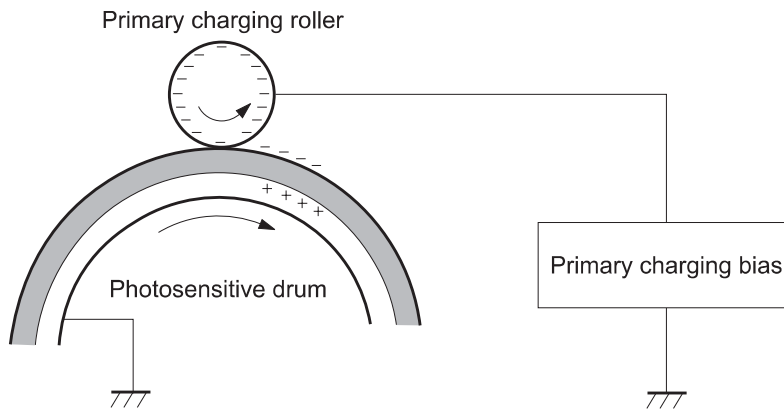
Latent-image formation stage

During the latent-image formation stage, the laser/scanner forms an invisible image on the photosensitive drum in the print cartridge.

Primary charging

Step 1: DC and AC biases are applied to the primary charging roller, which transfers a uniform negative potential to the photosensitive drum.

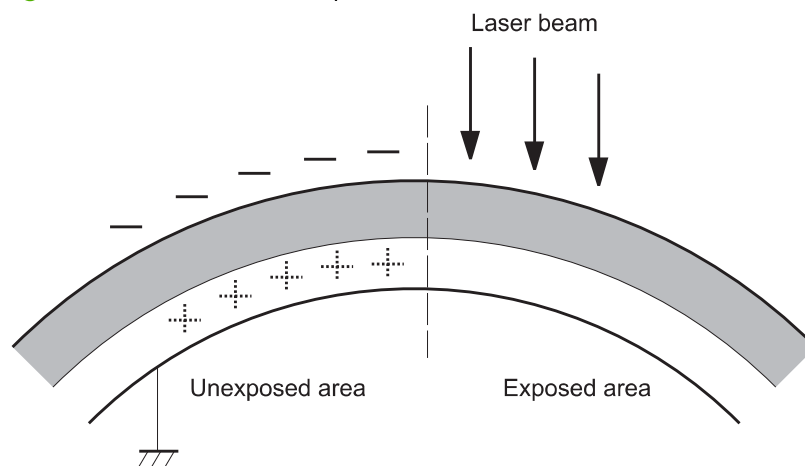
Figure 1-18 Primary charging



Laser beam exposure

Step 2: The laser beam scans the photosensitive drum to neutralize negative charges on parts of the drum surface. An electrostatic latent image is formed on the drum where negative charges were neutralized.

Figure 1-19 Laser beam exposure

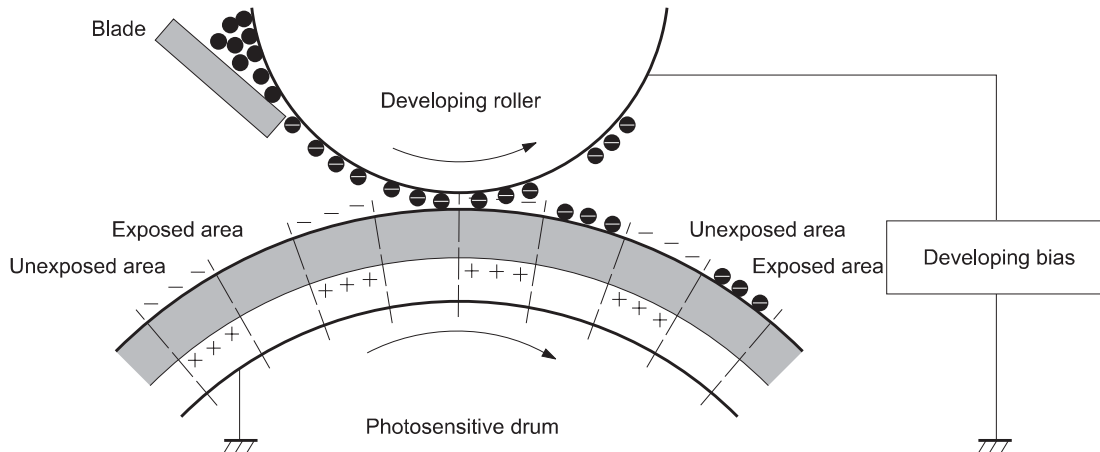


Developing stage

Print cartridge

Step 3: In the print cartridge, the developing cylinder comes in contact with the photosensitive drum to deposit toner onto the electrostatic latent image.

Figure 1-20 Print cartridge

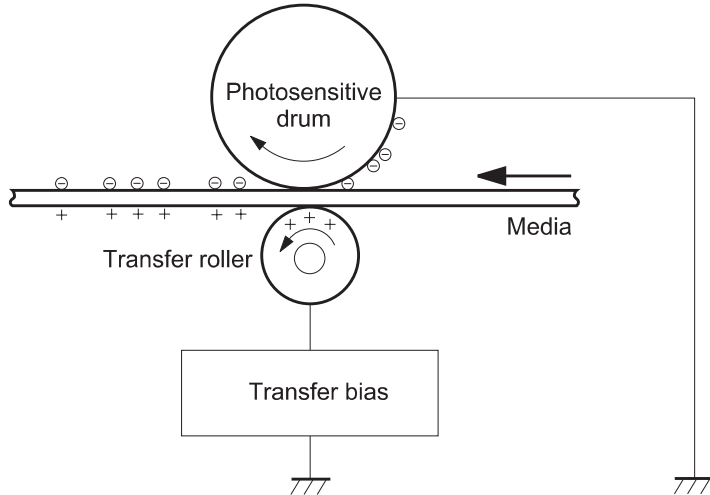


Toner acquires a negative charge from the friction that occurs when the developing roller rotates against the developing blade. The developing bias is applied to the developing roller to make a potential difference between the developing roller and the photosensitive drum. The negatively charged toner is attracted to the latent image on the photosensitive drum because the drum surface has a higher potential.

Transfer stage

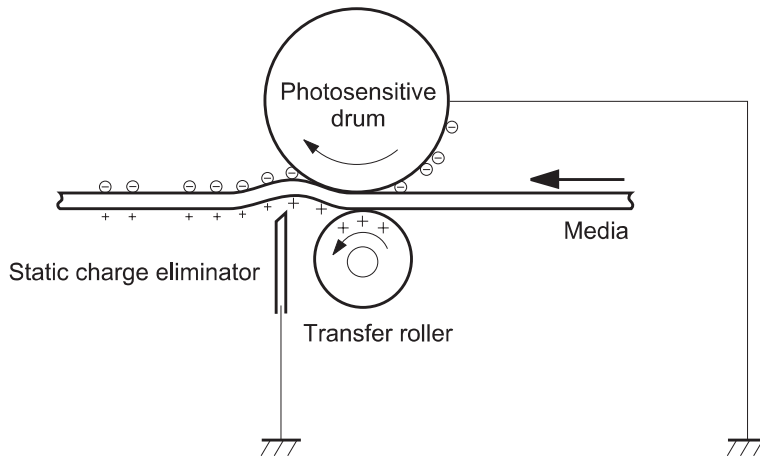
Step 4: The transfer charging roller, to which a DC positive bias is applied, imparts a positive charge on the print media. When the print media comes in contact with the photosensitive drum, the toner is transferred to the print media.

Figure 1-21 Transfer



Step 5: The elasticity of the print media causes its separation from the photosensitive drum. A static charge eliminator aids separation by weakening any electrostatic adhesion.

Figure 1-22 Separation

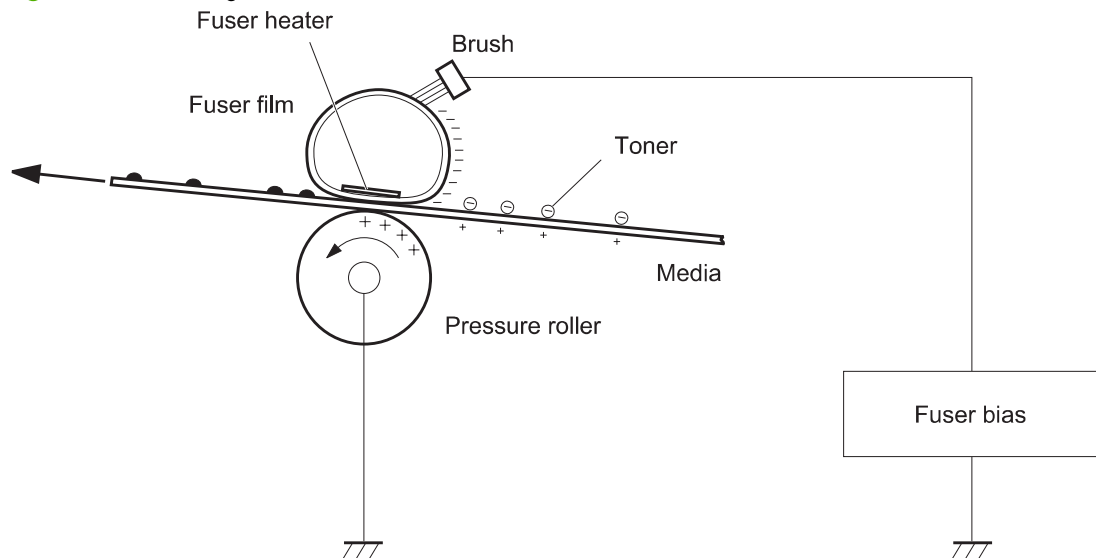


Fusing stage

Step 6: The DC negative bias applied to the fusing film strengthens the holding force of the toner on the print media and prevents the toner from scattering.

The product uses an on-demand fuser method. The toner image is permanently affixed to the printing paper by heat and pressure.

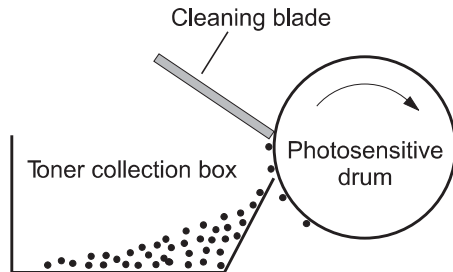
Figure 1-23 Fusing



Cleaning stage

Step 7: The cleaning blade scrapes the residual toner off of the photosensitive drum and deposits it into the waste toner case.

Figure 1-24 Drum cleaning



Toner detection

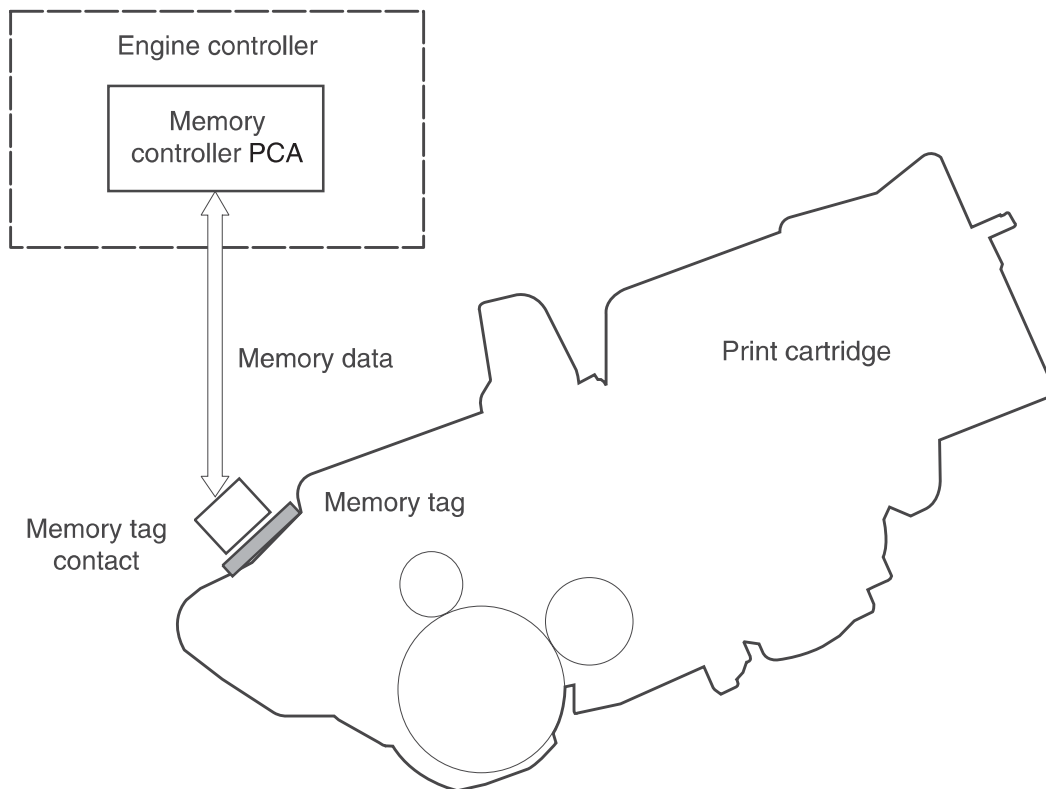
The product uses a nonvolatile memory tag built into the print cartridge. Print-cartridge detection happens when the engine controller detects the presence of a genuine HP print-cartridge that contains a memory tag. Toner detection happens as the engine controller reads or writes the data that is stored on the memory tag. The engine controller renews the information in the prescribed timing and reads or writes it from or to the memory tag.

The engine controller commands the memory tag to read or write with the following conditions:

- **Read**
 - Power is on
 - The cartridge door is closed
 - A command is received from the formatter
- **Write**
 - A page of media is printed
 - A command is received from the formatter

When the engine controller fails to read or write three times in a row, it determines that the memory tag is abnormal and sends a cartridge memory abnormality warning to the formatter.

Figure 1-25 Print cartridge memory tag



Pickup, feed, and delivery system

The pickup/feed/delivery system consists of several types of feed rollers and sensors. The ECU uses a motor and two solenoids to drive the rollers. Three media-detection sensors detect paper as it passes through the product. If media does not reach or pass each sensor within a specified time, the ECU determines that a jam has occurred and alerts the formatter.

Paper trays

The product has the following paper trays:

- Tray 1 (multipurpose tray; all models)
- Tray 2 (500-sheet tray; all models)
- Tray 3 (optional 500-sheet input tray; HP LaserJet P3015x)
- Tray 4 (optional 500-sheet input tray)

Photo sensors and switches

Figure 1-26 Photo sensors and switches (product)

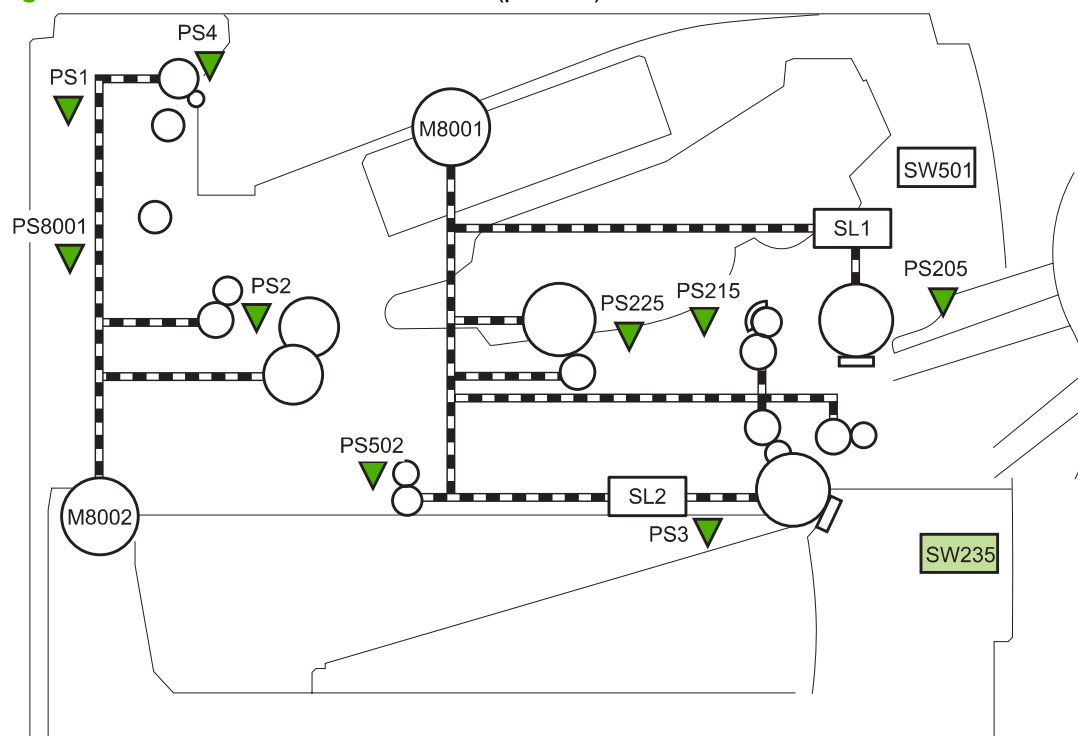


Table 1-10 Photo sensors and switches (product)

Item	Description	Item	Description
PS1	Face-up sensor	PS215	Top-of-Page (TOP) sensor
PS2	Fuser delivery sensor	PS225	Media width sensor
PS3	Cassette media-presence sensor	PS502	Duplex media-feed sensor (duplex models only)
PS4	Face-down tray media-full sensor	PS8001	Rear door sensor
PS205	Tray 1 (MP tray) media-presence sensor	SW235	Cassette presence sensor

Figure 1-27 Photo sensors and switches (Tray 3 and Tray 4)

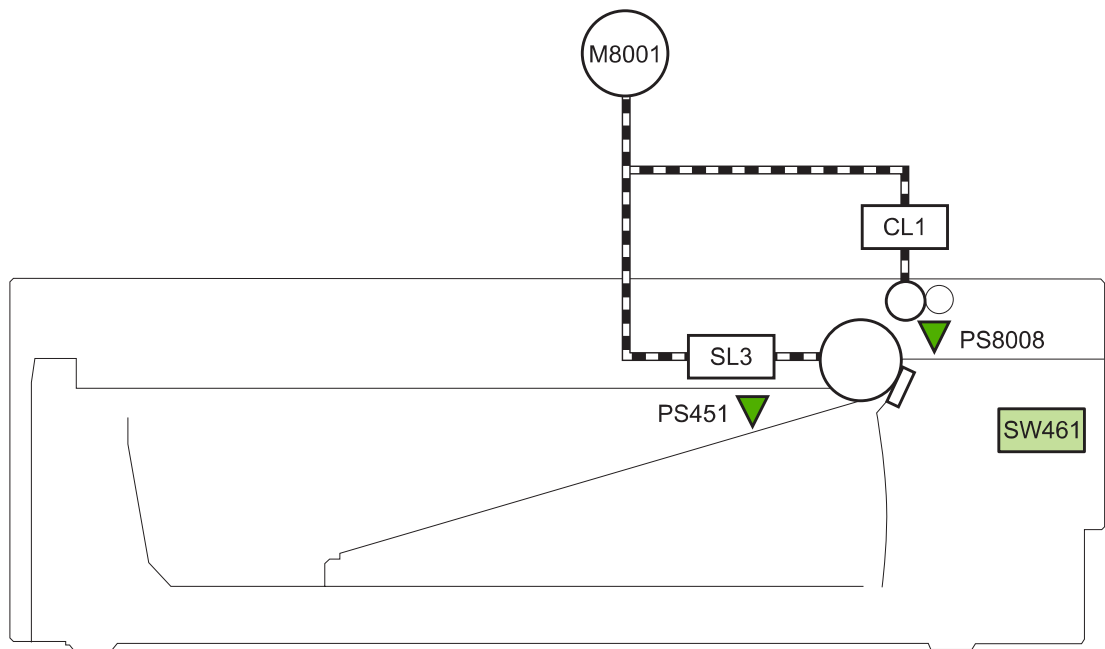


Table 1-11 Photo sensors and switches (Tray 3 and Tray 4)

Item	Description
PS451	Paper feeder cassette-media presence sensor
PS8008	Paper feeder media-feed sensor
SW461	Paper feeder cassette presence switch

¹ Tray 3 and Tray 4 are identical 500-sheet input trays.

Solenoids and clutches

Figure 1-28 Solenoids and clutches (product)

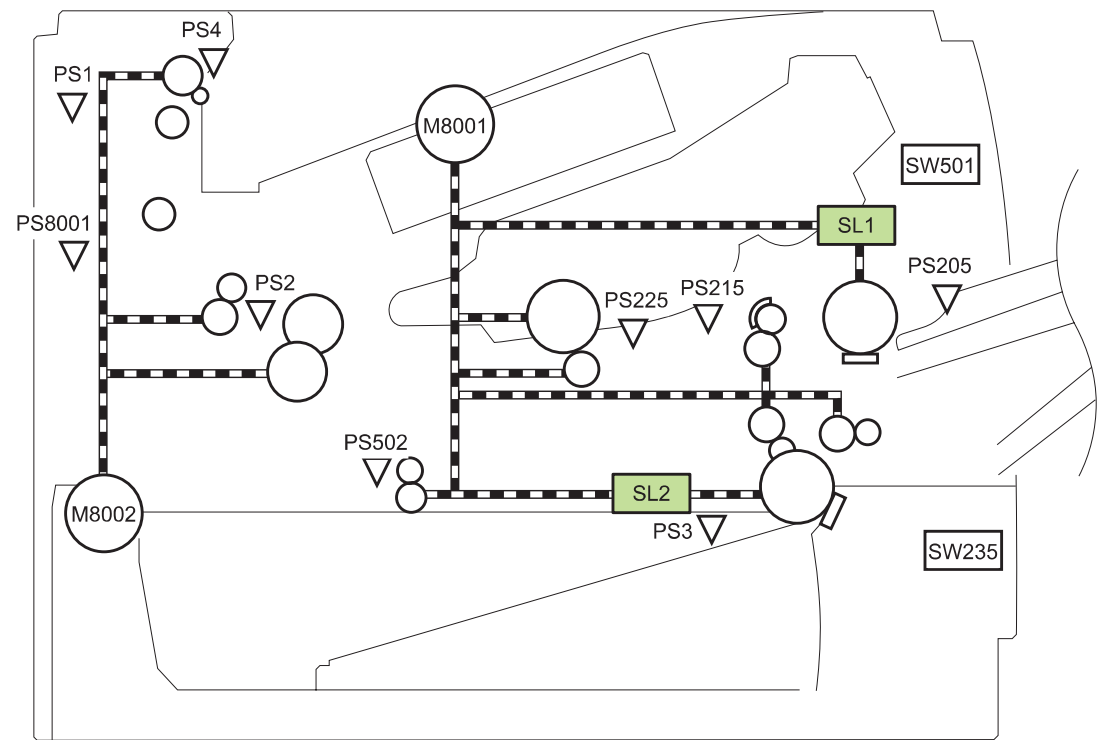


Table 1-12 Solenoids and clutches (product)

Item	Description
SL1	Tray 1 (multipurpose tray) pickup solenoid
SL2	Cassette (Tray 2) pickup solenoid

Figure 1-29 Solenoids and clutches (Tray 3 and Tray 4)

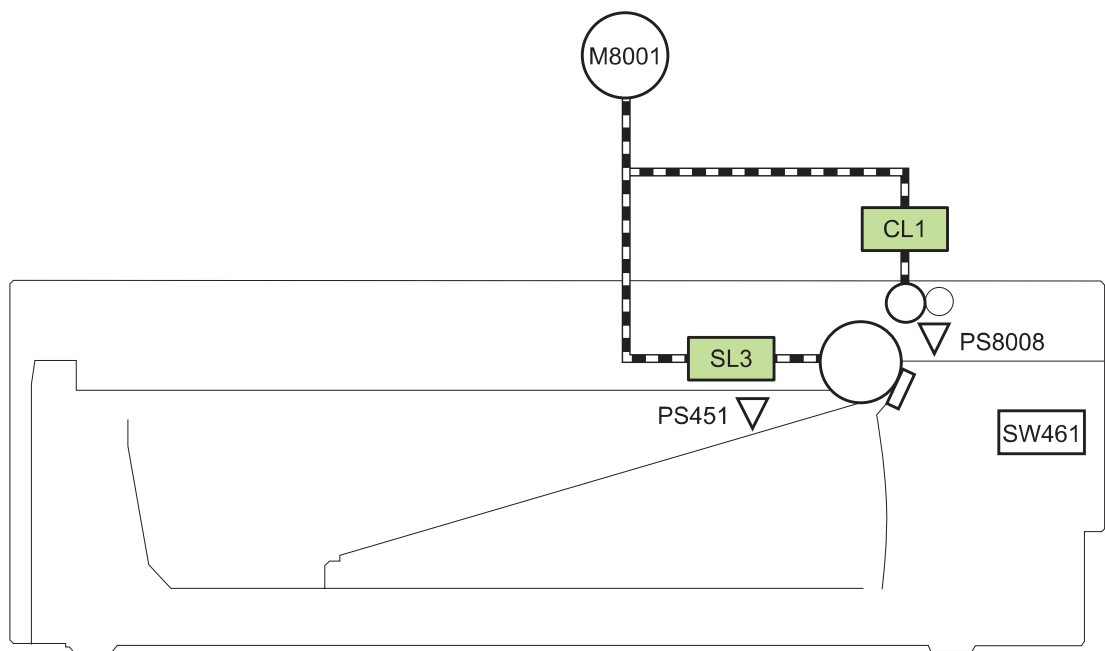


Table 1-13 Solenoids and clutches (Tray 3 and Tray 4)

Item	Description
SL3	Paper feeder pickup solenoid
CL1	Paper feeder pickup clutch

¹ Tray 3 and Tray 4 are identical 500-sheet input trays.

Tray 1 or Tray 2

Pickup and feed unit

The pickup and feed unit uses the following components and processes.

Cassette paper size detection/cassette paper detection

 **NOTE:** To find the following components, see [Photo sensors and switches on page 34](#).

- PS3; cassette media-presence sensor
- PS225; media width sensor (detects media width *after* the media enters the paper path)

Cassette pickup

 **NOTE:** To find the following components, see [Solenoids and clutches on page 36](#).

- SL2; cassette (Tray 2) pickup solenoid

Tray 1 paper pickup

 **NOTE:** To find the following components, see [Photo sensors and switches on page 34](#) and [Solenoids and clutches on page 36](#).

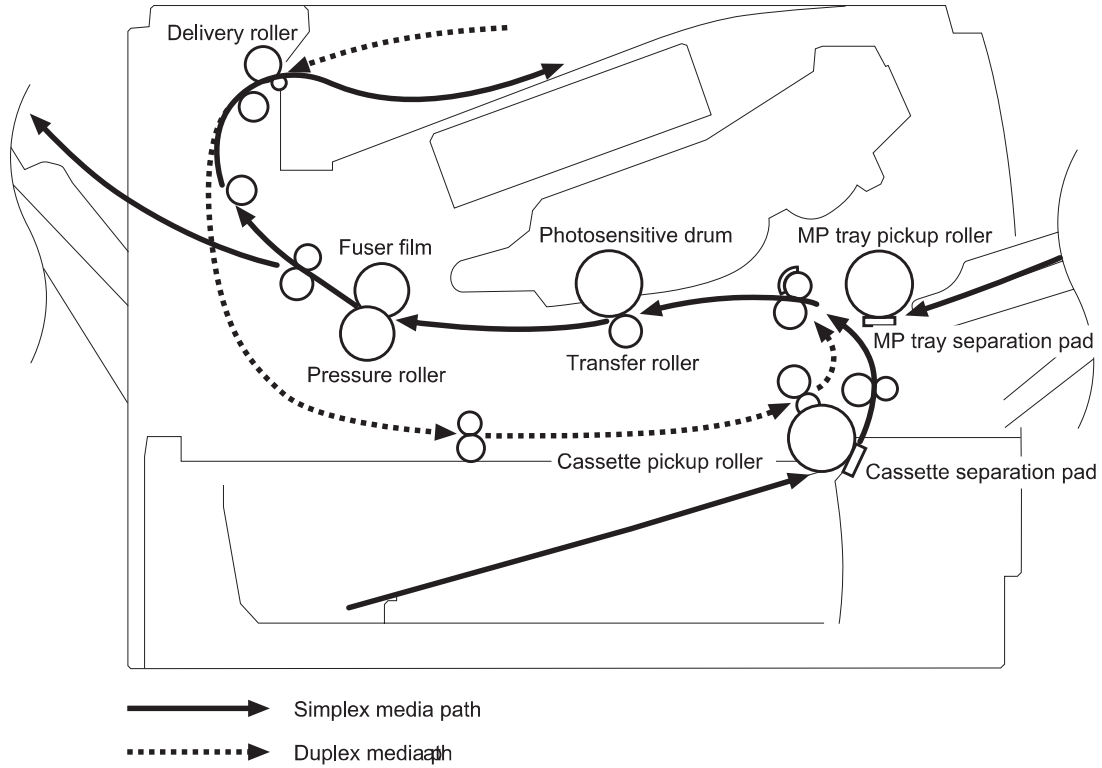
- PS205; Tray 1 (multipurpose tray) media-presence sensor
- SL1; Tray 1 (multipurpose tray) pickup solenoid

Paper pickup and feed

The following figure shows the pickup and feed paper path.

 **NOTE:** Duplex models include a duplex media-feed path for automatic two-sided printing.

Figure 1-30 Pickup, feed, and delivery block diagram



Jam detection

The product uses the following sensors to detect the presence of media and to check for jams. If media does not reach or pass each sensor within a specified time, the ECU determines that a jam has occurred and alerts the formatter.

 **NOTE:** To find the following components, see [Photo sensors and switches on page 34](#).

- PS2; fuser delivery sensor
- PS4; face-down tray media-full sensor
- PS215; Top-of-Page (TOP) sensor
- PS225; media width sensor
- PS502; duplex media-feed sensor (duplex models only)
- PS8008; paper feeder media-feed sensor

 **NOTE:** PS8008 is used in Tray 3 and Tray 4.

The product detects the following jams:

- Pickup delay jam
- Pickup stationary jam
- Delivery delay jam
- Delivery stationary jam
- Fuser wrapping jam
- Door open jam
- Residual media jam
- Duplex repickup jam (duplex models only)

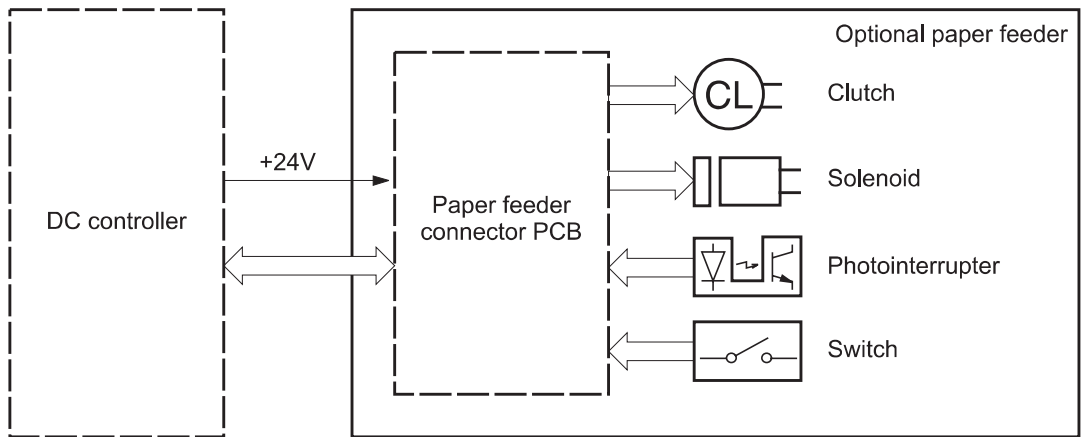
Additional tray

 **NOTE:** This product supports identical 500-sheet input trays (Tray 3 and Tray 4).

Tray driver PCA

The following figure shows the signals between the DC controller and the tray driver PCA.

Figure 1-31 Tray 3 and Tray 4 driver PCA block diagram

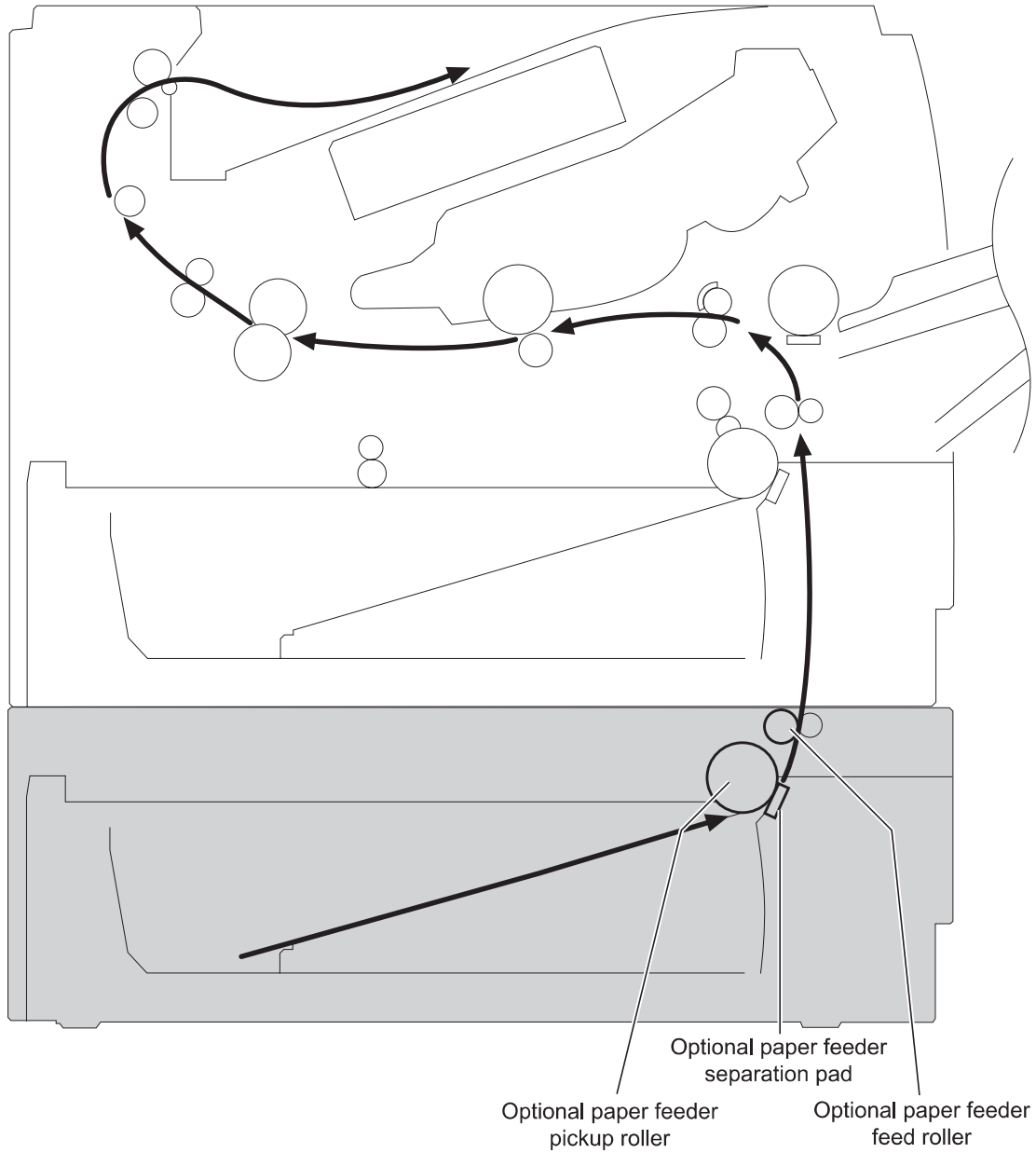


Paper pickup and feed

 **NOTE:** Tray 3 and Tray 4 are identical 500-sheet input trays.

The following figure shows the pickup and feed paper path (Tray 3 shown).

Figure 1-32 Tray 3 and Tray 4 pickup, feed, and delivery block diagram



Media level and size detection

- PS451; paper feeder media-presence sensor detects if media is present in the tray.



NOTE: PS451 is used in Tray 3 and Tray 4.

- Media size is detected after the page enters the product. See [Cassette paper size detection/cassette paper detection on page 38](#).

Jam detection

- PS8008; paper feeder media-feed sensor detects jams in the paper feeder.

2 Removal and replacement

- [Removal and replacement strategy](#)
- [Service approach](#)
- [Removal and replacement procedures](#)

Removal and replacement strategy

General cautions during removal and replacement

This chapter describes the removal and replacement of field-replaceable units (FRUs) only.

Replacing FRUs is generally the reverse of removal. Occasionally, notes and tips are included to provide directions for difficult or critical replacement procedures.

HP does *not* support repairing individual subassemblies or troubleshooting to the component level.

- ⚠ **WARNING!** Turn the product off, wait 5 seconds, and then remove the power cord before attempting to service the product. If this warning is not followed, severe injury can result, in addition to damage to the product. The power must be on for certain functional checks during troubleshooting. However, disconnect the power supply during parts removal.

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

The sheet-metal parts can have sharp edges. Be careful when handling sheet-metal parts.

- ⚠ **CAUTION:** Do not bend or fold the flat flexible cables (FFCs) during removal or installation. Also, do not straighten prefolds in the FFCs. You *must* fully seat all FFCs in their connectors. Failure to fully seat an FFC into a connector can cause a short circuit in a PCA.

Incorrectly routed or loose wire harnesses can interfere with other internal components and can become damaged or broken. Frayed or pinched harness wires can be difficult to find. When replacing wire harnesses, always use the provided wire loops, lance points, or wire-harness guides and retainers.

- 🔧 **NOTE:** To install a self-tapping screw, first turn it counterclockwise to align it with the thread pattern, and then carefully turn it clockwise to tighten. Do not overtighten. If a self-tapping screw-hole becomes stripped, repair the screw-hole or replace the affected assembly.

Note the length, diameter, color, type, and location of each screw. Be sure to return each screw to its original location during reassembly.

- 💡 **TIP:** For clarity, some photos in this chapter might show components removed that would not be removed to service the product. If necessary, remove the components listed at the beginning of a procedure before proceeding to service the product.

Electrostatic discharge

- ⚠ **CAUTION:**  Some parts are sensitive to electrostatic discharge (ESD). Look for the ESD reminder when removing product parts. Always perform service work at an ESD-protected workstation or mat, or use an ESD strap. If an ESD workstation, mat, or strap is not available, ground yourself by touching the sheet-metal chassis *before* touching an ESD-sensitive part.

Protect the ESD-sensitive parts by placing them in ESD pouches when they are out of the product.

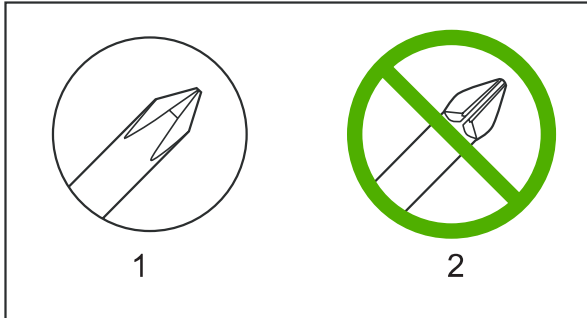
Required tools

- #2 Phillips 152 mm (6 in) screwdriver with magnetic tip
- #2 Phillips 76 mm (3 in) screwdriver with magnetic tip
- Small flat blade screwdriver

- Small needle-nose pliers
- ESD mat
- Penlight

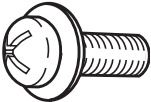
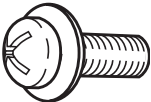
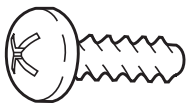
△ **CAUTION:** Always use a Phillips screwdriver (callout 1). Do not use a pozidrive screwdriver (callout 2) or any motorized screwdriver. These can damage screws or screw threads.

Figure 2-1 Phillips and pozidrive screwdriver comparison



Types of screws

📋 **NOTE:** The illustration in this section are for reference only. The screws in your product might look slightly different.

Illustration	Description	Size	Part number	Use
	Screw with washer	M3X6	XB2-7300-000CN	Used to secure metal components to metal components (for example, a ground wire to the frame)
	Screw, tapping	M3X6	XA9-1503-000CN	
	Screw	D-M3X6	XA9-1671-000CN	
	Screw	P-M3X8	XB4-5300-807CN	
	Screw, tapping, truss head	M4X10	XB4-7401-005CN	Used to secure anything to plastic

6 mm 8 mm 10 mm M 3 M 4



Service approach

Product repair normally begins by using the product internal diagnostics and the following two-step process:

1. Isolate the problem to the major system (for example, the network or server, or the product).
2. Troubleshoot the problem by using the procedures in chapter 6.

After you find a faulty part, the product 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.

Before performing service

- Remove all media from the product.
- Turn off the power using the power switch.
- Unplug the power cable and interface cable or cables.
- Place the product on an ESD workstation or mat, or use an ESD strap (if one is available). If an ESD workstation, mat, or strap is not available, ground yourself by touching the sheet-metal chassis *before* touching an ESD-sensitive part.
- Remove the print cartridges. See [Print cartridge on page 52](#).
- Remove the tray cassette or cassettes. See [Tray cassette \(Tray 2, Tray 3, or Tray 4\) on page 54](#).

After performing service

- Plug in the power cable.
- Reinstall the print cartridges.
- Reinstall the tray cassette or cassettes.
- If an optional paper feeder was installed, place the product on the feeder.

Post-service test

Perform the following test to verify that the repair or replacement was successful.

Print-quality test

1. Verify that you have completed the necessary reassembly steps.
2. Make sure that the tray contains clean, unmarked paper.
3. Attach the power cord and interface cable or interface cables, and then turn on the product.
4. Verify that the expected start-up sounds occur.
5. Print a configuration page, and then verify that the expected printing sounds occur.
6. Print a demo page, and then verify that the print quality is as expected.

7. Send a print job from the host computer, and then verify that the output meets expectations.
8. If necessary, restore any customer-specified settings.
9. Clean the outside of the product with a damp cloth.

Parts removal order

Figure 2-2 Parts removal order (1 of 2)

<u>Component</u>	<u>Remove</u>	<u>Remove</u>	<u>Remove</u>	<u>Remove</u>	<u>Remove</u>	<u>Remove</u>
Print cartridges						
Tray cassette (Tray 2, Tray 3, or Tray 4)						
Sub cover						
DIMM cover and DIMM						
Formatter cover and formatter PCA	DIMM cover					
Rear-door assembly						
Left Cover	Rear-door assembly					
Right-rear cover						
Tray 1 (multipurpose tray) cover	Rear-door assembly	Left Cover				
Cartridge door assembly	Rear-door assembly	Left Cover	Tray 1 cover			
Top-right cover	DIMM cover	Formatter cover				
Control panel	DIMM cover	Formatter cover				
Front-right and right-side cover assembly	DIMM cover	Formatter cover	Top-cover assembly			
Lower-right cover and bracket	DIMM cover	Formatter cover	Control panel	Front-right and right-side cover assembly		
Top cover	DIMM cover	Formatter cover	Rear-door assembly	Left Cover	Top-right cover	Control panel
Tray 1 (multipurpose tray) pickup roller						
Tray 1 (multipurpose tray) separation pad						
Tray 2, Tray 3, or Tray 4 pickup roller						
Tray 2, Tray 3, or Tray 4 separation pad						
Tray 2, Tray 3, or Tray 4 base-plate roller assembly						
Transfer roller						
USB port PCA	DIMM cover	Formatter cover	Top-right cover	Control panel	Front-right and right-side cover assembly	
Power-switch assembly	DIMM cover	Formatter cover	Top-right cover	Control panel	Front-right and right-side cover assembly	
Main Fan, fan duct, and environmental sensor	DIMM cover	Formatter cover	Top-right cover	Control panel	Front-right and right-side cover assembly	
Fuser	Rear-door assembly	Right-rear cover				
Registration assembly	Rear-door assembly	Left Cover				
Duplex media-feed guide	Rear-door assembly	Right-rear cover				
Laser/scanner assembly	DIMM cover	Formatter cover	Rear-door assembly	Left Cover	Top-right cover	Control panel
Engine control unit (ECU)	DIMM cover	Formatter cover	Rear-door assembly	Left Cover	Top-right cover	Control panel
Cassette pickup (Tray 2) solenoid or Tray 1 (multipurpose tray) pickup solenoid	DIMM cover	Formatter cover	Rear-door assembly	Left Cover	Top-right cover	Control panel
Pickup assembly	DIMM cover	Formatter cover	Rear-door assembly	Left Cover	Top-right cover	Control panel
Fuser motor	DIMM cover	Formatter cover	Rear-door assembly	Left Cover	Top-right cover	Control panel
Sub fan and fan duct	DIMM cover	Formatter cover	Rear-door assembly	Left Cover	Top-right cover	Control panel
High-voltage power supply	DIMM cover	Formatter cover	Rear-door assembly	Left Cover	Top-right cover	Control panel

Figure 2-3 Parts removal order (2 of 2)

Remove	Remove	Remove	Remove	Remove	Remove	Remove
Top cover						
Front-right and right-side cover assembly	Lower-right cover and bracket	Top cover	Power-switch assembly			
Front-right and right-side cover assembly	Lower-right cover and bracket	Top cover	Power-switch assembly	Engine control unit (ECU)		
Front-right and right-side cover assembly	Lower-right cover and bracket	Top cover	Power-switch assembly	Engine control unit (ECU)		
Front-right and right-side cover assembly	Lower-right cover and bracket	Top cover	Power-switch assembly	Engine control unit (ECU)		
Front-right and right-side cover assembly	Lower-right cover and bracket	Top cover	Power-switch assembly	Engine control unit (ECU)		
Front-right and right-side cover assembly	Lower-right cover and bracket	Top cover	Power-switch assembly	Duplex media-feed guide (duplex models only)	Engine control unit (ECU)	Sub fan and fan duct

Removal and replacement procedures

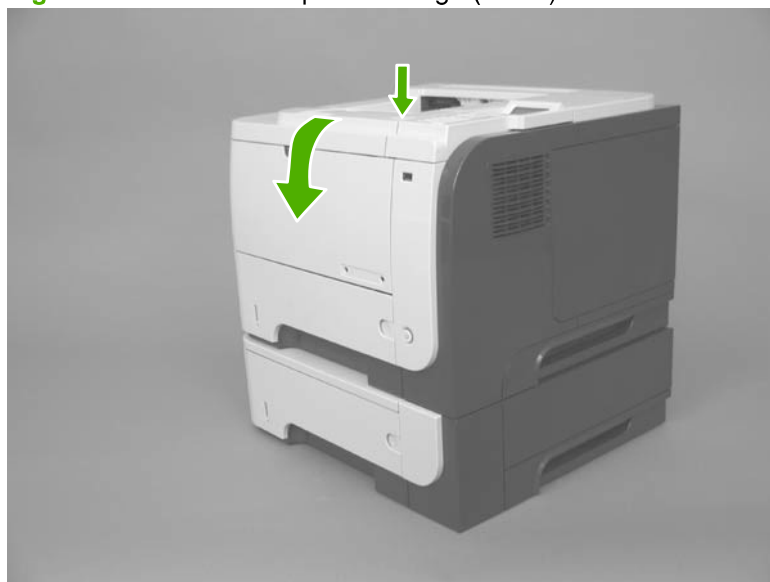
Print cartridge, cassettes, and sub cover

Print cartridge

△ **CAUTION:** If toner gets on your clothing, wipe it off with a dry cloth and wash clothing in cold water. *Hot water sets toner into fabric.*

1. Press the cartridge-door release button, and then open the cartridge door. Make sure that the door is completely open.

Figure 2-4 Remove the print cartridge (1 of 2)

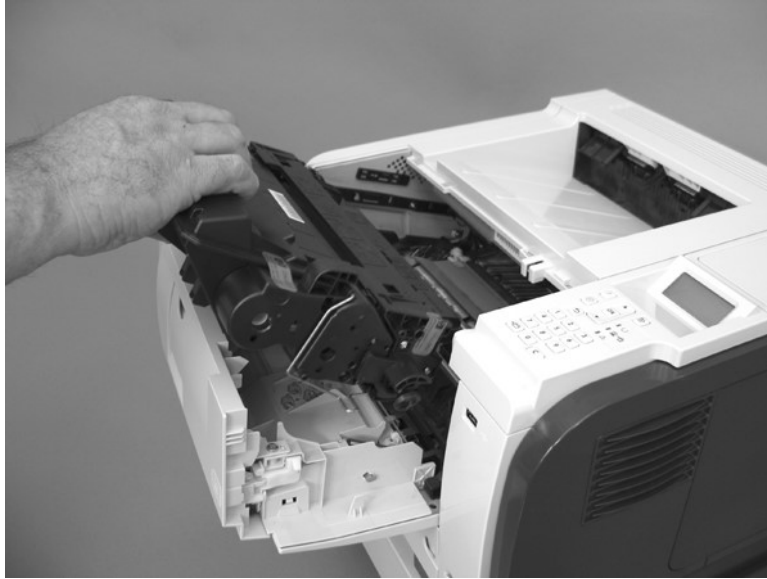


2. Grasp the print-cartridge handle and pull it out of the product.

△ **CAUTION:** Do not touch the green roller. Doing so can damage the cartridge. Do not expose the cartridge to strong light. Cover the cartridge with a sheet of paper to protect it from light.

💡 **Reinstallation tip** Align the print cartridge with its slot and insert the print cartridge until it clicks into place.

Figure 2-5 Remove the print cartridge (2 of 2)

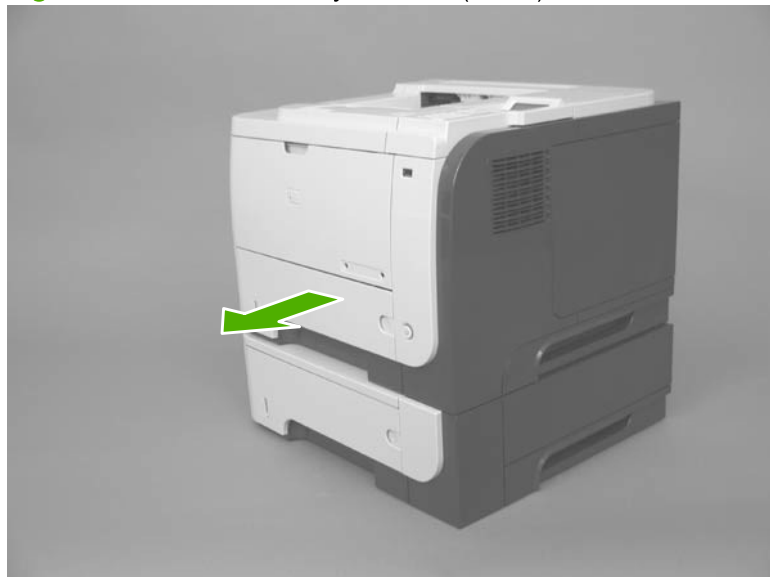


Tray cassette (Tray 2, Tray 3, or Tray 4)

 **NOTE:** Use this procedure to remove the Tray 2 or optional Tray 3 or Tray 4 cassette.

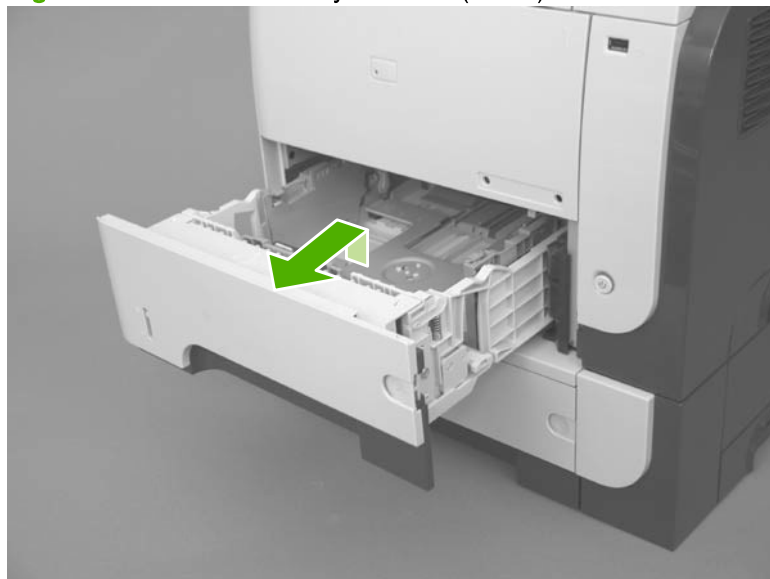
1. Pull the tray straight out of the product until it stops.

Figure 2-6 Remove the tray cassette (1 of 2)



2. Carefully lift up on the tray to release it, and then remove the tray.

Figure 2-7 Remove the tray cassette (2 of 2)



Sub cover

 **NOTE:** Duplex models only. The space under the sub cover is used by third-party manufacturers to install optional devices for this product (for example, a security card reader).

Use a small flat blade screwdriver to carefully separate the sub cover from the product.

 **CAUTION:** There are two tabs along the each of the long edges of the cover that fasten the cover to the product. Do not break the tabs when the cover is removed.

Figure 2-8 Remove the sub cover



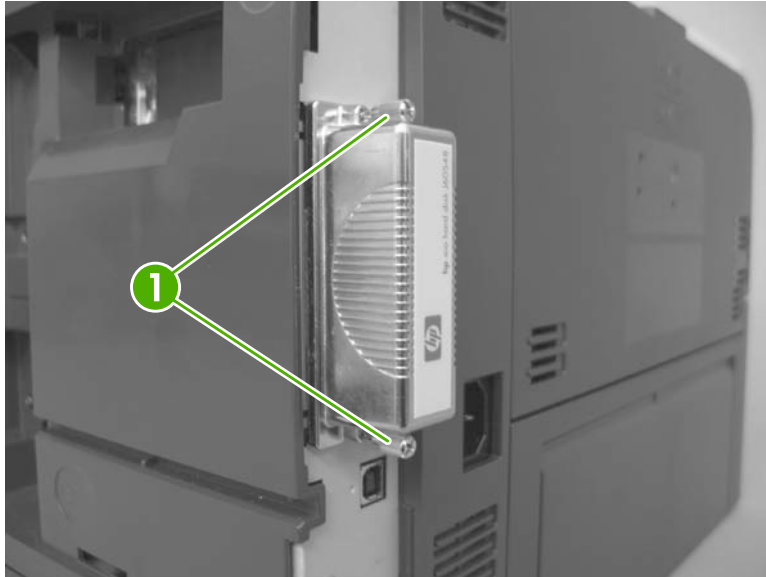
External panels, covers, doors, formatter PCA, DIMM, and EIO disk

EIO disk

⚠ **WARNING!**  ESD sensitive component.

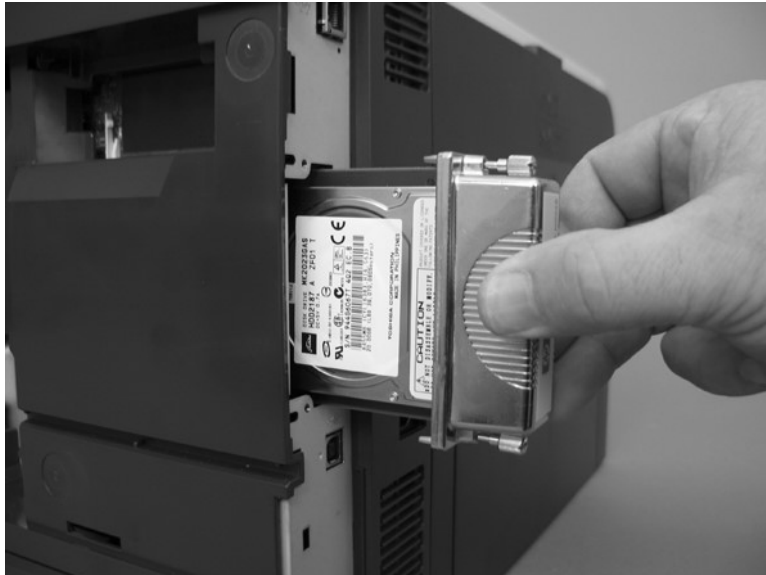
1. Loosen two thumb screws (callout 1).

Figure 2-9 Remove the EIO disk (1 of 2)



2. Pull the EIO disk straight out of the product to remove it.

Figure 2-10 Remove the EIO disk (2 of 2)



DIMM cover and DIMM

 **WARNING!**  ESD sensitive component.

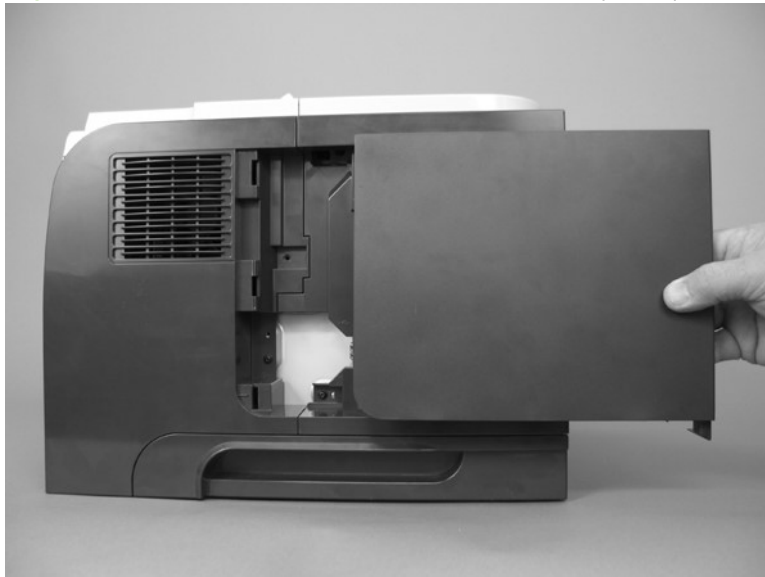
1. Slide the DIMM cover toward the back of the product to release it.

Figure 2-11 Remove the DIMM cover and DIMM (1 of 3)



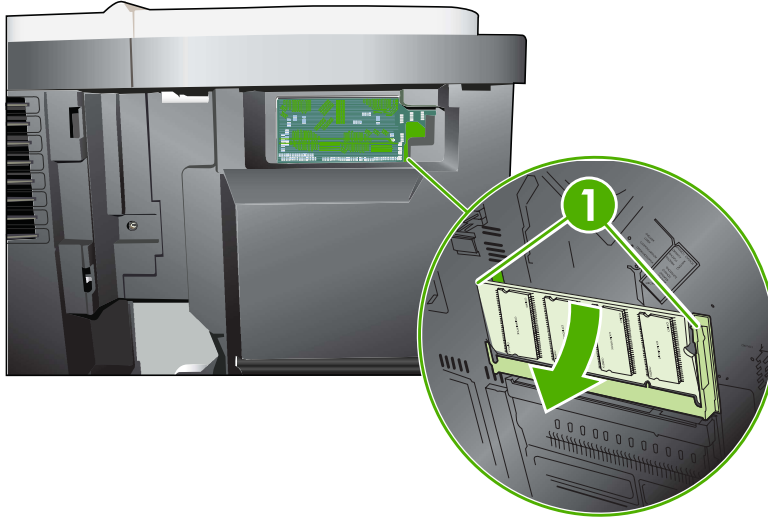
2. Lift the cover away from the product.

Figure 2-12 Remove the DIMM cover and DIMM (2 of 3)



3. Release two tabs (callout 1) and rotate the top of the DIMM away from the formatter. Lift up on the DIMM to remove it.

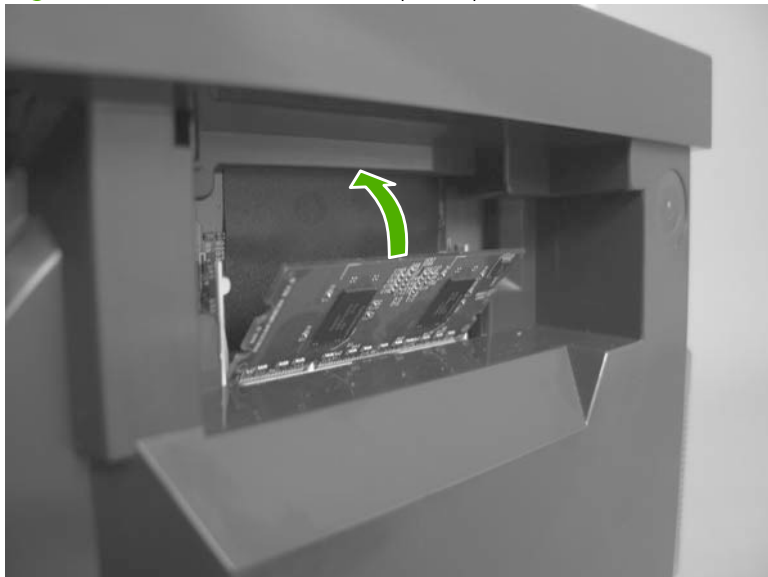
Figure 2-13 Remove the DIMM cover and DIMM (3 of 3)



Reinstall the DIMM

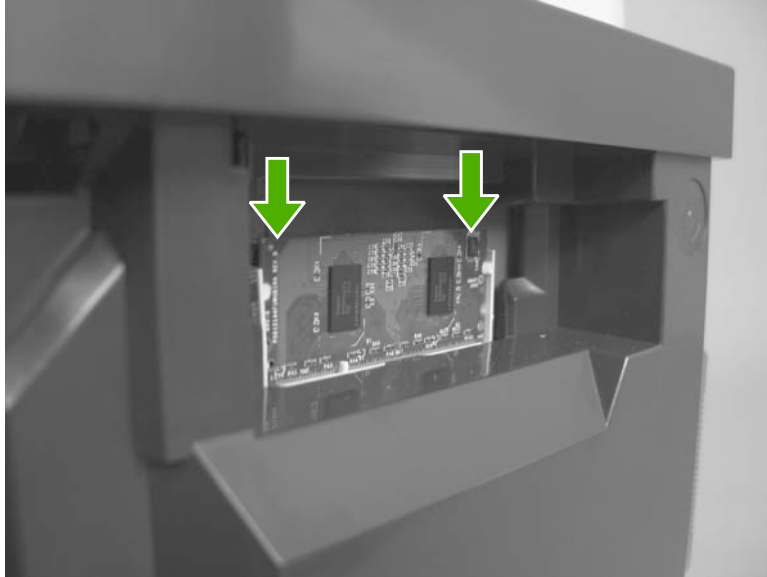
1. Position the DIMM at an angle to the DIMM slot, and rotate the top of the DIMM toward the formatter.

Figure 2-14 Reinstall the DIMM (1 of 2)



2. Push down to seat it in the DIMM slot. The DIMM must snap into the locking tabs on the DIMM slot.

Figure 2-15 Reinstall the DIMM (2 of 2)

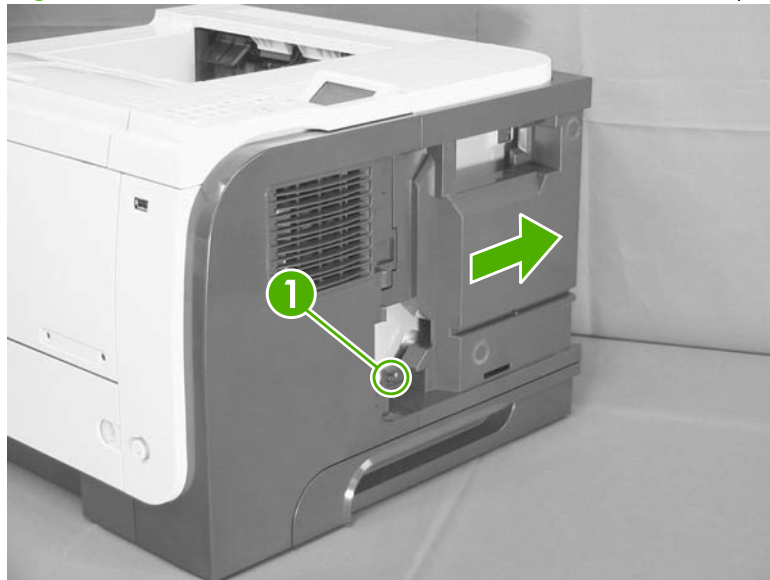


Formatter cover and formatter PCA

 **WARNING!**  ESD sensitive component.

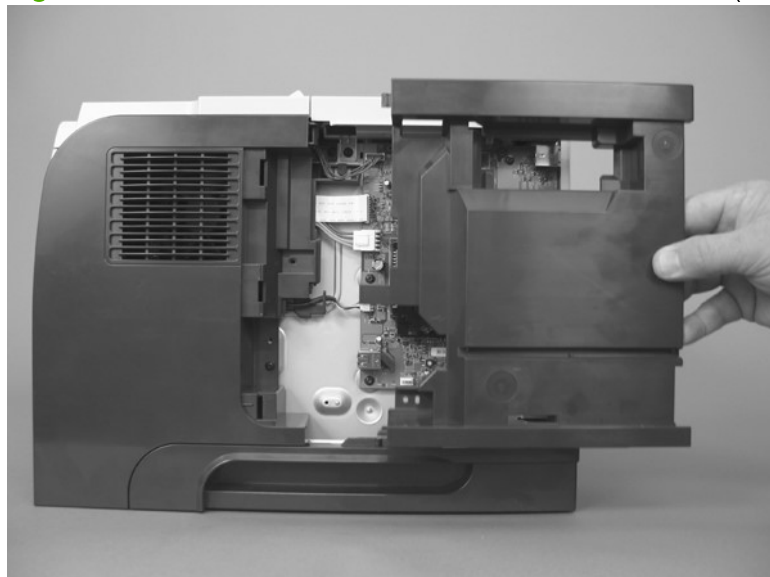
1. Remove the DIMM cover. See [DIMM cover and DIMM on page 57](#).
2. Remove one screw (callout 1), and then slide the formatter cover toward the back of the product to release it.

Figure 2-16 Remove the formatter cover and formatter PCA (1 of 4)



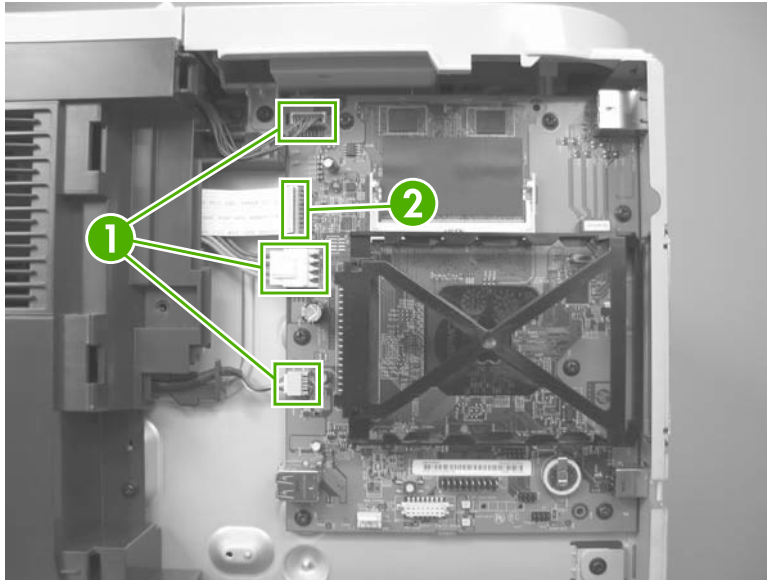
3. Lift the cover away from the product.

Figure 2-17 Remove the formatter cover and formatter PCA (2 of 4)



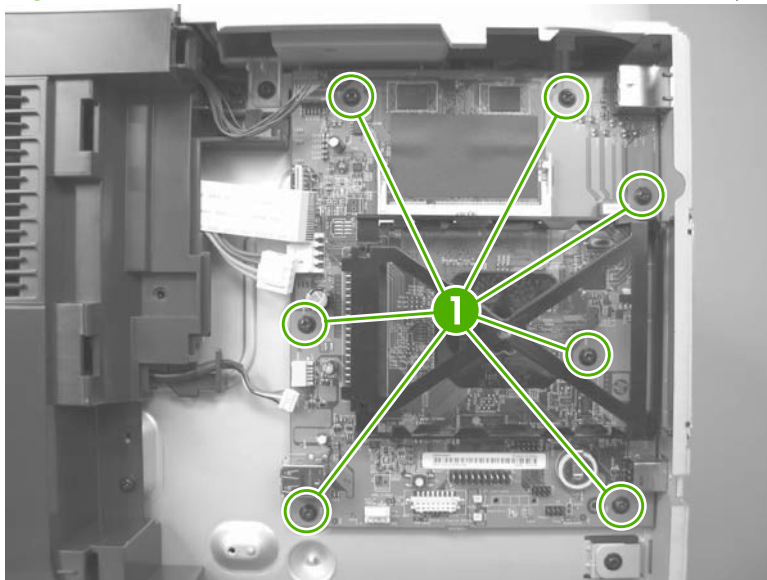
4. Disconnect three connectors (callout 1; J14, J17, and J16) and one FFC (callout 2; J18).

Figure 2-18 Remove the formatter cover and formatter PCA (3 of 4)



5. Remove seven screws (callout 1), and then carefully remove the formatter PCA.

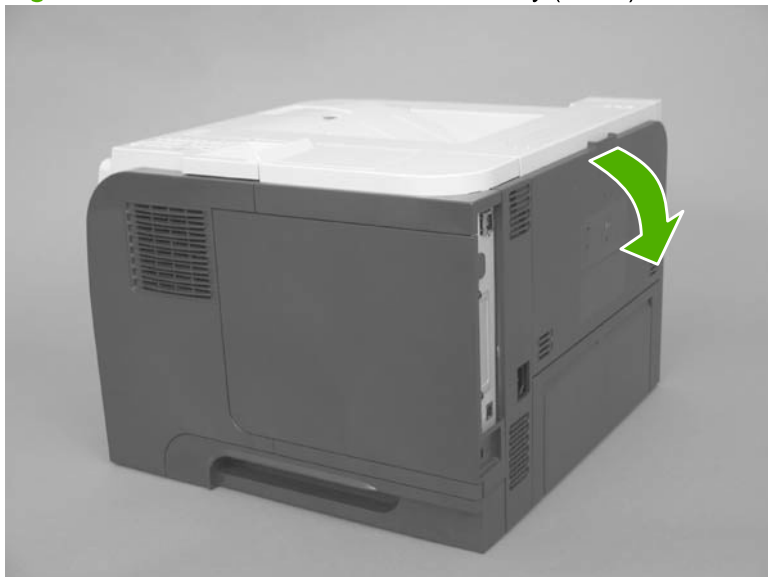
Figure 2-19 Remove the formatter cover and formatter PCA (4 of 4)



Rear-door assembly

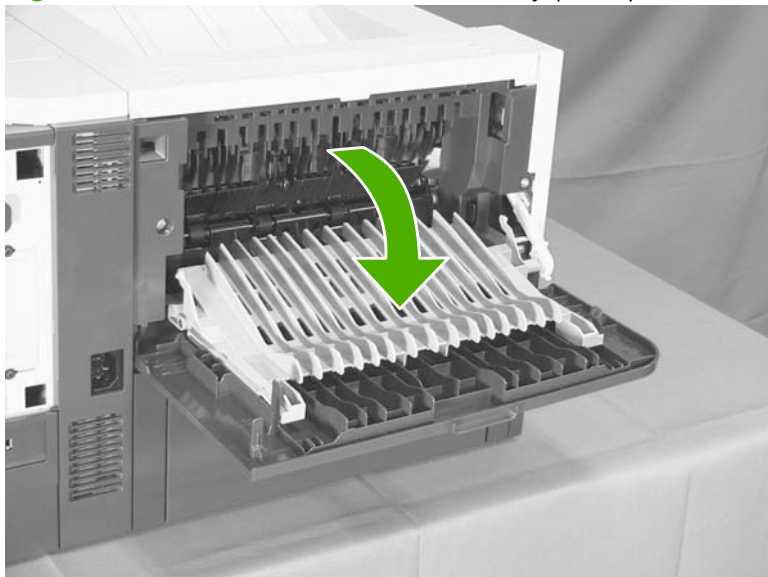
1. Open the rear door.

Figure 2-20 Remove the rear-door assembly (1 of 8)



2. Gently pull down on the door and lower the door until it is fully open.

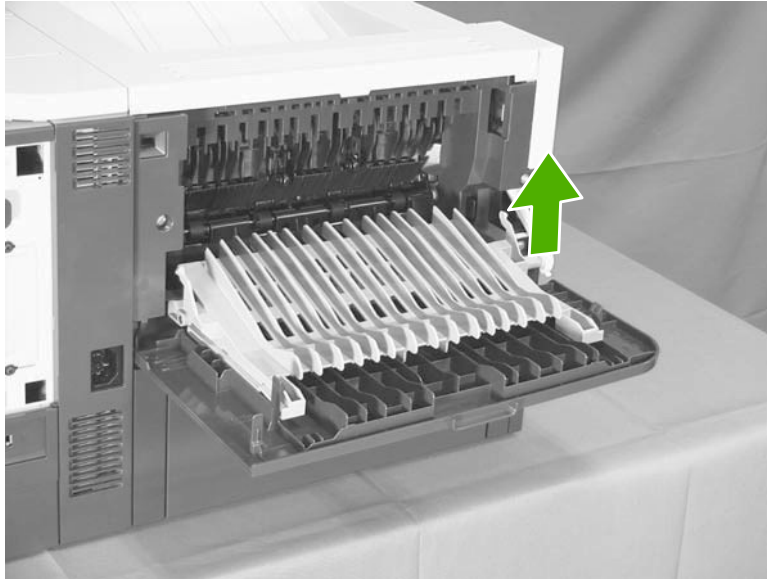
Figure 2-21 Remove the rear-door assembly (2 of 8)



3. Push up on the link arm to release it.

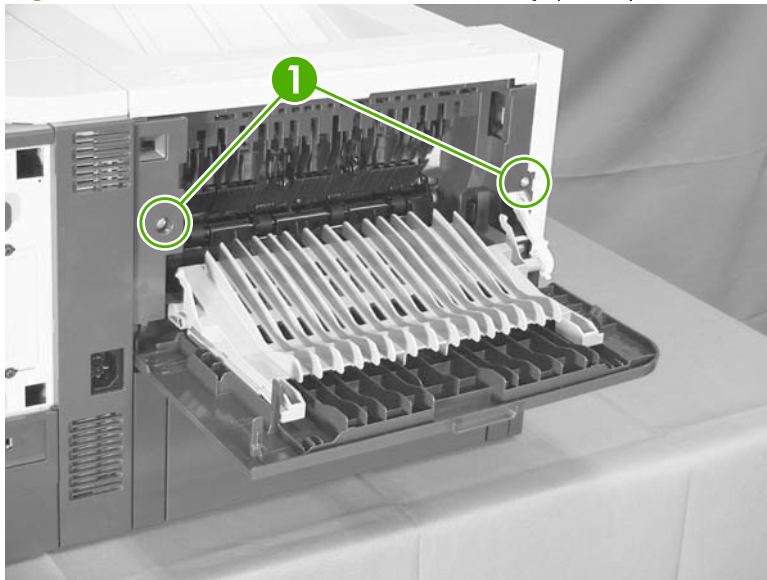
△ **CAUTION:** The link arm is under spring tension. Do not let the link arm snap back toward the product when you release it.

Figure 2-22 Remove the rear-door assembly (3 of 8)



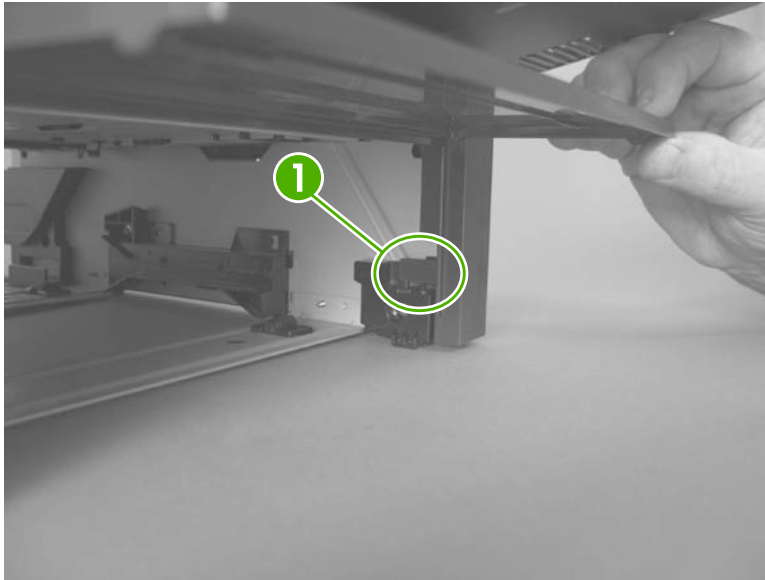
4. Remove two screws (callout 1).

Figure 2-23 Remove the rear-door assembly (4 of 8)



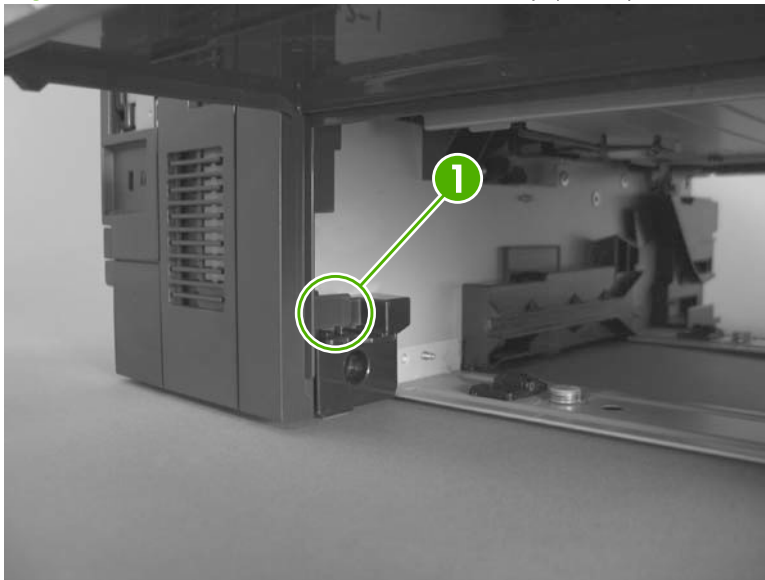
5. Open the lower-rear door, and then release one tab (callout 1).

Figure 2-24 Remove the rear-door assembly (5 of 8)



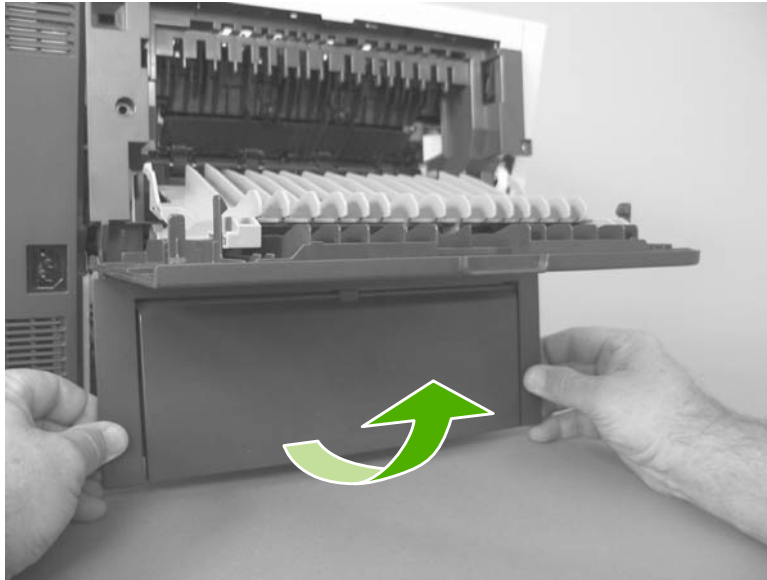
6. Release one tab (callout 1).

Figure 2-25 Remove the rear-door assembly (6 of 8)



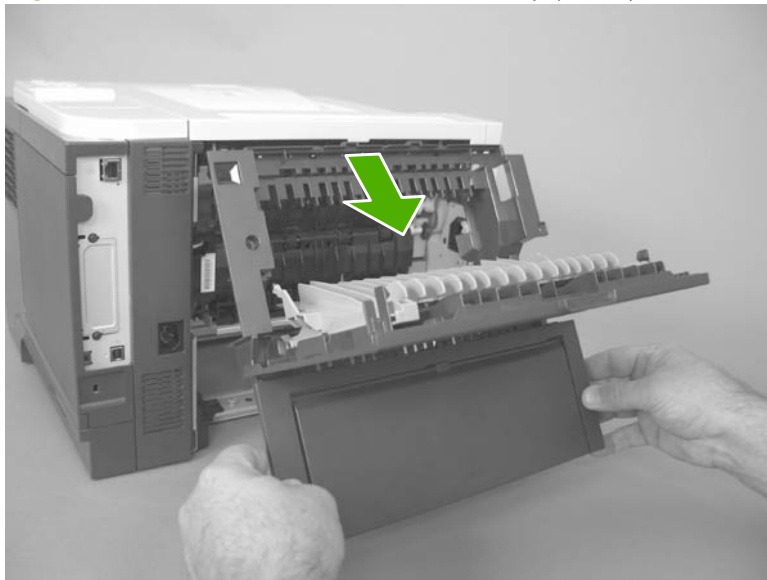
7. Rotate the bottom of the rear-door assembly away from the product.

Figure 2-26 Remove the rear-door assembly (7 of 8)



8. Pull down on the rear-door assembly to remove it.

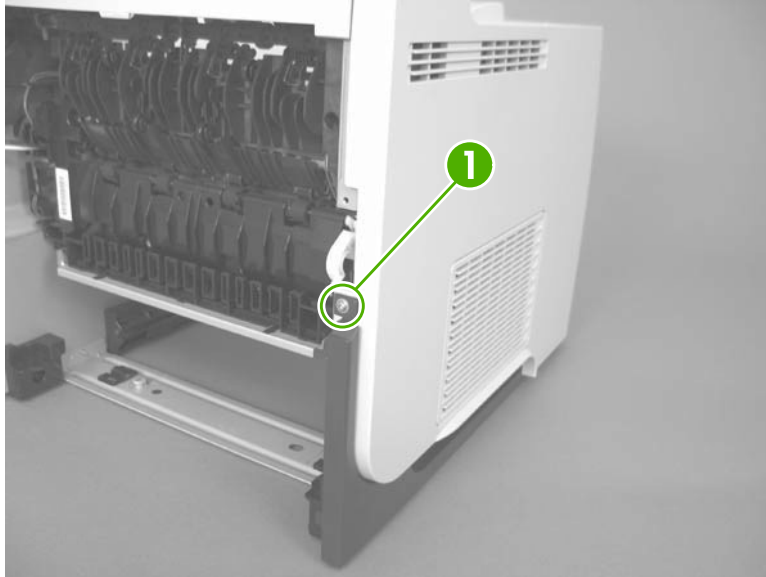
Figure 2-27 Remove the rear-door assembly (8 of 8)



Left cover

1. Remove the rear-door assembly. See [Rear-door assembly on page 62](#).
2. Remove one screw (callout 1).

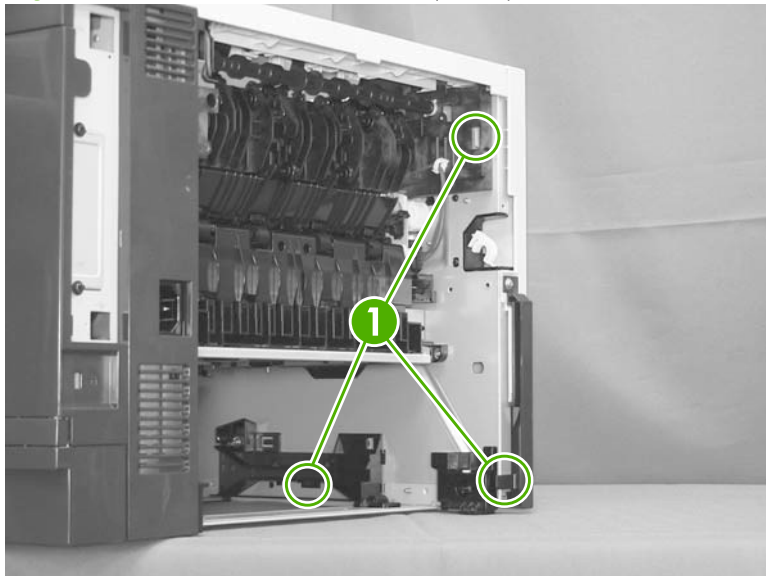
Figure 2-28 Remove the left cover (1 of 4)



3. Release three tabs (callout 1).

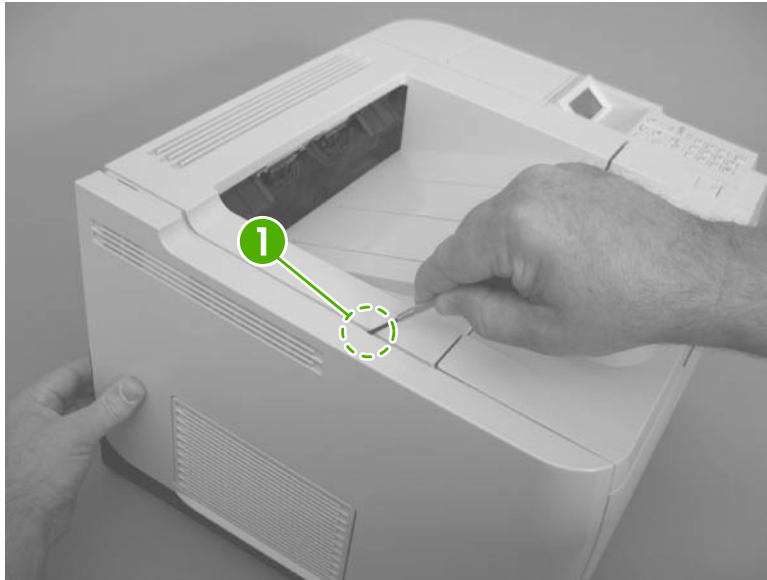
 **TIP:** The tab inside the cassette cavity is located below the plastic cassette rail. It might be easier if slightly lift up the left side of the product, and use a small flat blade screwdriver to release this tab.

Figure 2-29 Remove the left cover (2 of 4)



4. Release one tab (callout 1).

Figure 2-30 Remove the left cover (3 of 4)



5. Rotate the rear of the cover slightly away from the product, and then slide the cover toward the front of the product to remove it.

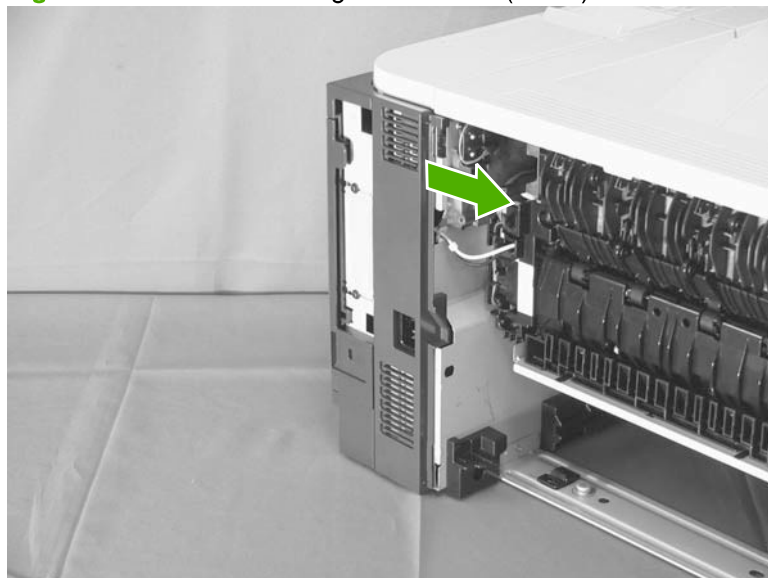
Figure 2-31 Remove the left cover (4 of 4)



Right-rear cover

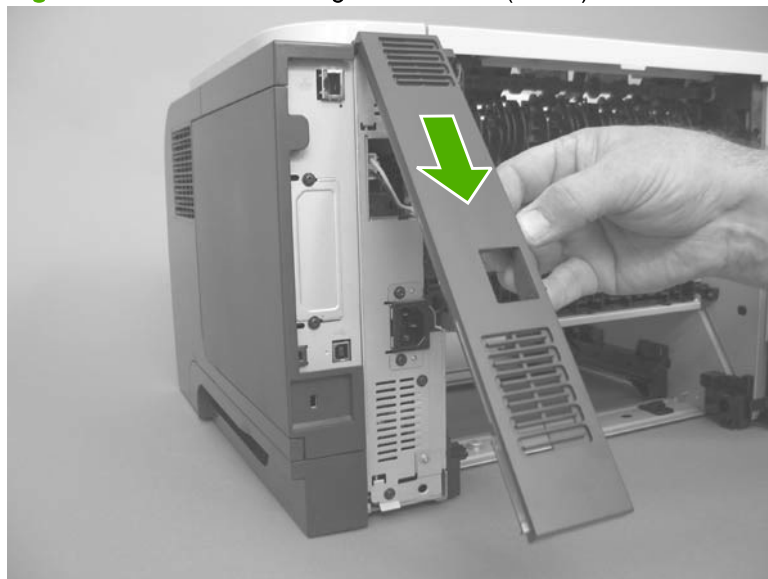
1. Remove the rear-door assembly. See [Rear-door assembly on page 62](#).
2. Slide the right-rear cover toward the inside of the product to release it.

Figure 2-32 Remove the right-rear cover (1 of 2)



3. Rotate the bottom of the cover away from the product, and then pull down on the cover to remove it.

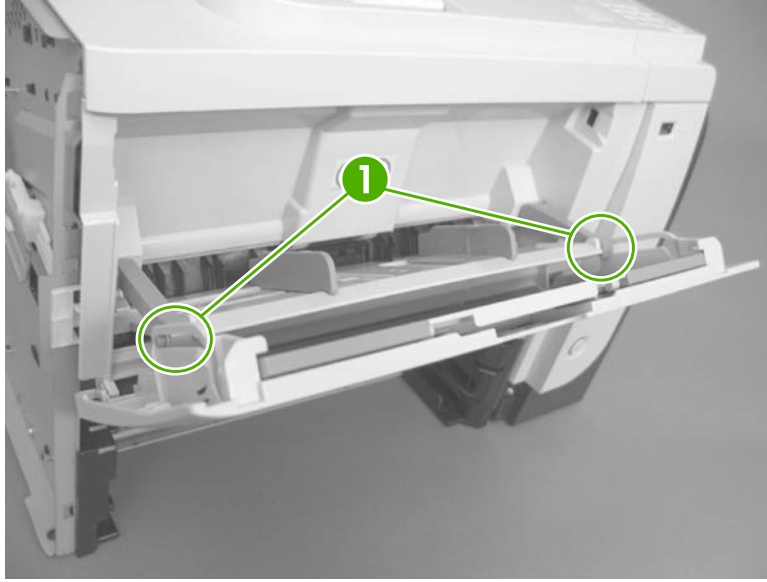
Figure 2-33 Remove the right-rear cover (2 of 2)



Tray 1 (multipurpose tray) cover

1. Before proceeding, remove the following components:
 - Rear-door assembly. See [Rear-door assembly on page 62](#).
 - Left cover. See [Left cover on page 66](#).
2. Carefully release two retaining arms (callout 1).

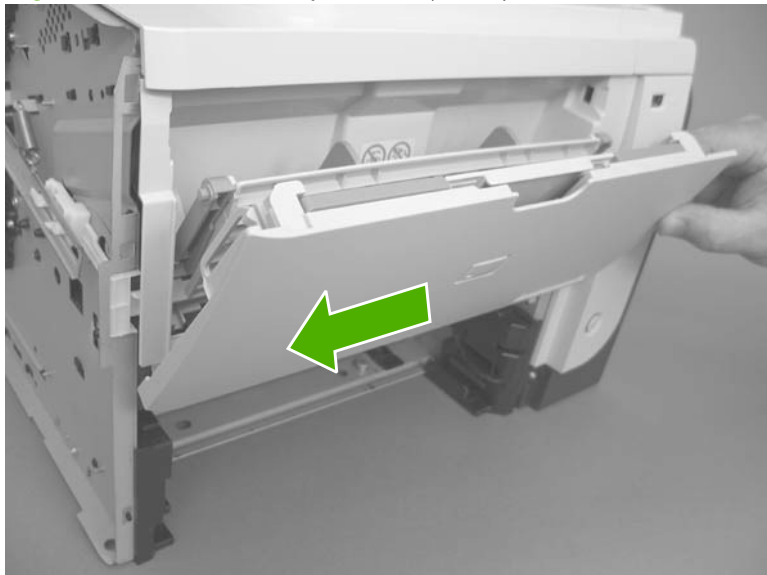
Figure 2-34 Remove Tray 1 cover (1 of 3)



3. Slightly lower the cover, and then slide it toward the left side of the product.

 **TIP:** If you lower the tray too far, it will not slide off of the hinge pins.

Figure 2-35 Remove Tray 1 cover (2 of 3)



4. Remove the Tray 1 cover.

Figure 2-36 Remove Tray 1 cover (3 of 3)



Cartridge-door assembly

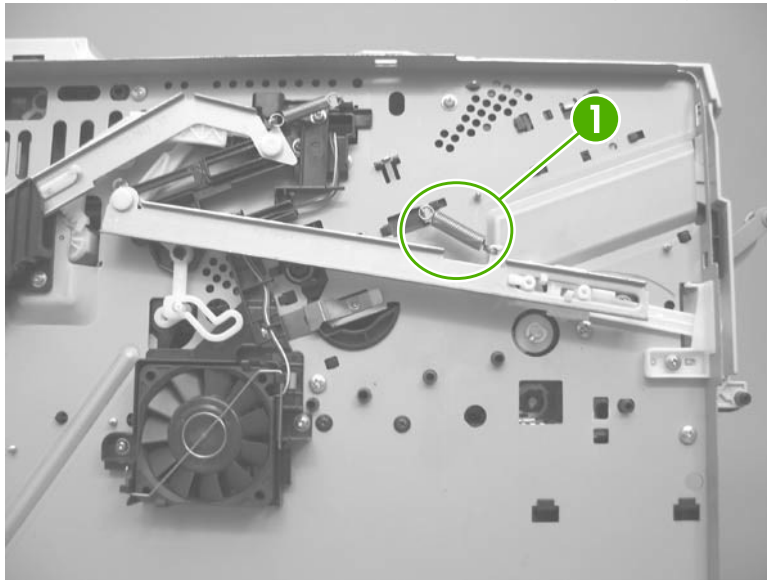
1. Before proceeding, remove the following components:

- Rear-door assembly. See [Rear-door assembly on page 62](#).
- Left cover. See [Left cover on page 66](#).
- Tray 1 (multipurpose tray) cover. See [Tray 1 \(multipurpose tray\) cover on page 69](#).

💡 **TIP:** The cartridge-door assembly can be removed without removing the Tray 1 cover. However, it is easier to remove and reinstall the door assembly when the Tray 1 cover is not installed.

2. Remove one spring (callout 1).

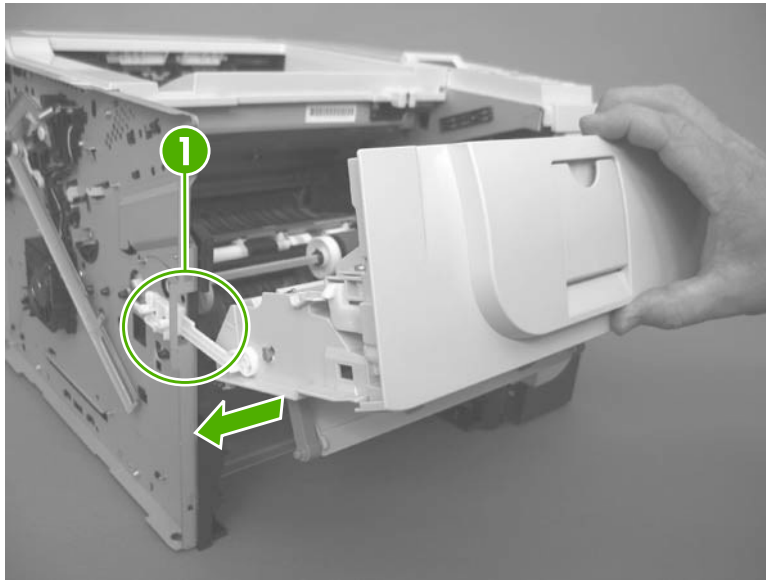
Figure 2-37 Remove the cartridge-door assembly (1 of 3)



3. Slightly slide the assembly toward the left side of the product to release it from the hinge pins.

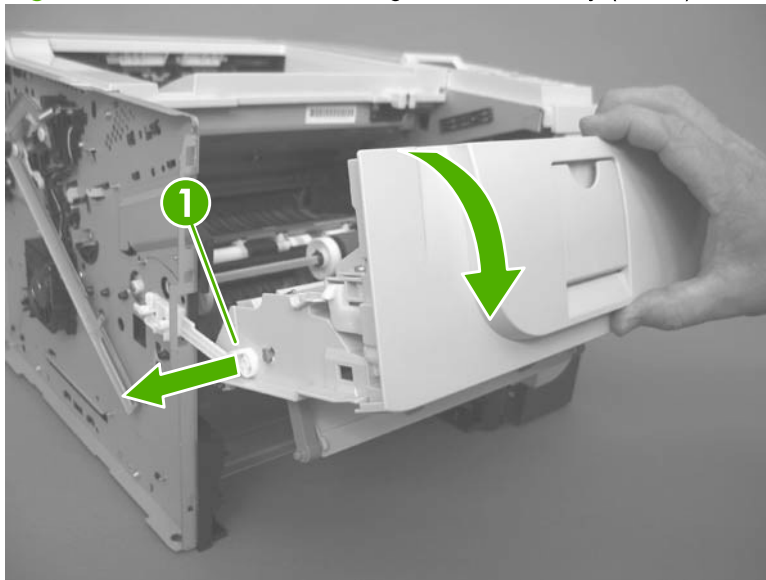
△ **CAUTION:** Do not damage the plastic link arm (callout 1).

Figure 2-38 Remove the cartridge-door assembly (2 of 3)



4. Rotate the assembly down, and then separate the plastic link arm (callout 1) from the assembly. Remove the cartridge-door assembly.

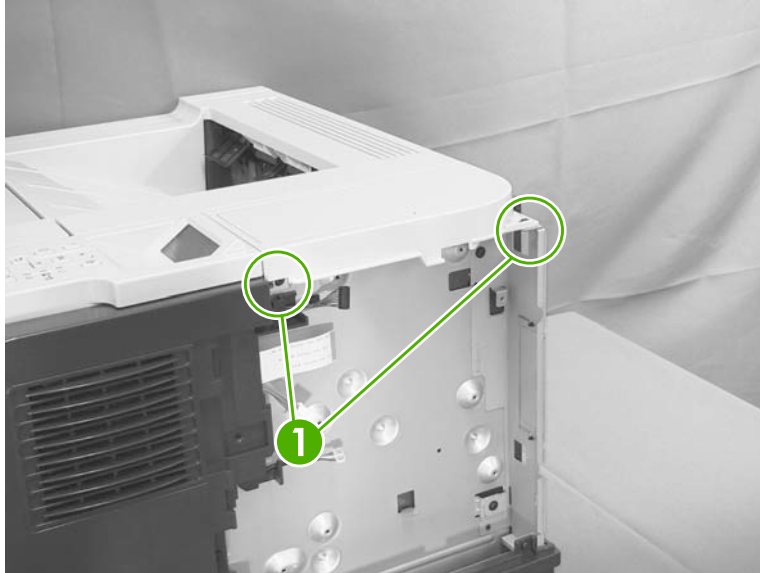
Figure 2-39 Remove the cartridge-door assembly (3 of 3)



Top-right cover

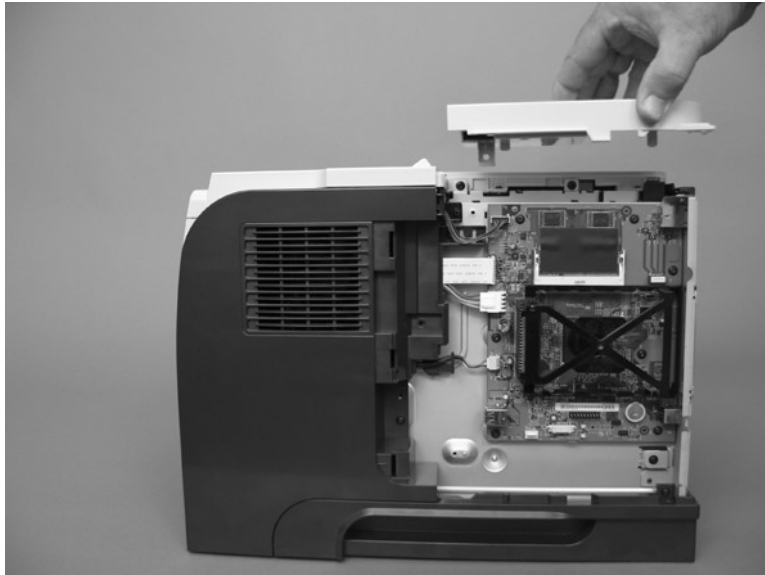
1. Before proceeding, remove the following components:
 - DIMM cover. See [DIMM cover and DIMM on page 57](#).
 - Formatter cover. See [Formatter cover and formatter PCA on page 60](#).
2. Remove two screws (callout 1).

Figure 2-40 Remove the top-right cover (1 of 2)



3. Lift the cover off of the product to remove it.

Figure 2-41 Remove the top-right cover (2 of 2)

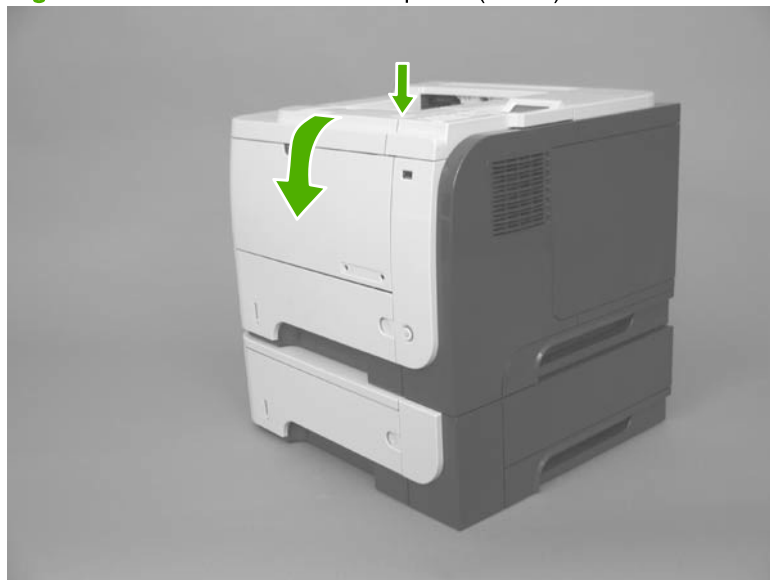


Control panel

⚠ WARNING!  ESD sensitive component.

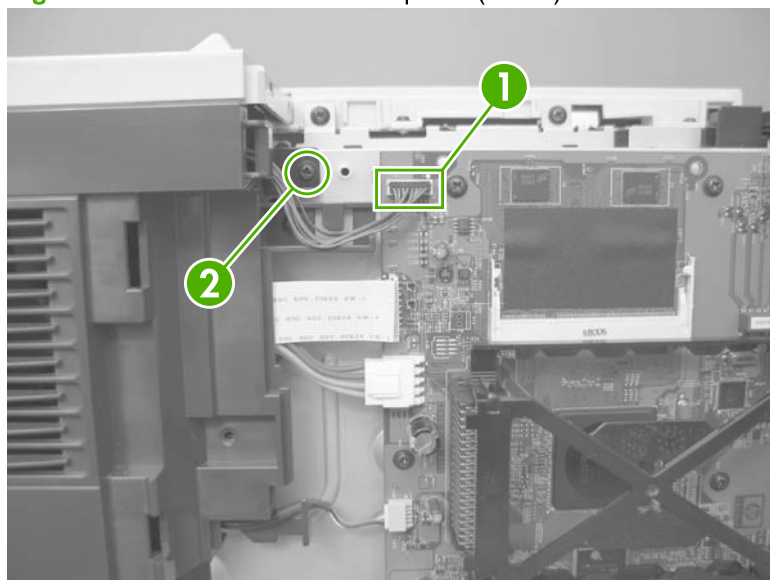
1. Before proceeding, remove the following components:
 - DIMM cover. See [DIMM cover and DIMM on page 57](#).
 - Formatter cover. See [Formatter cover and formatter PCA on page 60](#).
2. Press the cartridge-door release button, and then open the cartridge door. Make sure that the door is completely open.

Figure 2-42 Remove the control panel (1 of 4)



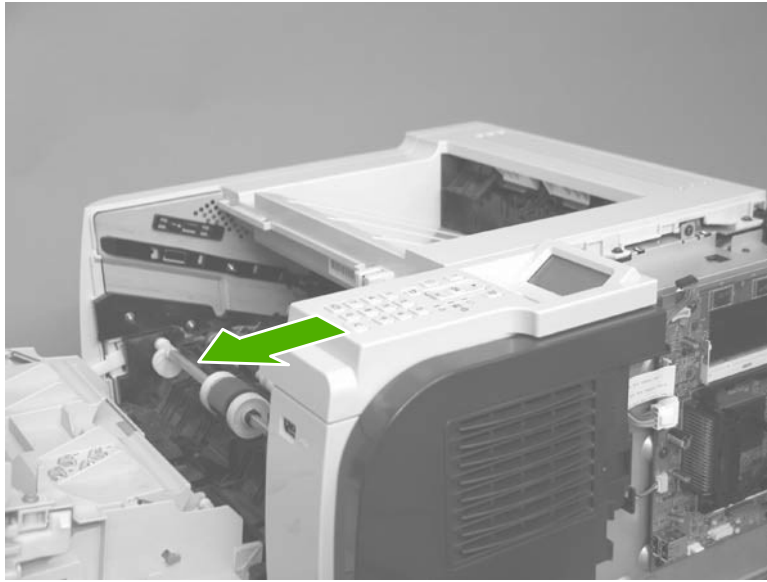
3. Disconnect one connector (callout 1), and then remove one screw (callout 2).

Figure 2-43 Remove the control panel (2 of 4)



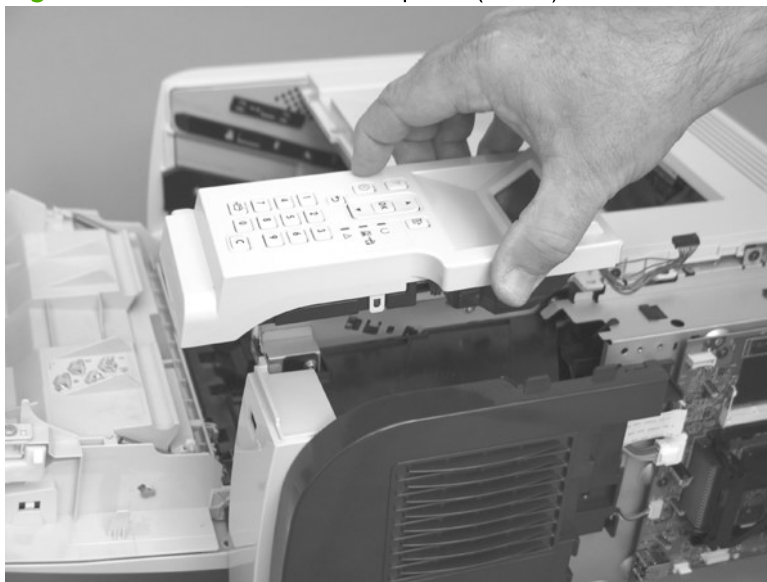
4. Slide the control panel toward the front of the product to release it.

Figure 2-44 Remove the control panel (3 of 4)



5. Lift the control panel off of the product.

Figure 2-45 Remove the control panel (4 of 4)



Front-right and right-side cover assembly

1. Before proceeding, remove the following components:

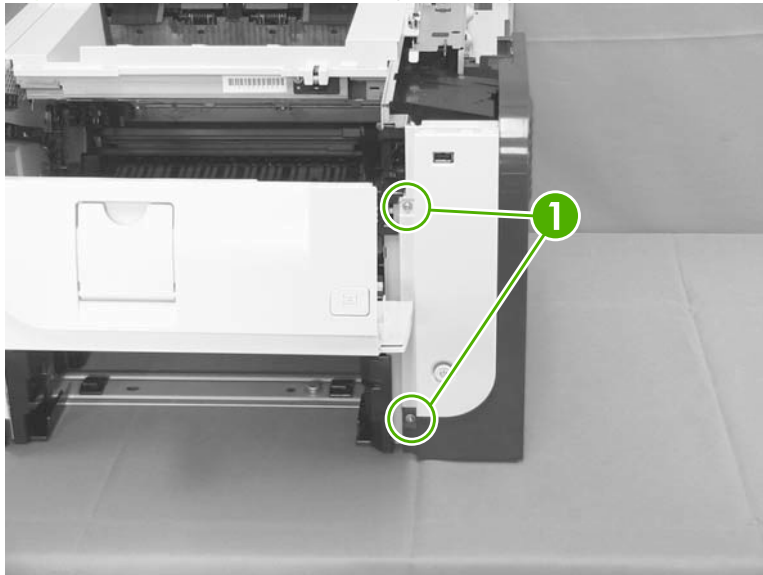
- DIMM cover. See [DIMM cover and DIMM on page 57](#).
- Formatter cover. See [Formatter cover and formatter PCA on page 60](#).
- Cartridge-door assembly. See [Cartridge-door assembly on page 71](#).

 **NOTE:** The figures in this section show the cartridge-door assembly installed. However, it might be easier to reinstall the front-right and right-side cover assembly if the cartridge-door assembly is removed.

- Control panel. See [Control panel on page 74](#).

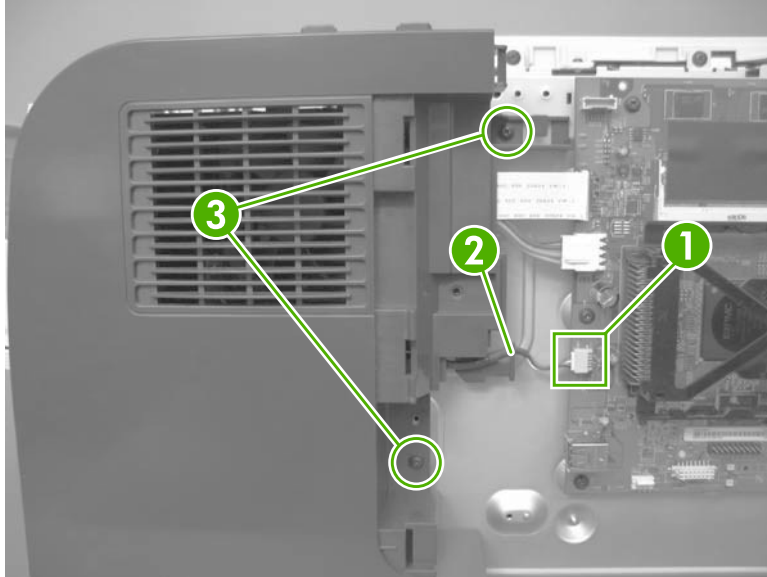
2. Remove two screws (callout 1).

Figure 2-46 Remove the front-right and right-side cover assembly (1 of 6)



3. Disconnect one connector (callout 1; J14), release the wire harness from the guide (callout 2), and then remove two screws (callout 3).

Figure 2-47 Remove the front-right and right-side cover assembly (2 of 6)

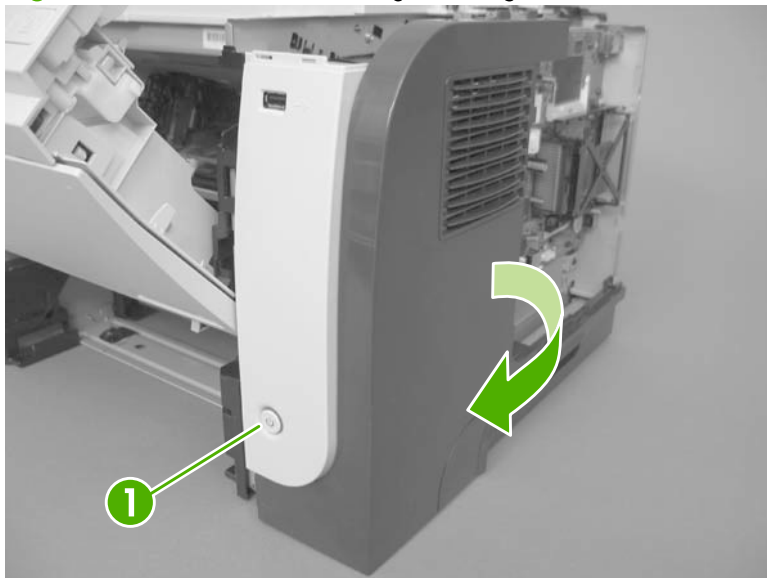


4. Slightly push the cover assembly toward the front of the product to release it, and then carefully rotate the cover away from the product.

△ **CAUTION:** Do not damage the covers or the cartridge-door assembly (if you did not remove it) when you rotate the cover assembly away from the product.

Do not dislodge the power-switch assembly (callout 1) when you rotate the cover assembly away from the product.

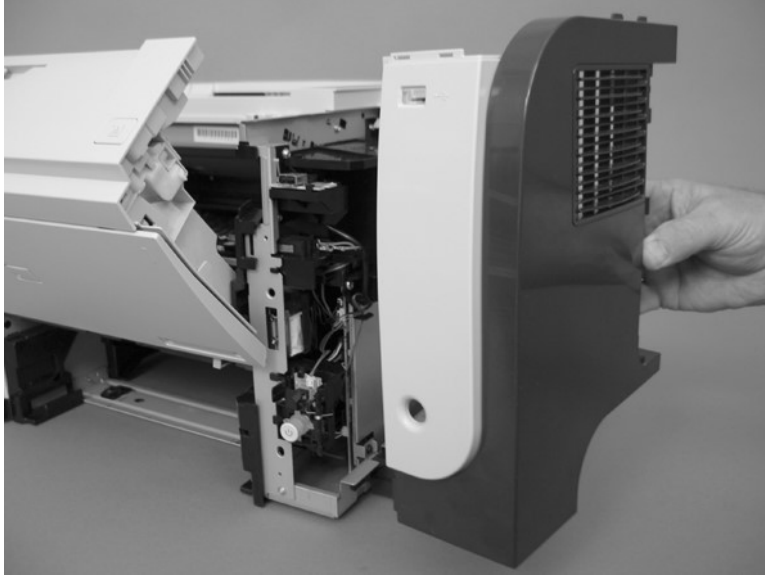
Figure 2-48 Remove the front-right and right-side cover assembly (3 of 6)



5. Remove the cover assembly.

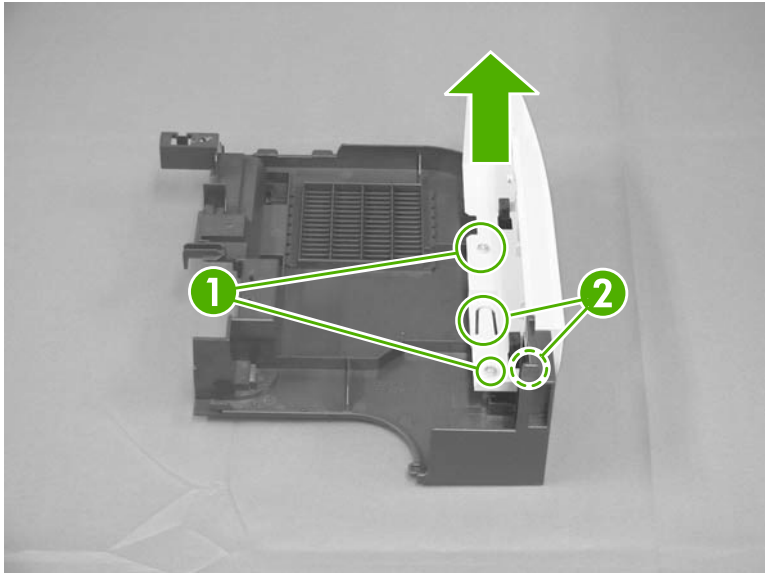
 **Reinstallation tip** The figures in this section show the cartridge-door assembly installed. However, it might be easier to reinstall the front-right and right-side cover assembly if the cartridge-door assembly is removed. See [Cartridge-door assembly on page 71](#).

Figure 2-49 Remove the front-right and right-side cover assembly (4 of 6)



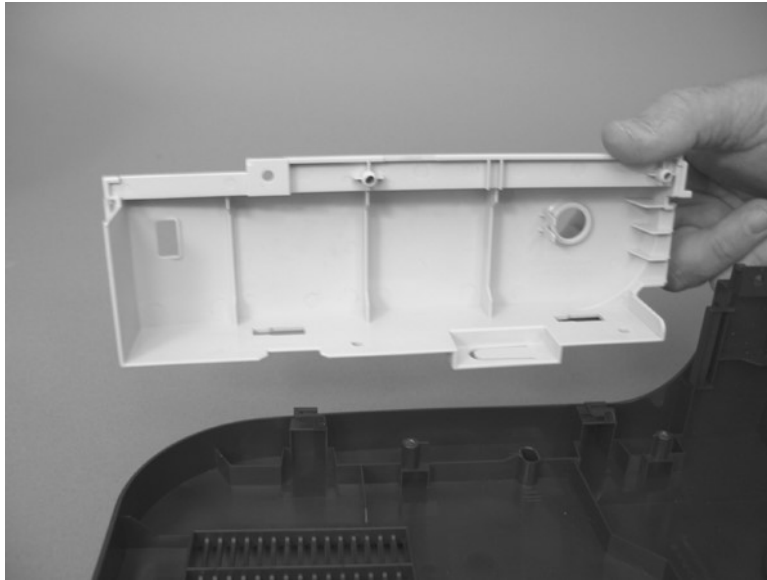
6. If necessary, remove two screws (callout 1), release two tabs (callout 2), and then slide the front-right cover toward the top of the right-side cover to release it.

Figure 2-50 Remove the front-right and right-side cover assembly (5 of 6)



7. If necessary, separate the front-right cover from the right-side cover.

Figure 2-51 Remove the front-right and right-side cover assembly (6 of 6)



Lower-right cover and bracket

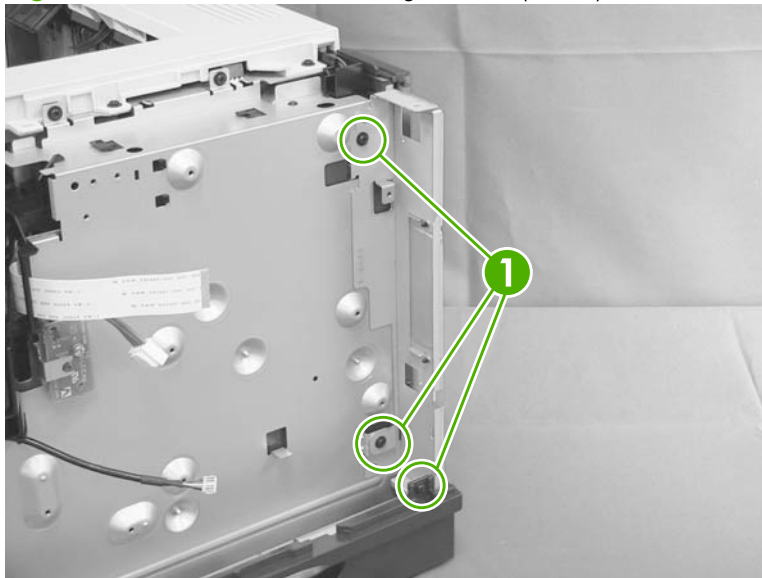
 **NOTE:** You do not need to remove the sheet-metal bracket to remove the lower-right cover. However, you must remove the bracket and the cover when removing some of the other product components in this chapter. Use this procedure to remove the cover only, or the cover and the bracket.

1. Before proceeding, remove the following components:
 - DIMM cover. See [DIMM cover and DIMM on page 57](#).
 - Formatter cover and Formatter PCA. See [Formatter cover and formatter PCA on page 60](#).
 - Top-right cover. See [Top-right cover on page 73](#).
 - Control panel. See [Control panel on page 74](#).
 - Front-right and right-side cover assembly. See [Front-right and right-side cover assembly on page 76](#).

2. **To remove the cover and the bracket:** Remove three screws (callout 1).

To remove the bracket only: Remove one screw (the bottom most screw in callout 1).

Figure 2-52 Remove the lower-right cover (1 of 4)

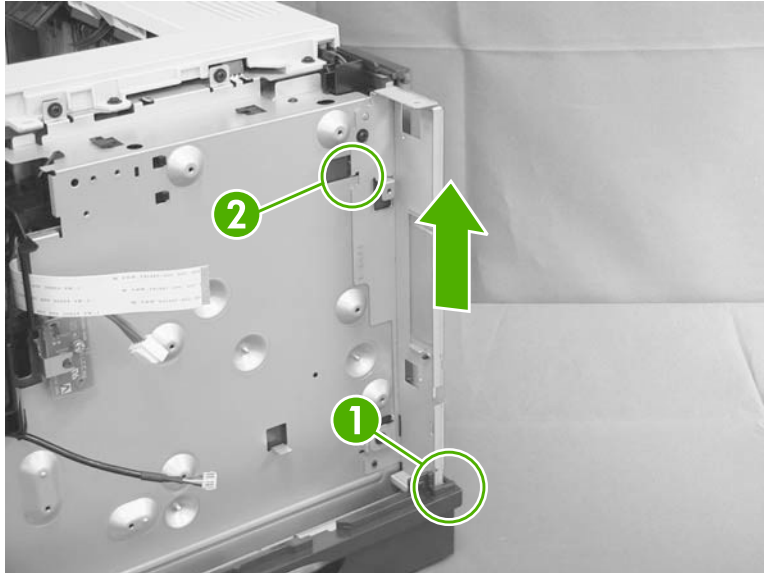


3. **To remove the bracket only::** Slide the sheet-metal bracket up to release it, and then remove the bracket.

 **NOTE:** You might need to slightly pull outward on the lower-right cover (callout 1) to release the sheet-metal bracket.

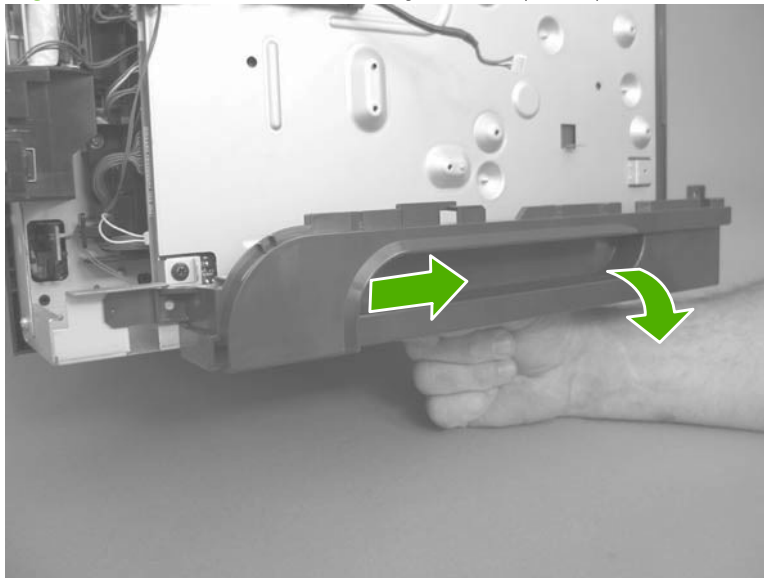
 **Reinstallation tip** When you reinstall the bracket, make sure that the tab (callout 2) is engaged in the slot in the chassis.

Figure 2-53 Remove the lower-right cover (2 of 4)



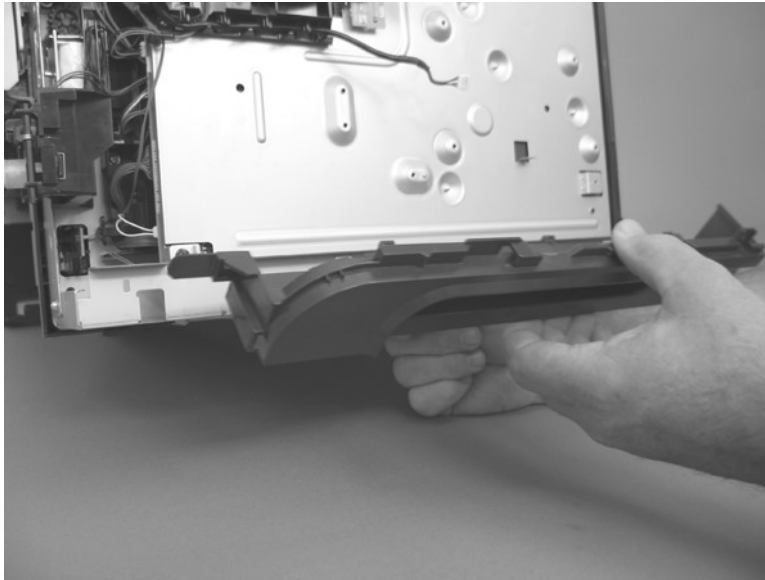
4. Raise the right side of the product, slide the lower-right cover toward the back of the product, and then rotate the cover away from the product.

Figure 2-54 Remove the lower-right cover (3 of 4)



5. Remove the lower-right cover.

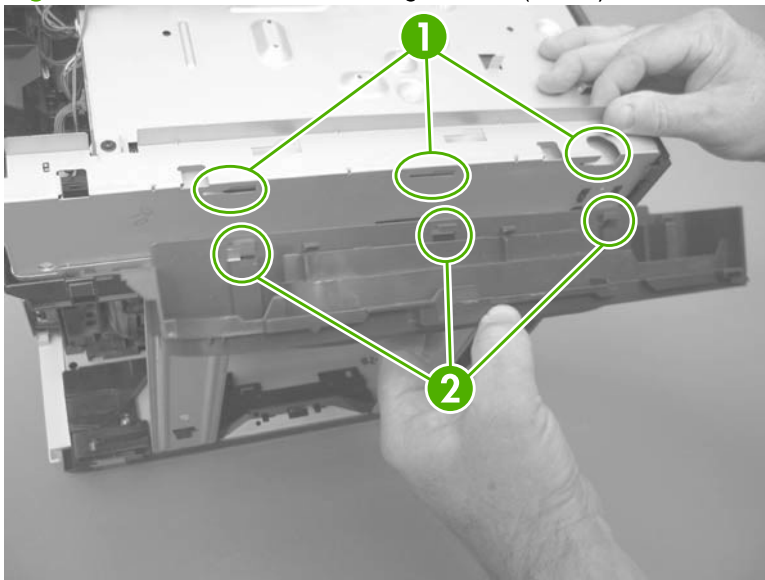
Figure 2-55 Remove the lower-right cover (4 of 4)



Reinstall the lower-right cover

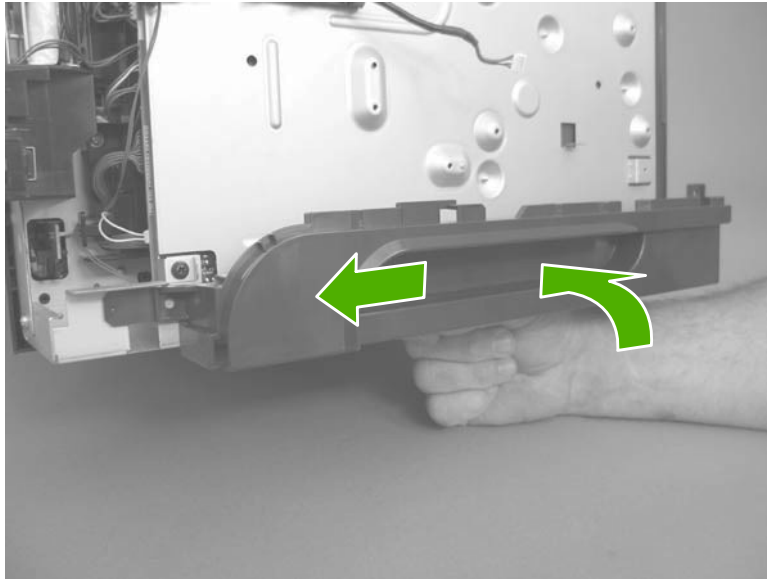
1. Carefully raise the right side of the product, find the three slots in the chassis (callout 1), and the three tabs (callout 2) along the bottom of the cover.

Figure 2-56 Reinstall the lower-right cover (1 of 2)



2. Rotate the cover up to engage the tabs with the slots, and then slide the cover toward the front of the product to install it.

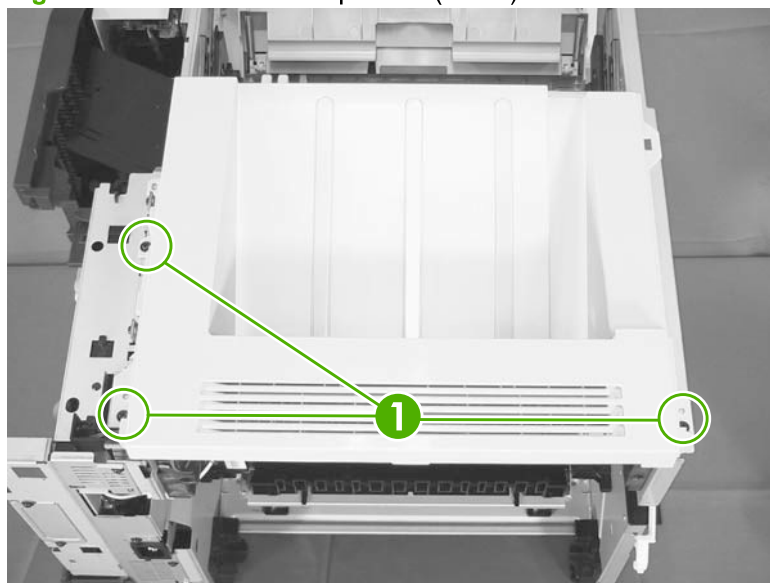
Figure 2-57 Remove the lower-right cover (2 of 2)



Top cover

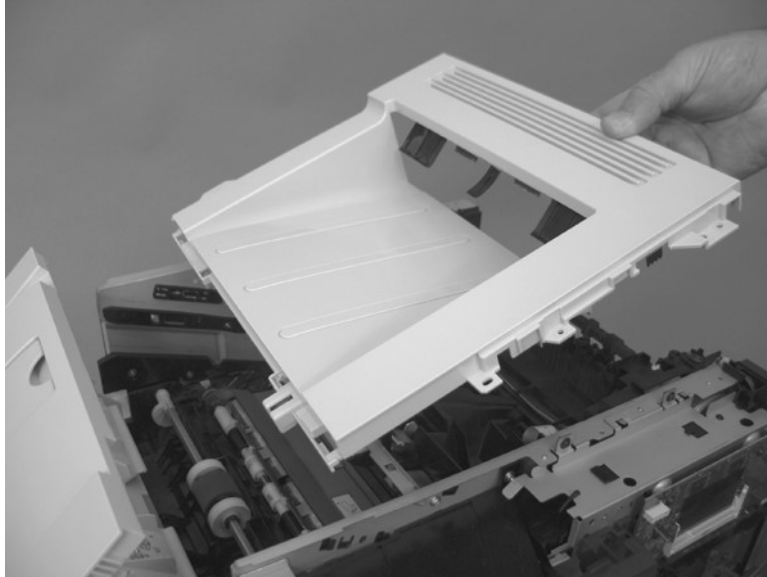
1. Before proceeding, remove the following components:
 - DIMM cover. See [DIMM cover and DIMM on page 57](#).
 - Formatter cover. See [Formatter cover and formatter PCA on page 60](#).
 - Rear-door assembly. See [Rear-door assembly on page 62](#).
 - Left cover. See [Left cover on page 66](#).
 - Top-right cover. See [Top-right cover on page 73](#).
 - Control panel. See [Control panel on page 74](#).
2. Remove three screws (callout 1).

Figure 2-58 Remove the top cover (1 of 2)



3. Slightly raise the rear of the cover, slide the cover toward the front of the product, and then remove it.

Figure 2-59 Remove the top cover (2 of 2)



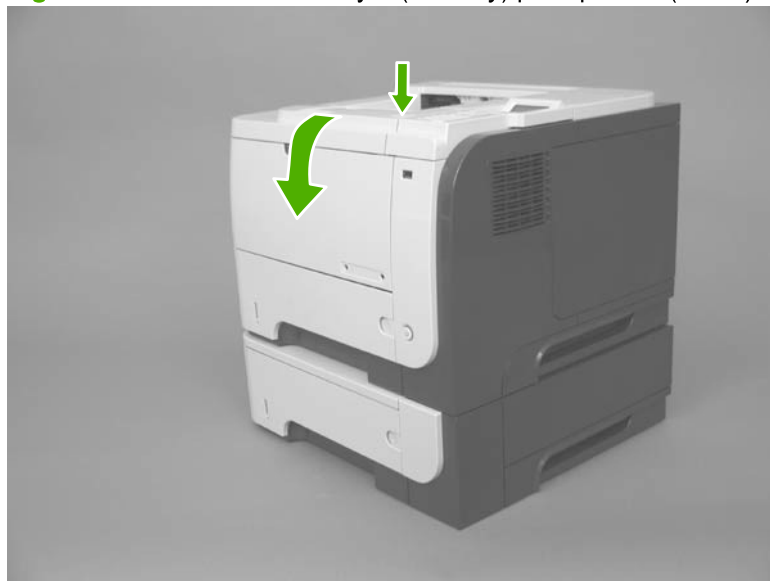
Main assemblies

Tray 1 (multipurpose tray) pickup roller

△ **CAUTION:** Do not touch the surface of the roller. Skin oils deposited on the roller might cause print-quality problems.

1. Press the cartridge-door release button, and then open the cartridge door. Make sure that the door is completely open.

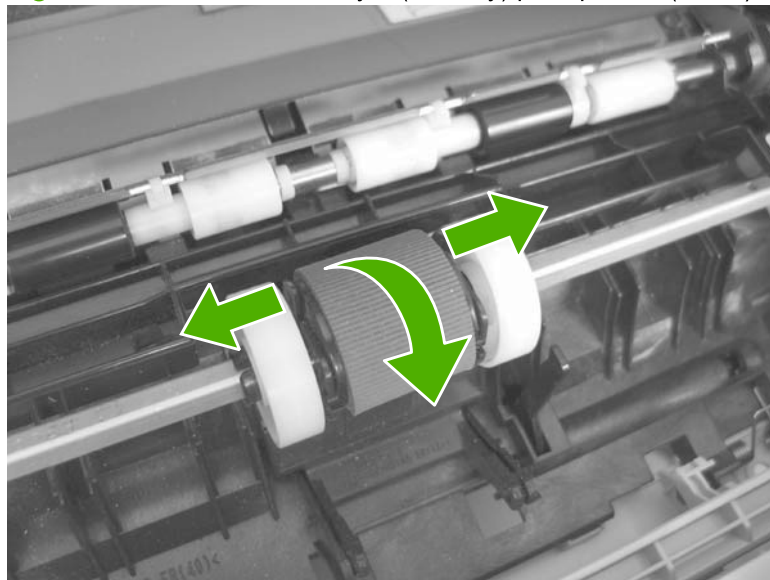
Figure 2-60 Remove the Tray 1 (MP tray) pickup roller (1 of 2)



2. Release two tabs, and then rotate the roller out and away from the product to remove it.

💡 **TIP:** It might be easier to release the tabs by using a small flat blade screwdriver.

Figure 2-61 Remove the Tray 1 (MP tray) pickup roller (2 of 2)



Tray 1 (multipurpose tray) separation pad

△ **CAUTION:** Do not touch the surface of the pad. Skin oils deposited on the roller might cause paper-handling problems.

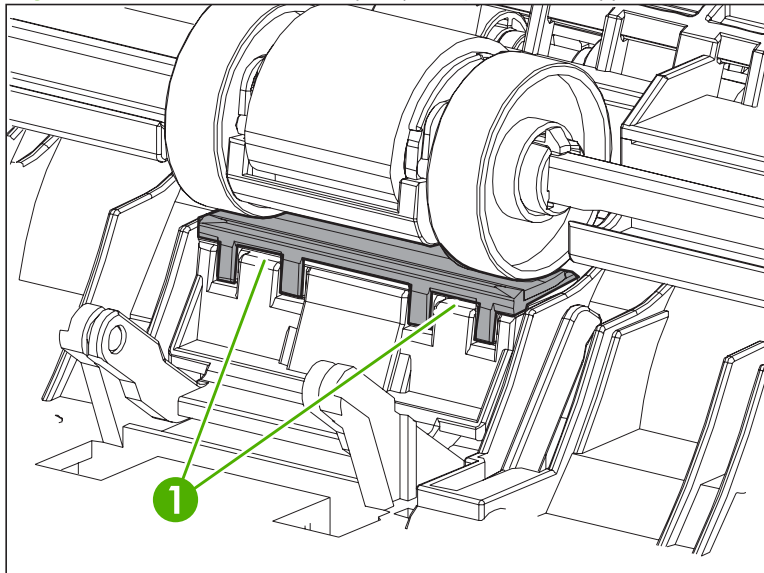
1. Press the cartridge-door release button, and then open the cartridge door. Make sure that the door is completely open.

Figure 2-62 Remove the Tray 1 (multipurpose tray) separation pad (1 of 2)



2. Release two tabs (callout 1), and then remove the separation pad.

Figure 2-63 Remove the Tray 1 (multipurpose tray) separation pad (2 of 2)



Tray 2, Tray 3, or Tray 4 pickup roller

△ **CAUTION:** Do not touch the surface of the roller. Skin oils deposited on the roller might cause print-quality problems.

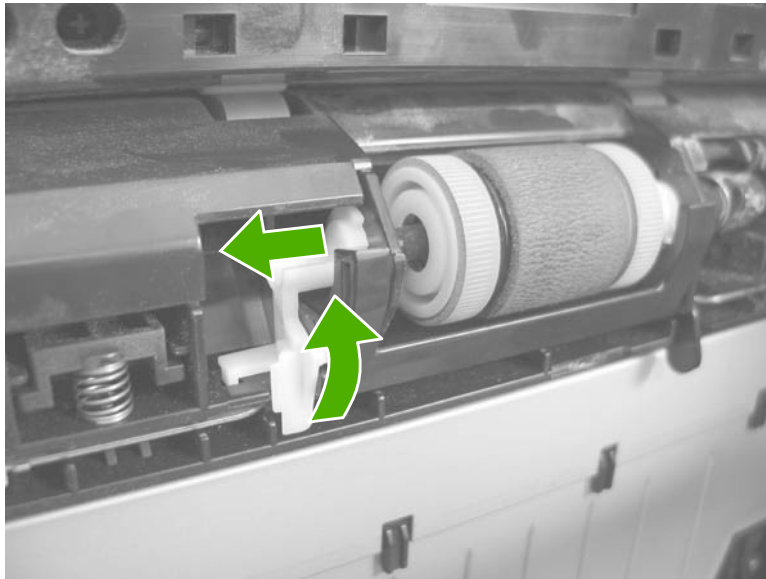
📝 **NOTE:** If you did not remove the Tray 2, Tray 3, or Tray 4 cassette before servicing the product, remove it now.

1. Carefully place the product front-side up, so that you can see into the opening where the cassette would be installed.

📝 **NOTE:** Debris can scratch or damage the back of the product. Before you place the product front-side up, remove any debris from the work surface. If possible, set the product on a clean, dry cloth to prevent scratching and damage.

2. Release the roller bushing, rotate the bushing up, and then slide the bushing off of the roller shaft.

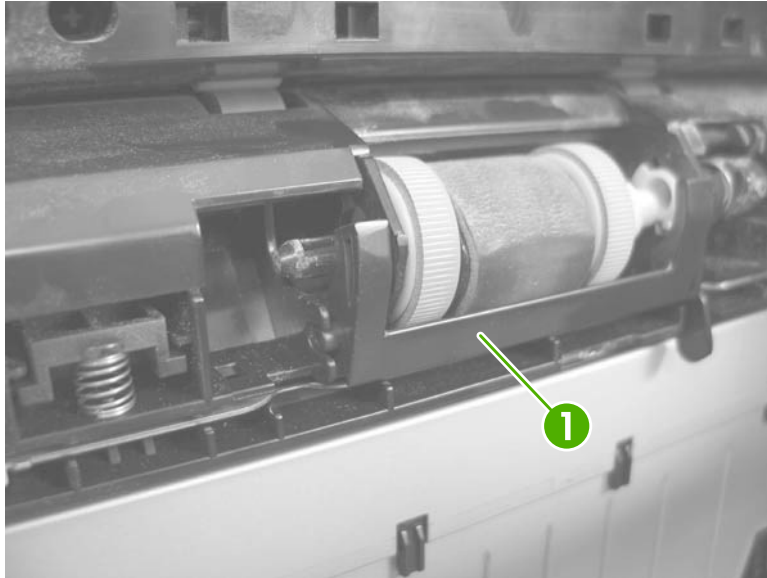
Figure 2-64 Remove the Tray 2, Tray 3, or Tray 4 pickup roller (1 of 3)



3. Carefully remove the black-plastic guard (callout 1).

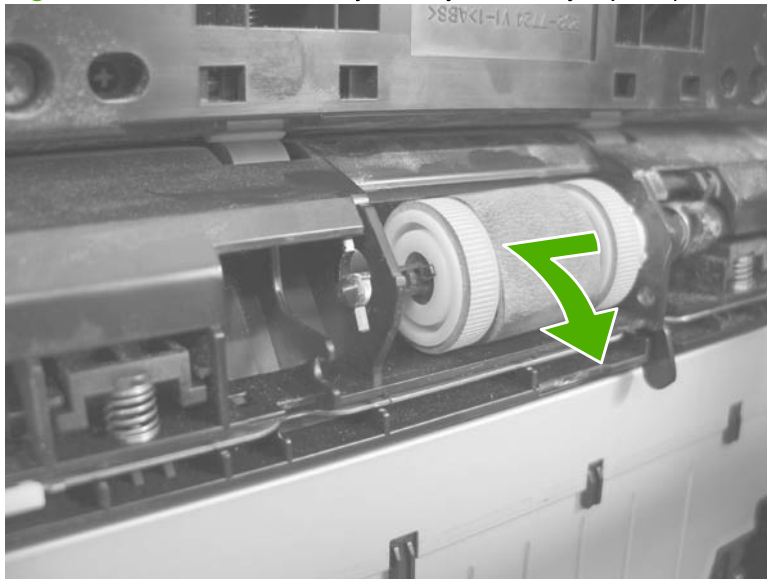
△ **CAUTION:** The guard is partially retained by the bushing removed in the previous step. Do not lose the guard when the bushing is removed.

Figure 2-65 Remove the Tray 2, Tray 3, or Tray 4 pickup roller (2 of 3)



4. Slide the roller toward the left side of the product, rotate the right end of the roller away from the product, and then remove the roller assembly.

Figure 2-66 Remove the Tray 2, Tray 3, or Tray 4 pickup roller (3 of 3)

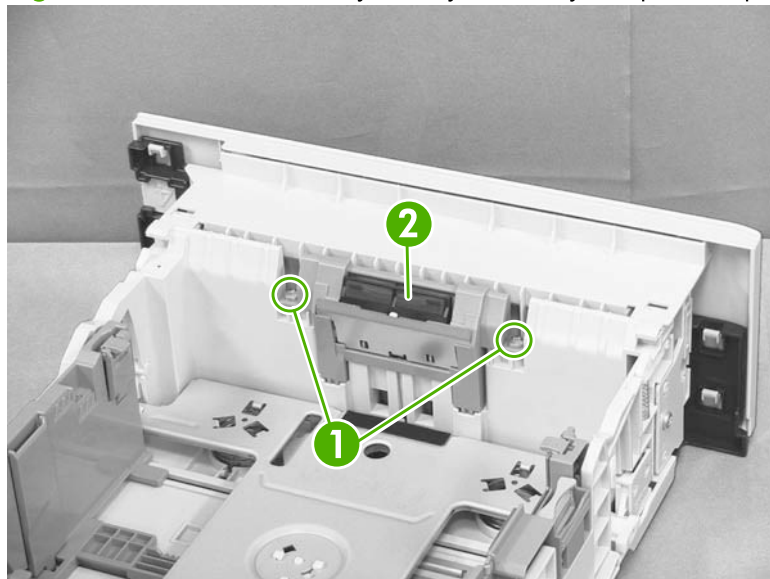


Tray 2, Tray 3, or Tray 4 separation pad

△ **CAUTION:** Do not touch the surface of the pad. Skin oils deposited on the roller might cause paper-handling problems.

1. Remove the tray cassette. See [Tray cassette \(Tray 2, Tray 3, or Tray 4\) on page 54](#).
2. Remove two screws (callout 1), and then remove the separation pad (callout 2).

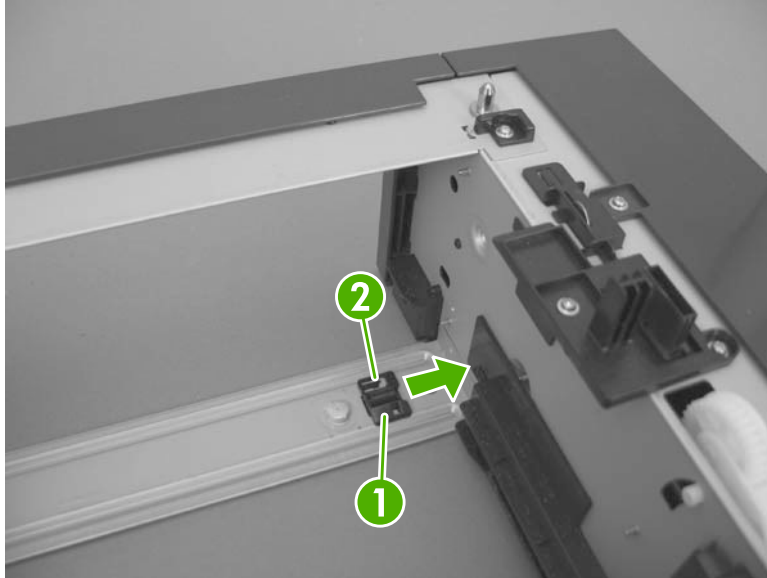
Figure 2-67 Remove the Tray 2, Tray 3, or Tray 4 separation pad



Tray 2, Tray 3, or Tray 4 base-plate roller assembly

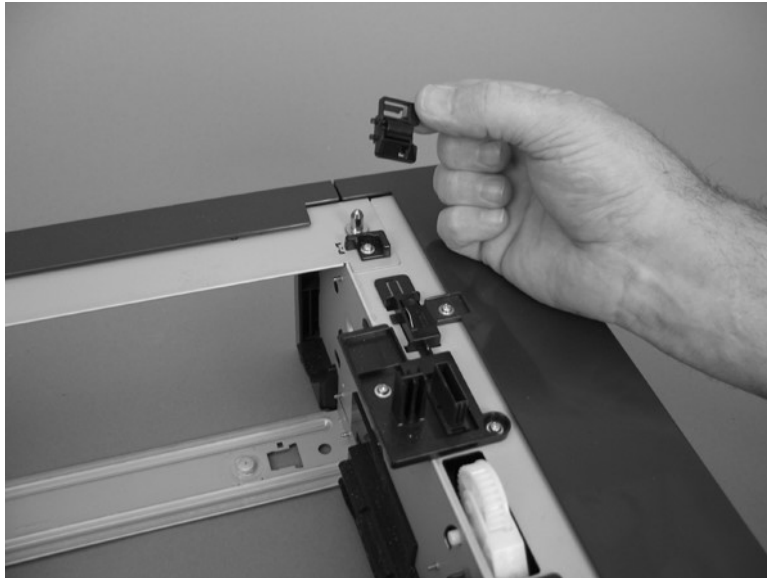
1. Remove the tray cassette. See [Tray cassette \(Tray 2, Tray 3, or Tray 4\) on page 54](#).
2. Locate the base roller assembly (callout 1), release one tab (callout 2), and then slide the assembly toward the outside of the product to release it.

Figure 2-68 Tray 2, Tray 3, or Tray 4 base plate roller assembly (1 of 2)



3. Remove the base roller assembly.

Figure 2-69 Tray 2, Tray 3, or Tray 4 base plate roller assembly (2 of 2)



Transfer roller

△ **CAUTION:** Do not touch the black-sponge portion of the transfer roller. Skin oils deposited on the transfer roller might cause print-quality problems.

1. Press the cartridge-door release button, and then open the cartridge door. Make sure that the door is completely open.

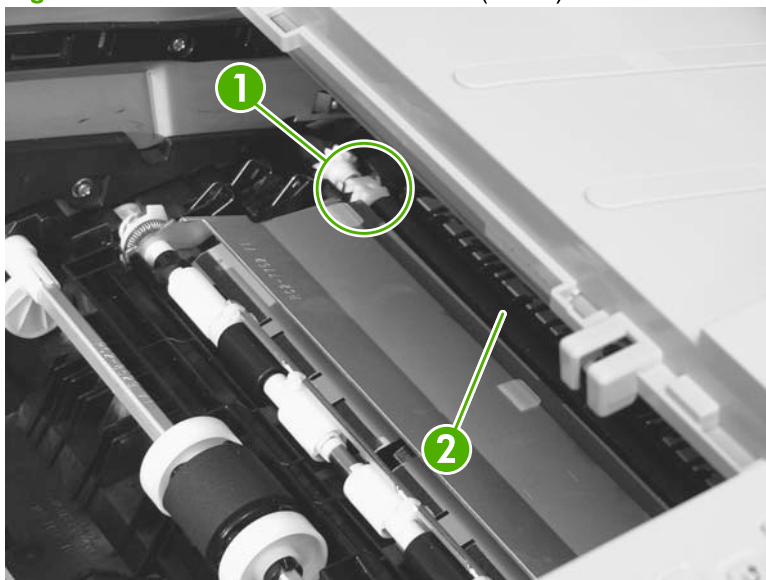
📝 **NOTE:** If you did not remove the print cartridge before servicing the product, remove it now.

Figure 2-70 Remove the transfer roller (1 of 3)



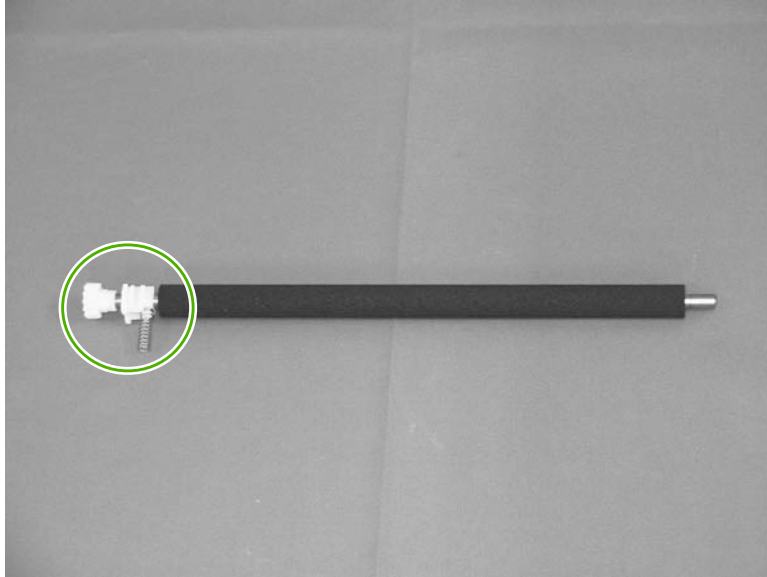
2. Release two tabs (callout 1) at the left end of the roller, slightly lift the end of the roller up, and then slide the roller (callout 2) toward the left to release it. Remove the roller.

Figure 2-71 Remove the transfer roller (2 of 3)



3. If necessary, remove the gear, the bushing, and the spring, and then install them on a replacement roller.

Figure 2-72 Remove the transfer roller (3 of 3)

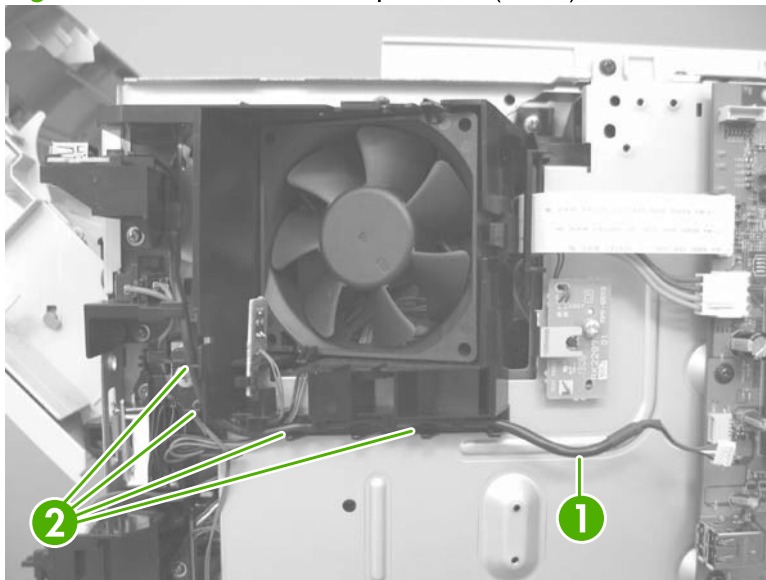


USB port PCA

 **WARNING!**  ESD sensitive component.

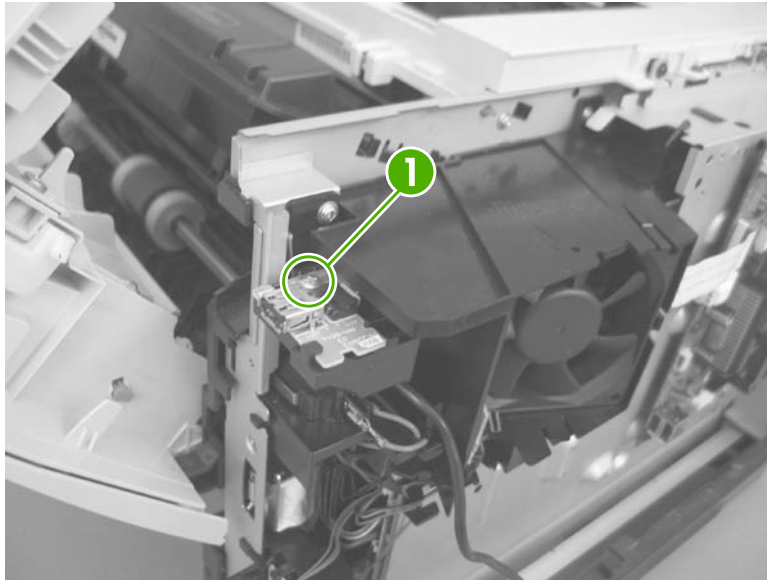
1. Before proceeding, remove the following components:
 - DIMM cover. See [DIMM cover and DIMM on page 57](#).
 - Formatter cover. See [Formatter cover and formatter PCA on page 60](#).
 - Top-right cover. See [Top-right cover on page 73](#).
 - Control panel. See [Control panel on page 74](#).
 - Front-right and right-side cover assembly. See [Front-right and right-side cover assembly on page 76](#).
2. Release the wire harness (callout 1) from the retainers (callout 2).

Figure 2-73 Remove the USB port PCA (1 of 3)



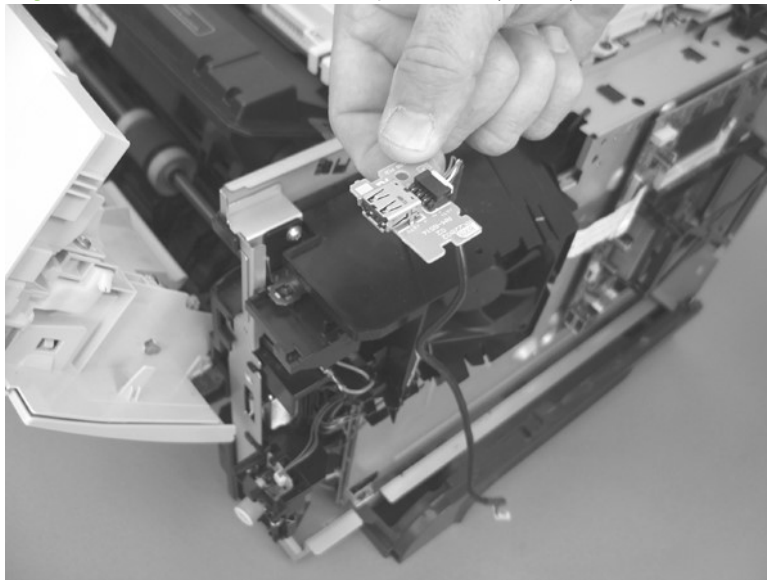
3. Remove one screw (callout 1).

Figure 2-74 Remove the USB port PCA (2 of 3)



4. Carefully remove the USB port PCA.

Figure 2-75 Remove the USB port PCA (3 of 3)

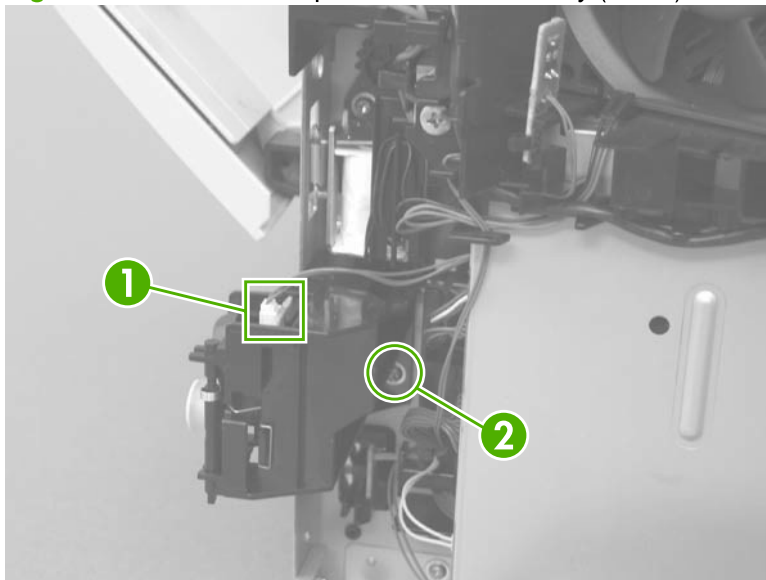


Power-switch assembly

⚠ **WARNING!**  ESD sensitive component.

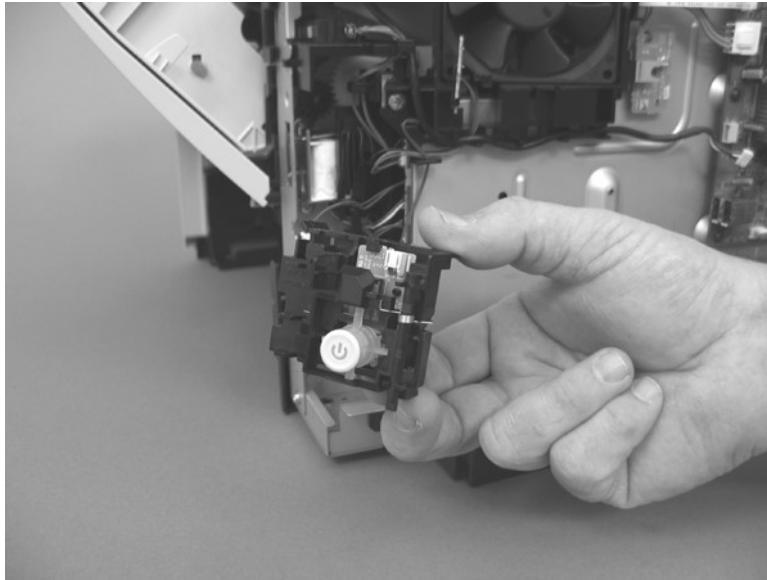
1. Before proceeding, remove the following components:
 - DIMM cover. See [DIMM cover and DIMM on page 57](#).
 - Formatter cover. See [Formatter cover and formatter PCA on page 60](#).
 - Top-right cover. See [Top-right cover on page 73](#).
 - Control panel. See [Control panel on page 74](#).
 - Front-right and right-side cover assembly. See [Front-right and right-side cover assembly on page 76](#).
2. Disconnect one connector (callout 1), and then remove one screw (callout 2).

Figure 2-76 Remove the power-switch assembly (1 of 2)



3. Remove the power-switch assembly.

Figure 2-77 Remove the power-switch assembly (2 of 2)



Main fan, fan duct, and environmental sensor

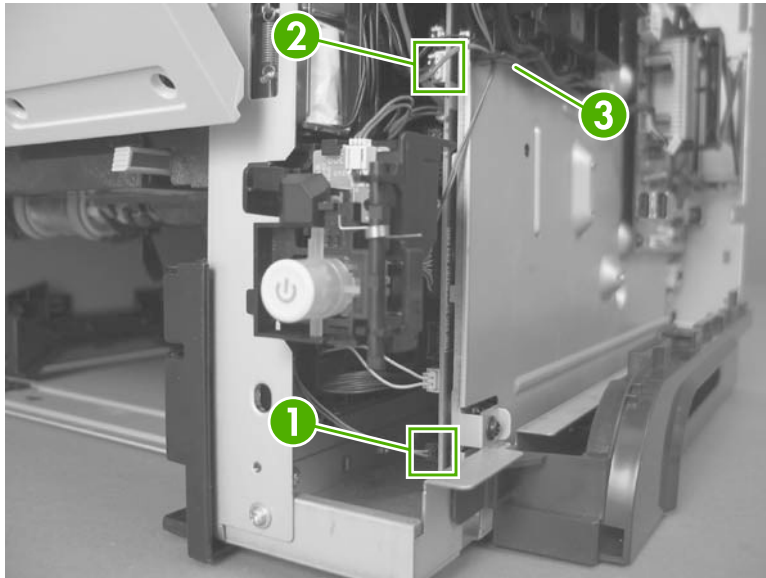
⚠ **WARNING!**  ESD sensitive component.

Use the steps in this procedure to remove only the environmental sensor, or the sensor and the main fan.

1. Before proceeding, remove the following components:
 - DIMM cover. See [DIMM cover and DIMM on page 57](#).
 - Formatter cover. See [Formatter cover and formatter PCA on page 60](#).
 - Top-right cover. See [Top-right cover on page 73](#).
 - Control panel. See [Control panel on page 74](#).
 - Front-right and right-side cover assembly. See [Front-right and right-side cover assembly on page 76](#).
2. **To remove the main fan, fan duct, and the environmental sensor:** Disconnect two connectors (callout 1 and callout 2), and then release the wire harnesses from the retainers (callout 3).

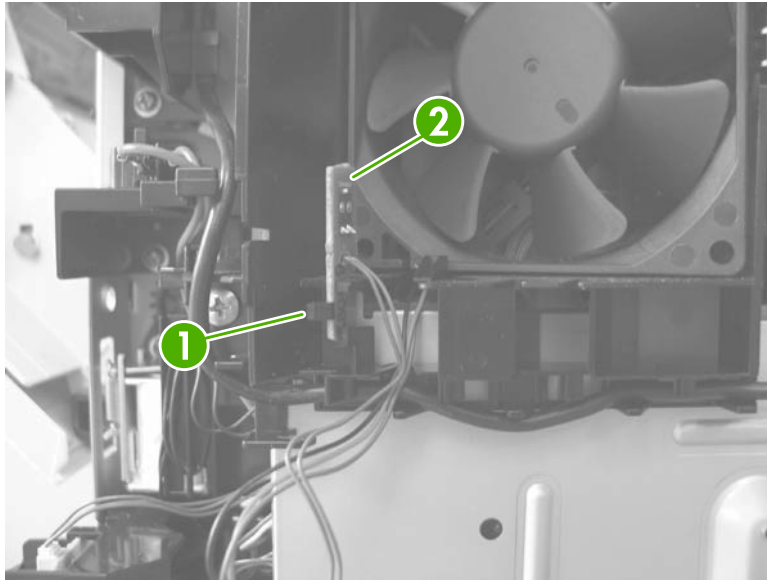
To remove the environmental sensor only: Disconnect one connector (callout 1) and release the wire harness from the retainers (callout 3).

Figure 2-78 Remove the main fan, fan duct, and the environmental sensor PCA (1 of 3)



3. Release one tab (callout 1), and then remove the environmental sensor (callout 2).

Figure 2-79 Remove the main fan, fan duct, and the environmental sensor PCA (2 of 3)

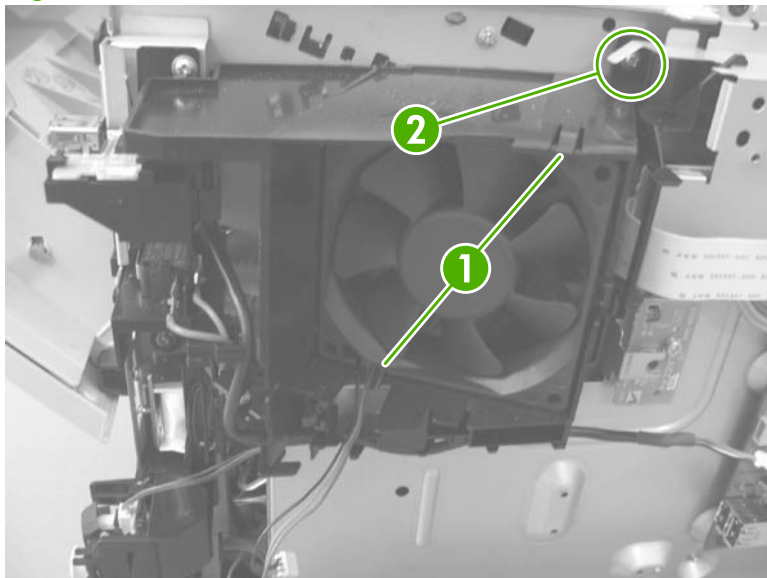


4. **To remove the main fan only:** Release two tabs (callout 1), and then remove the main fan.

To remove the main fan and fan duct: Remove one screw (callout 2), and then remove the main fan and fan duct together.

 **Reinstallation tip** **If only the main fan was removed:** When the fan is reinstalled, the air must flow into the product. Make sure that the label side of the fan is toward the inside of the product when the fan is reinstalled.

Figure 2-80 Remove the main fan, fan duct, and the environmental sensor PCA (3 of 3)

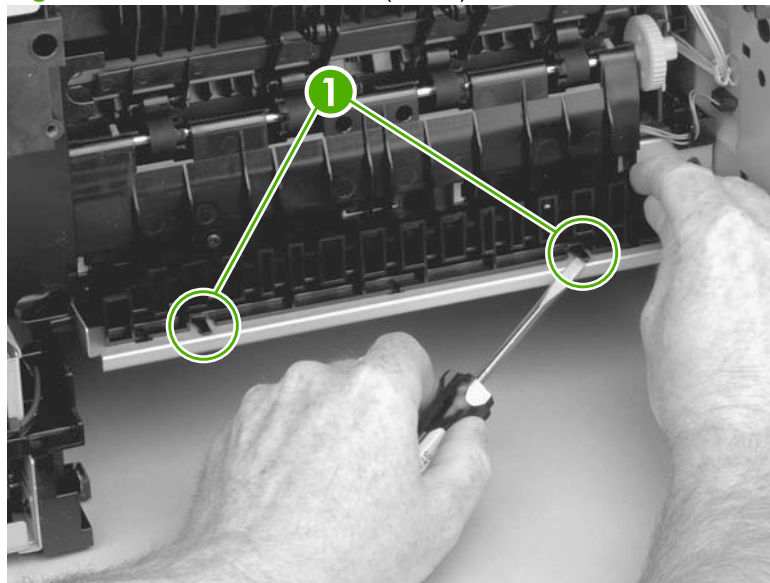


Fuser

1. Before proceeding, remove the following components:
 - Rear-door assembly. See [Rear-door assembly on page 62](#).
 - Right-rear cover. See [Right-rear cover on page 68](#).
2. **Duplex models only:** Release two tabs (callout 1) on the duplex media-feed guide, and then slide the guide toward the back of the product to remove it.

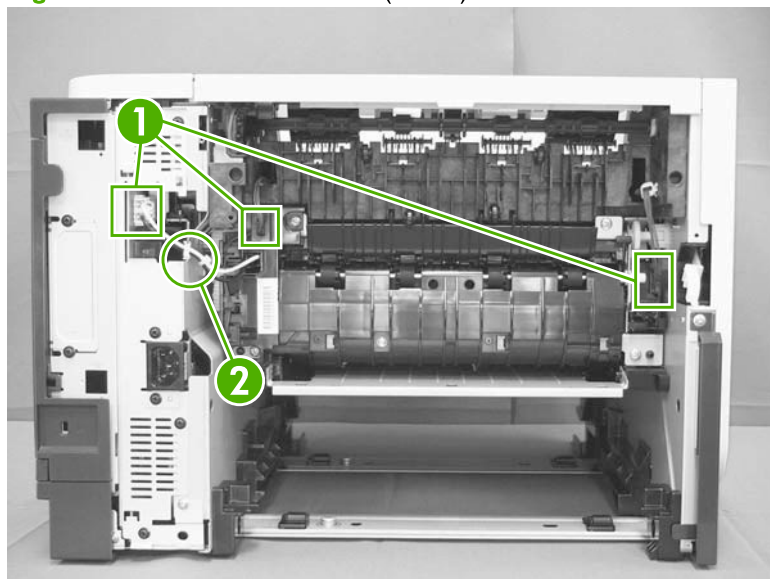
 **Reinstallation tip** Make sure that both tabs snap back into place when reinstalling the duplex media-feed guide.

Figure 2-81 Remove the fuser (1 of 4)



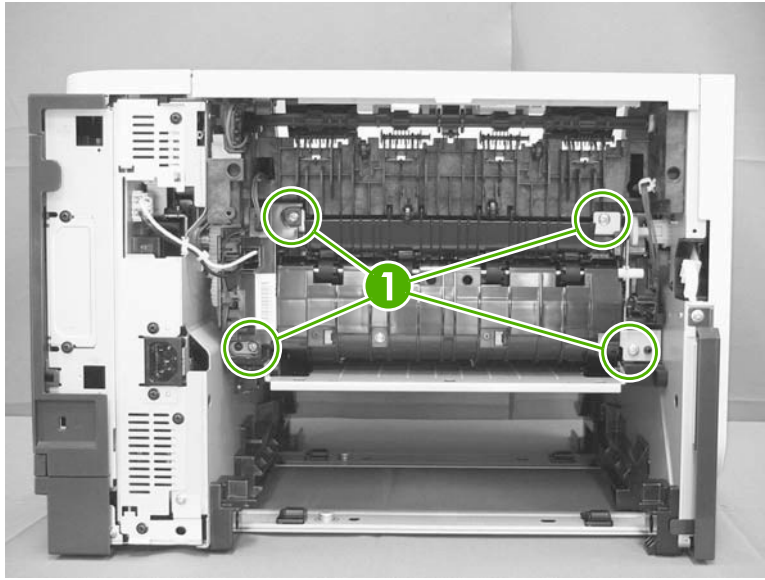
3. Disconnect three connectors (callout 1), and release one wire harness from the retainer (callout 2).

Figure 2-82 Remove the fuser (2 of 4)



4. Remove four screws (callout 1).

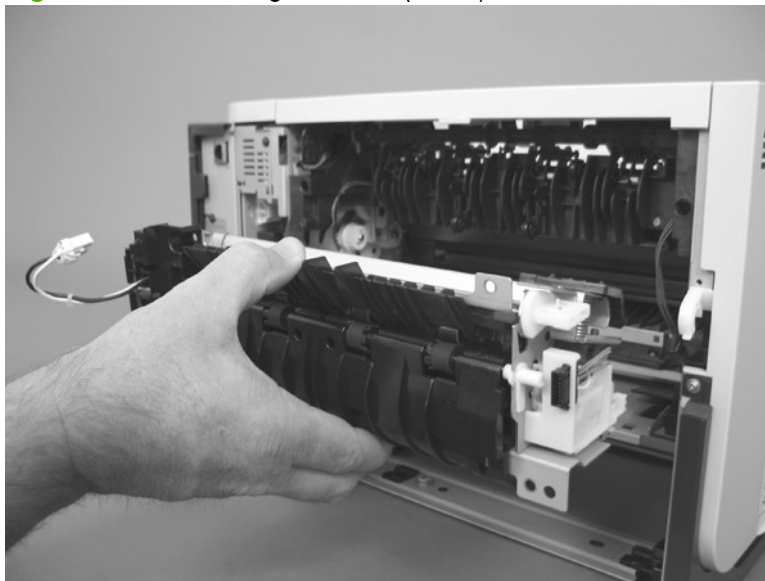
Figure 2-83 Removing the fuser (3 of 4)



5. Pull the fuser out of the back of the product.

△ **CAUTION:** To avoid damaging the fuser, the cartridge-door assembly must be closed before you remove the fuser.

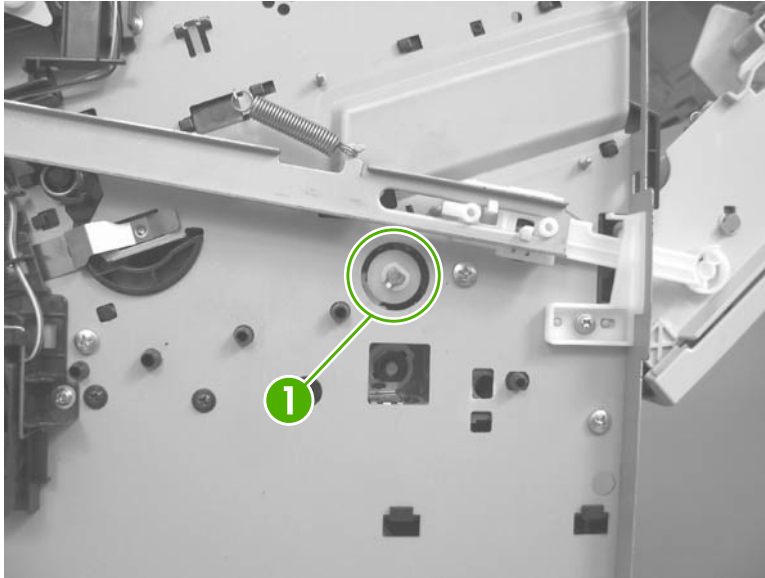
Figure 2-84 Removing the fuser (4 of 4)



Registration assembly

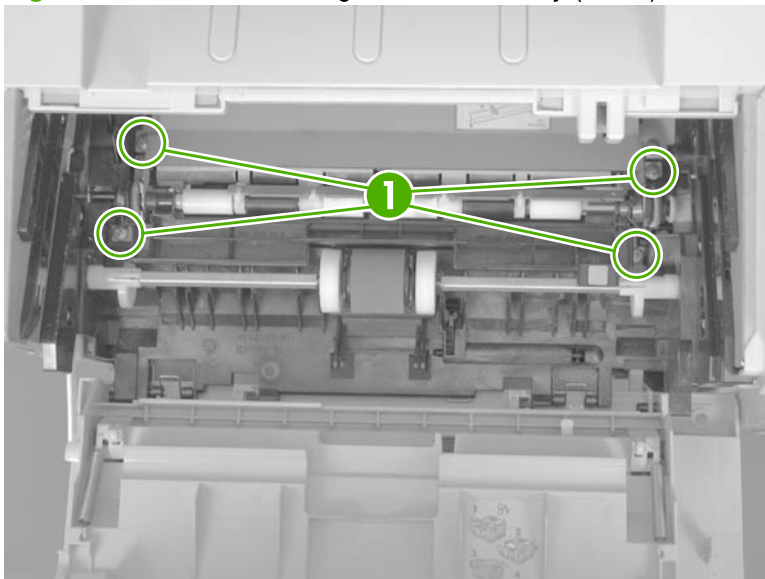
1. Before proceeding, remove the following components:
 - Rear-door assembly. See [Rear-door assembly on page 62](#).
 - Left cover. See [Left cover on page 66](#).
2. Unhook the clasp on the registration assembly gear (callout 1), and then slide the gear off of the shaft.

Figure 2-85 Remove the registration assembly (1 of 3)



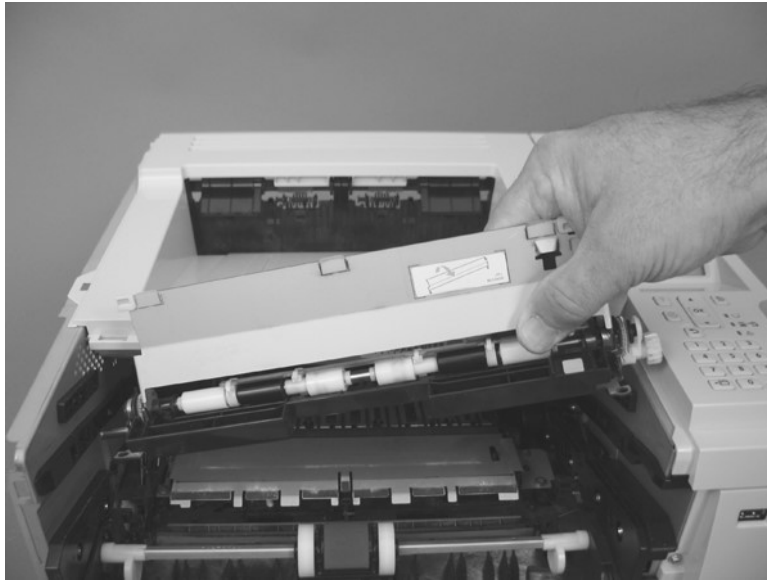
3. Open the cartridge door, and then remove four screws (callout 1).

Figure 2-86 Remove the registration assembly (2 of 3)



4. Lift the registration assembly out of the product, gear-end first.

Figure 2-87 Removing the registration assembly (3 of 3)



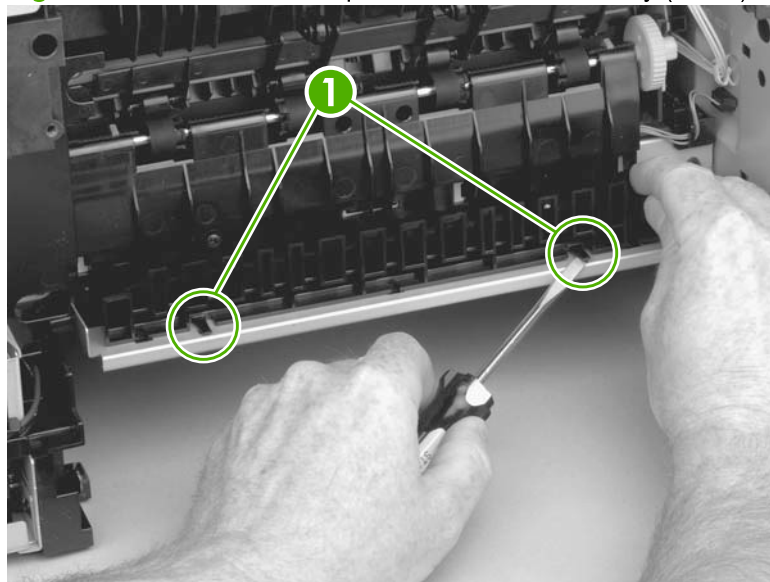
Duplex media-feed assembly

Duplex models only.

1. Before proceeding, remove the following components:
 - Rear-door assembly. See [Rear-door assembly on page 62](#).
 - Right-rear cover. See [Right-rear cover on page 68](#).
2. Release two tabs (callout 1) on the duplex media-feed guide, and then slide the guide toward the back of the product to remove it.

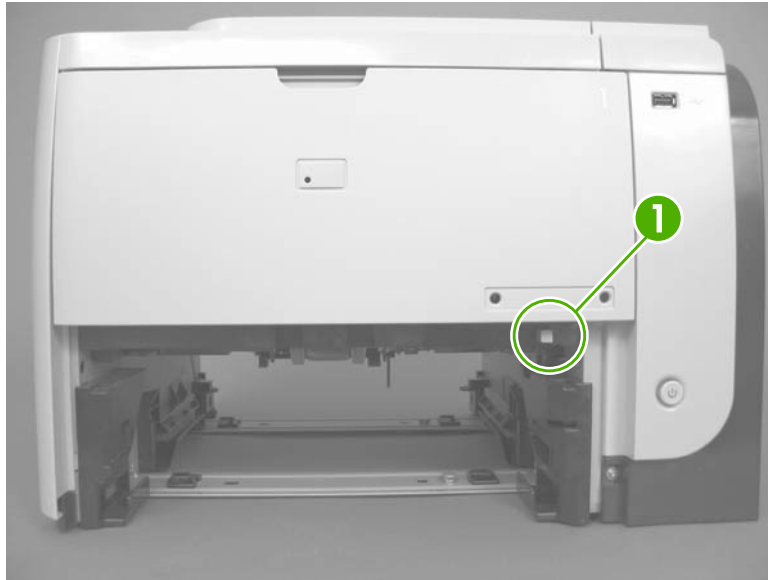
 **Reinstallation tip** Make sure that both tabs snap back into place when reinstalling the duplex media-feed guide.

Figure 2-88 Remove the duplex media-feed assembly (1 of 5)



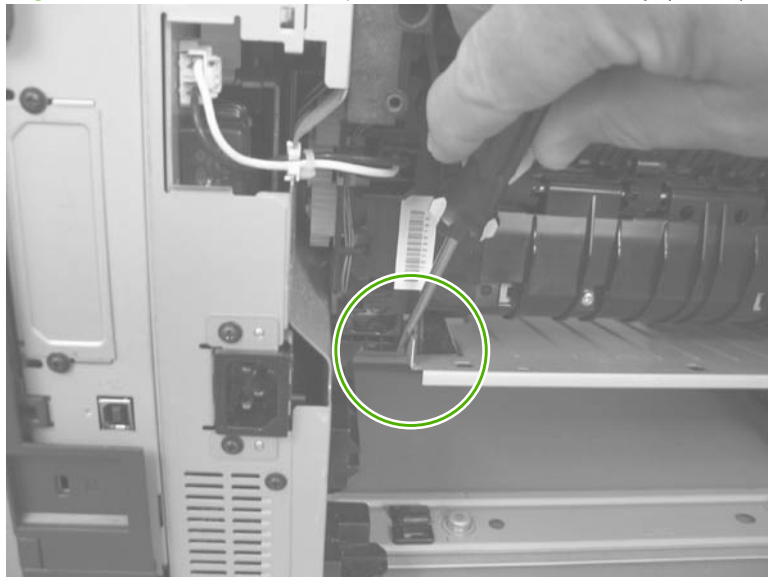
3. Press the green lever (callout 1) to release the duplex media-feed assembly.

Figure 2-89 Remove the duplex media-feed assembly (2 of 5)



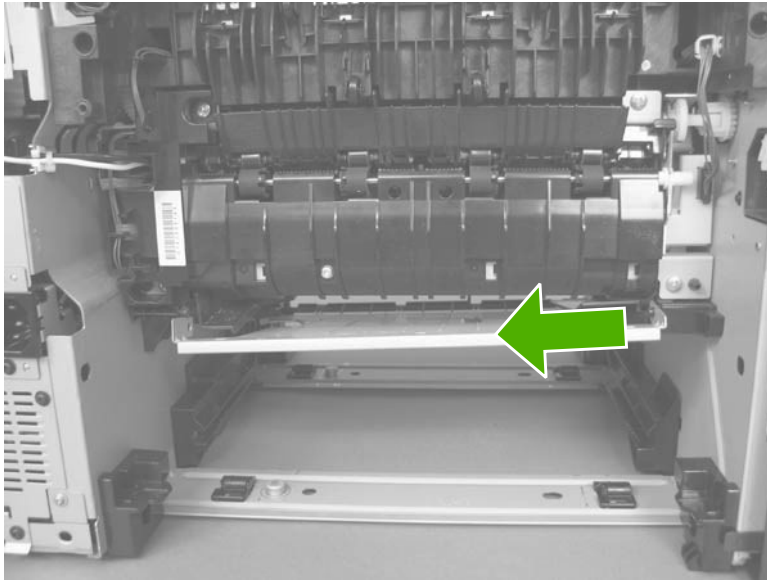
4. Use a small flat blade screwdriver to carefully pry the sheet-metal tab on the assembly away from the hinge pin to release it.

Figure 2-90 Remove the duplex media-feed assembly (3 of 5)



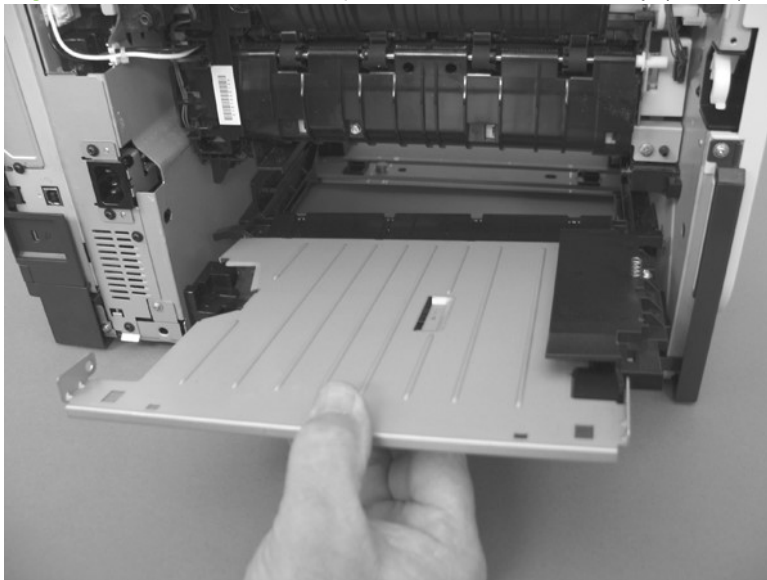
5. Slide the assembly away from the other hinge pin to release it.

Figure 2-91 Remove the duplex media-feed assembly (4 of 5)



6. Pull the duplex media-feed assembly out of the back of the product.

Figure 2-92 Remove the duplex media-feed assembly (5 of 5)

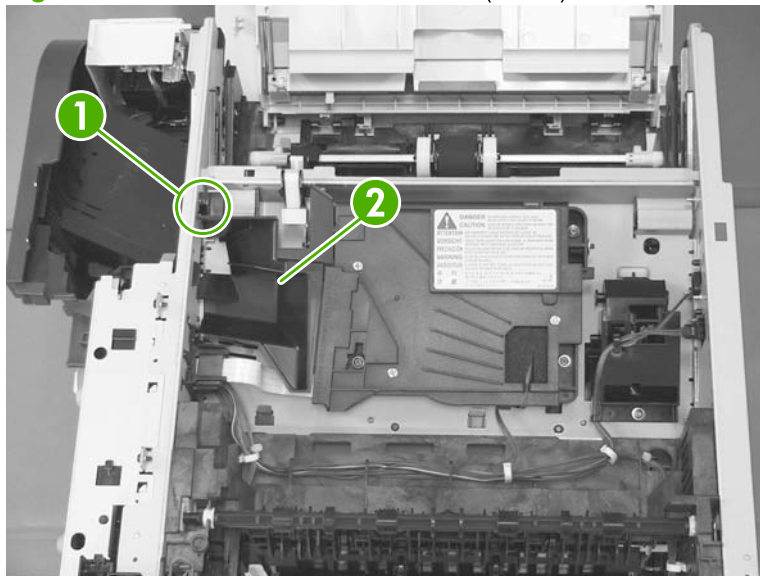


Laser/scanner

 **WARNING!**  ESD sensitive component.

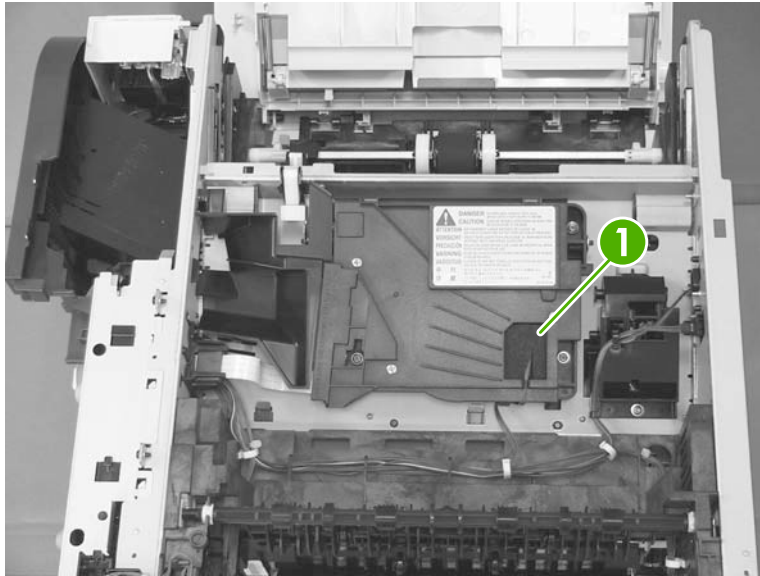
1. Before proceeding, remove the following components:
 - DIMM cover. See [DIMM cover and DIMM on page 57](#).
 - Formatter cover. See [Formatter cover and formatter PCA on page 60](#).
 - Rear-door assembly. See [Rear-door assembly on page 62](#).
 - Left cover. See [Left cover on page 66](#).
 - Top-right cover. See [Top-right cover on page 73](#).
 - Control panel. See [Control panel on page 74](#).
 - Top cover. See [Top cover on page 84](#).
2. Release one tab (callout 1) on the air duct, and then lift the air duct (callout 2) out of the product.

Figure 2-93 Remove the laser/scanner (1 of 5)



3. Remove the antistatic sponge (callout 1).

Figure 2-94 Remove the laser/scanner (2 of 5)



4. Disconnect one connector (callout 1) and one FFC (callout 2).

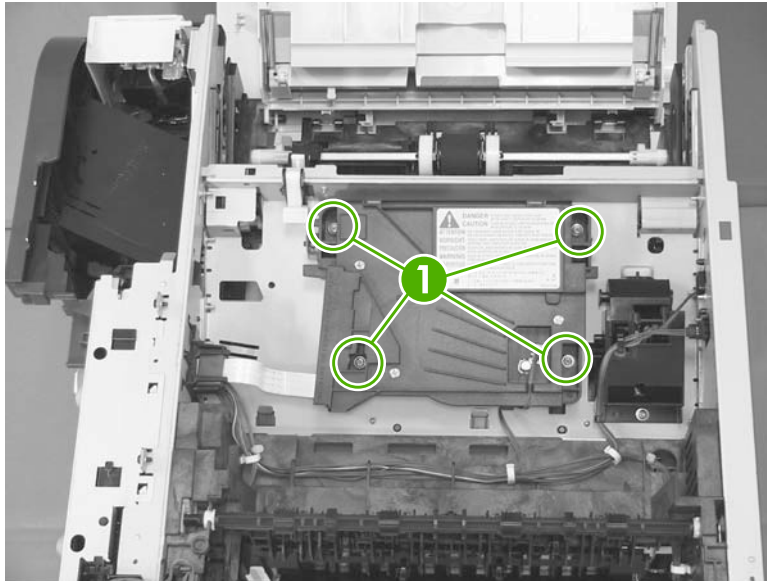
 **Reinstallation tip** Make sure that you correctly reconnect the FFC when the laser/scanner is installed. If the FFC is not correctly reconnected, a **51.1 ERROR** will appear on the control-panel display.

Figure 2-95 Remove the laser/scanner (3 of 5)



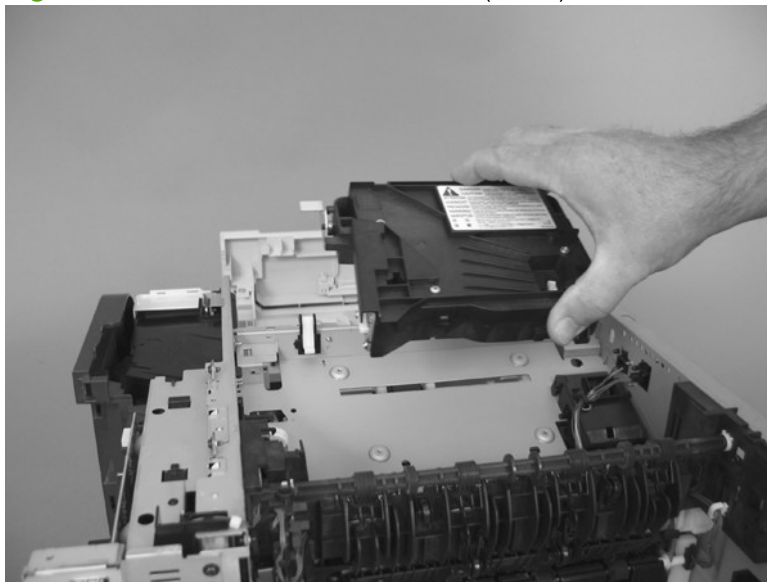
5. Remove four screws (callout 1).

Figure 2-96 Remove the laser/scanner (4 of 5)



6. Lift the laser/scanner up and out of the product.

Figure 2-97 Remove the laser/scanner (5 of 5)



Engine control unit (ECU)

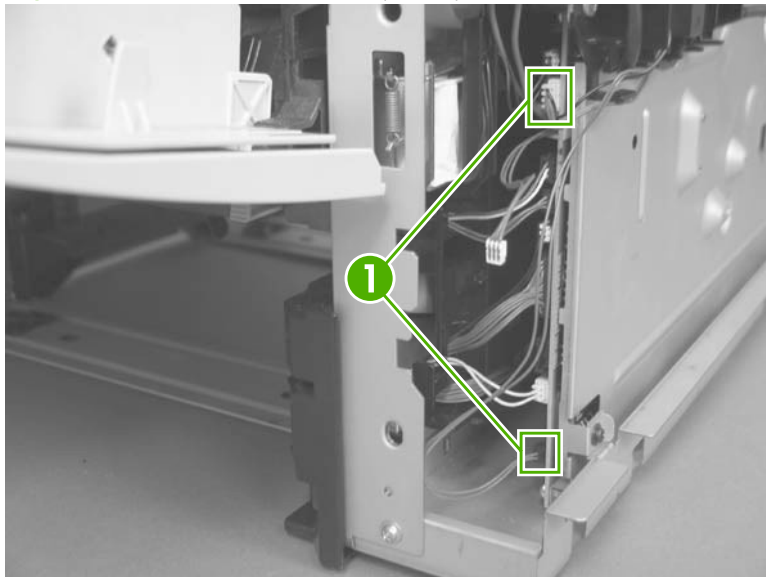
 **WARNING!**  ESD sensitive component.

1. Before proceeding, remove the following components:
 - DIMM cover. See [DIMM cover and DIMM on page 57](#).
 - Formatter cover and formatter PCA. See [Formatter cover and formatter PCA on page 60](#).
 - Rear-door assembly. See [Rear-door assembly on page 62](#).
 - Left cover. See [Left cover on page 66](#).
 - Top-right cover. See [Top-right cover on page 73](#).
 - Control panel. See [Control panel on page 74](#).
 - Front-right and right-side cover assembly. See [Front-right and right-side cover assembly on page 76](#).
 - Lower-right cover and bracket. See [Lower-right cover and bracket on page 80](#).
 - Top cover. See [Top cover on page 84](#).
 - Power switch assembly. See [Power-switch assembly on page 96](#).

 **TIP:** Removing the power-switch assembly makes it easier to disconnect the connectors at the front of the ECU.

2. Disconnect two connectors (callout 1).

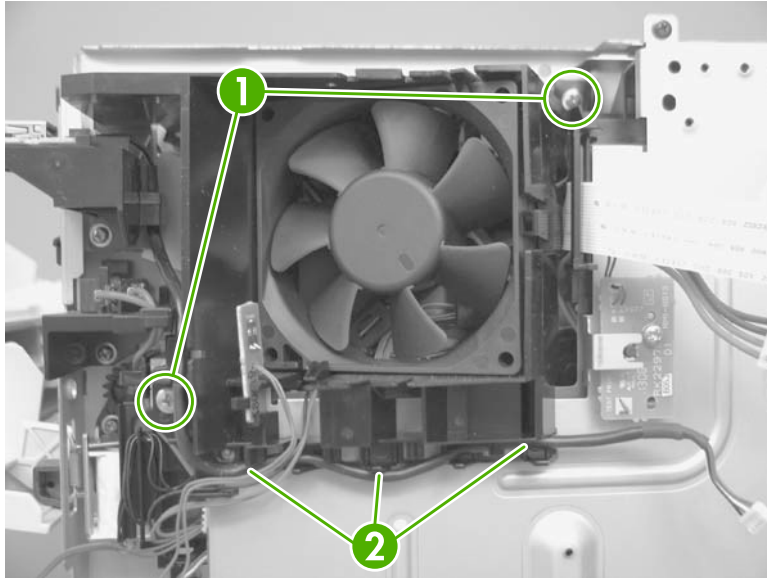
Figure 2-98 Remove the ECU (1 of 9)



3. Remove two screws (callout 1), and then remove the fan assembly.

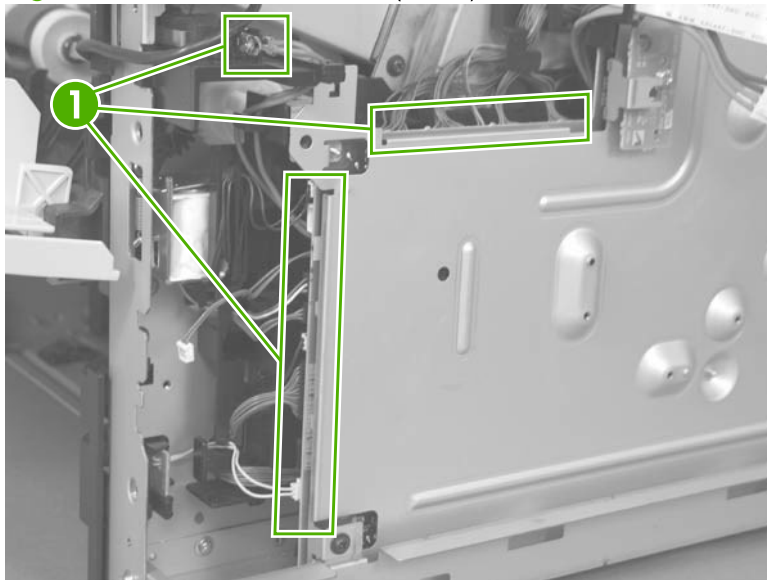
 **NOTE:** As you remove the fan assembly, release the USB wire harness from the retainers along the bottom of the assembly (callout 2).

Figure 2-99 Removing the ECU (2 of 9)



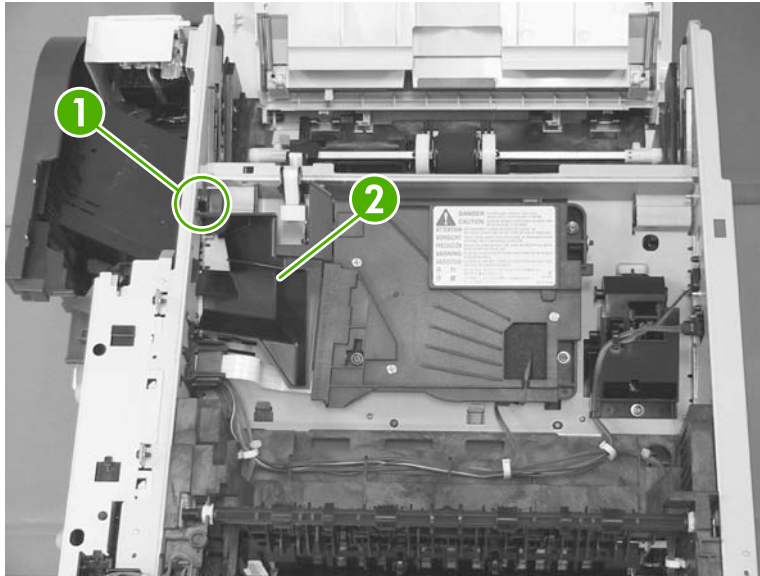
4. Disconnect 12 connectors (callout 1).

Figure 2-100 Remove the ECU (3 of 9)



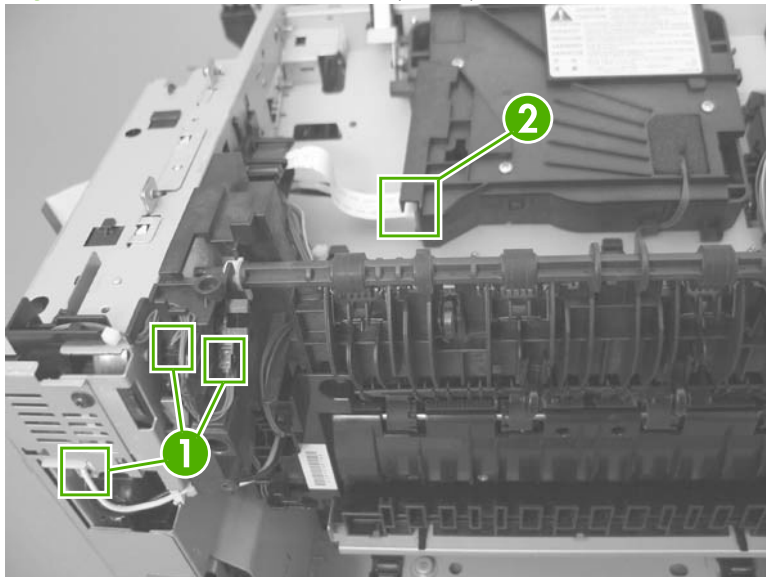
5. Release one tab (callout 1) on the air duct, and then lift the air duct out of the product.

Figure 2-101 Remove the ECU (4 of 9)



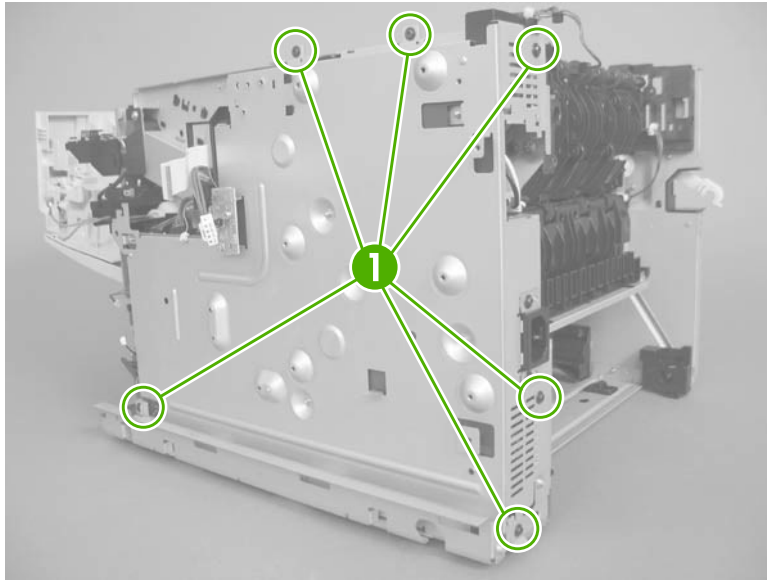
6. Disconnect three connectors (callout 1), one FFC (callout 2), and then release the wire harnesses from the retainers.

Figure 2-102 Remove the ECU (5 of 9)



7. Remove six screws (callout 1).

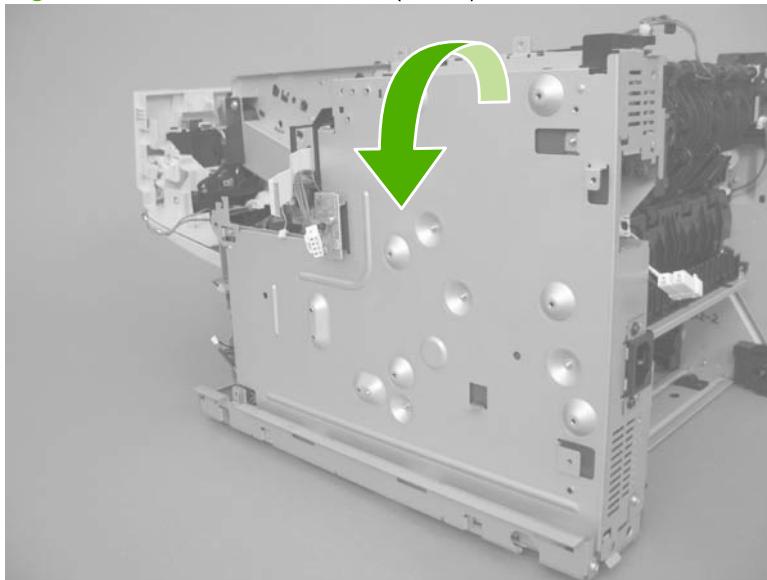
Figure 2-103 Remove the ECU (6 of 9)



8. Slight lift the ECU up, and then rotate the top of the ECU pan away from the product.

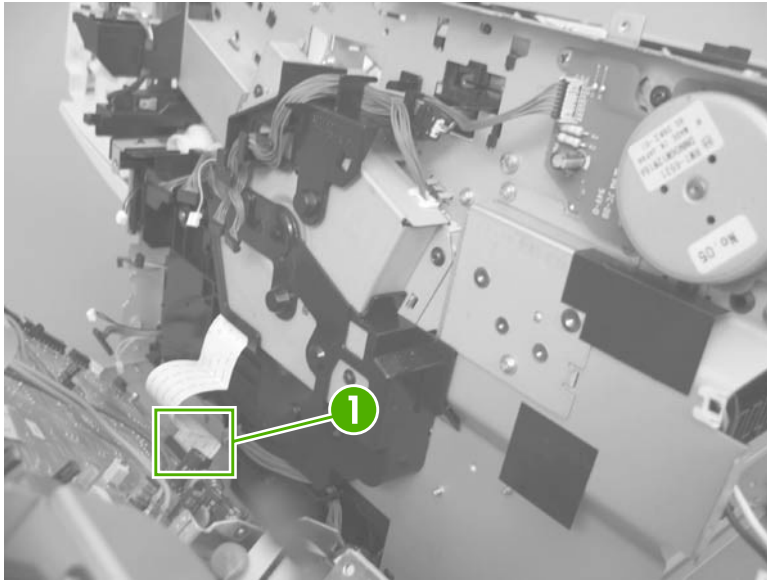
△ **CAUTION:** The ECU is still attached to the product by a FFC. Do not try to completely remove the ECU.

Figure 2-104 Remove the ECU (7 of 9)



9. Disconnect one FFC (callout 1).

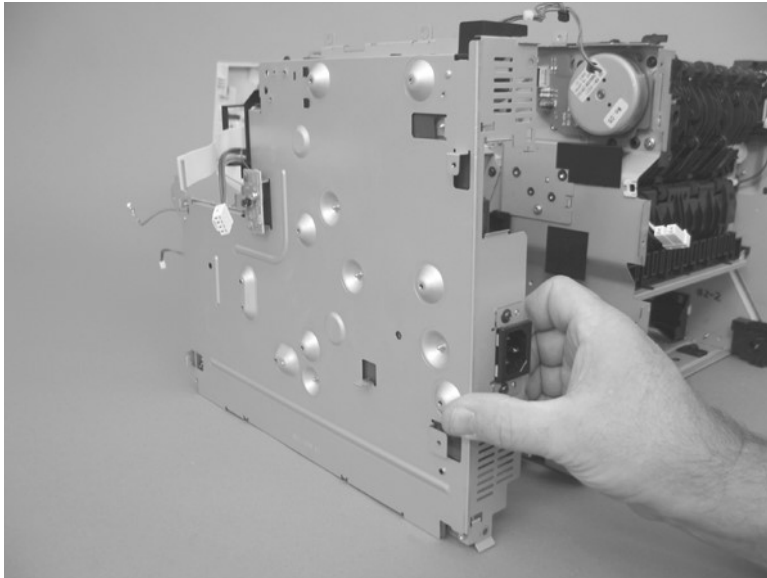
Figure 2-105 Remove the ECU (8 of 9)



10. Remove the ECU.

 **NOTE:** The ECU and the ECU pan together are a single field-replaceable unit (FRU). You do not have to separate the ECU and the ECU pan.

Figure 2-106 Remove the ECU (9 of 9)



Cassette pickup (Tray 2) solenoid or Tray 1 (multipurpose tray) pickup solenoid

1. Before proceeding, remove the following components:

- DIMM cover. See [DIMM cover and DIMM on page 57](#).
- Formatter cover and formatter PCA. See [Formatter cover and formatter PCA on page 60](#).
- Rear-door assembly. See [Rear-door assembly on page 62](#).
- Left cover. See [Left cover on page 66](#).
- Top-right cover. See [Top-right cover on page 73](#).
- Control panel. See [Control panel on page 74](#).
- Front-right and right-side cover assembly. See [Front-right and right-side cover assembly on page 76](#).
- Lower-right cover. See [Lower-right cover and bracket on page 80](#).
- Top cover. See [Top cover on page 84](#).
- Power switch assembly. See [Power-switch assembly on page 96](#).

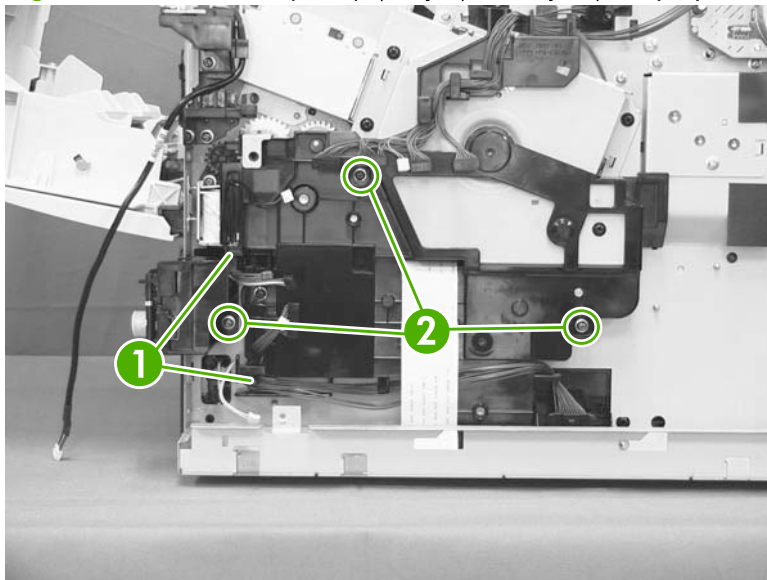
 **TIP:** Removing the power-switch assembly makes it easier to disconnect the connectors at the front of the ECU.

- Engine control unit (ECU). See [Engine control unit \(ECU\) on page 110](#).

2. Release the wire harness from the guides (callout 1), and then remove three screws (callout 2).

△ **CAUTION:** Do not try to remove the gear cover after the screws are removed (it is still attached to the solenoid-wire harness).

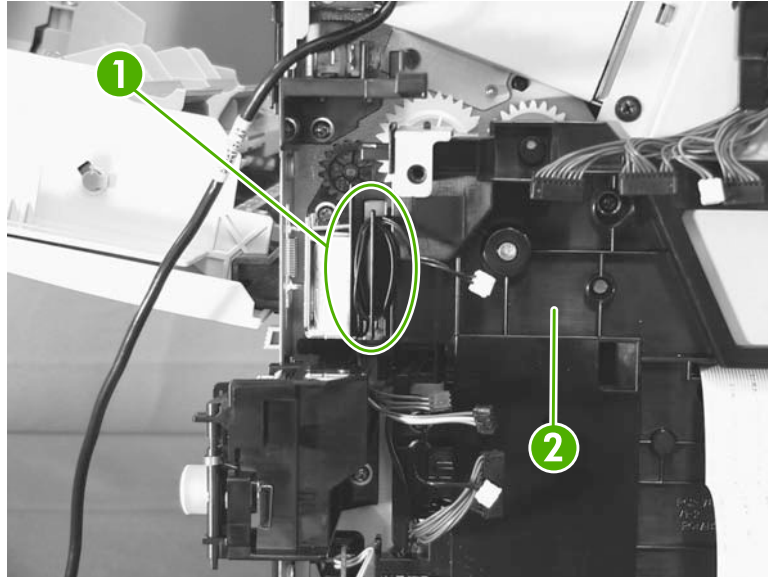
Figure 2-107 Cassette pickup (Tray 2) or Tray 1 (multipurpose tray) solenoid (1 of 3)



3. Carefully unwind the wire harness (callout 1) from the retainer on the gear cover (callout 2), and then remove the cover.

 **Reinstallation tip** When you reinstall the gear cover, make sure that you wrap the solenoid-wire harness around the retainer on and on-half times in a clockwise direction.

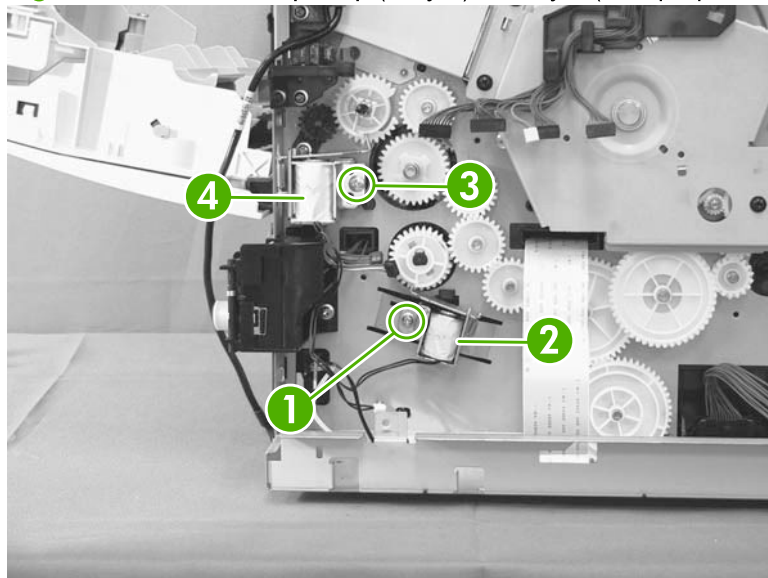
Figure 2-108 Cassette pickup (Tray 2) or Tray 1 (multipurpose tray) solenoid (2 of 3)



4. **For the cassette (Tray 2) pickup solenoid:** Remove one screw (callout 1), and then remove the solenoid (callout 2).

For the Tray 1 (multipurpose tray) pickup solenoid: Remove one screw (callout 3), and then remove the solenoid (callout 4).

Figure 2-109 Cassette pickup (Tray 2) or Tray 1 (multipurpose tray) solenoid (3 of 3)

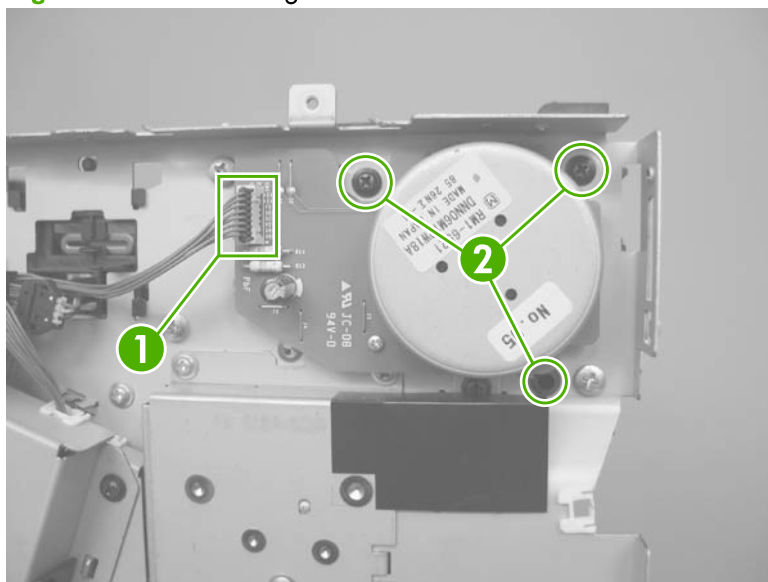


Fuser motor

 **WARNING!**  ESD sensitive component.

1. Before proceeding, remove the following components:
 - DIMM cover. See [DIMM cover and DIMM on page 57](#).
 - Formatter cover and formatter PCA. See [Formatter cover and formatter PCA on page 60](#).
 - Rear-door assembly. See [Rear-door assembly on page 62](#).
 - Left cover. See [Left cover on page 66](#).
 - Top-right cover. See [Top-right cover on page 73](#).
 - Control panel. See [Control panel on page 74](#).
 - Front-right and right-side cover assembly. See [Front-right and right-side cover assembly on page 76](#).
 - Lower-right cover. See [Lower-right cover and bracket on page 80](#).
 - Top cover. See [Top cover on page 84](#).
 - Power switch assembly. See [Power-switch assembly on page 96](#).
-  **TIP:** Removing the power-switch assembly makes it easier to disconnect the connectors at the front of the ECU.
- Engine controller unit (ECU). See [Engine control unit \(ECU\) on page 110](#).
2. Disconnect one connector (callout 1), remove three screws (callout 2), and then remove the fuser motor.

Figure 2-110 Removing the fuser motor



Sub fan and fan duct

1. Before proceeding, remove the following components:

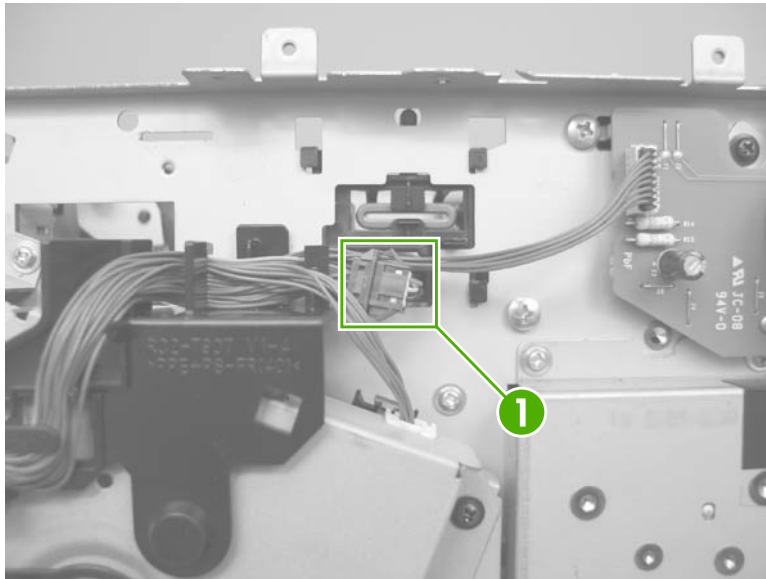
- DIMM cover. See [DIMM cover and DIMM on page 57](#).
- Formatter cover and formatter PCA. See [Formatter cover and formatter PCA on page 60](#).
- Rear-door assembly. See [Rear-door assembly on page 62](#).
- Left cover. See [Left cover on page 66](#).
- Top-right cover. See [Top-right cover on page 73](#).
- Control panel. See [Control panel on page 74](#).
- Front-right and right-side cover assembly. See [Front-right and right-side cover assembly on page 76](#).
- Lower-right cover. See [Lower-right cover and bracket on page 80](#).
- Top cover. See [Top cover on page 84](#).
- Power switch assembly. See [Power-switch assembly on page 96](#).

 **TIP:** Removing the power-switch assembly makes it easier to disconnect the connectors at the front of the ECU.

- Engine controller unit (ECU). See [Engine control unit \(ECU\) on page 110](#).

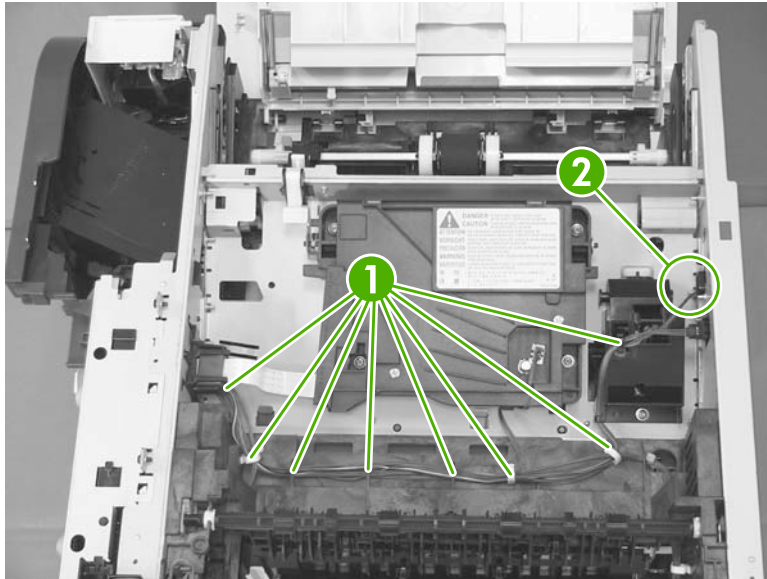
2. Disconnect one connector (callout 1).

Figure 2-111 Removing the sub fan and fan duct (1 of 5)



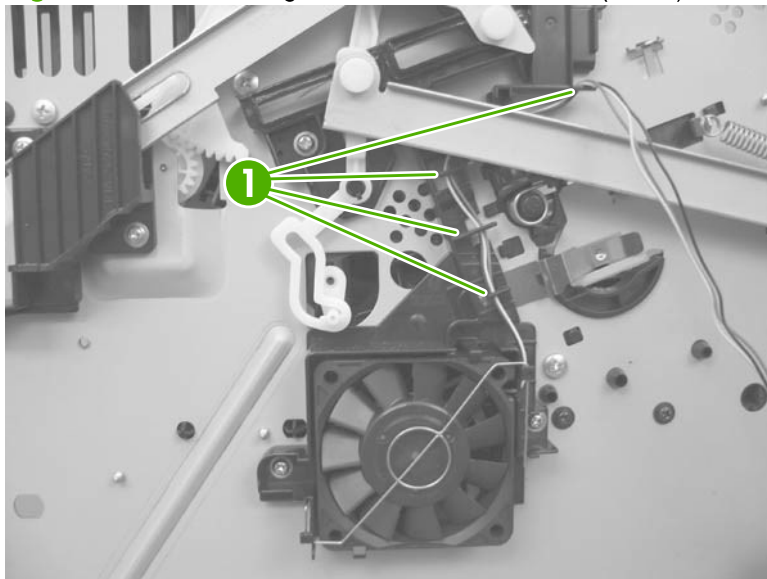
3. Release the wire harness from the retainers (callout 1), and then feed the wire harness through the opening in the chassis (callout 2).

Figure 2-112 Removing the sub fan and fan duct (2 of 5)



4. Release the wire harness from the retainers (callout 1).

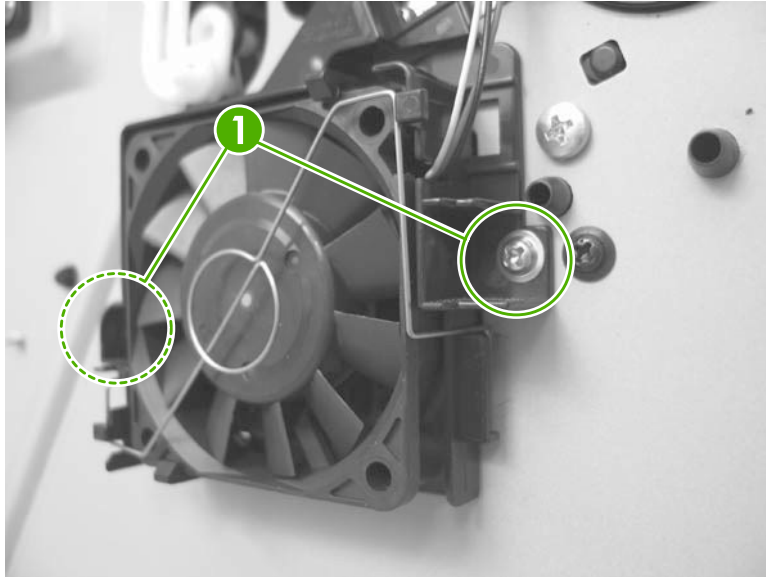
Figure 2-113 Removing the sub fan and fan duct (3 of 5)



5. **To remove the fan and duct:** Remove two screws (callout 1), and then carefully remove the fan and duct.

 **NOTE:** If necessary, release the metal static clip, release two tabs and separate the fan from the duct.

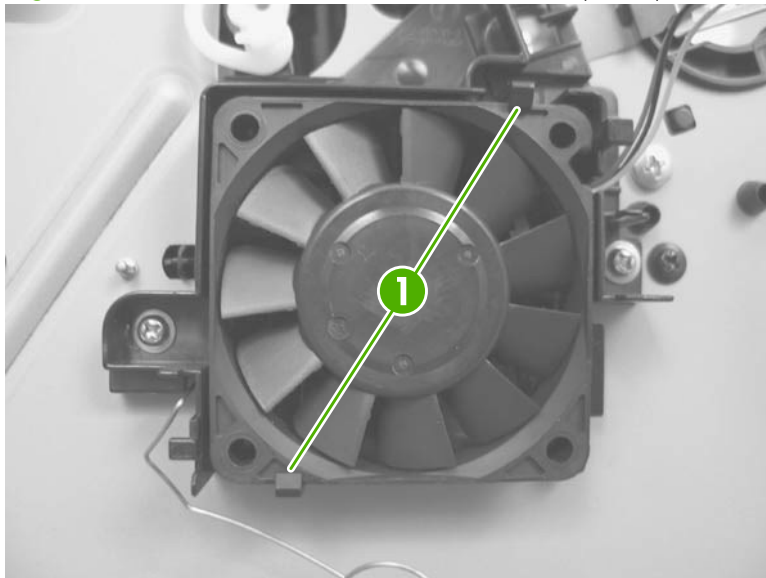
Figure 2-114 Remove the sub fan and fan duct (4 of 5)



6. **To remove the fan only:** Release the metal static clip, release two tabs (callout 1), and then remove the sub fan.

 **Reinstallation tip** If you install a replacement sub fan, the air must flow into the product. Arrows embossed on the fan frame indicate air flow direction.

Figure 2-115 Remove the sub fan and fan duct (5 of 5)



High-voltage power supply (HVPS)

1. Before proceeding, remove the following components:

- DIMM cover. See [DIMM cover and DIMM on page 57](#).
- Formatter cover and formatter PCA. See [Formatter cover and formatter PCA on page 60](#).
- Rear-door assembly. See [Rear-door assembly on page 62](#).
- Left cover. See [Left cover on page 66](#).
- Top-right cover. See [Top-right cover on page 73](#).
- Control panel. See [Control panel on page 74](#).
- Front-right and right-side cover assembly. See [Front-right and right-side cover assembly on page 76](#).
- Lower-right cover. See [Lower-right cover and bracket on page 80](#).
- Top cover. See [Top cover on page 84](#).
- Power switch assembly. See [Power-switch assembly on page 96](#).

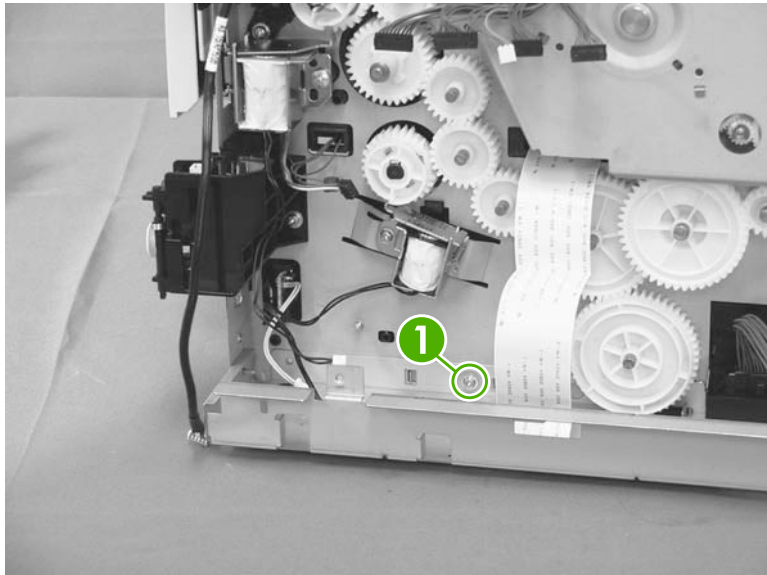
 **TIP:** Removing the power-switch assembly makes it easier to disconnect the connectors at the front of the ECU.

- **Duplex models only:** Duplex media-feed assembly. See [Duplex media-feed assembly on page 104](#).
- Engine control unit (ECU). See [Engine control unit \(ECU\) on page 110](#).
- Sub fan and duct. See [Sub fan and fan duct on page 118](#).

2. Remove one screw (callout 3).

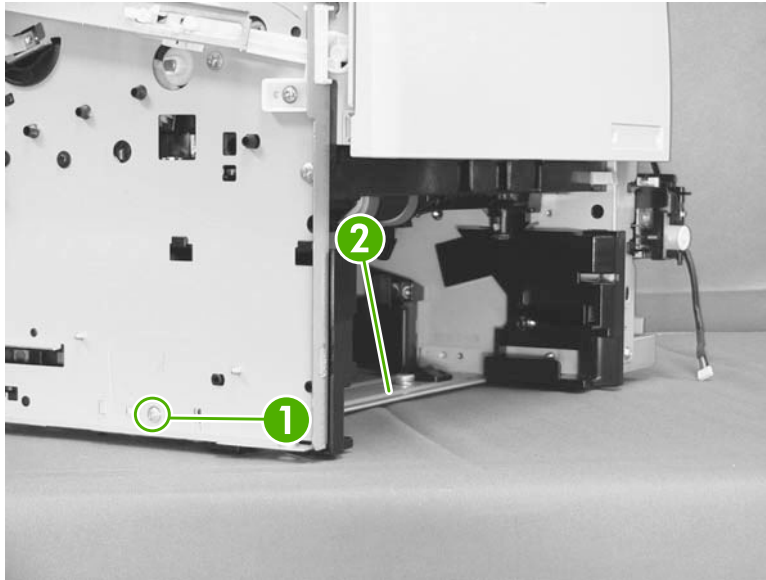
 **NOTE:** In this figure the gear cover is shown removed for clarity. Do not remove the gear cover. The gears behind the cover are not captive and can easily be dislodged if the cover is removed.

Figure 2-116 Remove the high-voltage power supply (1 of 11)



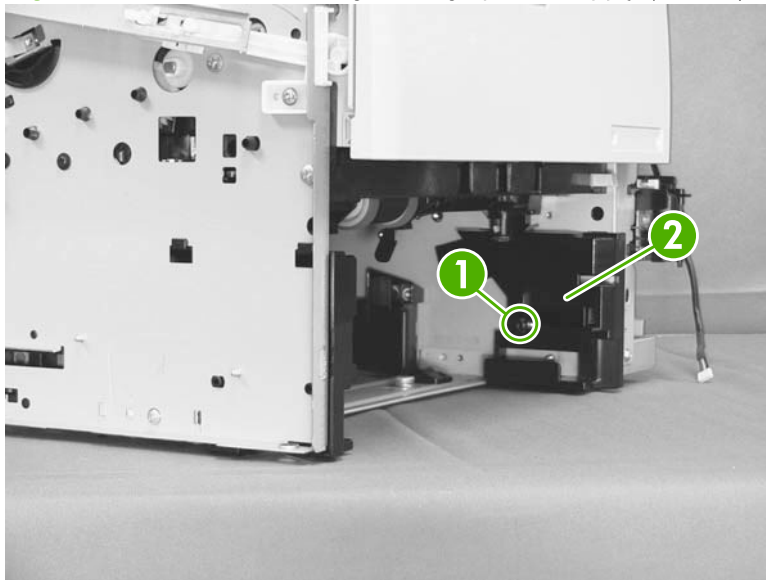
3. Remove one screw (callout 1), and then remove the base plate (callout 2).

Figure 2-117 Remove the high-voltage power supply (2 of 11)



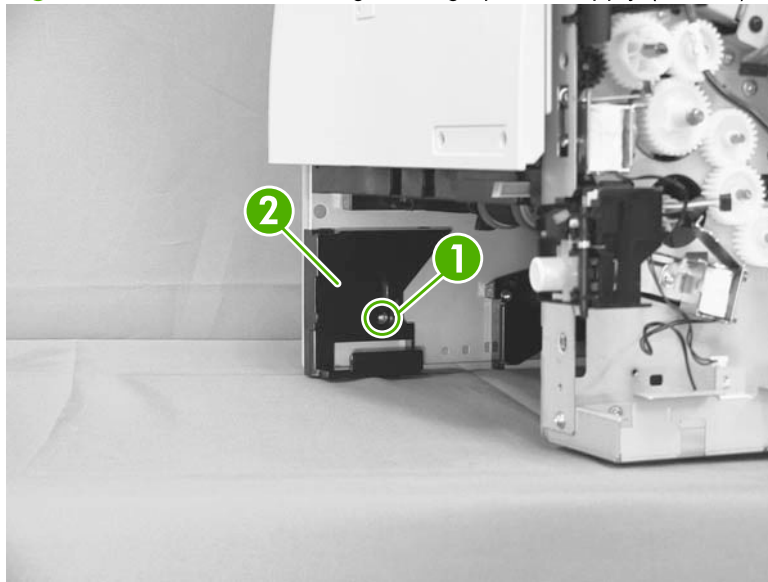
4. Remove one screw (callout 1), and then remove the right-side guide (callout 2).

Figure 2-118 Remove the high-voltage power supply (3 of 11)



5. Remove one screw (callout 1), and then remove the left-side guide (callout 2).

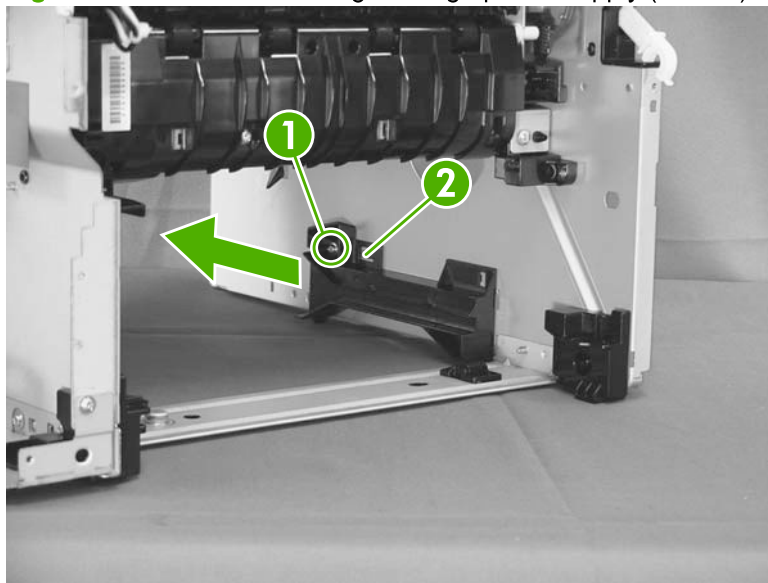
Figure 2-119 Remove the high-voltage power supply (4 of 11)



6. Remove one screw (callout 1), release one tab (callout 2) and then slide the guide toward the front of the product to release it.

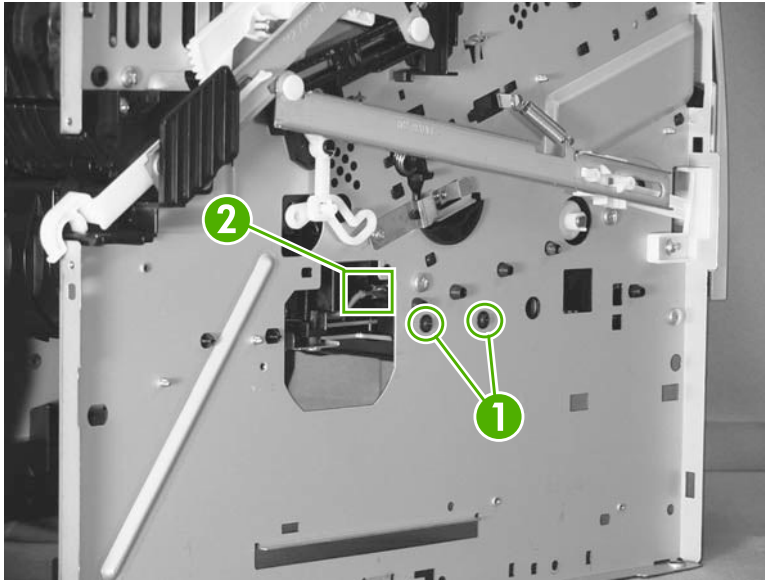
Remove the guide.

Figure 2-120 Remove the high-voltage power supply (5 of 11)



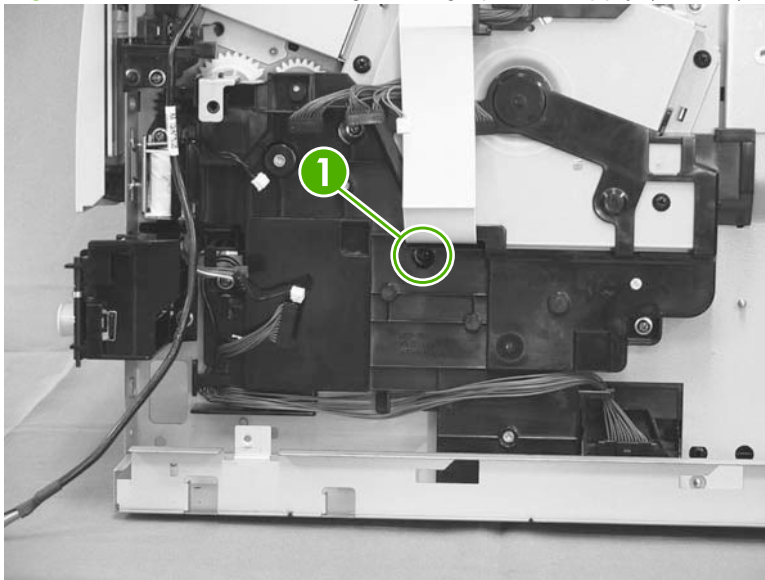
7. Disconnect one connector (callout 1), and then remove two screws (callout 2).

Figure 2-121 Remove the high-voltage power supply (6 of 11)



8. Remove one screw (callout 1).

Figure 2-122 Remove the high-voltage power supply (7 of 11)

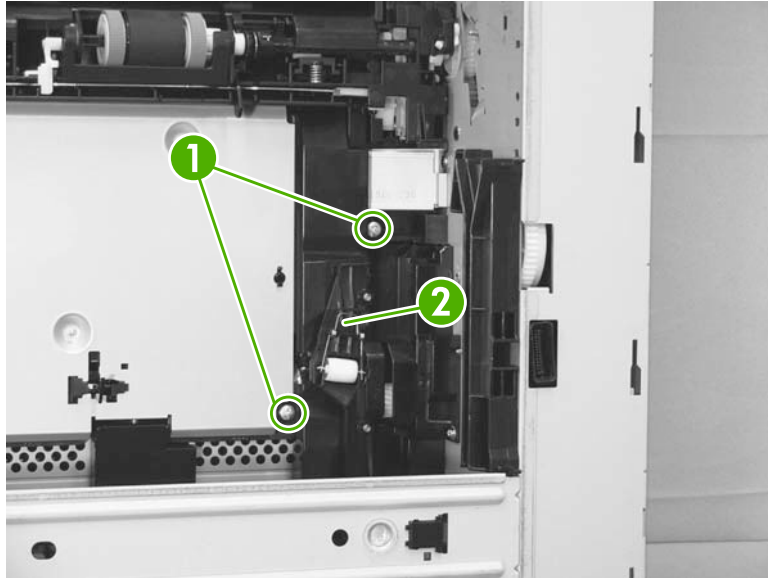


9. Place the product face-side up. Remove two screws (callout 1), and then remove the positioning guide (callout 2).

△ **CAUTION:** When you place the product face-side up, do not damage the rear-door link arm on the left side of the product.

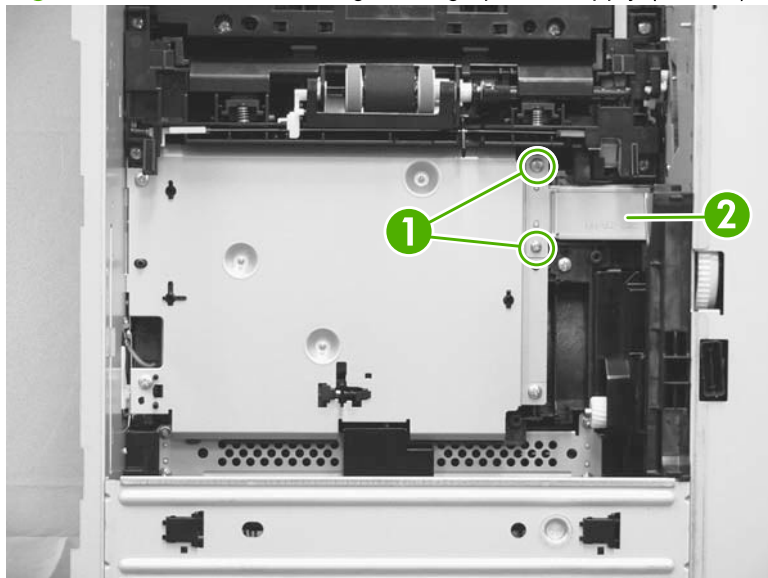
📝 **NOTE:** The positioning guide might appear to still be fastened to the product. You might have to use slight force to separate it from the product.

Figure 2-123 Remove the high-voltage power supply (8 of 11)



10. Remove two screws (callout 1), and then remove the plate (callout 2).

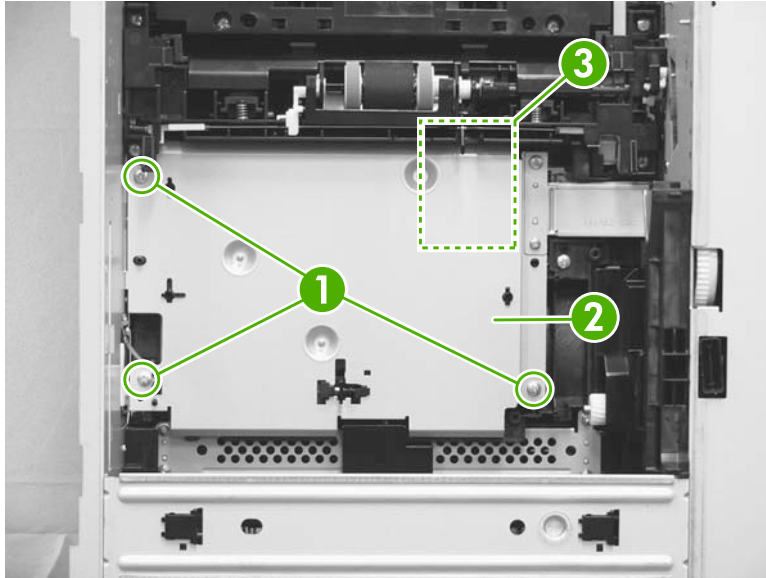
Figure 2-124 Remove the high-voltage power supply (9 of 11)



11. Remove three screws (callout 1), and then remove the high-voltage power supply (callout 2).

 **NOTE:** Disconnect two connectors and one FFC (callout 3) on the HPVVS as you separate the it from the product.

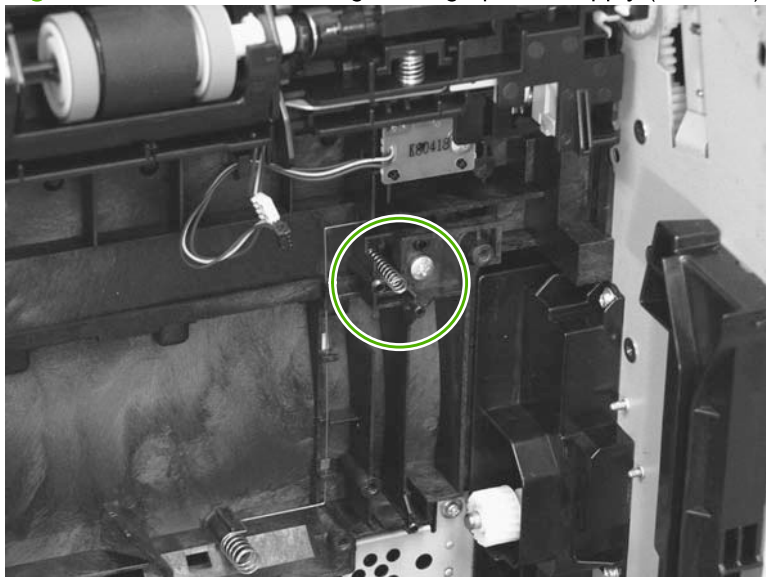
Figure 2-125 Remove the high-voltage power supply (10 of 11)



12. After the high-voltage power supply is removed, make sure that the spring on the chassis is in place.

 **CAUTION:** This spring is not captive and can easily be lost.

Figure 2-126 Remove the high-voltage power supply (11 of 11)



3 Solve problems

- [Solve problems checklist](#)
- [Menu map](#)
- [Troubleshooting process](#)
- [Tools for troubleshooting](#)
- [Clear jams](#)
- [Solve paper-handling problems](#)
- [Solve image-quality problems](#)
- [Clean the product](#)
- [Solve performance problems](#)
- [Solve connectivity problems](#)
- [Service mode functions](#)
- [Product updates](#)

Solve problems checklist

The following checklist contains basic questions that you can ask the customer to help define problems quickly.

Table 3-1 Initial troubleshooting checklist

Environment	• Is the product installed in a suitable environment? See Environmental specifications on page 309. • Is the product installed on a solid, level surface? • Is the supply voltage (from the wall receptacle) within the product's rated voltage (see Electrical specifications on page 308)? • Is the power cord fully seated into both the product and the electrical receptacle in the wall? • Is the product exposed to direct sunlight?
Media	• Does the customer use only supported print media? • Is the media in good condition (no curl, folds, or other flaws)? • Is the media stored correctly and within environmental limits? • Is the correct side of the page printed on first? • Is long-grain paper being used?
Input trays	• Is the correct amount of media loaded in the tray (not stacked above the arrows embossed in the tray)? • Is the media placed in the tray correctly? • The sliding media guides in the tray might be too tight to too loose.
Correctly adjust the sliding media guides	
1. Remove the tray from the product. 2. Remove the stack of paper. 3. Slide the media guides until the guide indicators align with the size of paper that you are using.	
NOTE: The supported paper sizes for the tray are embossed in the tray.	
4. Replace the stack of paper. 5. Install the tray in the product, and resend the print job.	
	• Is the tray cassette installed correctly in the product?
Print cartridge	• Is the print cartridge installed correctly?
Fuser	• Is the fuser installed correctly?
Covers and doors	• Is the cartridge door fully closed? • Is the rear door (face-up delivery) fully closed?

Table 3-1 Initial troubleshooting checklist (continued)

Condensation	• Does condensation occur following a temperature change (particularly in winter following cold storage)? If so, wipe off the affected parts or leave the product on for 10 to 20 minutes and then try to resume printing. • Was a print cartridge opened soon after it was moved from a cold room to a warm one? If so, allow the print cartridge and the product to acclimate to room temperature for one to two hours.
Miscellaneous	• Are any non-HP components installed? Check for any non-HP components (print cartridge, memory modules, and EIO cards) installed in the product and remove them. Hewlett-Packard recommends the use of HP components in its products. • Network models only: Remove the product from the network, and make sure that the failure is with the product before beginning troubleshooting.

Menu map

The menu map can be an important troubleshooting tool. The menu map shows each control-panel menu and submenu to aid navigation through the menu system. Print the menu map from the control panel by completing the following steps.

1. Press the **Menu** button .
2. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **INFORMATION** menu, and then press the **OK** button.
3. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **PRINT MENU MAP** submenu, and then press the **OK** button to print the pages.

Troubleshooting process

Determine the problem source

When the product malfunctions or encounters an unexpected situation, the product control panel alerts you to the situation. This chapter provides steps for correcting problems.

1	Is the product on and does a readable message appear?	Follow the power-on troubleshooting checks following this table.
Power on	Yes ▼ No ▲	After the control-panel display is functional, go to step 2.
2	Does Ready appear on the control-panel display?	If an error message appears, see Interpret control-panel messages on page 197 .
Control-panel messages	Yes ▼ No ▲	After the errors have been corrected, go to step 3.
3	Open the INFORMATION menu and print the configuration pages. Are all the accessories installed?	If accessories that are installed are not listed on the configuration pages, remove the accessory and reinstall it.
Information pages	Yes ▼ No ▲	After evaluating the configuration pages, go to step 4.
4	Does the print quality meet customer requirements?	Compare images with the sample defects in Solve image-quality problems on page 247 .
Image quality	Yes ▼ No ▲	When the print quality is acceptable, go to step 5.
5	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.
Interface	Yes. This is the end of the basic troubleshooting process. No ▲	If error messages appear on the control-panel display, see Interpret control-panel messages on page 197 .
		When the customer can print from the host computer, this is the end of the basic troubleshooting process.

Power subsystem

Power-on checks

Turn on the power. If the control-panel display remains blank or if it displays random patterns or asterisks, perform the power-on checks to find the cause of the problem.

1. Verify that the product is plugged into an active electrical outlet that delivers the correct voltage.
2. Verify that the power switch is in the ON position.
3. Make sure that the main fan on the right side runs for a short time.
 - If the control-panel display is blank, but the main fan runs after the power is turned on, print an engine test page to determine whether the problem is with the control-panel display, the formatter, or other components. See [Engine diagnostics on page 134](#).
 - The overcurrent/overvoltage protection circuit in the low-voltage power supply unit might be running. Turn the printer off, unplug the power cord, and turn the printer on. If the printer does not function, the fuse melts, or the power supply is malfunctioning, replace the engine controller unit. See [Engine control unit \(ECU\) on page 110](#).
 - Verify that the LEDs at the back of the product on the formatter, are functioning correctly. See [LED diagnostics on page 133](#).
4. Remove any HP Jetdirect or other EIO cards, and then turn off and turn on the product.

Tools for troubleshooting

Individual component diagnostics

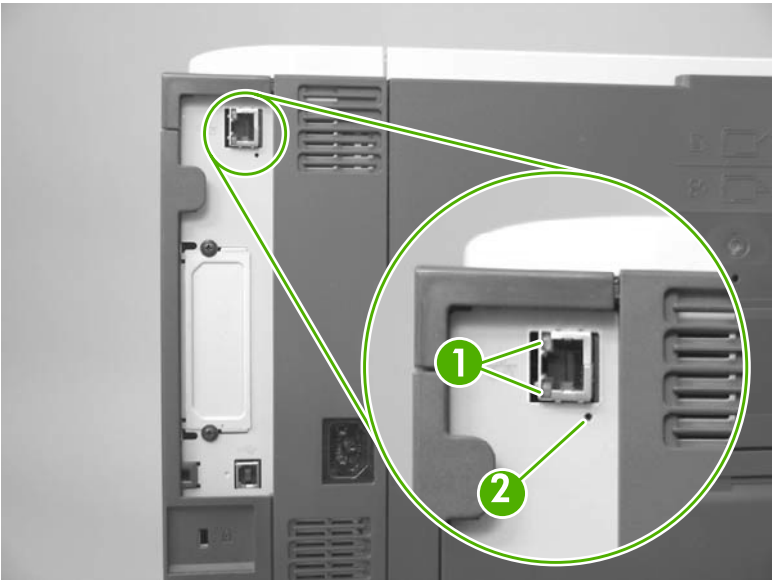
LED diagnostics

LEDs on the formatter can help identify and troubleshoot product problems.

LED indicators

Three LEDs on the formatter indicate that the product is functioning correctly.

Figure 3-1 Formatter LEDs



1	HP Jetdirect LEDs
2	Heartbeat LED

Formatter heartbeat LED

The heartbeat LED indicates that the formatter is functioning correctly. While the product is initializing after you turn it on, the LED blinks rapidly, and then turns off. When the product has finished the initialization sequence, the heartbeat LED pulses on and off.

The heartbeat LED performs the following sequences:

1. The LED blinks when the product power is on.
2. If the light is not blinking, check the following:
 - Reseat the formatter connectors.
 - Replace the memory.
 - Replace the formatter.
3. If the control panel display does not illuminate, perform an engine test to check the engine (see [Engine-test button on page 134](#)). You must have paper loaded in Tray 2 for the engine test.

HP Jetdirect LEDs

The embedded HP Jetdirect print server has two LEDs. The yellow LED indicates network activity, and the green LED indicates the link status. A blinking yellow LED indicates network traffic. If the green LED is off, a link has failed.

For link failures, check the network cable connections.

For nonlink errors, print a configuration page. The second page is the HP Jetdirect configuration page. Examine this page for any inconsistencies among the network settings.

Engine diagnostics

Printing test pages helps you determine whether or not the product engine and the formatter are functioning.

 **NOTE:** Information pages also can be used to solve product issues. For information about printing information pages, see the product user guide.

Engine-test button

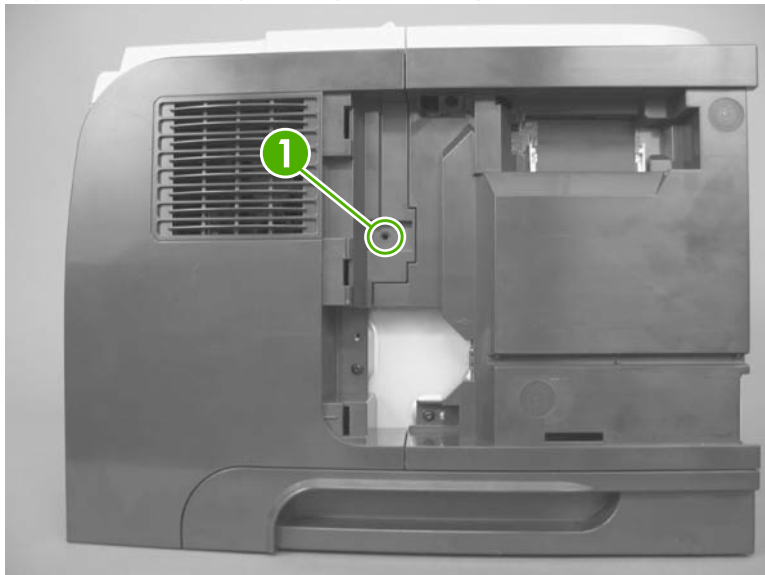
To verify that the product engine is functioning, print an engine-test page.

Print the engine test pages

 **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 in the formatter, the control panel, or the cable that connects them together.

1. Remove the DIMM cover. See [DIMM cover and DIMM on page 57](#).
2. Press the engine test-page button (callout 1).

Figure 3-2 Locating the engine-test-page switch



The test page should have a series of horizontal lines. The test page prints from the last tray that the product used to print, unless the product has been turned off and then turned on again since the most recent print job. If the product has been turned off and then on again since the most recent print job,

then the page will print from Tray 2. The product continuously prints test pages as long as the test-page switch is depressed. The product will not print a test page if it is in Sleep mode.

Print formatter test pages

If the engine test was successful with the formatter removed, reinstall the formatter and then print a configuration page to test the functionality of the formatter.

1. Press the **Menu** button .
2. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **INFORMATION** menu.
3. Press the **OK** button to select the menu.
4. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **PRINT CONFIGURATION** option.
5. Press the **OK** button to select the option and print the page.

Fuser test page

This test helps to determine if the fuser needs to be replaced, or if it has exceeded its expected life.

A customer can complete the steps below and describe the results to the HP Customer Care representative. If the page shows no problems, the fuser does not need replacing.

Replace the fuser (see [Fuser on page 100](#)) if the page shows the following problems:

- Fuser offset repeats in the boxes on the page
 - Lines or streaks on the page (usually down the edges of the page) indicate fuser contamination
1. Press the **Menu** button .
 2. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **DIAGNOSTICS** menu, and then press the **OK** button.
 3. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **PRINT FUSER TEST PAGE** menu, and then press the **OK** button.

Paper-path test (and automatic sensors test)

Paper-path test

1. Press the **Menu** button .
2. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **DIAGNOSTICS** menu, and then press the **OK** button.
3. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **PAPER PATH TEST** sub menu, and then press the **OK** button.
4. Select the paper path test options for the test you want to run

 **NOTE:** Values that have an asterisk (*) are the factory-default values. Some menu items have no default.

Item	Sub-item	Values	Description
PAPER PATH TEST			Tests the paper-handling features of the product, such as the configuration of the trays.
PRINT TEST PAGE			Generates a page for testing the paper-handling features. You must define the path for the test to test specific paper paths.
SOURCE		ALL TRAYS TRAY 1 TRAY 2* TRAY 3 TRAY 4	Specifies whether the test page is printed from all trays or from a specific tray.
DUPLEX		OFF ON	Determines whether the duplexer is used in the test.
COPIES		1* 10 50 100 500	Determines how many pages to send from the specified source as part of the test.

Paper-path sensors test

1. Press the **Menu** button .
2. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **DIAGNOSTICS** menu, and then press the **OK** button.
3. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **PAPER PATH SENSORS** sub menu, and then press the **OK** button.

4. Select the paper path test options for the test you want to run
5. Press the **OK** button to begin the test, and then observe the control-panel designators (see the table below). The sensors should display a **1** status as paper passes by the sensors.

Table 3-2 Paper-path sensors

Sensor name	Sensor number	Replacement part number	Description	Paper-path sensor test name
TOP sensor	PS215	RM1-6511-000CN	Photointerrupter	A TOP sensor
Fuser delivery sensor	PS2	110 Volt: RM1-6274-000CN 220 Volt: RM1-6319-000CN	Photointerrupter	B Fuser output sensor
Duplex media-feed sensor	PS502	RM1-6280-000CN	Photointerrupter	C Duplex sensor
Media width sensor	PS225	RM1-6512-000CN	Photointerrupter	D Paper width sensor 1
Paper feeder media-feed sensor - Tray 3 ¹	PS8008	CE530-69001	Photointerrupter	E Tray 3 feed sensor
Paper feeder media-feed sensor - Tray 4 ¹	PS8008	CE530-69001	Photointerrupter	F Tray 4 feed sensor

¹ Tray 3 and Tray 4 use a PS8008 sensor.

Sensor test (interactive)

Performs tests to determine whether the paper-path sensors are operating correctly.

Table 3-3 MANUAL SENSOR TEST (special mode test)

Sensor or switch name	Sensor number	Replacement part number	Description	Paper-path sensor test name	Testing of sensor
TOP sensor	PS215	RM1-6511-000CN	Photointerrupter	A TOP sensor	Open the cartridge door, remove the print cartridge, raise the registration shutter, and then use a screwdriver to activate the sensor.
Fuser delivery sensor	PS2	110 Volt: RM1-6274-000CN 220 Volt: RM1-6319-000CN	Photointerrupter	B Fuser output sensor	Open the rear door, and then use a screwdriver to activate the sensor.
Duplex media-feed sensor	PS502	RM1-6280-000CN (power supply)	Photointerrupter	C Duplex sensor	Remove the Tray 2 cassette, push the green button to drop the duplex tray, and then raise the tray.
Media width sensor	PS225	RM1-6512-000CN	PCA	D Paper width sensor 1	Open the cartridge door, remove the print cartridge, and then lift the registration flap to activate the sensor.

Table 3-3 MANUAL SENSOR TEST (special mode test) (continued)

Sensor or switch name	Sensor number	Replacement part number	Description	Paper-path sensor test name	Testing of sensor
Paper feeder media-feed sensor - Tray 3 ¹	PS8008	(Replace feeder unit)	Photointerrupter	E Tray 3 feed sensor	Remove the Tray 2 cassette, use a small screwdriver to activate the sensor through the small slot toward the front of the product.
Paper feeder media-feed sensor - Tray 4 ¹	PS8008	(Replace feeder unit)	Photointerrupter	F Tray 4 feed sensor	Remove the Tray 3 cassette, use a small screwdriver to activate the sensor through the small slot toward the front of the product.
Face-down media tray media-full sensor	PS4	Photo interruptor: WG8-5696-000CN Top-cover flag: RM1-6289-000CN	Photointerrupter	G FD tray full sensor	Lift the face-down tray output levers to activate the sensor.
Rear cover open sensor	PS1	WG8-5696-000CN	Photointerrupter	H Face-up detect sensor	Open the rear door to about 15 degrees.
Cartridge-door switch	SW501	WC4-5171-000CN	Switch	I Cartridge-door open switch	Open the cartridge door.
Face-up detect sensor	PS8001	WG8-5696-000CN	Photointerrupter	J Rear cover open sensor	Open the rear door to about 90 degrees.
MP tray media-presence sensor	PS205	RM1-6510-000CN	Photointerrupter	K Tray 1 paper sensor	Push the sensor lever to the right of the center of the tray, and hold it there for 3 seconds.
Cassette media-presence sensor	PS3	Currently not replaceable	Photointerrupter	L Tray 2 paper sensor	Remove the Tray 2 cassette, and then push the sensor lever.
Tray 2 cassette presence switch	SW235	RM1-6487-000CN (tray sensor PCA)	Switch	M Tray 2 detect sensor	Remove the Tray 2 cassette, and then reinstall it.

¹ Tray 3 and Tray 4 use a PS8008 sensor.

Table 3-4 MANUAL SENSOR TEST 2 (special mode test)

Sensor or switch name	Sensor number	Replacement part number	Description	Paper-path sensor test name	Testing of sensor
Paper feeder Tray 3 cassette media-presence sensor ¹	PS451	CE530-69001	Photointerrupter	N Tray 3 paper sensor	Remove the Tray 3 cassette, and then push the sensor lever.
Paper feeder Tray 3 cassette presence sensor ¹	PS461	CE530-69001	Photointerrupter	O Tray 3 detect sensor	Remove the Tray 3 cassette, and then reinstall it.

Table 3-4 MANUAL SENSOR TEST 2 (special mode test) (continued)

Sensor or switch name	Sensor number	Replacement part number	Description	Paper-path sensor test name	Testing of sensor
Paper feeder Tray 4 cassette media-presence sensor ¹	PS451	CE530-69001	Photointerrupter	P Tray 4 paper sensor	Remove the Tray 4 cassette, and then push the sensor lever.
Paper feeder Tray 4 cassette presence sensor ¹	PS461	CE530-69001	Photointerrupter	Q Tray 3 detect sensor	Remove the Tray 4 cassette, and then reinstall it.

¹ Tray 3 and Tray 4 use PS451 and PS461 sensors.

Access the **MANUAL SENSOR TEST** or the **MANUAL SENSOR TEST 2** in the **DIAGNOSTICS** menu.

1. Press the **Menu** button .
2. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **DIAGNOSTICS** menu, and then press the **OK** button.
3. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **MANUAL SENSOR TEST** or **MANUAL SENSOR TEST 2** menu, and then press the **OK** button.
4. Press the down arrow ▼ button or the up arrow ▲ button to highlight a test, and then press the **OK** button to select the test.
5. To exit the diagnostic test, press the stop button , and then select **EXIT DIAGNOSTICS**.

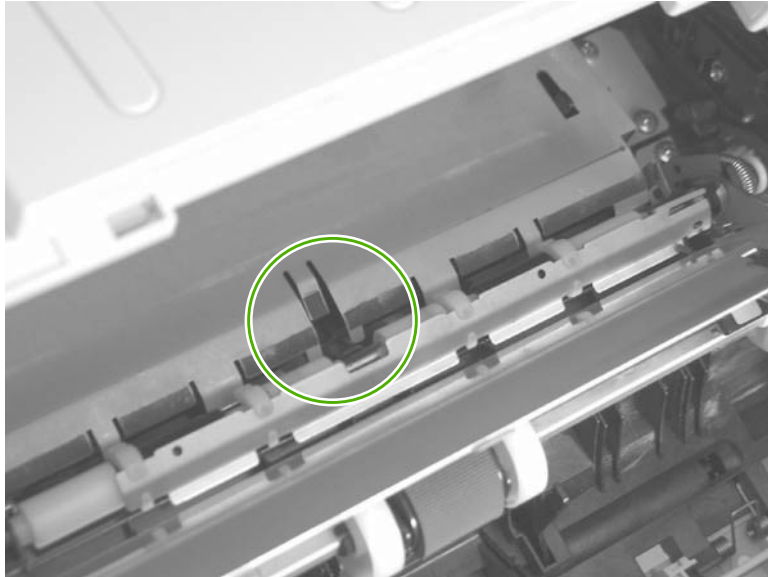
 **NOTE:** Menus are not available during a test. During a test, the **OK** button functions like the stop button .

A TOP (Top-of-Page) sensor

Test the TOP sensor (PS215)

1. Open the cartridge door, and then remove the print cartridge.
2. Raise the registration shutter.
3. Use a small screwdriver to activate the TOP sensor.

Figure 3-3 Test the TOP sensor



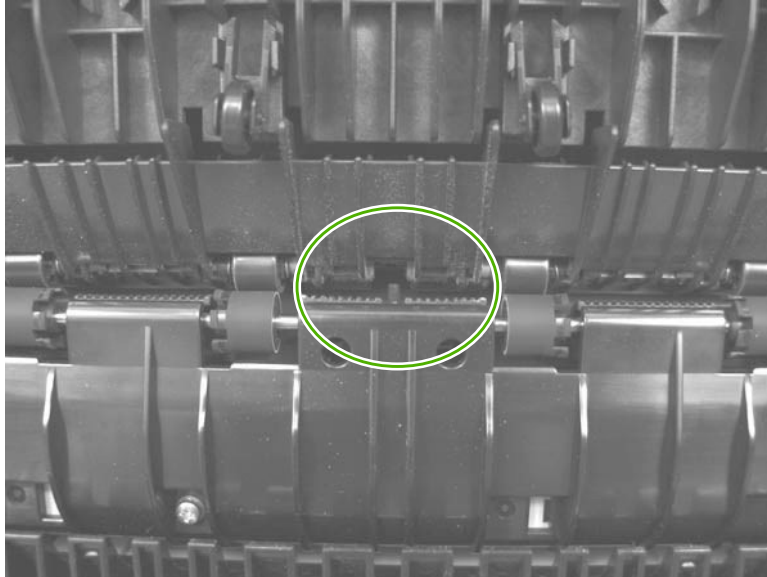
4. Check the control-panel display for sensor response.
5. If there is no response, replace the TOP sensor.

B Fuser output sensor

Test the fuser delivery sensor (PS2)

1. Open the rear door.
2. Slowly insert a piece of paper to activate the fuser delivery sensor.

Figure 3-4 Test the fuser delivery sensor



3. Check the control-panel display for a sensor response.
4. If there is no response, replace the fuser.

C Duplex sensor

Test the duplex media-feed sensor (PS502)

1. Remove the Tray 2 cassette.
2. Press the green lever to release the duplex media-feed assembly (metal tray).
3. Raise the duplex media-feed assembly until it snaps into place.

Figure 3-5 Test the duplex media-feed sensor



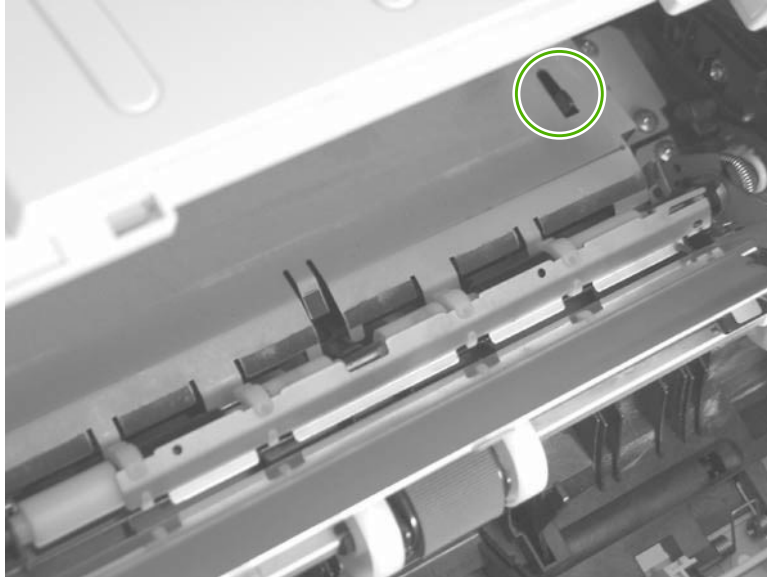
4. Check the control-panel display for sensor response.
5. If there is no response, replace the high-voltage power supply (duplex model).

D Paper width sensor 1

Test the media width sensor (PS225)

1. Open the cartridge door, and then remove the print cartridge.
2. Raise and then lower the registration flap to activate the sensor.

Figure 3-6 Test the media width sensor



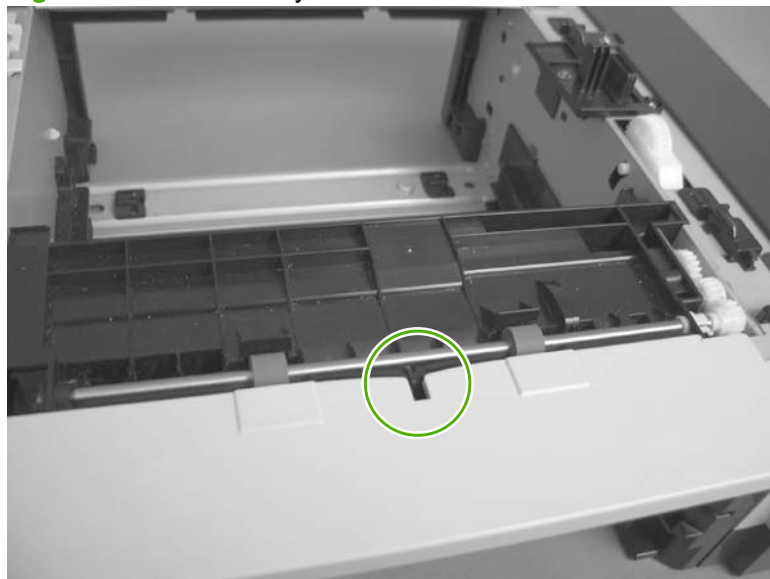
3. Check the control-panel display for a sensor response.
4. If there is no response, replace the media width sensor PCA.

E Tray 3 feed sensor

Test the Tray 3 media-feed sensor (PS8008)

1. Remove the Tray 3 cassette.
2. Use a small screwdriver to activate the sensor.

Figure 3-7 Test the Tray 3 media-feed sensor



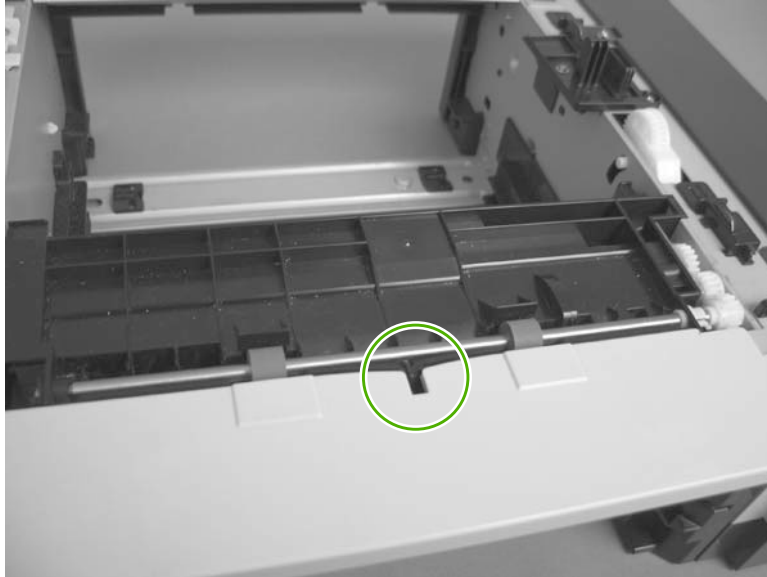
3. Check the control-panel display for sensor response.
4. If there is no response, replace the optional Tray 3 assembly.

F Tray 4 feed sensor

Test the Tray 4 media-feed sensor (PS8008)

1. Remove the Tray 4 cassette.
2. Use a small screwdriver to activate the sensor.

Figure 3-8 Test the Tray 4 media-feed sensor



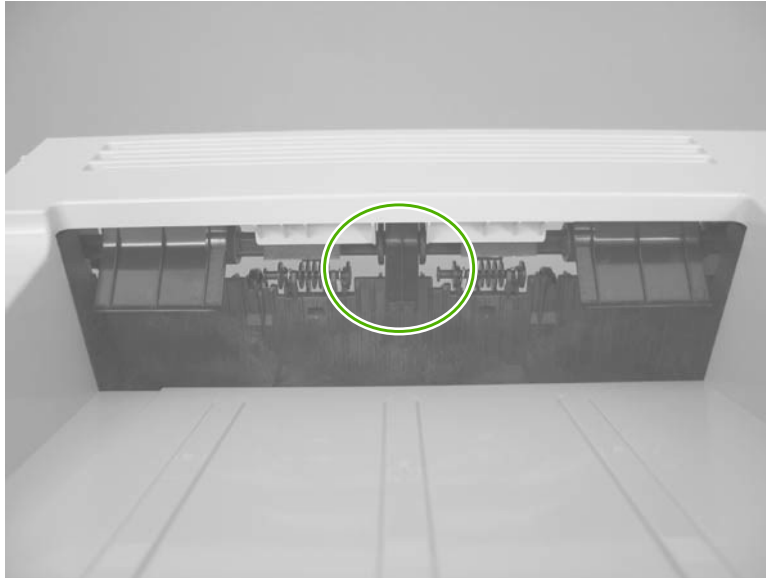
3. Check the control-panel display for sensor response.
4. If there is no response, replace the optional Tray 4 assembly.

G FD tray full sensor

Test the face-down media tray media-full (PS1)

1. Raise and then lower the output-bin levers to activate the sensor.

Figure 3-9 Test the face-down media tray media-full sensor



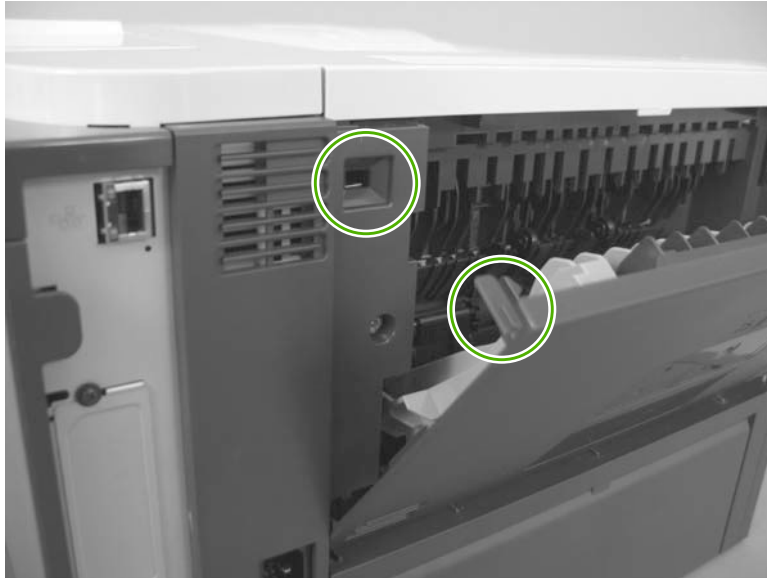
2. Check the control-panel display for sensor response.
3. If there is no response, replace the top-cover flag or the photo interrupter.

H Face up detect sensor

Test the rear cover open sensor (PS1)

1. Open the rear door until it stops to activate the sensor.

Figure 3-10 Test the rear cover open sensor



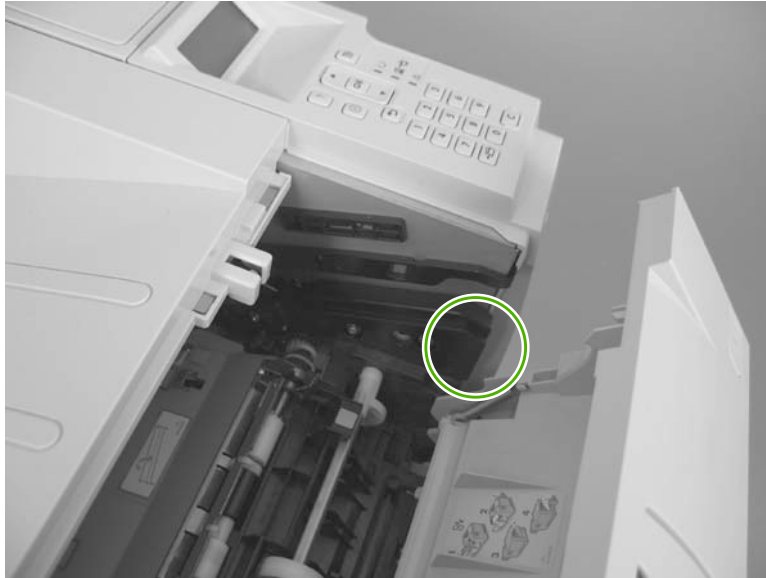
2. Check the control-panel display for sensor response.
3. If there is no response, replace the rear cover open sensor.

I Cartridge-door open switch

Test the cartridge-door open switch (SW501)

1. Open the cartridge door to activate the sensor.

Figure 3-11 Test the cartridge-door open switch



2. Check the control-panel display for sensor response.
3. If there is no response, make sure that the sensor-actuator tab on the door is not damaged or missing.

If necessary, replace the cartridge-door switch.

J Rear cover open sensor

Test the face-up detect sensor (PS8001)

1. Open the rear door, and then gently pull down on the door and lower the door until it is fully open to activate the sensor.

 **NOTE:** [Figure 3-13 Test the face-up detect sensor \(2 of 2\) on page 149](#) shows the location of the face-up detect sensor (PS8001) behind the left cover.

Figure 3-12 Test the face-up detect sensor (1 of 2)

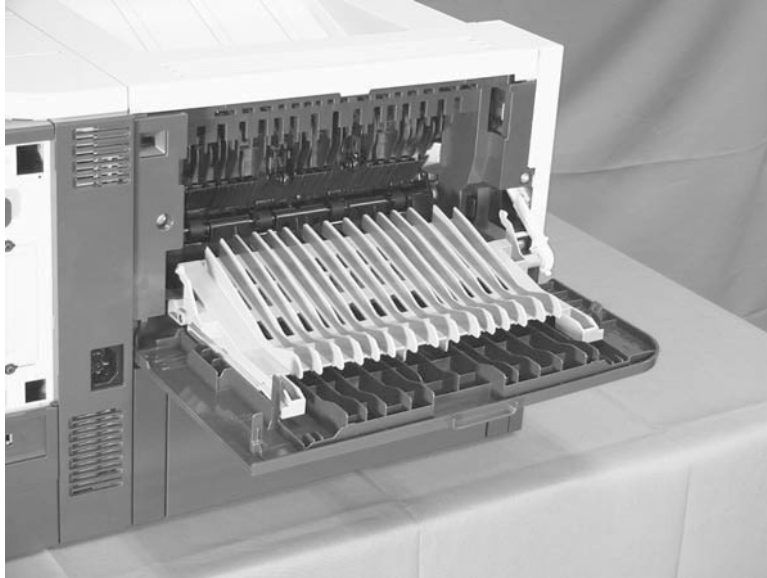
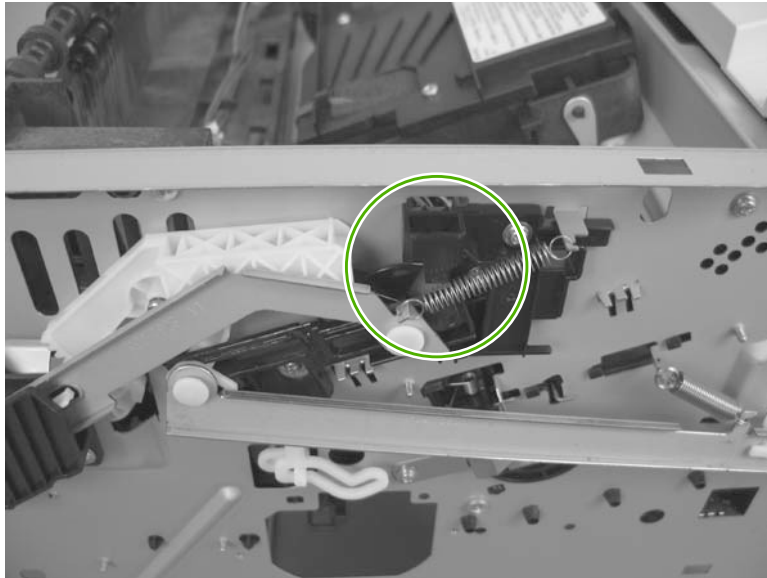


Figure 3-13 Test the face-up detect sensor (2 of 2)



2. Check the control-panel display for sensor response.
3. If there is no response, make sure that the sensor-actuator tab on the door is not damaged or missing.

If necessary, replace the face-up detect sensor.

K Tray 1 paper sensor

Tray 1 (multipurpose tray) media-presence sensor (PS205)

1. Push the sensor lever toward the right side of the product and hold it there for 3 seconds to activate the sensor.

Figure 3-14 Test the Tray 1 (multipurpose tray) media-presence sensor



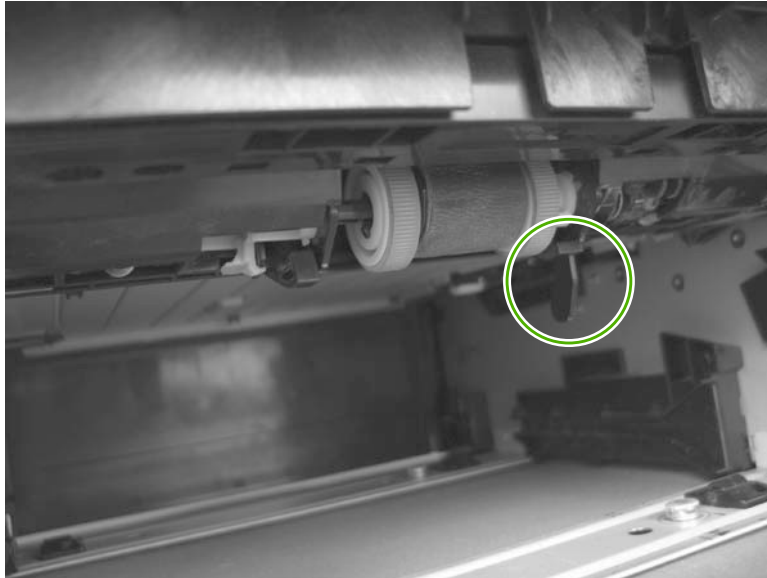
2. Check the control-panel display for sensor response.
3. If there is no response, replace the multipurpose sensor PCA.

L Tray 2 paper sensor

Tray 2 cassette media-presence sensor (PS3)

1. Remove the Tray 2 cassette, and then push on the sensor levers to activate the sensor.

Figure 3-15 Test the Tray 2 cassette media-presence sensor



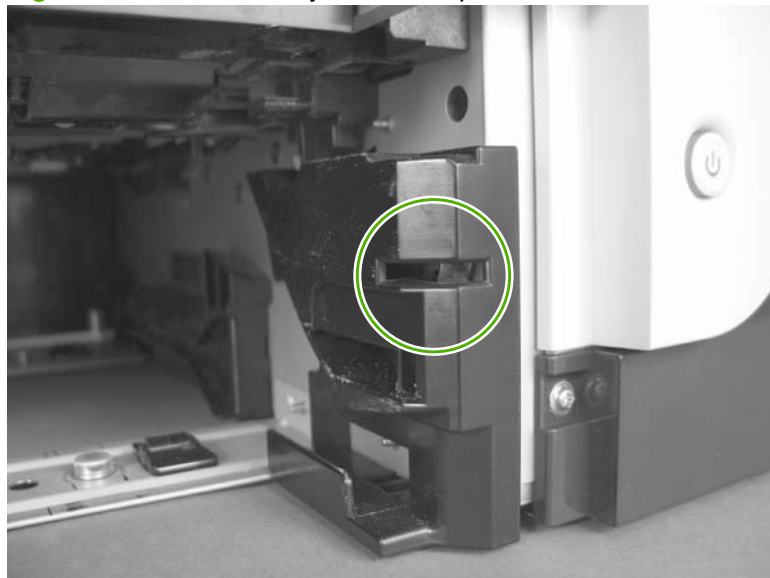
2. Check the control-panel display for sensor response.
3. If there is no response, replace the unit.

M Tray 2 detect switch

Tray 2 cassette presence switch (SW235)

1. Remove the Tray 2 cassette, and then install it to activate the sensor.

Figure 3-16 Test the Tray 2 cassette presence switch



2. Check the control-panel display for sensor response.
3. If there is no response, make sure that the sensor-actuator tab on the cassette is not damaged or missing.

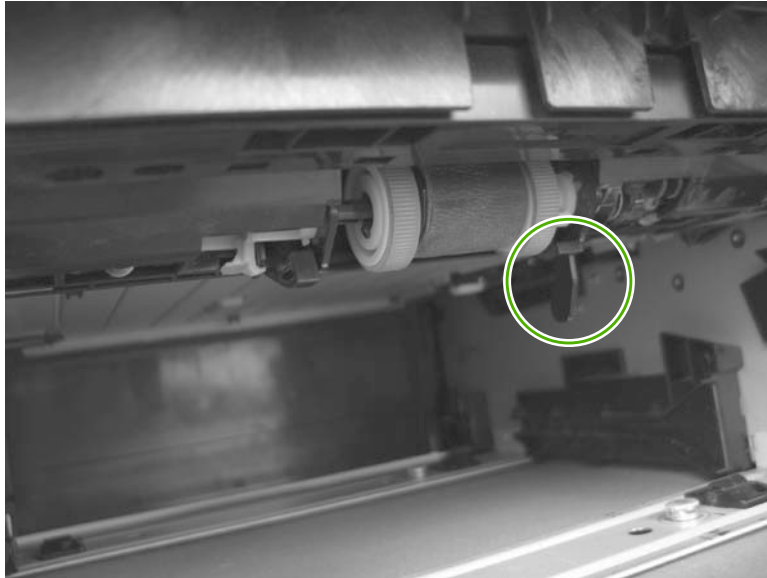
If necessary, replace the switch.

N Tray 3 paper sensor

Tray 3 media-presence sensor (PS451)

1. Remove the Tray 3 cassette, and then push on the sensor levers to activate the sensor.

Figure 3-17 Test the Tray 3 cassette media-presence sensor



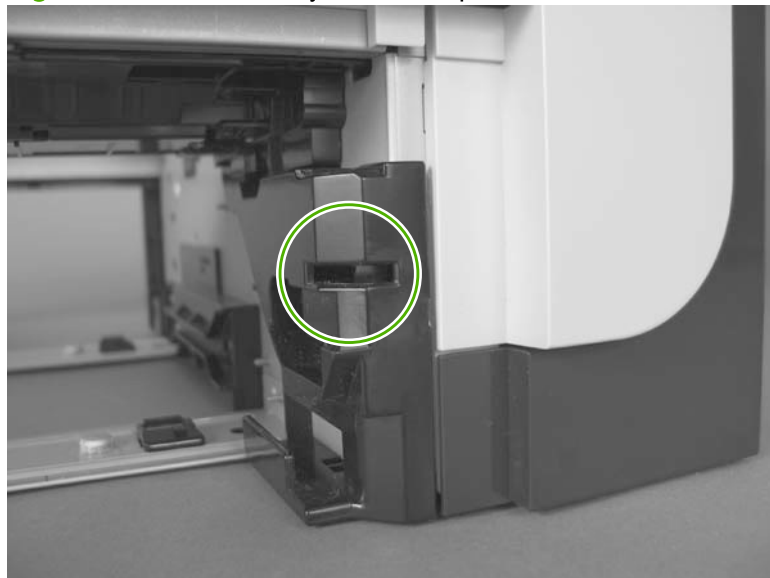
2. Check the control-panel display for sensor response.
3. If there is no response, replace the optional 500-sheet feeder.

O Tray 3 detect switch

Tray 3 cassette presence switch (SW461)

1. Remove the Tray 3 cassette, and then install it to activate the sensor.

Figure 3-18 Test the Tray 3 cassette presence switch



2. Check the control-panel display for sensor response.
3. If there is no response, make sure that the sensor-actuator tab on the cassette is not damaged or missing.

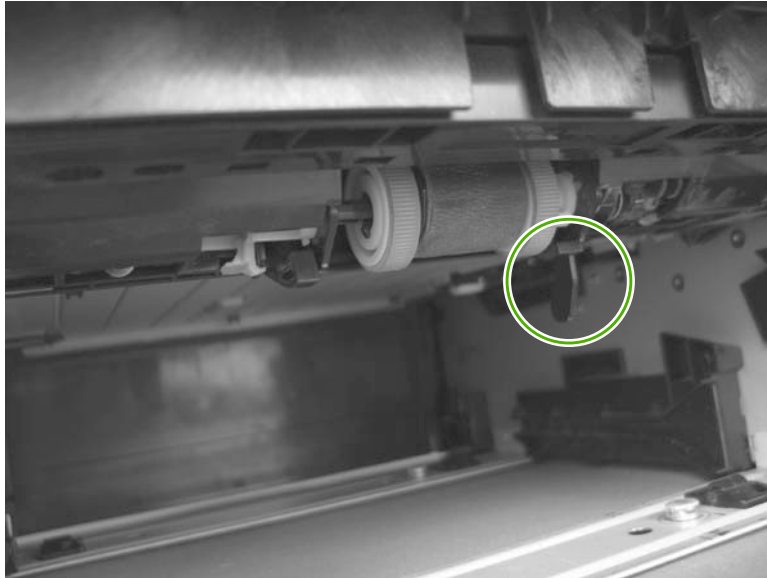
If necessary, replace the optional 500-sheet feeder.

P Tray 4 paper sensor

Tray 4 media-presence sensor (PS451)

1. Remove the Tray 4 cassette, and then push on the sensor levers to activate the sensor.

Figure 3-19 Test the Tray 4 cassette media-presence sensor



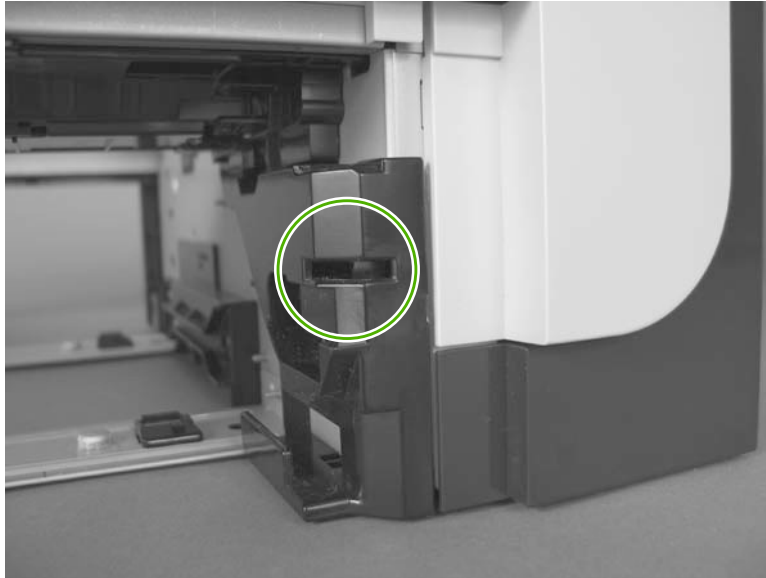
2. Check the control-panel display for sensor response.
3. If there is no response, replace the optional 500-sheet feeder.

Q Tray 4 detect switch

Tray 4 cassette presence switch (SW461)

1. Remove the Tray 4 cassette, and then install it to activate the sensor.

Figure 3-20 Test the Tray 4 cassette presence switch



2. Check the control-panel display for sensor response.
3. If there is no response, make sure that the sensor-actuator tab on the cassette is not damaged or missing.

If necessary, replace the optional 500-sheet feeder.

Print/stop test

Use this diagnostic test to isolate the cause of problems such as image formation defects and jams within the engine. The test can be programmed to stop from 0 to 60,000 ms.

Perform the print/stop test in the DIAGNOSTICS menu

1. Press the **Menu** button .
2. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **DIAGNOSTICS** menu.
3. Press the **OK** button to select the menu.
4. Press the down arrow ▼ button or the up arrow ▲ button to navigate to the **PRINT/STOP TEST** sub menu.
5. Press the **OK** button to select the sub menu.
6. Press the down arrow ▼ button or the up arrow ▲ button to set a stop time.

 **NOTE:** Range is 0 - 60,000 milliseconds. The default is 0.

Table 3-5 Print/stop settings

Duration	Description
0 msec	The leading edge of the paper stops about 10 mm (0.36 in) beyond the silver paper guide of the registration assembly.
100 msec	The leading edge of the paper stops about 24 mm (0.94 in) beyond the silver paper guide of the registration assembly.
500 msec	The leading edge of the paper stops prior to the paper entering the “nip” of the fuser assembly; the nip is the gap between the pressure roller and the hot fusing roller.
1000 msec	The leading edge of the paper stops about 55 mm (2.17 in) beyond the fuser assembly output rollers.
1200 msec	Simplex print operation: The leading edge of the paper stops 100 mm (3.94 in) past the face-down delivery stacker rollers.
1,500 msec	Simplex print operation: The leading edge of the paper stops 5 mm (0.20 in) beyond the output-bin-full sensor flags.
2,500 msec	Duplex print operation: The leading edge of the paper has passed through the fuser assembly and into the output stacker rollers. The paper has now reversed direction and stopped 90 mm (3.55 in) before the leading edge reaches the output-bin-full sensor flags.
3,000 msec	Duplex print operation: The leading edge of the paper has passed through the fuser assembly and into the output stacker rollers. The paper has now reversed direction and entered the duplex accessory. The leading edge of the paper stops about 15 mm (0.59 in) after encountering the duplex media-feed sensor (PS502).

7. Press the **OK** button to start the test.
8. Send a print job to the product. The product will stop printing at the selected time.